HP ProBook 4320s Notebook PC
HP ProBook 4321s Notebook PC
HP ProBook 4420s Notebook PC
HP ProBook 4421s Notebook PC

Maintenance and Service Guide

SUMMARY

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

Fourth Edition: August 2012

First Edition: March 2010

Document Part Number: 595288-004

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).

Table of contents

1 Product description

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
Product Name	HP ProBook 4320s Notebook PC **NOTE:** Discrete not for use in the People's Republic of China.	√	√		
	HP ProBook 4321s Notebook PC **NOTE:** For use in the People's Republic of China.		√		
	HP ProBook 4420s Notebook PC			√	√
	HP ProBook 4421s Notebook PC				√
Processors	**Intel® Core™**				
	● i7-640M, 2.80-GHz (Turbo up to 3.46 GHz), 4-MB L3 cache, 4 threads	√	√	√	√
	● i7-620M, 2.66-GHz (Turbo up to 3.33 GHz), 4-MB L3 cache, 4 threads	√	√	√	√
	● i5-580M, 2.80-GHz (Turbo up to 3.33 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-560M, 2.66-GHz (Turbo up to 3.20 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-540M, 2.53-GHz (Turbo up to 3.06 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-520M, 2.4-GHz (Turbo up to 2.93 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-480M, 2.66-GHz (Turbo up to 3.18 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-460M, 2.53-GHz (Turbo up to 2.80 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-450M, 2.40-GHz (Turbo up to 2.66 GHz), 3-MB L3 cache, 4 threads	√	√	√	√
	● i5-430M, 2.26-GHz (Turbo up to 2.53 GHz), 3-MB L3 cache, 4 threads	√	√	√	√

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	• i3-390M, 2.66-GHz, 3-MB L3 cache, 4 threads (35 W)	√	√	√	√
	• i3-380M, 2.53-GHz, 3-MB L3 cache, 4 threads (35 W)	√	√	√	√
	• i3-370M, 2.40-GHz, 3-MB L3 cache, 4 threads (35 W)	√	√	√	√
	• i3-350M, 2.26-GHz, 3-MB L3 cache, 4 threads (35 W)	√	√	√	√
	• i3-330M, 2.13-GHz, 3-MB L3 cache, 4 threads (35 W)	√	√	√	√
	Intel® Pentium®				
	• P6300, 2.26-GHz, 3-MB L3 cache	√	√	√	√
	• P6200, 2.13-GHz, 3-MB L3 cache	√	√	√	√
	• P6100, 2.00-GHz, 3-MB L3 cache	√	√	√	√
	Intel® Celeron®				
	• P4600, 2.00-GHz, 2-MB L3 cache	√	√	√	√
	• P4500, 1.86-GHz, 2-MB L3 cache	√	√	√	√
Chipsets	Intel® HM57 Express	√	√	√	√
Graphics	Intel® HD Graphics	√		√	
	Universal Memory Architecture (UMA) graphics subsystem integrated with shared video memory (dynamically allocated)				
	ATI Mobility Radeon™ HD 530v		√		√
	AMD discrete graphics; 512-MB DDR3, 800 MHz				
	ATI Mobility Radeon HD 5470		√		√
	AMD discrete graphics; 512-MB DDR3, 800 MHz				
	ATI Mobility Radeon HD 6370		√		√
	AMD discrete graphics; 1-GB DDR3, 800 MHz				
Panels	All display panel assemblies support privacy filter	√	√	√	√
	LED backlight	√	√	√	√
	• **33.8-cm** (13.3-in) HD (1366×768 resolution)	√	√		
	• **33.8-cm** (13.3-in) HD BrightView	√	√		
	• **33.8-cm** (13.3-in) HD with webcam	√	√		
	• **33.8-cm** (13.3-in) HD with webcam for use with WWAN	√			

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	● **33.8-cm** (13.3-in) HD BrightView with webcam	√	√		
	● **33.8-cm** (13.3-in) HD BrightView with webcam and WWAN	√			
	● **35.6-cm** (14.0-in) HD (1366×768 resolution)			√	√
	● **35.6-cm** (14.0-in) HD BrightView			√	√
	● **35.6-cm** (14.0-in) HD with webcam			√	√
	● **35.6-cm** (14.0-in) HD BrightView with webcam			√	√
Memory	2 customer-accessible/upgradable SODIMM memory module slots	√	√	√	√
	Supports dual-channel memory	√	√	√	√
	Supports up to 4 GB of system memory in Brazil	√	√		
	Supports up to 8 GB of system memory in all countries and regions except Brazil	√	√	√	√
	PC3-12800, 1333-MHz, DDR3	√	√	√	√
	Supports the following configuration in all countries and regions except Brazil: ● 8192-MB total system memory (4096-MB × 2, dual-channel) ● 4096-MB total system memory (4096-MB × 1) ● 4096-MB total system memory (2048-MB × 2, dual channel) ● 3072-MB total system memory (2048-MB + 1024-MB, dual channel) ● 2048-MB total system memory (2048-MB × 1) ● 2048-MB total system memory (1024-MB × 2, dual channel) ● 1024-MB total system memory (1024-MB × 1)	√	√	√	√
	Supports the following configurations in Brazil: ● 4096-MB total system memory (2048-MB × 2, dual-channel) ● 3072-MB total system memory (2048-MB + 1024-MB, dual channel) ● 2048-MB total system memory (2048-MB × 1)		√	√	√

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	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				
	● 320-GB, 7200-rpm				
	● 250-GB, 7200-rpm				
	HP 3D DriveGuard (not available on Linux)	√	√	√	√
Optical drives	Fixed	√	√	√	√
	12.7-mm (0.50-in) tray load	√	√	√	√
	Supports option of no optical drive	√	√	√	√
	Supports the following drives:				
	● Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive NOTE: Not available with UMA base model and Window XP.	√	√	√	√
	● DVD±RW SuperMulti Double-Layer Drive with LightScribe	√	√	√	√
	● DVD ROM Drive	√	√	√	√
Diskette drive	Supports external USB diskette drive only	√	√	√	√
Audio/Visual	HD audio - IDT 92HD80	√	√	√	√
	Integrated microphone	√	√	√	√
	Two stereo speakers	√	√	√	√
	Integrated 2.0-megapixel webcam (fixed focus)	√	√	√	√
Modem	High-speed 56k modem for all regions and countries except Brazil	√	√	√	√
	High-speed 56k modem for use in Brazil	√	√		
	Modem cable not included	√	√	√	√
	Supports no modem option	√	√	√	√
Ethernet	10/100/1000 Ethernet network interface card (NIC)	√	√	√	√
	S3/S4/S5 wake on LAN (AC only mode)	√	√	√	√
Wireless	**Integrated WLAN options by way of wireless module:**				

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	Support for the following WLAN formats:	√	√	√	√
	● Broadcom 802.11a/b/g/n 2×2				
	● Broadcom 802.11b/g				
	● Atheros 802.11b/g/n 1x1				
	● Realtek 802.11b/g/n 1x1				
	● Intel Advanced-N 6200 802.11a/b/g/n 2x2				
	● Intel Advanced-N 6200 802.11a/b/g 1x2				
	● Intel Wireless-N 1000 802.11b/g/n 1x2				
	● Intel Wireless-N 1000 802.11b/g 1x2				
	● Ralink 802.11 b/g/n RT3090BC4 BT combo				
	2 WLAN antennas built into display assembly	√	√	√	√
	Support for no-WLAN option	√	√	√	√
	Integrated personal area network (PAN) options by way of Bluetooth® module:				
	Support for no-WPAN option	√	√	√	√
	Broadcom Bluetooth 2.1 + EDR	√	√	√	√
	Integrated WWAN options by way of WWAN module:				
	WWAN module UNDP with 2 antennas (not available with Linux)	√			
	Two five-band WWAN antennas built into display assembly	√			
	Subscriber identity module (SIM) security (customer-accessible in battery bay)	√			
External media cards	One ExpressCard slot (34 mm)	√	√	√	√
	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 (3)	√	√	√	√
	Combo eSATA/USB 2.0 (1)	√	√	√	√

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	HDMI	√	√	√	√
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)	√	√	√	√
	Multi-pin AC power	√	√	√	√
Keyboard and pointing devices	**33.8-cm** (13.3-in) keyboard with TouchPad	√	√		
	35.6-cm (14.0-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)		√		√
	9-cell, 93-Wh Li-ion battery	√	√	√	√
	6-cell, 47-Wh Li-ion battery	√	√	√	√
Security	Supports Kensington security lock	√	√	√	√
	Intel AT support	√	√	√	√
Operating system	**Preinstalled:** NOTE: Windows Vista® includes SP1 and Windows® XP Pro includes SP3 (Ver 2 1)				
	Windows 7 Professional 32 (with Windows XP Professional images) with MS Basics (Japan only)	√	√	√	√
	Windows 7 Professional 32 with MS Basics (Japan only)	√	√	√	√
	Windows 7 Home Premium 32 with MS Basics (Japan only)	√	√	√	√
	Windows Vista Business 32 with MS Basics (Japan only)	√	√	√	√
	Windows Vista Home Basic 32 with MS Basics (Japan only)	√	√	√	√
	FreeDOS	√	√	√	√
	RedFlag Linux (People's Republic of China only)	√	√	√	√
	SUSE Linux (SLED11)	√	√	√	√
	Preinstalled with Office:				
	Windows 7 Starter with Office 2007 Ready (excludes Japan)	√	√	√	√

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	Windows 7 Starter with Office 2007 Ready - EDGI (available for Argentina, Brazil - English, Brazil, Latin America, Latin America - English, Russia, India, Asia Pacific, Thailand)	√	√	√	√
	Windows 7 Home Basic 32 with Office 2007 Ready (excludes Japan)	√	√	√	√
	Windows 7 Home Basic with Office 2007 Ready - EDGI (available for Argentina, Brazil - English, Brazil, Latin America, Latin America - English, Russia, People's Republic of China, India, Asia Pacific, Thailand)	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Ready (excludes Japan)	√	√	√	√
	Windows 7 Home Premium with Office 2007 Ready - EDGI (available for Argentina, Brazil - English, Brazil, Latin America, Latin America - English, Russia, People's Republic of China, Hong Kong, India, Asia Pacific, Thailand)	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Personal (Japan only)	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√
	Windows 7 Home Premium 32 with Office 2007 Professional (Japan only)	√	√	√	√
	Windows 7 Professional 32 with Office 2007 Ready (excludes Japan)	√	√	√	√
	Windows 7 Professional with Office 2007 Ready - EDGI (available for Argentina, Brazil - English, Brazil, Latin America, Latin America - English, Russia, People's Republic of China, Hong Kong, India, Asia Pacific, Thailand)	√	√	√	√
	Windows 7 Professional 32 with Office 2007 Personal (Japan only)	√	√	√	√
	Windows Vista® Professional 32 with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√
	Windows 7 Professional 32 with Office 2007 Professional (Japan only)	√	√	√	√
	Windows 7 Professional (with Windows XP Professional images) with Office 2007 Ready (excludes Japan)	√	√	√	√
	Windows 7 Professional (with Windows XP Professional images) with Office 2007 Ready - EDGI (available for Argentina, Brazil - English, Brazil, Latin America, Latin America - English, Russia, People's Republic of China, Hong Kong, India, Asia Pacific, Thailand)			√	√

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	Windows 7 Professional (with Windows XP Professional images) with Office 2007 Personal (Japan only)	√	√	√	√
	Windows 7 Professional (with Windows XP Professional images) with Office 2007 Personal with PowerPoint (Japan only)	√	√	√	√
	Windows 7 Professional (with Windows XP Professional images) with Office 2007 Professional (Japan only)	√	√	√	√
	Windows Vista Home Basic 32 with Office 2007 Ready (excludes Japan)	√	√	√	√
	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 Business 32 with Office 2007 Ready (excludes Japan)	√	√	√	√
	Windows Vista Business 32 with Office 2007 Personal (Japan only)	√	√	√	√
	Windows Vista Business 32 with Office 2007 Personal (Japan only)	√	√	√	√
	Windows Vista Business 32 with Office Professional (Japan only)	√	√	√	√
Restore media:					
	Windows 7 Professional 64	√	√	√	√
	Windows 7 Professional 32	√	√	√	√
	Windows 7 Home Premium 32	√	√	√	√
	Windows 7 Home Basic 32	√	√	√	√
	Windows 7 Starter	√	√	√	√
	Windows Vista Business 32	√	√	√	√
	Windows Vista Home Basic 32	√	√	√	√
	Windows XP Professional	√	√	√	√
	Microsoft Office Ready DVD	√	√	√	√
	DRDVD Windows 7 Home Premium/Windows 7 Professional	√	√	√	√
	DRDVD Windows 7 Starter/Windows 7 Home Basic	√	√	√	√

Category	Description	HP ProBook 4320s	HP ProBook 4320s / 4321s	HP ProBook 4420s	HP ProBook 4421s
		UMA	Discrete	UMA	Discrete
	DRDVD Windows XP Professional	√	√	√	√
	DRDVD Windows Vista	√	√	√	√
	Red Flag Linux (in the People's Republic of China only)	√	√	√	√
	SUSE Linux	√	√	√	√
	Certified: Microsoft® WHQL	√	√	√	√
	Web Support:				
	Windows 7 Professional 64	√	√	√	√
	Windows Vista Business 64	√	√	√	√
Serviceability	**End-user replaceable parts:**				
	AC adapter	√	√	√	√
	Battery (system)	√	√	√	√
	Bluetooth module	√	√	√	√
	Keyboard	√	√	√	√
	Speaker assembly	√	√	√	√
	Hard drive	√	√	√	√
	Memory module	√	√	√	√
	Optical drive	√	√	√	√
	WLAN module	√	√	√	√
	WWAN module	√	√	√	√

2 External component identification

Identifying hardware

Components included with the computer may vary by region and model. The illustrations in this chapter identify the standard features on most computer models.

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

Use the following instructions to see a list of hardware installed in the computer.

In Windows® 7:

▲ Select **Start > Control Panel > System and Security > Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

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.

In Windows Vista®:

1. **Select Start > Computer > System Properties**.

2. In the left pane, click **Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

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.

In Windows XP:

1. **Select Start > My Computer**.

2. In the left pane of the System Tasks window, select **View system information**.

3. Select **Hardware** tab > **Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

Top components

TouchPad
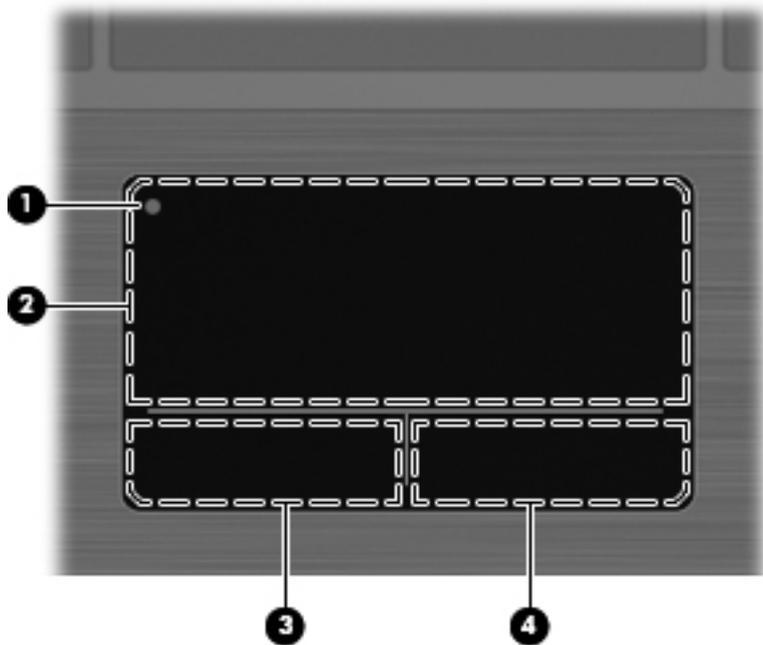
	Component	Description
(1)	TouchPad off indicator	To turn the TouchPad zone on and off, quickly double-tap the TouchPad off indicator.
		NOTE: When the TouchPad zone is active, the light is off.
(2)	TouchPad zone*	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button*	Functions like the left button on an external mouse.
(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, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

Lights
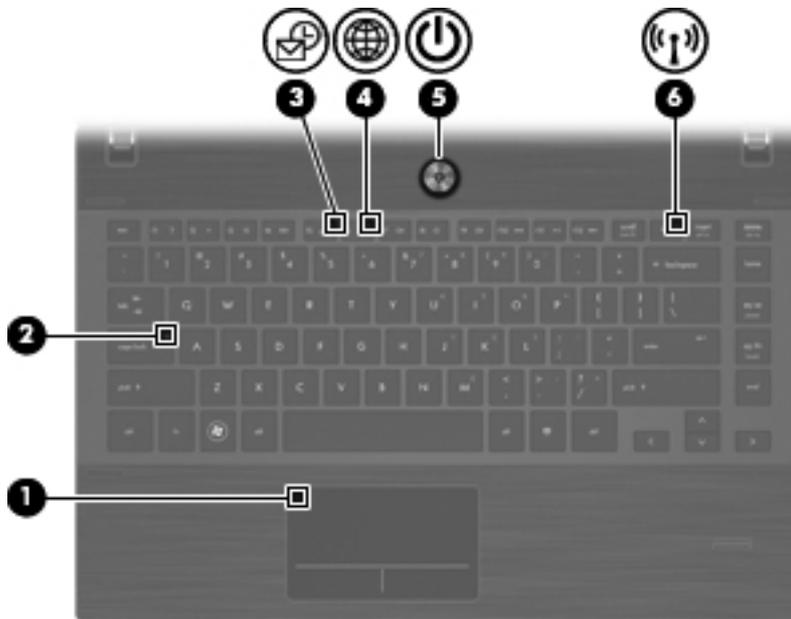
Component		Description
(1)	TouchPad off indicator	● Amber: The TouchPad is off.
		● Off: The TouchPad is on.
(2)	Caps lock light	On: Caps lock is on.
(3)	HP QuickLook light	Blinking: QuickLook is being opened or closed.
(4)	HP QuickWeb light	Blinking: The Web browser is being opened or closed.
(5)	Power light	● On: The computer is on.
		● Blinking: The computer is in Standby.
		● Off: The computer is off or in Hibernation.
(6)	Wireless light	● White: 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.

Buttons, speakers, switches, and fingerprint reader (select models only)

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)	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 Standby, press the button briefly to exit 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 > Performance and Maintenance > Power Options**.
(4)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

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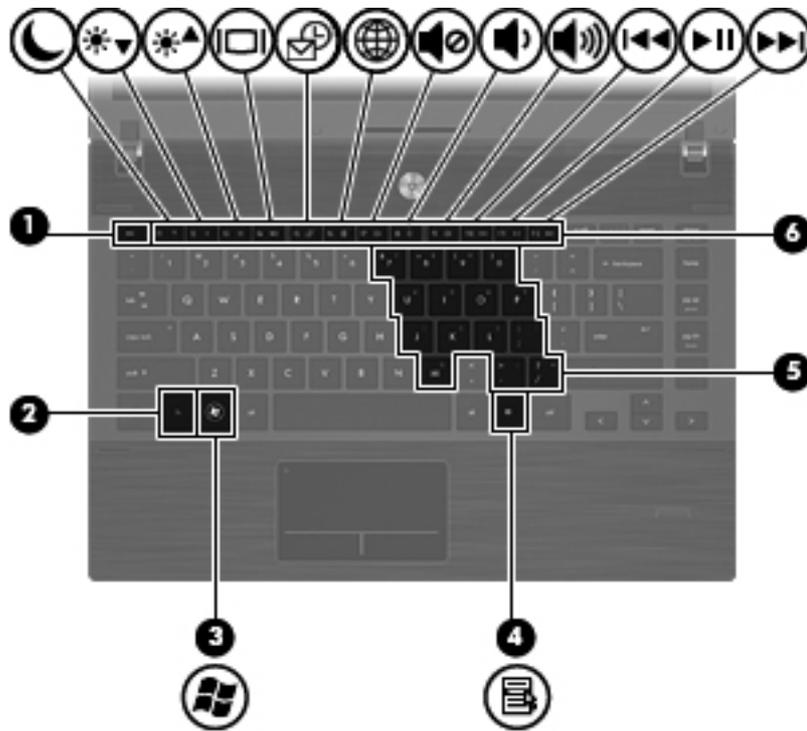
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications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

Front components

	Component	Description
(1)	Drive light	● Blinking white: The hard drive or optical drive is being accessed. ● Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	Media Card Reader	Supports the following optional digital card formats: ● Memory Stick ● Memory Stick Duo (adapter required) ● Memory Stick Pro (adapter required) ● MultiMediaCard (MMC) ● Secure Digital (SD) Memory Card ● xD-Picture Card (XD) ● xD-Picture Card (XD) Type H ● xD-Picture Card (XD) Type M
(3)	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.
(4)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Right-side components
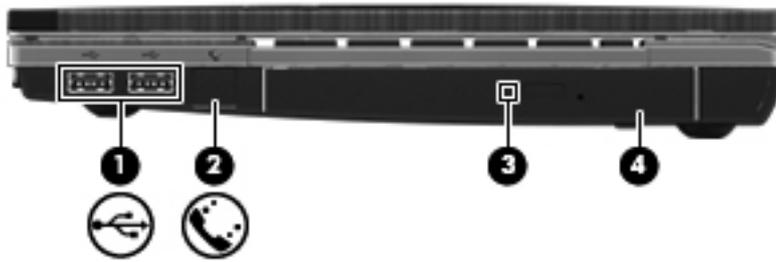
	Component	Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(4)	Optical drive (select models only)	Reads optical discs and, on select models, also writes to optical discs.

Left-side components
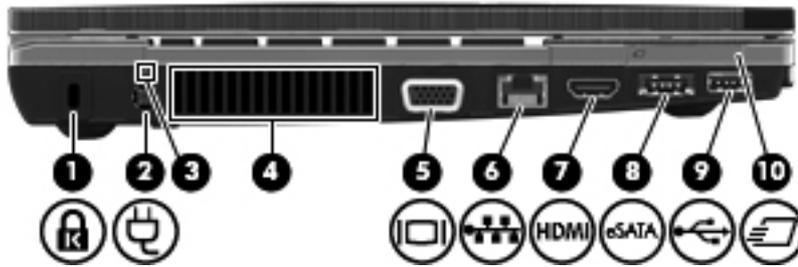
Component	Description
(1) Security cable slot	Attaches an optional security cable to the computer.
	NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2) Power connector	Connects an AC adapter.
(3) AC adapter light	● On: The computer is connected to external power and the battery is charging.
	● Off: The computer is not connected to external power.
(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) RJ-45 (network) jack	Connects a network cable.
(7) HDMI port	Connects an optional HDMI device.
(8) Combo eSATA/USB port	Connects an optional USB device or high-performance eSATA components, such as an eSATA external hard drive.
(9) USB port	Connects optional USB device.
(10) ExpressCard slot	Supports optional ExpressCards.

Bottom components
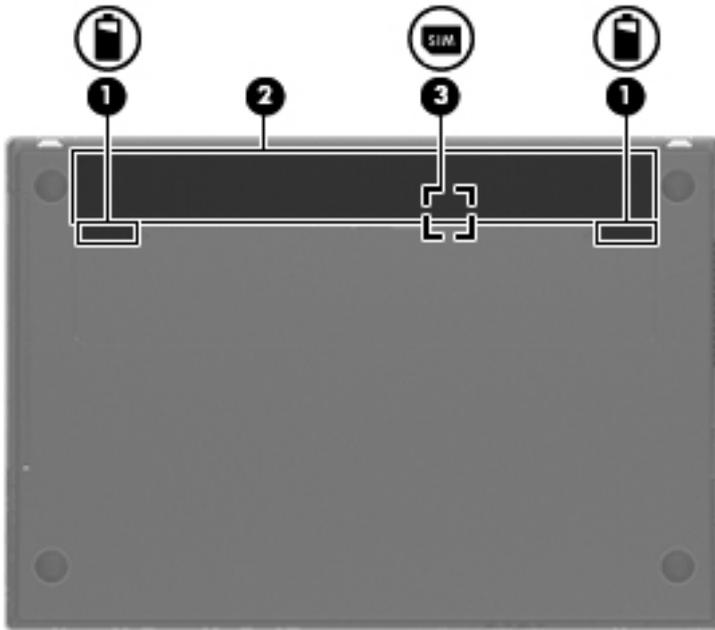
Component		Description
(1)	Battery release latches (2)	Release the battery from the battery bay.
(2)	Battery bay	Holds the battery.
(3)	SIM slot (select models only)	Contains a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.

Display

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 video and captures still photographs.

Wireless antennas (select models only)

The antennas send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer.
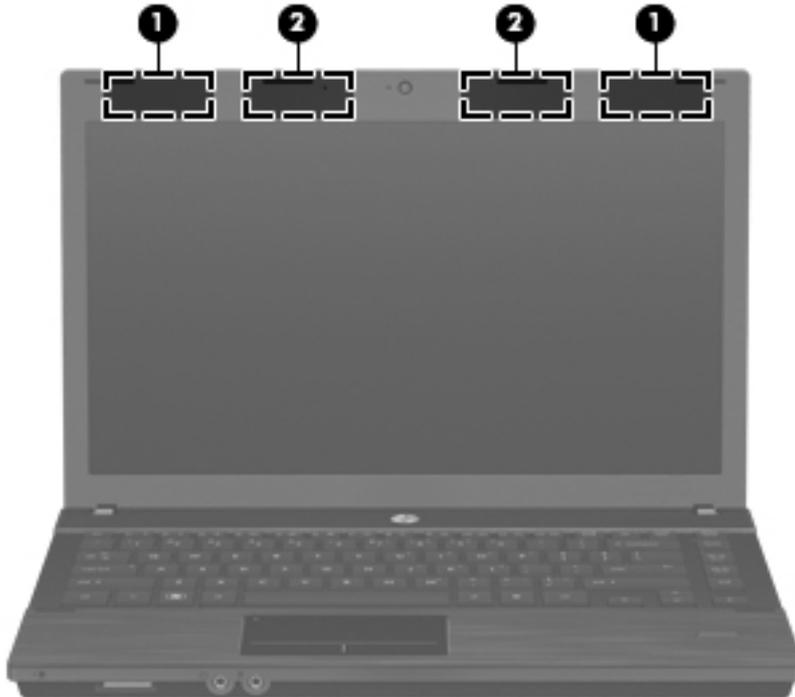
	Component	Description
(1)	WWAN antennas (2)*	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

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

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 an external power source.
(3)	AC adapter	Converts AC power to DC power.

