



HP Pavilion dv3 Entertainment PC

Maintenance and Service Guide

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MSG revision history

Revision	Publication date	Description
A	August 2010	Changed and added new spare part numbers.
B	December 2010	Added new spare part numbers to the following spare parts lists: <ul style="list-style-type: none">• Hard drives• Keyboards• Power cords• System boards

Safety warning notice

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- △ **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).
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1 Product description

Category	Description
Product Name	HP Pavilion dv3 Entertainment PC
Processors	<p>Intel® Quad Core™ processors (support Intel Turbo Boost Technology):</p> <ul style="list-style-type: none">• Intel Quad Core i7-840QM 1.86-GHz turbo processor, 8-MB L3 cache, 1333-MHz front side bus (FSB), 45-W• Intel Quad Core i7-820QM 1.73-GHz processor (SC turbo up to 3.06-GHz), 8-MB L3 cache, 45-W• Intel Quad Core i7-740QM 1.73-GHz turbo processor, 6-MB L3 cache, 1333-MHz FSB, 45-W• Intel Quad Core i7-720QM 1.60-GHz processor (SC turbo up to 2.80-GHz), 6-MB L3 cache, 45-W <hr/> <p>Intel Dual Core processors (support Intel Turbo Boost Technology):</p> <ul style="list-style-type: none">• Intel Dual Core i5-580M 2.66-GHz processor (SC turbo up to 3.33-GHz), 3-MB L3 cache• Intel Dual Core i5-560M 2.66-GHz processor (SC turbo up to 3.20-GHz), 3-MB L3 cache• Intel Dual Core i5-540M 2.53-GHz turbo processor, 3-MB L3 cache, 35-W• Intel Dual Core i5-520M 2.40-GHz turbo processor, 3-MB L3 cache, 35-W• Intel Dual Core i5-480M 2.66-GHz processor (turbo up to 2.93-GHz), 3-MB L3 cache, 1066-MHz• Intel Dual Core i5-460M 2.53-GHz turbo processor, 3-MB L3 cache• Intel Dual Core i5-450M 2.40-GHz turbo processor, 3-MB L3 cache, 35-W• Intel Dual Core i5-430M 2.26-GHz turbo processor, 3-MB L3 cache, 35-W• Intel Dual Core i3-390M 2.66-GHz processor, 3-MB L3 cache, 1066-MHz• Intel Dual Core i3-380M 2.53-GHz processor, 3-MB L3 cache, 1066-MHz FSB• Intel Dual Core i3-370M 2.40-GHz processor, 3-MB L3 cache, 1066-MHz FSB, 35-W• Intel Dual Core i3-350M 2.26-GHz processor, 3-MB L3 cache, 35-W <hr/> <p>Intel Pentium P6300 2.26-GHz processor 3-MB L3 cache, 1066-MHz</p> <hr/> <p>Intel Pentium P6200 2.13-GHz processor 3-MB L3 cache, 1066-MHz FSB</p> <hr/> <p>Intel Pentium P6100 2.00-GHz processor 3-MB L3 cache, 1066-MHz FSB</p> <hr/> <p>Intel Pentium P6000 1.86-GHz processor 3-MB L3 cache, 1066-MHz FSB</p>
Chipset	Intel HM55 Express chipset
Graphics	<p>ATI Park XT (ATI Mobility Radeon™ HD 5450 switchable discrete graphics with 512-MB of dedicated video memory (64 MB × 16 DDR3 @ 800 MHz × 4 PCs)</p> <p>ATI Park XT (ATI Mobility Radeon™ HD 5450 switchable discrete graphics with 1024-MB of dedicated video memory (128 MB × 16 DDR3 @ 800 MHz × 4 PCs)</p> <p>Pro 64-bit S3 package</p> <p>Supports BD playback with HD decode, and DX11 support and HDMI support</p>

Category	Description
Panel	<p>13.3-in high-definition (HD), LED BrightView (1366×768) SVA display</p> <p>All display assemblies include 2 wireless local area network (WLAN) antenna cables</p> <p>Supports privacy filter</p> <p>Supports 16:9 ultra wide aspect ratio</p> <p>Typical brightness: 200 nits</p> <p>Lighted logo on top bezel</p>
Memory	<p>2 customer-accessible/upgradable memory module slots</p> <p>Supports dual-channel memory</p> <p>Supports up to 16,384 GB of system RAM</p> <p>DDR3 1333-MHz, PC3-10600</p> <p>1333-MHz bus speed on computer models equipped with Quad Core processors</p> <p>1066-MHz bus speed on computer models equipped with Dual Core and Core Duo processors</p> <p>Supports the following configurations:</p> <ul style="list-style-type: none"> • 8192-MB total system memory (4096 × 2) • 6144-MB total system memory (4096 + 2148) • 4096-MB total system memory (2048 × 2) • 4096-MB total system memory (4096 × 1) • 3072-MB total system memory (2048 + 1024) • 2048-MB total system memory (1024 × 2) • 2048-MB total system memory (2048 × 1) • 1024-MB total system memory (1024 × 1, cannot be used on computer models equipped with Windows® 7, 64-bit operating systems)
Hard drives	<p>Supports 9.5-mm (2.5-in) hard drives</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Accelerometer (HP Mobile Data Protection System 3D) RAID 0/1 Support</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> • 750 GB (5400 rpm) • 640 GB (7200 rpm) • 640 GB (5400 rpm) • 500 GB (7200 rpm) • 320 GB (7200 rpm) • 250 GB (7200 rpm)
Optical drives	<p>Fixed (removal of 1 screw required)</p> <p>Customer-accessible</p> <p>Serial ATA</p>

Category	Description
	12.7-mm tray load
	Supports the following drives: <ul style="list-style-type: none"> • Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive • Blu-ray ROM DVD±RW Super Multi Double-Layer Drive (via SW Control) • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
	Supports boot from external USB diskette drive
Audio and video	Integrated dual-array digital microphones with appropriate software
	IDT92HD80 HD audio codec
	Dolby Advance Audio
	Supports Microsoft Premium Audio requirements
	Beam-forming, echo-cancellation, noise-suppression
	Supports 2 Pavilion-branded Dolby/Altec Lansing stereo speakers
	HP TrueVision low-light VGA camera (fixed, no tilt) with activity LED, 640×480 by 24 frames per second
Ethernet	Realtek 8111DL integrated 10/100/1000 GB network interface card (NIC)
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module:
	Two WLAN antennas built into display assembly
	Support for the following WLAN formats: <ul style="list-style-type: none"> • Intel Centrino Advanced-N 1000 802.11a/b/g/n WLAN module • Intel Centrino Ultimate-N 6300 802.11a/b/g/ WLAN module • Broadcom 4313/2070 802.11b/g/n WLAN module • Ralink RT 3090 802.11b/g/n WLAN module
	Integrated personal area network (PAN) options by way of Bluetooth® module:
	Support for no-WPAN option
	Broadcom Bluetooth
External media card	One Digital Media Reader slot, supporting the following optional formats: <ul style="list-style-type: none"> • Memory Stick (MS) • Memory Stick Pro (MSP) • MultiMediaCard (MMC) • Secure Digital High Capacity (SDHC) Memory card (standard and large size) • xD-Picture card (XD) (2)

Category	Description
Ports	<ul style="list-style-type: none"> • 3-pin AC power • Audio-in (mono microphone) • Audio-out (stereo headphone) • eSATA • HDMI version 1.3 supporting up to 1080p, 1920×1080 at 60 Hz and 1920×1200 at 60 Hz in DVI Mode • RJ-45 (Ethernet, includes link and activity lights) • USB 2.0 (3) • VGA (Dsub 15-pin) supporting 1900 × 1200 and 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)
Keyboard/pointing devices	<p>98%-scale, island-style keyboard with DuraCoat</p> <p>Clickpad with Mylar cover</p> <p>Supports Multitouch gestures (enabled by default)</p> <p>Taps enable by default</p>
Power requirements	<p>90-W HP Smart Adapter and 65-W Slim Travel Adapter AC adapters with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)</p> <p>Support for the following batteries:</p> <ul style="list-style-type: none"> • 9-cell, 2.80-Ah (93-Wh) Li-ion battery • 6-cell, 2.80-Ah (62-Wh) Li-ion battery • 6-cell, 2.55-Ah (55-Wh) Li-ion battery
Security	<p>Integrated fingerprint reader with Digital Persona software support</p> <p>Security cable slot</p>
Operating system	<p>Preinstalled:</p> <ul style="list-style-type: none"> • Windows® 7 Home Basic 32/64 • Windows 7 Home Premium 32/64 • Windows 7 Professional 32/64 • FreeDOS

2 External component identification

Top components

Display components



Item	Component	Description
(1)	Internal microphones (2)	Record sound.
(2)	Webcam light	On: The webcam is in use.
(3)	Webcam	Records video and captures still photographs.

Wireless antennas

On select computer models, at least 2 antennas send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer.



Component	Description
WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs.

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

To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

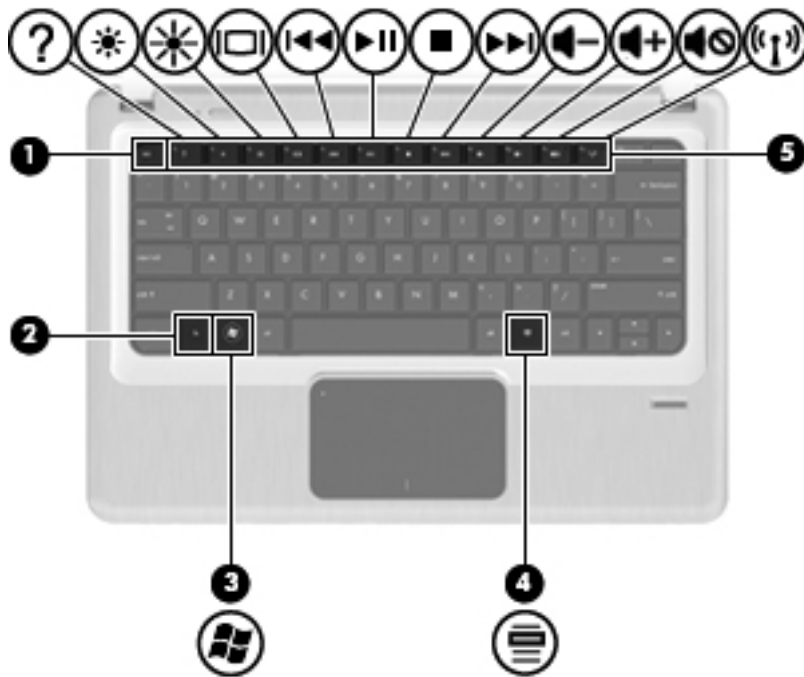
Power button and fingerprint reader (select models only)



Item	Component	Description
(1)	Power button*	<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>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select Start > Control Panel > System and Security > Power Options.</p>
(2)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

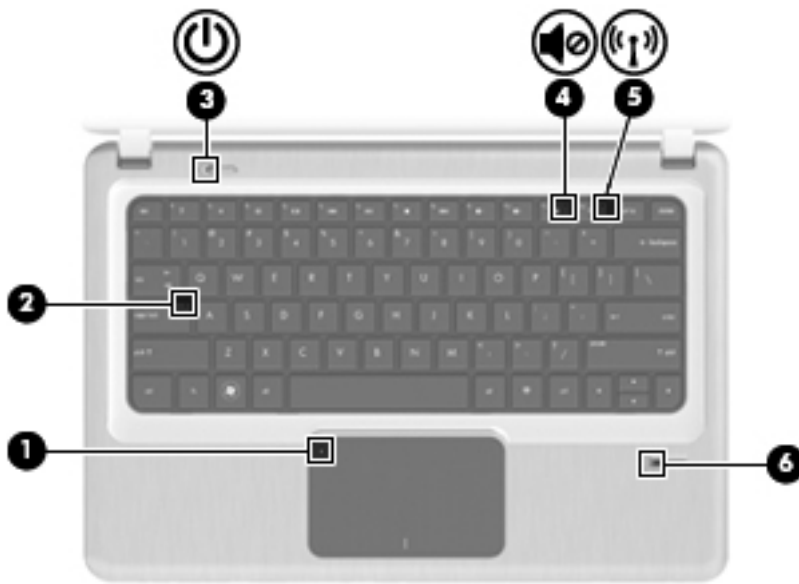
*This table describes factory settings. For information about changing factory settings, refer to the user guides located in Help and Support.

Keys



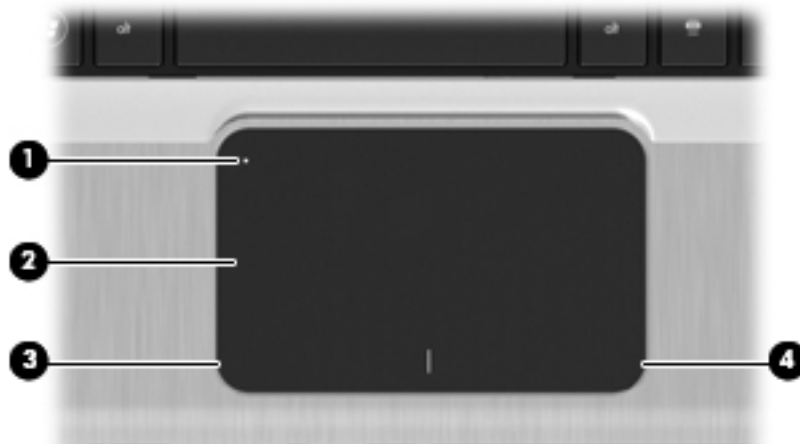
Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Displays system information when pressed in combination with the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)	Action keys	Execute frequently used functions.

Lights



Item	Component	Description
(1)	TouchPad light	On: TouchPad is disabled.
(2)	Caps lock light	On: Caps lock is on.
(3)	Power light	<ul style="list-style-type: none"> On: Power is on. Blinking: The computer is in the Sleep state. <p>NOTE: Another power light is located on the left side of the computer.</p>
(4)	Mute light	On: Speaker sound is off.
(5)	Wireless light	<ul style="list-style-type: none"> White: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on. <p>NOTE: Wireless devices are enabled at the factory.</p> <ul style="list-style-type: none"> Amber: All wireless devices are off.
(6)	Fingerprint reader light (select models only)	<ul style="list-style-type: none"> White: Fingerprint read is good. Amber: Fingerprint read is bad.

TouchPad



Item	Component	Description
(1)	TouchPad on/off button	Turns the TouchPad on and off. Quickly double-tap the button to turn the TouchPad on and off.
(2)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button*	Functions like the left button on an external mouse.
(4)	Right TouchPad button*	Functions like the right button on an external mouse.

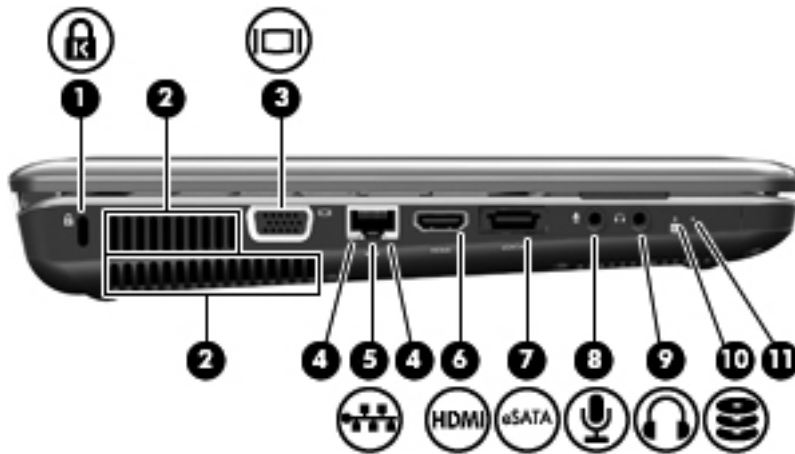
*This table describes factory settings. To view or change pointing device preferences, select **Start > Devices and Printers**. Then, right-click the icon representing your device, and select **Mouse settings**.

Front components



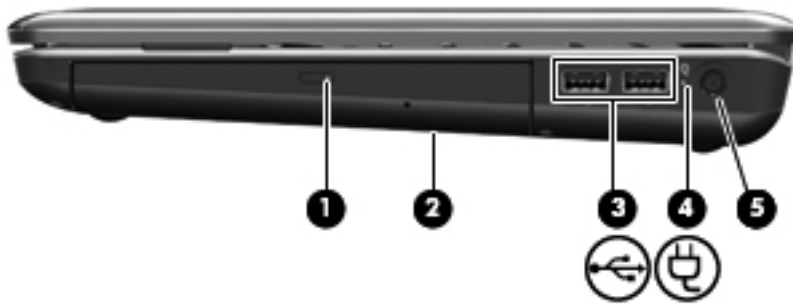
Item	Component	Description
(1)	Digital Media Slot	Supports the following optional digital card formats: <ul style="list-style-type: none">• Memory Stick (MS)• Memory Stick Pro (MSP)• MultiMediaCard (MMC)• Secure Digital High Capacity (SDHC) Memory card (standard and large size)• xD-Picture card (XD) (2)
(2)	Speakers (2)	Produce sound.

Left-side components



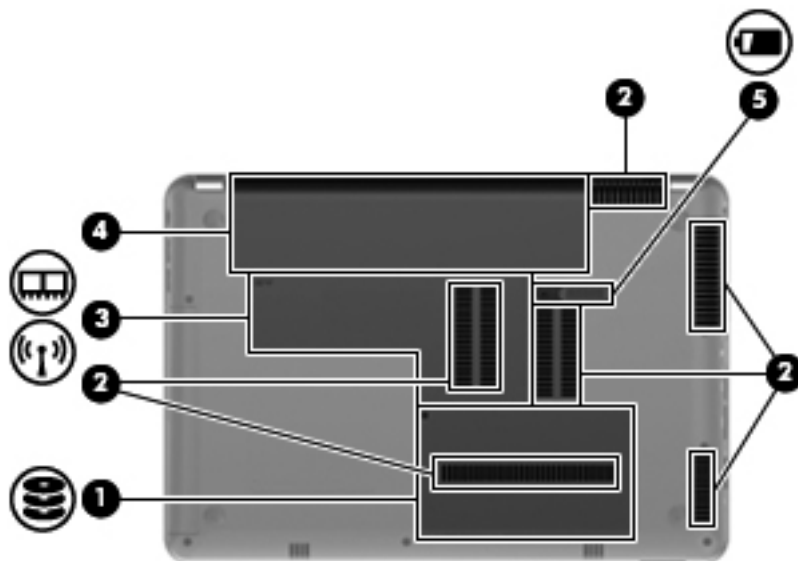
Item	Component	Description
(1)	Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Vents (2)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	RJ-45 (network) lights (2)	<ul style="list-style-type: none"> White: The network is connected. Amber: The network is showing activity.
(5)	RJ-45 (network) jack	Connects a network cable.
(6)	HDMI port	Connects an optional HDMI device.
(7)	eSATA/USB port	Connects high-performance eSATA components, such as an eSATA external hard drive, or connects an optional USB device.
(8)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(9)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(10)	Drive light	<ul style="list-style-type: none"> White: The hard drive is being accessed. Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.
(11)	Power light	<ul style="list-style-type: none"> On: Power is on. Blinking: The computer is in the Sleep state. NOTE: Another power light is located next to the power button.

Right-side components



Item	Component	Description
(1)	Optical drive light	<ul style="list-style-type: none"> On: The optical drive is being accessed. Off: The optical drive is idle.
(2)	Optical drive	Reads/Writes optical discs.
(3)	USB ports (2)	Connect optional USB devices.
(4)	Battery light	<ul style="list-style-type: none"> White: The computer is connected to external power and the battery is fully charged. Amber: The computer is connected to external power and the battery is charging. Blinking: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light continues to blink.
(5)	Power connector	Connects an AC adapter.

