# HP ENVY Notebook PC

Maintenance and Service Guide

**Product notice**

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

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

**Software terms**

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 refund subject to the refund policy of your place of purchase.

For any further information or to request a full refund of the computer, please contact your local point of sale (the seller).

# Safety warning notice

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

# Table of contents

# 1 Product description

| Category | Description |
| --- | --- |
| **Product Name** | HP ENVY Notebook PC |
| **Processors** | **5th generation Intel® Core™ i7 Processor (Broadwell U, BGA)** |
| | Intel Core i7-5500U (2.4GHz, turbo up to 3.0GHz), 1600MHz/4MB L3, Dual 15W |
| | **5th generation Intel Core i5 Processor (Broadwell U, BGA)** |
| | Intel Core i5-5200U (2.2GHz, turbo up to 2.7GHz), 1600MHz/3MB L3, Dual 15W |
| **Chipset** | Intel BDW U processor 1-chip BGA |
| **Graphics** | **Internal graphics:** |
| | Intel HD Graphics 5500 |
| | Support for HD decode, DX11, and HDMI |
| | **Hybrid Graphics:** |
| | NVIDIA N16S-GT (GeForce 940M) with 4096 or 2048MB of dedicated video memory |
| | Support for HD decode, DX11, and HDMI |
| | Support GPS (GPU Performance Scaling) |
| | Support Optimus |
| **Panel** | **16:9 ultra wide aspect ratio** |
| | ● 15.6-in, high-definition (HD), white light-emitting diode (WLED), AntiGlare (1366×768), flat - flat(3.8-mm), SVA, eDP; typical brightness 220 nits (non-touch) |
| | ● 15.6-in, high-definition (HD), white light-emitting diode (WLED), BrightView (1366×768), flat - flat (3.8-mm), SVA, eDP; typical brightness 220 nits (touch) |
| | ● 15.6-in, high-definition (FHD), white light-emitting diode (WLED), AntiGlare (1920×1080), slim - flat (3.2-mm), SVA, eDP; typical brightness 220 nits (touch and non-touch) |
| | ● 15.6-in, high-definition (QHD+), white light-emitting diode (WLED), AntiGlare (3200×1800), uslim - flat (3.0-mm), UWVA, eDP; typical brightness 300 nits (touch and non-touch) |
| | Touch solution with flush glass, multitouch enabled |
| **Memory** | Two non-accessible/upgradable memory module slots |
| | DDR3L-1600 dual channel support |
| | Support for 16-GB of system RAM in the following configurations: |
| | ● 16384-MB (8192-MB×2) |
| | ● 12288-MB (8192-MB×1+4096-MB×1) |
| | ● 8192-MB (8192-MB×1, 4096-MB×2) |
| | ● 6144-MB (4096-MB+2048-MB) |
| **Hard drive** | Support for 6.35-cm (2.5-in) SATA hard drives in 7.0-mm (.28-in) and 9.5-mm (.37-in) thickness |
| | Support for M.2 SATA storage (Port 0) (models with i7 processors and 4 GB discrete graphics memory only) |
| | Accelerometer/Hard disk drive protection support/Cool Sense support |

| Category | Description |
|---|---|
| | **Single hard drive configurations:** |
| | ● 2.0-TB, 5400-rpm, 9.5-mm |
| | ● 1.0-TB, 5400-rpm, 9.5-mm |
| | ● 500-GB, 5400-rpm, 7-mm/9.5-mm |
| | **SSHD configurations** |
| | 1TB (5400) + 8GB NAND Hybrid HDD 9.5mm |
| | **Dual Storage Configurations** (models with i7 processors and 4 GB discrete graphics memory only) |
| | 1TB (5400) 9.5mm + 256GB M.2 SATA SSD (TLC) |
| | **SSD configurations: (TLC)** (models with i7 processors and 4 GB discrete graphics memory only) |
| | 256 GB |
| **External optical drive** | **9.0mm tray load - SATA - Optional (not modular)** |
| | DVD+/-RW Double-Layer SuperMulti |
| | Support zero-power optical drive |
| | Support M-disc |
| **Webcam and microphone** | HP TrueVision HD: HD camera - fixed (no tilt) + activity LED, USB 2.0, M-JPEG (1280x720 by 30 frames per second) |
| | Camera with rubber for non-touch with bezel |
| | Camera without rubber for touch with flush glass |
| | Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression |
| | HP Noise Cancellation |
| | Supports Voice Recognition |
| **Audio** | Bang & Olufsen |
| | Quad speakers |
| | Subwoofer |
| **Ethernet** | Integrated 10/100/1000 network interface card (NIC) |
| **Sensor** | Accelerometer (for hard drive protection support/Cool Sense) |
| **Wireless networking** | **Integrated wireless options with dual antennas (M.2/PCIe):** |
| | ● Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 Combo Adapter |
| | ● Intel Dual Band Wireless-AC 7265 802.11 ac 2x2 WiFi + BT 4.0 Combo Adapter (non vPRO) |
| | ● Broadcom BCM43142 802.11 b/g/n 1x1 Wi-Fi + BT4.0 M.2 Combo Adapter |
| | Intel WiDi5.1 support |
| | Compatible with Miracast-certified devices (Windows 8.1) |
| **External media cards** | **HP Multi-Format Digital Media Card Reader** |
| | Supports SD/SDHC/SDXC |
| | Push-Push Insertion/Removal |
| **Internal card expansion** | One M.2 slot for WLAN |

| Category | Description |
|---|---|
| | One M.2 slot for SSD (models with i7 processors and 4 GB discrete graphics memory only) |
| **Ports** | Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected) |
| | AC Smart Pin adapter plug |
| | Headphone/microphone combo jack |
| | HDMI v1.4 supporting up to 1920×1080 @ 60Hz |
| | RJ-45 (Ethernet) |
| | (4) USB 3.0 ports (3 on left side, 1 on right side) |
| **Keyboard/pointing devices** | Full size, backlit, 3 coat paint, island-style keyboard with numeric keypad |
| | Touchpad requirements: |
| | ● Clickpad with image sensor |
| | ● Multitouch gestures enabled (default on: 2-finger scroll, pinch, rotate, 2-finger click, 3-finger flick) |
| | ● Support Win8 Modern Trackpad Gestures |
| | ● Taps enabled as default |
| **Power requirements** | Support for the following AC adapter: |
| | ● 90-W (models with QC UMA graphics memory or 4 GB discrete graphics memory) |
| | ● 65-W (models with 2 GB discrete graphics memory; worldwide except for India and the People's Republic of China) |
| | ● 65-W EM (models with 2 GB discrete graphics memory; for India and the People's Republic of China) |
| | ● 45-W (models with DC UMA graphics memory) |
| | 1 meter power cord |
| | Support for the following battery: |
| | ● 3-cell, 55.5-Wh, 4.85-Ah, Li-ion battery |
| | Battery life enhancement |
| | Support battery fast charge |
| **Security** | Support for the following: |
| | ● Kensington Security Lock |
| | ● Fingerprint reader with software support (HP Simple Pass) |
| **Operating system** | **Preinstalled:** |
| | Windows 10 |
| | Windows 10 Professional |
| | Windows 10 High End |
| | Windows 8.1 |
| | Windows 8.1 Professional |
| | Windows 8.1 (CPPP) |
| | Windows 7 Professional (non-touch models only) |

| Category | Description |
|---|---|
| | FreeDOS 2.0 (non-touch models only) |
| Serviceability | **End user replaceable parts:** |
| | • AC adapter |
| | • Optical drive |

# 2    External component identification

## Display



| Component | | Description |
|---|---|---|
| **(1)** | Internal display switch | Turns off the display and initiates Sleep if the display is closed while the power is on. |
| | | **NOTE:**   The internal display switch is not visible from the outside of the computer. |
| **(2)** | Internal microphones (2) | Record sound. |
| **(3)** | Webcam light | On: The webcam is in use. |
| **(4)** | Webcam<br><br>– or –<br><br>3D camera (Select products only) | Records video and captures photographs. Some models allow you to video conference and chat online using streaming video.<br><br>To use the webcam or 3D camera:<br><br>▲   **Windows 7**: To use the webcam, select **Start > All Programs > Communication and Chat > CyberLink YouCam**.<br><br>**Windows 8.1:**<br><br>▲   From the Start screen, type `camera`, and then select **Camera** from the list of applications.<br><br>**Windows 10:**<br><br>▲   Type `camera` in the taskbar search box, and then select **Camera**. |

| Component | | Description |
|---|---|---|
| | | **NOTE:** A 3D camera captures 3D images and displays them on the computer screen. It includes additional hardware (a 3D camera sensor and a 3D laser projector) plus special software. To learn more about using a 3D camera, open the Intel RealSense app **Welcome to Intel RealSense**. To access the 3D camera apps, go to the **Intel RealSense Technology** app. |
| **(5)** | WLAN antennas (2)* | Send and receive wireless signals to communicate with wireless local area networks (WLANs). |

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this document in **Windows 7**: Select **Start > HP Support Assistant > Next > My computer > User Guides**.

To access this document in **Windows 8.1**:

From the Start screen, type `support`, and then select the **HP Support Assistant** app.

– or –

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

To access this document in **Windows 10**:

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

# Top

## TouchPad
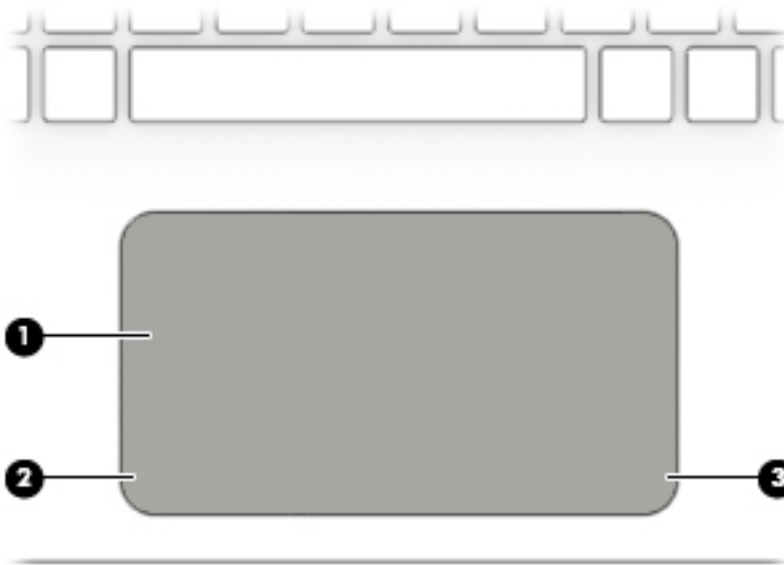


| Component | | Description |
|---|---|---|
| **(1)** | TouchPad zone | Reads your finger gestures to move the pointer or activate items on the screen. |
| **(2)** | Left TouchPad button | Functions like the left button on an external mouse. |
| **(3)** | Right TouchPad button | Functions like the right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

# Lights



| Component | | Description |
|---|---|---|
| **(1)** | Power light | • On: The computer is on. |
| | | • Blinking: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components. |
| | | • Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power. |
| **(2)** | Mute light | • Amber: Computer sound is off. |
| | | • Off: Computer sound is on. |
| **(3)** | Caps lock light | On: Caps lock is on, which switches the keys to all capital letters. |
| **(4)** | Fingerprint reader light (select models only) | • White: The fingerprint was read. |
| | | • Amber: The fingerprint was not read. |

# Buttons, speakers, and fingerprint reader (select models only)

| Component | | Description |
|---|---|---|
| **(1)** | Power button | • When the computer is off, press the button to turn on the computer. |
| | | • When the computer is on, press the button briefly to initiate Sleep. |
| | | • When the computer is in the Sleep state, press the button briefly to exit Sleep. |
| | | • When the computer is in Hibernation, press the button briefly to exit Hibernation. |
| | | **CAUTION:** Pressing and holding down the power button results in the loss of unsaved information. |
| | | If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. |
| | | To learn more about your power settings, see your power options. |
| | | **Windows 7:** |
| | | Select **Start > Control Panel > System and Security > Power Options**. |
| | | **Windows 8.1**:: |
| | | ▲ From the Start screen, type `power`, select **Power and sleep settings**, and then select **Power and sleep** from the list of applications. |
| | | – or – |

| Component | | Description |
|---|---|---|
| | | From the Windows desktop, right-click the **Start** button, and then select **Power Options**. |
| | | **Windows 10**: |
| | | ▲ Type `power` in the taskbar search box, and then select **Power and sleep settings**. |
| | | – or – |
| | | Right-click the **Start** button, and then select **Power Options**. |
| **(2)** | Speakers (2) | Produce sound. |
| **(3)** | Fingerprint reader (select models only) | Allows a fingerprint logon to Windows, instead of a password logon. |

# Keys



| Component | | Description |
|---|---|---|
| **(1)** | esc key | Displays system information when pressed in combination with the fn key. |
| **(2)** | fn key | Executes frequently used system functions when pressed in combination with the esc key or the spacebar. |
| **(3)** | Windows key | **Windows 7:** Displays the Start menu. |
| | | **Windows 8.1:** Returns you to the Start screen from an open app or the Windows desktop. |
| | | **NOTE:** Pressing the Windows key again will return you to the previous screen. |
| | | **Windows 10:** 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 models, the f5 action key turns the radiance backlight keyboard feature off or on. |
| **(5)** | num lock key | Turns the embedded numeric keypad on and off when pressed in combination with the fn key. |
| | | Alternates between the navigational and numeric functions on the integrated numeric keypad. |
| **(6)** | Integrated numeric keypad | When num lock has been enabled, the keypad can be used like an external numeric keypad. |

# Left side



| Component | | Description |
|---|---|---|
| **(1)** | Power connector | Connects an AC adapter. |
| **(2)** | AC adapter/battery light | • White: The AC adapter is connected and the battery is fully charged.<br><br>• Blinking white: The AC adapter is disconnected and the battery has reached a low battery level.<br><br>• Amber: The AC adapter is connected and the battery is charging.<br><br>• Off: The battery is not charging. |
| **(3)** | RJ-45 (network) jack/lights | Connects a network cable.<br><br>• White: The network is connected.<br><br>• Amber: Activity is occurring on the network. |
| **(4)** | HDMI port | Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device. |
| **(5)** | USB 3.0 ports (2) | Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. |
| **(6)** | USB 3.0 charging (powered) port | Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. Standard USB ports will not charge all USB devices or will charge using a low current. Some USB devices require power and require you to use a powered port.<br><br>**NOTE:**   USB charging ports can also charge select models of cell phones and MP3 players, even when the computer is off. |
| **(7)** | Audio-out (headphone)/Audio-in (microphone) jack | Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional microphone-only devices. |

| Component | | Description |
|---|---|---|
| | | **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 document: |
| | | **Windows 8.1:** |
| | | From the Start screen, type `support`, and then select the **HP Support Assistant** app. |
| | | – or – |
| | | From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar. |
| | | **Windows 10:** |
| | | Select **Start**, select **All apps**, select **HP Help and Support**, and then select **HP Documentation**. |
| | | **NOTE:**   When a device is connected to the jack, the computer speakers are disabled. |
| | | **NOTE:**   Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone). |
| **(8)** | SD | Memory card reader | Reads optional memory cards that enable you to store, manage, share or access information. |
| | | To insert a card: |
| | | 1.   Hold the card label-side up, with connectors facing the computer. |
| | | 2.   Insert the card into the memory card reader, and then press in on the card until it is firmly seated. |
| | | To remove a card: |
| | | ▲   Press in on the card, and then remove it from the memory card reader. |

# Right side



| Component | | Description |
|---|---|---|
| **(1)** ⏻ | Power light | ● On: The computer is on.<br><br>● Blinking: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components.<br><br>● Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power. |
| **(2)** | Hard drive light | ● Blinking white: The hard drive is being accessed.<br><br>● Amber: HP 3D DriveGuard (select models only) has temporarily parked the hard drive. |
| **(3)** | Security cable slot | Attaches an optional security cable to the computer.<br><br>**NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. |
| **(4)** | Optical drive (select models only) | Depending on your computer model, reads an optical disc or reads and writes to an optical disc.<br><br>**NOTE:** For disc compatibility information, go to the Help and Support web page. Follow the web page instructions to select your computer model. Select **Drivers & Downloads**, and then follow the on-screen instructions. |
| **(5)** | Optical drive eject button (select models only) | Releases the disc tray. |
| **(6)** SS⇌ | USB 3.0 port | Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. |

# Bottom
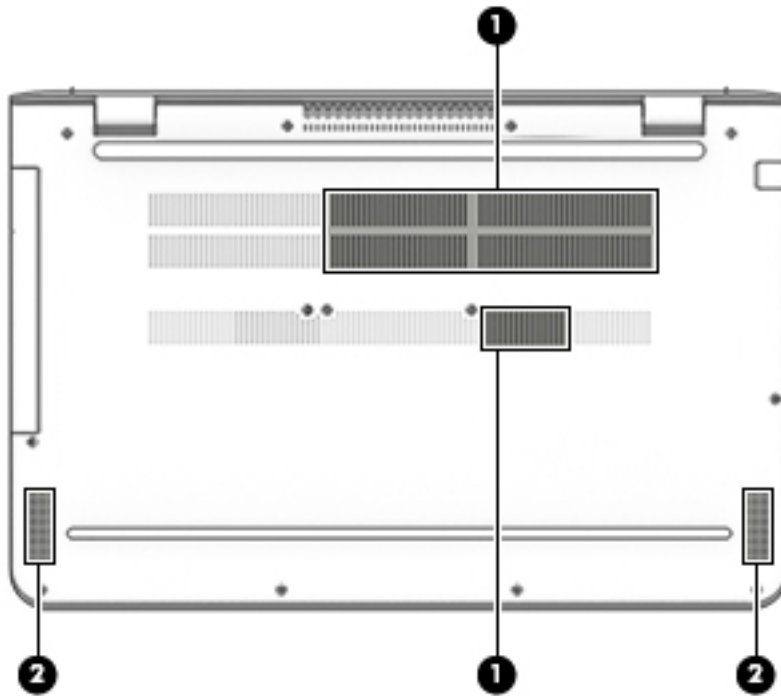


| Component | | Description |
|---|---|---|
| **(1)** | Vents (2) | Enable airflow to cool internal components. |
| | | **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.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

# Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.
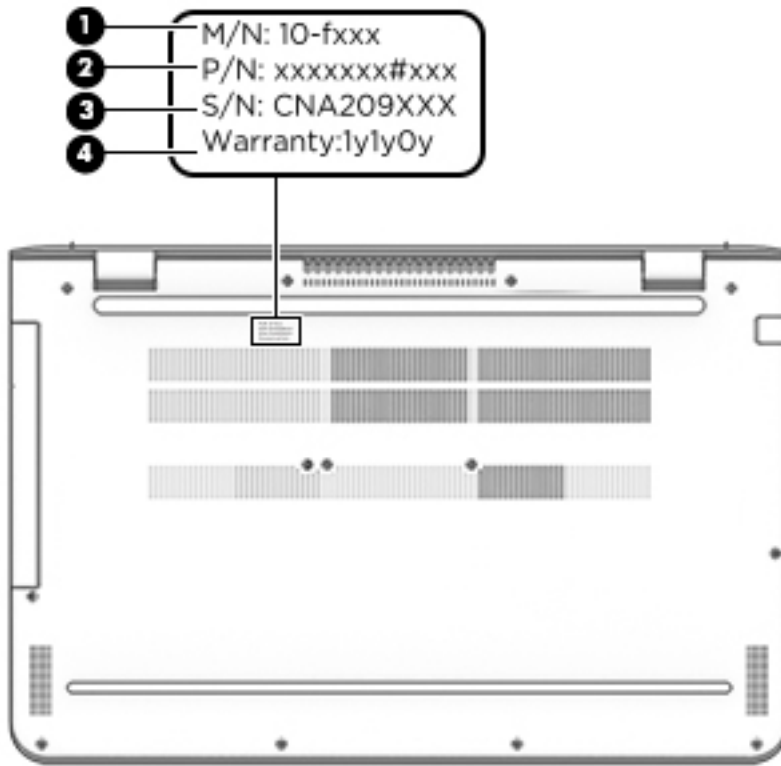
| Item | Description | Function |
|------|-------------|----------|
| **(1)** | Model description | This is the alphanumeric identifier used to locate documents, drivers, and support for the computer. |
| **(2)** | Part number/Product number (p/n) | This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed. |
| **(3)** | Serial number (s/n) | This is an alphanumeric identifier that is unique to each product. |
| **(4)** | Warranty period | This number describes the duration of the warranty period for the computer for each of the following categories:<br><br>• Defective part replacement<br><br>• HP authorized technician labor<br><br>• Repairs performed at customer site for those parts not eligible for Customer Self Repair (CSR) |

