HP 4410t Mobile Thin Client

Maintenance and Service Guide

Document Part Number: 571223-001

July 2009

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

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First Edition: July 2009
Document Part Number: 571223-001

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).

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1

Product description

Category	Description
Product name	HP 4410t Mobile Thin Client
Processors	Intel® Celeron® 575 2.00-GHz processor, 1-MB L2 cache, 667-MHz front side bus (FSB)
Chipset	Northbridge: Intel GL40 667-MHz FSB Southbridge: Intel ICH-9M
Graphics	Mobile Intel GMA X4500 HD Universal Memory Architecture (UMA) integrated with shared video memory (dynamically allocated)
Panel	■ 14.0-in, high-definition (HD, 1366 × 768), AntiGlare, light-emitting diode (LED) display assembly ■ 16:9 ratio ■ Supports privacy filter ■ Includes 2 WLAN antennas
Memory	2 customer-accessible/upgradable memory module slots Supports the following PC2-6400 configurations at 800 MHz: ■ 2048-MB total system memory (2048 × 1) ■ 1024-MB total system memory (1024 × 1)
Solid-state modules	Serial Advanced Technology Attachment (SATA) Supports the following solid-state modules: ■ 2-GB ■ 1-GB
Optical drive	8X DVD-ROM drive 12.7-mm tray load SATA Fixed (removal of 1 screw required) Customer-accessible Supports no-optical-drive option
Microphone	Integrated microphone Microphone jack
Audio	ADI 1984AJCPZ Stereo speakers Headphone jack
Modem	High-speed 56K data/fax modem Modem cable not included Supports no-modem option

(Continued)

Category	Description
Ethernet	Marvell 88E8072-B1 10/100/1000 Ethernet S3/S5 wake on LAN (AC mode only) Ethernet cable not included
Power requirements	65-W HP Smart Adapter 6-cell, 2.20-Ah (47-Wh) Li-ion battery
Wireless	Integrated WLAN options by way of wireless module 2 wireless antennas built into display assembly Supports no-WLAN option Support for the following WLAN formats: ■ Broadcom 4322AGN 802.11a/b/g/n WLAN module ■ Broadcom 4312G 802.11b/g WLAN module
External media cards	One ExpressCard slot, supporting optional ExpressCard/34 cards Media Card Reader supporting the following optional digital card formats: ■ Memory Stick (MS) ■ Memory Stick Pro (MSP) ■ MultiMediaCard (MMC) ■ MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) ■ Secure Digital (SD) Memory Card ■ Secure Digital High Capacity (SDHC) Memory Card ■ Secure Digital High Speed (SDHS) Memory Card ■ xD-Picture Card (XD) ■ xD-Picture Card (XD) Type H ■ xD-Picture Card (XD) Type M
Ports	Audio-in (mono microphone) Audio-out (stereo headphone) HDMI Multi-pin AC power RJ-11 (modem) RJ-45 (network) USB 2.0 (4) VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75Hz, hot plug/unplug and auto-detect
Keyboard/ pointing devices	Keyboard TouchPad with 2 TouchPad buttons Taps enabled by default
Security	Security cable slot
Operating system	**Preinstalled**: Microsoft® Windows® Embedded Standard **Web support**: Microsoft Windows Embedded Standard and Microsoft Windows XPe, Service Pack 3

2

External component identification

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

Top components

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

Wireless antennas

Component	Description
WLAN antennas (2)	Send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in the printed *Getting Started* guide.

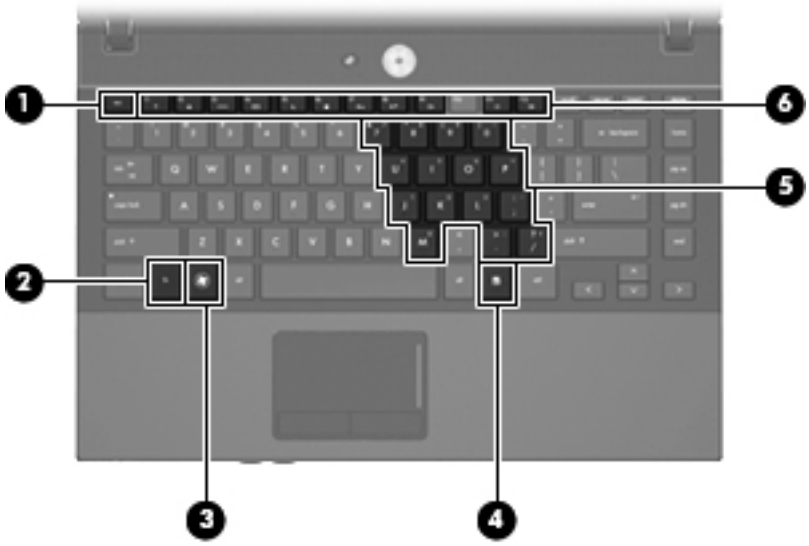
Display components

Item	Component	Description
(1)	Internal display switch	Turns off the display if the display is closed while the power is on.
(2)	Internal microphone	Records sound.

Buttons, switches, and speakers

Item	Component	Description
(1)	Speakers (2)	Produce sound.
(2)	Internal display switch	Turns off the display if the display is closed while the power is on.
(3)	Info button	Launches system information.
(4)	Power button	■ When the computer is off, press the button to turn on the computer. ■ When the computer is on, press the button to shut down the computer. ■ When the computer is in the Standby state, press the button briefly to exit Standby. If the computer has stopped responding, and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings and how to change them, select **Start > Control Panel > System and Maintenance > Power Options**.

Keys

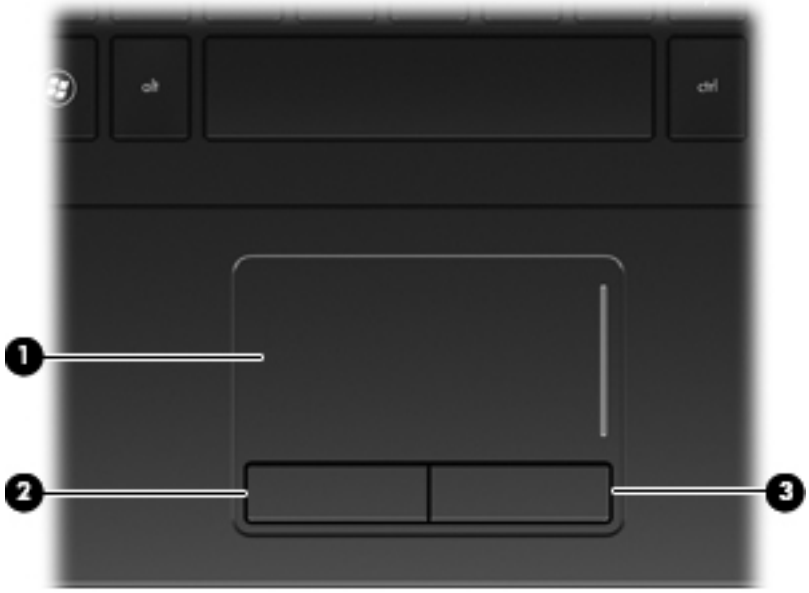


Item	Component	Description
(1)	**esc** key	Displays system information when pressed in combination with the **fn** key.
(2)	**fn** key	Executes frequently used system functions when pressed in combination with a function key or the **esc** key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)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

Lights

Item	Component	Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Info light	■ On: The computer is on. ■ Blinking (5 times): When the computer is on, press the button to display system information. ■ Off: The computer is off or in the Standby state.
(3)	Power light	■ On: The computer is on. ■ Blinking: The computer is in the Standby state. ■ Off: The computer is off.

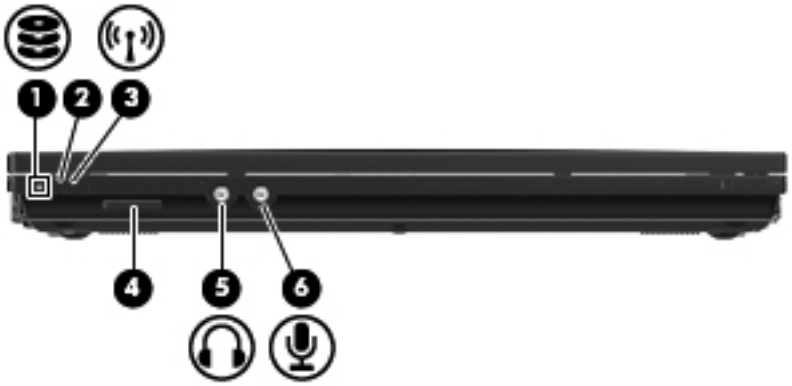
Pointing devices



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

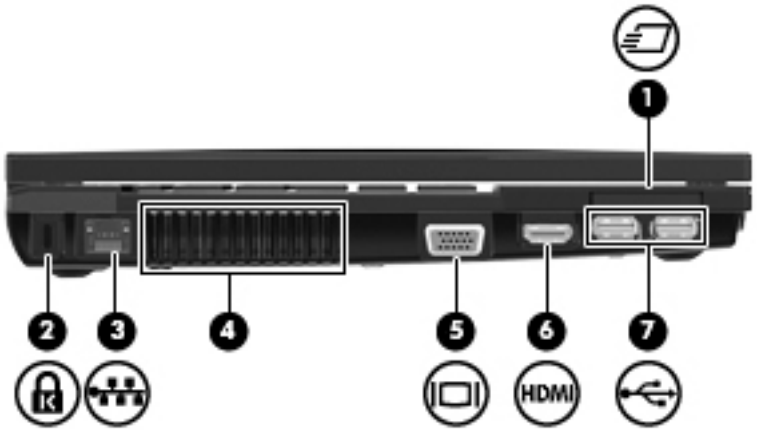
*This table describes factory settings. To view or change pointing device preferences, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

Front components



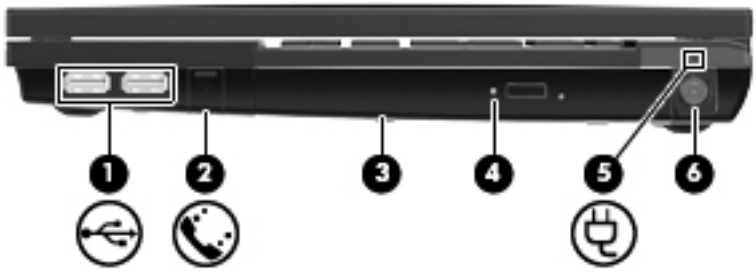
Item	Component	Description
(1)	Drive light	Blinking: The flash drive or optional optical drive is being accessed.
(2)	Wireless button	Turns the wireless feature on or off, but does not establish a wireless connection. ✎ A wireless network must be set up in order to establish a wireless connection.
(3)	Wireless light	■ Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. ■ Amber: All wireless devices are off.
(4)	Media Card Reader	Supports the following optional digital card formats: ■ Memory Stick (MS) ■ Memory Stick Pro (MSP) ■ MultiMediaCard (MMC) ■ MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC) ■ Secure Digital (SD) Memory Card ■ Secure Digital High Capacity (SDHC) Memory Card ■ Secure Digital High Speed (SDHS) Memory Card ■ xD-Picture Card (XD) ■ xD-Picture Card (XD) Type H ■ xD-Picture Card (XD) Type M
(5)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(6)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Left-side components



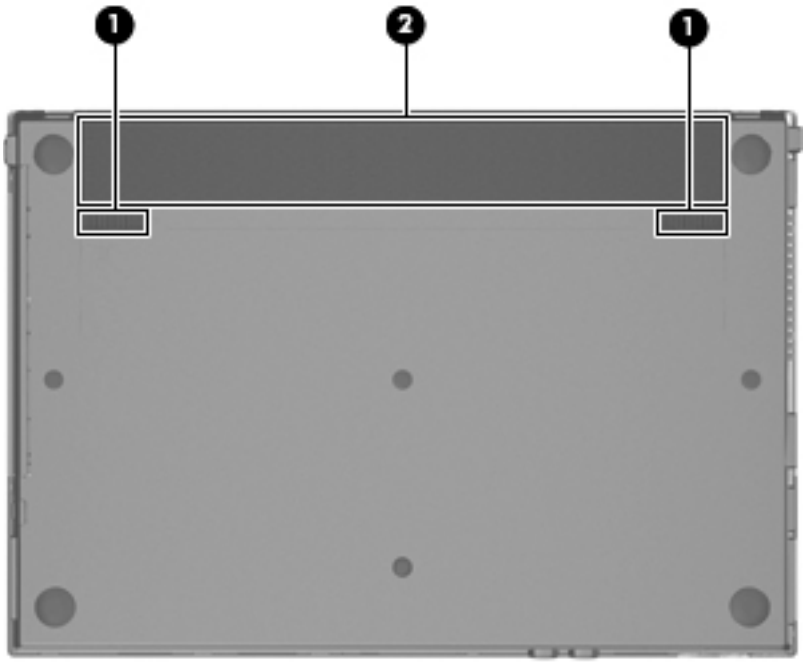
Item	Component	Description
(1)	ExpressCard slot	Supports optional ExpressCards.
(2)	Security cable slot	Attaches an optional security cable to the computer. ✎ The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	Vent	Enables airflow to cool internal components. ✎ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	External monitor port	Connects an external VGA monitor or projector.
(6)	HDMI port	Connects an optional HDMI device
(7)	USB ports (2)	Connect optional USB devices.

Right-side components



Item	Component	Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	RJ-11 (modem) jack	Connects a modem cable.
(3)	Optical drive (select models only)	Reads optical discs and, on select models, also writes to optical discs.
(4)	Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(5)	Battery light	■ Amber: A battery is charging. ■ Turquoise: A battery is close to full charge capacity. ■ Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. ■ Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(6)	Power connector	Connects an AC adapter.

Bottom components



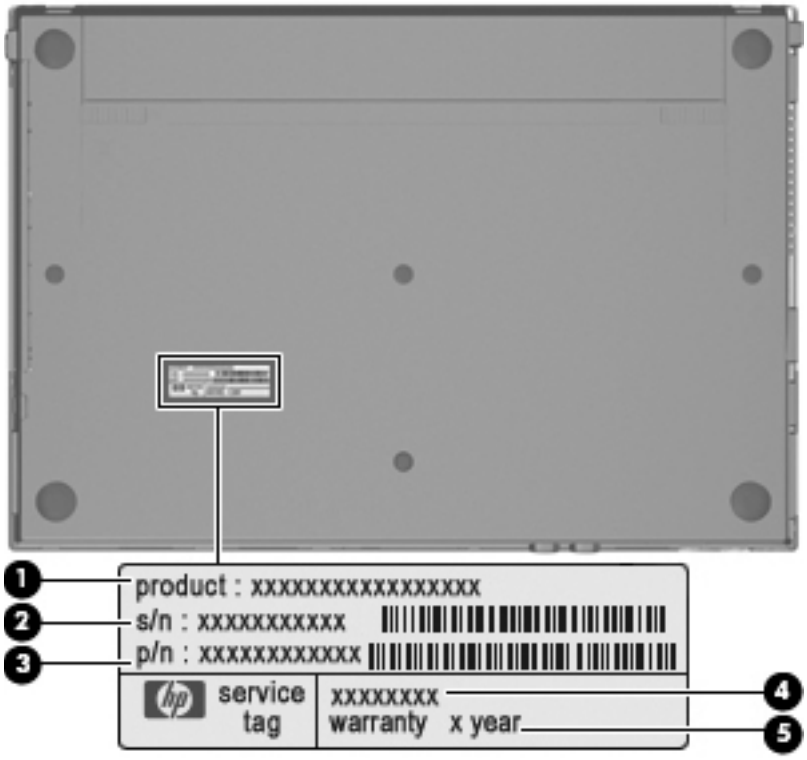
Item	Component	Description
(1)	Battery release latches (2)	Release the battery from the battery bay.
(2)	Battery bay	Holds the battery.

3

Illustrated parts catalog

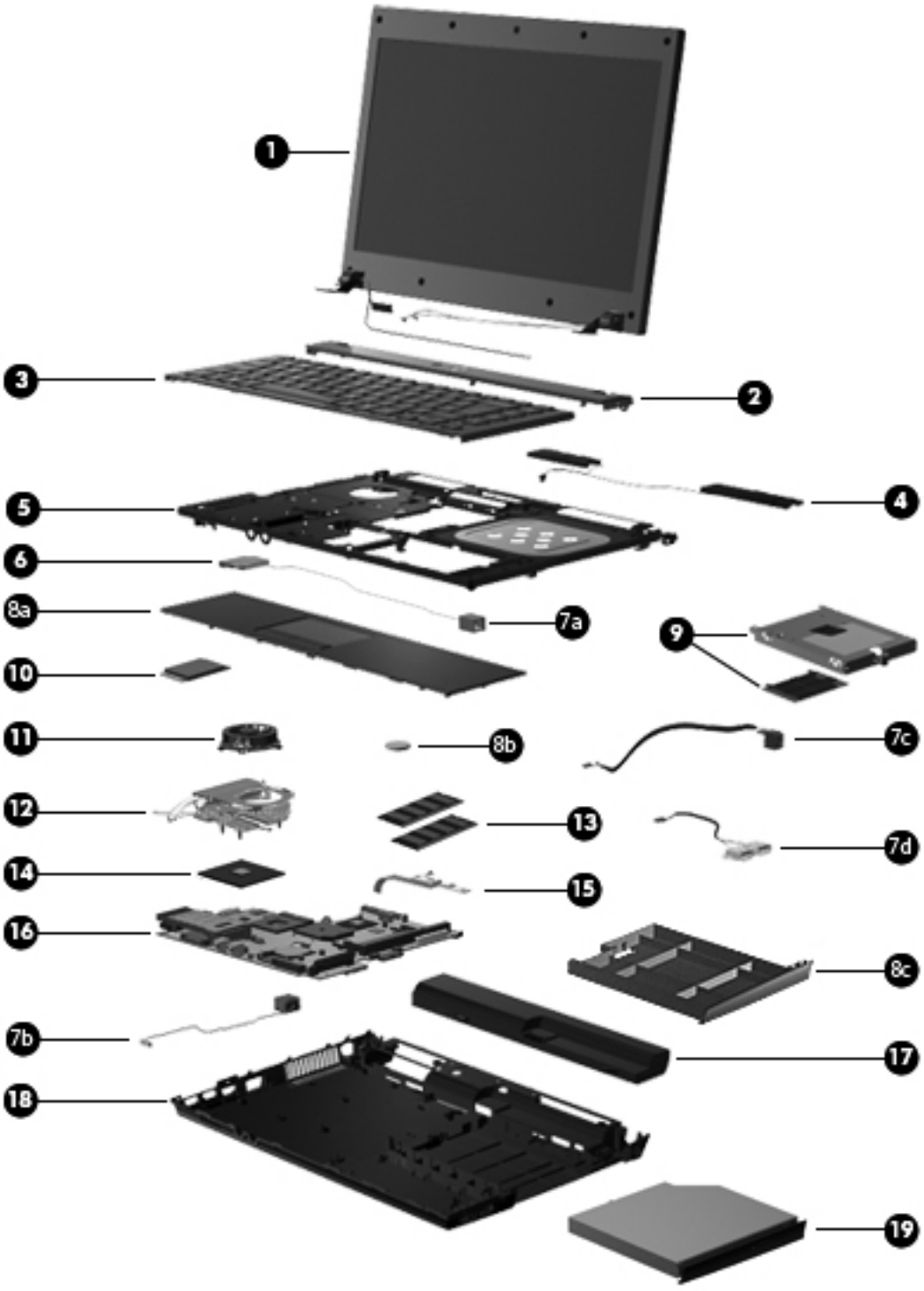
Service tag

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



Item	Component	Description
(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 determine what components and parts are needed.
(4)	Model description	This is the alphanumeric identifier 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
(1)	**14.1-in, SVA, HD, LED display assembly** (includes webcam module and cable, microphone and cable, 2 WLAN antenna transceivers and cables, nameplate, and logo)	578180-001
	✎ See "Display subcomponents" on page 3-6 for display assembly internal component spare part information.	
(2)	**Switch cover**	535860-001
(3)	**Keyboard** (includes keyboard cable):	
	■ For use in Brazil	536410-201
	■ For use in Bulgaria	536410-261
	■ For use in the Czech Republic	536410-221
	■ For use in Denmark	536410-081
	■ For use in France	536410-051
	■ For use in French Canada	536410-121
	■ For use in Germany	536410-041
	■ For use in Greece	536410-DJ1
	■ For use in Hungary	536410-211
	■ For use in Iceland	536410-DD1
	■ For use in Israel	536410-BB1
	■ For use in Italy	536410-061
	■ For use in Japan	536410-291
	■ For use in Latin America	536410-161
	■ For use in the Netherlands	536410-B31
	■ For use in Norway	536410-091
	■ For use in Portugal	536410-131
	■ For use in Russia	536410-251
	■ For use in Slovakia	536410-231
	■ For use in South Korea	536410-AD1
	■ For use in Spain	536410-071
	■ For use in Sweden and Finland	536410-B71
	■ For use in Switzerland	536410-BG1
	■ For use in Taiwan	536410-AB1
	■ For use in Thailand	536410-281
	■ For use in Turkey	536410-141
	■ For use in the United States	536410-001
(4)	**Speakers**	536420-001
(5)	**Top cover**	535865-001

