HP ENVY 14 Notebook PC

Maintenance and Service Guide

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Revision A

MSG revision history

Revision	Publication Date	Description
A	September 2010	Updated spare parts throughout MSG.

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP ENVY 14 Notebook PC
Processors	Intel Core i7-840QM 1.86- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)
	Intel Core i7-820QM 1.73- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)
	Intel Core i7-740QM 1.73- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)
	Intel Core i7-720QM 1.60- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)
	Intel Dual Core i5-580M 2.66-3.33-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W
	Intel Dual Core i5-560M 2.53-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W
	Intel Core i5-540M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)
	Intel Core i5-520M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)
	Intel Dual Core i5-460M 2.66-3.2-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W
	Intel Core i5-450M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)
	Intel Core i5-430M 2.26-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)
	Intel Dual Core i3-380M 2.53-GHz processor, 3-MB L3 cache, 1066-MHz FSB, 25-W
	Intel Core i3-370M 2.40-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache)
	Intel Core i3-350M 2.26-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache)
	Intel Pentium P6200 2.13-GHz processor 3-MB L3 cache, 1066-MHz FSB
	Intel Pentium P6100 2.0-GHz processor 3-MB L3 cache, 1066-MHz FSB
	Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)
Chipset	Intel HM55 Express chipset Platform controller hub (PCH): Ibex Peak-M
Graphics	Unified memory architecture (UMA, integrated) with shared video memory, memory size is dynamic change
	Intel HD Graphics
	Supports BD playback with HD decode, DX10.1 support and HDMI support
Panel	14.5-in, high-definition+ (HD+), radiance LED, WVA, AntiGlare (1600×900) display; typical brightness: 350 nits 14.5-in, (HD), LED, SVA, AntiGlare (1366×768) display; typical brightness: 220 nits All display assemblies include 2 wireless local area network (WLAN) antenna cables Supports 16:9 wide aspect ratio Lighted logo on top bezel
Memory	2 customer-accessible/upgradable memory module slots
	Supports dual-channel memory

Category	Description
	Supports up to 8192 GB of system RAM
	DDR3/1333-MHz
	Supports the following configurations: • 8192-MB total system memory (4096×2) • 6144-MB total system memory (4096×1 + 2048×1) • 4096-MB total system memory (4096×1 or 2048×2) • 3072-MB total system memory (2048×1 + 1024×1) • 2048-MB total system memory (2048×1 or 1024×2)
Hard drives	Supports **6.35-cm** (2.5-in) hard drives (HD) and solid-state drives (SSD), **12.5-mm** (.49-in) and **9.5-mm** (.37-in) thicknesses
	Customer-accessible
	Serial ATA
	Accelerometer (HP Mobile Data Protection System 3D)
	Supports the following single hard drive configurations: • 750–GB (7200–rpm) • 750–GB (5400–rpm) • 640–GB (7200–rpm) • 640-GB (5400-rpm) • 500-GB (7200-rpm) • 320-GB (7200-rpm) • 250-GB (7200-rpm)
	Supports the following single solid-state drive configurations: • 256-GB • 160-GB
Optical drive	Fixed
	Serial ATA
	12.7-mm tray load
	Supports a DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
Audio and video	2 dual-array Integrated omnidirectional digital microphones with beam-forming, echo-cancellation, noise-suppression software
	IDT92HD80 HD audio with D3 mode support
	Supports Microsoft Premium Requirements
	Dolby advanced audio
	2 Pavilion-branded Altec Lansing speakers
	Low-light HD webcam (fixed, no tilt) with activity LED, 1280×720 by 24 frames per second
Ethernet	Integrated Realtek RTL811DL 10/100/1000 GB network interface card (NIC)

Category	Description
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: • Broadcom 43224 802.11a/b/g/n 2×2 WiFi Adapter • Intel Centrino Advanced-N 6200 802.11a/b/g/n 2×2 WLAN module • Intel Centrino Advanced-N 6200 802.11a/b/g 2x2 WLAN module
	Two WWAN antennas built into display assembly
	Support for an HSPA EV-DO WWAN module:
External media card	Digital Media Slot supports the following digital card formats: • MultiMediaCard • Secure Digital (SD) Memory Card • Secure Digital High Capacity Memory card • Secure Digital Extended Capacity Memory Card
Ports	• 3-pin AC power • Audio-in (mono microphone) • Audio-out (stereo headphone) • eSATA combo with 3rd USB port • HDMI version 1.3c supporting 1080p with HDCP key (automatically switches from UMA mode to discrete mode when an HDMI device is connected to the mini-Display Port supporting super high definition external displays; fn+f4 incorporates all 3 video-out modes (HDMI, mDP, LCD) • RJ-45 (Ethernet, includes link and activity lights) • USB 2.0 (3)
Keyboard/pointing devices	Full-size (14.5 in), backlit, island-style keyboard
	f5/f6 control for backlight brightness
	TouchPad with gesture support (HP-defined, scroll, pinch, zoom)
	Taps enabled by default
Power requirements	90W slim travel AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector) 65W slim travel AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)
	Support for the following batteries: • 8-cell, 2.00-Ah (59-Wh) Li-ion battery • 6-cell, 2.80-Ah (62-Wh) Li-ion battery
Security	Security cable slot

Category	Description
Operating system	**Preinstalled:** • Windows® 7 Home Premium 64-bit • Windows 7 Home Professional 64-bit • Windows 7 Ultimate 64-bit • Linux (configurable with embedded HP QuickWeb
Serviceability	**End-user replaceable parts:** • AC adapter • Battery • Hard drive • Memory modules (2) • RTC battery • WLAN module • WWAN module

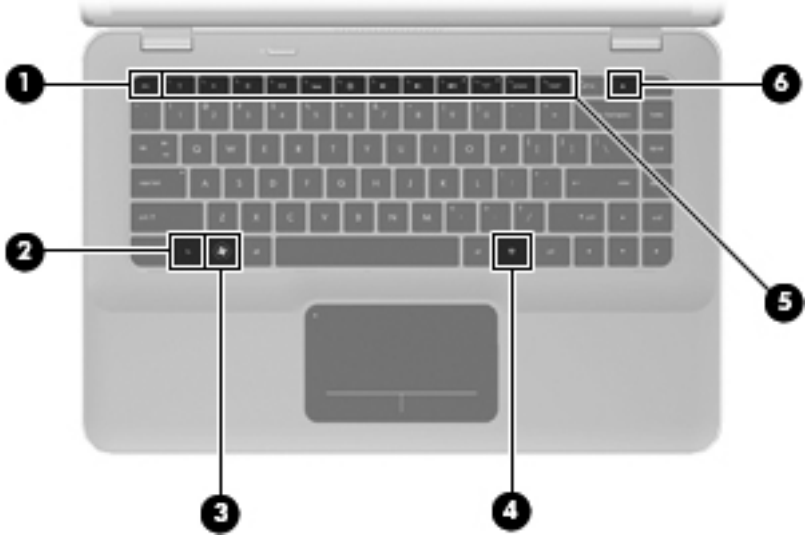
2 External component identification

Top

Button

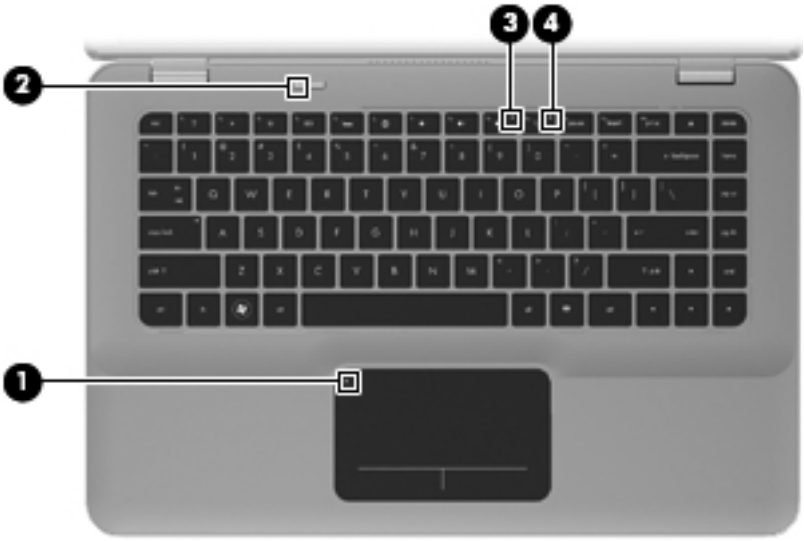
Component	Description
Power button*	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. 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. To learn more about your power settings, select **Start > Control Panel > System and Security > Power Options**, or refer to the *HP Notebook Reference Guide*.

Keys



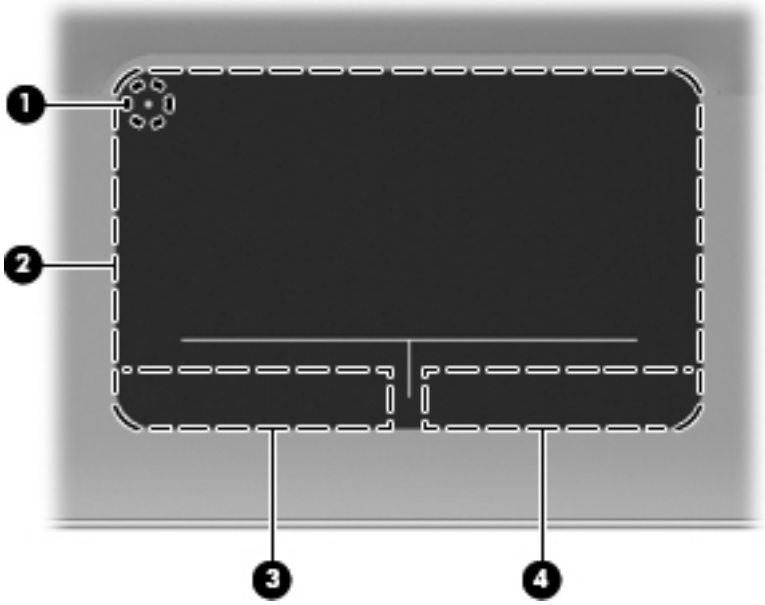
Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Displays system information when pressed in combination with the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu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

Lights



Item	Component	Description
(1)	TouchPad off indicator	• Amber: The TouchPad is off. • Off: The TouchPad is on.
(2)	Power light	• White: The computer is on. • Blinking white: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.
(3)	Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.
(4)	Wireless light	• White: An integrated wireless device, such as a WLAN device, is on. **NOTE:** Wireless devices are enabled at the factory. • Amber: All wireless devices are off.

TouchPad



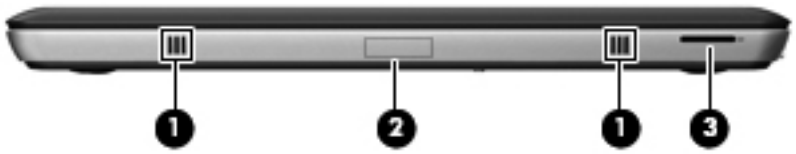
Item	Component	Description
(1)	TouchPad off indicator	Turns the TouchPad on and off. Quickly double-tap the TouchPad off indicator to turn the TouchPad on and off.
(2)	TouchPad zone	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button	Functions like the left button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

Display

Item	Component	Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(3)	Internal microphones (2)	Record sound.
(4)	Webcam	Records video and captures still photographs. To access the webcam, select **Start > All Programs > HP > HP MediaSmart > HP MediaSmart Webcam**.
(5)	Webcam light	On: The webcam is in use.

*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.

Front

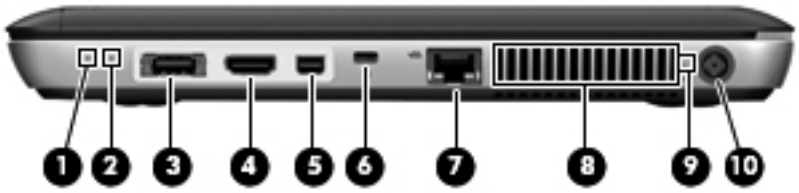


Item	Component	Description
(1)	Speakers (2)	Produce sound.
(2)	Bluetooth compartment	Contains a Bluetooth device.
(3)	Digital Media Slot	Supports the following digital card formats: • MultiMediaCard • Secure Digital (SD) Memory Card • Secure Digital High Capacity Memory card • Secure Digital Extended Capacity Memory Card

Left side

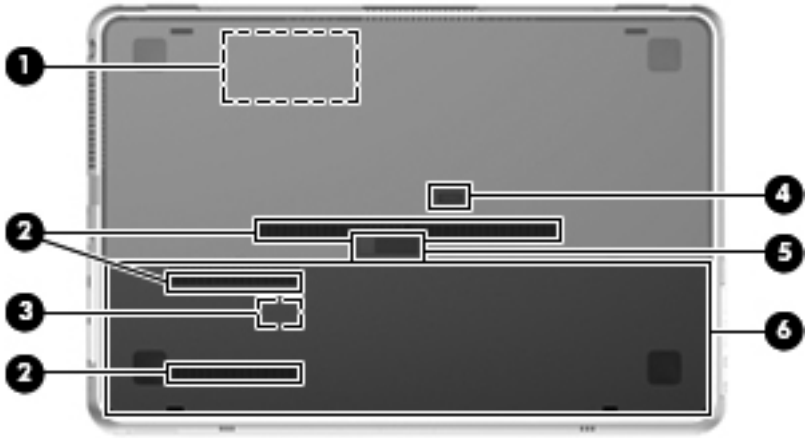
Item	Component	Description
(1)	Optical drive	Reads/writes optical discs. **CAUTION:** Do not insert 8-cm optical discs into the optical drive. This can cause damage to the computer.
(2)	USB ports (2)	Connect optional USB devices.
(3)	Audio-out (headphone) jack/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices. **NOTE:** When a device is connected to the jack, the computer speakers are disabled. **NOTE:** Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(4)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.

Right side



Item	Component	Description
(1)	Power light	• White: The computer is on. • Blinking white: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.
(2)	Drive light	• Blinking white: The hard drive is being accessed. • Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive. **NOTE:** For information on HP ProtectSmart Hard Drive Protection, refer to the *HP Notebook Reference Guide*.
(3)	eSATA/USB port	Connects a high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.
(4)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(5)	Mini DisplayPort	Connects an optional digital display device, such as a highperformance monitor or projector.
(6)	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.
(7)	RJ-45 (network) jack (2)	Connects a network cable.
(8)	Vents	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(9)	Battery light	• Off: The computer is running on battery power. • Blinking amber: The battery has reached a low battery level, a critical battery level, or there is a battery error. • Amber: A battery is charging. • White: The computer is connected to external power and the battery is fully charged.
(10)	Power connector	Connects an AC adapter.

Bottom components

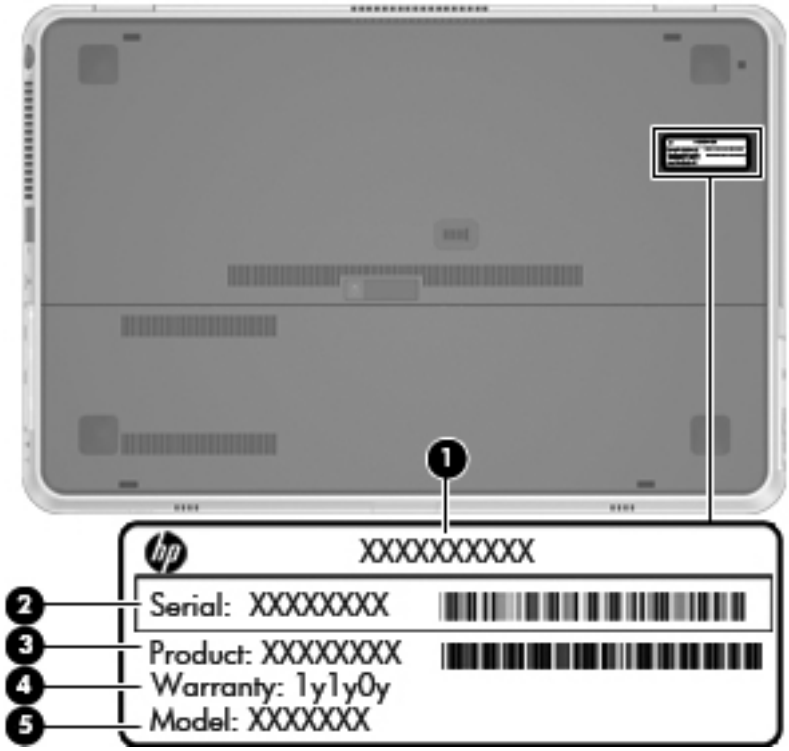


Item	Component	Description
(1)	Memory module/wireless module compartment	Contains the memory module slots and a wireless WAN module. **CAUTION:** To prevent an unresponsive system, replace the wireless module with a wireless module authorized for use by the governmental agency that regulates wireless 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.
(2)	Vents (3)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	SIM slot (select models only)	Contains a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(4)	Accessory battery connector	Connects an optional accessory battery.
(5)	Battery cover release latch	Releases the battery cover.
(6)	Battery bay	Holds the battery, the hard drive, and a wireless LAN module. **NOTE:** The battery is preinstalled in the battery bay at the factory. **CAUTION:** To prevent an unresponsive system, replace the wireless module with a wireless module authorized for use 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.

