



HP EliteBook 2740p Tablet PC

Maintenance and Service Guide

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Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP EliteBook 2740p Tablet PC
Processors	Intel® Core™i7 processors, Dual Core (soldered to system board) 620M, 2.66-GHz processor, 4-MB L3 cache
	Intel Core i5 processors, Dual Core (soldered to system board) 540M, 2.53-GHz processor, 3-MB L3 cache
	520M, 2.40-GHz processor, 3-MB L3 cache
Chipset	Mobile Intel QM57 Express Chipset
Graphics	Intel Graphics Media Accelerator HD Integrated with shared video memory Supports dual-display ports through the dock
Panel	30.7-cm (12.1-in) Illumi-Lite WXGA UWVA (1280x800) 30.7-cm (12.1-in) Illumi-Lite WXGA UWVA outdoor view (1280x800) with digitizer and/or multi-touch Chemically-strengthened glass top cover
Memory	Two customer-accessible/upgradeable memory module slots Supports dual-channel memory Supports up to 8 GB of PC3-10600, 1333-MHz, DDR3 system RAM (running at 1066 MHz) Supports the following configurations: <ul style="list-style-type: none">• 8192 (4096 × 2)• 6144 (4096 + 2048)• 4096 (2048 × 2)• 4096 (4096 × 1)• 3072 (2048 + 1024)• 2048 (2048 × 1)
Hard drives	Supports 4.57-cm (1.80-in) SATA hard drives Customer-accessible

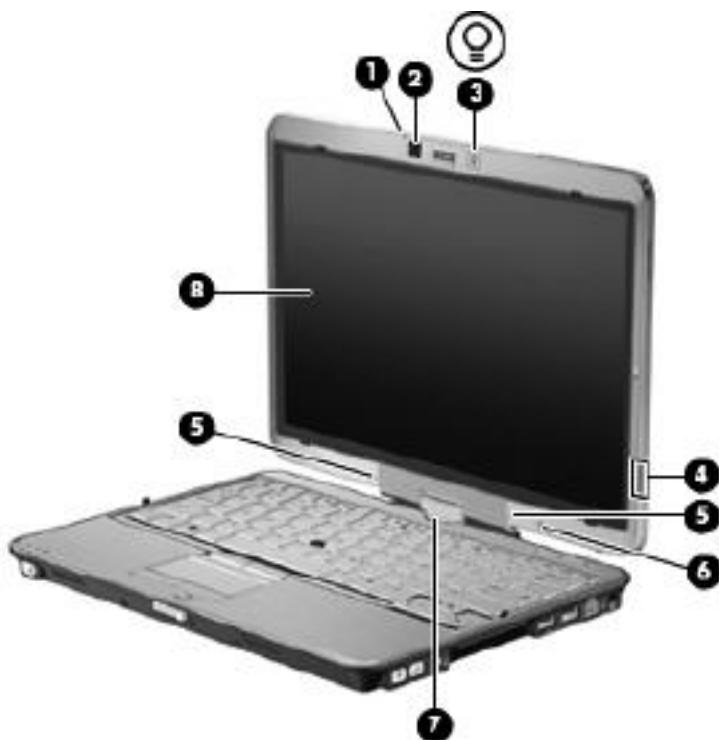
Category	Description
	<p>Supports the following drives:</p> <ul style="list-style-type: none"> ● 250-GB hard drive ● 160-GB hard drive ● 160-GB solid-state drive ● 80-GB solid-state drive
Audio/Visual	<p>Integrated dual-array microphone</p> <p>HD audio</p> <p>Stereo speakers (2)</p> <p>Integrated 2-megapixel webcam with business card reader software</p>
Modem	<p>56K V.92 MDC data/fax modem</p> <p>Modem cable not included</p> <p>Supports “No Modem” option</p>
Ethernet	<p>Intel 82577LM GbE LAN 10/100/1000 network interface card (NIC) with iAMT</p> <p>S3/S4/S5 wake on LAN</p> <p>NIC power down technology</p> <p>Ethernet cable not included</p>
Wireless	<p>Integrated WLAN options by way of wireless module:</p> <p>Two WLAN antennas built into display assembly</p> <p>Supports “no WLAN” option</p> <p>Supports the following WLAN formats:</p> <ul style="list-style-type: none"> ● Broadcom BCM4312 802.11b/g ● Broadcom 4322 AGN 802.11a/b/g/draft-n ● Intel Centrino® Advanced-N 6200 ABG ● Intel Centrino Advanced-N 6200 AGN <p>Integrated WWAN options by way of wireless module:</p> <p>Two WLAN antennas (world-wide 5-band) built into display assembly</p> <p>GPS support</p> <p>Subscriber identity module (SIM) security (customer-accessible in battery bay)</p> <p>Integrated personal area network (PAN) options by way of Bluetooth® module:</p> <p>Supports “no PAN” option</p> <p>Broadcom Bluetooth</p>
External media card	<p>ExpressCard 34 mm</p> <p>SD Card Reader supporting MultiMediaCard (MMC) and Secure Digital (SD) Memory Cards</p>
Ports	<p>Audio-in (stereo microphone)</p>

Category	Description
	Audio-out (stereo headphone)
	RJ-11 (modem)
	RJ-45 (Ethernet, includes link and activity lights)
	USB 2.0 (3), one powered
	VGA (Dsub 15-pin)
	1394a
	Multipin AC power
	Docking connector
Docking	HP 2740 Ultra-Slim Expansion Base (specific to computer)
Keyboard	Full-size keyboard
	Dual point
	Spill-resistant design, DuraKey coating
	Touchpad supports 2-way scroll with legend
	Digital eraser pen with tether
Power requirements	65-watt Smart AC adapter with localized cable plug support (3-wire plug with ground pin):
	6-cell, 44-Wh Li-ion battery with fuel gauge LEDs
	6-cell, 39-Wh Li-ion battery (only with 3 year warranties)
	Supports optional HP2700 Ultra-Slim Battery
	HP Fast Charge Technology
Security	Integrated fingerprint reader
	Integrated smart card reader
	Kensington Security Lock
	Trusted platform module (TPM) V.1.2
	Preboot authentication (password, smart card)
	HP ProtectTools, HP Power Assistant, HP SkyRoom
Operating system	Preinstalled:
	Windows 7 Professional 64
	Windows 7 Professional 32
	Windows 7 Professional with XPT images
	Windows Vista Business 32
	FreeDOS
	Preinstalled with Microsoft® Office:
	Windows 7 Professional 32 or 64 with Microsoft® Office 2007 Personal with Powerpoint
	Windows 7 Professional 32 or 64 with Microsoft Office 2007 Personal

Category	Description
	Windows 7 Professional 32 or 64 with Microsoft Office 2007 Professional
	Windows 7 Professional 32 or 64 with Microsoft Office 2007 Ready
	Windows 7 Professional with XPT images with Microsoft Office Ready
	Windows 7 Professional with XPT images with Microsoft Office Personal
	Windows 7 Professional with XPT images with Microsoft Office Personal with Powerpoint
	Windows 7 Professional with XPT images with Microsoft Office Professional
	Windows Vista Business 32 with Microsoft Office 2007 Ready
	Windows Vista Business 32 with Microsoft Office 2007 Personal with Powerpoint
	Windows Vista Business 32 with Microsoft Office 2007 Personal
	Windows Vista Business 32 with Microsoft 2007 Professional
Restore Media:	
	Windows 7 Professional 32 or 64
	Windows Vista Business 32
	Windows XP Tablet
	Microsoft Office 2007 Ready
	DRDVD Vista
	DRDVD Windows XP Tablet
	DRDVD Windows 7
Web-only support:	
	Windows Vista Enterprise 32 or 64
	Windows 7 Home Premium
Certified:	
	Microsoft WHQL
	SuSE Linux

2 External component identification

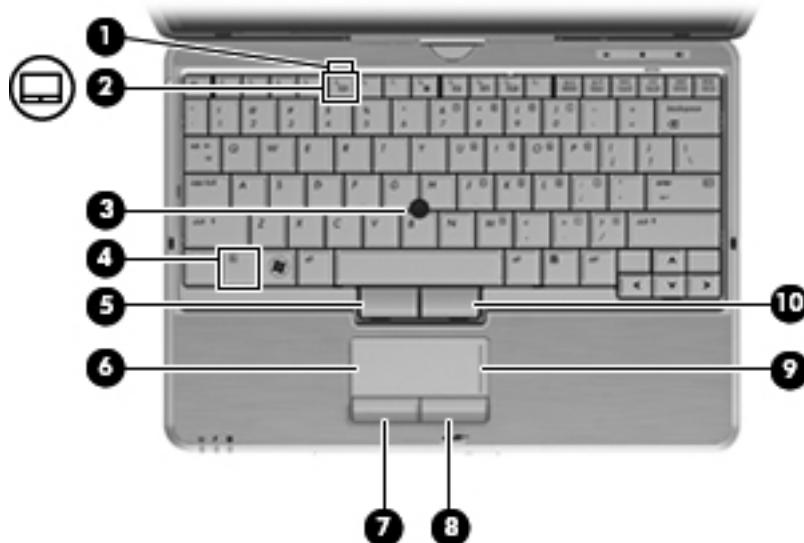
Display



Component	Description
(1) Webcam light	On: The webcam is in use.
(2) Webcam	Records audio and video and captures still photographs.
(3) Keyboard light button	Opens and turns on the keyboard light.
(4) HP Fingerprint Sensor	Allows a fingerprint logon to Windows instead of a password logon.
(5) Internal microphones (2)	Record sound and transmit sound for video conferencing and Voice over IP (VoIP).
(6) Ambient light sensor	Automatically adjusts the display brightness based on the lighting conditions in your environment.
(7) Convertible hinge	Swivels the display and converts the computer from traditional notebook mode into tablet mode or vice versa.
(8) Touch screen	Allows you to perform certain actions on the screen using your fingers.

Top components

Pointing devices

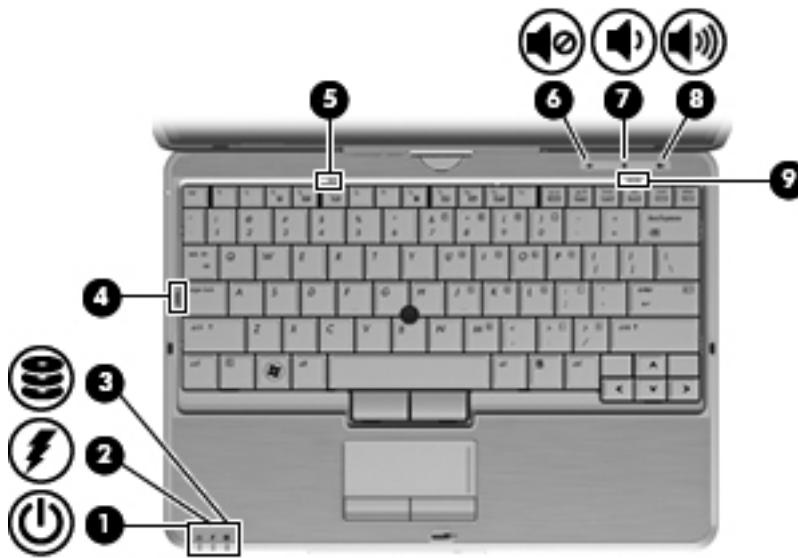


Component	Description
(1) TouchPad light	<ul style="list-style-type: none">Off: TouchPad is enabled.Amber: TouchPad is disabled.
(2) TouchPad on/off control	Enables/disables the TouchPad when pressed in combination with the fn key.
(3) Pointing stick*	Moves the pointer and selects or activates items on the screen.
(4) fn key	Enables/disables the TouchPad when pressed in combination with the f5 key.
(5) Left pointing stick button*	Functions like the left button on an external mouse.
(6) TouchPad*	Moves the pointer and selects or activates items on the screen.
(7) Left TouchPad button*	Functions like the left button on an external mouse.
(8) Right TouchPad button*	Functions like the right button on an external mouse.
(9) TouchPad scroll zone	Scrolls up or down.
(10) Right pointing stick button*	Functions like the right button on an external mouse.

*This table describes factory settings. To view or change pointing device preferences:

- In Windows 7, select **Start > Devices and Printers**. Then right-click the device representing your computer, and select **Mouse Settings**.
- In Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**.
- In Windows XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

Lights



Component	Description
(1) Power light	<ul style="list-style-type: none">On: The computer is on.Blinking: The computer is in the Sleep state.Off: The computer is off or in Hibernation.
(2) Battery light	<ul style="list-style-type: none">Amber: A battery is charging.Turquoise: A battery is close to full charge capacity.Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(3) Drive light	<ul style="list-style-type: none">Blinking turquoise: The hard drive is being accessed.Amber: HP 3D DriveGuard has temporarily parked the internal hard drive.
(4) Caps lock light	On: Caps lock is on.
(5) TouchPad light	<ul style="list-style-type: none">Off: TouchPad is enabled.Amber: TouchPad is disabled.
(6) Volume mute light	<ul style="list-style-type: none">Turquoise: Computer sound is on.Amber: Computer sound is off.
(7) Volume down light	Blinking: The volume down button is being used to decrease speaker volume.

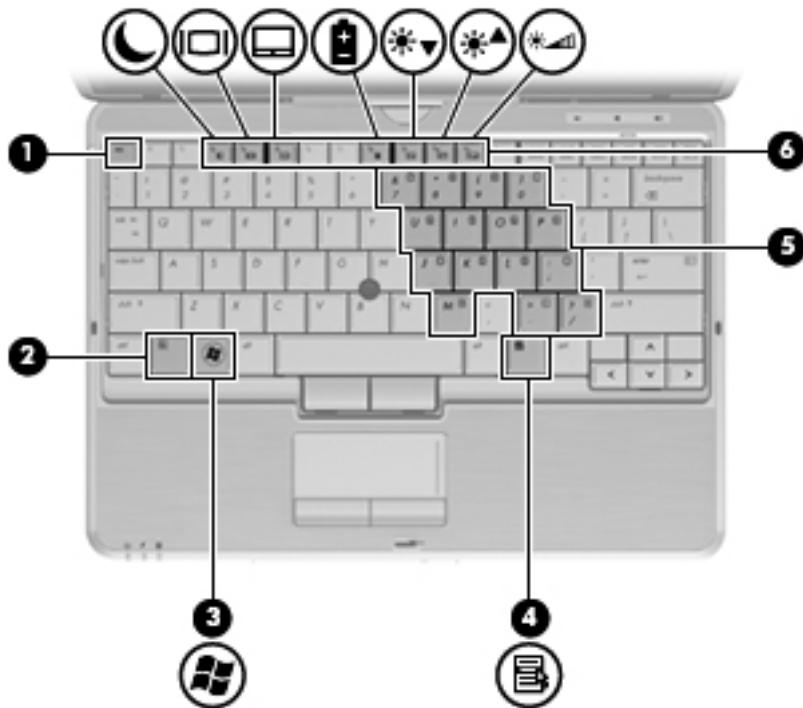
Component	Description
(8) Volume up light	Blinking: The volume up button is being used to increase speaker volume.
(9) Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.

Buttons and switches



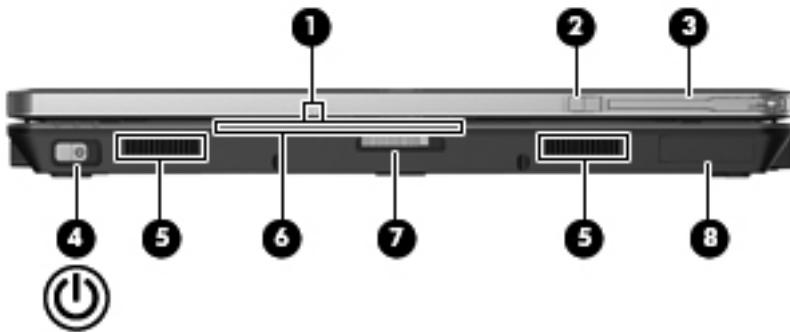
Component	Description
(1) Internal display switch	Turns off the display if the display is closed while the power is on.
(2) Volume mute button	Mutes and restores speaker sound.
(3) Volume down button	Decreases computer volume.
(4) Volume up button	Increases computer volume.

