HP Compaq 6830s Notebook PC
Maintenance and Service Guide

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Safety warning notice

⚠ **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	Computer models equipped with PM45 system board
Product Name	HP Compaq 6830s Notebook PC	√
Processors	Intel® Core™2 Duo processors	
	• T5670 1.80-GHz processor, 2-MB L2 cache, 800-MHz front side bus (FSB)	√
	• T5870 2.0-GHz processor, 2-MB L2 cache, 800-MHz FSB	√
	• P8400 2.26-GHz processor, 3-MB L2 cache, 1066-MHz FSB	√
	• P8600 2.40-GHz processor, 3-MB L2 cache, 1066-MHz FSB	√
	• T9400 2.53-GHz processor, 6-MB L2 cache, 1066-MHz FSB	√
	Intel Celeron® M processors	
	• 575 2.0-GHz processor, 1-MB L2 cache, 667-MHz FSB	√
	• 585 2.16-GHz processor, 1-MB L2 cache,667-MHz FSB	√
Chipset	Northbridge: Intel PM45 with up to 1066-MHz FSB	√
	Southbridge: Intel ICH9M	√
Graphics	ATI-M82SE discrete graphics subsystem memory with Hypermemory support	√
Panels	All display assemblies include 2 wireless local area network (WLAN) antennae	√
	• 17.0-inch WXGA BrightView	√
	• 17.0-inch WXGA+	√
	• 17.0-inch WSXGA+WVA	√
Memory	2 customer-accessible/upgradable memory module slots	√
	Supports dual-channel memory	√
	Supports up to 8 GB of system RAM	√
	PC2-5300, 667-MHz, DDR2	√

Category	Description	Computer models equipped with PM45 system board
	Supports the following configurations in all countries and regions except Brazil: • 8192-MB total system memory (4096 x 2, dual-channel) • 4096-MB total system memory (4096-MB x 1, dual-channel) • 4096-MB total system memory (2048 × 2, dual-channel) • 3072-MB total system memory (2048 + 1024, dual-channel) • 2048-MB total system memory (1024 × 2, dual-channel) • 2048-MB total system memory (2048 × 1) • 1024-MB total system memory (1024 × 1)	√
	Supports the following configurations only in Brazil: • 3072-MB total system memory (2048 + 1024, dual-channel) • 2048-MB total system memory (2048 × 1) • 2048-MB total system memory (1024 × 2, dual-channel) • 1024-MB total system memory (1024 × 1)	√
	PC2-5300, 800–MHz, DDR2	√
	Supports the following configurations in all countries and regions except Brazil: • 8192-MB total system memory (4096 x 2, dual-channel) • 4096-MB total system memory (4096 x 1, dual-channel) • 4096-MB total system memory (2048 x 2, dual-channel) • 3072-MB total system memory (2048 + 1024, dual-channel) • 2048-MB total system memory (2048 x 1) • 2048-MB total system memory (1024 x 2, dual-channel) • 1024-MB total system memory (1024 x 1)	√
	Supports the following configurations only in Brazil: • 3072-MB total system memory (2048 + 1024, dual-channel) • 2048-MB total system memory (2048 x 1) • 2048-MB total system memory (1024 x 2, dual-channel) • 1024-MB total system memory (1024 x 1)	√
Hard drives	Supports 9.5-mm, 2.5-inch hard drives	√
	Customer-accessible	√
	Serial ATA	√
	Supports Disk Sanitizer	√

Category	Description	Computer models equipped with PM45 system board
	Supports full disk encryption	√
	Supports HP 3D DriveGuard	√
	Supports the following drives: • 320-GB, 5400-rpm hard drive • 250-GB, 5400-rpm hard drive • 160-GB, 5400-rpm hard drive • 120-GB, 5400-rpm hard drive • 120-GB, 7200-rpm hard drive	√
Optical drives	Fixed (removal of 1 screw required)	√
	Customer-accessible	√
	Serial ATA	√
	12.7-mm tray load	√
	Supports the following optical drives: • DVD±RW SuperMulti Double-Layer Drive with LightScribe • Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer • DVD/CD-RW Combo Drive • DVD-ROM Drive	√
Diskette drive	Supports external USB diskette drive only	√
	Supports boot from external USB diskette drive	√
	Supports 3-mode diskette drive	√
Audio	HD audio - ADI1984	√
Modem	56K V.92 1.5-inch data/fax modem with digital line guard	√
Ethernet	Marvell 10/100/1000 Ethernet 88E8072–B1	√
	S3/S4/S5 wake on LAN: DC - no	√
	S3/S4/S5 wake on LAN: AC - yes	√
Wireless	**Integrated WLAN options by way of wireless module:**	
	2 WLAN antennae built into display assembly	√
	Support for no-WLAN option	√
	Support for the following WLAN formats: • Intel 802.11a/b/g/n • Broadcom 802.11a/b/g/n	√

Category	Description	Computer models equipped with PM45 system board
	• Broadcom 802.11b/g • Intel 802.11a/b/g	
	Integrated personal area network (PAN) options by way of Bluetooth® module:	
	Support for no-WPAN option	√
	Broadcom Bluetooth 2.0+EDR	√
External media card	One ExpressCard/54 slot	√
	Media Card Reader supporting Secure Digital (SD) Memory Card, Memory Stick, Memory Stick Pro, Memory Stick Duo, MultiMediaCard (MMC), and xD–Picture Card formats	√
Ports	Audio-in (stereo microphone)	√
	Audio-out (stereo headphone)	√
	RJ-11 (modem)	√
	RJ-45 (Ethernet, includes link and activity lights)	√
	USB (4)	√
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-Hz (hot plug/unplug with auto-detect)	√
	Headphone/Line Out	√
	3-pin AC power adapter	√
Keyboard/pointing devices	11.97-inch keyboard with integrated numeric keypad	√
	2–way scrolling, taps enabled as default	√
	TouchPad only, with 2 TouchPad buttons	√
Power requirements	90-W HP Smart AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)	√
	8-cell, 63-Wh Li-ion battery	√
	6-cell, 47-Wh Li-ion battery	√
	6-cell 55-Wh Li-ion battery	√
Security	Supports Kensington security sock	√
Operating system	**Preinstalled:**	
	Windows® Vista® Basic 32 with Office Ready	√
	Windows Vista Basic 32 with Office Personal (in Japan only)	√
	Windows Vista Basic 32 with Office Personal/PowerPoint (in Japan only)	√
	Windows Vista Basic 32 with Office Professional (in Japan only)	√
	Windows Vista Basic 32	√
	Windows Vista Business 32	√

Category	Description	Computer models equipped with PM45 system board
	Windows Vista Business 32 with Office Ready	√
	Windows Vista Business 32 with Office Personal (in Japan only)	√
	Windows Vista Business 32 with Office Personal/PowerPoint (in Japan only)	√
	Windows Vista Business with Office Professional (in Japan only)	√
	Windows Vista Business with Windows® XP Pro	√
	Windows Vista Business with Windows XP Pro with Office Personal/PowerPoint (in Japan only)	√
	Windows Vista Business with Windows XP Pro with Office Personal (in Japan only)	√
	Windows Vista Business with Windows XP Pro with Office Professional (in Japan only)	√
	Windows Vista Business with Windows XP Pro with Office Ready	√
	Windows Vista Home Premium with Office Ready	√
	FreeDOS	√
	Red Flag Linux (in the People's Republic of China only)	√
	Restore media:	
	Windows Vista Basic 32	√
	Windows Vista Home Premium	√
	Windows Vista Business 32	√
	Windows Vista Business 64	√
	Windows XP Pro	√
	Office Ready DVD	√
	Red Flag Linux (in the People's Republic of China only)	√
	DRDVD Windows Vista	√
	DRDVD Windows XP Pro	√
	Certified: Microsoft® WHQL	√
	Web support:	
	Windows XP Pro	√
Serviceability	**End-user replaceable parts:**	
	AC adapter	√
	Battery (system)	√
	Hard drive	√
	Memory module	√

Category	Description	Computer models equipped with PM45 system board
	Optical drive	√
	WLAN module	√

2 External component identification

Top components

Display components

Components		Description
(1)	Webcam light (select models only)	On: The integrated camera is in use.
(2)	Webcam (select models only)	Records audio and video and captures still photographs.

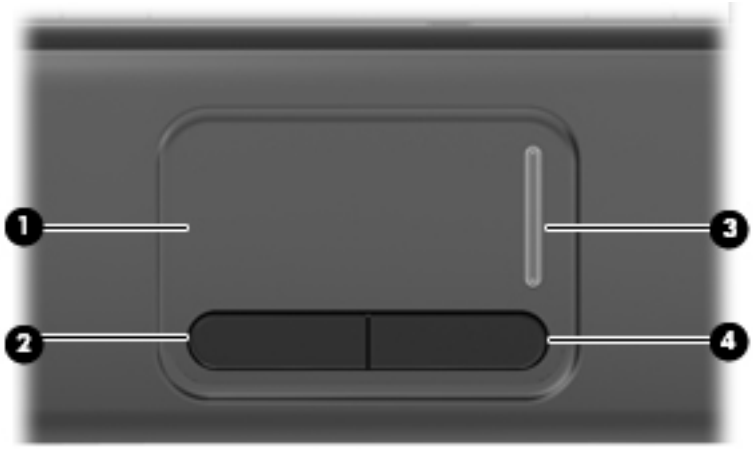
Wireless antennae (select models only)

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

NOTE: For optimal transmission, keep the areas immediately around the antennae free from obstructions.

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

TouchPad



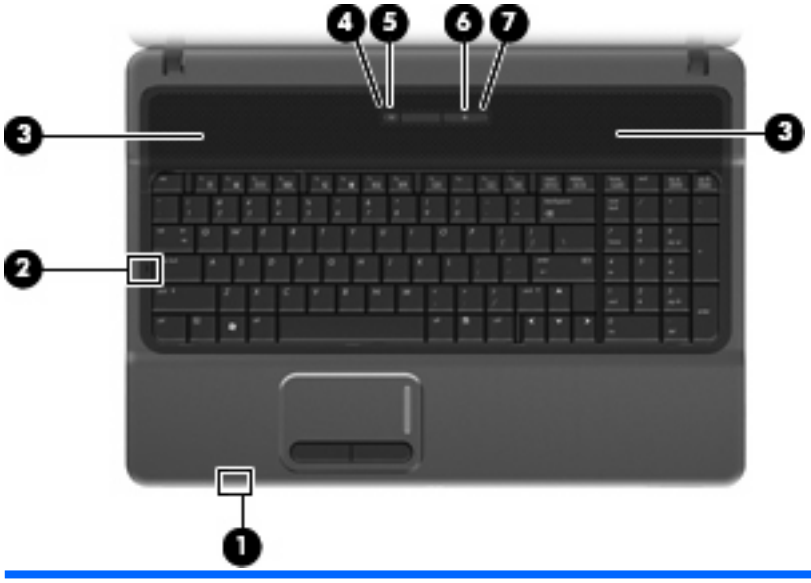
Item	Component	Function
(1)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(2)	Left TouchPad button*	Functions like the left button on an external mouse.
(3)	TouchPad scroll zone	Scrolls up or down.

Item	Component	Function
(4)	Right TouchPad button*	Functions like the right button on an external mouse.

*This table describes factory settings. View or change pointing device preferences as follows:

- In Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**.
- In Windows XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

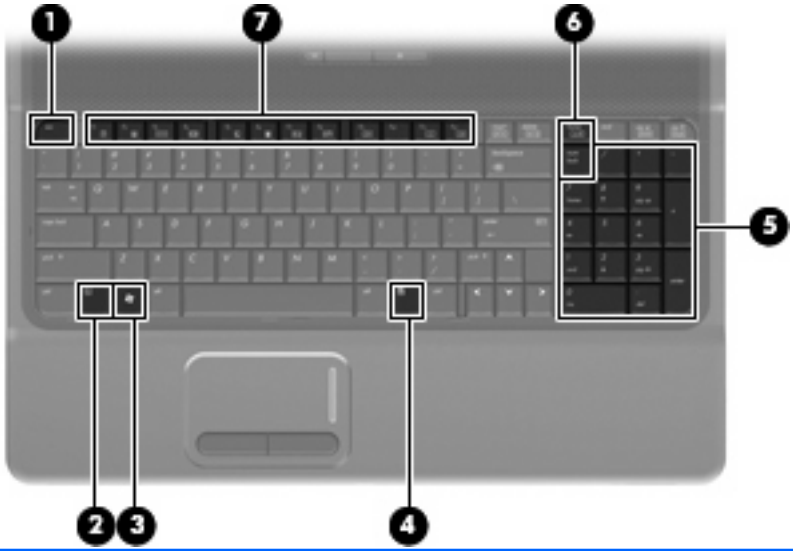
Buttons, switch, lights, and speakers



Item	Component	Function
(1)	Internal display switch	Turns off the display if the display is closed while the power is on.
(2)	Caps lock light	On: Caps lock is on.
(3)	Speakers (2)	Produce sound.
(4)	Wireless light	• Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Broadband Wireless Module, and/or a Bluetooth® device, is on. • Amber: All wireless devices are off.
(5)	Wireless button	Turns the wireless feature on or off, but does not establish a wireless connection. **NOTE:** You must set up or access a wireless network to establish a wireless connection.
(6)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to turn off the computer. • When the computer is in the Sleep state (Windows Vista) or in Standby (Windows XP), press the button briefly to exit the Sleep state or Standby. • When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.

Item	Component	Function
		To learn more about power settings, follow these steps: • In Windows Vista, select **Start > Control Panel > System and Maintenance > Power Options**. • In Windows XP, select **Start > Control Panel > Performance and Maintenance > Power Options**.
(7)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP). • Off: The computer is off or in Hibernation.

Keys

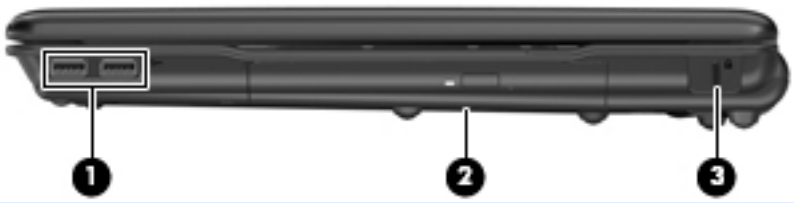


Item	Component	Function
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications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

Front components

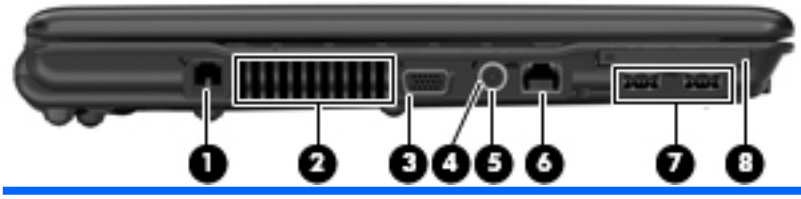
Item	Component	Function
(1)	Media Card Reader	Supports the Memory Stick, Memory Stick Pro, Memory Stick Duo, Secure Digital (SD) Memory Card, MultimediaCard (MMC), and xD-Picture Card formats.
(2)	Drive light	• Blinking turquoise: The hard drive or optical drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(3)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(4)	Internal microphone	Records sound.
(5)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Right-side components



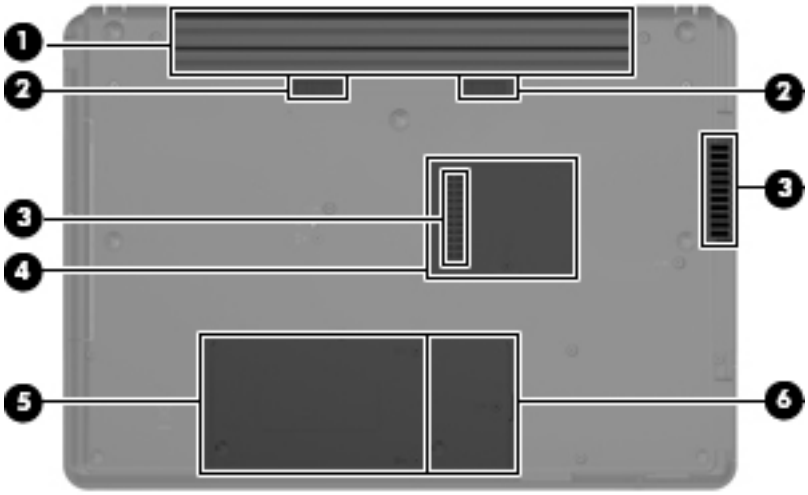
Item	Component	Function
(1)	USB ports (2)	Connect optional USB devices.
(2)	Optical drive	Reads an optical disc.
(3)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Left-side components



Item	Component	Function
(1)	RJ-11 (modem) jack	Connects a modem cable.
(2)	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.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	Battery light	• Amber: A battery is charging. • Turquoise: A battery is close to full charge capacity. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns 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.
(5)	Power connector	Connects an AC adapter.
(6)	RJ-45 (network) jack	Connects a network cable.
(7)	USB ports (2)	Connect optional USB devices.
(8)	ExpressCard slot	Supports optional ExpressCards.

Bottom components



Item	Component	Function
(1)	Battery bay	Holds the battery.
(2)	Battery release latches (2)	Release the battery from the battery bay.
(3)	Vents (2)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Memory module compartment	Contains a memory module.
(5)	Hard drive bay	Holds the hard drive.
(6)	WLAN module compartment (select models only)	Contains a WLAN module slot. **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

3 Illustrated parts catalog

Serial number location

The service tag, affixed to the bottom of the computer, provides information that may be needed when troubleshooting system problems. The service tag provides the following information:

(1) Product name: This is the product name affixed to the front of the computer.

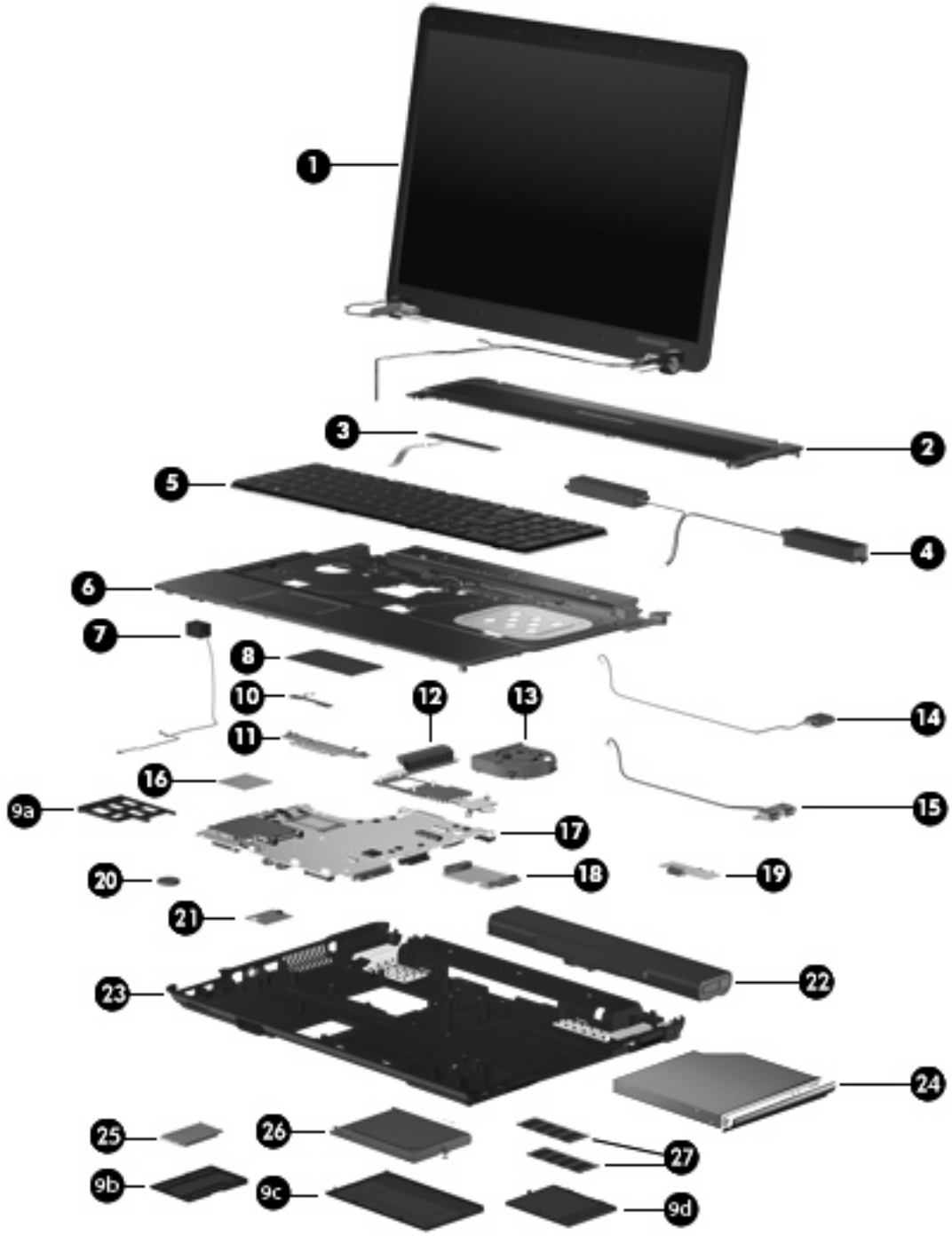
(2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.

(3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

(4) Model description: This is the number you use to locate documents, drivers, and support for your computer.

(5) Warranty period: This number describes the duration of the warranty period for this computer.