3 Illustrated parts catalog

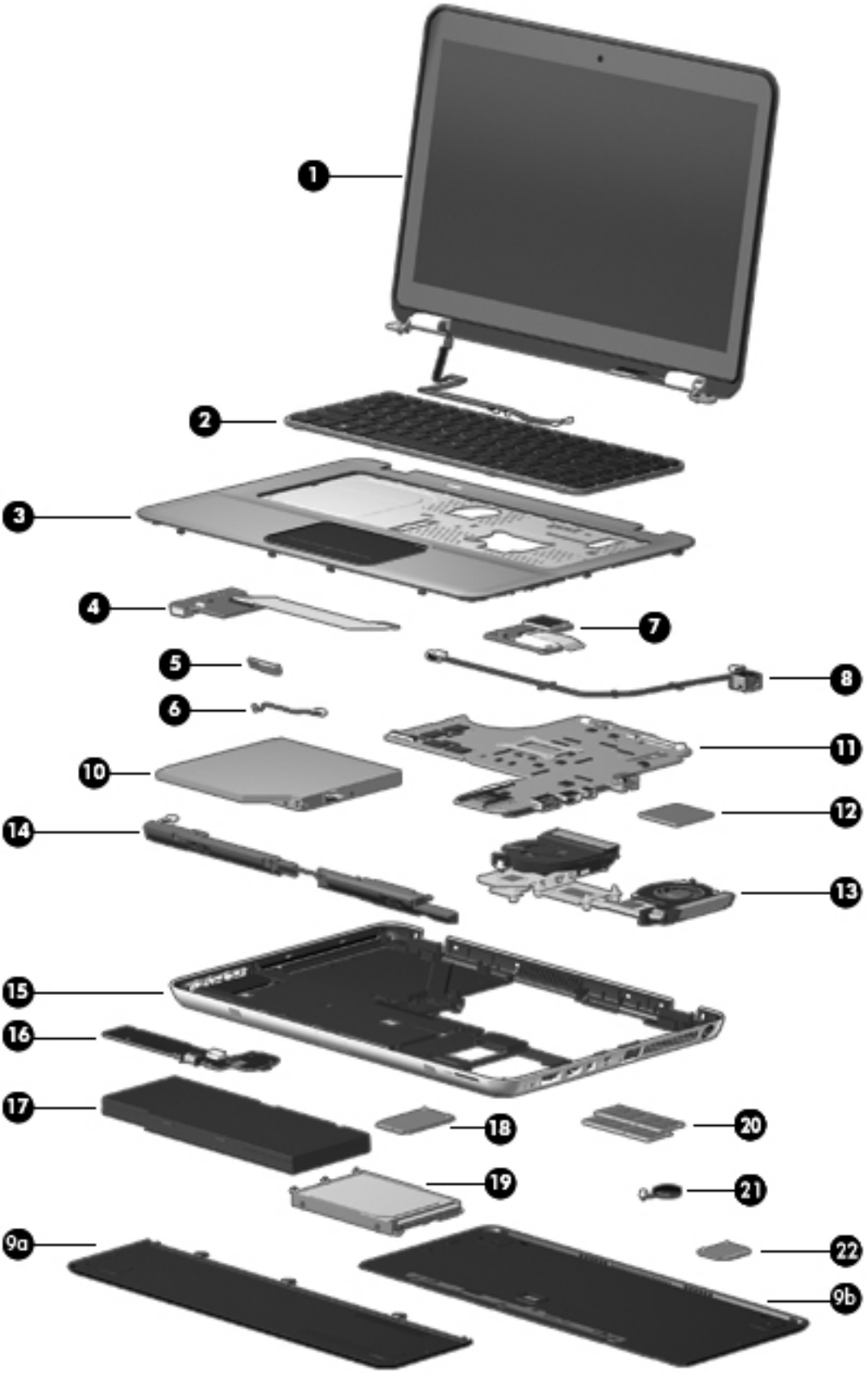
Service tag

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



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.
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	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)	**14.5-in, LED, HD, AntiGlare, flush glass display assembly** (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers,and 2 WWAN antenna cables and transceivers):	
	SVA display assembly for use only on Beats Edition computer models	619399-001
	SVA display assembly for use only on standard computer models	616270-001
	WVA HD+ display assembly for use only on standard computer models	608366-001
(2)	**Keyboard** (includes keyboard cable and keyboard light cable):	
	For use only on Beats Edition computer models:	
	• For use in Brazil	619400-201
	• For use in Canada	619400-121
	• For use in Denmark, Finland, and Norway	619400-DH1
	• For use in France	619400-051
	• For use in Germany	619400-041
	• For use in Japan	619400-291
	• For use in Latin America	619400-161
	• For use in the Netherlands	619400-B31
	• For use in Russia	619400-251
	• For use in Saudi Arabia	619400-171
	• For use in South Korea	619400-AD1
	• For use in Spain	619400-071
	• For use in Taiwan	619400-AB1
	• For use in Thailand	619400-281
	• For use in the United Kingdom and Singapore	619400-031
	• For use in the United States	619400-001
	• For us in Switzerland	619400-BG1
	• For use in Italy	619400-061
	For use only on standard computer models:	
	• For use in Brazil	608375-201
	• For use in Canada	608375-121
	• For use in Italy	608375-061
	• For use in Denmark, Finland, and Norway	608375-DH1
	• For use in France	608375-051
	• For use in Germany	608375-041
	• For use in Japan	608375-291
	• For use in Latin America	608375-161

Item	Description	Spare part number
	• For use in the Netherlands	608375-B31
	• For use in Portugal	608375-131
	• For use in Russia	608375-251
	• For use in Saudi Arabia	608375-171
	• For use in South Korea	608375-AD1
	• For use in Spain	608375-071
	• For use in Switzerland	608375-BG1
	• For use in Taiwan	608375-AB1
	• For use in Thailand	608375-281
	• For use in Turkey	608375-141
	• For use in the United Kingdom and Singapore	608375-031
	• For use in the United States	608375-001
(3)	**Top cover** (includes power button board and cable and TouchPad and TouchPad cable):	
	For use only on Beats Edition computer models	619402-001
	For use only on standard computer models	608377-001
(4)	**Audio/USB board** (includes cable)	608379-001
(5)	**Bluetooth module** (with gasket) **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 608385-001.	625485-001
	Cable Kit, includes:	608385-001
(6)	Bluetooth module cable	616779-001
(7)	**SIM/WWAN board** (includes cable)	608382-001
(8)	**Power connector cable**	608380-001
	Door Kit, includes:	608384-001
(9a)	Battery cover	
(9b)	Memory module/wireless module compartment cover	
	NOTE: See Door Kit on page 20 for more Door Kit component information.	
(10)	**DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe** (includes cable, connector board, and retention rails)	608374-001
(11)	**System board** (includes replacement thermal material):	
	For use only on computer models equipped with an Intel Core i7 processor	608365-001
	For use only on computer models equipped with an Intel Core i5, i3, or P6000 processor	608364-001
(12)	**Processor** (includes replacement thermal material):	
	Intel Core i7-840QM 1.86- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	612260-001

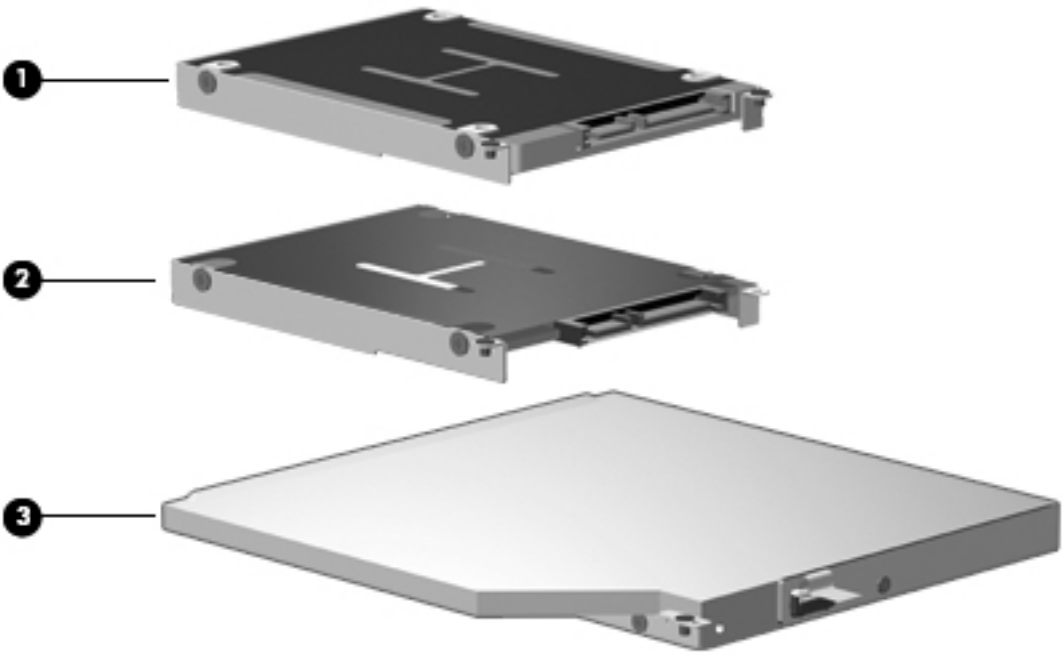
Item	Description	Spare part number
	Intel Core i7-820QM 1.73- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	583053-001
	Intel Core i7-740QM 1.73- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	612259-001
	Intel Core i7-720QM 1.60- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	586170-001
	Intel Dual Core i5-580M 2.66-3.33-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W	625825-001
	Intel Dual Core i5-560M 2.53-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W	625824-001
	Intel Core i5-540M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	594188-001
	Intel Core i5-520M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	594187-001
	Intel Core i5-460M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	626039-001
	Intel Core i5-450M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	613585-001
	Intel Core i5-430M 2.26-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	597624-001
	Intel Core Dual i3-380M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	625823-001
	Intel Core i3-370M 2.40-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache)	613584-001
	Intel Core i3-350M 2.26-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache)	597623-001
	Intel Pentium P6200 2.13-GHz processor 3-MB L3 cache, 1066-MHz FSB	625831-001
	Intel Core2 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
(13)	**Fan/heat sink assembly** (includes replacement thermal material)	608378-001
(14)	**Speakers** (include cable)	608381-001
(15)	**Base enclosure** (includes 4 rubber feet):	
	For use only on Beats Edition computer models	619401-001
	For use only on standard computer models	608376-001
(16)	**Battery connector board** (includes cable)	617265-001
(17)	**Battery:**	
	8-cell, 59-Wh, 2.00-Ah, Li-ion battery	593548-001
	6-cell, 62-Wh, 2.80-Ah, Li-ion battery	602410-001
(18)	**HSPA EV-DO WWAN module**	531993-001
(19)	**Hard drive** (includes hard drive bracket):	
	750–GB, 7200–rpm	633252-001
	750–GB, 5400–rpm	603787-001
	640–GB, 7200–rpm	621046-001
	640–GB, 5400–rpm	631161–001

Item	Description	Spare part number
	640-GB, 5400-rpm	608372-001
	500-GB, 7200-rpm	608371-001
	320-GB, 7200-rpm	608370-001
	250-GB, 7200-rpm	608369-001
	Solid-state drive (includes solid-state drive bracket):	
	256-GB	608368-001
	160-GB	608367-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and screws)	608373-001
(20)	**Memory modules** (2, PC3, 10600, 1333-MHz):	
	4096-MB	599092-001
	2048-MB	598856-001
	1024-MB	598859-001
(21)	**RTC battery** (includes cable and double-sided tape)	581926-001
(22)	**WLAN module:**	
	Broadcom 43224 802.11a/b/g/n 2×2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	582564-001
	Broadcom 43224 802.11a/b/g/n 2×2 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
	Intel Centrino Advanced-N 6200 802.11a/b/g/n 2×2 WLAN module	572509-001
	Intel Centrino Advanced-N 6200 802.11a/b/g 2x2 WLAN module	572510-001

Door Kit

Item	Description	Spare part number
	Door Kit, includes:	608384-001
(1)	Battery cover	
(2)	Memory module/wireless module compartment cover	

Mass storage devices



Item	Description	Spare part number
(1)	**Hard drive** (includes hard drive bracket):	
	750–GB, 7200–rpm	633252-001
	750–GB, 5400–rpm	603787-001

Item	Description	Spare part number
	640–GB, 7200–rpm	621046-001
	640-GB, 5400-rpm	631161-001
	640-GB, 5400-rpm	608372-001
	500-GB, 7200-rpm	608371-001
	320-GB, 7200-rpm	608370-001
	250-GB, 7200-rpm	608369-001
(2)	**Solid-state drive** (includes solid-state drive bracket):	
	256-GB	608368-001
	160-GB	608367-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and screws)	608373-001
(3)	**DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe** (includes cable, connector board, and retention rails)	608374-001

Miscellaneous parts

Description	Spare part number
AC adapter:	
90W PFC RC/V HP Smart AC adapter	609940-001
90W PFC RC/V EM HP Smart AC adapter	609947-001
90W PFC RC/V EM 3W	616072-001
HDMI to VGA adapter	530607-001
Headphone:	
Power cord:	
For use in Argentina	490371-D01
For use in Italy	490371-061
For use in Australia	490371-011
For use in Thailand	490371-201
For use in Brazil	490371-202
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Japan	490371-291
For use in North America	490371-001
For use in the People's Republic of China	490371-AA1

Description	Spare part number
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
Protective cover:	
Beats Edition protective cover	622391-001
Standard protective cover	623899-001
Screw Kit	608383-001

Sequential part number listing

Spare part number	Description
490371-001	Power cord for use in North America
490371-061	Power cord for use in Italy
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Thailand
490371-202	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
530607-001	HDMI to VGA adapter
531993-001	HSPA EV-DO WWAN module
572509-001	Intel Centrino Advanced-N 6200 802.11a/b/g/n 2×2 WLAN module
572510-001	Intel Centrino Advanced-N 6200 802.11a/b/g 2x2 WLAN module
581926-001	RTC battery (includes cable and double-sided tape)

Spare part number	Description
582564-001	Broadcom 43224 802.11a/b/g/n 2×2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
582564-002	Broadcom 43224 802.11a/b/g/n 2×2 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 i7-820QM 1.73- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
586170-001	Intel Core i7-720QM 1.60- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
593548-001	8-cell, 59-Wh, 2.00-Ah, Li-ion battery
594187-001	Intel Core i5-520M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
594188-001	Intel Core i5-540M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
597623-001	Intel Core i3-350M 2.26-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
597624-001	Intel Core i5-430M 2.26-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
598856-001	2048-MB memory module (PC3, 10600, 1333-MHz)
598859-001	1024-MB memory module (PC3, 10600, 1333-MHz)
599092-001	4096-MB memory module (PC3, 10600, 1333-MHz)
602410-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
603787-001	750-GB, 5400-rpm hard drive (includes hard drive bracket)
608364-001	System board for use only on computer models equipped with an Intel Core i5, i3, or P6000 processor (includes replacement thermal material)
608365-001	System board for use only on computer models equipped with an Intel Core i7 processor (includes replacement thermal material)

Spare part number	Description
608366-001	14.5-in, LED, HD+, AntiGlare, flush glass WVA display assembly for use only on standard computer models (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers,and 2 WWAN antenna cables and transceivers)
608367-001	160-GB solid-state drive (includes solid-state drive bracket)
608368-001	256-GB solid-state drive (includes solid-state drive bracket)
608369-001	250-GB, 7200-rpm hard drive (includes hard drive bracket)
608370-001	320-GB, 7200-rpm hard drive (includes hard drive bracket)
608371-001	500-GB, 7200-rpm hard drive (includes hard drive bracket)
608372-001	640-GB, 5400-rpm hard drive (includes hard drive bracket)
608373-001	Hard Drive Hardware Kit (includes hard drive bracket and screws)
608374-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe (includes cable, connector board, and retention rails)
608375-001	Keyboard for use only on standard computer models in the United States (includes keyboard cable and keyboard light cable)
608375-031	Keyboard for use only on standard computer models in the United Kingdom and Singapore (includes keyboard cable and keyboard light cable)
608375-041	Keyboard for use only on standard computer models in Germany (includes keyboard cable and keyboard light cable)
608375-051	Keyboard for use only on standard computer models in France (includes keyboard cable and keyboard light cable)
608375-061	Keyboard for use only on standard computer models in Italy (includes keyboard cable and keyboard light cable)
608375-071	Keyboard for use only on standard computer models in Spain (includes keyboard cable and keyboard light cable)
608375-121	Keyboard for use only on standard computer models in Canada (includes keyboard cable and keyboard light cable)
608375-131	Keyboard for use only on standard computer models in Portugal (includes keyboard cable and keyboard light cable)
608375-141	Keyboard for use only on standard computer models in Turkey (includes keyboard cable and keyboard light cable)
608375-161	Keyboard for use only on standard computer models in Latin America (includes keyboard cable and keyboard light cable)
608375-171	Keyboard for use only on standard computer models in Saudi Arabia (includes keyboard cable and keyboard light cable)
608375-201	Keyboard for use only on standard computer models in Brazil (includes keyboard cable and keyboard light cable)
608375-251	Keyboard for use only on standard computer models in Russia (includes keyboard cable and keyboard light cable)
608375-281	Keyboard for use only on standard computer models in Thailand (includes keyboard cable and keyboard light cable)
608375-291	Keyboard for use only on standard computer models in Japan (includes keyboard cable and keyboard light cable)

