HP 241 G1 Notebook PC

Maintenance and Service Guide

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Product notice

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

Not all features are available in all editions of Windows 8. This computer may require upgraded and/or separately purchased hardware, drivers, and/or software to take full advantage of Windows 8 functionality. See for http://www.microsoft.com details.

Software terms

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

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

Safety warning notice

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

Table of contents

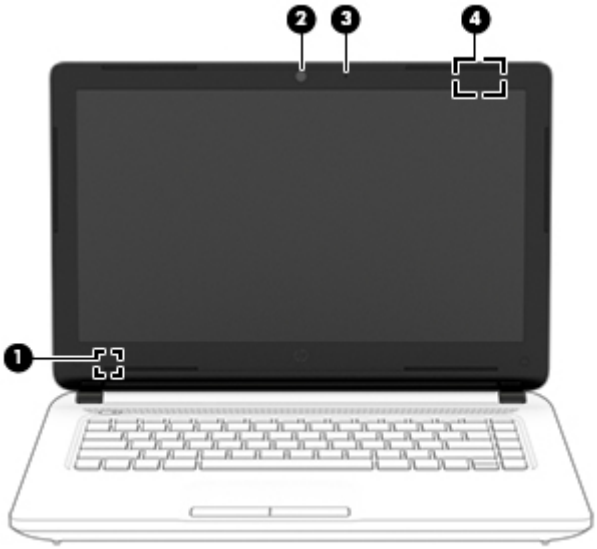
1 Product description

Category	Description
Product Name	HP 241 G1 Notebook PC
Processor	AMD A4-PRO 3340B 2.20-GHz processor (quad core, 25 W, 2-MB L2 cache)
Chipset	Integrated with processor
Panel	**35.6–cm** (14.0-in), BrightView, high-definition (HD), light-emitting diode (LED) backlit, 1366×768, SVA (3.6 mm), non-touch display panel with and without webcam Support for low-voltage differential signalling (LVDS) Typical brightness: 200 nits 16:9 Ultra Wide Aspect Ratio
Graphics	**Internal graphics** – Integrated universal memory architecture (UMA) graphics: AMD Radeon HD 8240
Memory	**Models without on-board memory** One memory module slot Support for DDR3L 1600 MHz single channel memory downgrade to 1333 MHz Single channel support Support for 2048-MB of system memory.
	Models with on-board memory Non- accessible / non-upgradeable DDR3L-1066MHz @ 1.35V single channel support (DDR3L-1600MHz downgrade to DDR3L-1066MHz) Supports up to 2 GB max on-board system memory
Primary storage	Support for **6.35-cm** (2.5-in) hard drives in **7.0-mm** (.28-in) and **9.5-mm** (.37-in) thickness Support for the following hard drives: • 500-GB, 5400-rpm, SATA, 7.0-mm hard drive • 250-GB, 5400-rpm, SATA, 7.0-mm hard drive
Audio and video	HP TrueVision HD webcam (fixed/no tilt), 1280×720 by 30 frames per second Support for non-webcam option Single digital microphone Dual speakers DTS Audio
Ethernet	Integrated 10/100 network interface card (NIC)
Wireless networking	Integrated wireless local area network (WLAN) options by way of wireless module Two WLAN antennas built into display assembly Support for the following WLAN formats:

Category	Description
	• Qualcomm Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter
Ports	AC adapter, HP Smart (4.5-mm barrel) Audio-in (mono microphone)/audio-out (stereo headphone) combo jack RJ-45 (Ethernet) USB 2.0 (3) VGA (Dsub 15 pin) supporting: 1920x1080 external resolution @ 60-Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video
Keyboard/pointing devices	Full-size, island-style, spill-resistant keyboard Touchpad configuration: • Multitouch gestures enabled • Taps enabled as default
Power requirements	Support for a removable 6-cell, 47-WHr, 2.20-AHr, Li-ion battery Support for a removable 4-cell, 41-WHr, 2.80-AHr, Li-ion battery Support for a 65-W EM HP Smart adapter, 4.5-mm
Security	Kensington Security Lock
Operating system	**Preinstalled:** Microsoft® Windows® 8.1 Update PRO 64 Microsoft® Windows® 8.1 Update PRO 64 Education Boss Linux (Dual boot operating system required) Driver support for Microsoft Windows 8.1 (64-bit)
Serviceability	**End user replaceable part**: AC adapter Battery (system) Memory module

2 External component identification

Display



Component		Description
(1)	Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on. **NOTE:** The internal display switch is not visible from the outside of the computer.
(2)	Webcam (select models only)	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video. To use the webcam: ▲ From the Start screen, type `camera`, and then select **Camera** from the list of applications.
(3)	Internal microphone	Record sound.
(4)	WLAN antenna*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

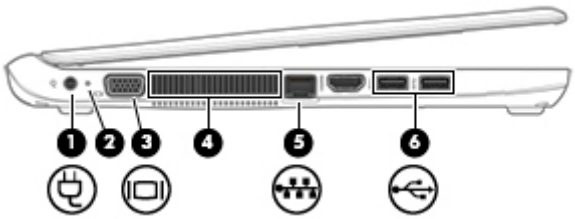
To access this document:

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

– or –

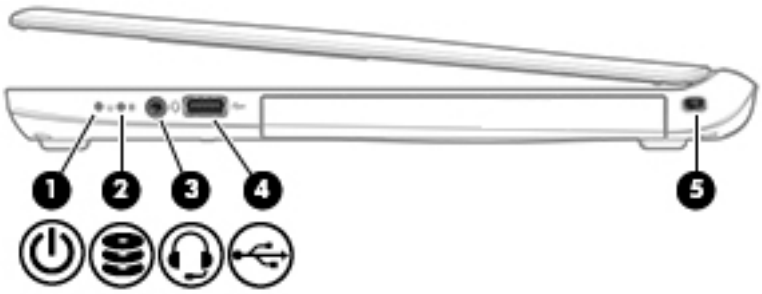
From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

Left side



Component			Description
(1)		Power connector	Connects an AC adapter.
(2)		AC adapter/battery light	• Amber: The computer is connected to external power and the battery is charged from 0 to 99 percent. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • White: The battery is fully charged.
(3)		External monitor port	Connects an external VGA monitor or projector.
(4)		Vent	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)		RJ-45 (network) jack/status lights	Connects a network cable. • White: The network is connected. • Amber: Activity is occurring on the network.
(6)		USB 3.0 ports (2)	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.

Right side



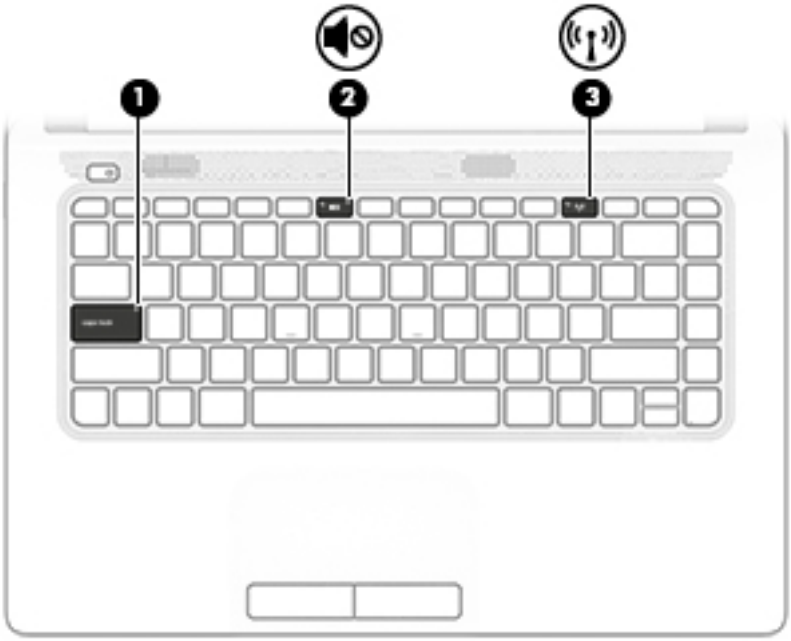
Component			Description
(1)		Power light	• White: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Hard drive light	• Blinking white: The hard drive is being accessed.
(3)		Audio-out (headphone)/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional microphone-only devices. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this document: ▲ From the Start screen, type `support`, and then select the **HP Support Assistant** app. – or – From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar. **NOTE:** When a device is connected to the jack, the computer speakers are disabled. **NOTE:** Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(4)		USB 2.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(5)		Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Top

TouchPad

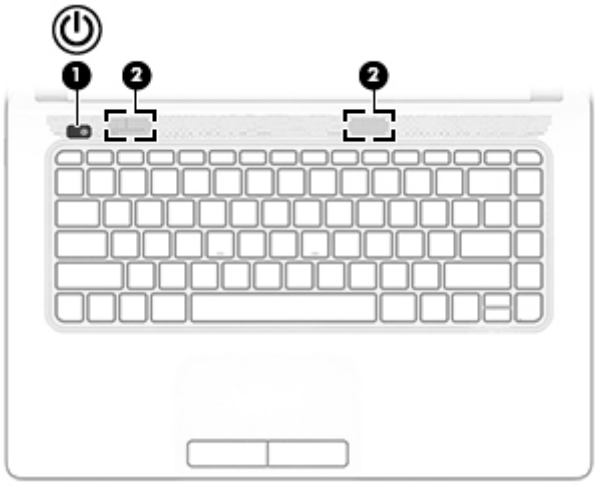
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen. **NOTE:** The TouchPad also supports edge-swipe gestures.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the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

Lights



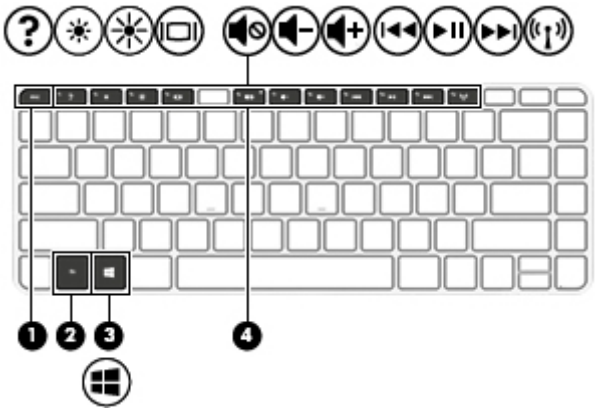
Component			Description
(1)		Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(2)		Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.
(3)		Wireless light	On: An integrated wireless device, such as a wireless local area network (WLAN) device is on. **NOTE:** On some models, the wireless light is amber when all wireless devices are off.

Buttons and speakers



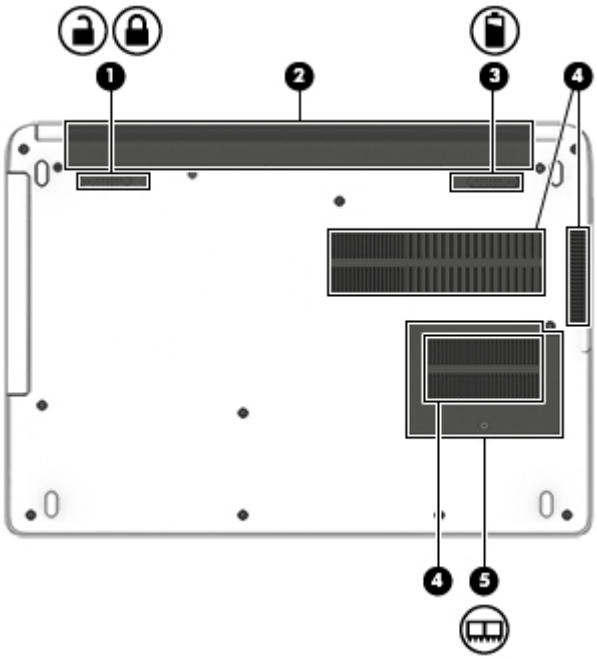
Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button will result in the loss of unsaved information. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. To learn more about your power settings, see your power options. ▲ From the Start screen, type `power`, select **Power and sleep settings**, and then select **Power and sleep** from the list of applications. – or – From the Windows desktop, right-click the **Start** button, and then select **Power Options**.
(2)	Speakers (2)	Produce sound.

