

Compaq Presario V6500 Notebook PC

Maintenance and Service Guide

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Safety warning notice

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- ⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer 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 computer 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	Full-featured computer models	Defeatured computer models
Product Name	Compaq Presario V6500 Notebook PC	•	•
Processors	Intel® Core™ 2 Duo processors		
	2.20-GHz processor, 4-MB L2 cache, 800-MHz front side bus (FSB)	•	•
	2.00-GHz processor, 2-MB L2 cache, 800-MHz FSB	•	•
	1.86-GHz processor, 1-MB L2 cache, 533-MHz (FSB)	•	•
	1.50-GHz processor, 2-MB L2 cache, 667-MHz FSB	•	•
	Intel Core Duo processors		
	T7300 2.0-GHz processor, 4-MB L2 cache, 800-MHz FSB	•	•
	T7100 1.8-GHz processor 2-MB L2 cache, 800-MHz FSB	•	•
	T5250 1.5-GHz processor 2-MB L2 cache, 667-MHz FSB	•	•
Chipset	Northbridge: Intel GM965	•	•
	Southbridge: Intel ICH8m	•	•
Graphics	Intel Extreme Graphics (Mobile Intel Graphics Media Accelerator X3100) UMA (integrated) with shared video memory, and: <ul style="list-style-type: none"> Up to 64 MB on computer models with 512 MB of system RAM or, Up to 256 MB on computer models with 1024 MB or more of system RAM Memory size is a dynamic change.	•	•
Panel	15.4-inch, WXGA BrightView	•	•
Memory	2 SODIMM slots	•	•
	Customer-accessible/upgradable	•	•
	Supports up to 4 GB of system RAM	•	•

Category	Description	Full-featured computer models	Defeatured computer models
	PC2-5300, 667-MHz, DDRII	•	•
	Supports the following configurations:	•	•
	<ul style="list-style-type: none"> • 4096 (2048 × 2) • 2048 (2048 × 1, 1024 × 2) • 1536 (1024 + 512) • 1024 (1024 × 1, 512 × 2) • 512 (512 × 1) 		
Hard drives	Supports 9.5-mm, 2.5-inch hard drives	•	•
	Serial ATA	•	•
	Supports the following drives:	•	•
	<ul style="list-style-type: none"> • 250-GB, 5400-rpm • 200-GB, 4200-rpm • 160-GB, 5400-rpm • 120-GB, 5400-rpm • 80-GB, 5400-rpm 		
Optical drives	Fixed (removal of 1 screw required)	•	•
	Parallel ATA	•	•
	12.7-mm tray load	•	•
	Supports the following drives:	•	•
	<ul style="list-style-type: none"> • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive • DVD-CD/RW Combo Drive 		
Diskette drive	Supports external USB drive only	•	•
Microphone	2 omnidirectional, dual-array microphones, with beam-forming, echo-cancellation, noise-suppression software	•	•
Audio	HD audio - Realtek ALC861-VD-GR	•	•
	Supports Windows Vista Premium Logo requirements	•	•
	Presario-branded Altec Lansing speakers	•	•
Modem	56K V.92 data/fax modem (SilonLab ML 3000)	•	•
	Supports all world-wide certification requirements	•	•

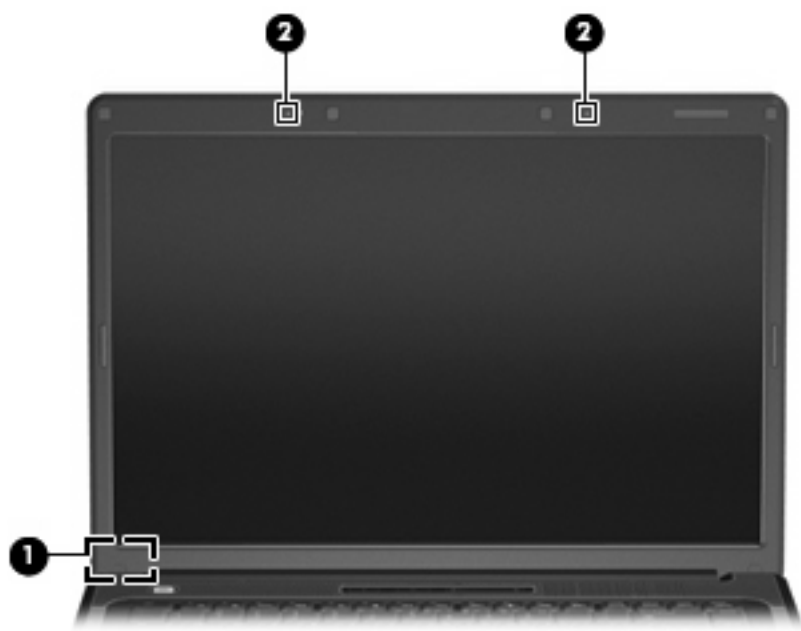
Category	Description	Full-featured computer models	Defeatured computer models
Ethernet	Modem cable not included	•	•
	Integrated Realtek 10/100 network interface card (NIC)	•	•
	Ethernet cable not included	•	•
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module:		
	Intel PRO Wireless 3945 802.11a/b/g and 802.11b/g with 2 antennae integrated into the display assembly	•	•
	Intel PRO Wireless 4965 802.11a/b/g/n with 3 antennae integrated into the display assembly @ 2.4 and 5.0 GHz	•	•
	Intel WLAN + Bluetooth®	•	•
External media card	One ExpressCard54 slot	•	•
	Digital Media Slot, supports SD, MMC, SDIO, MS, MSpro, xD	•	•
Ports	Audio-in (mono microphone)	•	•
	Audio-out (stereo headphone)	•	•
	Consumer infrared	•	•
	RJ-11 (modem)	•	•
	RJ-45 (Ethernet, includes link and activity lights)	•	•
	S-Video-out	•	•
	USB (3)	•	
	USB (1)		•
	VGA (Dsub 15-pin)	•	•
	1394	•	
	2-pin AC power	•	•
Docking	Expansion port 3 supports HP xb3000 Notebook Expansion Base and HP Notebook QuickDock	•	•
Keyboard/pointing devices	14.1-inch keyboard	•	•
	TouchPad with 2 buttons and four-way scroll (taps enabled as default)	•	•
Power requirements	12-cell 2.20-Ah Li-ion battery	•	•
	6-cell 2.55-Ah Li-ion battery	•	•
	6-cell 2.20-Ah Li-ion battery	•	•

Category	Description	Full-featured computer models	Defeatured computer models
	65-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector)	•	•
Security	Security cable slot	•	•
Operating system	Preinstalled:		
	Free DOS	•	•
	Windows Vista™ Business (32-bit)	•	•
	Windows Vista Home Basic (32-bit)	•	•
	Windows Vista Premium (32- and 64-bit)	•	•
	Windows Vista Home Basic (32-bit)	•	•
Serviceability	End-user replaceable parts:		
	AC adapter	•	•
	Battery (system)	•	•
	Hard drive	•	•
	Memory module	•	•
	Optical drive	•	•
	WLAN module	•	•

2 External component identification

Top components

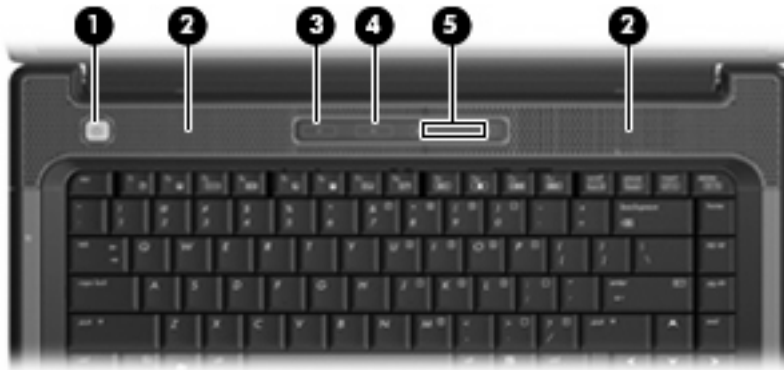
Display components



Item	Component	Description
(1)	Internal display switch*	Turns off the display if the display is closed while the computer is on.
(2)	Internal microphones (2) (select models only)	Record sound. NOTE: If there is a microphone icon next to each microphone opening, the computer has internal microphones.

*The location of the internal display switch varies by computer model.

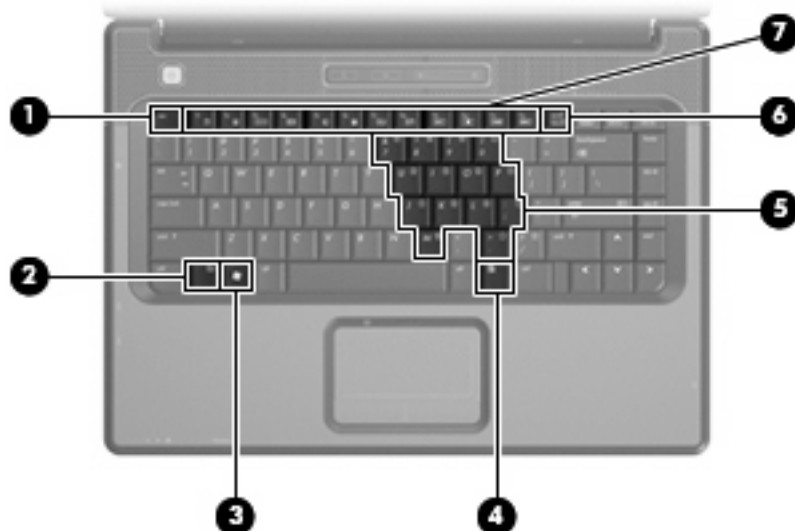
Buttons and speakers



Item	Component	Description
(1)	Power button*	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button to shut down the computer.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select Start > Control Panel > System and Maintenance > Power Options.</p>
(2)	Speakers (2)	Produce sound.
(3)	Media button	<ul style="list-style-type: none">• Opens the QuickPlay program (for models with QuickPlay preinstalled).• Opens the DVDPlay program (for models with DVDPlay preinstalled). <p>NOTE: If the computer has been set up to require a logon password, you may be asked to log on to Windows. QuickPlay or DVDPlay opens after you log on. Refer to the QuickPlay or DVDPlay software Help for more information.</p>
(4)	Volume mute button	Mutes and restores speaker sound.
(5)	Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume. You can also tap the minus sign on the scroll zone to decrease volume, or tap the plus sign on the scroll zone to increase volume.

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

Keys



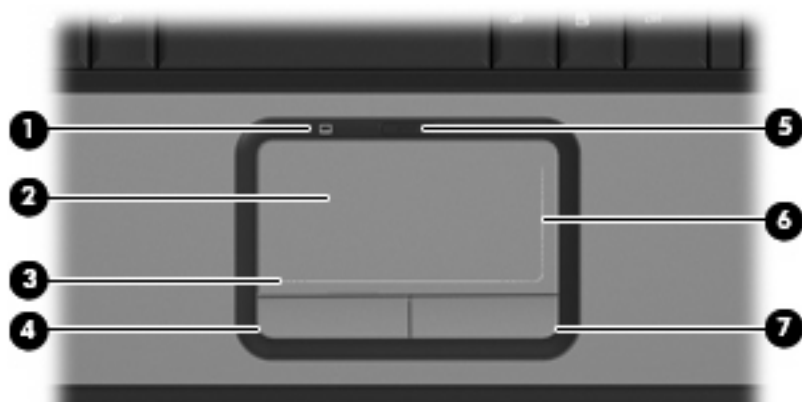
Item	Component	Function
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)	Embedded numeric keypad keys	Can be used like the keys on an external numeric keypad.
(6)	num lock key	Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light.
(7)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.

Lights



Item	Component	Description
(1)	Power lights (2)*	<ul style="list-style-type: none">On: The computer is on.Blinking: The computer is in the Sleep state.Off: The computer is off or in Hibernation.
(2)	Battery light	<ul style="list-style-type: none">On: A battery is charging.Blinking: A battery that is the only available power source has reached a low battery level or a critical battery level.Off: If the computer is plugged into an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(3)	Drive light	Blinking: The hard drive or optical drive is being accessed.
(4)	Caps lock light	On: Caps lock is on.
(5)	Volume mute light	<ul style="list-style-type: none">Blue: Computer sound is turned on.Amber: Computer sound is turned off.
(6)	Volume down light	Blinking: The volume scroll zone is being used to decrease speaker volume.
(7)	Volume up light	Blinking: The volume scroll zone is being used to increase speaker volume.
(8)	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
*The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.		

TouchPad



Item	Component	Function
(1)	TouchPad light	<ul style="list-style-type: none"> Blue: TouchPad is enabled. Amber: TouchPad is disabled.
(2)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(3)	TouchPad horizontal scroll zone	Scrolls left or right.
(4)	Left TouchPad button*	Functions like the left button on an external mouse.
(5)	TouchPad on/off button	Enables/disables the TouchPad.
(6)	TouchPad vertical scroll zone	Scrolls up or down.
(7)	Right TouchPad button*	Functions like the right button on an external mouse.
*This table describes factory settings. To view or change pointing device preferences, select Start > Control Panel > Hardware and Sound > Mouse .		

Front components



Item	Component	Function
(1)	Power light	<ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state. Off: The computer is off or in Hibernation.
(2)	Battery light	<ul style="list-style-type: none"> On: A battery is charging. Blinking: A battery that is the only available power source has reached a low battery level or a critical battery level. Off: If the computer is plugged into an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(3)	Drive light	Blinking: The hard drive or optical drive is being accessed.
(4)	Wireless switch	<p>Turns the wireless feature on or off, but does not create a wireless connection.</p> <p>NOTE: To establish a wireless connection, a wireless network must already be set up.</p>
(5)	Wireless light	<ul style="list-style-type: none"> Blue: An integrated wireless device, such as a WLAN device and/or a Bluetooth® device, is turned on. Amber: An integrated wireless device is turned off.
(6)	Consumer infrared lens (select models only)	Receives a signal from a remote control device, such as the HP Remote Control.
(7)	Audio-in (microphone)	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(8)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.

Left-side components



Item	Component	Function
(1)	S-Video-out jack	Connects an optional S-Video device such as a television, VCR, camcorder, overhead projector, or video capture card.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	Expansion port 3	Connects the computer to an optional docking device or expansion product. NOTE: The computer has only one expansion port. The term expansion port 3 describes the type of expansion port.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	RJ-11 (modem) jack	Connects a modem cable.
(6)	USB ports (1 or 2, depending on computer model)	Connect optional USB devices.
(7)	1394 port (select models only)	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(8)	Digital Media Slot (select models only)	Supports the following optional digital card formats: <ul style="list-style-type: none"> • Memory Stick (MS) • Memory Stick Pro (MSP) • MultiMediaCard (MMC) • Secure Digital Input/Output (SD I/O) • Secure Digital (SD) Memory Card • xDPicture Card (XD) • xD-Picture Card (XD) Type H • xD-Picture Card (XD) Type M

Rear component



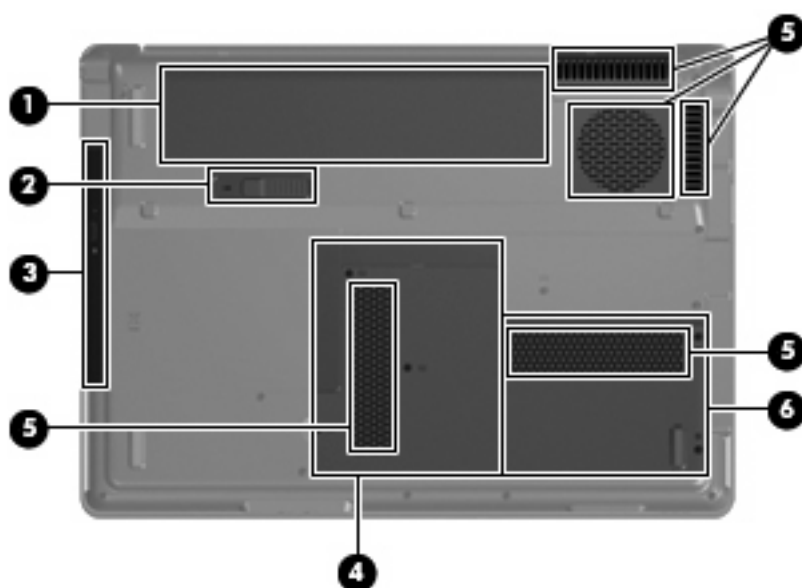
Component	Description
Vent	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Right-side components



Item	Component	Function
(1)	ExpressCard slot	Supports optional ExpressCard/54 cards.
(2)	Optical drive	Reads optical discs, and, on select models, also writes to optical discs.
(3)	Optical drive light	Blinking: The optical drive is being accessed.
(4)	USB port (select models only)	Connects an optional USB device.
(5)	Power connector	Connects an AC adapter.
(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.

Bottom components

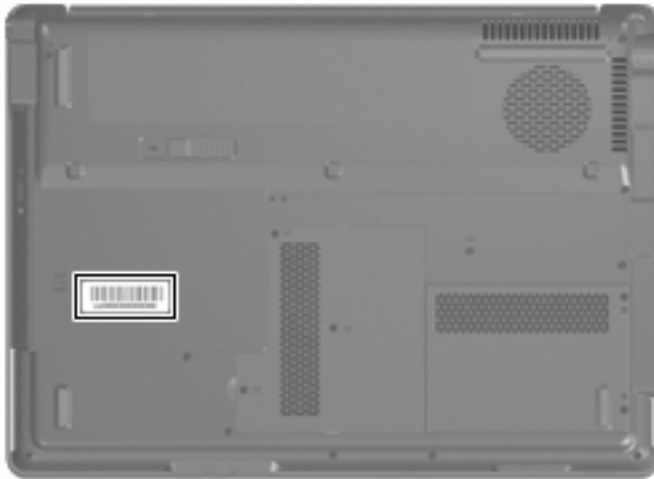


Item	Component	Function
(1)	Battery bay	Holds the battery.
(2)	Battery release latch	Releases the battery from the battery bay.
(3)	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
(4)	Memory/WLAN module compartment	Contains the memory module slots, the WLAN module slot, and the RTC battery. NOTE: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(5)	Vents (5)	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.
(6)	Hard drive bay	Holds the hard drive.

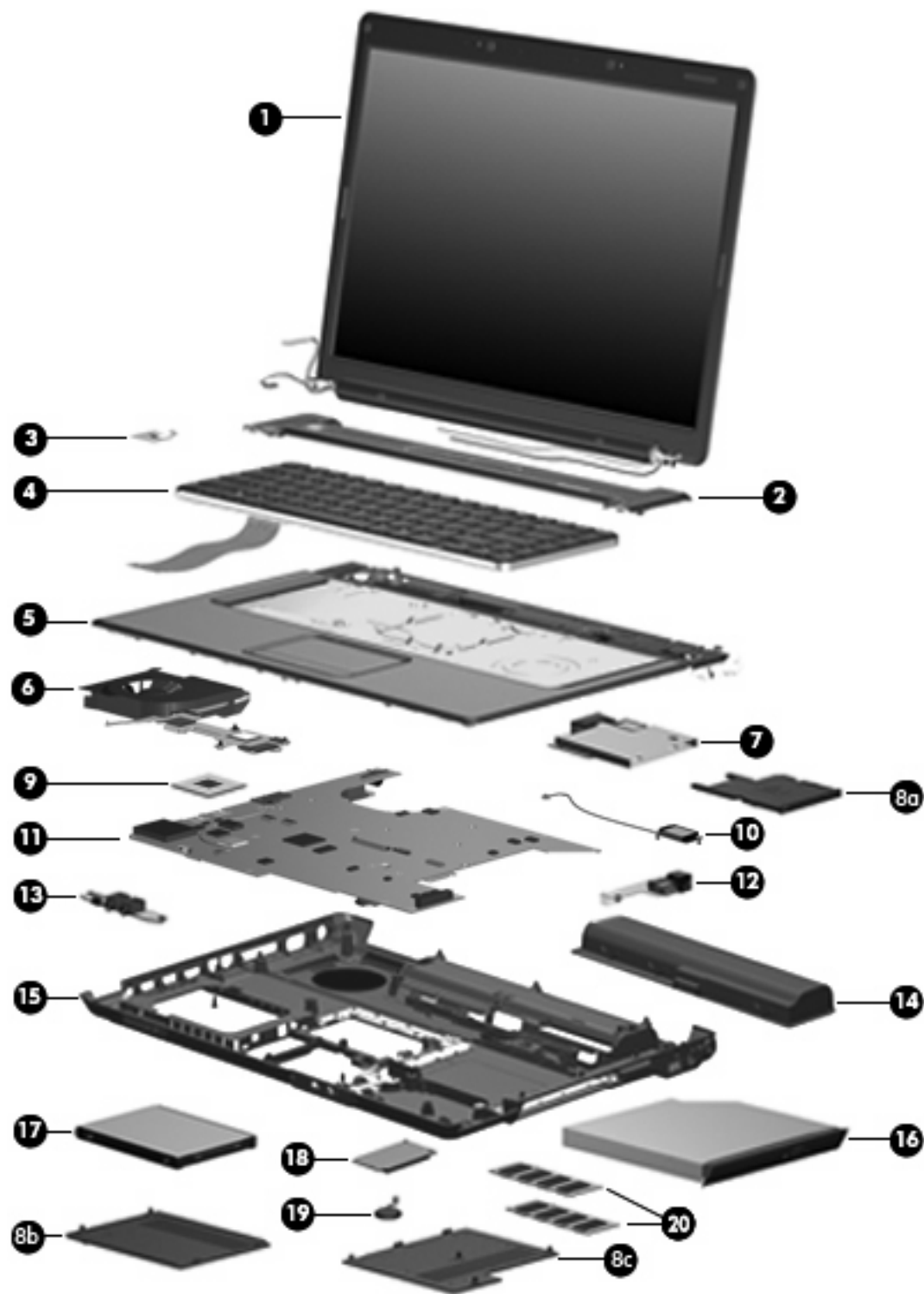
3 Illustrated parts catalog

Serial number location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer.