Computer major components



Item	Description	Spare part number
(1)	**Display assemblies** (include 2 WLAN antenna transceivers and cables)	
	17.0-inch, WXGA BrightView display assembly	490332-001
	17.0–inch WXGA BrightView display assembly with webcam	495897–001
	17.0-inch, WXGA Anti-Glare display assembly	490334-001

Item	Description	Spare part number
	17.0-inch, WXGA WVA display assembly	490333-001
	17.0-inch, WXGA WVA display assembly with webcam	495898-001
	17.0–inch WXGA Anti-Glare display assembly with webcam	495899–001
	Display internal components: not illustrated	
	Display bezel without webcam	490328-001
	Display bezel with webcam	495738-001
	Display enclosure (includes 2 WLAN antenna transceivers and cables)	490331-001
	Display hinges (includes left and right hinges)	490329-001
	Display inverter	490326-001
(2)	**Switch cover** (includes LED board and cable)	490315-001
(3)	**LED power button board** (included with the switch cover, spare part number 490315-001)	
(4)	**Speakers**	490341-001
(5)	**Keyboards**	
	For use in Saudi Arabia	490327-171
	For use in Brazil	490327-201
	For use in the Czech Republic	490327-221
	For use in Denmark	490327-081
	For use in Europe	490327-021
	For use in Belgium	490327-A41
	For use in French Canada	490327-121
	For use in France	490327-051
	For use in Greece	490327-151
	For use in Germany	490327-041
	For use in Israel	490327-BB1
	For use in Hungary	490327-211
	For use in Iceland	490327-DD1
	For use in Italy	490327-061
	For use in Japan	490327-291
	For use in South Korea	490327-AD1
	For use in Latin America	490327-161
	For use in Portugal	490327-131
	For use in Russia	490327-251
	For use in Sweden and Finland	490327-B71
	For use in Slovakia	490327-231

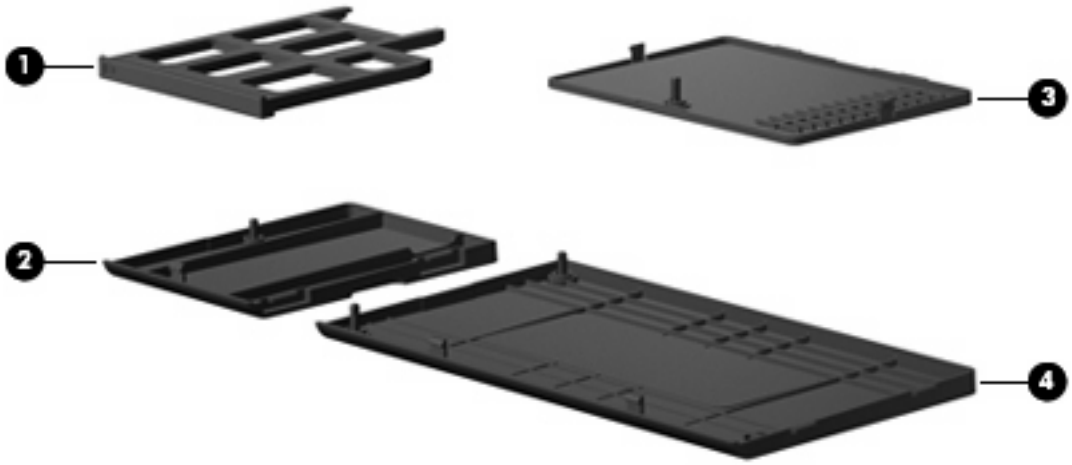
Item	Description	Spare part number
	For use in Slovenia	490327-BA1
	For use in Spain	490327-071
	For use in Switzerland	490327-111
	For use in Thailand	490327-281
	For use in Turkey	490327-141
	For use in Taiwan	490327-AB1
	For use in the United Kingdom	490327-031
	For use in the United States	490327-001
(6)	**Top cover** (includes TouchPad board and cable, and TouchPad button board and cable)	490342-001
(7)	**RJ–11 connector** (included in cable kit, spare part number 490314-001)	
(8)	**TouchPad** (Included with top cover, spare part number 490342-001)	
(9)	**Plastics Kit** (see Plastics Kit on page 22 for more Plastics Kit spare part information):	490335-001
(9a)	**ExpressCard slot bezel**	
(9b)	**WLAN module compartment cover**	
(9c)	**Hard drive bay cover**	
(9d)	**Memory module compartment cover**	
(10)	**TouchPad cable** (included with top cover, spare part number 490342-001)	
(11)	**TouchPad bracket** (included with top cover, spare part number 490342-001)	
(12)	**Heat sink** (includes replacement thermal material)	490325-001
(13)	**Fan**	490324-001
(14)	**Broadcom Bluetooth modules** (do not include Bluetooth module cable) **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.	
	For use in all countries and regions except Japan and Asia Pacific countries and regions	398393-002
	For use only in Japan and Asia Pacific countries and regions	450066-001
(15)	**USB connector and cable**	490313-001
(16)	**Modem**	461749-001
(17)	**System boards** (includes replacement thermal material and the ExpressCard assembly)	
	Iincludes 128-MB of graphics subsystem memory	490311-001
	Iincludes 256-MB of graphics subsystem memory	490312-001
(18)	**Optical drive connector board**	490310-001
(19)	**Battery extender board**	490308-001
	Processors (includes replacement thermal material) (not illustrated)	
	Intel Core2 Duo processors:	

Item	Description	Spare part number
	• P8400 2.26GHz (3-MB L2 cache, 1066-MHz FSB)	491486–001
	• P8600 2.40-GHz (3-MB L2 cache, 1066-MHz FSB)	491487–001
	• T9400 2.53-GHz (6-MB L2 cache, 1066-MHz FSB)	491489–001
	• T5670 1.80-GHz (2-MB L2 cache, 800-MHz FSB) (not available for Japan)*	491488-001
	• T5870 2.0-GHz (2-MB L2 cache, 800-MHz FSB)*	490338-001
	*Only available with Intel WLAN or no WLAN	
	Intel Celeron M processors:	
	• 575 2.0-GHz (1-MB L2 cache, 667-MHz FSB)	490336-001
	• 585 2.16-GHz (1-MB L2 cache, 667-MHz FSB)	490337-001
(20)	**RTC battery**	449137-001
(21)	**Modem modules** **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.	
	For use only in all countries and regions except Australia and New Zealand	461749-001
	For use only in Australia and New Zealand	461749-011
(22)	**8-cell, 63-Wh Li-ion battery**	490306–001
(23)	**Base enclosure** (includes rubber feet)	490305-001
	Rubber Kit (not illustrated, contains 7 computer feet and 8 display bezel screw covers)	490339-001
(24)	**Optical drives** (include bezel and bracket)	
	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer	490316–001
	DVD-ROM Drive	490317-001
	DVD±RW SuperMulti Double-Layer Drive with LightScribe	490318-001
	DVD/CD-RW Combo Drive	490319-001
	Cable Kit (not illustrated; see Cable Kit on page 23 for more Cable Kit spare part number information)	490314-001
(25)	**WLAN modules**	
	Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except Pakistan, Russia, and the Ukraine	480985-001
	Intel Wi-Fi Link 5100 802.11a/b/g WLAN module for use only in Pakistan, Russia, and the Ukraine	482957-001
	Broadcom BCM4312 802.11/b/g WLAN modules:	
	• For use in Antigua and Barbuda, Argentina, Aruba, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	459263-001
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria,	459263-002

Item	Description	Spare part number
	Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial 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, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	
	Broadcom 4322 802.11a/b/g/n WLAN modules:	
	• For use in Antigua & Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	487330-001
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Columbia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial 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, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	487330-002
(26)	**Hard drives** (include hard drive bracket)	
	320–GB, 5400–rpm	498310–001
	250–GB, 5400–rpm	490323–001
	160-GB, 5400-rpm	490322-001
	120-GB, 5400-rpm	490320-001

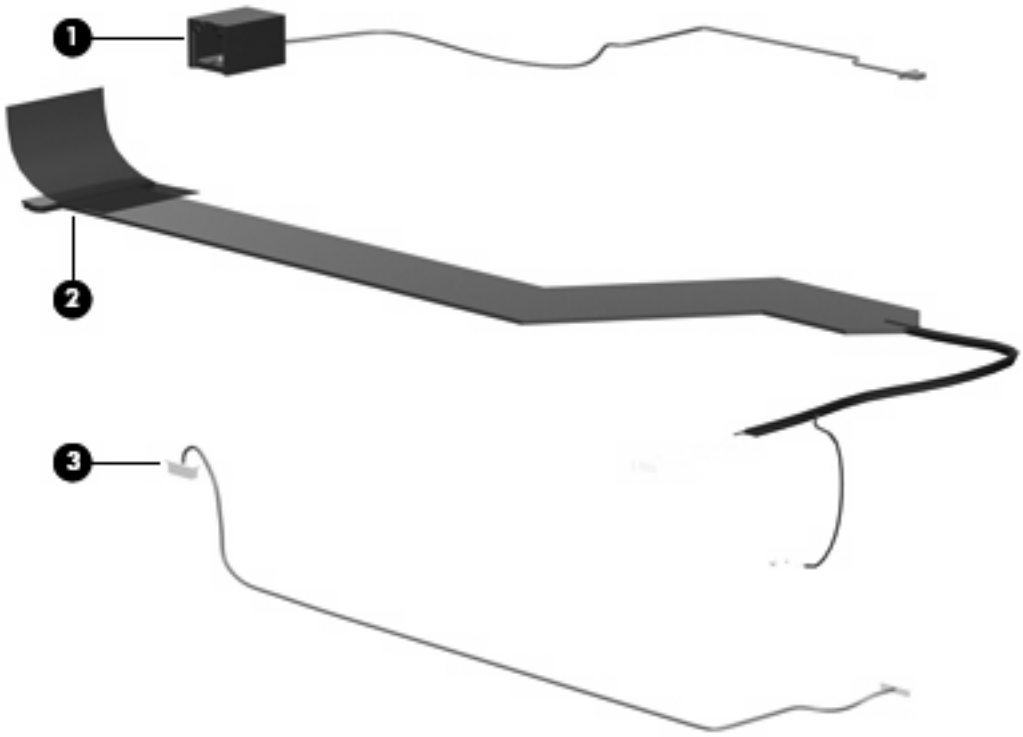
Item	Description	Spare part number
	120-GB, 7200-rpm	490321-001
(27)	**Memory modules** (PC2-5300, 667-MHz, DDR2)	
	1-GB	495175-001
	2-GB	495176-001
	Memory modules (PC2-6400, 667–MHz, DDR2)	
	1-GB	491483–001
	2-GB	491484–001

Plastics Kit



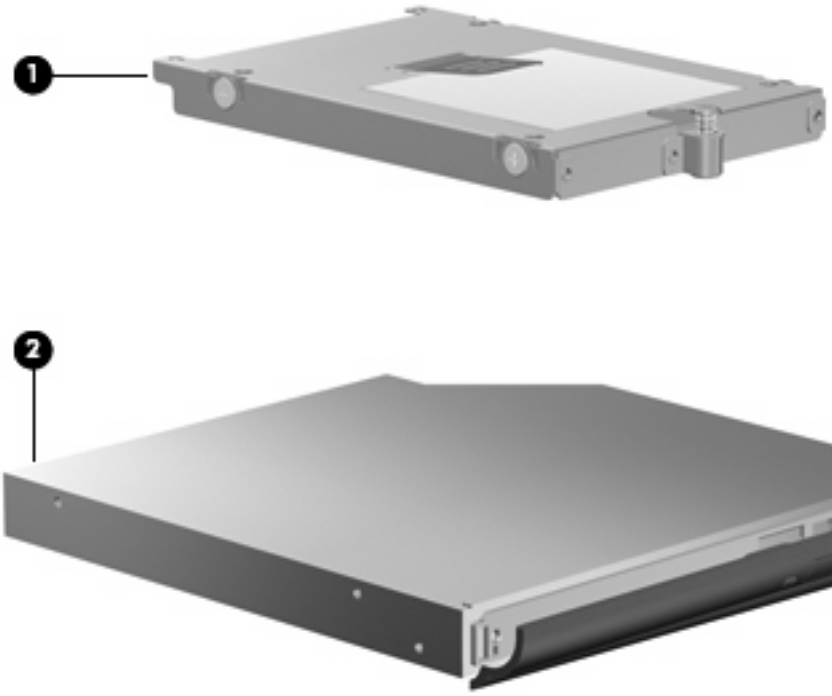
Item	Description	Spare part number
	Plastics Kit:	490335-001
(1)	ExpressCard slot bezel	
(2)	WLAN module compartment cover (includes one captive screw, secured by a C-clip)	
(3)	Memory module compartment cover (includes one captive screw, secured by a C-clip)	
(4)	Hard drive bay cover (includes 2 captive screws, secured by C-clips)	

Cable Kit



Item	Description	Spare part number
	Cable Kit:	490314-001
(1)	RJ-11 jack cable	
(2)	Display lid switch module and cable	
(3)	Bluetooth module cable	

Mass storage devices



Item	Description	Spare part number
(1)	**Optical drives** (include bezel and bracket)	
	DVD±RW SuperMulti Double-Layer Drive with LightScribe	490318-001
	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer	490316-001
	DVD/CD-RW Combo Drive	490319-001
	DVD–ROM Drive	490317–001
(2)	**Hard drives** (include bracket)	
	320-GB, 5400-rpm	498310-001
	250-GB, 5400-rpm	490323-001
	160-GB, 5400-rpm	490322-001
	120-GB, 5400-rpm	490320-001
	120-GB, 7200 rpm	490321-001

Miscellaneous parts

Description	Spare part number
AC adapter	
90-W HP Smart AC adapter for use in all countries and regions except India	463955-001
Carrying cases	
HP Universal Nylon Case	439425-001
HP Executive Leather Case	439427-001
HP Deluxe Nylon Backpack	439426–001
HP Deluxe Roller Case	446929-001
USB 1.1 diskette drive	359118-001
Power cords:	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in Europe	490371-021
For use in Iceland	490371-BB1
For use in India	490371-D61
For use in Italy	490371-061
For use in Japan	490371-291
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom	490371-031
For use in the United States	490371-001
Screw Kit • Phillips PM2.0×2.0 broad-head screw • Phillips PM2.0x3.0 screw • Phillips PM2.0×4.0 screw • Phillips PM2.5×4.0 screw • Phillips PM2.5x6.0 captive screw • Phillips PM2.5x9.0 screw	490340-001

Description	Spare part number
• Phillips PM3.0×4.0 screw	
• Phillips PM2.5×10.0 captive screw	
• Torx T8M2.0x2.0 broad-head screw	
• Torx T8M2.5×7.0 slotted screw	
• Torx T8M2.5×6.0 screw	
• Torx T8M2.5×4.0 screw	
• Torx T8M2.5×5.0 broad-head screw	
• Torx T8M2.5×10.0 slotted screw	

Sequential part number listing

Spare part number	Description
398393-002	Bluetooth module for use in North America **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.
439425-001	HP Universal Nylon Case
439426-001	HP Deluxe Nylon Backpack
439427-001	HP Executive Leather Case
446929–001	HP Deluxe Roller Case
449137-001	RTC battery
450066-001	Bluetooth module for use in Japan and Asia Pacific countries and regions **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.
459263-001	Broadcom BCM4312 802.11b/g WLAN module for use in Antigua and Barbuda, Argentina, Aruba, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
459263-002	Broadcom BCM4312 802.11/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial 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, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
461749-001	Modem module for use in all countries and regions except Australia and New Zealand **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.
461749-011	Modem module for use only in Australia and New Zealand **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.
463955-001	90-W HP Smart AC adapter for use in all countries and regions except India

Spare part number	Description
480985-001	Intel Wi–Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except Pakistan, Russia, and the Ukraine
482957-001	Intel Wi-Fi Link 5100 802.11a/b/g WLAN module for use only in Pakistan, Russia, and the Ukraine
487330-001	Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
487330-002	Broadcom 4322 802.11a/b//n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Columbia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial 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, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
490305-001	Base enclosure (includes rubber feet)
490306-001	8-cell, 63-Wh Li-ion battery
490308-001	System board battery connector
490310-001	System board optical disc drive connector
490311-001	System board with 128-MB of graphics subsystem memory (Includes replacement thermal material, and the ExpressCard assembly)
490312-001	System board with 256-MB of graphics subsystem memory (Includes replacement thermal material, and the ExpressCard assembly)
490313-001	USB connectors, system board
490314-001	Cable Kit (see Cable Kit on page 23 for more Cable Kit spare part information)
490315-001	Switch cover (includes LED board and cable)
490316-001	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer (includes bezel and bracket)
490317-001	DVD-ROM Drive
490318-001	DVD±RW SuperMulti Double-Layer Drive with LightScribe (includes bezel and bracket)
490319-001	DVD/CD-RW Combo Drive (includes bezel and bracket)
490320-001	120-GB, 5400-rpm hard drive (includes bracket)
490321-001	120-GB, 7200-rpm hard drive (includes bracket)
490322-001	160-GB, 5400-rpm hard drive (includes bracket)
490323-001	250-GB, 5400-rpm hard drive (includes bracket)

Spare part number	Description
490324-001	Fan
490325-001	Heat sink (includes replacement thermal material)
490326-001	Display inverter
490327-001	Keyboard for use in the United States
490327-021	Keyboard for use anywhere in Europe
490327-031	Keyboard for use in the United Kingdom
490327-041	Keyboard for use in Germany
490327-051	Keyboard for use in France.
490327-061	Keyboard for use in Italy
490327-071	Keyboard for use in Spain
490327-081	Keyboard for use in Denmark
490327-111	Keyboard for use in Switzerland
490327-121	Keyboard for use in French Canada
490327-131	Keyboard for use in Portugal
490327-141	Keyboard for use in Turkey
490327-151	Keyboard for use in Greece
490327-161	Keyboard for use in Latin America
490327-171	Keyboard for use in Saudi Arabia
490327-201	Keyboard for use in Brazil
490327-211	Keyboard for use in Hungary
490327-221	Keyboard for use in the Czech Republic
490327-231	Keyboard for use in Slovakia
490327-251	Keyboard for use in Russia
490327-281	Keyboard for use in Thailand
490327-291	Keyboard for use in Japan
490327-A41	Keyboard for use in Belgium
490327-AB1	Keyboard for use in Taiwan
490327-AD1	Keyboard for use in South Korea
490327-B71	Keyboard for use in Sweden and Finland
490327-BA1	Keyboard for use in Slovenia
490327-BB1	Keyboard for use in Israel
490327-DD1	Keyboard for use in Iceland
490328-001	Display bezel
490329-001	Bracket kit with display hinges (includes left and right hinges)

Spare part number	Description
490330-001	LCD cable
490331-001	Display enclosure (includes 2 wireless antenna transceivers and cables
490332-001	17.0-inch, WXGA display assembly with BrightView (includes 2 WLAN antenna transceivers and cables)
4490333-001	17.0-inch, WXGA display assembly with WVA (includes 2 WLAN antenna transceivers and cables)
490334-001	17.0-inch, WXGA display assembly with Anti-Glare (includes 2 WLAN antenna transceivers and cables)
490335-001	Plastics Kit (see Plastics Kit on page 22 for more Plastics Kit spare part information)
490336-001	Intel Celeron M 575 2.0-GHz processor (1-MB L2 cache, 667-MHz FSB, includes replacement thermal material)
490337-001	Intel Celeron M 585 2.16-GHz processor (1-MB L2 cache, 667-MHz FSB, includes replacement thermal material)
490338-001	Intel Core2 Duo T5870 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
490339-001	Rubber Kit (contains 6 computer feet and 8 display bezel screw covers)
490340-001	Screw Kit
490341-001	Speakers
490342-001	Top cover (includes TouchPad board and cable, and TouchPad button board and cable)
490371-D01	Power cord for use in Argentina
490371-011	Power cord for use in Australia and New Zealand
490371-201	Power cord for use in Brazil
490371-081	Power cord for use in Denmark
490371-021	Power cord for use in European countries
490371-BB1	Power cord for use in Iceland
490371-D61	Power cord for use in India
490371-061	Power cord for use in Italy
490371-291	Power cord for use in Japan
490371–AA1	Power cord for use in the People's Republic of China
490371-AR1	Power cord for use in South Africa
490371-AD1	Power cord for use in South Korea
490371-111	Power cord for use in Switzerland
490371-AB1	Power cord for use in Taiwan
490371-031	Power cord for use in the United Kingdom
490371-001	Power cord for use in the United States
491486-001	Intel Core2 Duo P8400 2.26-GHz processor (3-MB L2 cache, 1066-MHz FSB, includes replacement thermal material)
491487-001	Intel Core2 Duo P8600 2.40-GHz processor (32-MB L2 cache, 1066-MHz FSB, includes replacement thermal material)

Spare part number	Description
491489-001	Intel Core2 Duo T9400 2.53-GHz processor (6-MB L2 cache, 1066-MHz FSB, includes replacement thermal material)
491488-001	Intel Core2 Duo T5670 1.80-GHz processor (2-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
495175-001	1-GB memory module (PC2-5300, 667-MHz, DDR2)
495176-001	2-GB memory module (PC2-5300, 667-MHz, DDR2)
495897-001	17.0-inch, WXGA display assembly with BrightView and webcam (includes 2 WLAN antenna transceivers and cables)
495898-001	17.0-inch, WXGA display assembly with WVA and webcam (includes 2 WLAN antenna transceivers and cables)
495899-001	17.0-inch, WXGA display assembly with AG and webcam (includes 2 WLAN antenna transceivers and cables)
498310-001	320-GB, 5400-rpm hard drive (includes bracket)
	TouchPad board (included with top cover, spare part number 490342-001) (includes cable)
	TouchPad button board (included with top cover, spare part number 490342-001) (includes cable)

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Torx T8 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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

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 40).
5. Remove the real-time clock (RTC) battery (see RTC battery on page 66).
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 99 screws, in 14 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Serial number

The service tag, affixed to the bottom of the computer, provides information that may be needed when troubleshooting system problems. The service tag provides the following information:

(1) Product name: This is the product name affixed to the front of the computer.

(2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.

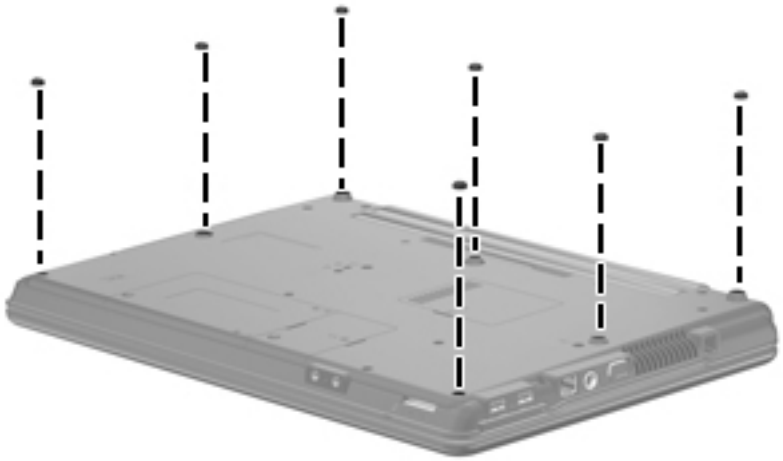
(3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

(4) Model description: This is the number you use to locate documents, drivers, and support for your computer.

