HP EliteBook 8730w Mobile Workstation

Maintenance and Service Guide

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MSG revision history

Revision	Publication date	Description
A	March 2010	The keyboard for Slovenia, spare part number 494002-BA1, has been added in the following locations: Computer major components on page 19, Sequential part number listing on page 28, and Keyboard on page 55. The graphics card heat sink for use in computer models with nVidia Quadro FX 3700M graphics cards, spare part number 518096-001, has been added in the following locations: Computer major components on page 19, Sequential part number listing on page 28, and Graphics card heat sink on page 61 The description for the graphics card heat sink for use in computer models with nVidia Quadro FX 2700M graphics cards, spare part number 494011-001, has been updated in the following locations: Computer major components on page 19, Sequential part number listing on page 28, and Graphics card heat sink on page 61. The 500-GB, 7200-rpm hard drive, spare part number 519527-001, and the 500-GB, 5400-rpm hard drive, spare part number 515870-001, have been added in the following locations: Product description on page 1, Computer major components on page 19, Sequential part number listing on page 28, and Hard drive on page 45. The processors have been updated in the following locations: Product description on page 1, Computer major components on page 19, Sequential part number listing on page 28, and Processor on page 68. The system board for use only in computer models with Core2 Duo processors in the People's Republic of China and Russia, spare part number 509762-001, and the system board for use only in computer models with Core2 Quad processors in the People's Republic of China and Russia, spare part number 509763-001, have been added in the following locations: Computer major components on page 19, Sequential part number listing on page 28, and System board on page 85.

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
Product Name	HP EliteBook 8730w Mobile Workstation
Processors	**Intel® Core™2 Duo processors**
	T9600 2.80-GHz processor 6-MB L2 cache, 1066-MHz front side bus (FSB)
	T9400 2.53-GHz processor 6-MB L2 cache, 1066-MHz FSB
	P8600 2.40-GHz processor 3-MB L2 cache, 1066-MHz FSB
	P8400 2.26-GHz processor 3-MB L2 cache, 1066-MHz FSB
	T9550 2.66-GHz processor, 6-MB L2 cache, 1066-MHz FSB
	T9800 2.93-GHz processor, 6-MB L2 cache, 1066-MHz FSB
	T9900 3.06-GHz processor, 6-MB L2 cache, 1066-MHz FSB
	Intel Core2 Quad processors
	Q9100 2.26-GHz processor 12-MB L2 cache, 1066-MHz FSB
	Q9000 2.0-GHz processor 6-MB L2 cache, 1066-MHz FSB
	Intel Core2 Extreme processors
	QX9300 2.53-GHz processor 12-MB L2 cache, 1066-MHz FSB
	X9100 3.06-GHz processor 6-MB L2 cache, 1066-MHz FSB
Chipset	Northbridge: Intel PM45 Express Chipset with iAMT 4.0 support
	Southbridge: Intel ICH9M-enhanced
Graphics	NVIDIA Quadro FX 3700M (NB9E-GLM3) graphics card with 1-GB graphics subsystem memory operating at 800 MHz
	NVIDIA Quadro FX 2700M (NB9E-GLM2) graphics card with 512-MB graphics subsystem memory operating at 800 MHz
	ATI Mobility FireGL V5725 (M86XT-GL) with 256-MB graphics subsystem memory operating at 800 MHz
	HDMI 1.3 Compliant
	OpenGL driver support
Panels	17.0-inch WUXGA WVA AntiGlare display assembly
	17.0-inch WUXGA WVA AntiGlare display assembly
	17.0-inch WSXGA+ WVA AntiGlare display assembly

Category	Description
	17.0-inch WUXGA DreamColor display assembly
	17.0-inch WXGA+ AnitGlare display assembly
Memory	2 customer-accessible/upgradable memory module slots
	Supports dual-channel memory
	Supports up to 8 GB of system RAM
	PC2-6400, 800-MHz, DDR2
	Supports the following configurations: • 8192-MB total system memory (4096 × 2, dual-channel) • 6144-MB total system memory (4096 + 2048) • 5120-MB total system memory (4096 + 1024) • 4096-MB total system memory (2048 × 2, dual channel) • 4096-MB total system memory (4096 × 1) • 3072-MB total system memory (2048 + 1024) • 2048-MB total system memory (1024 × 2, dual-channel) • 2048-MB total system memory (2048 × 1) • 1024-MB total system memory (1024 × 1)
Hard drives	Supports 9.5-mm 2.5-inch hard drives
	Customer-accessible
	Serial ATA
	Supports the following drives: • 500-GB, 7200 and 5400 rpm • 320-GB, 7200 rpm • 250-GB, 7200 and 5400 rpm • 160-GB, 7200 and 5400 rpm • 80-GB solid state drive
	HP 3D Drive Guard
Optical drives	Upgrade bay (removal of 1 screw required)
	Customer-accessible
	Serial ATA
	12.7-mm tray load
	Supports the following drives: • DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe • Blu-ray ROM DVD+/-RW SuperMulti DL Drive • DVD-ROM Drive

Category	Description
Diskette drive	Supports external USB diskette drive only
	Supports boot from external USB diskette drive
Microphone	Integrated dual-array microphone
Audio	ADI1984A HD Audio
Modem	56K V.92 1.5-inch data/fax modem with digital line guard
	HD audio interface
	Modem cable not included
Ethernet	Intel 82567LM 10/100/1000 network interface card (NIC) with iAMT
	S3/S4/S5 wake on LAN: DC - no
	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 • Intel 802.11a/b/g/n with iAMT support • Intel 802.11a/b/g • Intel 802.11a/b/g with iAMT support
	Integrated personal area network (PAN) options by way of Bluetooth® module:
	Support for no-WPAN option
	Broadcom Bluetooth
External media cards	One ExpressCard/54 slot
	Media Card Reader supporting Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Memory Stick (MS), Memory Stick Pro (MSP), xD-Picture Card (XD) and Memory Stick Duo
Ports	Audio-in (mono microphone)
	Audio-out (stereo headphone)
	High-Definition Multimedia Interface (HDMI)
	eSATA
	RJ-11 (modem)
	RJ-45 (Ethernet, includes link and activity lights)
	USB (4)
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-Hz (hot plug/unplug with auto-detect)

Category	Description
	3-pin AC power
Docking	HP Advanced Docking Station and HP Docking Station
Keyboard/pointing devices	14.4-inch keyboard with separate numeric keypad
	Dualpoint (pointing stick and TouchPad) with 3 pointing stick buttons and 3 TouchPad buttons and vertical scrolling (taps enabled as default)
Power requirements	The following AC adapters with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector): • 150-W PFC AC adapter • 120-W PFC AC adapter
	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	Full volume encryption
	Integrated fingerprint reader
	Integrated smart card reader
	Preboot authentication (password, smart card)
	Security cable slot
	Trusted platform module (TPM) V.1.2
Operating system	**Preinstalled:**
	Windows Vista® Business 32/64
	Windows Vista Home Basic 32
	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
	Windows Vista Business 32/64 with Office 2007 Pro
	Windows Home Basic with Office 2007 Ready
	Windows Vista Ultimate with Office 2007 Ready
	Windows XP Professional with Office 2007 Ready
	Windows XP Professional with Office 2007 Personal
	Windows XP Professional with Office 2007 Pro
	Restore media:
	Windows Vista Business 32/64
	Windows Vista Home Basic 32

Category	Description
	Windows Ultimate 32
	Windows XP Professional
	DRDVD Windows XP Pro
	DRDVD Windows Vista
	Supported:
	Window XP Professional 64 (SP2)
	Certified:
	Novell SuSE Linux
Serviceability	**End-user replaceable parts:**
	AC adapter
	Battery (system)
	Hard drive
	Memory module
	Optical drive
	WLAN module
	Bluetooth module
	Keyboard
	RTC battery
	Fan assembly
	Power button
	Switch cover

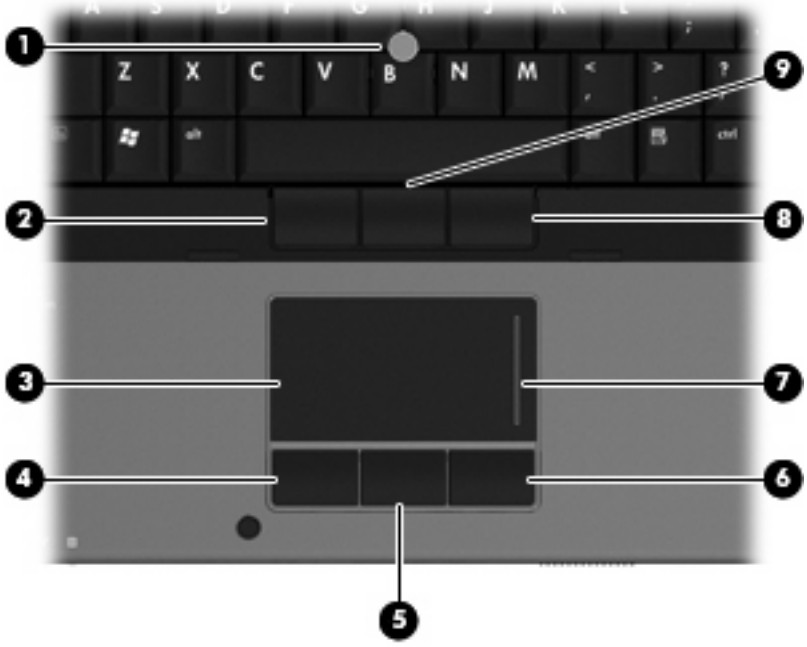
2 External component identification

Display

Component		Description
(1)	Internal display switch	Turns off the display if the display is closed while the power is on.
(2)	Internal microphones (2)	Record sound.
(3)	Webcam light	On: The webcam is in use.
(4)	Webcam	Records audio and video and captures still photographs.
(5)	Ambient light sensor	Automatically adjusts the display brightness based on the lighting conditions in your environment.

Top components

Pointing devices



Component		Description
(1)	Pointing stick*	Moves the pointer and selects or activates items on the screen.
(2)	Left pointing stick button*	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*	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*	Functions like the right button on an external mouse.
(9)	Center pointing stick button*	Functions like the center button on an external mouse.

*This table describes factory settings. To view or change pointing device preferences, follow these steps:

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

Lights

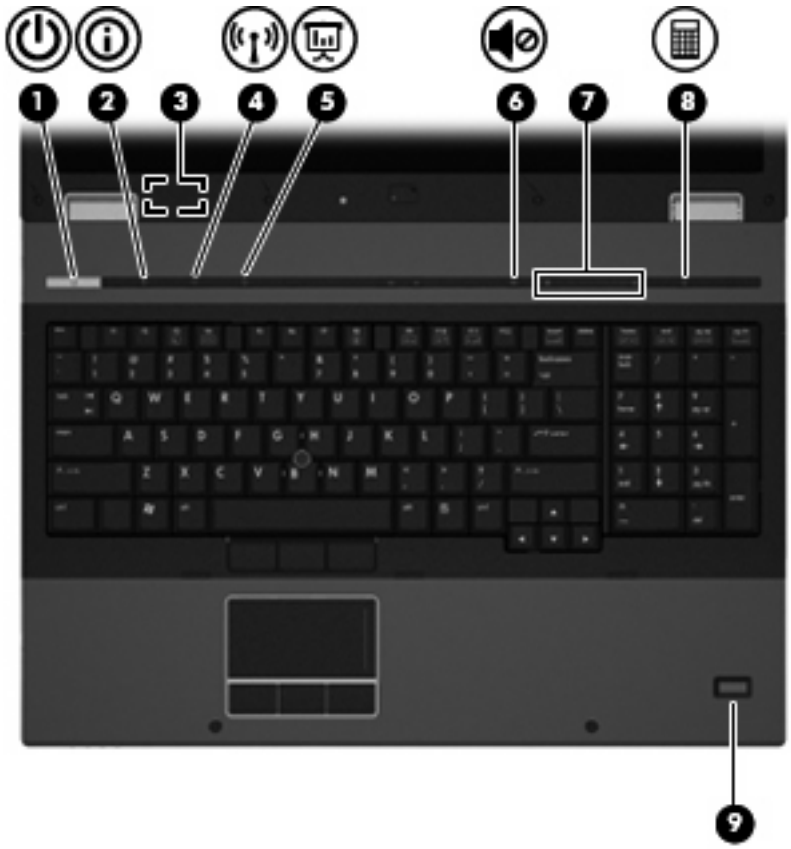
Component		Description
(1)	Power lights (2)*	• On: The computer is on. • Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP). • Off: The computer is off or in Hibernation.
(2)	Wireless lights (2)†	• On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on. • Amber: All wireless devices are off.
(3)	Caps lock light	On: Caps lock is on.
(4)	Num lock light	On: Num lock is on.
(5)	Volume mute light	• On: Computer sound is on. • Amber: Computer sound is off.
(6)	Volume down light	Blinking: The volume scroll zone is being used to decrease speaker volume.
(7)	Volume up light	Blinking: The volume scroll zone is being used to increase speaker volume.
(8)	Calculator light	On: The Windows calculator function is on.

Component		Description
(9)	Battery light	• Amber: A battery is charging. • Turquoise: A battery is close to full charge capacity. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(10)	Drive light	• Blinking: The hard drive or optical drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.

*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.

Buttons, switches, and fingerprint reader

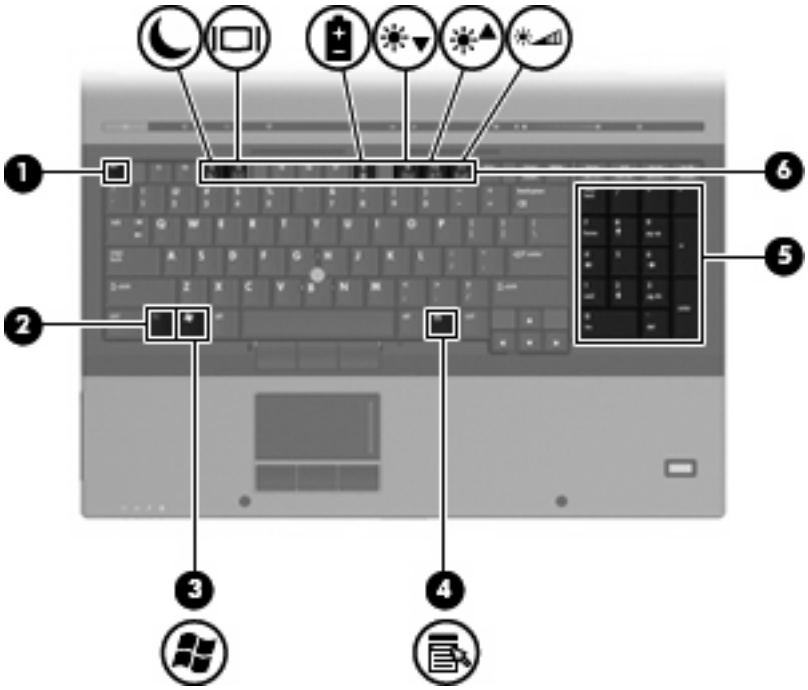


Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to shut down the computer. • When the computer is in the Sleep state (Windows Vista) or Standby (Windows XP), press the button briefly to exit Sleep 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 your power settings, follow these steps: • In Windows Vista, select **Start > Control Panel > System and Maintenance > Power Options**. • In Windows XP, select **Start > Control Panel > Performance and Maintenance > Power Options**.
(2)	Info button	Launches Info Center, which enables you to open various software solutions.
(3)	Internal display switch	Turns off the display if the display is closed while the power is on.

Component		Description
(4)	Wireless button	Turns the wireless feature on or off but does not establish a wireless connection. **NOTE:** You must set up or access a wireless network to establish a wireless connection.
(5)	Presentation button	Starts the presentation feature.
(6)	Volume mute button	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. You can also press the left side of the volume slider to decrease volume, or press the right side of the volume slider to increase volume.
(8)	Calculator button	Turns on the Windows calculator function.
(9)	Fingerprint 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.



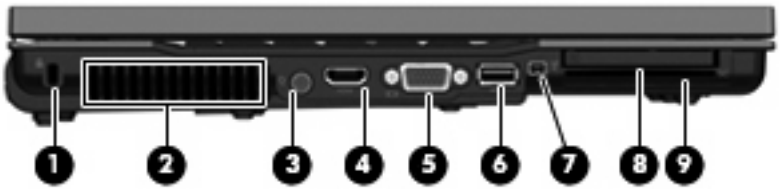
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications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

Front components

Component		Description
(1)	Wireless light	On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on. Amber: All wireless devices are off.
(2)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP). • Off: The computer is off or in Hibernation.
(3)	Battery light	• Amber: A battery is charging. • Turquoise: A battery is close to full charge capacity. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(4)	Drive light	Blinking: The hard drive or optical drive is being accessed. Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(5)	Speakers (2)	Produce sound.
(6)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. **NOTE:** When a device is connected to the headphone jack, the computer speakers are disabled.
(7)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Component		Description
(8)	Media Card Reader	Supports the following optional digital card formats: • Memory Stick • Memory Stick Duo • Memory Stick Pro • MultiMediaCard • Secure Digital Memory Card • xD-Picture Card • xD-Picture Card Type H • xD-Picture Card Type M
(9)	Display release button	Opens the computer.
(10)	Business card slot	Holds a business card in position so that the webcam can capture an image.

Left-side components



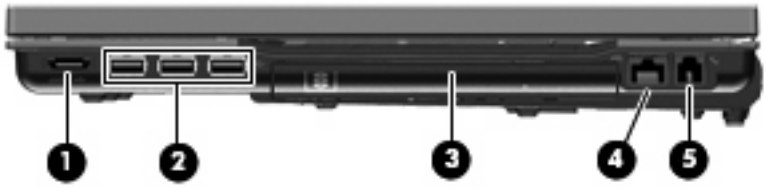
Component		Description
(1)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	Power connector	Connects an AC adapter.
(4)	HDMI port	Connects an optional HDMI device.
(5)	External monitor port	Connects an external VGA monitor or projector.
(6)	USB port	Connects an optional USB device.
(7)	1394 port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(8)	ExpressCard slot	Supports optional ExpressCards.
(9)	Smart card reader	Supports optional smart cards and Java™ Cards.

Rear component

The vent enables airflow to cool internal components.

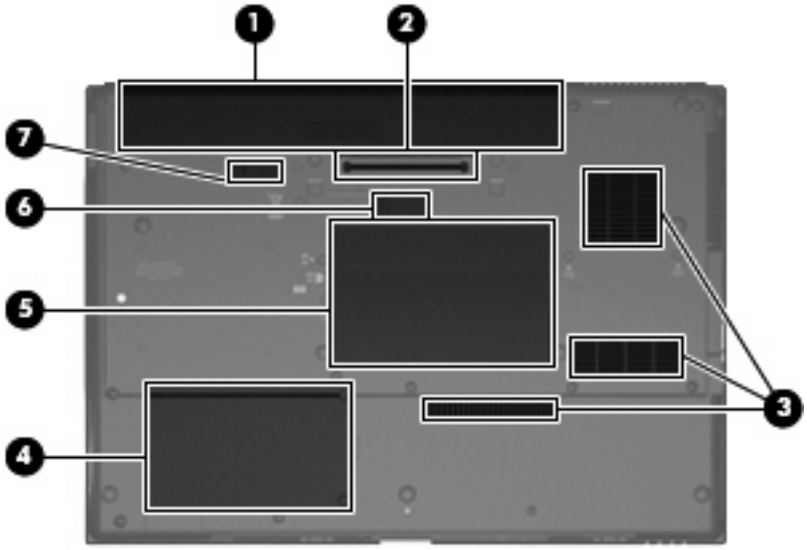
NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Right-side components



Component		Description
(1)	eSATA port	Connects high-performance eSATA components, such as an eSATA external hard drive.
(2)	USB ports (3)	Connect optional USB devices.
(3)	Upgrade bay	Supports an optical drive or hard drive.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	RJ-11 (modem) jack	Connects a modem cable.

Bottom components



Component		Description
(1)	Battery bay	Holds the battery.
(2)	Docking connector	Connects an optional docking device.
(3)	Vents (3)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Hard drive bay	Holds the hard drive and a Bluetooth device.
(5)	Memory module compartment	Contains the memory module slots and a wireless LAN module slot. **CAUTION:** To prevent an unresponsive system and the display of a warning message, replace the WLAN module with only a module authorized for use in the computer by the governmental agency that regulates wireless devices in your country. 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.
(6)	Accessory battery connector	Connects an optional accessory battery.
(7)	Battery release latch	Releases the battery from the battery bay.

Wireless antennae

The antennae send and receive signals from one or more wireless devices. These antennae are not visible from the outside of the computer.

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

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

3 Illustrated parts catalog

Service tag

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

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

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

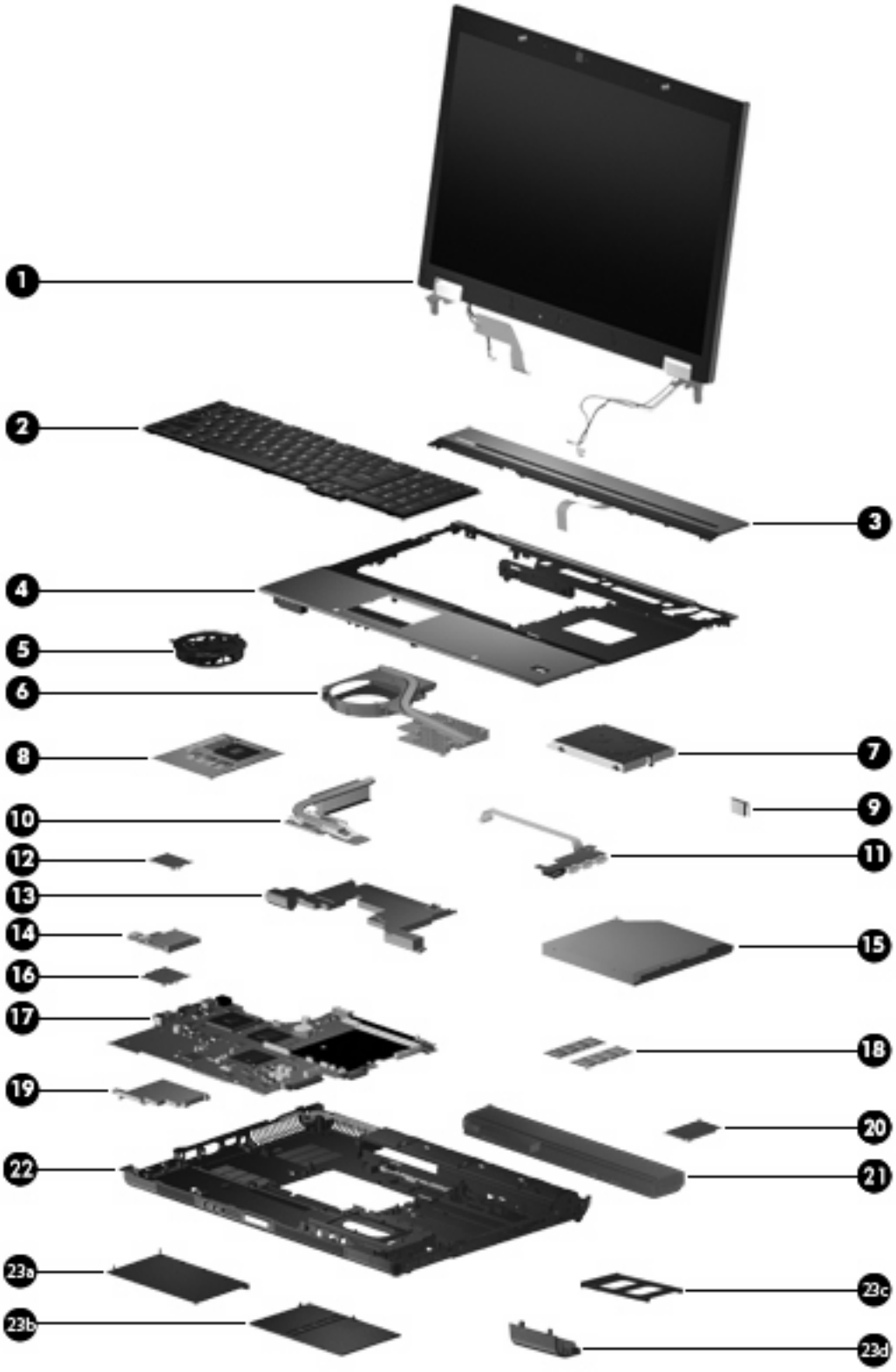
(3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

