



HP 250 G3 Notebook PC HP 256 G3 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 on all editions of Windows 8.1. This computer may require upgraded and/or separately purchased hardware, drivers, and/or software to take full advantage of Windows 8.1 functionality. See <http://www.microsoft.com> for details.

This computer may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://windows.microsoft.com/en-us/windows7/get-know-windows-7> for details.

Safety warning notice

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

Table of contents

1 Product description	1
2 External component identification	5
Display	5
Front	6
Right side	6
Left side	7
Top	8
TouchPad	8
Lights	9
Button	9
Keys	11
Bottom	12
Labels	13
3 Illustrated parts catalog	15
Computer major components	15
Miscellaneous parts	19
Display assembly subcomponents	21
Mass storage devices	22
Plastics Kit	23
Rubber Kit	23
Sequential part number listing	24
4 Removal and replacement procedures preliminary requirements	31
Tools required	31
Service considerations	31
Plastic parts	31
Cables and connectors	31
Drive handling	32
Grounding guidelines	32
Electrostatic discharge damage	32
Packaging and transporting guidelines	33
Workstation guidelines	33

5 Removal and replacement procedures for Customer Self-Repair parts	35
Component replacement procedures	35
Battery	35
Optical drive	37
Keyboard	39
6 Removal and replacement procedures for Authorized Service Provider parts	43
Component replacement procedures	43
Display subcomponents (bezel, webcam, panel)	43
Top cover	47
Power button board	50
TouchPad button board	51
Hard drive	53
WLAN module	55
Fan	57
Power connector cable	59
System board	60
USB board	64
Speakers	65
Heat sink assembly	67
RTC battery	70
Memory module	71
Display assembly	72
7 Using Setup Utility (BIOS) and HP PC Hardware Diagnostics (UEFI) in Windows 8.1	79
Starting Setup Utility (BIOS)	79
Updating the BIOS	79
Determining the BIOS version	79
Downloading a BIOS update	80
Using HP PC Hardware Diagnostics (UEFI)	80
Downloading HP PC Hardware Diagnostics (UEFI) to a USB device	81
8 Using Setup Utility (BIOS) and System Diagnostics in Windows 7	83
Starting Setup Utility (BIOS)	83
Updating the BIOS	83
Determining the BIOS version	83
Downloading a BIOS update	84
Using HP PC Hardware Diagnostics (UEFI)	84
Downloading HP PC Hardware Diagnostics (UEFI) to a USB device	85

9 Computer Setup (BIOS) and Advanced System Diagnostics in SUSE Linux	87
Starting Computer Setup	87
Using Computer Setup	87
Navigating and selecting in Computer Setup	87
Restoring factory settings in Computer Setup	88
Updating the BIOS	88
Determining the BIOS version	88
Downloading a BIOS update	89
Using HP PC Hardware Diagnostics (UEFI)	89
Downloading HP PC Hardware Diagnostics (UEFI) to a USB device	90
10 Specifications	91
Computer specifications	91
39.6-cm (15.6-in) display specifications	92
Hard drive specifications	93
DVD±RW SuperMulti DL Drive specifications	94
11 Backing up, restoring, and recovering in Windows 8.1	95
Creating recovery media and backups	95
Creating HP Recovery media	95
Restore and recovery	96
Recovering using HP Recovery Manager	97
What you need to know	97
Using the HP Recovery partition (select models only)	97
Using HP Recovery media to recover	98
Changing the computer boot order	98
Removing the HP Recovery partition (select models only)	98
12 Backing up, restoring, and recovering in Windows 7	99
Creating backups	99
Creating recovery media to recover the original system	99
What you need to know	99
Creating the recovery media	100
Creating system restore points	100
What you need to know	100
Creating a system restore point	100
Backing up system and personal information	100
Tips for a successful backup	101
What you need to know	101
Creating a backup using Windows Backup and Restore	101

Restore and recovery	102
Restoring to a previous system restore point	102
Restoring specific files	102
Restoring specific files using Windows Backup and Restore	102
Recovering the original system using HP Recovery Manager	102
What you need to know	102
Recovering using HP Recovery partition (select models only)	103
Recovering using the recovery media	103
Changing the computer boot order	103
13 Backup and Recovery in SUSE Linux	105
Backing up your information	105
Performing a system recovery	105
14 Statement of Volatility	107
Non-volatile memory usage	109
Questions and answers	111
15 Power cord set requirements	113
Requirements for all countries	113
Requirements for specific countries and regions	114
16 Recycling	117
Battery	117
Display	117
Index	123

1 Product description

Category	Description
Product name	HP 250 G3 Notebook PC HP 256 G3 Notebook PC (for China)
Processors	5th generation Intel® Core processors Intel Core i5 processor (EMEA only) Intel Core i3 processor (EMEA only) 4th generation Intel Core i processors Intel Core i5-4210U processor (1.7-GHz, 3-MB L2 cache, 1600-MHz) Intel Core i3-4030U processor (1.9-GHz, 3-MB L2 cache, 1600-MHz) Intel Core i3-4010U processor (1.7-GHz, 3-MB L2 cache, 1600-MHz) Intel Core i3-4005U processor (1.7-GHz, 3-MB L2 cache, 1600-MHz) 3rd generation Intel Core-i processor Intel Core i3-3217U processor (1.8-GHz, 3-MB L2 cache, 1600-MHz) Intel Bay Trail M processors Intel Pentium N3540 processor (2.16-GHz [turbo up to 2.66 GHz], 2-MB L2 cache, 1333-MHz) Intel Pentium N3530 processor (2.58-GHz, 2-MB L2 cache, 1333-MHz) Intel Pentium N3520 processor (2.17-GHz [turbo up to 2.42 GHz], 2-MB L2 cache, 1333-MHz) Intel Celeron N2840 processor (2.16-GHz [turbo up to 2.58 GHz], 1-MB L2 cache, 1333-MHz) Intel Celeron N2830 processor (2.41-GHz, 1-MB L2 cache, 1333-MHz) Intel Celeron N2920 processor (1.86-GHz [turbo up to 2.0 GHz], 2-MB L2 cache, 1066-MHz) Intel Celeron N2820 processor (2.13-GHz [turbo up to 2.4 GHz], 2-MB L2 cache, 1066-MHz) Intel Celeron N2815 processor (1.86-GHz [turbo up to 2.13 GHz], 1-MB L2 cache, 1066-MHz) Intel Celeron N2805 processor (1.46-GHz, 2-MB L2 cache, 1066-MHz)
Chipset	Intel Shark Bay ULT One Chip Solution Intel Lynx Point-LP PCH (Integrated in MCP) Intel HM76 Express Chipset Intel Bay Trail-M SoC
Graphics	Internal graphics: Intel HD Graphics 4400 (4th generation Intel processors) Intel HD Graphics 4000 (3rd generation Intel processors) Intel HD Graphics (Intel Bay Trail-M processors) Switchable discrete (external) graphics: Nvidia 820M N15V-GM 1 GB VRAM

Category	Description
	Nvidia 820M N15V-GM 2 GB VRAM (4th generation Intel processors)
	GPU power management enabled at launch
	Support DX11
	Support dynamic switching
	Support HD Decode and HDMI
Panel	<p>39.6-cm (15.6-in), high-definition (HD), light-emitting diode (LED), SVA Anti-Glare (1366×768) display, flat 3.8 mm; typical brightness: 200 nits</p> <p>39.6-cm (15.6-in), high-definition (HD), light-emitting diode (LED), SVA BrightView (1366×768) display, slim 3.2 mm; typical brightness: 200 nits (for touch solution only)</p>
	Touch screen is multi-touch enabled
	Supports LVDS
Memory	<p>1 or 2 customer-accessible/upgradable memory module slots (depending on model)</p> <p>DDR3L-1600-MHz Dual Channel Support</p> <p>DDR3L-1333-MHz Dual Channel Support (DDR3-1600 downgrade to DDR3-1333)</p> <p>DDR3L-1066-MHz Dual Channel Support (DDR3-1600 downgrade to DDR3-1066)</p> <p>Supports up to 8 GB of system RAM in the following configurations:</p> <ul style="list-style-type: none"> • 8192-MB total system memory (8192×1) or (4096×2) • 6144-MB total system memory (4096×1 + 2048×1) • 4096-MB total system memory (4096×1) or (2048×2) • 2048-MB total system memory (2048×1)
Hard drives	<p>Supports 6.35-cm (2.5-in) hard drives in 9.5-mm (.37-in) and 7.0-mm (.28-in) thicknesses</p> <p>Serial ATA</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> • 1-TB, 5400-rpm, 9.5-mm • 750-GB, 5400-rpm, 9.5-mm • 500-GB, 7200-rpm, 7.0-mm • 500-GB, 5400-rpm, 9.5-mm or 7.0-mm • 320-GB, 5400-rpm, 9.5-mm or 7.0-mm
Optical drive	<p>Fixed, serial ATA, 9.5-mm tray load</p> <p>DVD+/-RW Double-Layer SuperMulti</p> <p>Supports zero power optical drive</p> <p>Supports weight saver in optical drive bay</p>
Audio/video	<p>Single digital microphone</p> <p>HD audio, dual speakers</p> <p>HP TrueVision HD camera (fixed, no tilt with activity LED, 1280×720 by 30 frames per second)</p>
Ethernet	<p>Integrated 10/100 network interface card (NIC)</p> <p>Integrated 10/100/1000 network interface card (NIC) (UMA, non-touch models only)</p>

Category	Description
Wireless	<p>Integrated wireless local area network (WLAN) options by way of wireless module</p> <p>One or two WLAN antennas built into display assembly</p> <p>Compatible with Miracast-certified devices (Windows 8.1; not for models with Intel Pentium or Celeron processors)</p> <p>Single antenna support</p> <p>Support for the following WLAN formats:</p> <ul style="list-style-type: none"> • Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter • Qualcomm Atheros AR9485 802.11bgn 1x1 Wi-Fi Adapter • Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + BT 4.0 Combo Adapter • QCA 9565 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter
External media card	<p>HP Multi-Format Digital Media Reader</p> <p>Support SD/SDHC/SDXC</p> <p>Push-Pull Insertion/Removal</p>
Ports	<p>VGA (Dsub 15 pin) supporting 2048 × 1536 external resolution @ 75Hz</p> <p>HDMI version 1.4 supporting 1920 × 1200 @ 60Hz</p> <p>Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video</p> <p>RJ-45 (Ethernet, includes link and activity lights)</p> <p>USB 3.0 (1 port)</p> <p>USB 2.0 (2 ports)</p> <p>AC Smart Pin adapter plug</p> <p>Headphone/microphone in combo jack</p>
Keyboard/pointing devices	<p>Full-size textured "island style" keyboard with numeric keypad</p> <p>TouchPad with multi-touch gestures, 2-finger scrolling, and pinch-zoom enabled</p> <p>Taps enabled by default</p> <p>Support Win8.1+D212 Modern Trackpad Gestures</p> <p>Support PS/2, profile sensor (reserve for SMBus)</p>
Power requirements	<p>AC adapters:</p> <p>AC Adapter 65-W Smart nPFC, 3 pin, RC 4.5mm connector - non slim for use in discrete models</p> <p>AC Adapter 45-W Smart nPFC, 3 pin, RC 4.5mm connector - non slim for use in UMA models</p> <p>AC Adapter 65-W EM Smart nPFC, 3 pin, RC 4.5mm connector, 90 degree plug design for use in India/China</p> <p>1 meter power cord</p> <p>Batteries:</p> <p>4-cell, 41-Whr Li-ion battery</p> <p>3-cell, 31-Whr Li-ion battery</p>
Security	<p>Kensington Security Lock</p> <p>Support Intel Anti-Theft</p> <p>Support Intel IPT</p>

Category	Description
	OTP support
Operating system	<p>Preinstalled:</p> <ul style="list-style-type: none"> ● Windows 8.1 ● Windows 8.1 (CPPP) –China only ● Windows 8.1 Pro for Education ● Windows 7 (Windows 8.1 Downgrade) ● Windows 7 Home Basic ● Ubuntu ● FreeDOS 2.0
Serviceability	<p>End-user replaceable parts:</p> <ul style="list-style-type: none"> ● AC adapter ● Battery ● Optical drive ● Keyboard

2 External component identification

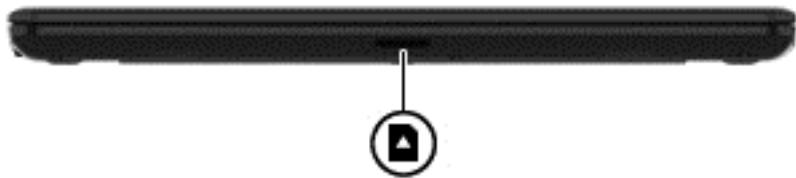
Display



Component	Description
(1) WLAN antennas (1 or 2)* (select models only)	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2) WWAN antennas (1 or 2)* (select models only)	Send and receive wireless signals to communicate with wireless wide area networks (WWAN).
(3) Webcam light	On: The webcam is in use.
(4) Webcam	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video. To use the webcam in Windows 8.1, from the Start screen, type camera , and then select Camera from the list of applications.
(5) Internal microphone	Records sound.
(6) 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.

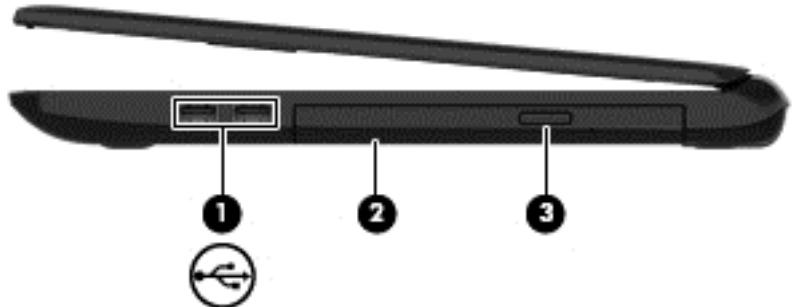
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. To access this guide in Windows 8.1, from the Start screen, type **support**, and then select the **HP Support Assistant** app.

Front



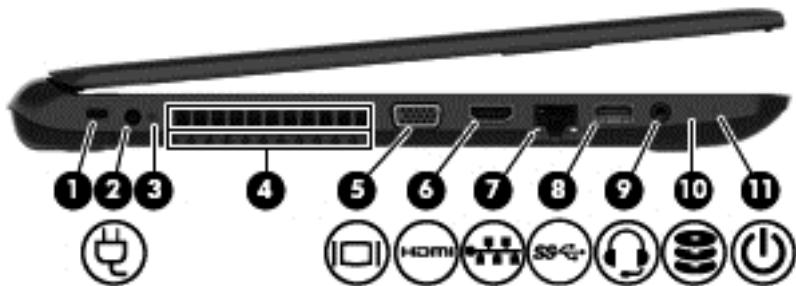
Component	Description
 Memory card reader	<p>Reads optional memory cards that store, manage, share, or access information.</p> <p>To insert a card:</p> <p>Hold the card label-side up, with connectors facing the slot, insert the card into the slot, and then push in on the card until it is firmly seated.</p> <p>To remove a card:</p> <p>Pull the card out of the slot.</p>

Right side



Component	Description
 (1)	USB 2.0 ports (2) Connect an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(2)	Optical drive (select models only) Depending on your computer model, reads an optical disc or reads and writes to an optical disc. NOTE: For disc compatibility information, go to the Help and Support web page. Follow the web page instructions to select your computer model. Select Support & Drivers , and then select Product Information .
(3)	Optical drive eject button (select models only) Releases the disc tray.

Left side

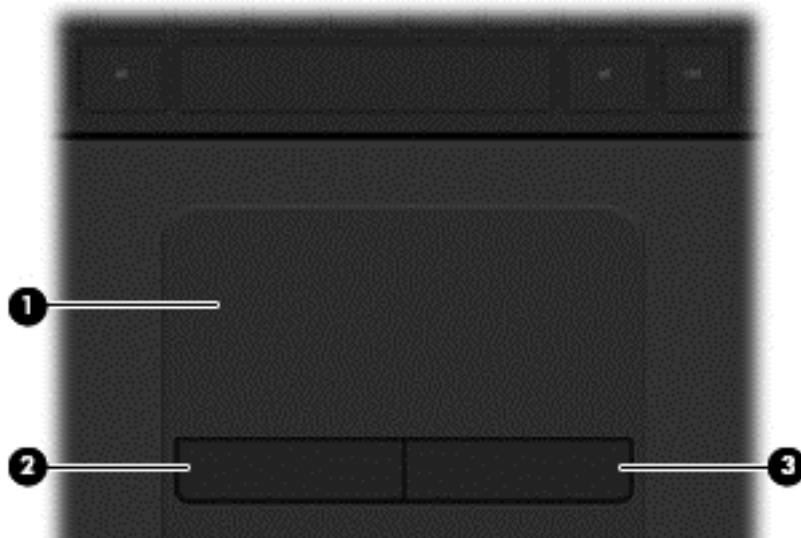


Component	Description
(1) Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2) Power connector	Connects an AC adapter.
(3) AC adapter light	<ul style="list-style-type: none"> On: The AC adapter is connected and the battery is charged. Off: The computer is using battery power.
(4) Vent	Enables 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) External monitor port (select models only)	Connects an external VGA monitor or projector.
(6) HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.
(7) RJ-45 (network) jack/status lights	<p>Connects a network cable.</p> <ul style="list-style-type: none"> White: The network is connected. Amber: Activity is occurring on the network.
(8) USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(9) Audio-out (headphone)/Audio-in (microphone) jack	<p>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.</p> <p>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 <i>Regulatory, Safety, and Environmental Notices</i>. To access this guide in Windows 8.1, from the Start screen, type support, and then select the HP Support Assistant app.</p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>

Component	Description
	NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(10)  Hard drive light	Blinking white: The hard drive is being accessed.

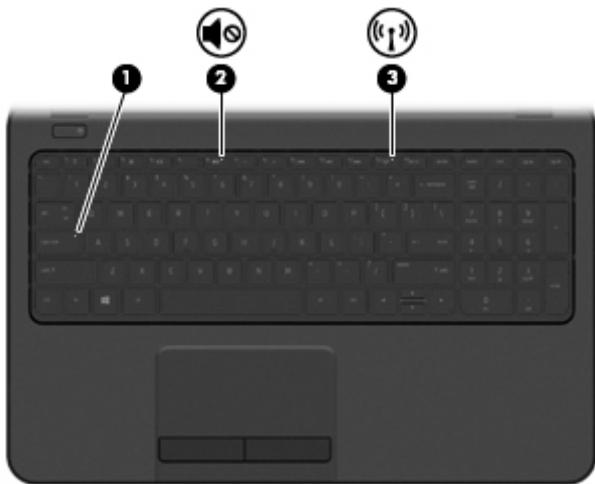
Top

TouchPad



Component	Description
(1) TouchPad zone	Moves the on-screen pointer and selects or activates 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



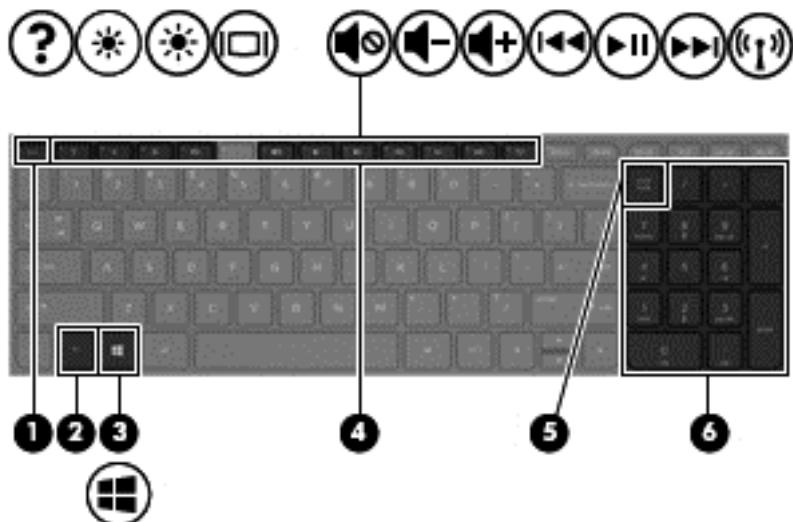
Component	Description
(1)	Caps lock light On: Caps lock is on, which switches the keys to all capital letters.
(2) 	Mute light <ul style="list-style-type: none">Amber: Computer sound is off.Off: Computer sound is on.
(3) 	Wireless light On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. NOTE: On some models, the wireless light is amber when all wireless devices are off.

Button



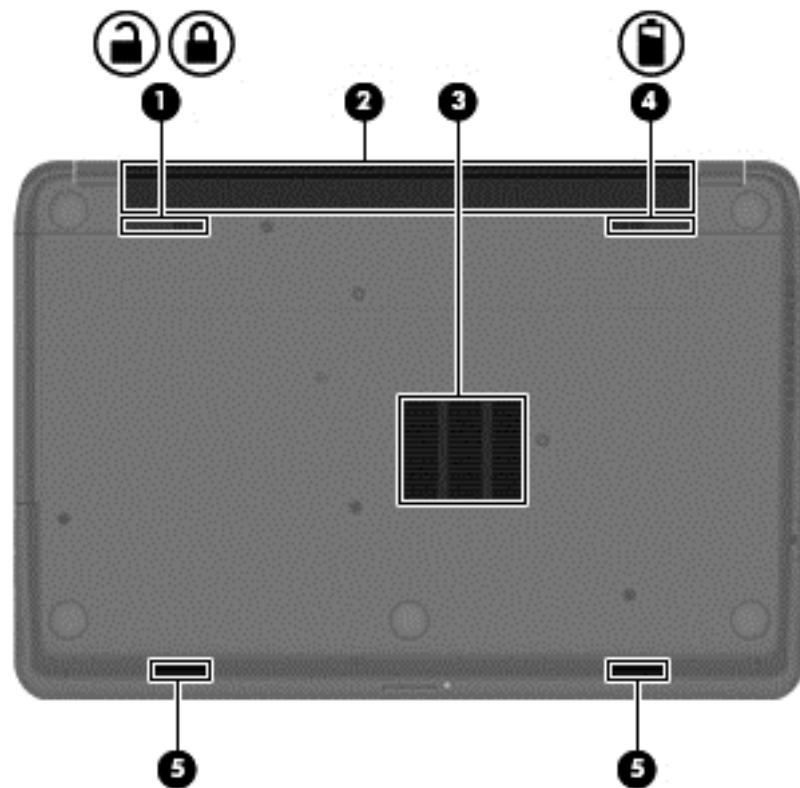
Component	Description
	<p>Power button</p> <ul style="list-style-type: none"> ● When the computer is off, press the button to turn on the computer. ● When the computer is on, press the button briefly to initiate Sleep. ● When the computer is in the Sleep state, press the button briefly to exit Sleep. ● When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding down the power button will result in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options. In Windows 8.1, from the Start screen, type power, select Power and sleep settings, and then select Power and sleep from the list of applications.</p>

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 spacebar or the esc key.
(3) Windows key	(Windows 8.1) Returns you to the Start screen from an open app or the Windows desktop. NOTE: Pressing the Windows key again will return you to the previous screen.
(4) Action keys	Execute frequently used system functions.
(5) num lk key	Alternates between the navigational and numeric functions on the integrated numeric keypad. NOTE: The keypad function that is active when the computer is turned off is reinstated when the computer is turned back on.
(6) Integrated numeric keypad	When num lk has been enabled, it can be used like an external numeric keypad. To alternate between this numeric function and the navigational function (indicated by the directional arrows on the keys), press the num lk key.

