HP Pavilion dv7 Entertainment PC

Maintenance and Service Guide

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This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; troubleshooting computer problems; and performing computer disassembly procedures.

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Safety warning notice

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

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1

Product description

Category	Description	Computer models equipped with M96 system board and graphics subsystems with discrete memory	Computer models equipped with M92 system board and graphics subsystems with discrete memory	Computer models equipped with graphics subsystems with UMA memory
Product Name	**HP Pavilion dv7 Entertainment PC**	x	x	x
Processors	AMD Turion™ X2 Ultra Dual-Core M640 35-W, 2.60-GHz with 2-MB L2 cache	x	x	x
	AMD Turion X2 Ultra Dual-Core M620 35-W, 2.50-GHz with 2-MB L2 cache	x	x	x
	AMD Turion X2 Ultra Dual-Core M600 35-W, 2.40-GHz, with 2-MB L2 cache	x	x	x
	AMD Turion™ X2 Dual-Core M520 35-W, 2.30-GHz, with 1-MB L2 cache	x	x	x
	AMD Turion X2 Dual-Core M500 35-W, 2.20-GHz, with 1-MB L2 cache	x	x	x
	AMD Athlon™ X2 Dual-Core M320 35-W, 2.10-GHz with 1-MB L2 cache	x	x	x
	AMD Athlon X2 Dual-Core M300 35-W, 2.00-GHz with 1-MB L2 cache	x	x	x
Chipset	Northbridge: AMD M870 chipset, ATI Mobility Radeon™ discrete graphics	x	x	
	Northbridge: AMD M880G chipset, ATI Mobility Radeon UMA graphics			x
	Southbridge: AMD SB710	x	x	x

(Continued)

Category	Description	Computer models equipped with M96 system board and graphics subsystems with discrete memory	Computer models equipped with M92 system board and graphics subsystems with discrete memory	Computer models equipped with graphics subsystems with UMA memory
Graphics	AMD internal graphics with Unified Memory Architecture (UMA), ATI discrete PCI Express graphics with discrete graphics subsystem memory			
	Unified Memory Architecture (UMA) with shared video memory: ■ Up to 358 MB of graphics subsystem memory on computer models equipped with 2048 MB or more of main system memory ■ Up to 251 MB of graphics subsystem memory on computer models equipped with 1024 MB or more of main system memory ■ Memory size is dynamic			x
	Discrete PCI Express x 16 graphics memory: ■ ATI Mobility Radeon HD 4650 (M96) with 1024 MB of dedicated video memory ■ ATI Mobility Radeon HD 4530 (M92) with 512 MB of dedicated video memory	x	x	
	Support for Blu-ray Disc playback with HD Decode and DX10 support	x	x	x
Panels	16:9 Ultra-wide aspect ratio supports the following display assemblies:	x	x	x
	■ 17.3-inch, HD+ (1600 x 900) AntiGlare LED	x	x	x
	■ 17.3-inch, HD+ (1600 x 900) BrightView LED	x	x	x
	Support for flush glass panel cover on AntiGlare panels	x	x	x
	Support for lighted logo on top bezel	x	x	x
	Typical brightness 200 nits	x	x	x

(Continued)

Category	Description	Computer models equipped with M96 system board and graphics subsystems with discrete memory	Computer models equipped with M92 system board and graphics subsystems with discrete memory	Computer models equipped with graphics subsystems with UMA memory
Memory	2 SODIMM slots—customer accessible/upgradable	x	x	x
	PC2-6400, 800-MHz, DDR2	x	x	x
	Dual-channel support	x	x	x
	Supports up to 8192 MB system memory: ■ 8192-MB total system memory (4096 MB x 2, dual-channel) ■ 6144-MB total system memory (2048 MB x 1 + 4096 MB x 1) ■ 4096-MB total system memory (2048 MB x 2, dual-channel) ■ 3072-MB total system memory (2048 MB x 1 + 1024 MB x 1) ■ 2048-MB total system memory (1024 MB x 2) ■ 2048-MB total system memory (2048 MB x 1) ■ 1024-MB total system memory (1024 MB x 1)	x	x	x
Hard drives	Supports all Serial ATA (SATA) 9.5-mm, 6.35-cm (2.50-inch) hard drives	x	x	x
	Supports up to 2 hard drives			
	Support for HP ProtectSmart Hard Drive Protection			
	Dual hard drive configurations: ■ 1-TB (500-GB, 7200-rpm x 2) (select models only) ■ 1-TB (500-GB, 5400-rpm x 2) ■ 640-GB (320-GB, 7200-rpm x 2) (select models only) ■ 640-GB (320-GB, 5400-rpm x 2) ■ 500-GB (250-GB, 7200-rpm x 2) (select models only) ■ 500-GB (250-GB, 5400-rpm x 2)	x	x	x
	Single hard drive configurations: ■ 500-GB, 7200-rpm (select models only) ■ 500-GB, 5400-rpm ■ 320-GB, 7200-rpm ■ 320-GB, 5400-rpm ■ 250-GB, 7200-rpm ■ 250-GB, 5400-rpm	x	x	x

(Continued)

Category	Description	Computer models equipped with M96 system board and graphics subsystems with discrete memory	Computer models equipped with M92 system board and graphics subsystems with discrete memory	Computer models equipped with graphics subsystems with UMA memory
Optical drives	12.7-mm tray load	x	x	x
	Serial ATA	x	x	x
	Fixed (1 screw for removal)	x	x	x
	Support for the following optical drives: ■ DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe ■ Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive	x	x	x
Webcam	Low-light VGA camera	x	x	x
	Fixed (no tilt)	x	x	x
	Activity LED	x	x	x
	640 x 480 by 24 frames per second	x	x	x
Microphone	2 omnidirectional digital microphones, dual-array with appropriate software (supports beam forming, echo cancellation, and noise suppression)	x	x	x
Audio	HD Audio (IDT)	x	x	x
	Integrated subwoofer	x	x	
	Supports Microsoft Premium Requirements	x	x	x
	Pavilion-branded Altec Lansing speakers	x	x	x
Modem	56K V.92 data/fax modem (select models only)	x	x	x
	Supports all world-wide certification requirements			
Ethernet	Integrated Realtek 10/100/1000 network interface card (NIC)	x	x	
	Integrated Realtek 10/100 NIC			x
Wireless	**Integrated wireless local area network (WLAN) options by way of wireless module:** 2 wireless antennas built into display assembly			
	Broadcom 4322 802.11a/b/g/n WLAN module	x	x	x
	Broadcom BCM4312 802.11b/g WLAN module	x	x	x
	Atheros 9285G 802.11b/g WLAN module	x	x	x
	Atheros 9280AGN 802.11a/b/g/n WLAN module	x	x	x

(Continued)

Category	Description	Computer models equipped with M96 system board and graphics subsystems with discrete memory	Computer models equipped with M92 system board and graphics subsystems with discrete memory	Computer models equipped with graphics subsystems with UMA memory
TV tuner	Integrated DVB-T TV tuner module* (select models only)	x	x	
	Support for TV tuner antennas for both DVB-T and ATSC/NTSC*	x	x	
	*There is no Athlon processor support for a TV tuner on discrete and UMA system boards. For TV tuners on computers equipped with an Athlon processor and the Blu-ray optical drive, the Athlon processor supports only dual-channel memory.			
External media card	One ExpressCard 54 slot	x	x	x
	Digital Media Slot supports Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Memory Stick (MS), Memory Stick Pro (MSP), and xD-Picture Card	x	x	x
Internal card expansion	Two Mini Card slots	x	x	x
	■ One slot for WLAN	x	x	x
	■ One slot for TV tuner	x	x	
Ports	Audio-in (stereo microphone)	x	x	x
	Audio-out (stereo headphone)	x	x	x
	Audio-out (stereo headphone with S/PDIF)	x	x	x
	Consumer infrared	x	x	x
	eSATA port combo with fourth USB port	x	x	x
	Four USB 2.0 ports	x	x	x
	Hot Plug/Unplug and auto-detect for correct output to wide-aspect vs. standard-aspect video	x	x	x
	High-Definition Multimedia Interface (HDMI) v1.3 supporting 1080p with HDCP key	x	x	x
	IEEE 1394a	x	x	
	RJ-11 modem (select models only)	x	x	x
	RJ-45 Ethernet, includes link and activity lights	x	x	x
	TV tuner antenna (select models only)	x	x	
	VGA (Dsub 15-pin) supports 1920 x 1200 external resolution @ 75Hz	x	x	
	VGA (Dsub 15-pin) supports 1600 x 1200 external resolution @ 75Hz			x
	2-pin AC power for 90-W AC adapter	x	x	x
Docking	Expansion port 3 supports the HP xb3000 Notebook Expansion Base and HP Notebook QuickDock	x	x	x

(Continued)

Category	Description	Computer models equipped with M96 system board and graphics subsystems with discrete memory	Computer models equipped with M92 system board and graphics subsystems with discrete memory	Computer models equipped with graphics subsystems with UMA memory
Keyboard/ pointing devices	17.3-inch full-size keyboard with numeric keypad	x	x	x
	Standard IMR keyboard	x	x	x
	UV painted keyboard (select models only)	x	x	x
	Touchpad supports 2-way scrolling	x	x	x
	Taps enabled as default	x	x	x
Power requirements	8-cell 2.55-Ah Li-ion battery with target life of: ■ 3.6 hours used with the discrete system board ■ 4.5 hours used with the UMA system board	x	x	x
	6-cell 2.20-Ah Li-ion battery with target life of 3 hours (for use with the UMA system board only)			x
	90-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector)	x	x	x
	65-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector)	x	x	x
Security	Security cable slot	x	x	x
	Fingerprint reader with Digital Persona Software support (select models only)	x	x	x
Operating system	**Preinstalled:**			
	Windows® 7	x	x	x
	Windows 7 Basic (32-bit)	x	x	x
	Windows 7 Basic (64-bit)	x	x	x
	Windows 7 Home Premium (32-bit/64-bit)	x	x	x
	Windows 7 Professional (64-bit)	x	x	x
Serviceability	**End-user replaceable parts:**			
	AC adapter	x	x	x
	Battery (system)	x	x	x
	Hard drives (2)	x	x	x
	Memory module	x	x	x
	Mini Card components for built-in WLAN/WWAN and integrated TV tuner components	x	x	x
	Optical drive	x	x	x

2

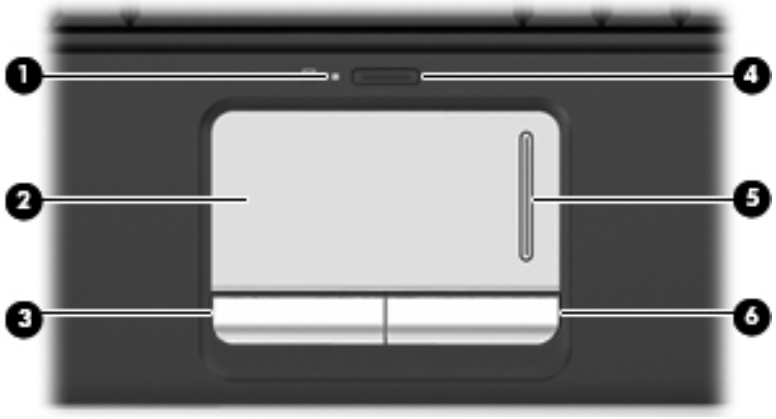
External component identification

Top components

Display components

Item	Component	Description
❶	Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on.
❷	Wireless antennas (3) (select models only)	Send and receive signals from one or more wireless devices. ✎ The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.
❸	Internal microphones (2)	Record sound.
❹	Webcam light	On: The webcam is in use.
❺	Webcam (select models only)	Records audio and video and captures still photographs.

TouchPad



Item	Component	Function
❶	TouchPad light	■ White: TouchPad is enabled. ■ Amber: TouchPad is disabled.
❷	TouchPad*	Moves the pointer and selects or activates items on the screen.
❸	Left TouchPad button*	Functions like the left button on an external mouse.
❹	TouchPad on/off button	Enables/disables the TouchPad.
❺	TouchPad scroll zone	Scrolls up or down.
❻	Right TouchPad button*	Functions like the right button on an external mouse.

*This table describes factory settings. To view and change pointing device preferences, select **Start > Devices and Printers.** Then, right-click the device representing your computer, and select **Mouse settings**.

Buttons

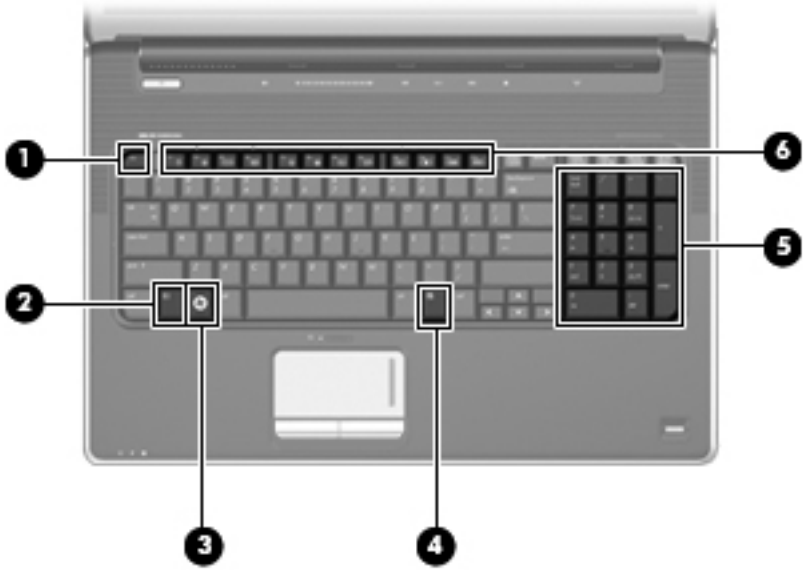
Item	Component	Description
❶	Power button*	■ When the computer is off, press the button to turn on the computer. ■ When the computer is on, press the button briefly to initiate Sleep. ■ When the computer is in the Sleep state, press the button briefly to exit Sleep. ■ When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings, Select **Start > Control Panel > System and Security > Power Options**.
❷	Speakers (2)	Produce sound.
❸	Volume mute button	Mutes and restores speaker sound.
❹	Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume. You can also tap the minus (-) sign on the scroll zone to decrease volume, or tap the plus (+) sign on the scroll zone to increase volume.
❺	Previous/rewind button	■ Plays the previous track or chapter when the button is pressed once. ■ Rewinds media when the button is pressed in combination with the **fn** key.
❻	Play/pause button	Plays or pauses media.
❼	Next/fast forward button	■ Plays the next track or chapter when the button is pressed once. ■ Fast forwards media when pressed in combination with the **fn** key.

(Continued)

Item	Component	Description
❽	Stop button	Stops playback.
❾	Wireless button	Turns the wireless feature on or off, but does not establish a wireless connection. ✎ To establish a wireless connection, a wireless network must already be set up.
❿	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

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

Keys



Item	Component	Function
❶	**esc** key	Displays system information when pressed in combination with the **fn** key.
❷	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
❸	Windows logo key	Displays the Windows Start menu.
❹	Windows applications key	Displays a shortcut menu for items beneath the pointer.
❺	Integrated numeric keypad keys	Can be used like the keys on an external numeric keypad.
❻	Function keys	Execute frequently used system functions when pressed in combination with the **fn** key.

Lights

Item	Component	Description
❶	Caps lock light	On: Caps lock is on.
❷	Power lights (2)*	■ On: The computer is on. ■ Blinking: The computer is in the Sleep state. ■ Off: The computer is off or in Hibernation.
❸	Volume mute light	■ White: Computer sound is on. ■ Amber: Computer sound is off.
❹	Volume down light	On: The volume scroll zone is being used to decrease speaker volume.
❺	Volume up light	On: The volume scroll zone is being used to increase speaker volume.
❻	Wireless light	■ On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. ■ Off: All wireless devices are off.
❼	Num Lock light	The integrated numeric keypad is enabled, or num lock is enabled on a connected optional numeric keypad.

(Continued)

Item	Component	Description
❽	Battery light (beside power connector)	■ On: A battery is charging. ■ Blinking: 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.
❾	Drive light	■ Blinking: The hard drive or optical drive is being accessed. ■ Amber: HP ProtectSmart Hard Drive Protection 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.

Front components

Item	Component	Description
❶	Power light	■ On: The computer is on. ■ Blinking: The computer is in the Sleep state. ■ Off: The computer is off or in Hibernation.
❷	Battery light	■ On: A battery is charging. ■ Blinking: 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 is turned off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
❸	Drive light	■ Blinking: The hard drive or optical drive is being accessed. ■ Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.
❹	Consumer infrared lens	Receives a signal from the remote control.
❺	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
❻	Audio-out (headphone) jacks (2)	Produce sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.

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

Rear component

Component	Description
Vent	Enables airflow to cool internal components. ✎ 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.

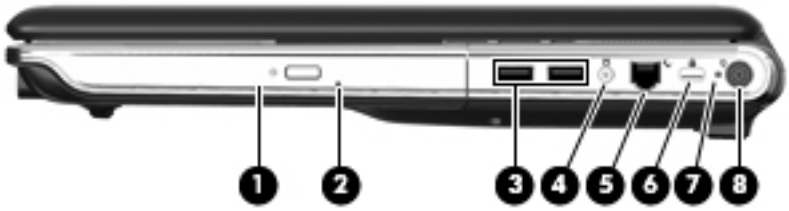
Left-side components

Item	Component	Function
❶	External monitor port	Connects an external VGA monitor or projector.
❷	Expansion port 3	Connects the computer to an optional docking device or an optional expansion product. ✎ The computer has only one expansion port. The term *expansion port 3* describes the type of expansion port.
❸	RJ-45 (network) jack	Connects a network cable.
❹	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
❺	eSATA/USB port (select models only)	Connects an optional high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device. ✎ Depending on your computer model, the computer may include a USB port only.
❻	USB port	Connects an optional USB device.
❼	1394 port (select models only)	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.

(Continued)

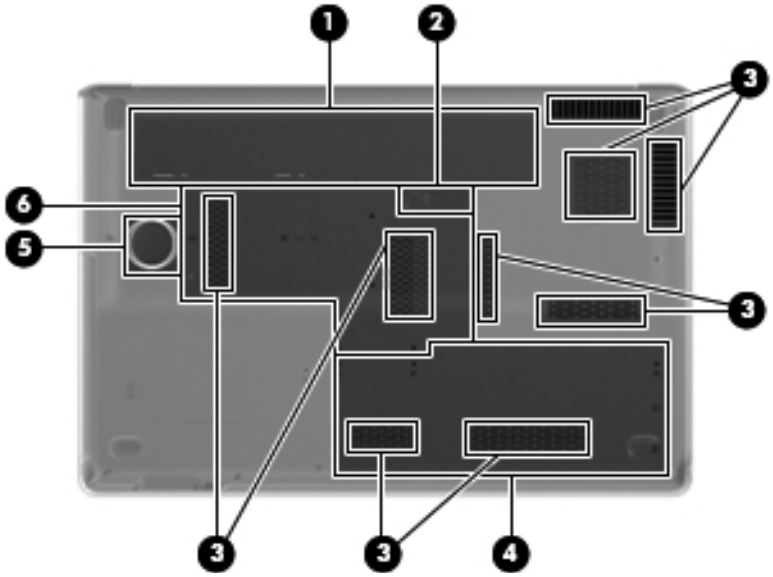
Item	Component	Function
❽	Digital Media Slot light	On: A digital card is being accessed.
❾	Digital Media Slot	Supports the following optional digital card formats: ■ Memory Stick (MS) ■ Memory Stick Pro (MSP) ■ MultiMediaCard (MMC) ■ Secure Digital (SD) Memory Card ■ Secure Digital High Capacity (SDHC) Memory Card ■ xD-Picture Card (XD) ■ xD-Picture Card (XD) Type H ■ xD-Picture Card (XD) Type M
❿	ExpressCard slot	Supports optional ExpressCard/54 cards.

Right-side components



Item	Component	Function
❶	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
❷	Optical drive light	Blinking: The optical drive is being accessed.
❸	USB ports (2)	Connect optional USB devices.
❹	TV antenna/cable jack (select models only)	Connects a TV antenna, a digital cable device, or a satellite device that receives standard or high-definition TV broadcasts.
❺	RJ-11 (modem) jack (select models only)	Connects a modem cable.
❻	Security cable slot	Attaches an optional security cable to the computer. ✎ The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
❼	AC adapter light	■ On: The computer is connected to external power. ■ Off: The computer is not connected to external power.
❽	Power connector	Connects an AC adapter.

Bottom components



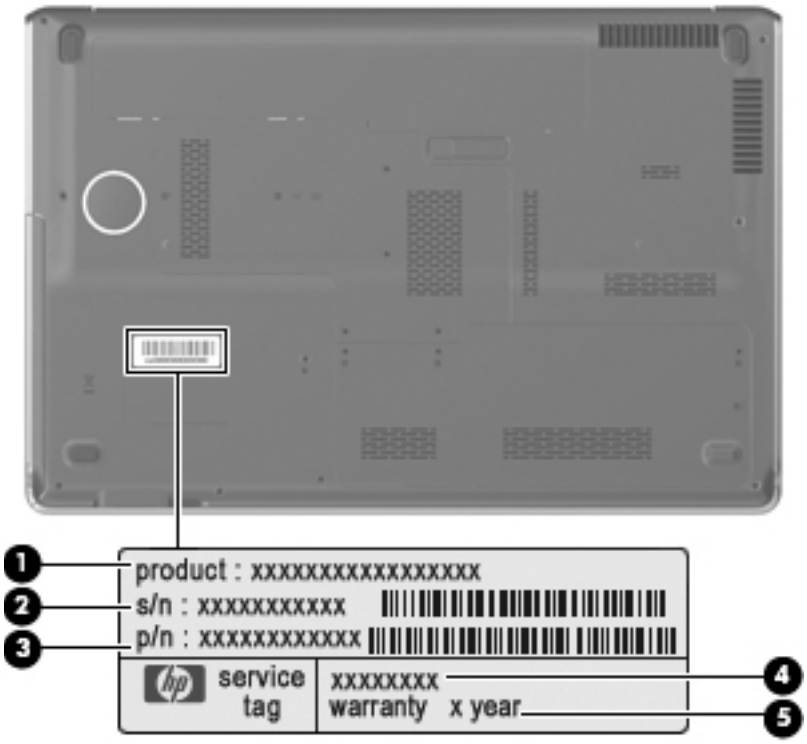
Item	Component	Function
❶	Battery bay	Holds the battery.
❷	Battery release latch	Releases the battery from the battery bay.
❸	Vents (9)	Enable airflow to cool internal components. ✎ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
❹	Secondary hard drive bay	Holds an optional secondary hard drive.
❺	Integrated subwoofer	Contains the subwoofer speaker.
❻	Primary hard drive bay	Holds the primary hard drive, the memory module slots, and the WLAN module module (select models only). △ To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact techhnical support through Help and Support.

3

Illustrated parts catalog

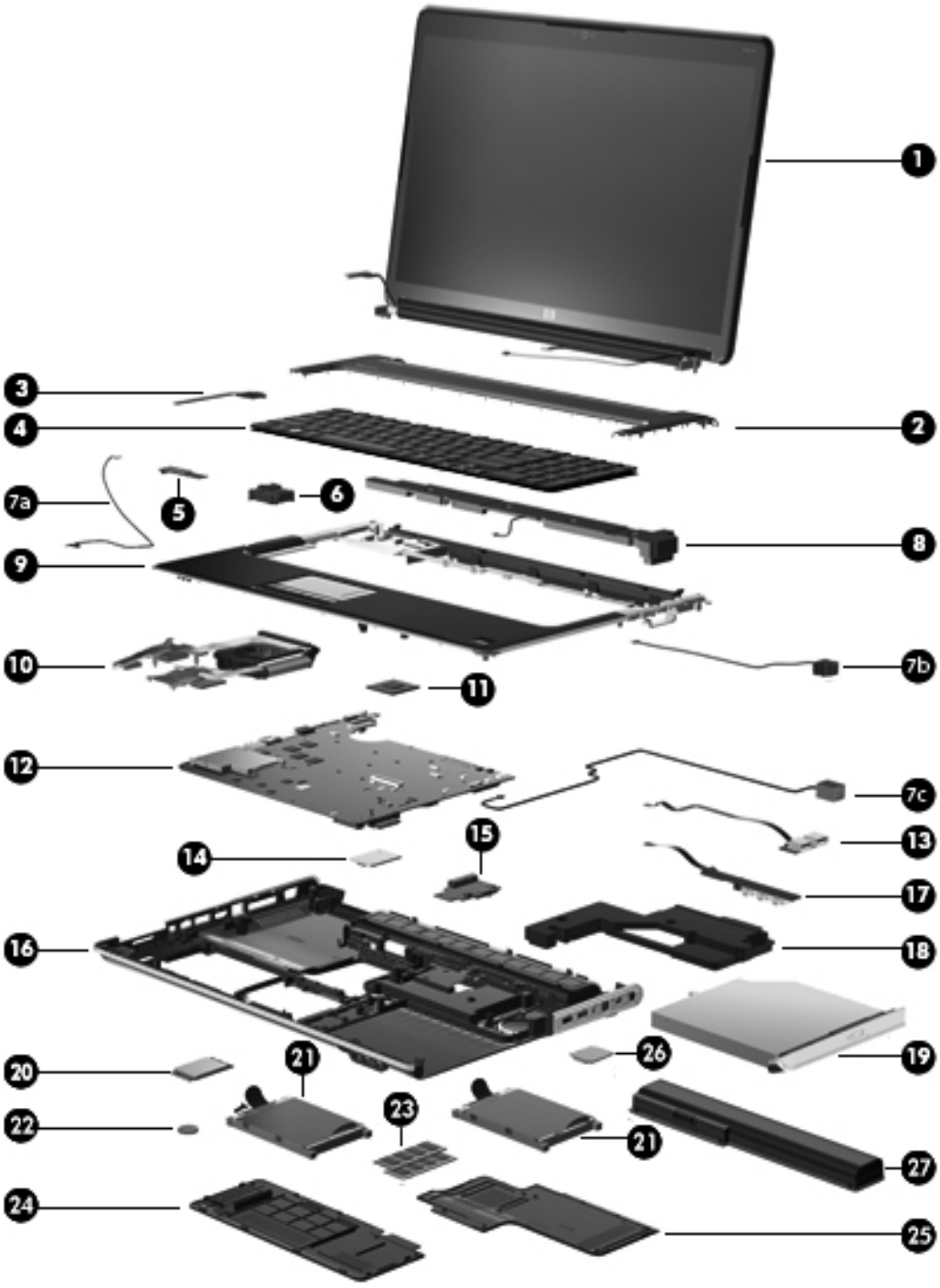
Service tag

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



Component	Description
❶ Product name	This is the product name affixed to the front of the computer.
❷ Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
❸ 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.
❹ Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.
❺ Warranty period	This number describes the duration of the warranty period for the computer.

Computer major components



Item	Description	Spare Part Number
(1)	**17.3-inch display assembly** (includes wireless antenna transceivers and cables, nameplate, and logo)	
	HD+ BrightView display assembly with webcam and 2 microphones, Espresso Black with molded finish	519259-001
	HD+ flush glass AntiGlare display assembly with webcam and 2 microphones, Espresso Black with molded finish	519260-001
	HD+ BrightView display assembly with webcam and 2 microphones, Moonlight White	516295-001
	HD+ flush glass AntiGlare display assembly with webcam and 2 microphones, Moonlight White	516296-001
	Display internal components	
	Display enclosure for use only with BrightView display assemblies, Espresso Black with molded finish	519261-001
	Display enclosure for use only with flush glass display assemblies, Espresso Black with molded finish	519262-001
	Display enclosure for use only with BrightView display assemblies, Moonlight White with molded finish	516304-001
	Display enclosure for use only with flush glass display assemblies, Moonlight White with molded finish	516443-001
	Display Cable Kit	516307-001
	Display Hinge Kit for use only with BrightView display assemblies	516306-001
	Display Hinge Kit for use only with flush glass display assemblies	516444-001
	Display Screw Kit for use only with BrightView display assemblies	516309-001
	Display Screw Kit for use only with flush glass display assemblies	531764-001
	Display Rubber Kit	516308-001
	Display bezel for use only with BrightView display assemblies	516305-001
	Bottom hinge cover for use only with flush glass display assemblies	531877-001
	Webcam/microphone module with cable	516312-001
(2)	**Switch cover, Moonlight White** (includes LED board and cable)	516300-001
	Switch cover, Espresso Black with molded finish (includes LED board and cable)	519269-001
(3)	**Power button board** (includes UMA cable)	518165-001
(4)	**Keyboard** (includes keyboard cable)	
	Keyboard in Espresso Black color with painted finish	
	French Canada	519266-121
	Keyboards in Espresso Black color with molded finish	
	Belgium	519265-A41
	Denmark, Norway, and Sweden	519265-DH1
	France	519265-051
	Germany	519265-041
	Italy	519265-061
	The Netherlands	519265-B31
	Portugal	519265-131

(Continued)

Item	Description	Spare Part Number
	Russia	519265-251
	Spain	519265-071
	Switzerland	519265-111
	Turkey	519265-141
	The United Kingdom	519265-031
	The United States	519265-001
	Keyboards in Moonlight White color with molded finish	
	Belgium	516356-A41
	Denmark, Norway, and Sweden	516356-DH1
	France	516356-051
	Germany	516356-041
	Italy	516356-061
	The Netherlands	516356-B31
	Portugal	516356-131
	Russia	516356-251
	Spain	516356-071
	Switzerland	516356-BG1
	Turkey	516356-141
	The United Kingdom	516356-031
	The United States	516356-001
	Keyboard in Moonlight White color with painted finish	
	French Canada	516357-121
(5)	**Bluetooth® module** ✎ The Bluetooth module kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.	537921-001
(6)	**Bluetooth bracket** (holds the Bluetooth module in the base enclosure)	
	Cable Kit (not illustrated) (includes the Bluetooth cable, TV tuner module cable, and the modem module connector cable)	516328-001
(7a)	**Bluetooth cable** ✎ The Bluetooth cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.	
(7b)	**TV tuner module cable** ✎ The TV tuner module cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.	
(7c)	**Modem module connector cable and RJ-11 jack** ✎ The modem module connector cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.	
(8)	**Speaker assembly**	531902-001

(Continued)

Item	Description	Spare Part Number
(9)	**Top cover** (includes TouchPad and TouchPad buttons)	
	Top cover with fingerprint reader and TouchPad, Espresso Black with molded finish	519267-001
	Top cover with fingerprint reader and TouchPad, Moonlight White	516299-001
	Top cover with TouchPad, Espresso Black with molded finish	519268-001
	Top cover with TouchPad, Moonlight White	516360-001
(10)	**Fan/heat sink assembly** (includes fan/heat sink)	
	Thermal module, discrete	533735-001
	Thermal module, UMA	533736-001
(11)	**Processor** (includes replacement thermal material)	
	■ AMD Turion™ X2 Ultra Dual-Core M640 35-W, 2.60-GHz with 2-MB L2 cache	576256-001
	■ AMD Turion X2 Ultra Dual-Core M620 35-W, 2.50-GHz with 2-MB L2 cache	576255-001
	■ AMD Turion X2 Ultra Dual-Core M600 35-W, 2.40-GHz with 2-MB L2 cache	576254-001
	■ AMD Turion X2 Dual-Core M520 35-W, 2.30-GHz with 1-MB L2 cache	583055-001
	■ AMD Turion X2 Dual-Core M500 35-W, 2.20-GHz with 1-MB L2 cache	576253-001
	■ AMD Athlon™ X2 Dual-Core M320 35-W, 2.10-GHz with 1-MB L2 cache	576252-001
	■ AMD Athlon X2 Dual-Core M300 35-W, 2.00-GHz with 1-MB L2 cache	578024-001
(12)	**System board** (includes replacement thermal material):	
	■ With discrete graphics subsystem and 1 GB of dedicated memory	574680-001
	■ With discrete graphics subsystem and 512 MB of dedicated memory	574681-001
	■ With UMA graphics subsystem and shared memory	574679-001
(13)	**USB connector**	
	USB board (not illustrated) (includes cable)	518168-001
(14)	**Modem module,** for use in all countries and regions except Australia and New Zealand	510100-001
	✎ The modem module spare parts kit does not include a modem module cable.The modem module cable is included in the Cable Kit, spare part number 516328 -001. See "Cable Kit" on page 3-12 for more Cable Kit information.	
(15)	**Optical drive board**	533734-001
(16)	**Base enclosure** (includes rubber feet)	516297-001
	Base enclosure with subwoofer (includes rubber feet)	589090-001
(17)	**Audio board** (includes cable)	518166-001
(18)	**Subwoofer**	516333-001
(19)	**Optical drive** (includes bezel and bracket)	
	■ Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive	509421-001
	■ DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	509419-001
	Optical drive board	533734-001
(20)	**DVB-T TV tuner module**	482899-003
	✎ The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit Information.	