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

3   Illustrated parts catalog

Serial number label location

When ordering parts or requesting information, the serial number label, located on the bottom of the computer, provides important information that you may need when contacting technical support.

(1) Product name	**(4)** Warranty period
(2) Serial number	**(5)** Model description (select models)
(3) Product number	
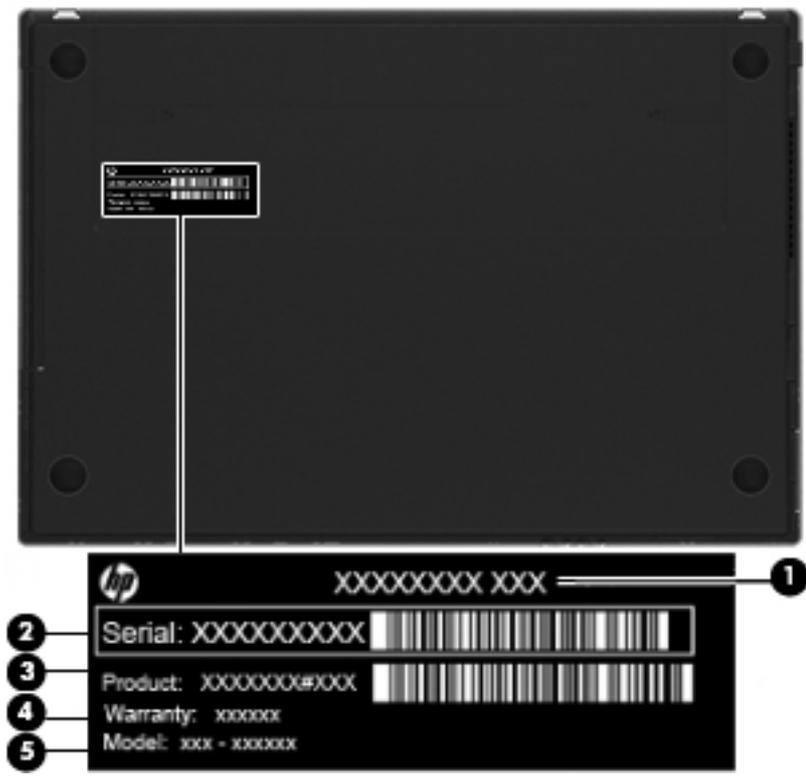
Computer major components
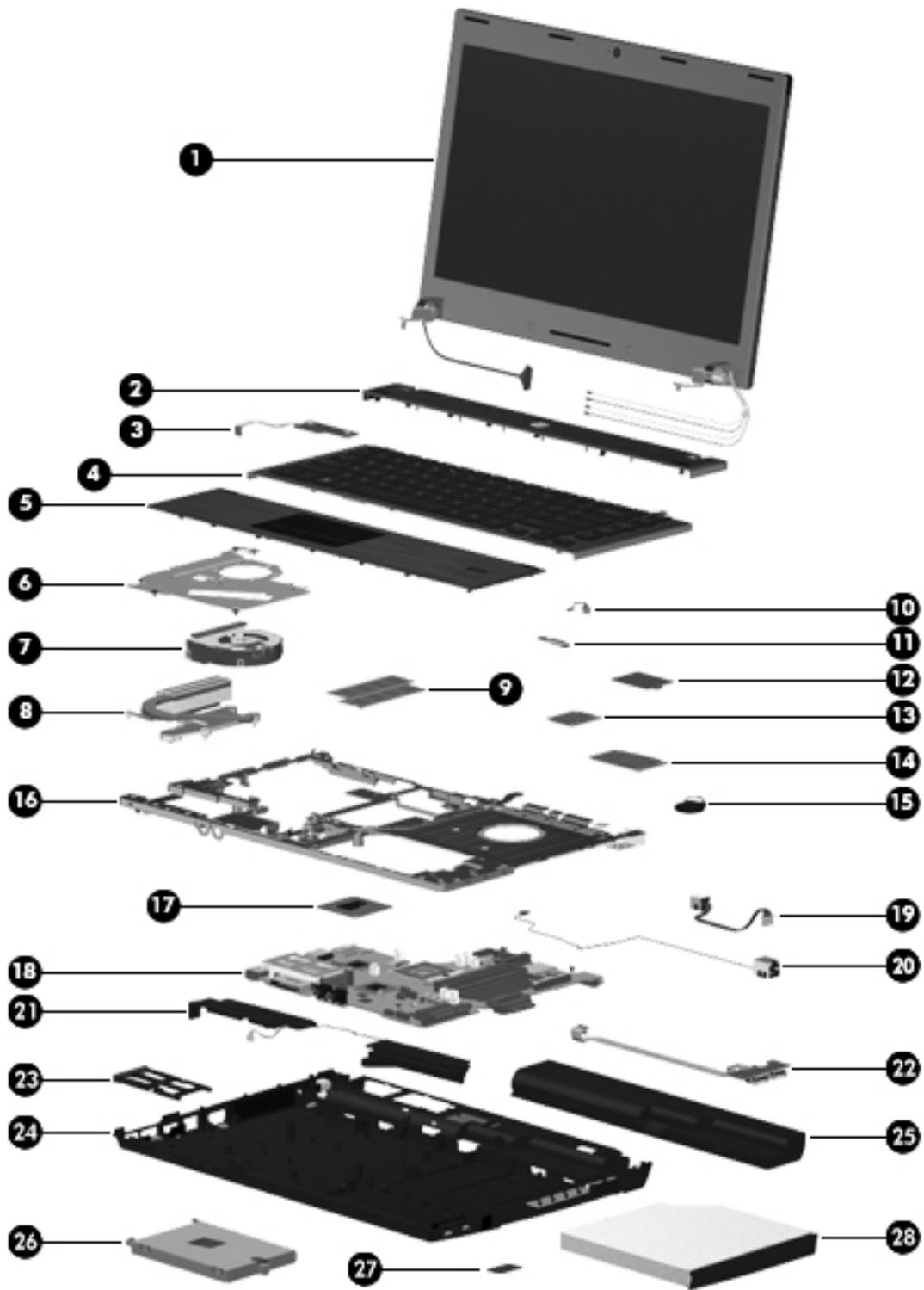
Item	Description	Spare part number
(1)	**Display assembly** (includes 2 WLAN antennas and cables and, on select computer models, 2 WWAN antennas and cables)	
	NOTE: WWAN is available only on select models with **33.8-cm** 13.3-in displays.	
	For use in black models:	
	● **33.8-cm** (13.3-in) HD (1366x768 resolution)	599553-001
	● **33.8-cm** (13.3-in) HD BrightView	599554-001
	● **33.8-cm** (13.3-in) HD BrightView with webcam	599555-001
	● **33.8-cm** (13.3-in) HD BrightView with webcam and WWAN	599556-001
	● **33.8-cm** (13.3-in) HD with webcam	599557-001
	● **33.8-cm** (13.3-in) HD with webcam and WWAN	599558-001
	● **35.6-cm** (14.0-in) HD (1366x768 resolution)	599559-001
	● **35.6-cm** (14.0-in) HD BrightView	599560-001
	● **35.6-cm** (14.0-in) HD BrightView with webcam	599561-001
	● **35.6-cm** (14.0-in) HD with webcam	599562-001
	For use in red models:	
	● **33.8-cm** (13.3-in) HD (1366x768 resolution)	608736-001
	● **33.8-cm** (13.3-in) HD BrightView	608737-001
	● **33.8-cm** (13.3-in) HD BrightView with webcam	608738-001
	● **33.8-cm** (13.3-in) HD with webcam	608739-001
	● **35.6-cm** (14.0-in) HD (1366x768 resolution)	608740-001
	● **35.6-cm** (14.0-in) HD BrightView	608741-001
	● **35.6-cm** (14.0-in) HD BrightView with webcam	608742-001
	● **35.6-cm** (14.0-in) HD with webcam	608743-001
	For use in champagne models:	
	● **33.8-cm** (13.3-in) HD (1366x768 resolution)	625690-001
	● **33.8-cm** (13.3-in) HD BrightView	625692-001
	● **33.8-cm** (13.3-in) HD BrightView with webcam	625693-001
	● **33.8-cm** (13.3-in) HD with webcam	625691-001
	● **35.6-cm** (14.0-in) HD (1366x768 resolution)	625694-001
	● **35.6-cm** (14.0-in) HD BrightView	625696-001
	● **35.6-cm** (14.0-in) HD BrightView with webcam	625697-001
	● **35.6-cm** (14.0-in) HD with webcam	625695-001
	For use in coffee-colored **35.6-cm** (14.0-in) models in Singapore	663979-001
(2)	**Switch cover**	

Item	Description	Spare part number
	For use in black models:	
	● For with **35.6-cm** (14.0-in) displays	599568-001
	● For with **33.8-cm** (13.3-in) displays	599567-001
	For use in red models:	
	● For with **35.6-cm** (14.0-in) displays	607653-001
	● For with **33.8-cm** (13.3-in) displays	607652-001
	For use in champagne models:	
	● For with **35.6-cm** (14.0-in) displays	625717-001
	● For with **33.8-cm** (13.3-in) displays	625716-001
(3)	**Power connector board (with cable)**	599517-001
(4)	**Keyboard**	
	In computer models with **33.8-cm** (13.3-in) displays:	
	● For use in Belgium	599572-A41
	● For use in Brazil	599572-201
	● For use in Bulgaria	599572-261
	● For use in Canada (French)	599572-121
	● For use in Denmark	599572-081
	● For use in Europe	599572-B31
	● For use in France	599572-051
	● For use in French Arabic region	599572-DW1
	● For use in Germany	599572-041
	● For use in Greece	599572-DJ1
	● For use in Hungary	599572-211
	● For use in Iceland	599572-DD1
	● For use in Israel	599572-BB1
	● For use in Italy	599572-061
	● For use in Japan	599572-291
	● For use in Korea	599572-AD1
	● For use in Latin America	599572-161
	● For use in Norway	599572-091
	● For use in Portugal	599572-131
	● For use in Russia	599572-251
	● For use in Saudi Arabia	599572-171
	● For use in Spain	599572-071

Item	Description	Spare part number
	● For use in Sweden and Finland	599572-B71
	● For use in Switzerland	599572-BG1
	● For use in Taiwan	599572-AB1
	● For use in Thailand	599572-281
	● For use in the Adriatic region	599572-BA1
	● For use in the Czech Republic and Slovakia	599572-A81
	● For use in the United Kingdom	599572-031
	● For use in the United States	599572-001
	● For use in Turkey	599572-141
	In computer models with **35.6-cm** (14.0-in) displays:	
	● For use in Belgium	599573-A41
	● For use in Brazil	599573-201
	● For use in Bulgaria	599573-261
	● For use in Canada (French)	599573-121
	● For use in Denmark	599573-081
	● For use in Europe	599573-B31
	● For use in France	599573-051
	● For use in French Arabic region	599573-DW1
	● For use in Germany	599573-041
	● For use in Greece	599573-DJ1
	● For use in Hungary	599573-211
	● For use in Iceland	599573-DD1
	● For use in Israel	599573-BB1
	● For use in Italy	599573-061
	● For use in Japan	599573-291
	● For use in Korea	599573-AD1
	● For use in Latin America	599573-161
	● For use in Norway	599573-091
	● For use in Portugal	599573-131
	● For use in Russia	599573-251
	● For use in Saudi Arabia	599573-171
	● For use in Spain	599573-071
	● For use in Sweden and Finland	599573-B71
	● For use in Switzerland	599573-BG1

Item	Description	Spare part number
	● For use in Taiwan	599573-AB1
	● For use in Thailand	599573-281
	● For use in the Adriatic region	599573-BA1
	● For use in the Czech Republic and Slovakia	599573-A81
	● For use in the United Kingdom	599573-031
	● For use in the United States	599573-001
	● For use in Turkey	599573-141
(5)	**Palm rest** (includes TouchPad)	
	For use in black models:	
	● For use with fingerprint reader and **33.8-cm** (13.3-in) displays	599549-001
	● For use with **33.8-cm** (13.3-in) displays	599551-001
	● For use with fingerprint reader and **35.6-cm** (14.0-in) displays	599550-001
	● For use with **35.6-cm** (14.0-in) displays	599552-001
	For use in red models:	
	● For use with fingerprint reader and **33.8-cm** (13.3-in) displays	607648-001
	● For use with **33.8-cm** (13.3-in) displays	607650-001
	● For use with fingerprint reader and **35.6-cm** (14.0-in) displays	607649-001
	● For use with **35.6-cm** (14.0-in) displays	607651-001
	For use in champagne models:	
	● For use with fingerprint reader and **33.8-cm** (13.3-in) displays	625712-001
	● For use with **33.8-cm** (13.3-in) displays	625714-001
	● For use with fingerprint reader and **35.6-cm** (14.0-in) displays	625713-001
	● For use with **35.6-cm** (14.0-in) displays	625715-001
(6)	**Top heat shield/bracket** (included with top cover)	
(7)	**Fan**	599544-001
(8)	**Processor heat sink**	
	For use with discrete graphics subsystems	599653-001
	For use with Unified Memory Architecture (UMA) graphics subsystems	599546-001
(9)	**Memory module** (PC3-12800, 1333-MHz, DDR3, shared)	
	4096-MB	641369-002
	2048-MB	652972-002
(10)	**Bluetooth module cable** (included in Cable kit on page 37, part number 599525-001)	
(11)	**Bluetooth module** (without cable)	537921-001

Item	Description	Spare part number
(12)	**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. See Cable kit on page 37 for more Cable Kit spare part information.	
	For use in all countries and regions except for Australia and New Zealand	628824-001
	For use in Australia and New Zealand	510100-011
(13)	**WLAN module**	
	Intel® Centrino™ Advanced-N 6200 802.11a/b/g 2x2	
	For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572510-001
	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2	
	For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572520-001
	Intel Centrino Wireless-N 1000 802.11b/g 1x2 for use in Russia and Ukraine	585984-001
	Intel WiFi Link 6200 802.11a/g/n	

Item	Description	Spare part number
	For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572509-001
Broadcom 4312G 802.11b/g WiFi Adapter		
	For use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
	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, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, 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
Realtek RTL8191SE 802.11b/g/n 1x1 WiFi Adapter		593533-001
Broadcom 43224AGN 802.11a/b/g/draft-n WiFi Adapter		
	For use in Antigua and Barbuda, Aruba, the Bahamas, Barbados, Belize, Canada, Guam, Guinea, Haiti, Jamaica, the Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, the US Virgin Islands, and the United States	582564-001

| Item	Description	Spare part number
	For use in Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Cayman Islands, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	582564-002
	Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter (Bluetooth 3.0+high-speed ready)	602992-001
	Broadcom 4313/2070 802.11b/g/n (1x1) and Bluetooth high-speed Half Mini Card	600370-001
	Broadcom 4313/2070 802.11b/g/n (1x1) WiFi Mini Card	593836-001
	Atheros AR9285G 802.11b/g/n 1x1 WiFi Adapter	605560-005
(14)	**WWAN module, Qualcomm EV-DO HSPA**	531993-001
(15)	**RTC battery**	599516-001
(16)	**Top cover**	
	For use with **33.8-cm** (13.3-in) displays	599569-001
	For use with **35.6-cm** (14.0-in) displays	599570-001
(17)	**Processor** (includes replacement thermal material)	
	Intel Core i7 processors:	
	● 620M 2.26-GHz	587259-001
	● 640M 2.80-GHz	625826-001
	Intel Core i5 processors:	
	● 430M 2.26-GHz	597624-001
	● 450M 2.40-GHz	613585-001
	● 460M 2.53-GHz	626039-001
	● 480M 2.66-GHz	634693-001
	● 520M 2.4-GHz	594187-001
	● 540M 2.53-GHz	594188-001
	● 560M 2.66-GHz – 3.20-GHz	625824-001

Item	Description	Spare part number
	● 580M 2.66-GHz – 3.33-GHz	625825-001
	Intel Core i3 processors:	
	● 330M 2.13-GHz	597622-001
	● 350M 2.26-GHz	597623-001
	● 370M 2.40-GHz	613584-001
	● 380M 2.53-GHz	625823-001
	● 390M 2.66-GHz	634692-001
	Intel Pentium processors:	
	● P6000 1.86-GHz	613586-001
	● P6100 2.00-GHz	613587-001
	● P6200 2.13-GHz	625831-001
	● P6300 2.26-GHz	635500-001
	Intel Celeron processors:	
	● P4500, 1.86-GHz	611699-001
	● P4600, 2.00-GHz	628941-001
(18)	**System board** (includes replacement thermal material)	
	For use in all countries and regions except for Russia and the People's Republic of China:	
	● For use with Unified Memory Architecture (UMA) graphics subsystem, WWAN module, and **33.8-cm** (13.3-in) displays	599521-001
	● For use with UMA graphics subsystem and **33.8-cm** (13.3-in) displays	599520-001
	● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **33.8-cm** (13.3-in) displays	599518-001
	● For use in models with ATI Mobility Radeon HD 5470 discrete graphics and **33.8-cm** (13.3-in) displays	628485-001
	● For use in models with ATI Mobility Radeon HD 6370 discrete graphics and **33.8-cm** (13.3-in) displays	628615-001
	● For use with UMA graphics subsystem and **35.6-cm** (14.0-in) displays	599523-001
	● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **35.6-cm** (14.0-in) displays	599522-001
	● For use in models with ATI Mobility Radeon HD 5470 discrete graphics and **35.6-cm** (14.0-in) displays	628487-001
	● For use in models with ATI Mobility Radeon HD 6370 discrete graphics and **35.6-cm** (14.0-in) displays	628617-001
	For use in only Russia and the People's Republic of China:	
	● For use with UMA graphics subsystem and **33.8-cm** (13.3-in) displays	625726-001
	● For use with UMA graphics subsystem, WWAN module, and **33.8-cm** (13.3-in) displays	625727-001
	● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **33.8-cm** (13.3-in) displays	625725-001

Item	Description	Spare part number
	● For use in models with ATI Mobility Radeon HD 5470 discrete graphics and **33.8-cm** (13.3-in) displays	628486-001
	● For use in models with ATI Mobility Radeon HD 6370 discrete graphics and **33.8-cm** (13.3-in) displays	628616-001
	● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **35.6-cm** (14.0-in) displays	608266-001
	● For use in models with ATI Mobility Radeon HD 5470 discrete graphics and **35.6-cm** (14.0-in) displays	628488-001
	● For use in models with ATI Mobility Radeon HD 6370 discrete graphics and **35.6-cm** (14.0-in) displays	628618-001
	● For use with UMA graphics subsystem and **35.6-cm** (14.0-in) displays	608267-001
(19)	**Power cable** (included in Cable kit on page 37, part number 599525-001).	
(20)	**RJ11 (modem) cable** (included in Cable kit on page 37, part number 599525-001)	
(21)	**Speakers**	
	● For use with **33.8-cm** (13.3-in) displays	599566-001
	● For use with **33.8-cm** (13.3-in) displays; includes metallic heat shield	663539-001
	● For use with **35.6-cm** (14.0-in) displays	605559-001
	● For use with **35.6-cm** (14.0-in) displays; includes metallic heat shield	663540-001
(22)	**USB connector board and cable**	599524-001
(23)	**ExpressCard slot bezel** (included in Plastics kit, see Plastics Kit on page 36)	
(24)	**Base enclosure**	
	For use in computer models with **33.8-cm** (13.3-in) displays	599514-001
	For use in computer models with **35.6-cm** (14.0-in) displays	599515-001
(25)	**Battery**	
	9-cell, 93-Wh (2.8Ah) Li-ion	593573-001
	6-cell, 47-Wh (2.2Ah) Li-ion	593572-001
(26)	**Hard drive** (includes hard drive bracket)	
	750-GB, 5400-rpm	634250-001
	640-GB, 7200-rpm	621046
	640-GB, 5400-rpm	631160-001
	500-GB, 7200-rpm	634920-001
	320-GB, 7200-rpm	603783-002
	250-GB, 7200-rpm	599541-001
	Hard Drive Hardware Kit	630889-001
(27)	**SIM** (provided by your wireless vendor for use with WWAN option)	
(28)	**Optical drive** (includes bezel)	

| Item	Description	Spare part number
	Blu-ray Disc ROM Drive with SuperMulti DVD±R/RW Double-Layer	599538-001
	DVD±RW SuperMulti Double-Layer Drive with LightScribe	599540-001
	DVD ROM Drive	599539-001
	Battery Latch Kit (not illustrated)	657098-001
	Optical drive connector for use in **35.6-cm** (14.0-in) (not illustrated)	632213-001

Display assembly components
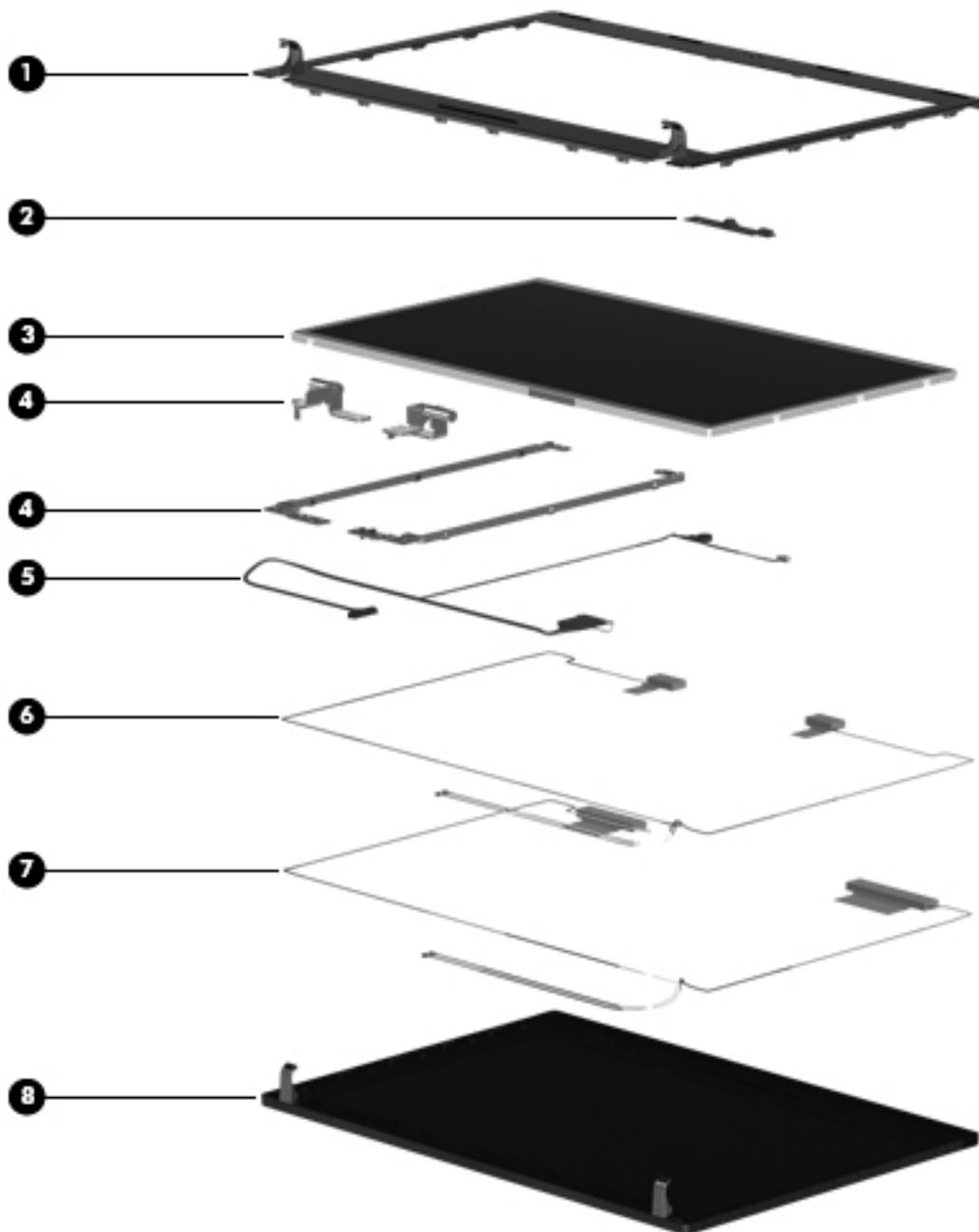
Item	Description	Spare part number
(1)	**Display bezel**	
	● For **33.8-cm** (13.3-in) displays with webcam	536421-001
	● For **35.6-cm** (14.0-in) displays with webcam	536424-001
	● For **33.8-cm** (13.3-in) displays without webcam	536423-001
	● For **35.6-cm** (14.0-in) displays without webcam	536422-001