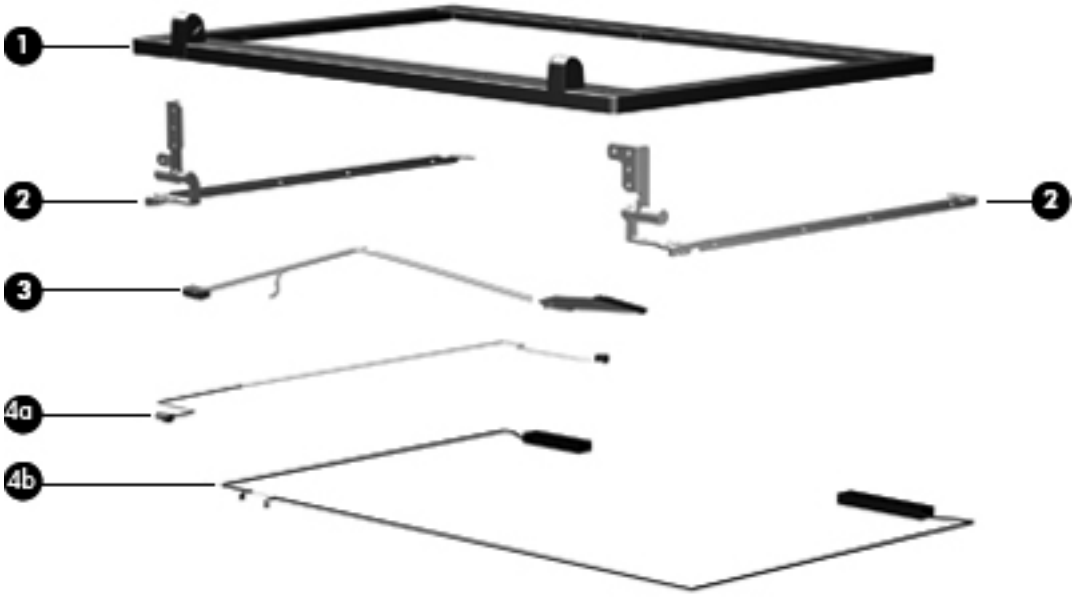
(Continued)

Item	Description	Spare part number
(6)	**Modem module**	510100-001
	✎ The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 536538-001.	
	Cable Kit, includes:	536538-001
(7a)	Modem module cable (includes RJ-11 connector)	
(7b)	Network cable (includes RJ-45 connector)	
(7c)	Power connector cable	
(7d)	USB board and cable	
	✎ See "Cable Kit" on page 3-7 for more Cable Kit spare part information.	
	Plastics Kit, includes:	535780-001
(8a)	Palm rest (includes TouchPad and TouchPad cable)	
(8b)	RTC battery	
(8c)	Optical drive space saver	
	✎ See "Plastics Kit" on page 3-9 for more Plastics Kit spare part information.	
(9)	**Solid-state module** (includes bracket):	
	■ 2-GB	578184-001
	■ 1-GB	578183-001
(10)	**WLAN module:**	
	■ Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504664-001
	■ Broadcom 4322AGN 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, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504664-002

(Continued)

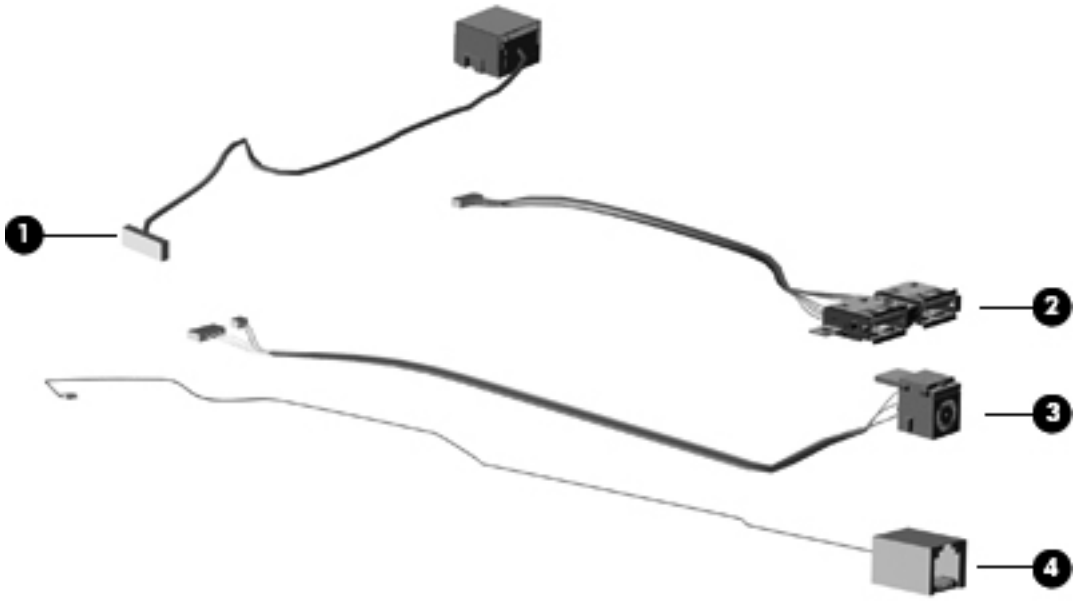
Item	Description	Spare part number
(10)	**WLAN module** *(continued)*	
	■ Broadcom 4312G 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
	■ Broadcom 4312G 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004
(11)	**Fan** (includes replacement thermal material)	535766-001
(12)	**Heat sink** (includes replacement thermal material)	535859-001
(13)	**Memory modules:**	
	■ 2048-MB (800-MHz, DDR2)	578182-001
	■ 1024-MB (800-MHz, DDR2)	578181-001
(14)	**Intel Celeron 575 2.00-GHz processor** (1-MB L2 cache, 667-MHz FSB; includes replacement thermal material)	537010-001
(15)	**Power button board** (includes cable)	574514-001
(16)	**System board** (includes replacement thermal material)	578179-001
(17)	**6-cell, 2.20-Ah (47-Wh) Li-ion battery**	535806-001
(18)	**Base enclosure** (includes 4 rubber feet)	535863-001
	Rubber Feet Kit (not illustrated, includes 4 rubber feet)	535793-001
(19)	**DVD-ROM drive** (includes bezel and bracket)	578185-001

Display subcomponents



Item	Description	Spare part number
(1)	**Display bezel**	536422-001
(2)	**Display hinges (2)**	535871-001
(3)	**Display panel cable**	536429-001
	Display Cable Kit, includes:	536430-001
(4a)	Microphone receiver and cable	
(4b)	Wireless antenna cable	

Cable Kit



Item	Description	Spare part number
	Cable Kit:	536538-001
(1)	Network cable (includes RJ-45 connector)	
(2)	USB board (includes cable)	
(3)	Power connector cable	
(4)	Modem module cable (includes RJ-11 connector)	

Mass storage devices

Item	Description	Spare part number
(1)	**Solid-state module** (includes bracket):	
	■ 2-GB	578184-001
	■ 1-GB	578183-001
(2)	**DVD-ROM drive** (includes bezel and bracket)	578185-001

Plastics Kit

Item	Description	Spare part number
	Plastics Kit:	535780-001
(1)	Optical drive space saver	
(2)	RTC battery	
(3)	Palm rest (includes TouchPad and TouchPad cable)	

Miscellaneous parts

Description	Spare part number
65-W PFC HP Smart Adapter	463958-001
Power cords:	
■ For use in Argentina	490371-D01
■ For use in Australia	490371-011
■ For use in Brazil	490371-201
■ For use in Europe, the Middle East, and Africa	490371-021
■ For use in India	490371-D61
■ For use in Israel	490371-BB1
■ For use in Italy	490371-061
■ For use in Japan	490371-291
■ For use in the People's Republic of China	490371-AA1
■ For use in South Africa	490371-AR1
■ For use in South Korea	490371-AD1
■ For use in Switzerland	490371-111
■ For use in Taiwan	490371-AB1
■ For use in the United Kingdom and Singapore	490371-031
■ For use in the United States	490371-001
Screw Kit:	535870-001
■ Phillips PM2.5×11.0 captive screws	
■ Phillips PM2.5×9.0 screws	
■ Phillips PM2.5×9.0 captive screws	
■ Phillips PM2.5×6.0 screws	
■ Phillips PM2.5×5.0 screws	
■ Phillips PM2.5×3.0 screws	
■ Phillips PM2.5×3.0 broadhead screws	
■ Phillips PM2.0×7.0 screws	
■ Phillips PM2.0×5.0 screws	
■ Phillips PM2.0×3.0 screws	
■ Torx T8M2.5×8.0 screws	
■ Torx T8M2.5×6.0 screws	

Sequential part number listing

Spare part number	Description
463958-001	65-W PFC HP Smart Adapter
490371-001	Power cord for use in the United States
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
504593-003	Broadcom 4312G 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands
504593-004	Broadcom 4312G 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe

(Continued)

Spare part number	Description
504664-001	Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands
504664-002	Broadcom 4322AGN 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, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
510100-001	Modem module ✎ The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 536538-001.
535766-001	Fan (includes replacement thermal material)
535780-001	Plastics Kit ✎ See “Plastics Kit” on page 3-9 for more Plastics Kit spare part information.
535793-001	Rubber Feet Kit (includes 4 rubber feet)
535806-001	6-cell, 2.20-Ah (47-Wh) Li-ion battery
535859-001	Heat sink (includes replacement thermal material)
535860-001	Switch cover
535863-001	Base enclosure (includes 4 rubber feet)
535865-001	Top cover
535870-001	Screw Kit
535871-001	Display hinges
536410-001	Keyboard for use in the United States
536410-041	Keyboard for use in Germany

(Continued)

Spare part number	Description
536410-051	Keyboard for use in France
536410-061	Keyboard for use in Italy
536410-071	Keyboard for use in Spain
536410-081	Keyboard for use in Denmark
536410-091	Keyboard for use in Norway
536410-121	Keyboard for use in French Canada
536410-131	Keyboard for use in Portugal
536410-141	Keyboard for use in Turkey
536410-161	Keyboard for use in Latin America
536410-201	Keyboard for use in Brazil
536410-211	Keyboard for use in Hungary
536410-221	Keyboard for use in the Czech Republic
536410-231	Keyboard for use in Slovakia
536410-251	Keyboard for use in Russia
536410-261	Keyboard for use in Bulgaria
536410-281	Keyboard for use in Thailand
536410-291	Keyboard for use in Japan
536410-AB1	Keyboard for use in Taiwan
536410-AD1	Keyboard for use in South Korea
536410-B31	Keyboard for use in the Netherlands
536410-B71	Keyboard for use in Sweden and Finland
536410-BB1	Keyboard for use in Israel
536410-BG1	Keyboard for use in Switzerland
536410-DD1	Keyboard for use in Iceland
536410-DJ1	Keyboard for use in Greece
536420-001	Speakers
536422-001	Display bezel
536429-001	Display panel cable
536430-001	Display Cable Kit (includes microphone receiver and cable, and wireless antenna cable)
536538-001	Cable Kit ✎ See “Cable Kit” on page 3-7 for more Cable Kit spare part information.

(Continued)

Spare part number	Description
537010-001	Intel Celeron 575 2.00-GHz processor (1-MB L2 cache, 667-MHz FSB; includes replacement thermal material)
574514-001	Power button board (includes cable)
578179-001	System board (includes replacement thermal material)
578180-001	14.1-in, SVA, HD, LED display assembly (includes webcam module and cable, microphone and cable, 2 WLAN antenna transceivers and cables, nameplate, and logo)
578181-001	1024-MB memory module (800-MHz, DDR2)
578182-001	2048-MB memory module (800-MHz, DDR2)
578183-001	1-GB solid-state module (includes bracket)
578184-001	2-GB solid-state module (includes bracket)
578185-001	DVD-ROM drive (includes bezel and bracket)

4

Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

- Flat-bladed screwdriver
- Phillips P0 and P1 screwdrivers
- Torx T8 screwdriver

Service considerations

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

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 solid-state module or optical drive, shut down the computer.
- Before handling a solid-state module or optical drive, be sure that you are discharged of static electricity. While handling a solid-state module or optical drive, avoid touching the connector.
- Before removing an optical drive, be sure that a disc is not in the drive, and be sure that the optical drive tray is closed.
- Handle solid-state modules or optical drives on surfaces covered with at least one inch of shock-proof foam.
- Avoid dropping solid-state modules or optical drives from any height onto any surface.
- After removing a solid-state module or optical drive, place it in a static-proof bag.
- Avoid exposing a solid-state module to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a solid-state module or optical drive to temperature extremes or liquids.
- If a solid-state module or optical drive must be mailed, place the solid-state module or optical 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 may work perfectly throughout a normal cycle. Or, the device may function normally for a while, and then degrade in the internal layers, reducing its life expectancy.

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

- Keep components in their electrostatic-safe containers until you are ready to install them.
- Use nonmagnetic tools.
- Before touching an electronic component, discharge static electricity by using the guidelines described in this section.
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- If you remove a component, place it in an electrostatic-safe container.

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until they arrive at static-free workstations.
- Place items on a grounded surface before removing them 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 workstation grounding guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

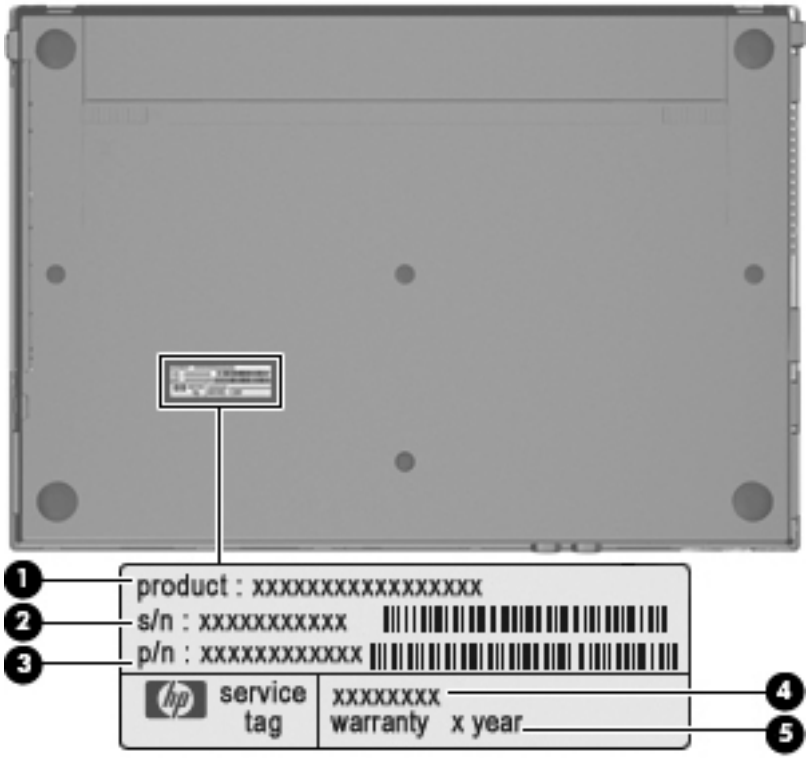
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 84 screws, in 12 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

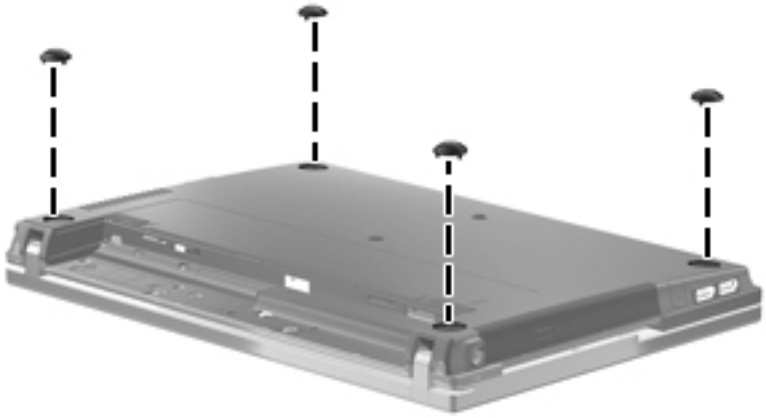
When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



Item	Component	Description
(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 determine what components and parts are needed.
(4)	Model description	This is the alphanumeric identifier 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

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 535793-001. There are 4 rubber feet that attach to the base enclosure in the locations shown in the following illustration.



Battery

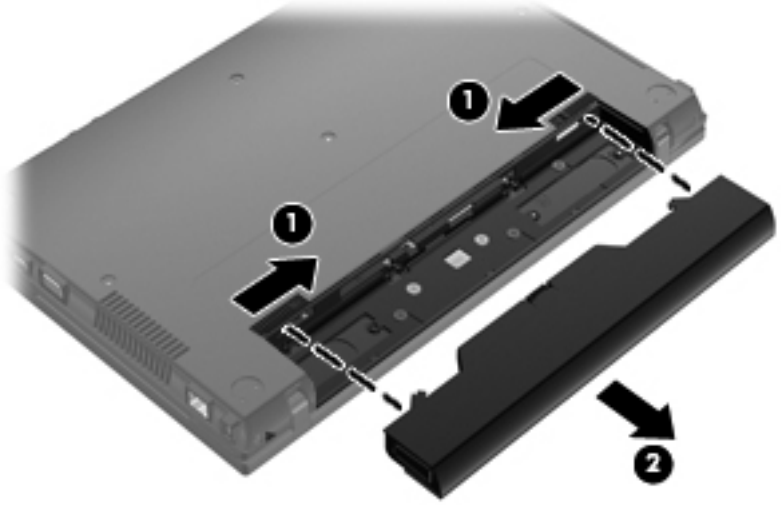
Description	Spare part number
6-cell, 2.20-Ah (47-Wh) Li-ion battery	535806-001

Before removing the battery, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latches ❶ to release the battery.
3. Remove the battery ❷.



Install the battery by inserting it into the battery bay until you hear a click.