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

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

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

Computer major components



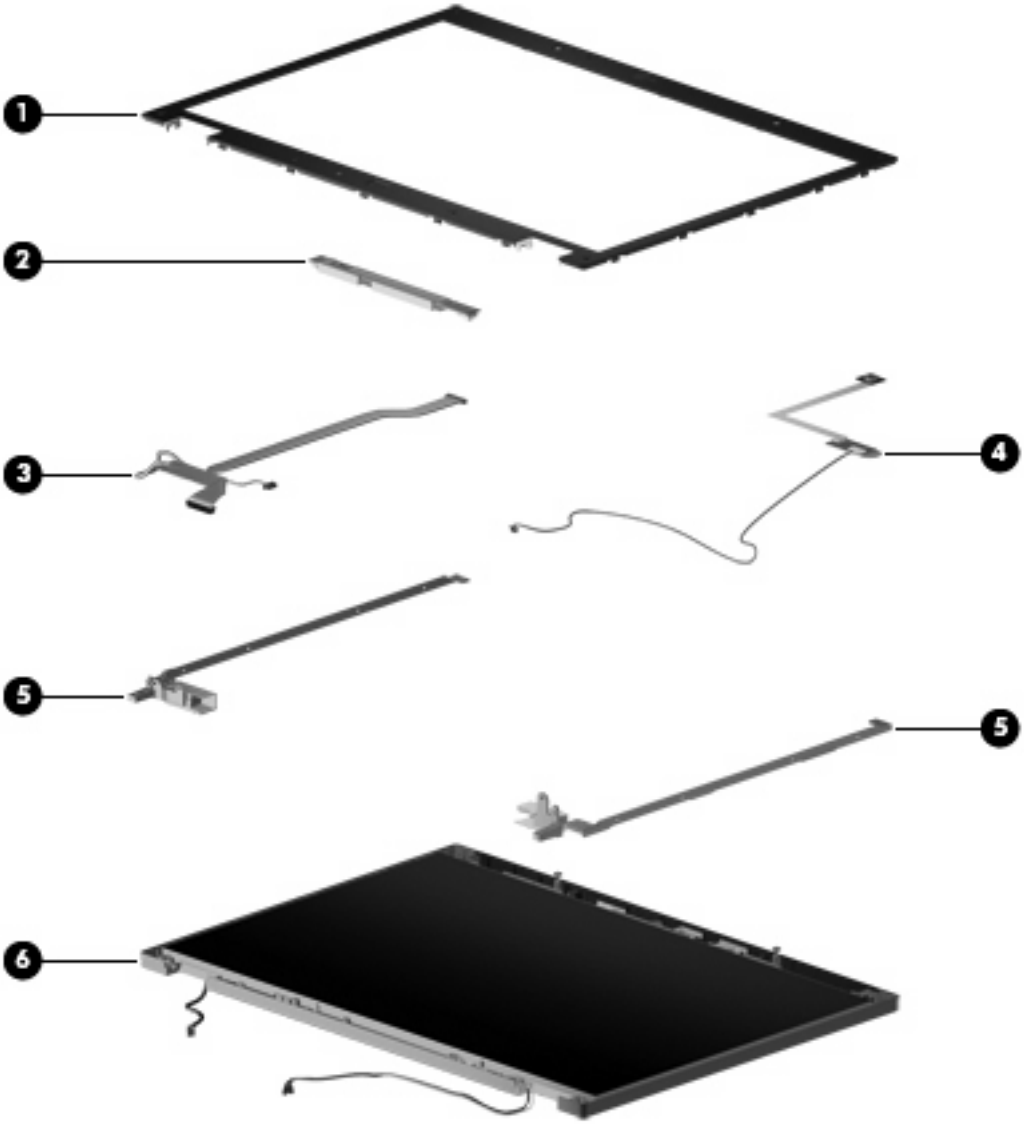
Item	Description	Spare part number
(1)	Display assemblies (include 3 WLAN antenna transceivers and cables)	
	17.0-inch WUXGA WVA AntiGlare display assembly without camera module	494016-001
	17.0-inch WUXGA WVA AntiGlare display assembly with camera module	494017-001
	17.0-inch WSXGA+ WVA AntiGlare display assembly without camera module	494012-001
	17.0-inch WSXGA+ WVA AntiGlare display assembly with camera module	494013-001
	17.0-inch WUXGA DreamColor display assembly without camera module	494014-001
	17.0-inch WUXGA DreamColor display assembly with camera module	494015-001
	17.0-inch WXGA+ AnitGlare display assembly without camera module	494018-001
	17.0-inch WXGA+ AnitGlare display assembly with camera module	494019-001
(2)	**Keyboards with pointing stick** (include keyboard cable and pointing stick cable)	
	For use in Belgium	494002-A41
	For use in Brazil	494002-201
	For use in the Czech Republic	494002-221
	For use in Denmark	494002-081
	For use in France	494002-051
	For use in French Canada	494002-121
	For use in Germany	494002-041
	For use in Greece	494002-151
	For use in Hungary	494002-211
	For use in Iceland	494002-DD1
	For use in Israel	494002-BB1
	For use in Italy	494002-061
	For use in Japan	494002-291
	For use in Latin America	494002-161
	For use in the Netherlands and Europe	494002-021
	For use in Norway	494002-091
	For use in Portugal	494002-131
	For use in Russia	494002-251
	For use in Saudi Arabia	494002-171
	For use in Slovakia	494002-231
	For use in Slovenia	*494002-BA1*
	For use in South Korea	494002-AD1
	For use in Spain	494002-071
	For use in Sweden and Finland	494002-B71

Item	Description	Spare part number
	For use in Switzerland	494002-111
	For use in Taiwan	494002-AB1
	For use in Thailand	494002-281
	For use in Turkey	494002-141
	For use in the United Kingdom	494002-031
	For use in the United States	494002-001
(3)	**Switch cover** (includes LED board and cable and power button board)	493986-001
(4)	**Top cover** (includes TouchPad, TouchPad bracket, TouchPad cable, fingerprint reader board and cable)	493987-001
(5)	**Fan**	494000-001
(6)	**Graphics card heat sink**	
	For use in computer models with nVidia Quadro FX 2700M graphics cards	494011-001
	For use in computer models with nVidia Quadro FX 3700M graphics cards	*518096-001*
	For use in computer models with ATI graphics cards	494211-001
(7)	**Hard drives** (include hard drive bracket and screws)	
	500-GB, 7200-rpm	*519527-001*
	500-GB, 5400-rpm	*515870-001*
	320-GB, 7200-rpm	493997-001
	250-GB, 7200-rpm	493996-001
	250-GB, 5400-rpm	493994-001
	160-GB, 7200-rpm	493992-001
	160-GB, 5400-rpm	493991-001
	80-GB, solid state drive (not illustrated)	493998-001
(8)	**Graphics cards** (include replacement thermal material)	
	ATI Mobility FireGL V5725	493982-001
	nVidia Quadro FX 2700M	493983-001
	nVidia Quadro FX 3700M	493984-001
(9)	**Bluetooth module** (includes Bluetooth module cable)	398393-002
(10)	**Heat sink assemblies** (include replacement thermal material)	
	For use only with computer models equipped with the following processors: P8400, P8600, T9400, and T9600	494010-001
	For use only with computer models equipped with the following processors: X9100, Q9100, and QX9300	494210-001
(11)	**USB/eSATA board** (includes cable)	493981-001
(12)	**Modem modules**	

Item	Description	Spare part number
	For use in all countries and regions except for Australia and New Zealand	461750-001
	For use only in Australia and New Zealand	461750-011
(13)	**Speaker assembly**	494029-001
(14)	**Media card reader/audio board**	493978-001
(15)	**Optical drives**	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	493990-001
	Blu-ray ROM DVD+/-RW SuperMulti DL Drive	493989-001
	DVD-ROM Drive	493988-001
(16)	**Intel Core2 Extreme processors** (include replacement thermal material)	
	QX9300 2.53-GHz processor (12-MB L2 cache, 1066-MHz FSB)	*507946-001*
	X9100 3.06-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507950-001*
	Intel Core2 Quad processors (include replacement thermal material)	
	Q9100 2.26-GHz processor (12-MB L2 cache, 1066-MHz FSB)	*507947-001*
	Q9000 2.0-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507948-001*
	Intel Core2 Duo processors (include replacement thermal material)	
	T9900 3.06-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*570434-001*
	T9800 2.93-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507951-001*
	T9600 2.8-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507955-002*
	T9550 2.66-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507953-001*
	T9400 2.53-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507956-002*
	P8600 2.4-GHz processor (3-MB L2 cache, 1066-MHz FSB)	*507963-002*
	P8400 2.26-GHz processor (3-MB L2 cache, 1066-MHz FSB)	*507964-002*
(17)	**System boards** (include replacement thermal material)	
	For use in computer models with dual core processors (includes RTC battery)	493980-001
	For use in computer models with quad core processors (includes RTC battery)	501508-001
	For use only in computer models with Core2 Duo processors in the People's Republic of China and Russia (includes RTC battery)	*509762-001*
	For use only in computer models with Core2 Quad processors in the People's Republic of China and Russia (includes RTC battery)	*509763-001*
(18)	**Memory modules**	
	4096-MB memory module (PC2-6400, 800-MHz, DDR2)	494009-001
	2048-MB memory module (PC2-6400, 800-MHz, DDR2)	494008-001
	1024-MB memory module (PC2-6400, 800-MHz, DDR2)	494007-001
(19)	**ExpressCard assembly**	493999-001
(20)	**WLAN modules**	

Item	Description	Spare part number
	For use in non-iAMT (Intel Active Management Technology) models:	
	• Intel WiFi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except for Russia, Ukraine, and Pakistan	480985-001
	• Intel WiFi Link 5100 802.11a/b/g WLAN module for use in Russia, Ukraine, and Pakistan	482957-001
	• Intel WiFi Link 5300 802.11a/b/g/n WLAN module for use in all countries and regions	480986-001
	For use in iAMT models:	
	• Intel WiFi Link 5100 802.11a/b/g/n for iAMT WLAN module for use in all countries and regions except for Russia, Ukraine, and Pakistan	506678-001
	• Intel WiFi Link 5100 802.11a/b/g for iAMT WLAN module for use in Russia, Ukraine, and Pakistan	506680-001
	• Intel WiFi Link 5300 802.11a/b/g/n for iAMT WLAN module for use in all countries and regions	506679-001
(21)	**8-cell, 2.55-Ah, Li-ion battery**	493976-001
(22)	**Base enclosure** (includes latch assembly)	493975-001
	Plastics Kit (see Plastics Kit on page 25 for more Plastics Kit spare part information):	494020-001
(23a)	Hard drive cover (includes 2 captive screws, secured by C-clips)	
(23b)	Memory module/WLAN module compartment cover (includes one captive screw, secured by a C-clip)	
(23c)	ExpressCard slot bezel	
(23d)	Bluetooth compartment cover	
	Rubber Kit (includes 8 feet in 2 different sizes)	494027-001
	Cable Kit (not illustrated; see Cable Kit on page 25 for more Cable Kit spare part number information)	493985-001

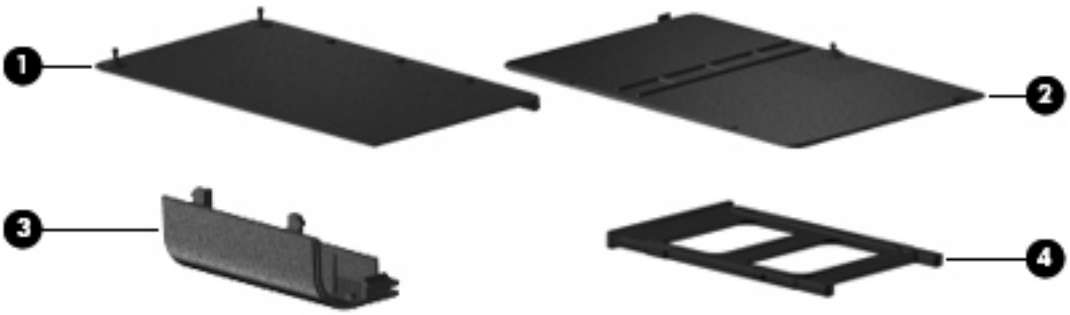
Display assembly components



Item	Description	Spare part number
(1)	**Display bezels**	
	For use only in computer models without a camera module	494003-001
	For use only in computer models with a camera module	487285-001
(2)	**Display inverter** for use only in models with an LCD display (includes Mylar shield)	494001-001
	Ambient light sensor board for use only in models with a DreamColor LED display – 494014-001 and 494015-001 (not illustrated)	495029-001
(3)	**Display cable**	
	For use only in computer models with a DreamColor LED display	495607-001
	For use only in computer models with an LCD display	494005-001

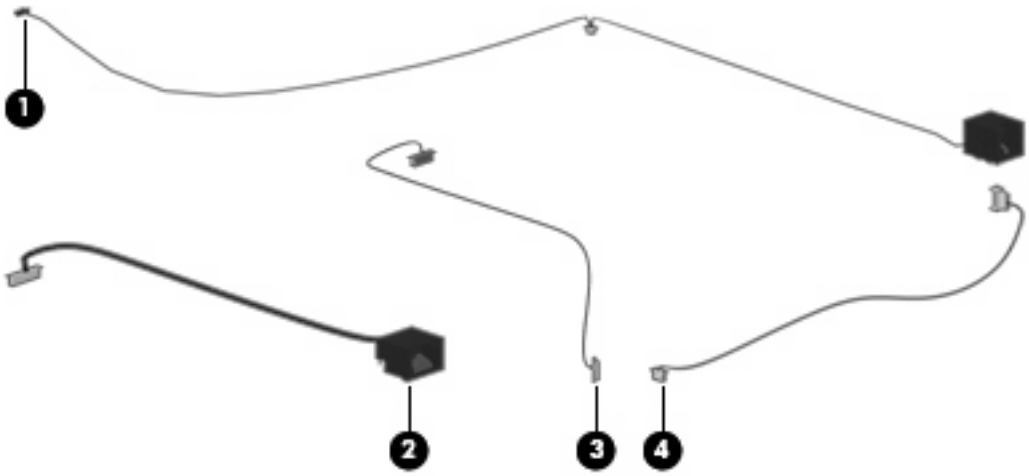
Item	Description	Spare part number
(4)	**Camera module** (includes flex cable)	494030-001
(5)	**Display Hinge Kit** (includes hinge covers)	494004-001
(6)	**Display enclosure** (includes wireless antennae and microphone)	
	For use only in computer models with a DreamColor LED display	495895-001
	For use only in computer models with an LCD display	494006-001

Plastics Kit



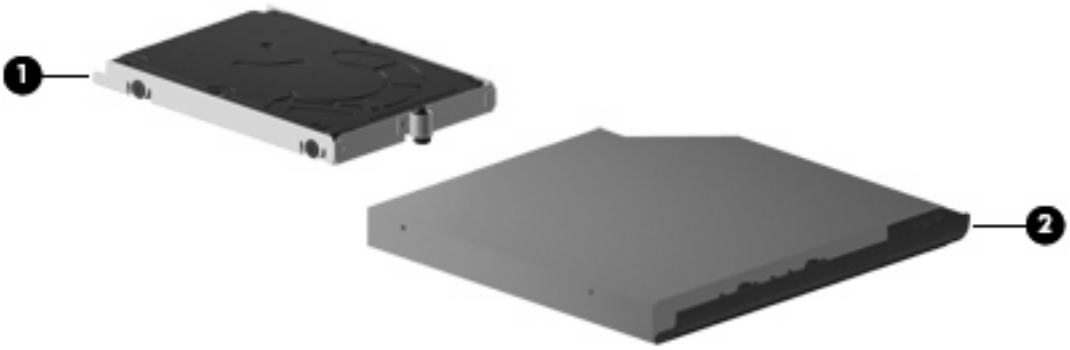
Item	Description	Spare part number
	Plastics Kit:	494020-001
(1)	Hard drive compartment cover (includes 2 captive screws, secured by C-clips)	
(2)	Memory module/WLAN module compartment cover (includes 3 captive screws, secured by C-clips)	
(3)	Bluetooth compartment cover	
(4)	ExpressCard slot bezel	

Cable Kit



Item	Description	Spare part number
	Cable Kit:	493985-001
(1)	RJ-45 jack cable	
(2)	RJ-11 jack cable	
(3)	Bluetooth cable	
(4)	Microphone extension cable	

Mass storage devices



Item	Description	Spare part number
(1)	**Hard drives** (include bracket and screws)	
	320-GB, 7200-rpm	493997-001
	250-GB, 7200-rpm	493996-001
	250-GB, 5400-rpm	493994-001
	160-GB, 7200-rpm	493992-001
	160-GB, 5400-rpm	493991-001
	Solid state drive, 80 GB (not illustrated)	493998-001
(2)	**Optical drives** (include bezel)	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	493990-001
	Blu-ray ROM DVD+/-RW SuperMulti DL Drive	493989-001
	DVD-ROM Drive	493988-001

Miscellaneous parts

Description	Spare part number
AC adapters	
150-W PFC AC adapter	463954-001
120-W PFC AC adapter	463953-001
Power cords:	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61

Description	Spare part number
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom	490371-031
For use in the United States	490371-001
Screw Kit • Phillips PM2.5×2.5 screw • Phillips PM2.5×3.0 screw • Phillips PM2.5×4.5 screw • Phillips PM2.0×3.0 screw • Torx T8M2.5×8.0 screw • Torx T8M2.5×4.0 screw	494028-001

Sequential part number listing

Spare part number	Description
398393-002	Bluetooth module (includes Bluetooth module cable)
449137-001	RTC battery
461750-001	Modem module for use in all countries and regions except for Australia and New Zealand
461750-011	Modem module for use only in Australia and New Zealand
463953-001	120-W PFC AC adapter
463954-001	150-W PFC AC adapter
480985-001	Intel WiFi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except for Russia, Ukraine, and Pakistan
480986-001	Intel WiFi Link 5300 802.11a/b/g/n WLAN module for use in all countries and regions
482957-001	Intel WiFi Link 5100 802.11a/b/g WLAN module for use in Russia, Ukraine, and Pakistan
490371-001	Power cord (3-wire) for use in North America
490371-011	Power cord (3-wire) for use in Australia
490371-021	Power cord (3-wire) for use in Europe, the Middle East, and Africa

Spare part number	Description
490371-031	Power cord (3-wire) for use in the United Kingdom
490371-061	Power cord (3-wire) for use in Italy
490371-081	Power cord (3-wire) for use in Denmark
490371-111	Power cord (3-wire) for use in Switzerland
490371-201	Power cord (3-wire) for use in Brazil
490371-291	Power cord (3-wire) for use in Japan
490371-AA1	Power cord (3-wire) for use in the People's Republic of China
490371-AB1	Power cord (3-wire) for use in Taiwan
490371-AD1	Power cord (3-wire) for use in South Korea
490371-AR1	Power cord (3-wire) for use in South Africa
490371-BB1	Power cord (3-wire) for use in Israel
490371-D01	Power cord (3-wire) for use in Argentina
490371-D61	Power cord (3-wire) for use in India
493975-001	Base enclosure (includes latch assembly)
493976-001	Battery, 8-cell, 2.55-Ah, Li-ion
493978-001	Media card reader/audio board
493980-001	System board for use in computer models with dual core processors (includes RTC battery and replacement thermal material)
493981-001	USB/eSATA board (includes cable)
493982-001	ATI Mobility FireGL V5725 graphics card; includes replacement thermal material
493983-001	nVidia Quadro FX 2700M graphics card; includes replacement thermal material
493984-001	nVidia Quadro FX 3700M graphics card; includes replacement thermal material
493985-001	Cable Kit (see Cable Kit on page 25 for more Cable Kit spare part information
493986-001	Switch cover (includes LED board and cable and power button board)
493987-001	Top cover (includes TouchPad, TouchPad bracket, TouchPad cable, fingerprint reader board and cable)
493988-001	DVD-ROM drive
493989-001	Blu-ray ROM DVD+/-RW SuperMulti DL Drive
493990-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
493991-001	160-GB, 5400-rpm hard drive (includes hard drive bracket and screws)
493992-001	160-GB, 7200-rpm hard drive (includes hard drive bracket and screws)
493994-001	250-GB, 5400-rpm hard drive (includes hard drive bracket and screws)
493996-001	250-GB, 7200-rpm hard drive (includes hard drive bracket and screws)
493997-001	320-GB, 7200-rpm hard drive (includes hard drive bracket and screws)
493998-001	80-GB, solid state drive (includes hard drive bracket and screws)

Spare part number	Description
493999-001	ExpressCard assembly
494000-001	Fan
494001-001	Display inverter for use only in models with an LCD display (includes Mylar shield)
494002-001	Keyboard with pointing stick for use in the United States
494002-021	Keyboard for use in Europe
494002-031	Keyboard for use in the United Kingdom
494002-041	Keyboard for use in Germany
494002-051	Keyboard for use in France
494002-061	Keyboard for use in Italy
494002-071	Keyboard for use in Spain
494002-081	Keyboard for use in Denmark
494002-091	Keyboard for use in Norway
494002-111	Keyboard for use in Switzerland
494002-121	Keyboard for use in French Canada
494002-131	Keyboard for use in Portugal
494002-141	Keyboard for use in Turkey
494002-151	Keyboard for use in Greece
494002-161	Keyboard for use in Latin America
494002-171	Keyboard for use in Saudi Arabia
494002-201	Keyboard for use in Brazil
494002-211	Keyboard for use in Hungary
494002-221	Keyboard for use in the Czech Republic
494002-231	Keyboard for use in Slovakia
494002-251	Keyboard for use in Russia
494002-281	Keyboard for use in Thailand
494002-291	Keyboard for use in Japan
494002-A41	Keyboard for use in Belgium
494002-AB1	Keyboard for use in Taiwan
494002-AD1	Keyboard for use in South Korea
494002-B71	Keyboard for use in Sweden and Finland
494002-BA1	*Keyboard for use in Slovenia*
494002-BB1	Keyboard for use in Israel
494002-DD1	Keyboard for use in Iceland
494003-001	Display bezel for use in computer models without a camera module

Spare part number	Description
494004-001	Display Bracket Kit (includes hinge covers)
494005-001	Display panel cable for use in computer models with LCD displays
494006-001	Display enclosure for use in computer models with LCD displays (includes wireless antennae and microphone)
494007-001	1024-MB memory module (PC-6400, 800-GHz, DDR2)
494008-001	2048-MB memory module (PC-6400, 800-GHz, DDR2)
494009-001	4096-MB memory module (PC2-6400, 800-MHz, DDR2)
494010-001	Heat sink for use only with computer models equipped with the following processors: P8400, P8600, T9400, and T9600 (includes replacement thermal material)
494011-001	*Graphics card heat sink for use in computer models with nVidia Quadro FX 2700M graphics cards*
494012-001	17.0-inch, WSXGA+ WVA AntiGlare display assembly without camera module (includes 3 WLAN antenna transceivers and cables)
494013-001	17.0-inch, WSXGA+ WVA AntiGlare display assembly with camera module (includes 3 WLAN antenna transceivers and cables)
494014-001	17.0-inch, WUXGA DreamColor display assembly without camera module (includes 3 WLAN antenna transceivers and cables)
494015-001	17.0-inch, WUXGA DreamColor display assembly with camera module (includes 3 WLAN antenna transceivers and cables)
494016-001	17.0-inch, WUXGA+ WVA AntiGlare display assembly without camera module (includes 3 WLAN antenna transceivers and cables)
494017-001	17.0-inch, WUXGA+ WVA AntiGlare display assembly with camera module (includes 3 WLAN antenna transceivers and cables)
494018-001	17.0-inch, WXGA+ AntiGlare display assembly without camera module (includes 3 WLAN antenna transceivers and cables)
494019-001	17.0-inch, WXGA+ AntiGlare display assembly with camera module (includes 3 WLAN antenna transceivers and cables)
494020-001	Plastics Kit (see Plastics Kit on page 25 for more Plastics Kit spare part information)
494027-001	Rubber Kit (includes 8 feet in 2 different sizes)
494028-001	Screw Kit
494029-001	Speaker assembly
494030-001	Camera module (includes flex cable)
494210-001	Heat sink for use only with computer models equipped with the following processors: X9100, Q9100, and QX9300 (includes replacement thermal material)
494211-001	Graphics card heat sink for use in computer models with ATI graphics cards
495029-001	Ambient light sensor board (for use only in models with a DreamColor LED display – 494014-001 and 494015-001)
495030-001	Display bezel for use in computer models with a camera module
495607-001	Display panel cable for use in computer models with DreamColor LED displays
495895-001	Display enclosure for use in computer models with DreamColor LED displays (includes wireless antennae and microphone)

Spare part number	Description
501508-001	System board for use only with computer models equipped with quad core processors (includes RTC battery and replacement thermal material)
506678-001	Intel WiFi Link 5100 802.11a/b/g/n for iAMT WLAN module for use in all countries and regions except for Russia, Ukraine, and Pakistan
506679-001	Intel WiFi Link 5300 802.11a/b/g/n for iAMT WLAN module for use in all countries and regions
506680-001	Intel WiFi Link 5100 802.11a/b/g for iAMT WLAN module for use in Russia, Ukraine, and Pakistan
507946-001	*Intel Core2 Extreme QX9300 2.53-GHz processor (12-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507947-001	*Intel Core2 Quad Q9100 2.26-GHz processor (12-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507948-001	*Intel Core2 Quad Q9000 2.0-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507950-001	*Intel Core2 Extreme X9100 3.06-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507951-001	*Intel Core2 Duo T9800 2.93-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507953-001	*Intel Core2 Duo T9550 2.66-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507955-002	*Intel Core2 Duo T9600 2.80-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507956-002	*Intel Core2 Duo T9400 2.53-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507963-002	*Intel Core2 Duo MV P8600 2.40-GHz processor (3-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
507964-002	*Intel Core2 Duo MV P8400 2.26-GHz processor (3-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*
509762-001	*System board for use only in computer models with Core2 Duo processors in the People's Republic of China and Russia (includes RTC battery)*
509763-001	*System board for use only in computer models with Core2 Quad processors in the People's Republic of China and Russia (includes RTC battery)*
515870-001	*500-GB, 5400-rpm hard drive (includes hard drive bracket and screws)*
518096-001	*Graphics card heat sink for use in computer models with nVidia Quadro FX 3700M graphics cards*
519527-001	*500-GB, 7200-rpm hard drive (includes hard drive bracket and screws)*
570434-001	*Intel Core2 Duo T9900 3.06-GHz processor (6-MB L2 cache, 1066-MHz FSB; includes replacement thermal material)*

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

The following sections include some of the considerations that you must keep in mind during disassembly and assembly procedures.

NOTE: As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.

Avoid exposing a drive to temperature extremes or liquids.

If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE.”

Grounding guidelines

Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, ESD contains enough power to alter device parameters or melt silicon junctions.

A discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Even if the spark is neither felt nor heard, damage may have occurred.

An electronic device exposed to ESD may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

△ **CAUTION:** To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

Keep components in their electrostatic-safe containers until you are ready to install them.

Use nonmagnetic tools.

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

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

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

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

The following table lists the shielding protection provided by antistatic bags and floor mats.

Material	Use	Voltage protection level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

Unknown user password

NOTE: This process will not work if Stringent Security is enabled in F10 Setup. Stringent Security installs passwords into the ROM so that it is not affected when the RTC battery is removed.

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 41).
5. Remove the real-time clock (RTC) battery (see RTC battery on page 58).
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 86 screws in 12 different sizes that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Serial number

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.

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

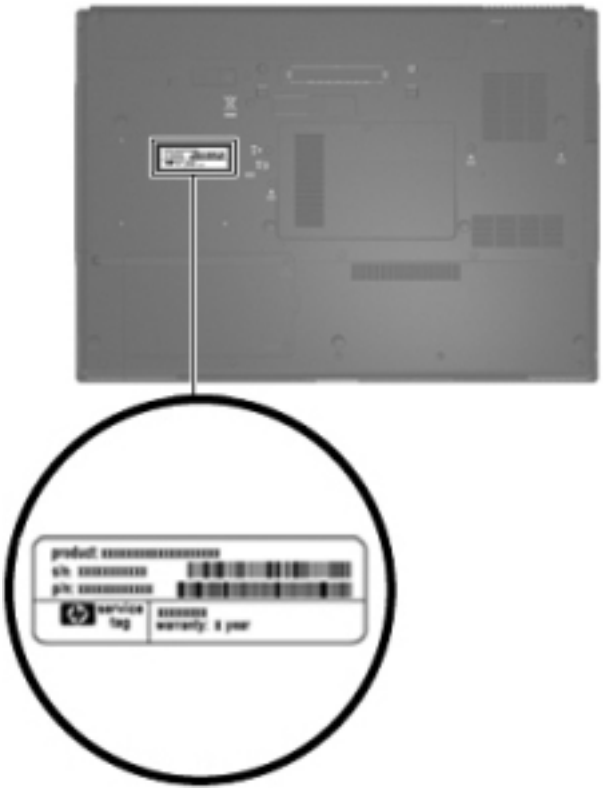
(2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.

