HP ProBook 4230s Notebook PC

Maintenance and Service Guide

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
Product Name	**HP ProBook 4230s Notebook PC**
Processors	**Intel® Core™ i7 processor, Dual Core**
	2620M, 2.70-GHz (Turbo up to 3.40-MHz) processor 4-MB L3 cache, 4 threads
	Intel Core i5 processors, Dual Core
	2540M, 2.60-GHz (Turbo up to 3.30-MHz) processor 3-MB L3 cache, 4 threads
	2520M, 2.50-GHz (Turbo up to 3.20-MHz) processor 3-MB L3 cache, 4 threads
	2430M, 2.40-GHz (Turbo up to 3.0-MHz) processor 3-MB L3 cache, 4 threads
	2410M, 2.30-GHz (Turbo up to 2.90) processor 3-MB L3 cache, 4 threads
	Intel Core i3 processors, Dual Core
	2350M, 2.30-GHz processor 3-MB L3 cache
	2330M, 2.20-GHz processor 3-MB L3 cache
	2310M, 2.10-GHz processor 3-MB L3 cache
	Intel Pentium Dual-Core processors
	B940, 2.1-GHz processor 2-MB L3 cache, 2 threads
	B910, 2.0-GHz processor 2-MB L3 cache, 2 threads
	Intel Celeron processors
	B840, 1.90-GHz processor 2-MB L3 cache, 2 threads
	B810, 1.60-GHz processor 2-MB L3 cache, 2 threads
Chipset	Mobile Intel HM65 chipset
Graphics	Intel HD Graphics 3000 (UMA)(non-Celeron)
	Intel HD Graphics (Celeron only)
	Integrated with shared video memory, dynamically allocated
Panel	All display assemblies include 2 wireless local area network (WLAN) antennas
	All displays are LED backlit
	30.7-cm (12.1-inch) WXGA, 1280x800, anti-glare
	30.7-cm (12.1-inch) WXGA, 1280x800 with camera, anti-glare

Category	Description
	30.7-cm (12.1-inch) WXGA, 1280x800 with camera and WWAN, anti-glare
	30.7-cm (12.1-inch) WXGA, 1280x800, BrightView
	30.7-cm (12.1-inch) WXGA, 1280x800 with camera, BrightView
	Support privacy filter
Memory	Two customer-accessible/upgradeable memory module slots supporting up to 8 GB of RAM
	Supports dual-channel memory
	PC3-10600, 1333-MHz, DDR3
	Supports the following configurations:
	• 8192 (4096 × 2)
	• 4096 (2048 × 2)
	• 4096 (4096 × 1)
	• 3072 (2048 + 1024)
	• 2048 (2048 × 1)
	• 2048 (1024 × 2)
	• 1024 (1024 × 1) (not available with 64-bit operating system or Restore Media)
Hard drives	Supports 9.5-mm or 7-mm, 6.35-cm (2.50-in) SATA hard drives with HP DriveGuard
	Customer-accessible
	Supports the following drives:
	• 750-GB, 7200-rpm
	• 500-GB, 7200-rpm
	• 320-GB, 7200-rpm
	• 250-GB, 7200-rpm
	• 640-GB, 5400-rpm
	• 500-GB, 5400-rpm
	• 320-GB, 5400-rpm
	• 250-GB, 5400-rpm
Audio/Visual	Integrated dual-array microphone (webcam models only)
	Integrated microphone (non-webcam models)
	Stereo speakers (2)
	Integrated webcam (720p HD), fixed focus
	Supports no camera option
	Headphone and microphone jacks
Modem	56K V.92 MDC data/fax modem

Category	Description
	Modem cable not included
	Supports "No Modem" option
Ethernet	Realtek RTL8151EH-CG 10/100/1000
	S3/S4/S5 wake on LAN
	Ethernet cable not included
Wireless	**Integrated WLAN options by way of wireless module:**
	Two WLAN antennas built into display assembly
	Supports "no WLAN" option
	Supports the following WLAN formats: ● Ralink 802.11 b/g/n 1×1 ● Realtek 802.11 b/g/n 1×1 ● Atheros 802.11 b/g/n +BT Combo ● Ralink 802.11 a/b/g/n +BT Combo ● Realtek 802.11 b/g/n +BT Combo ● Intel 802.11 a/b/g/n 2×2 +BT Combo
	Integrated WWAN options by way of wireless module:
	Two WWAN antennas built into display assembly (world-wide 5 band, configured with panels on all units)
	Subscriber identity module (SIM) security (customer-accessible in battery bay)
	Supports "no WWAN" option
	Qualcomm Gobi 3000 HSPA/CDMA with GPS
	Integrated personal area network (PAN) options by way of Bluetooth® module:
	Bluetooth 3.0 only supported by combo card
External media card	6-in-1 Digital Media Reader Slot
Ports	Audio-in (stereo microphone)
	Audio-out (stereo headphone)
	RJ-11 (modem)
	RJ-45 (Ethernet, includes link and activity lights)
	USB 3.0 (1)
	USB 2.0 + power port
	USB 2.0 (1)
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/ unplug with auto-detect)
	HDMI
	Multi-pin AC port

Category	Description
Keyboard/pointing devices	Full-sized keyboard
	Touchpad includes: supports 2-way scroll with legend, taps enabled by default, 2-finger scrolling and zoom enabled by default
Power requirements	Smart AC adapter with localized cable plug support (3-wire plug with ground pin):
	65-W "Smart" AC adapter
	65-W "Slim" AC adapter (ABJ and ACF only)
	In-line cavity
	6-cell, 62-Wh Li-ion battery
	4-cell, 41-Wh Li-ion battery
Security	Integrated fingerprint reader
	Intel AT support
	Support Kensington security lock
	Trusted Platform Module (TPM) support
	Support no fingerprint reader option
Operating system	**Preinstalled:**
	Windows 7 Professional 32 with Microsoft® Basics
	Windows 7 Professional 64 with Microsoft Basics
	Windows 7 Home Premium 64 with Microsoft Basics
	Windows 7 Home Premium 32 with Microsoft Basics
	Windows Vista Home Basic 32 with Microsoft Basics
	Novell™: SuSE Linux™ – SLED 11
	FreeDOS
	Preinstalled with Microsoft Office:
	Windows 7 Professional 32 with Microsoft Office 2010 Starter EDGI
	Windows 7 Professional 32 with Microsoft Office 2010 Starter
	Windows 7 Professional 32 with Microsoft Office 2010 Personal
	Windows 7 Professional 32 with Microsoft Office 2010 Home & Business
	Windows 7 Professional 32 with Microsoft Office 2010 Professional
	Windows 7 Professional 64 with Microsoft Office 2010 Starter EDGI
	Windows 7 Professional 64 with Microsoft Office 2010 Starter
	Windows 7 Professional 64 with Microsoft Office 2010 Personal
	Windows 7 Professional 64 with Microsoft Office 2010 Home & Business
	Windows 7 Professional 64 with Microsoft Office 2010 Professional
	Windows 7 Home Premium 32 with Microsoft Office 2010 Starter EDGI
	Windows 7 Home Premium 32 with Microsoft Office 2010 Starter

Category	Description
	Windows 7 Home Premium 32 with Microsoft Office 2010 Personal
	Windows 7 Home Premium 32 with Microsoft Office 2010 Home & Business
	Windows 7 Home Premium 32 with Microsoft Office 2010 Professional
	Windows 7 Home Premium 64 with Microsoft Office 2010 Starter EDGI
	Windows 7 Home Premium 64 with Microsoft Office 2010 Starter
	Windows 7 Premium 64 with Microsoft Office 2010 Personal
	Windows 7 Premium 64 with Microsoft Office 2010 Home & Business
	Windows 7 Premium 64 with Microsoft Office 2010 Professional
	Windows 7 Home Basic 32 with Microsoft Office 2010 Starter EDGI
	Windows 7 Home Basic 32 with Microsoft Office 2010 Starter
	Windows Vista Basic 32 with Microsoft Office 2010 Starter
	Windows Vista Basic 32 with Microsoft Office 2010 Personal
	Windows Vista Basic 32 with Microsoft Office 2010 Home & Business
	Windows Vista Basic 32 with Microsoft Office 2010 Professional
	Windows 7 Starter with Office 2010 Starter
	Windows 7 Starter with Office 2010 Starter - EDGI
	Restore Media:
	Windows 7 Professional 64
	Windows 7 Professional 32
	Windows 7 Home Basic 32
	Windows 7 Home Premium 64
	Windows 7 Home Premium 32
	Windows 7 Starter
	DRDVD Windows 7
	Windows Vista – through Service only
	Web-only support:
	Windows XP Professional
	Certified:
	Microsoft WHQL
Serviceability	**End-user replaceable parts:**
	AC adapter
	Battery (system)
	Hard drive
	Memory module

Category	Description
	WLAN module
	WWAN module, SIM
	Keyboard

2 External component identification

Display

Component		Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(3)	Internal microphone(s) (1 or 2 depending on model)	Record sound.
(4)	Webcam light (select models only)	On: The webcam is in use.

Component		Description
(5)	Webcam (select models only)	Records video and captures still photographs.
		To use the webcam, select **Start > All Programs > ArcSoft Camera Suite > WebCam Companion**.

*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.

Top

TouchPad
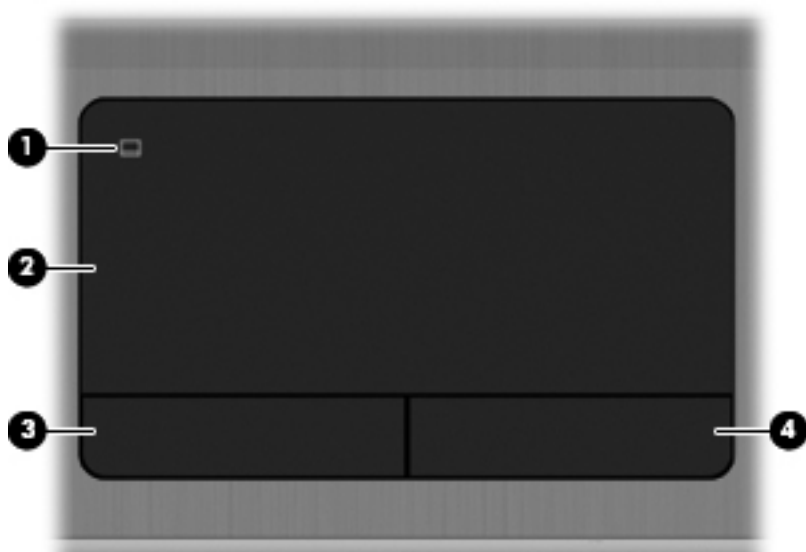
Component		Description
(1)	TouchPad on/off button	Turns the TouchPad on and off.
(2)	TouchPad	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

Lights

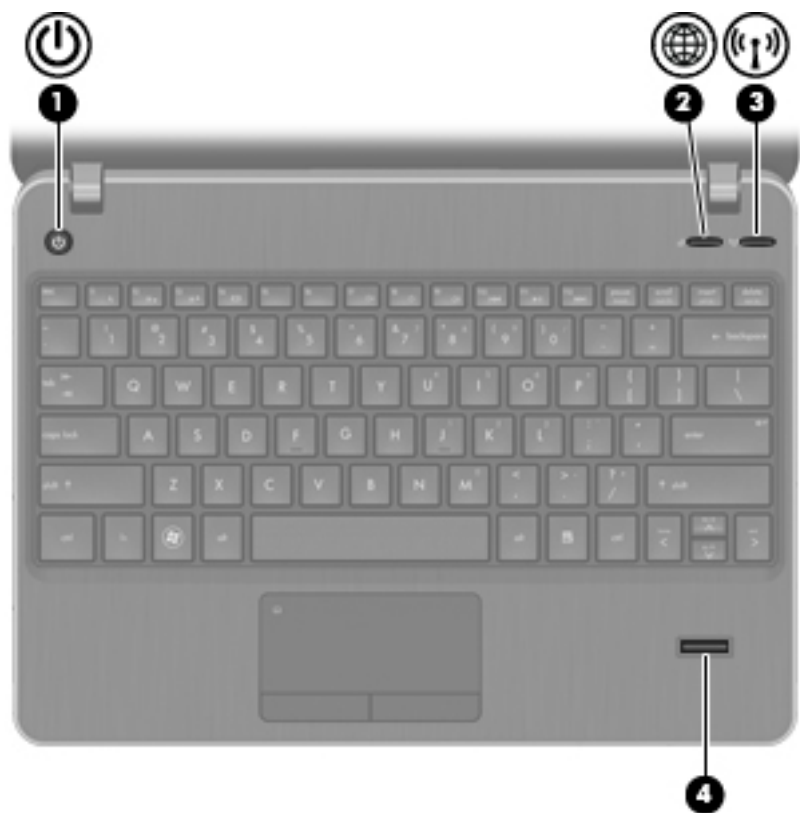| Component		Description
(1)	Power light	• On: The computer is on.
		• Blinking: The computer is in the Sleep state.
		• Off: The computer is off or in Hibernation.
(2)	QuickWeb light	• On: The computer is on or the default Web browser is in use.
		• Blinking: When the QuickWeb button is pressed, the light blinks 5 times, and then the default Web browser opens.
		NOTE: To use HP QuickWeb when the computer is off, HP QuickWeb must be enabled in Computer Setup.
(3)	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.
(4)	Caps lock light	On: Caps lock is on.
(5)	TouchPad light	• Off: The TouchPad is on.
		• Amber: The TouchPad is off.

Buttons and fingerprint reader (select models only)

Component		Description
(1)	Power button	● When the computer is off, press the button to turn on the computer.
		● When the computer is on, press the button briefly to initiate Sleep.
		● When the computer is in the Sleep state, press the button briefly to exit Sleep.
		● When the computer is in Hibernation, press the button briefly to exit Hibernation.
		If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.
		To learn more about your power settings:
		● **Windows 7**—Select **Start > Control Panel > System and Security > Power Options**.
		● **Windows Vista**—Select **Start > Control Panel > System and Maintenance > Power Options**
		● Or refer to the *HP Notebook Reference Guide*.