Bottom components

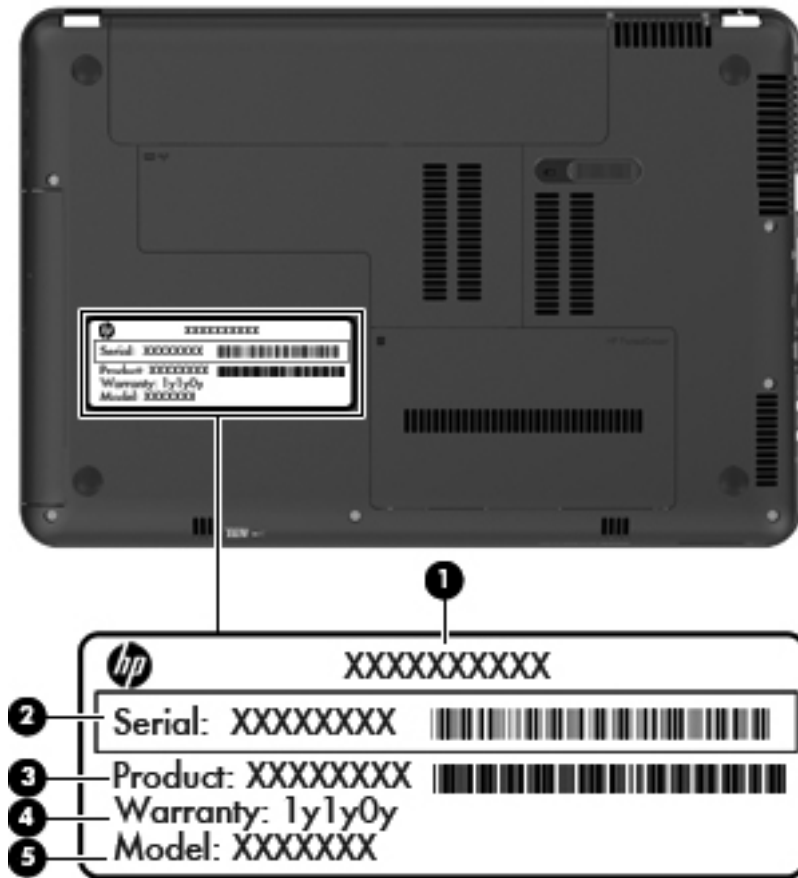


Item	Component	Description
(1)	Hard drive bay	Holds the hard drive.
(2)	Vents (6)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	Memory module/wireless module compartment	Holds a WLAN module and memory modules. NOTE: 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 computer functionality, and then contact technical support through Help and Support.
(4)	Battery bay	Holds the battery.
(5)	Battery release latch	Releases the battery from the battery bay.

3 Illustrated parts catalog

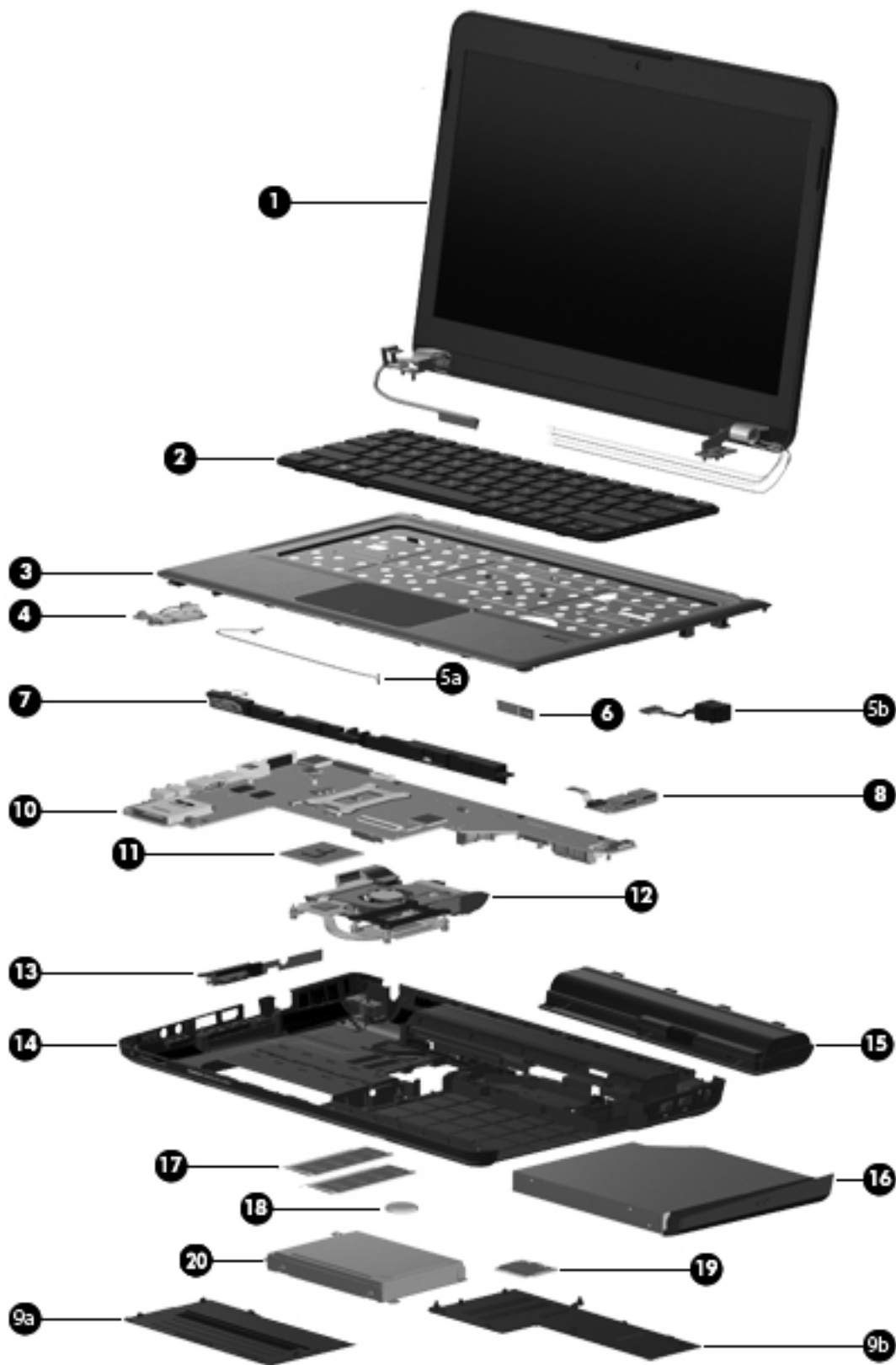
Serial number label

When ordering parts or requesting information, provide the computer serial number and model number provided on the serial number label.



Item	Component	Description
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician determine what components and parts are needed.
(5)	Warranty period	This number describes the duration of the warranty period for the computer.
(4)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Computer major components



Item	Description	Spare part number
(1)	13.3-in, BrightView, high-definition, LED display assembly (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers:	
	In black cherry	603903-001
	In brushed aluminum	603905-001
	In champagne	606021-001
	In shell white	606025-001
	In Sonoma red	606023-001
	NOTE: See Display assembly subcomponents on page 20 for more display component information and spare part numbers.	
(2)	Keyboard (includes a keyboard cable and 2 retention clips):	
	For use in Belgium	584161-A41
	For use in the Czech Republic	584161-221
	For use in Denmark, Finland, and Sweden	584161-DH1
	For use in France	584161-051
	For use in Germany	584161-041
	For use in Greece	584161-DJ1
	For use in Hungary	584161-211
	For use in Israel	584161-BB1
	For use in Italy	584161-061
	For use in Japan	584161-291
	For use in Latin America	584161-161
	For use in the Netherlands	584161-B31
	For use in Portugal	584161-131
	For use in Russia	584161-251
	For use in Saudi Arabia	584161-171
	For use in Slovenia	584161-BA1
	For use in South Korea	584161-AD1
	For use in Spain	584161-071
	For use in Switzerland	584161-BG1
	For use in Taiwan	584161-AB1
	For use in Thailand	584161-281
	For use in Turkey	584161-141
	For use in the United Kingdom and Singapore	584161-031
	For use in the United States and Canada	584161-001
(3)	Top cover (includes fingerprint reader board and bracket and TouchPad and cable):	

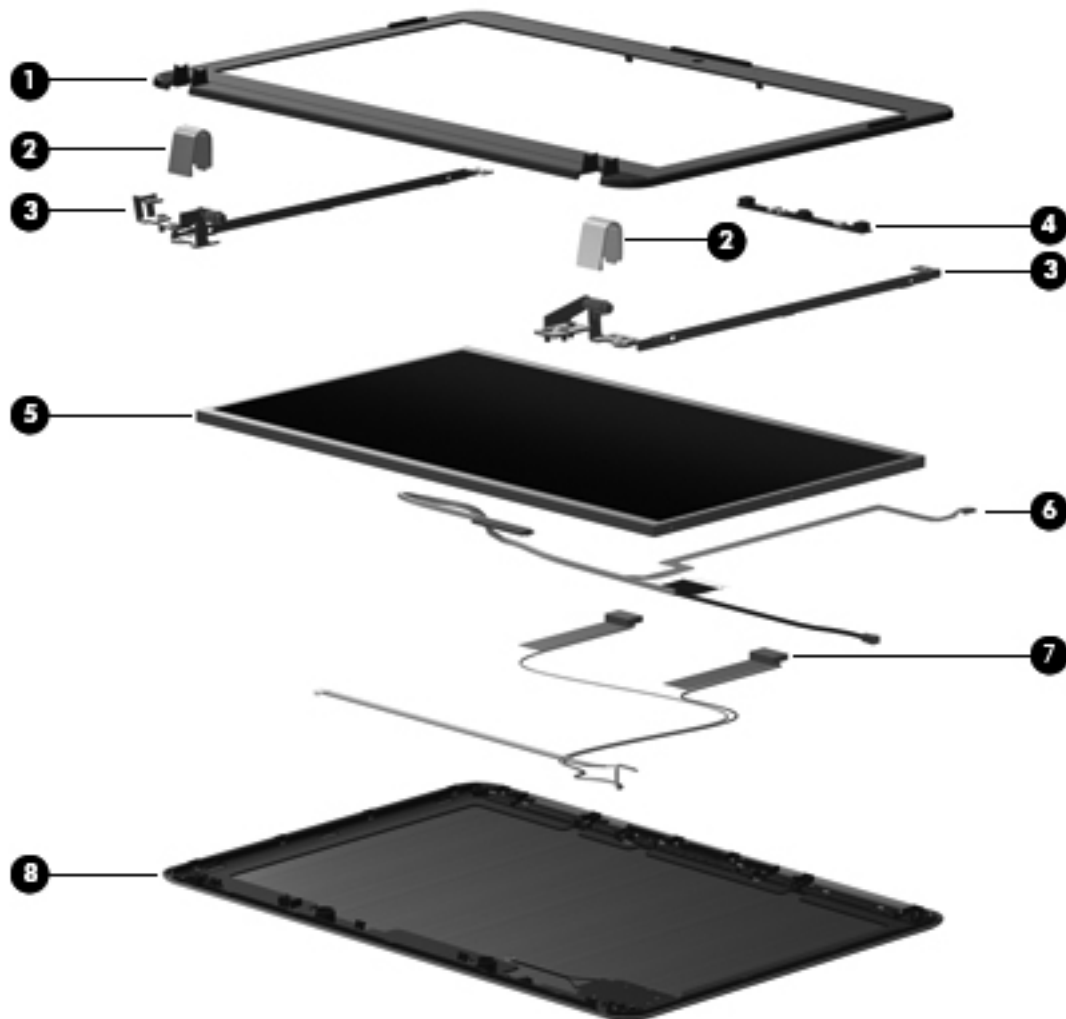
Item	Description	Spare part number
	In black cherry	601334-001
	In brushed aluminum	601335-001
	In champagne	606033-001
	In shell white	606035-001
	In Sonoma red	606034-001
(4)	Power button board (includes cable)	603923-001
	Cable Kit , includes:	603924-001
(5a)	Bluetooth module cable	
(5b)	Power connector cable	
	Fingerprint reader board cable (not illustrated)	
(6)	Bluetooth module	537921-001
	NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 603924-001. See Cable Kit on page 23 for more Cable Kit information.	
(7)	Speakers (include cable)	599426-001
(8)	USB board (includes cable)	603922-001
	Plastics Kit , includes:	599428-001
(9a)	Hard drive cover	
(9b)	Memory module/wireless module compartment cover	
	NOTE: See Plastics Kit on page 23 for more Plastics Kit information.	
(10)	System board (includes replacement thermal material):	
	For use only with Intel Core Quad processors	611348-001
	For use only with Intel Core Dual and Core2 processors	599414-001
	For use only with Intel Core Quad processors (1-GB)	622627-001
	For use only with Intel Core Dual and Core2 processors	622626-001
(11)	Processor (includes replacement thermal material):	
	Intel Core Quad i7-840QM 1.86-GHz turbo processor, 45W (1333-MHz FSB, 8-MB L3 cache)	612260-001
	Intel Core Quad i7-820QM 1.73-GHz (SC turbo up to 3.06-GHz), 45W processor (1333-MHz FSB, 8-MB L3 cache)	583053-001
	Intel Core Quad i7-740QM 1.73-GHz turbo processor, 45W (1333-MHz FSB, 6-MB L3 cache)	612259-001
	Intel Core Quad i7-720QM 1.60-GHz (SC turbo up to 2.80-GHz), 45W processor (1333-MHz FSB, 6-MB L3 cache)	586170-001
	Intel Core Dual i5-620M 2.26-GHz (SC turbo up to 2.53-GHz), 35W processor (1066-MHz FSB, 3-MB L3 cache)	587259-001
	Intel Core Dual i5-580M 2.66-GHz processor (SC turbo up to 3.33-GHz) (1066-MHz FSB, 3-MB L3 cache)	625825-001

Item	Description	Spare part number
	Intel Dual Core i5-560M 2.66-GHz processor (SC turbo up to 3.20-GHz) (1066-MHz FSB, 3-MB L3 cache)	625824-001
	Intel Core Dual i5-540M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	594188-001
	Intel Core Dual i5-520M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	594187-001
	Intel Dual Core i5-480M 2.66-GHz processor (turbo up to 2.93-GHz), 3-MB L3 cache, 1066-MHz	634693-001
	Intel Core Dual i5-460M 2.53-GHz turbo processor (1066-MHz FSB, 3-MB L3 cache)	626039-001
	Intel Core Dual i5-450M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	613585-001
	Intel Core Dual i5-430M 2.26-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	597624-001
	Intel Core Dual i5-390M 2.66-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	634692-001
	Intel Core Dual i5-380M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	625823-001
	Intel Core Dual i5-370M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	613584-001
	Intel Core Dual i3-350M 2.26-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	597623-001
	Intel Pentium P6300 2.26-GHz processor 3-MB L3 cache, 1066-MHz	635500-001
	Intel Pentium P6200 2.13-GHz processor (1066-MHz, 3-MB L3 cache)	625831-001
	Intel Pentium P6100 2.00-GHz processor (1066-MHz FSB, 3-MB L3 cache)	613587-001
	Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)	613586-001
	Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)	613586-001
	Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)	613586-001
	Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)	613586-001
(12)	Fan/heat sink assembly (includes replacement thermal material)	601336-001
(13)	Optical drive connector board	603921-001
(14)	Base enclosure (includes 4 rubber feet)	599422-001
	Rubber Feet Kit (not illustrated, includes 4 rubber feet)	599424-001
(15)	Battery:	
	9-cell, 93-Wh, 2.80-Ah, Li-ion battery	593550-001
	6-cell, 62-Wh, 2.80-Ah, Li-ion battery	593562-001
	6-cell, 55-Wh, 2.55-Ah, Li-ion battery	593554-001
(16)	Optical drive:	
	Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive	603918-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	603917-001
(17)	Memory modules (2, PC3, 10600, 1333-MHz):	
	4-GB	599092-001
	2-GB	598856-001
	1-GB	598859-001

Item	Description	Spare part number
(18)	RTC battery	449137-001
(19)	WLAN module:	
	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	580101-002
	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	582564-002
	Broadcom 4313/2070 802.11b/g/n WLAN module	600370-001
	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module	593530-001

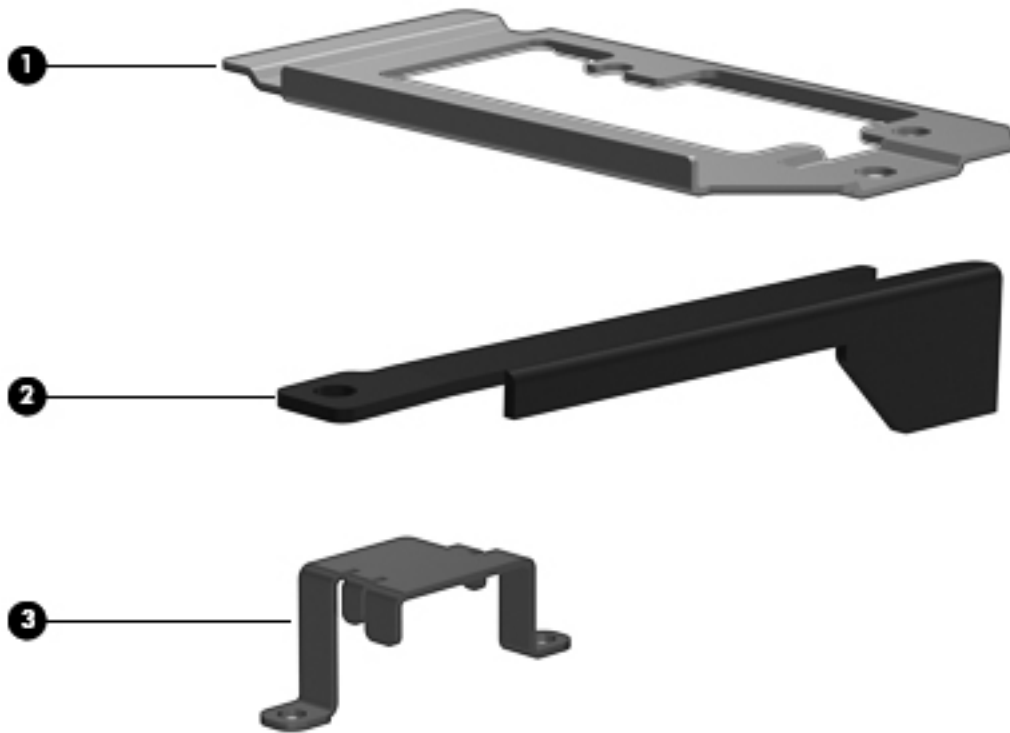
Item	Description	Spare part number
	Ralink RT 3090 802.11b/g/n WLAN module	602992-001
(20)	Hard drive (includes hard drive bracket and hard drive cable):	
	750-GB, 5400-rpm	634250-001
	640-GB,7200-rpm	621046-001
	640-GB, 5400-rpm	603785-001
	500-GB, 7200-rpm	603914-001
	320-GB, 7200-rpm	603913-001
	250-GB, 7200-rpm	603912-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and cable)	603916-001