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

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

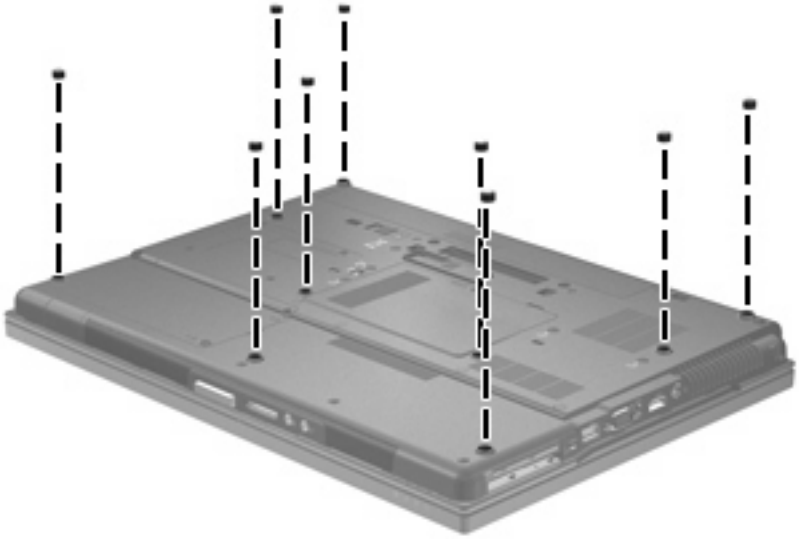
(5) Warranty period: This number describes the duration of the warranty period for this computer.

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



Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 494027-001. There are 9 rubber feet in 2 different sizes that attach to the base enclosure in the locations illustrated below.



Battery

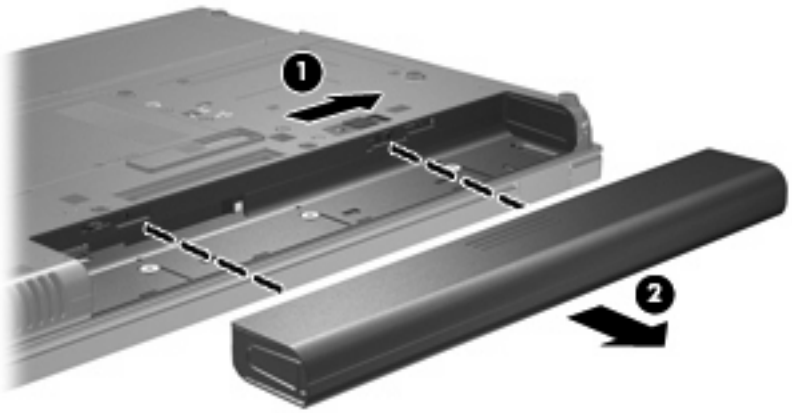
Description	Spare part number
8-cell, 2.55-Ah, Li-ion battery	493976-001

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 latch **(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.

Display inverter or ambient light sensor

NOTE: If it has been determined that the display inverter 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, the display hinges, or the display bezel, see Display assembly on page 70.

NOTE: The display inverter and the ambient light sensor are installed in the same location. The only difference in removal and replacement is the ambient light sensor does not include a backlight cable connector, while the inverter does. Models with LCD displays use the inverter, while models with DreamColor LED displays use the ambient light sensor.

Description	Spare part number
Display inverter for use only in models with an LCD display (includes Mylar shield)	494001-001
Ambient light sensor for use only in models with a DreamColor LED display – 494014-001 and 494015-001	495029-001

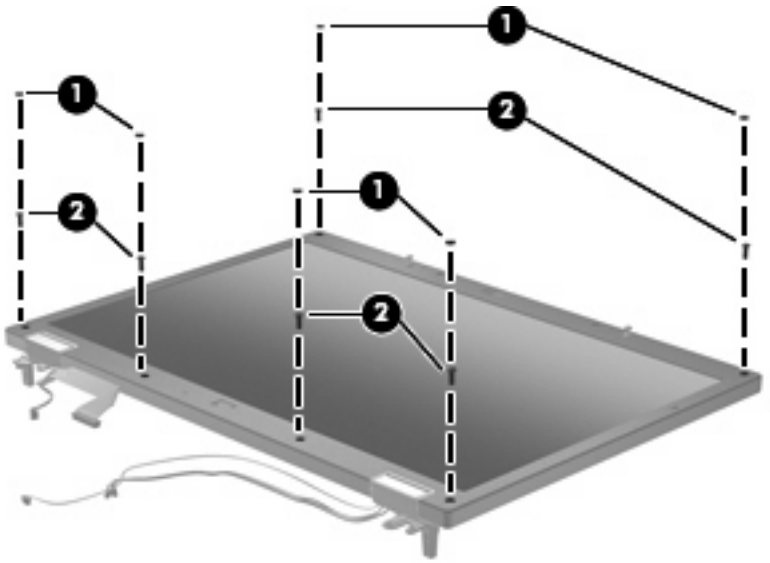
Before removing the display inverter or ambient light sensor, follow these steps:

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 41).

Remove the display inverter or ambient light sensor:

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

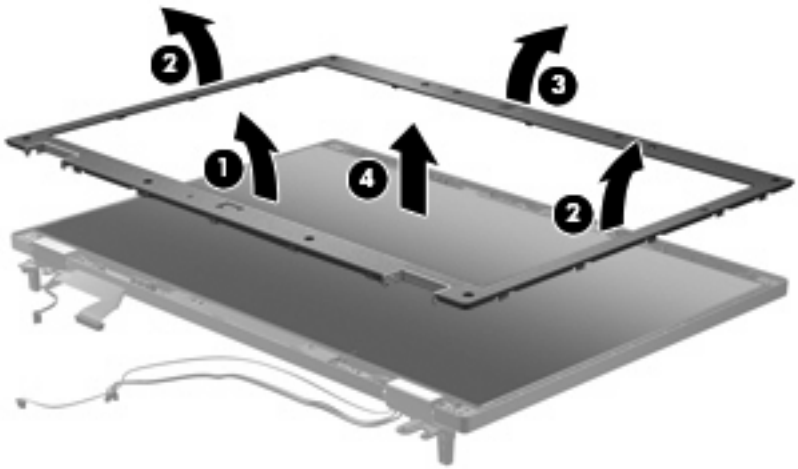
3. Remove the six screw covers **(1)** and six Torx T8M2.5×6.0 screws **(2)** that secure the display bezel to the display enclosure.



4. Flex the display bezel bottom edge **(1)**, the inside edges of the left and right sides **(2)**, and then the display bezel top edge **(3)** until the bezel disengages from the display assembly.

5. Lift the display bezel straight up **(4)** to remove it from the display assembly.

NOTE: There are two posts that protrude through two holes on the top edge of the bezel. So that you do not break the posts, be sure to lift the bezel straight up when removing it from the display assembly.



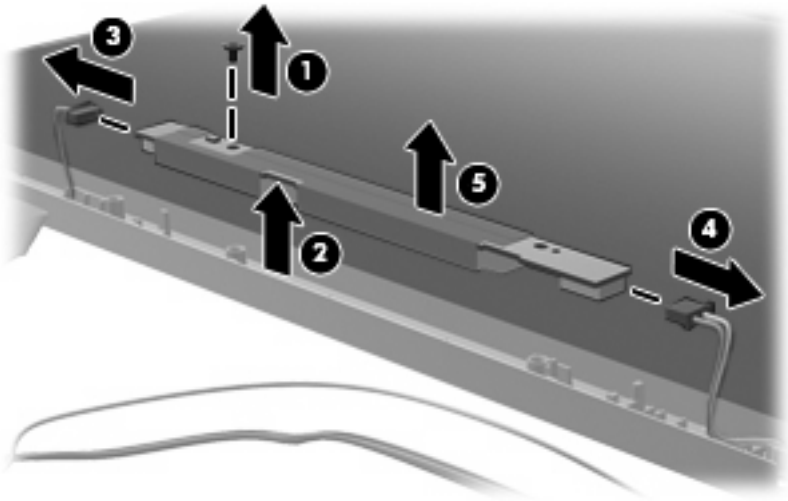
6. Remove the Torx T8M2.5×6.0 screw **(1)** that secures the display inverter or ambient light sensor to the display enclosure.

7. Release the inverter or sensor **(2)** from the display enclosure as far as the display panel cable and/or backlight cable allow.

NOTE: Models with a DreamColor LED display use the ambient light sensor which does not have a backlight cable connector.

8. Disconnect the display panel cable **(3)** and the backlight cable (inverter only) **(4)** from the display inverter or ambient light sensor.

9. Remove the display inverter or ambient light sensor **(5)**.



Reverse this procedure to install the display inverter or ambient light sensor.

Hard drive

NOTE: The hard drive spare part kit includes the hard drive bracket and screws.

Description	Spare part number
500-GB, 7200-rpm hard drive	*519527-001*
500-GB, 5400-rpm hard drive	*515870-001*
320-GB, 7200-rpm hard drive	493997-001
250-GB, 7200-rpm hard drive	493996-001
250-GB, 5400-rpm hard drive	493994-001
160-GB, 7200-rpm hard drive	493992-001
160-GB, 5400-rpm hard drive	493991-001
80-GB, solid state drive	493998-001

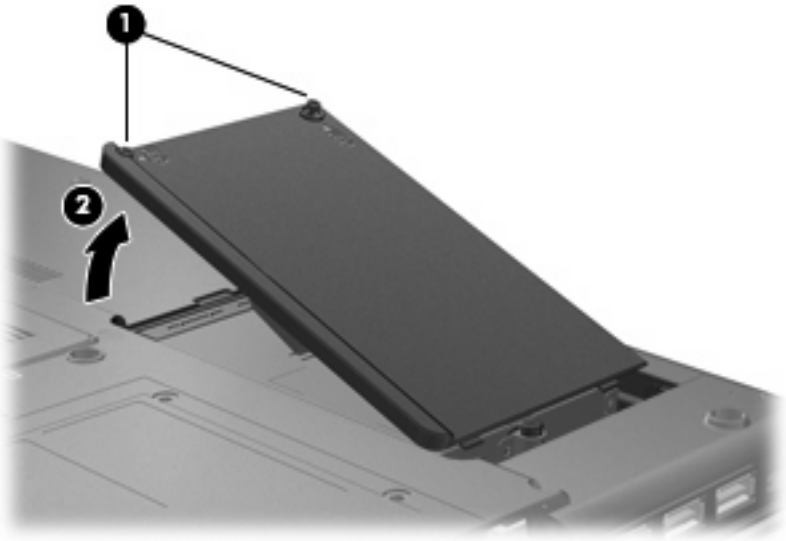
Before removing the hard drive, follow these steps:

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

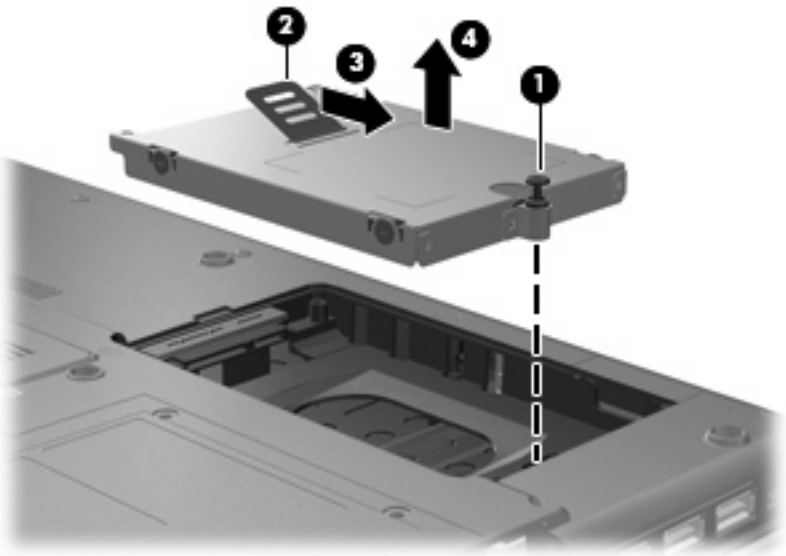
Remove the hard drive:

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 494020-001.

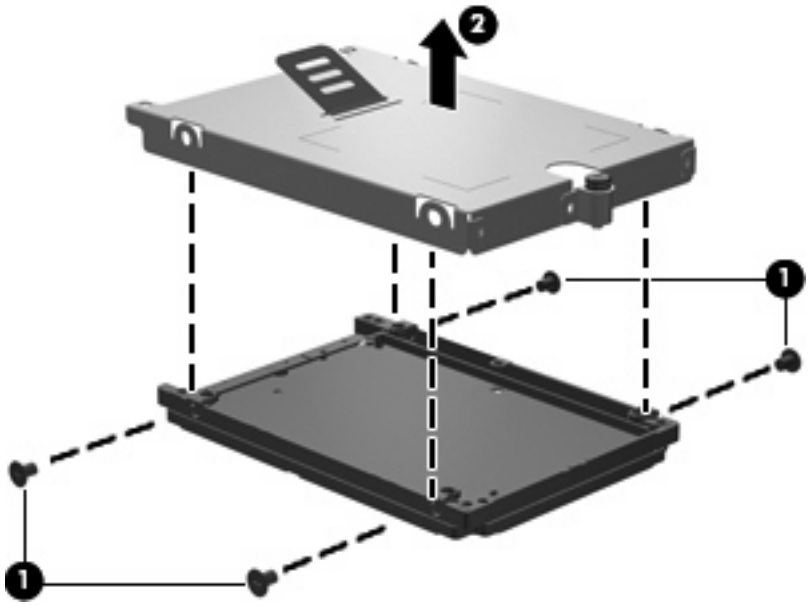


4. Loosen the Phillips PM2.5×11.0 captive screw **(1)** that secures the hard drive to the computer.
5. Grasp the Mylar tab **(2)** on the hard drive and slide the hard drive **(3)** to the right to disconnect it from the system board.
6. Remove the hard drive **(4)** from the hard drive bay.



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

Description	Spare part number
Bluetooth module (includes Bluetooth module cable)	398393-002

Before removing the Bluetooth module, follow these steps:

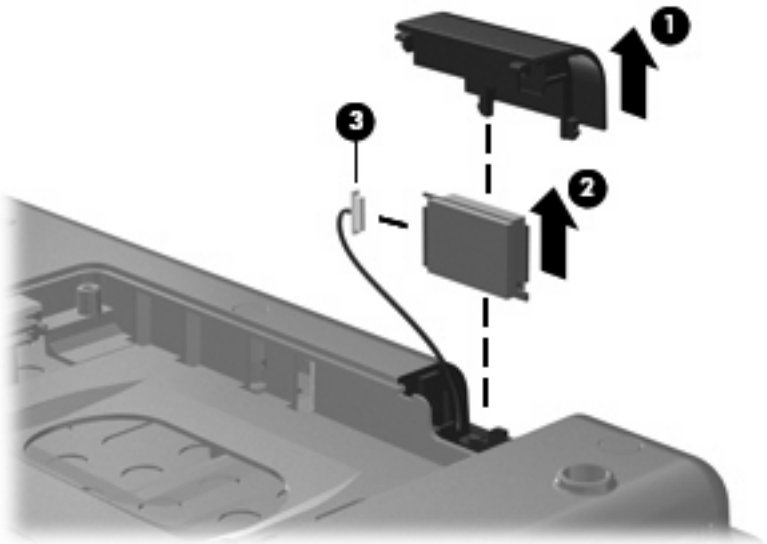
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

Remove the Bluetooth module:

1. Position the computer upside down with the front toward you.
2. Lift the back of the Bluetooth compartment cover up, and then lift the cover up and off the computer **(1)**.

NOTE: The Bluetooth compartment cover is available in the Plastics Kit, spare part number 494020-001.

3. Lift and remove the Bluetooth module **(2)** from the compartment 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.

Memory module

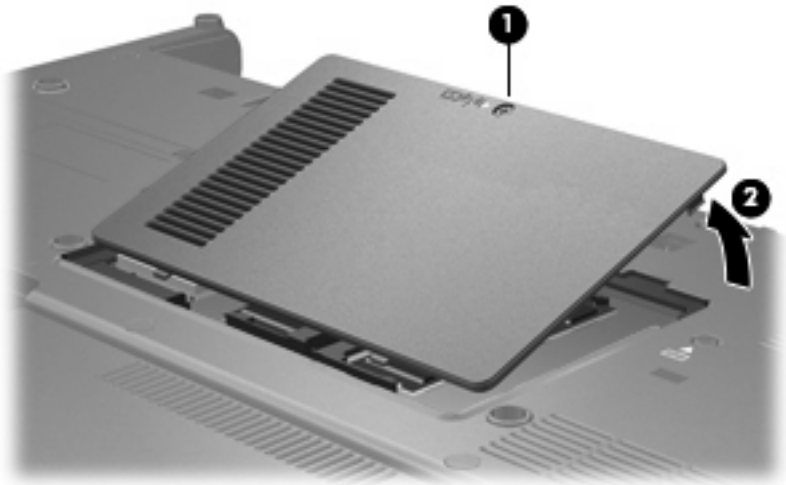
Description	Spare part number
4096-MB (PC2-6400, 800-MHz, DDR2)	494009-001
2048-MB (PC2-6400, 800-MHz, DDR2)	494008-001
1024-MB (PC2-6400, 800-MHz, DDR2)	494007-001

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 41).

Remove the memory module:

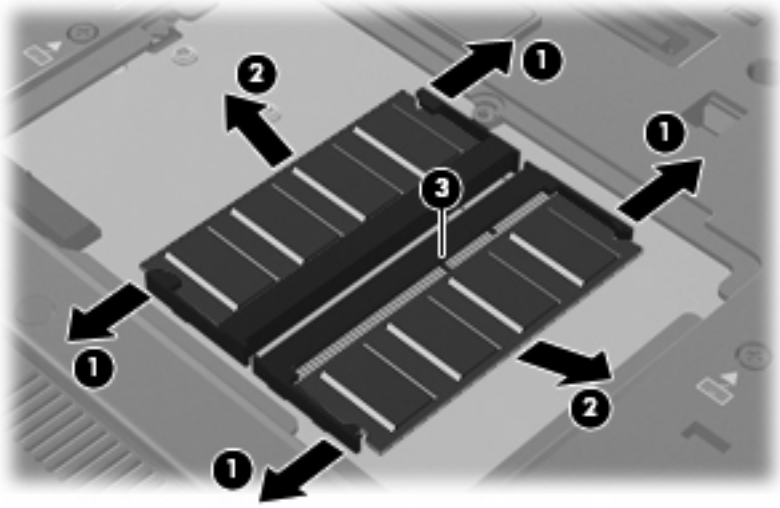
1. Loosen the Phillips PM2.5×5.0 captive screw **(1)** that secures the memory module/WLAN module compartment cover to the computer.
2. Lift the front edge of the cover, swing it up and forward **(2)**, and then remove the cover. The memory module/WLAN module compartment cover is included in the Plastics Kit, spare part number 494020-001.



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

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

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



Reverse this procedure to install the memory module.

WLAN module

Description	Spare part number
For use in non-iAMT models:	
Intel WiFi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except for Russia, Ukraine, and Pakistan	480985-001
Intel WiFi Link 5100 802.11a/b/g WLAN module for use in Russia, Ukraine, and Pakistan	482957-001
Intel WiFi Link 5300 802.11a/b/g/n WLAN module for use in all countries and regions	480986-001
For use in iAMT models:	
Intel WiFi Link 5100 802.11a/b/g/n for iAMT WLAN module for use in all countries and regions except for Russia, Ukraine, and Pakistan	506678-001
Intel WiFi Link 5100 802.11a/b/g for iAMT WLAN module for use in Russia, Ukraine, and Pakistan	506680-001
Intel WiFi Link 5300 802.11a/b/g/n for iAMT WLAN module for use in all countries and regions	506679-001

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 41).
5. Remove the memory module/WLAN module compartment cover (see Memory module on page 49).

Remove the WLAN module:

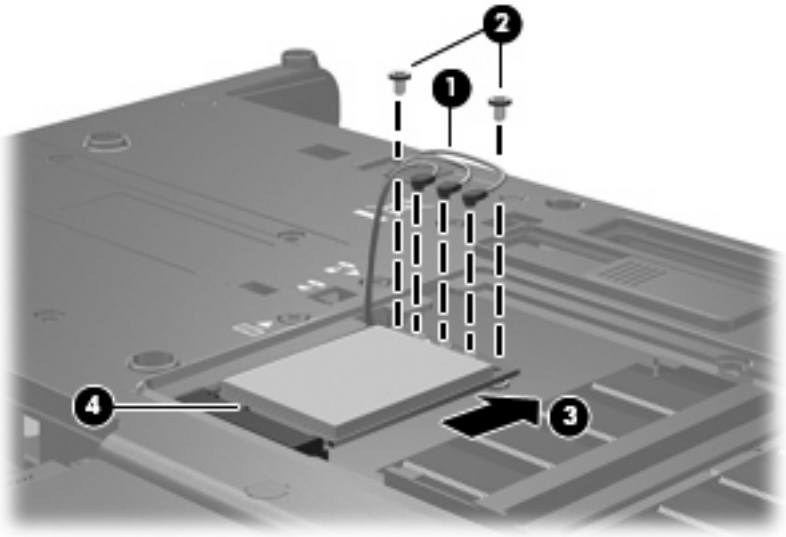
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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 is connected to the middle terminal on the WLAN module.

2. Remove the two Phillips PM2.0×4.0 screws **(2)** 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 **(3)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WLAN module.

Optical drive

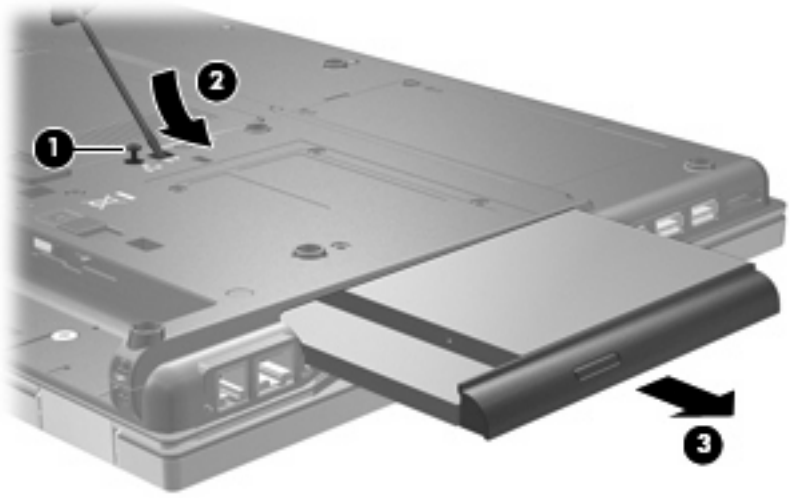
Description	Spare part number
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	493990-001
Blu-ray ROM DVD+/-RW SuperMulti DL Drive	493989-001
DVD-ROM Drive	493988-001

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 41).

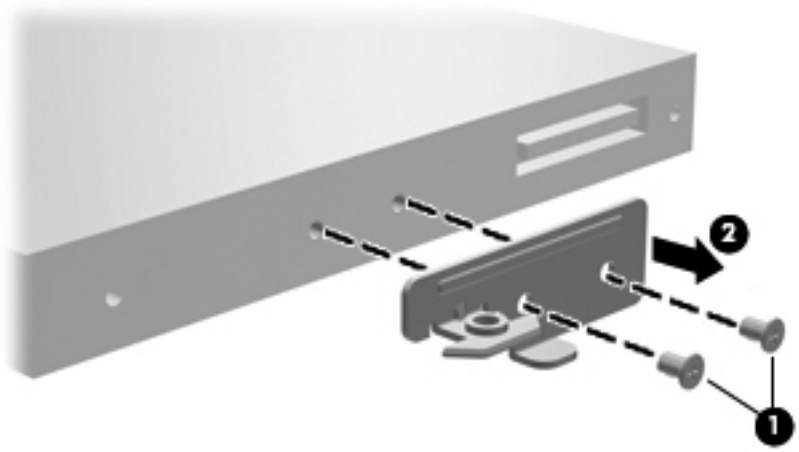
Remove the optical drive:

1. Position the computer with the left side toward you.
2. Loosen the captive Phillips PM2.5×9.0 screw **(1)** that secures the optical drive to the computer.
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access **(2)** and press the tab to the right to release the optical drive from the computer.
4. Remove the optical drive **(3)**.



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 reassemble and install an optical drive.

Keyboard

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

For use in:	Spare part number	For use in:	Spare part number
Belgium	494002-A41	Norway	494002-091
Brazil	494002-201	Portugal	494002-131
The Czech Republic	494002-221	Russia	494002-251
Denmark	494002-081	Saudi Arabia	494002-171
France	494002-051	Slovakia	494002-231
French Canada	494002-121	*Slovenia*	*494002-BA1*
Germany	494002-041	South Korea	494002-AD1
Greece	494002-151	Spain	494002-071
Hungary	494002-211	Sweden and Finland	494002-B71
Iceland	494002-DD1	Switzerland	494002-111
Israel	494002-BB1	Taiwan	494002-AB1
Italy	494002-061	Thailand	494002-281
Japan	494002-291	Turkey	494002-141
Latin America	494002-161	The United Kingdom	494002-031
The Netherlands and Europe	494002-021	The United States	494002-001

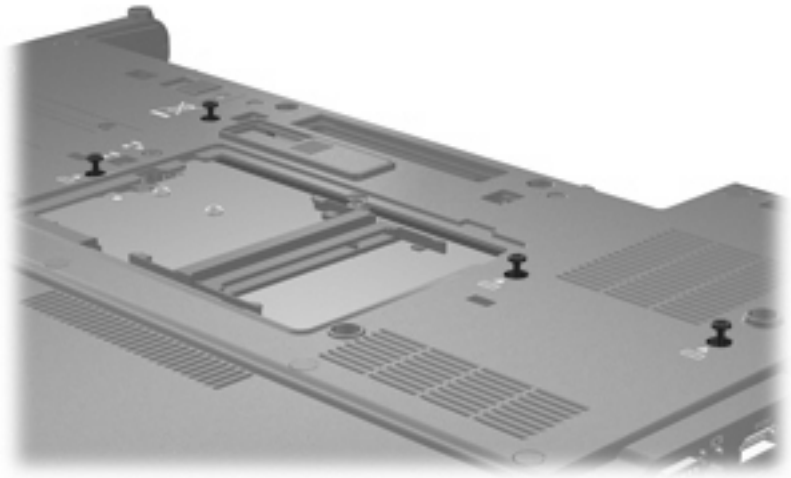
Before removing the keyboard, follow these steps:

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 41).