(Continued)

Item	Description	Spare Part Number
	TV tuner antenna cable with PAL jack (not illustrated)	482900-002
	TV tuner remote control with teletext, full function (not illustrated)	465541-001
(21)	**Hard drives** (Support for both primary and secondary hard drives. Each hard drive includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	
	■ 500-GB, 7200-rpm (select models only)	574640-001
	■ 500-GB, 5400-rpm	509417-001
	■ 320-GB, 7200-rpm	509413-001
	■ 320-GB, 5400-rpm	509415-001
	■ 250-GB, 7200-rpm	509412-001
	■ 250-GB, 5400-rpm	509414-001
	Hard Drive Hardware Kit (not illustrated, includes Mylar cover with tab and left and right bracket rails, connector cable, screws, and 4 rubber isolators)	517639-001
(22)	**RTC battery**	449729-001
(23)	**Memory modules** (800-MHz, PC2-6400, 2-SODIMM)	
	■ 4096-MB memory module with SDRAM	580287-001
	■ 2048-MB memory module	582086-001
	■ 1024-MB memory module	582085-001
	Hard drive covers for primary and secondary hard drives	518162-001
(24)	Secondary hard drive cover	
(25)	Primary hard drive cover	
(26)	**WLAN module**	
	Broadcom 4312 802.11b/g WLAN module:	
	■ For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-003

(Continued)

Item	Description	Spare Part Number
	■ Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
	Broadcom 4322 802.11a/b/g/n WLAN module:	
	■ For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
	■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal,the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518434-002
	Atheros 9285G 802.11b/g WLAN module:	
	■ For use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	518436-001

(Continued)

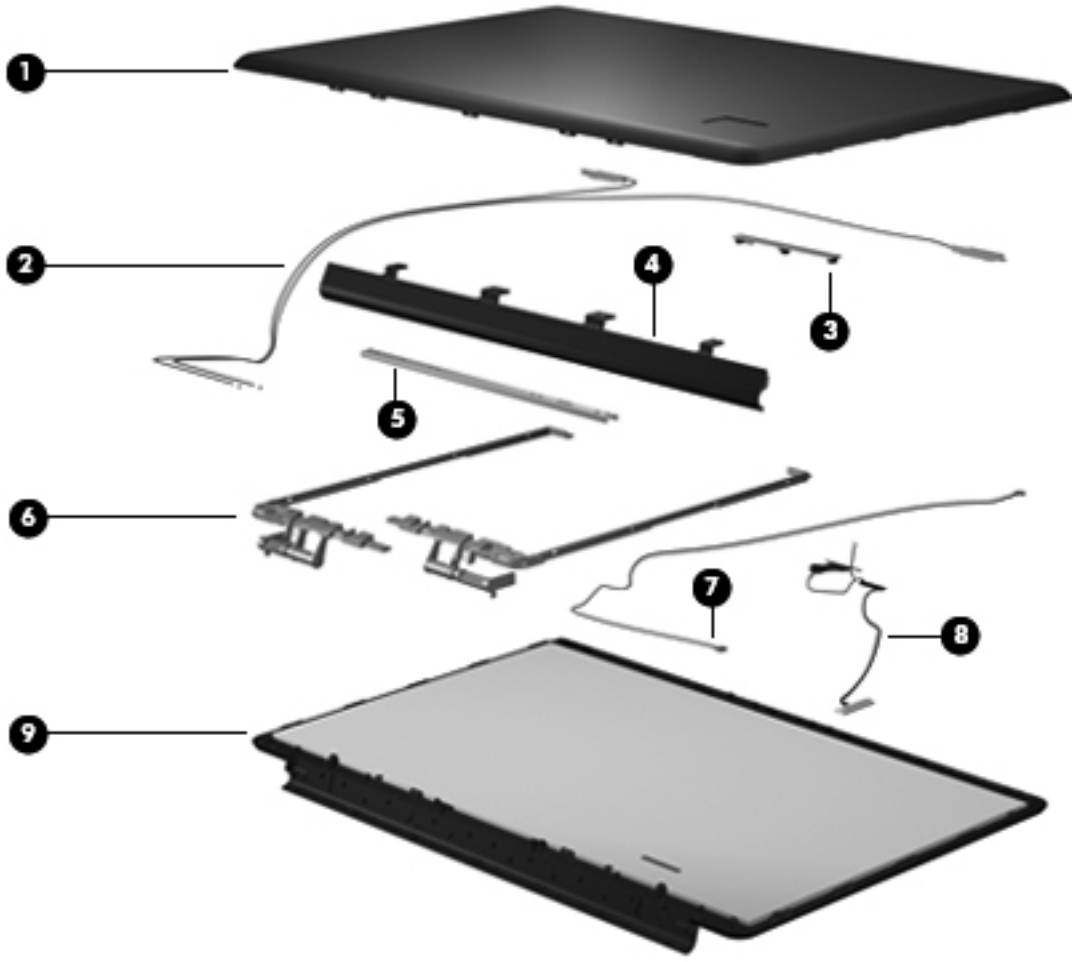
Item	Description	Spare Part Number
	■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bermuda, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan,Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518436-002
	Atheros 9280AGN 802.11a/b/g/n WLAN module:	
	■ For use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	518437-001
	■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bermuda, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518437-002
(27)	**Battery**	
	8-cell, 73-Wh, 2.55-Ah Li-ion battery for use with all computer models	480385-001
	6-cell, 47-Wh, 2.2-Ah Li-ion battery for use only with computer models with a UMA system board	486766-001

(Continued)

Item	Description	Spare Part Number
	ExpressCard slot bezel (not illustrated)	516324-001
	Rubber Kit (not illustrated) (includes 4 base enclosure rubber feet)	516326-001
	Screw Kit (not illustrated)	516327-001
	Power connector cable, 35W (not illustrated)	536857-001

Display assembly components

Flush glass display assembly spare parts

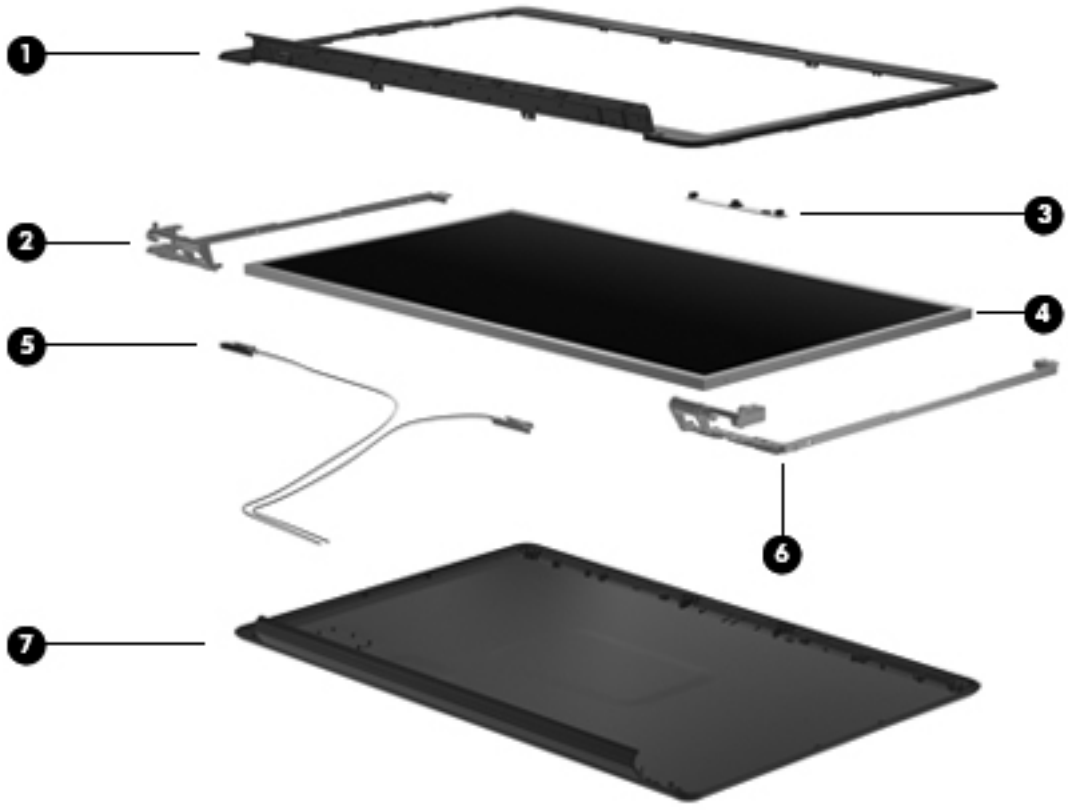


Item	Description	Spare part number
❶	**Display enclosure** (includes wireless antenna transceivers and cables and logo LED board and cable)	
	Moonlight White with molded finish	516443-001
	Espresso Black with molded finish	519262-001
❷	Wireless antenna transceivers and cables included with display enclosure	
❸	**Webcam/microphone module**	516448-001
❹	**Bottom hinge cover**	531877-001
❺	**Hinge horizontal bracket** (included with hinge vertical brackets, spare part number 516444-001)	
❻	**Hinge vertical brackets** (includes left and right hinges)	516444-001
❼	**Microphone** (included with display panel, spare part number 519260-001)	

(Continued)

Item	Description	Spare part number
❽	**Display panel cable** (included in Display Cable Kit, spare part number 516307-001)	
❾	**Display panel**	
	17.3-inch display panel, Espresso Black with molded finish (includes webcam and microphone)	519260-001
	17-3 inch display panel, Moonlight White (includes webcam and microphone)	516296-001
	Display Hinge Kit for flush glass assembly (not illustrated)	516444-001
	Display Cable Kit (not illustrated), includes display panel cable, and microphone receiver and cable	516307-001
	Display Rubber Kit (not illustrated), includes display bezel rubber screw covers	516308-001
	Display Screw Kit (not illustrated)	531764-001

BrightView display assembly spare parts

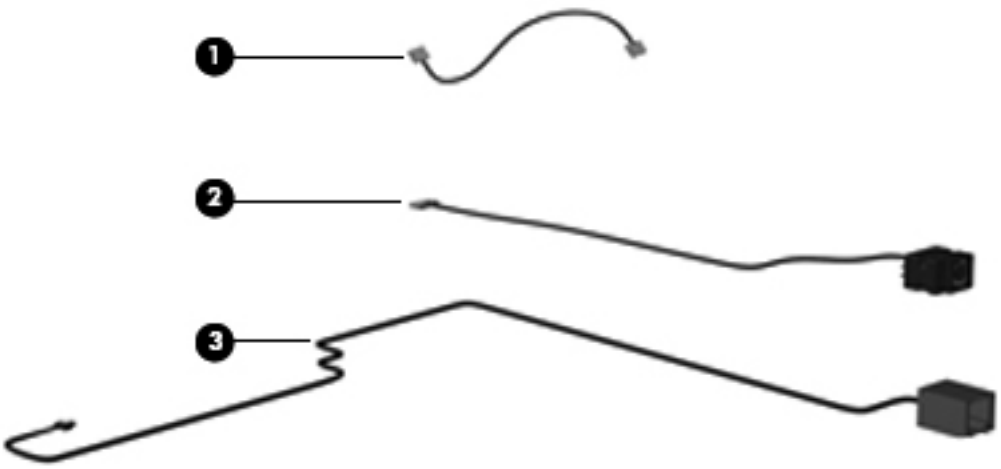


Item	Description	Spare part number
❶	**Display bezel**	516305-001
❷	**Left hinge vertical bracket** (included in Display Hinge Kit, spare part number 516306-001)	
❸	**Webcam/microphone module**	516312-001
❹	**Display panel**	
	17.3-inch Espresso Black with molded finish (includes webcam and microphone)	519259-001

(Continued)

Item	Description	Spare part number
	17.3-inch Moonlight White (includes webcam and microphone)	516295-001
	17.3-inch raw LED display panel	509407-001
❺	**Display panel cable** (included in Display Cable Kit, spare part number 516307-001)	
❻	**Right hinge vertical bracket** (included in Display Hinge Kit, spare part number 516306-001)	
❼	**Display back cover**	
	Espresso Black with molded finish	519261-001
	Moonlight White	516304-001
	Display Hinge Kit (not illustrated)	516306-001
	Display Cable Kit (not illustrated)	516307-001
	Display Rubber Kit (not illustrated)	516308-001
	Display Screw Kit (not illustrated)	516309-001

Cable Kit



Item	Description	Spare part number
	Cable Kit:	516328-001
❶	Bluetooth module cable	
❷	TV tuner module cable and connector	
❸	Modem module cable (includes RJ-11 jack)	

Mass storage devices

Item	Description	Spare part number
❶	**Hard drives** (Support for both primary and secondary hard drives. Each hard drive includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	
	500-GB, 7200-rpm (select models only)	574640-001
	500-GB, 5400-rpm	509417-001
	320-GB, 7200-rpm	509413-001
	320-GB, 5400-rpm	509415-001
	250-GB, 7200-rpm	509412-001
	250-GB, 5400-rpm	509414-001
	Hard Drive Hardware Kit (not illustrated), includes left and right bracket rails, connector cable, Mylar cover with tab, screws, and 4 rubber isolators	517639-001
❷	**Optical drives** (include bezel and bracket)	
	Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive	509421-001
	DVD±RW and CD-RW Supermulti Double-Layer Combo Drive with LightScribe	509419-001

Miscellaneous parts

Description	Spare part number
AC adapters	
90-W AC adapter	463955-001
65-W AC adapter	463958-001
Power cords:	
Belgium, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden	490371-021
Canada, French Canada, Latin America, Thailand, and the United States	490371-001
Denmark	490371-081
Italy	490371-061
Switzerland	490371-111
The United Kingdom and Singapore	490371-031
Remote control	
Full-function remote control with teletext	465541-001
Screw Kit ■ Phillips PM3.0×4.0 screws ■ Phillips PM2.5×7.0 screws ■ Phillips PM2.0 x 3.0 screws ■ Phillips PM2.5×6.0 captive screws ■ Phillips PM2.5×4.0 screws ■ Phillips PM2.0 x 4.0 screws ■ Phillips PM2.5 x 5.0 screws ■ Phillips PM2.5x5.0 broadhead screws ■ Phillips PM2.0 x 2.0 broadhead screws	516327-001

Sequential part number listing

Spare part number	Description
449729-001	RTC battery
463955-001	90-W AC adapter
463958-001	65-W AC adapter
465541-001	Full-function remote control with teletext
480385-001	8-cell 73-Wh, 2.55-Ah Li-on battery
482899-003	DVB-T TV tuner module, integrated ✎ The TV tuner module does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.
482900-002	TV tuner antenna cable with PAL Jack
486766-001	6-cell 47-Wh, 2.2-Ah Li-on battery

(Continued)

Spare part number	Description
490371-001	Power cord, 3-pin, for use in Canada, French Canada, Latin America, Thailand, and the United States
490371-021	Power cord, 3-pin, for use in Belgium, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden
490371-031	Power cord, 3-pin, for use in the United Kingdom and Singapore
490371-061	Power cord, 3-pin, for use in Italy
490371-081	Power cord, 3-pin, for use in Denmark
490371-111	Power cord, 3-pin, for use in Switzerland
504593-003	Broadcom 4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
504593-004	Broadcom 4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
509407-001	17.3-inch raw display panel with HD+ BrightView LED
509412-001	250-GB, 7200-rpm hard drive (includes bracket)
509413-001	320-GB, 7200-rpm hard drive (includes bracket)
509414-001	250-GB, 5400-rpm hard drive (includes bracket)
509415-001	320-GB, 5400-rpm hard drive (includes bracket)
509417-001	500-GB, 5400-rpm hard drive (includes bracket)
509419-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
509421-001	Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive
510100-001	Modem module for use in all countries and regions except Australia and New Zealand ✎ The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.
516295-001	17.3-inch HD+ BrightView display assembly with webcam and 2 microphones, Moonlight White (includes wireless antenna transceivers and cables)

(Continued)

Spare part number	Description
516296-001	17.3-inch HD+ flush glass AntiGlare display assembly with webcam and 2 microphones, Moonlight White (includes wireless antenna transceivers and cables)
516297-001	Base enclosure (includes rubber feet)
516299-001	Top cover with fingerprint reader, TouchPad and TouchPad buttons, Moonlight White
516300-001	Switch cover, Moonlight White (includes LED board and cable)
516304-001	Display enclosure, Moonlight White
516305-001	Display bezel
516306-001	Display Hinge Kit
516307-001	Display Cable Kit
516308-001	Display Rubber Kit
516309-001	Display Screw Kit
516312-001	Webcam/microphone module with cable
516324-001	ExpressCard slot bezel
516326-001	Rubber Kit
516327-001	Screw Kit
516328-001	Cable Kit
516333-001	Subwoofer
516356-001	Keyboard for use in the United States, Moonlight White with molded finish
516356-031	Keyboard for use in the United Kingdom, Moonlight White with molded finish
516356-041	Keyboard for use in Germany, Moonlight White with molded finish
516356-051	Keyboard for use in France, Moonlight White with molded finish
516356-061	Keyboard for use in Italy, Moonlight White with molded finish
516356-071	Keyboard for use in Spain, Moonlight White with molded finish
516356-131	Keyboard for use in Portugal, Moonlight White with molded finish
516356-141	Keyboard for use in Turkey, Moonlight White with molded finish
516356-251	Keyboard for use in Russia, Moonlight White with molded finish
516356-A41	Keyboard for use in Belgium, Moonlight White with molded finish
516356-B31	Keyboard for use in the Netherlands, Moonlight White with molded finish
516356-BG1	Keyboard for use in Switzerland, Moonlight White with molded finish
516356-DH1	Keyboard for use in Denmark, Norway, and Sweden, Moonlight White with molded finish
516357-121	Keyboard for use in French Canada, Moonlight White with painted finish
516360-001	Top cover with TouchPad and TouchPad buttons, Moonlight White
516443-001	Display enclosure for use only with computer models with flush glass display assemblies, Moonlight White with molded finish
516444-001	Display Hinge Kit for use only with computer models with flush glass display assemblies
517639-001	Hard Drive Hardware Kit
518162-001	Hard drive covers for primary and secondary hard drives
518165-001	Power button board with cable

(Continued)

Spare part number	Description
518166-001	Audio board with cable
518168-001	USB board with cable
518434-001	Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
518434-002	Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
518436-001	Atheros 9285G 802.11b/g WiFi Adapter for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands
518436-002	Atheros 9285G 802.11b/g WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bermuda, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea- Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People’s Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
518437-001	Atheros 9280AGN 802.11a/b/g/n WiFi Adapter for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands

(Continued)

Spare part number	Description
518437-002	Atheros 9280AGN 802.11a/b/g/n WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bermuda, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea- Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
519259-001	17.3-inch HD+ BrightView display panel with webcam and 2 microphones, Espresso Black with molded finish
519260-001	17.3-inch HD+ flush glass display panel with AntiGlare, webcam and 2 microphones, Espresso Black with molded finish
519261-001	Display enclosure for use only with computer models with BrightView display assemblies, Espresso Black with molded finish
519262-001	Display enclosure for use only with computer models with flush glass display assemblies, Espresso Black with molded finish
519265-001	Keyboard for use in the United States, Espresso Black with molded finish
519265-031	Keyboard for use in the United Kingdom, Espresso Black with molded finish
519265-041	Keyboard for use in Germany, Espresso Black with molded finish
519265-051	Keyboard for use in France, Espresso Black with molded finish
519265-061	Keyboard for use in Italy, Espresso Black with molded finish
519265-071	Keyboard for use in Spain, Espresso Black with molded finish
519265-111	Keyboard for use in Switzerland, Espresso Black with molded finish
519265-131	Keyboard for use in Portugal, Espresso Black with molded finish
519265-141	Keyboard for use in Turkey, Espresso Black with molded finish
519265-251	Keyboard for use in Russia, Espresso Black with molded finish
519265-A41	Keyboard for use in Belgium, Espresso Black with molded finish
519265-B31	Keyboard for use in the Netherlands, Espresso Black with molded finish
519265-DH1	Keyboard for use in Denmark, Norway, and Sweden, Espresso Black with molded finish
519266-121	Keyboard for use in French Canada, Espresso Black with painted finish
519267-001	Top cover with fingerprint reader and TouchPad and TouchPad buttons, Espresso Black with molded finish
519268-001	Top cover with TouchPad and TouchPad buttons, Espresso Black with molded finish

(Continued)

Spare part number	Description
519269-001	Switch cover, Espresso Black with molded finish (includes LED board and cable)
531764-001	Display Screw Kit for use only with computer models with flush glass display assemblies
531877-001	Bottom hinge covers for use only with computer models with flush glass display assemblies
531902-001	Speaker assembly
533734-001	Optical drive board
533735-001	Thermal module, discrete (includes fan/heat sink)
533736-001	Thermal module, UMA (includes fan/heat sink)
536857-001	Power connector cable 35W
537921-001	Bluetooth module (does not include a Bluetooth module cable) ✎ The Bluetooth module caable is included in the Cable Kit, spare part number 516328-001. See "Cable Kit" on page 3-12 for more Cable Kit information.
574640-001	500-GB, 7200-rpm hard drive (includes bracket)
574679-001	System board with UMA graphics subsystem and shared memory (includes replacement thermal material)
574680-001	System board with discrete graphics subsystem and 1 GB of dedicated memory (includes replacement thermal material)
574681-001	System board with discrete graphics subsystem and 512 MB of dedicated memory (includes replacement thermal material)
576252-001	AMD Athlon™ X2 Dual-Core M320 35-W, 2.10-GHz processor with 1-MB L2 cache
576253-001	AMD Turion™ X2 Dual-Core M500 35-W, 2.20-GHz processor with 1-MB L2 cache
576254-001	AMD Turion X2 Ultra Dual-Core M600 35-W, 2.40-GHz processor with 2-MB L2 cache
576255-001	AMD Turion X2 Ultra Dual-Core M620 35-W, 2.50-GHz processor with 2-MB L2 cache
576256-001	AMD Turion X2 Ultra Dual-Core M640 35-W, 2.60-GHz processor with 2-MB L2 cache
578024-001	AMD Athlon X2 Dual-Core M300 35-W, 2.00-GHz processor with 1-MB L2 cache
578090-001	Base enclosure for use only with computers equipped with a subwoofer
582085-001	Memory module 1024-MB, 800-MHz, PC2-6400
582086-001	Memory module 2048-MB, 800-MHz, PC2-6400
582087-001	Memory module 4096-MB, 800-MHz, PC2-6400
583055-001	AMD Turion X2 Dual-Core M520 35-W, 2.30-GHz processor with 1-MB L2 cache

4

Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

- Phillips P0 and P1 screwdrivers
- Flat-bladed screwdriver

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.
- Handle drives on surfaces covered with at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package "FRAGILE."

Grounding guidelines

Electrostatic discharge damage

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

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

An electronic device exposed to ESD may not be affected at all and may work perfectly throughout a normal cycle. Or the device may function normally for a while, and 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

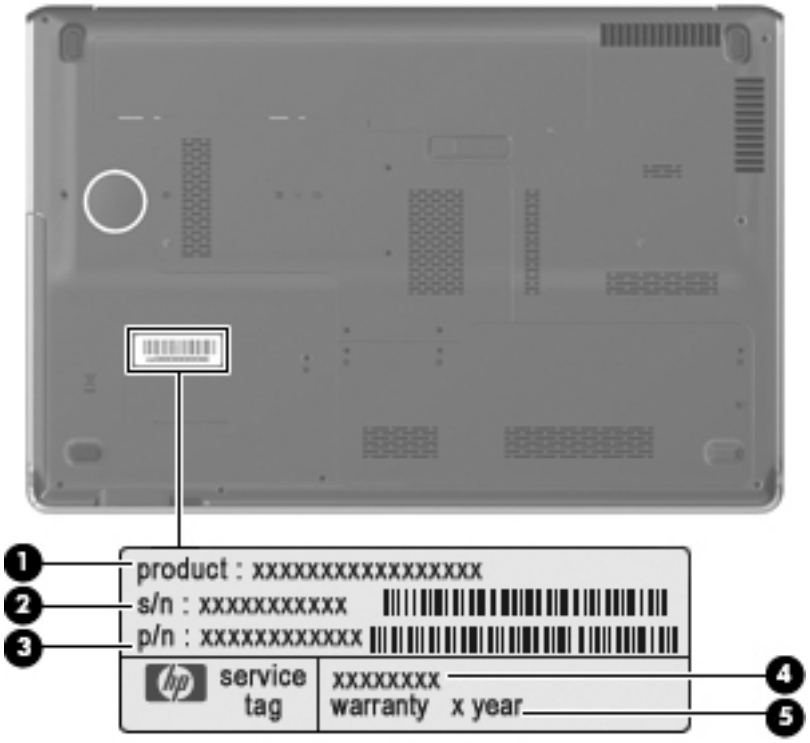
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 91 screws, in 8 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.

Service tag

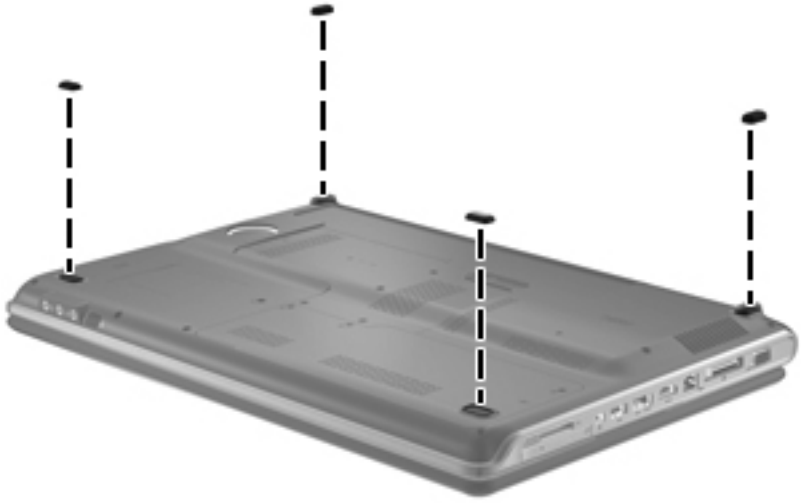
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



Component	Description
❶ Product name	This is the product name affixed to the front of the computer.
❷ Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
❸ 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.
❹ Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.
❺ Warranty period	This number describes the duration of the warranty period for the computer.

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 516326-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

Description	Spare part number
8-cell, 73-Wh, 2.55-Ah Li-ion battery (for use with all computer systems)	480385-001
6-cell, 47-Wh, 2.2-Ah Li-ion battery (for use with computer systems equipped with the UMA system board only)	486766-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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

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

Optical drive

The optical drive spare part kit includes an optical drive bezel and bracket.

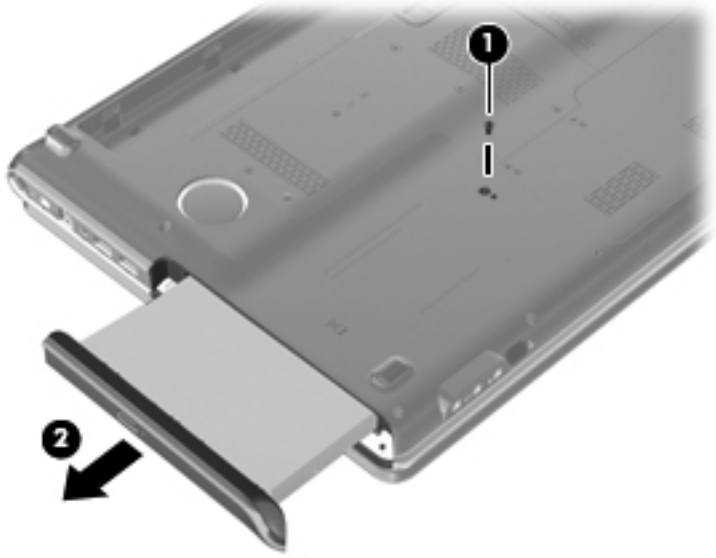
Description	Spare part number
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	509419-001
Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive	509421-001

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 4-7).

