HP Compaq 8510w Mobile Workstation and HP Compaq 8510p Notebook PC

Maintenance and Service Guide

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MSG revision history

Revision	Publication date	Description
A	May 2010	• Updated commodities in the following location: Product description on page 1. • Updated AC adapter spare part numbers in the following locations: Miscellaneous parts on page 30, Sequential part number listing on page 31 • Updated the RTC battery spare part number in the following locations: Miscellaneous parts on page 30, Sequential part number listing on page 31 • Added a newly supported display latch to spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31 • Added newly supported batteries to spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31, Battery on page 47 • Removed obsolete hard drives from spare parts listings in the following locations: Computer major components on page 18, Mass storage devices on page 29, Sequential part number listing on page 31, Hard drive on page 51 • Updated memory module spare part numbers in the following locations: Computer major components on page 18, Sequential part number listing on page 31, Memory module on page 56 • Added newly supported WWAN modules to spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31, WWAN module on page 61 • Added newly supported processors to spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31, Processor on page 67 • Removed obsolete WLAN modules from spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31, WLAN module on page 72 • Removed obsolete displays from spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31, Display assembly on page 79 • Added newly supported system boards to spare parts listings in the following locations: Computer major components on page 18, Sequential part number listing on page 31, System board and system board frame on page 90 • Updated hard drive specifications in the following location: Hard drive specifications on page 110

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	HP Compaq 8510w Mobile Workstation	HP Compaq 8510p Notebook PC
Product Name	**HP Compaq 8510w Mobile Workstation**	√	
	HP Compaq 8510p Notebook PC		√
Processors	**Intel® Core™ 2 Duo processors**		
	T9500 2.6-GHz processor 6-MB L2 cache, 800-MHz FSB	√	√
	T9300 2.5-GHz processor 6-MB L2 cache, 800-MHz FSB	√	√
	T8300 2.4-GHz processor 3-MB L2 cache, 800-MHz FSB	√	√
	T8100 2.1-GHz processor 3-MB L2 cache, 800-MHz FSB	√	√
	T7800 2.6-GHz processor 4-MB L2 cache, 800-MHz FSB	√	√
	T7700 2.4-GHz processor 4-MB L2 cache, 800-MHz FSB	√	√
	T7500 2.2-GHz processor 4-MB L2 cache, 800-MHz FSB	√	√
	T7300 2.0-GHz processor 4-MB L2 cache, 800-MHz FSB	√	√
	T7250 1.9-GHz processor 4-MB L2 cache, 800-MHz FSB	√	√
	T7100 1.8-GHz processor 2-MB L2 cache, 800-MHz FSB	√	√
Chipset	Northbridge: Intel 965PM with iAMT support	√	√
	Southbridge Intel ICH8M-enhanced	√	√
Graphics	ATI M76M graphics card with 256 MB of graphics subsystem memory (supports Hypermemory)	√	√

Category	Description	HP Compaq 8510w Mobile Workstation	HP Compaq 8510p Notebook PC
	nVidia Quadro FX 570M graphics card (supports TurboCache)	√	
	OpenGL driver support	√	
Panel	All display assemblies include 3 wireless local area network (WLAN) antennae	√	√
	15.4-inch WUXGA AntiGlare with 2 wireless wide area network (WWAN) antennae	√	√
	15.4-inch WSXGA+ AntiGlare with 2 WWAN antennae	√	√
	15.4-inch WXGA AntiGlare with 2 WWAN antennae	√	√
	15.4-inch WUXGA AntiGlare	√	√
	15.4-inch WSXGA+ AntiGlare	√	√
	15.4-inch WXGA AntiGlare	√	√
	Support privacy film	√	√
Memory	Two customer-accessible/upgradable memory module slots	√	√
	Supports dual channel memory	√	√
	Supports up to 8 GB of system RAM	√	√
	PC2-5300, 667-MHz, DDR2	√	√
	Supports the following configurations: • 8192 (4096 × 2, dual channel) • 6144 (4096 + 2048) • 5120 (4096 + 1024) • 4096 (4096 × 1) • 4096 (2048 × 2, dual channel) • 3072 (2048 + 1024) • 2048 (1024 × 2, dual channel) • 2048 (2048 × 1) • 1536 (1024 + 512) • 1024 (512 × 2, dual channel) • 1024 (1024 × 1) • 512 (512 × 1)	√	√

Category	Description	HP Compaq 8510w Mobile Workstation	HP Compaq 8510p Notebook PC
Hard drives	Supports 9.5-mm, 2.5-inch hard drives	√	√
	Customer-accessible	√	√
	Serial ATA	√	√
	Supports the following drives: • 250-GB, 7200-rpm • 160-GB, 7200-rpm	√	√
Optical drives	Fixed (removal of 1 screw required)	√	√
	Customer-accessible	√	√
	Parallel ATA	√	√
	12.7-mm tray load	√	√
	Supports the following drives: • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive • DVD-CD/RW Combo Drive • Blu-Ray DVD-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	√	√
Microphone	Integrated microphone	√	√
Audio	HD audio - ADI1981	√	√
Modem	56K V.92 1.5-inch data/fax modem with digital line guard	√	√
	HD audio interface	√	√
	Modem cable included in Brazil, the Czech Republic, Europe, France, Greece, Hungary, Israel, Latin America, Poland, Russia, Saudi Arabia, Slovakia, Slovenia, South Africa, Turkey, and the United Kingdom	√	√
Ethernet	Intel 82566MM 10/100/1000 network interface card (NIC) with iAMT	√	√
	S3/S4/S5 wake on LAN: DC - no	√	√

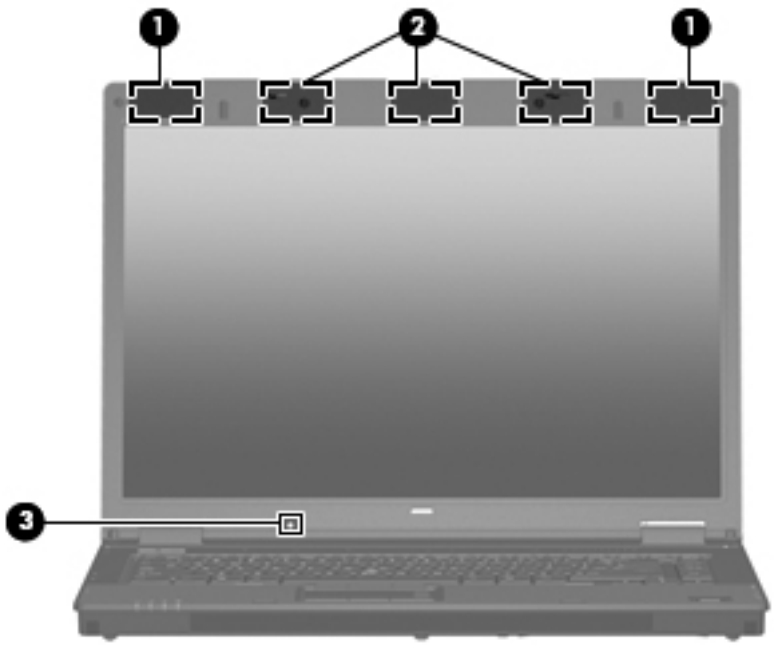
Category	Description	HP Compaq 8510w Mobile Workstation	HP Compaq 8510p Notebook PC
	S3/S4/S5 wake on LAN: AC - yes	√	√
	NIC power down technology	√	√
Wireless	**Integrated WLAN options by way of wireless module:**		
	Three WLAN antennae built into display assembly	√	√
	Support for no WLAN option	√	√
	Support for the following WLAN formats: • Intel 802.11a/b/g/n with iAMT support • Broadcom 802.11a/b/g • Intel 802.11a/b/g with iAMT support • Broadcom 802.11b/g	√	√
	Integrated WWAN options by way of wireless module:		
	Two WWAN 5-band antennae built into display assembly	√	√
	Subscriber identity module (SIM) security (customer-accessible in battery bay)	√	√
	Support for the following WWAN formats: • Evolution-data optimized (EVDO) • High-speed downlink packet access (HSDPA)	√	√
	Integrated personal area network (PAN) options by way of Bluetooth® module:		
	Support for no PAN option	√	√
	Broadcom Bluetooth	√	√
External media card	One Type I/II PC Card slot, supporting 16-bit and 32-bit (Cardbus) PC Card modules	√	√
	Integrated SD flash media slot with SD/MMC support	√	√
Ports	Audio-in (mono microphone)	√	√
	Audio-out (stereo headphone)	√	√
	HDMI 4	√	√
	RJ-11 (modem)	√	√
	RJ-45 (Ethernet, includes link and activity lights)	√	√
	USB (3)	√	

Category	Description	HP Compaq 8510w Mobile Workstation	HP Compaq 8510p Notebook PC
	USB (1)		√
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug with auto-detect)	√	√
	1394	√	
	3-pin AC power	√	√
Docking	(Picabo), (Moseley), (K2)	√	√
Keyboard/pointing devices	12.3-inch keyboard with durable key cap coating	√	√
	Dual point (pointing stick and TouchPad) with 3 pointing stick buttons and 3 TouchPad buttons and vertical scrolling (taps enabled as default)	√	√
	Touchpad only with 2 TouchPad buttons and vertical scrolling (taps enabled as default)		√
	Windows Vista Hardware Start Button	√	√
Power requirements	90-W AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)	√	√
	8-cell, 2.55-Ah (73-Wh) Li-ion battery	√	√
	Support for 8-cell Extended Life Battery	√	√
	Support for 12-cell Ultra Capacity Battery	√	√
Security	Integrated fingerprint reader	√	√
	Integrated Smart Card reader	√	√
	Security cable slot	√	√
	Trusted platform module (TPM) V.1.2	√	√
Operating system	**Preinstalled:**		
	Windows Vista® Business 32/64	√	√
	Windows Vista Ultimate 64	√	√
	Windows® XP Professional	√	√
	FreeDOS	√	√
	Preinstalled with Microsoft Office:		
	Windows Vista Business 32/64 with Office 2007 Ready	√	√
	Windows Vista Business 32/64 with Office 2007 Personal		√

Category	Description	HP Compaq 8510w Mobile Workstation	HP Compaq 8510p Notebook PC
	Windows XP Professional with Office 2007 Ready	√	√
	Windows XP Professional with Office 2007 Personal		√
	Restore Media:		
	Windows Vista Business 32/64	√	√
	Windows Vista Home 32	√	√
	Windows XP Professional	√	√
	DRDVD XP	√	√
	DRDVD Vista	√	√
	Supported:		
	Windows Vista Enterprise	√	√
	Windows® 2000	√	√
	Windows XP Professional 64	√	√
	Certified:		
	Linux	√	√
Serviceability	**End-user replaceable parts:**		
	AC adapter	√	√
	Battery (system)	√	√
	Hard drive	√	√
	Memory module	√	√
	Optical drive	√	√
	WLAN module	√	√

2 External component identification

Display components



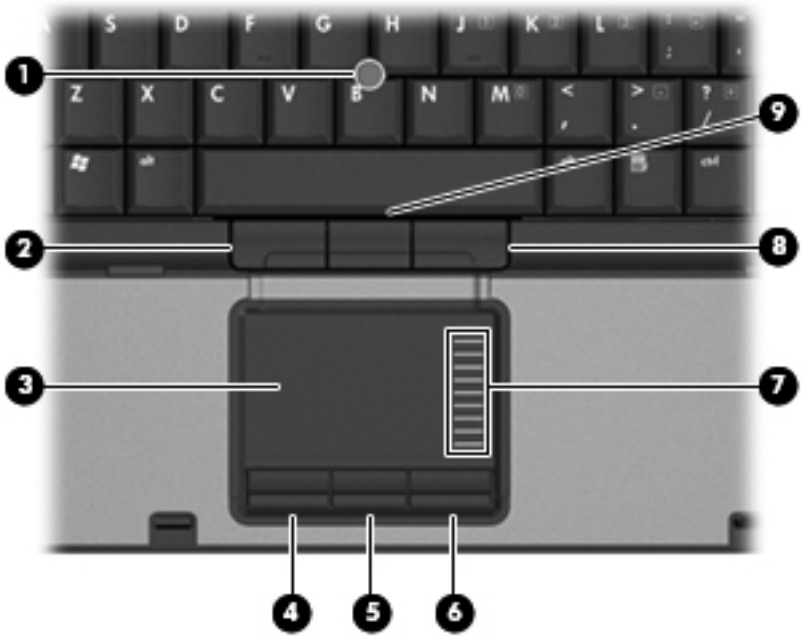
Item	Component	Function
(1)	WWAN antennae (2) (select models only)*	Send and receive wireless signals to communicate with WWANs.
(2)	WLAN antenna (3) (select models only)*	Send and receive wireless signals to communicate with WLANs.
(3)	Ambient light sensor	When activated, the sensor automatically adjusts the display brightness based on the surrounding lighting conditions.

*The antennae are not visible from the outside of the computer. 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.

Top components

Pointing devices



Item	Component	Function
(1)	Pointing stick (select models only)	Moves the pointer and selects or activates items on the screen.
(2)	Left pointing stick button (select models only)	Functions like the left button on an external mouse.
(3)	TouchPad	Moves the pointer and selects or activates items on the screen.
(4)	Left TouchPad button	Functions like the left button on an external mouse.
(5)	Center TouchPad button (select models only)	Functions like the center button on an external mouse.
(6)	Right TouchPad button	Functions like the right button on an external mouse.
(7)	TouchPad scroll zone	Scrolls up or down.
(8)	Right pointing stick button (select models only)	Functions like the right button on an external mouse.
(9)	Center pointing stick button (select models only)	Functions like the center button on an external mouse.

NOTE: 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**.

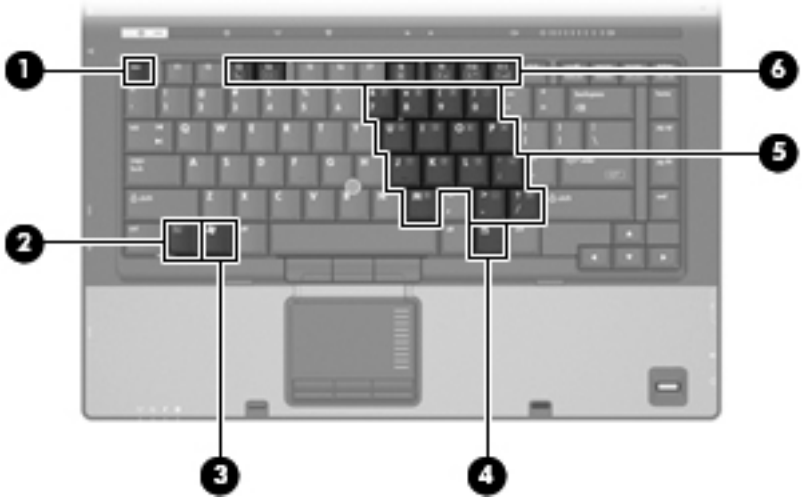
Buttons, switches, and fingerprint reader

Item	Component	Function
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to shut down the computer. • When the computer is in the Sleep state (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. 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 > System and Maintenance > Power Options**.
(2)	Internal display switch	Turns off the display if the display is closed while the power is on.
(3)	Info button	Launches Info Center, which enables you to open various software solutions.
(4)	Wireless button	Turns the wireless feature on or off, but does not establish a wireless connection. **NOTE:** A wireless network must be set up in order to establish a wireless connection.

Item	Component	Function
(5)	Presentation button	Starts the presentation feature.
(6)	Volume mute button (select models only)	Mutes and restores speaker sound.
(7)	Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume.
(8)	Internal microphone	Records sound.
(9)	HP Fingerprint Sensor (finger print reader)	Allows a fingerprint logon to Windows, instead of a password logon.

Keys

NOTE: Your computer may look slightly different from the illustration in this section.



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

Lights

Item	Component	Function
(1)	Wireless lights (2)†	• On: 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. • Off: All wireless devices are off.
(2)	Power lights (2)*	• On: The computer is on. • Blinking: The computer is in the Sleep state (Windows Vista) or in Standby (Windows XP). • Blinking rapidly: An AC adapter with a higher power rating should be connected. • Off: The computer is off or in Hibernation.
(3)	Battery light	• Amber: A battery is charging. • Green: 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.
(4)	Drive light	• Blinking green: The hard drive or optical drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the internal hard drive.

Item	Component	Function
(5)	Info center light	On: Info Center is on.
(6)	Presentation light	On: Presentation feature is on.
(7)	Caps lock light	On: Caps lock is on.
(8)	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
(9)	Volume mute light	• Off: Computer sound is on. • On: Computer sound is off.
(10)	Volume down light	Blinking: The volume scroll zone is being used to decrease speaker volume.
(11)	Volume up light	Blinking: The volume scroll zone is being used to increase speaker volume.

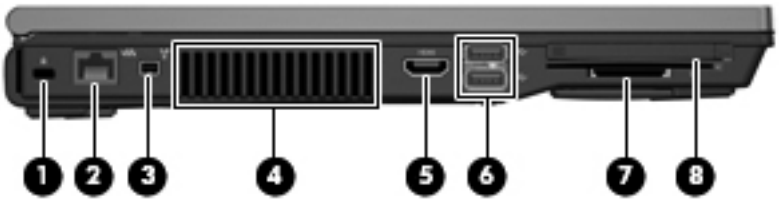
*The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.

†The 2 wireless lights display the same information. The light on the wireless button is visible only when the computer is open. The wireless light on the front of the computer is visible whether the computer is open or closed.

Front components

Item	Component	Function
(1)	Wireless light	• On: An integrated wireless device, such as a WLAN device, the HP Broadband Wireless Module, and/or a Bluetooth device, is turned on. • Off: All wireless devices are turned off.
(2)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state (Windows Vista) or in Standby (Windows XP). • Blinking rapidly: An AC adapter with a higher power rating should be connected. • Off: The computer is off or in Hibernation.
(3)	Battery light	• Amber: A battery is charging. • Green: 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.
(4)	Drive light	• Blinking green: The hard drive or optical drive is being accessed. • Amber (select models only): HP 3D DriveGuard has temporarily parked the hard drive.
(5)	Speakers	Produce sound.
(6)	Display release latch	Opens the computer.

Left-side components

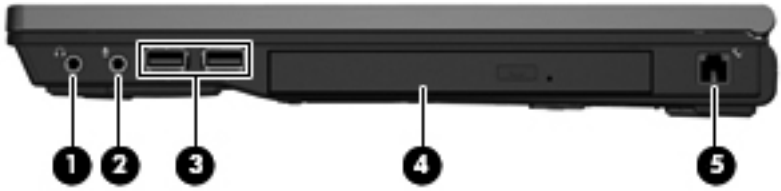


Item	Component	Function
(1)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2	RJ-45 (network) jack	Connects a network cable. **NOTE:** The RJ-45 (network) jack provides Gigabit Ethernet functionality.
(3)	1394 port (select models only)	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(4)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(6)	USB ports (2)	Connect optional USB devices.
(7)	Media Card Reader	Supports the following optional digital card formats: MultiMedia Card (MMC) and Secure Digital (SD) Memory Card.
(8)	PC Card slot (select models only)	Supports optional Type I or Type II 32-bit (CardBus) or 16-bit PC Cards.

Rear components

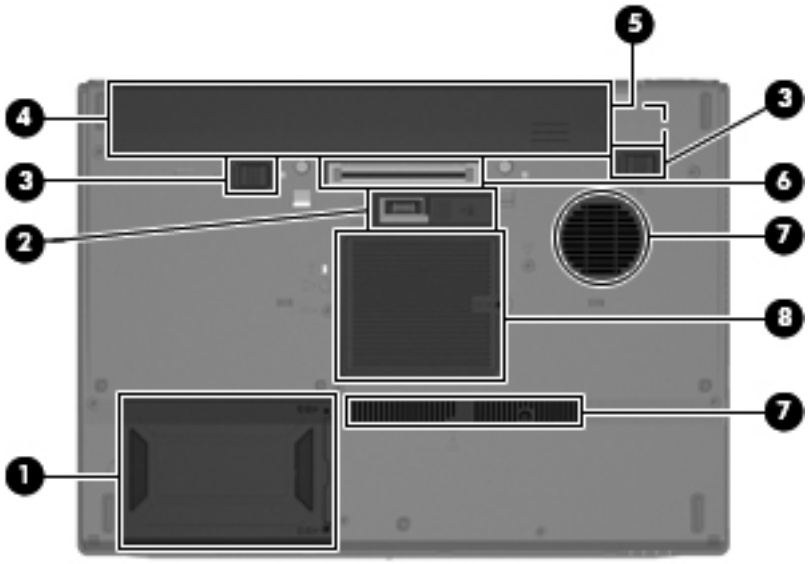
Item	Component	Function
(1)	Power connector	Connects an AC adapter.
(2)	External monitor port	Connects an external VGA monitor or projector.

Right-side components



Item	Component	Function
(1)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(2)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(3)	USB ports (2) (select models only)	Connect optional USB devices.
(4)	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
(5)	RJ-11 (modem) jack	Connects a modem cable.

Bottom components

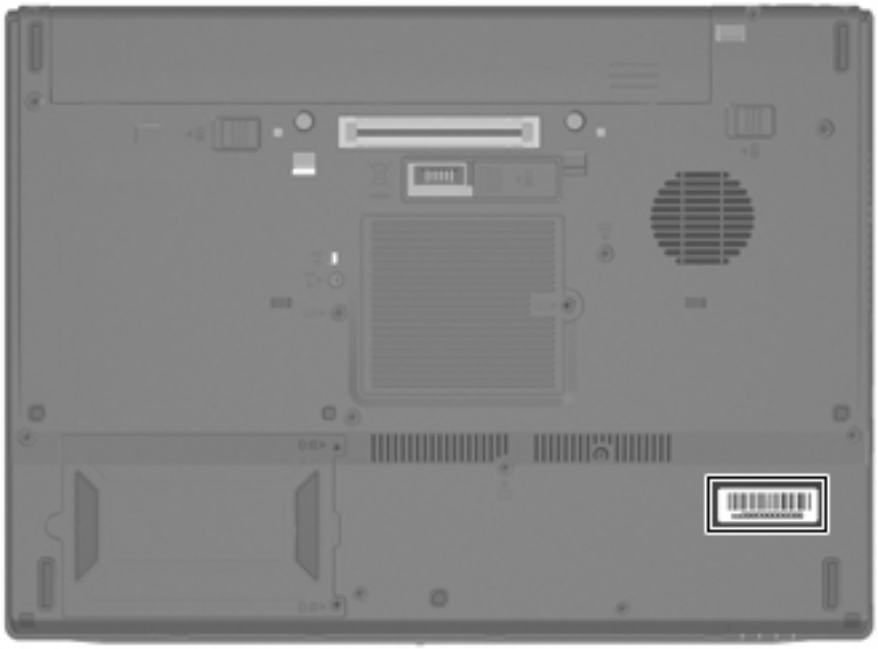


Item	Component	Function
(1)	Hard drive bay	Holds the hard drive.
(2)	Accessory battery connector	Connects an optional accessory battery.
(3)	Battery release latches (2)	Release the battery from the battery bay.
(4)	Battery bay	Holds the battery.
(5)	SIM slot (select models only)	Contains a SIM. The SIM slot is located inside the battery bay.
(6)	Docking connector	Connects an optional docking device.
(7)	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. Contains a WWAN module slot.
(8)	Memory module compartment	Contains a memory module slot and 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.

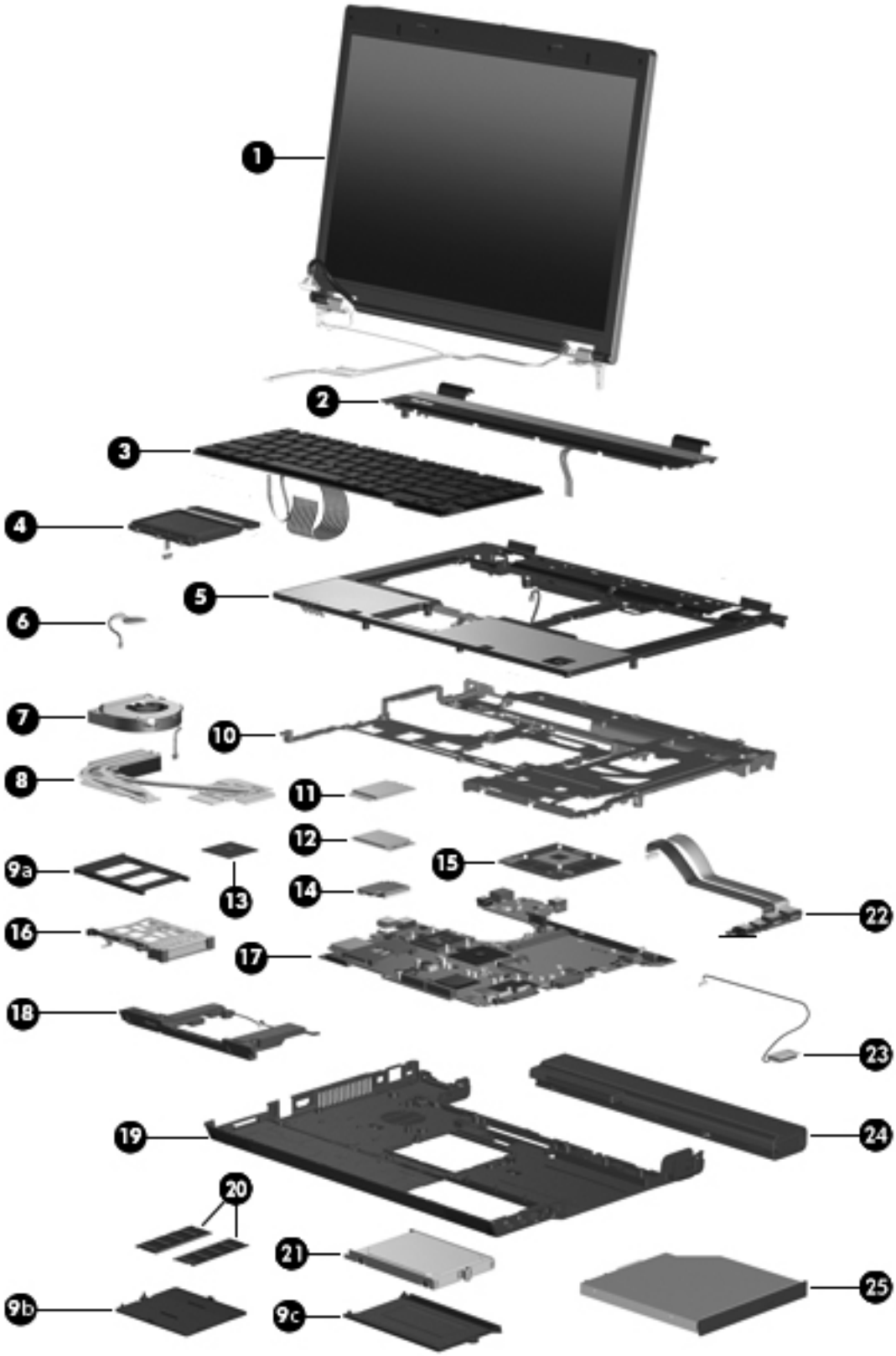
3 Illustrated parts catalog

Serial number location

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



Computer major components



Item	Description	Spare part number
(1)	**Display assemblies** for use with computer models equipped with WLAN and WWAN capability (includes 3 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)	
	15.4-inch, WSXGA+	452211-001
	15.4-inch, WXGA	452210-001
	Display assemblies for use with computer models equipped with only WLAN capability (includes 3 WLAN antenna transceivers and cables)	
	15.4-inch, WUXGA	452209-001
	15.4-inch, WSXGA+	452208-001
	15.4-inch, WXGA	452207-001
	Display internal components:	
	Display bezel for use with computer models equipped with WLAN and WWAN capability	455078-001
	Display bezel for use with computer models equipped with only WLAN capability	452215-001
	Display enclosure for use with computer models equipped with WLAN and WWAN capability (includes 3 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)	452217-001
	Display enclosure for use with computer models equipped only with WLAN capability (includes 3 WLAN antenna transceivers)	452216-001
	Display hinges	452213-001
	Display inverter	452214-001
	Display latch	516532-001
(2)	**Switch cover** (includes LED board and cable)	452226-001
(3)	**Keyboards with pointing stick** (include pointing stick and pointing stick cable)	
	For use in Belgium	452229-A41
	For use in Brazil	452229-201
	For use in the Czech Republic	452229-221
	For use in Denmark	452229-081
	For use in France	452229-051
	For use in French Canada	452229-121
	For use in Germany	452229-041
	For use in Greece	452229-DJ1
	For use in Hungary	452229-211
	For use in Iceland	452229-DD1
	For use in Israel	452229-BB1
	For use in Italy	452229-061