Keys



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with the esc key or the spacebar.
(3)	Windows key	Returns you to the Start screen from an open app or the Windows desktop. **NOTE:** Pressing the Windows key again will return you to the previous screen.
(4)	Action keys	Execute frequently used system functions.

Bottom



Component			Description
(1)		Battery lock latch	Locks and unlocks the battery in the battery bay
(2)		Battery bay	Holds the battery.
(3)		Battery release latch	Releases the battery.
(4)		Vents (3)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)		Service door	Provides access to the memory module slots

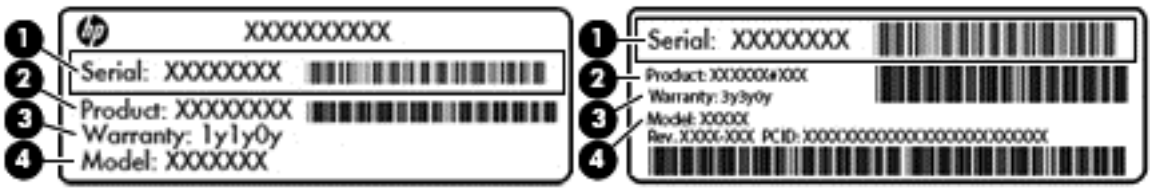
Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

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

- Service label—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

  Your service label will resemble one of the examples shown below. Refer to the illustration that most closely matches the service label on your computer.



Component	
(1)	Serial number
(2)	Product number
(3)	Warranty period
(4)	Model number (select models only)

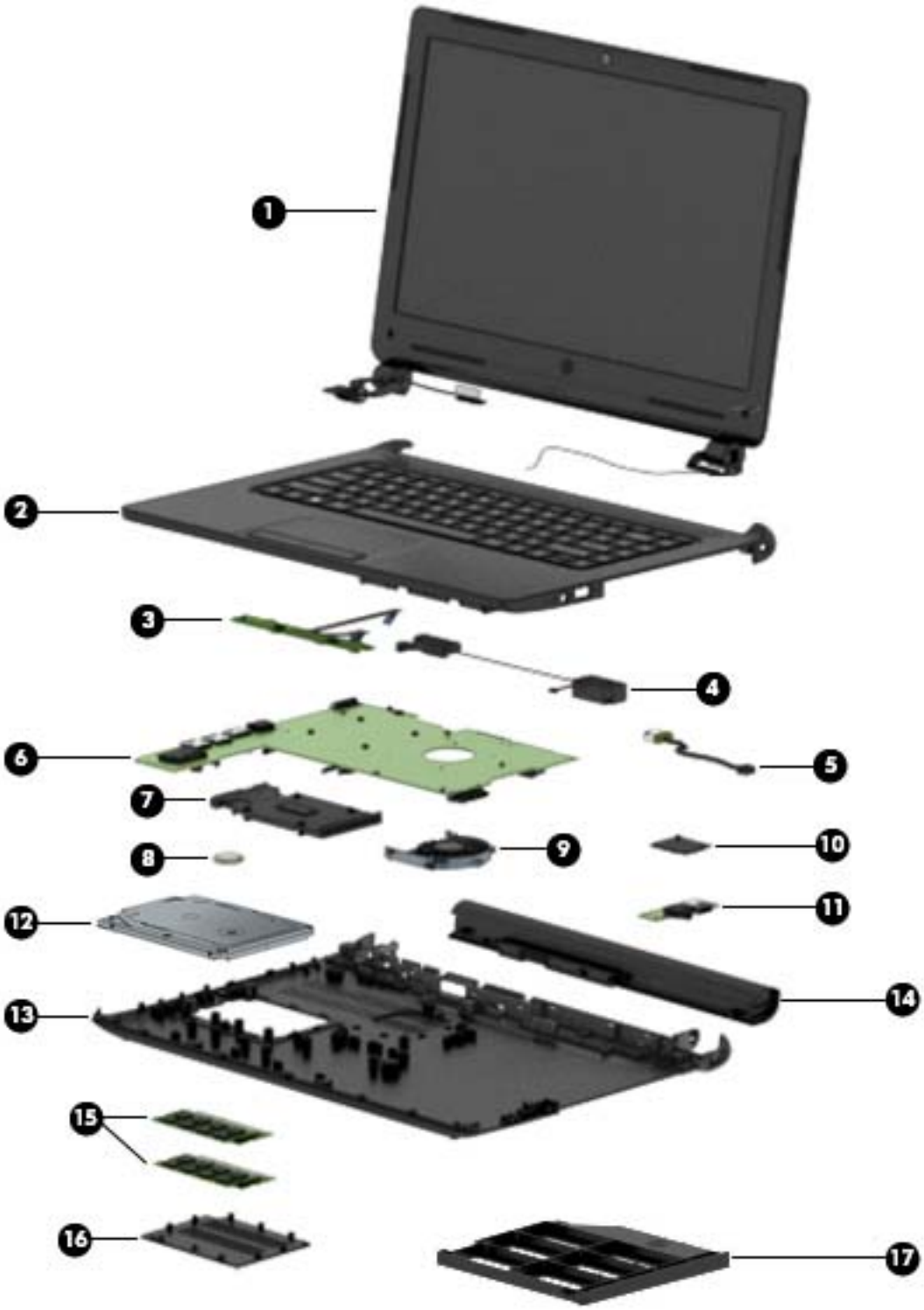
- Microsoft® Certificate of Authenticity label (select models only prior to Windows 8)—Contains the Windows Product Key. You may need the Product Key to update or troubleshoot the operating system. HP platforms with Windows 8 or Windows 8.x preinstalled do not have the physical label. Instead a Digital Product Key is electronically installed.

  NOTE: The Digital Product Key is automatically recognized and activated by Microsoft operating systems when a Windows 8 or Windows 8.x operating system is reinstalled using HP-approved recovery methods.

- 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.

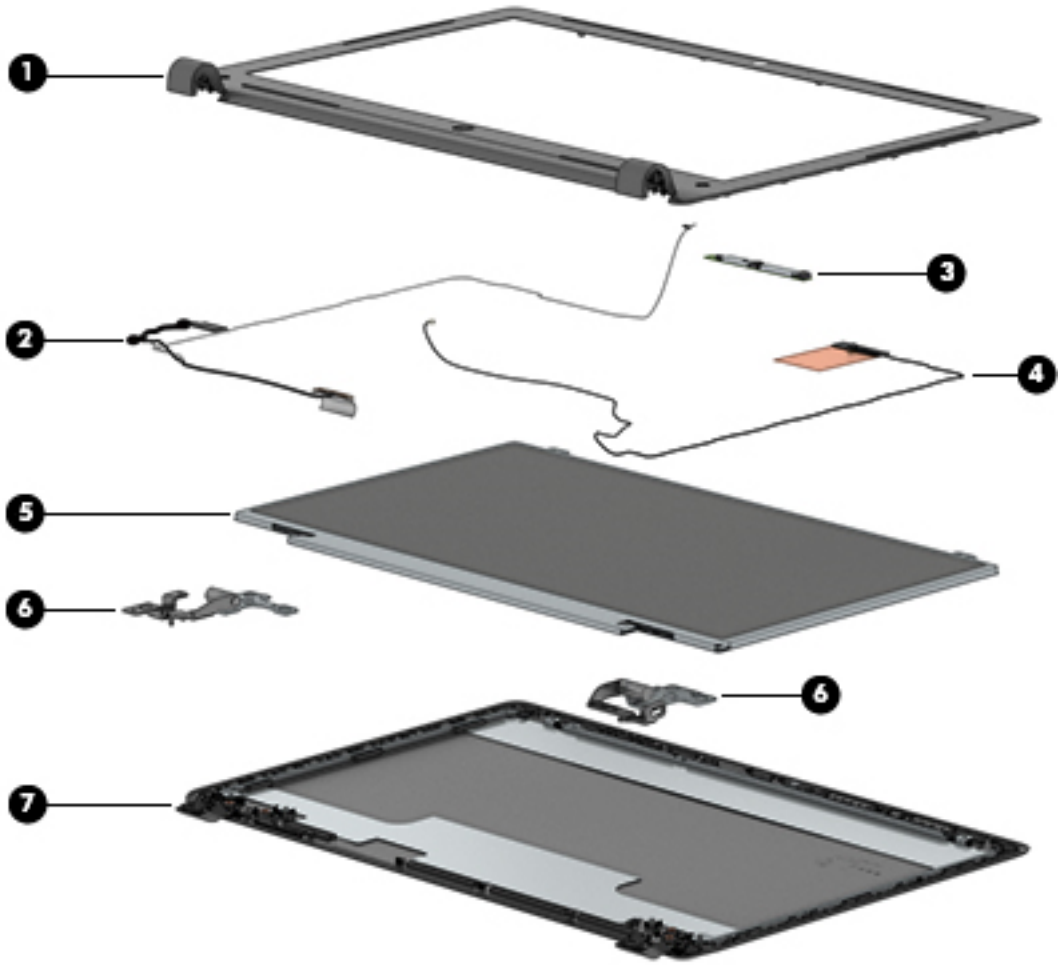
3 Illustrated parts catalog

Computer major components



Item	Component	Spare part number
(1)	**Display assembly**: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly components on page 14.	
(2)	**Top cover/keyboard** for use in India (includes touchpad and keyboard cable)	802473-D61
(3)	**TouchPad button board** (includes TouchPad cable, TouchPad button board cable, and double-sided adhesive)	802468-001
(4)	**Speaker Kit** (includes left and right speakers and cables)	802477-001
(5)	**Power connector cable**	802488-001
(6)	**System board** equipped with an A4-PRO 3340B 2.20-GHz processor (quad core, 25 W, 2-MB L2 cache) and the Windows 8 Professional operating system (includes replacement thermal material)	802492-601
(7)	**Heat sink** (includes replacement thermal material)	802480-001
(8)	**RTC battery**	718440-001
(9)	**Fan** (includes cable)	802479-001
(10)	**WLAN module:**	
	Qualcomm Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter	675794-001
(11)	**Audio/USB board**	802469-001
(12)	**Hard drive** (does not include hard drive bracket or hard drive connector adapter): **NOTE:** The hard drive bracket, rubber frame, and cable are included in the Hard Drive Hardware Kit, spare part number 802471-001. See Mass storage devices on page 15 for more information on the Hard Drive Hardware Kit.	
	500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778186-001
(13)	**Base enclosure**	802470-001
(14)	**Li-ion battery**	
	6-cell, 47-WHr, 2.20-AHr, Li-ion battery	796352-001
	4-cell, 41-WHr, 2.80-AHr, Li-ion battery	752237-001
(15)	**Memory modules** (DDR3L, 12800, 1600-MHz):	
	2 GB	691739-001
	Plastics Kit, includes:	802476-001
(16)	Memory cover	
(17)	Optical drive bay space saver	