Component			Description
(2)	⊕	HP QuickWeb light	• When the computer is off or in Hibernation, press the button to open HP QuickWeb.
			• When the computer is in Microsoft Windows, press the button to open the default Web browser.
			• When the computer is in HP QuickWeb, press the button to open the default Web browser.
			NOTE: For more information, refer to "HP QuickWeb" in this guide and to the HP QuickWeb software Help. If your computer does not have HP QuickWeb software, the button does not perform any action or function.
(3)	((ı))	Wireless button	Turns the wireless feature on or off but does not establish a wireless connection.
(4)	▭	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

Keys
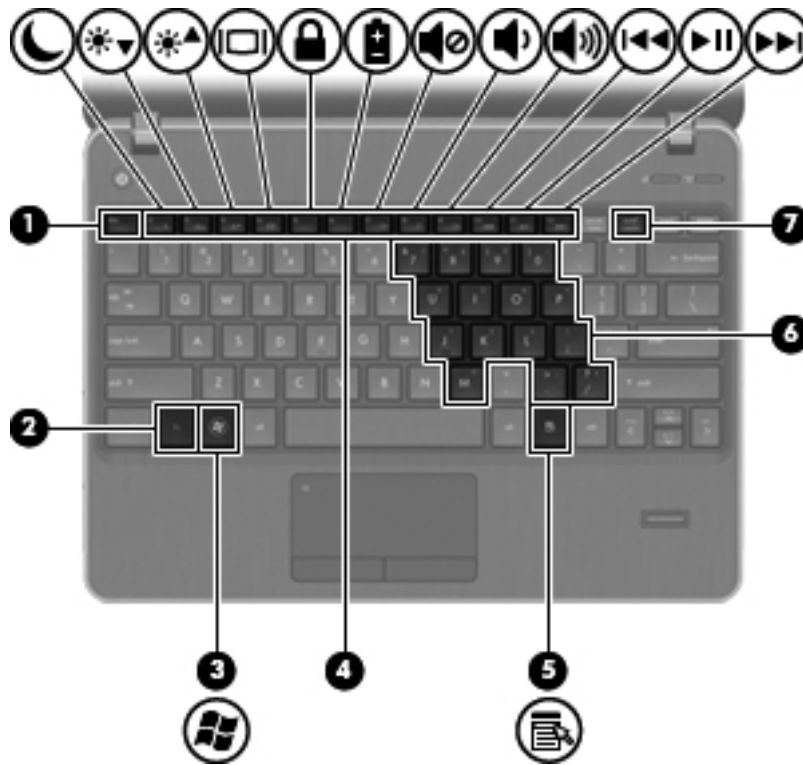
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, or the esc key.
(3)	Start key	Displays the Start menu.
(4)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(5)	Menu key	Displays the active programs's shortcut menu (same as the right-click menu).
(6)	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.
(7)	num lk key	Enables/disables the embedded numeric keypad when pressed in combination with the fn key.

Front

	Component	Description
(1)	Drive light	● Blinking white: The hard drive is being accessed. ● Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	Media Card Reader	Supports the following digital card formats: ● Memory Stick Pro ● Memory Stick Duo Pro ● MultiMediaCard ● MultiMediaCard Micro ● Secure Digital (SD) Card ● Secure Digital (SD) Card Micro
(3)	Speakers (2)	Produce sound.
(4)	Audio-out (headphone) jack	Connects optional headphones, earbuds, a headset, or television audio. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.
(5)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Left
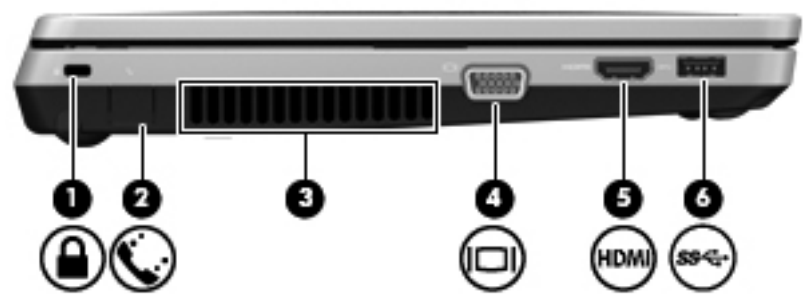
Component		Description
(1)	🔒 Security cable slot	Attaches an optional security cable to the computer.
		NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	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.
(4)	▢ External monitor port	Connects an external VGA monitor or projector.
(5)	HDMI HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(6)	SS⟲ SuperSpeed 3.0 USB port	Connects an optional USB device.

Right

Component		Description
(1)	AC adapter light	• White: The computer is connected to external power and the battery is 90 to 99% charged. • Amber: The computer is connected to external power and the battery is 0 to 90% charged. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: The battery is fully charged. **NOTE:** If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(2)	USB 2.0 powered/charging port	Connects optional USB devices.
(3)	USB port	Connects optional USB devices.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	Power connector	Connects an AC adapter.

Bottom

Component		Description
(1)	Battery and access cover release latches	Release the battery from the battery bay, and release the access cover from the computer.
(2)	Battery bay	Holds the battery.
(3)	SIM slot	Contains a wireless subscriber identity module (SIM) (select models only). The SIM slot is located inside the battery bay.
(4)	Vents (2)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	Access door	Contains the hard drive, the wireless LAN module slot, and the memory module slot. **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

3 Illustrated parts catalog

Service tag

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

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

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

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

- Warranty period **(4)**. This number describes the duration (in years) of the warranty period for the computer.

- Model description **(5)**. This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Computer major components
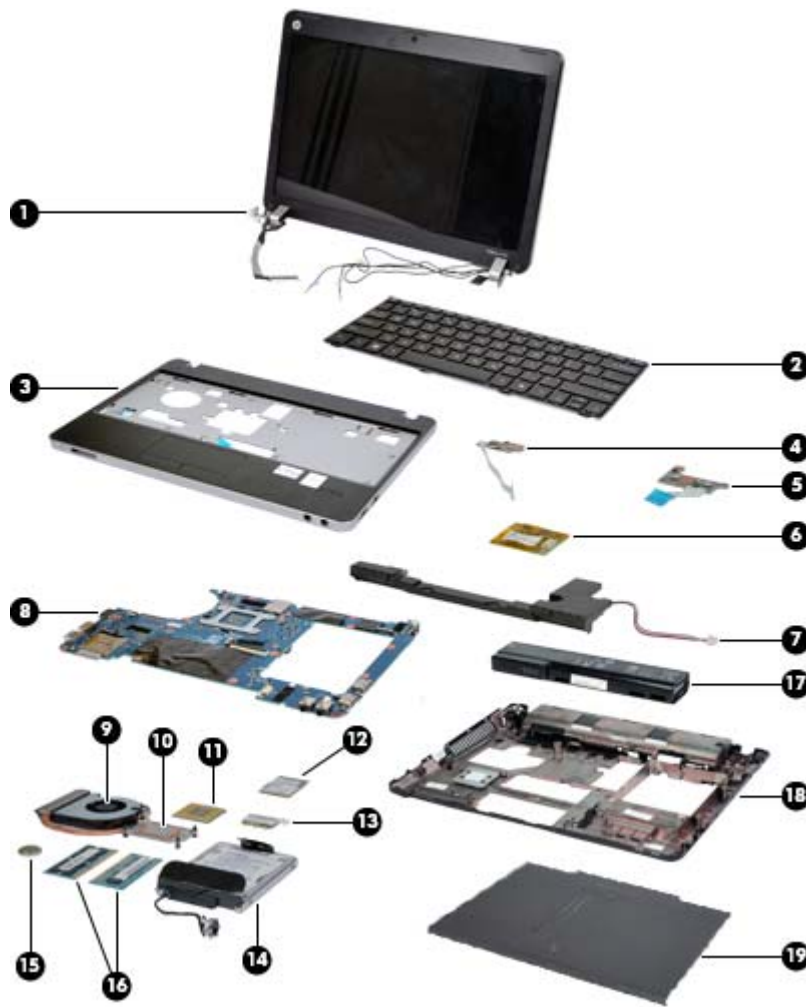
Item	Description	Spare part number
(1)	**Display panel**	
	30.7-cm (12.1-inch) WXGA, anti-glare	646017-001
	30.7-cm (12.1-inch) WXGA, anti-glare with webcam	646019-001
	30.7-cm (12.1-inch) WXGA, anti-glare with webcam and WWAN	646021-001
	30.7-cm (12.1-inch) WXGA, BrightView	646023-001
	30.7-cm (12.1-inch) WXGA, BrightView with webcam	646025-001
(2)	**Keyboard** (includes cable)	646029-xx1
	NOTE: For a detailed list of available keyboards, see Sequential part number listing on page 28.	
(3)	**Top cover** (includes Touchpad board)	
	For use in models with USB 3.0 and with a fingerprint reader	646041-001
	For use in models with USB 3.0 and without a fingerprint reader	646047-001

Item	Description	Spare part number
	With a fingerprint reader slot insert for use in computers that do not support a fingerprint reader	657232-001
	For use in computers with USB 2.0 and a fingerprint reader	657960-001
	For use in computers with USB 2.0 and without a fingerprint reader	657961-001
	With no USB logo for use in USB 2.0 or USB 3.0 computers with a fingerprint reader	666893-001
	With no USB logo for use in USB 2.0 or USB 3.0 computers without a fingerprint reader	666894-001
(4)	**Power button board**	647132-001
(5)	**Quick Launch board**	646048-001
(6)	**Modem module**	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, spare part number 646016-001. See Cable Kit on page 26 for more Cable Kit spare part number information.	
(7)	**Speaker assembly**	646038-001
(8)	**System board** (includes replacement thermal material)	
	For use in models without WWAN	646039-001
	For use models with WWAN	646040-001
	For use in models with WWAN in Russia and the People's Republic of China	646040-AA1
(9)	**Fan**	646027-001
(10)	**Heat sink** (includes replacement thermal material)	646028-001
(11)	**Processor**	
	Intel Core i7 processors, Dual Core	
	2620M, 2.7-GHz (turbo up to 3.4-GHz) processor 4-MB L3 cache	631252-001
	Intel Core i5 processors, Dual Core	
	2540M, 2.6-GHz (turbo up to 3.3-GHz) processor 3-MB L3 cache (includes phase change material (PCM))	631255-001
	2520M, 2.5-GHz (turbo up to 3.2-GHz) processor 3-MB L3 cache (includes phase change material (PCM))	631253-001
	2430M, 2.4-GHz (turbo up to 3.0-GHz) processor 3-MB L3 cache	653341-001
	2410M, 2.3-GHz (turbo up to 2.9-GHz) processor 3-MB L3 cache	638039-001
	Intel Core i3 processors, Dual Core	
	2350M, 2.3-GHz processor 3-MB L3 cache (includes thermal grease)	653340-001
	2330M, 2.2-GHz processor 3-MB L3 cache (includes thermal grease)	653339-001
	2310M, 2.1-GHz processor 3-MB L3 cache (includes thermal grease)	638037-001
	Intel Pentium Dual-Core processors	
	B950, 2.1-GHz, with 2-MB L3 cache	653338-001
	B940, 2.0-GHz, with 2-MB L3 cache	653337-001

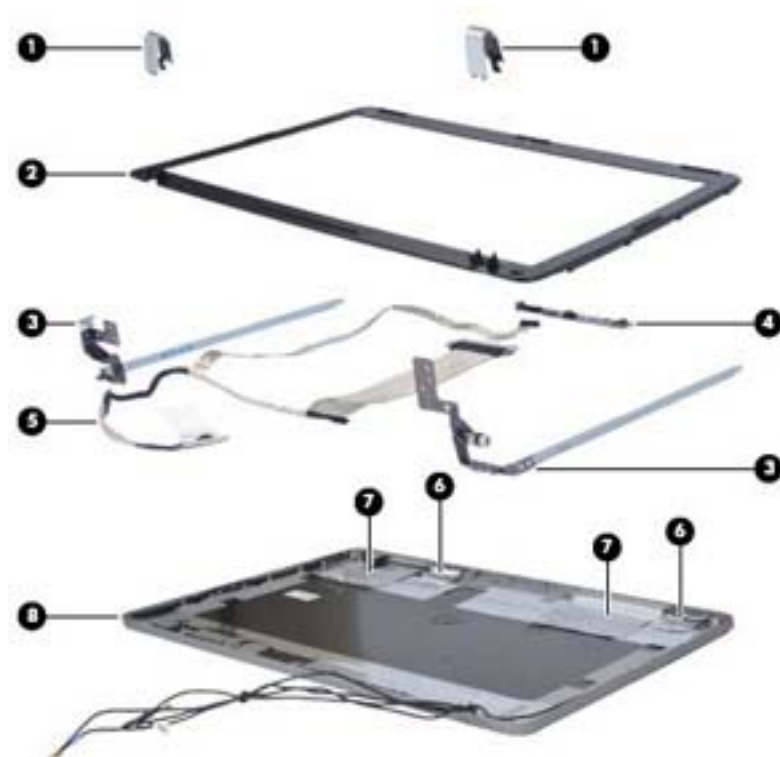| Item	Description	Spare part number
	Intel Celeron processors	
	B840, 1.9-GHz, with 2-MB L3 cache	664663-001
	B810, 1.6-GHz, with 2-MB L3 cache	646760-001
(12)	**WWAN modules**	
	HP un2430 EV-DO/HSPA Mobile Broadband Module	634400-001
	HP hs2340 HSPA+ Mobile Broadband Module	632155-001
(13)	**WLAN modules**	
	Atheros AR9002WB-1NGB 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	593127-001