Item	Description	Spare part number
	For use in Japan	452229-291
	For use in Latin America	452229-161
	For use in the Netherlands	452229-B31
	For use in Norway	452229-091
	For use in Portugal	452229-131
	For use in Russia	452229-251
	For use in Saudi Arabia	452229-171
	For use in Slovakia	452229-231
	For use in Slovenia	452229-BA1
	For use in South Korea	452229-AD1
	For use in Spain	452229-071
	For use in Sweden	452229-B71
	For use in Switzerland	452229-BG1
	For use in Taiwan	452229-AB1
	For use in Thailand	452229-281
	For use in Turkey	452229-141
	For use in the United Kingdom	452229-031
	For use in the United States	452229-001
	Keyboards without pointing stick	
	For use in Belgium	452228-A41
	For use in Brazil	452228-201
	For use in the Czech Republic	452228-221
	For use in Denmark	452228-081
	For use in France	452228-051
	For use in French Canada	452228-121
	For use in Germany	452228-041
	For use in Greece	452228-DJ1
	For use in Hungary	452228-211
	For use in Iceland	452228-DD1
	For use in Israel	452228-BB1
	For use in Italy	452228-061
	For use in Japan	452228-291

Item	Description	Spare part number
	For use in Latin America	452228-161
	For use in the Netherlands	452228-B31
	For use in Norway	452228-091
	For use in Portugal	452228-131
	For use in Russia	452228-251
	For use in Saudi Arabia	452228-171
	For use in Slovakia	452228-231
	For use in Slovenia	452228-BA1
	For use in South Korea	452228-AD1
	For use in Spain	452228-071
	For use in Sweden	452228-B71
	For use in Switzerland	452228-BG1
	For use in Taiwan	452228-AB1
	For use in Thailand	452228-281
	For use in Turkey	452228-141
	For use in the United Kingdom	452228-031
	For use in the United States	452228-001
(4)	**TouchPads** (include TouchPad cable)	
	With 3 TouchPad buttons and 3 pointing stick buttons for use with keyboards with pointing stick (includes TouchPad cable)	455969-001
	With 2 TouchPad buttons for use with keyboards without pointing stick (includes TouchPad cable)	454248-001
(5)	**Top cover** (includes fingerprint reader board and cable)	
	For use with HP Compaq 8510w computer models (includes fingerprint reader board and cable)	452224-001
	For use with HP Compaq 8510p computer models (does not include fingerprint reader board)	452223-001
	Fingerprint reader board (not illustrated; includes fingerprint reader board cable)	455427-001
(6)	**RTC battery**	501228-001
(7)	**Fan**	452199-001
(8)	**Heat sink** (includes a heat sink clip and replacement thermal material)	452227-001
	Thermal Material Kits (not illustrated)	
	For use in all countries or regions except Japan and Asia countries and regions	413706-001
	For use only in Japan and Asia Pacific countries and regions	445853-001

Item	Description	Spare part number
	Plastics Kit (see Plastics Kit on page 27 for more Plastics Kit spare part information):	452221-001
(9a)	PC Card slot bezel	
(9b)	Memory module compartment cover	
(9c)	Hard drive cover	
	Base enclosure rubber screw covers (2, not illustrated)	
	Computer feet (10, not illustrated)	
(10)	**System board frame**	455428-001
(11)	**WWAN modules**	
	HP ev2210 1xEVDO-A WWAN module	451131-001
	HP hs2300 HSDPA WWAN module	448673-003
	HP ev2200 1xEV-DO Broadband WWAN Module	399440-001
(12)	**WLAN modules**	
	Intel 802.11a/b/g/n WLAN modules:	
	• For use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam	441086-001
	• For use in Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan	441086-002
	• For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea	441086-003
	• For use in Japan	441086-291
	Broadcom 802.11a/b/g WLAN modules:	
	• For use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	441075-001

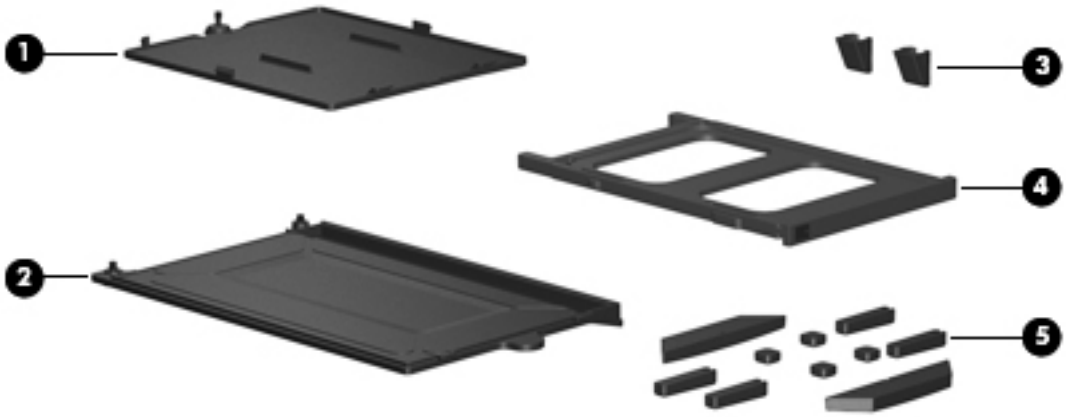
Item	Description	Spare part number
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, 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 and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, 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	441075-002
	• For use in Japan	441075-291
	Intel 802.11a/b/g WLAN modules:	
	• For use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam	441082-001
	• For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan	441082-002
	• For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea	441082-003
	• For use in Japan	441082-292
	Broadcom 802.11b/g WLAN modules:	
	• For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	441090-001

Item	Description	Spare part number
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, 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, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	441090-002
	• For use in Japan	441090-291
	Intel 802.11b/g WLAN module for use in Japan	448675-004
	Intel 802.11b/g WLAN module for use in Thailand	409280-004
(13)	**Intel Core Duo processors**	
	T9500 2.6-GHz processor (6-MB L2 cache, 800-MHz FSB)	463051-001
	T9300 2.5-GHz processor (6-MB L2 cache, 800-MHz FSB)	463050-001
	T8300 2.4-GHz processor (3-MB L2 cache, 800-MHz FSB)	463049-001
	T8100 2.1-GHz processor (3-MB L2 cache, 800-MHz FSB)	463048-001
	T7800 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB)	457612-001
	T7700 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB)	446894-001
	T7500 2.2-GHz processor (4-MB L2 cache, 800-MHz FSB)	446893-001
	T7300 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB)	446892-001
	T7250 2.0-GHz processor (2-MB L2 cache, 800-MHz FSB)	459463-001
	T7100 1.8-GHz processor (2-MB L2 cache, 800-MHz FSB)	446891-001

Item	Description	Spare part number
(14)	**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 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.	
	For use in all countries and regions except Australia and New Zealand	443899-001
	For use in Australia and New Zealand	443899-011
(15)	**Graphics cards** (include replacement thermal material)	
	ATI M76M graphics card with 256 MB of graphics subsystem memory (supports Hypermemory)	454247-001
	nVidia G84GLM graphics card with 256 MB of graphics subsystem memory (supports Turbo Cache)	455077-001
(16)	**PC Card assembly**	455893-001
(17)	**System boards** (include replacement thermal material)	
	For use in computer models equipped with WLAN and WWAN capability:	
	• In all countries and regions except Russia and the People's Republic of China with T7xxx processors	452219-001
	• In all countries and regions except Russia and the People's Republic of China with T8xxx and T9xxx processors	481536-001
	• Only in Russia and the People's Republic of China with T7xxx processors	510000-001
	• Only in Russia and the People's Republic of China with T8xxx and T9xxx processors	592233-001
	For use in computer models equipped only with WLAN capability:	
	• In all countries and regions except Russia and the People's Republic of China with T7xxx processors	452218-001
	• In all countries and regions except Russia and the People's Republic of China with T8xxx and T9xxx processors	481537-001
	• Only in Russia and the People's Republic of China with T7xxx processors	509999-001
	• Only in Russia and the People's Republic of China with T8xxx and T9xxx processors	592234-001
(18)	**Speaker assembly**	452225-001
(19)	**Base enclosure** (includes rubber feet)	452197-001
(20)	**Memory modules** (PC2-5300, 667-MHz, DDR2)	
	4096-MB	598855-001
	2048-MB	598858-001
	1024-MB	598861-001
	512-MB	598833-001
(21)	**Hard drives** (include hard drive bracket)	

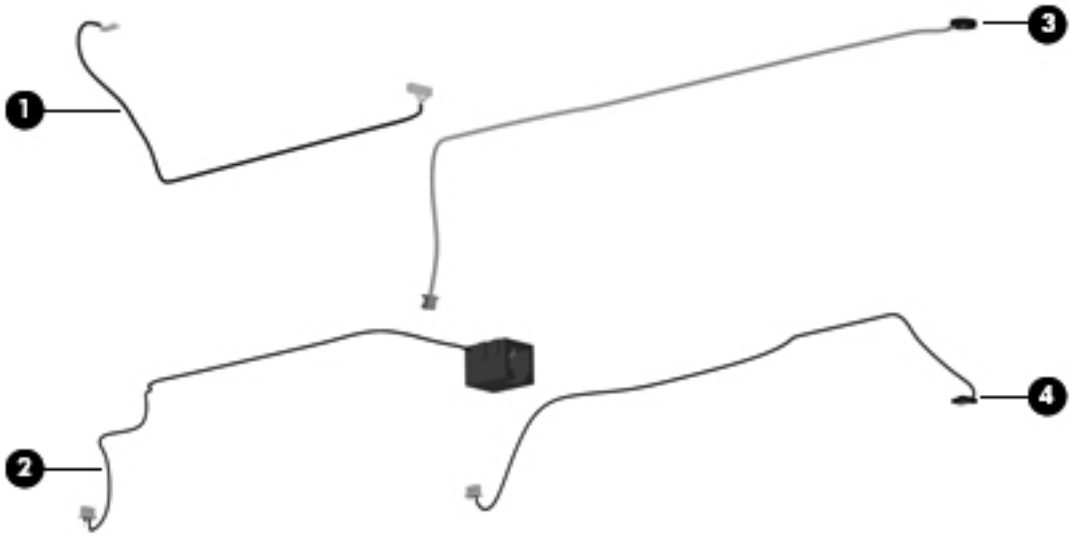
Item	Description	Spare part number
	250-GB, 7200-rpm	538972-001
	160-GB, 7200-rpm	455954-001
(22)	**USB/audio board** (includes USB board cable and audio board cable)	455426-001
(23)	**Broadcom Bluetooth modules** (do not include Bluetooth module cable) **NOTE:** The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 452198-001. See Cable Kit on page 28 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
(24)	**8-cell, 5.10-Ah (73-Wh) Li-ion battery**	
	For use in all countries and regions except for Japan and Thailand	452195-001
	For use in Japan	534064-001
	For use in Thailand	464474-001
(25)	**Optical drives** (include bezel)	
	DVD±RW and CD-RW Double-Layer Combo Drive with LightScribe	443903-001
	DVD±RW and CD-RW Double-Layer Combo Drive	443904-001
	Blu-Ray DVD-RW Drive	452220-001
	DVD/CD-RW Combo Drive	443901-001
	DVD-ROM Drive	443902-001
	Cable Kit (not illustrated; see Cable Kit on page 28 for more Cable Kit spare part number information)	452198-001

Plastics Kit



Item	Description	Spare part number
	Plastics Kit:	452221-001
(1)	Memory module compartment cover (includes one captive screw, secured by a C-clip)	
(2)	Hard drive cover (includes 2 captive screws, secured by C-clips)	
(3)	Base enclosure screw covers (2)	
(4)	PC Card slot bezel	
(5)	Computer feet (10)	

Cable Kit



Item	Description	Spare part number
	Cable Kit:	452198-001
(1)	Bluetooth module cable	
(2)	RJ-11 connector cable	
(3)	Microphone	
(4)	Modem module cable	

Mass storage devices

Item	Description	Spare part number
(1)	**Optical drives** (include bezel)	
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	443903-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	443904-001
	Blu-Ray DVD-RW Drive	452220-001
	DVD/CD-RW Combo Drive	443901-001
	DVD-ROM Drive	443902-001
(2)	**Hard drives** (include bracket)	
	250-GB, 7200-rpm	538972-001
	160-GB, 7200-rpm	455954-001

Miscellaneous parts

Description	Spare part number
AC adapters	
Smart Adapter, 90-W PFC, RC/V 3W	613153-001
Smart Adapter, 90-W PFC, RC/V EM 3W for use only in India	613160-001
Smart Adapter 90-W, non-PFC for use in India	463956-001
External MultiBay II	366143-001
External MultiBay II power cable and stand	366144-001
HP Extended Life Battery	367456-001
MultiBay 8X DVD-ROM Drive	373314-001
MultiBay 24X DVD/CD-RW Combo Drive	373315-001
Nylon carrying case	325814-001
USB 1.1 diskette drive	359118-001
Power cords:	
For use in Australia	246959-011
For use in Brazil	246959-201
For use in Denmark	246959-081
For use in Europe, the Middle East, and Africa	246959-021
For use in Israel	246959-BB1
For use in Italy	246959-061
For use in Japan	246959-291
For use in South Korea	246959-AD1
For use in Switzerland	246959-AG1
For use in the United Kingdom	246959-031

Description	Spare part number
For use the United States	246959-001
Screw Kit • Phillips PM2.5×4.0 screw • Phillips PM2.0×10.0 screw • Phillips PM2.0×5.0 captive screw • Phillips PM2.0×5.0 screw • Phillips PM2.0×4.0 screw • Phillips PM2.0×3.0 screw • Phillips PM2.0×2.0 broad head screw • Phillips PM2.0×2.0 screw • Phillips PM1.5×3.0 screw • Torx T8M2.5×7.0 screw • Torx T8M2.5×4.0 screw • Torx T6M2.0×5.0 screw	452222-001

Sequential part number listing

Spare part number	Description
246959-001	Power cord (3-wire) for use in North America
246959-011	Power cord (3-wire) for use in Australia
246959-021	Power cord (3-wire) for use in Europe, the Middle East, and Africa
246959-031	Power cord (3-wire) for use in the United Kingdom
246959-061	Power cord (3-wire) for use in Italy
246959-081	Power cord (3-wire) for use in Denmark
246959-201	Power cord (3-wire) for use in Norway
246959-291	Power cord (3-wire) for use in Japan
246959-AD1	Power cord (3-wire) for use in South Korea
246959-AG1	Power cord (3-wire) for use in Switzerland
246959-BB1	Power cord (3-wire) for use in Israel

Spare part number	Description
398393-002	Broadcom Bluetooth module for use in all countries and regions except Japan and Asia Pacific countries and regions **NOTE:** The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.
399440-001	HP ev2200 1xEV-DO Broadband WWAN Module
409280-004	Intel 802.11b/g WLAN module for use in Thailand
413706-001	Thermal Material Kit for use in all countries and regions except Japan and Asia Pacific countries and regions
441075-001	Broadcom 802.11a/b/g WLAN module for use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441075-002	Broadcom 802.11a/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, 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 and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, 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
441075-291	Broadcom 802.11a/b/g WLAN module for use in Japan
441082-001	Intel 802.11a/b/g WLAN module for use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam
441082-002	Intel 802.11a/b/g WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan
441082-003	Intel 802.11a/b/g WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea
441082-292	Intel 802.11a/b/g WLAN module for use in Japan

Spare part number	Description
441086-001	Intel 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam
441086-002	Intel 802.11a/b/g/n WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan
441086-003	Intel 802.11a/b/g/n WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea
441086-291	Intel 802.11a/b/g/n WLAN module for use in Japan
441090-001	Broadcom 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441090-002	Broadcom 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, 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, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
441090-291	Broadcom 802.11b/g WLAN module for use in Japan
443899-001	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 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.
443899-011	Modem module for use 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 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.

Spare part number	Description
443901-001	DVD/CD-RW Combo Drive
443902-001	DVD-ROM Drive
443903-001	DVD±RW and CD-RW Double-Layer Combo Drive
443904-001	DVD±RW and CD-RW Double-Layer Combo Drive with LightScribe
445853-001	Thermal Material Kit for use only in Japan and Asia Pacific countries and regions
446891-001	Intel Core Duo T7100 1.8-GHz processor (2-MB L2 cache, 800-MHz FSB)
446892-001	Intel Core Duo T7300 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB)
446893-001	Intel Core Duo T7500 2.2-GHz processor (4-MB L2 cache, 800-MHz FSB)
446894-001	Intel Core Duo T7700 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB)
448673-003	HP hs2300 HSDPA WWAN module
448675-004	Intel 802.11b/g WLAN module for use in Japan
450066-001	Broadcom Bluetooth module for use only in Japan and Asia Pacific countries and regions **NOTE:** The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.
451131-001	HP ev2210 1xEVDO-A WWAN module
452195-001	8-cell, 5.10-Ah (73-Wh) Li-ion battery for use in all countries and regions except Japan and Thailand
452197-001	Base enclosure (includes rubber feet)
452198-001	Cable Kit (see Cable Kit on page 28 for more Cable Kit spare part information)
452199-001	Fan
452207-001	15.4-inch WXGA display assembly for use with computer models equipped only with WLAN capability (includes 3 WLAN antenna transceivers and cables)
452208-001	15.4-inch WSXGA+ display assembly for use with computer models equipped only with WLAN capability (includes 3 WLAN antenna transceivers)
452209-001	15.4-inch WUXGA display assembly for use with computer models equipped only with WLAN capability (includes 3 WLAN antenna transceivers and cables)
452210-001	15.4-inch WXGA display assembly for use with computer models equipped with WLAN and WWAN capability (includes 3 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)
452211-001	15.4-inch WSXGA+ display assembly for use with computer models equipped with WLAN and WWAN capability (includes 3 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)
452213-001	Display hinges
452214-001	Display inverter
452215-001	Display bezel for use with computer models equipped with only WLAN capability

Spare part number	Description
452216-001	Display enclosure for use with computer models equipped only with WLAN capability (includes 3 WLAN antenna transceivers)
452217-001	Display enclosure for use with computer models equipped with WLAN and WWAN capability (includes 3 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)
452218-001	System board for use with computer models equipped only with WLAN capability
452219-001	System board for use with computer models equipped with WLAN and WWAN capability
452220-001	Blu-Ray DVD-RW Drive
452221-001	Plastics Kit (see Plastics Kit on page 27 for more Plastics Kit spare part information)
452222-001	Screw Kit
452223-001	Top cover for use with HP Compaq 8510p computer models (does not include fingerprint reader board)
452224-001	Top cover for use with HP Compaq 8510w computer models (includes fingerprint reader board and cable)
452225-001	Speaker assembly
452226-001	Switch cover (includes LED board and cable)
452227-001	Heat sink (includes a heat sink clip and replacement thermal material)
452228-001	Keyboard without pointing stick for use in the United States
452228-031	Keyboard without pointing stick for use in the United Kingdom (includes keyboard cable)
452228-041	Keyboard without pointing stick for use in Germany (includes keyboard cable)
452228-051	Keyboard without pointing stick for use in France (includes keyboard cable)
452228-061	Keyboard without pointing stick for use in Italy (includes keyboard cable)
452228-071	Keyboard without pointing stick for use in Spain (includes keyboard cable)
452228-081	Keyboard without pointing stick for use in Denmark (includes keyboard cable)
452228-091	Keyboard without pointing stick for use in Norway (includes keyboard cable)
452228-121	Keyboard without pointing stick for use in French Canada (includes keyboard cable)
452228-131	Keyboard without pointing stick for use in Portugal (includes keyboard cable)
452228-141	Keyboard without pointing stick for use in Turkey (includes keyboard cable)
452228-161	Keyboard without pointing stick for use in Latin America (includes keyboard cable)
452228-171	Keyboard without pointing stick for use in Saudi Arabia (includes keyboard cable)
452228-201	Keyboard without pointing stick for use in Brazil (includes keyboard cable)
452228-211	Keyboard without pointing stick for use in Hungary (includes keyboard cable)
452228-221	Keyboard without pointing stick for use in the Czech Republic (includes keyboard cable)
452228-231	Keyboard without pointing stick for use in Slovakia (includes keyboard cable)
452228-251	Keyboard without pointing stick for use in Russia (includes keyboard cable)
452228-281	Keyboard without pointing stick for use in Thailand (includes keyboard cable)

Spare part number	Description
452228-291	Keyboard without pointing stick for use in Japan (includes keyboard cable)
452228-A41	Keyboard without pointing stick for use in Belgium (includes keyboard cable)
452228-AB1	Keyboard without pointing stick for use in Taiwan (includes keyboard cable)
452228-AD1	Keyboard without pointing stick for use in South Korea (includes keyboard cable)
452228-B31	Keyboard without pointing stick for use in the Netherlands and Europe (includes keyboard cable)
452228-B71	Keyboard without pointing stick for use in Sweden (includes keyboard cable)
452228-BA1	Keyboard without pointing stick for use in Slovenia (includes keyboard cable)
452228-BB1	Keyboard without pointing stick for use in Israel (includes keyboard cable)
452228-BG1	Keyboard without pointing stick for use in Switzerland (includes keyboard cable)
452228-DD1	Keyboard without pointing stick for use in Iceland (includes keyboard cable)
452228-DJ1	Keyboard without pointing stick for use in Greece (includes keyboard cable)
452229-001	Keyboard with pointing stick for use in the United States (includes keyboard and pointing stick cables)
452229-031	Keyboard with pointing stick for use in the United Kingdom (includes keyboard and pointing stick cables)
452229-041	Keyboard with pointing stick for use in Germany (includes keyboard and pointing stick cables)
452229-051	Keyboard with pointing stick for use in France (includes keyboard and pointing stick cables)
452229-061	Keyboard with pointing stick for use in Italy (includes keyboard and pointing stick cables)
452229-071	Keyboard with pointing stick for use in Spain (includes keyboard and pointing stick cables)
452229-081	Keyboard with pointing stick for use in Denmark (includes keyboard and pointing stick cables)
452229-091	Keyboard with pointing stick for use in Norway (includes keyboard and pointing stick cables)
452229-121	Keyboard with pointing stick for use in French Canada (includes keyboard and pointing stick cables)
452229-131	Keyboard with pointing stick for use in Portugal (includes keyboard and pointing stick cables)
452229-141	Keyboard with pointing stick for use in Turkey (includes keyboard and pointing stick cables)
452229-161	Keyboard with pointing stick for use in Latin America (includes keyboard and pointing stick cables)
452229-171	Keyboard with pointing stick for use in Saudi Arabia (includes keyboard and pointing stick cables)
452229-201	Keyboard with pointing stick for use in Brazil (includes keyboard and pointing stick cables)
452229-211	Keyboard with pointing stick for use in Hungary (includes keyboard and pointing stick cables)
452229-221	Keyboard with pointing stick for use in the Czech Republic (includes keyboard and pointing stick cables)
452229-231	Keyboard with pointing stick for use in Slovakia (includes keyboard and pointing stick cables)
452229-251	Keyboard with pointing stick for use in Russia (includes keyboard and pointing stick cables)
452229-281	Keyboard with pointing stick for use in Thailand (includes keyboard and pointing stick cables)
452229-291	Keyboard with pointing stick for use in Japan (includes keyboard and pointing stick cables)
452229-A41	Keyboard with pointing stick for use in Belgium (includes keyboard and pointing stick cables)

Spare part number	Description
452229-AB1	Keyboard with pointing stick for use in Taiwan (includes keyboard and pointing stick cables)
452229-AD1	Keyboard with pointing stick for use in South Korea (includes keyboard and pointing stick cables)
452229-B31	Keyboard with pointing stick for use in the Netherlands and Europe (includes keyboard and pointing stick cables)
452229-B71	Keyboard with pointing stick for use in Sweden (includes keyboard and pointing stick cables)
452229-BA1	Keyboard with pointing stick for use in Slovenia (includes keyboard and pointing stick cables)
452229-BB1	Keyboard with pointing stick for use in Israel (includes keyboard and pointing stick cables)
452229-BG1	Keyboard with pointing stick for use in Switzerland (includes keyboard and pointing stick cables)
452229-DD1	Keyboard with pointing stick for use in Iceland (includes keyboard and pointing stick cables)
452229-DJ1	Keyboard with pointing stick for use in Greece (includes keyboard and pointing stick cables)
454247-001	ATI M76M graphics card with 256 MB of graphics subsystem memory (supports Hypermemory; includes replacement thermal material)
454248-001	TouchPad with 2 TouchPad buttons (for use with keyboards without pointing stick; includes TouchPad cable)
455077-001	nVidia G84GLM graphics card with 256 MB of graphics subsystem memory (supports Turbo Cache; includes replacement thermal material)
455078-001	Display bezel for use with computer models equipped with WLAN and WWAN capability
455426-001	USB/audio board (includes USB cable and audio cable)
455427-001	Fingerprint reader board (includes fingerprint reader board cable)
455428-001	System board frame
455893-001	PC Card assembly
455954-001	160-GB, 7200-rpm hard drive (includes hard drive bracket)
455969-001	TouchPad with 3 TouchPad buttons and 3 pointing stick buttons (for use with keyboards with pointing stick; includes TouchPad cable)
457612-001	Intel Core Duo T7800 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB)
459463-001	Intel Core Duo T7250 2.0-GHz processor (2-MB L2 cache, 800-MHz FSB)
463048-001	Intel Core Duo T8100 2.1-GHz processor (3-MB L2 cache, 800-MHz FSB)
463049-001	Intel Core Duo T8300 2.4-GHz processor (3-MB L2 cache, 800-MHz FSB)
463050-001	Intel Core Duo T9300 2.5-GHz processor (6-MB L2 cache, 800-MHz FSB)
463051-001	Intel Core Duo T9500 2.6-GHz processor (6-MB L2 cache, 800-MHz FSB)
463956-001	Smart Adapter, 90-W, non-PFC for use in India
464474-001	8-cell, 5.10-Ah (73-Wh) Li-ion battery only for use in Thailand
481536-001	System board for use with computer models equipped with WLAN and WWAN capability with T8xxx and T9xxx processors

Spare part number	Description
481537-001	System board for use with computer models equipped only with WLAN capability with T8xxx and T9xxx processors
501228-001	RTC battery
509999-001	System board for use with computer models equipped only with WLAN capability only in Russia and the People's Republic of China
510000-001	System board for use with computer models equipped with WLAN and WWAN capability only in Russia and the People's Republic of China
516532-001	Display latch
534064-001	8-cell, 5.10-Ah (73-Wh) Li-ion battery only for use in Japan
538972-001	250-GB, 7200-rpm hard drive (includes hard drive bracket)
592233-001	System board for use with computer models equipped with WLAN and WWAN capability with T8xxx and T9xxx processors for use only in Russia and China
592234-001	System board for use with computer models equipped only with WLAN capability with T8xxx and T9xxx processors for use only in Russia and China
598833-001	512-MB memory module (PC2-5300, 667-MHz, DDR2)
598855-001	4096-MB memory module (PC2-5300, 667-MHz, DDR2)
598858-001	2048-MB memory module (PC2-5300, 667-MHz, DDR2)
598861-001	1024-MB memory module (PC2-5300, 667-MHz, DDR2)
613153-001	Smart Adapter 90-W PFC, RC/V 3W
613160-001	Smart Adapter 90-W PFC, RC/V EM 3W for use only in India

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
- Hex metric 5.0-mm nut driver
- 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

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

Avoid exposing 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 47).
5. Remove the real-time clock (RTC) battery (see RTC battery on page 78).
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.