Display assembly subcomponents



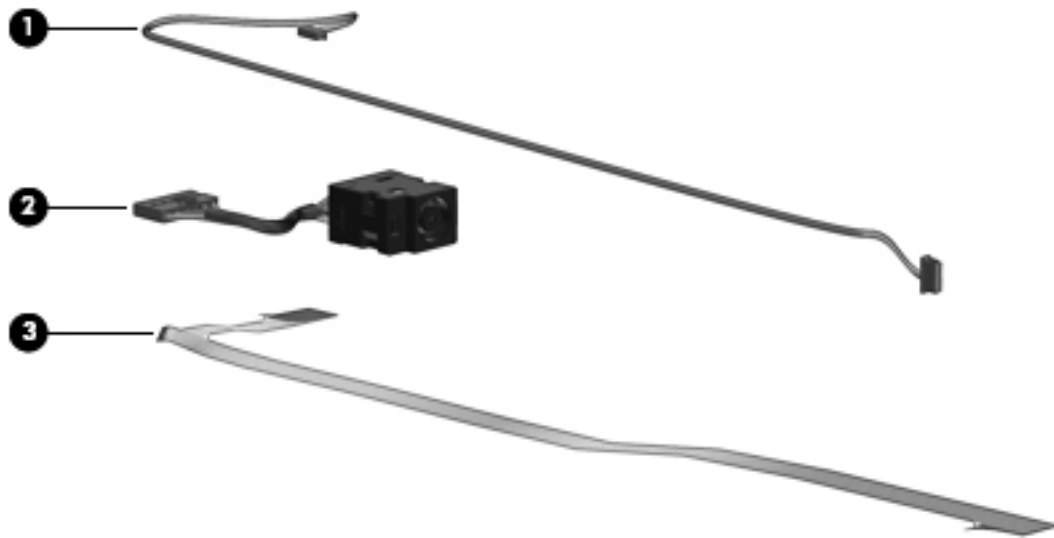
Item	Description	Spare part number
(1)	Display bezel	599417-001
(2)	Display hinge covers (2, also includes 2 Mylar screw covers)	603910-001
(3)	Display Hinge Kit (includes left and right display hinges)	599418-001
(4)	Webcam/microphone module (includes webcamera/microphone module cable)	599420-001
(5)	13.3-in, BrightView, high-definition, LED display panel	599416-001
(6)	Display Cable Kit (includes display panel cable)	599419-001
	Wireless Antenna Kit , includes:	599421-001
(7)	Left and right WLAN antenna transceivers and cables	
(8)	Display enclosure (includes logo light and cable):	
	In black cherry	601331-001
	In brushed aluminum	601332-001
	In champagne	606027-001
	In shell white	606031-001
	In Sonoma red	606029-001
	Display Screw Kit (not illustrated)	603911-001

Bracket Kit



Item	Description	Spare part number
	Bracket Kit , includes:	603925-001
(1)	Fingerprint reader board bracket	
(2)	Optical drive connector board bracket	
(3)	Power connector bracket	

Cable Kit



Item	Description	Spare part number
	Cable Kit , includes:	603924-001
(1)	Bluetooth module cable	
(2)	Power connector cable	
(3)	Fingerprint reader board cable	

Plastics Kit



Item	Description	Spare part number
	Plastics Kit , includes:	599428-001

Item	Description	Spare part number
(1)	Hard drive cover (includes one captive screw, secured by a C-clip)	
(2)	Memory module/wireless module compartment cover (include one captive screw, secured by a C-clip)	

Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (includes hard drive brackets and hard drive cables):	
	750-GB, 5400-rpm	634250-001
	640-GB, 7200-rpm	621046-001
	640-GB, 5400-rpm	603785-001
	500-GB, 7200-rpm	603914-001
	320-GB, 7200-rpm	603913-001
	250-GB, 7200-rpm	603912-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and cable)	603916-001
(2)	Optical drive:	
	Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive	603918-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	603917-001

Miscellaneous parts

Description	Spare part number
HP Smart AC adapter:	

Description	Spare part number
90W PFC RC/V	463955-001
90W PFC RC/V 3W	609940-001
90W PFC RC/V EM	535593-001
90W PFC RC/V EM 3W	609947-001
Power cord:	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom and Singapore	490371-031
For use in the United States and Canada	490371-001
Screw Kit	599425-001

Sequential part number listing

Spare part number	Description
409371-001	Power cord for use in the United States and Canada
409371-011	Power cord for use in Australia and New Zealand
409371-021	Power cord for use in Europe, the Middle East, and Africa
409371-031	Power cord for use in the United Kingdom and Singapore
409371-061	Power cord for use in Italy
409371-081	Power cord for use in Denmark
409371-111	Power cord for use in Switzerland
409371-201	Power cord for use in Brazil
409371-291	Power cord for use in Japan

Spare part number	Description
409371-AA1	Power cord for use in the People's Republic of China
409371-AB1	Power cord for use in Taiwan
409371-AD1	Power cord for use in South Korea
409371-AR1	Power cord for use in South Africa
409371-BB1	Power cord for use in Israel
449137-001	RTC battery
463955-001	90W PFC RC/V HP Smart AC adapter
490371-D01	Power cord for use in Argentina
535593-001	90W PFC RC/V EM HP Smart AC adapter
537921-001	Bluetooth module
	NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 603924-001. See Cable Kit on page 23 for more Cable Kit information.
580101-002	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe

Spare part number	Description
582564-002	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
583053-001	Intel Core Quad i7-820QM 1.73-GHz (SC turbo up to 3.06-GHz), 45W processor (1333-MHz FSB, 8-MB L3 cache; includes replacement thermal material)
584161-001	Keyboard for use in the United States and Canada (includes cable and 2 retention clips)
584161-031	Keyboard for use in the United Kingdom and Singapore (includes cable and 2 retention clips)
584161-041	Keyboard for use in Germany (includes cable and 2 retention clips)
584161-051	Keyboard for use in France (includes cable and 2 retention clips)
584161-061	Keyboard for use in Italy (includes cable and 2 retention clips)
584161-071	Keyboard for use in Spain (includes cable and 2 retention clips)
584161-131	Keyboard for use in Portugal (includes cable and 2 retention clips)
584161-141	Keyboard for use in Turkey (includes cable and 2 retention clips)
584161-161	Keyboard for use in Latin America (includes cable and 2 retention clips)
584161-171	Keyboard for use in Saudi Arabia (includes cable and 2 retention clips)
584161-211	Keyboard for use in the Czech Republic (includes cable and 2 retention clips)
584161-221	Keyboard for use in Hungary (includes cable and 2 retention clips)
584161-251	Keyboard for use in Russia (includes cable and 2 retention clips)
584161-281	Keyboard for use in Thailand (includes cable and 2 retention clips)
584161-291	Keyboard for use in Japan (includes cable and 2 retention clips)
584161-A41	Keyboard for use in Belgium (includes cable and 2 retention clips)
584161-AB1	Keyboard for use in Taiwan (includes cable and 2 retention clips)
584161-AD1	Keyboard for use in South Korea (includes cable and 2 retention clips)
584161-B31	Keyboard for use in the Netherlands (includes cable and 2 retention clips)
584161-BA1	Keyboard for use in Slovenia (includes cable and 2 retention clips)

Spare part number	Description
584161-BB1	Keyboard for use in Israel (includes cable and 2 retention clips)
584161-BG1	Keyboard for use in Switzerland (includes cable and 2 retention clips)
584161-DH1	Keyboard for use in Denmark, Finland, and Sweden (includes cable and 2 retention clips)
584161-DJ1	Keyboard for use in Greece (includes cable and 2 retention clips)
586170-001	Intel Core Quad i7-720QM 1.60-GHz (SC turbo up to 2.80-GHz), 45W processor (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
587259-001	Intel Core Dual i5-620M 2.26-GHz (SC turbo up to 2.53-GHz), 35W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
593530-001	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module
593550-001	9-cell, 93-Wh, 2.80-Ah, Li-ion battery
593554-001	6-cell, 55-Wh, 2.55-Ah, Li-ion battery
593562-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
594187-001	Intel Core Dual i5-520M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
594188-001	Intel Core Dual i5-540M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
597623-001	Intel Core Dual i3-350M 2.26-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
597624-001	Intel Core Dual i5-430M 2.26-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
598856-001	2-MB memory module (PC3, 10600, 1333-MHz)
598859-001	1-MB memory module (PC3, 10600, 1333-MHz)
599092-001	4-MB memory module (PC3, 10600, 1333-MHz)
599414-001	System board for use only with Intel Core Dual and Core2 processors (includes replacement thermal material)
599416-001	13.3-in, BrightView, high-definition, LED display panel
599417-001	Display bezel
599418-001	Display Hinge Kit (includes left and right display hinges)
599419-001	Display Cable Kit (includes display panel cable)
599420-001	Webcam/microphone module (includes webcamera/microphone module cable)
599421-001	Wireless Antenna Kit (includes left and right WLAN antenna transceivers and cables)
599422-001	Base enclosure (includes 4 rubber feet)
599424-001	Rubber Feet Kit (includes 4 rubber feet)
599425-001	Screw Kit
599426-001	Speakers (include cable)
599428-001	Plastics Kit

NOTE: See [Plastics Kit on page 23](#) for more Plastics Kit information.

Spare part number	Description
601331-001	Display enclosure in black cherry (includes logo light and cable)
601332-001	Display enclosure in brushed aluminum (includes logo light and cable)
601334-001	Top cover in black cherry (includes fingerprint reader board and bracket and TouchPad and cable):
601335-001	Top cover in brushed aluminum (includes fingerprint reader board and bracket and TouchPad and cable):
601336-001	Fan/heat sink assembly (includes replacement thermal material)
603903-001	13.3-in, BrightView, high-definition, LED display assembly in black cherry (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers):
603905-001	13.3-in, BrightView, high-definition, LED display assembly in brushed aluminum (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers):
603910-001	Display hinge covers (includes 2 Mylar screw covers)
603911-001	Display Screw Kit
603912-001	250-GB, 7200-rpm hard drive (includes hard drive bracket and hard drive cable)
603913-001	320-GB, 7200-rpm hard drive (includes hard drive bracket and hard drive cable)
603914-001	500-GB, 7200-rpm hard drive (includes hard drive bracket and hard drive cable)
603916-001	Hard Drive Hardware Kit (includes hard drive bracket and cable)
603917-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe
603918-001	Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive
603921-001	Optical drive connector board
603922-001	USB board (includes cable)
603923-001	Power button board (includes cable)
603925-001	Bracket Kit
	NOTE: See Bracket Kit on page 22 for more Cable Kit information.
603785-001	640-GB, 5400-rpm hard drive (includes hard drive bracket and hard drive cable)
606021-001	13.3-in, BrightView, high-definition, LED display assembly in champagne (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers):
606023-001	13.3-in, BrightView, high-definition, LED display assembly in Sonoma red (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers):
606025-001	13.3-in, BrightView, high-definition, LED display assembly in shell white (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers):
606027-001	Display enclosure in champagne (includes logo light and cable)
606029-001	Display enclosure in Sonoma red (includes logo light and cable)
606031-001	Display enclosure in shell white (includes logo light and cable)
606033-001	Top cover in champagne (includes fingerprint reader board and bracket and TouchPad and cable):
606034-001	Top cover in Sonoma red (includes fingerprint reader board and bracket and TouchPad and cable):
606035-001	Top cover in shell white (includes fingerprint reader board and bracket and TouchPad and cable):

Spare part number	Description
603924-001	Cable Kit NOTE: See Cable Kit on page 23 for more Cable Kit information.
609940-001	90W PFC RC/V 3W HP Smart AC adapter
609947-001	90W PFC RC/V EM 3W HP Smart AC adapter
611348-001	System board for use only with Intel Core Quad processors (includes replacement thermal material)
612259-001	Intel Core Quad i7-740QM 1.73-GHz turbo processor, 45W (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
612260-001	Intel Core Quad i7-840QM 1.86-GHz turbo processor, 45W (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
613584-001	Intel Core Dual i5-370M 2.40-GHz, 35W processor (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
613585-001	Intel Core Dual i5-450M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
613586-001	Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
613587-001	Intel Pentium P6100 2.00-GHz processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
621046-001	640-GB, 7200-rpm hard drive (includes hard drive bracket and hard drive cable)
625823-001	Intel Dual Core i3-380M 2.530-GHz processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
625824-001	Intel Dual Core i5-560M 2.66-GHz processor (SC turbo up to 3.20-GHz) (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
625825-001	Intel Core Dual i5-580M 2.66-GHz processor (SC turbo up to 3.33-GHz) (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
625831-001	Intel Pentium P6200 2.13-GHz processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
626039-001	Intel Core Dual i5-460M 2.53-GHz turbo processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
630819-001	Intel Core Dual i5-460M 2.53-GHz turbo processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
630820-001	Intel Core Dual i5-460M 2.53-GHz turbo processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
630821-001	Intel Core Dual i5-460M 2.53-GHz turbo processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
634250-001	750-GB, 5400-rpm hard drive (includes hard drive bracket and hard drive cable)
634692-001	Intel Core Dual i5-390M 2.66-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)
634693-001	Intel Dual Core i5-480M 2.66-GHz processor (turbo up to 2.93-GHz), 3-MB L3 cache, 1066-MHz
635500-001	Intel Pentium P6300 2.26-GHz processor 3-MB L3 cache, 1066-MHz

4 Removal and replacement procedures

Preliminary replacement 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.

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, 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

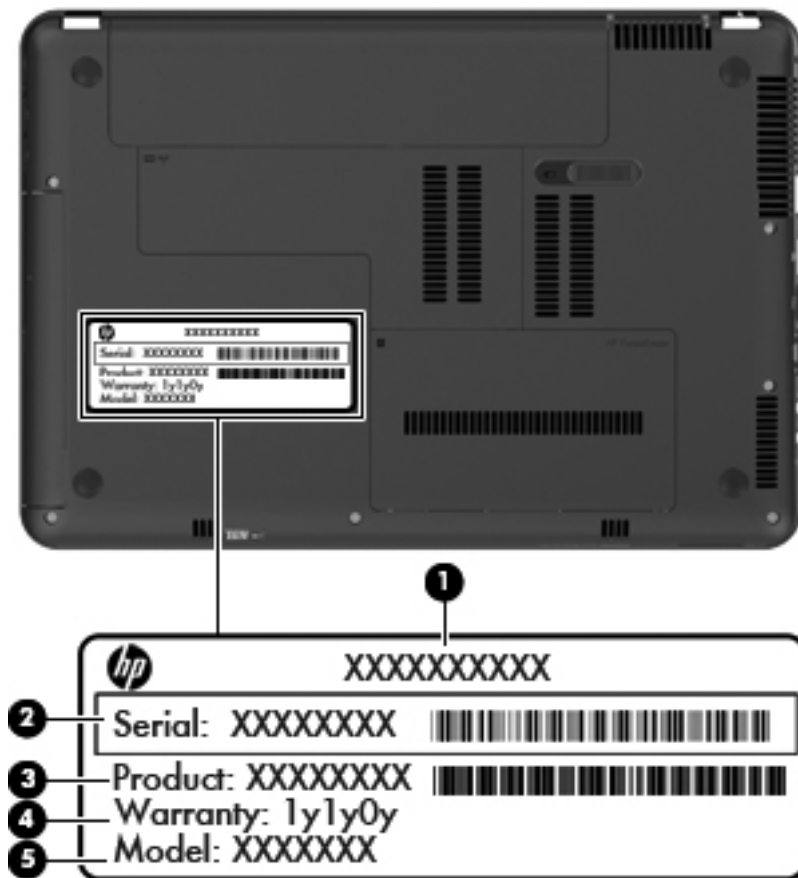
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 59 screws that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

Serial number label

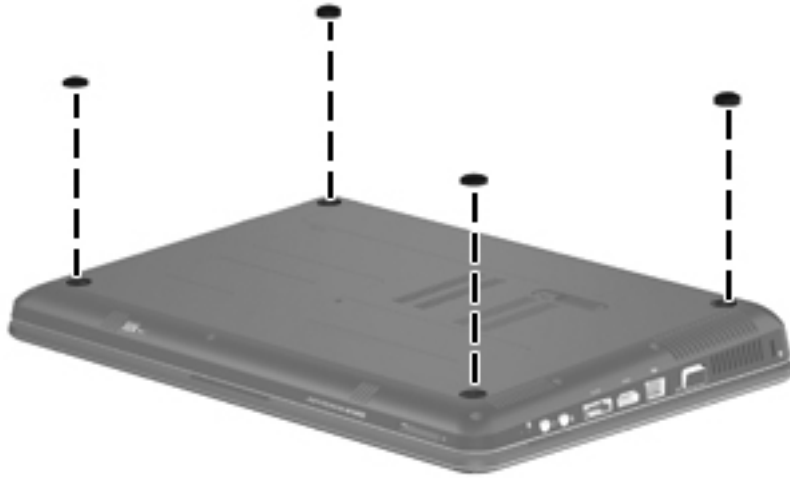
When ordering parts or requesting information, provide the computer serial number and model number provided on the serial number label.



Item	Component	Description
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician determine what components and parts are needed.
(5)	Warranty period	This number describes the duration of the warranty period for the computer.
(4)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 599424-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

Description	Spare part number
9-cell, 93-Wh, 2.80-Ah, Li-ion battery	593550-001
6-cell, 62-Wh, 2.80-Ah, Li-ion battery	593562-001
6-cell, 55-Wh, 2.55-Ah, Li-ion battery	593554-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside down on a flat surface, with the front toward you.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the front edge of the battery **(2)** upward.



4. Remove the battery from the computer.

To insert the battery, insert the rear edge of the battery into the battery bay, and pivot the front edge of the battery downward until it is seated. The battery release latch automatically locks the battery into place.

Memory module

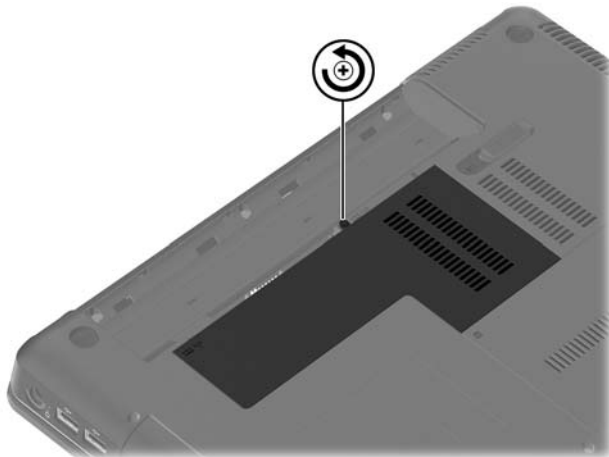
Description	Spare part number
4-GB (PC3, 10600, 1333-MHz)	599092-001
2-GB (PC3, 10600, 1333-MHz)	598856-001
1-GB (PC3, 10600, 1333-MHz)	598859-001

Before removing the 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 38](#)).


Remove the memory module:

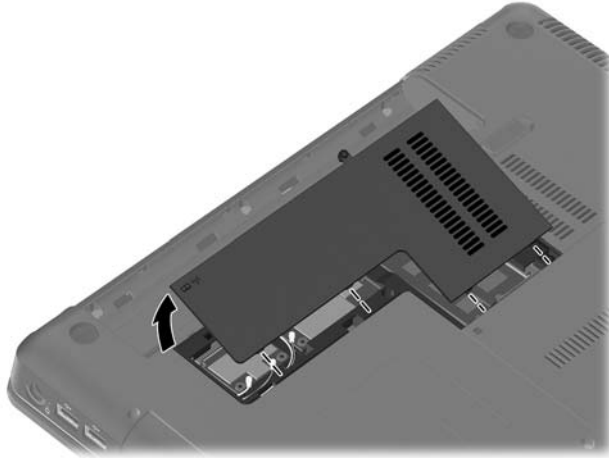
1. Position the computer with the front toward you.
2. Loosen the captive screw that secures the memory module/wireless module compartment cover to the computer.



