HP TouchSmart tx2 Notebook PC
Maintenance and Service Guide

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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; on troubleshooting computer problems; and on performing computer disassembly procedures.

First Edition: December 2008

Document Part Number: 501589-001

Safety warning notice

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

Table of contents

1 Product description

2 External component identification

Top components 5
Display components 5
Keys 7
Pointing devices 8
Front components 9
Left-side components 10
Right-side components 11
Rear components 12
Bottom components 13

3 Illustrated parts catalog

Service tag 14
Computer major components 15
Plastics Kit 20
Mass storage devices 21
Miscellaneous parts 22
Sequential part number listing 23

4 Removal and replacement procedures

Preliminary replacement requirements 27
Tools required 27
Service considerations 27
Plastic parts 27
Cables and connectors 28
Drive handling 28
Grounding guidelines 29
Electrostatic discharge damage 29
Packaging and transporting guidelines 30
Workstation guidelines 30
Equipment guidelines 31

Unknown user password 32
Component replacement procedures 33
Service tag 33
Computer feet 34
Battery 35
Pen 36
Hard drive 37
RTC battery 39
Optical drive 40
Memory module 41
WLAN module 43
Keyboard 46
Switch cover 48
Display assembly 50
Top cover 53
Power switch assembly 55
Bluetooth module 57
System board 58
Pen holder and pen eject assembly 61
Audio/infrared board 62
Fan/heat sink assembly 64
Processor 66

5 Setup Utility

Starting the Setup Utility 68
Changing the language of the Setup Utility 69
Navigating and selecting in the Setup Utility 69
Displaying system information 69
Restoring default settings in the Setup Utility 70
Using advanced Setup Utility features 70
Closing the Setup Utility 71
Setup Utility menus 71
Main menu 71
Security menu 71
System Configuration menu 72
Diagnostics menu 72

6 Specifications

Computer specifications 73
12.1-inch, WXGA BrightView display specifications 74
Hard drive specifications 75
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive specifications 76
System DMA specifications 77

System interrupt specifications 78
System I/O address specifications 79
System memory map specifications 81

7 Screw listing

Phillips PM3.0×3.0 screw 82
Phillips PM2.0×7.0 screw 83
Phillips PM2.0×4.0 screw 84
Phillips PM2.0×5.0 captive screw 86
Black Phillips PM2.0×3.0 screw 87
Phillips PM2.0×11.0 screw 88
Phillips PM2.5×6.0 screw 89
Silver Phillips PM2.0×3.0 screw 90

8 Backup and recovery

Recovering system information 91
Creating recovery discs 91
Backing up your information 92
When to back up 92
Backup suggestions 93
Using system restore points 93
When to create restore points 93
Create a system restore point 93
Restore to a previous date and time 95
Performing a recovery 96
Recovering from the recovery discs 96
Recovering from the partition on the hard drive 96

9 Connector pin assignments

Audio-in (microphone) 97
Audio-out (headphone) 97
External monitor 98
RJ-11 (modem) 99
RJ-45 (network) 99
S-Video-out 100
Universal Serial Bus 100

10 Power cord set requirements

Requirements for all countries or regions 101
Requirements for specific countries or regions 102

11 Recycling

Battery 103

Display 104

Index 109

1 Product description

Category	Description
Product Name	**HP TouchSmart tx2 Notebook PC**
Processors	AMD Turion™ 64 Mobile Technology Ultra Dual-Core ZM-86 processor, 2.40-GHz, 2-MB L2 cache, 800-MHz front side bus (FSB)
	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-84 processor, 2.30-GHz, 2-MB L2 cache, 800-MHz FSB
	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-82 processor, 2.20-GHz, 2-MB L2 cache, 800-MHz FSB
	AMD Turion 64 Mobile Technology Dual-Core RM-74 processor, 2.10-GHz, 1-MB L2 cache, 800-MHz FSB
	AMD Turion 64 Mobile Technology Dual-Core RM-72 processor, 2.00-GHz, 1-MB L2 cache, 800-MHz FSB
	AMD Mobile Athlon™ Dual-Core QL-64 processor, 2.10-GHz, 1-MB L2 cache, 667-MHz FSB
	AMD Mobile Athlon Dual-Core QL-62 processor, 2.00-GHz, 1-MB L2 cache, 667-MHz FSB
Chipset	ATI Northbridge: AMD M780G
	ATI Southbridge: SB700
Graphics	ATI Radeon HD 3200
	Unified memory architecture (UMA) graphics subsystem memory integrated with system memory; graphics subsystem memory size is dynamic change
Panels	12.1-inch, WXGA (1280 × 800, 16:10 wide aspect ratio), LED BrightView with NTRIG touch-screen (multitouch enabled) and EMR support
	Typical brightness: 200 nits
Memory	• Two SODIMM slots • Customer accessible/upgradable • Dual-channel support
	• DDR2, PC2-6400, 800-MHz
	8192-MB total system memory (4096 MB × 2, dual-channel)
	6144-MB total system memory (4096 MB + 2048 MB)
	4096-MB total system memory (4096 MB × 1, 2048 MB × 2, dual-channel)

Category	Description
	3072-MB total system memory (2048 MB + 1024 MB)
	2048-MB total system memory (2048 MB × 1, 1024 MB × 2, dual-channel)
	1024-MB total system memory (1024 MB × 1)
Hard drives	• Supports all 9.5-mm, 6.35-cm (2.5-inch) hard drives • Serial ATA
	500-GB, 5400-rpm
	400-GB, 5400-rpm
	320-GB, 5400-rpm
	250-GB, 7200- and 5400-rpm
	160-GB, 5400-rpm
Optical drives	• 12.7-mm tray load • Parallel ATA
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive
Web camera	Low-light VGA camera, fixed (no tilt), with activity light, 24 frames per second
Diskette drive	Supports external USB drive only
Audio	• HD audio–Azalia techology with SRS audio enhancement • Supports Microsoft® Gold requirements • Two omni-directional, dual-array microphones • Beam-forming, echo-cancellation, noise-suppression software • Pavilion-branded Altec Lansing speakers
Modem	• Motorola 56K V.92 data/fax modem • Supports all worldwide certification requirements • Modem cable is not included
Ethernet	• Integrated Realtek 10/100/1000 (Gigabit Ethernet) • Ethernet cable included
Wireless	**Integrated wireless local area network (WLAN) options by way of wireless module (includes two 2.4-GHz antennae in display assembly):**
	Broadcom 4322 802.11a/b/g/n + Bluetooth®
	Broadcom 4322 802.11a/b/g/n
	Broadcom BCM4312 802.11b/g + Bluetooth
	Broadcom BCM4312 802.11b/g
External media card	• One ExpressCard/34 slot, requires slot bezel • 5-in-1 Digital Media Slot, supports SD, MMC, MS, MSpro, and xD. With adapter (not included), supports mini versions of SD, MMC, and MS Duo.

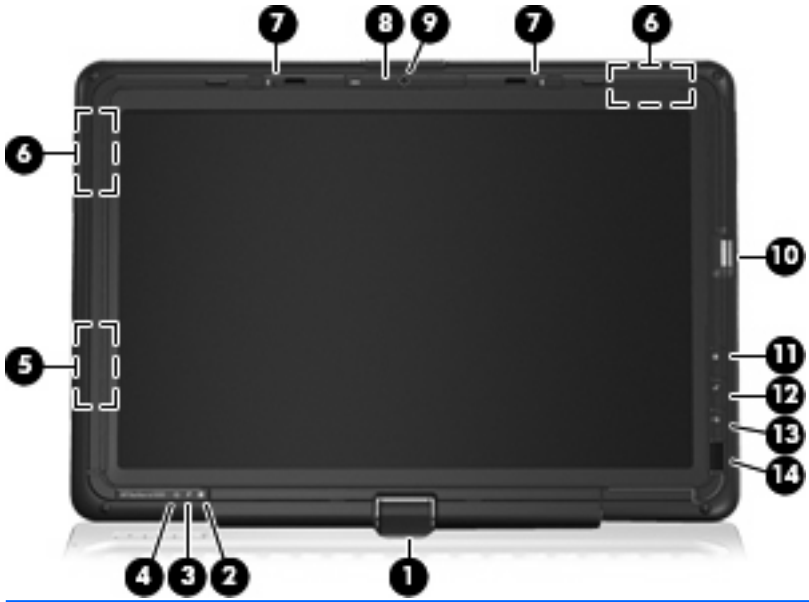
Category	Description
Ports	Audio-in (stereo microphone)
	Audio-out (stereo headphone)
	Audio-out (stereo headphone with S/PDIF)
	Consumer infrared (one in computer base, one in display assembly)
	eSATA
	High-definition multimedia interface (HDMI) v1.3 supporting 1080p with high-bandwidth digital content protection (HDCP) key
	RJ-11 (modem)
	RJ-45 (Ethernet), includes link and activity lights
	S-Video-out (includes component video support)
	USB (3)
	VGA (Dsub 15 pin) supporting 1600 × 1200 external resolution @ 75 Hz. Disabled when connected to devices through the expansion port 3. Hot plug, unplug, and auto detect for correct output to wide-aspect and standard-aspect video.
	1394a
	2-pin 65-W AC power
Docking	Docking support through the expansion port 3. Supports the HP xb3000 Notebook Expansion Base and the HP Notebook QuickDock.
Keyboard/pointing devices	12.1-inch keyboard with embedded numeric keypad
	Taps enabled as default
	TouchPad with 2 buttons and two-way scroll
	Wacom 9.0-mm touch-screen pen
Power requirements	8-cell, 73-Wh, 2.55-Ah Li-ion battery 6-cell, 55-Wh, 2.55-Ah Li-ion battery 4-cell, 37-Wh, 2.55-Ah Li-ion battery (for use only with computer models equipped with AMD Turion 64 processors)
	65-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector)
Security	Security cable slot
	Fingerprint reader with software support
Operating system	**Preinstalled:**
	Windows Vista® Business (32-bit)
	Windows Vista Premium (32- and 64-bit)
	Windows Vista Ultimate (64-bit)
Serviceability	**End-user replaceable parts:**
	AC adapter
	Battery (system)

Category	Description
	Hard drive
	Memory module
	Optical drive
	RTC battery
	WLAN module

2 External component identification

Top components

Display components



Item	Component	Function
(1)	Convertible hinge	Swivels the display and converts the computer from traditional notebook mode into slate mode or vice versa. In slate mode, the display is rotated and folded flat, so that you can view content while carrying the computer.
(2)	Drive light	Blinking: The hard drive or optical drive is being accessed.
(3)	Battery light	• On: A battery is charging. • Blinking: 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 is turned 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.

Item	Component	Function
(4)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.
(5)	Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on.
(6)	Wireless antennae (select models only)*	Send and receive wireless signals to communicate with WLANs. **NOTE:** The antennae are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennae free from obstructions.
(7)	Internal microphones (2)	Record sound.
(8)	Display release latch	Opens the computer.
(9)	Integrated camera (select models only)	Records video and captures still photographs.
(10)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows® instead of a password logon.
(11)	Mobility Center button	Opens Mobility Center.
(12)	MediaSmart button	Launches the MediaSmart program when the computer is on.
(13)	Rotate button	Rotates the screen image clockwise into 4 orientations: landscape primary, landscape secondary, portrait primary, and portrait secondary.
(14)	Consumer infrared lens	Receives a signal from the HP Remote Control.

*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.

Keys

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

Pointing devices

Item	Component	Function
(1)	TouchPad on/off button	Enables/disables the TouchPad.
(2)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button*	Functions like the left button on an external mouse.
(4)	TouchPad light	• Blue: TouchPad is enabled. • Amber: TouchPad is disabled.
(5)	TouchPad vertical scroll zone	Scrolls up or down.
(6)	Right TouchPad button*	Functions like the right button on an external mouse.

*This table describes factory settings. To view and change pointing device preferences, select **Start > Control Panel > Hardware and Sound > Mouse**.

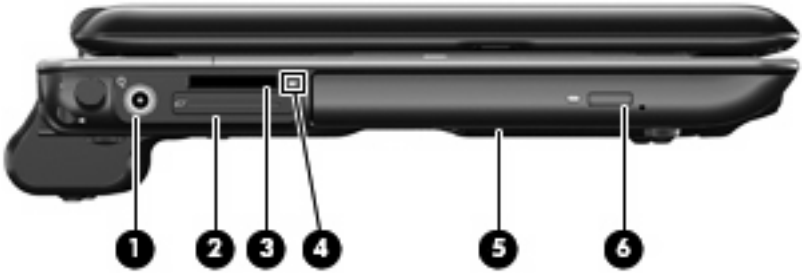
Front components

Item	Component	Function
(1)	Display release latch	Opens the computer.
(2)	Power switch*	• When the computer is off, slide the power switch to the right to turn on the computer. • When the computer is on, slide the power switch to the right to initiate Sleep. • When the computer is in the Sleep state, slide the power switch to the right briefly to exit Sleep. • When the computer is in Hibernation, slide the power switch to the right briefly to exit Hibernation. If the computer has stopped responding and Windows shutdown procedures are not effective, slide the power switch to the right and hold for at least 5 seconds to turn off the computer. To learn more about your power settings, select **Start > Control Panel > System and Maintenance > Power Options**. To learn more about Sleep or Hibernation, refer to the *Power Management* guide.
(3)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.
(4)	Consumer infrared lens	Receives a signal from the HP Remote Control.
(5)	Audio-out (headphone) S/PDIF jack	Provides enhanced audio performance, including surround sound and other high-end audio output.
(6)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(7)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(8)	Wireless switch	Turns the wireless feature on or off, but does not create a wireless connection. **NOTE:** A wireless network must be set up in order to establish a wireless connection.

Item	Component	Function
(9)	Wireless light	• Blue: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is turned on. • Amber: All wireless devices are turned off.

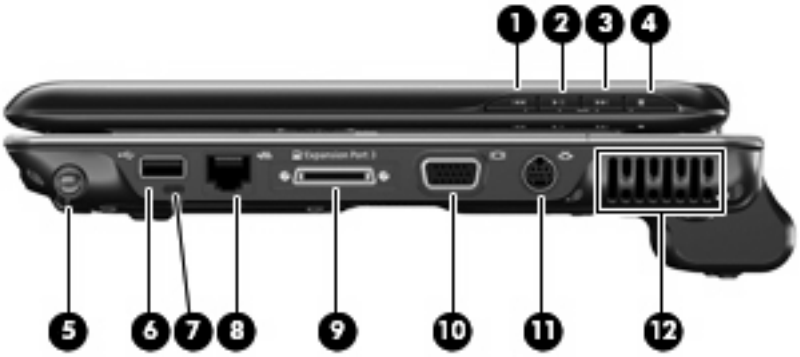
*This table describes factory settings. For information about changing factory settings, refer to the user guides located in Help and Support.

Left-side components



Item	Component	Function
(1)	Power connector	Connects an AC adapter.
(2)	ExpressCard slot	Supports optional ExpressCard/34 cards.
(3)	Digital Media Slot	Supports the following optional digital card formats: Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Memory Stick (MS), Memory Stick Pro (MSP), xD-Picture Card (XD), xD-Picture Card (XD) Type M.
(4)	Digital Media Slot light	On: A digital card is being accessed.
(5)	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
(6)	Optical light	Blinking: The optical drive is being accessed.

Right-side components

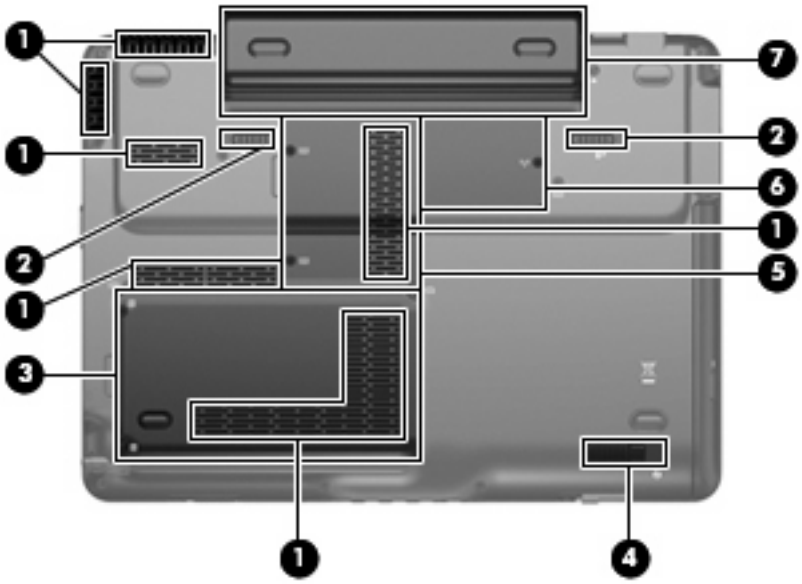


Item	Component	Function
(1)	Previous/rewind button	• Plays the previous track or chapter when the button is pressed once. • Rewinds media when the button is pressed simultaneously with the fn key.
(2)	Play/pause button	Plays or pauses media.
(3)	Next/fast forward button	• Plays the next track or chapter when the button is pressed once. • Fast forwards media when pressed simultaneously with the fn key.
(4)	Stop button	Stops playback.
(5)	Pen holder	Stores the pen.
(6)	USB port	Connects an optional USB device.
(7)	Pen tether hole	Connects the pen tether.
(8)	RJ-45 (network) jack	Connects a network cable.
(9)	Expansion port 3	Connects the computer to an optional docking device or an optional expansion product. **NOTE:** The computer has only one expansion port. The term *expansion port 3* describes the type of expansion port.
(10)	External monitor port	Connects an external VGA monitor or projector.
(11)	S-Video-out jack	Connects an optional S-Video device such as a television, VCR, camcorder, overhead projector, or video capture card.
(12)	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.

Rear components

Item	Component	Function
(1)	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.
(2)	RJ-11 (modem) jack	Connects a modem cable.
(3)	USB ports (2)	Connect optional USB devices.
(4)	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.

Bottom components



Item	Component	Function
(1)	Vents (6)	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.
(2)	Battery release latches (2)	Release the battery from the battery bay.
(3)	Hard drive bay	Holds the hard drive and the RTC battery.
(4)	Optical drive release latch	Releases the optical drive from the drive bay.
(5)	Memory module compartment	Contains the memory module slots.
(6)	WLAN module compartment	Holds a WLAN module (select models only). **NOTE:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(7)	Battery bay	Holds the battery.