Spare part number	Description
608375-AB1	Keyboard for use only on standard computer models in Taiwan (includes keyboard cable and keyboard light cable)
608375-AD1	Keyboard for use only on standard computer models in South Korea (includes keyboard cable and keyboard light cable)
608375-B31	Keyboard for use only on standard computer models in the Netherlands (includes keyboard cable and keyboard light cable)
608375-BG1	Keyboard for use only on standard computer models in Switzerland (includes keyboard cable and keyboard light cable)
608375-DH1	Keyboard for use only on standard computer models in Denmark, Finland, and Norway (includes keyboard cable and keyboard light cable)
608376-001	Base enclosure for use only on standard computer models (includes 4 rubber feet)
608377-001	Top cover for use only on standard computer models (includes power button board and cable and TouchPad and TouchPad cable)
608378-001	Fan/heat sink assembly (includes replacement thermal material)
608379-001	Audio/USB board (includes cable)
608380-001	Power connector cable
608381-001	Speakers (include cable)
608382-001	SIM/WWAN board (includes cable)
608383-001	Screw Kit
608384-001	Door Kit (includes the battery cover and the memory module/wireless module compartment cover) **NOTE:** See Door Kit on page 20 for more Door Kit component information.
608385-001	Cable Kit (includes the Bluetooth module cable)
609940-001	90W PFC RC/V HP Smart AC adapter
609947-001	90W PFC RC/V EM HP Smart AC adapter
612259-001	Intel Core i7-740QM 1.73- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
612260-001	Intel Core i7-840QM 1.86- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache; includes replacement thermal material)
613584-001	Intel Core i3-370M 2.40-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache; includes replacement thermal material)
613585-001	Intel Core i5-450M 2.40-GHz, 35W turbo 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 Core2 P6100 20-GHz processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
616072-001	Power cord for use in North America
616270-001	14.5-in, LED, HD, AntiGlare, flush glass SVA display assembly for use only on standard computer models (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers,and 2 WWAN antenna cables and transceivers)

Spare part number	Description
617265-001	Battery connector board (includes cable)
619399-001	14.5-in, LED, HD, AntiGlare, flush glass SVA display assembly for use only on Beats Edition computer models (includes display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers,and 2 WWAN antenna cables and transceivers)
619400-001	Keyboard for use only on Beats Edition computer models in the United States (includes keyboard cable and keyboard light cable)
619400-031	Keyboard for use only on Beats Edition computer models in the United Kingdom and Singapore (includes keyboard cable and keyboard light cable)
619400-041	Keyboard for use only on Beats Edition computer models in Germany (includes keyboard cable and keyboard light cable)
619400-051	Keyboard for use only on Beats Edition computer models in France (includes keyboard cable and keyboard light cable)
619400-071	Keyboard for use only on Beats Edition computer models in Spain (includes keyboard cable and keyboard light cable)
619400-121	Keyboard for use only on Beats Edition computer models in Canada (includes keyboard cable and keyboard light cable)
619400-161	Keyboard for use only on Beats Edition computer models in Latin America (includes keyboard cable and keyboard light cable)
619400-171	Keyboard for use only on Beats Edition computer models in Saudi Arabia (includes keyboard cable and keyboard light cable)
619400-201	Keyboard for use only on Beats Edition computer models in Brazil (includes keyboard cable and keyboard light cable)
619400-251	Keyboard for use only on Beats Edition computer models in Russia (includes keyboard cable and keyboard light cable)
619400-281	Keyboard for use only on Beats Edition computer models in Thailand (includes keyboard cable and keyboard light cable)
619400-291	Keyboard for use only on Beats Edition computer models in Japan (includes keyboard cable and keyboard light cable)
619400-AB1	Keyboard for use only on Beats Edition computer models in Taiwan (includes keyboard cable and keyboard light cable)
619400-AD1	Keyboard for use only on Beats Edition computer models in South Korea (includes keyboard cable and keyboard light cable)
619400-B31	Keyboard for use only on Beats Edition computer models in the Netherlands (includes keyboard cable and keyboard light cable)
619400-DH1	Keyboard for use only on Beats Edition computer models in Denmark, Finland, and Norway (includes keyboard cable and keyboard light cable)
619401-001	Base enclosure for use only on Beats Edition computer models (includes 4 rubber feet)
619402-001	Top cover for use only on Beats Edition computer models (includes power button board and cable and TouchPad and TouchPad cable)
621046-001	640-GB, 7200-rpm hard drive (includes hard drive bracket)
622391-001	Beats Edition protective cover
623899-001	Standard protective cover

Spare part number	Description
625485–001	Bluetooth module (with gasket) **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 608385-001.
625831–001	Intel Core2 P620 2.13Hz processor (1066-MHz, 3-MB L3 cache; includes replacement thermal material)
626039–001	Intel Core i5-460M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)
629879-001	Service door kit for Beats edition
631161-001	640-GB, 5400-rpm hard drive (includes hard drive bracket)
633252–001	750-GB, 7200-rpm hard drive (includes hard drive bracket)
634366-001	Thermal pad

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

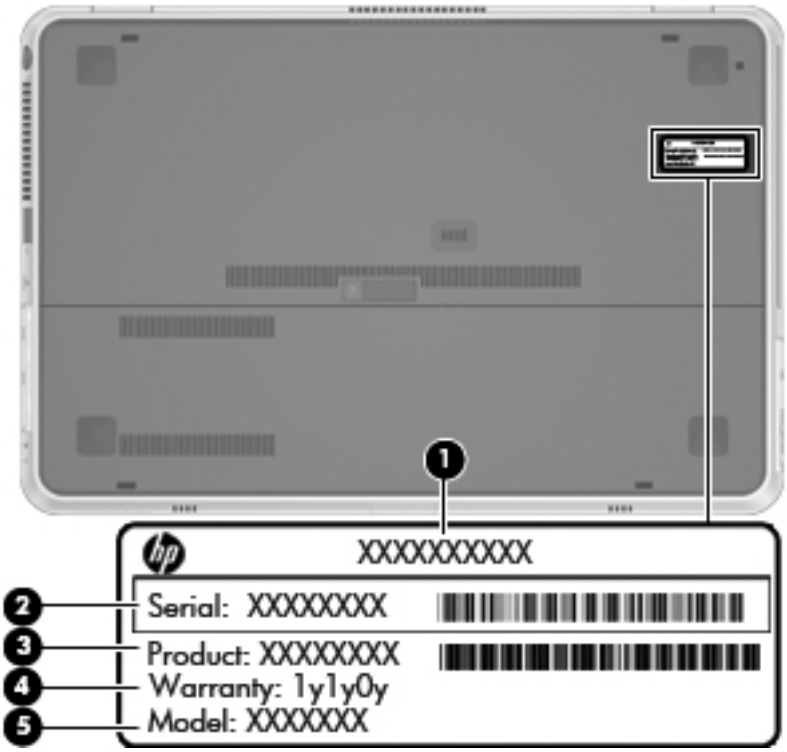
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 67 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.

Service tag

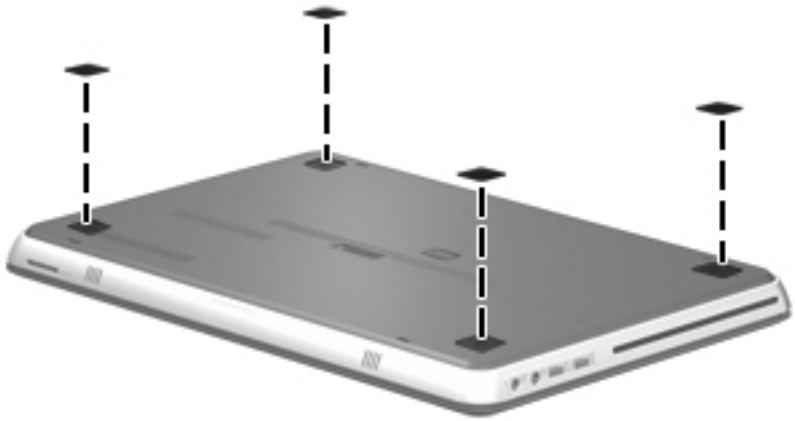
When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



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.
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	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. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

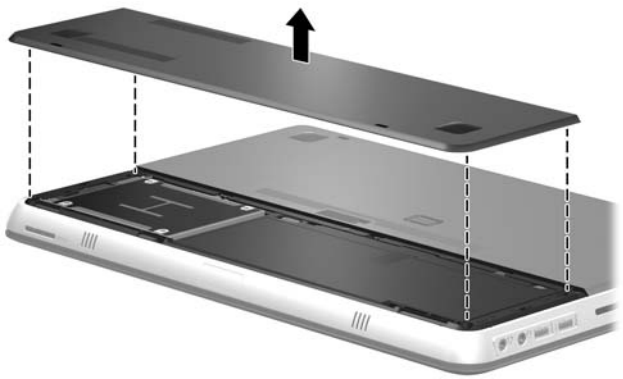
Description	Spare part number
8-cell, 59-Wh, 2.00-Ah, Li-ion battery	593548-001
6-cell, 62-Wh, 2.80-Ah, Li-ion battery	602410-001

Before disassembling the computer, follow these steps:

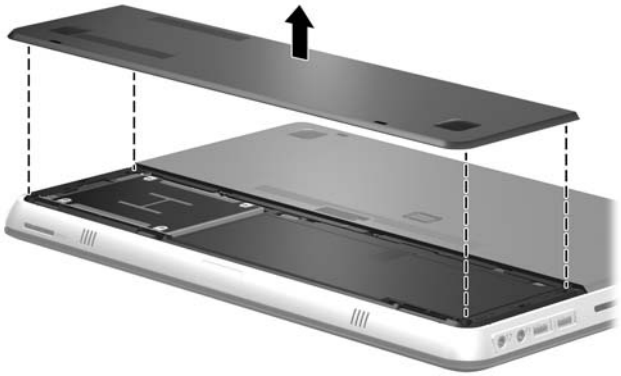
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

Remove the battery:

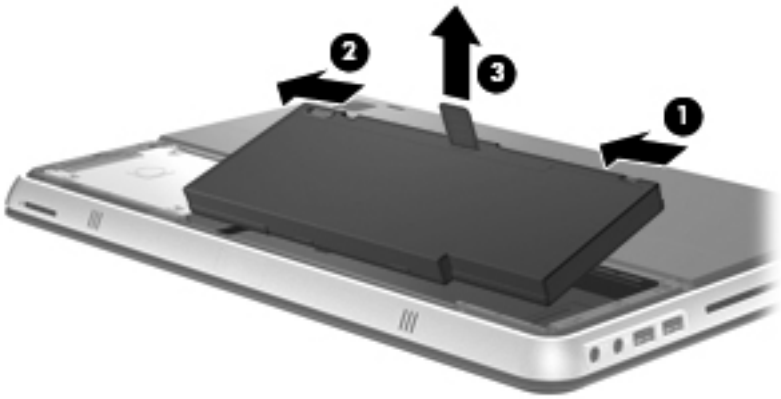
1. Slide the battery cover release latch **(1)**. (The battery cover releases forward **(2)**).



2. Remove the battery cover. The battery cover is included in the Door Kit, spare part number 608384-001.



3. Slide the right battery release latch **(1)** to unlock the battery.
4. Slide and hold the left battery release latch **(2)** to release the battery.
5. Pull the battery tab **(3)**, and then remove the battery from the computer.



To insert the battery:

1. Align the tabs on the front edge of the battery with the notches on the front edge of the battery bay.
2. Rotate the rear edge of the battery down into the battery bay until it is seated.
3. Slide the right battery release latch to lock the battery into place. (The left battery release latch will automatically lock into place.)
4. Replace the battery cover, and then slide the battery cover back until it is seated. (The battery cover release latch will automatically lock into place.)

SIM

Before removing the SIM, 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 cover and battery (see Battery on page 34).

Remove the memory module:

1. Press in on the SIM **(1)** to release it from the SIM slot.
2. Remove the SIM **(2)** from the SIM slot.

Install the SIM by inserting it into the SIM slot until you hear a click.

Mass storage device

NOTE: The mass storage device spare part kit includes a bracket.

Description	Spare part number
Hard drive:	
750–GB, 7200–rpm	633252-001
750–GB, 5400–rpm	603787-001
640–GB, 7200–rpm	621046-001
640–GB, 5400–rpm	631161–001
640-GB, 5400-rpm	608372-001
500-GB, 7200-rpm	608371-001
320-GB, 7200-rpm	608370-001

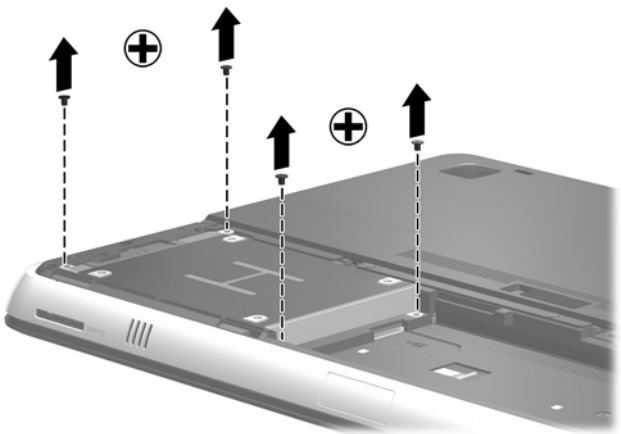
Description	Spare part number
250-GB, 7200-rpm	608369-001
Hard Drive Hardware Kit (includes hard drive bracket and screws)	608373-001
Solid-state drive:	
256-GB	608368-001
160-GB	608367-001

Before removing the mass storage device, 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 cover and battery (see Battery on page 34).

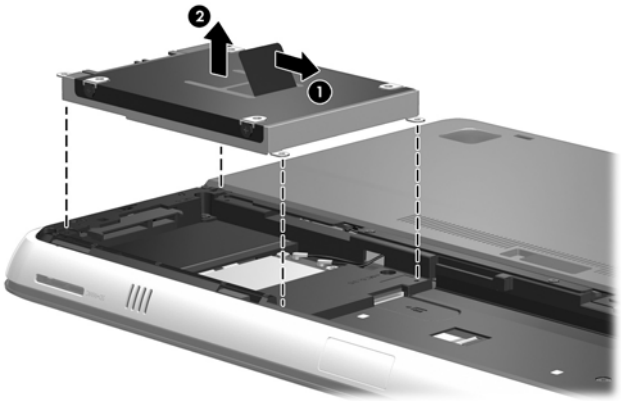
Remove the mass storage device:

1. Remove the four Phillips PM2.0×3.0 screws that secure the mass storage device to the computer.

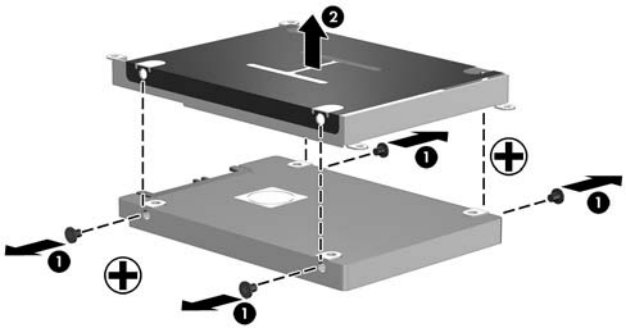


2. Use the Mylar tab **(1)** to slide the mass storage device to the right and disconnect it from the system board.

3. Lift the mass storage device **(2)** out of the mass storage device bay.



4. If it is necessary to replace the mass storage device bracket, remove the four Phillips PM3.0×3.0 screws **(1)** that secure the bracket to the mass storage device.
5. Remove the mass storage device bracket **(2)**. The mass storage device bracket and screws are included in the Hard Drive Hardware Kit, spare part number 608373-001.



Reverse this procedure to reassemble and install the mass storage device.

WWAN module

Description	Spare part number
HSPA EV-DO WWAN module	531993-001

△ **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 WWAN 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 cover and battery (see Battery on page 34).
5. Remove the hard drive (see Mass storage device on page 36).