Display assembly components



Item	Component	Spare part number
(1)	**Display bezel**	
	For use in models with a webcam	805099-001
	For use in models without a webcam	805100-001
(2)	**Display panel cable**	
	For use in models with a webcam	802483-001
	For use in models without a webcam	805102-001
(3)	**Webcam/microphone module** (includes double-sided adhesive)	802486-001
(4)	**Antenna Kit, WLAN**	802484-001
(5)	**35.6 cm (14.0-in), HD, SVA display panel**	802491-001
	Display Hinge Kit, includes:	802485-001
(6)	Left and right display hinge brackets	
(7)	**Display enclosure**	802482-001

Mass storage devices

Item	Component	Spare part number
(1)	**Hard drive** (does not include hard drive bracket, hard drive connector adapter, or screws): **NOTE:** The hard drive bracket, hard drive connector adapter, and screws are included in the Hard Drive Hardware Kit.	
	500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778186-001
	Hard Drive Hardware Kit, includes:	802471-001
(2a)	Hard drive rubber frame	
(2b)	Hard drive brackets (left and right)	
(2c)	Hard drive connector/cable	

Miscellaneous parts

Component	Spare part number
65-W HP Smart adapter (non-PFC, EM, 4.5-mm)	714657-001
Power cord for use only in India (3-pin, black, 1.0-m):	755530-D61
Rubber Kit	802487-001
Screw Kit	802475-001

Sequential part number listing

CSR flag designations:

A = Mandatory

B = Optional

C = Service technician recommended

N = Non-user replaceable

Spare part number	CSR flag	Description
691739-001	A	2-GB memory module (PCL3, 12800, 1600-MHz)
675794-001	N	Qualcomm Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter
714657-001	A	65-W HP Smart adapter (non-PFC, EM, 4.5-mm)
752237-001	N	4-cell, 41-WHr, 2.80-AHr, Li-ion battery
755530-D61	A	Power cord for use in India (3-pin, black, 1.0-m)
778186-001	N	500-GB, 5400-rpm, SATA, 7.0-mm hard drive (does not include hard drive bracket or hard drive connector adapter) **NOTE:** The bracket, rubber frame, and cable are included in the Hard Drive Hardware Kit, spare part number 802471-001.
796352-001	N	6-cell, 47-WHr, 2.20-AHr, Li-ion battery
802468-001	N	Touchpad button board
802469-001	N	Audio/USB board
802470-001	N	Base enclosure
802471-001	N	Hard Drive Hardware Kit (includes bracket, rubber frame, and cable)
718440-001	N	RTC battery (includes cable and double-sided adhesive)
802473-D61	N	Keyboard for use in India (includes touchpad and keyboard cable)
802475-001	N	Screw Kit
802476-001	N	Plastics Kit (includes memory module compartment cover and optical drive bay space saver)
802477-001	N	Speaker Kit (includes left and right speakers and cables)
802479-001	N	Fan (includes cable)
802480-001	N	Heat sink (includes replacement thermal material)
802482-001	N	Display enclosure
802483-001	N	Display cable for use in models with a webcam
802484-001	N	Antenna Kit (includes left and right wireless antenna cables and transceivers)
802485-001	N	Display Hinge Kit (includes left and right display hinges)
802486-001	N	Webcam/microphone module (includes double-sided adhesive)
802487-001	N	Rubber Kit (includes base enclosure rubber feet)
802488-001	N	Power connector cable
802491-001	N	**35.6–cm** (14.0-in), HD, SVA display panel
802492-601	N	System board equipped with an A4-PRO 3340B 2.20-GHz processor (quad core, 25 W, 2-MB L2 cache) and the Windows 8 Professional operating system (includes replacement thermal material
805099-001	N	Display bezel for use in models with a webcam
805100-001	N	Display bezel for use in models without a webcam
805102-001	N	Display cable for use in models without a webcam

4 Removal and replacement preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

Before removing or inserting a 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.

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, place it in a static-proof bag.

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

Typical electrostatic voltage levels			
	Relative humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures 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.

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

Component replacement procedures

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

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Labels on page 11 for details.

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

Battery

Description	Spare part number
6-cell, 47-WHr, 2.20-AHr, Li-ion battery	796352-001
4-cell, 41-WHr, 2.80-AHr, Li-ion battery	752237-001

Before removing the disassembling the computer, follow these steps:

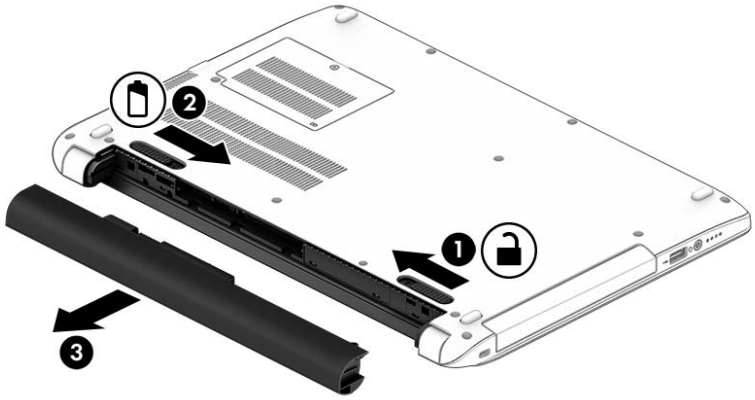
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

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

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

Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery lock **(1)** and battery release latch **(2)** inward to release the battery.
3. Remove the battery from the computer **(3)**.



Reverse this procedure to install the battery.

Memory cover

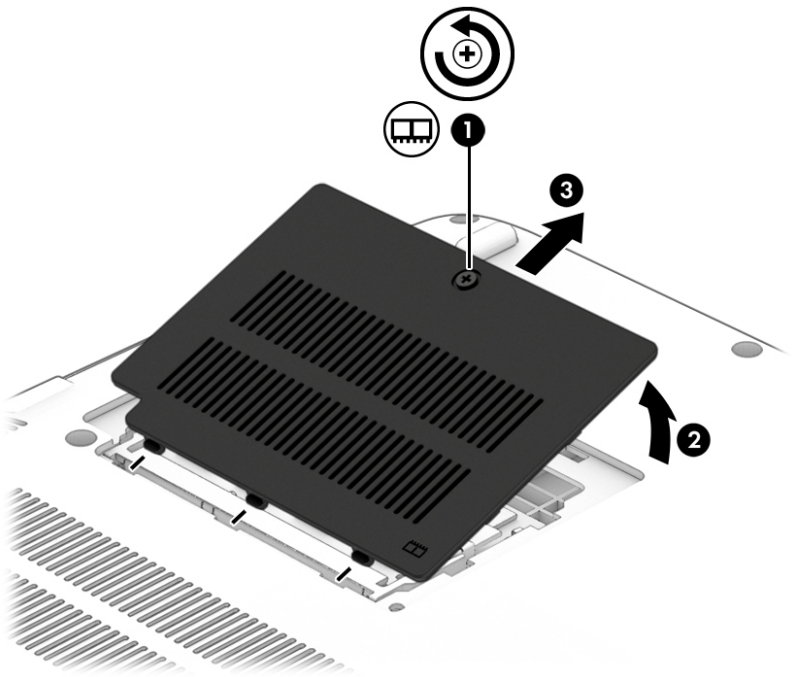
NOTE: The memory cover is included in the Plastics Kit, spare part number 802476-001.

Before removing the memory cover, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (See Battery on page 23).

Remove the memory cover:

1. Loosen the Phillips PM2.5×4.5 captive screw **(1)** that secures the memory cover to the computer.
2. Lift the rear edge of the memory cover **(2)** until it rests at an angle.
3. Remove the memory cover **(3)**.



Reverse this procedure to install the memory cover.

Memory module

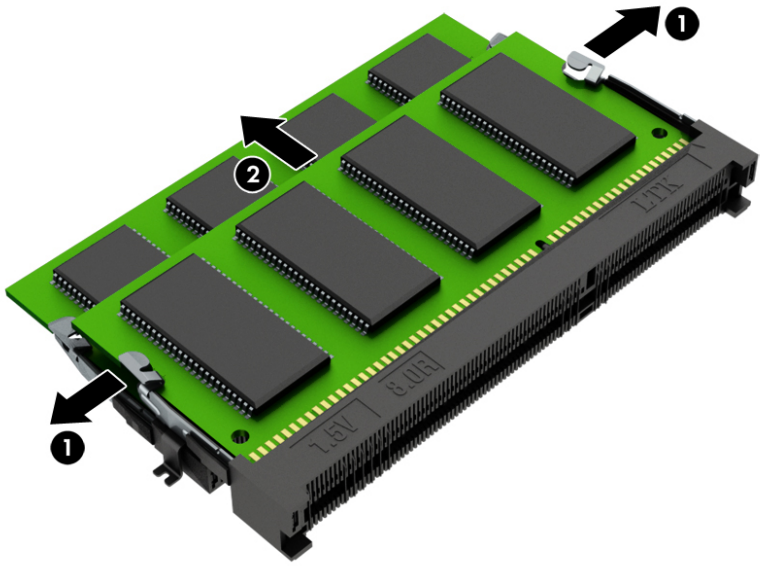
Description	Spare part number
2 GB	691739-001

Before removing the memory module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).

Remove the memory modules:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)
2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.



Reverse this procedure to install a memory module.

6 Removal and replacement procedures for Authorized Service Provider parts

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

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

Component replacement procedures

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

There are as many as 44 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Base enclosure

Description	Spare part number
Base enclosure (includes TouchPad and TouchPad cable)	802470-001

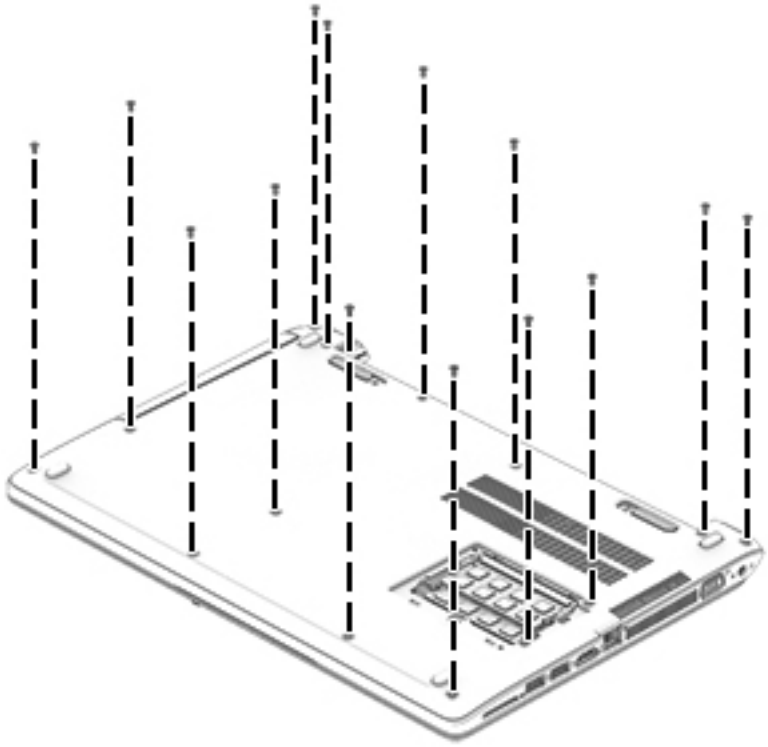
Before removing the base enclosure, follow these steps:

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 battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).