3 Illustrated parts catalog

Service tag

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

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

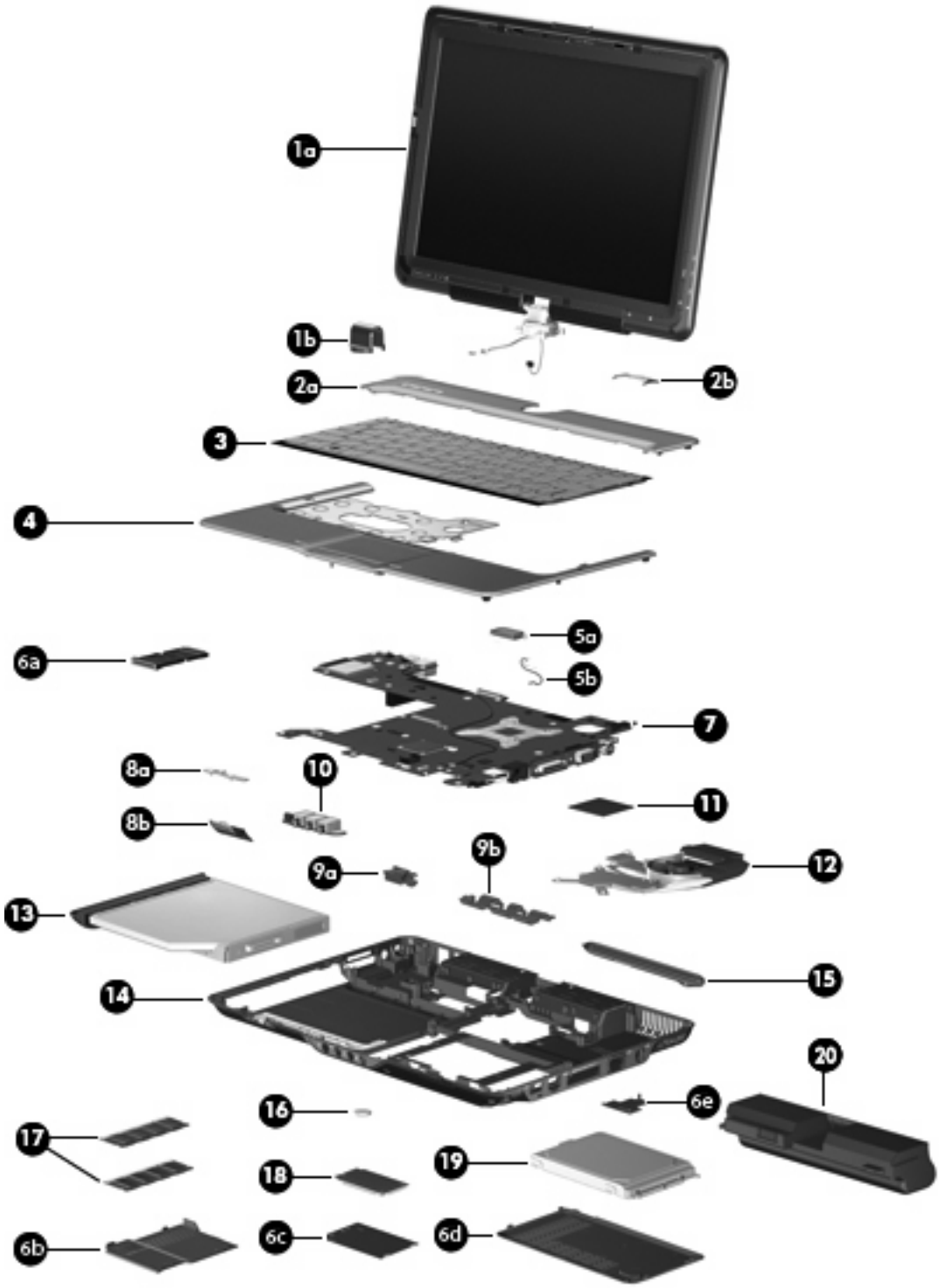
(2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.

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

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

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

Computer major components



Item	Description	Spare part number
(1a)	**Display assembly**	
	12.1-inch, WXGA, BrightView touch-screen display assembly with Web camera, fingerprint reader, microphones, and WLAN antenna cables	504468-001

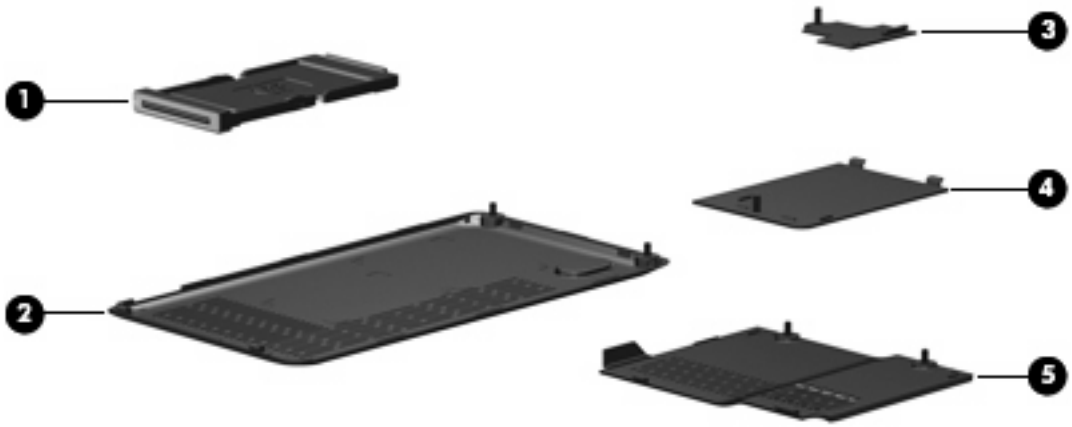
Item	Description	Spare part number
	12.1-inch, WXGA, BrightView touch-screen display assembly with Web camera, microphones, and WLAN antenna cables	504467-001
(1b)	**Display convertible hinge cover** (included with display assembly)	
	Display Rubber Kit (not illustrated, includes 8 display bezel rubber screw covers)	464824-001
(2a)	**Switch cover**	506827-001
(2b)	**Switch cover trim** (included with switch cover)	
(3)	**Keyboard** (includes keyboard cable)	
	Belgium	508112-A41
	Brazil	508112-201
	Canada	508112-121
	Denmark, Finland, and Norway	508112-DH1
	France	508112-051
	Germany	508112-041
	Israel	508112-BB1
	Italy	508112-061
	Japan	508112-291
	Latin America	508112-161
	The Netherlands	508112-B31
	Portugal	508112-131
	Russia	508112-251
	Saudi Arabia	508112-171
	South Korea	508112-AD1
	Spain	508112-071
	Switzerland	508112-111
	Taiwan	508112-AB1
	Thailand	508112-281
	Turkey	508112-141
	The United Kingdom	508112-031
	The United States	508112-001
(4)	**Top cover** (includes TouchPad and TouchPad cable, caps lock light board and cable, and top cover bumper pads)	506824-001
(5a)	**Bluetooth module**	483113-001
(5b)	**Bluetooth module cable**	487697-001
	Plastics Kit	487926-001
(6a)	ExpressCard slot bezel	

Item	Description	Spare part number
(6b)	Memory module compartment cover (includes 2 captive screws, secured with C-clips)	
(6c)	WLAN module compartment cover (includes 1 captive screw, secured with a C-clip)	
(6d)	Hard drive cover (includes one rubber foot and 2 captive screws, secured with C-clips)	
(6e)	Display connector cover (includes 1 captive screw, secured with a C-clip)	
(7)	**System board** (includes replacement thermal material)	504466-001
(8a)	**Power switch assembly** (includes power switch board cable and power switch board actuator)	506828-001
(8b)	**Power switch board actuator**	
(9a)	**Pen eject assembly** (includes pen holder)	506826-001
(9b)	**Pen holder**	
(10)	**Audio/infrared board** (includes audio/infrared board cable)	441144-001
(11)	**Processor** (includes replacement thermal material)	
	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-86 (2.40-GHz, 1-MB L2 cache, 800-MHz FSB)	507974-001
	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-84 (2.30-GHz, 1-MB L2 cache, 800-MHz FSB)	507975-001
	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-82 (2.20-GHz, 1-MB L2 cache, 800-MHz FSB)	507973-001
	AMD Turion 64 Mobile Technology Dual-Core RM-74 (2.20-GHz, 1-MB L2 cache, 800-MHz FSB)	507979-001
	AMD Turion 64 Mobile Technology Dual-Core RM-72 (2.10-GHz, 1-MB L2 cache, 800-MHz FSB)	507978-001
	AMD Athlon Dual-Core QL-64 (2.10-GHz, 512-KB L2 cache, 667-MHz FSB)	506053-001
	AMD Athlon Dual-Core QL-62 (2.00-GHz, 512-KB L2 cache, 667-MHz FSB)	506052-001
(12)	**Fan/heat sink assembly** (includes replacement thermal material)	487925-001
(13)	**Optical drive** (includes bezel)	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	509073-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	509074-001
(14)	**Base enclosure** (includes optical drive release assembly, 2 battery release latches, and 4 rubber feet)	506825-001
	Rubber Feet Kit (not illustrated, includes 4 base enclosure rubber feet and pen cover)	464821-001
(15)	**Pen**	464146-001
(16)	**RTC battery**	449729-001
(17)	**Memory modules** (DDR2, PC2-6400, 800-MHz)	
	4096-MB	506062-001
	248-MB	506061-001
	1024-MB	506060-001

Item	Description	Spare part number
(18)	**WLAN module**	
	Broadcom 4322 802.11a/b/g/n WLAN modules:	
	• For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	487330-001
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, 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, Puerto Rico, 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, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	487330-002
	Broadcom BCM4312 802.11b/g WLAN modules:	
	• For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	459263-001

Item	Description	Spare part number
	• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, 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, Puerto Rico, 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, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	459263-002
(19)	**Hard drive** (includes hard drive bracket, hard drive connector, and Mylar cover)	
	500-GB, 5400-rpm	506058-001
	400-GB, 5400-rpm	506057-001
	320-GB, 5400-rpm	506056-001
	250-GB, 7200-rpm	519190-001
	250-GB, 5400-rpm	506055-001
	160-GB, 5400-rpm	506054-001
	Hard Drive Hardware Kit (not illustrated; includes hard drive bracket, hard drive connector, and hard drive screws)	497744-001
(20)	**Battery**	
	8-cell, 73-Wh, 2.55-Ah, Li-ion	463650-003
	6-cell, 55-Wh, 2.55-Ah, Li-ion	441132-003
	4-cell, 37-Wh, 2.55-Ah, Li-ion (for use only with computer models equipped with the AMD Turion 64 processor)	441131-003

Plastics Kit



Item	Description	Spare part number
	Plastics Kit	487926-001
(1)	ExpressCard slot bezel	
(2)	Hard drive cover (includes 1 rubber foot and 2 captive screws, secured with C-clips)	
(3)	Display connector cover (includes 1 captive screw, secured with a C-clip)	
(4)	WLAN module compartment cover (includes 1 captive screw, secured with a C-clip)	
(5)	Memory module compartment cover (includes 2 captive screws, secured with C-clips)	

Mass storage devices

Item	Description	Spare part number
(1)	**Hard drive** (includes hard drive bracket, hard drive connector, and Mylar cover)	
	500-GB, 5400-rpm	506058-001
	400-GB, 5400-rpm	506057-001
	320-GB, 5400-rpm	506056-001
	250-GB, 7200-rpm	519190-001
	250-GB, 5400-rpm	506055-001
	160-GB, 5400-rpm	506054-001
	Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector, and hard drive screws)	497744-001
(2)	**Optical drive** (includes bezel and bracket)	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	509073-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	509074-001

Miscellaneous parts

Description	Spare part number
65-watt AC adapter	417220-001
HP protective sleeve	504580-001
HP Notebook Stand	466337-001
Remote control (fits into ExpressCard slot)	465539-002
Power cords:	
Argentina	490371-D01
Australia	490371-011
Brazil	490371-201
Denmark	490371-081
Europe, the Middle East, and Africa (excluding South Africa)	490371-021
India	490371-D61
Israel	490371-BB1
Italy	490371-061
Japan	490371-291
North America	490371-001
The People's Republic of China	490371-AA1
South Africa	490371-AR1
South Korea	490371-AD1
Switzerland	490371-111
Taiwan	490371-AB1
The United Kingdom and Singapore	490371-031
Screw Kit • Phillips PM3.0×3.0 screws • Phillips PM2.5×6.0 screws • Phillips PM2.0×11.0 screws • Black Phillips PM2.0×7.0 captive screws • Silver Phillips PM2.0×7.0 screws • Phillips PM2.0×5.0 captive screws • Phillips PM2.0×5.0 screws • Phillips PM2.0×4.0 captive screws • Phillips PM2.0×4.0 screws • Phillips PM2.0×3.0 screws	464116-001

Description	Spare part number
Wired headset with volume control	371693-003
Wireless laser mouse	430958-002

Sequential part number listing

Spare part number	Description
371693-003	Wired headset with volume control
417220-001	65-watt AC adapter
430958-002	Wireless laser mouse
441131-003	4-cell, 37-Wh, 2.55-Ah, Li-ion battery (for use only with computer models equipped with the AMD Turion 64 processor)
441132-003	6-cell, 55-Wh, 2.55-Ah, Li-ion battery
441144-001	Audio/infrared board (includes audio/infrared board cable)
449729-001	RTC battery
459263-001	Broadcom BCM4312 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
459263-002	Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, 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, Puerto Rico, 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, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
463650-003	8-cell, 73-Wh, 2.55-Ah, Li-ion battery
464116-001	Screw Kit
464146-001	Pen
464821-001	Rubber Feet Kit (includes 4 base enclosure rubber feet and pen cover)
464824-001	Display Rubber Kit (includes 8 display bezel rubber screw covers)
465539-002	Remote control (fits into ExpressCard slot)
466337-001	HP Notebook Stand

Spare part number	Description
483113-001	Bluetooth module
487330-001	Broadcom 4322 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
487330-002	Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, 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, Puerto Rico, 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, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
487697-001	Bluetooth module cable
487925-001	Fan/heat sink assembly (includes replacement thermal material)
487926-001	Plastics Kit (see Plastics Kit on page 20 for Plastics Kit spare part information)
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, the Middle East, and Africa (excluding South Africa)
490371-031	Power cord for use in the United Kingdom and Singapore
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

Spare part number	Description
497744-001	Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector, and hard drive screws)
504466-001	System board (includes replacement thermal material)
504467-001	12.1-inch, WXGA, BrightView touch-screen display assembly with Web camera, microphones, and WLAN antenna cables
504468-001	12.1-inch, WXGA, BrightView touch-screen display assembly with Web camera, microphones, fingerprint reader, and WLAN antenna cables
504580-001	HP protective sleeve
506052-001	AMD Athlon Dual-Core QL-62 2.00-GHz processor (512-KB L2 cache, 667-MHz FSB, includes replacement thermal material)
506053-001	AMD Athlon Dual-Core QL-64 2.10-GHz processor (512-KB L2 cache, 667-MHz FSB, includes replacement thermal material)
506054-001	160-GB, 5400-rpm hard drive (includes hard drive bracket, hard drive connector, and Mylar cover)
506055-001	250-GB, 5400-rpm hard drive (includes hard drive bracket, hard drive connector, and Mylar cover)
506056-001	320-GB, 5400-rpm hard drive (includes hard drive bracket, hard drive connector, and Mylar cover)
506057-001	400-GB, 5400-rpm hard drive (includes hard drive bracket, hard drive connector, and Mylar cover)
506058-001	500-GB, 5400-rpm hard drive (includes hard drive bracket, hard drive connector, and Mylar cover)
506060-001	1024-MB memory module (DDR2, PC2-6400, 800-MHz)
506061-001	2048-MB memory module (DDR2, PC2-6400, 800-MHz)
506062-001	4096-MB memory module (DDR2, PC2-6400, 800-MHz)
506824-001	Top cover (includes TouchPad and TouchPad cable, caps lock light board and cable, and top cover bumper pads)
506825-001	Base enclosure (includes optical drive release assembly, 2 battery release latches, and 4 rubber feet)
506826-001	Pen holder and pen eject assembly
506827-001	Switch cover (includes switch cover trim)
506828-001	Power switch assembly (includes power switch board cable and power switch board actuator)
507973-001	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-82 2.2-GHz processor (1-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
507974-001	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-86 2.4-GHz processor (1-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
507975-001	AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-84 2.3-GHz processor (1-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
507978-001	AMD Turion 64 Mobile Technology Dual-Core RM-72 2.1-GHz processor (1-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
507979-001	AMD Turion 64 Mobile Technology Dual-Core RM-74 2.2-GHz processor (1-MB L2 cache, 800-MHz FSB, includes replacement thermal material)
508112-001	Keyboard for use in the United States
508112-031	Keyboard for use in the United Kingdom
508112-041	Keyboard for use in Germany

Spare part number	Description
508112-051	Keyboard for use in France
508112-061	Keyboard for use in Italy
508112-071	Keyboard for use in Spain
508112-111	Keyboard for use in Switzerland
508112-121	Keyboard for use in Canada
508112-131	Keyboard for use in Portugal
508112-141	Keyboard for use in Turkey
508112-161	Keyboard for use in Latin America
508112-171	Keyboard for use in Saudi Arabia
508112-201	Keyboard for use in Brazil
508112-251	Keyboard for use in Russia
508112-281	Keyboard for use in Thailand
508112-291	Keyboard for use in Japan
508112-A41	Keyboard for use in Belgium
508112-AB1	Keyboard for use in Taiwan
508112-AD1	Keyboard for use in South Korea
508112-B31	Keyboard for use in the Netherlands
508112-BB1	Keyboard for use in Israel
508112-DH1	Keyboard for use in Denmark, Finland, and Norway
509073-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
509074-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive
519190-001	250-GB, 7200-rpm hard drive (includes hard drive bracket, hard drive connector, and Mylar cover)

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

Unknown user password

If the computer you are servicing has an unknown user password, follow these steps to clear the password.

NOTE: These steps also clear CMOS.

Before disassembling the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the real-time clock (RTC) battery (see RTC battery on page 39).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 47 screws, in 8 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

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

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

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

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

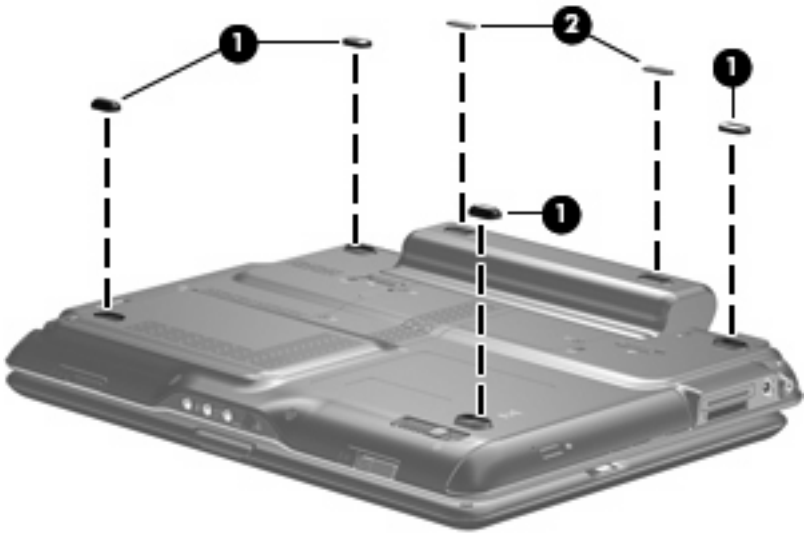
(4) Model description: This is the number used to locate documents, drivers, and support for the computer.

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

Computer feet

Description	Spare part number
Rubber Feet Kit (includes 4 base enclosure rubber feet and pen cover)	464821-001

The computer feet are adhesive-backed rubber pads. There are four computer feet **(1)** that adhere to the computer base enclosure, and two computer feet **(2)** that adhere to the high-capacity battery.