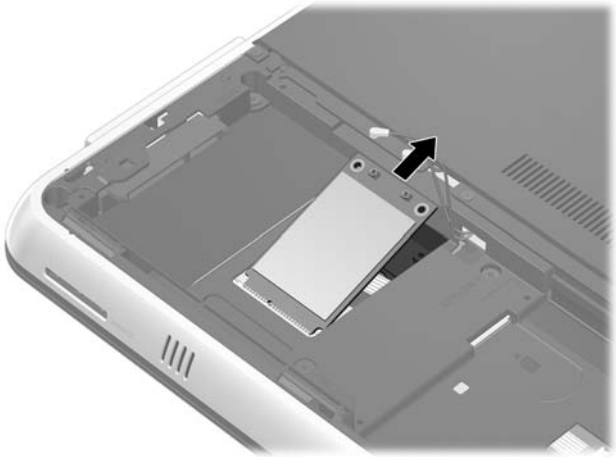
Remove the WWAN module:

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

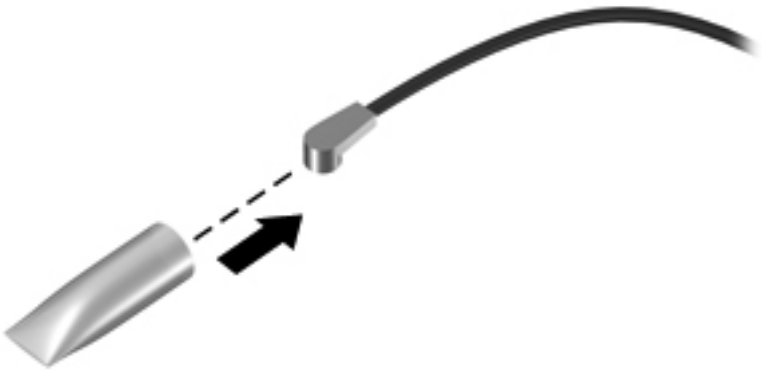
NOTE: The 1/red WWAN antenna cable is connected to the WWAN module 1/Main terminal. The 2/blue WWAN antenna cable is connected to the WWAN module 2/Aux terminal.

2. Remove the two Phillips PM2.0×3.0 screws that secure the WWAN module to the system board. (The WWAN module tilts up.)

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



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



Reverse this procedure to install the WWAN module.

WLAN module

Description	Spare part number
Broadcom 43224 802.11a/b/g/n 2×2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	582564-001
Broadcom 43224 802.11a/b/g/n 2×2 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
Intel Centrino Advanced-N 6200 802.11a/b/g/n 2×2 WLAN module	572509-001
Intel Centrino Advanced-N 6200 802.11a/b/g 2x2 WLAN module	572510-001

△ **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.

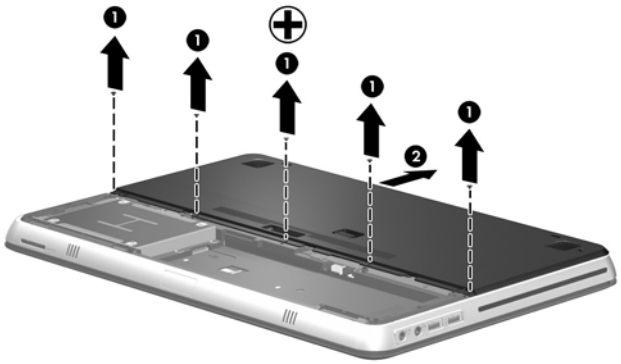
Before removing the WLAN module, follow these steps:

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 cover and battery (see Battery on page 34).

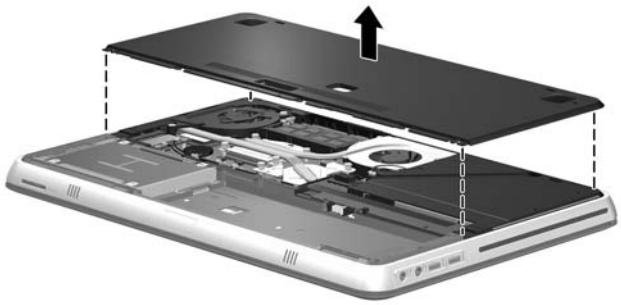
Remove the WLAN module:

1. Remove the five Phillips PM2.0×3.0 screws **(1)** that secure the memory module/wireless module compartment cover to the computer.

2. Slide the memory module/wireless module compartment cover **(2)** toward the back of the computer until the tabs on the cover disengage from the slots in the base enclosure.

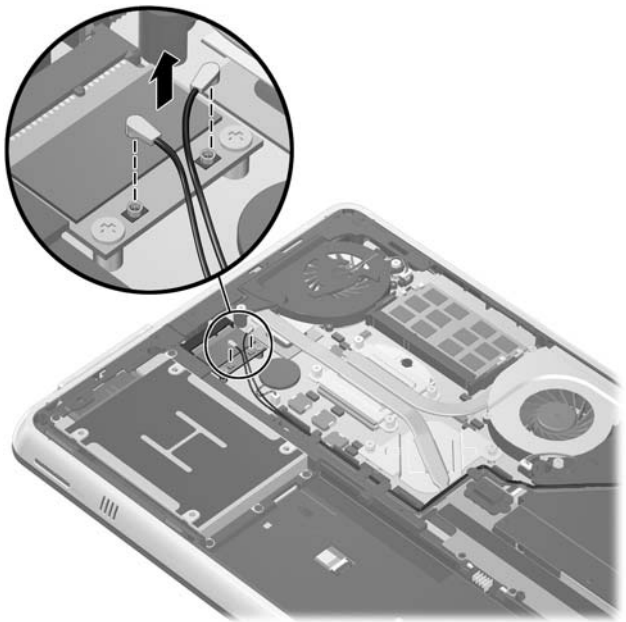


3. Remove the memory module/wireless module compartment cover. The memory module/wireless module compartment cover is included in the Door Kit, spare part number 608384-001.



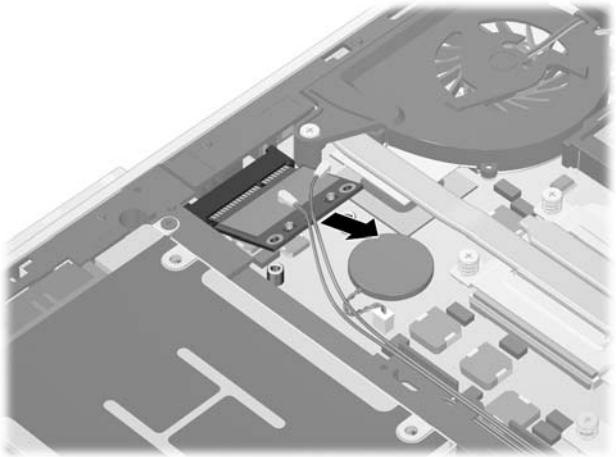
4. Disconnect the WLAN antenna cables from the terminals on the WLAN module.

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.

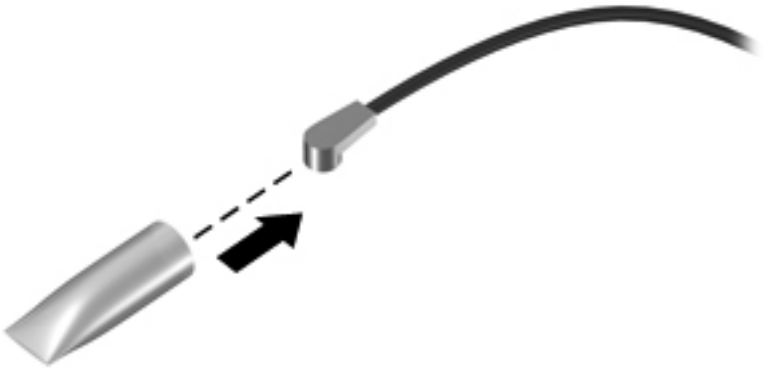


5. Remove the two Phillips PM2.0×3.0 screws that secure the WLAN module to the system board. (The WLAN module tilts up.)

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



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

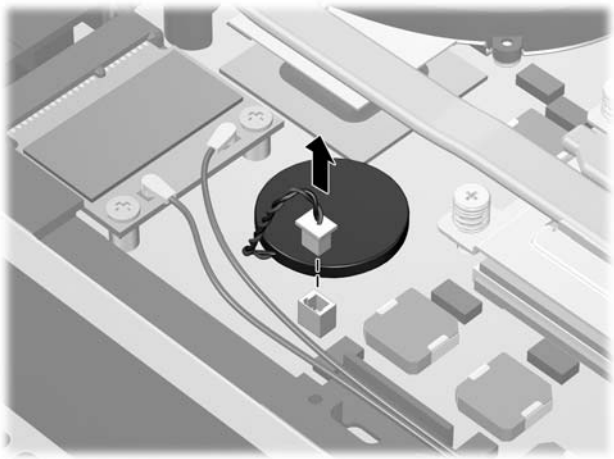
Description	Spare part number
RTC battery	581926-001

Before removing the RTC battery, follow these steps:

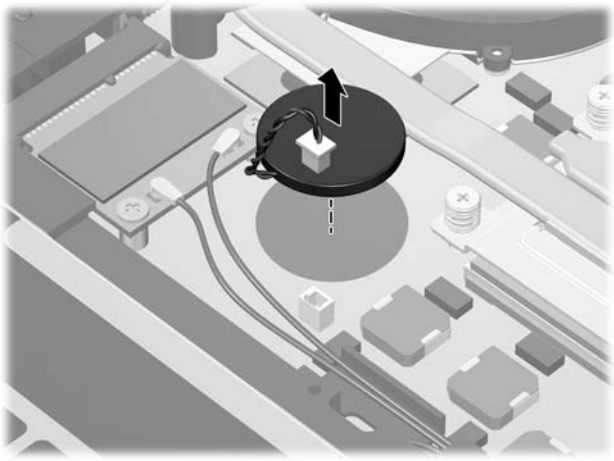
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).

Remove the RTC battery:

1. Disconnect the RTC battery cable from the system board.



2. Remove the RTC battery from the system board. The RTC battery is attached to the system board with double-sided tape.



Reverse this procedure to install the RTC battery.

Memory module

Description	Spare part number
4096-MB (PC3, 10600, 1333-MHz)	599092-001
2048-MB (PC3, 10600, 1333-MHz)	598856-001
1024-MB (PC3, 10600, 1333-MHz)	598859-001

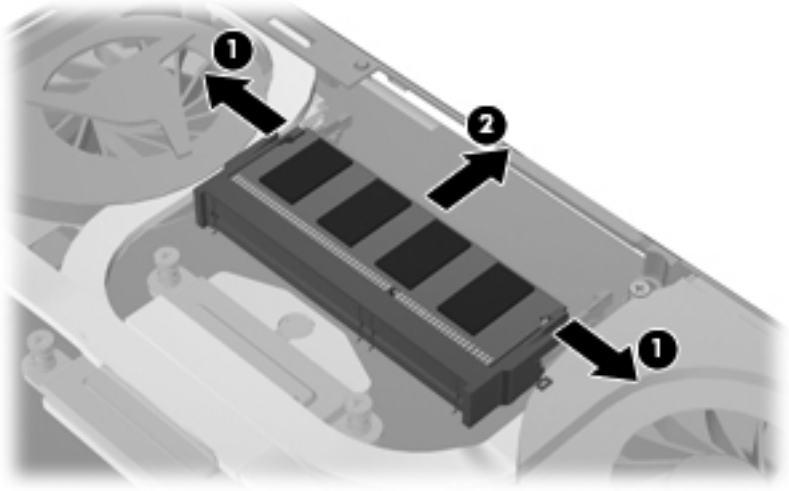
Before removing a memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).

Remove the memory module:

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

2. Remove the memory module **(2)** by pulling it away from the slot at an angle.



Reverse this procedure to install a memory module.

Battery connector board

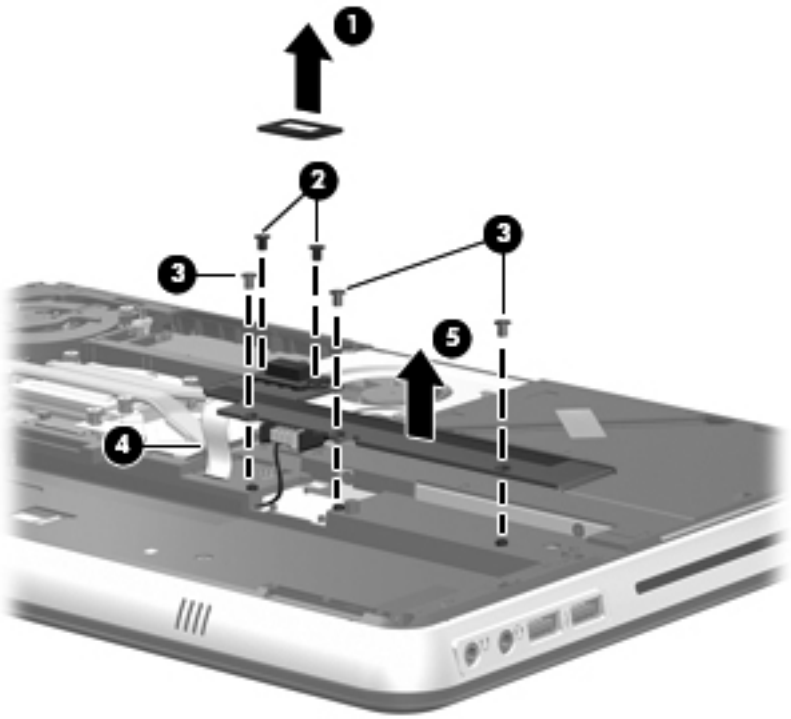
Description	Spare part number
Battery connector board (includes cable)	617265-001

Before removing the battery connector board, follow these steps:

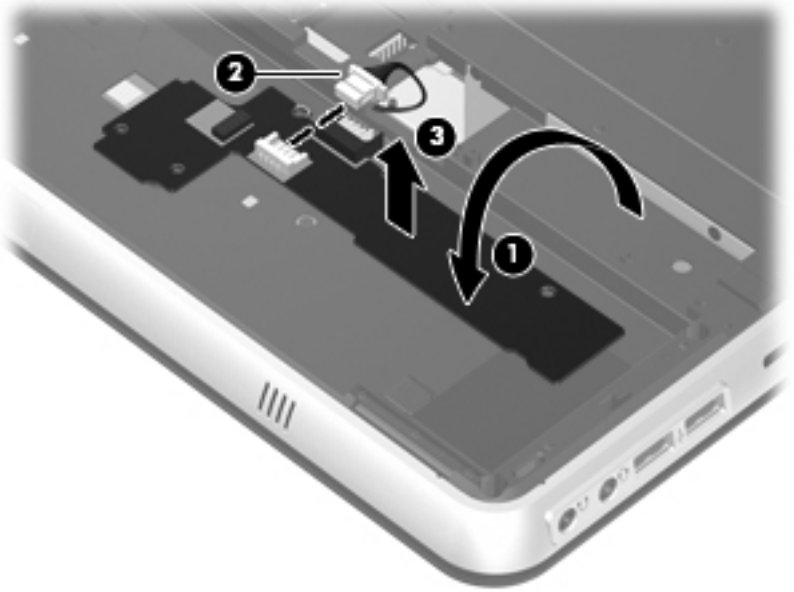
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).

Remove the battery connector board:

1. Remove the Mylar cover **(1)** located at the base of the accessory battery connector.
2. Remove the two Phillips PM2.5×4.0 screws **(2)** and the three Phillips PM2.0×3.0 screws **(3)** that secure the battery charger board to the base enclosure.
3. Release the zero insertion force (ZIF) connector to which the battery charger board cable is connected, and then disconnect the cable **(4)** from the connector.
4. Release the battery charger board **(5)** as far as the power cable allows.



5. Swing the rear edge of the battery charger board **(1)** up and forward until it rests upside down in the battery bay.
6. Disconnect the power extension cable **(2)** from the battery charger board.
7. Remove the battery charger board **(3)**.



Reverse this procedure to install the battery charger board.

Top cover

NOTE: The top cover spare part kit includes the power button board and cable and TouchPad and cable.