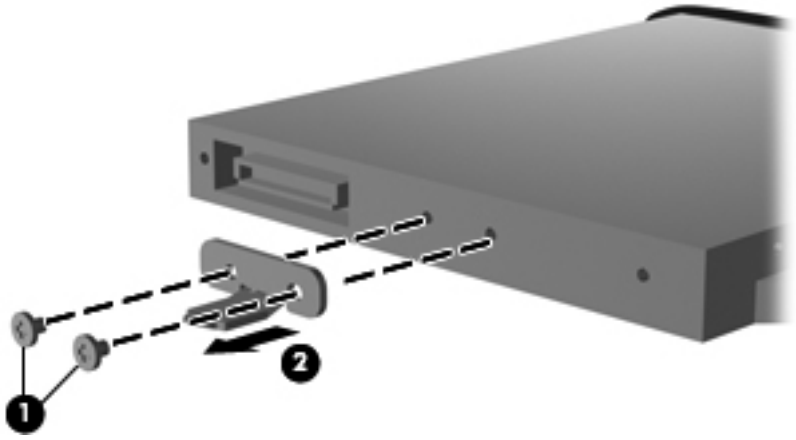
Remove the optical drive:

1. Position the computer upside down with the front toward you.
2. Remove the Phillips PM2.5×7.0 screw ❶ that secures the optical drive to the computer.
3. Slide the optical drive ❷ out of the computer.



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

5. Remove the two Phillips PM2.0×3.0 screws ❶ that secure the optical drive bracket to the optical drive, and then remove the bracket ❷.



Reverse this procedure to reassemble and install the optical drive.

Hard drive covers

Description	Spare part number
Hard drive covers for use with both primary and secondary hard drives	518162-001

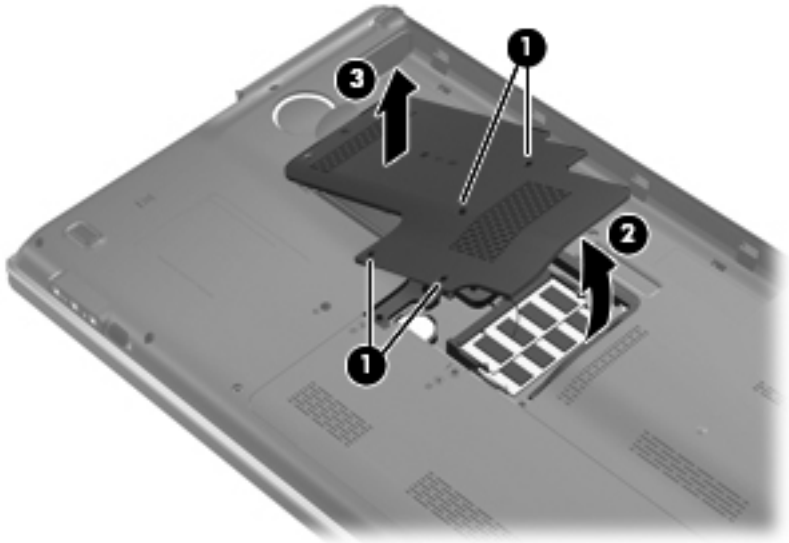
Primary hard drive cover

Before removing the primary hard drive 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 4-7).

Remove the primary hard drive cover:

1. Position the computer upside down with the front toward you.
2. Loosen the four Phillips PM2.5×6.0 captive screws ❶ that secure the hard drive cover to the computer.
3. Lift the right side of the hard drive cover ❷, and remove the cover ❸.



Reverse this procedure to install the primary hard drive cover.

Secondary hard drive cover

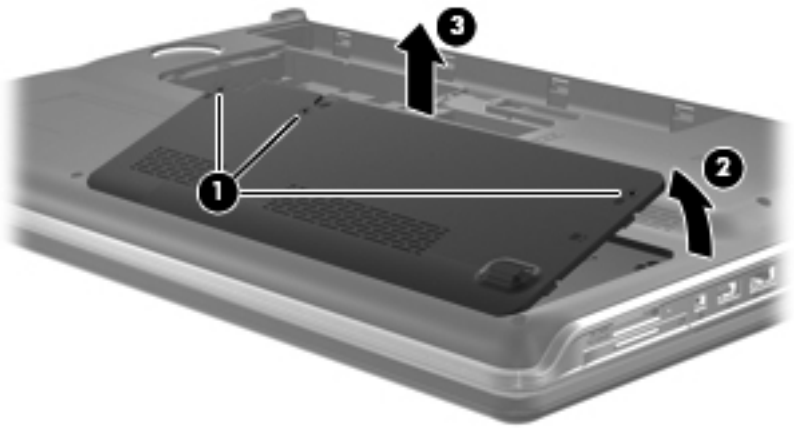
The primary hard drive cover must be removed before the secondary hard drive cover can be removed.

Before removing the secondary hard drive 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 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).

Remove the secondary hard drive cover:

1. Position the computer upside down with the front toward you.
2. Loosen the three Phillips PM2.5×6.0 captive screws ❶ that secure the secondary hard drive cover to the computer.
3. Lift the rear edge ❷, and remove the cover ❸.



Reverse this procedure to install the secondary hard drive cover.

Hard drive

The hard drive spare part kit (spare part number 517639-001) includes left and right bracket rails, a connector cable, Mylar cover with tab, and 4 rubber isolators.

Description	Spare part number
500-GB, 7200-rpm (select models only)	574640-001
500-GB, 5400-rpm	509417-001
320-GB, 7200-rpm	509413-001
320-GB, 5400-rpm	509415-001
250-GB, 7200-rpm	509412-001
250-GB, 5400-rpm	509414-001

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 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9). If you are removing the secondary hard drive, remove the secondary hard drive cover also (see "Secondary hard drive cover" on page 4-10).

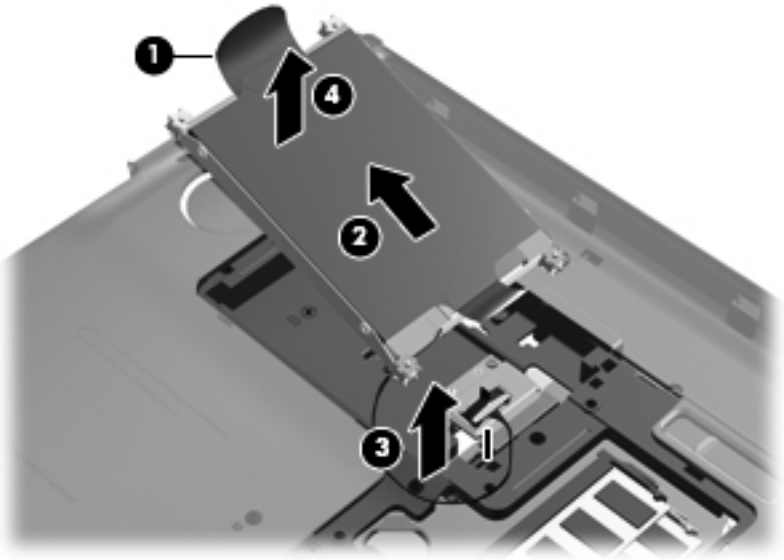
In order to remove the secondary hard drive cover, the primary hard drive cover must be removed first.

This computer has two hard drives in two separate hard drive bays. The following procedure can be used to remove a hard drive from either hard drive bay.

Remove the hard drive:

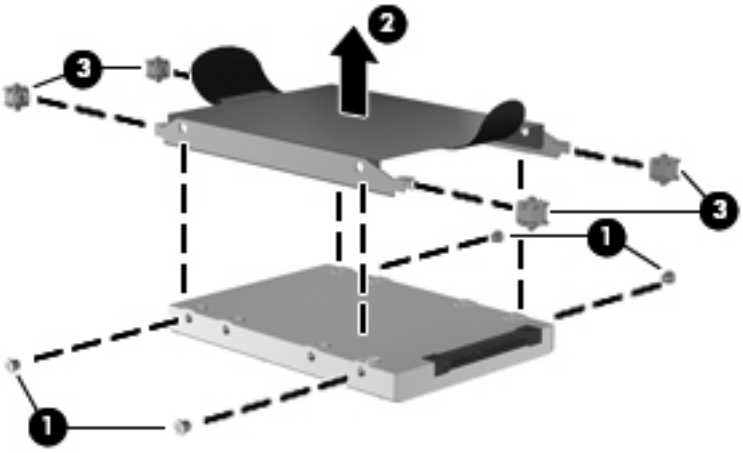
1. Position the computer upside down with the front toward you.

2. Use the Mylar tab ❶ to slide the hard drive to the left ❷, and then disconnect the hard drive cable ❸ from the system board.
3. Remove the hard drive ❹ from the hard drive bay.



4. If it is necessary to replace the hard drive bracket or any of the hard drive bracket components, remove the two Phillips PM3.0×4.0 screws ❶ from each side of the hard drive.
5. Lift the bracket ❷ straight up to remove it from the hard drive.

The four rubber isolators ❸ located on the ends of the bracket may also be replaced.



Reverse this procedure to install the hard drive.

Memory module

Description	Spare part number
4096-MB SDRAM (DDR2, 800-MHz, PC2-6400, 1-DIMM)	582087-001
2048-MB (DDR2, 800-MHz, PC2-6400, 1-DIMM)	582086-001
1024-MB (DDR2, 800-MHz, PC2-6400, 1-DIMM)	582085-001

Before removing the memory module, follow these steps:

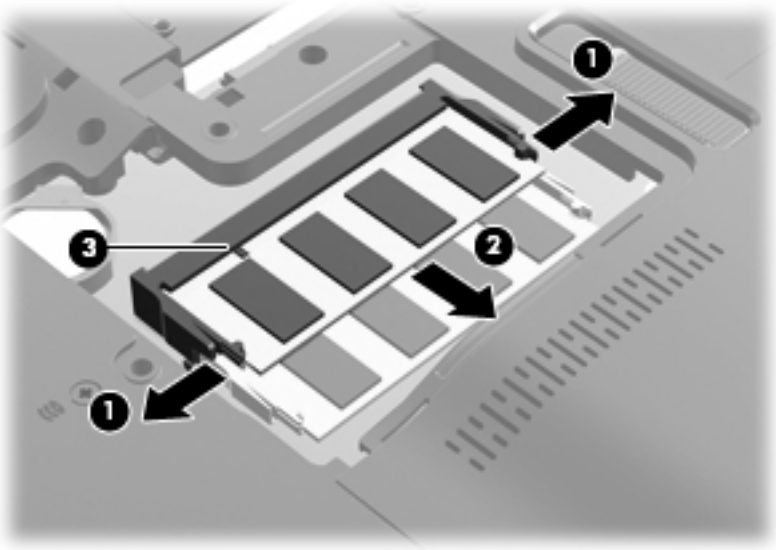
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).

Remove the memory module:

This computer has both primary and expansion memory module slots. The top memory module slot is for expansion memory and the bottom slot is for primary memory. The following procedure can be used to remove memory modules from either slot.

1. Spread the retaining tabs ❶ 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.)
2. Remove the module ❷ by pulling it away from the slot at an angle.

Memory modules are designed with a notch ❸ to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a memory module.

WLAN module

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

Description	Spare part number
Broadcom 4312 802.11b/g WLAN modules:	
For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-003
For use in Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
Broadcom 4322 802.11a/b/g/n WLAN module:	
■ For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001

(Continued)

Description	Spare part number
■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal,the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518434-002
Atheros 9285G 802.11b/g WLAN Adapter:	
■ For use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	518436-001
■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bermuda, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People’s Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan,Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518436-002

(Continued)

Description	Spare part number
Atheros 9280AGN 802.11a/b/g/n WLAN module:	
■ For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	518437-001
■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bermuda, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518437-002

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 4-7).
5. Remove the primary hard drive (see "Hard drive" on page 4-12).

Remove the WLAN module:

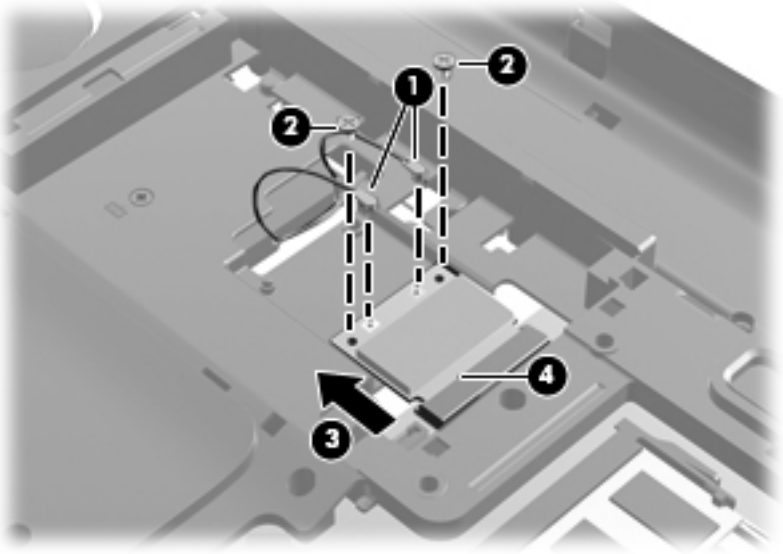
CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

1. Disconnect the WLAN antenna cables ❶ from the WLAN module.

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

2. Remove the two Phillips PM2.0×3.0 screws ❷ 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 ❸ by pulling it away from the slot at an angle.

WLAN modules are designed with a notch ❹ to prevent incorrect insertion into the WLAN module slot.



Reverse this procedure to install a WLAN module.

RTC battery

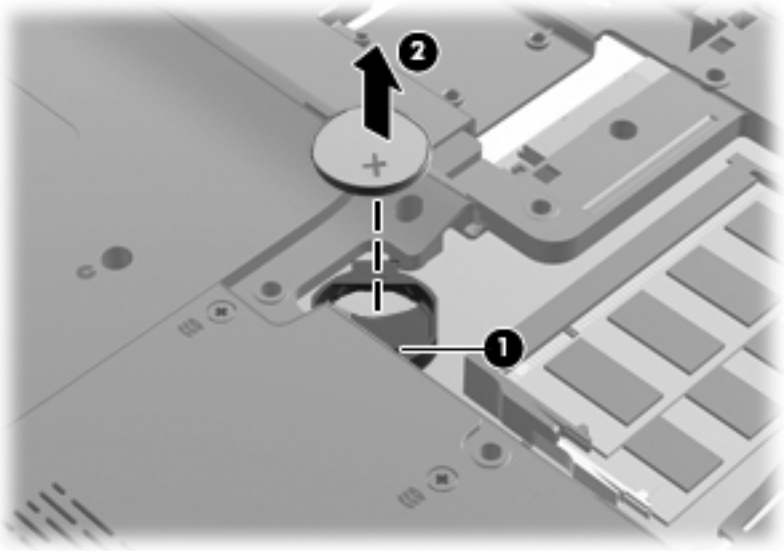
Description	Spare part number
RTC battery	449729-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).

Remove the RTC battery:

» Use a non-conductive pointed tool to reach into the notch on the lower right of the disc cell ❶ and lift up to remove the RTC battery ❷ from the socket on the system board.



Reverse this procedure to install the RTC battery. Be sure that the RTC battery is installed with the "+" sign facing up.

TV tuner module

The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 516328-001.

The TV tuner external antenna cable with PAL jack is available using spare part number 482900-002.

Description	Spare part number
DVB-T TV tuner module	482899-003

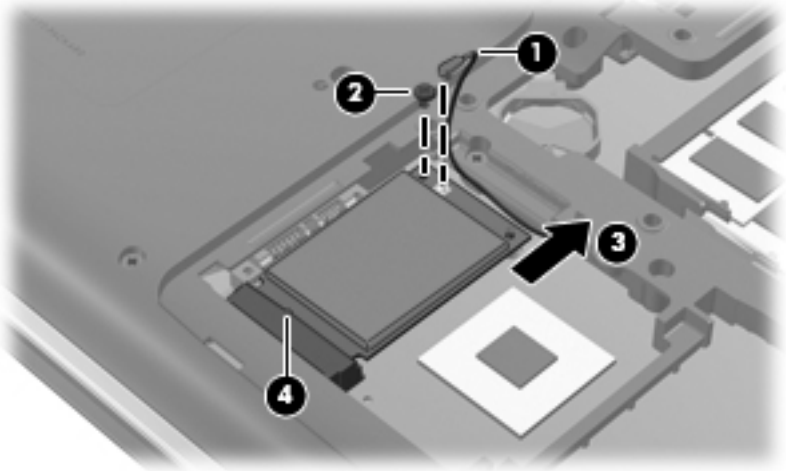
Before removing the TV tuner module, follow these steps:

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 4-7).
5. Remove the primary and secondary hard drive covers (see "Hard drive covers" on page 4-9).

Remove the TV tuner module:

1. Position the computer upside down with the front toward you. The TV tuner module is located in the secondary hard drive bay.
2. Disconnect the TV tuner module antenna cable ❶ from the terminal on the TV tuner module.
3. Remove the Phillips PM2.0×4.0 screw ❷ that secures the TV tuner module to the computer. (The edge of the module opposite the slot rises away from the computer.)
4. Remove the TV tuner module ❸.

The TV tuner module is designed with a notch ❹ to prevent incorrect insertion into the TV tuner module slot.



Reverse this procedure to install the TV tuner module.

Switch cover and keyboard

Description	Spare part number
Switch cover, Moonlight White color (includes LED board and cable)	516300-001
Switch cover, Espresso Black color in molded finish (includes LED board and cable)	519269-001

Keyboard in Espresso Black color in painted finish (includes keyboard cable)	
For use in country or region	**Spare part number**
French Canada	519266-121

Keyboards in Espresso Black color in molded finish (include keyboard cable)	
For use in country or region	**Spare part number**
Belgium	519265-A41
Denmark, Norway, and Sweden	519265-DH1
France	519265-051
Germany	519265-041
Italy	519265-061
The Netherlands	519265-B31
Portugal	519265-131
Russia	519265-251
Spain	519265-071
Switzerland	519265-111
Turkey	519265-141
The United Kingdom	519265-031
The United States	519265-001

Keyboards in Moonlight White color in molded finish (include keyboard cable)	
For use in country or region	**Spare part number**
Belgium	516356-A41
Denmark, Norway, and Sweden	516356-DH1
France	516356-051
Germany	516356-041
Italy	516356-061
The Netherlands	516356-B31
Portugal	516356-131
Russia	516356-251
Spain	516356-071
Switzerland	516356-BG1

(Continued)

Keyboards in Moonlight White color in molded finish (include keyboard cable)	
For use in country or region	**Spare part number**
Turkey	516356-141
The United Kingdom	516356-031
The United States	516356-001

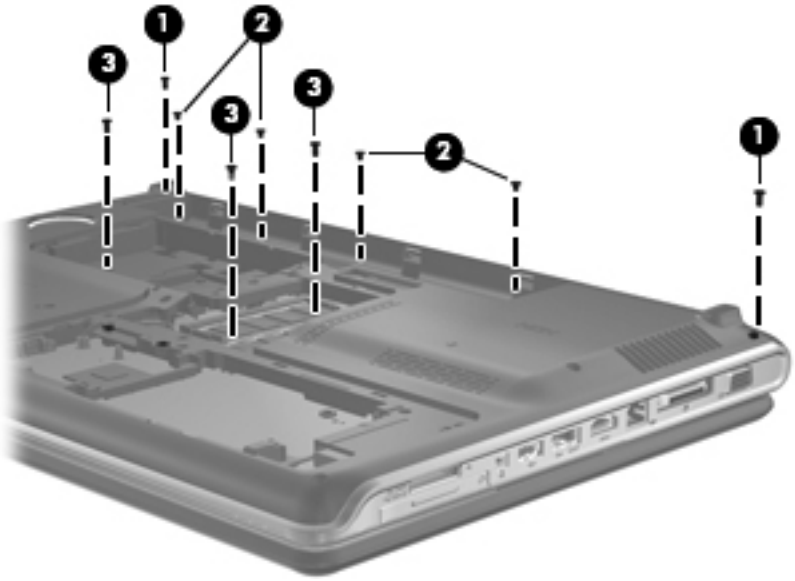
Keyboard in Moonlight White color in painted finish (includes keyboard cable)	
For use in country or region	**Spare part number**
French Canada	516357-121

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).
6. Remove the primary hard drive (see "Hard drive" on page 4-12).
7. Remove the optical drive (see "Optical drive" on page 4-8).

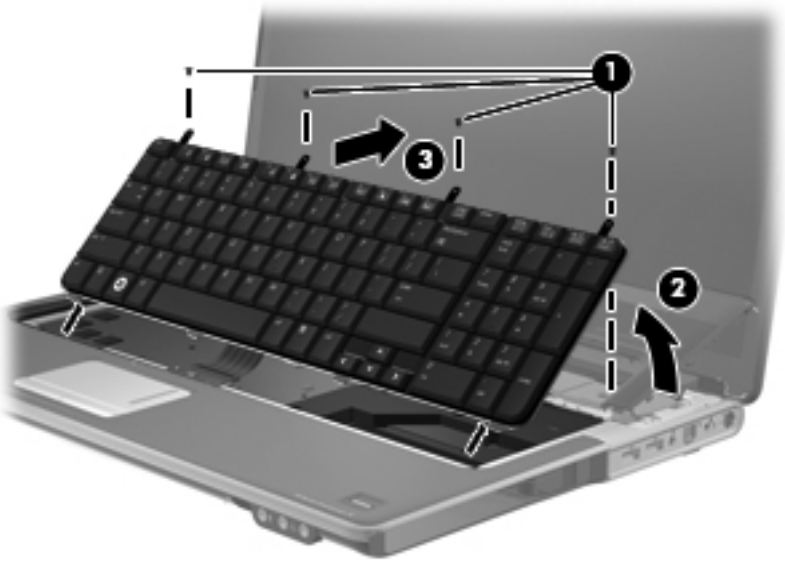
Remove the switch cover and keyboard:

1. Position the computer upside down, with the front toward you.
2. Remove the following screws:
   a. Two Phillips PM2.5×7.0 screws ❶, located in the back corners, that secure the keyboard to the computer
   b. Four Phillips PM2.5×4.0 screws ❷, located in the battery bay, that secure the switch cover to the computer
   c. Three Phillips PM2.5×7.0 screws ❸, located in the primary hard drive bay, that secure the switch cover to the computer

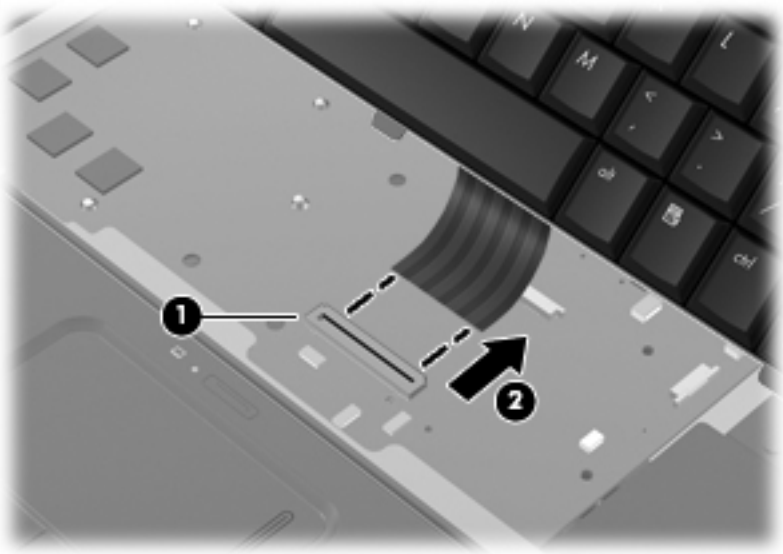


3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Lift the rear edge ❶ of the switch cover until it detaches from the computer.
6. Slide the switch cover ❷ back far enough to access the keyboard screws.

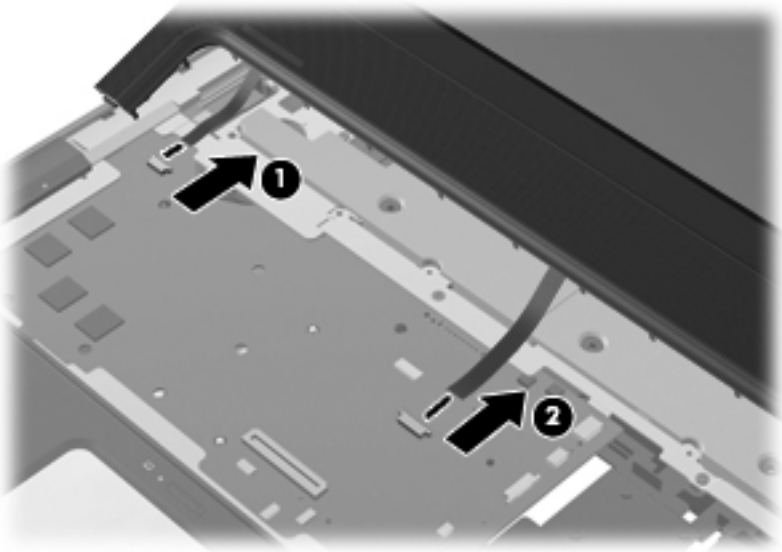
7. Remove the four Phillips PM2.0×3.0 screws ❶ that secure the keyboard to the computer.
8. Lift the rear edge ❷ of the keyboard and slide the keyboard ❸ back at an angle until the keyboard connector on the system board is accessible.



9. Release the zero insertion force (ZIF) connector ❶ to which the keyboard cable is connected and disconnect the keyboard cable ❷ from the system board.



10. Remove the keyboard.
11. Disconnect the power button board cable ❶ from the low insertion force (LIF) connector on the system board.
12. Disconnect the LED board cable ❷ from the LIF connector on the system board.



13. Remove the switch cover.

Reverse this procedure to install the switch cover and keyboard.

Power button board

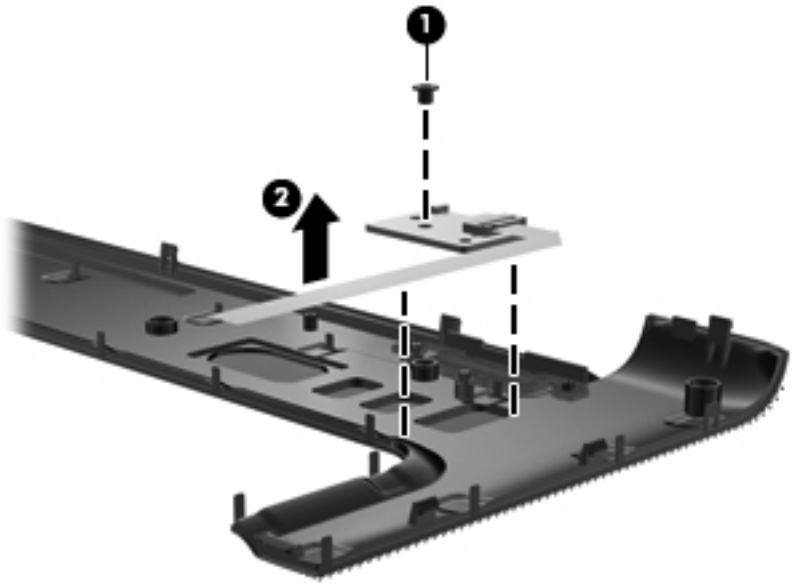
Description	Spare part number
Power button board (includes cable)	518165-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC Adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).
6. Remove the primary hard drive (see "Hard drive" on page 4-12).
7. Remove the switch cover and keyboard (see "Switch cover and keyboard" on page 4-21).

Remove the power button board:

1. Turn the switch cover upside down, with the front toward you.
2. Remove the Phillips PM2.0×4.0 screw ❶ that secures the power button board to the switch cover.
3. Remove the power button board ❷ and cable.



Reverse this procedure to install the power button board.

Speaker assembly

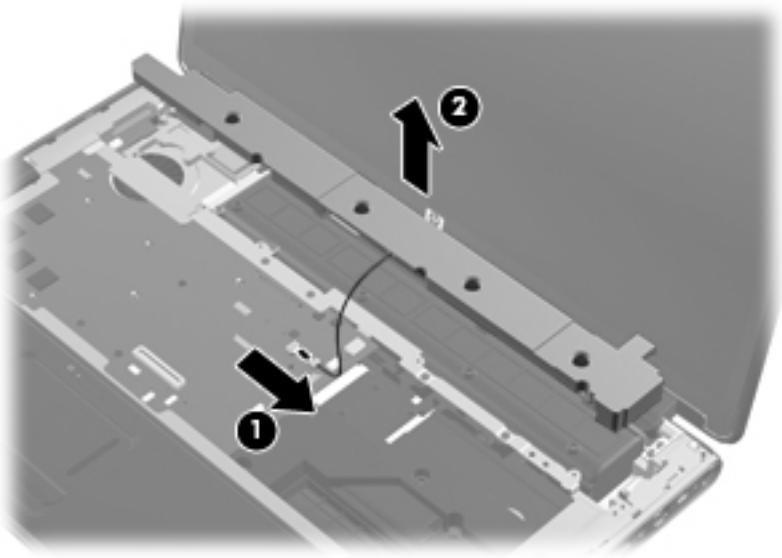
Description	Spare part number
Speaker assembly	531902-001

Before removing the speaker assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).
6. Remove the primary hard drive (see "Hard drive" on page 4-12).
7. Remove the switch cover and keyboard (see "Switch cover and keyboard" on page 4-21).

Remove the speaker assembly:

1. Disconnect the speaker assembly cable ❶ from the system board.
2. Remove the speaker assembly ❷.



Reverse this procedure to install the speaker assembly.

Bluetooth module

The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 516328-001.