# 3 Illustrated parts catalog

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

## Computer major components
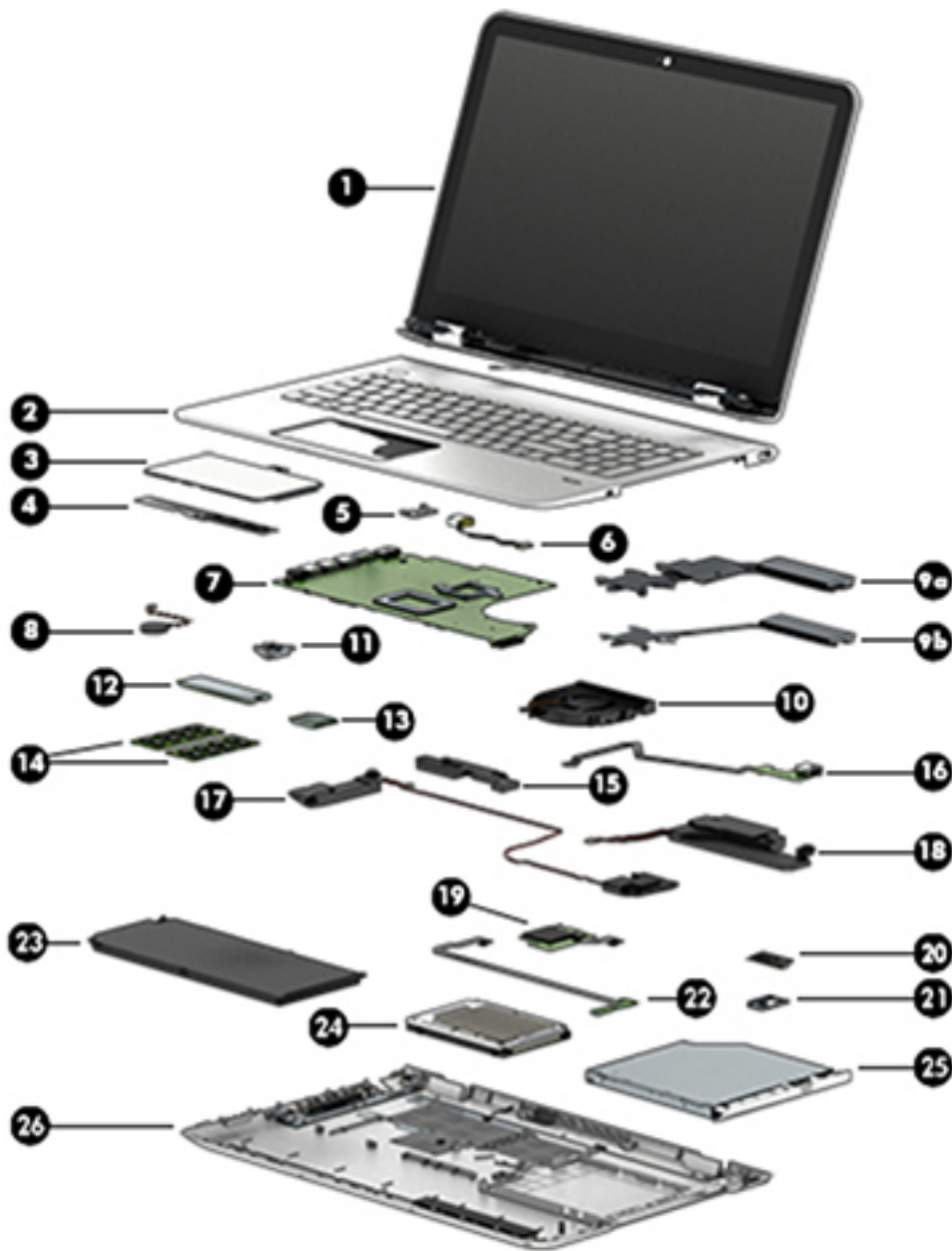
| Item | Component | Spare part number |
|------|-----------|-------------------|
| **(1)** | **Display assembly** (includes webcam/microphone module and wireless antenna cables): | |
| **(2)** | **Top cover with keyboard** | |
| | **NOTE:** For a list of country code suffixes for the top cover/keyboard spare part numbers listed below, see Bottom cover on page 35. | |
| | For use in models without fingerprint reader | 812692-xx1 |
| | For use in models with a fingerprint reader | 812726-xx1 |
| **(3)** | **TouchPad assembly** | 818040-001 |
| **(4)** | **Touchpad support bracket** | 818042-001 |
| | **Power connector cable kit** | 812681-001 |
| **(5)** | Power connector bracket | |
| **(6)** | Power connector cable | |
| **(7)** | **System board** (includes replacement thermal material) | |
| | All system boards use the following part numbers: | |
| | xxxxxx-001: No-Windows operating systems | |
| | xxxxxx-601: Windows 8.1 or Windows 10 operating system | |
| | Includes Intel Core i7-5500U processor and 4 GB of discrete graphics memory | 812712-xxx |
| | Includes Intel Core i7-5500U processor and 2 GB of discrete graphics memory | 812710-xxx |
| | Includes Intel Core i7-5500U processor and UMA graphics memory | 812713-xxx |
| | Includes Intel Core i5-5200U processor and 4 GB of discrete graphics memory | 812711-xx |
| | Includes Intel Core i5-5200U processor and 2 GB of discrete graphics memory | 812709-xxx |
| | Includes Intel Core i5-5200U processor and UMA graphics memory | 837094-xxx |
| **(8)** | **RTC battery** | 819504-001 |
| | **Heat sink** (includes replacement thermal material): | |
| **(9a)** | For use in models with discrete graphics | 812684-001 |
| **(9b)** | For use in models with UMA graphics | 812683-001 |
| | Includes fan, for use in models with UMA graphics | 830002-001 |
| **(10)** | **Fan** (includes cable) | 812682-001 |
| **(11)** | **RJ-45 door** | |
| | For use in models without an optical drive | 812701-001 |
| | For use in models with an optical drive | 818652-001 |
| **(12)** | **Solid-state drive** (M.2) | |
| | 256 GB | 812708-001 |
| | 128 GB, 2280 M.2 | 829985-001 |
| | 128 GB (Best Buy SKUs) | 820547-001 |
| **(13)** | **WLAN module** | |

| Item | Component | Spare part number |
|------|-----------|-------------------|
| | Broadcom BCM43142 802.11 b/g/n 1x1 Wi-Fi + BT4.0 M.2 Combo Adapter | 792608-005 |
| | Realtek RTL8723BE 802.11b/g/n 1x1 Wi-Fi + BT4.0 Combo Adapter | 784644-005 |
| | Intel Dual Band Wireless-AC 7265 802.11 ac 2x2 WiFi + BT 4.0 Combo Adapter (non vPRO) | 793840-005 |
| | Intel Dual Band Wireless-AC 3165 802.11 ac 1x1 WiFi + BT 4.0 Combo Adapter | 806723-005 |
| **(14)** | **Memory module** (PC3L-1600) | |
| | 8-GB | 693374-005 |
| | 4-GB | 691740-005 |
| | 2-GB | 691739-005 |
| **(15)** | **Rear speaker** | 812706-001 |
| **(16)** | **USB board** | 812695-001 |
| **(17)** | **Front speaker** | 812705-001 |
| **(18)** | **Subwoofer** | 812707-001 |
| **(19)** | **Card reader board** | 812694-001 |
| **(20)** | **Fingerprint reader board** | 818089-001 |
| **(21)** | **Fingerprint reader bracket** | 812700-001 |
| **(22)** | **LED board** (includes cable) | 812696-001 |
| **(23)** | **Battery** (Li-ion) | |
| | 3-cell, 48-Wh, 4.21-Ah (Best Buy SKUs) | 807417-005 |
| | 3-cell, 55-Wh, 4.56-Ah | 805094-005 |
| **(24)** | **Hard drive** (does not include hard drive bracket or hard drive connector cable): | |
| | 2.0 TB, 5400 rpm, 9.5-mm | 801808-005 |
| | 1.0 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm | 731999-005 |
| | 1.0 TB, 5400 rpm, 9.5-mm | 833907-005 |
| | 750 GB, 5400 rpm, 9.5-mm (Best Buy SKUs) | 778190-005 |
| | 500 GB, 5400 rpm, 7.0-mm | 778186-005 |
| | **Hard Drive Hardware Kit** (not illustrated, includes hard drive bracket and screws) | 812686-001 |
| | The hard drive connector cable is available using spare part number 812697-001. | |
| **(25)** | **DVD+/-RW Double-Layer SuperMulti Drive** | 812693-001 |
| **(26)** | **Base enclosure** | |
| | For use in models without an optical drive | 812672-001 |
| | For use in models with an optical drive | 812673-001 |

# Mass storage devices
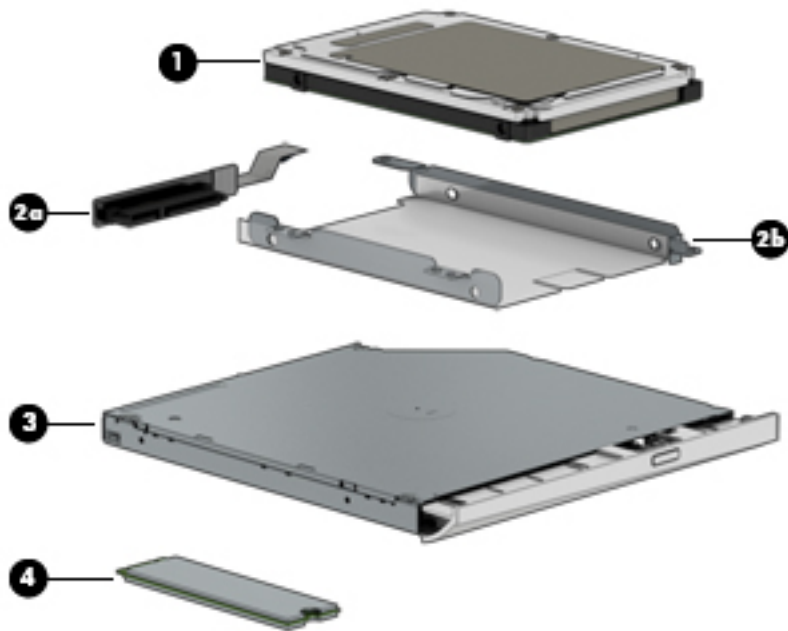


| Item | Component | Spare part number |
|------|-----------|-------------------|
| **(1)** | **Hard drive** (does not include hard drive bracket or hard drive connector cable): | |
| | 2.0 TB, 5400 rpm, 9.5-mm | 801808-005 |
| | 1.0 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm | 731999-005 |
| | 1.0 TB, 5400 rpm, 9.5-mm | 833907-005 |
| | 750 GB, 5400 rpm, 9.5-mm (Best Buy SKUs) | 778190-005 |
| | 500 GB, 5400 rpm, 7.0-mm | 778186-005 |
| **(2a)** | **Hard drive connector cable** | 812697-001 |
| | **Hard Drive Hardware Kit**, includes: | 812686-001 |
| **(2b)** | Hard drive bracket | |
| | Screws (not illustrated) | |
| **(3)** | **DVD+/-RW Double-Layer SuperMulti Drive** | 812693-001 |
| **(4)** | **Solid-state drive** (M.2, TLC) | |
| | 256 GB | 812708-001 |
| | 128 GB, 2280 M.2 | 829985-001 |
| | 128 GB (Best Buy SKUs) | 820547-001 |
| | **External USB DVD±RW Double-Layer with SuperMulti Drive** (not illustrated) | 747080-001 |

# Display assembly subcomponents – touch screen
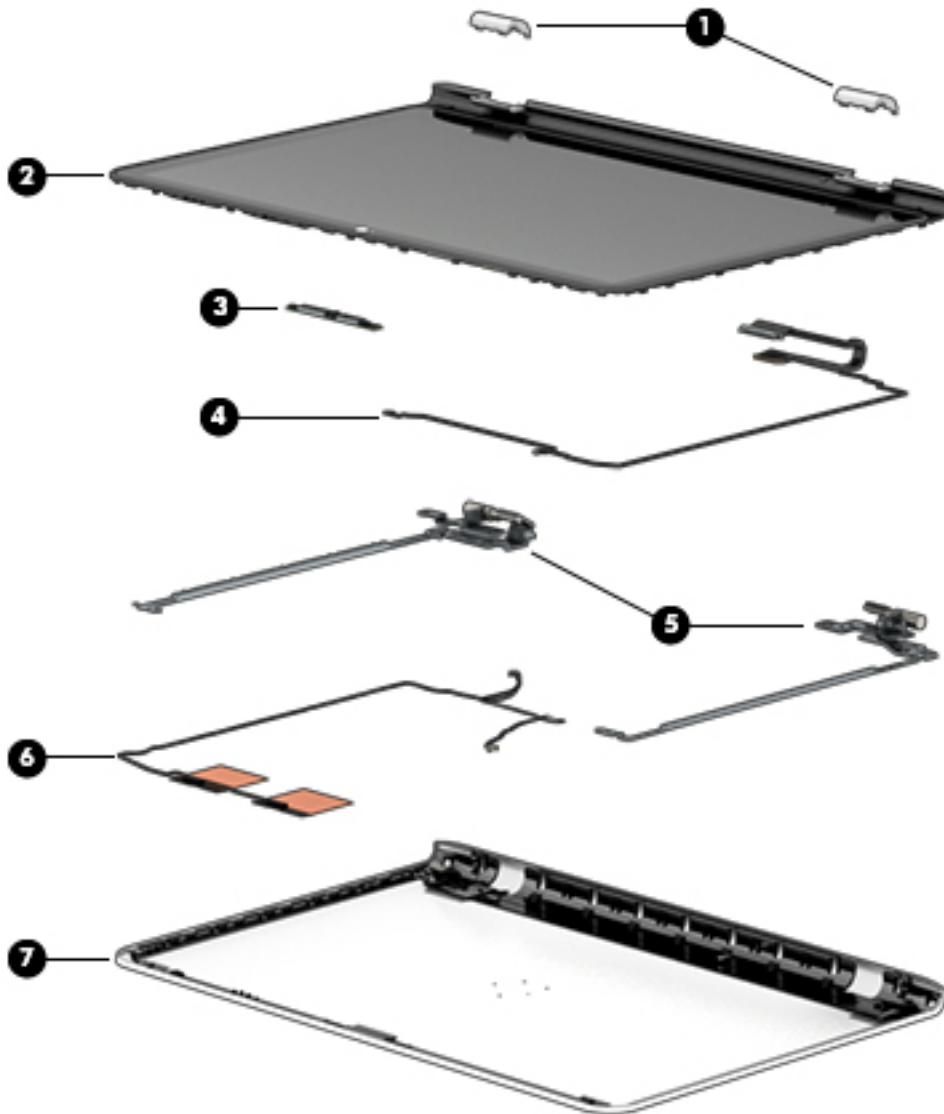


| Item | Component | Spare part number |
|------|-----------|-------------------|
| **(1)** | **Hinge covers** (left and right) | 812699-001 |
| **(2)** | **Raw display panel** (39.6-cm [15.6-in]; includes touch panel, touch board, bezel, rubber supports, display cable, webcam, and screws) | |
| | HD | 812689-001 |
| | FHD | 812690-001 |
| | QHD+ | 812691-001 |
| **(3)** | **Webcam module** | 812715-001 |
| **(4)** | **Display/webcam cable** | |
| | FHD touch screen models | 812676-001 |

| Item | Component | Spare part number |
|------|-----------|-------------------|
|      | QHD+ touch screen models | 812678-001 |
| **(5)** | **Hinges** (left and right, includes Mylar screw covers) | 812688-001 |
| **(6)** | **Antennas** (includes wireless antenna cables and transceivers) | 812669-001 |
| **(7)** | **Display enclosure** | 812671-001 |

# Display assembly subcomponents – non-touch screen
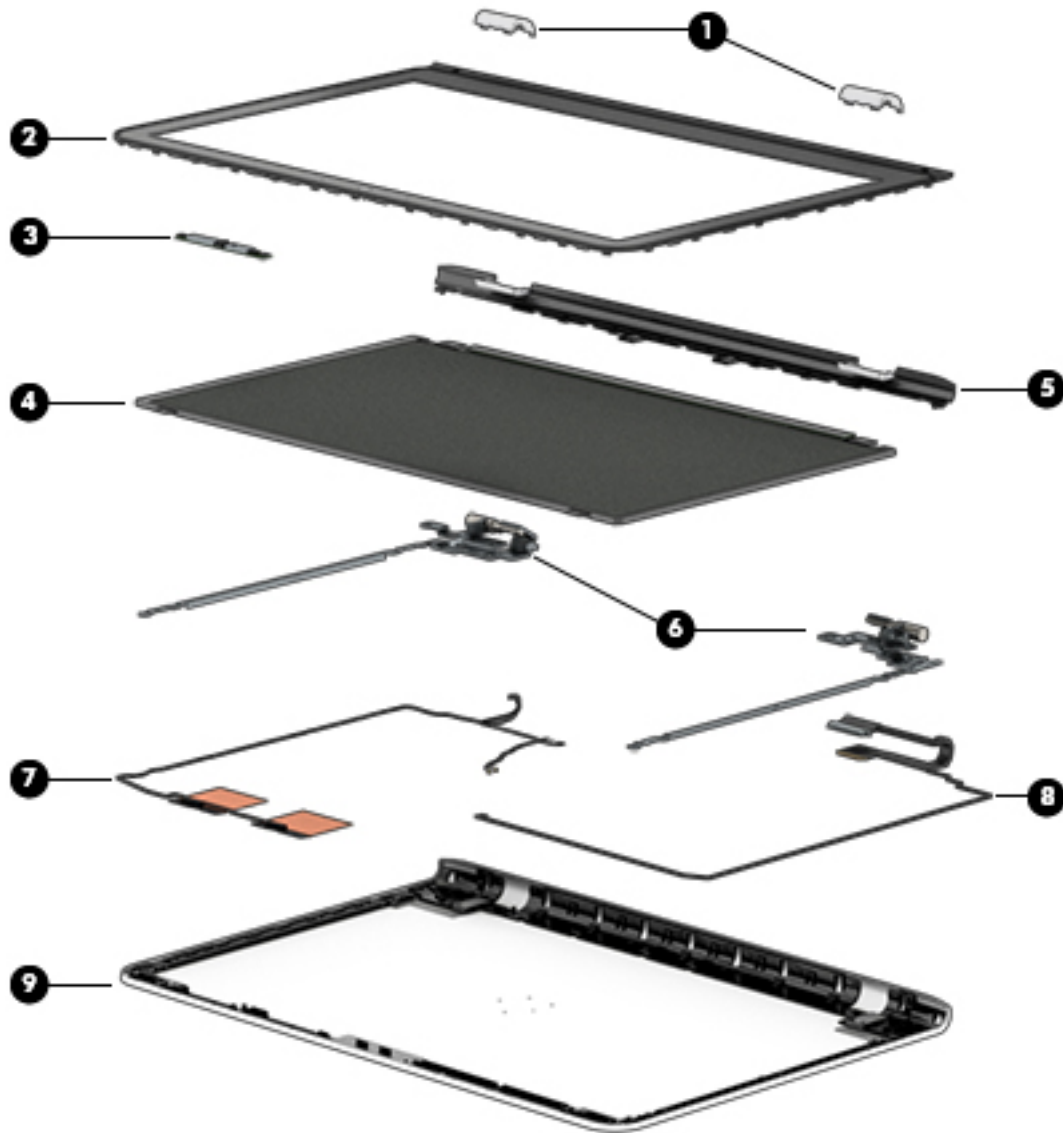


| Item | Component | Spare part number |
|------|-----------|-------------------|
| **(1)** | **Hinge covers** (left and right) | 812698-001 |
| **(2)** | **Bezel** | 812674-001 |

| Item | Component | Spare part number |
|------|-----------|-------------------|
| **(3)** | **Webcam module** | 812714-001 |
| **(4)** | **Raw display panel** (39.6-cm [15.6-in]; includes touch panel, touch board, bezel, rubber supports, display cable, webcam, and screws) | |
| | HD, BrightView | 812702-001 |
| | FHD, antiglare | 812703-001 |
| | QHD+, antiglare | 812704-001 |
| | UWVA, FHD, antiglare | 830003-001 |
| | UWVA, UHD, BrightView | 830511-001 |
| **(5)** | **Bezel trim** | 818043-001 |
| **(6)** | **Hinges** (left and right, includes Mylar screw covers) | 812687-001 |
| | For use with HD or FHD displays | 812687-001 |
| | For use with QHD+ displays | 823127-001 |
| **(7)** | **Antennas** (includes wireless antenna cables and transceivers) | 812668-001 |
| **(8)** | **Display/webcam cable** | |
| | For use with HD or FHD displays | 812675-001 |
| | For use with QHD+ displays | 812677-001 |
| | For use with UHD displays | 833581-001 |
| **(9)** | **Display enclosure** | |
| | For use with HD or FHD displays | 812670-001 |
| | For use with QHD+ displays | 823126-001 |
| | **LCD bracket** for use with QHD non-touch screen models | 825529-001 |