(5) Warranty period: This number describes the duration of the warranty period for this computer.

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 490339-001. There are 7 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

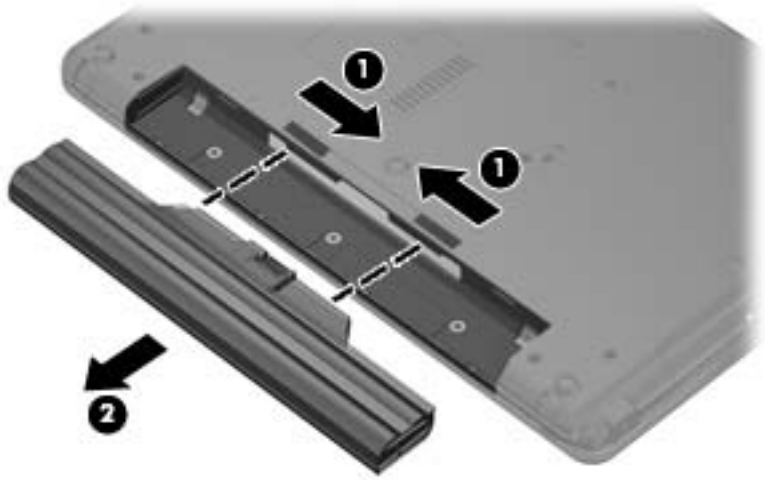
Description	Spare part number
8-cell, 63-Wh Li-ion battery	490306-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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



Install the battery by inserting it into the battery bay until you hear a click.

Hard drive

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

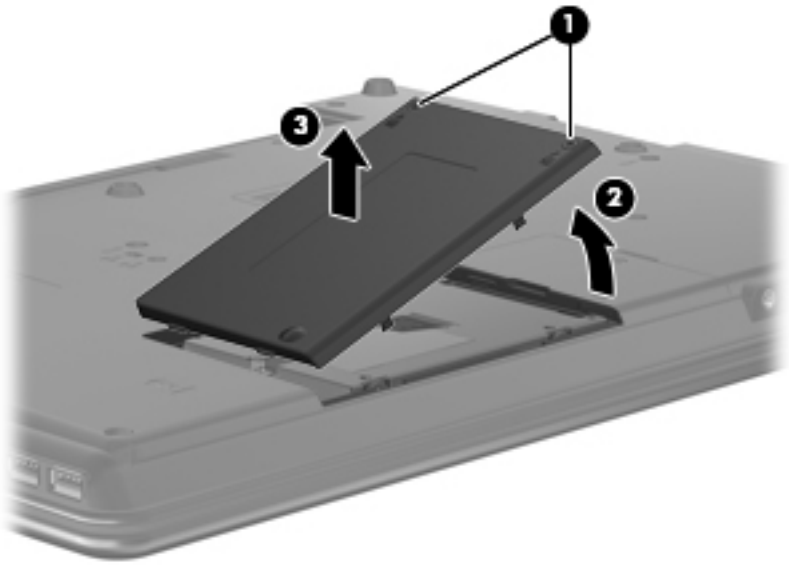
Description	Spare part number
320-GB, 5400-rpm hard drive	498310–001
250-GB, 5400–rpm hard drive	490323–001
160-GB, 5400-rpm hard drive	490322-001
120-GB, 5400-rpm hard drive	490320-001
120-GB, 7200-rpm hard drive	490321-001

Before removing the hard drive, follow these steps:

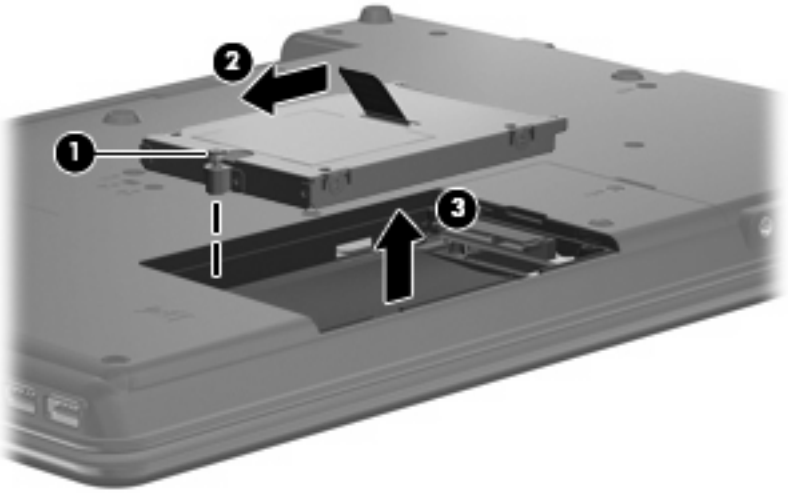
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).

Remove the hard drive:

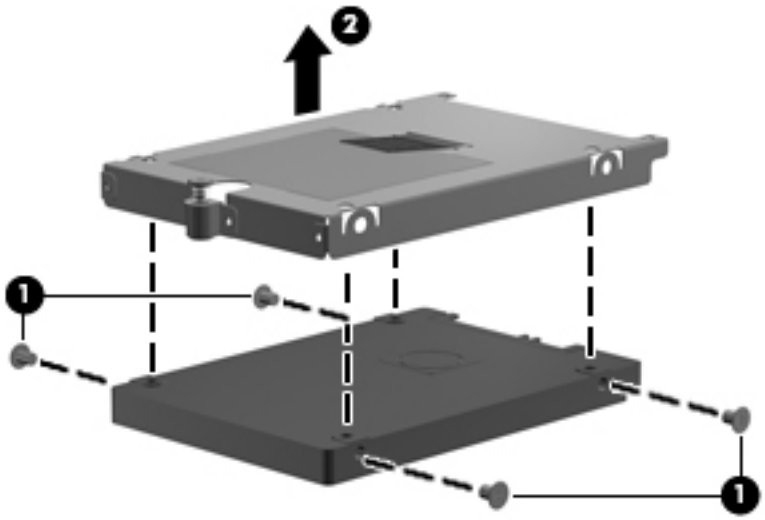
1. Position the computer with the front toward you.
2. Loosen the two Phillips 6.0-mm captive screws **(1)** that secure the hard drive bay cover to the computer.
3. Lift the right side of the hard drive bay cover **(2)**, swing it to the left, and remove the cover **(3)**. The hard drive bay cover is included in the Plastics Kit, spare part number 490335-001.



4. Loosen the Phillips 10.0-mm captive screw **(1)** that secures the hard drive to the computer.
5. Grasp the Mylar tab **(2)** on the hard drive and slide the hard drive to the left to disconnect it from the system board.
6. Remove the hard drive **(3)** from the hard drive bay.



7. If it is necessary to replace the hard drive bracket, remove the four Phillips 4.0-mm hard drive bracket screws **(1)** from each side of the hard drive.
8. Lift the bracket **(2)** straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

WLAN module

Description	Spare part number
Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except Pakistan, Russia, and the Ukraine	480985-001
Intel Wi-Fi Link 5100 802.11a/b/g WLAN module for use only in Pakistan, Russia, and the Ukraine	482957-001
Broadcom BCM4312 802.11b/g WLAN module	
• For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	459263-001
• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial 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, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	459263-002
Broadcom 4322 802.11a/b/g/n WLAN modules:	
• For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	487330-001
• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Columbia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial 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, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo,	487330-002

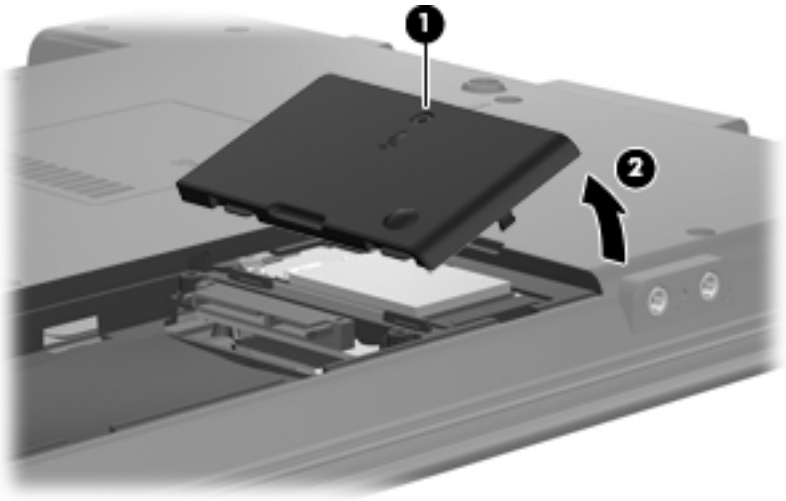
Description	Spare part number
Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	

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 40).

Remove the WLAN module:

1. Position the computer with the front toward you.
2. Loosen the Phillips 6.0-mm captive screw **(1)** that secures the WLAN module compartment cover to the computer.
3. Lift the right side of the WLAN module compartment cover, swing it to the left, and remove the cover **(2)**. The WLAN module compartment cover is included in the Plastics Kit, spare part number 490335-001.



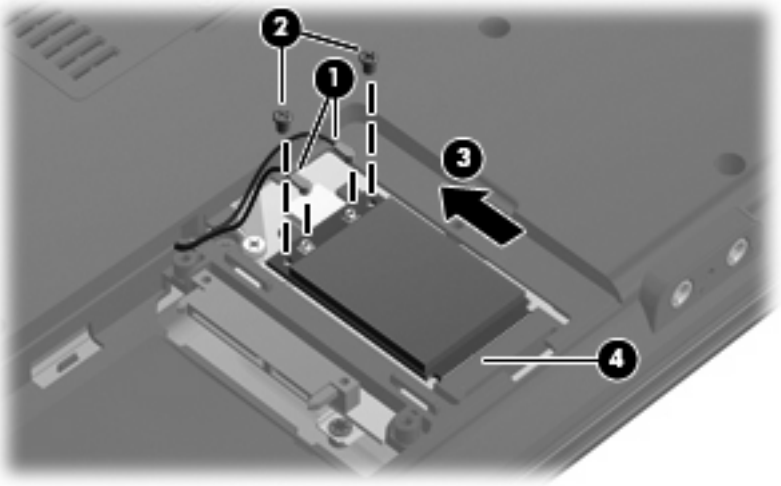
4. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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

5. Remove the two Phillips 4.0-mm screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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

NOTE: WLAN modules are designed with a notch **(4)** to prevent incorrect insertion.



Reverse this procedure to install the WLAN module.

Memory module

Description	Spare part number
1-GB (PC2-5300, 667-MHz, DDR2)	495175-001
2-GB (PC2-5300, 667-MHz, DDR2)	495176-001
1-GB (PC2-6400, 667-MHz, DDR2)	491483-001
2-GB (PC2-6400, 667-MHz, DDR2)	491484-001

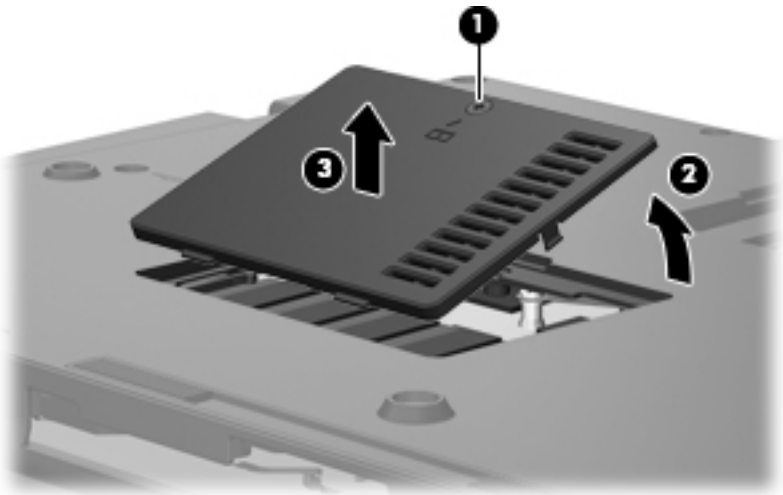
Before removing the memory module, follow these steps:

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 40).

Remove the memory module:

1. Loosen the Phillips 6.0-mm captive screw **(1)** that secures the memory module compartment cover to the computer.

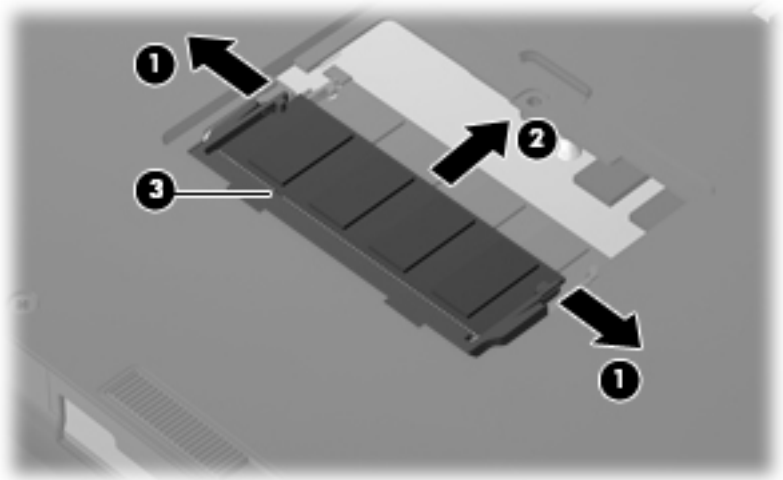
2. Lift the front edge of the cover **(2)**, swing it up and back, and remove the cover **(3)**. The memory module compartment cover is included in the Plastics Kit, spare part number 490335-001.



3. 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.)

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

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



Reverse this procedure to install a memory module.

Optical drive

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

Description	Spare part number
Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer	490316-001
DVD±RW SuperMulti Double-Layer Drive with LightScribe	490318-001
DVD/CD-RW Combo Drive	490319-001
DVD-ROM Drive	490317-001

Before removing the optical drive, follow these steps:

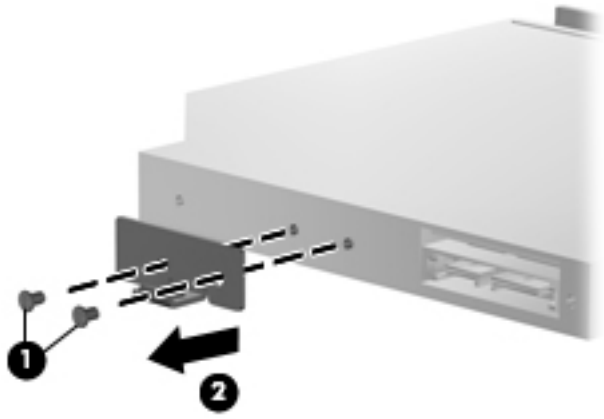
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).

Remove the optical drive:

1. Position the computer with the right side toward you.
2. Remove the Torx 7.0-mm screw **(1)** that secures the optical drive to the computer.
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access **(2)** and press the tab to the left to release the optical drive from the computer.
4. Remove the optical drive **(3)** from the computer.

5. If it is necessary to replace the optical drive bracket, position the optical drive with the rear toward you.
6. Remove the two Phillips 3.0-mm screws **(1)** that secure the optical drive bracket to the optical drive.

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



Reverse this procedure to reassemble and install an optical drive.

Switch cover and keyboard

Description			Spare part number
Switch cover (includes button board and cable)			**490315-001**
Keyboards for use in the following countries or regions:			
Brazil	490327-201	Latin America	490327-161
The Czech Republic	490327-221	Portugal	490327-131
Denmark	490327-081	Russia	490327-251
Europe	490327-021	Saudi Arabia	490327-171
Belgium	490327-A41	Slovakia	490327-231
France	490327-051	Slovenia	490327-BA1
French Canada	490327-121	South Korea	490327-AD1
Germany	490327-041	Spain	490327-071
Greece	490327-151	Sweden and Finland	490327-B71
Hungary	490327-211	Switzerland	490327-111
Iceland	490327-DD1	Taiwan	490327-AB1
Israel	490327-BB1	Thailand	490327-281
Italy	490327-061	Turkey	490327-141
Japan	490327-291	The United Kingdom	490327-031
		The United States	490327-001

Before removing the switch cover and keyboard, follow these steps:

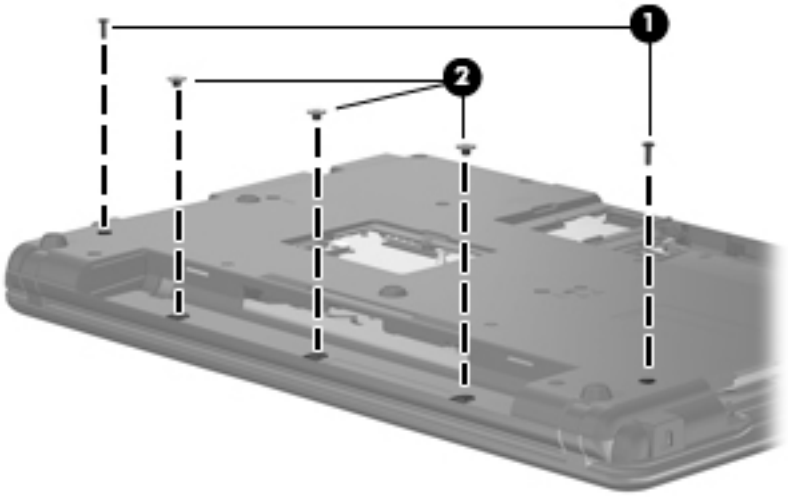
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).

Remove the switch cover and keyboard:

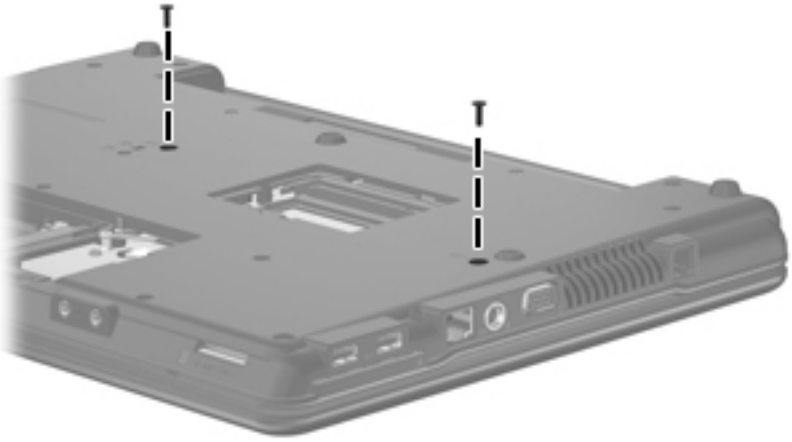
1. Remove the following screws:

   (1) Two Slotted Torx 10.0-mm screws

   (2) Three Torx 2.0-mm broad-head screws



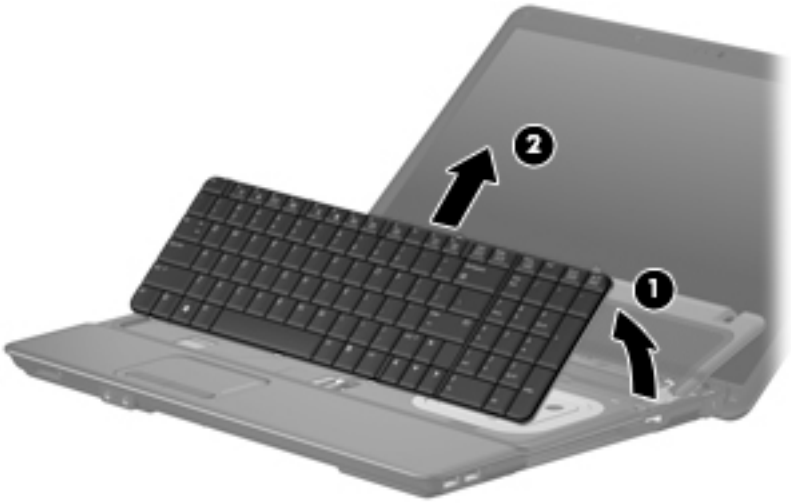
2. Remove the two Torx 7.0-mm screws that secure the keyboard to the computer.



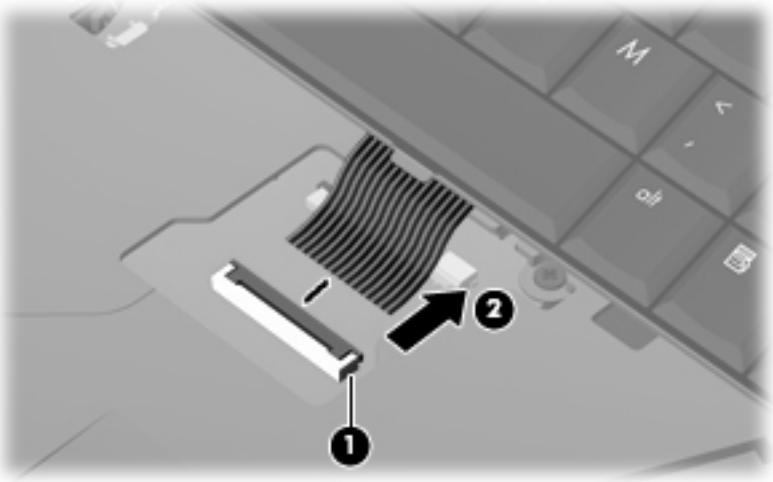
3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.

5. Lift the switch cover **(1)** straight up until it disengages from the computer, and slide it back **(2)** until it rests on the display assembly.

6. Lift up the rear edge of the keyboard **(1)**, and slide it back **(2)** to disengage the four tabs on the front of the keyboard from the switch cover.

