HP ProBook 4410s Notebook PC
HP ProBook 4411s Notebook PC
HP ProBook 4510s Notebook PC

Maintenance and Service Guide

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MSG revision history

Revision	Publication date	Description
A	October 2009	• Added information indicating support for DDR3 memory in the following location: Memory module on page 68. • Updated commodities in the following location: Product description on page 1. • Added newly supported memory modules to spare parts listings in the following locations: Computer major components on page 35, Sequential part number listing on page 48, Memory module on page 68 • Added newly supported processors to spare parts listings in the following locations: Computer major components on page 35, Sequential part number listing on page 48, Processor on page 110 • Added newly supported WLAN modules to spare parts listings in the following locations: Computer major components on page 35, Sequential part number listing on page 48, WLAN module on page 80 • Added newly supported hard drives to spare parts listings in the following locations: Computer major components on page 35, Sequential part number listing on page 48, Mass storage devices on page 46, Hard drive on page 78 • Added a newly supported Bluetooth module to spare parts listings in the following locations: Computer major components on page 35, Sequential part number listing on page 48, Bluetooth module on page 102 • Added newly supported system boards to spare parts listings in the following locations: Computer major components on page 35, Sequential part number listing on page 48, System board on page 112 • Added newly supported AC adapter to spare parts listings in the following locations: Miscellaneous parts on page 47, Sequential part number listing on page 48 • Changes to top cover descriptions in the following locations: Computer major components on page 35, Sequential part number listing on page 48, Top cover on page 90 • Deleted display cable spare part from the following locations: Display assembly components on page 43Sequential part number listing on page 48, Display assembly on computers with 15-in displays on page 84

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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	14" UMA/ GL40	14" UMA/ GL45	14" discrete	15.6" UMA/ GL40	15.6" UMA/ GL45	15.6" discrete
Product Name	HP ProBook 4410s Notebook PC	√	√				
	HP ProBook 4411s Notebook PC			√			
	HP ProBook 4510s Notebook PC				√	√	√
Processors	Intel® Core™2 Duo processors						
	• T9600 2.80-GHz, 6-MB L2 cache, 1066-MHz front side bus (FSB)	√	√	√	√	√	√
	• T9400 2.53-GHz, 6-MB L2 cache, 1066-MHz FSB	√	√	√	√	√	√
	• P8700 2.53-GHz, 3-MB L2 cache, 1066-MHz FSB	√	√	√	√	√	√
	• P8600 2.40-GHz, 3-MB L2 cache, 1066-MHz FSB	√	√	√	√	√	√
	• *P7570 2.26-GHz, 3-MB L2 cache, 1066-MHz FSB*		√	√		√	√
	• P7370 2.0-GHz, 3-MB L2 cache, 1066-MHz FSB	√	√	√	√	√	√
	• *T6670 2.2-GHz, 2-MB L2 cache, 800-MHz FSB*		√	√		√	√
	• T6570 2.1-GHz, 2-MB L2 cache, 800-MHz FSB	√	√	√	√	√	√
	• T5870 2.0-GHz, 2-MB L2 cache, 800-MHz FSB	√	√	√	√	√	√
	Intel Celeron® M processors						
	• 900 2.20-GHz, 1-MB L2 cache, 800-MHz FSB	√		√	√		√
	• 585 2.16-GHz, 2-MB L2 cache,800-MHz FSB	√		√	√		√
	Intel Pentium® Dual-Core processors						

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	• *T4400 2.2-GHz, 1-MB L2 cache, 800-MHz FSB*	√	√	√	√	√	√
	• *T4300 2.1-GHz, 1-MB L2 cache, 800-MHz FSB*	√	√	√	√	√	√
	• *T4200 2.0-GHz, 1-MB L2 cache, 800-MHz FSB*	√	√	√	√	√	√
	Intel Celeron Dual-Core processors						
	• *T3100 1.9-GHz, 1-MB L2 cache, 800-MHz FSB*	√		√	√		√
	• *T3000 1.8-GHz, 1-MB L2 cache, 800-MHz FSB*	√		√	√		√
	• T1700 1.83-GHz, 1-MB L2 cache, 667-MHz FSB	√		√	√		√
	• T1600 1.66-GHz, 1-MB L2 cache, 667-MHz FSB	√		√	√		√
Chipsets	Northbridge: Intel GL40 with up to 667-MHz FSB	√			√		
	Northbridge: Intel GM45 with up to 1066-MHz FSB		√			√	
	Northbridge: Intel PM45 with up to 1066-MHz FSB			√			√
	Southbridge: Intel ICH9M	√	√	√	√	√	√
Graphics	Intel Universal Memory Architecture (UMA) graphics subsystem integrated with shared video memory (dynamically allocated)	√	√		√	√	
	AMD Discrete Graphics ATI-M92S2LP w/Hypermemory support			√			√
Panels	All display assemblies support privacy filter	√	√	√	√	√	√
	• 14.0-in HD AntiGlare	√	√	√			
	• 14.0-in HD BrightView	√	√	√			
	• 14.0-in HD AntiGlare with webcam	√	√	√			
	• 14.0-in HD BrightView with webcam	√	√	√			
	• 15.6-in HD BrightView				√	√	√
	• 15.6-in HD BrightView with webcam				√	√	√
	• 15.6-in HD BrightView with webcam and WWAN				√	√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	• 15.6-in HD+ AntiGlare with webcam				√	√	√
	• 15.6-in HD+ AntiGlare with webcam and WWAN				√	√	√
Memory	2 customer-accessible/ upgradable memory module slots	√	√	√	√	√	√
	Supports dual-channel memory	√	√	√	√	√	√
	Supports up to 4 GB of system RAM	√			√		
	Supports up to 8 GB of system RAM		√	√		√	√
	PC2-5300, 800-MHz, DDR2	√	√	√	√	√	√
	Supports the following configuration in all countries and regions except Brazil: • 8192-MB total system memory (4096 x 2, dual-channel)		√	√		√	√
	Supports the following configurations in all countries and regions except Brazil: • 4096-MB total system memory (4096 × 1, dual-channel) • 4096-MB total system memory (2048 × 2, dual-channel) • 3072-MB total system memory (2048 + 1024) • 2048-MB total system memory (1024 × 2, dual-channel) • 2048-MB total system memory (2048 × 1) • 1024-MB total system memory (1024 × 1)		√	√		√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	Supports the following configurations only in Brazil: • 3072-MB total system memory (2048 x 1024, dual-channel) • 2048-MB total system memory (2048 × 1) • 2048-MB total system memory (1024 × 2, dual-channel) • 1024-MB total system memory (1024 × 1)	√	√	√			√
	PC3-10600, 1333-MHz, DDR3	√	√	√	√	√	√
	Supports the following configurations in all countries and regions except Brazil: • *8092-MB total system memory (4096 x 2, dual-channel)*		√	√		√	√
	Supports the following configurations in all countries and regions except Brazil: • *4096-MB total system memory (4096 x 1)* • *4096-MB total system memory (2048 x 2, dual-channel)* • *3072-MB total system memory (2048 + 1024, dual-channel)* • *2048-MB total system memory (2048 x 1)* • *2048-MB total system memory (1024 x 2, dual-channel)* • *1024-MB total system memory (1024 x 1)*	√	√	√	√	√	√
	Supports the following configurations only in Brazil: • *3072-MB total system memory (2048 + 1024, dual-channel)* • *2048-MB total system memory (2048 x 1)*	√	√	√	√	√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
Hard drives	Supports 9.5-mm, 6.35-cm (2.50-in) hard drives	√	√	√	√	√	√
	Customer-accessible	√	√	√	√	√	√
	Serial ATA	√	√	√	√	√	√
	Supports the following drives:	√	√	√	√	√	√
	• 500-GB, 7200-rpm						
	• 500-GB, 5400-rpm						
	• *320-GB, 7200-rpm*						
	• 320-GB, 5400-rpm						
	• *250-GB, 7200-rpm*						
	• 250-GB, 5400-rpm						
	• 160-GB, 7200-rpm						
	• 160-GB, 5400-rpm						
	HP 3D DriveGuard (not available on Linux)	√	√	√	√	√	√
Optical drives	Fixed	√	√	√	√	√	√
	12.7-mm tray load	√	√	√	√	√	√
	Supports option of no optical drive	√	√	√	√	√	√
	Supports the following drives:						
	• DVD-ROM Drive	√	√	√	√	√	√
	• DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with Lightscribe	√	√	√	√	√	√
	• Blu-ray ROM DVD±RW SuperMulti DL Drive		√	√		√	√
Diskette drive	Supports external USB diskette drive only	√	√	√	√	√	√
Audio	HD audio - ADI1984	√	√	√	√	√	√
Modem	56K V.92 3.8 cm (1.5-in) data/ fax modem	√	√	√	√	√	√
	Supports no modem option	√	√	√	√	√	√
Ethernet	10/100/1000 Ethernet network interface card (NIC)	√	√	√	√	√	√
	S3/S4/S5 wake on LAN: AC - yes	√	√	√	√	√	√
Wireless	**Integrated WLAN options by way of wireless module:**						

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	2 WLAN antennas built into display assembly	√	√	√	√	√	√
	Support for no-WLAN option	√	√	√	√	√	√
	Support for the following WLAN formats: • Broadcom 802.11a/b/g/n • Broadcom 802.11b/g	√	√	√	√	√	√
	• Intel 802.11 a/b/g • Intel 802.11 a/b/g/n	√	√	√	√	√	√
	• *Intel Wi-Fi Link 1000, 802.11b/g* • *Intel Wi-Fi Link 1000, 802.11 b/g/n*	√	√	√	√	√	√
	Integrated personal area network (PAN) options by way of Bluetooth® module:						
	Support for no-WPAN option	√	√	√	√	√	√
	Bluetooth 2.1	√	√	√	√	√	√
	Bluetooth 2.0	√	√	√	√	√	√
	Integrated WWAN options by way of HP Mobile Broadband Module:						
	WWAN module UNDP with 2 antennas (not available with Linux)				√	√	√
External media cards	One ExpressCard/54 slot	√	√	√	√	√	√
	Media Card Reader supporting Memory Stick (MS), Memory Stick Pro (MSP), Secure Digital (SD) Memory Card, Secure Digital High Capacity (SDHC) Memory Card, MultiMediaCard (MMC), and xD-Picture Card formats	√	√	√	√	√	√
Ports	Audio-in (stereo microphone)	√	√	√	√	√	√
	Audio-out (stereo headphone)	√	√	√	√	√	√
	RJ-11 (modem)	√	√	√	√	√	√
	RJ-45 (Ethernet, includes link and activity lights)	√	√	√	√	√	√
	USB 2.0 (4)	√	√	√	√	√	√
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)	√	√	√	√	√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	Multi-pin AC power	√	√	√	√	√	√
	HDMI	√	√	√	√	√	√
Keyboard/ pointing devices	14.0-in keyboard with TouchPad	√	√	√			
	15.6-in keyboard with TouchPad				√	√	√
	TouchPad only, with 2 TouchPad buttons and vertical scrolling (taps enabled as default)	√	√	√	√	√	√
Power requirements	65-W AC adapter with localized cable plug support (3-wire plug with ground pin)	√	√		√	√	
	90-W AC adapter with localized cable plug support (3-wire plug with ground pin)			√			√
	6-cell, 47-Wh Li-ion battery	√	√	√			
	8-cell, 63-Wh Li-ion battery				√	√	√
	6-cell, 47-Wh Li-ion battery				√	√	√
Security	Supports Kensington security lock	√	√	√	√	√	√
Operating system	**Preinstalled with Microsoft® Office:**						
	Windows 7 Home Basic 32 with Office 2007 Ready (excludes Japan)	√	√	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Ready (excludes Japan)	√	√	√	√	√	√
	Windows 7 Home Premium 32 E with Office 2007 Ready (excludes Japan)	√	√	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Personal (Japan only)	√	√	√	√	√	√
	Windows 7 Home Premium 32 E with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Professional (Japan only)	√	√	√	√	√	√
	Windows 7 Professional with Office 2007 Ready (excludes Japan)	√	√	√	√	√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	Windows 7 Professional with Office 2007 Ready (excludes Japan)	√	√	√	√	√	√
	Windows 7 Professional with Office 2007 Personal (Japan only)	√	√	√	√	√	√
	Windows 7 Professional with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√	√	√
	Windows 7 Professional with Office 2007 Professional (Japan only)	√	√	√	√	√	√
	Windows Vista® Home Basic 32 with Office 2007 Ready	√	√	√	√	√	√
	Windows Vista Home Basic 32 with Office 2007 Personal (Japan only)	√	√	√	√	√	√
	Windows Vista Home Basic 32 with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√	√	√
	Windows Vista Home Basic 32 with Office 2007 Professional (Japan only)	√	√	√	√	√	√
	Windows Vista Home Premium 32 with Office 2007 Ready				√	√	√
	Windows Vista Business 32 with Office 2007 Ready	√	√	√	√	√	√
	Windows Vista Business 32 with Office 2007 Personal (Japan only)	√	√	√	√	√	√
	Windows Vista Business 32 with Office Personal with PowerPoint (Japan only)	√	√	√	√	√	√
	Windows Vista Business 32 with Office Professional (Japan only)	√	√	√	√	√	√
	Windows Vista Business 32 (with XP Pro images) with Office 2007 Ready	√	√	√	√	√	√
	Windows Vista Business 32 (with XP Pro images) with Office 2007 Personal (Japan only)	√	√	√	√	√	√
	Windows Vista Business 32 (with XP Pro images) with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√	√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	Windows Vista Business 32 (with XP Pro images) with Office 2007 Professional (Japan only)	√	√	√	√	√	√
	SuSE Linux	√	√	√	√	√	√
	Preinstalled:						
	Windows 7 Professional 32 (Japan only)	√	√	√	√	√	√
	Windows 7 Home Premium 32 (Japan only)	√	√	√	√	√	√
	Windows Vista Home Basic 32 with MS Basics (Japan only)	√	√	√	√	√	√
	Windows Vista Business 32 with MS Basics (Japan only)	√	√	√	√	√	√
	Windows Vista Business 32 (with XP Professional images) with MS Basics (Japan only)	√	√	√	√	√	√
	FreeDOS	√	√	√	√	√	√
	RedFlag Linux (People's Republic of China only)	√	√	√	√	√	√
	Restore media:						
	Windows 7 Home Basic 32	√	√	√	√	√	√
	Windows 7 Home Premium 32	√	√	√	√	√	√
	Windows 7 Home Premium 64	√	√	√	√	√	√
	Windows 7 Professional 32	√	√	√	√	√	√
	Windows 7 Professional 64	√	√	√	√	√	√
	DRDVD Windows 7	√	√	√	√	√	√
	Windows Vista Home Basic 32	√	√	√	√	√	√
	Windows Vista Home Premium	√	√	√	√	√	√
	Windows Vista Business 32	√	√	√	√	√	√
	Windows® XP Professional	√	√	√	√	√	√
	SuSE Linux	√	√	√	√	√	√
	Red Flag Linux (in the People's Republic of China only)	√	√	√	√	√	√
	DRDVD Windows Vista	√	√	√	√	√	√
	DRDVD Windows XP Pro	√	√	√	√	√	√
	Windows Vista Office Ready DVD	√	√	√	√	√	√

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Category	Description	14” UMA/ GL40	14” UMA/ GL45	14” discrete	15.6” UMA/ GL40	15.6” UMA/ GL45	15.6” discrete
	Certified: Microsoft® WHQL	√	√	√	√	√	√
	Web Support:	√	√	√	√	√	√
	All Windows Vista versions	√	√	√	√	√	√
	Windows XP Professional	√	√	√	√	√	√
	SuSE Linux	√	√	√	√	√	√
Serviceability	**End-user replaceable parts:**						
	AC adapter	√	√	√			√
	Battery (system)	√	√	√			√
	Hard drive	√	√	√			√
	Memory module	√	√	√			√
	Optical drive	√	√	√			√
	WLAN module	√	√	√			√
	WWAN module				√	√	√

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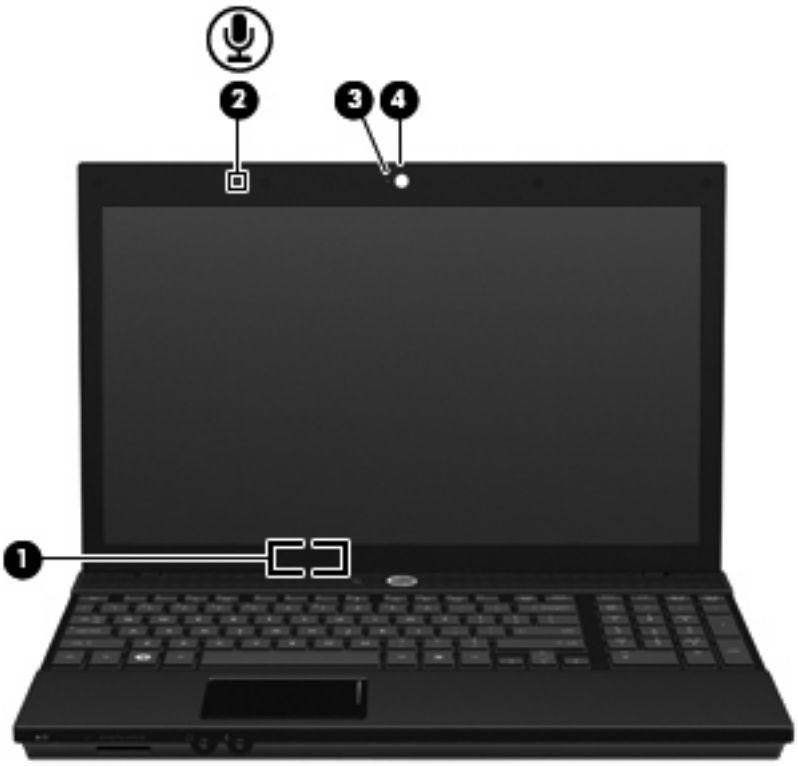
2 External component identification

Windows Vista and Windows XP

Display

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



Component		Description
(1)	Internal display switch	Turns off the display if the display is closed while the power is on.
(2)	Internal microphone	Records sound.
(3)	Webcam light (select models only)	On: The webcam is in use.
(4)	Webcam (select models only)	Records audio and video and captures still photographs.

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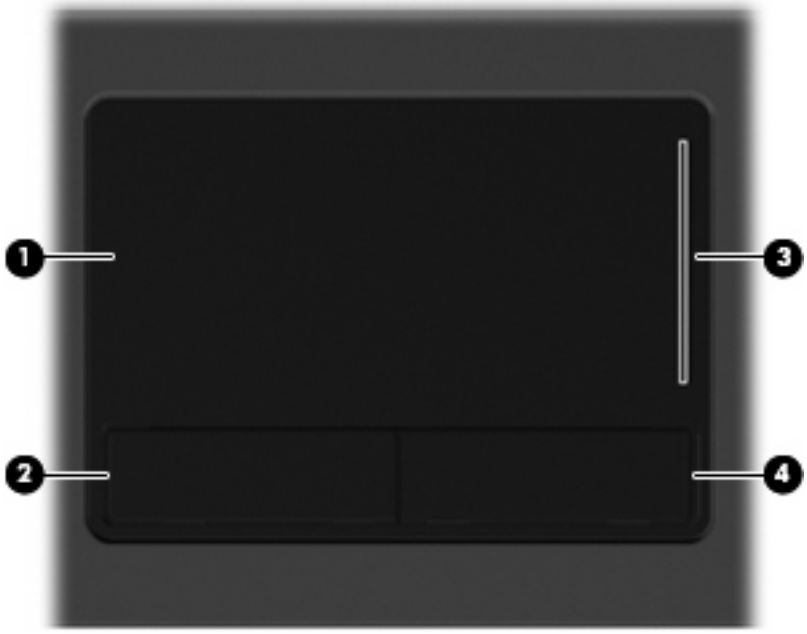
Top components

Pointing devices



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

*This table describes factory settings.

To view or change pointing device preferences in Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**. To view or change pointing device preferences in Windows XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

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Lights

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

Component		Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Info Center/QuickLook light	• On: The computer is on. • Blinking (5 times): ◦ When the computer is on, press button to launch Info Center. ◦ When the computer is off or in Hibernation, press button to launch QuickLook. • Off: The computer is off or in the Sleep state (Windows Vista) or Standby (Windows XP).
(3)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP). • Off: The computer is off or in Hibernation.

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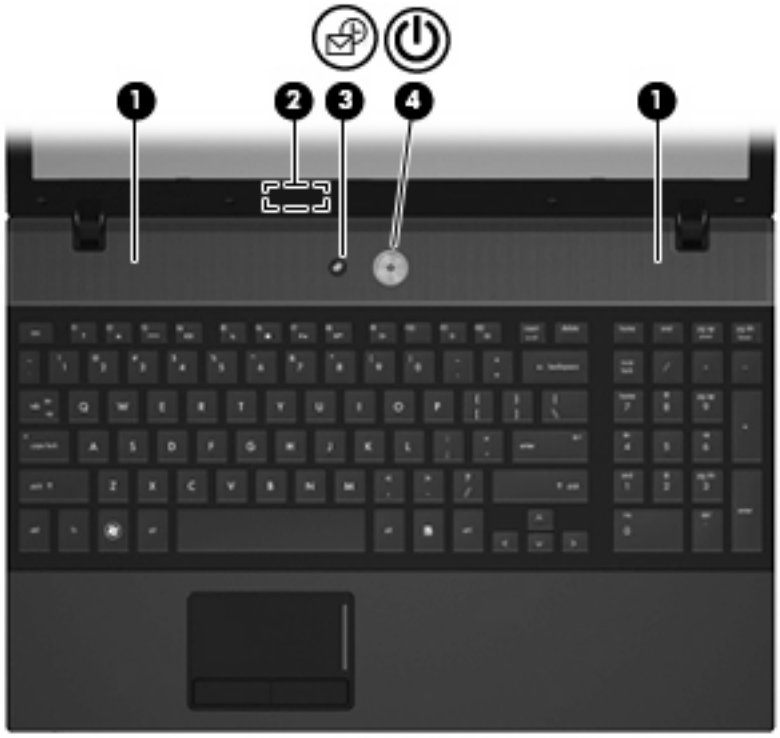
Buttons, switches, and speakers

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



Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Internal display switch	Turns off the display if the display is closed while the power is on.
(3)	Info Center/Quick Look button	Launches Info Center or QuickLook.
(4)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to shut down the computer. • When the computer is in the Sleep state (Windows Vista) or Standby (Windows XP), press the button briefly to exit Sleep or Standby. • When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings and how to change them, select **Start > Control Panel > System and Maintenance > Power Options**.

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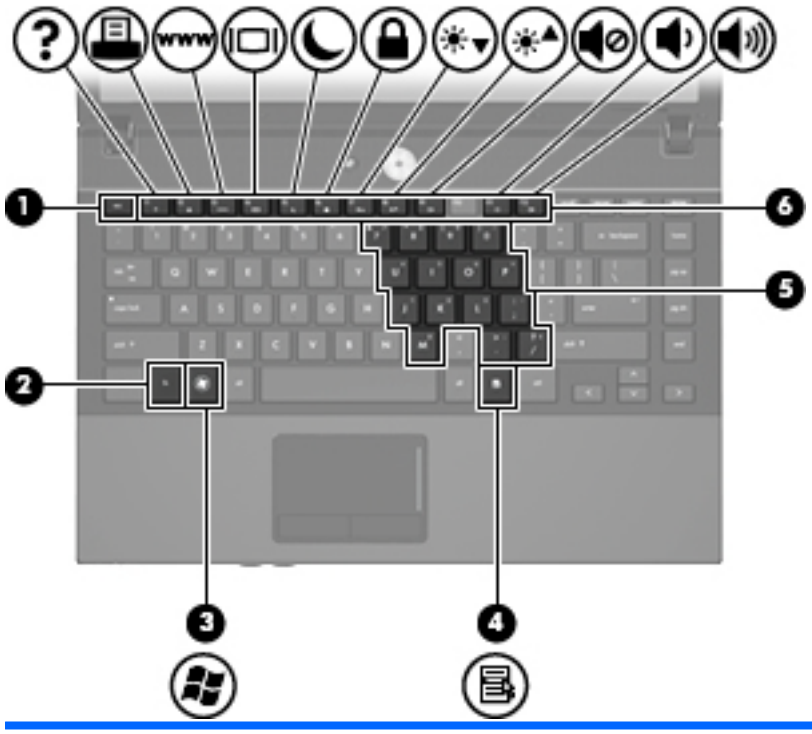
Keys

NOTE: Refer to the illustration that most closely matches your computer.



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

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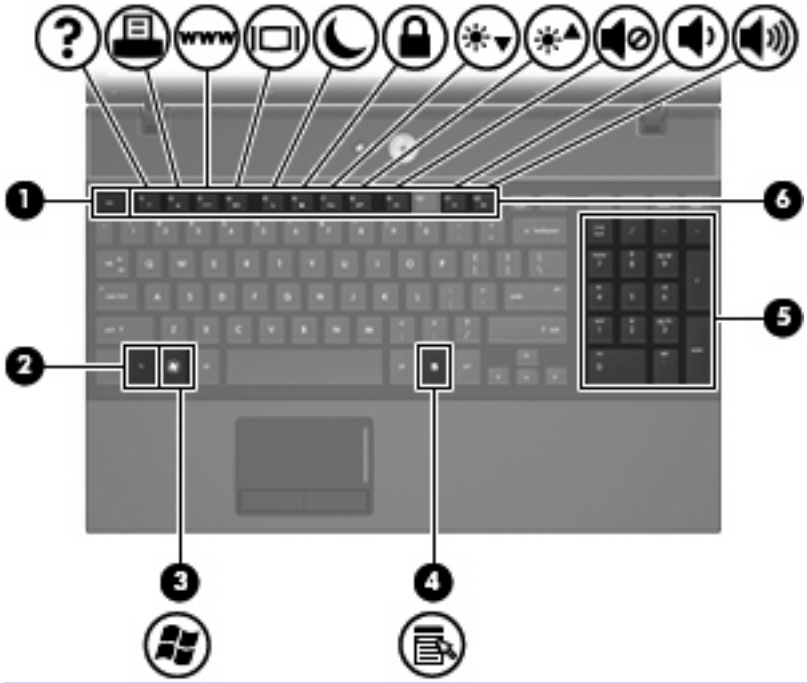

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications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

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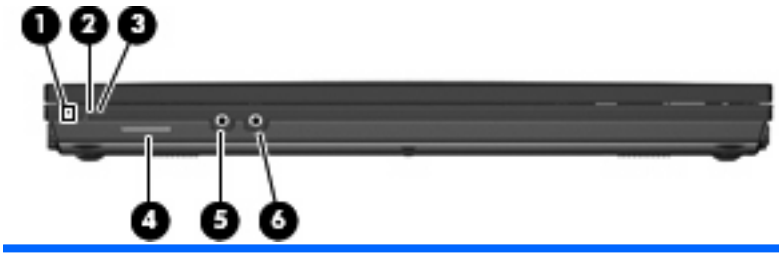
Front components



Component		Description
(1)	Drive light	• Blinking turquoise: The hard drive or optical drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	Wireless switch	Turns the wireless feature on or off but does not establish a wireless connection. **NOTE:** You must set up or access a wireless network to establish a wireless connection.
(3)	Wireless light	• Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on. • Amber: All wireless devices are off.
(4)	Media Card Reader	Supports the following optional digital card formats: • Memory Stick (MS) • Memory Stick Pro (MSP) • MultiMediaCard (MMC) • MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Secure Digital High Speed (SDHS) Memory Card • xD-Picture Card (XD) • xD-Picture Card (XD) Type H • xD-Picture Card (XD) Type M
(5)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. **NOTE:** When a device is connected to the headphone jack, the computer speakers are disabled.
(6)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

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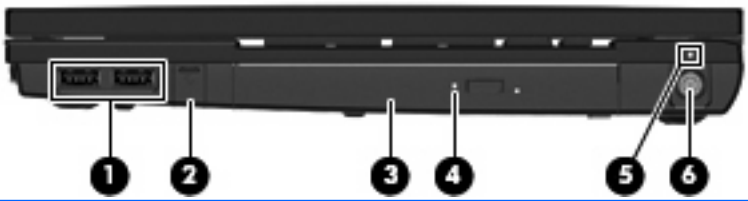
Right-side components



Component		Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	Optical drive (select models only)	Reads optical discs and, on select models, also writes to optical discs.
(4)	Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(5)	Battery light	• Amber: A battery is charging. • Turquoise: A battery is close to full charge capacity. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(6)	Power connector	Connects an AC adapter.

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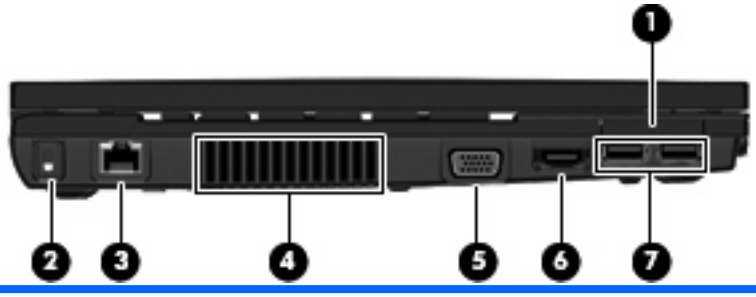
Left-side components



Component		Description
(1)	ExpressCard slot	Supports optional ExpressCards.
(2)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	External monitor port	Connects an external VGA monitor or projector.
(6)	HDMI port	Connect an optional HDMI device.
(7)	USB ports (2)	Connect optional USB devices.

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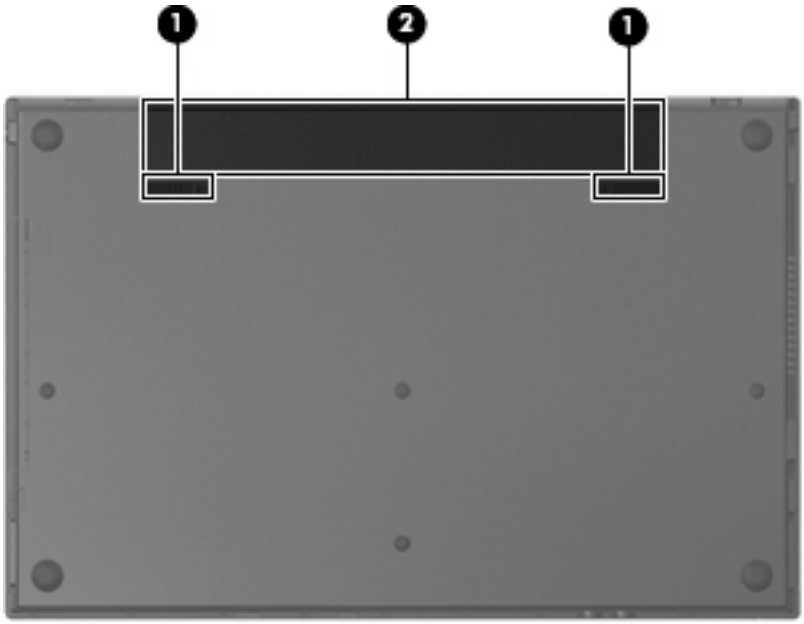
Bottom components



Component		Description
(1)	Battery release latches (2)	Release the battery from the battery bay.
(2)	Battery bay	Holds the battery.

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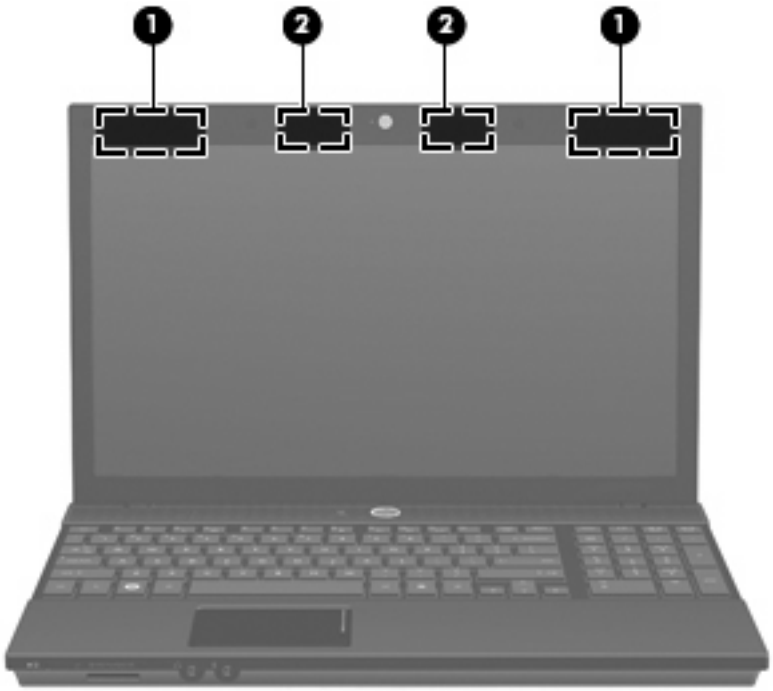
Wireless antennas



Component		Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).

*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 on the *User Guide* disc that has been provided with your computer.

NOTE: The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

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Additional hardware components

Component		Description
(1)	Power cord*	Connects an AC adapter to an AC outlet.
(2)	Battery*	Powers the computer when the computer is not plugged into external power.
(3)	AC adapter	Converts AC power to DC power.

*Batteries and power cords vary in appearance by country or region.

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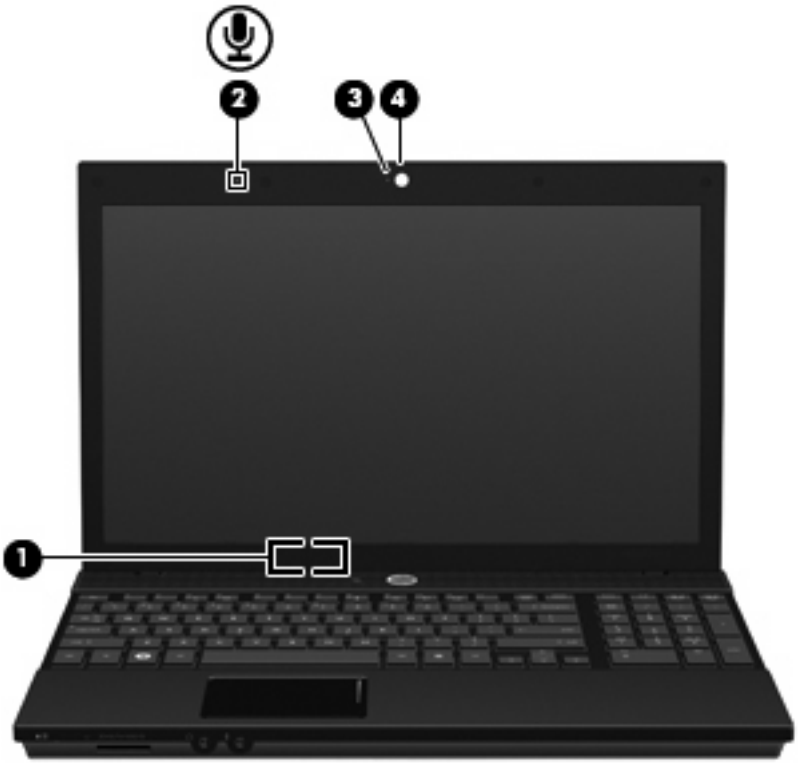
Linux

Display

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



Component		Description
(1)	Internal display switch	Turns off the display if the display is closed while the power is on.
(2)	Internal microphone	Records sound.
(3)	Webcam light (select models only)	On: The webcam is in use.
(4)	Webcam (select models only)	Records audio and video and captures still photographs.