Battery

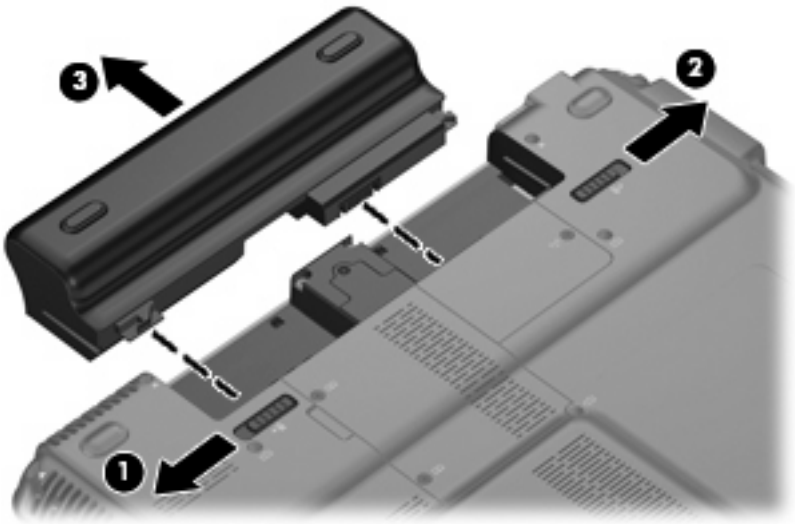
Description	Spare part number
8-cell, 73-Wh, 2.55-Ah, Li-ion battery	463650-003
6-cell, 55-Wh, 2.55-Ah, Li-ion battery	441132-003
4-cell, 37-Wh, 2.55-Ah, Li-ion battery (for use only with computer models equipped with the AMD Turion 64 processor)	441131-003

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside down, with the rear panel toward you.
2. Slide the battery lock latch **(1)** to your right, and then release it. (The battery disengages from the computer.)
3. Slide the battery release latch **(2)** to your left, and then release it.
4. Remove the battery **(3)** by sliding it straight back.



To install a battery, slide the battery into the battery bay until you hear a click.

Pen

Description	Spare part number
Pen	464146-001

Before removing the pen, 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 cord.
4. Remove the battery (see Battery on page 35).

Remove the pen:

1. Position the computer with the left side toward you.
2. Press in on the pen **(1)** to release it from the pen holder.
3. Remove the pen **(2)** from the pen holder.

Reverse this procedure to install the pen.

Hard drive

NOTE: The hard drive spare part kit includes a hard drive bracket, hard drive connector, and Mylar cover.

Description	Spare part number
500-GB, 5400-rpm	506058-001
400-GB, 5400-rpm	506057-001
320-GB, 5400-rpm	506056-001
250-GB, 7200-rpm	519190-001
250-GB, 5400-rpm	506055-001
160-GB, 5400-rpm	506054-001
Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector, and hard drive screws)	497744-001

Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).

Remove the hard drive:

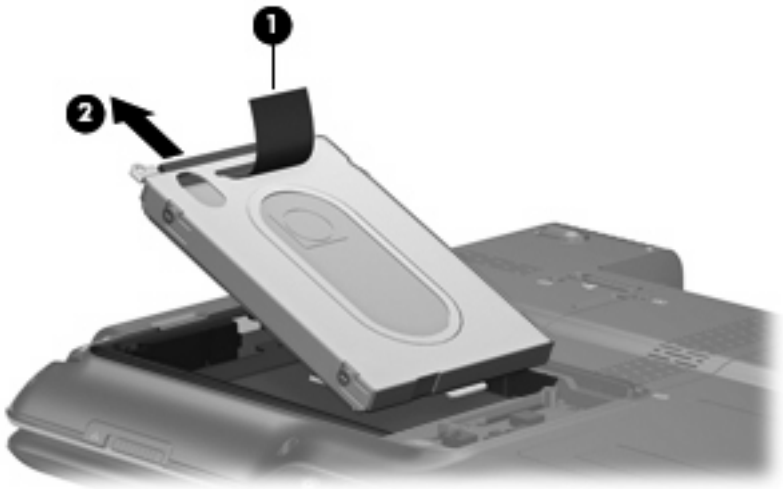
1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.0×5.0 captive screws **(1)** that secure the hard drive cover to the computer.
3. Lift the left side of the hard drive cover **(2)** and swing it to right.

4. Remove the hard drive cover.

NOTE: The hard drive cover is included in the Plastics Kit, spare part number 487926-001.

5. Grasp the Mylar tab **(1)** on the hard drive and lift the hard drive to disconnect it from the system board.

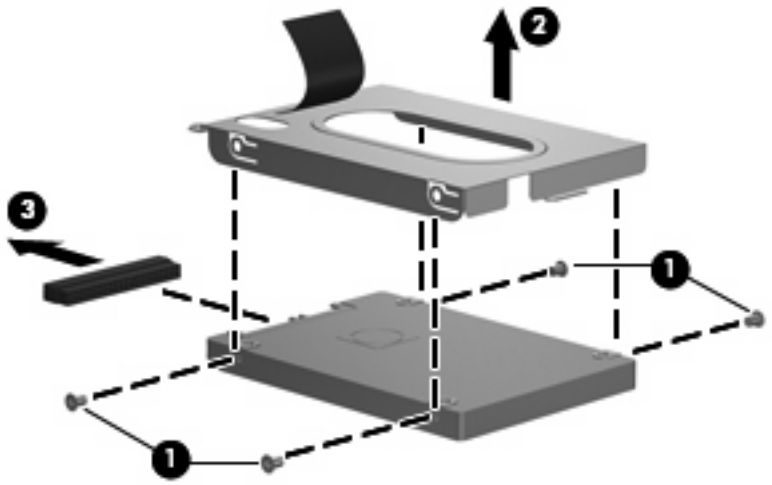
6. Remove the hard drive **(2)** from the hard drive bay.



7. If it is necessary to remove the hard drive bracket and connector, remove the two Phillips PM3.0×3.0 hard drive bracket screws **(1)** from each side of the hard drive.

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

9. Remove the connector **(3)** from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

RTC battery

NOTE: Removing the RTC battery and leaving it uninstalled for 5 or more minutes causes all passwords and CMOS settings to be cleared.

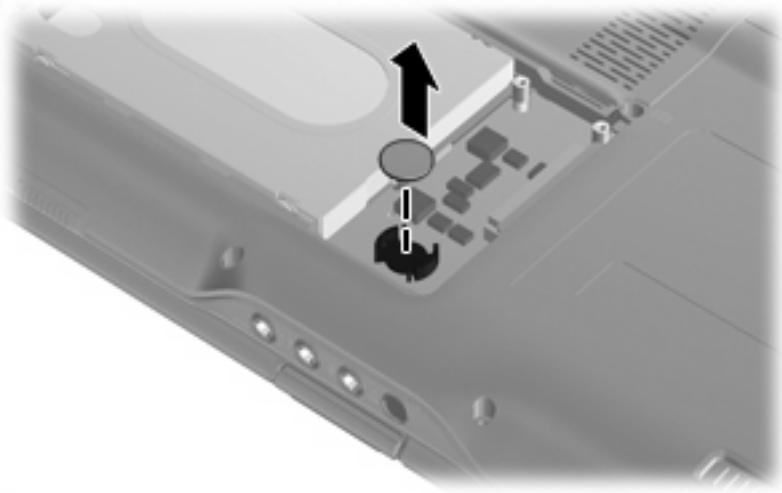
Description	Spare part number
RTC battery	449729-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the hard drive cover (see Hard drive on page 37).

Remove the RTC battery:

- Use a non-conductive, flat-bladed tool to pry the RTC battery out of the socket.



Reverse this procedure to install the RTC battery. Be sure the RTC battery is installed with the “+” sign facing up.

Optical drive

NOTE: The optical drive spare part kit includes an optical drive bezel.

Description	Spare part number
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	509073-001
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	509074-001

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).

Remove the optical drive:

1. Position the computer with the right side toward you.
2. Slide the optical drive release latch **(1)** toward you. (The optical drive is partially ejected from the optical drive bay.)
3. Remove the optical drive **(2)** from the computer.

To install an optical drive, slide the optical drive into the optical drive bay until you hear a click.

Memory module

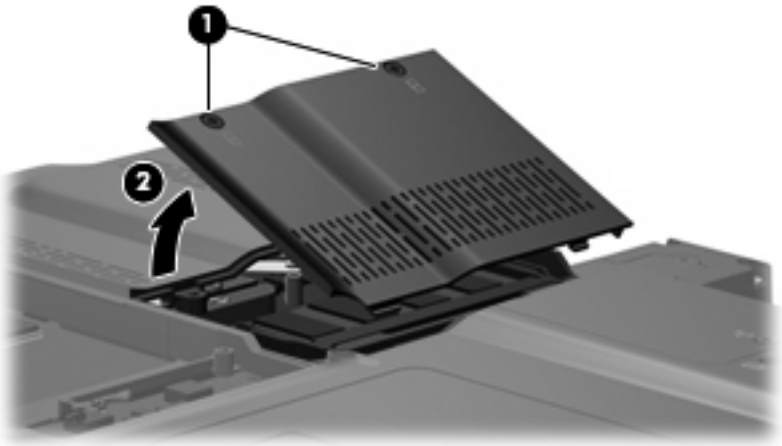
Description	Spare part number
4096-MB (DDR2, PC2-6400, 800-MHz)	506062-001
2048-MB (DDR2, PC2-6400, 800-MHz)	506061-001
1024-MB (DDR2, PC2-6400, 800-MHz)	506060-001

Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).

Remove the memory module:

1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.0×5.0 captive screws **(1)** that secure the memory module compartment cover to the computer.
3. Lift the left side of the cover **(2)** and swing it to the right.



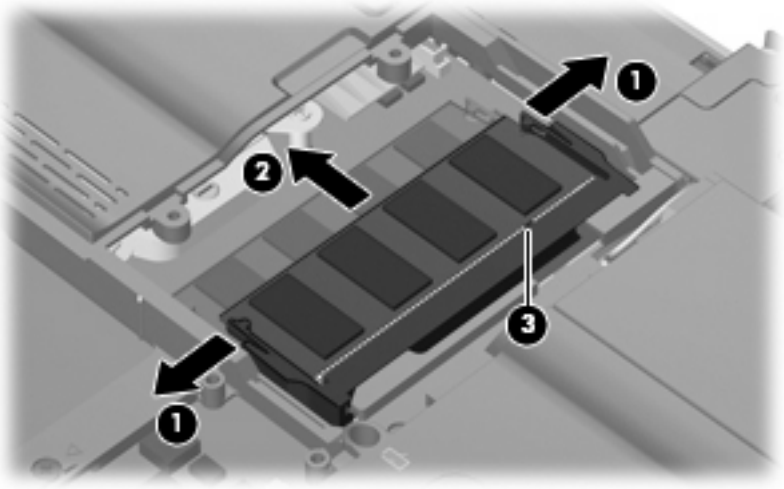
4. Remove the memory module compartment cover.

NOTE: The memory module compartment cover is included in the Plastics Kit, spare part number 487926-001.

5. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

6. Pull the module **(2)** away from the slot at an angle and remove it.

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.

WLAN module

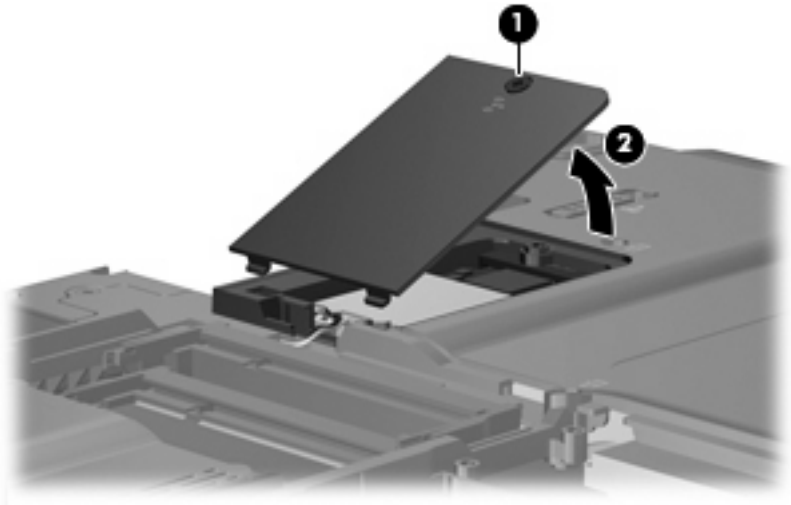
Description	Spare part number
Broadcom 4322 802.11a/b/g/n WLAN modules:	
For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	487330-001
For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, 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, Puerto Rico, 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, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	487330-002
Broadcom BCM4312 802.11b/g WLAN modules:	
• For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States	459263-001
• For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, 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, Puerto Rico, 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, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	459263-002

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).

Remove the WLAN module:

1. Position the computer with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw **(1)** that secures the WLAN module compartment cover to the computer.
3. Lift the right side of the WLAN module compartment cover **(2)** and swing it to the left.



4. Remove the WLAN module compartment cover.

NOTE: The WLAN module compartment cover is included in the Plastics Kit, spare part number 487926-001.

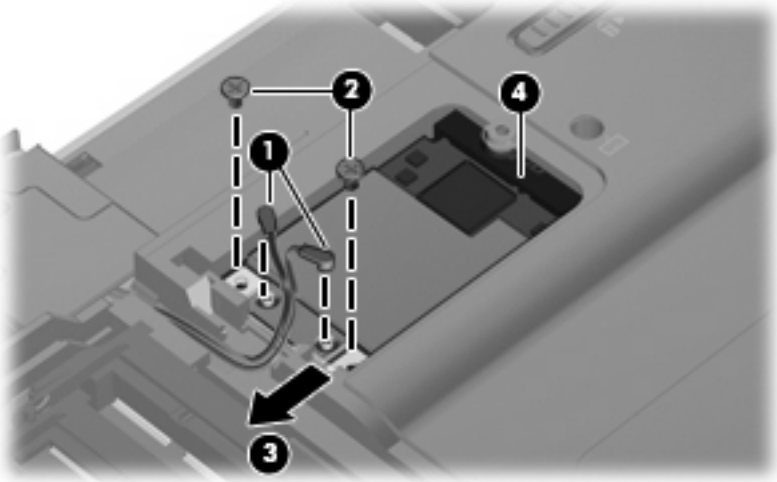
5. Disconnect the WLAN antenna cables **(1)** from the WLAN module.

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

6. Remove the two Phillips PM2.0×3.0 screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

7. Pull the WLAN module **(3)** away from the slot at an angle and remove it.

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



Reverse this procedure to install a WLAN module.

Keyboard

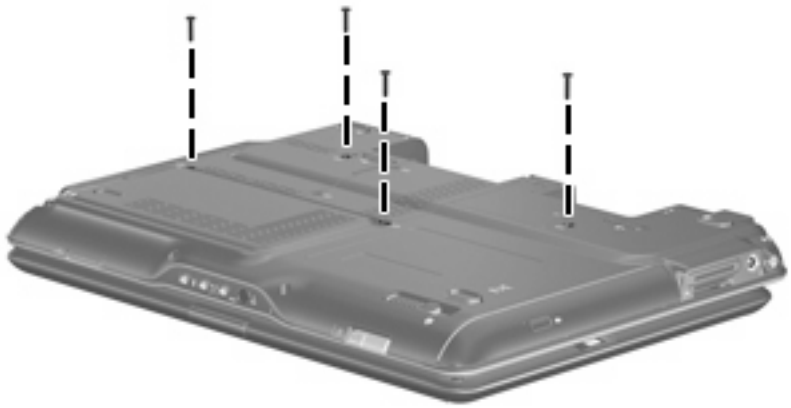
Description			
Country or region	**Spare part number**	**Country or region**	**Spare part number**
Belgium	508112-A41	Portugal	508112-131
Brazil	508112-201	Russia	508112-251
Canada	508112-121	Saudi Arabia	508112-171
Denmark, Finland, and Norway	508112-DH1	South Korea	508112-AD1
France	508112-051	Spain	508112-071
Germany	508112-041	Switzerland	508112-111
Israel	508112-BB1	Taiwan	508112-AB1
Italy	508112-061	Thailand	508112-281
Japan	508112-291	Turkey	508112-141
Latin America	508112-161	The United Kingdom	508112-031
The Netherlands	508112-B31	The United States	508112-001

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).

Remove the keyboard:

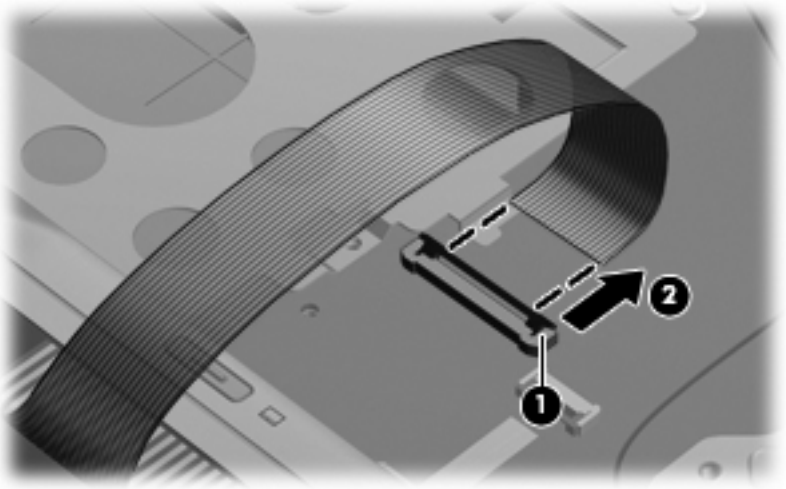
1. Position the computer with the front toward you.
2. Remove the four Phillips PM2.0×11.0 screws that secure the keyboard to the computer.



3. Turn the computer display-side up, with the front toward you.

4. Open the computer.
5. Lift the rear edge of the keyboard and swing it toward you until it rests on the palm rest.

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



7. Remove the keyboard.

Reverse this procedure to install the keyboard.

Switch cover

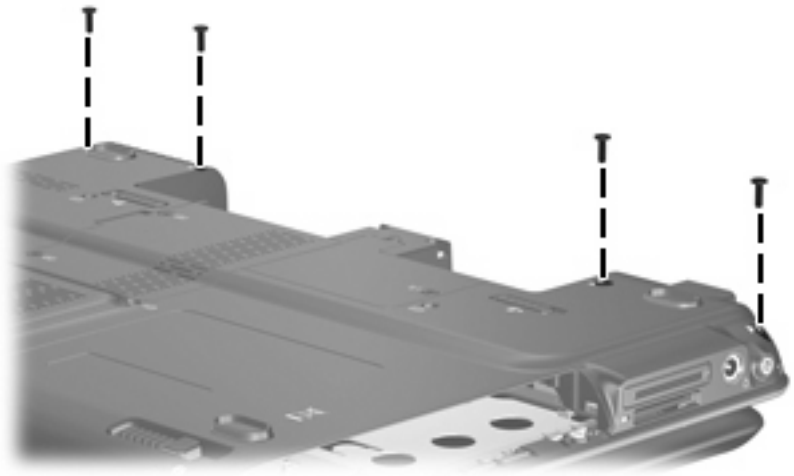
Description	Spare part number
Switch cover (includes display convertible hinge base cover)	506827-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the keyboard (see Keyboard on page 46).

Remove the switch cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the four Phillips PM2.0×7.0 screws that secure the switch cover to the computer.