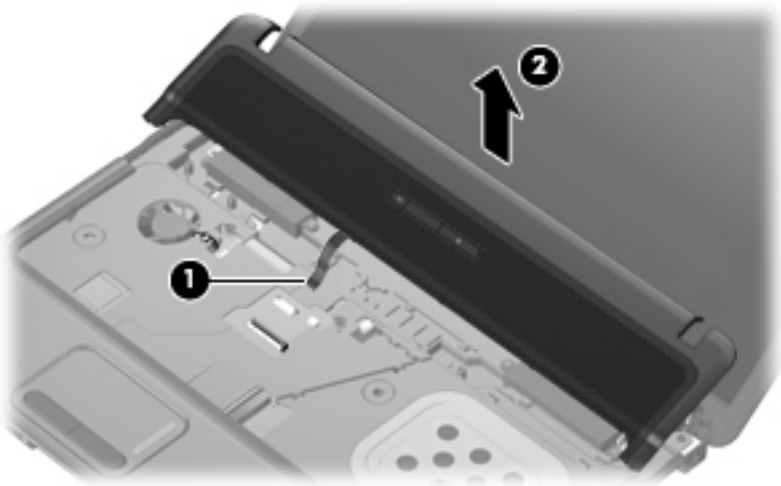


7. Release the zero insertion force (ZIF) connector **(1)** to which the keyboard cable is attached, and disconnect the keyboard cable **(2)** from the system board.



8. Remove the keyboard.

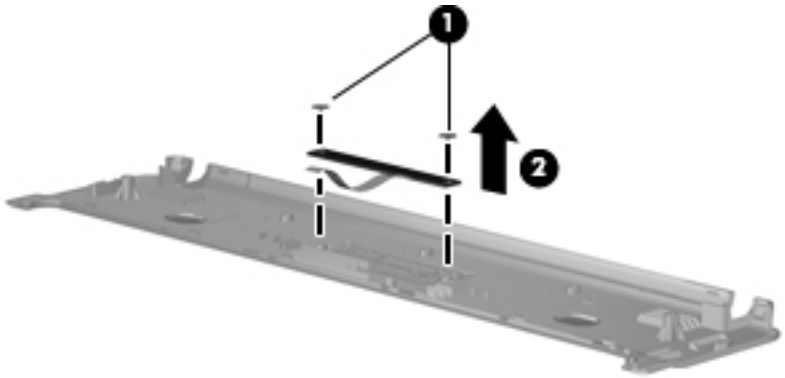
9. Release the ZIF connector and disconnect the LED ribbon cable from the system board **(1)**, and then lift the switch cover up to remove it **(2)** from the system board.



10. Turn the switch cover over.

11. Remove the two Phillips 2.0-mm broadhead screws **(1)** from the switch cover.

12. Remove the LED power button board **(2)** from the switch cover.



Reverse this procedure to install the switch cover and keyboard.

Speakers

Description	Spare part number
Speakers	490341-001

Before removing the speakers, follow these steps:

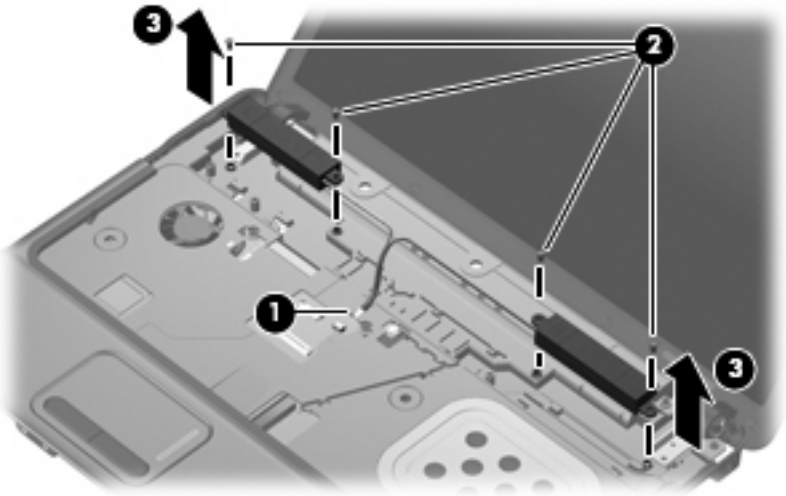
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).
5. Remove the keyboard (see Switch cover and keyboard on page 49).
6. Remove the switch cover (see Switch cover and keyboard on page 49).

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the system board and remove the speaker cable from the clips and routing channel.

NOTE: The two speakers are connected with a single cable.

2. Remove the four Phillips 4.0-mm screws **(2)** that secure the speakers to the top cover.
3. Remove the speakers **(3)** from the top cover.



Reverse this procedure to install the speakers.

Display assembly

NOTE: All display assembly spare part kits include 2 WLAN antenna transceivers and cables.

Description	Spare part number
17-inch, WXGA BrightView display assembly	490332-001
17-inch, WXGA BrightView display assembly with webcam	495897-001
17-inch, WXGA WVA display assembly	490333-001
17-inch, WXGA WVA display assembly with webcam	495898-001
17-inch, WXGA +Anti-Glare display assembly	490334-001
17-inch, WXGA + Anti-Glare display assembly with webcam	495899-001

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 40).
5. Disconnect the wireless antenna cables from the WLAN module (see WLAN module on page 43).
6. Remove the following components:
   a. Keyboard (see Switch cover and keyboard on page 49)
   b. Switch cover (see Switch cover and keyboard on page 49)
   c. Speakers (see Speakers on page 54)

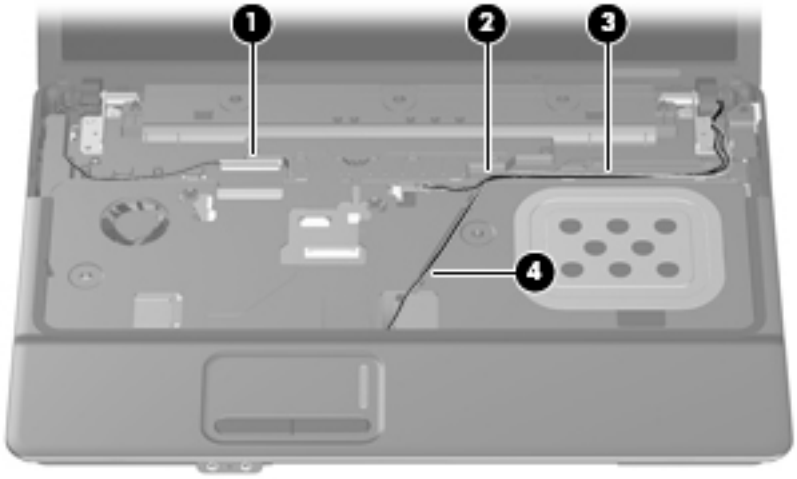
Remove the display assembly:

1. Open the computer as far as possible.
2. Disconnect the display panel cable **(1)** from the system board.

△ **CAUTION:** There is a ground loop off the display panel cable that is secured to the left hinge. Be sure you do not pull or damage the cable.

3. Disconnect the webcam and microphone module cables **(2)** from the system board and then remove the cables from the routing path **(3)**.

4. Make sure that the wireless antenna cables are disconnected from the WLAN module on the bottom of the computer, then remove the wireless antenna cables **(4)** from the clips and routing channels built into the top cover.

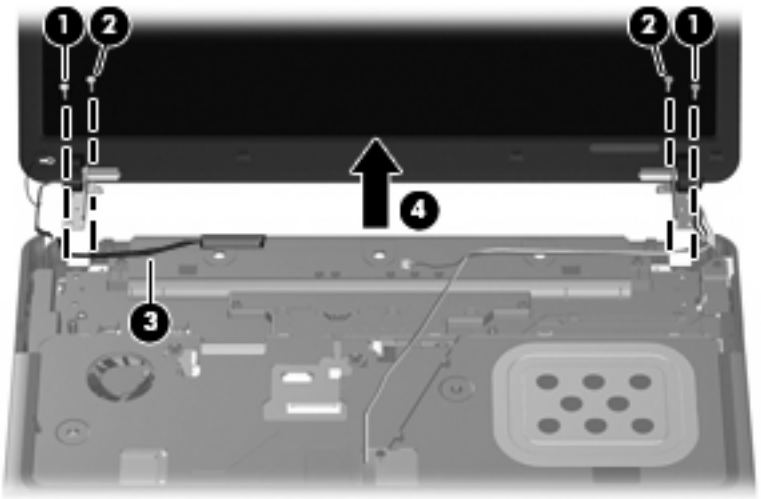


△ **CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

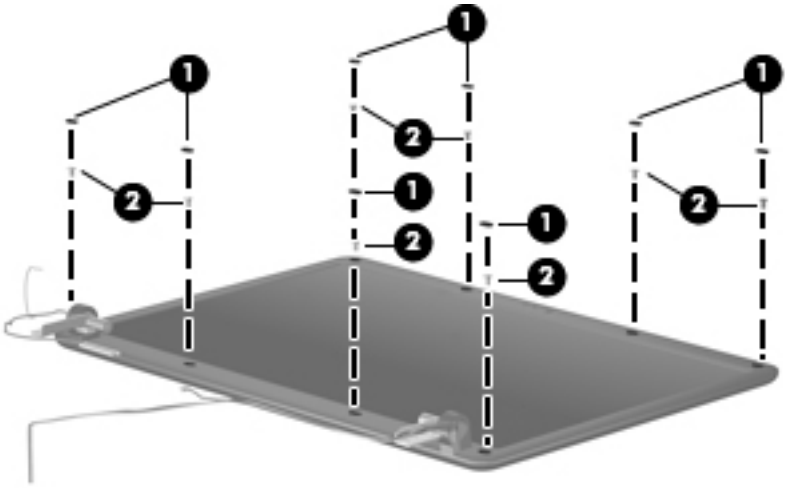
5. Remove the two Slotted Torx 10-mm screws **(1)** and the two Torx 7.0-mm screws **(2)** that secure the display assembly to the computer.

6. Release the display panel cable ground loop **(3)** from the system board.

7. Lift the display assembly **(4)** straight up and remove it.

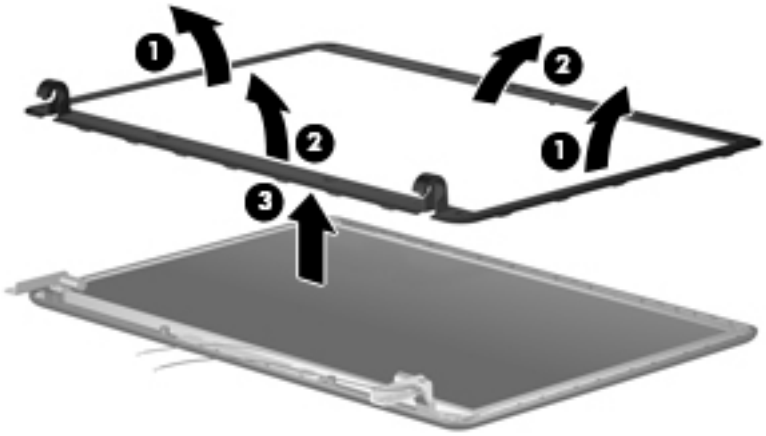


8. If it is necessary to replace the display bezel, display inverter, or display hinges, remove the eight rubber screw covers **(1)** and the eight Torx 6.0-mm screws **(2)** that secure the display bezel to the display assembly. The rubber screw covers are available in the Rubber Kit, spare part number 490339-001.

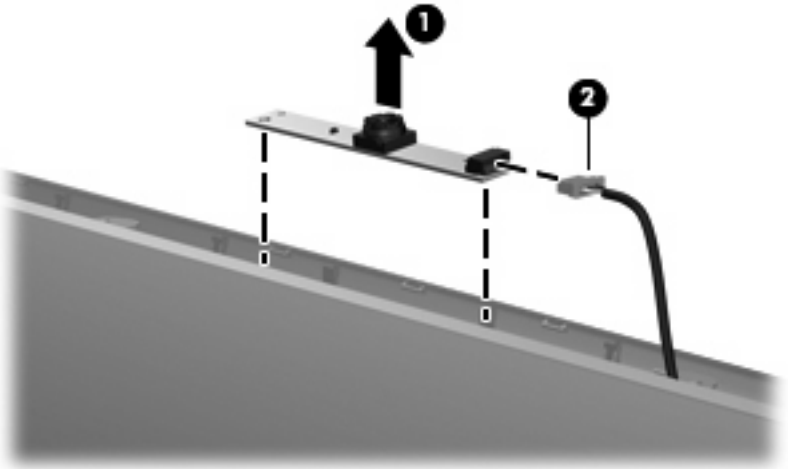


9. Flex the inside edges of the left and right sides **(1)** and the top and bottom sides **(2)** of the display bezel until the bezel disengages from the display enclosure.

10. Remove the display bezel **(3)**. The display bezel is available using spare part number 495738-001.



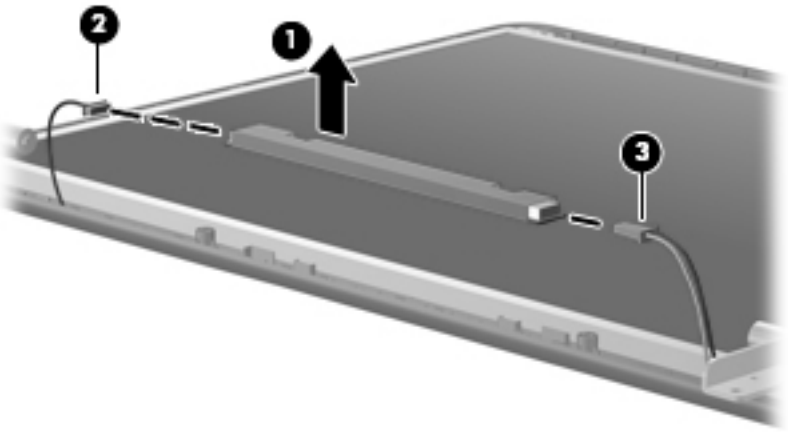
11. If it is necessary to replace the webcam module from the display enclosure, gently pull the webcam module from the double-sided tape on the display enclosure **(1)** and disconnect the webcam cable from the module **(2)**.



NOTE: To replace the webcam module in the display enclosure, align the holes on the webcam module with the pins on the display enclosure and press onto the double-sided tape.

12. 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 will allow.

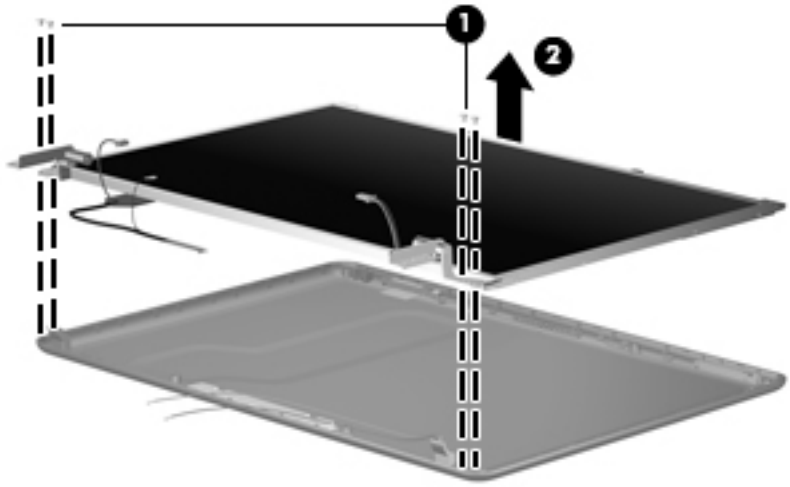
13. Disconnect the display panel cable **(2)** and the backlight cable **(3)** from the display inverter.



14. Remove the display inverter. The display inverter is available using spare part number 490326-001.

15. If it is necessary to replace the display hinges, remove the two Torx 6.0-mm screws **(1)** that secure the display panel to the display enclosure.

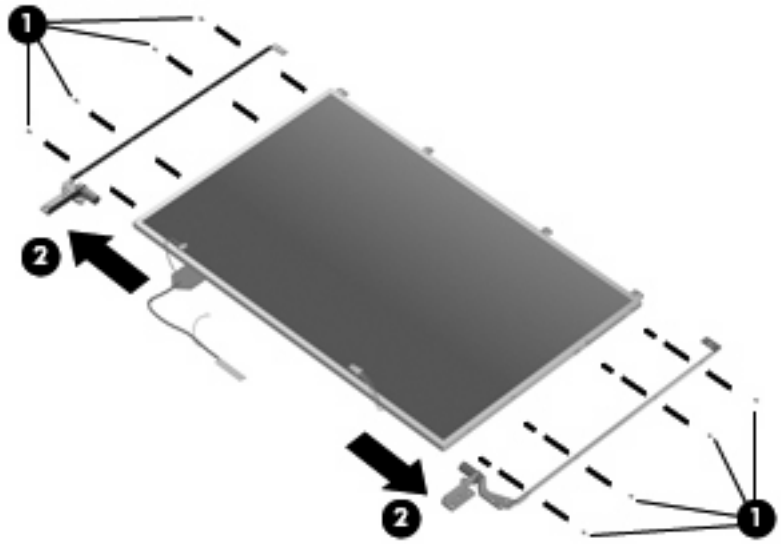
16. Remove the display panel **(2)**.



17. Remove the eight Phillips 3.0-mm screws **(1)** that secure each display hinge to the display panel.

NOTE: When removing or replacing the Phillips screws, be sure to remove or replace them in the same sequence as the numbering found on the display hinges (1–2–3–4).

18. Remove the display hinges **(2)**. The left and right display hinges are available using spare part number 490329-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover

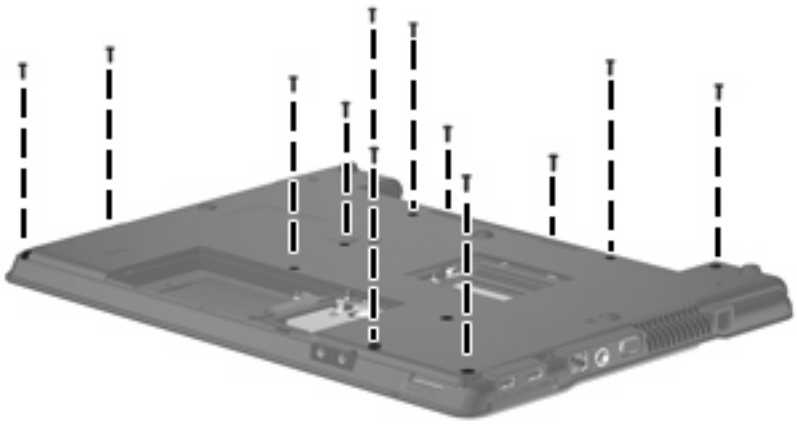
Description	Spare part number
Top cover	490342-001

Before removing the top cover, follow these steps:

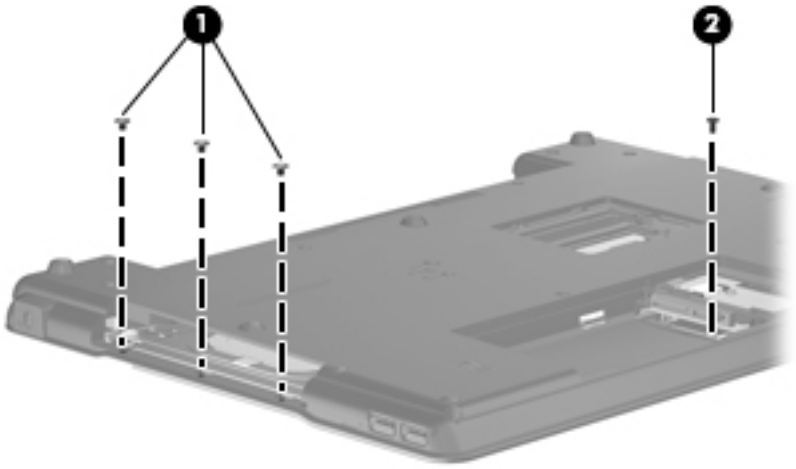
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. 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 12 top cover slotted Torx 7.0-mm screws.



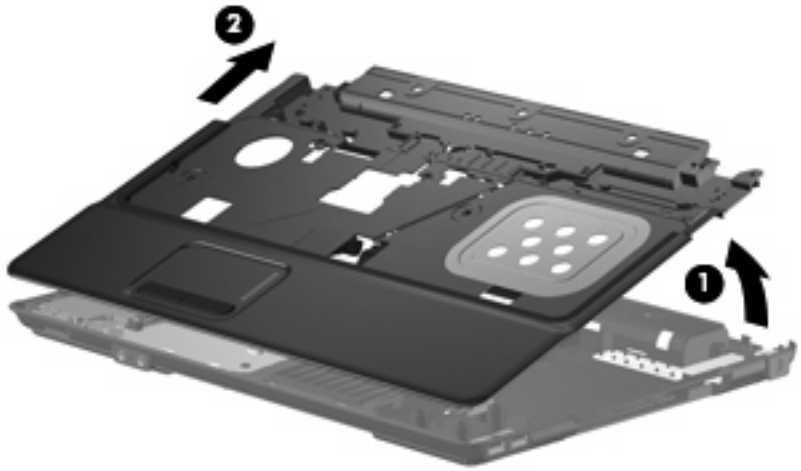
3. Remove the three Phillips 2.0-mm broad-head screws from the optical drive bay **(1)**, and remove the Torx 4.0-mm screw from the hard drive bay **(2)**.



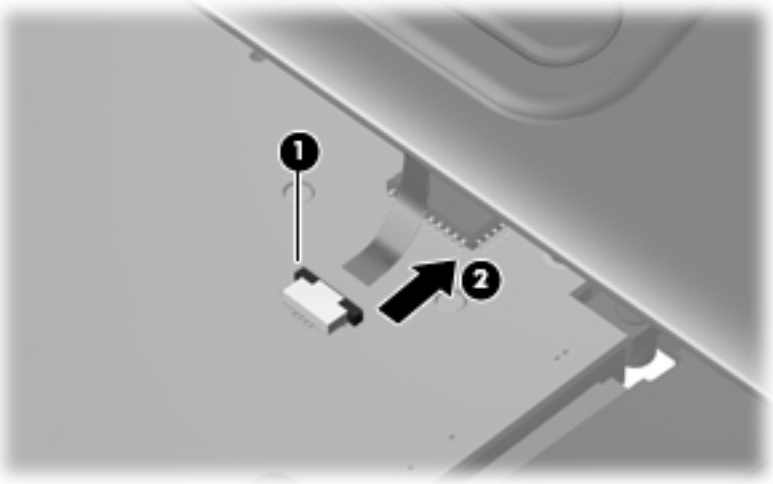
4. Turn the computer right-side up.