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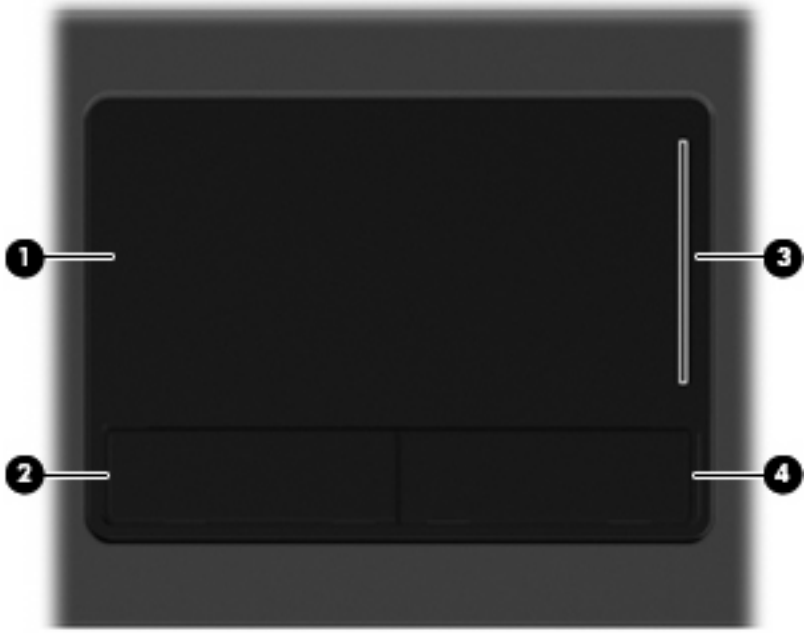
Top components

Pointing devices



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

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Lights

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

Component		Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Info Center/QuickLook light	• On: The computer is on. • Blinking (5 times): ◦ When the computer is on, press button to launch Info Center. ◦ When the computer is off or in Hibernation, press button to launch QuickLook. • Off: The computer is off or in the Suspend or Hibernation state.
(3)	Power light	• On: The computer is on. • Blinking: The computer is in Suspend. • Off: The computer is off or in Hibernation.

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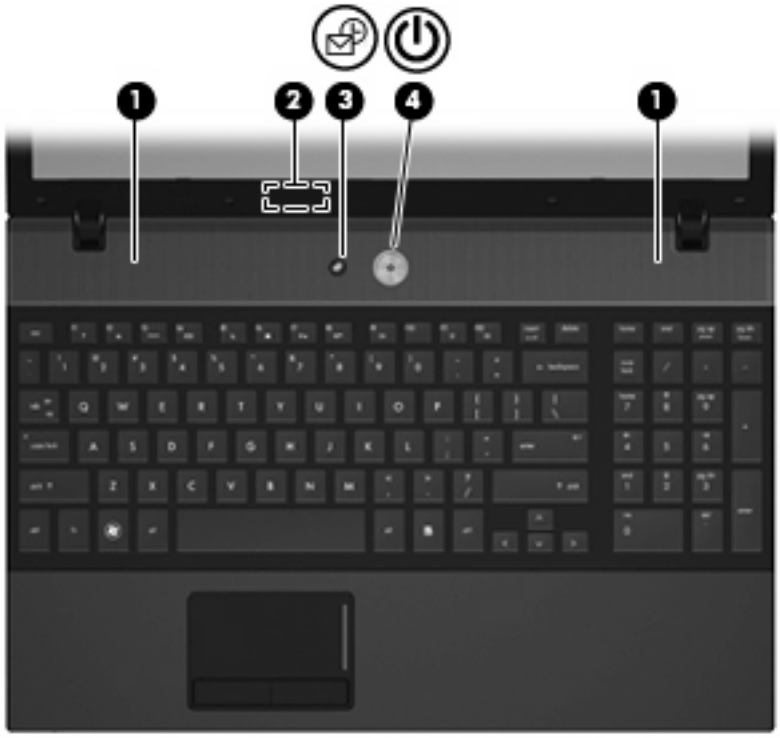
Buttons, switch, and speakers

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



Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Internal display switch	Turns off the display if the display is closed while the power is on.
(3)	Info Center/QuickLook button	Launches Info Center or QuickLook.
(4)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to shut down the computer. • When the computer is in Suspend, press the button briefly to exit Suspend. • When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and operating system 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 and how to change them, select **Computer > Control Center > System > Power Management**.

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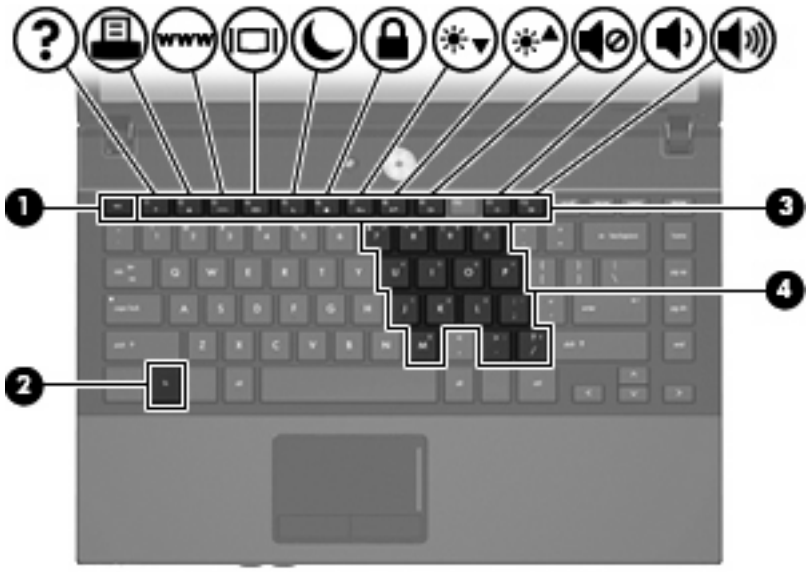
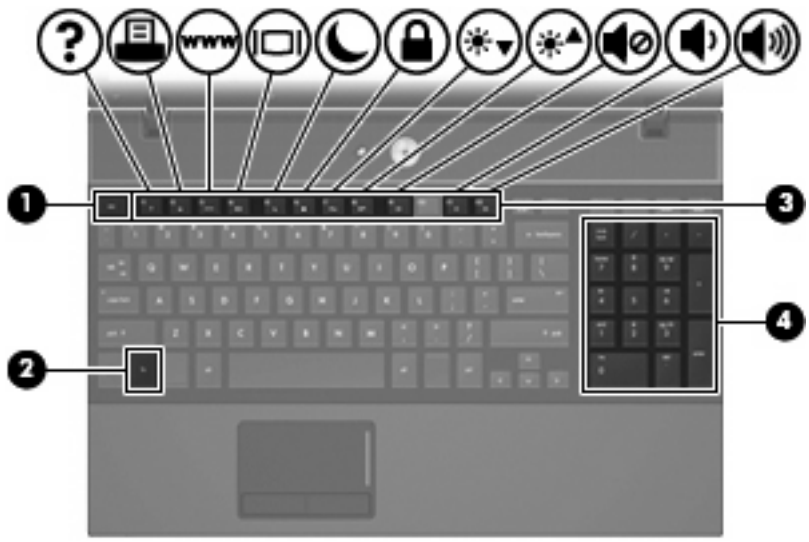
Keys

NOTE: Refer to the illustration that most closely matches your computer.



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, or the esc key.
(3)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(4)	Embedded numeric keypad keys	When the keypad has been enabled, the keys can be used like the keys on an external numeric keypad when pressed in combination with the fn and num lk keys.



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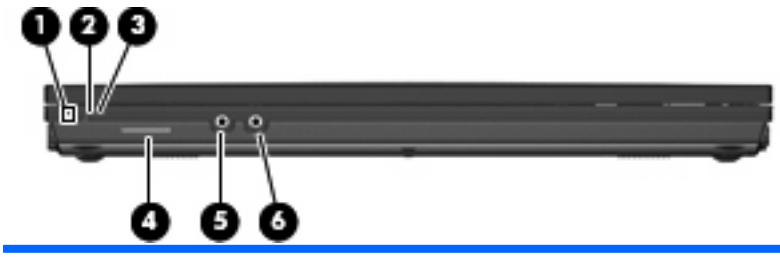
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(4)	Integrated numeric keypad keys	Can be used like the keys on an external numeric keypad.

Front components



Component		Description
(1)	Drive light	Blinking turquoise: The hard drive or optical drive is being accessed.
(2)	Wireless switch	Turns the wireless feature on or off but does not establish a wireless connection. **NOTE:** You must set up or access a wireless network to establish a wireless connection.
(3)	Wireless light	• Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on. • Amber: All wireless devices are off.
(4)	Media Card Reader	Supports the following optional digital card formats: • Memory Stick (MS) • Memory Stick Pro (MSP) • MultiMediaCard (MMC) • MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Secure Digital High Speed (SDHS) Memory Card • xD-Picture Card (XD) • xD-Picture Card (XD) Type H • xD-Picture Card (XD) Type M

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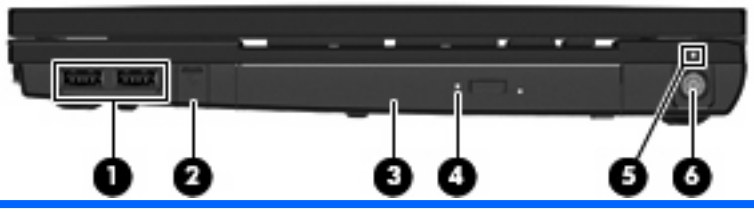
Component		Description
(5)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. **NOTE:** When a device is connected to the headphone jack, the computer speakers are disabled.
(6)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Right-side components



Component		Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	Optical drive (select models only)	Reads optical discs and, on select models, also writes to optical discs.
(4)	Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(5)	Battery light	• Amber: A battery is charging. • Turquoise: A battery is close to full charge capacity. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(6)	Power connector	Connects an AC adapter.

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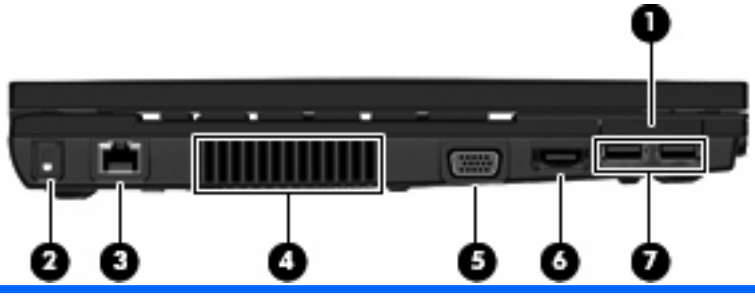
Left-side components



Component		Description
(1)	ExpressCard slot	Supports optional ExpressCards.
(2)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	External monitor port	Connects an external VGA monitor or projector.
(6)	HDMI port	Connects an optional HDMI device
(7)	USB ports (2)	Connect optional USB devices.

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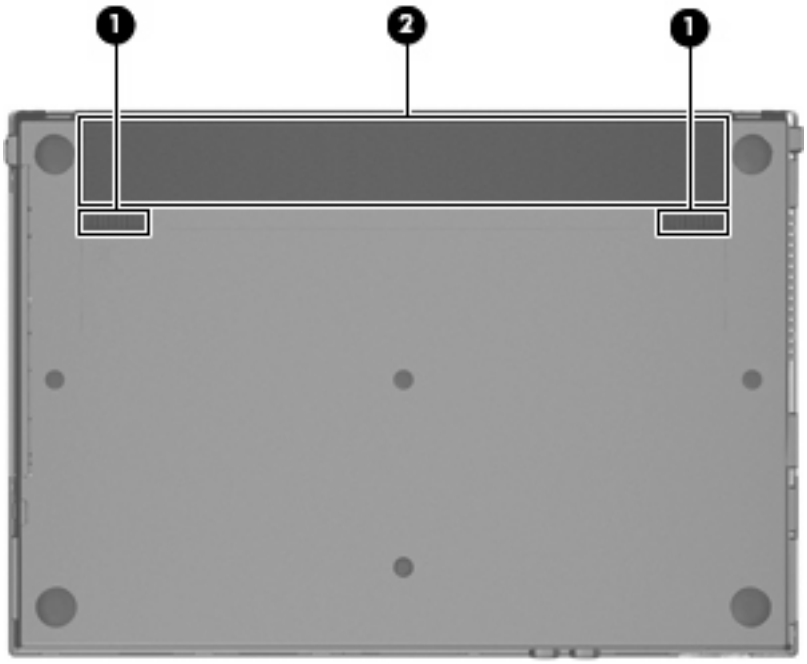
Bottom components



Component		Description
(1)	Battery release latches (2)	Release the battery from the battery bay.
(2)	Battery bay	Holds the battery.

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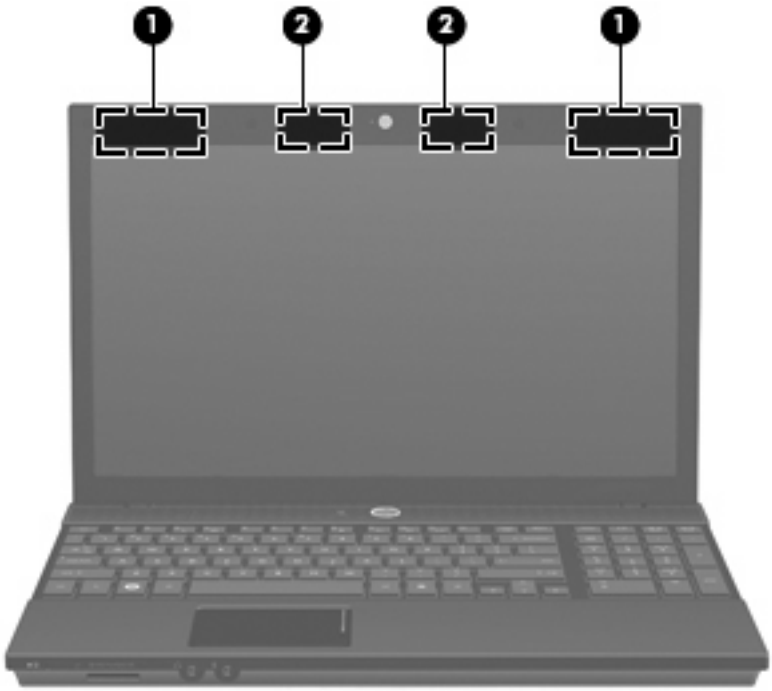
Wireless antennas



Component		Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).

*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 on the *User Guide* disc that has been provided with your computer.

NOTE: The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

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Additional hardware components

Component		Description
(1)	Power cord*	Connects an AC adapter to an AC outlet.
(2)	Battery*	Powers the computer when the computer is not plugged into external power.
(3)	AC adapter	Converts AC power to DC power.

*Batteries and power cords vary in appearance by country or region.

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3 Illustrated parts catalog

Service tag

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

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

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

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

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

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

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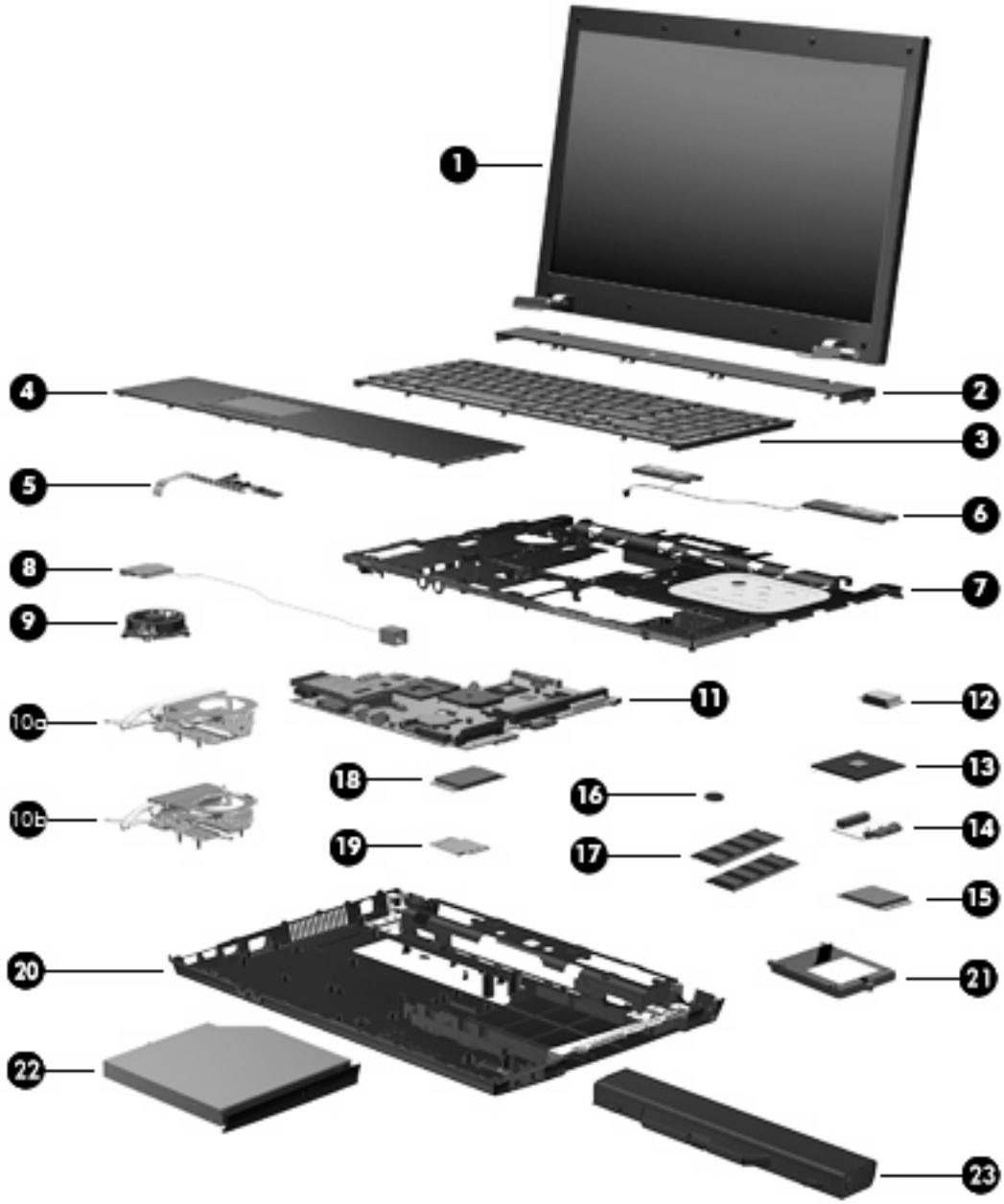
Computer major components



Item	Description	Spare part number
(1)	**Display assembly** (includes 2 WLAN antenna transceivers and cables and, on select computer models, 2 WWAN antenna transceivers and cables) **NOTE:** WWAN is available only on 15.6-in models.	
	For use only with black computers with 15.6-in displays	
	• 15.6-in HD WXGA BrightView display assembly (1366×768 resolution)	535850-001
	• 15.6-in HD WXGA BrightView display assembly for use in computers equipped with a webcam (1366×768 resolution)	535853-001

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Item	Description	Spare part number
	• 15.6-in HD WXGA BrightView display assembly for use in computers with a webcam and WWAN module (1366×768 resolution)	535854-001
	• 15.6-in HD WXGA AntiGlare display assembly (1366×768 resolution)	535849-001
	• 15.6-in WXGA HD AntiGlare display assembly for use on computers equipped with a webcam (1366×768 resolution)	535851-001
	• 15.6-in WXGA HD+ AntiGlare display assembly for use on computers equipped with a webcam (1600×900 resolution)	535855-001
	• 15.6-in WXGA HD AntiGlare display assembly for use in computers with a webcam and a WWAN module (1366×768 resolution)	535852-001
	• 15.6-in WXGA HD+ AntiGlare display assembly for use in computers with a webcam and a WWAN module (1600×900 resolution)	535856-001
	For use only with red computers with 15.6-in displays	
	• 15.6-in HD WXGA BrightView display assembly (1366×768 resolution)	572716-001
	• 15.6-in HD WXGA BrightView display assembly for use in computers equipped with a webcam (1366×768 resolution)	572719-001
	• 15.6-in HD WXGA BrightView display assembly for use in computers with a webcam and WWAN module (1366×768 resolution)	572720-001
	• 15.6-in HD WXGA AntiGlare display assembly (1366×768 resolution)	572715-001
	• 15.6-in WXGA HD AntiGlare display assembly for use on computers equipped with a webcam (1366×768 resolution)	572717-001
	• 15.6-in WXGA HD+ AntiGlare display assembly for use on computers equipped with a webcam (1600×900 resolution)	572721-001
	• 15.6-in WXGA HD AntiGlare display assembly for use in computers with a webcam and a WWAN module (1366×768 resolution)	572718-001
	• 15.6-in WXGA HD+ AntiGlare display assembly for use in computers with a webcam and a WWAN module (1600×900 resolution)	572722-001
	For use only with black computers with 14.0-in displays	
	• 14.0-in WXGA HD BrightView display assembly	535844-001
	• 14.0-in WXGA HD BrightView display assembly for use in computers equipped with a webcam	535847-001
	• 14.0-in WXGA HD AntiGlare display assembly	535843-001
	• 14.0-in WXGA HD AntiGlare display assembly for use in computers equipped with a webcam	535846-001
	For use only with red computers	
	• 14.0-in WXGA HD BrightView display assembly	572710-001
	• 14.0-in WXGA HD BrightView display assembly for use in computers equipped with a webcam	572713-001
	• 14.0-in WXGA HD AntiGlare display assembly	572709-001
	• 14.0-in WXGA HD AntiGlare display assembly for use in computers equipped with a webcam	572712-001
(2)	**Switch cover**	

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Item	Description	Spare part number
	For use in black computers with 15-in displays	535861-001
	For use in red computers with 15-in displays	572726-001
	For use in black computers with 14-in displays	535860-001
	For use in red computers with 14-in displays	572725-001
(3)	**Keyboard** **NOTE:** For a detailed list of available keyboards, see Sequential part number listing on page 48.	
	For use in computers with 15-in displays	536537-xxx
	For use in computers with 14-in displays	536410-xxx
(4)	**Palm rest** (includes TouchPad)	
	For use in black computers with 15-in displays	535868-001
	For use in red computers with 15-in displays	572728-001
	For use in black computers with 14-in displays	535867-001
	For use in red computers with 14-in displays	572727-001
(5)	*Power button board*	
	For use in computers with 15-in displays	*574513-001*
	For use in computers with 14-in displays	*574514-001*
(6)	**Speakers**	
	For use in computers with 15-in displays	536598-001
	For use in computers with 14-in displays	536420-001
(7)	**Top cover**	
	For use in computers with 15-in displays	535866-001
	For use in computers with 14-in displays	535865-001
(8)	**Modem module** **NOTE:** The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part numbers 536539-001 (for computers with 15-in displays) and 536538-001 (for computers with 14-in displays). See Cable Kit on page 45 for more Cable Kit spare part information.	
	For use in all countries and regions except Australia and New Zealand	510100-001
	For use only in Australia and New Zealand	510100-011
(9)	**Fan**	535766-001
	Heat sink	
(10a)	For use in computers with discrete graphics subsystems	535767-001
(10b)	For use in computers with UMA graphics subsystems	535859-001
(11)	**System board** (includes replacement thermal material)	
	For use only in computers with DDR2 memory that include a WWAN module:	

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Item	Description	Spare part number
	• GL47 system board with UMA graphics subsystem memory	535858-001
	• GL40 system board with UMA graphics subsystem memory	535857-001
	• System board with discrete graphics subsystem memory	535756-001
	For use only in computers with DDR2 memory that do not include a WWAN module:	
	• GL47 system board with UMA graphics subsystem memory	*574510-001*
	• GL40 system board with UMA graphics subsystem memo	*574509-001*
	• System board with discrete graphics subsystem memory	*574508-001*
	For use only in computers with DDR3 memory that include a WWAN module:	
	• *GM45 system board with UMA graphics subsystem memory*	*583081-001*
	• *GL40 system board with UMA graphics subsystem memory*	*583080-001*
	• System board with discrete graphics subsystem memory	*583082-001*
	For use only in computers with DDR3 memory that do not include a WWAN module:	
	• *GM45 system board with UMA graphics subsystem memory*	*583079-001*
	• *GL40 system board with UMA graphics subsystem memory*	*583078-001*
	• *System board with discrete graphics subsystem memory*	*583077-001*
(12)	**Bluetooth module**	
	HP Integrated module with Bluetooth 2.0 wireless technology	483113-001
	HP Integrated module with Bluetooth 2.1 wireless technology	**537921-001**
(13)	**Processor** (includes replacement thermal material) (not illustrated)	
	Intel Core2 Duo processors	
	• T5870 2.0-GHz (2-MB L2 cache, 800-MHz FSB)	535835-001
	• T6570 2.1-GHz (2-MB L2 cache, 800-MHz FSB)	513598-001
	• *T6670 2.2-GHz (2-MB L2 cache, 800-MHz FSB)*	*572927-001*
	• P7370 2.0-GHz (3-MB L2 cache, 1066-MHz FSB)	507966-001
	• *P7570 2.2-GHz (2-MB L2 cache, 800-MHz FSB)*	*572930-001*
	• P8600 2.40-GHz (3-MB L2 cache, 1066-MHz FSB)	507961-001
	• P8700 2.53-GHz (3-MB L2 cache, 1066-MHz FSB)	507960-001
	• T9400 2.53-GHz (6-MB L2 cache, 1066-MHz FSB)	507954-001
	• T9600 2.8-GHz (6-MB L2 cache, 1066-MHz FSB)	507952-001
	Intel Celeron M processors	
	• 585 2.16-GHz (1-MB L2 cache, 667-MHz FSB)	519898-001
	• 900 2.2-GHz (1-MB L2 cache, 667-MHz FSB)	534419-001
	Intel Pentium Dual-Core processors	
	• *T4200 2.0-GHz (1-MB L2 cache, 800-MHz FSB)*	*513599-001*

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Item	Description	Spare part number
	• *T4300 2.1-GHz (1-MB L2 cache, 800-MHz FSB)*	*572929-001*
	• *T4400 2.2-GHz (1-MB L2 cache, 800-MHz FSB)*	*584296-001*
	Intel Celeron Dual-Core processors	
	• T1600 1.66-GHz (1-MB L2 cache, 667-MHz FSB)	532324-001
	• T1700 1.83-GHz (1-MB L2 cache, 667-MHz FSB)	534084-001
	• *T3000 1.8-GHz (1-MB L2 cache, 800-MHz FSB)*	*572926-001*
	• *T3100 1.9-GHz (1-MB L2 cache, 800-MHz FSB)*	*572925-001*
(14)	**Optical drive connector**	535862-001
(15)	**WLAN module**	
	Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module (for use in all countries and regions except Pakistan, Russia, and the Ukraine)	480985-001
	Intel Wi-Fi Link 5100 802.11a/b/g WLAN module	482957-001
	Broadcom 4322 802.11a/b/g/n WLAN modules	
	• For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504664-001
	• 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	504664-002
	Broadcom BCM4312 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

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Item	Description	Spare part number
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, 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 AGN 802.11a/b/g WLAN module	
	• *For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, 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*	*518434-001*

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Item	Description	Spare part number
	• *For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, 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*
	Intel Wi-Fi Link 1000, 802.11b/g/n WLAN module:	
	For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Cayman Islands, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Guadeloupe, Guam, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Quatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	*572520-001*
(16)	**RTC battery**	449137-001
(17)	**Memory modules**	
	For use in computers with DDR2 memory modules:	
	• 1-GB (PC2-6400, 800-MHz, DDR2)	536427-001
	• 2-GB (PC2-6400, 800-MHz, DDR2)	536428-001
	For use in computers with DDR3 memory modules:	
	• *1-GB (PC3-10600, 1333-MHz, DDR3)*	*587830-001*
	• *2-GB (PC3-10600, 1333-MHz, DDR3)*	*587831-001*
(18)	**HP Mobile Broadband Module**	483377-002
(19)	**Subscriber identification module (SIM)**	536599-001

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Item	Description	Spare part number
(20)	**Base enclosure**	
	For use in computers with 15-in displays	535864-001
	For use in computers with 14-in displays	535863-001
(21)	**Hard drive** (includes hard drive bracket)	
	500-GB, 7200-rpm	*575195-001*
	500-GB, 5400-rpm	536414-001
	320-GB, 7200-rpm	*575194-001*
	320-GB, 5400-rpm	536413-001
	250-GB, 7200-rpm	538972-001
	250-GB, 5400-rpm	536412-001
	160-GB, 7200-rpm	538971-001
	160-GB, 5400-rpm	536411-001
(22)	**Optical drive** (includes bezel)	
	DVD-ROM Drive	536415-001
	DVD±RW Double-Layer Drive with LightScribe	536416-001
	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer	536417-001
	Rubber Kit (not illustrated, contains 8 computer feet and 8 display bezel screw covers)	535793-001
(23)	**Battery**	
	8-cell, 63-Wh for use in computers with 15-in displays	535753-001
	6-cell, 47-Wh for use in computers with 15-in displays	536418-001
	6-cell, 47-Wh for use in computers with 14-in displays	572032-001

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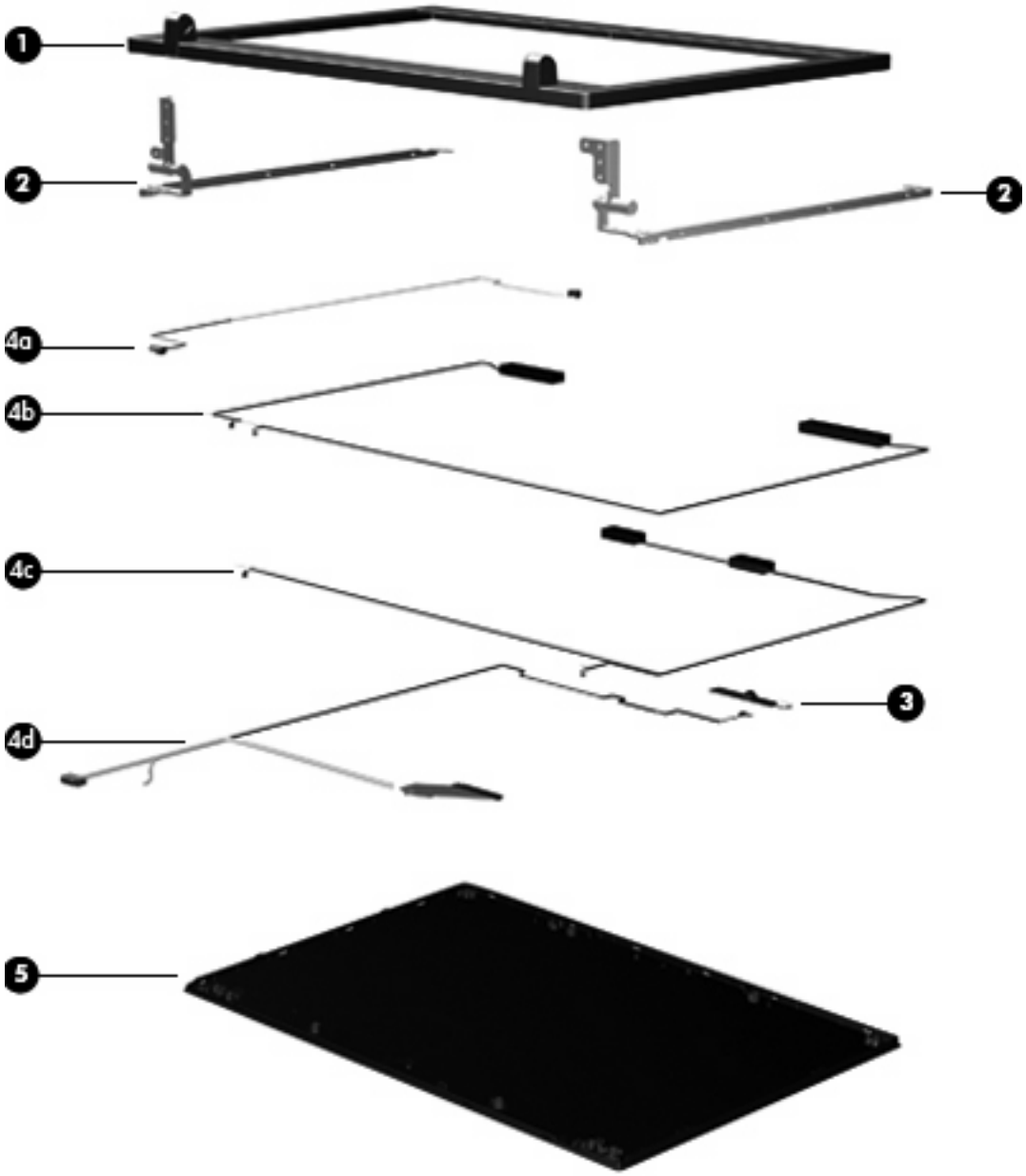
Display assembly components



Item	Description	Spare part number
(1)	**Display bezel**	
	For use in computers with 15-in displays with a webcam	536421-001
	For use in computers with 15-in displays without a webcam	536424-001
	For use in computers with 14-in displays with a webcam	536423-001
	For use in computers with 14-in displays without a webcam	536422-001
(2)	**Display Hinge Kit**	
	For use in computers with 15-in displays	535872-001

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Item	Description	Spare part number
	For use in computers with 14-in displays	535871-001
(3)	**Webcam module**	535797-001
	Display Cable Kit	
	For use in computers with 15-in HD displays	536433-001
	For use in computers with 14-in displays	536430-001
(4a)	Microphone cable	
(4b)	WLAN antenna transceivers and cables	
(4c)	WWAN antenna transceivers and cables	
(4d)	Display/webcam cable	
(5)	**Display enclosure**	
	For use in black computers with 15-in displays	536426-001
	For use in red computers with 15-in displays	572724-001
	For use in black computers with 14-in displays	536425-001
	For use in red computers with 14-in displays	572723-001

Plastics Kit

Item	Description	Spare part number
	Plastics Kit:	535780-001
(1)	ExpressCard slot bezel	
(2)	Optical drive bezel	