3. Turn the computer display-side up, with the front toward you.
4. Open the computer.

5. Rotate the display clockwise approximately 45 degrees.

6. Lift the left and right front corners of the switch cover **(1)** until it disengages from the computer.
7. Rotate the switch cover **(2)** counterclockwise and remove it from the computer.

Reverse this procedure to install the switch cover.

Display assembly

Description	Spare part number
12.1-inch, WXGA, BrightView touch-screen display assembly with Web camera, fingerprint reader, microphones, and WLAN antenna cables	504468-001
12.1-inch, WXGA, BrightView touch-screen display assembly with Web camera, microphones, and WLAN antenna cables	504467-001

Before removing the display assembly, follow these steps:

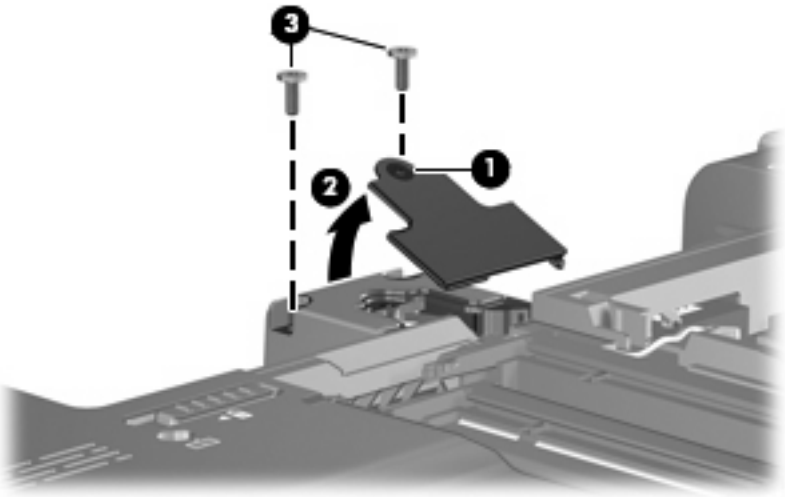
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the memory module compartment cover (see Memory module on page 41).
6. Remove the WLAN module compartment cover and disconnect the wireless antenna cables from the WLAN module (see WLAN module on page 43).
7. Remove the keyboard (see Keyboard on page 46).
8. Remove the switch cover (see Switch cover on page 48).

Remove the display assembly:

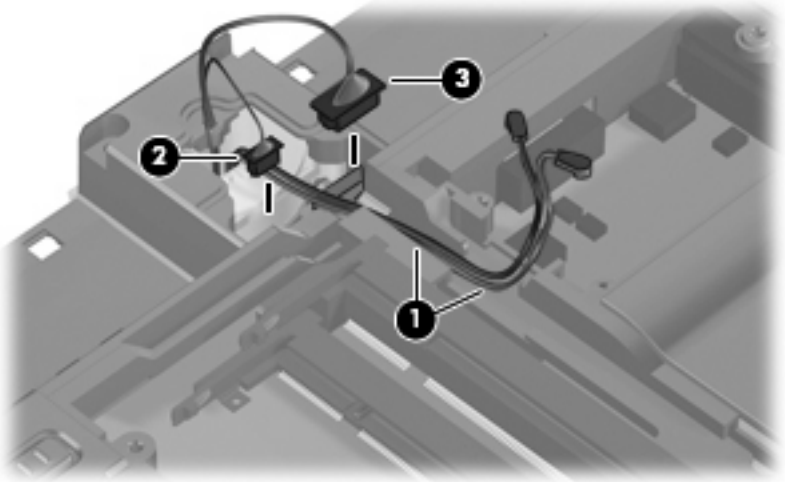
1. Close the computer and turn it upside down, with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw **(1)** that secures the display connector cover to the computer.
3. Lift the rear edge of the display connector cover **(2)** and swing it toward you.
4. Remove the display connector cover.

NOTE: The display connector cover is included in the Plastics Kit, spare part number 487926-001.

5. Remove the two Phillips PM2.5×6.0 screws **(3)** that secure the display assembly to the computer.



6. Remove the wireless antenna cables **(1)** from the routing channel built into the base enclosure.
7. Disconnect the camera cable **(2)** and the microphone cable **(3)** from the system board.

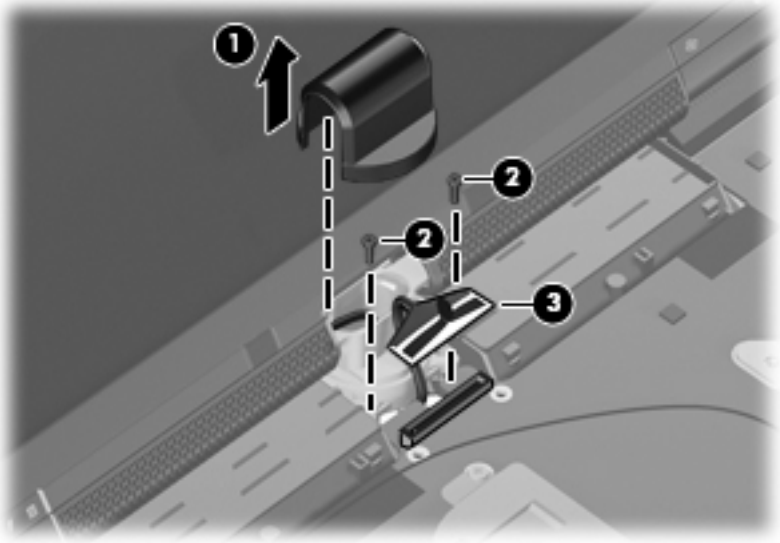


8. Turn the computer display-side up, with the front toward you.
9. Open the computer.
10. Remove the display convertible hinge cover **(1)**.

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

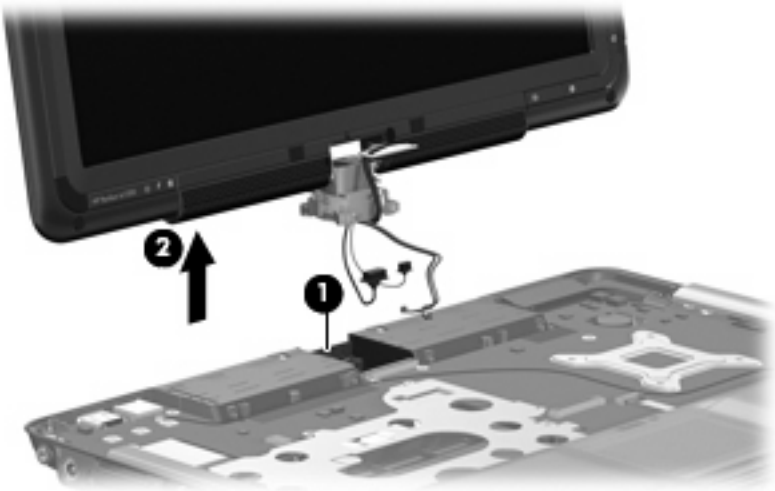
11. Remove the two Phillips PM2.5×6.0 screws **(2)** that secure the display assembly to the computer.

12. Disconnect the display panel cable **(3)** from the system board.



NOTE: As you remove the display assembly, be sure that the display cables and wireless antenna cables move cleanly through the opening **(1)** in the computer.

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



Reverse this procedure to install the display assembly.

Top cover

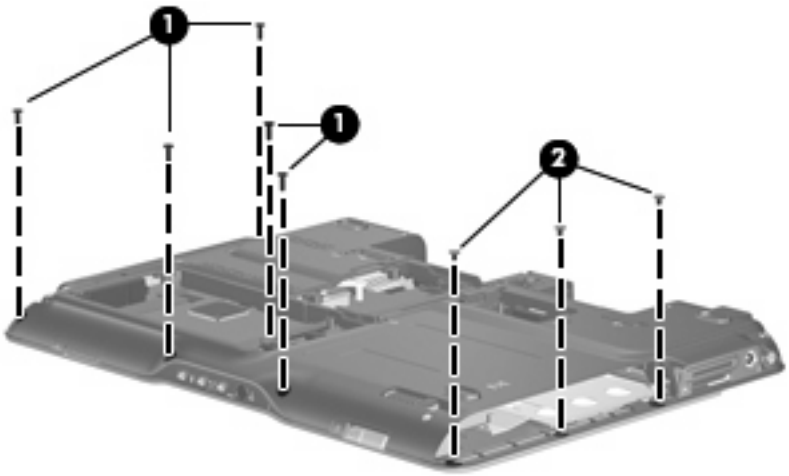
Description	Spare part number
Top cover (includes TouchPad and TouchPad cable, caps lock light board and cable, and top cover bumper pads)	506824-001

Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Optical drive (see Optical drive on page 40)
   c. Keyboard (see Keyboard on page 46)
   d. Switch cover (see Switch cover on page 48)
   e. Display assembly (see Display assembly on page 50)

Remove the top cover:

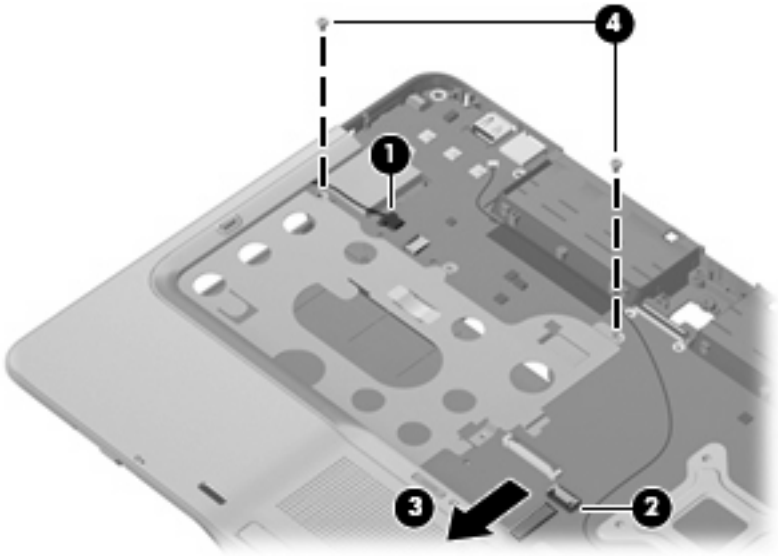
1. Turn the computer upside down, with the front toward you.
2. Remove the five Phillips PM2.0×7.0 screws **(1)** and the three Phillips PM2.0×4.0 screws **(2)** that secure the top cover to the computer.



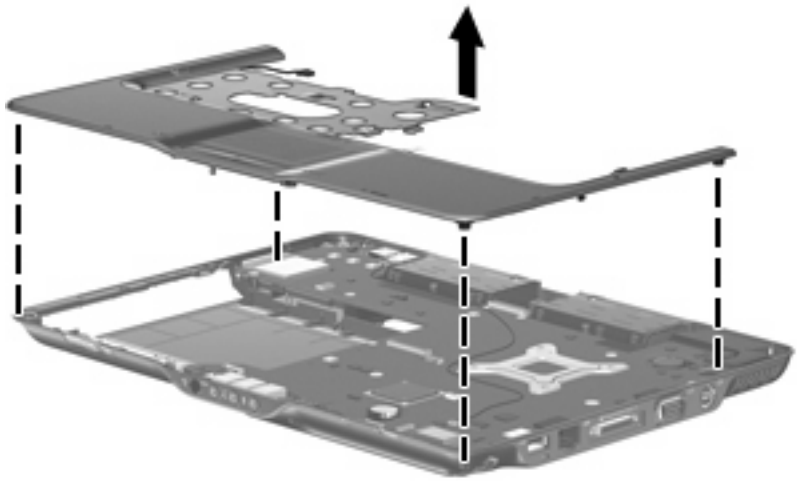
3. Turn the computer right-side up, with the front toward you.
4. Disconnect the display lid switch board cable **(1)** from the system board.

5. Release the ZIF connector **(2)** to which the TouchPad cable is connected and disconnect the TouchPad cable **(3)**.

6. Remove the two Phillips PM2.0×4.0 screws **(4)** that secure the top cover to the base enclosure.



7. Lift the top cover straight up and remove it.



Reverse this procedure to install the top cover.

Power switch assembly

Description	Spare part number
Power switch assembly (includes power switch board cable and actuator switch)	506828-001

Before removing the power switch assembly, follow these steps:

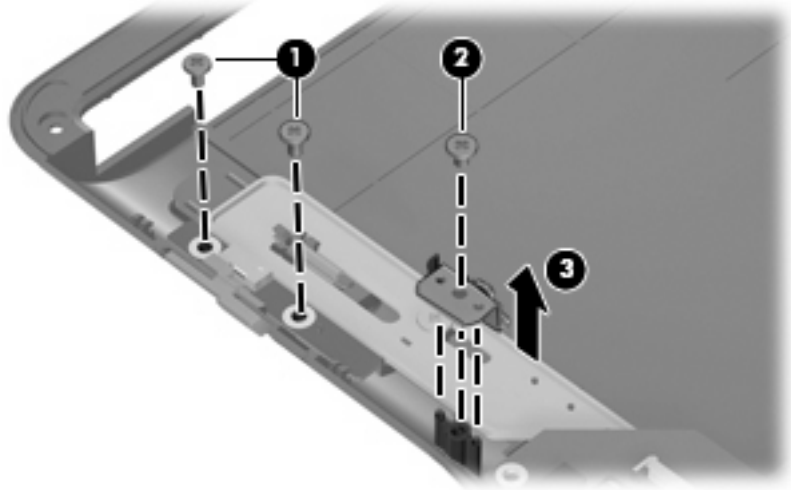
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Optical drive (see Optical drive on page 40)
   c. Keyboard (see Keyboard on page 46)
   d. Switch cover (see Switch cover on page 48)
   e. Display assembly (see Display assembly on page 50)
   f. Top cover (see Top cover on page 53)

Remove the power switch assembly:

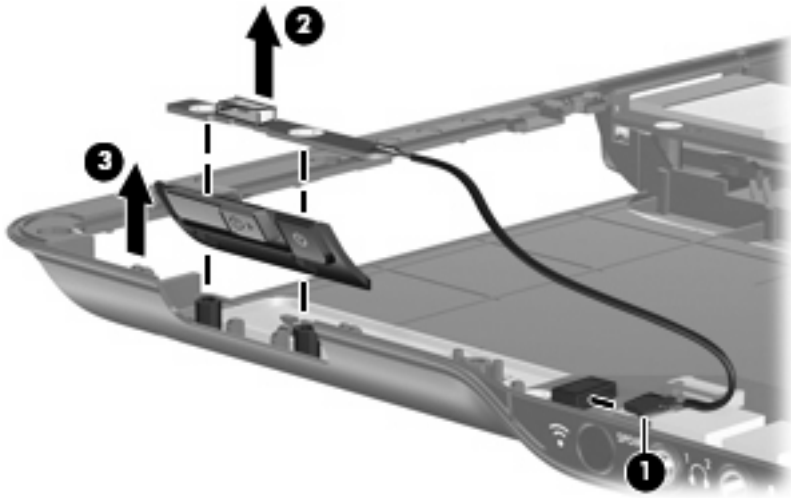
1. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the power switch board to the base enclosure.
2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the display release hook assembly to the base enclosure.

3. Remove the display release hook assembly **(3)**.

NOTE: The display release hook assemblies are included with the base enclosure spare part kit.



4. Disconnect the power switch board cable **(1)** from the system board.
5. Remove the power switch board **(2)** and power switch actuator **(3)** from the base enclosure.



Reverse this procedure to install the power switch assembly.

Bluetooth module

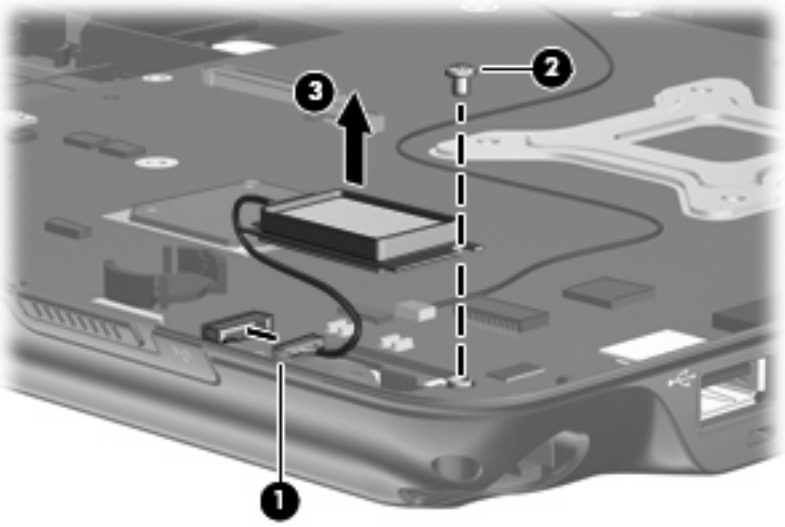
Description	Spare part number
Bluetooth module	483113-001
Bluetooth module cable	487697-001

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 cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Optical drive (see Optical drive on page 40)
   c. Keyboard (see Keyboard on page 46)
   d. Switch cover (see Switch cover on page 48)
   e. Display assembly (see Display assembly on page 50)
   f. Top cover (see Top cover on page 53)

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the Bluetooth module to the system board.
3. Remove the Bluetooth module **(3)**.



Reverse this procedure to install the Bluetooth module.

System board

Description	Spare part number
System board (includes replacement thermal material)	504466-001

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

- Memory module (see Memory module on page 41)
- WLAN module (see WLAN module on page 43)
- RTC battery (see RTC battery on page 39)
- Bluetooth module (see Bluetooth module on page 57)
- Fan/heat sink assembly (see Fan/heat sink assembly on page 64)
- Processor (see Processor on page 66)

Before removing the system board, follow these steps:

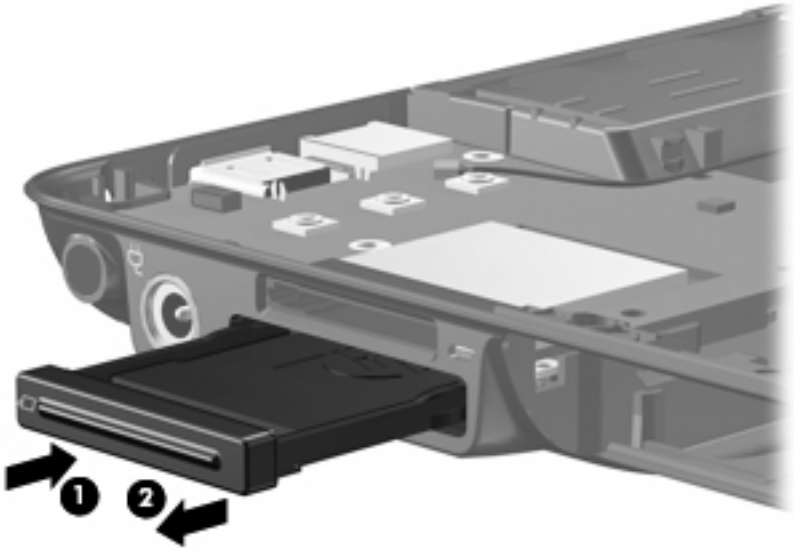
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Memory module compartment cover (see Memory module on page 41)
   c. Optical drive (see Optical drive on page 40)
   d. Keyboard (see Keyboard on page 46)
   e. Switch cover (see Switch cover on page 48)
   f. Display assembly (see Display assembly on page 50)
   g. Top cover (see Top cover on page 53)
   h. Power switch assembly (see Power switch assembly on page 55)

Remove the system board:

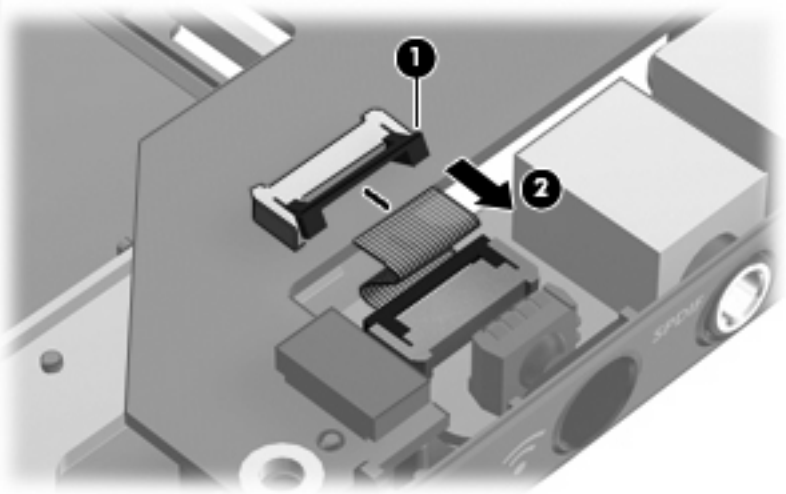
1. Press in on the ExpressCard slot bezel **(1)** to release the bezel from the ExpressCard slot.