5. Remove the three slotted Torx 7.0-mm screws from the top cover.

6. Lift the rear edge of the top cover **(1)** until it disengages from the base enclosure. Then tilt the top cover back **(2)** until the TouchPad cable is accessible.



7. Release the ZIF connector **(1)** to which the TouchPad cable is connected, and then disconnect the TouchPad cable **(2)** from the system board.

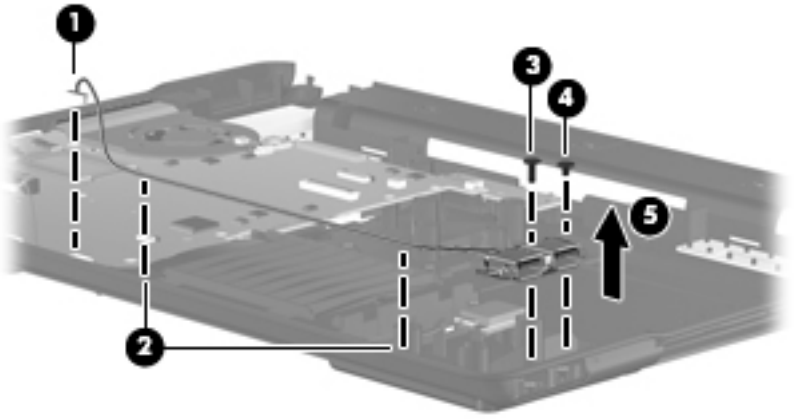


8. Remove the top cover.

Reverse this procedure to install the top cover.

USB board

1. Disconnect the USB cable from the system board **(1)**.
2. Lift up the USB connector and remove the cable from the cable routing path **(2)**.
3. Remove the Phillips 9.0-mm screw **(3)** and the Phillips 4.0-mm screw **(4)** from the system board.
4. Remove the USB board **(5)**.



Reverse this procedure to install the USB board.

Bluetooth module

NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.

Description	Spare part number
For use in all countries and regions except Japan and Asia Pacific countries and regions	398393-002
For use only Japan and Asia Pacific countries and regions	450066-001

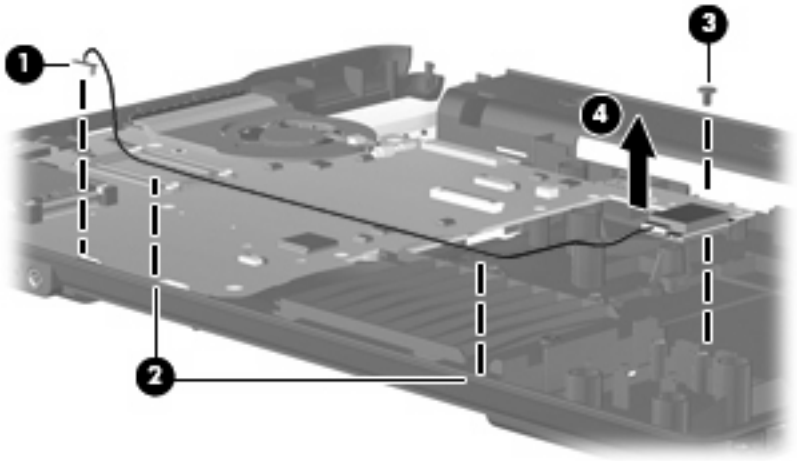
Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Remove the Bluetooth module cable **(2)** from the routing path.
3. Remove the Phillips 4.0-mm screw **(3)** that secures the Bluetooth module to the base enclosure.

4. Remove the Bluetooth module **(4)** from the base enclosure.



Reverse this procedure to install the Bluetooth 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	449137-001

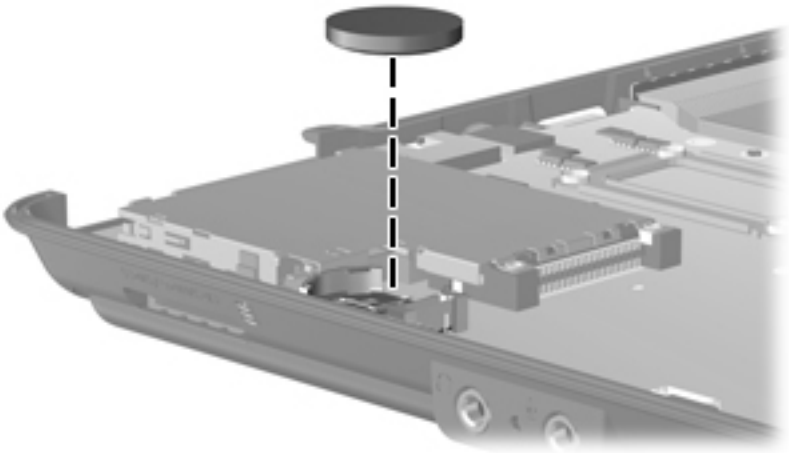
Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)
   h. System board (see System board on page 68)

Remove the RTC battery:

1. Turn the system board upside down, with the audio connectors toward you.

2. Remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery.

System board

NOTE: All system board spare part kits include the ExpressCard assembly.

NOTE: All system board spare part kits include replacement thermal material.

Description	Spare part number
System board includes 128-MB of graphics subsystem memory	490311-001
System board includes 256-MB of graphics subsystem memory	490312-001

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 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)

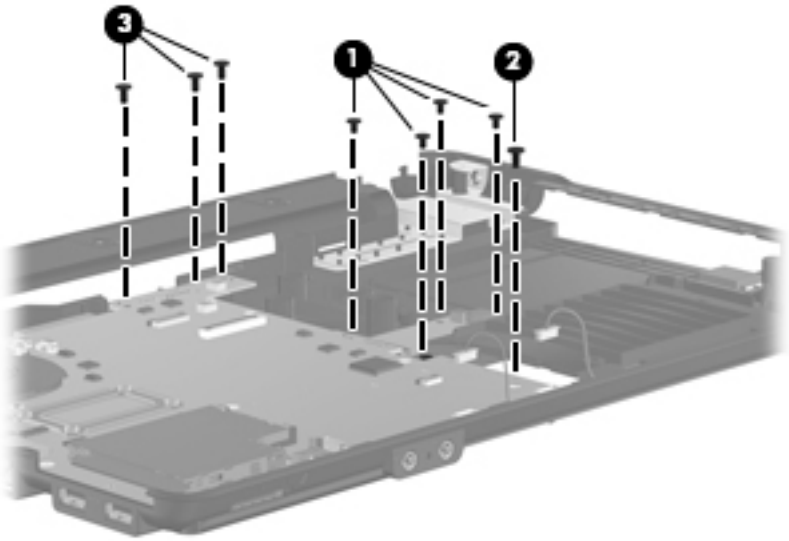
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory module (see Memory module on page 45)
- WLAN module (see WLAN module on page 43)
- Processor (see Processor on page 76)

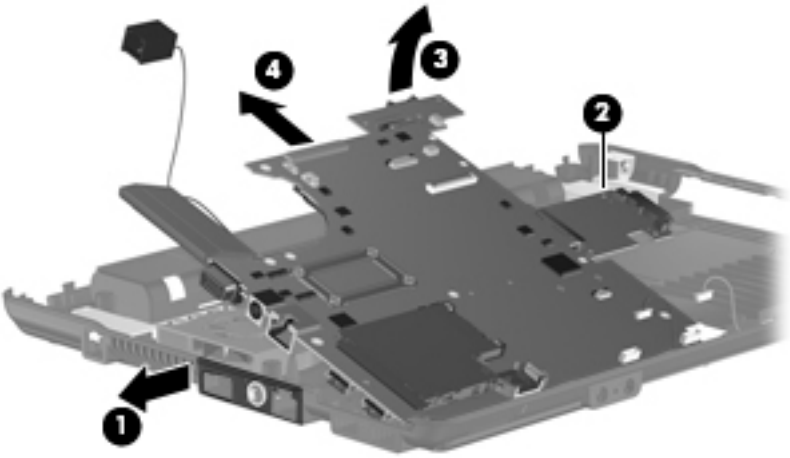
To remove the system board:

1. Remove the four Phillips 4.0-mm screws **(1)** that secure the optical drive connector board to the base enclosure.
2. Remove the Torx 6.0-mm screw **(2)** that secures the system board to the base enclosure.

3. Remove the three Torx 6.0-mm screws **(3)** that secure the battery connector board to the base enclosure.



4. Flex the left side of the base enclosure until the external monitor connector **(1)** and the heat sink **(2)** are clear of the openings in the base enclosure.
5. Lift the rear edge of the system board **(3)** until it rests at an angle.
6. Remove the system board **(4)** from the base enclosure by sliding it back.



Reverse the preceding procedure to install the system board.

Fan

Description	Spare part number
Fan	490324-001

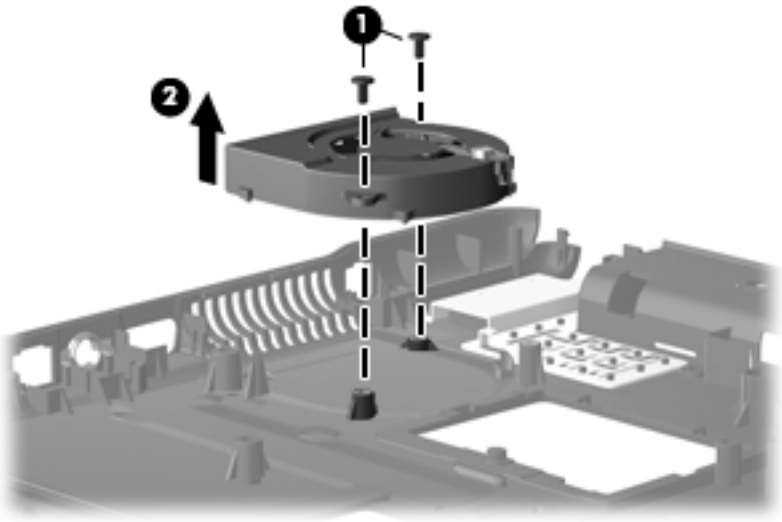
Before removing the fan, follow these steps:

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 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)
   h. System board (see System board on page 68)

Remove the fan:

1. Remove the two Torx 6.0-mm screws **(1)** that secure the fan to the base enclosure.

2. Remove the fan **(2)** from the base enclosure.



Reverse this procedure to install the fan.

NOTE: To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left side of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Modem module

NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 490314-001. See Cable Kit on page 23 for more Cable Kit spare part number information.

Description	Spare part number
For use in all countries and regions except Australia and New Zealand	461749-001
For use only in Australia and New Zealand	461749-011

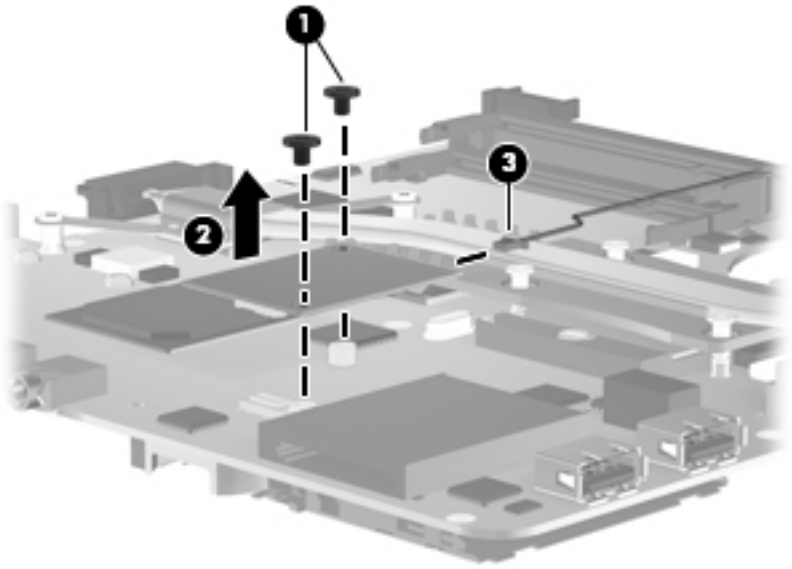
Before removing the modem module, follow these steps:

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 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)
   h. System board (see System board on page 68)

Remove the modem module:

1. Turn the system board upside down, with the audio connectors toward you.
2. Remove the two Phillips 4.0-mm screws **(1)** that secure the modem module to the system board.
3. Lift the modem module **(2)** straight up to release it from the system board.

4. Disconnect the modem module cable **(3)** .



5. Remove the modem module.

Reverse this procedure to install the modem module.

Heat sink

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

Description	Spare part number
Heat sink (includes replacement thermal material)	490325-001

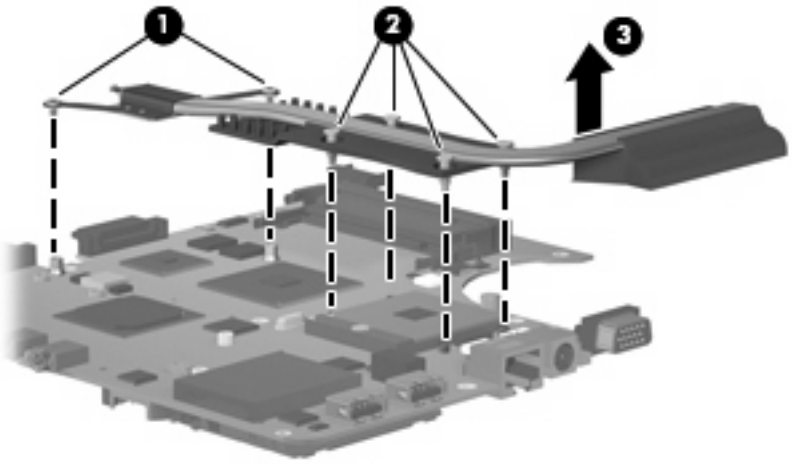
Before removing the heat sink, follow these steps:

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 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)
   h. System board (see System board on page 68)

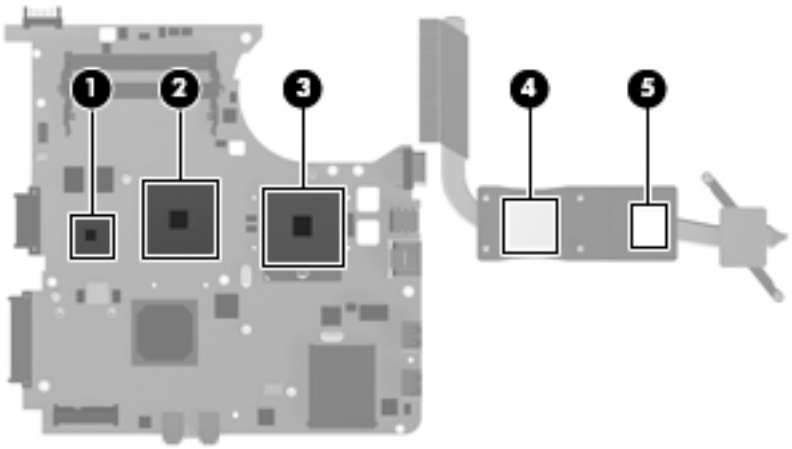
Remove the heat sink:

1. Turn the system board upside down, with the audio connectors toward you.
2. Remove the two Phillips 10-mm captive screws from the heat sink extension **(1)**.
3. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the four Phillips 10-mm captive screws **(2)** around the processor.

4. Remove the heat sink **(3)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the system board **(1)**, **(2)**, and **(3)**, and the heat sink components **(4)** and **(5)** each time the heat sink is removed. Replacement thermal material is included with all heat sink, system board, and processor spare part kits.



Reverse this procedure to install the heat sink.

Processor

NOTE: All processor spare part kits include replacement thermal material.

Description	Spare part number
Intel Core2 Duo processors	
• P8400 2.26-GHz processor (3-MB L2 cache, 1066-MHz FSB)	491486-001
• P8600 2.4-GHz processor (3-MB L2 cache, 1066-MHz FSB)	491487-001
• T9400 2.53-GHz processor (6-MB L2 cache, 1066-MHz FSB)	491489-001
• T5670 1.80-GHz processor (2-MB L2 cache, 800-MHz FSB)	491488-001
• T5870 2.0-GHz processor (2-MB L2 cache, 800-MHz FSB)	490388-001
Intel Celeron M Processors	
• Cel-575 2.0-GHz processor (1-MB, 667-MHz FSB)	490336-001
• Cel-585 2.16-GHz processor (1-MB, 667-MHz FSB)	490337-001

Before removing the processor, follow these steps:

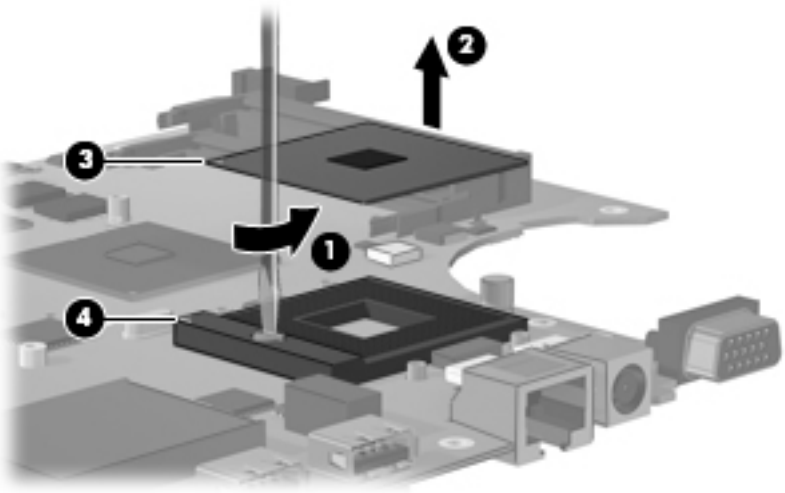
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 40).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 41)
   b. Optical drive (see Optical drive on page 47)
   c. Keyboard (see Switch cover and keyboard on page 49)
   d. Switch cover (see Switch cover and keyboard on page 49)
   e. Speakers (see Speakers on page 54)
   f. Display assembly (see Display assembly on page 55)
   g. Top cover (see Top cover on page 60)
   h. System board (see System board on page 68)

Remove the processor:

1. Turn the system board upside down, with the USB connectors toward you.
2. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.

3. Lift the processor **(2)** straight up and remove it.

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



Reverse this procedure to install the processor.

5 Computer Setup

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

NOTE: Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

NOTE: Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

NOTE: An external keyboard connected by USB can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup:

1. Turn on or restart the computer.
2. Before Windows® opens and while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen, press f10.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

   Because Computer Setup 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 select an item, press enter.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc.
   - To view navigation information, press f1.
   - To change the language, press f2.

2. Select the **File, Security, Diagnostics,** or **System Configuration** menu.

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

   - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore Changes and Exit**. Then follow the instructions on the screen.
   - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing f10 while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore** defaults, and then press enter.
3. When the confirmation dialog box opens, press f10.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

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

Computer Setup menus

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

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

File menu

Select	To do this
System information	• View identification information for the computer and the batteries in the system. • View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	• Create a new BIOS user account. • View a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Enable/disable the fingerprint reader (select models only; disabled by default).
Allow reset of HP ProtectTools security keys	Enable/disable reset of HP ProtectTools security keys.
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive (enabled by default). • Change a DriveLock user password or master password. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay. **CAUTION:** If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

Diagnostics menu

Select	To do this
Hard Drive Self-Test options	Run a comprehensive self-test on any hard drive in the system.
Memory Check	Run a comprehensive check on system memory.
Startup Check (select models only)	Verify the system components needed for starting the computer.

System Configuration menu

NOTE: Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language (or press f2)	Change the Computer Setup language.
Boot options	• Set f9, f10, and f12 delay when starting up. • Enable/disable CD-ROM boot. • Enable/disable floppy boot. • Enable/disable internal network adapter boot and set the boot mode (PXE or RPL). • Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system. • Set the Express Boot Popup delay in seconds. • Set the boot order.
Device configurations	• Swap the functions of the fn key and left ctrl key. • Enable/disable multiple standard pointing devices at startup. (To set the computer to support only a single, usually nonstandard, pointing device at startup, select **Disable**.) • Enable/disable USB legacy support. When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard, mouse, and hub in Computer Setup even when a Windows operating system is not running. ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer or to an optional docking device (select models only). • Select a parallel port mode: EPP (Enhanced Parallel Port), standard, bidirectional, or ECP (Enhanced Capabilities Port). • Enable/disable BIOS DMA data transfers. • Enable/disable fan always on while connected to an AC outlet. • Enable/disable Intel® Data Execution Prevention or AMD PSAE Execution Disable. When enabled, the processor can disable some virus code execution, which helps to improve computer security. • Enable/disable LAN Power Save. When enabled, saves power by turning off the LAN when not in use. • Enable/disable SATA Native Mode. • Enable/disable Dual Core CPU. • Enable/disable Secondary Battery Fast Charge. • Choose Bit-shift or LBA assisted HDD Translation Mode. • Enable/disable Windows direct application launcher. • Enable/disable HP Lockout.

Select	To do this
Built-In Device Options	• Enable/disable embedded WWAN Device Radio. • Enable/disable embedded WLAN Device Radio. • Enable/disable embedded Bluetooth® Device Radio. • Enable/disable LAN/WLAN Switching. When enabled, switches to a WLAN when a LAN is either unavailable or disconnected. • Enable/disable Wake on LAN from Off. • Enable/disable the ambient light sensor.
Port Options	• Enable/disable the serial port. • Enable/disable the parallel port. • Enable/disable the flash media reader. • Enable/disable the USB port. **CAUTION:** Disabling the USB port also disables MultiBay II devices and ExpressCard devices on the advanced port replicator. • Enable/disable the 1394 port. • Enable/disable the cardbus slot. • Enable/disable the ExpressCard slot. • Enable/disable the infrared port. • Enable/disable the optical disk drive. • Enable/disable the network controller.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Depth	28.50 cm	11.22 in
Width	39.60 cm	15.60 in
Height (front to rear)	3.23 to 3.58 cm	1.27 to 1.41 in
Weight (equipped with optical drive, hard drive, and battery)	2.95 kg	6.50 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A – 90 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
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.