Switch cover

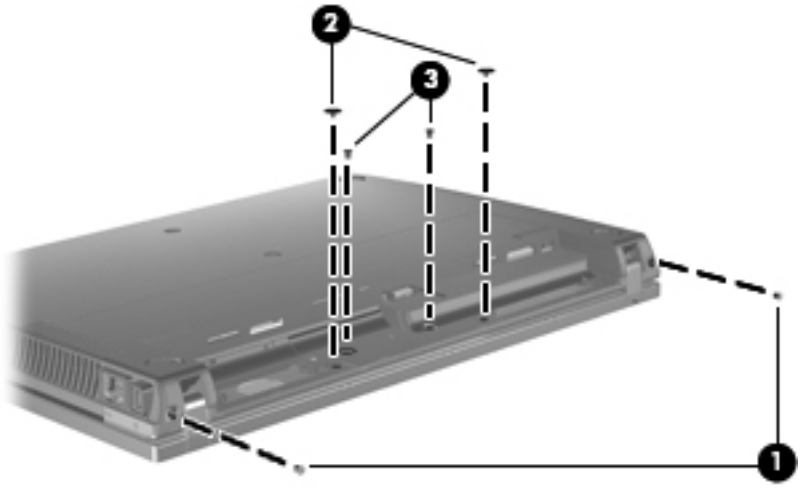
Description	Spare part number
Switch cover	535860-001

Before removing the switch cover, follow these steps:

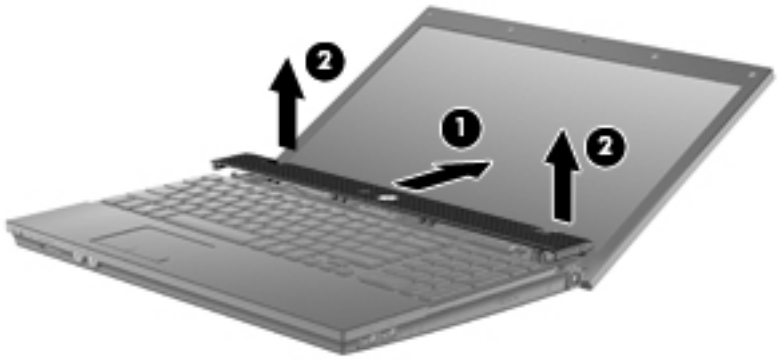
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).

Remove the switch cover:

1. Remove the following screws:
   - ❏ Two Phillips PM2.5×5.0 screws ❶
   - ❏ Two Phillips PM2.5×3.0 broadhead screws ❷
   - ❏ Two Phillips PM2.5×3.0 screws ❸



2. Turn the computer display-side up with the front toward you.
3. Open the computer as far as possible.
4. Slide the switch cover ❶ back, and then remove it ❷.



Reverse this procedure to install the switch cover.

Keyboard

For use in country or region:	Spare part number	For use in country or region:	Spare part number
■ Brazil	536410-201	■ The Netherlands	536410-B31
■ Bulgaria	536410-261	■ Norway	536410-091
■ The Czech Republic	536410-221	■ Portugal	536410-131
■ Denmark	536410-081	■ Russia	536410-251
■ France	536410-051	■ Slovakia	536410-231
■ French Canada	536410-121	■ South Korea	536410-AD1
■ Germany	536410-041	■ Spain	536410-071
■ Greece	536410-DJ1	■ Sweden and Finland	536410-B71
■ Hungary	536410-211	■ Switzerland	536410-BG1
■ Iceland	536410-DD1	■ Taiwan	536410-AB1
■ Israel	536410-BB1	■ Thailand	536410-281
■ Italy	536410-061	■ Turkey	536410-141
■ Japan	536410-291	■ The United States	536410-001
■ Latin America	536410-161		

Before removing the keyboard, follow these steps:

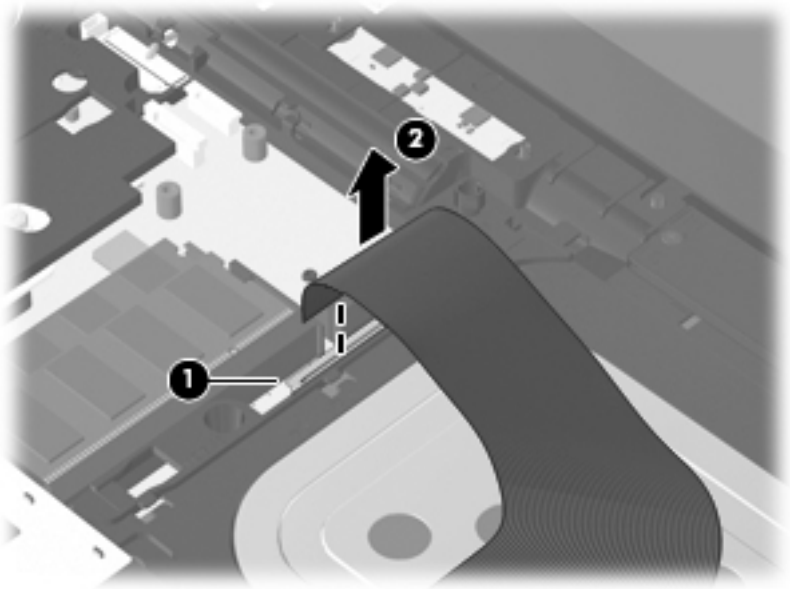
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the switch cover (see “Switch cover” on page 4-8).

Remove the keyboard:

1. Remove the three Phillips PM2.5×5.0 screws that secure the keyboard to the computer.

2. Slide the keyboard ❶ toward the display.
3. Lift the keyboard ❷ until it rests just above the computer.
4. Swing the left side of the keyboard ❸ up and to the right until it rests upside down next to the computer.

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



6. Remove the keyboard.

Reverse this procedure to install the keyboard.

Memory module

Description	Spare part number
■ 2048-MB memory module (800-MHz, DDR2)	578182-001
■ 1024-MB memory module (800-MHz, DDR2)	578181-001

Before removing the memory module, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the switch cover (see "Switch cover" on page 4-8).
6. Remove the keyboard (see "Keyboard" on page 4-9).

Remove the memory module:

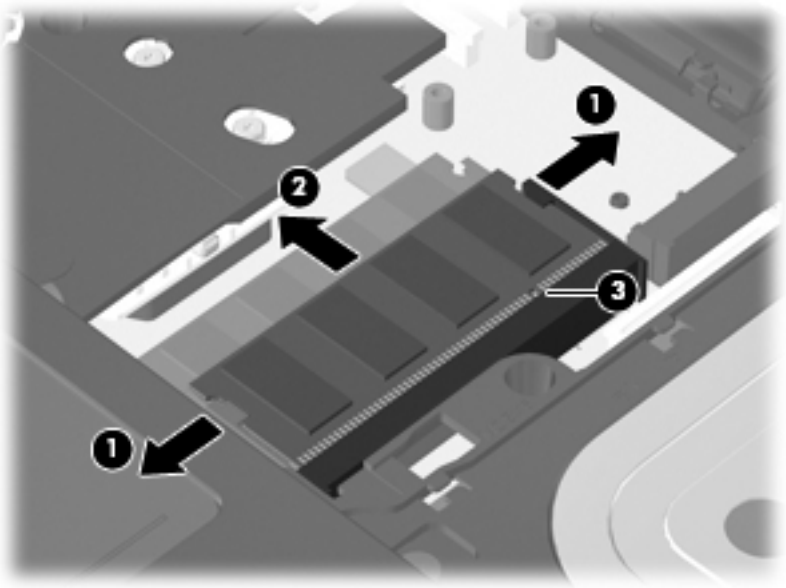
The top memory module slot is for expansion memory, and the bottom slot is for primary memory.

1. Pull away the retention clips ❶ on each side of the memory module to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

CAUTION: To prevent damage to the memory module, hold it by the edges only. Do not touch the components on the memory module.

2. Grasp the edge of the memory module ❷, and gently pull it out of the memory module slot.

   Memory modules are designed with a notch ❸ to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a memory module.

Optical drive

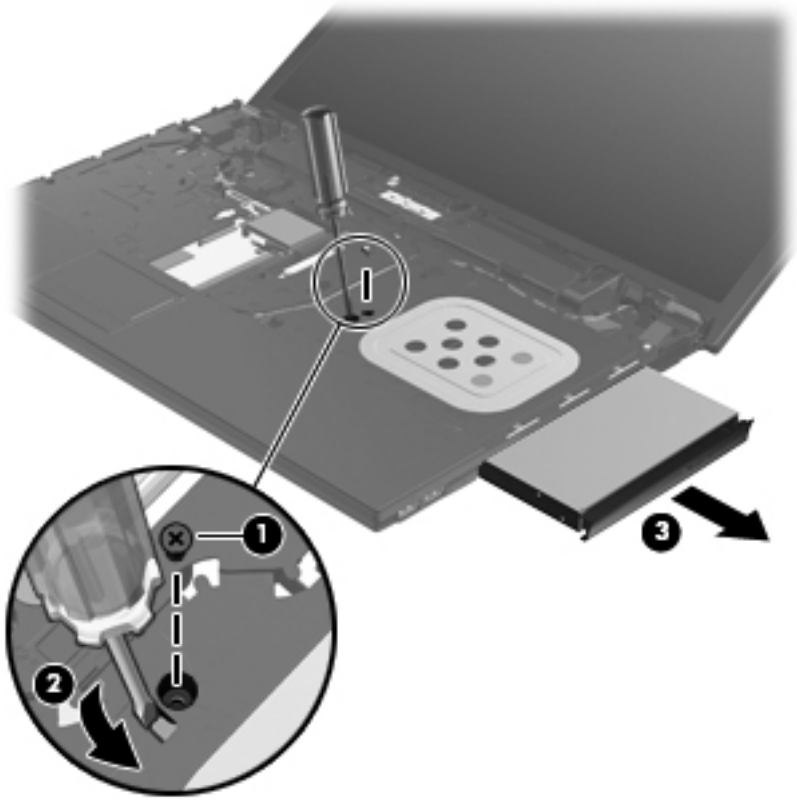
Description	Spare part number
DVD-ROM drive (includes bezel and bracket)	578185-001

Before removing the optical drive, follow these steps:

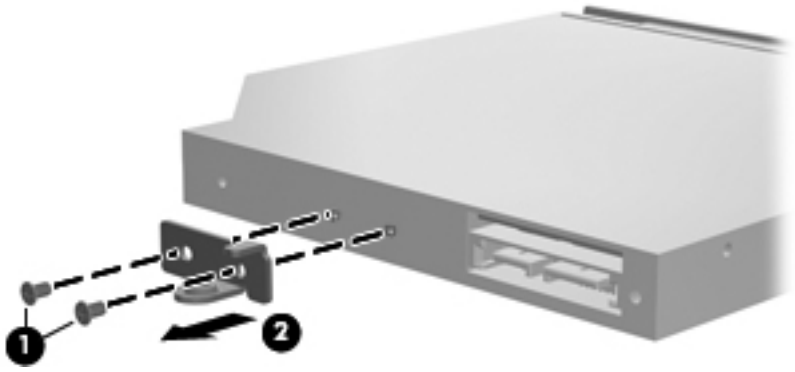
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the switch cover (see "Switch cover" on page 4-8).
6. Remove the keyboard (see "Keyboard" on page 4-9).

Remove the optical drive:

1. Position the computer with the right side toward you.
2. Remove the Phillips PM2.5×6.0 screw ❶ that secures the optical drive to the computer.
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access ❷, and then press the tab to the right to release the optical drive from the computer.
4. Remove the optical drive ❸ from the optical drive bay.



5. If it is necessary to replace the optical drive bracket, follow these steps:
   a. Position the optical drive with the rear toward you.
   b. Remove the two Phillips PM2.0×3.0 screws ❶ that secure the optical drive bracket to the optical drive.
   c. Remove the optical drive bracket ❷.



Reverse this procedure to reassemble and install the optical drive.

Speakers

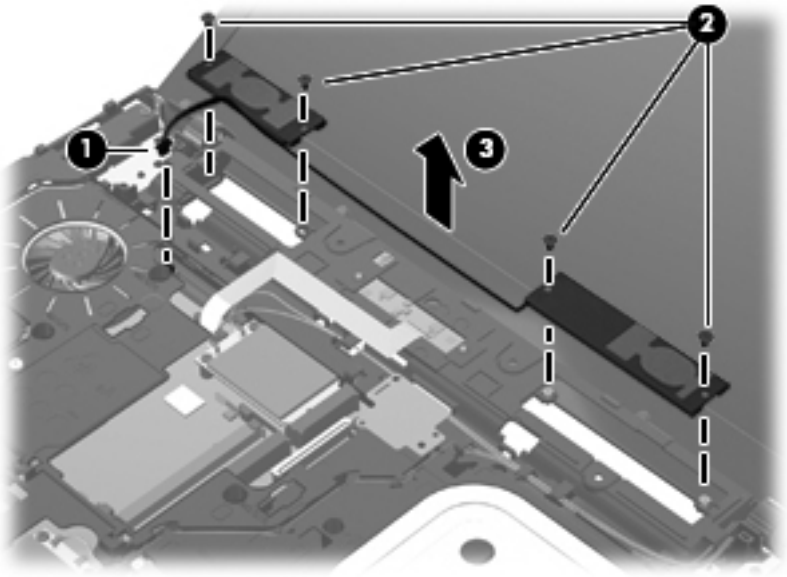
Description	Spare part number
Speakers	536420-001

Before removing the speakers, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the switch cover (see "Switch cover" on page 4-8).
6. Remove the keyboard (see "Keyboard" on page 4-9).

Remove the speakers:

1. Disconnect the speaker cable ❶ from the system board.
2. Remove the four Phillips PM2.5×3.0 screws ❷ that secure the speakers to the base enclosure.
3. Remove the speakers ❸.



Reverse this procedure to install the speakers.

Palm rest

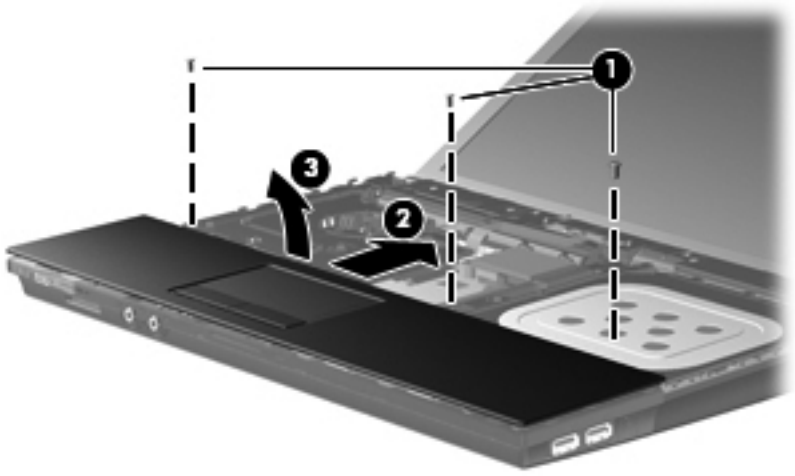
The palm rest is included in the Plastics Kit, spare part number 535780-001. The palm rest includes the TouchPad and TouchPad cable.

Before removing the palm rest, follow these steps:

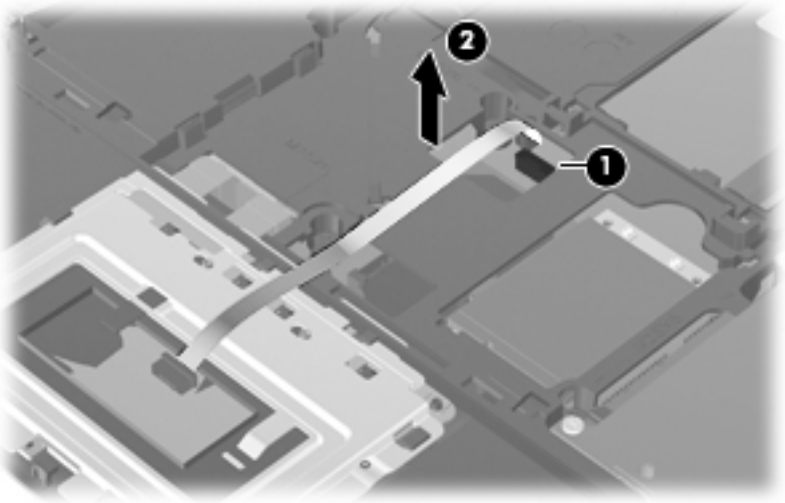
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the switch cover (see "Switch cover" on page 4-8).
6. Remove the keyboard (see "Keyboard" on page 4-9).

Remove the palm rest:

1. Remove the three Phillips PM2.5×3.0 broadhead screws ❶ that secure the palm rest to the top cover.
2. Slide the palm rest ❷ toward the display, and then lift the palm rest ❸ as far as the TouchPad cable allows.



3. Release the ZIF connector ❶ to which the TouchPad cable is attached, and then disconnect the TouchPad cable ❷ from the system board.



Reverse this procedure to install the palm rest.

WLAN module

Description	Spare part number
Broadcom 4322AGN 802.11a/b/g/n WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504664-001
Broadcom 4322AGN 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, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504664-002
Broadcom 4312G 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the United States, and the U.S. Virgin Islands	504593-003
Broadcom 4312G 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-004

Before removing the WLAN module, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Palm rest (see "Palm rest" on page 4-16)

Remove the WLAN module:

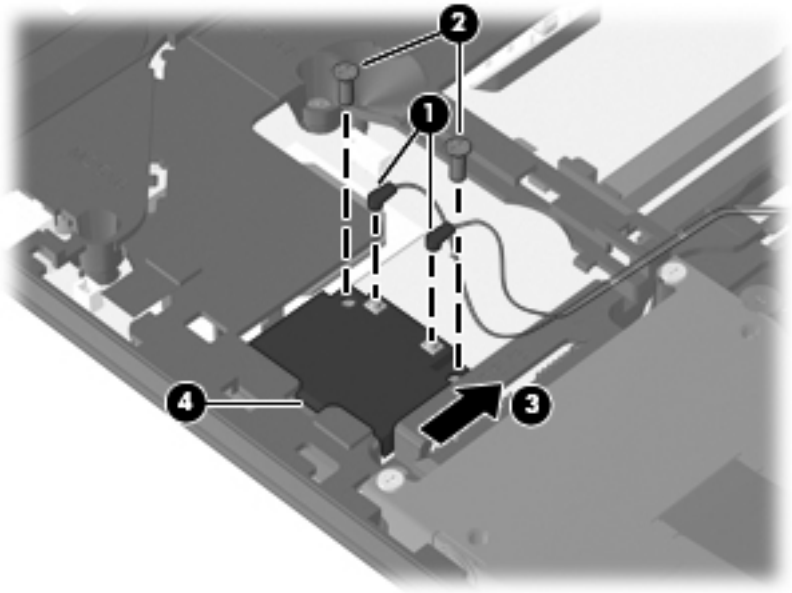
CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

1. Disconnect the WLAN antenna cables ❶ from the terminals on the WLAN module.

   ✎ The black WLAN antenna cable is connected to the WLAN module "Main" terminal. The white WLAN antenna cable is connected to the WLAN module "Aux" terminal.

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

   ✎ WLAN modules are designed with a notch ❹ to prevent incorrect insertion of the WLAN module into the WLAN module slot.



Reverse this procedure to install the WLAN module.

Solid-state module

The solid-state module spare part kit includes a solid-state bracket.