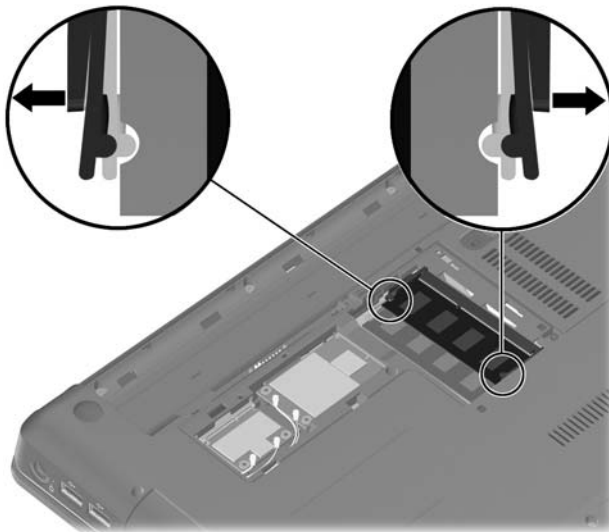
3. Pivot the rear edge of the memory module/wireless module compartment cover upward.

4. Pivot the rear edge of the memory module/wireless module compartment cover upward. Remove the memory module/wireless module compartment cover. The memory module/wireless module compartment cover is included in the Plastics Kit, spare part number 599428-001.


 **NOTE:** The top memory module slot contains the expansion memory module. The memory module slot contains the primary memory module.

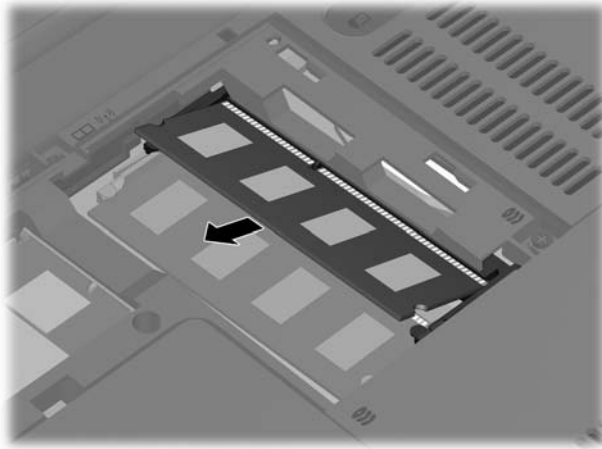


5. Spread the retaining tabs on each side of the memory module slot to release the memory module. (The memory module tilts up.)



6. Remove the memory module by pulling it away from the slot at an angle.

 **NOTE:** Memory modules are designed with a notch to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a memory module.

WLAN module

Description	Spare part number
Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	580101-002
Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	582564-002
Broadcom 4313/2070 802.11b/g/n WLAN module	600370-001
Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module	593530-001
Ralink RT 3090 802.11b/g/n WLAN module	602992-001


△ **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 technical support.

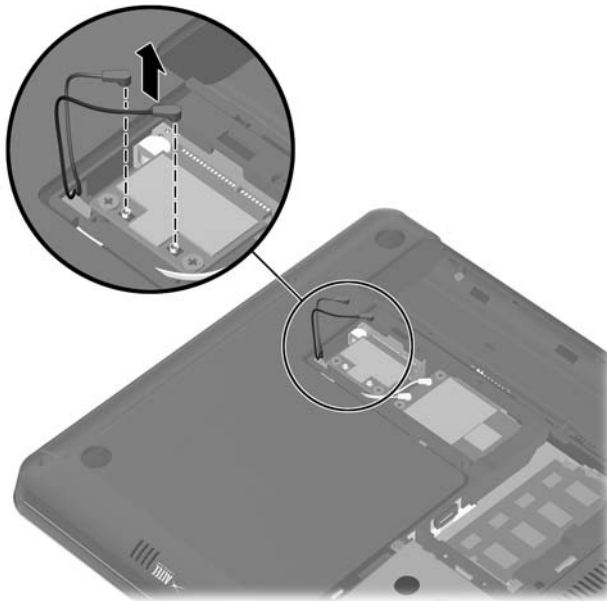
Before removing the WLAN module, follow these steps:

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 38](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 39](#)).

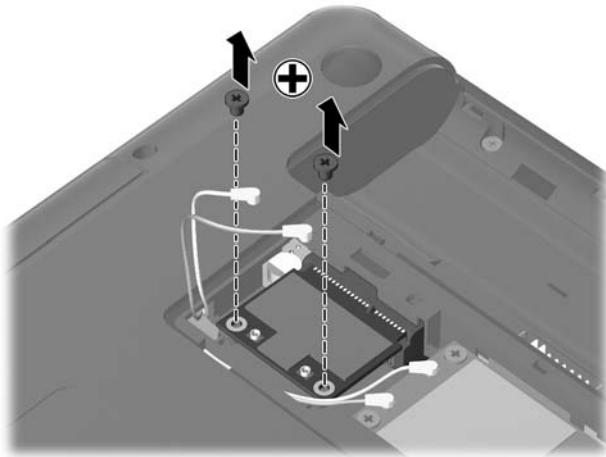
Remove the WLAN module:

1. Disconnect the WLAN antenna cables from the terminals on the WLAN module.


 **NOTE:** The 1/black WLAN antenna cable is connected to the WLAN module 1/Main terminal. The 2/gray WLAN antenna cable is connected to the WLAN module 2/Aux terminal.

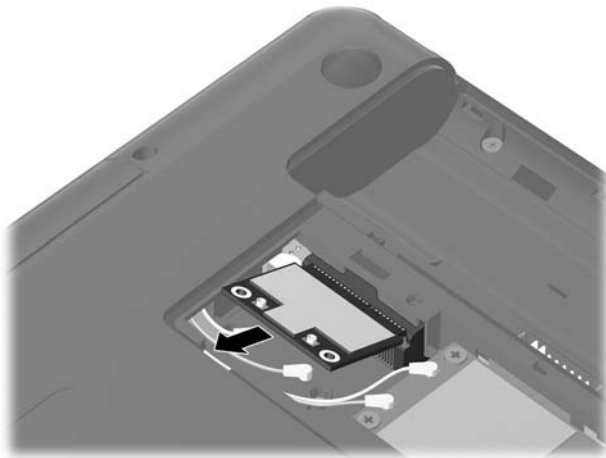



2. Remove the two Phillips PM2.0×4.0 screws that secure the WLAN module to the system board. (The WLAN module tilts up.)

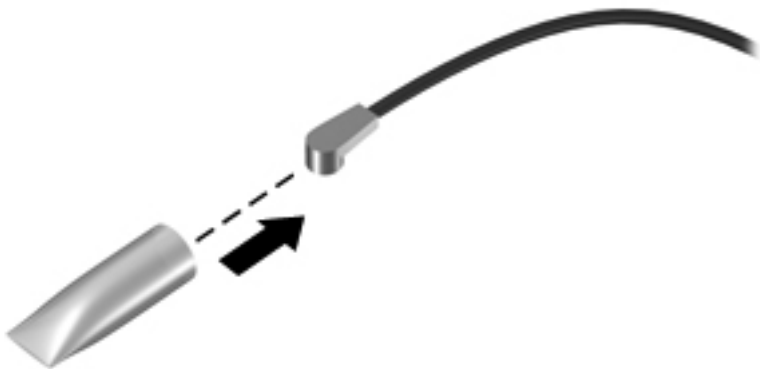


3. Remove the WLAN module by pulling the module away from the slot at an angle.

 **NOTE:** WLAN modules are designed with a notch (4) to prevent incorrect insertion of the WLAN module into the WLAN module slot.



 **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.

RTC battery

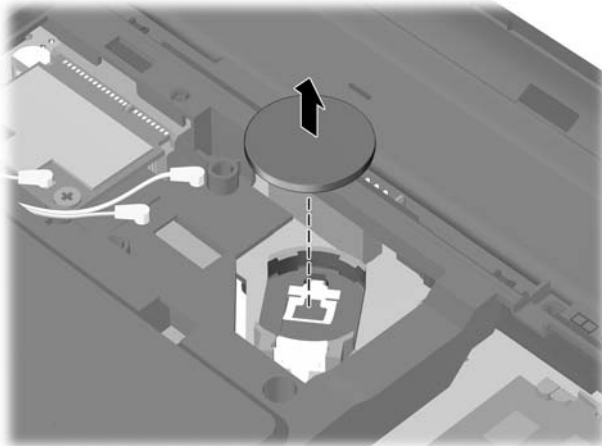
Description	Spare part number
RTC battery	449137-001

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 38](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 39](#)).


Remove the RTC battery:

- ▲ Remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery. When installing the RTC battery, make sure the “+” sign faces up.

Hard drive

 **NOTE:** The hard drive spare part kit includes a hard drive bracket and hard drive connector cable.

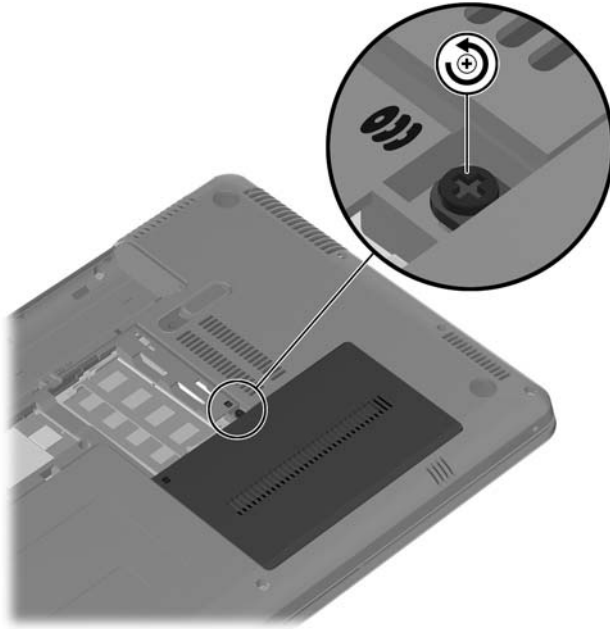
Description	Spare part number
750-GB, 5400-rpm	634250-001
640-GB, 7200-rpm	621046-001
640-GB, 5400-rpm	603785-001
500-GB, 7200-rpm	603914-001
320-GB, 7200-rpm	603913-001
250-GB, 7200-rpm	603912-001
Hard Drive Hardware Kit (includes hard drive bracket and cable)	603916-001

Before removing the hard drive, follow these steps:

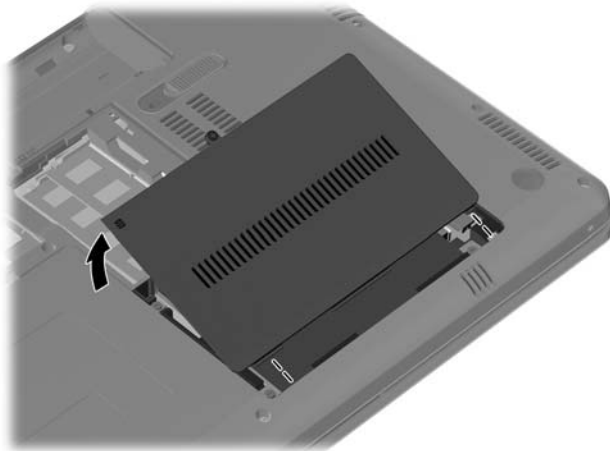
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 39](#)).
6. Remove the hard drive cover (see [Hard drive on page 46](#)).

Remove the hard drive:

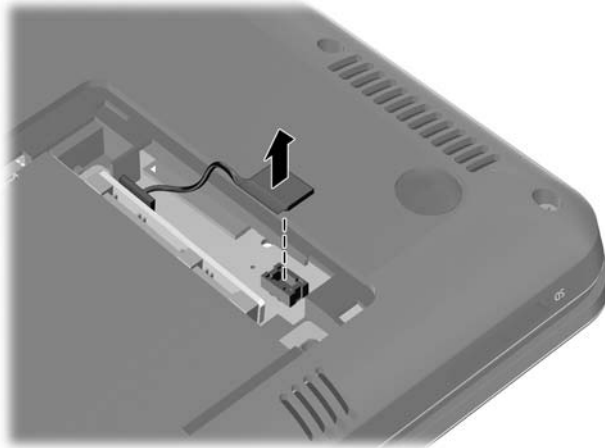
1. Loosen the captive screw that secures the hard drive cover to the computer.



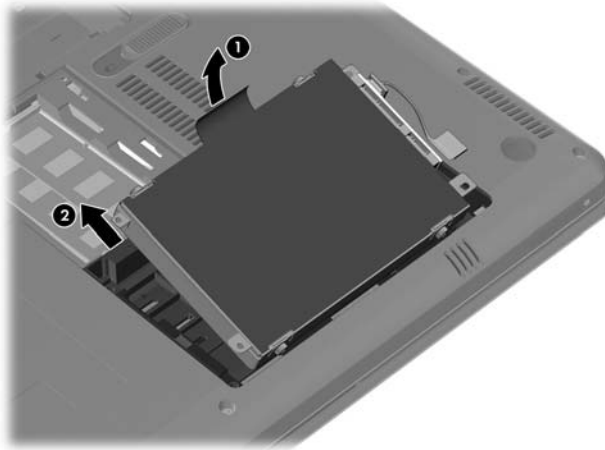
2. Pivot the rear edge of the hard drive cover, and then remove the hard drive cover. The hard drive cover is included in the Plastics Kit, spare part number 599428-001.



3. Disconnect the hard drive cable from the system board.

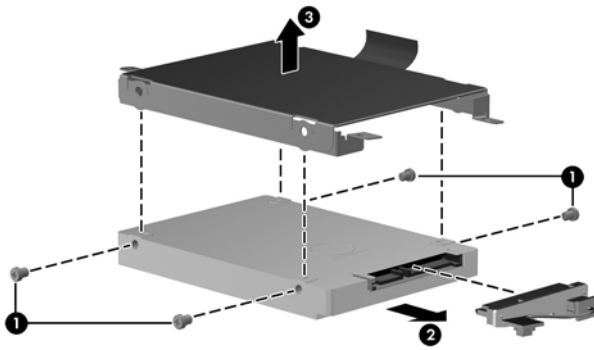


4. Use the Mylar tab (1) to lift the rear edge of the hard drive until it rests at an angle.
5. Remove the hard drive (2) by sliding it up and back at an angle.



6. If it is necessary to replace the hard drive bracket, remove the four Phillips PM3.0×3.0 screws (1) that secure the bracket to the hard drive.
7. If it is necessary to replace the hard drive connector cable, disconnect the cable (2) from the hard drive. The hard drive bracket and hard drive connector cable are included in the Hard Drive Hardware Kit, spare part number 603916-001.

- Lift the hard drive bracket straight up **(3)** and remove the bracket from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

Optical drive

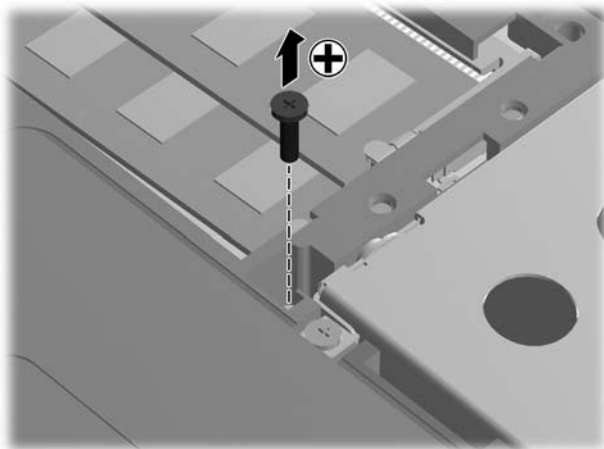
Description	Spare part number
Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive	603918-001
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	603917-001

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 38](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 39](#)).
6. Remove the hard drive cover (see [Hard drive on page 46](#)).

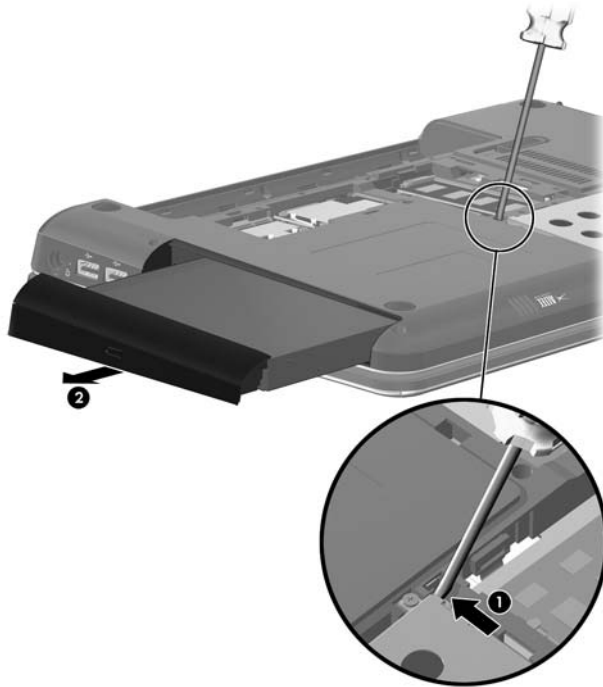
Remove the optical drive:

1. Remove the PM2.5×7.0 screw that secures the optical drive to the base enclosure.



2. Insert a flat-bladed screwdriver into the access hole (1) next to the screw was just removed.

- Slide the optical drive **(2)** to the left to disconnect it from the system board.




- Remove the optical drive.
- If it is necessary to replace the optical drive bracket, remove the PM2.0×4.0 screws **(1)** that secure the optical drive bracket to the optical drive.
- Remove the optical drive bracket **(2)**.



Reverse this procedure to install the optical drive.

Top cover

 **NOTE:** The top cover spare part kit includes the fingerprint reader board and bracket and the TouchPad and cable.

Description	Spare part number
In black cherry	601334-001
In brushed aluminum	601335-001
In champagne	606033-001

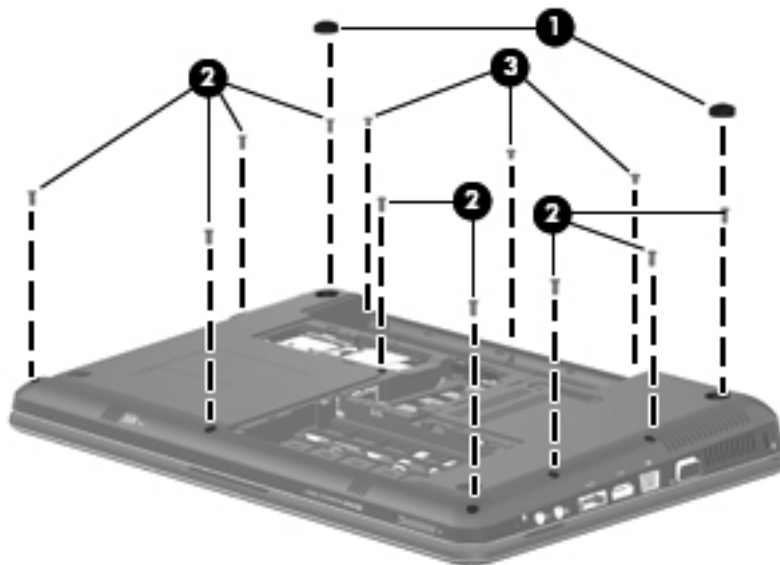
Description	Spare part number
In shell white	606035-001
In Sonoma red	606034-001

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 38](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 39](#)).
6. Remove the optical drive (see [Optical drive on page 50](#)).