Item	Description	Spare part number
	Realtek 8188BC8 802.11a/b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	602993-001
	Ralink 5390GN 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	630703-001

Item	Description	Spare part number
	Ralink 8190BC8 802.11b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	630813-001
	Realtek 8188GN 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	640926-001

Item	Description	Spare part number
	Intel Centrino® Advanced-N 6230 for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	636672-001
(14)	**Hard drive**	
	750-GB, 7200-rpm	633252-001
	640-GB, 5400-rpm	603785-001
	500-GB, 7200-rpm	634926-001
	500-GB, 5400-rpm	634638-001
	320-GB, 5400-rpm	645193-001
	320-GB, 7200-rpm	634862-001
	250-GB, 7200-rpm	634861-001
	250-GB, 5400-rpm	645191-001
(15)	**RTC battery**	650924-001
(16)	**Memory modules** (PC3-10600, 1333-MHz, DDR3)	
	Before adding new memory, make sure you update the computer to the latest BIOS.	
	CAUTION: Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.	
	4-GB	621569-001
	2-GB	621565-001
	1-GB	639736-001
(17)	**Battery, Li-ion**	
	6-cell (62 WHr, 2.8 Ah)	633803-001

Item	Description	Spare part number
	6-cell, 55 WHr, 2.8 Ah Li-ion battery	660151-001
	4-cell (41 WHr, 2.8 Ah)	633801-001
(18)	**Base enclosure**	646013-001
(19)	**Access door**	646049-001

Display components

Item	Description	Spare part number
(1)	**Display bezel**	
	For use on models with a webcam	646014-001
	For use on models without a webcam	646015-001
(2)	**Display hinge cover**	646043-001
(3)	**Display hinge/bracket kit** (includes left and right hinges and brackets)	646042-001
(4)	**Webcam module**	642795-001
	Microphone module (not illustrated)	642797-001
(5)	**Display Cable Kit** (includes integrated webcam cable)	646044-001
(6)	**WLAN antennas**	646010-001
(7)	**WWAN antennas**	646011-001

Item	Description	Spare part number
(8)	**Display enclosure**	646012-001
	Bracket Kit (includes RJ-11 bracket and power bracket; not illustrated)	646045-001

Plastics Kit

Item	Description	Spare part number
	Plastics Kit	646035-001
(1)	RJ-11 holder	
(2)	Secure Digital card protective insert	
(3)	SIM protective insert	

Cable Kit
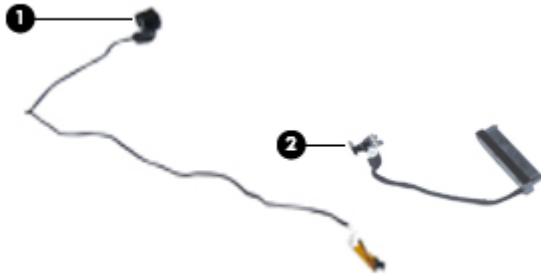
Item	Description	Spare part number
	Cable Kit	646016-001
(1)	Hard drive cable	
(2)	RJ-11 connector cable	

Mass storage devices

Description	Spare part number
Hard drives	
750-GB, 7200-rpm	633252-001
640-GB, 5400-rpm	603785-001
500-GB, 7200-rpm	634926-001
500-GB, 5400-rpm	634638-001
320-GB, 5400-rpm	645193-001
320-GB, 7200-rpm	634862-001
250-GB, 7200-rpm	634861-001
250-GB, 5400-rpm	645191-001
Hard Drive Hardware Kit (includes hard drive bracket, insulator, and screws)	646046-001
External DVD±RW and CD-RW DL Combo Drive	602041-001

Miscellaneous parts

Description	Spare part number
AC adapters	
65-W AC adapter	609939-001
65-W AC adapter for use in India	609948-001
65-W travel adapter	592814-001
Power cords:	
For use in Australia and New Zealand	490371-011
For use in the People's Republic of China	490371-AA1
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in South Korea	490371-AD1
For use in Taiwan	490371-AB1
For use in the United Kingdom	490371-031
For use in the United States	490371-001
Rubber Kit (includes bottom feet)	646036-001
Screw Kit	646037-001
Power cable, 65-W	414135-001
Adapter, plug head for use in the Asia/Pacific region	601451-371
Adapter, USB power	619240-001
HP keyed cable lock	626729-001
Mouse, optical, 2-button	390632-001
HP optical travel mouse	434594-001
HP basic carrying case	455084-001
Professional slim, top load case	592923-001
Notebook combination lock	591699-001
Nylon case	612757-001

Sequential part number listing

Spare part number	Description
390632-001	Mouse, optical, 2-button
414135-001	Power cable, 65-W
434594-001	HP optical travel mouse
455084-001	HP basic carrying case
490371-001	Power cord for use in North America
490371-011	Power cord for use in Australia and New Zealand
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-D61	Power cord for use in India
591699-001	Notebook combination lock
592814-001	65-W travel adapter
592923-001	Professional slim, top load case
593127-001	Atheros AR9002WB-1NGB 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
601451-371	Adapter, plug head for use in the Asia/Pacific region
602041-001	External DVD±RW and CD-RW DL Combo Drive

Spare part number	Description
602993-001	Realtek 8188BC8 802.11a/b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
603785-001	640-GB, 5400-rpm hard drive
609939-001	65-W AC adapter
609948-001	65-W AC adapter for use in India
612757-001	Nylon case
619240-001	Adapter, USB power
621565-001	2-GB memory module (PC3-10600, 1333-MHz, DDR3)
621569-001	4-GB memory module (PC3-10600, 1333-MHz, DDR3)
626729-001	HP keyed cable lock
628824-001	Modem module
	NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 646016-001. See Cable Kit on page 26 for more Cable Kit spare part number information.

Spare part number	Description
630703-001	Ralink 5390GN 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
630813-001	Ralink 8190BC8 802.11b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
631252-001	Intel Core i7 processor, 2620M, 2.7-GHz (turbo up to 3.4-GHz) processor, 4-MB L3 cache (includes thermal material)
631253-001	Intel Core i5 processor, 2520M, 2.5-GHz (turbo up to 3.2-GHz) processor, 3-MB L3 cache (includes thermal material)
631255-001	Intel Core i7 processor, 2540M, 2.6-GHz (turbo up to 3.3-GHz) processor, 3-MB L3 cache (includes thermal material)
632155-001	HP hs2340 HSPA+ Mobile Broadband Module (WWAN)
633252-001	750-GB, 7200-rpm hard drive
633801-001	4-cell, 41 WHr, 2.8 Ah Li-ion battery

Spare part number	Description
633803-001	6-cell, 62 WHr, 2.8 Ah Li-ion battery
634400-001	HP un2430 EV-DO/HSPA Mobile Broadband Module
634638-001	500-GB, 5400-rpm hard drive
634861-001	250-GB, 7200-rpm hard drive
634862-001	320-GB, 7200-rpm hard drive
634926-001	500-GB, 7200-rpm hard drive
636672-001	Intel Centrino Advanced-N 6230 for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
638037-001	Intel Core i3 processor, 2310M, 2.1-GHz, 3-MB L3 cache (includes thermal material)
638039-001	Intel Core i5 processor, 2410M, 2.3-GHz (turbo up to 2.9-GHz), 3-MB L3 cache (includes thermal material)
639736-001	1-GB memory module (PC3-10600, 1333-MHz, DDR3)

Spare part number	Description
640926-001	Realtek 8188GN 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
642795-001	Webcam module
642797-001	Microphone module
645191-001	250-GB, 5400-rpm hard drive
645193-001	320-GB, 5400-rpm hard drive
646010-001	WLAN antennas
646011-001	WWAN antennas
646012-001	Display enclosure
646013-001	Base enclosure
646014-001	Display bezel for use with models with a webcam
646015-001	Display bezel for use with models without a webcam
646016-001	Cable Kit(see Cable Kit on page 26 for more Cable Kit spare part information)
646017-001	Display assembly, 30.7-cm (12.1-inch) WXGA, anti-glare
646019-001	Display assembly, 30.7-cm (12.1-inch) WXGA, anti-glare with webcam
646021-001	Display assembly, 30.7-cm (12.1-inch) WXGA, anti-glare with webcam and WWAN
646023-001	Display assembly, 30.7-cm (12.1-inch) WXGA, BrightView
646025-001	Display assembly, 30.7-cm (12.1-inch) WXGA, BrightView with webcam
646027-001	Fan
646028-001	Heat sink
646029-001	Keyboard for use in the United States
646029-281	Keyboard for use in Thailand
646029-291	Keyboard for use in Japan

Spare part number	Description
646029-AB1	Keyboard for use in Taiwan
646029-AD1	Keyboard for use in South Korea
646029-D61	Keyboard for use in India
646035-001	Plastics Kit
646036-001	Rubber Kit (includes bottom feet)
646037-001	Screw Kit
646038-001	Speaker Kit
646039-001	System board for use in models without WWAN
646040-001	System board for models with WWAN
646040-AA1	System board for use in models with WWAN in Russia and the People's Republic of China
646041-001	Top cover for use in models with USB 3.0 and a fingerprint reader
646042-001	Display hinge/bracket kit
646043-001	Display hinge cover
646044-001	Display Cable Kit (includes integrated webcam cable)
646045-001	Bracket Kit (includes RJ-11 bracket and power bracket)
646046-001	Hard Drive Hardware Kit (includes hard drive bracket, insulator, and screws)
646047-001	Top cover for use in models with USB 3.0 and without a fingerprint reader
646048-001	Quick Launch board
646049-001	Access door
646760-001	Intel Celeron processor, B810, 1.6-GHz, 2-MB L3 cache (include thermal material)
647132-001	Power button board
650924-001	RTC battery
653337-001	Intel Pentium Dual-Core processor, B940, 2.0-GHz, 2-MB L3 cache (includes thermal material)
653338-001	Intel Pentium Dual-Core processor, B950, 2.1-GHz, 2-MB L3 cache (includes thermal material)
653339-001	Intel Core i3 processor, 2330M, 2.2-GHz, 3-MB L3 cache (includes thermal material)
653340-001	Intel Core i3 processor, 2350M, 2.3-GHz, 3-MB L3 cache (includes thermal material)
653341-001	Intel Core i5 processor, 2430M, 2.4-GHz (turbo up to 3.0-GHz), 3-MB L3 cache (includes thermal material)
657232-001	Top cover with a fingerprint reader slot insert for use in computers that do not support a fingerprint reader
657960-001	Top cover for use in computers with USB 2.0 and a fingerprint reader
657961-001	Top cover for use in computers with USB 2.0 and without a fingerprint reader
660151-001	6-cell, 55 WHr, 2.8 Ah Li-ion battery
664663-001	Intel Celeron processor, B840, 1.9-GHz, 2-MB L3 cache (includes thermal material)
666893-001	Top cover with no USB logo for use in USB 2.0 or USB 3.0 computers with a fingerprint reader
666894-001	Top cover with no USB logo for use in USB 2.0 or USB 3.0 computers without a fingerprint reader

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, and then degrade in the internal layers, reducing its life expectancy.

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

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

Use nonmagnetic tools.

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

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

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

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

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

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

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

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.

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

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

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

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

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

- Avoid contact with pins, leads, or circuitry.

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

Equipment guidelines

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

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape

- Antistatic smocks, aprons, and sleeve protectors

- Conductive bins and other assembly or soldering aids

- Nonconductive foam

- Conductive tabletop workstations with ground cords of one megohm resistance

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

- Field service kits

- Static awareness labels

- Material-handling packages

- Nonconductive plastic bags, tubes, or boxes

- Metal tote boxes

- Electrostatic voltage levels and protective materials

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

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

Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 95 screws and screw locks, in 15 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

Service tag

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

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

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

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

- Warranty period **(4)**. This number describes the duration (in years) of the warranty period for the computer.

- Model description **(5)**. This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 646036-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.
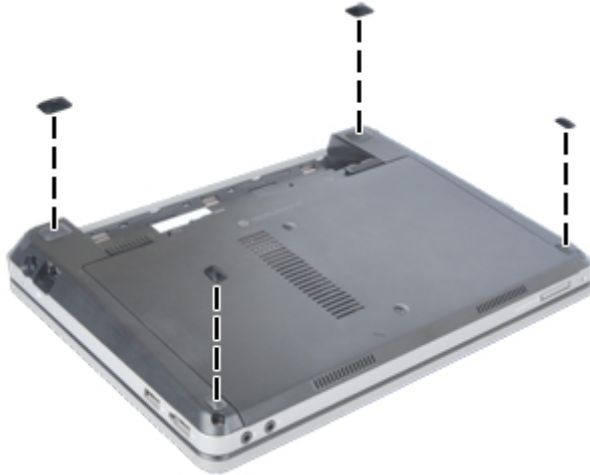
Battery

Description	Spare part number
6-cell, 62 WHr, 2.8 Ah Li-ion battery	633803-001
6-cell, 55 WHr, 2.8 Ah Li-ion battery	660151-001
4-cell, 41 WHr, 2.8 Ah Li-ion battery	633801-001

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. Position 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. Rotate the battery upward **(2)**, and then remove it from the computer **(3)**.
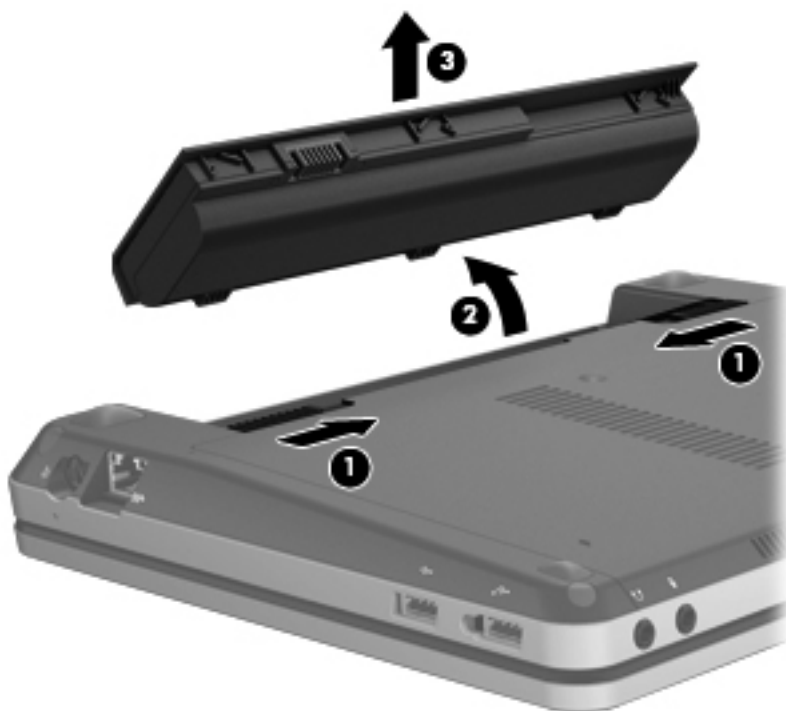
Install the battery by inserting it into the battery bay until you hear a click.