Remove the keyboard:

1. Position the computer upside down with the front toward you.

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

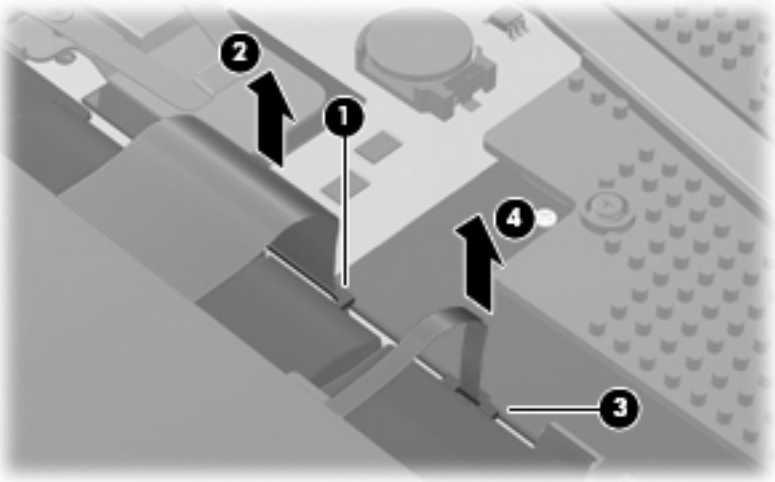


3. Turn the computer right-side up, with the front toward you.

4. Lift the upper right corner of the keyboard **(1)** and swing the rear of the keyboard up **(2)**.

5. 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.

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



7. Remove the keyboard.

Reverse this procedure to install the keyboard.

RTC battery

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

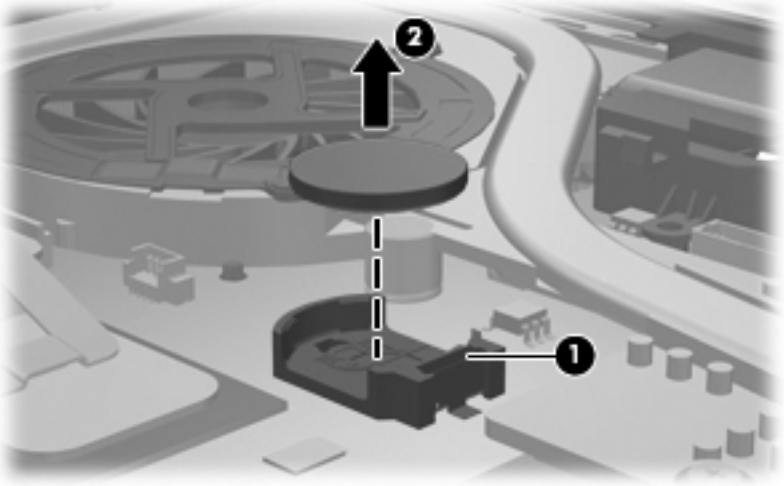
Description	Spare part number
RTC battery	449137-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 41).
5. Remove the keyboard (see Keyboard on page 55).

Remove the RTC battery:

1. Press the clip on the right side of the battery socket **(1)** toward the right until the battery disengages from beneath the clip.
2. Remove the RTC battery **(2)** from the system board.



Reverse this procedure to install the RTC battery.

Switch cover

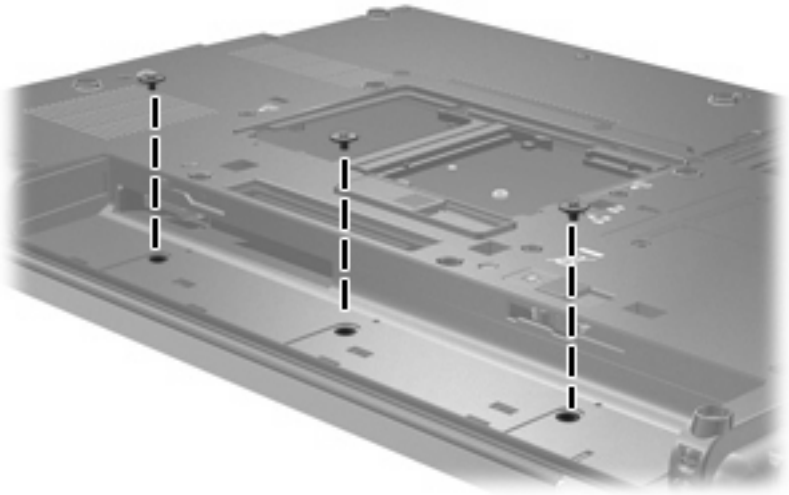
Description	Spare part number
Switch cover (includes LED board and cable and power button board)	493986-001

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 41).
5. Remove the keyboard (see Keyboard on page 55).

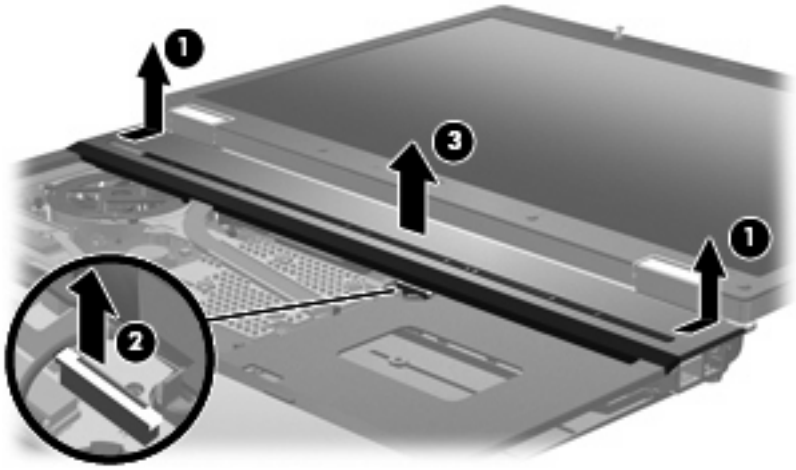
Remove the switch cover:

1. Turn the computer upside down, with the rear panel toward you.
2. Remove the three PM2.0×3.0 broadhead screws 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. Lift the left and right sides of the switch cover to release it from the computer **(1)**.
6. Release the ZIF connector to which the LED board cable is connected **(2)** and disconnect the cable from the system board.

7. Remove the switch cover **(3)** by lifting it straight up.



Reverse this procedure to install the switch cover.

Fan

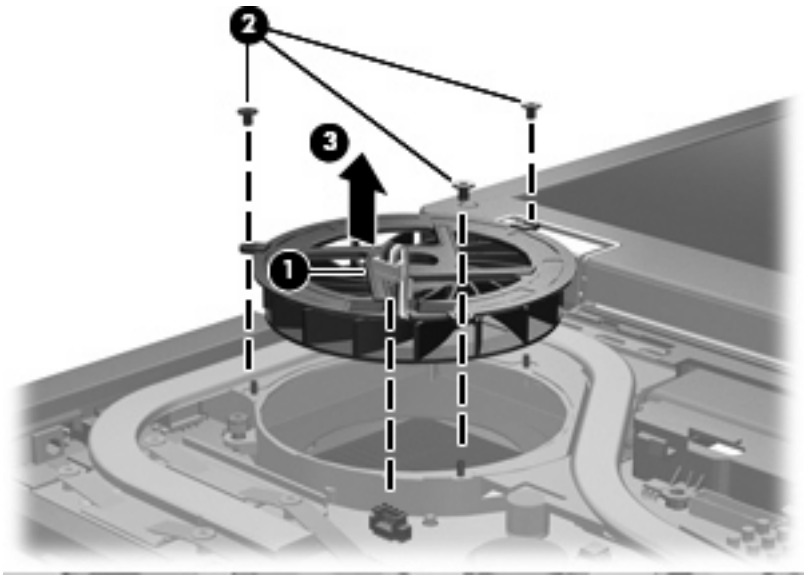
Description	Spare part number
Fan	494000-001

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 41).
5. Remove the keyboard (see Keyboard on page 55).
6. Remove the switch cover (see Switch cover on page 59).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the three PM2.0×3.0 screws **(2)** that secure the fan to the computer.
3. Lift the fan from the computer **(3)**.



Reverse this procedure to install the fan.

Graphics card heat sink

NOTE: The spare part kit for the graphics card heat sink includes replacement thermal material.

Description	Spare part number
Graphics card heat sink for use in computer models with nVidia Quadro FX 2700M graphics cards	494011-001
Graphics card heat sink for use in computer models with ATI graphics cards	494211-001
Graphics card heat sink for use in computer models with nVidia Quadro FX 3700M graphics cards	*518096-001*

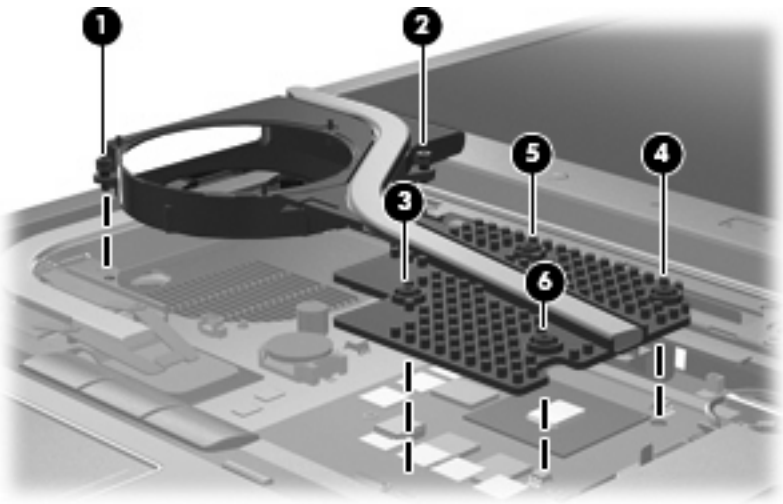
Before removing the graphics card heat sink, follow these steps:

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 following components:
   a. Battery (see Battery on page 41).
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Fan (see Fan on page 61)

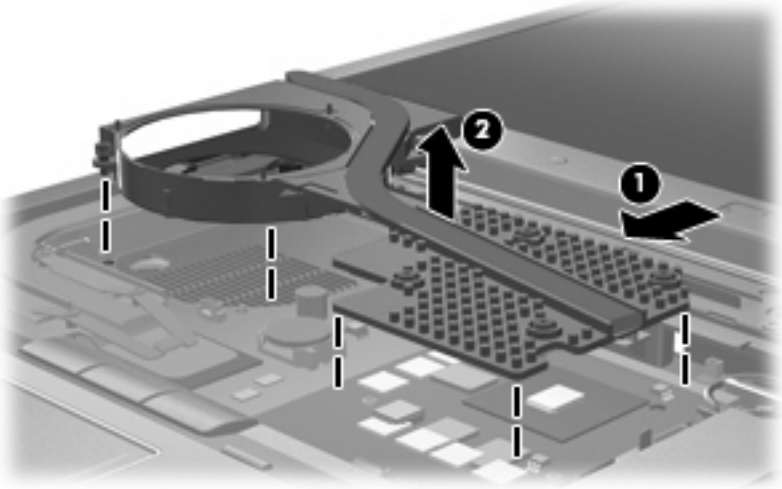
Remove the graphics card heat sink:

1. Loosen the two black captive PM3.0×10.0 screws and four silver captive PM3.0×10.0 screws in the order shown in the following illustration. You may have to move the inverter cable to access the screw identified by callout **(2)**.

NOTE: The heat sink may look different from the illustrations in this section, depending upon the model.



2. Lift the heat sink up slightly and toward the front of the computer **(1)** to disengage it from the system board, and then lift the heat sink from the computer **(2)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the graphics card heat sink and the graphics card each time the graphics card heat sink is removed.

Reverse this procedure to install the graphics card heat sink.

Graphics card

NOTE: The spare parts kit for the graphics card includes replacement thermal material.

Description	Spare part number
ATI Mobility FireGL V5725	493982-001
nVidia Quadro FX 2700M	493983-001
nVidia Quadro FX 3700M	493984-001

Before removing the graphics card, follow these steps:

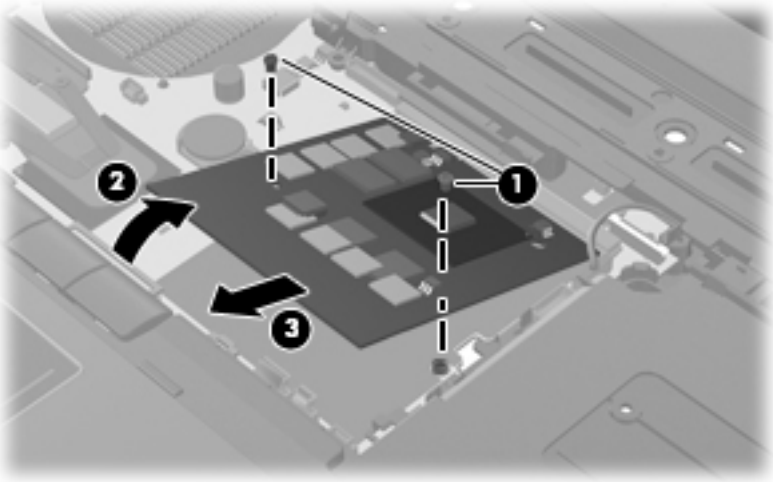
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Fan (see Fan on page 61)
   e. Graphics card heat sink (Graphics card heat sink on page 61)

Remove the graphics card:

1. Remove the two PM2.5×4.0 screws **(1)** that secure the graphics card to the system board.
2. Lift the front edge of the graphics card **(2)** until it clears the adjacent edge of the top cover.

3. Remove the graphics card by sliding it away from the graphics card slot at an angle **(3)**.

NOTE: The graphics card is designed with a notch to prevent incorrect installation.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the graphics card and graphics card heat sink each time the graphics card heat sink is removed.

Reverse this procedure to install the graphics card.

Processor heat sink

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

Description	Spare part number
For use only with computer models equipped with the following processors: P8400, P8600, T9400, and T9600	494010-001
For use only with computer models equipped with the following processors: X9100, Q9100, and QX9300	494210-001

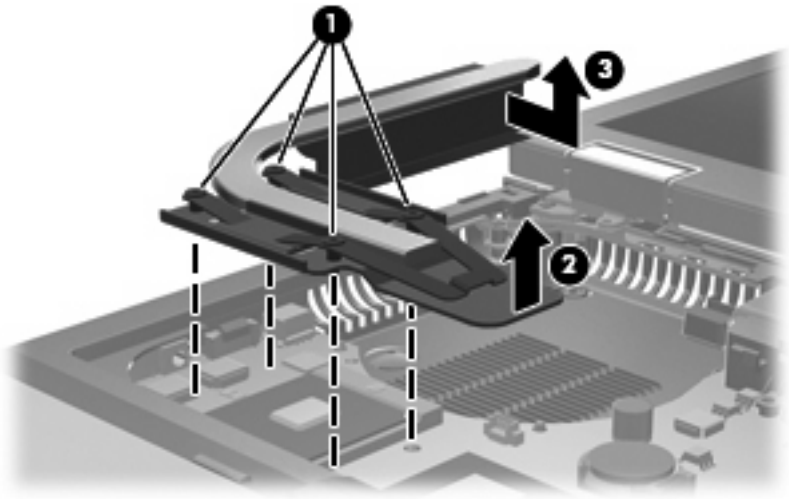
Before removing the processor heat sink, follow these steps:

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 following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Fan (see Fan on page 61)
   e. Graphics card heat sink (Graphics card heat sink on page 61)

Remove the processor heat sink:

1. In the order indicated on the heat sink, loosen the four Phillips PM2.0×8.0 captive screws **(1)** that secure the processor heat sink to the base enclosure.
2. Lift the right side of the processor heat sink **(2)** until it disengages from the processor.

3. Release the processor heat sink by sliding it to the right until it clears the base enclosure, and then lift the heat sink up and out of the computer **(3)**.



Reverse this procedure to install the processor heat sink.

NOTE: The thermal material must be thoroughly cleaned from the surfaces of the processor heat sink and the processor each time the processor heat sink is removed.

Processor

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

Description	Spare part number
Intel Core2 Extreme QX9300 2.53-GHz processor (12-MB L2 cache, 1066-MHz FSB)	*507946-001*
Intel Core2 Extreme X9100 3.06-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507950-001*
Intel Core2 Quad Q9100 2.26-GHz processor (12-MB L2 cache, 1066-MHz FSB)	*507947-001*
Intel Core2 Quad Q9000 2.0-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507948-001*
Intel Core2 Duo T9900 3.06-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*570434-001*
Intel Core2 Duo T9800 2.93-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507951-001*
Intel Core2 Duo T9550 2.66-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507953-001*
Intel Core2 Duo T9600 2.80-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507955-002*
Intel Core2 Duo T9400 2.53-GHz processor (6-MB L2 cache, 1066-MHz FSB)	*507956-002*
Intel Core2 Duo MV P8600 2.40-GHz processor (3-MB L2 cache, 1066-MHz FSB)	*507963-002*
Intel Core2 Duo MV P8400 2.26-GHz processor (3-MB L2 cache, 1066-MHz FSB)	*506964-002*

Before removing the processor, follow these steps:

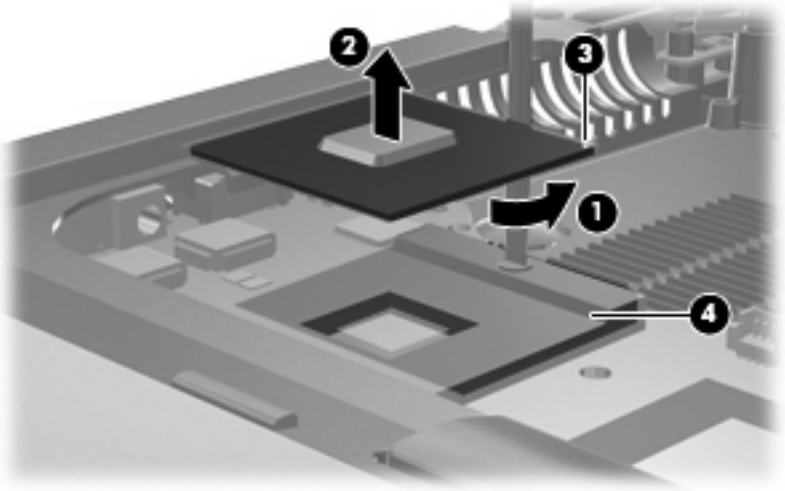
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Fan (see Fan on page 61)
   e. Graphics card heat sink (Graphics card heat sink on page 61)
   f. Processor heat sink (see Processor heat sink on page 66)

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 socket when you install the processor.



Reverse this procedure to install the processor.

Display assembly

NOTE: All display assembly spare part kits include 3 WLAN antenna transceivers and cables.

Description	Spare part number
17.0-inch, WUXGA+ WVA AntiGlare display assembly without camera module	494016-001
17.0-inch, WUXGA+ WVA AntiGlare display assembly with camera module	494017-001
17.0-inch, WSXGA+ WVA AntiGlare display assembly without camera module	494012-001
17.0-inch, WSXGA+ WVA AntiGlare display assembly with camera module	494013-001
17.0-inch, WUXGA DreamColor display assembly without camera module	494014-001
17.0-inch, WUXGA DreamColor display assembly with camera module	494015-001
17.0-inch, WXGA+ AntiGlare display assembly without camera module	494018-001
17.0-inch, WXGA+ AntiGlare display assembly with camera module	494019-001

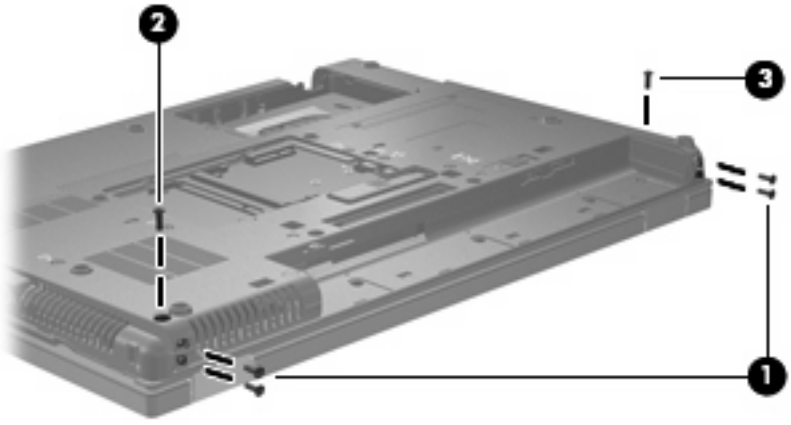
Before removing the display assembly, follow these steps:

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 41).
5. Remove the keyboard (see Keyboard on page 55).
6. Remove the switch cover (see Switch cover on page 59).

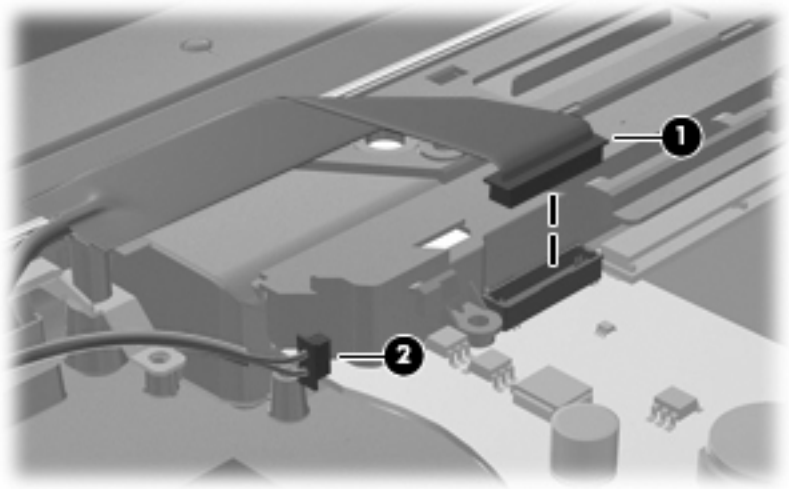
Remove the display assembly:

1. Turn the computer upside down, with the rear panel toward you.
2. Remove the four Torx T8M2.5×9.0 screws **(1)** from the rear panel that secure the display assembly to the computer.
3. Remove the Torx T8M2.5×9.0 screw **(2)** from the left rear corner of the computer.

4. Remove the PM2.5×4.0 screw **(3)** from the battery bay.

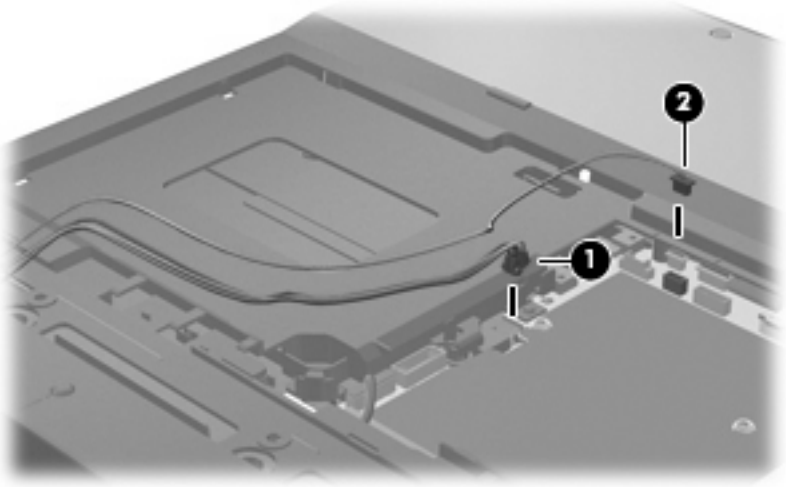


5. Turn the computer right-side up, with the front toward you and open as far as possible.
6. Disconnect the display panel cable **(1)** from the system board. The display panel cable is available using spare part number 495607-001 for DreamColor LED models, 494005-001 for LCD models.
7. Disconnect the microphone cable **(2)** from the system board.



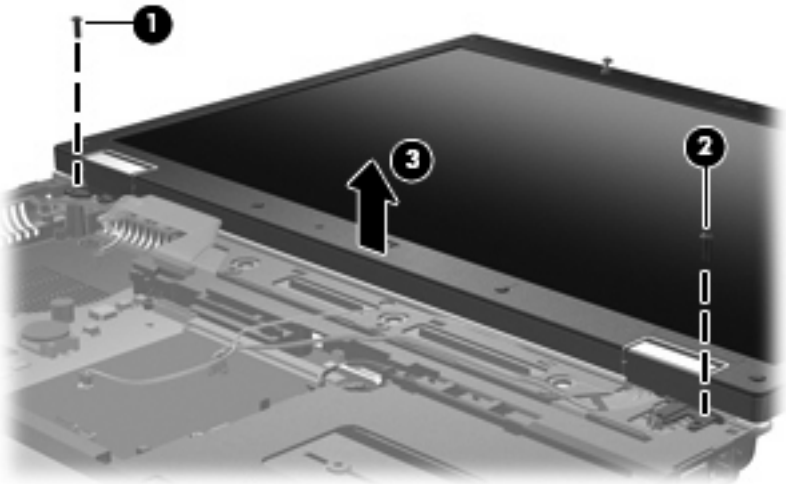
8. Remove the wireless antenna cables from the clips **(1)** and routing channels built into the top cover.

9. Disconnect the camera cable **(2)** from the system board.



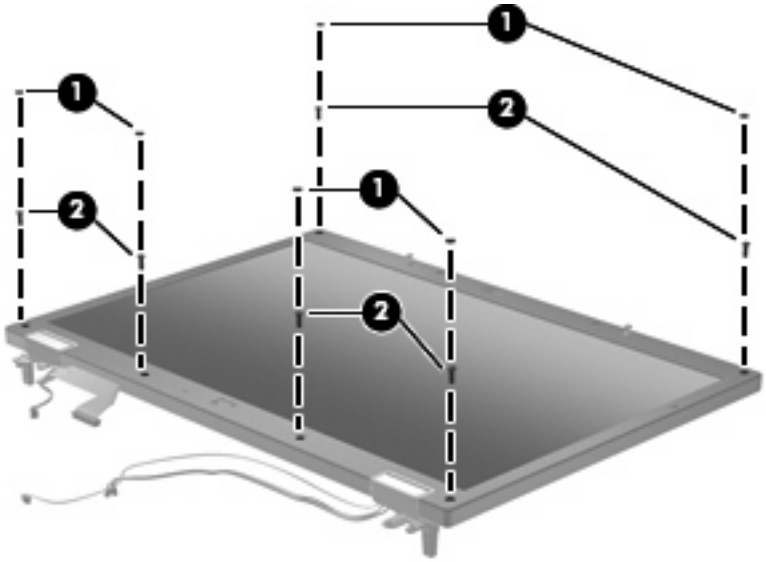
△ **CAUTION:** The display assembly will be unsupported when the following screws are removed. To prevent damage to the display assembly, support it before removing the screws.

