# HP 15 Laptop PC

## Maintenance and Service Guide

© Copyright 2018 HP Development Company, L.P.

AMD and AMD Radeon are trademarks of Advanced Micro Devices, Inc. Bluetooth is a trademark owned by its proprietor and used by HP Inc. under license. Microsoft and Windows are trademarks of the Microsoft group of companies.

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

First Edition: April 2018

Document Part Number: L19675-001

**Product notice**

This user 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. Go to 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 full refund subject to the refund policy of your seller.

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

## Important Notice about Customer Self-Repair Parts

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

## Safety warning notice

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

# Table of contents


1 Product description ..... 1

2 Getting to know your computer ..... 6

Right side ..... 6

Left side ..... 7

Display ..... 8

Keyboard area ..... 9

TouchPad ..... 9

Lights ..... 10

Button and speakers ..... 11

Special keys ..... 12

Action keys ..... 13

Bottom ..... 14

Labels ..... 15

3 Illustrated parts catalog ..... 16

Computer major components ..... 16

Cables ..... 20

Display assembly subcomponents ..... 21

Miscellaneous parts ..... 23

Mass storage devices ..... 24

4 Removal and replacement procedures preliminary requirements ..... 26

Tools required ..... 26

Service considerations ..... 26

Plastic parts ..... 26

Cables and connectors ..... 27

Drive handling ..... 27

Grounding guidelines ..... 28

Electrostatic discharge damage ..... 28

Packaging and transporting guidelines ..... 29

Workstation guidelines ..... 29

Equipment guidelines ..... 30

5 Removal and replacement procedures for Customer Self-Repair parts ..... 31

Component replacement procedures ..... 31

Optical drive ..... 32

**6 Removal and replacement procedures for Authorized Service Provider parts ..... 35**

Component replacement procedures ..... 35

Bottom cover ..... 36

Battery ..... 39

Memory ..... 41

Hard drive ..... 43

Solid-state drive ..... 45

Solid-state drive bracket and connector board ..... 46

WLAN module ..... 48

Hard drive connector board ..... 49

USB/card reader board ..... 50

TouchPad button board ..... 51

TouchPad module ..... 52

Fan ..... 54

Heat sink assembly ..... 55

Display assembly ..... 59

System board ..... 68

Speakers ..... 71

Power connector cable (DC-in) ..... 72

Top cover with keyboard ..... 73

**7 Using Setup Utility (BIOS) ..... 74**

Starting Setup Utility (BIOS) ..... 74

Updating Setup Utility (BIOS) ..... 74

Determining the BIOS version ..... 74

Downloading a BIOS update ..... 75

**8 Using HP PC Hardware Diagnostics ..... 76**

Using HP PC Hardware Diagnostics Windows ..... 76

Downloading HP PC Hardware Diagnostics Windows ..... 76

Downloading the latest HP PC Hardware Diagnostics Windows version ..... 77

Downloading HP Hardware Diagnostics Windows by product name or number (select products only) ..... 77

Installing HP PC Hardware Diagnostics Windows ..... 77

Using HP PC Hardware Diagnostics UEFI ..... 77

Starting HP PC Hardware Diagnostics UEFI ..... 78

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive ..... 78

Downloading the latest HP PC Hardware Diagnostics UEFI version ..... 78

Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only) ... 78
Using Remote HP PC Hardware Diagnostics UEFI settings (select products only) ... 79
Downloading Remote HP PC Hardware Diagnostics UEFI ... 79
Downloading the latest Remote HP PC Hardware Diagnostics UEFI version ... 79
Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number ... 79
Customizing Remote HP PC Hardware Diagnostics UEFI settings ... 79

**9 Backing up, restoring, and recovering ... 81**
Creating recovery media and backups ... 81
Creating HP Recovery media (select products only) ... 81
Using Windows tools ... 82
Restore and recovery ... 83
Recovering using HP Recovery Manager ... 83
What you need to know before you get started ... 83
Using the HP Recovery partition (select products only) ... 84
Using HP Recovery media to recover ... 84
Changing the computer boot order ... 85
Removing the HP Recovery partition (select products only) ... 86

**10 Specifications ... 87**
Computer specifications ... 87
39.6-cm (15.6-in) display specifications ... 88
M.2 SATA solid-state drive specifications ... 88
M.2 PCIe solid-state drive specifications ... 89
Hard drive specifications ... 90

**11 Power cord set requirements ... 91**
Requirements for all countries ... 91
Requirements for specific countries and regions ... 91

**12 Recycling ... 93**

**Index ... 94**

# 1 Product description

| Category | Description |
|---|---|
| **Product Name** | **HP 15 Laptop PC** |
| | Model numbers: |
| | 15-db0000 ~ 15-db0999 |
| | 15g-dx0000 ~ 15g-dx0999 |
| | 15q-dy0000 ~ 15q-dy0999 |
| | 15z-db000 |
| **Processor** | **AMD Dual-Core A9-Series Processor:** |
| | A9-9425 (3.1 GHz, turbo up to 3.7 GHz), 2133 MHz/1-MB L2 cache, dual core, 15 W |
| | **AMD Dual-Core A6-Series Processor:** |
| | A6-9225 (2.6 GHz, turbo up to 3.0 GHz), 2133 MHz/1-MB L2 cache, dual core, 15 W |
| | **AMD Dual-Core A4-Series Processor:** |
| | A4-9125 (2.3 GHz, turbo up to 2.6 GHz), 2133 MHz/1-MB L2 cache, dual core, 15 W |
| | **AMD Quad-Core E2-Series Processor:** |
| | E2-9000e (1.5 GHz, turbo up to 2.0 GHz), 1866 MHz/1-MB L2 cache, dual core, 6 W |
| | **AMD Quad-Core R5-Series Accelerated Processor:** |
| | Ryzen 5-2500U (2.0 GHz, turbo up to 3.6 GHz), 6-MB L2+L3 cache, 2400 MHz, quad core, 15 W |
| | **AMD Dual-Core R3-Series Accelerated Processor:** |
| | Ryzen 3-2300U (2.0 GHz, turbo up to 3.4 GHz), 2-MB L2 cache, DDR4-2400 MHz, dual core, 15 W |
| | Ryzen 3-2200U (2.5 GHz, turbo up to 3.4 GHz), 1-MB L3 cache, DDR4-2400 MHz, dual core, 15 W |
| **Graphics** | Supports HD decode, DX12, HDMI |
| | **Internal graphics:** |
| | AMD Radeon™ Vega 8 Mobile Graphics (Ryzen 5 processor) |
| | AMD Radeon Vega 6 Mobile Graphics (Ryzen 3-2300 processor) |
| | AMD Radeon Vega 3 Mobile Graphics (Ryzen 3-2200 processor) |
| | AMD Radeon R5 Graphics (A9 processor) |
| | AMD Radeon R4 Graphics (A6 processor) |
| | AMD Radeon R3 Graphics (A4 processor) |
| | AMD Radeon R2 Graphics (E2 processor) |
| | **External graphics:** |
| | AMD Radeon 530 with up to 4 GB of dedicated video memory |

| Category | Description |
|---|---|
| | AMD Radeon 530 with up to 2 GB of dedicated video memory |
| | AMD Radeon 520 with up to 2 GB of dedicated video memory |
| **Panel** | **39.6-cm (15.6-in), WLED, eDP, slim-flat (3.2 mm), 16:10 ultra wide aspect ratio:** |
| | High definition (HD)(1366×768), BrightView, SVA, 220 nits |
| | HD (1366×768), anti glare, SVA, 220 nits |
| | HD (1366×768), BrightView, SVA, 200 nits, Touch on Panel (TOP) |
| | Full high-definition (FHD) (1920×1080), anti glare, SVA, 220 nits |
| | FHD (1920×1080), anti glare, UWVA, 220 nits, narrow bezel |
| | Touch solution with bezel, multi-touch enabled |
| **Memory** | **Two memory module slots** (Ryzen, A9 processors): |
| | Memory is non-customer accessible/non-upgradeable |
| | DDR4-2400 dual channel support (Ryzen processors) |
| | DDR4-1866 dual channel support (A9 processors) |
| | Supports up to 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 + 4096×2) |
| | • 4096 MB (4096 MB×1) |
| | **One memory module slot** (E2/A4/A6 processors): |
| | Memory is non-customer accessible/non-upgradeable |
| | DDR4-1866 single channel support |
| | Supports up to 8 GB of system RAM in the following configurations: |
| | • 8192 MB (8192 MB×1) |
| | • 4096 MB (4096 MB×1) |
| **Primary storage** | **Single hard drive configurations, 6.35 cm (2.5-in), 7.0 mm/7.2 mm/9.5 mm, SATA hard drives:** |
| | 2 TB, 5400 rpm, 9.5 mm |
| | 2 TB, 5400 rpm, 7.2 mm |
| | 1 TB, 5400 rpm, 9.5 mm |
| | 1 TB, 5400 rpm, 7.2 mm |
| | 500 GB, 5400 rpm, 7.0 mm |
| | **M.2, SATA-3, solid-state drives:** |
| | 256 GB, TLC |
| | 128 GB, TLC |
| | **PCIe, NVMe, M.2 solid-state drives**: |

| Category | Description |
|---|---|
| | 256 GB |
| | **Dual storage configurations** (Ryzen and A9 processors): |
| | 256 GB, PCIe, solid-state drive + 1 TB, 5400 rpm hard drive |
| | 128 GB, SATA-3, TLC, solid-state drive + 1 TB, 5400 rpm hard drive |
| **Optical drive** | 9.0 mm tray load |
| | DVD+/-RW Double-Layer Writer |
| **Camera** | **HP TrueVision HD Camera** - indicator LED, USB2.0, HD BSI sensor, f2.0 |
| | 720p by 30 frames per second |
| | Single digital microphone |
| | **HP Webcam** - VGA camera, indicator LED, USB 2.0, f2.4 |
| | 640×480 by 30 frames per second |
| | Single digital microphone |
| **Audio** | **Audio Application Name**: HP Audio Control |
| | Dual speakers |
| **Ethernet** | Ethernet Integrated 10/100/1000 NIC |
| **Wireless networking** | Compatible with Miracast-certified devices |
| | **Integrated Wireless options with dual antennas (M.2/PCIe):** |
| | Realtek RTL8822BE 802.11 ac 2×2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) |
| | **Integrated Wireless options with single antenna (M.2/PCIe):** |
| | Realtek RTL8821CE 802.11 ac 1×1 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) |
| | Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter |
| **External media cards** | **HP Multi-Format Digital Media Card Reader** |
| | Supports SD/SDHC/SDXC |
| | Push-pull insertion/removal |
| **Internal card expansion** | One M.2 slot for solid-state drive |
| | One M.2 slot for WLAN |
| **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) |
| | HDMI v1.4 supporting: up to 1920×1080 @ 60Hz |
| | USB 2.0 port (right side) |
| | (2) USB 3.1 Gen 1 ports (left side) |
| | RJ-45/Ethernet |
| | Audio-out (headphone)/audio-in (microphone) combo jack |
| | AC Smart Pin adapter plug |

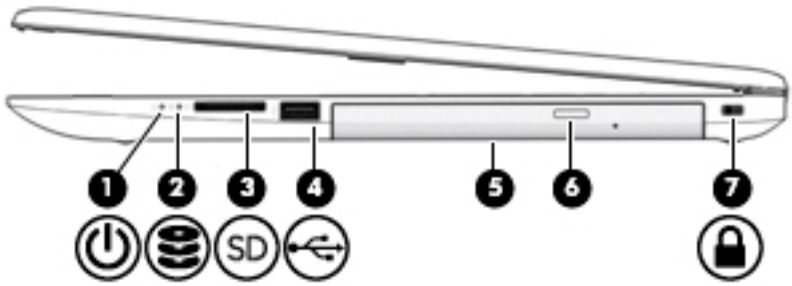
| Category | Description |
|---|---|
| **Keyboard/pointing devices** | **Keyboard:** |
| | Full-size, textured, island-style keyboard with numeric keypad |
| | Full-size, two coat paint, backlit (ash silver only), island-style keyboard with numeric keypad |
| | Full-size, four coat paint, backlit, island-style keyboard with numeric keypad |
| | **TouchPad:** |
| | Multitouch gestures enabled |
| | Support Modern Trackpad Gestures |
| | Taps enabled by default |
| **Power requirements** | **Battery:** |
| | 3-cell Prismatic/Polymer battery, 41 Whr |
| | Supports battery fast charge |
| | **AC adapter, barrel type:** |
| | 65 W Smart, nPFC, right angle, 4.5 mm (models with discrete graphics) |
| | 65 W Smart, nPFC, 4.5 mm, EM |
| | 65 W Smart, nPFC, 4.5 mm - for use in Argentina (models with discrete graphics) |
| | 45 W Smart, nPFC, right angle, 4.5 mm (models with UMA graphics) |
| | 45 W Smart, nPFC, 4.5 mm - for use in Argentina (models with UMA graphics) |
| | **Power cord (C5):** |
| | 1 m, conventional |
| **Security** | Kensington Security Lock |
| | Supports firmware-based Trusted Platform Module (fTPM) 2.0 |
| **Operating system** | FreeDOS 2.0 |
| | Windows 10 Home 64 |
| | Windows 10 Home 64 Chinese Market CPPP |
| | Windows 10 Home 64 High-End Chinese Market CPPP |
| | Windows 10 Home 64 Plus |
| | Windows 10 Home 64 Plus QVC |
| | Windows 10 Home 64 Plus Single Language |
| | Windows 10 Home 64 Plus Single Language APAC EM PPP |
| | Windows 10 Home 64 Plus Single Language India Market PPP |
| | Windows 10 Home 64 Plus Single Language Indonesia Market PPP |
| | Windows 10 Home 64 Plus Web/Kiosk |
| | Windows 10 Home 64 QVC |
| | Windows 10 Home 64 Single Language |

| Category | Description |
|---|---|
| | Windows 10 Home 64 Single Language APAC EM PPP |
| | Windows 10 Home 64 Single Language India Market PPP |
| | Windows 10 Home 64 Single Language Indonesia Market PPP |
| | Windows 10 Home 64 Single Language Value APAC EM PPP |
| | Windows 10 Home 64 Single Language Value India Market PPP |
| | Windows 10 Home 64 Single Language Value Indonesia Market PPP |
| | Windows 10 Home 64 Value Notebook Single Language |
| | Windows 10 Home 64 Value Notebook Single Language SEAP |
| | Windows 10 Home 64 Value Notebook Single Language select GEO |
| | Windows 10 Home 64 Web/Kiosk |
| | Windows 10 Pro 64 |
| **Serviceability** | **End user replaceable parts:** |
| | AC adapter |
| | Optical drive |

# 2 Getting to know your computer

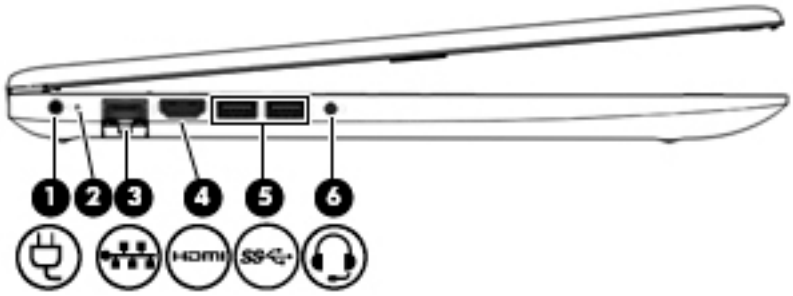
Your computer features top-rated components. This chapter provides details about your components, where they're located, and how they work.

## Right side



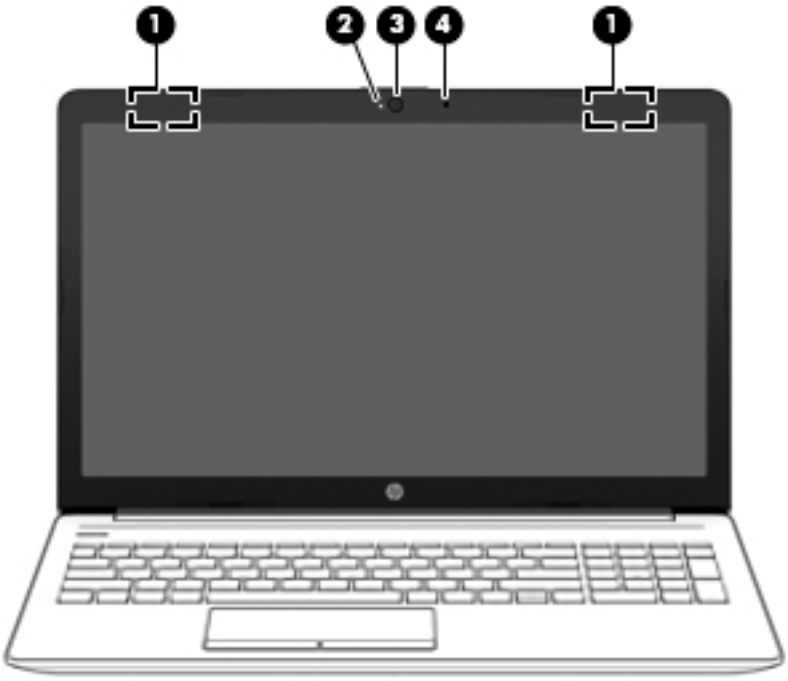

| Component | | | Description |
|---|---|---|---|
| (1) | | Power light | • On: The computer is on.<br>• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.<br>• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. |
| (2) | | Drive light | • Blinking white: The hard drive is being accessed. |
| (3) | SD | Memory card reader | Reads optional memory cards that enable you to store, manage, share, or access information.<br>To insert a card:<br>1. Hold the card label-side up, with connectors facing the computer.<br>2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated.<br>To remove a card:<br>▲ Pull to remove the card from the memory card reader. |
| (4) | | USB port | Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. |
| (5) | | Optical drive | Depending on your computer model, reads an optical disc or reads and writes to an optical disc. |
| (6) | | Optical drive eject button | Releases the optical drive disc tray. |
| (7) | | Security cable slot | Attaches an optional security cable to the computer.<br>**NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. |

# Left side




| Component | | | Description |
|---|---|---|---|
| **(1)** | | Power connector | Connects an AC adapter. |
| **(2)** | | AC adapter and battery light | • White: The AC adapter is connected and the battery is fully charged.<br>• Blinking white: The AC adapter is disconnected and the battery has reached a low battery level.<br>• Amber: The AC adapter is connected and the battery is charging.<br>• Off: The battery is not charging. |
| **(3)** | | RJ-45 (network) jack/status lights | Connects a network cable.<br>• White: The network is connected.<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 High-Definition Multimedia Interface (HDMI) device. |
| **(5)** | | USB SuperSpeed ports (2) | Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer. |
| **(6)** | | Audio-out (headphone)/Audio-in (microphone) combo jack | Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.<br>**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*.<br>To access this guide:<br>▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.<br>**NOTE:** When a device is connected to the jack, the computer speakers are disabled. |

# Display




| Component | | Description |
|---|---|---|
| **(1)** | WLAN antennas* (1 or 2 depending on model) | Send and receive wireless signals to communicate with wireless local area networks (WLANs). |
| **(2)** | Camera light | On: The camera is in use. |
| **(3)** | Camera | Allows you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon..<br>**NOTE:** Camera functions vary depending on the camera hardware and software installed on your product. |
| **(4)** | Internal microphone | Records sound. |

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

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

To access this guide:

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.