# Cables
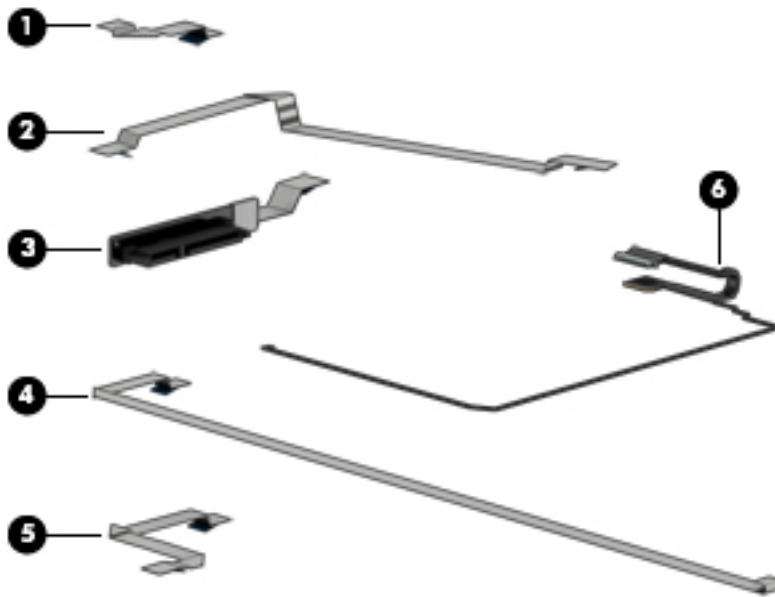


| Item | Component | Spare part number |
|------|-----------|-------------------|
| **(1)** | **Card reader board cable** | 812680-001 |
| **(2)** | **USB board cable** | 812679-001 |
| **(3)** | **Hard drive cable** | 812697-001 |
| **(4)** | **Fingerprint reader cable** (not illustrated) | 818039-001 |
| **(5)** | **Touchpad cable** | 818041-001 |
| **(6)** | **Display cable** | |
| | FHD touch screen models | 812676-001 |
| | FHD non-touch screen models | 812675-001 |
| | QHD+ touch screen models | 812678-001 |
| | QHD+ non-touch screen models | 812677-001 |
| | UHD non-touch screen models | 833581-001 |

# Miscellaneous parts

| Component | Spare part number |
|---|---|
| **AC adapter:** | |
| 45-W HP Smart AC adapter | 741727-001 |
| 65-W HP Smart AC adapter for use only in all countries and regions except for India and the People's Republic of China | 710412-001 |
| 65-W HP Smart AC adapter for use only in India and the People's Republic of China | 714657-001 |
| 90-W HP Smart AC adapter | 710413-001 |
| **HDMI-to-VGA adapter** | 701943-001 |
| **Power cord** (3-pin, black, 1.00-m): | |
| For use in Australia | 755530-011 |
| For use in Denmark | 755530-081 |
| For use in Europe, the Middle East, and Africa | 755530-021 |
| For use in India | 755530-D61 |
| For use in Italy | 755530-061 |
| For use in Japan | 755530-291 |
| For use in North America | 755530-001 |
| For use in the People's Republic of China | 755530-AA1 |
| For use in South Africa | 755530-AR1 |
| For use in South Korea | 755530-AD1 |
| For use in Switzerland | 755530-111 |
| For use in Taiwan | 755530-AB1 |
| For use in Thailand | 755530-201 |
| For use in the United Kingdom | 755530-031 |
| **Screw Kit** | 818086-001 |

# 4 Removal and replacement procedures preliminary requirements

## Tools required

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

- Flat-bladed screw driver
- Magnetic screw driver
- Phillips P0 and P1 screw drivers

## Service considerations

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

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

## Plastic parts

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

## Cables and connectors

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

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

## Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

# Grounding guidelines

## Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

| Typical electrostatic voltage levels | | | |
|---|---|---|---|
| | Relative humidity | | |
| Event | 10% | 40% | 55% |
| Walking across carpet | 35,000 V | 15,000 V | 7,500 V |
| Walking across vinyl floor | 12,000 V | 5,000 V | 3,000 V |
| Motions of bench worker | 6,000 V | 800 V | 400 V |
| Removing DIPS from plastic tube | 2,000 V | 700 V | 400 V |
| Removing DIPS from vinyl tray | 11,500 V | 4,000 V | 2,000 V |
| Removing DIPS from 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 for Customer Self-Repair parts

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

📝 **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.

## Component replacement procedures

📝 **NOTE:** Please read and follow the procedures described here to access and replace Customer Self-Repair parts successfully.

📝 **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 Service tag on page 16 for details.

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

# Optical drive

**NOTE:** Optical drive spare part kits include bracket and bezel.

| Description | Spare part number |
|---|---|
| DVD+/-RW Double-Layer SuperMulti Drive | 812693-001 |

Before removing the optical 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.

To remove the optical drive:

1.  Remove the Phillips PM2.5×8.0 screw **(1)** that secures the optical drive to the computer.

2.  Remove the optical drive **(2)** by sliding it out of the optical drive bay.
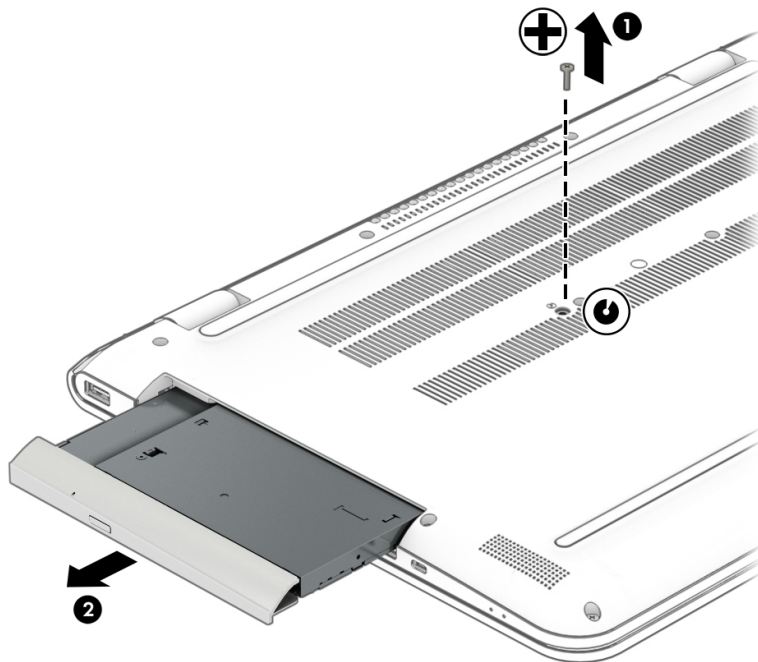
**3.** If it is necessary to replace the bracket on the rear of the optical drive, remove the two Phillips PM2.0×3.0 screws **(1)** that secure the bracket to the drive, and then remove the bracket **(2)**.
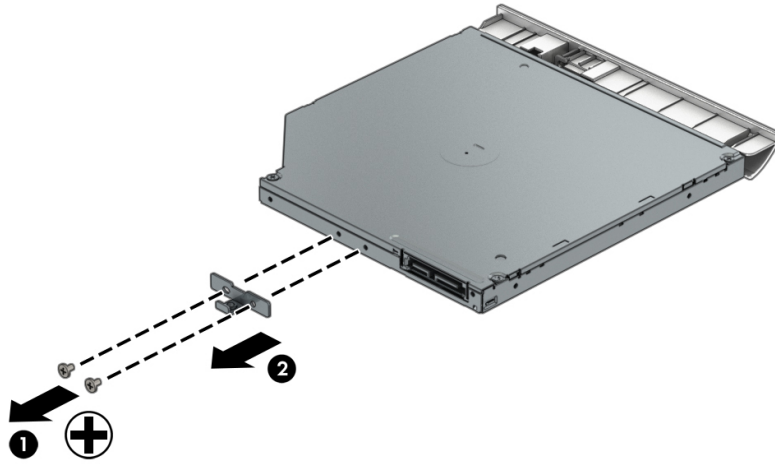
Reverse this procedure to reassemble and install the optical drive.

# 6 Removal and replacement procedures for Authorized Service Provider 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.

**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.

## Component replacement procedures

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

There are as many as 75 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

# Bottom cover

In this section, the first table provides the main spare part number for the top covers/keyboards. The second table provides the country code suffixes for the spare part number.

| Description | Spare part number |
|---|---|
| Bottom cover for use in models without an optical drive | 812672-001 |
| Bottom cover for use in models with an optical drive | 812673-001 |
| Top cover with keyboard for use in models without a fingerprint reader | 812692-xx1 |
| Top cover with keyboard for use in models with a fingerprint reader | 812726-xx1 |

| For use in country or region | Spare part number | For use in country or region | Spare part number | For use in country or region | Spare part number |
|---|---|---|---|---|---|
| Belgium | -A41 | Italy | -061 | South Korea | -AD1 |
| Bulgaria | -261 | Japan | -291 | Spain | -071 |
| Canada | -DB1 | Latin America | -161 | Switzerland | -BG1 |
| Czech Republic and Slovakia | -FL1 | The Netherlands | -B31 | Taiwan | -AB1 |
| Denmark, Finland, and Norway | -DH1 | Portugal | -131 | Thailand | -281 |
| France | -051 | Romania | -271 | Turkey | -141 |
| Germany | -041 | Russia | -251 | United Kingdom | -031 |
| Greece | -151 | Saudi Arabia | -171 | United States | -001 |
| Hungary | -211 | Slovenia | -BA1 | | |

Before removing the bottom cover, follow these steps:

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

**2.** Disconnect the power from the computer by unplugging the power cord from the computer.

**3.** Disconnect all external devices from the computer.

Remove the bottom cover:

**1.** Remove the eight Phillips PM2.5×8.0 screws that secure the bottom cover to the computer.
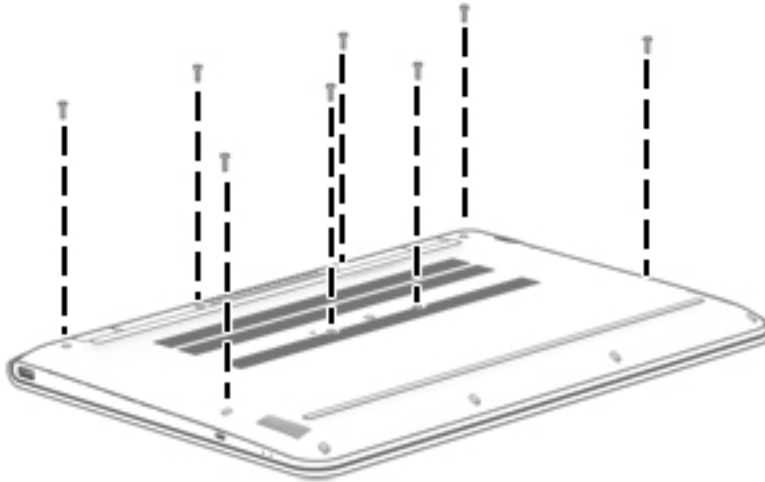
2.  Remove the four Phillips PM2.5×4.0 screws that secure the bottom cover to the computer.
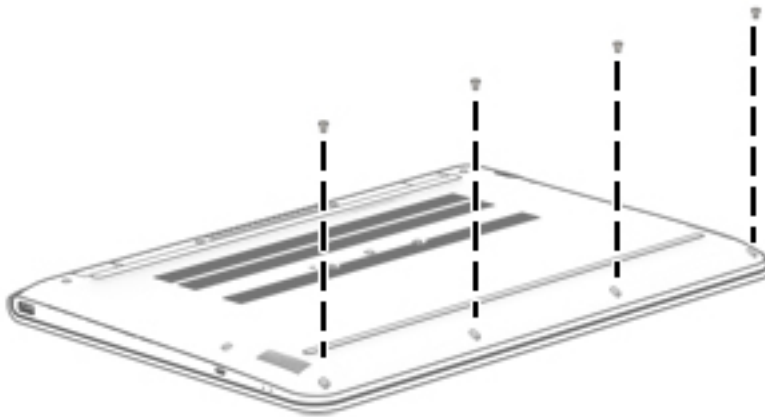
**3.** Remove the bottom cover by working your way around and prying to disengage bottom cover from computer.
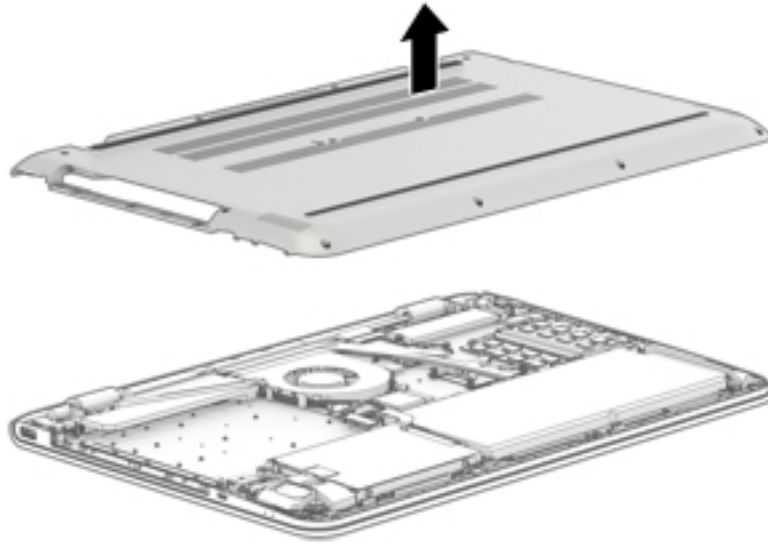
Reverse this procedure to install the bottom cover.

## WLAN module

| Description | Spare part number |
| --- | --- |
| Broadcom BCM43142 802.11 b/g/n 1x1 Wi-Fi + BT4.0 M.2 Combo Adapter | 792608-005 |
| Realtek RTL8723BE 802.11b/g/n 1x1 Wi-Fi + BT4.0 Combo Adapter | 784644-005 |
| Intel Dual Band Wireless-AC 7265 802.11 ac 2x2 WiFi + BT 4.0 Combo Adapter (non vPRO) | 793840-005 |
| Intel Dual Band Wireless-AC 3165 802.11 ac 1x1 WiFi + BT 4.0 Combo Adapter | 806723-005 |

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

Before removing the WLAN module, follow these steps:

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

2.  Disconnect the power from the computer by unplugging the power cord from the computer.

3.  Disconnect all external devices from the computer.

4.  Remove the bottom cover (see ).

5.  Disconnect the battery.



Remove the WLAN module:

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

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

2.  Remove the Phillips PM2.0×2.5 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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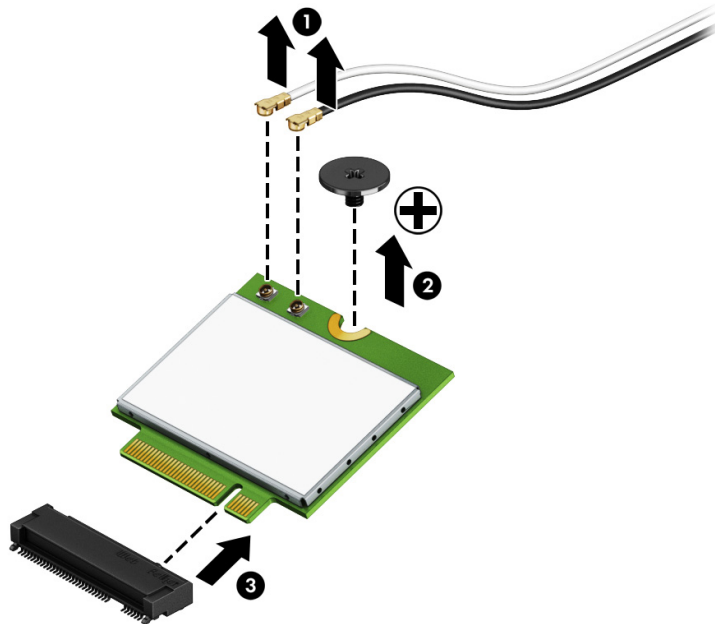


**NOTE:** If the WLAN antenna cables are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.
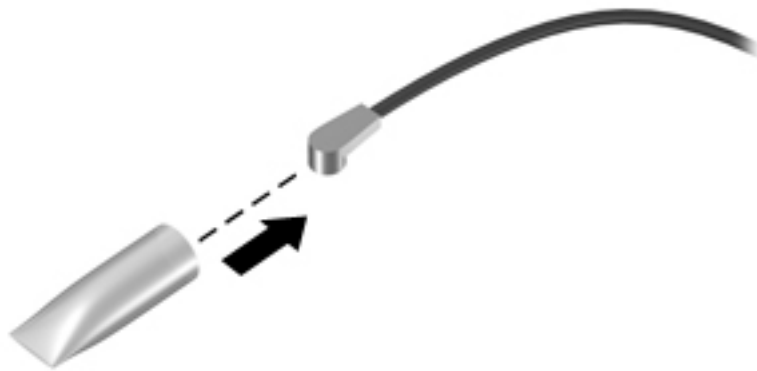


Reverse this procedure to install the WLAN module.

# Memory module

| Description | Spare part number |
| --- | --- |
| 8-GB (PC3L-1600) | 693374-005 |
| 4-GB (PC3L-1600) | 691740-005 |
| 2-GB (PC3L-1600) | 691739-005 |

**Update BIOS before adding memory modules**

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

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

To update BIOS:

1. Navigate to www.hp.com.

2. Click **Support & Drivers > click Drivers & Software**.

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

4. Click the link for the computer model.

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

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

7. Click the link for the most recent BIOS.

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

Before removing a memory module, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

**5.** Disconnect the battery.

Remove the memory module:

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

**2.** Remove the memory module **(2)** by pulling the module away from the slot at an angle.
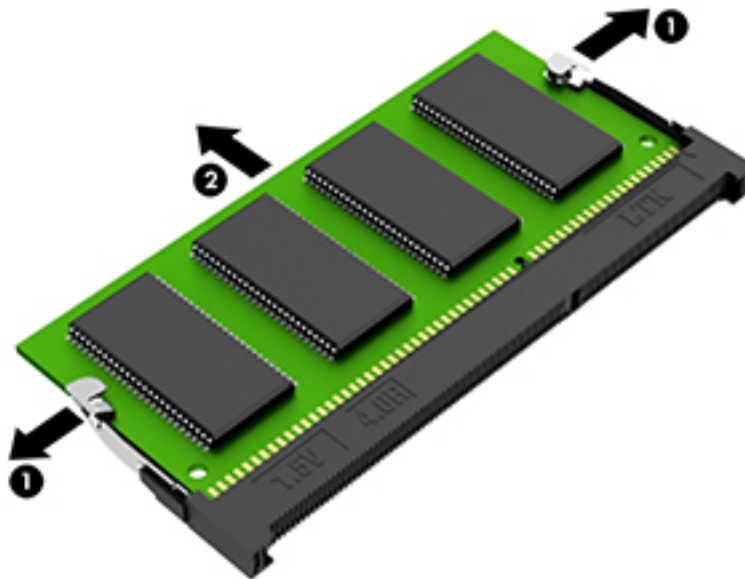
Reverse this procedure to install a memory module.

## Solid-state drive (M.2)

| Description | Spare part number |
|---|---|
| 256 GB solid-state drive, M.2, TLC | 812708-001 |
| 128 GB, 2280 M.2 | 829985-001 |
| 128 GB solid-state drive, M.2, TLC (Best Buy SKUs) | 820547-001 |

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

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

2.  Disconnect the power from the computer by unplugging the power cord from the computer.

3.  Disconnect all external devices from the computer.

4.  Remove the bottom cover (see Bottom cover on page 35).

5.  Disconnect the battery.



Remove the solid-state drive:

1.  Remove the Phillips PM2.0×3.5 screw **(1)** that secures the solid-state drive to the system board.

2.  Remove the solid-state drive **(2)** by pulling the drive away from the slot at an angle.

Reverse this procedure to install the solid-state drive.