Item	Description	Spare part number
(2)	**Webcam module**	599571-001
(3)	**Display panel** (also included with display assembly; see [Computer major components on page 23](#))	
	● **33.8-cm** (13.3-in), HD, BrightView	588160-001
	● **35.6-cm** (14.0-in), HD, BrightView	592144-001
	● **33.8-cm** (13.3-in), HD, Anti-Glare	623175-001
	● **35.6-cm** (14.0-in), HD, Anti-Glare	623176-001
(4)	**Display hinge kit**	
	● Display hinge and panel bracket (left and right) for **33.8-cm** (13.3-in) displays	599536-001
	● Display hinge and panel bracket (left and right) for **35.6-cm** (14.0-in) displays	599537-001
(5)	**Display cable** (includes microphone and, on select models, webcam connector)	
	● Display cable for **33.8-cm** (13.3-in) displays with webcam	599534-001
	● Display cable for use with **33.8-cm** (13.3-in) displays with webcam on models without WWAN	616070-001
	● Display cable for **35.6-cm** (14.0-in) displays with webcam	605558-001
	● Display cable for **33.8-cm** (13.3-in) displays without webcam	605557-001
	● Display cable for **35.6-cm** (14.0-in) displays without webcam	599535-001
(6)	**WLAN antennas and cables** (included with back cover)	
(7)	**WWAN antennas and cables** (included with back covers used with WWAN option)	
(8)	**Display back cover**	
	For use on black models:	
	● For **33.8-cm** (13.3-in) displays without WWAN	599526-001
	● For **33.8-cm** (13.3-in) displays with WWAN	599528-001
	● For **33.8-cm** (13.3-in) displays with webcam and without WWAN	607094-001
	● For **35.6-cm** (14.0-in) displays with webcam and without WWAN	605556-001
	● For **35.6-cm** (14.0-in) displays without WWAN	599527-001
	For use on red models:	
	● For **33.8-cm** (14.0-in) displays without WWAN	607645-001
	● For **35.6-cm** (14.0-in) displays with webcam and without WWAN	607646-001
	● For **33.8-cm** (13.3-in) displays without WWAN	607643-001
	● For **33.8-cm** (13.3-in) displays with webcam and without WWAN	607644-001
	For use on champagne models:	
	● For **33.8-cm** (14.0-in) displays without WWAN	625710-001
	● For **35.6-cm** (14.0-in) displays with webcam and without WWAN	625711-001
	● For **33.8-cm** (13.3-in) displays without WWAN	625698-001

| Item	Description	Spare part number
	● For **33.8-cm** (13.3-in) displays with webcam and without WWAN	625699-001
	For use in coffee-colored **35.6-cm** (14.0-in) models in Singapore	663980-001

Plastics Kit
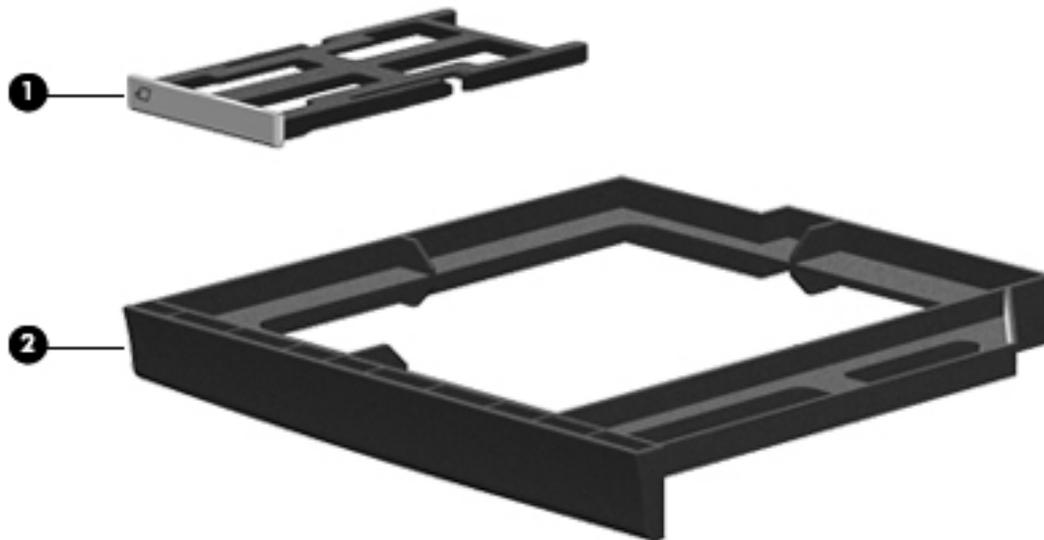
Item	Description	Spare part number
	Plastics Kit:	599563-001
(1)	ExpressCard slot bezel	
(2)	Optical drive blank (used with no ODD option)	
	RJ11 (modem) connector blank (not illustrated, used with No-Modem option)	

Cable kit
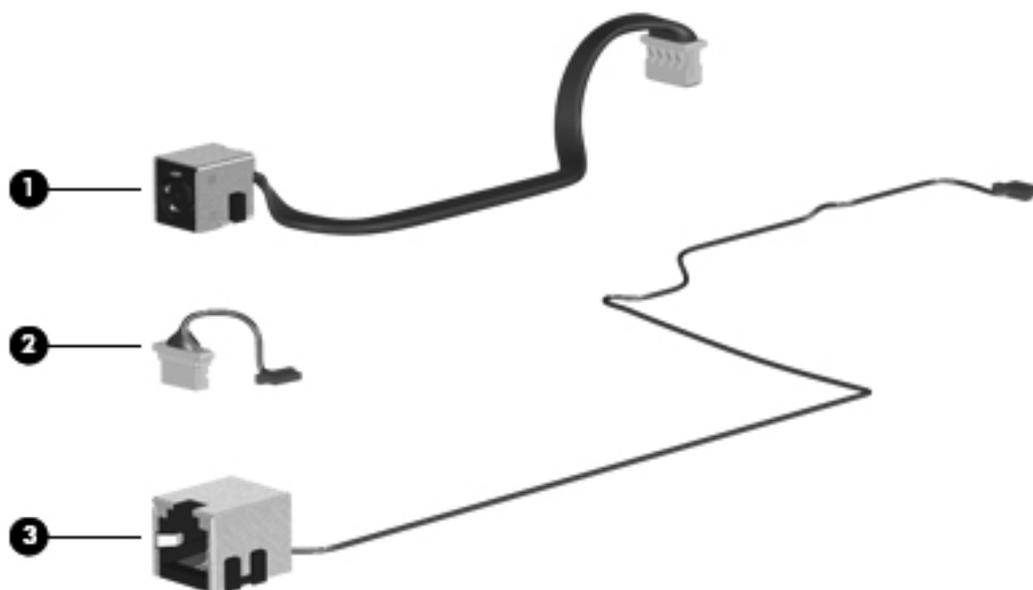
Item	Description	Spare part number
	Cable kit:	599525-001
(1)	Power cable	
(2)	Bluetooth cable	
(3)	RJ-11 (modem) jack cable	

Mass storage devices
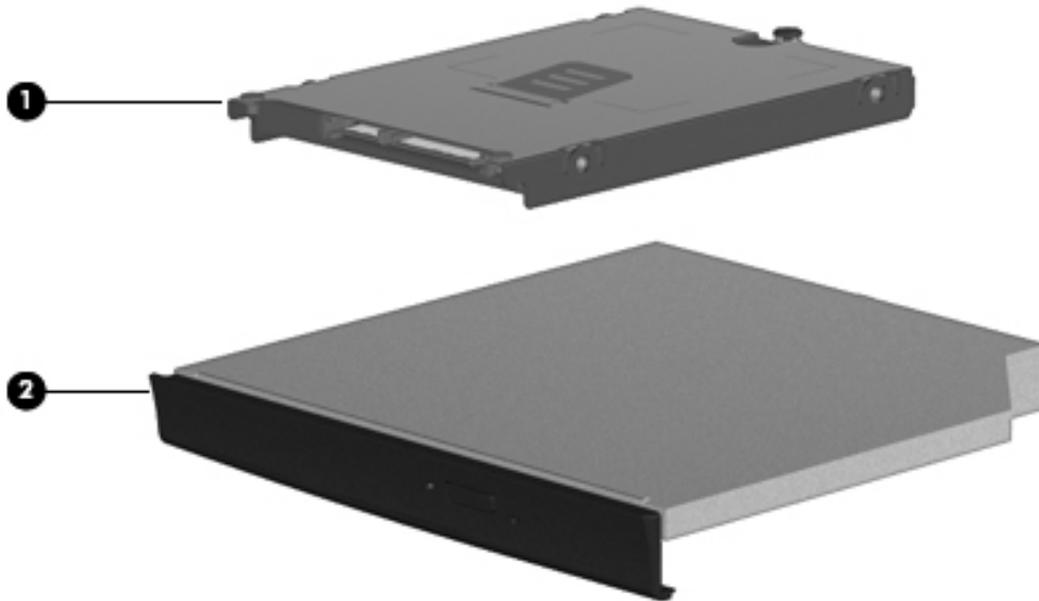
Item	Description	Spare part number
(1)	**Hard drive** (includes bracket)	
	750-GB, 5400-rpm	634250-001
	640-GB, 7200-rpm	621046
	640-GB, 5400-rpm	631160-001
	500-GB, 7200-rpm	634920-001
	320-GB, 7200-rpm	603783-002
	250-GB, 7200-rpm	599541-001
	Hard Drive Hardware Kit	630889-001
(2)	**Optical drive** (includes bezel)	
	Blu-ray Disc ROM Drive with SuperMulti DVD ±R/RW Double-Layer	599538-001
	DVD±RW SuperMulti Double-Layer Drive with LightScribe	599540-001
	DVD-ROM Drive	599539-001

Miscellaneous parts

Description	Spare part number
AC adapters	
65-W, 3-pin Smart AC adapter	
● For use in all countries and regions except India	609939-001
● For use in India	609948-001
90-W Slimline AC adapter	
● For use in all countries and regions except India	609940-001
● For use in India	609947-001
Power cords (AC power, 3-pin, black, 1.83 m)	
● For use in Argentina	490371-D01
● For use in Austria	490371-011
● For use in Brazil	490371-202
● For use in Denmark	490371-081
● For use in Europe	490371-021
● For use in India	490371-D61
● For use in Israel	490371-BB1
● For use in Italy	490371-061
● For use in Japan	490371-291
● For use in North America	490371-001
● For use in the People's Republic of China	490371-AA1
● For use in South Africa	490371-AR1
● For use in South Korea	490371-AD1
● For use in Switzerland	490371-111
● For use in Taiwan	490371-AB1
● For use in the United Kingdom and Singapore	490371-031

Description	Spare part number
Rubber kit (includes display bumpers, display screw covers, base enclosure feet, and display hinge bumpers)	599564-001
Screw kit, includes:	599565-001

- T8 slotted-Torx M2.5x6.5

- T8 slotted-Torx M2.5x5.0

- T8 slotted-Torx M2.5x3.0

- Phillips P1 M2.5x5.0

- Phillips P1 M2.5x3.0

- Phillips P1 M2.0x3.0

- Phillips P0 M2.0x2.5

- Phillips M3.0x3.5

Sequential part number listing

Spare part number	Description
490371-001	Power cord (AC power, 3-pin, black, 1.83 m), for use in North America
490371-011	Power cord (AC power, 3-pin, black, 1.83 m), for use in Austria
490371-021	Power cord (AC power, 3-pin, black, 1.83 m), for use in Europe
490371-031	Power cord (AC power, 3-pin, black, 1.83 m), for use in the United Kingdom and Singapore
490371-061	Power cord (AC power, 3-pin, black, 1.83 m), for use in Italy
490371-081	Power cord (AC power, 3-pin, black, 1.83 m), for use in Denmark
490371-111	Power cord (AC power, 3-pin, black, 1.83 m), for use in Switzerland
490371-202	Power cord (AC power, 3-pin, black, 1.83 m), for use in Brazil
490371-291	Power cord (AC power, 3-pin, black, 1.83 m), for use in Japan
490371-AA1	Power cord (AC power, 3-pin, black, 1.83 m), for use in the People's Republic of China
490371-AB1	Power cord (AC power, 3-pin, black, 1.83 m), for use in Taiwan
490371-AD1	Power cord (AC power, 3-pin, black, 1.83 m), for use in South Korea
490371-AR1	Power cord (AC power, 3-pin, black, 1.83 m), for use in South Africa
490371-BB1	Power cord (AC power, 3-pin, black, 1.83 m), for use in Israel
490371-D01	Power cord (AC power, 3-pin, black, 1.83 m), for use in Argentina
490371-D61	Power cord (AC power, 3-pin, black, 1.83 m), for use in India
504593-003	Broadcom 4312G 802.11b/g WiFi Adapter for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands
504593-004	Broadcom 4312G 802.11b/g WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, 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
510100-011	Modem for use in Australia and New Zealand
531993-001	WWAN module, Qualcomm EV-DO HSPA

Spare part number	Description
537921-001	Bluetooth module (without cable)
572509-001	Intel WiFi Link 6200 802.11 a/g/n for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam
572510-001	Intel Centrino Advanced-N 6200 802.11a/b/g 2x2 for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam
572520-001	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam
582564-001	Broadcom 43224AGN 802.11a/b/g/draft-n WiFi Adapter for use in Antigua and Barbuda, Aruba, the Bahamas, Barbados, Belize, Canada, Guam, Guinea, Haiti, Jamaica, the Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, the US Virgin Islands, and the United States

Spare part number	Description
582564-002	Broadcom 43224AGN 802.11a/b/g/draft-n WiFi Adapter for use in Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Cayman Islands, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
585984-001	Intel Centrino Wireless-N 1000 802.11b/g 1x2 for use in Russia and Ukraine
587259-001	Processor, Intel Core i7-620M 2.26-GHz
588160-001	Display panel, **33.8-cm** (13.3-in), HD, BrightView
592144-001	Display panel, **35.6-cm** (14.0-in), HD, BrightView
593533-001	Realtek RTL8191SE 802.11b/g/n 1x1 WiFi Adapter
593572-001	Battery, 6-cell, 47-Wh (2.2Ah) Li-ion
593573-001	Battery, 9-cell, 93-Wh (2.8Ah) Li-ion
593836-001	Broadcom 4313/2070 802.11b/g/n (1x1) WiFi Mini Card
594187-001	Processor, Intel Core i5-520M 2.4-GHz
594188-001	Processor Intel Core i5-540M 2.53-GHz
597622-001	Processor, Intel Core i3-330M 2.13-GHz
597623-001	Processor, Intel Core i3-350M 2.26-GHz
597624-001	Processor, Intel Core i5-430M 2.26-GHz
599514-001	Base enclosure, for use with **33.8-cm** (13.3-in) models
599515-001	Base enclosure, for use in **35.6-cm** (14.0-in) models
599516-001	RTC battery
599517-001	Power connector board and cable
599518-001	System board, for use with **33.8-cm** (13.3-in) models and ATI Mobility Radeon HD 530v discrete graphics for use in all countries and regions except for Russia and the People's Republic of China
599520-001	System board, for use with **33.8-cm** (13.3-in) models and Unified Memory Architecture (UMA) graphics subsystem for use in all countries and regions except for Russia and the People's Republic of China
599521-001	System board, for use with **33.8-cm** (13.3-in) models and Unified Memory Architecture (UMA) graphics subsystem and WWAN module for use in all countries and regions except for Russia and the People's Republic of China

Spare part number	Description
599522-001	System board, for use with **35.6-cm** (14.0-in) models and ATI Mobility Radeon HD 530v discrete graphics for use in all countries and regions except for Russia and the People's Republic of China
599523-001	System board, for use with **35.6-cm** (14.0-in) models and Unified Memory Architecture (UMA) graphics subsystem for use in all countries and regions except for Russia and the People's Republic of China
599524-001	USB board and cable
599525-001	Cable kit
599526-001	Display back cover for **33.8-cm** (13.3-in) displays without WWAN
599527-001	Display back cover for **35.6-cm** (14.0-in) displays without WWAN
599528-001	Display back cover for **33.8-cm** (13.3-in) displays with WWAN
599530-001	Display bezel for **33.8-cm** (13.3-in) models with webcam
599531-001	Display bezel for **35.6-cm** (14.0-in) models with webcam
599532-001	Display bezel for **33.8-cm** (13.3-in) models without webcam
599533-001	Display bezel for **35.6-cm** (14.0-in) models without webcam
599534-001	Display cable for **33.8-cm** (13.3-in) displays with webcam
599535-001	Display cable for **35.6-cm** (14.0-in) displays without webcam
599536-001	Display hinge and bracket (left and right) for **33.8-cm** (13.3-in) models
599537-001	Display hinge and bracket (left and right) for **35.6-cm** (14.0-in) models
599538-001	Blu-ray Disc ROM Drive with SuperMulti DVD ±R/RW Double-Layer
599539-001	DVD ROM Drive
599540-001	DVD ±RW SuperMulti Double-Layer Drive with LightScribe
599541-001	Hard drive, 250-GB, 7200-rpm
599544-001	Fan
599546-001	Processor heat sink for use with Unified Memory Architecture (UMA) graphics subsystem
599549-001	Palm rest with TouchPad and fingerprint reader for use with **33.8-cm** (13.3-in) displays
599550-001	Palm rest with TouchPad and fingerprint reader for use with **35.6-cm** (14.0-in) displays
599551-001	Palm rest with TouchPad for use with **33.8-cm** (13.3-in) displays, red
599552-001	Palm rest with TouchPad for use with **35.6-cm** (14.0-in) displays
599553-001	Display assembly, **33.8-cm** (13.3-in) HD (1366x768 resolution)
599554-001	Display assembly, **33.8-cm** (13.3-in) HD BrightView
599555-001	Display assembly, **33.8-cm** (13.3-in) HD BrightView with webcam
599556-001	Display assembly, **33.8-cm** (13.3-in) HD BrightView with webcam and WWAN
599557-001	Display assembly, **33.8-cm** (13.3-in) HD with webcam
599558-001	Display assembly, **33.8-cm** (13.3-in) HD with webcam and WWAN
599559-001	Display assembly, **35.6-cm** (14.0-in) HD (1366x768 resolution)

Spare part number	Description
599560-001	Display assembly, **35.6-cm** (14.0-in) HD BrightView
599561-001	Display assembly, **35.6-cm** (14.0-in) HD BrightView with webcam
599562-001	Display assembly, **35.6-cm** (14.0-in) HD with webcam
599563-001	Plastics kit
599564-001	Rubber kit
599565-001	Screw kit
599566-001	Speaker assembly, **33.8-cm** (13.3-in)
599567-001	Switch cover, **33.8-cm** (13.3-in)
599568-001	Switch cover, **35.6-cm** (14.0-in)
599569-001	Top cover, for use with **33.8-cm** (13.3-in) models
599570-001	Top cover, for use with **35.6-cm** (14.0-in) models
599571-001	Webcam module
599572-001	Keyboard, **33.8-cm** (13.3-in), for use in the United States
599572-031	Keyboard, **33.8-cm** (13.3-in), for use in the United Kingdom
599572-041	Keyboard, **33.8-cm** (13.3-in), for use in Germany
599572-051	Keyboard, **33.8-cm** (13.3-in), for use in France
599572-061	Keyboard, **33.8-cm** (13.3-in), for use in Italy
599572-071	Keyboard, **33.8-cm** (13.3-in), for use in Spain
599572-081	Keyboard, **33.8-cm** (13.3-in), for use in Denmark
599572-091	Keyboard, **33.8-cm** (13.3-in), for use in Norway
599572-121	Keyboard, **33.8-cm** (13.3-in), for use in Canada (French)
599572-131	Keyboard, **33.8-cm** (13.3-in), for use in Portugal
599572-141	Keyboard, **33.8-cm** (13.3-in), for use in Turkey
599572-161	Keyboard, **33.8-cm** (13.3-in), for use in Latin America
599572-171	Keyboard, **33.8-cm** (13.3-in), for use in Saudi Arabia
599572-201	Keyboard, **33.8-cm** (13.3-in), for use in Brazil
599572-211	Keyboard, **33.8-cm** (13.3-in), for use in Hungary
599572-251	Keyboard, **33.8-cm** (13.3-in), for use in Russia
599572-261	Keyboard, **33.8-cm** (13.3-in), for use in Bulgaria
599572-281	Keyboard, **33.8-cm** (13.3-in), for use in Thailand
599572-291	Keyboard, **33.8-cm** (13.3-in), for use in Japan
599572-A41	Keyboard, **33.8-cm** (13.3-in), for use in Belgium
599572-A81	Keyboard, **33.8-cm** (13.3-in), for use in the Czech Republic and Slovakia
599572-AB1	Keyboard, **33.8-cm** (13.3-in), for use in Taiwan

Spare part number	Description
599572-AD1	Keyboard, **33.8-cm** (13.3-in), for use in South Korea
599572-B31	Keyboard, **33.8-cm** (13.3-in), for use in Europe
599572-B71	Keyboard, **33.8-cm** (13.3-in), for use in Sweden and Finland
599572-BA1	Keyboard, **33.8-cm** (13.3-in), for use in the Adriatic region
599572-BB1	Keyboard, **33.8-cm** (13.3-in), for use in Israel
599572-BG1	Keyboard, **33.8-cm** (13.3-in), for use in Switzerland
599572-DD1	Keyboard, **33.8-cm** (13.3-in), for use in Iceland
599572-DJ1	Keyboard, **33.8-cm** (13.3-in), for use in Greece
599572-DW1	Keyboard, **33.8-cm** (13.3-in), for use in French Arabic region
599573-001	Keyboard, **35.6-cm** (14.0-in), for use in the United States
599573-031	Keyboard, **35.6-cm** (14.0-in), for use in the United Kingdom
599573-041	Keyboard, **35.6-cm** (14.0-in), for use in Germany
599573-051	Keyboard, **35.6-cm** (14.0-in), for use in France
599573-061	Keyboard, **35.6-cm** (14.0-in), for use in Italy
599573-071	Keyboard, **35.6-cm** (14.0-in), for use in Spain
599573-081	Keyboard, **35.6-cm** (14.0-in), for use in Denmark
599573-091	Keyboard, **35.6-cm** (14.0-in), for use in Norway
599573-121	Keyboard, **35.6-cm** (14.0-in), for use in Canada (French)
599573-131	Keyboard, **35.6-cm** (14.0-in), for use in Portugal
599573-141	Keyboard, **35.6-cm** (14.0-in), for use in Turkey
599573-161	Keyboard, **35.6-cm** (14.0-in), for use in Latin America
599573-171	Keyboard, **35.6-cm** (14.0-in), for use in Saudi Arabia
599573-201	Keyboard, **35.6-cm** (14.0-in), for use in Brazil
599573-211	Keyboard, **35.6-cm** (14.0-in), for use in Hungary
599573-251	Keyboard, **35.6-cm** (14.0-in), for use in Russia
599573-261	Keyboard, **35.6-cm** (14.0-in), for use in Bulgaria
599573-281	Keyboard, **35.6-cm** (14.0-in), for use in Thailand
599573-291	Keyboard, **35.6-cm** (14.0-in), for use in Japan
599573-A41	Keyboard, **35.6-cm** (14.0-in), for use in Belgium
599573-A81	Keyboard, **35.6-cm** (14.0-in), for use in the Czech Republic and Slovakia
599573-AB1	Keyboard, **35.6-cm** (14.0-in), for use in Taiwan
599573-AD1	Keyboard, **35.6-cm** (14.0-in), for use in Korea
599573-B31	Keyboard, **35.6-cm** (14.0-in), for use in Europe
599573-B71	Keyboard, **35.6-cm** (14.0-in), for use in Sweden and Finland

Spare part number	Description
599573-BA1	Keyboard, **35.6-cm** (14.0-in), for use in the Adriatic region
599573-BB1	Keyboard, **35.6-cm** (14.0-in), for use in Israel
599573-BG1	Keyboard, **35.6-cm** (14.0-in), for use in Switzerland
599573-DD1	Keyboard, **35.6-cm** (14.0-in), for use in Iceland
599573-DJ1	Keyboard, **35.6-cm** (14.0-in), for use in Greece
599573-DW1	Keyboard, **35.6-cm** (14.0-in), for use in French Arabic region
599653-001	Processor heat sink for use with discrete graphics subsystem
600370-001	Broadcom 4313/2070 802.11b/g/n (1x1) and Bluetooth high-speed Half Mini Card
602992-001	Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter (Bluetooth 3.0+high-speed ready)
603783-002	Hard drive, 320-GB, 7200-rpm
605556-001	Display back cover for **35.6-cm** (14.0-in) displays with webcam and without WWAN
605557-001	Display cable for **33.8-cm** (13.3-in) displays without webcam
605558-001	Display cable for **35.6-cm** (14.0-in) displays with webcam
605559-001	Speaker assembly, **35.6-cm** (14.0-in)
605560-005	Atheros AR9285G 802.11b/g/n 1x1 WiFi Adapter
607094-001	Display back cover for **33.8-cm** (13.3-in) displays with webcam and without WWAN
607643-001	Display back cover for **33.8-cm** (13.3-in) displays without WWAN, red
607644-001	Display back cover for **33.8-cm** (13.3-in) displays with webcam and without WWAN, red
607645-001	Display back cover for **35.6-cm** (14.0-in) displays without WWAN, red
607646-001	Display back cover for **35.6-cm** (14.0-in) displays with webcam and without WWAN, red
607648-001	Palm rest with TouchPad and fingerprint reader for use with **33.8-cm** (13.3-in) displays, red
607649-001	Palm rest with TouchPad and fingerprint reader for use with **35.6-cm** (14.0-in) displays, red
607650-001	Palm rest with TouchPad for use with **33.8-cm** (13.3-in) displays, red
607651-001	Palm rest with TouchPad for use with **35.6-cm** (14.0-in) displays, red
607652-001	Switch cover, **33.8-cm** (13.3-in), red
607653-001	Switch cover, **35.6-cm** (14.0-in), red
608266-001	System board, for use with **35.6-cm** (14.0-in) models with ATI Mobility Radeon HD 530v discrete graphics in the People's Republic of China and Russia
608267-001	System board, for use with **35.6-cm** (14.0-in) models with Unified Memory Architecture (UMA) graphics subsystem in the People's Republic of China and Russia
608736-001	Display assembly, **33.8-cm** (13.3-in) HD (1366x768 resolution), red
608737-001	Display assembly, **33.8-cm** (13.3-in) HD BrightView, red
608738-001	Display assembly, **33.8-cm** (13.3-in) HD BrightView with webcam, red
608739-001	Display assembly, **33.8-cm** (13.3-in) HD with webcam, red

