HP Mini 5102

Maintenance and Service Guide

SUMMARY

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

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Revision A

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 Mini 5102
Processor	Intel® Atom™ N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)
	Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)
Chipset	Intel® NM10 Express
Graphics	Intel® Universal Memory Architecture (UMA) graphics subsystem
	Broadcom Crystal HD Enhanced Video Decoder (32 MB × 16 DDR2) optional **NOTE:** Not supported by computers with WWAN option installed.
Panel	Wide-aspect 16:9 ratio panels All display assemblies include 1 webcam, 2 microphones, and 2 wireless local-area network (WLAN) antennas/cables (WWAN is optional).
	Capacitive touch screen optional
	25.7-cm (10.1-in) high-definition (1366 × 768) AntiGlare LED
	25.7-cm (10.1-in) standard-definition (1024 × 600) AntiGlare LED
Memory	One customer-accessible/upgradable memory module slot
	Supports up to 2 GB of system memory
	PC2-5300, 800 MHz, DDR2 (running at 667-MHz)
	Supports the following configurations:
	• 2048-MB total system memory (2048 × 1) **NOTE:** Not supported by computers with Windows® XP Home or with Windows 7 Starter .
	• 1024-MB total system memory (1024 × 1)
Mass storage devices	**Hard drive**
	Supports the following **9.5-mm, 6.35-cm** (2.50-in) SATA hard drives:
	• 320-GB, 7200-RPM **NOTE:** Not supported by computers with Windows® XP Home or with Windows 7 Starter in select countries and regions.

Category	Description
	• 250-GB, 7200-RPM **NOTE:** Not supported by computers with Windows® XP Home.
	• 160-GB, 7200-RPM
	Solid state drive (SSD)
	Supports the following **6.35-cm** (2.50-in) SATA solid state drives:
	• 80 GB **NOTE:** Not supported by computers with Windows® XP Home or with Windows 7 Starter.
	• 128 GB **NOTE:** Not supported by computers with Windows® XP Home or with Windows 7 Starter.
Optical drive	Supports external USB optical drives only
Diskette drive	Supports external USB diskette drives only
Audio/Visual	High-definition (HD) audio
	Integrated speakers (2)
	Fixed integrated stereo microphones (2)
	Fixed integrated 2-MP webcam
Modem	Supports external USB modems only
Ethernet	Integrated 10/100/1000 Wake-On-LAN network interface card (NIC)
Wireless	2 WLAN antennas built into display assembly. WWAN antennas (2) with WWAN option (worldwide 5-band antenna configured with select models)
	Integrated WLAN modules: • 802/11/a/b/g/n • 802.11 b/g/n • 802.11b/g with Bluetooth • 802.11 b/g
	Support for No WLAN option
	Integrated WWAN option **NOTE:** Not supported by computers with Linux installed. **NOTE:** Not supported by computers with HD Enhanced Video Accelerator installed.
	Integrated WPAN Bluetooth® module
	Support for No WPAN option.
External media cards	Media Card Reader with push-push technology supporting: • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card

Category	Description
Ports	Audio-in (stereo microphone)
	Audio out (stereo headphone)
	RJ-45 (Ethernet, includes link and activity lights)
	USB (2)
	USB+ (powered) (1)
	VGA (D-sub 15) supporting 1920 × 1440 external monitor (hot plug/unplug with auto-detect)
	3-pin AC power
Keyboard/pointing device	92%, spill-resistant keyboard
	Dura-Keys
	TouchPad, with 2 TouchPad buttons and 2-way scrolling (taps enabled as default)
Power requirements	**AC adapter** • 65-W Smart AC adapter • 40-W Smart AC adapter **NOTE:** AC adapter includes connector on cable and localized plug support.
	Battery • 6 cell Li-Ion (66-Wh) 3.0-Ah • 6 cell Li-ion (55-Wh) 2.55-Ah • 4-cell Li-ion (29-Wh) 2.0-Ah
Security	Supports HP Kensington Security Lock
Operating system	**Preinstalled:**
	Windows 7 Professional 32
	Windows 7 Professional 32 with Windows XP Pro images
	Windows 7 Home Premium
	Windows 7 Starter
	Windows XP Home SP3 for NetBooks
	FreeDOS
	SUSE Linux (SLED 11)
Serviceability	**Customer Self-Replacement (CSR):** • AC adapter • Battery (system) • Keyboard • Memory module • Hard drive

2 External component identification

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

To see a list of hardware installed in the computer, follow these steps:

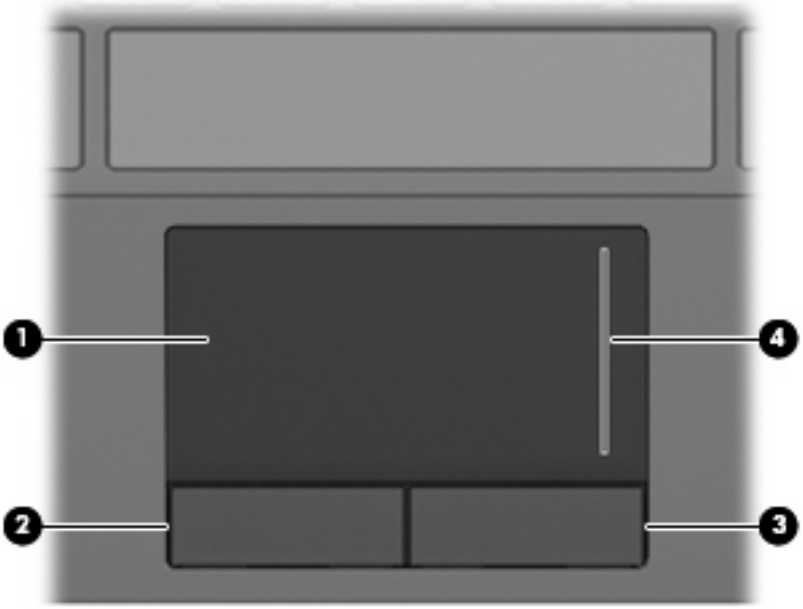
- Select **Start > Control Panel > System and Security > Device Manager**.

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

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

Top components

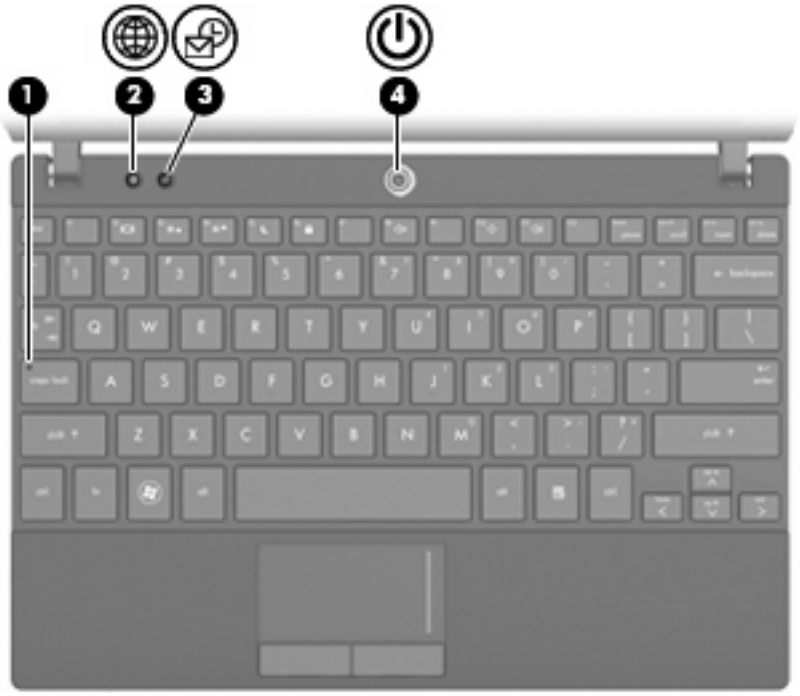
TouchPad



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

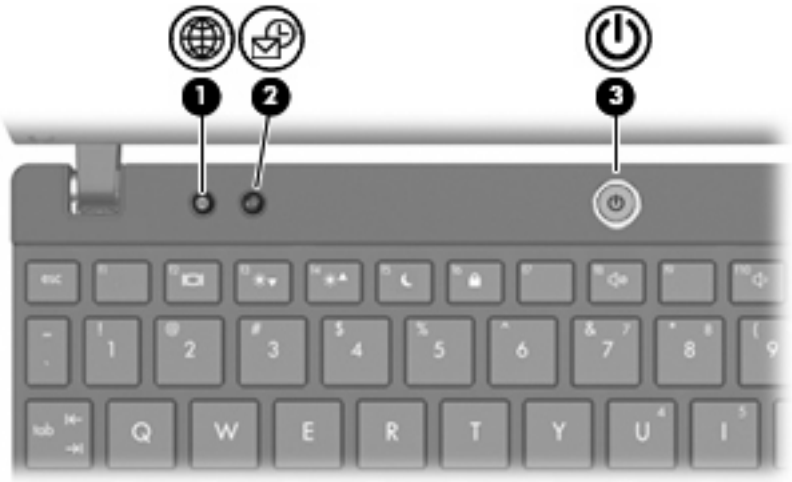
*This table describes factory settings. To view or change pointing device preferences, select **Start > Devices and Printers**. Then, right-click the device representing your computer, and select **Mouse settings**.

Lights



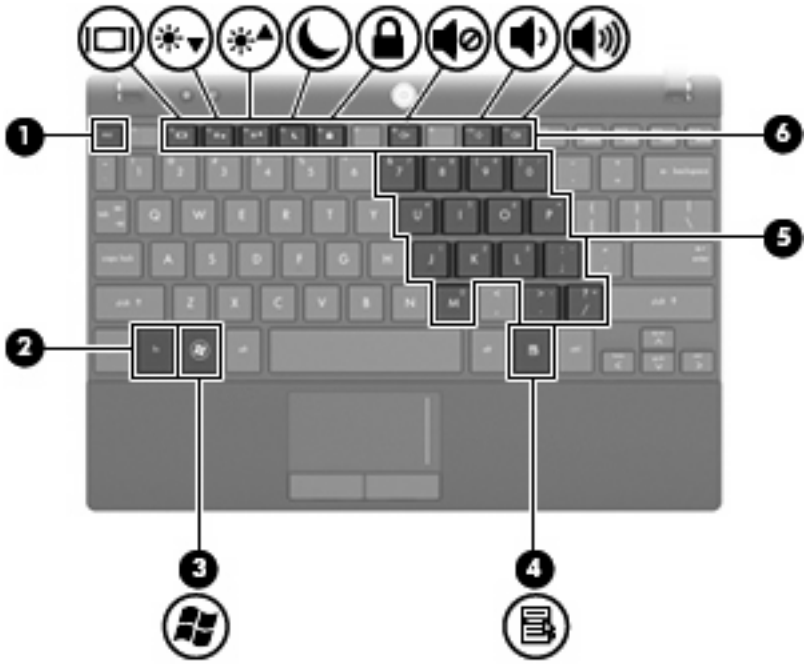
Component		Description
(1)	Caps lock light	On: Caps lock is on.
(2)	QuickWeb light	On: The Web browser is in use.
(3)	QuickLook light	• On: The computer is on. • Off: The computer is off or in Sleep or Hibernation.
(4)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.

Buttons



Component		Description
(1)	QuickWeb button	• 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.
(2)	QuickLook button	• 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.
(3)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to shut down the computer. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings, select **Start > Control Panel > System and Security > Power Options**.

Keys

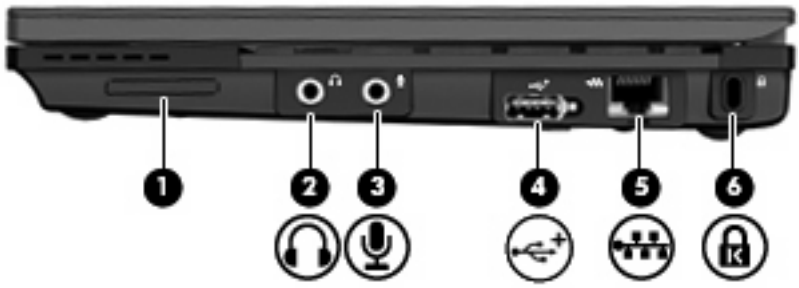


Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Displays system information when pressed in combination with the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu 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 the action represented by the icon on the key.

Front components

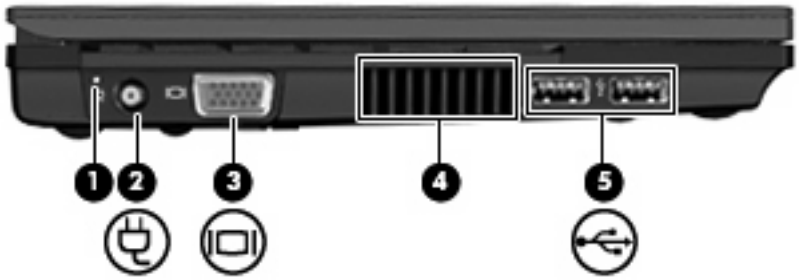
Component		Description
(1)	Drive light	Blinking: The hard drive is being accessed.
(2)	Wireless light	• Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. • Amber: All wireless devices are off. **NOTE:** The wireless light turns amber when the computer turns on and all wireless devices are off.
(3)	Wireless switch	Turns the wireless feature on or off, but does not create a wireless connection. **NOTE:** To establish a wireless connection, a wireless network must already be set up.
(4)	Speakers (2)	Produce sound.

Right-side components



Component		Description
(1)	SD Card Reader	Supports the following optional digital card formats: • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card
(2)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. **NOTE:** When a device is connected to the headphone jack, the computer speakers are disabled.
(3)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(4)	Powered USB port	Provides power to a USB device, such as an optional external optical drive, if used with a powered USB cable.
(5)	RJ-45 (network) jack	Connects a network cable.
(6)	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

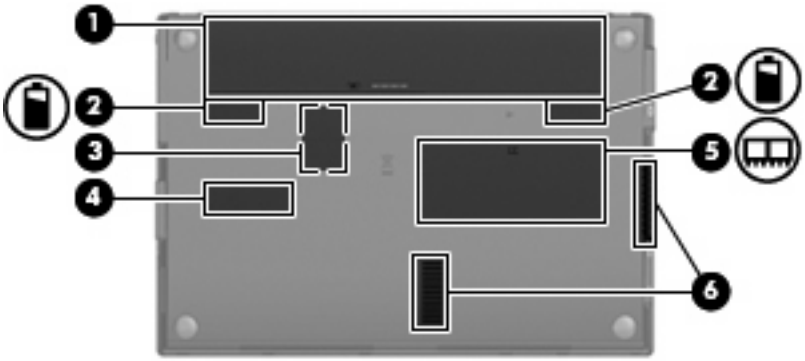


Component		Description
(1)	Battery light	• Amber: A battery is charging. • Turquoise: A battery is close to full charge capacity. • Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. • Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level..
(2)	Power connector	Connects an AC adapter.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	USB ports (2)	Connect optional USB devices.

Display components

Component		Description
(1)	Webcam light	On: The webcam is in use.
(2)	Webcam	Records audio and video and captures still photographs.
(3)	Internal microphones (2)	Record sound. **NOTE:** If there is a microphone icon next to each microphone opening, your computer has internal microphones.

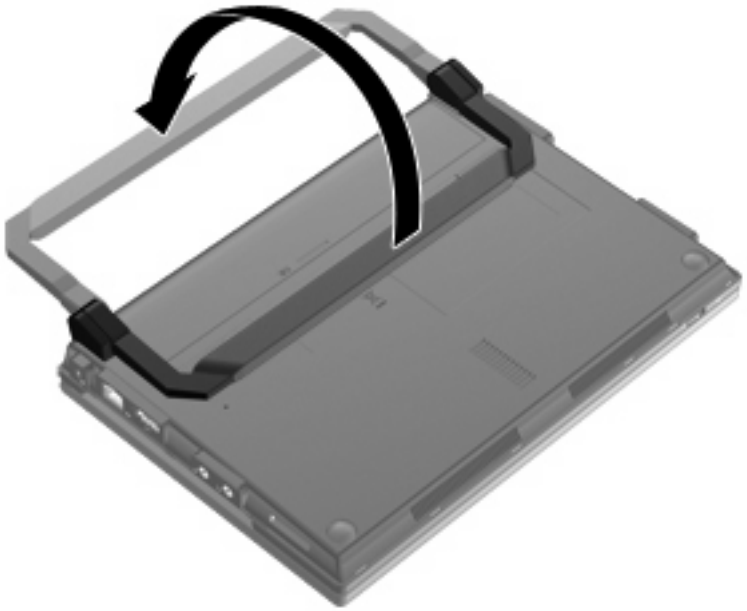
Bottom components



Component		Description
(1)	Battery bay	Holds the battery.
(2)	Battery release latches (2)	Release the battery from the battery bay.
(3)	SIM slot (select models only)	Contains a wireless subscriber identity module (SIM).
(4)	Service tag	Provides the product brand and series name, serial number (s/n), and product number (p/n) of your computer. Have this information available when you contact technical support.
(5)	Memory module compartment	Contains the memory module slot.
(6)	Vents (2)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

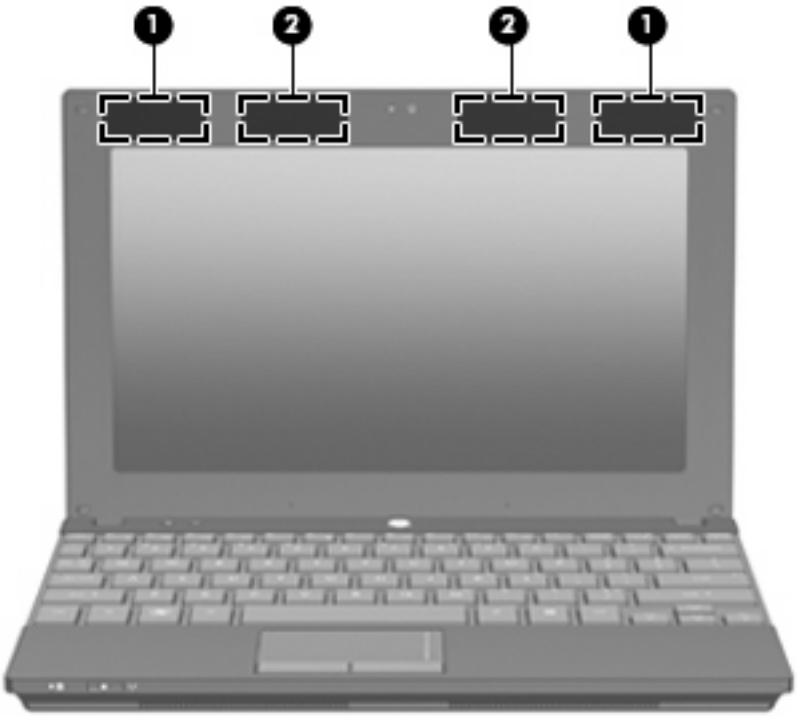
Carrying handle

Select models of the computer have an optional carrying handle that is attached to the bottom of the computer. The handle can be extended by rotating it away from the computer as shown in the following illustration.



Wireless antennas

On select models of the computer, at least 2 antennas send and receive signals from one or more wireless devices.