SIM

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

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

Before removing the SIM, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

Remove the SIM:

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

2. Remove the SIM **(2)** from the SIM slot.
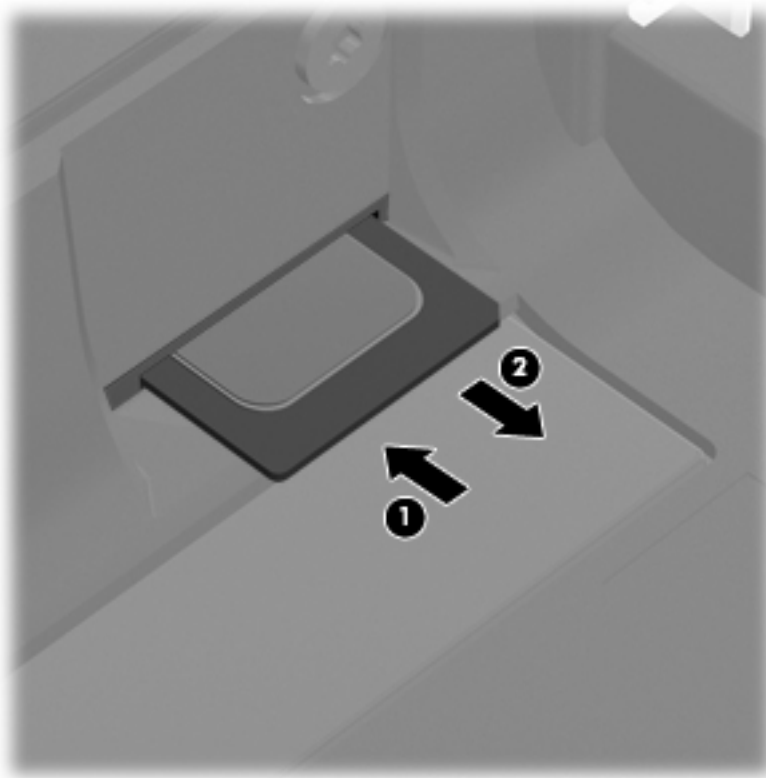
Reverse this procedure to install the SIM.

Access door

Description	Spare part number
Access door	646049-001

Before disassembling the computer, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

Remove the access door:

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

2. Remove the locking screw (if installed) **(1)** and slide the access door release latches **(2)** to release the cover.

3. Slide the door toward the front of the computer, and then lift the door off the computer **(3)**.

NOTE: The access door screw may be placed in the secure slot **(4)** for safekeeping while the cover is removed or if the screw is not inserted after replacing the access door.
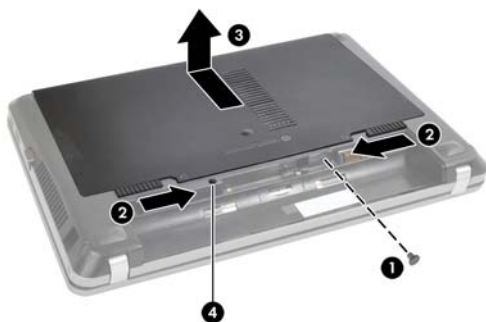
Reverse the removal procedures to install the access door.

Hard drive

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

Description	Spare part number
750-GB, 7200-rpm hard drive	633252-001
640-GB, 5400-rpm hard drive	603785-001
500-GB, 7200-rpm hard drive	634926-001
500-GB, 5400-rpm hard drive	634638-001
320-GB, 7200-rpm hard drive	634862-001
320-GB, 5400-rpm hard drive	645193-001
250-GB, 7200-rpm hard drive	634861-001
250-GB, 5400-rpm hard drive	645191-001
Hard Drive Hardware Kit (includes hard drive bracket, insulator, and screws)	646046-001

Before disassembling the computer, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see).

5. Remove the access door (see).

Remove the hard drive:

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

2. Disconnect the hard drive cable from the system board **(1)**.

3. Remove the four Phillips PM2.0×4.0 screws **(2)** that secure the hard drive to the computer.

4. Lift the hard drive **(3)** from the hard drive bay far enough to access the hard drive cable.

5. Disconnect the hard drive cable from the hard drive **(4)**.
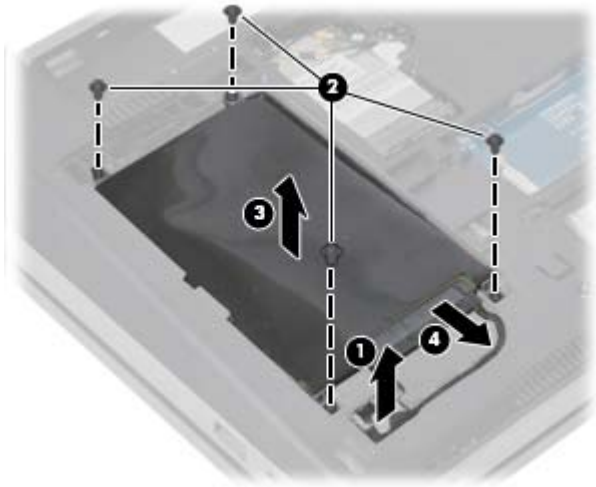
6. If it is necessary to replace the hard drive bracket, remove the tape **(1)** that secures the Mylar cover down onto the bracket, and then lift to open the Mylar cover **(2)**.

7. Remove the two Phillips PM3.0×3.0 hard drive bracket screws **(3)** from each side of the hard drive (4 total screws).

8. Rotate the hard drive upward and remove it from the bracket **(4)**.
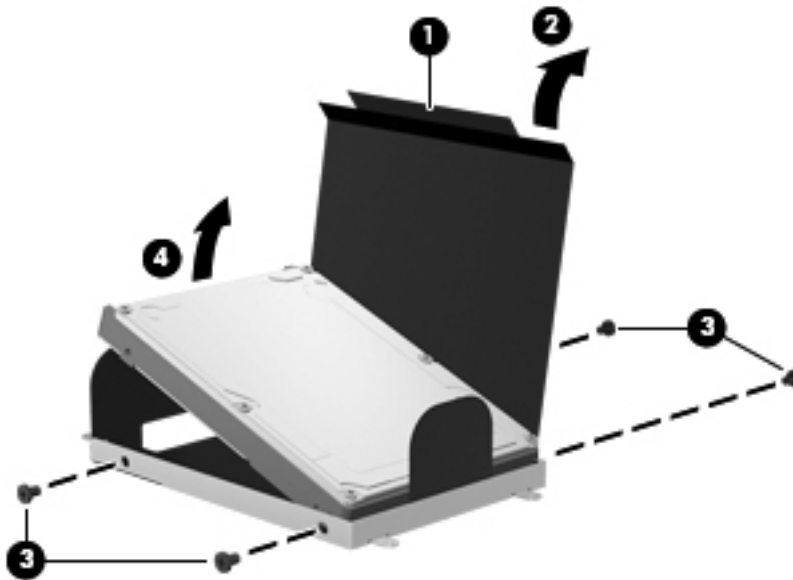
Reverse this procedure to reassemble and install the hard drive.

Memory modules

NOTE: This procedure is valid for either memory module.

Description	Spare part number
1-GB (PC3-10600, 1333-MHz, DDR3)	639736-001
2-GB (PC3-10600, 1333-MHz, DDR3)	621565-001
4-GB (PC3-10600, 1333-MHz, DDR3)	621569-001

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.

CAUTION: Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to www.hp.com.

2. Click **Support & Drivers >** click **Drivers & Software**.

3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.

4. Click the link for the computer model.

5. Select the operating system, and then click **Next**.

6. Under **Step 2: Select a Download**, click the **BIOS** link.

7. Click the link for the most recent BIOS.

8. Click the **Download** button, and then follow the on-screen instructions.

Before removing the memory module, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the access door (see Access door on page 43).

Remove the memory module:

1. Position the computer upside-down with the battery bay 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.
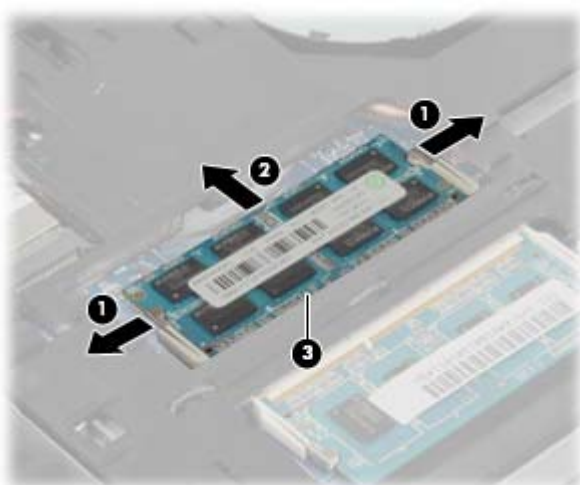
Reverse this procedure to install a memory module.

WWAN module

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

Description	Spare part number
HP un2430 EV-DO/HSPA Mobile Broadband Module	634400-001
HP hs2340 HSPA+ Mobile Broadband Module	632155-001

Before removing the WWAN module, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the SIM (see SIM on page 42).

6. Remove the access door (see Access door on page 43).

Remove the WWAN module:

1. Position the computer upside-down with the battery bay 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 WWAN module "Main" terminal. The blue WWAN antenna cable is connected to the WWAN module "Aux" terminal.

3. Remove the two Phillips PM2.0×4.0 screws **(2)** that secure the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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.

   Figure 4-1 Removing the WWAN module
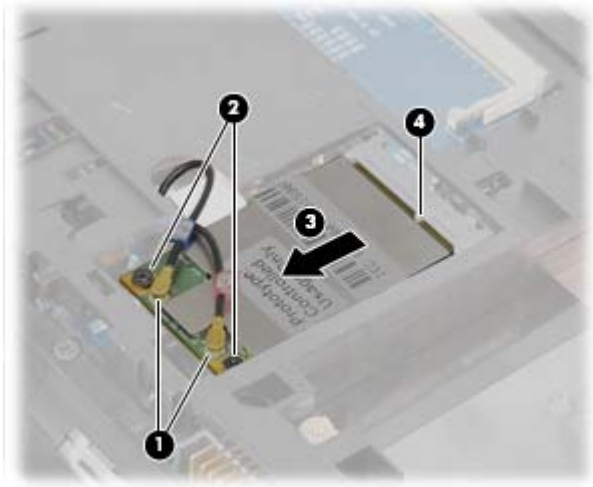
   NOTE: If the WWAN antennas are not connected to the terminals on the WWAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.
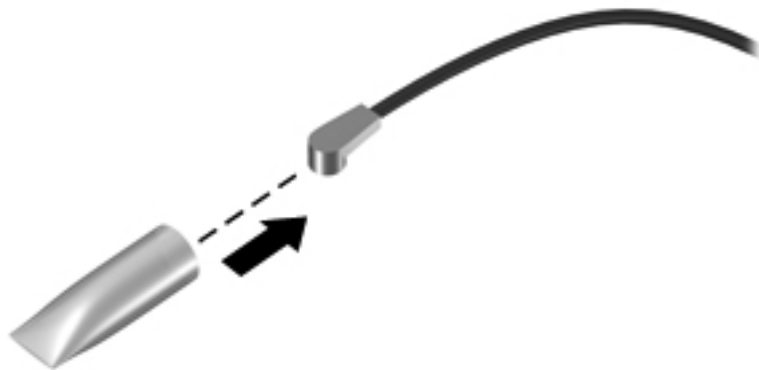
Reverse this procedure to install the WWAN module.

WLAN/Bluetooth combo card

The computer uses a card that provides both WLAN and Bluetooth functionality.

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

Description	Spare part number
Atheros AR9002WB-1NGB 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	593127-001
Realtek 8188BC8 802.11a/b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	602993-001

Description	Spare part number
Ralink 5390GN 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	630703-001
Ralink 8190BC8 802.11b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	630813-001

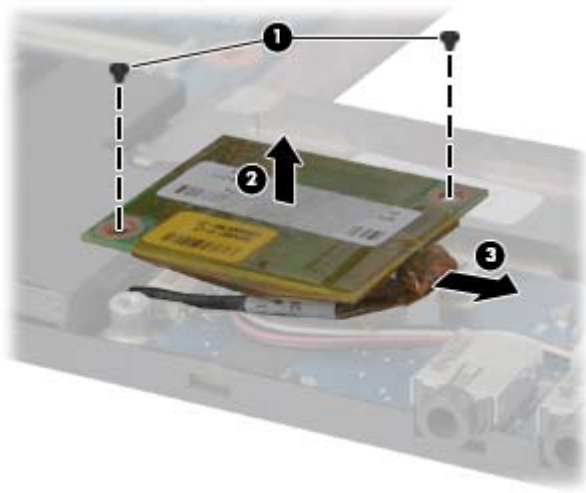| Description	Spare part number
Realtek 8188GN 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	640926-001
Intel Centrino Advanced-N 6230 for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Baltics, 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, Canada, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, 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, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Puerto Rico, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Russia, 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, 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, the United States, the US Virgin Islands, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	636672-001

Before removing the WLAN module, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the access door (see Access door on page 43).