Bottom



Component	Description
(1) 	Battery lock and unlock latch Locks and unlocks the battery in the battery bay.
(2)	Battery bay Holds the battery.
(3)	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.
(4) 	Battery release latch Releases the battery.
(5)	Speaker openings (2) Produce sound.

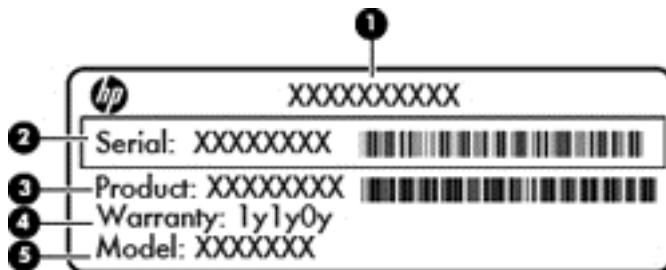
Labels

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

IMPORTANT: All labels described in this section will be located in one of 2 places depending on your computer model: Affixed to the bottom of the computer, or located in the battery bay.

- 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.

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



Component

- (1) Product name
- (2) Serial number
- (3) Product number
- (4) Warranty period
- (5) Model number (select models only)



Component

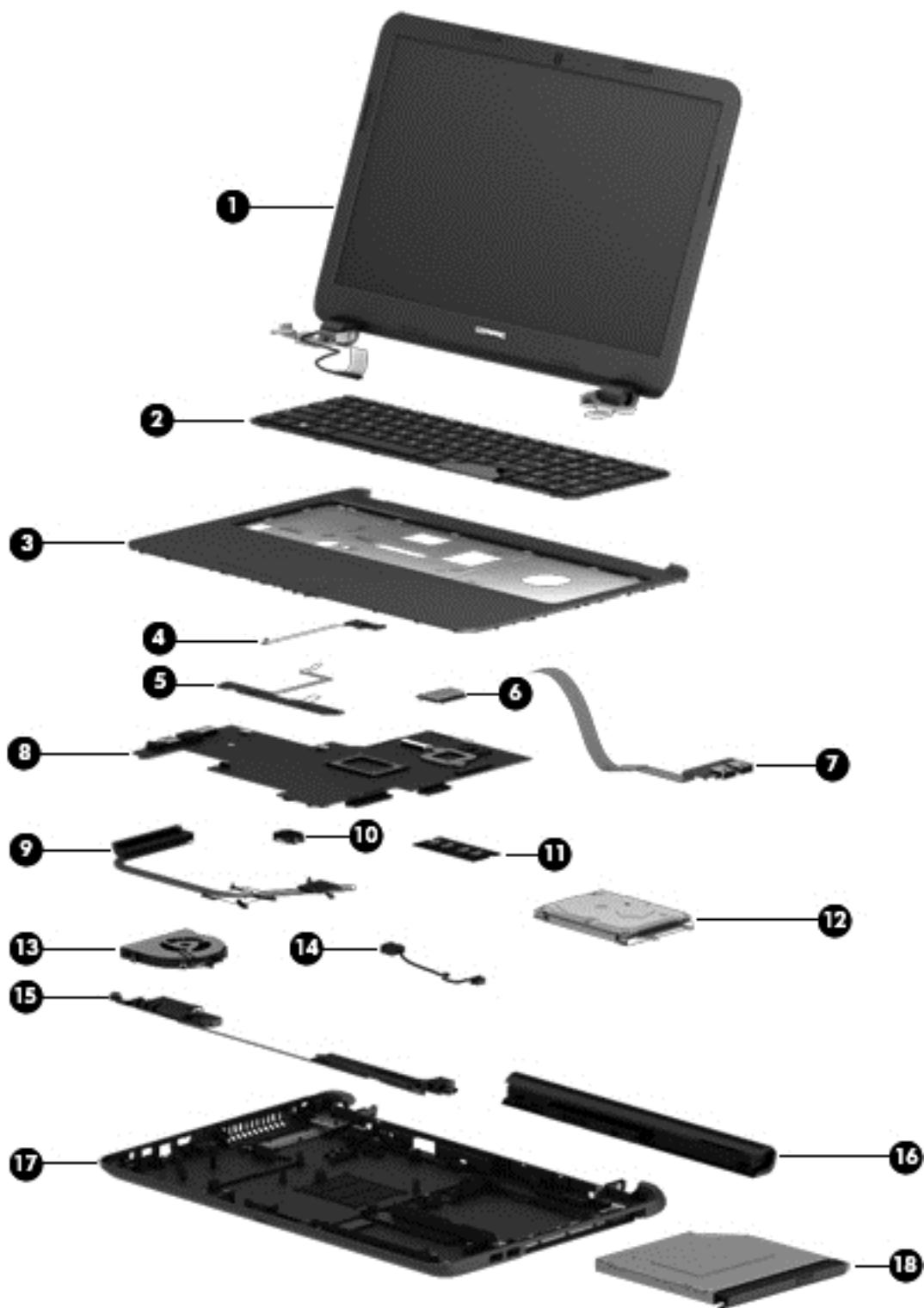
- (1) Serial number
- (2) Product number
- (3) Warranty period
- (4) Model number (select models only)
- (5) Revision number

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

3 Illustrated parts catalog

Computer major components

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



Item	Component	Spare part number
(1)	Display assembly (39.6-cm [15.6-in] HD, anti-glare, touchscreen) NOTE: For display assembly spare part information, see Display assembly subcomponents on page 21 .	
(2)	Keyboard	

Item	Component	Spare part number
	For use in the United States	749658-001
	For use in the United Kingdom	749658-031
	For use in Germany	749658-041
	For use in France	749658-051
	For use in Italy	749658-061
	For use in Spain	749658-071
	For use in Portugal	749658-131
	For use in Turkey	749658-141
	For use in Greece	749658-151
	For use in Latin America	749658-161
	For use in Saudi Arabia	749658-171
	For use in Hungary	749658-211
	For use in Russia	749658-251
	For use in Bulgaria	749658-261
	For use in Romania	749658-271
	For use in Thailand	749658-281
	For use in Japan	749658-291
	For use in Belgium	749658-A41
	For use in Taiwan	749658-AB1
	For use in South Korea	749658-AD1
	For use in the Netherlands	749658-B31
	For use in Slovenia	749658-BA1
	For use in Israel	749658-BB1
	For use in Switzerland	749658-BG1
	For use in French Canada	749658-DB1
	For use in Denmark, Finland, and Norway	749658-DH1
	For use in the Czech Republic and Slovakia	749658-FL1
(3)	Top cover (includes touchpad)	754214-001
(4)	Power button board (includes cable)	749650-001
(5)	Touchpad button board (includes bracket)	749651-001
(6)	WLAN module:	
	Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter	690020-001
	Realtek RT8723BE 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter	753077-001
	Realtek RTL8188EE 802.11bgn Wi-Fi Adapter	709848-001

Item	Component	Spare part number
	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
	Atheros AR9565 802.11bgn + Bluetooth 4.0 Wi-Fi Adapter	733476-001
	Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT4.0 HMC Combo Adapter	753076-001
(7)	USB board (includes cable)	749649-001
(8)	System board (includes replacement thermal materials): All system boards use the following part numbers: xxxxxx-001: Without the Windows operating system xxxxxx-501: Windows 8.1 Standard xxxxxx-601: Windows 8.1 Professional	
	Touch screen models:	
	• Intel Core i3-3217U processor and UMA graphics	763753-xxx
	• Intel Core i3-4005U processor and UMA graphics	774715-xxx
	• Intel Core i3-4010U processor and 1 GB of discrete graphics	763752-xxx
	• Intel Core i3-4030U processor and 1 GB of discrete graphics	780126-xxx
	Non-touch screen models:	
	• Intel Celeron N2815 processor and UMA graphics	761543-xxx
	• Intel Celeron N2830 processor and UMA graphics	774711-xxx
	• Intel Celeron N2840 processor and UMA graphics	787810-xxx
	• Intel Pentium N3520 processor and UMA graphics	761541-xxx
	• Intel N3530 processor and UMA graphics	774712-xxx
	• Intel N3540 processor and UMA graphics	787809-xxx
	• Intel Core i3-3217U processor and UMA graphics	761537-xxx
	• Intel Core i3-3217U processor and UMA graphics	761538-xxx
	• Intel Core i3-3217U processor and 1 GB of discrete graphics	761540-xxx
	• Intel Core i3-4005U processor and UMA graphics	774716-xxx
	• Intel Core i3-4005U processor, UMA graphics memory, and an Integrated 10/100/1000 NIC (Giga LAN)	785481-xxx
	• Intel Core i3-4005U processor and 1 GB of discrete graphics	774714-xxx
	• Intel Core i3-4005U processor and 2 GB of discrete graphics memory in HP 250 and 256 G3 models	780128-xxx
	• Intel Core i3-4010U processor and 1 GB of discrete graphics	761539-xxx
	• Intel Core i3-4010U processor and UMA graphics	761536-xxx
	• Intel Core i3-4030U processor and UMA graphics memory in HP 250 G3 models	780124-xxx
	• Intel Core i3-4030U processor and UMA graphics memory in HP 250 and 256 G3 models with an Integrated 10/100/1000 NIC (Giga LAN)	786713-xxx
	• Intel Core i3-4030U processor and 1 GB of discrete graphics memory in HP 250 G3 models	780125-xxx

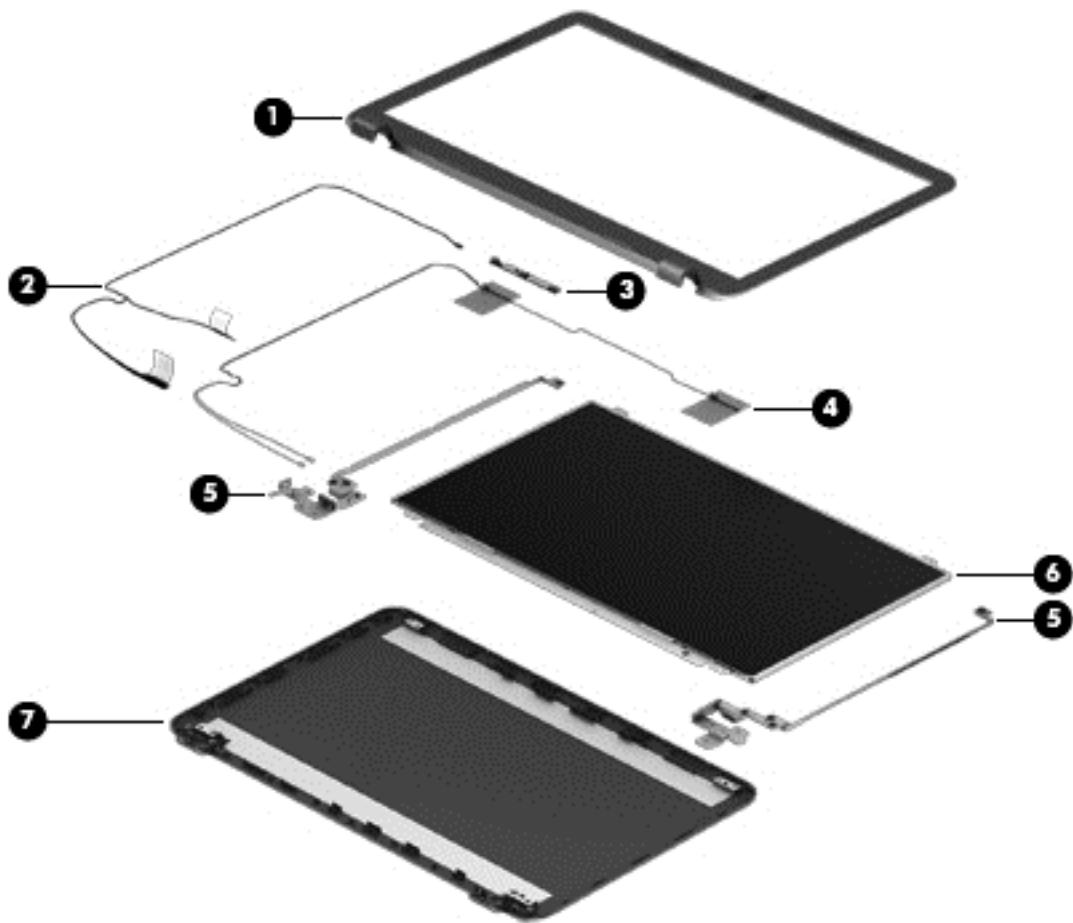
Item	Component	Spare part number
	• Intel Core i3-4030U processor and 2 GB of discrete graphics memory in HP 256 G3 models	780127-xxx
	• Intel Core i5-4210U processor and UMA graphics memory in models	761535-xxx
	• Intel Core i5-4210U processor and UMA graphics memory in HP 250 G3 models with an Integrated 10/100/1000 NIC (Giga LAN)	780119-xxx
	• Intel Core i5-4210U processor and 2 GB of discrete graphics memory in HP 250 and 256 G3 models	780120-xxx
	• Intel Core i5 processor and UMA graphics	780118-xxx
(9)	Heat sink assembly (includes replacement thermal materials):	
	For use in models with UMA graphics	753895-001
	For use in models with discrete graphics	762728-001
(10)	RTC battery	759981-001
(11)	Memory module (PC3L, 12800, 1600-MHz):	
	8-GB	693374-001
	4 GB	691740-001
	2 GB	691739-001
(12)	Hard drive (SATA; does not include bracket):	
	NOTE: The hard drive bracket is available using spare part number 749648-001.	
	1-GB, 5400-rpm, 2.5-inch	676521-001
	750 GB, 5400 rpm, 2.5 inch	634250-001
	500-GB, 7200-rpm, 7-mm	703267-001
	500-GB, 5400-rpm, 2.5-inch	669299-001
	320-GB, 5400-rpm, 2.5-inch	622643-001
(13)	Fan	753894-001
(14)	Power connector cable	749647-001
(15)	Speakers (includes left and right speakers and cable)	749653-001
(16)	Battery :	
	4-cell, 41-Whr, 2.8-Ah Li-ion battery	740715-001
	3-cell, 31-Whr, 2.8-Ah Li-ion battery	746641-001
(17)	Base enclosure	754213-001
(18)	Optical drive (DVD+/-RW Double-Layer SuperMulti)	750636-001

Miscellaneous parts

Component	Spare part number
HP Smart AC adapter:	

Component	Spare part number
65-W, non-PFC, 4.5 mm (for use in all countries and regions except for the People's Republic of China and India)	710412-001
45-W non-PFC, non-slim HP Smart AC adapter (for use in all countries and regions except for the People's Republic of China and India)	741727-001
Power cord (3-pin, black, 1.00-m):	
• For use in Australia	755530-011
• For use in Europe, the Middle East, and Africa	755530-021
• For use in Denmark	755530-081
• For use in India	755530-D61
• For use in Israel	755530-BB1
• For use in Japan	755530-291
• For use in North America	755530-001
• For use in the People's Republic of China	755530-AA1
• For use in South Africa	755530-AR1
• For use in South Korea	755530-AD1
• For use in Switzerland	755530-111
• For use in Taiwan	755530-AB1
• For use in Thailand	755530-201
• For use in the United Kingdom and Singapore	755530-031
Rubber Kit (includes front and rear feet)	749652-001
Screw Kit	749657-001
Case, top load, for use in HP 250/256 G3 models	679921-001

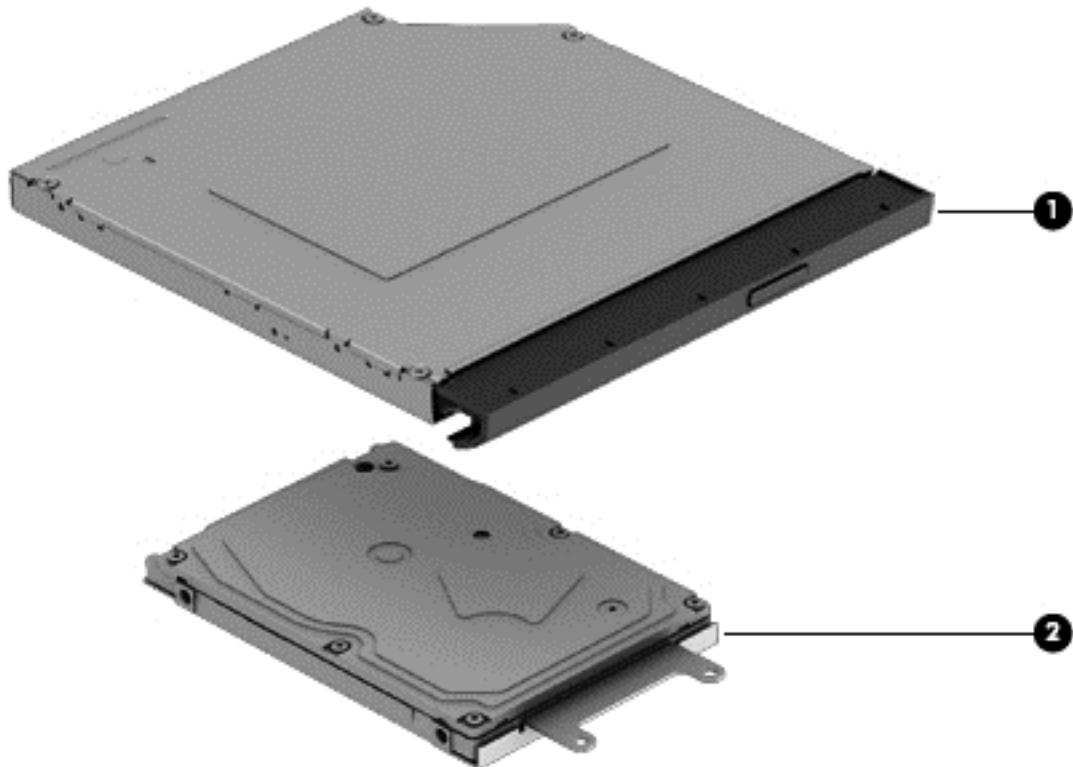
Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel (includes Mylar screw covers):	
	For use in HP 250 G3 models	749644-001
	For use in HP 256 G3 models (China only)	783998-001
(2)	Display cable (includes display panel cable and webcam/microphone cable)	749646-001
(3)	Webcam/microphone module	749654-001
(4)	Antennas (includes wireless antenna cables and transceivers)	
	For use in models without a touch screen	749638-001
	For use in models with a touch screen	774163-001
(5)	Hinges (left and right)	749655-001
	For use in models without a touch screen	749655-001
	For use in models with a touch screen	774166-001
(6)	Raw display panel (39.6-cm [15.6-in], HD, WLED, BrightView)	
	Non-touch screen	750635-001
	Touch screen	774165-001

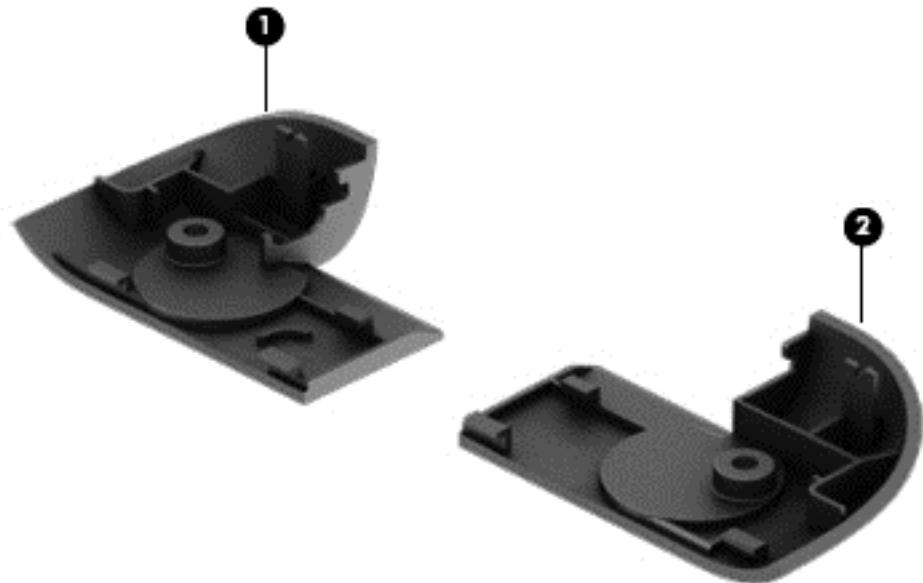
Item	Component	Spare part number
(7)	Display enclosure:	
	For use in touch screen models	774164-001
	For use in non-touch screen models	749641-001

Mass storage devices



Item	Component	Spare part number
(1)	Optical drive (DVD+/-RW Double-Layer SuperMulti)	750636-001
(2)	Hard drive, SATA; does not include bracket:	
	1-GB, 5400-rpm, 2.5-inch	676521-001
	750 GB, 5400 rpm, 2.5 inch	634250-001
	500-GB, 7200-rpm, 7-mm	703267-001
	500-GB, 5400-rpm, 2.5-inch	669299-001
	320-GB, 5400-rpm, 2.5-inch	622643-001
	Hard drive bracket	749648-001

Plastics Kit



Item	Component	Spare part number
	Plastics Kit , includes:	749656-001
(1)	Left cover	
(2)	Right cover	

Rubber Kit

Component	Spare part number
Rubber Kit , includes:	749652-001
Front feet	
Rear feet	

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
622643-001	A	320-GB, 5400-rpm, 2.5-in SATA hard drive (does not include cable or bracket)
634250-001	A	750 GB, 5400 rpm, 2.5 in hard drive (does not include cable or bracket)
669299-001	A	500-GB, 5400-rpm, 2.5-in SATA hard drive (does not include cable or bracket)
675794-001	A	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter
676521-001	A	1-TB, 5400-rpm, 2.5-in SATA hard drive (does not include cable or bracket)
679921-001	A	Case, top load
690020-001	A	Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter
691739-001	A	2-GB memory module (PC3L, 12800, 1600-MHz)
691740-001	A	4-GB memory module (PC3L, 12800, 1600-MHz)
693374-001	A	8-GB memory module (PC3L, 12800, 1600-MHz)
703267-001	A	500-GB, 7200-rpm, 7-mm hard drive
709848-001	A	Realtek RTL8188EE 802.11bgn Wi-Fi Adapter
710412-001	N	AC adapter, 65-W, non-PFC, 4.5 mm
733476-001	A	Atheros AR9565 802.11bgn + Bluetooth 4.0 Wi-Fi Adapter
740715-001	A	4-cell, 41-Whr, 2.8-Ah Li-ion battery
741727-001	A	45-W non-PFC, non-slim HP Smart AC adapter (for use in all countries and regions except for the People's Republic of China and India)
746641-001	A	3-cell, 31-Whr, 2.8-Ah Li-ion battery
749638-001	N	Antennas for use in models without a touch screen (includes wireless antenna cables and transceivers)
749641-001	N	Display enclosure for use in non-touch screen models
749644-001	N	Display bezel for use in HP 250 G3 models
749646-001	N	Display cable for use in models with out a touch screen (includes display panel cable and webcam/microphone cable)
749647-001	N	Power connector cable
749648-001	N	Hard drive bracket
749649-001	N	USB board (includes cable)
749650-001	N	Power button board (includes cable)
749651-001	N	TouchPad button board (includes bracket)