Keys



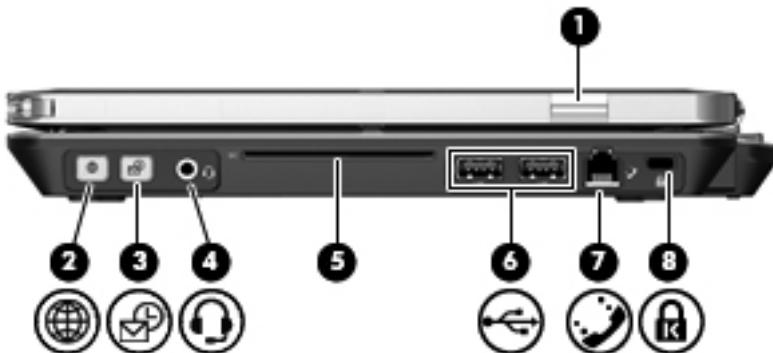
Component	Description
(1) esc key	Displays system information when pressed in combination with the fn key.
(2) fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(3) Windows logo key	Displays the Windows Start menu.
(4) Windows applications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

Front components



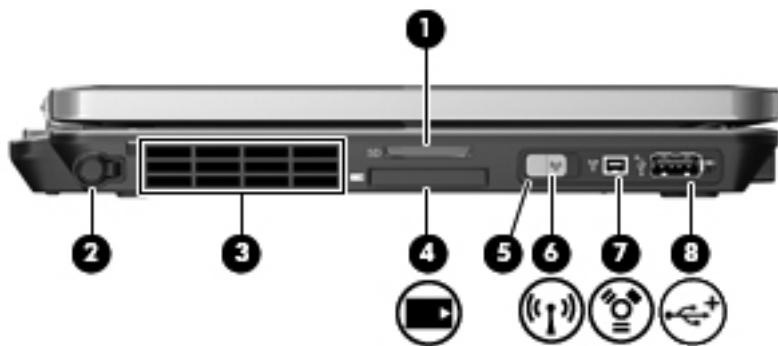
Component	Description
(1) Webcam light	On: The webcam is in use.
(2) External WWAN antenna button	Opens the external wireless wide area network (WWAN) antenna.
(3) External WWAN antenna	Sends and receives wireless signals to communicate with WWANs.
(4) Power switch	<ul style="list-style-type: none">When the computer is off, slide the switch to the right to turn on the computer.When the computer is on, slide the switch to the right to shut down the computer.When the computer is in the Sleep state, slide the switch to the right briefly to exit Sleep.When the computer is in Hibernation, slide the switch to the right briefly to exit Hibernation. <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, slide the switch to the right and hold for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select Start > Control Panel > System and Maintenance > Power Options.</p>
(5) Speakers (2)	Produce sound.
(6) Business card slot	Holds a business card in position so that the webcam can capture an image.
(7) Display release latch	Opens the computer.
(8) Bluetooth® compartment	Contains an optional Bluetooth device.

Right-side components



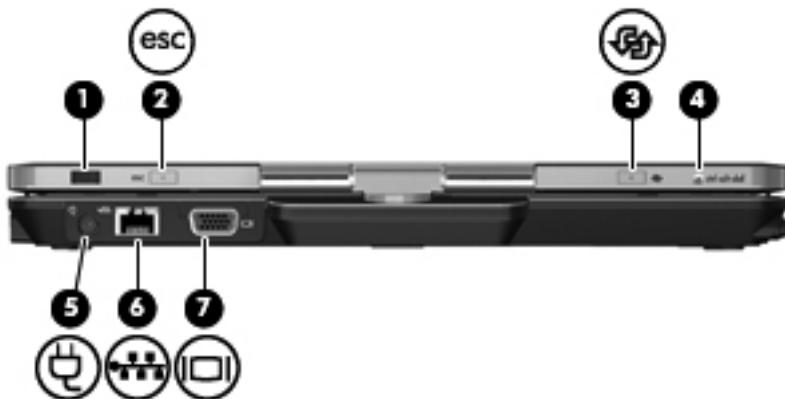
Component	Description
(1) HP Fingerprint Sensor (fingerprint reader)	Allows a fingerprint logon to Windows instead of a password logon.
(2) QuickWeb button	<ul style="list-style-type: none">When the computer is off, press the button to open HP QuickWeb.When the computer is on, press the button to open the default Web browser.
(3) QuickLook button	<ul style="list-style-type: none">When the computer is off, press the button to open HP QuickLook.When the computer is on, press the button to open Software Setup.
	NOTE: If Software Setup is not available, the default Web browser opens.
(4) Audio-out (headphone) jack/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. Also connects an optional headset microphone. NOTE: When a device is connected to the headphone jack, the computer speakers are disabled.
(5) Smart card reader	Supports optional smart cards and Java™ Cards.
(6) USB ports (2)	Connect optional USB devices.
(7) RJ-11 (modem) jack	Connects a modem cable.
(8) 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.

Left-side components



Component	Description
(1) Media Card Reader	Supports the following optional digital card formats: <ul style="list-style-type: none">• Secure Digital (SD) Memory Card• MultiMediaCard (MMC)
(2) Pen holder	Stores the digitizer pen.
(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) ExpressCard slot (select models only)	Supports optional ExpressCards.
(5) Wireless light	<ul style="list-style-type: none">• Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Mobile Broadband Module, and/or a Bluetooth device, is on.• Amber: All wireless devices are off.
(6) Wireless switch	Turns the wireless feature on or off, but does not create a wireless connection. NOTE: A wireless network must be set up in order to establish a wireless connection.
(7) 1394 port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(8) Powered USB port	Provides power to a USB device, such as an optional external MultiBay, if used with a powered USB cable.

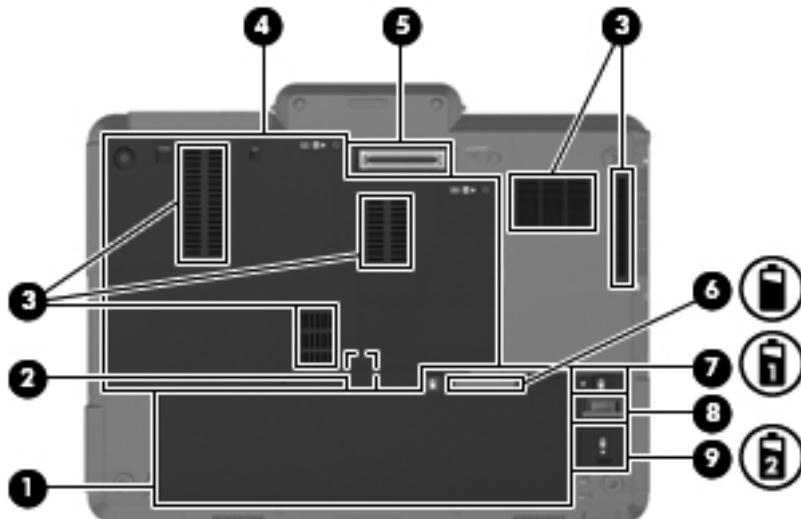
Rear components



Component	Description
(1) Jog dial	In tablet mode, functions like the enter key and the up and down arrows on a standard keyboard. <ul style="list-style-type: none">• Press inward to enter a command.• Rotate up to scroll up.• Rotate down to scroll down.
(2) esc button	In tablet mode, allows you to exit or escape out of an application.
(3) Rotate button	In tablet mode, switches the image between landscape and portrait orientation.
(4) ctrl+alt+del button	In tablet mode: <ul style="list-style-type: none">• While Windows is running, press the button with the pen to enter the ctrl+alt+del command.*• While the Computer Setup utility is running, press the button with the pen to enter the reset command. The computer resets and all unsaved information is lost. The reset function can be used to restore functionality when the system has become unresponsive.
(5) Power connector	Connects an AC adapter.
(6) RJ-45 (network) jack	Connects a network cable.
(7) External monitor port	Connects an external VGA monitor or projector.

*To protect your work and the system, the [ctrl+alt+delete](#) command cannot be entered using the [ctrl](#), [alt](#), and [del](#) keys on the on-screen keyboard.

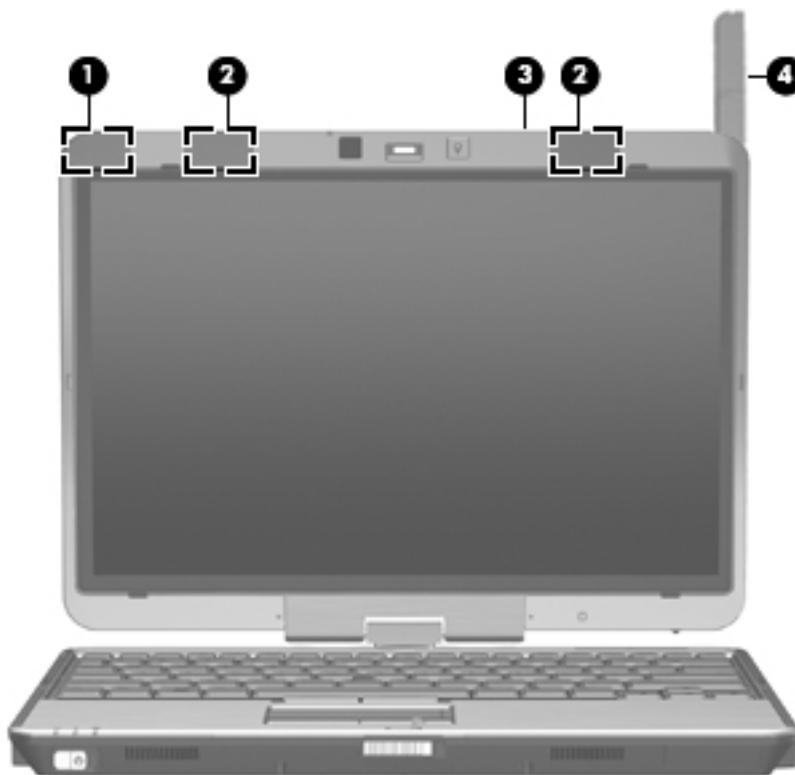
Bottom components



Component	Description
(1) Battery bay	Holds the battery and subscriber identity module (SIM).
(2) SIM slot	Contains a wireless subscriber identity module (SIM) (select models only). The SIM slot is located inside the battery bay.
(3) Vents (5)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4) Hard drive bay	Holds the hard drive, memory module slots, WLAN module (select models only), and WWAN module (select models only).
(5) Docking connector	Connects an optional docking device.
(6) Charge level indicator	Displays the approximate remaining battery charge.
(7) Battery release latch	Releases the battery from the battery bay.
(8) Accessory battery connector	Connects an optional accessory battery.
(9) Accessory battery connector door	Slides open to expose the accessory battery connector.

Wireless antennas (select models only)

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



Component	Description
(1) WWAN antenna (1)*	Sends and receives wireless signals to communicate with wireless wide area networks (WWANs).
(2) WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(3) External WWAN antenna button**	Press to open the external WWAN antenna.
(4) External WWAN antenna**	Sends and receives wireless signals to communicate with WWANs.

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

**Before connecting to a WWAN, press the WWAN antenna button to open the external WWAN antenna to a vertical position. The external WWAN antenna allows you to connect to a WWAN, and then to the Internet, using the integrated HP Mobile Broadband Module and service from a supported mobile network operator. Do not close the external WWAN antenna if you are connected to a WWAN.

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

3 Illustrated parts catalog

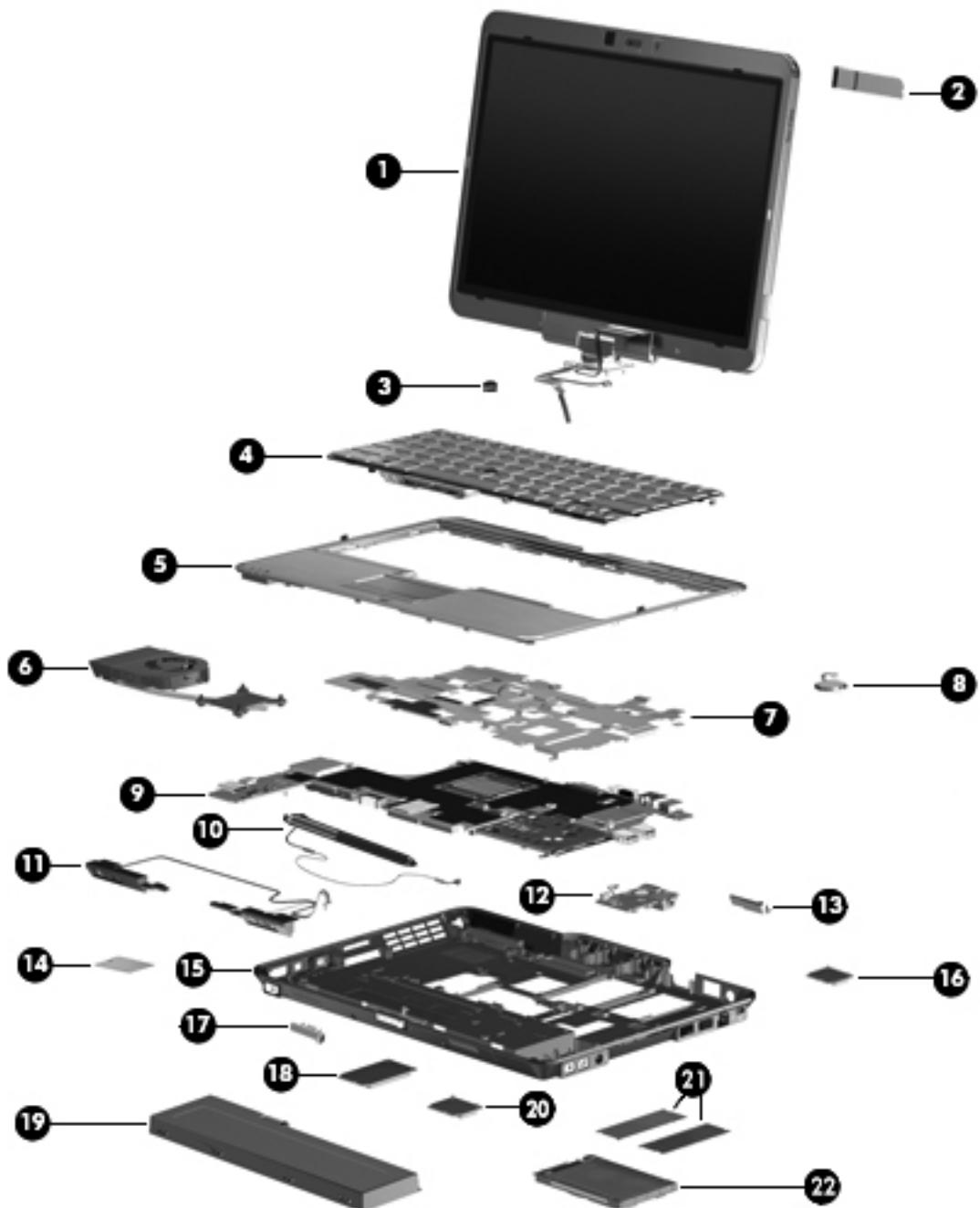
Service tag

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 assembly (includes 2 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)	
	30.7-cm (12.1-in) WXGA, LED, AntiGlare display	597827-001
	30.7-cm (12.1-in) WXGA, LED, AntiGlare display for use outdoors	597828-001
	30.7-cm (12.1-in) WXGA, LED, AntiGlare touch screen display	612497-001
(2)	External antenna	597835-001

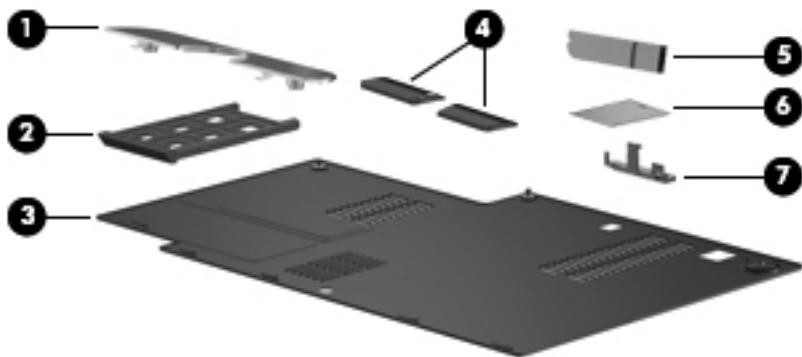
Item	Description	Spare part number
(3)	Pointing stick	486565-001
(4)	Keyboard with pointing stick (includes two buttons and two cables)	
	For use in Belgium	597841-A41
	For use in Brazil	597841-201
	For use in Bulgaria	597841-261
	For use in the Czech Republic	597841-221
	For use in Denmark	597841-081
	For use in France	597841-051
	For use in French Canada	597841-121
	For use in Germany	597841-041
	For use in Greece	597841-DJ1
	For use in Hungary	597841-211
	For use in Iceland	597841-DD1
	For use in Israel	597841-BB1
	For use in Italy	597841-061
	For use in Japan	597841-291
	For use in Latin America	597841-161
	For use in the Netherlands	597841-B31
	For use in Norway	597841-091
	For use in Portugal	597841-131
	For use in Russia	597841-251
	For use in Saudi Arabia	597841-171
	For use in Slovakia	597841-231
	For use in South Korea	597841-AD1
	For use in Spain	597841-071
	For use in Sweden	597841-B71
	For use in Switzerland	597841-BG1
	For use in Taiwan	597841-AB1
	For use in Thailand	597841-281
	For use in Turkey	597841-141
	For use in the United Kingdom	597841-031
	For use in the United States	597841-001
(5)	Top cover (includes TouchPad board and capacitive board)	597833-001
(6)	Fan/heat sink assembly (includes replacement thermal material)	597840-001