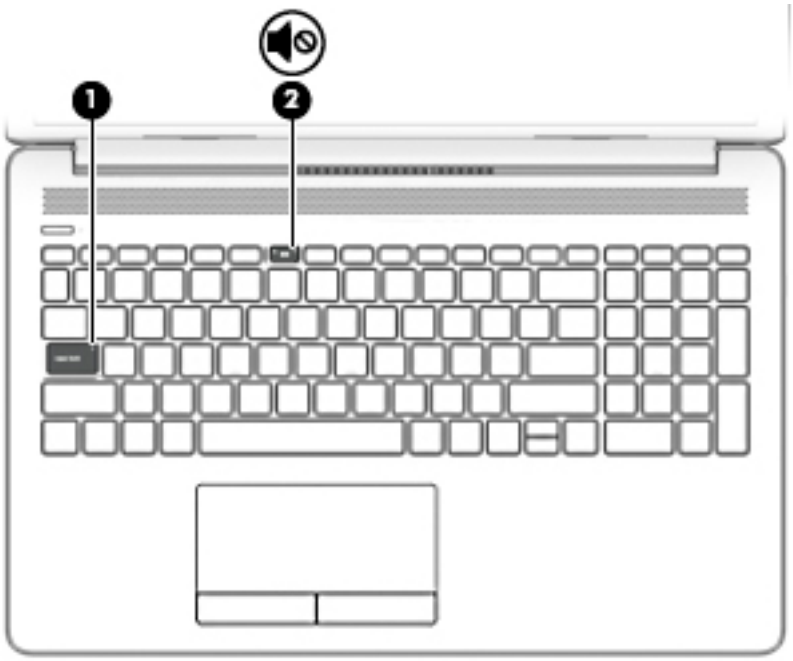
2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

# Keyboard area

## TouchPad

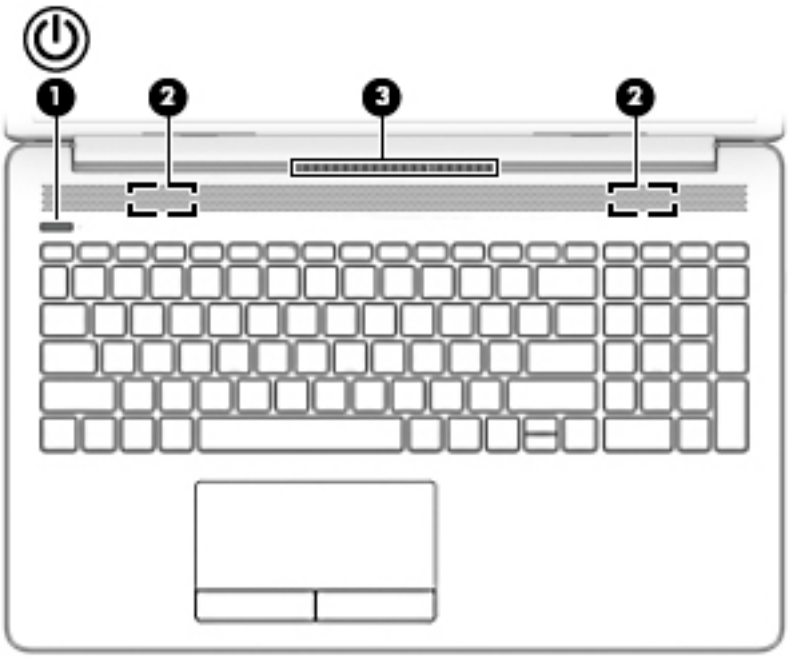
| Component | | Description |
|---|---|---|
| **(1)** | TouchPad zone | Reads your finger gestures to move the pointer or activate items on the screen. |
| **(2)** | Left TouchPad button | Functions like the left button on an external mouse. |
| **(3)** | Right TouchPad button | Functions like the right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

## Lights



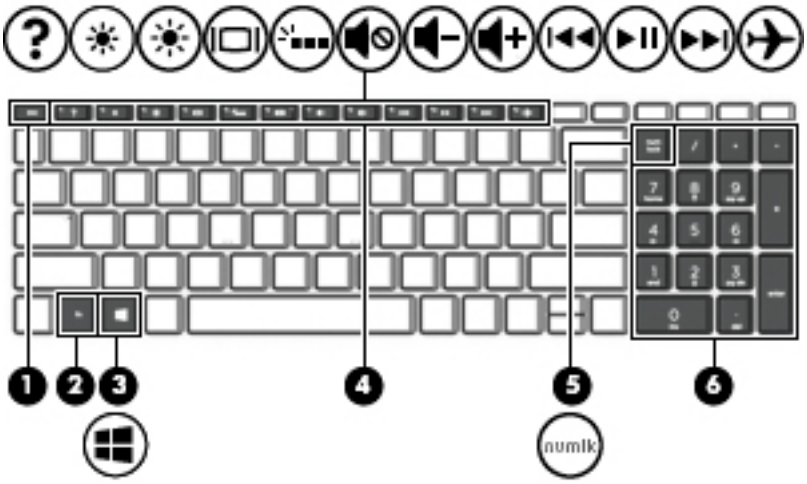

| Component | | Description |
|---|---|---|
| (1) | Caps lock light | On: Caps lock is on, which switches the key input to all capital letters. |
| (2) | Mute light | • On: Computer sound is off.<br>• Off: Computer sound is on. |

## Button and speakers




| Component | | Description |
|---|---|---|
| **(1)** | Power button | • When the computer is off, press the button to turn on the computer.<br>• When the computer is on, press the button briefly to initiate Sleep.<br>• When the computer is in the Sleep state, press the button briefly to exit Sleep.<br>• When the computer is in Hibernation, press the button briefly to exit Hibernation.<br>**CAUTION:** Pressing and holding down the power button results in the loss of unsaved information.<br>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.<br>To learn more about your power settings, see your power options:<br>▲ Right-click the **Power** icon, and then select **Power Options**. |
| **(2)** | Speakers (2) | Produce sound. |
| **(3)** | Vent | Enables airflow to cool internal components.<br>**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. |

## Special keys




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

## Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see Special keys on page 12.

▲ To use an action key, press and hold the key.

| Icon | Description |
|---|---|
| | Opens the “How to get help in Windows 10” webpage. |
| | Decreases the screen brightness incrementally as long as you hold down the key. |
| | Increases the screen brightness incrementally as long as you hold down the key. |
| | Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor. |
| | Turns the keyboard backlight off or on.<br>**NOTE:** To conserve battery power, turn off this feature. |
| | Mutes or restores speaker sound. |
| | Decreases speaker volume incrementally while you hold down the key. |
| | Increases speaker volume incrementally while you hold down the key. |
| | Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD). |
| | Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD. |
| | Plays the next track of an audio CD or the next section of a DVD or a BD. |
| | Turns the airplane mode and wireless feature on or off.<br>**NOTE:** The airplane mode key is also referred to as the wireless button.<br>**NOTE:** A wireless network must be set up before a wireless connection is possible. |

# Bottom

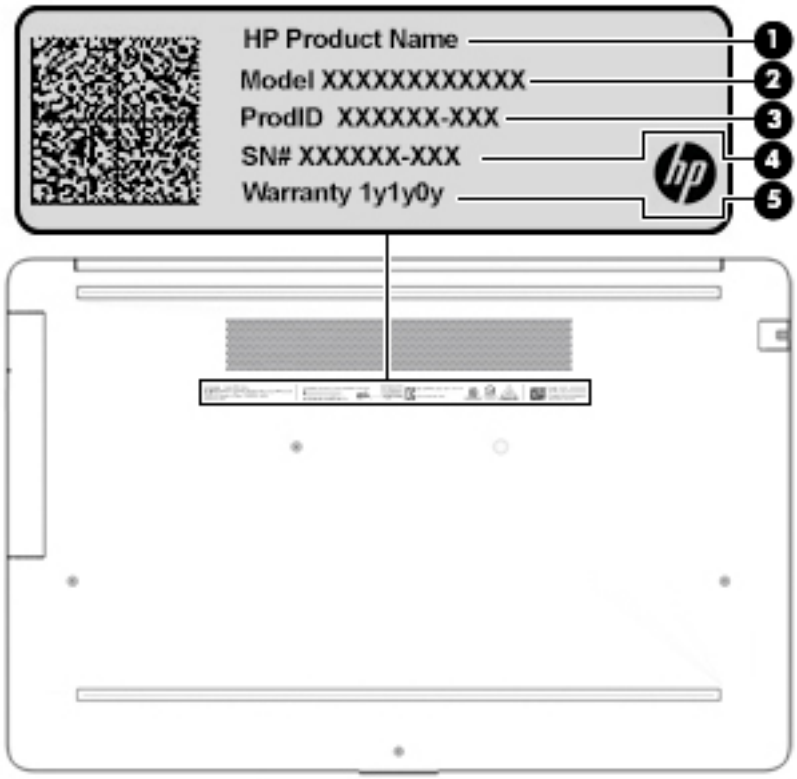
| Component | Description |
|---|---|
| Vent | Enables airflow to cool internal components.<br><br>**NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |

# Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer. Labels may be in paper form or imprinted on the product.

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

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




| Component | |
|---|---|
| **(1)** | HP product name |
| **(2)** | Model number |
| **(3)** | Product ID |
| **(4)** | Serial number |
| **(5)** | Warranty period |

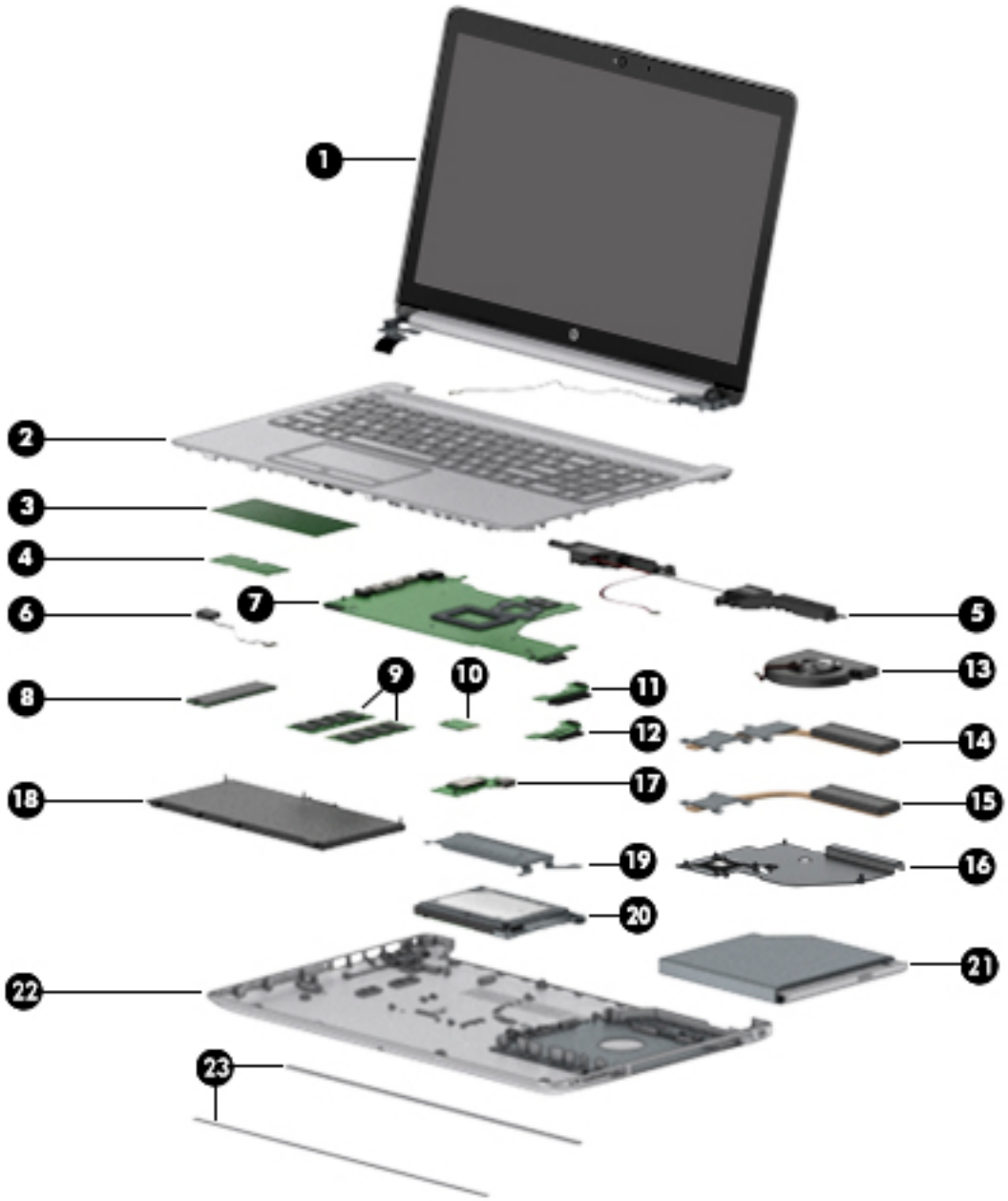
- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

# 3 Illustrated parts catalog

## Computer major components

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

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



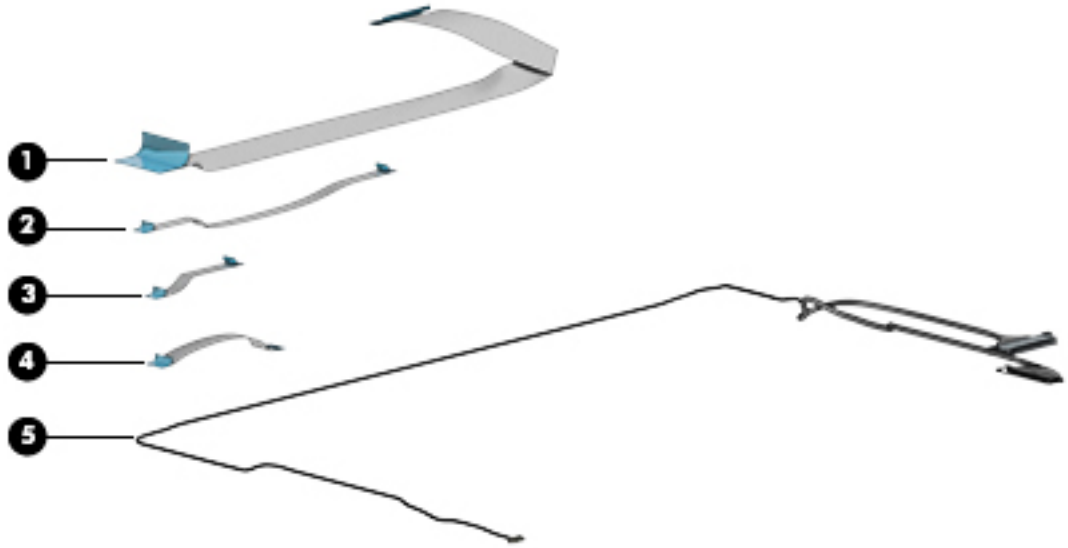
| Item | Component | Spare part number |
|---|---|---|
| **(1)** | **Display**<br>**NOTE:** Displays are not spared as whole units. Display subcomponent spare parts are available. For spare part information, see Display assembly subcomponents on page 21. | Not spared |
| **(2)** | **Top cover/keyboard**<br>**NOTE:** For a detailed list of country codes, see Top cover with keyboard on page 73. | |
| | Keyboard, no backlight, jet black | L20387-xx1 |
| | Keyboard, no backlight, full-featured models, snow white | L20388-xx1 |
| | Keyboard, no backlight, defeatured models, snow white | L23066-xx1 |
| | Keyboard, no backlight, ash silver | L20386-xx1 |
| | Keyboard, backlit, ash silver (available only with -001 United States, -002 India, and -DB1 Canadian French keyboards) | L23074-xx1 |
| | Keyboard, no backlight, iridescent pale rose gold (available only with -001 United States keyboards) | L28504-001 |
| | Keyboard, backlit, iridescent pale rose gold (available only with -001 United States keyboards) | L28505-001 |
| | Keyboard, no backlight, iridescent ceramic white (available only with -001 United States keyboards) | L28506-001 |
| | Keyboard, backlit, iridescent ceramic white (available only with -001 United States keyboards) | L28507-001 |
| **(3)** | **TouchPad module** | L20449-001 |
| **(4)** | **TouchPad button board** | not spared |
| **(5)** | **Speakers** (includes cable) | L20453-001 |
| **(6)** | **Power connector cable (DC-in)** | L20475-001 |
| **(7)** | **System board**<br>**NOTE:** All system board spare part kits include replacement thermal material.<br>All system boards use the following part numbers:<br>xxxxxx-001: Non-Windows operating systems<br>xxxxxx-601: Windows operating system | |
| | For use in models with discrete graphics memory: | |
| | • AMD Ryzen 3-2200U processor | L20668-001 |
| | • AMD A9-9425 processor | L20480-001 |
| | • AMD A6-9225 processor | L20481-001 |
| | For use in models with UMA graphics memory: | |
| | • AMD Ryzen 5-2500U processor | L20664-001 |
| | • AMD Ryzen 3-2300U processor | L20665-001 |
| | • AMD Ryzen 3-2200U processor | L20666-001 |
| | • AMD A9-9425 processor | L20477-001 |
| | • AMD A4-9125 processor | L20478-001 |
| | • AMD A6-9225 processor | L31720-001 |

| Item | Component | Spare part number |
|---|---|---|
| | • AMD E2-9000e processor | L20479-001 |
| **(8)** | **Solid-state drive**<br>**NOTE:** For spare part information, see Mass storage devices on page 24. | |
| **(9)** | **Memory modules** (2400 MHz DDR4) | |
| | 8 GB | 862398-855 |
| | 4 GB | 862397-855 |
| **(10)** | **WLAN module** | |
| | Realtek RTL8822BE 802.11 ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) | 924813-855 |
| | Realtek RTL8821CE 802.11 ac 1x1 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) | L17365-005 |
| | Realtek RTL8723DE 802.11 bgn 1x1 WiFi + Bluetooth 4.2 Combo Adapter | L21480-005 |
| **(11)** | **Hard drive connector board** | L20454-001 |
| **(12)** | **Solid-state drive connector board** | L20457-001 |
| **(13)** | **Fan** | |
| | For use in models with discrete graphics | L20473-001 |
| | For use in models with UMA graphics | L20474-001 |
| | **Heat sink** | |
| **(14)** | For use in models with AMD Ryzen processors and discrete graphics | L20482-001 |
| | For use in models with AMD A6/A9 processors and discrete graphics | L20484-001 |
| **(15)** | For use in models with AMD Ryzen processors and integrated UMA graphics | L20483-001 |
| | For use in models with AMD A6/A9 processors and integrated UMA graphics | L20491-001 |
| **(16)** | For use in fanless models with AMD E2-9000e processors | L20494-001 |
| **(17)** | **USB/card reader board**<br>The USB/card reader board cable is available using spare part number L20452-001. | L20448-001 |
| **(18)** | **Battery** (3-cell, 48 WHr) | L11119-855 |
| **(19)** | **Solid-state drive bracket** | L20458-001 |
| **(20)** | **Hard drive**<br>**NOTE:** For spare part information, see Mass storage devices on page 24. | |
| **(21)** | **DVD+/-RW Double-Layer Writer** | L20485-001 |
| **(22)** | **Bottom cover** | |
| | For use in models with an optical drive | |
| | • Snow white | L20389-001 |
| | • Jet black | L20390-001 |
| | • Natural silver | L20391-001 |
| | • Pale gold | L20392-001 |

| Item | Component | Spare part number |
|---|---|---|
| | • Twilight blue | L20393-001 |
| | • Scarlet red | L20397-001 |
| | • Smoke gray | L20395-001 |
| | • Maroon burgundy | L20398-001 |
| | • Iridescent pale rose gold | L28510-001 |
| | • Iridescent ceramic white | L28512-001 |
| | For use in models without an optical drive | |
| | • Snow white | L20399-001 |
| | • Jet black | L20400-001 |
| | • Natural silver | L20401-001 |
| | • Pale gold | L20402-001 |
| | • Twilight blue | L20403-001 |
| | • Scarlet red | L20405-001 |
| | • Smoke gray | L20404-001 |
| | • Iridescent pale rose gold | L28511-001 |
| | • Iridescent ceramic white | L28513-001 |
| | • Maroon burgundy | L31719-001 |
| **(23)** | **Rubber feet** | |
| | Front feet: | |
| | • Pale gold | L20408-001 |
| | • Scarlet red | L20411-001 |
| | • Twilight blue | L20409-001 |
| | • Maroon burgundy | L20412-001 |
| | • Dark ash silver | L20406-001 |
| | • Asteroid silver | L20407-001 |
| | • Iridescent pale rose gold | L28518-001 |
| | • Iridescent ceramic white | L28520-001 |
| | Rear feet: | |
| | • Pale gold | L20415-001 |
| | • Scarlet red | L20418-001 |
| | • Twilight blue | L20416-001 |
| | • Maroon burgundy | L20419-001 |
| | • Dark ash silver | L20413-001 |
| | • Asteroid silver | L20414-001 |