Spare part number	CSR flag	Description
749652-001	N	Rubber Kit (includes front and rear feet)
749653-001	N	Speakers (includes left and right speakers and cable)
749654-001	N	Webcam/microphone module, HD
749655-001	N	Hinges for use in models without a touch screen (left and right)
749656-001	N	Plastics Kit (includes left and right covers)
749657-001	N	Screw Kit
749658-001	B	Keyboard for use in the United States
749658-031	B	Keyboard for use in the United Kingdom
749658-041	B	Keyboard for use in Germany
749658-051	B	Keyboard for use in France
749658-061	B	Keyboard for use in Italy
749658-071	B	Keyboard for use in Spain
749658-131	B	Keyboard for use in Portugal
749658-141	B	Keyboard for use in Turkey
749658-151	B	Keyboard for use in Greece
749658-161	B	Keyboard for use in Latin America
749658-171	B	Keyboard for use in Saudi Arabia
749658-211	B	Keyboard for use in Hungary
749658-251	B	Keyboard for use in Russia
749658-261	B	Keyboard for use in Bulgaria
749658-271	B	Keyboard for use in Romania
749658-281	B	Keyboard for use in Thailand
749658-291	B	Keyboard for use in Japan
749658-A41	B	Keyboard for use in Belgium
749658-AB1	B	Keyboard for use in Taiwan
749658-AD1	B	Keyboard for use in South Korea
749658-B31	B	Keyboard for use in the Netherlands
749658-BA1	B	Keyboard for use in Slovenia
749658-BB1	B	Keyboard for use in Israel
749658-BG1	B	Keyboard for use in Switzerland
749658-DB1	B	Keyboard for use in French Canada
749658-DH1	B	Keyboard for use in Denmark, Finland, and Norway
749658-FL1	B	Keyboard for use in the Czech Republic and Slovakia
750635-001	N	Raw display panel, non-touch screen

Spare part number	CSR flag	Description
750636-001	A	DVD+/-RW Double-Layer SuperMulti Drive
753076-001	A	Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT4.0 HMC Combo Adapter
753077-001	A	Realtek RT8723BE 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter
753894-001	N	Fan
753895-001	N	Heat sink for use in models with UMA graphics
754213-001	N	Base enclosure
754214-001	N	Top cover (includes touchpad)
755530-001	A	Power cord for use in Intel models in North America (3-pin, black, 1.00-m)
755530-011	A	Power cord for use in Intel models in Australia (3-pin, black, 1.00-m)
755530-021	A	Power cord for use in Intel models in Europe, the Middle East, and Africa (3-pin, black, 1.00-m)
755530-031	A	Power cord for use in Intel models in the United Kingdom and Singapore (3-pin, black, 1.00-m)
755530-081	A	Power cord for use in Intel models in Denmark (3-pin, black, 1.00-m)
755530-111	A	Power cord for use in Intel models in Switzerland (3-pin, black, 1.00-m)
755530-201	A	Power cord for use in Intel models in Thailand (3-pin, black, 1.00-m)
755530-291	A	Power cord for use in Intel models in Japan (3-pin, black, 1.00-m)
755530-AA1	A	Power cord for use in Intel models in the People's Republic of China (3-pin, black, 1.00-m)
755530-AB1	A	Power cord for use in Intel models in Taiwan (3-pin, black, 1.00-m)
755530-AD1	A	Power cord for use in Intel models in South Korea (3-pin, black, 1.00-m)
755530-AR1	A	Power cord for use in Intel models in South Africa (3-pin, black, 1.00-m)
755530-BB1	A	Power cord for use in Intel models in Israel (3-pin, black, 1.00-m)
755530-D61	A	Power cord for use in Intel models in India (3-pin, black, 1.00-m)
759981-001	N	RTC battery
761535-001	N	System board with Intel Core i5-4210U processor and UMA graphics memory for use in models without Windows 8.1
761535-501	N	System board with Intel Core i5-4210U processor and UMA graphics memory for use in models with Windows 8.1 Standard
761535-601	N	System board with Intel Core i5-4210U processor and UMA graphics memory for use in models with Windows 8.1 Professional
761536-001	N	System board with Intel Core i3-4010U processor and UMA graphics memory for use in models without Windows 8.1
761536-501	N	System board with Intel Core i3-4010U processor and UMA graphics memory for use in models with Windows 8.1 Standard
761536-601	N	System board with Intel Core i3-4010U processor and UMA graphics memory for use in models with Windows 8.1 Professional
761537-001	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in models without Windows 8.1

Spare part number	CSR flag	Description
761537-501	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in models with Windows 8.1 Standard
761537-601	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in models with Windows 8.1 Professional
761538-001	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in models without Windows 8.1 and with WWAN
761538-501	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in models with Windows 8.1 Standard and with WWAN
761538-601	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in models with Windows 8.1 Professional and with WWAN
761539-001	N	System board with Intel Core i3-4010U processor and 1 GB of discrete graphics memory for use in models without Windows 8.1
761539-501	N	System board with Intel Core i3-4010U processor and 1 GB of discrete graphics memory for use in models with Windows 8.1 Standard
761539-601	N	System board with Intel Core i3-4010U processor and 1 GB of discrete graphics memory for use in models with Windows 8.1 Professional
761540-001	N	System board with Intel Core i3-3217U processor and 1 GB of discrete graphics memory for use in models without Windows 8.1
761540-501	N	System board with Intel Core i3-3217U processor and 1 GB of discrete graphics memory for use in models with Windows 8.1 Standard
761540-601	N	System board with Intel Core i3-3217U processor and 1 GB of discrete graphics memory for use in models with Windows 8.1 Professional
761541-001	N	System board with Intel Pentium N3520 processor and UMA graphics memory for use in models without Windows 8.1
761541-501	N	System board with Intel Pentium N3520 processor and UMA graphics memory for use in models with Windows 8.1 Standard
761541-601	N	System board with Intel Pentium N3520 processor and UMA graphics memory for use in models with Windows 8.1 Professional
761543-001	N	System board with Intel Celeron N2815 processor and UMA graphics memory for use in models without Windows 8.1
761543-501	N	System board with Intel Celeron N2815 processor and UMA graphics memory for use in models with Windows 8.1 Standard
761543-601	N	System board with Intel Celeron N2815 processor and UMA graphics memory for use in models with Windows 8.1 Professional
762728-001	N	Heat sink for use in models with discrete graphics
763752-001	N	System board with Intel Core i3-4010U processor and 1 GB of discrete graphics memory for use in touch screen models without Windows 8.1
763752-501	N	System board with Intel Core i3-4010U processor and 1 GB of discrete graphics memory for use in touch screen models with Windows 8.1 Standard
763752-601	N	System board with Intel Core i3-4010U processor and 1 GB of discrete graphics memory for use in touch screen models with Windows 8.1 Professional
763753-001	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in touch screen models without Windows 8.1

Spare part number	CSR flag	Description
763753-501	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in touch screen models with Windows 8.1 Standard
763753-601	N	System board with Intel Core i3-3217U processor and UMA graphics memory for use in touch screen models with Windows 8.1 Professional
774163-001	N	Antennas for use in models with a touch screen
774164-001	N	Display enclosure for use in models with a touch screen
774165-001	N	Raw display panel, touch screen, includes bezel
774166-001	N	Hinges for use in models with a touch screen (left and right)
774711-001	N	System board with Intel Celeron N2830 processor and UMA graphics memory for use in models without Windows 8.1
774711-501	N	System board with Intel Celeron N2830 processor and UMA graphics memory for use in models with Windows 8.1 Standard
774711-601	N	System board with Intel Celeron N2830 processor and UMA graphics memory for use in models with Windows 8.1 Professional
774712-001	N	System board with Intel Pentium N3530 processor and UMA graphics memory for use in models without Windows 8.1
774712-501	N	System board with Intel Pentium N3530 processor and UMA graphics memory for use in models with Windows 8.1 Standard
774712-601	N	System board with Intel Pentium N3530 processor and UMA graphics memory for use in models with Windows 8.1 Professional
774714-001	N	System board with Intel Core i3-4005U processor and 1 GB of discrete graphics memory for use in models without Windows 8.1
774714-501	N	System board with Intel Core i3-4005U processor and 1 GB of discrete graphics memory for use in models with Windows 8.1 Standard
774714-601	N	System board with Intel Core i3-4005U processor and 1 GB of discrete graphics memory for use in models with Windows 8.1 Professional
774715-001	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in touch screen models without Windows 8.1
774715-501	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in touch screen models with Windows 8.1 Standard
774715-601	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in touch screen models with Windows 8.1 Professional
774716-001	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in models without Windows 8.1
774716-501	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in models with Windows 8.1 Standard
774716-601	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in models with Windows 8.1 Professional
780118-001	N	System board with Intel Core i5 processor and UMA graphics memory for use in HP 250 G3 models without Windows 8.1
780118-501	N	System board with Intel Core i5 processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Standard

Spare part number	CSR flag	Description
780118-601	N	System board with Intel Core i5 processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Professional
780119-001	N	System board with Intel Core i5-4210U processor and UMA graphics memory for use in HP 250 G3 models without Windows 8.1 and with an Integrated 10/100/1000 NIC (Giga LAN)
780119-501	N	System board with Intel Core i5-4210U processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Standard and with an Integrated 10/100/1000 NIC (Giga LAN)
780119-601	N	System board with Intel Core i5-4210U processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Professional and with an Integrated 10/100/1000 NIC (Giga LAN)
780120-001	N	System board with Intel Core i5-4210U processor and 2 GB of discrete graphics memory for use in HP 250 and 256 G3 models without Windows 8.1
780120-501	N	System board with Intel Core i5-4210U processor and 2 GB of discrete graphics memory for use in HP 250 and 256 G3 models with Windows 8.1 Standard
780120-601	N	System board with Intel Core i5-4210U processor and 2 GB of discrete graphics memory for use in HP 250 and 256 G3 models with Windows 8.1 Professional
780124-001	N	System board with Intel Core i3-4030U processor and UMA graphics memory for use in HP 250 G3 models without Windows 8.1
780124-501	N	System board with Intel Core i3-4030U processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Standard
780124-601	N	System board with Intel Core i3-4030U processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Professional
780125-001	N	System board with Intel Core i3-4030U processor and 1 GB of discrete graphics memory for use in HP 250 G3 models non-touch screen models without Windows 8.1
780125-501	N	System board with Intel Core i3-4030U processor and 1 GB of discrete graphics memory for use in HP 250 G3 models non-touch screen models with Windows 8.1 Standard
780125-601	N	System board with Intel Core i3-4030U processor and 1 GB of discrete graphics memory for use in HP 250 G3 models non-touch screen models with Windows 8.1 Professional
780126-001	N	System board with Intel Core i3-4030U processor and 1 GB of discrete graphics memory for use in HP 250 G3 models touch screen models without Windows 8.1
780126-501	N	System board with Intel Core i3-4030U processor and 1 GB of discrete graphics memory for use in HP 250 G3 models touch screen models with Windows 8.1 Standard
780126-601	N	System board with Intel Core i3-4030U processor and 1 GB of discrete graphics memory for use in HP 250 G3 models touch screen models with Windows 8.1 Professional
780127-001	N	System board with Intel Core i3-4030U processor and 2 GB of discrete graphics memory for use in HP 256 G3 models touch screen models without Windows 8.1
780127-501	N	System board with Intel Core i3-4030U processor and 2 GB of discrete graphics memory for use in HP 256 G3 models touch screen models with Windows 8.1 Standard
780127-601	N	System board with Intel Core i3-4030U processor and 2 GB of discrete graphics memory for use in HP 256 G3 models touch screen models with Windows 8.1 Professional
780128-001	N	System board with Intel Core i3-4005U processor and 2 GB of discrete graphics memory for use in HP 256 G3 models without Windows 8.1
780128-501	N	System board with Intel Core i3-4005U processor and 2 GB of discrete graphics memory for use in HP 256 G3 models with Windows 8.1 Standard
780128-601	N	System board with Intel Core i3-4005U processor and 2 GB of discrete graphics memory for use in HP 256 G3 models with Windows 8.1 Professional

Spare part number	CSR flag	Description
783998-001	N	Display bezel for use in HP 256 G3 models (China only)
785481-001	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in HP 250 and 256 G3 models without Windows 8.1 and with an Integrated 10/100/1000 NIC (Giga LAN)
785481-501	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in HP 250 and 256 G3 models with Windows 8.1 Standard and with an Integrated 10/100/1000 NIC (Giga LAN)
785481-601	N	System board with Intel Core i3-4005U processor and UMA graphics memory for use in HP 250 and 256 G3 models with Windows 8.1 Professional and with an Integrated 10/100/1000 NIC (Giga LAN)
786713-001	N	System board with Intel Core i3-4030U processor and UMA graphics memory for use in HP 250 and 256 G3 models without Windows 8.1 and with an Integrated 10/100/1000 NIC (Giga LAN)
786713-501	N	System board with Intel Core i3-4030U processor and UMA graphics memory for use in HP 250 and 256 G3 models with Windows 8.1 Standard and with an Integrated 10/100/1000 NIC (Giga LAN)
786713-601	N	System board with Intel Core i3-4030U processor and UMA graphics memory for use in HP 250 and 256 G3 models with Windows 8.1 Professional and with an Integrated 10/100/1000 NIC (Giga LAN)
787809-001	N	System board with Intel Pentium N3540 processor and UMA graphics memory for use in HP 250 G3 models without Windows 8.1
787809-501	N	System board with Intel Pentium N3540 processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Standard
787809-601	N	System board with Intel Pentium N3540 processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Professional
787810-001	N	System board with Intel Celeron N2840 processor and UMA graphics memory for use in HP 250 G3 models without Windows 8.1
787810-501	N	System board with Intel Celeron N2840 processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Standard
787810-601	N	System board with Intel Celeron N2840 processor and UMA graphics memory for use in HP 250 G3 models with Windows 8.1 Professional

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

Event	Typical electrostatic voltage levels		
	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 non-conductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and 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 $\pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures for Customer Self-Repair parts

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

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

Component replacement procedures

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 13](#) for details.

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

There are as many as 5 screws that must be removed, replaced, or loosened when servicing Customer Self-Repair parts. Make special note of each screw size and location during removal and replacement.

Battery

Description	Spare part number
4-cell, 41-Whr, 2.8-Ah Li-ion battery	740715-001
3-cell, 31-Whr, 2.8-Ah Li-ion battery	746641-001

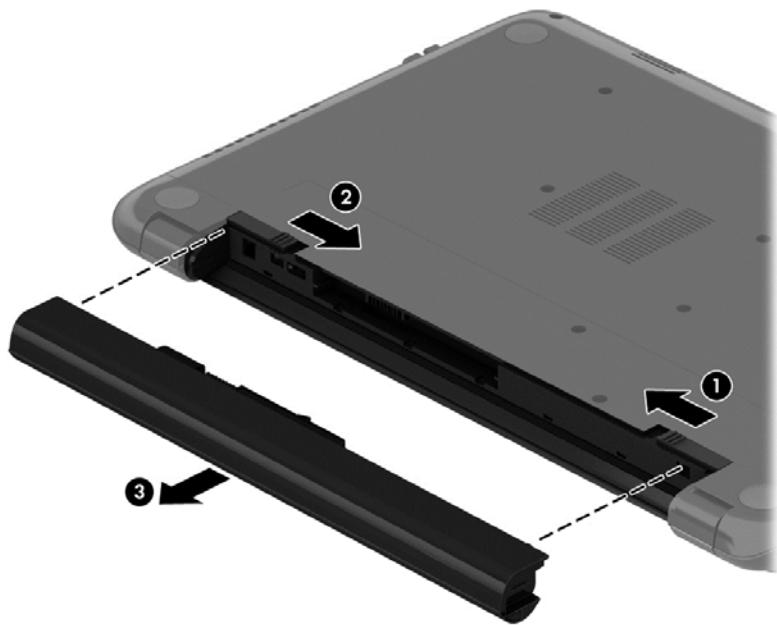
Before disassembling the computer, follow these steps:

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

To remove the battery:

1. Position the computer upside down on a flat surface.
2. Slide the battery lock latch **(1)**, and then slide the battery release latch **(2)** to release the battery.

- 3.** Remove the battery from the computer **(3)**.



Optical drive

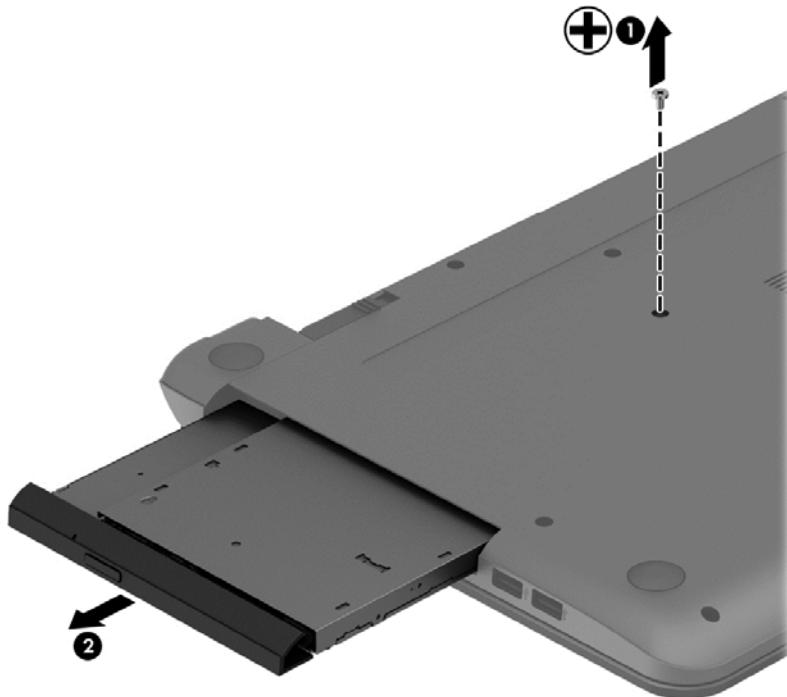
Description	Spare part number
DVD+/-RW Double-Layer SuperMulti Drive	750636-001

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).

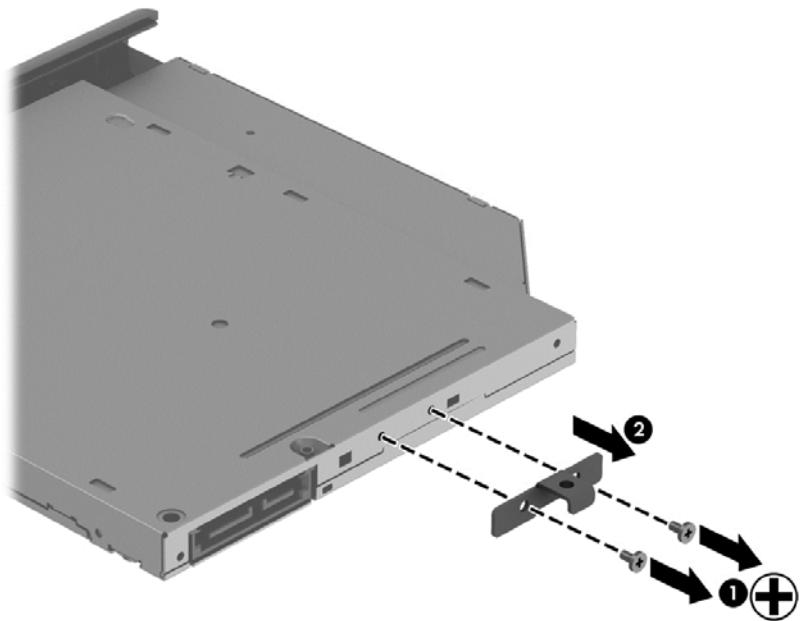
To remove the optical drive:

1. Remove the Phillips PM2.5×5.0 screw **(1)** that secures the optical drive to the computer.
2. Remove the optical drive **(2)** by sliding it out of the optical drive bay.



3. If it is necessary to replace the optical drive bracket on the rear of the optical drive, position the optical drive with the rear panel toward you.
4. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the bracket to the optical drive.

5. Remove the optical drive bracket (2).



Reverse this procedure to reassemble and install the optical drive.

Keyboard

Description	Spare part number
Keyboard for use in the United States	749658-001
Keyboard for use in the United Kingdom	749658-031
Keyboard for use in Germany	749658-041
Keyboard for use in France	749658-051
Keyboard for use in Italy	749658-061
Keyboard for use in Spain	749658-071
Keyboard for use in Portugal	749658-131
Keyboard for use in Turkey	749658-141
Keyboard for use in Greece	749658-151
Keyboard for use in Latin America	749658-161
Keyboard for use in Saudi Arabia	749658-171
Keyboard for use in Hungary	749658-211
Keyboard for use in Russia	749658-251
Keyboard for use in Bulgaria	749658-261
Keyboard for use in Romania	749658-271
Keyboard for use in Thailand	749658-281
Keyboard for use in Japan	749658-291
Keyboard for use in Belgium	749658-A41
Keyboard for use in Taiwan	749658-AB1
Keyboard for use in South Korea	749658-AD1
Keyboard for use in the Netherlands	749658-B31
Keyboard for use in Slovenia	749658-BA1
Keyboard for use in Israel	749658-BB1
Keyboard for use in Switzerland	749658-BG1
Keyboard for use in French Canada	749658-DB1
Keyboard for use in Denmark, Finland, and Norway	749658-DH1
Keyboard for use in the Czech Republic and Slovakia	749658-FL1

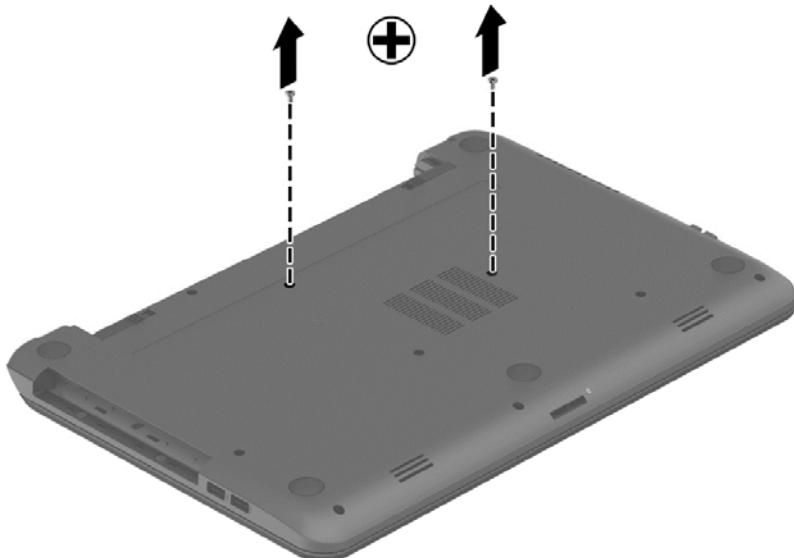
Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.

- 3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4.** Remove the battery (see [Battery on page 35](#)).

To remove the keyboard:

- 1.** Position the computer upside down with the front toward you.
- 2.** Remove the two Phillips PM2.5×5.0 screws that secure the keyboard to the computer.