Spare part number	Description
608740-001	Display assembly, **35.6-cm** (14.0-in) HD (1366x768 resolution), red
608741-001	Display assembly, **35.6-cm** (14.0-in) HD BrightView, red
608742-001	Display assembly, **35.6-cm** (14.0-in) HD BrightView with webcam, red
608743-001	Display assembly, **35.6-cm** (14.0-in) HD with webcam, red
609939-001	65-W, 3-pin Smart AC adapter for use in all countries and regions except India
609940-001	90-W Slimline AC adapter for use in all countries and regions except India
609947-001	90-W Slimline AC adapter for use in India
609948-001	65-W, 3-pin Smart AC adapter for use in India
611699-001	Intel Celeron P4500, 1.86-GHz processor
613584-001	Intel Core i3-370M 2.40-GHz processor
613585-001	Intel Core i5-450M 2.40-GHz processor
613586-001	Intel Pentium P6000, 1.86-GHz processor
613587-001	Intel Pentium P6100, 2.00-GHz processor
616070-001	Display cable for use with **33.8-cm** (13.3-in) displays with webcam on models without WWAN
621046-001	Hard drive, 640-GB, 7200-rpm
623175-001	Display panel, **33.8-cm** (13.3-in), HD, Anti-Glare
623176-001	Display panel, **35.6-cm** (14.0-in), HD, Anti-Glare
625275-001	System board, for use with **33.8-cm** (13.3-in) models with ATI Mobility Radeon HD 530v discrete graphics in the People's Republic of China and Russia
625276-001	System board, for use with **33.8-cm** (13.3-in) models with Unified Memory Architecture (UMA) graphics subsystem in the People's Republic of China and Russia
625277-001	System board, for use with **33.8-cm** (13.3-in) models with UMA graphics and WWAN in the People's Republic of China and Russia
625690-001	Display assembly, **33.8-cm** (13.3-in) HD (1366x768 resolution), champagne
625691-001	Display assembly, **33.8-cm** (13.3-in) HD with webcam, champagne
625692-001	Display assembly, **33.8-cm** (13.3-in) HD BrightView, champagne
625693-001	Display assembly, **33.8-cm** (13.3-in) BrightgView with webcam, champagne
625694-001	Display assembly, **35.6-cm** (14.0-in) HD (1366x768 resolution), champagne
625695-001	Display assembly, **35.6-cm** (14.0-in) HD with webcam, champagne
625696-001	Display assembly, **35.6-cm** (14.0-in) BrightView, champagne
625697-001	Display assembly, **35.6-cm** (14.0-in) BrightView with webcam, champagne
625698-001	Display back cover for **33.8-cm** (13.3-in) displays without WWAN, champagne
625699-001	Display back cover for **33.8-cm** (13.3-in) displays with webcam and without WWAN, champagne
625710-001	Display back cover for **35.6-cm** (14.0-in) displays without WWAN, champagne
625711-001	Display back cover for **35.6-cm** (14.0-in) displays with webcam and without WWAN, champagne

Spare part number	Description
625712-001	Palm rest with TouchPad and fingerprint reader for use with **33.8-cm** (13.3-in) displays, champagne
625713-001	Palm rest with TouchPad and fingerprint reader for use with **35.6-cm** (14.0-in) displays, champagne
625714-001	Palm rest with TouchPad for use with **33.8-cm** (13.3-in) displays, champagne
625715-001	Palm rest with TouchPad for use with **35.6-cm** (14.0-in) displays, champagne
625716-001	Switch cover, **33.8-cm** (13.3-in), champagne
625717-001	Switch cover, **35.6-cm** (14.0-in), champagne
625823-001	Intel Core i3-380M 2.53-GHz processor
625824-001	Intel Core i5-560M 2.66-GHz – 3.20-Ghz processor
625825-001	Intel Core i5-580M 2.66-GHz – 3.33-Ghz processor
625826-001	Intel Core i7-640M 2.80-GHz processor
625831-001	Intel Pentium P6200, 2.13-GHz processor
626039-001	Intel Core i5-460M 2.53-GHz processor
628485-001	System board, for use with **33.8-cm** (13.3-in) models with ATI Mobility Radeon HD 5470 discrete graphics for use in all countries and regions except for Russia and the People's Republic of China
628486-001	System board, for use with **33.8-cm** (13.3-in) models with ATI Mobility Radeon HD 5470 discrete graphics only in Russia and the People's Republic of China
628487-001	System board, for use with **35.6-cm** (14.0-in) models with ATI Mobility Radeon HD 5470 discrete graphics for use in all countries and regions except for Russia and the People's Republic of China
628488-001	System board, for use with **35.6-cm** (14.0-in) models with ATI Mobility Radeon HD 5470 discrete graphics for use only in Russia and the People's Republic of China
628615-001	System board, for use with **33.8-cm** (13.3-in) models with ATI Mobility Radeon HD 6370 discrete graphics for use in all countries and regions except for Russia and the People's Republic of China
628616-001	System board, for use with **33.8-cm** (13.3-in) models with ATI Mobility Radeon HD 6370 discrete graphics only in Russia and the People's Republic of China
628617-001	System board, for use with **35.6-cm** (14.0-in) models with ATI Mobility Radeon HD 6370 discrete graphics for use in all countries and regions except for Russia and the People's Republic of China
628618-001	System board, for use with **35.6-cm** (14.0-in) models with ATI Mobility Radeon HD 6370 discrete graphics for use only in Russia and the People's Republic of China
628824-001	High-speed 56K modem for use in all countries and regions except Australia and New Zealand
628941-001	Intel Celeron P4600, 2.00-GHz processor
630889-001	Hard Drive Hardware Kit
631160-001	Hard drive, 640-GB, 5400-rpm
632213-001	Optical drive connector for use in **35.6-cm** (14.0-in)
634250-001	Hard drive, 750-GB, 5400-rpm
634692-001	Intel Core i3-390M 2.66-GHz processor
634693-001	Intel Core i5-480M 2.66-GHz processor
634920-001	Hard drive, 500-GB, 7200-rpm

Spare part number	Description
635500-001	Intel Pentium P6300, 2.26-GHz processor
641369-002	Memory module (PC3-12800 shared), 4096-MB
652972-002	Memory module (PC3-12800 shared), 2048-MB
657098-001	Battery Latch Kit
663539-001	Speaker assembly, **33.8-cm** (13.3-in); includes metallic heat shield
663540-001	Speaker assembly, **35.6-cm** (14.0-in); includes metallic heat shield
663979-001	Display assembly for use in coffee-colored **35.6-cm** (14.0-in) models in Singapore
663980-001	Display back cover for use in coffee-colored **35.6-cm** (14.0-in) models in Singapore

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
- Phillips P0 and P1 screwdrivers
- Torx T8 screwdriver

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.

- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.

- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.

- Place items on a grounded surface before removing items from their containers.

- Always be properly grounded when touching a component or assembly.

- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.

- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.

- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.

- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.

- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.

- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

- Avoid contact with pins, leads, or circuitry.

- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.

- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape

- Antistatic smocks, aprons, and sleeve protectors

- Conductive bins and other assembly or soldering aids

- Nonconductive foam

- Conductive tabletop workstations with ground cords of one megohm resistance

- Static-dissipative tables or floor mats with hard ties to the ground

- Field service kits

- Static awareness labels

- Material-handling packages

- Nonconductive plastic bags, tubes, or boxes

- Metal tote boxes

- Electrostatic voltage levels and protective materials

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

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

Component replacement procedures

This section provides removal and replacement procedures.

There are as many as 83 screws, in 8 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Serial number label

The serial number label, located on the bottom of the computer, provides important information that you may need when contacting technical support.

NOTE: Serial number label color varies on select models.

(1) Product name		**(4)** Warranty period
(2) Serial number		**(5)** Model description (select models)
(3) Product number		

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 4 rubber feet that attach to the base enclosure in the locations illustrated below.
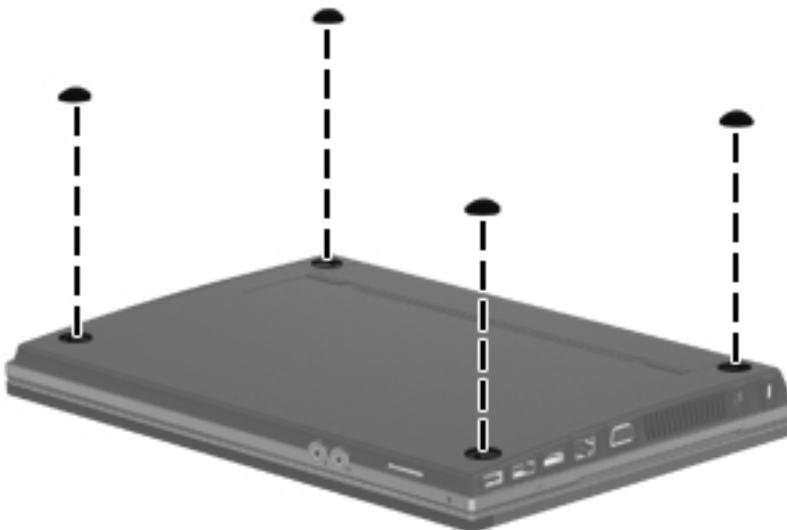
Battery

Description	Spare part number
Battery	
9-cell, 93-Wh (2.8Ah) Li-ion	593573-001
6-cell, 47-Wh (2.2Ah) Li-ion	593572-001

Before disassembling the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

Remove the battery:

1. Turn the computer upside-down on a flat surface with the battery bay toward you.

2. Slide the battery release latches **(1)** to release the battery.

3. Remove the battery **(2)** from the computer.
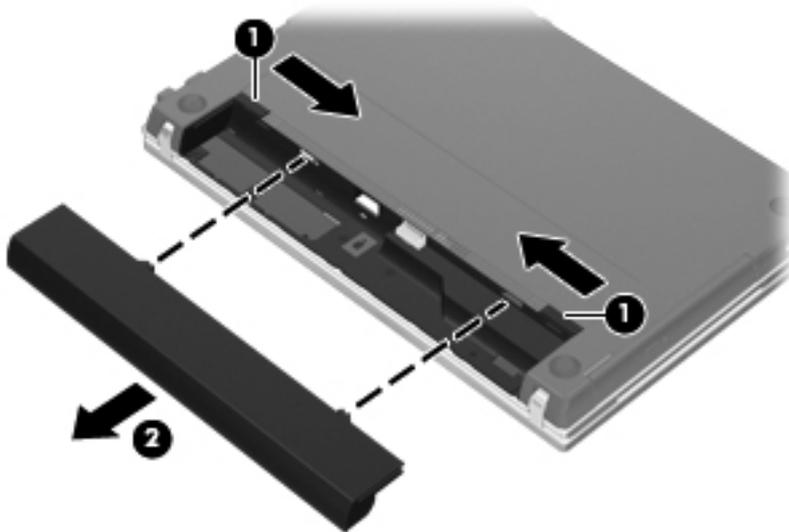
Install the battery by inserting it into the battery bay until you hear a click.

SIM

> **NOTE:** This section applies only to select models with WWAN capability.

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

Before removing the SIM, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the battery (see Battery on page 57).

Remove the SIM:

1. Push on the SIM **(1)** to release it from the SIM slot.

2. Remove the SIM **(2)** from the computer.
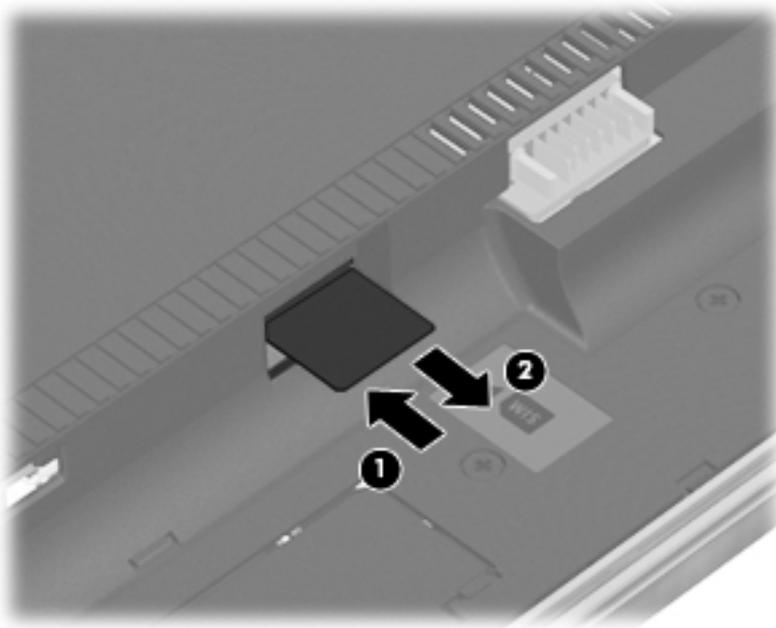
Install the SIM by inserting it into the SIM slot and pushing until you hear a click.

> **CAUTION:** If a SIM is inserted backwards or upside down, the battery may not snap into place properly and could damage the SIM and the SIM connector.

To prevent damage to the connectors, use minimal force when inserting a SIM.

Switch cover

Description	Spare part number
Switch cover	
For use in black models:	
● For with **35.6-cm** (14.0-in) displays	599568-001
● For with **33.8-cm** (13.3-in) displays	599567-001
For use in red models:	
● For with **35.6-cm** (14.0-in) displays	607653-001
● For with **33.8-cm** (13.3-in) displays	607652-001
For use in champagne models:	
● For with **35.6-cm** (14.0-in) displays	625717-001
● For with **33.8-cm** (13.3-in) displays	625716-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see Battery on page 57).

Remove the switch cover:

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

2. Remove the four PM2.5×3.0 screws in the battery bay.
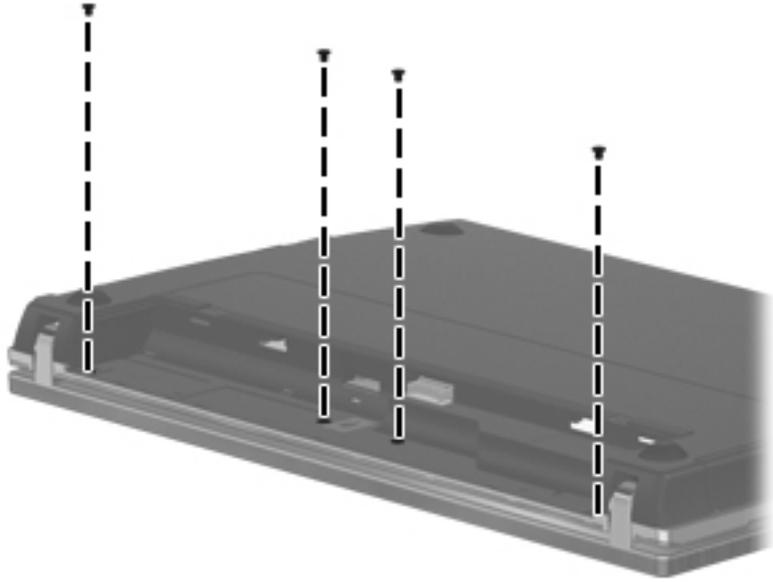
3. Open the computer as far as possible.

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

Reverse this procedure to install the switch cover and keyboard.

Keyboard

| Description	Spare part number
Keyboard	
For computer models with **33.8-cm** (13.3-in) displays	599572-*xxx*
For computer models with **35.6-cm** (14.0-in) displays:	599573-*xxx*
NOTE: For a detailed list of keyboards see the parts list in Computer major components on page 23	

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see Battery on page 57).

5. Remove the switch cover (see Switch cover on page 59).

Remove the keyboard:

1. Remove the three Phillips PM2.5×3.0 screws that secure the keyboard to the computer.

   NOTE: On computer models with **35.6-cm** (14.0-in) displays, remove four screws that secure the keyboard to the computer.
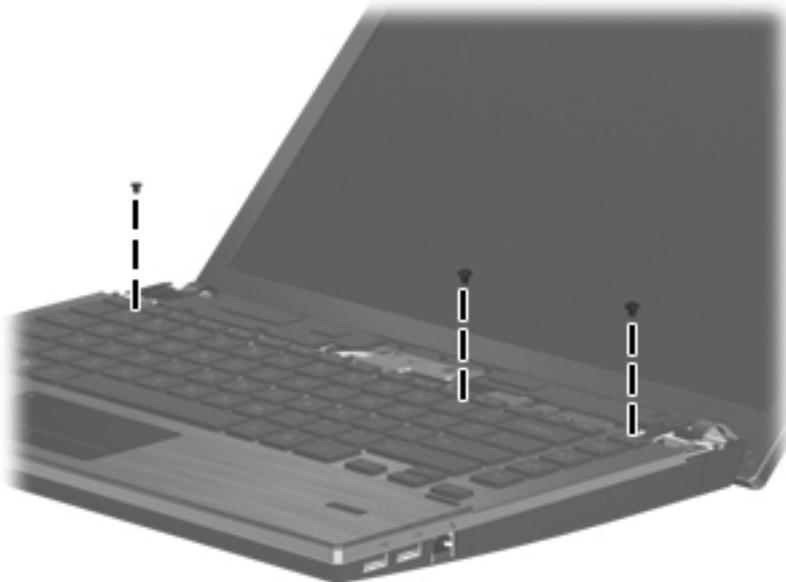
2. Slide the keyboard back toward the display **(1)**, and then rotate it right **(2)** until it rests upside down on the right side of the computer.
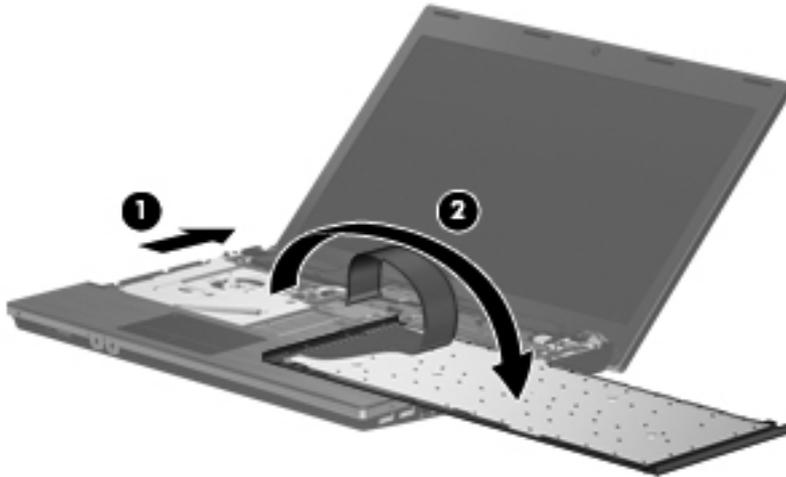
3. Release the zero insertion force (ZIF) connector **(1)** to which the keyboard cable is attached, and disconnect the keyboard cable **(2)** from the system board.

4. Remove the keyboard **(3)**.
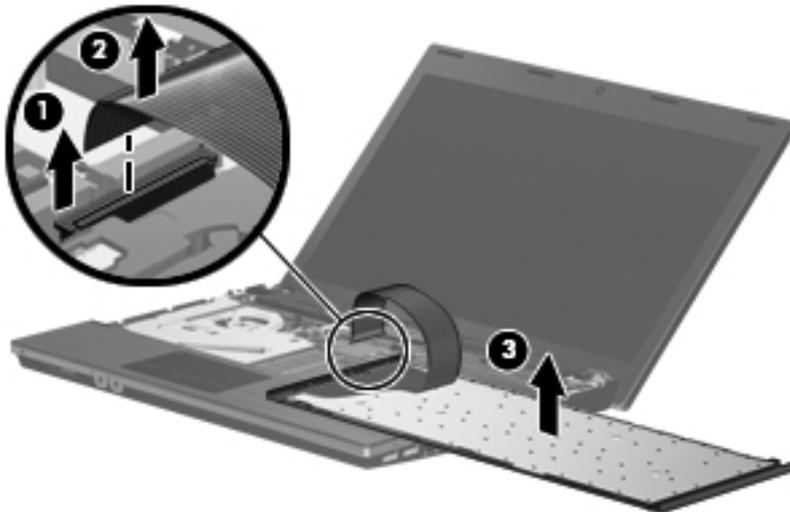
Memory module

Description	Spare part number
Memory module (PC3-12800, 1333-MHz, DDR3, shared)	
4096-MB	641369-002
2048-MB	652972-002

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 57).

5. Remove the switch cover (see Switch cover on page 59).

6. Remove the keyboard (see Keyboard on page 61).

   **NOTE:** You can release the keyboard without removing the keyboard cable from the system board, and then rotate it right until it rests upside down on the right side of the computer to remove the memory modules.

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.)

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.
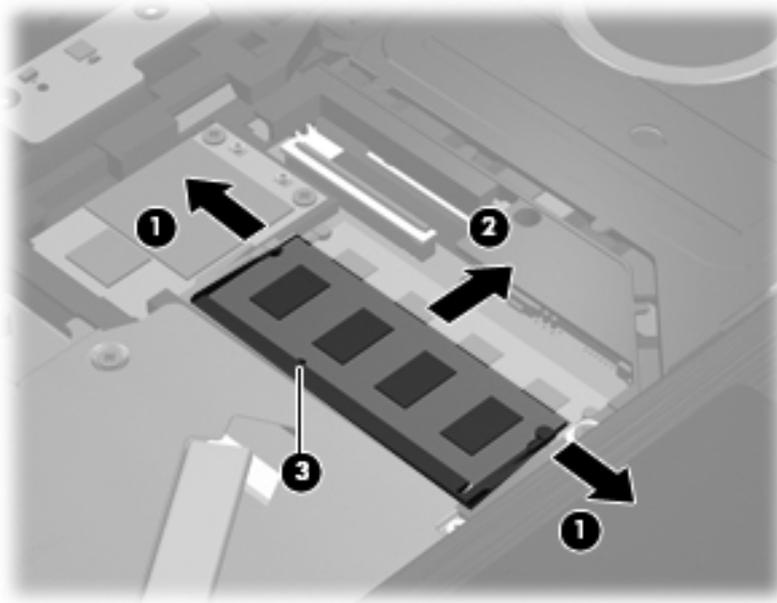
Reverse this procedure to install a memory module.

Optical drive

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

| Description	Spare part number
Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive	599538-001
DVD ±RW SuperMulti Double-Layer Drive with LightScribe	599540-001
DVD ROM Drive	599539-001

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 57).

5. Remove the switch cover (see Switch cover on page 59).

6. Remove the keyboard (see Keyboard on page 61)

NOTE: You can release the keyboard without removing the keyboard cable from the system board, and then rotate it left until it rests upside down on the left side of the computer to remove the optical drive .

Remove the optical drive:

1. Position the computer with the right side toward you.

2. Remove the Phillips PM2.5×5.0 screw **(1)** that secures the optical drive to the computer.

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

4. Remove the optical drive **(3)** from the computer.
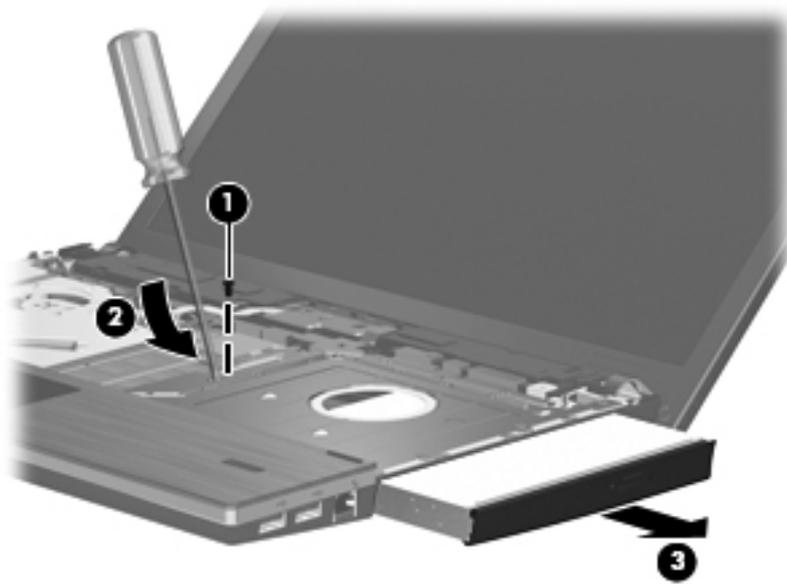
5. If it is necessary to replace the optical drive bracket, position the optical drive with the rear toward you.

6. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.

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

Reverse this procedure to reassemble and install an optical drive.

Power connector board

Description	Spare part number
Power connector board with cable	599517-001

Before removing the power connector 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 57).

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

Remove the power connector board:

1. Release the ZIF connector that connects the power connector board cable to the system board **(1)**, and then disconnect the power connector board cable **(2)**.