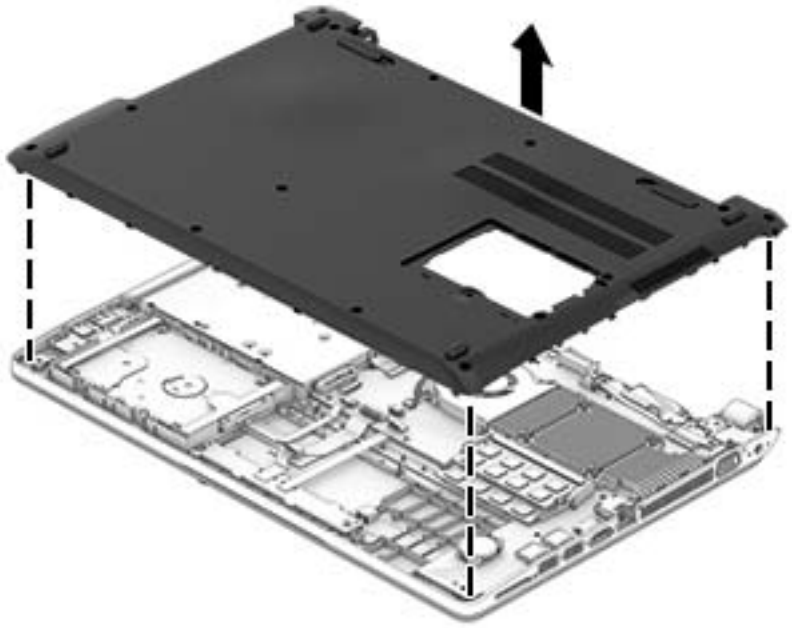
Remove the base enclosure:

1. Close the computer.
2. Position the computer upside down with the front toward you.

3. Remove the 14 Phillips PM2.0×4.5 screws **(2)** that secure the top cover to the base enclosure.



4. Lift the base enclosure from the computer.



Reverse this procedure to install the base enclosure.

WLAN module

Description	Spare part number
Qualcomm Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter	675794-001

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

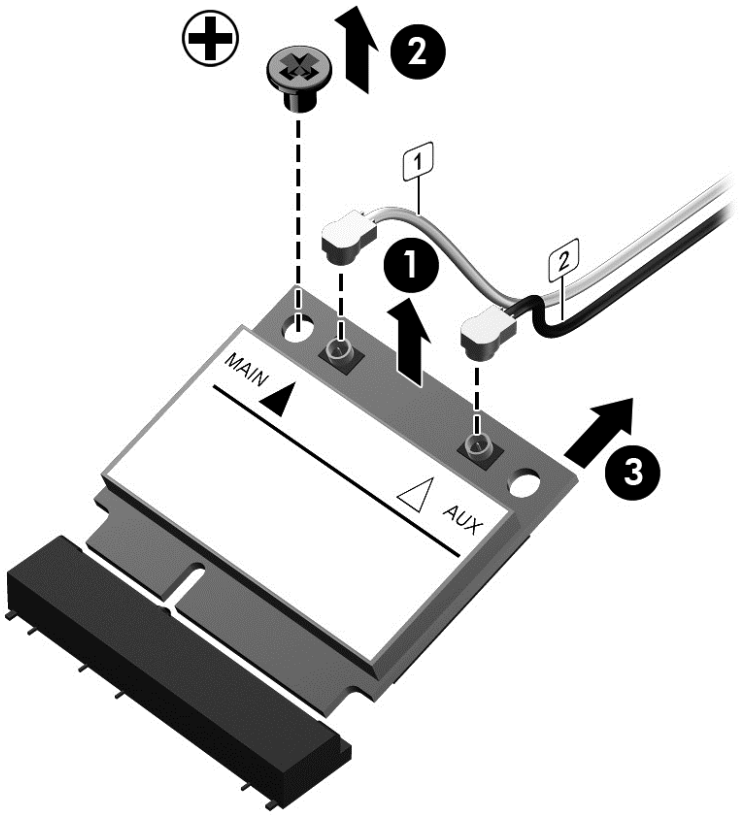
Remove the WLAN module:

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

NOTE: The WLAN antenna cable labeled “1” connects to the WLAN module “Main” terminal labeled “1”.

2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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



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

Reverse this procedure to install the WLAN module.

Hard drive

NOTE: The hard drive bracket, rubber frame, and cable are included in the Hard Drive Hardware Kit, spare part number 802471-001. See Mass storage devices on page 15 for more information on the Hard Drive Hardware Kit.

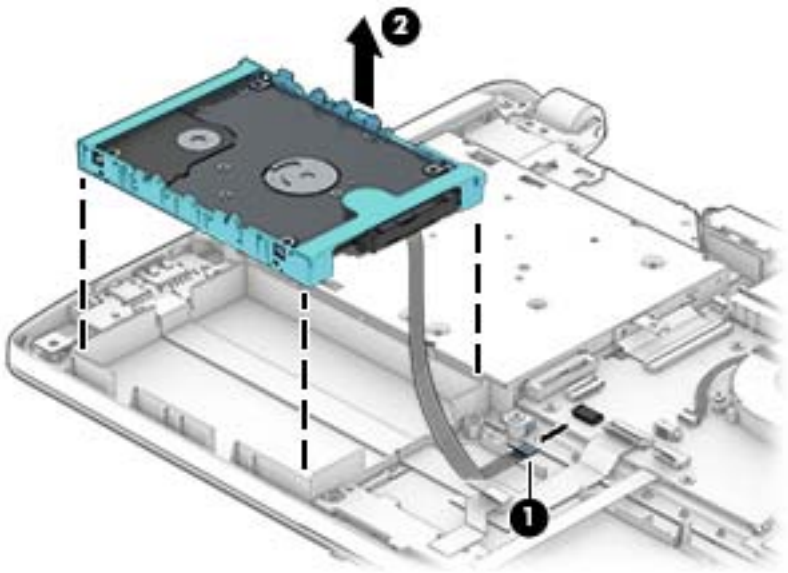
Description	Spare part number
500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778186-001

Before removing the battery, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

Remove the hard drive:

1. Disconnect the hard drive cable from the system board **(1)**.
2. Remove the hard drive **(2)** from the hard drive bay.

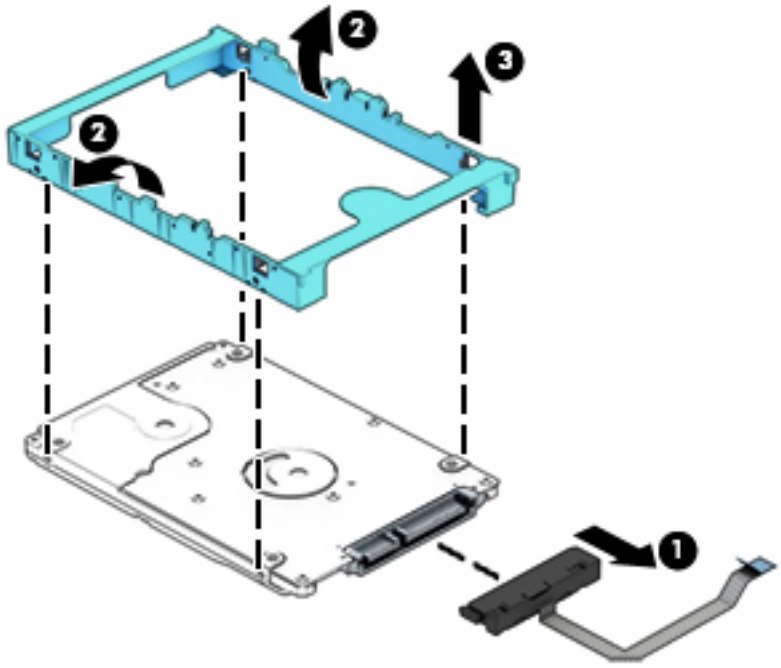


3. If it is necessary to disassemble the hard drive, perform the following steps:
   a. Position the hard drive with the hard drive connector adapter toward you.
   b. Disconnect the hard drive connector **(1)** from the hard drive.

      The hard drive bracket, rubber frame, and cable are available in the Hard Drive Hardware Kit, spare part number 802471-001.

c. Release the left and right sides of the hard drive bracket **(2)** from the hard drive.

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



Reverse this procedure to reassemble and install the hard drive.

RTC battery

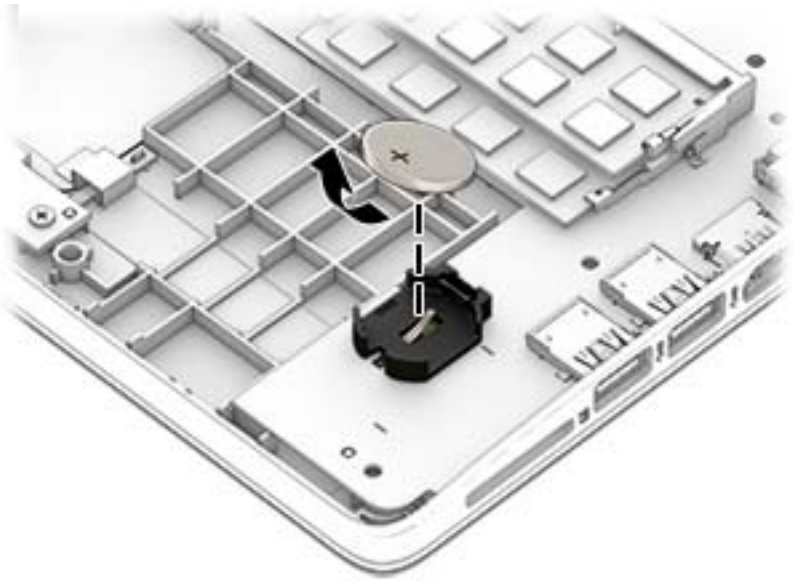
Description	Spare part number
RTC battery (includes cable and double-sided adhesive)	718440-001

Before removing the RTC battery, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

Remove the RTC battery:

1. Turn the system board upside down with the front toward you.
2. Use a plastic flat-bladed tool to release the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery. When installing the RTC battery in the system board socket, make sure the “+” is facing up.

Audio/USB board

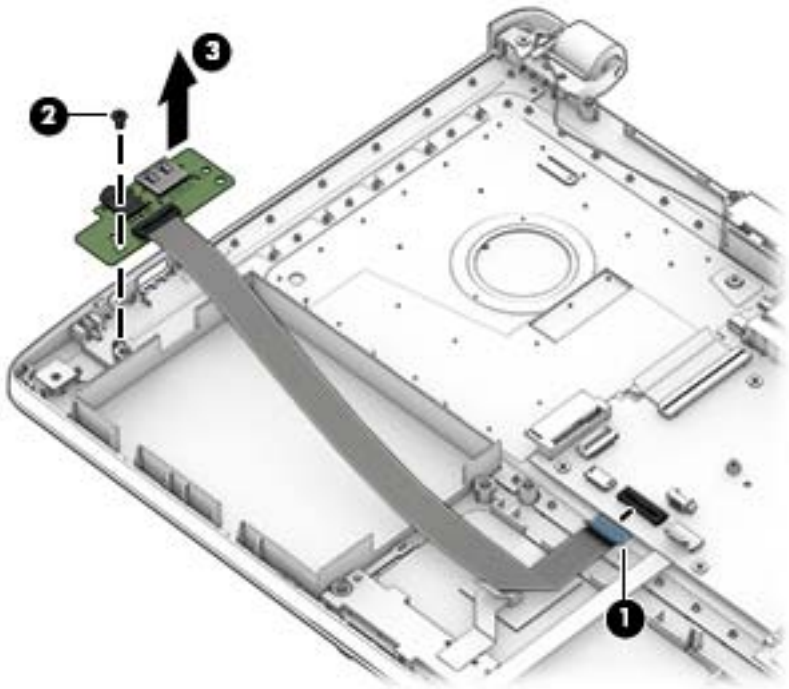
Description	Spare part number
Audio/USB board (includes audio jack, USB port, and cable)	802469-001

Before removing the audio/USB board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

Remove the audio/USB board:

1. Disconnect the audio/USB board cable from the system board **(1)**.
2. Remove the Phillips PM2.5×4.0 screw **(2)** that secures the audio/USB board to the computer.
3. Remove the audio/USB board **(3)** and cable.