17.0-inch, WXGA+WVA display specifications

	Metric	U.S.
Dimensions		
Height	24.4 cm	9.6 in
Width	38.1 cm	15.0 in
Diagonal	43.2 cm	17.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1440 × 900	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	6.5 W	
Viewing angle	+/-45 horizontal, +15/–35° vertical (typical)	

Hard drive specifications

	320-GB	250-GB*	160-GB*	120-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks	625,141,400	488,376,120	312,560,640	234,420,480
Disc rotational speed	5400 rpm	5400 rpm	5400 rpm	7200 and 5400 rpm
Operating temperature				5°C to 55°C (41°F to 131°F)

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact technical support for details.

Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer specifications

Applicable disc	Read:	Write:	
	CD-DA, CD+(E)G, CD-MIDI, CDTEXT, 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, DVDROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, HD-ROM (Single Layer), HD-ROM (Dual Layer), HD DVD-R, HD DVD-R for Dual Layer, HD DVD-RW	CD-R and CD-RW DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9),DVD-RW, DVD-RAM	
Access time	**CD**	**DVD**	**HD**
Random	170 ms	170 ms	230 ms
Cache buffer	8 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		
1X BD-ROM	4,500 KB/sec		
1X BD-R read	4,500 KB/sec		
1X BD-RE read	4,500 KB/sec		
Transfer mode	Multiword DMA Mode		

DVD±RW SuperMulti Double-Layer Combo Drive specifications

Applicable disc	**Read:** 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	**Write:** CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Access time	**CD**	**DVD**
Random	< 175 ms	< 230 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD-ROM	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	

DVD/CD-RW Combo Drive specifications

Applicable disc	**Read:** 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	**Write:** CD-R and CD-RW
Access time	**CD**	**DVD**
Random	< 110 ms	< 130 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	3,600 KB/sec	
24X CD-R	3,600 KB/sec	
24X CD-RW	3,600 KB/sec	
Transfer mode	Multiword DMA mode 2	

DVD-ROM Drive specifications

Applicable disc	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18, CD-ROM (Mode 1 and 2), CD Digital Audio, CD-XA ready (Mode 2, Form 1 and Form 2), CD-I (Mode 2, Form 1 and Form 2), CD-R, CD-RW, Photo CD (single and multisession), CD-Bridge	
Access time	**CD**	**DVD**
Random	< 100 ms	< 125 ms
Cache buffer	512 KB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	

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 ExpressCard
DMA6	Not assigned
DMA7	Not assigned
*ExpressCard 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 configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.	
NOTE: ExpressCards 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	ExpressCard 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)

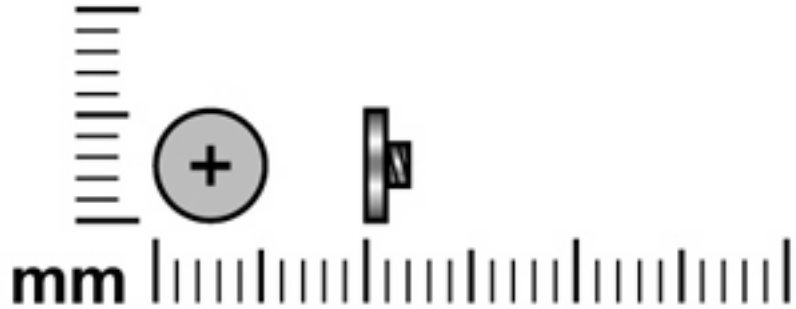
System memory map specifications

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-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

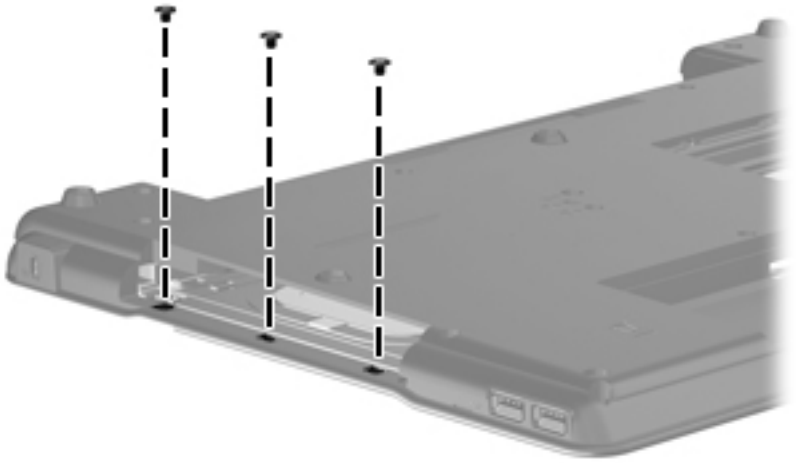
7 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws listed in this section are available in the Screw Kit, spare part number 490340-001.

Phillips PM2.0×2.0 broad-head screw

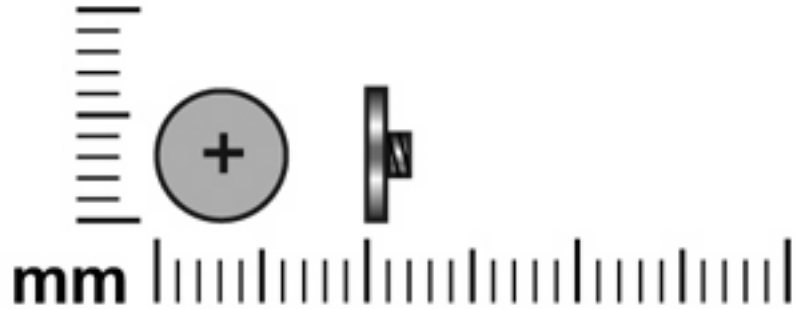


Color	Quantity	Length	Thread	Head diameter
Black	3	2.0 mm	2.0 mm	5.0 mm

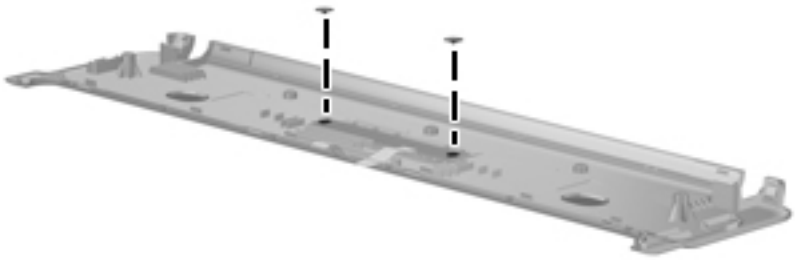


Where used: 3 screws that secure the top cover to the display enclosure

Phillips PM2.0x2.0 broad-head screw



Color	Quantity	Length	Thread	Head diameter
Black	2	2.0 mm	2.0 mm	6.0 mm

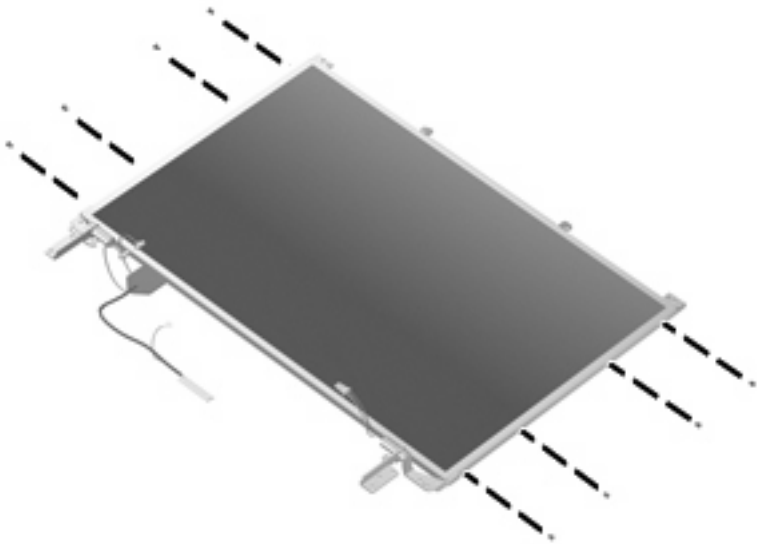


Where used: 2 screws that secure the button board to the switch cover

Phillips PM2.0×3.0 screw

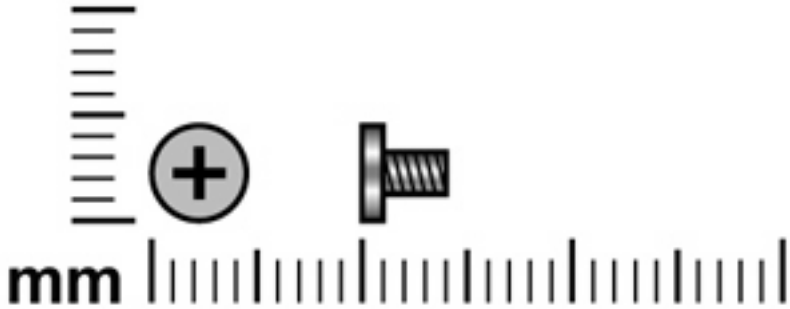
Color	Quantity	Length	Thread	Head diameter
Silver	10	3.0 mm	2.0 mm	4.5 mm

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

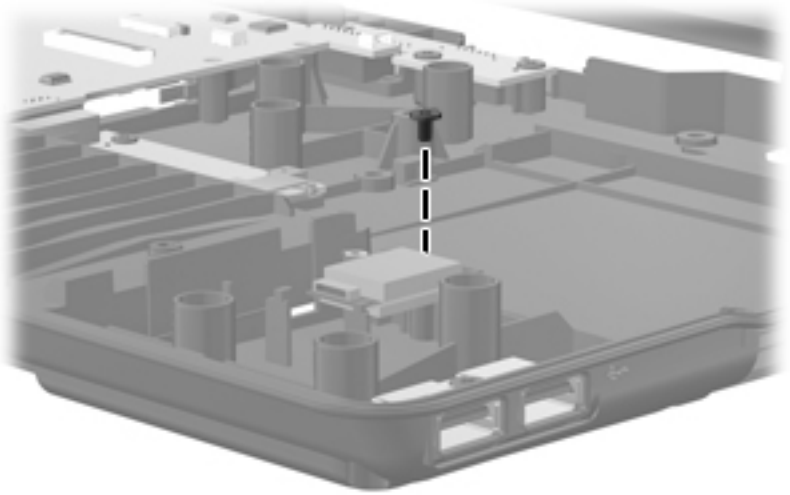


Where used: 8 screws that secure the display hinges to the display assembly

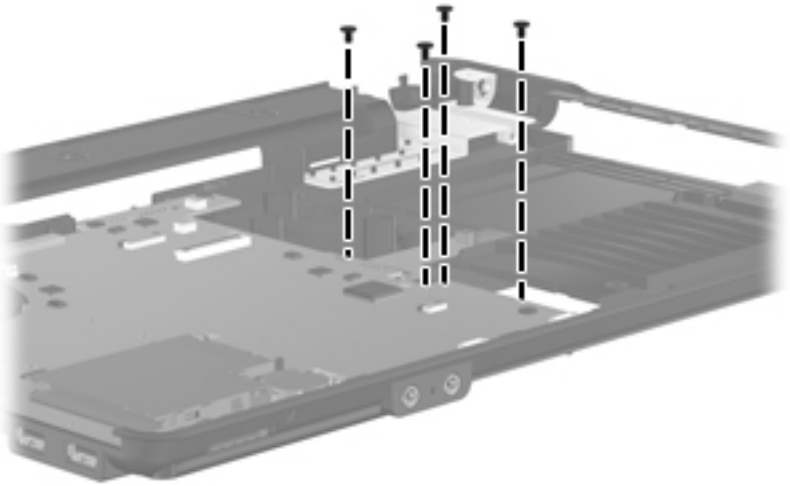
Phillips PM2.0x4.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	5	4.0 mm	2.0 mm	4.5 mm

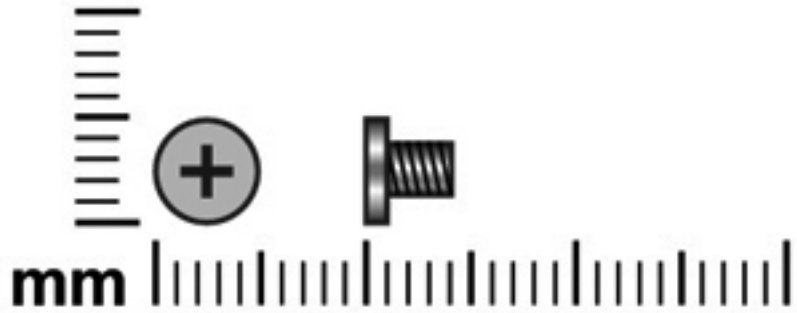


Where used: 1 screw that secures the Blueotooth module to the base enclosure

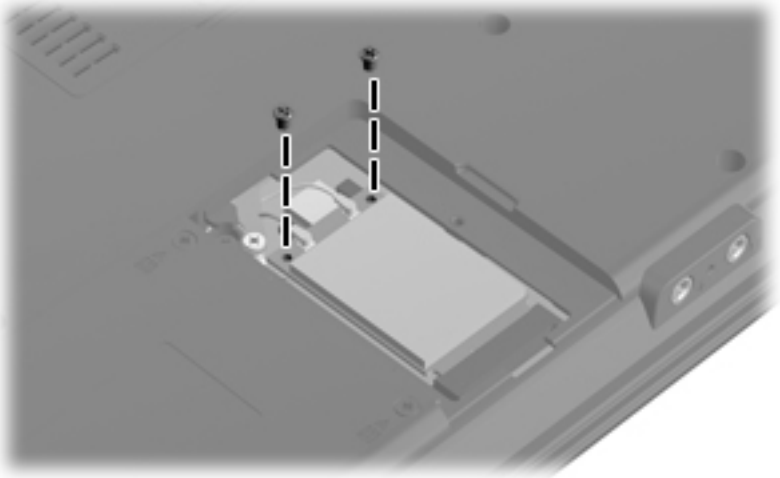


Where used: 4 screws that secure the optical drive connector board to the system board

Phillips PM2.5×4.0 screw

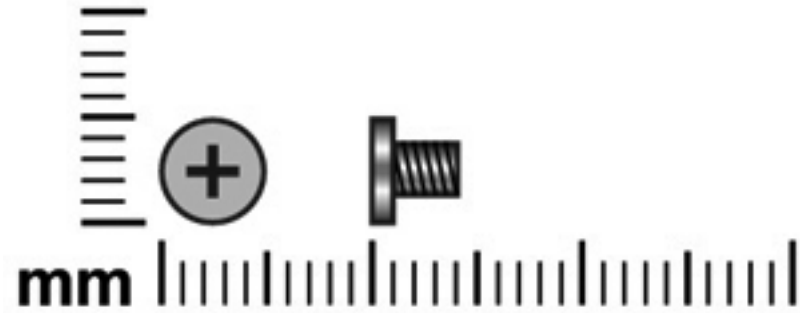


Color	Quantity	Length	Thread	Head diameter
Silver	2	4.0 mm	2.5 mm	5.0 mm

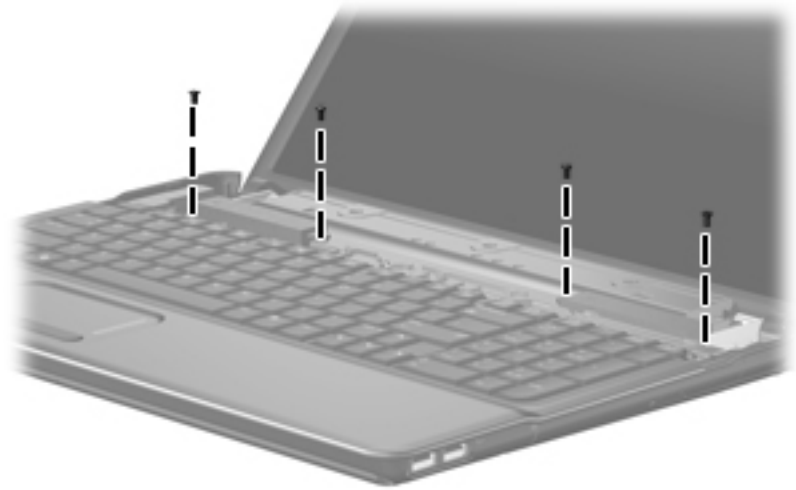


Where used: 2 screws that secure the WLAN module to the system board

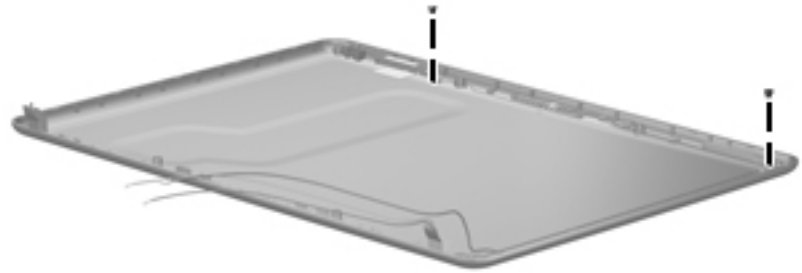
Phillips PM2.5×4.0 screw



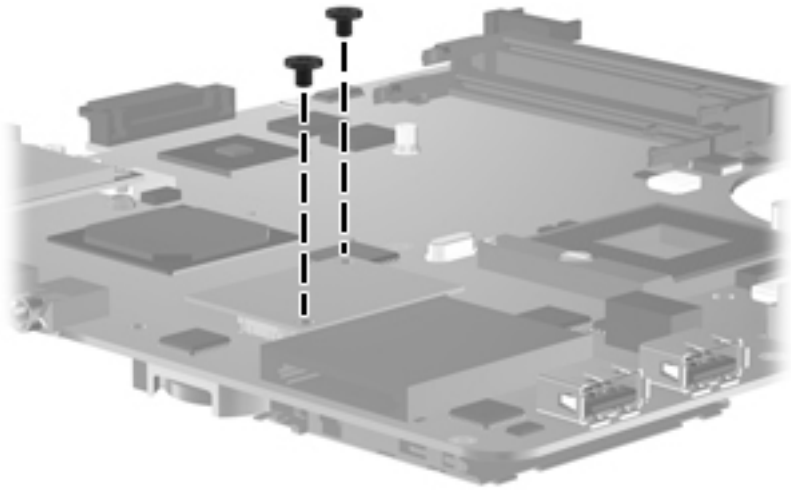
Color	Quantity	Length	Thread	Head diameter
Black	9	4.0 mm	2.5 mm	5.0 mm



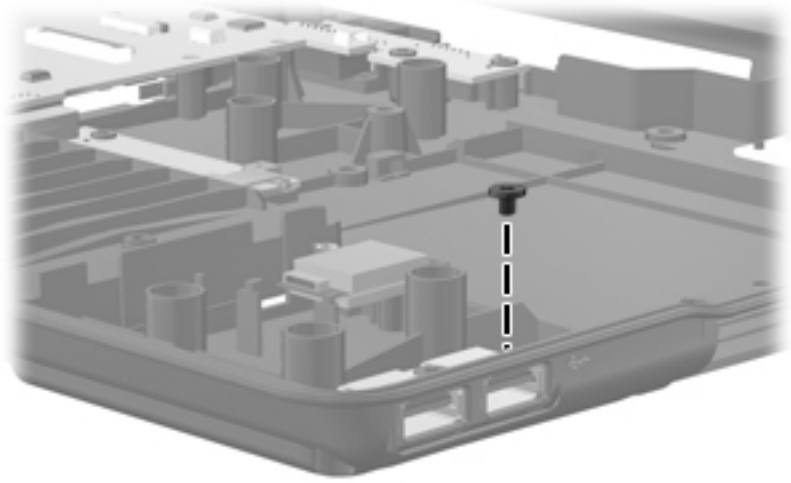
Where used: 4 screws that secure the speakers to the system board



Where used: 2 wireless antenna transceiver screws that secure the transceiver to the base enclosure

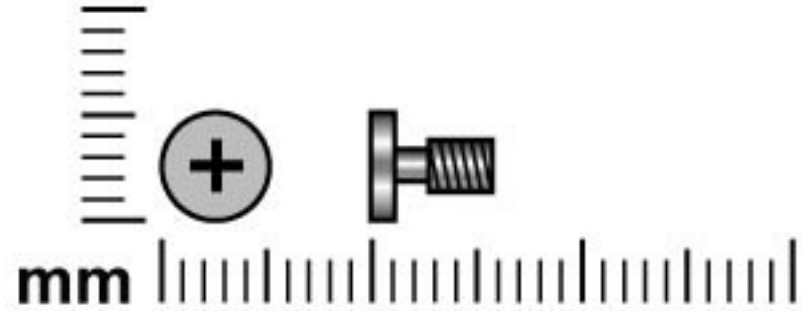


Where used: 2 screws that secure the modem module to the system board

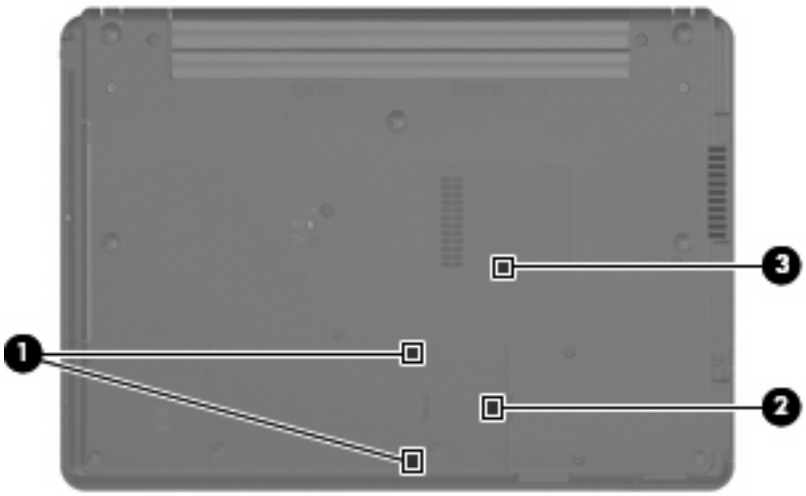


Where used: 1 screw that secures the USB board to the base enclosure

Phillips PM2.5×6.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Black	4	6.0 mm	2.5 mm	5.0 mm