Remove the top cover:

1. Remove the two rubber feet **(1)** from the rear corners of the base enclosure. The rubber feet are included in the Rubber Feet Kit, spare part number 599424-001.
2. Remove the nine Phillips PM2.5×7.0 screws **(2)** that secure the top cover to the computer.
3. Remove the three Phillips PM2.0×4.0 screws **(3)** that secure the top cover to the computer in the battery bay.



4. Turn the computer display-side up, with the front toward you.
5. Open the computer as far as it will open.
6. Lift the front edge of the top cover **(1)** until the top cover cables are accessible.

7. Release the zero insertion force (ZIF) connector **(2)** to which the TouchPad cable is attached, and then disconnect the TouchPad cable from the system board.
8. Release the ZIF connector **(3)** to which the keyboard cable is attached, and then disconnect the keyboard cable from the system board.
9. Release the ZIF connector **(4)** to which the power button board cable is attached, and then disconnect the power button board cable from the system board.



10. Remove the top cover.

Reverse this procedure to install the top cover.

Power button board

Description	Spare part number
Power button board (includes cable)	603923-001

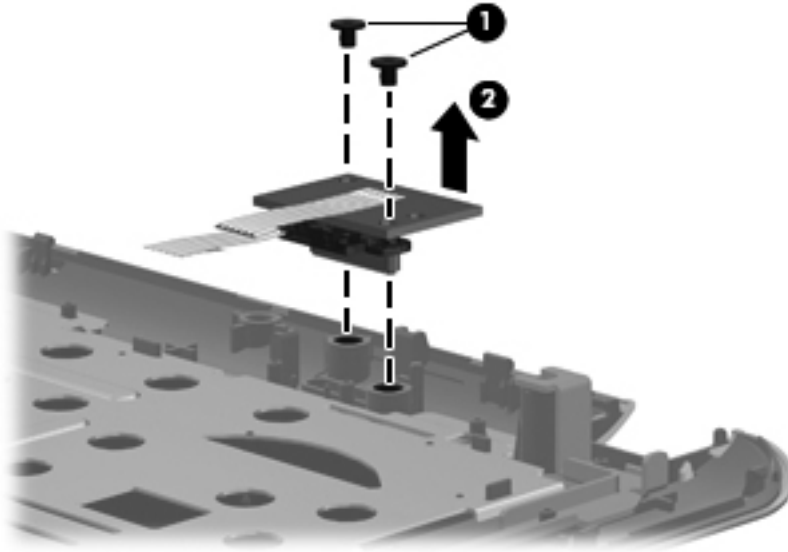
Before removing the power button board, follow these steps:

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 38](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 39](#))
 - b. Optical drive (see [Optical drive on page 50](#)).
 - c. Top cover (see [Top cover on page 51](#))

Remove the power button board:


1. Turn the top cover upside down, with the front toward you.
2. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the power button board to the top cover.

3. Remove the power button board (2).



Reverse this procedure to install the power button board.

Keyboard

 **NOTE:** The keyboard spare part kit includes a keyboard cable and 2 retention clips.

Description	Spare part number
For use in Belgium	584161-A41
For use in the Czech Republic	584161-221
For use in Denmark, Finland, and Sweden	584161-DH1
For use in France	584161-051
For use in Germany	584161-041
For use in Greece	584161-DJ1
For use in Hungary	584161-211
For use in Israel	584161-BB1
For use in Italy	584161-061
For use in Japan	584161-291
For use in Latin America	584161-161
For use in the Netherlands	584161-B31
For use in Portugal	584161-131
For use in Russia	584161-251
For use in Saudi Arabia	584161-171
For use in Slovenia	584161-BA1
For use in South Korea	584161-AD1
For use in Spain	584161-071
For use in Switzerland	584161-BG1
For use in Taiwan	584161-AB1
For use in Thailand	584161-281
For use in Turkey	584161-141
For use in the United Kingdom and Singapore	584161-031
For use in the United States and Canada	584161-001

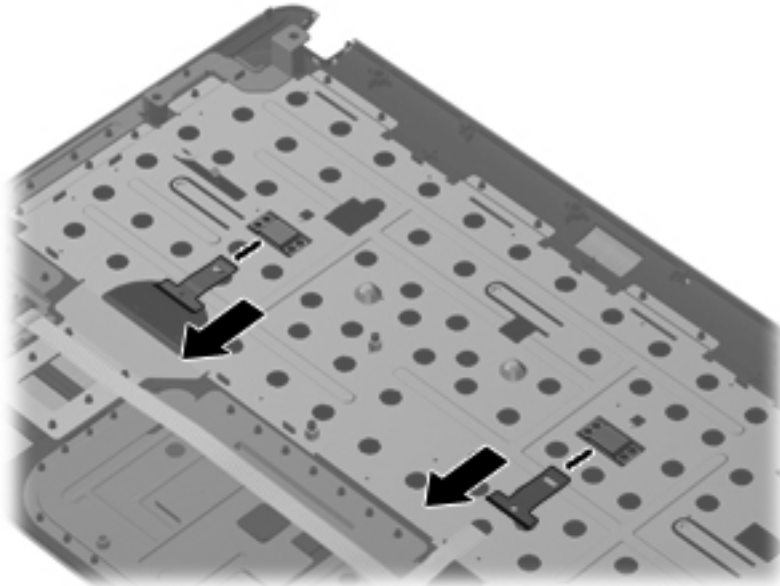
Before removing the keyboard, follow these steps:

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

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 39](#))
 - b. Optical drive (see [Optical drive on page 50](#)).
 - c. Top cover (see [Top cover on page 51](#))

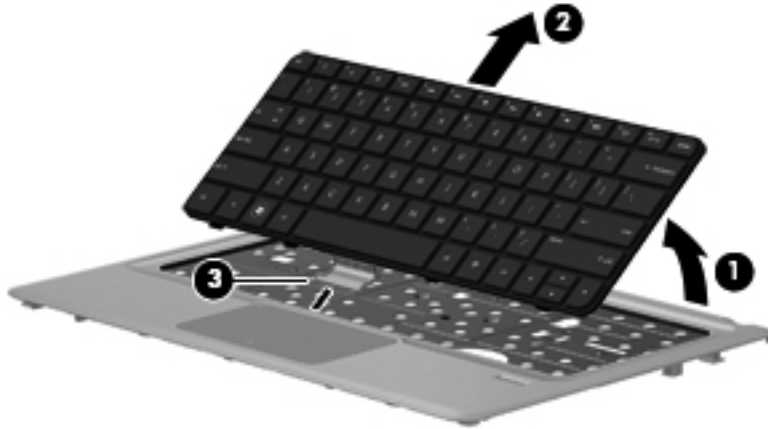
Remove the keyboard:

1. Turn the top cover upside down, with the front toward you.
2. Slide the keyboard retention clips toward the bottom of the top cover.



3. Turn the top cover right-side up, with the front toward you.
4. Lift the rear edge of the keyboard **(1)** until it rests at an angle.
5. Release the keyboard **(2)** by sliding it up and back at an angle.


6. Release the keyboard cable (3) from the opening in the top cover.



7. Remove the keyboard.

Reverse this procedure to install the keyboard.

Bluetooth module

 **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 603924-001.

Description	Spare part number
Bluetooth module	537921-001

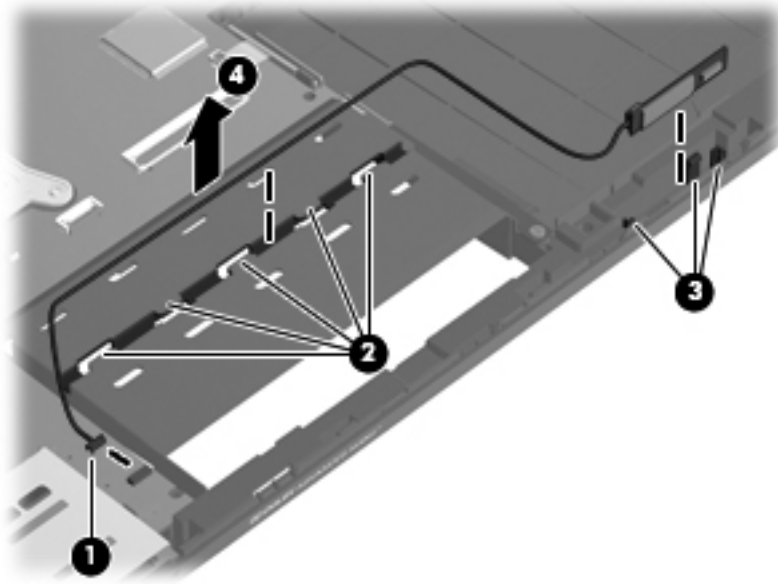
Before removing the Bluetooth module, follow these steps:

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 38](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 39](#))
 - b. Optical drive (see [Optical drive on page 50](#)).
 - c. Top cover (see [Top cover on page 51](#))

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable (1) from the system board.
2. Release the Bluetooth module cable from the clips (2) and routing channel built into the base enclosure.
3. Release the Bluetooth module from the clips (3) built into the base enclosure.

4. Remove the Bluetooth module and Bluetooth module cable (4).



Reverse this procedure to install the Bluetooth module.

Speakers

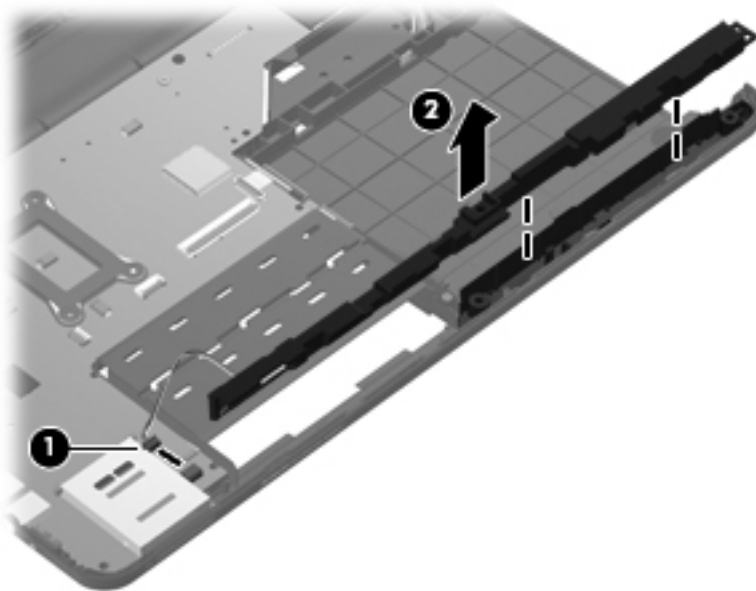
Description	Spare part number
Speakers (include cable)	599426-001

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 38](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 39](#))
 - b. Optical drive (see [Optical drive on page 50](#)).
 - c. Top cover (see [Top cover on page 51](#))

Remove the speakers:

1. Disconnect the speaker cable (1) from the system board.
2. Remove the speakers (2).



Reverse this procedure to install the speakers.

USB board

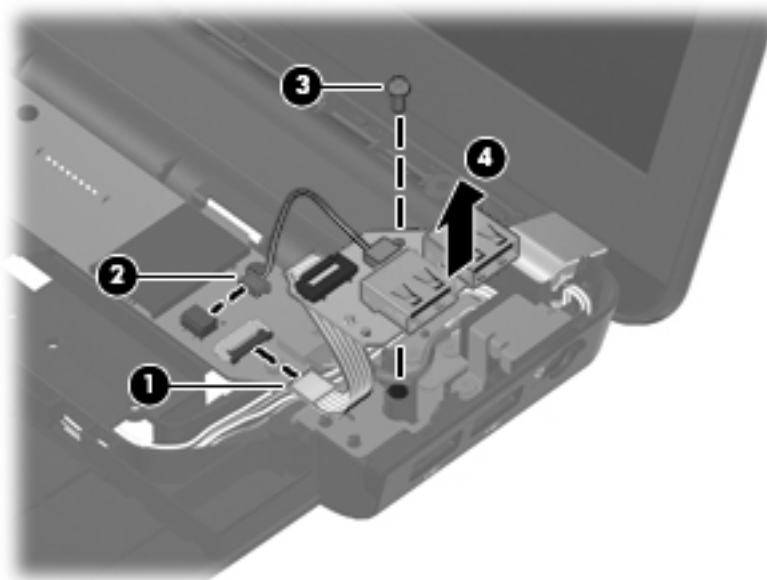
Description	Spare part number
USB board (includes cable)	603922-001

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 38](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 39](#))
 - b. Optical drive (see [Optical drive on page 50](#)).
 - c. Top cover (see [Top cover on page 51](#))


Remove the USB board:

1. Release the ZIF connector to which the USB board ribbon cable is connected, and then disconnect the USB board ribbon cable **(1)** from the system board.
2. Disconnect the USB board cable **(2)** from the USB board.
3. Remove the Phillips PM2.0×4.0 screw **(3)** that secures the USB board to the base enclosure.
4. Remove the USB board **(4)**.



Reverse this procedure to install the USB board.

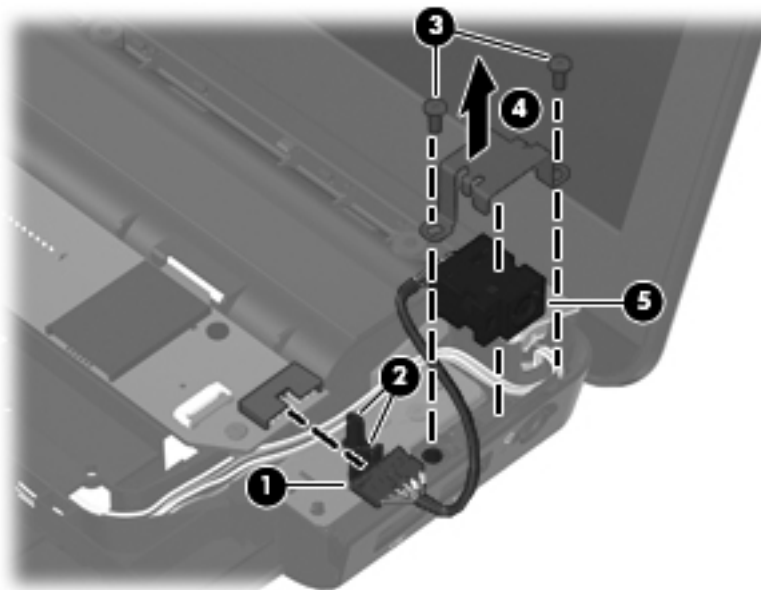
Power connector cable

 **NOTE:** The power connector cable is included in the Cable Kit, spare part number 603924-001.

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 38](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 39](#))
 - b. Optical drive (see [Optical drive on page 50](#)).
 - c. Top cover (see [Top cover on page 51](#))
 - d. USB board (see [USB board on page 60](#))


Remove the power connector cable:

1. Disconnect the power cable **(1)** from the system board.
2. Release the power cable from the clips**(2)** built into the base enclosure.
3. Remove the two Phillips PM2.5×5.0 screws **(3)** that secure the power connector and bracket to the base enclosure.
4. Remove the power connector bracket **(4)**. The power connector bracket is included in the Bracket Kit, spare part number 603925-001.
5. Release the power connector **(5)** from the clip built into the base enclosure.



Reverse this procedure to install the power connector cable.

System board

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

Description	Spare part number
For use only with Intel Core Quad processors	611348-001
For use only with Intel Core Dual and Core2 processors	599414-001
For use only with Intel Core Quad processors (1 GB)	622627-001
For use only with Intel Core Dual and Core2 processors (1 GB)	622626-001

Before removing the system board, follow these steps:

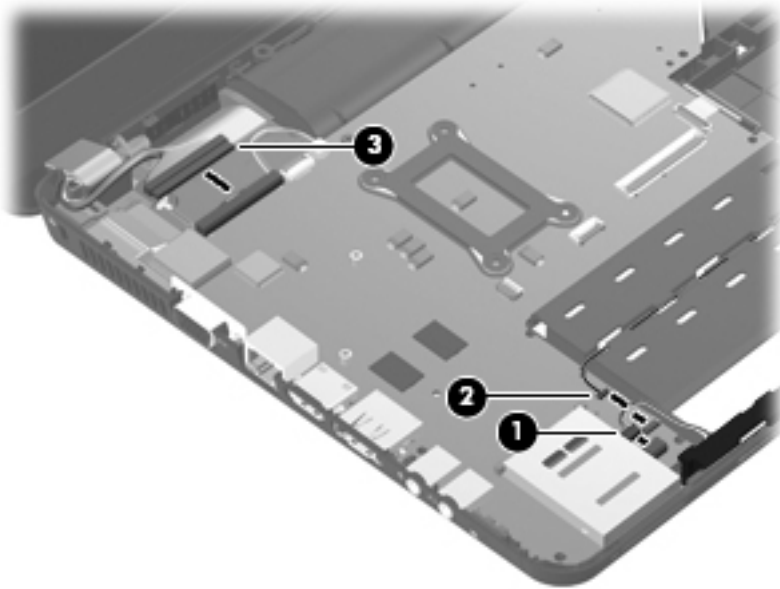
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 42](#))
 - b. Hard drive (see [Hard drive on page 46](#))
 - c. Optical drive (see [Optical drive on page 50](#))
 - d. Top cover (see [Top cover on page 51](#))

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:

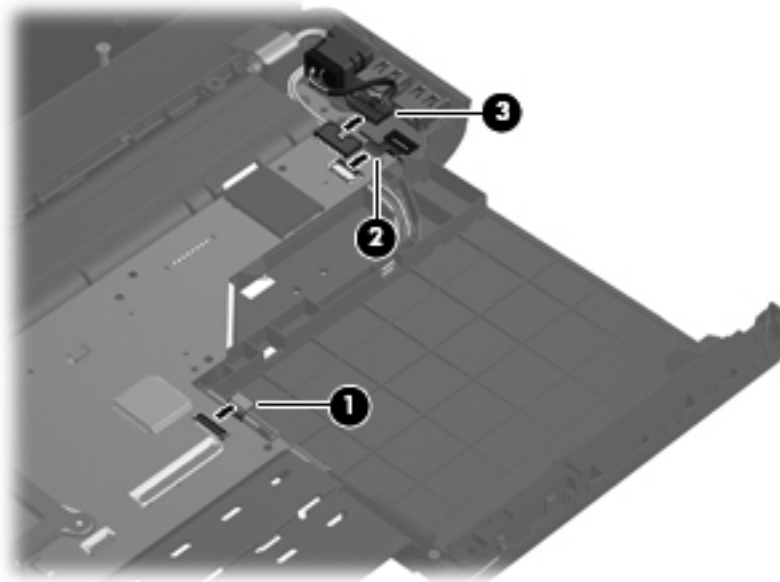
- Memory modules (see [Memory module on page 39](#))
- RTC battery (see [RTC battery on page 45](#))
- RTC battery (see [RTC battery on page 45](#))
- Memory modules (see [Memory module on page 39](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 65](#))
- Processor (see [Processor on page 68](#))

Remove the system board:

1. Disconnect the following cables from the system board:
 - (1) Speaker cable
 - (2) Bluetooth module cable
 - (3) Display panel cable