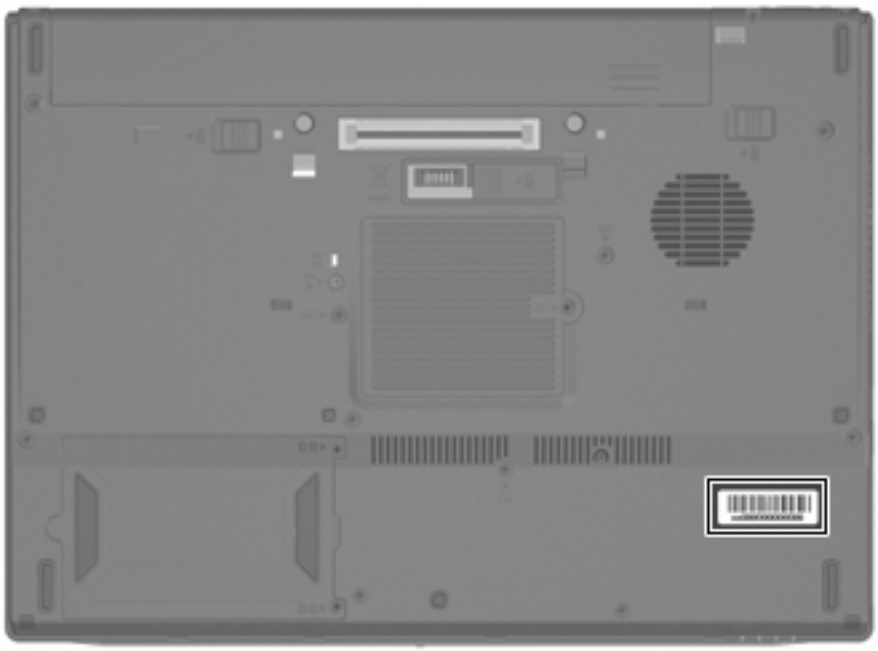
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 97 screws and screw locks, in 17 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

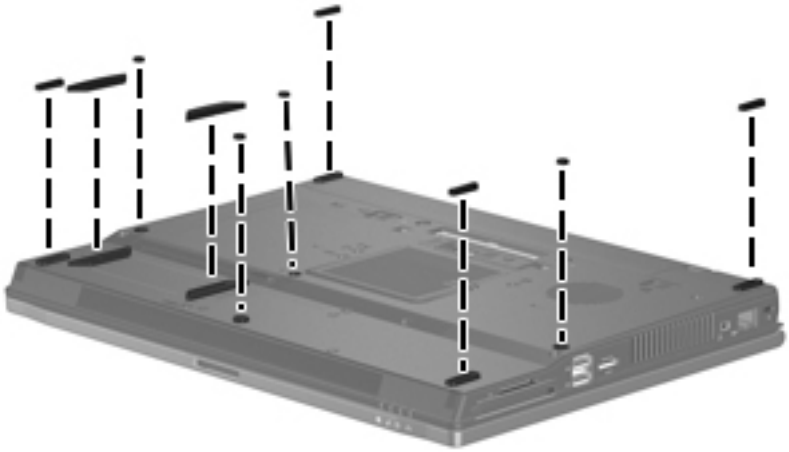
Serial number

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



Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Plastics Kit, spare part number 452221-001. There are 10 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

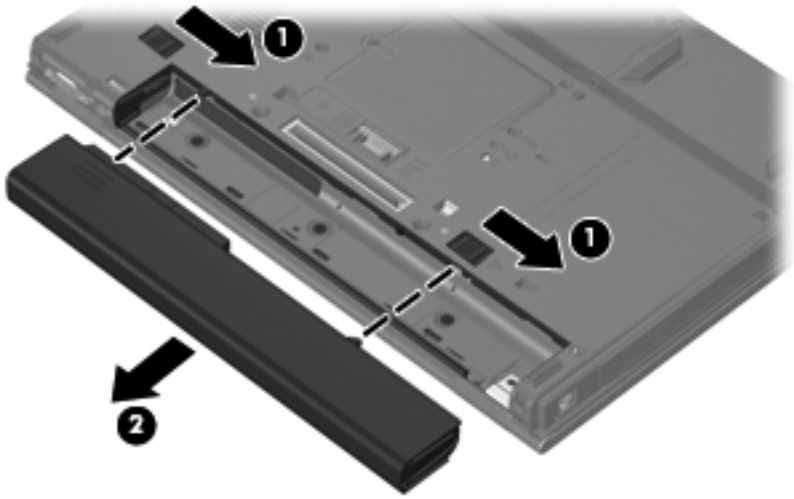
Description	Spare part number
8-cell, 5.10-Ah (73-Wh) Li-ion battery	452195-001
8-cell, 5.10-Ah (73-Wh) Li-ion battery only for use in Thailand	464474-001
8-cell, 5.10-Ah (73-Wh) Li-ion battery only for use in Japan	534064-001

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.

SIM

NOTE: This section applies only to computer models with WWAN capability.

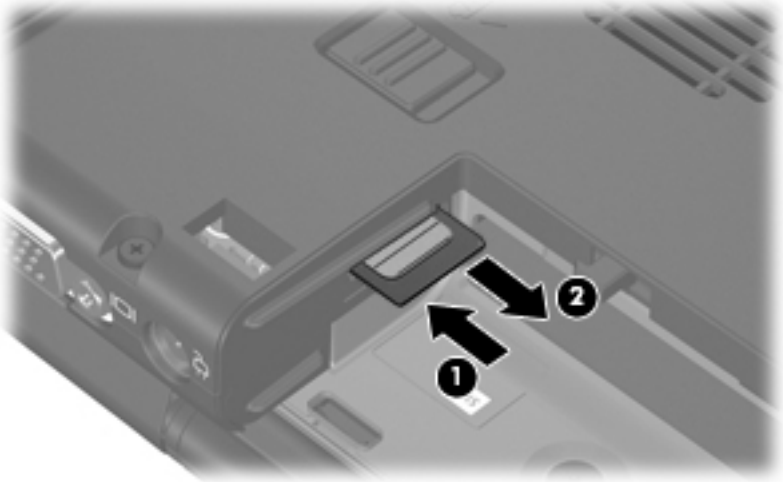
NOTE: If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

Before removing the SIM, follow these steps:

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

Remove the SIM:

1. Press in on the SIM **(1)**. (The module is partially ejected from the SIM slot.)
2. Remove the SIM **(2)** from the SIM slot.



Reverse this procedure to install the SIM.

Display inverter

NOTE: If it has been determined that the display inverter is the component that must be replaced to complete the computer repair, the display assembly does not have to be removed. Follow the procedures in this section to replace the display inverter. For information on replacing the display assembly and the display hinges, see Display assembly on page 79.

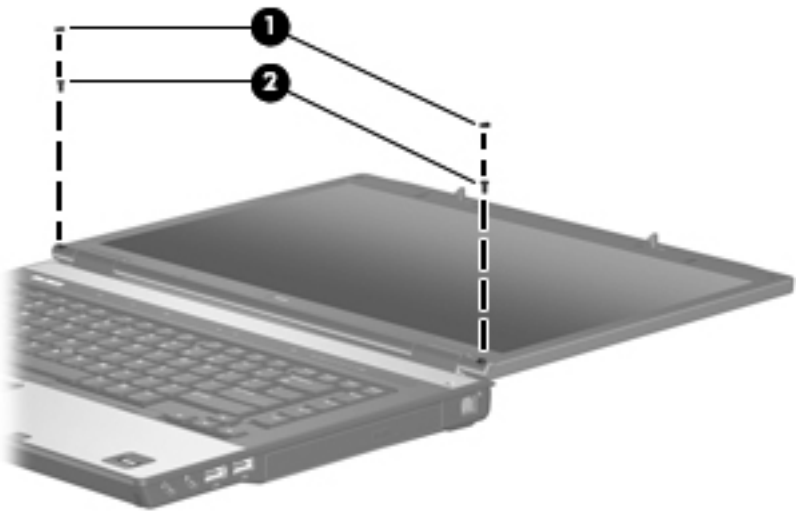
Description	Spare part number
Display inverter (includes 2-sided tape)	452214-001

Before removing the display inverter, 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 47).

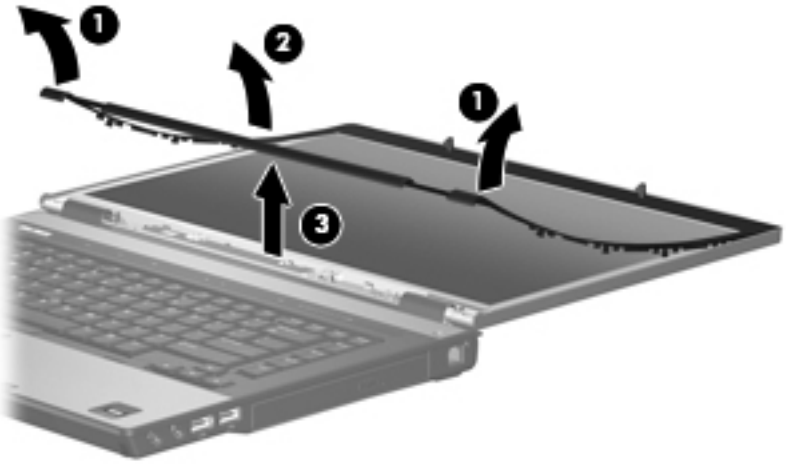
Remove the display inverter:

1. Turn the computer right-side up, with the front toward you.
2. Open the computer as far as possible.
3. Remove the two rubber screw covers **(1)** on the bottom edge of the display bezel.
4. Remove the two Torx T8M2.5×7.0 screws **(2)** that secure the display bezel bottom edge to the display assembly.

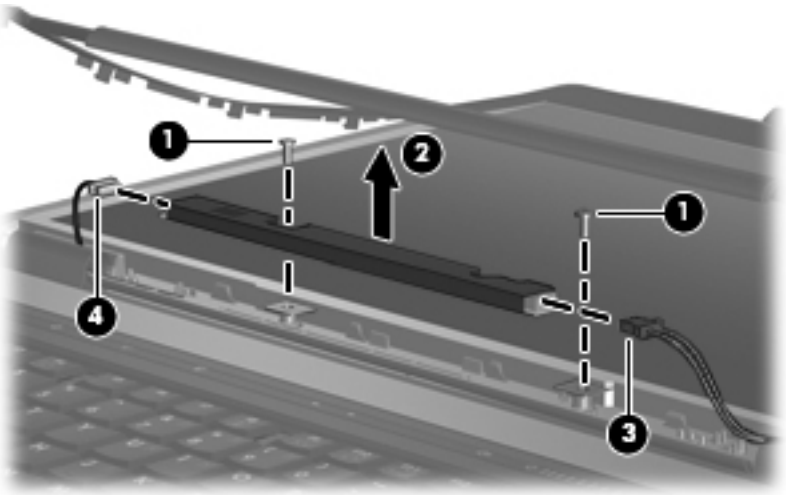


5. Flex the inside edges of the left and right sides **(1)** and the display bezel bottom edge **(2)** until the bezel disengages from the display assembly.

6. Release the display bezel bottom edge **(3)** from the display assembly.



7. Remove the two Torx T8M2.5×6.0 screws **(1)** that secure the display inverter to the display enclosure.
8. Release the inverter **(2)** from the display enclosure as far as the display panel cable and backlight cable allow.
9. Disconnect the backlight cable **(3)** and the display panel cable **(4)** from the display inverter.



10. Remove the display inverter.

Reverse this procedure to install the display inverter.

Hard drive

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

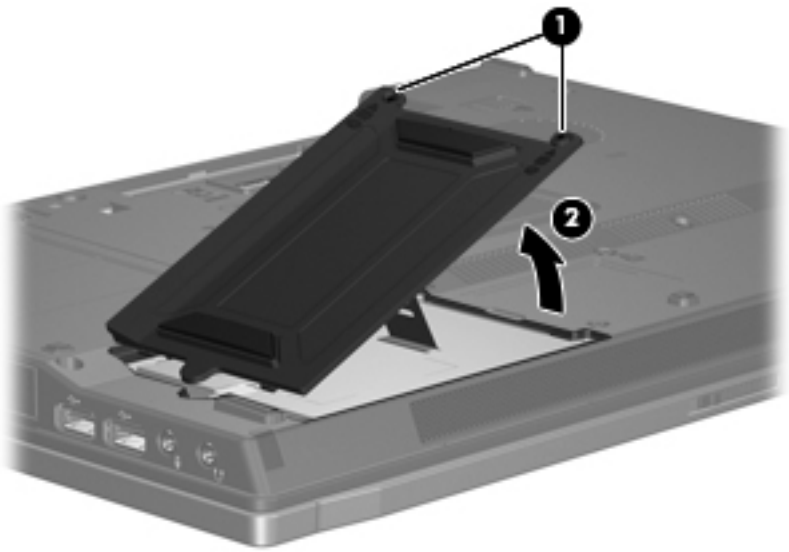
Description	Spare part number
250-GB, 7200-rpm hard drive	538972-001
160-GB, 7200-rpm hard drive	455954-001

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.
4. Remove the battery (see Battery on page 47).

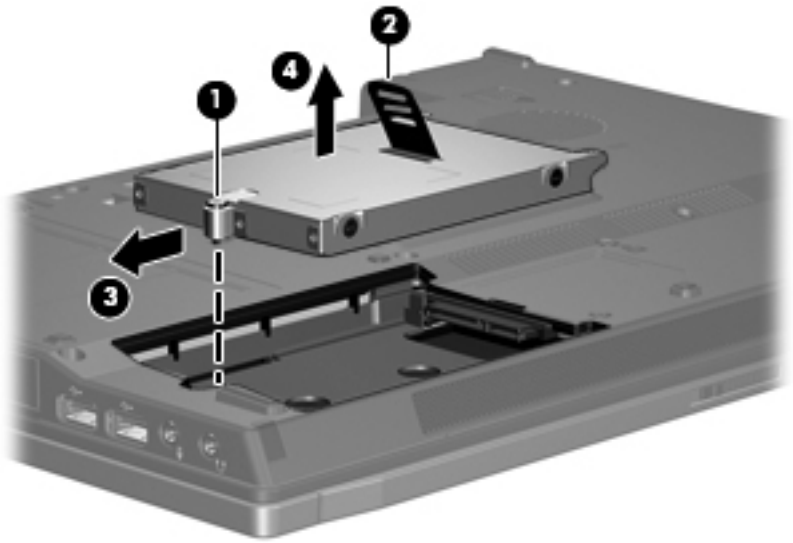
Remove the hard drive:

1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.0×5.0 captive screws **(1)** that secure the hard drive cover to the computer.
3. Lift the right side of the hard drive cover **(2)**, swing it to left, and remove the cover. The hard drive cover is included in the Plastics Kit, spare part number 452221-001



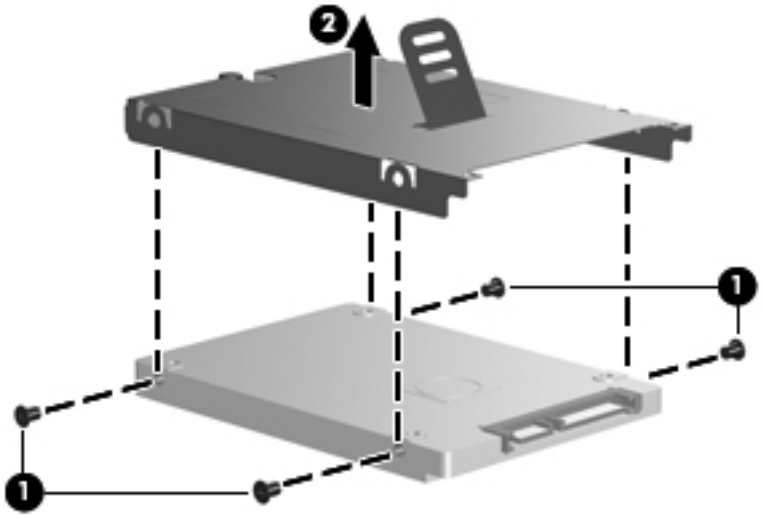
4. Loosen the Phillips PM2.5×11.0 captive screw **(1)** that secures the hard drive to the computer.
5. Grasp the Mylar tab **(2)** on the hard drive and slide the hard drive **(3)** to the left to disconnect it from the system board.

6. Remove the hard drive **(4)** from the hard drive bay.



7. If it is necessary to replace the hard drive bracket, remove the two Phillips PM3.0×4.0 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.

Bluetooth module

NOTE: The Bluetooth module spare part kits do not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.

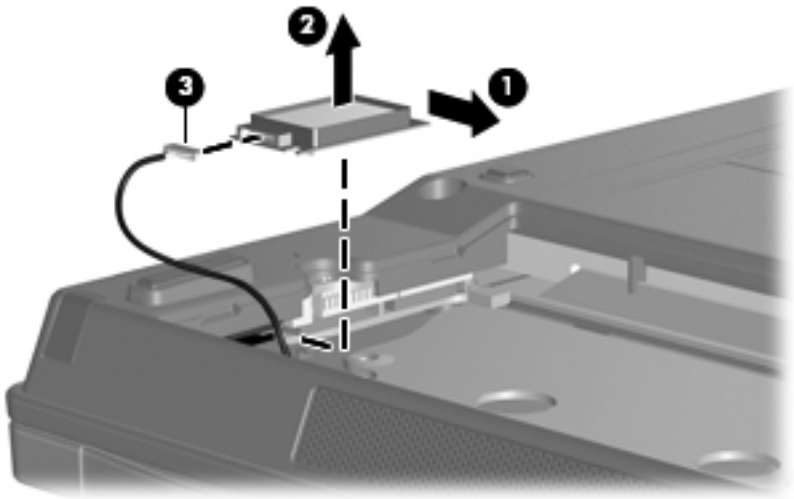
Description	Spare part number
For use in all countries and regions except Japan and Asia Pacific countries and regions	398393-002
For use only in Japan and Asia Pacific countries and regions	450066-001

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 47).
5. Remove the hard drive (see Hard drive on page 51).

Remove the Bluetooth® module:

1. Position the computer with the front toward you.
2. Release the Bluetooth module **(1)** from the clip in the hard drive bay by sliding it to the right.
3. Remove the Bluetooth module **(2)** from the hard drive bay by lifting it straight up.
4. Disconnect the Bluetooth module cable **(3)** from the Bluetooth module.



Reverse this procedure to reassemble and install the Bluetooth module.

Optical drive

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

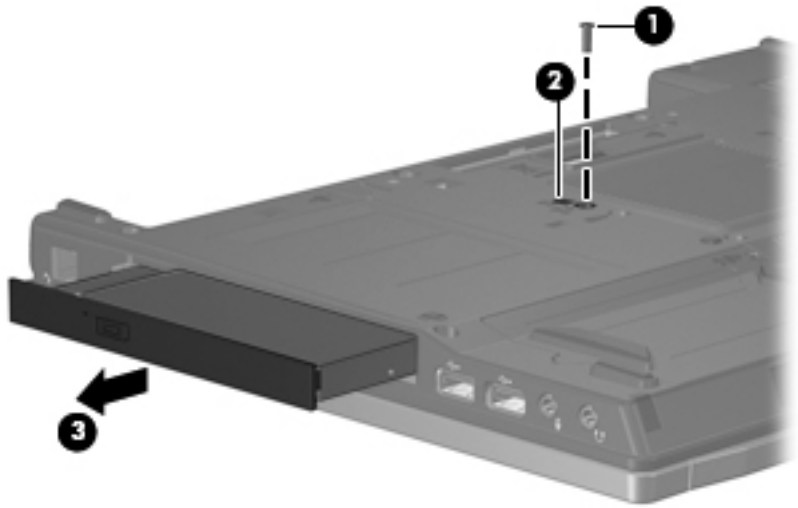
Description	Spare part number
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	443903-001
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	443904-001
Blu-Ray DVD-RW Drive	452220-001
DVD/CD-RW Combo Drive	443901-001
DVD-ROM Drive	443902-001

Before removing the optical drive, follow these steps:

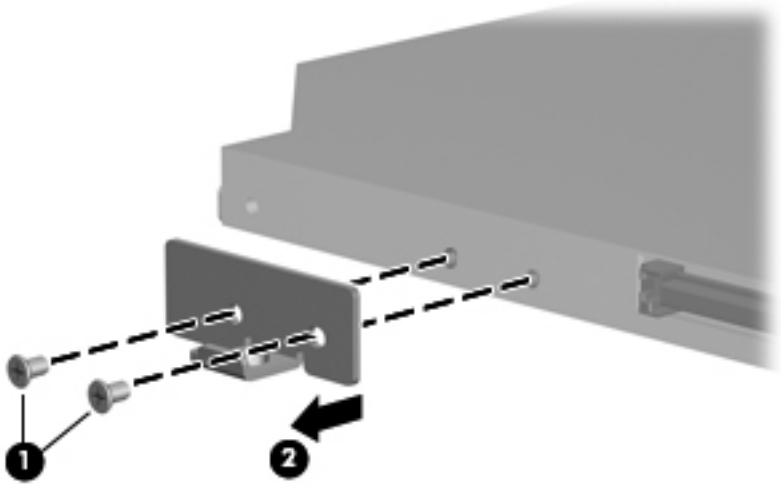
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

Remove the optical drive:

1. Position the computer with the right side toward you.
2. Remove the Phillips PM2.5×9.0 screw **(1)** that secures the optical drive to the computer.
3. Push the optical drive tab **(2)** 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 PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.
7. Remove the optical drive bracket **(2)**.



Reverse this procedure to install an optical drive.

Memory module

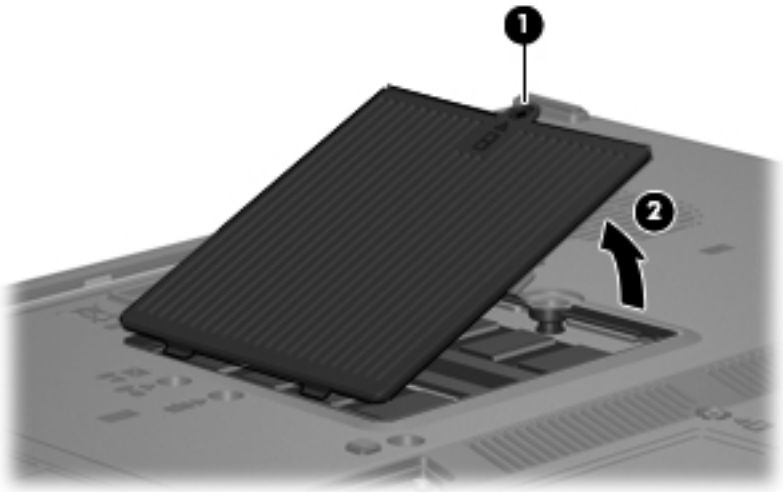
Description	Spare part number
4096-MB (PC2-5300, 667-MHz, DDR2)	598855-001
2048-MB (PC2-5300, 667-MHz, DDR2)	598858-001
1024-MB (PC2-5300, 667-MHz, DDR2)	598861-001
512-MB (PC2-5300, 667-MHz, DDR2)	598833-001

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 47).

Remove the memory module:

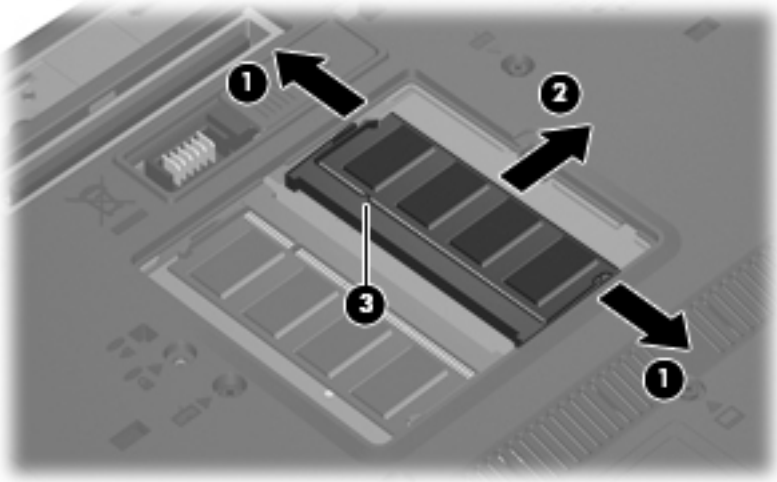
1. Position the computer with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw **(1)** that secures the memory module compartment cover to the computer.
3. Lift the right side of the cover **(2)**, swing it up and to the right, and remove the cover. The memory module compartment cover is included in the Plastics Kit, spare part number 452221-001.



4. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

5. Remove the 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 installation into the memory module slot.



Reverse this procedure to install a memory module.

Keyboard

For use in:	Spare part number	For use in:	Spare part number
Keyboards with pointing stick (includes pointing stick cable):			
Belgium	455529-A41	The Netherlands and Europe	455529-021
Brazil	455529-201	Norway	455529-091
The Czech Republic	455529-221	Portugal	455529-131
Denmark	455529-081	Russia	455529-251
France	455529-051	Saudi Arabia	455529-171
French Canada	455529-121	Slovakia	455529-231
Germany	455529-041	Slovenia	455529-BA1
Greece	455529-151	Spain	455529-071
Hungary	455529-211	Sweden and Finland	455529-B71
Iceland	455529-DD1	Switzerland	455529-111
Israel	455529-BB1	Taiwan	455529-AB1
Italy	455529-061	Thailand	455529-281
Japan	455529-291	Turkey	455529-141
South Korea	455529-AD1	The United Kingdom	455529-031
Latin America	455529-161	The United States	455529-001

For use in:	Spare part number	For use in:	Spare part number
Keyboards without pointing stick:			
Belgium	455528-A41	The Netherlands and Europe	455528-021
Brazil	455528-201	Norway	455528-091
The Czech Republic	455528-221	Portugal	455528-131
Denmark	455528-081	Russia	455528-251
France	455528-051	Saudi Arabia	455528-171
French Canada	455528-121	Slovakia	455528-231
Germany	455528-041	Slovenia	455528-BA1
Greece	455528-151	Spain	455528-071
Hungary	455528-211	Sweden and Finland	455528-B71
Iceland	455528-DD1	Switzerland	455528-111
Israel	455528-BB1	Taiwan	455528-AB1
Italy	455528-061	Thailand	455528-281
Japan	455528-291	Turkey	455528-141
South Korea	455528-AD1	The United Kingdom	455528-031
Latin America	455528-161	The United States	455528-001

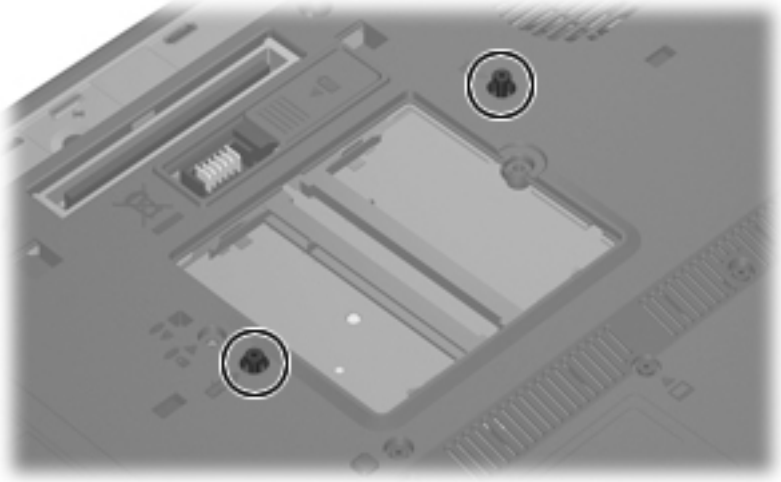
Before removing the keyboard, follow these steps:

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

Remove the keyboard:

1. Turn the computer upside down, with the front toward you.

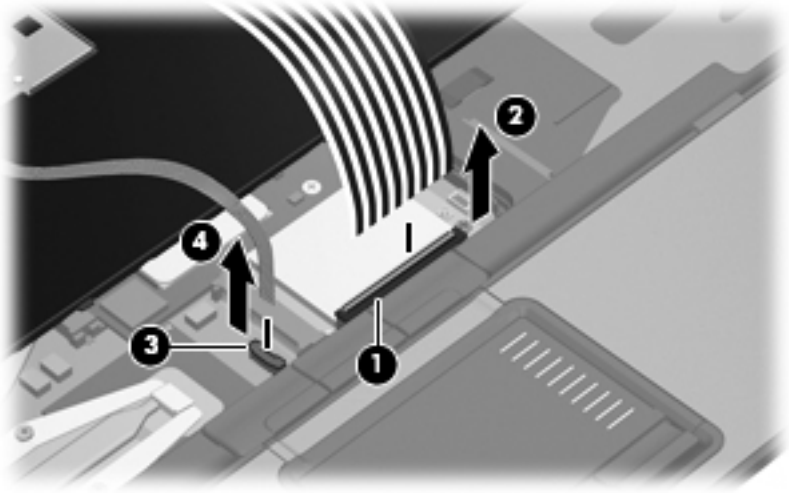
2. Loosen the two Phillips PM2.5×9.0 captive screws that secure the keyboard to the computer.



3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Slide the four keyboard retention tabs **(1)** toward you. The tabs are located between the esc and f1 keys, between the f4 and f5 keys, between the f8 and f9 keys, and between the f12 and scroll keys.
6. Lift the rear edge of the keyboard **(2)** and slide it back until it rests on the display assembly.