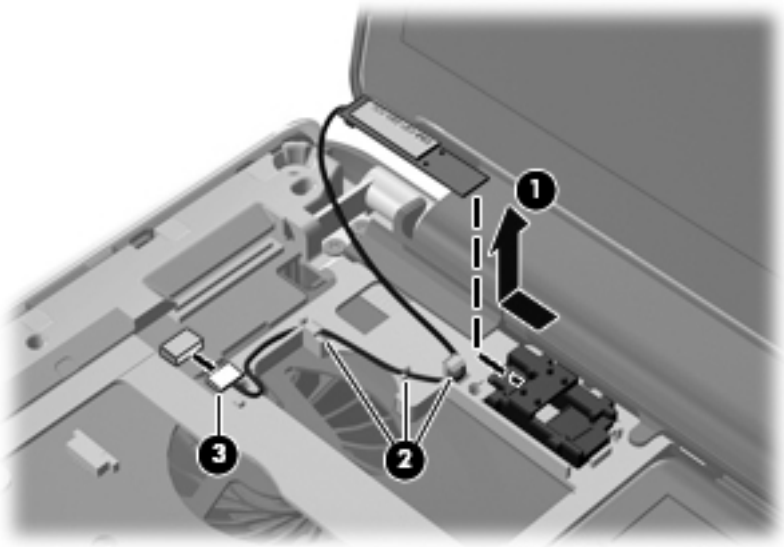
Description	Spare part number
Bluetooth module	537921-001

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC Adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the primary hard drive cover (see "Primary hard drive cover" on page 4-9).
6. Remove the primary hard drive (see "Hard drive" on page 4-12).
7. Remove the switch cover and keyboard (see "Switch cover and keyboard" on page 4-21).
8. Remove the speaker assembly (see "Speaker assembly" on page 4-26).

Remove the Bluetooth module:

1. Slide the Bluetooth module out of the rubber bracket ❶ that secures the Bluetooth module to the computer.
2. Release the Bluetooth cable from the routing channel ❷.
3. Disconnect the Bluetooth cable from the system board ❸.



Reverse this procedure to install the Bluetooth module.

Display assembly

All display assemblies include a webcam, 2 microphones, and 2 wireless antenna transceivers and cables.

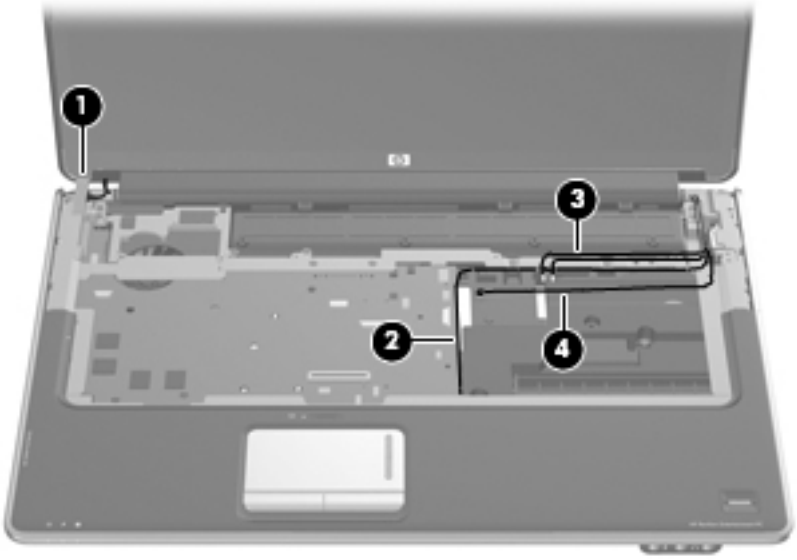
Description	Spare part number
17.3-inch HD+ flush glass, AntiGlare display assembly, Moonlight White	516296-001
17.3-inch HD+ flush glass, AntiGlare display assembly, Espresso Black in molded finish	519260-001
17.3-inch HD+ BrightView display assembly, Moonlight White	516295-001
17.3-inch HD+ BrightView display assembly, Espresso Black in molded finish	519259-001

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 4-7).
5. Remove the following components:
   a. Primary hard drive cover (see “Primary hard drive cover” on page 4-9).
   b. Primary hard drive (see “Hard drive” on page 4-12).
   c. Optical drive (see “Optical drive” on page 4-8).
   d. Memory module (see “Memory module” on page 4-14).
   e. WLAN module (see “WLAN module” on page 4-15).
   f. Switch cover and keyboard (see “Switch cover and keyboard” on page 4-21).
   g. Speaker assembly (see “Speaker assembly” on page 4-26)

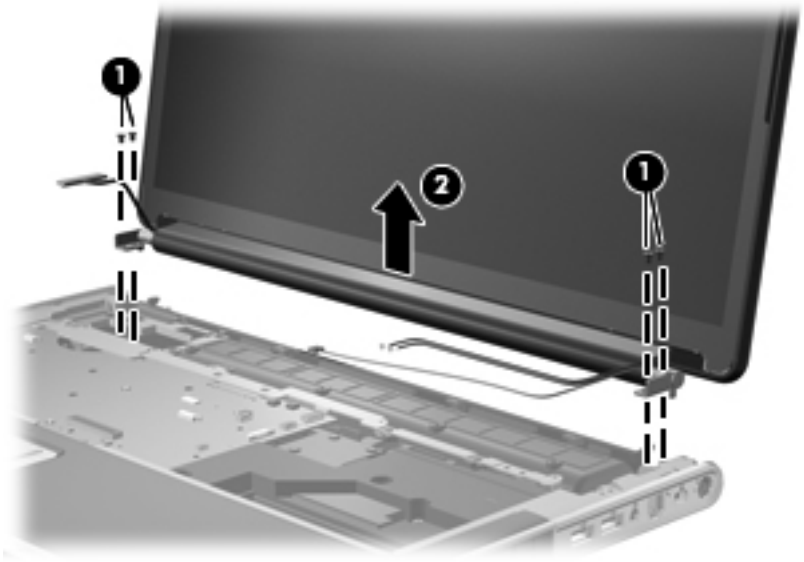
Remove the display assembly:

1. Disconnect the display panel cable ❶ and the webcam/microphone cable ❷ from the system board.
2. Remove the WLAN antenna cables from the clips ❸ built into the top cover.
3. Disconnect the TV tuner cable from the system board ❹.



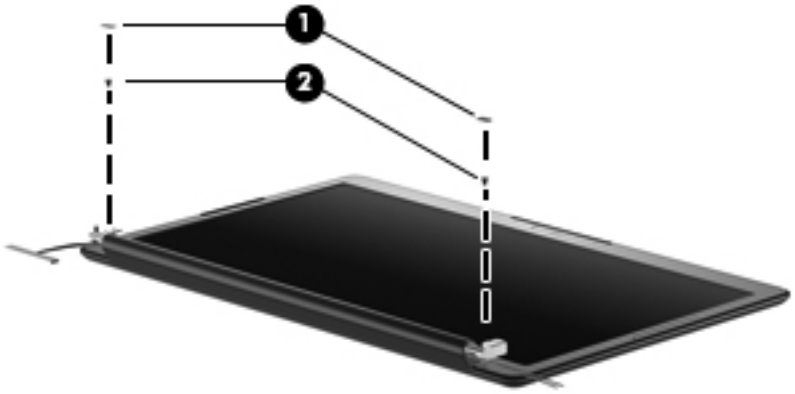
CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

4. Remove the four Phillips PM2.5×7.0 screws ❶ that secure the display assembly to the computer.
5. Remove the display assembly ❷.

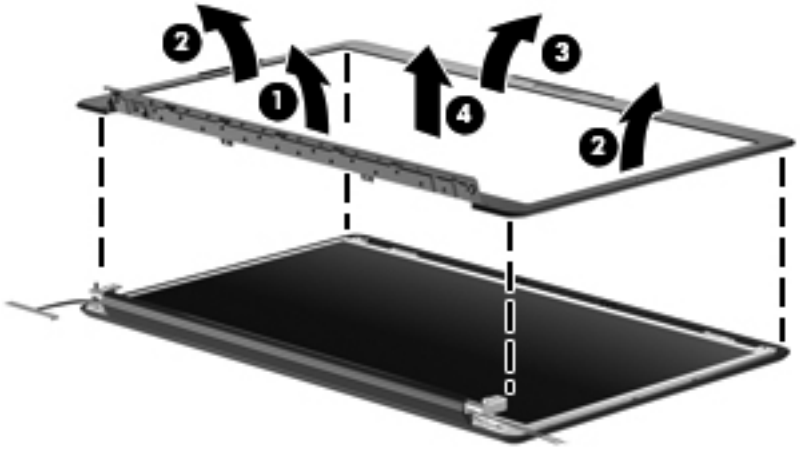


Steps 6 through 21 provide display panel removal information for computer models equipped with BrightView display assemblies. See steps 22 through 34 for display panel removal information for computer models equipped with AntiGlare display assemblies.

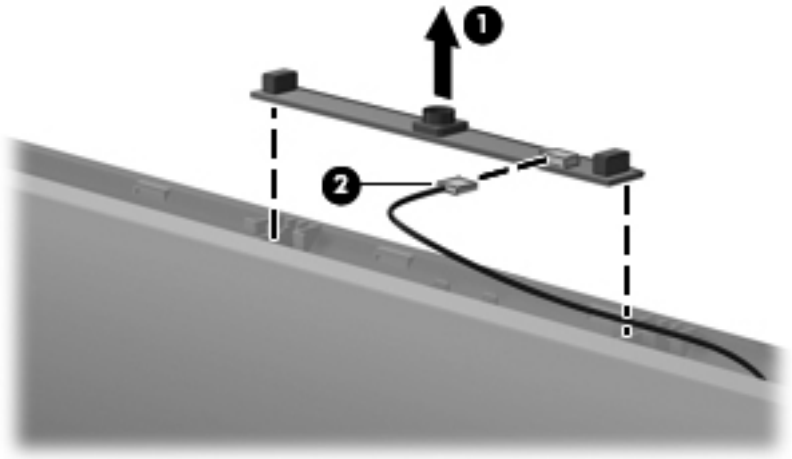
6. If it is necessary to replace the display enclosure or any of the display assembly internal components on a BrightView display assembly, remove the two rubber screw covers ❶ on the display bezel lower edge. The display rubber screw covers are included in the Display Rubber Kit, spare part number 516308-001.
7. Remove the two Phillips PM2.5×7.0 screws ❷ that secure the display bezel to the display assembly.



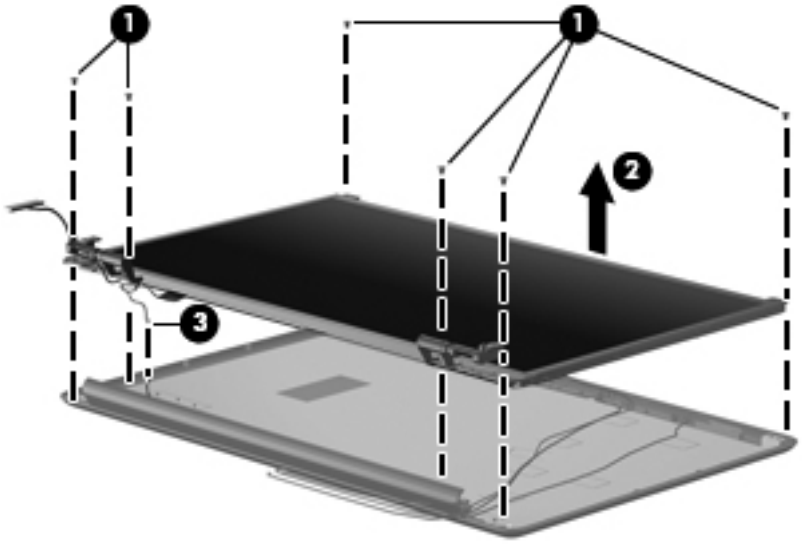
8. Flex the inside edges of the bottom edge ❶, the left and right sides ❷, and the top edge ❸ of the display bezel until the bezel disengages from the display enclosure.
9. Remove the display bezel ❹. The display bezel is available using spare part number 516305-001.



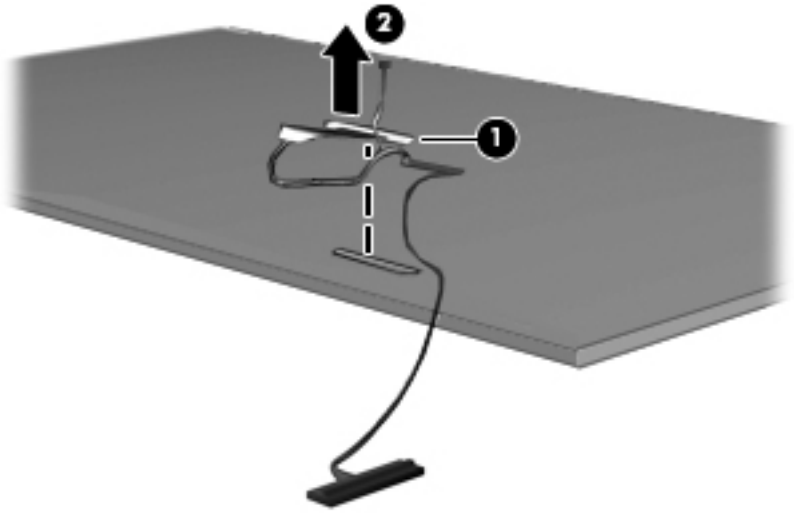
10. If it is necessary to replace the webcam module, pull the webcam module ❶ up to release it from the adhesive strip.
11. Disconnect the webcam cable from the connector ❷ on the webcam module.



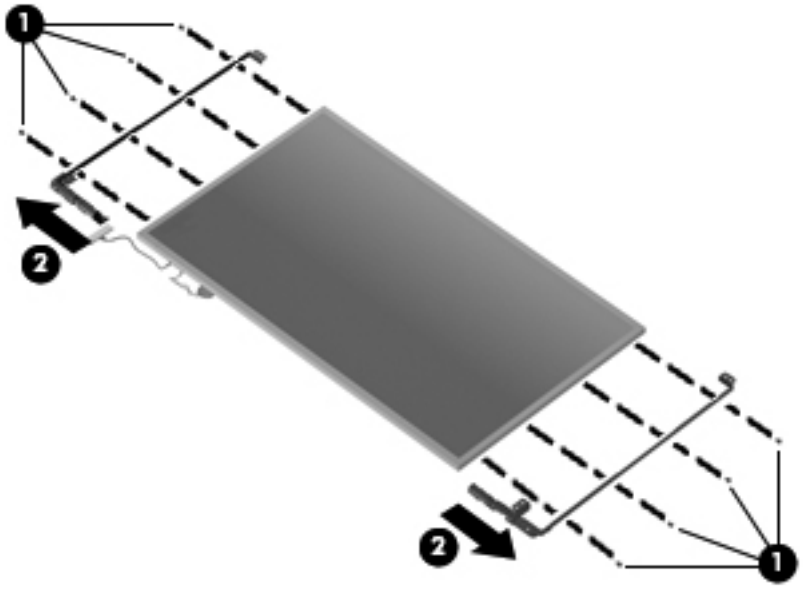
12. If it is necessary to replace the display panel, remove the six Phillips PM2.5×4.0 screws ❶ that secure the display panel to the display enclosure.
13. Release the display panel ❷ as far as the display logo LED board cable allows.
14. Disconnect the display logo LED board cable ❸ from the display panel cable.



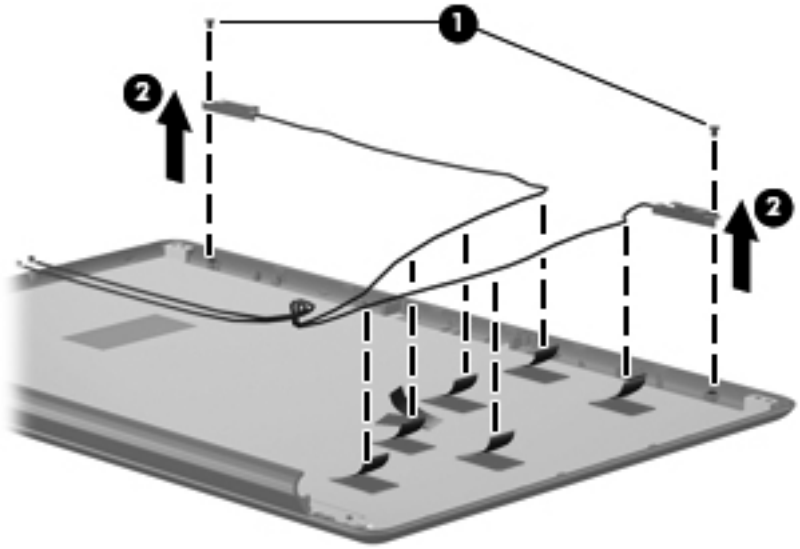
15. Remove the display panel. The display panel is available using the following spare part numbers:
    - ❏ 519259-001 (17.3-inch, HD+ BrightView display panel, Espresso Black color in molded finish)
    - ❏ 516295-001 (17.3-inch, HD+ BrightView display panel, Moonlight White color)
16. If it is necessary to remove the display panel cable, disconnect the display panel cable from the connector ❶.
17. Remove the tape ❷ that secures the cable to the display panel.



18. If it is necessary to replace the display hinges, remove the four Phillips PM2.0×4.0 screws ❶ that secure each display hinge to the display panel.
19. Remove the display hinges ❷. The display hinges are available using spare part number 516306-001.

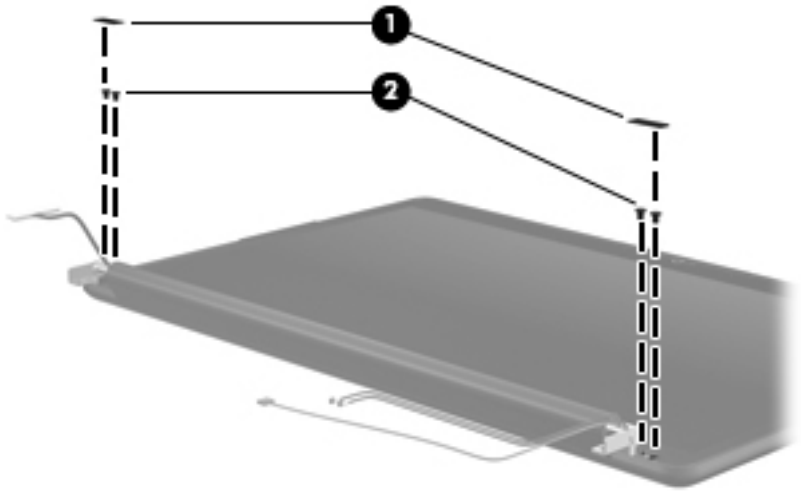


20. If it is necessary to replace the wireless antenna transceivers and cables, remove the Phillips PM2.5×4.0 screw ❶ that secures each transceiver to the display enclosure.
21. Remove the wireless antenna transceivers with the cables ❷ from the display enclosure.

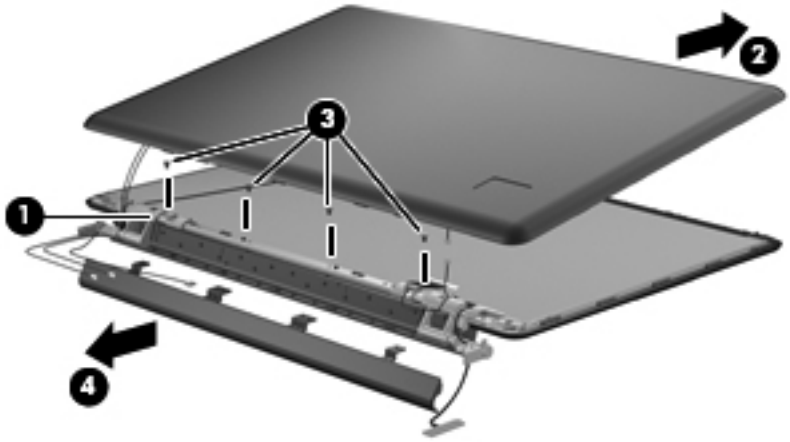


Steps 22 through 34 provide display panel removal information for computer models equipped with AntiGlare display assemblies. See steps 6 through 21 for display panel removal information for computer models equipped with BrightView display assemblies.

22. If it is necessary to replace the display bezel or any of the AntiGlare display assembly internal components, remove the following screw covers and screws:
    a. Two rubber screw covers ❶ on the display bezel bottom edge. The display rubber screw covers are included in the Display Rubber Kit, spare part number 516308-001.
    b. Four Phillips PM2.5×7.0 screws ❷.

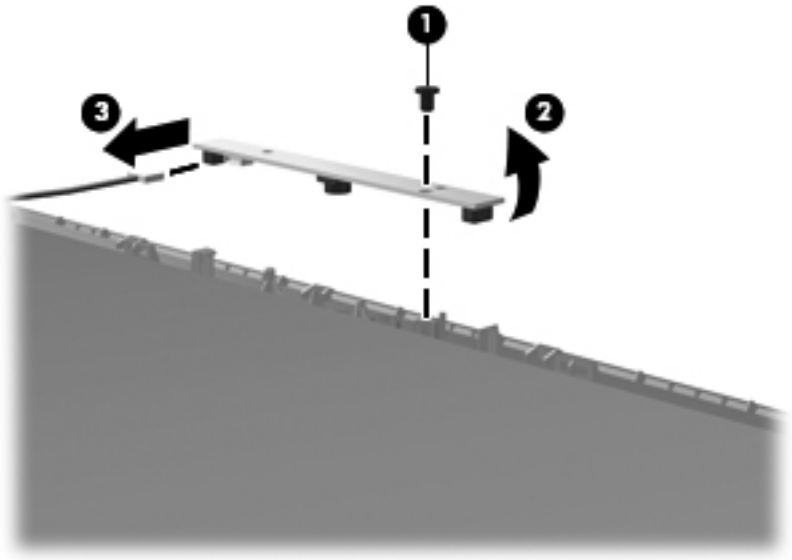


23. Turn the display assembly upside down, with the bottom edge toward you.
24. Separate the bottom edge of the display enclosure from the display bezel ❶, and slide the enclosure ❷ down far enough to display the four screws that secure the bottom cover to the display assembly.
25. Remove the four Phillips PM2.5×4.0 screws ❸, and then remove the bottom cover ❹ from the display assembly.

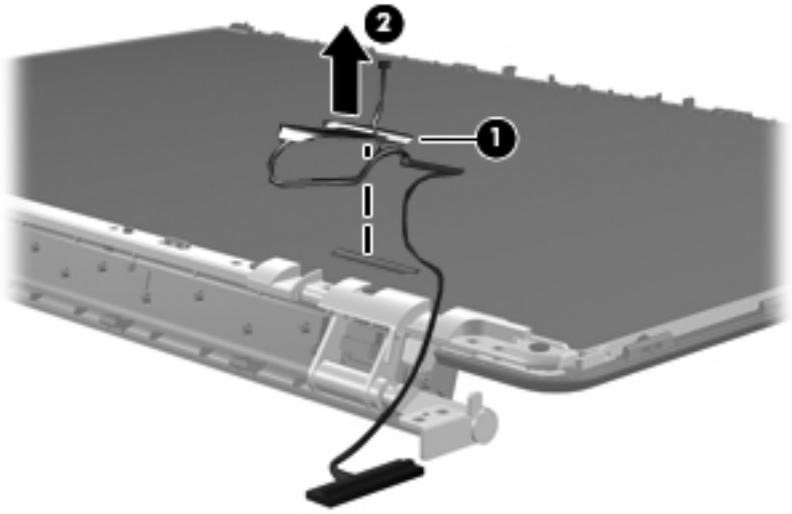


26. Disconnect the display logo LED cable from the display panel cable ❶, and then remove the antenna cables from the display assembly clip ❷, leaving them attached to the display enclosure.
27. Remove the display enclosure ❸. The AntiGlare display enclosure is available using spare part numbers 519262-001 (Espresso Black), and 516443-001 (Moonlight White), and includes the display logo LED board and the wireless antenna transceivers and cables.

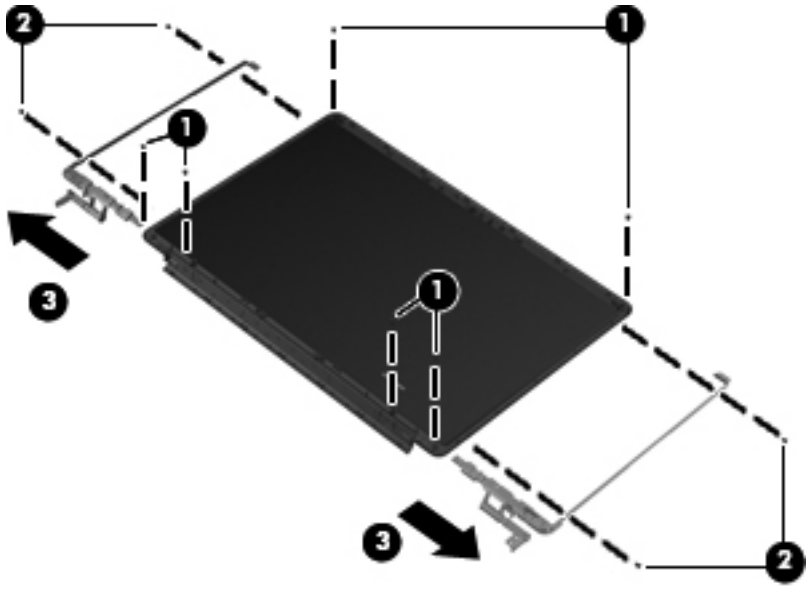
28. If it is necessary to replace the webcam/microphone module, remove the Phillips PM2.0×3.0 screw ❶ that secures the webcam/microphone module to the display panel.
29. Lift the webcam/microphone module up on the right side ❷ and slide it out.
30. Remove the webcam/microphone module cable from the clip on the left hinge ❸. The webcam/microphone module is available using spare part number 516312-001.



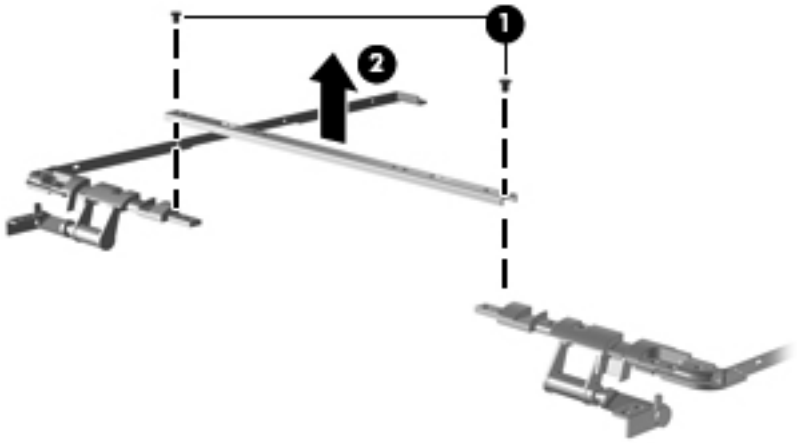
31. Disconnect the display panel cable ❶ from the display panel, and then remove it from the back of the display panel ❷.



32. If it is necessary to remove the display hinges and bracket, remove the six Phillips PM2.5×5.0 hinge screws ❶ and the four Phillips PM2.0×3.0 screws ❷ that secure the display hinges and bracket to the display panel.
33. Remove the display hinges and bracket ❸.



34. If it is necessary to disassemble the display bracket, remove the two Phillips PM2.5×5.0 screws ❶, and remove the center of the bracket ❷.



Reverse this procedure to reassemble and install the display assembly.

Top cover

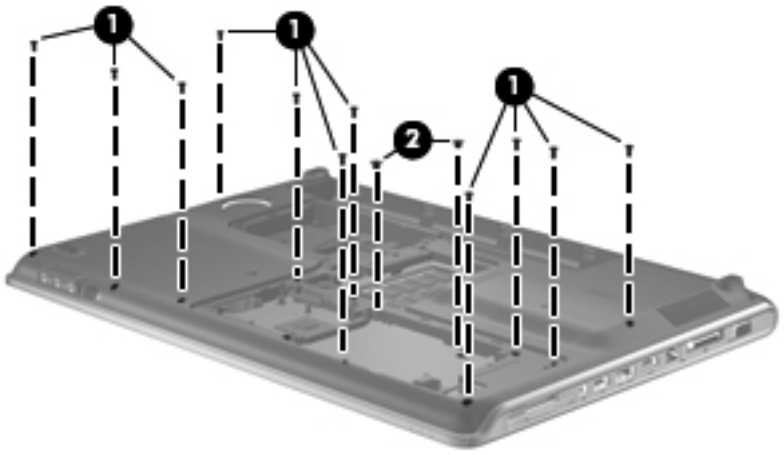
Description	Spare part number
For use only with computer models equipped with a fingerprint reader and TouchPad, Moonlight White color	516299-001
For use only with computer models equipped with TouchPad only, Moonlight White color	516360-001
For use only with computer models equipped with a fingerprint reader and TouchPad, Espresso Black color with molded finish	519267-001
For use only with computer models equipped with TouchPad only, Espresso Black color with molded finish	519268-001

Before removing the top cover, follow these steps:

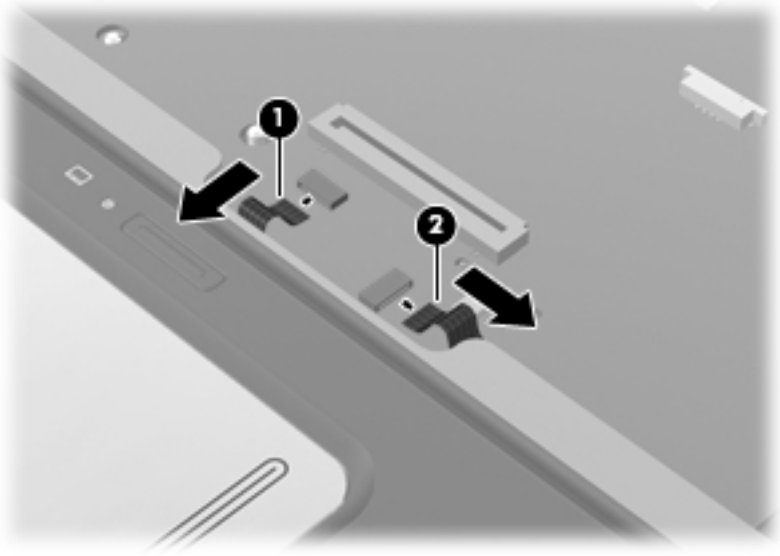
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. WLAN module (see "WLAN module" on page 4-15)
   e. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   f. Speaker assembly (see "Speaker assembly" on page 4-26)
   g. Display assembly (see "Display assembly" on page 4-28)

Remove the top cover:

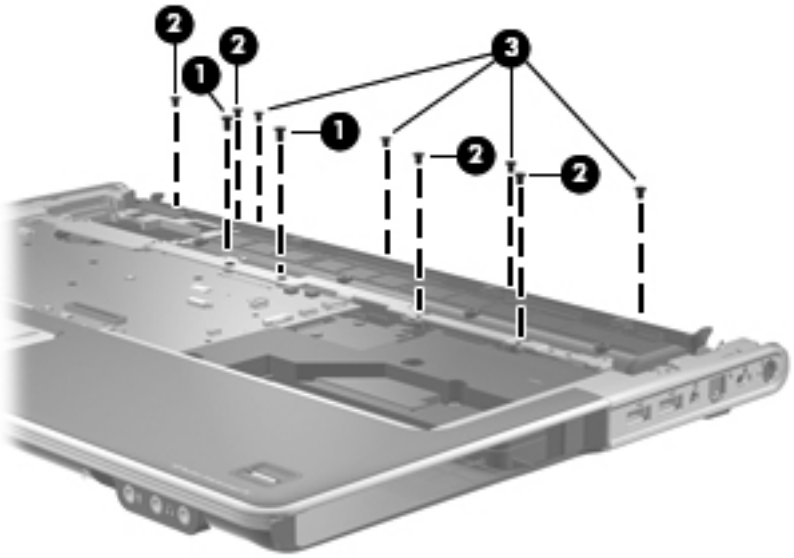
1. Position the computer upside down, with the front toward you.
2. Remove the 11 Phillips PM2.5×7.0 screws ❶ and the 2 Phillips PM2.5×4.0 screws ❷ that secure the top cover to the bottom of the computer.