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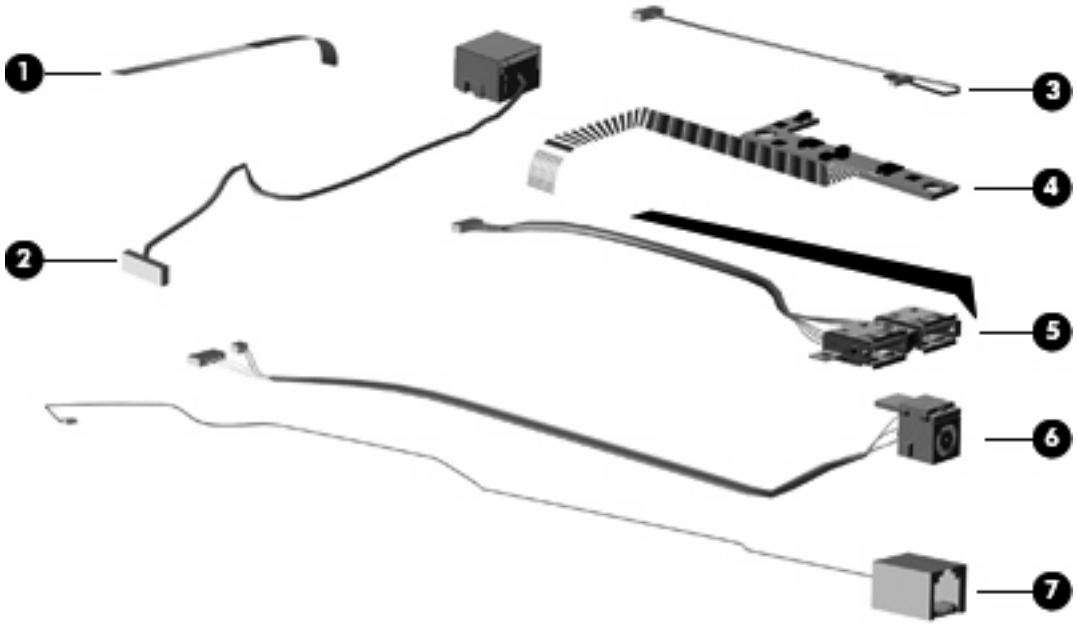
Cable Kit



Item	Description	Spare part number
	Cable Kit:	
	For use in computers with 15-in displays	536539-001
	For use in computers with 14-in displays	536538-001
(1)	TouchPad cable	
(2)	RJ-45 cable	
(3)	Bluetooth cable	
(4)	Power button board cable	
(5)	USB cable	
(6)	Power cable	
(7)	RJ-11 (modem) jack cable	

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Mass storage devices

Item	Description	Spare part number
(1)	**Hard drive** (includes bracket)	
	500-GB, 7200-rpm	*575195-001*
	500-GB, 5400-rpm	536414-001
	320-GB, 7200-rpm	*575194-001*
	320-GB, 5400-rpm	536413-001
	250-GB, 7200-rpm	538972-001
	250-GB, 5400-rpm	536412-001
	160-GB, 7200-rpm	538971-001
	160-GB, 5400-rpm	536411-001
(2)	**Optical drive** (includes bezel)	
	DVD±RW Double-Layer Drive with LightScribe	536416-001
	DVD-ROM Drive	536415-001
	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer	536417-001

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Miscellaneous parts

Description	Spare part number
AC adapters	
65-W AC adapter	463958-001
90-W Slimline AC adapter (for use in all countries and regions except India)	463955-001
90-W Slimline NPFC AC adapter (for use in India)	463956-001
90-W Slimline PFC AC adapter (for use in India)	535593-001
Power cords	
For use in the United States	246959-001
For use in Australia and New Zealand	246959-011
For use in Europe, the Middle East, and Africa	246959-021
For use in the United Kingdom	246959-031
For use in Italy	246959-061
For use in Denmark	246959-081
For use in Switzerland	246959-AG1
For use in Brazil	246959-201
For use in Japan	246959-291
For use in South Korea	246959-AD1
For use in Israel	246959-BB1
Screw Kit, includes: • Phillips PM3.0×4.0 screw • Phillips PM2.0x3.0 screw • Phillips PM2.5×9.0 captive screw • Phillips PM2.5×11.0 captive screw • Phillips PM3.0×8.0 screw • Phillips PM2.0×4.0 screw • Phillips PM2.5×3.0 screw • Phillips PM2.5×3.0 broadhead screw • Phillips PM2.5×7.0 screw • Phillips PM2.5×6.0 screw • Phillips PM2.5×4.5 screw	535870-001

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Sequential part number listing

Spare part number	Description
246959-001	Power cord for use in the United States
246959-011	Power cord for use in Australia and New Zealand
246959-021	Power cord for use in Europe, the Middle East, and Africa
246959-031	Power cord for use in the United Kingdom
246959-061	Power cord for use in Italy
246959-081	Power cord for use in Denmark
246959-201	Power cord for use in Brazil
246959-291	Power cord for use in Japan
246959-AD1	Power cord for use in South Korea
246959-AG1	Power cord for use in Switzerland
246959-BB1	Power cord for use in Israel
449137-001	RTC battery
463955-001	90-W Slimline AC adapter (for use in all countries and regions except India)
463956-001	90-W Slimline NPFC AC adapter (for use in India)
463958-001	65-W AC adapter
480985-001	Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except Pakistan, Russia, and the Ukraine
482957-001	Intel Wi-Fi Link 5100 802.11a/b/g WLAN module
483113-001	HP Integrated Bluetooth 2.0 module for use in all countries and regions except Japan and Asia Pacific (does not include the Bluetooth module cable)
483377-001	HP Mobile Broadband Module
483377-002	HP Mobile Broadband Module
504593-003	Broadcom BCM4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States

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Spare part number	Description
504593-004	Broadcom BCM4312 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
504664-001	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
504664-002	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
507952-001	Intel Core2 Duo T9600 2.8-GHz processor (6-MB, L2 cache, 1066-MHz FSB)
507954-001	Intel Core2 Duo T9400 2.53-GHz processor (6-MB, L2 cache, 1066-MHz FSB)
507960-001	Intel Core2 Duo P8700 2.53-GHz processor (3-MB, L2 cache, 1066-MHz FSB)
507961-001	Intel Core2 Duo P8600 2.40-GHz processor (3-MB, L2 cache, 1066-MHz FSB)
507966-001	Intel Core2 Duo P7370 2.0-GHz processor (3-MB L2 cache, 1066-MHz FSB)
510100-001	Modem module for use in all countries and regions except Australia and New Zealand
510100-011	Modem module for use in Australia and New Zealand
513598-001	Intel Core2 Duo T6570 2.1-GHz processor (2-MB L2 cache, 800-MHz FSB)

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Spare part number	Description
513599-001	*Intel Pentium Dual-Core T4200 2.0-GHz processor (1-MB L2 cache, 800-MHz FSB)*
518434-001	*Broadcom 4322 AGN 802.11a/b/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*
518434-002	*Broadcom 4322 AGN 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, 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*
519898-001	Intel Celeron M 585 2.16-GHz processor (1-MB, L2 cache, 667-MHz FSB)
532324-001	Intel Celeron Dual-Core T1600 1.66-GHz processor (1-MB L2 cache, 667-MHz FSB)
534084-001	Intel Celeron Dual-Core T1700 1.83-GHz processor (1-MB L2 cache, 667-MHz FSB)
534419-001	Intel Celeron 900 2.2-GHz processor (1-MB, L2 cache, 667-MHz FSB)
535593-001	90-W Slimline PFC AC adapter (for use in India)
535753-001	8-cell, 63-Wh Li-ion battery for use in computers with 15-in displays
535756-001	System board for use in computers with DDR2 memory and discrete graphics subsystem memory that include a WWAN module (includes replacement thermal material)
535766-001	Fan
535767-001	Heat sink for use in computers with discrete graphics subsystems
535780-001	Plastics Kit (see Plastics Kit on page 44 for more Plastics Kit spare part information)
535793-001	Rubber Kit (contains 8 computer feet and 8 display bezel screw covers)
535797-001	Webcam module
535835-001	Intel Core2 Duo T5870 2.0-GHz processor (2-MB L2 cache, 800-MHz FSB)
535843-001	14.0-in WXGA HD AntiGlare display assembly for use in black computers
535844-001	14.0-in WXGA HD BrightView display assembly for use in black computers
535846-001	14.0-in WXGA HD AntiGlare display assembly for use in black computers equipped with a webcam
535847-001	14.0-in WXGA HD BrightView display assembly for use in black computers equipped with a webcam
535849-001	15.6-in WXGA HD AntiGlare display assembly for use in black computers
535850-001	15.6-in WXGA HD BrightView display assembly for use in black computers

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Spare part number	Description
535851-001	15.6-in WXGA HD AntiGlare display assembly for use on black computers with a webcam
535852-001	15.6-in WXGA HD AntiGlare display assembly for use in black computers with a webcam and a WWAN module
535853-001	15.6-in WXGA HD BrightView display assembly for use in black computers equipped with a webcam
535854-001	15.6-in WXGA HD BrightView display assembly for use in black computers equipped with a webcam and WWAN module
535855-001	15.6-in WXGA HD+ AntiGlare display assembly for use in black computers equipped with a webcam
535856-001	15.6-in WXGA HD+ AntiGlare display assembly for use in black computers with a webcam and a WWAN module
535857-001	System board for use only with computers with DDR2 memory with UMA graphics subsystem memory and GL40 system boards that include a WWAN module (includes replacement thermal material)
535858-001	System board for use in computers with DDR2 memory with GL47 system boards that include a WWAN module (includes replacement thermal material)
535859-001	Heat sink for use in computers with UMA graphics subsystems (includes replacement thermal material)
535860-001	Switch cover for use in black computers with 14-in displays
535861-001	Switch cover for use in black computers with 15-in displays
535862-001	Optical drive connector
535863-001	Base enclosure for use in computers with 14-in displays
535864-001	Base enclosure for use in computers with 15-in displays
535865-001	Top cover for use in computers with 14-in displays
535866-001	Top cover for use in computers with 15-in displays
535867-001	Palm rest for use in black computers with 14-in displays (includes TouchPad)
535868-001	Palm rest for use in black computers with 15-in displays (includes TouchPad)
535870-001	Screw Kit
535871-001	Display Hinge Kit for use in computers with 14-in displays
535872-001	Display Hinge Kit for use in computers with 15-in displays
536410-001	Keyboard for use in the United States on computers with 14-in displays
536410-121	Keyboard for use in French Canada on computers with 14-in displays
536410-161	Keyboard for use in Latin America on computers with 14-in displays
536410-201	Keyboard for use in Brazil on computers with 14-in displays
536410-281	Keyboard for use in Thailand on computers with 14-in displays
536410-291	Keyboard for use in Japan on computers with 14-in displays
536410-AB1	Keyboard for use in Taiwan on computers with 14-in displays
536410-AD1	Keyboard for use in South Korea on computers with 14-in displays
536411-001	160-GB, 5400-rpm hard drive (includes hard drive bracket)
536412-001	160-GB, 5400-rpm hard drive (includes hard drive bracket)

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Spare part number	Description
536413-001	320-GB, 5400-rpm hard drive (includes hard drive bracket)
536414-001	500-GB, 5400-rpm hard drive (includes hard drive bracket)
536415-001	DVD-ROM Drive (includes bezel)
536416-001	DVD±RW Double-Layer Drive with LightScribe (includes bezel)
536417-001	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer (includes bezel)
536418-001	6-cell 47-Wh Li-ion battery for use in computers with 15-in displays
536420-001	Speakers for use in computers with 14-in displays
536421-001	Display bezel for use in computers with 15-in displays and a webcam
536422-001	Display bezel for use in computers with 14-in displays without a webcam
536423-001	Display bezel for use in computers with 14-in displays and a webcam
536424-001	Display bezel for use in computers with 15-in displays without a webcam
536425-001	Display enclosure for use in black computers with 14-in displays
536426-001	Display enclosure for use in black computers with 15-in displays
536427-001	Memory module, 1-GB, (PC2-6400, 800-MHz, DDR2)
536428-001	Memory module, 2-GB (PC2-6400, 800-MHz, DDR2)
536429-001	Display cable for use in computers with 14-in displays
536430-001	Display Cable Kit for use in computers with 14-in displays
536431-001	Display cable for use in computers with 15-in HD displays
536433-001	Display Cable Kit for use in computers with 15-in displays
536537-001	Keyboard for use in the United States on computers with 15-in displays
536537-031	Keyboard for use in the United Kingdom on computers with 15-in displays
536537-041	Keyboard for use in Germany on computers with 15-in displays
536537-051	Keyboard for use in France on computers with 15-in displays
536537-061	Keyboard for use in Italy on computers with 15-in displays
536537-071	Keyboard for use in Spain on computers with 15-in displays
536537-081	Keyboard for use in Denmark on computers with 15-in displays
536537-091	Keyboard for use in Norway on computers with 15-in displays
536537-121	Keyboard for use in French Canada on computers with 15-in displays
536537-131	Keyboard for use in Portugal only on computers with 15-in displays
536537-141	Keyboard for use in Turkey only on computers with 15-in displays
536537-161	Keyboard for use in Latin America on computers with 15-in displays
536537-171	Keyboard for use in Saudi Arabia on computers with 15-in displays
536537-201	Keyboard for use in Brazil on computers with 15-in displays

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Spare part number	Description
536537-211	Keyboard for use in Hungary on computers with 15-in displays
536537-221	Keyboard for use in the Czech Republic on computers with 15-in displays
536537-231	Keyboard for use in Slovakia on computers with 15-in displays
536537-251	Keyboard for use in Russia on computers with 15-in displays
536537-261	Keyboard for use in Bulgaria on computers with 15-in displays
536537-281	Keyboard for use in Thailand on computers with 15-in displays
536537-291	Keyboard for use in Japan on computers with 15-in displays
536537-A41	Keyboard for use in Europe on computers with 15-in displays
536537-AB1	Keyboard for use in Taiwan on computers with 15-in displays
536537-AD1	Keyboard for use in South Korea on computers with 15-in displays
536537-B31	Keyboard for International use on computers with 15-in displays
536537-B71	Keyboard for use in Finland on computers with 15-in displays
536537-BA1	Keyboard for use in Slovenia on computers with 15-in displays
536537-BB1	Keyboard for use in Israel on computers with 15-in displays
536537-BG1	Keyboard for use in Switzerland on computers with 15-in displays
536537-DD1	Keyboard for use in Iceland on computers with 15-in displays
536537-DJ1	Keyboard for use in Greece on computers with 15-in displays
536538-001	Cable Kit for use in computers with 14-in displays
536539-001	Cable Kit for use in computers with 15-in displays
536598-001	Speakers for use in computers with 15-in displays
536599-001	SIM
537921-001	*HP Integrated Bluetooth 2.1 module*
538971-001	160-GB, 7200-rpm hard drive (includes hard drive bracket)
538972-001	160-GB, 7200-rpm hard drive (includes hard drive bracket)
572032-001	6-cell, 47-Wh Li-ion battery for use in computers with 14-in displays
572520-001	*Intel Wi-Fi Link 1000, 802.11b/g/n WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Cayman Islands, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Guadeloupe, Guam, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Quatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam*
572709-001	*14.0-in WXGA HD AntiGlare display assembly for use in red computers*

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Spare part number	Description
572710-001	*14.0-in WXGA HD BrightView display assembly for use in red computers*
572712-001	14.0-in WXGA HD AntiGlare display assembly for use in red computers equipped with a webcam
572713-001	14.0-in WXGA HD BrightView display assembly for use in red computers equipped with a webcam
572715-001	15.6-in HD WXGA AntiGlare display assembly for use in red computers (1366×768 resolution)
572716-001	15.6-in HD WXGA BrightView display assembly for use in red computers (1366×768 resolution)
572717-001	15.6-in WXGA HD AntiGlare display assembly for use on red computers equipped with a webcam (1366×768 resolution)
572718-001	15.6-in WXGA HD AntiGlare display assembly for use in red computers with a webcam and a WWAN module (1366×768 resolution)
572719-001	15.6-in HD WXGA BrightView display assembly for use in red computers equipped with a webcam (1366×768 resolution)
572720-001	15.6-in HD WXGA BrightView display assembly for use in red computers with a webcam and WWAN module (1366×768 resolution)
572721-001	15.6-in WXGA HD+ AntiGlare display assembly for use in red computers equipped with a webcam (1600×900 resolution)
572722-001	15.6-in WXGA HD+ AntiGlare display assembly for use in red computers with a webcam and a WWAN module (1600×900 resolution)
572723-001	Display enclosure for use in red computers with 14-in displays
572724-001	Display enclosure for use in red computers with 15-in displays
572725-001	Switch cover for use in red computers with 14-in displays
572726-001	Switch cover for use in red computers with 15-in displays
572727-001	Palm rest for use in red computers with 14-in displays (includes TouchPad)
572728-001	Palm rest for use in red computers with 15-in displays (includes TouchPad)
572925-001	*Intel Celeron Dual-Core T3100 1.8-GHz processor (1-MB L2 cache, 800-MHz FSB)*
572926-001	*Intel Celeron Dual-Core T3000 1.9-GHz processor (1-MB L2 cache, 800-MHz FSB)*
572927-001	*Intel Core2 Duo T6670 2.2-GHz processor (2-MB L2 cache, 800-MHz FSB)*
572929-001	*Intel Pentium Dual-Core T4300 2.1-GHz processor (1-MB L2 cache, 800-MHz FSB)*
572930-001	*Intel Core2 Duo P7570 2.26-GHz processor (3-MB L2 cache, 1066-MHz FSB)*
574508-001	System board for use only in computers with DDR2 memory with discrete graphics subsystem memory that do not include a WWAN module
574509-001	System board for use only in computers with DDR2 memory with UMA graphics subsystem memory and GL40 system boards that do not include a WWAN module
574510-001	System board for use only in computers with DDR2 memory with UMA graphics subsystem memory and GL47 system boards that do not include a WWAN module
574513-001	Power button board for use in computers with 15-in displays
574514-001	Power button board for use in computers with 14-in displays
575194-001	*320-GB, 7200-rpm hard drive*
575195-001	*500-GB, 7200-rpm hard drive*

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Spare part number	Description
583077-001	*System board for use in computers with DDR3 memory and discrete graphics that do not include a WWAN module*
583078-001	*GL40 system board for use in computers with DDR3 memory and UMA graphics subsystem memory that do not include a WWAN module*
583079-001	*GM45 system board for use in computers with DDR3 memory and UMA graphics subsystem memory that do not include a WWAN module*
583080-001	*GL40 system board for use in computers with DDR3 memory and UMA graphics subsystem memory that include a WWAN module*
583081-001	*GM45 system board for use in computers with DDR3 memory and UMA graphics subsystem memory that include a WWAN module*
583082-001	*System board for use in computers with DDR3 memory and discrete graphics that include a WWAN module*
584296-001	*Intel Pentium Dual-Core T4400 2.2-GHz processor (1-MB L2 cache, 800-MHz FSB)*
587830-001	*Memory module, 1-GB, (PC3-10600, 1333-MHz, DDR3)*
587831-001	*Memory module, 2-GB, (PC3-10600, 1333-MHz, DDR3)*

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4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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.

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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.”

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Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

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

Typical electrostatic voltage levels

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

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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.

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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

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Component replacement procedures

This section provides removal and replacement procedures.

There are as many as 121 screws, in 12 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

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

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

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

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

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

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

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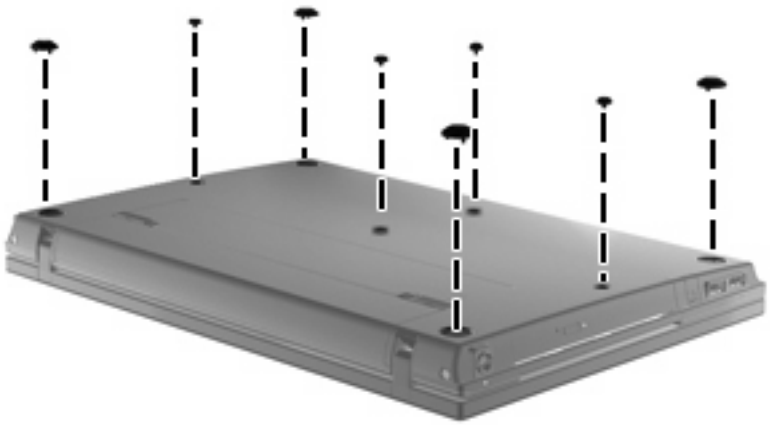
Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 535793-001. There are 8 rubber feet that attach to the base enclosure in the locations illustrated below.



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Battery

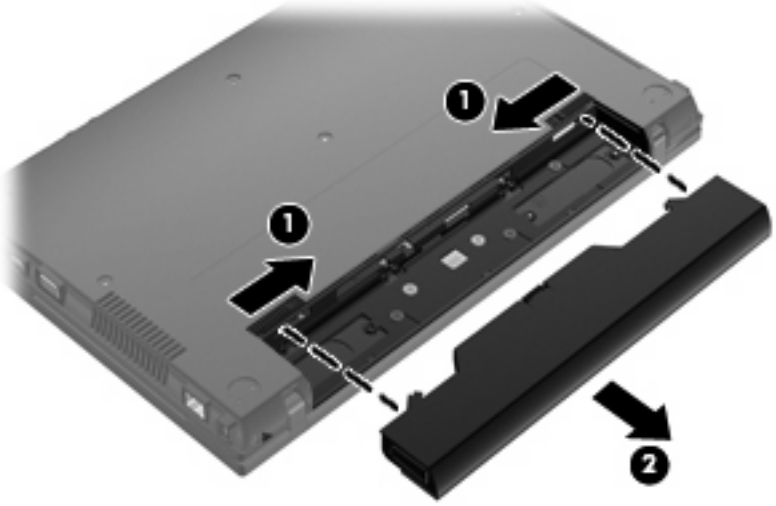
Description	Spare part number
8-cell, 63-Wh Li-on battery for use in computers with 15-in displays	535753-001
6-cell, 47-Wh Li-on battery for use in computers with 15-in displays	536418-001
6-cell, 47-Wh Li-on battery for use in computers with 14-in displays	572032-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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



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

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Switch cover and keyboard

Description	Spare part number
Switch covers	
For use in black computers with 15-in displays	535861-001
For use in red computers with 15-in displays	572726-001
For use in black computers with 14-in displays	535860-001
For use in red computers with 14-in displays	572725-001
Keyboards for use in computers with 15-in displays	536537-xxx
Keyboards for use in computers with 14-in displays	536410-xxx
NOTE: For a detailed list of available keyboards, see Sequential part number listing on page 48.	

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 63).

Remove the switch cover and keyboard:

1. Position the computer upside-down with the rear toward you.

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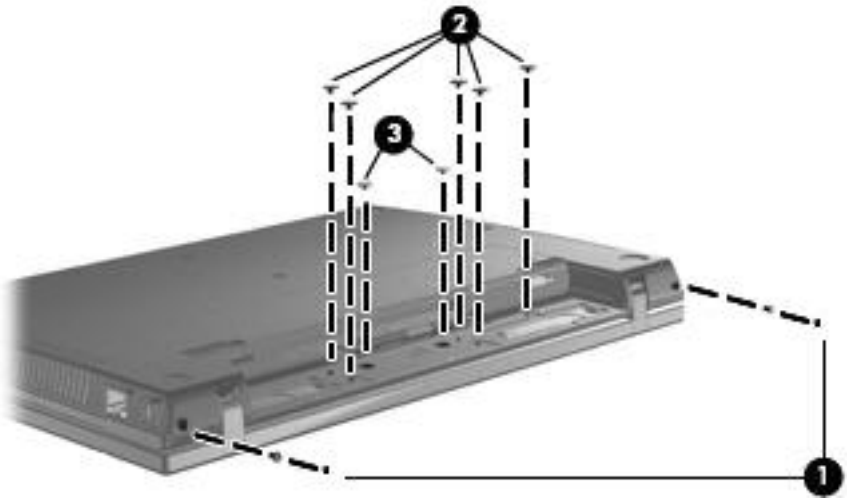
2. To remove the switch cover on 15-in models, remove the following screws:

   (1) Two screw covers and two PM2.5×3.0 screws

   (2) Five PM2.5×3.0 broadhead screws

   (3) Two PM2.0×3.0 screws



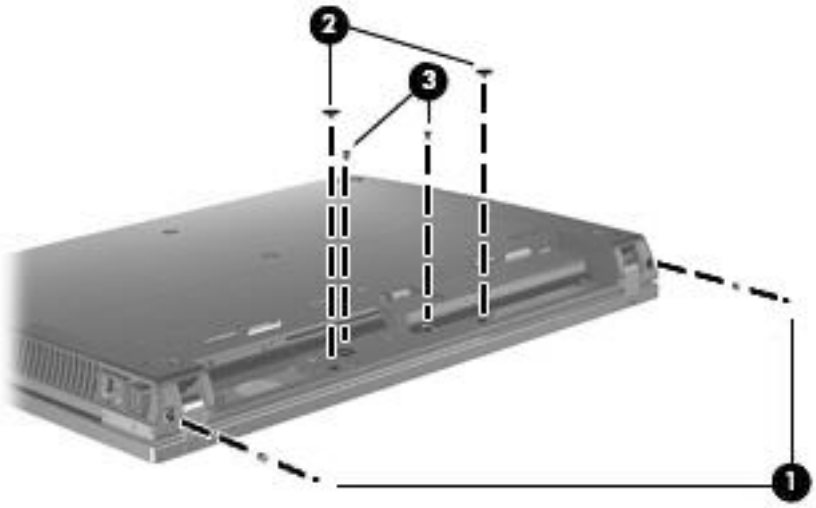
– or –

To remove the switch cover on 14-in models, remove the following screws:

(1) Two screw covers and two PM2.5×3.0 screws

(2) Two PM2.5×3.0 broadhead screws

(3) Two PM2.0×3.0 screws



3. Open the computer as far as possible.

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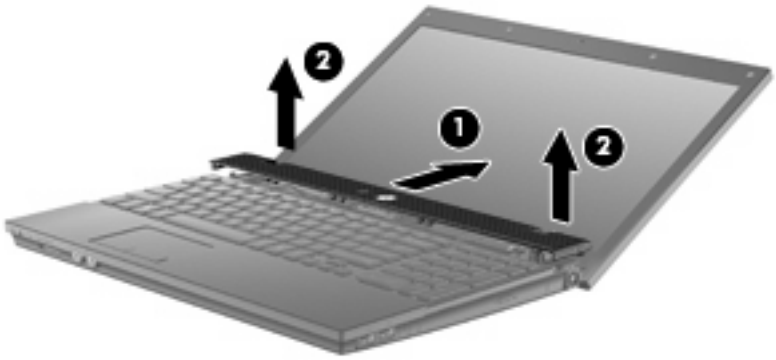
4. Slide the switch cover back **(1)**, and then remove it from the computer **(2)**.



5. On computers with 15-in displays, remove the two Phillips PM2.5×3.0 screws that secure the keyboard to the computer.

– or –

On computers with 14-in displays, remove the three Phillips PM2.5×3.0 screws that secure the keyboard to the computer.

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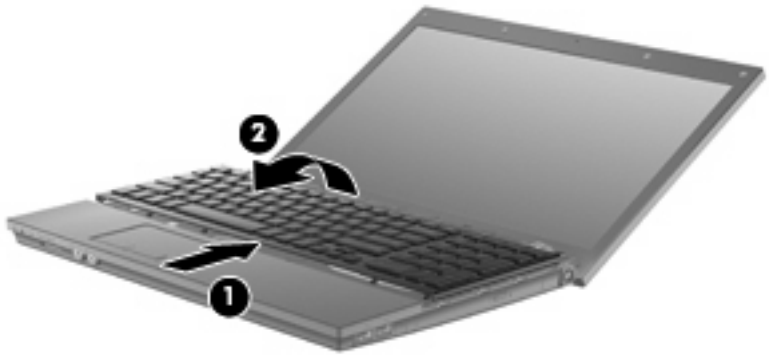
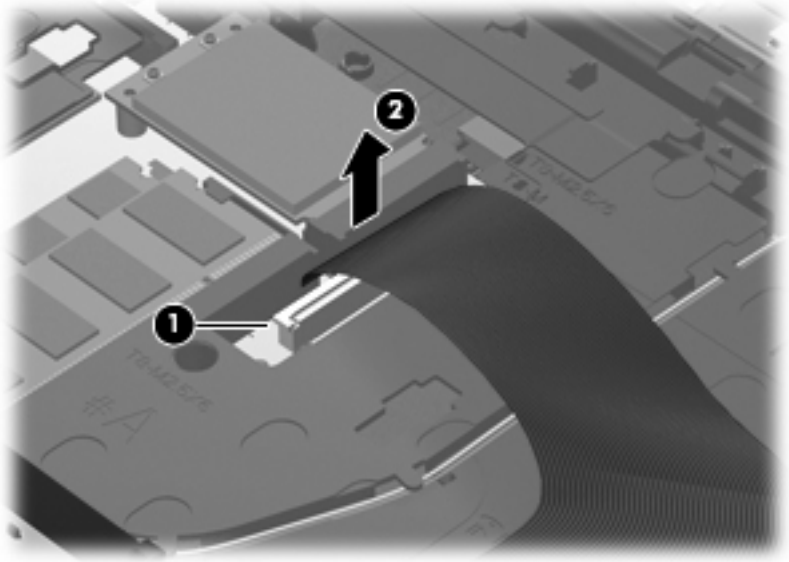
6. Slide the keyboard back toward the display **(1)**, and then rotate it forward **(2)** until it rests upside-down on the palm rest.



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



8. Remove the keyboard.

Reverse this procedure to install the switch cover and keyboard.

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Memory module

NOTE: Older models use DDR2 memory, while newer models use DDR3 memory. You cannot use model numbers to determine the type of memory a model uses.

NOTE: When adding a second memory module, be sure it is the same type and speed as the installed memory module. DDR2 memory modules cannot be mixed with DDR3 memory modules.

Description	Spare part number
For use in models that use DDR2 memory	
2-GB (PC2-6400, 800-MHz, DDR2)	536428-001
1-GB (PC2-6400,800-MHz, DDR2)	536427-001
For use in models that use DDR3 memory	
2-GB (PC3-10600, 1333-MHz, DDR3)	*587831-001*
1-GB (PC3-10600, 1333-MHz, DDR3)	*587830-001*

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 63).
5. Remove the switch cover and keyboard (see Switch cover and keyboard on page 64).

Remove the memory module:

1. Position the computer right-side up with the front toward you.
2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

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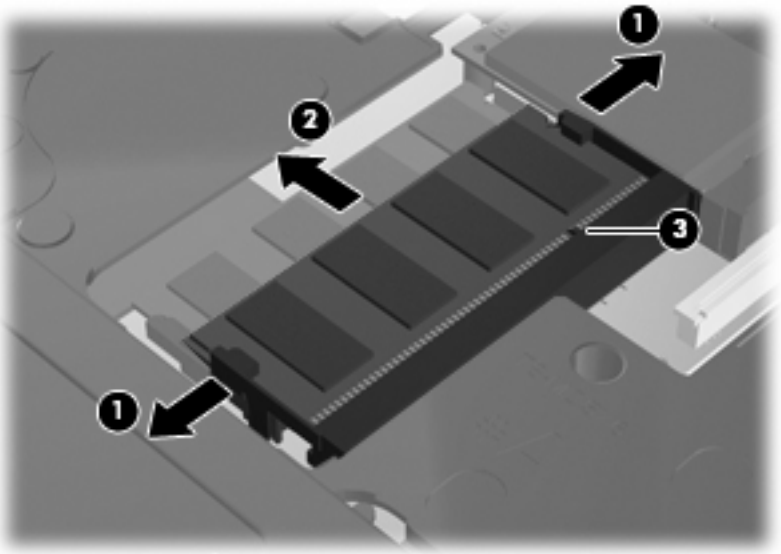
3. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install a memory module.

Optical drive

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

Description	Spare part number
DVD±RW Double-Layer Drive with LightScribe (includes bezel)	536416-001
Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer (includes bezel)	536417-001
DVD-ROM Drive (includes bezel)	536415-001

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 63).
5. Remove the switch cover and keyboard (see Switch cover and keyboard on page 64).

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Remove the optical drive:

1. Position the computer with the right side toward you.
2. Remove the Phillips PM2.5×7.0 screw **(1)** that secures the optical drive to the computer.

NOTE: On 15-in models the screw is located in a hole in the top cover. See the first image below.

NOTE: On 14-in models the screw is located directly below the keyboard ZIF connector. See the second image below.

3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access **(2)** and press the tab to the right to release the optical drive from the computer.

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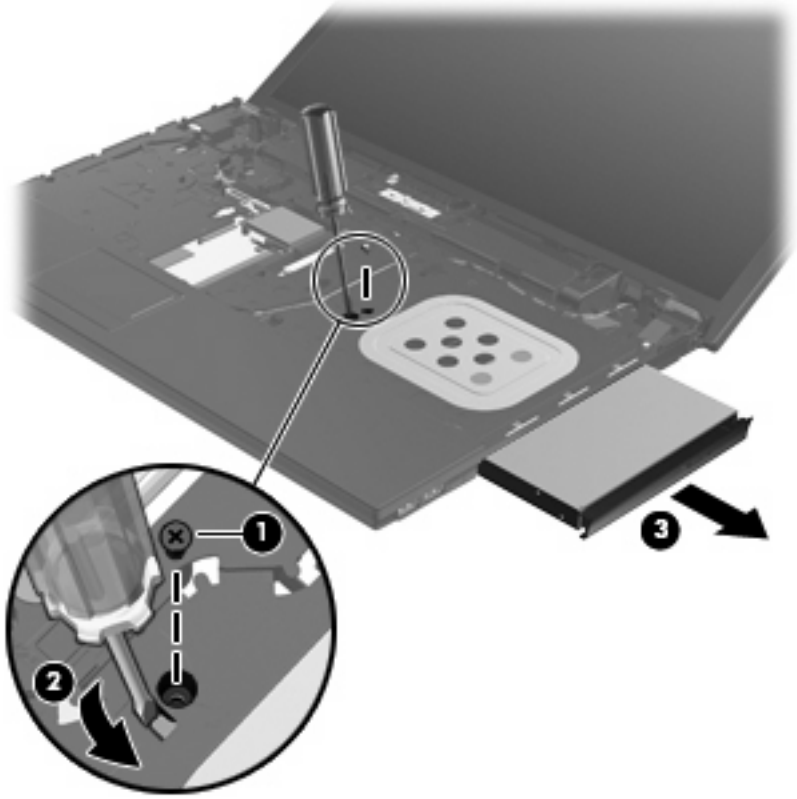
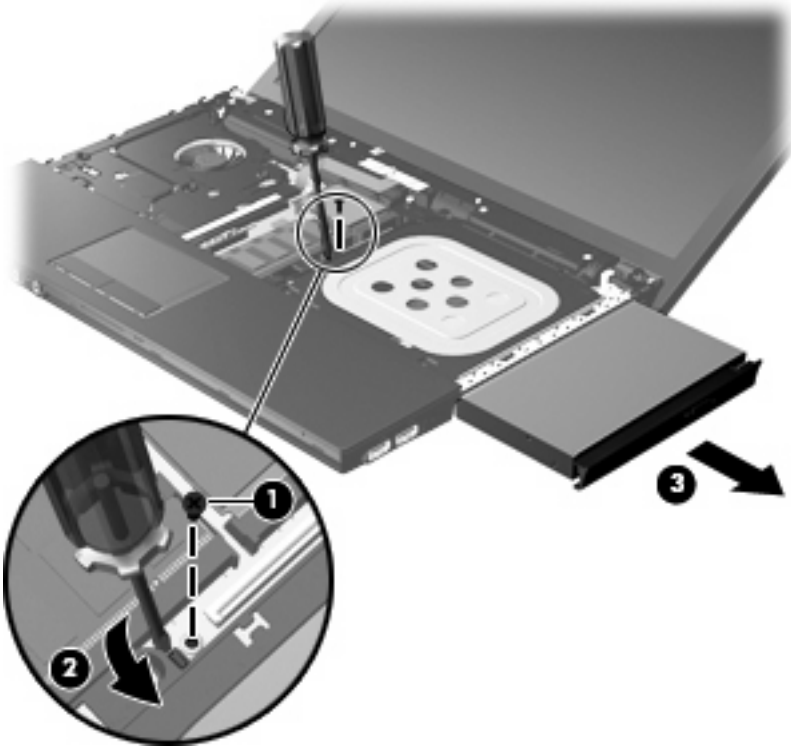
4. Remove the optical drive **(3)** from the computer.