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. Release the ZIF connector **(3)** to which the pointing stick cable is attached, and disconnect the pointing stick cable **(4)** from the system board.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

WWAN module

△ **CAUTION:** The WWAN module and the WLAN module are not interchangeable.

Description	Spare part number
HP ev2210 1xEVDO-A WWAN module	451131-001
HP hs2300 HSDPA WWAN module	448673-003
HP ev2200 1xEV-DO Broadband WWAN Module	399440-001

Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 47).
5. Remove the SIM (see SIM on page 48).
6. Remove the keyboard (see Keyboard on page 58).

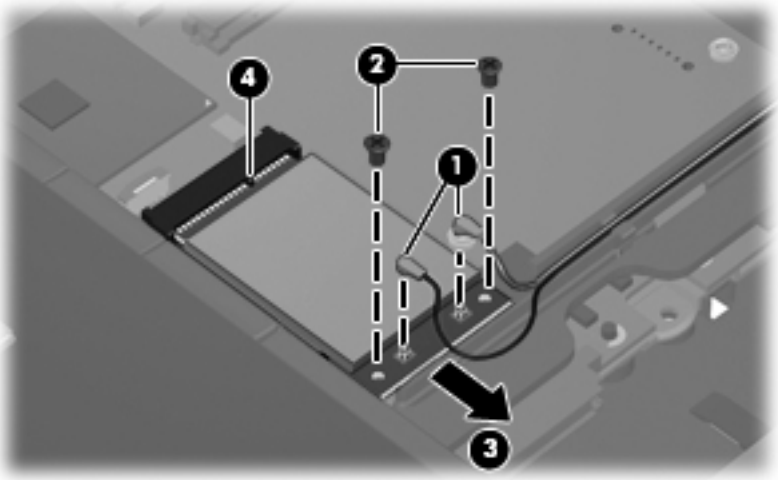
Remove the WWAN module:

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

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

2. Remove the two Phillips PM2.5×4.0 screws **(2)** that secure the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)
3. Remove the WWAN module **(3)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WWAN module.

Fan

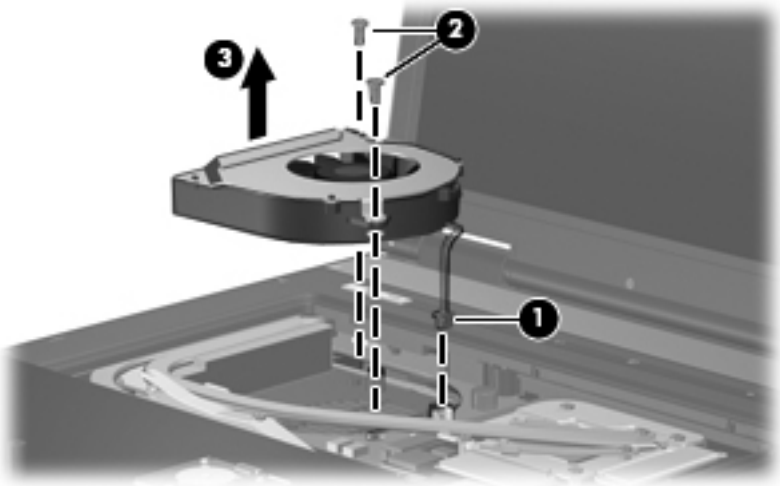
Description	Spare part number
Fan	452199-001

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 47).
5. Remove the keyboard (see Keyboard on page 58).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the two Phillips PM2.0×6.0 screws **(2)** that secure the fan to the base enclosure.
3. Remove the fan **(3)** 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.

Heat sink

Description	Spare part number
Heat sink (includes a heat sink clip and replacement thermal material)	452227-001
Thermal Material Kits	
For use in all countries or regions except Japan and Asia countries and regions	413706-001
For use only in Japan and Asia Pacific countries and regions	445853-001

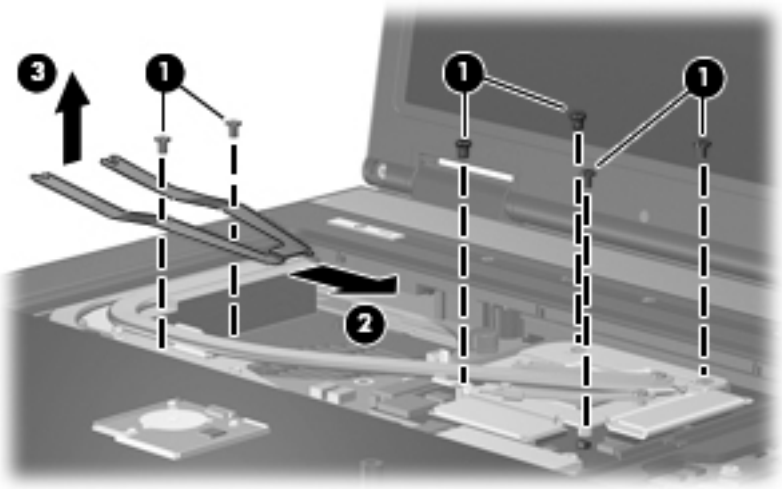
Before removing the heat sink, follow these steps:

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 47).
5. Remove the keyboard (see Keyboard on page 58).
6. Remove the fan (see Fan on page 63).

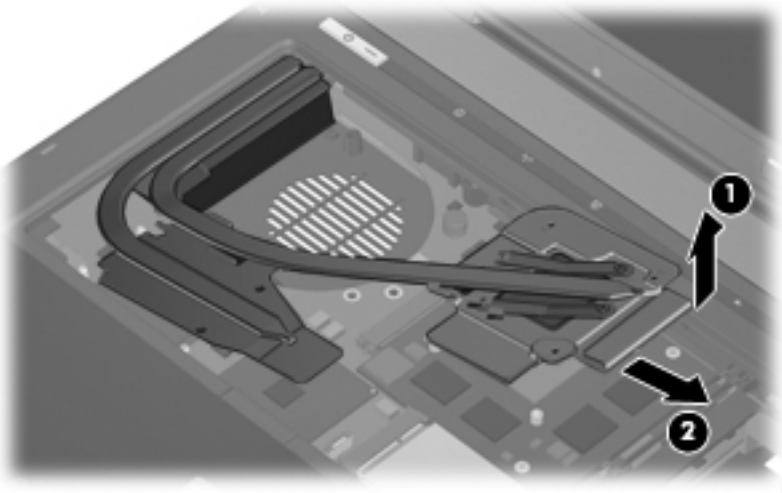
Remove the heat sink:

1. Remove the six Phillips PM2.0×3.0 screws **(1)** that secure the heat sink and the heat sink retention clip to the base enclosure.
2. Release the heat sink retention clip **(2)** by sliding it to the right.

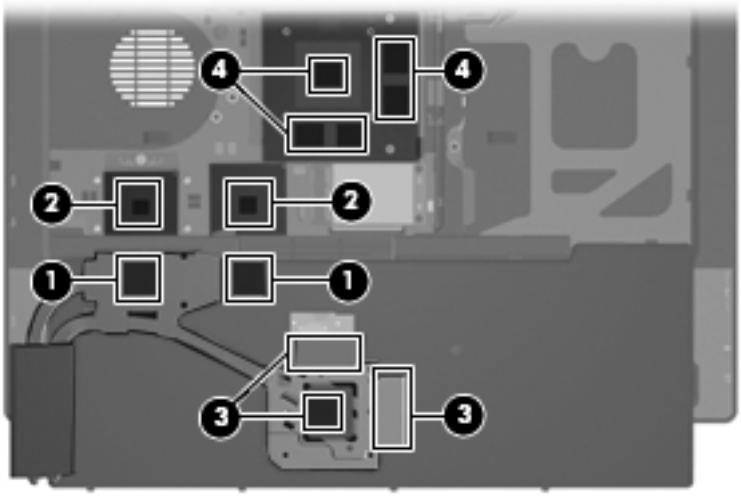
3. Remove the heat sink retention clip **(3)**.



4. Lift the right side of the heat sink **(1)** to disengage it from the graphics card.
5. Remove the heat sink **(2)** by sliding it to the right.



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



Reverse this procedure to install the heat sink.

Processor

NOTE: All processor spare part kits include replacement thermal material. The Thermal Material Kit is also available using spare part numbers 413706-001 (for use in all countries or regions except Japan and Asia countries and regions) and 445853-001 (for use only in Japan and Asia Pacific countries and regions).

Description	Spare part number
Intel Core Duo T9500 2.6-GHz processor (6-MB L2 cache, 800-MHz FSB)	463051-001
Intel Core Duo T9300 2.5-GHz processor (6-MB L2 cache, 800-MHz FSB)	463050-001
Intel Core Duo T8300 2.4-GHz processor (3-MB L2 cache, 800-MHz FSB)	463049-001
Intel Core Duo T8100 2.1-GHz processor (3-MB L2 cache, 800-MHz FSB)	463048-001
Intel Core Duo T7800 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB)	457612-001
Intel Core Duo T7700 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB)	446894-001
Intel Core Duo T7500 2.2-GHz processor (4-MB L2 cache, 800-MHz FSB)	446893-001
Intel Core Duo T7300 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB)	446892-001
Intel Core Duo T7250 2.0-GHz processor (2-MB L2 cache, 800-MHz FSB)	459463-001
Intel Core Duo T7100 1.8-GHz processor (2-MB L2 cache, 800-MHz FSB)	446891-001

Before removing the processor, follow these steps:

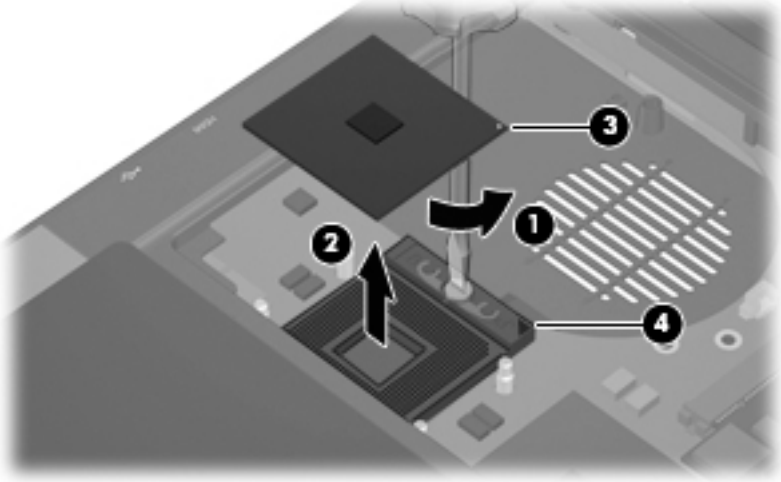
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 47).
5. Remove the following components:
   a. Keyboard (see Keyboard on page 58)
   b. Fan (see Fan on page 63)
   c. Heat sink (see Heat sink on page 64)

Remove the processor:

1. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.

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

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



Reverse this procedure to install the processor.

Graphics card

NOTE: All graphics card spare part kits include replacement thermal material.

Description	Spare part number
ATI M76M graphics card with 256 MB of graphics subsystem memory (supports Hypermemory)	454247-001
nVidia G84GLM graphics card with 256 MB of graphics subsystem memory (supports Turbo Cache)	455077-001
Thermal Material Kits	
For use in all countries or regions except Japan and Asia countries and regions	413706-001
For use only in Japan and Asia Pacific countries and regions	445853-001

Before removing the graphics card, follow these steps:

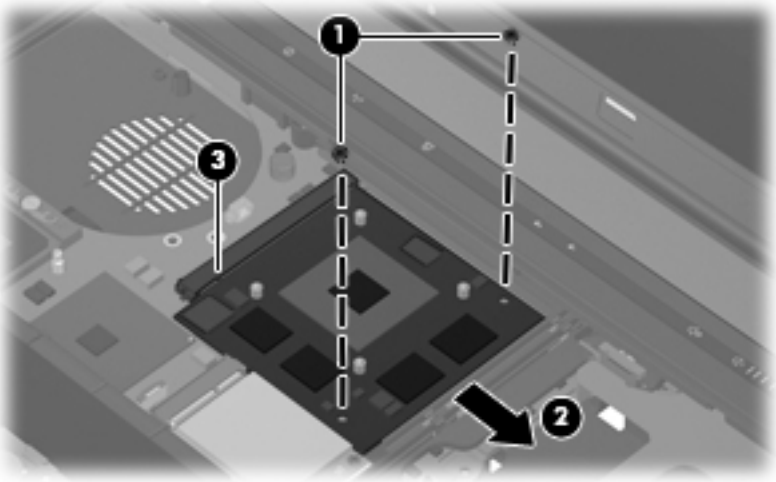
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

4. Remove the battery (see Battery on page 47).
5. Remove the following components:
   a. Keyboard (see Keyboard on page 58)
   b. Fan (see Fan on page 63)
   c. Heat sink (see Heat sink on page 64)

Remove the graphics card:

1. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the graphics card to the computer. (The edge of the board opposite the graphics card slot rises away from the computer.)
2. Remove the graphics card **(2)** by sliding it away from the graphics card slot at an angle.

NOTE: The graphics card is designed with a notch **(3)** to prevent incorrect installation.



Reverse this procedure to install the graphics card.

TouchPad

NOTE: All TouchPad spare part kits include a TouchPad cable. The TouchPad cable is also included in the Cable Kit, spare part number 452198-001.

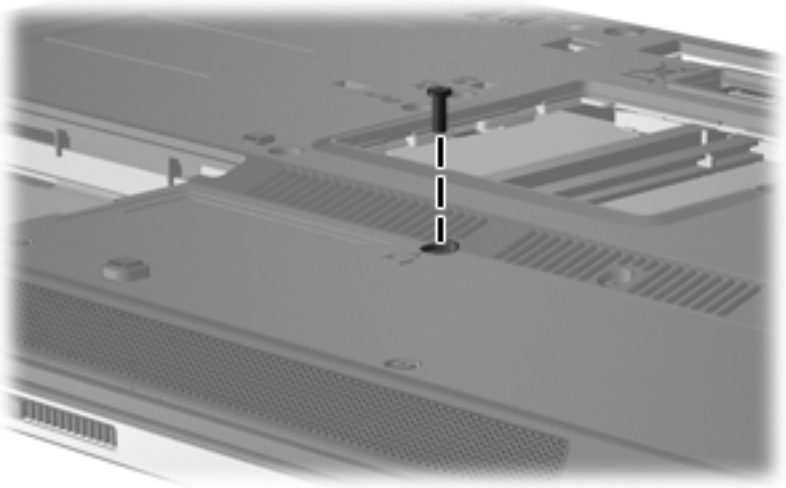
Description	Spare part number
With 3 TouchPad buttons and 3 pointing stick buttons for use with keyboards with pointing stick	455969-001
With 2 TouchPad buttons for use with keyboards without pointing stick	454248-001

Before removing the TouchPad, 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 47).
5. Remove the keyboard (see Keyboard on page 58).

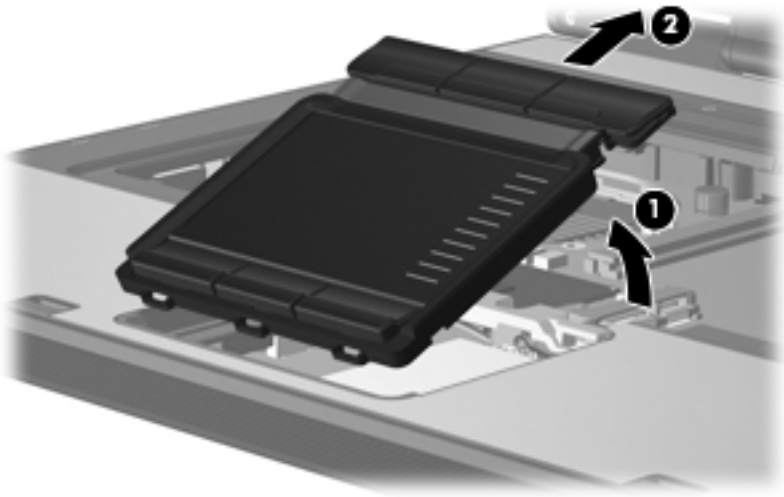
Remove the TouchPad:

1. Turn the computer upside down, with the front toward you.
2. Remove the Torx T8M2.5×9.0 screw that secures the TouchPad to the computer.

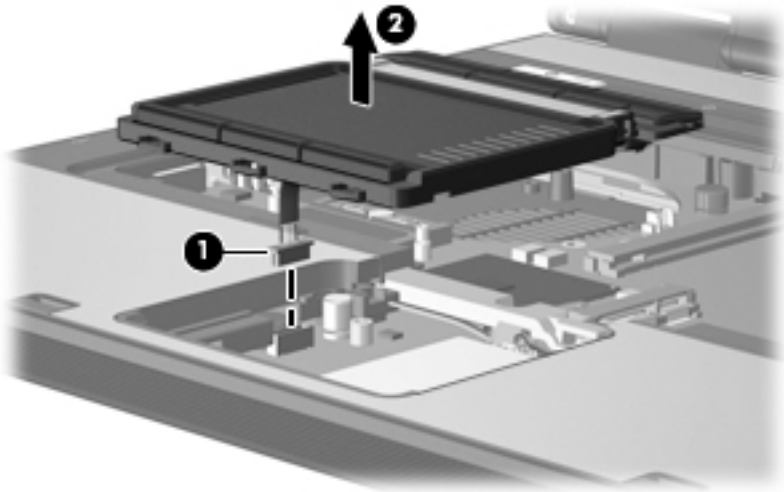


3. Turn the computer right side up, with the front toward you.
4. Lift the rear edge of the TouchPad **(1)** until it disengages from the top cover.

5. Release the TouchPad **(2)** by sliding it toward the display.



6. Disconnect the TouchPad cable **(1)** from the system board.
7. Remove the TouchPad **(2)**.



Reverse this procedure to install the TouchPad.

WLAN module

△ **CAUTION:** The WLAN module and the WWAN module are not interchangeable.

Description	Spare part number
Intel 802.11a/b/g/n WLAN modules:	
• For use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam	441086-001
• For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan	441086-002
• For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea	441086-003
• For use in Japan	441086-291
Broadcom 802.11a/b/g WLAN modules:	
• For use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	441075-001
• 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, 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 and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, 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	441075-002
• For use in Japan	441075-291
Intel 802.11a/b/g WLAN modules:	

Description	Spare part number
• For use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam	441082-001
• For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan	441082-002
• For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea	441082-003
• For use in Japan	441082-292
Broadcom 802.11b/g WLAN modules:	
• For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	441090-001
• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, 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, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	441090-002
• For use in Japan	441090-291
Intel 802.11b/g WLAN module for use in Japan	448675-004
Intel 802.11b/g WLAN module for use in Thailand	409280-004

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 47).
5. Remove the keyboard (see Keyboard on page 58).
6. Remove the TouchPad (see TouchPad on page 70).

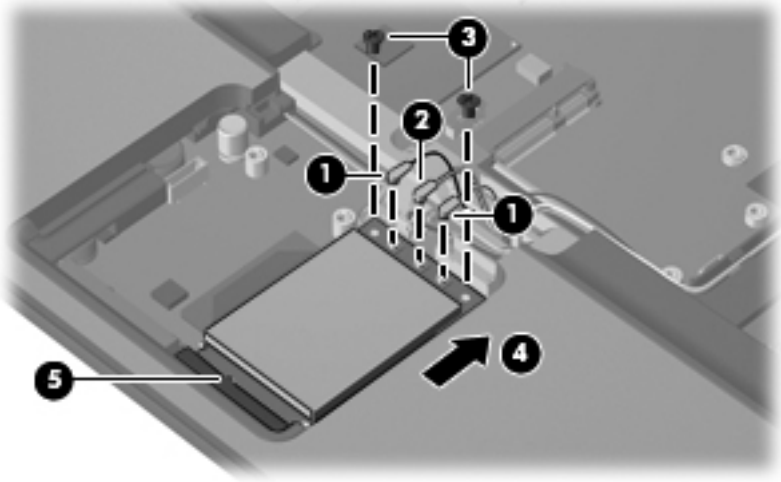
Remove the WLAN module:

1. 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. If the computer is equipped with an 802.11a/b/g/n WLAN module, the yellow WLAN antenna cable **(2)** is connected to the middle terminal on the WLAN module.

2. Remove the two Phillips PM2.5×4.0 screws **(3)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)
3. Remove the WLAN module **(4)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WLAN module.

Switch cover

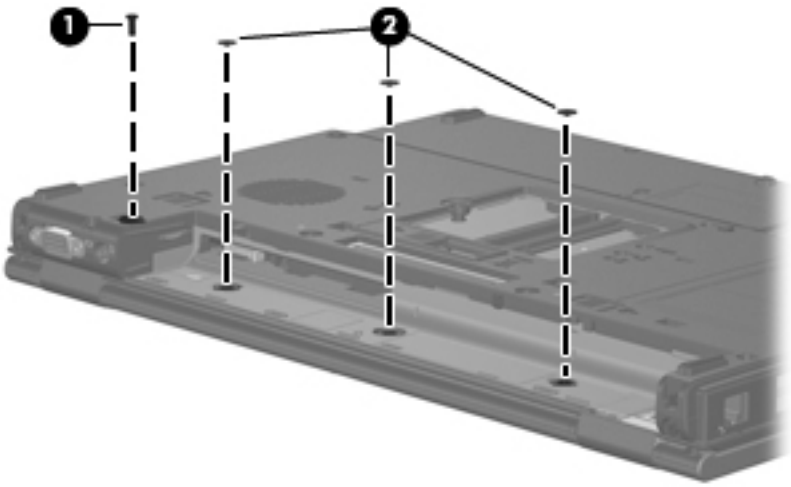
Description	Spare part number
Switch cover (includes LED board and cable)	452226-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 47).
5. Remove the keyboard (see Keyboard on page 58).

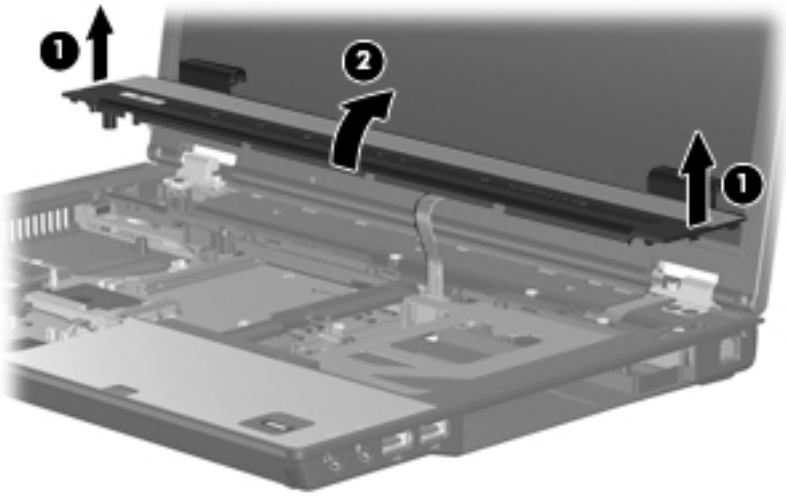
Remove the switch cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the Torx T8M2.5×9.0 screw **(1)** and the three Phillips PM2.0×2.0 screws **(2)** that secure the switch cover to the computer.

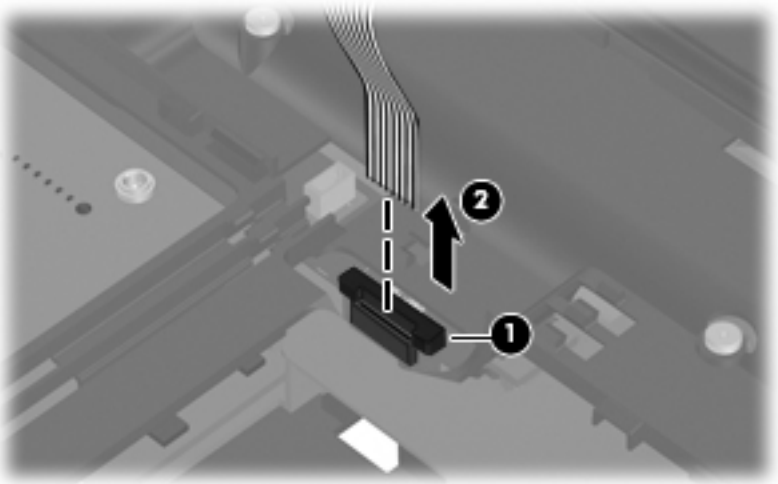


3. Turn the computer right-side up, with the front toward you.
4. Open the computer as far as possible.
5. Release the switch cover by lifting the left and right edges of the switch cover **(1)** until the switch cover disengages from the computer.

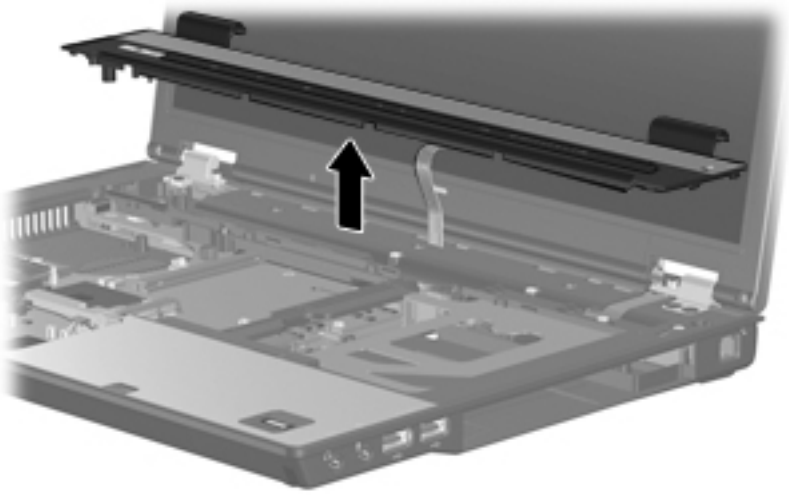
6. Lift the switch cover **(2)** up and back.



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



8. Remove the switch cover.



Reverse this procedure to install switch cover.

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.

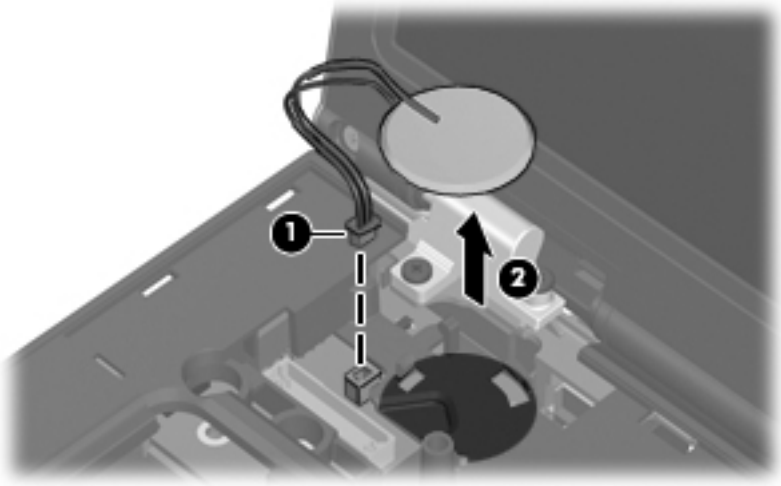
Description	Spare part number
RTC battery	501228-001

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 47).
5. Remove the memory module (see Memory module on page 56).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Remove the RTC battery **(2)** from the clip built into the top cover.



Reverse this procedure to install the RTC battery.