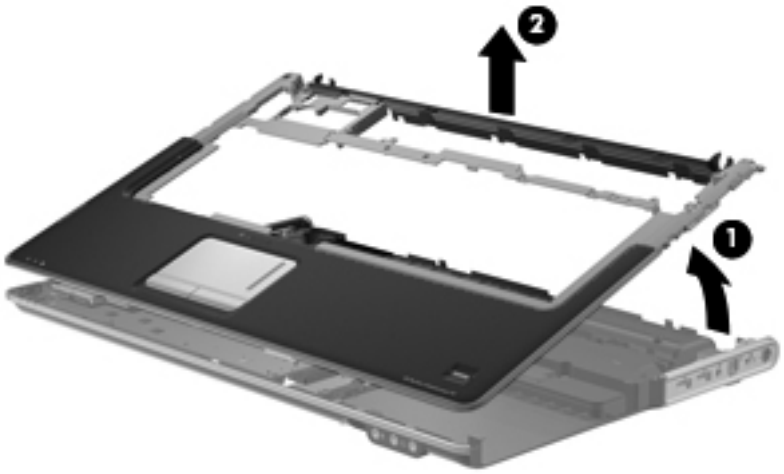
3. Turn the computer right-side up, with the front toward you.
4. Disconnect the following cables from the system board:
   a. TouchPad board LIF cable ❶
   b. Fingerprint reader board LIF cable ❷ (select models only)



5. Remove the following screws that secure the top cover to the computer:
   a. 2 Phillips PM2.5×7.0 screws ❶
   b. 4 Phillips PM2.0×3.0 screws ❷
   c. 4 Phillips PM2.5×5.0 screws ❸



6. Lift the rear edge ❶ of the top cover until it rests at an angle.
7. Remove the top cover ❷ by lifting it straight up.



Reverse this procedure to install the top cover.

System board

All system board spare kits include replacement thermal material.

Description	Spare part number
With discrete graphics subsystem and 1 GB of dedicated memory	574680-001
With discrete graphics subsystem and 512 MB of dedicated memory	574681-001
With UMA graphics subsystem and shared memory	574679-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Memory module (see "Memory module" on page 4-14)
   e. WLAN module (see "WLAN module" on page 4-15)
   f. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   g. Speaker assembly (see "Speaker assembly" on page 4-26)
   h. Bluetooth module (see "Bluetooth module" on page 4-27)
   i. Display assembly (see "Display assembly" on page 4-28)
   j. Top cover (see "Top cover" on page 4-37)

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:

- TV tuner module (see "TV tuner module" on page 4-20)
- RTC battery (see "RTC battery" on page 4-19)
- Memory modules (see "Memory module" on page 4-14)
- WLAN module (see "WLAN module" on page 4-15)
- Bluetooth module (see "Bluetooth module" on page 4-27)
- Modem module (see "Modem module" on page 4-43)
- Fan/heat sink assembly (see "Fan/heat sink assembly" on page 4-51)
- Processor (see "Processor" on page 4-54)

Remove the system board:

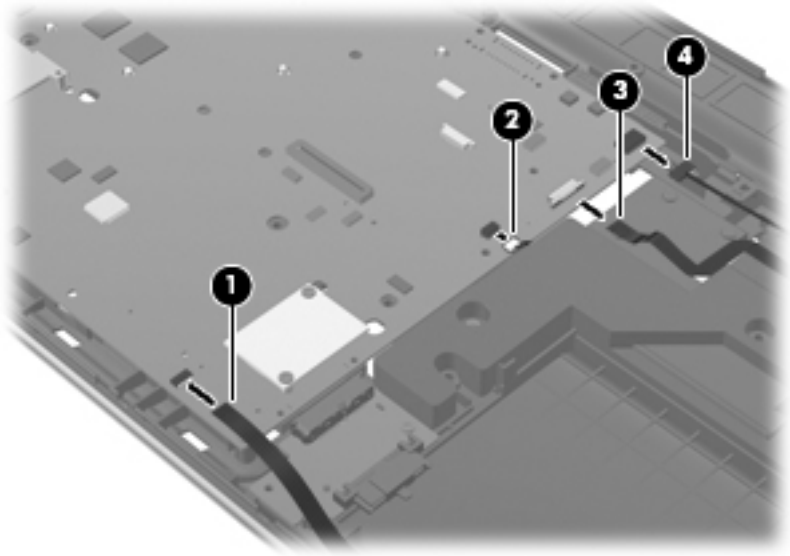
1. Disconnect the following cables from the system board:
   a. Audio/infrared board cable ❶

   ✎ The audio/infrared board cable connects to a LIF connector on the system board.

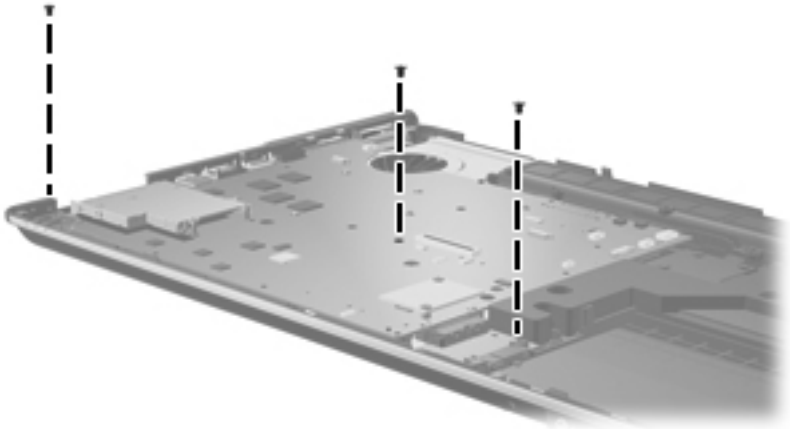
   b. Subwoofer cable ❷ (select models only)
   c. USB board cable ❸

   ✎ The USB board cable connects to a LIF connector on the system board.

   d. Power connector cable ❹

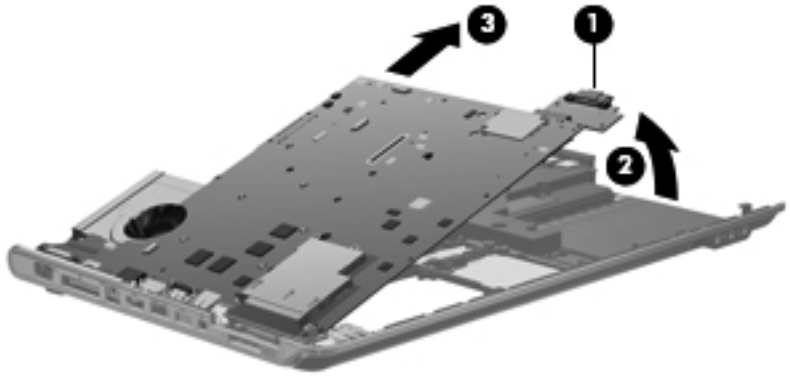


2. Remove the three Phillips PM2.5×5.0 screws that secure the system board to the base enclosure.

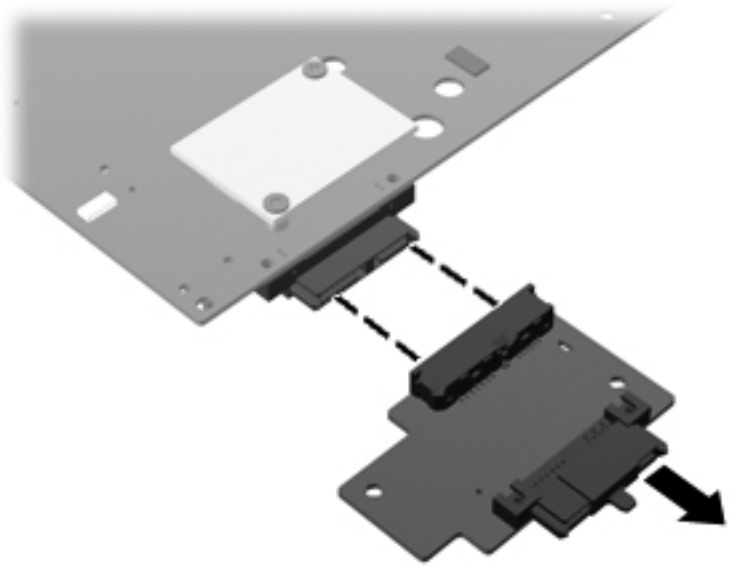


WARNING: To avoid damaging the optical drive board, do not use the optical drive board ❶ to lift the system board out of the base enclosure.

3. Lift the right side of the system board up until it rests at an angle ❷.
4. Remove the system board ❸ by sliding it up and to the right at an angle.



5. If it is necessary to remove the optical drive board, grasp the end of the optical drive board and pull it away from the system board. The optical drive board spare part number is 533723-001.



Reverse this procedure to install the optical drive board and the system board.

Modem module

The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 516328-001.

Description	Spare part number
Modem module for use in all countries and regions except Australia and New Zealand	510100-001

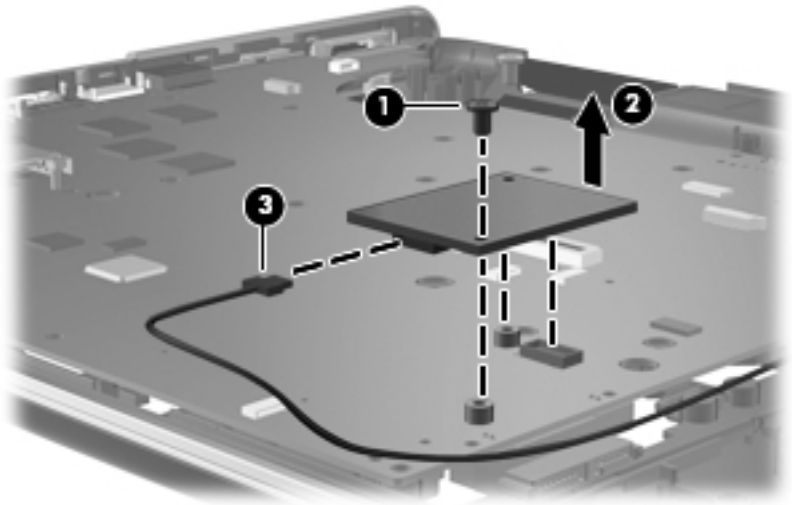
Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Memory module (see "Memory module" on page 4-14)
   e. WLAN module (see "WLAN module" on page 4-15)
   f. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   g. Speaker assembly (see "Speaker assembly" on page 4-26)
   h. Display assembly (see "Display assembly" on page 4-28)
   i. Top cover (see "Top cover" on page 4-37)
   j. System board (see "System board" on page 4-40)

Remove the modem module:

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

2. Remove the Phillips PM2.0×4.0 screw ❶ that secures the modem module to the system board.
3. Lift the modem module ❷ up.
4. Disconnect the modem module cable ❸, and then remove the modem module from the system board.



Reverse this procedure to install the modem module.

Audio/infrared board

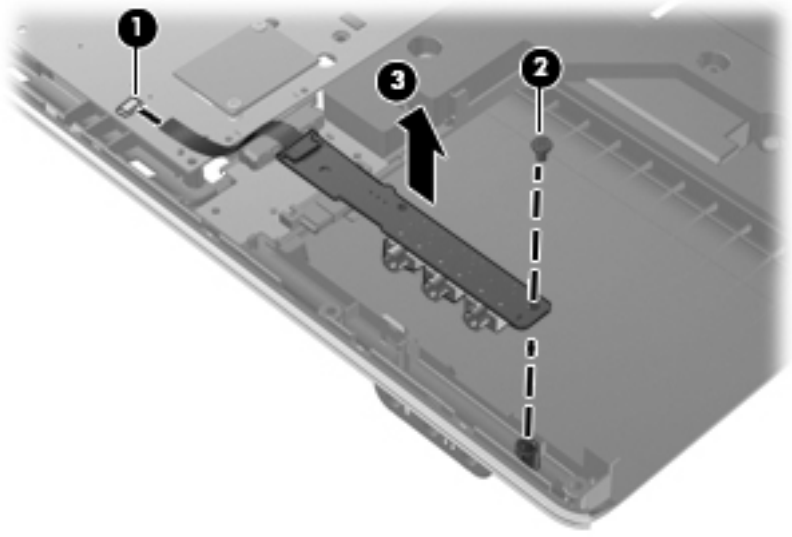
Description	Spare part number
Audio/infrared board (includes cable)	518166-001

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   e. Speaker assembly (see "Speaker assembly" on page 4-26)
   f. Display assembly (see "Display assembly" on page 4-28)
   g. Top cover (see "Top cover" on page 4-37)

Remove the audio/infrared board:

1. Position the computer with the front toward you.
2. Open the audio/infrared board cable LIF connector ❶, and disconnect the cable from the system board.
3. Remove the Phillips PM2.5×4.0 screw ❷ that secures the audio/infrared board to the base enclosure.
4. Lift the audio/infrared board ❸ straight up to remove it from the base enclosure.



Reverse this procedure to install the audio/infrared board.

USB board

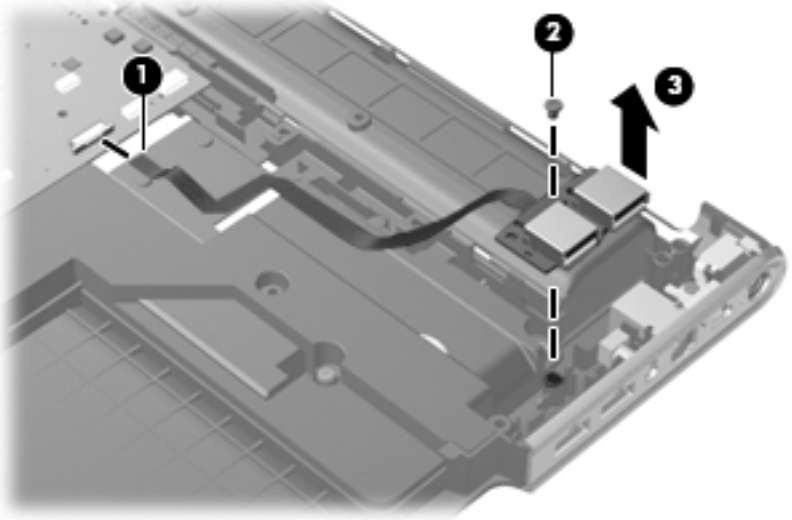
Description	Spare part number
USB board (includes cable)	518168-001

Before removing the USB board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   e. Speaker assembly (see "Speaker assembly" on page 4-26)
   f. Display assembly (see "Display assembly" on page 4-28)
   g. Top cover (see "Top cover" on page 4-37)

Remove the USB board:

1. Disconnect the USB board cable from the connector ❶ on the system board.
2. Remove the Phillips PM2.5×5.0 screw ❷ that secures the USB board to the base enclosure.
3. Remove the USB board ❸ from the base enclosure.



Reverse this procedure to install the USB board.

Subwoofer

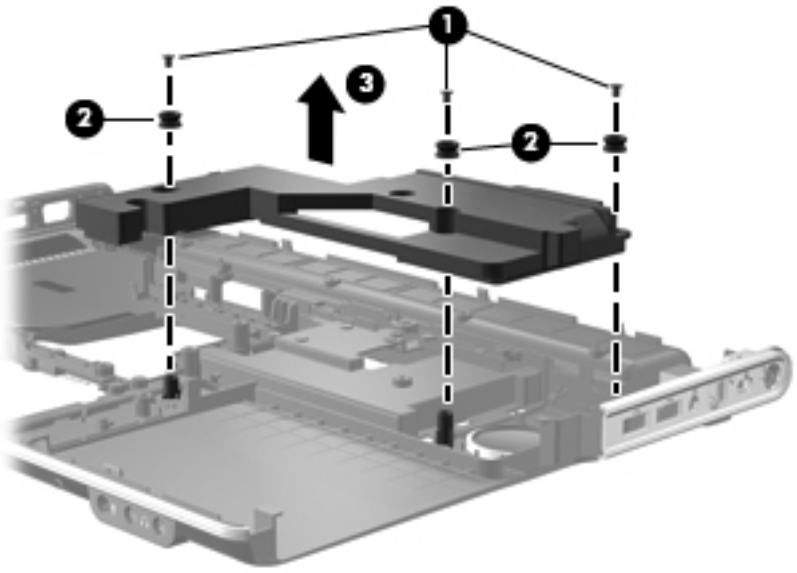
Description	Spare part number
Subwoofer	516333-001

Before removing the subwoofer, 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 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   e. Speaker assembly (see "Speaker assembly" on page 4-26)
   f. Display assembly (see "Display assembly" on page 4-28)
   g. Top cover (see "Top cover" on page 4-37)
   h. USB board (see "USB board" on page 4-46)

Remove the subwoofer:

1. Remove the three Phillips PM2.5×5.0 broadhead screws ❶ that secure the subwoofer to the base enclosure.
2. Ensure that the rubber grommets ❷ that contained the broadhead screws are still in place.
3. Remove the subwoofer ❸.



Reverse this procedure to install the subwoofer.

TV tuner module cable

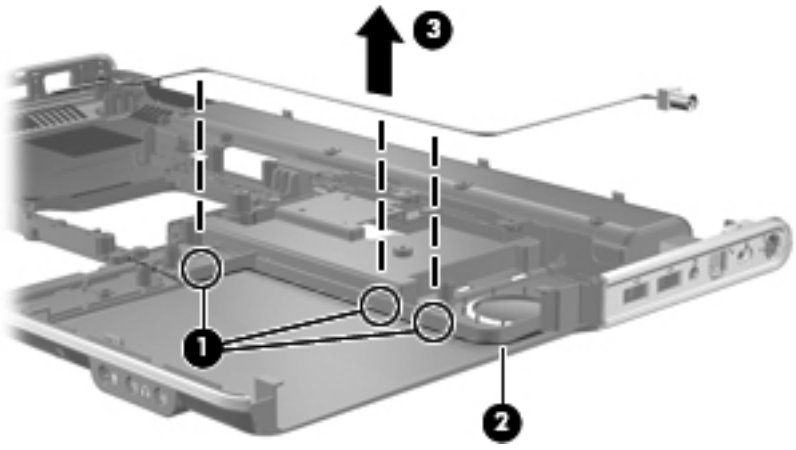
The TV tuner module cable is available in the Cable Kit, spare part number 516328-001.

Before removing the TV tuner module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. WLAN module (see "WLAN module" on page 4-15)
   e. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   f. Display assembly (see "Display assembly" on page 4-28)
   g. Top cover (see "Top cover" on page 4-37)
   h. System board (see "System board" on page 4-40)
   i. USB board (see "USB board" on page 4-46)

Remove the TV tuner module cable:

1. Release the clips ❶ built into the base enclosure that secure the TV tuner antenna connector.
2. Remove the TV tuner module cable from the clips and routing channel ❷ built into the base enclosure.
3. Remove the TV tuner module cable ❸ from the base enclosure.



Reverse this procedure to install the TV tuner module cable.

Modem module cable

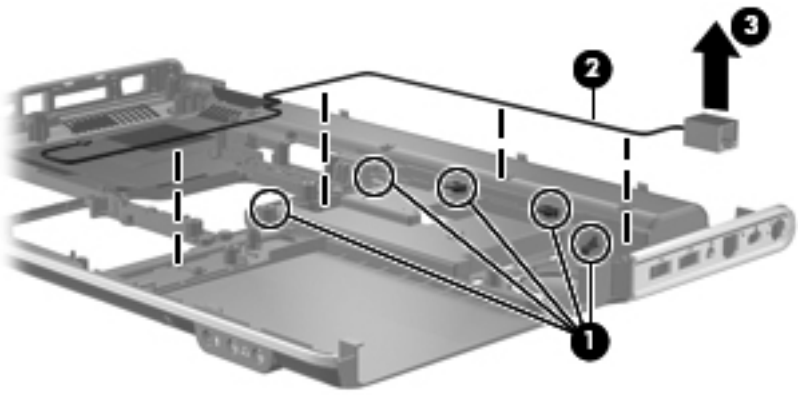
The modem module cable including the RJ-11 jack is available in the Cable Kit, spare part number 516328-001.

Before removing the modem module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Memory module (see "Memory module" on page 4-14)
   e. WLAN module (see "WLAN module" on page 4-15)
   f. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   g. Speaker assembly (see "Speaker assembly" on page 4-26)
   h. Display assembly (see "Display assembly" on page 4-28)
   i. Top cover (see "Top cover" on page 4-37)
   j. System board (see "System board" on page 4-40)
   k. USB board (see "USB board" on page 4-46)

Remove the modem module cable:

1. Release the clips ❶ built into the base enclosure that secure the RJ-11 jack and cable.
2. Remove the modem module cable ❷ from the clips and routing channel built into the base enclosure.
3. Remove the RJ-11 jack ❸ from the base enclosure.



Reverse this procedure to install the modem module cable and RJ-11 jack.

Power connector cable

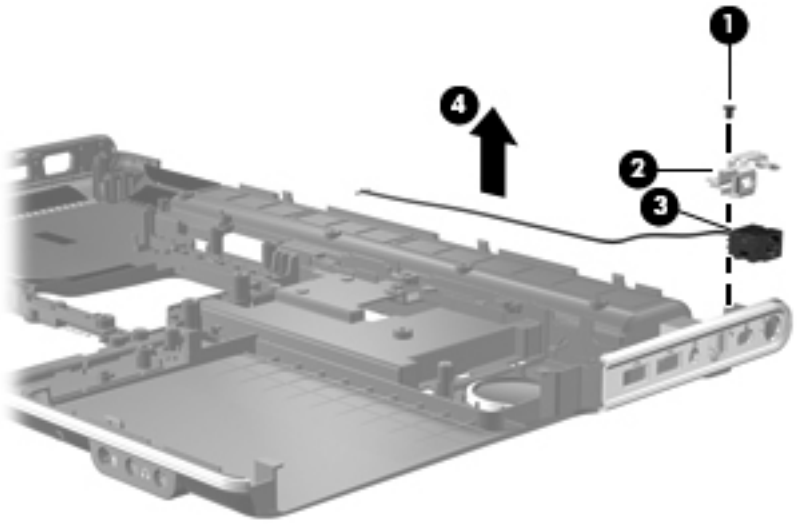
The power connector cable is available in the Cable Kit, spare part number 516328-001.

Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. WLAN module (see "WLAN module" on page 4-15)
   e. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   f. Speaker assembly (see "Speaker assembly" on page 4-26)
   g. Display assembly (see "Display assembly" on page 4-28)
   h. Top cover (see "Top cover" on page 4-37)
   i. System board (see "System board" on page 4-40)
   j. USB board (see "USB board" on page 4-46)

Remove the power connector cable:

1. Remove the Phillips PM2.5×7.0 screw ❶ that secures the power connector and bracket to the base enclosure.
2. Remove the power connector bracket ❷.
3. Remove the power connector from the base enclosure ❸ and release the power connector cable from the routing channel ❹.



Reverse this procedure to install the power connector cable assembly.

Fan/heat sink assembly

The fan/heat sink assembly spare kit includes replacement thermal material.

Description	Spare part number
Thermal module, discrete graphics subsystem **(**includes fan/heat sink assembly**)**	533735-001
Thermal module, UMA graphics subsystem memory (includes fan/heat sink assembly)	533736-001

To properly ventilate the computer, allow at least a 7.6-cm (3-in) clearance on the right side and rear panel of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

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

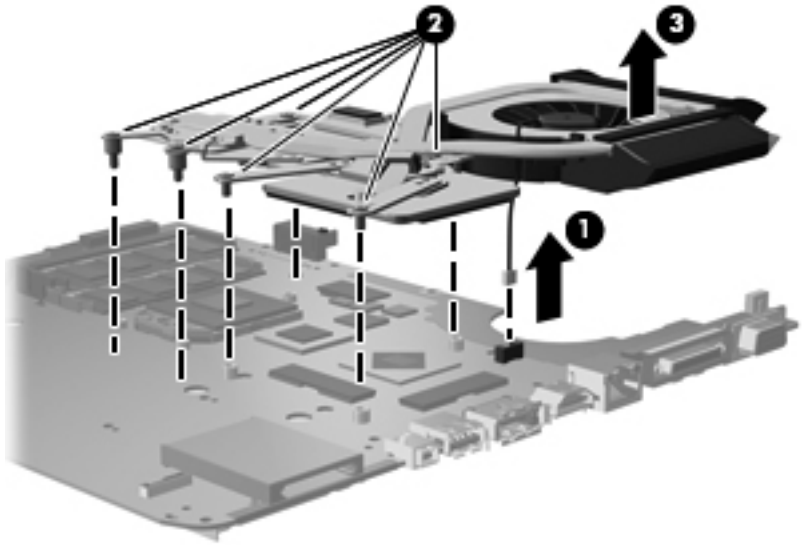
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see "Hard drive covers" on page 4-9)
   b. Primary and secondary hard drives (see "Hard drive" on page 4-12)
   c. Optical drive (see "Optical drive" on page 4-8)
   d. Memory module (see "Memory module" on page 4-14
   e. WLAN module (see "WLAN module" on page 4-15)
   f. Switch cover and keyboard (see "Switch cover and keyboard" on page 4-21)
   g. Speaker assembly (see "Speaker assembly" on page 4-26)
   h. Bluetooth module (see "Bluetooth module" on page 4-27)
   i. Display assembly (see "Display assembly" on page 4-28)
   j. Top cover (see "Top cover" on page 4-37)
   k. System board (see "System board" on page 4-40)
   l. USB board (see "USB board" on page 4-46)

Remove the fan/heat sink assembly:

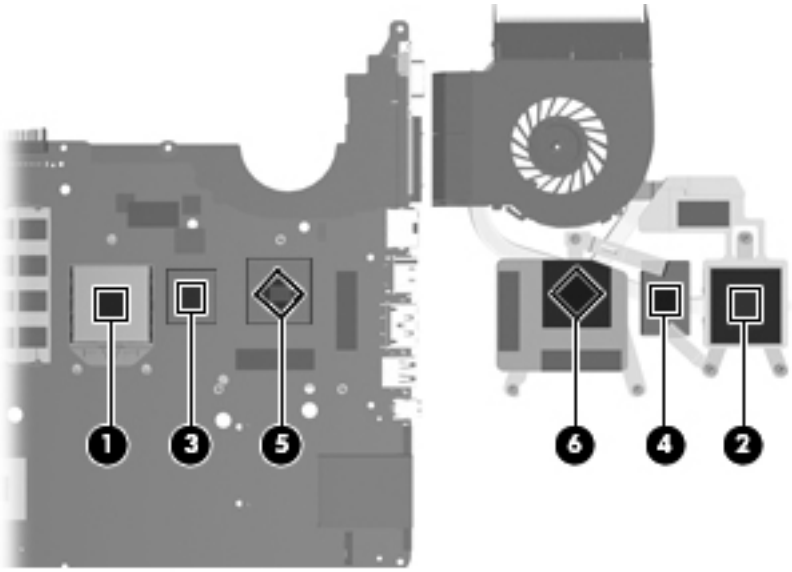
Steps 1 through 4 apply only to computer models equipped with discrete graphics subsystem memory. See steps 5 through 8 for information on computer models equipped with UMA graphics subsystem memory.

1. Turn the system board upside down, with the expansion port 3 and external monitor port toward you.
2. Disconnect the fan cable ❶ from the system board.
3. Loosen the six Phillips PM2.5×6.0 captive screws ❷ that secure the fan/heat sink assembly to the system board.