Computer major components



Item	Description	Spare part number
(1)	15.4-inch, WXGA, BrightView display assembly (includes microphones)	446485-001

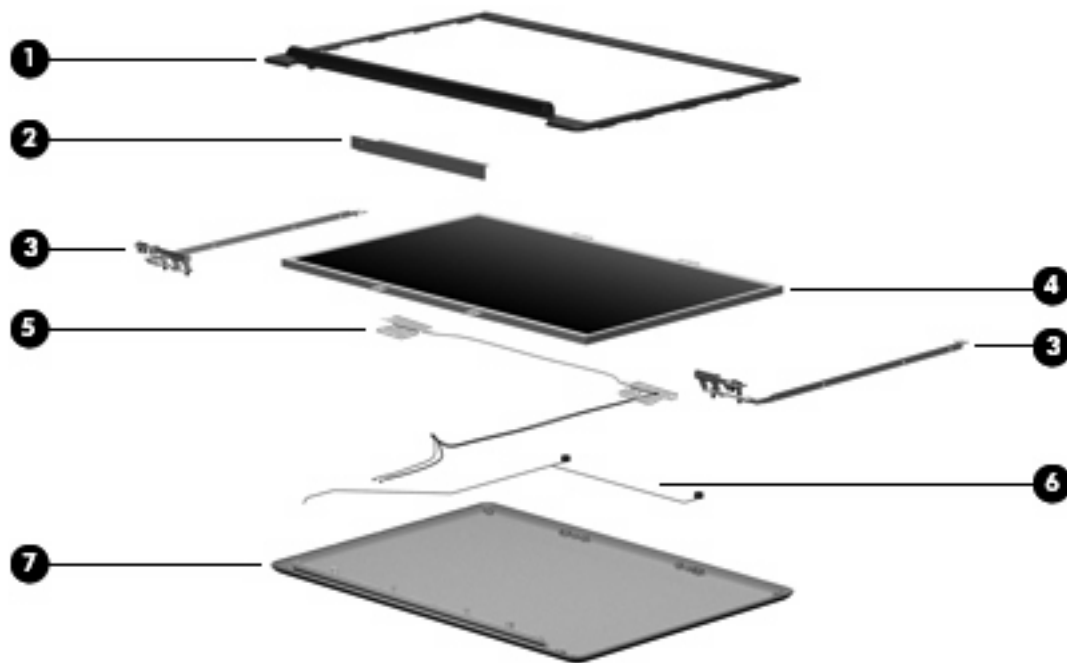
Item	Description	Spare part number
	NOTE: See Display assembly components on page 20 for more display assembly spare part information.	
(2)	Switch cover (includes LED board and cable)	431425-001 and 451010-001
(3)	Power button board (includes power button board cable)	431438-001
(4)	Keyboards	
	Denmark, Finland, Norway, and Sweden	441428-DH1
	France	441428-051
	French Canada	441428-121
	Italy	441428-061
	South Korea	441428-AD1
	Latin America	441428-161
	The Netherlands and Europe	441428-B31
	Saudi Arabia	441428-171
	Spain	441428-071
	Taiwan	441428-AB1
	Thailand	441428-281
	Turkey	441428-141
	The United Kingdom	441428-031
	The United States	441428-001
(5)	Top cover (includes speakers, TouchPad and cable)	446510-001 and 455514-001
(6)	Fan/heat sink assembly (includes thermal material)	446522-001
(7)	ExpressCard assembly	431440-001
	Plastics Kit (see Plastics Kit on page 21 for more Plastics Kit information):	438669-001
(8a)	ExpressCard slot bezel	
(8b)	Hard drive cover (includes 2 captive screws, secured by C-clips)	
(8c)	Memory/WLAN module compartment cover (includes 3 captive screws, secured by C-clips)	
	HDMI port cover (not illustrated)	
(9)	Processors (include thermal material)	
	Intel Core 2 Duo processors:	
	• 2.20-GHz processor (4-MB L2 cache, 800-MHz FSB)	453771-001
	• 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB)	455515-001
	• 1.86-GHz processor (1-MB L2 cache, 533-MHz FSB)	453773-001
	• 1.50-GHz processor (2-MB L2 cache, 667-MHz FSB)	453772-001

Item	Description	Spare part number
	Intel Core Duo processors:	
	<ul style="list-style-type: none"> T7300 2.00-GHz processor (4-MB L2 cache, 800-MHz FSB) 	446478-001
	<ul style="list-style-type: none"> T7100 1.80-GHz processor (2-MB L2 cache, 800-MHz FSB) 	446479-001
	<ul style="list-style-type: none"> T5250 1.50-GHz processor (2-MB L2 cache, 667-MHz FSB) 	453033-001
	Processor bracket (not illustrated)	450370-001
(10)	Bluetooth module (includes Bluetooth module cable)	412766-002
(11)	System board (includes modem cable)	453770-001 and 446475-001
(12)	USB/power connector board (includes USB/power connector board cable)	447444-001
(13)	Audio boards (include audio board cable)	
	For use with computer models equipped with consumer infrared	449453-001
	For use with computer models not equipped with consumer infrared	431443-001
(14)	Batteries	
	12-cell, 8.80-AH, Li-ion	451864-001
	6-cell, 2.55-AH, Li-ion	446507-001
	6-cell, 2.20-AH, Li-ion	446506-001
(15)	Base enclosure (includes infrared lens and wireless on/off switch)	448343-001
	Rubber Kit (not illustrated; includes base enclosure rubber feet and display bezel screw covers)	431431-001
(16)	Optical drives (include bezel)	
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	446505-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	446504-001
	DVD/CD-RW Combo Drive	446503-001
(17)	Hard drives (include hard drive bracket)	
	250-GB, 5400-rpm	453775-001
	200-GB, 4200-rpm	451863-001
	160-GB, 5400-rpm	451862-001
	120-GB, 5400-rpm	446498-001
	80-GB, 5400-rpm	446497-001
	60-GB, 5400-rpm	446496-001
(18)	WLAN modules	
	Intel 802.11a/b/g/n WLAN modules:	
	<ul style="list-style-type: none"> For use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam 	441086-001

Item	Description	Spare part number
	<ul style="list-style-type: none"> For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan 	441086-002 and 441087-002
	<ul style="list-style-type: none"> For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea 	441086-003 and 441088-003
	<ul style="list-style-type: none"> For use in Japan 	441086-291 and 441089-291
	<ul style="list-style-type: none"> For use in South Korea 	441086-AD1
Intel 802.11a/b/g WLAN modules:		
	<ul style="list-style-type: none"> For use in Antigua & Barbuda, Argentina, Australia, the Bahamas, Barbados, Brunei, Canada, Chile, the Dominican Republic, Guam, Guatemala, Hong Kong, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Saudi Arabia, Taiwan, the United States, and Vietnam 	451861-001
	<ul style="list-style-type: none"> For use in Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Brazil, Bulgaria, the Cayman Islands, Colombia, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, the United Kingdom, and Uzbekistan 	451861-002
	<ul style="list-style-type: none"> For use in Ecuador, Haiti, Honduras, Pakistan, the People's Republic of China, Peru, Qatar, South Korea, Uruguay, and Venezuela 	451861-003
	<ul style="list-style-type: none"> For use in Japan 	451861-291
Broadcom 802.11b/g WLAN modules:		
	<ul style="list-style-type: none"> For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States 	441090-001
	<ul style="list-style-type: none"> For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & 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, Israel, Italy, the Ivory Coast, Jamaica, 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 Netherlands, the Netherlands Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, 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 & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, 	441090-002

Item	Description	Spare part number
	Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	
	<ul style="list-style-type: none"> For use in Japan 	441090-291
	Intel 802.11b/g WLAN module for use in Thailand	451861-004
(19)	RTC battery (includes 2-sided tape)	446518-001 and 449729-001
(20)	Memory modules (667-MHz, PC2-5300, 1-DIMM)	
	2048-MB	453774-001
	1024-MB	446495-001
	512-MB	446494-001
	Cable Kit (not illustrated; see Cable Kit on page 22 for more Cable Kit information)	446520-001

Display assembly components



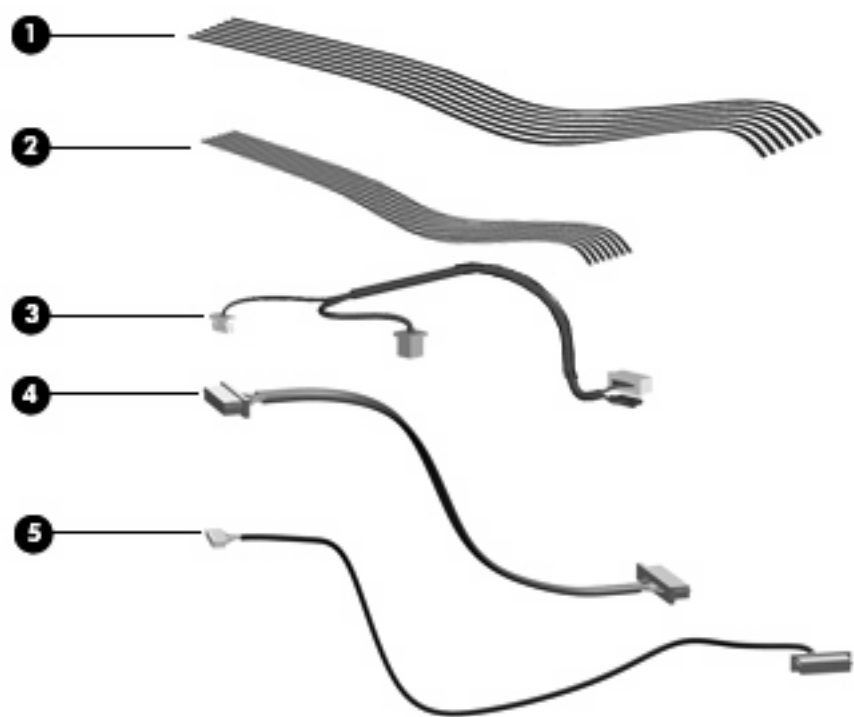
Item	Description	Spare part number
(1)	Display bezel	433283-001 and 453328-001
(2)	Display inverter (includes Mylar shield)	431391-001
(3)	Display Hinge Kit (includes left and right display hinges)	433288-001
(4)	Display panel (15.4-inch, WXGA, BrightView; includes display panel cable)	446480-001
(5)	Wireless Antenna Kits	
	For use only with computer models equipped with an 802.11a/b/g/n WLAN module (includes 3 wireless antenna transceivers and cables)	449728-001
	For use only with computer models equipped with an 802.11a/b/g or 802.11b/g WLAN module (includes 2 wireless antenna transceivers and cables)	449726-001
(6)	Microphone	431393-001
(7)	Display enclosure	446488-001
	Display Cable Kit (not illustrated)	433287-001
	Display Screw Kit (not illustrated)	431400-001

Plastics Kit



Item	Description	Spare part number
Plastics Kit:		438669-001
(1)	ExpressCard slot bezel	
(2)	Hard drive cover (includes 2 captive screws, secured by C-clips)	
(3)	Memory/WLAN module compartment cover (includes 3 captive screws, secured by C-clips)	

Cable Kit



Item	Description	Spare part number
Cable Kit:		446520-001
(1)	LED board cable	
(2)	Power button board cable	
(3)	USB/power connector board cable	
(4)	Audio board cable	
(5)	Bluetooth module cable	

Mass storage devices



Item	Description	Spare part number
(1)	Hard drives (include hard drive bracket)	
	250-GB, 5400-rpm	453775-001
	200-GB, 4200-rpm	451863-001
	160-GB, 5400-rpm	451862-001
	120-GB, 5400-rpm	446498-001
	80-GB, 5400-rpm	446497-001
	60-GB, 5400-rpm	446496-001
(2)	Optical drives (include bezel and bracket)	
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	446501-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	446500-001
	DVD/CD-RW Combo Drive	446499-001

Miscellaneous parts

Description	Spare part number
AC adapters	
90-W non-PFC AC adapter	432309-001
90-W PFC AC adapter	453198-001
65-W non-PFC AC adapter	402018-001
65-W PFC AC adapter	453199-001
ATSC/NTSC TV tuner antenna	439131-001
ATSC/NTSC/PAL TV tuner	439130-001
Composite video cable	407939-001
DVB-T tuner	412175-001
DVB-T wireless antenna adapter	412176-001
ExpressCard Kit (includes software CD)	445170-001
HP backpack	405527-001
HP carrying case	418162-001
HP Remote Control	435743-001
Infrared emitter with cable	439129-001
Label Kit	446525-001
Optical wired mouse	436238-001
RF input adapter cable (without ferrite)	407940-001
USB digital drive	364727-002
Windows Vista remote control (fits inside ExpressCard slot)	439128-001
Windows Vista remote control (does not fit inside ExpressCard slot)	439254-001
Wired headset	371693-001
Wireless laser mouse with cable adapter	430958-001
Power cords:	
Australia and New Zealand	394279-011
Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden	394279-021
Canada, French Canada, Latin America, Thailand, and the United States	394279-001
Denmark	394279-081
India	394279-D61
Israel	394279-BB1
Italy	394279-061
Japan	394279-291

Description	Spare part number
South Korea	394279-AD1
The People's Republic of China	394279-AA1
Switzerland	394279-111
Taiwan	394279-AB1
The United Kingdom and Hong Kong	394279-031
Screw Kit (see Screw listing on page 91 for more Screw Kit information)	434983-001
<ul style="list-style-type: none"> • Hex HM5.0×9.0 standoff • Phillips PM3.0×3.0 screw • Phillips PM2.5×10.0 screw • Phillips PM2.5×7.0 screw • Phillips PM2.5×5.0 captive screw • Phillips PM2.5×4.0 captive screw • Phillips PM2.5×4.0 screw • Phillips PM2.5×3.0 screw • Phillips PM2.0×7.0 screw • Phillips PM2.0×5.0 captive screw • Phillips PM2.0×3.0 screw • Phillips PM2.0×2.0 screw 	

Sequential part number listing

Spare part number	Description
364727-002	USB digital drive
371693-001	Wired headset with volume control
394279-001	Power cord for use in the United States
394279-011	Power cord for use in Australia
394279-021	Power cord for use in Europe
394279-031	Power cord for use in the United Kingdom
394279-061	Power cord for use in Italy
394279-081	Power cord for use in Denmark
394279-111	Power cord for use in Switzerland
394279-291	Power cord for use in Japan
394279-AA1	Power cord for use in the People's Republic of China

Spare part number	Description
394279-AB1	Power cord for use in Taiwan
394279-AD1	Power cord for use in South Korea
394279-BB1	Power cord for use in Israel
394279-D61	Power cord for use in India
402018-001	65-watt PFC AC adapter
405527-001	HP backpack
407939-001	Composite video cable
407940-001	RF input adapter cable (without ferrite)
412175-001	DVB-T tuner
412176-001	DVB-T antenna adapter
412766-002	Bluetooth module (includes Bluetooth module cable)
418162-001	HP carrying case
430958-001	Wireless laser mouse
431391-001	Display inverter (includes Mylar shield)
431393-001	Microphone
431400-001	Display Screw Kit (see Screw listing on page 91 for more Display Screw Kit information)
431425-001	Switch cover (includes LED board and cable)
431431-001	Rubber Kit (includes base enclosure rubber feet and display bezel screw covers)
431438-001	Power button board (includes power button board cable)
431440-001	ExpressCard assembly
431443-001	Audio board with infrared lens
432309-001	90-watt non-PFC AC adapter
433283-001	Display bezel for use only with computer models not equipped with microphones
433287-001	Display Cable Kit
433288-001	Display Hinge Kit (includes left and right display hinges)
434983-001	Screw Kit
436238-001	Optical wired mouse
438669-001	Plastics Kit (see Plastics Kit on page 21 for more Plastics Kit information)
439128-001	Windows Vista remote control (fits inside ExpressCard slot)
439129-001	Infrared emitter with cable
439130-001	ATSC/NTSC/PAL TV tuner
439131-001	ATSC/NTSC TV tuner antenna
439254-001	Windows Vista remote control (does not fit inside ExpressCard slot)

Spare part number	Description
441086-001	Intel 802.11a/b/g/n WLAN module for use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam
441086-002	Intel 802.11a/b/g/n WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan
441086-003	Intel 802.11a/b/g/n WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea
441086-291	Intel 802.11a/b/g/n WLAN module for use in Japan
441086-AD1	Intel 802.11a/b/g/n WLAN module for use in South Korea
441087-002	Intel 802.11a/b/g/n WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan
441088-003	Intel 802.11a/b/g/n WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea
441089-291	Intel 802.11a/b/g/n WLAN module for use in Japan
441090-001	Broadcom 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441090-002	Broadcom 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & 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, Israel, Italy, the Ivory Coast, Jamaica, 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 Netherlands Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, 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 & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
441090-291	Broadcom 802.11b/g WLAN module for use in Japan
441428-001	Keyboard for use in the United States
441428-031	Keyboard for use in the United Kingdom

Spare part number	Description
441428-051	Keyboard for use in France
441428-061	Keyboard for use in Italy
441428-071	Keyboard for use in Spain
441428-121	Keyboard for use in French Canada
441428-141	Keyboard for use in Turkey
441428-161	Keyboard for use in Latin America
441428-171	Keyboard for use in Saudi Arabia
441428-281	Keyboard for use in Thailand
441428-AB1	Keyboard for use in Taiwan
441428-AD1	Keyboard for use in Thailand
441428-B31	Keyboard for international use
441428-DH1	Keyboard for use in Finland, Norway, and Sweden
445170-001	ExpressCard Kit (includes software CD)
446475-001	System board
446478-001	Intel Core Duo T7300 2.0-GHz processor (4-MB L2 cache; includes thermal material)
446479-001	Intel Core Duo T7100 1.8-GHz processor (2-MB L2 cache; includes thermal material)
446480-001	15.4-inch, WXGA, SVA, TFT BrightView display panel (includes display panel cable)
446485-001	15.4-inch, WXGA, BrightView display assembly (includes microphones)
446488-001	Display enclosure
446494-001	512-MB memory module (667-MHz, PC2-5300, 1-DIMM)
446495-001	1024-MB memory module (667-MHz, PC2-5300, 1-DIMM)
446496-001	60-GB, 5400-rpm hard drive (includes hard drive bracket)
446497-001	80-GB, 5400-rpm hard drive (includes hard drive bracket)
446498-001	120-GB, 5400-rpm hard drive (includes hard drive bracket)
446503-001	DVD/CD-RW Combo Drive
446504-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
446505-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
446506-001	6-cell, 2.20-AH battery
446507-001	6-cell, 2.55-AH battery
446510-001	Top cover (includes speakers and TouchPad and cable)
446518-001	RTC battery (includes 2-sided tape)
446520-001	Cable Kit (see Cable Kit on page 22 for more Cable Kit information)
446522-001	Fan/heat sink assembly (includes thermal material)
446525-001	Label Kit

Spare part number	Description
447444-001	USB/power connector board (includes USB/power connector board cable)
448343-001	Base enclosure (includes infrared lens and wireless on/off switch)
449453-001	Audio board with infrared lens
449726-001	Wireless Antenna Kit for use only with computer models equipped with an 802.11a/b/g or 802.11b/g WLAN module (includes 2 wireless antenna transceivers and cables)
449728-001	Wireless Antenna Kit for use only with computer models equipped with an 802.11a/b/g/n WLAN module (includes 3 wireless antenna transceivers and cables)
449729-001	RTC battery
450370-001	Processor bracket
451010-001	Switch cover (includes LED board)
451861-001	Intel 802.11a/b/g WLAN module for use in Antigua and Barbuda, Argentina, Australia, the Bahamas, Barbados, Brunei, Canada, Chile, the Dominican Republic, Guam, Guatemala, Hong Kong, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Saudi Arabia, Taiwan, the United States, and Vietnam
451861-002	Intel 802.11a/b/g WLAN module for use in Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Brazil, Bulgaria, the Cayman Islands, Colombia, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, the United Kingdom, and Uzbekistan
451861-003	Intel 802.11a/b/g WLAN module for use in Ecuador, Haiti, Honduras, Pakistan, the People's Republic of China, Peru, Qatar, South Korea, Uruguay, and Venezuela
451861-004	Intel 802.11b/g WLAN module for use in Thailand
451861-291	Intel 802.11a/b/g WLAN module for use in Japan
451862-001	160-GB, 5400-rpm hard drive
451863-001	200-GB, 4200-rpm hard drive
451864-001	12-cell, 8.8-AH battery
453033-001	Intel Core Duo T5250 1.50-GHz processor (2-MB L2 cache, 533-MHz FSB; includes thermal material)
453198-001	90-watt, PFC AC adapter
453199-001	65-watt, PFC AC adapter
453328-001	Display bezel for use only with computer models equipped with microphones
453770-001	System board
453771-001	Intel Core 2 Duo 2.20-GHz processor (4-MB L2 cache, 800-MHz FSB; includes thermal material)
453772-001	Intel Core 2 Duo 1.50-GHz processor (2-MB L2 cache, 667-MHz FSB; includes thermal material)
453773-001	Intel Core 2 Duo 1.86-GHz processor (1-MB L2 cache, 533-MHz FSB; includes thermal material)
453774-001	2048-MB memory module (PC2-5300, 667-MHz, DDR2)
453775-001	250-GB, 5400-rpm hard drive

Spare part number	Description
455514-001	Top cover (includes TouchPad)
455515-001	Intel Core 2 Duo 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB; includes thermal material)

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

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

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 a 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.

Use nonmagnetic tools.

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm $\pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips 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 plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

Unknown user password

If the computer you are servicing has an unknown user password, follow these steps to clear the password.



NOTE: These steps also clear CMOS.

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.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the RTC battery (see [RTC battery on page 43](#)).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

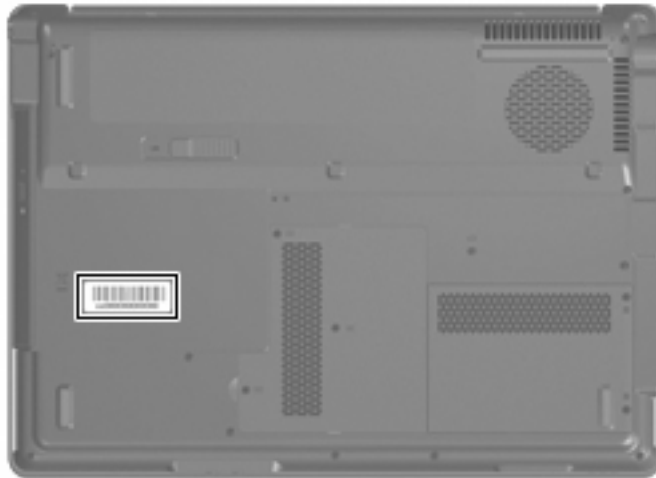
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 87 screws and standoffs, in 13 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and standoff size and location during removal and replacement.