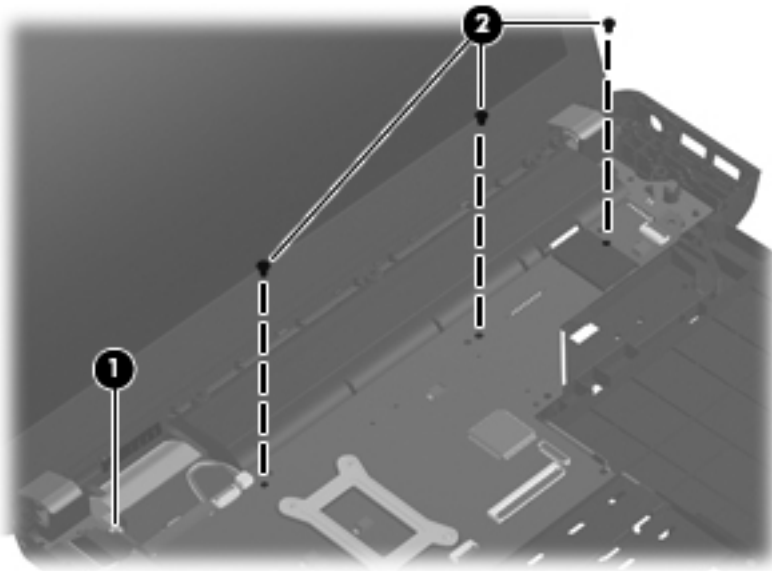


2. Disconnect the following cables from the system board:
 - (1) Optical drive connector cable
 - (2) USB board cable
 - (3) Power cable

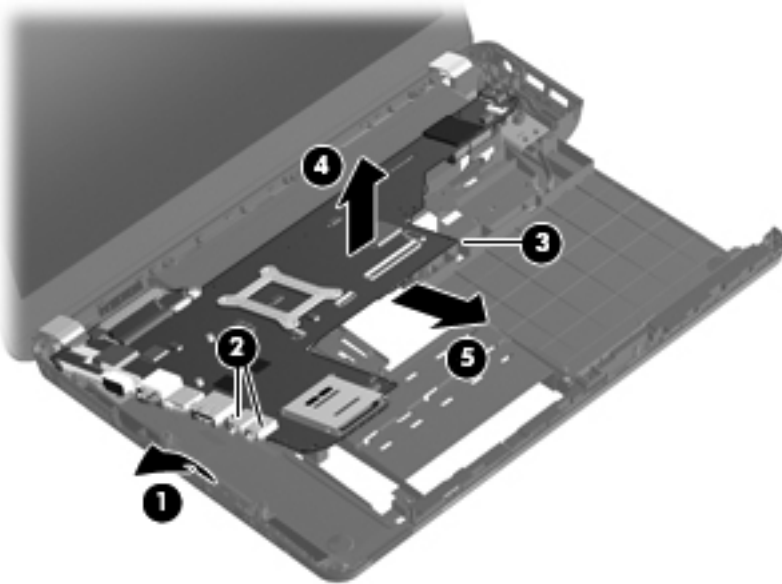


3. Loosen the captive Phillips screw (1) that secures the fan to the base enclosure.

4. Remove the three Phillips PM2.5×5.0 screws (2) that secure the system board to the base enclosure.




5. Flex and hold the left edge of the base enclosure slightly (1) until the audio connectors (2) are clear of the openings in the base enclosure.
6. Use the corner of the system board (3) near the optical drive connector to lift the front edge of the system board (4) until it rests at an angle.
7. Remove the system board (5) by sliding it up and forward at an angle.



Reverse this procedure to install the system board.

Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes replacement thermal material)	601336-001

 **NOTE:** To properly ventilate the computer, allow at least 7.6 cm (3 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.

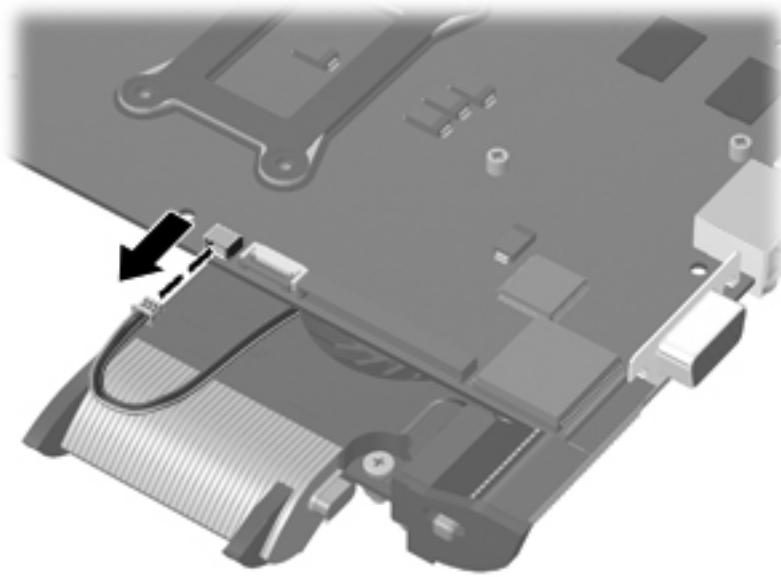
Before removing the fan/heat sink assembly, follow these steps:

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 38](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 42](#))
 - b. Hard drive (see [Hard drive on page 46](#))
 - c. Optical drive (see [Optical drive on page 50](#))
 - d. Top cover (see [Top cover on page 51](#))
 - e. System board (see [System board on page 62](#))


Remove the fan/heat sink assembly:

1. Position the system board with the rear toward you.

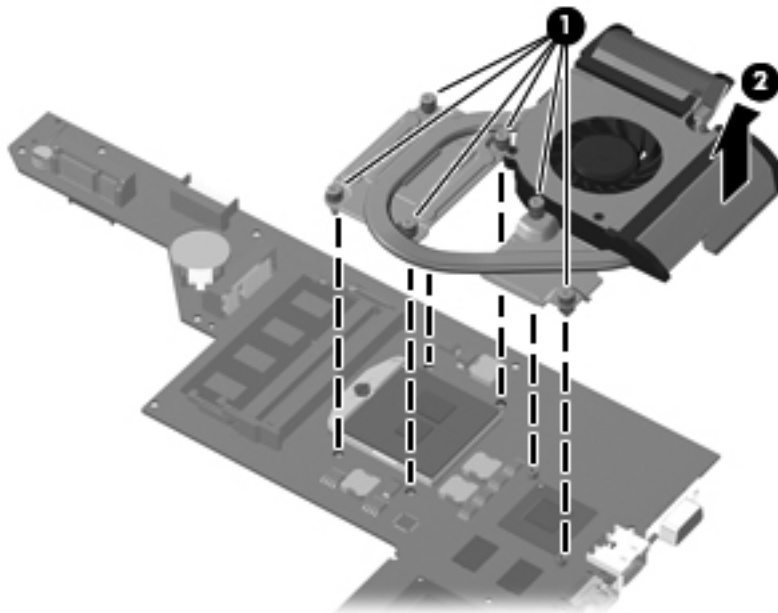
2. Disconnect the fan cable from the system board.




3. Turn the system board upside down, with the front toward you.
4. Loosen the six Phillips captive screws (1) that secure the fan/heat sink assembly to the system board.

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

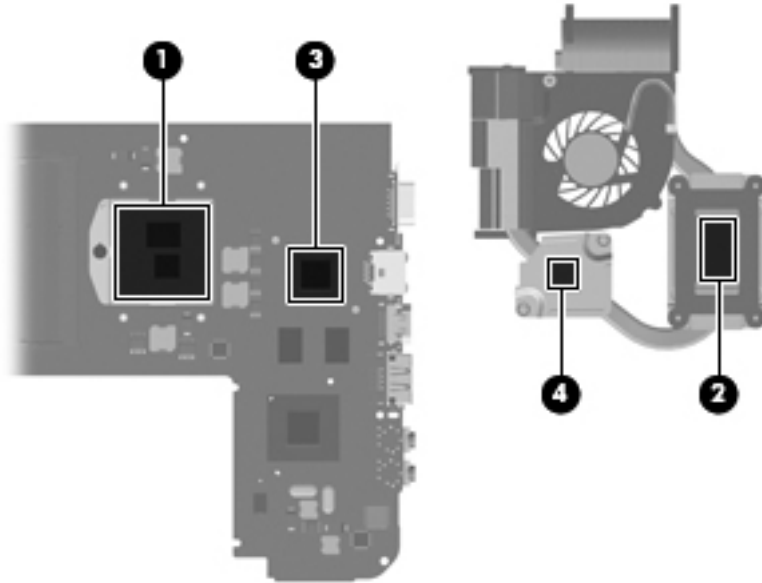
5. Remove the fan/heat sink assembly (2).



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed:

- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- Thermal pads are used on the graphics subsystem chip **(3)** and the heat sink section **(4)** that services it

Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



Reverse this procedure to install the fan/heat sink assembly.

Processor

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

Description	Spare part number
Intel Core Quad i7-840QM 1.86-GHz turbo processor, 45W processor (1333-MHz FSB, 8-MB L3 cache)	612260-001
Intel Core Quad i7-820QM 1.73-GHz (SC turbo up to 3.06-GHz), 45W processor (1333-MHz FSB, 8-MB L3 cache)	583053-001
Intel Core Quad i7-740QM 1.73-GHz turbo processor, 45W (1333-MHz FSB, 6-MB L3 cache)	612259-001
Intel Core Quad i7-720QM 1.60-GHz (SC turbo up to 2.80-GHz), 45W processor (1333-MHz FSB, 6-MB L3 cache)	586170-001
Intel Core Dual i5-580M 2.66-GHz processor (SC turbo up to 3.33-GHz) (1066-MHz FSB, 3-MB L3 cache)	625825-001
Intel Dual Core i5-560M 2.66-GHz processor (SC turbo up to 3.20-GHz) (1066-MHz FSB, 3-MB L3 cache)	625824-001
Intel Core Dual i5-540M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	594188-001
Intel Core Dual i5-520M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	594187-001
Intel Dual Core i5-480M 2.66-GHz processor (turbo up to 2.93-GHz), 3-MB L3 cache, 1066-MHz	634693-001
Intel Core Dual i5-460M 2.53-GHz turbo processor (1066-MHz FSB, 3-MB L3 cache)	626039-001
Intel Core Dual i5-450M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	613585-001
Intel Core Dual i5-430M 2.26-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	597624-001
Intel Core Dual i5-390M 2.66-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	634692-001
Intel Core Dual i5-380M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	625823-001
Intel Core Dual i5-370M 2.40-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	613584-001
Intel Core Dual i3-350M 2.26-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	597623-001
Intel Pentium P6300 2.26-GHz processor 3-MB L3 cache, 1066-MHz	635500-001
Intel Pentium P6200 2.13-GHz processor (1066-MHz, 3-MB L3 cache)	625831-001
Intel Pentium P6100 2.00-GHz processor (1066-MHz, 3-MB L3 cache)	613587-001
Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)	613586-001


Before removing the processor, follow these steps:

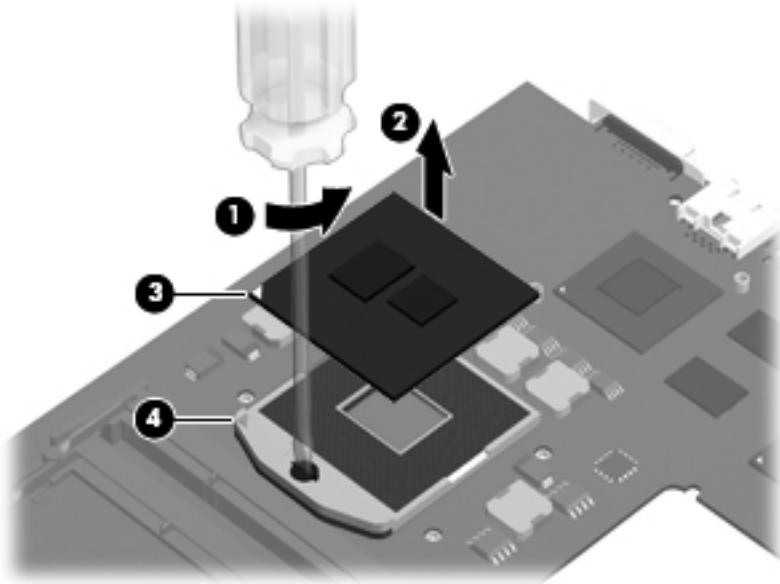
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.

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 38](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 42](#))
 - b. Hard drive (see [Hard drive on page 46](#))
 - c. Optical drive (see [Optical drive on page 50](#))
 - d. Top cover (see [Top cover on page 51](#))
 - e. System board (see [System board on page 62](#))

Remove the processor:

1. Turn the processor locking screw (1) one-half turn counterclockwise, until you hear a click.
2. Lift the processor (2) straight up, and remove it.

 **NOTE:** The gold triangle (3) on the processor must be aligned with the triangle icon (4) embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

Optical drive connector board

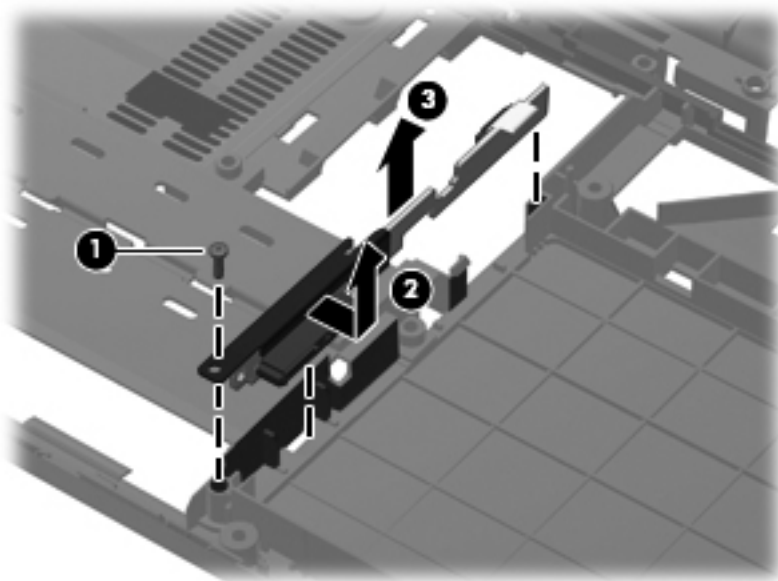
Description	Spare part number
Optical drive connector cable	603921-001

Before removing the optical drive connector 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 38](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 42](#))
 - b. Hard drive (see [Hard drive on page 46](#))
 - c. Optical drive (see [Optical drive on page 50](#))
 - d. Top cover (see [Top cover on page 51](#))
 - e. System board (see [System board on page 62](#))

Remove the optical drive connector board:

1. Remove the Phillips PM2.0×4.0 screw (1) that secures the optical drive connector board to the base enclosure.
2. Lift the front edge of the optical drive connector board bracket (2) until it rests at an angle.
3. Remove the optical drive connector bracket (3) by sliding it up and forward at an angle. The optical drive connector bracket is included in the Bracket Kit, spare part number 603925-001.
4. Remove the optical drive connector board (4).



Reverse this procedure to install the optical drive connector board.

Display assembly

Description	Spare part number
13.3-in, BrightView, high-definition, LED display assembly (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers)	
In black cherry	603903-001
In brushed aluminum	603905-001
In champagne	606021-001
In shell white	606025-001
In Sonoma red	606023-001

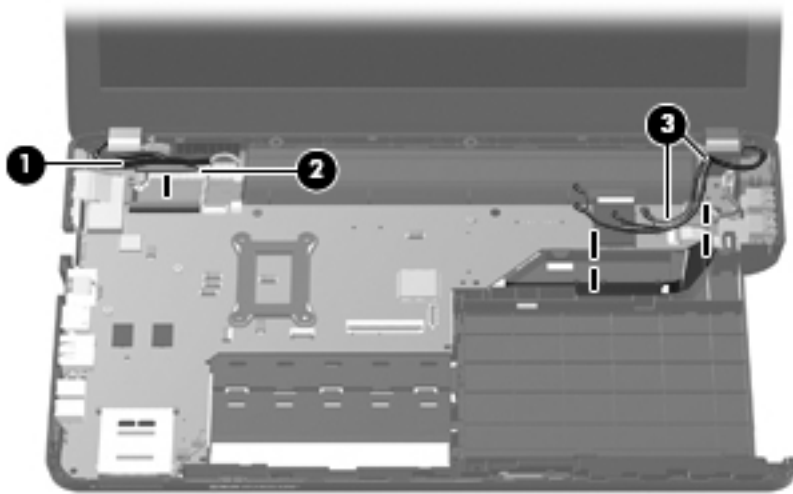
Before removing the display assembly, follow these steps:

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 38](#)), and then remove the following components:
 - a. Hard drive cover (see [Hard drive on page 46](#))
 - b. Memory module/wireless module compartment cover (see [Memory module on page 39](#)).
 - c. Keyboard (see [Keyboard on page 55](#))
 - d. Top cover (see [Top cover on page 51](#))

Remove the display assembly:

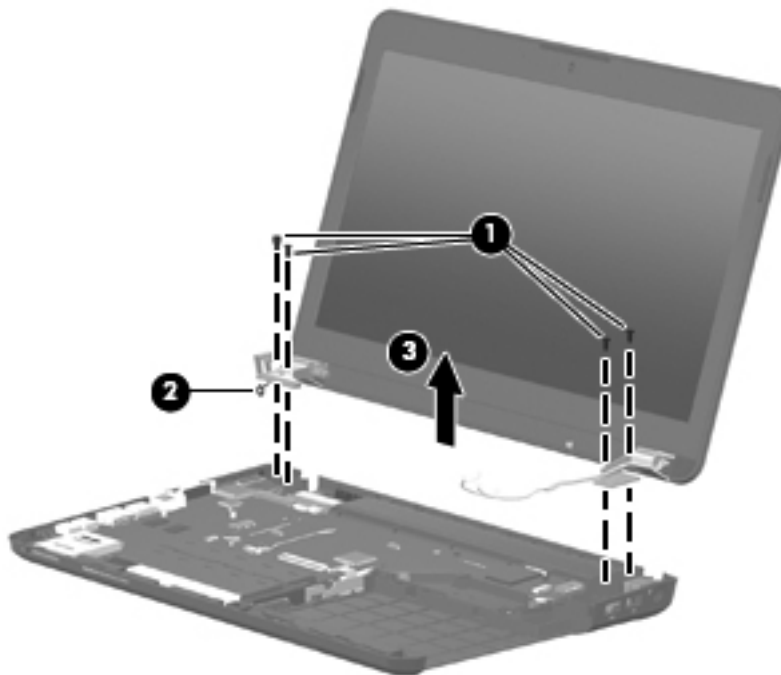
1. Disconnect the display panel cable **(1)** from the system board and release the cable from the clip **(2)** built into the base enclosure.

2. Release the wireless antenna cables (3) from the opening and the routing clips in the base enclosure.



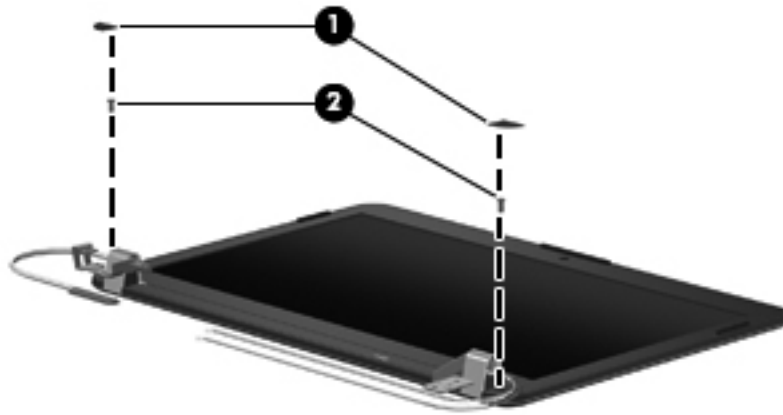
△ **CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

3. Remove the four Phillips PM2.5×7.0 screws (1) that secure the display assembly to the computer.
4. Remove the display assembly (2).