2. Remove the ExpressCard slot bezel **(2)** from the ExpressCard slot.

NOTE: The ExpressCard slot bezel is included in the Plastics Kit, spare part number 487926-001.

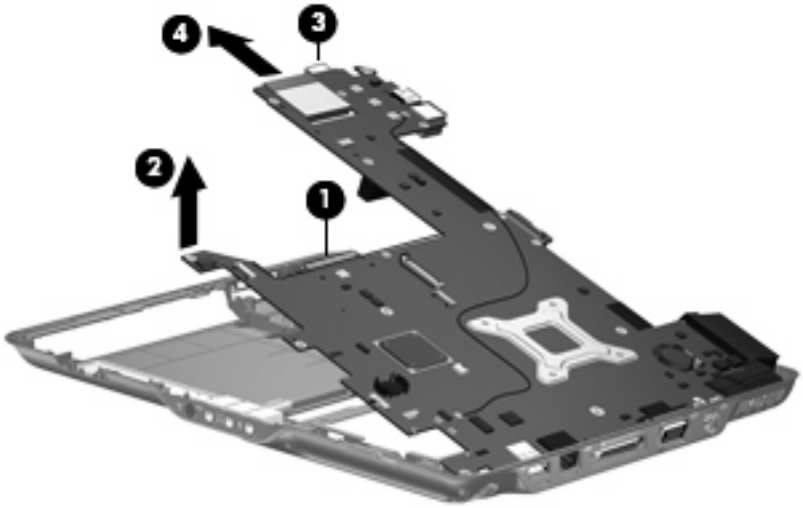


3. Release the ZIF connector **(1)** to which the audio/infrared board cable is connected and disconnect the audio/infrared board cable **(2)** from the system board.



4. Use the optical drive connector **(1)** to lift the left side of the system board **(2)** until the power connector **(3)** is clear of the base enclosure.

5. Pull the system board **(4)** away from the top cover at an angle and remove it.



Reverse this procedure to install the system board.

Pen holder and pen eject assembly

Description	Spare part number
Pen holder and pen eject assembly	506826-001

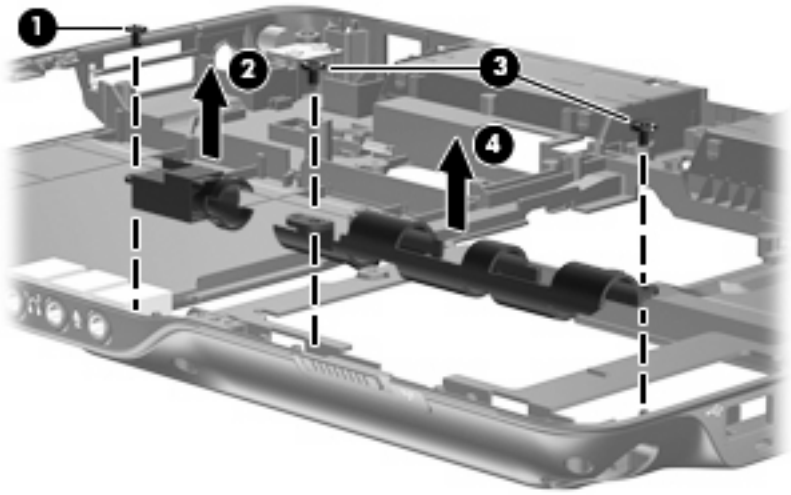
Before removing the pen holder and pen eject assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Pen (see Pen on page 36)
   b. Hard drive (see Hard drive on page 37)
   c. Memory module compartment cover (see Memory module on page 41)
   d. Optical drive (see Optical drive on page 40)
   e. Keyboard (see Keyboard on page 46)
   f. Switch cover (see Switch cover on page 48)
   g. Display assembly (see Display assembly on page 50)
   h. Top cover (see Top cover on page 53)
   i. Power switch assembly (see Power switch assembly on page 55)
   j. System board (see System board on page 58)

Remove the pen holder and pen eject assembly:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the pen eject assembly to the base enclosure.
2. Remove the pen eject assembly **(2)**.
3. Remove the two Phillips PM2.0×3.0 screws **(3)** that secure the pen holder to the base enclosure.

4. Remove the pen holder **(4)**.



Reverse this procedure to install the pen holder and pen eject assembly.

Audio/infrared board

Description	Spare part number
Audio/infrared board (includes audio/infrared board cable)	441144-001

Before removing the audio/infrared board, follow these steps:

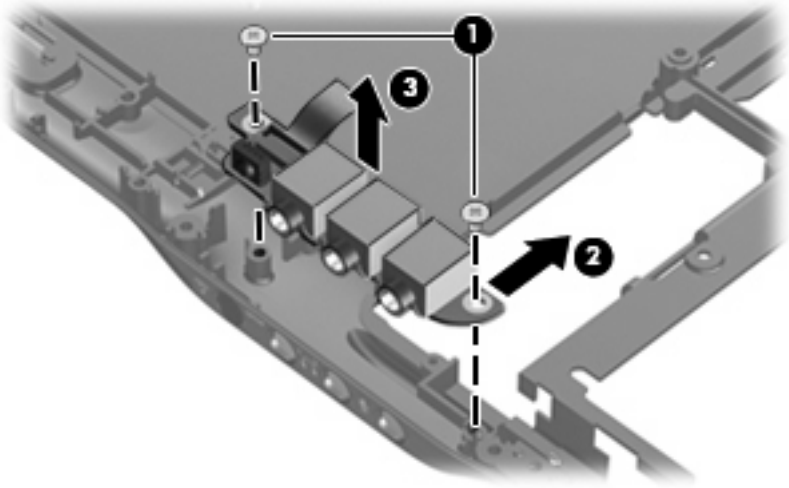
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Memory module compartment cover (see Memory module on page 41)
   c. Optical drive (see Optical drive on page 40)
   d. Keyboard (see Keyboard on page 46)
   e. Switch cover (see Switch cover on page 48)
   f. Display assembly (see Display assembly on page 50)
   g. Top cover (see Top cover on page 53)
   h. Power switch assembly (see Power switch assembly on page 55)

i. System board (see System board on page 58)

j. Pen holder (see Pen holder and pen eject assembly on page 61)

Remove the audio/infrared board:

1. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the audio/infrared board to the system board.
2. Release the audio/infrared board **(2)** by sliding it away from you until the connectors on the front of the board disengage from the openings in the base enclosure.
3. Remove the audio/infrared board **(3)**.



Reverse this procedure to install the audio/infrared board.

Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes thermal material)	487925-001

NOTE: To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the right side and rear panel of the computer.

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

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

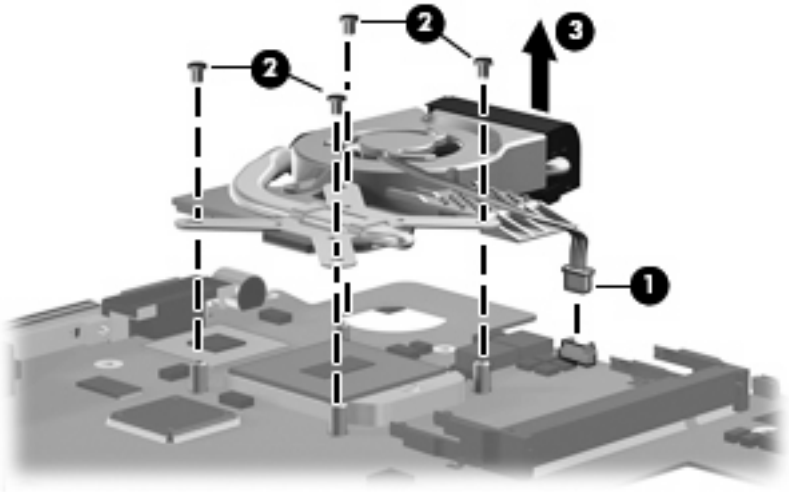
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Memory module compartment cover (see Memory module on page 41)
   c. Optical drive (see Optical drive on page 40)
   d. Keyboard (see Keyboard on page 46)
   e. Switch cover (see Switch cover on page 48)
   f. Display assembly (see Display assembly on page 50)
   g. Top cover (see Top cover on page 53)
   h. Power switch assembly (see Power switch assembly on page 55)
   i. System board (see System board on page 58)

Remove the fan/heat assembly:

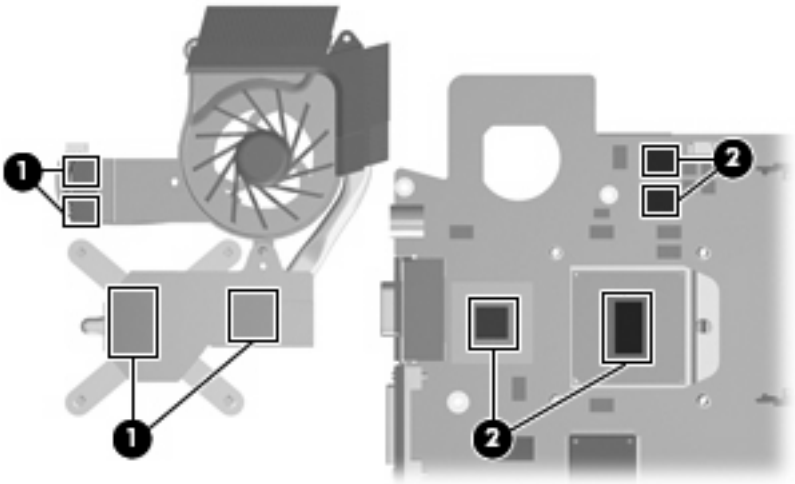
1. Disconnect the fan cable **(1)** from the system board.
2. Remove the four Phillips PM2.0×4.0 screws **(2)** that secure the fan/heat sink assembly to the system board.

3. Remove the fan/heat sink assembly **(3)**.

NOTE: Due to the adhesive quality of the thermal material located between the fan/heat sink assembly and system board components, it may be necessary to move the fan/heat sink assembly from side to side to detach the assembly.



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



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

Processor

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

Desription	Spare part number
AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-86 processor (2.40-GHz, 1-MB L2 cache, 800-MHz FSB)	507974-001
AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-84 processor (2.30-GHz, 1-MB L2 cache, 800-MHz FSB)	507975-001
AMD Turion 64 Mobile Technology Ultra Dual-Core ZM-82 processor (2.20-GHz, 1-MB L2 cache, 800-MHz FSB)	507973-001
AMD Turion 64 Mobile Technology Dual-Core RM-74 processor (2.20-GHz, 1-MB L2 cache, 800-MHz FSB)	507979-001
AMD Turion 64 Mobile Technology Dual-Core RM-72 processor (2.10-GHz, 1-MB L2 cache, 800-MHz FSB)	507978-001
AMD Turion 64 Mobile Technology Dual-Core QL-64 processor (2.10-GHz, 512-KB L2 cache, 667-MHz FSB)	506053-001
AMD Turion 64 Mobile Technology Dual-Core QL-62 processor (2.00-GHz, 512-KB L2 cache, 667-MHz FSB)	506052-001

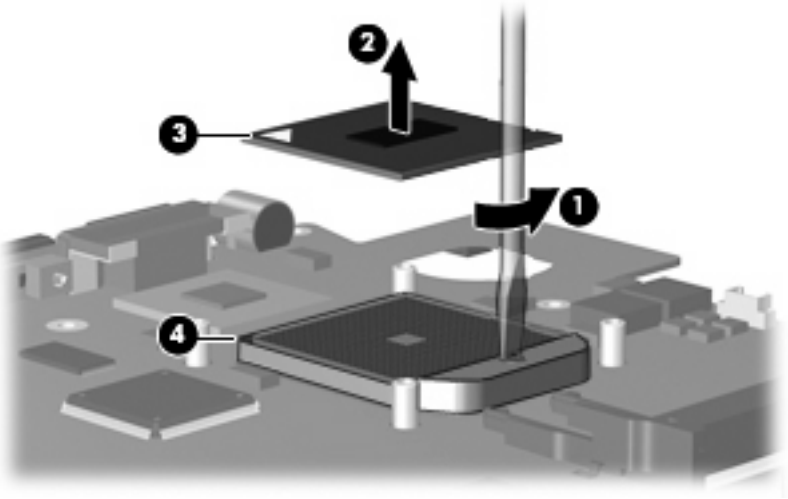
Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see Battery on page 35).
5. Remove the following components:
   a. Hard drive (see Hard drive on page 37)
   b. Memory module compartment cover (see Memory module on page 41)
   c. Optical drive (see Optical drive on page 40)
   d. Keyboard (see Keyboard on page 46)
   e. Switch cover (see Switch cover on page 48)
   f. Display assembly (see Display assembly on page 50)
   g. Top cover (see Top cover on page 53)
   h. Power switch assembly (see Power switch assembly on page 55)
   i. System board (see System board on page 58)

Remove the processor:

1. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.
2. Lift the processor **(2)** straight up and remove it.

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



Reverse this procedure to install the processor.

5 Setup Utility

⚠ **WARNING!** Only authorized technicians trained by HP should repair this equipment. All troubleshooting and repair procedures are detailed to allow repair at only the subassembly or module level. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or modify any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

Starting the Setup Utility

The Setup Utility is a ROM-based information and customization utility that can be used even when your Windows operating system is not working or will not load.

NOTE: The fingerprint reader (select models only) does not work when accessing the Setup Utility.

The utility reports information about the computer and provides settings for startup, security, and other preferences.

To start the Setup Utility:

1. Turn on or restart the computer.
2. Before Windows opens and while “Press <F10> to enter setup” is displayed in the lower-left corner of the screen, press f10.

Changing the language of the Setup Utility

The following procedure explains how to change the language of the Setup Utility. If the Setup Utility is not already running, begin at step 1. If the Setup Utility is already running, begin at step 2.

1. To start the Setup Utility, turn on or restart the computer, and then press f10 while “Press <F10> to enter setup” is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **System Configuration > Language**, and then press enter.
3. Press f5 or f6 (or use the arrow keys) to select a language, and then press enter to select a language.
4. When a confirmation prompt with your preference selected is displayed, press enter to save your preference.
5. To set your preferences and exit the Setup Utility, press f10 and then follow the instructions on the screen.

Your preferences go into effect when the computer restarts in Windows.

Navigating and selecting in the Setup Utility

Because the Setup Utility is not Windows-based, it does not support the TouchPad. Navigation and selection are by keystroke.

- To choose a menu or a menu item, use the arrow keys.
- To choose an item in a drop-down list or to toggle a field, for example an Enable/Disable field, use either the arrow keys or f5 or f6.
- To select an item, press enter.
- To close a text box or return to the menu display, press esc.
- To display additional navigation and selection information while the Setup Utility is open, press f1.

Displaying system information

The following procedure explains how to display system information in the Setup Utility. If the Setup Utility is not open, begin at step 1. If the Setup Utility is open, begin at step 2.

1. To start the Setup Utility, turn on or restart the computer, and then press f10 while “Press <F10> to enter setup” is displayed in the lower-left corner of the screen.
2. Access the system information by using the **Main** menu.
3. To exit the Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press enter. (The computer restarts in Windows.)

Restoring default settings in the Setup Utility

The following procedure explains how to restore the Setup Utility default settings. If the Setup Utility is not already running, begin at step 1. If the Setup Utility is already running, begin at step 2.

1. To start the Setup Utility, turn on or restart the computer, and then press f10 while “Press <F10> to enter setup” is displayed in the lower-left corner of the screen.
2. Select **Exit > Load Setup Defaults**, and then press enter.
3. When the Setup Confirmation is displayed, press enter to save your preferences.
4. To set your preferences and exit the Setup Utility, press f10, and then follow the instructions on the screen.

The Setup Utility default settings are set when you exit the Setup Utility and go into effect when the computer restarts.

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

Using advanced Setup Utility features

This section describes the Setup Utility features recommended for all users. For more information about the Setup Utility features recommended for advanced users only, refer to Help and Support, which is accessible only when the computer is in Windows.

The Setup Utility features available for advanced users include a hard drive self-test, a Network Service Boot, and settings for boot order preferences.

The “<F12> to boot from LAN” message that is displayed in the lower-left corner of the screen each time the computer is started or restarted in Windows is the prompt for a Network Service Boot.

The “Press <F9> to change boot order” message that is displayed in the lower-left corner of the screen each time the computer is started or restarted in Windows is the prompt to change the boot order.

Closing the Setup Utility

You can close the Setup Utility with or without saving changes.

- To close the Setup Utility and save your changes from the current session, use either of the following procedures:
  - Press f10, and then follow the instructions on the screen.

    — or —

  - If the Setup Utility menus are not visible, press esc to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press enter.

    When you use the f10 procedure, you are offered an option to return to the Setup Utility. When you use the Exit Saving Changes procedure, the Setup Utility closes when you press enter.
- To close the Setup Utility without saving your changes from the current session:

  If the Setup Utility menus are not visible, press esc to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press enter.

After the Setup Utility closes, the computer restarts in Windows.

Setup Utility menus

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

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

Main menu

Select	To do this
System information	• View and change the system time and date. • View identification information about the computer. • View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).

Security menu

Select	To do this
Administrator password	Enter, change, or delete an administrator password.
Power-On Password	Enter, change, or delete a power-on password.

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Enhanced SATA support (select models only)	Enable/disable enhanced SATA mode.
Boot Options	Set the following boot options: • f10 and f12 Delay (sec.)—Set the delay for the f10 and f12 functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20). • CD-ROM boot—Enable/disable boot from CD-ROM. • Floppy boot—Enable/disable boot from Floppy. • Internal Network Adapter boot—Enable/disable boot from Internal Network Adapter. • Boot Order—Set the boot order for: ◦ USB Floppy ◦ ATAPI CD/DVD ROM Drive ◦ Hard drive ◦ USB Diskette on Key ◦ USB Hard drive ◦ Network adapter
Button Sound (select models only)	Enable/disable the Quick Launch Button tapping sound.
Video memory up to (select models only)	Select the amount of video memory.