Serial number

Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



Battery

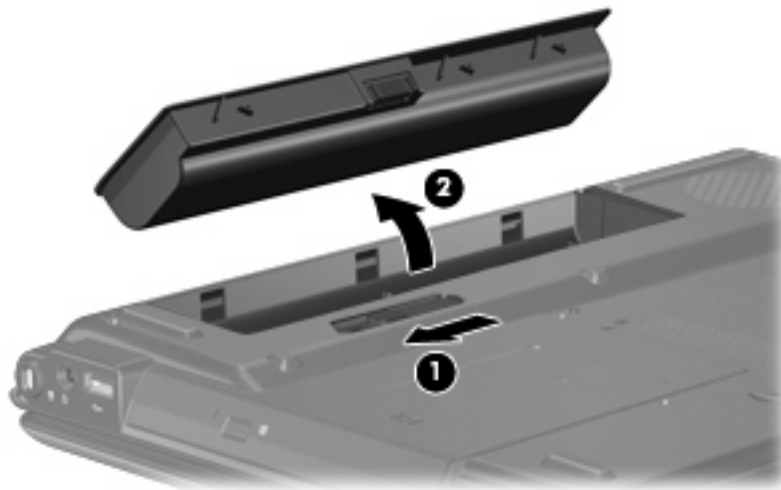
Description	Spare part number
12-cell, 8.80-Ah Li-ion battery	451864-001
6-cell, 2.55-Ah Li-ion battery	446507-001
6-cell, 2.20-Ah Li-ion battery	446506-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the battery **(2)** upward and remove it from the computer.



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

Hard drive

 **NOTE:** All hard drive spare part kits include a hard drive bracket.

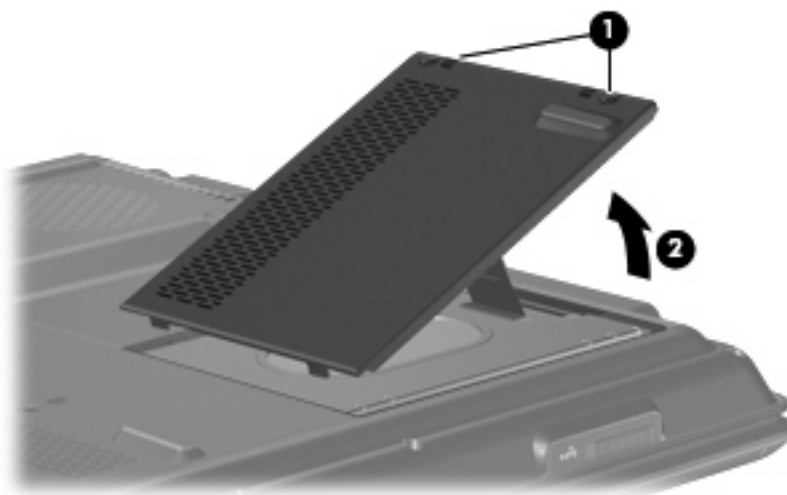
Description	Spare part number
250-GB, 5400-rpm	453775-001
200-GB, 4200-rpm	451863-001
160-GB, 5400-rpm	451862-001
120-GB, 5400-rpm	446498-001
80-GB, 5400-rpm	446497-001
60-GB, 5400-rpm	446496-001

Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).

Remove the hard drive:

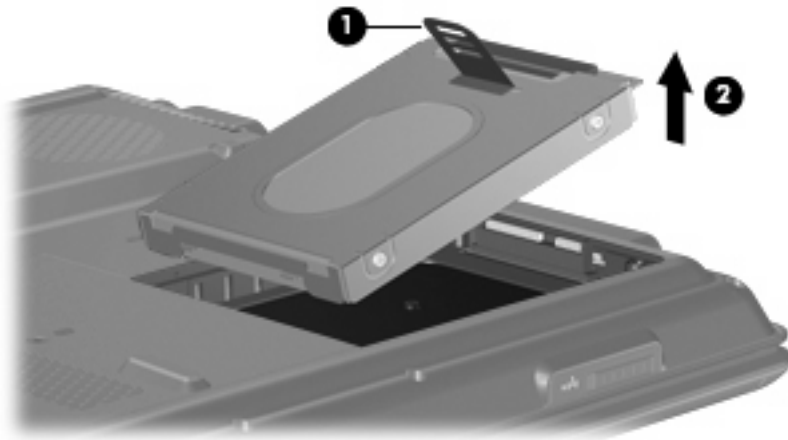
1. Loosen the two Phillips PM2.0×5.0 screws **(1)** that secure the hard drive cover to the computer.
2. Lift the right side of the hard drive cover **(2)**, swing it to left, and remove the cover.



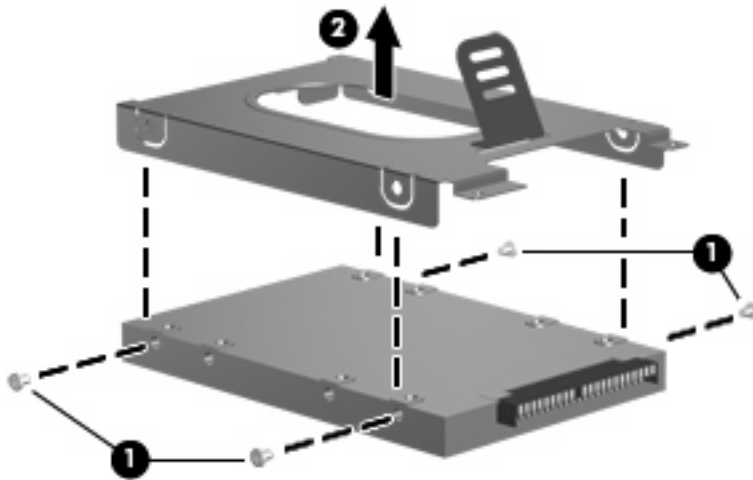
3. Remove the hard drive cover.

 **NOTE:** The hard drive cover is included in the Plastics Kit, spare part number 438669-001.

4. Use the Mylar tab **(1)** to lift the hard drive **(2)** until it disconnects from the computer.



5. Remove the hard drive.
6. If it is necessary to remove the hard drive bracket, remove the four Phillips PM3.0x3.0 screws **(1)** that secure the hard drive bracket to the hard drive.
7. Lift the bracket **(2)** straight up to remove it from the hard drive.

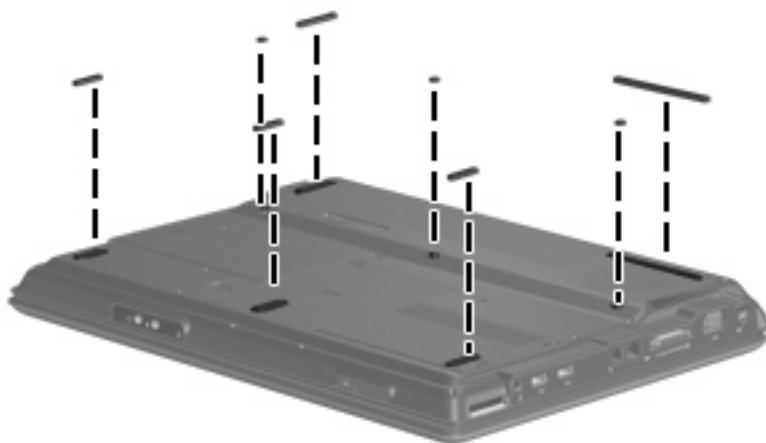


Reverse this procedure to reassemble and install the hard drive.

Computer feet

Description	Spare part number
Rubber Kit (includes base enclosure rubber feet and display bezel screw covers)	431431-001

The computer feet are adhesive-backed rubber pads. The feet attach to the base enclosure in the locations illustrated below.



Memory module

Description	Spare part number
2048-MB (PC2-5300, 667-MHz, 1-DIMM)	453774-001
1024-MB (PC2-5300, 667-MHz, 1-DIMM)	446495-001
512-MB (PC2-5300, 667-MHz, 1-DIMM)	446494-001

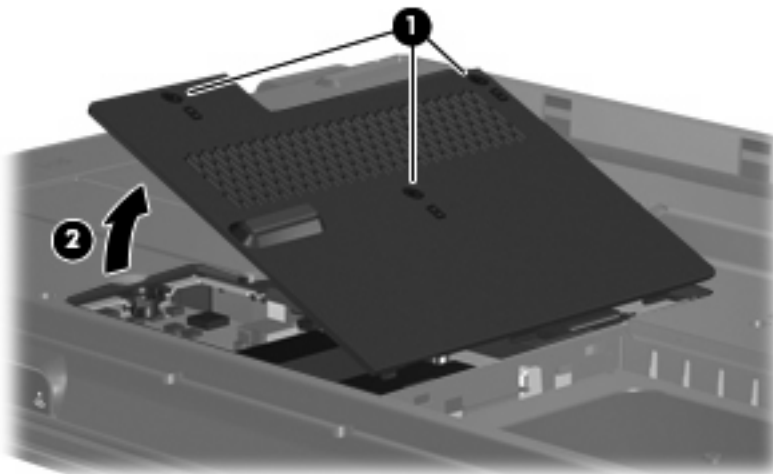
Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).

Remove the memory module:

1. Loosen the three Phillips PM2.0×5.0 screws **(1)** that secure the memory/WLAN module compartment cover to the computer.

2. Lift the left side of the cover **(2)**, swing it to the right, and remove the cover.

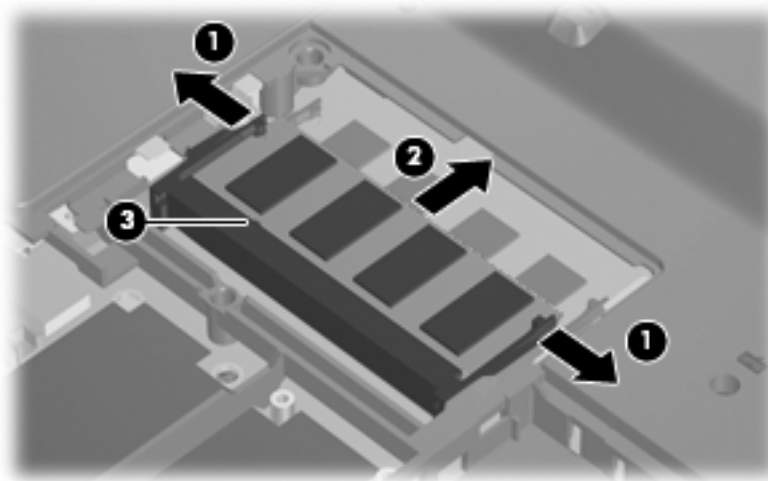


3. Remove the memory/WLAN module compartment cover.

 **NOTE:** The memory/WLAN module compartment cover is included in the Plastics Kit, spare part number 438669-001.

4. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
5. Remove the module **(2)** by pulling it away from the slot at an angle.

 **NOTE:** Memory modules are designed with a notch **(3)** to prevent incorrect installation into the memory module slot.



Reverse this procedure to install a memory module.

RTC battery

 **NOTE:** Removing the RTC battery and leaving it uninstalled for 5 or more minutes causes all passwords and CMOS settings to be cleared.

Description	Spare part number
RTC battery (includes 2-sided tape)	446518-001 and 449729-001

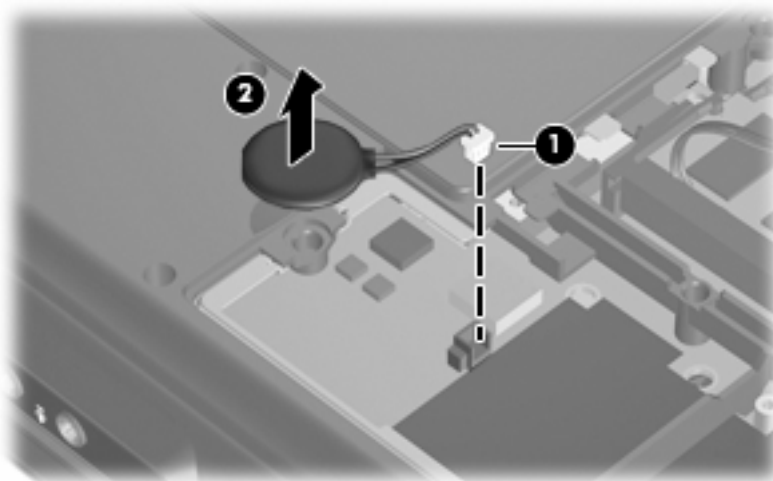
Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the memory/WLAN module compartment cover (see [Memory module on page 41](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Remove the RTC battery **(2)**.

 **NOTE:** The RTC battery is secured to the computer by 2-sided tape. All replacement RTC battery spare part kits include 2-sided tape.



Reverse this procedure to install the RTC battery.

WLAN module

Description	Spare part number
Intel 802.11a/b/g/n WLAN modules:	
<ul style="list-style-type: none"> For use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam 	441086-001
<ul style="list-style-type: none"> For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan 	441086-002 and 441087-002
<ul style="list-style-type: none"> For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea 	441086-003 and 441088-003
<ul style="list-style-type: none"> For use in Japan 	441086-291 and 441089-291
<ul style="list-style-type: none"> For use in South Korea 	441086-AD1
Intel 802.11a/b/g WLAN modules:	
<ul style="list-style-type: none"> For use in Antigua & Barbuda, Argentina, Australia, the Bahamas, Barbados, Brunei, Canada, Chile, the Dominican Republic, Guam, Guatemala, Hong Kong, India, Indonesia, Malaysia, Mexico, New Zealand, Panama, Paraguay, Saudi Arabia, Taiwan, the United States, and Vietnam 	451861-001
<ul style="list-style-type: none"> For use in Aruba, Austria, Azerbaijan, Bahrain, Belgium, Bermuda, Brazil, Bulgaria, the Cayman Islands, Colombia, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, the United Kingdom, and Uzbekistan 	451861-002
<ul style="list-style-type: none"> For use in Ecuador, Haiti, Honduras, Pakistan, the People's Republic of China, Peru, Qatar, South Korea, Uruguay, and Venezuela 	451861-003
<ul style="list-style-type: none"> For use in Japan 	451861-291
Broadcom 802.11b/g WLAN modules:	
<ul style="list-style-type: none"> For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States 	441090-001
<ul style="list-style-type: none"> For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & 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-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, 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, 	441090-002

Description	Spare part number
Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, 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 & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	
<ul style="list-style-type: none"> For use in Japan 	441090-291
802.11b/g WLAN module for use in Thailand	451861-004

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the memory/WLAN module compartment cover (see [Memory module on page 41](#)).

Remove the WLAN module:

1. Disconnect the two WLAN antenna cables **(1)** from the WLAN module.

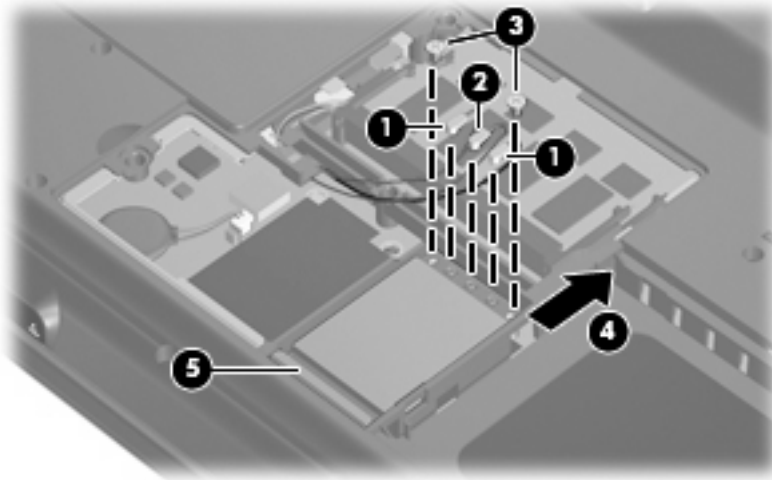
 **NOTE:** The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The gray WLAN antenna cable is connected to the WLAN module “Aux” terminal.

NOTE: Computer models equipped with an 802.11a/b/g/n WLAN module have an additional wireless antenna cable **(2)**, yellow in color.

2. Remove the two Phillips PM2.0×3.0 screws **(3)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

3. Remove the WLAN module **(4)** by pulling it away from the slot at an angle.

 **NOTE:** WLAN modules are designed with a notch **(5)** to prevent incorrect installation into the WLAN module slot.



Reverse this procedure to install a WLAN module.

Optical drive



NOTE: All optical drive spare part kits include an optical drive bezel.

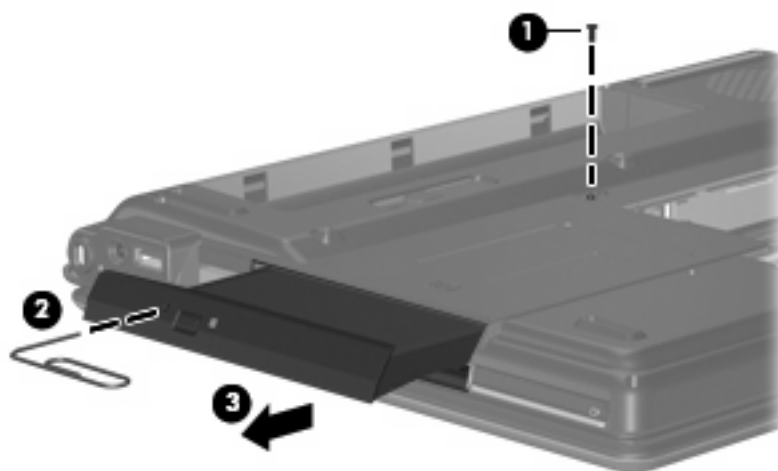
Description	Spare part number
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	446505-001
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	446504-001
DVD/CD-RW Combo Drive	446503-001

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).

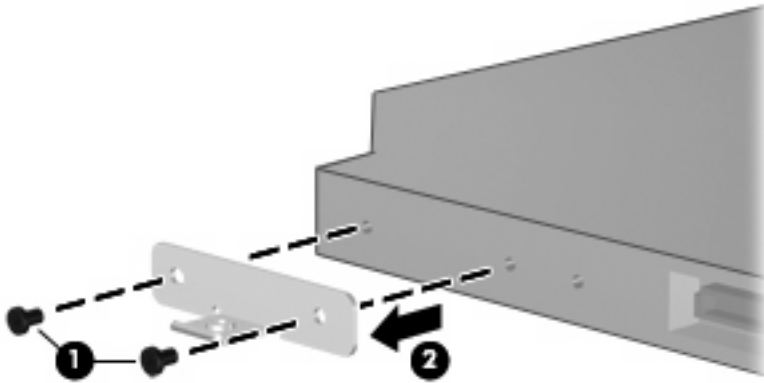
Remove the optical drive:

1. Position the computer with right side toward you.
2. Remove the Phillips PM2.5×7.0 screw **(1)** that secures the optical drive to the computer.
3. Insert a thin tool, such as a paper clip **(2)**, into the disc tray release access. (The optical drive disc tray is partially ejected from the optical drive.)
4. Use the disc tray frame to slide the optical drive **(3)** out of the computer.
5. Remove the optical drive.



6. If it is necessary to replace the optical drive bracket, position the optical drive with the optical drive bracket toward you.

7. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.
8. Remove the optical drive bracket **(2)**.



Reverse the above procedure to reassemble and install the optical drive.

Switch cover

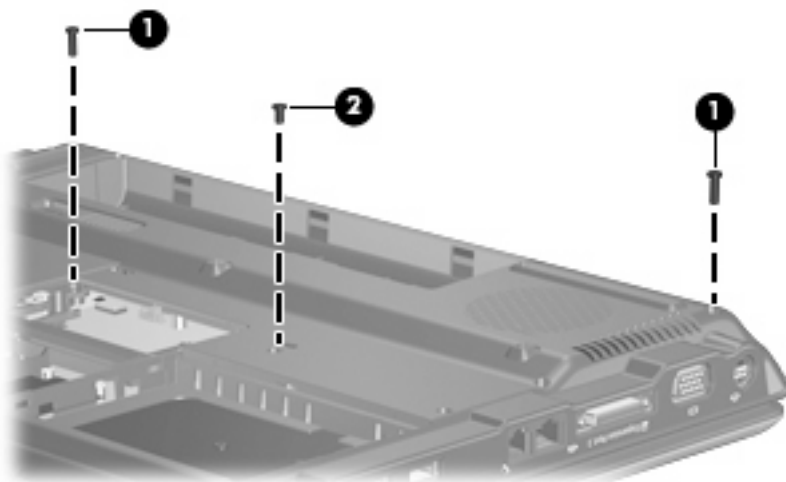
Description	Spare part number
Switch cover (includes LED board and cable)	431425-001 and 451010-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).

Remove the switch cover:

1. Remove the two Phillips PM2.5×10.0 screws **(1)** and the Phillips PM2.5×4.0 screw **(2)** that secure the switch cover to the computer.

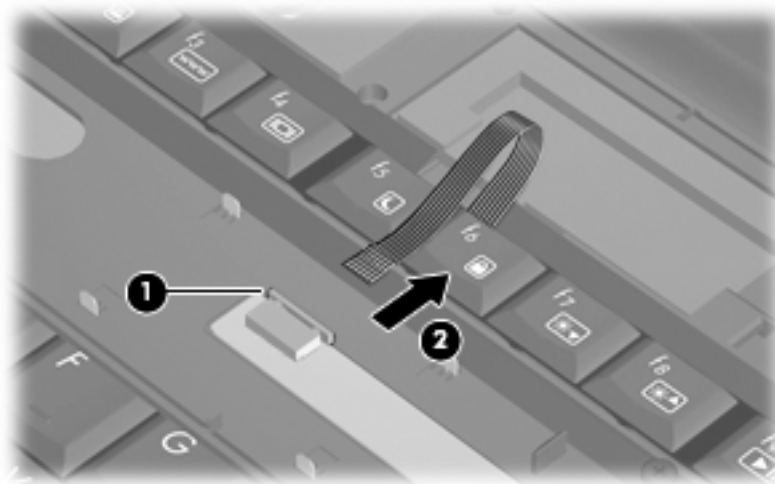


2. Turn the computer display-side up, with the front toward you.
3. Open the computer as far as possible.

4. Lift the rear edge of the switch cover and swing it forward until it rests on the keyboard.



5. Release the zero insertion force (ZIF) connector **(1)** to which the LED board cable is connected, and disconnect the cable **(2)** from the LED board.



6. Remove the switch cover.

Reverse this procedure to install the switch cover.