- 3.** Position the computer upright with the front toward you.
- 4.** Lift to rotate up the top of the keyboard **(1)**, and then lift the keyboard **(2)** to disengage it from the computer.



5. Rotate the keyboard over onto the palm rest **(1)**, and the lift the ZIF connector **(2)** and disconnect the keyboard cable from the system board **(3)**.



Reverse this procedure to install the keyboard.

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

 **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 13](#) for details.

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

There are as many as 56 screws that must be removed, replaced, or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Display subcomponents (bezel, webcam, panel)

This section describes removing display subcomponents that do not require that you remove the entire display assembly from the computer. You can remove the display bezel, webcam/microphone module, and display panel while the display assembly is still attached to the computer.

To remove the remaining display subcomponents, you must remove the entire display assembly from the computer. See [Display assembly on page 72](#) for more information about removing the display assembly in its entirety.

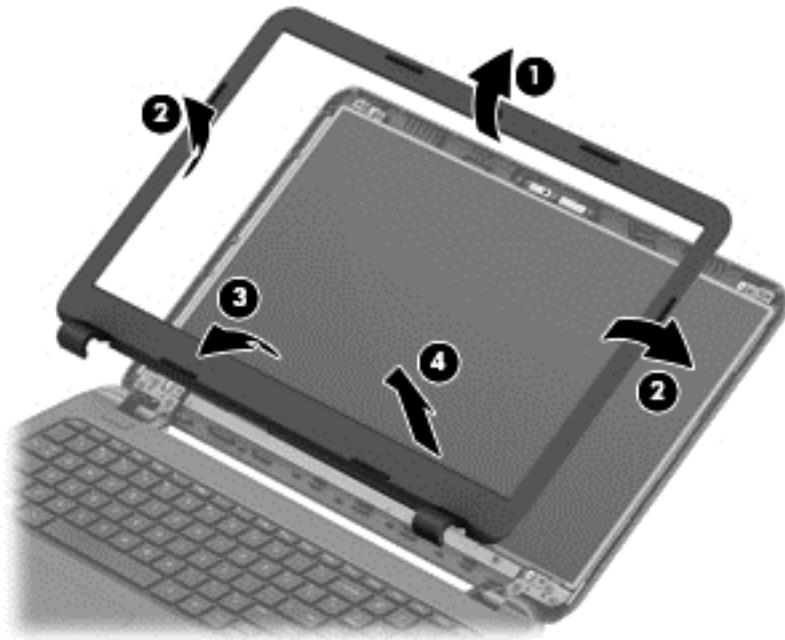
Description	Spare part number
Raw display panel	
Non-touch screen	750635-001
For Touch screen	774165-001
Display bezel	
For use in HP 250 G3 models	749644-001
For use in HP 256 G3 models (China only)	783998-001
Webcam/microphone module	749654-001

Before removing display subcomponents while the display assembly is still attached to the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).

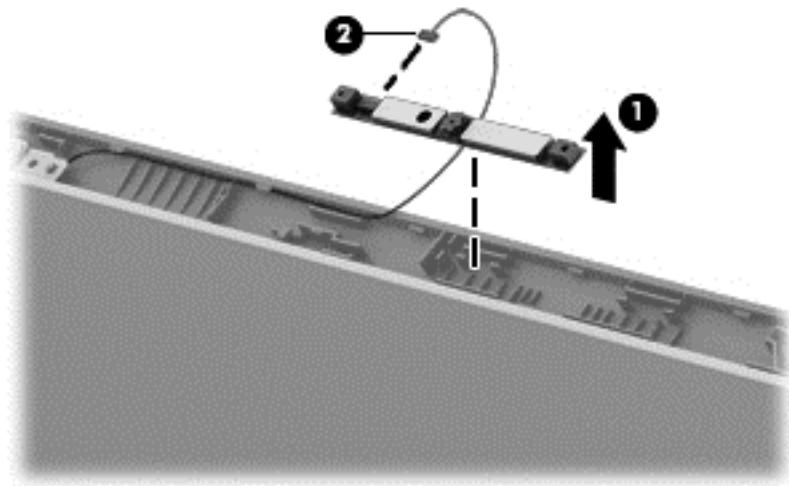
To remove the display bezel, webcam/microphone module, and raw display panel:

1. Position the computer upright with the front toward you, and then open it.
2. Flex the inside 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.
3. Remove the display bezel **(4)**.



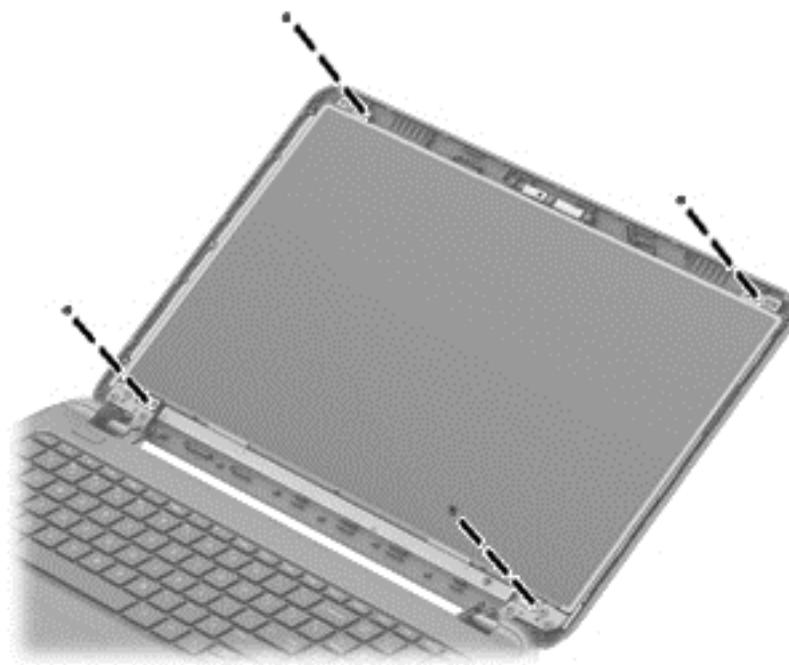
4. To remove the webcam/microphone module:
 - a. Position the display assembly with the top edge toward you.
 - b. Lift to disengage the adhesive that secures the webcam/microphone module to the display, and then remove the module enough to access the cable connection on the module **(1)**.

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



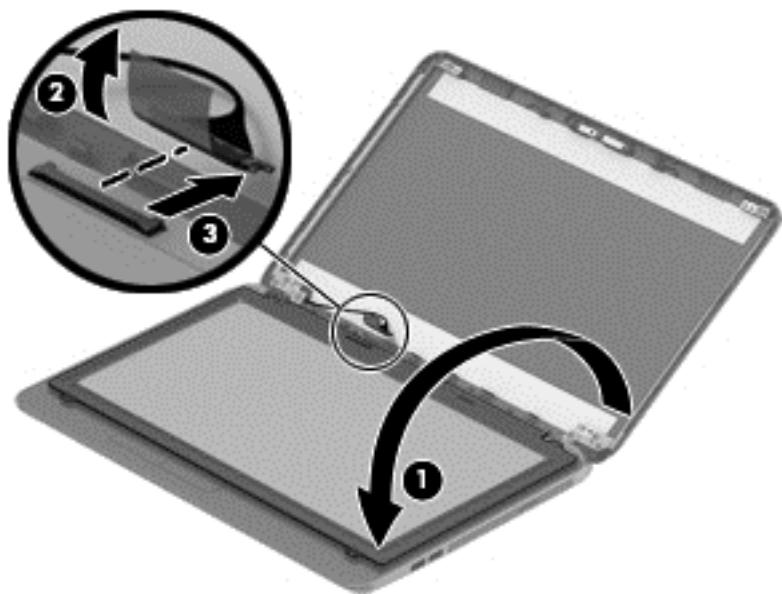
5. To remove the display panel:

- a. Remove the four Phillips PM2.5×3.5 screws that secure the display panel to the enclosure.



- b. Rotate the display panel onto the keyboard to gain access to the display cable connection on the back of the panel (1).

- c. On the back of the display panel, release the adhesive strip **(2)** that secures the display panel cable to the display panel, and then disconnect the cable **(3)**.



Reverse this procedure to reassemble and install the display bezel, webcam/microphone module, and display panel.

Top cover

 **NOTE:** The top cover spare part kit includes the TouchPad.

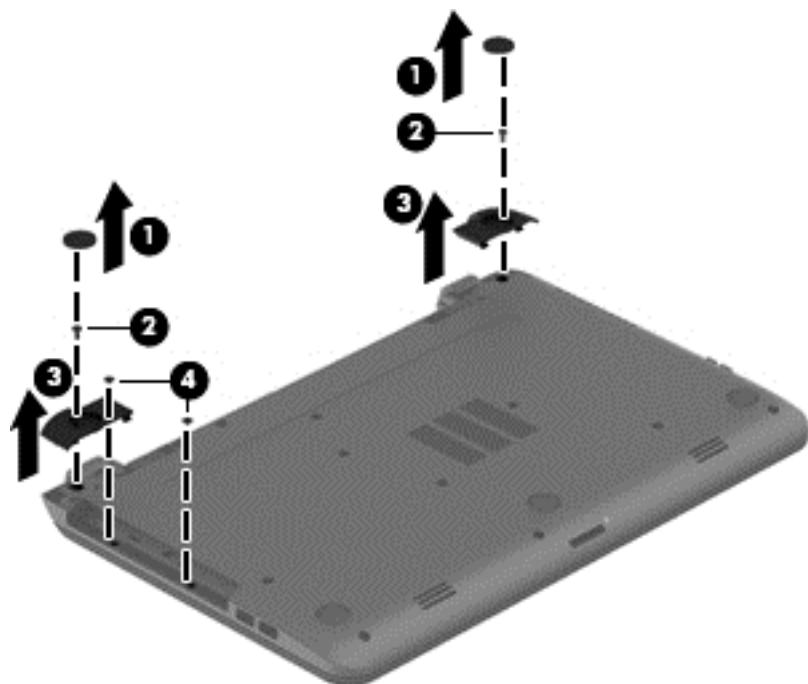
Description	Spare part number
Top cover (includes touchpad)	754214-001

Before removing the top cover, follow these steps:

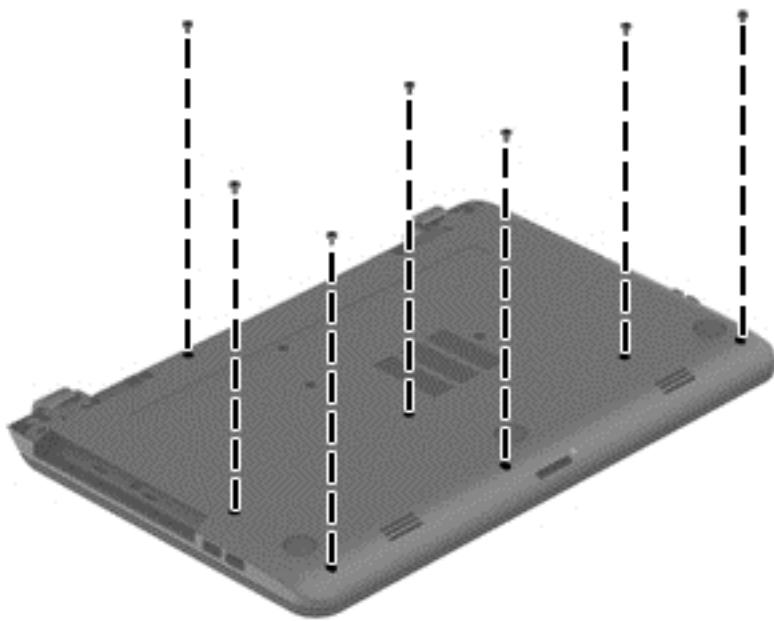
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the keyboard (see [Keyboard on page 39](#)).

To remove the top cover:

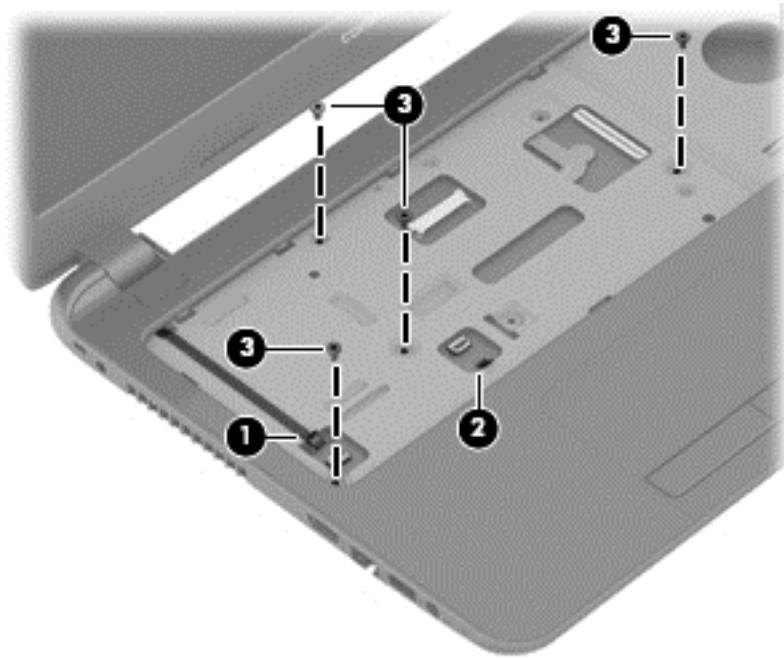
1. Position the computer upside down with the front toward you.
2. Remove the rear covers by prying off the two rubber feet (1), removing the two Phillips PM2.5×8.0 screws (2) that secure the rear covers to the computer, and then lifting the rear covers off the computer (3).
3. Remove the two Phillips broadhead PM2.5×2.0 screws from the optical drive bay (4).



4. Remove the seven Phillips PM2.5×5.0 screws that secure the top cover to the computer.

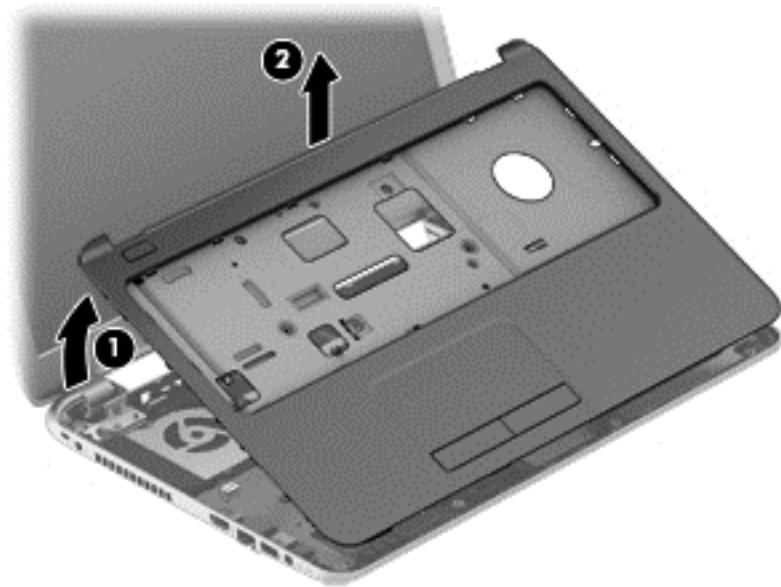


5. Position the computer upright with the front toward you.
6. Disconnect the power button board cable **(1)** and the touchpad button board cable **(2)**.
7. Remove the four Phillips PM2.5×5.0 screws **(3)** that secure the top cover to the computer.



8. Lift the rear edge of the top cover **(1)** until it disengages from the base enclosure.

9. Remove the top cover (2).



Reverse this procedure to install the top cover.

Power button board

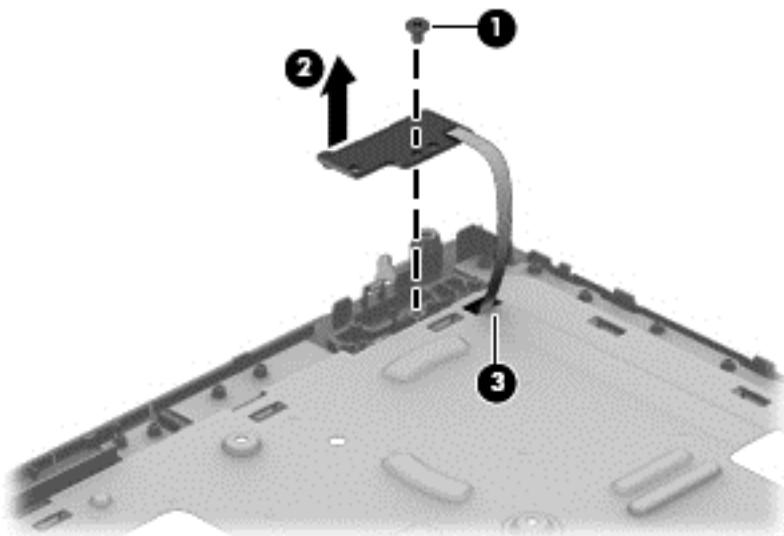
Description	Spare part number
Power button board (includes cable)	749650-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the keyboard (see [Keyboard on page 39](#)).
6. Remove the top cover (see [Top cover on page 47](#)).

To remove the power button board:

1. Position the top cover upside down.
2. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the power button board to the top cover.
3. Lift the board and cable up and remove from the top cover **(2)** while pulling cable through the hole in top cover **(3)**.



Reverse this procedure to install the power button board and cable.

TouchPad button board

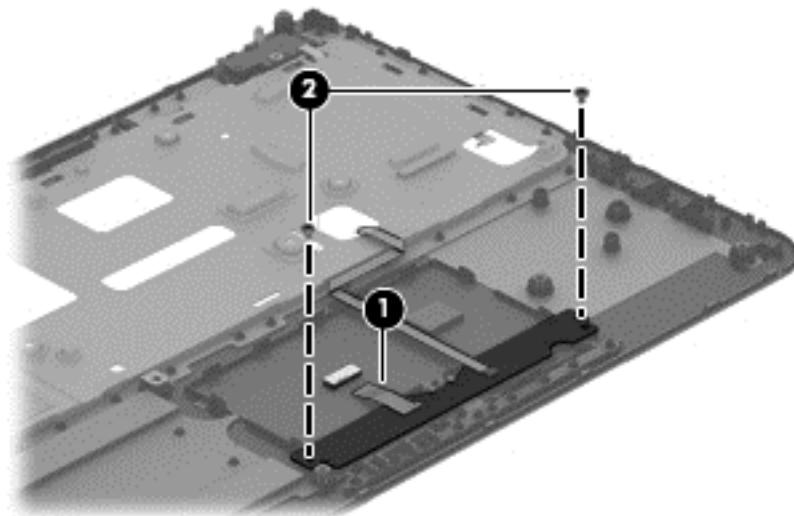
Description	Spare part number
TouchPad button board (includes bracket)	749651-001

Before removing the TouchPad button board, follow these steps:

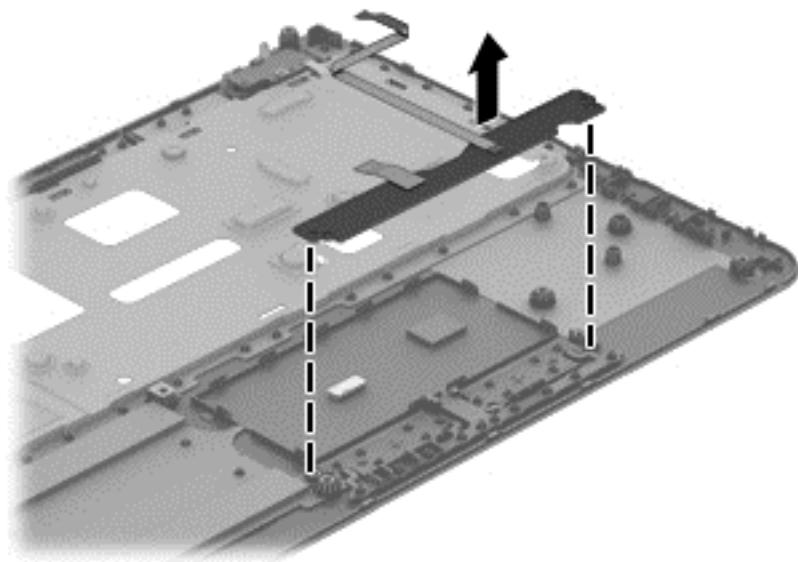
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the keyboard (see [Keyboard on page 39](#)).
6. Remove the top cover (see [Top cover on page 47](#)).

To remove the TouchPad button board:

1. Position the top cover upside down with the front toward you.
2. Disconnect the touchpad board cable from the touchpad (1).
3. Remove the two Phillips PM2.0×3.5 screws (2) that secure the TouchPad button board to the top cover.



4. Remove the TouchPad button board and cable.



Reverse this procedure to install the power button board and cable.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive bracket.

Description	Spare part number
1-GB, 5400-rpm, 2.5-inch	676521-001
750 GB, 5400 rpm, 2.5 inch	634250-001
500-GB, 7200-rpm, 7-mm	703267-001
500-GB, 5400-rpm, 2.5 inch	669299-001
320-GB, 5400-rpm, 2.5-inch	622643-001
Hard drive bracket	749648-001

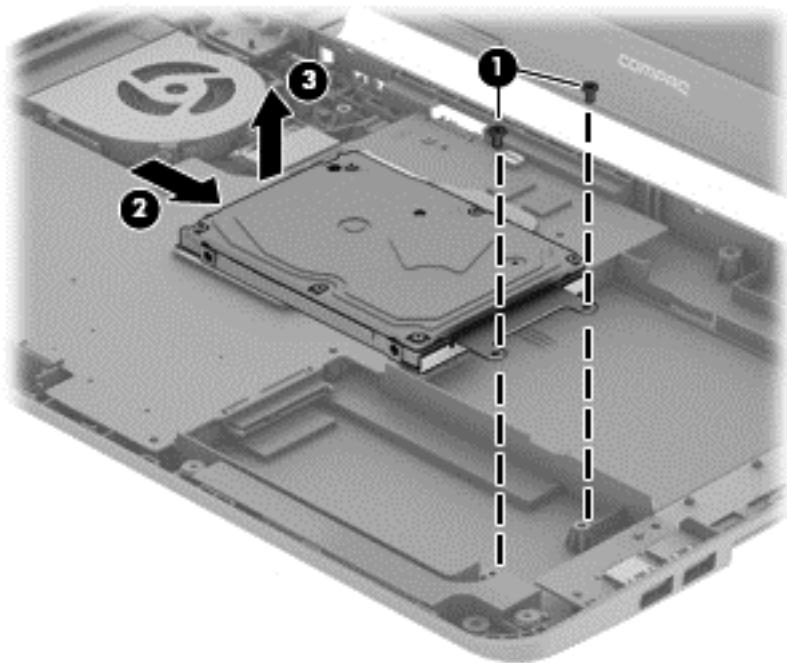
Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the keyboard (see [Keyboard on page 39](#)).
6. Remove the top cover (see [Top cover on page 47](#)).