NOTE: 15-in model shown below



NOTE: 14-in model shown below



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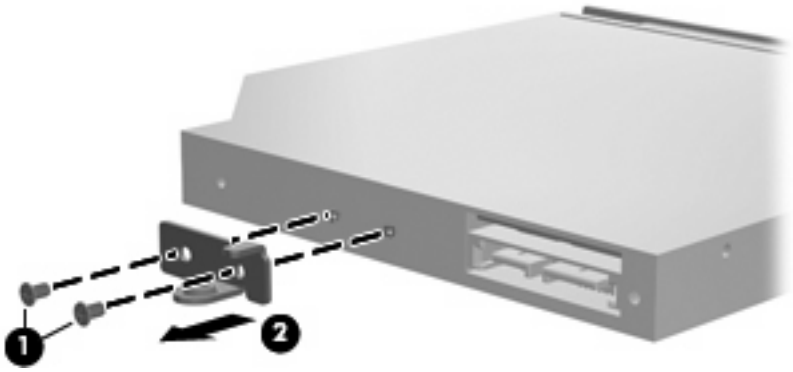
5. If it is necessary to replace the optical drive bracket, position the optical drive with the rear toward you.
6. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.
7. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install an optical drive.

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Speakers

Description	Spare part number
For use in computers with 15-in displays	536598-001
For use in computers with 14-in displays	536420-001

Before removing the speakers, follow these steps:

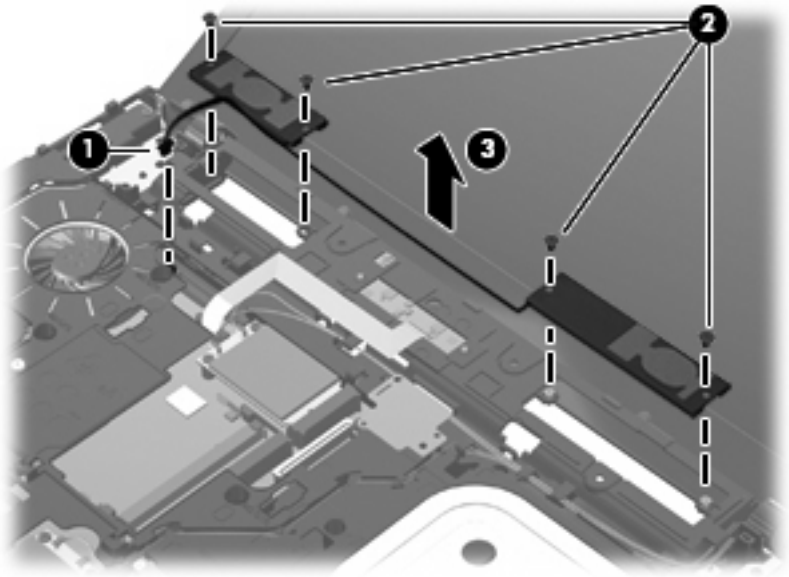
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 63).
5. Remove the switch cover and keyboard (see Switch cover and keyboard on page 64).

Remove the speakers:

1. Position the computer right-side up with the front toward you.
2. Disconnect the speaker cable **(1)** from the system board.

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

3. Remove the four Phillips PM2.5×3.0 screws **(2)** that secure the speakers to the top cover.
4. Remove the speaker cable from the clips and routing channel, and then remove the speakers from the computer **(3)**.



Reverse this procedure to install the speakers.

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WWAN module

NOTE: Only computers with 15-in displays include a WWAN module.

Description	Spare part number
HP Mobile Broadband Module	483377-002

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.

Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 63).
5. Remove the switch cover and keyboard (see Switch cover and keyboard on page 64)

Remove the WWAN module:

1. Position the computer right-side up with the front toward you.
2. Disconnect the WWAN antenna cables **(1)** from the terminals on the WWAN module.

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

3. Remove the two Phillips PM2.5×3.0 screws **(2)** that secure the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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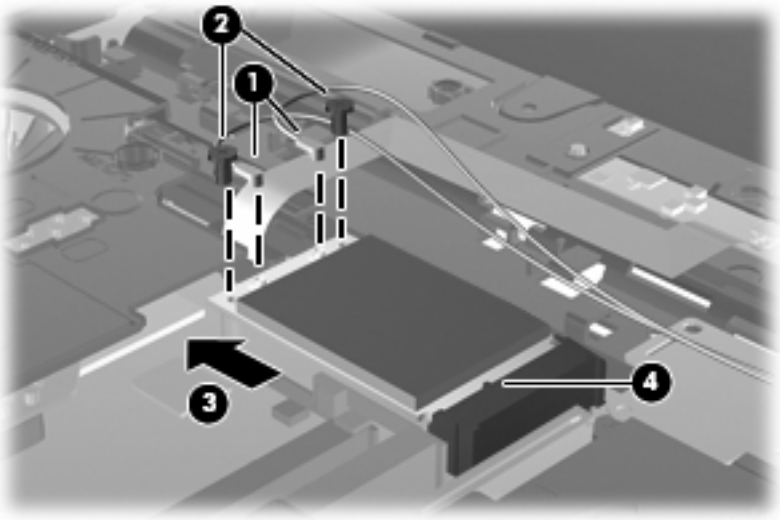
4. Remove the WWAN module **(3)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WWAN module.

Palm rest

Description	Spare part number
Palm rest for use in black computers with 15-in displays (includes TouchPad)	535868-001
Palm rest for use in red computers with 15-in displays (includes TouchPad)	572728-001
Palm rest for use in black computers with 14-in displays (includes TouchPad)	535867-001
Palm rest for use in red computers with 14-in displays (includes TouchPad)	572727-001

Before removing the palm rest, 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 63).
5. Remove the switch cover and keyboard (see Switch cover and keyboard on page 64)

Remove the palm rest:

1. Position the computer right-side up with the front toward you.

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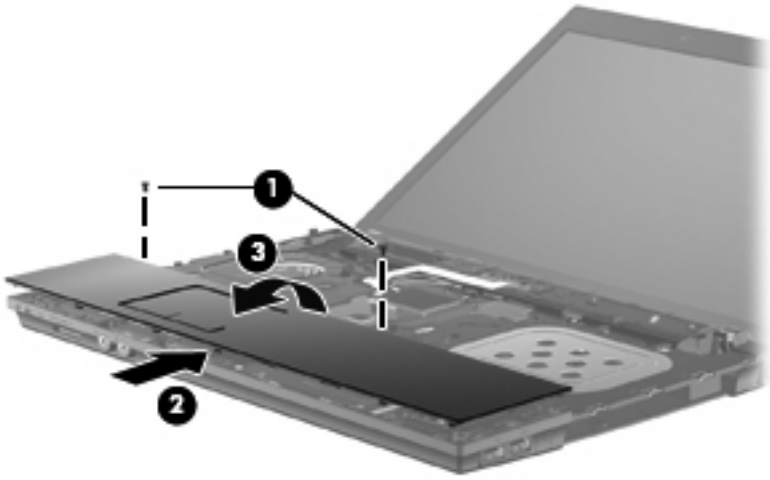
2. On 15-in models:

   a. Remove the two Phillips PM2.5×3.0 broadhead screws **(1)** that secure the palm rest to the computer.

   b. Slide the palm rest back toward the display **(2)**, and then lift and rotate the front edge **(3)** to gain access to the TouchPad cable.

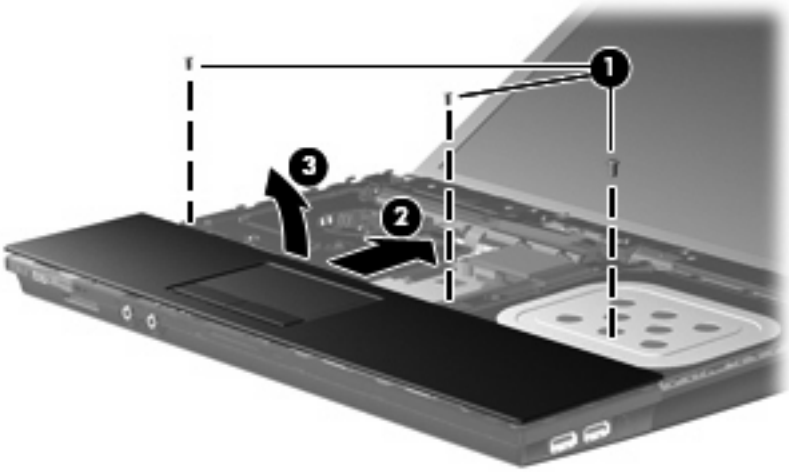


– or –

On 14-in models:

   a. Remove the three Phillips PM2.5×3.0 broadhead screws **(1)** that secure the palm rest to the computer.

   b. Slide the palm rest back toward the display **(2)**, and then lift the front edge **(3)** to gain access to the TouchPad cable.



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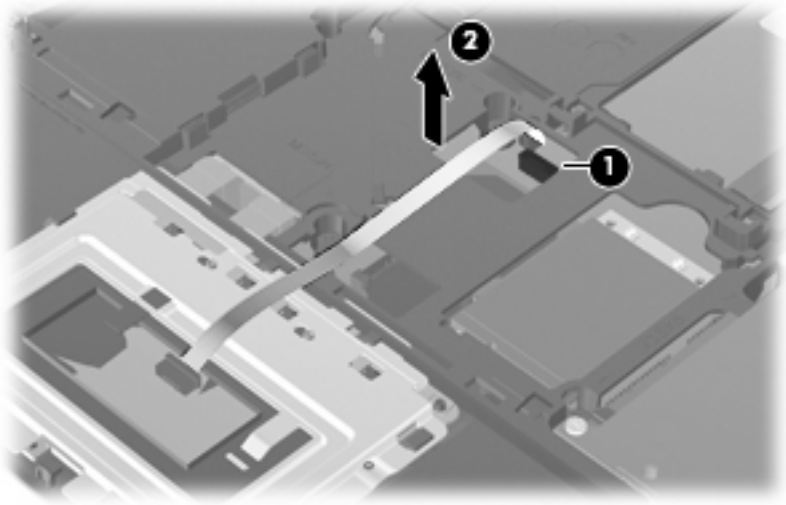
3. Release the ZIF connector **(1)** to which the TouchPad cable is connected, and then disconnect the TouchPad cable **(2)** from the system board.



4. Remove the palm rest.

Reverse this procedure to install the palm rest.

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Hard drive

NOTE: The hard drive spare part kit includes a hard drive bracket.

Description	Spare part number
500-GB, 7200-rpm hard drive	*575195-001*
500-GB, 5400-rpm hard drive	536414-001
320-GB, 7200-rpm hard drive	*575194-001*
320-GB, 5400-rpm hard drive	536413-001
250-GB, 7200-rpm hard drive	538972-001
250-GB, 5400-rpm hard drive	536412-001
160-GB, 7200-rpm hard drive	538971-001
160-GB, 5400-rpm hard drive	536411-001

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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Palm rest (see Palm rest on page 75)

Remove the hard drive:

1. Position the computer right-side up with the front toward you.
2. Remove the two Phillips PM2.0×4.0 screws **(1)** and loosen the Phillips PM2.5×11.0 captive screw **(2)** that secures the hard drive to the computer.
3. Grasp the Mylar tab on the hard drive and slide the hard drive **(3)** to the left to disconnect it from the system board.

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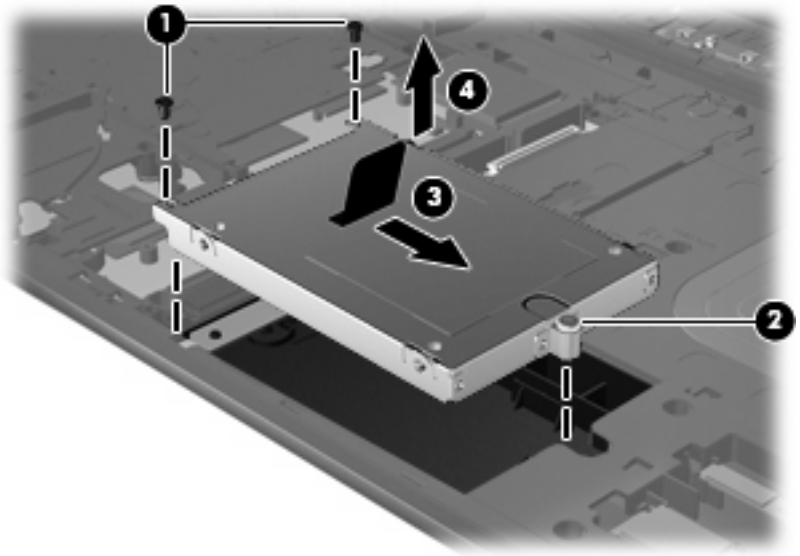
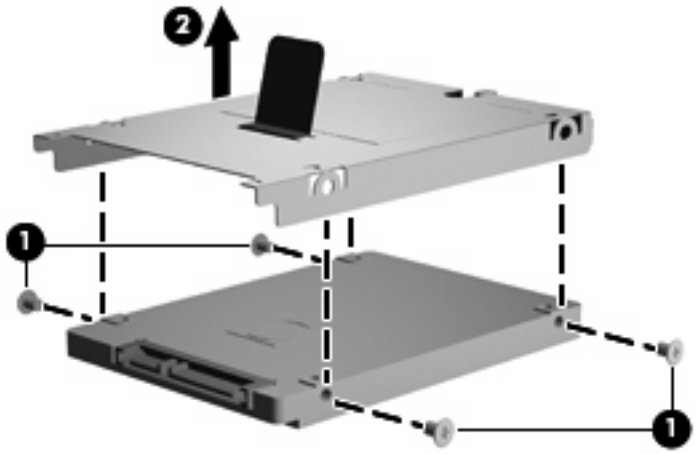
4. Remove the hard drive **(4)** from the hard drive bay.



5. If it is necessary to replace the hard drive bracket, remove the two Phillips PM3.0×4.0 hard drive bracket screws **(1)** from each side of the hard drive.

6. Lift the bracket **(2)** straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

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WLAN module

Description	Spare part number
Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions except Pakistan, Russia, and the Ukraine	480985-001
Intel Wi-Fi Link 5100 802.11a/b/g WLAN module	482957-001
Broadcom 4322 802.11a/b/g/n WLAN modules:	
• For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504664-001
• 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	504664-002
Broadcom BCM4312 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

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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	504593-004
Broadcom 4322 AGN 802.11a/b/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*	*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*

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Description	Spare part number
Intel Wi-Fi Link 1000, 802.11b/g/n WLAN module	
• *For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Cayman Islands, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Guadeloupe, Guam, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Nigeria, Oman, Pakistan, Panama, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, Quatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam*	*572520-001*

△ **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.

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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Palm rest (see Palm rest on page 75)

Remove the WLAN module:

1. Position the computer right-side up with the front toward you.
2. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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

3. Remove the two Phillips PM2.5×3.0 screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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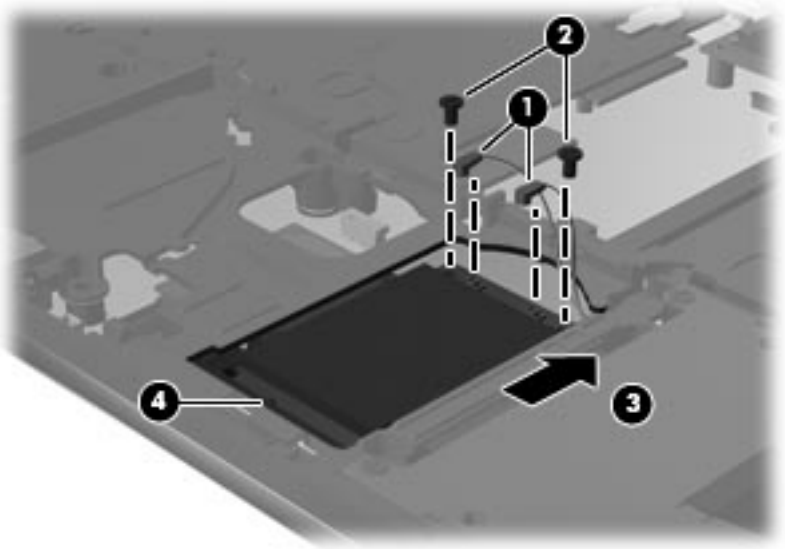
4. Remove the WLAN module **(3)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WLAN module.

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Display assembly on computers with 15-in displays

NOTE: For information about removing the display from 14-in models, see Display assembly on computers with 14-in displays on page 97.

NOTE: The display assembly spare part kit includes 2 WLAN antenna transceivers and cables.

Description	Spare part number
For use only with black computers with 15.6-in displays	
15.6-in WXGA HD BrightView display assembly	535850-001
15.6-in WXGA HD BrightView display assembly for use in computers equipped with a webcam and WWAN module	535854-001
15.6-in WXGA HD BrightView display assembly for use on computers equipped with a webcam	535853-001
15.6-in WXGA HD AntiGlare display assembly	535849-001
15.6-in WXGA HD AntiGlare display assembly for use on computers equipped with a webcam	535851-001
15.6-in WXGA HD+ AntiGlare display assembly for use on computers equipped with a webcam	535855-001
15.6-in WXGA HD AntiGlare display assembly for use on computers equipped with a webcam and WWAN	535852-001
15.6-in WXGA HD+ AntiGlare display assembly for use on computers equipped with a webcam and WWAN	535856-001
For use only with red computers with 15.6-in displays	
15.6-in HD WXGA BrightView display assembly (1366×768 resolution)	572716-001
15.6-in HD WXGA BrightView display assembly for use in computers equipped with a webcam (1366×768 resolution)	572719-001
15.6-in HD WXGA BrightView display assembly for use in computers with a webcam and WWAN module (1366×768 resolution)	572720-001
15.6-in HD WXGA AntiGlare display assembly (1366×768 resolution)	572715-001
15.6-in WXGA HD AntiGlare display assembly for use on computers equipped with a webcam (1366×768 resolution)	572717-001
15.6-in WXGA HD+ AntiGlare display assembly for use on computers equipped with a webcam (1600×900 resolution)	572721-001
15.6-in WXGA HD AntiGlare display assembly for use in computers with a webcam and a WWAN module (1366×768 resolution)	572718-001
15.6-in WXGA HD+ AntiGlare display assembly for use in computers with a webcam and a WWAN module (1600×900 resolution)	572722-001

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.

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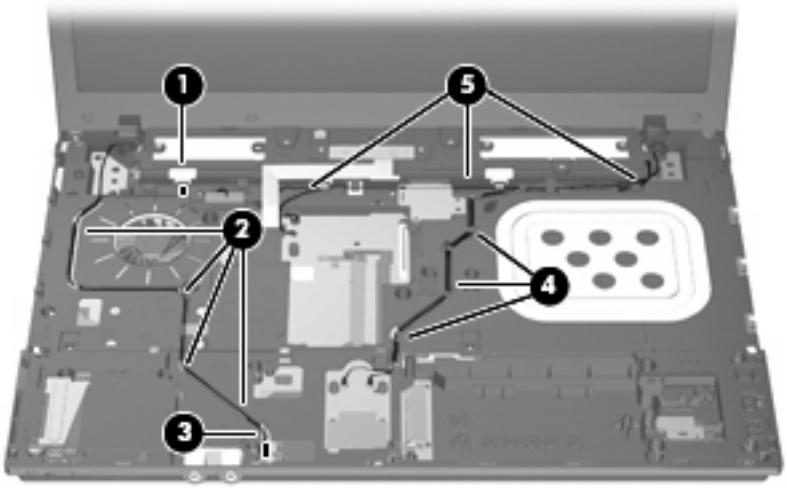
4. Remove the battery (see Battery on page 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Speakers (see Speakers on page 73)
   c. Palm rest (see Palm rest on page 75)

Remove the display cables:

1. Position the computer right-side up with the front toward you.
2. Open the computer as far as possible.
3. Disconnect the display panel and webcam cable **(1)** from the system board.
4. Remove the microphone module cable from the routing path **(2)**, and then disconnect the cable **(3)** from the system board.
5. Remove the WLAN wireless antenna cables **(4)** from the tape, clips, and routing channels built into the top cover.
6. On models with a WWAN module, remove the WWAN wireless antenna cables **(5)** from the tape, clips, and routing channels built into the top cover.



Remove the display assembly:

△ **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.

1. Remove the six Phillips PM2.5×6.0 screws **(1)** that secure the display assembly to the computer.

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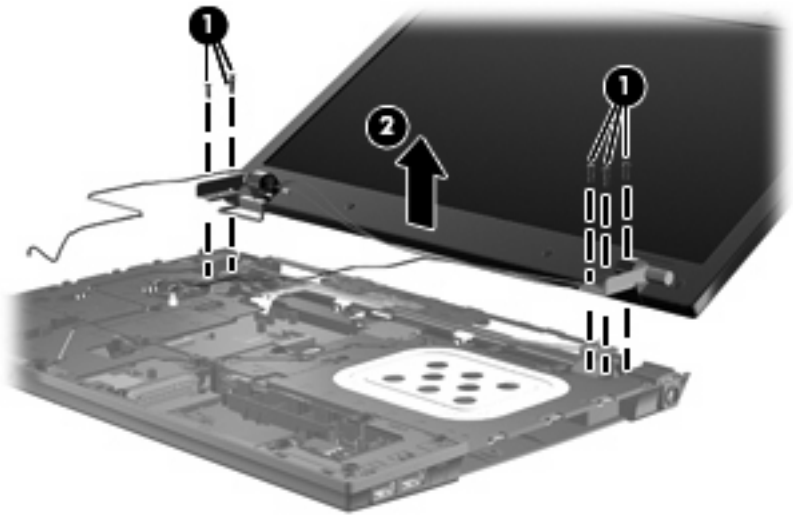
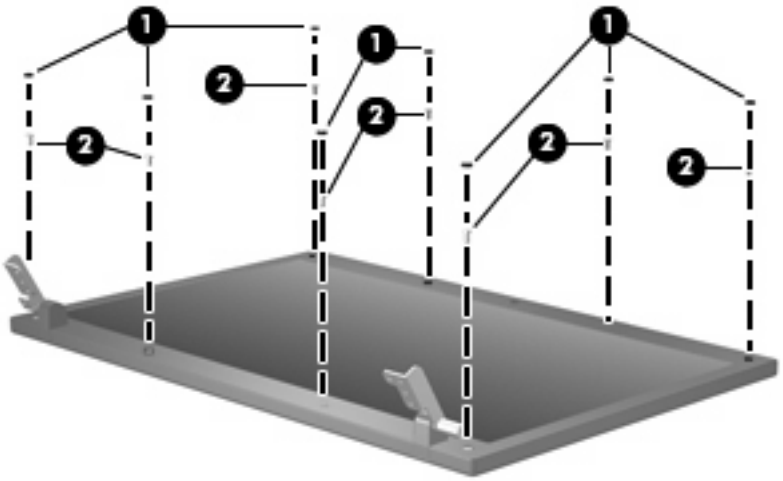
2. Lift the display assembly **(2)** straight up and remove it.



3. If it is necessary to replace the display bezel, display enclosure, or display hinges, remove the eight rubber screw covers **(1)** and the eight Phillips PM2.0×6.0 screws **(2)** that secure the display bezel to the display assembly. The rubber screw covers are available in the Rubber Kit, spare part number 535793-001.



4. Remove the bezel:

   a. Flex the top of the bezel until it disengages from the display enclosure **(1)**.

   b. Flex the inside bottom of the bezel until it disengages from the display enclosure **(2)**.

   c. Flex the outside bottom of the bezel until it disengages from the display enclosure **(3)**.

   d. Lift the bottom corners of the bezel until it disengages **(4)**.

   e. Lift the bezel at the seam in the hinges until it disengages **(5)**.

   f. Remove the bezel from the display enclosure.

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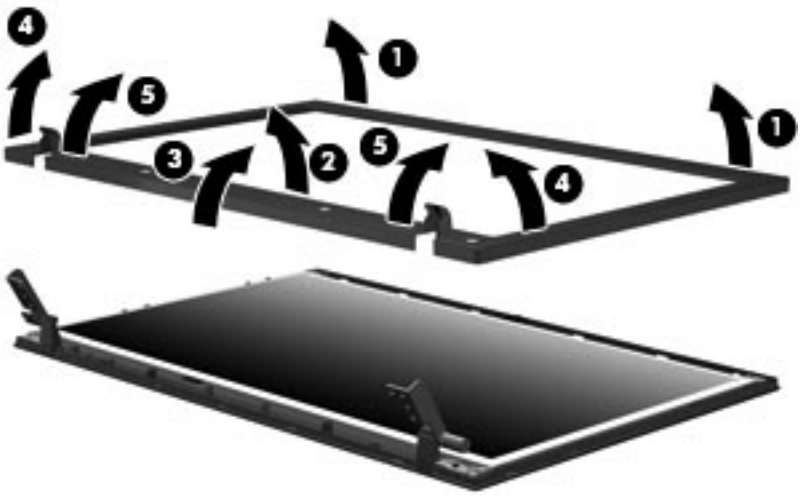
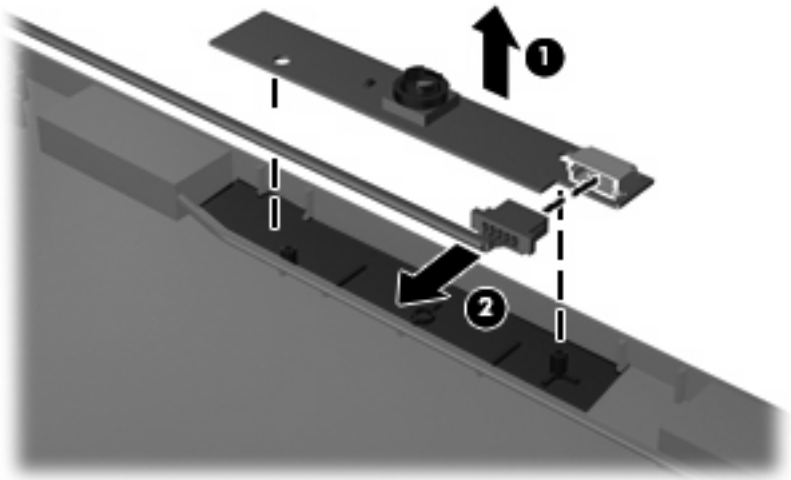


The display bezel is available using spare part numbers 536423-001 on computers with 14-in displays and a webcam and 536422-001 on computers with 14-in displays and no webcam.

5. If it is necessary to replace the webcam module, gently pull the webcam module away from the double-sided tape on the display enclosure **(1)**, disconnect the webcam cable from the module **(2)**, and then remove the webcam. The webcam module can be ordered by using spare part number 535797-001.



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

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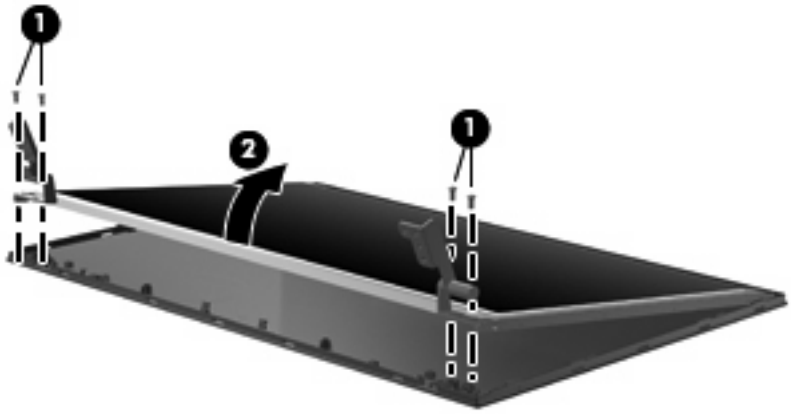
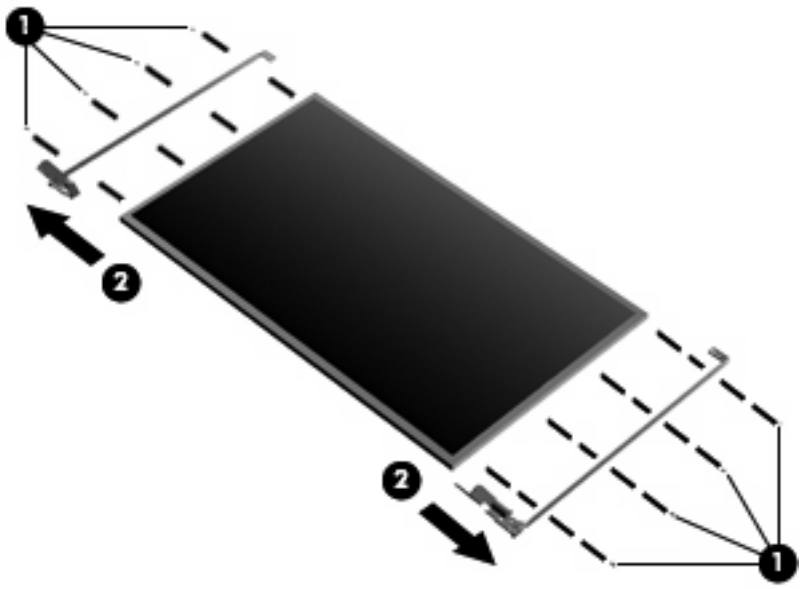
6. If it is necessary to replace the display hinges, remove the display panel by removing the four Phillips PM2.5×4.5 screws **(1)** that secure the panel to the display enclosure, and then remove the panel from the enclosure **(2)**.



7. Remove the eight Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel, and then remove the display hinges **(2)**. The left and right display hinges are available in the Display Hinge Kit, spare part number 535872-001 for computers with 15-in displays.



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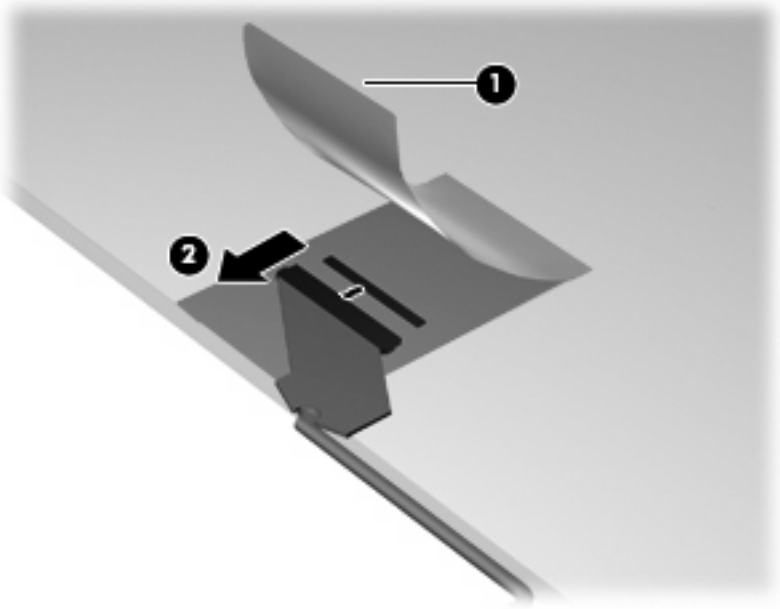
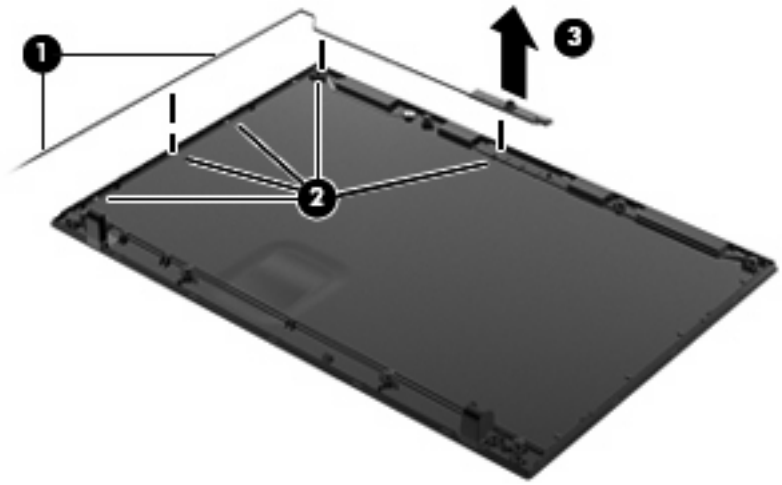
8. If it is necessary to replace the display/webcam cable, turn the display panel upside-down and peel back the tape that secures the display cable to the display panel **(1)**, and then disconnect the cable from the connector on the back of the display panel **(2)**.

NOTE: The display cable and webcam cable are bound together as one cable assembly.



9. Gently pull the webcam cable **(1)** from the clips and routing channels **(2)** built into the top cover. The display/webcam cable is included in the Display Cable Kit, spare part number 536433-001 for computers with 15-in displays.



Reverse this procedure to reassemble and install the display assembly.

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Top cover

NOTE: The top cover removal procedures differ for 15-in computers from those of 14-in computers.

NOTE: You must remove the top cover before you can remove the display assembly on computers with 14-in displays. You do not have to remove the top cover to remove the display assembly on computers with 15-in displays.

Description	Spare part number
Top cover for use in computers with 15-in displays	535866-001
Top cover for use in computers with 14-in displays	535865-001

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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Speakers (see Speakers on page 73)
   c. Optical drive (see Optical drive on page 69)
   d. Palm rest (see Palm rest on page 75)

Remove the top cover:

NOTE: Steps 1 through 5 illustrate how to remove the top cover from computers with 15-in displays. Steps 6 through 10 illustrate how to remove the top cover from computers with 14-in displays.