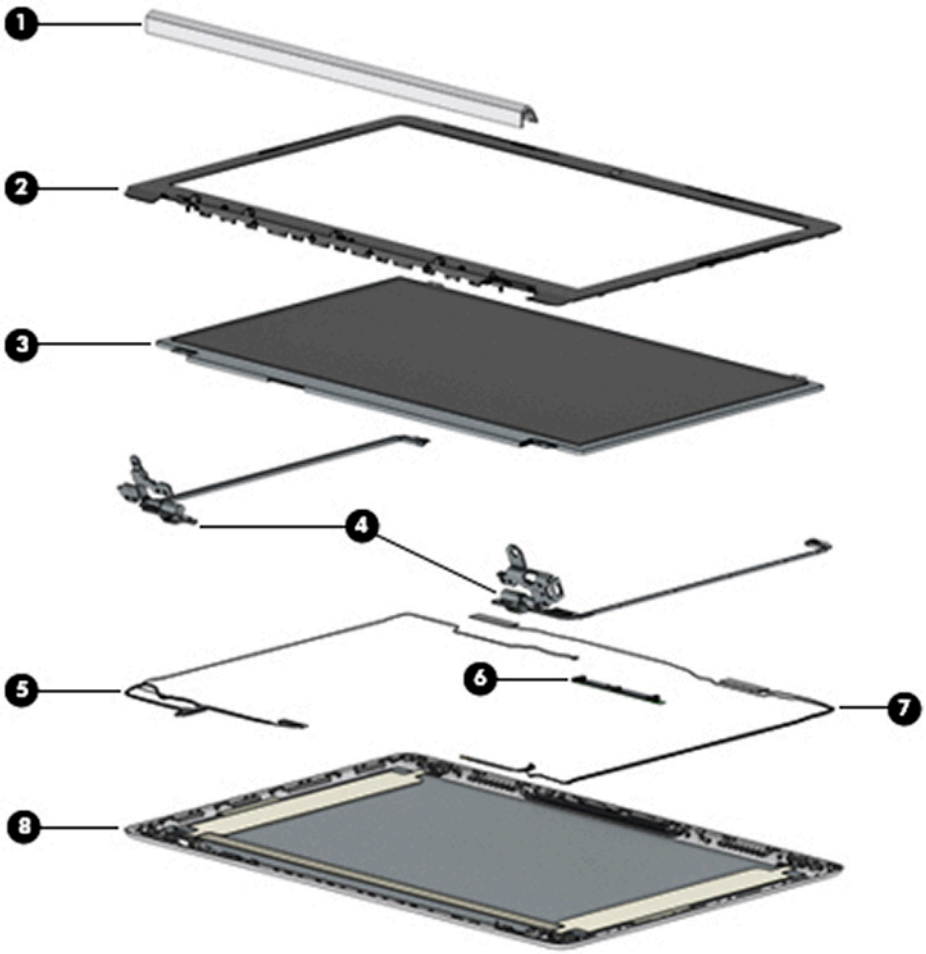
| Item | Component | Spare part number |
|---|---|---|
| | • Iridescent pale rose gold | L28519-001 |
| | • Iridescent ceramic white | L28521-001 |

# Cables




| Item | Component | Spare part number |
|---|---|---|
| **(1)** | **USB/card reader board cable** | L20452-001 |
| **(2)** | **TouchPad button board cable** | L20451-001 |
| **(3)** | **TouchPad cable** | L20450-001 |
| **(4)** | **Hard drive/solid-state drive cable** | L20456-001 |
| **(5)** | **Display cable** | |
| | Display cable, non-touch, HD | L20443-001 |
| | Display cable, non-touch, FHD | L23064-001 |
| | Display cable, touch, HD | L20442-001 |

# Display assembly subcomponents




| Item | Component | Spare part number |
|---|---|---|
| **(1)** | **Hinge cover** | |
| | Jet black | L20423-001 |
| | Sparkling black | L20427-001 |
| | Natural silver | L20424-001 |
| | Pale gold | L20425-001 |
| | Scarlet red | L20430-001 |
| | Twilight blue | L20426-001 |
| | Smoke gray | L20428-001 |
| | Snow white (full-featured models) | L20422-001 |
| | Snow white (defeatured) models | L21306-001 |
| | Maroon burgundy | L20431-001 |
| | Iridescent pale rose gold | L28516-001 |
| | Iridescent ceramic white | L28517-001 |

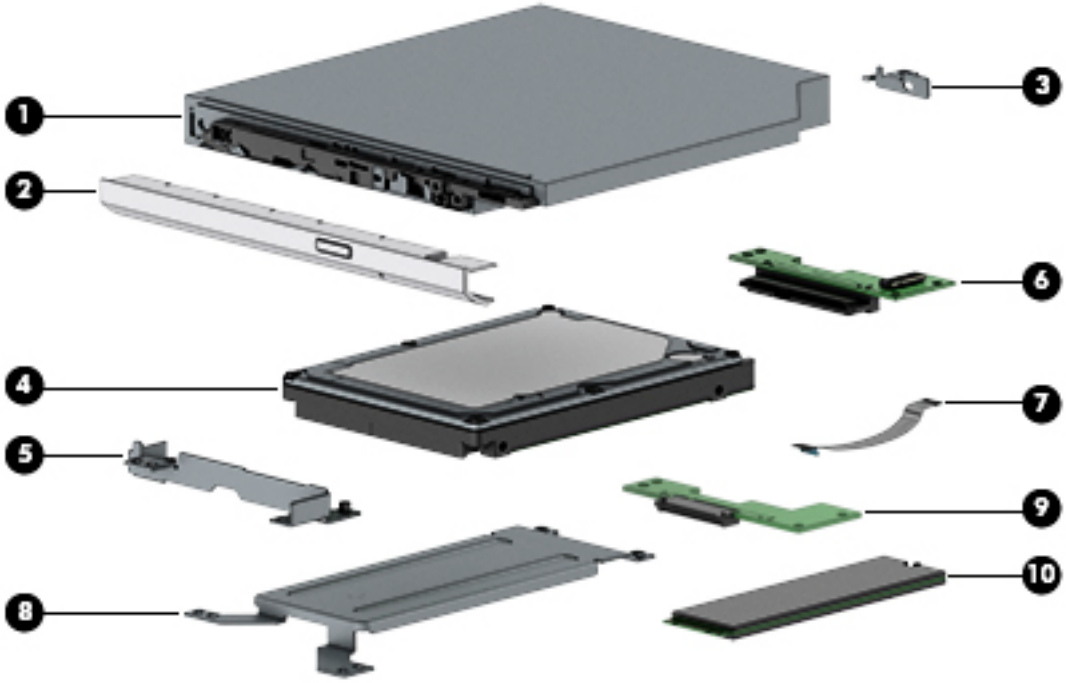
| Item | Component | Spare part number |
|---|---|---|
| **(2)** | **Display bezel** | L20421-001 |
| **(3)** | **Display panel** | |
| | HD, BrightView, non-touch | L20379-001 |
| | HD, anti glare, non-touch | L20378-001 |
| | HD, BrightView, touch-on panel (TOP) | L20380-001 |
| | FHD, anti glare, non-touch | L20376-001 |
| | FHD, anti glare, narrow bezel | L20377-001 |
| | **Miscellaneous Display Kit** (includes gaskets [4] and rubber corner positioning tools [4]; not illustrated)) | L23065-001 |
| | **Display panel stretchable adhesive tape** (not illustrated) | L29080-001 |
| **(4)** | **Hinge Kit** (includes left and right hinges) | L20420-001 |
| **(5)** | **Display cable** | |
| | Non-touch, HD | L20443-001 |
| | Non-touch, FHD | L23064-001 |
| | Touch, HD | L20442-001 |
| **(6)** | **Camera module** | |
| | HD camera | L20447-001 |
| | VGA camera | L20446-001 |
| **(7)** | **WLAN antenna cable** | |
| | Single antenna | L20445-001 |
| | Single antennas, narrow bezel | L23060-001 |
| | Dual antennas | L20444-001 |
| | Dual antennas, narrow bezel | L23059-001 |
| **(8)** | **Back cover** | |
| | Jet black | L20433-001 |
| | Jet black (narrow bezel models) | L23061-001 |
| | Sparkling black | L20437-001 |
| | Natural silver | L20434-001 |
| | Natural silver (narrow bezel models) | L23062-001 |
| | Pale gold | L20435-001 |
| | Scarlet red | L20440-001 |
| | Twilight blue | L20436-001 |
| | Smoke gray | L20438-001 |
| | Smoke gray (narrow bezel models) | L23063-001 |
| | Snow white (full-featured models | L20432-001 |

| Item | Component | Spare part number |
|---|---|---|
| | Snow white (defeatured models) | L21307-001 |
| | Maroon burgundy | L20441-001 |
| | Iridescent pale rose gold | L28508-001 |
| | Iridescent ceramic white | L28509-001 |

# Miscellaneous parts

| Component | Spare part number |
|---|---|
| **AC adapter** | |
| 65 W AC adapter, nPFC, 4.5 mm | 710412-001 |
| 65 W AC adapter, nPFC, SMART, RC, 4.5 mm, EM | 913691-850 |
| 65 W AC adapter, nPFC, 4.5 mm for use in Argentina | 710340-850 |
| 45 W AC adapter, nPFC, SMART, RC, 4.5 mm, non-slim | 741727-001 |
| 45 W AC adapter, nPFC, SMART, RC, 4.5 mm for use in Argentina | 741553-852 |
| **Power cord, C5, conventional, 1.0 m** | |
| For use in Argentina | L19357-001 |
| For use in Australia | L19358-001 |
| For use in Denmark | L19360-001 |
| For use in Europe | L19361-001 |
| For use in India | L19363-001 |
| For use in Israel | L19362-001 |
| For use in Italy | L19364-001 |
| For use in Japan | L19365-001 |
| For use in North America | L19367-001 |
| For use in the People's Republic of China | L19368-001 |
| For use in South Africa | L19369-001 |
| For use in South Korea | L19366-001 |
| For use in Switzerland | L19370-001 |
| For use in Taiwan | L19372-001 |
| For use in Thailand | L19371-001 |
| For use in the United Kingdom | L19373-001 |
| **Screw Kit** | L20476-001 |
| **HP Rugged Bluetooth Speaker, black** | 900777-001 |
| **HP Sleeve** | L07806-101 |

# Mass storage devices




| Item | Component | Spare part number |
|---|---|---|
| **(1)** | **DVD+/-RW Double-Layer Writer** | L20485-001 |
| **(2)** | **Optical drive bezel** | |
| | Natural silver | L20462-001 |
| | Pale gold | L20463-001 |
| | Scarlet red | L20467-001 |
| | Smoke gray | L20465-001 |
| | Twilight blue | L20464-001 |
| | Maroon burgundy | L20468-001 |
| | Jet black | L20461-001 |
| | Snow white | L20460-001 |
| | Iridescent pale rose gold | L28514-001 |
| | Iridescent ceramic white | L28515-001 |
| **(3)** | **Optical drive bracket** | L20459-001 |
| **(4)** | **Hard drive**, 7 mm | |
| | 2 TB, 5400 rpm | 912487-855 |
| | 1 TB, 5400 rpm | 762990-005 |
| | 500 GB, 5400 rpm | 778186-005 |
| **(5)** | **Hard drive bracket** | L20455-001 |

| Item | Component | Spare part number |
|---|---|---|
| **(6)** | **Hard drive connector board** | L20454-001 |
| **(7)** | **Hard drive/solid-state drive cable** | L20456-001 |
| **(8)** | **Solid-state drive bracket** | L20458-001 |
| **(9)** | **Solid-state drive connector board** | L20457-001 |
| **(10)** | **Solid-state drive** (M.2) | |
| | 256 GB, PCIe, NVMe | L20384-001 |
| | 256 GB, SATA-3, TLC | L20382-001 |
| | 128 GB, SATA-3, TLC | L20381-001 |

# 4 Removal and replacement procedures preliminary requirements

## Tools required

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

- Phillips P1 magnetic screwdriver
- Plastic, non-marking pry tool

## Service considerations

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

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

### Plastic parts

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

## Cables and connectors

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

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

## Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

# Grounding guidelines

## Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

**Typical electrostatic voltage levels**

| | 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 plastic foam | 14,500 V | 5,000 V | 3,500 V |
| Removing bubble pack from PCB | 26,500 V | 20,000 V | 7,000 V |
| Packing PCBs in foam-lined box | 21,000 V | 11,000 V | 5,000 V |

## Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

## Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and plastic foam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

## Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

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

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

# 5 Removal and replacement procedures for Customer Self-Repair parts

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

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

## Component replacement procedures

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

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

## Optical drive

| Description | Spare part number |
|---|---|
| **DVD+/-RW Double-Layer Writer** | L20485-001 |
| **Optical drive bracket** | L20459-001 |
| **Optical drive bezel** | |
| Natural silver | L20462-001 |
| Pale gold | L20463-001 |
| Scarlet red | L20467-001 |
| Smoke gray | L20465-001 |
| Twilight blue | L20464-001 |
| Maroon burgundy | L20468-001 |
| Jet black | L20461-001 |
| Snow white | L20460-001 |
| Iridescent pale rose gold | L28514-001 |
| Iridescent ceramic white | L28515-001 |

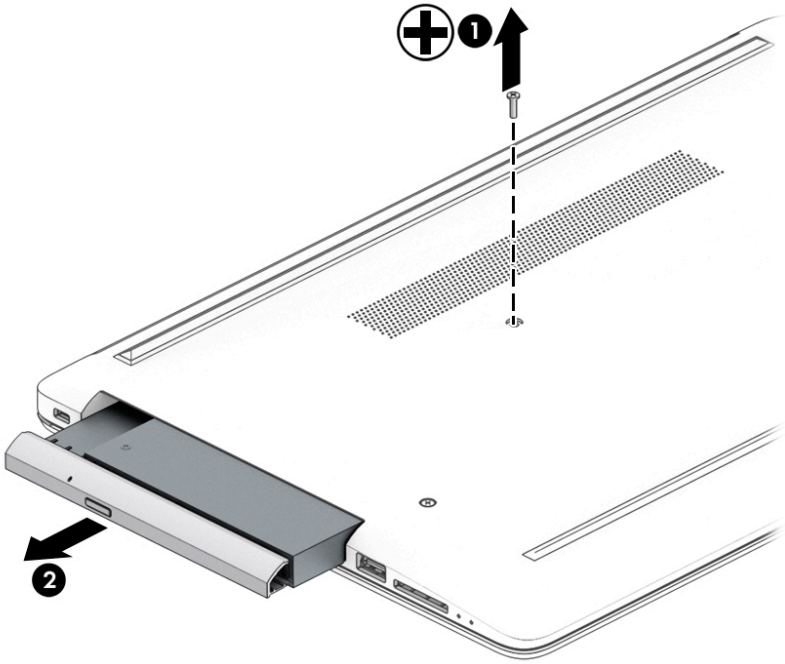
Before removing the optical drive, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

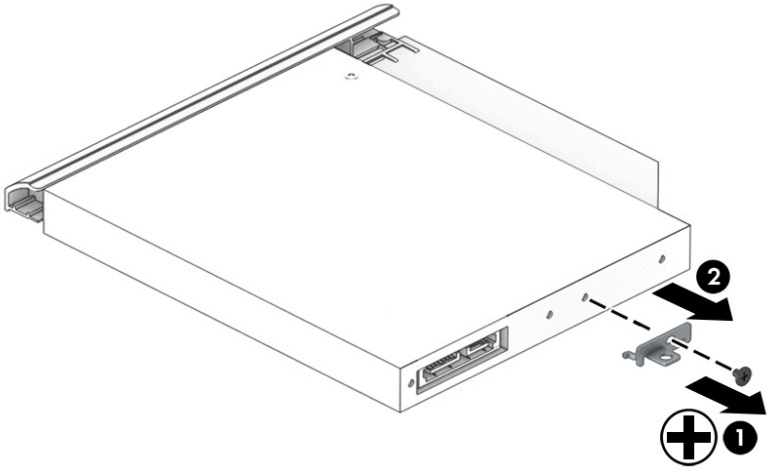
Remove the optical drive:

1. Remove the Phillips M2.5×9.0 screw **(1)** that secures the drive to the computer.

2. Slide the optical drive out of the computer **(2)**.



3. If it necessary to remove the bracket from the rear of the optical drive, remove the Phillips M2.0×3.0 screw **(1)**, and the remove the bracket from the drive **(2)**.