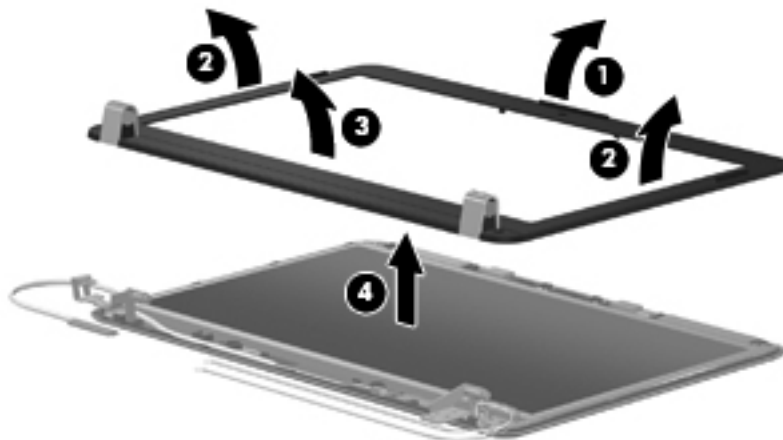


5. If it is necessary to replace the display bezel or any of the display assembly internal components:
 - a. Remove the Mylar screw covers (1). The screw covers are included in the display hinge cover spare part kit, spare part number 603910-001.

- b. Remove the two Phillips PM2.5×5.0 screws (2) that secure the display bezel to the display assembly.

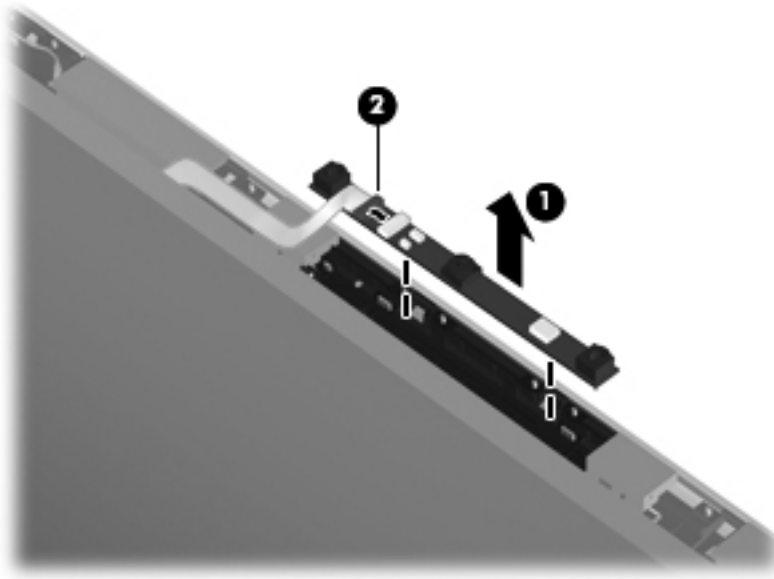


- c. Flex the inside edges of the top edge (1), left and right sides (2), and the bottom edge (3) of the display bezel until the bezel disengages from the display enclosure.
- d. Remove the display bezel (4). The display bezel is available using spare part number 599417-001.



6. If it is necessary to replace the webcam/microphone module:
- a. Release the webcam/microphone module (1) as far as the webcam/microphone module allows.

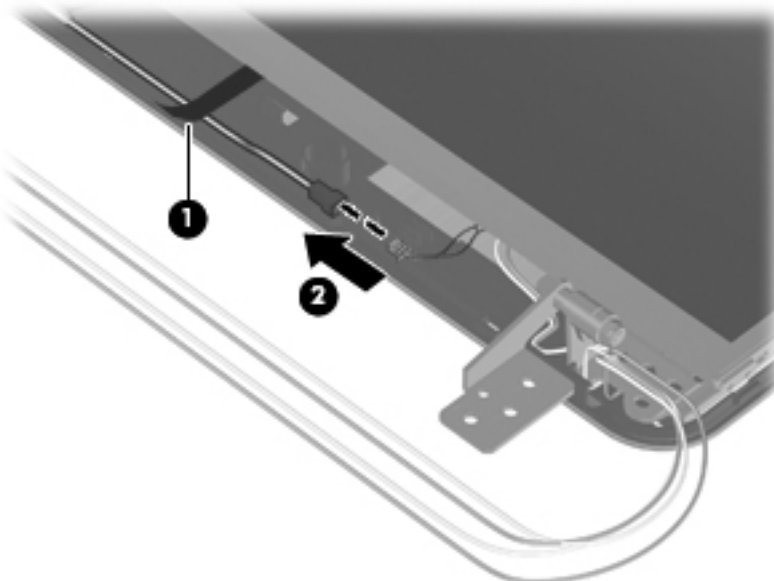
- b. Disconnect the webcam/microphone module cable (2) from the webcam/microphone module.



- c. Remove the webcam/microphone module. The webcam/microphone module is available using spare part number 599420-001.

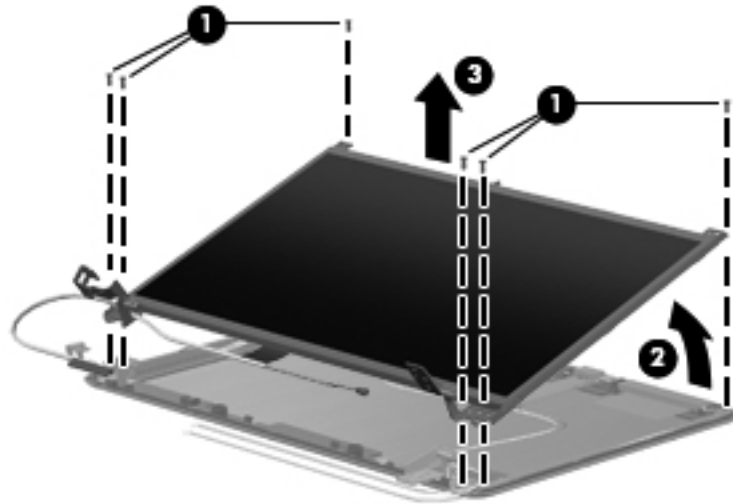
7. If it is necessary to replace the display panel:

- a. Detach the display panel cable (1) from the display enclosure. (The display panel cable is attached to the display enclosure using double-sided tape).
- b. Disconnect the logo light cable (2) from the display panel cable.

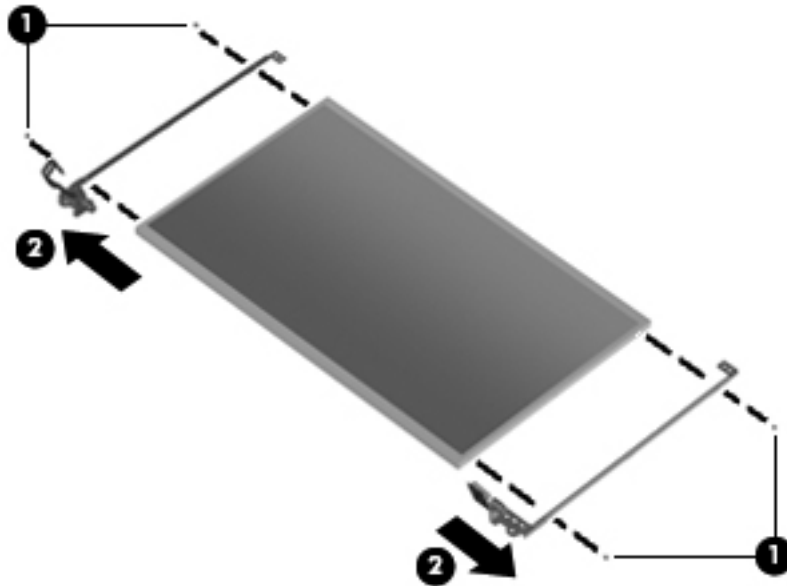


- c. Remove the six Phillips PM2.5×5.0 screws (1) that secure the display panel to the display enclosure.
- d. Lift the top edge of the display panel (2) until it rests at an angle.

- e. Remove the display panel (3). The display panel is available using spare part number 599416-001.

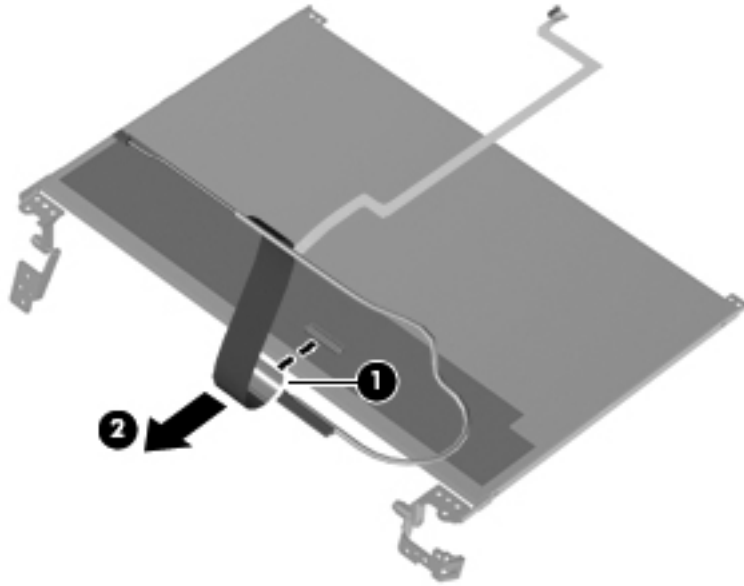


8. If it is necessary to replace the display hinges:
- Remove the four Phillips PM2.0×3.0 screws (1) that secure the hinges to the display panel.
 - Remove the hinges (2). The hinges are available using spare part number 599418-001.



9. If it is necessary to replace the display panel cable:
- Release the support strip (1) that secures the display panel cable to the display panel.

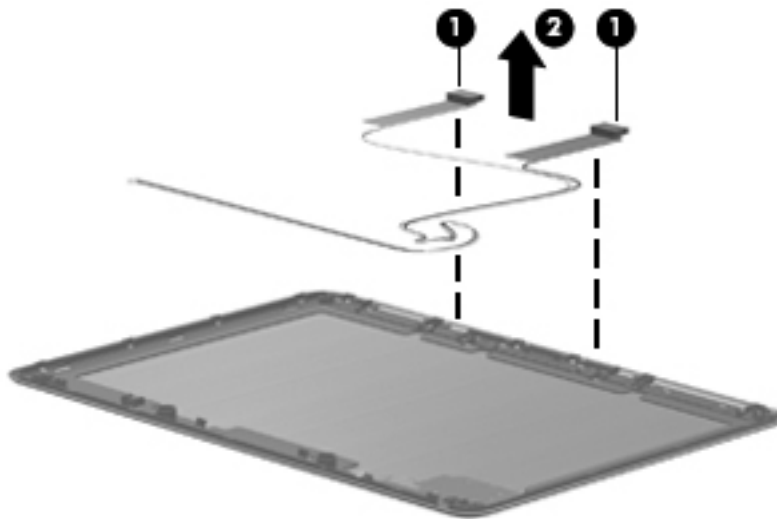
- b. Disconnect the display panel cable (2) from the display panel.



- c. Remove the display panel cable. The display panel cable is available using spare part number 599419-001, and includes the webcam cable.

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

- a. Detach the wireless antenna transceivers (1) from the display enclosure.
- b. Remove the wireless antenna cables (2) and transceivers. The wireless antenna cables and transceivers are available in the Wireless Antenna Kit, spare part number 599421-001.




Reverse this procedure to reassemble and install the display assembly.

5 Setup Utility

Starting Setup Utility

Setup Utility is a ROM-based information and customization utility that can be used even when your Windows operating system is not working.

 **NOTE:** The fingerprint reader (select models only) cannot be used to access Setup Utility.

The utility reports information about the computer and provides settings for startup, security, and other preferences.

To start Setup Utility:

- ▲ Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**.
2. When the Startup Menu is displayed, press **f10**.

Using Setup Utility

Changing the language of Setup Utility

The following procedure explains how to change the language of Setup Utility. If Setup Utility is not already running, begin at step 1. If Setup Utility is already running, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Use the arrow keys to select a language, and then press **enter**.
4. When a confirmation prompt with your language selected is displayed, press **enter**.
5. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your change goes into effect immediately.

Navigating and selecting in Setup Utility

Because Setup Utility is not Windows based, it does not support the TouchPad. Navigation and selection are by keystroke.

- To choose a menu or a menu item, use the arrow keys.
- To choose an item in a list or to toggle a field, for example an Enable/Disable field, use either the arrow keys or **f5** or **f6**.
- To select an item, press **enter**.
- To close a text box or return to the menu display, press **esc**.
- To display additional navigation and selection information while Setup Utility is open, press **f1**.

Displaying system information

The following procedure explains how to display system information in Setup Utility. If Setup Utility is not open, begin at step 1. If Setup Utility is open, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Select the **Main** menu. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

Restoring default settings in Setup Utility

The following procedure explains how to restore the Setup Utility default settings. If Setup Utility is not already running, begin at step 1. If Setup Utility is already running, begin at step 2.


1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Use the arrow keys to select **Exit > Load Setup Defaults**, and then press **enter**.
3. When the Setup Confirmation is displayed, press **enter**.
4. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

The Setup Utility default settings go into effect when the computer restarts.

 **NOTE:** The Setup Utility default settings go into effect when the computer restarts.

Exiting Setup Utility


You can exit Setup Utility with or without saving changes.

- To exit Setup Utility and save your changes from the current session:
If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.
- To exit Setup Utility without saving your changes from the current session:
If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

After either choice, the computer restarts in Windows.

Setup Utility menus

The menu tables in this section provide an overview of Setup Utility options.

 **NOTE:** Some of the Setup Utility menu items listed in this chapter may not be supported by your computer.

Main menu

Select	To do this
System information	<ul style="list-style-type: none">• View and change the system time and date.• View identification information about the computer.• View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).

Security menu

Select	To do this
Administrator password	Enter, change, or delete an administrator password.
Power-On Password	Enter, change, or delete a power-on password.

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Button Sound (select models only)	Enable/disable the capacitive button tapping sound.
Virtualization Technology (select models only)	Enable/disable the processor Virtualization Technology.
Processor C6 State (select models only)	Enable/disable the processor C6 sleep state.
LAN Power Saving (select models only)	Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode.
Card Reader/1394 Power Saving (select models only)	Enable/disable Card Reader/1394 Power Saving.
Fan Always On	Enable/disable Fan Always On. When enabled, the computer fan will always be on.
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none">• f10 and f12 Delay (seconds)—Set the delay for the f10 and f12 functions of Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20).• CD-ROM boot—Enable/disable boot from CD-ROM.• Floppy boot—Enable/disable boot from diskette.• Internal Network Adapter boot—Enable/disable boot from Internal Network Adapter.• Boot Order—Set the boot order for:<ul style="list-style-type: none">◦ Hard drive◦ Internal CD/DVD ROM drive◦ USB Diskette on Key/USB hard disk◦ USB CD/DVD ROM drive◦ USB floppy◦ Network adapter

Diagnostics menu

Select	To do this
Hard Disk Self Test	<p>Run a comprehensive self-test on the hard drive.</p> <p>NOTE: On models with two hard drives, this menu option is called Primary Hard Disk Self Test.</p>
Secondary Hard Disk Self Test (select models only)	Run a comprehensive self-test on a secondary hard drive.
Memory Test	Run a diagnostic test on the system memory.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	32.30 cm	12.72 in
Depth	22.20 cm	8.74 in
Height (front to back)	2.95 cm to 3.90 cm	1.16 in to 1.54 in
Weight		
	2.29 kg	5.06 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A – 120 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 90%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

13.3-inch, SVA display specifications

13.3" HD LED BrightView (1366x768) (5.2mm) SVA	Metric	U.S.
Dimensions		
Width	17.8 cm	7.00 in
Depth	28.4 cm	11.2 in
Diagonal	33.6 cm	13.3 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 nits (typical)	
Backlight	LED	
Character display	80 × 25	
Total power consumption	6.0 W	
Viewing angle	+/-65 horizontal, +/-50° vertical (typical)	

Hard drive specifications

	640-GB*	500-GB*	320-GB*	250-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks	1,250,242,867	976,752,240	625,121,433	488,376,120
Disk rotational speed	5400 rpm	7200 rpm	7200 rpm	7200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)			
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.				
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.				

Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive specifications

Applicable disc	Read:	Write:
	BD-ROM, BD-ROM-DL, BD-R, BD-R-DL, BD-RE, BD-RE-DL, DVD-ROM, DVD+R, DVD+R-DL, DVD+RW, DVD-R, DVD-R-DL, DVD-RW, DVD-RAM (Ver.2), CD-DA, CD-ROM (mode 1 and mode 2), CD-ROM XA (mode 2, form 1 and form 2), Photo CD (single and multiple sessions), CD Extra, CD-R, CD-RW, and CD-TEXT	DVD-RAM (Ver.2), DVD+R, DVD-R, CD-R, and CD-ROM
Access time	BD	DVD
Random	< 230 ms	< 180 ms
Cache buffer	4.5 MB	
Data transfer rate		
2X BD-RAM	9 MB/sec	
8X DVD	2,400 KB/sec	
16X CD-R	2,400 KB/sec	
16X CD-RW	2,400 KB/sec	

DVD±RW and CD-RW Super Multi Double-Layer Combo 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, 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
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Cache buffer	2.5 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	


Applicable disc	Read:	Write:
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	

7 Backup and recovery

Tools provided by the operating system and HP Recovery Manager software are designed to help you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Backing up your information
- Creating a set of recovery discs
- Creating system restore points
- Recovering a program or driver
- Performing a full system recovery


Creating recovery discs

 **NOTE:** HP recommends that you create recovery discs to be sure that you can restore your system to its original factory state if you experience serious system failure or instability. Create these discs after setting up the computer for the first time.

NOTE: Handle these discs carefully and keep them in a safe place. The software allows the creation of only one set of recovery discs.

Note the following guidelines before creating recovery discs:

- You will need high-quality DVD+R, DVD-R, or CD-R discs. All these discs are purchased separately. DVDs have a much higher capacity than CDs. If you use CDs, up to 20 discs may be required, whereas only a few DVDs are required.

 **NOTE:** Read-write discs (such as CD-RW and DVD±RW) and double-layer DVD±R discs are not compatible with the Recovery Manager software.

- The computer must be connected to AC power during this process.
- Only one set of recovery discs can be created per computer.
- Number each disc before inserting it into the computer optical drive.
- If necessary, you can exit the program before you have finished creating the recovery discs. The next time you open Recovery Manager, you will be prompted to continue the disc creation process.

To create a set of recovery discs:


1. Click **Start**, click **All Programs**, click **Recovery Manager**, and then click **Recovery Disc Creation**.
2. Follow the on-screen instructions.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create a set of recovery discs immediately after software setup. These discs will allow you to start up (boot) the computer in case of system instability or failure.

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. Back up your system at the following times:

- On a regularly scheduled basis

 **NOTE:** Set reminders to back up your information periodically.

- Before the computer is repaired or restored
- Before you add or modify hardware or software

Note the following when backing up:

- Create system recovery points using Recovery Manager, and periodically copy them to disc.
- Create system restore points using the Windows System Restore feature, and periodically copy them to disc.
- Store personal files in the Documents library and back up this folder periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of the settings. The screen shot can be a time-saver if you have to reset your preferences.

To copy the screen and paste the image into a word-processing document, follow these steps:

1. Display the screen.
2. Copy the screen:

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

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


3. Open a word-processing document, click **Edit**, and then click **Paste**.
 4. Save the document.
- You can back up your information to an optional external hard drive, a network drive, or discs.
 - When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD-R, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

 **NOTE:** Double-layer DVD±R discs are not supported.

- When backing up to discs, number each disc before inserting it into the optical drive of the computer.