Remove the WLAN module:

1. Position the computer upside-down with the battery bay toward you.

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

> **NOTE:** The WLAN antenna cable labeled "1" connects to the WLAN module "Main" terminal labeled "1". The WLAN antenna cable labeled "2" connects to the WLAN module "Aux" terminal labeled "2". If the computer is equipped with an 802.11a/b/g/n WLAN module, the yellow WLAN antenna cable connects to the middle terminal on the WLAN module.

3. Remove the two Phillips PM2.0×4.0 screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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.
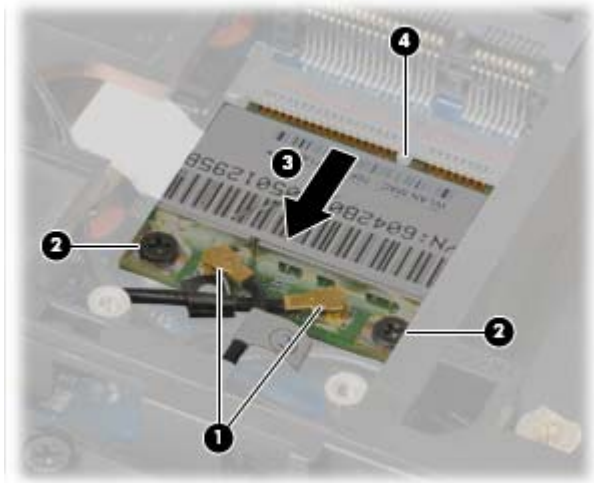
> **NOTE:** If the WLAN antennas are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.
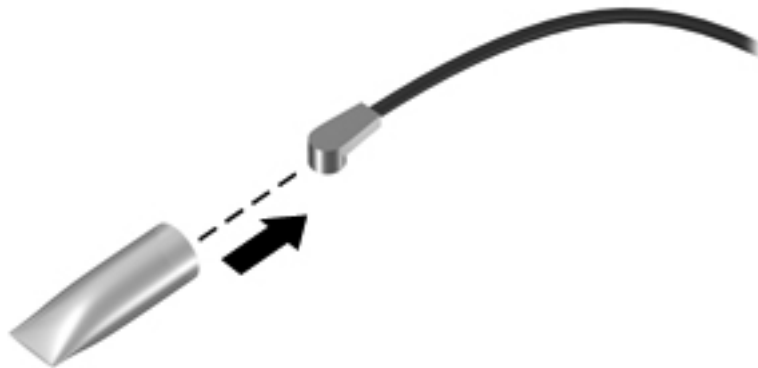
Reverse this procedure to install the WLAN module.

Keyboard

NOTE: For a detailed list of available keyboards, see Sequential part number listing on page 28.

Description	Spare part number
Keyboard	646029-xxx

Before removing the keyboard, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the access door (see Access door on page 43).

Remove the keyboard:

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

2. Remove the two Torx T8M2.5×7.0 screws that secure the keyboard to the computer.
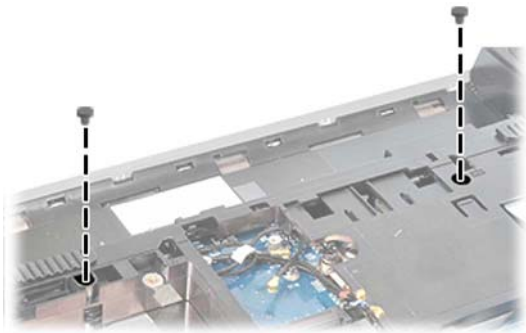
3. Keep the computer upside-down and open it to allow the keyboard room to disengage.

4. Using a pointed tool placed through the access hole in the battery bay, press to disengage the keyboard.
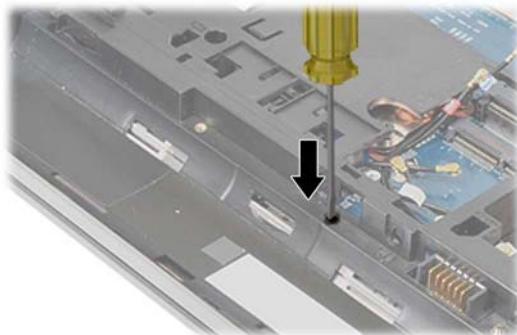
5. Position the computer upright and open it as far as possible.

6. Using a slim screwdriver, release the four top keyboard tabs at the indicated locations and lift the top of the keyboard up and place it on the palm rest.

7. Lift the keyboard connector latch and disconnect the keyboard cable from the system board.
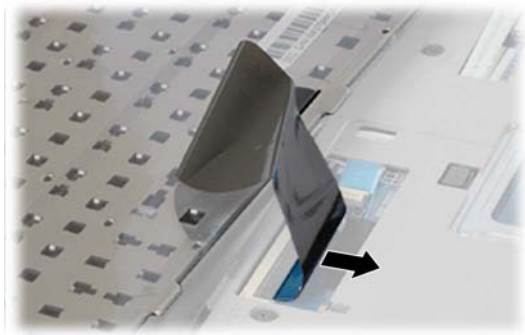
8. Remove the keyboard from the computer.

Reverse this procedure to install the keyboard.

Top cover

Description	Spare part number
Top cover for use in models with USB 3.0 and a fingerprint reader	646041-001
Top cover for use in models with USB 3.0 and without a fingerprint reader	646047-001
Top cover with a fingerprint reader slot insert for use in computers that do not support a fingerprint reader	657232-001
Top cover for use in computers with USB 2.0 and a fingerprint reader	657960-001
Top cover for use in computers with USB 2.0 and without a fingerprint reader	657961-001
Top cover with no USB logo for use in USB 2.0 or USB 3.0 computers with a fingerprint reader	666893-001
Top cover with no USB logo for use in USB 2.0 or USB 3.0 computers without a fingerprint reader	666894-001

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 41).

5. Remove the following components:

   a. Access door (see Access door on page 43).

   b. WLAN module (see WLAN/Bluetooth combo card on page 49)

   c. WWAN module (see WWAN module on page 47)

   d. Keyboard (see Keyboard on page 54)

Remove the top cover:

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

2. Remove the 4 rubber screw covers **(1)** and 6 Torx T8M2.5×8.0 screws **(2)** that secure the top cover to the computer:
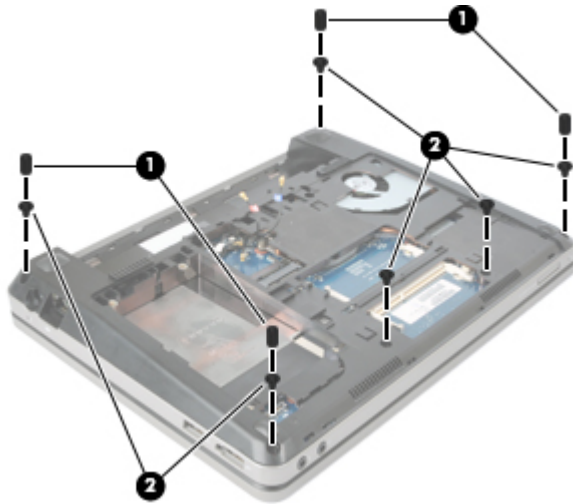
3. Turn the computer upright and open it as far as possible.

4. Remove the 5 Torx T8M2.5×6.0 screws **(1)** and the Phillips PM2.0×4.0 screw **(2)** that secures the top cover to the computer.

5. Remove the following cables from the system board:

(3) Power button

(4) QuickLaunch board

(5) Card reader

(6) Touchpad
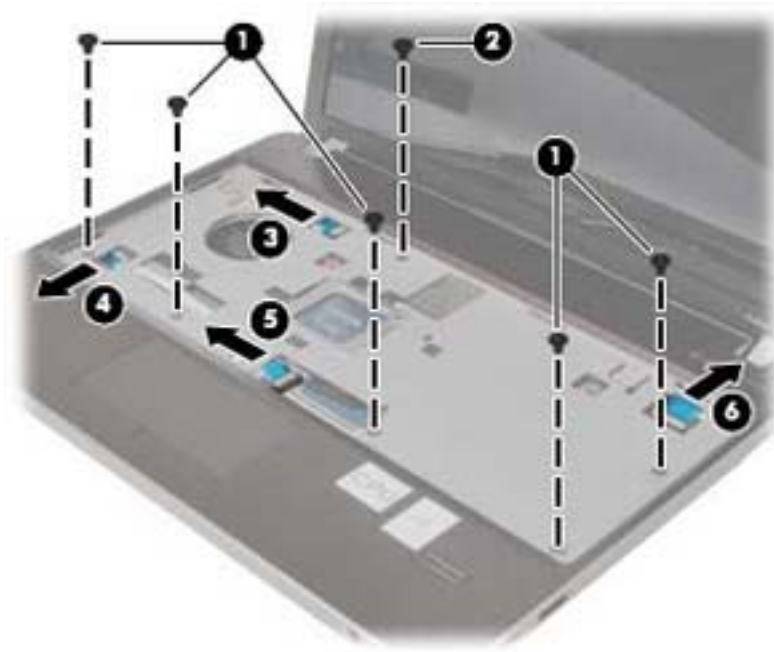
6. Position the upside-down with the battery bay toward you.

7. Insert a screwdriver through the holes in the battery bay and press to disengage the top cover from the computer.

8. Position the computer upright with the front toward you.

9. To remove the top cover, lift the top and pull the cover away from the display until it clears the front audio ports, and then lift it off the computer.

Reverse this procedure to install the top cover.

Quick Launch board

Description	Spare part number
Quick Launch board	646048-001

Before removing the Quick Launch 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 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

Remove the Quick Launch board:

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

2. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the board to the top cover.

3. Lift the board straight up and off the top cover **(2)**.
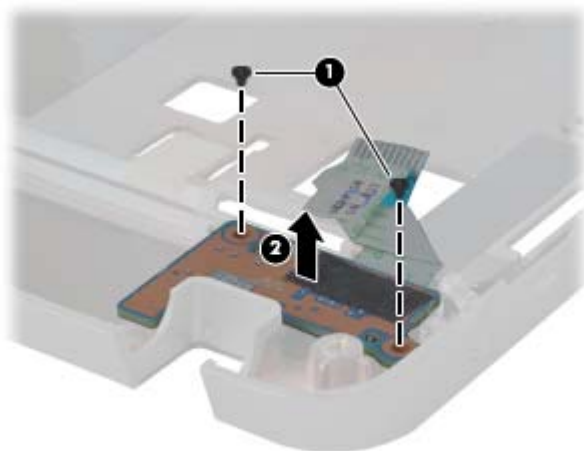
Reverse this procedure to install the Quick Launch board.

Power button board

Description	Spare part number
Power button board	647132-001

Before removing the power button board, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

Remove the power button board:

1. Position the top cover upside-down.

2. Remove the Phillips PM2.0×4.0 screw **(1)** that secures the power button board to the top cover.

3. Lift the side of the board up at an angle, and then slide it out from under the tab to remove it from the top cover **(2)**.
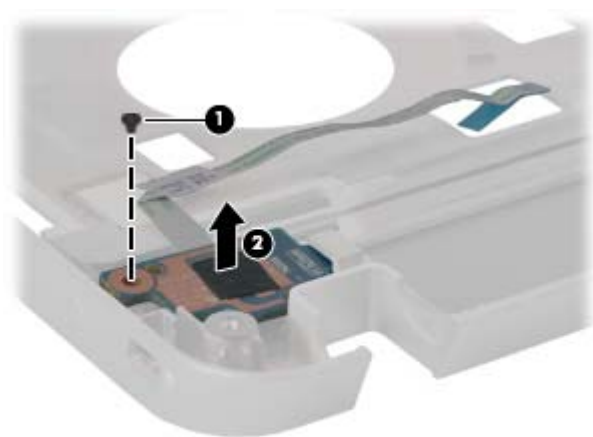
Reverse this procedure to install the power button board.

Modem module

NOTE: The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 646016-001. See Cable Kit on page 26 for more Cable Kit spare part number information.

| Description	Spare part number
Modem module	628824-001

Before removing the modem module, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

Remove the modem module:

1. Position the computer upright and open it.

2. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the modem module to the system board.

3. Lift the modem straight up **(2)** to disconnect it from the system board.

4. Disconnect the modem module cable **(3)** from the modem module.

Reverse this procedure to install the modem module.

Speaker assembly

Description	Spare part number
Speaker Kit	646038-001

Before removing the speaker assembly, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

    f. Modem module (see Modem module on page 61)

Remove the speaker assembly:

1. Position the computer upright with the front toward you.

2. Disconnect the cable from the system board **(1)**.

3. Remove the tape the secures the speaker cable to the system board **(2)**.

4. Lift the speaker from the computer **(3)**.
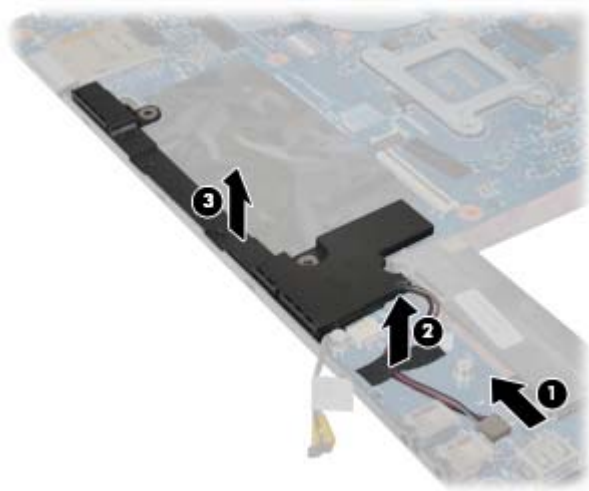
Reverse this procedure to install the speaker assembly.