1. Position the computer right-side up with the front toward you.

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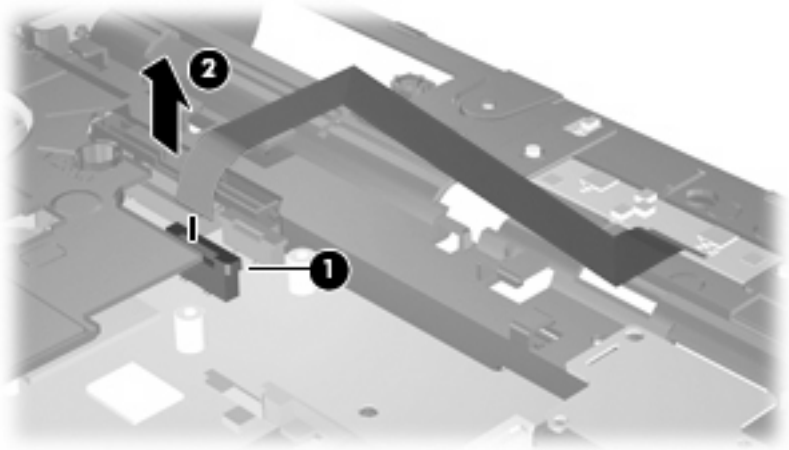
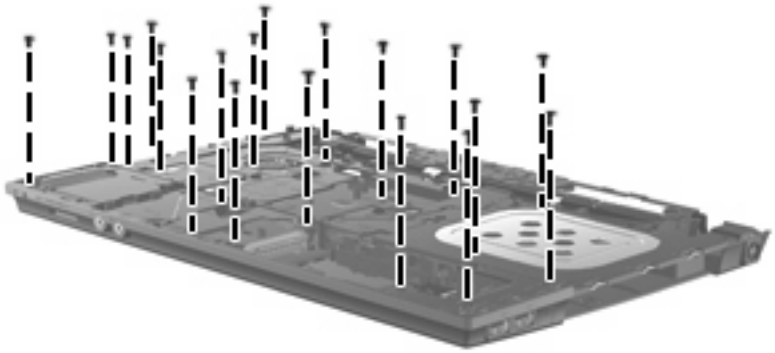
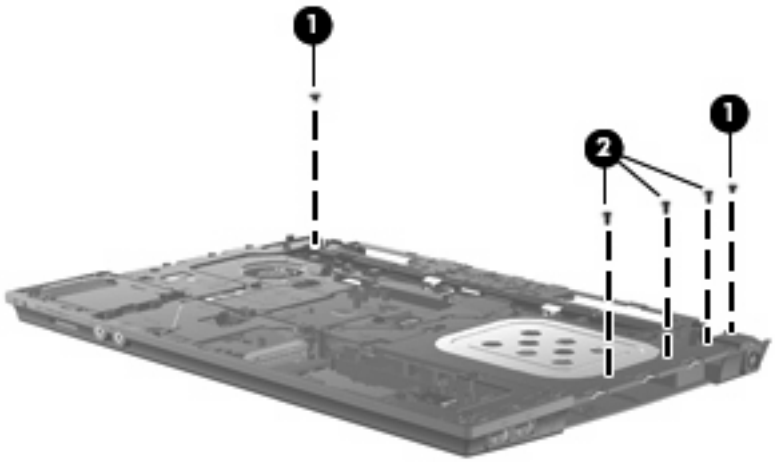
2. Disconnect the power button board cable from the system board by releasing the ZIF connector **(1)**, and then disconnecting the cable **(2)**.



3. Remove the 19 Phillips PM2.5×6.0 screws that secure the top cover to the computer.



4. Remove the two Phillips PM2.0×4.0 screws **(1)** and the three Phillips PM2.0×2.0 screws **(2)** that secure the top cover to the computer.



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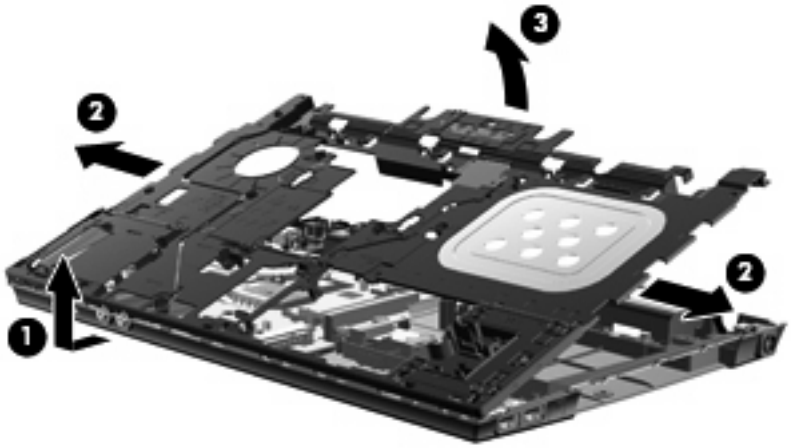
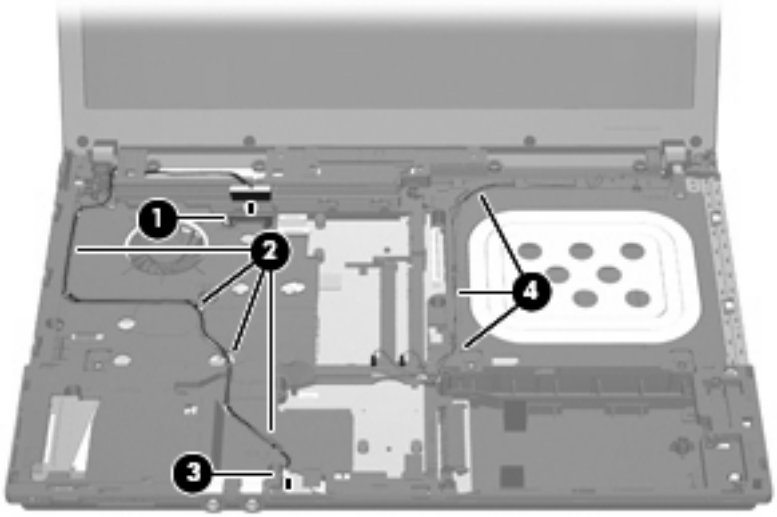
5. Flex the front edge of the top cover and lift up **(1)** until it disengages from the base enclosure, release the top cover from the sides of the base enclosure **(2)**, and then remove the top cover **(3)**.



NOTE: Steps 6 through 13 illustrate how to remove the top cover from computers with 14-in displays. Steps 1 through 5 illustrate how to remove the top cover from computers with 15-in displays.

6. Position the computer right-side up with the front toward you.
7. Disconnect the display panel cable **(1)** from the system board.
8. Remove the microphone module cable from the routing path **(2)**, and then disconnect the cable **(3)** from the system board.
9. Remove the WLAN wireless antenna cables **(4)** from the clips and routing channels built into the top cover.



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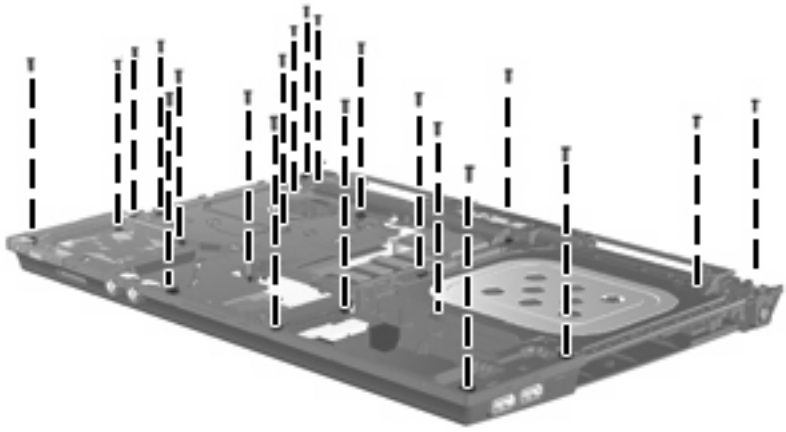
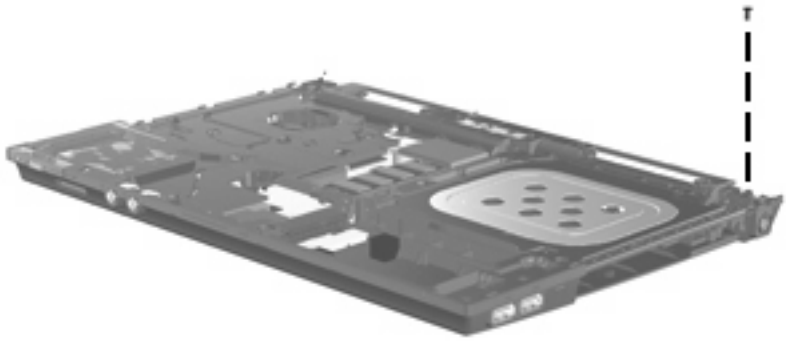
10. Remove the 21 PM2.5×6.0 screws that secure the top cover to the computer.

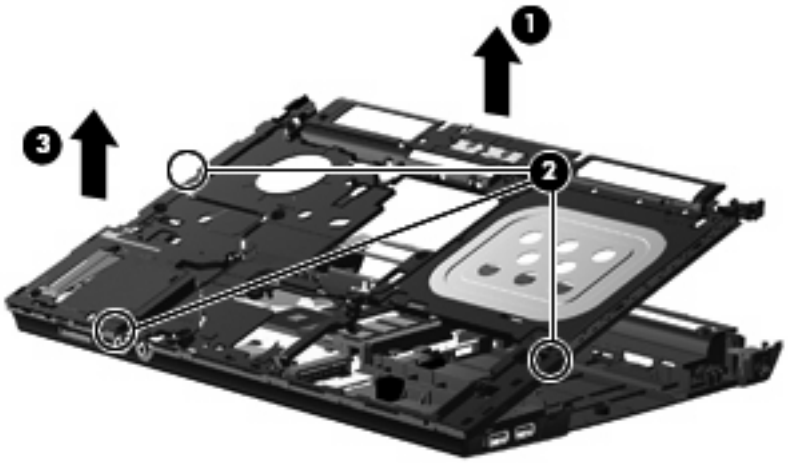


11. Remove the Phillips PM2.0×4.5 screw that secures the top cover to the computer.



12. Lift the top cover until it disengages from the base enclosure **(1)**. Locations at which the top cover more securely connects to the base enclosure are indicated by callout **(2)**. If necessary, apply additional upward pressure at these points to disengage the top cover.

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



Reverse this procedure to install the top cover.

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Power button board

Description	Spare part number
Power button board for use in computers with 15-in displays (includes cable)	574513-001
Power button board for use in computers with 14-in displays (includes cable)	574514-001

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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Optical drive (see Optical drive on page 69)
   c. Speakers (see Speakers on page 73)
   d. Palm rest (see Palm rest on page 75)
   e. Hard drive (see Hard drive on page 78)
   f. Top cover (see Top cover on page 90)
   g. Display assembly (see Display assembly on computers with 15-in displays on page 84 or Display assembly on computers with 14-in displays on page 97)

Remove the power button board:

1. Position the top cover upside-down with the rear toward you.

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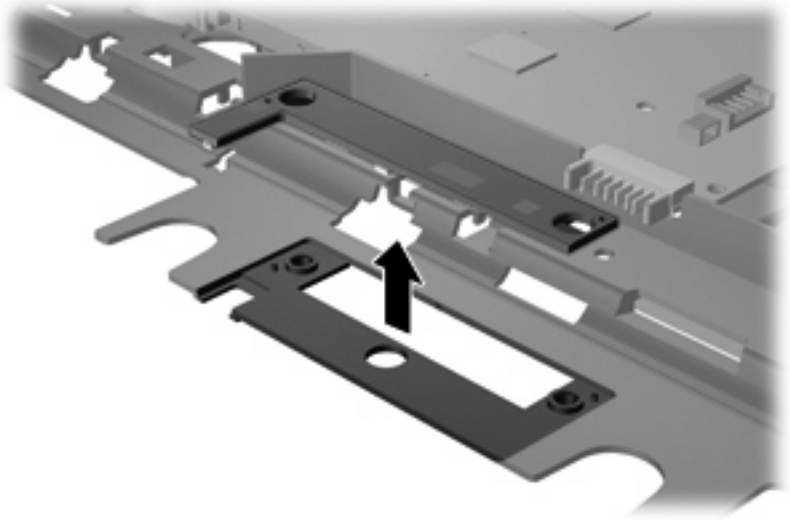
2. Lift the power button board straight up and off the top cover.

NOTE: Computer with 15-in display shown.



Reverse this procedure to install the power button board.

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RTC battery

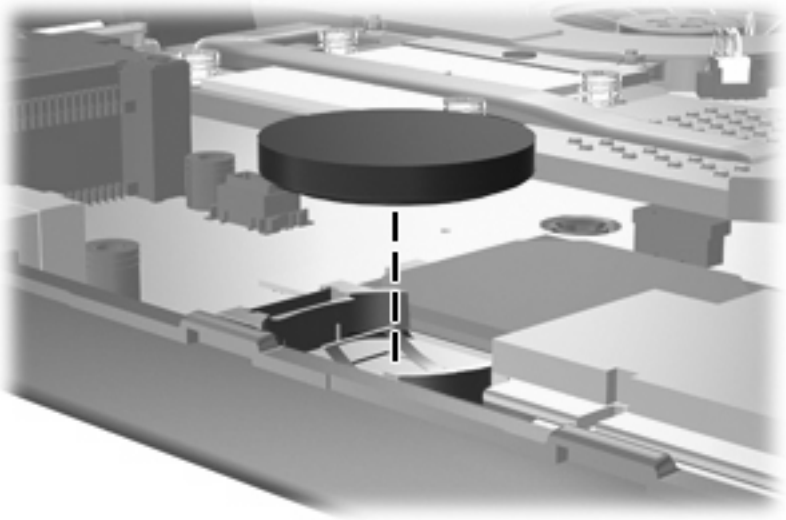
Description	Spare part number
RTC battery	449137-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Palm rest (see Palm rest on page 75)
   c. Top cover on 14-in models (see Top cover on page 90)

Remove the RTC battery:

1. Position the computer right-side up with the front toward you.
2. Remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery.

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Display assembly on computers with 14-in displays

NOTE: For information about removing the display from 15-in models, see Display assembly on computers with 15-in displays on page 84.

NOTE: The display assembly spare part kit includes 2 WLAN antenna transceivers and cables.

Description	Spare part number
For use only with black computers with 14.0-in displays	
14.0-in WXGA HD BrightView display assembly	535844-001
14.0-in WXGA HD BrightView display assembly for use in computers equipped with a webcam	535847-001
14.0-in WXGA HD AntiGlare display assembly	535843-001
14.0-in WXGA HD AntiGlare display assembly for use in computers equipped with a webcam	535846-001
For use only with red computers	
14.0-in WXGA HD BrightView display assembly	572710-001
14.0-in WXGA HD BrightView display assembly for use in computers equipped with a webcam	572713-001
14.0-in WXGA HD AntiGlare display assembly	572709-001
14.0-in WXGA HD AntiGlare display assembly for use in computers equipped with a webcam	572712-001

Before removing the 14-in 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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Optical drive (see Optical drive on page 69)
   c. Speakers (see Speakers on page 73)
   d. Top cover (see Top cover on page 90)
   e. Palm rest (see Palm rest on page 75)

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Remove the display assembly:

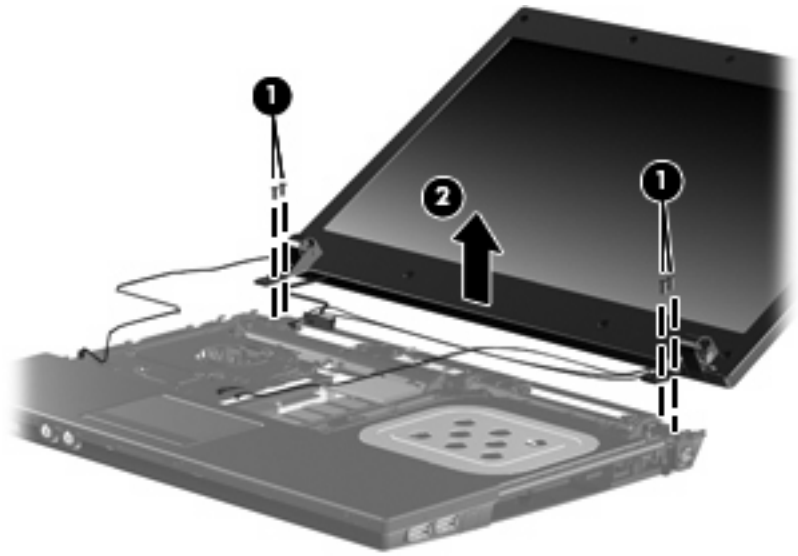
1. Position the computer right-side up with the front toward you.
2. Open the computer as far as possible.

△ **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.

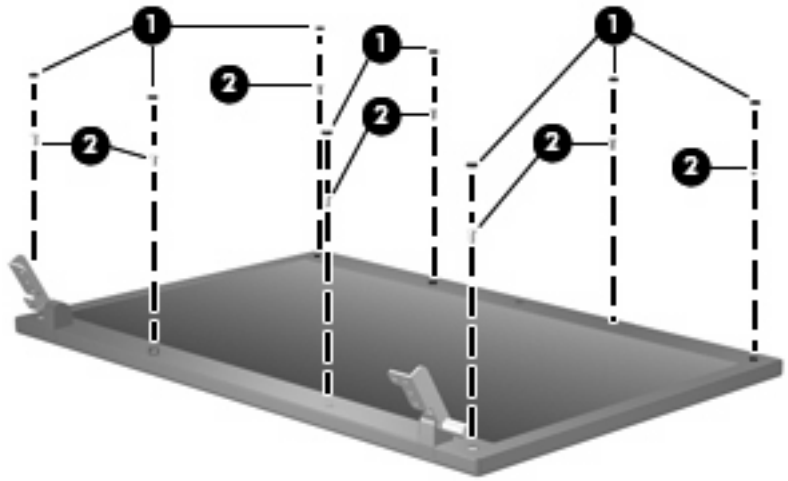
3. Remove the four Phillips PM2.5×4.5 screws **(1)** that secure the display assembly to the computer.

NOTE: When replacing the display assembly, only replace the four bottom screws. The top screw on each side is replaced when you install the top cover.

4. Lift the display assembly up and off the computer **(2)**.



5. If it is necessary to replace the display bezel, display enclosure, or display hinges, remove the eight rubber screw covers **(1)** and the eight Phillips PM2.5×6.0 screws **(2)** that secure the display bezel to the display assembly. The rubber screw covers are available in the Rubber Kit, spare part number 535793-001.



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6. Remove the bezel:

   a. Flex the top of the bezel until it disengages from the display enclosure **(1)**.

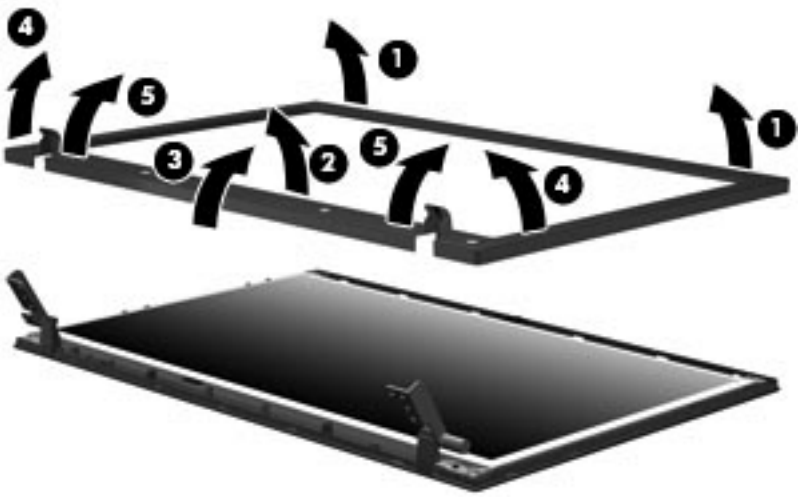
   b. Flex the inside bottom of the bezel until it disengages from the display enclosure **(2)**.

   c. Flex the outside bottom of the bezel until it disengages from the display enclosure **(3)**.

   d. Lift the bottom corners of the bezel until it disengages **(4)**.

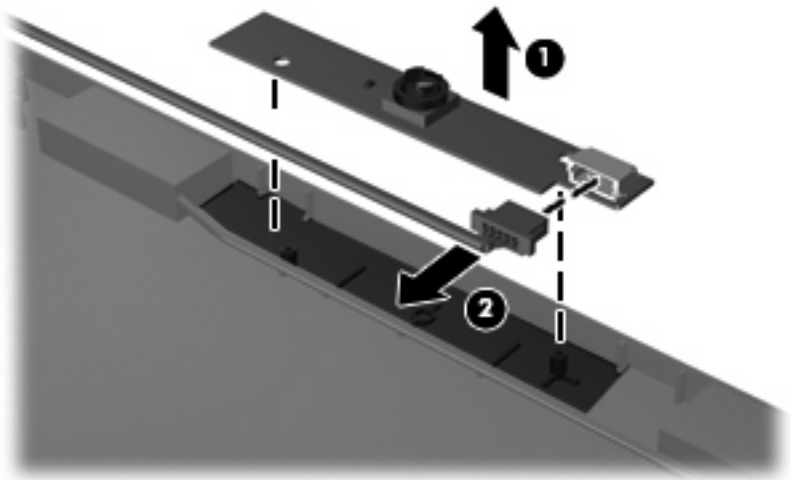
   e. Lift the bezel at the seam in the hinges until it disengages **(5)**.

   f. Remove the bezel from the display enclosure.



The display bezel is available using spare part numbers 536423-001 on computers with 14-in displays and a webcam and 536422-001 on computers with 14-in displays and no webcam.

7. If it is necessary to replace the webcam module, gently pull the webcam module away from the double-sided tape on the display enclosure **(1)** and disconnect the webcam cable from the module **(2)**. The webcam module can be ordered by using spare part number 535797-001.



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

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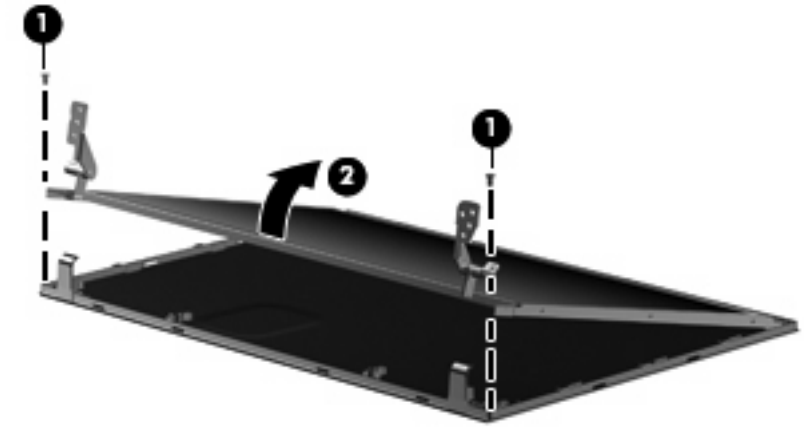
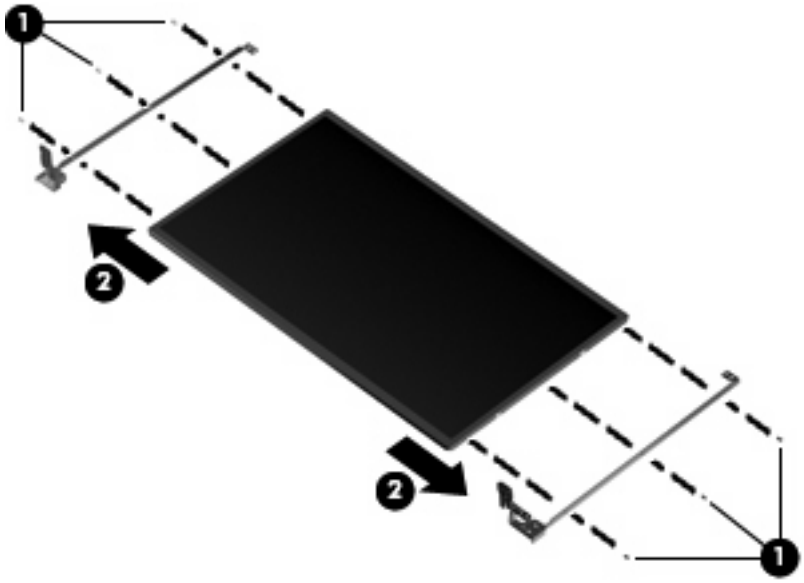
8. If it is necessary to replace the display hinges, remove the two Phillips PM2.5×4.5 screws **(1)** that secure the panel to the display enclosure. Then lift the bottom of the panel **(2)** to remove it from the enclosure.



9. Remove the six Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel, and then remove the display hinges **(2)**. The left and right display hinges are available in the Hinge Kit, spare part number 535871-001 for computers with 14-in displays.



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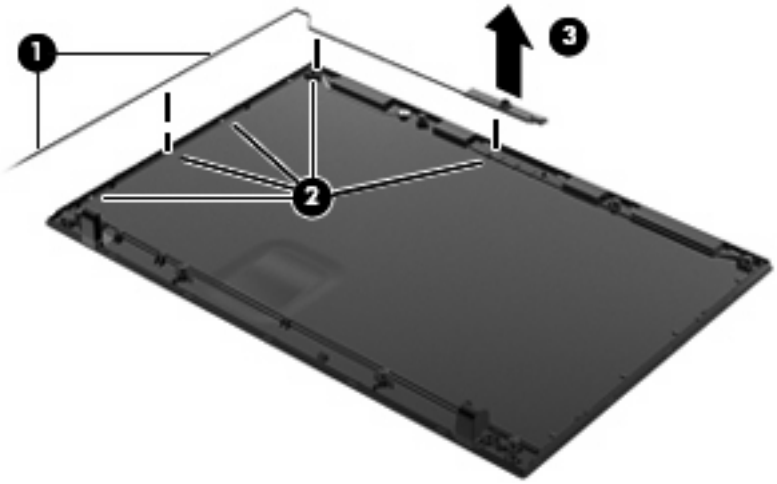
10. If it is necessary to replace the webcam cable, gently pull the webcam cable **(1)** from the clips and routing channels **(2)** built into the top cover, and then remove the cable **(3)**. The webcam cable is included in the Display Cable Kit, spare part number 536430-001 for computers with 14-in displays.



Reverse this procedure to install the display assembly.

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Bluetooth module

NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 536539-001 for computers with 15-in displays, 536538-001 for computers with 14-in displays. See Cable Kit on page 45 for more Cable Kit spare part number information.

Description	Spare part number
HP Integrated Bluetooth 2.0 module for use in all countries and regions except Japan and Asia Pacific countries and regions	483113-001
HP Integrated Bluetooth 2.1 module for use in all countries and regions except Japan and Asia Pacific countries and regions	*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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Top cover (see Top cover on page 90)
   c. Palm rest (see Palm rest on page 75)
   d. Hard drive (see Hard drive on page 78)

Remove the Bluetooth module:

1. Position the computer right-side up with the front toward you.
2. Disconnect the Bluetooth module cable **(1)** from the system board.
3. Remove the Bluetooth module cable **(2)** from the routing path.

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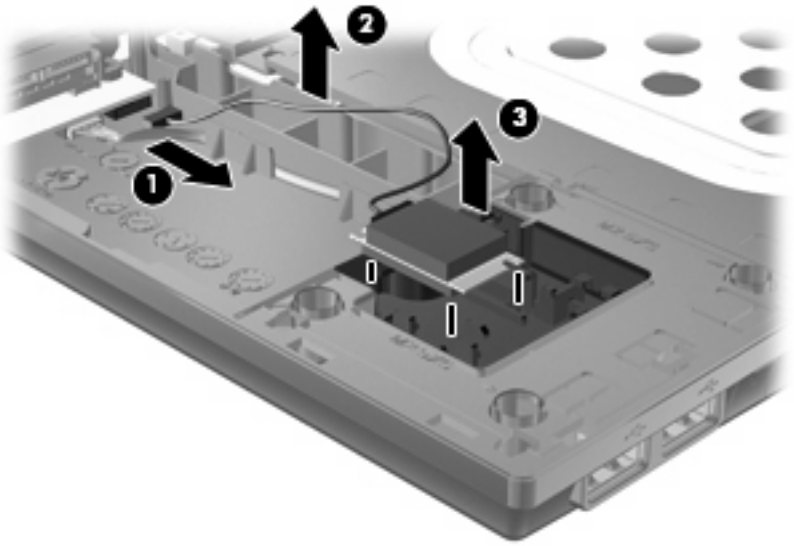
4. Remove the Bluetooth module **(3)** from the base enclosure.



Reverse this procedure to install the Bluetooth module.

Modem module

Description	Spare part number
For use in all countries and regions except Australia and New Zealand	510100-001
For use only in Australia and New Zealand	510100-011

Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Optical drive (see Optical drive on page 69)
   c. Speakers (see Speakers on page 73)
   d. Palm rest (see Palm rest on page 75)
   e. Top cover (see Top cover on page 90)

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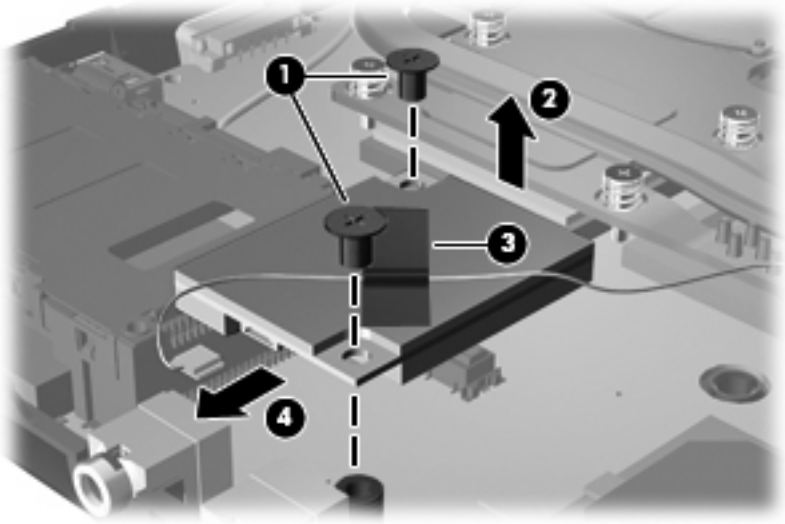
Remove the modem module:

1. Position the computer right-side up with the front toward you.
2. Remove the two Phillips PM2.5×3.0 screws **(1)** that secure the modem module to the system board.
3. Lift the modem module **(2)** straight up to disconnect it from the system board.
4. Remove the tape **(3)** that secures the cable to the modem module, and then disconnect the modem module cable **(4)**.



5. Remove the modem module.

Reverse this procedure to install the modem module.

USB connector assembly

NOTE: The USB connector assembly is included in the Misc Cable Kit, spare part number 536539-001 for computers with 15-in displays or 536538-001 for computers with 14-in displays.

Before removing the USB connector 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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Optical drive (see Optical drive on page 69)
   c. Speakers (see Speakers on page 73)
   d. Palm rest (see Palm rest on page 75)

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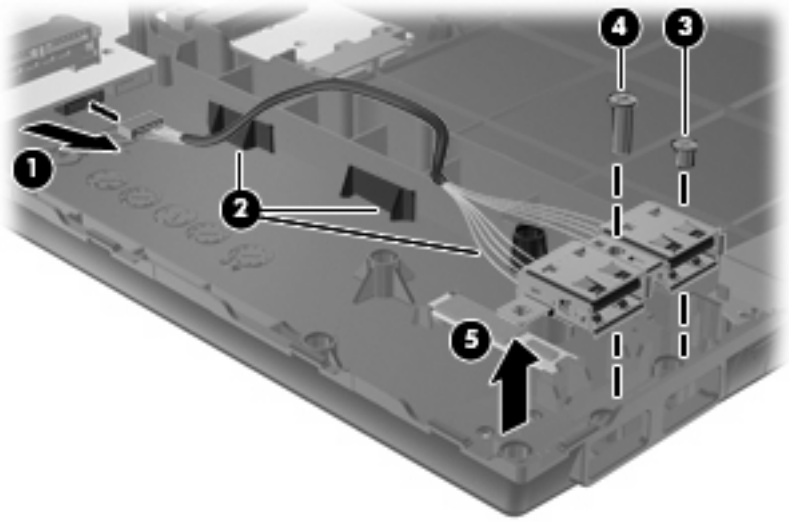
e. Hard drive (see Hard drive on page 78)

f. Display assembly (see Display assembly on computers with 15-in displays on page 84 or Display assembly on computers with 14-in displays on page 97)

g. Top cover (see Top cover on page 90)

Remove the USB connector assembly:

1. Position the computer right-side up with the right side toward you.
2. Disconnect the cable from the system board **(1)** and remove the cable from the routing path in the base enclosure **(2)**.
3. Remove the Phillips PM2.5×3.0 screw **(3)** and the Phillips PM2.5×7.0 screw **(4)** that secure the USB connector assembly to the base enclosure.
4. Remove the USB connector assembly **(5)** from the base enclosure.



Reverse this procedure to install the USB connector assembly.

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Heat sink and fan

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

Description	Spare part number
Heat sink for use in computers with UMA graphics subsystems	535859-001
Heat sink for use in computers with discrete graphics subsystems	535767-001
Fan	535766-001

Before removing the heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Speakers (see Speakers on page 73)
   c. Optical drive (see Optical drive on page 69)
   d. Palm rest (see Palm rest on page 75)
   e. Top cover (see Top cover on page 90)

Remove the heat sink:

NOTE: Steps 1 through 3 apply to computers with discrete subsystem memory on the system board. Steps 4 through 6 apply to computers with UMA subsystem memory. Step 7 shows how to remove the fan from the heat sink.

1. Position the computer right-side up with the front toward you.
2. Following the sequence stamped into the heat sink, loosen the seven screws **(1)**, **(2)**, **(3)**, **(4)**, **(5)**, **(6)**, **(7)** around the processor.