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

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

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

Additional hardware components

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

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

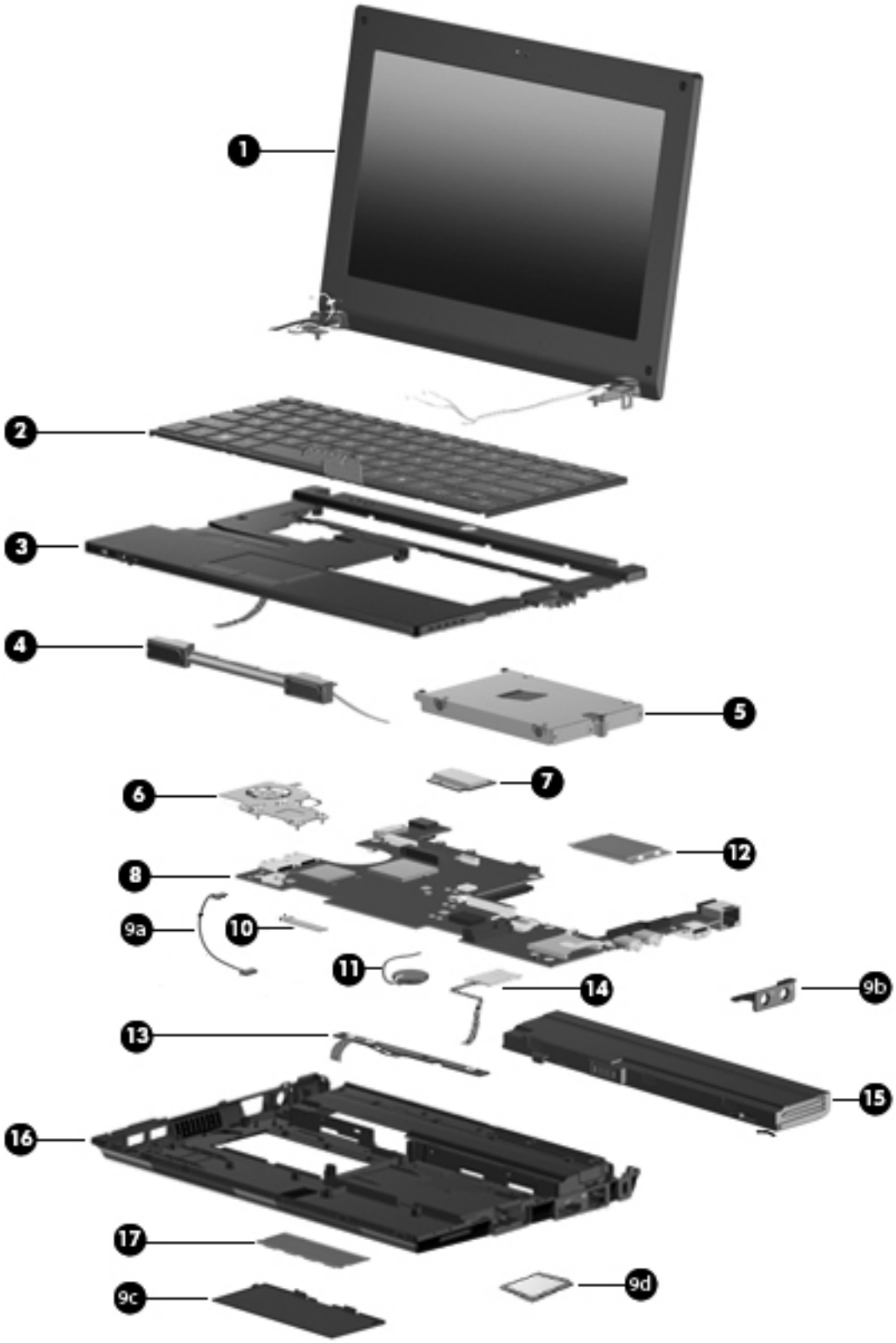
3 Illustrated parts catalog

Service tag

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

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

Device major components



Item	Description	Spare part number
(1)	**Display panel assembly** (includes 1 webcam, 2 microphones, and 2 WLAN antennas with cables; 2 WWAN antennas with cables on select models) See Display assembly components on page 24 for a comprehensive list of display assembly spare parts.	
	• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, black	598456-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, red	607178-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, blue	607180-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam, black	598454-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, black	580616-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, red	607182-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, blue	607184-001
	• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam	577969-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, black	598455-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, red	607177-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, blue	607179-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam	598453-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, black	580615-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, red	607181-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, blue	607183-001
	• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam	577968-001
(2)	**Keyboard**, **25.7 cm** (10.1 in)	
	• For use in Belgium	578364-A41
	• For use in Brazil	578364-201
	• For use in Bulgaria	578364-261
	• For use in the Czech Republic	578364-221
	• For use in Denmark	578364-081
	• For use in Europe	578364-B31
	• For use in France	578364-051

Item	Description	Spare part number
	• For use in French Canada	578364-121
	• For use in Finland, and Sweden	578364-B71
	• For use in Germany	578364-041
	• For use in Greece	578364-DJ1
	• For use in Hungary	578364-211
	• For use in Iceland	578364-DD1
	• For use in Israel	578364-BB1
	• For use in Italy	578364-061
	• For use in Japan	578364-291
	• For use in Latin America	578364-161
	• For use in Norway	578364-091
	• For use in Portugal	578364-131
	• For use in Russia	578364-251
	• For use in Saudi Arabia	578364-171
	• For use in Slovakia	578364-231
	• For use in Slovenia	578364-BA1
	• For use in South Korea	578364-AD1
	• For use in Spain	578364-071
	• For use in Switzerland	578364-BG1
	• For use in Taiwan	578364-AB1
	• For use in Thailand	578364-281
	• For use in Turkey	578364-141
	• For use in the United Kingdom	578364-031
	• For use in the United States	578364-001
(3)	**Top cover** (includes TouchPad)	
	• Black	577926-001
	• Red	598461-001
	• Blue	598462-001
(4)	**Speaker assembly** (includes cable)	577967-001
(5)	**Hard drive** **NOTE:** Hard drive spares include mounting bracket and screws.	
	• 320-GB, 7200-RPM, for use with WWAN option	593643-001
	• 320-GB, 7200-RPM, SATA	577974-001
	• 250-GB, 7200-RPM, for use with WWAN option	593642-001

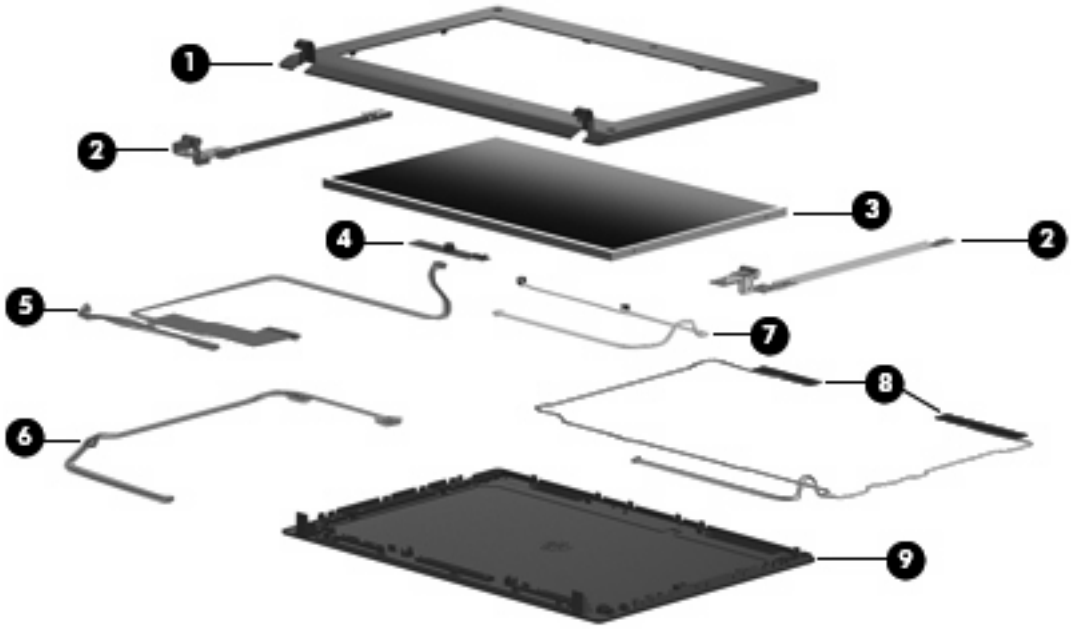
Item	Description	Spare part number
	• 250-GB, 7200-RPM, SATA	577973-001
	• 160-GB, 7200-RPM, for use with WWAN option	593641-001
	• 160-GB, 7200-RPM, SATA	577972-001
	Solid state drive (SSD) **NOTE:** Solid state drive spares include mounting bracket and screws.	
	• 128-GB, SATA	606971-001
	• 80-GB, SATA	583004-001
(6)	**Fan and heat sink assembly** (includes replacement thermal material)	598452-001
(7)	**WLAN module**	
	Broadcom 4312G 802.11b/g WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready)	575920-001
	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter	
	• For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, 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 Wireless-N 1000 802.11b/g/n 1x2	

Item	Description	Spare part number
	• For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572520-001
	• For use in Russia and Ukraine	585984-001
	Broadcom 4312G 802.11b/g WiFi Adapter	
	• For use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
(8)	**System board** (includes processor, replacement thermal material, and RTC battery)	
	• Includes Intel Atom N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)	598449-001
	• Includes Intel Atom N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB) for use in the People's Republic of China	598450-001
	• Includes Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)	598447-001
	• Includes Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB) for use in the People's Republic of China	598448-001

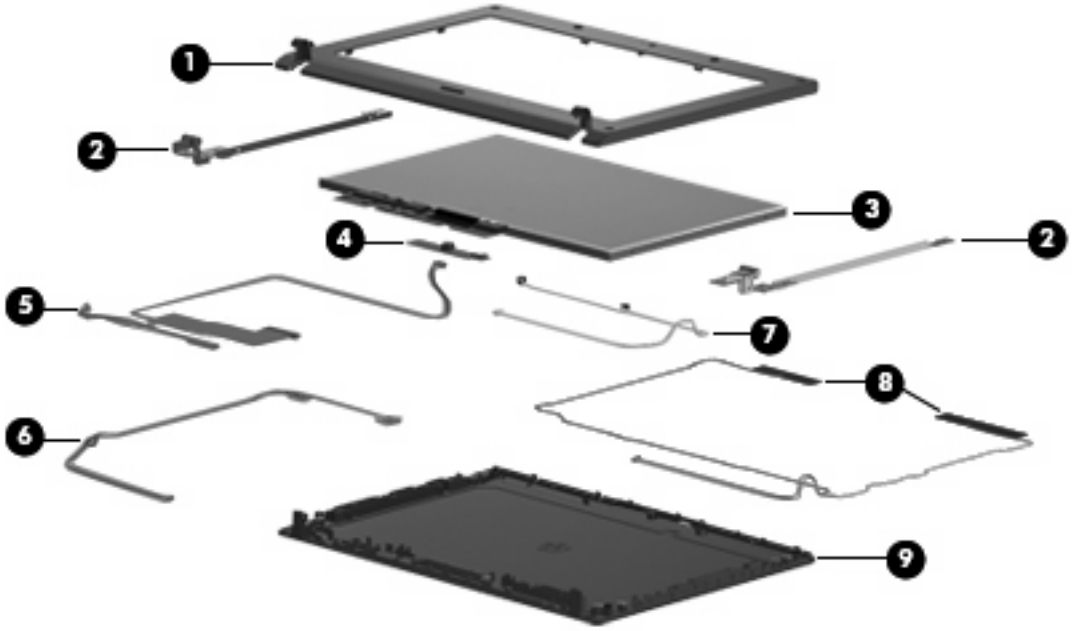
Item	Description	Spare part number
	Plastics kit with Bluetooth cable	605743-001
	(9a) Bluetooth cable	
	(9b) Audio connector cover	
	(9c) Memory module compartment cover	
	(9d) Blank for Media Card Reader	
(10)	**Bluetooth module**	537921-001
(11)	**RTC battery**	507707-001
(12)	**Optional minicard:**	
	WWAN module, Qualcomm EV-DO HSPA (includes mounting bracket) **NOTE:** Not supported by computers with Linux installed. **NOTE:** Not supported by computers with the HD Enhanced Video Accelerator installed.	531993-001
	HD Enhanced Video Accelerator (graphics decoder)	578237-001
(13)	**Power button board** (includes cable)	598451-001
(14)	**SIM board** (includes cable)	577923-001
(15)	**Battery**	
	• 6 cell Li-ion (66 Wh) 3.0 Ah	535629-001
	• 6 cell Li-ion (55 Wh) 2.55 Ah	579027-001
	• 4-cell Li-ion (29-Wh) 2.0-Ah	579026-001
(16)	**Base enclosure** (includes 4 rubber device feet)	607111-001
(17)	**Memory module** (PC2-6400, shared)	
	• 2048-MB **NOTE:** Not supported by computers with Windows® XP Home SP3, or with Windows 7 Starter installed.	598858-001
	• 1024-MB	598861-001

Display assembly components

NOTE: The first figure below shows the non-touch display assembly and the second figure shows the touch-screen display assembly.



NOTE: The following figure shows the components of the touch-screen display assembly. The display bezel thickness increases to accommodate the touch-screen glass and board.



Item	Description	Spare part number
(1)	**Display bezel**	
	• For use with touch screen with webcam	598460-001
	• For use with non-touch screen with webcam	577929-001

Item	Description	Spare part number
(2)	**Display hinge kit** (Includes left and right display panel hinges)	577930-001
(3)	**LCD panel** **NOTE:** The non-touch display assembly includes the LCD panel. See the display assembly part number in Device major components on page 18.	
	• LCD with touch glass for use with high definition display assembly	607113-001
	• LCD with touch glass for use with WSVGA display assembly	607112-001
(4)	**Webcam module**	577927-001
(5)	**Display panel/webcam cable**	
	• For use in high-definition display assembly	577932-001
	• For use in WSVGA display assembly	577931-001
	Display cable kit includes the following cables:	577933-001
(6)	• WLAN antennas (2) with cable	
(7)	• Dual microphone with cable	
(8)	• WWAN antennas (2) with cable	
(9)	**Display back cover** (includes logo)	
	• Black for use with touch screen	598457-001
	• Red for use with touch screen	598458-001
	• Blue for use with touch screen	598459-001
	• Black for use with non-touch screen	577928-001
	• Red for use with non-touch screen	606201-001
	• Blue for use with non-touch screen	606970-001

Miscellaneous parts

Description	Spare part number
65-W, 3-pin Smart AC adapter	
• For use in all countries and regions except India	463958-001
• For use in India	577170-001
40-W, 3-pin Smart AC adapter (for use in all countries and regions)	583186-001
Power cord	
• For use in Argentina	490371-D01
• For use in Australia	490371-011
• For use in Brazil	490371-201
• For use in Denmark	490371-081
• For use in Europe	490371-021
• For use in India	490371-D61
• For use in Israel	490371-BB1
• For use in Italy	490371-061
• For use in Japan	490371-291
• For use in North America	490371-001
• For use in the People's Republic of China	490371-AA1
• For use in Singapore and the United Kingdom	490371-031
• 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
Rubber kit (contains 4 rubber device feet – 2 front and 2 rear)	578361-001

Description	Spare part number
Optional carrying handle (see Carrying handle on page 14)	606384-001
Screw kit Includes the following replacement screws: • PM1.6×2.5×3.5 • PM2.0×2.0×6.8 broad head • PM2.0×2.5 • PM2.0×3.0×4.0 • PM2.0x2.5x4.5 • PM2.5×4.0 • PM2.5×5.0×5.5 • PM2.6×4.5	578362-001

Sequential part number listing

Spare part number	Description
463958-001	65-W, 3-pin Smart AC adapter for use in all countries and regions except India
490371-001	Power cord for use in North America
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe
490371-031	Power cord for use in Singapore and 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
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
504593-003	Broadcom 4312G 802.11b/g WiFi Adapter for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands
504593-004	Broadcom 4312G 802.11b/g WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
507707-001	RTC battery

Spare part number	Description
518434-001	WLAN module, Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
518434-002	WLAN module, Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, 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	Optional WWAN module, Qualcomm EV-DO HSPA (includes mounting bracket) **NOTE:** Not supported by computers with Linux installed. **NOTE:** Not supported by computers with HD Enhanced Video Accelerator installed.
535629-001	Battery, 6 cell Li-ion (66 Wh) 3.0 Ah
537921-001	Bluetooth module
572520-001	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam
575920-001	WLAN module, Broadcom 4312G 802.11b/g WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready)
577170-001	65-W, 3-pin Smart AC adapter for use in India
577923-001	SIM board with cable
577926-001	Top cover with TouchPad, black
577927-001	Webcam module

Spare part number	Description
577928-001	Display back cover with logo for use with non-touch screen, black
577929-001	Display bezel for use with non-touch screen with webcam
577930-001	Display hinge kit (includes left and right display panel hinges and screws)
577931-001	Display panel/webcam cable for use in WSVGA display assembly
577932-001	Display panel/webcam cable for use in high-definition display assembly
577933-001	Display cable kit with the WLAN antennas (2) and cable, dual array microphone with cable, and WWAN antennas (2) with cable on select models.
577967-001	Speaker assembly with cable
577968-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam
577969-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam
577972-001	Hard drive, 160-GB, 7200-RPM, SATA
577973-001	Hard drive, 250-GB, 7200-RPM, SATA
577974-001	Hard drive, 320-GB, 7200-RPM, SATA
578237-001	HD Enhanced Video Accelerator (graphics decoder)
578361-001	Rubber kit (contains 2 front and 2 rear rubber device feet)
578362-001	Screw kit
578364-001	Keyboard, **25.7-cm** (10.1-in) for use in the United States
578364-031	Keyboard, **25.7-cm** (10.1-in) for use in the United Kingdom
578364-041	Keyboard, **25.7-cm** (10.1-in) for use in Germany
578364-051	Keyboard, **25.7-cm** (10.1-in) for use in France
578364-061	Keyboard, **25.7-cm** (10.1-in) for use in Italy
578364-071	Keyboard, **25.7-cm** (10.1-in) for use in Spain
578364-081	Keyboard, **25.7-cm** (10.1-in) for use in Denmark
578364-091	Keyboard, **25.7-cm** (10.1-in) for use in Norway
578364-121	Keyboard, **25.7-cm** (10.1-in) for use in French Canada
578364-131	Keyboard, **25.7-cm** (10.1-in) for use in Portugal
578364-141	Keyboard, **25.7-cm** (10.1-in) for use in Turkey
578364-161	Keyboard, **25.7-cm** (10.1-in) for use in Latin America
578364-171	Keyboard, **25.7-cm** (10.1-in) for use in Saudi Arabia
578364-201	Keyboard, **25.7-cm** (10.1-in) for use in Brazil
578364-211	Keyboard, **25.7-cm** (10.1-in) for use in Hungary
578364-221	Keyboard, **25.7-cm** (10.1-in) for use in the Czech Republic
578364-231	Keyboard, **25.7-cm** (10.1-in) for use in Slovakia
578364-251	Keyboard, **25.7-cm** (10.1-in) for use in Russia