System board

📝 **NOTE:** All system board spare part kits include replacement thermal material.

Description	Spare part number
System board for use in models without WWAN	646039-001
System board for use in models with WWAN	646040-001
System board for use in models with WWAN in Russia and the People's Republic of China	646040-AA1

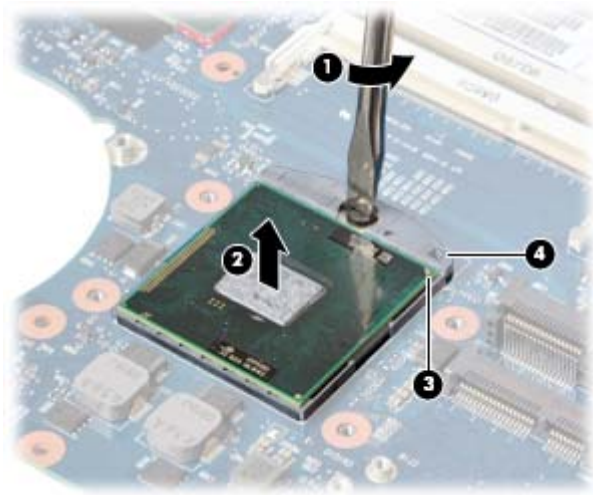Before removing the system board, follow these steps:

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 41).

5. Remove the following components:

   a. Access door (see Access door on page 43).

   b. Hard drive (see Hard drive on page 44)

   c. Keyboard (see Keyboard on page 54)

   d. Top cover (see Top cover on page 55)

   e. Speaker assembly (see Speaker assembly on page 62)

When replacing the system board, be sure to remove the following components from the defective system board and install on the replacement system board:

● SIM (see SIM on page 42)

● Memory module (see Memory modules on page 46)

● WLAN module (see WLAN/Bluetooth combo card on page 49)

● WWAN module (see WWAN module on page 47)

● Modem module (see Modem module on page 61)

● Processor (see Processor on page 71)

Remove the system board:

1. Position the computer upright and open it.

2. Disconnect the display cable from the system board **(1)** and lift it aside.

3. Remove the Phillips PM2.5×5.0 screw **(2)** that secures the system board to the base enclosure.

4. Remove the Phillips PM2.5×7.0 screw **(3)** that secures the system board to the base enclosure.

5. Lift to remove the power connector bracket on the right side of the system board **(4)**.

   The power connector bracket is available in the Bracket Kit, spare part number 646045-001.

6. Lift the right side of the system board up at an angle **(5)**, and then lift the system board from the computer **(6)**.
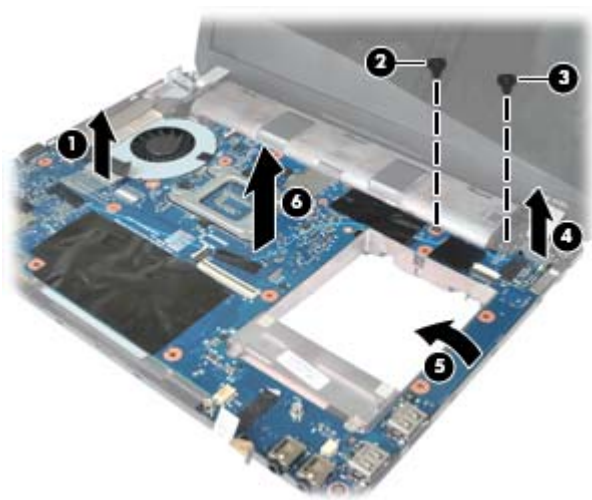
Reverse this procedure to install the system board.

RTC battery

Description	Spare part number
RTC battery	650924-001

Before removing the RTC battery, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

    f. Modem module (see Modem module on page 61)

    g. System board (see System board on page 63)

Remove the RTC battery:

1. Position the system board upside-down.

2. Use a screwdriver to loosen the battery from the slot **(1)**.

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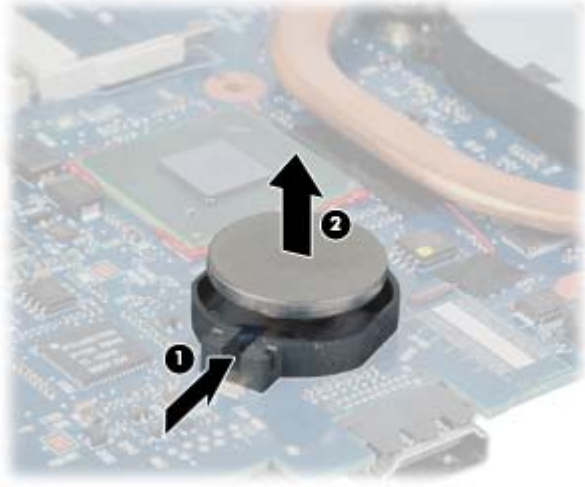
Reverse this procedure to install the RTC battery.

Fan

Description	Spare part number
Fan	646027-001

Before removing the fan, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

    f. Modem module (see Modem module on page 61)

    g. System board (see System board on page 63)

Remove the fan:

1. Position the system board upside-down.

2. Remove the Phillips PM2.5×4.0 screw **(1)** that secures the fan to the system board.

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

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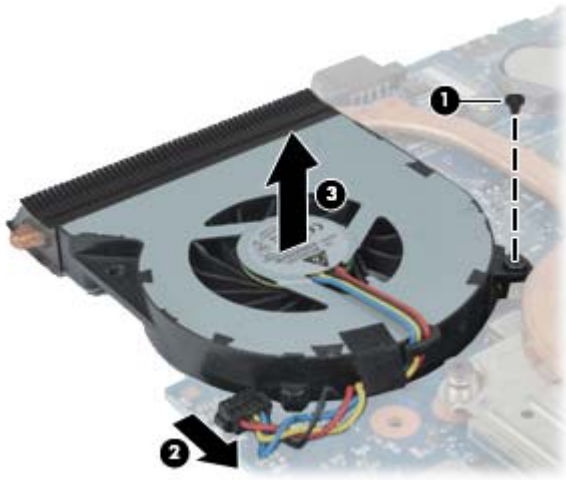
Reverse this procedure to install the fan.

📝 **NOTE:** To properly ventilate the computer, allow at least a 7.6-cm (3-in) clearance on the left side of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Heat sink

All heat sink spare part kits include replacement thermal material.

Description	Spare part number
Heat sink	646028-001

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 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

    f. Modem module (see Modem module on page 61)

    g. System board (see System board on page 63)

    h. Fan (see Fan on page 67)

Remove the heat sink:

1. Position the system board upside-down.

2. To remove the heat sink, in the order indicated, loosen the four captive Phillips screws **(1) — (4)** that secure the heat sink to the system board.

3. Remove the heat sink from the system board **(5)**.
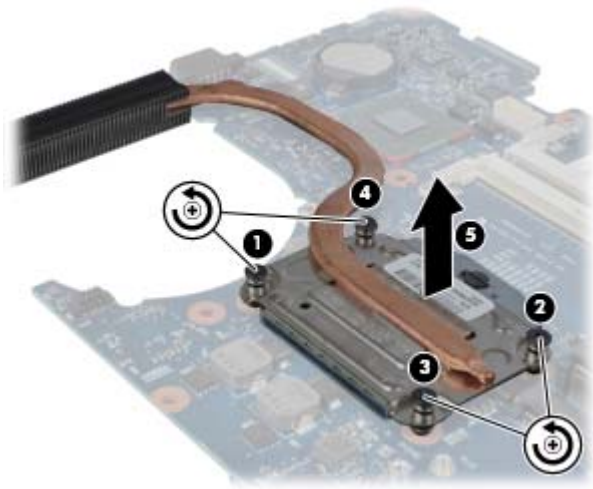
> **NOTE:** Thoroughly clean thermal material from the surfaces of the system board component **(1)** and the heat sink **(2)** each time you remove the heat sink. All heat sink and processor spare part kits include thermal material.
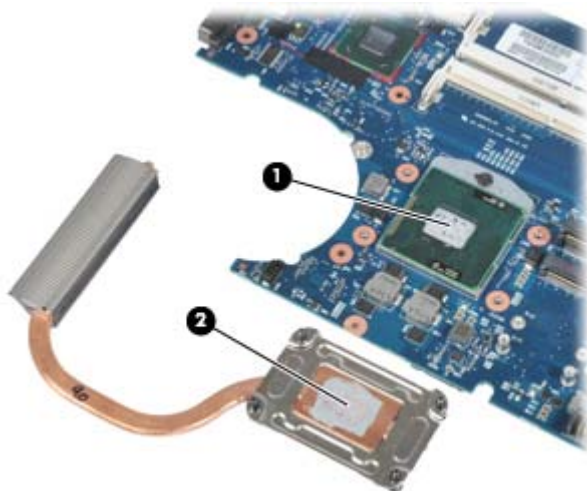
Reverse this procedure to install the heat sink.

Processor

NOTE: All processor spare part kits include replacement thermal material.

Description	Spare part number
Intel Core i7 processor, Dual Core	
2620M, 2.7-GHz (turbo up to 3.4-GHz) processor with 4-MB L3 cache (includes thermal grease)	631252-001
Intel Core i5 processors, Dual Core	
2540M, 2.6-GHz (turbo up to 3.3-GHz) processor with 3-MB L3 cache (includes thermal grease)	631255-001
2520M, 2.5-GHz (turbo up to 3.2-GHz) processor with 3-MB L3 cache (includes thermal grease)	631253-001
2430M, 2.4-GHz (turbo up to 3.0-GHz) processor with 3-MB L3 cache (includes thermal grease)	653341-001
2410M, 2.3-GHz (turbo up to 2.9-GHz) processor with 3-MB L3 cache (includes thermal grease)	638039-001
Intel Core i3 processors, Dual Core	
2350M, 2.3-GHz processor with 3-MB L3 cache	653340-001
2330M, 2.2-GHz processor with 3-MB L3 cache	653339-001
2310M, 2.1-GHz processor with 3-MB L3 cache (includes thermal grease)	638037-001
Intel Pentium Dual-Core processors	
B950, 2.1-GHz, with 2-MB L3 cache	653338-001
B940, 2.0-GHz, with 2-MB L3 cache	653337-001
Intel Celeron processors	
B840, 1.9-GHz, with 2-MB L3 cache	664663-001
B810, 1.6-GHz, with 2-MB L3 cache	646760-001

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 41).

5. Remove the following components:

    a. Access door (see Access door on page 43).

    b. WLAN module (see WLAN/Bluetooth combo card on page 49)

    c. WWAN module (see WWAN module on page 47)

    d. Keyboard (see Keyboard on page 54)

    e. Top cover (see Top cover on page 55)

f. Modem module (see Modem module on page 61)

g. System board (see System board on page 63)

h. Fan (see Fan on page 67)

i. Heat sink (see Heat sink on page 69).

Remove the processor:

1. Position the system board upside-down.

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

Reverse this procedure to install the processor.

RJ-11 jack cable

📝 **NOTE:** The RJ-11 jack cable is included in the Cable Kit, spare part number 646016-001.

The RJ-11 bracket is available in the Bracket Kit, spare part number 646045-001.

Before removing the RJ-11 jack 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 41).

5. Remove the following components:

   a. Access door (see Access door on page 43).

   b. WLAN module (see WLAN/Bluetooth combo card on page 49)

   c. WWAN module (see WWAN module on page 47)

   d. Keyboard (see Keyboard on page 54)

   e. Top cover (see Top cover on page 55)

   f. Modem module (see Modem module on page 61)

   g. System board (see System board on page 63)

Remove the RJ-11 jack cable:

1. Position the base enclosure upright with the front toward you.

2. Remove the Phillips PM2.0×4.0 screw **(1)** that secures the RJ-11 jack to the enclosure.

3. Remove the RJ-11 jack cable **(2)** from the tape, clips, and routing channel **(3)** built into the base enclosure.
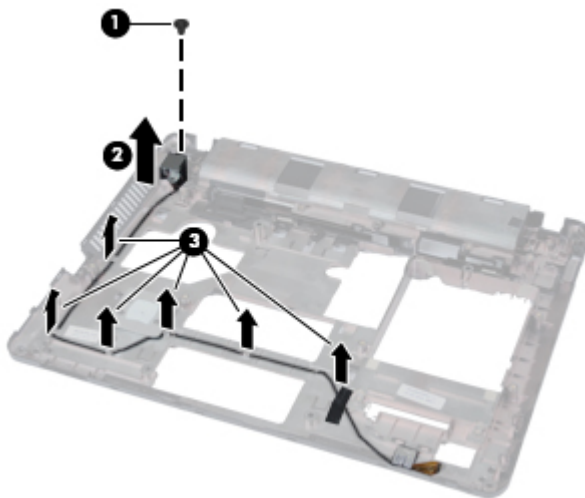
Reverse this procedure to install the RJ-11 jack cable.

Display assembly

All display assemblies include WLAN antenna transceivers and cables. WWAN models include 2 WWAN antenna transceivers and cables.

Description	Spare part number
Display assembly, 30.7-cm (12.1-inch) WXGA, anti-glare	646017-001
Display assembly, 30.7-cm (12.1-inch) WXGA, anti-glare with webcam	646019-001
Display assembly, 30.7-cm (12.1-inch) WXGA, anti-glare with webcam and WWAN	646021-001
Display assembly, 30.7-cm (12.1-inch) WXGA, BrightView	646023-001
Display assembly, 30.7-cm (12.1-inch) WXGA, BrightView with webcam	646025-001

Before removing the display assembly, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the battery (see Battery on page 41).