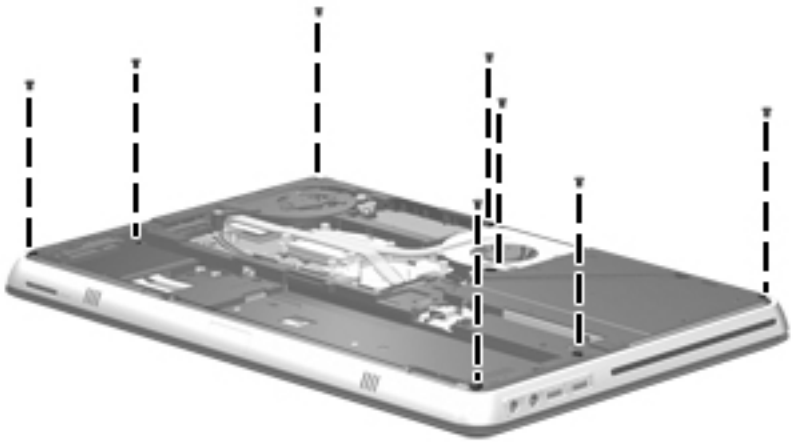
Description	Spare part number
For use only on Beats Edition computer models	619402-001
For use only on standard computer models	608377-001

Before removing the top cover, follow these steps:

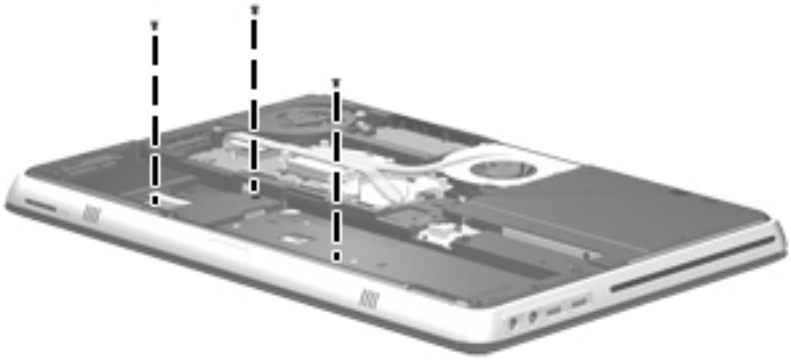
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).

Remove the top cover:

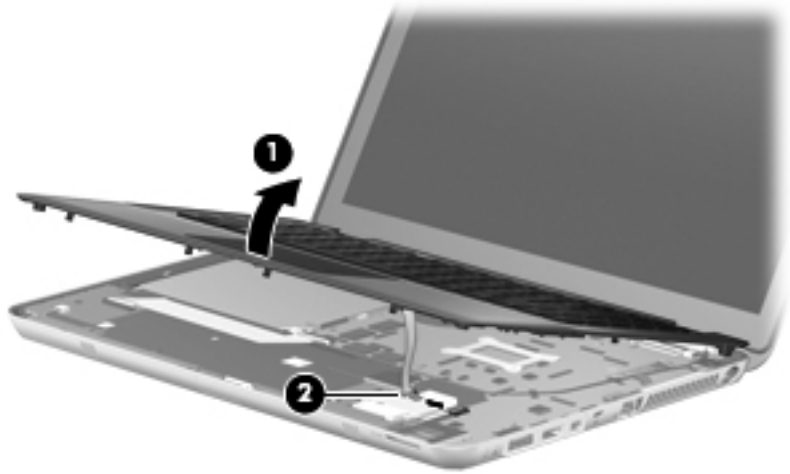
1. Remove the eight Phillips PM2.5×7.0 screws that secure the top cover to the computer.



2. Remove the three Phillips PM2.0×3.0 screws that secure the top cover to the computer in the battery bay.

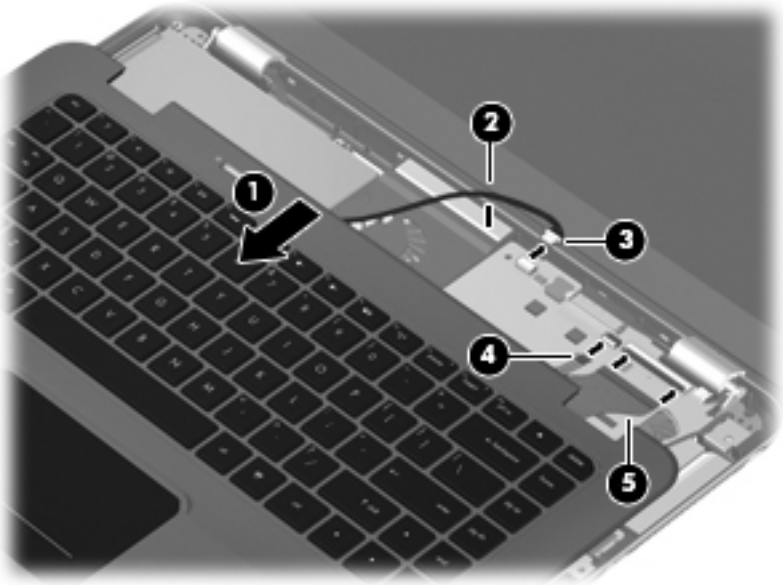


3. Turn the computer right side up, with the front toward you.
4. Open the computer as far as it will open.
5. Lift the front edge of top cover **(1)** until the TouchPad cable is accessible.
6. Release the ZIF connector to which the TouchPad cable is attached, and then disconnect the cable **(2)** from the system board.



7. Slide the top cover **(1)** forward until the power button board cable, keyboard cable, and keyboard light cable are accessible.
8. Release the power button board cable **(2)** from the fan surface. (The power button board cable is attached to the fan surface with double-sided tape.)
9. Disconnect the power button board cable **(3)** from the system board.
10. Release the ZIF connector to which the keyboard light cable is attached, and then disconnect the cable **(4)** from the system board.

11. Release the ZIF connector to which the keyboard cable is attached, and then disconnect the cable **(5)** from the system board.



12. Remove the top cover.

Reverse this procedure to install the top cover.

Keyboard

NOTE: The keyboard spare part kit includes a keyboard cable and a keyboard light cable.

For use in country or region:	Spare part number	For use in country or region:	Spare part number
For use only on Beats Edition computer models:			
• For use in Brazil	619400-201	• For use in Russia	619400-251
• For use in Canada	619400-121	• For use in Saudi Arabia	619400-171
• For use in Denmark, Finland, and Norway	619400-DH1	• For use in South Korea	619400-AD1
• For use in France	619400-051	• For use in Spain	619400-071
• For use in Germany	619400-041	• For use in Taiwan	619400-AB1
• For use in Japan	619400-291	• For use in Thailand	619400-281
• For use in Latin America	619400-161	• For use in the United Kingdom and Singapore	619400-031
• For use in the Netherlands	619400-B31	• For use in the United States	619400-001
For use only on standard computer models:			
• For use in Brazil	608375-201	• For use in Saudi Arabia	608375-171
• For use in Canada	608375-121	• For use in South Korea	608375-AD1
• For use in Denmark, Finland, and Norway	608375-DH1	• For use in Spain	608375-071

For use in country or region:	Spare part number	For use in country or region:	Spare part number
• For use in France	608375-051	• For use in Switzerland	608375-BG1
• For use in Germany	608375-041	• For use in Taiwan	608375-AB1
• For use in Japan	608375-291	• For use in Thailand	608375-281
• For use in Latin America	608375-161	• For use in Turkey	608375-141
• For use in the Netherlands	608375-B31	• For use in the United Kingdom and Singapore	608375-031
• For use in Portugal	608375-131	• For use in Italy	608375-061
• For use in Russia	608375-251		

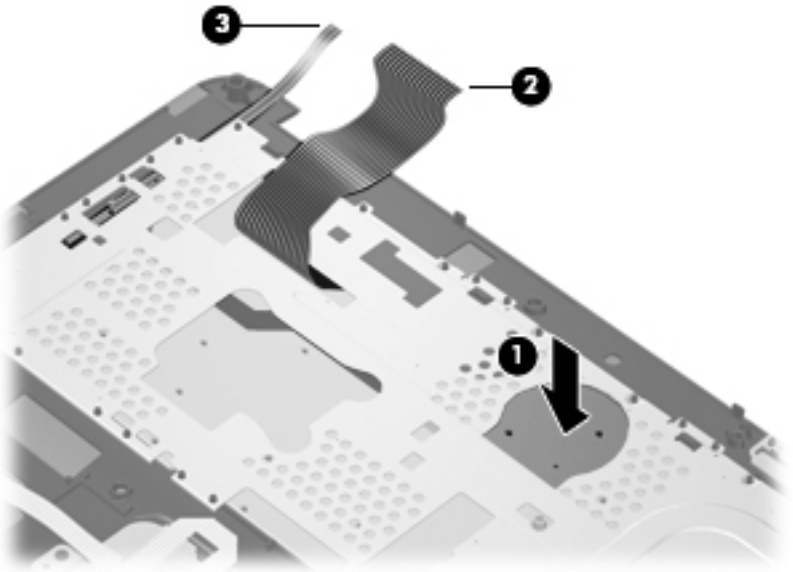
Before removing the keyboard, follow these steps:

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 cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
6. Remove the top cover (see Top cover on page 50).

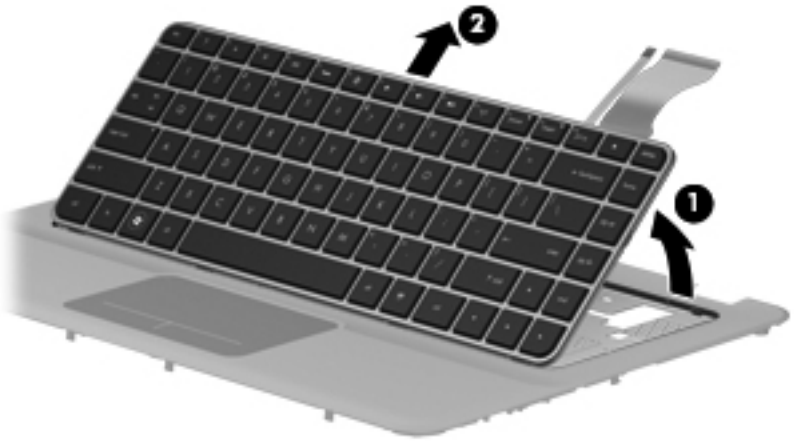
Remove the keyboard:

1. Turn the top cover upside down, with the front toward you.
2. Press on the back of the keyboard **(1)** through the opening in the top cover until the keyboard disengages from the top cover.

3. Release the keyboard light cable **(2)** and the keyboard cable **(3)** through their respective openings in the top cover.



4. Turn the top cover and keyboard right-side up, with the front toward you.
5. Swing the rear edge of the keyboard **(1)** up and forward until it rests at an angle.
6. Slide the keyboard **(2)** back at an angle until the tabs on the front edge of keyboard disengage from the slots in the top cover.



7. Remove the keyboard.

Reverse this procedure to install the keyboard.

Audio/USB board

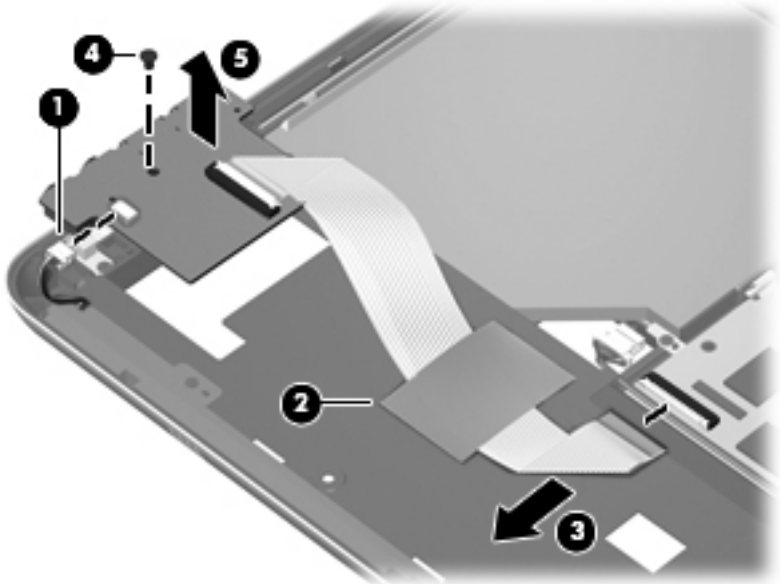
Description	Spare part number
Audio/USB board (includes cable)	608379-001

Before removing the audio/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 cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
6. Remove the top cover (see Top cover on page 50).

Remove the audio/USB board:

1. Disconnect the speaker cable **(1)** from the audio/USB board.
2. Release the grounding tape **(2)** that secures the audio/USB board cable to the base enclosure.
3. Release the ZIF connector to which the audio/USB board cable is attached, and then disconnect the cable **(3)** from the system board.
4. Remove the Phillips PM2.5×4.0 screw **(4)** that secures the audio/USB board to the base enclosure.
5. Remove the audio/USB board **(5)** and cable.



Reverse this procedure to install the audio/USB board and cable.

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 608385-001.

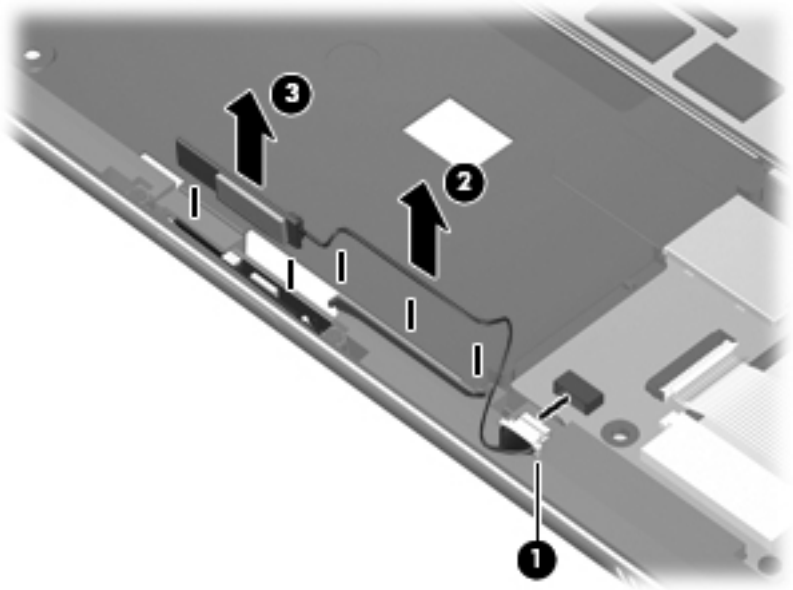
Description	Spare part number
Bluetooth module (with gasket)	625485–001

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 cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
6. Remove the top cover (see Top cover on page 50).

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the SIM/WWAN board.
2. Release the Bluetooth module cable from the routing clips **(2)** built into the base enclosure.
3. Release the Bluetooth module **(3)** from the retention clip built into the base enclosure.



4. Remove the Bluetooth module and cable.

Reverse this procedure to install the Bluetooth module and cable.

SIM/WWAN board

Description	Spare part number
SIM/WWAN board (includes cable)	608382-001

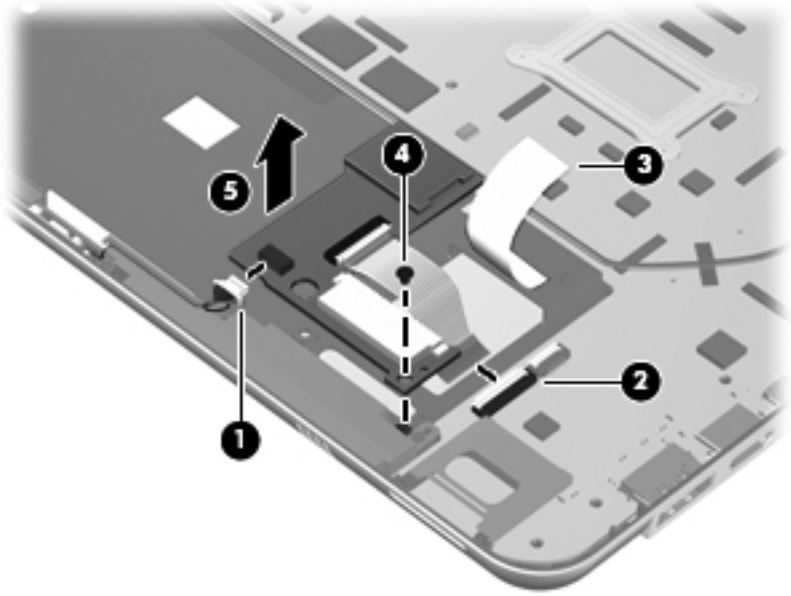
Before removing the SIM/WWAN board, follow these steps:

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 cover and battery (see Battery on page 34), and then remove the following components:
   a. SIM (see SIM on page 35)
   b. Hard drive (see Mass storage device on page 36)
   c. WWAN module (see WWAN module on page 38)
   d. Memory module/wireless module compartment cover (see WLAN module on page 41)
   e. Top cover (see Top cover on page 50)

Remove the SIM/WWAN board:

1. Disconnect the Bluetooth module cable **(1)** from the SIM/WWAN board.
2. Release the grounding tape **(2)** that secures the SIM/WWAN cable to the base enclosure.
3. Release the ZIF connector to which the SIM/WWAN board cable is attached, and then disconnect the cable **(3)** from the system board.
4. Remove the Phillips PM2.0×3.0 screw **(4)** that secures the SIM/WWAN board to the base enclosure.

5. Remove the SIM/WWAN board **(5)** and cable.



Reverse this procedure to install the SIM/WWAN board and cable.