Spare part number	Description
578364-261	Keyboard, **25.7-cm** (10.1-in) for use in Bulgaria
578364-281	Keyboard, **25.7-cm** (10.1=in) for use in Thailand
578364-291	Keyboard, **25.7-cm** (10.1-in) for use in Japan
578364-A41	Keyboard, **25.7-cm** (10.1-in) for use in Belgium
578364-AB1	Keyboard, **25.7-cm** (10.1-in) for use in Taiwan
578364-AD1	Keyboard, **25.7-cm** (10.1-in) for use in South Korea
578364-B31	Keyboard, **25.7-cm** (10.1-in) for use in Europe
578364-B71	Keyboard, **25.7-cm** (10.1-in) for use in Finland, and Sweden
578364-BA1	Keyboard, **25.7-cm** (10.1-in) for use in Slovenia
578364-BB1	Keyboard, **25.7-cm** (10.1-in) for use in Israel
578364-BG1	Keyboard, **25.7-cm** (10.1-in) for use in Switzerland
578364-DD1	Keyboard, **25.7-cm** (10.1-in) for use in Iceland
578364-DJ1	Keyboard, **25.7-cm** (10.1 in) for use in Greece
579026-001	Battery, 4-cell Li-ion (29-Wh) 2.0-Ah
579027-001	Battery, 6-cell Li-ion battery (55-Wh) 2.55-Ah
580615-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, black
580616-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, black
583004-001	Solid state drive (SSD), 80-GB, SATA
583186-001	40-W, 3-pin, Smart AC adapter for use in all countries and regions
585984-001	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 for use in Russia and Ukraine
593641-001	Hard drive, 160-GB, 7200-RPM, for use with WWAN option
593642-001	Hard drive, 250-GB, 7200-RPM, for use with WWAN option
593643-001	Hard drive, 320-GB, 7200-RPM, for use with WWAN option
598447-001	System board (including replacement thermal material and RTC battery), Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)
598448-001	System board (including replacement thermal material and RTC battery), Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB) for use in the People's Republic of China
598449-001	System board (including replacement thermal material and RTC battery), Intel Atom N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)
598450-001	System board (including replacement thermal material and RTC battery), Intel Atom N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB) for use in the People's Republic of China
598451-001	Power button board with cable
598452-001	Fan and heat sink assembly with replacement thermal material

Spare part number	Description
598453-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam
598454-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam, black
598455-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, black
598456-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, black
598457-001	Display back cover with logo for use with touch screen, black
598458-001	Display back cover with logo for use with touch screen, red
598459-001	Display back cover with logo for use with touch screen, blue
598460-001	Display bezel for use with touch screen with webcam
598461-001	Top cover with TouchPad, red
598462-001	Top cover with TouchPad, blue
598858-001	Memory module, PC2-6400, shared, 2048-MB **NOTE:** Not supported by computers with Windows® XP Home SP3, or with Windows 7 Starter installed.
598861-001	Memory module, PC2-6400, shared, 1024-MB
605743-001	Plastics kit with Bluetooth cable
606201-001	Display back cover with logo for use with non-touch screen, red
606384-001	Optional carrying handle
606970-001	Display back cover with logo for use with non-touch screen, blue
606971-001	Solid state drive (SSD), 128-GB, SATA
607111-001	Base enclosure (includes 2 front and 2 rear device feet)
607112-001	LCD with touch glass for use with WSVGA display assembly
607113-001	LCD with touch glass for use with high definition display assembly
607177-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, red
607178-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, red
607179-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, blue
607180-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, blue
607181-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, red
607182-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, red

Spare part number	Description
607183-001	Display panel assembly, **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, blue
607184-001	Display panel assembly, **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, blue

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

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 device, 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 device, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the device.

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 device, damage to a drive, or loss of information, observe these precautions:

Before removing or inserting a hard drive, shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device 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.

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

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

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

Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 65 screws, in 9 different sizes, that must be removed, replaced, or loosened when servicing the device. Make special note of each screw size and location during removal and replacement.

Service tag

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

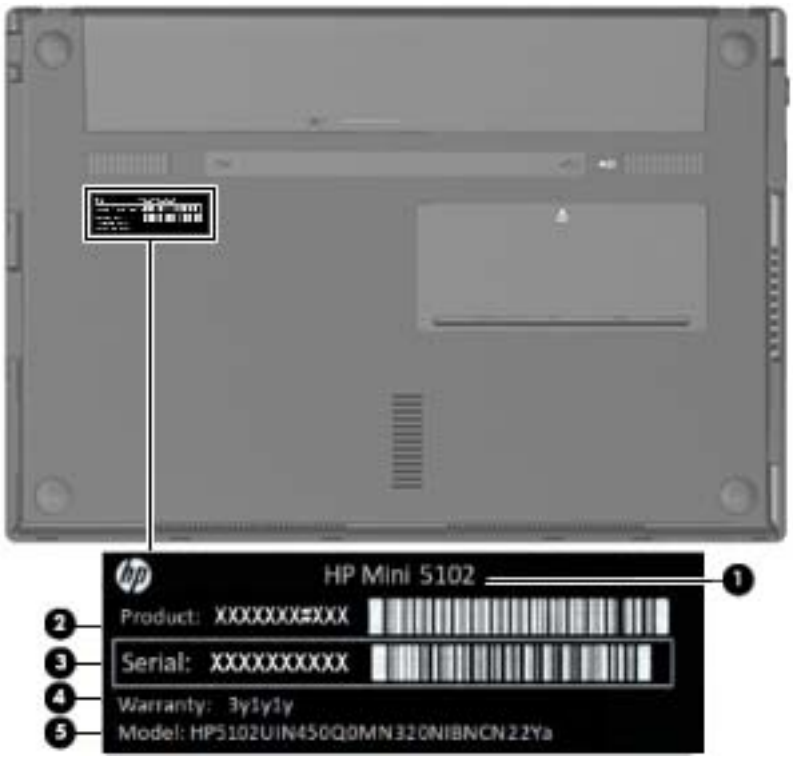
(1) Product name: This is the product name affixed to the front of the device.

(2) Product number: 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.

(3) Serial number: This is an alphanumeric identifier that is unique to each product.

(4) Warranty period: This number describes the duration of the warranty period for the device.

(5) Model description (select models): This is the alphanumeric identifier used to locate documents, drivers, and support for the device.



Device feet

The device feet are adhesive-backed rubber pads. The rear feet are attached and the front feet are tethered to the bottom of the base enclosure.

NOTE: The front and rear device feet are not interchangeable. Due to the adhesive nature of the rubber pads, they should be replaced after removal.

NOTE: The rear device feet may not be applied on models that use the optional carrying handle (see Carrying handle on page 14).

Description	Spare part number
Rubber kit (contains 4 rubber device feet – 2 front and 2 rear)	578361-001

Battery

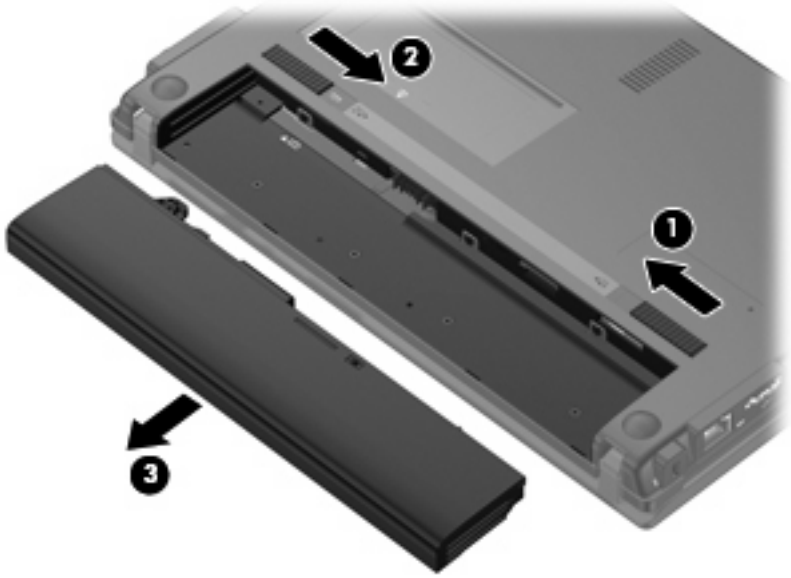
Description	Spare part number
6 cell Li-ion (66 Wh) 3.0 Ah	535629-001
6 cell Li-ion battery (55 Wh) 2.55 Ah	579027-001
4-cell Li-ion (29-Wh) 2.0-Ah	579026-001

Before removing the battery, follow these steps:

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

Remove the battery:

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



Reverse this procedure to install a battery.

SIM

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

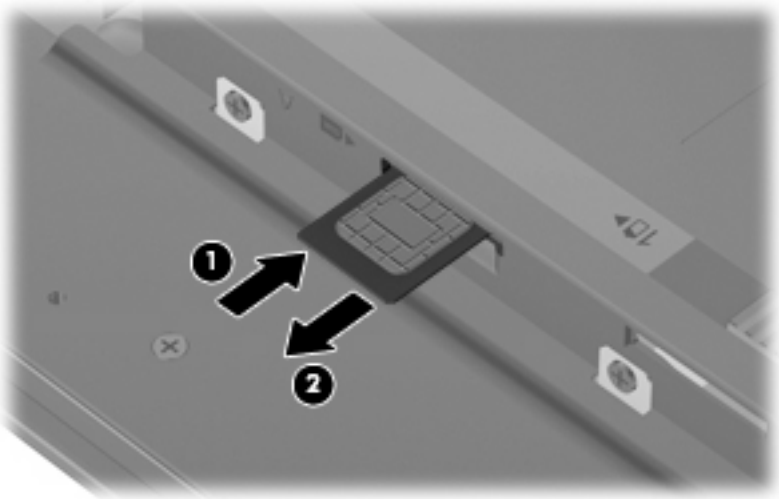
NOTE: If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

Before removing the SIM, follow these steps:

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

Remove the SIM:

1. Press in on the SIM **(1)**. (The module is partially ejected from the SIM slot.)
2. Remove the SIM **(2)** from the SIM slot.



Reverse this procedure to insert the SIM.

Memory module

Description	Spare part number
Memory module, PC2-6400, shared, 2048-MB **NOTE:** Not supported by computers with Windows® XP Home SP3, or with Windows 7 Starter installed.	598858-001
Memory module, PC2-6400, shared, 1024-MB	598861-001

Before removing the memory module, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).

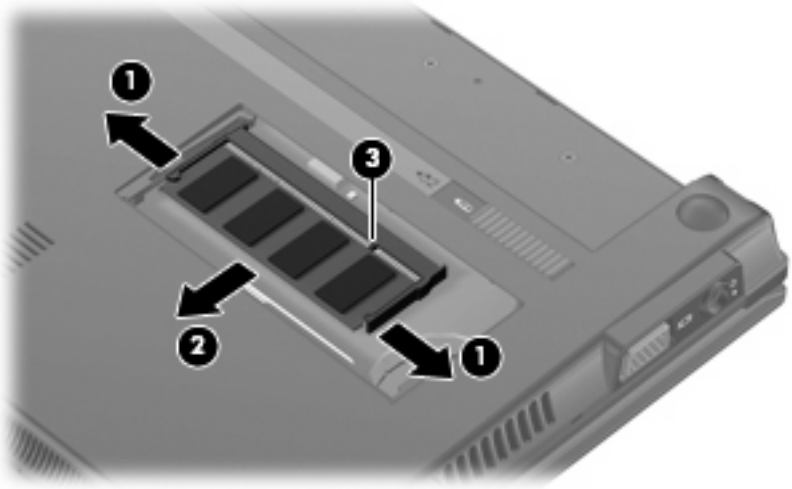
Remove the memory module:

1. With the battery removed, slide the battery release latch in front of the memory module compartment **(1)** to release the memory module cover from the computer.
2. Swing the cover up and away from the outside of the computer to remove the cover **(2)**.

3. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The module tilts up.)

4. 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

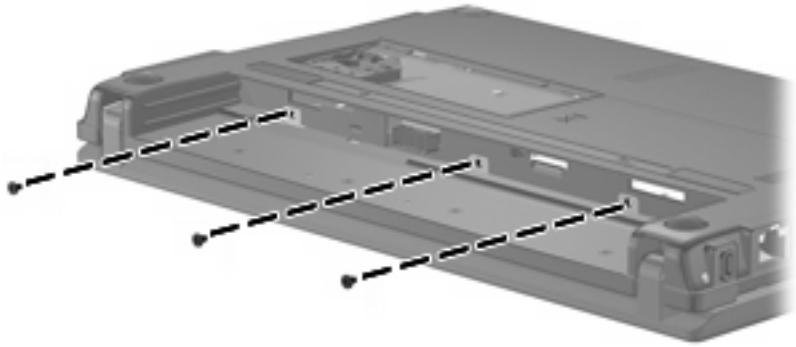
Description	Spare part number
For use in Belgium	578364-A41
For use in Brazil	578364-201
For use in Bulgaria	578364-261
For use in the Czech Republic	578364-221
For use in Denmark	578364-081
For use in Europe	578364-B31
For use in France	578364-051
For use in French Canada	578364-121
For use in Finland, and Sweden	578364-B71
For use only in Germany	578364-041
For use in Greece	578364-DJ1
For use in Hungary	578364-211
For use in Iceland	578364-DD1
For use in Israel	578364-BB1
For use in Italy	578364-061
For use in Japan	578364-291
For use in Latin America	578364-161
For use in Norway	578364-091
For use in Portugal	578364-131
For use in Russia	578364-251
For use in Saudi Arabia	578364-171
For use in Slovakia	578364-231
For use in Slovenia	578364-BA1
For use in South Korea	578364-AD1
For use in Spain	578364-071
For use in Switzerland	578364-BG1
For use in Taiwan	578364-AB1
For use in Thailand	578364-281
For use in Turkey	578364-141
For use in the United Kingdom	578364-031
For use only in the United States	578364-001

Before removing the keyboard, follow these steps:

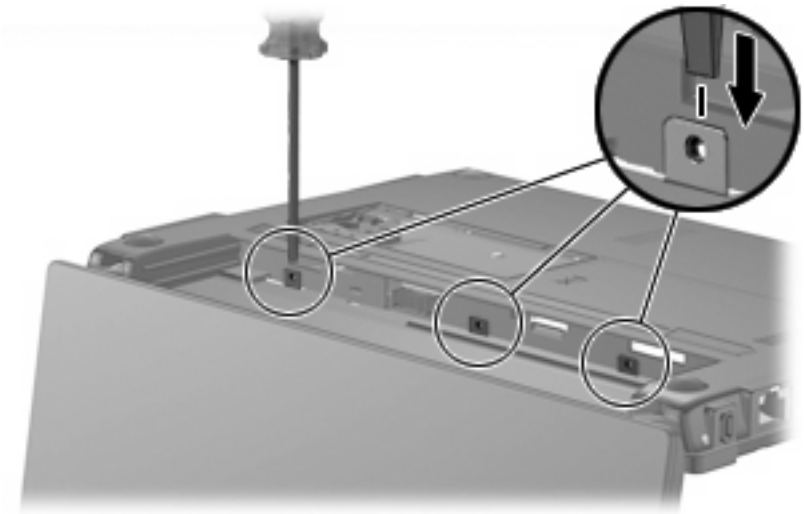
1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).

Remove the keyboard:

1. Remove the 3 Phillips PM2.0×3.0 screws that secure the keyboard to the device.



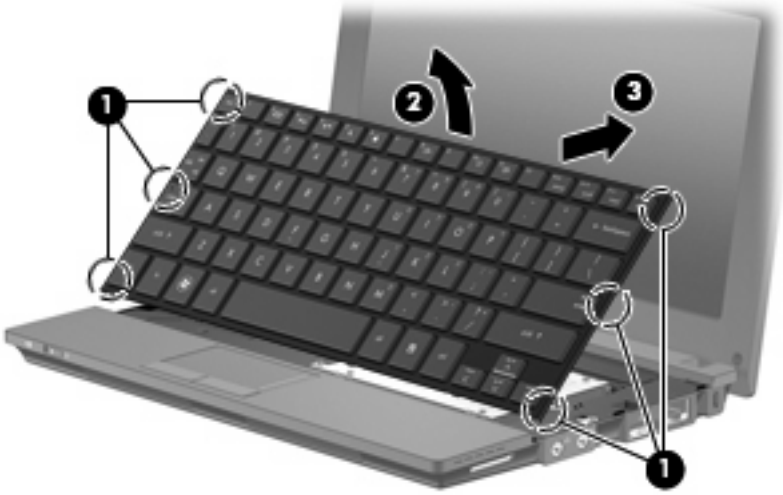
2. Open the display 90 degrees.
3. Use a tool to push the screw tabs directly down to release the rear edge of the keyboard.



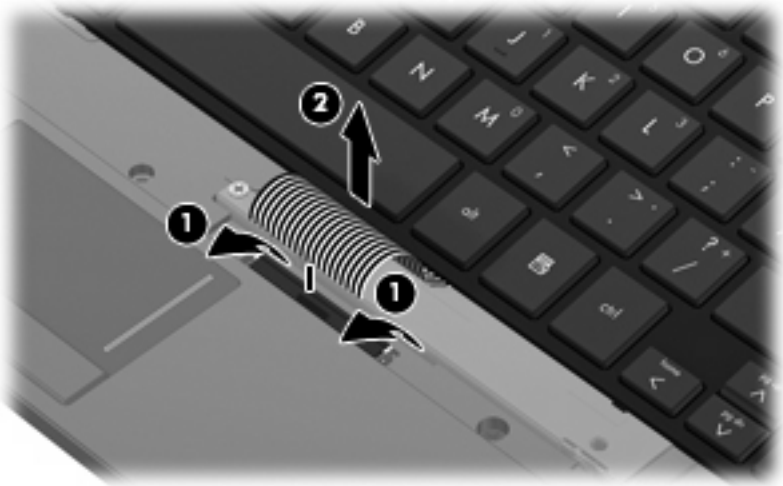
4. Turn the device right-side up, and then lift up on the left and right retention tabs **(1)** of the keyboard until the keyboard releases.

5. Swing the keyboard forward **(2)**, and slide the keyboard back until its top edge rests on the display assembly **(3)**.

NOTE: You can also rest the keyboard upside down on the palm rest to access the keyboard cable.



6. Release the zero insertion force (ZIF) connector **(1)** to which the keyboard cable is attached.
7. Disconnect the cable **(2)**.



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

Mass storage devices

NOTE: Each hard drive spare part kit and solid state drive spare part kit includes a bracket and screws.