Diagnostics menu

Select	To do this
Hard Disk Self Test	Run a comprehensive self-test on the hard drive. **NOTE:** On models with two hard drives, this menu option is called the **Primary Hard Disk Self Test**.
Secondary Hard Disk Self Test (select models only)	Run a comprehensive self-test on a secondary hard drive.
Memory Test	Run a diagnostic test on the system memory.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Height (front to back)	3.1 to 3.9 cm	1.22 to 1.54 in
Width	30.6 cm	12.05 in
Depth	22.4 cm	8.82 in
Weight (with optical drive, hard drive, and battery)	1.95 kg	4.29 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	

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

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

12.1-inch, WXGA BrightView display specifications

	Metric	U.S.
Dimensions		
Height	16.2 cm	6.4 in
Width	26.0 cm	10.2 in
Diagonal	30.6 cm	12.1 in
Number of colors	Up to 16.8 million	
Contrast ratio	300:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.300 × 0.300 mm	
Format	1280 × 800	
Configuration	RGB stripe	
Backlight	CCFL	
Refresh rate	60 Hz	
PPI	107	
Viewing angle	+/-45° horizontal, +/-25° vertical (typical)	

Hard drive specifications

	500-GB*	400-GB*	320-GB*	250-GB*	160-GB*
Dimensions					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	102 g	102 g	102 g	102 g	102 g
Interface type	ATA-7	ATA-7	ATA-7	ATA-7	ATA-7
Transfer rate					
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)					
Single track	3 ms	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms	24 ms
Logical blocks	976,773,168	781,422,768	604,234,532	495,702,655	317,249,699
Disc rotational speed	5400-rpm	5400-rpm	5400-rpm	7200- and 5400-rpm	5400-rpm
Operating temperature	5°C to 55°C (41°F to 131°F)				

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

†Actual drive specifications may differ slightly.

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

DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive specifications

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

System DMA specifications

Hardware DMA	System function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned
*PC Card controller can use DMA 1, 2, or 5.	

System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft Natural Keyboard
IRQ2	Cascaded
IRQ3	USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—SMBus Controller—24C3 Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	USB UHCI controller—24C2
	Graphic Controller
	Realtek RTL8139 Family PCI Fast Ethernet Controller
IRQ11	USB EHCI controller—24CD
	USB UHCI controller—24C4
	USB UHCI controller—24C7
	Pro/Wireless 2200BG
	TI OHCI 1394 host controller
	TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel
*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.	
NOTE: PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.	

System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 “Super I/O” configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/RTC
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2
I/O Address (hex)	System Function (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	JoyStick (decoded in ESS1688)
202 - 21F	Unused

I/O address (hex)	System function (shipping configuration)
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	“A” diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

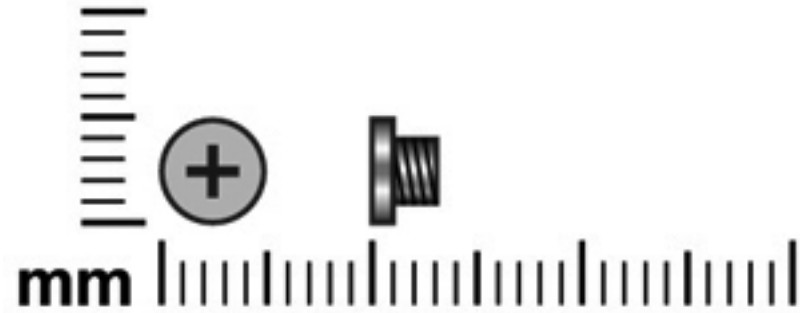
System memory map specifications

Size	Memory address	System function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFF	Video memory (direct access)
4 GB	08200000-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

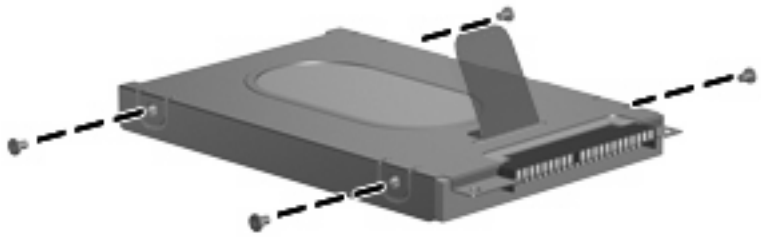
7 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws and screw locks listed in this section are available in the Screw Kit, spare part number 464116-001.

Phillips PM3.0×3.0 screw

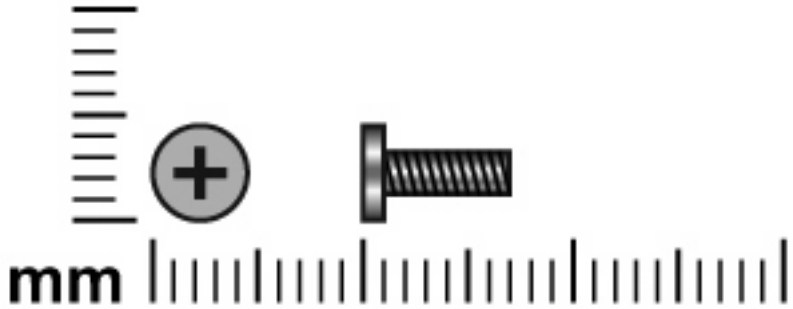


Color	Quantity	Length	Thread	Head width
Silver	4	3.0 mm	3.0 mm	5.0 mm

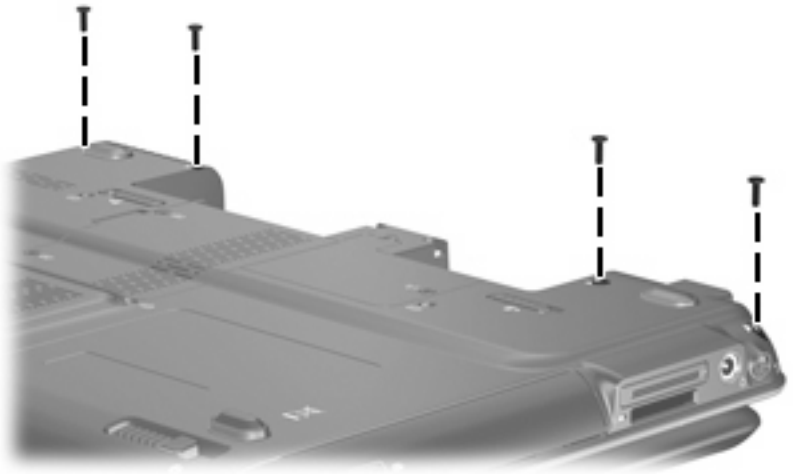


Where used: 4 screws that secure the hard drive bracket to the hard drive

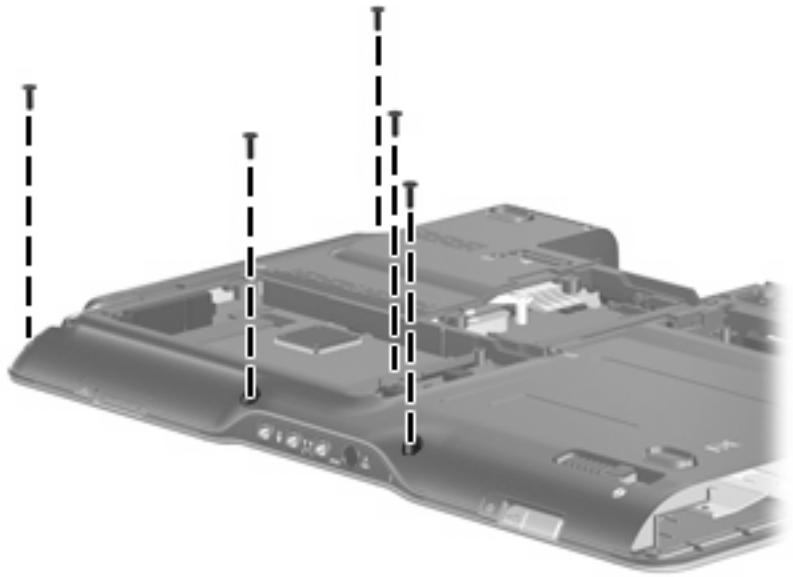
Phillips PM2.0×7.0 screw



Color	Quantity	Length	Thread	Head width
Black	9	7.0 mm	2.0 mm	4.5 mm

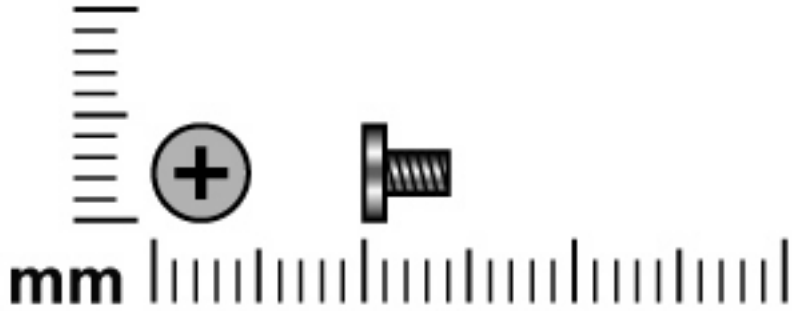


Where used: 4 screws that secure the switch cover to the computer

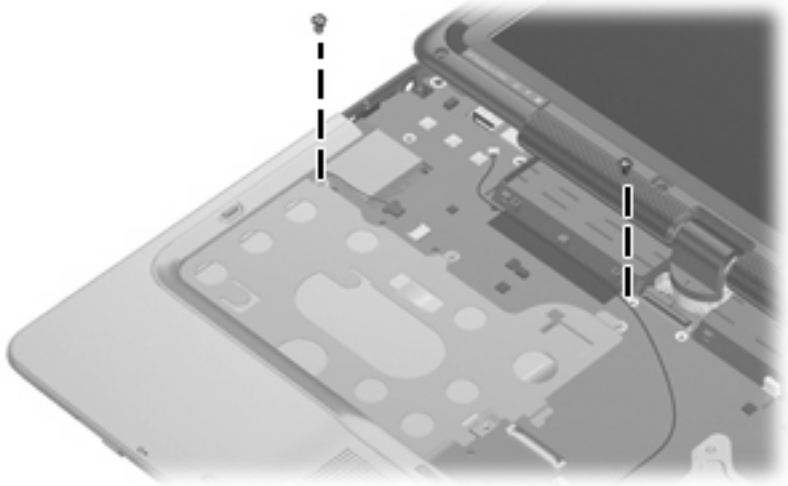


Where used: 5 screws that secure top cover to the computer

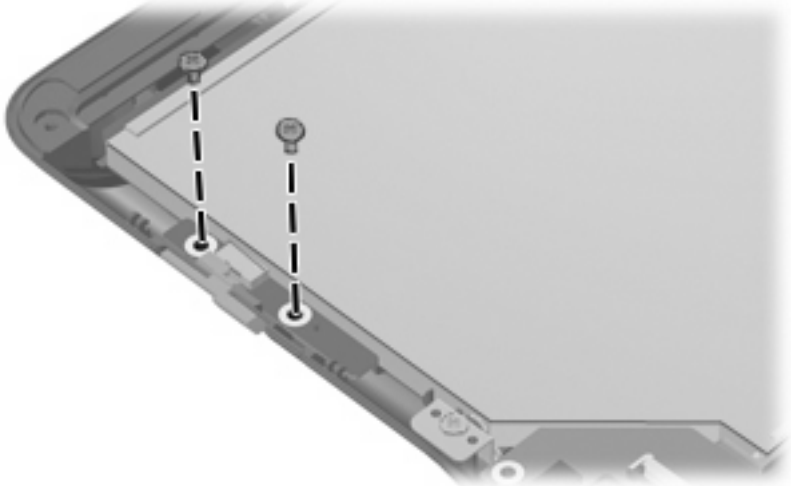
Phillips PM2.0×4.0 screw



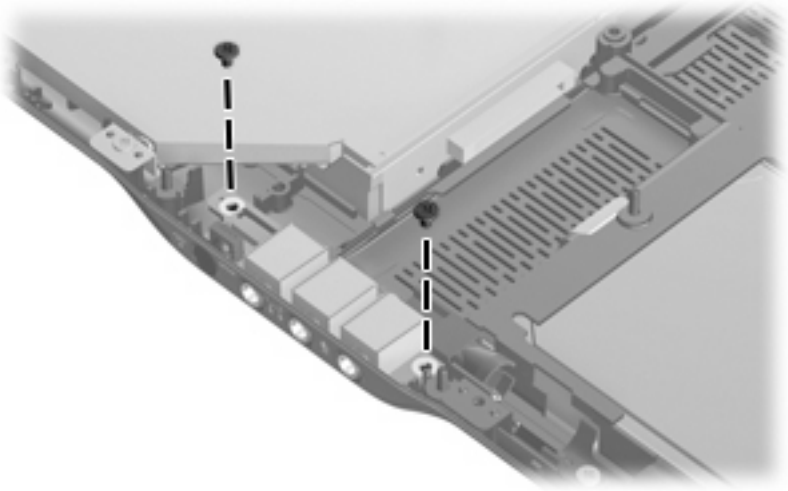
Color	Quantity	Length	Thread	Head width
Silver	10	4.0 mm	2.0 mm	4.5 mm



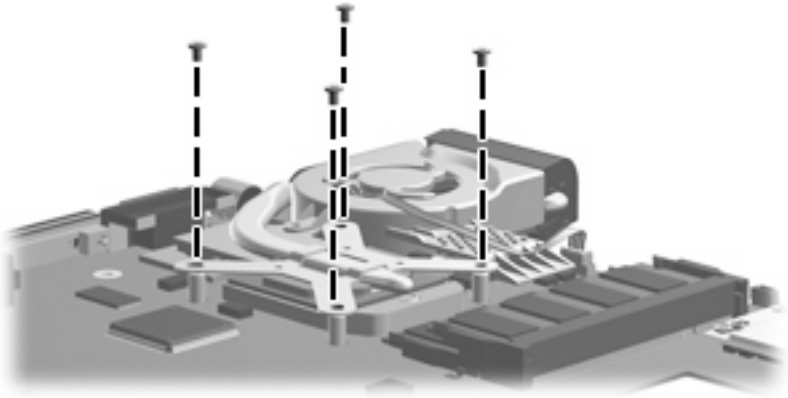
Where used: 2 screws that secure the top cover to the computer



Where used: 2 screws that secure the power switch board to the base enclosure

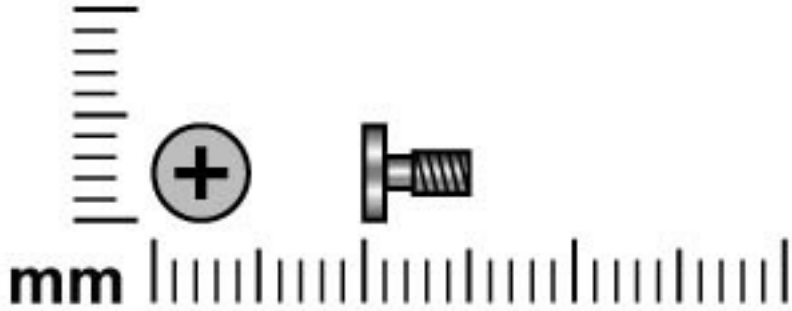


Where used: 2 screws that secure the audio/infrared board to the base enclosure

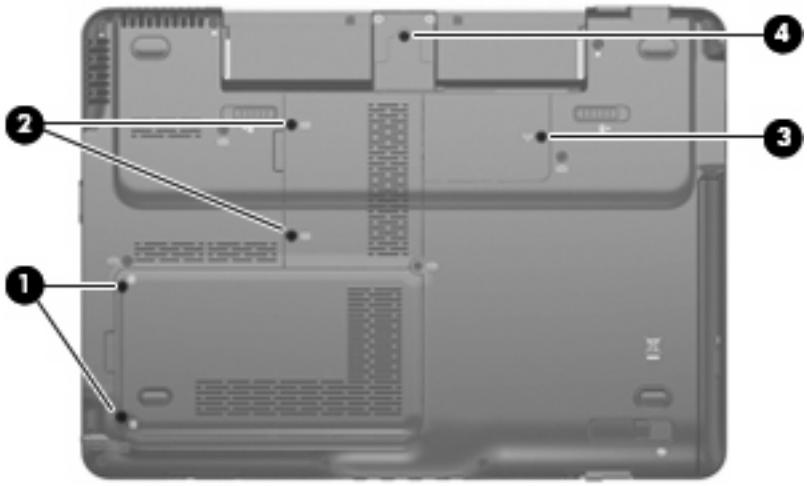


Where used: 4 screws that secure the fan/heat sink assembly to the system board

Phillips PM2.0×5.0 captive screw



Color	Quantity	Length	Thread	Head width
Black	6	5.0 mm	2.0 mm	4.5 mm



Where used:

(1) Two captive screws (secured with C-clips) that secure the hard drive cover to the computer

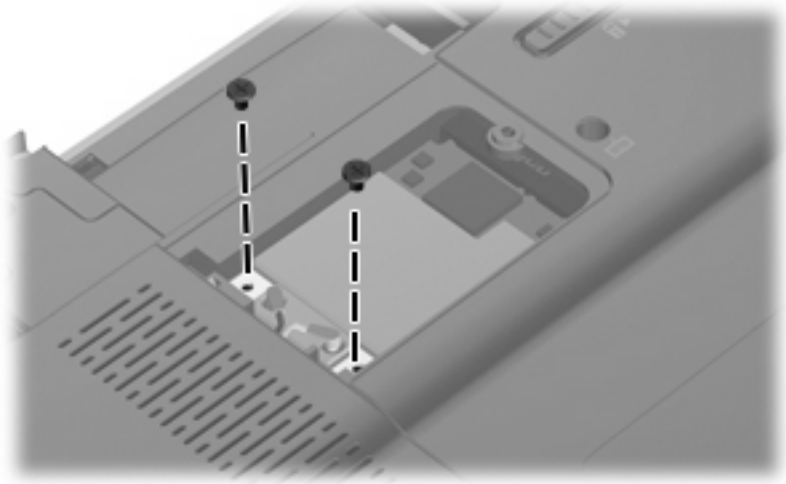
(2) Two captive screws (secured with C-clips) that secure the memory module compartment cover to the computer

(3) One captive screw (secured with a C-clip) that secures the WLAN module compartment cover to the computer

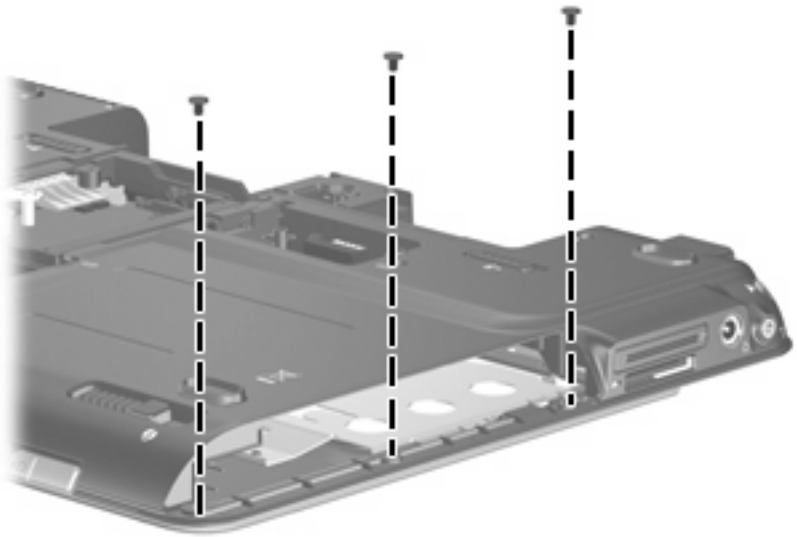
(4) One captive screw (secured with a C-clip) that secures the display cable cover to the computer