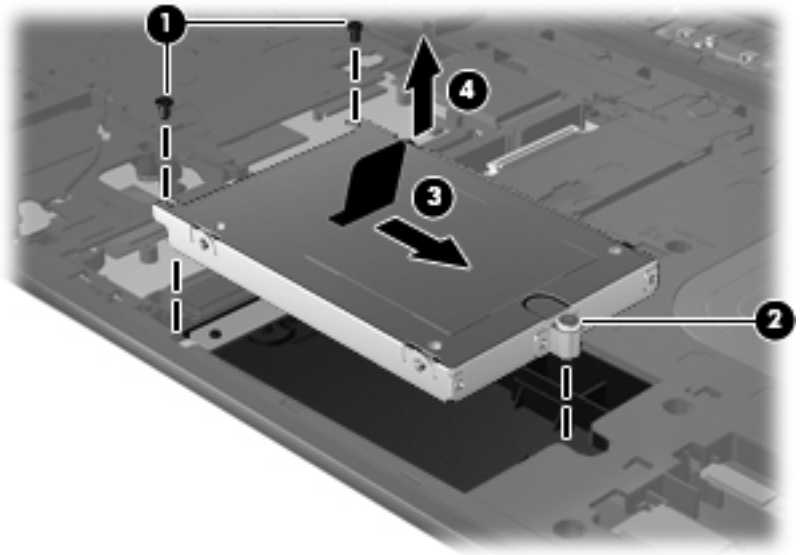
Description	Spare part number
■ 2-GB solid-state module	578184-001
■ 1-GB solid-state module	578183-001

Before removing the solid-state module, follow these steps:

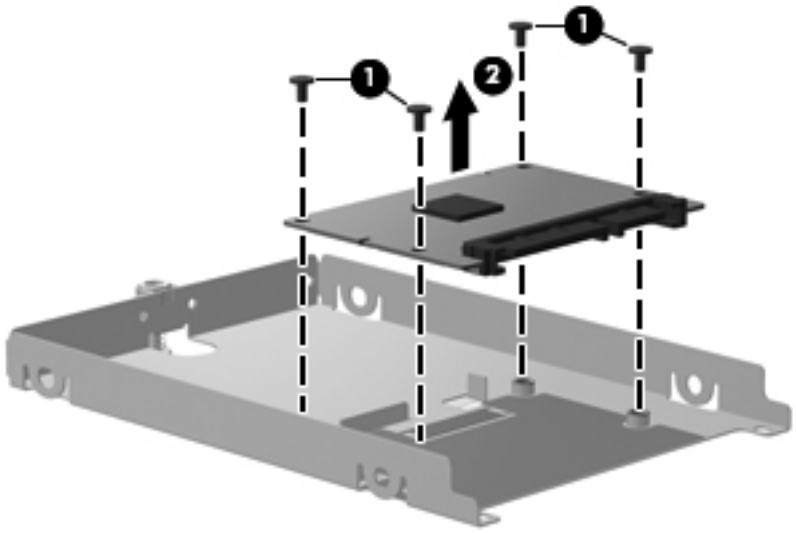
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Palm rest (see "Palm rest" on page 4-16)

Remove the solid-state module:

1. Remove the two Phillips PM2.0×5.0 screws ❶ that secure the solid-state module cover to the computer.
2. Loosen the Phillips PM2.5×11.0 captive screw ❷ that secures the solid-state module cover to the computer.
3. Grasp the Mylar tab on the solid-state module, and slide the solid-state module ❸ to the right to disconnect it from the system board.
4. Remove the solid-state module ❹.



5. If it is necessary to replace the solid-state module bracket, follow these steps:
   a. Turn the solid-state module upside down.
   b. Remove the four Phillips PM2.0×7.0 screws ❶ that secure the solid-state module to the bracket.
   c. Lift the solid-state module ❷ straight up to remove it from the bracket.



Reverse this procedure to reassemble and install the solid-state module.

Top cover

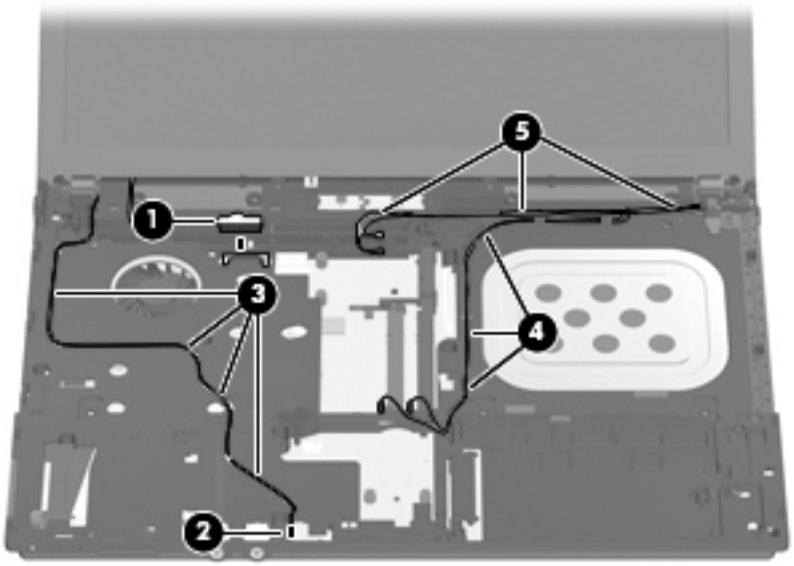
Description	Spare part number
Top cover	535865-001

Before removing the top cover, follow these steps:

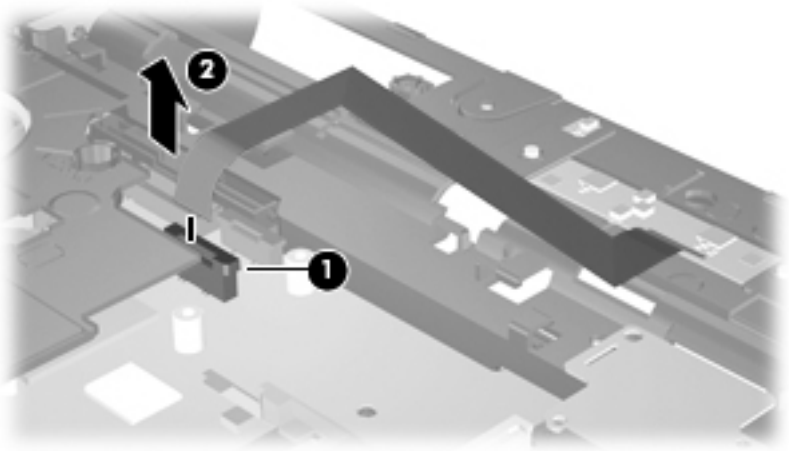
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the following components:
   a. Switch cover (see “Switch cover” on page 4-8)
   b. Keyboard (see “Keyboard” on page 4-9)
   c. Optical drive (see “Optical drive” on page 4-13)
   d. Speakers (see “Speakers” on page 4-15)
   e. Palm rest (see “Palm rest” on page 4-16)
   f. Solid-state module (see “Solid-state module” on page 4-20)

Remove the top cover:

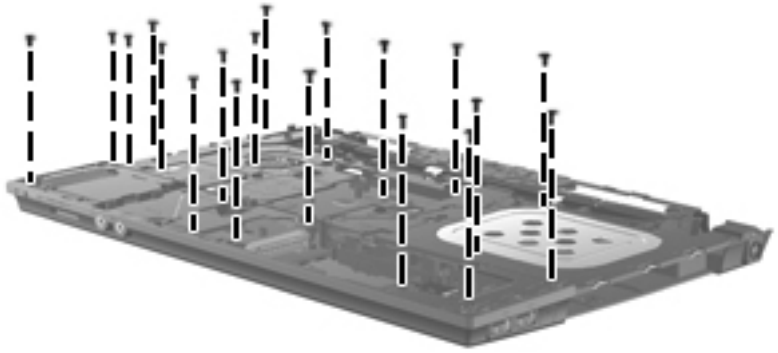
1. Disconnect the display panel cable ❶ from the system board.
2. Disconnect the microphone cable ❷ from the system board, and then release the microphone cable from the clips ❸ and routing channel built into the top cover.
3. Release the wireless antenna cables from the clips ❹ and routing channel built into the top cover.



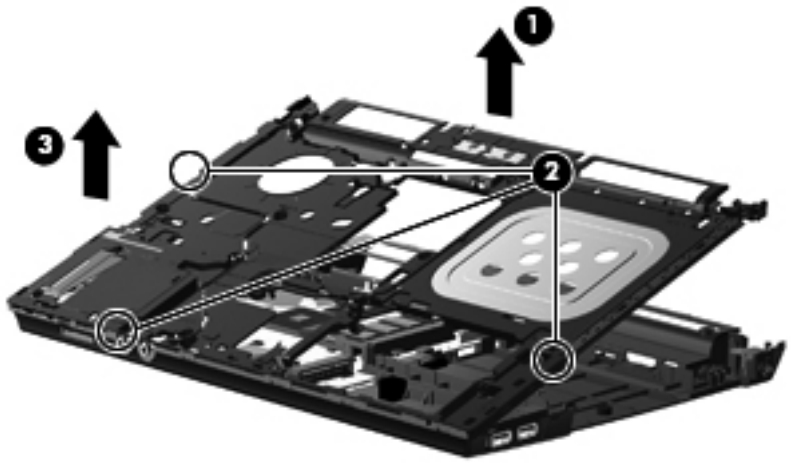
4. Release the ZIF connector ❶ to which the power button board cable is attached, and then disconnect the power button board cable ❷ from the system board.



5. Remove the 19 Torx T8M2.5×8.0 screws that secure the top cover to the base enclosure.



6. Lift the rear edge of the top cover ❶ until it disengages from the base enclosure. Callout ❷ identifies the locations where the top cover more securely connects to the base enclosure. If necessary, apply additional upward and outward pressure at these points to disengage the top cover.
7. Remove the top cover ❸.



Reverse this procedure to install the top cover.

Modem module

The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 536538-001. See "Modem module cable" on page 4-28 for modem module cable removal information.

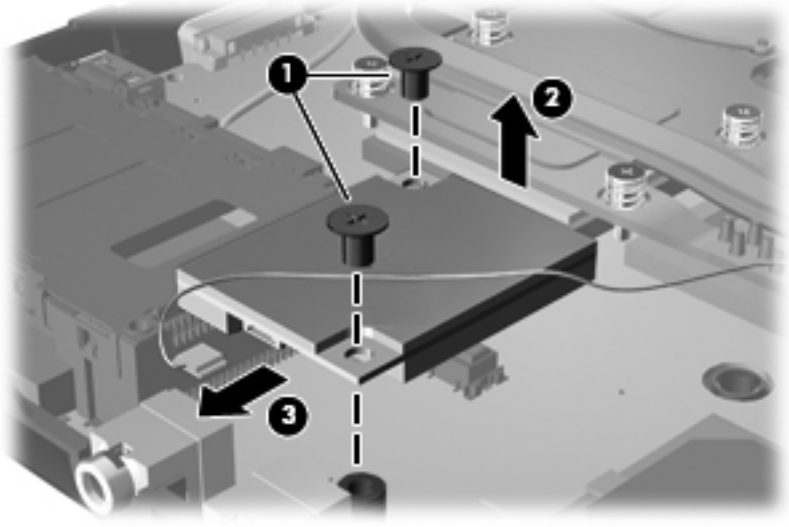
Description	Spare part number
Modem module	510100-001

Before removing the modem module, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)

Remove the modem module:

1. Remove the two Phillips PM2.5×3.0 screws ❶ that secure the modem module to the system board.
2. Lift the modem module ❷ away from the system board to disconnect it.
3. Disconnect the modem module cable ❸ from the modem module.



4. Remove the fingerprint modem module.

Reverse this procedure to install the modem module.

RTC battery

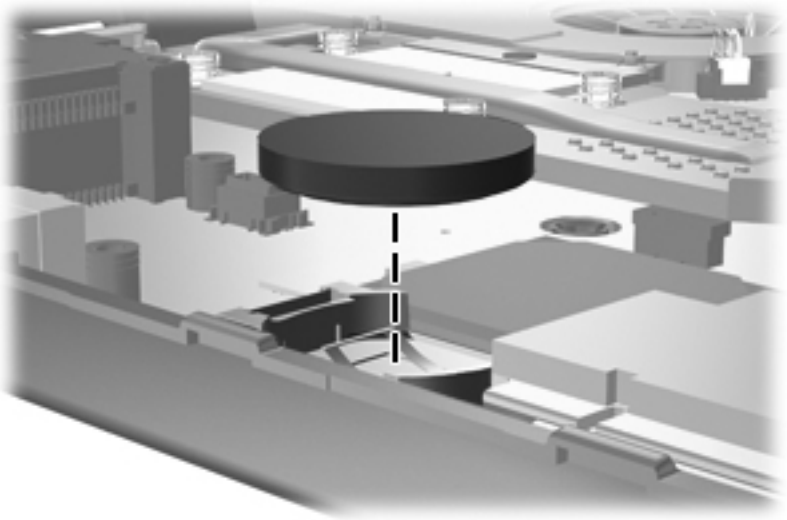
The RTC battery is included in the Plastics Kit, spare part number 535780-001.

Before removing the RTC battery, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)

Remove the RTC battery:

» Remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery.

USB board

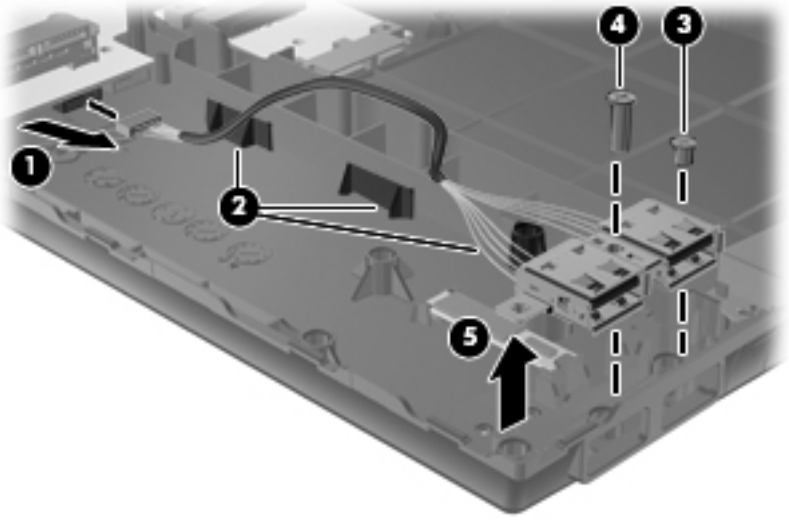
The USB board and cable are included in the Cable Kit, spare part number 536538-001.

Before removing the USB board and cable, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)

Remove the USB board and cable:

1. Disconnect the USB board cable ❶ from the system board.
2. Release the USB board cable from the clips ❷ built into the base enclosure.
3. Remove the Phillips PM2.5×3.0 screw ❸ and the Phillips PM2.5×9.0 screw ❹ that secure the USB board to the base enclosure.
4. Remove the USB board and cable ❺.



Reverse this procedure to install the USB board and cable.

Modem module cable

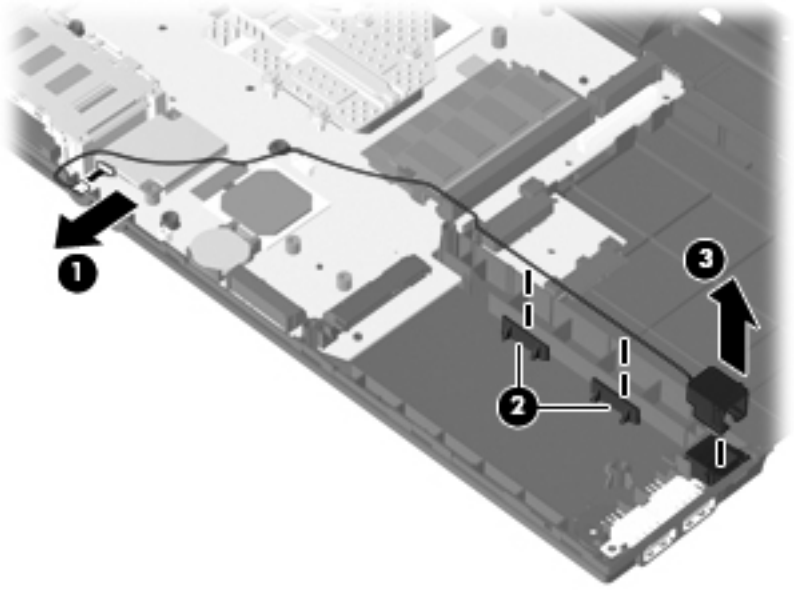
The modem module cable is included in the Cable Kit, spare part number 536538-001.

Before removing the modem module cable, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)

Remove the modem module cable:

1. Disconnect the modem module cable ❶ from the modem module.
2. Release the modem module cable ❷ from the clips built into the base enclosure.
3. Release the RJ-11 connector ❸ from the clip built into the base enclosure.



4. Remove the modem module cable.

Reverse this procedure to install the modem module cable.

Heat sink

The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
Heat sink	535859-001

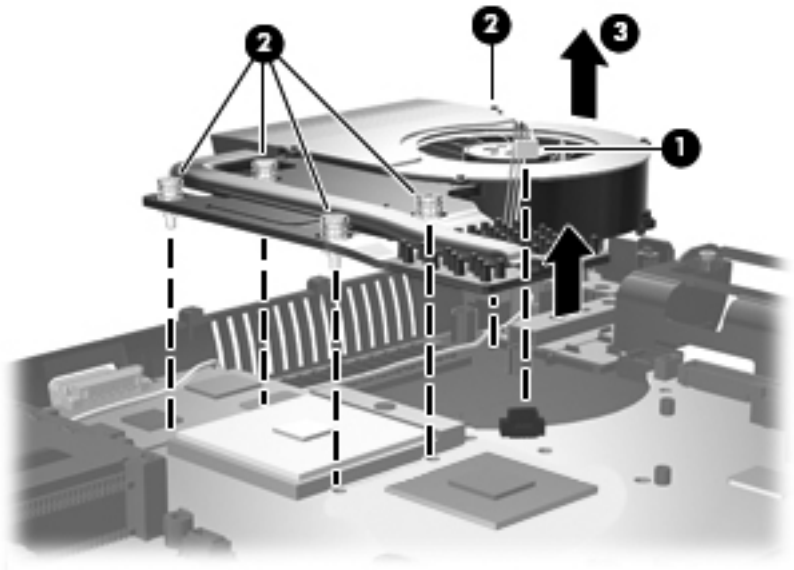
Before removing the heat sink, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)

Remove the heat sink:

1. Disconnect the fan cable ❶ from the system board.
2. Following the sequence stamped into the heat sink, loosen the five Phillips PM2.5×9.0 captive screws ❷ that secure the heat sink to the system board.
3. Remove the heat sink ❸.

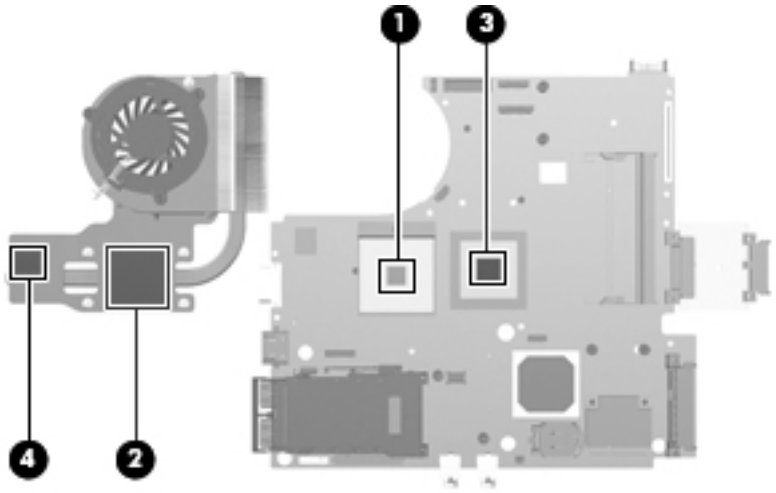
Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the heat sink from side to side to detach it.