Keyboard

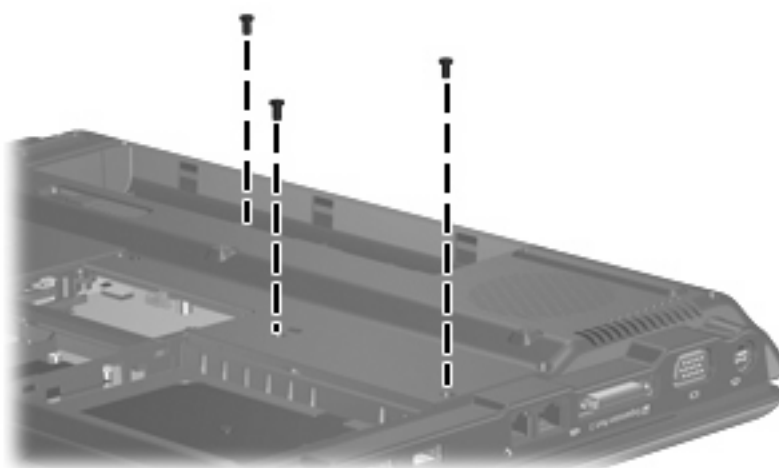
Description			
For use in:	Spare part number	For use in:	Spare part number
Finland, Norway, and Sweden	441428-DH1	Saudi Arabia	441428-171
France	441428-051	Spain	441428-071
French Canada	441428-121	Taiwan	441428-AB1
International	441428-B31	Thailand	441428-281
Italy	441428-061	Turkey	441428-141
South Korea	441428-AD1	The United Kingdom	441428-031
Latin America	441428-161	The United States	441428-001

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the switch cover (see [Switch cover on page 49](#)).

Remove the keyboard:

1. Turn the computer upside down, with the front toward you.
2. Remove the three Phillips PM2.5×7.0 screws that secure the keyboard to the computer.

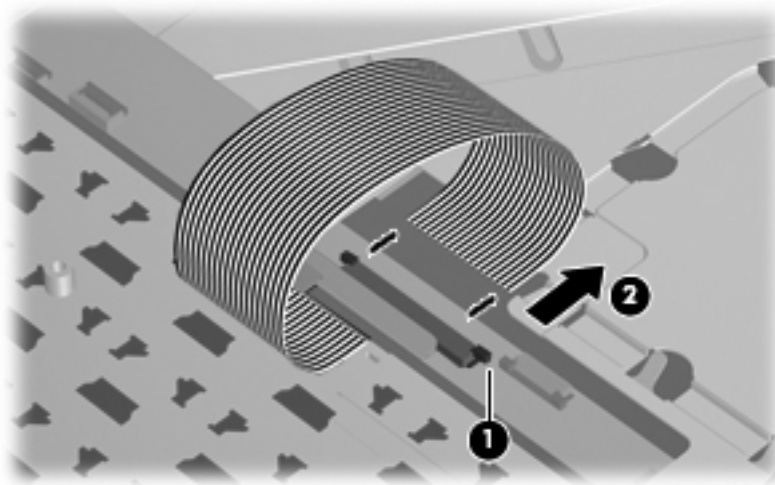


3. Turn the computer display-side up, with the front toward you.

4. Open the computer as far as possible.
5. Lift the rear edge of the keyboard **(1)** until it rests at an angle.
6. Release the keyboard **(2)** by sliding it back to disengage the tabs on the front edge of the keyboard from the top cover.
7. Swing the keyboard **(3)** up and forward until it rests on the palm rest.



8. Release the ZIF connector **(1)** to which the keyboard cable is attached, and disconnect the keyboard cable **(2)** from the system board.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

Power button board

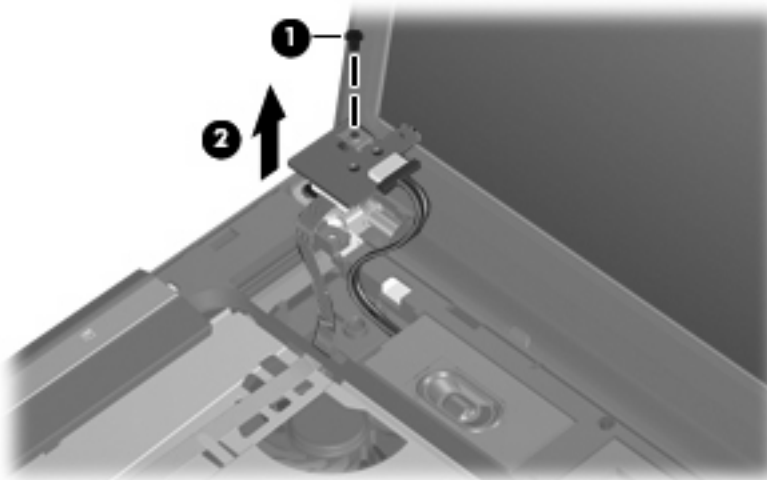
Description	Spare part number
Power button board (includes power button board cable)	431438-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the switch cover (see [Switch cover on page 49](#)).
6. Remove the keyboard (see [Keyboard on page 51](#)).

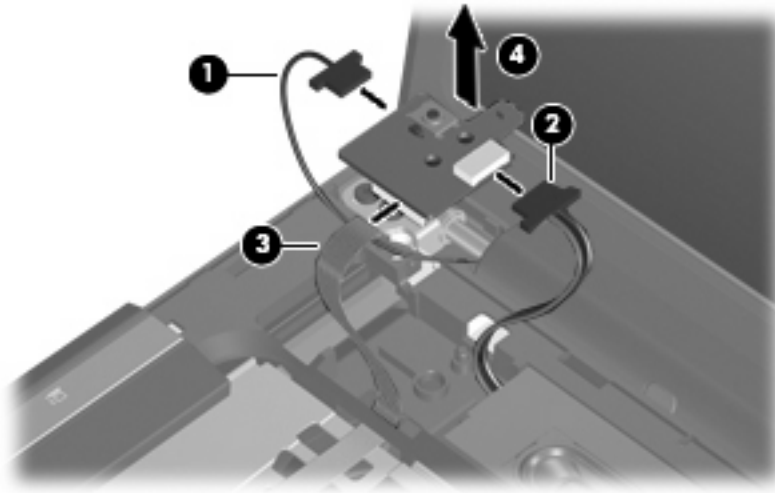
Remove the power button board:

1. Remove the Phillips PM2.5×4.0 screw **(1)** that secures the power button board to the fan/heat sink assembly.
2. Release the power button board **(2)** from the computer as far as the cables allow.



3. Disconnect the microphone cable **(1)** and the speaker cable **(2)** from the power button board.
4. Release the ZIF connector **(3)** to which the power button board cable is connected, and disconnect the cable.

5. Remove the power button board (4).



Reverse this procedure to install the power button board.

Display assembly

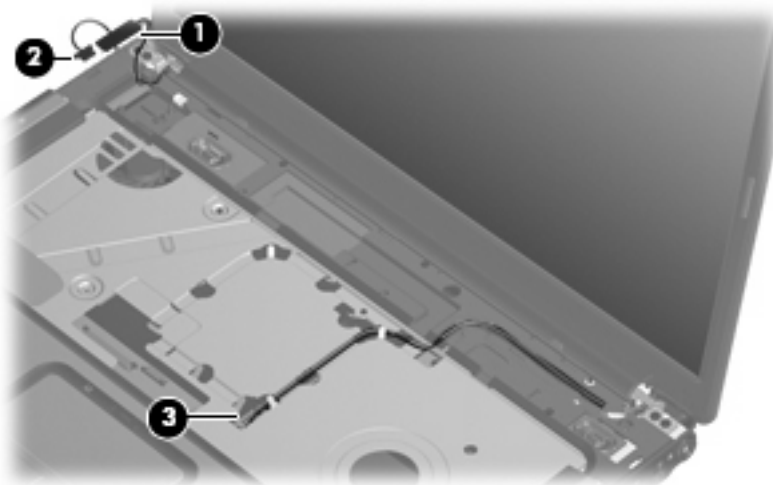
Description	Spare part number
15.4-inch, WXGA, BrightView display assembly (includes microphones)	446485-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Disconnect the WLAN antenna cables from the WLAN module (see [WLAN module on page 44](#)).
6. Remove the following components:
 - a. Switch cover (see [Switch cover on page 49](#))
 - b. Keyboard (see [Keyboard on page 51](#))

Remove the display assembly:

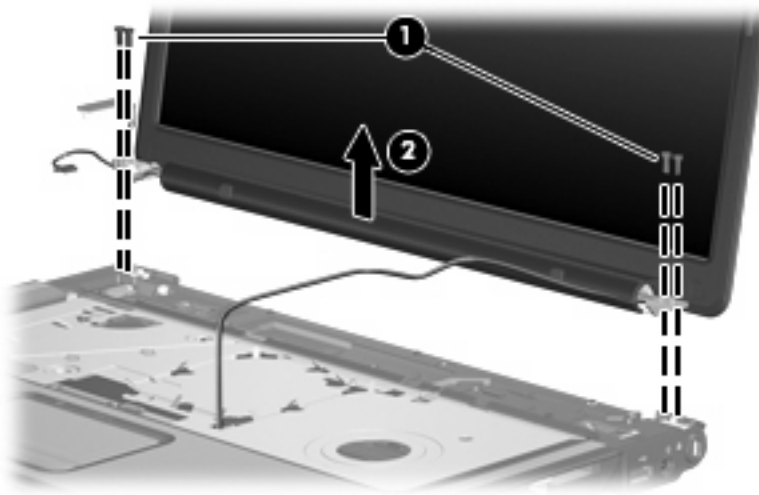
1. Disconnect the display panel cable **(1)** from the system board.
2. Disconnect the microphone cable **(2)** from the power button board.
3. Remove the wireless antenna cables **(3)** from the clips in the top cover.



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

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

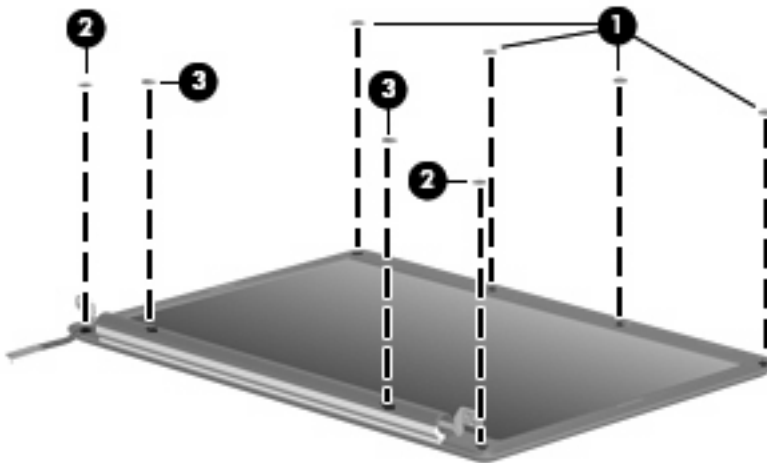
5. Remove the display assembly **(2)**.



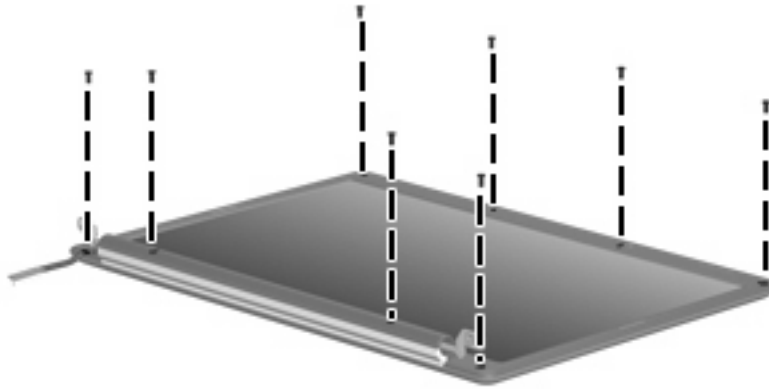
6. If it is necessary to replace the display bezel or any of the display assembly internal components, remove the following screw covers:

- (1)** Four covers on the top edge of the bezel
- (2)** Two covers on the lower bezel edges
- (3)** Two covers on the lower-inside edge of the bezel

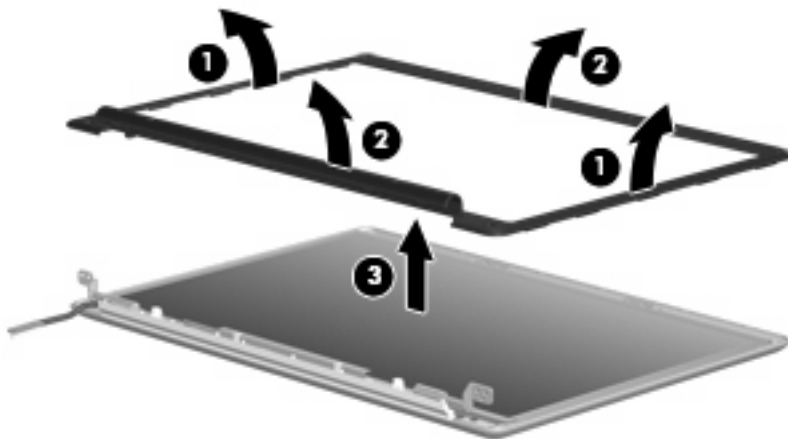
The display rubber screw covers are included in the Display Screw Kit, spare part number 431400-001.



7. Remove the eight Phillips PM2.5×7.0 screws that secure the display bezel to the display assembly.

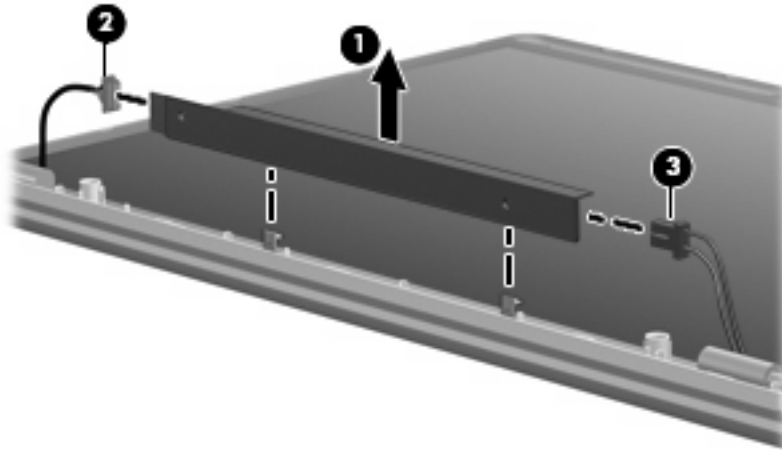


8. Flex the inside edges of the left and right sides **(1)** and the top and bottom sides **(2)** of the display bezel until the bezel disengages from the display enclosure.
9. Remove the display bezel **(3)**. The display bezels are available using spare part numbers 433283-001 and 453328-001.

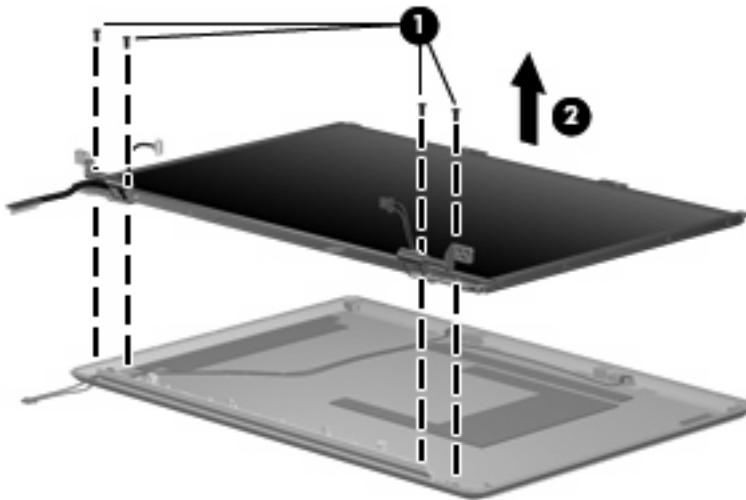


10. If it is necessary to replace the display inverter, remove the inverter **(1)** from the display enclosure as far as the display panel cable and the backlight cable allow.

11. Disconnect the display panel cable **(2)** and the backlight cable **(3)** from the inverter.

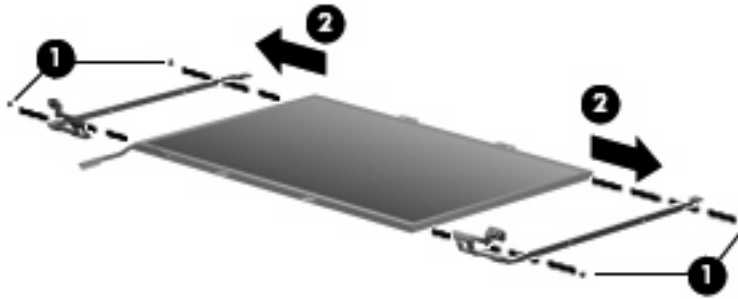


12. Remove the display inverter. The display inverter is available using spare part number 431391-001.
13. If it is necessary to replace the display panel, remove the four Phillips PM2.5×4.0 screws **(1)** that secure the display panel to the display enclosure.
14. Remove the display panel **(2)**. The display panel is available using spare part number 446480-001.

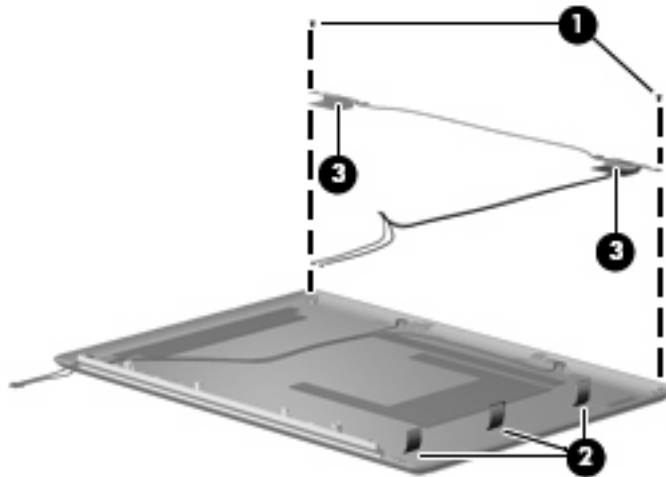


15. If it is necessary to replace the display hinges, remove the two Phillips PM2.0×3.0 screws **(1)** that secure each display hinge to the display panel.

16. Remove the display hinges (2). The display hinges are available using spare part number 433288-001.

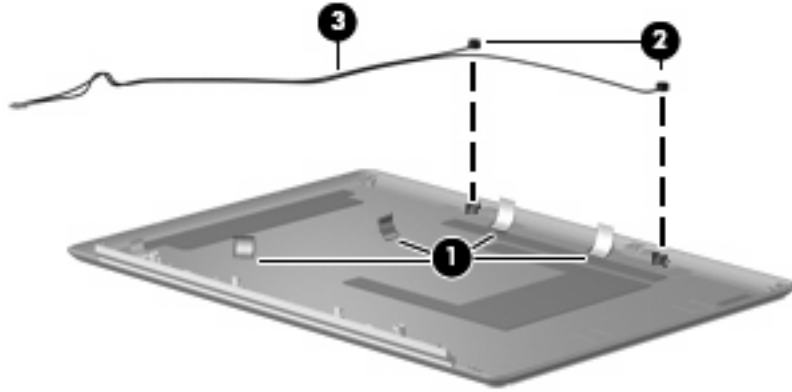


17. If it is necessary to replace the wireless antenna transceivers and cables, remove the Phillips PM2.0×3.0 screw (1) that secures each transceiver to the display enclosure.
18. Release the retention tabs (2) built into the display enclosure that secure the wireless antenna cables and remove the cables from the tabs.
19. Detach the wireless antenna transceivers (3) from the display enclosure. The wireless antenna transceivers and cables are available using spare part numbers 449728-001 (for use only with computer models equipped with an 802.11a/b/g/n WLAN module) and 449726-001 (for use only with computer models equipped with an 802.11a/b/g or 802.11b/g WLAN module).



20. Remove the wireless antenna transceivers and cables.
21. If it is necessary to replace the microphones and cables, release the retention tabs (1) built into the display enclosure that secure the microphone cables to the display enclosure.
22. Remove the microphone receivers (2) from the clips in the display enclosure.

23. Remove the microphone cables (**3**) from the display enclosure. The microphones and cables are available using spare part number 431393-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover

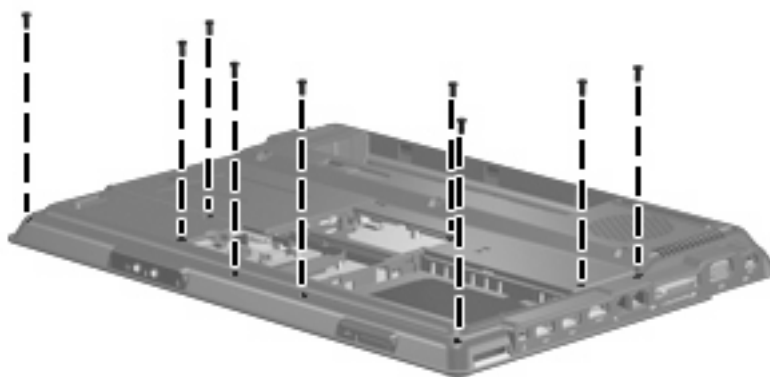
Description	Spare part number
Top cover (includes speakers and TouchPad and cable)	446510-001 and 455514-001

Before removing the top cover, follow these steps:

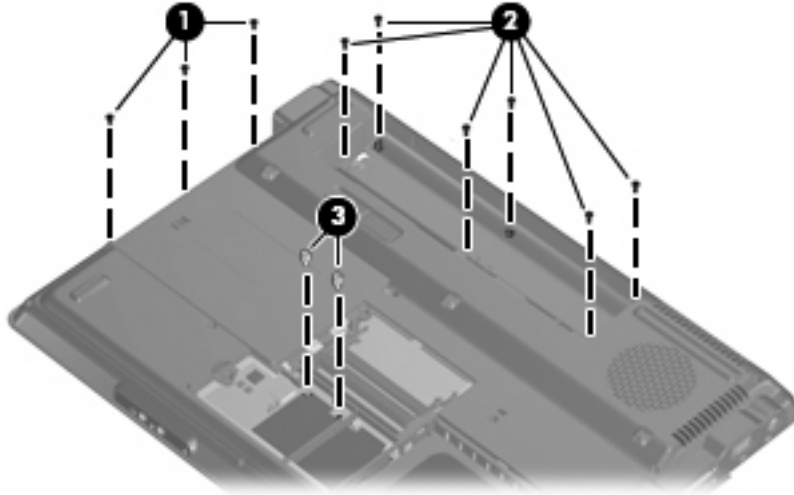
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))

Remove the top cover:

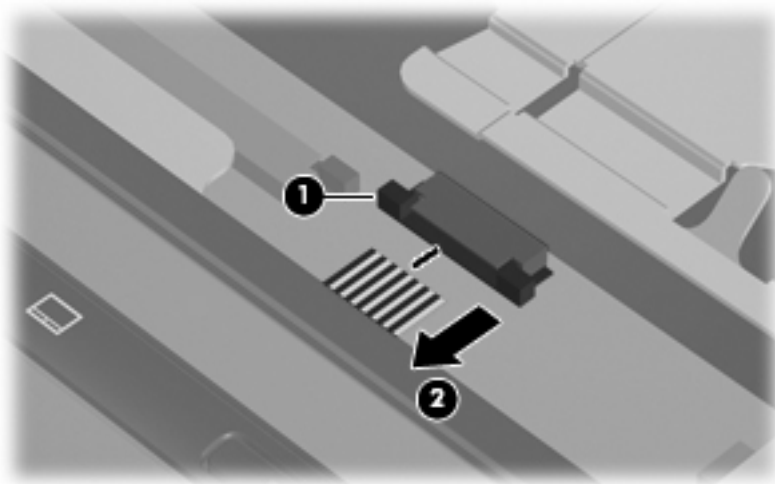
1. Turn the computer upside down, with the front toward you.
2. Remove the nine Phillips PM2.5×7.0 screws that secure the top cover to the computer.