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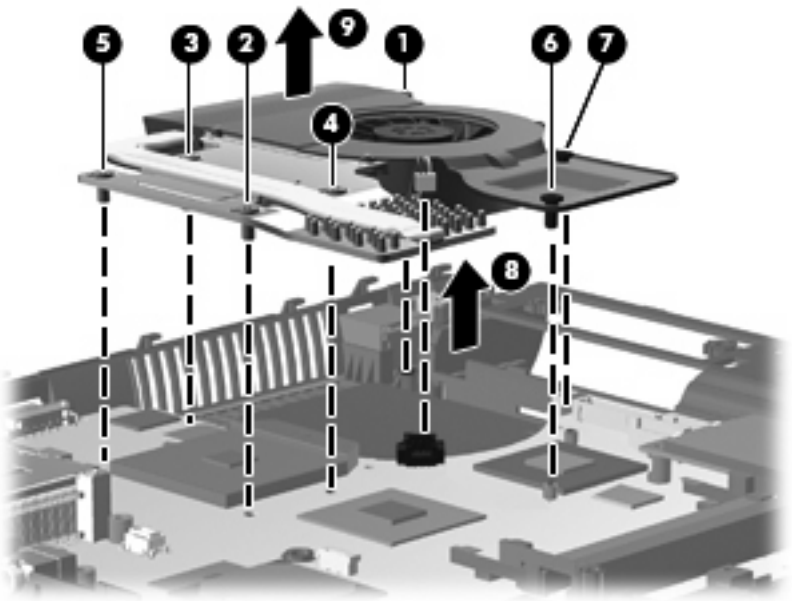
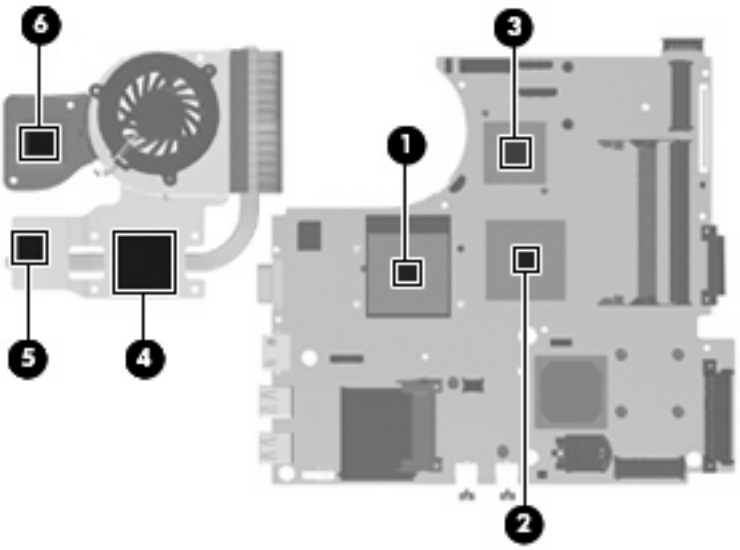
3. Disconnect the fan cable from the system board **(8)**, and then remove the heat sink **(9)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the system board **(1)**, **(2)**, and **(3)**, and the heat sink components **(4)**, **(5)**, and **(6)** each time the heat sink is removed. Replacement thermal material is included with all heat sink, system board, and processor spare part kits.



NOTE: Steps 4 through 6 apply to computers with UMA subsystem memory. Steps 1 through 3 apply to computers with discrete subsystem memory. Step 7 shows how to remove the fan from the heat sink.

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

5. Following the sequence stamped into the heat sink, loosen the five screws **(1)**, **(2)**, **(3)**, **(4)**, **(5)** around the processor.

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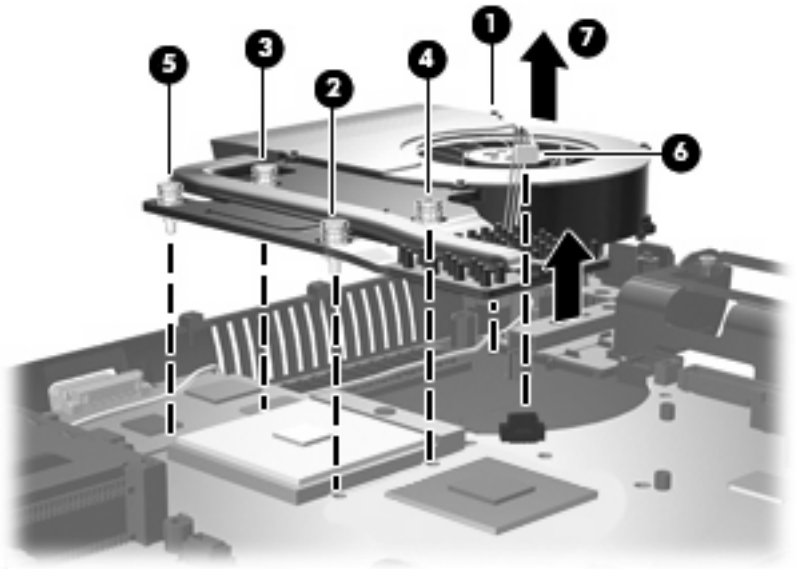
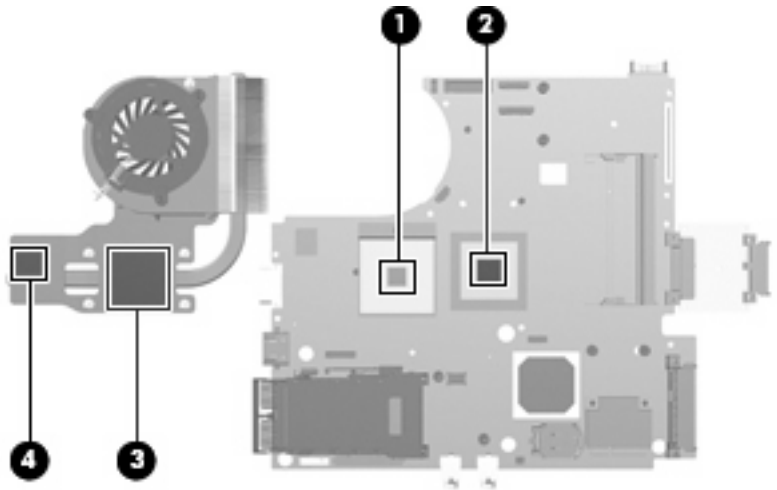
6. Disconnect the fan cable from the system board **(6)**, and remove the heat sink **(7)**.



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



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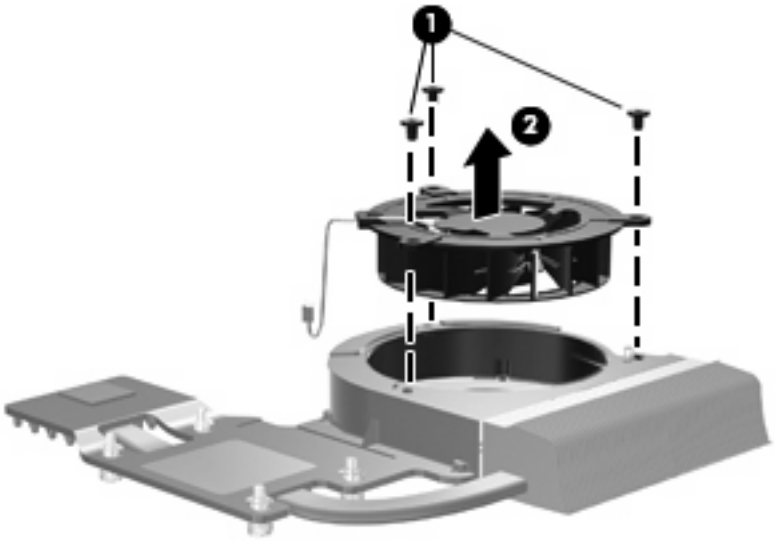
7. If it is necessary to remove the fan from the heat sink, remove the three Phillips PM2.0×3.0 screws **(1)** that secure the fan to the heat sink, and then remove the fan from the heat sink **(2)**.



Reverse this procedure to install the heat sink and fan.

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Processor

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

Description	Spare part number
Intel Core2 Duo processors	
T5870 2.0-GHz processor (2-MB L2 cache, 800-MHz FSB)	535835-001
T6570 2.1-GHz processor (2-MB L2 cache, 800-MHz FSB)	513598-001
T6670 2.2-GHz processor (2-MB L2 cache, 800-MHz FSB)	*572927-001*
T9400 2.53-GHz processor (6-MB L2 cache, 1066-MHz FSB)	507954-001
T9600 2.8-GHz processor (6-MB L2 cache, 1066-MHz FSB)	507952-001
P7370 2.0-GHz processor (3-MB L2 cache, 1066-MHz FSB)	507966-001
P7570 2.2-GHz processor (2-MB L2 cache, 800-MHz FSB)	*572930-001*
P8600 2.4-GHz processor (3-MB L2 cache, 1066-MHz FSB)	507961-001
P8700 2.53-GHz processor (3-MB L2 cache, 1066-MHz FSB)	507960-001
Intel Celeron M Processors	
585 2.16-GHz processor (1-MB L2 cache, 667-MHz FSB)	519898-001
900 2.2-GHz processor (1-MB L2 cache, 667-MHz FSB)	534419-001
Intel Pentium Dual-Core processors	
T4200 2.0-GHz processor (1-MB L2 cache, 800-MHz FSB)	*513599-001*
T4300 2.1-GHz processor (1-MB L2 cache, 800-MHz FSB)	*572929-001*
T4400 2.2-GHz processor (1-MB L2 cache, 800-MHz FSB)	*584296-001*
Intel Celeron Dual-Core processors	
T1600 1.66-GHz processor (1-MB L2 cache, 667-MHz FSB)	532324-001
T1700 1.83-GHz processor (1-MB L2 cache, 667-MHz FSB)	534084-001
T3000 1.8-GHz processor (1-MB L2 cache, 800-MHz FSB)	*572925-001*
T3100 1.9-GHz processor (1-MB L2 cache, 800-MHz FSB)	*572926-001*

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.

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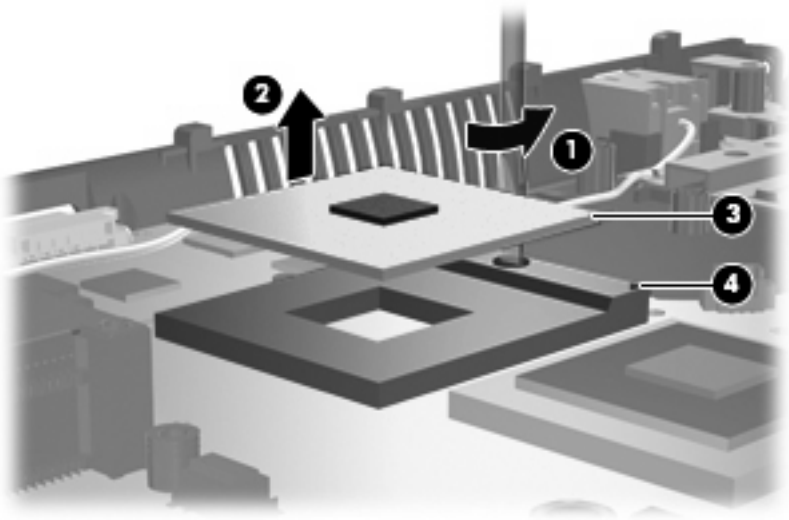
4. Remove the battery (see Battery on page 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Optical drive (see Optical drive on page 69)
   c. Speakers (see Speakers on page 73)
   d. Palm rest (see Palm rest on page 75)
   e. Top cover (see Top cover on page 90)

Remove the processor:

1. Position the computer right-side up with the front toward you.
2. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.
3. Lift the processor **(2)** straight up and remove it.

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



Reverse this procedure to install the processor.

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System board

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

Description	Spare part number
System board for use in computers with DDR2 memory that include a WWAN module:	
GL47 system board with UMA graphics subsystem memory	535858-001
GL40 system board with UMA graphics subsystem memory	535857-001
System board with discrete graphics subsystem memory	535756-001
System board for use in computers with DDR2 memory that do not include a WWAN module:	
GL47 system board with UMA graphics subsystem memory	574510-001
GL40 system board with UMA graphics subsystem memory	574509-001
System board with discrete graphics subsystem memory	574508-001
System board for use in computers with DDR3 memory that include a WWAN module:	
GM45 system board with UMA graphics subsystem memory	*583081-001*
GL40 system board with UMA graphics subsystem memory	*583080-001*
System board with discrete graphics subsystem memory	*583082-001*
System board for use in computers with DDR3 memory that do not include a WWAN module:	
GM45 system board with UMA graphics subsystem memory	*583079-001*
GL40 system board with UMA graphics subsystem memory	*583078-001*
System board with discrete graphics subsystem memory	*583077-001*

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 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Speakers (see Speakers on page 73)
   c. WWAN module (see WWAN module on page 74)
   d. Palm rest (see Palm rest on page 75)
   e. WLAN module (see WLAN module on page 80)
   f. Hard drive (see Hard drive on page 78)

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g. Optical drive (see Optical drive on page 69)

h. Display assembly (see Display assembly on computers with 15-in displays on page 84 or Display assembly on computers with 14-in displays on page 97)

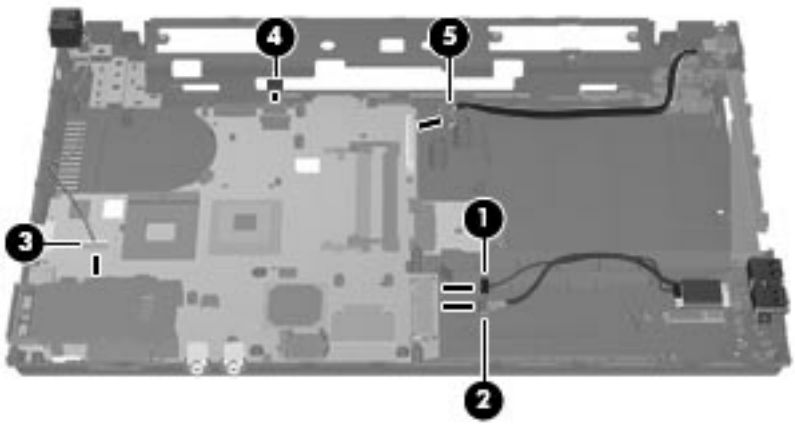
i. Top cover (see Top cover on page 90)

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

- Memory module (see Memory module on page 68)
- WLAN module (see WLAN module on page 80)
- WWAN module (see WWAN module on page 74)
- Modem module (see Modem module on page 103)
- Processor (see Processor on page 110)

Remove the system board:

1. Position the computer right-side up with the front toward you.
2. Disconnect the following cables from the system board:
   - **(1)** Bluetooth module cable
   - **(2)** USB connector module cable
   - **(3)** RJ-45 cable
   - **(4)** SIM board
   - **(5)** Power cable



3. Lift the rear edge of the system board **(1)** until it rests at an angle.

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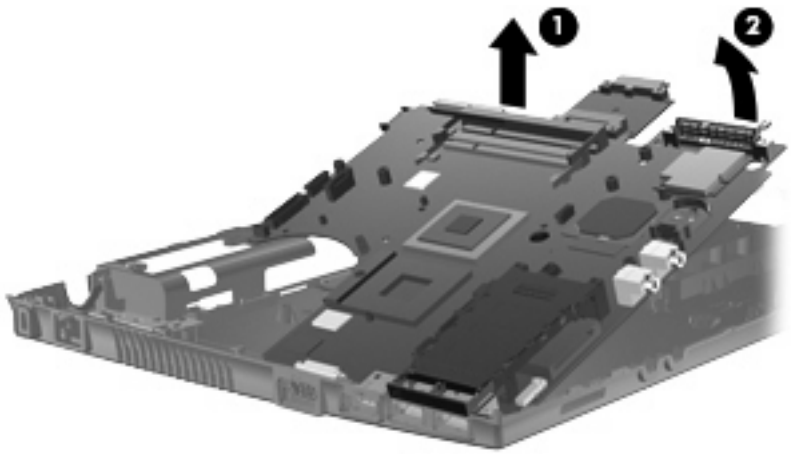
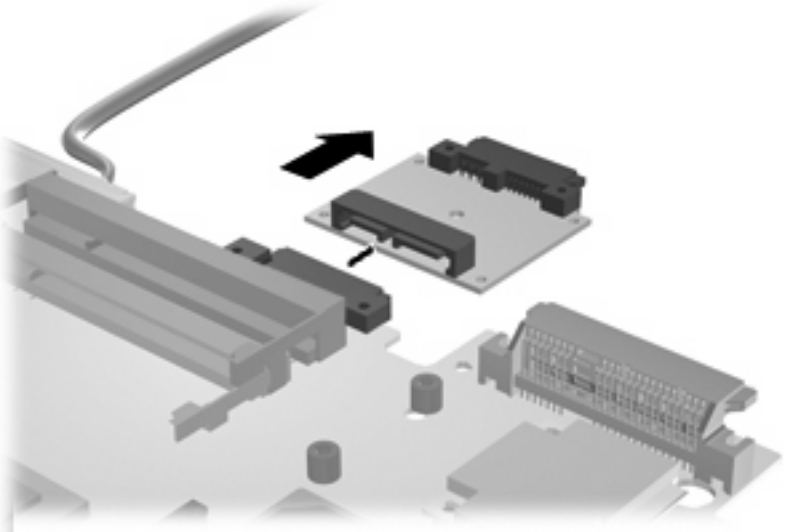
4. Remove the system board from the base enclosure **(2)**.



5. (15-in models only) If it is necessary to remove the optical drive connector from the system board, pull the optical drive board straight off the connector on the system board. The optical drive board is available using spare part number 535862-001.



Reverse this procedure to install the system board.

SIM

Description	Spare part number
SIM	536599-001

Before removing the SIM, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.

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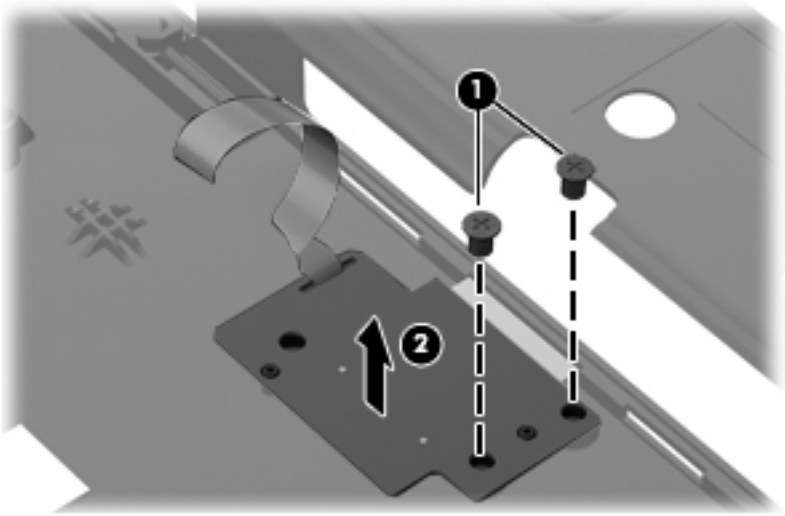
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 63).
5. Remove the following components:
   a. Switch cover and keyboard (see Switch cover and keyboard on page 64)
   b. Optical drive (see Optical drive on page 69)
   c. Speakers (see Speakers on page 73)
   d. WWAN module (see WWAN module on page 74)
   e. Palm rest (see Palm rest on page 75)
   f. WLAN module (see WLAN module on page 80)
   g. Hard drive (see Hard drive on page 78)
   h. Top cover (see Top cover on page 90)
   i. Display assembly (see Display assembly on computers with 15-in displays on page 84 or Display assembly on computers with 14-in displays on page 97)
   j. System board (see System board on page 112)

Remove the SIM:

1. Position the computer right-side up with the front toward you.
2. Remove the two Phillips PM2.5×3.0 screws **(1)** that secure the SIM to the system board.
3. Remove the SIM **(2)** by pulling the module straight up and off the computer.



Reverse this procedure to install the SIM.

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5 Computer Setup

Computer Setup in Windows Vista and Windows XP

Starting Computer Setup

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

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

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

To start Computer Setup, follow these steps:

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

Using Computer Setup

Navigating and selecting in Computer Setup

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

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

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

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NOTE: You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press f10 to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

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

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

  – or –

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

  – or –

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

  – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

   – or –

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

Your changes go into effect when the computer restarts.

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

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Computer Setup menus

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

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

File menu

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

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Security menu

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

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

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Diagnostics menu

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

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System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot Options	• Set a Startup Menu delay (in seconds). • Enable/disable Custom Logo (disabled by default). • Enable/disable Display Diagnostic URL (enabled by default). • Enable/disable CD-ROM boot (enabled by default). • Enable/disable SD Card boot (enabled by default). • Enable/disable floppy boot (enabled by default). • Enable/disable PXE Internal NIC boot (disabled by default). • Set the Express Boot Popup delay in seconds. • Set the boot order.
Device Configurations	• Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running. ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer. • Enable/disable fan always on while connected to an AC outlet (disabled by default). • Enable/disable Data Execution Prevention (select models only; disabled by default). When enabled, the processor can disable some virus code execution, which helps to improve computer security. • SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ◦ AHCI (Advanced Host Controller Interface) ◦ IDE (Integrated Drive Electronics) **NOTE:** Availability of the options above varies by computer model. • Enable/disable HP QuickLook 2 (enabled by default). • Enable/disable Virtualization Technology (select models only; disabled by default). • Enable/disable Dual Core CPU (enabled by default). • Enable/Disable Unified Extensible Firmware Interface (UEFI) mode (enabled by default).

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Select	To do this
Built-In Device Options	• Enable/disable the wireless button state (enabled by default). • Enable/disable embedded WWAN device radio (enabled by default). • Enable/disable embedded Bluetooth® device radio (enabled by default). • Enable/disable the Network Interface Controller (LAN) (enabled by default). • Set the wake on LAN state. Options include the following: ◦ Disabled ◦ Boot to Network (set by default) ◦ Follow Boot Order • Enable/disable the optical disc drive (enabled by default). • Enable/disable the microphone. • Enable/disable a modem device (enabled by default). • Enable/disable the embedded WLAN device (enabled by default). • Enable/disable LAN/WLAN switching (disabled by default). • Enable/disable the integrated camera (select models only; enabled by default).
Port Options (all are enabled by default)	**NOTE:** All port options are enabled by default. • Enable/disable the ExpressCard slot. • Enable/disable the flash media reader. • Enable/disable the USB port. **CAUTION:** Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

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Computer Setup in Linux

Starting Computer Setup

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

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

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

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

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before your operating system opens and while the “F10=ROM Based Setup” message is displayed in the lower-left corner of the screen, press f10.

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Using Computer Setup

Navigating and selecting in Computer Setup

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

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

   Because Computer Setup is not operating system based, it does not support the TouchPad. Navigation and selection are by keystroke:

   - To choose a menu or a menu item, use the arrow keys.
   - To select an item, press enter.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc.
   - To view navigation information, press f1.
   - To change the language, press f2.

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

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

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

Your preferences go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

Your preferences go into effect when the computer restarts.

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

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Computer Setup menus

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

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

File menu

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

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Security menu

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

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options	• Enable/disable stringent security. • Enable/disable the password requirement on computer restart.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive. • Enter, change, or disable DriveLock on an optional MultiBay hard drive. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.

Diagnostics menu

Select	To do this
HDD Self-Test Options	Run a comprehensive self-test on any hard drive in the system or on any optional MultiBay hard drive.
Memory Check	Run a comprehensive check on system memory.

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System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot options	• Set an f9, f10, and f12 delay when starting up. • Enable/disable CD-ROM boot. • Enable/disable floppy boot. • Enable/disable internal network adapter boot. • Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system. • Set the Express Boot Popup delay in seconds. • Set the boot order. ◦ 1st boot device: USB CD-ROM ◦ 2nd boot device: USB floppy ◦ 3rd boot device: USB SuperDisk ◦ 4th boot device: Notebook hard drive ◦ 5th boot device: USB hard disk ◦ 6th boot device: Network controller
Device Configurations	• Swap the functions of the fn key and left ctrl key. • Enable/disable USB legacy support. When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a your operating system is not running. ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer. • Enable/disable BIOS DMA data transfers. • Enable/disable fan always on while connected to an AC outlet. • Enable/disable data execution prevention. • Enable/disable LAN power saving mode. • Enable/disable SATA Native Mode. • Enable/disable Dual Core CPU. • Enable/disable HDD translation mode.

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Select	To do this
Built-in device options	• Enable/disable embedded WLAN Device Radio. • Enable/disable embedded Bluetooth Device Radio. • Enable/disable Network Interface Controller (NIC) • Enable/disable LAN/WLAN Switching. • Enable/disable Wake on LAN. • Enable/disable the integrated camera (webcam)
Port options	• Enable/disable USB port. • Enable/disable ExpressCard slot.

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6 Specifications

Computer specifications

	Metric	U.S.
Dimensions – 15-in		
Depth	24.96 cm	9.83 in
Width	37.18 cm	14.6 in
Height (front to rear)	3.15 to 3.63 cm	1.24 to 1.43 in
Dimensions – 14-in		
Depth	23.24 cm	9.15 in
Width	33.60 cm	13.2 in
Height (front to rear)	3.10 to 3.58 cm	1.22 to 1.41 in
Weight – 15-in (equipped with optical drive, WXGA display assembly, 1 memory module, hard drive, and 6-cell battery)	< 2.59 kg	< 5.7 lbs
Weight – 14-in (equipped with optical drive, WXGA display assembly, 1 memory module, hard drive, and 6-cell battery)	< 2.27 kg	< 5.0 lbs
Input power		
Operating voltage	18.5 V dc @ 4.74 A – 90 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		

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	Metric	U.S.
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

14.1-in WXGA display specifications

	Metric	U.S.
Dimensions		
Height	27.94 cm	11.0 in
Width	20.83 cm	8.2 in
Diagonal	35.56 cm	14.1 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-40° horizontal, +20/-40° vertical (typical)	

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15.6-in WXGA display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.1 in
Width	33.1 cm	13.0 in
Diagonal	39.1 cm	15.6 in
Number of colors	Up to 16.8 million	
Contrast ratio	300:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	CCFL	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	+/-30° horizontal, +10/–40° vertical (typical)	

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Hard drive specifications

	500-GB*	320-GB*	250-GB*	160-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks	1,048,576,000	625,141,400	488,376,280	312,560,640
Disc rotational speed	5400 rpm	5400 rpm	7200 and 5400 rpm	7200 rpm and 5400 rpm
Operating temperature	5°C to 55°C (41° F to 131°F)	5°C to 55°C (41° F to 131°F)	5°C to 55°C (41° F to 131°F)	5°C to 55°C (41° F to 131°F)

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

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

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DVD-ROM Drive specifications

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

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DVD±RW Double-Layer Combo Drive specifications

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

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

Applicable disc	**Read:**	**Write:**	
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, HD-ROM (Single Layer), HD-ROM (Dual Layer), HD DVD-R, HD DVD-R for Dual Layer, HD DVD-RW, BD-ROM, BD-R, BR-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 KB/sec		
8X DVD-ROM	10,800 KB/sec		
24X CD-R	3,600 KB/sec		
16X CD-RW	2,400 KB/sec		
8X DVD+R	10,800 KB/sec		
4X DVD+RW	5,400 KB/sec		
8X DVD-R	10,800 KB/sec		
4X DVD-RW	5,400 KB/sec		
2.4X DVD+R(9)	2,700 KB/sec		
5X DVD-RAM	6,750 KB/sec		
1X BD-ROM	4,500 KB/sec		
1X BD-R read	4,500 KB/sec		
1X BD-RE read	4,500 KB/sec		
Transfer mode	Multiword DMA Mode		

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System DMA specifications, Windows Vista and XP

Hardware DMA	System function
DMA4	Direct memory access controller
*ExpressCard controller can use DMA 1, 2, or 5.	

System interrupt specifications, Windows Vista

Hardware IRQ	System function
ISA0	System timer
ISA1	Standard 101-/102-Key or Microsoft Natural Keyboard
ISA8	System CMOS/real-time clock
ISA100 - ISA119	Microsoft ACPI-Compliant System
ISA12	Synaptics PS/2 TouchPad
ISA120 - ISA129	Microsoft ACPI-Compliant System
ISA13	Numeric data processor
ISA130 - ISA139	Microsoft ACPI-Compliant System
ISA14	ATA Channel 0
ISA140 - ISA149	Microsoft ACPI-Compliant System
ISA15	ATA Channel 1
ISA150 - ISA190	Microsoft ACPI-Compliant System
ISA23	HP Mobile Data Protection Sensor
ISA81 - ISA99	Microsoft ACPI-Compliant System
PCI16	Intel ICH9 Family USB Universal Host Controller – 2937
PCI16	Mobile Intel 4 Series Express Chipset Family
PCI17	Broadcom 802.11b/g WLAN
PCI17	High Definition Audio Controller
PCI17	Intel ICH9 Family USB Universal Host Controller – 2938
PCI17	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
PCI18	Intel ICH9 Family USB Universal Host Controller – 2939
PCI18	Intel ICH9 Family USB Universal Host Controller – 2936
PCI18	Standard Dual Channel PCI IDE Controller
PCI19	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
PCI-2	Intel ICH9 Family PCI Express Root Port 1 - 2940
PCI20	Intel ICH9 Family Universal Host Controller – 2934
PCI20	Intel ICH9 Family USB2 Enhanced Host Controller – 293A

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Hardware IRQ	System function
PCI22	Intel ICH9 Family Universal Host Controller – 2935
PCI-3	Intel ICH9 Family PCI Express Root Port 2 - 2942
PCI-4	Intel ICH9 Family PCI Express Root Port 3 - 2944
PCI-5	Intel ICH9 Family PCI Express Root Port 5 - 2948
PCI-6	Intel ICH9 Family PCI Express Root Port 6 - 294A

System interrupt specifications, Windows XP

Hardware IRQ	System function
ISA0	System timer
ISA1	Standard 101-/102-Key or Microsoft Natural Keyboard
ISA8	System CMOS/real-time clock
ISA9	Microsoft ACPI-Compliant System
ISA12	Synaptics PS/2 TouchPad
ISA13	Numeric data processor
ISA23	HP Mobile Data Protection Sensor
PCI16	Intel ICH9 Family USB Universal Host Controller – 2937
PCI16	Mobile Intel 4 Series Express Chipset Family
PCI17	Broadcom 4322AG 802.11a/b/g/draft-n Wi-Fi Adapter
PCI17	Intel ICH9 Family PCI Express Root Port 1 - 2940
PCI17	Intel ICH9 Family PCI Express Root Port 5 - 2948
PCI17	Intel ICH9 Family USB Universal Host Controller – 2938
PCI17	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
PCI17	Microsoft UAA Bus Driver for High Definition Audio
PCI18	Intel ICH9 Family PCI Express Root Port 3 - 2944
PCI18	Intel ICH9 Family USB Universal Host Controller – 2939
PCI18	Intel ICH9 Family USB Universal Host Controller – 2936
PCI19	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
PCI20	Intel ICH9 Family Universal Host Controller – 2934
PCI20	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
PCI21	ICH9M-E/M SATA AHCI Controller
PCI22	Intel ICH9 Family Universal Host Controller – 2935

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System I/O address specifications, Windows Vista

I/O address (hex)	System function (shipping configuration)
000 - 01F	Direct memory access controller
000 - CF7	PCI bus
020 - 021	Programmable interrupt controller
024 - 025	Programmable interrupt controller
028 - 029	Programmable interrupt controller
02C - 02D	Programmable interrupt controller
02E - 02F	Motherboard resources
030 - 031	Programmable interrupt controller
034 - 035	Programmable interrupt controller
038 - 039	Programmable interrupt controller
03C - 03D	Programmable interrupt controller
040 - 043	System timer
04E - 04F	Motherboard resources
050 - 053	System timer
060 - 060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
061 - 061	Motherboard resources
062 - 062	Microsoft ACPI-Compliant Embedded Controller
063 - 063	Motherboard resources
064 - 064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
065 - 065	Motherboard resources
066 - 066	Microsoft ACPI-Compliant Embedded Controller
067 - 067	Motherboard resources
070 - 070	Motherboard resources
070 - 077	System CMOS/real time clock
080 - 080	Motherboard resources
081 - 091	Direct memory access controller
092 - 092	Motherboard resources
093 - 09F	Direct memory access controller
0A0 - 0A1	Programmable interrupt controller
0A4 - 0A5	Programmable interrupt controller
0A8 - 0A9	Programmable interrupt controller
0AC - 0AD	Programmable interrupt controller
0B0 - 0B1	Programmable interrupt controller

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I/O address (hex)	System function (shipping configuration)
0B2 - 0B3	Motherboard resources
0B4 - 0B5	Programmable interrupt controller
0B8 - 0B9	Programmable interrupt controller
0BC - 0BD	Programmable interrupt controller
0C0 - 0DF	Direct memory access controller
0F0 - 0F0	Numeric data processor
170 - 177	ATA Channel 1
1F0 - 1F7	ATA Channel 0
200 - 27F	Motherboard resources
376 - 376	ATA Channel 1
3B0 - 3BB	Mobile Intel 4 Series Express Chipset Family
3C0 - 3DF	Mobile Intel 4 Series Express Chipset Family
3F6 - 3F6	ATA Channel 0
400 - 47F	Motherboard resources
4D0 - 4D1	Programmable interrupt controller
500 - 57F	Motherboard resources
D00 - FFFF	PCI bus
1000 - 1003	Motherboard resources
1010 - 101F	Motherboard resources
2000 - 20FF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
2000 - 2FFF	Intel ICH9 Family PCI Express Root Port 6 – 294A
3000 - 4FFF	Intel ICH9 Family PCI Express Root Port 6 – 2948
5000 - 6FFF	Intel ICH9 Family PCI Express Root Port 6 – 2944
7000 - 701F	Intel ICH9 Family USB Universal Host Controller – 2936
7020 - 703F	Intel ICH9 Family USB Universal Host Controller – 2935
7040 - 705F	Intel ICH9 Family USB Universal Host Controller – 2934
7060 - 707F	Intel ICH9 Family USB Universal Host Controller – 2939
7080 - 709F	Intel ICH9 Family USB Universal Host Controller – 2938
70A0 - 70BF	Intel ICH9 Family USB Universal Host Controller – 2937
70C0 - 70CF	Standard Dual Channel PCI IDE Controller
70D0 - 70DF	Standard Dual Channel PCI IDE Controller
70E0 - 70EF	Standard Dual Channel PCI IDE Controller
70F0 - 70FF	Standard Dual Channel PCI IDE Controller
7100 - 7107	Standard Dual Channel PCI IDE Controller

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I/O address (hex)	System function (shipping configuration)
7108 - 710F	Standard Dual Channel PCI IDE Controller
7120 - 7127	Mobile Intel 4 Series Express Chipset Family
7128 - 712B	Standard Dual Channel PCI IDE Controller
712C - 712F	Standard Dual Channel PCI IDE Controller
EF80 - EF9F	Motherboard resources
FE00 - FE0F	Motherboard resources
FE80 - FE8F	Motherboard resources
FFFF - FFFF	Motherboard resources