The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed:

- Thermal paste is used on the processor ❶ and the heat sink section ❷ that services it.
- Thermal pads are used on the Northbridge chip ❸ and the heat sink section ❹ that services it.

Replacement thermal material is included with all system board, heat sink, and processor spare part kits.



When replacing the heat sink, be sure to remove the fan from the defective heat sink and install it on the replacement heat sink. See “Fan” on page 4-32 for fan removal instructions.

Reverse this procedure to install the heat sink.

Fan

The fan spare part kit includes replacement thermal material.

Description	Spare part number
Fan	535766-001

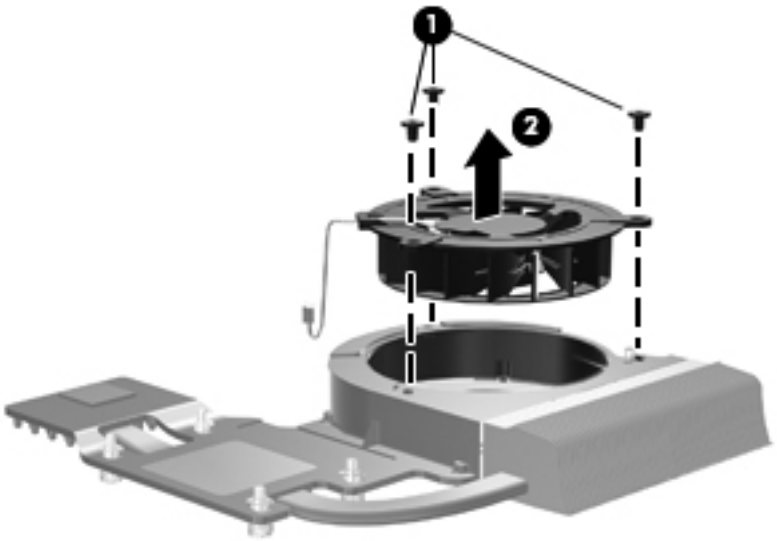
To properly ventilate the computer, allow at least 7.6 cm (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions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

Before removing the fan, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the following components:
   a. Switch cover (see “Switch cover” on page 4-8)
   b. Keyboard (see “Keyboard” on page 4-9)
   c. Optical drive (see “Optical drive” on page 4-13)
   d. Speakers (see “Speakers” on page 4-15)
   e. Palm rest (see “Palm rest” on page 4-16)
   f. Solid-state module (see “Solid-state module” on page 4-20)
   g. Top cover (see “Top cover” on page 4-22)
   h. Heat sink (see “Heat sink” on page 4-29)

Remove the fan:

1. Remove the three Phillips PM2.0×3.0 screws ❶ that secure the fan to the heat sink.
2. Remove the fan ❷.



Reverse this procedure to install the fan.

Processor

The processor spare part kit includes replacement thermal material.

Description	Spare part number
Intel Celeron 575 2.00-GHz processor (1-MB L2 cache, 667-MHz FSB)	537010-001

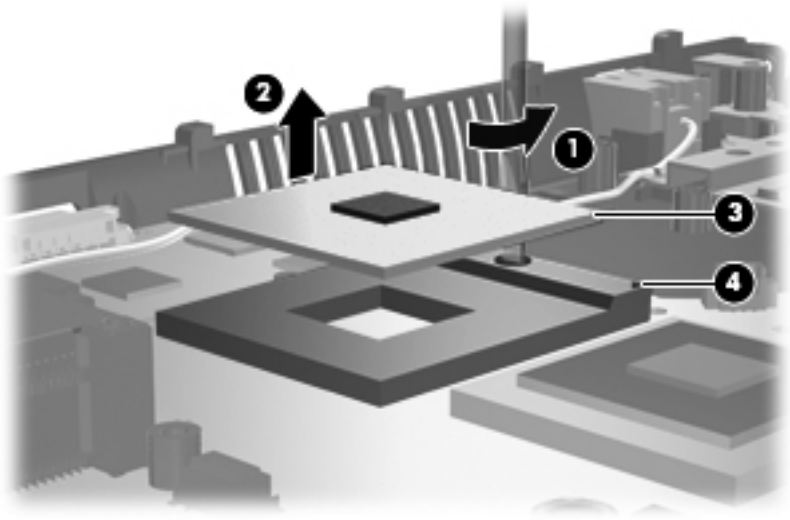
Before removing the processor, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the following components:
   a. Switch cover (see “Switch cover” on page 4-8)
   b. Keyboard (see “Keyboard” on page 4-9)
   c. Optical drive (see “Optical drive” on page 4-13)
   d. Speakers (see “Speakers” on page 4-15)
   e. Palm rest (see “Palm rest” on page 4-16)
   f. Solid-state module (see “Solid-state module” on page 4-20)
   g. Top cover (see “Top cover” on page 4-22)
   h. Heat sink (see “Heat sink” on page 4-29)

Remove the processor:

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

   ✎ When you install the processor, the gold triangle ❸ on the processor must be aligned with the triangle ❹ embossed on the processor socket.



Reverse this procedure to install the processor.

Power button board

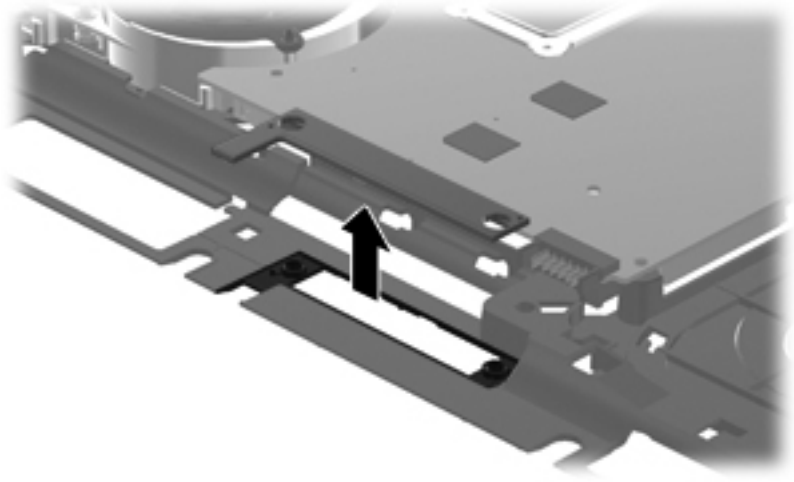
Description	Spare part number
Power button board (includes cable)	574514-001

Before removing the power button board and cable, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the following components:
   a. Switch cover (see “Switch cover” on page 4-8)
   b. Keyboard (see “Keyboard” on page 4-9)
   c. Optical drive (see “Optical drive” on page 4-13)
   d. Speakers (see “Speakers” on page 4-15)
   e. Palm rest (see “Palm rest” on page 4-16)
   f. Solid-state module (see “Solid-state module” on page 4-20)
   g. Top cover (see “Top cover” on page 4-22)

Remove the power button board and cable:

1. Detach the power button board from the base enclosure. The power button board is attached to the base enclosure with double-sided tape.



2. Remove the power button board and cable.

Reverse this procedure to install the power button board and cable.

Display assembly

Description	Spare part number
14.1-in, SVA, HD, LED display assembly (includes webcam module and cable, microphone and cable, 2 WLAN antenna transceivers and cables, nameplate, and logo)	578180-001

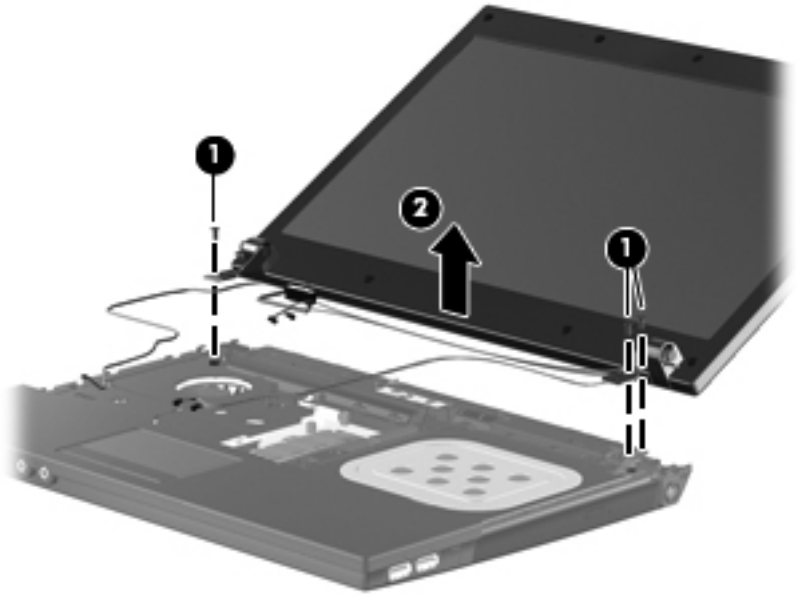
Before removing the display assembly, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)

Remove the display assembly:

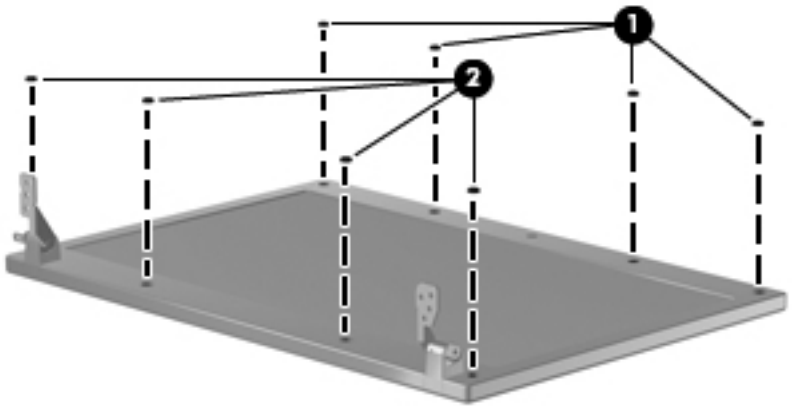
CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

1. Remove the three Phillips PM2.5×5.0 screws ❶ that secure the display assembly to the computer.
2. Lift the display assembly ❷ straight up and remove it.

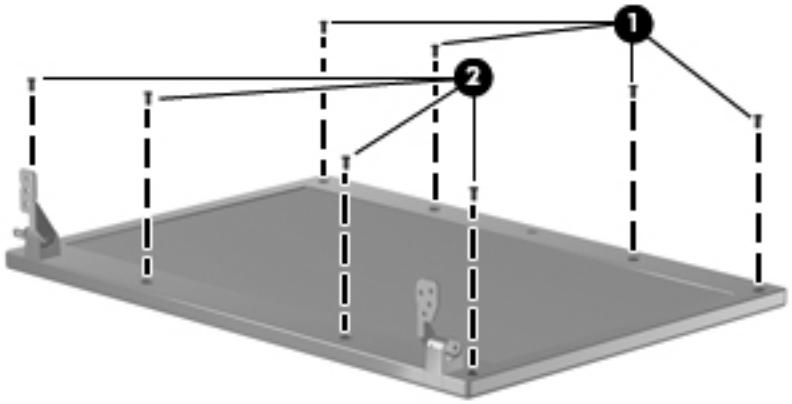


3. If it is necessary to replace the display bezel or any of the display assembly internal components:
   a. Remove the eight rubber screw covers ❶ and ❷.

   ✎ The rubber screw covers ❶ on the top edge of the display bezel are larger than the rubber screw covers ❷ on the bottom edge of the display bezel.

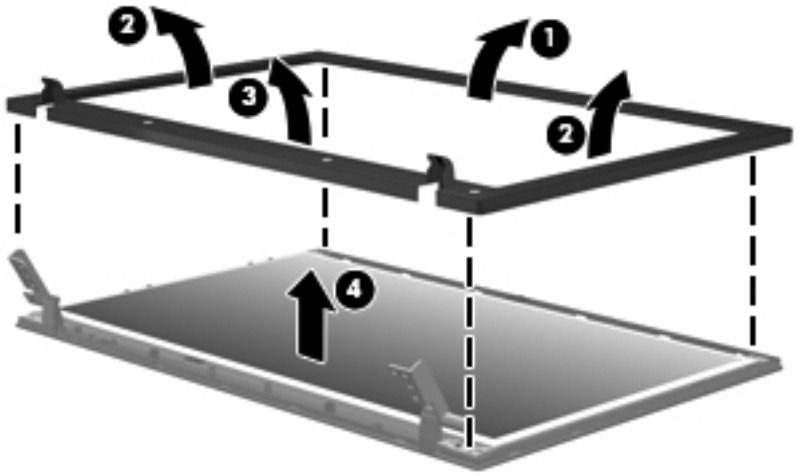


   b. Remove the four Torx T8M2.5×6.0 screws ❶ and the four Phillips PM2.5×5.0 screws ❷ that secure the display bezel to the display assembly.



c. Flex the inside edges of the top edge ❶, the left and right sides ❷, and the bottom edge ❸ of the display bezel until the bezel disengages from the display enclosure.

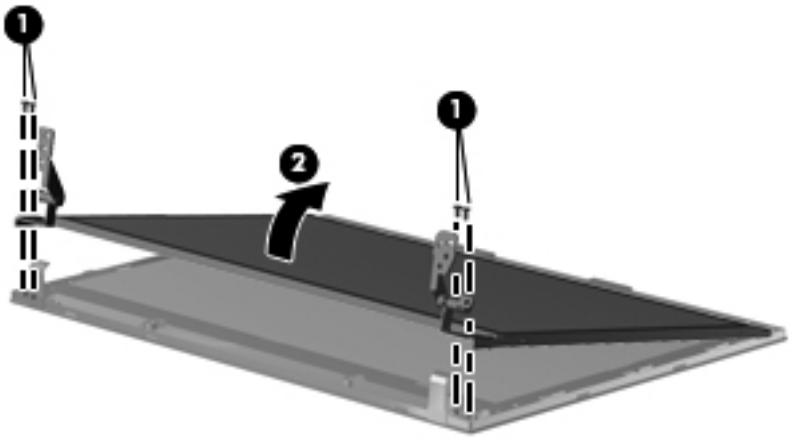
d. Remove the display bezel ❹.



4. If it is necessary to replace the display hinges:

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

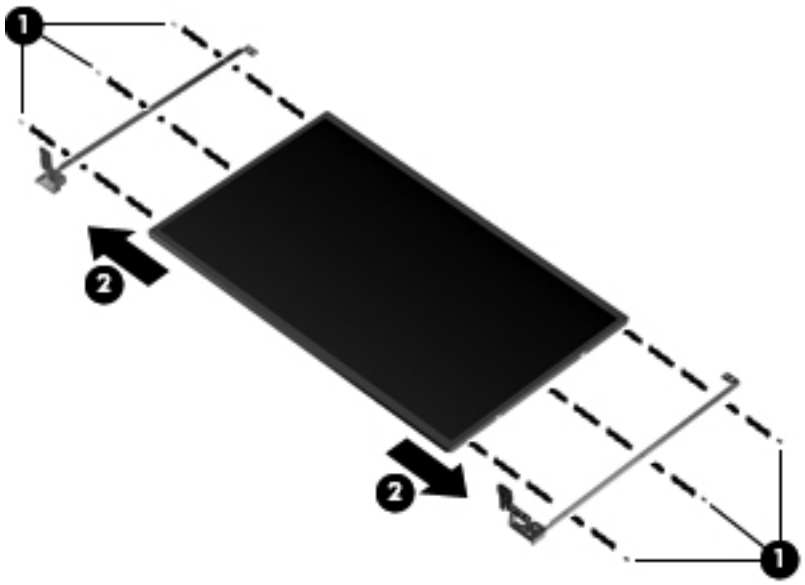
b. Release the display panel ❷ by lifting the bottom edge of the display panel.



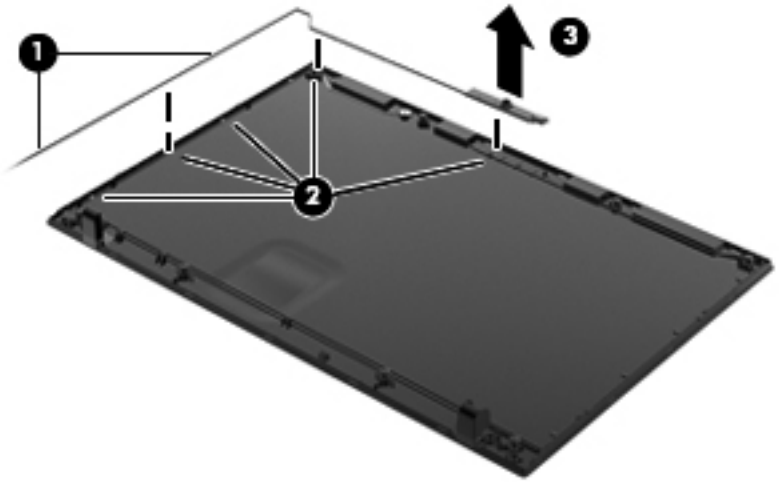
c. Remove the display panel from the display enclosure.

d. Remove the six Phillips PM2.0×3.0 screws ❶ that secure the display hinges to the display panel.

e. Remove the display hinges ❷ from the display panel. The display hinges are available using spare part number 535871-001.



5. If it is necessary to replace the webcam module cable, release the webcam module cable ❶ from the clips and routing channels ❷ built into the display enclosure, and then remove the cable ❸. The webcam module cable is included in the Display Cable Kit, spare part number 536430-001.



Reverse this procedure to reassemble and install the display assembly.

System board

The system board spare part kit includes replacement thermal material.

Description	Spare part number
System board	578179-001

Before removing the system board, follow these steps:

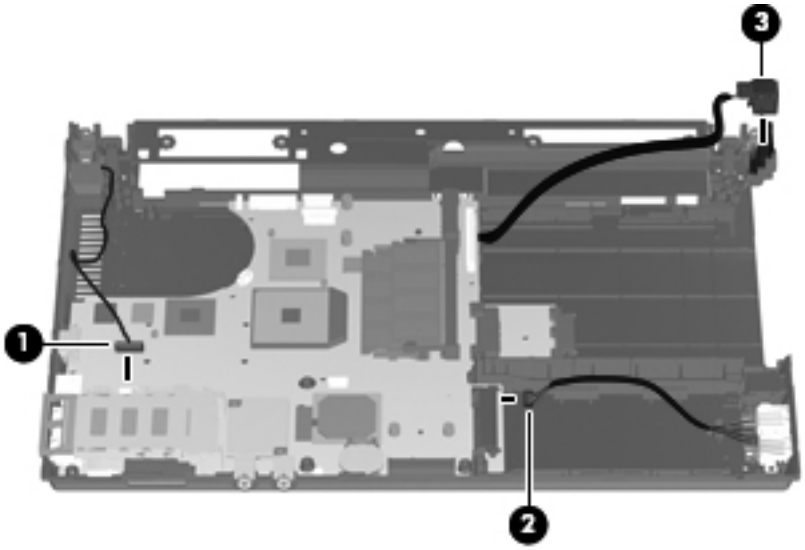
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)
   h. Heat sink (see "Heat sink" on page 4-29)
   i. Display assembly (see "Display assembly" on page 4-37)

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

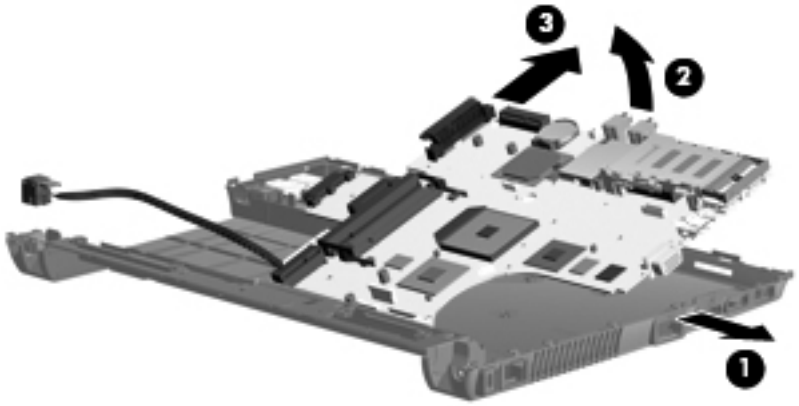
- Memory modules (see "Memory module" on page 4-12)
- WLAN module (see "WLAN module" on page 4-18)
- Modem module (see "Modem module" on page 4-24)
- RTC battery (see "RTC battery" on page 4-26)
- Processor (see "Processor" on page 4-34)
- Power connector cable (see "Power connector cable" on page 4-43)

Remove the system board:

1. Disconnect the network cable ❶ and the USB board cable ❷ from the system board.
2. Release the power connector ❸ from the clip built into the base enclosure.