# RJ-45 door

| Description | Spare part number |
|---|---|
| RJ-45 door for use in models without an optical drive | 812701-001 |
| RJ-45 door for use in models with an optical drive | 818652-001 |

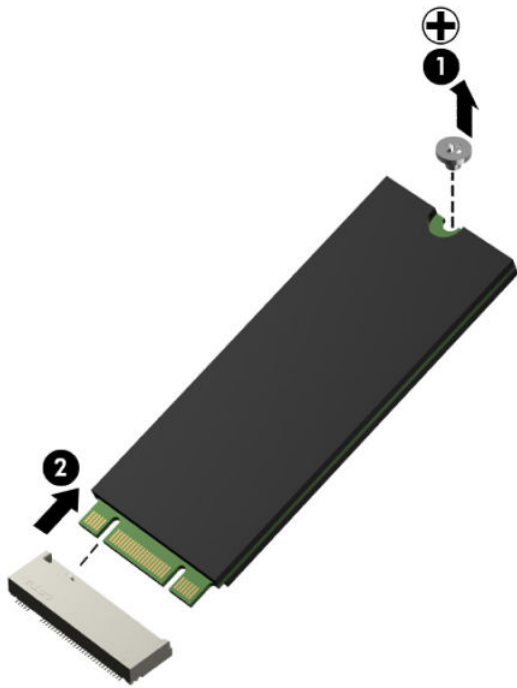Before removing the RJ-45 door, follow these steps:

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

2.    Disconnect the power from the computer by unplugging the power cord from the computer.

3.    Disconnect all external devices from the computer.

4.    Remove the bottom cover (see ).

5.    Disconnect the battery.



Remove the RJ-45 door:

1.    Remove the two Phillips PM2.0×5.0 screws **(1)** that secure the RJ-45 door to the computer.

**2.** Remove the RJ-45 door **(2)**.



Reverse this procedure to install the RJ-45 door.

# Fan

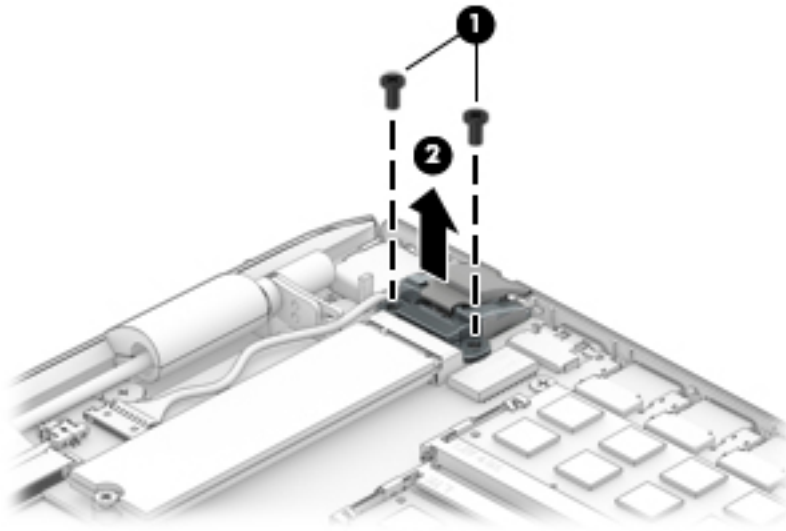| Description | Spare part number |
|---|---|
| Fan (includes cable) | 812682-001 |

Before removing the fan, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Disconnect the battery.



Remove the fan:

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

2. Remove the two Phillips PM2.5×4.0 screws **(2)** that secure the fan to the computer.

3. Disconnect and then remove the antenna cables from the clips on side of the fan **(3)**.

4. Disconnect and then remove the subwoofer cable from the clips on side of the fan **(4)**.

**5.** Remove the fan **(5)**.

Reverse this procedure to install the fan.

# USB board

| Description | Spare part number |
|---|---|
| USB board | 812695-001 |
| USB board cable | 812679-001 |

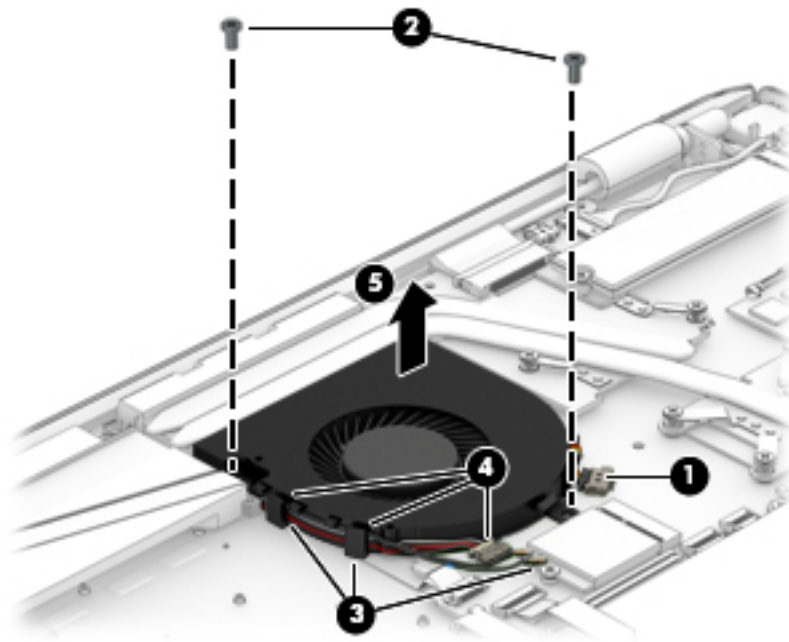Before removing the USB board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).
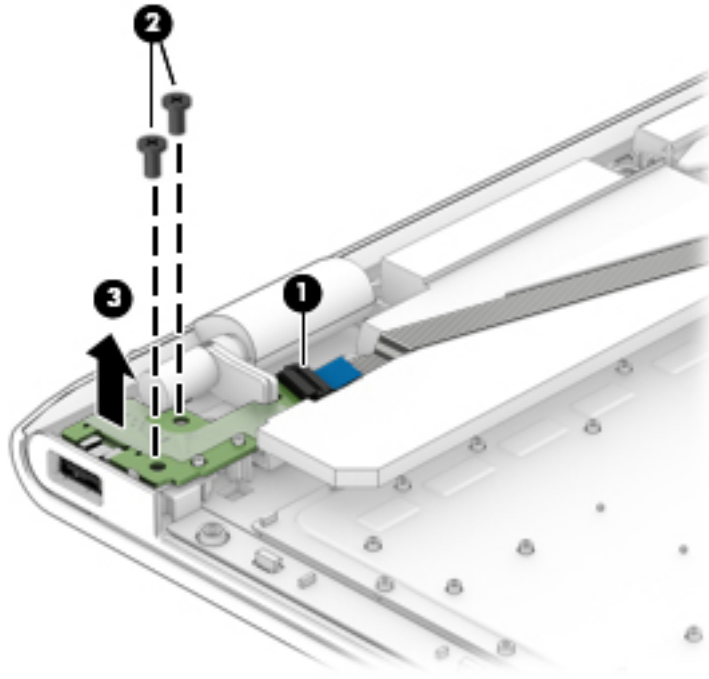
5. Disconnect the battery.



Remove the USB board:

1. Disconnect the cable **(1)** from the USB board.

2. Remove the Phillips PM2.5×5.0 screws **(2)** that secure the USB board to the computer.

**3.** Remove the USB board **(3)**.

Reverse this procedure to install the USB board.

# Subwoofer

| Description | Spare part number |
|---|---|
| Subwoofer | 812707-001 |

Before removing the subwoofer, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (Bottom cover on page 35).

5. Disconnect the battery.
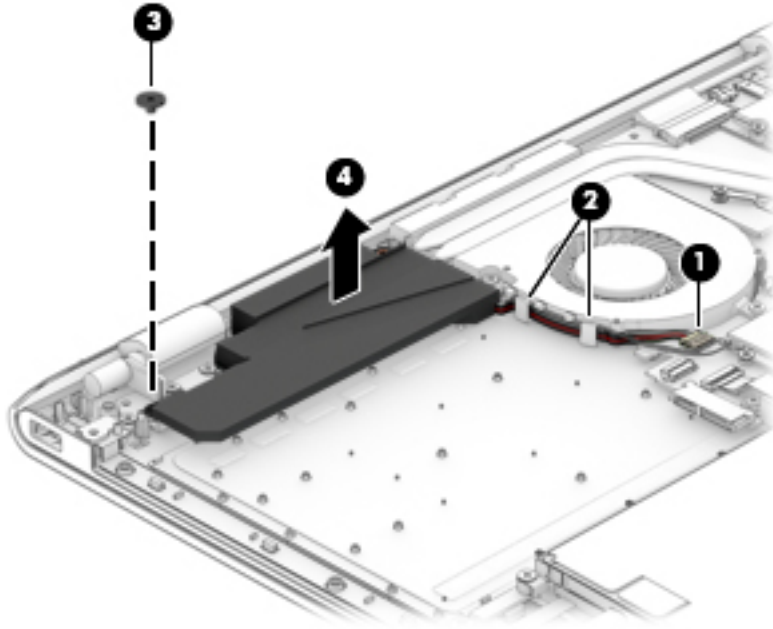


6. Remove the USB board (see USB board on page 48).

Remove the subwoofer:

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

2. Remove the cable from the clips built into the fan **(2)**.

3. Remove the Phillips PM2.5×5.0 screw **(3)** that secures the subwoofer to the computer.

**4.** Remove the subwoofer **(4)**.

Reverse this procedure to install the subwoofer.

# Heat sink

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

| Description | Spare part number |
| --- | --- |
| Heat sink for use in models with UMA graphics memory | 812683-001 |
| Heat sink with fan for use in models with UMA graphics memory | 830002-001 |
| Heat sink for use in models with discrete graphics memory | 812684-001 |

Before removing the heat sink, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see ).

5. Disconnect the battery.



Remove the heat sink:

1. Following the 1 through 4 sequence stamped into the heat sink, remove the four Phillips PM2.0×3.0 screws **(1)** that secure the heat sink to the system board.

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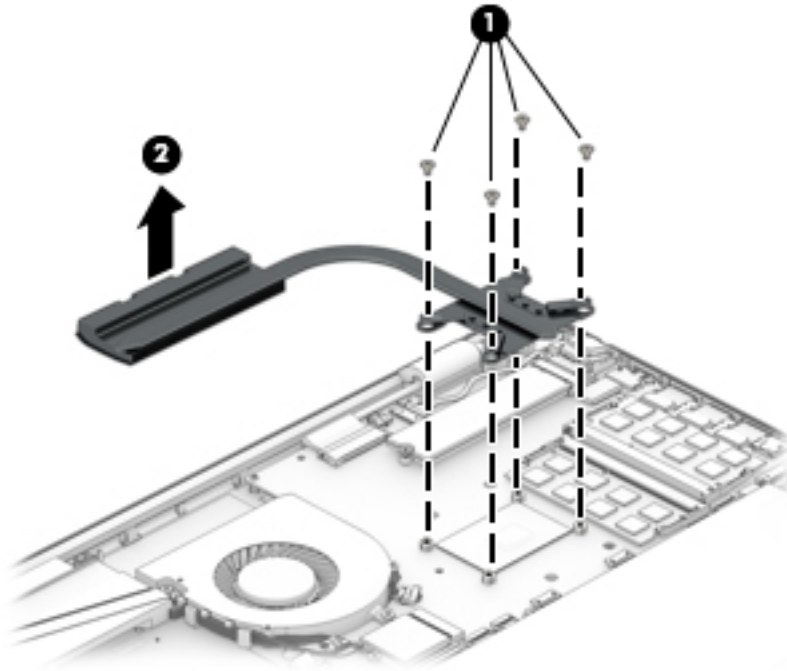


📝 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink, processor, and system board spare part kits. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.
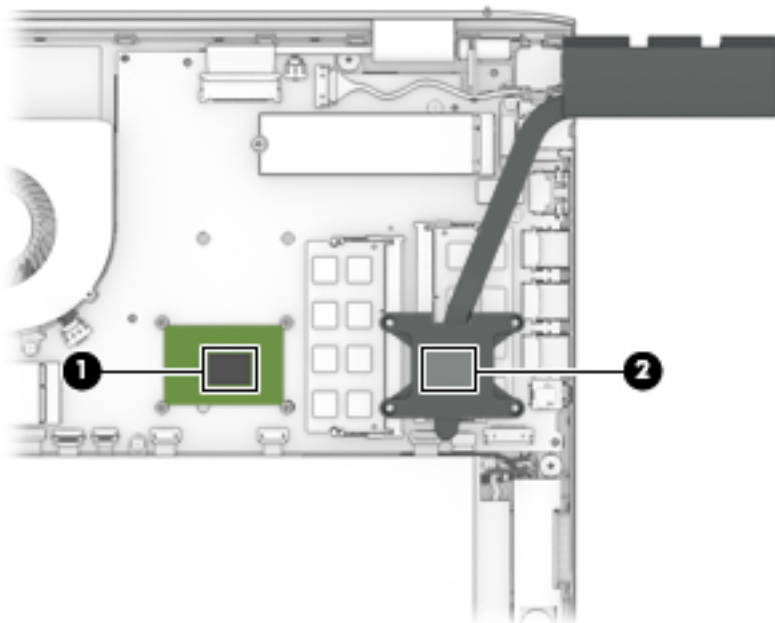


Reverse this procedure to install the heat sink.

# Battery

| Description | Spare part number |
|---|---|
| 3-cell, 48-Wh, 4.21-Ah, Li-ion battery (Besy Buy SKUs) | 807417-005 |
| 3-cell, 55-Wh, 4.56-Ah, Li-ion battery | 805094-005 |

Before removing the battery, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

Remove the battery:

**⚠ WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

**⚠ CAUTION:** Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

1. Remove the five Phillips PM2.5×4.0 screws **(1)** that secure the battery to the computer.

2. Disconnect the battery cable from the system board **(2)**.

3. Remove the battery **(3)** from the computer.
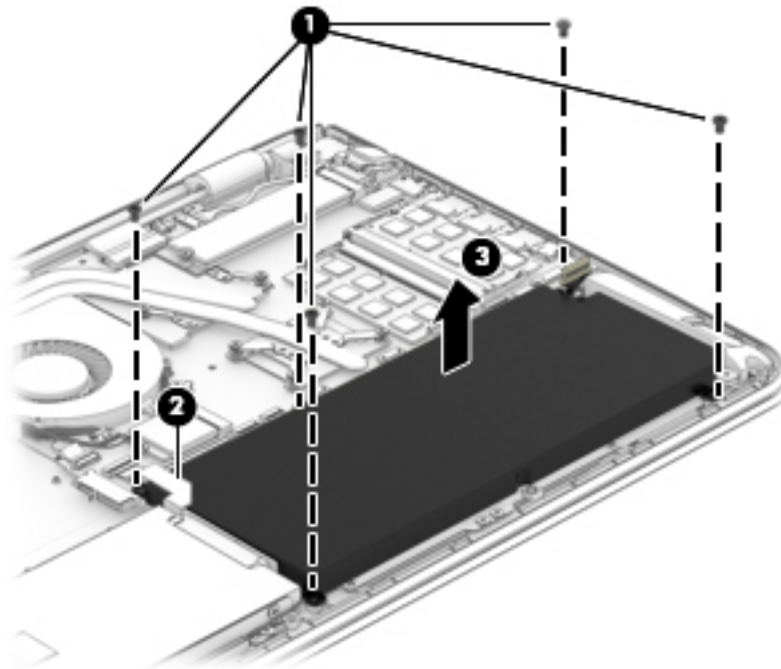
Reverse this procedure to install the battery.

# Hard drive

**NOTE:** The hard drive spare part kit does not include the hard drive bracket or hard drive connector cable. The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 812686-001. The hard drive cable is available using spare part number 812697-001.

| Description | Spare part number |
|---|---|
| 2.0 TB, 5400 rpm, 9.5-mm | 801808-005 |
| 1.0 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm | 731999-005 |
| 1.0 TB, 5400 rpm, 9.5-mm | 833907-005 |
| 750 GB, 5400 rpm, 9.5-mm (Best Buy SKUs) | 778190-005 |
| 500 GB, 5400 rpm, 7.0-mm | 778186-005 |
| Hard Drive Hardware Kit (includes bracket and screws) | 812686-001 |
| Hard drive cable | 812697-001 |

Before removing the hard drive, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see ).

5. Remove the battery (see ).

Remove the hard drive:

1. Disconnect the hard drive cable from the system board **(1)**.

2. Remove the four Phillips PM2.5×3.0 screws **(2)** that secure the hard drive assembly to the computer.

**3.** Lift up on the hard drive tab **(3)** to remove the hard drive assembly from the hard drive bay.
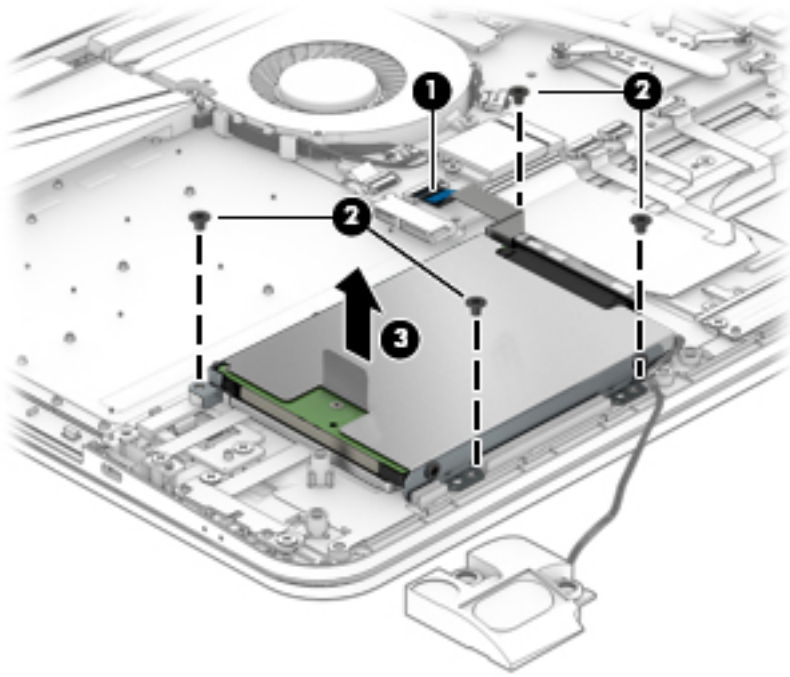


**4.** If it is necessary to disassemble the hard drive, perform the following steps:

**a.** Disconnect the hard drive connector cable **(1)** from the hard drive.

**b.** Remove the four Phillips PM2.5×3.0 screws **(2)** that secure the hard drive cover to the hard drive.

**c.** Remove the hard drive bracket **(3)** from the hard drive.

The hard drive bracket and screws are available in the Hard Drive Hardware Kit, spare part number 812686-001. The hard drive connector cable is available using spare part number 812697-001.
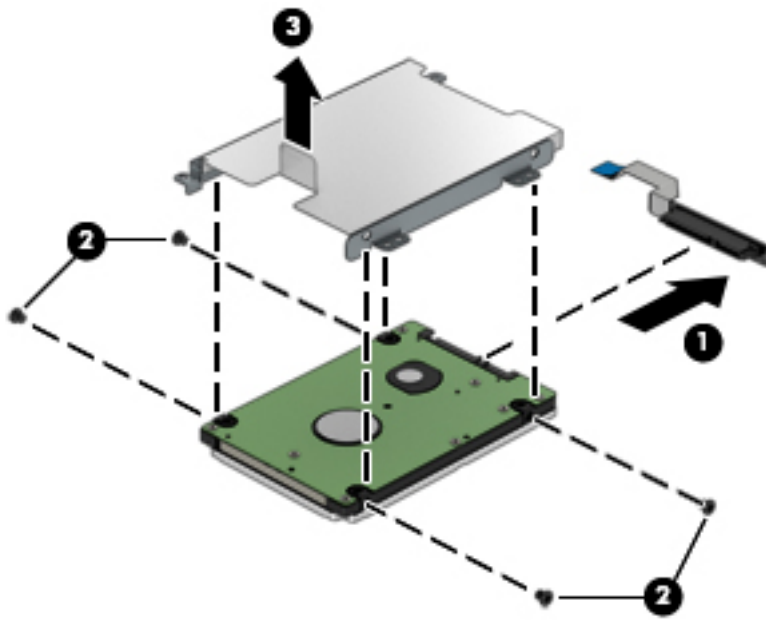


Reverse this procedure to install the RTC battery.

# Speakers (front)

| Description | Spare part number |
|---|---|
| Speaker Kit | 812705-001 |

Before removing the speakers, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

Remove the speakers:

1. Remove the two broadhead Phillips PM2.0×2.0 screws **(1)** that secure the speaker to the computer.

   **NOTE:** The speaker includes rubber isolators **(2)** around the screws. These isolators are crucial to the performance of the speakers.