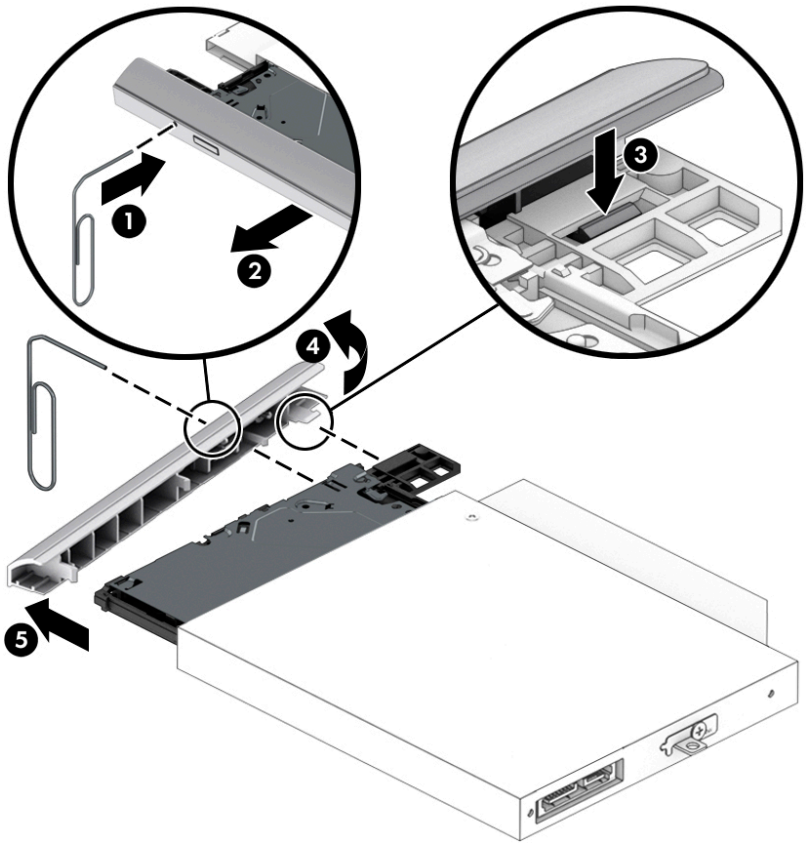


4. If it necessary to remove the bezel from the front of the optical drive:

   **a.** Insert a paper clip into the release hole on the front of the bezel **(1)**. The left side of the bezel rotates outward **(2)**.

   **b.** Press the tab to release the bezel from the drive **(3)**.

   **c.** Rotate the side of the bezel **(4)**, and then remove it **(5)**.




Reverse this procedure to reassemble and install the optical drive.

# 6 Removal and replacement procedures for Authorized Service Provider parts

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

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

## Component replacement procedures

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

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

There are as many as 46 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

## Bottom cover

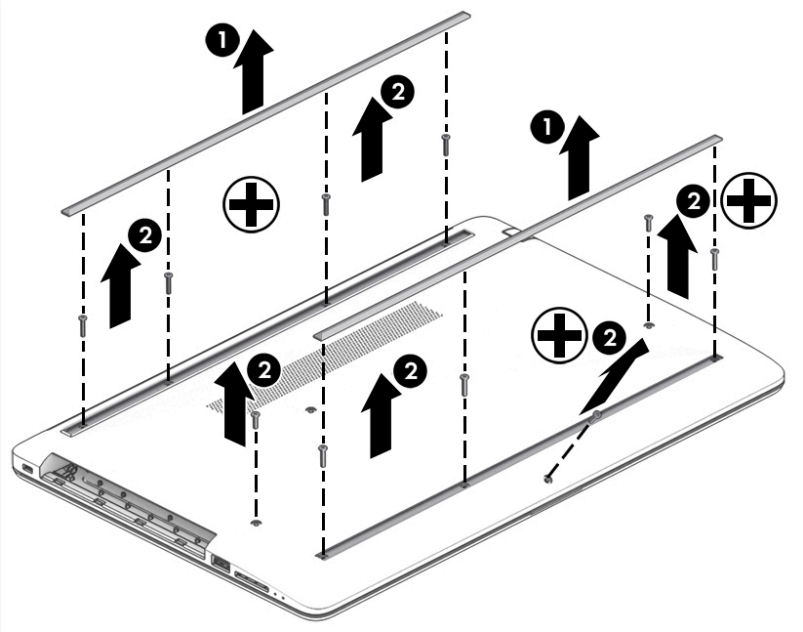
| Description | Spare part number |
|---|---|
| Bottom cover for use in models with an optical drive | |
| • Snow white | L20389-001 |
| • Jet black | L20390-001 |
| • Natural silver | L20391-001 |
| • Pale gold | L20392-001 |
| • Twilight blue | L20393-001 |
| • Scarlet red | L20397-001 |
| • Smoke gray | L20395-001 |
| • Maroon burgundy | L20398-001 |
| • Iridescent pale rose gold | L28510-001 |
| • Iridescent ceramic white | L28512-001 |
| Bottom cover for use in models without an optical drive | |
| • Snow white | L20399-001 |
| • Jet black | L20400-001 |
| • Natural silver | L20401-001 |
| • Pale gold | L20402-001 |
| • Twilight blue | L20403-001 |
| • Scarlet red | L20405-001 |
| • Smoke gray | L20404-001 |
| • Iridescent pale rose gold | L28511-001 |
| • Iridescent ceramic white | L28513-001 |
| • Maroon burgundy | L31719-001 |
| Front feet: | |
| • Pale gold | L20408-001 |
| • Scarlet red | L20411-001 |
| • Twilight blue | L20409-001 |
| • Maroon burgundy | L20412-001 |
| • Dark ash silver | L20406-001 |
| • Asteroid silver | L20407-001 |
| • Iridescent pale rose gold | L28518-001 |
| • Iridescent ceramic white | L28520-001 |
| Rear feet: | |
| • Pale gold | L20415-001 |

| Description | Spare part number |
|---|---|
| • Scarlet red | L20418-001 |
| • Twilight blue | L20416-001 |
| • Maroon burgundy | L20419-001 |
| • Dark ash silver | L20413-001 |
| • Asteroid silver | L20414-001 |
| • Iridescent pale rose gold | L28519-001 |
| • Iridescent ceramic white | L28521-001 |

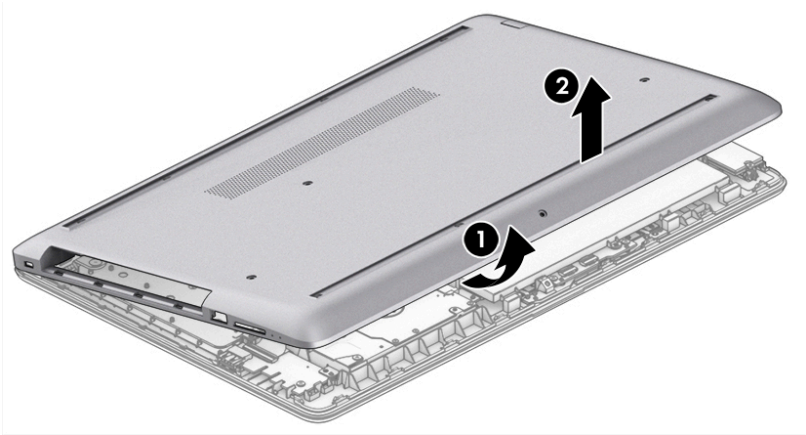
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the optical drive (see Optical drive on page 32).

Remove the bottom cover:

1. Peel the rubber feet off the bottom of the computer **(1)**.
2. Remove the 10 Phillips M2.5×9.0 screws that secure the bottom cover to the computer.



3. Starting near the middle, bottom of the bottom cover **(1)**, pry the cover up to remove it **(2)**.




Reverse this procedure to install the bottom cover.

## Battery

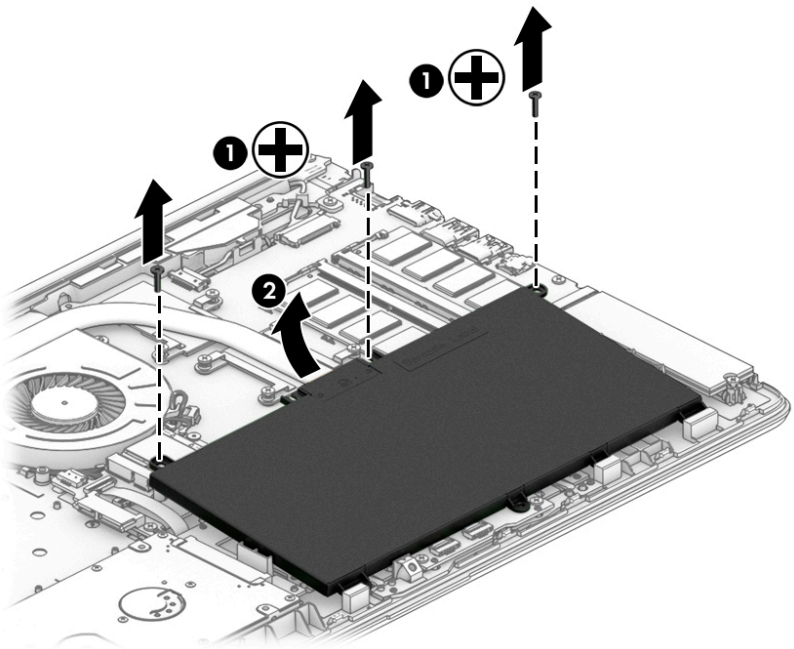
| Description | Spare part number |
|---|---|
| Battery (3-cell, 48 Wr) | L11119-855 |

Before removing the battery, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).

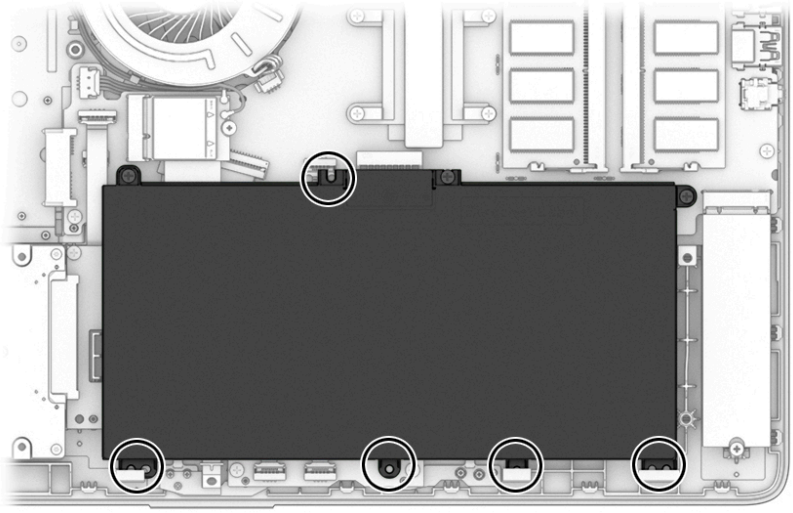
Remove the battery:

1. Remove the three Phillips M2.0×8.0 screws **(1)** that secure the battery to the computer.
2. Remove the battery from the computer **(2)**.




Reverse this procedure to install the battery.

When installing the battery, be sure to install screws in the proper locations. The following image shows the locations around the battery that have holes but do NOT require screws.



# Memory

| Description | Spare part number |
|---|---|
| Memory module, 8 GB | 862398-855 |
| Memory module, 4 GB | 862397-855 |

Before removing the memory modules, follow these steps:

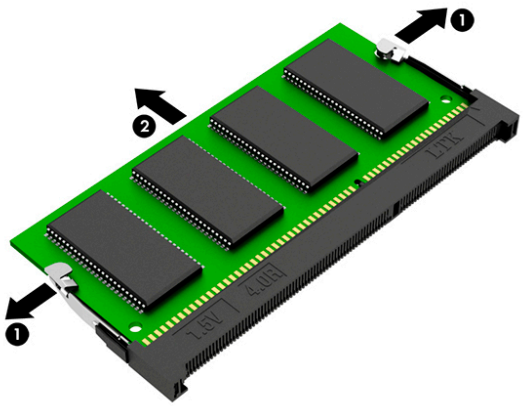
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the memory modules:

1. Spread the two retention clips outward **(1)** until the memory module tilts up at a 45-degree angle.
2. Grasp the edge of the memory module **(2)**, and then gently pull the module out of the slot. Use the same procedure to remove both memory modules.

**CAUTION:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

To protect a memory module after removal, place it in an electrostatic-safe container.

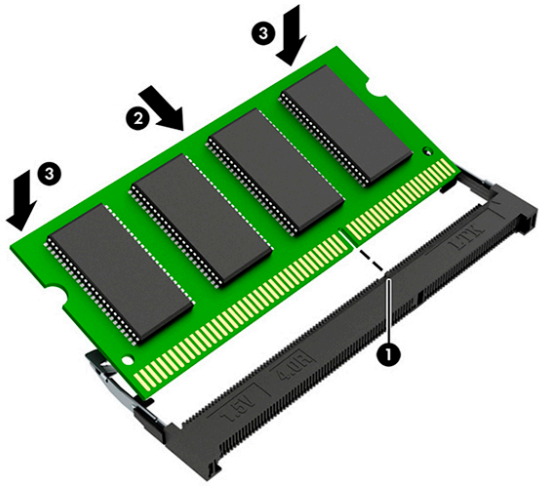


Install the memory modules:

**IMPORTANT:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module. Do not bend the memory module.

1. Align the notched edge of the memory module with the tab in the memory module slot **(1)**.
2. Press the module into the slot until seated **(2)**.

3. Gently press down on the module edges until the side retention clips snap into place **(3)**.



# Hard drive

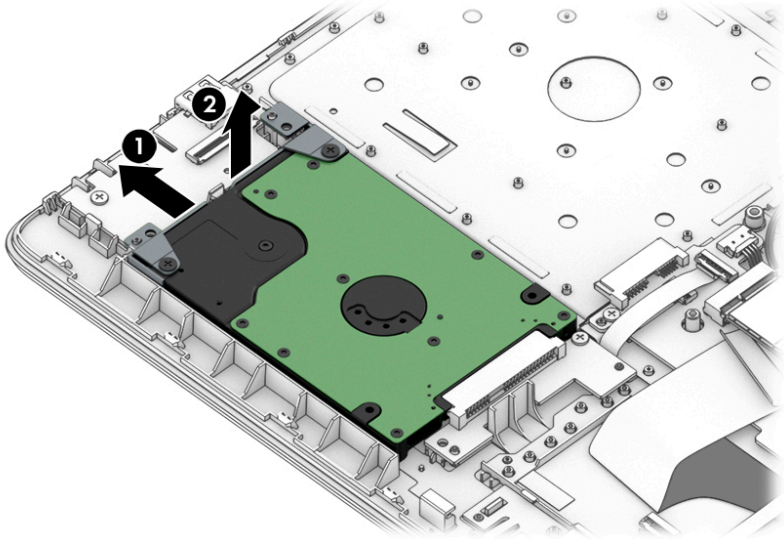
| Description | Spare part number |
|---|---|
| Hard drive, 2 TB, 5400 rpm, 7 mm | 912487-855 |
| Hard drive, 1 TB, 5400 rpm, 7 mm | 762990-005 |
| Hard drive, 500 GB, 5400 rpm, 7 mm | 778186-005 |
| Hard drive bracket | L20455-001 |

Before removing the hard drive, follow these steps:

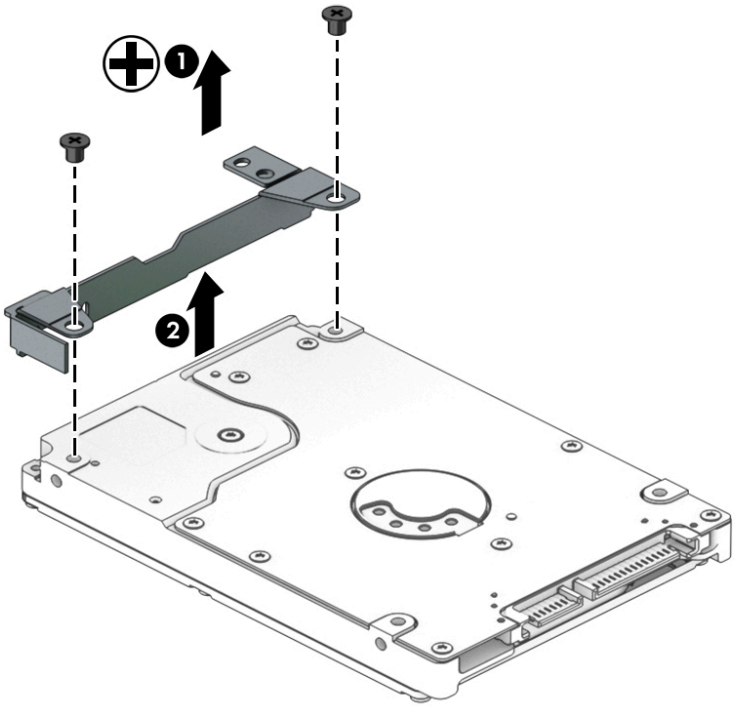
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the hard drive:

1. Slide the hard drive away from the connector **(1)**, and then lift the hard drive out of the computer **(2)**.



2. If it is necessary to disassemble the hard drive, remove the two Phillips M3.0×3.0 screws **(1)**, and then lift the bracket off the drive **(2)**.




Reverse this procedure to reassemble and install the hard drive.

## Solid-state drive

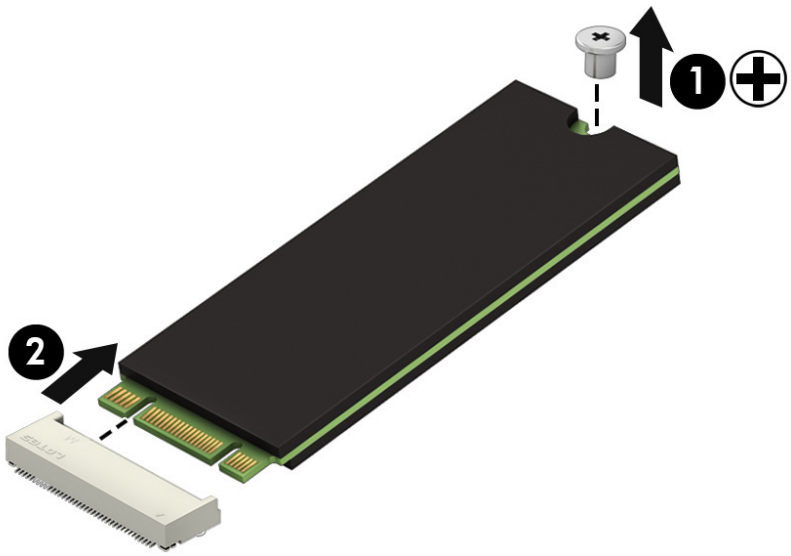
| Description | Spare part number |
|---|---|
| 256 GB, PCIe, NVMe | L20384-001 |
| 256 GB, SATA-3, TLC | L20382-001 |
| 128 GB, SATA-3, TLC | L20381-001 |

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

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the solid-state drive:

▲ Remove the Phillips M2.0×3.0 screw **(1)**, and then pull the solid-state drive module from the socket **(2)**.




Reverse this procedure to install the solid-state drive.

## Solid-state drive bracket and connector board

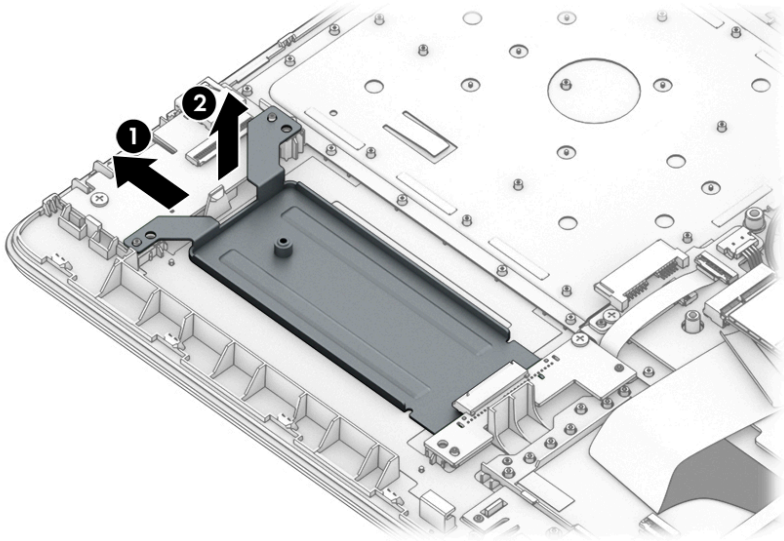
| Description | Spare part number |
|---|---|
| Solid-state drive bracket | L20458-001 |
| Solid-state drive connector board | L22542-001 |
| Solid-state drive cable | L20456-001 |

Before removing the solid-state drive bracket and connector board, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).
7. Remove the solid-state drive (see Solid-state drive on page 45).