Using Windows Backup and Restore

To create a backup using Windows Backup and Restore, follow these steps:

 **NOTE:** Be sure that the computer is connected to AC power before you start the backup process.


NOTE: The backup process may take over an hour, depending on file size and the speed of the computer.

1. Click **Start**, click **All Programs**, click **Maintenance**, and then click **Backup and Restore**.
2. Follow the on-screen instructions to set up and create a backup.

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

Using system restore points


When you back up your system, you are creating a system restore point. A system restore point allows you to save and name a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

 **NOTE:** Recovering to an earlier restore point does not affect data files saved or e-mails created since the last restore point.

You also can create additional restore points to provide increased protection for your system files and settings.

When to create restore points

- Before you add or extensively modify software or hardware
- Periodically, whenever the system is performing optimally

 **NOTE:** If you revert to a restore point and then change your mind, you can reverse the restoration.

Create a system restore point


1. Click **Start**, click **Control Panel**, click **System and Security**, and then click **System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Under **Protection Settings**, select the disk for which you want to create a restore point.
5. Click **Create**.
6. Follow the on-screen instructions.

Restore to a previous date and time


To revert to a restore point (created at a previous date and time), when the computer was functioning optimally, follow these steps:

1. Click **Start**, click **Control Panel**, click **System and Security**, and then click **System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Click **System Restore**.
5. Follow the on-screen instructions.

Performing a recovery

 **NOTE:** You can recover only files that you have previously backed up. HP recommends that you use Recovery Manager to create a set of recovery discs (entire drive backup) as soon as you set up your computer.

Recovery Manager software allows you to repair or restore the system if you experience system failure or instability. Recovery Manager works from recovery discs that you create or from a dedicated recovery partition (select models only) on the hard drive. However, if your computer includes a solid-state drive (SSD), you may not have a recovery partition. If that is the case, recovery discs have been included with your computer. Use these discs to recover your operating system and software.

 **NOTE:** Windows has its own built-in repair features, such as System Restore. If you have not already tried these features, try them before using Recovery Manager. For more information on these built-in repair features, click Start, and then click Help and Support.

NOTE: Recovery Manager recovers only the software that was preinstalled at the factory. Software not provided with this computer must be downloaded from the manufacturer's Web site or reinstalled from the disc provided by the manufacturer.


Recovering using the recovery discs

To restore the system from the recovery discs:

1. Back up all personal files.
2. Insert the first recovery disc into the optical drive and restart the computer.
3. Follow the on-screen instructions.

Recovering using the partition on the hard drive

On some models, you can perform a recovery from the partition on the hard drive by using either the Start button or **f11**. This restores the computer to its factory condition.


 **NOTE:** If your computer includes an SSD, you may not have a recovery partition. If the computer does not have a recovery partition, you will not be able to recover using this procedure. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software.

To restore the system from the partition, follow these steps:

1. Access Recovery Manager in either of the following ways:
 - Click **Start**, click **All Programs**, click **Recovery Manager**, and then click **Recovery Manager**.

– or –

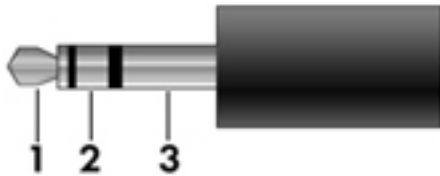
 - a. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
 - b. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.

 **NOTE:** It may take several minutes for Recovery Manager to load.

2. Click **System Recovery** in the **Recovery Manager** window.
3. Follow the on-screen instructions.

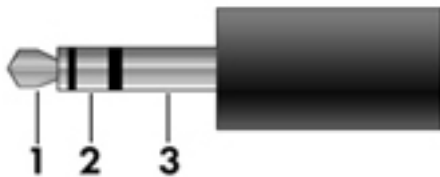
8 Connector pin assignments

Audio-in (microphone)



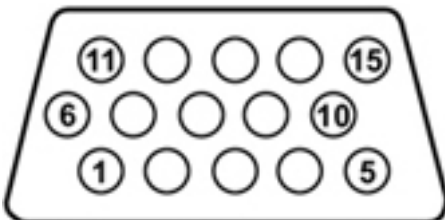
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

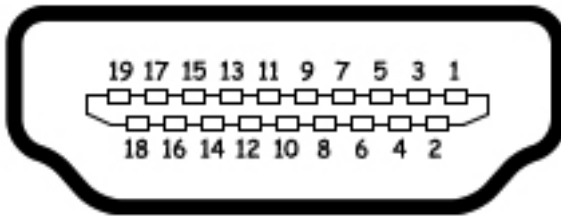
External monitor



Pin	Signal
1	Red analog
2	Green analog

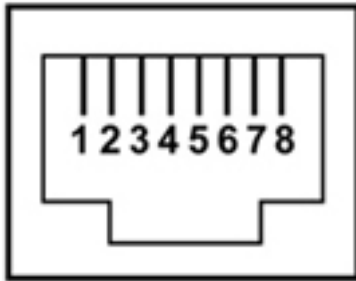
Pin	Signal
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



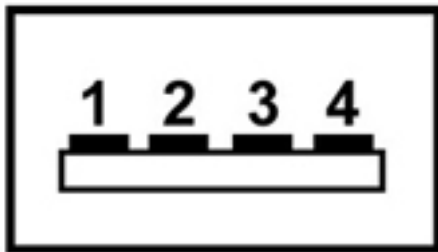
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2-
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1-
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0-
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	CEC
14	No connect
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect
20	Shell

RJ-45 (network)



Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

Universal Serial Bus



Pin	Signal
1	+5 VDC
2	Data
3	Data +
4	Ground

9 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 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	COC	5
South Korea	EK	4
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

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

10 Recycling

Battery

When a 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 computer battery disposal.

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>.
-

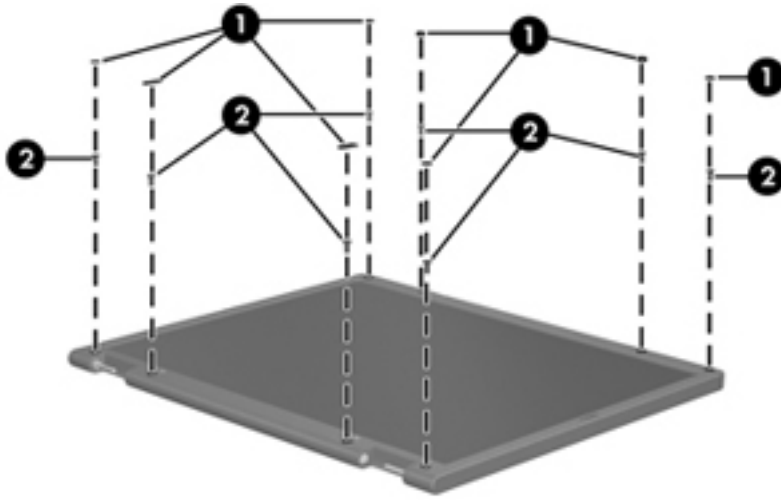
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight (1) and the liquid crystal display (LCD) panel (2).



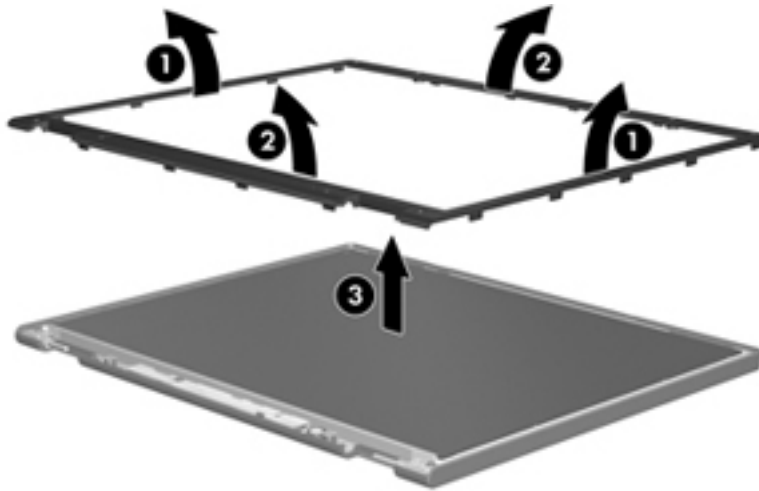
-
- 📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

Perform the following steps:

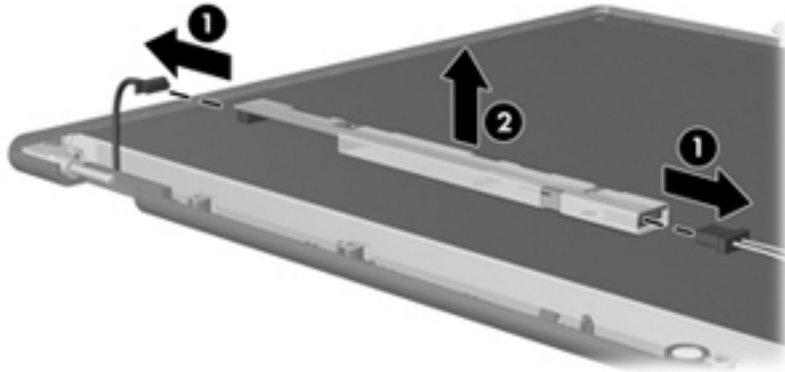
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



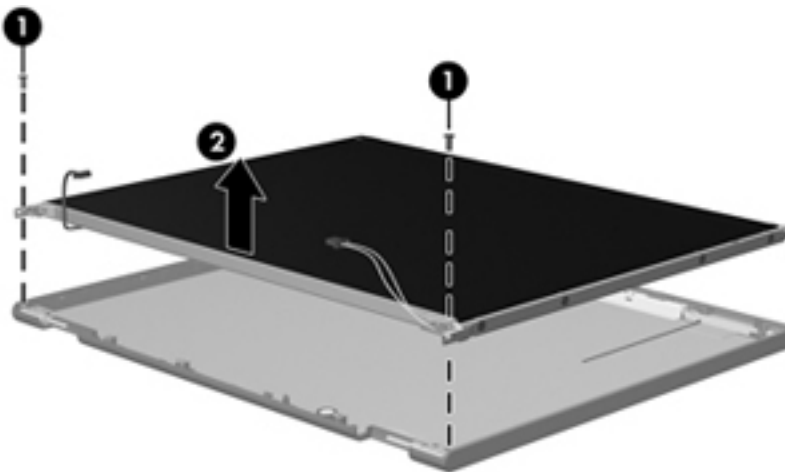
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel 3.



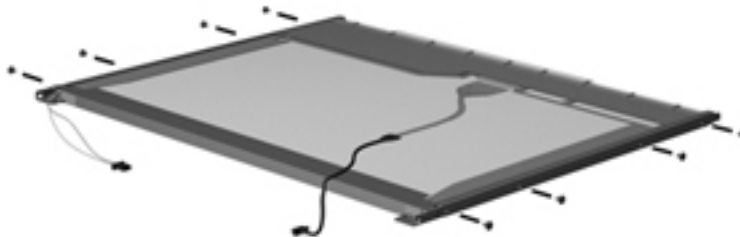
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter 2.



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.

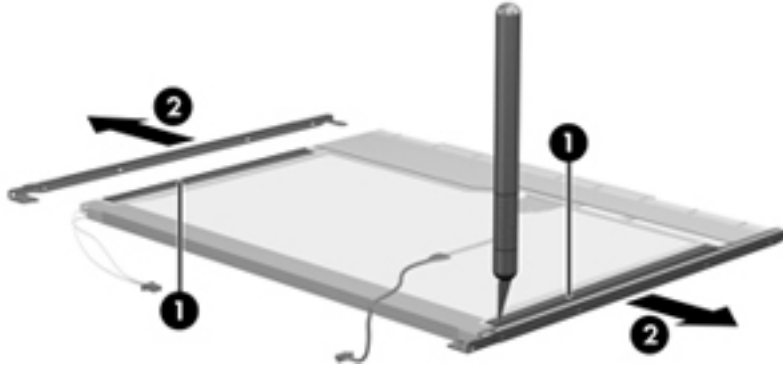


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



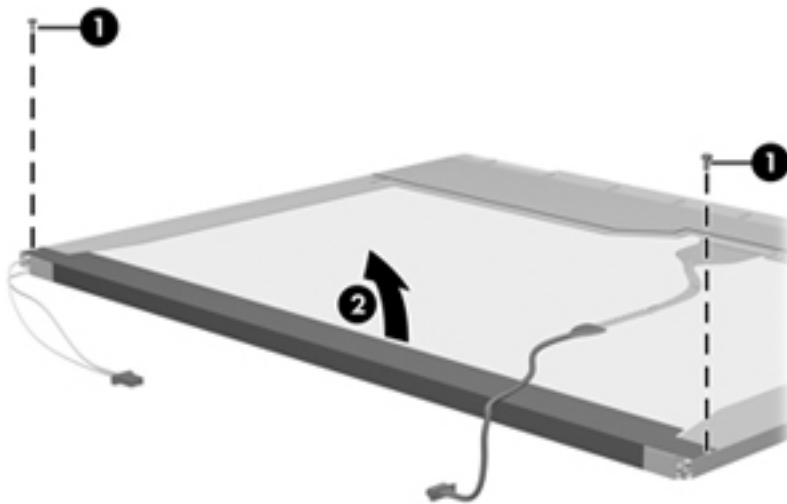
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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.

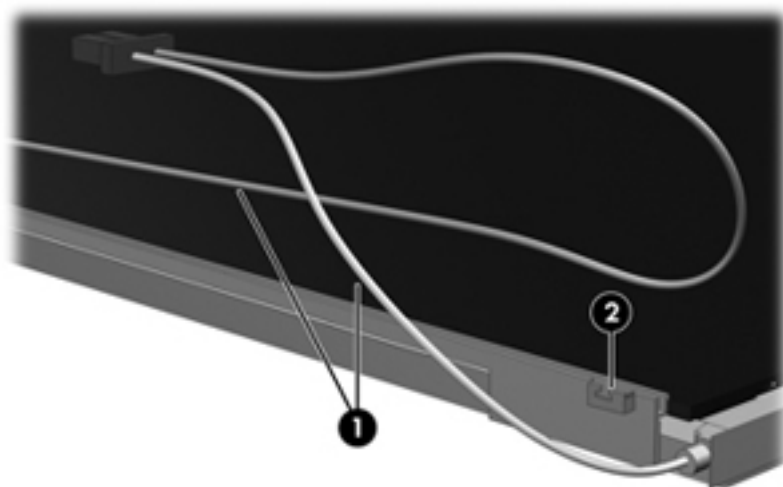
12. Lift the top edge of the backlight cover (2) and swing it outward.



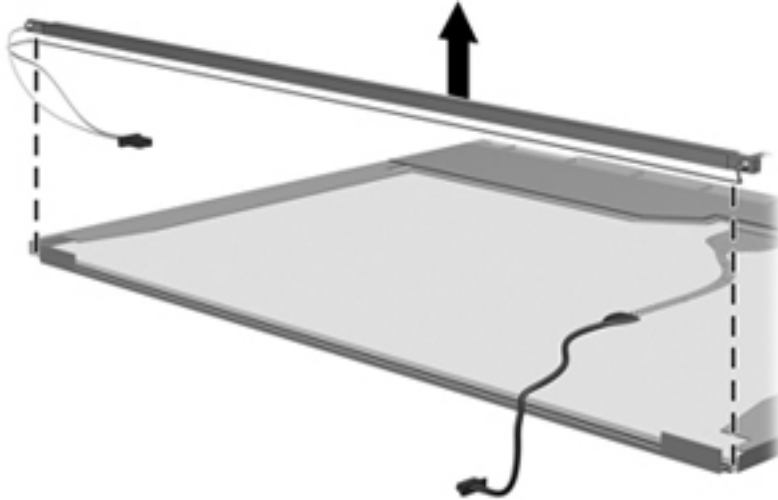
13. Remove the backlight cover.

14. Turn the display panel right-side up.

15. Remove the backlight cables (1) from the clip (2) in the display panel.

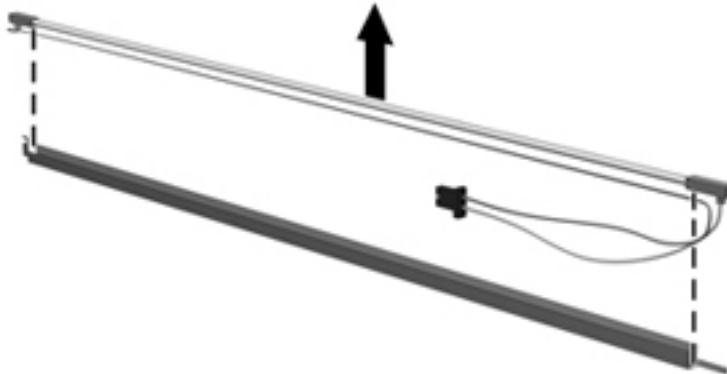


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



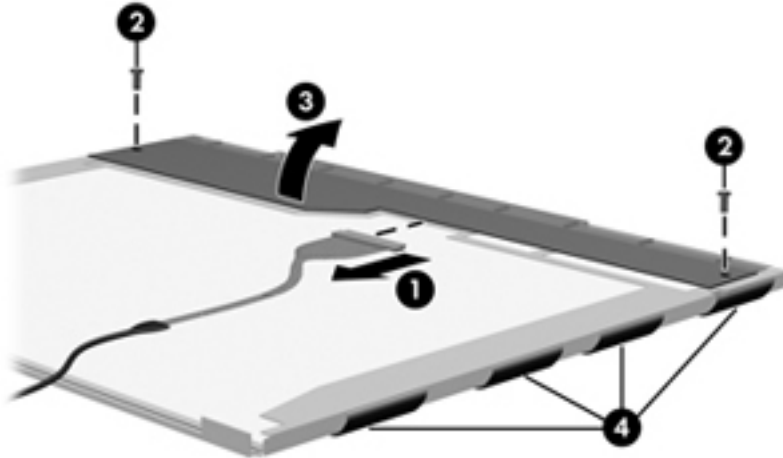
⚠ WARNING! The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Remove the backlight from the backlight frame.

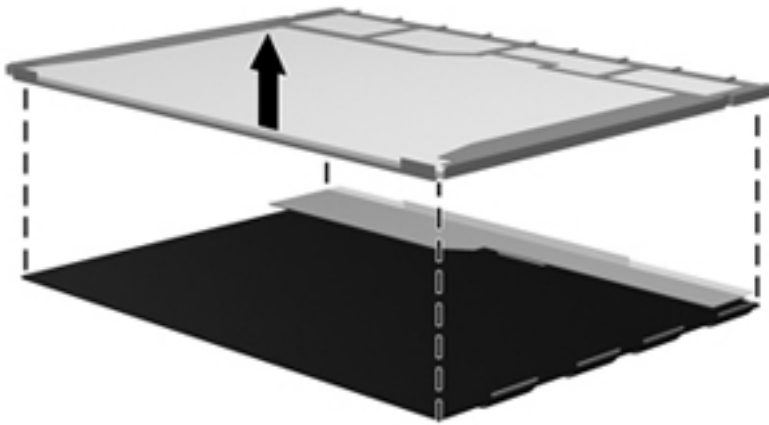


19. Disconnect the display cable (1) from the LCD panel.
20. Remove the screws (2) that secure the LCD panel to the display rear panel.
21. Release the LCD panel (3) from the display rear panel.

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.

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