4. Remove the fan/heat sink assembly ❸ by lifting it straight up.



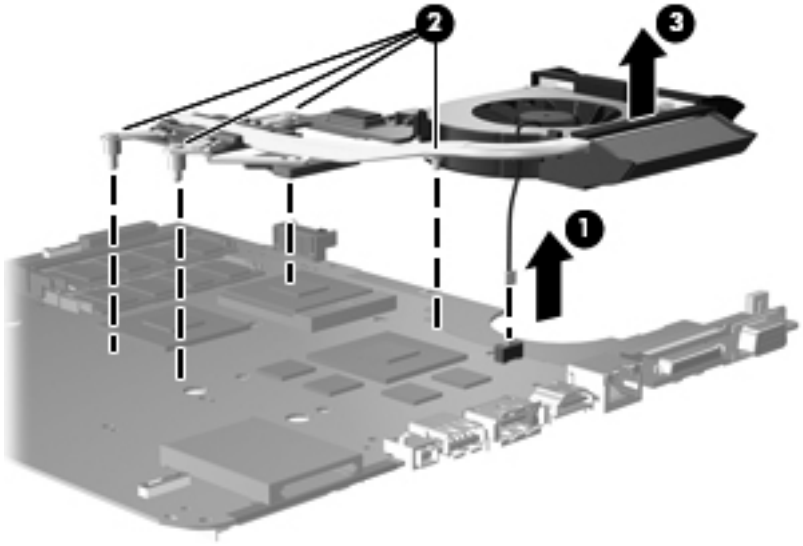
The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is used on the processor ❶ and the heat sink section ❷ that services it. Thermal pads are used on the Northbridge chip ❸ and Northbridge contact ❹, the graphics subsystem chip ❺ and graphics/heat sink contact ❻. Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



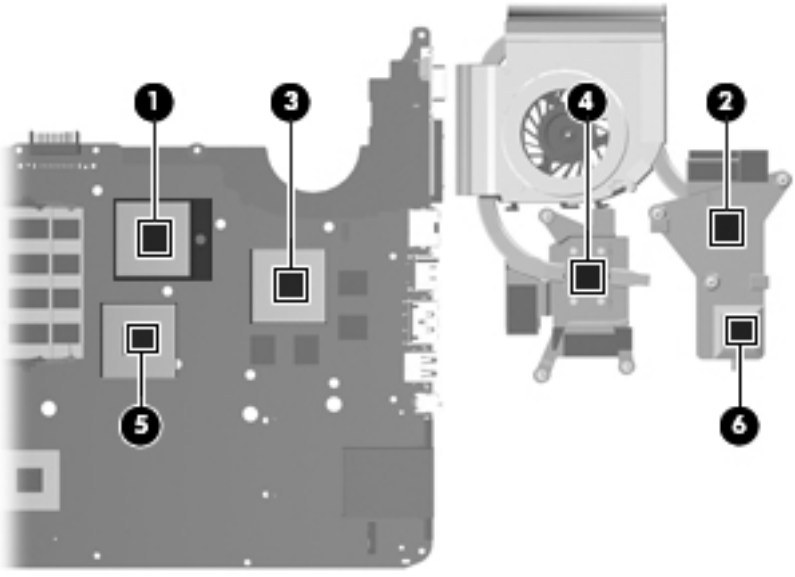
Steps 5 through 8 apply only to computer models equipped with UMA graphics subsystem memory.

5. Turn the system board upside down, with the expansion port 3 and external monitor port toward you.
6. Disconnect the fan cable ❶ from the system board.
7. Loosen the four Phillips PM2.5×6.0 captive screws ❷ that secure the fan/heat sink assembly to the system board.
8. Remove the fan/heat sink assembly ❸ from the system board.

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



The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is used on the processor ❶ and the heat sink section ❷ that services it. Thermal pads are used on the graphics subsystem chip ❸ and graphics/heat sink contact ❹, the Northbridge chip ❺ and Northbridge contact ❻. Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



Reverse this procedure to install the fan/heat sink assembly.

Processor

All processor spare part kits include replacement thermal material.

Description	Spare part number
AMD Turion™ X2 Ultra Dual-Core M640 35-W, 2.60-GHz processor with 2-MB L2 cache	576256-001
AMD Turion X2 Ultra Dual-Core M620 35-W, 2.50-GHz processor with 2-MB L2 cache	576255-001
AMD Turion X2 Ultra Dual-Core M600 35-W, 2.40-GHz processor with 2-MB L2 cache	576254-001
AMD Turion X2 Dual-Core M520 35-W, 2.30-GHz processor with 1-MB L2 cache	583055-001
AMD Turion X2 Dual-Core M500 35-W, 2.20-GHz processor with 1-MB L2 cache	576253-001
AMD Athlon™ X2 Dual-Core M320 35-W, 2.10-GHz processor with 1-MB L2 cache	576252-001
AMD Athlon X2 Dual-Core M300 35-W, 2.00-GHz processor with 1-MB L2 cache	578024-001

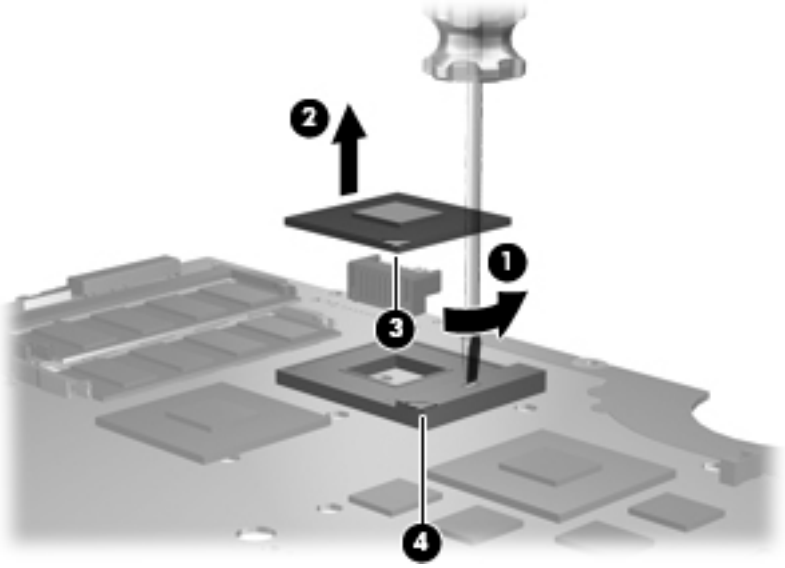
Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the following components:
   a. Primary and secondary hard drive covers (see “Hard drive covers” on page 4-9)
   b. Primary and secondary hard drives (see “Hard drive” on page 4-12)
   c. Optical drive (see “Optical drive” on page 4-8)
   d. Memory module (see “Memory module” on page 4-14)
   e. WLAN module (see “WLAN module” on page 4-15)
   f. Switch cover and keyboard (see “Switch cover and keyboard” on page 4-21)
   g. Speaker assembly (see “Speaker assembly” on page 4-26)
   h. Bluetooth module (see “Bluetooth module” on page 4-27)
   i. Display assembly (see “Display assembly” on page 4-28)
   j. Top cover (see “Top cover” on page 4-37)
   k. System board (see “System board” on page 4-40)
   l. Fan/heat sink assembly (see “Fan/heat sink assembly” on page 4-51)

Remove the processor:

1. Turn the processor locking screw ❶ one-half turn counterclockwise until you hear a click.
2. Lift the processor ❷ straight up and remove it.

The gold triangle ❸ on the processor must be aligned with the triangle icon ❹ embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

5

Setup Utility

Starting the Setup Utility

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

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

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

To start the Setup Utility:

» Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **f10**.

– or –

1. Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **esc**.
2. When the Startup Menu is displayed, press **f10**.

Using the Setup Utility

Changing the language of the Setup Utility

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

1. Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **f10**.

   – or –

   Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.
2. Use the arrow keys to select **System Configuration** > **Language**, and then press **enter**.
3. Use the arrow keys to select a language, and then press **enter**.
4. When a confirmation prompt with your language selected is displayed, press **enter**.
5. To save your change and exit the Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your change goes into effect immediately.

Navigating and selecting in the Setup Utility

Because the Setup Utility is not Windows based, it does not support the TouchPad. Navigation and selection are by keystroke.

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

Displaying system information

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

1. Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **f10**.

   – or –

   Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key from Startup Menu" message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.
2. Select the **Main** menu. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit the Setup Utility without changing any settings, use the arrow keys to select **Exit** > **Exit Discarding Changes**, and then press **enter**.

Restoring default settings in the Setup Utility

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

1. Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **f10**.

   – or –

   Open the Setup Utility by turning on or restarting the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.
2. Use the arrow keys to select **Exit** > **Load Setup Defaults**, and then press **enter**.
3. When the Setup Confirmation is displayed, press **enter**.
4. To save your change and exit the Setup Utility, use the arrow keys to select **Exit** > **Exit Saving Changes**, and then press **enter**.

The Setup Utility default settings go into effect when the computer restarts.

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

Exiting the Setup Utility

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

- To exit the Setup Utility and save your changes from the current session:

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

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

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

After either choice, the computer restarts in Windows.

Setup Utility menus

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

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

Main menu

Select	To do this
System information	■ View and change the system time and date. ■ View identification information about the computer. ■ View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).

Security menu

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

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Button Sound (select models only)	Enable/disable the capacitive button tapping sound.
Virtualization Technology (select models only)	Enable/disable the processor Virtualization Technology.
Processor C6 State (select models only)	Enable/disable the processor C6 sleep state.
LAN Power Saving (select models only)	Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode.
Card Reader/1394 Power Saving (select models only)	Enable/disable Card Reader/1394 Power Saving.
Fan Always On	Enable/disable Fan Always On. When enabled, the computer fan will always be on.
Boot Options	Set the following boot options: ■ **f9** and **f10** Delay (sec.)—Set the delay for the **f9** and **f10** functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20). ■ CD-ROM boot—Enable/disable boot from CD-ROM. ■ Floppy boot—Enable/disable boot from diskette. ■ Internal Network Adapter boot—Enable/disable boot from Internal Network Adapter. ■ Boot Order—Set the boot order for: ❒ USB Floppy ❒ Internal CD/DVD ROM drive ❒ USB CD/DVD ROM drive ❒ Hard drive ❒ USB Diskette on Key ❒ USB Hard drive ❒ Network adapter

Diagnostics menu

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

6

Specifications

Computer specifications

	Metric	U.S.
Dimensions for computer models with BrightView display assemblies		
Width	41.26 cm	16.24 in
Depth	27.70 cm	10.90 in
Height (front to rear)	3.52 to 4.44 cm	1.38 to 1.74 in
Weight - BrightView (with optical drive, hard drive, and battery)	3.51 kg	7.74 lbs
Second hard drive adds	0.13 kg	0.28 lbs
Camera adds	0.009 kg	0.02 lbs
Dimensions for computer models with AntiGlare display assemblies		
Width	41.26 cm	16.24 in
Depth	27.70 cm	10.90 in
Height (front to rear)	3.40 to 4.32 cm	1.34 to 1.70 in
Weight - AntiGlare (with optical drive, hard drive, and battery)	3.72 kg	8.2 lbs
Second hard drive adds	0.13 kg	0.28 lbs
Camera adds	0.009 kg	0.02 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
	19 V dc @ 4.74 A - 90 W	
Operating current	3.5 A for 65 W	
	4.74 A for 90 W	
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%	

(Continued)

	Metric	U.S.
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

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

17.3-inch, HD+ AntiGlare display specifications (some models also support flush glass panel cover)

	Metric	U.S.
Dimensions		
Height	30.8 cm	12.15 in
Width	43.3 cm	17.03 in
Diagonal	43.9 cm	17.29 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1600 × 900	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	2 W	
Viewing angle	+/-65° horizontal, +/-50° vertical (typical)	

17.3-inch HD+ BrightView display specifications

	Metric	U.S.
Dimensions		
Height	30.7 cm	12.15 in
Width	33.1 cm	17.03 in
Diagonal	43.9 cm	17.29 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1600 × 900	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	2 W	
Viewing angle	+/-65° horizontal, +/-50° vertical (typical)	

Hard drive specifications

	500-GB*	500-GB*	320-GB*	320-GB*	250-GB*	250-GB*
Dimensions						
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA	SATA	SATA
Transfer rate						
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)						
Single track	3 ms	3 ms	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms	24 ms	24 ms
Logical blocks	1,048,576,000	1,048,576,000	625,141,400	625,141,400	488,397,168	488,397,168
Disc rotational speed	7200-rpm	5400-rpm	7200-rpm	5400 rpm	7200-rpm	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.

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

Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive specifications

Applicable disc	**Read:**	**Write:**	
	CD-DA, CD+(E)G, CD-MIDI, CDTEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, HD-ROM (Single Layer), HD-ROM (Dual Layer), HD DVD-R, HD DVD-R for Dual Layer, HD DVD-RW, BD-ROM, BD-R, BD-RE	CD-R and CD-RW, DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9), DVD-RW, DVD-RAM	
Access time	**CD**	**DVD**	**HD**
Random	170 ms	170 ms	230 ms
Cache buffer	8 MB		
Data transfer rate			
24X CD-ROM	3,600 MB/sec		
8X DVD	10,800 KB/sec		
24X CD-R	3,600 KB/sec		
16X CD-RW	2,400 KB/sec		
8X DVD+R	10,800 KB/sec		
4X DVD+RW	5,400 KB/sec		
8X DVD-R	10,800 KB/sec		
4X DVD-RW	5,400 KB/sec		
2.4 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 SuperMulti Double-Layer Combo Drive specifications

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

System DMA specifications, AMD

Hardware DMA	**System function**
DMA4	Direct memory access controller

System interrupt specifications, AMD discrete graphics

Hardware	IRQ System function
IRQ0	High precision event timer
IRQ1	Standard 101-/102-Key or Microsoft® Natural PS/2 Keyboard
IRQ5	RICOH OHCI Compliant IEEE 1394 Host Controller
IRQ7	Ricoh Memory Stick Controller Ricoh SD/MMC Host Controller Ricoh XD-Picture Card Controller SDA Standard Compliant SD Host Controller
IRQ8	High precision event timer
IRQ10	nVidia nForce PCI System Management
IRQ11	nVidia nForce System Management Controller
IRQ12	Synaptics PS/2 Port TouchPad
IRQ13	Numeric data processor
IRQ14	ATA Channel 0
IRQ15	ATA Channel 1
IRQ16	Broadcom WLAN adapter
IRQ17	Standard Enhanced PCI to USB Host Controller
IRQ18	Standard OpenHCD USB Host Controller
IRQ19	nVidia GeForce8400M GS
IRQ20	nVidia nForce Networking Controller
IRQ21	HDA Controller
IRQ23	Standard Dual Channel PCI IDE Controller

System interrupt specifications, AMD UMA graphics

Hardware	IRQ System function
IRQ0	High precision event timer
IRQ1	Standard 101-/102-Key or Microsoft® Natural PS/2 Keyboard
IRQ5	RICOH OHCI Compliant IEEE 1394 Host Controller
IRQ7	Ricoh Memory Stick Controller Ricoh SD/MMC Host Controller Ricoh XD-Picture Card Controller SDA Standard Compliant SD Host Controller
IRQ8	High precision event timer
IRQ10	nVidia nForce PCI System Management
IRQ11	nVidia nForce System Management Controller
IRQ12	Synaptics PS/2 Port TouchPad
IRQ13	Numeric data processor
IRQ14	ATA Channel 0
IRQ15	ATA Channel 1
IRQ16	nVidia MCP67M
IRQ18	Standard OpenHCD USB Host Controller Standard OpenHCD USB Host Controller
IRQ19	Broadcom WLAN adapter
IRQ21	HDA Controller
IRQ22	Standard Enhanced PCI to USB Host Controller Standard Enhanced PCI to USB Host Controller
IRQ23	Standard Dual Channel PCI IDE Controller

System I/O address specifications, AMD

I/O address (hex)	System function (shipping configuration)
0000 - 0008	DMA controller
000A - 000F	DMA controller
0020 - 0021	Program interrupt controller
0040 - 0043	System Timer
0060 - 0060	Standard 101-/102-Key or Microsoft® Natural PS/2 Keyboard
0061 - 0061	System speaker
0062 - 0062	Microsoft ACPI-Compliant Embedded Controller
0064 - 0064	Standard 101-/102-Key or Microsoft® Natural PS/2 Keyboard
0066 - 0066	Microsoft ACPI-Compliant Embedded Controller
0070 - 0071	System CMOS/real time clock
0081 - 0083	DMA controller
0087 - 0087	DMA controller
0089 - 008B	DMA controller
008F - 008F (UMA only)	DMA controller
00A0 - 00A1	Programmable interrupt controller
00C0 - 00D1	DMA controller
00D4 - 00DF	DMA controller
00F0 - 00F1	Numeric data processor
0170 - 0177	ATA Channel 1
01F0 - 01F7	ATA Channel 0
0376 - 0376	ATA Channel 1
03B0 - 03BB	nVidia GeForce8400M GS (discrete) nVidia MCP67M (UMA)
03B0 - 03BB (discrete only)	PCI standard PCI-to-PCI bridge
03C0 - 03DF	nVidia GeForce8400M GS (discrete) nVidia MCP67M (UMA)
03C0 - 03DF (discrete only)	PCI standard PCI-to-PCI bridge
03F6 - 03F6	ATA Channel 0
3000 - 303F	nVidia nForce PCI System Management
3040 - 307F	nVidia nForce PCI System Management
3080 - 30BF	nVidia nForce PCI System Management
30C0 - 30CF	Standard Dual Channel PCI IDE Controller
30D0 - 30DF	Standard Dual Channel PCI IDE Controller
30E0 - 30E3	Standard Dual Channel PCI IDE Controller
30E8 - 30EB	Standard Dual Channel PCI IDE Controller
30EC - 30EF	Standard Dual Channel PCI IDE Controller

(Continued)

I/O address (hex)	System function (shipping configuration)
30F0 - 30F7	Standard Dual Channel PCI IDE Controller
30F8 - 30FF (discrete only)	Standard Dual Channel PCI IDE Controller
4000 - 407F (discrete only)	nVidia GeForce8400M GS
4000 - 4FFF	PCI standard PCI-to-PCI bridge
5000 - 5FFF (discrete only)	PCI standard PCI-to-PCI bridge

System memory map specifications, AMD discrete graphics

Size	Memory address	System function
128 KB	000A0000-000BFFFF	nVidia GeForce8400M GS
16 KB	B0000000-B0003FFF	HDA Controller
8 KB	B0004000-B0005FFF	Standard Dual Channel PCI IDE Controller
4 KB	B0006000-B0006FFF	Standard OpenHCD USB Host Controller
256 KB	B0007000-B00070FF	Standard Enhanced PCI to USB Host Controller
4 KB	B0008000-B0008FFF	nVidia nForce Networking Controller
512 KB	B0080000-B00FFFFF	nVidia nForce System Management Controller
2 KB	B0100000-B01007FF	RICOH OHCI Compliant IEEE 1394 Host Controller
256 B	B0100800-B01008FF	SDA Standard Compliant SD Host Controller
256 B	B0100C00-B0100CFF	Ricoh SD/MMC Host Controller
256 B	B0101000-B01010FF	Ricoh Memory Stick Controller
256 B	B0101400-B01014FF	Ricoh XD-Picture Card Controller
16 KB	B0200000-B0203FFF	Broadcom WLAN adapter
16 MB	B1000000-B1FFFFFF	nVidia GeForce8400M GS
32 MB	B2000000-B3FFFFFF	nVidia GeForce8400M GS
1 MB	B6000000-B60FFFFF	Broadcom WLAN adapter
256 MB	C0000000-CFFFFFFF	nVidia GeForce8400M GS
1 KB	FED00000-FED003FF	High precision event timer

System memory map specifications, AMD UMA graphics

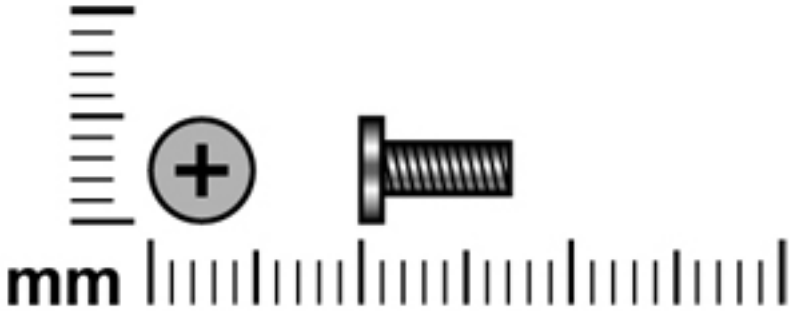
Size	Memory address	System function
128 KB	000A0000-000BFFFF	nVidia MCP67M
16 KB	B0000000-B0003FFF	HDA Controller
8 KB	B0004000-B0005FFF	Standard Dual Channel PCI IDE Controller
4 KB	B0006000-B0006FFF	Standard OpenHCD USB Host Controller
256 B	B0007000-B00070FF	Standard Enhanced PCI to USB Host Controller
256 B	B0007400-B00074FF	Standard Enhanced PCI to USB Host Controller
16 B	B0007800-B000780F	nVidia nForce Networking Controller
256 B	B0007C00-B0007CFF	nVidia nForce Networking Controller
4 KB	B0008000-B0008FFF	Standard OpenHCD USB Host Controller
4 KB	B0009000-B0009FFF	nVidia nForce Networking Controller
512 KB	B0080000-B00FFFFF	nVidia nForce System Management Controller
16 MB	B1000000-B1FFFFFF	nVidia MCP67M
16 MB	B2000000-B2FFFFFF	nVidia MCP67M
2 KB	B3000000-B30007FF	Ricoh OHCI Compliant IEEE 1394 Host Controller
256 B	B3000800-B30008FF	SDA Standard Compliant SD Host Controller
256 B	B3000C00-B3000CFF	Ricoh SD/MMC Host Controller
256 B	B3001000-B30010FF	Ricoh Memory Stick Controller
256 B	B3001400-B30014FF	Ricoh XD-Picture Card Controller
16 KB	B6000000-B6003FFF	Broadcom WLAN adapter
256 KB	C0000000-CFFFFFFF	nVidia MCP67M
1 KB	FED00000-FED003FF	High precision event timer

7

Screw listing

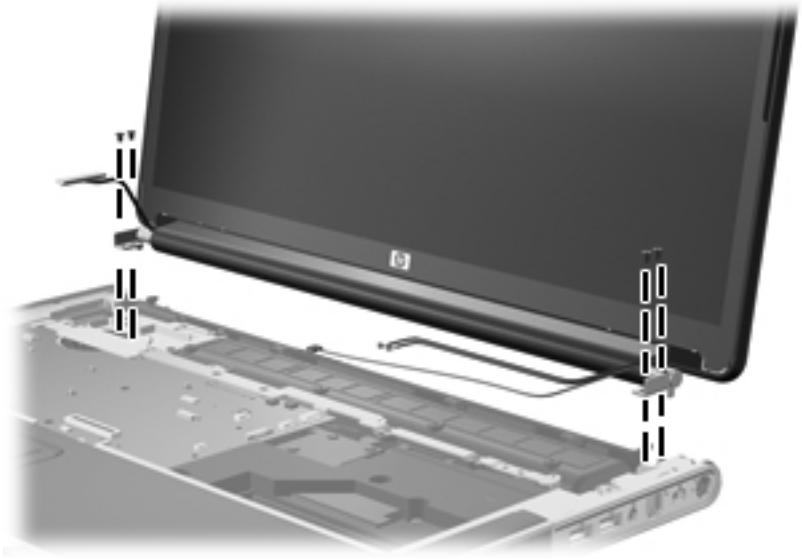
This section provides specification and reference information for the screws used in the computer. Some screws listed in this section are available in the Screw Kit, spare part number 5163277-001.

Phillips PM2.5×7.0 screw

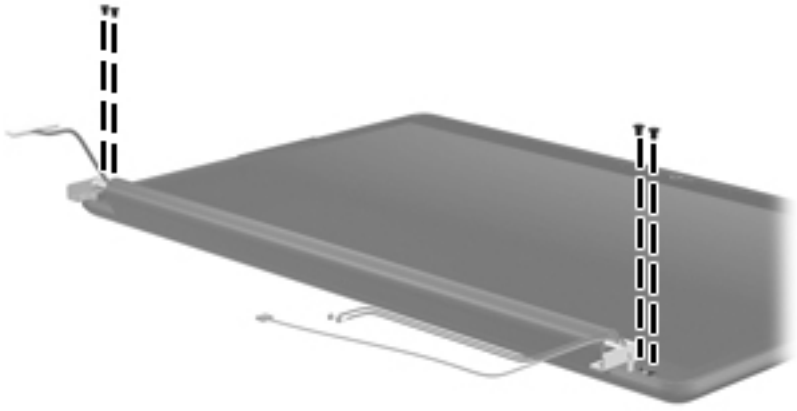


Color	Quantity	Length	Thread	Head diameter
Black	30	7.0 mm	2.5 mm	5.0 mm

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

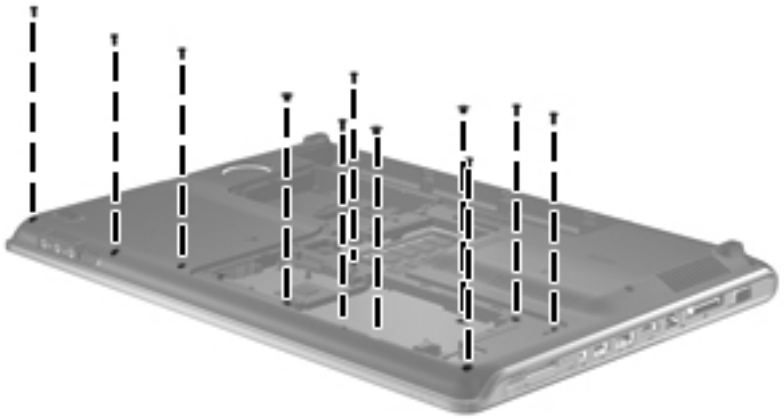


Where used: 4 screws that secure the display assembly to the computer

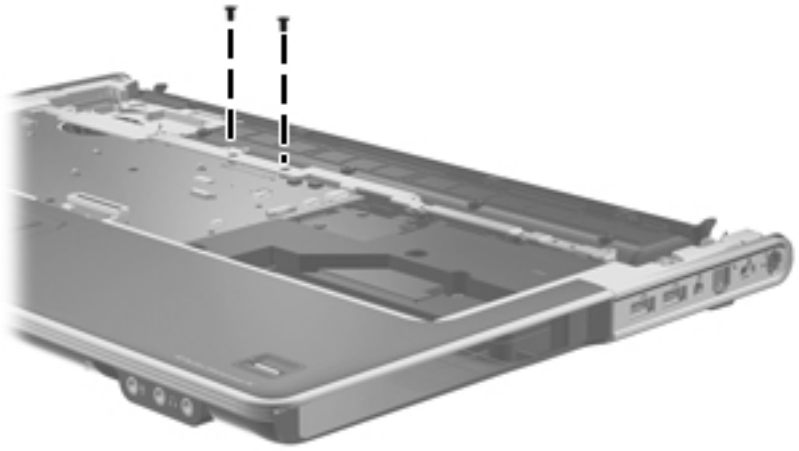


Where used: 4 screws that secure the display bezel to the display enclosure on computer models equipped with an AntiGlare display assembly

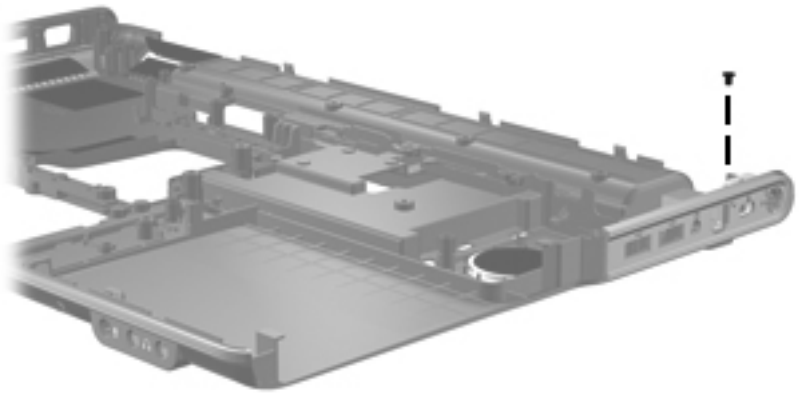
Where used: 2 screws that secure the display bezel to the display enclosure on computer models equipped with a BrightView display assembly



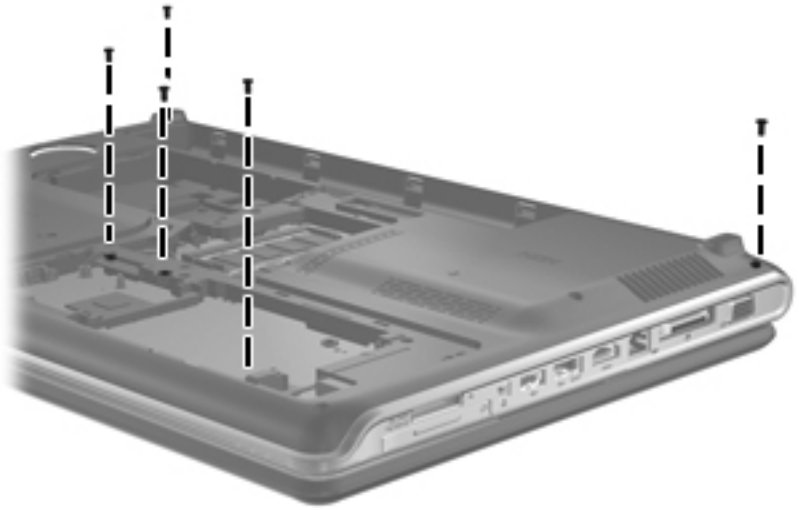
Where used: 11 screws on the bottom of the computer that secure the top cover to the base enclosure



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

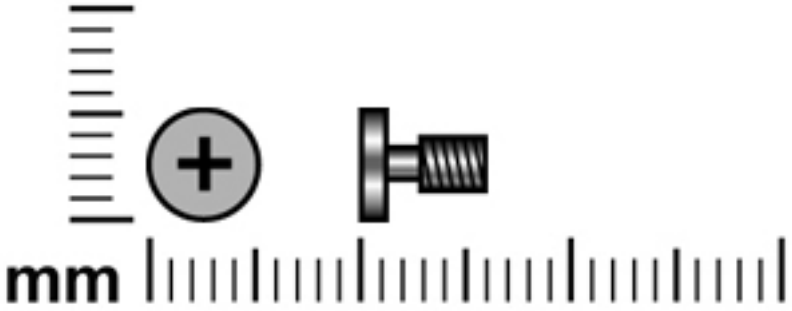


Where used: One screw that secures the power connector and bracket to the base enclosure