2. Remove the speaker cable from its routing path **(3)**.

3. Remove the speaker **(4)**.
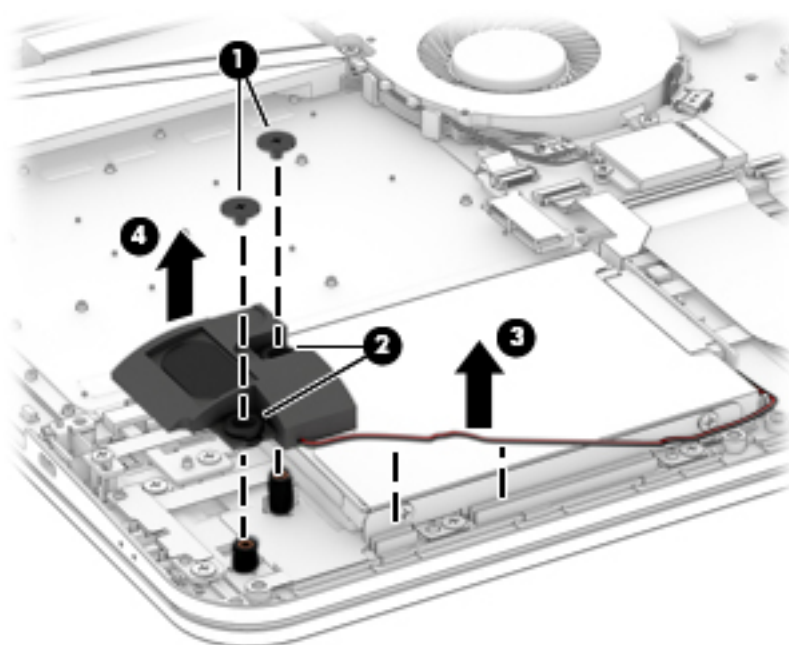


4. Disconnect the speaker cable **(1)** from the system board.

**5.** Disconnect the six cables from the connectors that the speaker cable is routed under **(2)**.

For proper cable routing, see .

**6.** Remove the two broadhead Phillips PM2.0×2.0 screws **(3)** that secure the speaker to the computer.

> **NOTE:** The speaker includes rubber isolators **(4)** around the screws. These isolators are crucial to the performance of the speakers.

> **NOTE:** Note the way the speaker cable is routed near the RTC battery **(5)**.

**7.** Remove the speaker cable from its routing path **(6)**.

**8.** Remove the speaker **(7)**.
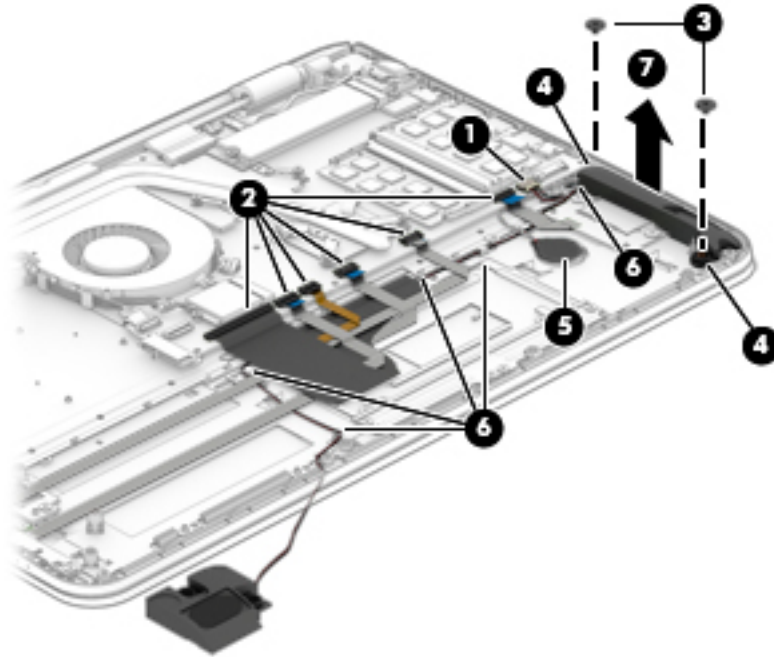
Reverse this procedure to install the speakers.

# Cable routing

There are six ribbon cables that connect to the system board that route under the battery with specific routing around and through each other. Use the image below to determine correct cabling.

**(1):** Card reader cable

**(2):** Fingerprint reader cable

**(3):** Touchpad cable

**(4):** Keyboard backlight cable

**(5):** LED board cable

**(6):** Keyboard cable

# LED board

| Description | Spare part number |
|---|---|
| LED board (includes cable) | 812696-001 |

Before removing the LED board, follow these steps:
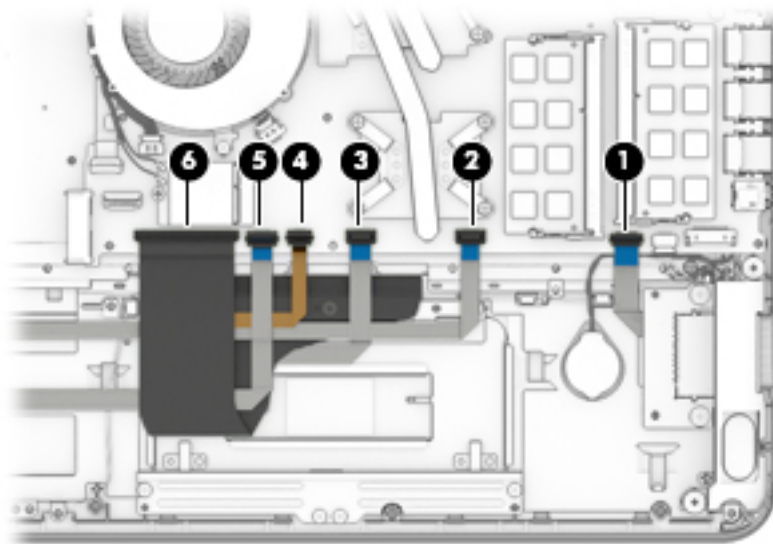
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the right speaker (Speakers (front) on page 57).

Remove the LED board:

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

2. Pull the ribbon cable up to disengage the adhesive securing it to the computer **(2)**.

3. Remove the two Phillips PM2.5×3.0 screws **(3)** that secure the LED board to the computer.

4. Remove the LED board **(4)** from the computer while routing the LED board cable under the keyboard cable.
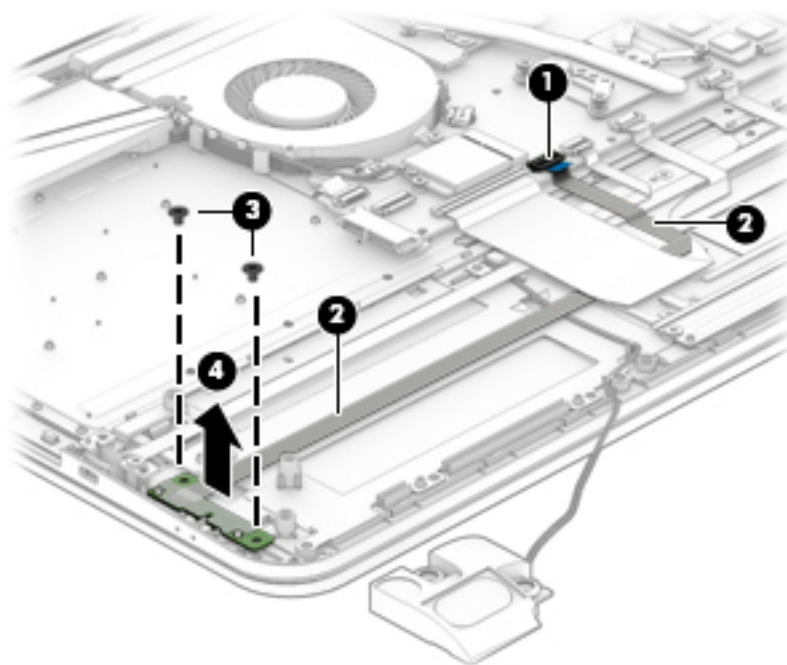


Reverse this procedure to install the LED board.

# Fingerprint reader board

| Description | Spare part number |
| --- | --- |
| Fingerprint reader board | 818089-001 |
| Fingerprint reader bracket | 812700-001 |
| Fingerprint reader cable | 818039-001 |

Before removing the fingerprint reader board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the right speaker (Speakers (front) on page 57).

Remove the fingerprint reader board:

1. Disconnect the fingerprint reader board cable **(1)** from the touchpad board.

2. Pull the ribbon cable up to disengage the adhesive securing it to the computer **(2)**.

3. Remove the Phillips broadhead PM2.0×5.0 screw **(3)** that secures the fingerprint reader board to the computer.

4. Lift the bracket from atop the fingerprint reader board **(4)**.

**5.** Remove the fingerprint reader board **(5)** from the computer while routing the fingerprint reader board cable under the cables.



Reverse this procedure to install the fingerprint reader board.

# Card reader board

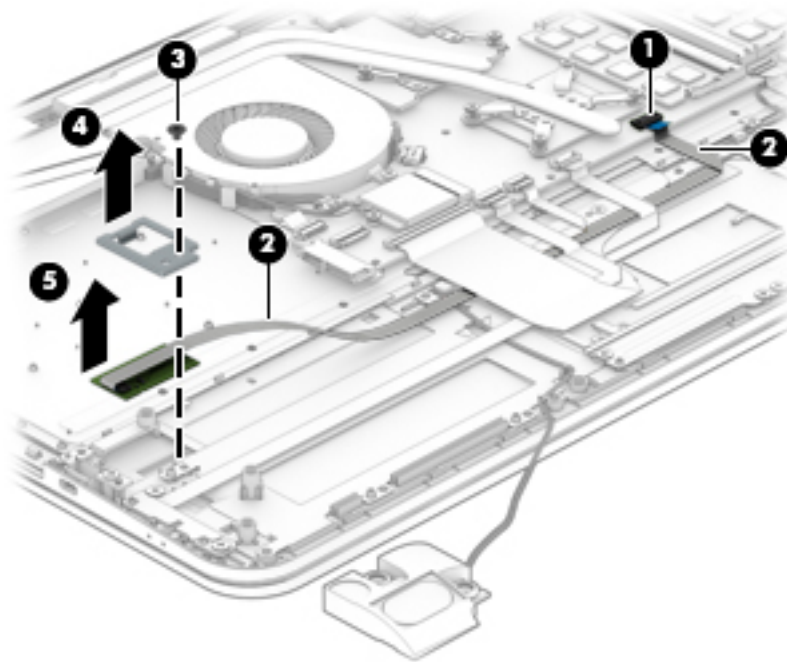| Description | Spare part number |
|---|---|
| Card reader board | 812694-001 |
| Card reader board cable | 812680-001 |

Before removing the card reader board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the speakers (see Speakers (front) on page 57).

Remove the card reader board:

1. Remove the two broadhead Phillips PM2.0×3.0 screws **(1)** that secure the card reader board to the computer.

2. Remove the card reader board **(2)**.
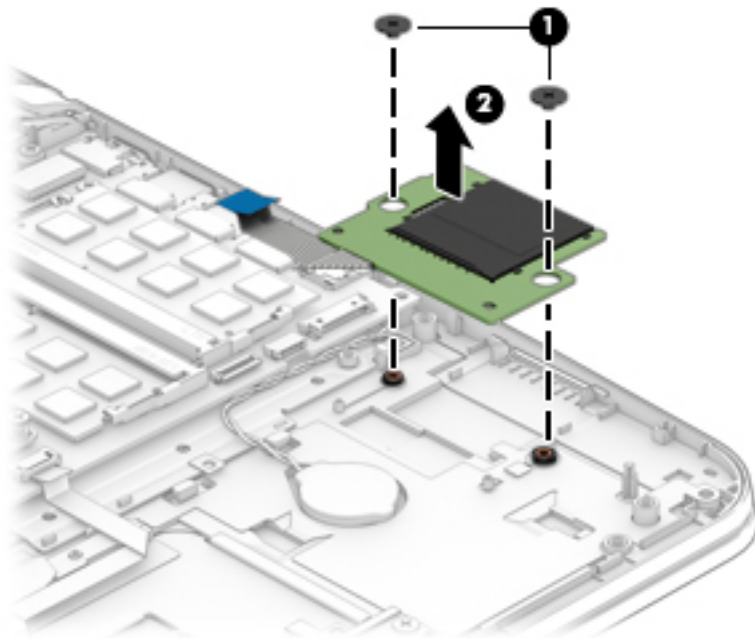


Reverse this procedure to install the card reader board.

## TouchPad assembly

| Description | Spare part number |
|---|---|
| TouchPad assembly | 818040-001 |
| Touchpad support bracket | 818042-001 |
| Touchpad cable | 818041-001 |

Before removing the TouchPad, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the speakers (see Speakers (front) on page 57).
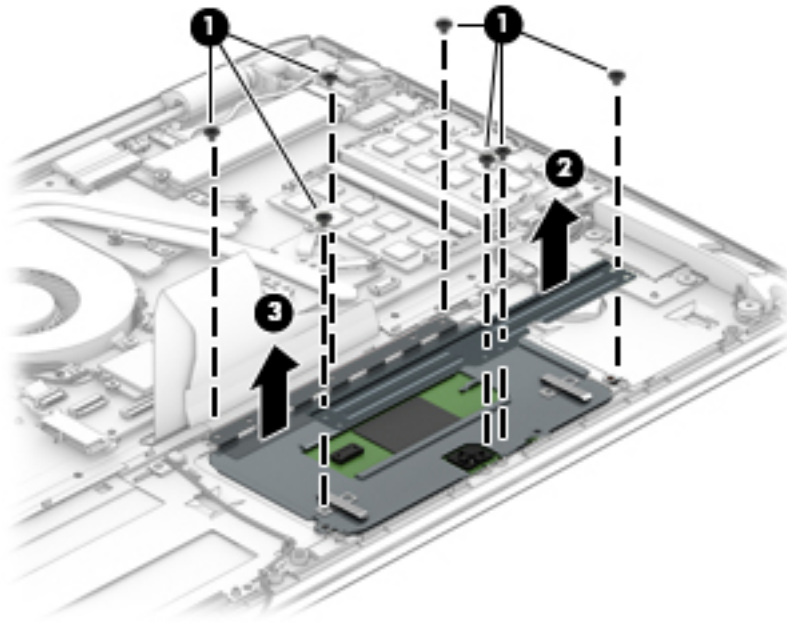
Remove the TouchPad:

1. Disconnect the TouchPad cable from the TouchPad **(1)**.

2. Remove the TouchPad **(2)** cable from the computer.
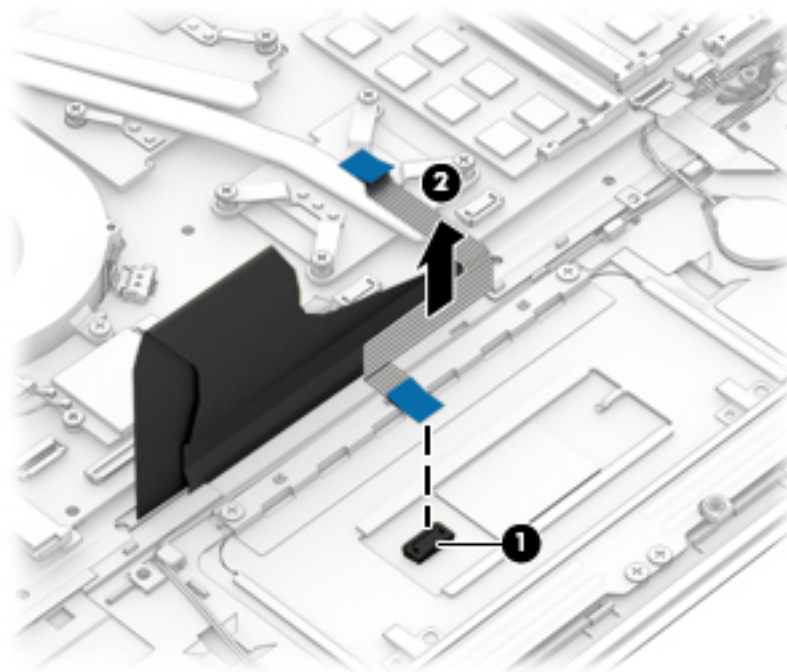


3. Remove the seven Phillips PM2.0×3.0 screws **(1)** that secure the TouchPad bracket to the computer.

**4.** Remove the TouchPad bracket **(2)**, and the remove the TouchPad **(3)**.

Reverse this procedure to install the TouchPad.

# System board

**NOTE:** The system board spare part kit includes replacement thermal material.

All system boards use the following part numbers:

xxxxxx-001: No-Windows operating systems

xxxxxx-601: Windows 8.1 or Windows 10 operating system

| Description | Spare part number |
|---|---|
| System board, includes Intel Core i7-5500U processor and 4 GB of discrete graphics memory | 812712-xxx |
| System board, includes Intel Core i7-5500U processor and 2 GB of discrete graphics memory | 812710-xxx |
| System board, includes Intel Core i7-5500U processor and UMA graphics memory | 812713-xxx |
| System board, includes Intel Core i5-5200U processor and 4 GB of discrete graphics memory | 812711-xxx |
| System board, includes Intel Core i5-5200U processor and 2 GB of discrete graphics memory | 812709-xxx |
| System board, includes Intel Core i5-5200U processor and UMA graphics memory | 837094-xxx |

Before removing the system board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the front speakers (see Speakers (front) on page 57).

8. Remove the fan (see Fan on page 46).

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

- Memory module (see Memory module on page 40)

- Heat sink (see Heat sink on page 52)

- Fan (see Fan on page 46)

- WLAN module (see WLAN module on page 38)

Remove the system board:

1. Disconnect the following cables from the system board:

    **(1)** Display cable

    **(2)** Speaker cable

    **(3)** Power connector cable

    **(4)** Subwoofer cable

**(5)** Keyboard cable

**(6)** LED board cable

**(7)** Keyboard backlight cable

**(8)** Touchpad cable

**(9)** Fingerprint reader cable

**(10)** Card reader cable

**(11)** Speaker cable
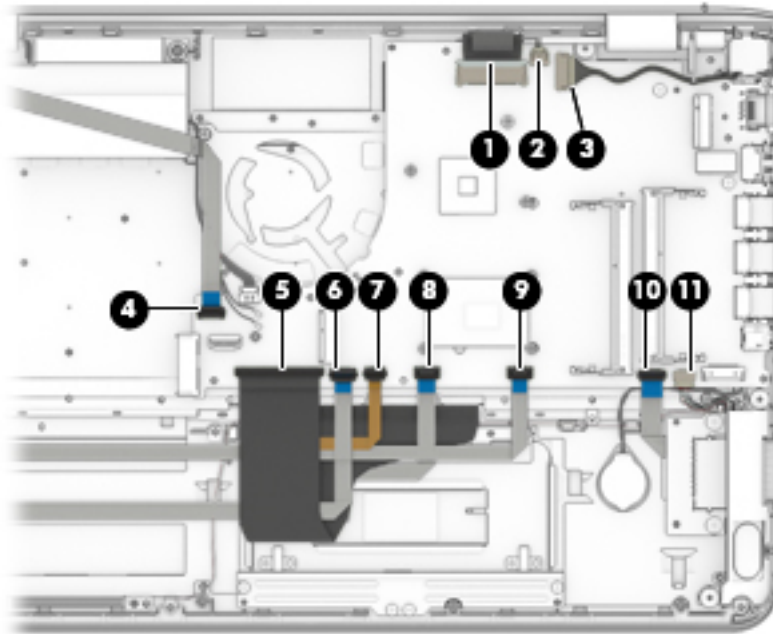


2.  Remove the two Phillips PM2.5×3.0 screws that secure the system board to the computer **(1)**.

**3.** Remove the system board **(2)** from the computer.
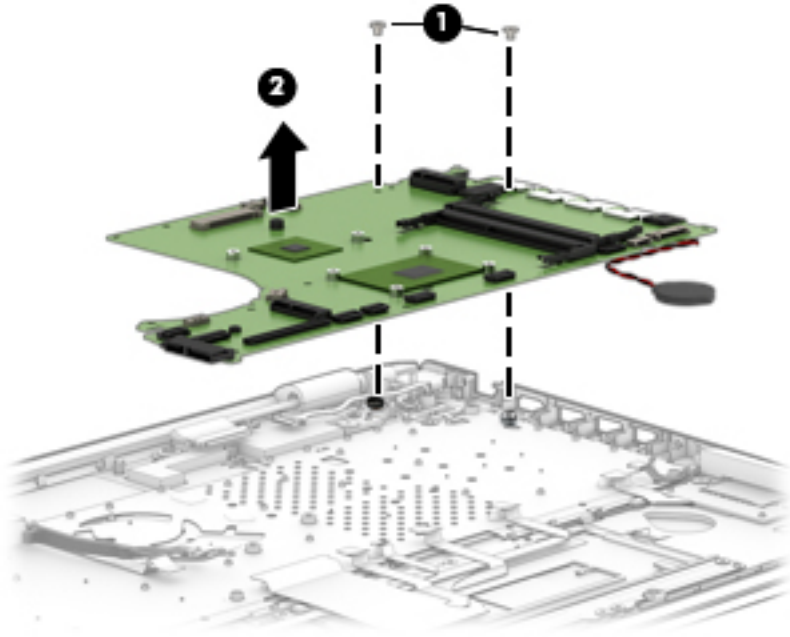


Reverse this procedure to install the system board.