Description	Spare part number
Hard drive, 320-GB, 7200-RPM, for use with WWAN option	593643-001
Hard drive, 320-GB, 7200-RPM, SATA	577974-001
Hard drive, 250-GB, 7200-RPM, for use with WWAN option	593642-001
Hard drive, 250-GB, 7200-RPM, SATA	577973-001
Hard drive, 160-GB, 7200-RPM, for use with WWAN option	593641-001
Hard drive, 160-GB, 7200-RPM, SATA	577972-001
Solid state drive, 128-GB, SATA	606971-001
Solid state drive, 80-GB, SATA	583004-001

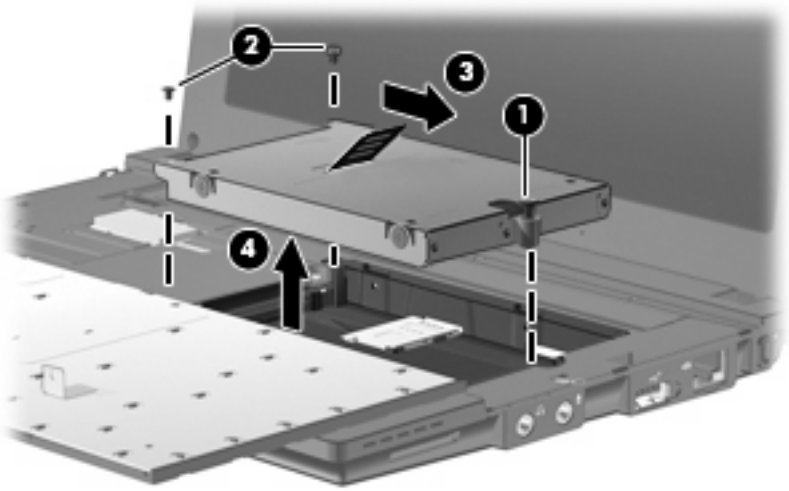
Before removing the hard drive or solid state drive, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the keyboard (see Keyboard on page 45).

To remove the hard drive or the solid state drive:

1. Loosen the Phillips PM2.5×10.0 captive screw **(1)**, and remove the 2 Phillips PM2.0×3.0 screws **(2)** that secure the drive assembly to the base enclosure.

2. Use the Mylar tab to slide the assembly to the right **(3)** to disconnect it, and remove the assembly **(4)**.

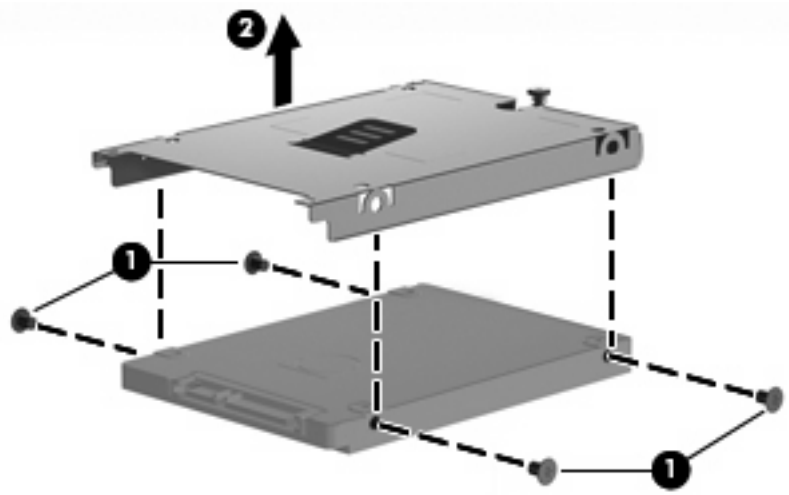


3. Remove the mounting bracket.

   On a hard drive:

   a. Remove the 4 Phillips PM3.0×3.0 screws **(1)** that secure the hard drive bracket to the hard drive.

   b. Using the Mylar tab, lift the bracket **(2)** away from the hard drive.

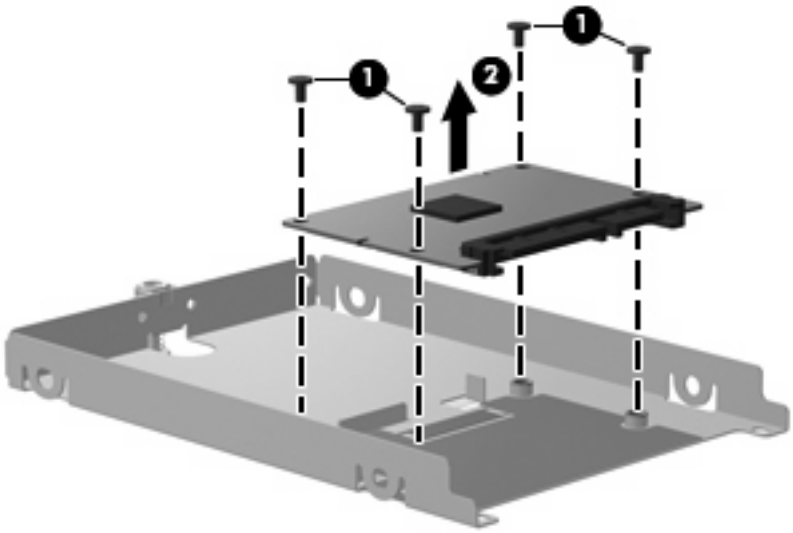


   – or –

   On a solid state drive:

   a. Remove the 4 Phillips PM2.0×3.0 screws **(1)** that secure the solid-state drive bracket to the solid state drive.

   b. Lift the solid-state drive module **(2)** to remove it.



Reverse this procedure to install a hard drive or solid state drive.

WLAN module

Description	Spare part number
Broadcom 4312G 802.11b/g WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready)	575920-001
Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter	
• For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, 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 Wireless-N 1000 802.11b/g/n 1x2	
• For use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Panama, Paraguay, the People's Republic China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the U.S. Virgin Islands, the United States, Venezuela, and Vietnam	572520-001
• For use in Russia and Ukraine	585984-001
Broadcom 4312G 802.11b/g WiFi Adapter	

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

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

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

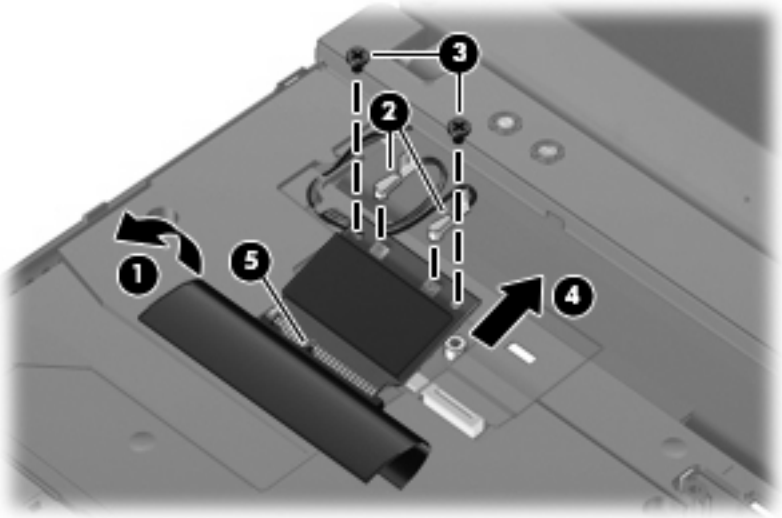
Before removing the WLAN module, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive or solid state drive (see Mass storage devices on page 48)

Remove the WLAN module:

1. Pull back the Mylar shield **(1)** from WLAN module.
2. Disconnect the wireless antenna cables **(2)** from the terminals on the WLAN module.
3. Remove the 2 Phillips PM2.0×3.0 screws **(3)** that secure the WLAN module to the system board. (The module tilts up.)
4. Remove the WLAN module **(4)** by pulling the module away from the slot at an angle.

NOTE: WLAN modules are designed with a notch **(5)** to prevent incorrect insertion into the WLAN module slot.



Reverse this procedure to install the WLAN module.

SIM module

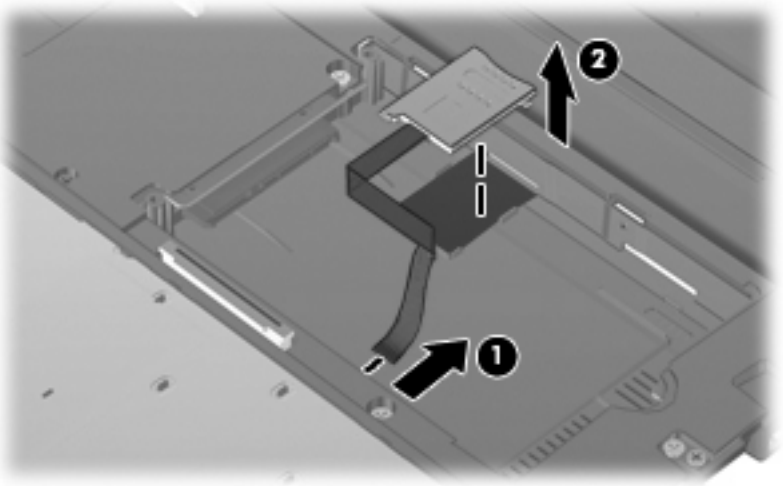
Description	Spare part number
SIM module board (includes cable)	577923-001

Before removing the SIM module, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. Remove the SIM (see SIM on page 42).
6. Remove the keyboard (see Keyboard on page 45).
7. Remove the hard drive or solid state drive (see Mass storage devices on page 48).

Remove the SIM module:

☐ Disconnect the LIF cable **(1)** from the computer, and remove the SIM module **(2)**.



Reverse this procedure to install the SIM module.

Top cover

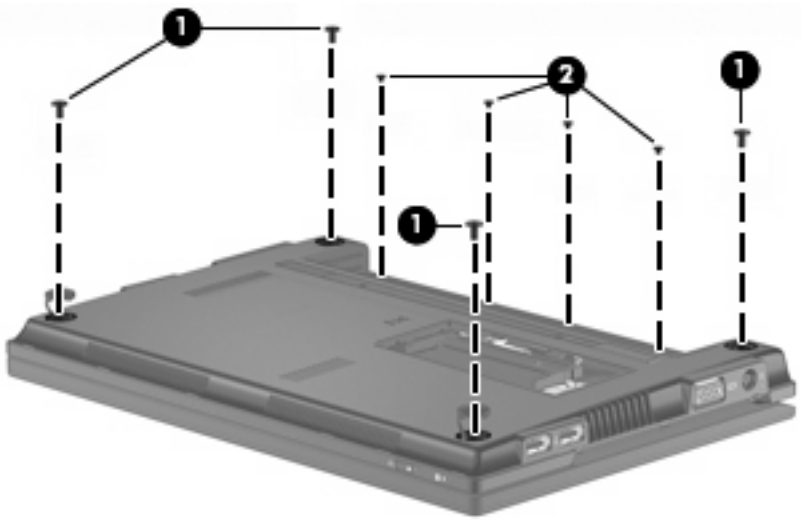
Description	Spare part number
Top cover with TouchPad, black	577926-001
Top cover with TouchPad, red	598461-001
Top cover with TouchPad, blue	598462-001

Before removing the top cover, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the memory module (see Memory module on page 43).
7. Remove the keyboard (see Keyboard on page 45).
8. Remove the hard drive or solid state drive (see Mass storage devices on page 48).
9. Remove the WLAN module (see WLAN module on page 51)

Remove the top cover:

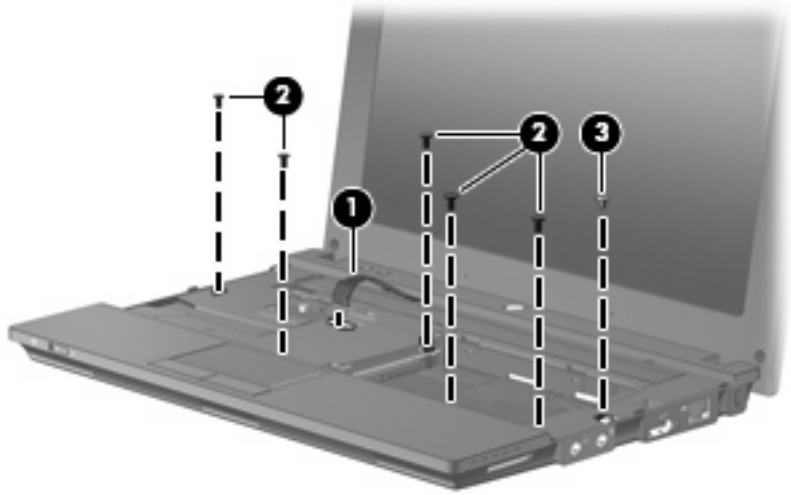
1. Turn the device upside down, with the front toward you.
2. Use a thin, flat tool to release the 4 rubber device feet.
3. Remove the 4 Torx T8 2.5×5.0 screws **(1)**, and the 4 Phillips PM2.0×3.0 screws **(2)** that secure the top cover to the base enclosure.



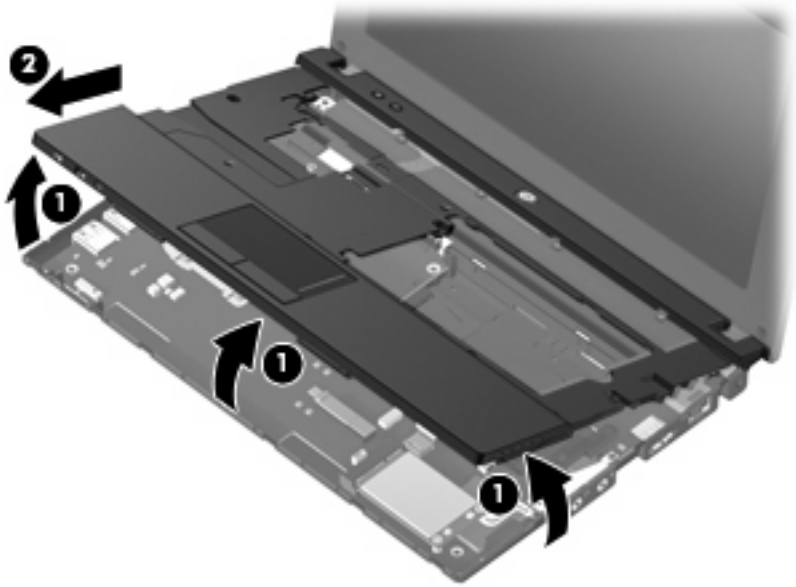
4. Turn the device right-side up, with the front toward you.
5. Open the device as far as possible.
6. Release the ZIF connector **(1)** that connects the button board cable to the system board.

NOTE: If not done when removing the WLAN module on page 51, release any WLAN cable routed along the top cover.

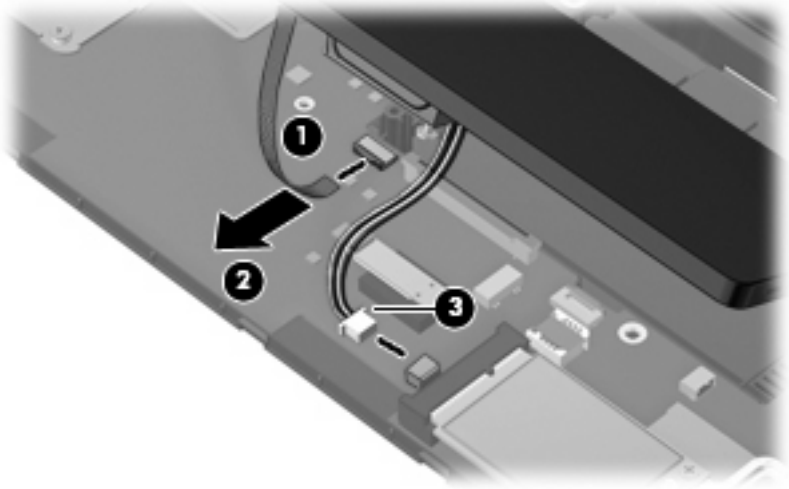
7. Remove the following screws that secure the top cover to the base enclosure:
   - **(2)** - 5 Phillips PM2.0×6.0
   - **(3)** - 1 Phillips PM2.0×2.5



8. Release the clips along the front edge of the top cover and open the front of the top cover **(1)** enough to see the TouchPad and speaker cables.
9. Lift the back edge of the top cover up and forward **(2)** to release the clips along the rear edge of the top cover.



10. Release the ZIF connector **(1)** for the TouchPad button board cable, and disconnect the cable **(2)** from the system board.
11. Disconnect the speaker cable **(3)** from the system board, and then remove the top cover.



Reverse this procedure to install the top cover.

Speaker

Description	Spare part number
Speaker assembly with cable	577967-001

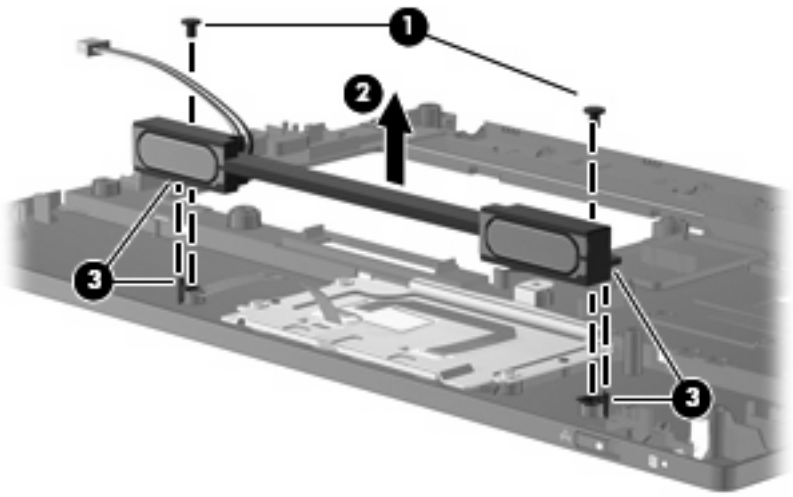
Before removing the speaker assembly, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the memory module (see Memory module on page 43).
7. Remove the keyboard (see Keyboard on page 45).
8. Remove the hard drive (see Mass storage devices on page 48).
9. Remove the top cover (see Top cover on page 55).

Remove the speaker assembly:

1. Turn the top cover upside down, with the front toward you.
2. Remove the 2 Phillips PM2.0×3.0 screws **(1)** that secure the assembly to the top cover, and remove the speaker assembly **(2)** from the top cover.

NOTE: If seated tight, work the speaker back and forth to release the speaker from the speaker alignment pins **(3)**.



Reverse this procedure to install the speaker assembly.

WWAN module

Description	Spare part number
WWAN module, Qualcomm EV-DO HSPA (includes mounting bracket)	531993-001
NOTE: Not supported by computers with Linux installed.	
NOTE: Not supported by computers with the HD Enhanced Video Accelerator installed.	

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

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

Before removing the WWAN module, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. Remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive (see Mass storage devices on page 48)
   c. Top cover (see Top cover on page 55)

Remove the WWAN module:

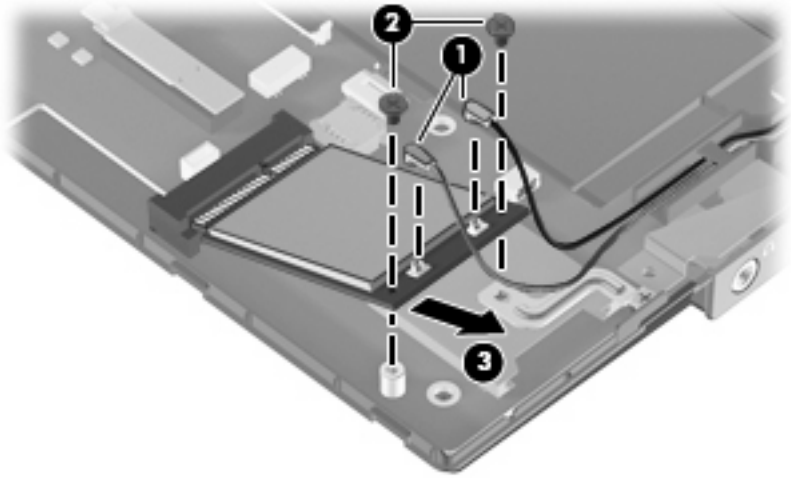
1. Disconnect the wireless antenna cables **(1)** from the terminals on the WWAN module.