Item	Description	Spare part number
(7)	System board shield (includes replacement thermal material)	597838-001
(8)	RTC battery	482963-001
(9)	System board (includes replacement thermal material) For use in all countries and regions except for Russia and the People's Republic of China: <ul style="list-style-type: none">• Equipped with Intel Core i7 620M Dual Core processors (2.66-GHz, 4-MB L3 cache) 607702-001• Equipped with Intel Core i5 540M Dual Core processors (2.53-GHz, 3-MB L3 cache) 600462-001• Equipped with Intel Core i5 520M Dual Core processors (2.40-GHz, 3-MB L3 cache) 600463-001 For use only in Russia and the People's Republic of China: <ul style="list-style-type: none">• Equipped with Intel Core i7 620M Dual Core processors (2.66-GHz, 4-MB L3 cache) 607706-001• Equipped with Intel Core i5 540M Dual Core processors (2.53-GHz, 3-MB L3 cache) 607704-001• Equipped with Intel Core i5 520M Dual Core processors (2.40-GHz, 3-MB L3 cache) 607705-001	
(10)	Pen (includes tether)	606899-001
(11)	Speaker assembly	597836-001
(12)	Audio connector board	597834-001
(13)	Bluetooth module (does not include Bluetooth module cable)	537921-001
	NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 597832-001. See Cable Kit on page 24 for more Cable Kit spare part number information.	
(14)	Smart card reader	597839-001
(15)	Base enclosure	611561-001
(16)	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 597832-001. See Cable Kit on page 24 for more Cable Kit spare part number information.	
	For use in all countries and regions except Australia and New Zealand	510099-001
	For use in Australia and New Zealand	510099-011
(17)	Latch assembly	597837-001
(18)	WWAN module	531993-001
(19)	Li-ion battery	
	6-cell, 44-Wh, 2.0-Ah	454668-001
	6-cell, 39-Wh, 2.0-Ah	593592-001
(20)	WLAN modules Broadcom 4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-003

Item	Description	Spare part number
	Broadcom 4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
	Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
	Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518434-002
	Intel Centrino Advanced-N 6200 ABG for use in Pakistan, Russia, and Ukraine	572510-001

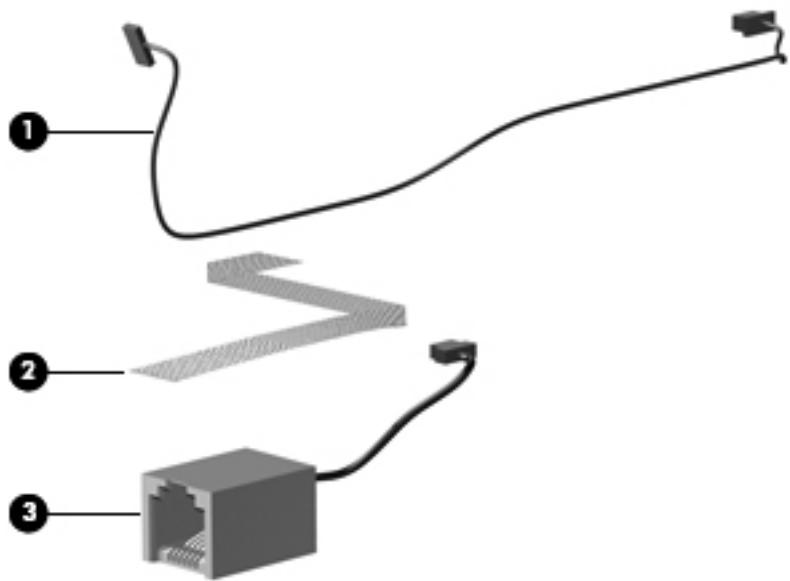
Item	Description	Spare part number
	Intel Centrino Advanced-N 6200 AGN for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Cayman Islands, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Martinique, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	572509-001
(21)	Memory modules (PC3-10600, 1333-MHz, DDR3)	
	4-GB	599092-001
	2-GB	598856-001
	1-GB	598859-001
(22)	Hard drives (includes Mylar cover with tab, rubber gasket, and bracket)	
	250-GB, 5400-rpm, 4.6-cm (1.8-in)	597825-001
	160-GB, 5400-rpm, 4.6-cm (1.8-in)	607703-001
	160-GB solid-state drive	600464-001
	80-GB solid-state drive	597826-001

Plastics Kit



Item	Description	Spare part number
	Plastics Kit	597829-001
(1)	Display hinge cover	
(2)	ExpressCard slot protective insert	
(3)	Hard drive cover (includes 4 captive screws, secured by C-clips)	
(4)	Pick buttons	
(5)	External antenna	
(6)	Smart card reader bezel	
(7)	Bluetooth module holder	

Cable Kit



Item	Description	Spare part number
	Cable Kit	597832-001
(1)	Bluetooth module cable	
(2)	Audio cable	
(3)	RJ-11 connector cable	

Mass storage devices

Description	Spare part number
Hard drives (include Mylar cover with tab, rubber gasket, and bracket)	
250-GB, 5400-rpm, 4.6-cm (1.8-in)	597825-001
160-GB, 5400-rpm, 4.6-cm (1.8-in)	607703-001
160-GB solid-state drive (SSD)	600464-001
80-GB solid-state drive (SSD)	597826-001

Miscellaneous parts

Description	Spare part number
65-W AC adapter	613152-001
Rubber Kit (includes feet and screw covers)	597830-001
HP 2740 Ultra-Slim Expansion Base	606172-001
External antenna	597835-001
Pointing stick cover	607814-001
Power cords	
For use in Argentina	490371-D01
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom	490371-031

Description	Spare part number
For use in the United States	490371-001
Screw Kit	597831-001
<ul style="list-style-type: none"> • Phillips PM2.5×12.0 captive screw • Phillips PM2.0×3.0 screw • Phillips PM2.0×7.0 captive screw • Phillips PM3.0×5.0 screw • Phillips PM2.5×6.0 screw • Phillips PM2.0×5.0 captive screw • Phillips PM2.5×3.0 screw • Phillips PM2.5×5.0 screw • Torx T8M2.0×8.0 screw • Torx T8M2.5×7.0 screw • Torx T8M2.5×6.0 screw • Torx T8M2.5×8.0 screw 	

Sequential part number listing

Spare part number	Description
454668-001	6-cell, 39-Wh, 2.0-Ah, Li-ion battery
482963-001	RTC battery
490371-001	Power cord for use in North America
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Brazil
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-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel

Spare part number	Description
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
504593-003	Broadcom 4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
504593-004	Broadcom 4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
510099-001	Modem module for use in all countries and regions except Australia and New Zealand 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 597832-001. See Cable Kit on page 24 for more Cable Kit spare part number information.
510099-011	Modem module for use in Australia and New Zealand
518434-001	Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States

Spare part number	Description
518434-002	Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
531993-001	WWAN Module
537921-001	Bluetooth module (does not include cable)
572509-001	Intel Centrino Advanced-N 6200 AGN WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Cayman Islands, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Martinique, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam
572510-001	Intel Centrino Advanced-N 6200 ABG WLAN module for use in Pakistan, Russia, and Ukraine
593592-001	6-cell, 44-Wh, 2.0-Ah, Li-ion battery
597825-001	250-GB, 5400-rpm, 4.6-cm (1.8-in) hard drive (includes Mylar cover with tab, rubber gasket, and bracket)
597826-001	80-GB solid-state drive (includes Mylar cover with tab, rubber gasket, and bracket)
597827-001	30.7-cm (12.1-in) WXGA, LED, AntiGlare display assembly (includes 2 WLAN antenna transceivers and cables and 2 WWAN antenna transceivers and cables)
597828-001	30.7-cm (12.1-in) WXGA, LED, AntiGlare display for use outdoors (includes 2 WLAN antenna transceivers and 2 WWAN antenna transceivers and cables)
597829-001	Plastics Kit (see Plastics Kit on page 23 for more Plastics Kit spare part information)
597830-001	Rubber Kit (includes feet and screw covers)
597831-001	Screw Kit
597832-001	Cable Kit (see Cable Kit on page 24 for more Cable Kit spare part information)
597833-001	Top cover (includes TouchPad board and capacitive board)

Spare part number	Description
597834-001	Audio connector board
597835-001	External antenna
597836-001	Speaker assembly
597837-001	Latch assembly (includes latch, bracket, two screws, and spring)
597838-001	System board shield (includes replacement thermal material)
597839-001	Smart card reader
597840-001	Fan/heat sink assembly (includes replacement thermal material)
597841-001	Keyboard with pointing stick for use in the United States (includes two buttons and two cables)
597841-031	Keyboard with pointing stick for use in the United Kingdom (includes two buttons and two cables)
597841-041	Keyboard with pointing stick for use in Germany (includes two buttons and two cables)
597841-051	Keyboard with pointing stick for use in France (includes two buttons and two cables)
597841-061	Keyboard with pointing stick for use in Italy (includes two buttons and two cables)
597841-071	Keyboard with pointing stick for use in Spain (includes two buttons and two cables)
597841-081	Keyboard with pointing stick for use in Denmark (includes two buttons and two cables)
597841-091	Keyboard with pointing stick for use in Norway (includes two buttons and two cables)
597841-121	Keyboard with pointing stick for use in French Canada (includes two buttons and two cables)
597841-131	Keyboard with pointing stick for use in Portugal (includes two buttons and two cables)
597841-141	Keyboard with pointing stick for use in Turkey (includes two buttons and two cables)
597841-161	Keyboard with pointing stick for use in Latin America (includes two buttons and two cables)
597841-171	Keyboard with pointing stick for use in Saudi Arabia (includes two buttons and two cables)
597841-201	Keyboard with pointing stick for use in Brazil (includes two buttons and two cables)
597841-211	Keyboard with pointing stick for use in Hungary (includes two buttons and two cables)
597841-221	Keyboard with pointing stick for use in the Czech Republic (includes two buttons and two cables)
597841-231	Keyboard with pointing stick for use in Slovakia (includes two buttons and two cables)
597841-251	Keyboard with pointing stick for use in Russia (includes two buttons and two cables)
597841-261	Keyboard with pointing stick for use in Bulgaria (includes two buttons and two cables)
597841-281	Keyboard with pointing stick for use in Thailand (includes two buttons and two cables)
597841-291	Keyboard with pointing stick for use in Japan (includes two buttons and two cables)
597841-A41	Keyboard with pointing stick for use in Belgium (includes two buttons and two cables)
597841-AB1	Keyboard with pointing stick for use in Taiwan (includes two buttons and two cables)
597841-AD1	Keyboard with pointing stick for use in South Korea (includes two buttons and two cables)
597841-B31	Keyboard with pointing stick for use in the Netherlands and Europe (includes two buttons and two cables)
597841-B71	Keyboard with pointing stick for use in Sweden (includes two buttons and two cables)

Spare part number	Description
597841-BB1	Keyboard with pointing stick for use in Israel (includes two buttons and two cables)
597841-BG1	Keyboard with pointing stick for use in Switzerland (includes two buttons and two cables)
597841-DD1	Keyboard with pointing stick for use in Iceland (includes two buttons and two cables)
597841-DJ1	Keyboard with pointing stick for use in Greece (includes two buttons and two cables)
598856-001	2-GB memory module (PC3-10600, 1333-MHz, DDR3)
598859-001	1-GB memory module (PC3-10600, 1333-MHz, DDR3)
599092-001	4-GB memory module (PC3-10600, 1333-MHz, DDR3)
600462-001	System board with Intel Core i5 540M Dual Core processor (2.53-GHz, 3-MB L3 cache) for use in all countries and regions except for Russia and the People's Republic of China
600463-001	System board with Intel Core i5 520M Dual Core processor (2.40-GHz, 3-MB L3 cache) for use in all countries and regions except for Russia and the People's Republic of China
600464-001	160-GB solid-state drive (includes Mylar cover with tab, rubber gasket, and bracket)
606172-001	HP 2740 Ultra-Slim Expansion Base
606899-001	Pen (includes tether)
607702-001	System board with Intel Core i7 620M Dual Core processor (2.66-GHz, 4-MB L3 cache) for use in all countries and regions except for Russia and the People's Republic of China
607703-001	160-GB, 5400-rpm, 4.6-cm (1.8-in) hard drive (includes Mylar cover with tab, rubber gasket, and bracket)
607704-001	System board with Intel Core i5 540M Dual Core processor (2.53-GHz, 3-MB L3 cache) for use only in Russia and the People's Republic of China
607705-001	System board with Intel Core i5 520M Dual Core processor (2.40-GHz, 3-MB L3 cache) for use only in Russia and the People's Republic of China
607706-001	System board with Intel Core i7 620M Dual Core processor (2.66-GHz, 4-MB L3 cache) for use only in Russia and the People's Republic of China
607814-001	Pointing stick cover
611561-001	Base enclosure
612497-001	30.7-cm (12.1-in) WXGA, LED, AntiGlare touch screen display (includes 2 WLAN antenna transceivers and 2 WWAN antenna transceivers and cables)
613152-001	65-W AC adapter

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.

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

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 $\pm 10\%$ 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
Metalized 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

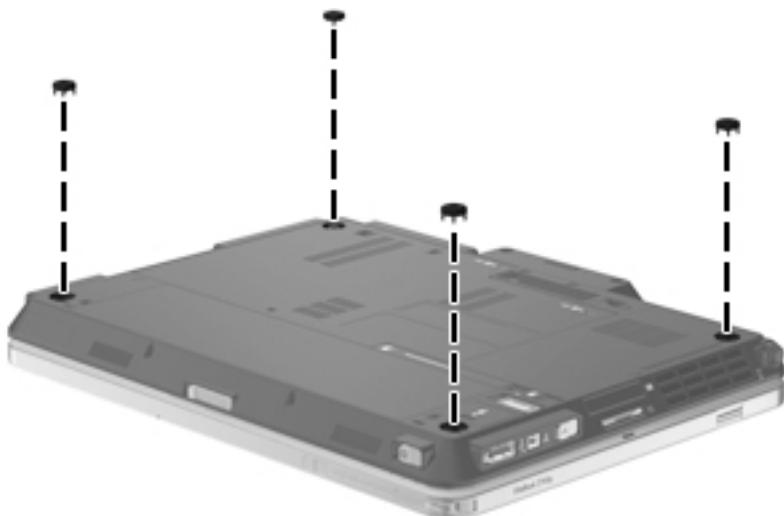
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



- 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 595785-001. There are four rubber feet that attach to the base enclosure in the locations illustrated below.

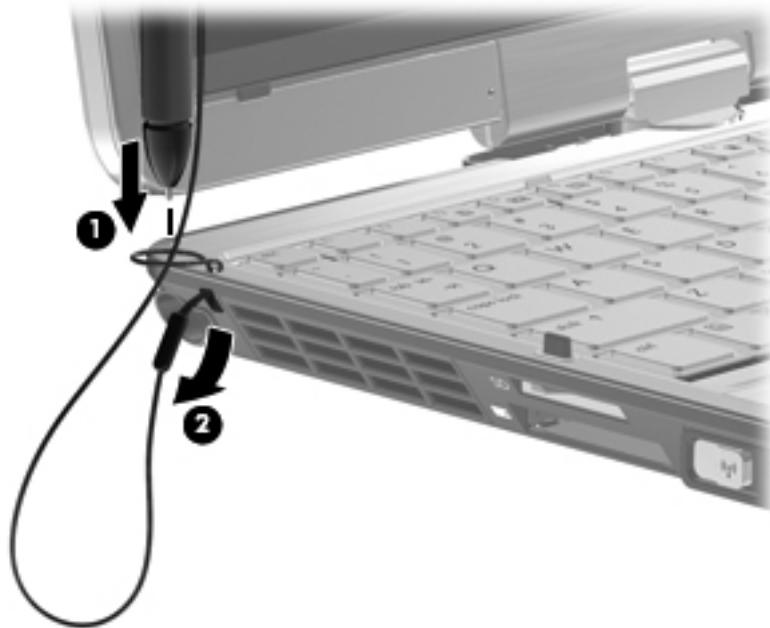


Pen

Description	Spare part number
Pen (includes tether)	606899-001

Remove the pen:

1. Position the computer right-side up, with the left side toward you.
2. Pull the loop on the tether until it is large enough to pass the pen through it, and then pull the pen through the loop (1).
3. Remove the pen and tether from the computer (2).