2. Gently pull the power connector board away from the double-sided tape that secures the board to the base enclosure.

3. Remove the power connector board **(3)**.
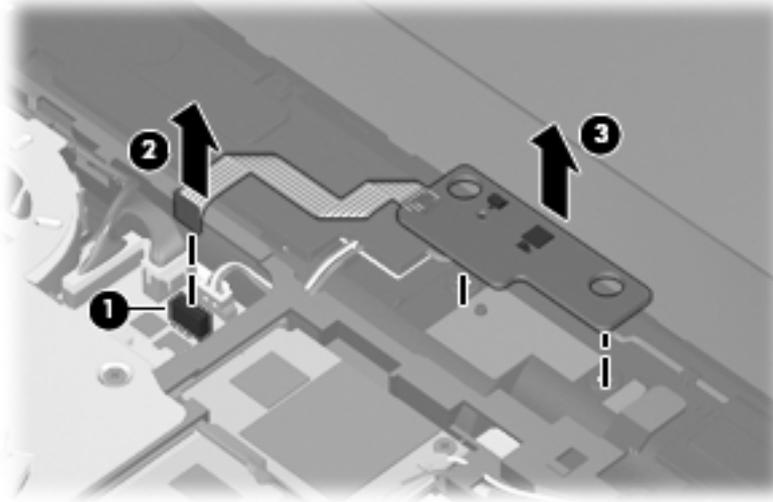
Reverse this procedure to install the power connector board.

Speakers

Description	Spare part number
Speakers for use in computer models with **33.8-cm** (13.3-in) displays	599566-001
Speakers for use in computer models with **33.8-cm** (13.3-in) displays; includes metallic heat shield	663539-001
Speakers for use in computer models with **35.6-cm** (14.0-in) displays	605559-001
Speakers for use in computer models with **35.6-cm** (14.0-in) displays; includes metallic heat shield	663540-001

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 57).

5. Remove the switch cover and keyboard (see Switch cover on page 59).

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 two Phillips PM2.5×3.0 screws **(2)** that secure the speakers to the base enclosure.

4. Remove the speaker cable from the clips and routing channel, and then remove the speakers from the computer **(3)**.
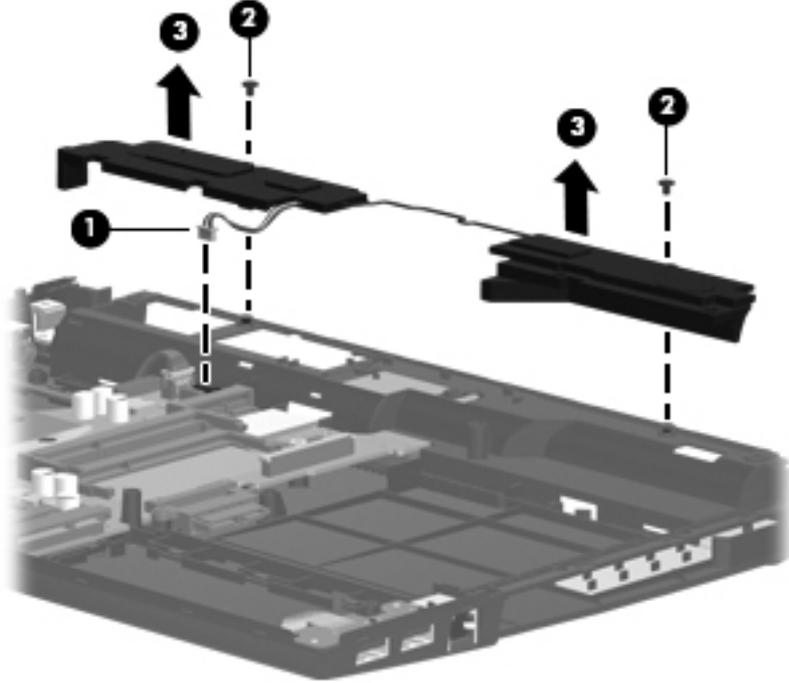
Reverse this procedure to install the speakers.

WWAN module

NOTE: Only select models with include a WWAN module (see Product description on page 1).

Description	Spare part number
Qualcomm EV-DO HSPA	531993-001

⚠ **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 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 57).

5. Remove the switch cover (see Switch cover on page 59)

6. Remove the keyboard (see Keyboard on page 61)

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 module tilts up.)

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.
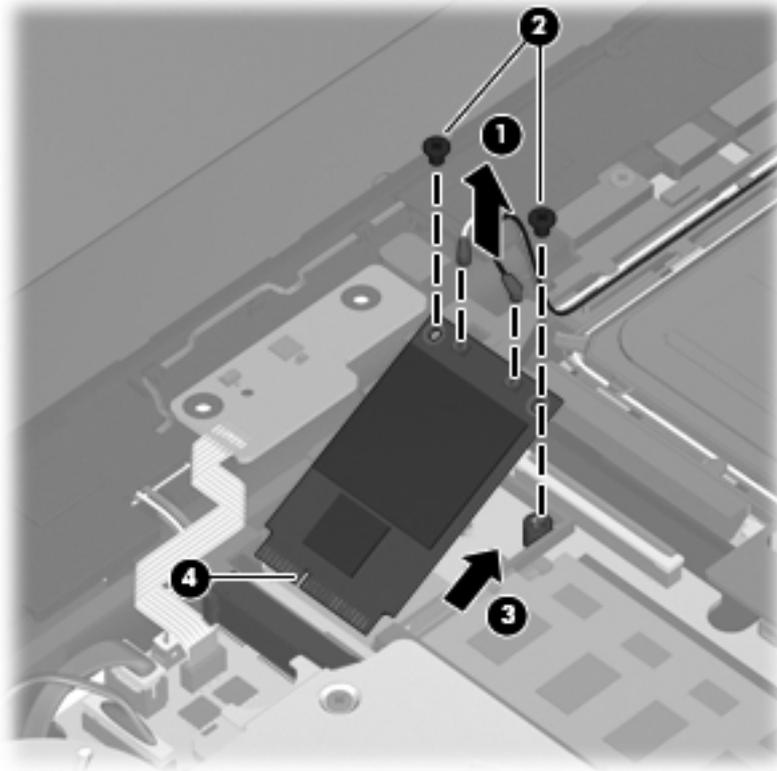
Reverse this procedure to install the WWAN module.

Palm rest

Description	Spare part number
Palm rest (includes TouchPad)	
For use in black models:	
● For use with fingerprint reader and **35.6-cm** (14.0-in) displays	599550-001
● For use with **35.6-cm** (14.0-in) displays	599552-001
● For use with fingerprint reader and **33.8-cm** (13.3-in) displays	599549-001
● For use with **33.8-cm** (13.3-in) displays	599551-001
For use in red models:	
● For use with fingerprint reader and **35.6-cm** (14.0-in) displays	607649-001
● For use with **35.6-cm** (14.0-in) displays	607651-001
● For use with fingerprint reader and **33.8-cm** (13.3-in) displays	607648-001
● For use with **33.8-cm** (13.3-in) displays	607650-001
For use in champagne models:	
● For use with fingerprint reader and **35.6-cm** (14.0-in) displays	625713-001
● For use with **35.6-cm** (14.0-in) displays	625715-001
● For use with fingerprint reader and **33.8-cm** (13.3-in) displays	625712-001
● For use with **33.8-cm** (13.3-in) displays	625714-001

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 57).

5. Remove the switch cover (see Switch cover on page 59)

6. Remove the keyboard (see Keyboard on page 61)

Remove the palm rest:

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

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

3. Slide the palm rest to the right **(2)**, and then turn it over from the front edge **(3)** until it rests upside down on the top cover.
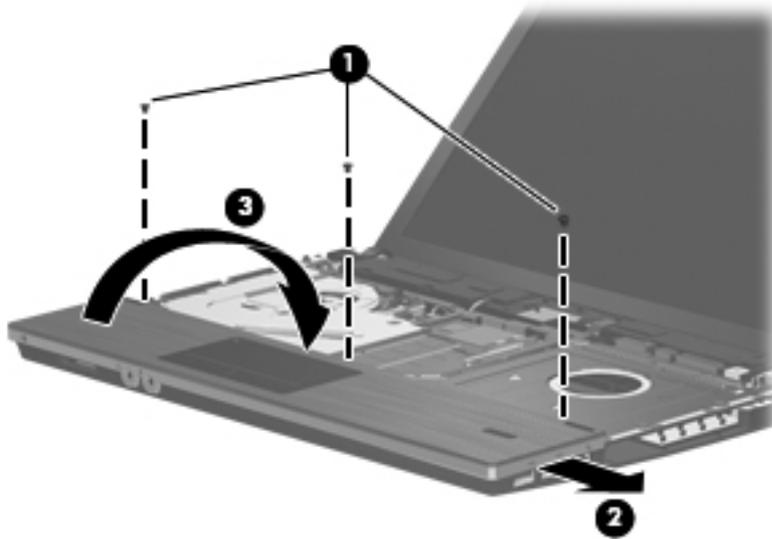
4. Release the fingerprint reader connector **(1)**, and then remove the fingerprint reader cable **(2)** from the system board.

5. Release the TouchPad cable connector **(3)**, and then remove the TouchPad cable **(4)** from the system board.

6. Remove the palm rest **(5)**.
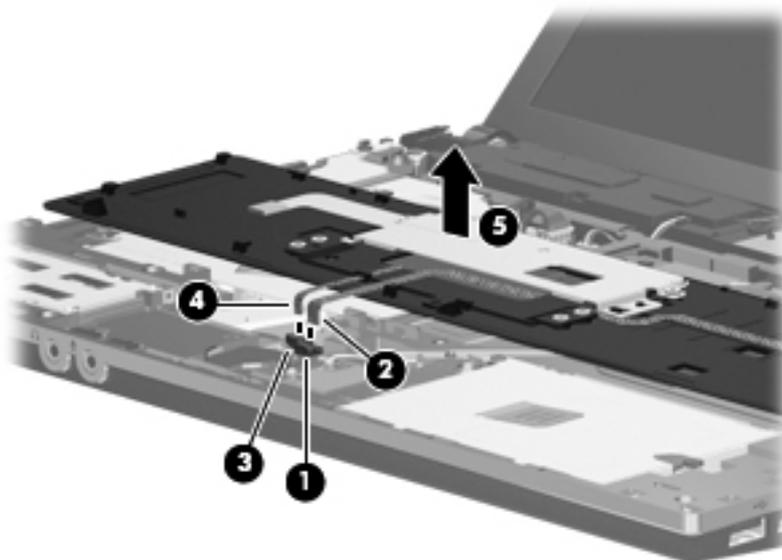
Reverse this procedure to install the palm rest.

Hard drive

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

Description	Spare part number
750-GB, 5400-rpm	634250-001
640-GB, 7200-rpm	621046
640-GB, 5400-rpm	631160-001
500-GB, 7200-rpm hard drive	634920-001
320-GB, 7200-rpm hard drive	603783-002
250-GB, 7200-rpm hard drive	599541-001
Hard Drive Hardware Kit	630889-001

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 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Palm rest (see Palm rest on page 72)

Remove the hard drive:

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

2. Remove the two Phillips PM2.0×3.0 screws **(1)** and loosen the Phillips PM2.5×10.0 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.

4. Remove the hard drive **(4)** from the hard drive bay.
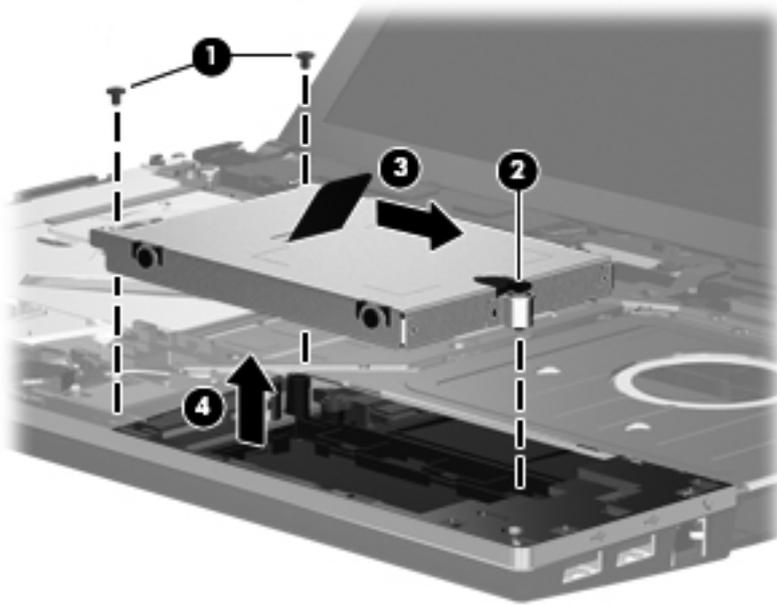
5. If it is necessary to replace the hard drive bracket, remove the two Phillips PM3.0×3.0 hard drive bracket screws **(1)** from each side of the hard drive.

6. Lift the bracket **(2)** straight up to remove it from the hard drive.
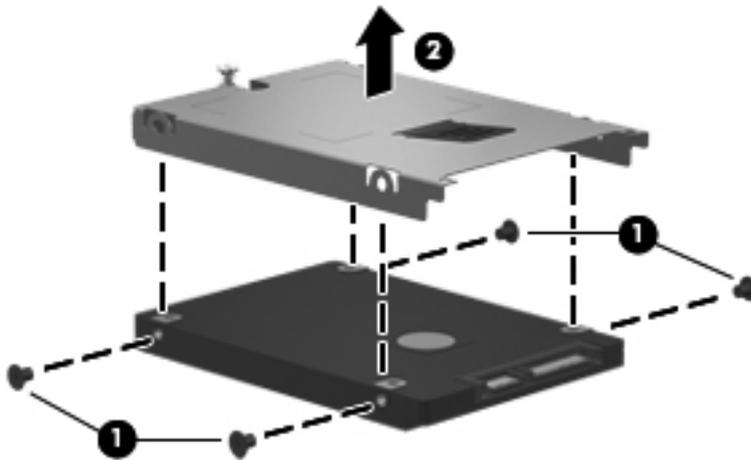
Reverse this procedure to reassemble and install the hard drive.

RTC battery

| Description	Spare part number
RTC battery	599516-001

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 power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the following components:

    a. Battery (see Battery on page 57)

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

    c. Keyboard (see Keyboard on page 61)

    d. Palm rest (see Palm rest on page 72)

Remove the RTC battery:

1. Disconnect the RTC battery connector from the system board **(1)**.

2. Remove the RTC battery from the system board **(2)**.
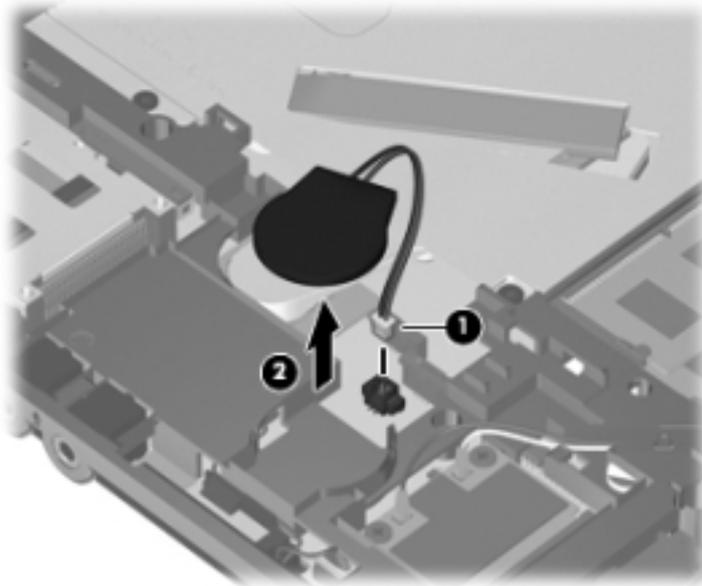
Reverse this procedure to install the RTC battery.

WLAN module

| Description	Spare part number
Intel® Centrino™ Advanced-N 6200 802.11a/b/g 2x2	
For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572510-001
Intel Centrino Wireless-N 1000 802.11b/g/n 1x2	
For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572520-001
Intel Centrino Wireless-N 1000 802.11b/g 1x2 for use in Russia and Ukraine	585984-001
Intel WiFi Link 6200 802.11a/g/n	
For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the 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, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572509-001
Broadcom 4312G 802.11b/g WiFi Adapter	
For use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003

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, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, 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
Realtek RTL8191SE 802.11b/g/n 1x1 WiFi Adapter	593533-001
Broadcom 43224AGN 802.11a/b/g/draft-n WiFi Adapter	
For use in Antigua and Barbuda, Aruba, the Bahamas, Barbados, Belize, Canada, Guam, Guinea, Haiti, Jamaica, the Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, the US Virgin Islands, and the United States	582564-001
For use in Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Cayman Islands, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	582564-002
Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter (Bluetooth 3.0+high-speed ready)	602992-001
Broadcom 4313/2070 802.11b/g/n (1x1) and Bluetooth high-speed Half Mini Card	600370-001
Broadcom 4313/2070 802.11b/g/n (1x1) WiFi Mini Card	593836-001
Atheros AR9285G 802.11b/g/n 1x1 WiFi Adapter	605560-005

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 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Palm rest (see Palm rest on page 72)

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.)

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.
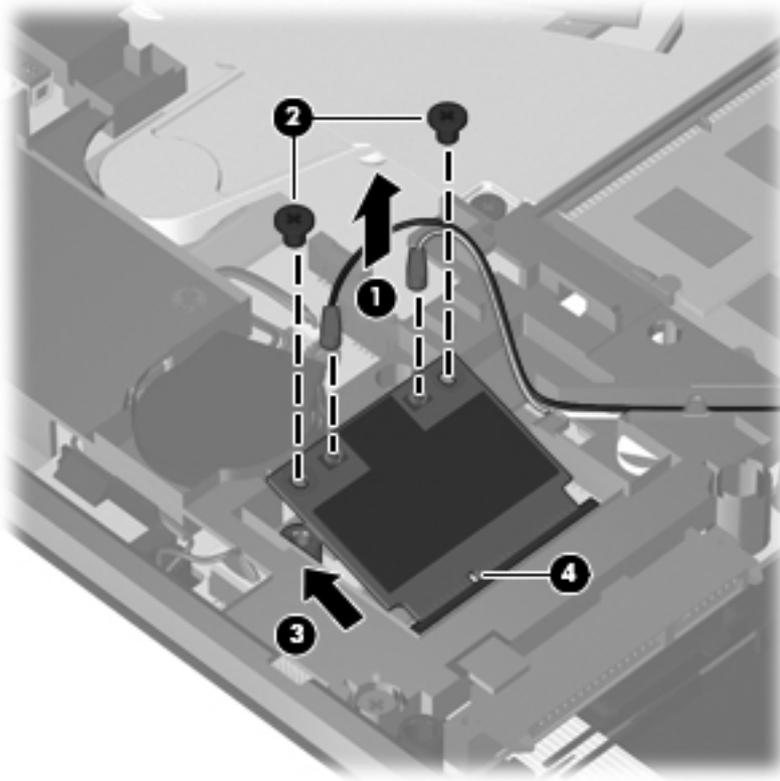
Reverse this procedure to install the WLAN module.

Bluetooth module

Description	Spare part number
Bluetooth module (Bluetooth module cable included in the Cable kit, part number 599525-001, see Cable kit on page 37)	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 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Palm rest (see Palm rest on page 72)

Remove the Bluetooth module:

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

2. Remove the Bluetooth module from the base enclosure **(1)**.

3. Disconnect the Bluetooth module cable **(2)**, and then remove the Bluetooth module.

4. Remove the Bluetooth module cable **(3)** from the system board.
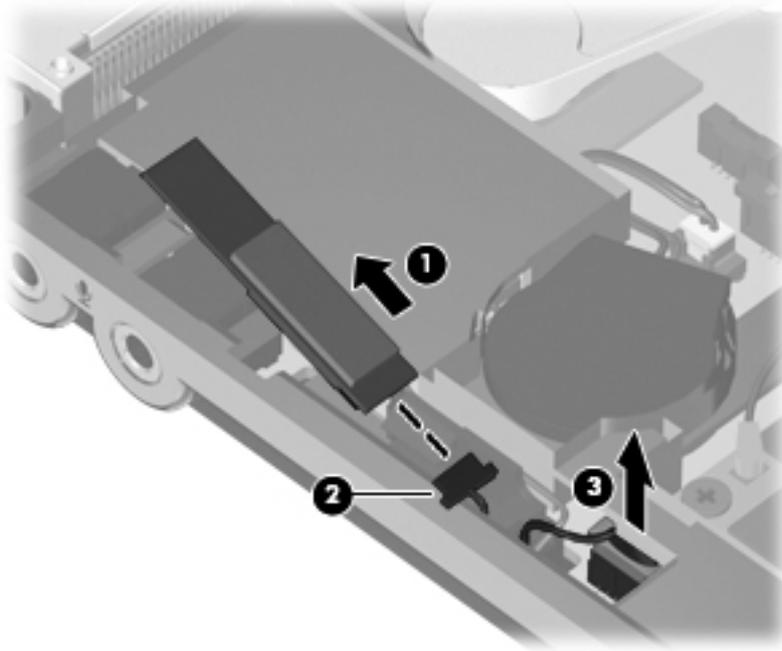
Reverse this procedure to install the Bluetooth module.

Heat sink and fan

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

Description	Spare part number
Fan	599544-001
Processor heat sink	
For use with discrete graphics subsystems	599653-001
For use with Unified Memory Architecture (UMA) graphics subsystems	599546-001

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 57).

5. Remove the following components:

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

    b. Keyboard (see Keyboard on page 61)

    c. Palm rest (see Palm rest on page 72)

Remove the heat sink:

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

2. Remove the six Phillips PM2.5×3.0 screws **(1)** that secure the heat shield to the top cover.

3. Remove the Phillips PM2.5×5.0 screw **(2)** that secures the heat shield to the top cover.

4. Lift the right edge of the heat shield to disengage the tabs on the left side of the heat shield from the top cover, and then remove the heat shield **(3)**.
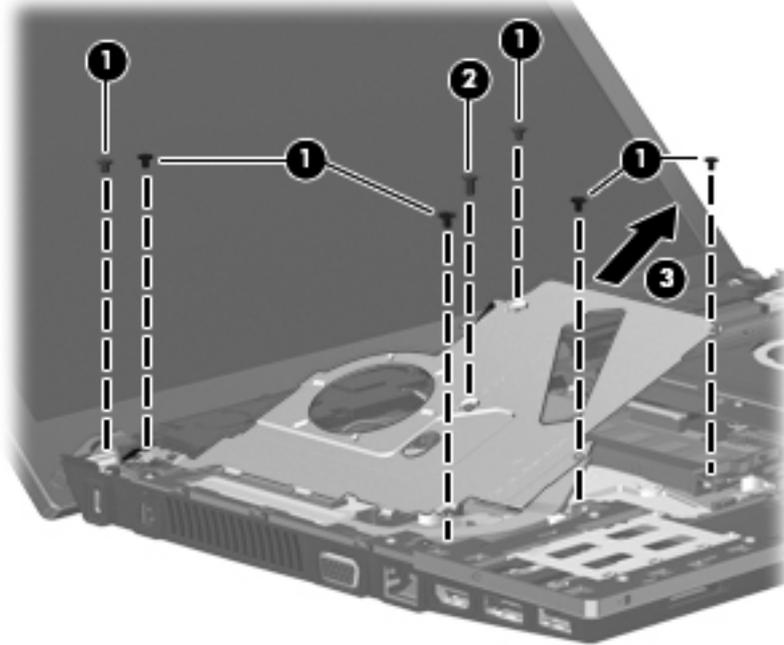
5. Disconnect the fan cable from the system board **(1)**.

6. Loosen the 2.0×5.0 captive screw from the system board, and then remove the fan **(3)**.
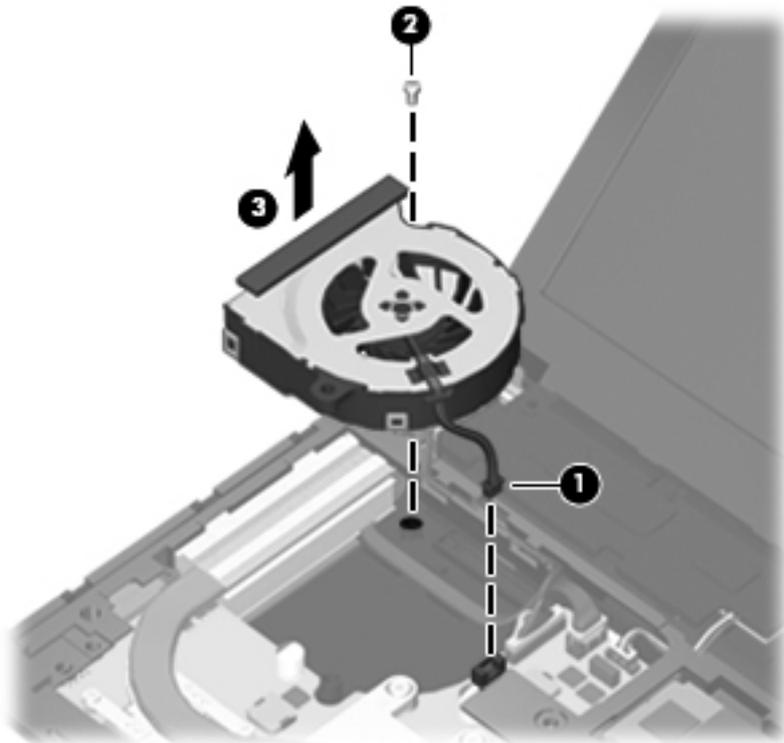
7. Following the sequence stamped into the heat sink, loosen the four PM2.5×10.0 captive screws **(1)** that secure the heat sink to the processor.

> **NOTE:** Loosen the two additional screws that secure the heat sink to the graphics devices on models with discrete graphics subsystem memory.