Optical drive

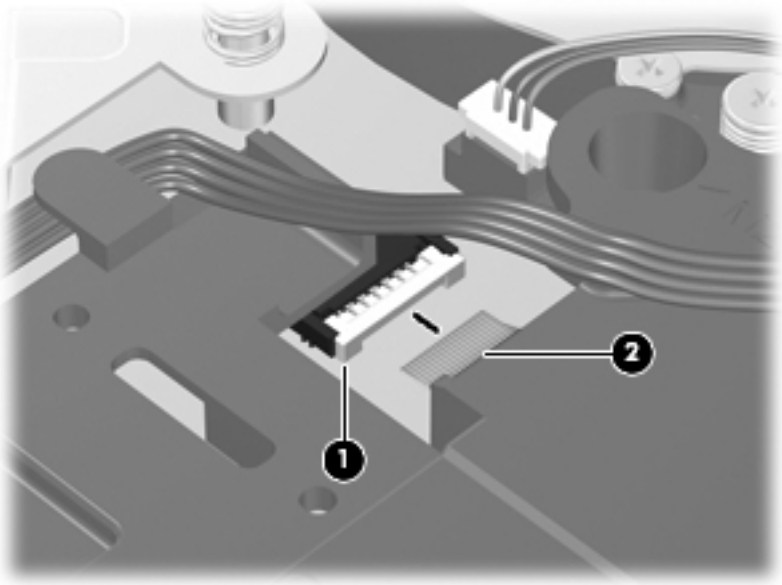
Description	Spare part number
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe (includes cable, connector board, and retention rails)	608374-001

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 cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
6. Remove the top cover (see Top cover on page 50).

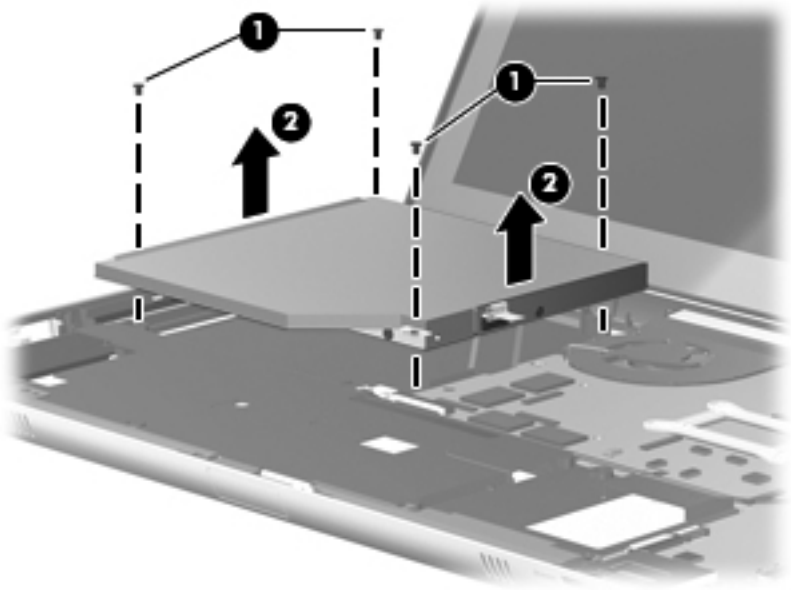
Remove the optical drive:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Release the ZIF connector **(1)** to which the optical drive cable is attached, and then disconnect the cable **(2)** from the system board.



4. Turn the computer right-side up, with the front toward you.
5. Open the computer as far as it will open.
6. Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the optical drive to the base enclosure.

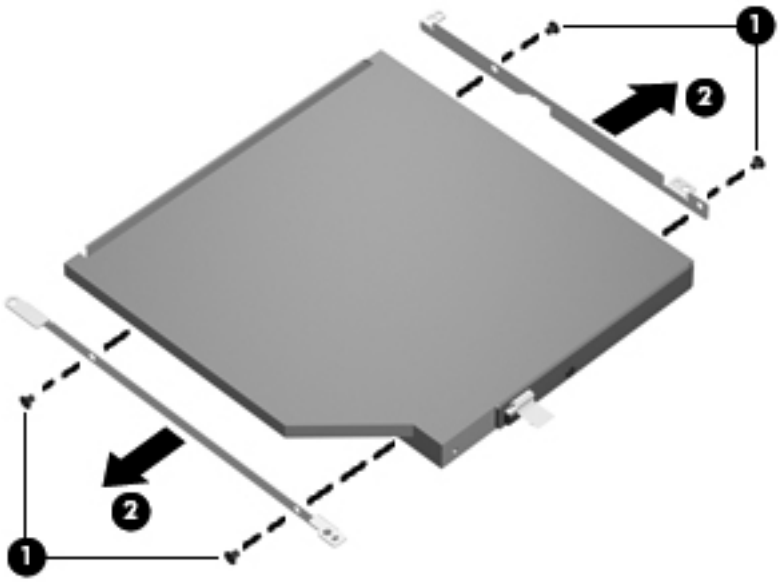
7. Remove the optical drive **(2)**.



8. If it is necessary to replace the optical drive retention rails:

   a. Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the retention rails to the optical drive.

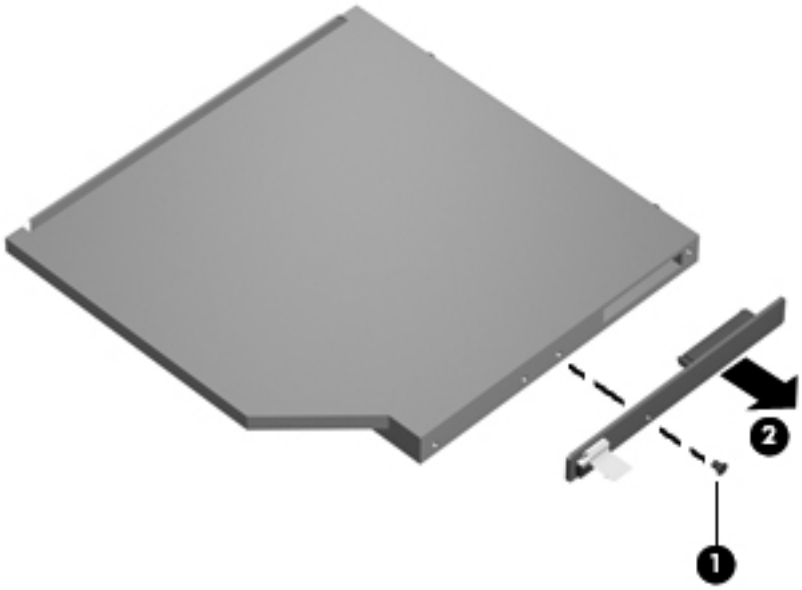
   b. Remove the retention rails **(2)**.



9. If it is necessary to replace the optical drive connector board:

   a. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the connector board to the optical drive.

b. Remove the connector board **(2)**.



Reverse this procedure to install the optical drive cable.

Power connector cable

Description	Spare part number
Power connector cable	608380-001

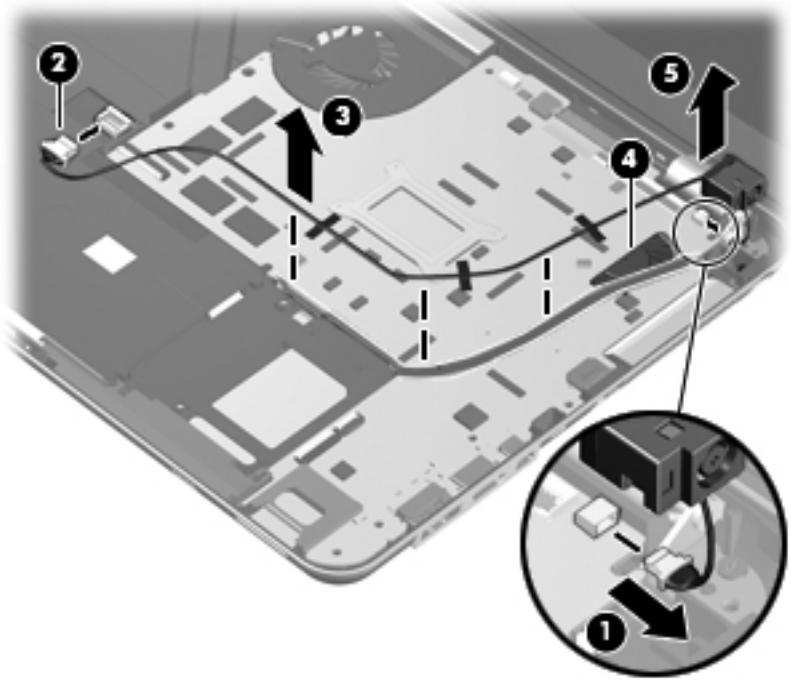
Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
6. Remove the top cover (see Top cover on page 50).

Remove the power connector cable:

1. Disconnect the power extension cable **(1)** from the battery connector board.
2. Release the power extension cord **(2)** from the system board. (The power extension cord is attached to the system board with double-sided tape.)
3. Disconnect the power connector cable **(3)** from the system board.

4. Release the power connector **(4)** from the alignment clip built into the base enclosure.



5. Remove the power connector cable.

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 on computer models equipped with an Intel Core i7 processor	608365-001
For use only on computer models equipped with an Intel Core i5, i3, or P6000 processor	608364-001

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 cover and battery (see Battery on page 34).
5. Remove the hard drive (see Mass storage device on page 36).
6. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
7. Disconnect the battery charger board ribbon cable from the system board (see Battery connector board on page 48).

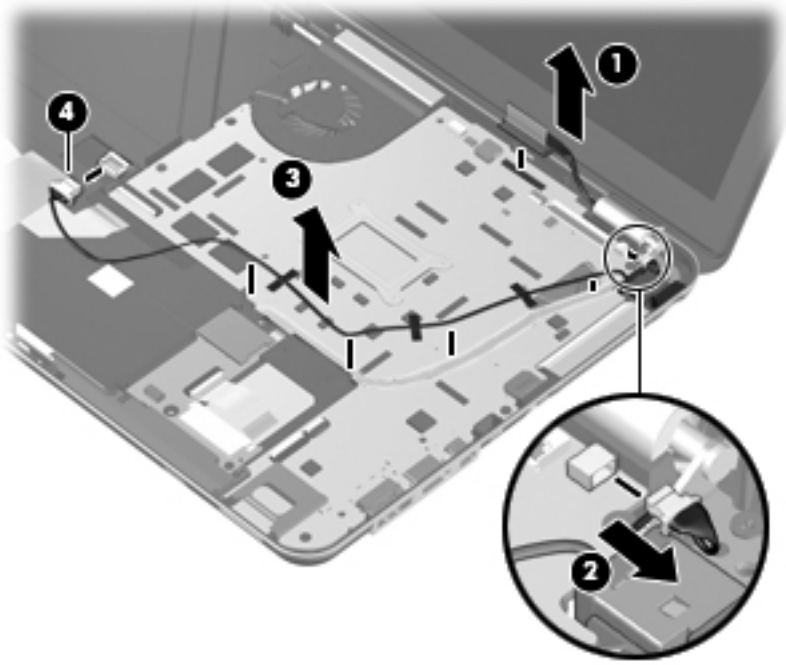
8. Remove the top cover (see Top cover on page 50).
9. Disconnect the optical drive cable from the system board (see Optical drive on page 59).

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:

- SIM (see SIM on page 35)
- WLAN module (see WLAN module on page 41)
- RTC battery (see RTC battery on page 45)
- Memory module (see Memory module on page 46)
- Fan/heat sink assembly (see Fan/heat sink assembly on page 65)
- Processor (see Processor on page 67)

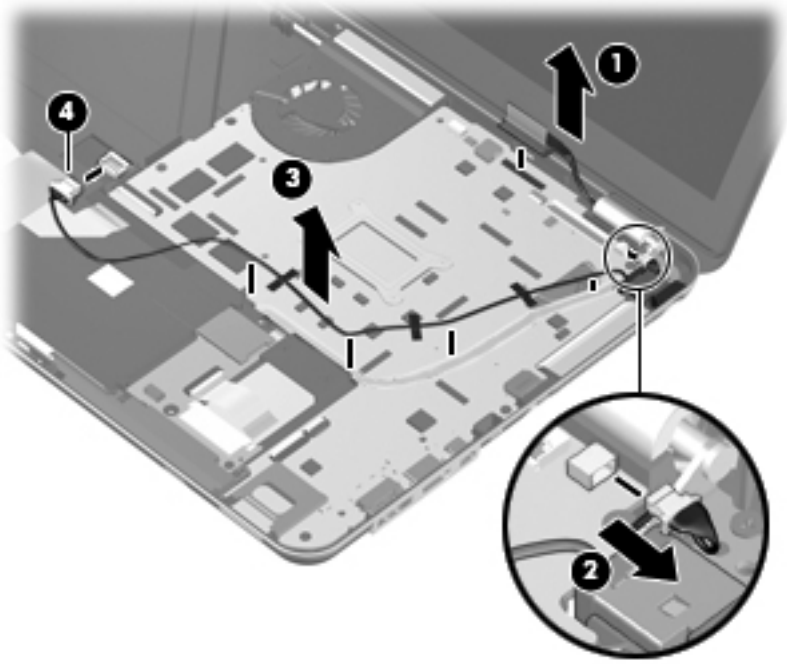
Remove the system board:

1. Release the ZIF connector to which the audio/USB board cable is attached, and then disconnect the cable **(1)** from the system board.
2. Release the ZIF connector to which the SIM/WWAN board cable is attached, and then disconnect the cable **(2)** from the system board.

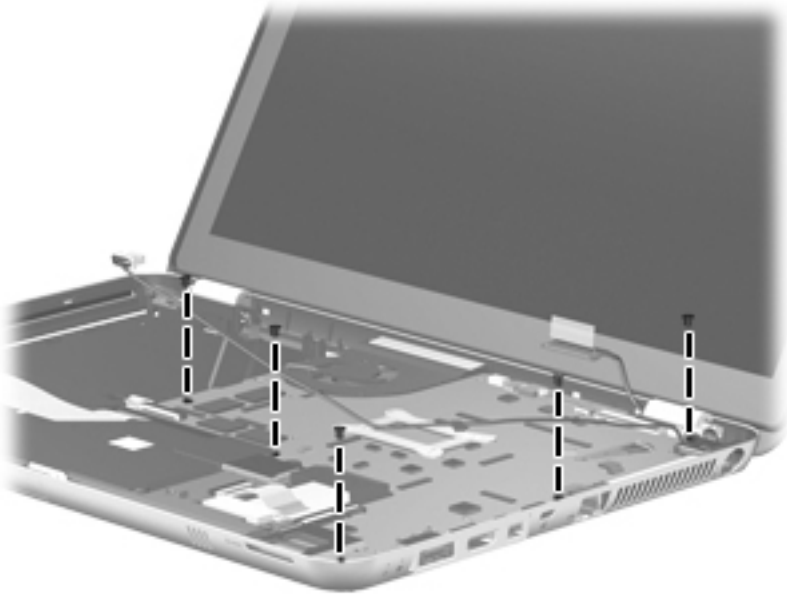


3. Disconnect the display panel cable **(1)** from the system board.
4. Disconnect the power connector cable **(2)** from the system board.
5. Disconnect the power extension cable **(3)** from the battery connector board.

6. Release the power extension cord **(4)** from the system board. (The power extension cord is attached to the system board with double-sided tape.)

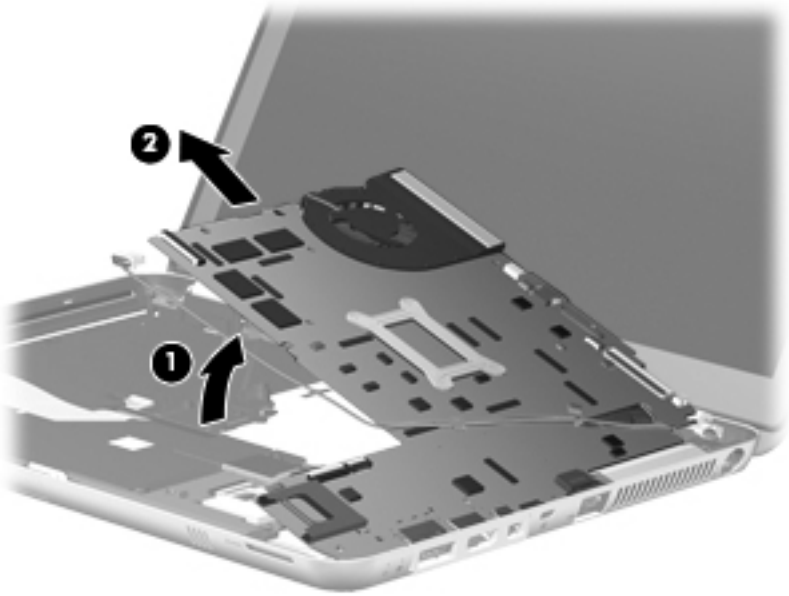


7. Remove the five Phillips PM2.5×5.0 screws that secure the system board to the base enclosure.



8. Lift the left side of the system board **(1)** until it rests at an angle.

9. Remove the system board **(2)** by sliding it up and to the left 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)	608378-001

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:

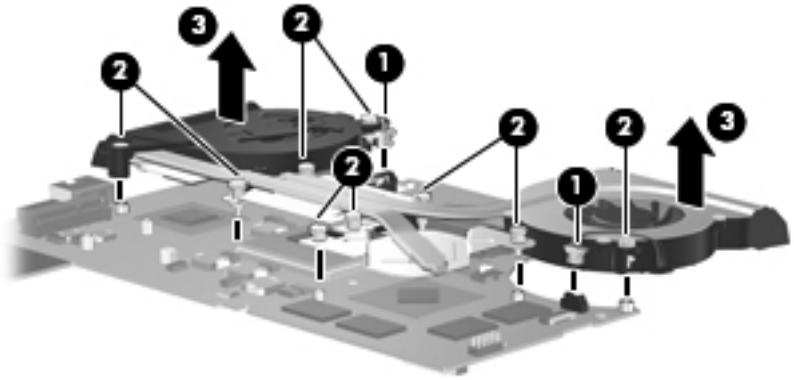
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery cover and battery (see Battery on page 34).
5. Remove the hard drive (see Mass storage device on page 36).
6. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
7. Disconnect the battery charger board ribbon cable from the system board (see Battery connector board on page 48).
8. Remove the top cover (see Top cover on page 50).