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 2 Phillips PM2.0×4.0 screws **(2)** that secure the WWAN module **(3)** to the base enclosure and mounting bracket. (The module tilts up.)

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

NOTE: The mounting bracket on the right side of the WWAN module is only used with the WWAN module mini-card and secures to the base enclosure with a PM 2.0×2.0 screw.



Reverse this procedure to install the WWAN module.

RTC battery

Description	Spare part number
RTC battery	507707-001

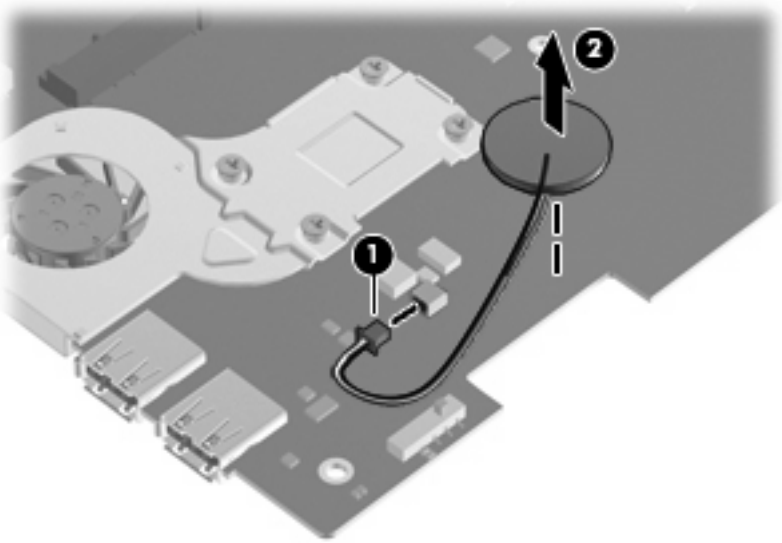
Before removing the real-time clock (RTC) battery, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the Keyboard (see Keyboard on page 45).
7. Remove the Hard drive (see Mass storage devices on page 48).
8. Remove the Top cover (see Top cover on page 55).

Remove the RTC battery:

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

NOTE: The RTC battery is attached to the system board with double-sided tape.



Reverse this procedure to install the RTC battery.

Bluetooth module

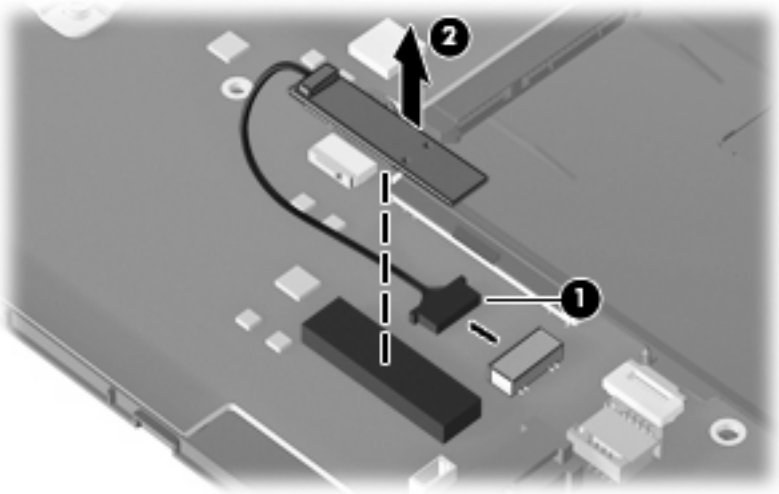
Description	Spare part number
Bluetooth module	537921-001

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 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive (see Mass storage devices on page 48)
   c. Top cover (see Top cover on page 55)

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)**.
2. Release the Bluetooth module from the adhesive pad to which it is affixed **(2)**, and remove the Bluetooth module.



Reverse this procedure to install the Bluetooth module.

Power button board

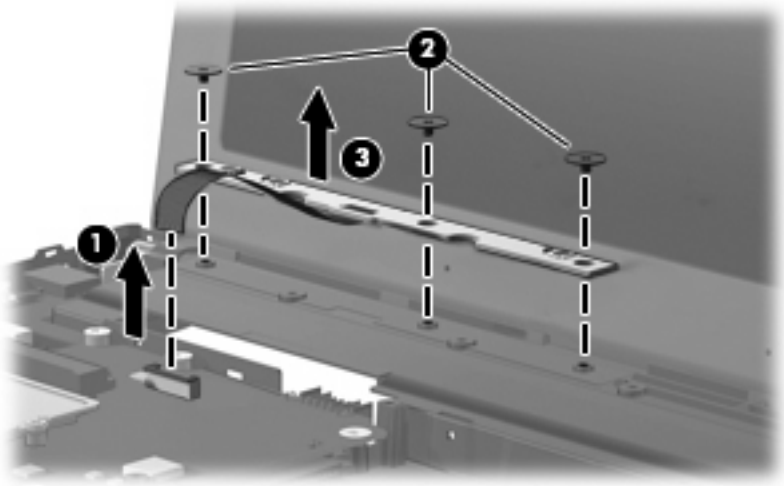
Description	Spare part number
Power button board with cable	598451-001

Before removing the power button board, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive (see Mass storage devices on page 48)
   c. Top cover (see Top cover on page 55)

Remove the power button board:

1. Disconnect the power button board cable **(1)**.
2. Remove the 3 Phillips PM2.0×2.0×7.0 broad head screws **(2)** that secure the power button board to the base enclosure.
3. Remove the power button board **(3)**.



Reverse this procedure to install the power button board.

Display assembly

Description	Spare part number
Display assembly (includes 1 webcam, 2 microphones, and 2 WLAN antenna with cables; WWAN antennas with cables on select models)	
• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, black	598456-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, red	607178-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam and WWAN option, blue	607180-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare, touch-screen display for use with webcam, black	598454-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, black	580616-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, red	607182-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam and WWAN option, blue	607184-001
• **25.7-cm** (10.1-in), high-definition, AntiGlare display assembly for use with webcam	577969-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, black	598455-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, red	607177-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam and WWAN option, blue	607179-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare, touch-screen display for use with webcam	598453-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, black	580615-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, red	607181-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam and WWAN option, blue	607183-001
• **25.7-cm** (10.1-in), WSVGA, AntiGlare display assembly for use with webcam	577968-001
Display bezel	
• For use with touch screen with webcam	598460-001
• For use with non-touch screen with webcam	577929-001
Display hinge kit (Includes left and right display panel hinges)	577930-001
Touch screen LCD panel	
• For use with high-definition display assembly	607113-001
• For use with WSVGA display assembly	607112-001

Description	Spare part number
Webcam module	577927-001
Display panel/webcam cable	
• For use in high-definition display assembly	577932-001
• For use in WSVGA display assembly	577931-001
Display cable kit includes the following cables:	577933-001
• WLAN antennas (2) with cables	
• Dual microphone with cable	
• WWAN antennas (2) with cables on select models	
Display back cover (includes logo)	
• For use with touch screen, black	598457-001
• For use with touch screen, red	598458-001
• For use with touch screen, blue	598459-001
• For use with non-touch screen, black	577928-001
• For use with non-touch screen, red	606201-001
• For use with non-touch screen, blue	606970-001

Before removing the display assembly, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive (see Mass storage devices on page 48)
   c. WLAN module (see WLAN module on page 51)
   d. Top cover (see Top cover on page 55)

Remove the display assembly:

1. Disconnect the following cables and grounding tape from the system board and cable routing clips:

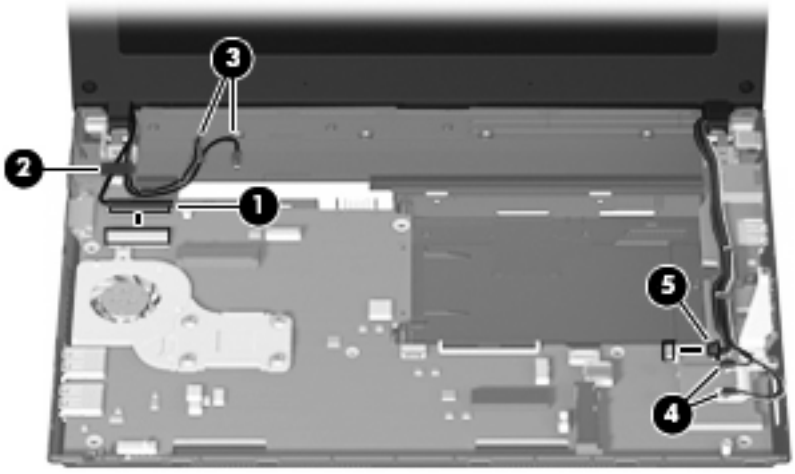
   (1) Display panel cable

   (2) Display panel cable grounding tape

   (3) WLAN cables

   (4) WWAN cables (select models only)

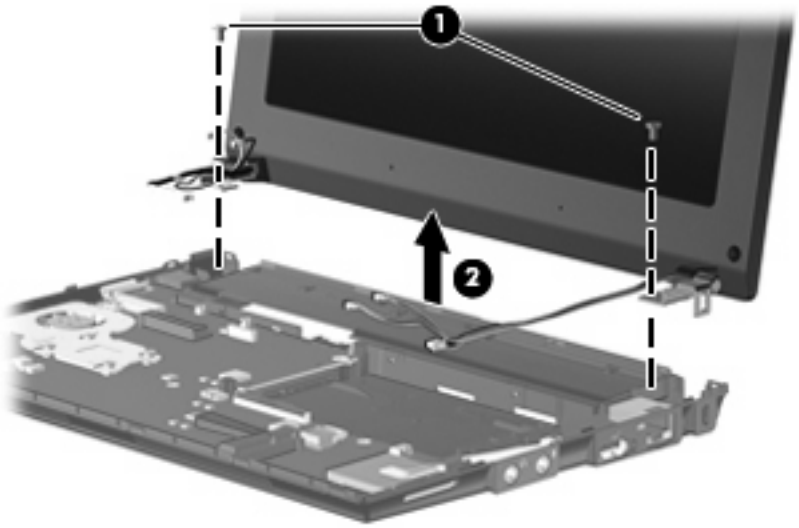
   (5) Microphone cable



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

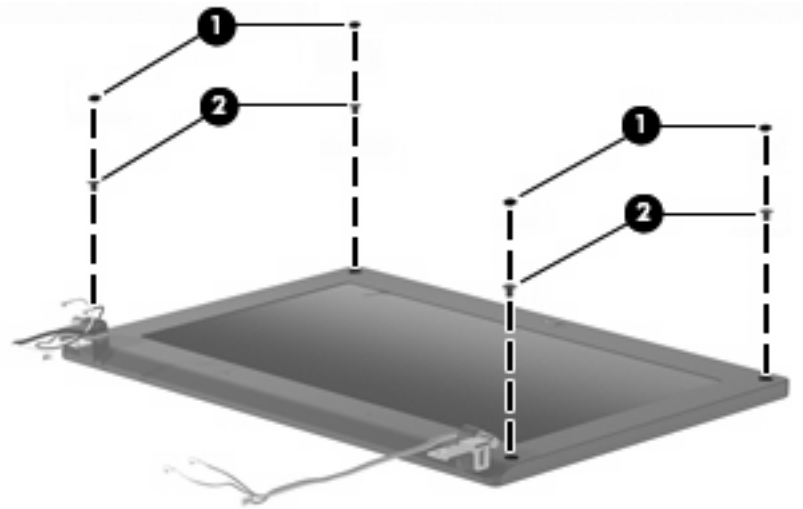
2. Remove the 2 Phillips PM2.5×5.0 screws **(1)** that secure the display assembly to the device.

3. Remove the display assembly **(2)**.



4. If it is necessary to replace the display bezel, perform the following steps:

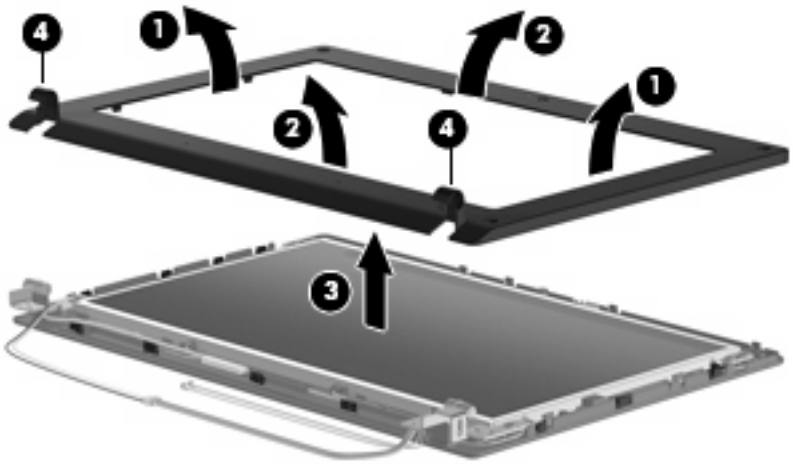
   a. Remove the 4 Mylar screw covers **(1)** from the corners of the display bezel, and then remove the 4 2.5×3.0 screws **(2)** that secure the display bezel to the back cover.



   b. Flex the inside edges of the left and right sides **(1)**, and then the top and bottom **(2)** of the display bezel until the bezel disengages from the display enclosure.

   c. Remove the display bezel **(3)**.

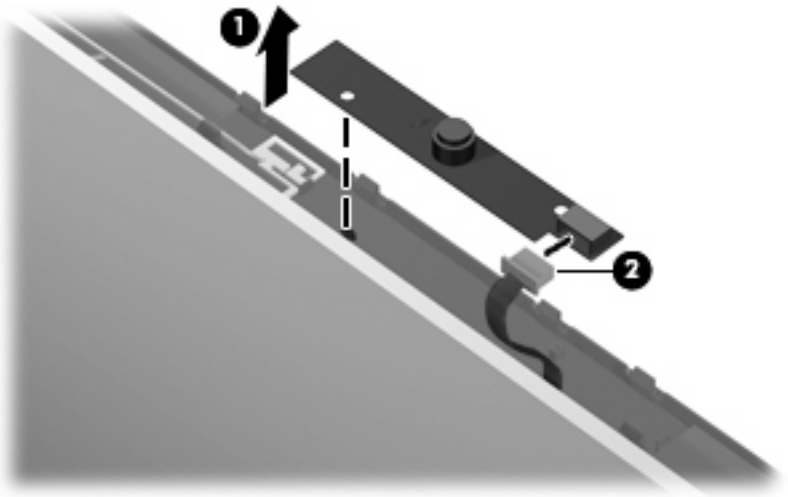
   NOTE: Tabs on the hinge covers **(4)** lock to insets on the base enclosure.



5. If it is necessary to replace the webcam module, perform the following steps:

   a. Lift the webcam **(1)**.

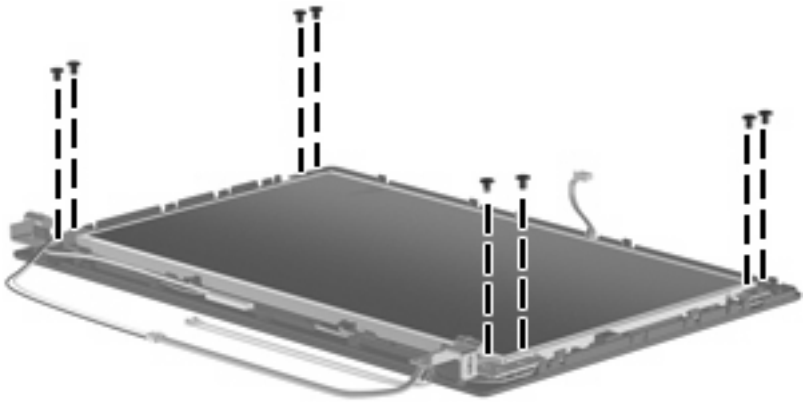
b. Disconnect the webcam cable **(2)** from the webcam.



c. Remove the webcam.

6. If it is necessary to replace the non-touch display panel, perform the following steps:

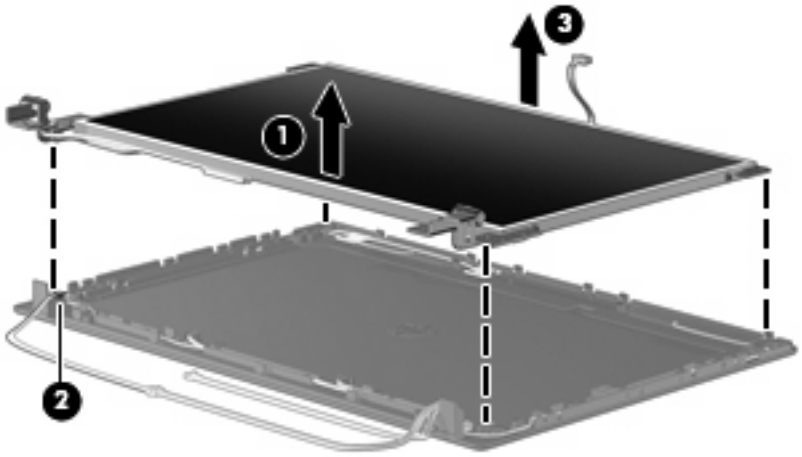
a. Remove the 8 Phillips PM2.5×5.0 screws that secure the display panel to the display enclosure.



b. Lift the bottom edge of the display panel up from the display back cover **(1)**.

c. Disengage the display panel cable **(2)** from the left hinge clip.

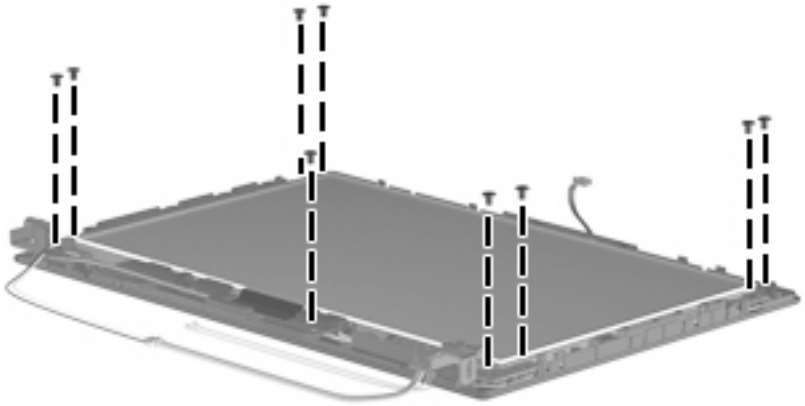
d. Remove the display panel **(3)** from the display back cover.



– or –

On touch-screen display assemblies:

a. Remove the 9 Phillips PM2.5×5.0 screws that secure the display panel to the display enclosure.



b. Lift the top edge of the display panel up from the back cover **(1)**.