8. Lift the heat sink off the processor **(2)**, and then lift the heat sink up and to the right to remove the heat sink from the base enclosure **(3)**.
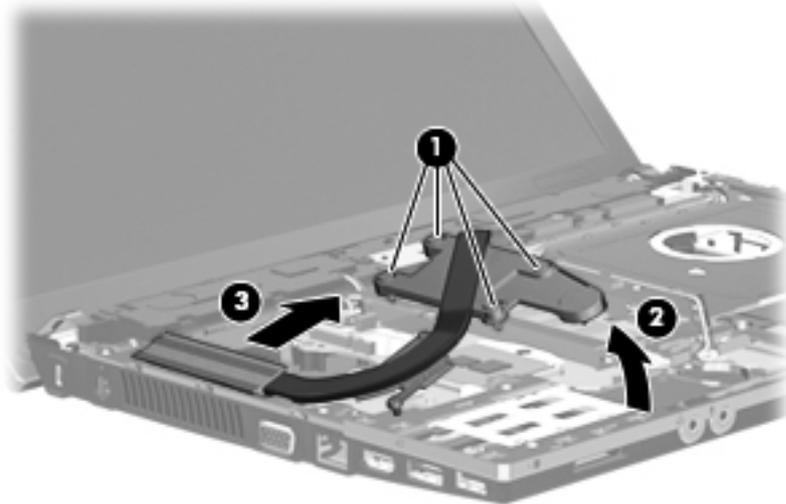
> **NOTE:** The thermal material must be thoroughly cleaned from the surfaces heat sink for the discrete system board **(1)**, **(2)**, and **(3)**, and the system board **(4)**, **(5)**, and **(6)** each time the heat sink is removed. Replacement thermal material is included with all heat sink, system board, and processor spare part kits.
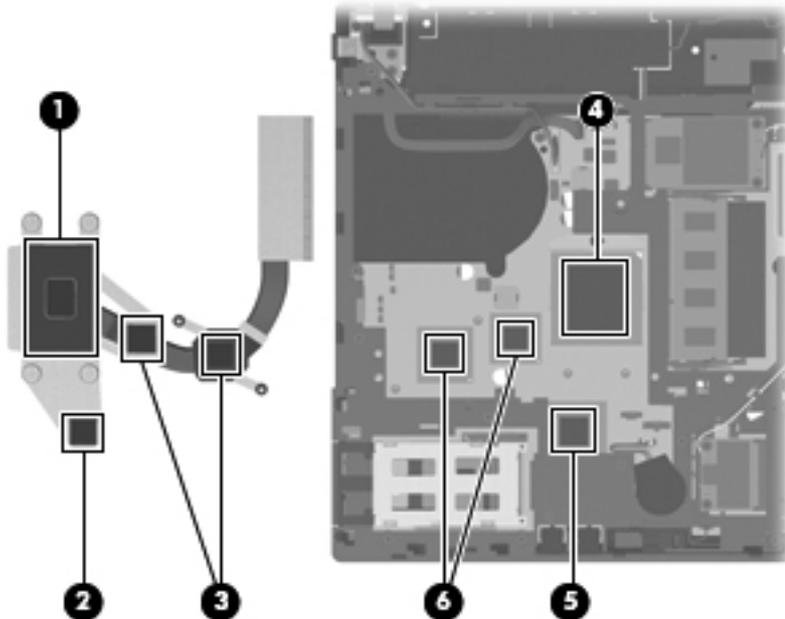
NOTE: The thermal material must be thoroughly cleaned from the surfaces of heat sink for the UMA system board **(1)**, **(2)**, and **(3)** and the system board components **(3)**, **(4)** and **(5)** each time the heat sink is removed. Replacement thermal material is included with all heat sink, system board, and processor spare part kits.
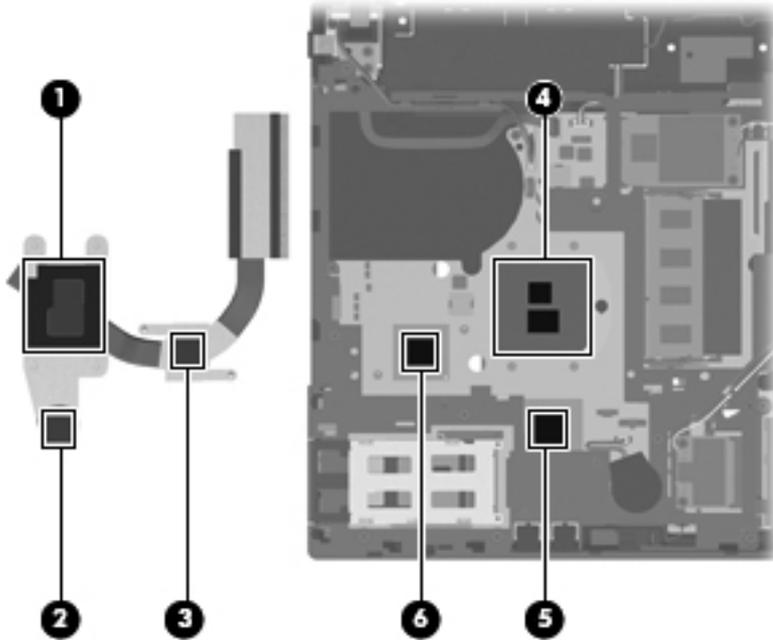
Reverse this procedure to install the heat sink and fan.

Processor

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

Description	Spare part number
Processor (includes replacement thermal material) (not illustrated)	
Intel Core i7 processors:	
620M 2.26-GHz	587259-001
640M 2.80-GHz	625826-001
Intel Core i5 processors:	
430M 2.26-GHz	597624-001
450M 2.40-GHz	613585-001
460M 2.53-GHz	626039-001
480M 2.66-GHz	634693-001
520M 2.4-GHz	594187-001
540M 2.53-GHz	594188-001
560M 2.66-GHz – 3.20-Ghz	625824-001
580M 2.66-GHz – 3.33-Ghz	625825-001
Intel Core i3 processors:	
330M 2.13-GHz	597622-001
350M 2.26-GHz	597623-001
370M 2.40-GHz	613584-001
380M 2.53-GHz	625823-001
390M 2.66-GHz	634692-001
Intel Pentium processors:	
P6000, 1.86-GHz	613586-001
P6100, 2.00-GHz	613587-001
P6200, 2.13-GHz	625831-001
P6300, 2.26-GHz	635500-001
Intel Celeron processors:	
P4500, 1.86-GHz	611699-001
P4600, 2.00-GHz	628941-001

Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see Battery on page 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Optical drive (see Optical drive on page 65)

   d. Speakers (see Speakers on page 68)

   e. Palm rest (see Palm rest on page 72)

   f. Top cover (see Top cover on page 99)

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.
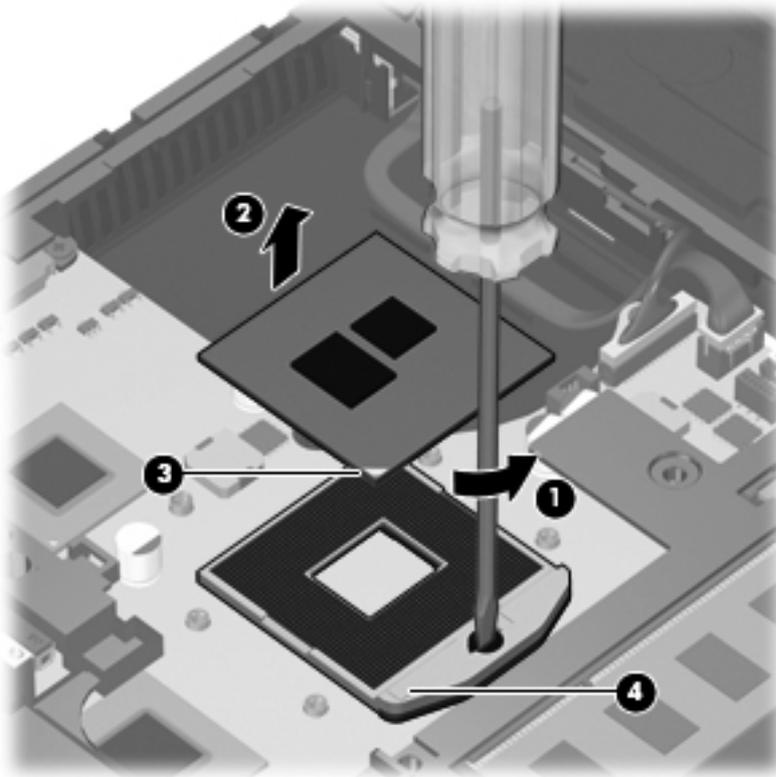
Reverse this procedure to install the processor.

Power connector cable

NOTE: The power connector cable is included in the Cable kit on page 37, part number 599525-001.

Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see Battery on page 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Fan and heat sink (see Heat sink and fan on page 83)

   d. Speakers (see Speakers on page 68)

Remove the power connector cable.

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

2. Release the power connector cable from the system board **(1)**.

3. Remove the modem cable **(2)** from the routing in the base enclosure.
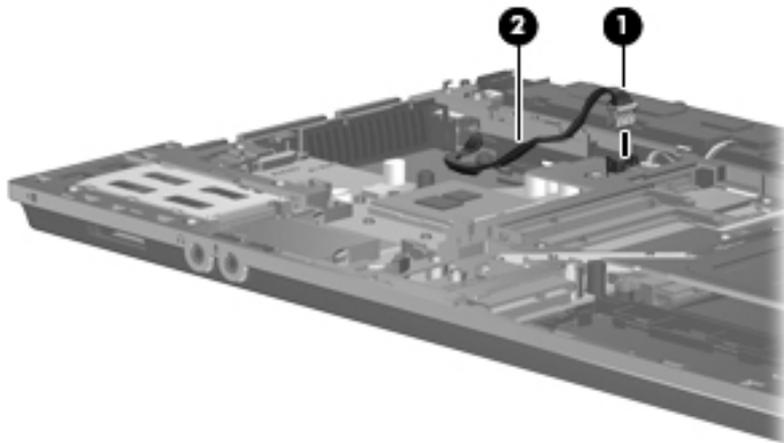
4. Remove the power connector cable

Reverse this procedure to install the power connector cable.

Display assembly

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

Description	Spare part number
Display assembly (includes 2 WLAN antennas and cables and, on select computer models, 2 WWAN antennas and cables)	
NOTE: WWAN is available only on select models with **33.8-cm** 13.3-in displays.	
For use in black models:	
● **33.8-cm** (13.3-in) HD (1366x768 resolution)	599553-001
● **33.8-cm** (13.3-in) HD BrightView	599554-001
● **33.8-cm** (13.3-in) HD BrightView with webcam	599555-001
● **33.8-cm** (13.3-in) HD BrightView with webcam and WWAN	599556-001
● **33.8-cm** (13.3-in) HD with webcam	599557-001
● **33.8-cm** (13.3-in) HD with webcam and WWAN	599558-001
● **35.6-cm** (14.0-in) HD (1366x768 resolution)	599559-001
● **35.6-cm** (14.0-in) HD BrightView	599560-001
● **35.6-cm** (14.0-in) HD BrightView with webcam	599561-001
● **35.6-cm** (14.0-in) HD with webcam	599562-001
For use in red models:	
● **33.8-cm** (13.3-in) HD (1366x768 resolution)	608736-001
● **33.8-cm** (13.3-in) HD BrightView	608737-001
● **33.8-cm** (13.3-in) HD BrightView with webcam	608738-001
● **33.8-cm** (13.3-in) HD with webcam	608739-001
● **35.6-cm** (14.0-in) HD (1366x768 resolution)	608740-001
● **35.6-cm** (14.0-in) HD BrightView	608741-001
● **35.6-cm** (14.0-in) HD BrightView with webcam	608742-001
● **35.6-cm** (14.0-in) HD with webcam	608743-001
For use in champagne models:	
● **33.8-cm** (13.3-in) HD (1366x768 resolution)	625690-001
● **33.8-cm** (13.3-in) HD BrightView	625692-001
● **33.8-cm** (13.3-in) HD BrightView with webcam	625693-001
● **33.8-cm** (13.3-in) HD with webcam	625691-001
● **35.6-cm** (14.0-in) HD (1366x768 resolution)	625694-001
● **35.6-cm** (14.0-in) HD BrightView	625696-001
● **35.6-cm** (14.0-in) HD BrightView with webcam	625697-001
● **35.6-cm** (14.0-in) HD with webcam	625695-001

Description	Spare part number
For use in **35.6-cm** (14.0-in) coffee-colored models in Singapore	663979-001
Display bezel	
● For use with **33.8-cm** (13.3-in) displays with webcam	536421-001
● For use with **35.6-cm** (14.0-in) displays with webcam	536424-001
● For use with **33.8-cm** (13.3-in) displays without webcam	536423-001
● For use with **35.6-cm** (14.0-in) displays without webcam	536422-001
Webcam module	599571-001
Display panel (included with display assembly)	
● **33.8-cm** (13.3-in), HD, BrightView	588160-001
● **35.6-cm** (14.0-in), HD, BrightView	592144-001
● **33.8-cm** (13.3-in), HD, Anti-Glare	623175-001
● **35.6-cm** (14.0-in), HD, Anti-Glare	623176-001
Display hinge kit	
● Display hinge and panel bracket (left and right) for **33.8-cm** (13.3-in) displays	599536-001
● Display hinge and panel bracket (left and right) for **35.6-cm** (14.0-in) displays	599537-001
Display cable (includes microphone and, on select models, webcam connector)	
● Display cable for use with **33.8-cm** (13.3-in) displays with webcam	599534-001
● Display cable for use with **33.8-cm** (13.3-in) displays with webcam on models without WWAN	616070-001
● Display cable for use with **35.6-cm** (14.0-in) displays with webcam	605558-001
● Display cable for use with **33.8-cm** (13.3-in) displays without webcam	605557-001
● Display cable for use with **35.6-cm** (14.0-in) displays without webcam	599535-001
WLAN antennas and cables	
WWAN antennas and cables	
Display back cover	
For use in black models:	
● For use with **33.8-cm** (13.3-in) displays without WWAN	599526-001
● For use with **35.6-cm** (14.0-in) displays without WWAN	599527-001
● For use with **33.8-cm** (13.3-in) displays with WWAN	599528-001
● For use with **35.6-cm** (14.0-in) displays with webcam and without WWAN	605556-001
● For use with **33.8-cm** (13.3-in) displays with webcam and without WWAN	607094-001
For use in red models:	
● For use with **33.8-cm** (13.3-in) displays without WWAN,	607643-001
● For use with **33.8-cm** (13.3-in) displays with webcam and without WWAN	607644-001
● For use with **33.8-cm** (14.0-in) displays without WWAN	607645-001

Description	Spare part number
● For use with **35.6-cm** (14.0-in) displays with webcam and without WWAN	607646-001
For use in champagne models:	
● For use with **33.8-cm** (13.3-in) displays without WWAN,	625698-001
● For use with **33.8-cm** (13.3-in) displays with webcam and without WWAN	625699-001
● For use with **33.8-cm** (14.0-in) displays without WWAN	6256710-001
● For use with **35.6-cm** (14.0-in) displays with webcam and without WWAN	625711-001
For use in **35.6-cm** (14.0-in) coffee-colored models in Singapore	663980-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see Battery on page 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Speakers (see Speakers on page 68)

   d. Palm rest (see Palm rest on page 72)

   e. WWAN cables (see WWAN module on page 70)

   f. WLAN cables (see WLAN module on page 77)

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 five T8 slotted-Torx M2.5×6.0 screws **(1)** that secure the display assembly to the base enclosure.

📝 **NOTE:** Your model of the computer have four screws.

2. Disconnect the display cable from the system board **(2)**, and remove all cables from the routing channels along the top cover **(3)**.

3. Lift the display assembly **(4)** straight up and remove it from the base enclosure.
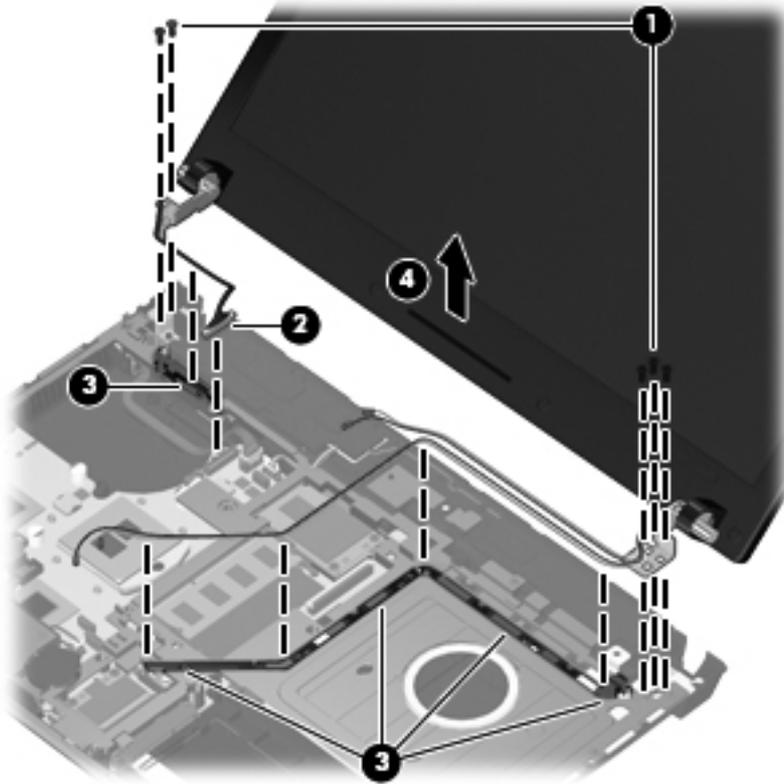
4. If it is necessary to replace the display bezel, display enclosure, or display hinges, remove the four Mylar screw covers **(1)** and the four T8 slotted-Torx M2.5×6.0 screws **(2)** that secure the display bezel to the display assembly. The screw covers are available in the rubber kit, spare part number 599564-001.
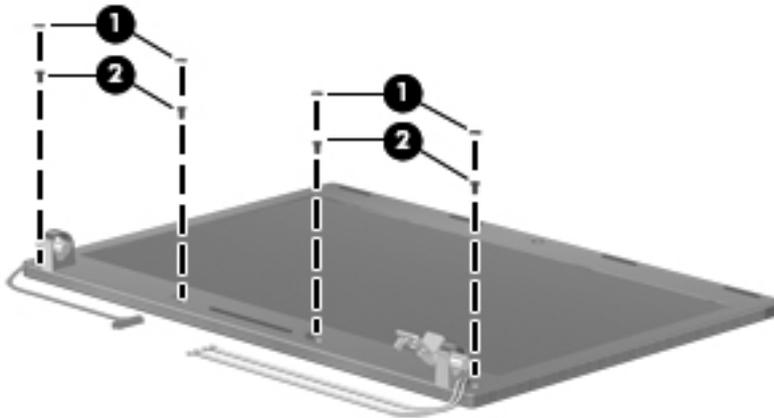
5. Remove the bezel:

    a. Flex the top of the bezel from the inside edge until it disengages from the display back cover **(1)**.

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

c. Flex the inside edge of the left side and the right side of the bezel until it disengages from the display back cover **(3)**.

d. Remove the display bezel from the display back cover **(4)**.
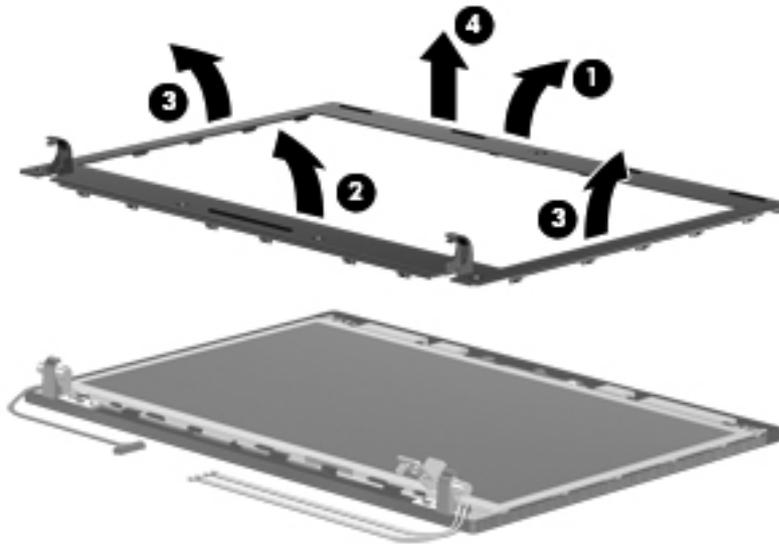
6. If it is necessary to replace the webcam module, gently pull the webcam module away from the double-sided tape on the display back cover **(1)**, disconnect the webcam cable from the module **(2)**, and then remove the webcam.
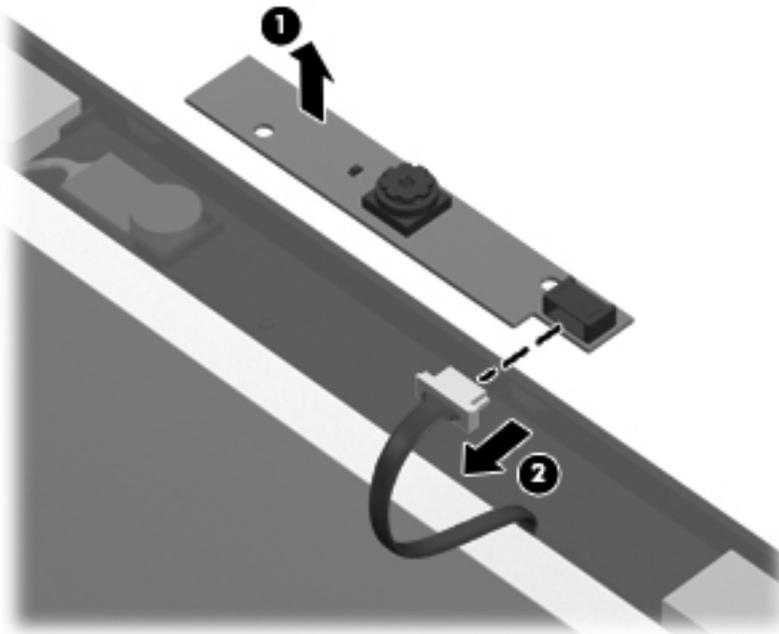
NOTE: To replace the webcam module in the display enclosure, align the holes on the webcam module with the pins on the display enclosure and press onto the double-sided tape.

7. If it is necessary to replace the display hinges, remove the display panel by removing the four T8 slotted-Torx 2.5×5.0 screws **(1)** that secure the panel to the bottom of the display back cover and the two T8 slotted-Torx 2.5×3.0 screws **(2)** that secure the display panel to the top of the display back cover.

8. Lift the top of the display panel away from the back cover **(3)**, and then remove the display panel **(4)**.
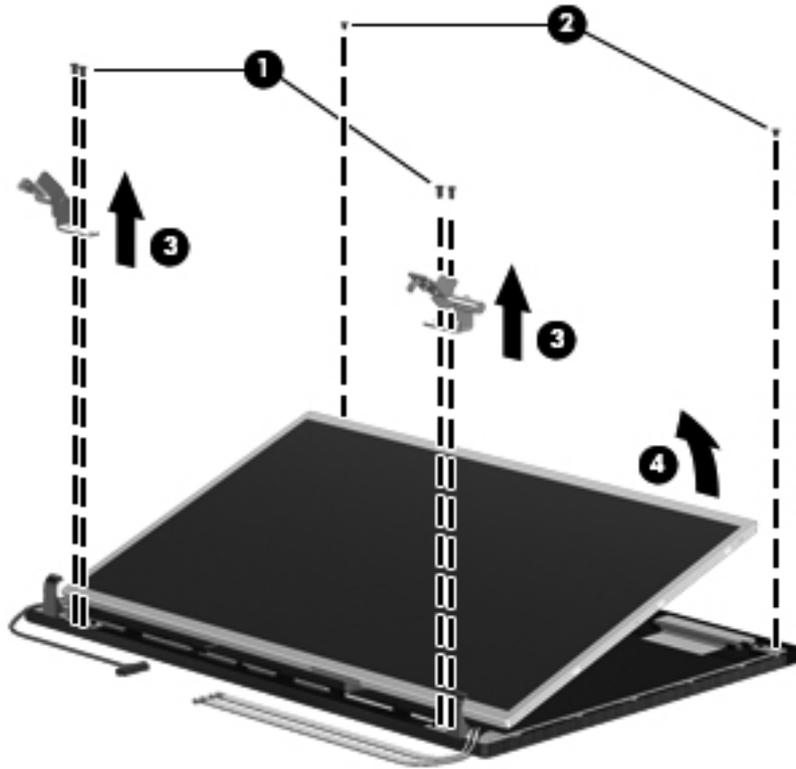
9. Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel, and then remove the display hinges **(2)**. The left and right display hinges are available in the display hinge kit.
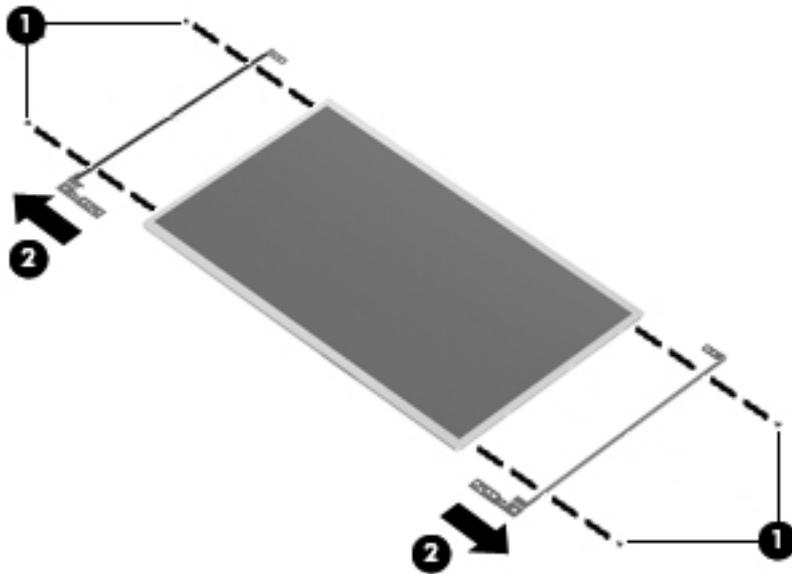
10. If it is necessary to replace the display/webcam cable, turn the display panel upside-down and peel back the tape that secures the display cable to the display panel **(1)**, and then release the connector locking bar **(2)**.