10. Remove the PM2.5×4.0 screw **(1)** from the left display hinge.
11. Remove the Torx T8M2.5×9.0 screw **(2)** from the right hinge.
12. Lift the display assembly **(3)** straight up and remove it.



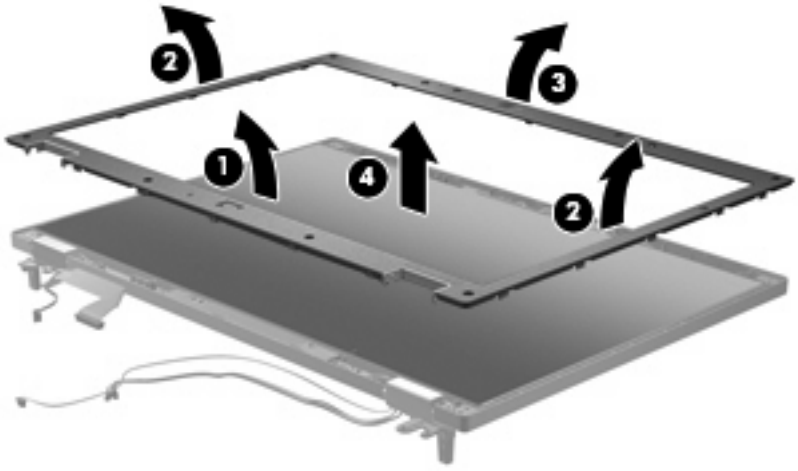
13. If it is necessary to replace the display bezel or display hinges, remove the six screw covers **(1)** and six Torx T8M2.5×6.0 screws **(2)** that secure the display bezel to the display enclosure. The display bezel is available using spare part number 494003-001 for models without a camera module, 495030-001 for models with a camera module.

NOTE: See Display inverter or ambient light sensor on page 42 for display inverter replacement instructions.



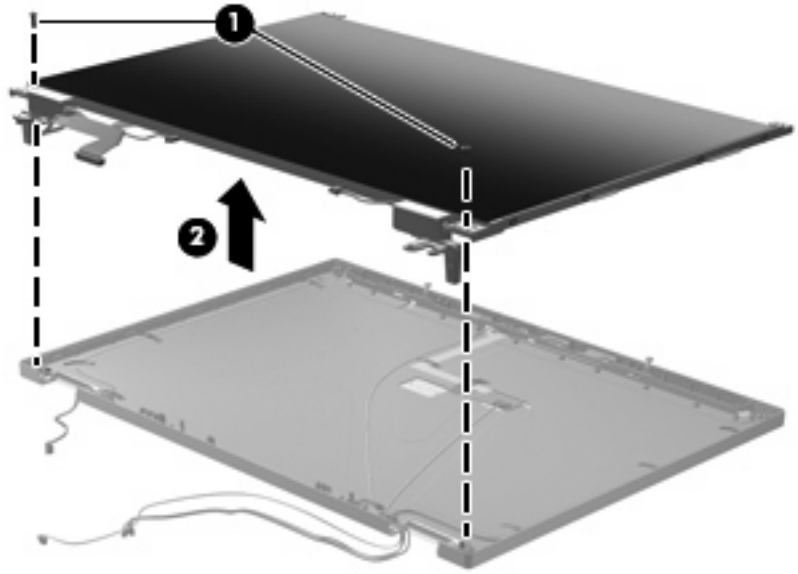
14. Flex the display bezel bottom edge **(1)**, the inside edges of the left and right sides **(2)**, and then the display bezel top edge **(3)** until the bezel disengages from the display assembly.

NOTE: There are two posts that protrude through two holes on the top edge of the bezel. So that you do not break the posts, be sure to lift the bezel straight up when removing it from the display assembly **(4)**.



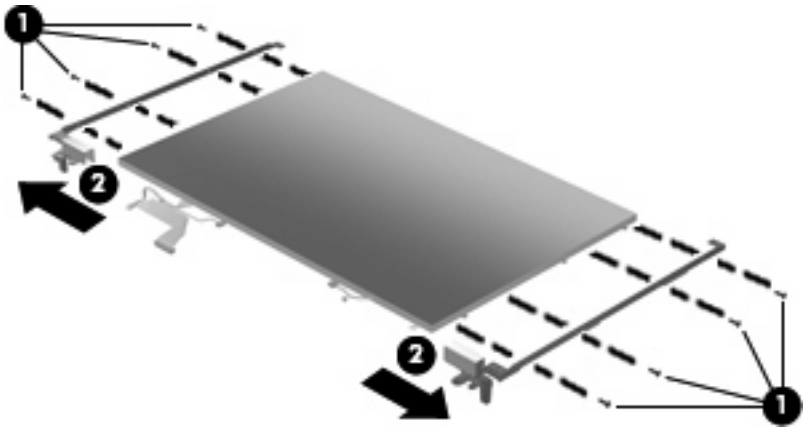
15. If it is necessary to remove the display panel, remove the two Torx T8M2.5×6.0 screws **(1)** that secure the display panel to the display enclosure.

16. Remove the display panel from the display enclosure by lifting it straight up **(2)**. The display enclosure is available using spare part number 495895-001 for DreamColor LED models, 494005-001 for LCD models.

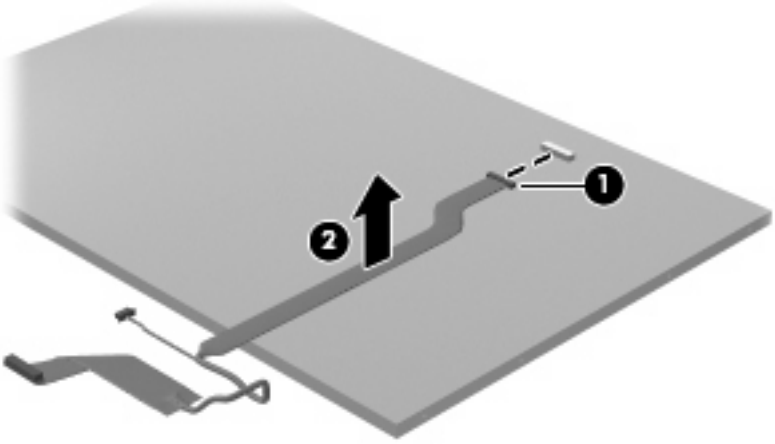


17. If it is necessary to replace the display hinges, remove the four Phillips PM2.0×4.0 screws **(1)** that secure each display hinge to the display panel.

18. Remove the display hinges **(2)**. The left and right display hinges are included in the Display Bracket Kit, spare part number 494004-001.



19. If it is necessary to replace the display cable, disconnect the cable from the connector **(1)**, and then remove the cable from the display enclosure **(2)**. The display cable is available using spare part number 494005-001 for LCD displays, 495607-001 for DreamColor LED displays.



Reverse this procedure to reassemble and install the display assembly.

Camera module

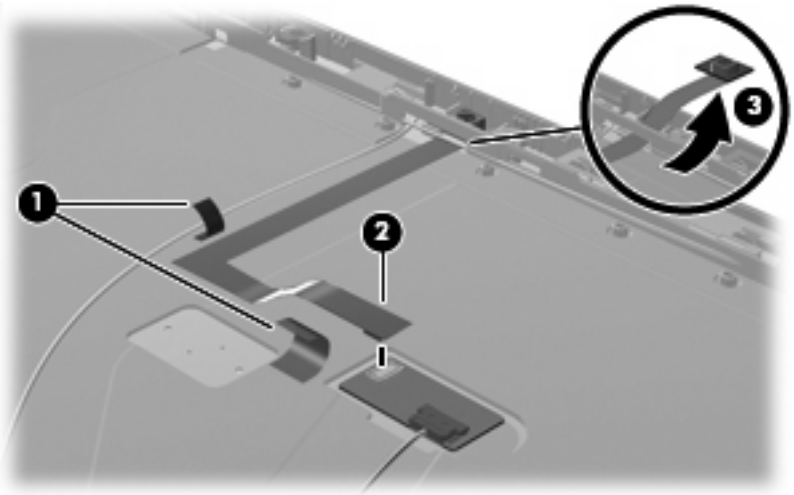
Description	Spare part number
Camera module (includes flex cable)	494030-001

Before removing the camera module, follow these steps:

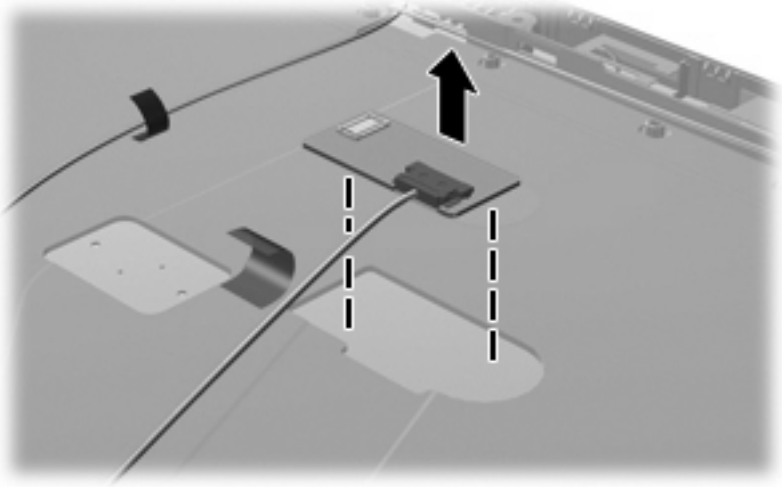
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Display (see Display assembly on page 70)

Remove the camera module:

1. Loosen the tape **(1)** that secures the camera cable to the display enclosure.
2. Disconnect the camera flex cable from the camera board **(2)**.
3. Use a flat-bladed screwdriver to loosen the camera module from the clips in the display enclosure, and then pull the module and cable through the opening near the top of the enclosure **(3)**.



4. Use a flat-blade screwdriver to loosen tape that secures the camera module board to the display enclosure, and then remove the board.



Reverse this procedure to install the camera module.

Top cover

NOTE: The top cover spare part kit includes a fingerprint reader board and cable.

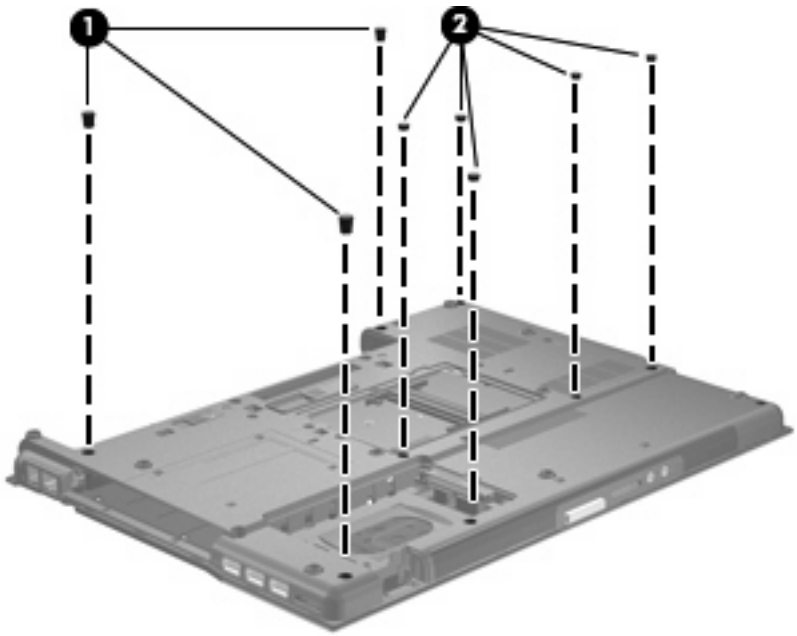
Description	Spare part number
Top cover (includes TouchPad, TouchPad bracket, TouchPad cable, fingerprint reader board and cable)	493987-001

Before removing the top cover, follow these steps:

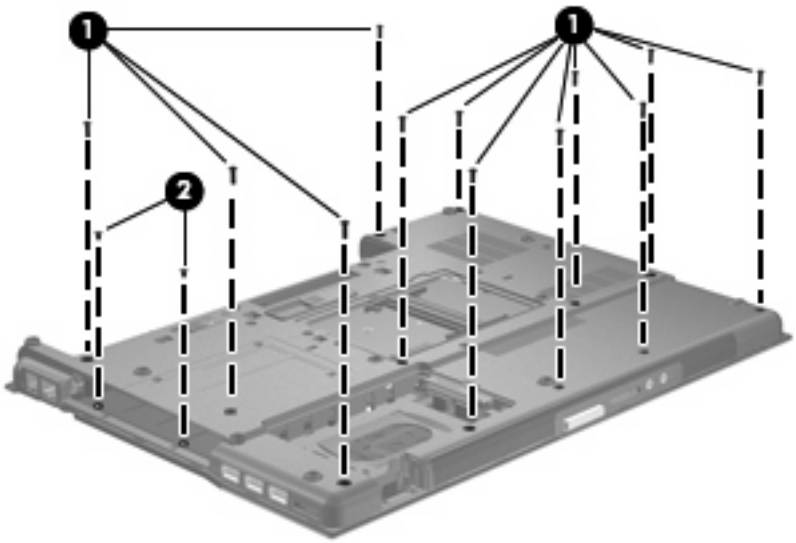
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Display assembly (see Display assembly on page 70)

Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the three large **(1)** and five small **(2)** rubber screw covers.

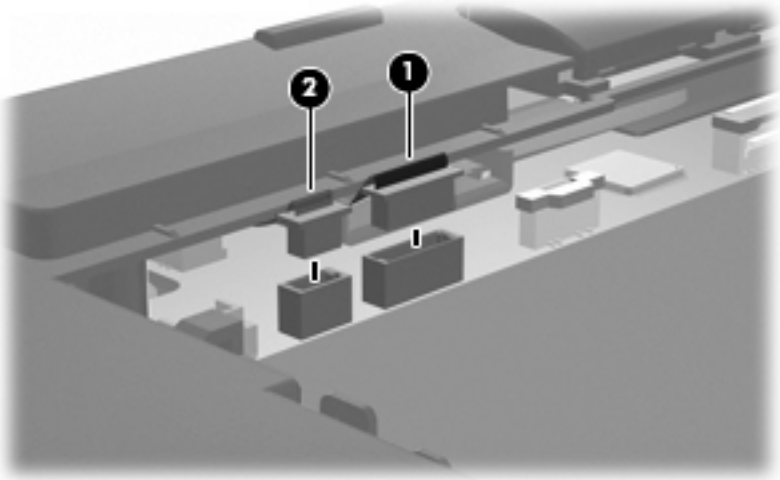


3. Remove the 12 Torx T8M2.5×9.0 screws **(1)** and two PM2.5×4.0 screws **(2)** that secure the top cover to the base enclosure.

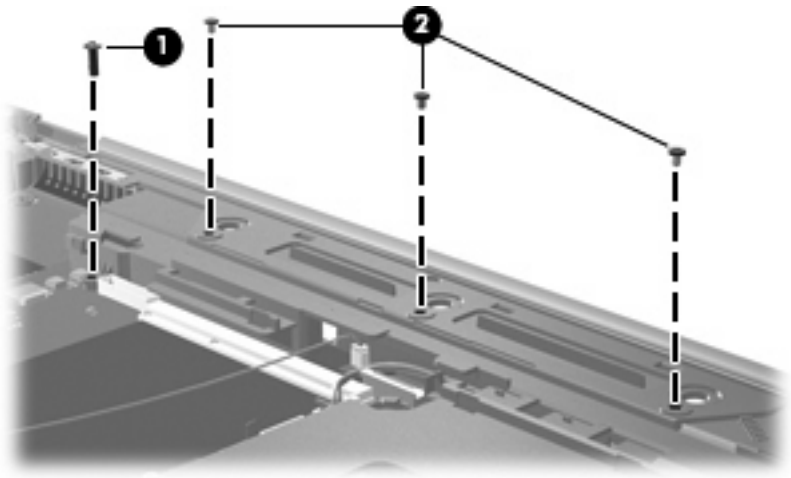


4. Turn the computer right-side up, with the front toward you.

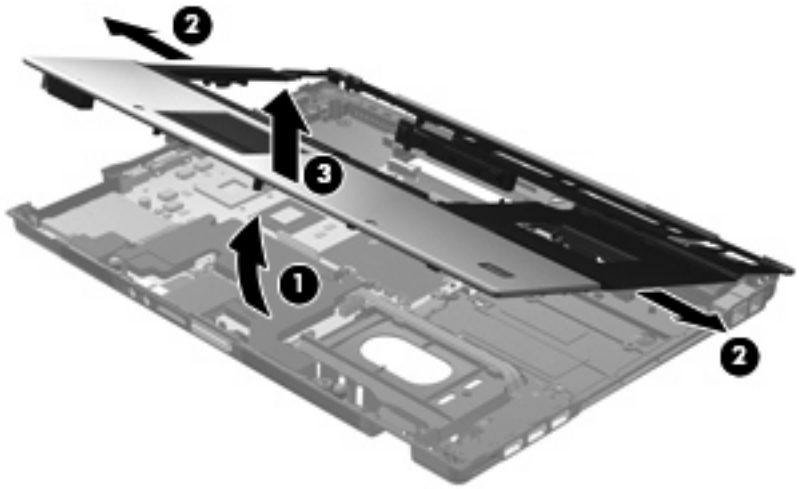
5. Disconnect the TouchPad board cable **(1)** and the fingerprint reader board cable **(2)** from the system board.



6. Remove the one Torx T8M2.5×9.0 screw **(1)** and the three PM2.5×4.0 screws **(2)** that secure the top cover to the computer.



7. Lift the front edge of the top cover **(1)** until it rests at an angle.
8. Lift the left and right edges of the top cover outward and then up **(2)** up until it disengages from the base enclosure.
9. Remove the top cover **(3)**.



Reverse this procedure to install the top cover.

Media card reader/audio board

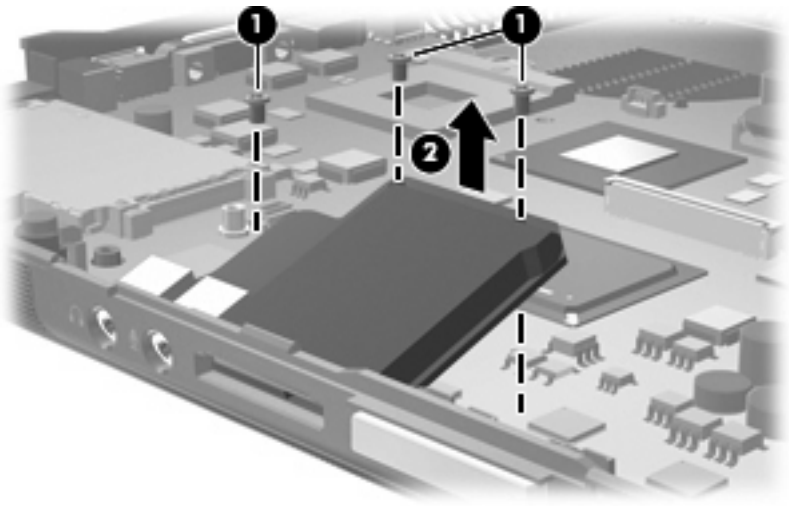
Description	Spare part number
Media card reader/audio board	493978-001

Before removing the media card reader/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 following components:
   a. Battery (see Battery on page 41).
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Display assembly (see Display assembly on page 70)
   e. Top cover (see Top cover on page 78)

Remove the media card reader/audio board:

1. Remove the three PM2.5×4.0 screws that secure the board to the system board **(1)**.
2. Lift the back of the board up, and then lift it from the system board **(2)**.



Reverse this procedure to install the media card reader/audio board.

USB/eSATA board

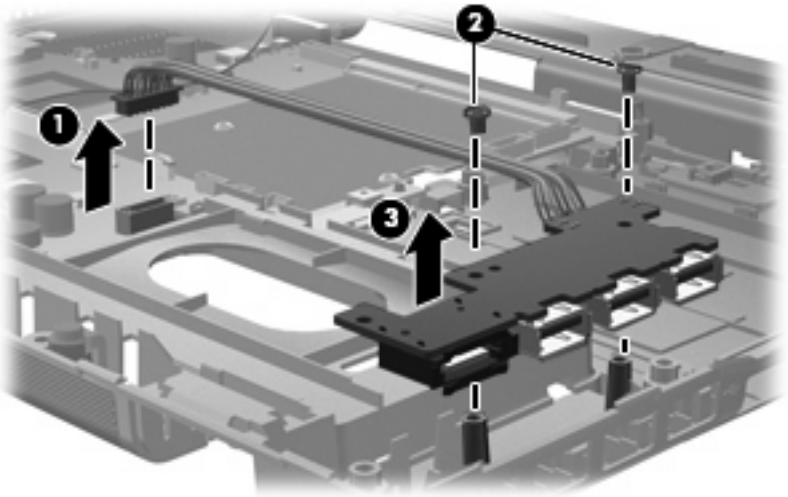
Description	Spare part number
USB/eSATA board (includes cable)	493981-001

Before removing the USB/eSATA 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 following components:
   a. Battery (see Battery on page 41)
   b. Optical drive (see Optical drive on page 53)
   c. Keyboard (see Keyboard on page 55)
   d. Switch cover (see Switch cover on page 59)
   e. Display assembly (see Display assembly on page 70)
   f. Top cover (see Top cover on page 78)

Remove the USB/eSATA board:

1. Disconnect the USB/eSATA board cable **(1)** from the system board.
2. Remove the two PM2.5×4.0 screws **(2)** that secure the USB/eSATA board to the base enclosure.
3. Lift the left side of the USB/audio board **(3)** until the USB and eSATA connectors disengage from the openings in the base enclosure.



4. Remove the USB/eSATA board and cable from the base enclosure.

Reverse this procedure to install the USB/eSATA board.

Speaker assembly

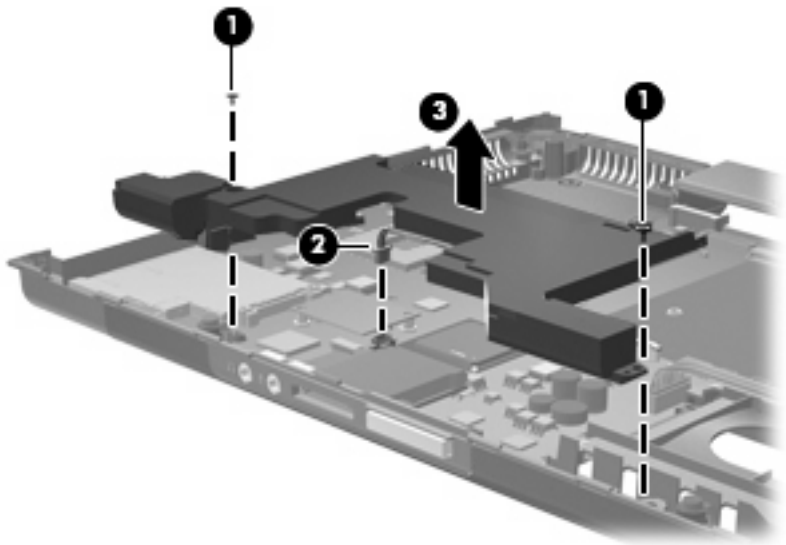
Description	Spare part number
Speaker assembly	494029-001

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 following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Display assembly (see Display assembly on page 70)
   e. Top cover (see Top cover on page 78)

Remove the speaker assembly:

1. Remove the two PM2.5×4.0 screws **(1)** that secure the speaker to the base enclosure.
2. Disconnect the speaker cable **(2)** from the system board.
3. Remove the speaker assembly **(3)** from the base enclosure.



Reverse this procedure to install the speaker assembly.

Modem module

Description	Spare part number
Modem module for use in all countries and regions except for Australia and New Zealand	461750-001
Modem module for use only in Australia and New Zealand	461750-011

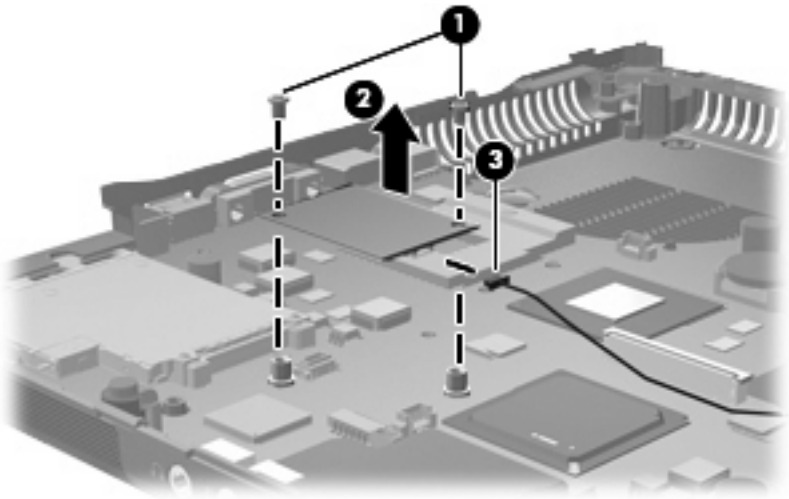
Before removing the modem module, follow these steps:

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 following components:
   a. Battery (see Battery on page 41)
   b. Keyboard (see Keyboard on page 55)
   c. Switch cover (see Switch cover on page 59)
   d. Display assembly (see Display assembly on page 70)
   e. Top cover (see Top cover on page 78)
   f. Speaker assembly (see Speaker assembly on page 83)

Remove the modem module:

1. Remove the two Phillips PM2.0×4.0 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 modem module.



4. Remove the modem module.

Reverse this procedure to install the modem module.