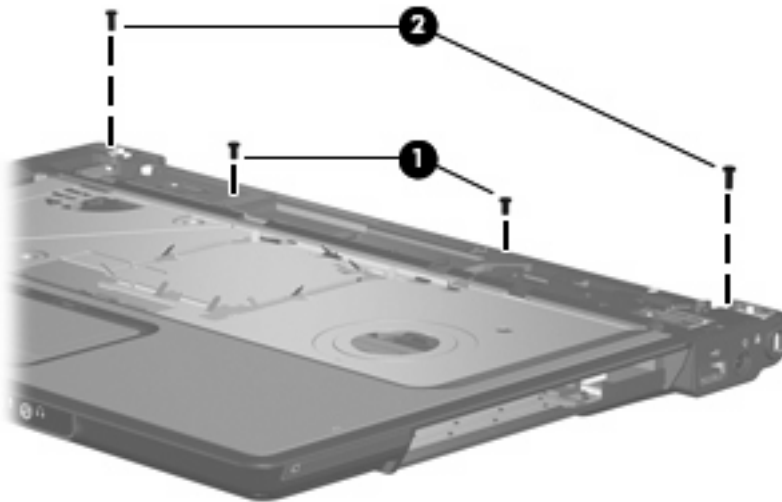
3. Remove the following screws:
- (1) Three Phillips PM2.5×3.0 screws
 - (2) Six Phillips PM2.5×4.0 screws
 - (3) Two Hex HM5.0×9.0 screw locks



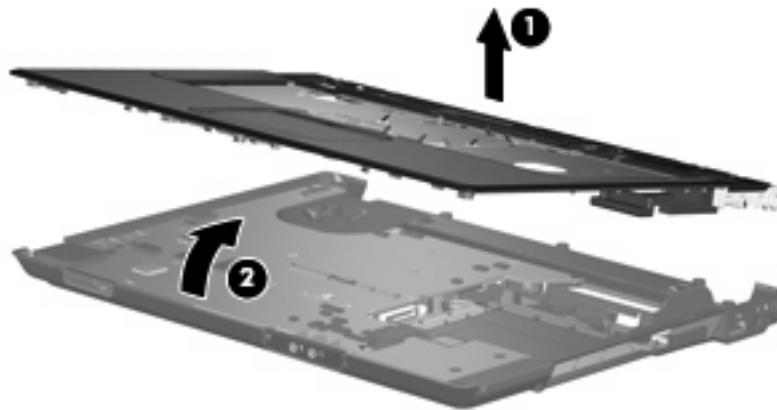
4. Turn the computer right-side up, with the front toward you.
5. Release the ZIF cable (1) to which the TouchPad cable is connected, and disconnect the TouchPad cable (2).



6. Remove the two Phillips PM2.5×7.0 screws **(1)** and the two Phillips PM2.5×4.0 screws **(2)** that secure the top cover to the base enclosure.



7. Lift the front edge of the top cover **(1)** until it disengages from the computer.
8. Remove the top cover **(2)**.



Reverse this procedure to install the top cover.

Bluetooth module

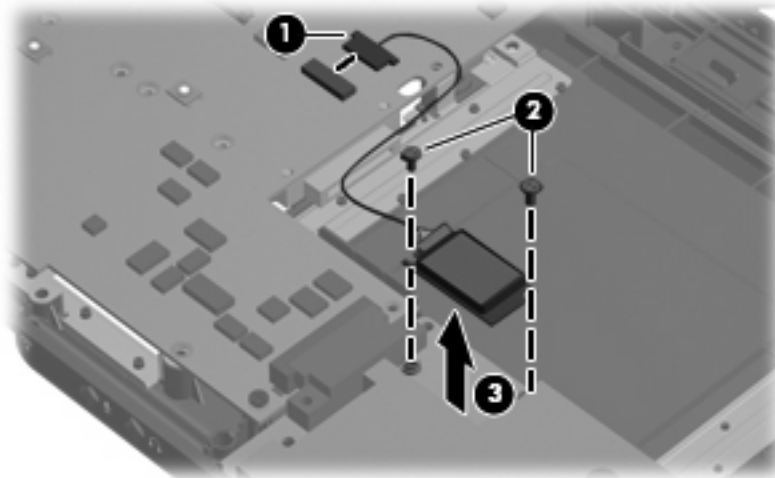
Description	Spare part number
Bluetooth module (includes Bluetooth module cable)	412766-002

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))
 - f. Top cover (see [Top cover on page 61](#)).

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Remove the two Phillips PM2.0×2.0 screws **(2)** that secure the Bluetooth module to the system board.
3. Remove the Bluetooth module **(3)**.



Reverse this procedure to install the Bluetooth module.

ExpressCard assembly

Description	Spare part number
ExpressCard assembly	431440-001

Before removing the ExpressCard assembly, follow these steps:

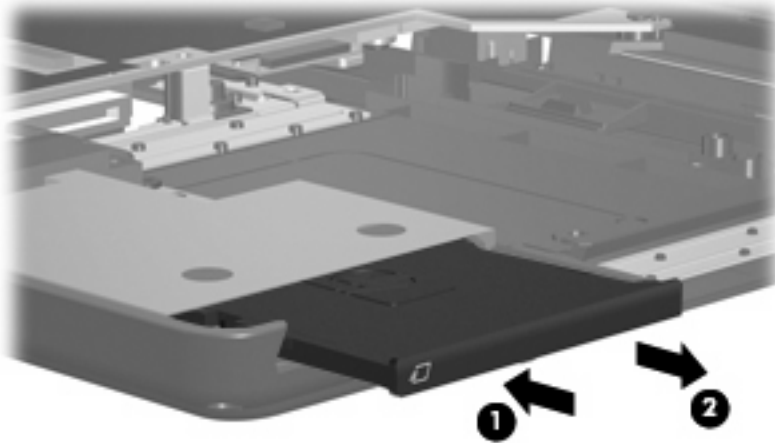
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))
 - f. Top cover (see [Top cover on page 61](#)).

Remove the ExpressCard assembly:

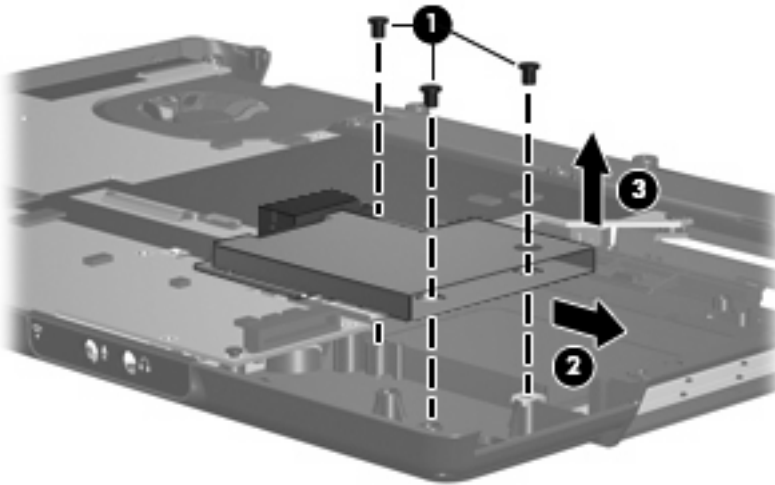
1. Push in on the ExpressCard slot bezel **(1)** to release the bezel from the ExpressCard slot.

2. Remove the ExpressCard slot bezel **(2)** from the ExpressCard slot.

 **NOTE:** The ExpressCard slot bezel is included in the Plastics Kit, spare part number 438669-001.



3. Remove the three Phillips PM2.5×4.0 screws **(1)** that secure the ExpressCard assembly to the system board.
4. Disconnect the ExpressCard assembly **(2)** from the system board by sliding it to the right.
5. Remove the ExpressCard assembly **(3)**.



Reverse this procedure to install the ExpressCard assembly.

USB/power connector board

Description	Spare part number
USB/power connector board (includes USB/power connector board cable)	447444-001

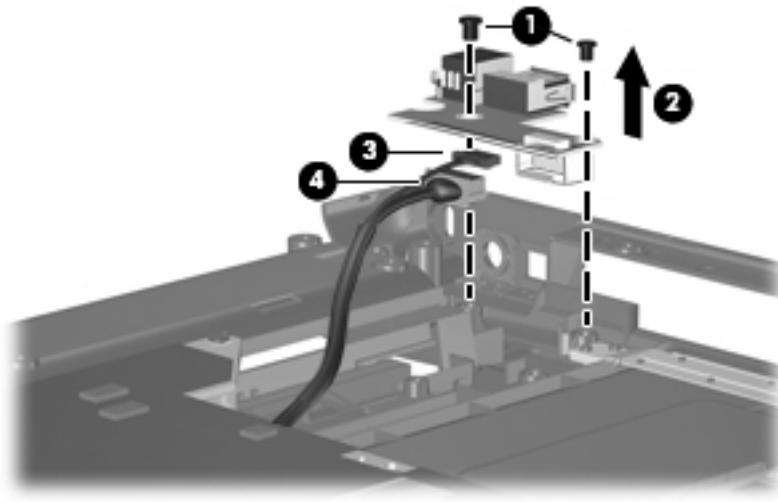
Before removing the USB/power connector board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))
 - f. Top cover (see [Top cover on page 61](#)).

Remove the USB/power connector board:

1. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the USB/power connector board to the computer.
2. Release the USB/power connector board **(2)** as far as the USB/power connector board cable allows.

3. Disconnect the USB board cable (3) and the power connector board cable (4) from the USB/power connector board.



4. Remove the USB/power connector board.

Reverse this procedure to install the USB/power connector board.

System board

Description	Spare part number
System board	446475-001 and 453770-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))
 - f. Top cover (see [Top cover on page 61](#))

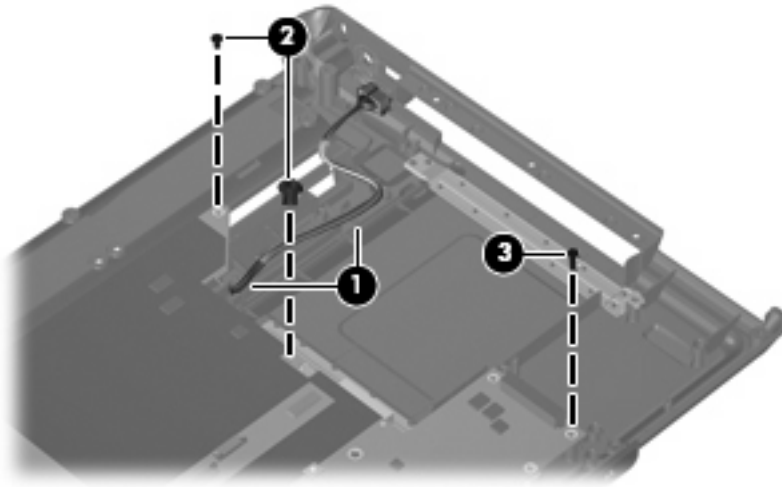
- g. Audio board (see [Audio board on page 71](#))
- h. USB/power connector board (see [USB/power connector board on page 67](#))

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

- Memory modules (see [Memory module on page 41](#))
- RTC battery (see [RTC battery on page 43](#))
- WLAN module (see [WLAN module on page 44](#))
- Bluetooth module (see [Bluetooth module on page 64](#))
- ExpressCard assembly (see [ExpressCard assembly on page 65](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 72](#))
- Processor (see [Processor on page 75](#))

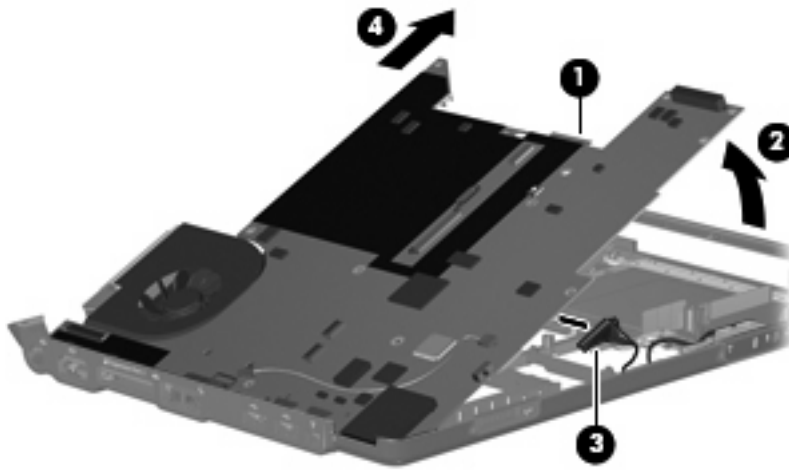
Remove the system board:

1. Remove the USB/power connector board cable **(1)** from the clips built into the base enclosure.
2. Remove the Phillips PM2.5×4.0 screw **(2)** and the Phillips PM2.0×7.0 screw **(3)** that secure the system board to the base enclosure.

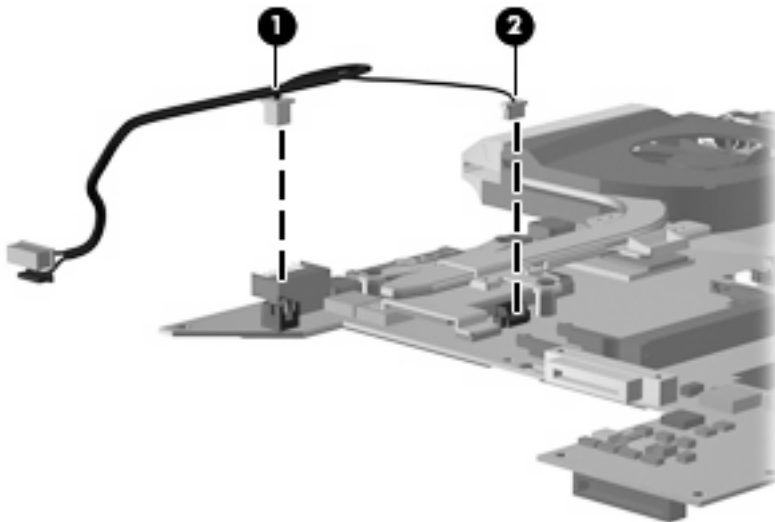


3. Use the optical drive connector **(1)** to lift the right side of the system board **(2)** until it rests at an angle.
4. Disconnect the audio board cable **(3)** from the system board.

5. Release the system board **(4)** by sliding it to the right until the connectors on the left side of the system board disengage from the base enclosure.



6. Remove the system board.
7. If it is necessary to replace the USB/power connector board cable, turn the system board upside down with the front toward you.
8. Disconnect the power connector board cable **(1)** and the USB board cable **(2)** from the system board.



Reverse the above procedure to install the system board and USB/power connector board cable.

Audio board

Description	Spare part number
Includes consumer infrared lens	449453-001
Does not include consumer infrared lens	431443-001

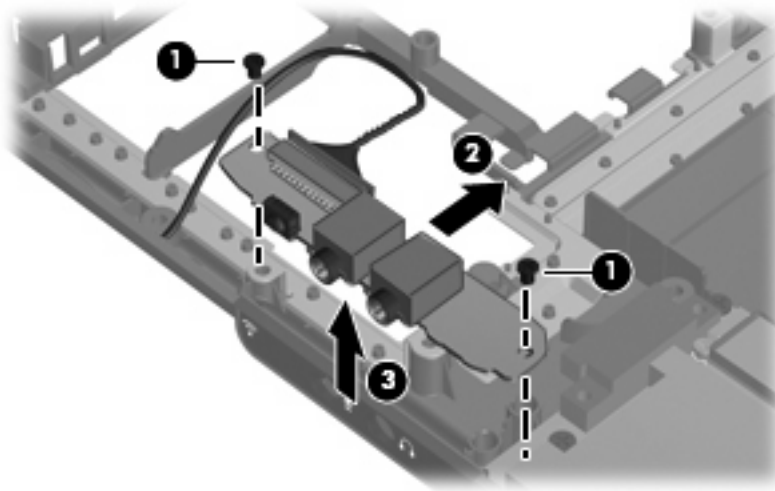
Before removing the audio board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))
 - f. Top cover (see [Top cover on page 61](#)).

Remove the audio board:

1. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the audio board to the computer.
2. Release the audio board **(2)** by sliding it back to disengage the audio connectors from the base enclosure.

3. Remove the audio board **(3)** by lifting it straight up.



Reverse this procedure to install the audio board.

Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes thermal material)	446522-001

 **NOTE:** When replacing the fan/heat sink assembly, be sure that the power button board is removed from the defective fan/heat sink assembly and installed on the replacement fan/heat sink assembly. See [Power button board on page 53](#) for power button board removal information.

NOTE: To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the right side and rear panel 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 applications. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

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

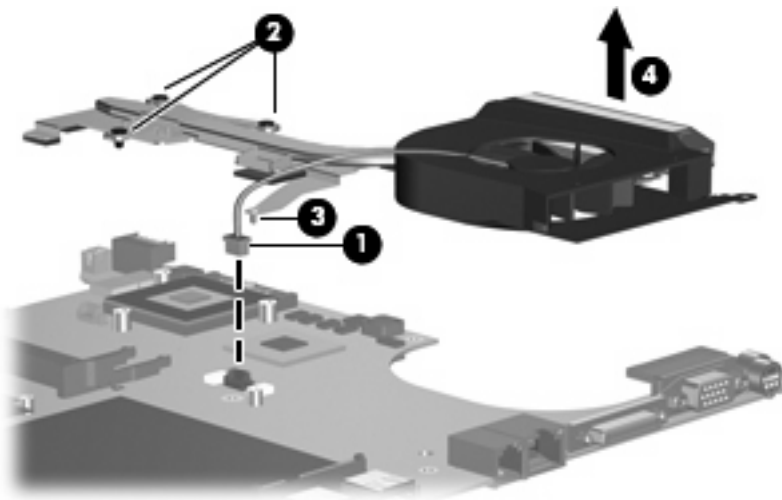
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))

- c. Switch cover (see [Switch cover on page 49](#))
- d. Keyboard (see [Keyboard on page 51](#))
- e. Display assembly (see [Display assembly on page 55](#))
- f. Top cover (see [Top cover on page 61](#))
- g. Audio board (see [Audio board on page 71](#))
- h. USB/power connector board (see [USB/power connector board on page 67](#))
- i. System board (see [System board on page 68](#))

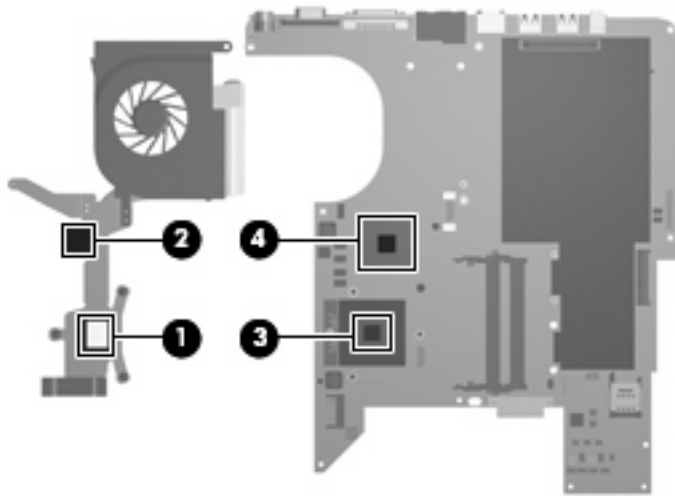
Remove the fan/heat sink assembly:

1. Turn the system board upside down, with the expansion port 3 and external monitor port toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Loosen the three Phillips PM2.5×5.0 captive screws **(2)** and the Phillips PM2.5×4.0 captive screw **(3)** that secure the fan/heat sink assembly to the system board.
4. Remove the fan/heat sink assembly **(4)**.

 **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 the assembly.



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly **(1)** and **(2)**, the processor **(3)**, and the system board component **(4)** each time the fan/heat sink assembly is removed. Thermal material must be installed on all surfaces before the fan/heat sink assembly is reinstalled. 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:** All processor spare part kits include thermal material.