11. Release the cable from the display panel connector **(3)**.

NOTE: The display cable includes the microphone and webcam connector.
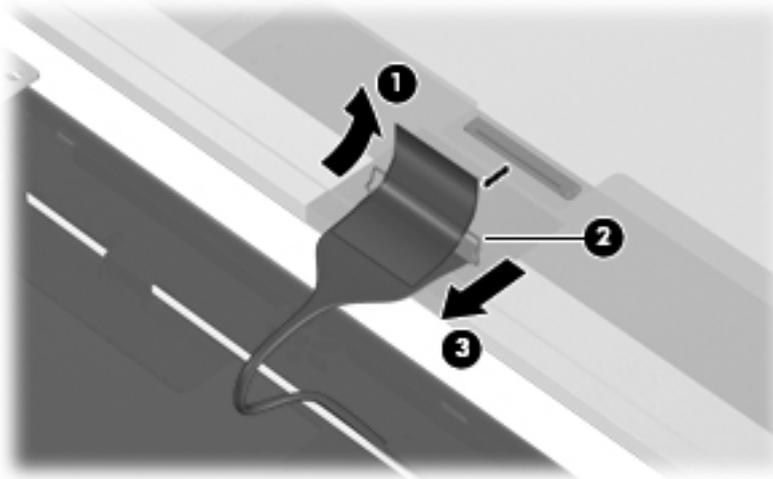
12. Gently pull the integrated microphone **(1)** from the clips at the top of the display back cover, remove the display cable from the clips and routing channels **(2)** along the bottom of the display back cover, and then remove the display cable **(3)**. The display/mic/webcam cable is included in the display cable kit.
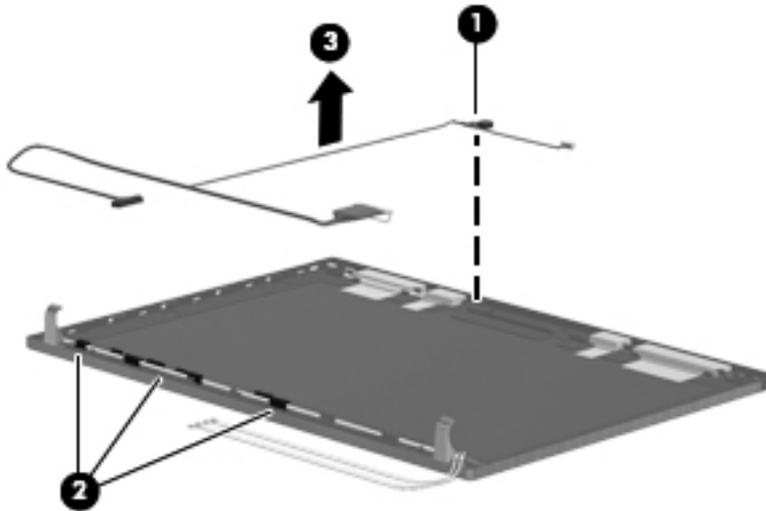
13. If it is necessary to remove the wireless antennas and cables:

    a. Detach the WLAN antennas **(1)** and the WWAN antennas **(2)** from the adhesive on the back cover, and then route the cables through the clips **(3)** that secure the antenna cables to the display back cover.
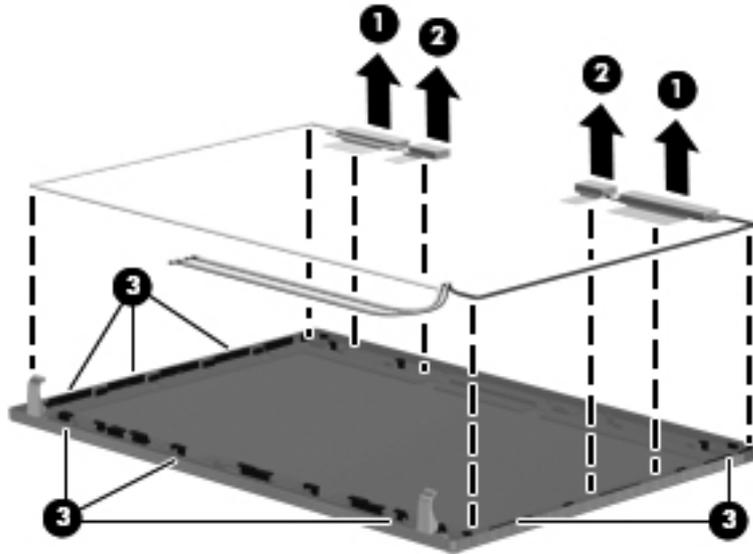
    b. Remove the wireless antennas and cables.

Reverse this procedure to reassemble and install the display assembly.

Top cover

Description	Spare part number
Top cover	
For use with **33.8-cm** (13.3-in) displays	599569-001
For use with **35.6-cm** (14.0-in) displays	599570-001

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 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Speakers (see Speakers on page 68)

   d. Optical drive (see Optical drive on page 65)

   e. Palm rest (see Palm rest on page 72)

Remove the top cover:

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

2. Remove the 14 T8 slotted-Torx 2.5×5.0 screws **(1)** and the 3 PM2.0×3.0 screws **(2)** that secure the top cover to the base enclosure.
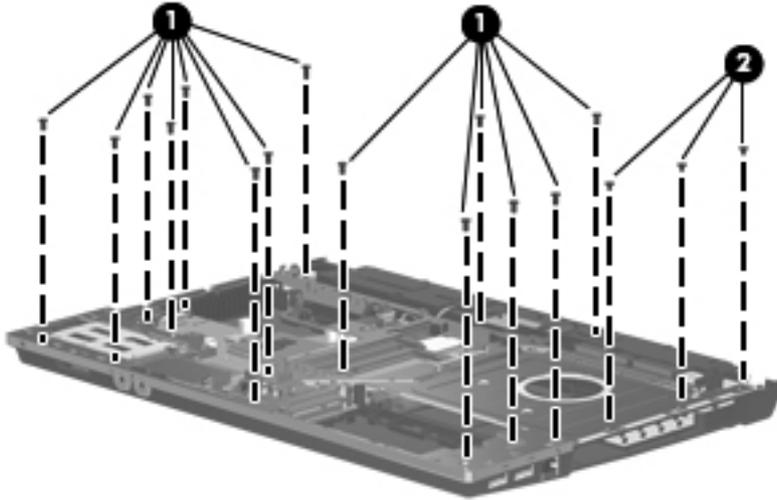
3. If installed, remove the ExpressCard slot bezel **(1)**, release the top cover from the sides of the base enclosure **(2)**, and then remove the top cover **(3)**.
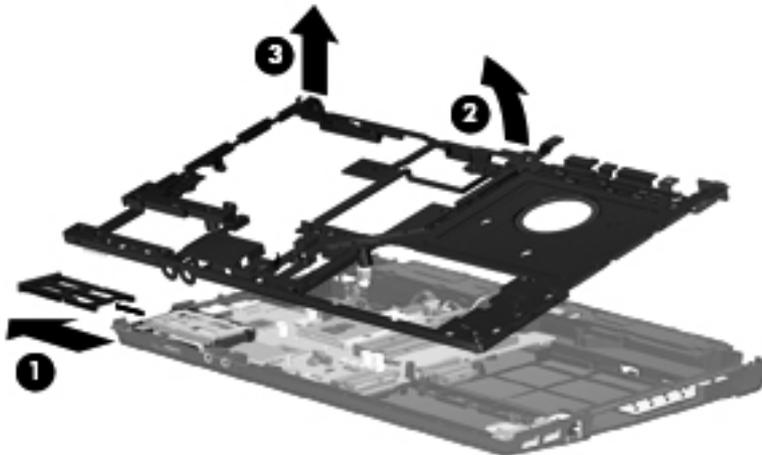
Reverse this procedure to install the top cover.

Modem module

Description	Spare part number
Modem module for use in all countries and regions except for Australia and New Zealand	628824-001
NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included in the cable kit. See Cable kit on page 37 for more cable kit spare part information.	
Modem module for use in Australia and New Zealand	510100-011
NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included in the cable kit. See Cable kit on page 37 for more cable kit spare part information.	

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 57).

5. Remove the following components:

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

   b. Keyboard (see Keyboard on page 61)

   c. Optical drive (see Optical drive on page 65)

   d. Speakers (see Speakers on page 68)

   e. Palm rest (see Palm rest on page 72)

   f. Top cover (see Top cover on page 99)

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. Disconnect the modem module cable **(3)**.
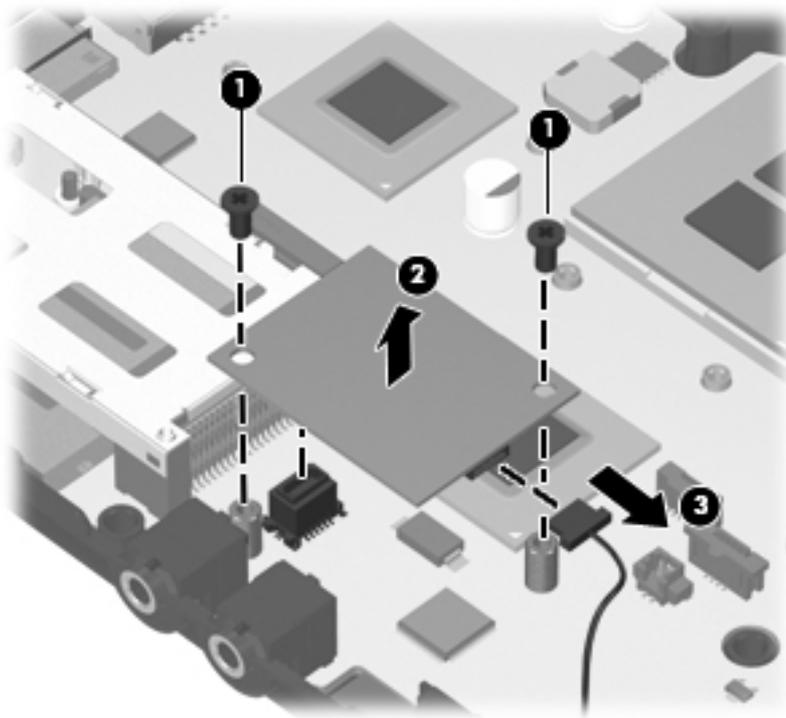
5. Remove the modem module.

Reverse this procedure to install the modem module.

System board

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

Description	Spare part number
System board (includes replacement thermal material)	
For use in all countries and regions except for Russia and the People's Republic of China:	
● For use with UMA graphics subsystem, WWAN module, and **33.8-cm** (13.3-in) displays	599521-001
● For use with UMA graphics subsystem and **33.8-cm** (13.3-in) displays	599520-001
● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **33.8-cm** (13.3-in) displays	599518-001
● For use with models with ATI Mobility Radeon HD 5470 discrete graphics and **33.8-cm** (13.3-in) displays	628485-001
● For use with models with ATI Mobility Radeon HD 6370 discrete graphics and **33.8-cm** (13.3-in) displays	628615-001
● For use with UMA graphics subsystem and **35.6-cm** (14.0-in) displays	599523-001
● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **35.6-cm** (14.0-in) displays	599522-001
● For use with models with ATI Mobility Radeon HD 5470 discrete graphics and **35.6-cm** (14.0-in) displays	628487-001
● For use with models with ATI Mobility Radeon HD 6370 discrete graphics and **35.6-cm** (14.0-in) displays	628617-001
For use only in Russia and the People's Republic of China:	
● For use with UMA graphics subsystem, WWAN module, and **33.8-cm** (13.3-in) displays	625277-001
● For use with UMA graphics subsystem and **33.8-cm** (13.3-in) displays	625276-001
● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **33.8-cm** (13.3-in) displays	625275-001
● For use with models with ATI Mobility Radeon HD 5470 discrete graphics and **33.8-cm** (13.3-in) displays	628486-001
● For use with models with ATI Mobility Radeon HD 6370 discrete graphics and **33.8-cm** (13.3-in) displays	628616-001
● For use with UMA graphics subsystem and **35.6-cm** (14.0-in) displays in the People's Republic of China and Russia	608267-001
● For use in models with ATI Mobility Radeon HD 530v discrete graphics and **35.6-cm** (14.0-in) displays in the People's Republic of China and Russia	608266-001
● For use with models with ATI Mobility Radeon HD 5470 discrete graphics and **35.6-cm** (14.0-in) displays	628488-001
● For use with models with ATI Mobility Radeon HD 6370 discrete graphics and **35.6-cm** (14.0-in) displays	628618-001

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 57).

5. Remove the following components:

   a. SIM (see SIM on page 58)

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

   c. Keyboard (see Keyboard on page 61)

   d. Speakers (see Speakers on page 68)

   e. WWAN module (see WWAN module on page 70)

   f. Palm rest (see Palm rest on page 72)

   g. Bluetooth module and cable (see Bluetooth module on page 81)

   h. WLAN module (see WLAN module on page 77)

   i. Hard drive (see Hard drive on page 74)

   j. Optical drive (see Optical drive on page 65)

   k. Display assembly (see Display assembly on page 91)

   l. Top cover (see Top cover on page 99)

   m. Power connector and cable

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 63)

- WLAN module (see WLAN module on page 77)

- WWAN module (see WWAN module on page 70)

- Modem module (see Modem module on page 101)

- Processor (see Processor on page 87)

Remove the system board:

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

2. Remove the T8 slotted-Torx 2.5×5.0 screw **(1)** that secures the system board to the base enclosure.

3. Disconnect the USB board cable from the system board **(2)**.

4. Use the ODD connector **(3)** to lift the right side of the system board from the base enclosure **(4)**.

5. Lift the system board up and to the right to remove the system board **(5)**.
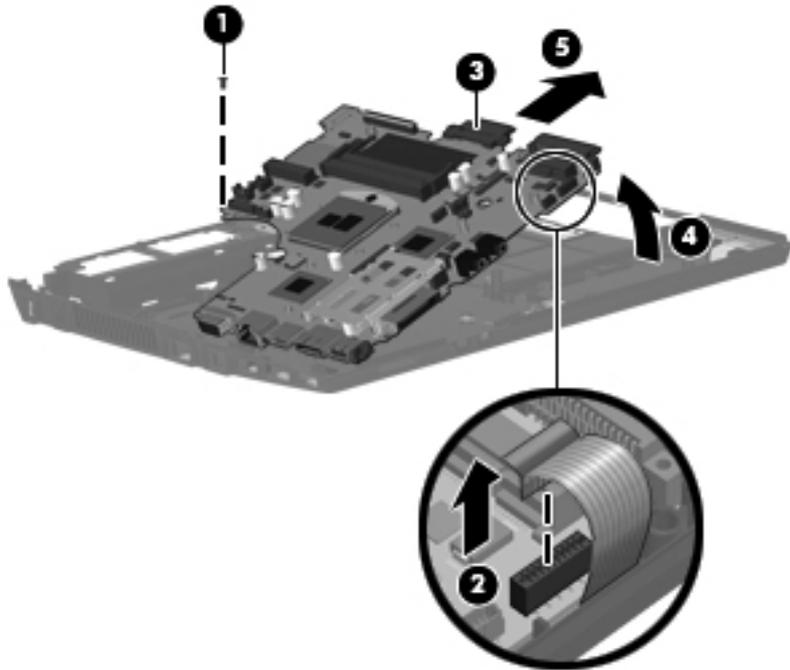
Reverse this procedure to install the system board.

USB connector board

Description	Spare part number
USB board with cable	599524-001

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).

5. Remove the following components:

   a. Switch cover (see)

   b. Keyboard (see)

   c. Optical drive (see)

   d. Speakers (see)

e. Palm rest (see Palm rest on page 72)

f. Hard drive (see Hard drive on page 74)

g. Display assembly (see Display assembly on page 91)

h. Top cover (see Top cover on page 99)

i. System board (see System board on page 103)

Remove the USB connector assembly:

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

2. Release the USB connector board cable from the base enclosure clips and routing channel **(1)**.

3. Remove the USB connector assembly **(2)** from the base enclosure.
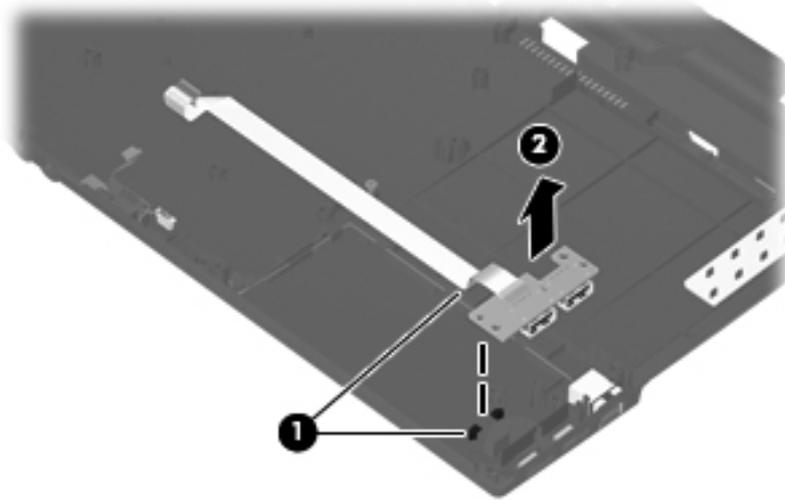
Reverse this procedure to install the USB connector assembly.

Modem module cable

NOTE: The modem module cable with RJ11 connector is included in the <u>Cable kit on page 37</u>, part number 599525-001.

Before removing the modem module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

4. Remove the battery (see <u>Battery on page 57</u>).

5. Remove the following components:

    a. Switch cover (see <u>Switch cover on page 59</u>)

    b. Keyboard (see <u>Keyboard on page 61</u>)

    c. Optical drive (see <u>Optical drive on page 65</u>)

    d. Speakers (see <u>Speakers on page 68</u>)

    e. Palm rest (see <u>Palm rest on page 72</u>)

    f. Hard drive (see <u>Hard drive on page 74</u>)

    g. Display assembly (see <u>Display assembly on page 91</u>)

    h. Top cover (see <u>Top cover on page 99</u>)

    i. System board (see <u>System board on page 103</u>)

    j. USB connector board and cable (see <u>USB connector board on page 105</u>)

Remove the modem cable.

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

2. Release the modem RJ11 connector from the base enclosure clips **(1)**.

3. Remove the modem cable **(2)** from the routing in the base enclosure.
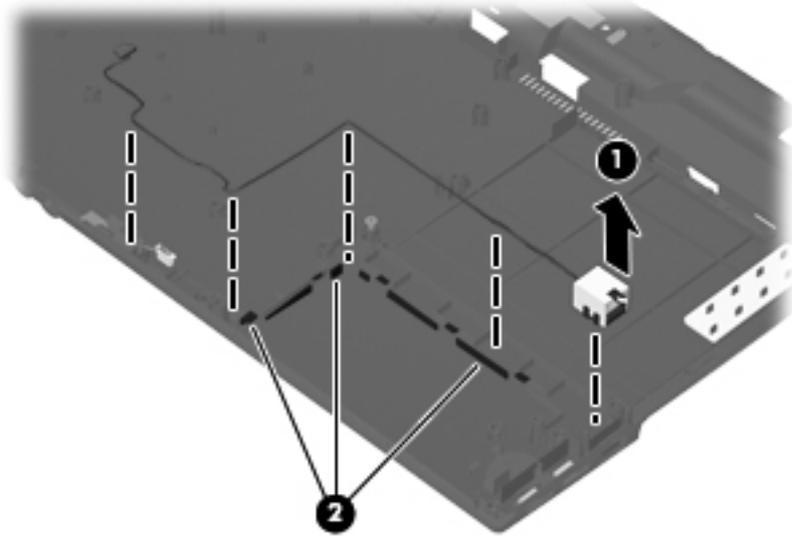
4. Remove the modem cable.

Reverse this procedure to install the modem cable.

5   Computer Setup

Computer Setup in Windows 7

To view the drives installed on the computer, select **Start>Computer**.

On models with a secondary hard drive (drive D), the optical drive becomes drive E. The next drive added to the system, such as a new USB drive, will be assigned the next available drive letter.

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 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 "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press esc.

3. 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.

   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.

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

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

     – 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

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 esc while the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen.

2. Press f10 to enter BIOS Setup.

3. Use the arrow keys to select **File>Restore defaults**, and then press enter.

4. When the confirmation dialog box opens, press f10.

5. To save your preferences and exit Computer Setup, use the arrow keys to select **File>Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

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

Computer Setup menus

The menu tables in this section provide an overview of the 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.
Set system date and time	Change date and time ● Set date: MM:DD:YYYY ● Set time: HH:MM
System Diagnostics	● F1: System information ● F2: Start-up test ● F3: Run-in test ● F4: Hard disk test
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.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Administrator Tools	
BIOS administrator password	Enter, change, or delete a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account password	● Select from a list of BIOS users. ● Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
User Tools	
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.
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. ● Last Pass: Displays Disk Sanitizer Completion Report **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

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. - Set the MultiBoot Express Boot Popup delay in seconds. - Enable/disable Custom Logo (disabled by default). - Enable/display Display Diagnostic URL. - Enable/disable SD card boot. - Enable/disable floppy boot. - Enable/disable PXE Internal NIC boot. - Set the UEFI boot order: Windows Boot Manager. - Set the legacy boot order: 1st boot device: Notebook hard drive 2nd boot device: USB floppy 3rd boot device: USB CD-ROM 4th boot device: USB hard drive 5th boot device: Notebook Ethernet 6th boot device: SD card

Select	To do this
Device configurations	• Enable Fn Key Switch
	• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:
	◦ Use of a USB keyboard in Computer Setup even when 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 fan always on while connected to an AC outlet.
	• Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security.
	• Enable/disable LAN power saving mode.
	• Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available:
	◦ AHCI (Advanced Host Controller Interface)
	◦ IDE (Integrated Drive Electronics)
	• Enable/disable HP QuickLook.
	• Enable/disable HP QuickLook preboot authentication on HP QuickLook boot.
	• Enable/disable HP QuickWeb.
	• Enable/disable HP QuickWeb: Write Protect (disabled by default).
	• Enable/disable Intel® HT Technology.
	• Enable/disable Wake on USB (disabled by default).
	• Enable/disable Numlock state at boot: Off /On (disabled by default).

Select	To do this
Built-in device options	● Enable/disable the wireless switch state.
	● Enable/disable embedded WLAN device radio.
	● Enable/disable Network Interface Controller (NIC).
	● Enable/disable LAN/WLAN Switching (disabled by default).
	● Set the wake on LAN state.
	◦ Disabled
	◦ Boot to Network
	◦ Follow Boot Order
	● Enable/disable the integrated camera (webcam).
	● Enable/disable Power Monitor Circuit.
	● Enable/disable the audio device.
	● Enable/disable the microphone.
	● Enable/disable the internal speakers.
Port options	Enable/disable USB port.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

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.

   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.

Computer Setup menus

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

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

File menu

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

Security menu

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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	● Create a new BIOS user account. ● View a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (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.

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.

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)

Select	To do this
	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).
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.

Select	To do this
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

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.

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.

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.

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.

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.

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.

6   Specifications

Computer specifications

	33.8-cm (13.3-in) models	*35.6-cm* (14.0-in) models
Dimensions		
Depth	**22.81** cm (8.98 in)	**23.24 cm** (9.15 in)
Width	**32.2 cm** (12.68 in)	**33.6 cm** (13.23 in)
Height (front to rear)	**27.0 to 35.3 cm** (1.07 to 1.39 in)	**27.0 to 35.0 cm** (1.07 to 1.38 in)
Weight		
● With 6-cell battery, no WWAN, no Bluetooth, no modem, one memory module, and optical disk drive	**< 2.15 kg** (4.74 lbs)	**< 2.27 kg** (5.0 lbs)
● With 6-cell battery, no WWAN, no Bluetooth, no modem, one memory module; without optical disk drive	**< 2.02 kg** (4.45 lbs)	**< 4.71 kg** (2.14 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)	

	33.8-cm (13.3-in) models	*35.6-cm* (14.0-in) models
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
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.

33.8-cm (13.3-in) display specifications

Dimensions	
Height	**20.83 cm** (8.2 in)
Width	**27.94 cm** (11.0 in)
Diagonal	**33.6 cm** (13.3 in)
Number of colors	Up to 16.8 million
Contrast ratio	250:1 (typical)
Brightness	200 nits (typical)
Pixel resolution	
Pitch	0.279 × 0.279 mm
Format	SD: 1280 × 800; HD: 1366 × 768
Configuration	RGB vertical stripe
Backlight	LED
Character display	80 × 25
Total power consumption	4.0 W
Viewing angle	±40° horizontal, +120/-40° vertical (typical)

35.6-cm (14.0-in) display specifications

Dimensions	
Height	**17.6 cm** (17.6 cm)
Width	**31.1 cm** (12.24 in)
Diagonal	**35.7 cm** (14.06 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; HD: 1366 × 768
Configuration	RGB vertical stripe
Backlight	LED
Character display	80 × 25
Total power consumption	4.0 W
Viewing angle	±40° horizontal, +120/-40° vertical (typical)

Hard drive specifications

	500-GB*	320-GB*	250-GB*
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g
Interface type	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.0 ms	1.5 ms	2.0 ms
Average	14.0 ms	12.0 ms	12.0 ms
Maximum	22.0 ms	22.0 ms	22.0 ms
Logical blocks	976,773,168	625,142,448	488,397,168
Disc rotational speed	7200 rpm	7200 rpm	7200 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)

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

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

DVD 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
Random access time	
DVD	< 125 ms
CD	< 100 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

DVD±RW SuperMulti Double-Layer Drive with LightScribe specifications

Applicable disc	
Read	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM
Write	CD-R and CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Random access time	
DVD	< 230 ms
CD	< 175 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

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

Applicable disc	
Read	BD-ROM, BD-ROM-DL, BD-R, BD-R-DL, BD-RE, BD-RE-DL, DVD-ROM, DVD+R, DVD+R-DL, DVD+RW, DVD-R, DVD-R-DL, DVD-RW, DVD-RAM (Ver.2), CD-DA, CD-ROM (mode 1 and mode 2), CD-ROM XA (mode 2, form 1 and form 2), Photo CD (single and multiple sessions), CD Extra, CD-R, CD-RW, and CD-TEXT
Write	DVD-RAM (Ver.2), DVD+R, DVD-R, CD-R, and CD-ROM
Random access time	
BD	< 230 ms
DVD	< 180 ms
CD	< 180 ms
Cache buffer	8 MB
Data transfer rate	
24X CD-ROM	3,600 KB/sec
8X DVD-ROM	10,800 KB/sec
4X BD	18,000 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

System resource specifications

You can use Device Manager to get a graphical view of the system resources that control how the devices work on the computer. System resources you can access from Device Manager are direct memory access (DMA) channels, input/output (I/O) ports, interrupt request (IRQ) lines, and memory addresses.