Reverse this procedure to install the pen.

Battery

Description	Spare part number
8-cell, 44-Wh, 2.0-Ah, Li-ion battery	454668-001
8-cell, 39-Wh, 2.0-Ah, Li-ion battery	593592-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside-down on a flat surface, with the battery bay toward you.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the edge of the battery upward **(2)** and remove it from the computer **(3)**.



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

SIM

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

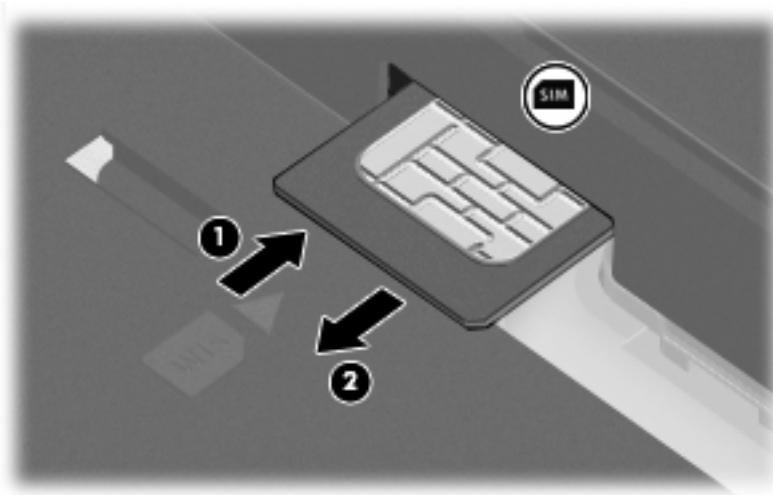
NOTE: If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

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 39](#)).

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.

Hard drive

 **NOTE:** All hard drive spare part kits include Mylar cover with tab, rubber gasket, and bracket.

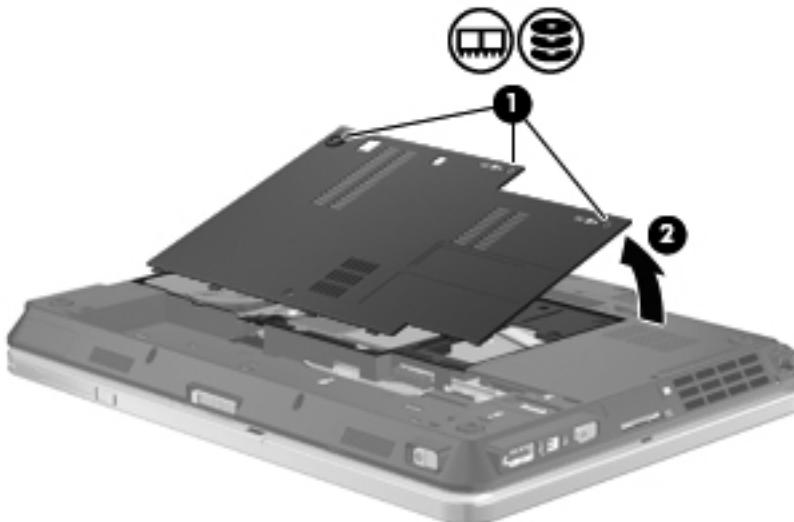
Description	Spare part number
250-GB, 5400-rpm, 4.6-cm (1.8-in) hard drive	597825-001
160-GB, 5400-rpm, 4.6-cm (1.8-in) hard drive	607703-001
160-GB solid-state drive (SSD)	600464-001
80-GB solid-state drive (SSD)	597826-001

Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).

Remove the hard drive:

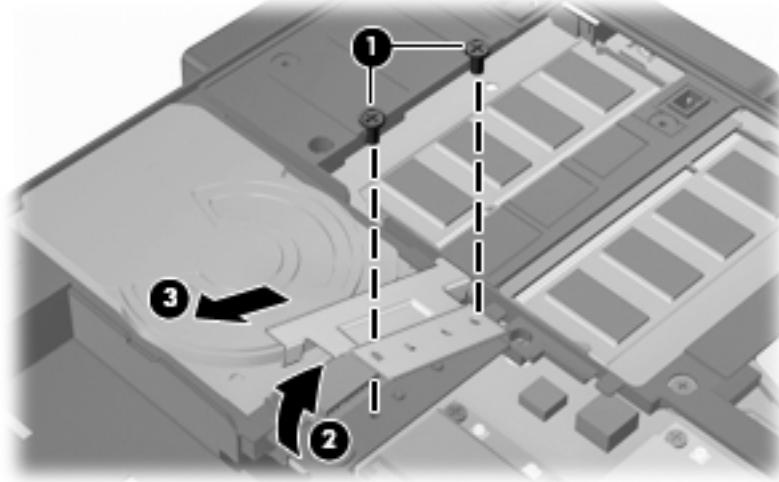
1. Position the computer upside-down, with the front toward you.
2. Loosen the three Phillips PM2.0×5.0 captive screws **(1)** that secure the hard drive cover to the computer.
3. Lift the rear edge of the hard drive cover **(2)** until it rests at an angle, and then remove the hard drive cover. The hard drive cover is included in the Plastics Kit, spare part number 597829-001.



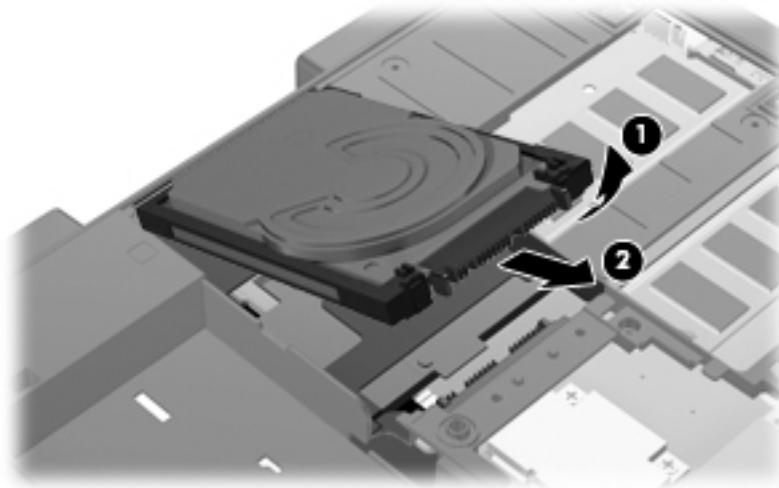
4. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the hard drive bracket to the computer.

5. Lift the left side of the bracket up at an angle (2), and then remove the bracket from the computer (3).

NOTE: The right side of the bracket has a tab that fits into a slot in the computer. When reinstalling, make sure to insert the tab into the slot or the bracket will not seat correctly.



6. At the corner of the hard drive, pull the drive up (1) until it rests at an angle.
7. Pull the hard drive away from the bay and out of the computer (2).



Reverse this procedure to reassemble and install the hard drive.

WLAN module

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

Description	Spare part number
Broadcom BCM4312 802.11/b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-003
Broadcom BCM4312 802.11/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
Broadcom 4322 AGN 802.11a/b/g/draft-n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	518434-002

Description	Spare part number
Intel Centrino Advanced-N 6200 AGN for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Cayman Islands, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Martinique, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Tunisia, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	572509-001
Intel Centrino Advanced-N 6200 ABG for use in Pakistan, Russia, and Ukraine	572510-001

Before removing the WLAN module, follow these steps:

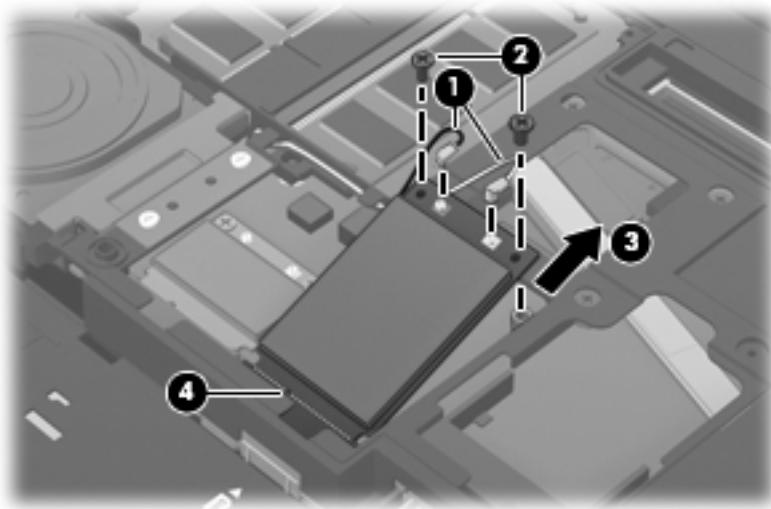
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#)).

Remove the WLAN module:

1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.
-  **NOTE:** The black WLAN antenna cable is connected to the WLAN module "Main" terminal. The white WLAN antenna cable is connected to the WLAN module "Aux" terminal.
2. Remove the two Phillips PM2.5×3.0 barrel screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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

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



Reverse this procedure to install the WLAN module.

WWAN module

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

Description	Spare part number
WWAN module	531993-001

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 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#)).

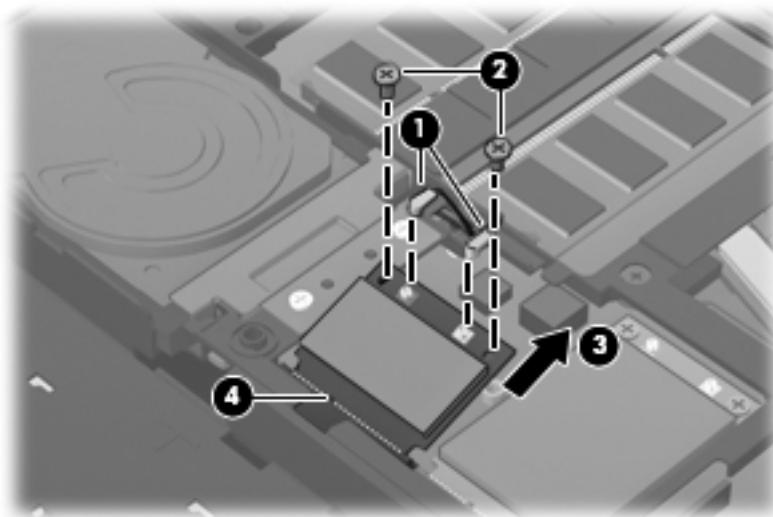
Remove the WWAN module:

1. 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.

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

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



Reverse this procedure to install the WWAN module.

Memory modules

Description	Spare part number
1-GB (PC3-10600, 1333-MHz, DDR3)	598859-001
2-GB (PC3-10600, 1333-MHz, DDR3)	598856-001
4-GB (PC3-10600, 1333-MHz, DDR3)	599092-001

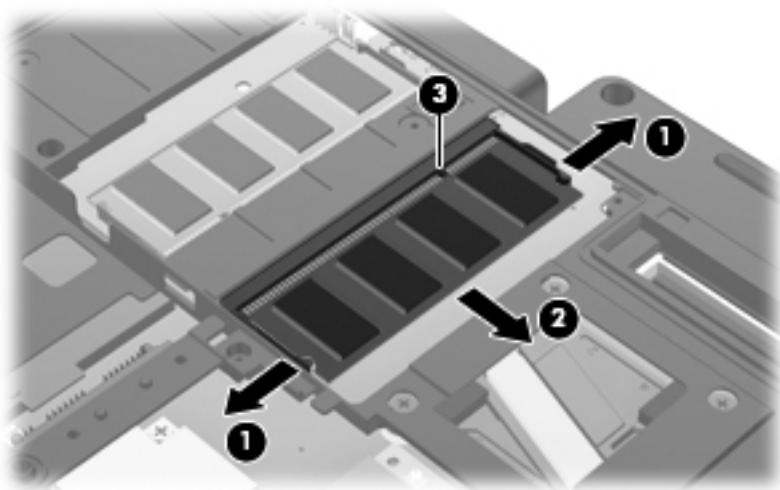
Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#)).

Remove the memory module:

1. 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.)
2. 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.

Keyboard

For use in:	Spare part number	For use in:	Spare part number
Keyboard with pointing stick (includes two buttons and two cables):			
Belgium	597841-A41	Latin America	597841-161
Brazil	597841-201	The Netherlands and Europe	597841-B31
Bulgaria	597841-261	Norway	597841-091
Czech Republic	597841-221	Portugal	597841-131
Denmark	597841-081	Russia	597841-251
France	597841-051	Saudi Arabia	597841-171
French Canada	597841-121	Slovakia	597841-231
Germany	597841-041	Spain	597841-071
Greece	597841-DJ1	Sweden and Finland	597841-B71
Hungary	597841-211	Switzerland	597841-BG1
Iceland	597841-DD1	Taiwan	597841-AB1
Israel	597841-BB1	Thailand	597841-281
Italy	597841-061	Turkey	597841-141
Japan	597841-291	The United Kingdom	597841-031
South Korea	597841-AD1	The United States	597841-001

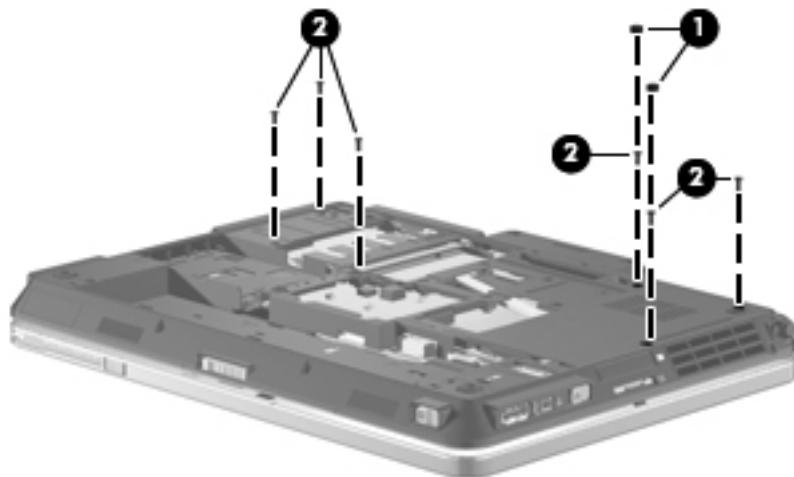
Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#)).

Remove the keyboard:

1. Turn the computer upside-down, with the front toward you.

2. Remove the two Mylar screw covers (1) and the six Torx T8M2.0×8.0 screws (2) that secure the keyboard to the computer.

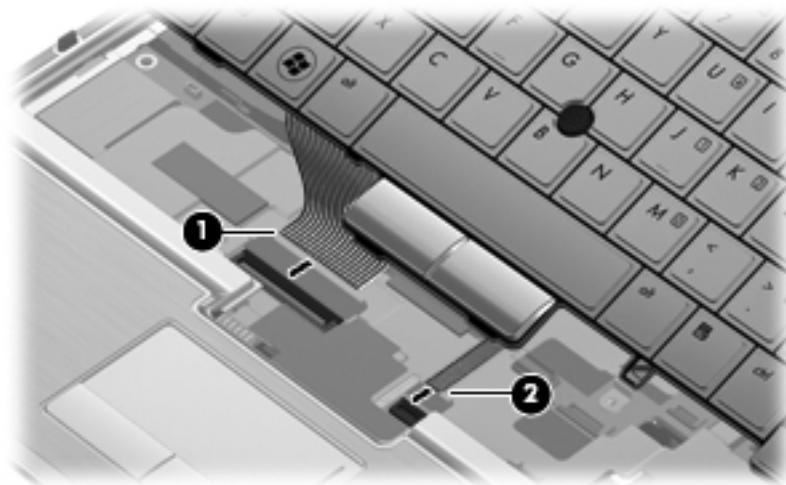


3. Turn the computer right-side up, with the front toward you.
4. Open the computer as far as possible.
5. Lift the upper rear edge of the keyboard (1) until it releases, work your way across the top of the keyboard toward the right while releasing the keyboard from the top cover, lift the rear of the keyboard up until it rests at an angle (2), and then lift the keyboard up enough to gain access to the cables underneath (3).