System I/O address specifications, Windows XP

I/O address (hex)	System function (shipping configuration)
000 - 01F	Direct memory access controller
000 - CF7	PCI bus
020 - 021	Programmable interrupt controller
024 - 025	Programmable interrupt controller
028 - 029	Programmable interrupt controller
02C - 02D	Programmable interrupt controller
02E - 02F	Motherboard resources
030 - 031	Programmable interrupt controller
034 - 035	Programmable interrupt controller
038 - 039	Programmable interrupt controller
03C - 03D	Programmable interrupt controller
040 - 043	System timer
04E - 04F	Motherboard resources
050 - 053	System timer
060 - 060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
061 - 061	Motherboard resources
062 - 062	Microsoft ACPI-Compliant Embedded Controller
063 - 063	Motherboard resources
064 - 064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
065 - 065	Motherboard resources
066 - 066	Microsoft ACPI-Compliant Embedded Controller
067 - 067	Motherboard resources

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I/O address (hex)	System function (shipping configuration)
070 - 070	Motherboard resources
070 - 077	System CMOS/real time clock
080 - 080	Motherboard resources
081 - 091	Direct memory access controller
092 - 092	Motherboard resources
093 - 09F	Direct memory access controller
0A0 - 0A1	Programmable interrupt controller
0A4 - 0A5	Programmable interrupt controller
0A8 - 0A9	Programmable interrupt controller
0AC - 0AD	Programmable interrupt controller
0B0 - 0B1	Programmable interrupt controller
0B2 - 0B3	Motherboard resources
0B4 - 0B5	Programmable interrupt controller
0B8 - 0B9	Programmable interrupt controller
0BC - 0BD	Programmable interrupt controller
0C0 - 0DF	Direct memory access controller
0F0 - 0F0	Numeric data processor
200 - 27F	Motherboard resources
2E4 - 2E7	ISAPNP Read Data Port
3B0 - 3BB	Mobile Intel 4 Series Express Chipset Family
3C0 - 3DF	Mobile Intel 4 Series Express Chipset Family
3F6 - 3F6	ATA Channel 0
400 - 47F	Motherboard resources
4D0 - 4D1	Programmable interrupt controller
500 - 57F	Motherboard resources
A79 - A79	ISAPNP Read Data Port
D00 - FFFF	PCI bus
1000 - 1003	Motherboard resources
1010 - 101F	Motherboard resources
2000 - 20FF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
2000 - 2FFF	Intel ICH9 Family PCI Express Root Port 6 – 294A
3000 - 4FFF	Intel ICH9 Family PCI Express Root Port 6 – 2948
5000 - 6FFF	Intel ICH9 Family PCI Express Root Port 6 – 2944
7000 - 701F	ICH9M-E/M SATA AHCI Controller

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I/O address (hex)	System function (shipping configuration)
7020 - 703F	Intel ICH9 Family USB Universal Host Controller – 2936
7040 - 705F	Intel ICH9 Family USB Universal Host Controller – 2935
7060 - 707F	Intel ICH9 Family USB Universal Host Controller – 2934
7080 - 709F	Intel ICH9 Family USB Universal Host Controller – 2939
70A0 - 70BF	Intel ICH9 Family USB Universal Host Controller – 2938
70C0 - 70DF	Intel ICH9 Family USB Universal Host Controller – 2937
70E0 - 70E7	ICH9M-E/M SATA AHCI Controller
70E8 - 70EF	ICH9M-E/M SATA AHCI Controller
70F0 - 70F7	Mobile Intel 4 Series Express Chipset Family
70F8 - 70FB	ICH9M-E/M SATA AHCI Controller
70FC - 70FF	ICH9M-E/M SATA AHCI Controller
EF80 - EF9F	Motherboard resources
FE00 - FE0F	Motherboard resources
FE80 - FE8F	Motherboard resources
FFFF - FFFF	Motherboard resources

System memory map specifications, Windows Vista

Memory address	System function
000A0000-000BFFFF	Mobile Intel 4 Series Express Chipset Family
000A0000-000BFFFF	PCI Bus
80000000-8FFFFFFF	Mobile Intel 4 Series Express Chipset Family
80000000-DFFFFFFF	PCI Bus
90000000-903FFFFF	Mobile Intel 4 Series Express Chipset Family
90400000-904FFFFF	Mobile Intel 4 Series Express Chipset Family
90500000-905FFFFF	Intel 82801 PCI Bridge – 2448
90600000-90603FFF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
90600000-906FFFFF	Intel ICH9 Family PCI Express Port 6 – 294A
90700000-946FFFFF	Intel ICH9 Family PCI Express Port 5 – 2948
94700000-986FFFFF	Intel ICH9 Family PCI Express Port 3 – 2944
98700000-98703FFF	Broadcom 802.11b/g WLAN
98700000-987FFFFF	Intel ICH9 Family PCI Express Port 2– 2942
98800000-988FFFFF	Intel ICH9 Family PCI Express Port 1 – 2940
98900000-98903FFF	High Definition Audio Controller

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Memory address	System function
98904000-989043FF	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
98904400-989047FF	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
E0000000-EFFFFFFF	Motherboard resources
F0000000-FEDFFFFF	High precision event timer
FEC00000-FEC00FFF	Motherboard resources
FED00000-FED003FF	Motherboard resources
FED10000-FED13FFF	Motherboard resources
FED18000-FED18FFF	Motherboard resources
FED1C000-FED1FFFF	Motherboard resources
FED20000-FED3FFFF	Motherboard resources
FED40000-FED44FFF	Motherboard resources
FED45000-FED8FFFF	Motherboard resources
FEE01000-FFFFFFFF	PCI Bus
FF000000-FFFFFFFF	Intel 82802 Firmware Hub Device

System memory map specifications, Windows XP

Memory address	System function
000A0000-000BFFFF	Mobile Intel 4 Series Express Chipset Family
000A0000-000BFFFF	PCI Bus
40000000-4FFFFFFF	Mobile Intel 4 Series Express Chipset Family
40000000-DFFFFFFF	PCI Bus
50000000-503FFFFF	Mobile Intel 4 Series Express Chipset Family
50400000-504FFFFF	Mobile Intel 4 Series Express Chipset Family
50600000-50603FFF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
50600000-506FFFFF	Intel ICH9 Family PCI Express Port 6 – 294A
50700000-546FFFFF	Intel ICH9 Family PCI Express Port 5 – 2948
54700000-586FFFFF	Intel ICH9 Family PCI Express Port 3 – 2944
58700000-58703FFF	Broadcom 4322AG 802.11a/b/g/draft-n Wi-Fi Adapter
58700000-587FFFFF	Intel ICH9 Family PCI Express Port 2– 2942
58800000-588FFFFF	Intel ICH9 Family PCI Express Port 1 – 2940
58900000-58903FFF	Microsoft UAA Bus Driver for High Definition Audio

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Memory address	System function
58904000-589047FF	Intel ICM9M-E/M SATA AHCI Controller
58904800-58904BFF	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
58904C00-58904FFF	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
E0000000-EFFFFFFF	Motherboard resources
F0000000-FEDFFFFF	PCI Bus
FEC00000-FEC00FFF	Motherboard resources
FED00000-FED003FF	High Precision Event Timer
FED10000-FED13FFF	Motherboard resources
FED18000-FED18FFF	Motherboard resources
FED19000-FED19FFF	Motherboard resources
FED1C000-FED1FFFF	Motherboard resources
FED20000-FED3FFFF	Motherboard resources
FED40000-FED44FFF	Motherboard resources
FED45000-FED8FFFF	Motherboard resources
FEE01000-FFFFFFFF	PCI Bus
FF000000-FFFFFFFF	Intel 82802 Firmware Hub Device

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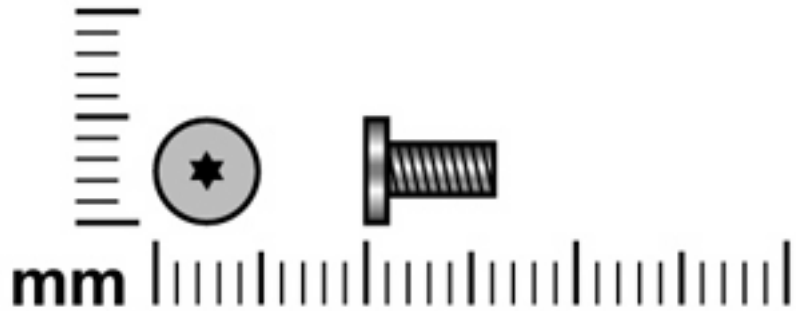
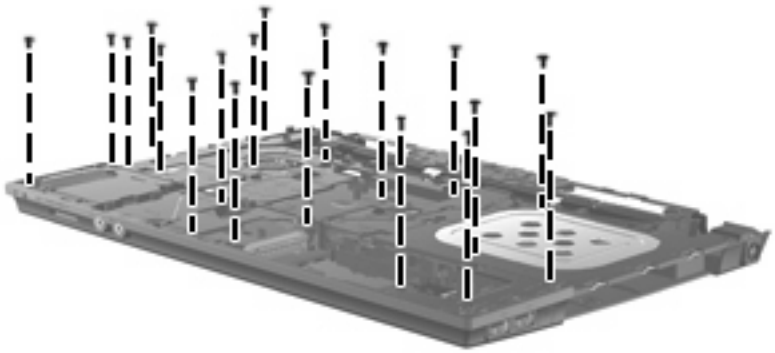
7 Screw listing

This chapter provides specification and reference information for the screws used in the computer. All screws listed in this section are available in the Screw Kit, spare part number 535870-001.

Torx T8M2.5×6.0 screw



Color	Quantity	Length	Thread	Head diameter
Silver	19	6.0 mm	2.5 mm	5.0 mm



Where used: 19 screws that secure the top cover to computers equipped with 15-in displays

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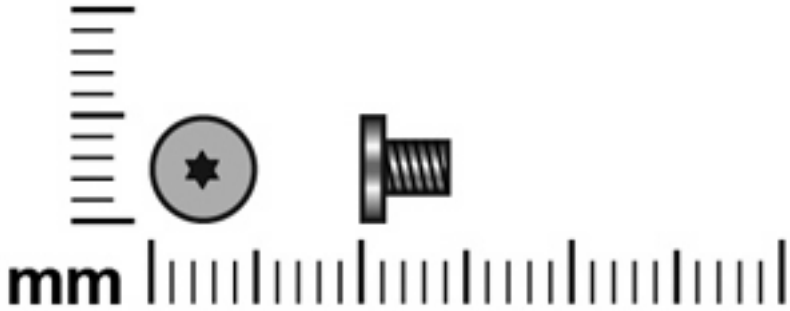
Torx T8M2.5×4.0 screw



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

Where used: 2 screws that secure the top cover to computers equipped with 15-in displays

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Phillips PM2.0×2.0 screw

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

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

Phillips PM2.0×3.0 screw

Color	Quantity	Length	Thread	Head diameter
Silver	19	3.0 mm	2.0 mm	5.0 mm

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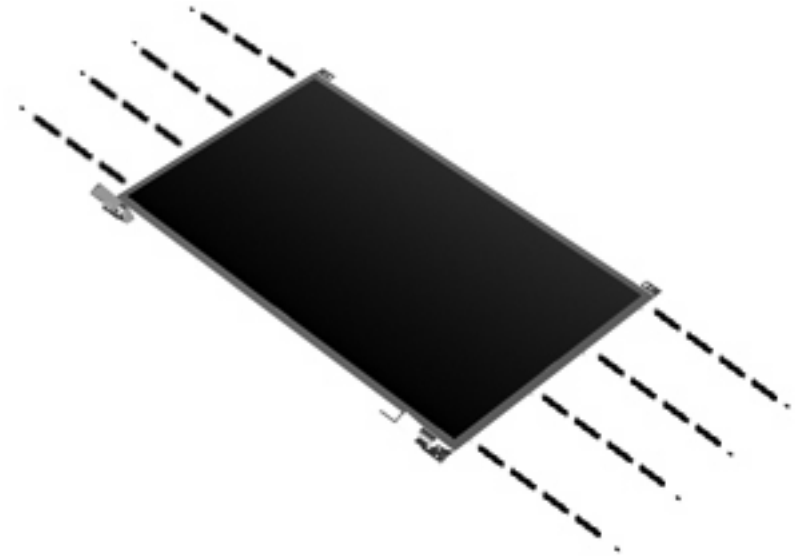
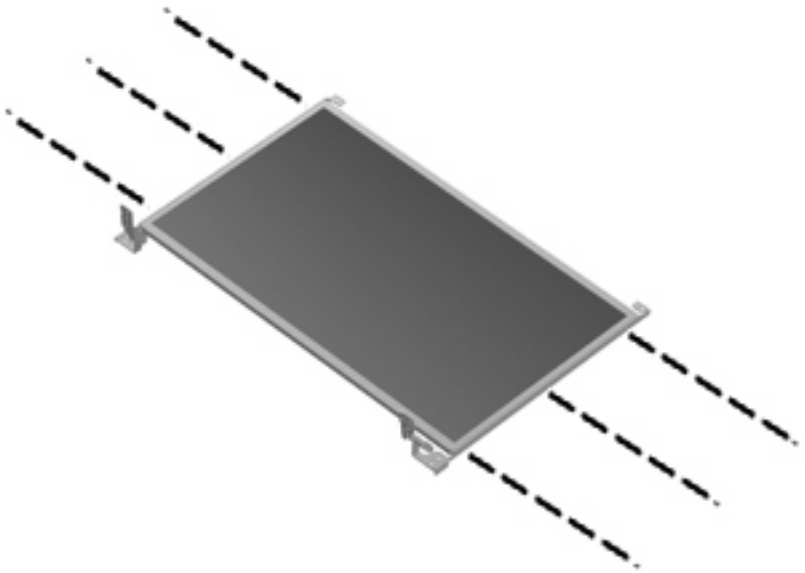
Where used: 2 screws that secure the optical drive bracket to the optical drive



Where used: 8 screws that secure the display hinges to the 15-in display assembly



Where used: 6 screws that secure the display hinges to the 14-in display assembly

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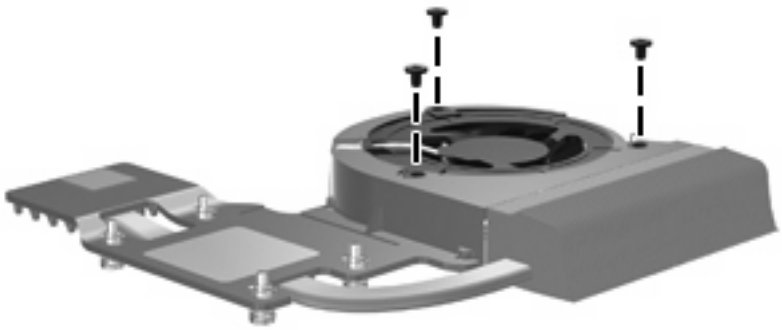
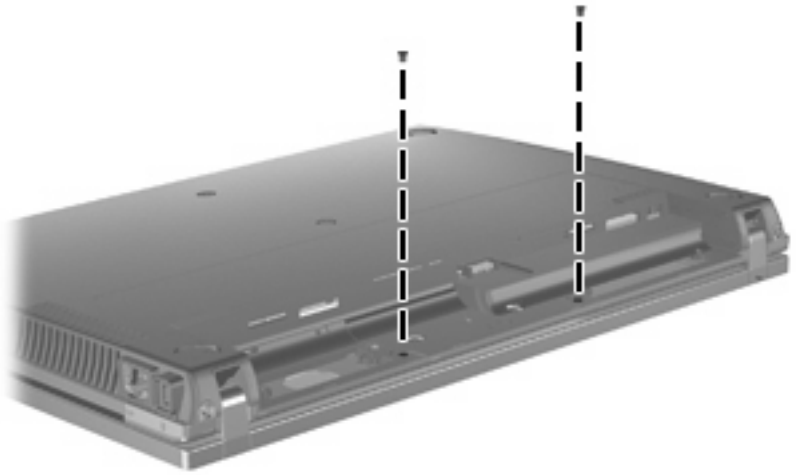


Where used: 3 screws that secure the fan to the heat sink

Phillips PM2.0×3.0 screw

Color	Quantity	Length	Thread	Head diameter
Black	2	3.0 mm	2.0 mm	5.0 mm



Where used: 2 screws that secure the switch cover to computers with 14-in displays

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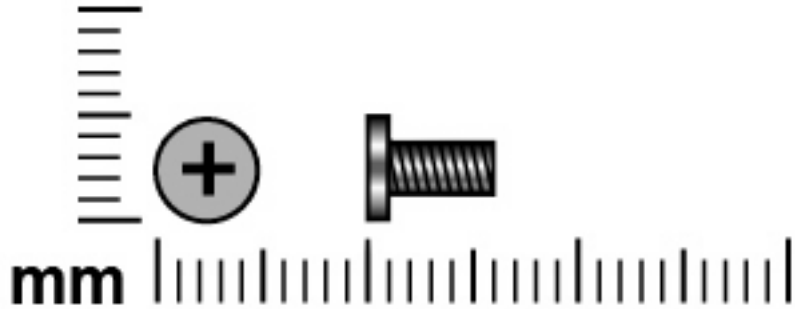
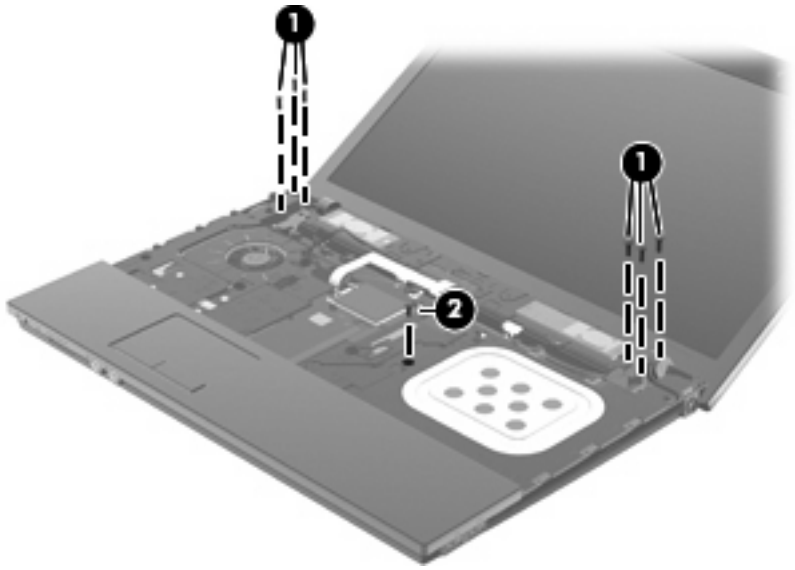
Phillips PM2.5×6.0 screw



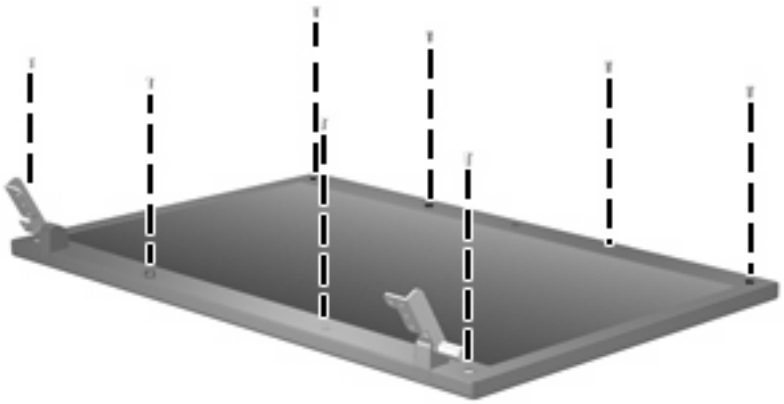
Color	Quantity	Length	Thread	Head diameter
Black	15 (15-in models) or 30 (14-in models)	6.0 mm	2.5 mm	5.0 mm



Where used:

(1) Six screws that secure the 15-in display to the computer

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



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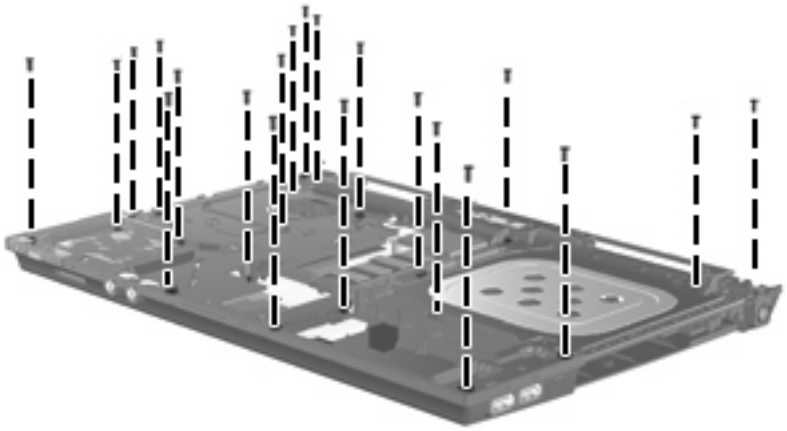
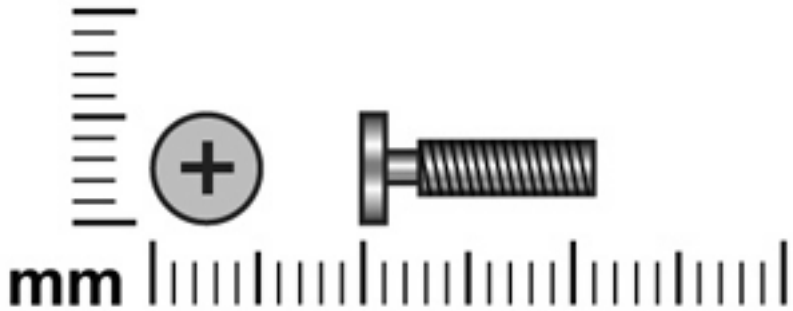
Where used: 8 screws that secure the display bezel to the display enclosure

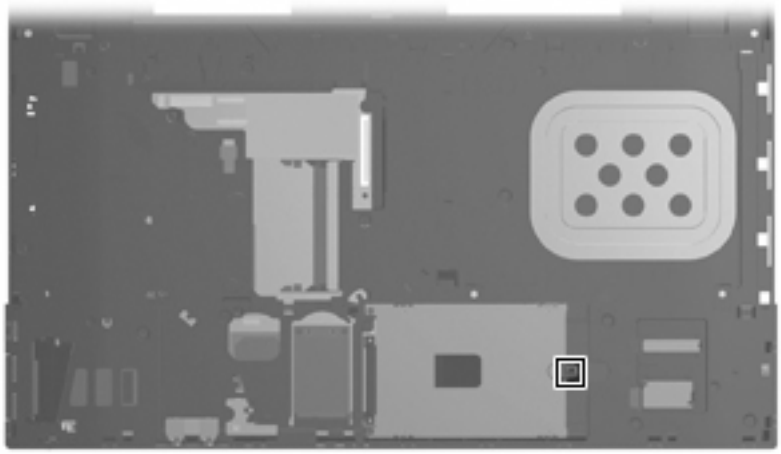


Where used: 21 screws that secure the top cover to the base enclosure on computers with 14-in displays

Phillips PM2.5×11.0 captive screw



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



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

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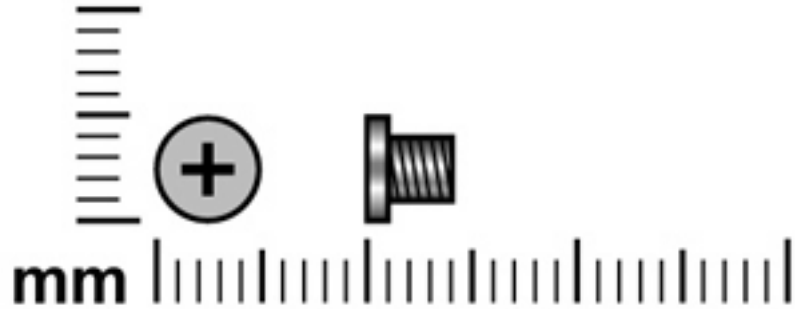
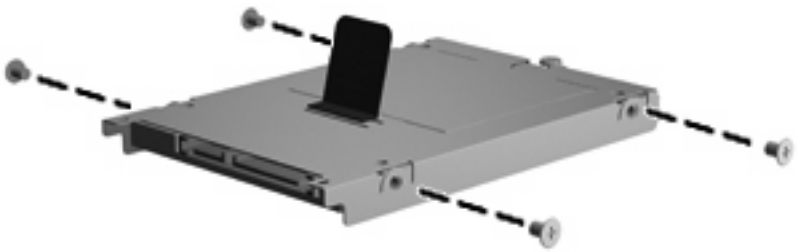
Phillips PM3.0×4.0 screw



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

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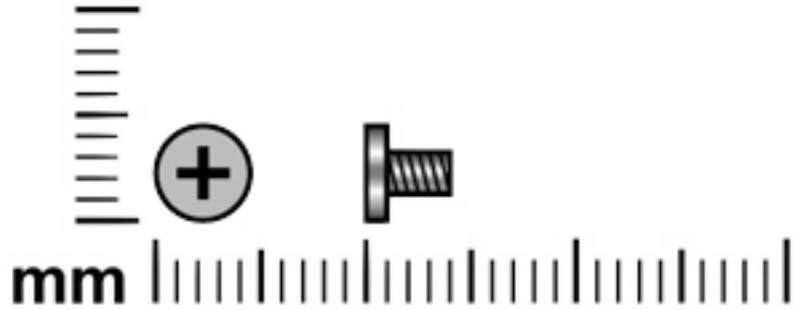
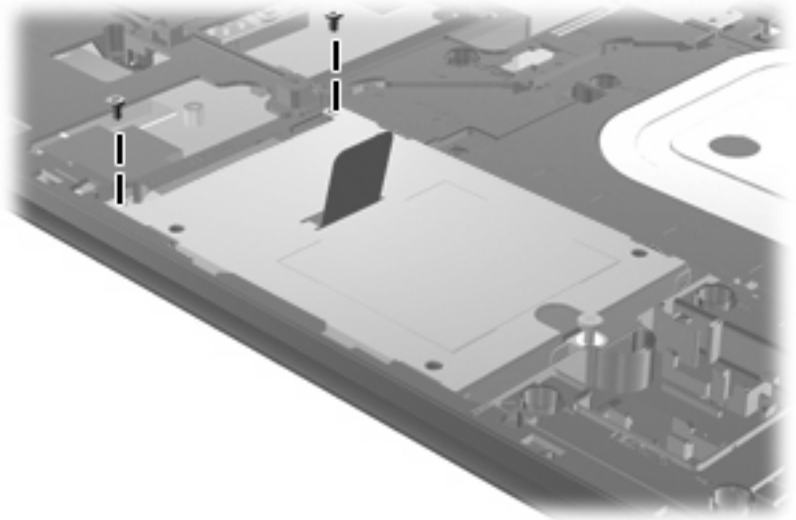
Phillips PM2.0×4.0 screw



Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	2.0 mm	5.0 mm



Where used: 2 screws that secure the hard drive to the computer

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

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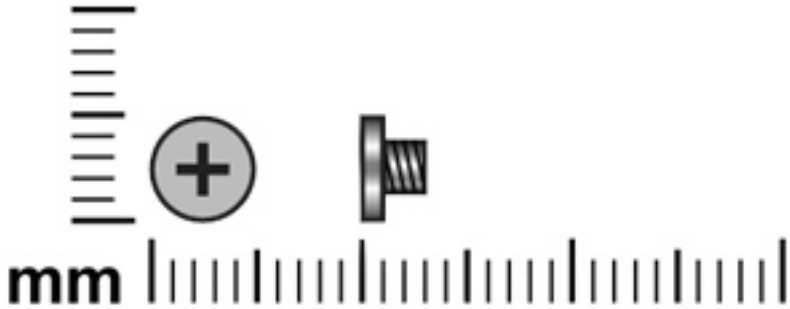
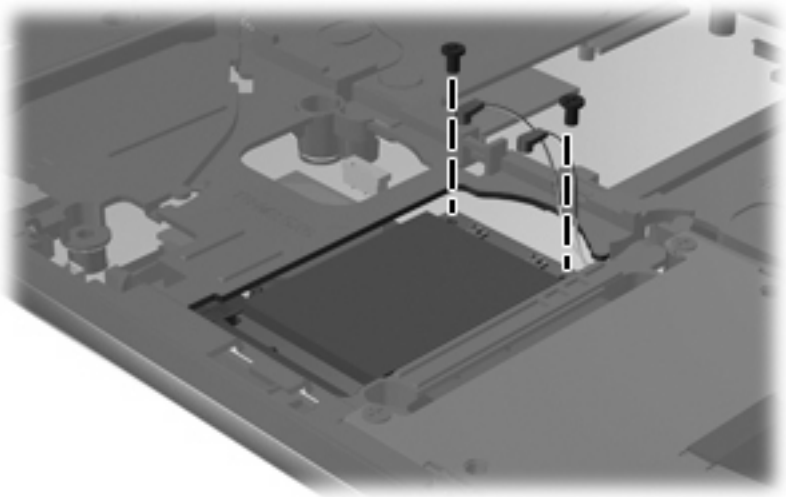
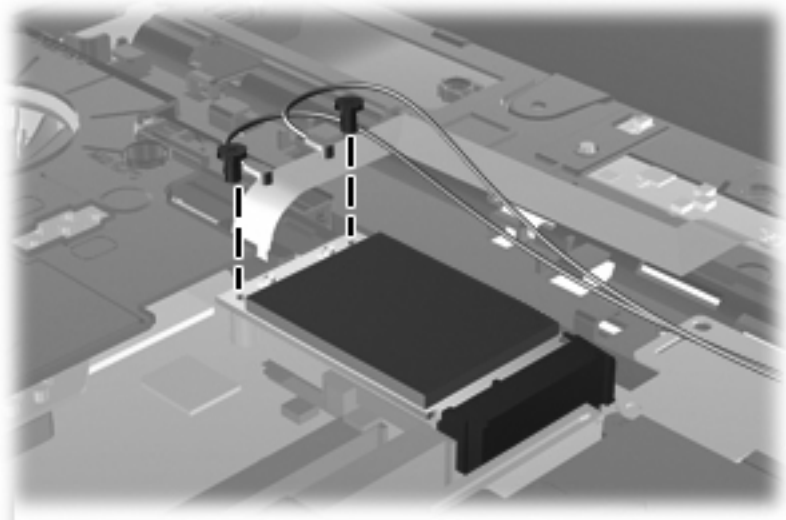
Phillips PM2.5×3.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	17 (15-in models) or 18 (14-in models)	3.0 mm	2.5 mm	5.0 mm



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



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

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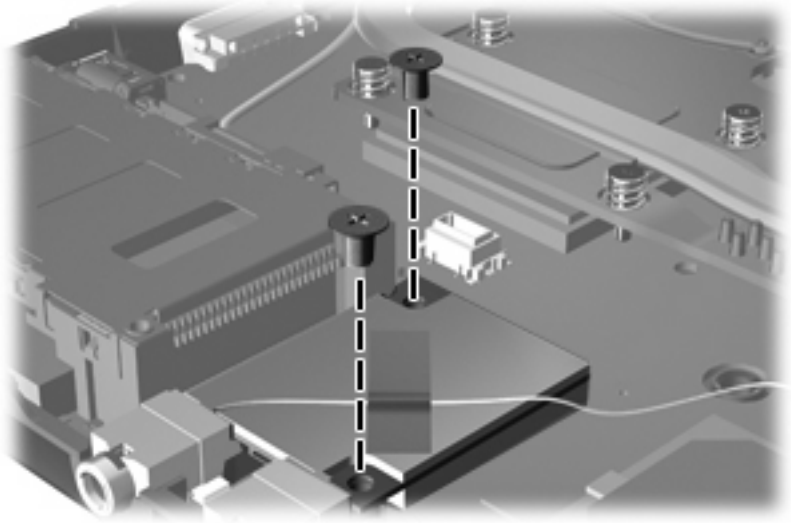

Where used: 2 screws that secure the modem module to the system board

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

Where used: 2 screws that secure the keyboard to computers with 15-in displays

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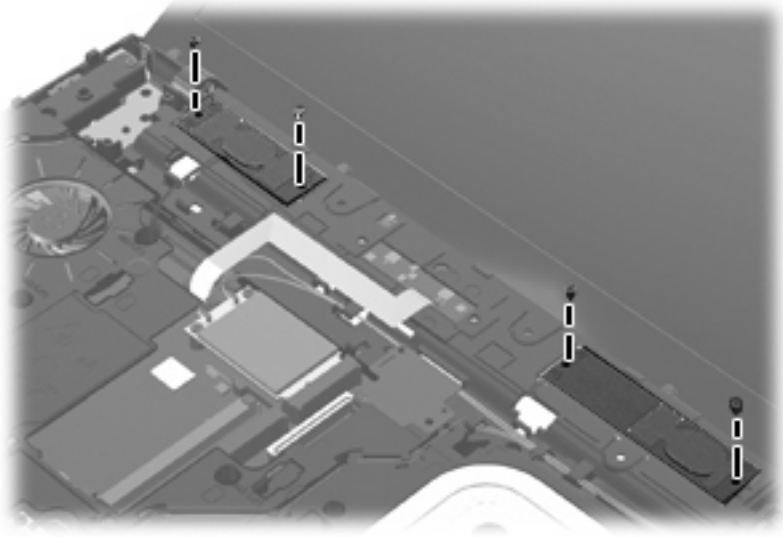
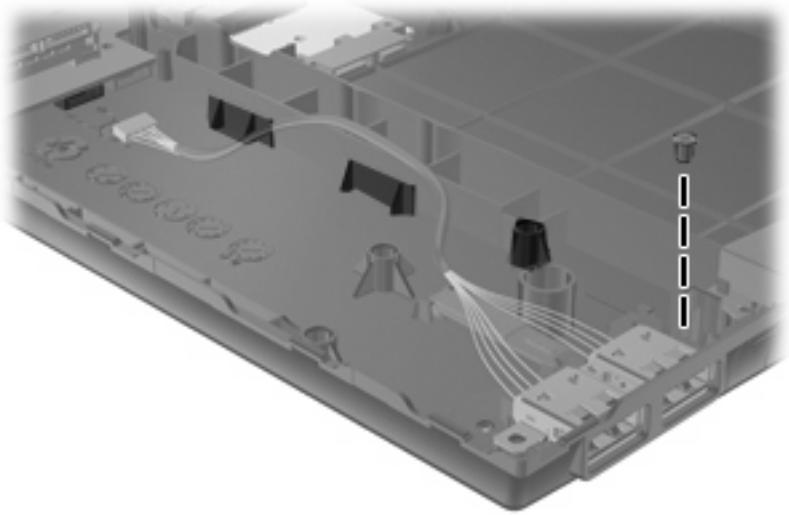
Where used: 3 screws that secure the keyboard to computers with 14-in displays