Display assembly

Description	Spare part number
Display assemblies for use with computer models equipped with WLAN and WWAN capability (includes 3 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)	
15.4-inch, WSXGA+	452211-001
15.4-inch, WXGA	452210-001
Display assemblies for use with computer models equipped with only WLAN capability (includes 3 WLAN antenna transceivers and cables)	
15.4-inch, WUXGA	452209-001
15.4-inch, WSXGA+	452208-001
15.4-inch, WXGA	452207-001

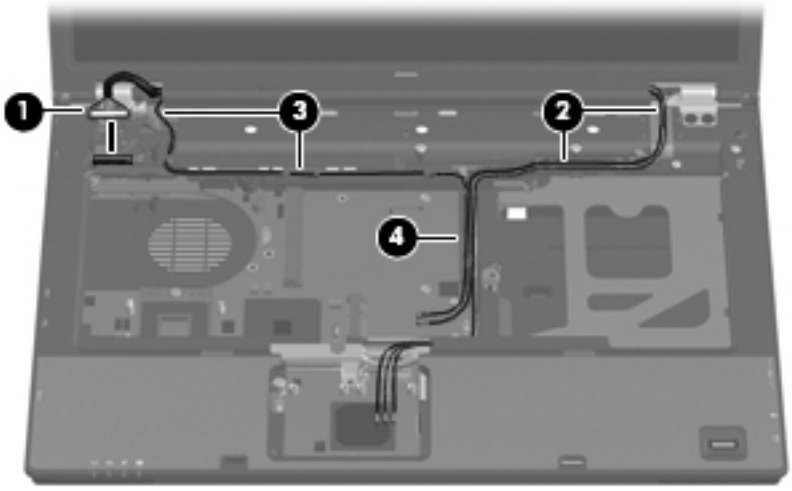
Before removing the display assembly, follow these steps:

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 47).
5. Disconnect the wireless antenna cables from the WLAN module (see WLAN module on page 72) and the WWAN module (see WWAN module on page 61).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 58)
   b. Switch cover (see Switch cover on page 75)

Remove the display assembly:

1. Disconnect the display panel cable **(1)** from the system board.

2. Remove the wireless antenna cables from the clips **(2)** and **(3)** and routing channels **(4)** built into the top cover.

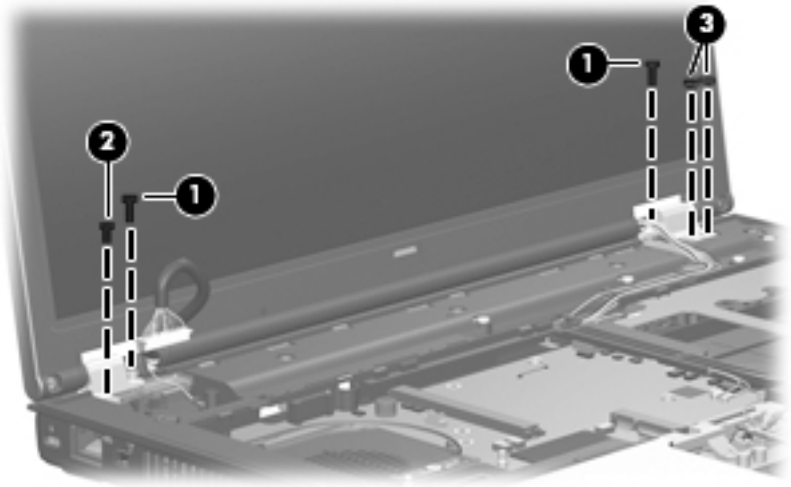


3. Remove the following screws:

   (1) Two Torx T8M2.5×9.0 screws

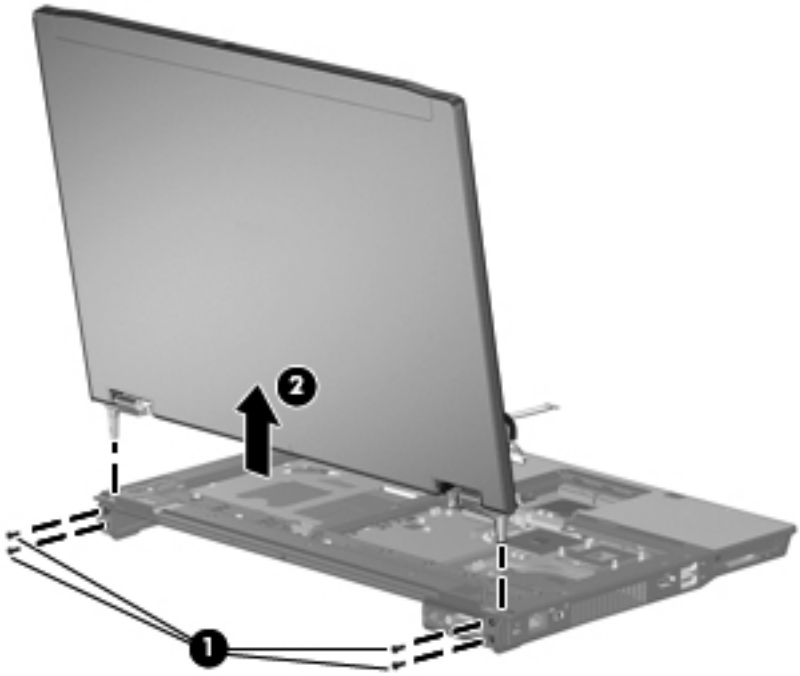
   (2) One Phillips PM2.5×4.0 screw

   (3) Two Phillips PM2.0×2.0 screws



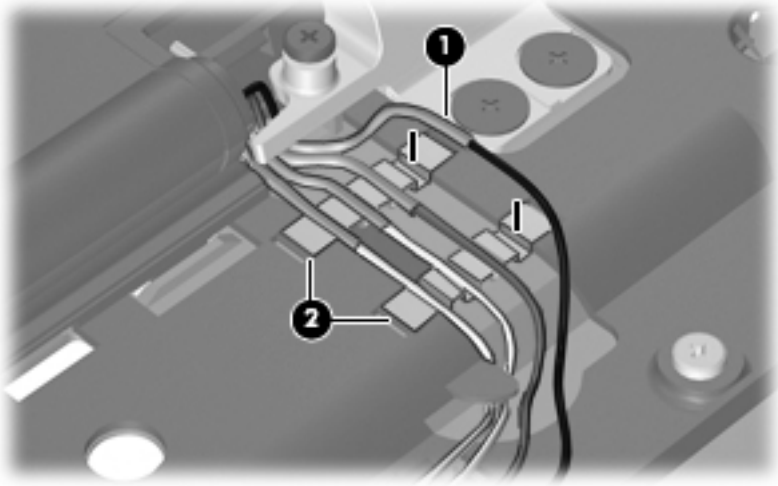
4. Position the computer with the rear panel toward you.
5. Remove the four Torx T8M2.5×9.0 screws **(1)** that secure the display assembly to the computer.

6. Lift the display assembly **(2)** straight up and remove it.



△ **CAUTION:** When installing the display assembly, be sure that the 4 wireless antenna cables routed out of the display right hinge are routed and arranged properly. Each antenna cable has an exposed section of cable and a metallic grounding sleeve **(1)**. The grounding sleeve must completely cover the exposed section of cable. Each cable must be secured inside a space in the copper grounding clip **(2)**. Left to right, the cables must be installed in a white, yellow, red, black sequence.

Failure to follow these routing instructions can result in degradation of the computer's WLAN and WWAN performance.



7. If it is necessary to replace the display bezel or display hinges, remove the following:

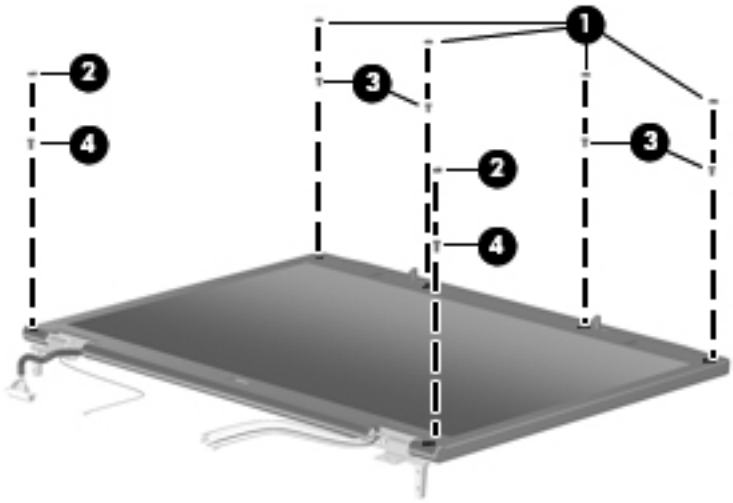
   (1) Four rubber screw covers on the display bezel top edge

   (2) Two rubber screw covers on the display bezel bottom edge

   (3) Four Torx T8M2.5×6.0 screws on the display bezel top edge

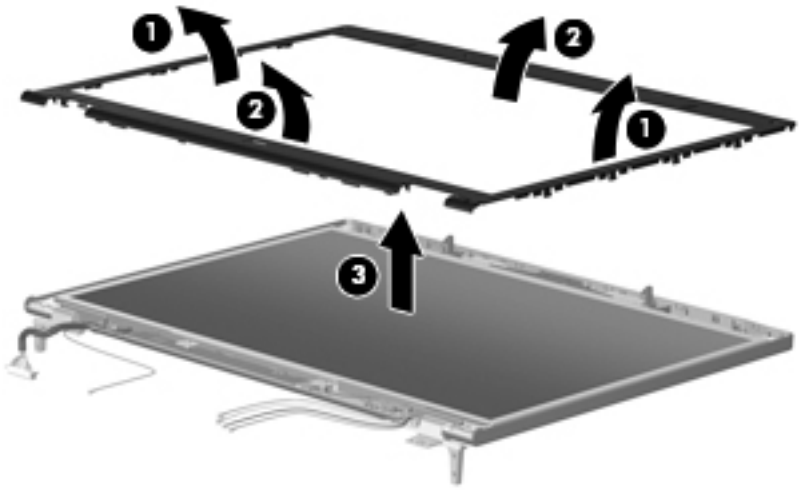
   (4) Two Torx T8M2.5×7.0 screws on the display bezel bottom edge

NOTE: See Display inverter on page 49 for display inverter replacement instructions.



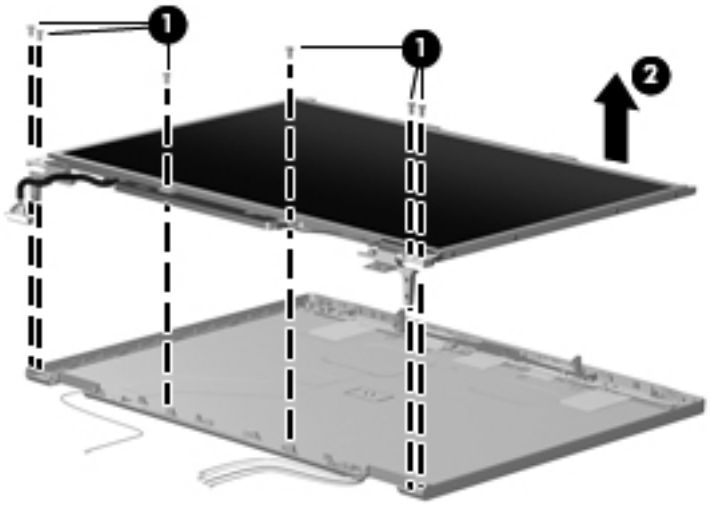
8. Flex the inside edges of the left and right sides **(1)** and the top and bottom sides **(2)** of the display bezel until the bezel disengages from the display enclosure.

9. Remove the display bezel **(3)**. The display bezel is available using spare part numbers 455078-001 (for use with computer models equipped with WLAN and WWAN capability) and 452215-001 (for use with computer models equipped with only WLAN capability).

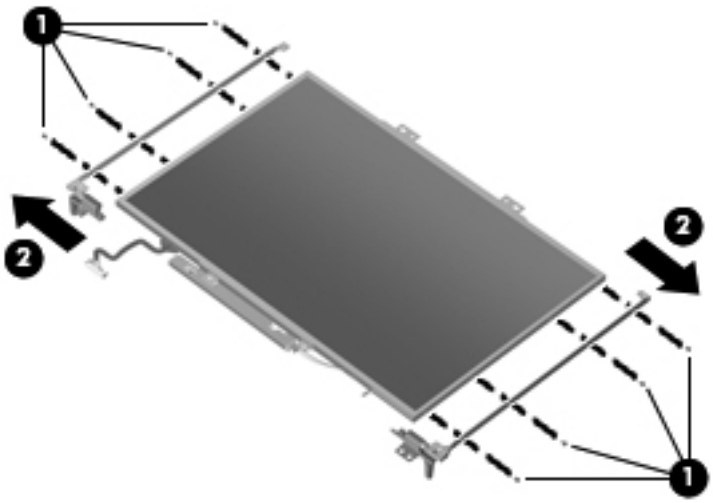


10. If it is necessary to replace the display hinges, remove the six Torx T8M2.5×6.0 screws **(1)** that secure the display panel to the display enclosure.

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



12. Remove the four Phillips PM2.0×4.0 screws **(1)** that secure each display hinge to the display panel.
13. Remove the display hinges **(2)**. The left and right display hinges are available using spare part number 452213-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover

Description	Spare part number
For use with HP Compaq 8510w computer models (includes fingerprint reader board and cable)	452224-001
For use with HP Compaq 8510p computer models (does not include fingerprint reader board)	452223-001

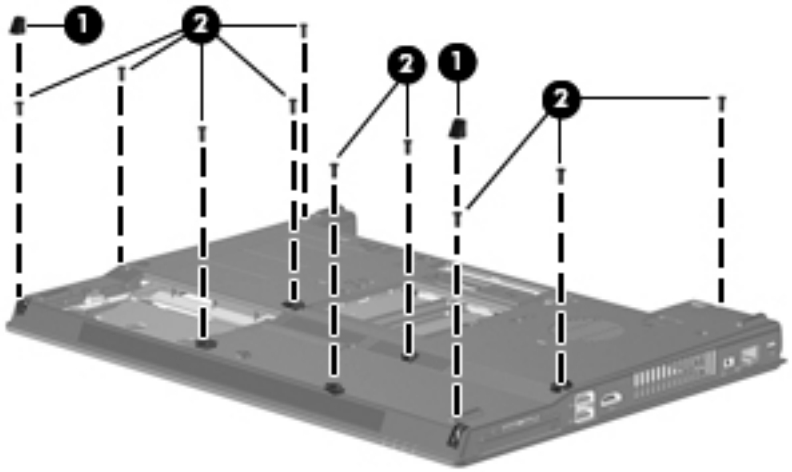
Before removing the top cover, follow these steps:

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 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Switch cover (see Switch cover on page 75)
   e. TouchPad (see TouchPad on page 70)
   f. Display assembly (see Display assembly on page 79)

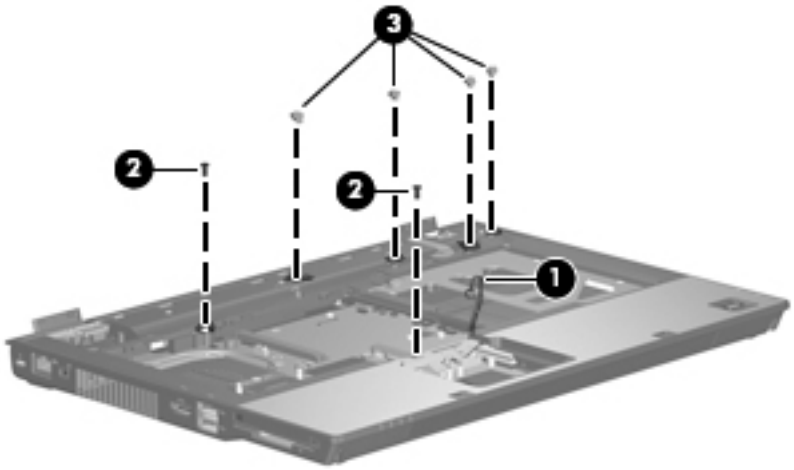
Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the two rubber screw covers **(1)**. The rubber screw covers are included in the Plastics Kit, spare part number 452221-001.

3. Remove the ten Torx T8M2.5×9.0 screws **(2)** that secure the top cover to the base enclosure.

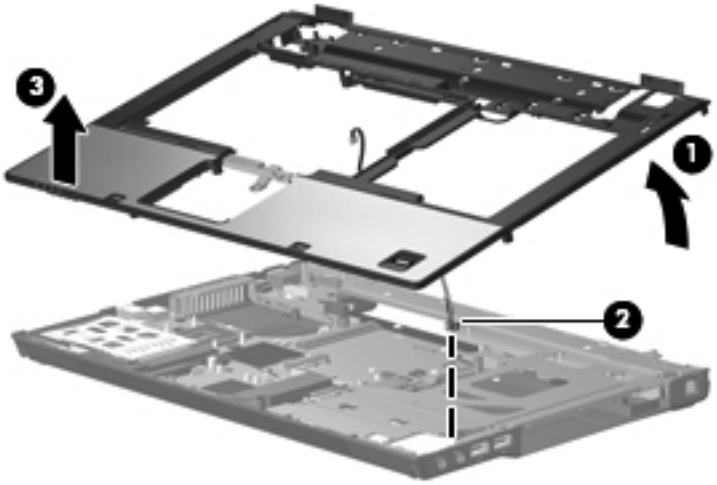


4. Turn the computer right-side up, with the front toward you.
5. Disconnect the fingerprint reader board cable **(1)** from the system board.
6. Remove the two Torx T8M2.5×7.0 screws **(2)** and the four Phillips PM2.5×3.0 screws **(3)** that secure the top cover to the computer.

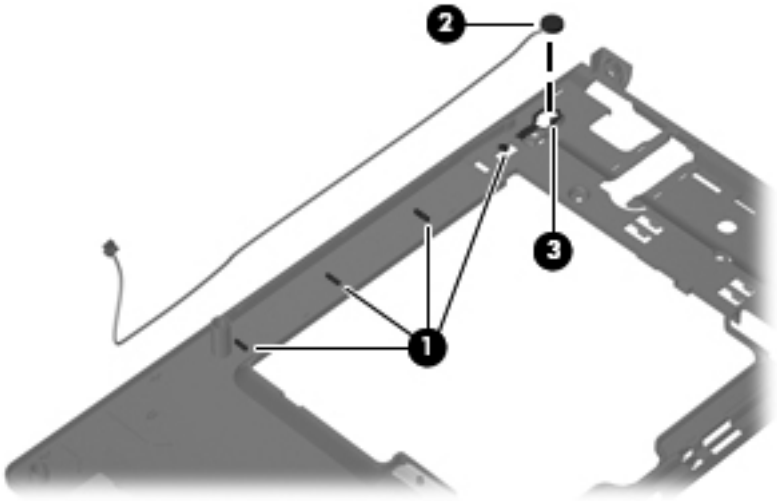


7. Lift the rear edge of the top cover **(1)** and swing it up and forward until it rests at an angle.
8. Disconnect the microphone cable **(2)** from the system board.

9. Remove the top cover **(3)**.



10. If it is necessary to replace the microphone, turn the top cover upside down with the front toward you.
11. Remove the microphone cable from the clips **(1)** built into the top cover.
12. Remove the microphone receiver **(2)** from the clip **(3)** built into the top cover.



Reverse this procedure to install the top cover.

Speaker assembly

Description	Spare part number
Speaker assembly	452225-001

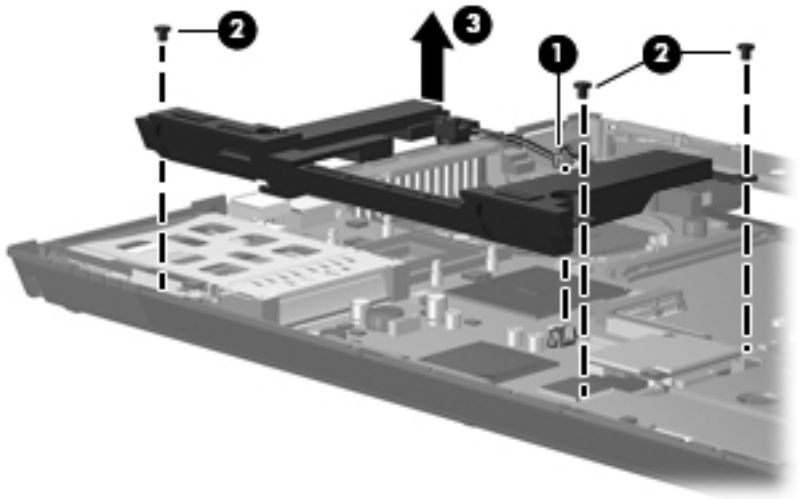
Before removing the speaker assembly, follow these steps:

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 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Switch cover (see Switch cover on page 75)
   e. TouchPad (see TouchPad on page 70)
   f. Display assembly (see Display assembly on page 79)
   g. Top cover (see Top cover on page 84)

Remove the speaker assembly:

1. Disconnect the speaker cable **(1)** from the system board.
2. Remove the three Phillips PM2.5×4.0 screws **(2)** that secure the speaker assembly to the base enclosure.

3. Remove the speaker assembly **(3)** from the base enclosure.



Reverse this procedure to install the speaker assembly.

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 452198-001. See Cable Kit on page 28 for more Cable Kit spare part number information.

Description	Spare part number
Modem module for use in all countries and regions except Australia and New Zealand	443899-001
Modem module for use in Australia and New Zealand	443899-011

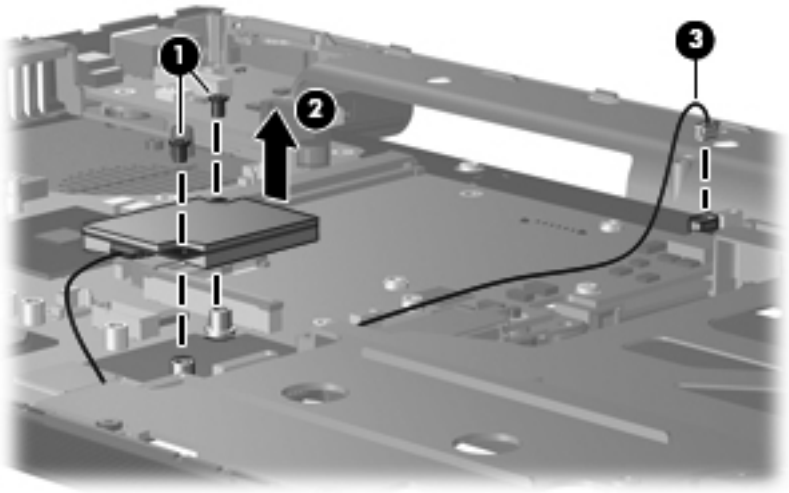
Before removing the modem module, follow these steps:

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 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Switch cover (see Switch cover on page 75)
   e. TouchPad (see TouchPad on page 70)
   f. Display assembly (see Display assembly on page 79)
   g. Top cover (see Top cover on page 84)
   h. Speaker assembly (see Speaker assembly on page 87)

Remove the modem module:

1. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the modem module to the system board.
2. Disconnect the modem module **(2)** from the system board by lifting it straight up.

3. Disconnect the modem module cable **(3)** from the system board.



Reverse this procedure to install the modem module.

System board and system board frame

NOTE: All system board spare part kits include replacement thermal material. The Thermal Material Kit is also available using spare part numbers 413706-001 (for use in all countries or regions except Japan and Asia countries and regions) and 445853-001 (for use only in Japan and Asia Pacific countries and regions).

Description	Spare part number
For use in computer models equipped with WLAN and WWAN capability:	
• In all countries and regions except Russia and the People's Republic of China with T7xxx processors	452219-001
• In all countries and regions except Russia and the People's Republic of China with T8xxx and T9xxx processors	481536-001
• Only in Russia and the People's Republic of China with T7xxx processors	510000-001
• Only in Russia and the People's Republic of China with T8xxx and T9xxx processors	592233-001
For use in computer models equipped only with WLAN capability:	
• In all countries and regions except Russia and the People's Republic of China with T8xxx and T9xxx processors	481537-001
• In all countries and regions except Russia and the People's Republic of China with T7xxx processors	452218-001
• Only in Russia and the People's Republic of China with T8xxx and T9xxx processors	592234-001
• Only in Russia and the People's Republic of China with T7xxx processors	509999-001
System board frame	455428-001

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 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Fan (see Fan on page 63)
   e. Heat sink (see Heat sink on page 64)
   f. Switch cover (see Switch cover on page 75)
   g. TouchPad (see TouchPad on page 70)
   h. Display assembly (see Display assembly on page 79)
   i. Top cover (see Top cover on page 84)
   j. Speaker assembly (see Speaker assembly on page 87)
   k. Modem module (see Modem module on page 89)

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

- SIM (see SIM on page 48)
- Memory module (see Memory module on page 56)
- WLAN module (see WLAN module on page 72)
- WWAN module (see WWAN module on page 61)
- Processor (see Processor on page 67)
- Graphics card (see Graphics card on page 68)
- PC Card assembly (see PC Card assembly on page 95)

Remove the system board:

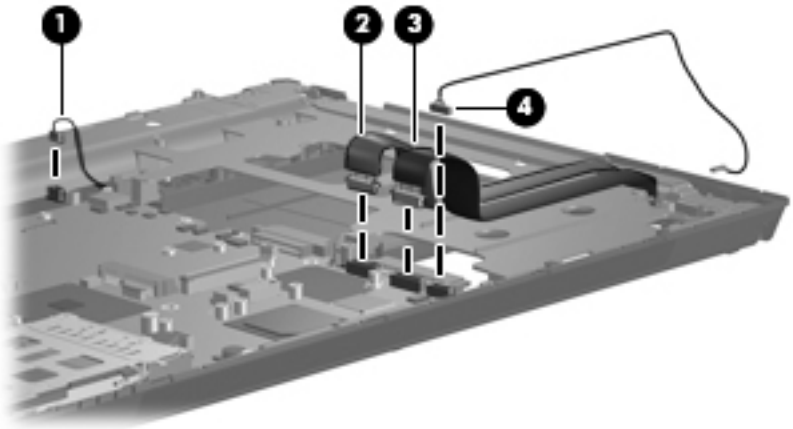
1. Disconnect the following cables from the system board:

   (1) RJ-11 connector cable

   (2) USB board cable

   (3) Audio board cable

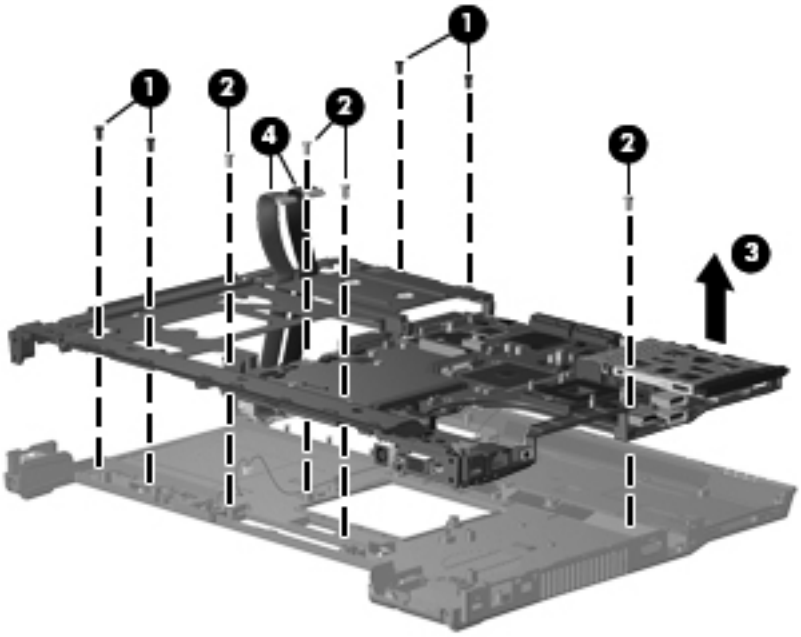
   (4) Bluetooth module cable



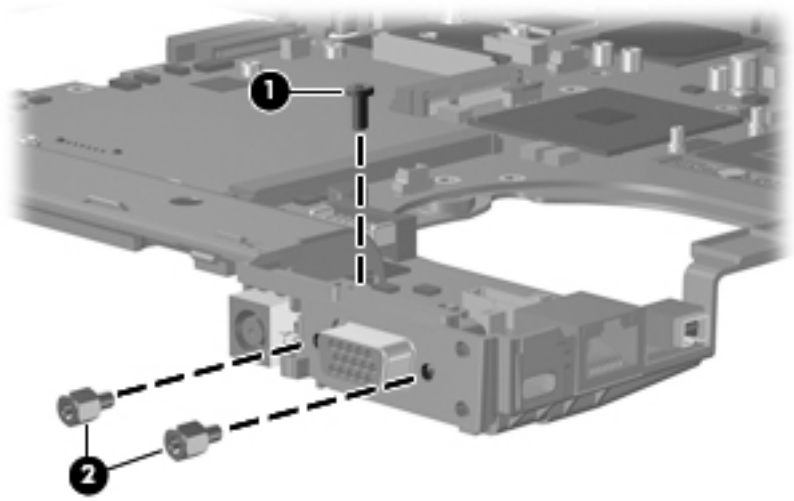
2. Position the base enclosure with the rear panel toward you.
3. Remove the four black Phillips PM2.5×7.0 screws **(1)** and the four silver Phillips PM2.5×7.0 screws **(2)** that secure the system board frame to the base enclosure.