# RTC battery

| Description | Spare part number |
|---|---|
| RTC battery | 819504-001 |

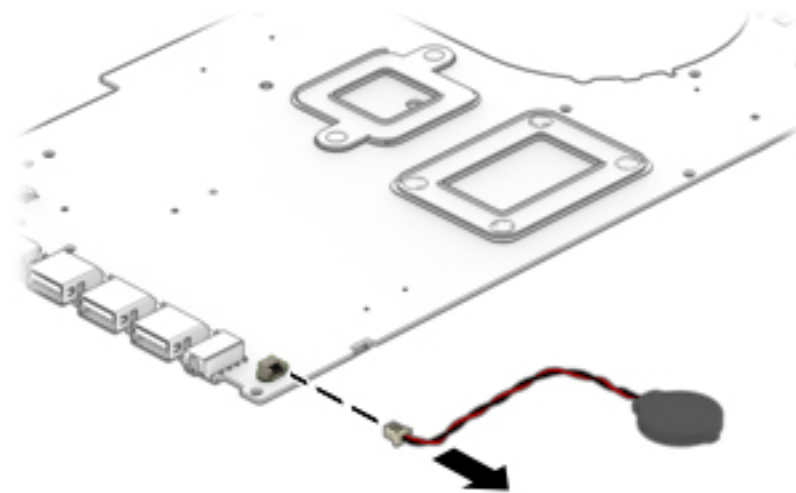Before removing the RTC battery, follow these steps:

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

2.  Disconnect the power from the computer by unplugging the power cord from the computer.

3.  Disconnect all external devices from the computer.

4.  Remove the bottom cover (see Bottom cover on page 35).

5.  Remove the battery (see Battery on page 54).

6.  Remove the hard drive (see Hard drive on page 55).

7.  Remove the system board (see System board on page 66).

Remove the RTC battery:

▲  Disconnect the disc cell RTC battery cable from the system board, and then remove the battery.

Reverse this procedure to install the RTC battery.

# Speaker (rear)

| Description | Spare part number |
|---|---|
| Speaker Kit | 812705-001 |

Before removing the rear speaker, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the system board (see System board on page 66).

Remove the rear speaker:

1. Remove the broadhead Phillips PM2.0×2.0 screw **(1)** that secures the speaker to the computer.

> **NOTE:** The speaker includes rubber isolators **(2)** around the screws. These isolators are crucial to the performance of the speaker.

2. Remove the rear speaker **(3)**.

Reverse this procedure to install the rear speaker.

# Display assembly – touch screen

To remove the display assembly and access the display assembly subcomponents, follow these steps:
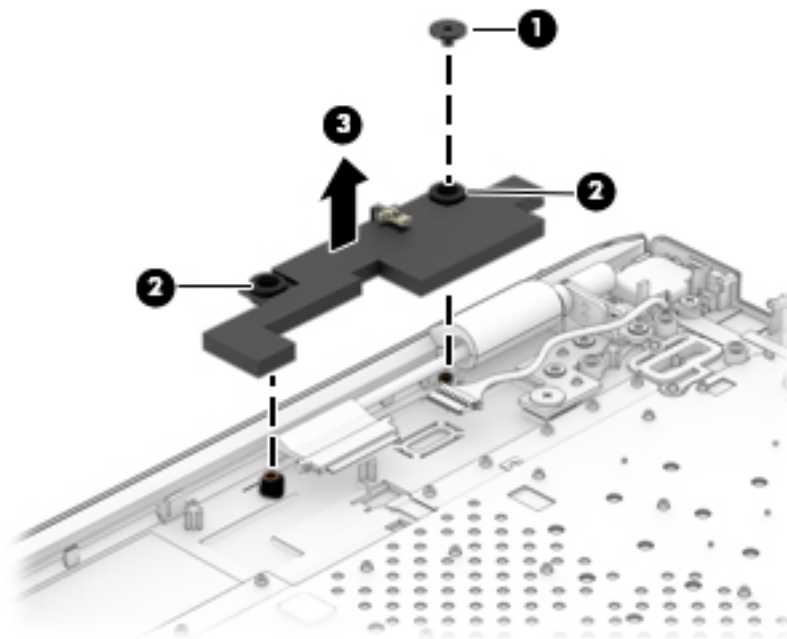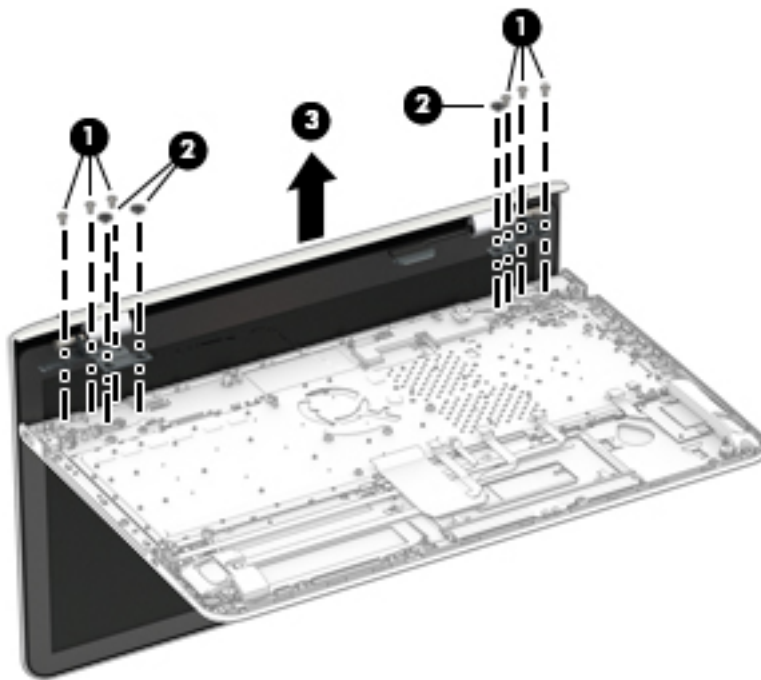
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the speakers (see Speakers (front) on page 57).

8. Remove the system board (see System board on page 66).

Remove the display assembly:

1. Open the computer and position the computer with the display hanging over the edge of a tablet.

> **CAUTION:** Be sure to support the display as you remove the screws to avoid the display falling and sustaining damage.

2. Remove the six Phillips PM2.5×4.0 screws **(1)** (three on each hinge) that secure the display assembly to the computer.

3. Remove the three broadhead Phillips PM2.5×2.5 screws **(2)** (two on the right hinge, one of the left hinge) that secure the display assembly to the computer.

4. Separate the display from the computer **(3)**.

If it is necessary to replace any of the display assembly subcomponents:

1. To remove the display rear cover:

   The display hinge covers are available using spare part number 812699-001.

   The display rear cover is available using spare part number 812671-001.

   The display raw panel is available using spare part number 812689-001 for HD panels, 812690-001 for FHD panels, and 812691-001 for QHD+ panels. The raw panel kit includes touch panel, touch board, bezel, rubber supports, display cable, webcam, and screws.

   a. Remove the two screw covers **(1)** and two Phillips PM2.5×3.5 screws **(2)** that secure the display rear cover to the display.

   b. Work a plastic tool around the seam to separate the display rear cover from the display **(3)**.

   c. Remove the display rear cover **(4)**.
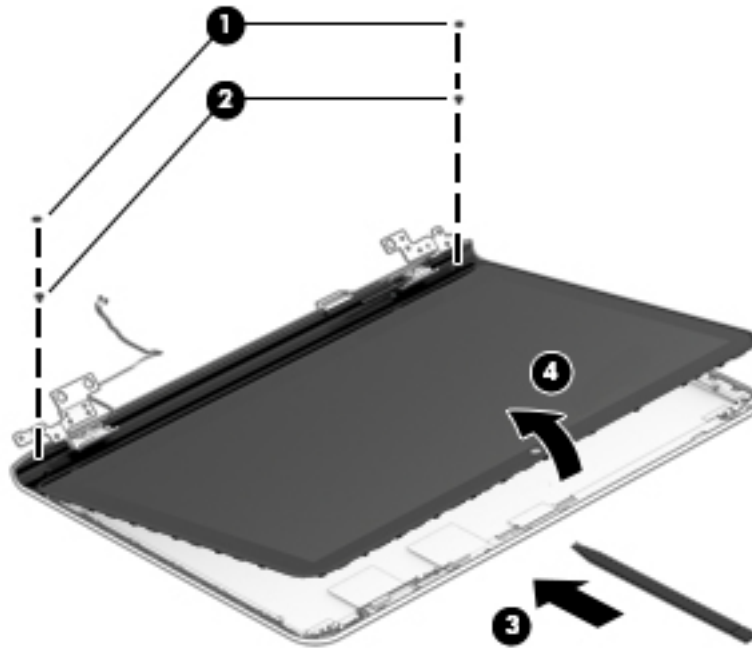


   d. Rotate the hinges open as far as possible.

   e. Lift the display hinge covers off the display **(1)**.

**f.** Note the routing of the antenna cables **(2)** and display cable **(3)** for reassembly.
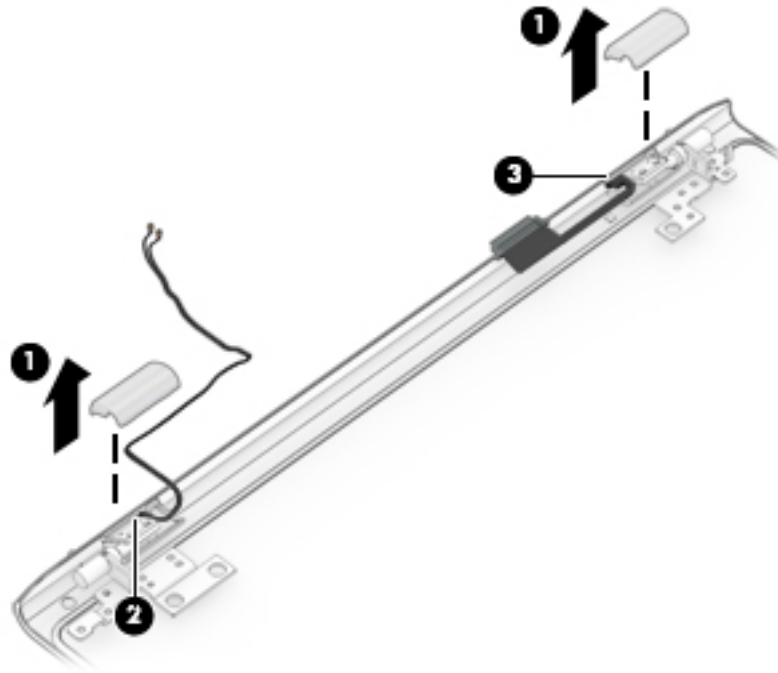
**2.** To remove the webcam/microphone module:

The webcam is available using spare part number 812715-001.

**a.** Position the display assembly with the top edge toward you.

**b.** Lift the tape from atop the webcam **(1)**.

**c.** Lift the webcam enough to access the connector **(2)**.

**d.** Disconnect the cable **(3)** from the webcam module.
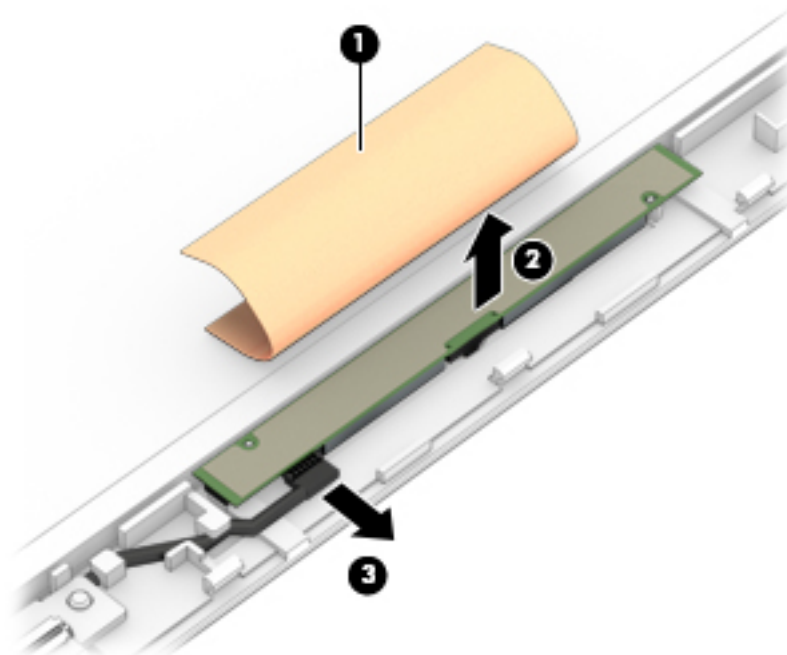
3. To remove the display/webcam cable:

The display cable is available using spare part number 812676-001 for FHD displays and 812678-001 for QHD+ displays.

   a. Disconnect the cable from the webcam module **(1)**.

   b. Disconnect the cable **(2)** from the touch control board **(3)**.

   c. Remove the cable from the clips **(4)** built into the side of the display.

   d. Disconnect the cable from the bottom of the display panel **(5)**.
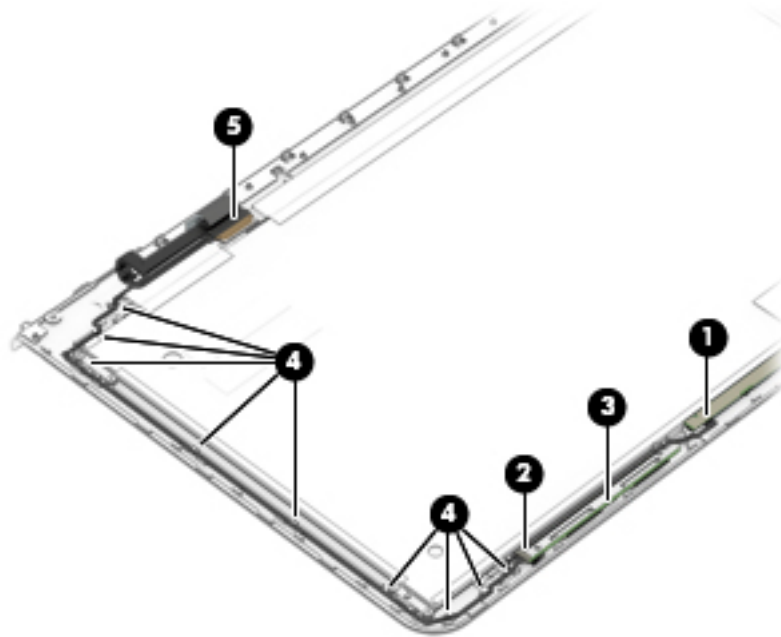


4. To remove the display hinges:

The display hinges are available using spare part number 812688-001.

   a. Remove the six Phillips PM2.5×2.0 screws **(1)** from the bottom of the hinges, and the two Phillips PM2.0×2.5 screws **(2)** from the top of the hinges that secure the display hinges to the display enclosure.

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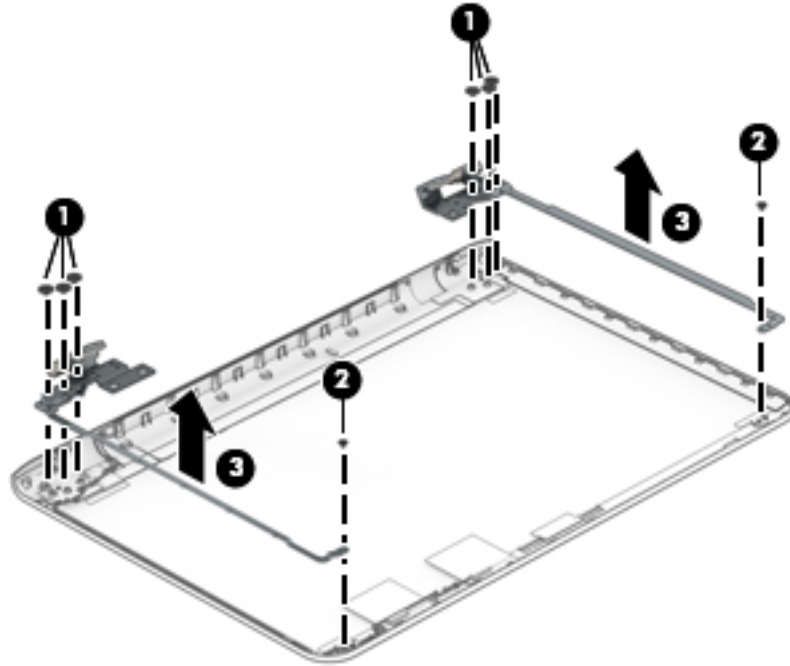


5. To remove the wireless antenna cables and transceivers, peel the transceivers from the enclosure **(1)**, release the wireless antenna cables from the clips or tape **(2)** that secure the cables to the display enclosure, and then remove the antenna cables and transceivers **(3)**.

   The antennas are available using spare part number 812669-001.
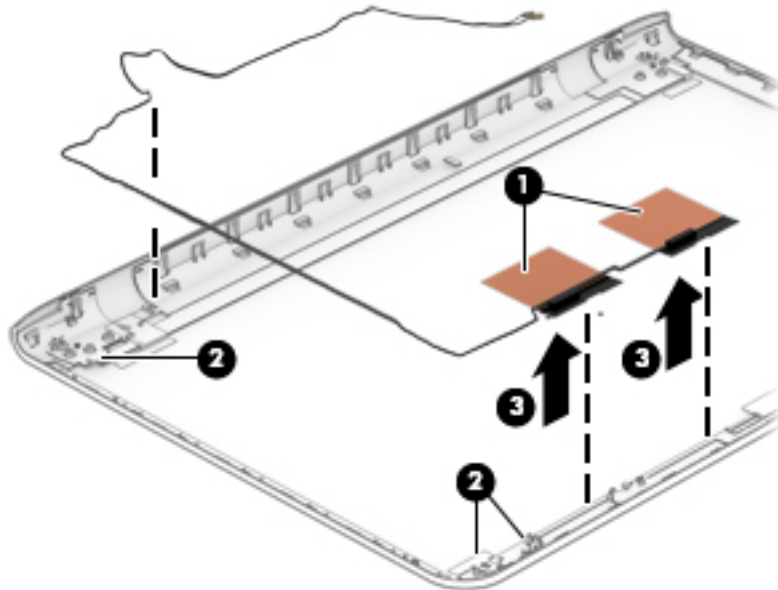


6. If replacing the display cover, be sure that the subcomponents (including the webcam/microphone module, the antenna receivers, and all associated cables and hardware) are transferred to the new cover.

Reverse this procedure to install the display assembly.

# Display assembly – non-touch screen

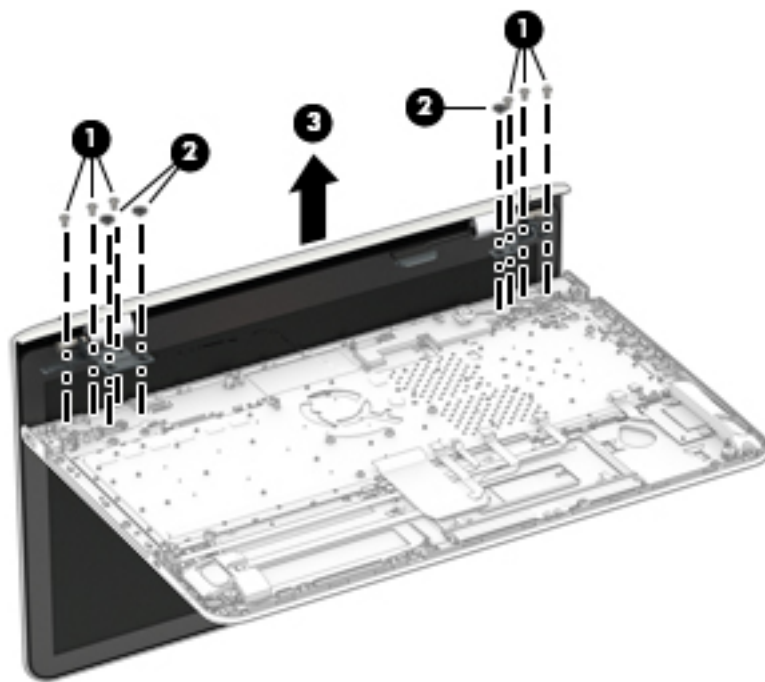To remove the display assembly and access the display assembly subcomponents, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the speakers (see Speakers (front) on page 57).