System board

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

Description	Spare part number
System board for use in computer models with dual core processors (includes RTC battery)	493980-001
System board for use in computer models with quad core processors (includes RTC battery)	501508-001
System board for use only in computer models with Core2 Duo processors in the People's Republic of China and Russia (includes RTC battery)	*509762-001*
System board for use only in computer models with Core2 Quad processors in the People's Republic of China and Russia (includes RTC battery)	*509763-001*

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 following components:
   a. Battery (see Battery on page 41)
   b. Hard drive (see Hard drive on page 45)
   c. Bluetooth module (see Bluetooth module on page 48)
   d. Optical drive (see Optical drive on page 53)

e. Keyboard (see Keyboard on page 55)

f. Switch cover (see Switch cover on page 59)

g. Fan (see Fan on page 61)

h. Graphics card heat sink (see Graphics card heat sink on page 61)

i. Graphics card (see Graphics card on page 64)

j. Processor heat sink (see Processor heat sink on page 66)

k. Display assembly (see Display assembly on page 70)

l. Top cover (see Top cover on page 78)

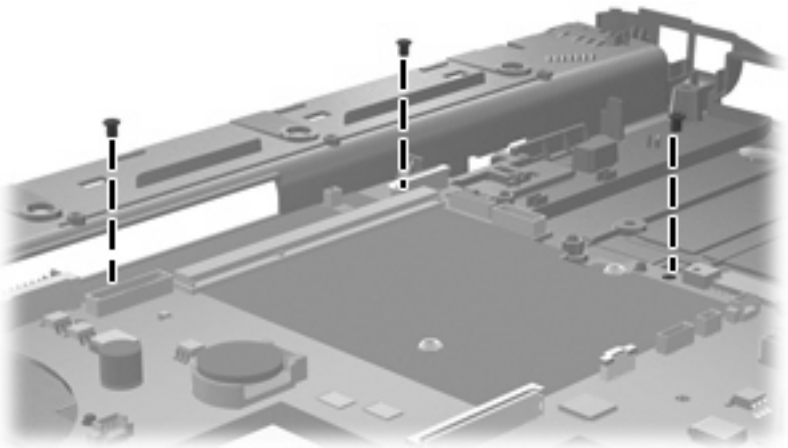
m. Speaker assembly (see Speaker assembly on page 83)

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

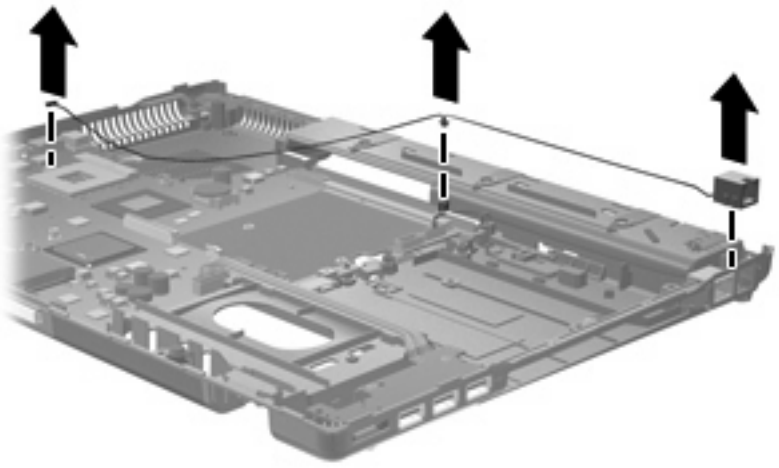
- Memory modules (see Memory module on page 49)
- WLAN module (see WLAN module on page 51)
- Modem module (see Modem module on page 84)
- Processor (see Processor on page 68)
- ExpressCard assembly (see ExpressCard assembly on page 88)

Remove the system board:

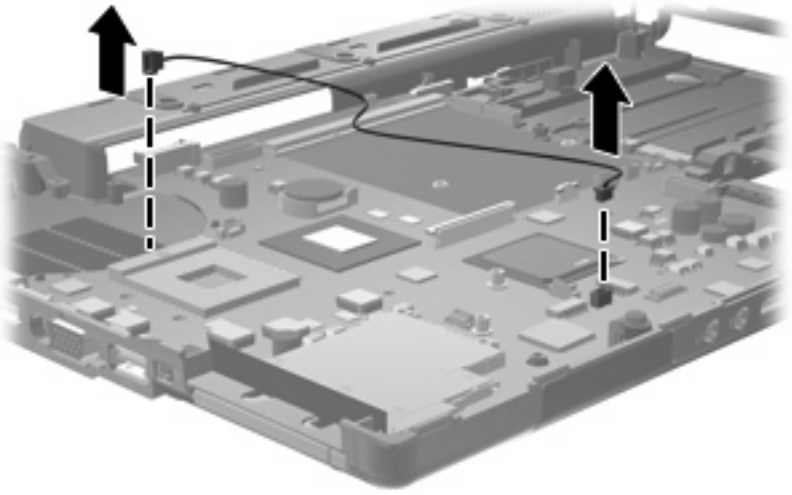
1. Turn the computer right-side up, with the front toward you.
2. Remove the three PM2.5×4.0 screws that secure the system board to the base enclosure.



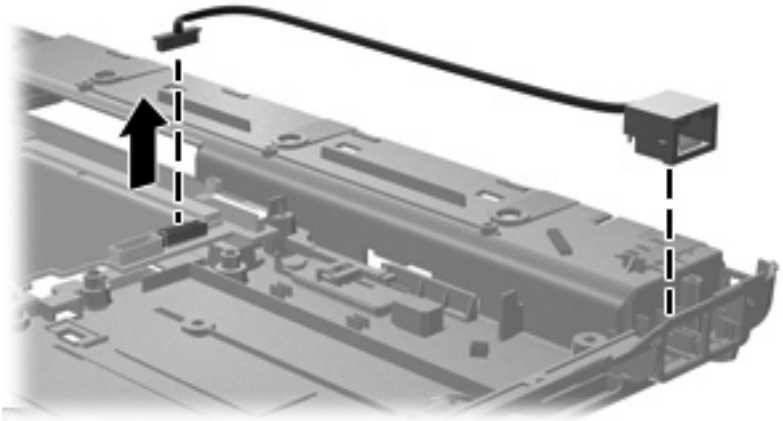
3. Disconnect the modem cable from the system board:



4. Disconnect the microphone cable from the system board.

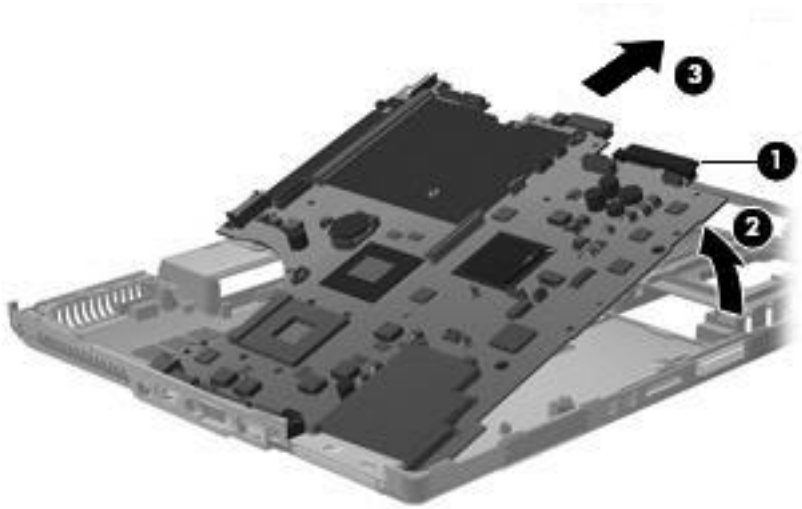


5. Disconnect the RJ-11 cable from the system board and remove the jack from the base enclosure.



6. Use the optical drive connector **(1)** to lift the right side of the system board **(2)** until it rests at an angle.

7. Remove the system board **(3)** by sliding it away from the base enclosure at an angle.



Reverse this procedure to install the system board.

ExpressCard assembly

Description	Spare part number
ExpressCard assembly	493999-001

Before removing the ExpressCard assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
   a. Battery (see Battery on page 41)
   b. Hard drive (see Hard drive on page 45)
   c. Bluetooth module (see Bluetooth module on page 48)
   d. Optical drive (see Optical drive on page 53)
   e. Keyboard (see Keyboard on page 55)
   f. Switch cover (see Switch cover on page 59)
   g. Fan (see Fan on page 61)
   h. Graphics card heat sink (see Graphics card heat sink on page 61)
   i. Graphics card (see Graphics card on page 64)

j. Processor heat sink (see Processor heat sink on page 66)

k. Display assembly (see Display assembly on page 70)

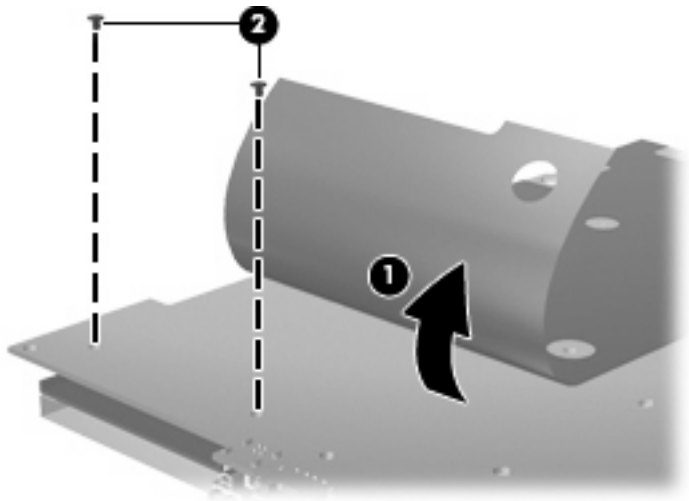
l. Top cover (see Top cover on page 78)

m. Speaker assembly (see Speaker assembly on page 83)

n. System board (see System board on page 85)

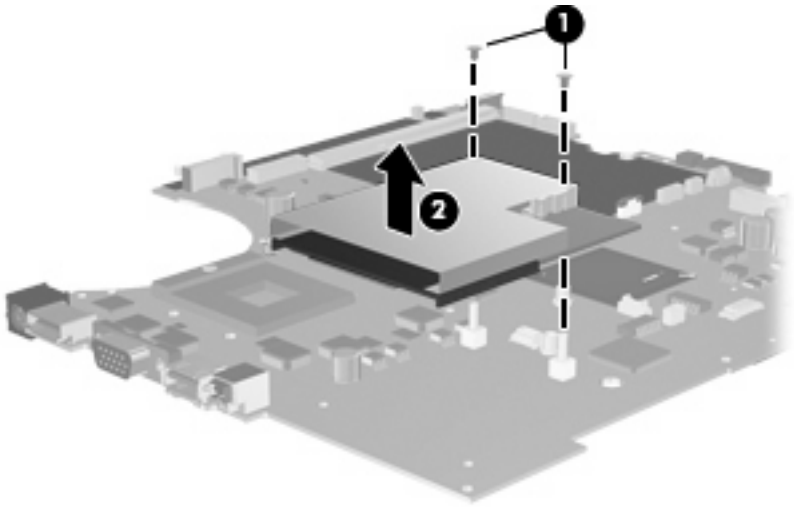
Remove the ExpressCard assembly:

1. Turn the system board upside down, with the ExpressCard eject button toward you.
2. Lift the Mylar covering up **(1)** to expose the screws that secure the assembly to the system board.
3. Remove the two Phillips PM2.0×6.0 screws **(2)** that secure the ExpressCard assembly to the system board.



4. Turn the system board right-side up.
5. Remove the two Phillips PM2.0×7.0 screws **(1)** that secure the ExpressCard assembly to the system board.

6. Remove the ExpressCard assembly from the system board **(2)**.



Reverse this procedure to install the ExpressCard assembly.

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: An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press f10 to enter BIOS Setup.

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.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
   - To select a menu or a menu item, use the keyboard arrow keys and then press enter, or use a pointing device to click the item.
   - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

   NOTE: You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.
2. Press f10 to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

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

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the arrow keys to select **File > Ignore changes and exit**, and then press enter.

  – or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

  – or –

  Use the arrow keys to select **File > Save changes and exit**, and then press enter.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

NOTE: Restoring defaults will not change the hard drive mode.

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

1. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press f10 to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

   – or –

   Use the arrow keys to select **File > Save changes and exit**, and then press enter.

Your changes 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.
Set System Date and Time	Set or change the date and time on the computer.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

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

Diagnostics menu

Select	To do this
System Diagnostics menu	• F1 System Information—Displays the following information: ◦ Identification information for the computer and the batteries in the system. ◦ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version. • F2 Start-up Test—Verifies the system components needed for starting the computer. • F3 Run-In Test—Runs a comprehensive check on system memory. • F4 Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system. • F5 Error Log—Displays a log file if any errors have occurred.

System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot Options	• Set a Startup Menu delay (in seconds). • Enable/disable Custom Logo (disabled by default). • Enable/disable Display Diagnostic URL (enabled by default). • Enable/disable CD-ROM boot (enabled by default). • Enable/disable SD Card boot (enabled by default). • Enable/disable floppy boot (enabled by default). • Enable/disable PXE Internal NIC boot (enabled by default). • Set the Express Boot Popup delay in seconds. • Set the boot order.
Device Configurations	• Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard 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. • Select a parallel port mode: ECP (Enhanced Capabilities Port), standard, bidirectional, or EPP (Enhanced Parallel Port). • Enable/disable fan always on while connected to an AC outlet (enabled by default). • Enable/disable LAN Power Save (select models only). When enabled, saves power by turning off the LAN when not in use (enabled by default). • Enable/disable Data Execution Prevention. When enabled, the processor can disable some virus code execution, which helps to improve computer security. • SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ◦ AHCI (Advanced Host Controller Interface) ◦ IDE (Integrated Drive Electronics) ◦ RAID (select models only)

Select	To do this
	NOTE: Availability of the options above varies by computer model. • Enable/disable secondary battery fast charge (enabled by default). • Enable/disable HP QuickLook 2 (enabled by default). • Enable/disable Virtualization Technology (select models only; disabled by default). • Enable/disable TXT (Intel Trusted Execution Technology) (select models only; disabled by default). • Enable/disable Dual Core CPU (select models only; enabled by default). • Enable/Disable Unified Extensible Firmware Interface (UEFI) mode (disabled by default).
Built-In Device Options	• Enable/disable the wireless button state (enabled by default). • Enable/disable embedded WWAN device radio (select models only; enabled by default). • Enable/disable embedded Bluetooth device radio (enabled by default). • Enable/disable the Network Interface Controller (LAN) (enabled by default). • Set the wake on LAN state. Options include the following: ◦ Disabled ◦ Boot to Network (set by default) ◦ Follow Boot Order • Enable/disable the fingerprint device (enabled by default). • Enable/disable a modem device (enabled by default). • Enable/disable the embedded WLAN device (enabled by default). • Enable/disable LAN/WLAN switching (disabled by default). • Enable the ambient light sensor (enabled by default). • Enable/disable the Notebook Multibay device (enabled by default). • Enable/disable the integrated camera (select models only; enabled by default).

Select	To do this
Port Options (all are enabled by default)	**NOTE:** All port options are enabled by default. • Enable/disable the Smart Card slot. • Enable/disable the ExpressCard slot. • 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 devices and ExpressCard devices on the advanced port replicator. • Enable/disable the 1394 port.
AMT Options	**NOTE:** All AMT options are disabled by default. • Enable/disable Firmware Verbosity. • Enable/disable AMT Setup Prompt (CTRL-P). • Enable/disable USB Key Provisioning Support. • Enable/disable Unconfigure AMT on Next Boot. • Enable/disable Terminal Emulation Mode • Enable/disable Firmware Progress Event Support. • Enable/disable include TYPE-131 in SMBIOS.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	28.2 cm	11.1 in
Width	39.3 cm	15.5 in
Height (front to rear)	3.2 cm	1.3 in
Weight (equipped with 8-cell battery, 80-GB/5400-rpm hard drive, optical drive, one 1024-MB memory module, WLAN module, pointing stick, TouchPad, and nVidia GM84 graphics card; varies by configuration)	3.5 kg	7.6 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A – 120 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	

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

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

17.0-inch, WUXGA+WVA display specifications

	Metric	U.S.
Dimensions		
Height	24.4 cm	9.65 in
Width	38.1 cm	15.0 in
Diagonal	43.2 cm	17.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.172 × 0.172 mm	
Format	1920 × 1200	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	6.0 W	
Viewing angle	+/-65° horizontal, +/-50° vertical (typical)	

17.0-inch, WSXGA+WVA display specifications

	Metric	U.S.
Dimensions		
Height	24.4 cm	9.6 in
Width	38.1 cm	15.0 in
Diagonal	43.2 cm	17.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.172 × 0.172 mm	
Format	1680 × 1050	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	7.0 W	
Viewing angle	+/-60° horizontal, +40/-50° vertical (typical)	

17.0-inch, WXGA+WVA display specifications

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

Hard drive specifications

	250-GB*	250-GB*	160-GB*
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g
Interface type	SATA	SATA	SATA
Transfer rate	300 MB/sec	300 MB/sec	150 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.1 ms	1.1 ms	1.5 ms
Average	12 ms	12 ms	0.5 ms
Maximum	20 ms	20 ms	20.5 ms
Logical blocks	625,142,448	488,397,168	312,581,808
Disk rotational speed	7200 rpm	7200 and 5400 rpm	7200 and 5400 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.			
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.			

Blu-ray ROM DVD+/-RW SuperMulti DL Drive specifications

Applicable disc	**Read:** CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, BD-ROM, BD-RE. BD-R	**Write:** CD-R and CD-RW DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9),DVD-RW, DVD-RAM	
Access time	**CD**	**DVD**	**Blu-ray**
Random	150 ms	180 ms	300 ms
Cache buffer	8 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		
1X BD-ROM	4,500 KB/sec		
1X BD-R read	4,500 KB/sec		
1X BD-RE read	4,500 KB/sec		
Transfer mode	Multiword DMA Mode		

DVD±RW and CD-RW Combo Drive, Double-Layer with LightScribe specifications

Applicable disc	**Read:** CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	**Write:** CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Access time	**CD**	**DVD**
Random	< 175 ms	< 230 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD-ROM	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	

DVD-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	
Access time	**CD**	**DVD**
Random	< 100 ms	< 125 ms
Cache buffer	512 KB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	

System DMA specifications

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

System 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

System interrupt specifications

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

System I/O address specifications

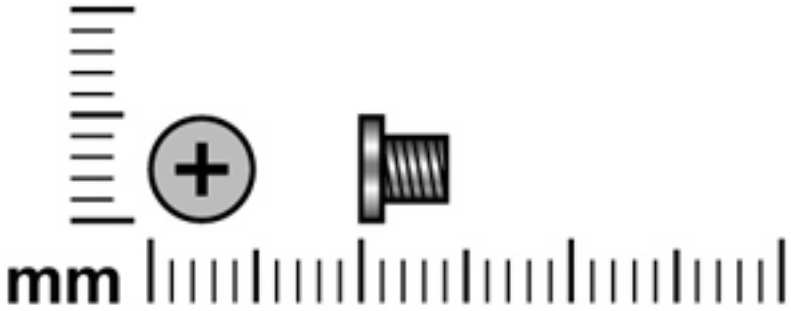
I/O address (hex)	System function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 “Super I/O” configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F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

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

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 494028-001.

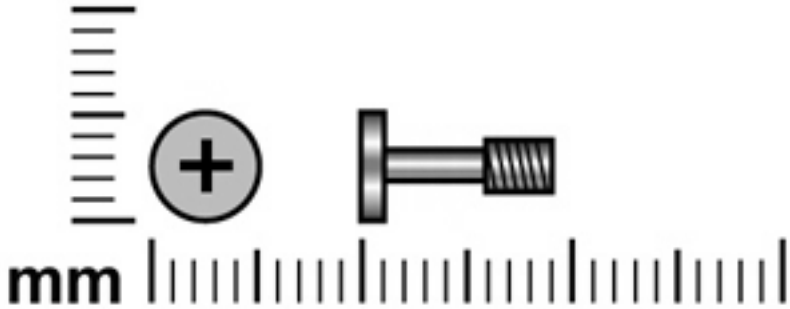
Phillips PM3.0×4.0 screw



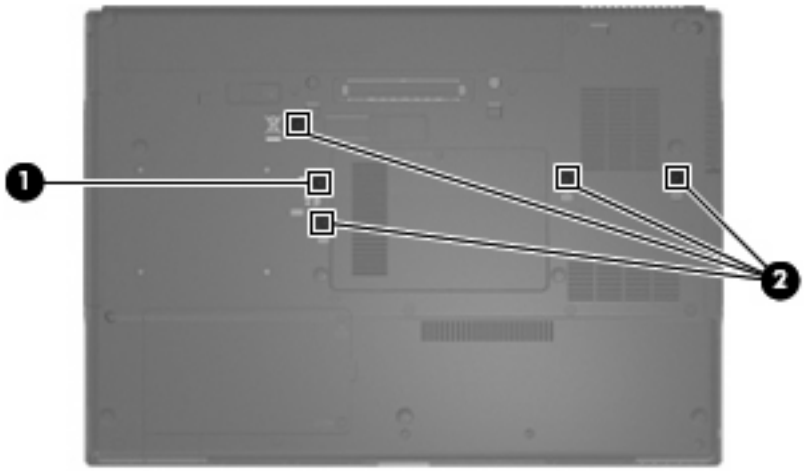
Color	Quantity	Length	Thread	Head diameter
Black	4	4.0 mm	3.0 mm	5.0 mm

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

Phillips PM2.5×9.0 captive screw



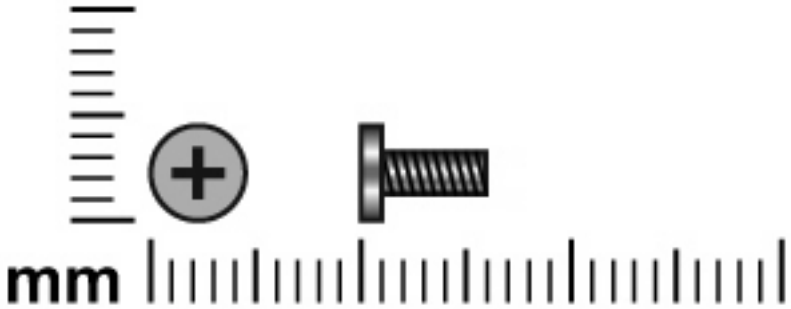
Color	Quantity	Length	Thread	Head diameter
Black	5	9.0 mm	2.5 mm	5.0 mm



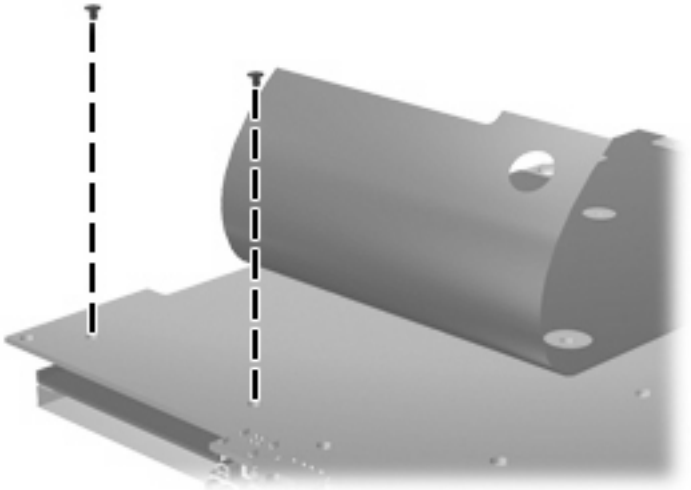
Where used: (1) One captive screw that secures the optical drive to the computer (screw is secured by a C-clip)

Where used: (2) Four captive screws that secure the keyboard to the computer (screws are secured by C-clips)

Phillips PM2.0×6.0 screw

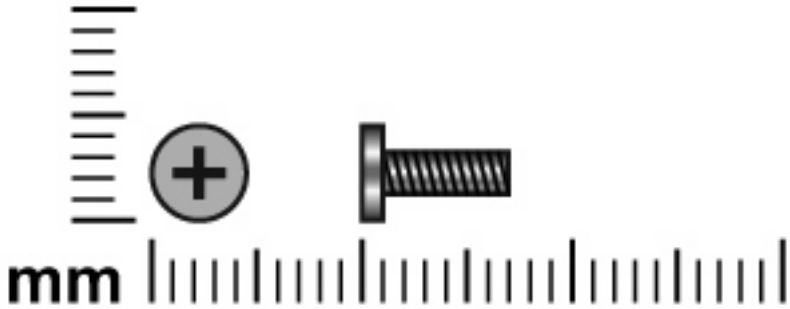


Color	Quantity	Length	Thread	Head diameter
Silver	2	6.0 mm	2.0 mm	5.0 mm

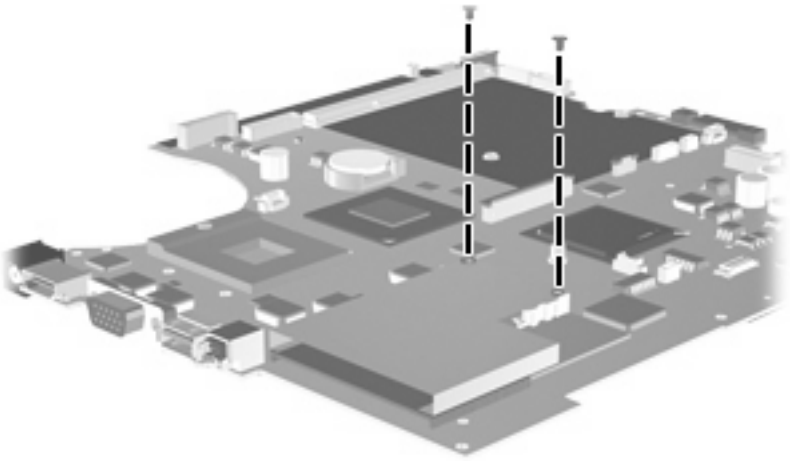


Where used: 2 screws that secure the ExpressCard to the system board

Phillips PM2.0×7.0 screw

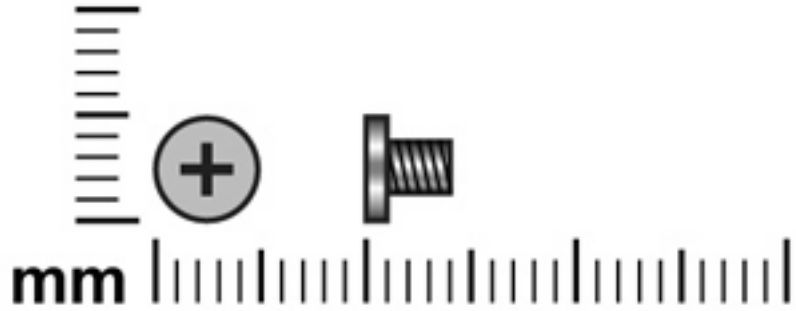


Color	Quantity	Length	Thread	Head diameter
Silver	2	7.0 mm	2.0 mm	5.0 mm

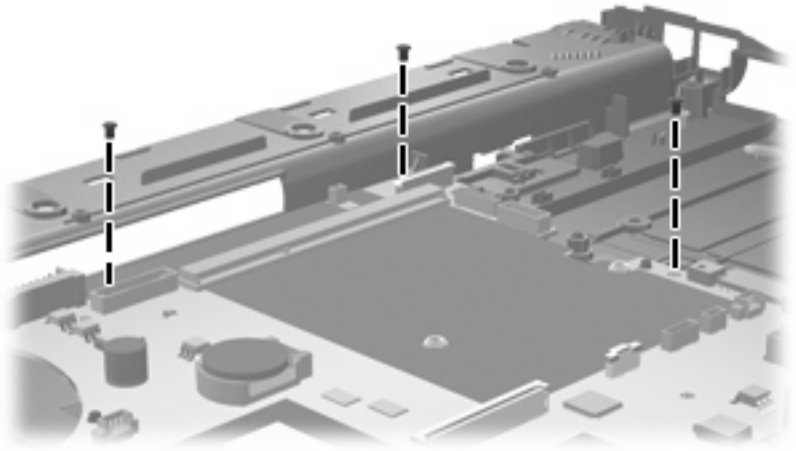


Where used: 2 screws that secure the ExpressCard assembly to the base enclosure

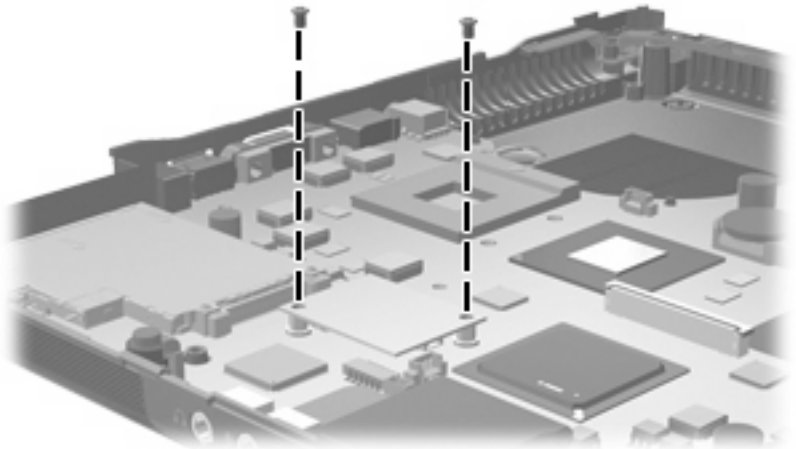
Phillips PM2.5×4.0 screw



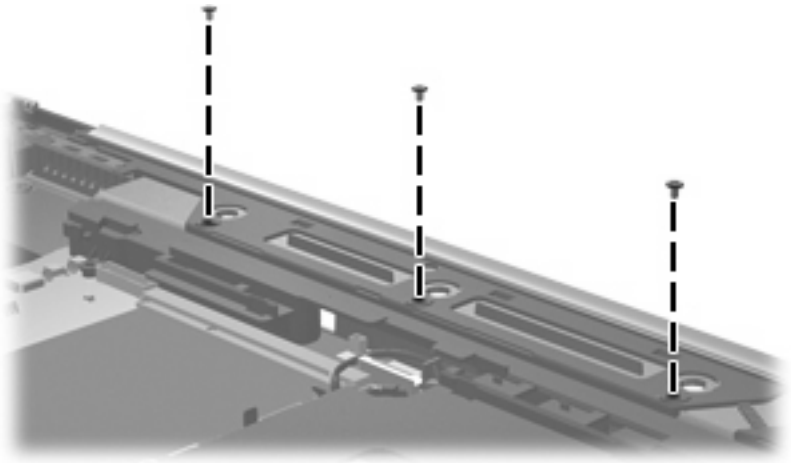
Color	Quantity	Length	Thread	Head diameter
Black	20	4.0 mm	2.5 mm	5.0 mm