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

7. Release the ZIF connector to which the pointing stick cable (2) is attached, and then disconnect the pointing stick cable from the system board.



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover

All top covers include TouchPad board and capacitive board.

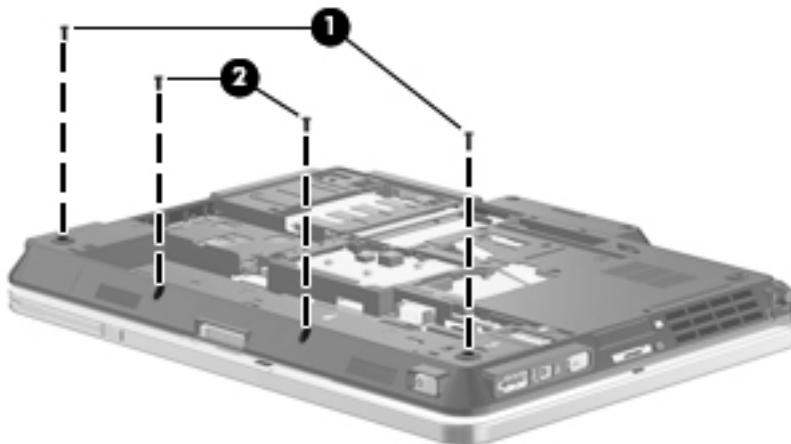
Description	Spare part number
Top cover	597833-001

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 39](#)).
5. Remove the keyboard (see [Keyboard on page 48](#))
6. Remove the hard drive cover (see [Hard drive on page 41](#)).

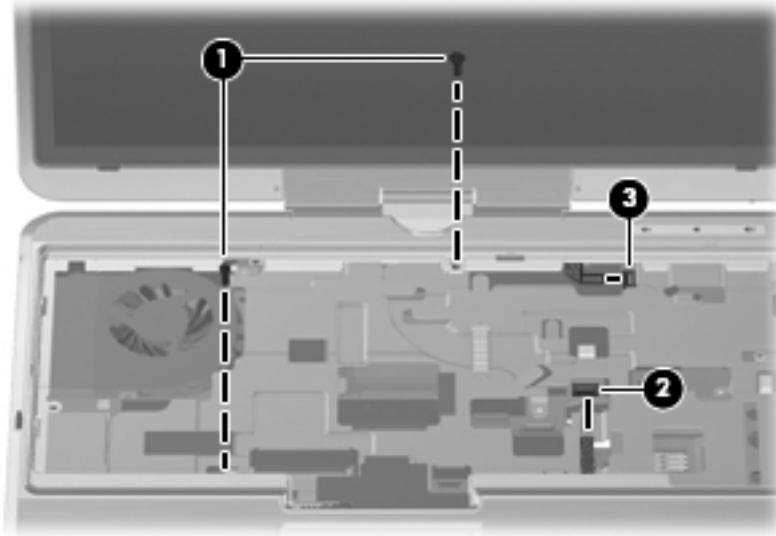
Remove the top cover:

1. Turn the computer upside-down, with the front toward you.
2. Remove the two Torx T8M2.0×8.0 screws (1) located in the bottom feet. You do not need to remove the feet.
3. Remove the two Torx T8M2.0×6.0 screws (2) located below the battery bay.

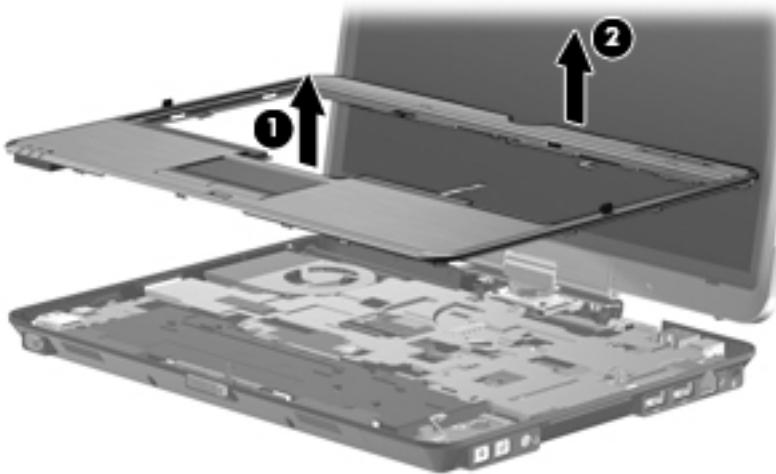


4. Turn the computer right-side up, with the front toward you.
5. Open the computer as far as possible.
6. Remove the two Phillips PM2.5×7.0 screws (1) from the top of the top cover.
7. Disconnect the TouchPad cable from the system board ZIF connector (2).

8. Disconnect the capacitive strip cable from the system board ZIP connector (3).



9. Lift the edge of the top cover near the TouchPad (1) to disengage it from the computer.
10. Disengage the remainder of the top cover from the computer, and then lift the top cover up (2) and off the computer.



Reverse this procedure to install the top cover.

RTC battery

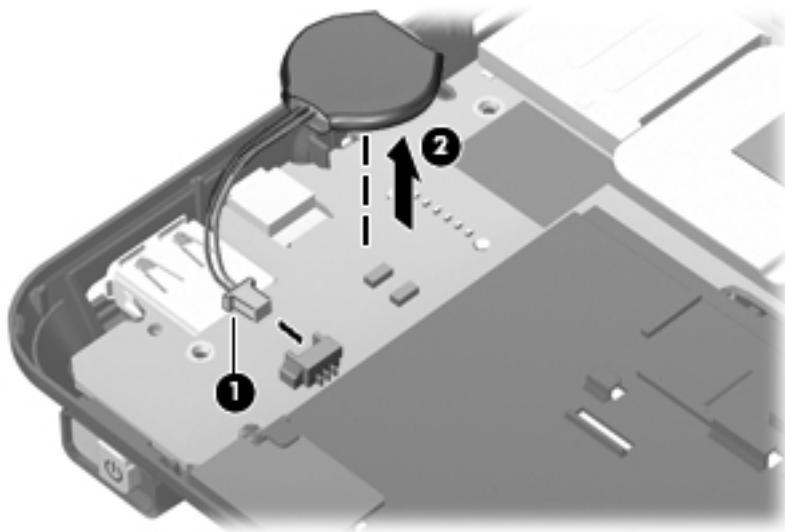
Description	Spare part number
RTC battery	482963-001

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 39](#)).
5. Remove the following components:
 - a. Hard drive cover (see [Hard drive on page 41](#)).
 - b. Keyboard (see [Keyboard on page 48](#)).
 - c. Top cover (see [Top cover on page 51](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Gently pull the battery away from the double-sided tape that secures it to the system board **(2)** and remove it from the computer.



Reverse this procedure to install the RTC battery.

Audio connector board

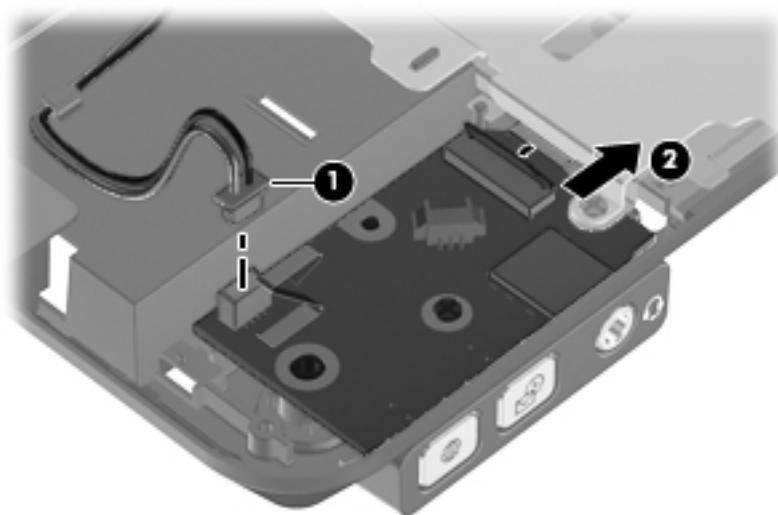
Description	Spare part number
Audio connector board	597834-001

Before removing the audio connector board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the following components:
 - a. Hard drive cover (see [Hard drive on page 41](#)).
 - b. Keyboard (see [Keyboard on page 48](#))
 - c. Top cover (see [Top cover on page 51](#))

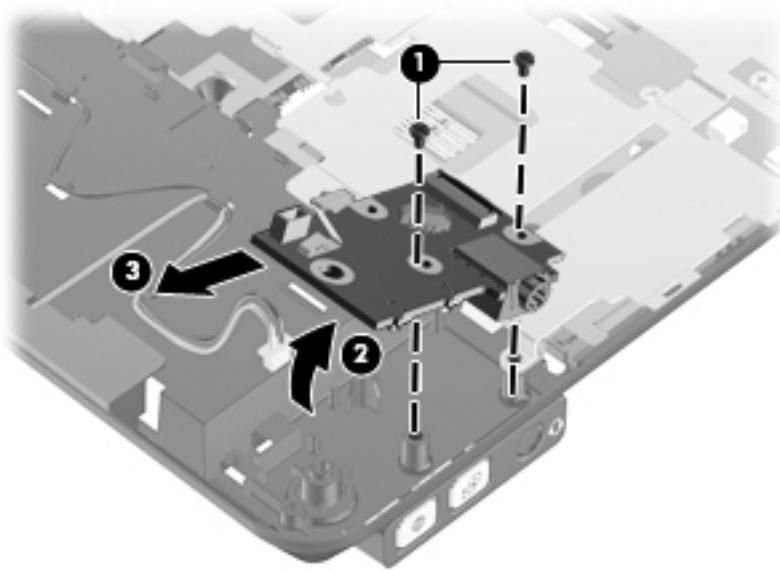
Remove the audio connector board:

1. Position the computer right-side up, with the front toward you.
2. Disconnect the speaker cable (1) from the audio connector board.
3. Disconnect the audio cable (2) from the audio connector board ZIF connector.



4. Remove the two Phillips PM2.0×4.0 screws (1) that secure the audio connector board to the base enclosure.

5. Lift the board (2) up at an angle, then slide the board toward the front of the computer (3) until it is clear of the system board shield.



Reverse this procedure to install the audio connector board.

Bluetooth module

 **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 597832-001. See [Cable Kit on page 24](#) for more Cable Kit spare part number information.

The Bluetooth module holder is included in the Plastics Kit, spare part number 597829-001. See [Plastics Kit on page 23](#) for more Plastics Kit spare part number information.

Description	Spare part number
Bluetooth module	537921-001

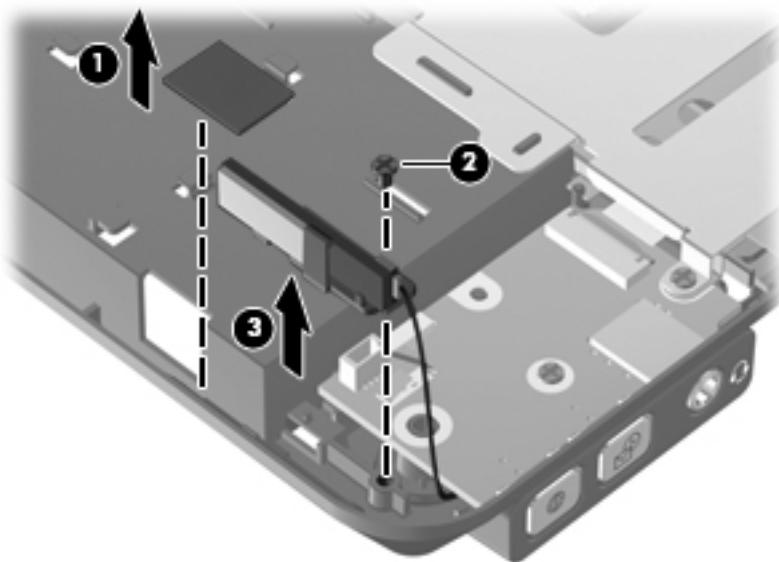
Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the following components:
 - a. Hard drive cover (see [Hard drive on page 41](#))
 - b. Keyboard (see [Keyboard on page 48](#))
 - c. Top cover (see [Top cover on page 51](#))

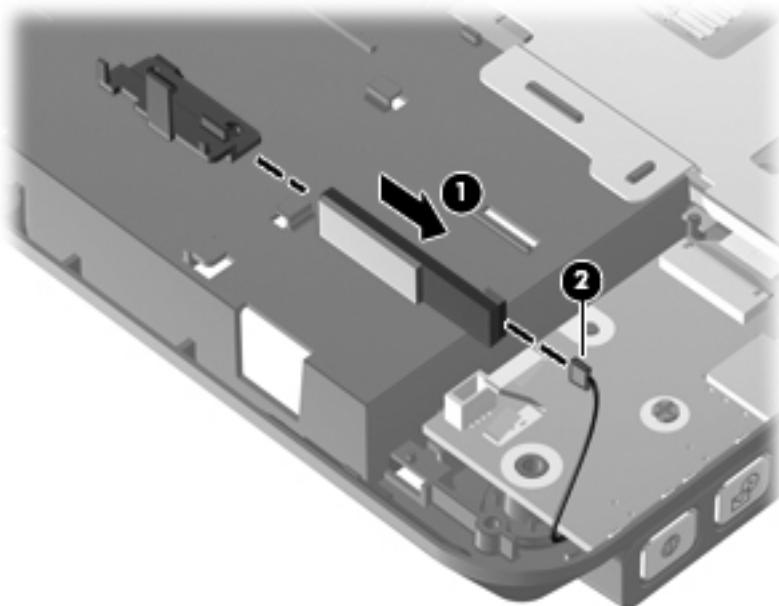
Remove the Bluetooth module:

1. Position the computer right-side up, with the front toward you.
2. Remove the foam insulator from in front of the module (1).
3. Remove the Phillips PM2.0×4.0 screw (2) that secures the Bluetooth module holder to the computer.

4. Lift the Bluetooth module holder (3) as far as the cable will allow.



5. Slide the Bluetooth module from the holder (1), and then disconnect the Bluetooth module cable from the Bluetooth module (2).



6. Remove the Bluetooth module and holder from the computer.

Reverse this procedure to reassemble and install the Bluetooth module and holder.

Latch assembly

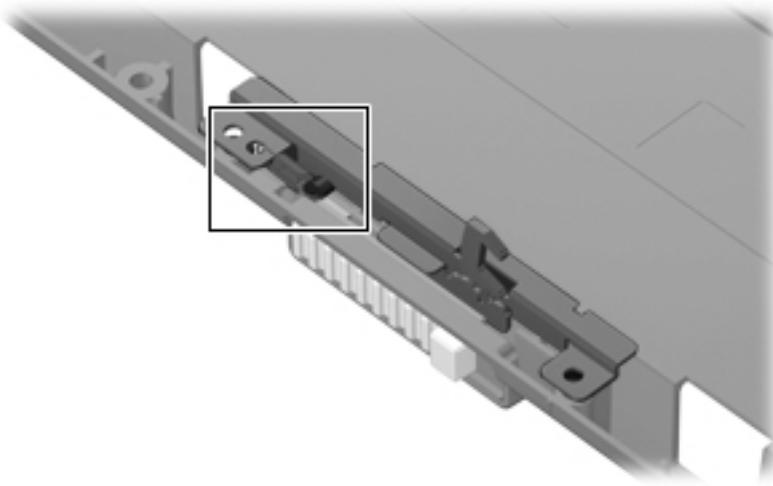
 **NOTE:** All latch assembly kits include the latch, bracket, two screws, and spring.