3. Position the base enclosure with the rear toward you.
4. Flex the right side of the base enclosure ❶ outward until the USB connectors and the HDMI connector are clear of the openings in the base enclosure.
5. Lift the rear edge of the system board ❷ until it rests at an angle.
6. Remove the system board ❸ by sliding it back.



Reverse this procedure to install the system board.

Power connector cable

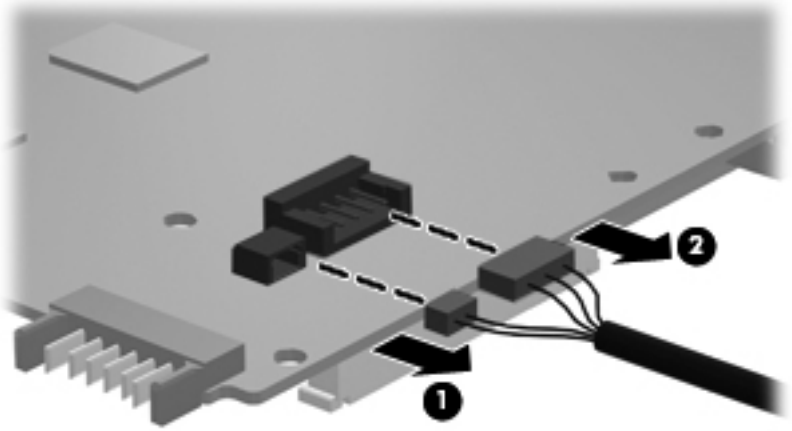
The power connector cable is included in the Cable Kit, spare part number 536538-001.

Before removing the power connector cable, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see "Battery" on page 4-7).
5. Remove the following components:
   a. Switch cover (see "Switch cover" on page 4-8)
   b. Keyboard (see "Keyboard" on page 4-9)
   c. Optical drive (see "Optical drive" on page 4-13)
   d. Speakers (see "Speakers" on page 4-15)
   e. Palm rest (see "Palm rest" on page 4-16)
   f. Solid-state module (see "Solid-state module" on page 4-20)
   g. Top cover (see "Top cover" on page 4-22)
   h. Heat sink (see "Heat sink" on page 4-29)
   i. Display assembly (see "Display assembly" on page 4-37)
   j. System board (see "System board" on page 4-41)

Remove the power connector cable:

1. Turn the system board upside down, with the power connector cable toward you.
2. Disconnect the power connector cables ❶ and ❷ from the system board.



3. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Network cable

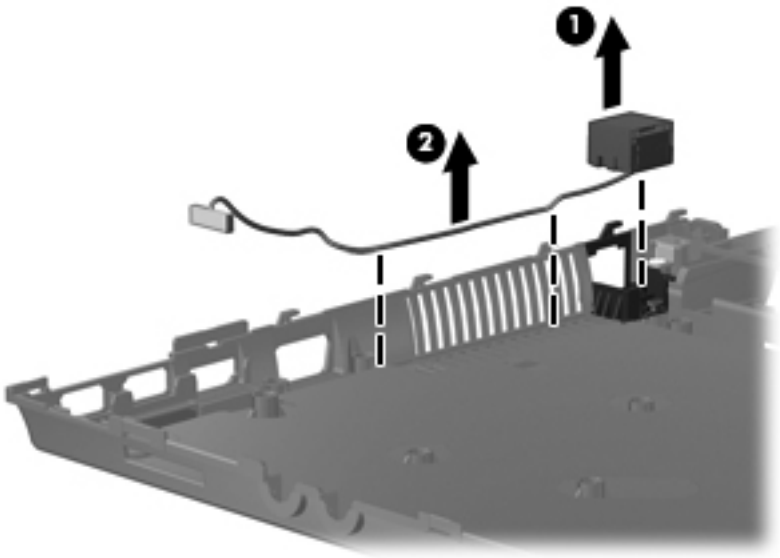
The network cable is included in the Cable Kit, spare part number 536538-001.

Before removing the network cable, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see “Battery” on page 4-7).
5. Remove the following components:
   a. Switch cover (see “Switch cover” on page 4-8)
   b. Keyboard (see “Keyboard” on page 4-9)
   c. Optical drive (see “Optical drive” on page 4-13)
   d. Speakers (see “Speakers” on page 4-15)
   e. Palm rest (see “Palm rest” on page 4-16)
   f. Solid-state module (see “Solid-state module” on page 4-20)
   g. Top cover (see “Top cover” on page 4-22)
   h. Heat sink (see “Heat sink” on page 4-29)
   i. Display assembly (see “Display assembly” on page 4-37)
   j. System board (see “System board” on page 4-41)

Remove the network cable:

1. Release the RJ-45 connector ❶ from the clip built into the base enclosure.
2. Release the network cable ❷ from the base enclosure. The network cable is attached to the base enclosure with double-sided tape.



3. Remove the network cable.

Reverse this procedure to install the network cable.

5

Computer Setup

Starting Computer Setup

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

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

Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before Windows opens, and while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen, press **f10**.

Using Computer Setup

Navigating and selecting in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

   Because Computer Setup is not 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 select an item, press **enter**.
   - ❏ To close open dialog boxes and return to the main Computer Setup screen, press **esc**.
   - ❏ To view navigation information, press **f1**.
   - ❏ To change the language, press **f2**.
2. Select the **File, Security, Diagnostics**, or **System Configuration** menu.
3. To exit Computer Setup, use one of the following methods:
   - ❏ To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore changes and exit**. Then follow the instructions on the screen.
   - ❏ To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save changes and exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Computer Setup menus

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

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

File menu

Select	To do this
System Information	■ View identification information for the computer and the batteries in the system. ■ View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.
Ignore changes and exit	Cancel any changes entered during the current session and exit Computer Setup.
Save changes and exit	Save any changes entered during the current session and exit Computer Setup. Your changes go into effect when the computer restarts.

Security menu

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

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options	■ Enable/disable stringent security. ■ Enable/disable the password requirement on computer restart.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

Diagnostics menu

Select	To do this
Memory Check	Run a comprehensive test on system memory.

System Configuration menu

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

Select	To do this
Language (or press **f2**)	Change the Computer Setup language.
Boot Options	■ Set an **f9**, **f10**, and **f12** delay when starting up. ■ Enable/disable CD-ROM boot. ■ Enable/disable floppy boot. ■ Enable/disable internal network adapter boot and set the boot mode (PXE). ■ Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system. ■ Set the Express Boot Popup delay, in seconds. ■ Set the boot order.
Device Configurations	■ Swap the functions of the **fn** key and left **ctrl** key. ■ Enable/disable USB legacy support. When enabled, USB legacy support allows the following: ❒ Use of a USB keyboard in Computer Setup, even when a Windows operating system is not running ❒ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer
Built-In Device Options	■ Enable/disable embedded WLAN Device Radio. ■ Enable/disable Network Interface Controller (LAN). ■ Enable/disable LAN/WAN switching. ■ Enable/disable Wake on LAN. ■ Enable/disable the optical disc drive.
Port Options	■ Enable/disable the USB port. ■ Enable/disable the ExpressCard slot.

6

Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	23.24 cm	9.15 in
Width	33.60 cm	13.20 in
Height (front to back)	3.10 to 3.58 cm	1.22 to 1.41 in
Weight	1.99 kg	4.31 lbs
Input power		
Operating voltage	19.0 V dc @ 4.74 A - 65 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft

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

14.1-in display specifications

	Metric	U.S.
Dimensions		
Height	20.83 cm	8.2 in
Width	27.94 cm	11.0 in
Diagonal	35.81 cm	14.1 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	±40° horizontal, +120°/-40° vertical (typical)	

DVD-ROM drive specifications

Applicable disc	Read:	Write:
	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, CDEXTRA, Portfolio, CD-R, CD-RW), CDR, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW
Access time	**CD**	**DVD**
Random	< 110 ms	< 130 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	
24X CD-RW	3,600 KB/sec	

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*	Not applicable
DMA6	Not assigned
DMA7	Not assigned

*ExpressCard controller can use DMA 1, 2, or 5.

System memory map specifications

Size	Memory address	System function
640 KB	00000000–0009FFFF	Base memory
128 KB	000A0000–000BFFFF	Video memory
64 KB	000C0000–000CFFFF	Video BIOS
64 KB	000E8000–000FFFFF	System BIOS
	00100000–XFFFFFFF	Extended memory (based on memory installed)
	(X+1)0000000–FEDFFFFF	PCI bus
	FED00000–FED003FF	High precision event timer
	FEE01000–FFFFFFFF	PCI bus

System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-key or Microsoft natural keyboard
IRQ8	System CMOS/real-time clock
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ16	Intel ICH9 family USB universal host controller 2937 Mobile Intel 4 Series express chipset family
*IRQ17	High-definition audio controller Intel ICH9 family USB universal host controller 2938 Marvell Yukon 88E8072 PCIE-gigabit Ethernet controller
IRQ18	Intel ICH9 family USB universal host controller 2939 Intel ICH9 family USB universal host controller 2936
IRQ19	Intel ICH9 family USB2 enhanced controller 293C
IRQ20	Intel ICH9 family USB2 enhanced controller 293A Intel ICH9 family USB universal host controller 2934
IRQ21	Intel ICH9M-E/M SATA AHCI controller
IRQ22	Intel ICH9 family USB universal host controller 2935

*Default configuration; other possible audio configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

✎ ExpressCards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

✎ For operating systems after Windows 2000, APIC (Advanced programming interrupt controller) is used.

System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000–01F	DMA controller
020–021	Program interrupt controller
024–025	Program interrupt controller
028–029	Program interrupt controller
02C–03D	Program interrupt controller
02E–02F	Motherboard resources
030–031	Program interrupt controller
034–035	Program interrupt controller
038–039	Program interrupt controller
03C–03D	Program interrupt controller
040–043	System timer
04E–04F	Motherboard resources
050–053	System timer
060	Standard 101-/102-key or Microsoft natural keyboard
061	Motherboard resources
062	Microsoft ACPI-compliant embedded controller
063	Motherboard resources
064	Standard 101-/102-key or Microsoft natural keyboard
065	Motherboard resources
066	Microsoft ACPI-compliant embedded controller
067	Motherboard resources
070	Motherboard resources
071–077	System CMOS/real-time clock
080	Motherboard resources
081–091	Direct memory access controller
092	Motherboard resources
093–09F	Direct memory access controller
0A0–0A1	Program interrupt controller
0A4–0A5	Program interrupt controller
0A8–0A9	Program interrupt controller
0AC–0AD	Program interrupt controller
0B0–0B1	Program interrupt controller
0B2–0B3	Motherboard resources
0B4–0B5	Program interrupt controller
0B8–0B9	Program interrupt controller
0BC–0BD	Program interrupt controller

(Continued)

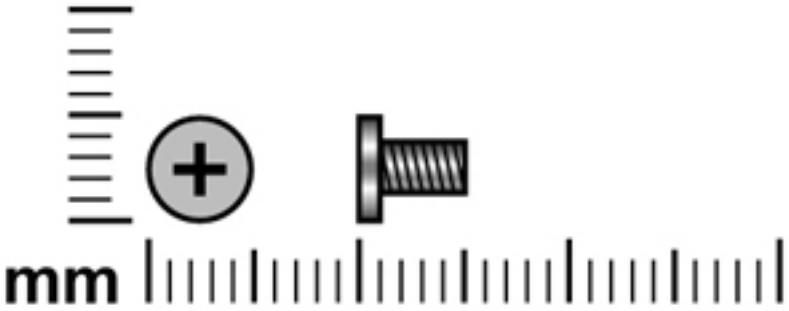
I/O address (hex)	System function (shipping configuration)
0C0–0DF	Direct memory access controller
0F0–0F0	Numeric data processor
0200–027F	Motherboard resources
3B0–3BB	Mobile Intel 4 Series express chipset family
3C0–3DF	Mobile Intel 4 Series express chipset family
400–47F	Motherboard resources
4D0–4D1	Programmable interrupt controller
500–57F	Motherboard resources
1000–1003	Motherboard resources
1010–101F	Motherboard resources
2000–20FF	Marvell Yukon 88E8072 PCIE-gigabit Ethernet controller
2000–2FFF	ICH9 family PCI express root port6-294A
3000–4FFF	ICH9 family PCI express root port5-2948
5000–6FFF	ICH9 family PCI express root port3-2944
7000–701F	ICH9M-E/M SATA AHCI controller
7020–703F	ICH9 family USB universal host controller 2936
7040–705F	ICH9 family USB universal host controller 2935
7060–707F	ICH9 family USB universal host controller 2934
7080–709F	ICH9 family USB universal host controller 2939
70A0–70BF	ICH9 family USB universal host controller 2938
70C0–70DF	ICH9 family USB universal host controller 2937
70E0–70E7	ICH9M-E/M SATA AHCI controller
70E8–70EF	ICH9M-E/M SATA AHCI Controller
70F0–70F7	Mobile Intel 4 Series express chipset family
70F8–70FB	ICH9M-E/M SATA AHCI controller
70FC–70FF	ICH9M-E/M SATA AHCI controller
EF80–EF9F	Motherboard resources
FE00–FE0F	Motherboard resources
FE80–EF8F	Motherboard resources
FFFF	Motherboard resources

7

Screw listing

This chapter provides specification and reference information for the screws used in the computer. The screws listed in this chapter are available in the Screw Kit, spare part number 535870-001.

Phillips PM2.5×5.0 screw

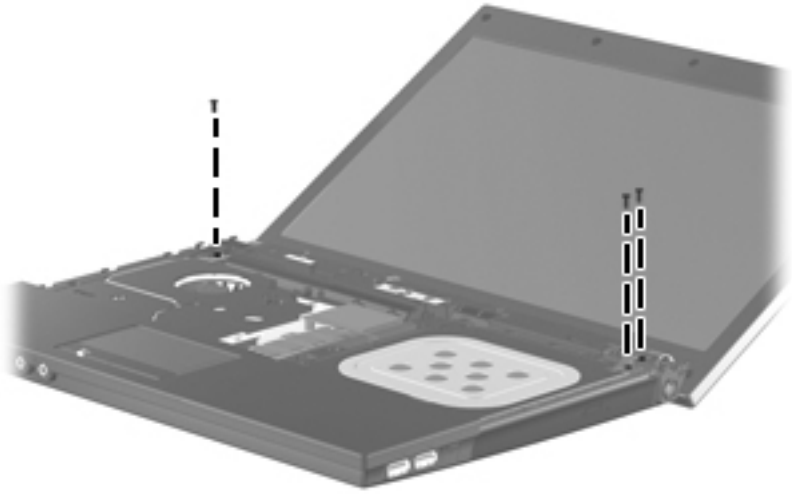


Color	Quantity	Length	Thread	Head diameter
Black	16	5.0 mm	2.5 mm	5.0 mm

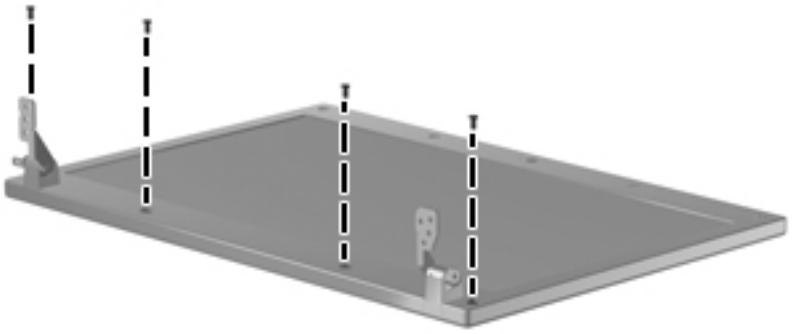
Where used: 2 screws that secure the switch cover to the computer

Where used: 3 screws that secure the keyboard to the computer

Where used: 3 screws that secure the display assembly to the computer

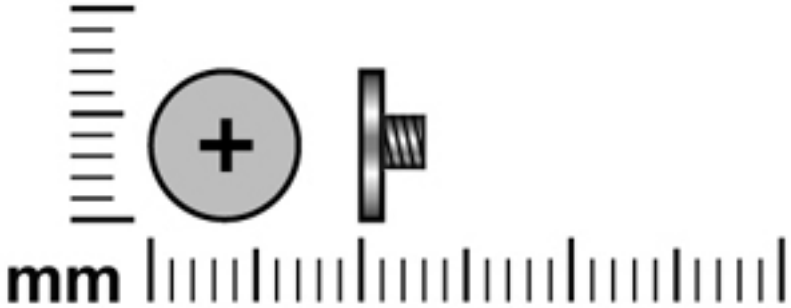


Where used: 4 screws that secure the display bezel to the display assembly



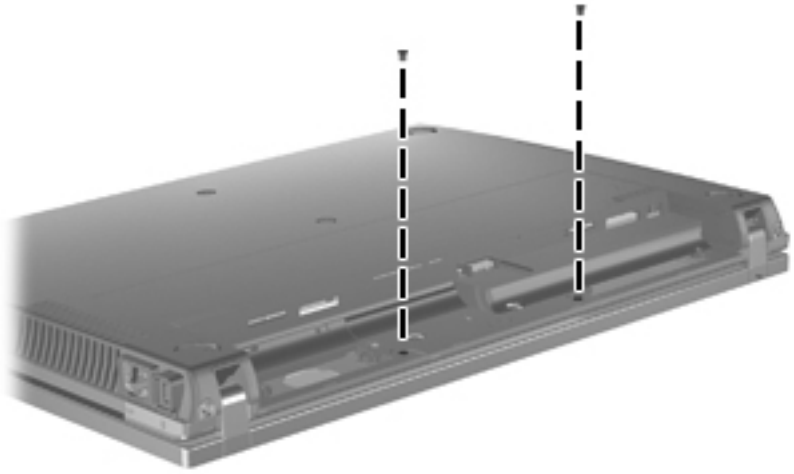
Where used: 4 screws that secure the display panel to the display enclosure