8. Remove the system board (see System board on page 66).

Remove the display assembly:

1. Open the computer and position the computer with the display hanging over the edge of a tablet.

⚠ **CAUTION:** Be sure to support the display as you remove the screws to avoid the display falling and sustaining damage.

2. Remove the six Phillips PM2.5×4.0 screws **(1)** (three on each hinge) that secure the display assembly to the computer.

3. Remove the three broadhead Phillips PM2.5×2.5 screws **(2)** (two on the right hinge, one of the left hinge) that secure the display assembly to the computer.

4. Separate the display from the computer **(3)**.

If it is necessary to replace any of the display assembly subcomponents:

1. To remove the display bezel:

**a.** Remove the two screw covers **(1)** and two Phillips PM2.0×3.0 screws **(2)** that secure the bezel to the display.

**b.** Flex the inside of the top edge **(3)**, the left and right edges **(4)**, and the bottom edge **(5)** of the display bezel until the bezel disengages from the display enclosure.

**c.** Remove the display bezel **(6)**.

The bezel is available using spare part number 812674-001.
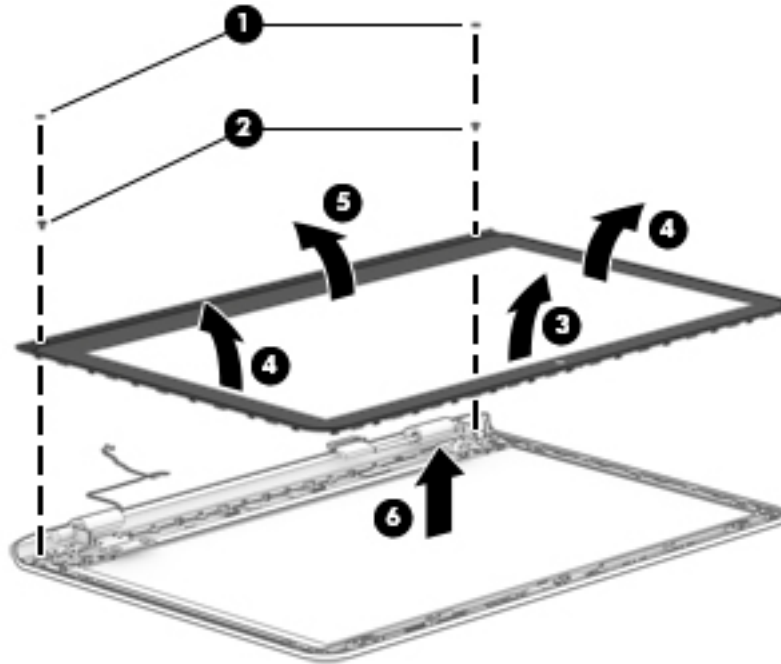
**d.** Lift the hinge covers from the display.

The hinge covers are available using spare part number 812698-001.



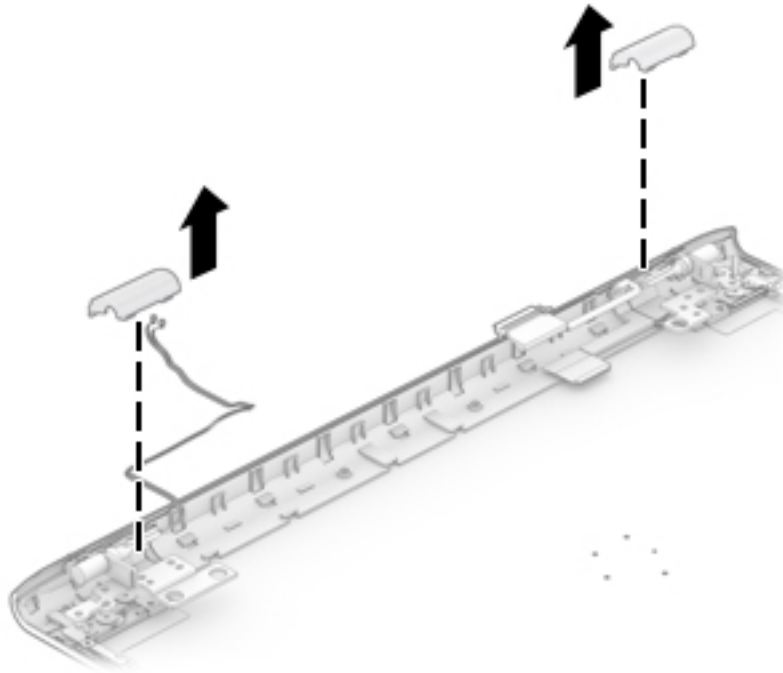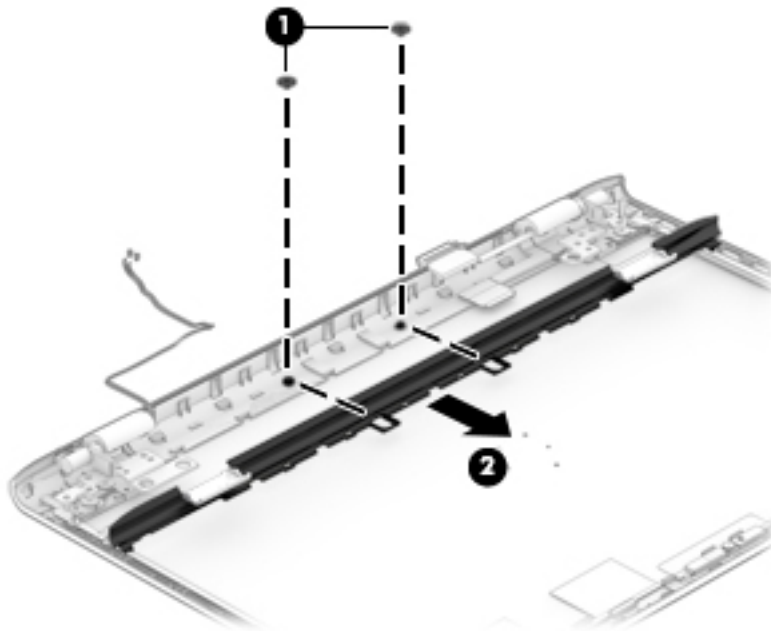**e.** Remove the bezel trim by removing the two broadhead Phillips PM2.0×2.4 screws **(1)**, and then sliding the trim away from the bezel **(2)**.

The bezel trim is available using spare part number 818043-001.



**2.** To remove the webcam/microphone module:

**a.** Position the display assembly with access to the top edge.

**b.** Lift the webcam/microphone module enough to gain access to the connector **(1)**. (The module is attached to the display enclosure with double-sided tape.)

**c.** Disconnect the cable **(2)** from the module.

The webcam is available using spare part number 812714-001.
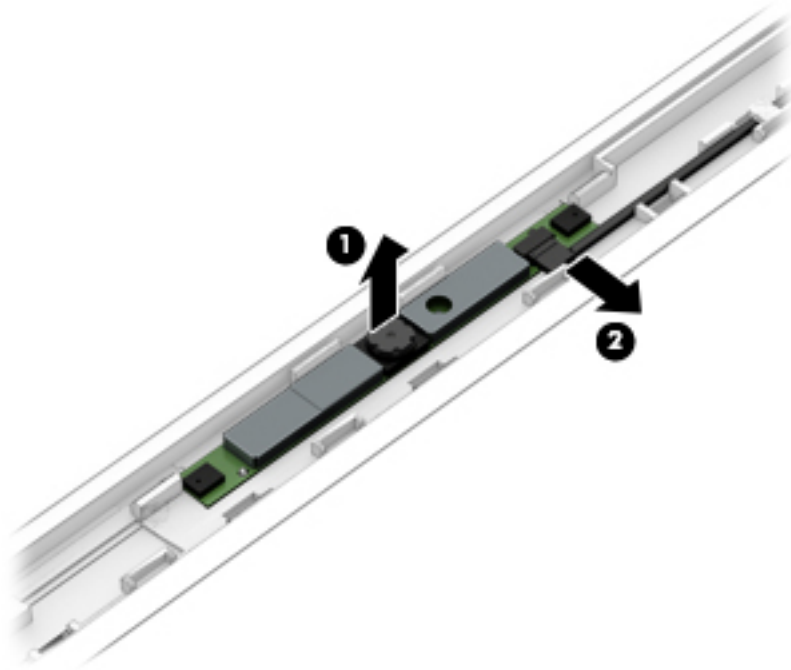
**3.** To remove the display panel:

**a.** Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the display panel to the enclosure.

**b.** Rotate the display panel out of the enclosure **(2)** to gain access to the display cable connection on the back of the panel.

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

812702-001: HD, BrightView displays

812703-001: FHD, antiglare displays

812704-001: QHD+, antiglare displays

830003-001: UWVA, FHD, antiglare displays

830511-001: UWVA, UDH, BrightView displays
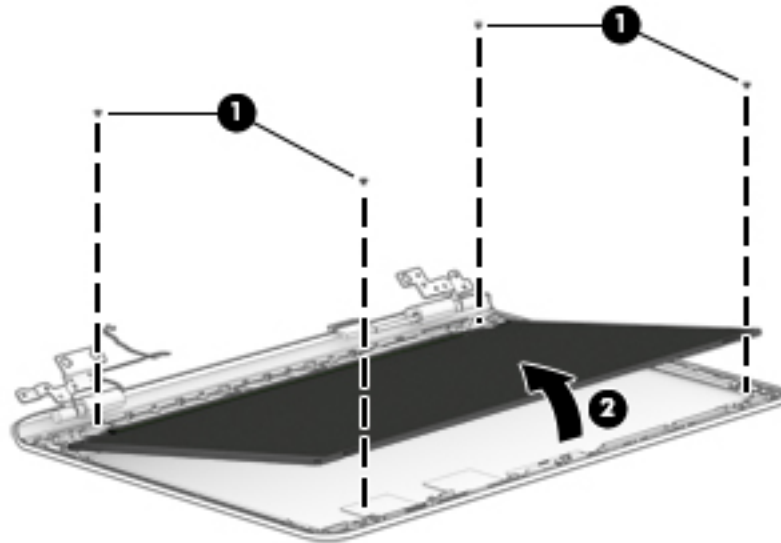


**c.** On the back of the display panel, release the adhesive strip **(1)** that secures the display panel cable to the display panel, and then disconnect the cable **(2)**.

**d.** Remove the display panel from the computer **(3)**.
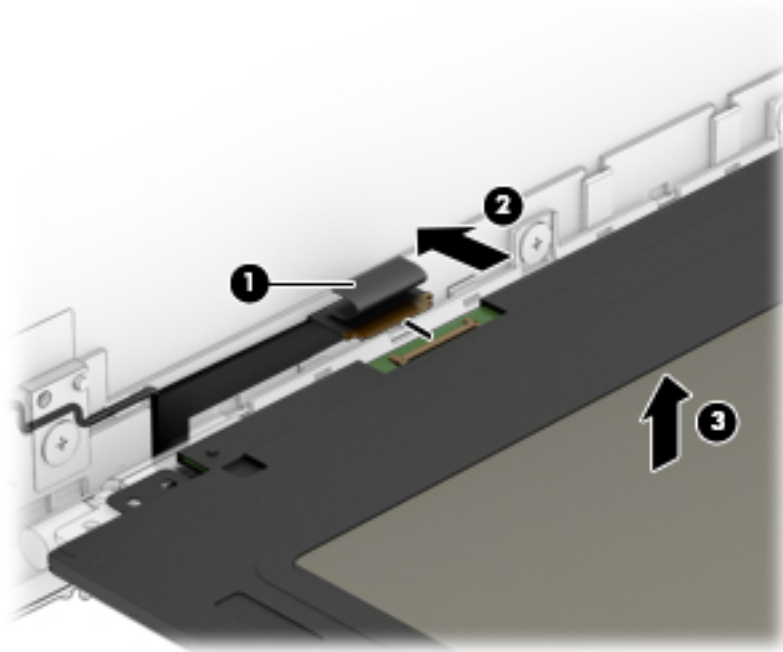


4. To remove the display hinges:

   **a.** Remove the eight Phillips PM2.5×3.5 screws **(1)** (four per hinge) that secure the hinges to the sides of the display enclosure.

   **b.** Remove the six broadhead Phillips PM2.0×3.0 screws **(2)** (three per hinge) that secure the hinges to the bottom of the display enclosure.

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

The display hinges are available using spare part number 812687-001 for HD and FHD displays and 823127-001 for QHD+ displays.
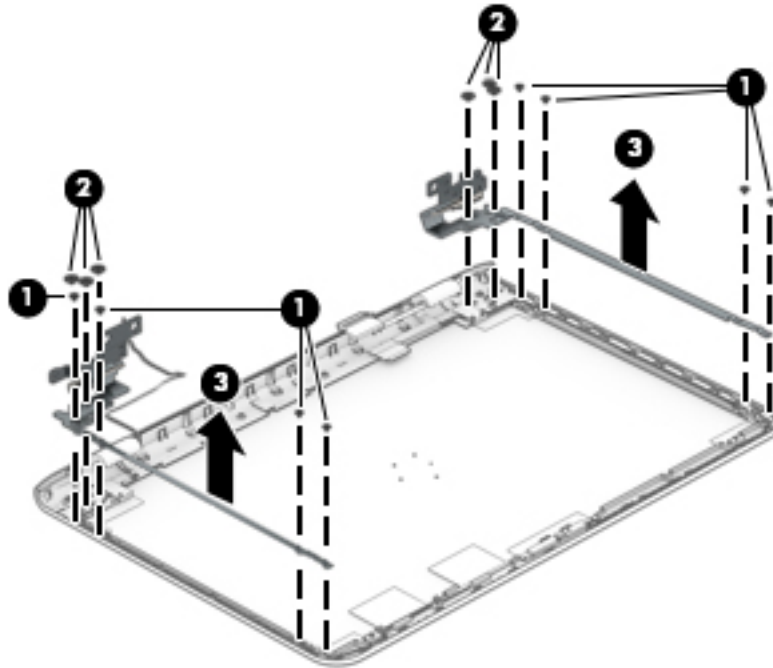


**5.** To remove the wireless antenna cables and transceivers, peel the transceivers from the top of the enclosure **(1)**, release the wireless antenna cables from the clips built into the display enclosure **(2)**, and then remove the cables and transceivers **(3)**.

The antenna cables are available using spare part number 812668-001.
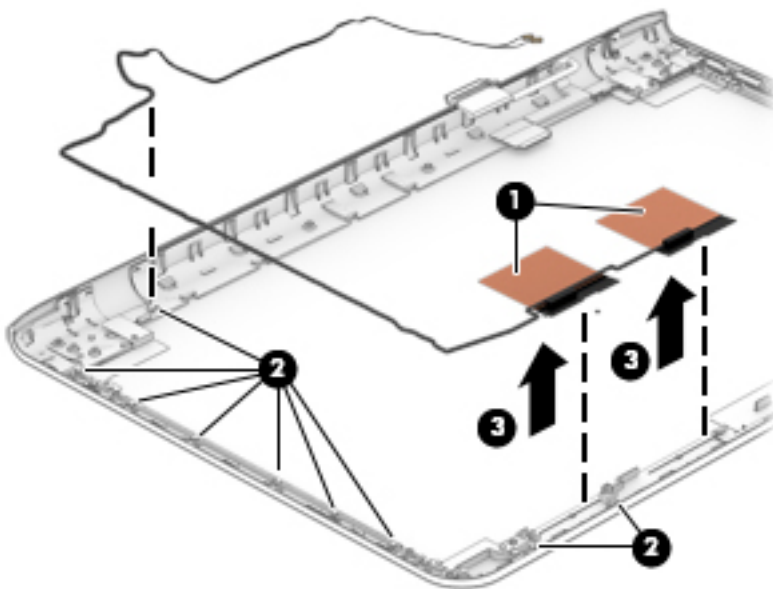
6. To remove the display/webcam cable, remove the cable from the clips built into the display enclosure **(1)**, and then remove the cable from the display enclosure **(2)**.

   The display cable is available using spare part number 812675-001 for HD and FHD displays, 812677-001 for QHD+ displays, and 833581-001 for UHD displays.
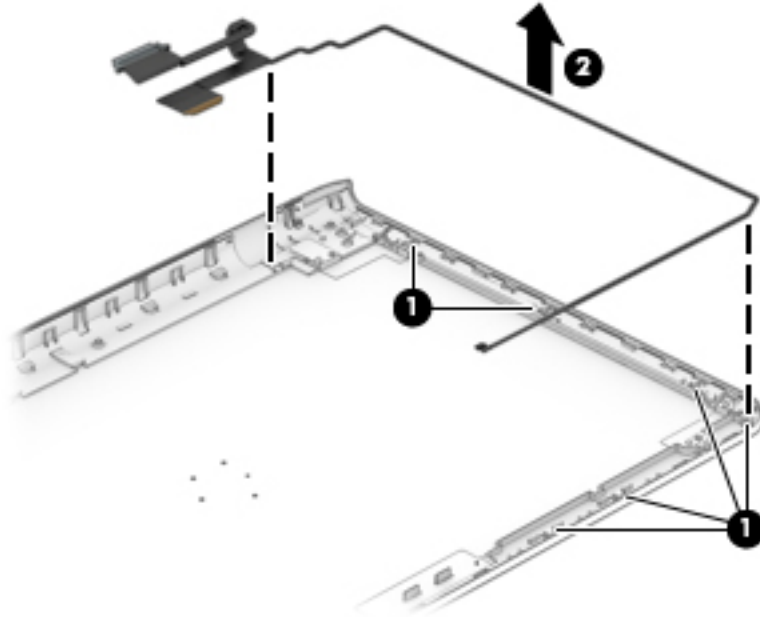
7. If replacing the display enclosure, be sure that the subcomponents (including the webcam/microphone module, the antenna receivers, and all associated cables and hardware) are transferred to the new enclosure.

   The display enclosure is available using spare part number 812670-001 for HD and FHD models and 823126-001 for QHD+ models.

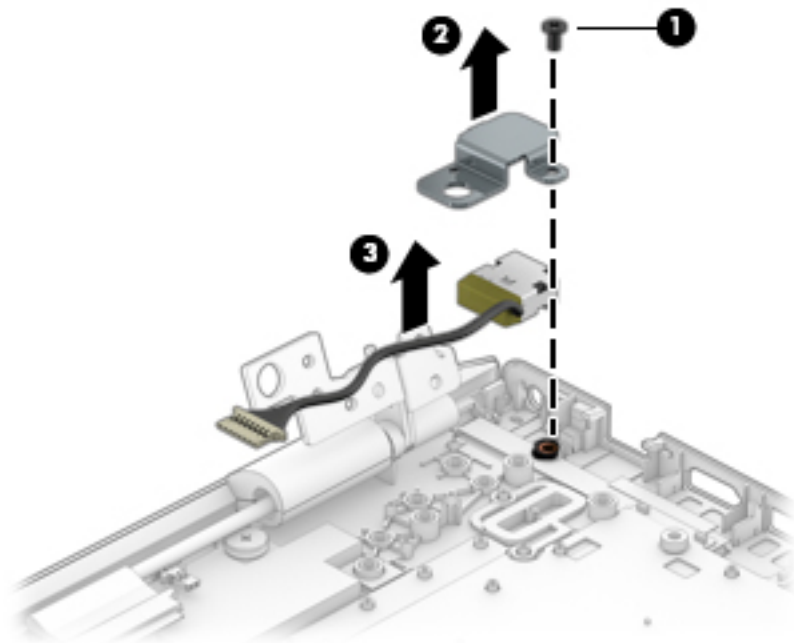Reverse this procedure to install the display assembly.

# Power connector cable

| Description | Spare part number |
|---|---|
| Power connector cable (includes bracket) | 812681-001 |

Before removing the power connector cable, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 35).

5. Remove the battery (see Battery on page 54).

6. Remove the hard drive (see Hard drive on page 55).

7. Remove the speakers (see Speakers (front) on page 57).

8. Remove the system board (see System board on page 66).

9. Remove the display (see Display assembly – touch screen on page 71).

Remove the power connector cable:

1. Remove the Phillips PM2.5×4.0 screw **(1)** that secures the power connector bracket to the computer.

2. Lift the bracket from atop the power connector **(2)**.

3. Remove the power connector **(3)** from the computer.



Reverse this procedure to install the power connector cable.

# 7 Using Setup Utility (BIOS) in Windows 7

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.

## Starting Setup Utility (BIOS)

▲ To start Setup Utility (BIOS), turn on or restart the computer, quickly press esc, and then press f10.

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

## Updating the 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.

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

To use Setup Utility (BIOS):

1. Start Setup Utility (BIOS).

2. Use the arrow keys to select **Main**, and then make note of your current BIOS version.

3. To exit Setup Utility (BIOS) without saving your changes, use the tab key and the arrow keys to select **Exit > Exit Discarding Changes**, and then press enter.

To check for later BIOS versions, see .