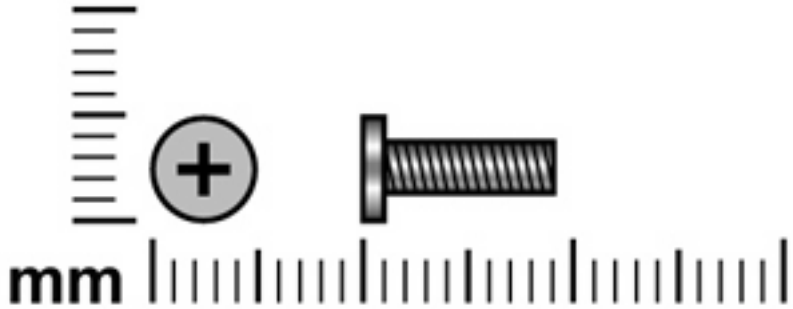
Where used:

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

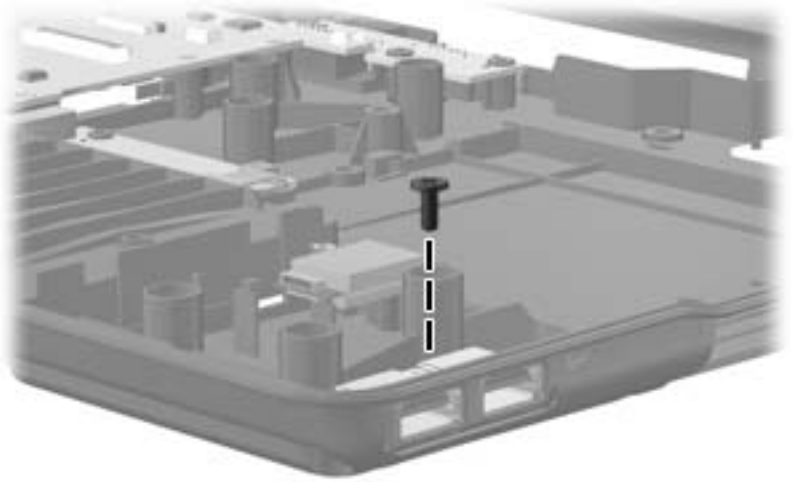
(2) One captive screw that secures the WLAN module compartment cover to the computer (screw is secured by a C-clip)

(3) One captive screw that secures the memory module compartment cover to the computer (screw is secured by a C-clip)

Phillips PM2.5×9.0 screw

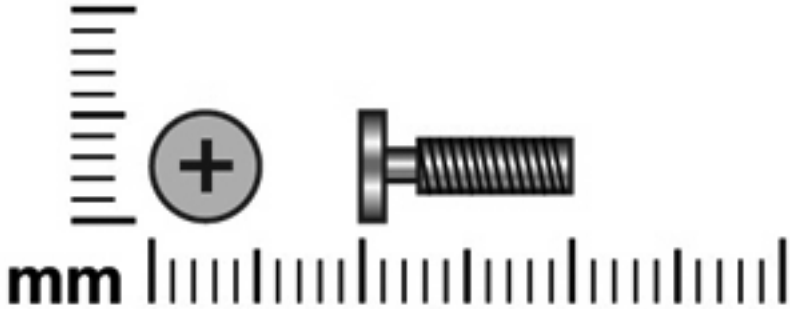


Color	Quantity	Length	Thread	Head diameter
Black	1	9.0 mm	2.5 mm	4.5 mm

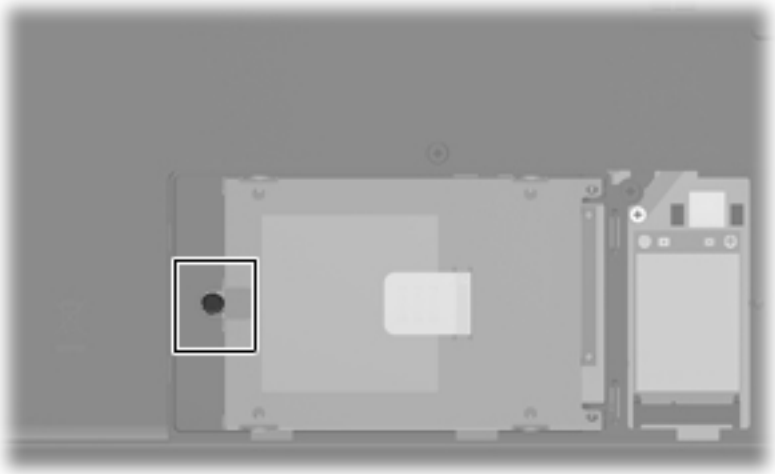


Where used: 1 screw that secures the USB board to the base enclosure

Phillips PM2.5×10.0 captive screw

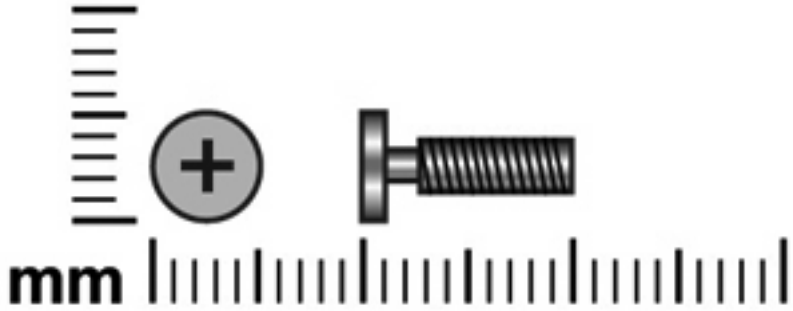


Color	Quantity	Length	Thread	Head diameter
Black	1	10.0 mm	2.5 mm	5.0 mm

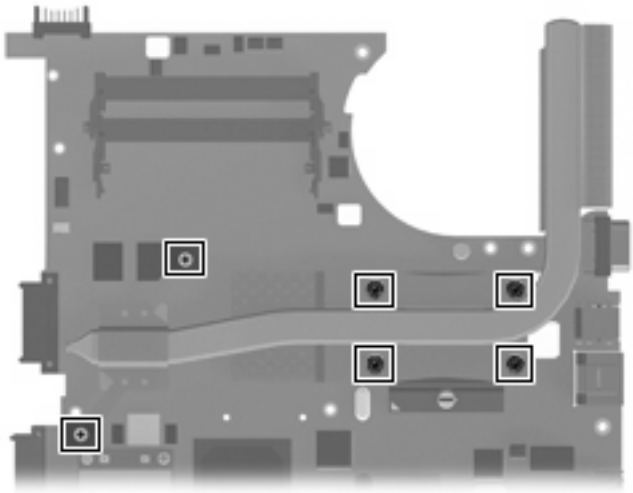


Where used: One captive screw that secures the hard drive to the computer (screw is secured to the hard drive bracket)

Phillips PM2.5x10.0 captive screw

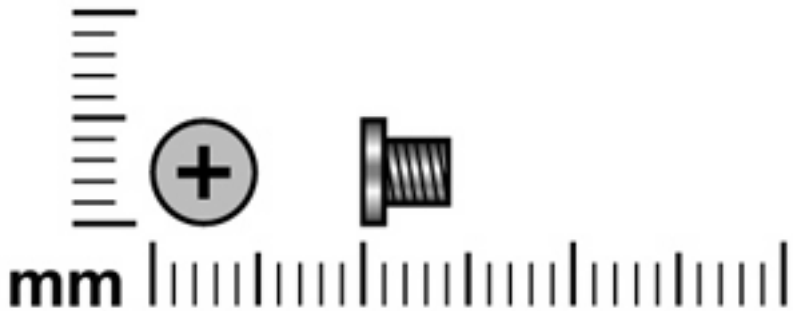


Color	Quantity	Length	Thread	Head diameter
Silver	6	10.0 mm	2.5 mm	5.9 mm

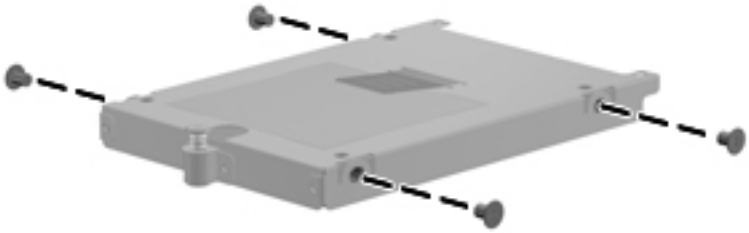


Where used: 6 captive screws that secure the heat sink to the system board (screws are secured to the heat sink by C-clips)

Phillips PM3.0×4.0 screw

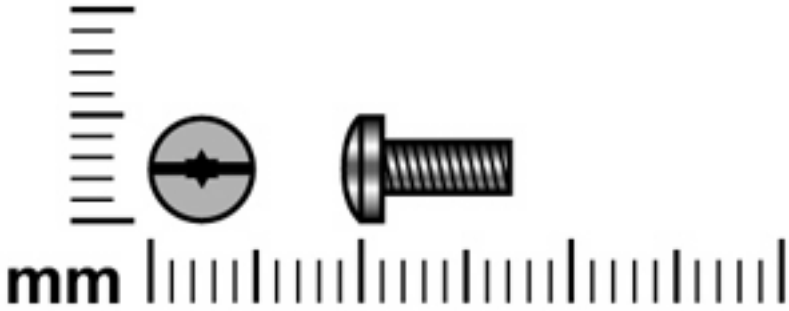


Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	3.0 mm	5.0 mm

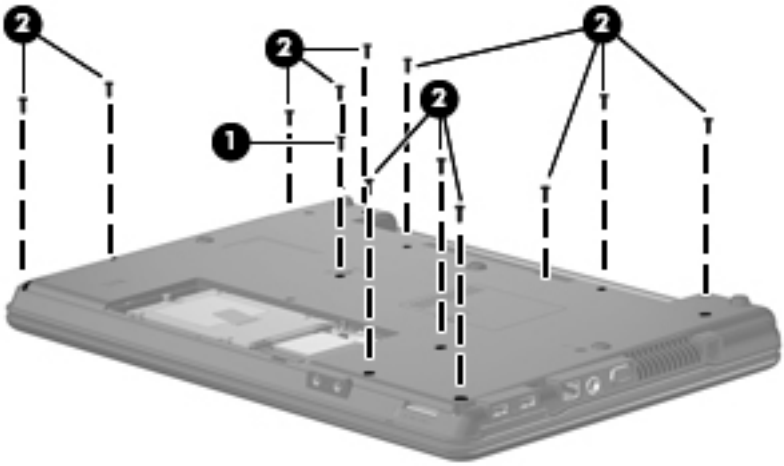


Where used: 4 screws that secure the hard drive bracket to the hard drive

Slotted Torx ST8M2.5×7.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	19	7.0 mm	2.5 mm	5.0 mm



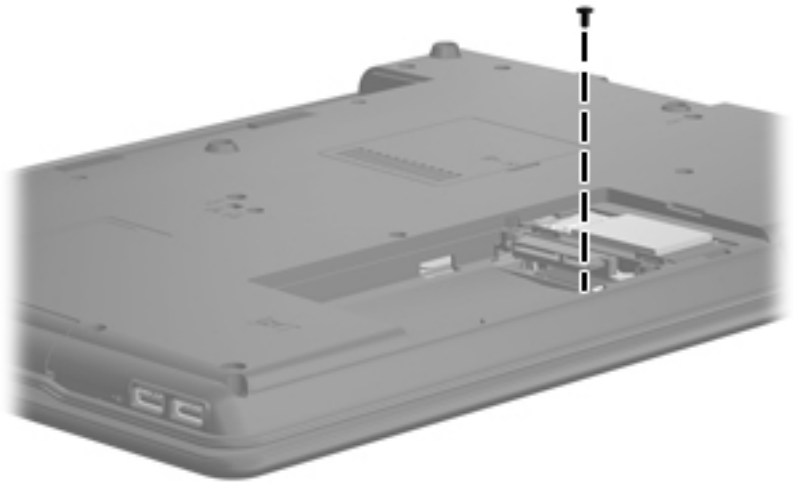
Where used:

(1) One screw that secures the optical drive to the computer

(2) Twelve screws that secure the switch cover to the computer

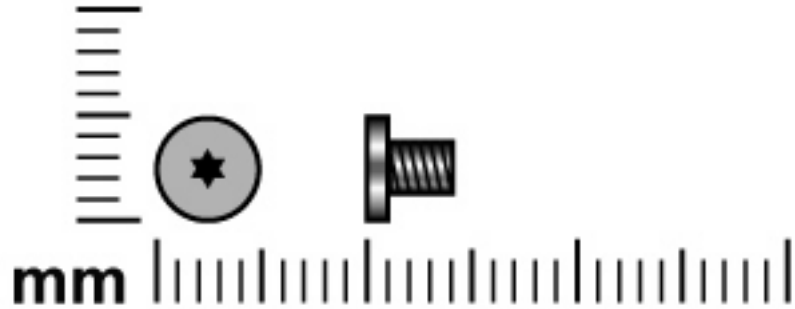
Where used: 2 screws that secure the display assembly to the computer

Where used: 3 screws that secure the top cover to the base enclosure



Where used: 1 screw that secures the top cover to the base enclosure

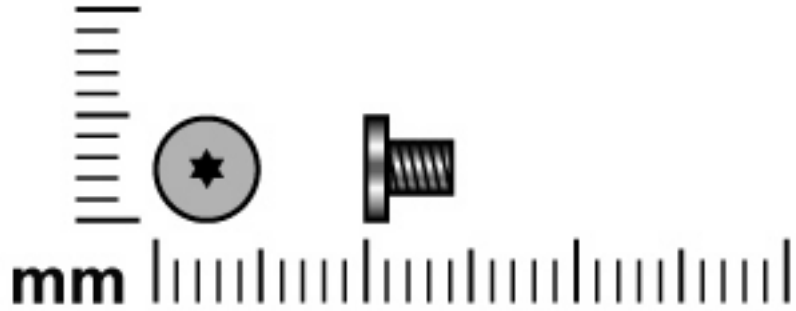
Torx T8M2.5×5.0 broad-head screw



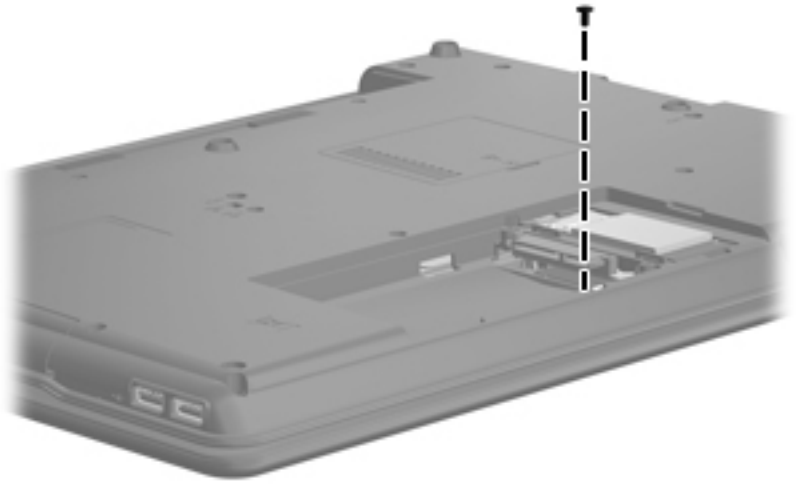
Color	Quantity	Length	Thread	Head diameter
Black	2	5.0 mm	2.5 mm	8.0 mm

Where used: 2 screws that secure the display panel to the display assembly

Torx T8M2.5×4.0 screw

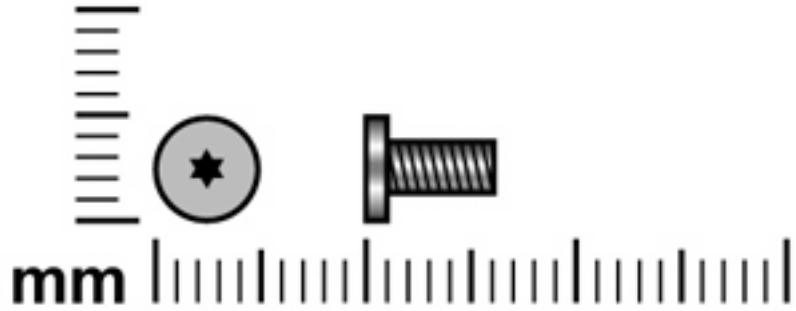


Color	Quantity	Length	Thread	Head diameter
Black	1	4.0 mm	2.5 mm	5.0 mm

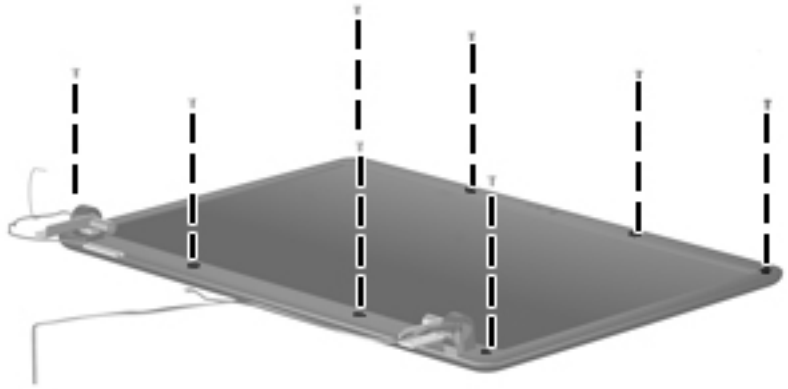


Where used: One screw that secures the top cover to the base enclosure

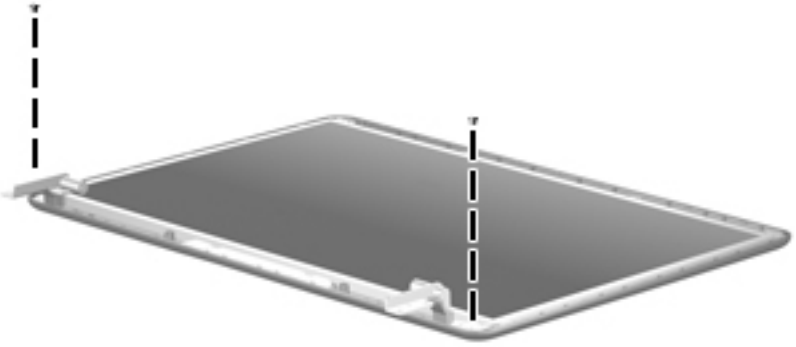
Torx T8M2.5×6.0 screw



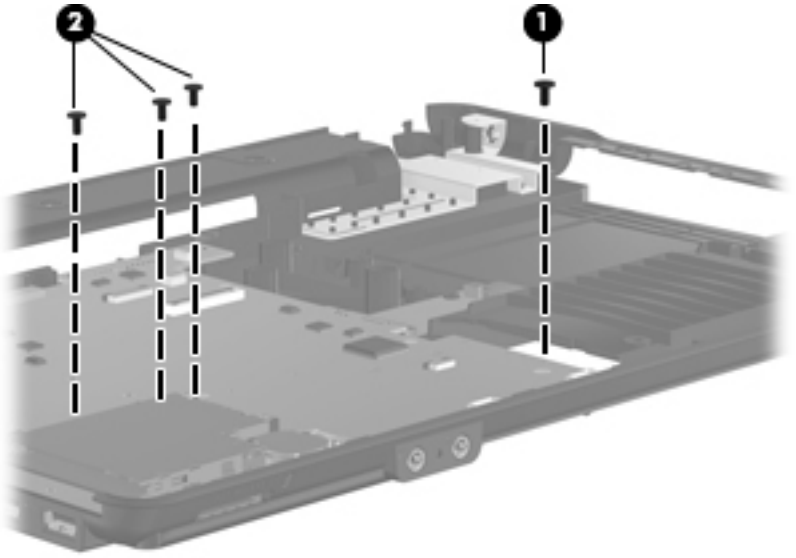
Color	Quantity	Length	Thread	Head diameter
Black	16	6.0 mm	2.5 mm	5.0 mm



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



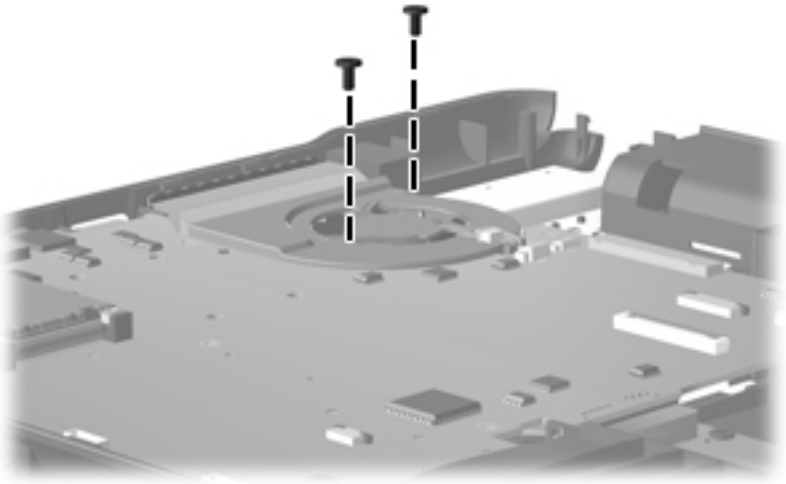
Where used: Two screws that secure the display panel to the display assembly



Where used:

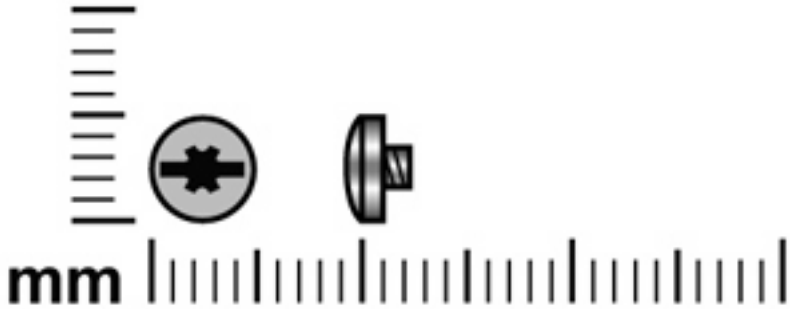
(1) One screw that secures the system board to the base enclosure

(2) Three screws that secure the battery connector board to the base enclosure



Where used: Two screws that secure the fan to the base enclosure

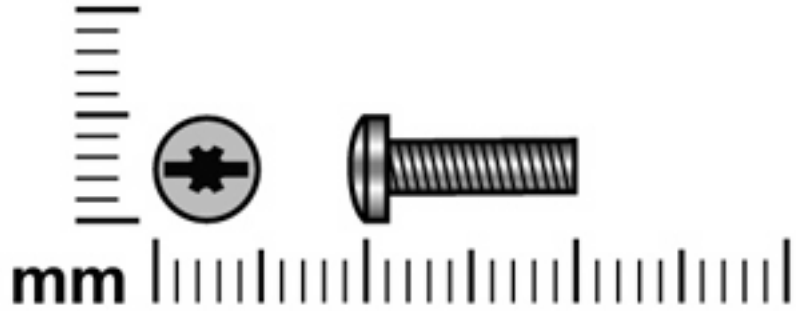
Slotted Torx T8M2.0x2.0 screw



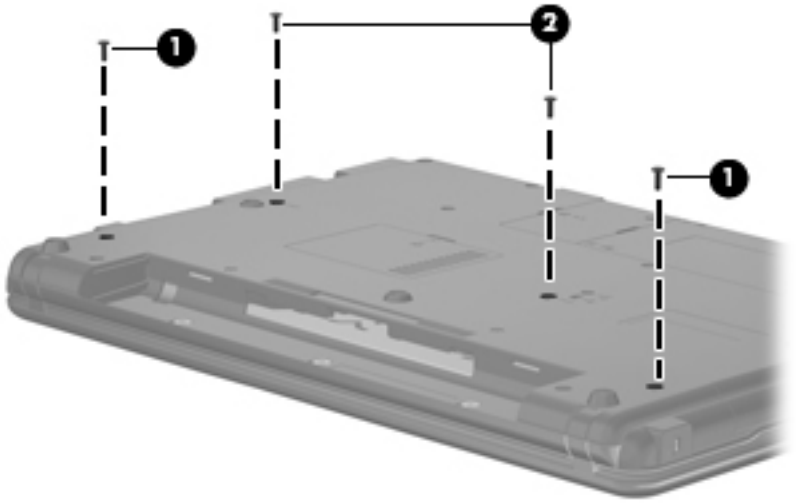
Color	Quantity	Length	Thread	Head diameter
Black	2	2.0 mm	2.0 mm	5.0 mm

Where used: 2 screws that secure the switch cover to the base enclosure

Slotted Torx T8M2.5x10.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	6	10.0 mm	2.5 mm	5.0 mm



Where used: 4 screws that secure the switch cover and keyboard to the base enclosure

Where used: 2 screws that secure the display assembly to the base enclosure

8 Backup and recovery

Backup and recovery in Windows Vista

Overview

To protect your information, use the Backup and Restore Center to back up individual files and folders, back up your entire hard drive (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

The Backup and Restore Center provides the following options:

- Backing up individual files and folders
- Backing up the entire hard drive (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools

NOTE: For detailed instructions, perform a search for these topics in Help and Support.