Description	Spare part number
Latch assembly	597837-001

Before removing the latch 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 39](#)).
5. Remove the following components:
 - a. Hard drive cover (see [Hard drive on page 41](#))
 - b. Keyboard (see [Keyboard on page 48](#))
 - c. Top cover (see [Top cover on page 51](#))

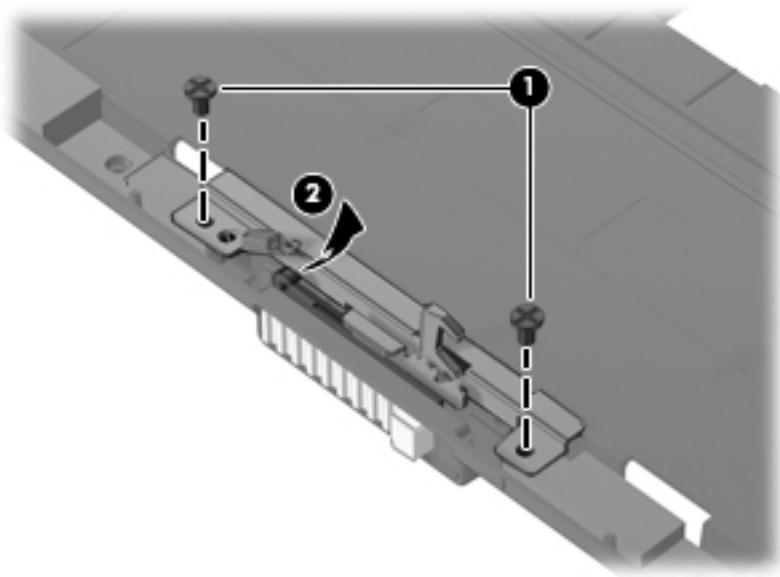
 **NOTE:** The latch mechanism includes a small spring. Please note the installed location of this spring in the following illustration prior to disassembling the latch mechanism to allow for correct reassembly.



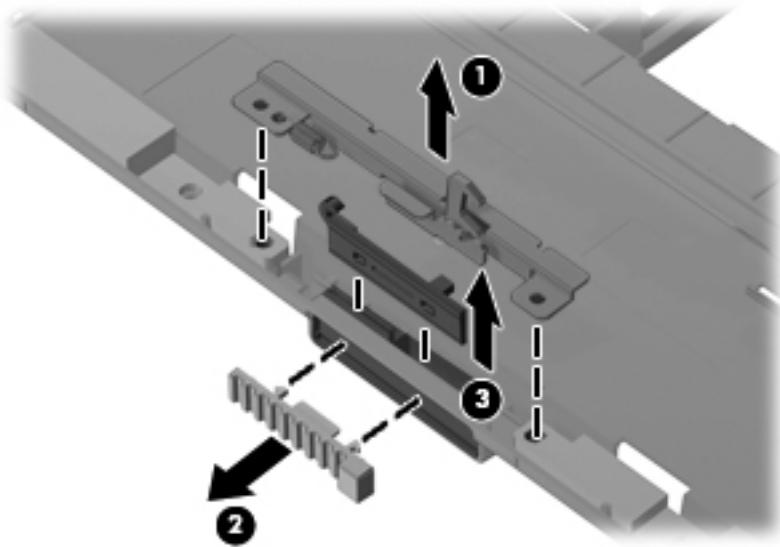
Remove the latch assembly:

1. Position the computer right-side up, with the front toward you.
2. Remove the two Phillips PM2.0x4.0 screws (1) that secure the latch bracket to the base enclosure.

3. Detach the spring from the latch (2).



4. Lift the bracket from the computer (1), pull the front latch away from the front of the computer (2), and then lift the inner latch piece from the computer (3).



Reverse this procedure to install the latch assembly.

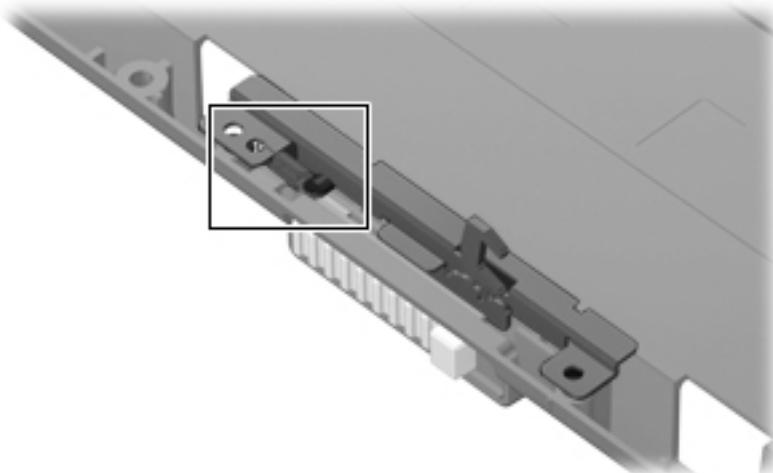
Speaker assembly

Description	Spare part number
Speaker assembly	597836-001

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 39](#)).
5. Remove the following components:
 - a. Hard drive cover (see [Hard drive on page 41](#))
 - b. Keyboard (see [Keyboard on page 48](#))
 - c. Top cover (see [Top cover on page 51](#))

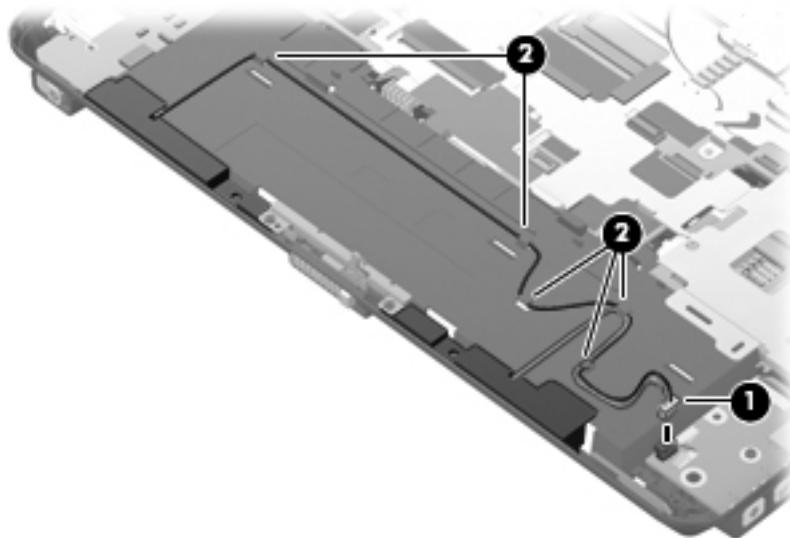
 **NOTE:** Removal of the speakers involves loosening the front latch mechanism. This mechanism includes a small spring. Please note the installed location of this spring in the following illustration prior to disassembling the latch mechanism to allow for correct reassembly.



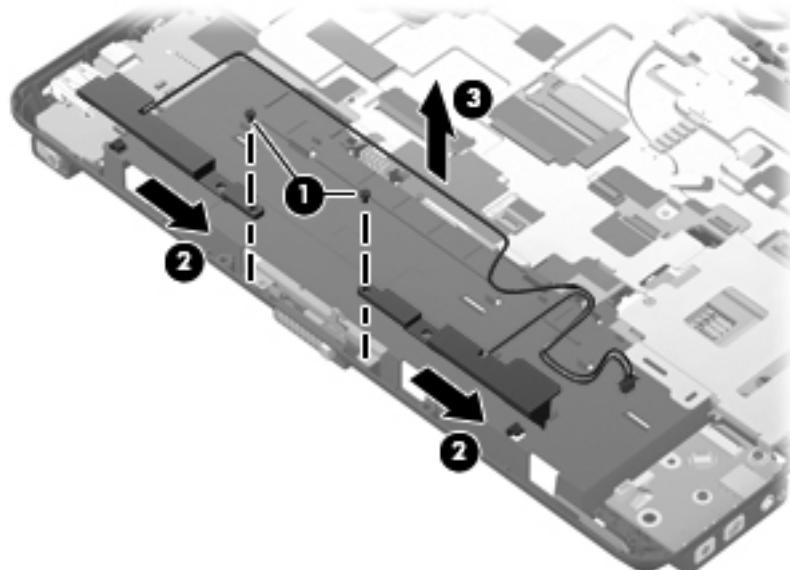
Remove the speaker assembly:

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

2. Unplug the speaker cable (1) from the audio connector board, and note the routing channel (2) of the speaker cable on the enclosure base.



3. Remove the two Phillips PM2.0×4.0 screws (1) that secure the speaker assembly to the base enclosure.
4. Slide the speakers toward the right (2), and then lift the speakers and cables from the base enclosure (3).



Reverse this procedure to install the speaker assembly.

Display assembly

All display assemblies include two WLAN antenna transceivers and cables and two WWAN antenna transceivers and cables.

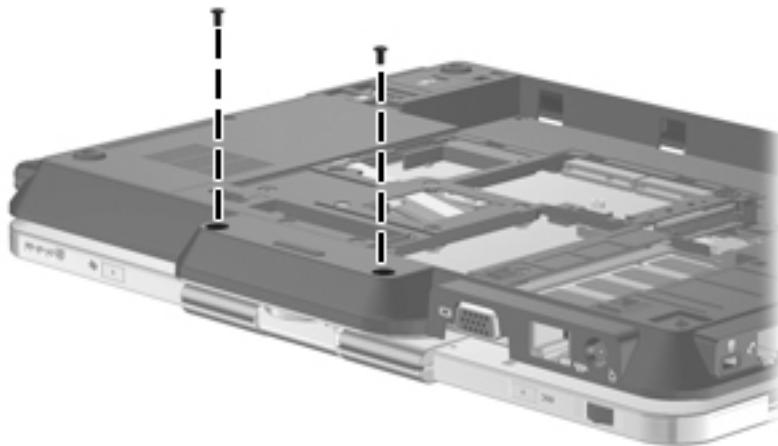
Description	Spare part number
30.7-cm (12.1-in) WXGA, LED, AntiGlare display assembly	597827-001
30.7-cm (12.1-in) WXGA, LED, AntiGlare display for use outdoors	597828-001
30.7-cm (12.1-in) WXGA, LED, AntiGlare, touch screen display	612497-001

Before removing the display assembly, follow these steps:

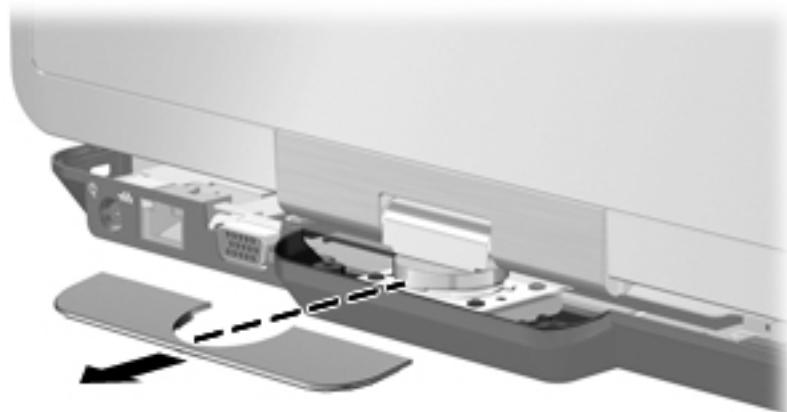
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 43](#)) and the WWAN module (see [WWAN module on page 46](#)).
7. Remove the following components:
 - a. Keyboard (see [Keyboard on page 48](#))
 - b. Top cover (see [Top cover on page 51](#))

Remove the display assembly:

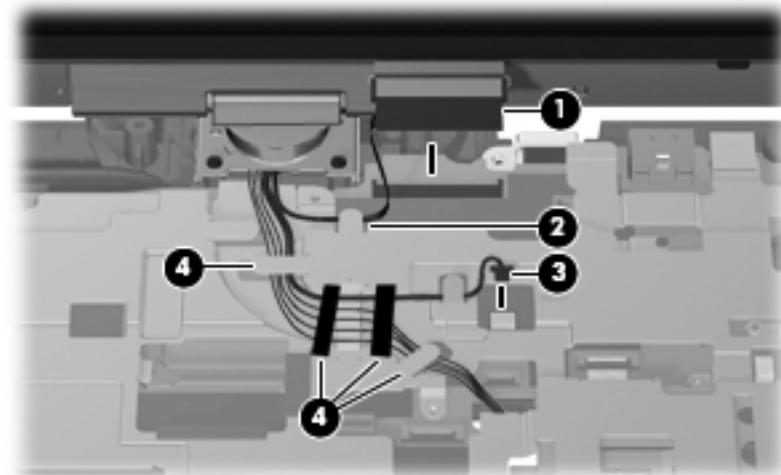
1. Position the computer upside down, with the rear toward you.
2. Remove the two Torx TM2.0×5.0 screws that secure the hinge cover to the computer.



- 3.** Position the computer right-side up, with the rear toward you.
- 4.** Slide the hinge cover away from the computer. The hinge cover is available in the Plastics Kit, spare part number 597829-001.



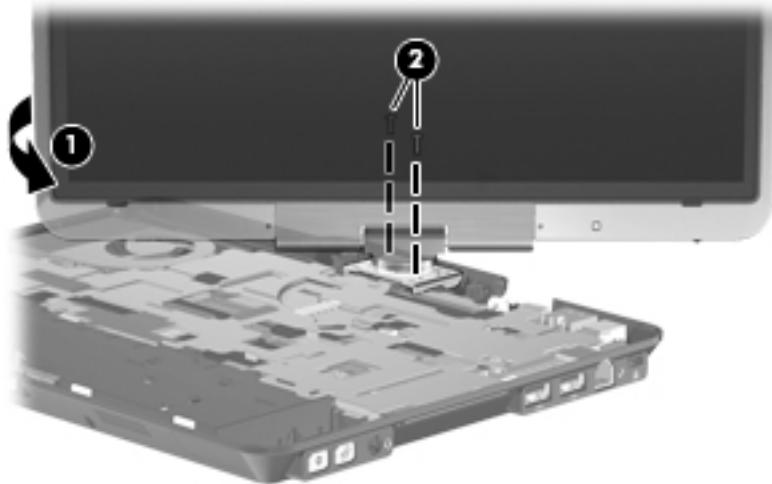
- 5.** Position the computer right-side up, with the front toward you.
- 6.** Disconnect the display panel cable (**1**) from the system board.
- 7.** Remove the display panel cable from the clip built into the system board shield (**2**).
- 8.** Disconnect the microphone cable (**3**) from the system board.
- 9.** Remove the WLAN and WWAN antenna cables from the channel, clips, and tape that secure the cables to the system board shield (**4**).



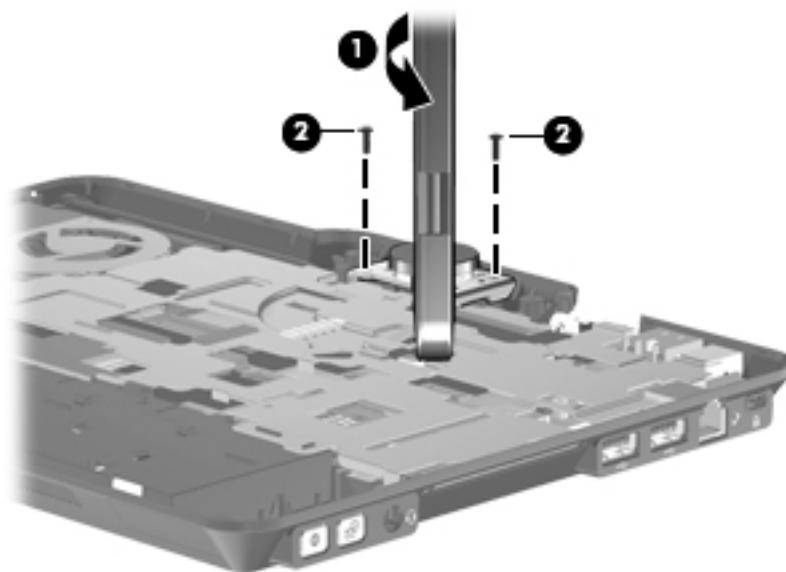
- 10.** Position the computer right-side up, with the rear toward you.
- 11.** Rotate the display (**1**) to gain easier access to the screws in the display bracket.

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

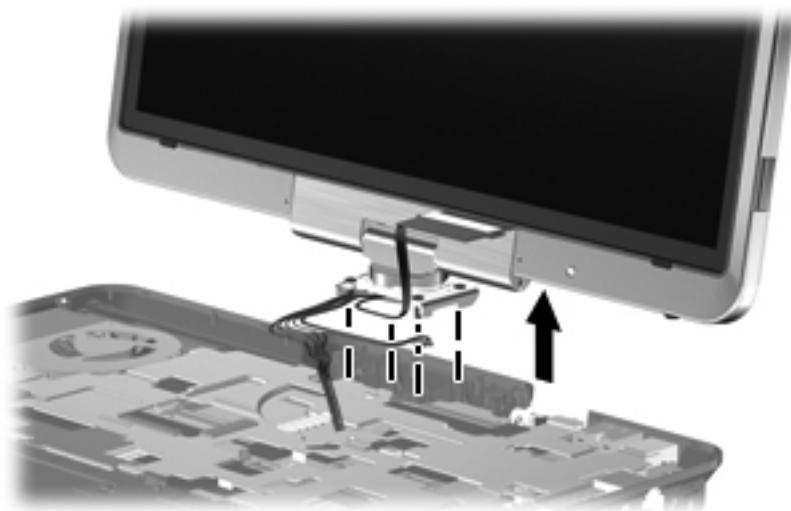
12. Remove two Phillips PM2.5×7.0 screws (2) that secure the display assembly to the base enclosure.