Reverse this procedure to install the audio/USB board.

Fan

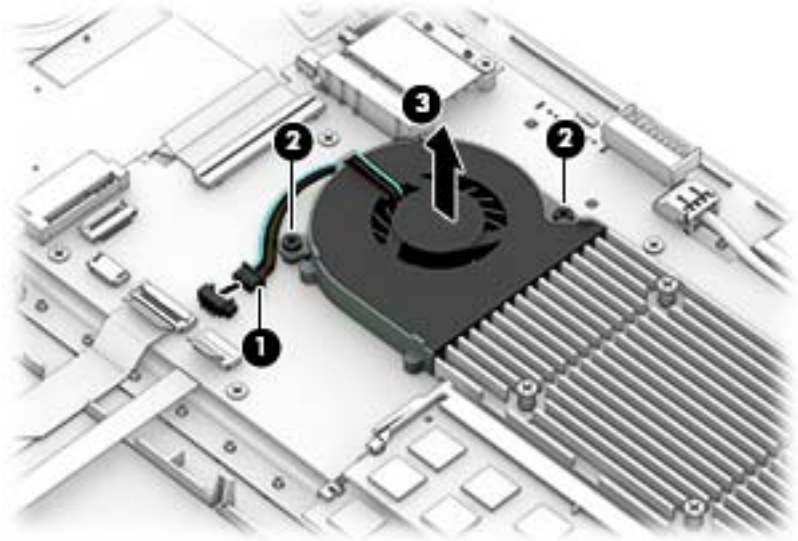
Description	Spare part number
Fan (includes cable)	802479-001

Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

Remove the fan:

1. Disconnect the fan cable from the system board **(1)**.
2. Loosen the two Phillips screws **(2)** that secure the fan to the system board.
3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

Heat sink

Description	Spare part number
Heat sink (includes replacement thermal material)	802480-001

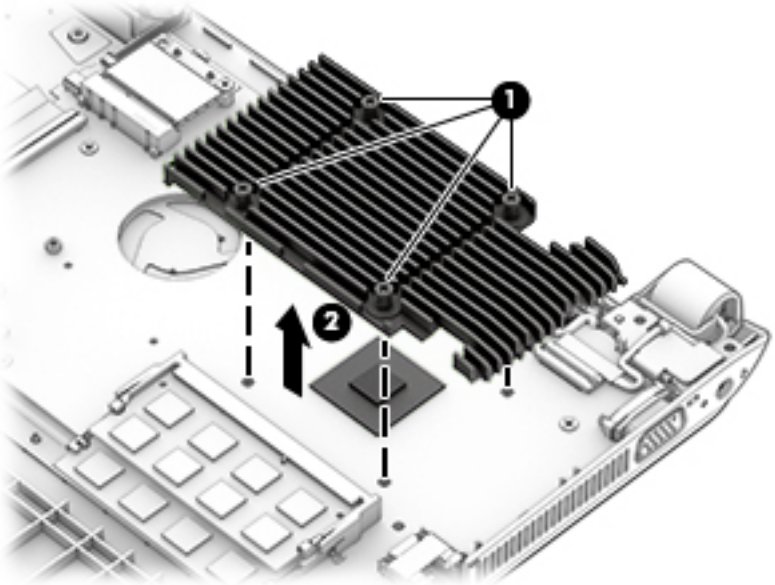
Before removing the heat sink, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

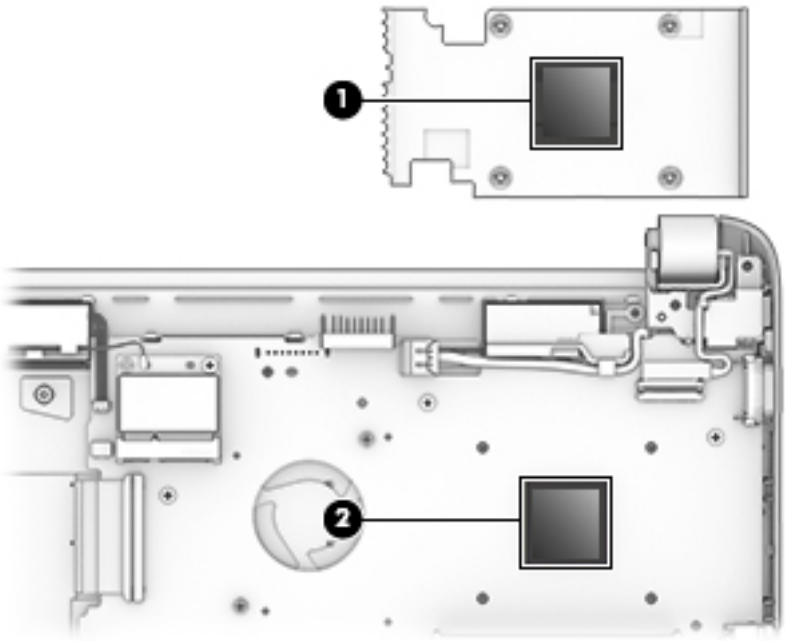
Remove the heat sink:

1. Turn the system board upside down with the front toward you.
2. Following the 1 through 4 sequence stamped into the heat sink, loosen the four Phillips captive screws **(1)** that secure the heat sink to the system board.
3. Remove the heat sink **(2)**.

NOTE: Due to the adhesive quality of the thermal material located between the heat sink and the system board components, it may be necessary to move the heat sink from side to side to detach it.



NOTE: The thermal material must be thoroughly cleaned from and reinstalled on the surfaces of the heat sink **(1)** and the system board component **(2)** each time the heat sink is removed.



Reverse this procedure to install the heat sink.

TouchPad button board

Description	Spare part number
TouchPad button board (includes TouchPad cable, TouchPad button board cable, and double-sided adhesive)	802468-001

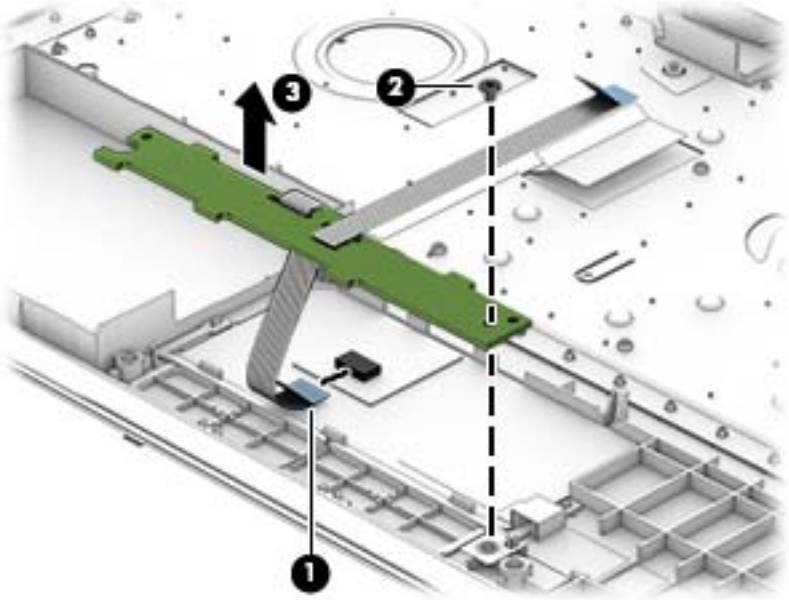
Before removing the TouchPad button board, follow these steps:

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 battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

Remove the TouchPad button board:

1. Turn the top cover upside down with the front toward you.
2. Disconnect the TouchPad board cable from the TouchPad **(1)**.
3. Remove the Phillips PM2.0×4.5 screw **(2)** that secures the TouchPad button board to the computer.

4. Remove the TouchPad button board from the computer.



Reverse this procedure to install the TouchPad button board.

System board

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

Description	Spare part number
System board equipped with an A4-PRO 3340B 2.20-GHz processor (quad core, 25 W, 2-MB L2 cache) and the Windows 8 Professional operating system (includes replacement thermal material):	802492-601

Before removing the system board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).

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

- WLAN module (see WLAN module on page 28)
- Memory modules (see Memory module on page 25)
- RTC battery (see RTC battery on page 32)
- Heat sink (see Heat sink on page 35)

Remove the system board:

1. Disconnect the following cables from the system board:

   (1): Speaker cable

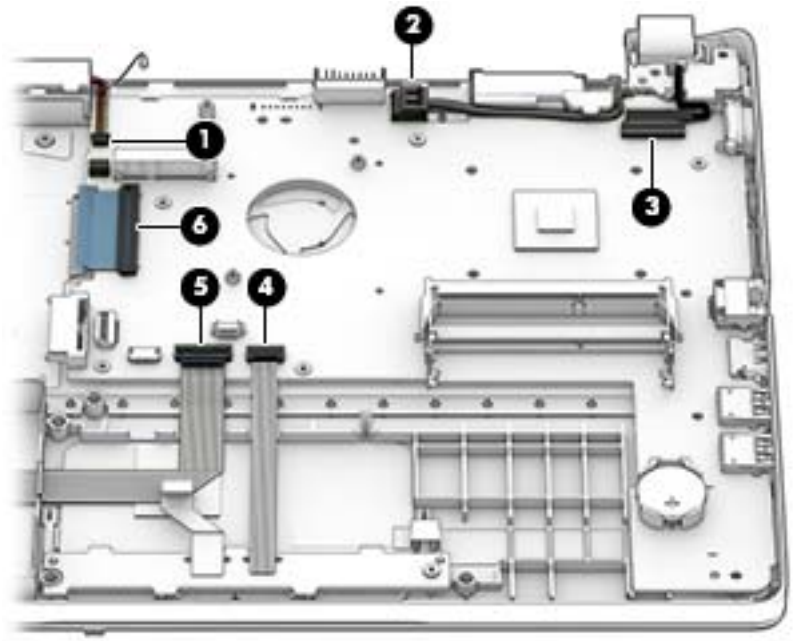
   (2): Power connector cable

   (3): Display cable

   (4): Touchpad cable

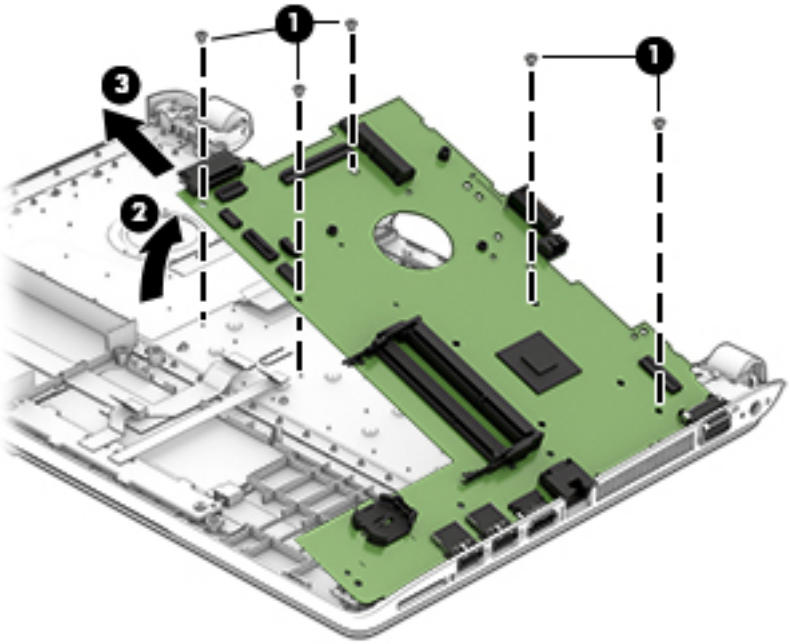
   (5): Audio/USB board cable

   (6): Keyboard cable



2. Remove the cable from atop the right speaker, and then lift the speaker aside to gain access to the screw underneath.
3. Remove the five Phillips PM2.5×3.0 screws that secure the system board to the base enclosure **(1)**.
4. Lift up on the left side of the system board **(2)** until it rests at an angle.