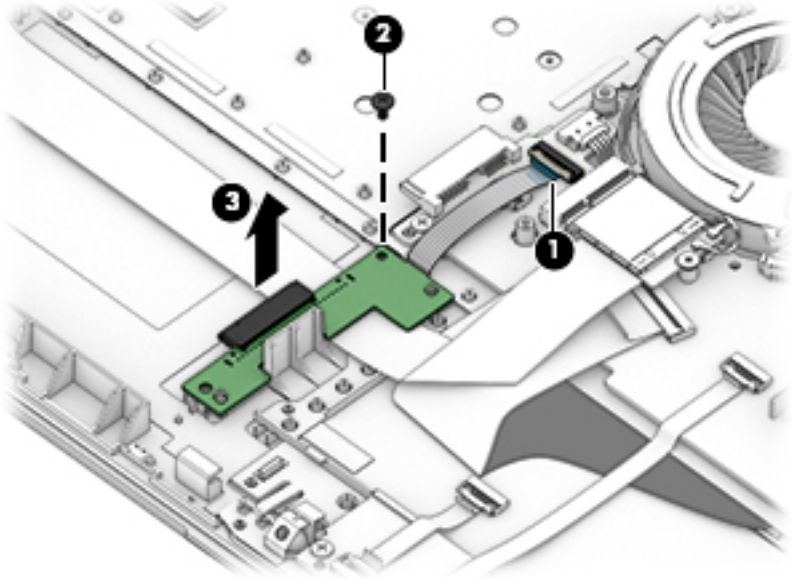
Remove the solid-state drive bracket and connector board:

1. Slide the bracket toward the side of the computer **(1)**, and then lift the bracket out of the computer **(2)**.




2. Disconnect the solid-state connector board cable from the system board ZIF connector **(1)**.
3. Remove the Phillips M2.0×3.0 screw **(2)** that secures the board to the computer.

4. Remove the connector board from the computer **(3)**.




Reverse this procedure to install the solid-state drive bracket and connector board.

## WLAN module

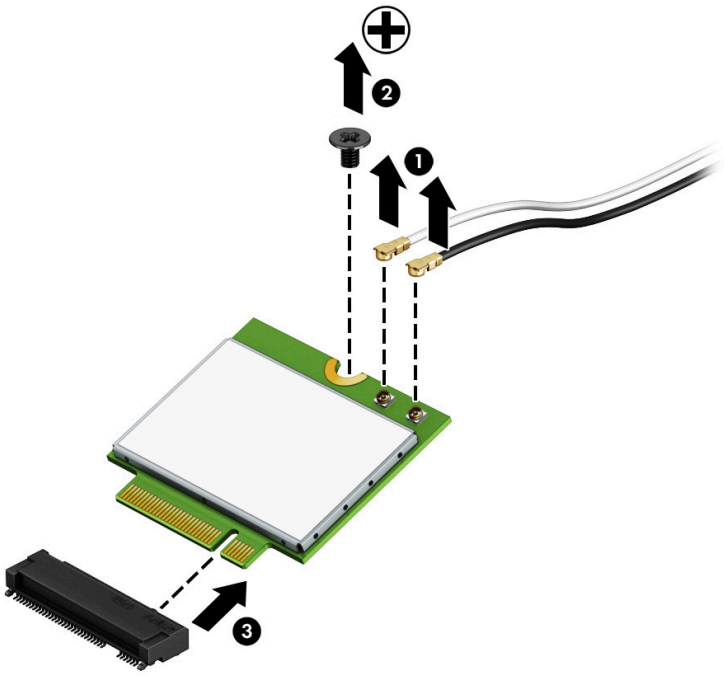
| Description | Spare part number |
|---|---|
| Realtek RTL8822BE 802.11 ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) | 924813-855 |
| Realtek RTL8821CE 802.11 ac 1x1 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) | L17365-005 |
| Realtek RTL8723DE 802.11 bgn 1x1 WiFi + Bluetooth 4.2 Combo Adapter | L21480-005 |

Before removing the WLAN, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the WLAN module:

1. Disconnect the two antenna cables from the module **(1)**.
2. Remove the Phillips M2.0×3.0 screw **(2)**, and then pull the module out of the socket **(3)**.




Reverse this procedure to install the WLAN module.

## Hard drive connector board

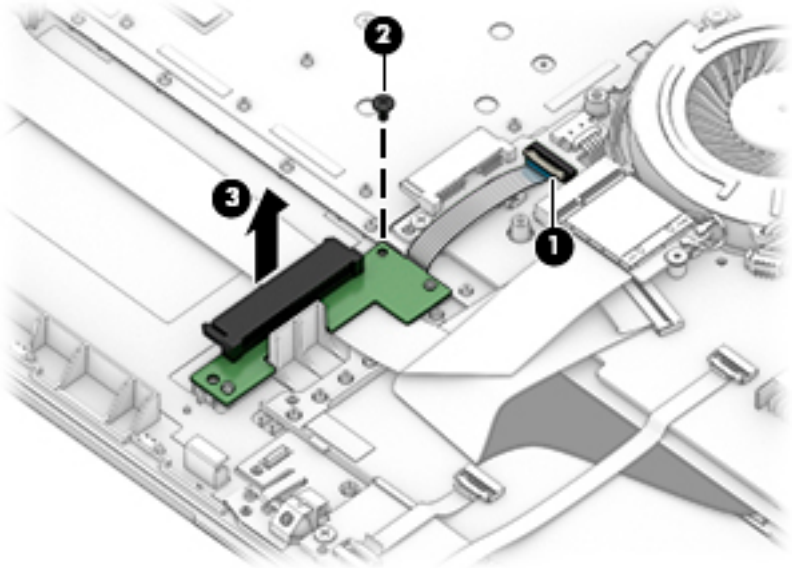
| Description | Spare part number |
|---|---|
| Hard drive connector board | L20454-001 |

Before removing the hard drive connector 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 optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).
7. Remove the hard drive (see Hard drive on page 43).

Remove the hard drive connector:

1. Disconnect the cable from the system board ZIF connector **(1)**.
2. Remove the Phillips M2.0×3.0 screw **(2)** that secures the board to the computer.
3. Remove the board from the computer **(3)**.




Reverse this procedure to install the hard drive connector board.

## USB/card reader board

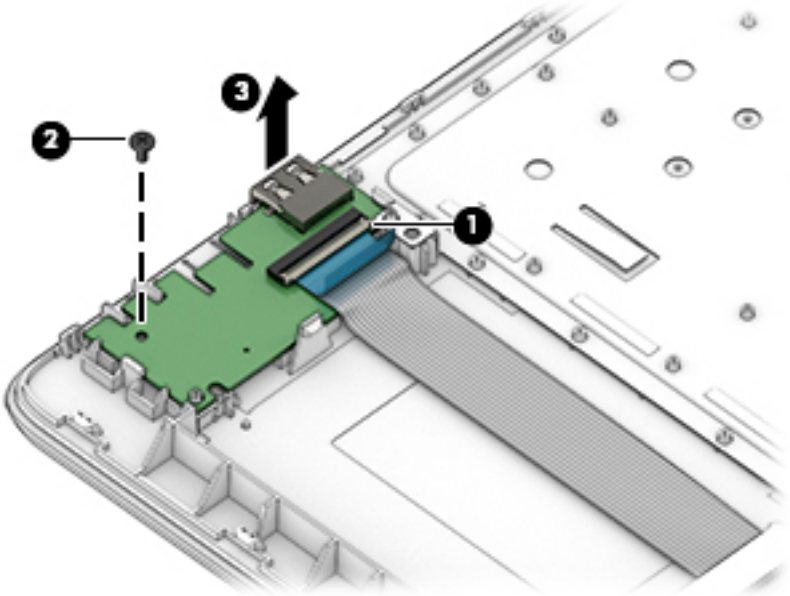
| Description | Spare part number |
|---|---|
| USB/card reader board | L20448-001 |
| USB/card reader board cable | L20452-001 |

Before removing the USB/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 optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the USB/card reader board:

1. Disconnect the cable from the ZIF connector on the USB board **(1)**.
2. Remove the Phillips M2.0×3.0 screw **(2)**, and then remove the board from the computer **(3)**.




Reverse this procedure to replace the USB/card reader board.

## TouchPad button board

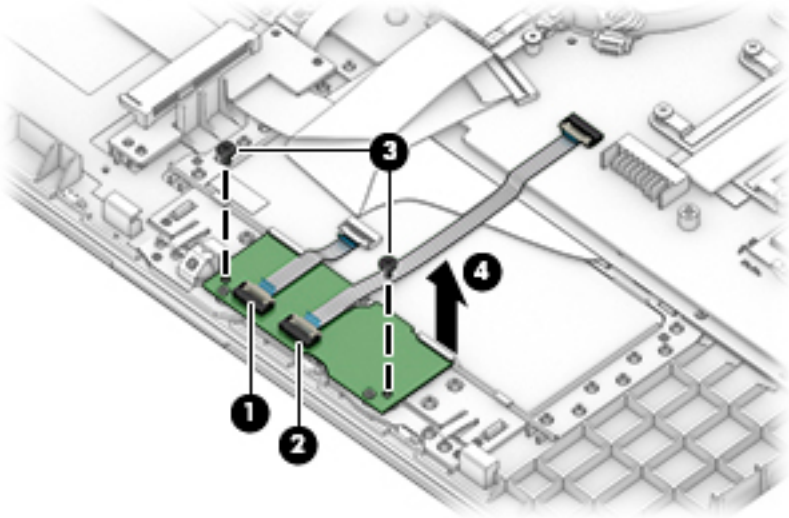
| Description | Spare part number |
|---|---|
| TouchPad button board | not spared |
| TouchPad button board cable | L20451-001 |

Before removing the TouchPad button board, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the TouchPad button board:

1. Disconnect the system board cable from the ZIF connector on the TouchPad button board **(1)**.
2. Disconnect the TouchPad cable from the ZIF connector on the TouchPad button board **(2)**.
3. Remove the two Phillips M2.0×3.0 screws **(3)** that secure the board to the computer.
4. Remove the TouchPad button board from the computer **(4)**.




Reverse this procedure to install the TouchPad button board.

## TouchPad module

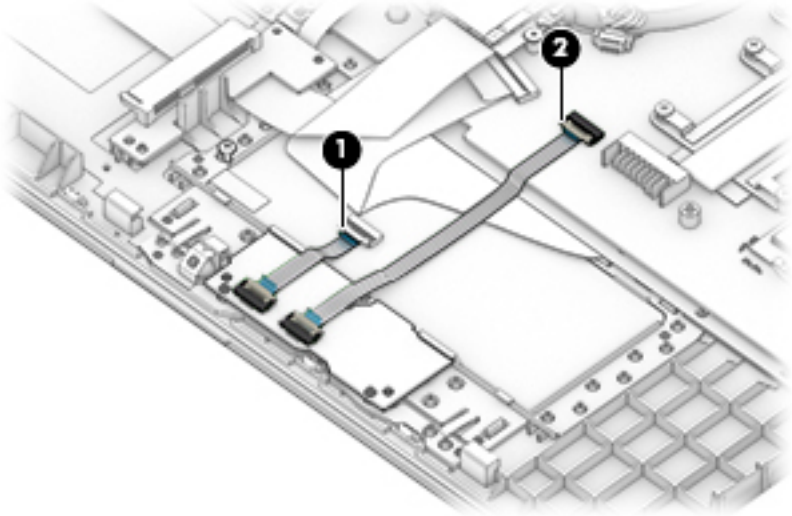
| Description | Spare part number |
|---|---|
| TouchPad module | L20449-001 |
| TouchPad module cable | L20450-001 |

Before removing the TouchPad module, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

To remove the TouchPad module:

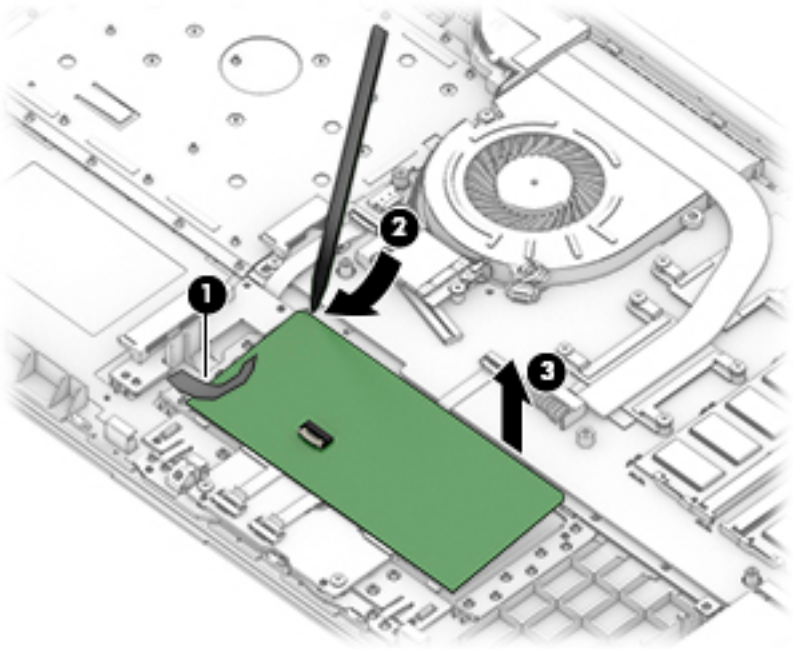
1. Disconnect the TouchPad cable from the ZIF connector on the TouchPad **(1)** and the TouchPad button board cable from the ZIF connector on the system board **(2)**.




2. Peel the tape off the TouchPad **(1)**.
3. Starting in the corner, use a plastic, non-marking tool to pry up the TouchPad module to disengage the adhesive that secures it to the top cover **(2)**

4. Working around each edge, pry the TouchPad module loose, and then remove it from the computer **(3)**.

**NOTE:** The TouchPad module may be very tight and difficult to remove.




Reverse this procedure to install the TouchPad module.

## Fan

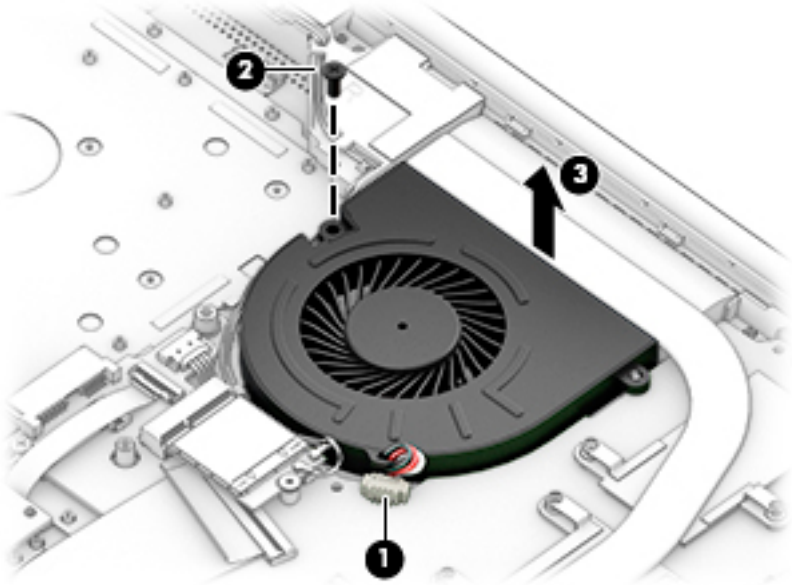
| Description | Spare part number |
|---|---|
| Fan for use in models with discrete graphics | L20473-001 |
| Fan for use in models with UMA graphics | L20474-001 |

Before removing the fan, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

Remove the fan:

1. Disconnect the fan cable from the system board **(1)**.
2. Remove the Phillips M2.5×6.0 screw **(2)** that secures the fan to the computer.
3. Lift the fan from the computer **(3)**.




Reverse this procedure to install the fan.

## Heat sink assembly

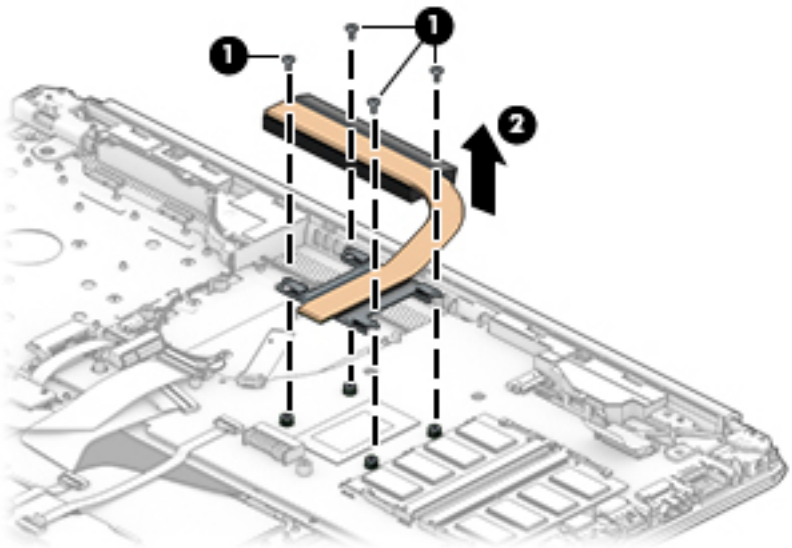
| Description | Spare part number |
|---|---|
| Heat sink for use in models with AMD Ryzen processors and discrete graphics | L20482-001 |
| Heat sink for use in models with AMD A6/A9 processors and discrete graphics | L20484-001 |
| Heat sink for use in models with AMD Ryzen processors and integrated UMA graphics | L20483-001 |
| Heat sink for use in models with AMD A6/A9 processors and integrated UMA graphics | L20491-001 |
| Heat plate for use in fanless models with AMD E2-9000e processors | L20494-001 |

Before removing the heat sink, follow these steps:

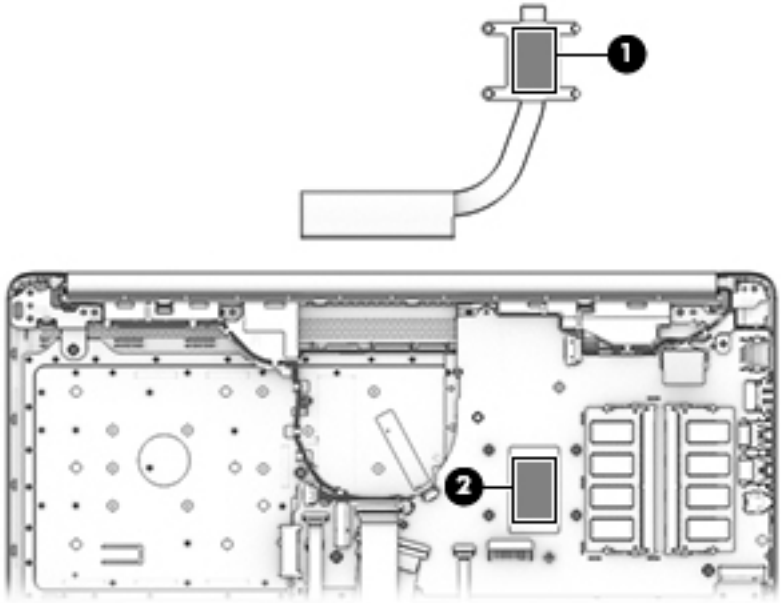
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

To remove the heat sink assembly from products with integrated UMA graphics:

1. In the order indicated on the heat sink assembly, remove the four Phillips M2.0×3.0 screws **(1)** that secure the heat sink to the computer.
2. Lift the heat sink assembly from the computer **(2)**.