Description	Spare part number
Intel Core 2 Duo processors:	
2.20-GHz processor (4-MB L2 cache, 800-MHz FSB)	453771-001
2.00-GHz processor (2-MB L2 cache, 800-MHz FSB)	455515-001
1.86-GHz processor (1-MB L2 cache, 533-MHz FSB)	453773-001
1.50-GHz processor (2-MB L2 cache, 667-MHz FSB)	453772-001
Intel Core Duo processors:	
T7300 2.0-GHz processor (4-MB L2 cache)	446478-001
T7100 1.8-GHz processor (2-MB L2 cache)	446479-001
T5250 1.5-GHz processor (2-MB L2 cache)	453033-001
Processor bracket	450370-001

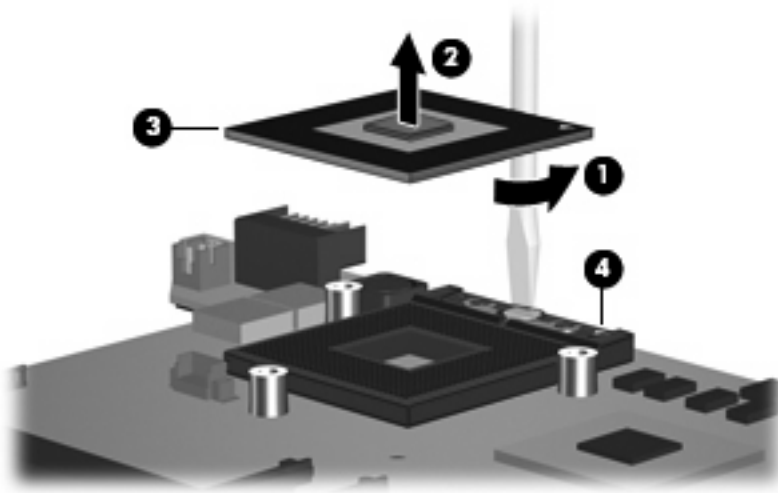
Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 38](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 39](#))
 - b. Optical drive (see [Optical drive on page 47](#))
 - c. Switch cover (see [Switch cover on page 49](#))
 - d. Keyboard (see [Keyboard on page 51](#))
 - e. Display assembly (see [Display assembly on page 55](#))
 - f. Top cover (see [Top cover on page 61](#))
 - g. Audio board (see [Audio board on page 71](#))
 - h. USB/power connector board (see [USB/power connector board on page 67](#))
 - i. System board (see [System board on page 68](#))
 - j. Fan/heat sink assembly (see [Fan/heat sink assembly on page 72](#))

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.

5 Setup Utility

Starting the Setup Utility

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



NOTE: The fingerprint reader (select models only) does not work when accessing the Setup Utility.

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

To start the Setup Utility:

1. Turn on or restart the computer.
2. Before Windows opens and while “Press <F10> to enter setup” is displayed in the lower-left corner of the screen, press **F10**.

Changing the language of the Setup Utility

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

1. To start the Setup Utility, turn on or restart the computer, and then press **F10** while “Press <F10> to enter setup” is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Press **F5** or **F6** (or use the arrow keys) to select a language, and then press **enter** to select a language.
4. When a confirmation prompt with your preference selected is displayed, press **enter** to save your preference.
5. To set your preferences and exit the Setup Utility, press **F10** and then follow the instructions on the screen.

Your preferences go into effect when the computer restarts in Windows.

Navigating and selecting in the Setup Utility

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

Displaying system information

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

1. To start the Setup Utility, turn on or restart the computer, and then press **f10** while “Press to enter setup” is displayed in the lower-left corner of the screen.
2. Access the system information by using the **Main** menu.
3. To exit the Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**. (The computer restarts in Windows.)

Restoring default settings in the Setup Utility

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

1. To start the Setup Utility, turn on or restart the computer, and then press **f10** while “Press to enter setup” is displayed in the lower-left corner of the screen.
2. Select **Exit > Load Setup Defaults**, and then press **enter**.
3. When the Setup Confirmation is displayed, press **enter** to save your preferences.
4. To set your preferences and exit the Setup Utility, press **f10**, and then follow the instructions on the screen.

The Setup Utility default settings are set when you exit the Setup Utility and go into effect when the computer restarts.

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

Using advanced Setup Utility features

This chapter describes the Setup Utility features recommended for all users. For more information about the Setup Utility features recommended for advanced users only, refer to Help and Support, which is accessible only when the computer is in Windows.

The Setup Utility features available for advanced users include a hard drive self-test, a Network Service Boot, and settings for boot order preferences.

The "<F12> to boot from LAN" message that is displayed in the lower-left corner of the screen each time the computer is started or restarted in Windows is the prompt for a Network Service Boot.

The "Press <ESC> to change boot order" message that is displayed in the lower-left corner of the screen each time the computer is started or restarted in Windows is the prompt to change the boot order.

Closing the Setup Utility

You can close the Setup Utility with or without saving changes.

- To close the Setup Utility and save your changes from the current session, use either of the following procedures:

- Press **F10**, and then follow the instructions on the screen.

—or—

- 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**.

When you use the **F10** procedure, you are offered an option to return to the Setup Utility. When you use the Exit Saving Changes procedure, the Setup Utility closes when you press **enter**.

- To close the Setup Utility without saving your changes from the current session:

If the Setup Utility menus are not visible, press **ESC** to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

After the Setup Utility closes, the computer restarts in Windows.

Setup Utility menus

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

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

Main menu

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

Security menu

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

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Enhanced SATA support (select models only)	Enable/disable enhanced SATA mode.
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none">• f10 and f12 Delay (sec.) Set the delay for the f10 and f12 functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20).• CD-ROM boot Enable/disable boot from CD-ROM.• Floppy boot Enable/disable boot from Floppy.• Internal Network Adapter boot Enable/disable boot from Internal Network Adapter.• Boot Order Set the boot order for:<ul style="list-style-type: none">◦ USB Floppy◦ ATAPI CD/DVD ROM Drive◦ Hard drive◦ USB Diskette on Key◦ USB Hard drive◦ Network adapter

Select	To do this
Button Sound (select models only)	Enable/disable the Quick Launch Button tapping sound.
Video memory up to (select models only)	Select the amount of video memory.

Diagnostics menu

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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Height (front to back)	4.09 cm	1.61 in
Width	35.71 cm	14.06 in
Depth	25.71 cm	10.12 in
Weight (with optical drive, hard drive, and battery)	2.86 kg	6.31 lbs
Input power		
Operating voltage	18.5 V dc — 19.0 V dc	
Operating current	3.5 A or 4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
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	

	Metric	U.S.
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.		

15.4-inch, WXGA, BrightView display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	150 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-65° horizontal, +/-50° vertical (typical)	

Hard drive specifications

	250-GB*	200-GB*	160-GB*	120-GB*	80-GB*
Dimensions					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	102 g	102 g	102 g	102 g	102 g
Interface type	SATA	SATA	SATA	SATA	SATA
Transfer rate					
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA 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	3 ms
Average	13 ms	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms	24 ms
Logical blocks	488,379,125	390,706,000	312,560,480	234,433,260	156,280,320
Disk rotational speed	5400 rpm	4200 rpm	5400 rpm	5400 rpm	5400 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)				
NOTE: Certain restrictions and exclusions apply. Consult technical support for details.					
* 1 GB = 1 billion bytes when referring to hard drive storage capacity. Accessible capacity is less. Actual drive specifications may differ slightly.					

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 (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 μm	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Audio output level	Audio-out, 0.7 Vrms	
Cache buffer	2 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	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

System DMA specifications

Hardware DMA	System function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned
*PC Card controller can use DMA 1, 2, or 5.	

System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft® Natural Keyboard
IRQ2	Cascaded
IRQ3	Intel 82801DB/DBM USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—Link Audio Intel 82801DB/DBM SMBus Controller—24C3 Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	Intel USB UHCI controller—24C2 Intel 82852/82855 GM/GME Graphic Controller Realtek RTL8139 Family PCI Fast Ethernet Controller
IRQ11	Intel USB EHCI controller—24CD Intel USB UHCI controller—24C4 Intel USB UHCI controller—24C7 Intel Pro/Wireless 2200BG TI OHCI 1394 host controller TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel
*Default configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.	
NOTE: PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.	

System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 "Super I/O" configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/RTC
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2
I/O Address (hex)	System Function (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	JoyStick (decoded in ESS1688)
202 - 21F	Unused

I/O address (hex)	System function (shipping configuration)
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	"A" diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

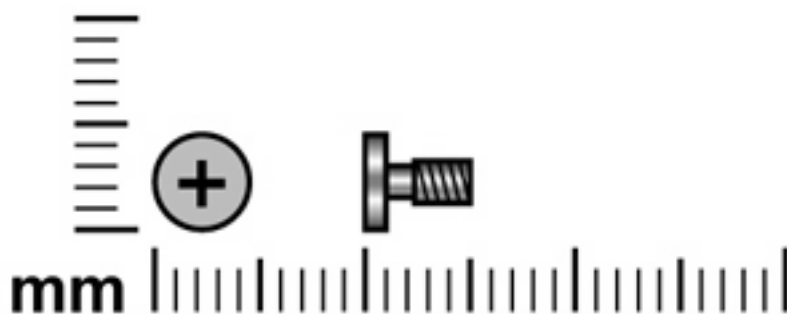
System memory map specifications

Size	Memory address	System function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFF	Video memory (direct access)
4 GB	08200000-FFFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

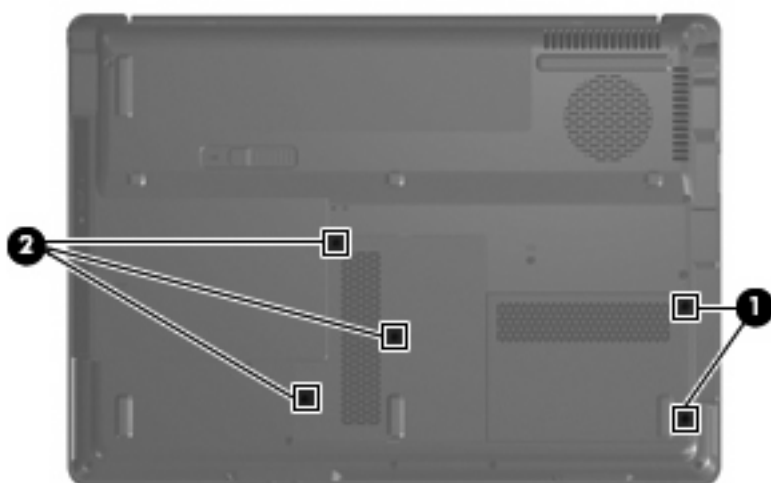
7 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws and screw locks listed in this section are available in the Screw Kit, spare part number 434893-001, and the Display Screw Kit, spare part number 431400-001.

Phillips PM2.0×5.0 captive screw



Color	Quantity	Length	Thread	Head width
Black	5	5.0 mm	2.0 mm	5.0 mm

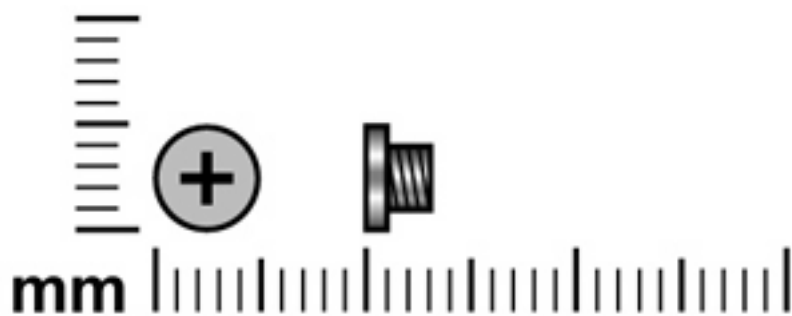


Where used:

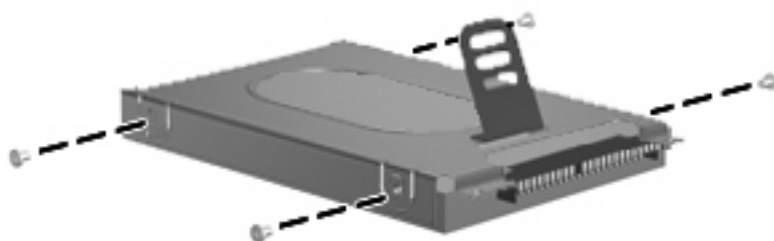
(1) Two captive screws (secured by C-clips) that secure the hard drive cover to the computer

(2) Three captive screws (secured by C-clips) that secure the memory/WLAN module compartment cover to the computer

Phillips PM3.0×3.0 screw



Color	Quantity	Length	Thread	Head width
Silver	4	3.0 mm	3.0 mm	5.0 mm

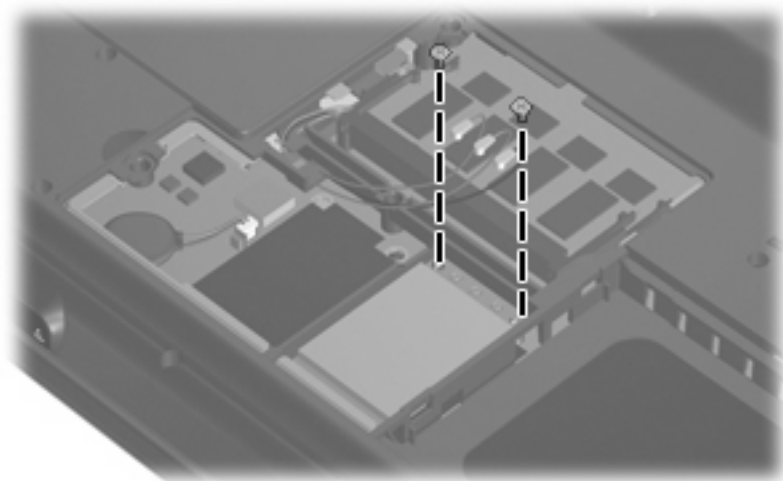


Where used: 4 screws that secure the hard drive bracket to the hard drive

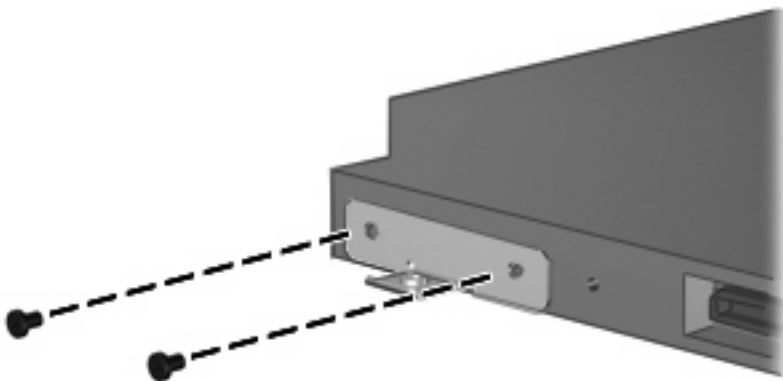
Phillips PM2.0×3.0 screw



Color	Quantity	Length	Thread	Head width
Silver	10	3.0 mm	2.0 mm	4.5 mm



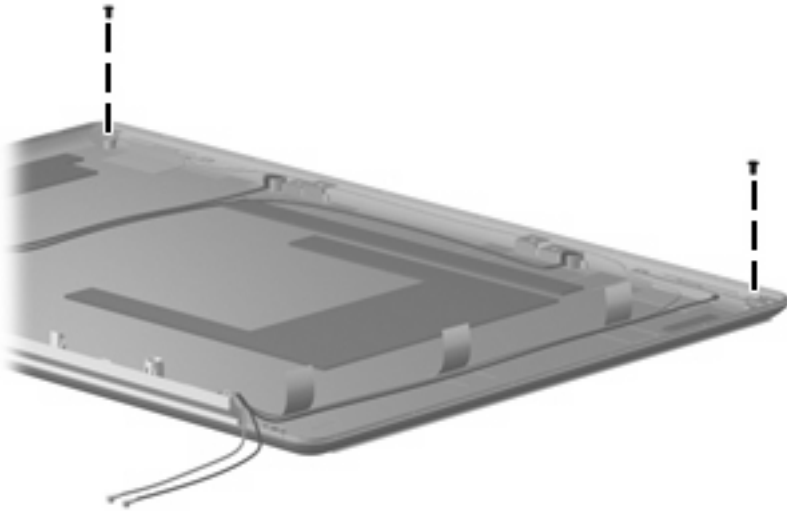
Where used: 2 screws that secure the WLAN module to the system board



Where used: 2 screws that secure the optical drive bracket to the optical drive

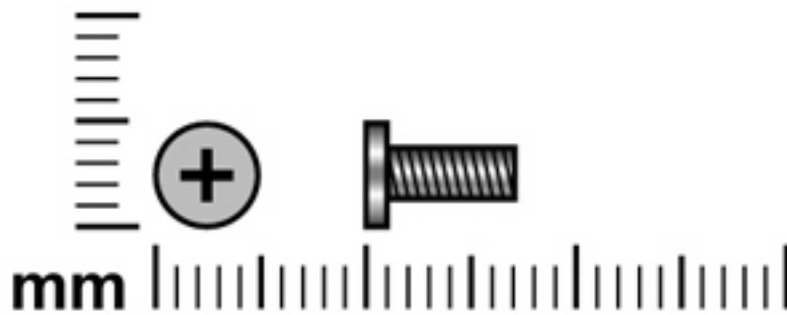


Where used: 2 screws that secure the wireless antenna transceivers to the display enclosure

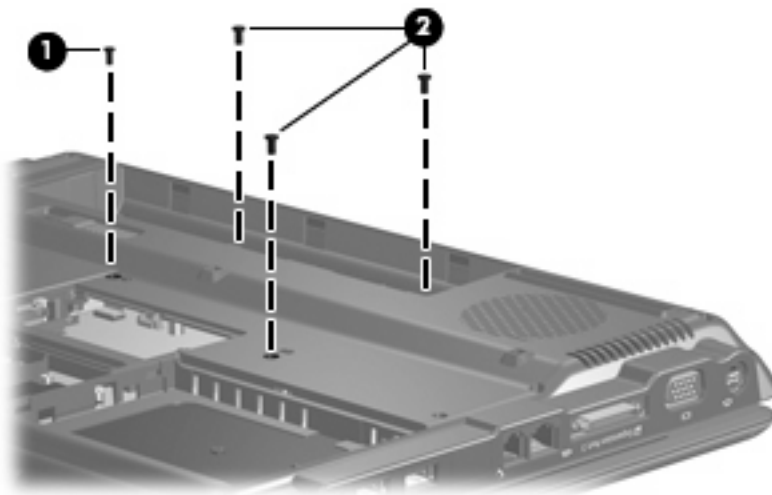


Where used: 4 screws that secure the display hinges to the display panel

Phillips PM2.5×7.0 screw

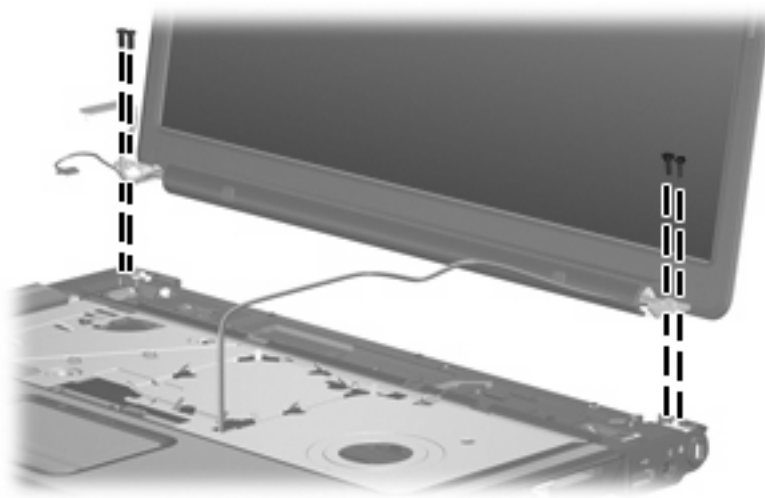


Color	Quantity	Length	Thread	Head width
Black	27	7.0 mm	2.5 mm	5.0 mm

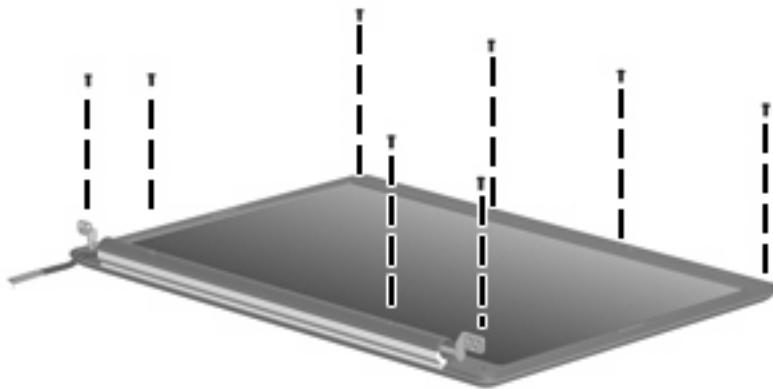


Where used:

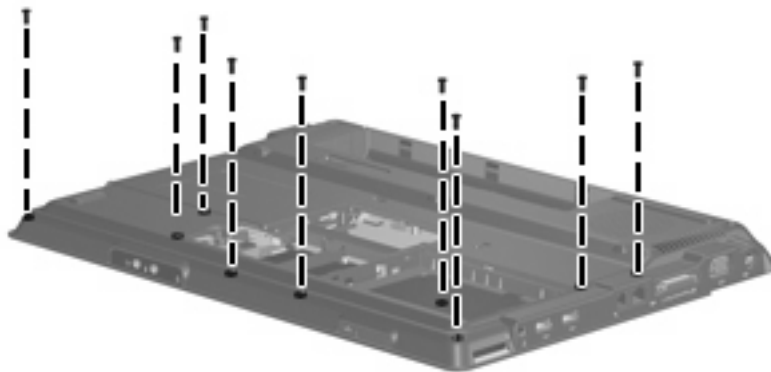
- (1) One screw that secures the optical drive to the computer
- (2) Three screws that secure the keyboard to the computer