4. Lift the system board **(3)** and frame straight up and remove them from the base enclosure.

NOTE: When removing the system board and frame, be sure that the USB/audio board cables **(4)** route cleanly through the opening in the system board frame.

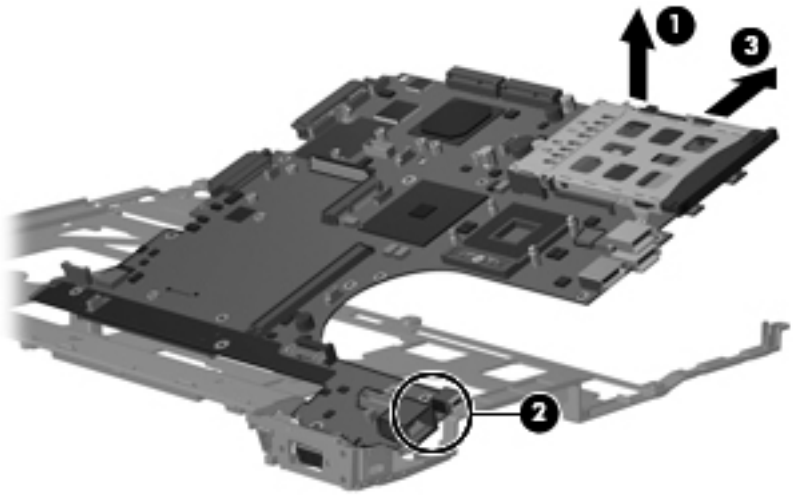


5. Remove the silver Phillips PM2.5×7.0 screw **(1)** and the two HM5.0×9.0 screw locks **(2)** that secure the system board to the system board frame.



6. Lift the front edge of the system board **(1)** until the it clears the right side of the system board frame **(2)**.

7. Remove the system board **(3)** from the system board frame by sliding it forward.



Reverse the preceding procedure to install the system board.

RJ-11 connector cable

NOTE: The RJ-11 connector cable is included in the Cables Kit, spare part number 452198-001.

Before removing the RJ-11 connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Fan (see Fan on page 63)
   e. Heat sink (see Heat sink on page 64)
   f. Switch cover (see Switch cover on page 75)
   g. TouchPad (see TouchPad on page 70)
   h. Display assembly (see Display assembly on page 79)
   i. Top cover (see Top cover on page 84)

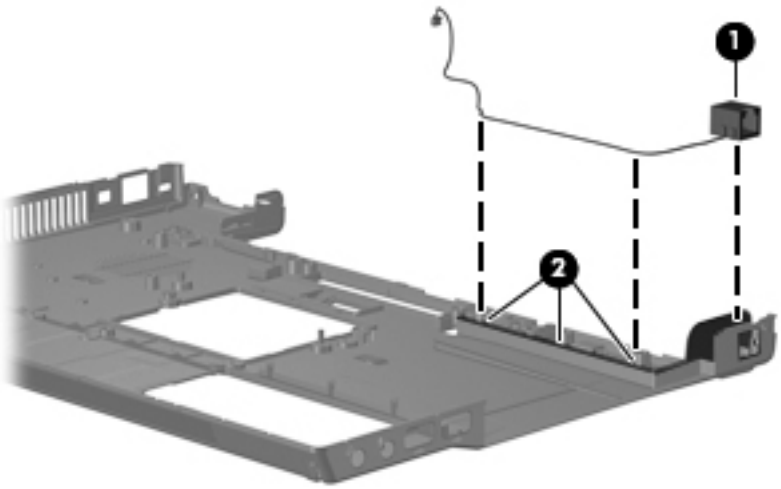
j. Speaker assembly (see Speaker assembly on page 87)

k. Modem module (see Modem module on page 89)

l. System board (see System board and system board frame on page 90)

Remove the RJ-11 connector cable:

1. Remove the RJ-11 connector **(1)** from the clip built into the base enclosure.
2. Remove the RJ-11 connector cable from the clips and routing channel **(2)** built into the base enclosure.



3. Remove the RJ-11 connector cable from the base enclosure.

Reverse this procedure to install the RJ-11 connector cable.

PC Card assembly

Description	Spare part number
PC Card assembly	455893-001

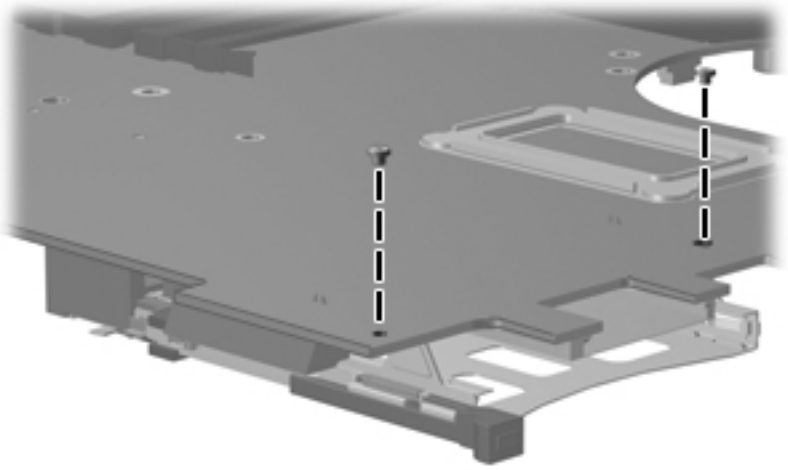
Before removing the PC Card assembly, follow these steps:

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 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Fan (see Fan on page 63)
   e. Heat sink (see Heat sink on page 64)
   f. Switch cover (see Switch cover on page 75)
   g. TouchPad (see TouchPad on page 70)
   h. Display assembly (see Display assembly on page 79)
   i. Top cover (see Top cover on page 84)
   j. Speaker assembly (see Speaker assembly on page 87)
   k. Modem module (see Modem module on page 89)
   l. System board (see System board and system board frame on page 90)

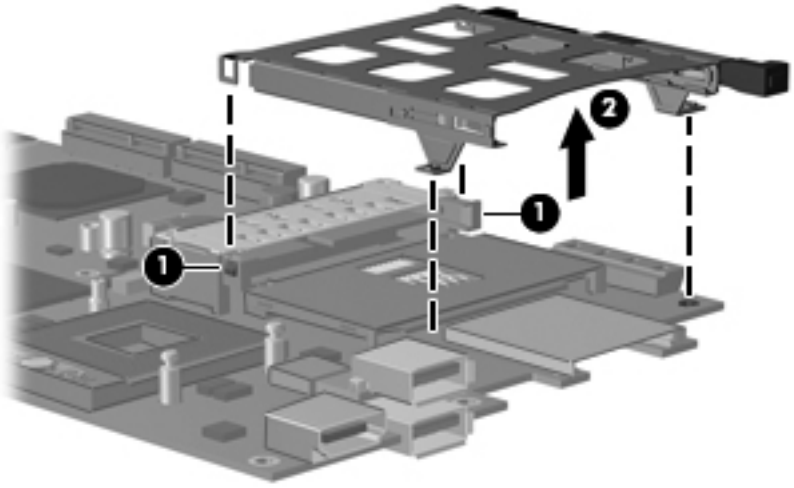
Remove the PC Card assembly:

1. Turn the system board upside down, with the front toward you.
2. Remove the two Phillips PM2.0×3.0 screws that secure the PC Card assembly to the system board.



3. Detach the slots on the PC Card assembly from the tabs on the PC Card connector **(1)**.

4. Remove the PC Card assembly **(2)**.



Reverse this procedure to install the PC Card assembly.

USB/audio board

Description	Spare part number
USB/audio board (includes USB cable and audio cable)	455426-001

Before removing the USB/audio board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 47).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 51)
   b. Optical drive (see Optical drive on page 54)
   c. Keyboard (see Keyboard on page 58)
   d. Fan (see Fan on page 63)
   e. Heat sink (see Heat sink on page 64)
   f. Switch cover (see Switch cover on page 75)
   g. TouchPad (see TouchPad on page 70)

h. Display assembly (see Display assembly on page 79)

i. Top cover (see Top cover on page 84)

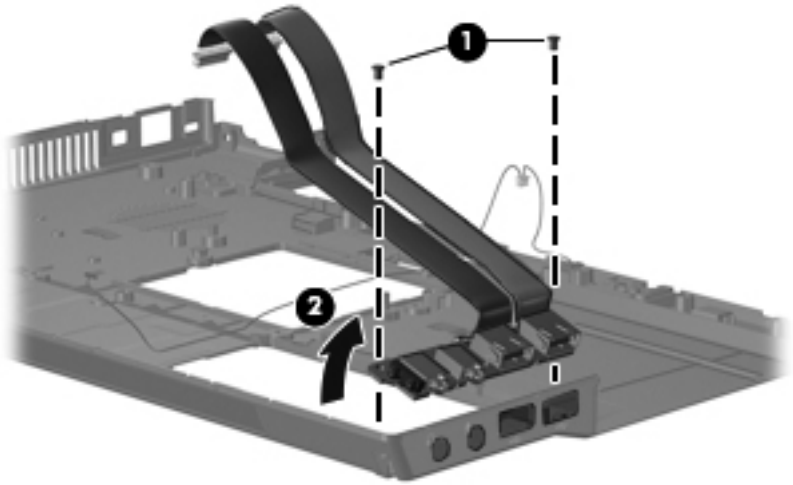
j. Speaker assembly (see Speaker assembly on page 87)

k. Modem module (see Modem module on page 89)

l. System board (see System board and system board frame on page 90)

Remove the USB/audio board:

1. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the USB/audio board to the base enclosure.
2. Lift the left side of the USB/audio board **(2)** until the USB and audio connectors disengage from the openings in the base enclosure.



3. Remove the USB/audio board and cables from the base enclosure.

Reverse this procedure to install the USB/audio board.

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

Select	To do this
Setup password	Enter, change, or delete a setup password.
Power-On password	Enter, change, or delete a power-on password.
Password options	• Enable/disable stringent security. • Enable/disable password requirement on computer restart.
DriveLock passwords	• Enable/disable DriveLock on any computer hard drive and on optional MultiBay hard drives. • 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.
Smart Card security	Enable/disable support for smart card and Java™ Card power-on authentication. **NOTE:** Power-on authentication for smart cards is supported only on computers with optional smart card readers. **NOTE:** You must have an administrator password to change this setting.
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help. **NOTE:** You must have a setup password to change this setting.
System IDs	Enter user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.

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.

Select	To do this
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		
Length	26.0 cm	10.24 in
Width	35.7 cm	14.00 in
Height (front to rear)	2.8 to 3.4 cm	1.10 to 1.34 in
Weight (equipped with optical drive, 8-cell battery, one 512-MB memory module, pointing stick, and TouchPad)	2.77 kg	6.1 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		

	Metric	U.S.
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

15.4.-inch, WUXGA display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1920 × 1200	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	7.0 W	
Viewing angle	+/-40 horizontal, +/–50° vertical (typical)	

15.4-inch, WSXGA+ display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1680 × 1050	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	7.0 W	
Viewing angle	+/-40 horizontal, +/–50° vertical (typical)	

15.4-inch, WXGA display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	7.0 W	
Viewing angle	+/-40 horizontal, +/–50° vertical (typical)	

Hard drive specifications

	250-GB*	160-GB*
Dimensions		
Height	9.5 mm	9.5 mm
Width	70 mm	70 mm
Weight	101 g	101 g
Interface type	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec
Security	ATA security	ATA security
Seek times (typical read, including setting)		
Single track	3 ms	3 ms
Average	13 ms	13 ms
Maximum	24 ms	24 ms
Logical blocks	488,397,168	312,560,640
Disc rotational speed	7200 rpm	7200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)	

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

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

DVD±RW and CD-RW Double-Layer Combo Drive specifications

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

DVD/CD-RW Combo Drive specifications

Applicable disc	**Read:**	**Write:**
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	**CD**	**DVD**
Random	< 110 ms	< 130 ms
Full stroke	< 210 ms	< 225 ms
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	3,600 KB/sec	
24X CD-R	3,600 KB/sec	
24X CD-RW	3,600 KB/sec	
Transfer mode	Multiword DMA mode 2	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

DVD-ROM Drive

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	
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 µm	
Access time	**CD**	**DVD**
Random	< 100 ms	< 125 ms
Full stroke	< 175 ms	< 225 ms
Audio output level	Line-out, 0.7 Vrms	
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	
Startup time	< 10 seconds	
Stop time	< 3 seconds	

System DMA specifications

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

System interrupt specifications

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

System I/O address specifications

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

I/O address (hex)	System function (shipping configuration)
201	JoyStick (decoded in ESS1688)
202 - 21F	Unused
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	“A” diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

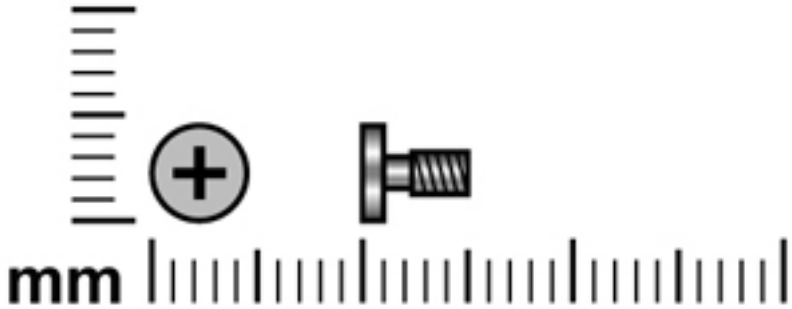
System memory map specifications

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

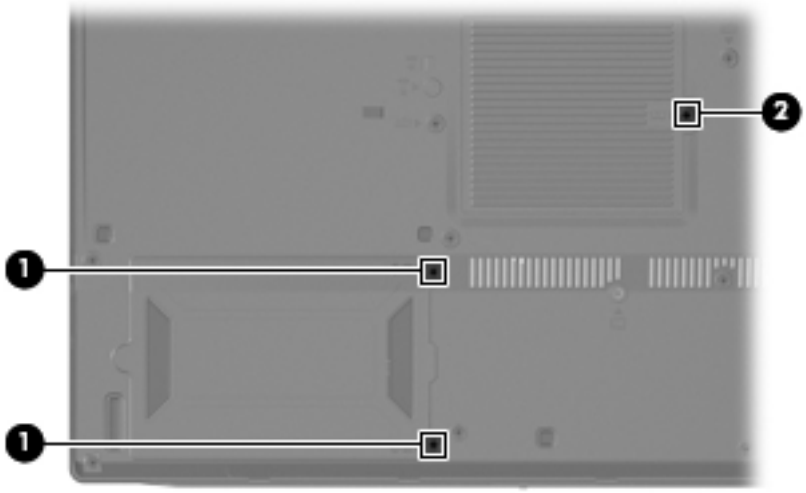
7 Screw listing

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 452222-001.

Phillips PM2.0×5.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Black	3	5.0 mm	2.0 mm	4.5 mm

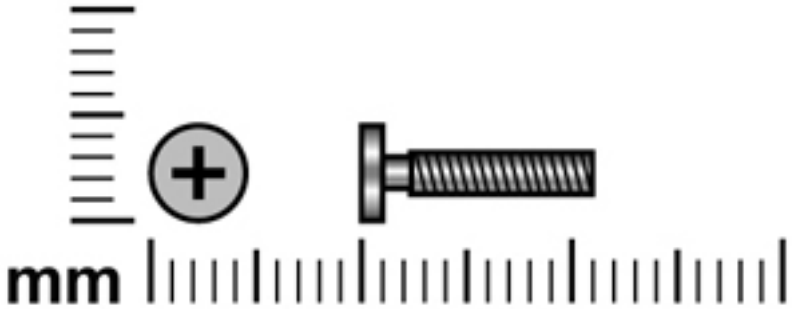


Where used:

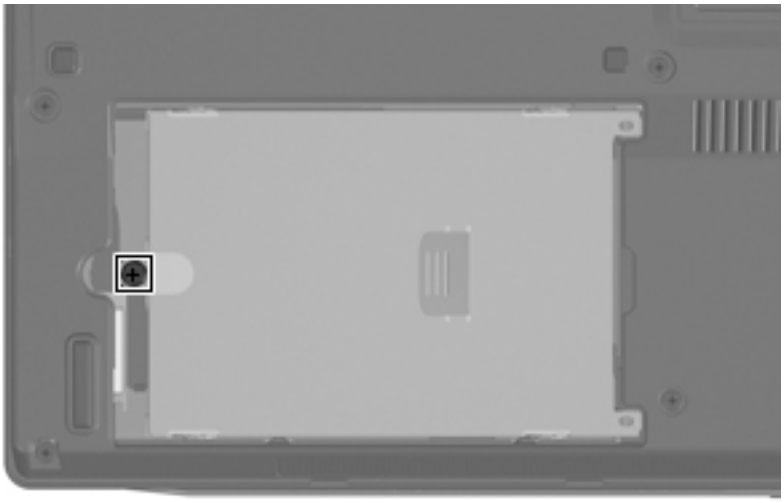
(1) Two screws that secure the hard drive cover to the computer (screws are captured on the cover by C-clips)

(2) One screw that secures the memory module compartment cover to the computer (screw is captured on the cover by a C-clip)

Phillips PM2.0×11.0 captive screw

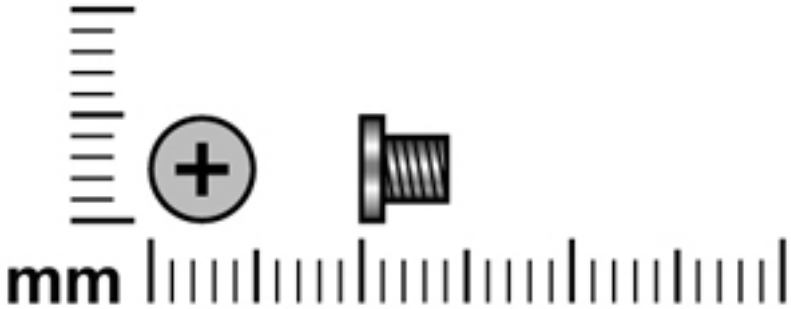


Color	Quantity	Length	Thread	Head diameter
Silver	1	11.0 mm	2.0 mm	5.0 mm



Where used: One screw that secures the hard drive to the computer

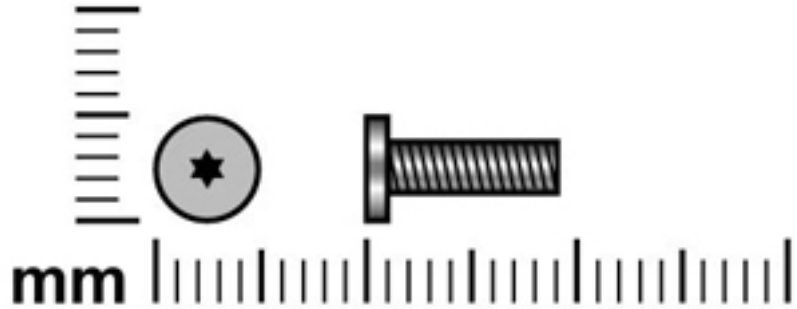
Phillips PM3.0×4.0 screw



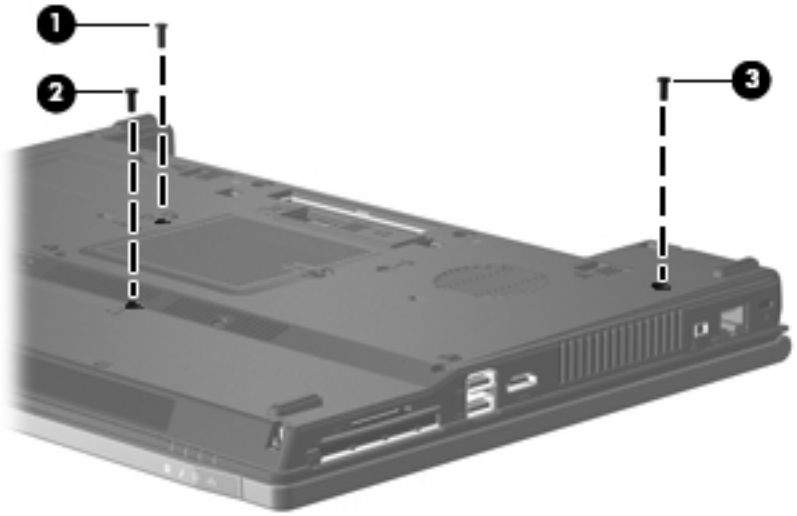
Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	3.0 mm	5.0 mm

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

Torx T8M2.5×9.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	19	9.0 mm	2.5 mm	5.0 mm

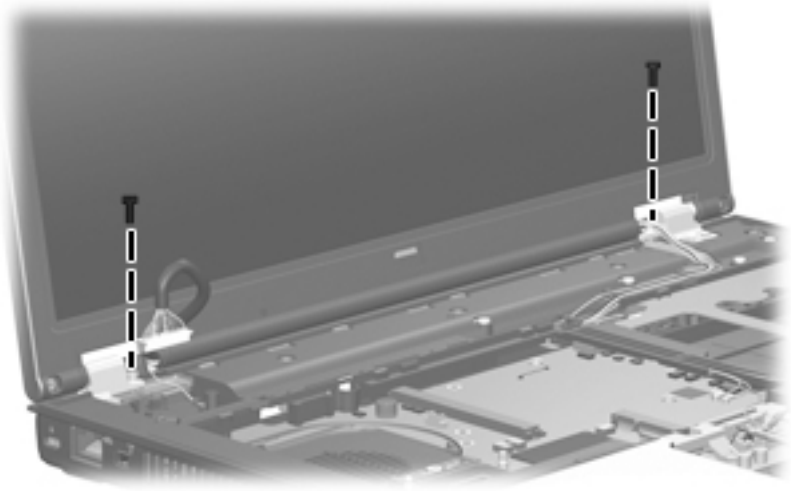


Where used:

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

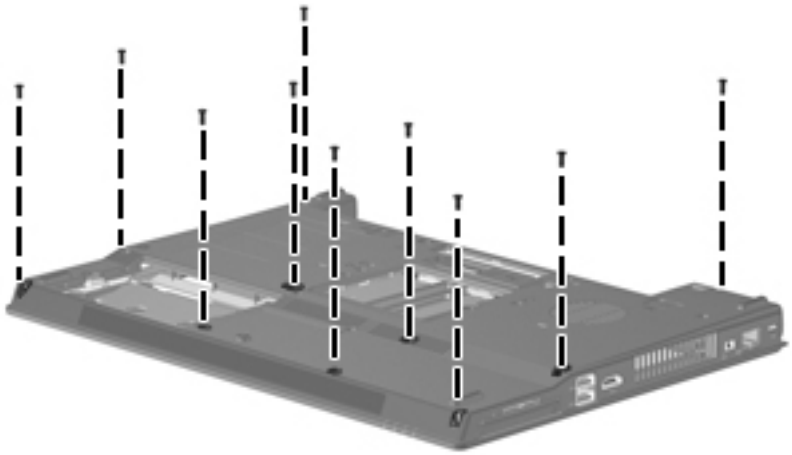
(2) One screw that secures the TouchPad to the computer

(3) One screw that secures the switch cover to the computer



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

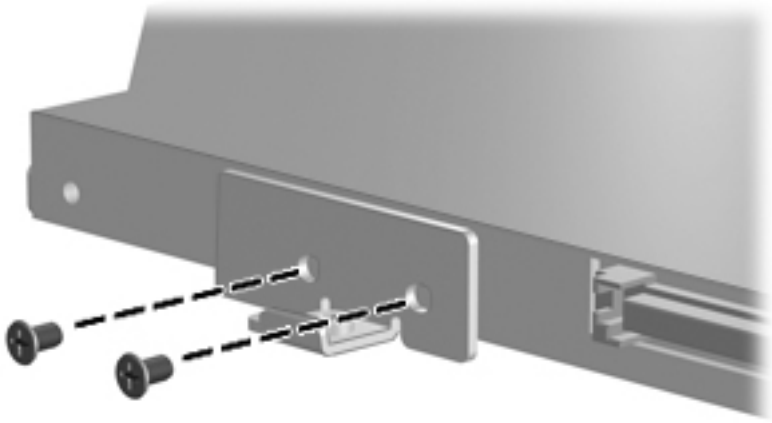
Where used: 4 screws that secure the display assembly to the computer



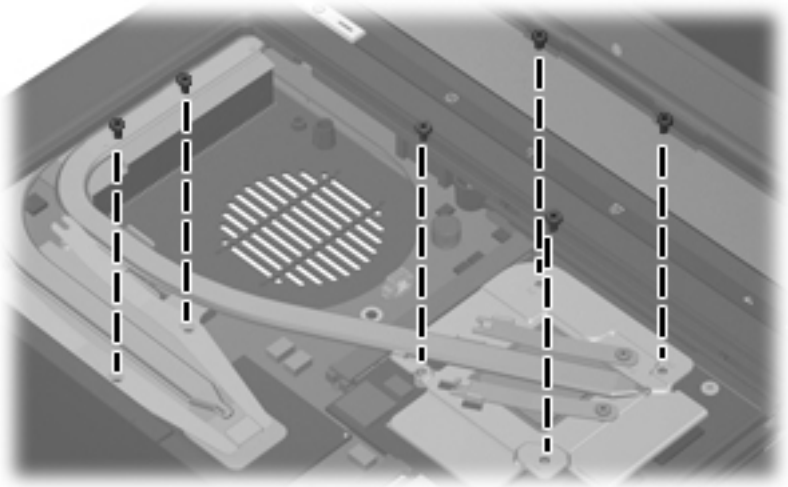
Where used: 10 screws that secure the top cover to the base enclosure

Silver Phillips PM2.0×3.0 screw

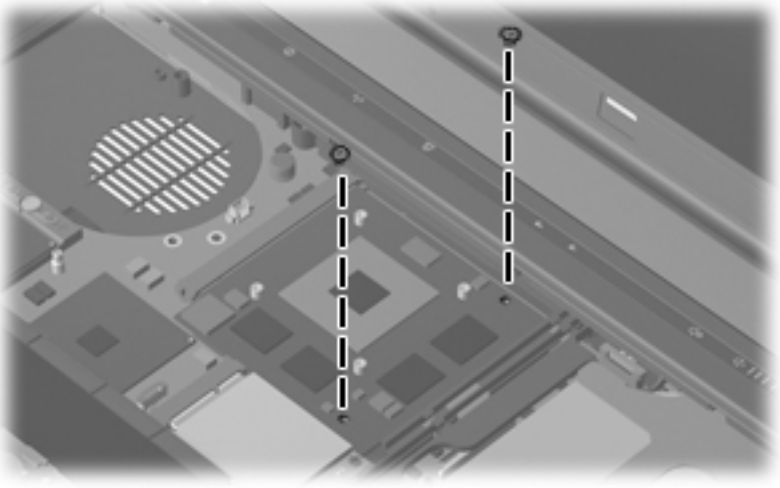
Color	Quantity	Length	Thread	Head diameter
Silver	10	3.0 mm	2.0 mm	4.5 mm