5. Remove the system board **(3)** by pulling it to the left at an angle.



Reverse this procedure to install the system board.

Speakers

Description	Spare part number
Speaker Kit (includes left and right speakers and cables)	802477-001

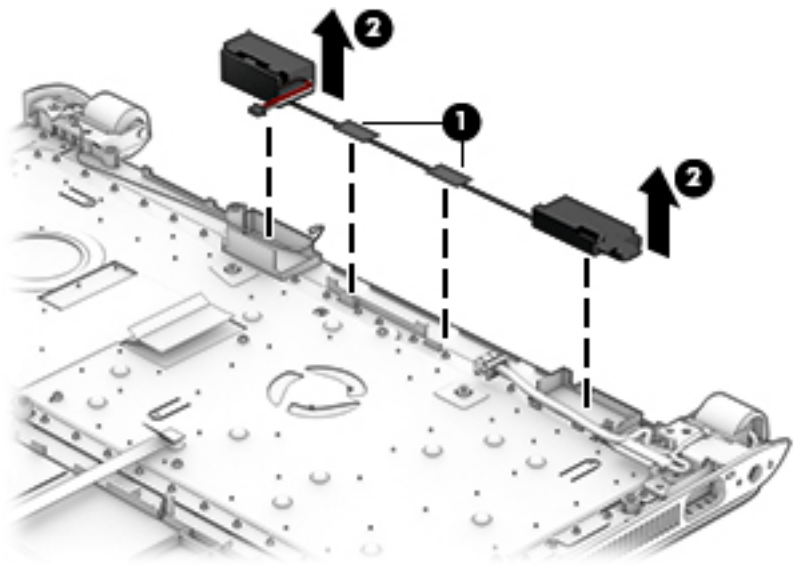
Before removing the speakers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).
7. Remove the system board (see System board on page 37).

Remove the speakers:

1. Lift the cable between the speakers to disengage the Mylar tape that secures it to the computer **(1)**.

2. Remove the speakers **(2)**.



Reverse this procedure to install the speakers.

Power connector cable

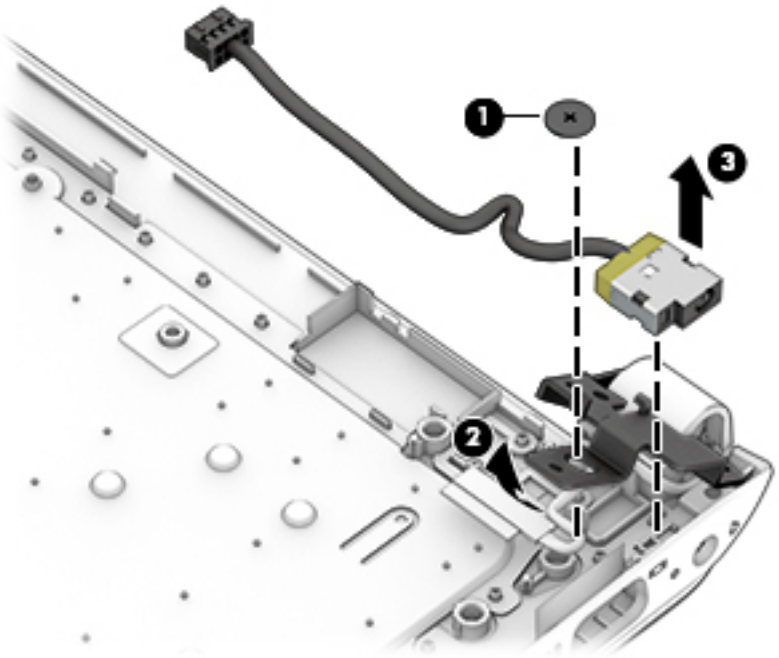
Description	Spare part number
Power connector cable	802488-001

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 battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).
7. Remove the system board (see System board on page 37).

Remove the power connector cable:

1. Remove the Phillips broadhead PM2.5×3.0 screw **(1)** that secures the display hinge and power connector.
2. Rotate the display hinge upward to gain access to the power connector **(2)**.
3. Remove the power connector and cable from the computer **(3)**.



4. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Display assembly

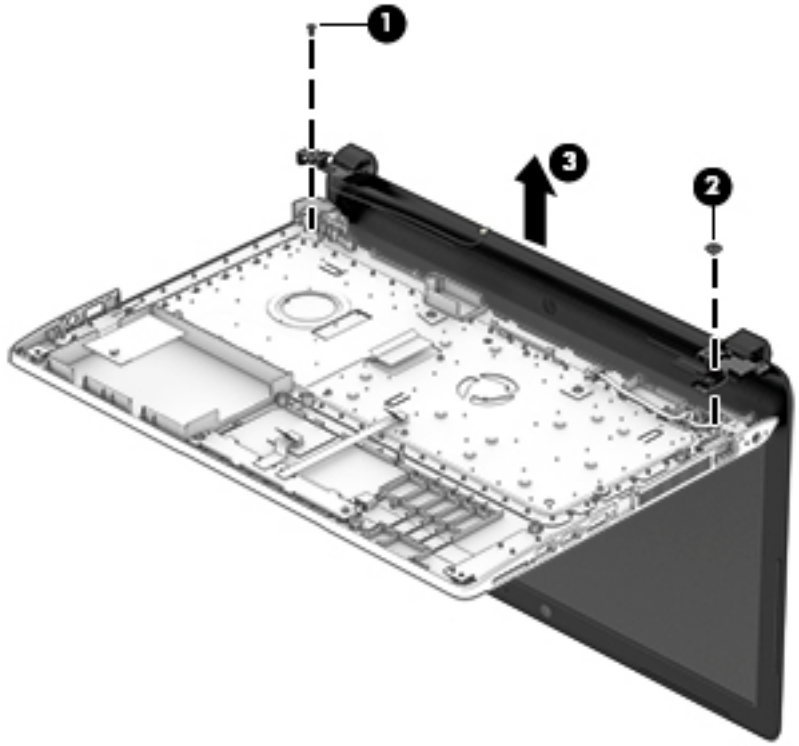
NOTE: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 23).
5. Remove the memory cover (see Memory cover on page 24).
6. Remove the bottom cover (see Base enclosure on page 26).
7. Remove the system board (see System board on page 37).

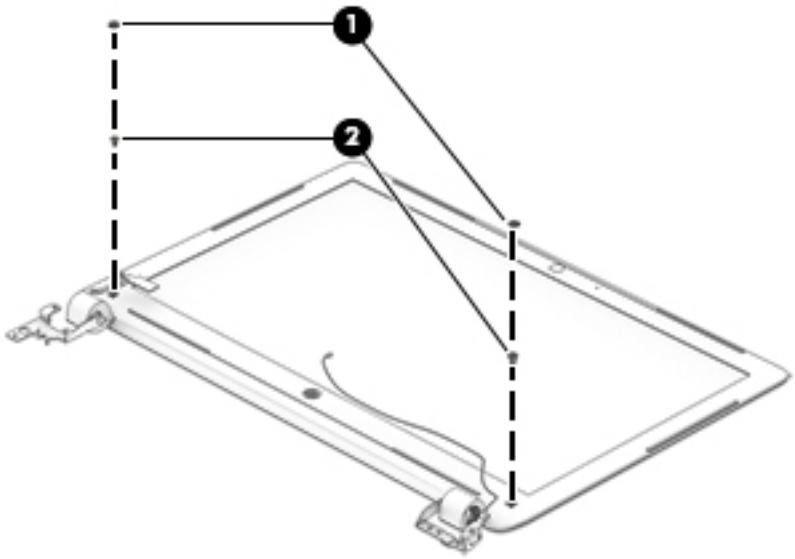
Remove the display assembly:

1. Position the computer upside down with the display hanging off the edge of the table.
2. Remove the Phillips PM2.5×4.0 screw **(1)** that secures the right display hinge to the computer.
3. Remove the Phillips broadhead PM2.5×3.0 screw **(2)** that secures the left display hinge to the computer.
4. Remove the display assembly **(3)**.



5. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
   a. Remove the two display bezel screw covers **(1)**.

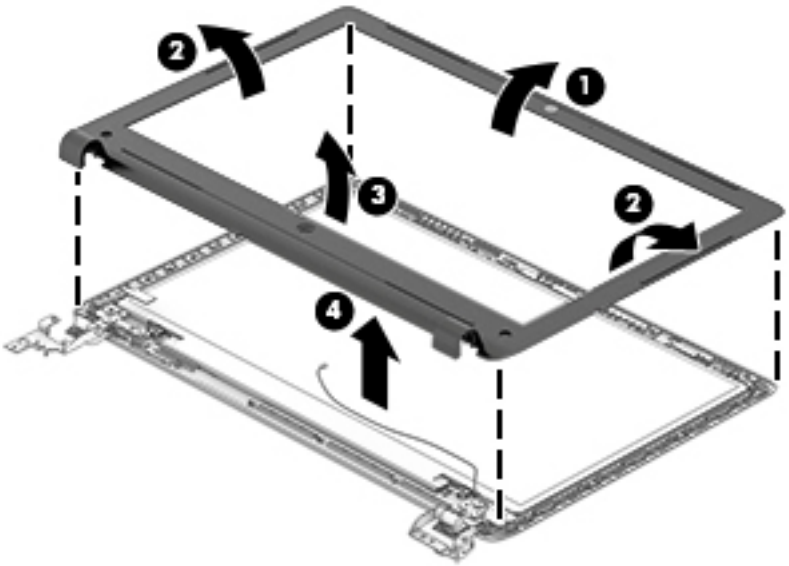
b. Remove the two Phillips PM2.5×4.0 screws **(2)** that secure the display bezel to the display assembly.