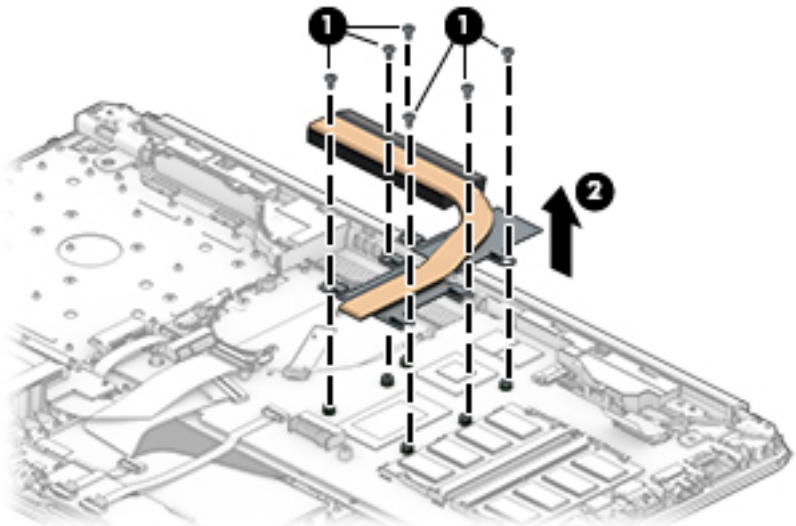


3. Thoroughly clean the thermal material from the surface of the heat sink **(1)** and its associated system board component **(2)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

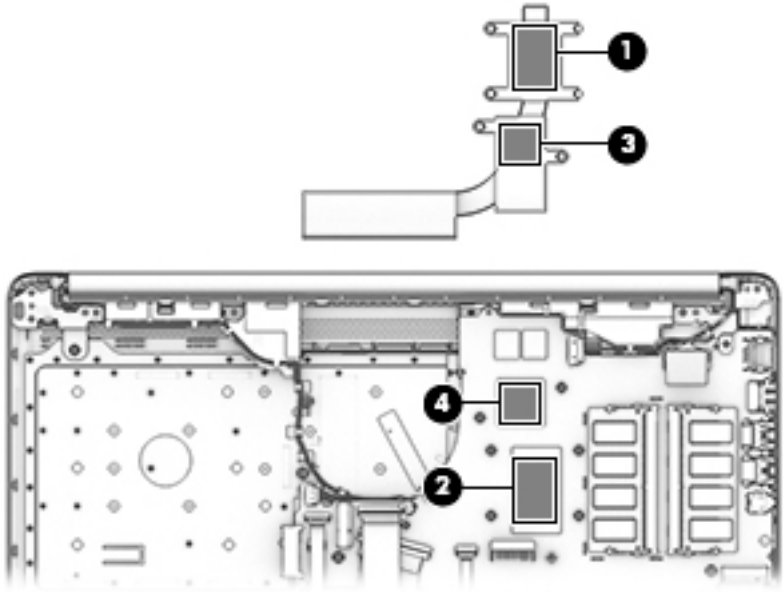



To remove the heat sink assembly from products with discrete graphics:

1. In the order indicated on the heat sink assembly, remove the six Phillips M2.0×3.0 screws **(1)** that secure the heat sink to the computer.
2. Lift the heat sink assembly from the computer **(2)**.

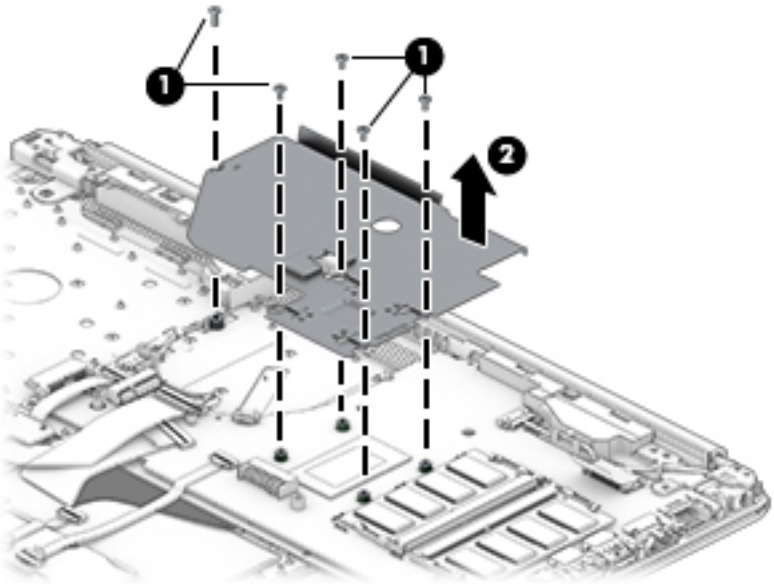


3. Thoroughly clean the thermal material from the surfaces of the heat sink **(1)(3)** and associated system board components **(2)(4)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

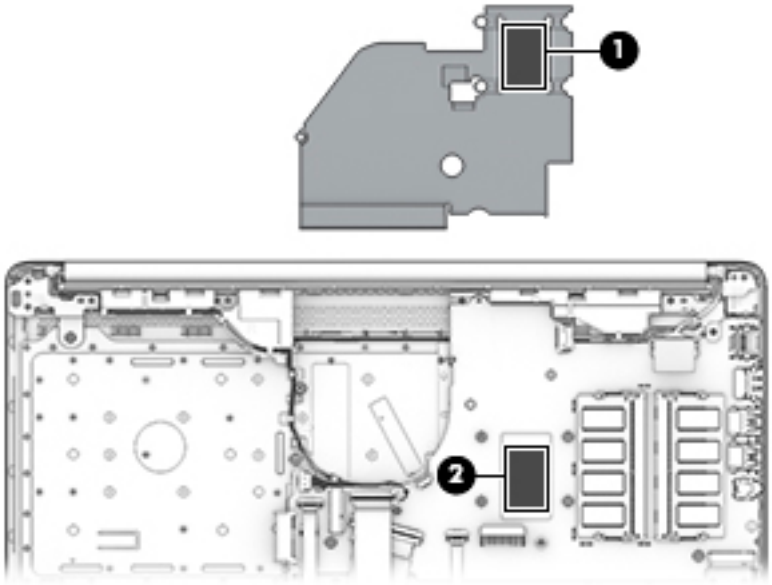



To remove the heat plate from fanless models:

1. In the order indicated on the heat plate, remove the five Phillips M2.0×3.0 screws **(1)** that secure the heat plate to the computer.
2. Lift the heat plate from the computer **(2)**.



3. Thoroughly clean the thermal material from the surface of the heat plate **(1)** and associated system board component **(2)** each time the heat plate is removed. Replacement thermal material is included with the heat plate and system board spare part kits.




Reverse this procedure to install the heat plate or heat sink assembly.

## Display assembly

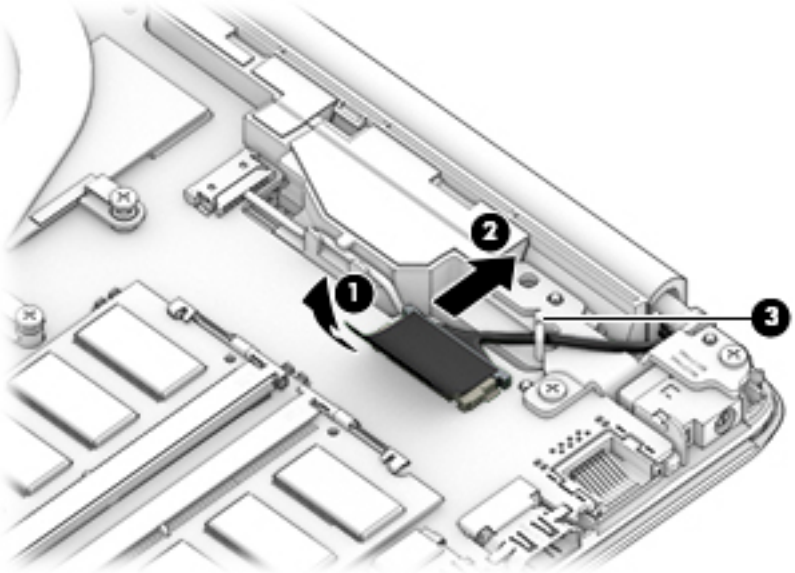
Full hinge-up displays are not spared. Displays are spared only at the subcomponent level.

Before removing the display panel, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).

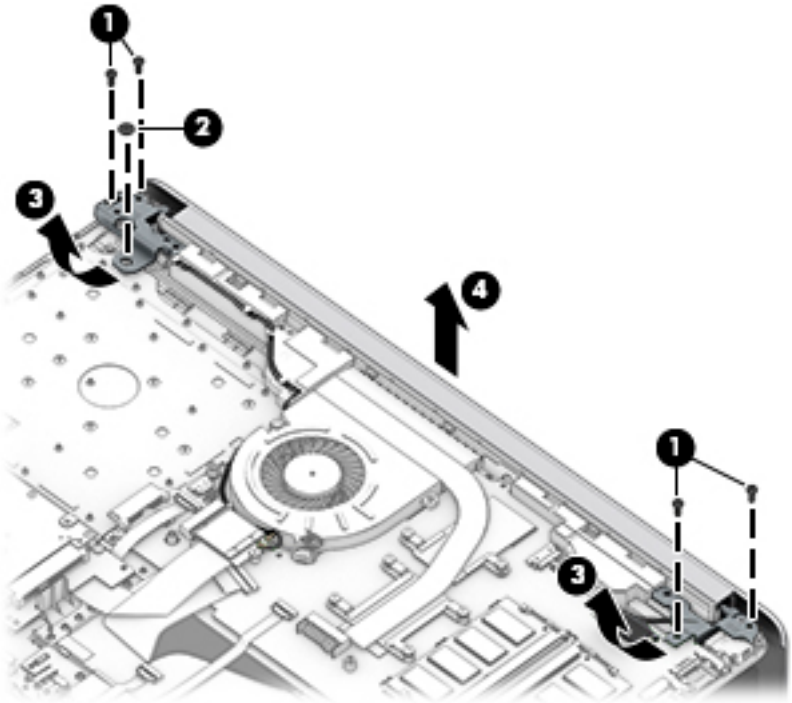
Remove the display assembly:

1. Lift the tape from the display connector on the system board **(1)**.
2. Disconnect the cable from the connector **(2)**.
3. Remove the cable from the clip **(3)**.




4. Remove the four Phillips M2.5×6.0 screws **(1)** from the display hinges.
5. Remove the Phillips broad head M2.0×2.0 screw **(2)** from the right display hinge.
6. Rotate the hinges upward **(3)**.

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




Remove the display assembly subcomponents:

1. To remove the hinge cover, pull upward near the hinge to disengage it from the display enclosure **(1)**, and then remove the hinge cover from the display enclosure **(2)**.

   Hinge covers are available using the following spare part numbers:

   L20423-001: Jet black

   L20427-001: Sparkling black

   L20424-001: Natural silver

   L20425-001: Pale gold

   L20430-001: Scarlet red

   L20426-001: Twilight blue

   L20428-001: Smoke gray

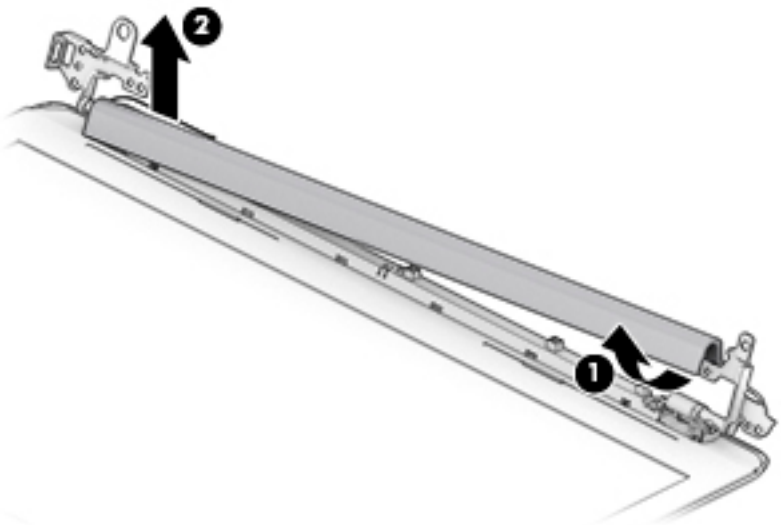
   L20422-001: Snow white (full-featured models)

   L21306-001: Snow white (defeatured models)

   L20431-001: Maroon burgundy

   L28516-001: Iridescent pale rose gold

   L28517-001: Iridescent ceramic white



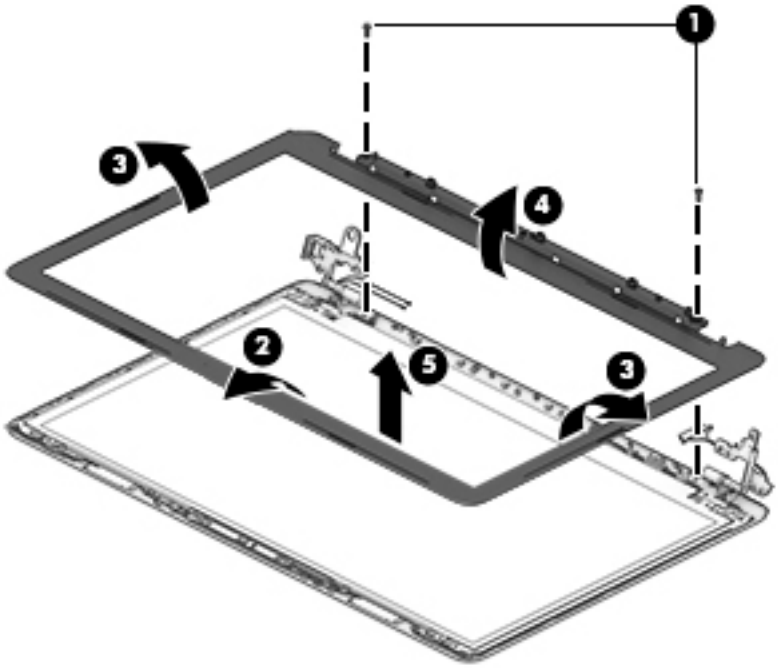
When replacing the hinge cover, make sure the hinges rotate downward as far as they can go. Align the cover, and then start from above and rotate the cover downward onto the hinges. Make sure the clips snap into place along the bottom of the display cover.

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

   a. Remove the two Phillips M2.0×3.0 screws **(1)**, flex the top **(2)** of the bezel, the inside edges of the left and right sides **(3)**, and then the bottom **(4)** of the bezel until it disengages from the display enclosure.

   b. Remove the bezel **(5)**.

      The display bezel is available using spare part number L20421-001.

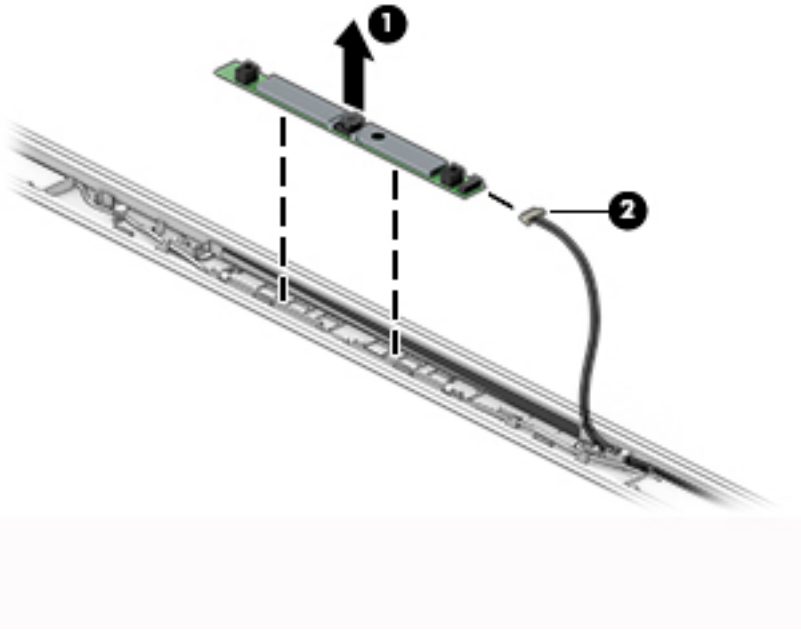


3. If it is necessary to replace the camera/microphone module:

   a. Detach the module **(1)** from the display back cover. (The module is attached with double-sided adhesive.)

**b.** Disconnect the cable **(2)** from the camera/microphone module.

The HD camera module is available using spare part number L20447-001. The VGA camera module is available using spare part number L20446-001.



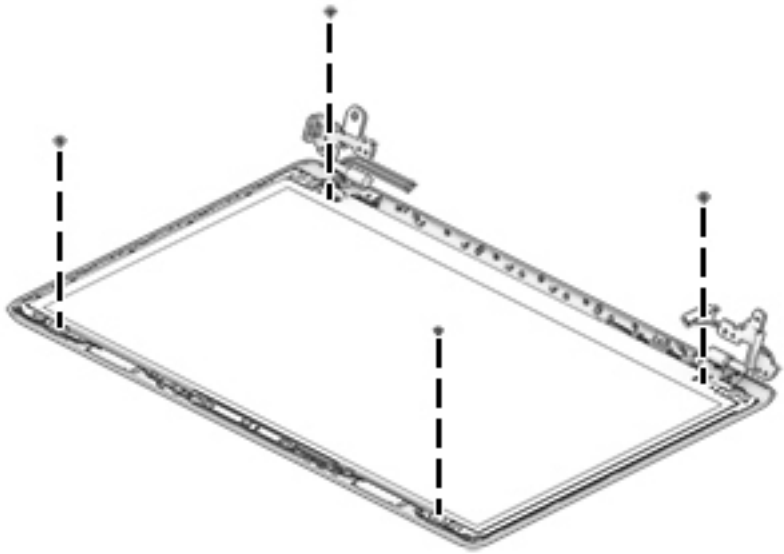

**4.** If it is necessary to replace the display panel:

**IMPORTANT:** HD panels are secured to the display enclosure with screws. FHD panels are secured with tape.

**a. HD panels:**

Remove the four Phillips M2.0×3.0 screws that secure the panel to the display enclosure **(2)**.