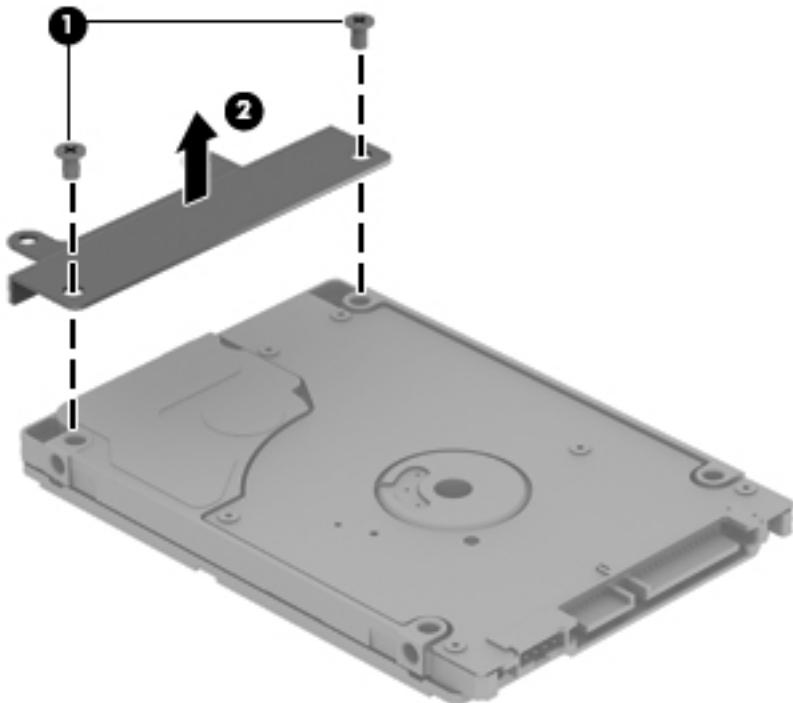
To remove the hard drive:

1. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the hard drive to the computer.
2. Slide the hard drive to disengage it from the connector **(2)**.

3. Lift the hard drive from the computer **(3)**.



4. To remove the hard drive bracket, remove the two Phillips PM3.0×4.0 screws **(1)** that secure the bracket to the hard drive.
5. Remove the hard drive bracket from the hard drive **(2)**.



Reverse this procedure to reassemble and install the hard drive.

WLAN module

Description	Spare part number
Ralink RT3290LE 802.11bgn 1x1 Wi-Fi and Bluetooth 4.0 Combo Adapter	690020-001
Realtek RT8723BE 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter	753077-001
Realtek RTL8188EE 802.11bgn Wi-Fi Adapter	709848-001
Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
Atheros AR9565 802.11bgn + Bluetooth 4.0 Wi-Fi Adapter	733476-001
Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT4.0 HMC Combo Adapter	753076-001

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

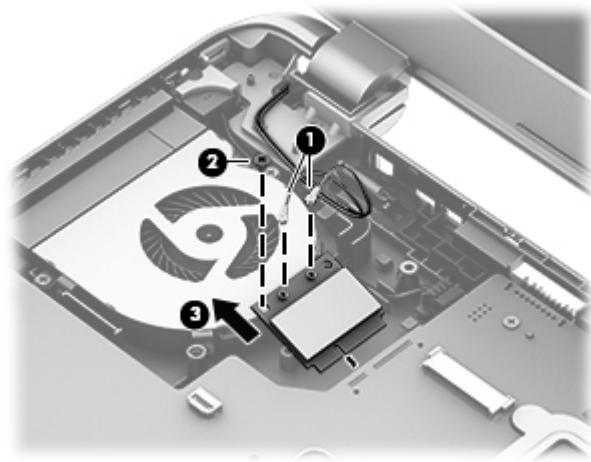
Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the keyboard (see [Keyboard on page 39](#)).
6. Remove the top cover (see [Top cover on page 47](#)).

To remove the WLAN module:

1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.
- 📝 NOTE:** The #1 WLAN antenna cable is connected to the WLAN module Main terminal. The #2 WLAN antenna cable is connected to the WLAN module Aux terminal.
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 by pulling the module away from the slot at an angle **(3)**.



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



Reverse this procedure to install the WLAN module.

Fan

 **NOTE:** The fan spare part kit includes replacement thermal materials.

Description	Spare part number
Fan	753894-001

 **NOTE:** To properly ventilate the computer, allow at least **7.6 cm** (3.0 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

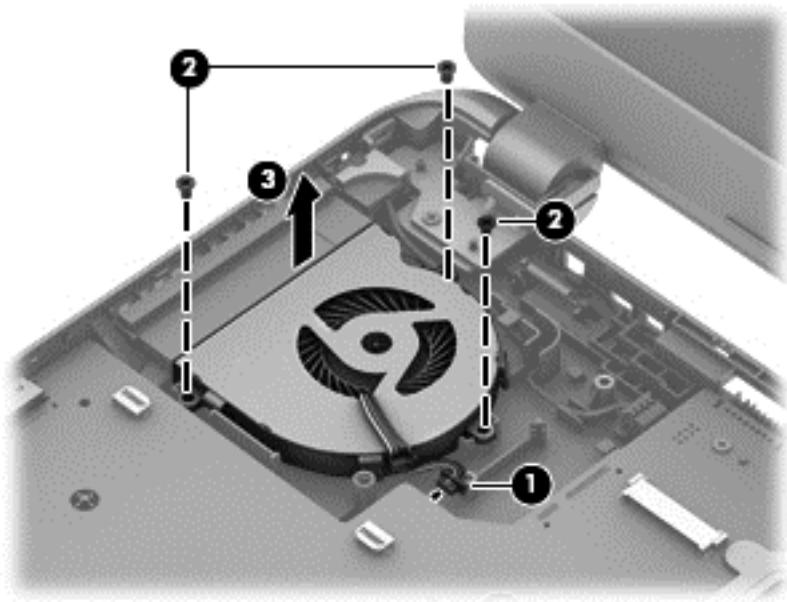
Before removing the fan/heat sink assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the keyboard (see [Keyboard on page 39](#)).
6. Remove the top cover (see [Top cover on page 47](#)).

To remove the fan:

1. Position the computer upright and open it.
2. Disconnect the fan cable **(1)** from the system board.
3. Remove the three Phillips PM2.5×5.0 screws **(2)** that secure the fan to the computer.

4. Remove the fan from the computer **(3)**.



Reverse this procedure to install the fan.

Power connector cable

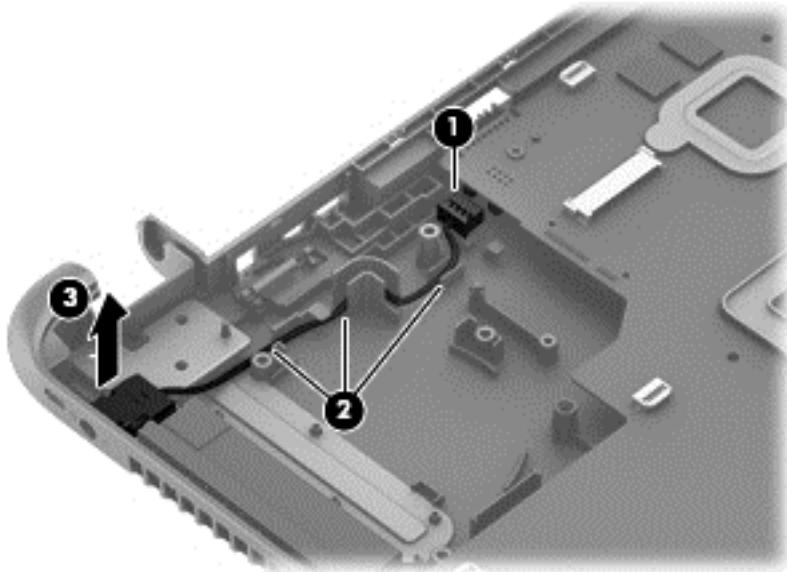
Description	Spare part number
Power connector cable	749647-001

Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - Display (see [Display assembly on page 72](#))

To remove the power connector cable:

1. Position the computer upright.
2. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the cable to the computer.
3. Disconnect the power connector cable **(2)** from the system board.
4. Release the power connector cable from the clips **(3)** built into the chassis.
5. Remove the power connector cable **(4)**.



Reverse this procedure to install the power connector cable.

System board



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

Description	Spare part number
System board (includes processor and replacement thermal materials):	
All system boards use the following part numbers:	
xxxxxx-001: Without the Windows operating system	
xxxxxx-501: Windows 8.1 Standard	
xxxxxx-601: Windows 8.1 Professional	
Touch screen models:	
• Intel Core i3-3217U processor and UMA graphics	763753-xxx
• Intel Core i3-4005U processor and UMA graphics	774715-xxx
• Intel Core i3-4010U processor and 1 GB of discrete graphics	763752-xxx
• Intel Core i3-4030U processor and 1 GB of discrete graphics memory in HP 250 G3 models	780126-xxx
Non-touch screen models:	
• Intel Celeron N2815 processor and UMA graphics	761543-xxx
• Intel Celeron N2830 processor and UMA graphics	774711-xxx
• Intel Celeron N2840 processor and UMA graphics memory in HP 250 G3 models	787810-xxx
• Intel Pentium N3520 processor and UMA graphics	761541-xxx
• Intel N3530 processor and UMA graphics	774712-xxx
• Intel N3540 processor and UMA graphics memory in HP 250 G3 models	787809-xxx
• Intel Core i3-3217U processor and UMA graphics	761537-xxx
• Intel Core i3-3217U processor and UMA graphics memory in models with WWAN	761538-xxx
• Intel Core i3-3217U processor and 1 GB of discrete graphics	761540-xxx
• Intel Core i3-4005U processor and UMA graphics	774716-xxx
• Intel Core i3-4005U processor and UMA graphics memory in models with an Integrated 10/100/1000 NIC (Giga LAN)	785481-xxx
• Intel Core i3-4005U processor and 1 GB of discrete graphics	774714-xxx
• Intel Core i3-4005U processor and 2 GB of discrete graphics memory in HP 250 and 256 G3 models	780128-xxx
• Intel Core i3-4010U processor and 1 GB of discrete graphics	761539-xxx
• Intel Core i3-4010U processor and UMA graphics	761536-xxx
• Intel Core i3-4030U processor and UMA graphics memory in HP 250 G3 models	780124-xxx
• Intel Core i3-4030U processor and UMA graphics memory in HP 250 and 256 G3 models with an Integrated 10/100/1000 NIC (Giga LAN)	786713-xxx
• Intel Core i3-4030U processor and 1 GB of discrete graphics memory in HP 250 G3 models	780125-xxx
• Intel Core i3-4030U processor and 2 GB of discrete graphics memory in HP 256 G3 models	780127-xxx

Description	Spare part number
• Intel Core i5-4210U processor and UMA graphics	761535-xxx
• Intel Core i5-4210U processor and UMA graphics memory in HP 250 G3 models with an Integrated 10/100/1000 NIC (Giga LAN)	780119-xxx
• Intel Core i5-4210U processor and 2 GB of discrete graphics memory in HP 250 and 256 G3 models	780120-xxx
• Intel Core i5 processor and UMA graphics	780118-xxx

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - WLAN module (see [WLAN module on page 55](#))
 - Hard drive (see [Hard drive on page 53](#))



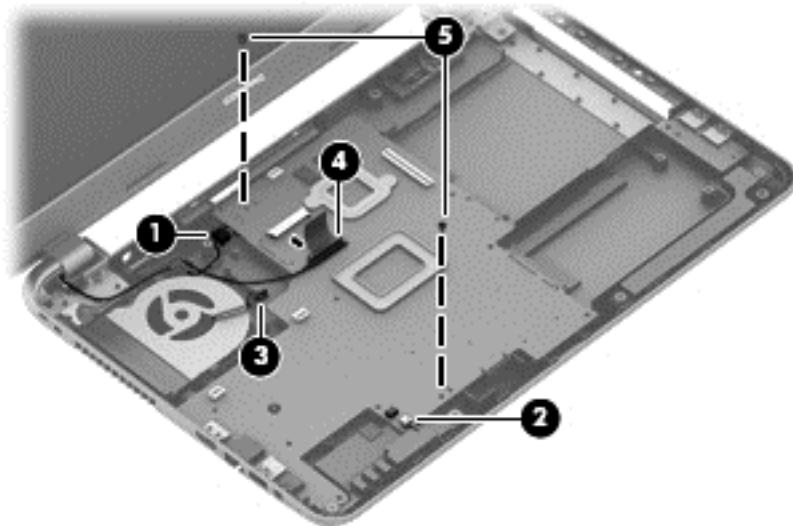
NOTE: When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory module (see [Memory module on page 71](#))
- Heat sink assembly (see [Heat sink assembly on page 67](#))

To remove the system board:

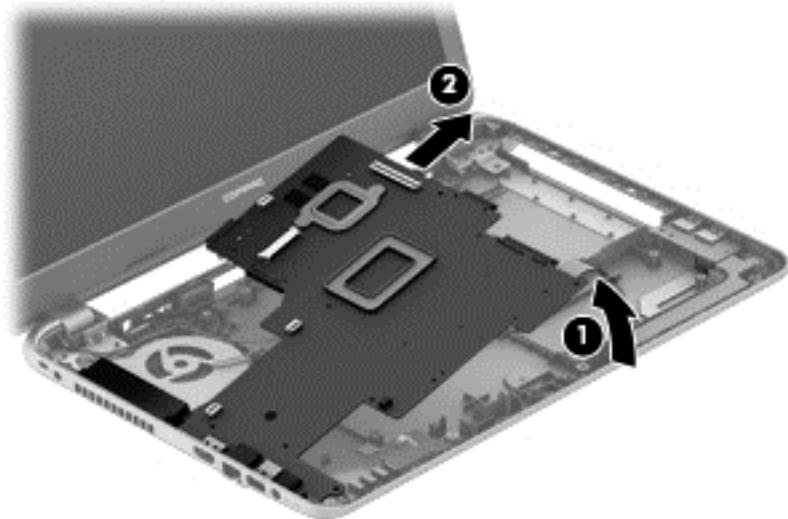
1. Position the computer upright, and then disconnect the following cables from the system board:
 - (1): Power connector cable
 - (2): Speaker cable
 - (3): Fan cable
 - (4): Display cable

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



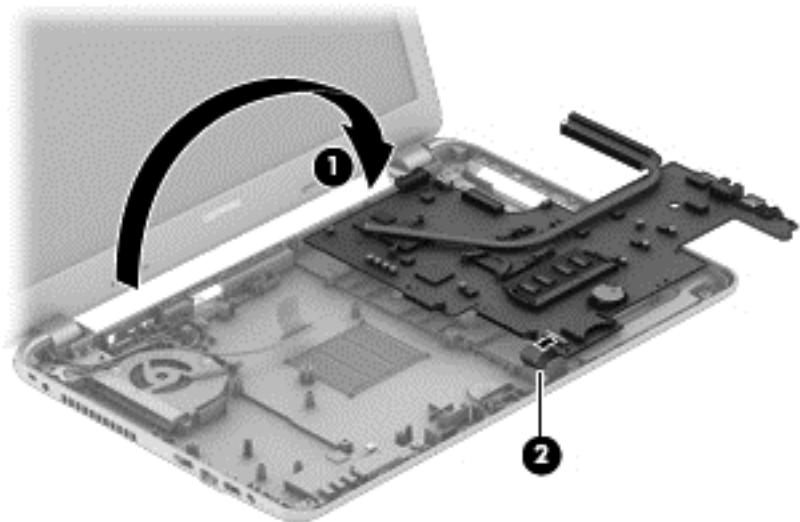
3. Lift the right side of the system board (1), and then pull the board away from the computer enough to disengage the connectors from the side of the base enclosure (2).

NOTE: Be careful not to inadvertently disconnect the speaker cable when lifting the system board.



4. Flip the system board upside down to gain access to the speaker connector (1).

5. Disconnect the USB board cable from the system board **(2)**.



Reverse this procedure to install the system board.

USB board

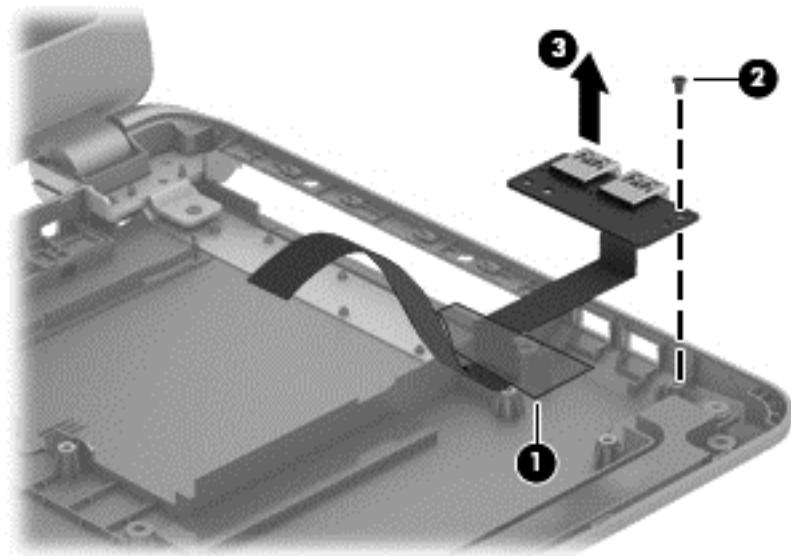
Description	Spare part number
USB board (includes cable)	749649-001

Before removing the USB board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - WLAN module (see [WLAN module on page 55](#))
 - System board (see [System board on page 60](#))
 - Hard drive (see [Hard drive on page 53](#))

To remove the USB board:

1. Position the computer upright.
2. Disconnect the USB board cable from the system board **(1)**.
3. Remove the tape that secures it to the cable to the base enclosure **(2)**.
4. Remove the Phillips PM2.5×5.0 screw **(3)** that secures the USB board to the base enclosure.
5. Remove the USB board **(4)**.



Reverse this procedure to install the USB board.

Speakers

Description	Spare part number
Speakers (includes left and right speakers and cable)	749653-001

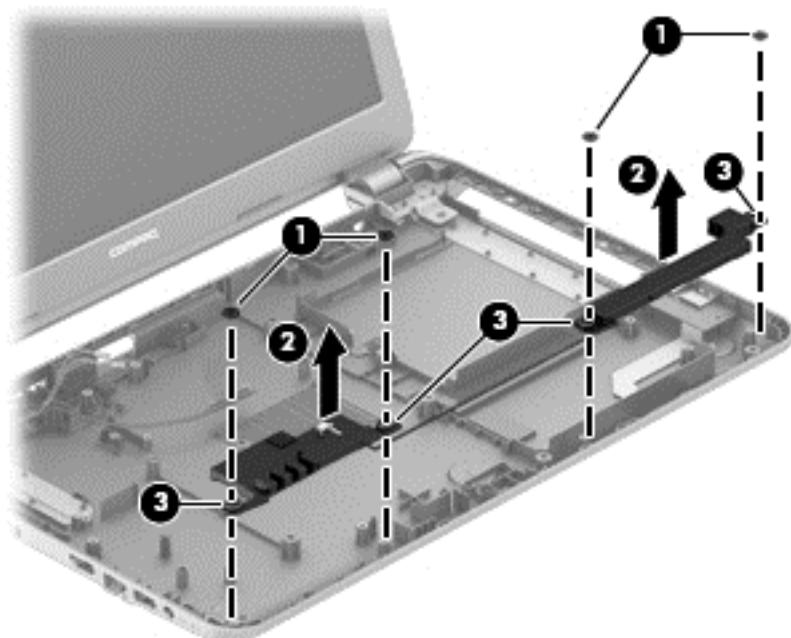
Before removing the speakers, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - WLAN module (see [WLAN module on page 55](#))
 - Hard drive (see [Hard drive on page 53](#))
 - System board (see [System board on page 60](#))

To remove the speakers:

1. Remove the four Phillips broadhead PM2.0×2.0 screws **(1)** that secure the speakers to the computer.
2. Lift the speakers from the base enclosure **(2)**.

 **NOTE:** Note the rubber gaskets **(3)** around each screw. When installing the speakers, make sure the gaskets are installed correctly.



Reverse this procedure to install the speakers.

Heat sink assembly



NOTE: The heat sink assembly spare part kit includes replacement thermal materials.

Description	Spare part number
Heat sink for use in models with UMA graphics	753895-001
Heat sink for use in models with discrete graphics	762728-001



NOTE: To properly ventilate the computer, allow at least **7.6 cm** (3.0 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Before removing the heat sink assembly, follow these steps:

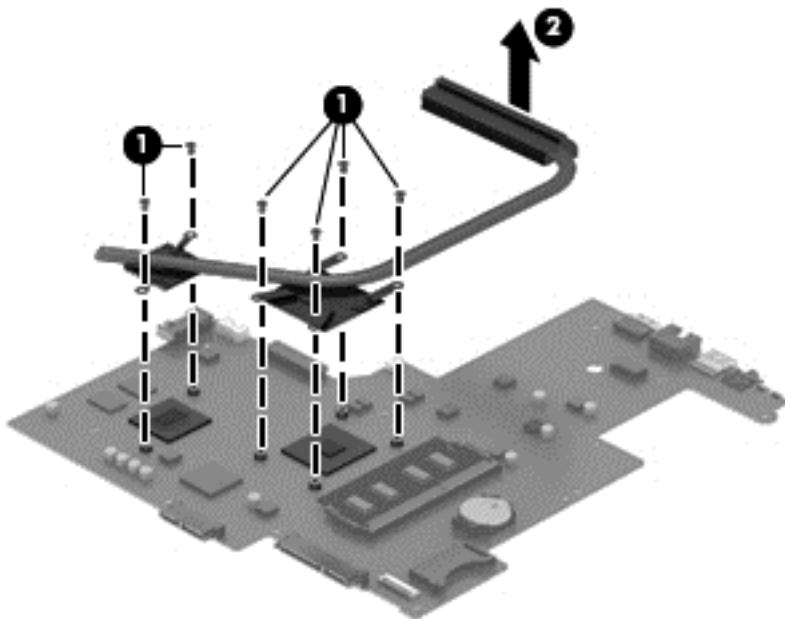
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - WLAN module (see [WLAN module on page 55](#))
 - System board (see [System board on page 60](#))

To remove the heat sink assembly:

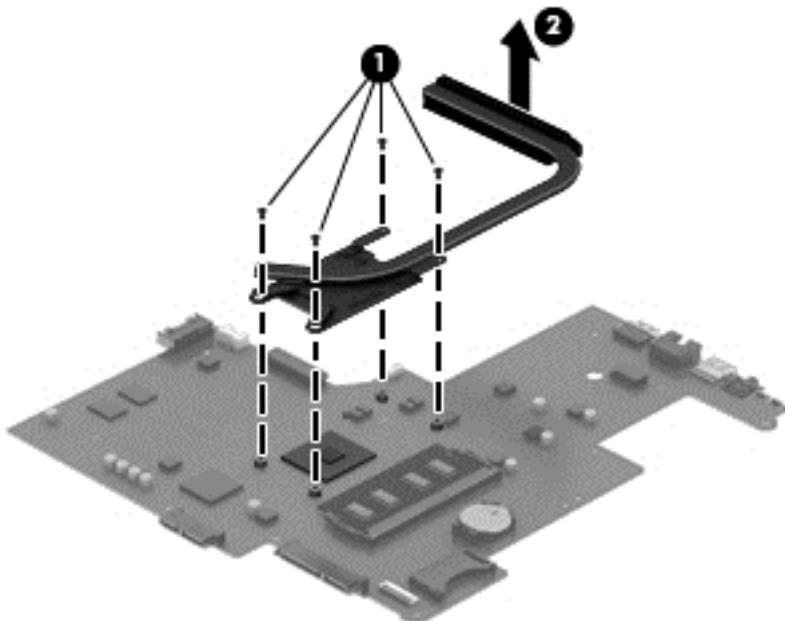
1. Position the system board upside down.
2. Loosen the screws on the heat sink (**1**) that secure the heat sink assembly to the system board.