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



Where used: One screw that secures the USB connector assembly to the computer

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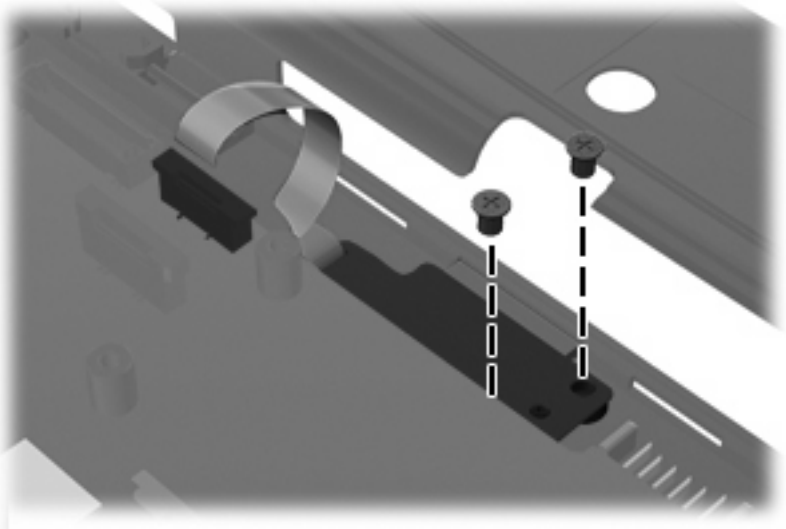
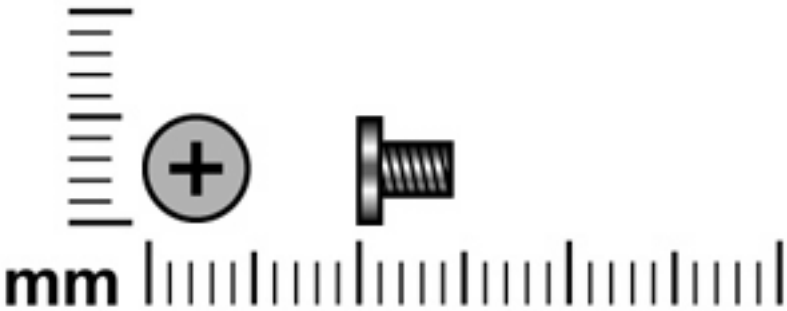


Where used: 2 screws that secure the SIM to the computer

Phillips PM2.5×4.5 screw



Color	Quantity	Length	Thread	Head diameter
Black	4 (15-in models) or 7 (14-in models)	4.5 mm	2.5 mm	5.0 mm

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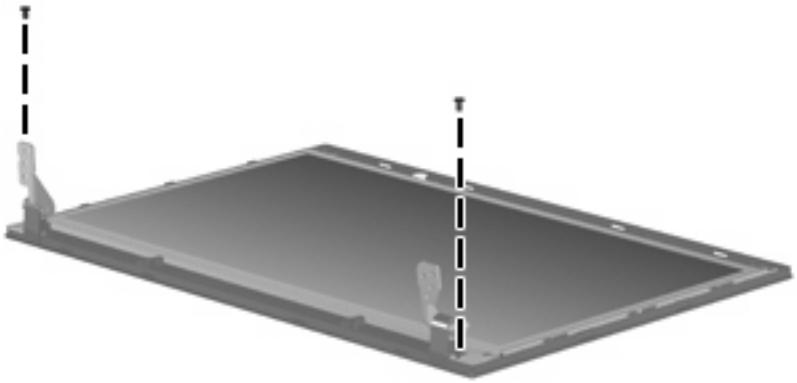
Where used: 4 screws that secure the display assembly to computers with 14-in displays

Where used: 4 screws that secure the display panel to the 15-in display enclosure



Where used: 2 screws that secure the display bezel to the 14-in display enclosure

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Where used: One screw in the right rear that secures the top cover to computers with 14-in displays

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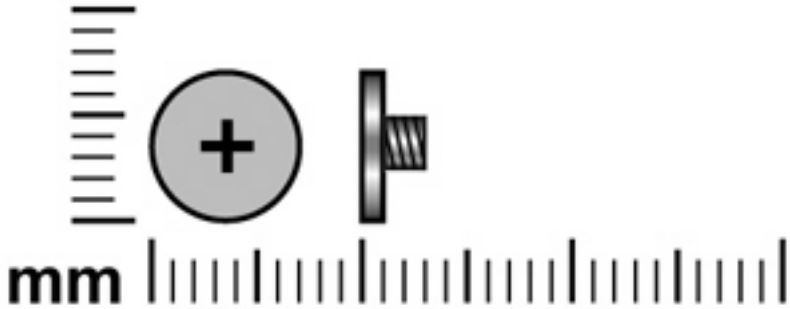
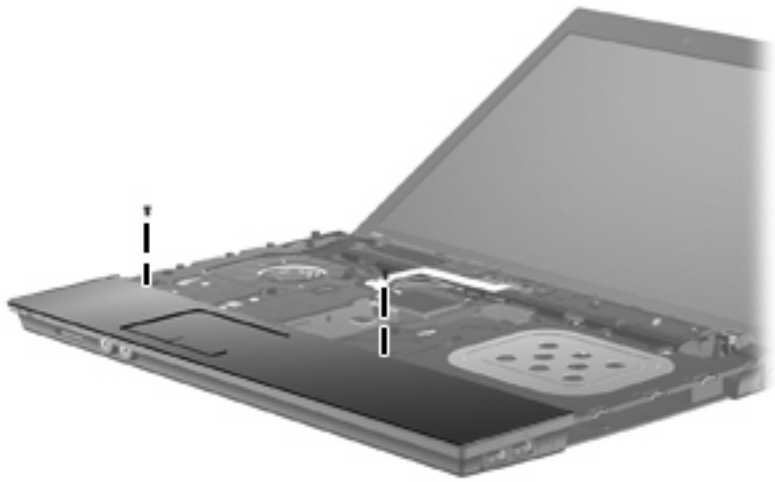
Phillips PM2.5×3.0 broadhead screw



Color	Quantity	Length	Thread	Head diameter
Black	9 (15-in models) or 5 (14-in models)	3.0 mm	2.5 mm	7.0 mm



Where used: 2 screws that secure the system board to computers with 15-in displays

Where used: 3 screws that secure the system board to computers with 14-in displays

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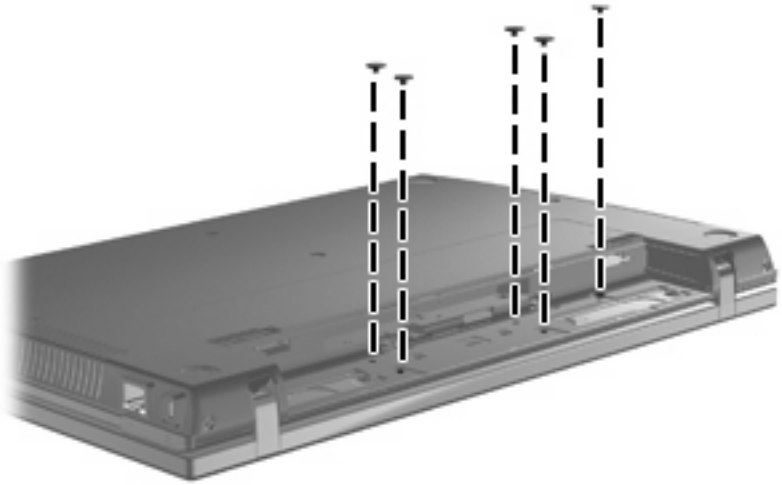
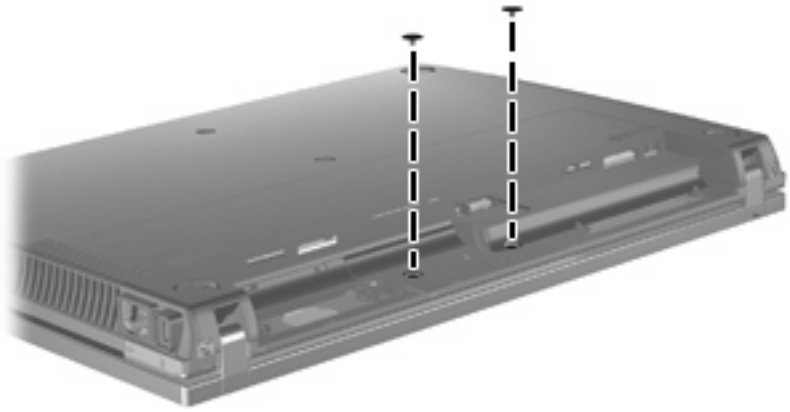


Where used: 5 screws that secure the switch cover to computers with 15-in displays



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

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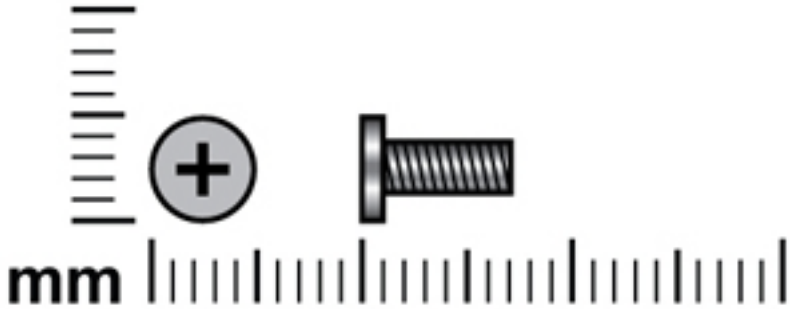
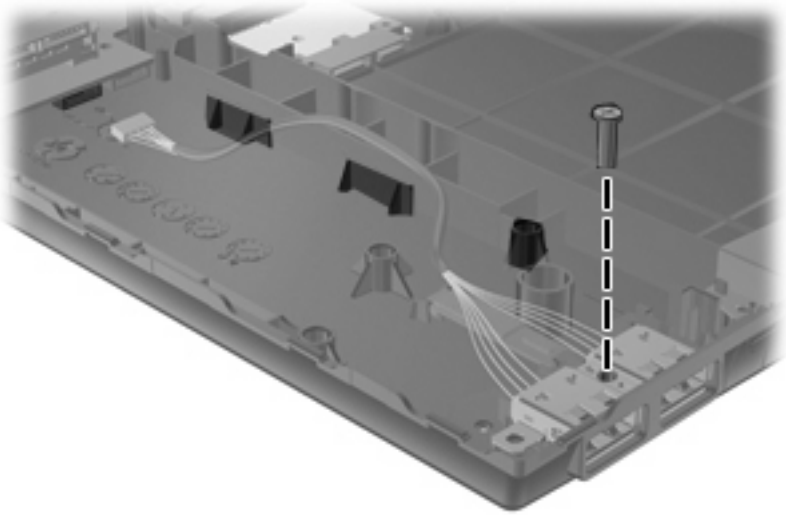
Phillips PM2.5×7.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	1	7.0 mm	2.5 mm	5.0 mm



Where used: One screw that secures the USB connector assembly to the computer

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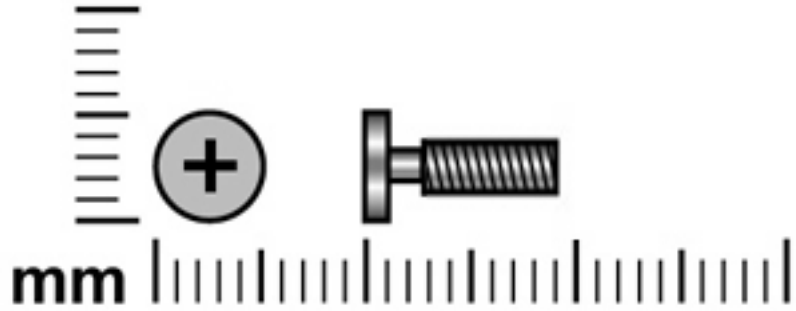
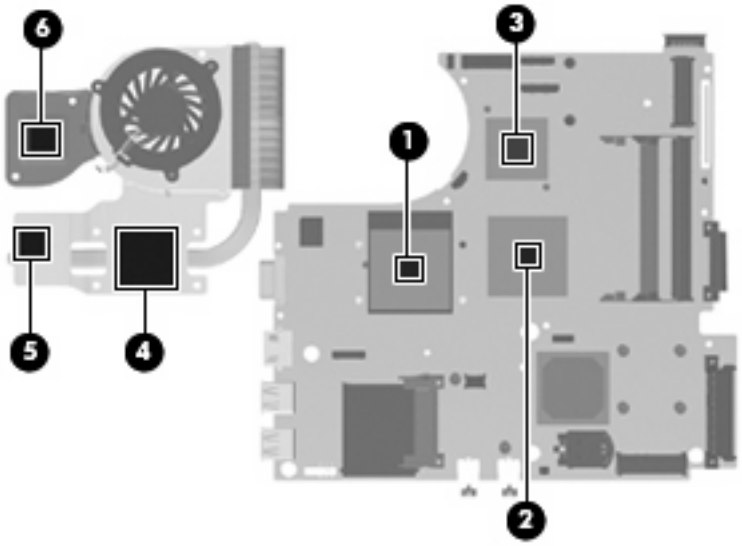
Phillips PM2.5×9.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Silver	7 (discrete) or 5 (UMA)	9.0 mm	2.5 mm	5.0 mm



Where used: 7 screws that secure the heat sink to the system board for computers with discrete memory

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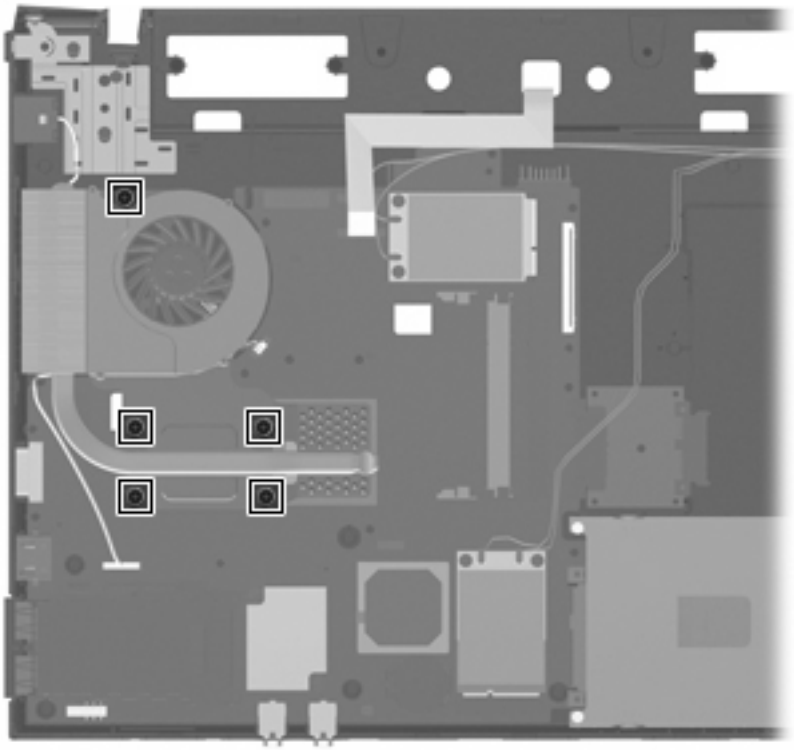

Where used: 5 screws that secure the heat sink to the system board for computers with UMA memory

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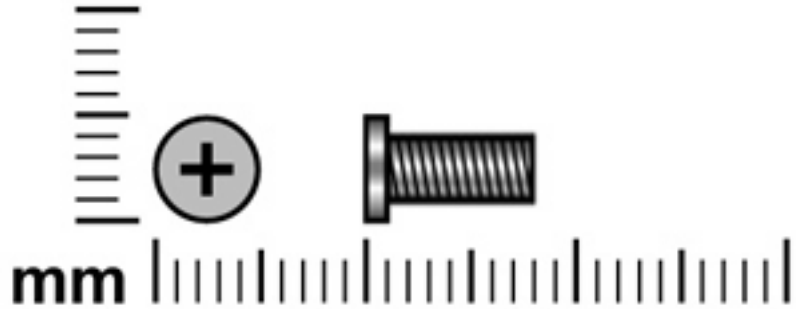
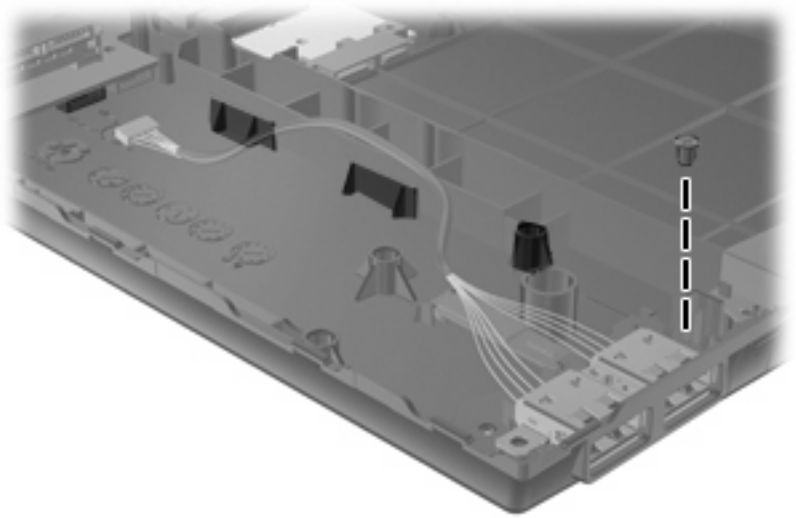
Phillips PM3.0×8.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	1	8.0 mm	3.0 mm	5.0 mm



Where used: One screw that secures the USB connector assembly to the computer

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8 Backup and recovery

Backup and recovery in Windows Vista

Overview

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

The Backup and Restore Center provides the following options:

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

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

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

Backing up your information

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

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

Note the following when backing up:

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

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To create a screen shot:

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

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

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

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

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

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

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

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

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

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

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

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

Performing a recovery

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

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

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

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Using the Windows recovery tools

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

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

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

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

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

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

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

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

Using f11

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

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

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

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

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

5. Follow the on-screen instructions.

Using a Windows Vista operating system DVD (purchased separately)

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

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

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

NOTE: This process takes several minutes.

1. If possible, back up all personal files.

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

3. When prompted, press any keyboard key.

4. Follow the on-screen instructions.

5. Click **Next**.

6. Select **Repair your computer**.

7. Follow the on-screen instructions.

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Backup and recovery in Windows XP

Overview

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

Windows provides the following options:

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

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

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

Backing up your information

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

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

Note the following when backing up:

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

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

  a. Display the screen you want to save.

  b. Copy the screen image:

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

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

  c. Open a word-processing document, click **Edit > Paste**.

  The screen image is added to the document.

  d. Save the document.

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

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

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

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

Performing a recovery

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

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

Recovering your information

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

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

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

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

Recovering the operating system and programs

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

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

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

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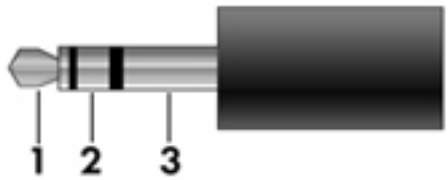
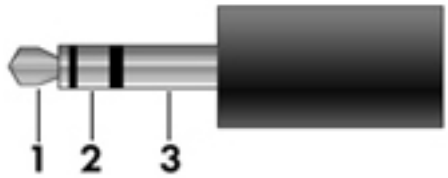
9 Connector pin assignments

Audio-in (microphone)



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

Audio-out (headphone)



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

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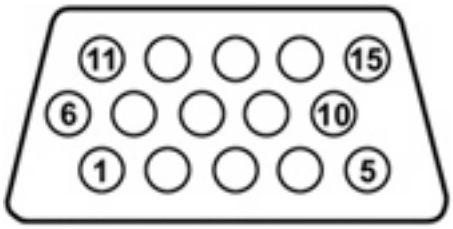
External monitor



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

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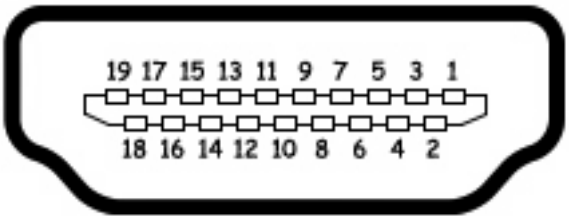
HDMI



Pin	Signal
1	Transition minimized differential signal (TMDS) data 2+
2	TMDS data 2 shield
3	TMDS data 2–
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1–
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0–
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	Consumer electronic control (CEC)
14	Not connected
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect

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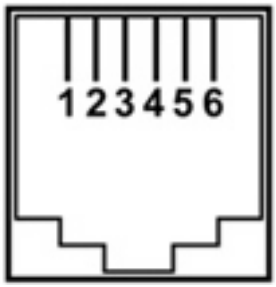
RJ-11 (modem)



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

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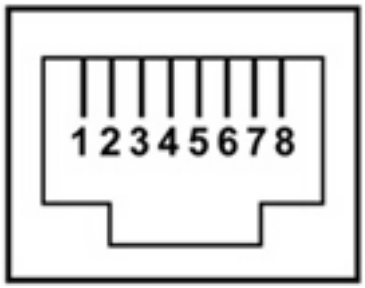
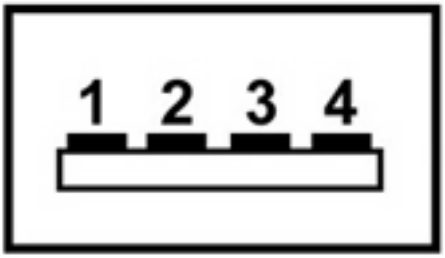
RJ-45 (network)



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

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10 Power cord set requirements

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

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

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

Requirements for all countries and regions

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

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

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Requirements for specific countries and regions

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

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

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

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

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

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

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11 Recycling

Battery

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

Display

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

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

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

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

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

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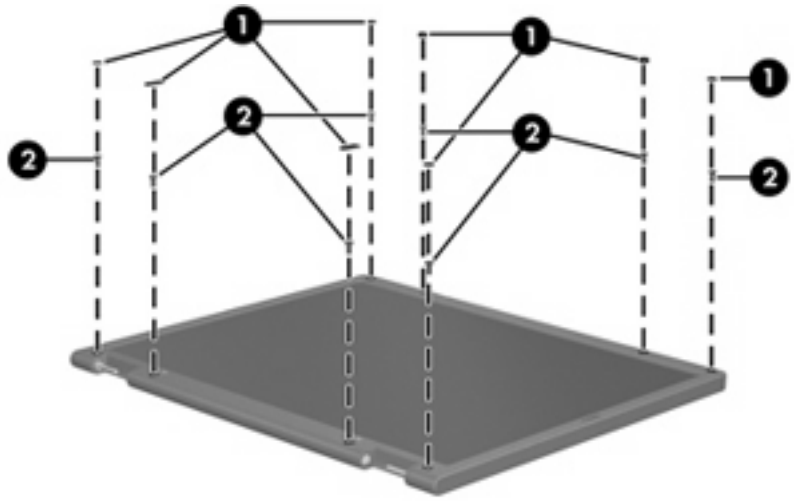
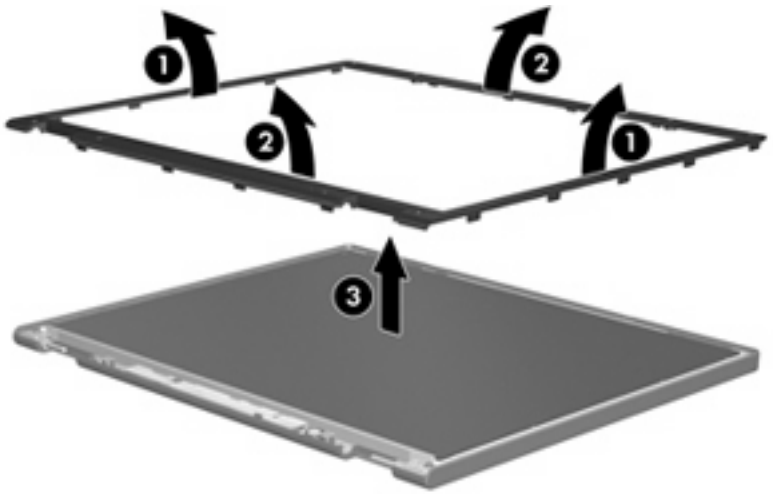
Perform the following steps to disassemble the display assembly:

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



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



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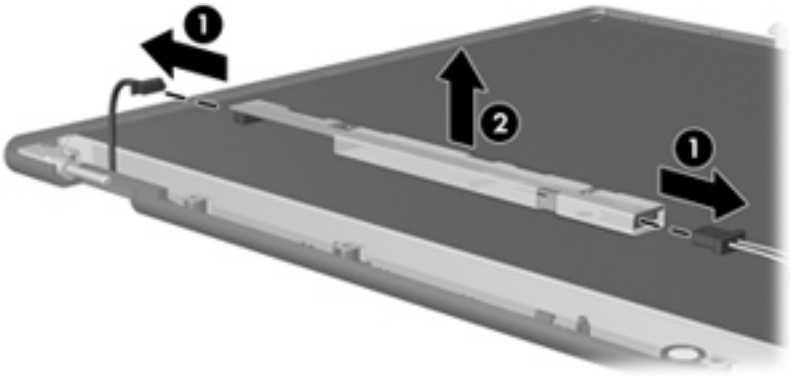
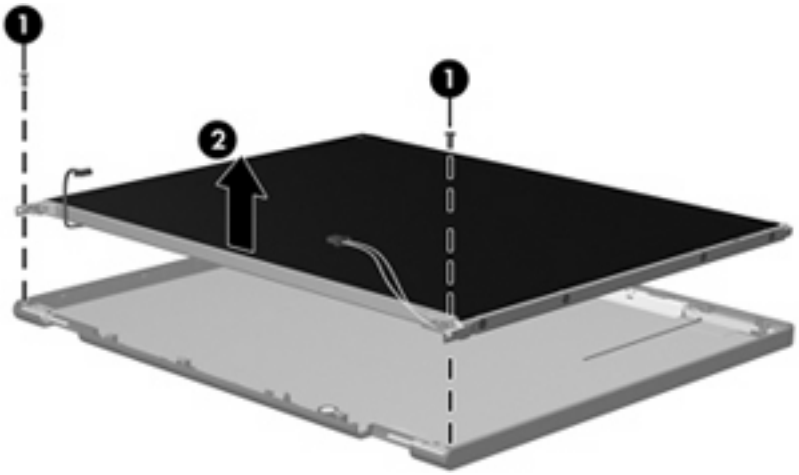
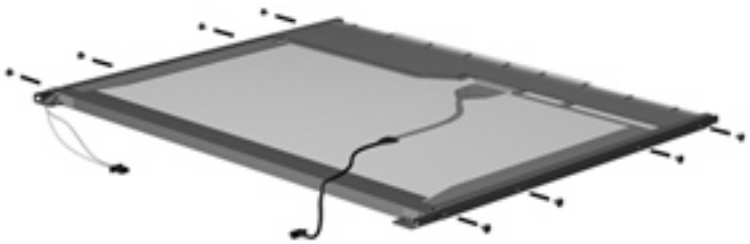
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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



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



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

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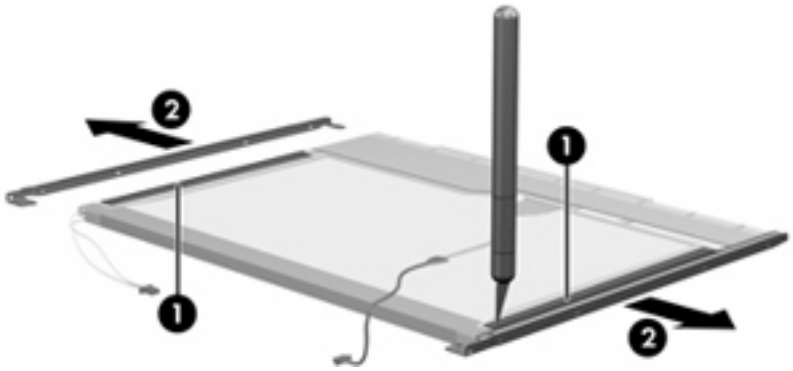
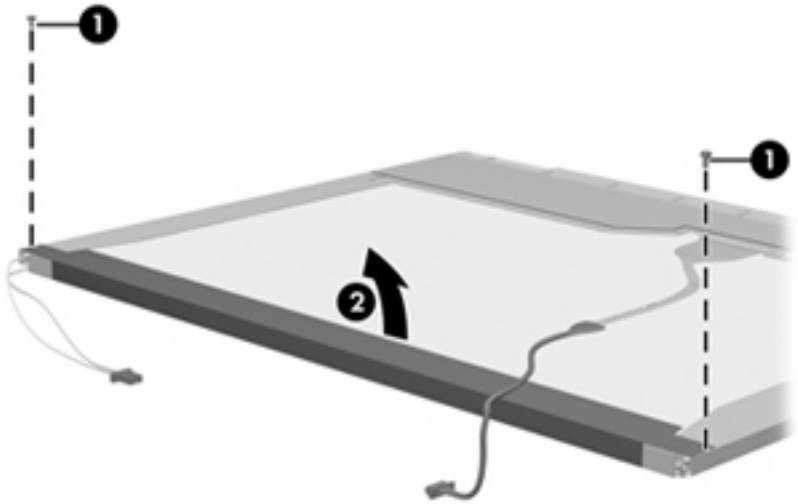
10. Remove the display panel frame **(2)** from the display panel.



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



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

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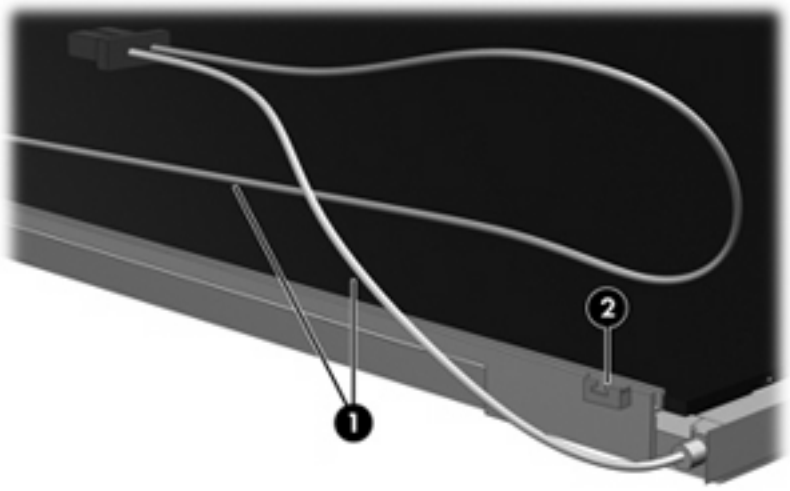
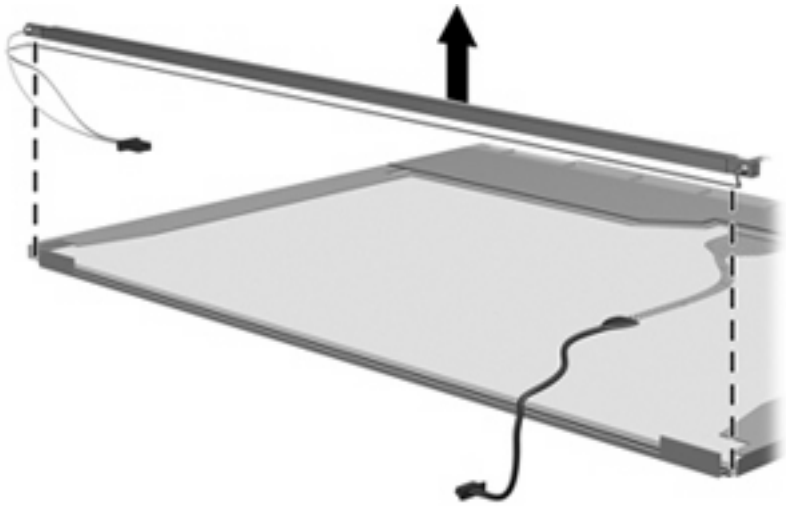
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



16. Turn the display panel upside-down.

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

17. Remove the backlight frame from the display panel.



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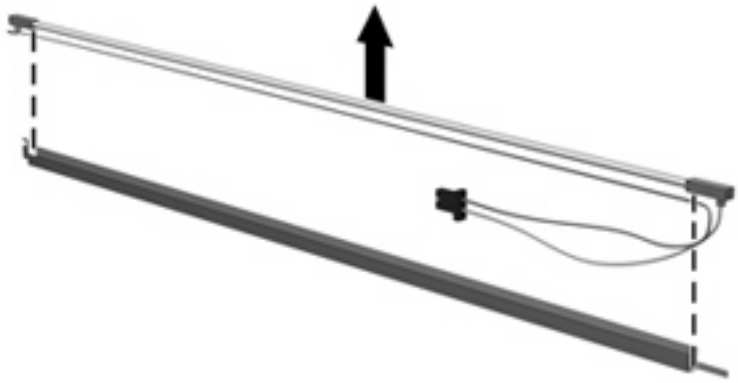
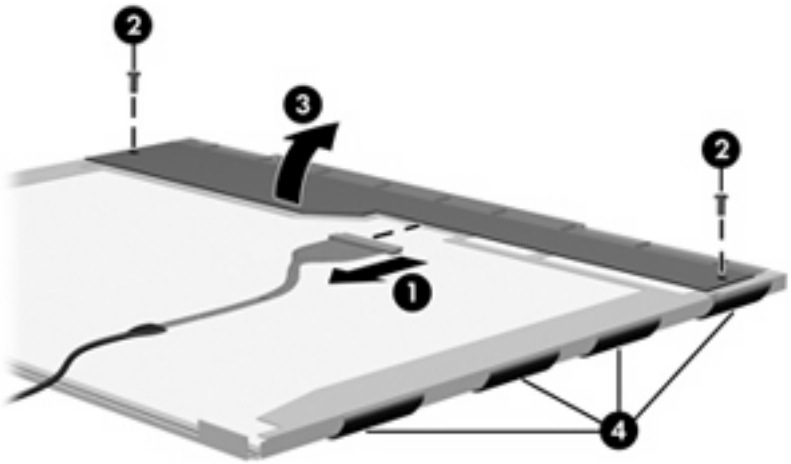
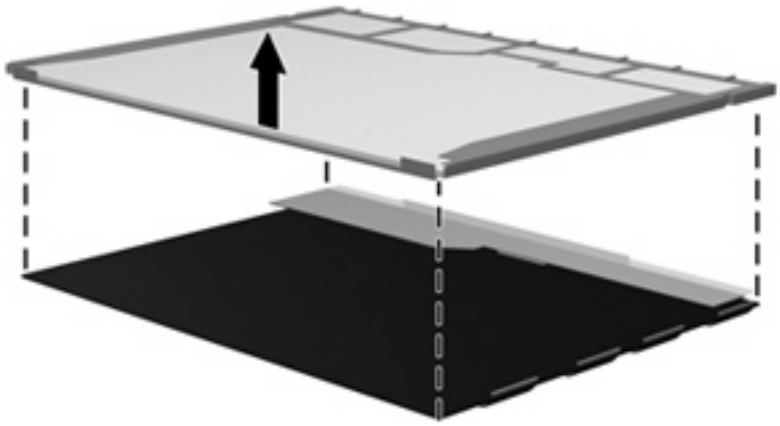
18. Remove the backlight from the backlight frame.



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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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