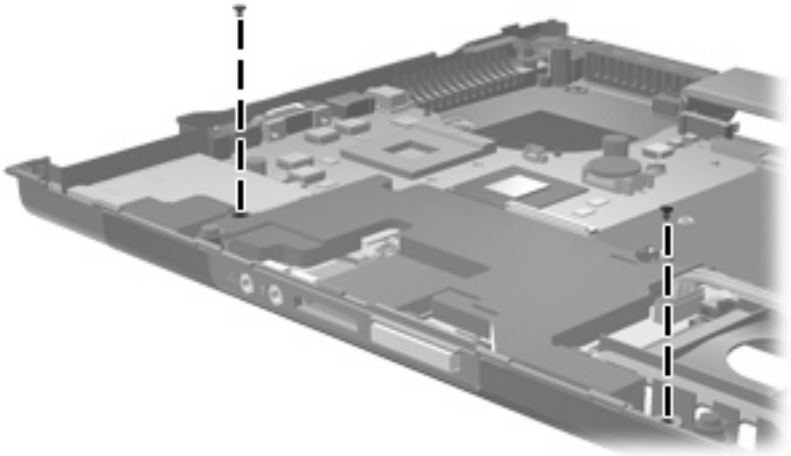
Where used: 3 screws that secure the system board to the base enclosure



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

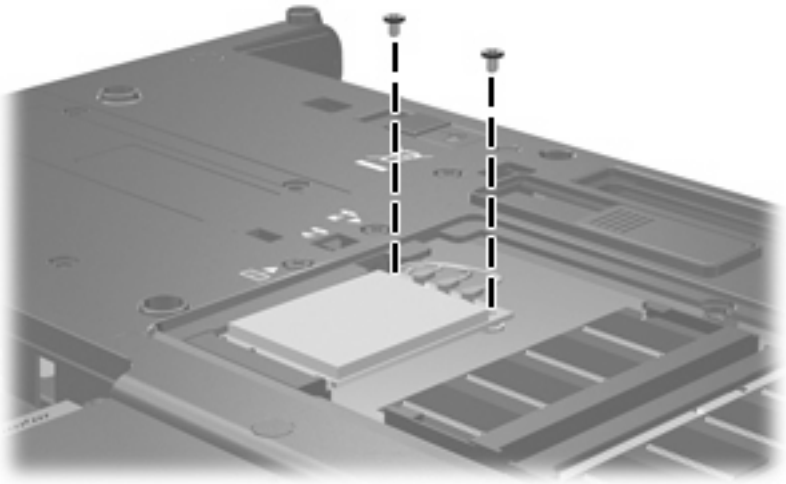


Where used: 3 screws that secure the top cover to the base enclosure

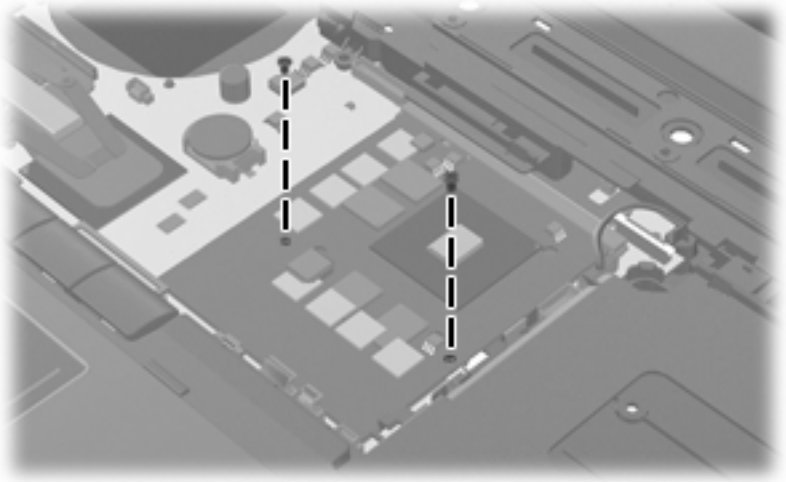


Where used: 2 screws that secure the speaker assembly to the base enclosure

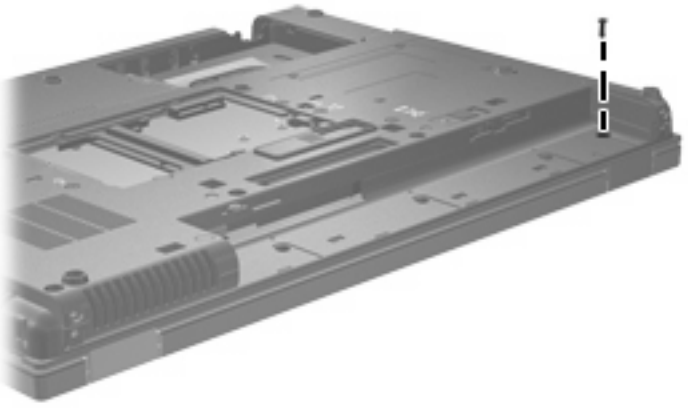
Where used: 2 screws that secure the top cover to the system board



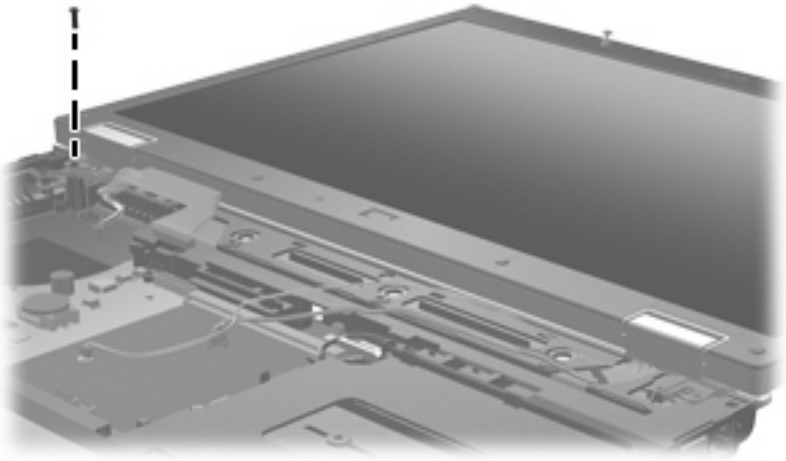
Where used: 2 screws that secure the WLAN module to the computer



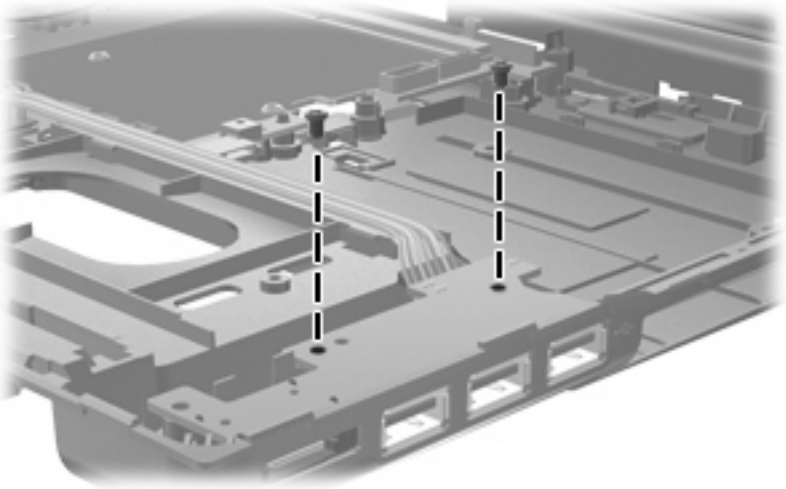
Where used: 2 screws that secure the graphics card to the system board



Where used: One screw in the battery bay that secures the display to the base enclosure

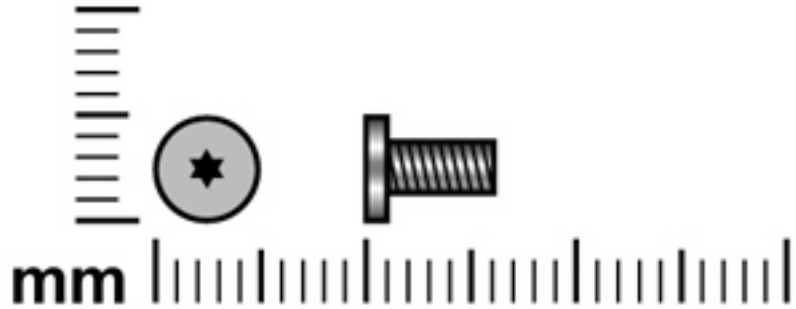


Where used: One screw near the left hinge that secures the display to the base enclosure

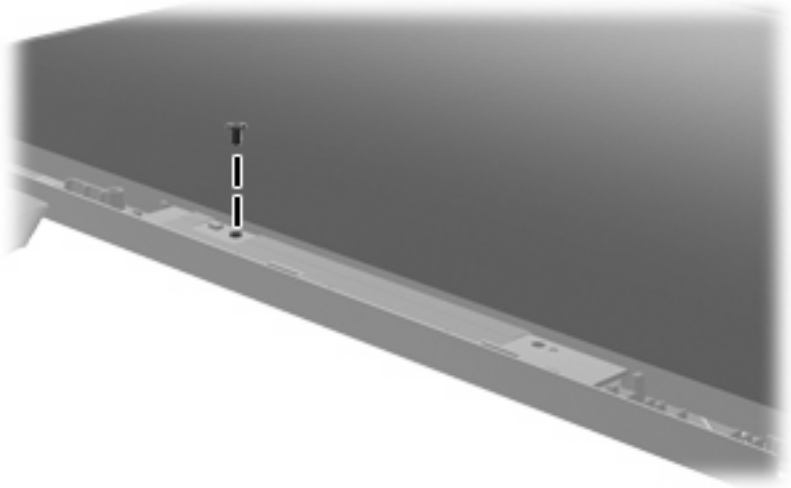


Where used: 2 screws that secure the USB/eSATA module to the base enclosure

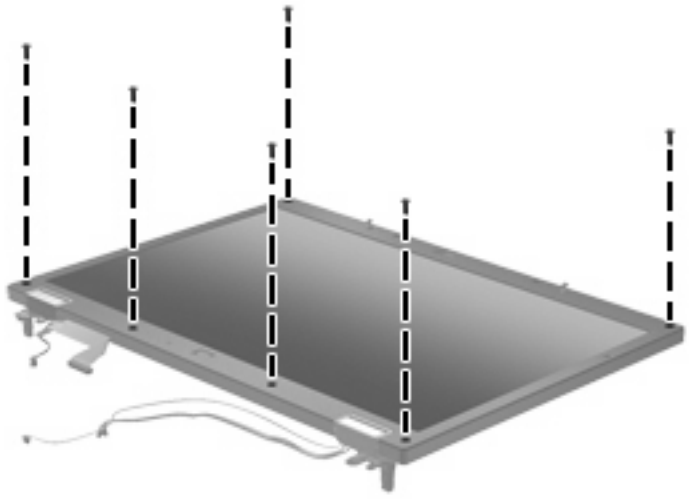
Torx T8M2.5×6.0 screw



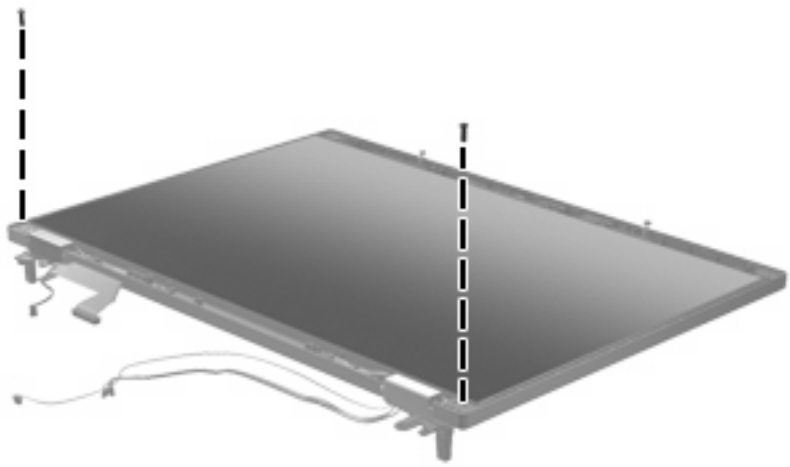
Color	Quantity	Length	Thread	Head diameter
Black	9	6.0 mm	2.5 mm	5.0 mm



Where used: One screw that secures the inverter to the display enclosure

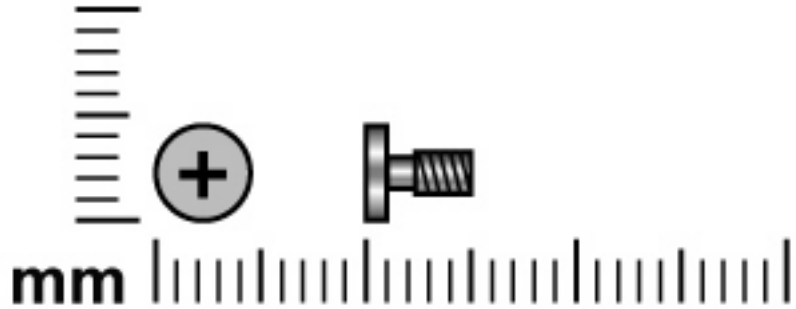


Where used: 6 screws that secure the display bezel to the display enclosure

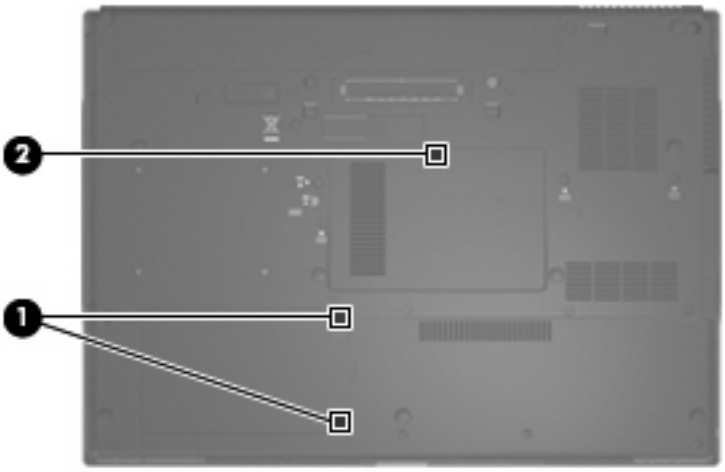


Where used: 2 screws that secure the display panel to the display enclosure

Phillips PM2.0×5.0 captive screw



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

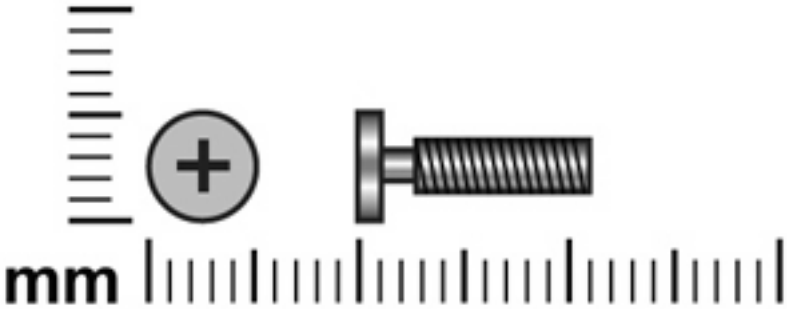


Where used:

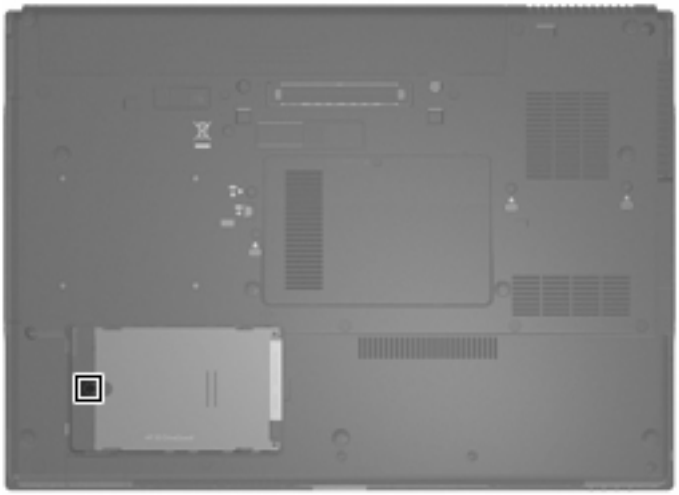
(1) 2 captive screws that secure the hard drive compartment cover to the computer (screws are secured by C-clips)

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

Phillips PM2.5×11.0 captive screw



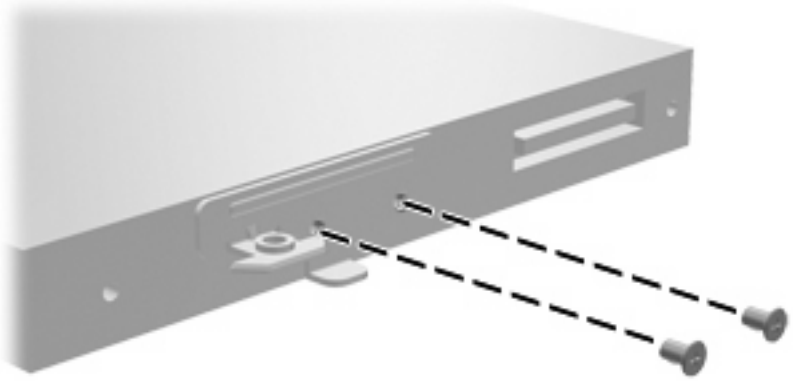
Color	Quantity	Length	Thread	Head diameter
Black	1	11.0 mm	2.5 mm	5.0 mm



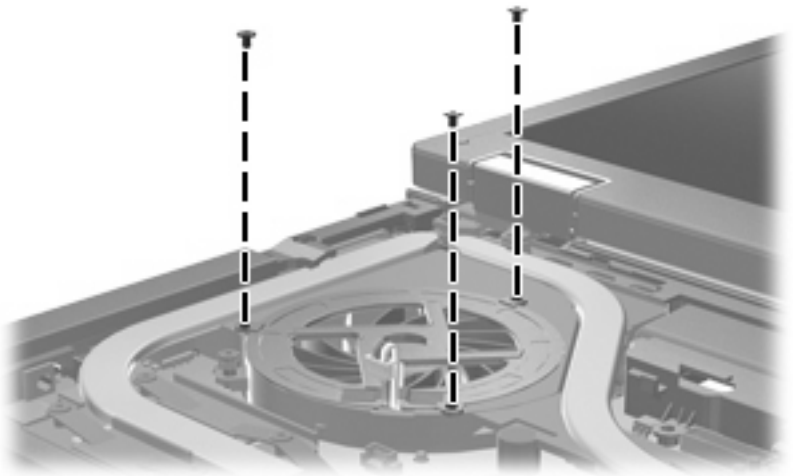
Where used: 1 captive screw that secures the hard drive to the computer

Phillips PM2.0×3.0 screw

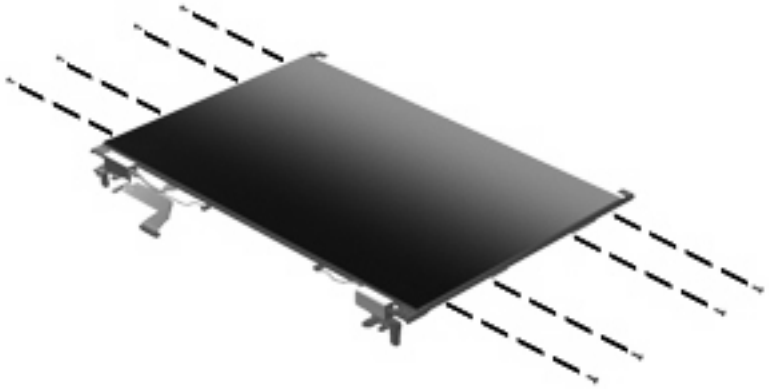
Color	Quantity	Length	Thread	Head diameter
Silver	13	3.0 mm	2.0 mm	5.0 mm



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

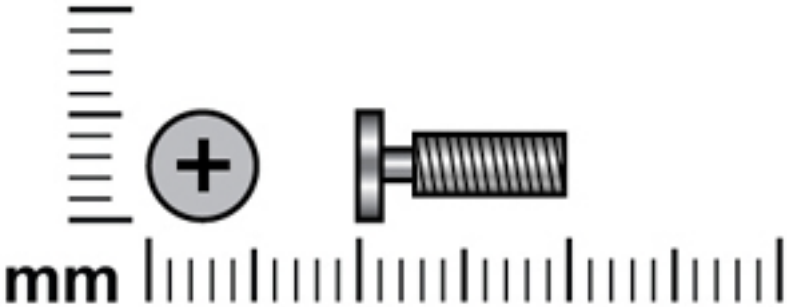


Where used: 3 screws that secure the fan to the base enclosure

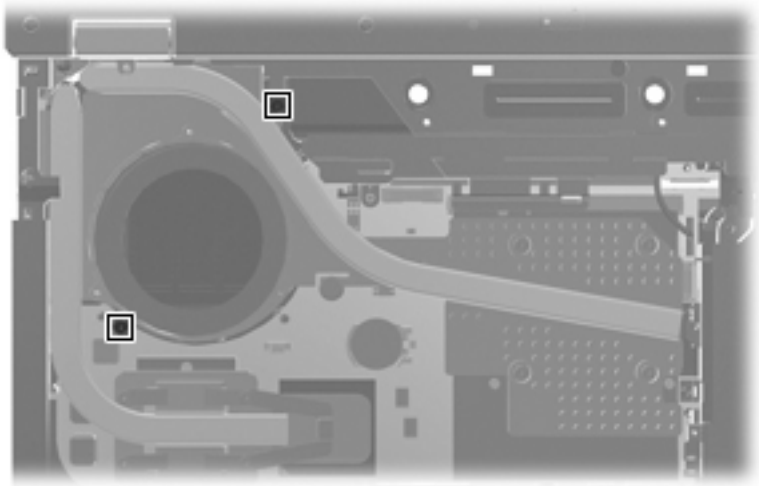


Where used: 8 screws that secure the display brackets to the display

Phillips PM3.0×10.0 captive screw

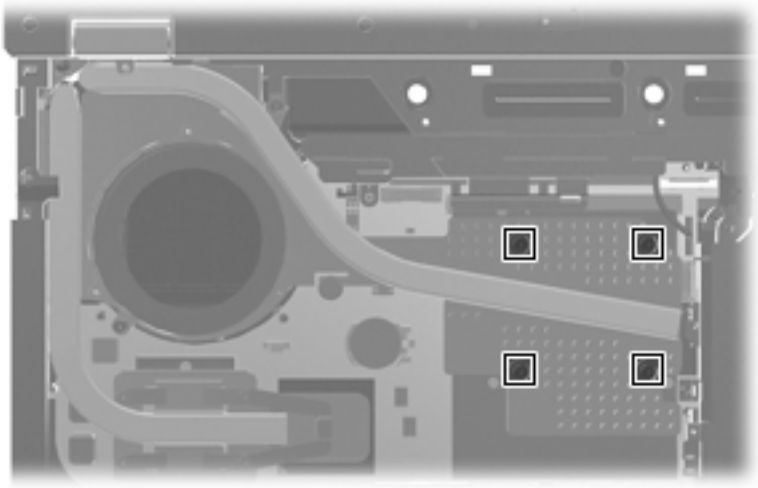


Color	Quantity	Length	Thread	Head diameter
Black	2	10.0 mm	3.0 mm	5.0 mm



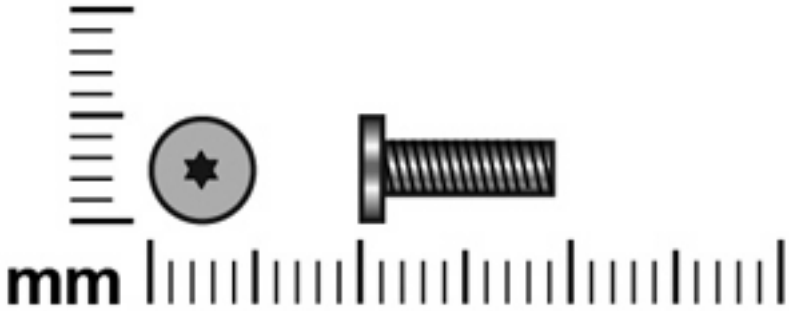
Where used: 2 captive screws that secure the graphics card heat sink to the computer (screws are secured by C-clips)