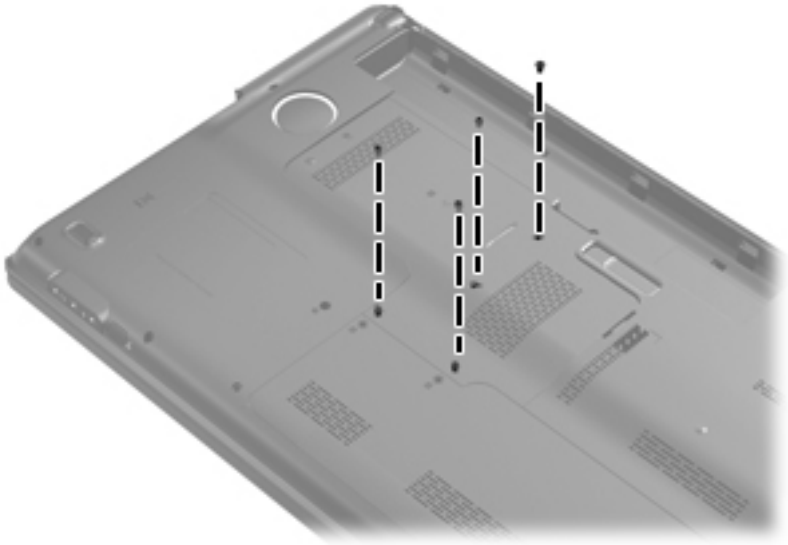


Where used: 5 screws that secure the switch cover and keyboard to the computer

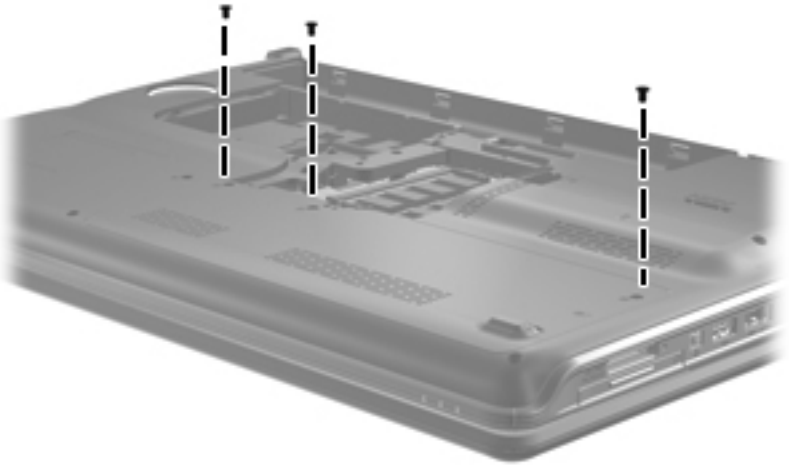
Phillips PM2.5×6.0 captive screw



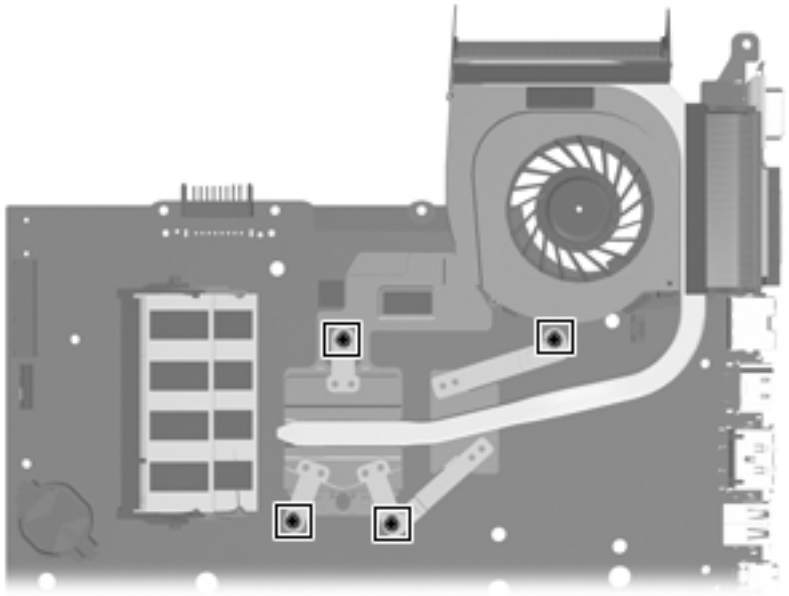
Color	Quantity	Length	Thread	Head diameter
Silver	17	6.0 mm	2.5 mm	5.0 mm



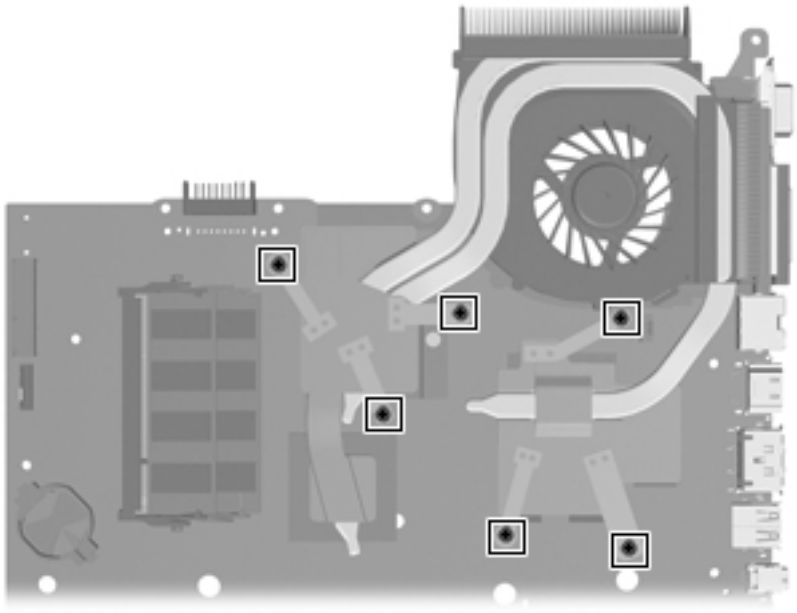
Where used: 4 captive screws that secure the primary hard drive cover to the primary hard drive bay



Where used: 3 captive screws that secure the secondary hard drive cover to the secondary hard drive bay

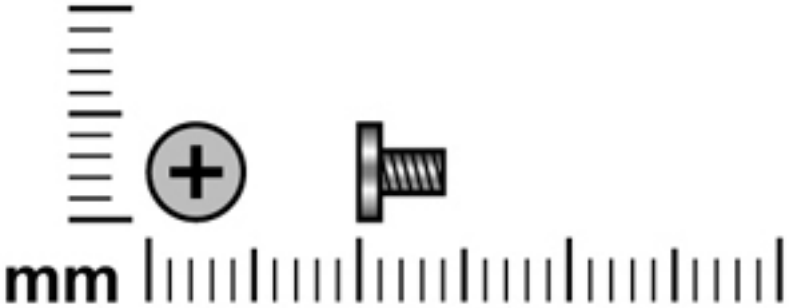


Where used: 4 captive screws that secure the UMA heat sink assembly to the system board

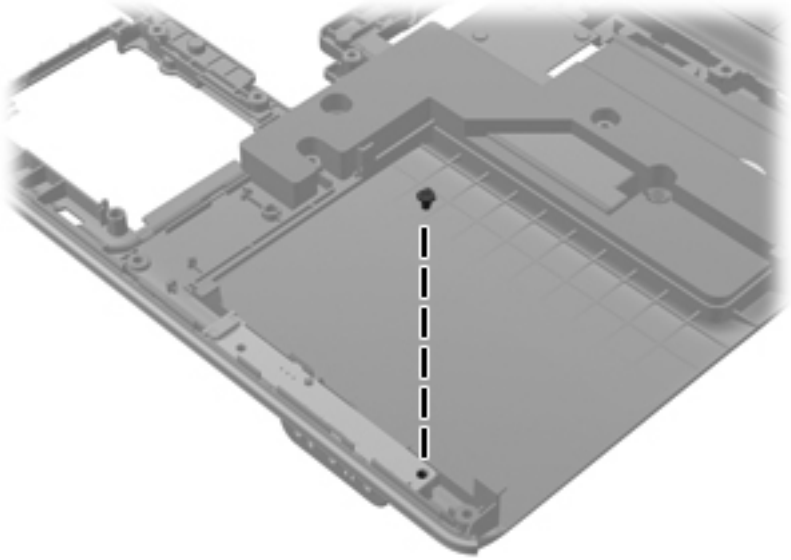


Where used: 6 captive screws that secure the discrete heat sink assembly to the system board

Phillips PM2.0×4.0 screw

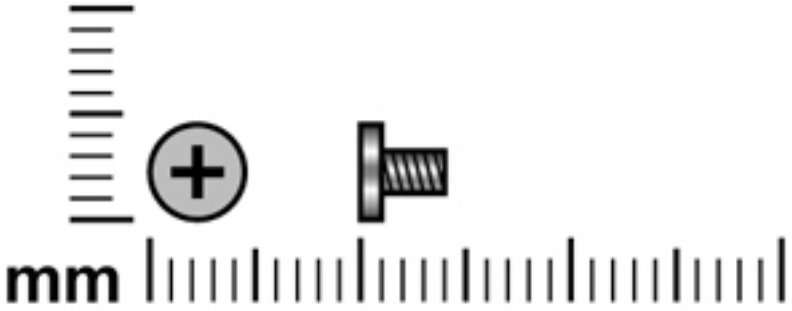


Color	Quantity	Length	Thread	Head diameter
Black	1	4.0 mm	2.0	4.5 mm

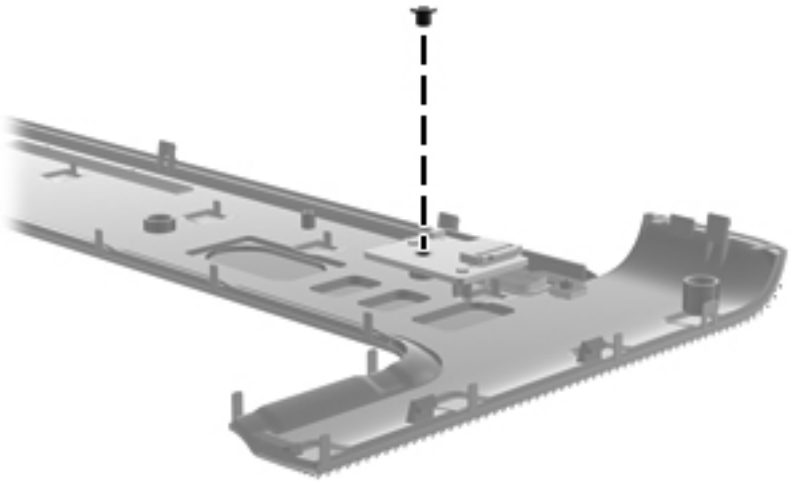


Where used: One screw that secures the audio board to the base enclosure

Phillips PM2.0×4.0 screw

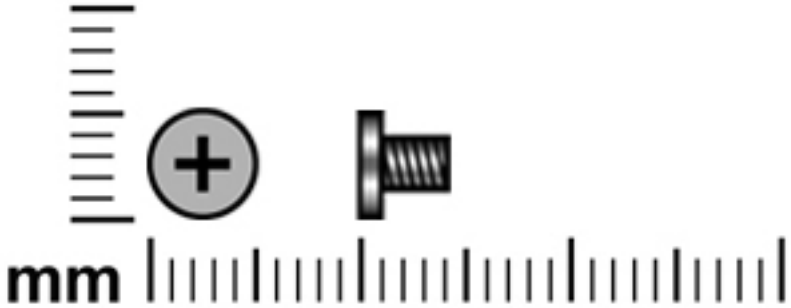


Color	Quantity	Length	Thread	Head diameter
Silver	1	4.0 mm	2.0 mm	4.5 mm

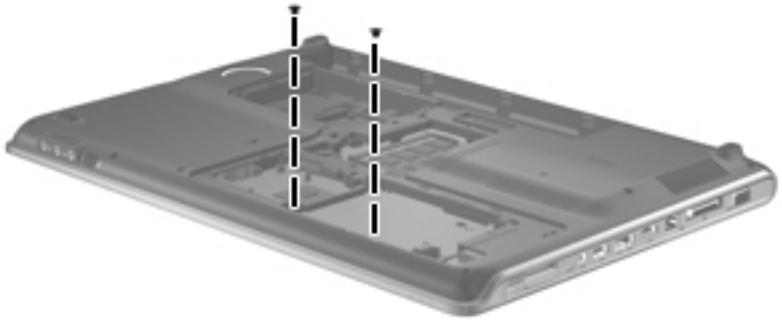


Where used: One screw that secures the power button board to the switch cover

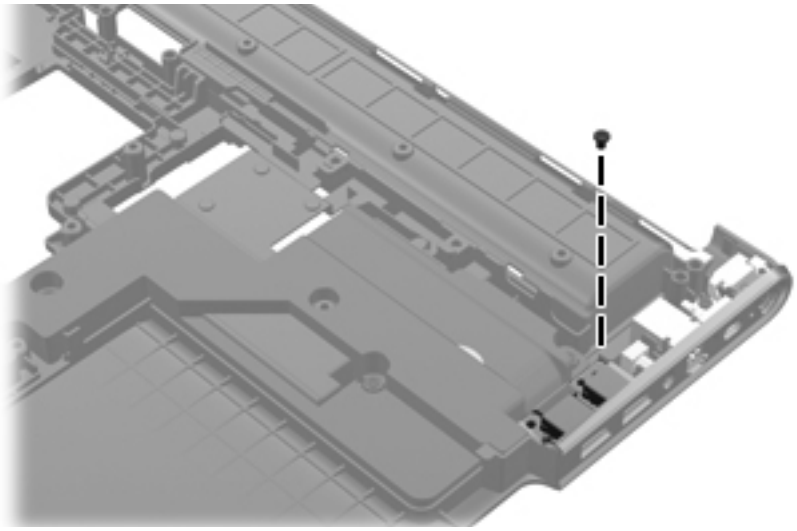
Phillips PM2.5×4.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	3	4.0 mm	2.5 mm	5.0 mm

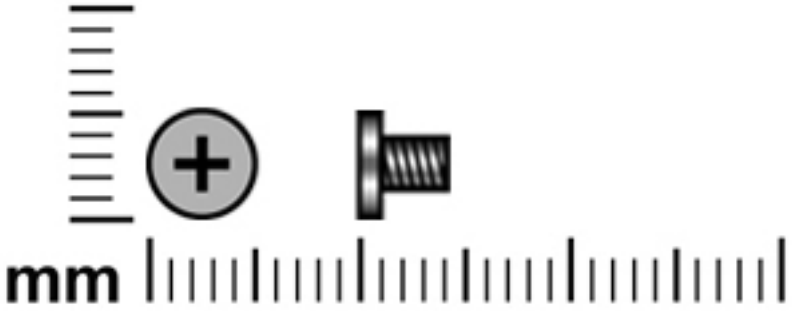


Where used: 2 screws (next to second hard drive bay) that secure the top cover to the computer

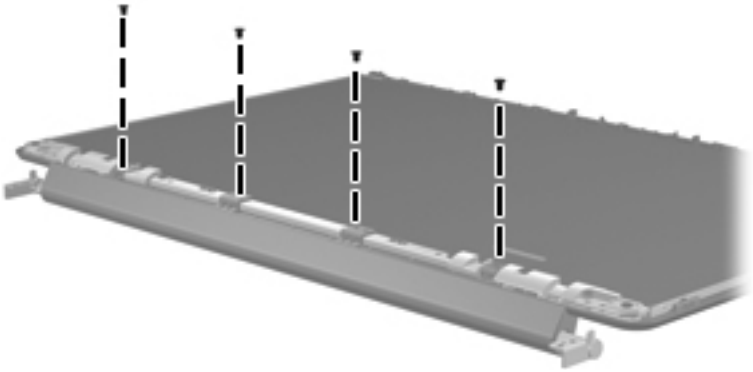


Where used: One screw that secures the USB connector board to the base enclosure

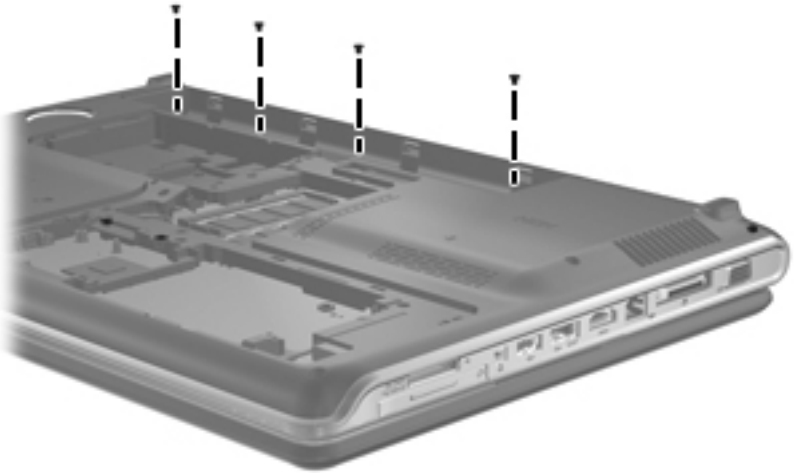
Phillips PM2.5×4.0 screw



Color	Quantity	Length	Thread	Head diameter
Silver	8	4.0 mm	2.5 mm	5.0 mm

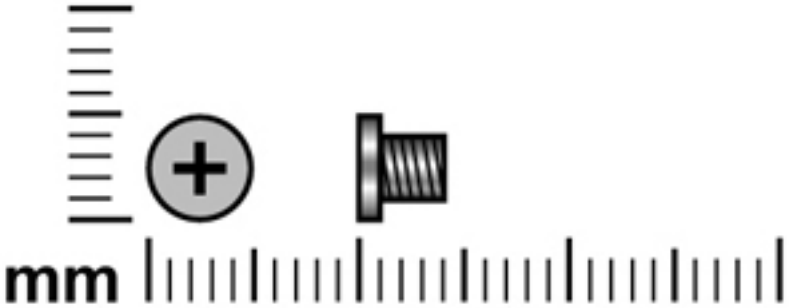


Where used: 4 screws that secure the bottom cover to the display enclosure on computer models equipped with AntiGlare display assemblies

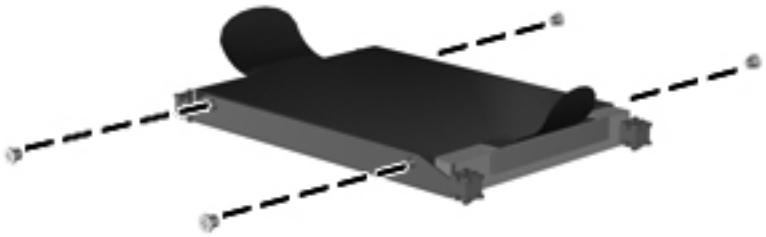


Where used: 4 screws (on the bottom of the computer) that secure the switch cover to the computer

Phillips PM3.0×4.0 screw

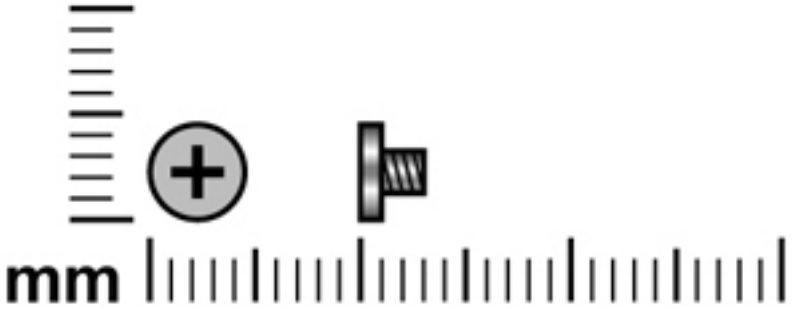


Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	3.0 mm	5.0 mm

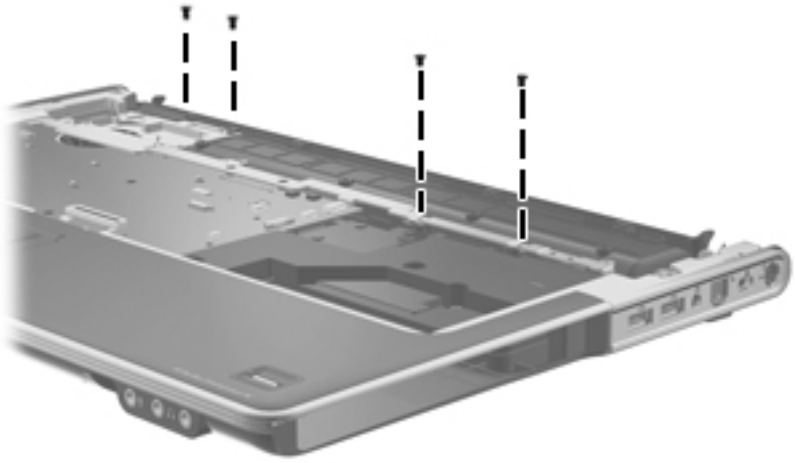


Where used: 4 screws that secure the hard drive bracket to the hard drive

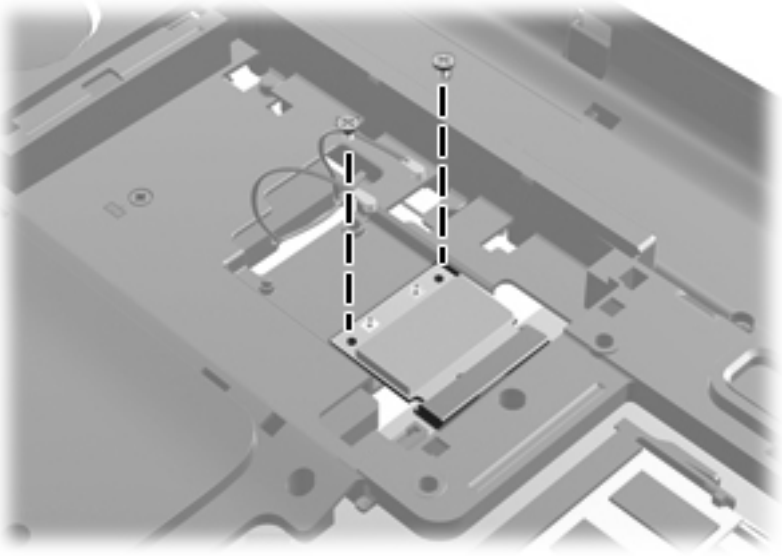
Phillips PM2.0×3.0 screw



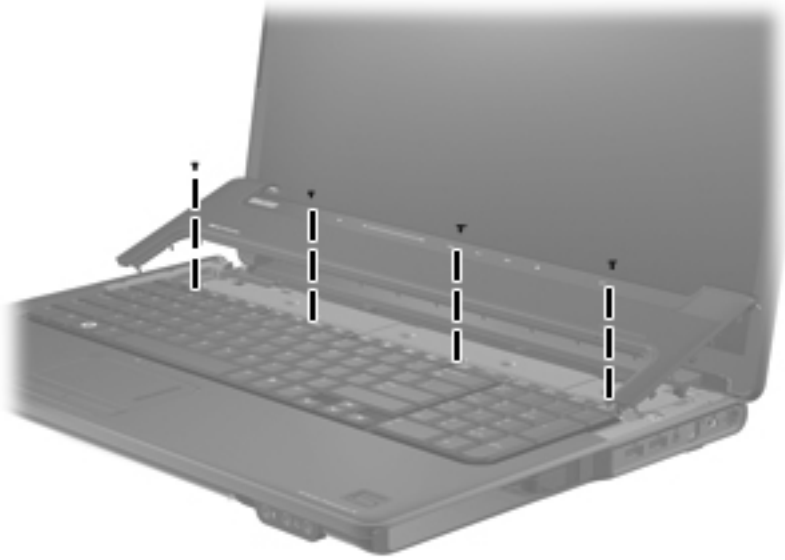
Color	Quantity	Length	Thread	Head diameter
Silver	18	3.0 mm	2.0 mm	4.0 mm



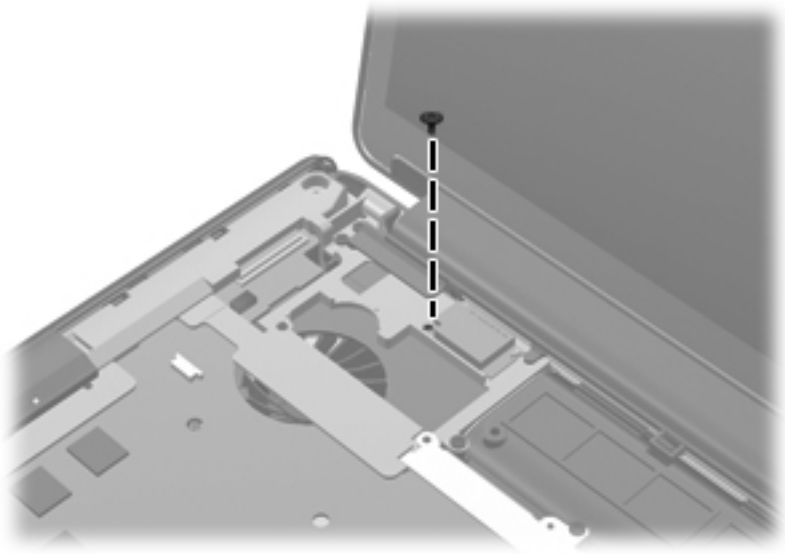
Where used: 4 screws that secure the top cover to the computer



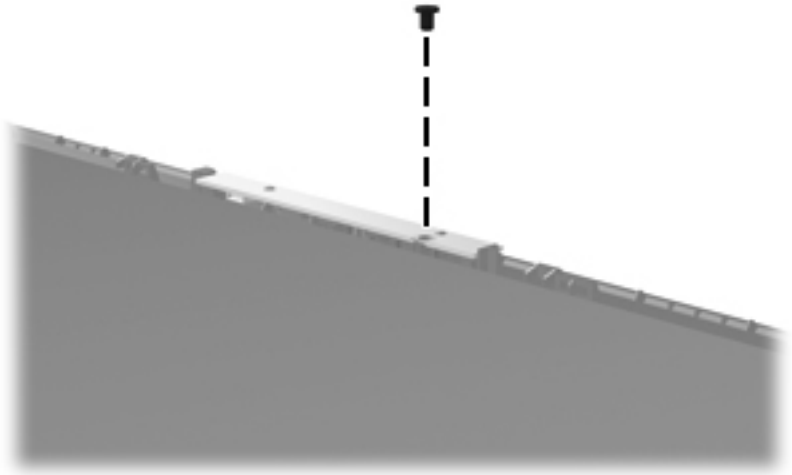
Where used: 2 screws that secure the WLAN module to the base enclosure



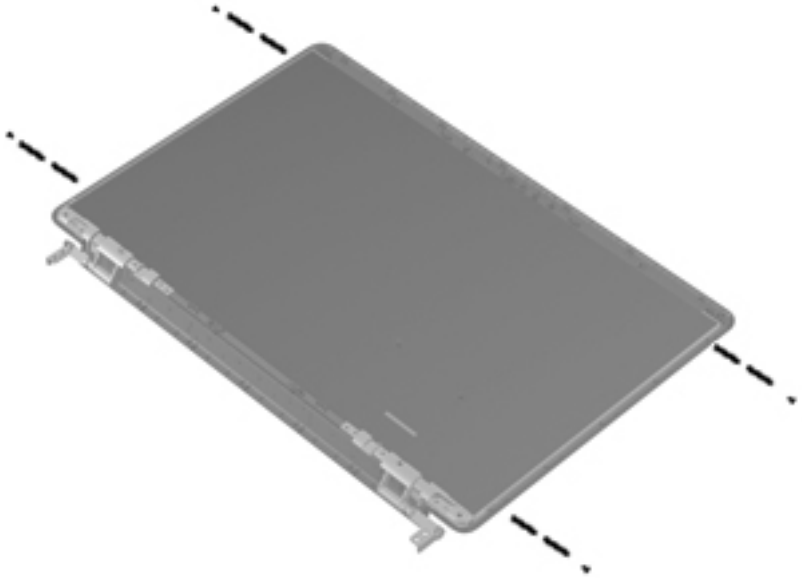
Where used: 4 screws that secure the keyboard to the computer



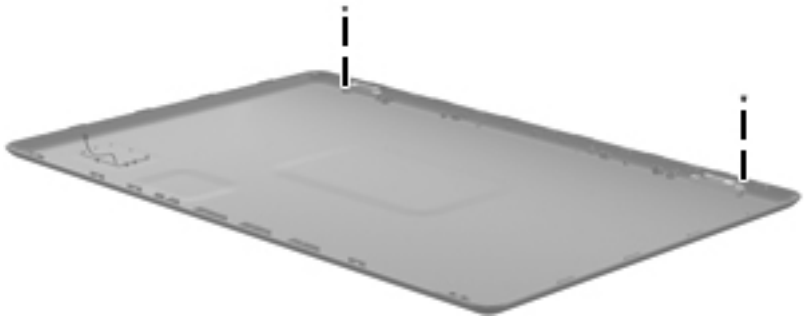
Where used: One screw that secures the Bluetooth module to the computer



Where used: One screw that secures the webcam module to the display enclosure

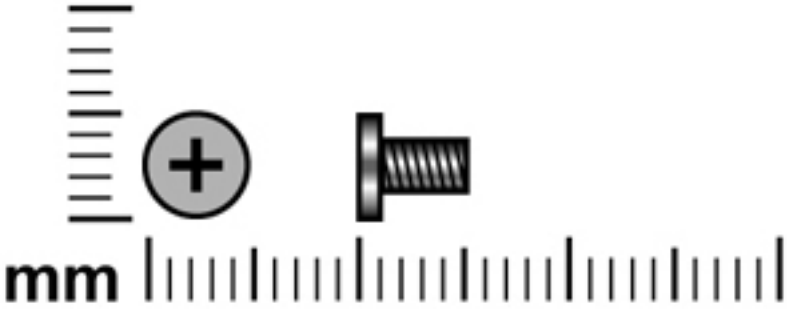


Where used: 4 screws that secure the hinge bracket to the display panel (for computers equipped with flush glass display assemblies)

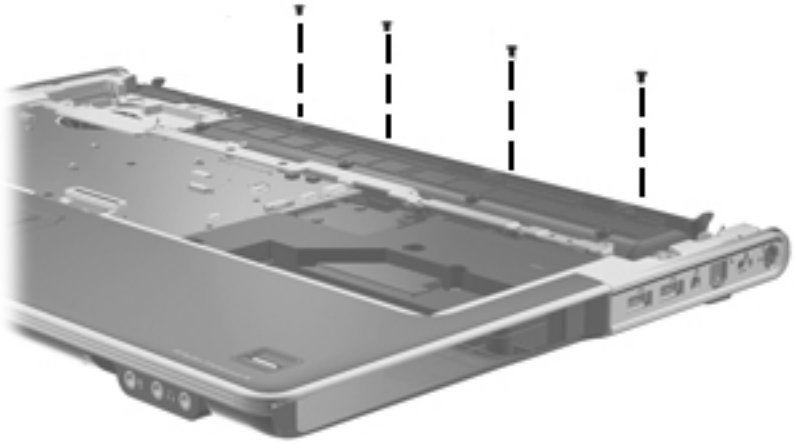


Where used: 2 screws that secure the antenna transceivers to the display enclosure (for computers equipped with flush glass display assemblies)