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

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

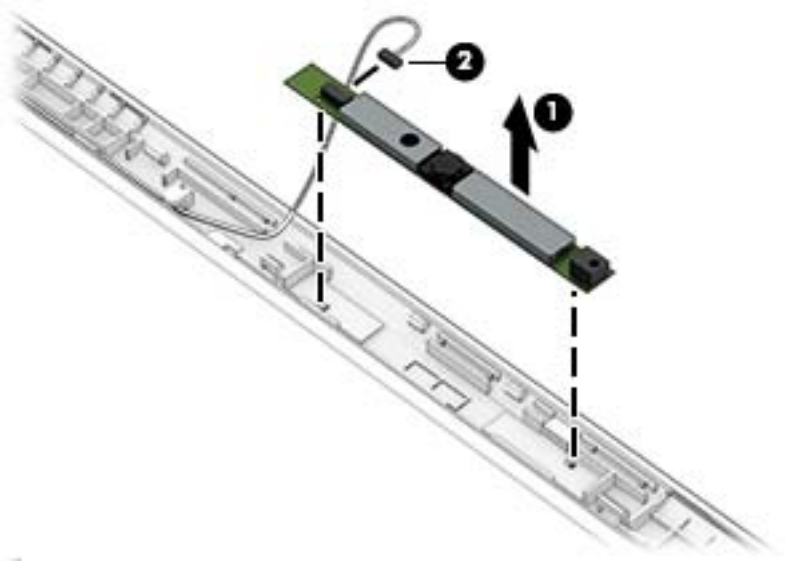
The display bezel is available using spare part number 805099-001 for models with a webcam and 805100-001 for models without a webcam.



6. If it is necessary to replace the webcam/microphone module:

a. Detach the webcam/microphone module **(1)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided adhesive.)

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

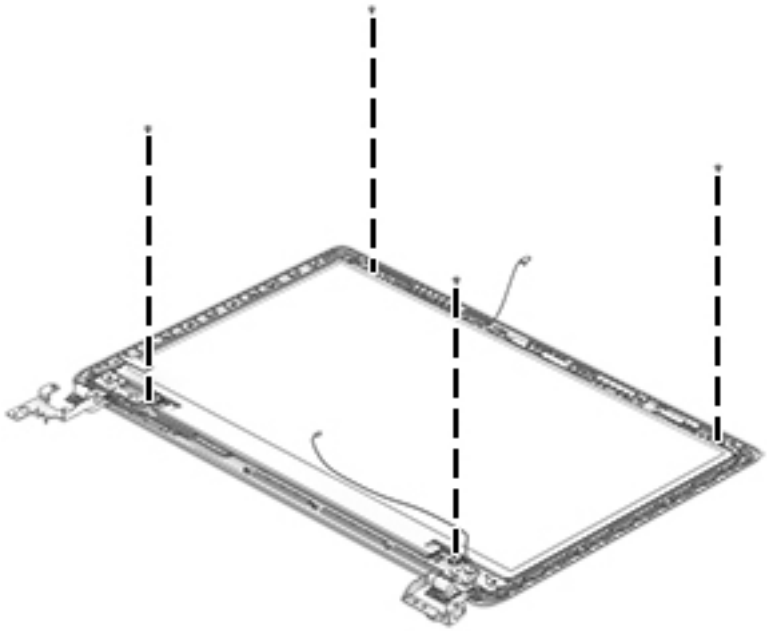


c. Remove the webcam/microphone module.

The webcam/microphone module is available using spare part number 802486-001.

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

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

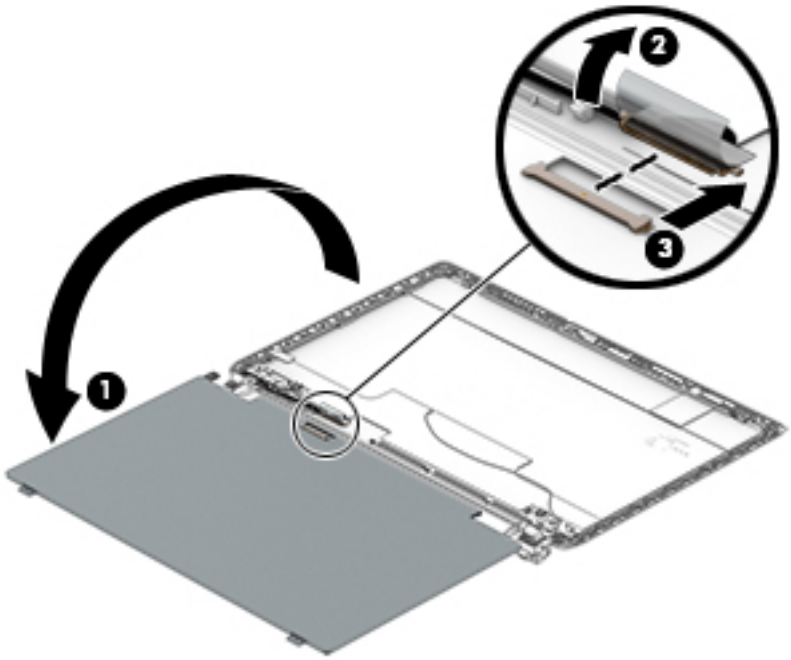


⚠ **CAUTION:** Before turning the display panel upside down, make sure the work surface is clear of tools, screws, and any other foreign objects. Failure to follow this caution can result in damage to the display panel.

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

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

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



e. Remove the display panel.

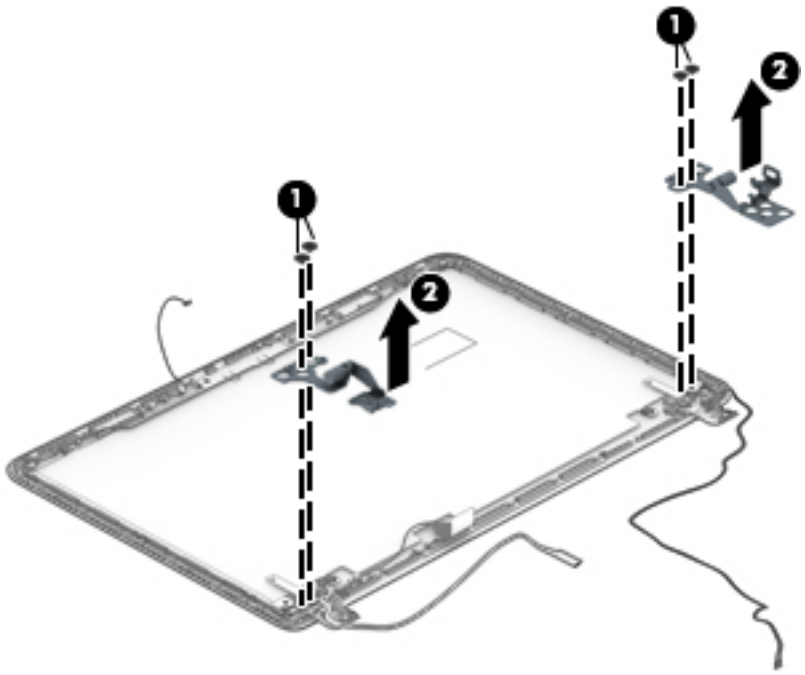
The display panel is available using spare part number 802491-001.

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

a. Remove the four Phillips PM2.5×3.25 broadhead screws **(1)** that secure the display hinges to the display enclosure.

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

The display hinges are included in the Display Hinge Kit, spare part number 802485-001.

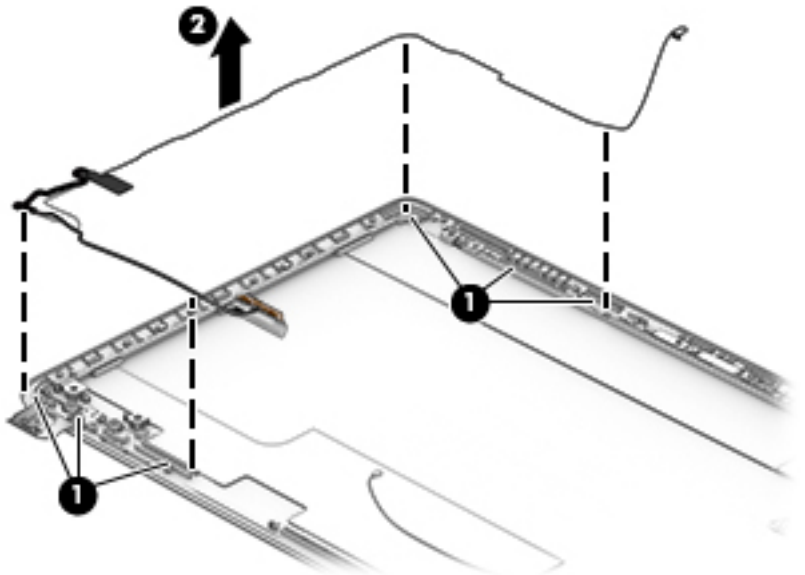


9. If it is necessary to replace the display cable:

a. Release the cable from the clips **(1)** and routing channel built into the top, right, and bottom edges of the display enclosure.

b. Remove the display cable from the display enclosure **(2)**.

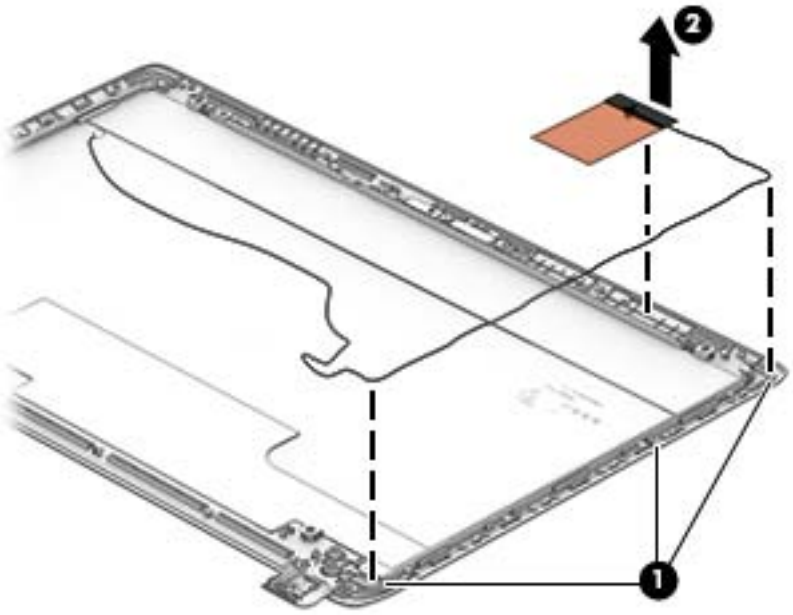
The display cable is available using spare part number 802483-001 for models with a webcam and 805102-001 for models with out a webcam.



10. If it is necessary to replace the WLAN antenna cables and transceivers:

a. Release the WLAN antenna cable from the clips **(1)** and routing channel built into the top edge and right side of the display enclosure.

b. Detach the WLAN antenna transceiver **(2)** from the display enclosure. (The WLAN antenna transceiver is attached to the display enclosure with double-sided adhesive.)



c. Remove the WLAN antenna cable and transceiver.

The WLAN antenna cable and transceiver is included in the Antenna Kit, spare part number 802484-001.

Reverse this procedure to reassemble install the display assembly.

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.

Starting Setup Utility (BIOS)

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

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 48).
2. Select **Main**, and then make note of your BIOS version.
3. Select **Exit**, select **Exit Discarding Changes**, and then follow the on-screen instructions.

Downloading a BIOS update

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

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

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

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

   – or –

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

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

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

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

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

   If the update is more recent than your BIOS, make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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

1. From the Start screen, type `file`, and then select **File Explorer**.

   – or –

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

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

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

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

   The BIOS installation begins.