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

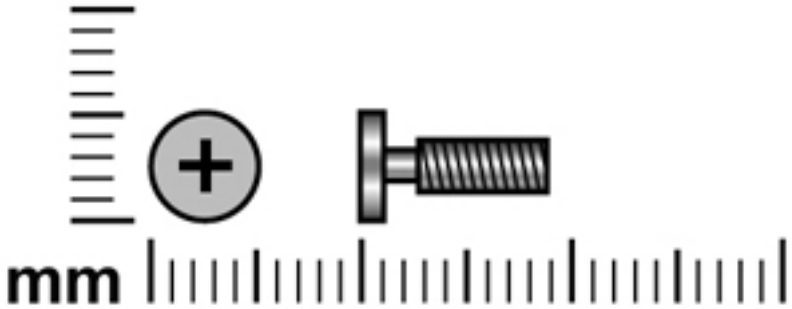


Where used: 6 screws that secure the heat sink to the system board

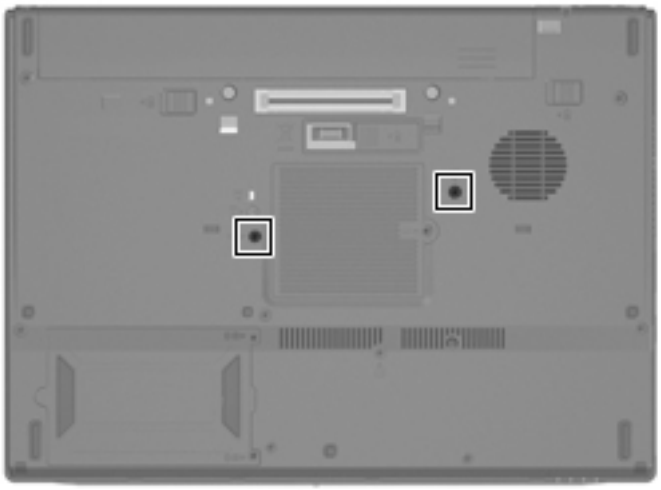


Where used: 2 screws that secure the graphics card to the system board

Phillips PM2.5×9.0 captive screw

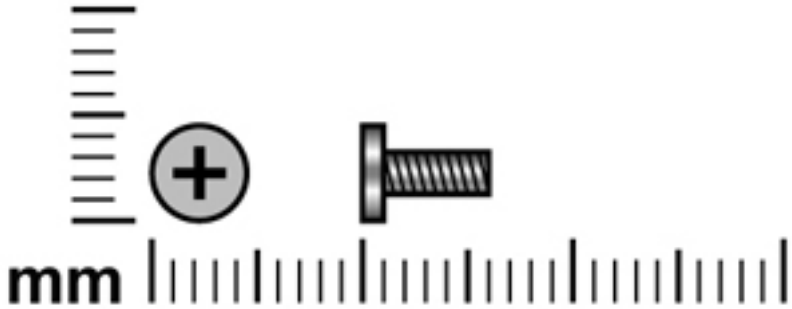


Color	Quantity	Length	Thread	Head diameter
Black	2	9.0 mm	2.5 mm	5.0 mm

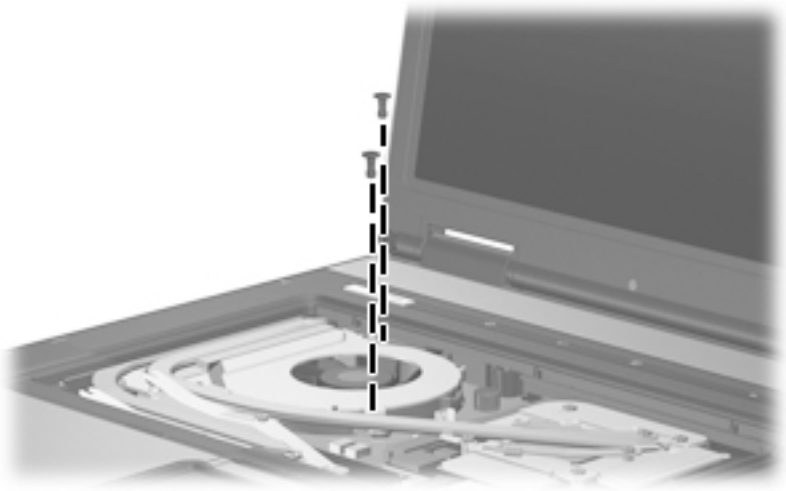


Where used: 2 captive screws that secure the keyboard to the computer

Phillips PM2.0×6.0 screw

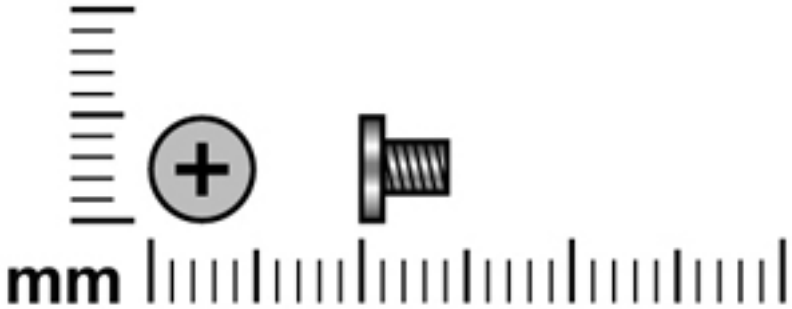


Color	Quantity	Length	Thread	Head diameter
Silver	2	6.0 mm	2.0 mm	4.5 mm

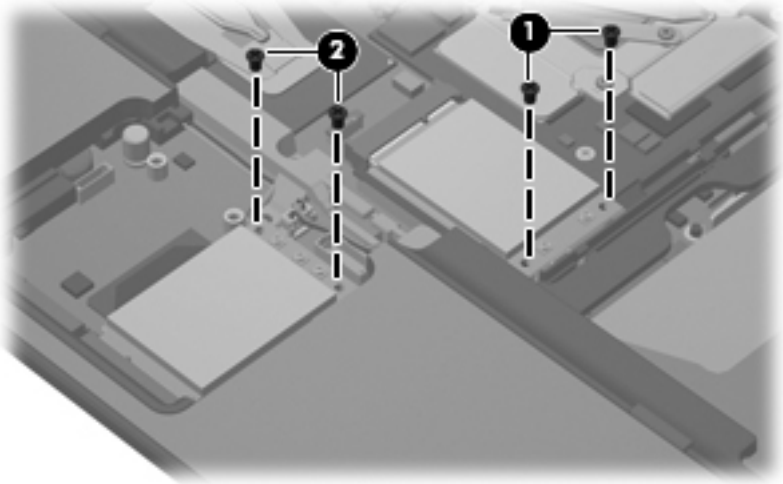


Where used: 2 screws that secure the fan to the base enclosure

Phillips PM2.5×4.0 screw



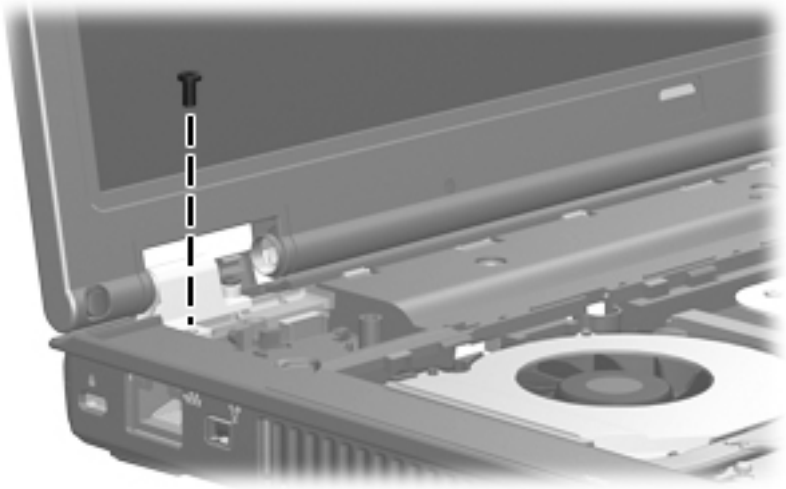
Color	Quantity	Length	Thread	Head diameter
Black	10	4.0 mm	2.5 mm	5.0 mm



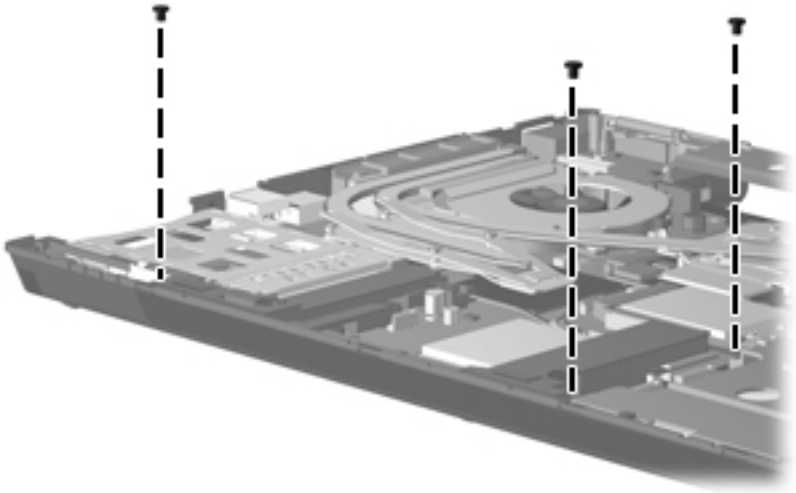
Where used:

(1) Two screws that secure the WWAN module to the computer

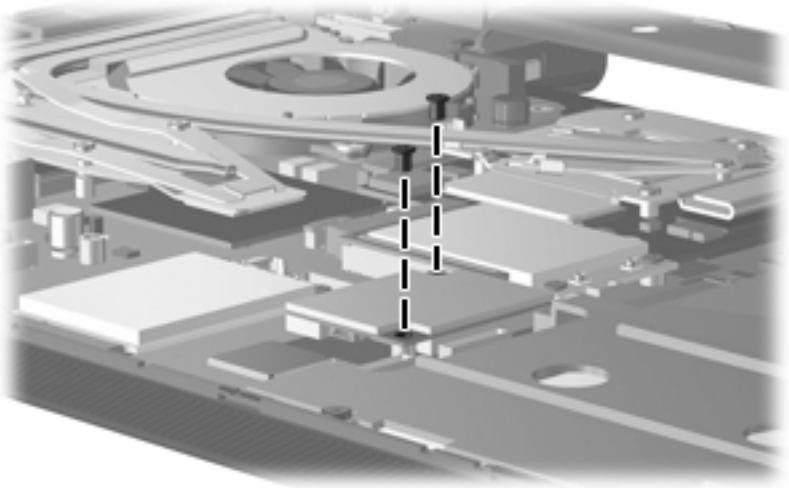
(2) Two screws that secure the WLAN module to the computer



Where used: One screw that secures the display assembly to the computer



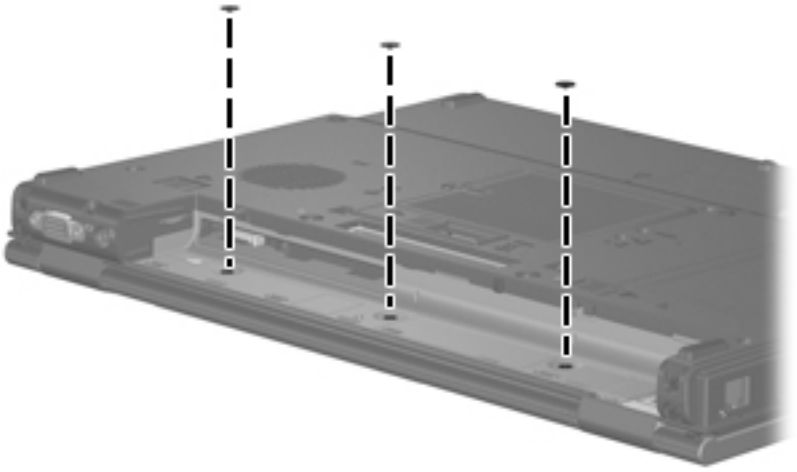
Where used: 3 screws that secure the speaker assembly to the base enclosure



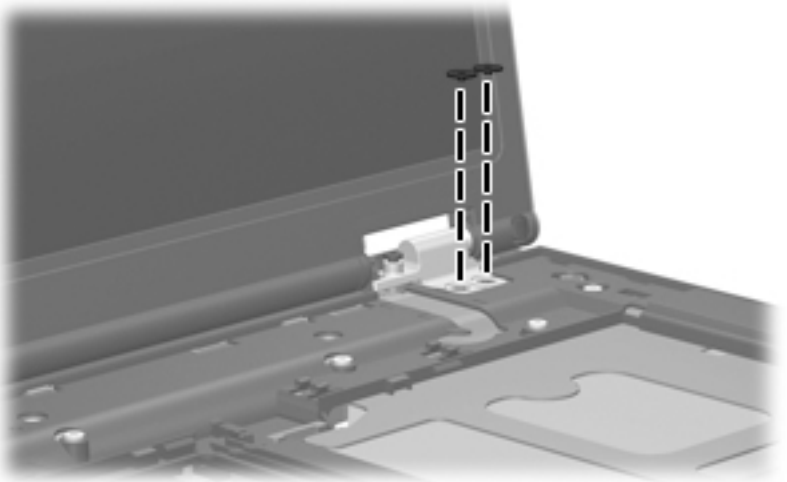
Where used: 2 screws that secure the modem module to the system board

Phillips PM2.0×2.0 screw

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

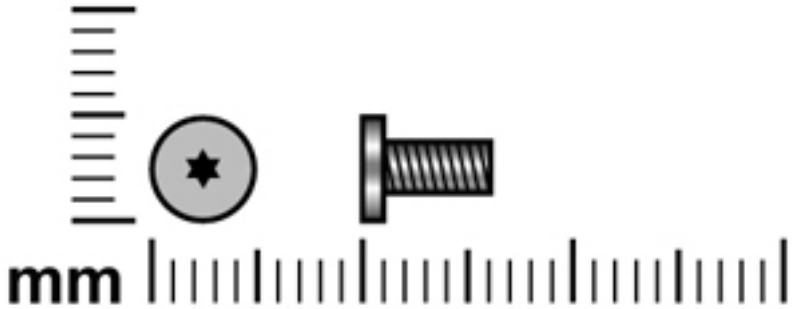


Where used: 3 screws that secure the switch cover to the computer

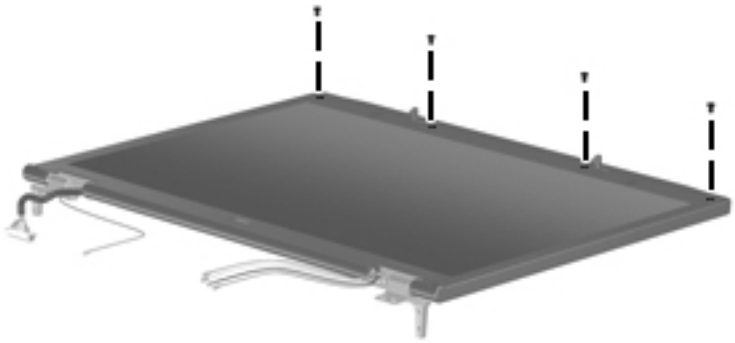


Where used: 2 screws that secure the display assembly to the computer

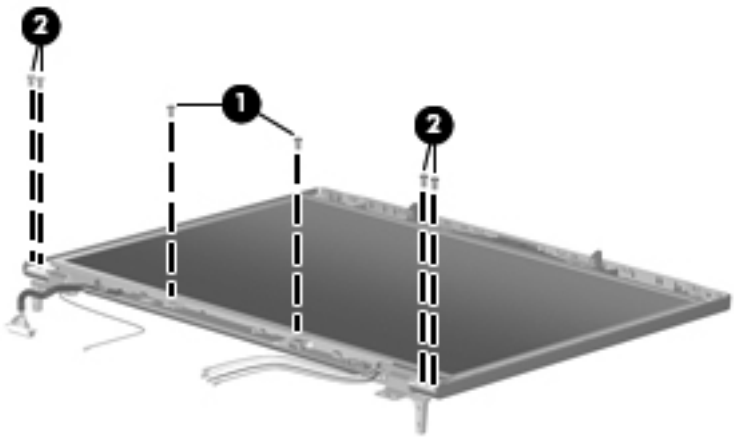
Torx T8M2.5×6.0 screw



Color	Quantity	Length	Thread	Heat width
Black	10	6.0 mm	2.5 mm	5.0 mm



Where used: 4 screws that secure the display bezel top edge to the display assembly

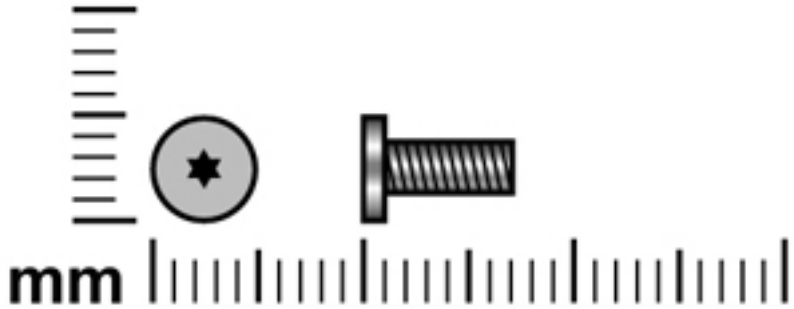


Where used:

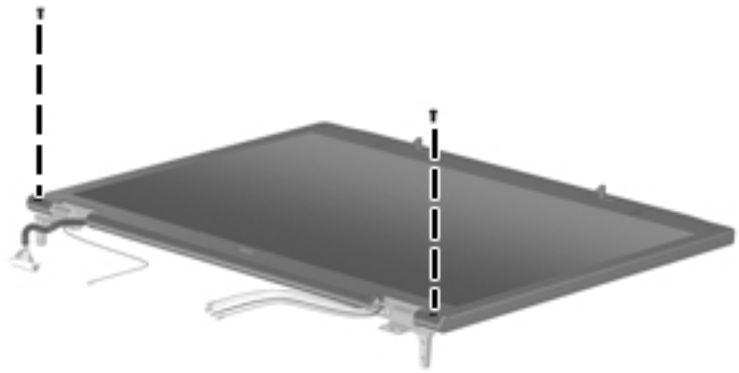
(1) Two screws that secure the display inverter to the display enclosure

(2) Four screws that secure the display panel to the display enclosure

Torx T8M2.5×7.0 screw

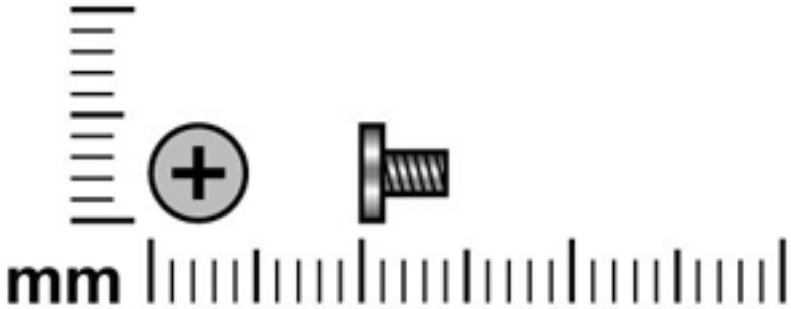


Color	Quantity	Length	Thread	Head diameter
Silver	2	7.0 mm	2.5mm	5.0 mm

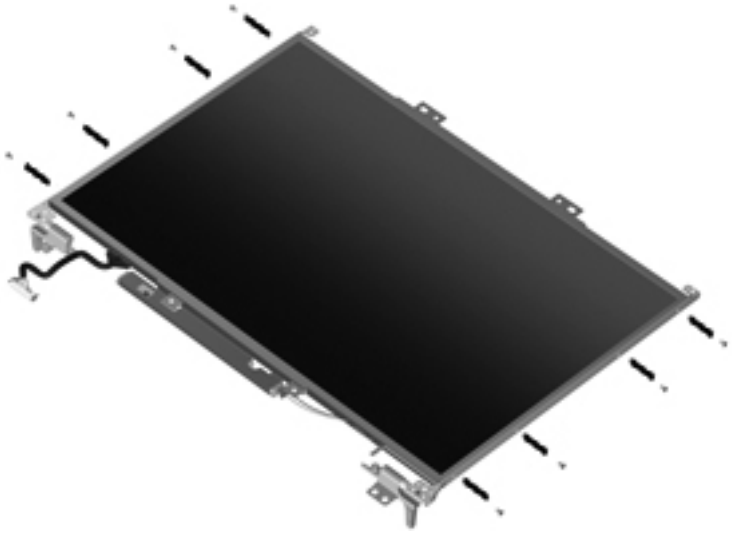


Where used: 2 screws that secure the display bezel bottom edge to the display enclosure

Phillips PM2.0×4.0 screw

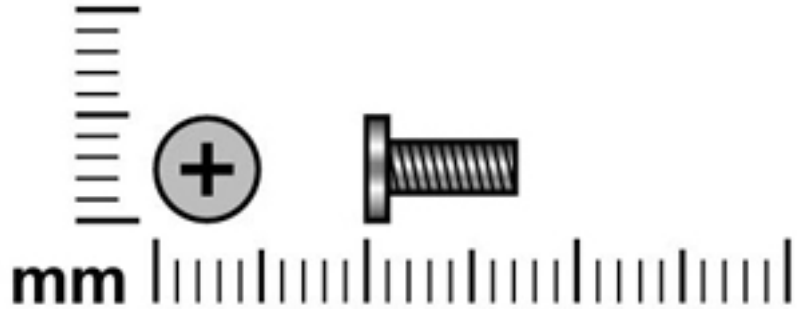


Color	Quantity	Length	Thread	Head diameter
Silver	8	4.0 mm	2.0 mm	4.5 mm

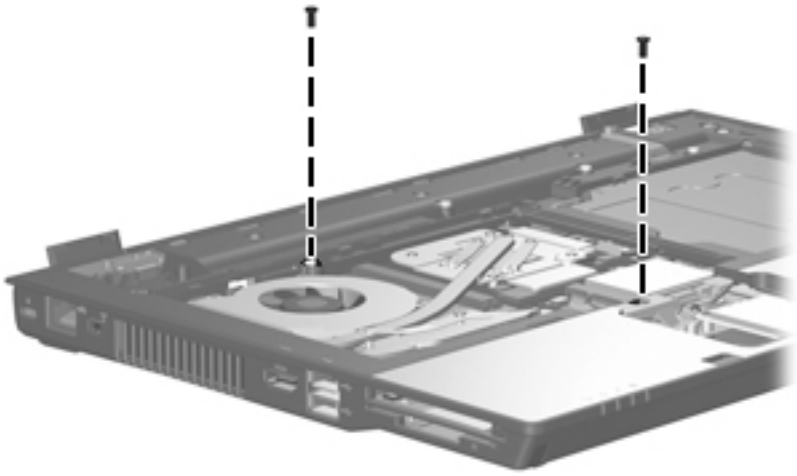


Where used: 8 screws that secure the display hinges to the display panel

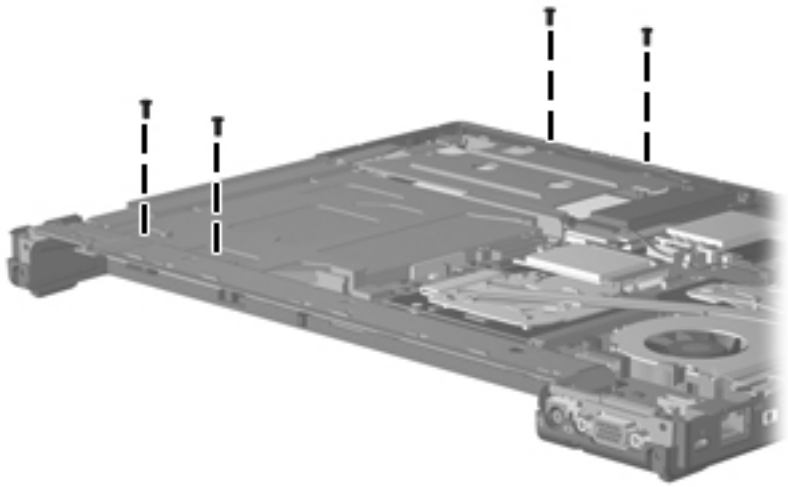
Black Phillips PM2.5×7.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	6	7.0 mm	2.5 mm	5.0 mm

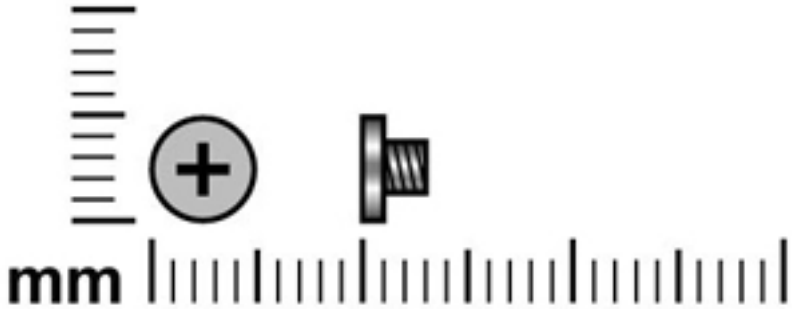


Where used: 2 screws that secure the top cover to the base enclosure

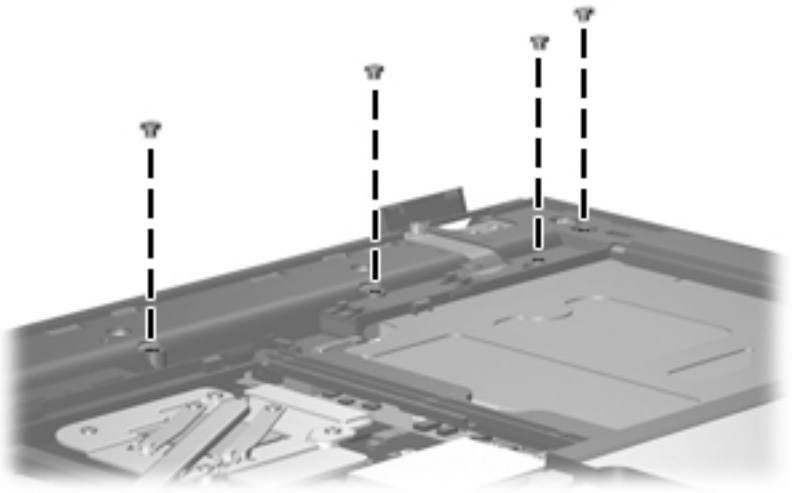


Where used: 4 screws that secure the system board frame to the base enclosure

Phillips PM2.5×3.0 screw

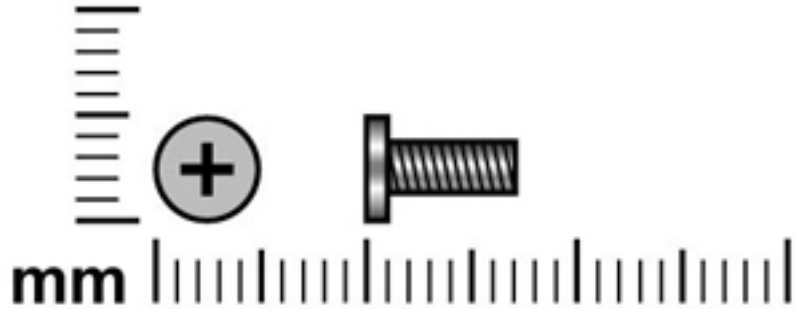


Color	Quantity	Length	Thread	Head diameter
Silver	4	3.0 mm	2.5 mm	5.0 mm

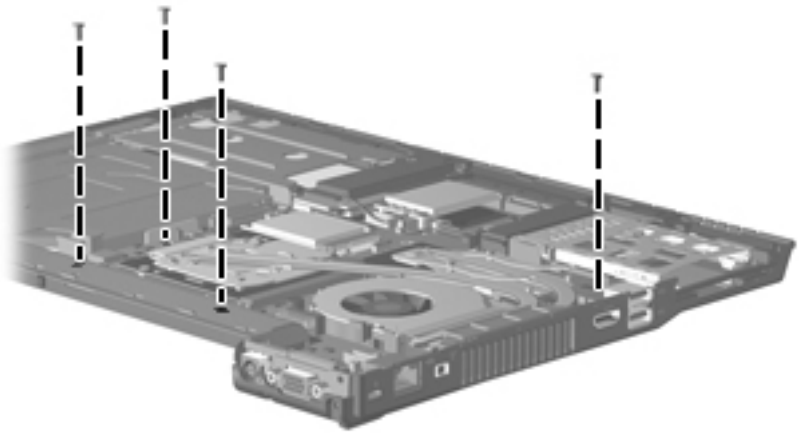


Where used: 4 screws that secure the top cover to the base enclosure

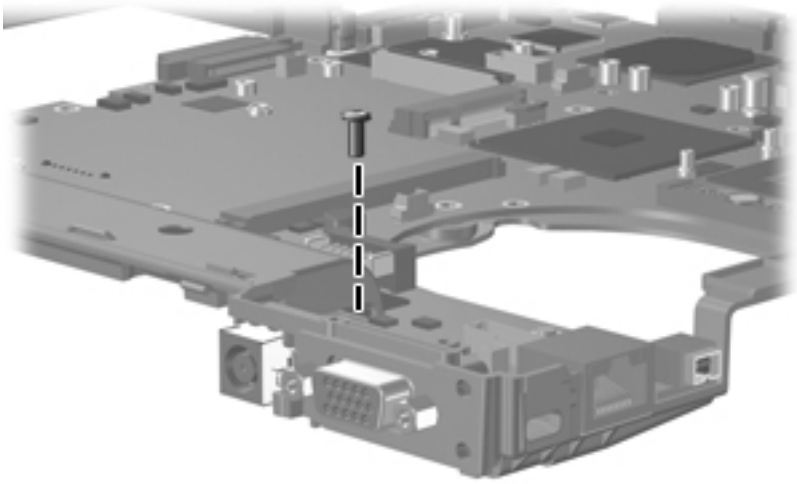
Silver Phillips PM2.5×7.0 screw



Color	Quantity	Length	Thread	Head diameter
Silver	5	7.0 mm	2.5 mm	5.0 mm

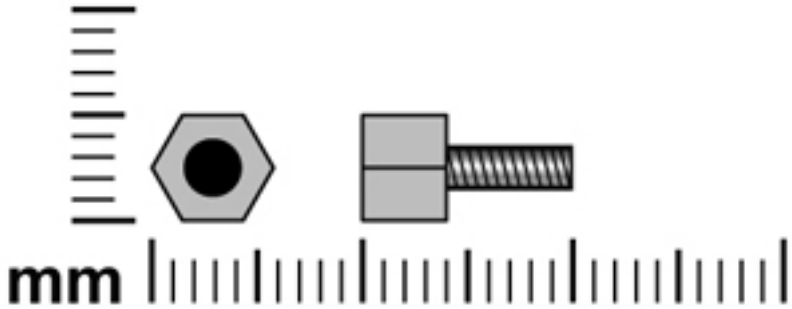


Where used: 4 screws that secure the system board frame to the base enclosure

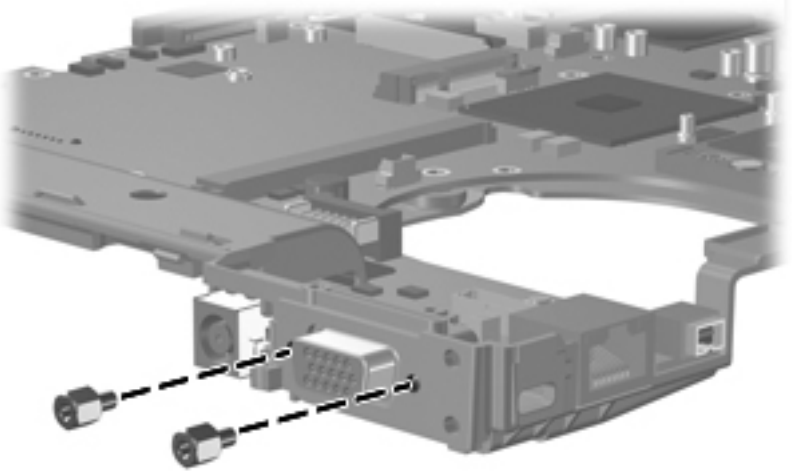


Where used: One screw that secures the system board to the system board frame

Hex Metric HM5.0×10.0 screw lock



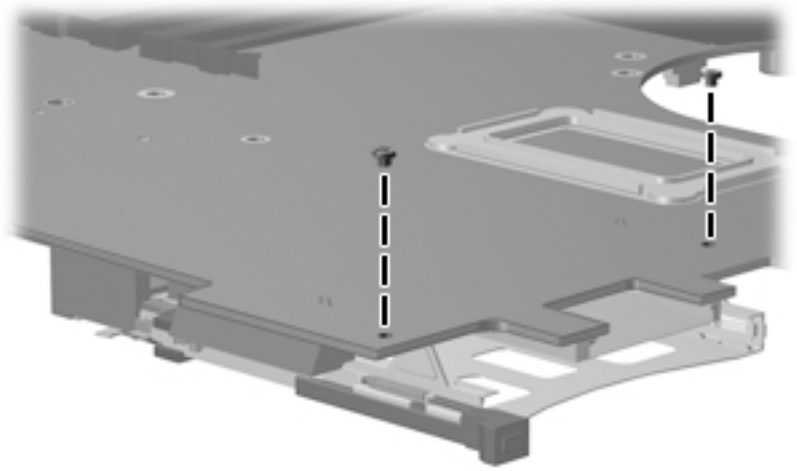
Color	Quantity	Length	Thread	Head diameter
Silver	2	10.0 mm	3.0 mm	5.0 mm