3. Remove the heat sink assembly **(2)** from the system board.

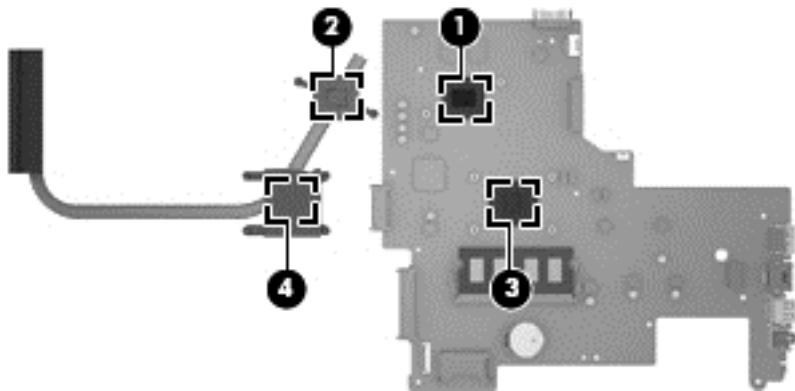
Discrete graphics:



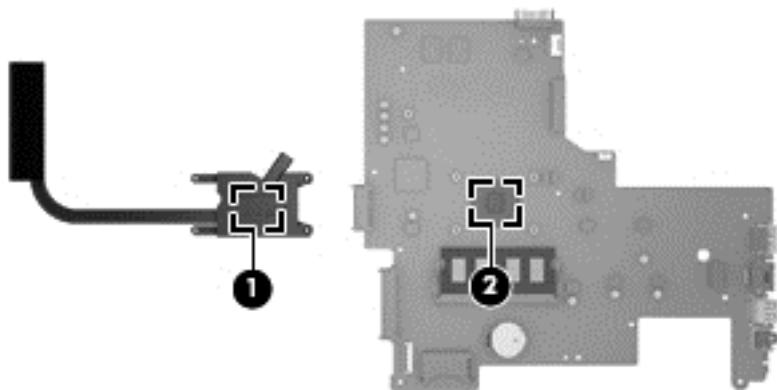
UMA graphics:



- **Discrete graphics:** Thermal paste is used on the processor and associated heat sink area **(1)(2)**, as well as the graphics chip and associated heat sink area **(3)(4)**.



- **UMA graphics:** Thermal paste is used on the heat sink (1) and the processor (2).



Reverse this procedure to reassemble and install the heat sink assembly.

RTC battery

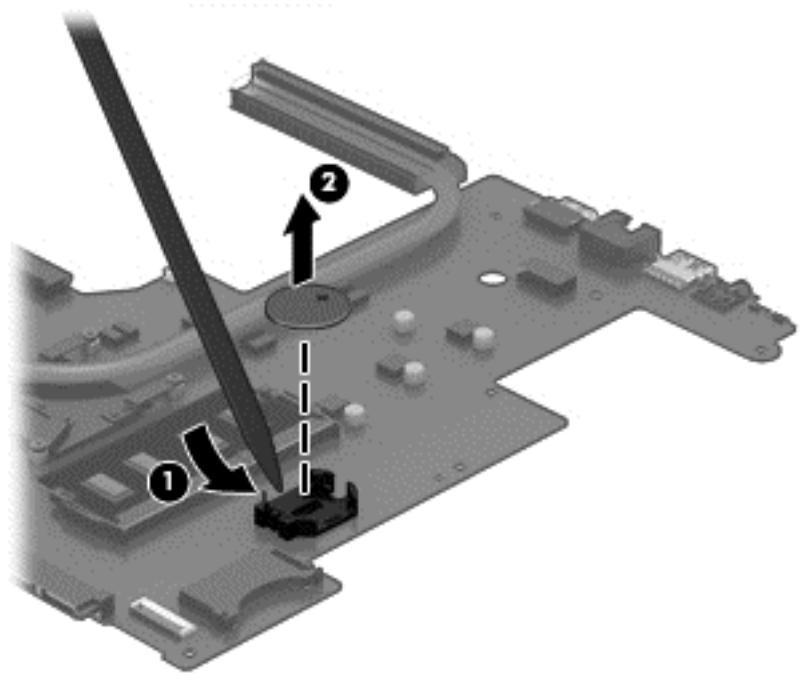
Description	Spare part number
RTC battery	759981-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - WLAN module (see [WLAN module on page 55](#))
 - System board (see [System board on page 60](#))

To remove the RTC battery:

1. Position the system board upside down.
2. Using a thin tool or screwdriver, disengage the battery from the socket **(1)**, and then remove the battery **(2)**.



Reverse this procedure to install the RTC battery.

Memory module

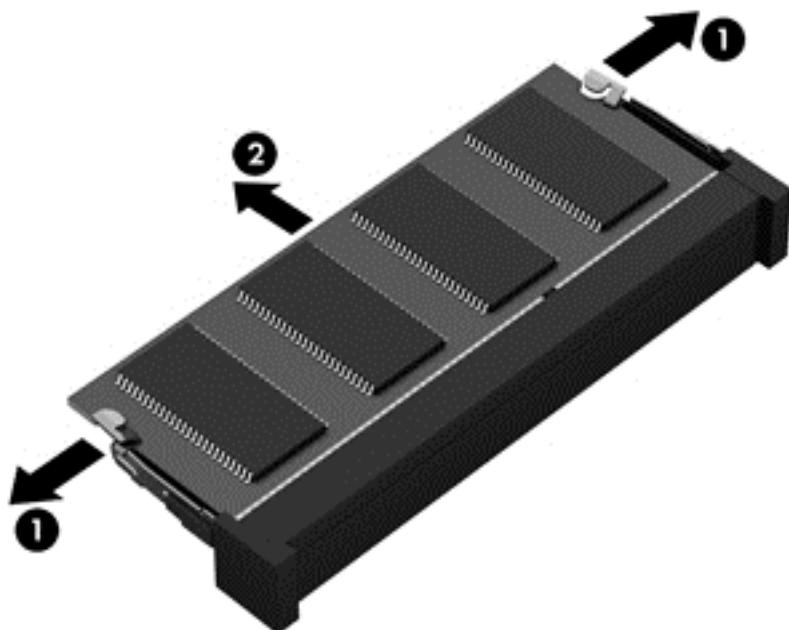
Description	Spare part number
8-GB (PC3L, 12800, 1600-MHz)	693374-001
4-GB (PC3L, 12800, 1600-MHz)	691740-001
2-GB (PC3L, 12800, 1600-MHz)	691739-001

Before removing a memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))
 - WLAN module (see [WLAN module on page 55](#))
 - System board (see [System board on page 60](#))

To remove a memory module:

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



Reverse this procedure to install a memory module.

Display assembly

This section describes removing the display assembly in its entirety and disassembling all the display subcomponents.

If you only need to remove the display bezel, webcam/microphone module, or display panel, you do not need to remove the entire display assembly from the computer. See [Display subcomponents \(bezel, webcam, panel\) on page 43](#) for more information about removing the display subcomponents that do not require that you remove the entire display assembly from the computer.

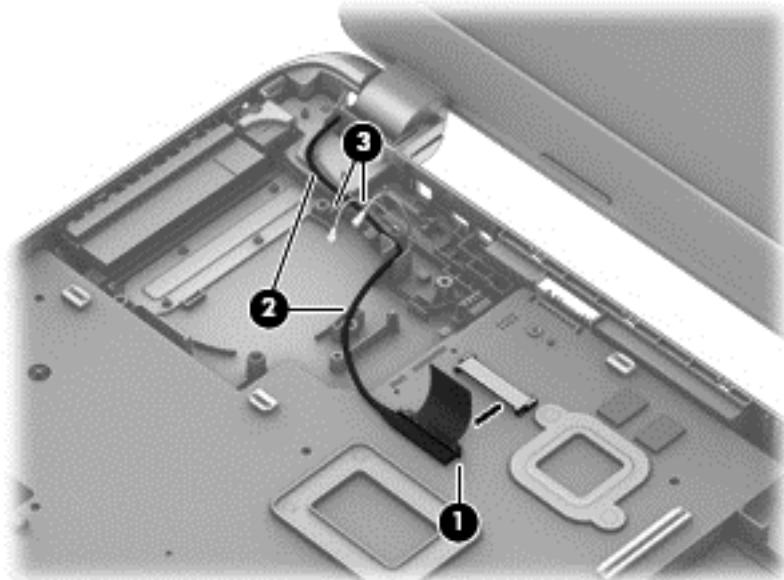
Description	Spare part number
Raw display panel	
For use in non-touch screen models	750635-001
For use in touch screen models	774165-001
Antennas	
For use in models without a touch screen (includes wireless antenna cables and transceivers)	749638-001
For use in touch screen models (includes wireless antenna cables and transceivers)	774163-001
Display bezel	
For use in HP 250 G3 models	749644-001
For use in HP 256 G3 models (China only)	783998-001
Display cable	
Display enclosure	
Touch screen models	774164-001
Non-touch screen models	749641-001
Display hinges (left and right)	
Models without a touch screen	749655-001
Models with a touch screen	774166-001
Webcam/microphone module, HD	

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the following components:
 - Keyboard (see [Keyboard on page 39](#))
 - Top cover (see [Top cover on page 47](#))

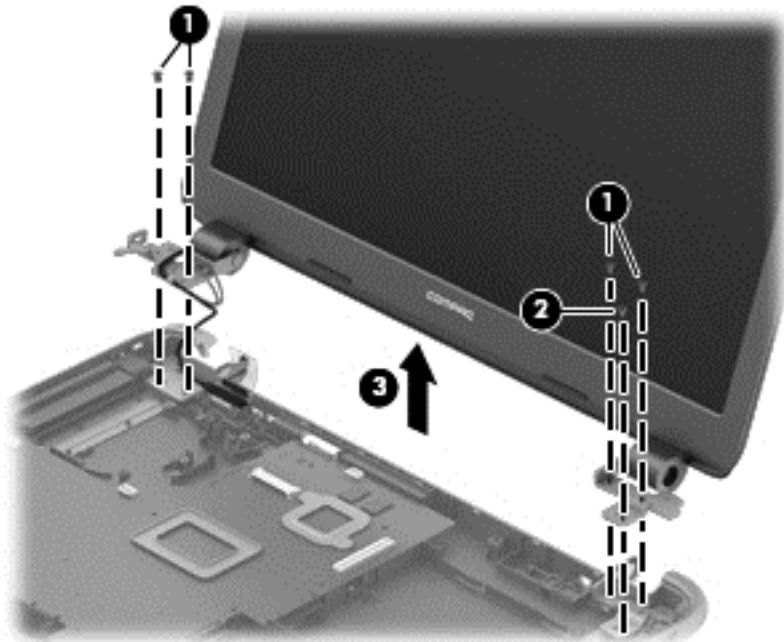
To remove the display assembly:

1. Disengage the adhesive and disconnect the display panel cable **(1)** from the system board.
2. Remove the display panel cable from its routing path **(2)**.
3. Release the wireless antenna cables from the clips **(3)** built into the base enclosure.



CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

4. Remove the four Phillips PM2.5×5.0 screws **(1)** (two from each hinge) and one Phillips PM2.5×3.5 screw **(2)** (on the right hinge) that secures the display assembly to the computer.
5. Remove the display assembly **(3)**.



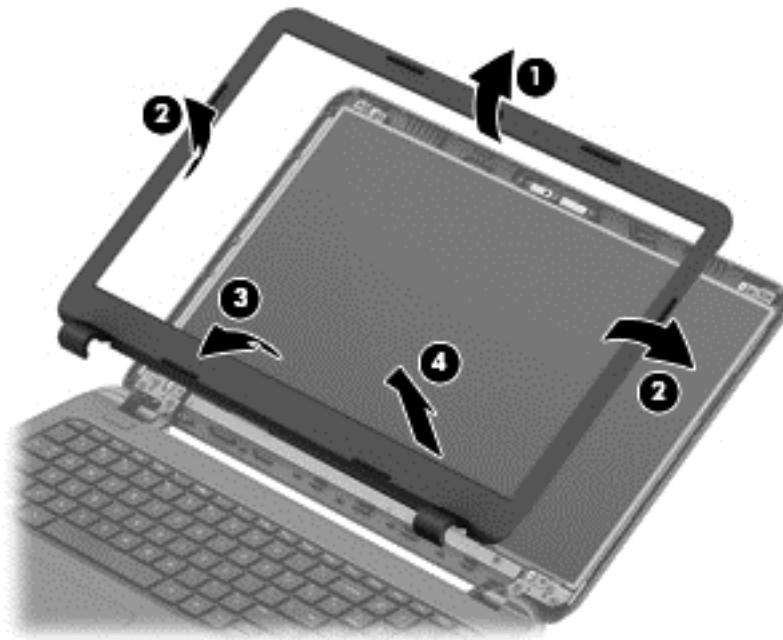
If it is necessary to replace any of the display assembly subcomponents:

1. To remove the display bezel:

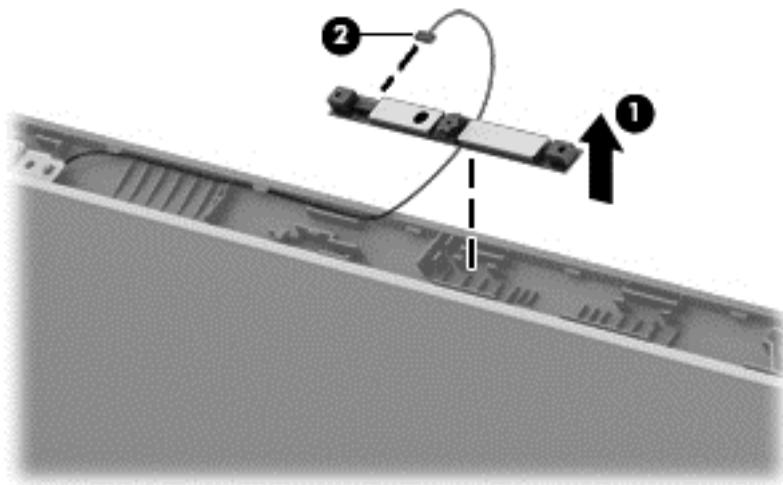
- a. Flex the inside of the top edge (1), the left and right edges (2), and the bottom edge (3) of the display bezel until the bezel disengages from the display enclosure.
- b. Remove the display bezel (4).



NOTE: In this procedure, the display will NOT be connected to the computer, as shown in the following image.

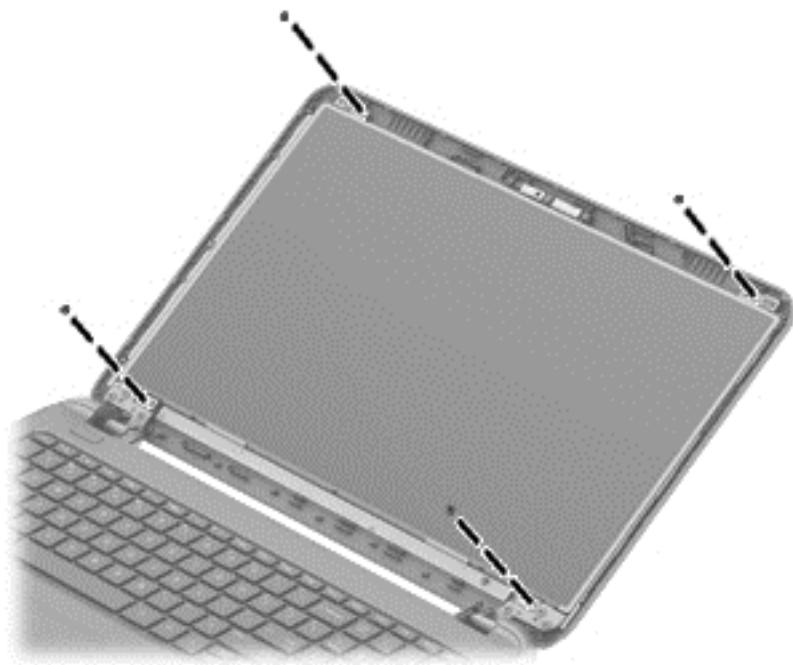


2. To remove the webcam/microphone module:
 - a. Position the display assembly with the top edge toward you.
 - b. Disconnect the cable (1) from the module.
 - c. Remove the webcam/microphone module (2). (The module is attached to the display enclosure with double-sided tape.)



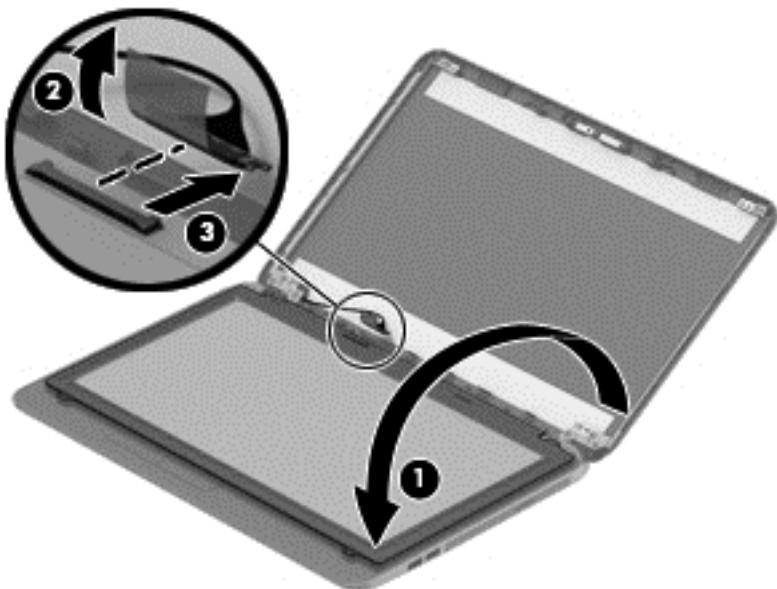
3. To remove the display panel:
 - a. Remove the four Phillips PM2.5×3.5 screws that secure the display panel to the enclosure.

 **NOTE:** In this procedure, the display will NOT be connected to the computer, as shown in the following image.



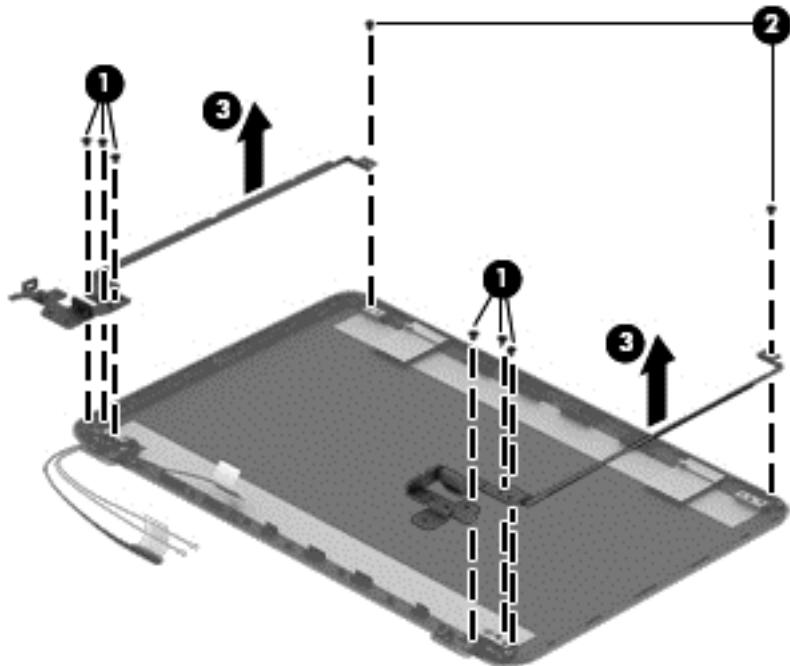
- b. Rotate the display panel onto the keyboard to gain access to the display cable connection on the back of the panel **(1)**.
- c. On the back of the display panel, release the adhesive strip **(2)** that secures the display panel cable to the display panel, and then disconnect the cable **(3)**.

 **NOTE:** In this procedure, the display will NOT be connected to the computer, as shown in the following image.

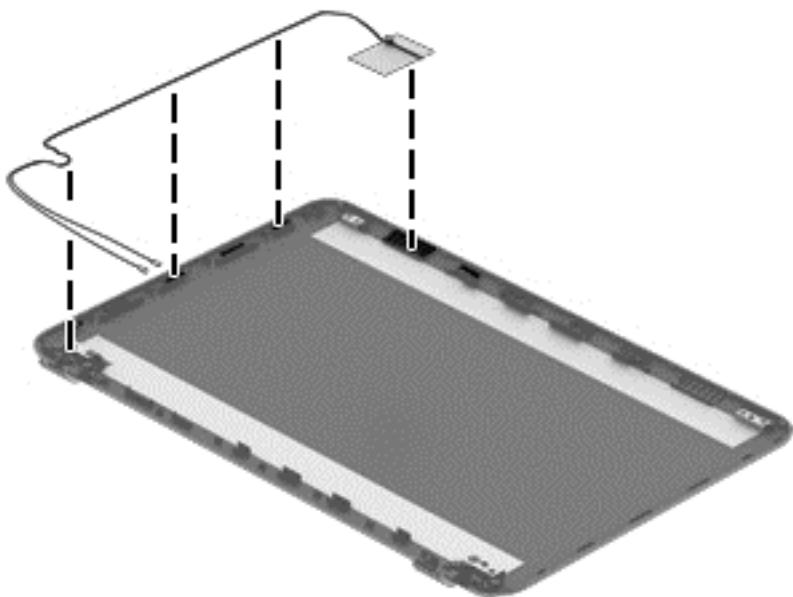


4. To remove the display hinges:

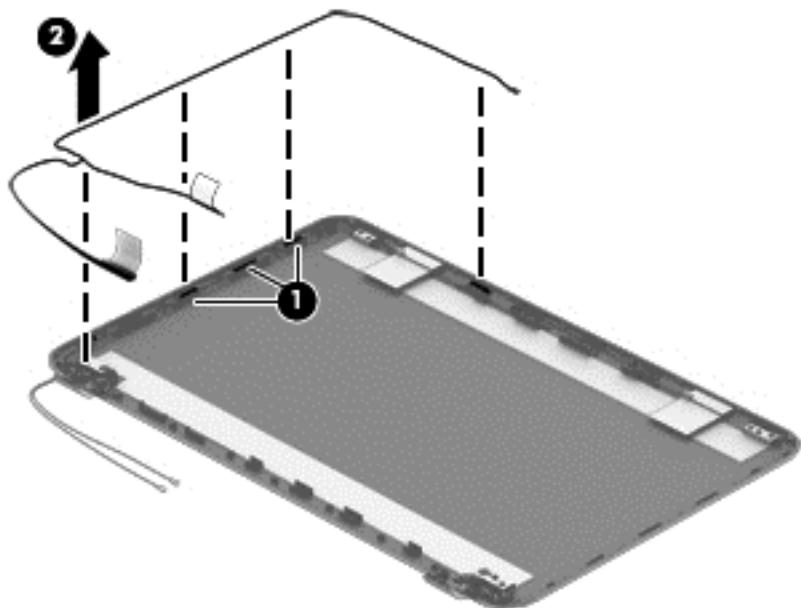
- a. Remove the eight Phillips PM2.5×3.5 screws **(1)** that secure the display hinges to the display panel.
- b. Remove the display hinges **(2)**.