Black Phillips PM2.0×3.0 screw

Color	Quantity	Length	Thread	Head width
Black	5	3.0 mm	2.0 mm	4.5 mm

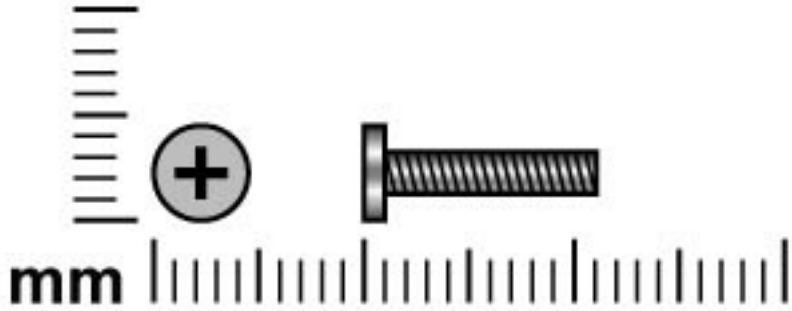


Where used: 2 screws that secure the WLAN module to the computer

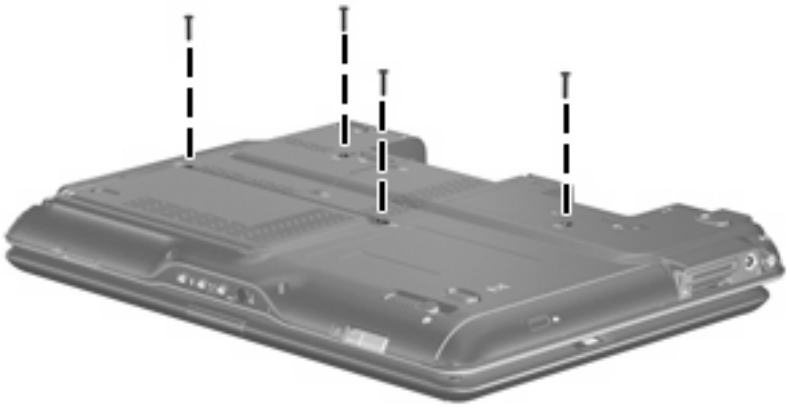


Where used: 3 screws that secure the top cover to the base enclosure

Phillips PM2.0×11.0 screw

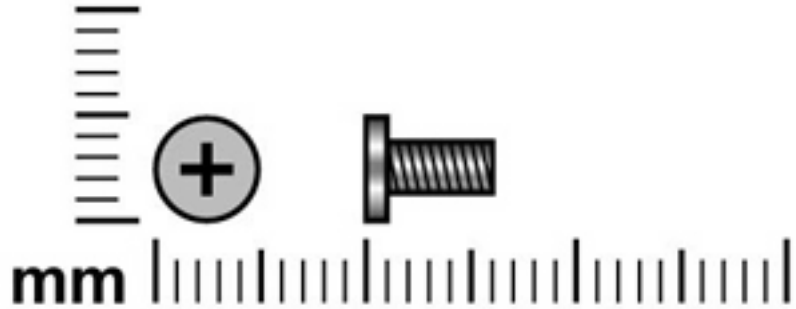


Color	Quantity	Length	Thread	Head width
Black	4	11.0 mm	2.0 mm	4.5 mm

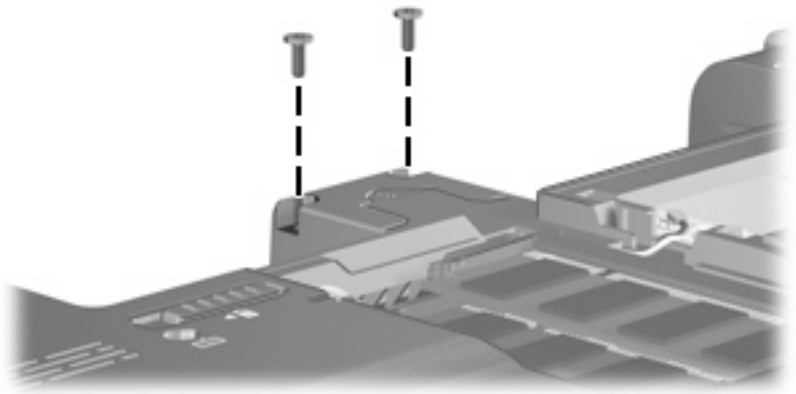


Where used: 4 screws that secure the keyboard to the computer

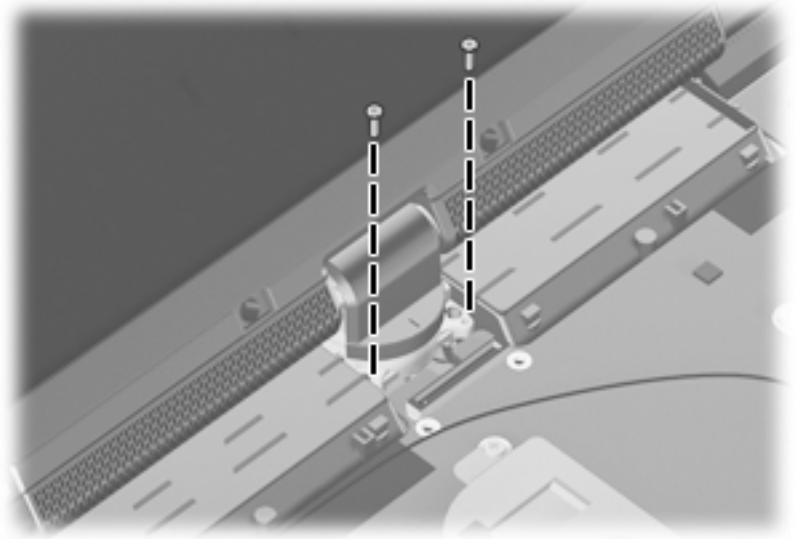
Phillips PM2.5×6.0 screw



Color	Quantity	Length	Thread	Head width
Silver	4	6.0 mm	2.5 mm	5.0 mm



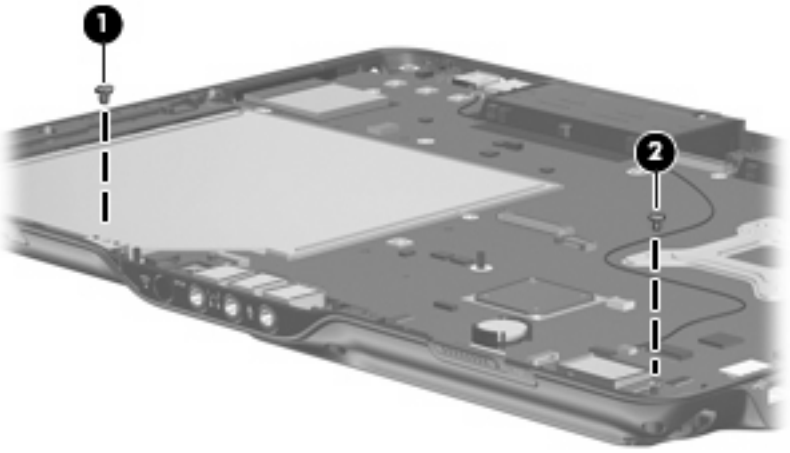
Where used: 2 screws that secure the display assembly to the computer



Where used: 2 screws that secure the display assembly to the computer

Silver Phillips PM2.0×3.0 screw

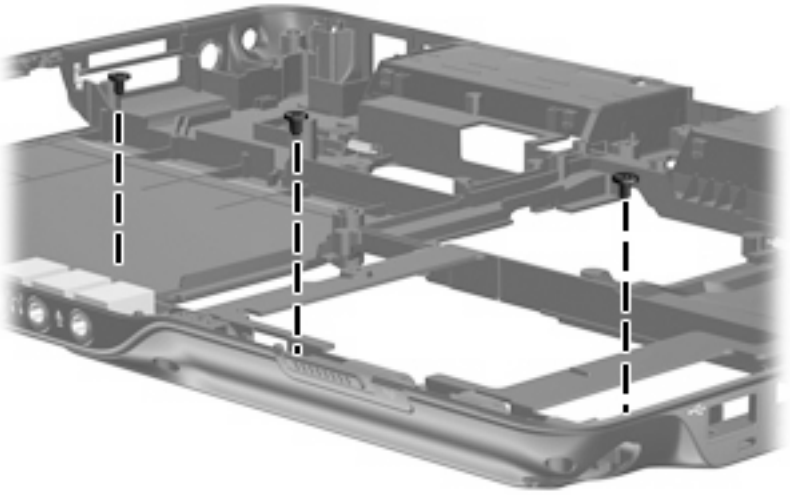
Color	Quantity	Length	Thread	Head width
Silver	5	3.0 mm	2.0 mm	4.5 mm



Where used:

(1) One screw that secures the display release hook to the base enclosure

(2) One screw that secures the Bluetooth module to the base enclosure



Where used: 3 screws that secure the pen eject assembly and pen holder to the base enclosure

8 Backup and recovery

Recovering system information

Tools provided by the operating system and Recovery Manager software are designed to help you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Backing up your information regularly to protect your important system files.
- Making a set of recovery discs (Recovery Manager software feature). Recovery discs are used to start up (boot) your computer and restore the operating system and software programs to factory settings in case of system failure or instability.
- Creating system restore points (operating system feature). System restore points allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state.
- Recovering a program or driver (Recovery Manager software feature). This feature helps you reinstall a program or driver without performing a full system recovery.
- Performing a full system recovery (Recovery Manager software feature). With Recovery Manager, you can recover your full factory image if you experience system failure or instability. Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

NOTE: Handle these discs carefully and keep them in a safe place. The software allows the creation of only one set of recovery discs.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed on your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.

  NOTE: Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the Recovery Manager software.

- The computer must be connected to AC power during this process.
- Only one set of recovery discs can be created per computer.

- Number each disc before inserting it into the computer optical drive.
- If necessary, you can exit the program before you have finished creating the recovery discs. The next time you open Recovery Manager, you will be prompted to continue the disc creation process.

To create a set of recovery discs:

1. Select **Start > All Programs > Recovery Manager > Recovery Manager**.

   Recovery Manager opens.

2. Click **Advanced Options**.

   NOTE: If you are operating the computer on battery power, you will be prompted to connect to AC power before you can go to the next step.

3. Click **Recovery disc creation**, and then click **Next**.
4. Follow the on-screen instructions.

Backing up your information

When to back up

- On a regularly scheduled basis

  NOTE: Set reminders to back up your information periodically.

- Before the computer is repaired or restored
- Before you add or modify hardware or software

Backup suggestions

- Create a set of recovery discs using Recovery Manager.
- Create system restore points using the Windows System Restore feature, and periodically copy them to disc.
- Store personal files in the Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.

  To copy the screen and paste it into a word-processing document, follow these steps:

  a. Display the screen.

  b. Copy the screen:

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

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

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

Using system restore points

When you back up your system, you are creating a system restore point. A system restore point allows you to save and name a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

NOTE: Recovering to an earlier restore point does not affect data files saved or e-mails created since the last restore point.

You also can create additional restore points to provide increased protection for your system files and settings.

When to create restore points

- Before you add or extensively modify software or hardware
- Periodically, whenever the system is performing optimally

NOTE: If you revert to a restore point and then change your mind, you can reverse the restoration.

Create a system restore point

1. Select **Start > Control Panel > System and Maintenance > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Under **Automatic restore points**, select the disk for which you want to create a restore point.
5. Click **Create**.

The System Protection window opens.

6. Follow the on-screen instructions.

Restore to a previous date and time

To revert to a restore point (created at a previous date and time), when the computer was functioning optimally, follow these steps:

1. Select **Start > Control Panel > System and Maintenance > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Click the **System Restore** button, and then click **Next**.

   The System Restore window opens.
5. Follow the on-screen instructions.

Performing a recovery

Recovery Manager software allows you to repair or restore the system if you experience system failure or instability. Recovery Manager works from recovery discs that you create or from a dedicated recovery partition on the hard drive.

NOTE: Windows has its own built-in repair features, such as System Restore and driver roll-back capabilities. If you have not already tried these features, try them before using Recovery Manager.

NOTE: Recovery Manager recovers only software that was preinstalled at the factory. Software not provided with this computer must be downloaded from the manufacturer's Web site or reinstalled from the disc provided by the manufacturer.

Recovering from the recovery discs

To restore the system from the recovery discs:

1. Back up all personal files.
2. Insert the first recovery disc into the optical drive and restart the computer.
3. Follow the on-screen instructions.

Recovering from the partition on the hard drive

You can perform a recovery from the partition on the hard drive from either the Start button or f11.

To restore the system from the partition, follow these steps:

1. Access Recovery Manager in either of the following ways:
   - Select **Start > All Programs > Recovery Manager > Recovery Manager**.

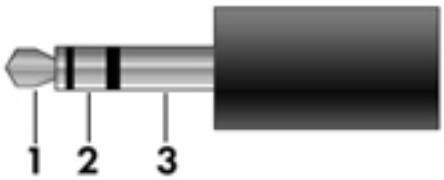
     –or–

   - Restart the computer and press f11 while the “Press <F11> for recovery” message is displayed on the screen. Then select **Recovery Manager**.

   Recovery Manager opens.
2. Click **Advanced Options**.
3. Click **System recovery**, and then click **Next**.
4. Follow the on-screen instructions.

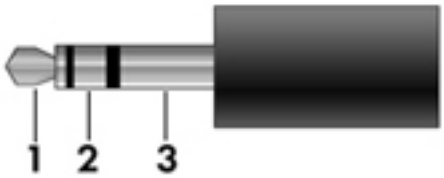
9 Connector pin assignments

Audio-in (microphone)



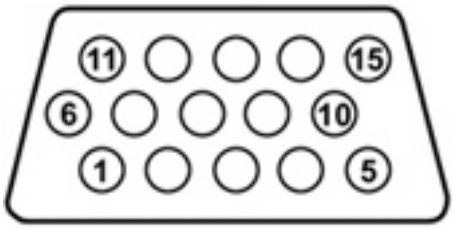
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



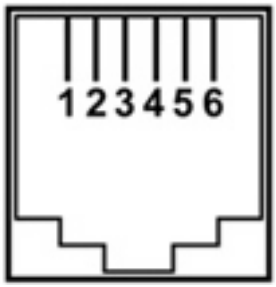
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



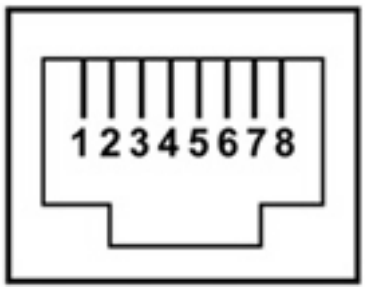
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



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

RJ-45 (network)

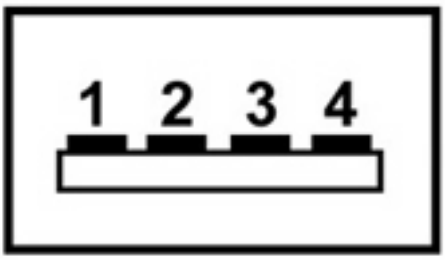


Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

S-Video-out

Pin	Signal
1	S-VHS color (C) signal
2	Composite video signal
3	S-VHS intensity (Y) signal
4	S-VHS color ground
5	TV-CD
6	S-VHS intensity ground
7	Composite video ground

Universal Serial Bus



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

10 Power cord set requirements

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

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

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

Requirements for all countries or regions

The requirements listed below are applicable to all countries or 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 each country or region's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries or regions

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.

11 Recycling

Battery

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

Display

⚠ **WARNING!** The backlight contains mercury. Caution should be exercised 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. Careful handling should be exercised when removing these components.

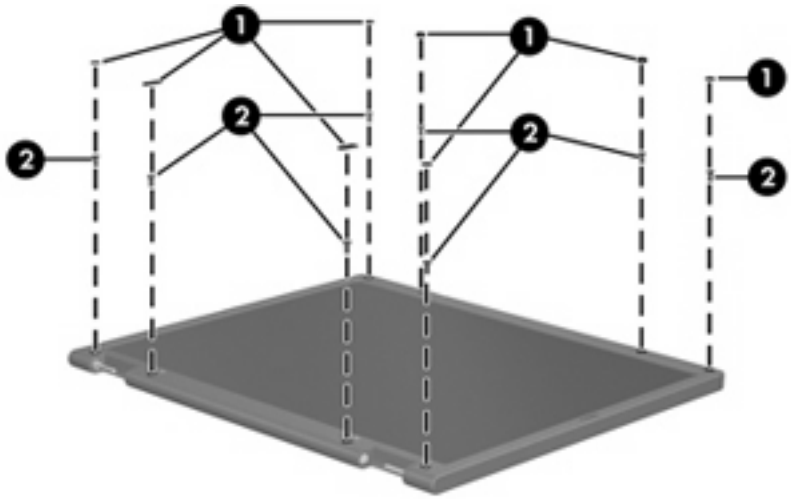
NOTE: **Materials Disposal**. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, 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.

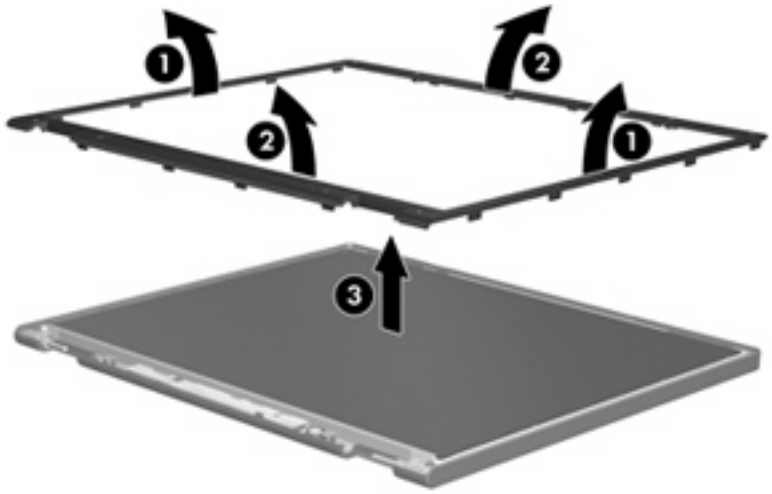
Perform the following steps to disassemble the display assembly:

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

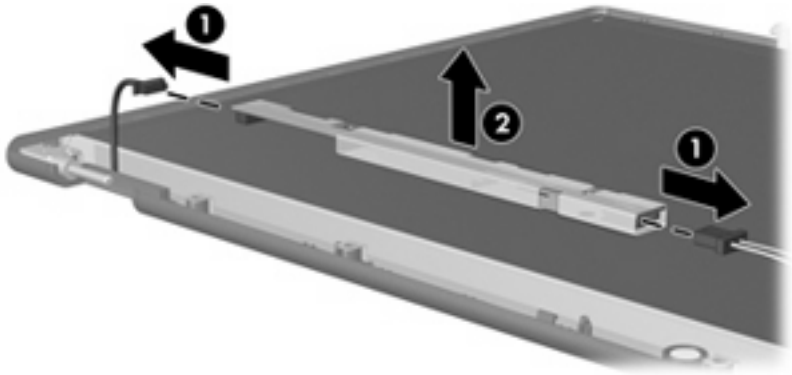


2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.