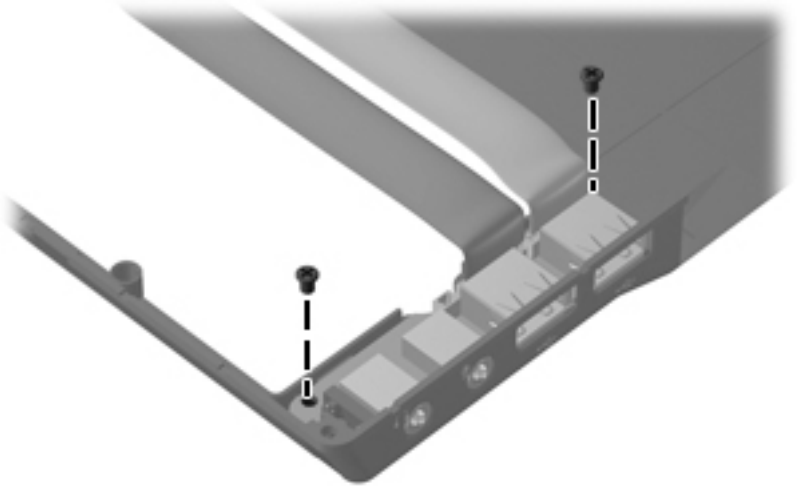
Where used: 2 screw locks that secure the system board to the system board frame

Black Phillips PM2.0×3.0 screw

Color	Quantity	Length	Thread	Head diameter
Black	4	3.0 mm	2.0 mm	4.5 mm



Where used: 2 screws that secure the PC Card assembly to the system board



Where used: 2 screws that secure the USB/audio board to the base enclosure

8 Backup and recovery

Backup and recovery in Windows Vista

Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed in your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.

NOTE: Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the HP Backup & Recovery Manager software.

- The computer must be connected to AC power during the process.
- Only one set of the recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel the disc creation before you have finished creating the recovery discs. The next time you select **Create a set of recovery discs (Recommended)**, you will be prompted to continue the disc creation.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create a set of recovery discs (Recommended)**, and then click **Next**.
4. Follow the on-screen instructions.

Backing up your information

NOTE: You can only recover files that you have previously backed up. HP recommends that you use HP Backup & Recovery Manager to create an entire drive backup as soon as you set up your computer.

With HP Backup & Recovery Manager, you can perform the following tasks:

- Backing up your information regularly to protect your important system files
- Creating system recovery points that allow you to reverse undesireable changes to your computer by restoring the computer to an earlier state
- Scheduling backups at specific intervals or events

When to back up

- On a regularly scheduled basis

NOTE: Set reminders to back up your information periodically.

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

Backup suggestions

- Create a set of recovery discs using HP Backup & Recovery Manager.
- Create system recovery points using HP Backup & Recovery Manager, and periodically copy them to disc.
- Store personal files in the Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings.

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

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

  a. Display the screen.

  b. Copy the screen.

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

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

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

NOTE: Before you can perform backup and recovery procedures, the computer must be connected to external power.

NOTE: Drivers, utilities, and software installed by HP can be copied to a CD or to a DVD using HP Backup & Recovery Manager.

Backing up specific files or folders

You can back up specific files or folders to the recovery partition on the hard drive, to an optional external hard drive, or to optical discs (CDs or DVDs).

NOTE: This process will take several minutes, depending on the file size and the speed of the computer.

To back up specific files or folders:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Back up user created files and folders**, and then click **Next**.
5. Follow the on-screen instructions.

Backing up the entire hard drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows® operating system, software, and all personal files and folders.

NOTE: A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.

NOTE: This process may take over an hour, depending on your computer speed and the amount of data being stored.

To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Create or manage Entire Drive Backups**, and then click **Next**.
5. Follow the on-screen instructions.

Creating recovery points

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

NOTE: The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make copies of changes made after that time.

HP recommends that you create recovery points at the following times:

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

NOTE: Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

To create a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.
5. Follow the on-screen instructions.

Scheduling backups

Use HP Backup Scheduler to schedule backups for the entire system, for recovery points, or for specific files and folders. With this tool, you can schedule backups at specific intervals (daily, weekly, or monthly) or at specific events, such as at system restart or when you dock to an optional docking station (select models only).

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.
2. Follow the on-screen instructions.

Performing a recovery

NOTE: You can only recover files that you have previously backed up. HP recommends that you use HP Backup & Recovery Manager to create an entire drive backup as soon as you set up your computer.

HP Backup & Recovery Manager helps you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Recovering important files—This feature helps you reinstall important files without performing a full system recovery.
- Performing a full system recovery—With HP Backup & Recovery Manager, you can recover your full factory image if you experience system failure or instability. HP Backup & Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

Performing a recovery from the recovery discs

To perform a recovery from the recovery discs, follow these steps:

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

Performing a recovery from the hard drive

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows
- From the recovery partition

Initiating a recovery in Windows

To initiate a recovery in Windows, follow these steps:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
3. Click **Next**.
4. Click **Perform a recovery**, and then click **Next**.
5. Follow the on-screen instructions.

Initiating a recovery from the hard drive recovery partition

To initiate a recovery from the hard drive recovery partition, follow these steps:

1. Back up all personal files.
2. Restart the computer, and then press f11 before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.

Backup and recovery in Windows XP

Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed in your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.

NOTE: Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the HP Backup and Recovery Manager software.

- The computer must be connected to AC power during the process.
- Only one set of the recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel the disc creation before you have finished creating the recovery discs. The next time you select **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, you will be prompted to continue the disc creation.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, and then click **Next**.
4. Follow the on-screen instructions.

Backing up your information

NOTE: You can only recover files that you have previously backed up. HP recommends that you use HP Backup and Recovery Manager to create an entire drive backup as soon as you set up your computer.

With HP Backup and Recovery Manager, you can perform the following tasks:

- Backing up your information regularly to protect your important system files
- Creating system recovery points that allow you to reverse undesireable changes to your computer by restoring the computer to an earlier state
- Scheduling backups at specific intervals or events

When to back up

- On a regularly scheduled basis

NOTE: Set reminders to back up your information periodically.

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

Backup suggestions

- Create a set of recovery discs using HP Backup and Recovery Manager.
- Create system recovery points using HP Backup and Recovery Manager, and periodically copy them to disc.
- Store personal files in the My Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings.

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

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

  a. Display the screen.

  b. Copy the screen.

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

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

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

NOTE: Before you can perform backup and recovery procedures, the computer must be connected to external power.

NOTE: Drivers, utilities, and software installed by HP can be copied to a CD or to a DVD using HP Backup and Recovery Manager.

Backing up specific files or folders

You can back up specific files or folders to the recovery partition on the hard drive, to an optional external hard drive, or to optical discs (CDs or DVDs).

NOTE: This process will take several minutes, depending on the file size and the speed of the computer.

To back up specific files or folders:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Back up individual files and folders**, and then click **Next**.
5. Follow the on-screen instructions.

Backing up the entire hard drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows® operating system, software, and all personal files and folders.

NOTE: A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.

NOTE: This process may take over an hour, depending on your computer speed and the amount of data being stored.

To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Back up entire hard drive**, and then click **Next**.
5. Follow the on-screen instructions.

Creating recovery points

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

NOTE: The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make copies of changes made after that time.

HP recommends that you create recovery points at the following times:

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

NOTE: Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

To create a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.
5. Follow the on-screen instructions.

Scheduling backups

Use HP Backup Scheduler to schedule backups for the entire system, for recovery points, or for specific files and folders. With this tool, you can schedule backups at specific intervals (daily, weekly, or monthly) or at specific events, such as at system restart or when you dock to an optional docking station (select models only).

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.
2. Follow the on-screen instructions.

Performing a recovery

NOTE: You can only recover files that you have previously backed up. HP recommends that you use HP Backup and Recovery Manager to create an entire drive backup as soon as you set up your computer.

HP Backup and Recovery Manager helps you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Recovering important files—This feature helps you reinstall important files without performing a full system recovery.
- Performing a full system recovery—With HP Backup and Recovery Manager, you can recover your full factory image if you experience system failure or instability. HP Backup and Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

Performing a recovery from the recovery discs

To perform a recovery from the recovery discs, follow these steps:

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

Performing a recovery from the hard drive

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows
- From the recovery partition

Initiating a recovery in Windows

To initiate a recovery in Windows, follow these steps:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
3. Click **Next**.
4. Click **Recover important files or the entire system**, and then click **Next**.
5. Follow the on-screen instructions.

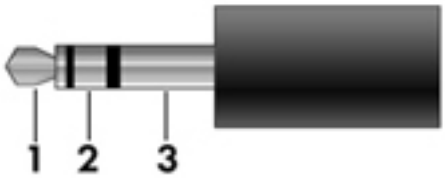
Initiating a recovery from the hard drive recovery partition

To initiate a recovery from the hard drive recovery partition, follow these steps:

1. Back up all personal files.
2. Restart the computer, and then press f11 before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.

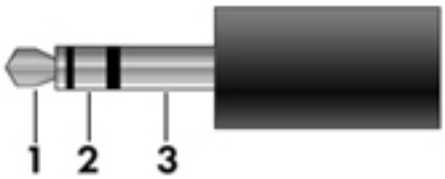
9 Connector pin assignments

Audio-out (headphone)



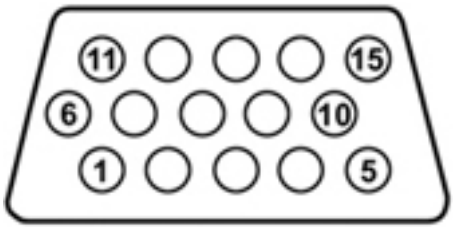
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

Audio-in (microphone)



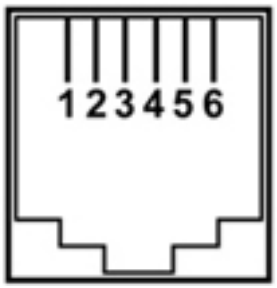
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

External monitor



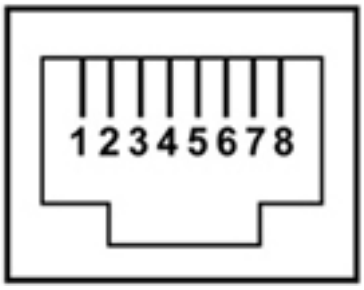
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



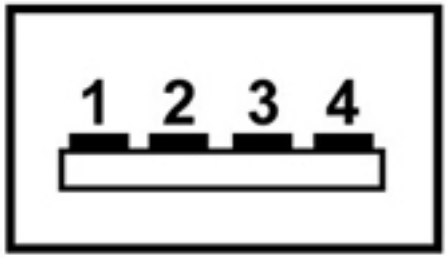
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)



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

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
Korea	EK	4
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

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

11 Recycling

Battery

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for computer battery disposal.

Display

⚠ **WARNING!** The backlight contains mercury. 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. Careful handling must be exercised when removing these components. When you remove these components, handle them carefully.

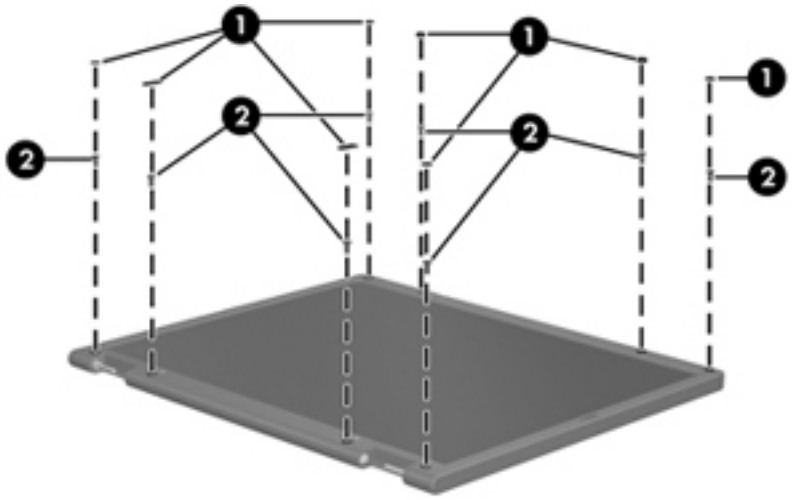
NOTE: **Materials Disposal**. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities,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

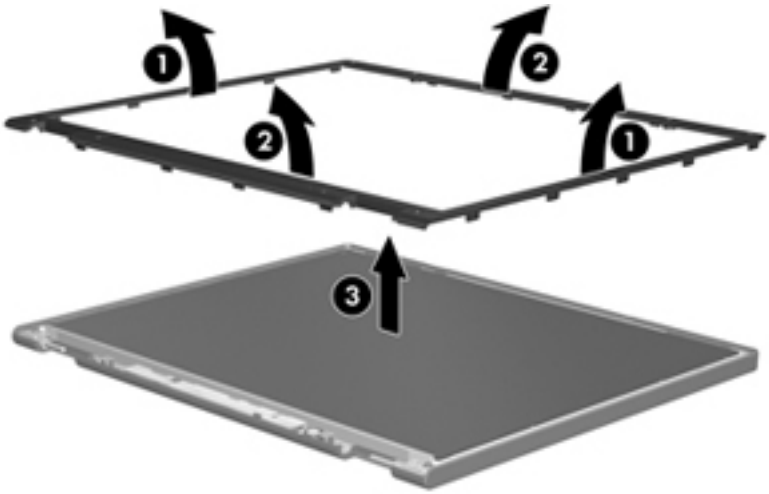
NOTE: The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

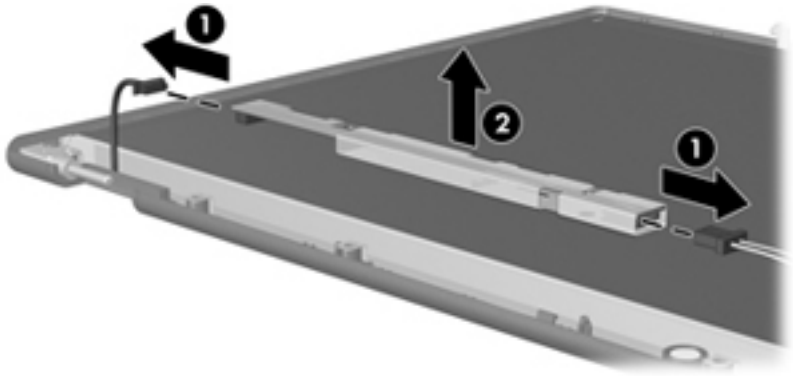
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



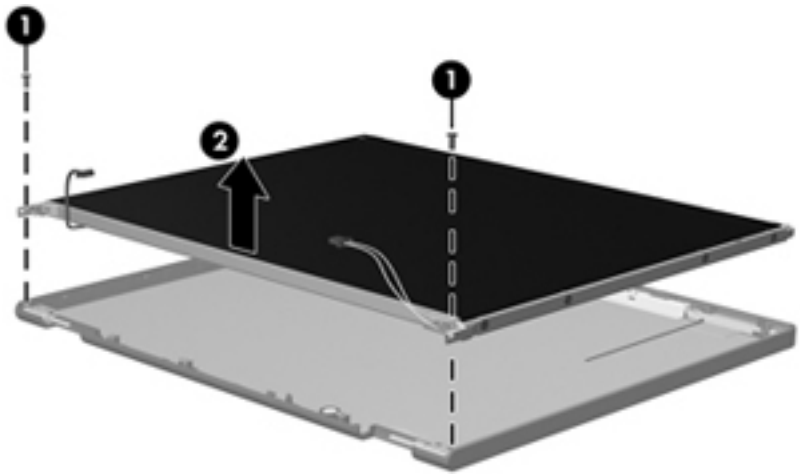
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



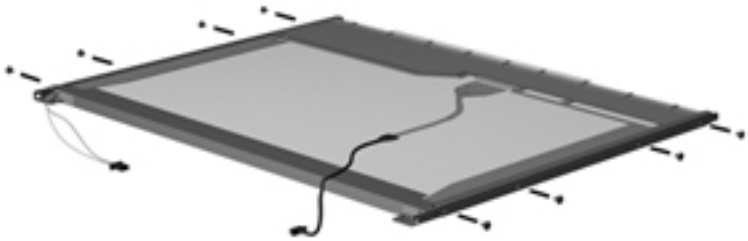
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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.

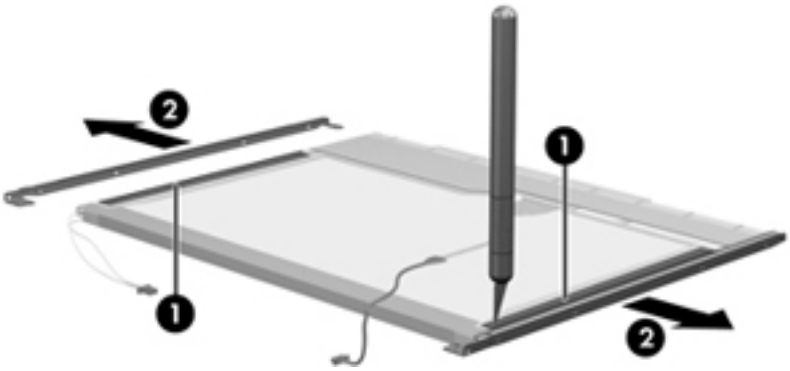


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

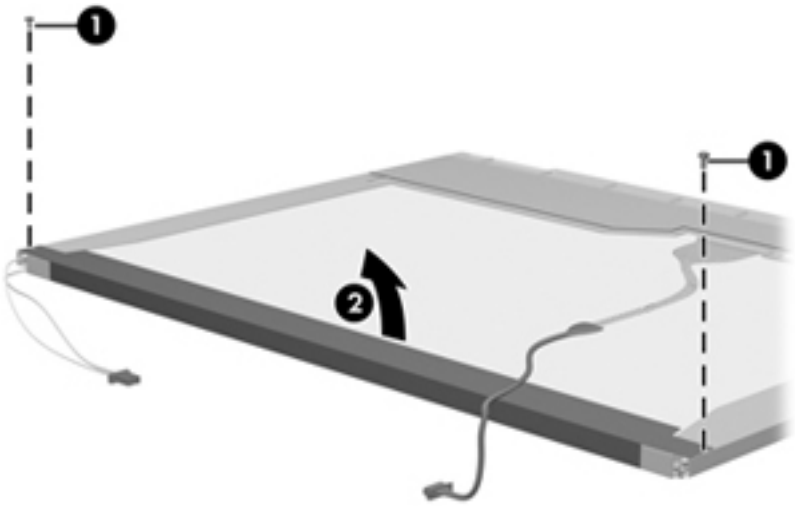


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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

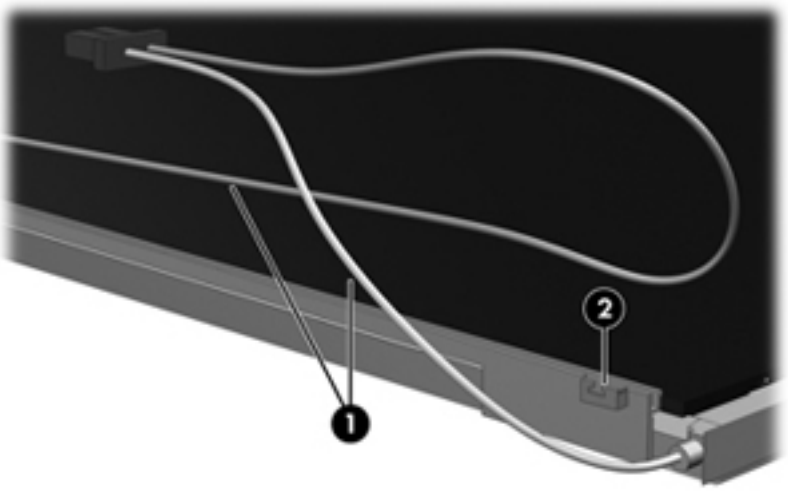


11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



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

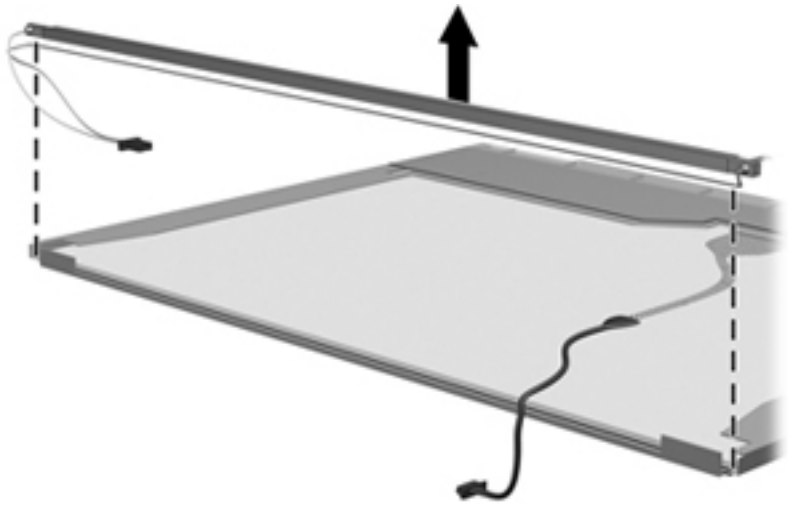
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



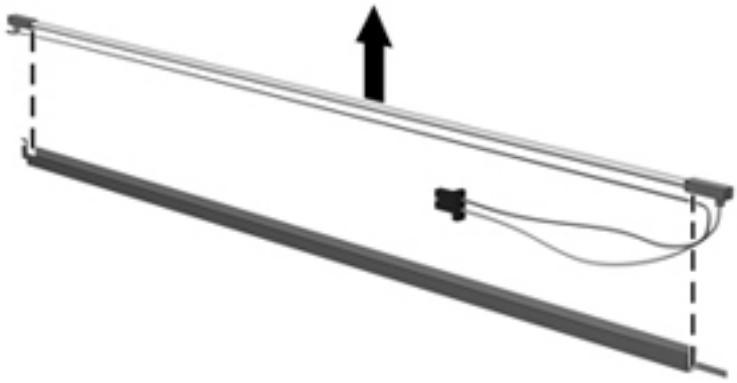
16. Turn the display panel upside down.

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

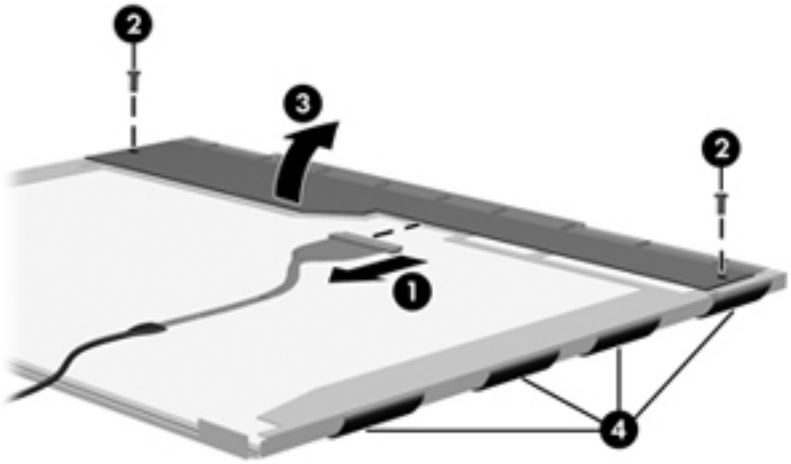
17. Remove the backlight frame from the display panel.



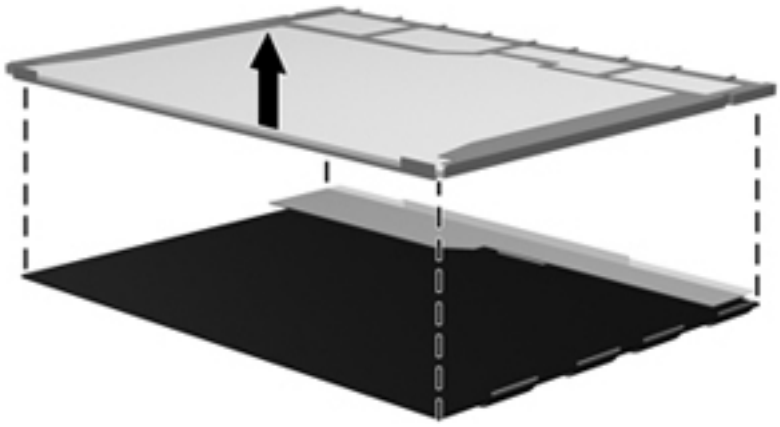
18. Remove the backlight from the backlight frame.



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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