9. Disconnect the optical drive cable from the system board (see Optical drive on page 59).
10. Remove the system board (see System board on page 62).

Remove the fan/heat sink assembly:

1. Turn the system board upside down with the front toward you.
2. Disconnect the two fan cables **(1)** from the system board.
3. Loosen the nine captive screws **(2)** that secure the fan/heat sink assembly to the system board.
4. Remove the fan/heat sink assembly **(3)**.

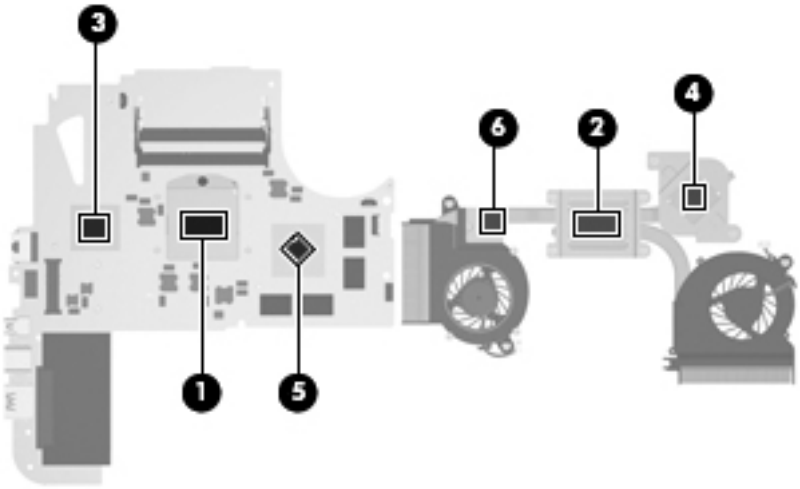
NOTE: Due to the adhesive quality of the thermal material located between the fan/heat sink assembly and system board components, it may be necessary to move the fan/heat sink assembly from side to side to detach it.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the processor 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
- A thermal pad is used on the PCH chip **(3)** and the heat sink section **(4)** that services it
- Thermal paste is used on the graphics subsystem chip **(5)** and the heat sink section **(6)** 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 i7-840QM 1.86- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	612260-001
Intel Core i7-820QM 1.73- to 3.06-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	583053-001
Intel Core i7-740QM 1.73- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	612259-001
Intel Core i7-720QM 1.60- to 2.80-GHz, 35W turbo processor (1333-MHz FSB, 6-MB L3 cache)	586170-001
Intel Dual Core i5-580M 2.66-3.33-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W	625825-001
Intel Dual Core i5-560M 2.53-GHz processor, (SC turbo up to 3.06-GHz), 3-MB L3 cache, 35-W	625824-001
Intel Core i5-540M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	594188-001
Intel Core i5-520M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	594187-001
Intel Core i5-460M 2.53-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	626039–001
Intel Core i5-450M 2.40-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	613585-001
Intel Core i5-430M 2.26-GHz, 35W turbo processor (1066-MHz FSB, 3-MB L3 cache)	597624-001
Intel Core Dual i3-380M 2.53-GHz, 35W processor (1066-MHz FSB, 3-MB L3 cache)	625823-001
Intel Core i3-370M 2.40-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache)	613584-001
Intel Core i3-350M 2.26-GHz, 25W processor (1066-MHz FSB, 3-MB L3 cache)	597623-001
Intel Pentium P6200 2.13-GHz processor 3-MB L3 cache, 1066-MHz FSB	625831-001
Intel Pentium P6100 2.0-GHz processor 3-MB L3 cache, 1066-MHz FSB	613587-001
Intel Core2 P6000 1.86-GHz processor (1066-MHz, 3-MB L3 cache)	613586-001

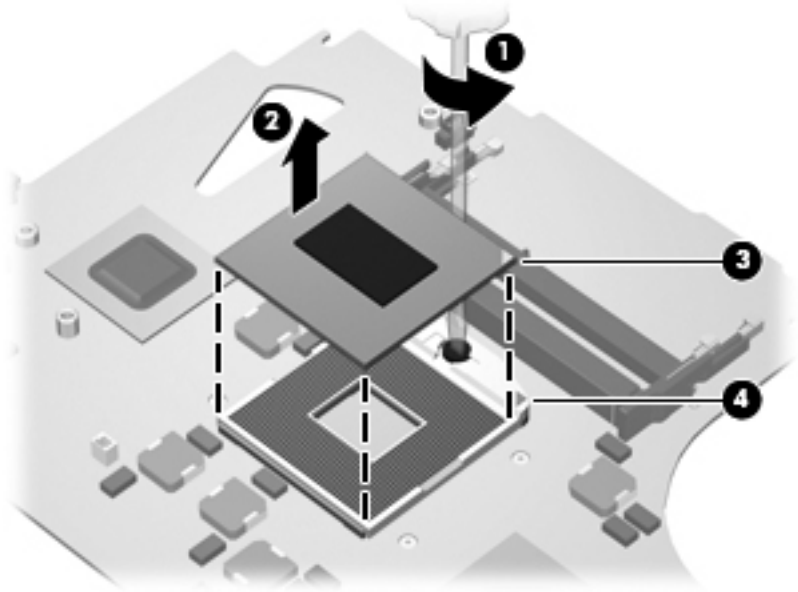
Before removing the processor, follow these steps:

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 cover and battery (see Battery on page 34).
5. Remove the hard drive (see Mass storage device on page 36).
6. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
7. Disconnect the battery charger board ribbon cable from the system board (see Battery connector board on page 48).
8. Remove the top cover (see Top cover on page 50).
9. Disconnect the optical drive cable from the system board (see Optical drive on page 59).
10. Remove the system board (see System board on page 62).
11. Remove the fan/heat sink assembly (see Fan/heat sink assembly on page 65).

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.

Speakers

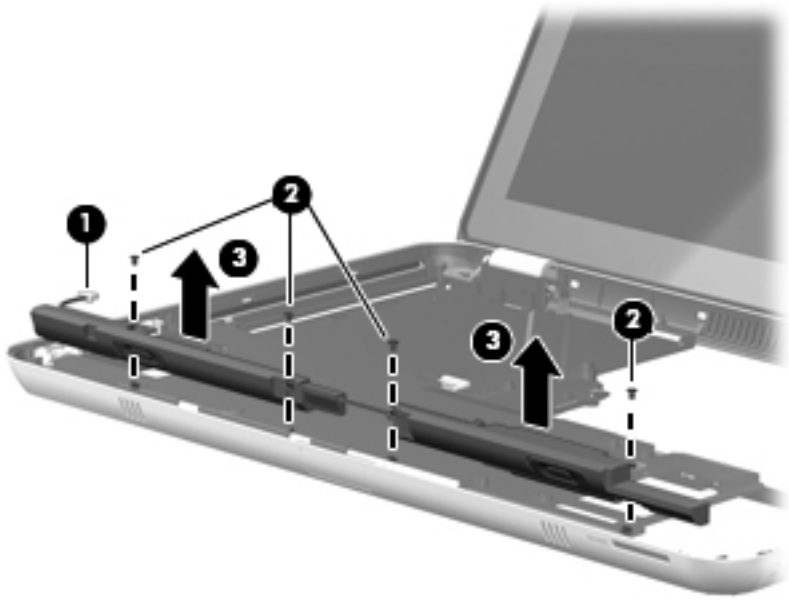
Description	Spare part number
Speakers (include cable)	608381-001

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 cover and battery (see Battery on page 34).
5. Remove the hard drive (see Mass storage device on page 36).
6. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
7. Disconnect the battery charger board ribbon cable from the system board (see Battery connector board on page 48).
8. Remove the top cover (see Top cover on page 50).
9. Disconnect the optical drive cable from the system board (see Optical drive on page 59).
10. Remove the system board (see System board on page 62).

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the audio/USB board.
2. Remove the four Phillips PM2.0×3.0 screws **(2)** that secure the speakers to the base enclosure.
3. Remove the speakers **(3)**.



Reverse this procedure to install the speakers.

Display assembly

NOTE: The display assembly spare part kit includes a display panel cable, webcam/microphone module and cable, 2 WLAN antenna cables and transceivers,and 2 WWAN antenna cables and transceivers.

Description	Spare part number
14.5-in, LED, HD, AntiGlare, flush glass SVA display assembly for use only on Beats Edition computer models	619399-001
14.5-in, LED, HD, AntiGlare, flush glass SVA display assembly for use only on standard computer models	616270-001
14.5-in, LED, HD+, AntiGlare, flush glass WVA display assembly for use only on standard computer models	608366-001

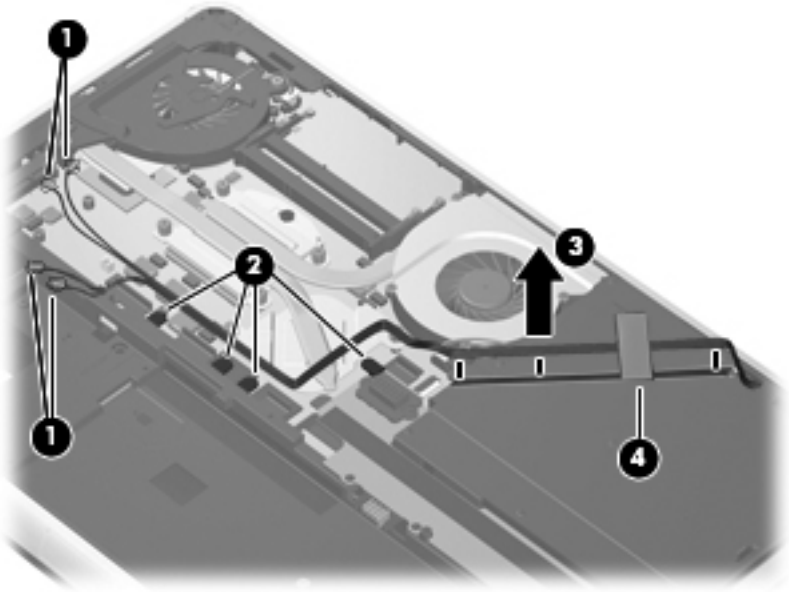
Before removing the display assembly, follow these steps:

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 cover and battery (see Battery on page 34).
5. Remove the memory module/wireless module compartment cover (see WLAN module on page 41).
6. Remove the top cover (see Top cover on page 50).

Remove the display assembly:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the wireless antenna cables **(1)** from the WWAN and WLAN modules.
4. Release the wireless antenna cables from the routing clips **(2)** built into the base enclosure.
5. Release the grounding tape **(3)** that secures the WWAN antenna cables to the base enclosure.

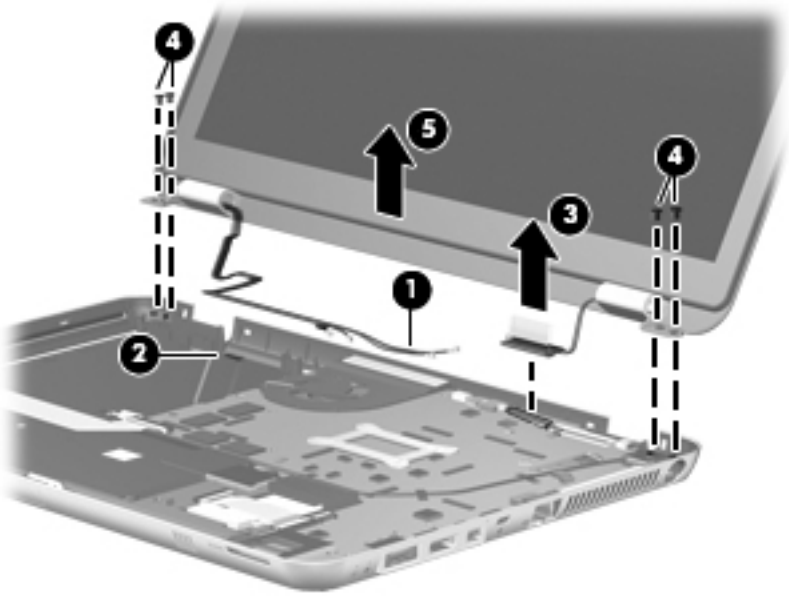
6. Detach the wireless antenna cables **(4)** from the routing channel built into the base enclosure. (The wireless antenna cables are attached to the base enclosure with double-sided tape.)



7. Release the wireless antenna cables **(1)** from the opening **(2)** in the base enclosure.
8. Disconnect the display panel cable **(3)** from the system board.

△ **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.

9. Remove the four Phillips PM2.5×4.0 screws **(4)** that secure the display assembly to the computer.
10. Remove the display assembly **(5)**.



Reverse this procedure to reassemble the display assembly.

5 Setup Utility (BIOS)

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

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

Starting Setup Utility

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

▲ Turn on or restart 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.

Using Setup Utility

Changing the language of Setup Utility

1. Start Setup Utility.
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 takes 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 and 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

1. Start Setup Utility.
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 factory default settings in Setup Utility

1. Start Setup Utility.
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 factory settings take effect when the computer restarts.

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

Exiting Setup Utility

- 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.

Updating the BIOS

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

Most BIOS updates on the HP Web site are packaged in compressed files called SoftPaqs.

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

Determining the BIOS version

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

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

1. Start Setup Utility.
2. If the system information is not displayed, use the arrow keys to select the **Main** menu.

   BIOS and other system information is displayed.
3. To exit Setup Utility, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press enter.

Downloading a BIOS update

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

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

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

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

1. Access the page on the HP Web site that provides software for your computer:

   Windows 7—Select **Start > Help and Support > Maintain**.

   Windows XP—Select **Start > Help and Support**, and then select the software and drivers update.

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

3. At the download area, follow these steps:

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

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

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

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

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

1. **Windows 7**—Open Windows Explorer by selecting **Start > Computer**.

   Windows XP—Open Windows Explorer by selecting **Start > My Computer**.

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

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

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

   The BIOS installation begins.

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

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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions:		
Width	**35.6 cm**	14.02 in
Depth	**23.70 cm**	9.33 in
Height (front to back)	**2.77 cm to 2.82 cm**	1.09 in to 1.11 in
Weight:	**2.38 kg**	5.25 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A - 90W	
Operating current	4.74 A	
Temperature		
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.

14.5-inch, SVA display specifications

	Metric	U.S.
Dimensions		
Width	**33.2 cm**	13.1 in
Height	**18.7 cm**	7.4 in
Diagonal	**37.1 cm**	14.6 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.

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	
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

Recovery after a system failure is as good as your most recent backup. HP recommends that you create recovery discs immediately after software setup. 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.

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 computer failure:

- Creating a set of recovery discs (Recovery Manager software feature)
- Backing up your information
- Creating system restore points
- Recovering a program or driver
- Performing a full system recovery (from the partition or recovery discs)

NOTE: Recovery discs have been included if your computer does not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window.

Recovery discs

HP recommends that you create recovery discs to be sure that you can restore your computer to its original factory state if the hard drive fails, or if for any reason you cannot recover using the recovery partition tools. Create these discs after setting up the computer for the first time.

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

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

Guidelines:

- Purchase high-quality DVD-R, DVD+R, BD-R (writable Blu-ray), or CD-R discs. DVDs and BDs have a much higher storage capacity than CDs. If you use CDs, up to 20 discs may be required, whereas only a few DVDs or BDs are required.

  NOTE: Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) 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 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. Select **Start > All Programs > Recovery Manager > Recovery Disc Creation**.
2. Follow the on-screen instructions.

Performing a system recovery

Recovery Manager software allows you to repair or restore the computer to its original factory state. Recovery Manager works from recovery discs or from a dedicated recovery partition (select models only) on the hard drive.

Note the following when performing a system recovery:

- You can recover only files that you have previously backed up. HP recommends that you use HP Recovery Manager to create a set of recovery discs (entire drive backup) as soon as you set up the computer.
- 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.
- Recovery Manager recovers only 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 dedicated recovery partition

On some models, you can perform a recovery from the partition on the hard drive, accessed by clicking **Start** or pressing the f11 key. This type of recovery restores the computer to its factory condition without using recovery discs.