Where used: 4 screws that secure the display assembly to the computer



Where used: 8 screws that secure the display bezel to the display assembly

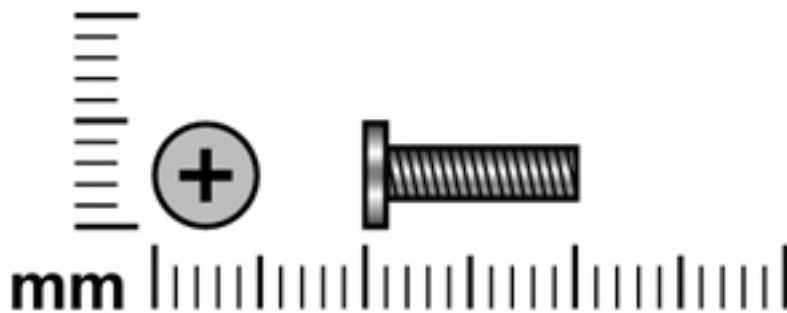


Where used: 9 screws that secure the top cover to the computer

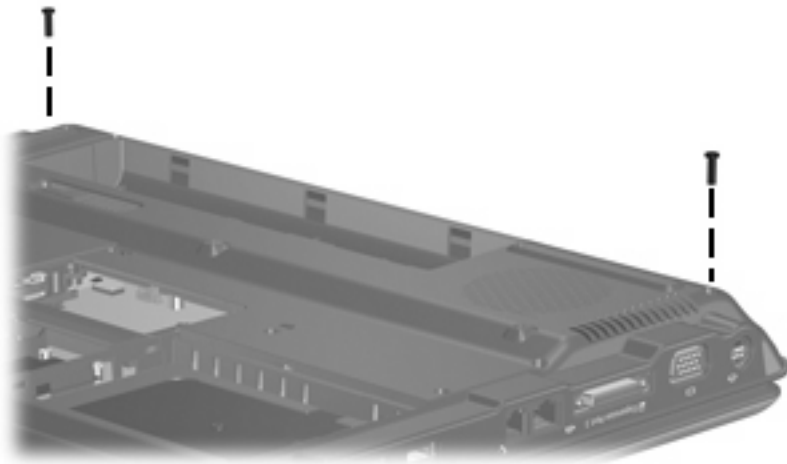


Where used: 2 screws that secure the top cover to the computer

Phillips PM2.5×10.0 screw

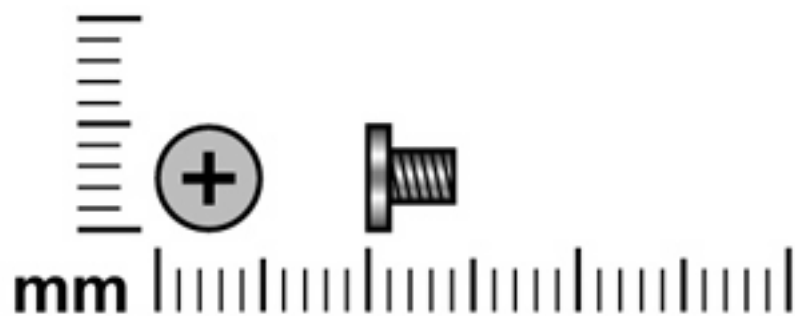


Color	Quantity	Length	Thread	Head width
Black	2	10.0 mm	2.5 mm	5.0 mm

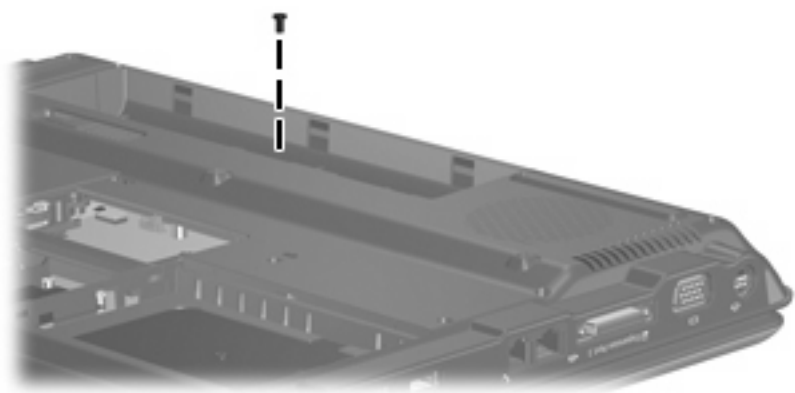


Where used: 2 screws that secure the switch cover to the computer

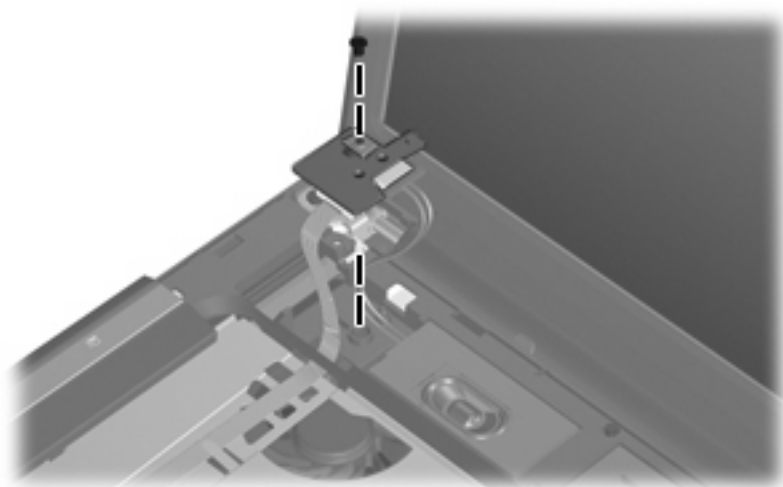
Phillips PM2.5×4.0 screw



Color	Quantity	Length	Thread	Head width
Black	25	4.0 mm	2.5 mm	5.0 mm



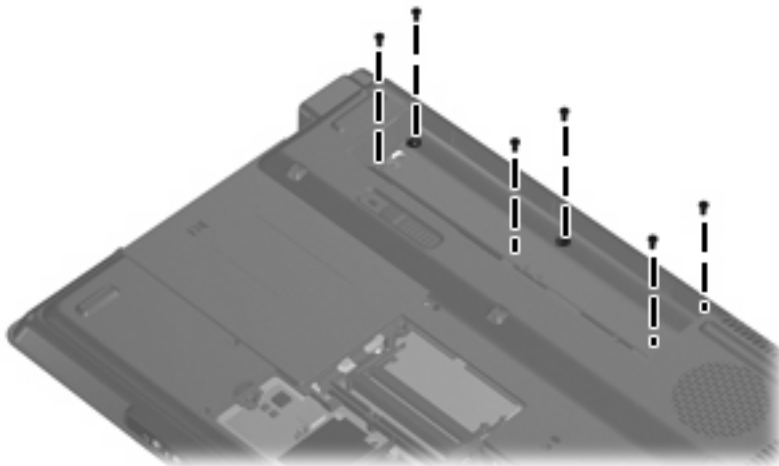
Where used: One screw that secures the switch cover to the computer



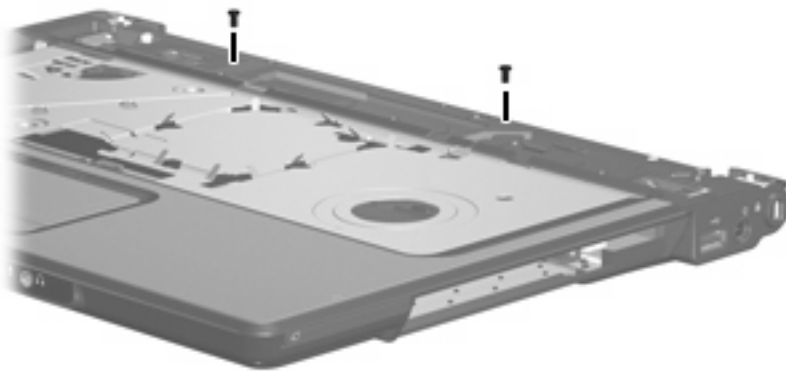
Where used: One screw that secures the power button board to the fan/heat sink assembly



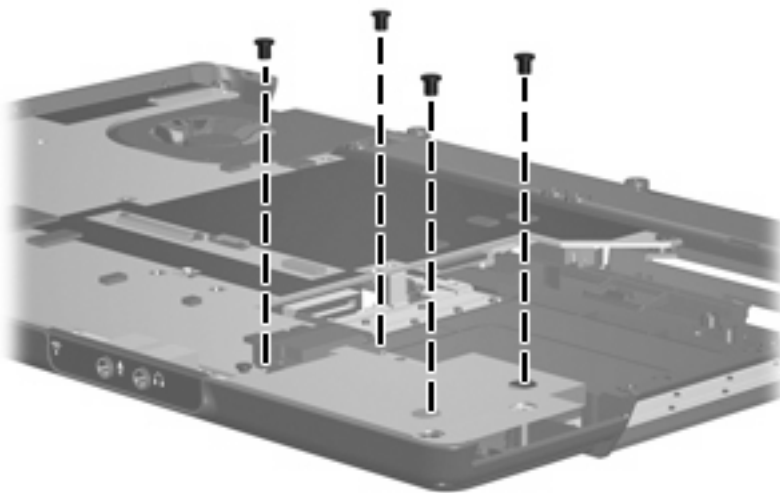
Where used: 6 screws that secure the display panel to the display enclosure



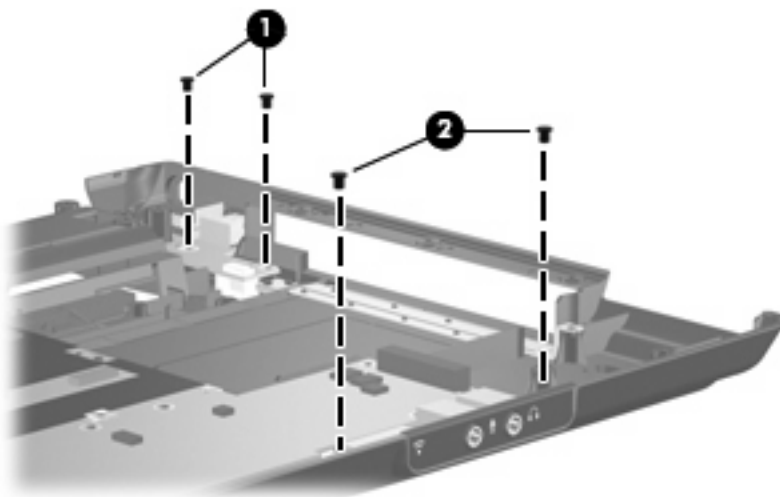
Where used: 6 screws that secure the top cover to the computer



Where used: 2 screws that secure the top cover to the computer

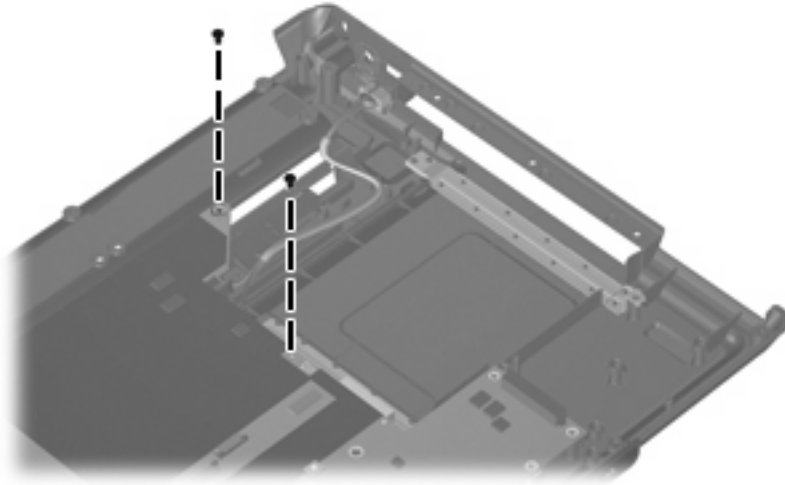


Where used: 4 screws that secure the ExpressCard assembly to the computer



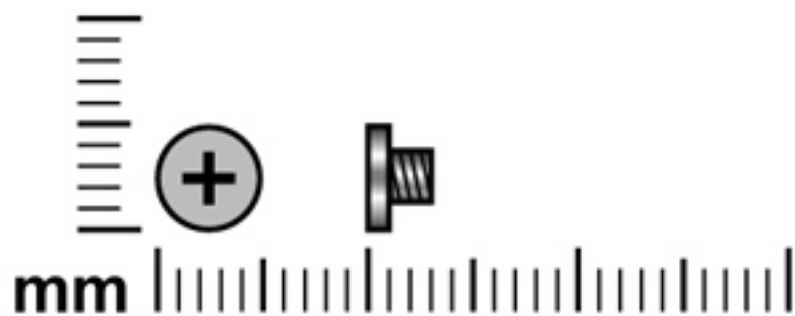
Where used:

- (1)** Two screws that secure the USB/power connector board to the computer
- (2)** Two screws that secure the audio board to the computer

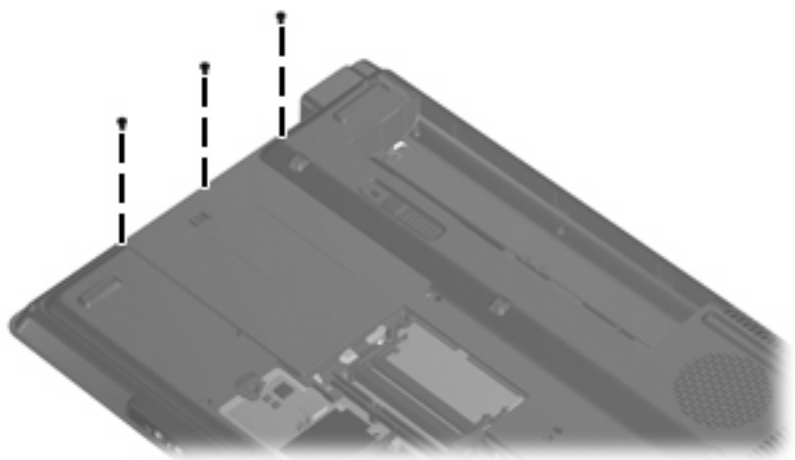


Where used: 2 screws that secure the system board to the computer

Phillips PM2.5×3.0 screw

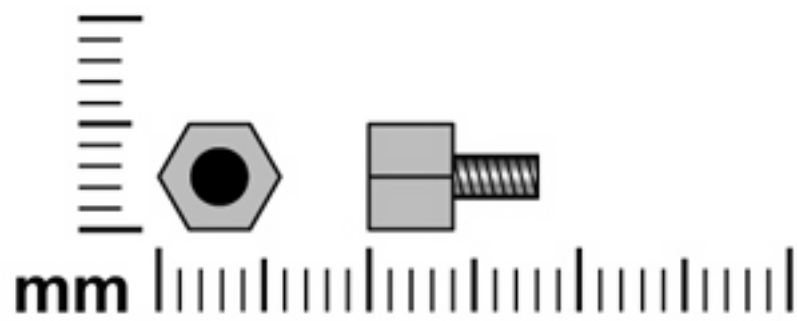


Color	Quantity	Length	Thread	Head width
Black	3	3.0 mm	2.5 mm	4.5 mm

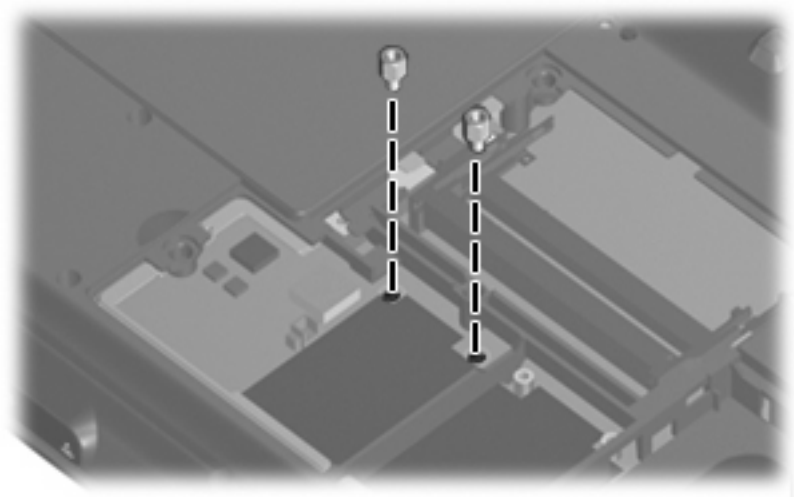


Where used: 3 screws that secure the top cover to the computer

Hex HM5.0×9.0 standoff

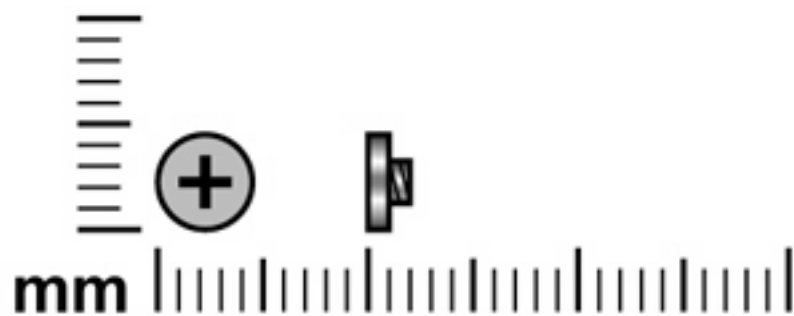


Color	Quantity	Length	Thread	Head width
Silver	2	8.0 mm	2.5 mm	5.0 mm

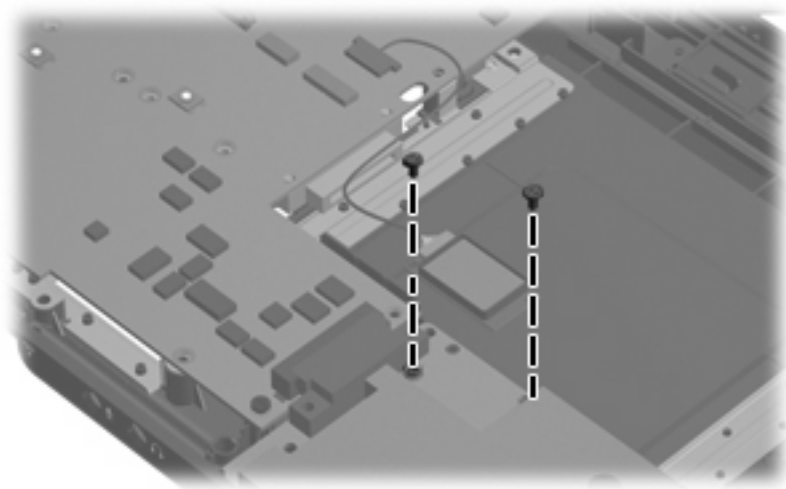


Where used: 2 standoffs that secure the top cover to the computer

Phillips PM2.0×2.0 screw

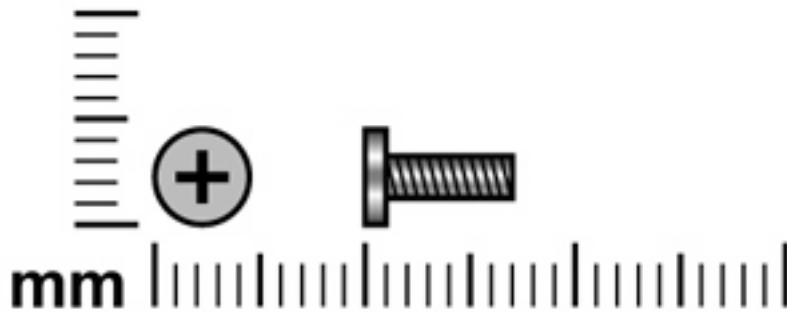


Color	Quantity	Length	Thread	Head width
Silver	2	2.0 mm	2.0 mm	4.0 mm

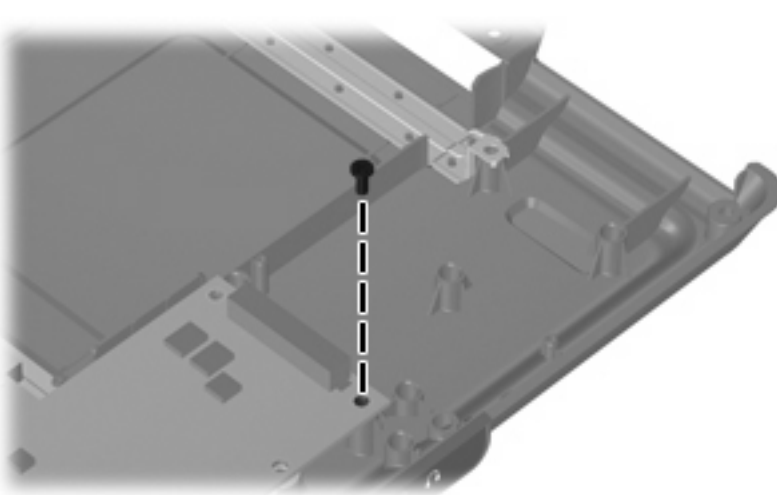


Where used: 2 screws that secure the Bluetooth module to the system board

Phillips PM2.0×7.0 screw

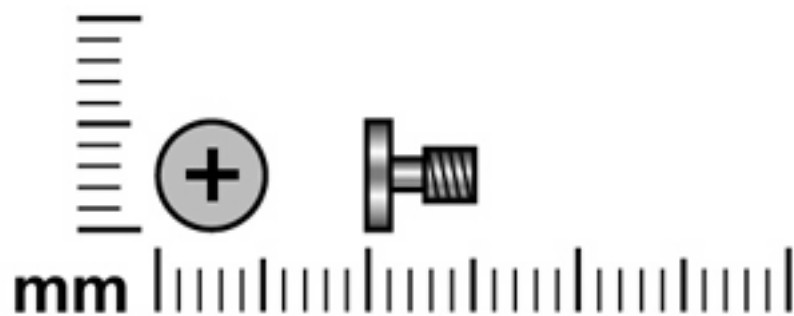


Color	Quantity	Length	Thread	Head width
Silver	1	7.0 mm	2.0 mm	5.0 mm



Where used: One screw that secures the system board to the base enclosure

Phillips PM2.5×5.0 captive screw

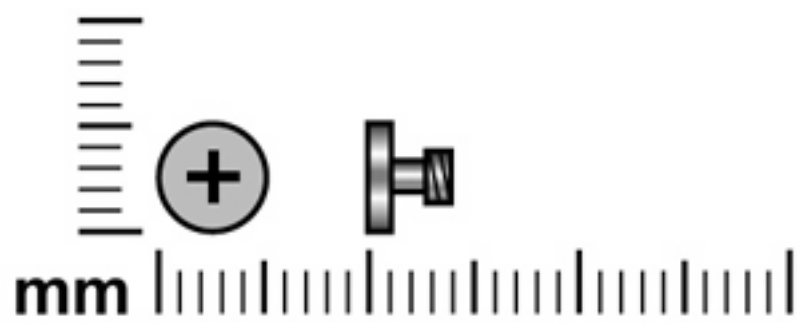


Color	Quantity	Length	Thread	Head width
Black	3	5.0 mm	2.5 mm	5.0 mm

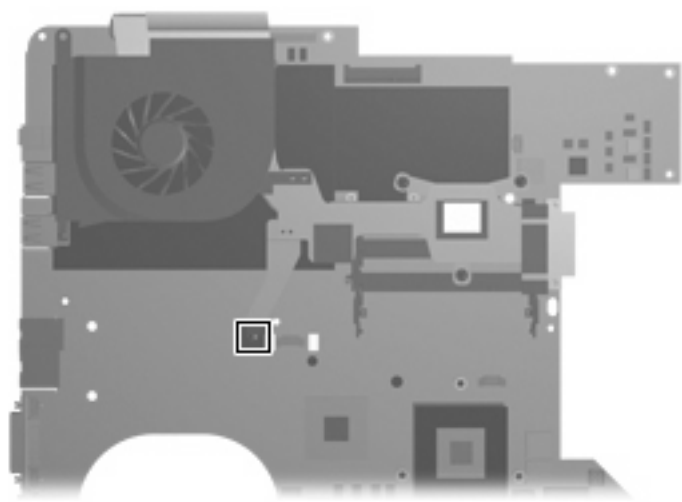


Where used: 3 captive screws (secured by C-clips) that secure the fan/heat sink assembly to the computer

Phillips 2.5×4.0 captive screw



Color	Quantity	Length	Thread	Head width
Silver	1	4.0 mm	2.5 mm	5.0 mm



Where used: One captive screw (secured by a C-clip) that secures the fan/heat sink to the computer

8 Backup and Recovery

Recovering system information

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

- Back up your information regularly to protect your important system files.
- Make a set of recovery discs (Recovery Manager software feature). Recovery discs are used to start up (boot) your computer and restore the operating system and software programs to factory settings in case of system failure or instability.
- Create system restore points (operating system feature). System restore points allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state.
- Recover a program or driver (Recovery Manager software feature). This feature helps you reinstall a program or driver without performing a full system recovery.
- Perform a full system recovery (Recovery Manager software feature). With Recovery Manager, you can recover your full factory image if you experience system failure or instability. Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

Backing up your information

When to back up

- On a regularly scheduled basis.