### 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 or Hibernation.

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

1. Select **Start**, type `hp support assistant`, and then select the **HP Support Assistant** program.

2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.

3. At the download area, follow these steps:

   a. Identify the BIOS update that is later than 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.

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

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

1. Open Windows Explorer by selecting **Start > Computer**.

2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).

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

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

   The BIOS installation begins.

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

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

# 8 Using Setup Utility (BIOS) in Windows 8.1

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.

## 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 the BIOS

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

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

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

### Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than the one currently installed on the computer, you need to know the version of the system BIOS that is installed.

BIOS version information (also known as *ROM date* and *System BIOS*) can be revealed from the Start screen by typing `support`, selecting the **HP Support Assistant** app, selecting **My computer**, and then selecting **System Information**, or by using Setup Utility (BIOS).

1. Start Setup Utility (BIOS) (see ).

2. Select **Main**, and then make note of your BIOS version.

3. Select **Exit**, select **Exit Discarding Changes**, and then follow the on-screen instructions.

### 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. From the Start screen, type `support`, and then select the **HP Support Assistant** app.

   – or –

   From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

2. Click **Updates and tune-ups**, and then click **Check for HP updates now**.

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, 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.

   If the update is more recent than your BIOS, 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. From the Start screen, type `file`, and then select **File Explorer**.

   – or –

   From the Windows desktop, right-click the **Start** button, and then select **File Explorer**.

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

3. Using the hard drive path you recorded earlier, open the folder on your hard drive 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.

# 9 Using Setup Utility (BIOS) in Windows 10

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. The on-screen keyboard, which displays in tablet mode, cannot access Setup Utility.

## Starting Setup Utility (BIOS)

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

**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. The on-screen keyboard, which displays in tablet mode, cannot access Setup Utility.

- Computers or tablets with keyboards:

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

- Tablets without keyboards:

  1. Turn on or restart the tablet, and then quickly hold down the volume down button.

     - or -

     Turn on or restart the tablet, and then quickly hold down the Windows button.

  2. Tap **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*):

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

   – or –

Click the question mark icon in the taskbar.

**2.**   Select **My PC**, and then select **Specifications**.

– or –

▲   Use Setup Utility (BIOS).

To use Setup Utility (BIOS):

**1.**   Start Setup Utility (BIOS) (see ).

**2.**   Select **Main**, select System Information, and then make note of the BIOS version.

**3.**   Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see .

# Downloading a BIOS update

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

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

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

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

– or –

Click the question mark icon in the taskbar.

**2.**   Click **Updates**, and then click **Check for updates and messages**.

**3.**   Follow the on-screen instructions.

**4.**   At the download area, follow these steps:

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

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

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

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

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

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

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

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

     The BIOS installation begins.

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

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

# Synchronizing a tablet and keyboard (select products only)

For a tablet with a detachable keyboard, when you attach the tablet to the keyboard and restart the computer, Setup Utility (BIOS) checks to see if the Embedded Controller firmware on the keyboard needs to be synchronized. If so, synchronization begins. If the synchronization is interrupted, a notification screen displays for 10 seconds before the tablet restarts and attempts to synchronize again.

📝 **NOTE:**   The Embedded Controller firmware will synchronize ONLY if the tablet or keyboard battery is more than 50% charged, or if your tablet is connected to AC power.

# 10 Backing up, restoring, and recovering in Windows 7

Your computer includes tools provided by the operating system and HP to help you safeguard your information and retrieve it if ever needed.

## Creating backups

1. Use HP Recovery Manager to create recovery media immediately after you set up the working computer.

2. As you add hardware and software programs, create system restore points.

3. As you add photos, video, music, and other personal files, create a backup of your system and personal information.

### Creating recovery media to recover the original system

After you successfully set up the computer, you should create recovery discs or a recovery flash drive using HP Recovery Manager. You will need these recovery discs or recovery flash drive to perform a system recovery should the hard drive become corrupted. A system recovery reinstalls the original operating system, and then configures the settings for the default programs.

#### What you need to know

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.

- HP Recovery Manager examines the computer and determines the required storage capacity for the flash drive or the number of blank DVD discs that will be required.

  Use DVD-R, DVD+R, DVD-R DL, DVD+R DL discs or a flash drive. Do not use rewriteable discs such as CD ±RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software.

- If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.

- The creation process can take up to an hour or more. Do not interrupt the creation process.

- Store the recovery media in a safe location, separate from the computer.

- If necessary, you can exit the program before you have finished creating the recovery media. The next time you open HP Recovery Manager, you will be prompted to continue the process.

### Creating the recovery media

1. Select **Start** and type `recovery` in the search field. Select **HP Recovery Manager** from the list. Allow the action to continue, if prompted.

2. Click **Recovery Media Creation**.

3. Follow the on-screen instructions to continue.

To recover, see .

## Creating system restore points

A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A restore point contains information such as registry settings that Windows uses. Restoring to a previous restore point allows you to reverse changes that have been made to the system since the restore point was created.

Restoring to an earlier system restore point does not affect data files saved or emails created since the last restore point, but it does affect software you may have installed.

For example, if you download a photo from a digital camera and then restore the computer to the state it was on the previous day, the photo remains on the computer.

However, if you install photo viewing software and then restore your computer to the state it was on the previous day, the software will be uninstalled, and you won't be able to use it.

### What you need to know

- If you restore to a restore point and then change your mind, you can undo the restoration.
- You should create system restore points:
  - Before you add or change software or hardware
  - Periodically, whenever the computer is running normally
- System Restore also saves shadow copies of files that have been changed since the last restore point was created. For more information about using shadow copies to restore, see Help and Support.

### Creating a system restore point

1. Select **Start > Control Panel > System and Security > System**.

2. In the left pane, click **System Protection**.

3. Click the **System Protection** tab.

4. Click **Create**, and follow the on-screen instructions.

To restore, see .

## Backing up system and personal information

Your computer stores information that is important to you, such as files, emails, and photos, and you will want to keep that information even if you download a virus or the system stops working properly. How completely you are able to recover your files depends on how recent your backup is. As you add new software and data files, you should create backups on a regular basis.

## Tips for a successful backup

- Number backup discs before inserting them into the optical drive.

- Store personal files in the Documents, Music, Pictures, and Videos libraries, and back up these folders periodically.

- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to re-enter your preferences.

To create a screen shot:

1. Display the screen you want to save.

2. Copy the screen image:

   To copy only the active window, press alt+prt sc.

   To copy the entire screen, press prt sc.

3. Open a word-processing document or graphics editing program, and then select **Edit > Paste**. The screen image is added to the document.

4. Save and print the document.

## What you need to know

- You can back up your information to an optional external hard drive, a flash drive, a network drive, or discs.

- Connect the computer to AC power during backups.

- Allow enough time for the backup. Depending on files sizes, it may take more than an hour.

- Verify the amount of free space on your backup storage device before you back up.

- You should back up:

  ◦ Before adding or changing software or hardware.

  ◦ Before the computer is repaired or restored.

  ◦ On a regular schedule to be sure you have recent copies of personal information.

  ◦ After you add many files—for example, if you saved videos from a birthday party.

  ◦ Before using antivirus software to remove a malicious program.

  ◦ After adding information that is hard to replace, such as pictures, videos, music, project files, or data records.

## Creating a backup using Windows Backup and Restore

Windows allows you to back up files using Windows Backup and Restore. You can select the level you want to back up, from individual folders to drives. The backups are compressed to save space. To back up:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.

2. Follow the on-screen instructions to schedule and create a backup.

**NOTE:** Windows includes the User Account Control feature to improve the security of the computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. See Help and Support for more information.

To restore, see Restoring specific files using Windows Backup and Restore on page 95.

# Restore and recovery

## Restoring to a previous system restore point

Sometimes installing a software program causes your computer or Windows to behave unpredictably. Usually uninstalling the software fixes the problems. If uninstalling does not fix the problems, you can restore the computer to a previous system restore point (created at an earlier date and time).

To restore to a previous system restore point, when the computer was running correctly:

1.  Select **Start > Control Panel > System and Security > System**.

2.  In the left pane, click **System Protection**.

3.  Click the **System Protection** tab.

4.  Click **System Restore**, and follow the on-screen instructions.

## Restoring specific files

If files are accidentally deleted from the hard disk and they can no longer be restored from the Recycle Bin, or if files become corrupt, restoring specific files is useful. Restoring specific files is also useful if you ever choose to recover the original system using HP Recovery Manager. You can only restore specific files that you have backed up before.

### Restoring specific files using Windows Backup and Restore

Windows allows you to restore files that were backed up using Windows Backup and Restore:

1.  Select **Start > Control Panel > System and Security > Backup and Restore**.

2.  Follow the on-screen instructions to restore your backup.

📝 **NOTE:**  Windows includes the User Account Control feature to improve the security of the computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. See Help and Support for more information.

## Recovering the original system using HP Recovery Manager

HP Recovery Manager software allows you to repair or recover the computer to its original factory state.

### What you need to know

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

*   A system recovery should be used as a final attempt to correct computer issues. If you have not already tried restore points (see Restoring to a previous system restore point on page 95) and partial restores (see Restoring specific files on page 95), try them before using HP Recovery Manager to recover your system.

*   A system recovery must be performed if the computer hard drive fails or if all attempts to correct any functional computer issues fail.

- If the recovery media do not work, you can obtain recovery discs for your system from the HP website.

- The Minimized Image Recovery option is recommended for advanced users only. All hardware-related drivers and software are re-installed, but other software applications are not. Do not interrupt the process until it is complete, otherwise the recovery will fail.

## Recovering using HP Recovery partition (select models only)

The HP Recovery partition (select models only), allows you to restore your system without the need for recovery discs or a recovery flash drive. This type of recovery can only be used if the hard drive is still working.

To check for the presence of a recovery partition, select **Start**, right-click **Computer** then select **Manage > Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

**NOTE:** Recovery discs have been included if your computer did not ship with a recovery partition.

1. Access HP Recovery Manager in either of the following ways:

   - Select **Start** and type `recovery` in the search field. Select **HP Recovery Manager** from the list.

     – or –

   - Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen. Then press f11 while the "F11 (System Recovery)" message is displayed on the screen.

2. Click **System Recovery** in the **HP Recovery Manager** window.

3. Follow the on-screen instructions.

## Recovering using the recovery media

1. If possible, back up all personal files.

2. Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.

   – or –

   Insert the recovery flash drive into a USB port on your computer, and then restart the computer.

   **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See .

3. Press f9 at system bootup.

4. Select the optical drive or the flash drive.

5. Follow the on-screen instructions.

### Changing the computer boot order

To change the boot order for recovery discs:

1. Restart the computer.

2. Press esc while the computer is restarting, and then press f9 for boot options.

3. Select **Internal CD/DVD ROM Drive** from the boot options window.

To change the boot order for a recovery flash drive:

1. Insert the flash drive into a USB port.

2. Restart the computer.

3. Press esc while the computer is restarting, and then press f9 for boot options.

4. Select the flash drive from the boot options window.

# 11 Backing up, restoring, and recovering in Windows 8.1

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

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

For additional information, refer to the HP Support Assistant.

▲ From the Start screen, type `support`, and then select the **HP Support Assistant** app.

   - or -

   From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

## Creating recovery media and backups

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

- Use HP Recovery Manager after you successfully set up the computer to create HP Recovery media. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Creating HP Recovery media (select models only) on page 98. For information on the recovery options that are available using the recovery media, see Recovering using HP Recovery Manager on page 100.

- Use Windows tools to create system restore points and create backups of personal information.

   For more information, see Using Windows tools on page 99.

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

### Creating HP Recovery media (select models only)

📝 **IMPORTANT:** If your computer does not list a Recovery Media Creation option, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

HP Recovery Manager is a software program that allows you to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and the software programs installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.

- HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.

- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.

- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.

- The creation process can take an hour or more. Do not interrupt the creation process.

- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.

2. Select **Recovery Media Creation**, and then follow the on-screen instructions.

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 100.

# Using Windows tools

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

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

▲ From the Start screen, type `help`, and then select **Help and Support**.

– or –

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

For more information and steps, see Help and Support.

# Restore and recovery

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

**IMPORTANT:** Not all methods are available on all models.

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

▲ From the Start screen, type `support`, and then select the **HP Support Assistant** app.

- or -

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

● If you need to correct a problem with a preinstalled application or driver, use the Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.

▲ From the Start screen, type `recovery`, select **HP Recovery Manager**, select **Drivers and Applications Reinstall**, and then follow the on-screen instructions.

● On select models, if you want to reset your computer using a minimized image, you can choose the HP Minimized Image Recovery option from the HP Recovery partition or HP Recovery media. Minimized Image Recovery installs only drivers and hardware-enabling applications. Other applications included in the image continue to be available for installation through the Drivers and Applications Reinstall option in HP Recovery Manager.

For more information, see Recovering using HP Recovery Manager on page 100.

● If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 100. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 98.

● On select models, if you want to recover the computer's original factory partition and content , or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 100.

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

For more information, see Removing the HP Recovery partition (select models only) on page 102.

## Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from support, or by using the HP Recovery partition (select models only). If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 98.

### What you need to know before you get started

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

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

● HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 98.

● To use the Factory Reset option (select models only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 98.

● If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP

website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

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

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

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.

- Minimized Image Recovery (select models only)—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.

- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select models only) allows System Recovery and Minimized Image Recovery (select models only).

## Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

1. From the Start screen, type `recovery`, select **HP Recovery Manager**, and then select **HP Recovery Environment**.

   - or-

   Press f11 while the computer boots, or press and hold f11 as you press the power button.

2. Select **Troubleshoot** from the boot options menu.

3. Select **Recovery Manager**, and then follow the on-screen instructions.

## Using HP Recovery media to recover

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

1. If possible, back up all personal files.

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

   **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See .

3. Follow the on-screen instructions.

## Changing the computer boot order

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

To change the boot order:

**1.** Insert the HP Recovery media.

**2.** Start Computer Setup:

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

**3.** Select the optical drive or USB flash drive from which you want to boot.

**4.** Follow the on-screen instructions.

## Removing the HP Recovery partition (select models only)

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

**IMPORTANT:** After you remove the HP Recovery partition, you can no longer use the Windows Refresh option or the Windows option to remove everything and reinstall Windows. In addition, you will not be able to perform System Recovery or Minimized Image Recovery from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Creating HP Recovery media (select models only) on page 98.

Follow these steps to remove the HP Recovery partition:

**1.** From the Start screen, type `recovery`, and then select **HP Recovery Manager**.

**2.** Select **Remove Recovery Partition**, and then follow the on-screen instructions.

# 12 Backing up, restoring, and recovering in Windows 10

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

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

For additional information, refer to the HP support assistant app.

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

– or –

Click the question mark icon in the taskbar.

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

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

## Creating recovery media and backups

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

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Creating HP Recovery media (select products only) on page 103. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 104.

- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Recovering using HP Recovery Manager on page 105.

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

## Creating HP Recovery media (select products only)

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

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

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

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.

  ○ Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.

  ○ HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.

  ○ To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.

  ○ If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

  ○ Be sure that the computer is connected to AC power before you begin creating the recovery media.

  ○ The creation process can take an hour or more. Do not interrupt the creation process.

  ○ If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media:

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

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

2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see .

# Using Windows tools

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

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

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

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

# Restore and recovery

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

**IMPORTANT:** Not all methods are available on all products.

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

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

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

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

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 105. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 103.

- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 105.

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

  For more information, see Removing the HP Recovery partition (select products only) on page 107.

## Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 103.

### What you need to know before you get started

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

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

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 103.

- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 103.

- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP

website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

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

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

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.

- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

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

## Using the HP Recovery partition (select products only)

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

To start HP Recovery Manager from the HP Recovery partition:

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

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

   - or-

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

   For tablets without keyboards:

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

   - or -

   Turn on or restart the tablet, and then quickly hold down the Windows button; then select f11.

2. Select **Troubleshoot** from the boot options menu.

3. Select **Recovery Manager**, and then follow the on-screen instructions.

## Using HP Recovery media to recover

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

1. If possible, back up all personal files.

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

   **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 107.

3. Follow the on-screen instructions.

## Changing the computer boot order

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

To change the boot order:

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

1. Insert the HP Recovery media.

2. Access BIOS:

   For computers or tablets with keyboards attached:

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

   For tablets without keyboards:

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

      - or -

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

3. Select the optical drive or USB flash drive from which you want to boot.

4. Follow the on-screen instructions.

## Removing the HP Recovery partition (select products only)

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

**IMPORTANT:** After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see .

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

Follow these steps to remove the HP Recovery partition:

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

2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

# 13 Using HP PC Hardware Diagnostics (UEFI)

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

> **NOTE:** To start BIOS on a convertible computer, your computer must be in notebook mode and you must use the keyboard attached to your tablet. The on-screen keyboard, which displays in tablet mode, cannot access BIOS.

To start HP PC Hardware Diagnostics UEFI:

1. Start BIOS:

   - Computers or tablets with keyboards:

     ▲ Turn on or restart the computer, quickly press esc.

   - Tablets without keyboards:

     ▲ Turn on or restart the tablet, and then quickly hold down the volume down button.

       - or -

       Turn on or restart the tablet, and then quickly hold down the Windows button.

2. Press or tap f2.

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

   a. Connected USB drive

   > **NOTE:** To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 109.

   b. Hard drive

   c. BIOS

3. When the diagnostic tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions. On a tablet, press the volume down button to stop a diagnostic test.

> **NOTE:** If you need to stop a diagnostic test on computers or tablets with a keyboard, press esc.

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

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

**Download the latest UEFI version:**

1.  Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2.  In the HP PC Hardware Diagnostics section, click the **Download** link, and then select **Run**.

**Download any version of UEFI for a specific product:**

1.  Go to http://www.hp.com/support, and then select your country. The HP Support page is displayed.

2.  Click **Drivers & Downloads**.

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

    – or –

    Click **Find Now** to let HP automatically detect your product.

4.  Select your computer, and then select your operating system.

5.  In the **Diagnostic** section,  follow the on-screen instructions to select and download the UEFI version you want.

# 14 Specifications

## Computer specifications

| | Metric | U.S. |
|---|---|---|
| **Dimensions** | | |
| Width | **384 mm** | 15.12 in |
| Depth | **255 mm** | 10.04 in |
| Height (front) | **21.6** | 0.85 in |
| Height (rear) | **23.7 mm** | 0.93 in |
| Weight | **2370 g** | 5.22 lbs |
| **Input power** | | |
| Operating voltage and current | 19.5 V dc @ 2.31 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.

# 39.6-cm (15.6-in) display specifications

|  | Metric | U.S. |
|---|---|---|
| Active diagonal size | 39.6-cm | 15.6-in |
| Resolution | 1366x768 (HD) | |
| Surface treatment | AntiGlare | |
| Brightness | 220 nits | |
| Viewing angle | SVA | |
| Backlight | WLED | |
| Graphics adapter | eDP | |
| Thickness | 3.8 mm | |

# Hard drive specifications

|  | 1-TB* | 750-GB* |
|---|---|---|
| **Dimensions** | | |
| Height | 9.5 mm | 9.5 mm |
| Length | 100.4 mm | 100.4 mm |
| Width | 69.9 mm | 69.9 mm |
| Weight | 107.0 g | 115.0 g |
| **Interface type** | SATA | SATA |
| **Transfer rate** | | |
| Synchronous (maximum) | 300 MB/sec | 300 MB/sec |
| Security | ATA security | ATA security |
| **Seek times** (typical read, including setting) | | |
| Single track | 2.0 ms | 1.5 ms |
| Average (read/write) | 12 ms | 11 ms |
| Maximum | 22 ms | 14 ms |
| **Logical blocks** | 1,953,525,168 | 1,465,149,168 |
| **Disk rotational speed** | 5400 rpm | 5400 rpm |
| **Operating temperature** | | |

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.

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

# 15 Power cord set requirements

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

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

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

## Requirements for all countries

The following requirements are applicable to all countries and regions:

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

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

- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.

- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

## Requirements for specific countries and regions

| Country/region | Accredited agency | Applicable note number |
|---|---|---|
| Australia | EANSW | 1 |
| Austria | OVE | 1 |
| Belgium | CEBC | 1 |
| Canada | CSA | 2 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |
| Italy | IMQ | 1 |
| Japan | METI | 3 |
| The Netherlands | KEMA | 1 |
| Norway | NEMKO | 1 |
| The People's Republic of China | COC | 5 |
| South Korea | EK | 4 |

| Country/region | Accredited agency | Applicable note number |
| --- | --- | --- |
| Sweden | SEMKO | 1 |
| Switzerland | SEV | 1 |
| Taiwan | BSMI | 4 |
| The United Kingdom | BSI | 1 |
| The United States | UL | 2 |

1.  The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

2.  The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3.  The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

4.  The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

5.  The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

# 16 Recycling

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

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

# Index