5. Remove the following components:

   a. Access door (see Access door on page 43).

   b. Hard drive (see Hard drive on page 44)

   c. WLAN module (see WLAN/Bluetooth combo card on page 49)

   d. WWAN module (see WWAN module on page 47)

   e. Keyboard (see Keyboard on page 54)

   f. Top cover (see Top cover on page 55)

   g. System board (see System board on page 63)

Remove the display assembly:

1. Position the computer upright with the front toward you.

2. Open the computer as far as possible.

3. Remove the antenna cables from their routing paths in the base enclosure **(1)**.

4. Remove the five Phillips PM2.5×8.0 screws **(2)** from the hinges, the Phillips PM2.5×8.0 screw **(3)** from the security bracket, and then lift the display from the computer **(4)**.

   When installing the display assembly, be sure that the wireless antenna cables are routed and arranged properly.

   Failure to properly route the antennas can result in degradation of the computer's WLAN and WWAN performance.
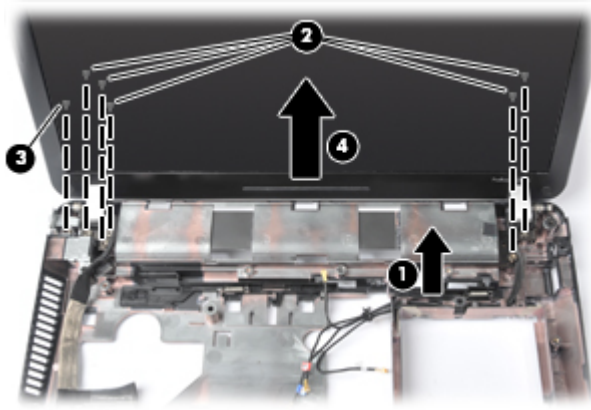
5. To replace the display bezel, remove the two rubber screw covers and the two Phillips PM2.5×5.0 screws **(1)** in the bottom corners of the display bezel.

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

   The bezel is available using the following spare part numbers:

   646015-001: models without a webcam

   646014-001: models with a webcam

7. The hinge covers **(5)** slide off the hinges when you remove the bezel.

   The hinge covers are available using spare part number 646043-001
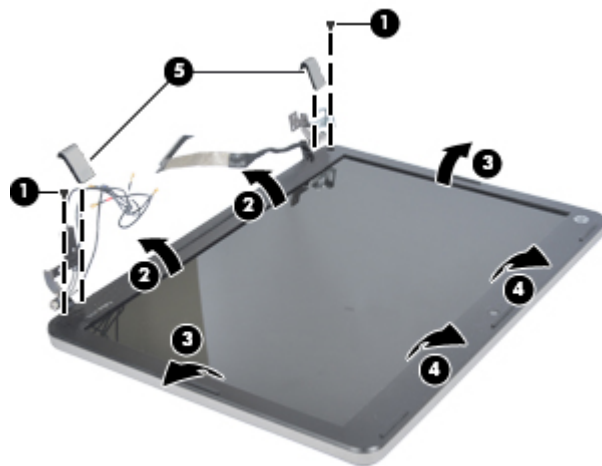
8. Remove the display bezel.

9. If it is necessary to replace the webcam module (shown in the following image) or microphone module from the display enclosure, disconnect the cable from the module **(1)**, and then gently pull the module away from the double-sided tape on the display enclosure **(2)**.

The webcam module is available using spare part number 642795-001.

The microphone module is removed using the same procedure and is available using spare part number 642797-001.
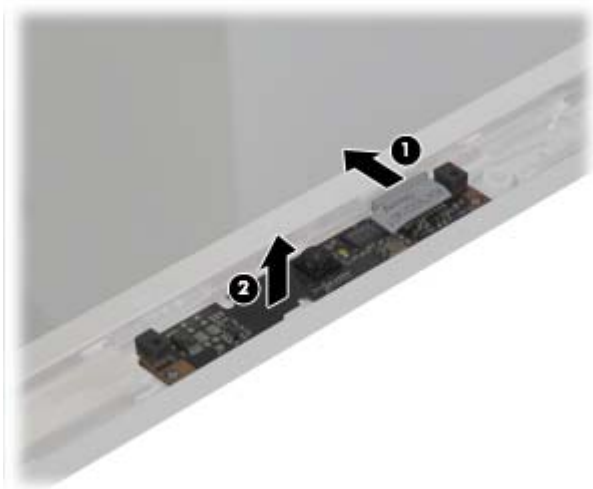
10. If it is necessary to remove the display panel, remove the two Phillips PM2.5×5.0 screws **(1)** at the bottom and two Phillips PM2.5×5.0 broadhead screws **(2)** at the top that secure the panel to the display enclosure.

11. Lift the panel out of the display enclosure **(3)**.
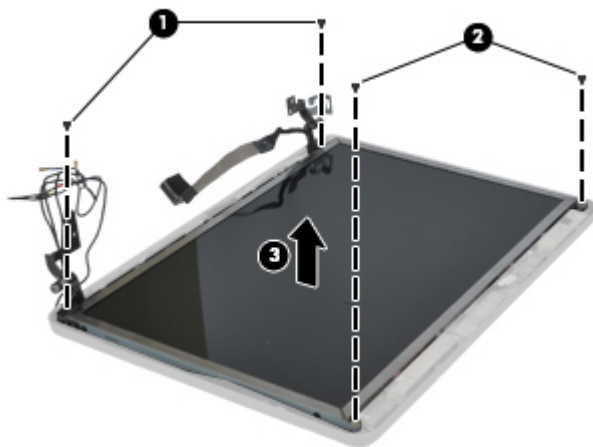
12. Disconnect the display panel cable from the back of the display panel by pressing the latches on the side of the connector **(1)**, and then disconnecting the cable from the panel **(2)**.

The display cable is available using spare part number 646044-001, and includes the integrated webcam cable.
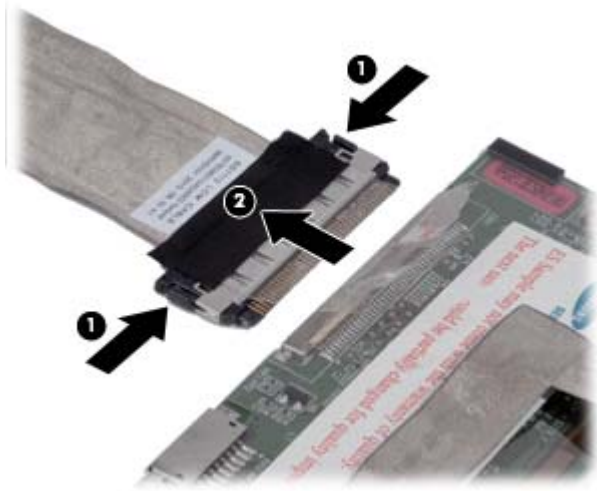
13. If it is necessary to replace the display hinges, remove the two Phillips PM2.5×3.0 screws that secure each display hinge to the display panel, and then remove the hinges from the panel.

Display hinges are available using spare part number 646042-001.
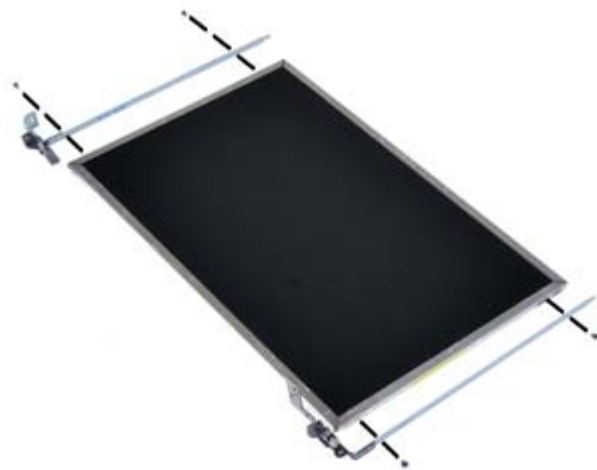
14. If you need to remove the WLAN or WWAN antennas, lift the WLAN antenna cables **(1)** or WWAN antenna cables **(2)** from the clips and routing paths built into the display enclosure.

The WLAN antennas are available using spare part number 646010-001, and the WWAN antennas are available using spare part number 646011-001.

⚠ **CAUTION:** When installing the display assembly, be sure that the wireless antenna cables are routed and arranged properly.

Failure to properly route the antennas can result in degradation of the computer's wireless performance.

Reverse this procedure to reassemble and install the display assembly.

5 Computer Setup (BIOS) and System Diagnostics

Using Computer Setup

Computer Setup, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

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 Computer Setup.

Navigating and selecting in Computer Setup

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 Computer Setup.

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.

- To save your changes and exit Computer Setup menus:

  Cclick 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 Computer 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.

Updating the BIOS

Updated versions of the BIOS may be available on the HP Web site.

Most BIOS updates on the HP Web site are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than those currently installed on the computer, you need to know the version of the system BIOS currently installed.

BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed by pressing fn+esc (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup.

2. Use a pointing device or the arrow keys to select **File > System Information**.

3. 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.

Downloading a BIOS update

⚠ **CAUTION:**   To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep or Hibernation.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. Select **Start > Help and Support > Maintain**.

2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.

3. At the download area, follow these steps:

    a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.

    b. Follow the on-screen instructions to download your selection to the hard drive.

        Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Open Windows Explorer by selecting **Start > Computer**.

2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.

4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.

Using System Diagnostics

System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The following diagnostic tests are available in System Diagnostics:

- Start-up test—This test analyzes the main computer components that are required to start the computer.

- Run-in test—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.

- Hard disk test—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.

- Memory test—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.

- Battery test—This test analyzes the condition of the battery. If the battery fails the test, contact HP Customer Support to report the issue and purchase a replacement battery.

You can also view system information and error logs in the System Diagnostics window.

To start System Diagnostics:

1. Turn on or restart the computer. While the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen, press esc. When the Startup Menu is displayed, press f2.

2. Click the diagnostic test you want to run, and then follow the on-screen instructions.

6   Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	21.2 cm	8.4 in
Width	28.8 cm	11.3 in
Height (front to rear)	2.5 to 3.2 cm	1.0 to 1.3 in
Weight (equipped with optical drive, 1 DIMM, hard drive, optical drive, WLAN module, 6 cell battery)	1.6 kg	3.5 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 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 (14.7 to 10.1 psia)	-15 m to 3,048 m	50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	

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

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

30.7-cm (12.1-in), HD+ display specifications

	Metric	U.S.
Active diagonal size	30.7-cm	12.1-in
Resolution	128x800	
Active area	344.16x193.59	
PPI	118	
Surface treatment	Anti-glare	
	BrightView	
Contrast ratio	300:1 (typical) – Anti-glare	
	500:1 (typical) – BrightView	
Response time	2 ms	
Brightness	250 nits (typical)	
Viewing angle	WVA	
Backlight	LED	
Display colors	262,144	
Pixel arrangement	RGB vertical stripe	
Pixel pitch	0.204, 0.204	

Hard drive specifications

	750-GB*	640-GB*	500-GB*	320-GB*	250-GB*
Dimensions					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	115 g	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)					
Single track	1.5 ms	2 ms	3 ms	3 ms	3 ms
Average	11 ms	12 ms	13 ms	13 ms	13 ms
Maximum	14 ms	22 ms	24 ms	24 ms	24 ms
Logical blocks	1,465,149,168	1,250,263,728	1,048,576,000	625,141,400	488,397,168
Disc rotational speed	7200 rpm	7200 rpm or 5400 rpm			
Operating temperature		5°C to 55°C (41°F to 131°F)			

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

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

Specification information in Device Manager

Device Manager allows you to view and control the hardware attached to the computer, as well as provides hardware specification information.

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

NOTE: Windows 7 and Windows Vista include 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 Windows Help and Support for more information.

After you open Device Manager, drill-down to a device and double-click it to access its properties.

To access Device Manager in Windows 7:

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

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

To access Device Manager in Windows Vista:

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

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

To access Device Manager 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**.

7 Backup and recovery

Windows 7

- [Backing up your information](#)
- [Performing a system 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) by using the installed optical drive (select models only) or an optional external optical drive, 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) by using the installed optical drive (select models only) or an optional external optical drive

- Backing up your information

- 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.

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

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.

Backing up your information

Recovery after a system failure is as good as your most recent backup. You should create system repair discs (select models only) by using the installed optical drive (select models only) or an optional external optical drive, 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.

● 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 or the type of external optical drive you are using.

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:

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).

Performing a system recovery

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 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 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. For additional information, refer to Using a Windows 7 operating system DVD (purchased separately) on page 90.

Using the Windows recovery tools

To recover information you previously backed up:

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

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

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 check for the Windows partition, select **Start > Computer**.

   To check for the HP Recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

   📝 **NOTE:** If the Windows partition and the HP Recovery partition are not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to .

3. If the Windows partition and the HP Recovery partition are listed, restart the computer, and then press f8 before the Windows operating system loads.

4. Select **Startup Repair**.

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 recovery tools

⚠ **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:

1. If possible, back up all personal files.

2. If possible, check for the presence of the HP Recovery partition: click **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 DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to .

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.

Using a Windows 7 operating system DVD (purchased separately)

To order a Windows 7 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 7 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 7 operating system DVD:

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

1. If possible, back up all personal files.

2. Restart the computer, and then insert the Windows 7 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.

Windows Vista

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.

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.

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.

- 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:

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.

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 Using a Windows Vista operating system DVD (purchased separately) on page 93.

Using the Windows recovery tools

To recover information you previously backed up:

1. Select **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.

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 Using a Windows Vista operating system DVD (purchased separately) on page 93.

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 recovery tools

⚠ **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.