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

1. Access Recovery Manager in either of the following ways:
   - Select **Start > All Programs > Recovery Manager > Recovery Manager**.

     – or –

   - Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen. Then, press f11 while the “F11 (HP Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **Recovery Manager** window.
3. Follow the on-screen instructions.

Recovering using the recovery discs

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

Backing up your information

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

- At regularly scheduled times

NOTE: Set reminders to back up your information periodically.

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

Guidelines:

- Create system restore points using the Windows System Restore feature, and periodically copy them to an optical disc or an external hard drive. For more information on using system restore points, refer to “Using system restore points”.
- Store personal files in the Documents library and back up this folder periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

Using Windows Backup and Restore

Windows Backup and Restore allows you to back up individual files or back up the entire computer image.

Guidelines:

- Be sure that the computer is connected to AC power before you start the backup process.
- Allow enough time to complete the backup process. Depending on file sizes, it may take over an hour.

To create a backup:

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

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

Using system restore points

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.

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 files and settings.

When to create restore points

- Before you add or extensively modify software or hardware
- Periodically, whenever the computer is functioning 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. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Follow the on-screen instructions.

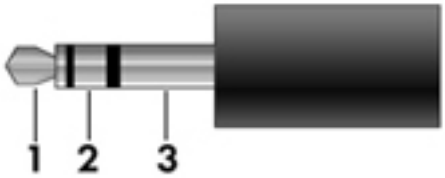
Restore to a previous date and time

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

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

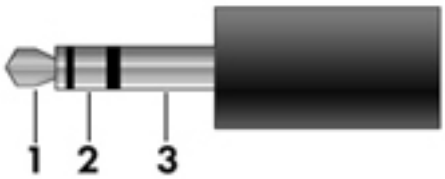
8 Connector pin assignments

Audio-in (microphone)



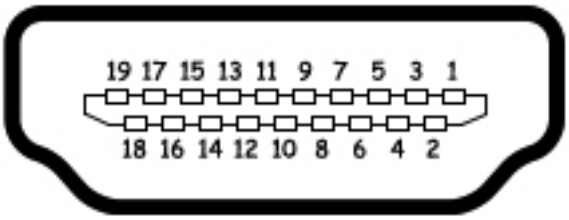
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



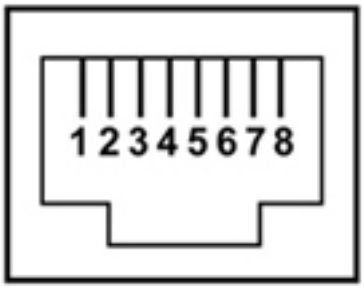
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

HDMI



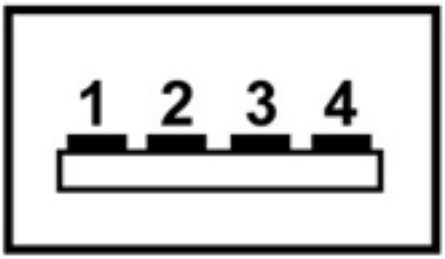
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2–
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1–
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0–
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	CEC
14	No connect
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect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

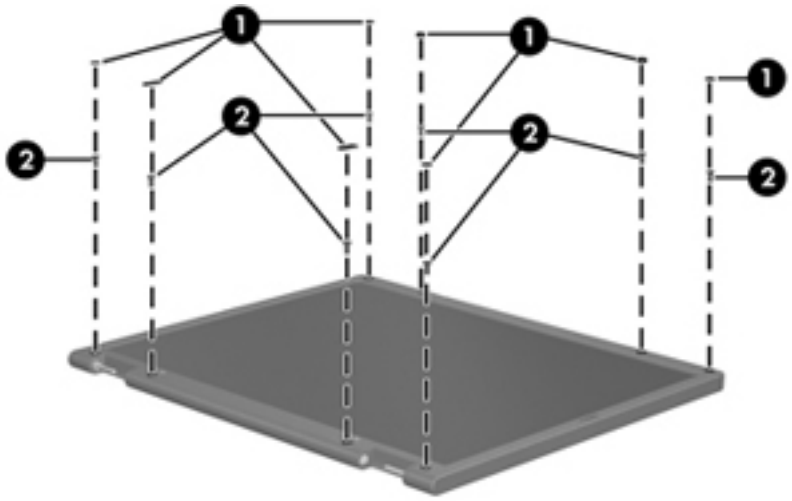
NOTE: Materials Disposal. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, 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)**.

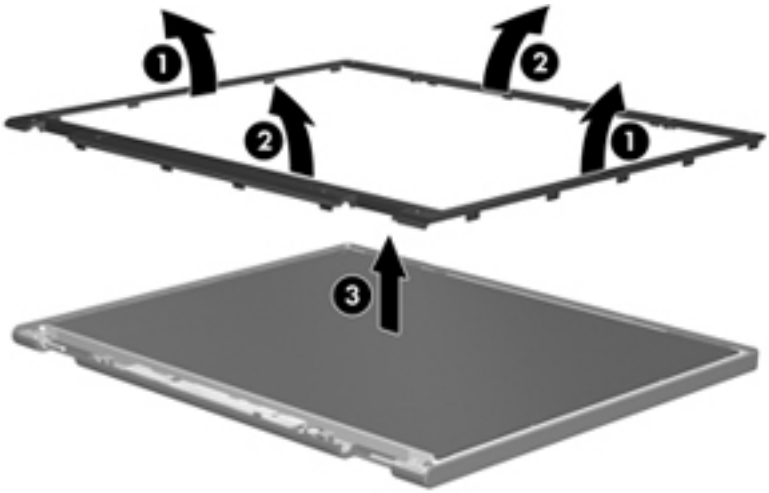
NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps:

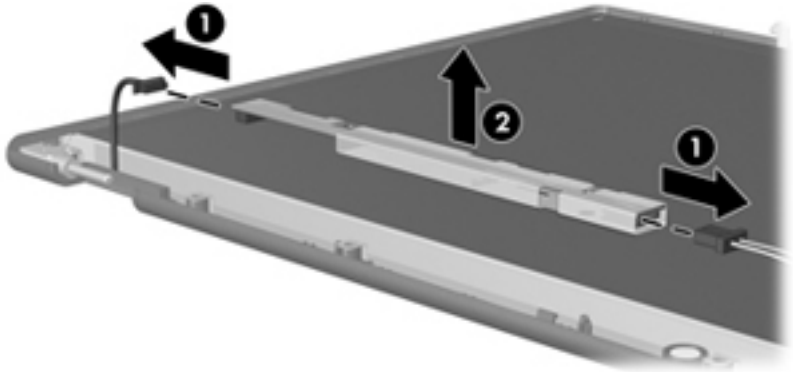
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



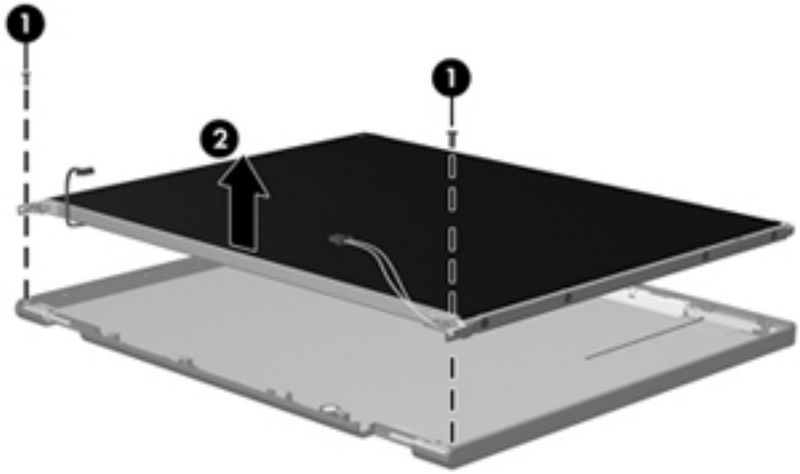
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



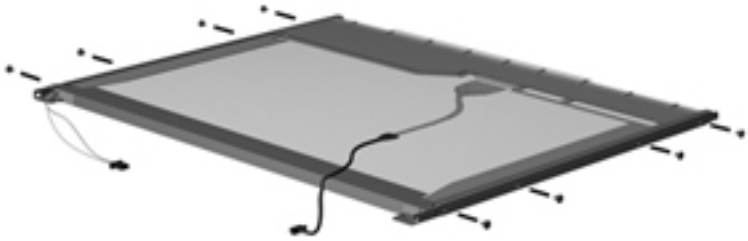
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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.

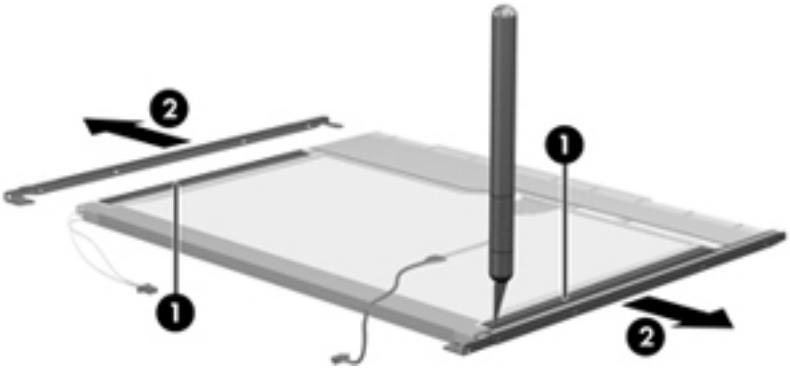


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

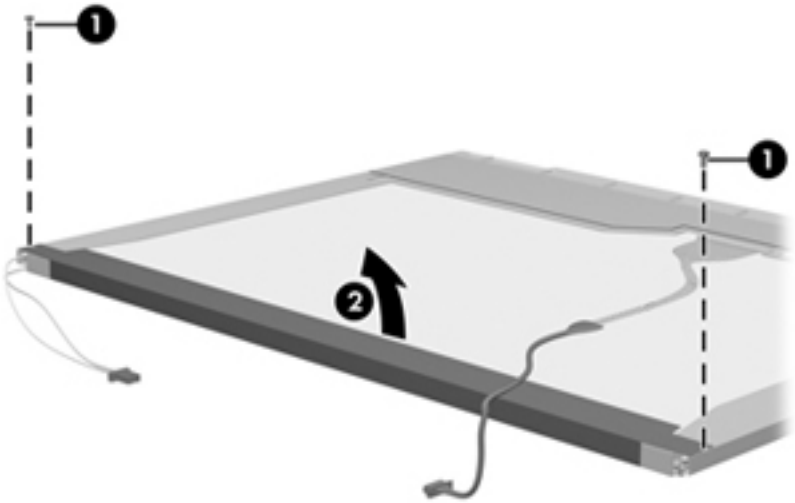


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

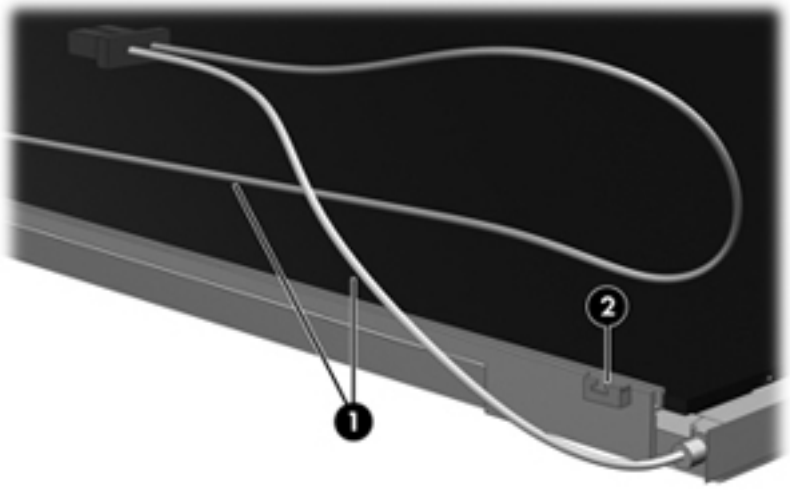
10. Remove the display panel frame **(2)** from the display panel.



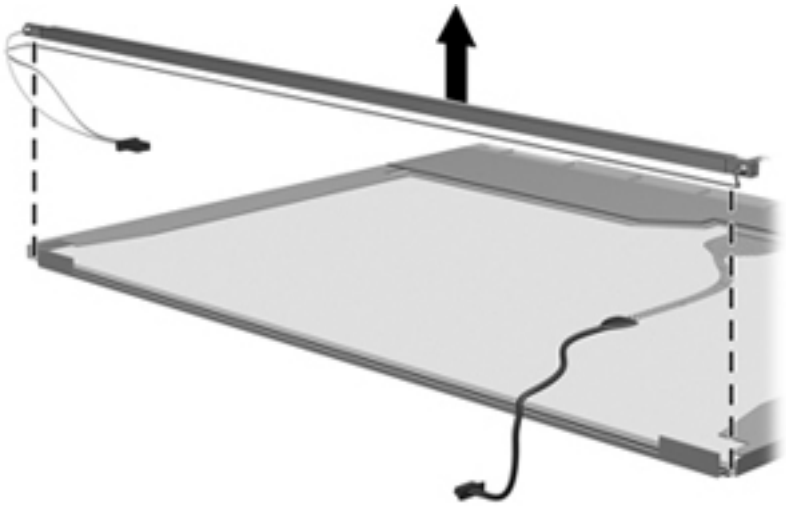
11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



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.

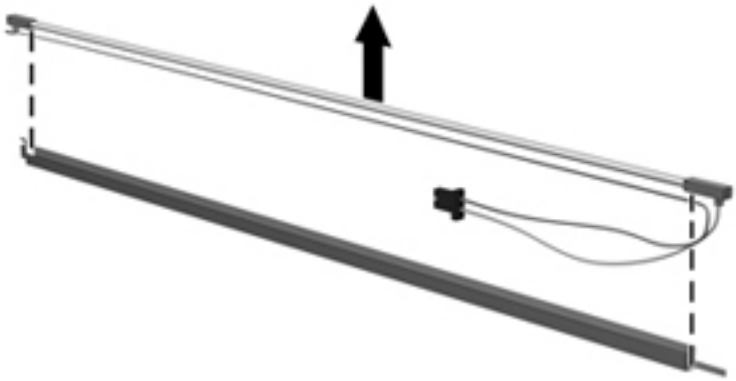


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



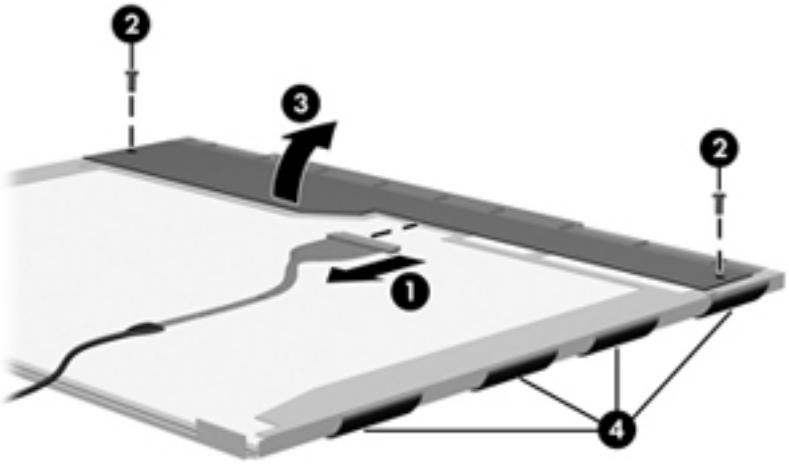
⚠ **WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Remove the backlight from the backlight frame.

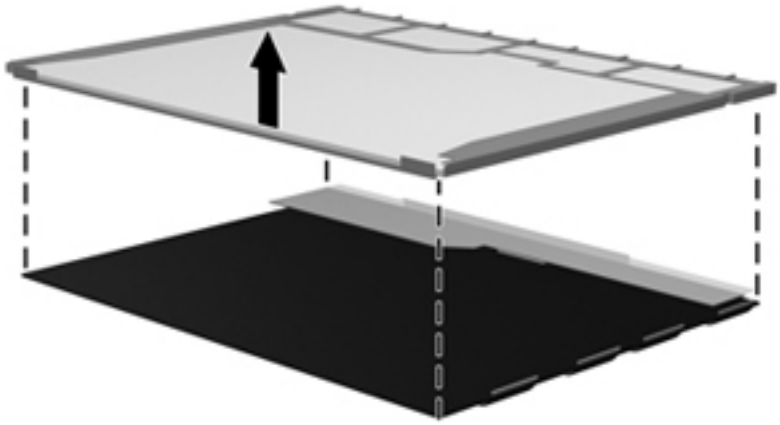


19. Disconnect the display cable **(1)** from the LCD panel.
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **(3)** from the display rear panel.

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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