Remove the four Phillips M2.0×3.0 screws that secure the panel to the display enclosure.

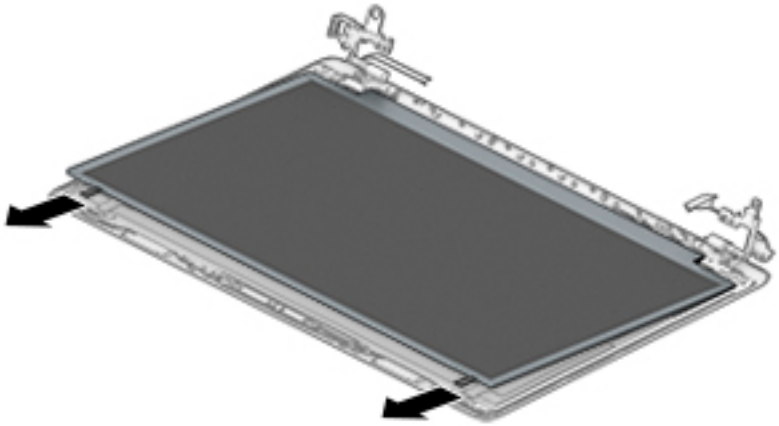


**FHD panels:**

**b.** Pull the tape out from behind the left and right sides of the panel.

**NOTE:** You have to pull on the tape multiple times before it is completely removed.

Display panel stretchable adhesive tape is available using spare part number L29080-001.

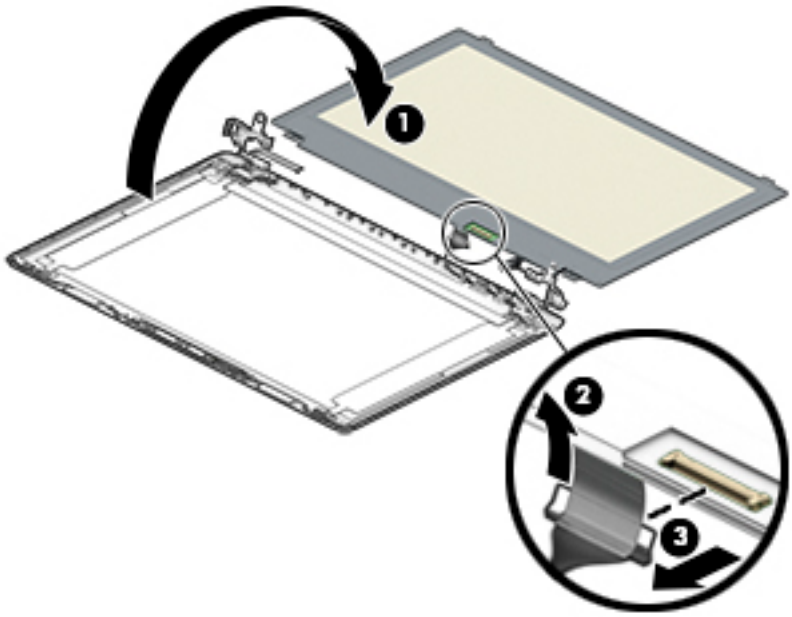


**c.** **HD and FHD panels:**

Swing the top edge of the display panel forward and position it upside down next to the display enclosure **(1)**.

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

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




f. Remove the display panel.

Raw display panels are available using the following spare part numbers:

L23208-001: FHD, anti glare

L23209-001: FHD, BrightView

L23210-001: HD, anti glare

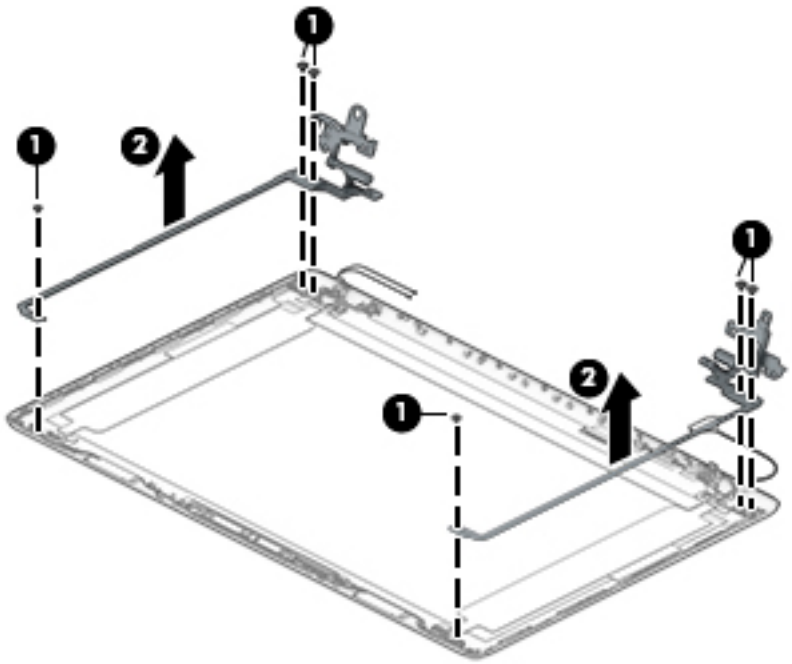
L23211-001: HD, BrightView

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

a. Remove the three Phillips M2.5×2.5 screws **(1)** from each hinge.

**b.** Remove the display hinges **(2)**.

The display hinges are available using spare part number L20420-001.



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

**a.** Release the cable from the retention clips and routing channel built into the bottom edge and side of the display enclosure **(1)**.

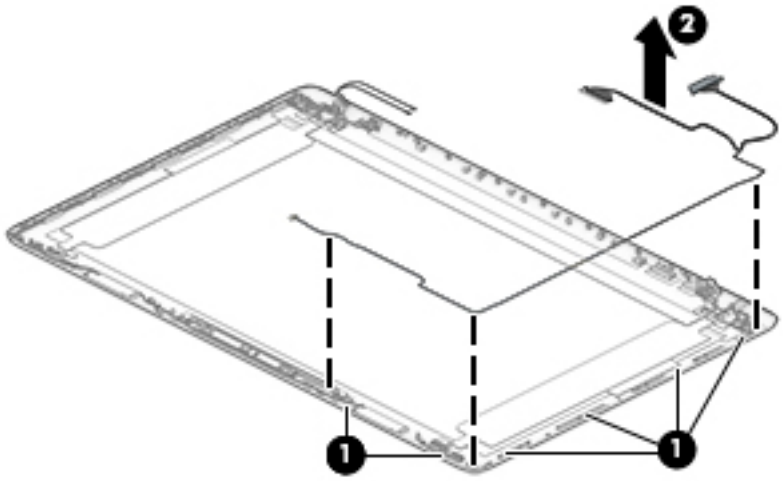
**b.** Remove the display panel cable **(2)**.

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

L20443-001: HD, non-touch display

L23064-001: FHD, non-touch display

L20442-001: HD, touch display



7. If it is necessary to replace the wireless antenna cables and transceivers:

**a.** Remove the antennas from the top of the display enclosure **(1)**.

**b.** Release the wireless antenna cables from the retention clips and routing channel built into the sides of the display enclosure **(2)**.

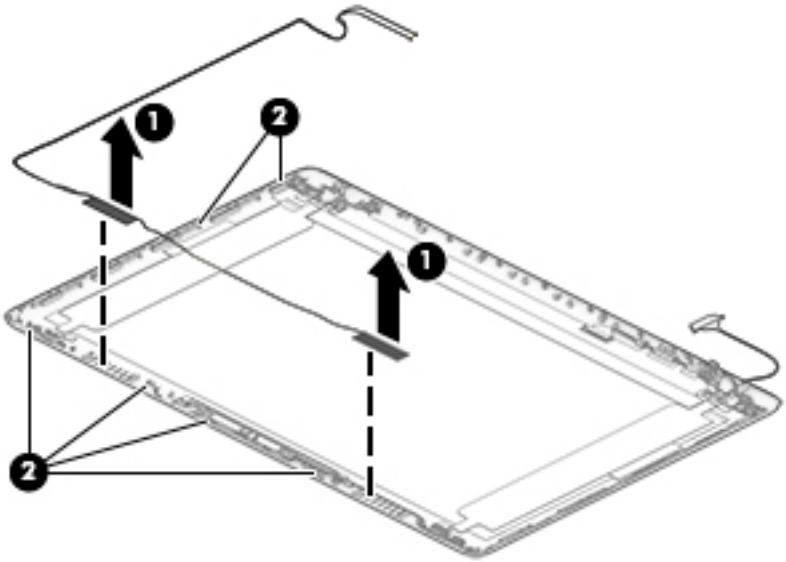
Antennas are available using the following spare part numbers:

L20445-001: Single antenna models

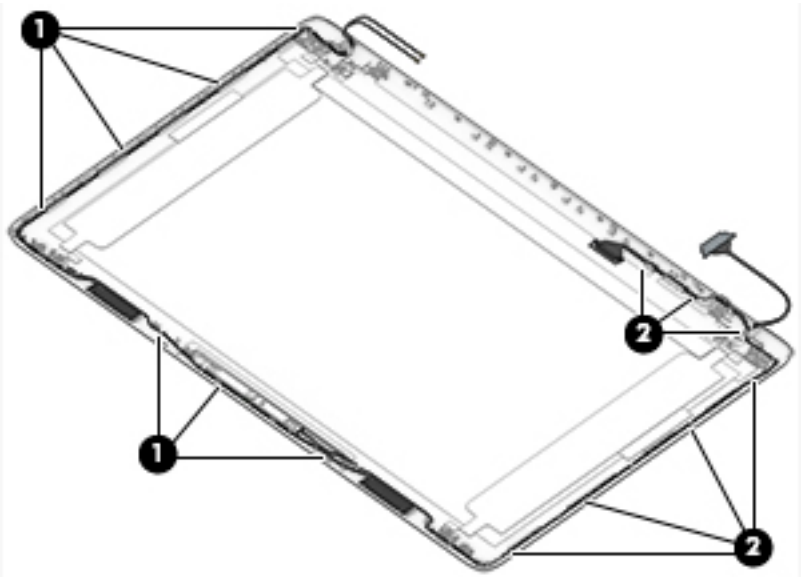
L23060-001: Single antenna, narrow bezel models

L20444-001: Dual antenna models

L23059-001: Dual antenna, narrow bezel models



Use the following image to determine proper cable routing in the display of the antenna cable **(1)** and display cable **(2)**.



The display rear cover is available using the following spare part numbers:

L20433-001: Jet black

L23061-001: Jet black (narrow bezel models)

L20437-001: Sparkling black

L20434-001: Natural silver

L23062-001: Natural silver (narrow bezel models)

L20435-001: Pale gold

L20440-001: Scarlet red

L20436-001: Twilight blue

L20438-001: Smoke gray

L23063-001: Smoke gray (narrow bezel models)

L20432-001: Snow white (full-featured models)

L21307-001: Snow white (defeatured models)

L20441-001: Maroon burgundy

L28509-001: Iridescent ceramic white

L28508-001: Iridescent pale rose gold

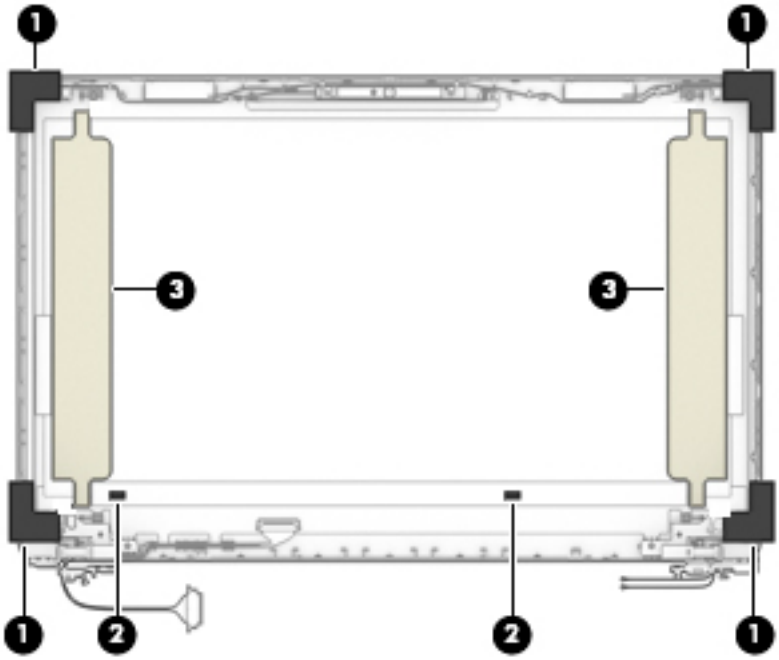
Reverse these procedures to reassemble and install the display assembly components.

When reassembling an FHD display assembly, be sure the install the following parts into the display enclosure from the Display Miscellaneous Kit, spare part number L23065-001 and display panel stretchable adhesive tape, spare part number L29080-001.

**(1):** Four positioning corner pieces

**(2):** Two gaskets

**(3):** Display panel stretchable adhesive tape



## System board

**NOTE:** All system board spare part kits include replacement thermal material.

All system boards use the following part numbers:

xxxxxx-001: Non-Windows operating systems

xxxxxx-601: Windows operating system

| Description | Spare part number |
|---|---|
| System board for use in models with discrete graphics memory: | |
| • AMD Ryzen 3-2200U processor | L20668-001 |
| • AMD A9-9425 processor | L20480-001 |
| • AMD A6-9225 processor | L20481-001 |
| System board for use in models with UMA graphics memory: | |
| • AMD Ryzen 5-2500U processor | L20664-001 |
| • AMD Ryzen 3-2300U processor | L20665-001 |
| • AMD Ryzen 3-2200U processor | L20666-001 |
| • AMD A9-9425 processor | L20477-001 |
| • AMD A6-9225 processor | L20478-001 |
| • AMD A4-9125 processor | L31720-001 |
| • AMD E2-9000e processor | L20479-001 |

Before removing the system board, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Bottom cover (see Bottom cover on page 36)
   c. Battery (see Battery on page 39)
   d. Display (see Display assembly on page 59)

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

- WLAN module (see WLAN module on page 48)
- Memory modules (see Memory on page 41)
- Heat sink (see Heat sink assembly on page 55)

Remove the system board:

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

1. Disconnect the following cables from the system board:

   **(1)**: Keyboard backlight cable

   **(2)**: Hard drive connector cable

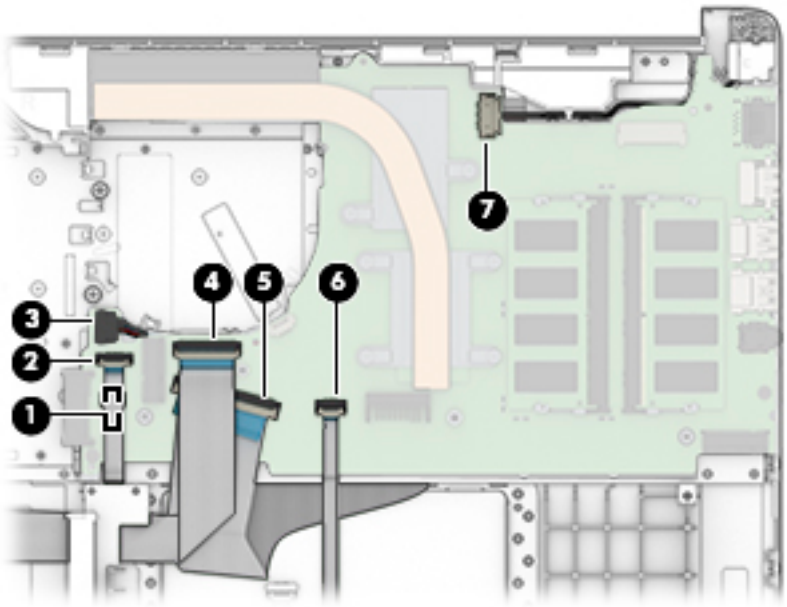
   **(3)**: Speaker cable

   **(4)**: USB/card reader board cable

   **(5)**: Keyboard cable

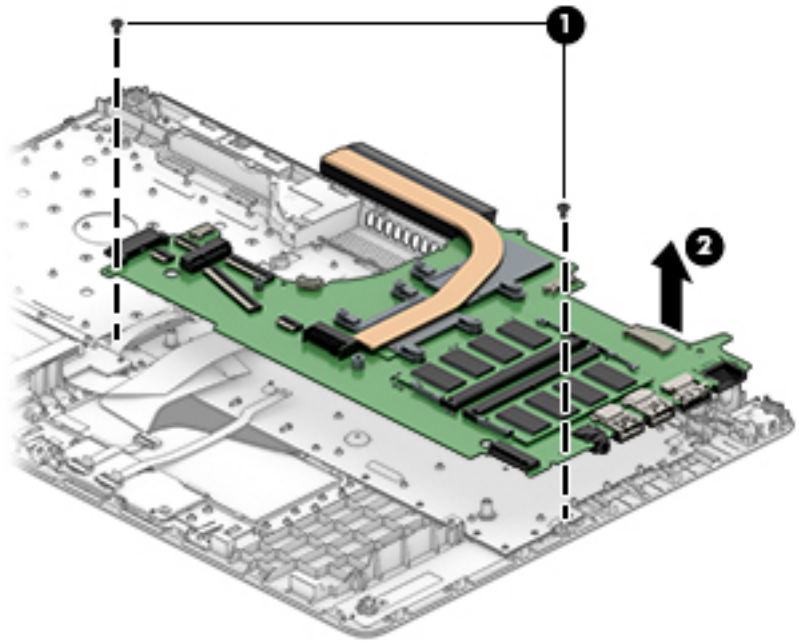
   **(6)**: TouchPad button board cable

   **(7)**: Power connector cable




2. Remove the two Phillips M2.0×3.0 screws that secure the system board to the computer **(1)**.

3. Lift the left side of the system board, and then remove the system board from the computer **(2)**.




Reverse this procedure to install the system board.

## Speakers

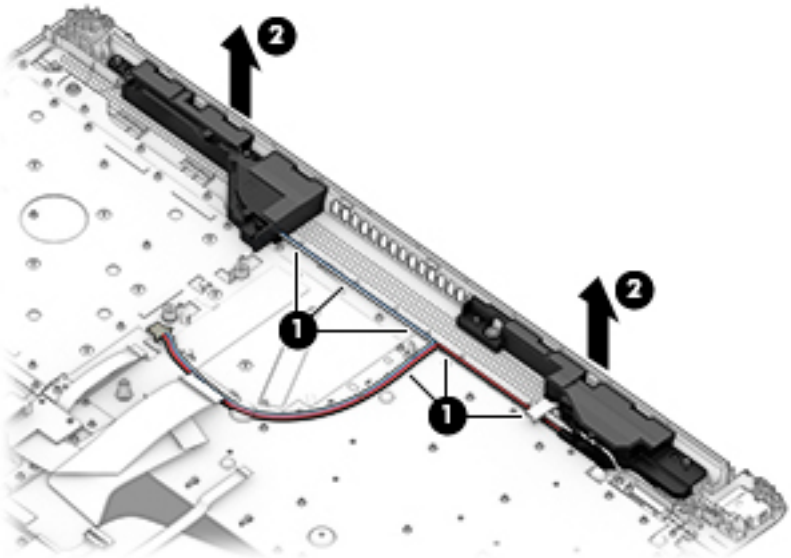
| Description | Spare part number |
|---|---|
| Speaker Kit | L20453-001 |

Before removing the speakers, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).
7. Remove the display (see Display assembly on page 59).