Color	Quantity	Length	Thread	Head diameter
Silver	4	10.0 mm	3.0 mm	5.0 mm

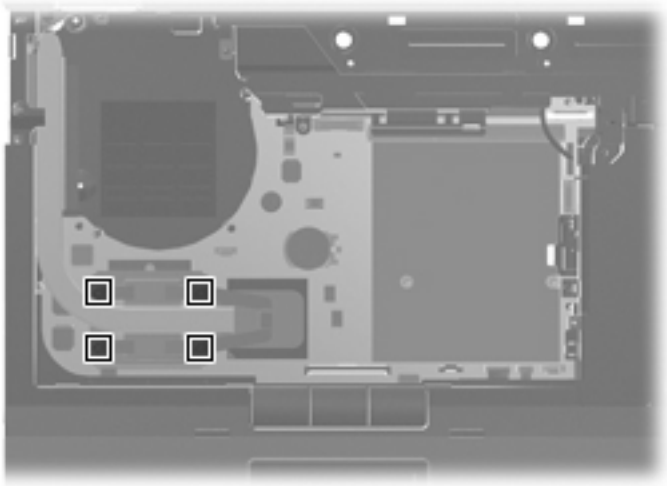


Where used: 4 captive screws that secure the graphics card heat sink to the computer

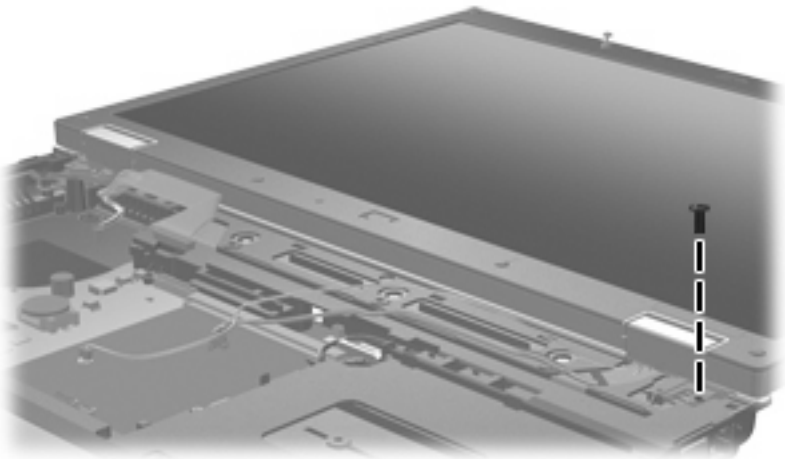
Torx TM2.5×9.0 screw



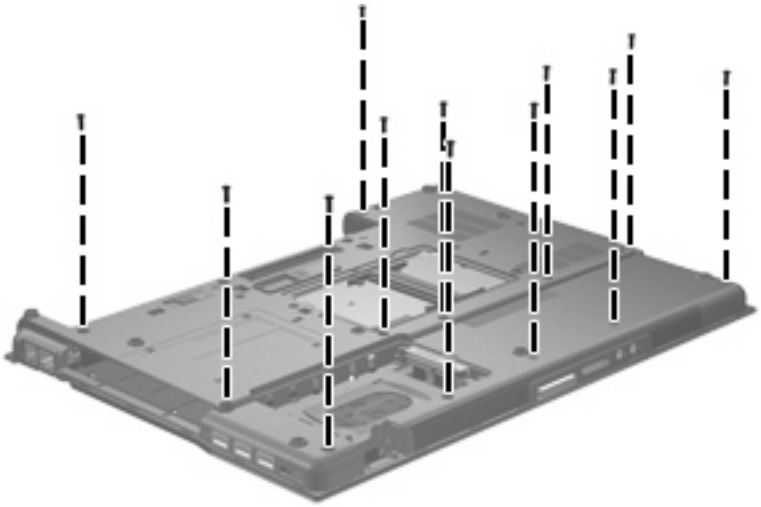
Color	Quantity	Length	Thread	Head diameter
Black	18	9.0 mm	2.5 mm	5.0 mm



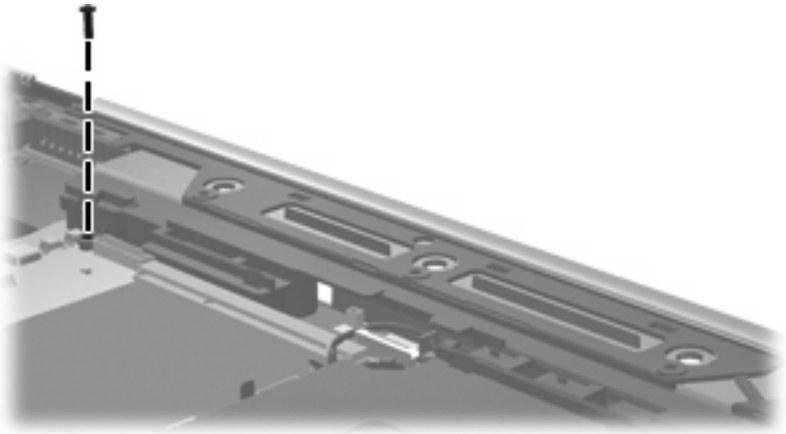
Where used: 4 screws that secure the heat sink to the computer



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

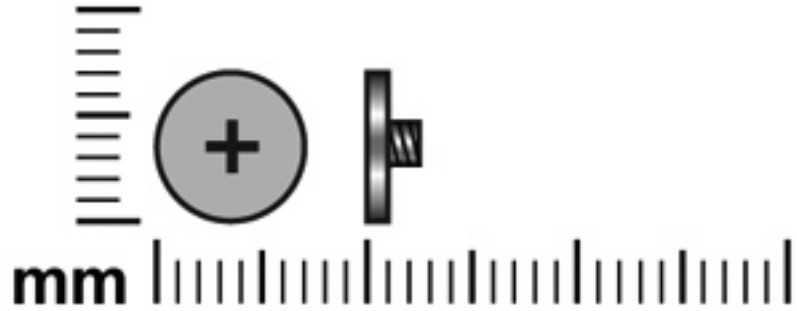


Where used: 12 screws that secure the top cover to the base enclosure

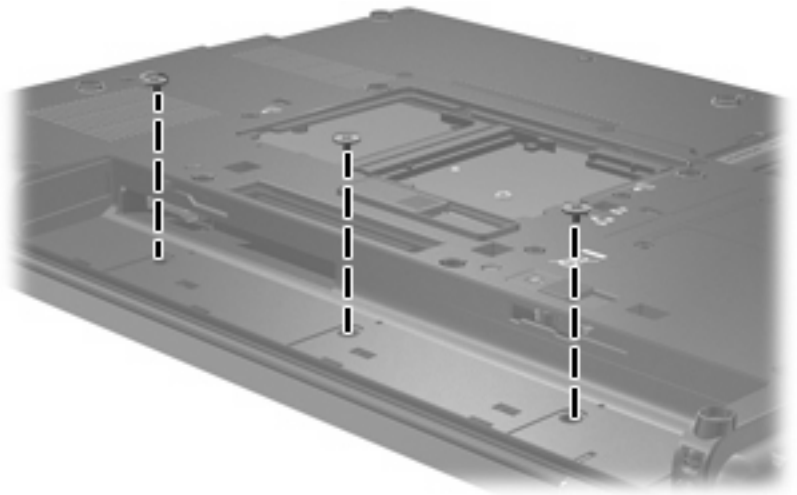


Where used: One screw that secures the top cover to the base enclosure

Black Phillips PM2.0×3.0 broad head screw



Color	Quantity	Length	Thread	Head diameter
Black	3	2.0 mm	3.0 mm	7.0 mm



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

8 Backup and recovery

Backup and recovery in Windows Vista

Overview

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

The Backup and Restore Center provides the following options:

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

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

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

Backing up your information

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

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

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

To create a screen shot:

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

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

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

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

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

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

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

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

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

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

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

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

Performing a recovery

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

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

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

Using the Windows recovery tools

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

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

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

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

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

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

   NOTE: If the Windows partition and the HP Recovery partition have been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

3. Restart the computer, and then press f8 before the Windows operating system loads.
4. Select **Repair your computer**.
5. Follow the on-screen instructions.

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

Using f11

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

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

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

   NOTE: If the HP Recovery partition has been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

3. Turn on or restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

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

Using a Windows Vista operating system DVD (purchased separately)

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

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

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

NOTE: This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows Vista operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

Backup and recovery in Windows XP

Overview

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

Windows provides the following options:

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

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

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

Backing up your information

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

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

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.
- Back up templates stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.

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

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

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

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

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

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

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

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

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

Performing a recovery

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

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

Recovering your information

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

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

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

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

Recovering the operating system and programs

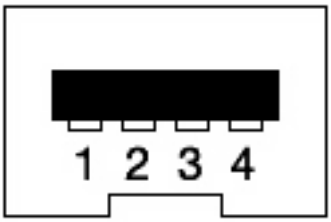
CAUTION: The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed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

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

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

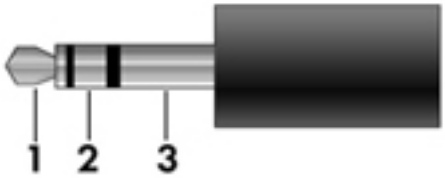
9 Connector pin assignments

1394



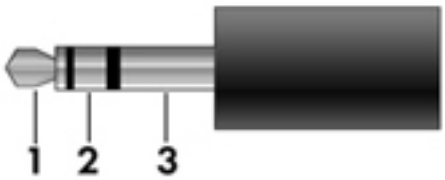
Pin	Signal
1	Twisted pair B-
2	Twisted pair B+
3	Twisted pair A-
4	Twisted pair A+

Audio-in (microphone)



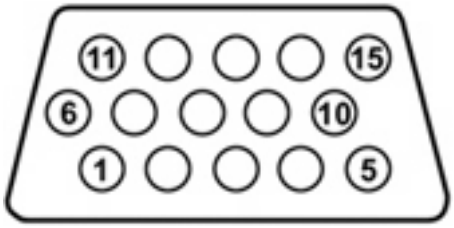
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



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

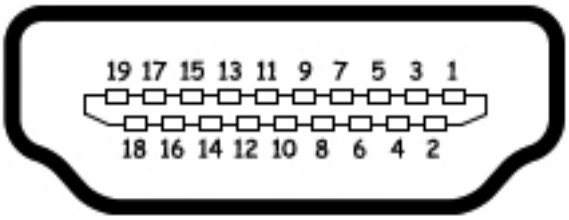
External monitor



Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog

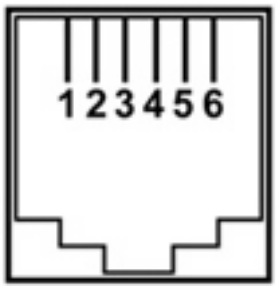
Pin	Signal
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



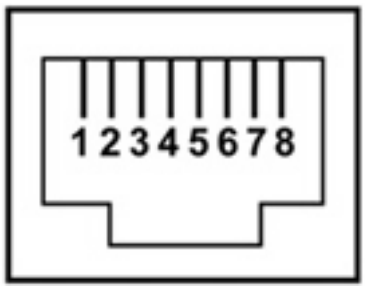
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2–
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1–
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0–
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock–
13	CEC
14	Not connected
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect
20	Shell

RJ-11 (modem)



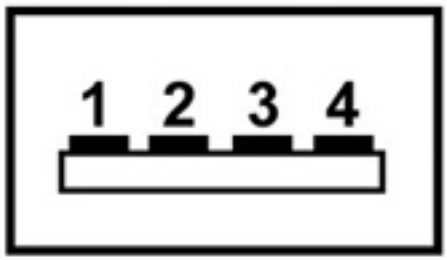
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)



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

Universal Serial Bus



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

10 Power cord set requirements

The wide range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

Requirements for all countries and regions

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

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

Requirements for specific countries and regions

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

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

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

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

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

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

11 Recycling

Battery

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

Display

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

△ **CAUTION:** The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

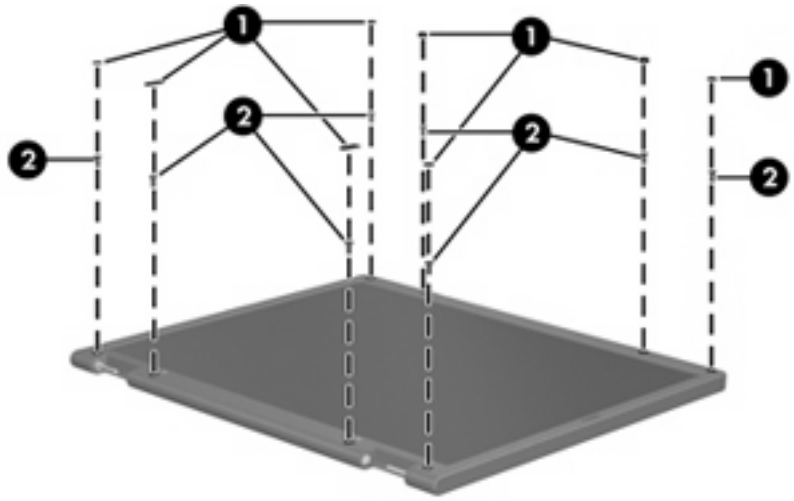
NOTE: **Materials Disposal**. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities,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

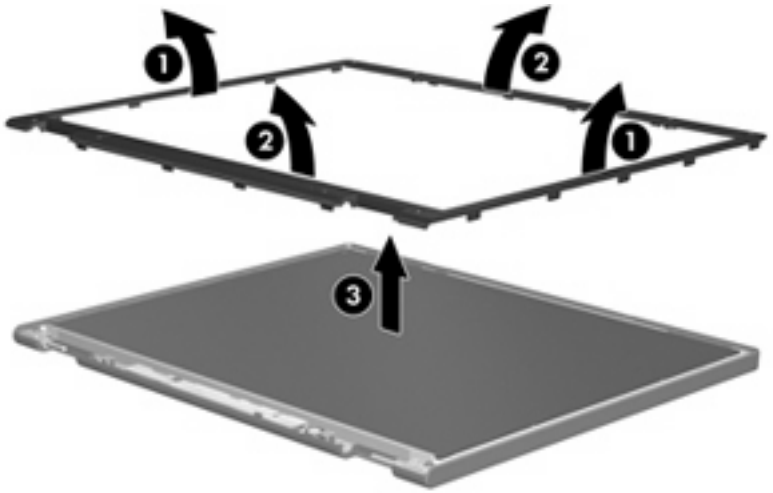
NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

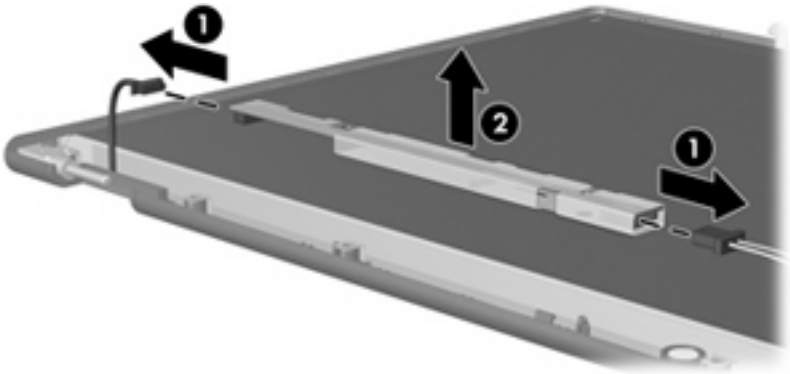
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



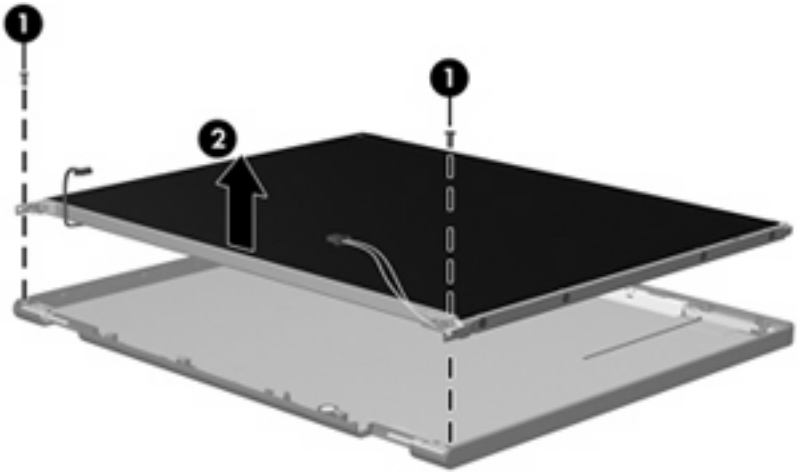
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



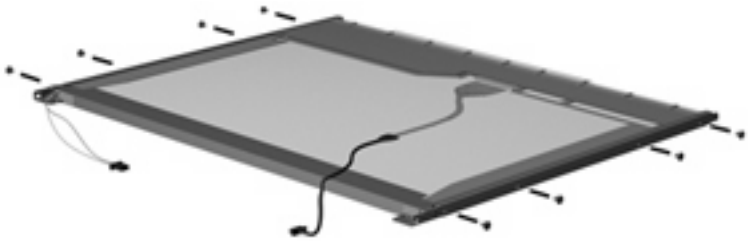
4. Disconnect all display panel cables **(1)** from the display inverter and remove the display inverter **(2)**.



5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly **(2)** from the display enclosure.

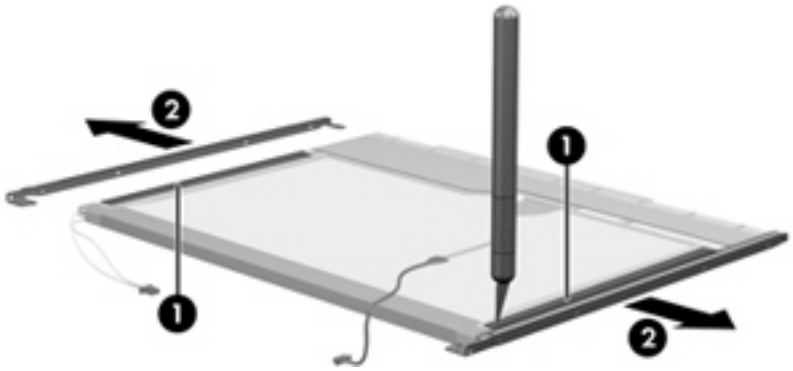


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

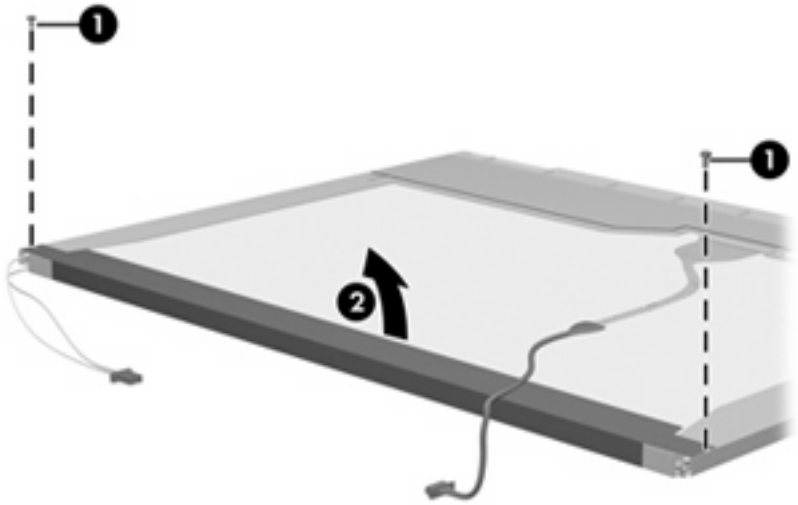


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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

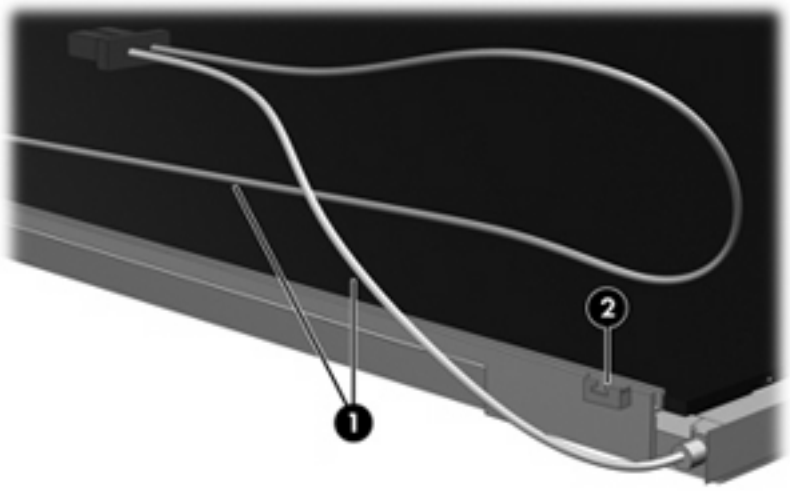


11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



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

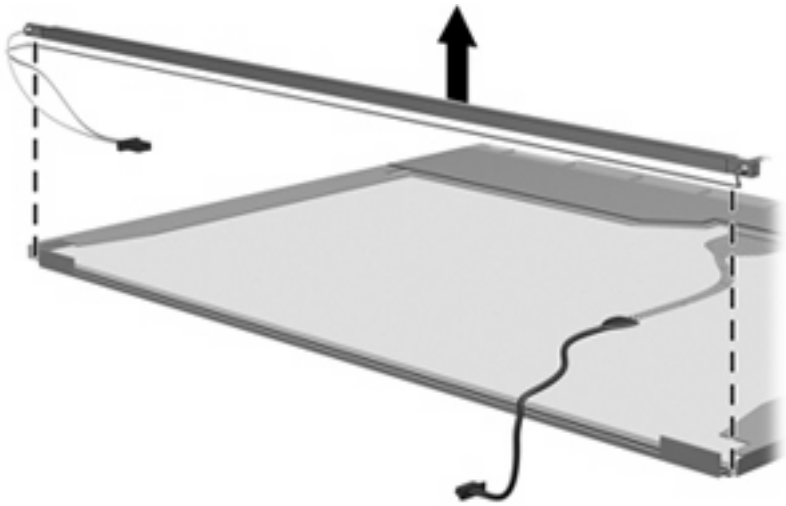
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



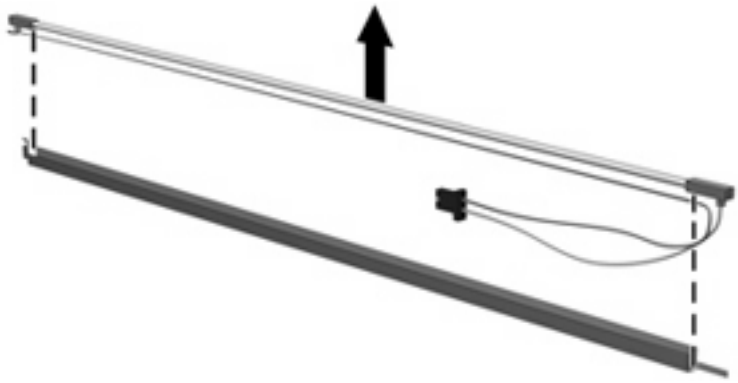
16. Turn the display panel upside down.

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

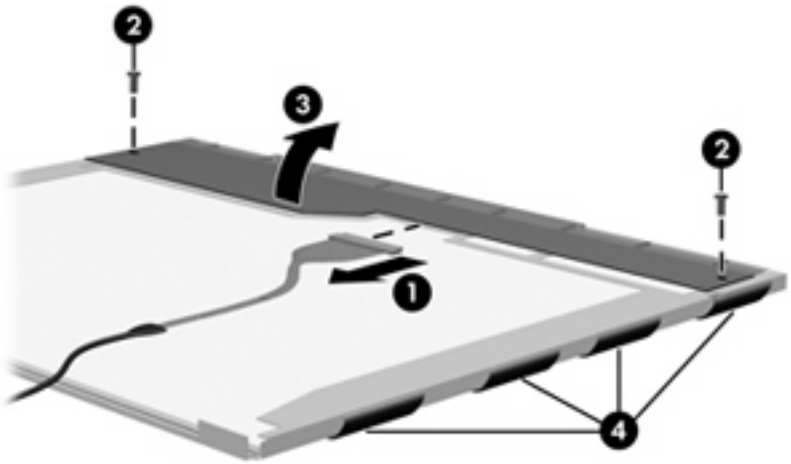
17. Remove the backlight frame from the display panel.



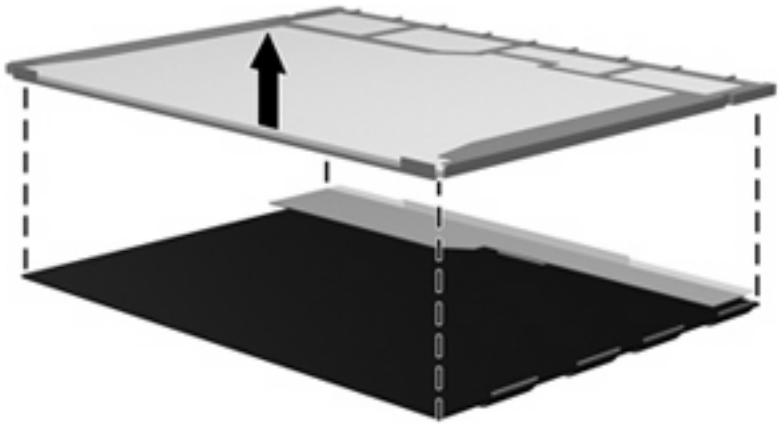
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel cable **(1)** from the LCD panel.
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **(3)** from the display rear panel.
22. Release the tape **(4)** that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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