Phillips PM2.5×3.0 broadhead screw



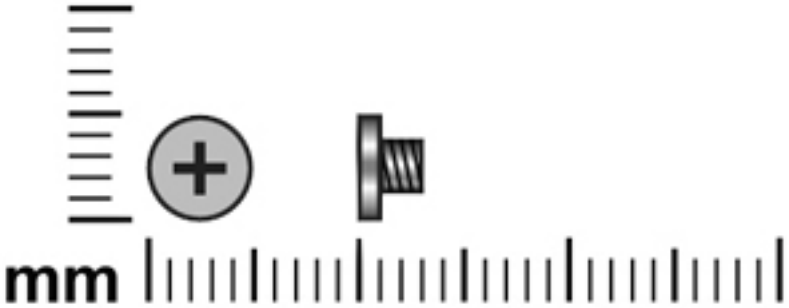
Color	Quantity	Length	Thread	Head diameter
Black	7	3.0 mm	2.5 mm	7.0 mm

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



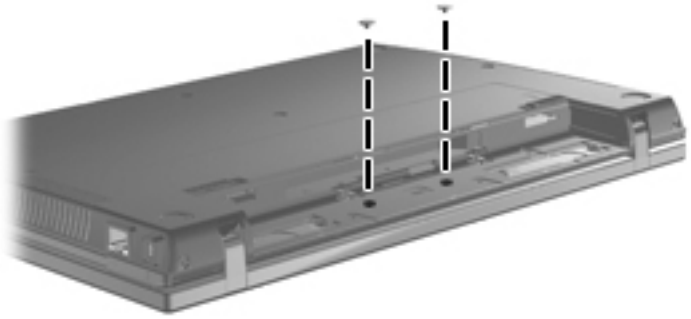
Where used: 3 screws that secure the palm rest to the computer

Phillips PM2.5×3.0 screw

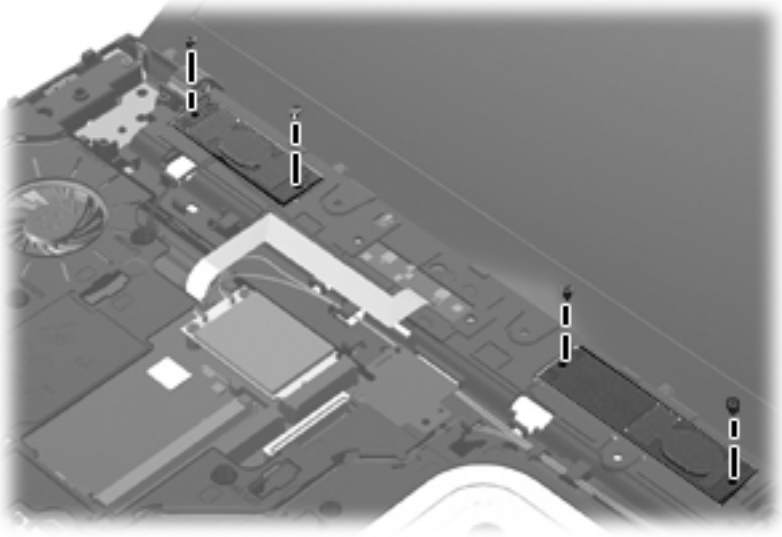


Color	Quantity	Length	Thread	Head diameter
Black	11	2.5 mm	3.0 mm	5.0 mm

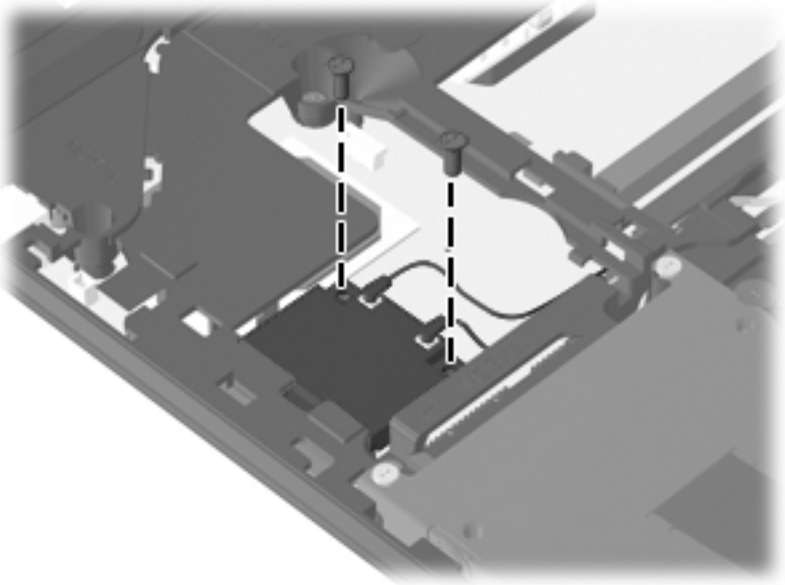
Where used: 2 screws that secure the switch cover to the computer



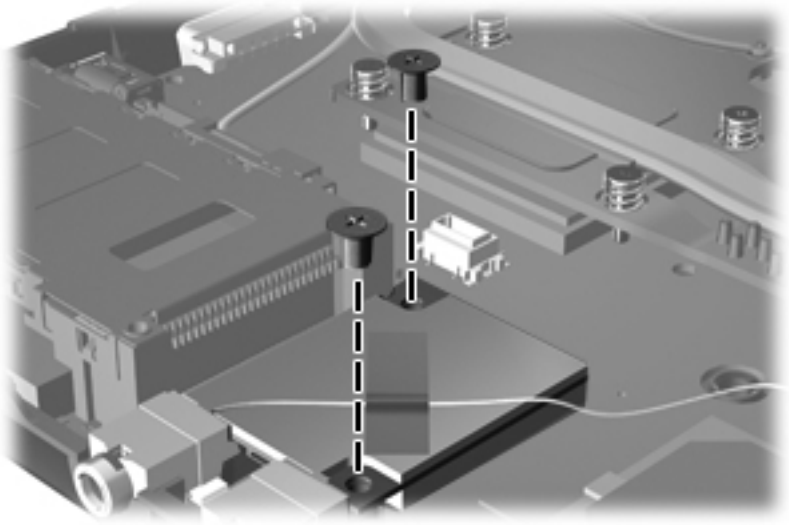
Where used: 4 screws that secure the speakers to the base enclosure



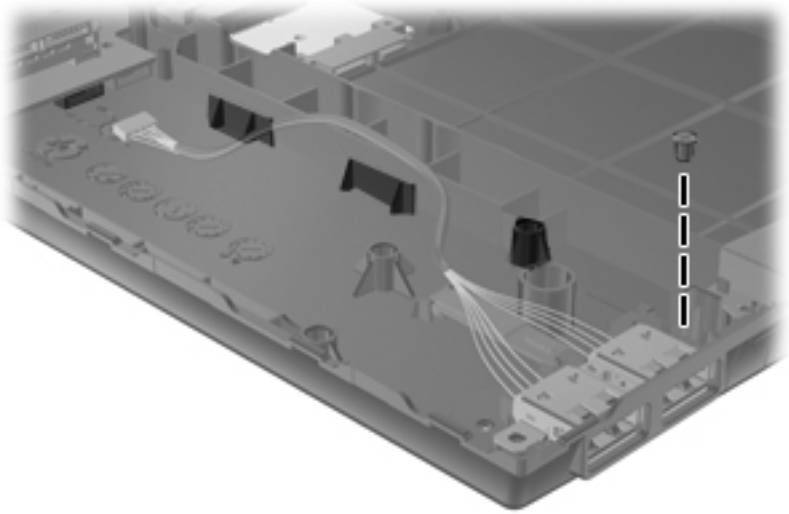
Where used: 2 screws that secure the WLAN module to the computer



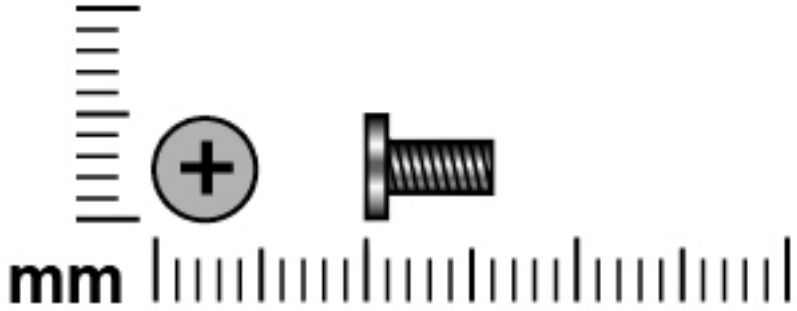
Where used: 2 screws that secure the modem module to the system board



Where used: One screw that secures the USB board to the base enclosure

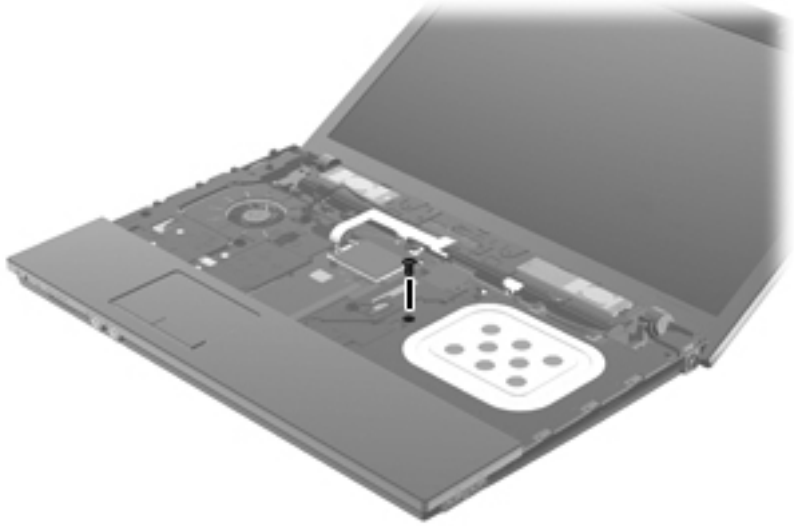


Phillips PM2.5×6.0 screw

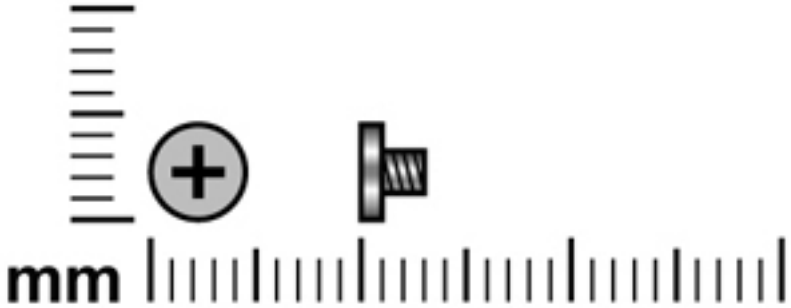


Color	Quantity	Length	Thread	Head diameter
Black	1	6.0 mm	2.5 mm	5.0 mm

Where used: One screw that secures the optical drive to the computer



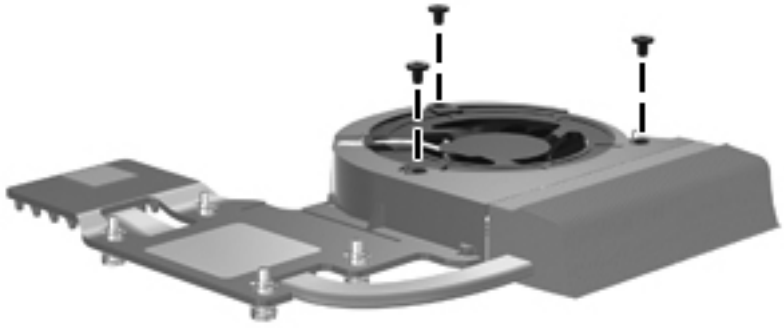
Phillips PM2.0×3.0 screw



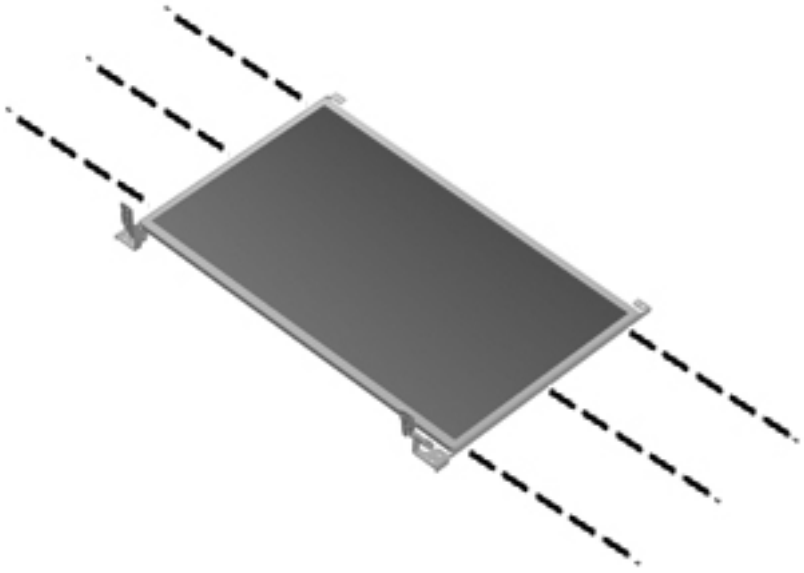
Color	Quantity	Length	Thread	Head diameter
Silver	11	3.0 mm	2.0 mm	4.0 mm

Where used: 2 screws that secure the optical drive bracket to the optical drive

Where used: 3 screws that secure the fan to the heat sink



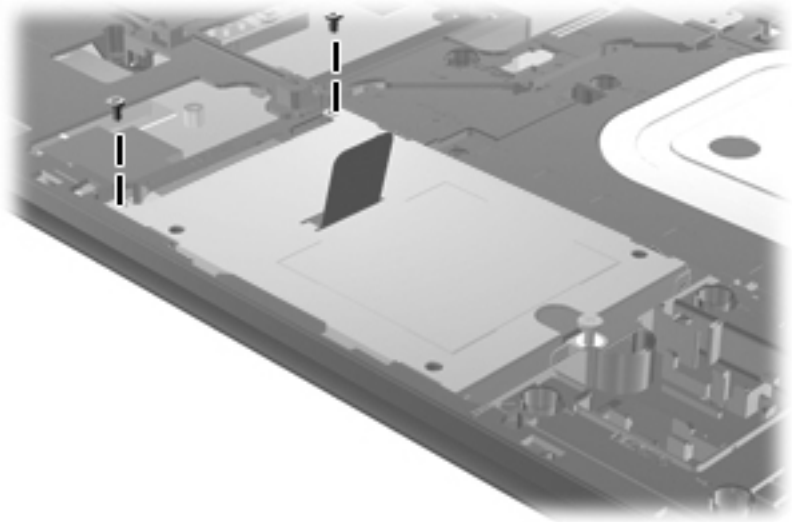
Where used: 6 screws that secure the display hinges to the display panel



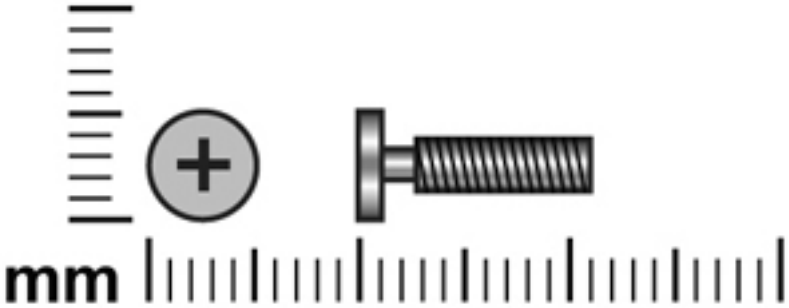
Phillips PM2.0×5.0 screw

Color	Quantity	Length	Thread	Head diameter
Silver	2	5.0 mm	2.0 mm	5.0 mm

Where used: 2 screws that secure the solid-state module to the computer

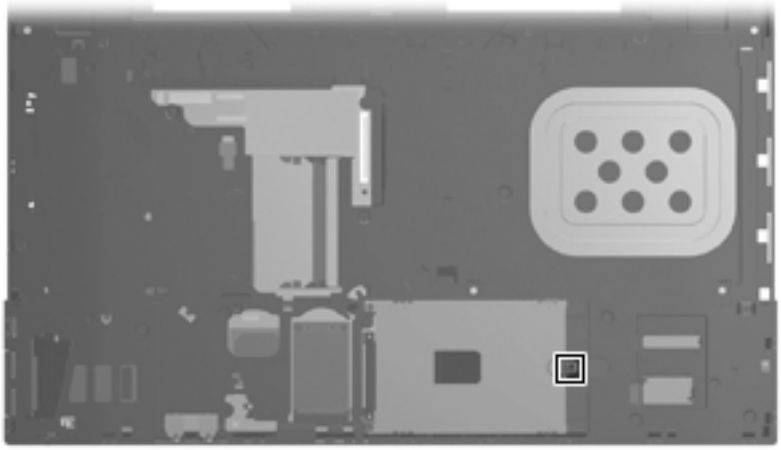


Phillips PM2.5×11.0 captive screw

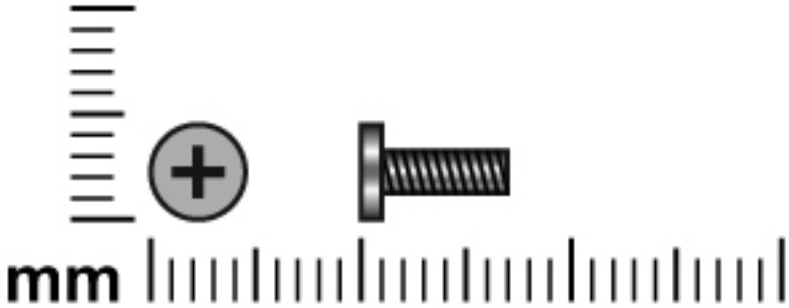


Color	Quantity	Length	Thread	Head diameter
Silver	1	11.0 mm	2.5 mm	5.0 mm

Where used: One captive screw that secures the solid-state module to the computer (the screw is secured to the solid-state module by a C-clip)

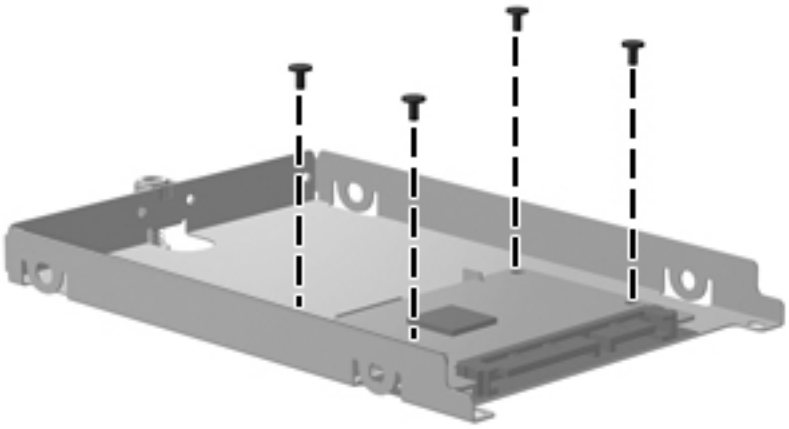


Phillips PM2.0×7.0 screw

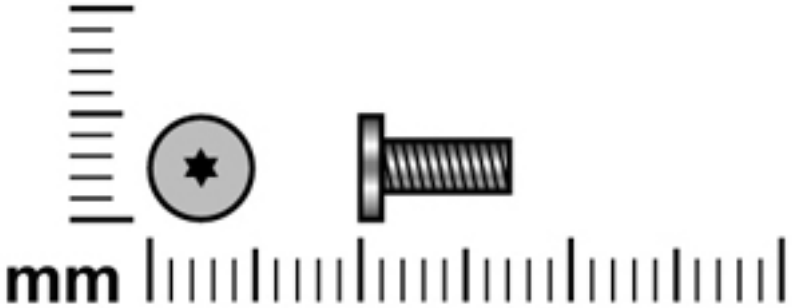


Color	Quantity	Length	Thread	Head diameter
Silver	4	7.0 mm	2.0 mm	5.0 mm

Where used: 4 screws that secure the solid-state module to the solid-state module bracket