NOTE: In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear 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 create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:

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

   To copy the entire screen, press **fn+prt sc**.
3. Open a word-processing document, and then select **Edit > Paste**.

   The screen image is added to the document.
4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

NOTE: DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.

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

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

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

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

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to back up your entire computer (select models only) or your files.

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

Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use the Backup and Restore Center to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- f11 recovery tools: You can use the f11 recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

NOTE: If you are unable to boot (start up) your computer, you must purchase a Windows Vista® operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Click **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.

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

To recover your information using Startup Repair, follow these steps:

CAUTION: Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition. To find the partitions, select **Start > Computer**.

   NOTE: If the Windows partition and the HP Recovery partition have been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.
3. Restart the computer, and then press f8 before the Windows operating system loads.
4. Select **Repair your computer**.
5. Follow the on-screen instructions.

NOTE: For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

Using f11

CAUTION: Using f11 completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The f11 recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

To recover the original hard drive image using f11, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition. To find the partition, select **Start > Computer**.

   NOTE: If the HP Recovery partition has been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.
3. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

4. Press f11 while the “Press <F11> for recovery” message is displayed on the screen.

5. Follow the on-screen instructions.

Using a Windows Vista operating system DVD (purchased separately)

If you are unable to boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows Vista operating system DVD, go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.

△ **CAUTION:** Using a Windows Vista operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows Vista operating system DVD, follow these steps:

NOTE: This process takes several minutes.

1. If possible, back up all personal files.

2. Restart the computer, and then insert the Windows Vista operating system DVD into the optical drive before the Windows operating system loads.

3. When prompted, press any keyboard key.

4. Follow the on-screen instructions.

5. Click **Next**.

6. Select **Repair your computer**.

7. Follow the on-screen instructions.

Backup and recovery in Windows XP

Overview

To protect your information, use the Windows® Backup utility (select models only) to back up files and folders or create recovery points. In case of system failure, you can use the backup files to restore your computer.

Windows provides the following options:

- Backing up individual files and folders
- Backing up all files and folders
- Scheduling automatic backups
- Creating recovery points
- Recovering information

NOTE: For detailed instructions, perform a search for these topics in Help and Support.

NOTE: In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

You can back up individual files or folders to an optional external hard drive or to a network drive.

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.
- Back up templates stored in their associated programs.
- Save customized settings that appear 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 you want to save.

  b. Copy the screen image:

  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, click **Edit > Paste**.

  The screen image is added to the document.

  d. Save the document.

To create a backup using the Windows Backup utility (select models only), follow these steps:

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

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

1. Click **Start > All Programs > Accessories > System Tools > Backup**.
2. Follow the on-screen instructions.

Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools (select models only): You can use the Windows Backup utility to recover information you have previously backed up.
- *Operating System* and *Driver Recovery* discs (included with your computer): You can use the discs to recover your operating system and programs installed at the factory.

Recovering your information

To recover information you previously backed up, follow these steps:

1. If possible, back up all personal files.
2. Click **Start > All Programs > Accessories > System Tools > Backup**.

   The Backup or Restore Wizard opens.
3. Click **Restore files and settings**, and then click **Next**.
4. Follow the on-screen instructions.

NOTE: For additional information on initiating a recovery in Windows, perform a search for this topic in Help and Support.

Recovering the operating system and programs

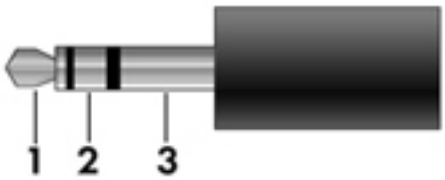
CAUTION: The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled.

To recover your operating system and programs, follow these steps:

1. If possible, back up all personal files.
2. Insert the *Operating System* disc into the optical drive.
3. Shut down the computer.
4. Turn on the computer.
5. Follow the on-screen instructions to install the operating system.
6. After the operating system is installed, remove the *Operating System* disc and insert the *Driver Recovery* disc.
7. Follow the on-screen instructions to install the drivers and programs.

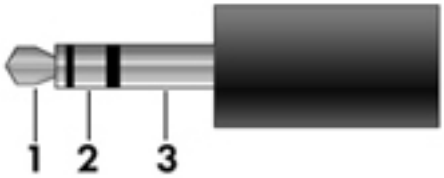
9 Connector pin assignments

Audio-in (microphone)



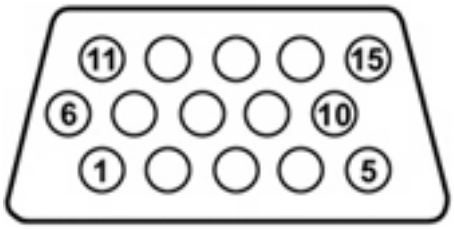
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



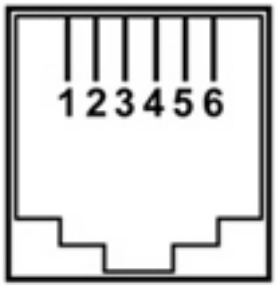
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



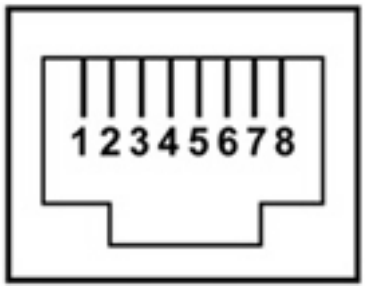
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



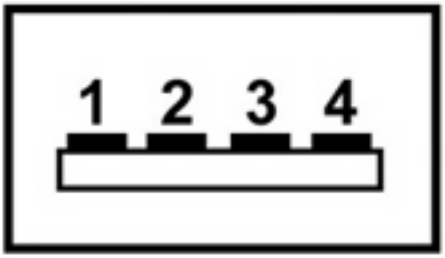
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)



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

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

Requirements for all countries and regions

The requirements listed below are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

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. Exercise caution 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. When you remove these components, handle them carefully.

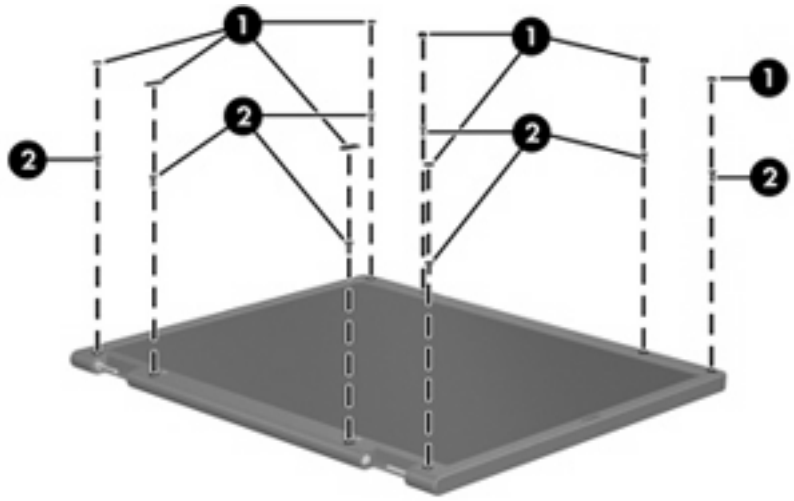
NOTE: **Materials Disposal**. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities,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

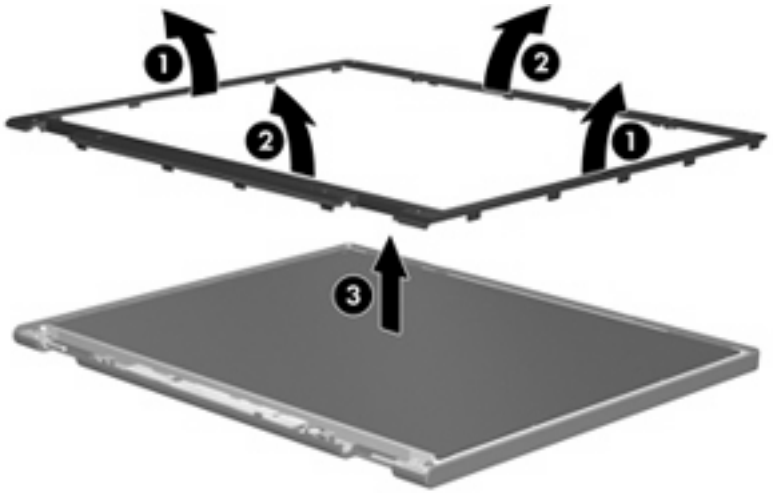
NOTE: The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

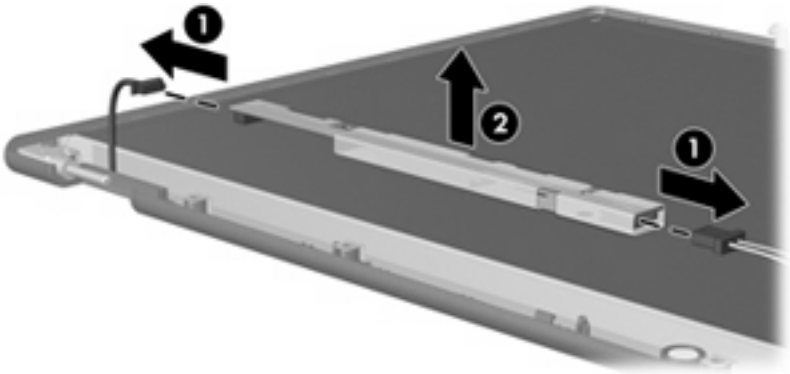
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



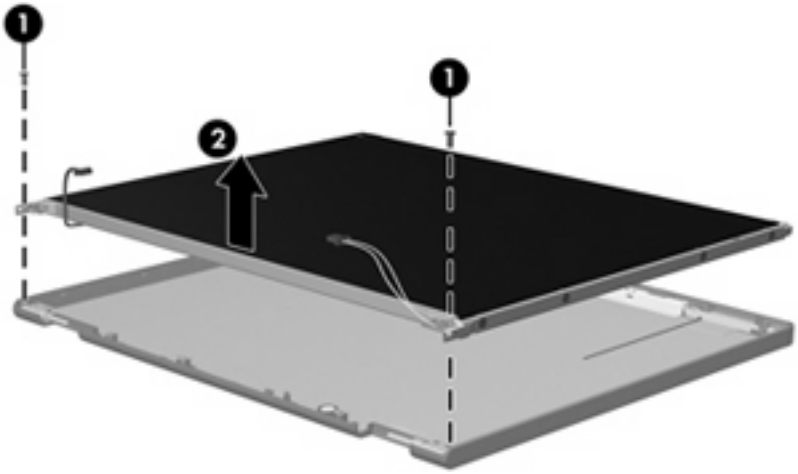
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



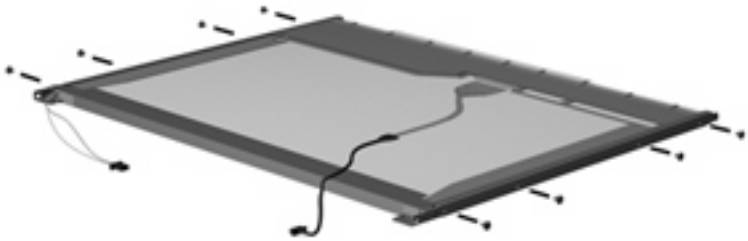
4. Disconnect all display panel cables **(1)** from the display inverter and remove the display inverter **(2)**.



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.

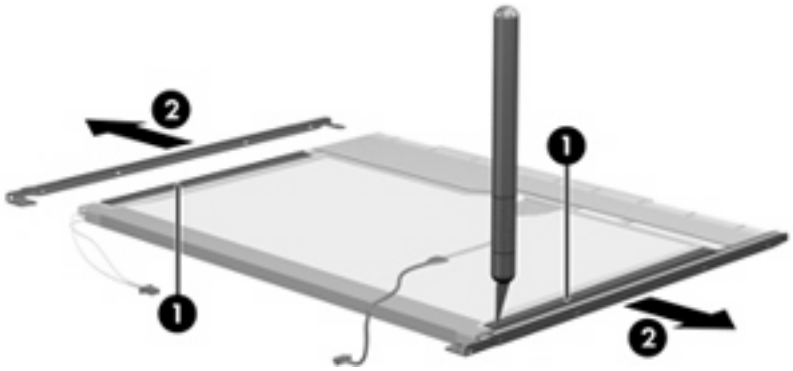


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

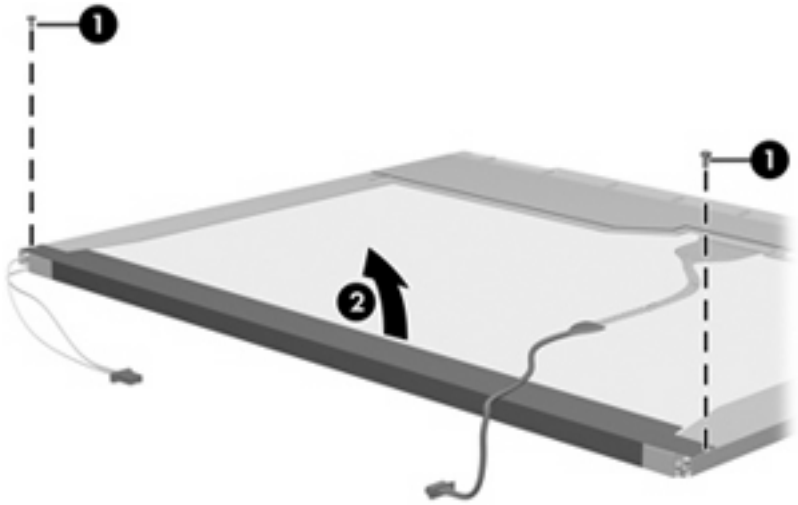


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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

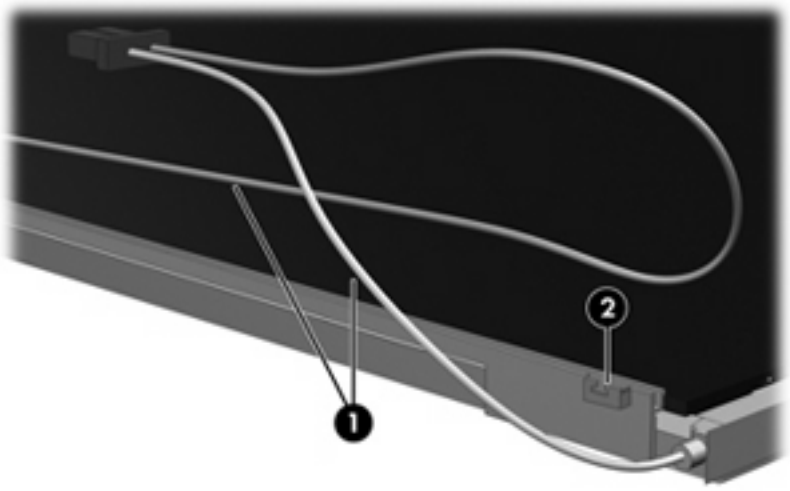


11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



13. Remove the backlight cover.
14. Turn the display panel right-side up.

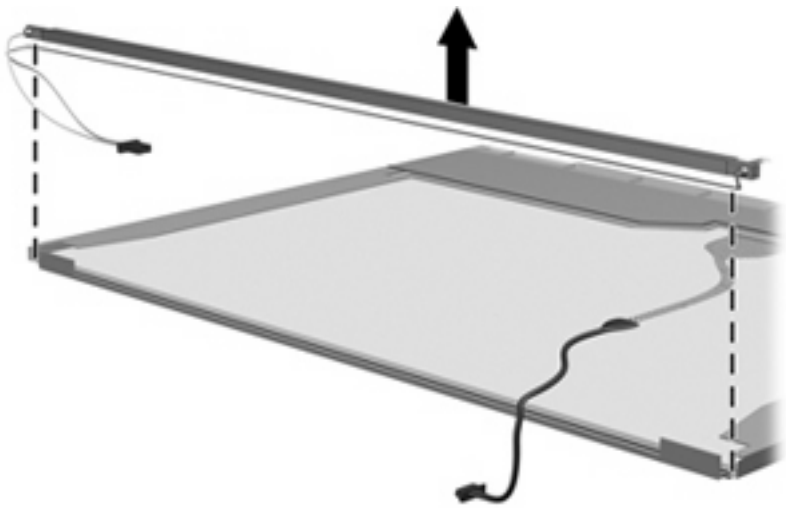
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



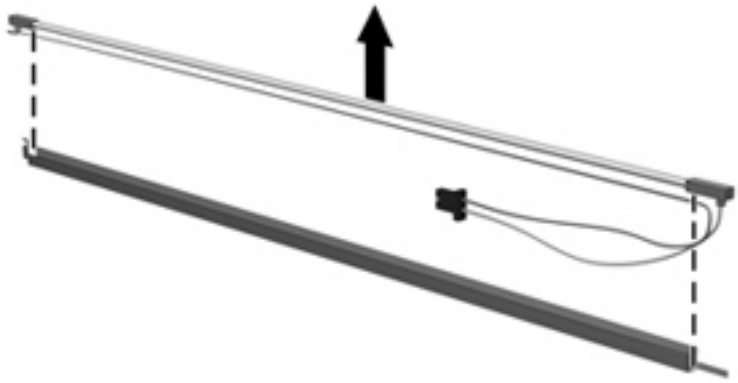
16. Turn the display panel upside down.

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

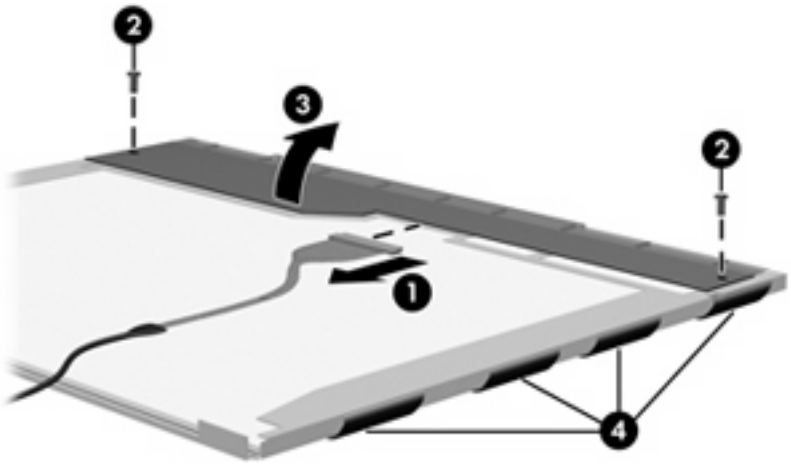
17. Remove the backlight frame from the display panel.



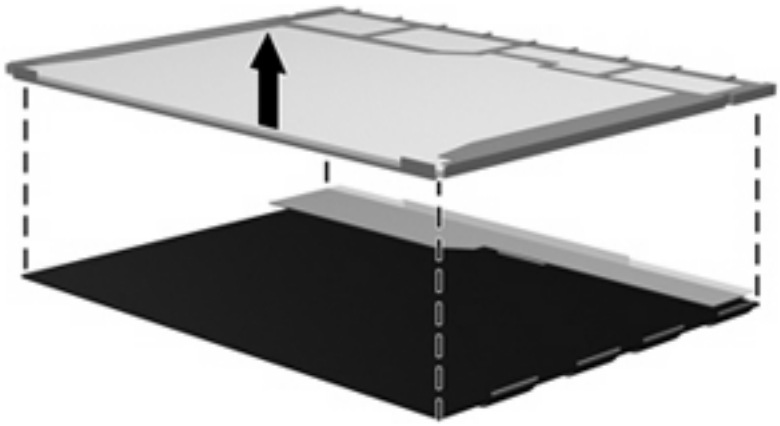
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel 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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