📝 **NOTE:** If your computer includes a solid-state drive (SSD), you may not have a recovery partition. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, select **Start > Computer**. If the partition is present, an HP Recovery drive is listed in the Hard Disk Drives section of the window.

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 Using a Windows Vista operating system DVD (purchased separately) on page 93.

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)

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:

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.

8   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.

9   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 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.
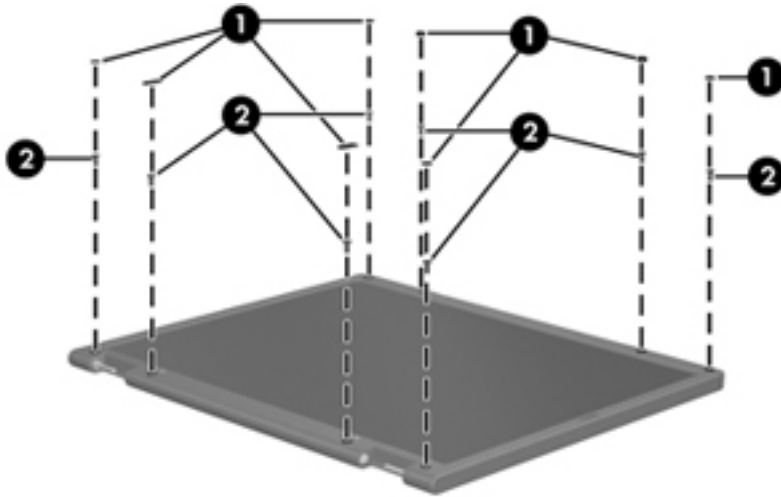
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.

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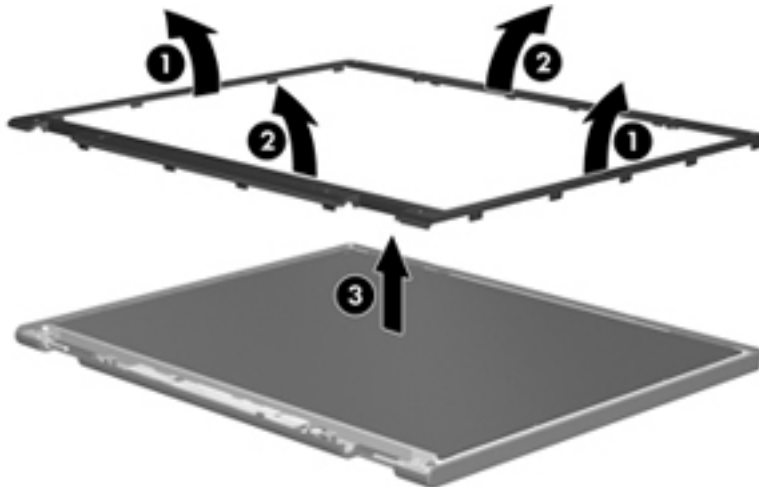
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.
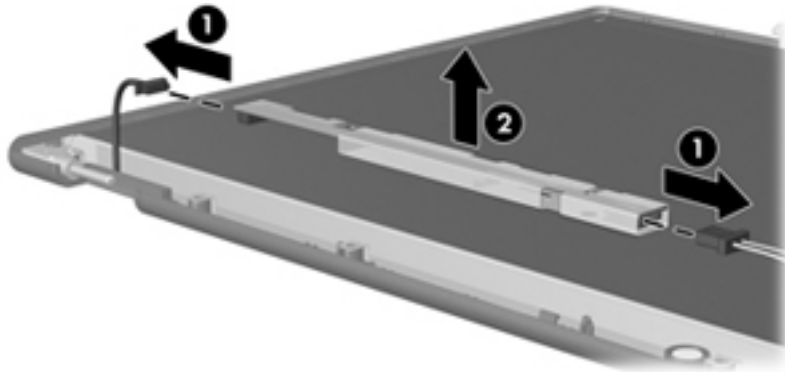
5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.

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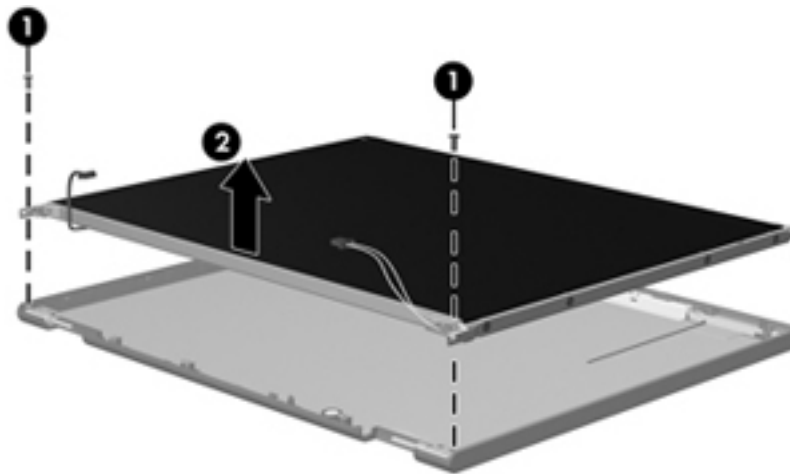
7. Position the display panel assembly upside-down.

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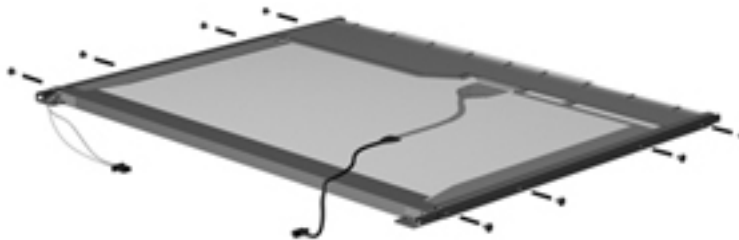
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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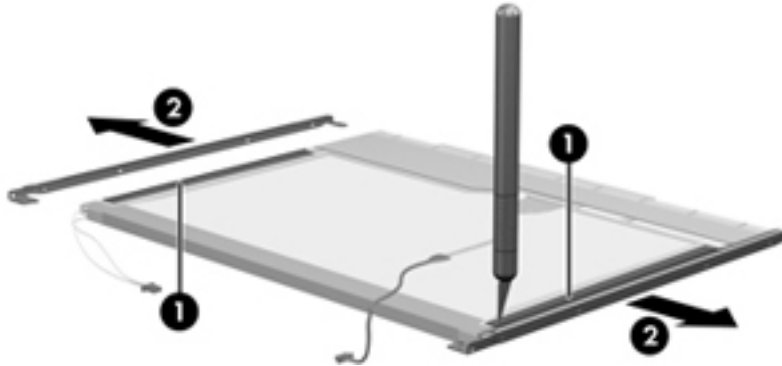
11. Remove the screws **(1)** that secure the backlight cover to the display panel.

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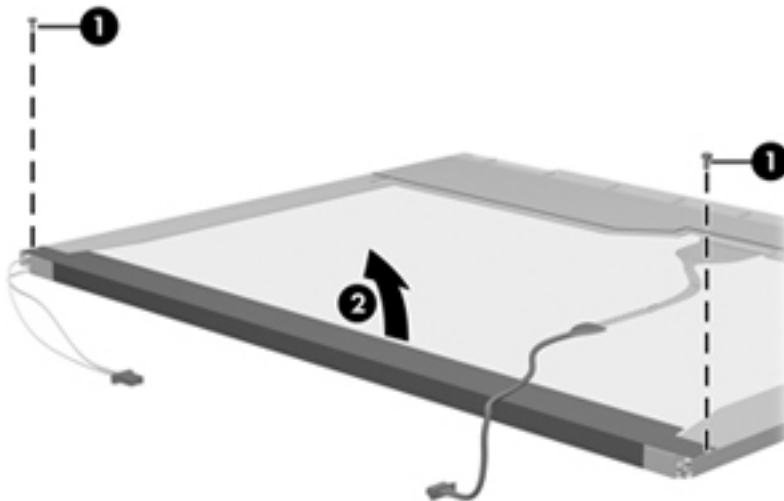
13. Remove the backlight cover.

14. Position the display panel right-side up.

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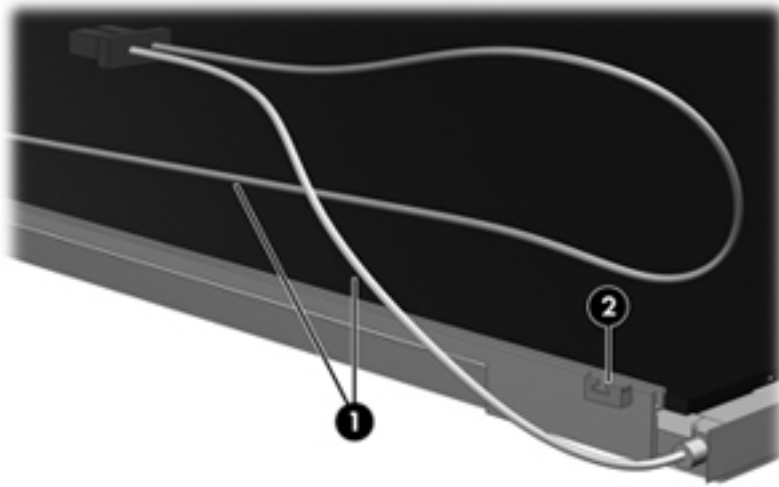
16. Position the display panel upside-down.

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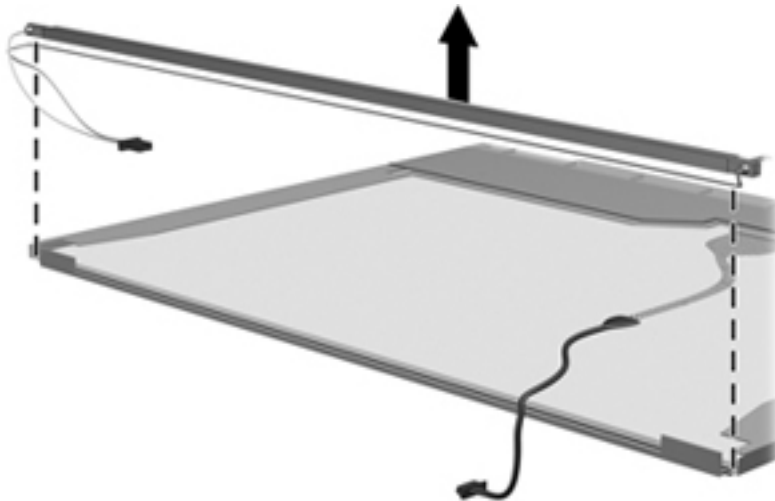
18. Remove the backlight from the backlight frame.
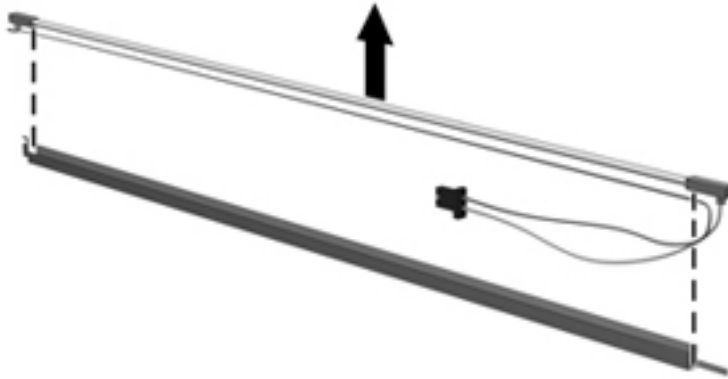
19. Disconnect the display panel cable **(1)** from the LCD panel.

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.
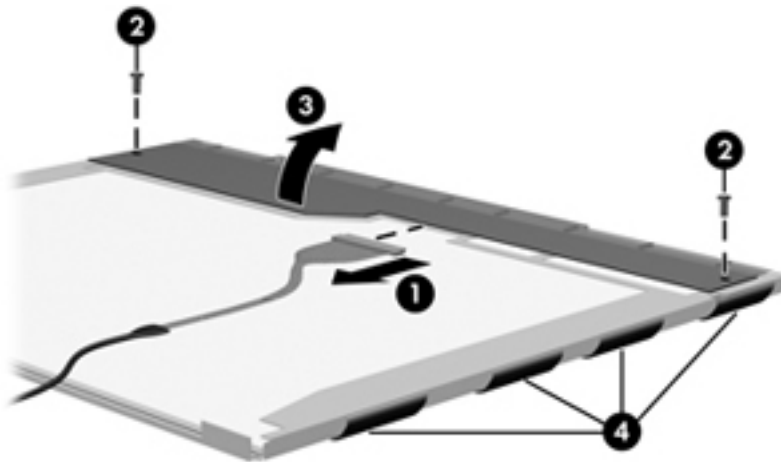
23. Remove the LCD panel.
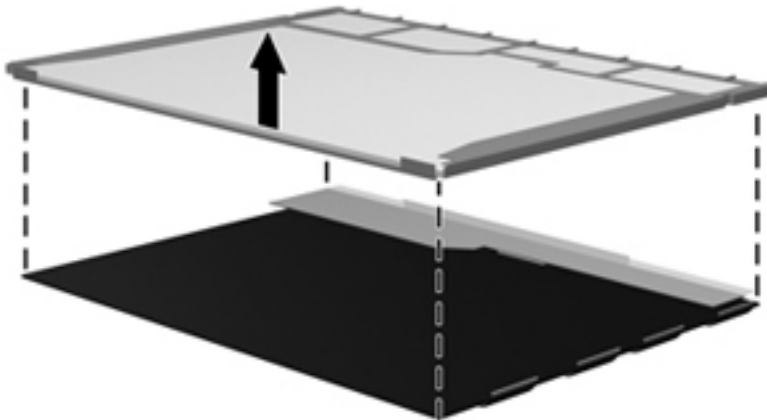
24. Recycle the LCD panel and backlight.

Index