Remove the speakers:

1. Remove the speaker cable from the clips built into the computer **(1)**.
2. Remove the speakers from the computer **(2)**.




Reverse this procedure to install the speakers.

## Power connector cable (DC-in)

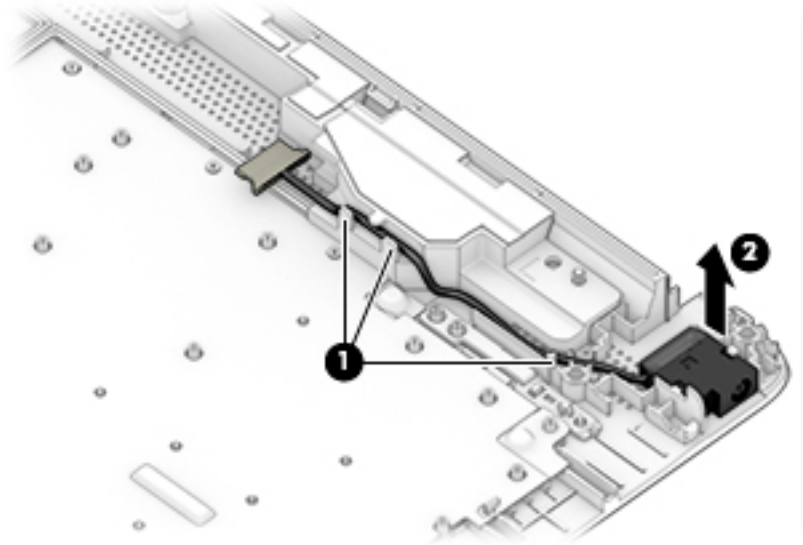
| Description | Spare part number |
|---|---|
| Power connector cable | L20475-001 |
| | L09552-001 |

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 optical drive (see Optical drive on page 32).
5. Remove the bottom cover (see Bottom cover on page 36).
6. Remove the battery (see Battery on page 39).
7. Remove the system board (see System board on page 68).
8. Remove the display (see Display assembly on page 59).

Remove the power connector cable:

1. Remove the cable from the clips built into the computer **(1)**.
2. Remove the power connector cable from the computer **(2)**.




Reverse this procedure to install the power connector cable.

## Top cover with keyboard

The top cover with keyboard remains after removing all other spared parts from the computer.

In this section, the first table provides the main spare part number for the keyboards. The second table provides the country codes.

| Description | Spare part number |
|---|---|
| Keyboard, no backlight, jet black | L20387-xx1 |
| Keyboard, no backlight, full-featured models, snow white | L20388-xx1 |
| Keyboard, no backlight, defeatured models, snow white | L23066-xx1 |
| Keyboard, no backlight, ash silver | L20386-xx1 |
| Keyboard, backlit, ash silver (available only with -001 United States, -002 India, and -DB1 Canadian French keyboards) | L23074-xx1 |
| Keyboard, no backlight, iridescent pale rose gold (available only with -001 United States keyboards) | L28504-001 |
| Keyboard, backlit, iridescent pale rose gold (available only with -001 United States keyboards) | L28505-001 |
| Keyboard, no backlight, iridescent ceramic white (available only with -001 United States keyboards) | L28506-001 |
| Keyboard, backlit, iridescent ceramic white (available only with -001 United States keyboards) | L28507-001 |

| 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 | Israel | -BB1 | Slovenia | -BA1 |
| Bulgaria | -261 | Italy | -061 | South Korea | -AD1 |
| Canada | -DB1 | Japan | -291 | Spain | -071 |
| Czech Republic and Slovakia | -FL1 | Latin America | -161 | Switzerland | -BG1 |
| Denmark, Finland, and Norway | -DH1 | The Netherlands | -B31 | Taiwan | -AB1 |
| France | -051 | Portugal | -131 | Thailand | -281 |
| Germany | -041 | Romania | -271 | Turkey | -141 |
| Greece | -151 | Russia | -251 | United Kingdom | -031 |
| Hungary | -211 | Saudi Arabia | -171 | United States | -001 |
| India | -002 | | | | |

# 7 Using Setup Utility (BIOS)

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

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

## Starting Setup Utility (BIOS)

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

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

## Updating Setup Utility (BIOS)

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

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

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

### Determining the BIOS version

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

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

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

     – or –

     Click the question mark icon in the taskbar.
  2. Select **My PC**, and then select **Specifications**.
- Setup Utility (BIOS)
  1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 74).
  2. Select **Main**, select **System Information**, and then make note of the BIOS version.
  3. Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see Downloading a BIOS update on page 75.

## Downloading a BIOS update

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

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

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

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

   – or –

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

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

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

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

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

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

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

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

# 8 Using HP PC Hardware Diagnostics

## Using HP PC Hardware Diagnostics Windows

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 76.

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

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

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

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

   – or –

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

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

      – or –

      Select the question mark icon in the taskbar.

   b. Select **Troubleshooting and fixes**.

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

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

   **NOTE:** If you need to stop a diagnostic test at any time, select **Cancel**.

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

## Downloading HP PC Hardware Diagnostics Windows

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

### Downloading the latest HP PC Hardware Diagnostics Windows version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select the installation location:

   To run the tool on your computer, download it to the computer desktop.

   – or –

   To run the tool from a USB flash drive, download it to a USB flash drive.
3. Select **Run**.

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

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

To download HP PC Hardware Diagnostics Windows by product name or number (select products only), follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, and then enter the product name or number.
3. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select the installation location:

   To run the tool on your computer, download it to the computer desktop.

   – or –

   To run the tool from a USB flash drive, download it to a USB flash drive.
4. Select **Run**.

### Installing HP PC Hardware Diagnostics Windows

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

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

## Using HP PC Hardware Diagnostics UEFI

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

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

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

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

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

## Starting HP PC Hardware Diagnostics UEFI

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

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

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

   a. Connected USB flash drive

   **NOTE:** To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 78.

   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.

## Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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

**NOTE:** The HP PC Hardware Diagnostics UEFI download instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are provided.

### Downloading the latest HP PC Hardware Diagnostics UEFI version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics UEFI** section, select **Download UEFI Diagnostics**, and then select **Run**.

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

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

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

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

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

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

## Downloading Remote HP PC Hardware Diagnostics UEFI

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

### Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics UEFI** section, select **Download Remote Diagnostics**, and then select **Run**.

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

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

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

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

## Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

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

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

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.

3. Make your customization selections.
4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

# 9 Backing up, restoring, and recovering

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

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

For additional information, refer to the HP Support Assistant app.

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

– or –

Select 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 tablet to the keyboard base 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 81. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 82.
- 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 83.

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

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

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

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

You can use Windows tools to create system restore points and create backups of personal information, see Using Windows tools on page 82.

- 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 tablet to the keyboard base before beginning these steps.

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 83.

# 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 83. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 81.

- 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 83.

- 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 86.

## 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 81.

### 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 81.

- 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 81.

- 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 tablet to the keyboard base 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 up button; then select **f11**.

   – or –

   - Turn on or restart the tablet, and then quickly hold down the volume down 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 85.
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 tablet to the keyboard base before beginning these steps.

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

   For computers or tablets with keyboards attached:

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

   For tablets without keyboards:

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

     – or –

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

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

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

**IMPORTANT:** After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Creating HP Recovery media (select products only) on page 81.

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

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

# 10 Specifications

## Computer specifications

| | Metric | U.S. |
|---|---|---|
| **Dimensions** | | |
| Length | 246.0 mm | 10.72 in |
| Width | 376.0 mm | 16.33 in |
| Height | 22.5 mm | 0.97 in |
| **Weight** (lowest configuration) | | |
| SSD, Ryzen processors, UMA graphics | 1829.5 g | 4.03 lbs |
| SSD, A9/A6/A4 processors, UMA graphics | 1771.5 g | 3.91 lbs |
| SSD, Ryzen/A9/A6/A4 processors, discrete graphics | 1855.5 g | 4.09 lbs |
| HDD and ODD, Ryzen processors, UMA graphics | 2062.7 g | 4.55 lbs |
| HDD and ODD, A9/A6/A4 processors, UMA graphics | 2004.7 g | 4.42 lbs |
| HDD and ODD, Ryzen/A9/A6/A4 processors, discrete graphics | 2088.7 g | 4.60 lbs |
| **Input power** | | |
| Operating voltage | 19.0 V dc @ 4.74 A – 90 W or 18.5 V dc @ 3.5 A - 65 W or 45 W | |
| Operating current | 4.74 A or 3.5 A | |
| **Temperature** | | |
| Operating (not writing to optical disc) | 0°C to 35°C | 32°F to 95°F |
| Operating (writing to optical disc) | 5°C to 35°C | 41°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| **Relative humidity** | | |
| Operating | 10% to 90% | |
| Nonoperating | 5% to 95% | |

**NOTE:** Applicable product safety standards specify thermal limits for plastic surfaces. The computer 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 | FHD: 1920×1080<br>HD: 1366×768 | |
| Surface treatment | Anti-glare<br>BrightView | |
| Brightness | 220 nits<br>200 nits (BrightView, HD, Touch-on Panel) | |
| Viewing angle | SVA<br>UWVA (FHD, anti glare panel) | |
| Backlight | WLED | |
| Aspect ratio | 16:10 ultra wide | |
| Display panel interface | eDP | |
| Width | Slim-flat, 3.2 mm | |

# M.2 SATA solid-state drive specifications

| | 128-GB* | 256-GB* |
|---|---|---|
| **Height** | 1.35 mm | 1.35 mm |
| **Weight** | < 10 g | < 10 g |
| **Form factor** | M.2 2280-D2-B-M | M.2 2280-D2-B-M |
| **Transfer rate** | up to 540 MB/sec | up to 540 MB/sec |
| **Interface type** | SATA-3 | SATA-3 |
| Ready time, maximum (to not busy) | 1.0 ms | < 1.0 ms |
| Access times, logical | 0.1 ms | 0.1 ms |
| **Total logical sectors** | 234,441,648 | 468,883,296 |
| **Operating temperature** | 0°C to 70°C (32°F to 158°F) | |

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

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

# M.2 PCIe solid-state drive specifications

| | 256-GB* |
|---|---|
| **Dimensions** | |
| Height | 1 mm |
| Length | 50.8 mm |
| Width | 28.9 mm |
| Weight | < 10 g |
| **Interface type** | ATA-7 |
| **Transfer rate** | |
| Sequential Read | Up to 2150 MB/s |
| Random Read | Up to 300,000 IOPs |
| Sequential Write | Up to 1260 MB/s |
| Random Write | Up to 100,000 IOPs |
| **Ready time, Maximum (to not busy)** | 1.0 s |
| **Access times** | |
| Logical | 0.1 ms |
| **Total logical sectors** | 500,118,192 |
| **Operating temperature** | |
| Operating | 0° to 70°C (32°F to 158°F) |
| Non-operating | -40° to 80°C (-40°F to 176°F) |
| *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. | |

# Hard drive specifications

| | 2-TB* | 1-TB* | 500-GB* |
|---|---|---|---|
| **Dimensions** | | | |
| Height | 7.2 mm or 9.5 mm | 7.2 mm or 9.5 mm | 7.0 mm |
| Length | 100.4 mm | 100.4 mm | 100.6 mm |
| Width | 69.9 mm | 69.9 mm | 70.1 mm |
| Weight | 130.0 g | 107.0 g | 92.0 g |
| **Interface type** | SATA | SATA | SATA |
| **Transfer rate** | | | |
| Synchronous (maximum) | 300 MB/sec | 300 MB/sec | 300 MB/sec |
| Security | ATA security | ATA security | ATA security |
| **Seek times** (typical read, including setting) | | | |
| Single track | 2.0 ms | 2.0 ms | 3 ms |
| Average (read/write) | 12 ms | 12 ms | 13 ms |
| Maximum | 22 ms | 22 ms | 24 ms |
| **Logical blocks** | 3,907,029,168 | 1,953,525,168 | 1,048,576,000 |
| **Disk rotational speed** | 5400 rpm | 5400 rpm | 5400 rpm |
| **Operating temperature** | **0°C to 60°C** (32°F to 140°F) | | |
| *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. | | | |

# 11 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 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.

# 12 Recycling

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

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

# Index


**A**

AC adapter and battery light, identifying 7
AC adapter, spare part numbers 23
action keys
  airplane mode 13
  help 13
  identifying 12, 13
  keyboard backlight 13
  mute 13
  next track 13
  pause 13
  play 13
  screen brightness 13
  speaker volume 13
  switch screen image 13
  using 13
airplane mode key 13
antenna
  removal 65
audio
  adjusting volume 13
audio, product description 3
audio-out (headphone)/audio-in (microphone) combo jack, identifying 7

**B**

back cover
  spare part number 22
backups 81
battery
  removal 39
  spare part number 18, 39
BIOS
  determining version 74
  downloading an update 75
  starting the Setup Utility 74
  updating 74
Bluetooth label 15
boot order
  changing 85
bottom components 14
bottom cover
  removal 36
  spare part number 18, 36
buttons
  left TouchPad 9
  optical drive eject 6
  power 11
  right TouchPad 9

**C**

camera
  identifying 8
  product description 3
camera light, identifying 8
camera module
  spare part number 22
camera/microphone module
  spare part numbers 62
caps lock light, identifying 10
chipset, product description 1
components
  bottom 14
  display 8
  keyboard area 9
  left side 7
  right side 6
computer major components 16
computer specifications 87
connector, power 7

**D**

Display assembly
  spare part numbers 17
display assembly
  removal 59
  subcomponents 21
display assembly components
  removal 59
  spare part numbers 59
display bezel
  removal 61
  spare part numbers 22, 61
display cable, spare part number 22
display components 8
display panel
  product description 2
  removal 62
display panel cable
  removal 65
  spare part numbers 65
display specifications 88
drive light, identifying 6
DVD+/-RW Double-Layer Writer
  spare part number 18, 24, 32

**E**

esc key, identifying 12
ethernet
  product description 3

**F**

fan
  removal 54
  spare part number 18, 54
fn key, identifying 12

**G**

Get Help in Windows 10 action key 13

**H**

hard drive
  product description 2
  removal 43
  spare part number 18, 24
  spare part numbers 43
  specifications 90
hard drive bracket
  spare part number 24
hard drive connector board
  removal 49
  spare part number 18, 25, 49
hard drive/solid-state drive cable
  spare part number 25
HDMI port
  identifying 7
heat sink
  spare part numbers 18

heat sink assembly
removal 55
spare part numbers 55
hinge
removal 64
spare part number 65
hinge cover
spare part number 21
Hinge Kit
spare part number 22
HP PC Hardware Diagnostics UEFI
downloading 78
starting 78
using 77
HP PC Hardware Diagnostics Windows
downloading 76
installing 77
using 76
HP Recovery Manager
correcting boot problems 85
starting 84
HP Recovery media
creating 81
recovery 84
HP Recovery partition
recovery 84
removing 86

I
integrated numeric keypad, identifying 12
internal microphones, identifying 8

J
jacks
audio-out (headphone)/audio-in (microphone) 7
network 7
RJ-45 (network) 7

K
keyboard
product description 4
removal 73
spare part number 73
spare part numbers 17
keyboard backlight action key 13
keypad, integrated numeric 12
keys
action 12
airplane mode 13
esc 12
fn 12
num lock 12
Windows 12

L
labels
Bluetooth 15
regulatory 15
serial number 15
service 15
wireless certification 15
WLAN 15
left side components 7
lights
AC adapter and battery 7
camera 8
caps lock 10
drive 6
mute 10
power 6
RJ-45 (network) status 7

M
M.2 solid-state drive
specifications 89
memory
product description 2
removal 41
spare part number 18
spare part numbers 41
MicroSD memory card reader, identifying 6
minimized image recovery 84
minimized image, creating 83
model name 1
mute light, identifying 10
mute volume action key 13

N
network jack, identifying 7
next track action key 13

O
operating system, product description 4
optical drive
product description 3
removal 32
spare part numbers 32
optical drive eject button, identifying 6
optical drive, identifying 6
original system recovery 83

P
panel
spare part numbers 22
pause action key 13
play action key 13
pointing device, product description 4
ports
HDMI 7
product description 3
USB 6
USB SuperSpeed 7
power button, identifying 11
power connector
identifying 7
power connector cable
removal 72
spare part numbers 72
power cord
set requirements 91
power lights, identifying 6
power requirements, product description 4
processor 1
product description
audio 3
camera 3
chipset 1
display panel 2
ethernet 3
external media cards 3
hard drive 2
keyboard 4
memory 2
operating system 4
optical drive 3
pointing device 4
ports 3
power requirements 4
processor 1
product name 1
security 4
serviceability 5
wireless networking 3
product name 1

product name and number, computer 15

R
recover
options 83
recovery
discs 82, 84
HP Recovery Manager 83
media 84
starting 84
supported discs 82
system 83
USB flash drive 84
using HP Recovery media 82
recovery media
creating 81
creating using HP Recovery Manager 82
recovery partition
removing 86
regulatory information
regulatory label 15
wireless certification labels 15
Remote HP PC Hardware Diagnostics UEFI settings
customizing 79
using 79
removal/replacement
procedures 31, 35
right side components 6
RJ-45 (network) jack, identifying 7
RJ-45 (network) status lights, identifying 7

S
screen brightness action keys 13
Screw Kit, spare part numbers 23
security cable slot, identifying 6
security, product description 4
serial number, computer 15
service labels, locating 15
serviceability, product description 5
slots
memory card reader 6
security cable 6
solid-state drive
removal 45
spare part number 18, 25
spare part numbers 45
specifications 88
solid-state drive bracket and connector board
removal 46
spare part numbers 46
solid-state drive cable
spare part number 25
solid-state drive connector board
spare part number 18
speaker volume action keys 13
speakers
identifying 11
removal 71
spare part number 17
spare part numbers 71
special keys, using 12
specifications
computer 87
display 88
hard drive 90
M.2 solid-state drive 89
solid-state drive 88
supported discs, recovery 82
switch screen image action key 13
system board
removal 68
spare part number 17
spare part numbers 68
system recovery 83
system restore point
creating 82
system restore point, creating 81

T
top cover
removal 73
spare part number 73
top cover/keyboard
spare part numbers 17
TouchPad button board
removal 51
spare part number 17
spare part numbers 51
TouchPad buttons
identifying 9
TouchPad module
removal 52
spare part number 17, 52
TouchPad zone, identifying 9
traveling with the computer 15

U
USB port, identifying 6
USB SuperSpeed port, identifying 7
USB/card reader board
removal 50
spare part number 18, 50

V
vents, identifying 11, 14
volume
adjusting 13
mute 13

W
webcam/microphone module
removal 61
Windows
system restore point 81, 82
Windows key, identifying 12
Windows tools
using 82
wireless antenna
removal 65
wireless certification label 15
wireless networking
product description 3
WLAN
removal 48
spare part numbers 48
WLAN antenna
removal 65
WLAN antennas, identifying 8
WLAN cable
spare part number 22
WLAN device 15
WLAN label 15
WLAN module
spare part number 18

Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com