5. To remove the wireless antenna cables and transceivers, release the wireless antenna cables from the clips built into the display enclosure.



6. To remove the display/webcam cable, remove the cable from the clips built into the display enclosure **(1)**, and then remove the cable from the display enclosure **(2)**.



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

Reverse this procedure to reassemble and install the display assembly.

7 Using Setup Utility (BIOS) and HP PC Hardware Diagnostics (UEFI) in Windows 8.1

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

Starting Setup Utility (BIOS)

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

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

Updating the BIOS

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

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

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 those currently installed on the computer, you need to know the version of the system BIOS currently installed.

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

1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 79](#)).
2. Use the arrow keys to select **Main**, and then make note of your current BIOS version.
3. To exit Setup Utility (BIOS) without saving your changes, use the arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press **enter**.
4. Select **Yes**.

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.

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

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

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

1. From the Start screen, type `file`, 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.

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. Turn on or restart the computer, quickly press **esc**, and then press **f2**.

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

- a. Connected USB drive

 **NOTE:** To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 81](#).

- b. Hard drive

- c. BIOS

2. 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 **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**.

8 Using Setup Utility (BIOS) and System Diagnostics in Windows 7

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

Starting Setup Utility (BIOS)

To start Setup Utility (BIOS), follow these steps:

1. 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.
2. Press `f10` to enter Setup Utility (BIOS).

Information about how to navigate in Setup Utility (BIOS) is located at the bottom of the screen.



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

Updating the BIOS

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

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

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 those currently installed on the computer, you need to know the version of the system BIOS currently installed.

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

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

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep or Hibernation.

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

1. Select **Start > Help and Support > Maintain**.
 2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
 3. At the download area, follow these steps:
 - a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the on-screen instructions to download your selection to the hard drive.
- Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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

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

1. Open Windows Explorer by selecting **Start > Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder 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.

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. Turn on or restart the computer, quickly press **esc**, and then press **f2**.

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

- a. Connected USB drive
-
-  **NOTE:** To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 85](#).
- b. Hard drive
 - c. BIOS
2. 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 **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 Hardward Diagnostics to USB device.

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

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

Option 2: Support and Drivers pages—Provides 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**.
6. Click **Download**, and then select **Run**.

9 Computer Setup (BIOS) and Advanced System Diagnostics in SUSE Linux

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

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

Starting Computer Setup

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

To start Computer Setup, follow these steps:

1. 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.
2. Press `f10` to enter Computer Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

To navigate and select in Computer Setup, follow these steps:

1. 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.
 - To select a menu or a menu item, use the `tab` key and the keyboard arrow keys and then press `enter`, or use a pointing device to click the item.
 - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
 - To close open dialog boxes and return to the main Computer Setup screen, press `esc`, and then follow the on-screen instructions.

 **NOTE:** You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press `f10` to enter Computer Setup.

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

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

– or –

Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.

– or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the **tab** key and the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup



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

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

1. 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.
2. Press **f10** to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.



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

Updating the BIOS

Updated versions of the BIOS may be available on the HP Web site.

Most BIOS updates on the HP Web site 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 those currently installed on the computer, you need to know the version of the system BIOS currently installed.

BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed as follows:

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **File > System Information**.
3. To exit Computer Setup without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.

 **NOTE:** You can also determine the BIOS version by turning on or restarting the computer, pressing the **esc** key while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then pressing the **f1** key. Follow the on-screen instructions to exit this screen.

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 Suspend or Hibernation.

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

1. Open your web browser. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.
2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. Click the option for software and driver downloads, type your computer model number in the product box, and then press **enter**. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
4. Click your specific product from the models listed.
5. Click the appropriate operating system.
6. Go to the BIOS section and download the BIOS software package.
7. Follow the installation instructions as provided with the downloaded BIOS software package.

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

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. Turn on or restart the computer, quickly press **esc**, and then press **F2**.

The BIOS searches two 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 90](#).

b. BIOS

2. 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 **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 Hardward Diagnostics to USB device.

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

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

Option 2: Support and Drivers pages—Provides 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**.
6. Click **Download**, and then select **Run**.

10 Specifications

Computer specifications

	Metric	U.S.
Dimensions (touch models)		
Depth	25.9 cm	10.2 in
Width	37.8 cm	14.88 in
Height	2.53 cm	1.00 in
Weight		
3 cell battery	2190 g	4.83 lb
4 cell battery	2230 g	4.92 lb
Input power		
Operating voltage and current	18.5 V dc @ 3.5 A or 19.5 V dc @ 3.33 A – 65 W 19 V dc @ 4.74 A or 19.5 V dc @ 4.62 A – 90 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

39.6-cm (15.6-in) display specifications

	Metric	U.S.
Active diagonal size	39.6-cm	15.6-in
Resolution	1600x900 (HD+)	
Active area	309.399x173.952	
PPI	112	
Surface treatment	Anti-glare	
Contrast ratio	300:1 (typical)	
Response time	8 ms	
Brightness	200 nits (typical)	
Viewing angle	SVA	
Backlight	LED	
Luminance uniformity @ 13 points	1.4 (typ), 1.6 (max)	
Lifetime (1/2 luminance)	12,000 hours	
Color coordinate (white)	(0.313, 0.329)	
Color tolerance (White)	+/- 0.02	
Color tolerance (W, R, G, B)	+/- 0.03	
Color gamut	45% typical	

Hard drive specifications

	1-TB*	750-GB*	500-GB*	320-GB*				
Dimensions								
Height	9.5 mm	9.5 mm	7.0 mm or 9.5 mm	7.0 mm or 9.5 mm				
Length	100.4 mm	100.4 mm	100.6 mm	100.4 mm				
Width	69.9 mm	69.9 mm	70.1 mm	69.9 mm				
Weight	115.0 g	115.0 g	92.0 g	98.8 g				
Interface type								
	SATA	SATA	SATA	SATA				
Transfer rate								
Synchronous (maximum)	300 MB/sec	300 MB/sec	300 MB/sec	300 MB/sec				
Security	ATA security	ATA security	ATA security	ATA security				
Seek times (typical read, including setting)								
Single track	1.4 ms	1.5 ms	3 ms	3 ms				
Average (read/write)	10 ms	11 ms	13 ms	13 ms				
Maximum	12 ms	14 ms	24 ms	24 ms				
Logical blocks								
	1,938,921,461	1,465,149,168	1,048,576,000	625,142,448				
Disk rotational speed								
	5400 rpm	5400 rpm	5400 rpm	5400 rpm				
Operating temperature								
	0°C to 60°C (32°F to 140°F)							
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.								
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.								

DVD±RW SuperMulti DL Drive specifications

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD-ROM	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

11 Backing up, restoring, and recovering in Windows 8.1

This chapter provides information about the following processes:

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

Creating recovery media and backups

1. After you successfully set up the computer, 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.

HP Recovery media you create will provide the following recovery options:

- System Recovery—Reinstalls the original operating system and the programs that were installed at the factory.
- Minimized Image Recovery—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.

See [Creating HP Recovery media on page 95](#).

2. Use the Windows tools to create system restore points and create backups of personal information. For more information and steps, see Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

Creating HP Recovery media

HP Recovery Manager is a software program that offers a way 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 HP 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 blank USB flash drive or the number of blank DVD discs 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 up to 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:



IMPORTANT: For tablets, connect to the keyboard dock before beginning these steps (select models only).

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 97](#).

Restore and recovery

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

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information and steps, see Help and Support. From the Start screen, type `help`, and then select **Help and Support**.
- 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.

- 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 (select models only) 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 97](#).

- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media that you have created. For more information, see [Recovering using HP Recovery Manager on page 97](#). If you have not already created recovery media, see [Creating HP Recovery media on page 95](#).

- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see [Recovering using HP Recovery Manager on page 97](#).
- If you wish 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 98](#).

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 created or by using the HP Recovery partition (select models only). If you have not already created recovery media, see [Creating HP Recovery media on page 95](#).

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

- 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.

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.
- 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 on page 95](#).
- To use the Factory Reset option, you must use HP Recovery media. If you have not already created recovery media, see [Creating HP Recovery media on page 95](#).
- 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 wish to retain.

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:



IMPORTANT: For tablets, connect to the keyboard dock before beginning these steps (select models only).

1. Press **f11** while the computer boots.
– or –
Press and hold **f11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

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

1. If possible, back up all personal files.
 2. Insert the HP Recovery media that you created, 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 98](#).
3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

1. Insert the HP Recovery media you created.
2. Restart the computer, quickly press **esc**, and then press **f9** for boot options.
3. Select the optical drive or USB flash drive you want to boot from.
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 on page 95](#).

Follow these steps to remove the HP Recovery partition:

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

12 Backing up, restoring, and recovering in Windows 7

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

Creating backups

1. Use HP Recovery Manager to create recovery media immediately after you set up the working computer.
2. As you add hardware and software programs, create system restore points.
3. As you add photos, video, music, and other personal files, create a backup of your system and personal information.

Creating recovery media to recover the original system

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

What you need to know

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the flash drive or the number of blank DVD discs that will be required.

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

- If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.
- Store the recovery media in a safe location, separate from the computer.
- If necessary, you can exit the program before you have finished creating the recovery media. The next time you open HP Recovery Manager, you will be prompted to continue the process.

Creating the recovery media

1. Select **Start** and type `recovery` in the search field. Select **Recovery Manager** from the list. Allow the action to continue, if prompted.
2. Click **Recovery Media Creation**.
3. Follow the on-screen instructions to continue.

To recover, see [Recovering the original system using HP Recovery Manager on page 102](#).

Creating system restore points

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

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

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

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

What you need to know

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

Creating a system restore point

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **Create**, and follow the on-screen instructions.

To restore, see [Restoring to a previous system restore point on page 102](#).

Backing up system and personal information

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

Tips for a successful backup

- Number backup discs before inserting them into the optical drive.
- Store personal files in the Documents, Music, Pictures, and Videos libraries, and back up these folders periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to re-enter your preferences.

To create a screen shot:

1. Display the screen you want to save.

2. Copy the screen image:

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

To copy the entire screen, press **prt sc**.

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

4. Save and print the document.

What you need to know

- You can back up your information to an optional external hard drive, a flash drive, a network drive, or discs.
- Connect the computer to AC power during backups.
- Allow enough time for the backup. Depending on files sizes, it may take more than an hour.
- Verify the amount of free space on your backup storage device before you back up.
- You should back up:
 - Before adding or changing software or hardware.
 - Before the computer is repaired or restored.
 - On a regular schedule to be sure you have recent copies of personal information.
 - After you add many files—for example, if you saved videos from a birthday party.
 - Before using antivirus software to remove a malicious program.
 - After adding information that is hard to replace, such as pictures, videos, music, project files, or data records.

Creating a backup using Windows Backup and Restore

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

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to schedule and create a backup.



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

To restore, see [Restoring specific files using Windows Backup and Restore on page 102](#).

Restore and recovery

Restoring to a previous system restore point

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

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

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **System Restore**, and follow the on-screen instructions.

Restoring specific files

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

Restoring specific files using Windows Backup and Restore

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

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to restore your backup.



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

Recovering the original system using HP Recovery Manager

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the disc provided by the manufacturer.
- A system recovery should be used as a final attempt to correct computer issues. If you have not already tried restore points (see [Restoring to a previous system restore point on page 102](#)) and partial restores (see [Restoring specific files on page 102](#)), try them before using HP Recovery Manager to recover your system.
- A system recovery must be performed if the computer hard drive fails or if all attempts to correct any functional computer issues fail.

- If the recovery media do not work, you can obtain recovery discs for your system from the HP website.
- The Minimized Image Recovery option is recommended for advanced users only. All hardware-related drivers and software are re-installed, but other software applications are not. Do not interrupt the process until it is complete, otherwise the recovery will fail.

Recovering using HP Recovery partition (select models only)

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

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



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

1. Access HP Recovery Manager in either of the following ways:
 - Select **Start** and type `recovery` in the search field. Select **Recovery Manager** from the list.
– or –
 - Turn on or restart the computer, and then press `esc` while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen. Then press `f11` while the “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **HP Recovery Manager** window.
3. Follow the on-screen instructions.

Recovering using the recovery media

1. If possible, back up all personal files.
2. Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.
– or –

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



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 103](#).

3. Press `f9` at system bootup.
4. Select the optical drive or the flash drive.
5. Follow the on-screen instructions.

Changing the computer boot order

To change the boot order for recovery discs:

1. Restart the computer.
2. Press `esc` while the computer is restarting, and then press `f9` for boot options.
3. Select **Internal CD/DVD ROM Drive** from the boot options window.

To change the boot order for a recovery flash drive:

1. Insert the flash drive into a USB port.
2. Restart the computer.
3. Press **esc** while the computer is restarting, and then press **f9** for boot options.
4. Select the flash drive from the boot options window.

13 Backup and Recovery in SUSE Linux

Recovery after a system failure is as good as your most recent backup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

Backing up your information

You should back up your computer files on a regular schedule to maintain a current backup. You can manually back up your information to an optional external drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times
- Before the computer is repaired or restored
- Before you add or modify hardware or software

To back up your home directory files using **Backup Manager Settings**:

1. Select **Computer > More Applications > Tools > Backup Manager Settings**, and click **Backup my home directory**.
2. Click **Storage Destination Location**, and then select a location to back up your information.
3. Click **Schedule**, and then select a time schedule to perform backups at a regularly scheduled time.

To immediately back up your information, click the **Backup Now** check box.

 **NOTE:** Before you back up your information, be sure you have designated a location to save the backup files.

4. Click **Save and Backup** to start the backup and to save the backup settings.

To restore backup files:

1. Select **Computer > More Applications > Tools > Backup Manager Restore**.
2. Click **Backup Source**, and then select the location of the backup files.
3. Click **Restore Destination**, and then select the destination to restore the files.
4. Select the **Optical Disk** option.
5. Under **Restore Point**, click the time and date of the backup.

 **NOTE:** If multiple backups have been performed, click **Use the latest version** to restore the latest version.

6. Click **Restore** to start restoring the files, or click **Cancel** to cancel the operation.

Performing a system recovery

Recovery allows you to repair or restore the computer to its original factory state. You can create an HP Factory Image Restore DVD, using an installed or an external DVD±RW optical drive. You can also restore the computer to its factory condition from the HP dedicated recovery partition on the hard drive.

 **CAUTION:** Using Recovery completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery tool reinstalls the original operating system and HP programs and drivers that were installed at the factory. Software, drivers, and updates not installed by HP must be manually reinstalled. Personal files must be restored from a backup.

To restore the computer using the HP Factory Image Restore DVD, you must first create the recovery disc. To create the recovery disc:

 **NOTE:** HP recommends that you create the HP Factory Image Restore DVD in the event of a system failure.

1. Select **Computer > More Applications**.
2. In the left pane, click **Tools**, and then click **Create HP Factory Image Restore DVD** in the right pane.
3. Follow the on-screen instructions to create an image file to burn a recovery disc.

To restore the computer from the recovery disc, follow these steps:

1. If possible, back up all personal files.
2. Insert the HP Factory Image Restore DVD into the optical drive and restart the computer.
3. As the computer is restarting, press **f9** to open the Computer Setup boot option menu.
4. Press the down arrow to select **Restore SLED HP-BNB preload image** from the **Linux boot** menu, and then press **enter**.
5. Using the arrow keys, select **Yes** when prompted: **Do you want to start the System-Restore?**
6. Follow the on-screen instructions.

 **NOTE:** You can also restore the computer from the partition by restarting the computer, and then pressing the **f11** key.

If you are unable to boot (start up) your computer from the hard drive partition with the primary operating system or from the recovery partition, and you did not create a system recovery disc, you must purchase a *SUSE Linux Enterprise Desktop Operating System* DVD to reinstall the operating system. For additional information, see the *Worldwide Telephone Numbers* booklet.

14 Statement of Volatility

The purpose of this document is to provide general information regarding non-volatile memory in industry-standards based HP Business Notebook PC systems and provide 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 Notebook 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 Notebook PC system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. The steps below will remove personal data from the notebook PC, including the nonvolatile memory found in Intel-based and AMD-based system boards. Some of these steps are disclosed in the Maintenance & Service Guides available for HP PC products available on the product support pages at www.hp.com.

1. Follow steps (a) through (i) 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. Enter BIOS (F10) Setup by powering on the system and pressing F10 when prompted near the bottom of the display, or press the ESC key to display the start up menu, then press F10. If the system has a BIOS administrator password, enter the password at the prompt.
 - b. Select the **File** menu, then **Restore Defaults**.
 - c. Select the **System Configuration** menu, then **Restore Security 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 the tag that has been set. Press the spacebar once to clear the tag, then press **Enter** to return to the prior menu.
 - e. If a DriveLock password is set, select the **Security** menu, scroll down to **DriveLock**, then select **DriveLock password**. Select the desired hard drive. Click **Disable protection**, enter the existing master DriveLock password, then press **Enter** to confirm and return to the prior menu. Repeat this procedure if more than one hard drive has a DriveLock password.
 - f. If an Automatic DriveLock password is set, select the **Security** menu, scroll down to **Automatic DriveLock**, then select the desired hard drive and disable protection. Repeat this procedure if more than one hard drive has an Automatic DriveLock password.
 - g. Select the **File** menu, then **Reset BIOS Security to factory default**. Click **yes** at the warning message.
 - h. Select the **File** menu, then **Save Changes and Exit**.
 - i. Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint sensor, one or two prompts will appear. One to clear the TPM and the other to Reset Fingerprint Sensor; press F1 to accept or F2 to reject.

If the HP notebook model number ends in a 'p' or 'w' and includes Intel® Centrino with VProTM, reboot the PC and enter BIOS Setup by pressing F10 when prompted. Select **System**

Configuration, then **AMT Options**. Then select **Unconfigure AMT** on next boot. Select **Save** then **Yes**. Select the **File** menu, and then select **Save Changes and Exit**. Reboot the system and confirm that you want to unconfigure AMT.

- j. If the optional Intel® Anti-Theft Technology (AT) was activated, contact the provider to deactivate it.
- k. If the optional Absolute® Software Computrace® management and tracking service was activated on the notebook PC, contact the provider to deactivate it.
- l. Remove all power and system batteries for at least 24 hours.

2. Remove and retain the storage drive or clear the contents of the drive.

a. **Hard Disk Drive (HDD)**

Clear the HDD contents by using the HP Disk Sanitizer® utility or a third party application that, ideally, is U.S. Department of Defense (DOD) 5220.22-M approved.

To run HP Disk Sanitizer, enter BIOS Setup by powering on the system and pressing **F10** when prompted near the bottom of the display, or press **ESC** to display the start up menu, then press **F10**. Select the **Security** menu and scroll down to the **Utilities** menu. Select **Disk Sanitizer** and select the desired drive. For a higher level of protection, select **Optimum**.



NOTE: This process will take a long time, and the amount of time varies based on the hard drive capacity.

b. **Solid State Drive (SSD)**

Clear the SSD contents by using the BIOS Setup Secure Erase command option, or by using a third party utility designed to erase data from an SSD. To run Secure Erase, enter BIOS Setup by powering on the system and pressing **F10** when prompted near the bottom of the display. Select the **Security** menu and scroll down to the **Utilities** menu. Select **Secure Erase** and select the desired hard drive.

Non-volatile memory usage

Non Volatile 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?
Real Time Clock (RTC) battery backed-up CMOS configuration memory (CMOS)	256 Bytes	No	Yes	Stores system date and time and limited keyboard controller data.	Using the F10 Setup utility or changing the Microsoft® Windows® date & time.	This memory is not write-protected. HP recommends password protecting the F10 Setup utility.
Controller (NIC) EEPROM	64 Kbytes (not customer accessible)	No	Yes	Store NIC configuration and NIC firmware.	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 NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC nonfunctional.
Keyboard ROM	64 Kbytes (not customer accessible)	No	Yes	Stores firmware code (keyboard, mouse, & battery management).	Programmed at the factory. Code is updated when the system BIOS is updated.	A utility is required for writing data to this memory and is available on the HP website. Writing data to this ROM in an inappropriate manner can render the PC nonfunctional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	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 to 5 MBytes	Yes	Yes	Store 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 F10 setup utility or a custom utility.	A utility is required for writing data to this memory and is available on the HP website. Writing data to this ROM in an inappropriate manner can render the PC nonfunctional.
Intel Management Engine Firmware (present only in models ending in a 'p' or 'w' or with Intel Centrino Pro technology)	1.5 or 5MByte	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	The Intel chipset is configured to enforce HW 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

					third party data store contents can populated by a remote management console or local applications registered by an administrator to have access to the space.	Intel can be applied using this utility.
Bluetooth flash	2Mbit	No	Yes	Stores Bluetooth configuration and firmware.	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 if the flash requires an upgrade.
802.11 WLAN EEPROM	4kb to 8kb	No	Yes	Stores configuration and calibration data.	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	64K bit	No	Yes	Store Web Cam configuration and firmware.	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	512kByte Flash	Yes	Yes	Stores fingerprint templates.	By enrolling 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)?**
 - a. Turn on or restart the computer and press **F10** when prompted near the bottom of the display.
 - b. Select **File**, then select **Restore defaults**.
 - c. Follow the on-screen instructions.
 - d. Select **File**, save changes and exit, then press **Enter**.
- 2. 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. There are various third party tools available to read SPD memory.
- 3. Does the “Firmware Hub for System BIOS” contain the BIOS program? Is this chip writable, and if so how?**

The Firmware Hub does contain the BIOS program and is writable. A utility is required to perform the write function.
- 4. In some PC systems, the Firmware Hub for System BIOS is a flash memory chip so that updates can be written by the customer. Is this true for these BIOS chips?**

Yes, they are flash memory chips.
- 5. What is meant by “Restore the nonvolatile memory found in Intel-based system boards”?**

This relates to clearing the Real Time Clock (RTC) CMOS memory that contains PC configuration data.
- 6. Does resetting the CMOS configuration memory return the PC back to factory defaults?**

The process of resetting the CMOS will return certain system settings to factory default but will not reset many of the system data and configuration defaults to their factory settings. To return these system data and configuration defaults to factory settings, refer to question and answer 1 and follow the instructions for returning the BIOS settings to factory defaults.

15 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.5 m** (5.0 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 or 250 V ac, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75mm² 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.

Country/region	Accredited agency	Applicable note number
<p>2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.</p> <p>3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75mm² or 1.25mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.</p> <p>4. The flexible cord must be Type RVV, 3-conductor, 0.75mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.</p> <p>5. The flexible cord must be Type H05VV-F 3X0.75mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.</p> <p>6. The flexible cord must be Type HVCTF 3X1.25mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.</p> <p>7. For 127 V ac, the flexible cord must be Type SVT or SJT 3 x 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3X0.75/1.00mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.</p>		

16 Recycling

Battery

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>.