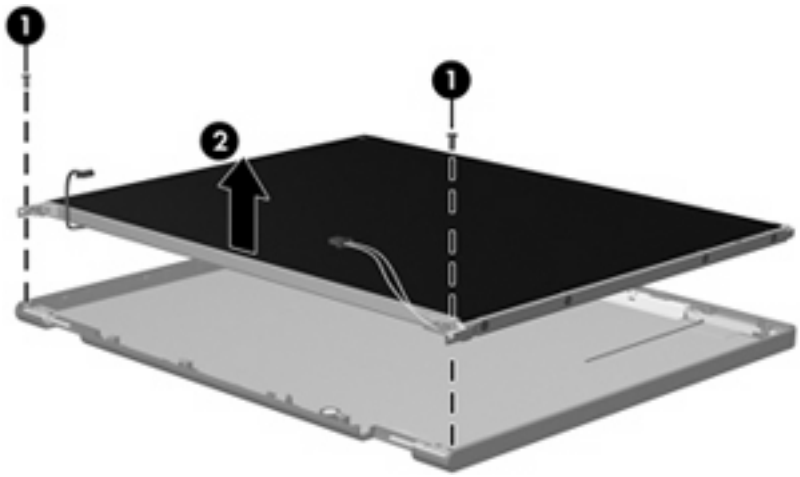
3. Remove the display bezel **(3)**.



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

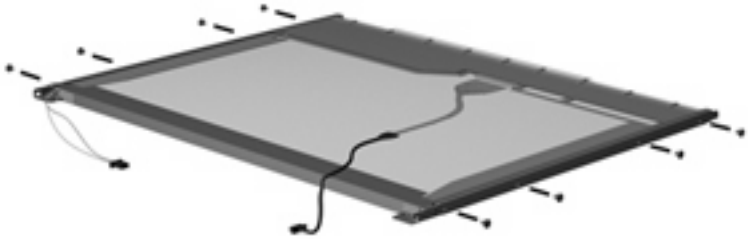


5. Remove all screws **(1)** that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly **(2)** from the display enclosure.

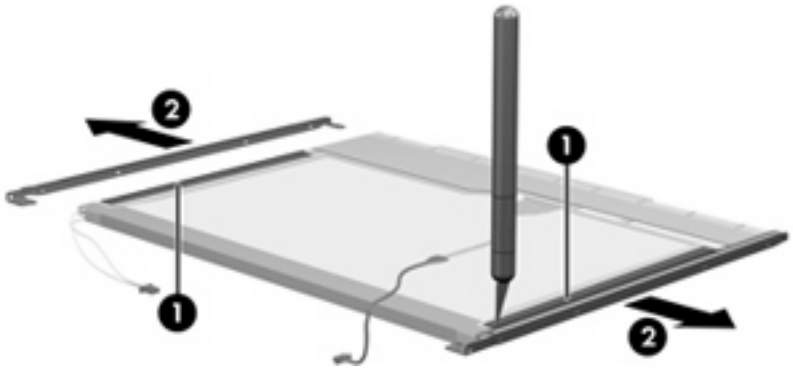


7. Turn the display panel assembly upside down.

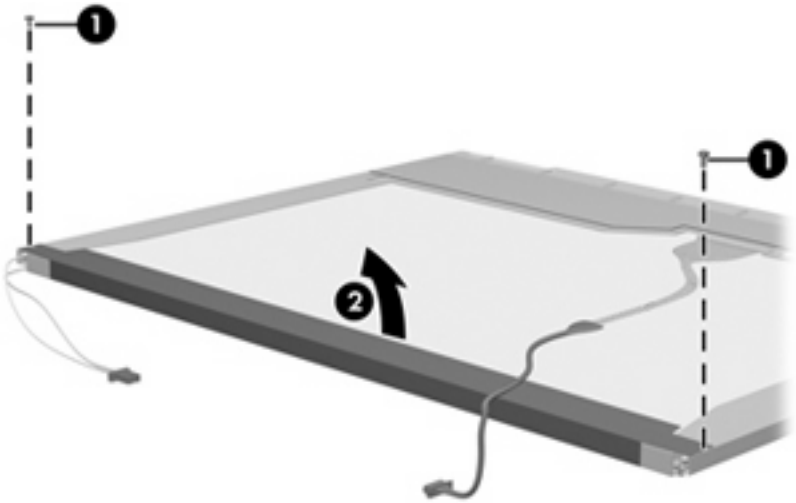
8. Remove all screws that secure the display panel frame to the display panel.



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.

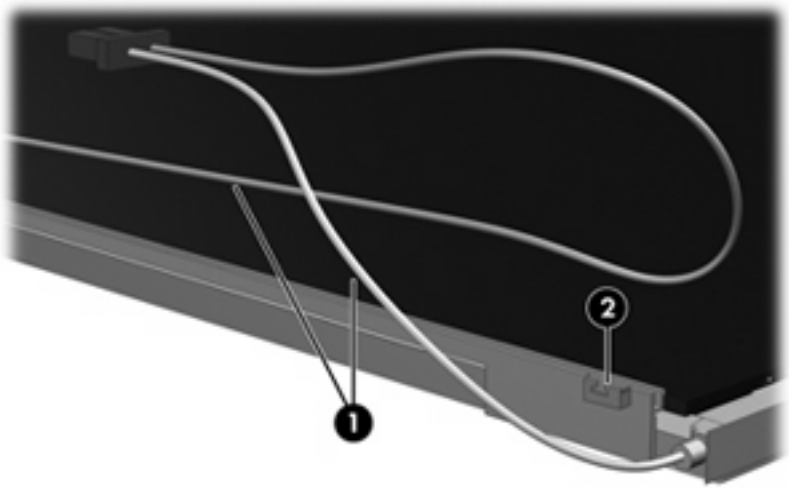


11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



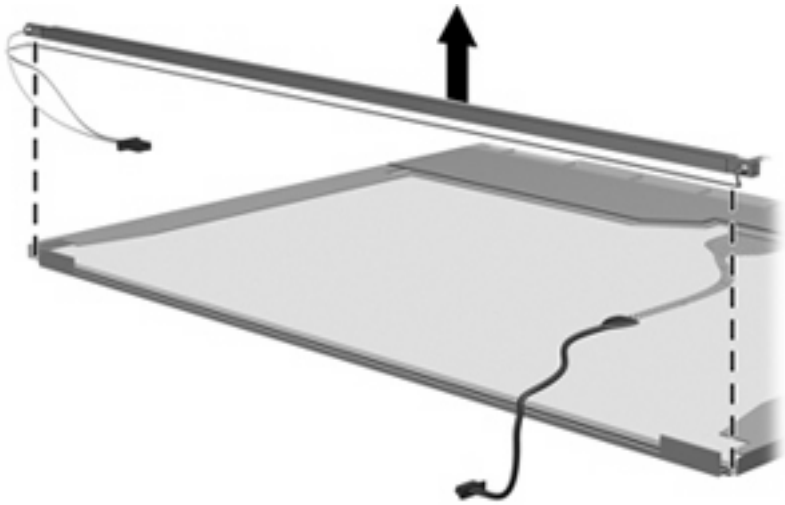
13. Remove the backlight cover.
14. Turn the display panel right-side up.

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



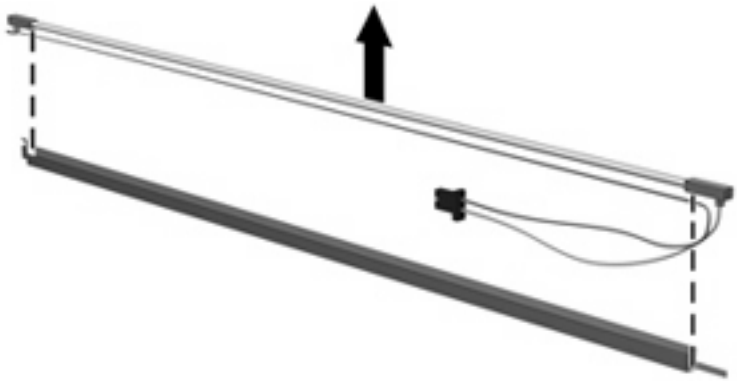
16. Turn the display panel upside down.

17. Remove the backlight frame from the display panel.

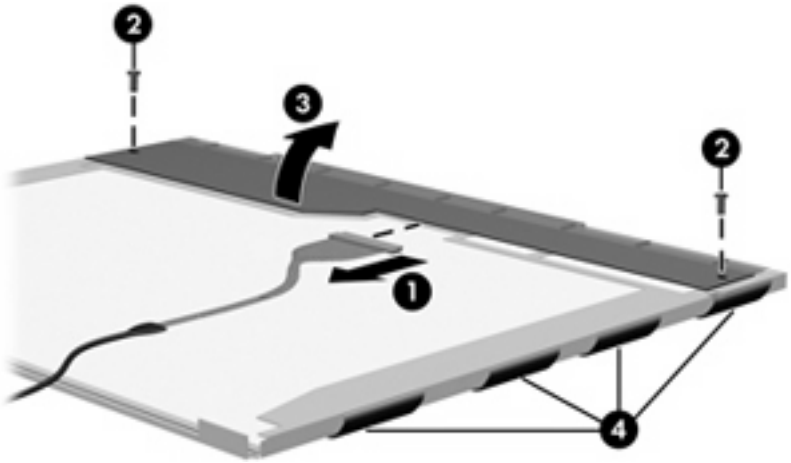


⚠ **WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

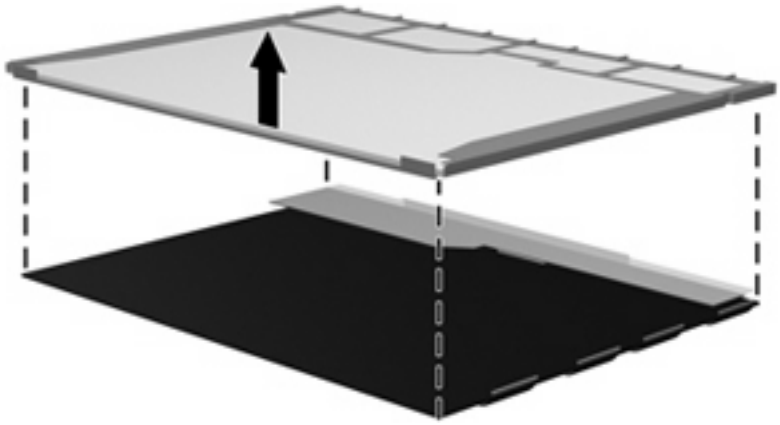
18. Remove the backlight from the backlight frame.



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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

Index

A

AC adapter, spare part number 22, 23
administrator password 71
advanced Setup Utility features 70
antenna, locations 6
applications key, Windows 7
audio, product description 2
audio-in jack
  location 9
  pin assignments 97
audio-out jack
  location 9
  pin assignments 97
audio-out S/PDIF jack 9
audio/infrared board
  removal 62
  spare part number 17, 23, 62

B

backup 92
base enclosure, spare part number 17, 25
battery
  removal 35
  spare part numbers 19, 23, 35
battery bay 13
battery light 5
battery release latch 13
Bluetooth module
  removal 57
  spare part number 16, 24, 57
Bluetooth module cable
  spare part number 24
Bluetooth module cable, spare part number 16, 57
boot options 72
boot order 72
bottom components 13
button sound 72
buttons
  MediaSmart 6
  Mobility Center 6
  next/fast forward 11
  play/pause 11
  previous/rewind 11
  rotate 6
  stop 11

C

cables, service considerations 28
camera
  location 6
  product description 2
changing the Setup Utility language 69
chipset, product description 1
closing the Setup Utility 71
CMOS clearing 32
components
  bottom 13
  display 5
  front 5, 9
  keyboard 7
  left-side 10
  rear 12
  right-side 11
computer feet
  locations 34
  spare part number 17, 23, 34
computer specifications 73
connector pin assignments
  audio-in jack 97
  audio-out jack 97
  external monitor port 98
  headphone jack 97
  microphone jack 97
  modem jack 99
  monitor port 98
  network jack 99
  RJ-11 jack 99
  RJ-45 jack 99
  S-Video-out jack 100
  Universal Serial Bus (USB) port 100
connectors, service considerations 28
convertible hinge 5

D

Diagnostics menu 72
Digital Media Slot 10
Digital Media Slot light 10
diskette drive
  precautions 28
  product description 2
display assembly
  removal 50
  spare part numbers 15, 25, 50
display components
  identifying 5
  recycling 104
display connector cover
  illustrated 20
  removal 50
display convertible hinge 5
display panel, product description 1
display release latch 6, 9
Display Rubber Kit, spare part number 16, 23
display specifications 74
display switch 6

docking support, product description 3
drive light 5
drives, boot order 72
drives, preventing damage 28
DVD±RW and CD-RW Double-Layer Combo Drive
precautions 28
removal 40
spare part numbers 17, 21, 26, 40
specifications 76

E
electrostatic discharge 29
enhanced SATA support 72
esc key 7
Ethernet, product description 2
expansion port 3 11
ExpressCard slot 10
ExpressCard slot bezel
illustrated 20
removal 59
external media cards, product description 2
external monitor port
location 11
pin assignments 98

F
fan/heat sink assembly
removal 64
spare part number 17, 24, 64
feet
locations 34
spare part number 17, 34
fingerprint reader 6, 68
fn key 7
front components 5, 9
function keys 7

G
graphics, product description 1
grounding equipment and methods 31

H
hard drive
precautions 28
product description 2
removal 37
spare part numbers 19, 21, 25, 26, 37
specifications 75
hard drive bay 13
hard drive cover
illustrated 20
removal 38
Hard Drive Hardware Kit, spare part number 19, 21, 25, 37
hard drive self test 72
headphone jack
location 9
pin assignments 97
headset, spare part number 23
hinge, display convertible 5

I
I/O address specifications 79
infrared lens 6, 9
interrupt specifications 78

J
jacks
audio-in 9
audio-out 9
audio-out S/PDIF 9
headphone 9
microphone 9
modem 12
network 11
RJ-11 12
RJ-45 11
S-Video-out 11

K
keyboard
product description 3
removal 46
spare part numbers 16, 25, 26, 46
keyboard components 7
keypad keys 7
keys
esc 7
fn 7
function 7
Windows applications 7
Windows logo 7

L
language support 69, 72
left-side components 10
lights
battery 5
Digital Media Slot 10
drive 5
optical drive release 10
power 6, 9
wireless 10

M
Main menu 71
mass storage devices, spare part numbers 21
MediaSmart button 6
memory map specifications 81
memory module
product description 1
removal 41
spare part numbers 17, 25, 41
memory module compartment 13
memory module compartment cover
illustrated 20
removal 41
memory test 72
microphone jack
location 9
pin assignments 97
microphones 6
Mobility Center button 6
model name 1
modem jack
location 12
pin assignments 99
modem module, product description 2
monitor port
location 11
pin assignments 98
mouse, spare part number 23

N
navigating in the Setup Utility 69
network jack
location 11
pin assignments 99
next/fast forward button 11

Notebook Stand, spare part number 22, 23

O
operating system, product description 3
optical drive
location 10
precautions 28
product description 2
removal 40
spare part numbers 17, 21, 40
specifications 76
optical drive light 10
optical drive release latch 13

P
packing guidelines 30
password clearing 32
passwords 71
pen
removal 36
spare part number 17, 23, 36
pen eject assembly
removal 61
spare part number 17, 25, 61
pen holder
removal 61
spare part number 17, 25, 61
pen tether hole 11
plastic parts 27
Plastics Kit
contents 20
spare part number 16, 20, 24
play/pause button 11
pointing devices
components 8
product description 3
ports
expansion port 3 11
external monitor 11
monitor 11
product description 3
Universal Serial Bus (USB) 11, 12
power connector 10
power cord
spare part numbers 24
power cord set requirements 101
power cord, spare part numbers 22
power light 6, 9
power requirements, product description 3
power switch 9
power switch assembly
removal 55
spare part number 17, 25, 55
power-on password 71
previous/rewind button 11
processor
product description 1
removal 66
spare part numbers 17, 25, 66
product description
audio 2
camera 2
chipset 1
diskette drive 2
display panel 1
docking support 3
Ethernet 2
external media cards 2
graphics 1
hard drives 2
keyboard 3
memory module 1
modem module 2
operating system 3
optical drives 2
pointing devices 3
ports 3
power requirements 3
processors 1
product name 1
security 3
serviceability 3
wireless 2
product name 1
protective sleeve, spare part number 22, 25

R
rear components 12
recovery discs 91
recovery, system 91, 96
remote control, spare part number 22, 23
removal/replacement
preliminaries 27
procedures 33
restore points 93
right-side components 11
RJ-11 jack
location 12
pin assignments 99
RJ-45 jack
location 11
pin assignments 99
rotate button 6
RTC battery
removal 39
spare part number 17, 23, 39
Rubber Feet Kit, spare part number 17, 23, 34

S
S-Video-out jack
location 11
pin assignments 100
Screw Kit
contents 82
spare part number 22, 23
screw listing 82
secondary hard drive self test 72
security cable slot 12
Security menu 71
security, product description 3
selecting in the Setup Utility 69
service considerations 27
service tag 14, 33
serviceability, product description 3
Setup Utility
changing the language 69
Diagnostics menu 72
displaying system information 69
Main menu 71
navigating 69
overview 68

Security menu 71
selecting 69
starting 68
System Configuration menu 72
using advanced features 70
slots
Digital Media Slot 10
ExpressCard 10
software, safeguarding information 91
specifications
computer 73
display 74
DVD±RW and CD-RW Double-Layer Combo Drive 76
hard drive 75
I/O addresses 79
interrupts 78
memory map 81
optical drive 76
system DMA 77
static-shielding materials 31
stop button 11
switch cover
removal 48
spare part number 16, 25, 48
system board
removal 58
spare part number 17, 25, 58
System Configuration menu 72
system DMA 77
system information 69, 71
system memory map 81
system recovery 91
system restore points 93

T
thermal material, replacement 65
tools required 27
top cover
removal 53
spare part number 16, 25, 53
TouchPad 8
TouchPad left button 8
TouchPad light 8
TouchPad on/off button 8
TouchPad right button 8
TouchPad scroll zone 8
transporting guidelines 30

U
Universal Serial Bus (USB) port
location 11, 12
pin assignments 100
unknown password 32

V
vents 11, 12, 13
video memory 72

W
Windows applications key 7
Windows logo key 7
wireless light 10
wireless switch 9
wireless, product description 2
WLAN module
removal 43
spare part number 24
spare part numbers 18, 23, 43
WLAN module compartment 13
WLAN module compartment cover
illustrated 20
removal 44
workstation guidelines 30