13. Rotate the display (1) to gain access to the remaining two screws in the display bracket.
14. Remove remaining two Phillips PM2.5×7.0 screws (2) that secure the display assembly to the base enclosure.



- 15.** Lift the display assembly straight up and remove it.



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

Failure to follow these routing instructions can result in degradation of the computer's WLAN and WWAN performance.

Reverse this procedure to reassemble and install the display assembly.

System board shield

 **NOTE:** All system board shield kits include replacement thermal material.

Description	Spare part number
System board shield	597838-001

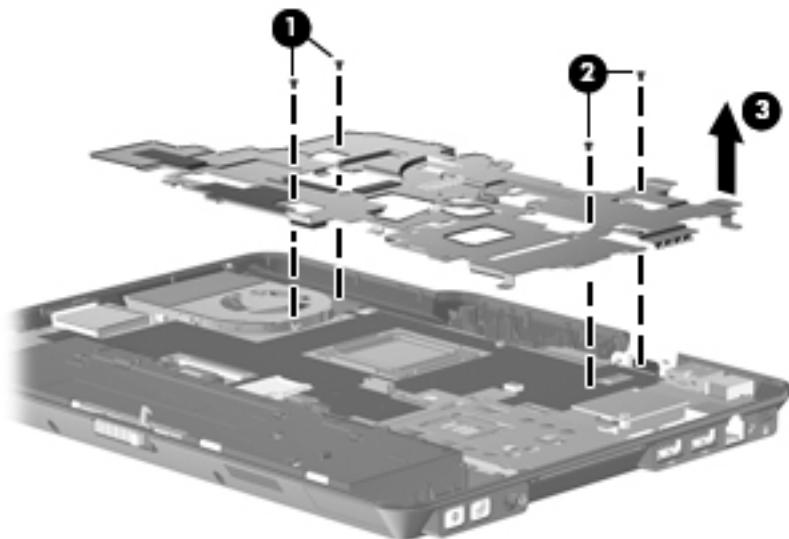
Before removing the system board shield, follow these steps:

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 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#))
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 43](#)) and the WWAN module (see [WWAN module on page 46](#)).
7. Remove the following components:
 - a. Keyboard (see [Keyboard on page 48](#))
 - b. Top cover (see [Top cover on page 51](#))
 - c. Display assembly (see [Display assembly on page 62](#))

Remove the system board shield:

1. Position the computer right-side up, with the front toward you.
2. Remove the two PM2.0×4.0 screws **(1)** and two the PM2.0×3.0 screws **(2)** that secure the shield to the computer.

3. Remove the shield from the computer (3).



Reverse this procedure to install the system board shield.

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 597832-001. See [Cable Kit on page 24](#) for more Cable Kit spare part number information.

Description	Spare part number
Modem module for use in all countries and regions except Australia and New Zealand	510099-001
Modem module for use in Australia and New Zealand	510099-011

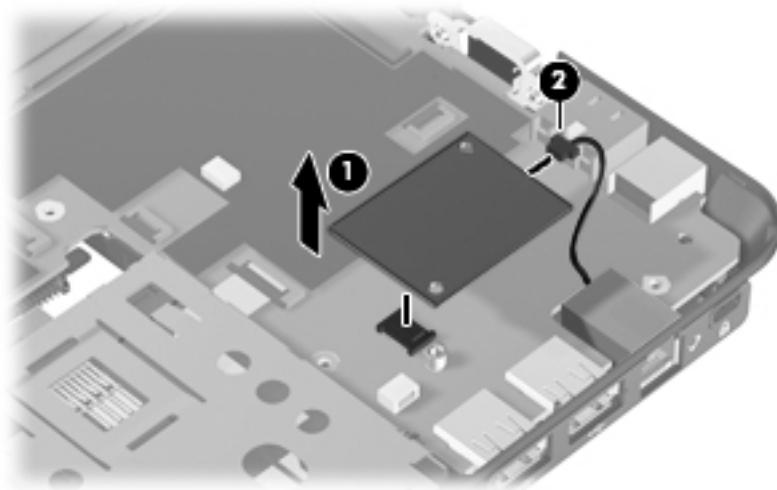
Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#))
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 43](#)) and the WWAN module (see [WWAN module on page 46](#)).
7. Remove the following components:
 - a. Keyboard (see [Keyboard on page 48](#))
 - b. Top cover (see [Top cover on page 51](#))

- c. Display assembly (see [Display assembly on page 62](#))
- d. System board shield (see [System board shield on page 66](#))

Remove the modem module:

1. Turn the computer right-side up, with the front toward you.
2. Disconnect the modem module **(1)** from the system board by lifting it straight up.
3. Disconnect the modem module cable **(2)** from the modem module, and then remove the module from the computer.



Reverse this procedure to install the modem module.

Smart card reader

Description	Spare part number
Smart card reader (includes cable)	597839-001

Before removing the smart card reader, follow these steps:

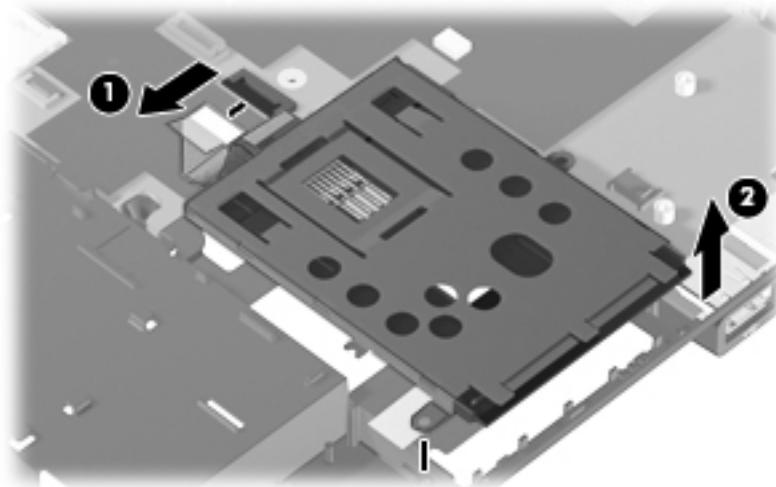
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the hard drive cover (see [Hard drive on page 41](#))

6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 43](#)) and the WWAN module (see [WWAN module on page 46](#)).
7. Remove the following components:
 - a. Keyboard (see [Keyboard on page 48](#))
 - b. Top cover (see [Top cover on page 51](#))
 - c. Display assembly (see [Display assembly on page 62](#))
 - d. System board shield (see [System board shield on page 66](#))

Remove the smart card reader:

1. Position the computer right-side up, with the front toward you.
2. Disconnect the smart card reader cable from the ZIF connector on the system board (1).
3. Lift the smart card reader out of the chassis (2)

 **NOTE:** Adhesive secures the reader to the base enclosure. You must break the adhesion to remove the reader.



Reverse this procedure to install the smart card reader.

System board

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

Description	Spare part number
For use in all countries and regions except for Russia and the People's Republic of China:	
• Equipped with Intel Core i7 620M Dual Core processors (2.66-GHz, 4-MB L3 cache)	607702-001
• Equipped with Intel Core i5 540M Dual Core processors (2.53-GHz, 3-MB L3 cache)	600462-001
• Equipped with Intel Core i5 520M Dual Core processors (2.40-GHz, 3-MB L3 cache)	600463-001
For use only in Russia and the People's Republic of China:	
• Equipped with Intel Core i7 620M Dual Core processors (2.66-GHz, 4-MB L3 cache)	607706-001
• Equipped with Intel Core i5 540M Dual Core processors (2.53-GHz, 3-MB L3 cache)	607704-001
• Equipped with Intel Core i5 520M Dual Core processors (2.40-GHz, 3-MB L3 cache)	607705-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 41](#))
 - b. Keyboard (see [Keyboard on page 48](#))
 - c. Top cover (see [Top cover on page 51](#))
 - d. Display assembly (see [Display assembly on page 62](#))
 - e. System board shield (see [System board shield on page 66](#))
 - f. Smart card reader (see [Smart card reader on page 68](#))
 - g. Modem module (see [Modem module on page 67](#))

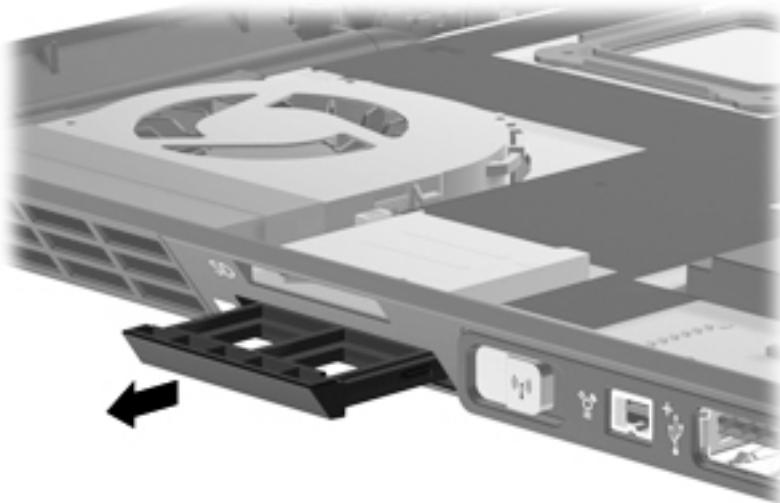
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- SIM (see [SIM on page 40](#))
- Memory modules (see [Memory modules on page 47](#))
- WLAN module (see [WLAN module on page 43](#))
- WWAN module (see [WWAN module on page 46](#))

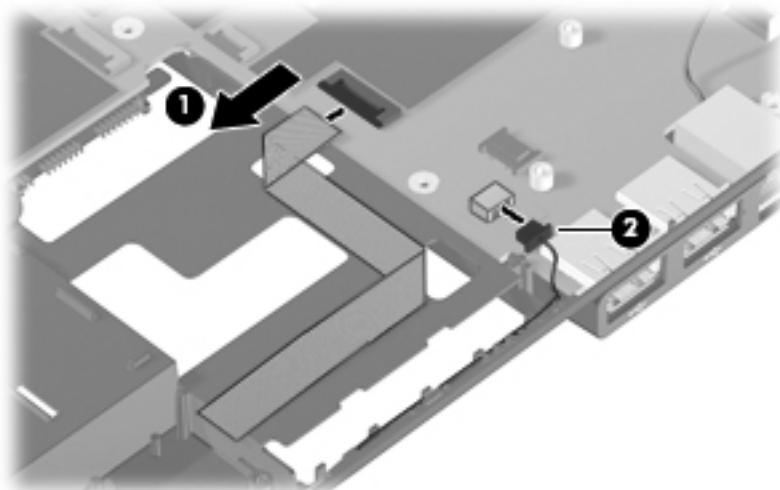
- Modem module (see [Modem module on page 67](#))
- Heat sink (see [Fan/heatsink assembly on page 73](#))

Remove the system board:

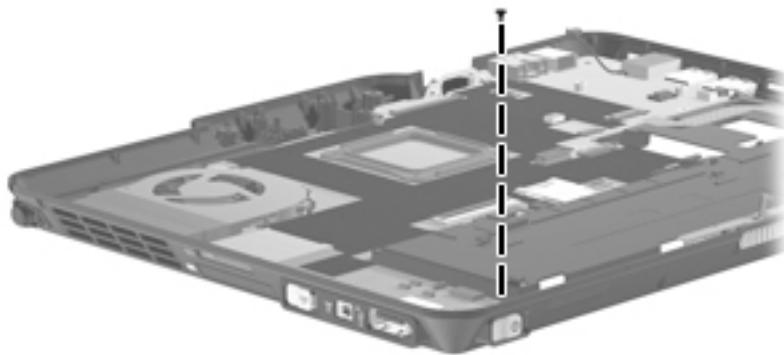
1. Position the computer right-side up, with the front toward you.
2. Remove the ExpressCard or ExpressCard slot holder.



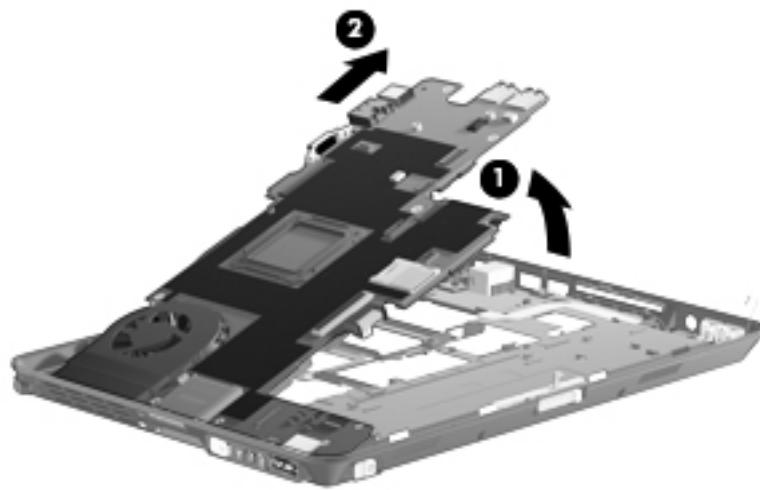
3. Disconnect the audio connector board cable (1) and the Bluetooth module cable (2) from the system board.



4. Remove the Phillips PM2.0×4.0 screw that secures the system board to the base enclosure.



5. Lift the right side of the system board (1), and then lift it out of the base enclosure (2).



Reverse this procedure to install the system board.

Fan/heat sink assembly

All heat sink spare part kits include replacement thermal material.

Description	Spare part number
Fan/heat sink assembly	597840-001

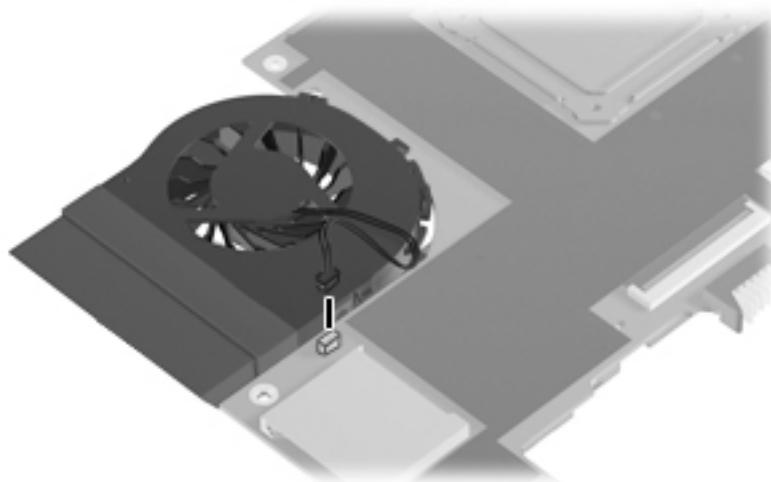
Before removing the fan/heat sink assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 39](#)).
5. Remove the following components:
 - a. WLAN module (see [WLAN module on page 43](#))
 - b. WWAN module (see [WWAN module on page 46](#))
 - c. Hard drive (see [Hard drive on page 41](#))
 - d. Keyboard (see [Keyboard on page 48](#))
 - e. Top cover (see [Top cover on page 51](#))
 - f. Display assembly (see [Display assembly on page 62](#))
 - g. System board shield (see [System board shield on page 66](#))
 - h. Modem module (see [Modem module on page 67](#))
 - i. System board (see [System board on page 70](#))
 - j. Smart card reader (see [Smart card reader on page 68](#))

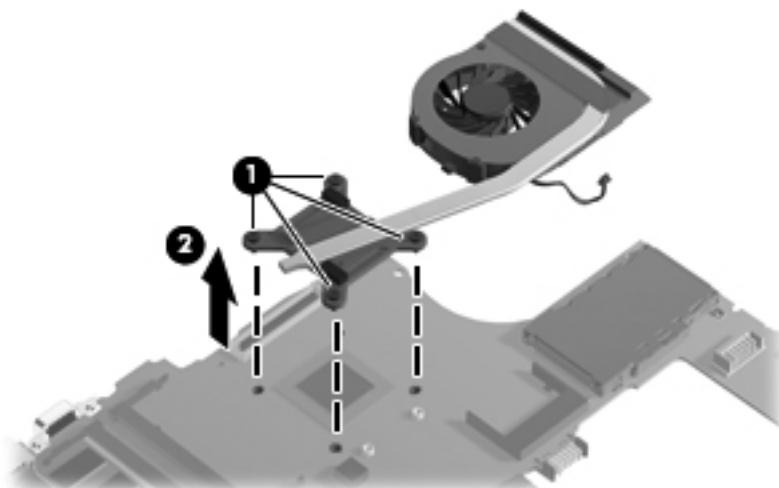
Remove the fan/heat sink assembly:

1. Position the system board upside down.

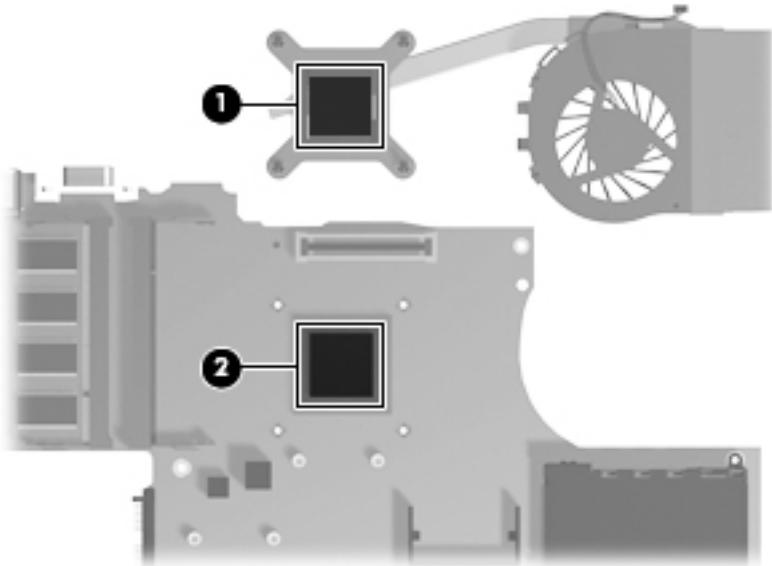
2. Disconnect the fan cable from the system board.