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

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

8 Using HP PC Hardware Diagnostics (UEFI)

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

To start HP PC Hardware Diagnostics (UEFI):

1. Start Setup Utility:

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

2. Press or tap **f2**.

   The BIOS searches 3 places for the diagnostic tools, in the following order:

   a. Connected USB drive

   NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 50.

   b. Hard drive

   c. BIOS

3. When the diagnostic tool opens, use the keyboard arrow keys to select the type of diagnostic test you want to run, and then follow the on-screen instructions.

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

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

NOTE: Instructions for downloading HP PC Hardware Diagnostics (UEFI) are provided in English only.

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

Option 1: HP PC Diagnostics homepage— Provides access to the latest UEFI version

1. Go to http://hp.com/go/techcenter/pcdiags.
2. Click the UEFI **Download** link, and then select **Run**.

Option 2: Support and Drivers pages—Provide downloads for a specific product for earlier and later versions

1. Go to http://www.hp.com.
2. Point to **Support**, located at the top of the page, and then click **Download Drivers**.
3. In the text box, enter the product name, and then click **Go**.

   – or –

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

4. Select your computer model, and then select your operating system.
5. In the **Diagnostic** section, click **HP UEFI Support Environment**.

   – or –

   Click **Download**, and then select **Run**.

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**366 mm**	14.41 in
Depth	**244 mm**	9.61 in
Height	**22.9 mm**	0.9 in
Weight	**1.99 kg**	5.34 lb
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W DC plug **NOTE:** This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms. **NOTE:** The computer operating voltage and current can be found on the system regulatory label.	
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (non-condensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

35.6-cm (14.0-in) display specifications

	Metric	U.S.
Dimensions		
Height	**17.6 cm**	6.93 in
Width	**31.2 cm**	12.28 in
Diagonal	**35.7 cm**	14.06 in
Number of colors	up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	**0.197 × 0.197 mm**	
Format	HD, SVA (1366 x 768)	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

Hard drive specifications

	500-GB*	250-GB*
Dimensions		
Height	7 mm	7 mm
Length	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm
Weight	110 g	110 g
Interface type	SATA	SATA
Transfer rate		
Synchronous (maximum)	1.1 GB/sec	1.1 GB/sec
Security	ATA security or SED	ATA security
Seek times (typical read, including setting)		
Single track	1.5 ms	1.5 ms
Average (read/write)	11/13 ms	11/13 ms
Maximum	22 ms	22 ms
Logical blocks	976,773,168	488,386,584
Disk rotational speed	5400 rpm	5400 rpm
Operating temperature		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.		
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.		

10 Backing up, restoring, and recovering

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

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

For additional information, refer to the HP Support Assistant.

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

- or -

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

IMPORTANT: If you will be using media to recover your system, the computer battery must have at least 70% battery power remaining before starting the recovery process.

Creating recovery media and backups

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

- Use HP Recovery Manager after you successfully set up the computer to create HP Recovery media. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Creating HP Recovery media (select models only) on page 55. For information on the recovery options that are available using the recovery media, see Recovering using HP Recovery Manager on page 57.
- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Using Windows tools on page 56.

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

Creating HP Recovery media (select models only)

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

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

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take an hour or more. Do not interrupt the creation process.
- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Recovery Media Creation**, and then follow the on-screen instructions.

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 57.

Using Windows tools

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

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

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

– or –

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

For more information and steps, see Help and Support.

Restore and recovery

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

IMPORTANT: Not all methods are available on all models.

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

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

  - or -

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

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

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

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

  For more information, see Recovering using HP Recovery Manager on page 57.

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 57. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 55.

- On select models, if you want to recover the computer's original factory partition and content , or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 57.

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

  For more information, see Removing the HP Recovery partition (select models only) on page 59.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from support, or by using the HP Recovery partition (select models only). If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 55.

What you need to know before you get started

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

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

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 55.

- To use the Factory Reset option (select models only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 55.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

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

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

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- Minimized Image Recovery (select models only)—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.
- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

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

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

1. From the Start screen, type `recovery`, select **Recovery Manager**, and then select **HP Recovery Environment**.
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 59.

3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

1. Insert the HP Recovery media.
2. Start Computer Setup:
   - ▲ Turn on or restart the computer, quickly press esc, and then press f9 for boot options.
3. Select the USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

Removing the HP Recovery partition (select models only)

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

IMPORTANT: After you remove the HP Recovery partition, you can no longer use the Windows Refresh option or the Windows option to remove everything and reinstall Windows. In addition, you will not be able to perform System Recovery or Minimized Image Recovery from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Creating HP Recovery media (select models only) on page 55.

Follow these steps to remove the HP Recovery partition:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

11 Statement of memory volatility

The purpose of this chapter is to provide general information regarding nonvolatile memory in HP Business PCs. This chapter also provides general instructions for restoring nonvolatile memory that can contain personal data after the system has been powered off and the hard drive has been removed.

HP Business PC products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP, assuming that no subsequent modifications have been made to the system and assuming that no applications, features, or functionality have been added to or installed on the system.

Following system shutdown and removal of all power sources from an HP Business PC system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. Use the steps below to remove personal data from the PC, including the nonvolatile memory found in Intel-based and AMD-based system boards.

1. Follow steps (a) through (j) below to restore the nonvolatile memory that can contain personal data. Restoring or reprogramming nonvolatile memory that does not store personal data is neither necessary nor recommended.

   a. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

   NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

   b. Select **Main**, select **Restore Defaults**, and then select **Yes** to load defaults.

   c. Select the **Security** menu, select **Restore Security Level Defaults**, and then select **Yes** to restore security level defaults.

   d. If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select **Asset Tracking Number**. Clear the tag, and then make the selection to return to the prior menu.

   e. If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Tools** under the **Utilities** menu. Select **Hard Drive Tools**, select **DriveLock**, then uncheck the checkbox for **DriveLock password on restart**. Select **OK** to proceed.

   f. If an Automatic DriveLock password is set, select the **Security** menu, scroll down to **Hard Drive Tools** under the **Utilities** menu. Select **Hard Drive Tools**, scroll down to **Automatic DriveLock**, then select the desired hard drive and disable protection. At the automatic drive lock warning screen, select **Yes** to continue. Repeat this procedure if more than one hard drive has an Automatic DriveLock password.

   g. Select the **Main** menu, and then select **Reset BIOS Security to factory default**. Click **Yes** at the warning message.

   h. Select the **Main** menu, select **Save Changes and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.

i. Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint reader, one or two prompts will appear—one to clear the TPM and the other to Reset Fingerprint Sensor; press or tap F1 to accept or F2 to reject.

j. Remove all power and system batteries for at least 24 hours.

2. Complete one of the following:

- Remove and retain the storage drive.

– or –

- Clear the drive contents by using a third party utility designed to erase data from an SSD.

– or –

- Clear the contents of the drive by using the following BIOS Setup Secure Erase command option steps:

IMPORTANT: If you clear data using Secure Erase, it cannot be recovered.

a. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

b. Select the **Security** menu and scroll down to the **Utilities** menu.

c. Select **Hard Drive Tools**.

d. Under **Utilities**, select **Secure Erase**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

– or –

- Clear the contents of the drive by using the following Disk Sanitizer command steps:

IMPORTANT: If you clear data using Disk Sanitizer, it cannot be recovered.

NOTE: The amount of time it takes for Disk Sanitizer to run can take several hours. Plug the computer into an AC outlet before starting.

a. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

b. Select the **Security** menu and scroll down to the **Utilities** menu.

c. Select **Hard Drive Tools**.

d. Under **Utilities**, select **Disk Sanitizer**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

Nonvolatile memory usage

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	2 MBytes	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical PC configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select models only) on page 65.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 Bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using the Computer Setup (BIOS), or changing the Microsoft Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KBytes (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility is required to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a PC. The specific write-protection method varies by memory vendor.
System BIOS	4 MBytes to 5 MBytes	Yes	Yes	Stores system BIOS code and PC configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are input using the Computer Setup (BIOS) or a custom utility.	**NOTE:** Writing data to this ROM in an inappropriate manner can render the PC non-functional. A utility is required for writing data to this memory and is available on the HP website; go to http://www.hp.com/support, and select your country. Select **Drivers &**

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
						Downloads, and then follow the on-screen instructions.
Intel Management Engine Firmware (present in only specific ZBook and EliteBook models. For more information, go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then follow the on-screen instructions.)	1.5 MBytes or 5 MBytes	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	The Intel chipset is configured to enforce hardware protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash	2 Mbit	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility is required for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 Kbit to 8 Kbit	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Web camera	64 Kbit	No	Yes	Stores webcam configuration and firmware.	Webcam memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader	512 KByte flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

1. **How can the BIOS settings be restored (returned to factory settings)?**

   IMPORTANT: Restore defaults does not securely erase any data on your hard drive. See question and answer 6 for steps to securely erase data.

   Restore defaults does not reset the Custom Secure Boot keys. See question and answer 7 for information about resetting the keys.

   a. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

   b. Select **Main**, and then select **Restore defaults**.

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

2. **What is a UEFI BIOS, and how is it different from a legacy BIOS?**

   The Unified Extensible Firmware Interface (UEFI) BIOS is an industry-standard software interface between the platform firmware and an operating system (OS). It is a replacement for the older BIOS architecture, but supports much of the legacy BIOS functionality.

   Like the legacy BIOS, the UEFI BIOS provides an interface to display the system information and configuration settings and to change the configuration of your computer before an OS is loaded. BIOS provides a secure run-time environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (Touchscreen, TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make menu and configuration selections. The UEFI BIOS also contains basic system diagnostics.

   The UEFI BIOS provides functionality beyond that of the legacy BIOS. In addition, the UEFI BIOS works to initialize the computer's hardware before loading and executing the OS; the run-time environment allows the loading and execution of software programs from storage devices to provide more functionality, such as advanced hardware diagnostics (with the ability to display more detailed system information) and advanced firmware management and recovery software.

   HP has provided options in Computer Setup (BIOS) to allow you to run in legacy BIOS, if required by the operating system. Examples of this requirement would be if you upgrade or downgrade the OS.

3. **Where does the UEFI BIOS reside?**

   The UEFI BIOS resides on a flash memory chip. A utility is required to write to the chip.

4. **What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory module? How would this data be written?**

   The DIMM SPD memory contains information about the memory module, such as size, serial number, data width, speed/timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. This EEPROM cannot be written to when the memory module is installed in a PC. Third-party tools do exist that can write to the EEPROM when the memory module is not installed in a PC. Various third-party tools are available to read SPD memory.

5. **What is meant by "Restore the nonvolatile memory found in Intel-based system boards"?**

   This message relates to clearing the Real Time Clock (RTC) CMOS memory that contains PC configuration data.

6. **How can the BIOS security be reset to factory defaults and data erased?**

IMPORTANT: Resetting will result in the loss of information.

These steps will not reset Custom Secure Boot Keys. See question and answer 7 for information about resetting the keys.

a. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

b. Select **Main**, and then select **Reset BIOS Security to Factory Default**.

c. Follow the on-screen instructions.

d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

7. **How can the Custom Secure Boot Keys be reset?**

Secure Boot is a feature to ensure that only authenticated code can start on a platform. If you enabled Secure Boot and created Custom Secure Boot Keys, simply disabling Secure Boot will not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure you used to create the Custom Secure Boot Keys, but make the selection to clear or delete all Secure Boot Keys.

a. Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

b. Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.

c. At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select models only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors your computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start restores the BIOS to its previously safe state, without user intervention. Those select computer models ship with HP Sure Start configured and enabled. HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

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

12 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer. Requirements for all countries 113

Requirements for specific countries and regions

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

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

13 Recycling

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

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

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