If two devices require the same resource and create a device conflict, you can manually change the resource settings in Device Manager to be sure each setting is unique.

⚠ **CAUTION:** Improperly changing resource settings can disable your hardware and cause your computer to malfunction or become inoperable. Only users who have expert knowledge of computer hardware and hardware configurations should change resource settings.

To view resource settings in Windows 7 and Windows Vista:

1. Select **Start** > **Computer**.

2. Click **System properties** near the top of the Computer folder.

3. On the left, click **Device Manager**.

4. On the **View** menu, click one of the following:

   ● **Resources by type**

   ● **Resources by connection**

To view resource settings in Windows XP:

1. Select **Start** > **My Computer**, or double-click **My Computer** on the desktop.

2. Under System Tasks, click **View system information**.

3. In the System Properties window, select the **Hardware** tab.

4. Click **Device Manager**.

5. On the **View** menu, click one of the following:

   ● **Resources by type**

   ● **Resources by connection**

7 Backup and recovery

Windows 7 backup and recovery

To protect your information, use Windows® Backup and Restore to back up individual files and folders, back up your entire hard drive (select models only), create system repair discs (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.

Windows Backup and Restore provides the following options:

- Creating a system repair disc (select models only)
- Backing up individual files and folders
- Creating a system image (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

Recovery after a system failure is as complete as your most current backup. You should create system repair discs (select models only) and 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. The system repair discs (select models only) are used to start up (boot) the computer and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

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 library, and back it up regularly.

- Back up templates that are stored in their associated programs.

- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

  To create a screen shot:

  1. Display the screen you want to save.

  2. Copy the screen image:

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

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

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

     The screen image is added to the document.

  4. Save the document.

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

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

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

To create a backup using Backup and Restore, 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**.

2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create a system repair disc (select models only).

   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.

Recovering

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

- Windows recovery tools: You can use Windows Backup and Restore 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 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 and you cannot use the system repair discs you previously created (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system.

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. Personal files must be restored from a backup.

1. If possible, back up all personal files.

2. If possible, check for the presence of the HP Recovery partition. select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   NOTE: If the HP Recovery partition is not listed, you must recover your operating system and programs using the *Windows 7 Operating System Operating System* DVD and the *Driver Recovery* disc (both purchased separately). For additional information, contact technical support by selecting **Start>Help and Support>Contact support**.

3. If the HP Recovery partition is listed, restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.

4. Press f11 while the "Press f11 for recovery" message is displayed on the screen.

5. Follow the on-screen instructions.

NOTE: Windows 7 provides additional recovery tools through the operating system. For additional information, go to Help and Support.

NOTE: If you are unable to boot (start up) your computer, you must purchase a *Windows 7 Operating System* DVD to reboot the computer and repair the operating system. For additional information, contact technical support by selecting **Start>Help and Support>Contact support**.

Backup and recovery in Windows Vista

Overview

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

The Backup and Restore Center provides the following options:

- Backing up individual files and folders

- Backing up the entire hard drive (select models only)

- Scheduling automatic backups (select models only)

- Creating system restore points

- Recovering individual files

- Restoring the computer to a previous state

- Recovering information using recovery tools

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

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

Backing up your information

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

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

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.

- Back up templates that are stored in their associated programs.

- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

    To create a screen shot:

    1. Display the screen you want to save.

    2. Copy the screen image:

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

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

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

The screen image is added to the document.

4. Save the document.

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

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

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

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

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

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

1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.

2. Follow the on-screen instructions to back up your entire computer (select models only) or your files.

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

Performing a recovery

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

- Windows recovery tools: You can use the Backup and Restore Center to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.

- f11 recovery tools: You can use the f11 recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

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

Using the Windows recovery tools

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

1. Click **Start > All Programs > Maintenance > Backup and Restore Center**.

2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.

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

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

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

1. If possible, back up all personal files.

2. If possible, check for the presence of the Windows partition and the HP Recovery partition. To find the partitions, select **Start > Computer**.

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

3. Restart the computer, and then press f8 before the Windows operating system loads.

4. Select **Repair your computer**.

5. Follow the on-screen instructions.

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

Using f11

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

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

1. If possible, back up all personal files.

2. If possible, check for the presence of the HP Recovery partition. To find the partition, select **Start > Computer**.

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

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

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

5. Follow the on-screen instructions.

# Using a Windows Vista operating system DVD (purchased separately)

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

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

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

📝 **NOTE:** This process takes several minutes.

1. If possible, back up all personal files.

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

3. When prompted, press any keyboard key.

4. Follow the on-screen instructions.

5. Click **Next**.

6. Select **Repair your computer**.

7. Follow the on-screen instructions.

Backup and recovery in Windows XP

Overview

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

Windows provides the following options:

- Backing up individual files and folders

- Backing up all files and folders

- Scheduling automatic backups

- Creating recovery points

- Recovering information

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

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

Backing up your information

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

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

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.

- Back up templates stored in their associated programs.

- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.

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

    a.   Display the screen you want to save.

    b.   Copy the screen image:

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

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

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

        The screen image is added to the document.

    d.   Save the document.

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

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

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

1.   Click **Start > All Programs > Accessories > System Tools > Backup**.

2.   Follow the on-screen instructions.

Performing a recovery

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

- Windows recovery tools (select models only): You can use the Windows Backup utility to recover information you have previously backed up.

- *Operating System* and *Driver Recovery* discs (included with your computer): You can use the discs to recover your operating system and programs installed at the factory.

Recovering your information

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

1.   If possible, back up all personal files.

2.   Click **Start > All Programs > Accessories > System Tools > Backup**.

The Backup or Restore Wizard opens.

3.   Click **Restore files and settings**, and then click **Next**.

4.   Follow the on-screen instructions.

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

Recovering the operating system and programs

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

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

1.   If possible, back up all personal files.

2.   Insert the *Operating System* disc into the optical drive.

3.   Shut down the computer.

4.   Turn on the computer.

5.   Follow the on-screen instructions to install the operating system.

6.   After the operating system is installed, remove the *Operating System* disc and insert the *Driver Recovery* disc.

7.   Follow the on-screen instructions to install the drivers and programs.

Linux backup and recovery

Use the instructions in this section if SUSE Linux SLED 11 is installed on your computer.

To protect your information, back up your files and folders. Then if the system fails, you can restore your important files from copies. You can also use the options listed in this section to restore the operating system and programs that were installed at the factory.

⚠ **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 original operating system and HP programs and drivers that were installed at the factory. Software, drivers, and updates not installed by HP must be manually reinstalled. Personal files must be restored from a backup.

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

1. If possible, back up all personal files.

2. Restart the computer, and then press f11 while the "Press <F11> for recovery" message is displayed on the screen.

3. Follow the on-screen instructions.

8 Connector pin assignments

Audio-in (microphone)
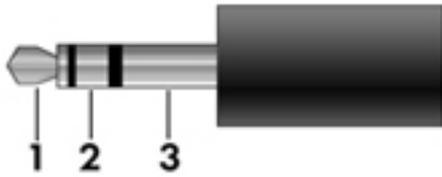
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)
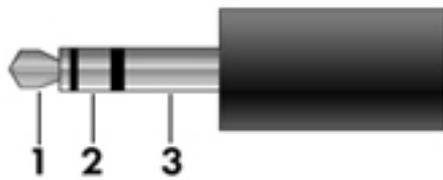
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

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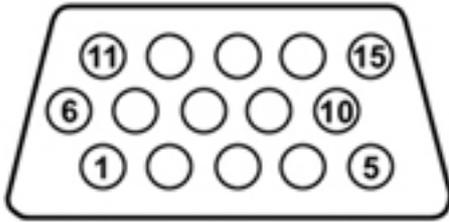
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

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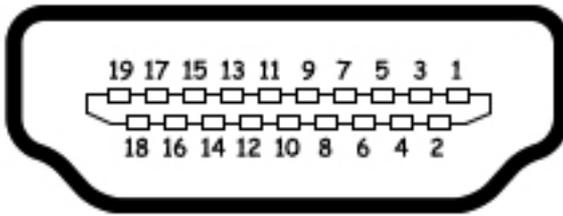
Pin	Signal
1	Transition minimized differential signal (TMDS) data 2+
2	TMDS data 2 shield
3	TMDS data 2–
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1–
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0–
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	Consumer electronic control (CEC)
14	Not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

RJ-11 (modem)
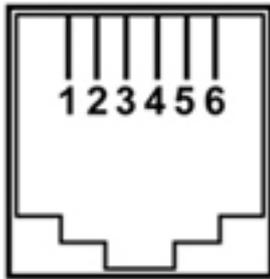
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)
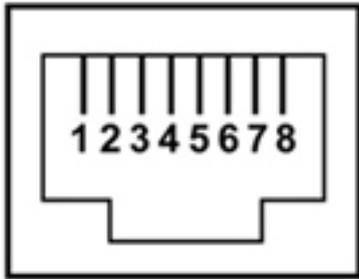
Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

Universal Serial Bus
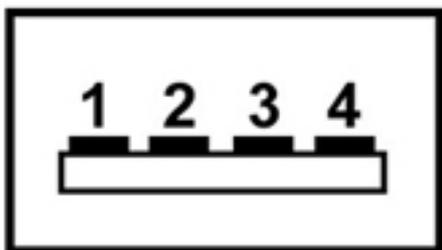
Pin	Signal
1	+5 VDC (4.75 V minimum under a continuous 0.5-A load)
2	Data -
3	Data +
4	Ground

eSATA/USB
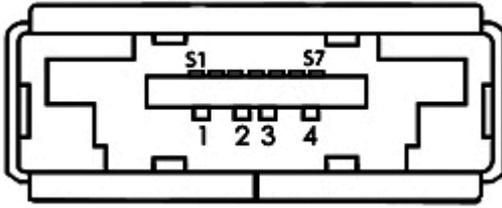
Pin	Signal
1	USB +5 VDC
2	USB Data -
3	USB Data +
4	USB Ground
S1	eSATA Ground
S2	eSATA Transmit Data A+
S3	eSATA Transmit Data A-
S4	eSATA Ground
S5	eSATA Receive Data B-
S6	eSATA Transmit Data B+
S7	eSATA Ground

9 Power cord set requirements

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

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

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

Requirements for all countries and regions

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

- The length of the power cord set must be at least 1.5 m (5.0 ft) and no more than 2.0 m (6.5 ft).

- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.

- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.

- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

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

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

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

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

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

10   Recycling

Battery

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

Display

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

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

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

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

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

Perform the following steps to disassemble the display assembly:

1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.
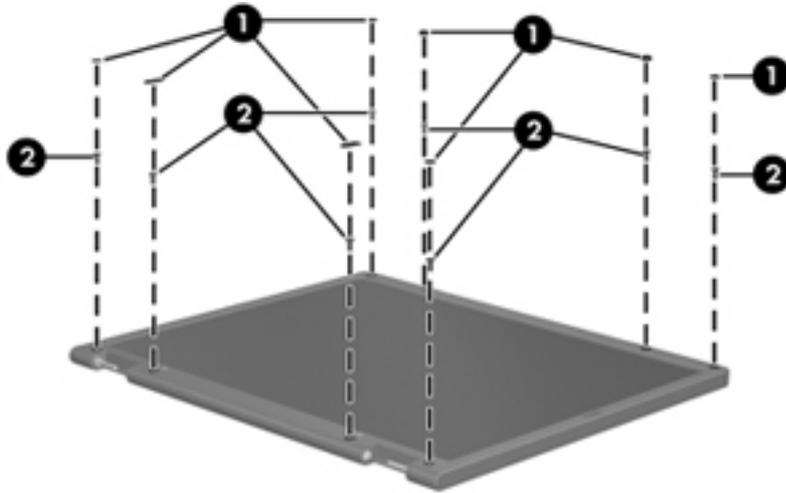
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.

3. Remove the display bezel **(3)**.
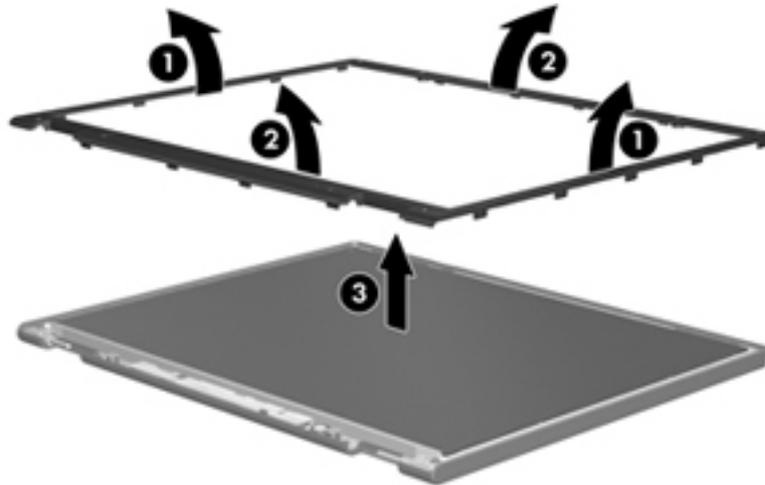
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.
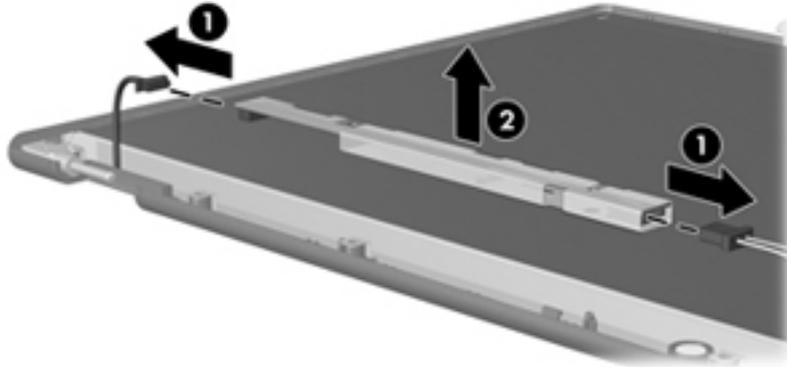
5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.

6. Remove the display panel assembly **(2)** from the display enclosure.
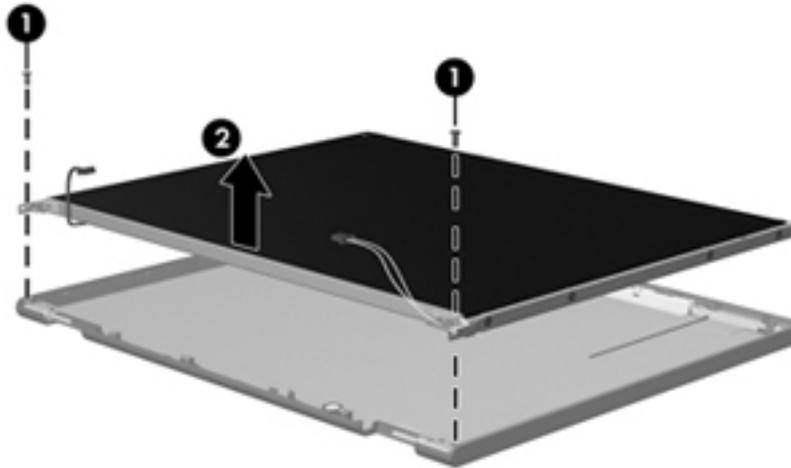
7. Turn the display panel assembly upside-down.

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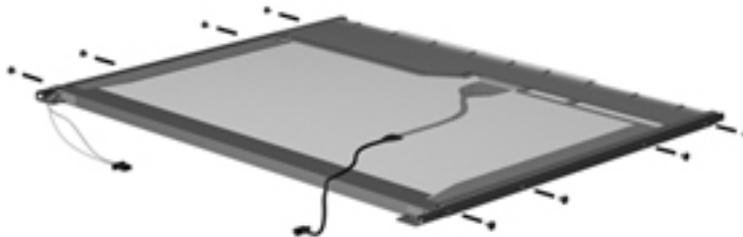
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

10. Remove the display panel frame **(2)** from the display panel.
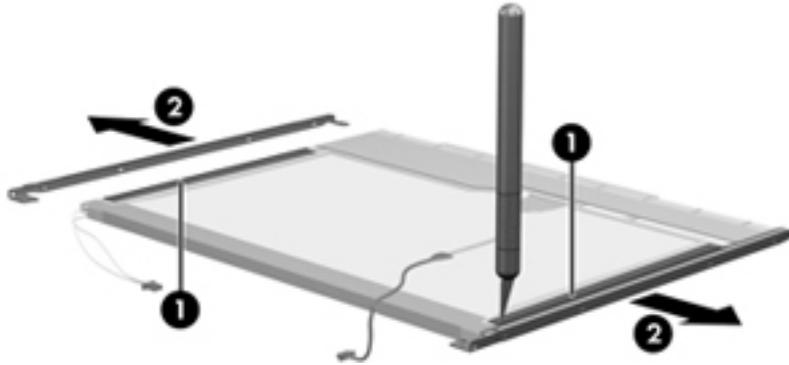
11. Remove the screws **(1)** that secure the backlight cover to the display panel.

12. Lift the top edge of the backlight cover **(2)** and swing it outward.
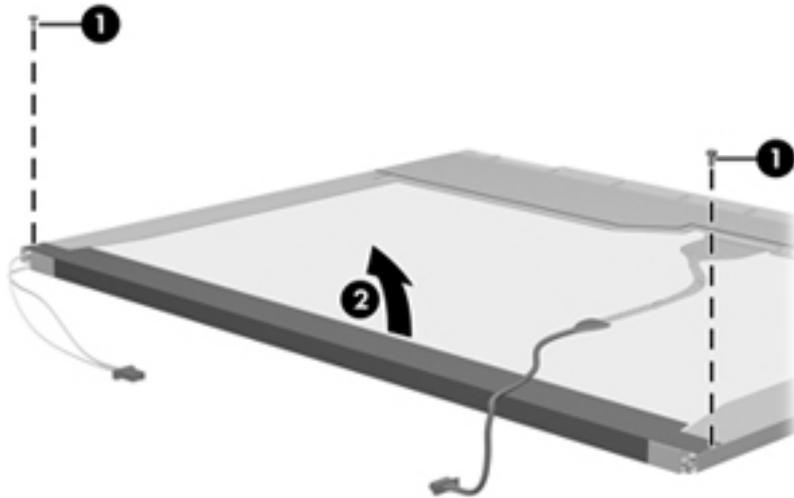
13. Remove the backlight cover.

14. Turn the display panel right-side up.

15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.
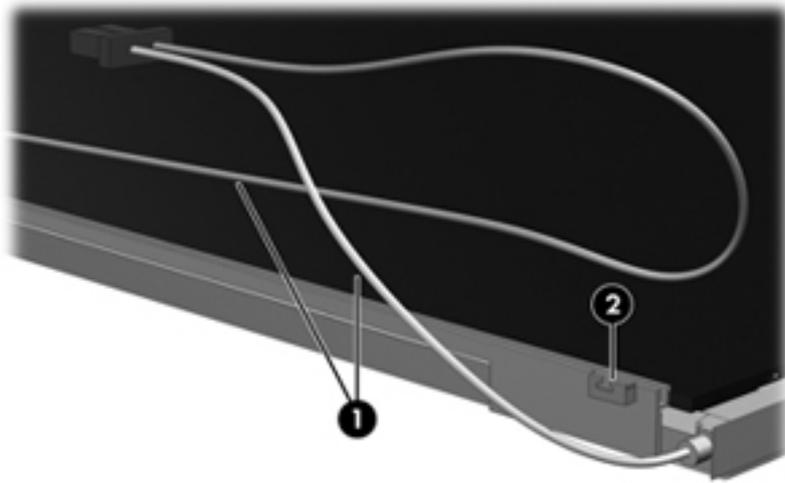
16. Turn the display panel upside-down.

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

17. Remove the backlight frame from the display panel.
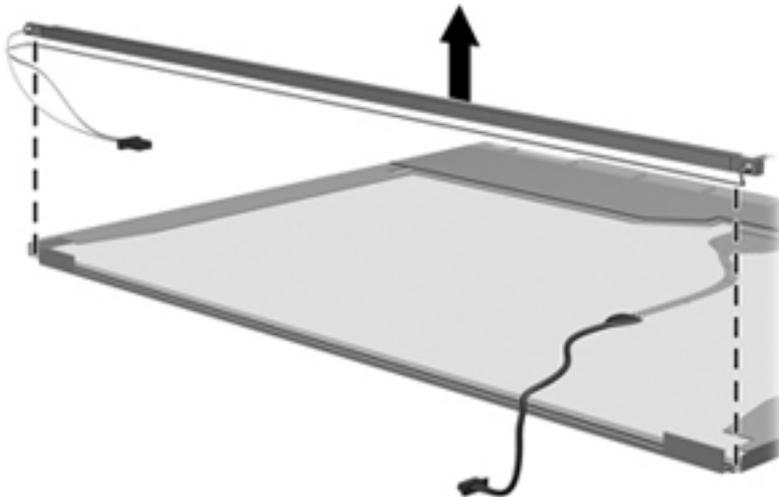
18. Remove the backlight from the backlight frame.
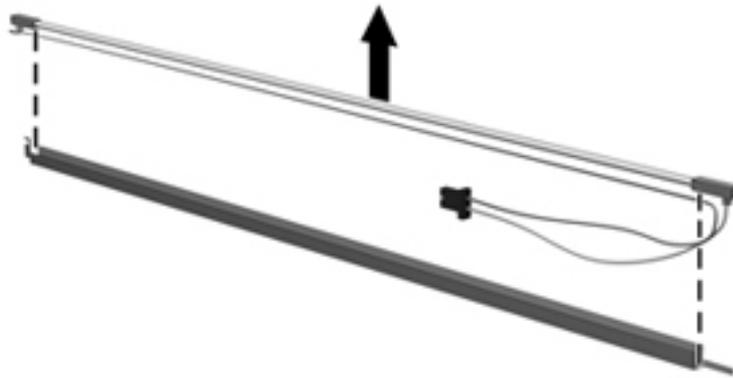
19. Disconnect the display panel cable **(1)** from the LCD panel.

20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.

21. Release the LCD panel **(3)** from the display rear panel.

22. Release the tape **(4)** that secures the LCD panel to the display rear panel.
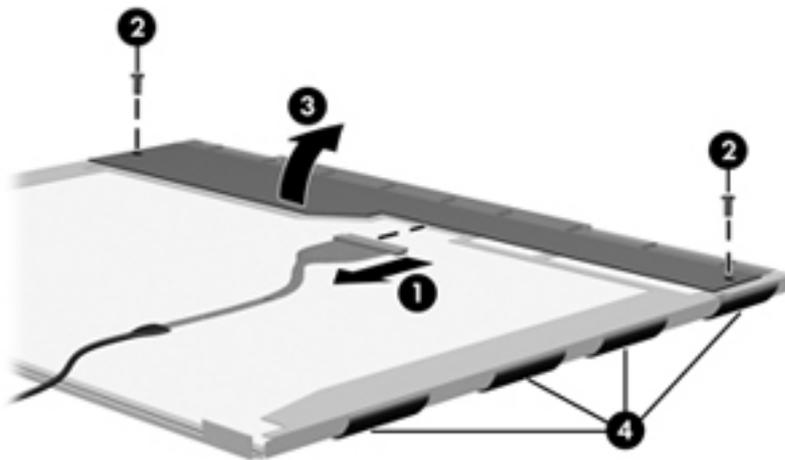
23. Remove the LCD panel.
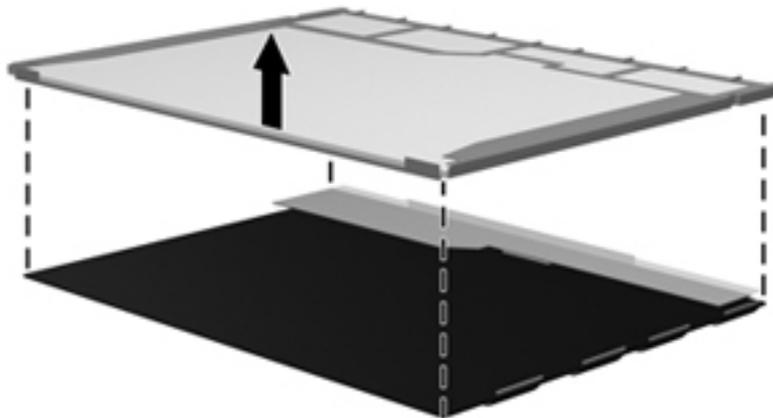
24. Recycle the LCD panel and backlight.

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