Phillips PM2.5×5.0 screw (black)

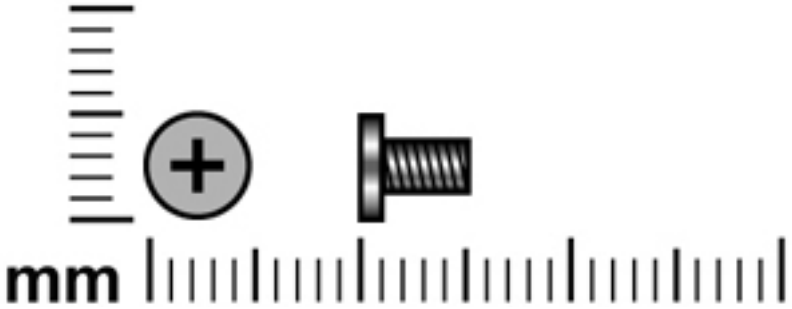


Color	Quantity	Length	Thread	Head diameter
Black	4	5.0 mm	2.5	5.0 mm

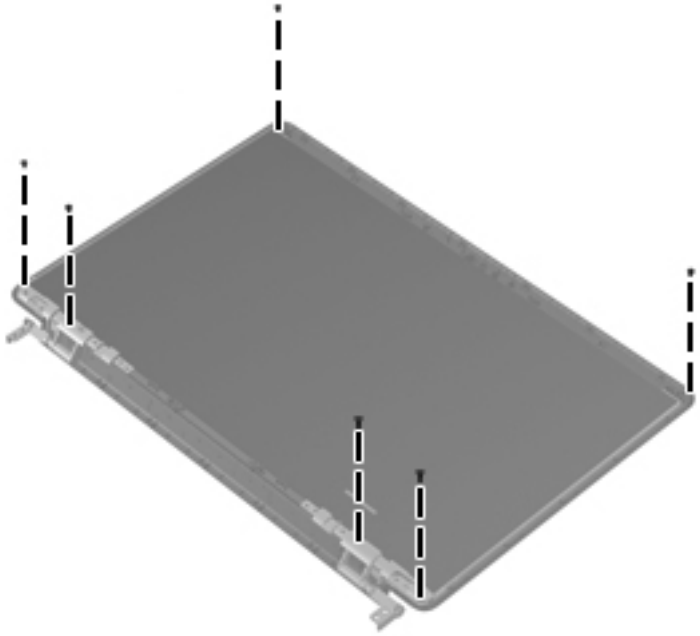


Where used: 4 screws that secure the top cover to the computer

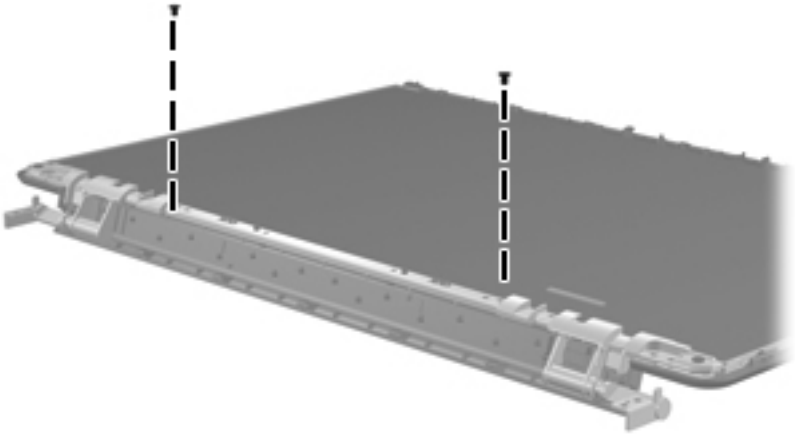
Phillips PM2.5×5.0 screw (silver)



Color	Quantity	Length	Thread	Head diameter
Silver	8	5.0 mm	2.5	5.0 mm

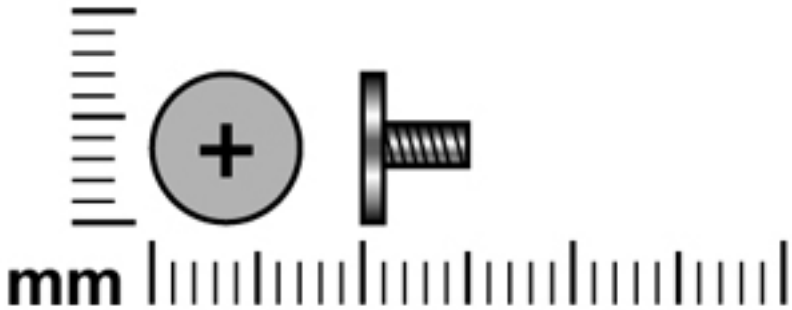


Where used: 6 screws that secure the hinges to the display panel

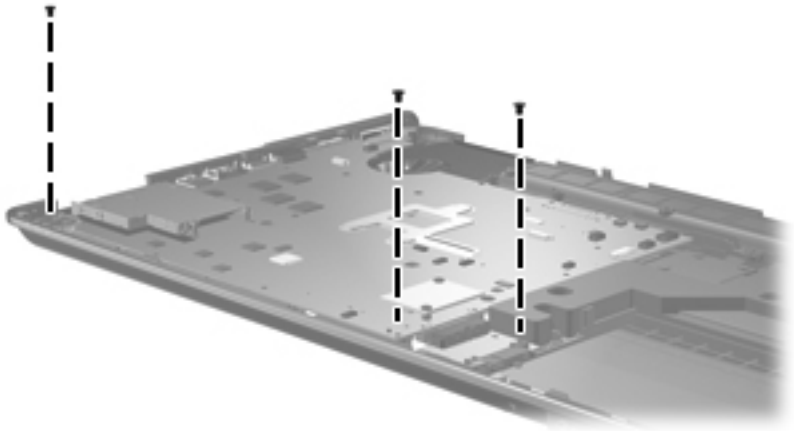


Where used: 2 screws that secure the bracket to the display panel

Phillips PM2.5×5.0 broadhead screw (black)

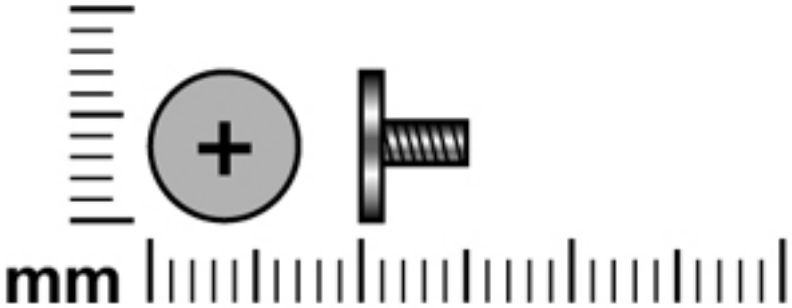


Color	Quantity	Length	Thread	Head diameter
Black	3	5.0 mm	2.5	7.0 mm

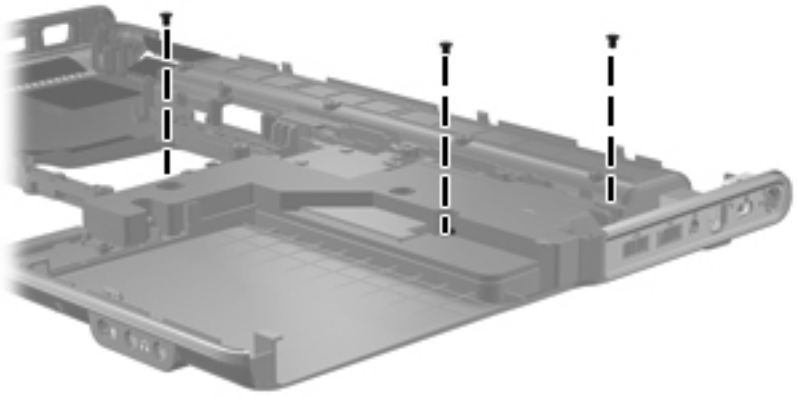


Where used: 3 broadhead screws that secure the system board to the computer

Phillips PM2.5×5.0 broadhead screw (silver)

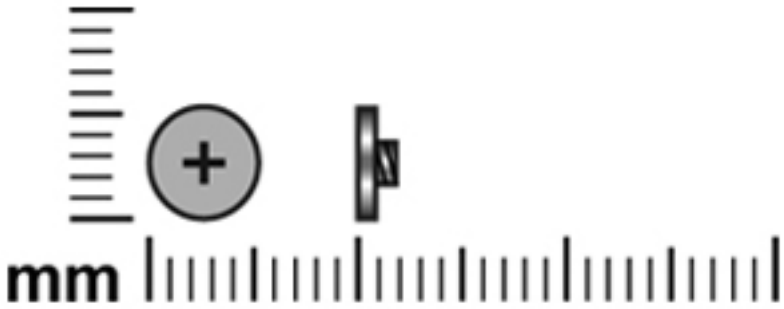


Color	Quantity	Length	Thread	Head diameter
Silver	3	5.0 mm	2.5	7.0 mm

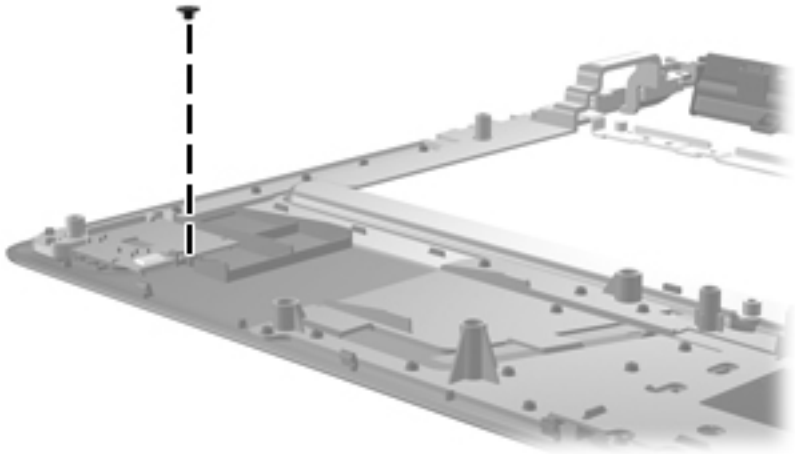


Where used: 3 broadhead screws that secure the subwoofer to the base enclosure

Phillips PM2.0×2.0 broadhead screw



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



Where used: One broadhead screw that secures the fingerprint reader board to the top cover

8

Backup and recovery

Recovering system information

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

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

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

✎ Computers with a solid-state drive (SSD) may not have a recovery partition. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, select **Start,** right-click **Computer**, click **Manage,** and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window.

Creating recovery discs

HP recommends that you create recovery discs to be sure that you can restore your system to its original factory state if you experience serious system failure or instability. Create these discs after setting up the computer for the first time.

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

✎ If your computer does not include an internal optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP Web site.

Note the following guidelines before creating recovery discs:

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

  ✎ Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs, are not compatible with the Recovery Manager software.

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

To create a set of recovery discs:

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

   Recovery Manager opens.

2. Follow the on-screen instructions.

Backing up your information

As you add new software and data files, you should back up your system on a regular basis to maintain a reasonably current backup. Back up your system at the following times:

- At regularly scheduled times

  ✎ Set reminders to back up your information periodically.

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

Note the following when backing up:

- Create system restore points using the Windows System Restore feature, and periodically copy them to disc.
- Store personal files in the Documents library and back up this folder periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

  To copy the screen and paste it into a word-processing document, follow these steps:

  a. Display the screen.

  b. Copy the screen:

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

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

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

  d. Save the document.

- You can back up your information to an optional external hard drive, a network drive, or discs.
- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD-R, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

  ✎ DVDs 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.

Using Windows Backup and Restore

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

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

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**.
2. Follow the on-screen instructions to set up and create a backup.

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.

Using system restore points

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

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

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

When to create restore points

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

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

Create a system restore point

1. Select **Start** > **Control Panel** > **System and Security** > **System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Under **Protection Settings**, select the disk for which you want to create a restore point.
5. Click **Create**.
6. Follow the on-screen instructions.

Restore to a previous date and time

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

1. Select **Start** > **Control Panel** > **System and Security** > **System**.
2. In the left pane, click **System protection**.

3. Click the **System Protection** tab.
4. Click **System Restore**.
5. Follow the on-screen instructions.

Performing a recovery

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

Recovery Manager software allows you to repair or restore the system if you experience system failure or instability. Recovery Manager works from recovery discs that you create or from a dedicated recovery partition (select models only) on the hard drive. However, if your computer includes a solid-state drive (SSD), you may not have a recovery partition. If that is the case, recovery discs have been included with your computer. Use these discs to recover your operating system and software.

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

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

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the dedicated recovery partition (select models only)

Computers with an SSD may not have a recovery partition. If the computer does not have a recovery partition, you will not be able to recover using this procedure. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software.

On some models, you can perform a recovery from the partition on the hard drive, accessed by pressing either the Start button or **f11**. This restores the computer to its factory condition.

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

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

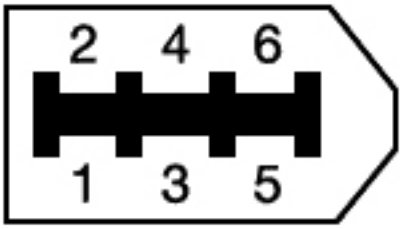
     –or–

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

9

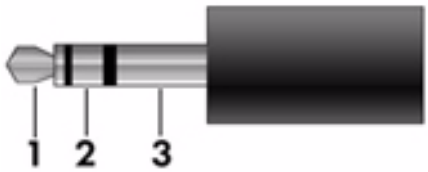
Connector pin assignments

1394



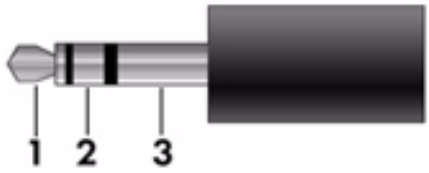
Pin	Signal
1	Power
2	Ground
3	TPB-
4	TPB+
5	TPA-
6	TPA+

Audio-in (microphone)



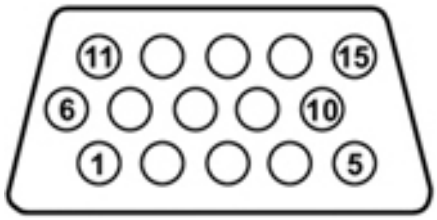
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



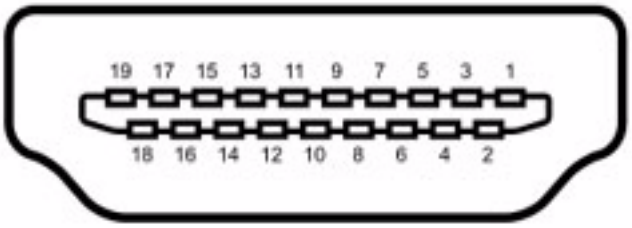
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



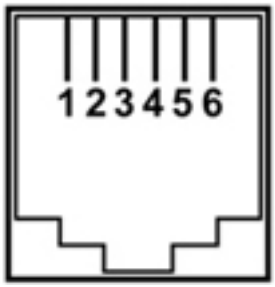
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



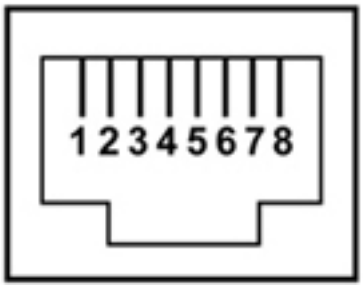
Pin	Signal
1	Transition minimized differential signal (TDMS) data 2+
2	Transition minimized differential signal (TDMS) data 2 shield
3	Transition minimized differential signal (TDMS) data 2-
4	Transition minimized differential signal (TDMS) data 1+
5	Transition minimized differential signal (TDMS) data 1 shield
6	Transition minimized differential signal (TDMS) data 1 shield
7	Transition minimized differential signal (TDMS) data 0+
8	Transition minimized differential signal (TDMS) data 0 shield
9	Transition minimized differential signal (TDMS) data 0-
10	Transition minimized differential signal (TDMS) Clock +
11	Transition minimized differential signal (TDMS) data clock shield
12	Transition minimized differential signal (TDMS) data clock-
13	Consumer electronics control (CEC)
14	Not connected
15	Display data channel (DDC) clock
16	Display data channel (DDC) data
17	Ground
18	+5V Power
19	Hot plug detect
20	Shell

RJ-11 (modem)



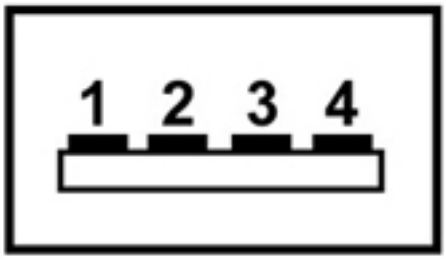
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

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 or 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 each country or region's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries or regions

Country/region Accredited agency	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: 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.

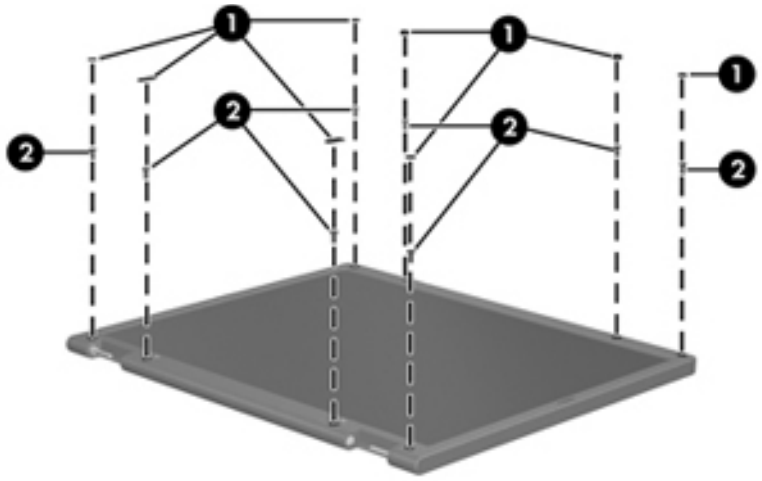
Materials Disposal. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see 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 ❶ and the liquid crystal display (LCD) panel ❷.

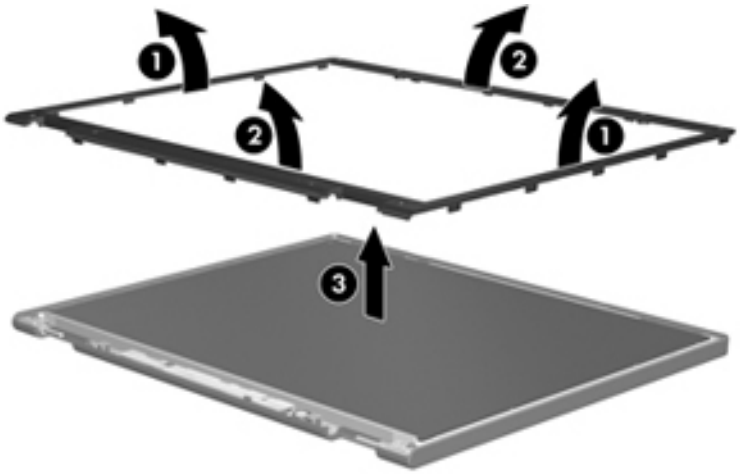
The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

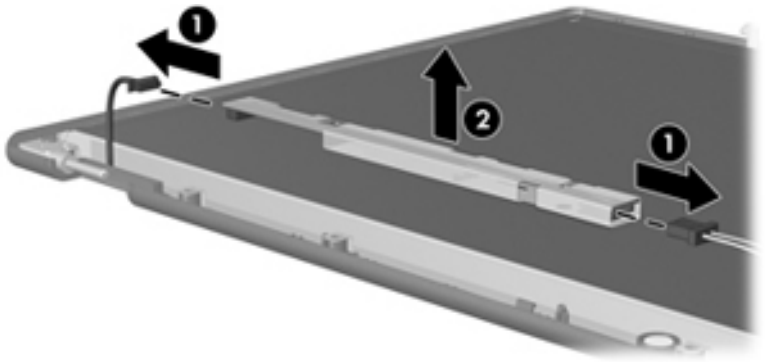
1. Remove all screw covers ❶ and screws ❷ that secure the display bezel to the display assembly.



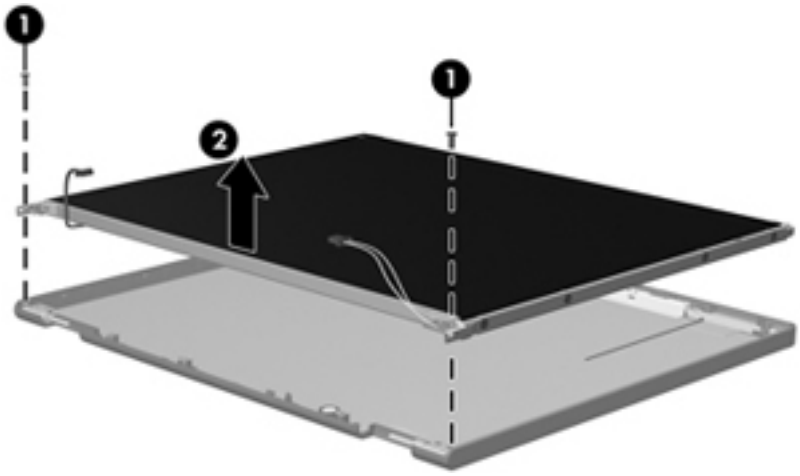
2. Lift up and out on the left and right inside edges ❶ and the top and bottom inside edges ❷ of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ❸.



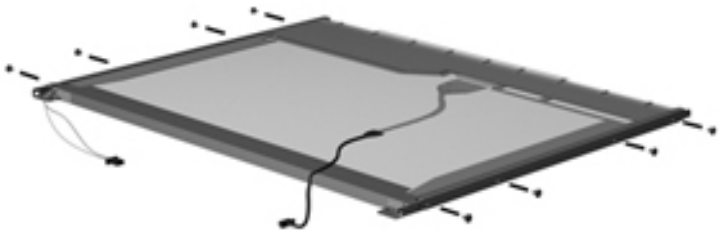
4. Disconnect all display panel cables ❶ from the display inverter and remove the inverter ❷.



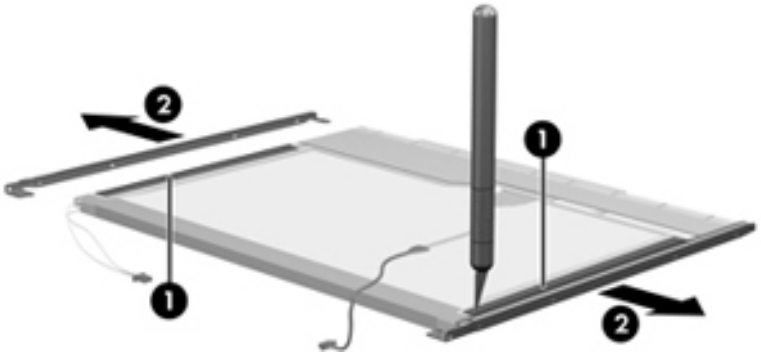
5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly ❷ from the display enclosure.



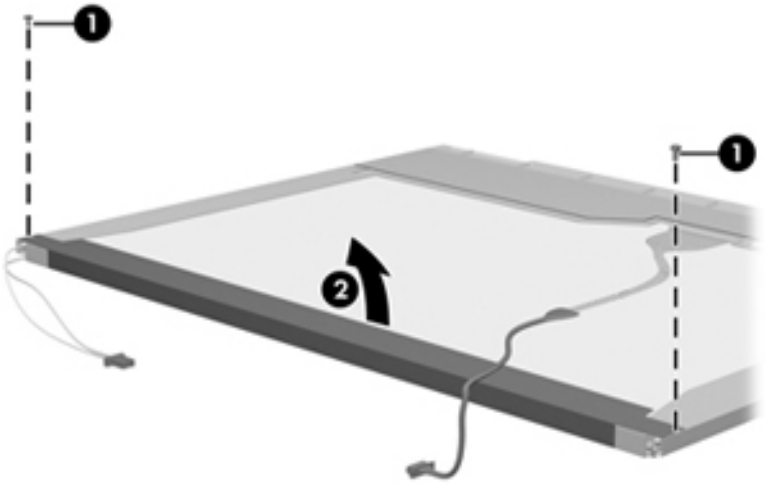
7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



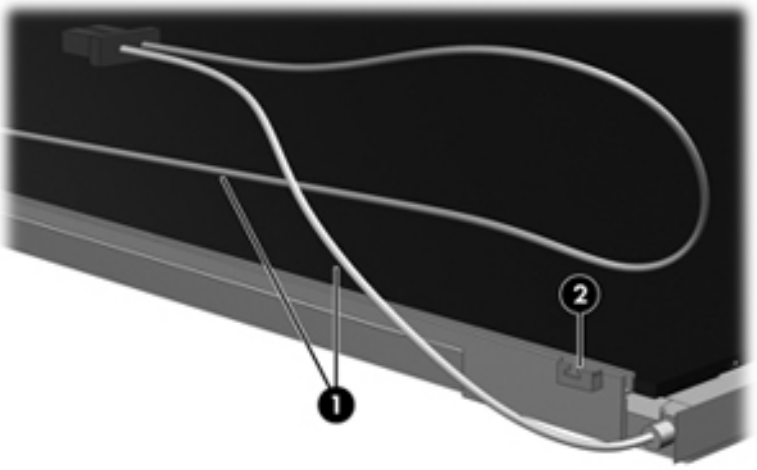
9. Use a sharp-edged tool to cut the tape ❶ that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



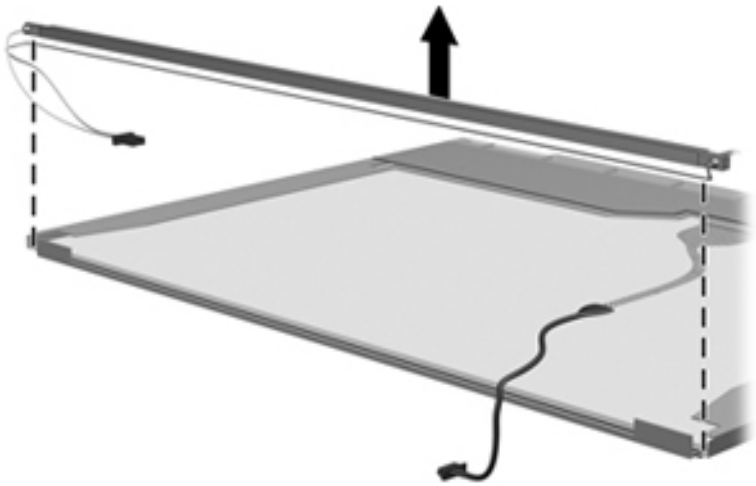
11. Remove the screws ❶ that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover ❷ and swing it outward.



13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables ❶ from the clip ❷ in the display panel.

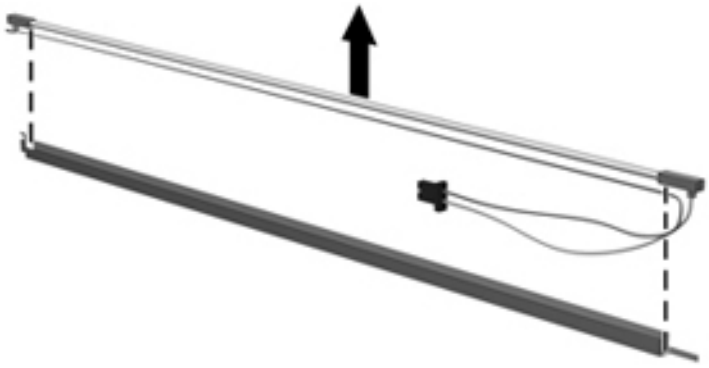


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

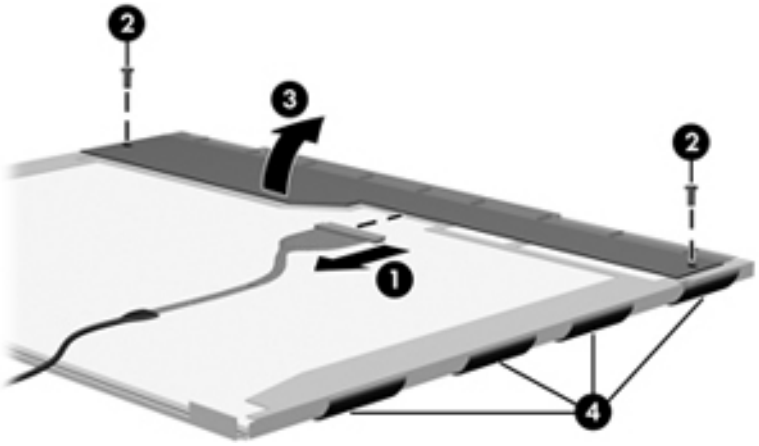


WARNING: The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

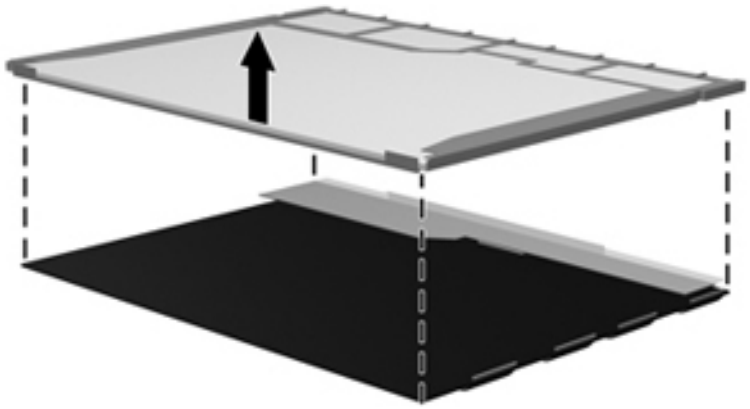
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel cable ❶ from the LCD panel.
20. Remove the screws ❷ that secure the LCD panel to the display rear panel.
21. Release the LCD panel ❸ from the display rear panel.
22. Release the tape ❹ 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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