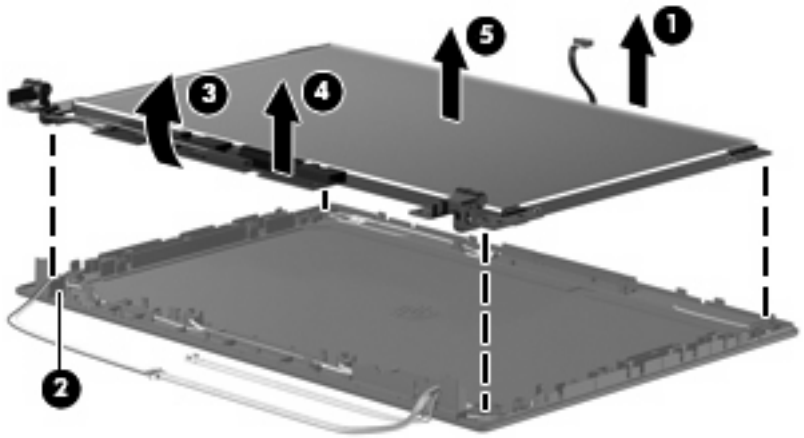
c. Disengage the display panel cable **(2)** from the left hinge clip.

d. Disengage the touch-screen display board **(3)** from the snap hooks on the back cover.

△ **CAUTION:** Do not bend the cable when disengaging the touch-screen display board.

e. Release the touch-screen display board **(4)** from display back cover.

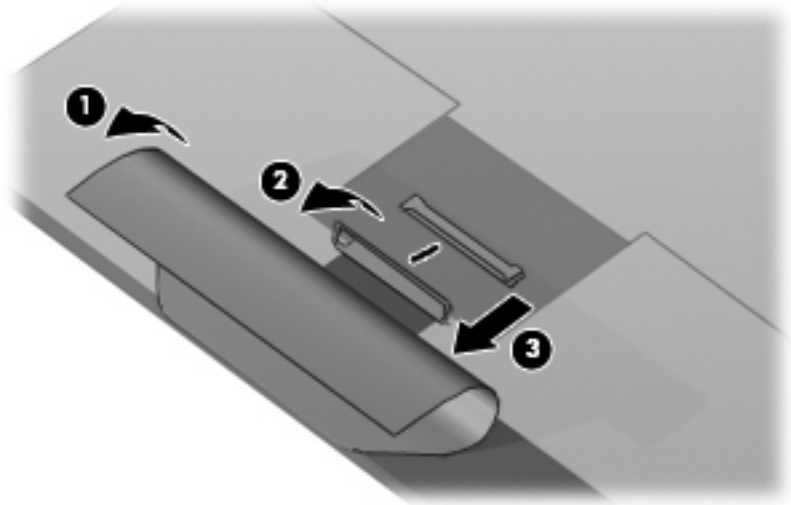
f. Remove the display panel from display back cover **(5)**.



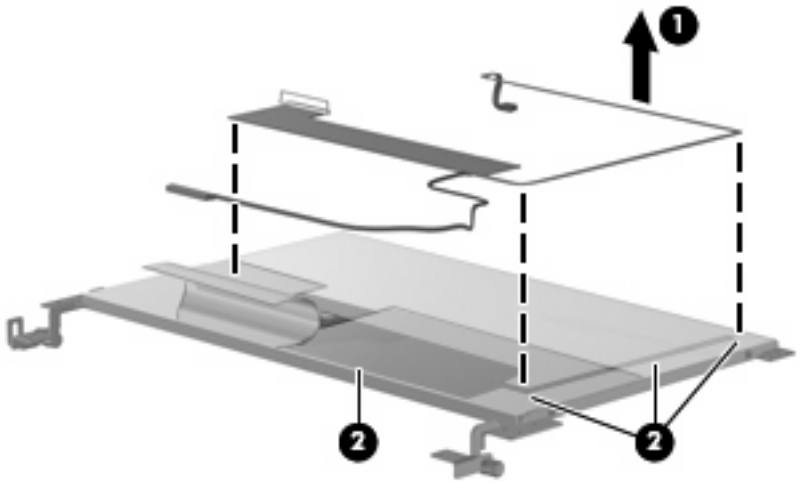
7. If it is necessary to replace the display panel/webcam cable, use the following steps:

   a. Turn the display panel over, and peel back the Mylar shield **(1)** on the back of the display panel.

   b. Lift the adhesive strip **(2)** that secures the cable to the back of the display panel, and disconnect the display panel/webcam cable **(3)**.



c. Release the display panel/webcam cable **(1)** from the adhesive points **(2)** along the cable route on the back of the display panel.

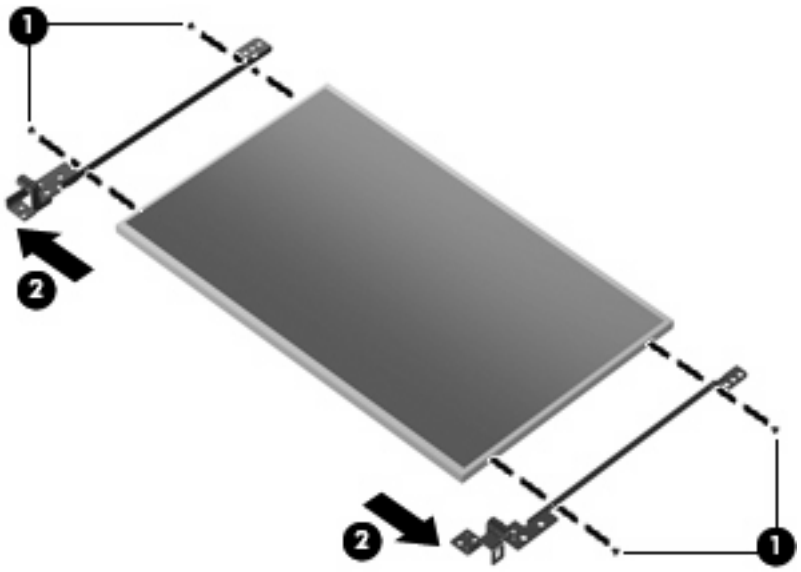


d. Remove the display panel/wedcam cable.

8. If it is necessary to replace the display hinges, perform the following steps:

   a. Remove the 2 Phillips PM2.0×3.0 screws **(1)** that secure each hinge to the display panel.

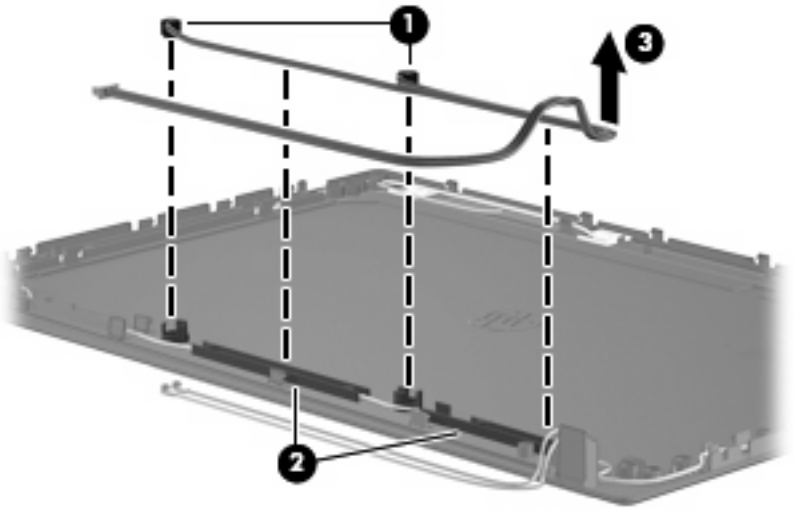
   b. Remove the hinges **(2)**.



9. If it is necessary to replace the microphone receiver, perform the following steps:

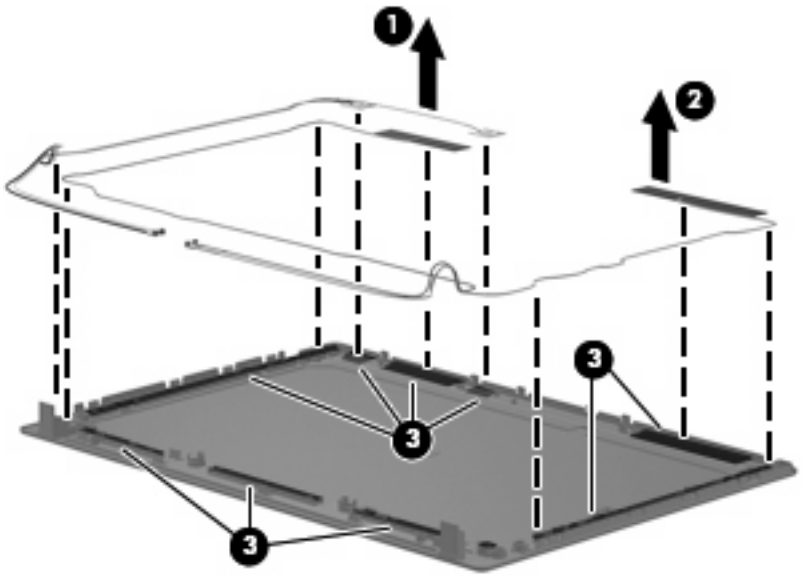
   a. Release the microphone receiver from the clip **(1)** that secures it to the display enclosure.

b. Pull the receiver through the tabs **(2)**, and remove the microphone receiver **(3)**.



10. If it is necessary to replace the wireless antennas and cables, perform the following steps:

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



b. Remove the wireless antennas and cables.

Reverse this procedure to reassemble and install the display assembly.

System board

Description	Spare part number
System board (includes processor and replacement thermal material)	
• Includes Intel Atom N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)	598449-001
• Includes Intel Atom N470 1.83-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB) for use in the People's Republic of China	598450-001
• Includes Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB)	598447-001
• Includes Intel Atom N450 1.66-GHz processor, 512-KB Level 2 cache, 667-MHz front-side bus (FSB) for use in the People's Republic of China	598448-001

Before removing the system board, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive (see Mass storage devices on page 48)
   c. Top cover (see Top cover on page 55)
   d. Display assembly (see Display assembly on page 64)

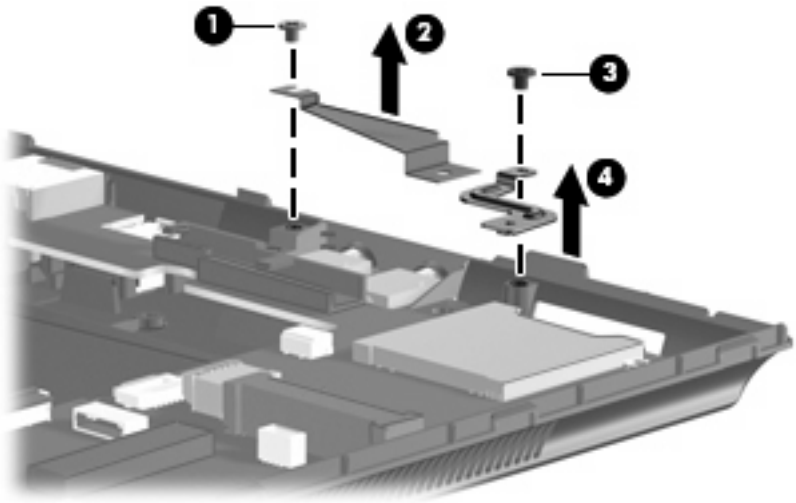
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- WLAN module (see WLAN module on page 51)
- WWAN module, if included (see WWAN module on page 59)
- Bluetooth module (see Bluetooth module on page 62)

Remove the system board:

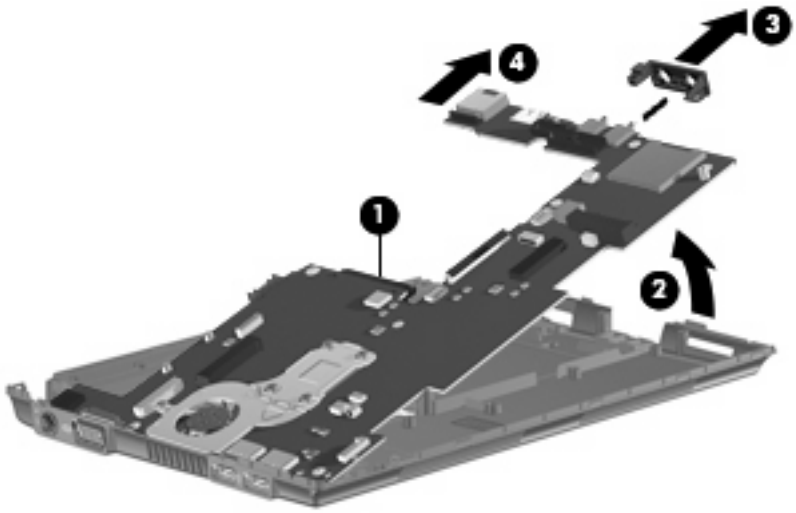
1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the bracket over the audio connectors to the base enclosure, and then remove the bracket **(2)**.
2. Remove the bracket that sec

3. On models with the WWAN option installed remove the Phillips PM2.0×2.0 screw **(3)** that secures the WWAN bracket to the base enclosure, and then remove the WWAN bracket **(4)**.



4. Grasp the system board at the midpoint of the board **(1)**, and tilt it up to the left **(2)**.

5. Remove the audio connector cover and pull the system board **(3)** out to the right at an angle to remove the system board from the base enclosure.



Reverse the procedure to install the system board.

Fan and heat sink assembly

Description	Spare part number
Fan and heat sink assembly (includes replacement thermal material)	598452-001

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

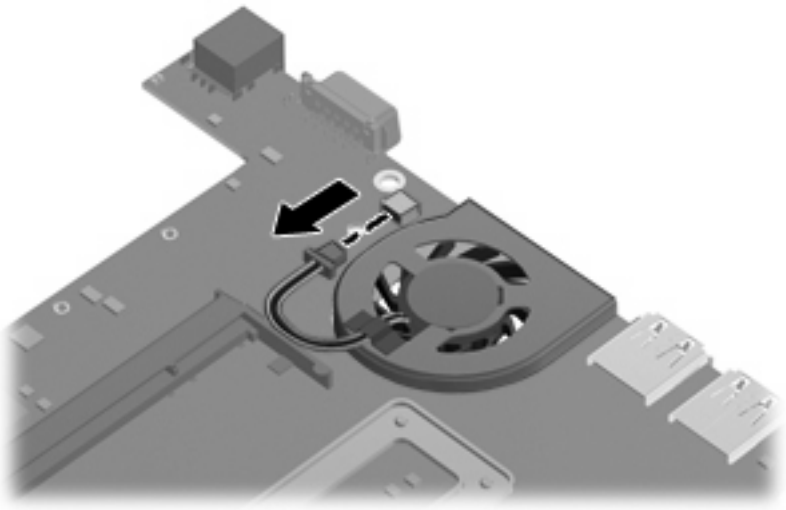
Before removing the fan and heat sink assembly, follow these steps:

1. Shut down the device. If you are unsure whether the device is off or in Hibernation, turn the device on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the device.
3. Disconnect the power from the device by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the device.
4. Remove the battery (see Battery on page 41).
5. If your device has WWAN capability, remove the SIM (see SIM on page 42).
6. Remove the following components:
   a. Keyboard (see Keyboard on page 45)
   b. Hard drive (see Mass storage devices on page 48)
   c. Top cover (see Top cover on page 55)
   d. WLAN module (see WLAN module on page 51)
   e. Display assembly (see Display assembly on page 64)
   f. System board (see System board on page 73)

Remove the fan and heat sink assembly:

1. Turn the system board upside down.

2. Disconnect the fan cable from the system board.



3. Turn the system board right side up.

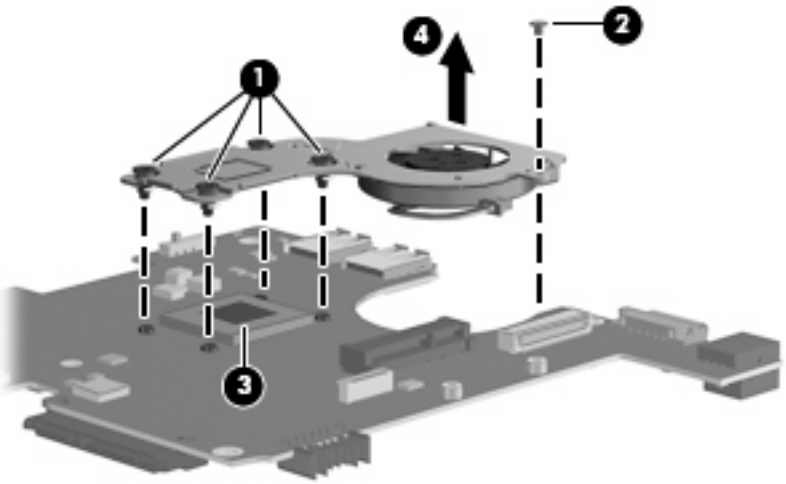
4. Loosen the 4 Phillips PM2.5×5.0 captive screws **(1)** that secure the fan and heat sink assembly to the system board.

NOTE: The screws are numbered 1 through 4. Follow this order when removing the screws.

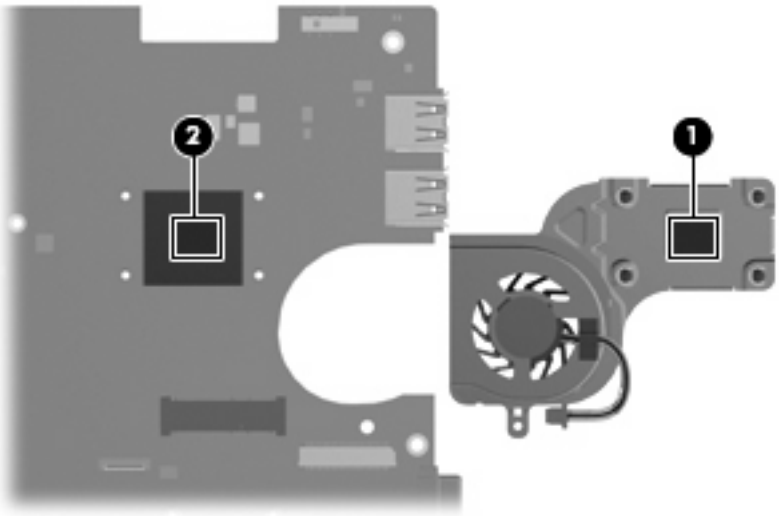
5. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the fan and heat sink assembly to the system board.

6. If necessary, work the heat sink back and forth to release the heat sink from the thermal paste **(3)** on the processor.

7. Remove the fan and heat sink assembly **(4)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the fan and heat sink assembly and the system board each time the fan and heat sink assembly is removed. Thermal paste is used on the processor **(1)**. Replacement thermal material is included with all fan and heat sink assembly, and system board spare part kits.