NOTE: Set reminders to back up your information periodically.

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

Back up suggestions

- Create system restore points using the Windows System Restore feature.
- Store personal files in the Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings.

The screen shot can be a time saver if you have to reset your preferences.

To copy the screen and paste it into a word-processing document:

a. Display the screen.

b. Copy the screen:

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

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

c. Open a word-processing document, and then select **Edit > Paste**.

Using system restore points

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



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

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

When to create restore points

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



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

Create a system restore point

1. Select **Start > Control Panel > System and Maintenance > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Under Automatic restore points, select the disk for which you want to create a restore point.
5. Click **Create**.

The System Protection window opens.

6. Follow the on-screen instructions.

Restore to a previous date and time

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

1. Select **Start > Control Panel > System and Maintenance > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Click the **System Restore** button, and then click **Next**.

The System Restore window opens.

5. Follow the on-screen instructions.

Creating recovery discs

Recovery Manager creates a set of recovery CDs or DVDs for the computer. Use recovery discs to restore the operating system and software programs to factory settings, in case of system failure or instability.

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

Note the following guidelines before creating recovery discs:

- You will need high quality CD-R, DVD-R, or DVD+R discs (purchased separately).

 **NOTE:** Formatted DVD±RW discs and DVD±RW double-layer discs are not compatible with the Recovery Manager software.

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

To create a set of recovery discs:

1. Select **Start > All Programs > Recovery Manager > Recovery Manager**.

Recovery Manager opens.

2. Click **Advanced Options**.

 **NOTE:** If you are operating the computer on battery power, you will be prompted to connect to AC power before you can go to the next step.

3. Click **Recovery disc creation**, and then click **Next**.
4. Follow the on-screen instructions.

Reinstalling software programs and drivers

If a program or driver preinstalled at the factory is accidentally erased or is damaged, Recovery Manager allows you to reinstall it.

 **NOTE:** Software not provided with this computer must be reinstalled from the disc provided by the manufacturer or downloaded from the manufacturer's Web site.

NOTE: Before reinstalling the program, be sure it is fully uninstalled.

Recovery Manager replaces corrupted system files and reinstalls deleted system files within the program.

- In most cases, if the program you are reinstalling is still on your computer, the reinstallation process does not affect your personal settings.
- In all cases, if a program has been deleted from your computer, the reinstallation process reinstalls the program or utility to the factory image but cannot restore your personal settings.

Reinstalling preinstalled programs and drivers

1. Remove the program or driver:

 **NOTE:** In some cases, drivers are not listed in the Programs and Features list. If the driver is not listed, it does not need to be removed.

- a. Select **Start > Control Panel > Programs > Uninstall a program**.
 - b. Right-click the program or driver you want to remove, and then click **Uninstall**.
2. Reinstall the program or driver:
 - a. Select **Start > All Programs > Recovery Manager > Recovery Manager**.
Recovery Manager opens.
 - b. Click **Advanced Options**.
 - c. Click either **Software program re-installation** or **Hardware driver re-installation**, and then click **Next**.
 - d. Follow the on-screen instructions.
 - e. Restart the computer if prompted.

Reinstalling programs from discs

1. Insert the disc into the optical drive.
2. When the installation wizard opens, follow the installation instructions on the screen.
3. Restart the computer if prompted.

Performing a recovery

Recovery Manager software allows you to repair or restore the system if you experience system failure or instability. Recovery Manager works from recovery discs that you create or from a dedicated recovery partition on the hard drive.

 **NOTE:** Windows has its own built-in repair features, such as System Restore and driver rollback capabilities. If you have not already tried these features, try them before using Recovery Manager.

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

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the partition on the hard drive

You can perform a recovery from the partition on the hard drive from either the Start button or [f11](#).

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

1. Access Recovery Manager in either of the following ways:
 - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
 - Restart the computer and press [f11](#) while the "Press <F11> for recovery" message is displayed on the screen. Then select **Recovery Manager**.

Recovery Manager opens.

2. Click **Advanced Options**.
3. Click **System recovery**, and then click **Next**.
4. Follow the on-screen instructions.

Deleting the recovery partition on the hard drive

The Recovery Manager Advanced Options menu provides the option of deleting the recovery partition, which will increase space on the hard drive. Delete the recovery partition only if you have already created recovery discs.

- △ **CAUTION:** After you create the recovery discs, you can increase space on the hard drive by deleting the recovery partition. However, doing this is not recommended. If you delete this partition, you will lose any information that is on the partition, including Recovery Manager software. Thereafter, you must use the recovery discs to access Recovery Manager software.

To delete the recovery partition:

1. If you have not already created recovery discs, create them now.
2. Select **Start > All Programs > Recovery Manager > Recovery Manager**.
Recovery Manager opens.
3. Click **Advanced Options**.
4. Click **Remove recovery partition**, and then click **Next**.
5. Follow the on-screen instructions.

Updating reinstalled software

After you perform a system recovery, connect to the Internet to update all reinstalled software.

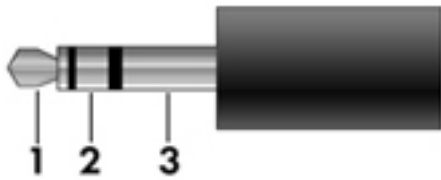
To access update links for the operating system and other software provided on your computer:

- ▲ Select **Start > Help and Support**.

To update optional software, follow the instructions provided by the software manufacturer. Some programs include an update feature you can access from a Help button or menu within the program.

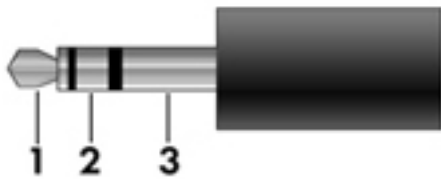
9 Connector pin assignments

Audio-out (headphone)



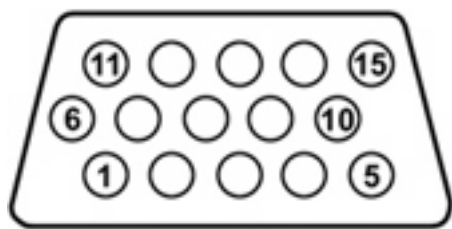
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

Audio-in (microphone)



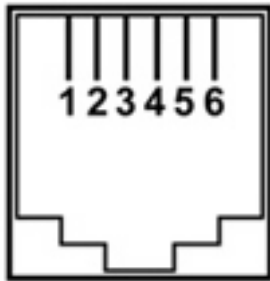
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

External monitor



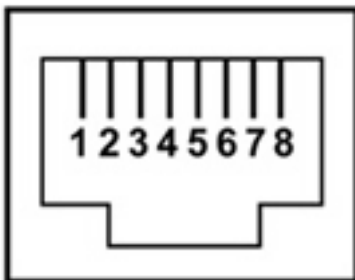
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)



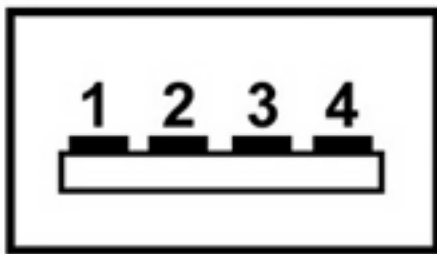
Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

S-Video-out



Pin	Signal
1	S-VHS color (C) signal
2	Composite video signal
3	S-VHS intensity (Y) signal
4	S-VHS color ground
5	TV-CD
6	S-VHS intensity ground
7	Composite video ground

Universal Serial Bus



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

10 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 or regions must meet the requirements of the country or region where the computer is used.

Requirements for all countries or regions

The requirements listed below are applicable to all countries or 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 each country or region's power system.
- 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 or 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
South Korea	EK	4
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

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

11 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 appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling must be exercised when removing these components.

📝 **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.eiae.org>.

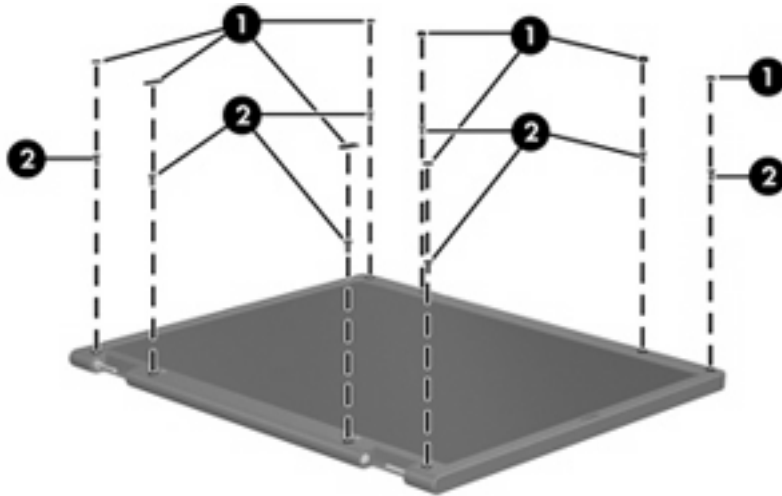
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



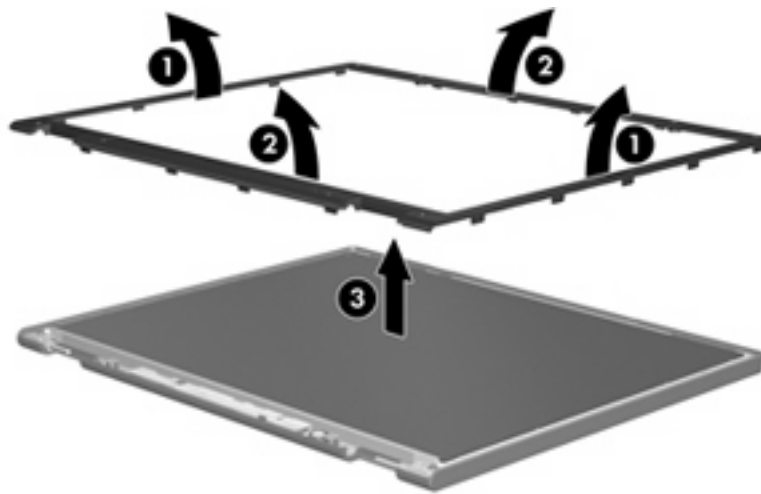
📝 **NOTE:** The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

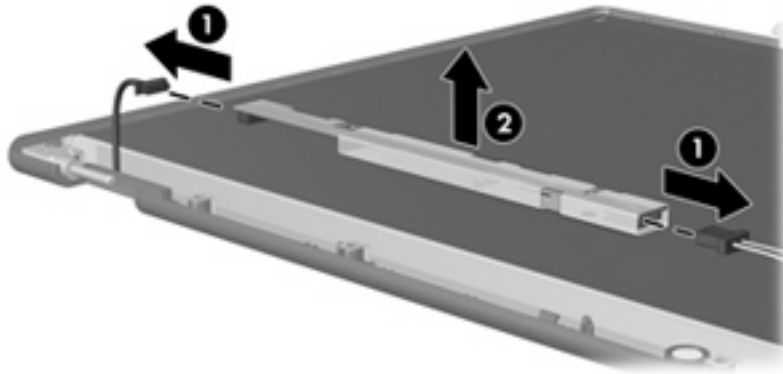
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



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)**.

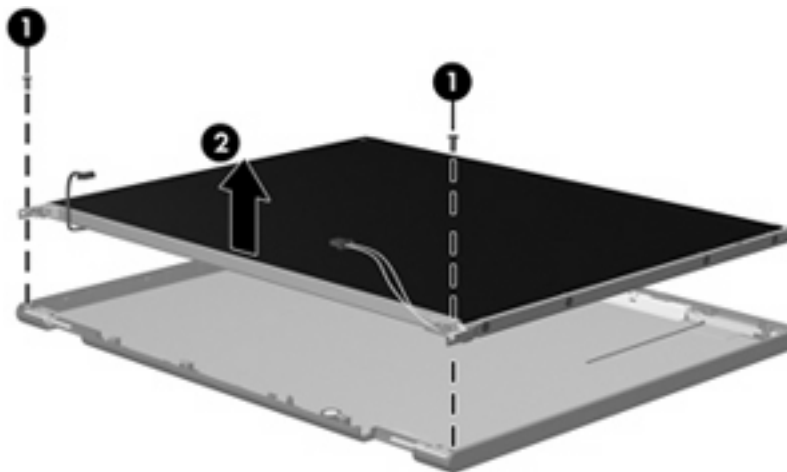


4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



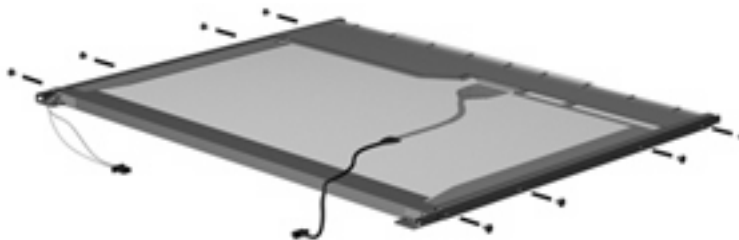
5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.

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



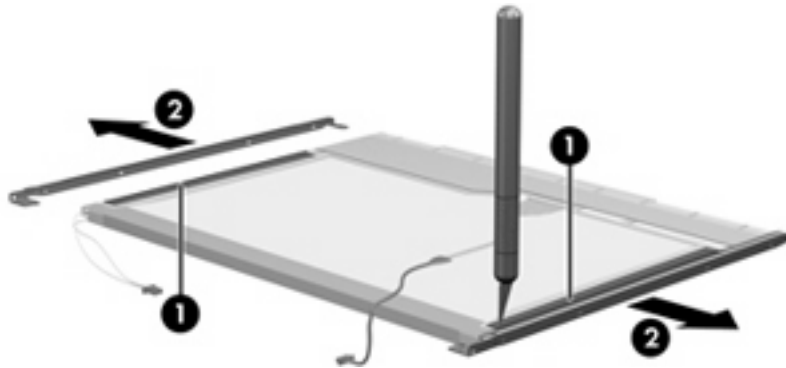
7. Turn the display panel assembly upside down.

8. Remove all screws that secure the display panel frame to the display panel.



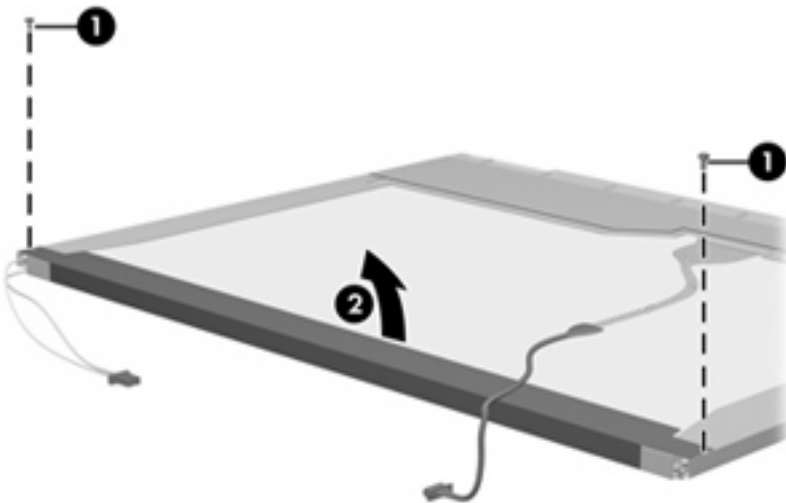
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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.

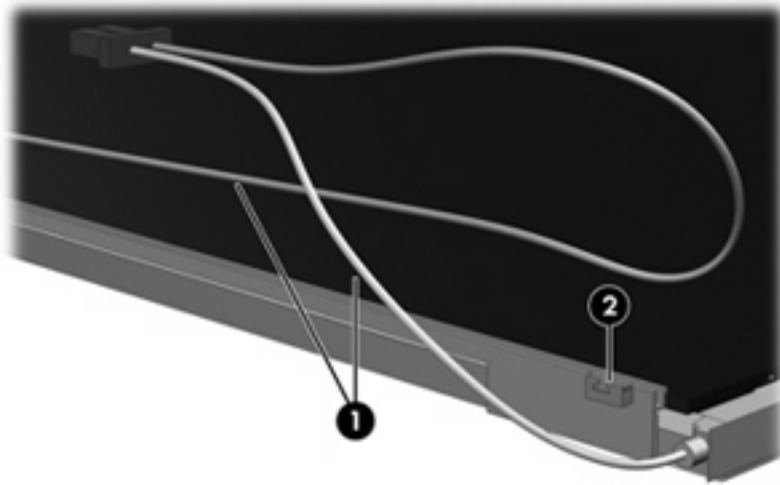
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



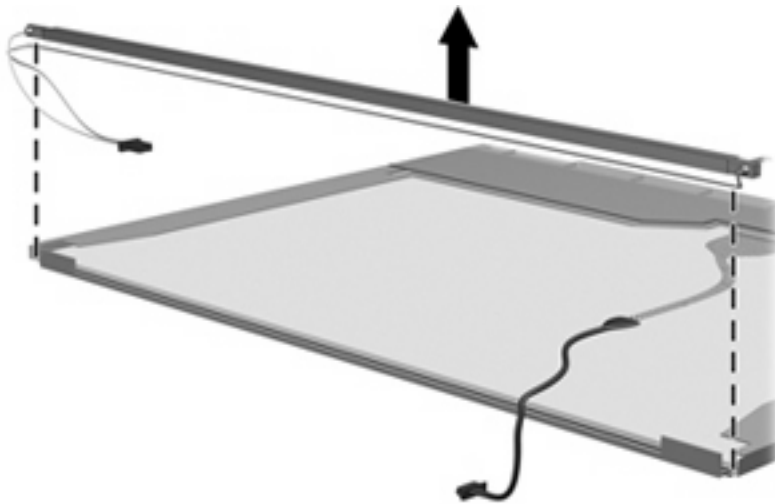
13. Remove the backlight cover.

14. Turn the display panel right-side up.

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

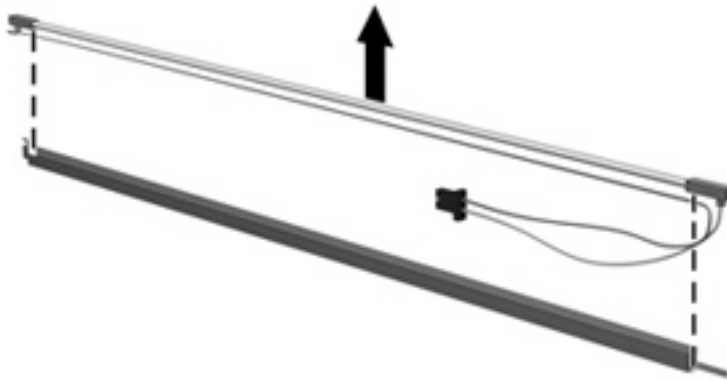


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

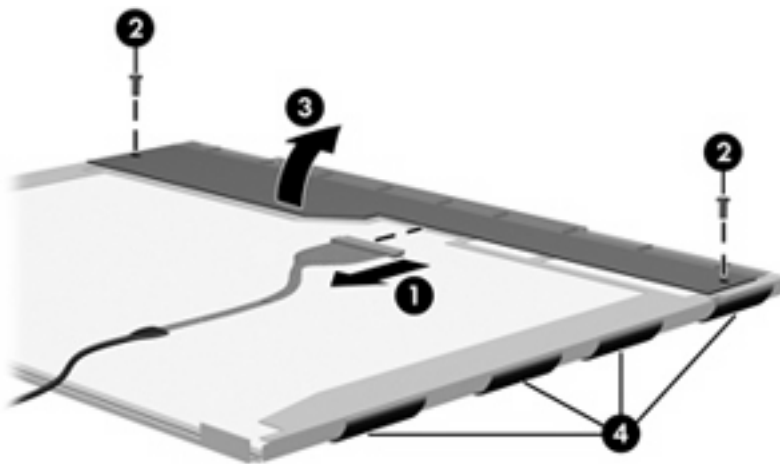


⚠ WARNING! The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

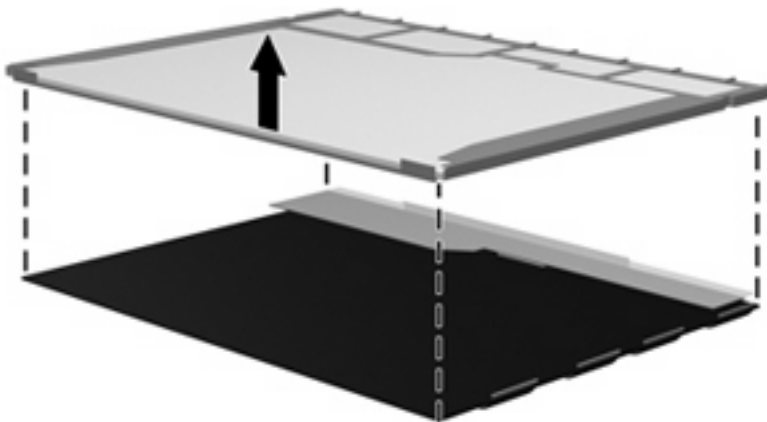
18. Remove the backlight from the backlight frame.



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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