3. In the order indicated on the heat sink, loosen the four Phillips captive screws **(1)** that secure the heat sink to the base enclosure.
4. Remove the fan/heat sink assembly from the system board **(2)**.



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



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

Misc cables

 **NOTE:** The Cable Kit includes the audio connector board cable, Bluetooth cable, and RJ-11 connector and cable.

Description	Spare part number
Cable Kit	597832-001

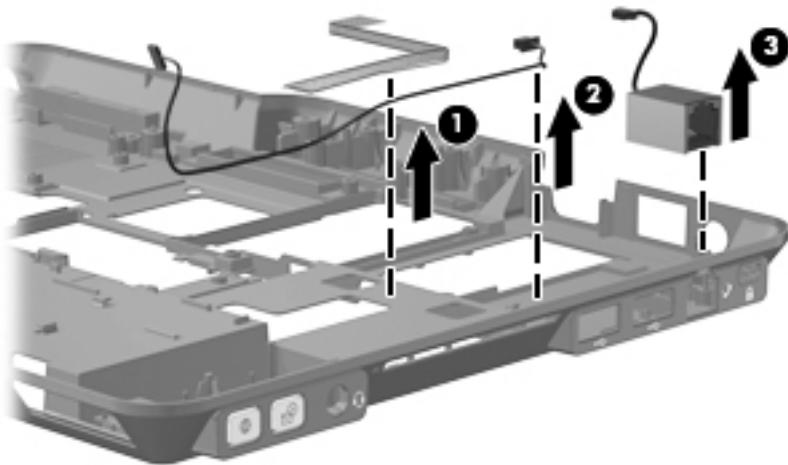
Before removing the cables, follow these steps:

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 39](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 41](#))
 - b. Keyboard (see [Keyboard on page 48](#))
 - c. Display assembly (see [Display assembly on page 62](#))
 - d. Top cover (see [Top cover on page 51](#))
 - e. System board shield (see [System board shield on page 66](#))
 - f. Modem module (see [Modem module on page 67](#))

- g. System board (see [System board on page 70](#))
- h. Smart card reader (see [Smart card reader on page 68](#))

Remove the cables:

1. Position the computer right-side up, with the right side toward you.
2. Remove the necessary cable as follows, noting the routing path of the cable:
 - (1) Audio connector board cable
 - (2) Bluetooth cable
 - (3) RJ-11 connector and cable



Reverse this procedure to install the cables.

5 Computer Setup

Starting Computer Setup

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

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

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

To start Computer Setup, follow these steps:

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

Using Computer Setup

Navigating and selecting in Computer Setup

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

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

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

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

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

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

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

– or –

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

– or –

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

– or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

– or –

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

Your changes go into effect when the computer restarts.

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

Computer Setup menus

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

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

File menu

Select	To do this
System Information	<ul style="list-style-type: none">● View identification information for the computer and the batteries in the system.● View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Set System Date and Time	Set or change the date and time on the computer.
System Diagnostics	<p>Displays the following information:</p> <ul style="list-style-type: none">● System Information<ul style="list-style-type: none">○ Identification information for the computer and the batteries in the system.○ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.● Start-up Test—Verifies the system components needed for starting the computer.● Run-In Test—Runs a comprehensive check on system memory.● Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system.● Memory Test—Runs a comprehensive test on any memory installed in the computer.● Battery Test—Runs a comprehensive test on any batteries installed in the computer.● Error Log—Displays a log file if any errors have occurred.
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Ignore Changes and Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes and Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management > Create New BIOS User Account (requires a BIOS administrator password)	<ul style="list-style-type: none">• Select from a list of BIOS users.• Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (select models only; disabled by default).
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Anti Theft > AT-p	Enable/disable Anti-Theft Protection.
DriveLock Password	<ul style="list-style-type: none">• Enable/disable DriveLock on any computer hard drive (enabled by default).• Change a DriveLock user password or master password.
<p>NOTE: DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>	
Automatic DriveLock	Enable/disable Automatic DriveLock support.
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help.
<p>NOTE: You must have a setup password to change this setting.</p>	
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay.
<p>CAUTION: If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.</p>	
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot Options	<ul style="list-style-type: none">● Set a startup menu delay (in seconds).● Set the MultiBoot Express popup delay (in seconds).● Enable/disable custom logo (disabled by default).● Enable/disable display diagnostic URL (enabled by default).● Enable/disable CD-ROM boot (enabled by default).● Enable/disable SD card boot (enabled by default).● Enable/disable floppy boot (enabled by default).● Enable/disable PXE internal NIC boot (enabled by default).● Enable/Disable Unified Extensible Firmware Interface (UEFI) Boot Mode (disabled by default).● Set the legacy boot order.
Device Configurations	<ul style="list-style-type: none">● Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following:<ul style="list-style-type: none">○ Use of a USB keyboard in Computer Setup even when a Windows operating system is not running○ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer● Enable/disable fan always on while connected to an AC outlet (disabled by default).● Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security (disabled by default).● Select a SATA (Serial Advanced Technology Attachment) device mode. The following options are available:<ul style="list-style-type: none">○ AHCI (Advanced Host Controller Interface)○ IDE (Integrated Drive Electronics)○ RAID (Redundant Array of Independent Disks) (select models only)

Select	To do this
	<p>NOTE: Availability of these options varies by computer model.</p> <ul style="list-style-type: none">● Enable/disable secondary battery fast charge (enabled by default).● Enable/disable HP QuickLook (enabled by default).● Enable/disable preboot authentication on HP QuickLook boot (enabled by default).● Enable/disable HP QuickWeb (enabled by default).● Enable/disable HP QuickWeb write protect (disabled by default).● Enable/disable virtualization technology (select models only; disabled by default).● Enable/disable TXT (Intel Trusted Execution Technology) (select models only; disabled by default).● Enable/disable Multi Core CPU (enabled by default).● Enable/disable Intel HT Technology (enabled by default).● Enable/disable Wake on USB (enabled by default).● Enable/disable Num lock state at boot (disabled by default).

Select	To do this
Built-In Device Options	<ul style="list-style-type: none"> ● Enable/disable the wireless button state (enabled by default). ● Enable/disable embedded WWAN device radio (select models only; enabled by default). ● Enable/disable embedded WLAN device radio (select models only; enabled by default). ● Enable/disable the embedded Bluetooth device radio (enabled by default). ● Enable/disable the network interface controller (enabled by default). ● Enable/disable LAN/WLAN switching (disabled by default). ● Set the wake on LAN state. Options include the following: <ul style="list-style-type: none"> ○ Disabled ○ Boot to Network ○ Follow Boot Order ● Enable/disable the ambient light sensor. ● Enable/disable the fingerprint device (enabled by default). ● Enable/disable the integrated camera (enabled by default). ● Enable/disable the power monitor circuit (enabled by default). ● Enable/disable the audio device (enabled by default). ● Enable/disable a modem device (enabled by default). ● Enable/disable the microphone (enabled by default). ● Enable/disable the internal speakers (enabled by default).
Port Options	<p>NOTE: All port options are enabled by default.</p> <ul style="list-style-type: none"> ● Enable/disable the flash media reader. ● Enable/disable the USB port. <p>CAUTION: Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator.</p> <ul style="list-style-type: none"> ● Enable/disable the 1394 port. ● Enable/disable the ExpressCard slot. ● Enable/disable the Smart card slot. ● Enable/disable the eSATA port.

Select	To do this
AMT Options	<p>NOTE: All AMT options are disabled by default.</p> <ul style="list-style-type: none"> ● Enable/disable firmware verbosity. ● Enable/disable AMT setup prompt (Ctrl-P). ● Enable/disable USB key provisioning support. ● Enable/disable unconfigure AMT on next boot. ● Select terminal emulation mode: <ul style="list-style-type: none"> ◦ ANSI ◦ VT100 ● Enable/disable firmware progress event support. ● Enable/disable initiate Intel CIRA.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	21.2 cm	8.35 in
Width	29.0 cm	11.4 in
Height (front to rear)	3.2 cm	1.25 in
Weight (equipped with 1 DIMM, 6-cell battery, WLAN module)	1.72 kg	3.80 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), WXGA display specifications

	Metric	U.S.
Dimensions		
Height	16.9 cm	6.7 in
Width	26.2 cm	10.3 in
Diagonal	30.8 cm	12.1 in
Surface treatment		
Anti-glare		
Number of colors		
Up to 16.8 million		
Contrast ratio		
250:1 (typical)		
Brightness		
180 nits (typical)		
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight		
LED		
Character display		
80 × 25		
Total power consumption		
4.0 W		
Viewing angle		
+/-40° horizontal		
		+120°/-40° horizontal

Hard drive specifications

	160-GB*	250-GB*
Dimensions		
Height	8.0 mm	8.0 mm
Width	45.7 mm	45.7 mm
Weight	101 g	101 g
Interface type		
Transfer rate	100 MB/sec	100 MB/sec
Security		
Seek times (typical read, including setting)		
Single track	3 ms	3 ms
Average	13 ms	13 ms
Maximum	24 ms	24 ms
Logical blocks		
	312,581,808	488,397,168
Disc rotational speed		
	5400 rpm	5400 rpm
Operating temperature		
*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.		

7 Backup and recovery

Windows 7

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

Windows Backup and Restore provides the following options:

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

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

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

Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create system repair discs (select models only) and your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. The system repair discs (select models only) are used to start up (boot) the computer and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

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

Note the following when backing up:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated programs.

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

To create a screen shot:

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

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

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

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

The screen image is added to the document.

4. Save the document.

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

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

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

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

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

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

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create a system repair disc (select models only).

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

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 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 the “Using a Windows 7 operating system DVD (purchased separately)” section in this guide.

Using the Windows recovery tools

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

1. 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.

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

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

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

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition.

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

To check for the HP Recovery partition, select **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 the “Using a Windows 7 operating system DVD (purchased separately)” section in this guide.

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. On the Advanced Boot Options screen, use the arrow keys to highlight **Repair your computer**, and then press **enter**.
5. Follow the on-screen instructions.

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

Using f11

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

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

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.

 **NOTE:** If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows 7 operating system DVD (purchased separately)” section in this guide.

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** to enter the HP Recovery menu.
5. Follow the on-screen instructions.

Using a Windows 7 operating system DVD (purchased separately)

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. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows 7 operating system DVD, go to <http://www.hp.com/support>, select your country or region, and then 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, follow these steps:

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

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows 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.

Backing up your information

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

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

Note the following when backing up:

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

To create a screen shot:

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

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

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

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

The screen image is added to the document.

4. Save the document.

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

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

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

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

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

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

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

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

Performing a recovery

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

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

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

Using the Windows recovery tools

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

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

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

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

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

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

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

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

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

Using f11

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

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

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

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

3. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
4. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

Using a Windows Vista operating system DVD (purchased separately)

If you are unable to boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows Vista operating system DVD, go to <http://www.hp.com/support>, select your country or region, and then

follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.

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

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

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

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

Windows XP

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

Windows provides the following options:

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

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

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

Backing up your information

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

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

Note the following when backing up:

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

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

a. Display the screen you want to save.

b. Copy the screen image:

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

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

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

The screen image is added to the document.

d. Save the document.

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

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

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

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

Performing a recovery

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

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

Recovering your information

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

1. If possible, back up all personal files.
2. Click **Start > All Programs > Accessories > System Tools > Backup**.
The Backup or Restore Wizard opens.
3. Click **Restore files and settings**, and then click **Next**.
4. Follow the on-screen instructions.

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

Recovering the operating system and programs

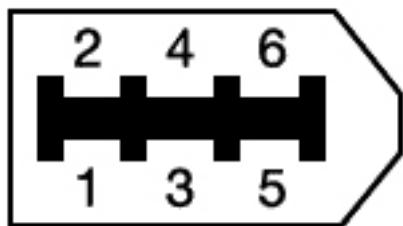
 **CAUTION:** The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed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

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

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

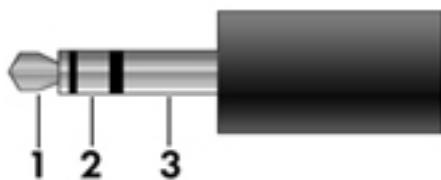
8 Connector pin assignments

1394



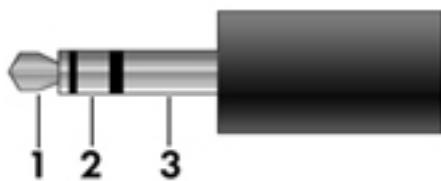
Pin	Signal
1	Power
2	Ground
3	TPB-
4	TPB+
5	TPA-
6	TPA+

Audio-out (headphone)



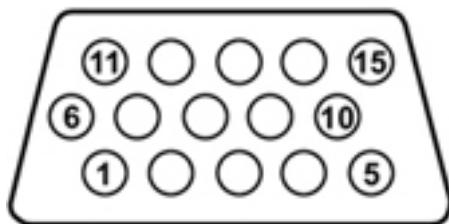
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

Audio-in (microphone)



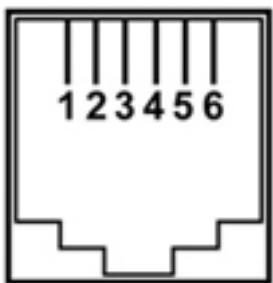
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

External monitor



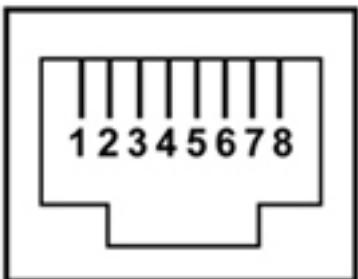
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



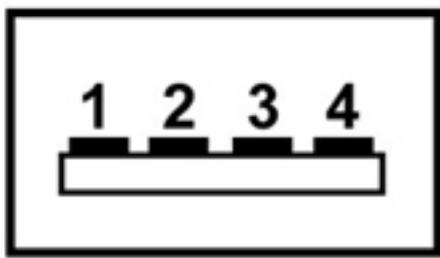
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

RJ-45 (network)



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

Universal Serial Bus



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

9 Power cord set requirements

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

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

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

Requirements for all countries and regions

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

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

Requirements for specific countries and regions

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

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

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

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

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

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

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