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

5 Computer Setup

Computer Setup in Windows 7

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

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

Starting Computer Setup

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

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

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

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before your operating system opens and while the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press esc.
3. Press f10 to enter BIOS Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

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

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

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

   - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to click the item.
   - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
   - To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

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

2. Press f10 to enter BIOS Setup.
3. Select the **File, Security, Diagnostics,** or **System Configuration** menu.
4. To exit Computer Setup, choose one of the following methods:

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

     – or –

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

     – or –

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

     – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing esc while the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen.
2. Press f10 to enter BIOS Setup.
3. Use the arrow keys to select **File > Restore defaults**, and then press enter.
4. When the confirmation dialog box opens, press f10.
5. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

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

Computer Setup menus

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

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

File menu

Select	To do this
System information	• View identification information for the computer. • View specification information for the processor, cache and memory size, and system ROM.
Set system date and time	Change date and time • Set date: MM:DD:YYYY • Set time: HH:MM
System Diagnostics	• F1: System information • F2: Start-up test • F3: Run-in test • F4: Hard disk test
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Administrator Tools	
BIOS administrator password	Enter, change, or delete a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account password	• Select from a list of BIOS users. • Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
User Tools	
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. • Last Pass: Displays Disk Sanitizer Completion Report **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot options	• Set a Startup Menu delay in seconds. • Set the MultiBoot Express Boot Popup delay in seconds. • Enable/disable Custom Logo (disabled by default). • Enable/display Display Diagnostic URL. • Enable/disable SD card boot. • Enable/disable floppy boot. • Enable/disable PXE Internal NIC boot. • Set the UEFI boot order: Windows Boot Manager. • Set the legacy boot order: ◦ 1st boot device: Notebook hard drive ◦ 2nd boot device: USB floppy ◦ 3rd boot device: USB CD-ROM ◦ 4th boot device: USB hard drive ◦ 5th boot device: Notebook Ethernet ◦ 6th boot device: SD card

Select	To do this

Device configurations	• Enable Fn Key Switch
	• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:
	  ◦ Use of a USB keyboard in Computer Setup even when your operating system is not running.
	  ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.
	• Enable/disable fan always on while connected to an AC outlet.
	• Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security.
	• Enable/disable LAN power saving mode.
	• Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available:
	  ◦ AHCI (Advanced Host Controller Interface)
	  ◦ IDE (Integrated Drive Electronics)
	• Enable/disable HP QuickLook.
	• Enable/disable HP QuickLook preboot authentication on HP QuickLook boot.
	• Enable/disable HP QuickWeb.
	• Enable/disable HP QuickWeb: Write Protect (disabled by default).
	• Enable/disable Intel® HT Technology.
	• Enable/disable Wake on USB (disabled by default).
	• Enable/disable Numlock state at boot: Off /On (disabled by default).

Select	To do this

Built-in device options	• Enable/disable the wireless switch state.
	• Enable/disable embedded WLAN device radio.
	• Enable/disable Network Interface Controller (NIC).
	• Enable/disable LAN/WLAN Switching (disabled by default).
	• Set the wake on LAN state.
	  ◦ Disabled
	  ◦ Boot to Network
	  ◦ Follow Boot Order
	• Enable/disable the integrated camera (webcam).
	• Enable/disable Power Monitor Circuit.
	• Enable/disable the audio device.
	• Enable/disable the microphone.
	• Enable/disable the internal speakers.

Port options	Enable/disable USB port.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

Computer Setup in Windows Vista

Starting Computer Setup

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

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

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

To start Computer Setup, follow these steps:

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

Using Computer Setup

Navigating and selecting in Computer Setup

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

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

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

   NOTE: You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.
2. Press f10 to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

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

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

  – or –

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

  – or –

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

  – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

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

   – or –

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

Your changes go into effect when the computer restarts.

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

Computer Setup menus

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

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

File menu

Select	To do this
System Information	• View identification information for the computer and the batteries in the system. • View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Set System Date and Time	Set or change the date and time on the computer.
System Diagnostics	Displays the following information: • System Information ◦ Identification information for the computer and the batteries in the system. ◦ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version. • Start-up Test—Verifies the system components needed for starting the computer. • Run-In Test—Runs a comprehensive check on system memory. • Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system. • 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.
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
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.
DriveLock Passwords	• Enable/disable DriveLock on any computer hard drive (enabled by default). • Change a DriveLock user password or master password. **NOTE:** DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
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. **NOTE:** You must have a setup password to change this setting.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay. **CAUTION:** If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot Options	• Set a Startup Menu delay (in seconds). • Enable/disable MultiBoot (enabled by default). • Set the Express Boot Popup delay in seconds. • Enable/disable Custom Logo (disabled by default). • Enable/disable Display Diagnostic URL (enabled by default). • Enable/disable CD-ROM boot (disabled 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	• Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following: ◦ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer • Select a parallel port mode: ECP (Enhanced Capabilities Port), standard, bidirectional, or EPP (Enhanced Parallel Port). • 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). • SATA (Serial Advanced Technology Attachment) device mode. The following options are available: ◦ AHCI (Advanced Host Controller Interface) ◦ IDE (Integrated Drive Electronics) ◦ RAID (select models only)

Select	To do this
	NOTE: Availability of these options varies by computer model. • 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 Elevated Security (disabled by default). • Enable/disable Virtualization Technology (select models only; disabled by default). • Enable/disable Wake on USB (enabled by default). • Enable/disable Num lock state at boot (disabled by default). • Enable/disable TXT (Intel® Trusted Execution Technology) (select models only; disabled by default).

Select	To do this
Built-In Device Options	• Enable/disable the wireless button state (enabled by default). • Enable/disable embedded WLAN device radio (select models only; enabled by default). • Enable/disable the Network Interface Controller (LAN) (enabled by default). • Enable/disable the embedded Bluetooth® device radio (enabled by default). • Enable/disable LAN/WLAN switching (disabled by default). • Enable/disable LAN Power Save (select models only). When enabled, saves power by turning off the LAN when not in use (enabled by default). • Set the wake on LAN state. Options include the following: ◦ Disabled ◦ Boot to Network ◦ Follow Boot Order • Enable/disable the Notebook Upgrade Bay device (enabled by default). • Enable/disable the Power Monitor Circuit (enabled by default). • Enable/disable the audio devices (enabled by default). • Enable/disable the fingerprint 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).

Select	To do this
Port Options (all are enabled by default)	**NOTE:** All port options are enabled by default. • Enable/disable the serial port. • Enable/disable the parallel port. • Enable/disable the flash media reader. • Enable/disable the USB port. **CAUTION:** Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator. • Enable/disable the 1394 port. • Enable/disable the ExpressCard slot. • Enable/disable the Smart Card slot. • Enable/disable the eSATA port.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

Computer Setup in Windows XP

Starting Computer Setup

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

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

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

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before your operating system opens and while the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press esc.

Using Computer Setup

Navigating and selecting in Computer Setup

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

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

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

   NOTE: You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.
2. Press f10 to enter BIOS Setup.

3. Select the **File, Security, Diagnostics,** or **System Configuration** menu.
4. To exit Computer Setup, choose one of the following methods:
   - To exit Computer Setup without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

     – or –

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

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

     – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing esc while the "Press the ESC key for Startup Menu" message is displayed in the lower-left corner of the screen.
2. Press f10 to enter BIOS Setup.
3. Use the arrow keys to select **File > Restore defaults**, and then press enter.
4. When the confirmation dialog box opens, press f10.
5. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

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

Computer Setup menus

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

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

File menu

Select	To do this
System information	• View identification information for the computer 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. • Set date: MM:DD:YYYY • Set time: HH:MM
System Diagnostics	• F1: System information • F2: Start-up test • F3: Run-in test • F4: Hard disk test
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (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
Administrator Tools	
Setup BIOS administrator password	Enter, change, or delete a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account password	• Select from a list of BIOS users. • Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
User Tools	
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. • Last Pass: Displays Disk Sanitizer Completion Report **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot options	• Set a Startup Menu delay in seconds. • Set the MultiBoot Express Boot Popup delay in seconds. • Enable/disable Custom Logo (disabled by default). • Enable/display Display Diagnostic URL. • Enable/disable SD card boot. • Enable/disable floppy boot. • Enable/disable PXE Internal NIC boot. • Set the UEFI boot order: Windows Boot Manager. • Set the legacy boot order: ◦ 1st boot device: Notebook hard drive ◦ 2nd boot device: USB floppy ◦ 3rd boot device: USB CD-ROM ◦ 4th boot device: USB hard drive ◦ 5th boot device: Notebook Ethernet ◦ 6th boot device: SD card

Select	To do this

Device configurations	• Enable Fn Key Switch
	• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:
	  ◦ Use of a USB keyboard in Computer Setup even when your operating system is not running.
	  ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.
	• Enable/disable fan always on while connected to an AC outlet.
	• Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security.
	• Enable/disable LAN power saving mode.
	• Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available:
	  ◦ AHCI (Advanced Host Controller Interface)
	  ◦ IDE (Integrated Drive Electronics)
	• Enable/disable HP QuickLook.
	• Enable/disable HP QuickLook preboot authentication on HP QuickLook boot.
	• Enable/disable HP QuickWeb.
	• Enable/disable HP QuickWeb: Write Protect (disabled by default).
	• Enable/disable Intel® HT Technology.
	• Enable/disable Wake on USB (disabled by default).
	• Enable/disable Numlock state at boot: Off /On (disabled by default).

Select	To do this

Built-in device options	• Enable/disable the wireless button state.
	• Enable/disable embedded WLAN device radio.
	• Enable/disable Network Interface Controller (NIC).
	• Enable/disable LAN/WLAN Switching (disabled by default).
	• Set the wake on LAN state.
	  ◦ Disabled
	  ◦ Boot to Network
	  ◦ Follow Boot Order
	• Enable/disable the integrated camera (webcam).
	• Enable/disable Power Monitor Circuit.
	• Enable/disable the audio device.
	• Enable/disable the microphone.
	• Enable/disable the internal speakers.

Port options	Enable/disable USB port.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

Computer Setup in SUSE Linux

Starting Computer Setup

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

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

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

To start Computer Setup, follow these steps:

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

Computer Setup menus

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

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

File menu

Select	To do this
System information	• View identification information for the computer. • View specification information for the processor, cache and memory size, and system ROM.
Set system date and time	Change date and time • Set date: MM:DD:YYYY • Set time: HH:MM
System Diagnostics	• F1: System information • F2: Start-up test • F3: Run-in test • F4: Hard disk test
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Reset BIOS security to factory default	Restore the BIOS security settings to the factory default.

Select	To do this
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Administrator Tools	
Setup BIOS administrator password	Enter, change, or delete a BIOS administrator password.
User Management (requires a BIOS administrator password)	
Create New BIOS User Account password	• Select from a list of BIOS users. • Select from a list of ProtectTools users.
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
User Tools	
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: • Fast: Runs the Disk Sanitizer erase cycle once. • Optimum: Runs the Disk Sanitizer erase cycle 3 times. • Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. • Last Pass: Displays Disk Sanitizer Completion Report **CAUTION:** If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

System Configuration menu

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

Select	To do this
Language	Change the Computer Setup language.
Boot options	• Set a Startup Menu delay in seconds. • Set the MultiBoot Express Boot Popup delay in seconds. • Enable/disable Custom Logo (disabled by default). • Enable/display Display Diagnostic URL. • Enable/disable SD card boot. • Enable/disable floppy boot. • Enable/disable PXE Internal NIC boot. • Enable/disable UEFI Boot Mode (disabled by default). • Set the legacy boot order: ◦ 1st boot device: Notebook hard drive ◦ 2nd boot device: USB floppy ◦ 3rd boot device: USB CD-ROM ◦ 4th boot device: USB hard drive ◦ 5th boot device: Notebook Ethernet ◦ 6th boot device: SD card

Select	To do this

Device configurations	• Enable Fn Key Switch
	• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:
	  ◦ Use of a USB keyboard in Computer Setup even when your operating system is not running.
	  ◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.
	• Enable/disable fan always on while connected to an AC outlet.
	• Enable/disable Data Execution Prevention (select models only). When enabled, the processor can disable some virus code execution, which helps to improve computer security.
	• Enable/disable LAN power saving mode.
	• Set the SATA (Serial Advanced Technology Attachment) device mode. The following options are available:
	  ◦ AHCI (Advanced Host Controller Interface)
	  ◦ IDE (Integrated Drive Electronics)
	• Enable/disable HP QuickLook.
	• Enable/disable HP QuickLook preboot authentication on HP QuickLook boot.
	• Enable/disable HP QuickWeb.
	• Enable/disable HP QuickWeb: Write Protect (disabled by default).
	• Enable/disable Intel® HT Technology.
	• Enable/disable Wake on USB (disabled by default).
	• Enable/disable Numlock state at boot: Off /On (disabled by default).

Select	To do this

Built-in device options	• Enable/disable the wireless switch state.
	• Enable/disable embedded WLAN device radio.
	• Enable/disable Network Interface Controller (NIC).
	• Enable/disable LAN/WLAN Switching (disabled by default).
	• Set the wake on LAN state.
	  ◦ Disabled
	  ◦ Boot to Network
	  ◦ Follow Boot Order
	• Enable/disable the integrated camera (webcam).
	• Enable/disable Power Monitor Circuit.
	• Enable/disable the audio device.
	• Enable/disable the microphone.
	• Enable/disable the internal speakers.

Port options	Enable/disable USB port.
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

6 Specifications

Device specifications

	Metric	U.S.
Dimensions		
Depth	**18.0 cm**	7.09 in
Width	**26.17 cm**	10.30 in
Height (at front, non-touch screen)	**2.32 cm**	0.91 in
Height (at front, touch screen)	**2.48 cm**	0.98 in
Weight		
25.7 cm (10.1 in) non-touch screen display equipped with a 3-cell battery, 160-GB hard drive, 1-GB memory, WLAN module, and 2 wireless antennas	**1.2 kg**	2.64 lb
25.7 cm (10.1 in) touch screen display equipped with a 3-cell battery, 160-GB hard drive, 1-GB memory, WLAN module, and 2 wireless antennas	**1.3 kg**	2.86 lb
Input power		
Operating voltage	18.5 V dc, 13.5 W	
Operating current	0.73 A	
Temperature		
Operating	**0°C to 35°C**	32°F to 95°F
Non-operating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Non-operating	5% to 95%	
Shock		
Non-operating	200 g, 2 ms, half-sine	
Operating	125 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 grms	
Non-operating	1.50 grms	

	Metric	U.S.
Maximum altitude (unpressurized)		
Operating	**-15.24 to 3,048 m**	-50 to 10,000 ft
Non-operating	**-15.24 to 12,192 m**	-50 to 40,000 ft

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

25.7-cm (10.1-in), high-definition, 16:9, AntiGlare display specifications

Dimensions	
Height	**12.52 cm** (4.93 in)
Width	**22.27 cm** (8.77 in)
Diagonal	**25.55 cm** (10.06 in)
Number of colors	262,144
Contrast ratio	400:1 (typical)
Refresh rate	60 Hz
Brightness	200 nits (typical)
Pixel resolution	
Pitch	0.1630 mm
Format	1366 x 768, 16:9
Configuration	RGB vertical stripe
Backlight	LED
PPI	156
Viewing angle	±30° horizontal, ±10° vertical (typical)

25.7-cm (10.1-in), WSVGA, AntiGlare display specifications

Dimensions	
Height	**12.52 cm** (4.93 in)
Width	**22.27 cm** (8.77 in)
Diagonal	**25.55 cm** (10.06 in)
Number of colors	262,144
Contrast ratio	400:1 (typical)
Refresh rate	60 Hz
Brightness	200 nits (typical)
Pixel resolution	
Pitch (H × V)	0.2175 × 0.2088 mm
Format	1024 × 600
Configuration	RGB vertical stripe
Backlight	LED
PPI	117 (H)/122 (V)
Viewing angle	±30° horizontal, ±10 vertical (typical)

Hard drive specifications

	320 GB*	250 GB*	160 GB*
Dimensions			
Height	**9.5 mm** (0.37 in)	**9.5 mm** (0.37 in)	**9.5 mm** (0.37 in)
Width	**70 mm** (2.75 in)	**70 mm** (2.76 in)	**70 mm** (2.76 in)
Weight	**115 g** (4.06 oz)	**115 g** (4.06 oz)	**115 g** (4.06 oz)
Interface type	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ		
Transfer rate (synchronous, maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.5 ms	1.5 ms	1.5 ms
Average	11.0 ms	11.0 ms	11.0 ms
Maximum	22.0 ms	22.0 ms	22.0 ms
Logical blocks	625,142,448	488,397,168	312,581,808
Disc rotational speed	7200 rpm	7200 rpm	7200 rpm
Operating temperature (case)	**0°C to 60°C** (32°F to 140°F)		

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

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

Solid state drive specifications

Performance	
Sequential read (maximum)	250 MB/s
Sequential write (maximum)	70 MB/s
Characteristics	
Interface	SATA revision 2.6
Flash type	MLC (LBG) NAND
Flash capacity	60 GB, 128 GB
Features	ATA Security; ATA-7 ;SATA 2.6; DIPM
Electrical specifications	
DC supply voltage	5.0 V ±5%
Standby current	130 mA (typical)
Active current	Read = 210.1 mA (average) Write = 225.9 mA (average)
Environmental specifications	
Operating temperature	**0°C to +70°C** (32°F to 158°F)
Storage temperature	**-55°C to +95°C** (-67°F to 203°F)
Operating altitude	up to **24,384 m** (80,000 feet)
Humidity	5% to 90% non-condensing
Shock	1500 g
Vibration (operating)	20 g peak, 10~2000 Hz
Physical specifications	
Connector	7+15 pin SATA connector
Weight	**86 g** (3.03 oz)
Dimensions (height × width)	**9.5 × 70 mm** (0.37 × 2.75 in)
Regulations and compliance	RoHS, China RoHS, SGS ROHS, FCC, CE UL – PCB Only

System resource specifications

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

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

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

To view resource settings in Windows 7 and Windows Vista:

1. Select **Start > Computer**.
2. Click **System properties** near the top of the Computer folder.
3. On the left, click **Device Manager**.
4. On the **View** menu, click one of the following:
   - **Resources by type**
   - **Resources by connection**

To view resource settings in Windows XP:

1. Select **Start > My Computer**, or double-click **My Computer** on the desktop.
2. Under System Tasks, click **View system information**.
3. In the System Properties window, select the **Hardware** tab.
4. Click **Device Manager**.
5. On the **View** menu, click one of the following:
   - **Resources by type**
   - **Resources by connection**

7 Backup and recovery

Windows 7 backup and recovery

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

Windows Backup and Restore provides the following options:

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

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

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

Backing up

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

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

Note the following when backing up:

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

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

  To create a screen shot:

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

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

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

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

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

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

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

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

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

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

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

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

Recovering

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

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

NOTE: If you are unable to boot (start up) your computer and you cannot use the system repair discs you previously created (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system.

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

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

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

3. If the HP Recovery partition is listed, restart the computer, and then press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
4. Press f11 while the “Press f11 for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

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

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

Windows Vista backup and recovery

Use the instructions in this section if Windows Vista is installed on your computer.

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.

Windows Vista® provides the following advanced backup and recovery 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 instructions on these procedures, go to Help and Support.

Backing up

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.

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 optional external optical drive you use.

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 optional external optical drive.

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

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

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

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

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

Recovering

In case of system failure, use the f11 recovery tool to recover your original hard drive image.

NOTE: The image includes the Windows® operating system and software programs installed at the factory.