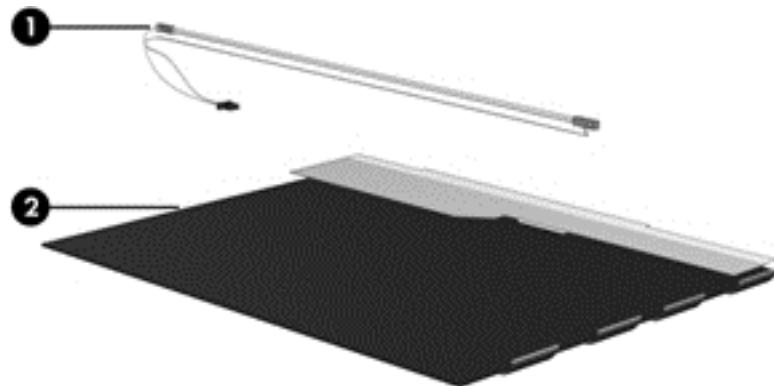
Display

⚠️ WARNING! The backlight contains mercury. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

⚠️ CAUTION: The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

📝 NOTE: Materials Disposal. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see the Electronic Industries Alliance (EIA) Web site at <http://www.eiai.org>.

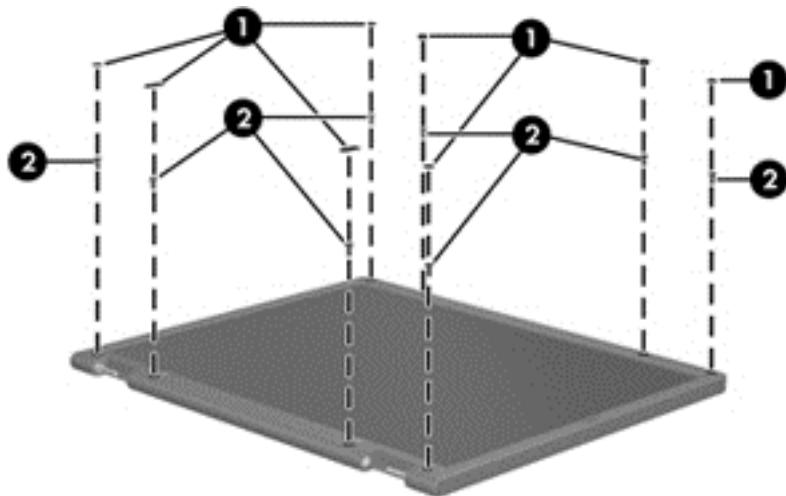
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight (1) and the liquid crystal display (LCD) panel (2).



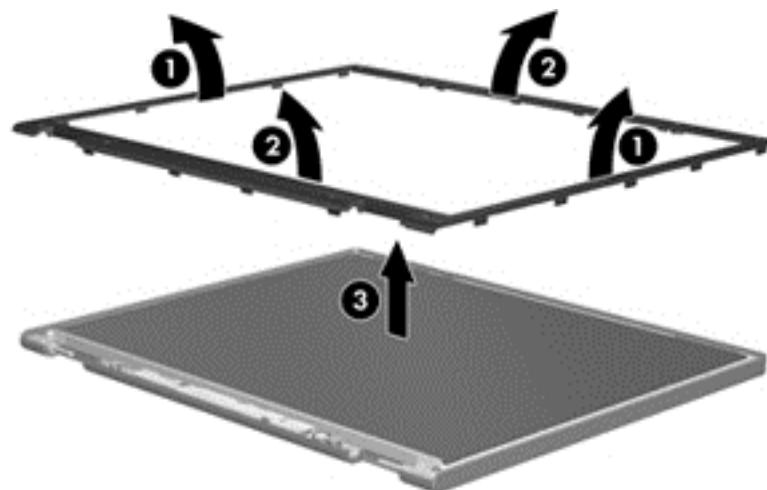
📝 NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps:

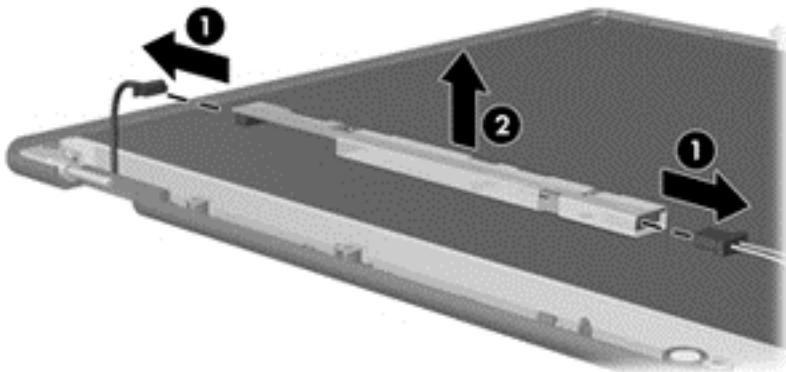
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.

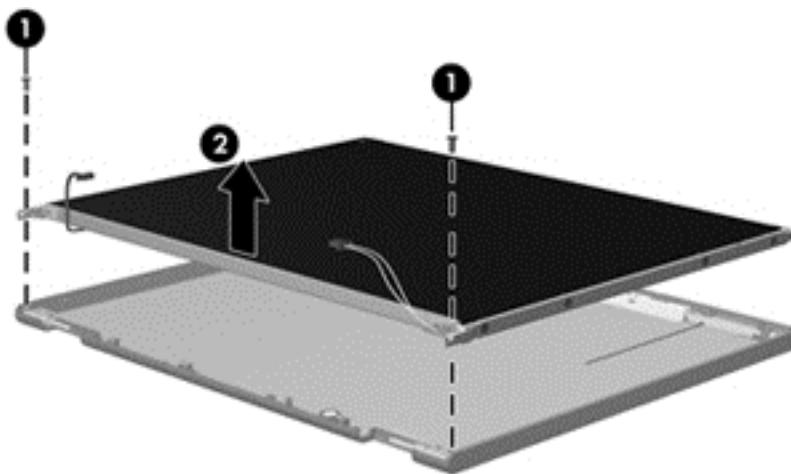


4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.

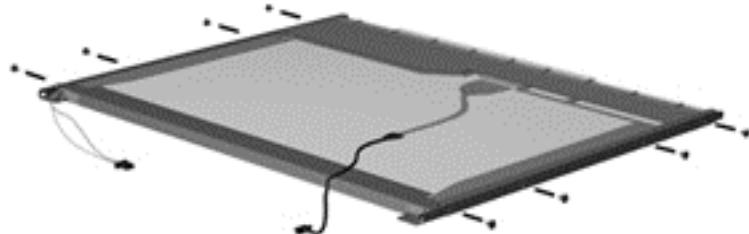


5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.

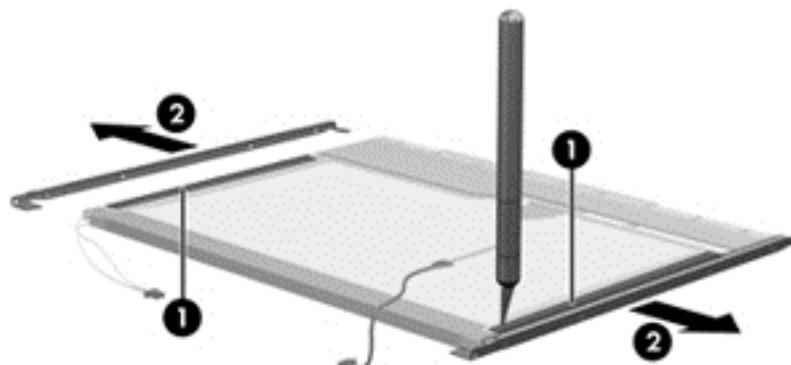
6. Remove the display panel assembly **(2)** from the display enclosure.



7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

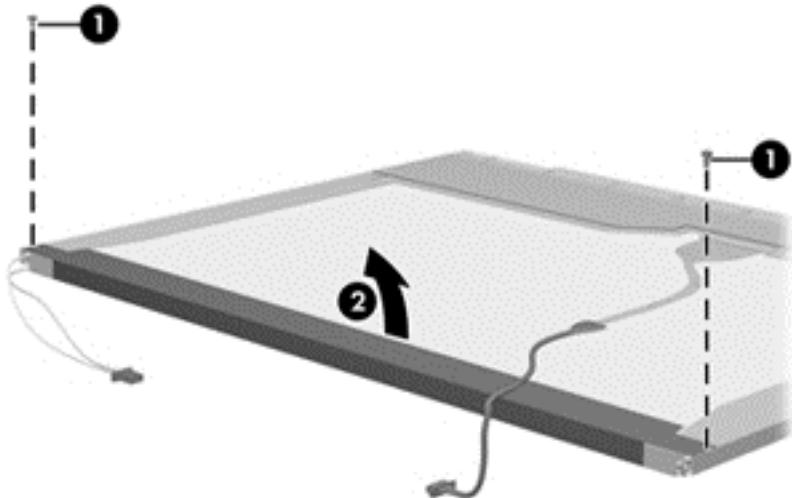


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame **(2)** from the display panel.

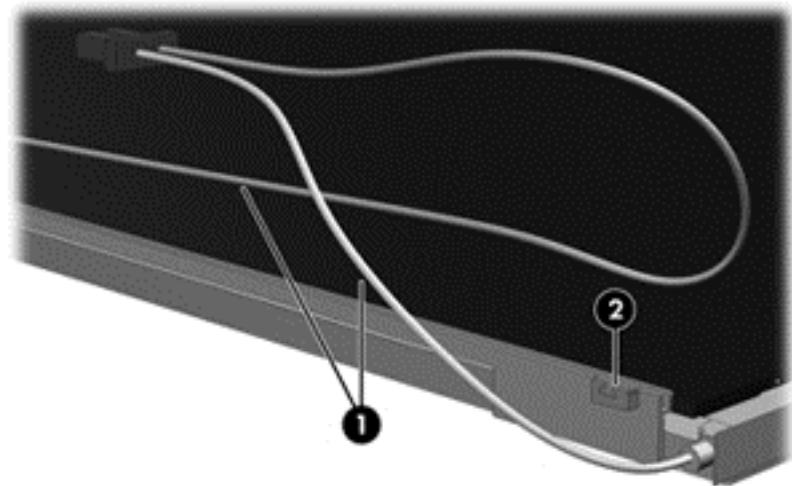


11. Remove the screws **(1)** that secure the backlight cover to the display panel.

- 12.** Lift the top edge of the backlight cover **(2)** and swing it outward.

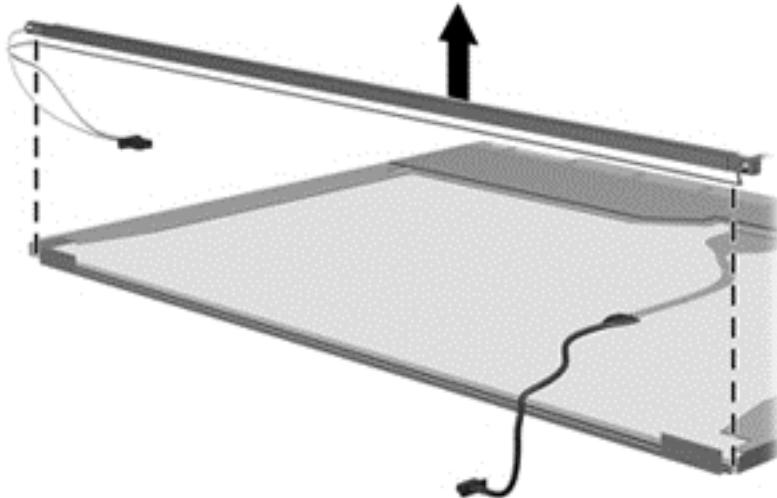


- 13.** Remove the backlight cover.
14. Turn the display panel upright.
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



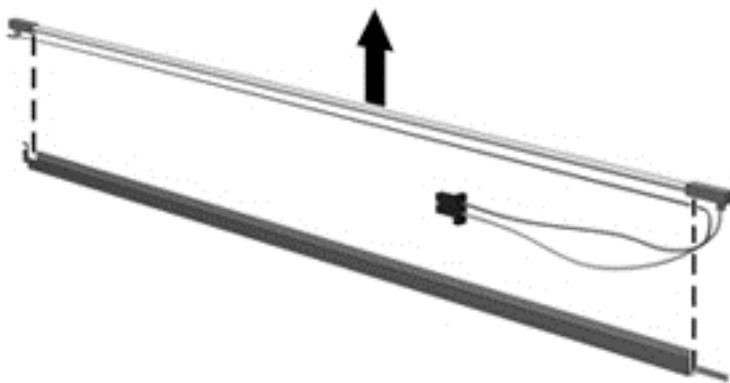
- 16.** Turn the display panel upside down.

17. Remove the backlight frame from the display panel.



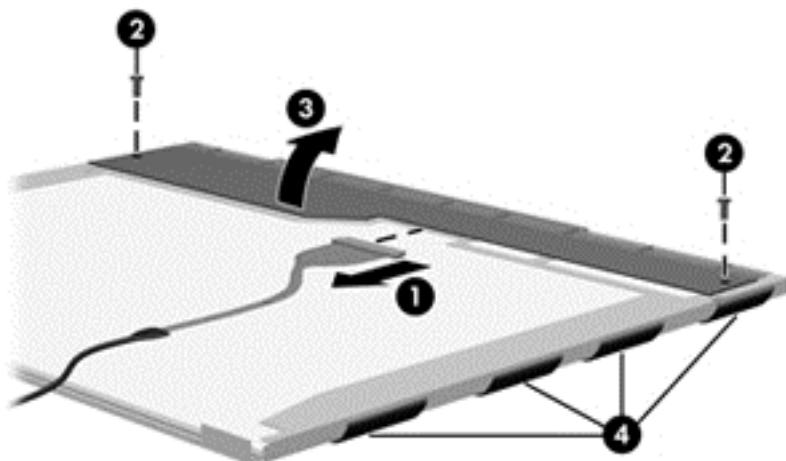
⚠️ WARNING! The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Remove the backlight from the backlight frame.

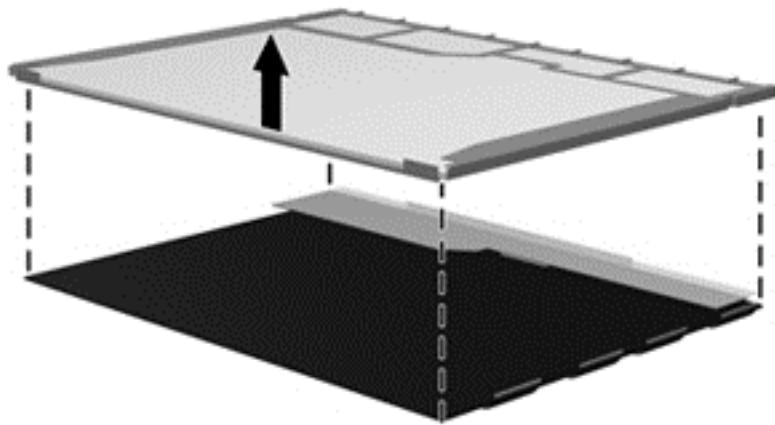


19. Disconnect the display cable **(1)** from the LCD panel.
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **(3)** from the display rear panel.

- 22.** Release the tape **(4)** that secures the LCD panel to the display rear panel.



- 23.** Remove the LCD panel.



- 24.** Recycle the LCD panel and backlight.

Index

A

AC adapter 7
action keys
 identifying 11
antennas
 illustrated 21
 removing 76, 77
 spare part number 24
audio, product description 2
audio-out (headphone)/audio-in
(microphone) jack 7

B

backup 105
backups 95, 99
base enclosure
 illustrated 19
 spare part number 26
battery
 illustrated 19
 removing 35
 spare part number 24
battery bay, identifying 12
battery lock and unlock latch,
 identifying 12
battery release latch 12
BIOS
 determining version 79, 83, 88
 downloading an update 80, 84,
 89
 updating 79, 83, 88

Bluetooth label 13
boot order
 changing 103
 changing HP Recovery Manager
 98
bottom 13
buttons
 left TouchPad 8
 power 10
 right TouchPad 8

C

cables, service considerations 31
caps lock light, identifying 9

chipset, product description 1

components

 bottom 12
 display 5
 front side 6
 left side 7
 right side 6
 top 8

computer major components,
 illustrated 15

Computer Setup

 navigating and selecting 87
 restoring factory settings 88

computer specifications 91

connector, power 7

connectors, service considerations
 31

D

deleted files
 restoring 96, 102

display assembly
 illustrated 16
 removing 43, 72
 spare part numbers 16

display assembly subcomponents
 illustrated 21
 removing 43, 72

display bezel
 illustrated 21
 removing 44, 73

display cable
 illustrated 21
 removing 75
 spare part number 24

display enclosure
 illustrated 22
 removing 77
 spare part number 24

display panel
 illustrated 21
 product description 2
 removing 45, 74, 75
 spare part number 25

display specifications 92

DVD±RW SuperMulti DL Drive

 specifications 94

E

electrostatic discharge 32
equipment guidelines 34
esc key, identifying 11
Ethernet, product description 2
external media cards 3
external monitor port, identifying 7

F

fan
 illustrated 19, 26
 removing 57

fn key, identifying 11

G

graphics, product description 1
grounding guidelines 32
guidelines
 equipment 34
 grounding 32
 packaging 33
 transporting 33
 workstation 33

H

hard drive
 illustrated 19, 22
 precautions 32
 product description 2
 removing 53
 spare part number 24
 specifications 93

Hard drive bracket
 illustrated 22
 spare part number 24

hard drive bracket
 removing 54

hard drive light 8

HDMI port
 identifying 7

- heat sink assembly**
 illustrated 19
 removing 19, 67
- hinges**
 illustrated 21
 removing 45, 74, 75
 spare part number 25, 28
- HP PC Hardware Diagnostics (UEFI)**
 downloading 81, 85, 90
 using 80, 84
- HP Recovery Manager** 102
 correcting boot problems 98
 starting 97
- HP Recovery media**
 creating 95
 recovery 98
- HP Recovery partition**
 recovery 97
 removing 98
- I**
- integrated numeric keypad,
 identifying 11
- internal display switch, identifying 5
- internal microphone, identifying 5
- J**
- jacks
 audio-out (headphone)/audio-in (microphone) 7
 network 7
 RJ-45 (network) 7
- K**
- keyboard
 illustrated 16
 product description 3
 removing 39
- keys
 action 11
 esc 11
 fn 11
 num lk 11
 Windows 11
- L**
- labels
 Bluetooth 13
 regulatory 13
 serial number 13
- service 13
 wireless certification 13
 WLAN 13
- latch, battery release 12
- left cover
 illustrated 23
- legacy support, USB 87
- lights
 AC adapter 7
 caps lock 9
 hard drive 8
 mute 9
 power 8
 RJ-45 (network) status 7
 wireless 9
- M**
- mass storage devices
 illustrated 22
 precautions 32
- memory card reader, identifying 6
- memory module
 illustrated 19
 product description 2
 removing 71
 spare part number 24
- microphone
 product description 2
- minimized image
 creating 97
- minimized image recovery 97
- model name 1
- mute light, identifying 9
- N**
- network jack, identifying 7
- num lk key, identifying 11
- O**
- operating system 4
- optical drive
 illustrated 19, 22
 precautions 32
 product description 2
 removing 37
 spare part number 26
 specifications 94
- optical drive rear bracket
 removing 37
- optical drive, identifying 6
- original system recovery 97, 102
- P**
- packaging guidelines 33
- plastic parts, service considerations 31
- Plastics Kit
 illustrated 23
 spare part number 25
- pointing device 3
- ports
 external monitor 7
 HDMI 7
 product description 3
 USB 2.0 6
 USB 3.0 7
- power button 9
 identifying 10
- power button board
 illustrated 17
 removing 50
 spare part number 24
- power connector cable
 illustrated 19
 removing 59
 spare part number 24
- power connector, identifying 7
- power cord
 requirements for all countries 113
 requirements for specific countries and regions 114
 set requirements 113
 spare part number 26
- power lights, identifying 8
- power requirements 3
- processors 1
- product description
 audio 2
 chipset 1
 display panel 2
 Ethernet 2
 external media cards 3
 graphics 1
 hard drive 2
 keyboard 3
 memory module 2
 microphone 2
 operating system 4
 optical drive 2
 pointing device 3
 ports 3

power requirements 3
 processors 1
 product name 1
 security 3
 serviceability 4
 video 2
 wireless 3
 product name 1
 product name and number,
 computer 13

R

recovering from the recovery discs 103
 recovering the original system 102
 recovery 102, 105
 discs 95, 98
 HP Recovery Manager 97, 102
 media 98
 options 96
 starting 97
 supported discs 95
 system 97
 USB flash drive 98
 using HP Recovery media 96
 recovery discs 99
 recovery media 99
 creating 95
 creating using HP Recovery
 Manager 96
 recovery partition
 removing 98
 recovery, system 102
 regulatory information
 regulatory label 13
 wireless certification labels 13
 removal/replacement
 preliminaries 31
 procedures 35, 43
 restore
 Windows File History 96
 restore points 100
 restoring the original system
 creating recovery media 99
 right cover
 illustrated 23
 RJ-45 (network) jack, identifying 7
 RJ-45 (network) status lights,
 identifying 7

RTC battery
 illustrated 19, 26
 removing 70
 Rubber Kit
 illustrated 23
 Rubber Kit, spare part number 25

S

Screw Kit, spare part number 25
 security cable slot, identifying 7
 security, product description 3
 serial number 13
 serial number, computer 13
 service considerations
 cables 31
 connectors 31
 plastic parts 31
 service labels
 locating 13
 serviceability, product description 4
 slots
 memory card 6
 security cable 7
 speakers
 illustrated 19
 removing 65
 spare part number 25
 specifications
 computer 91
 display 92
 DVD±RW SuperMulti DL Drive 94
 hard drive 93
 optical drive 94
 supported discs 99
 recovery 95
 system board
 removing 60
 spare part number 18, 60
 system recovery 97, 102
 system restore point
 creating 95
 system restore points 100
 creating 100

T

tools required 31
 top cover
 illustrated 17
 removing 47
 spare part number 25

TouchPad
 buttons 8
 TouchPad button board
 removing 51
 spare part number 17, 24, 51
 TouchPad zone, identifying 8
 transporting guidelines 33
 traveling with the computer 13

U

USB 2.0 ports, identifying 6
 USB 3.0 port, identifying 7
 USB board
 removing 64
 spare part number 18, 24
 USB legacy support 87

V

vents, identifying 7, 12
 video, product description 2

W

webcam
 identifying 5
 webcam light, identifying 5
 webcam/microphone cable
 illustrated 21
 removing 45, 74, 75
 spare part number 24
 webcam/microphone module
 illustrated 21
 removing 44, 74
 spare part number 25
 Windows
 File History 96
 restoring files 96
 system restore point 95
 Windows Backup and Restore
 restoring files 102
 Windows key, identifying 11
 wireless antennas
 illustrated 21
 removing 76, 77
 spare part number 24
 wireless certification label 13
 wireless light 9
 wireless, product description 3
 WLAN antennas, identifying 5
 WLAN device 13
 WLAN label 13

WLAN module
 illustrated 17
 removing 55
workstation guidelines 33
WWAN antennas, identifying 5