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

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

   NOTE: If the HP Recovery partition has been deleted, you will need to recover your operating system and programs using the *Windows Vista Operating System* and the *Driver Recovery* discs (purchased separately). For additional information, contact technical support by selecting **Start > Help and Support > Contact support**.

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.

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

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

Windows XP backup and recovery

Use the instructions in this section if Windows XP is installed on your computer.

To protect your information, use the Windows® Backup utility 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.

NOTE: Windows Backup utility is available only on the notebooks with the Windows XP Professional operating system. If your notebook has Windows XP Home, you can back up your personal files to a USB external hard drive (purchased separately).

Windows XP Professional provides the following advanced backup and recovery options:

- Backing up individual files and folders
- Backing up all files and folders
- Scheduling automatic backups (select models only)
- Scheduling automatic backups
- Creating recovery points
- Recovering information

NOTE: For instructions on these procedures, go to Help and Support.

Backing up

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.

In Windows XP Professional, use the Windows Backup utility to create a backup. Click **Start > All Programs > Accessories > System Tools > Backup**. Follow the on-screen instructions to back up your files.

In Windows XP Home, copy data files to a USB external hard drive (purchased separately).

Recovering

In case of system failure or instability, use the *Operating System* disc and the *Driver Recovery* discs that are included with the computer to recover your 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 as well as software and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled. Personal files must be restored from a backup.

1. If possible, back up all personal files.
2. Shut down the computer.
3. Insert the *Operating System* disc into an optional external optical drive.
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.

NOTE: For additional information, go to Help and Support.

SUSE Linux backup and recovery

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

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

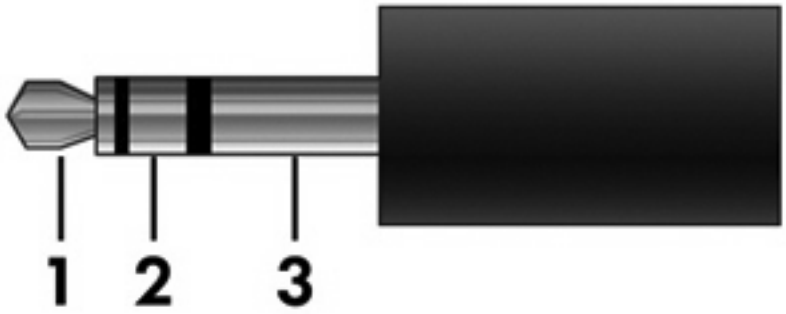
△ **CAUTION:** Using f11 completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The f11 recovery tool reinstalls the original operating system and HP programs and drivers that were installed at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

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

1. If possible, back up all personal files.
2. Restart the computer, and then press f11 while the “Press <F11> for recovery” message is displayed on the screen.
3. Follow the on-screen instructions.

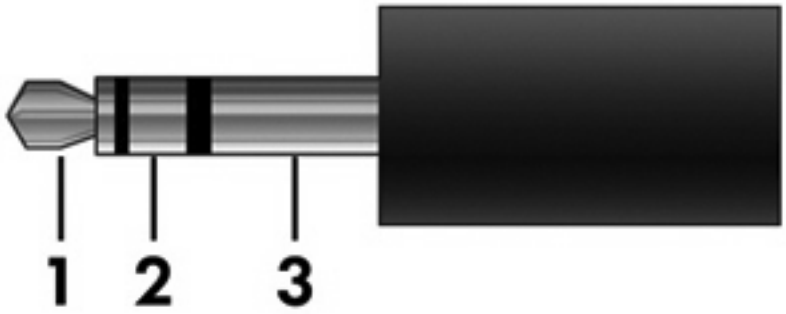
8 Connector pin assignments

Audio-in (microphone)



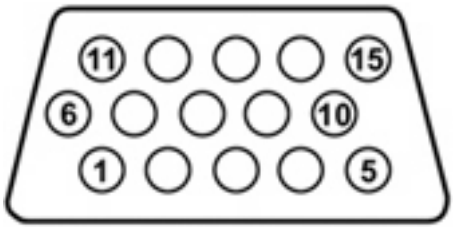
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



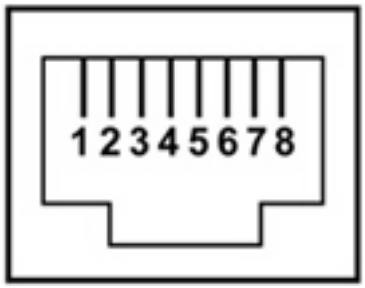
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



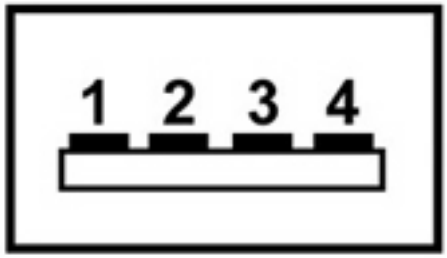
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

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

The USB+ power port on the right side of the computer powers HP USB external devices (see Right-side components on page 10). The port provides a minimum of 4.75 V measpin on the ured at the USB connector under a continuous 2.5-A load. The port is capable of 3 A for <1 ms.

The USB + power port is identified by a 3.5 mm diameter key jack, which supports the pin on the USB + power cable for HP external devices.

NOTE: The standard USB ports on the left side on the computer provide a minimum of 4.75 V under a continuous 0.5-A load only.

9 Power cord set requirements

The wide range input feature of the device 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 device 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 device 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 device.

Requirements for specific countries and regions

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

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

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

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

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

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

10 Recycling

Battery

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

Display

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

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

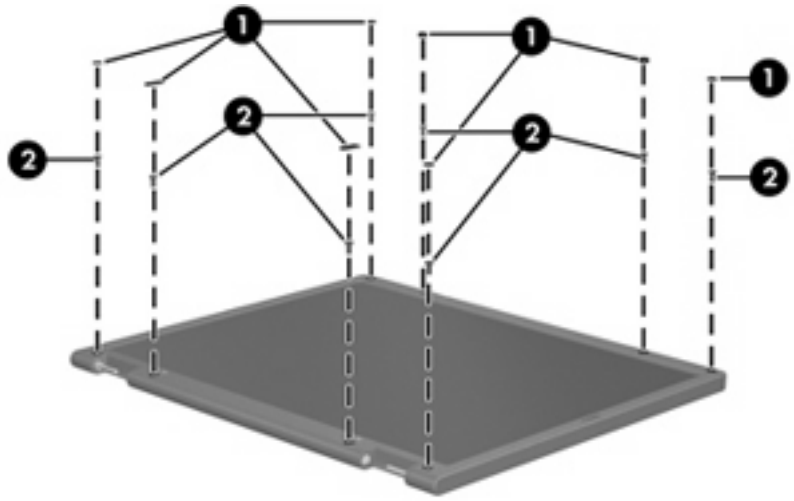
NOTE: **Materials Disposal**. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities,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

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

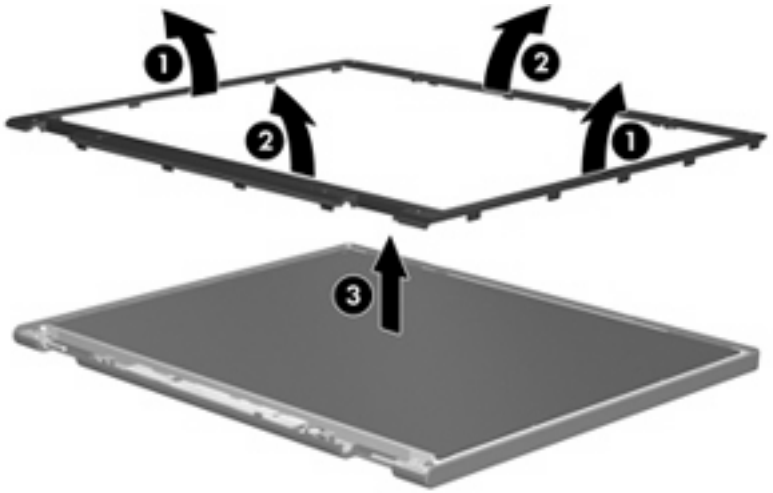
NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

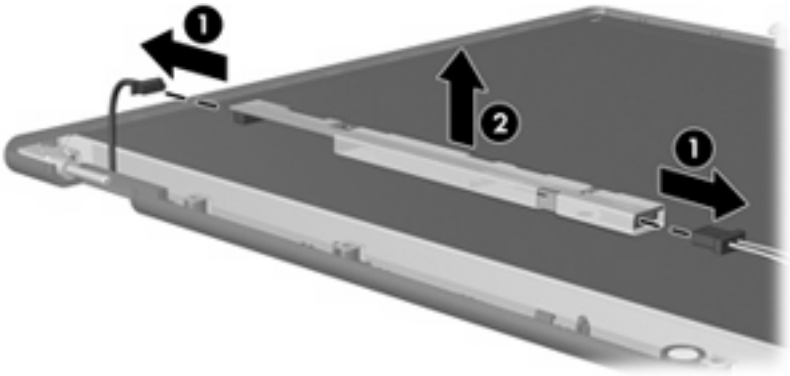
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



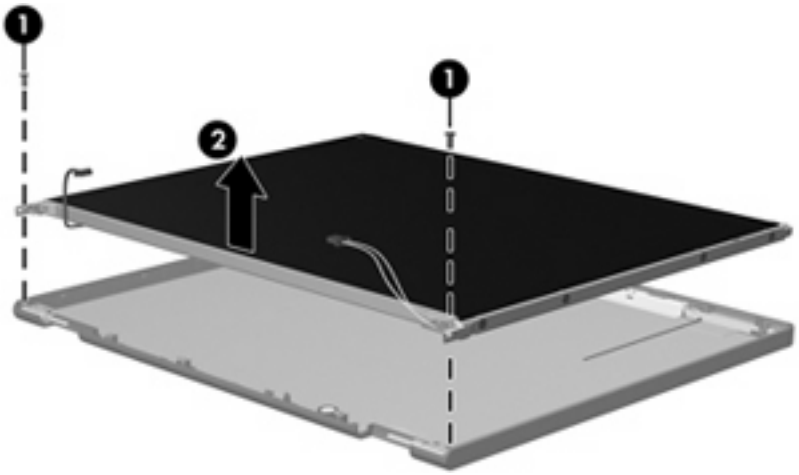
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



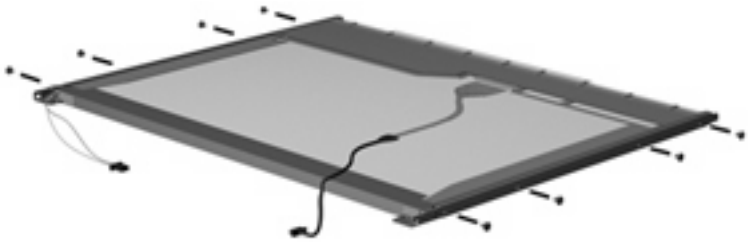
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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

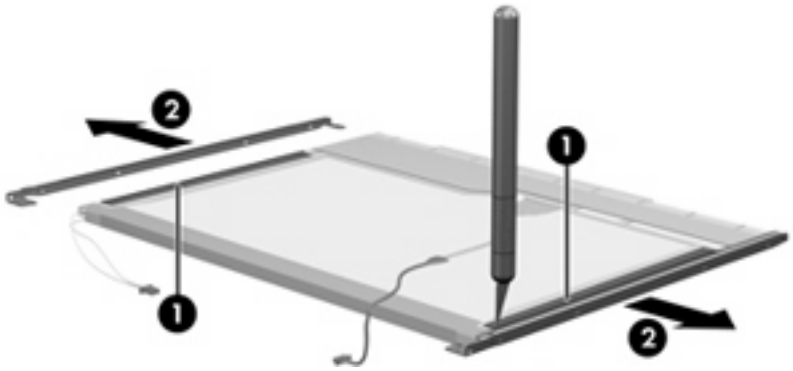


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

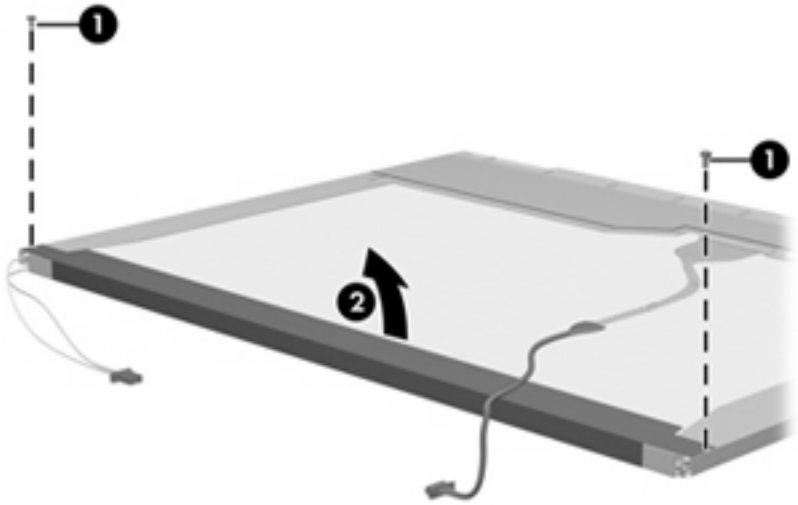


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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

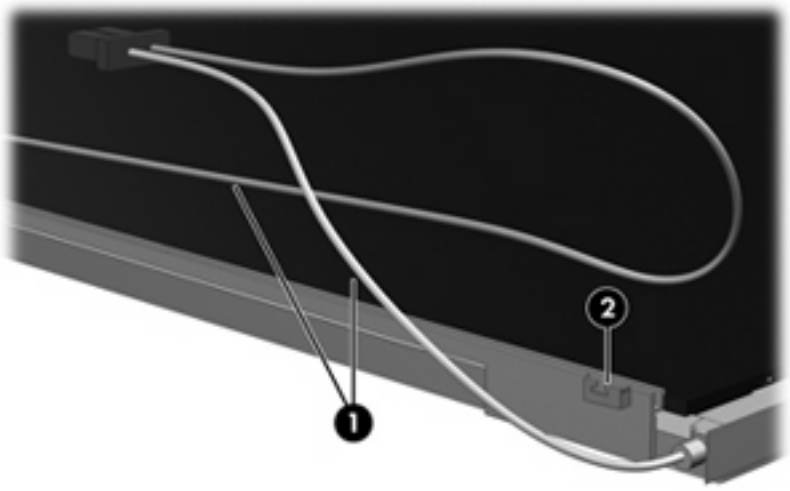


11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



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

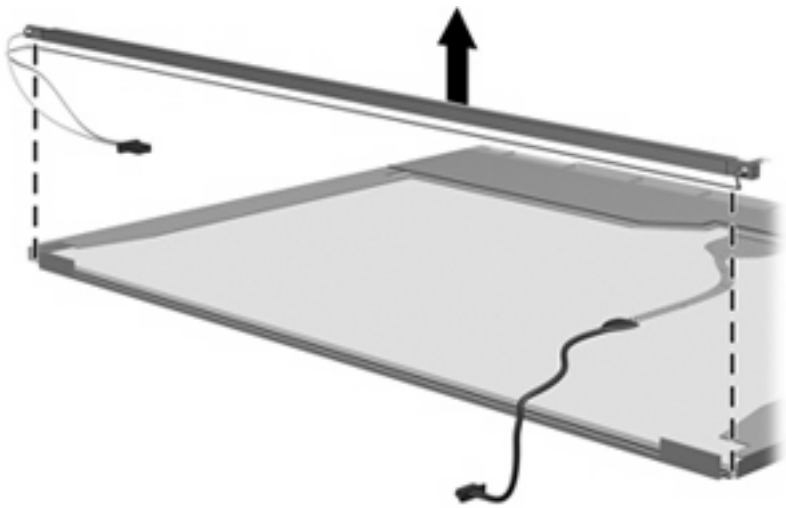
15. Remove the backlight cables **(1)** from the clip **(2)** in the display panel.



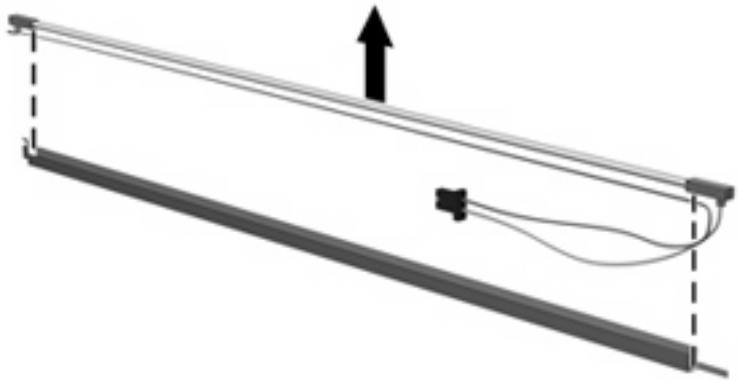
16. Turn the display panel upside down.

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

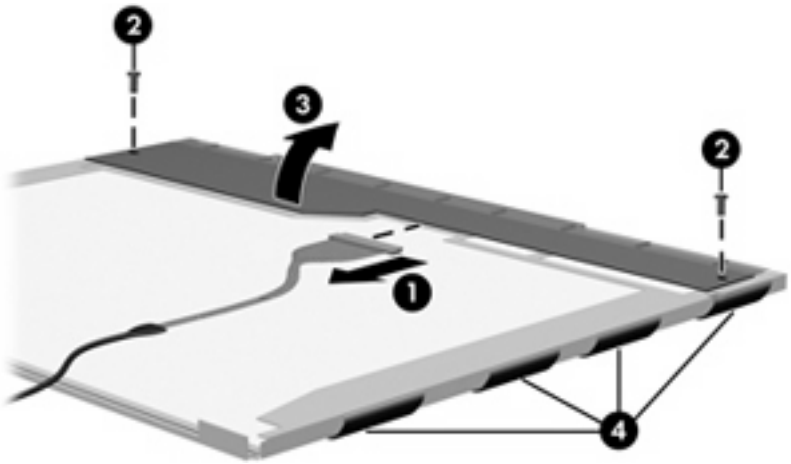
17. Remove the backlight frame from the display panel.



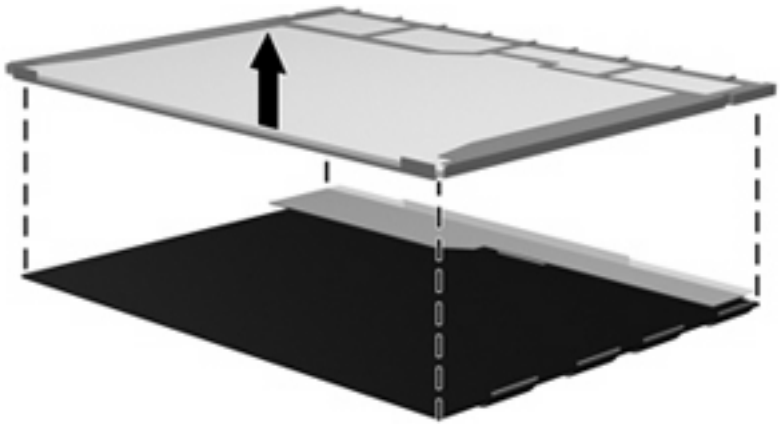
18. Remove the backlight from the backlight frame.



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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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