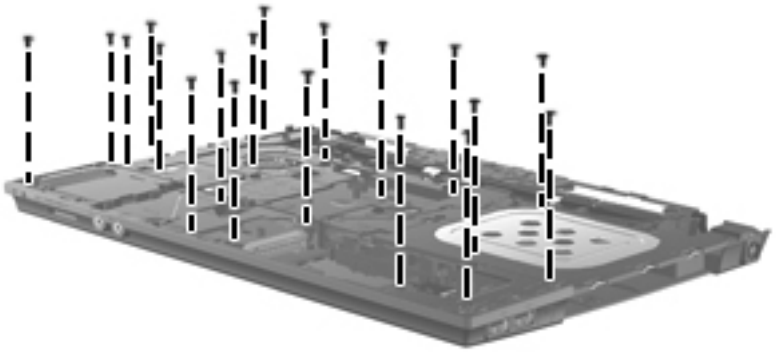


Torx T8M2.5×8.0 screw

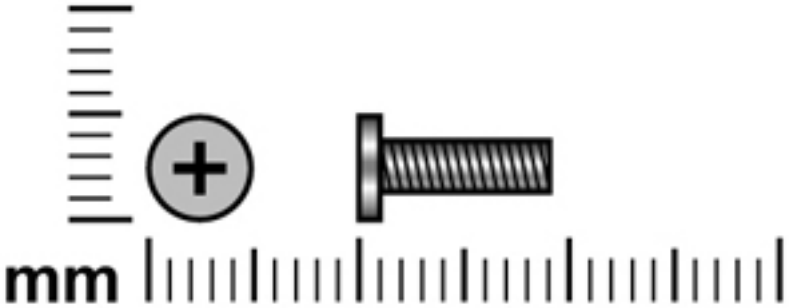


Color	Quantity	Length	Thread	Head diameter
Black	19	8.0 mm	2.5 mm	5.0 mm

Where used: 19 screws that secure the top cover to the base enclosure

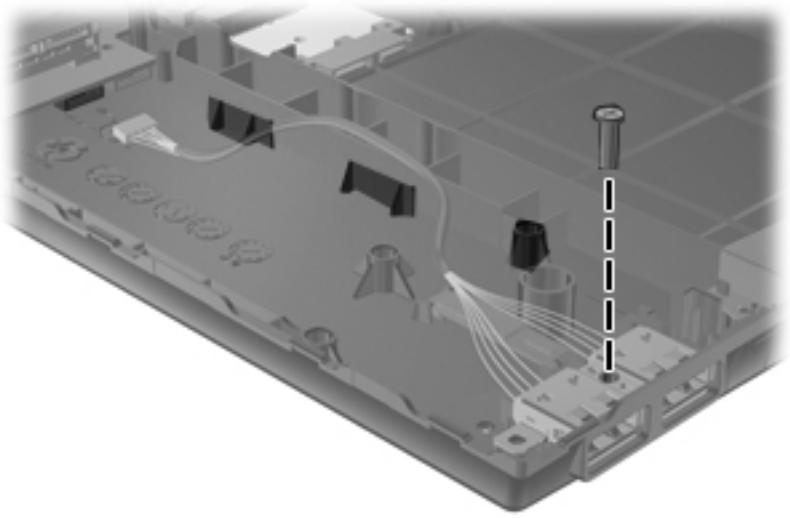


Phillips PM2.5×9.0 screw

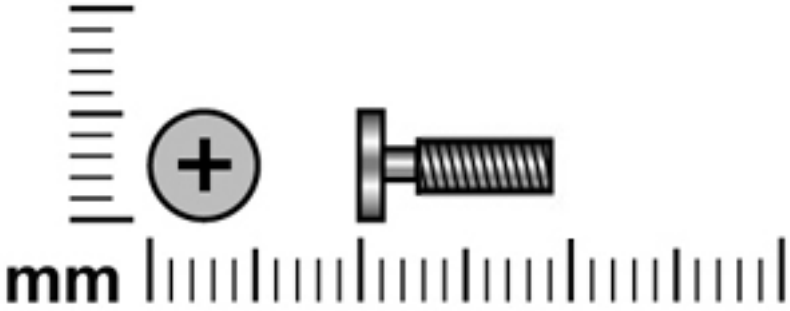


Color	Quantity	Length	Thread	Head diameter
Black	1	9.0 mm	2.5 mm	5.0 mm

Where used: One screw that secures the USB board to the base enclosure

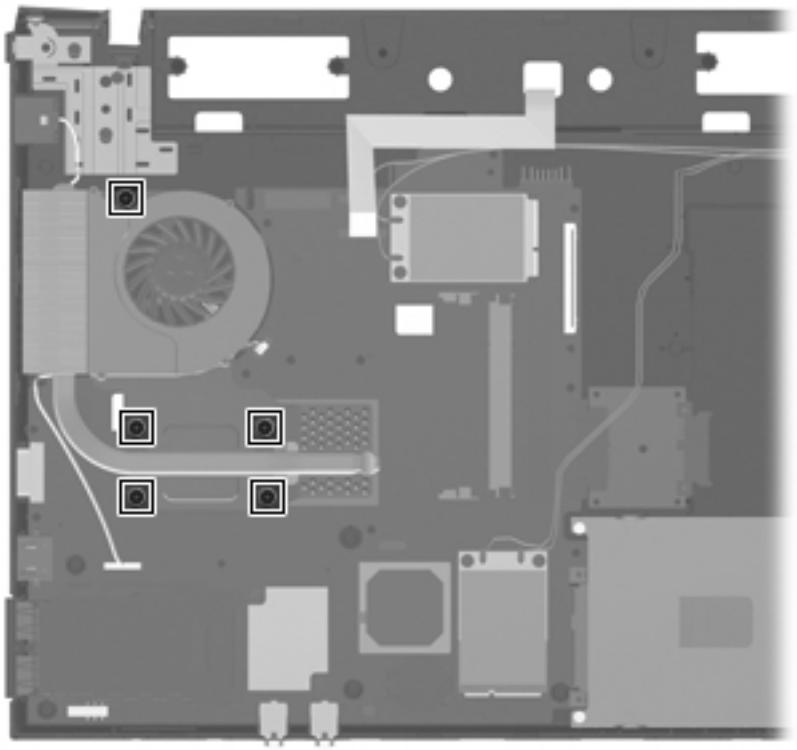


Phillips PM2.5×9.0 captive screw

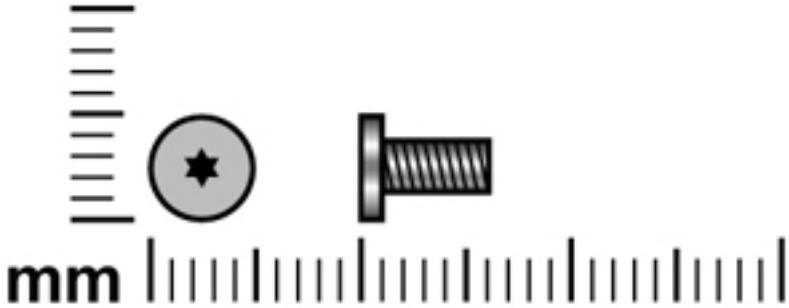


Color	Quantity	Length	Thread	Head diameter
Silver	5	9.0 mm	2.5 mm	2.0 mm

Where used: 5 captive screws that secure the heat sink to the system board (the screws are secured to the heat sink by C-clips)

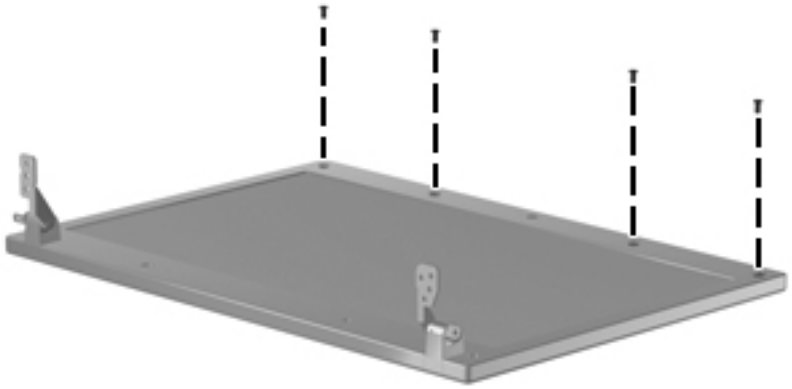


Torx T8M2.5×6.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	4	6.0 mm	2.5 mm	5.0 mm

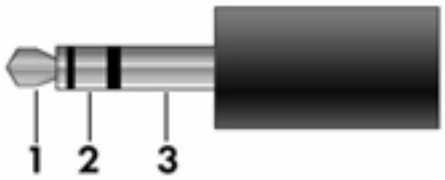
Where used: 4 screws that secure the display bezel to the display assembly



8

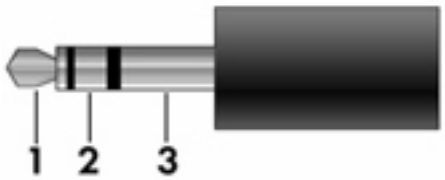
Connector pin assignments

Audio-in (microphone)



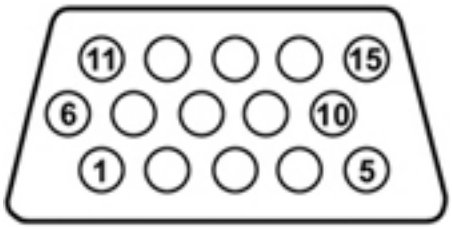
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



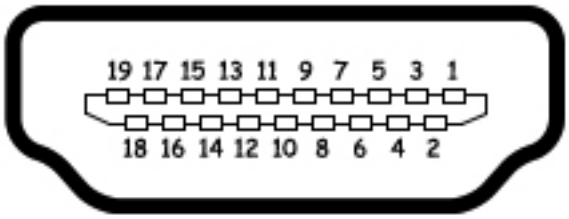
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



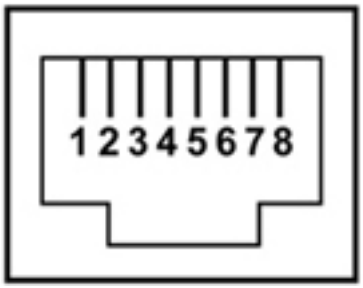
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



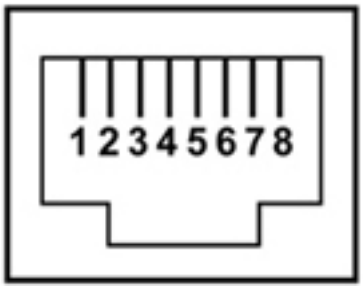
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2-
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1-
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0-
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	CEC
14	No connect
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect

RJ-45 (network)



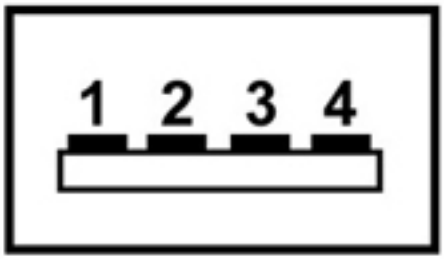
Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

RJ-11 (modem)



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

Universal Serial Bus



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

9

Power cord set requirements

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

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

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

Requirements for all countries and regions

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

10

Recycling

Battery

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

Display

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

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

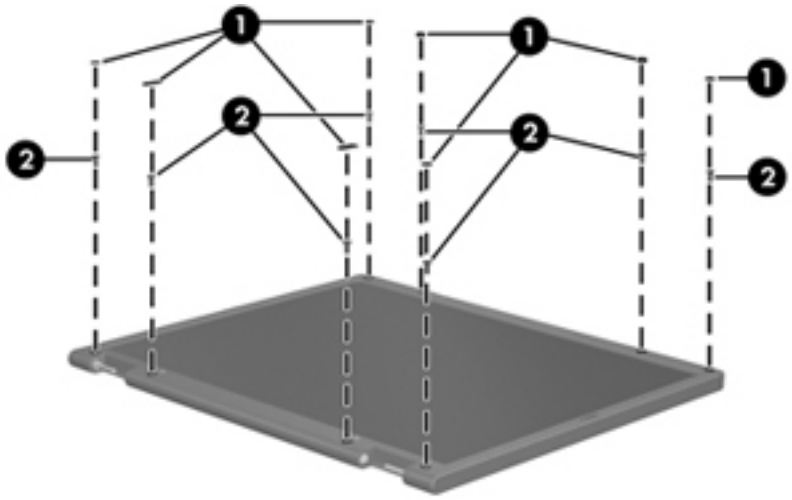
Materials Disposal. The backlight in the display assembly of this HP product contains mercury, which might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see 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 ❶ and the liquid crystal display (LCD) panel ❷.

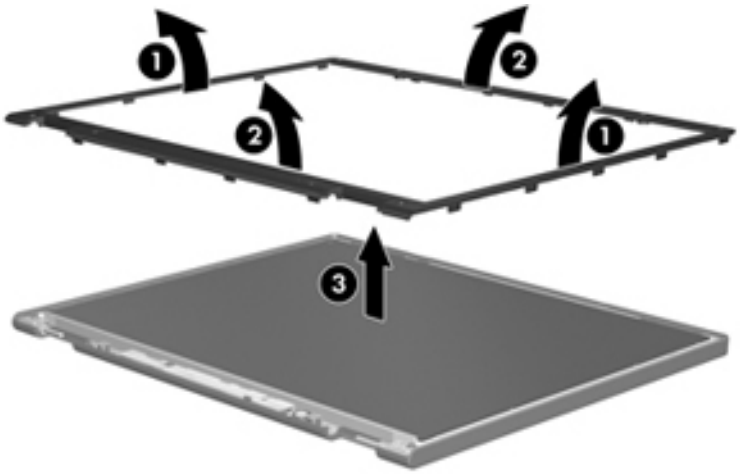
The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

To disassemble the display assembly, follow these steps:

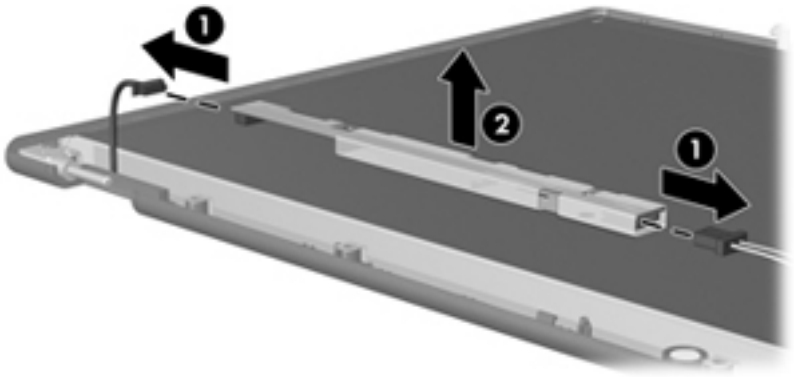
1. Remove all screw covers ❶ and screws ❷ that secure the display bezel to the display assembly.



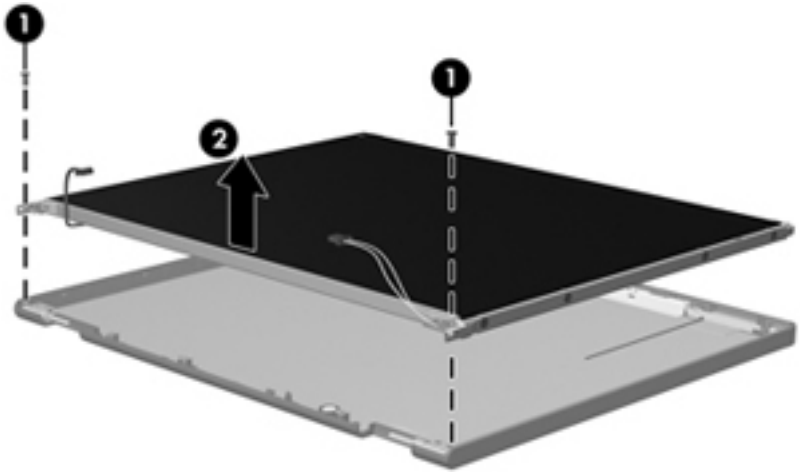
2. Lift up and out on the left and right inside edges ❶ and the top and bottom inside edges ❷ of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ❸.



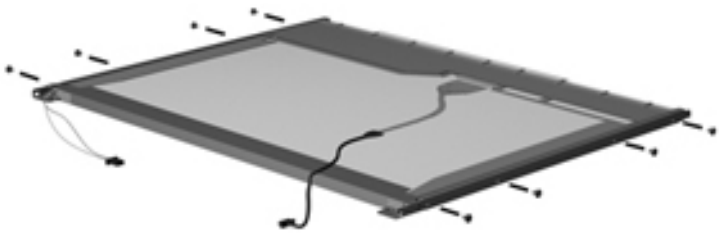
4. Disconnect all display panel cables ❶ from the display inverter, and then remove the inverter ❷.



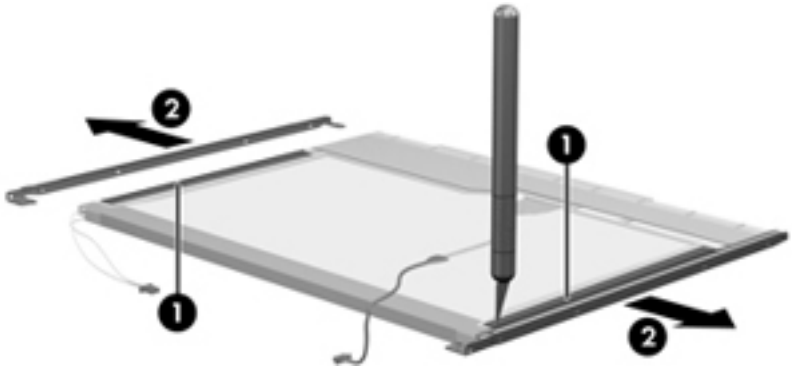
5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly ❷ from the display enclosure.



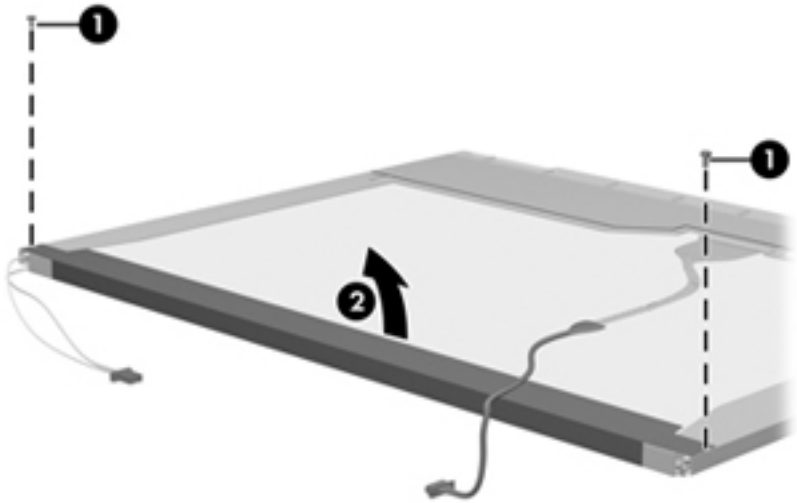
7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



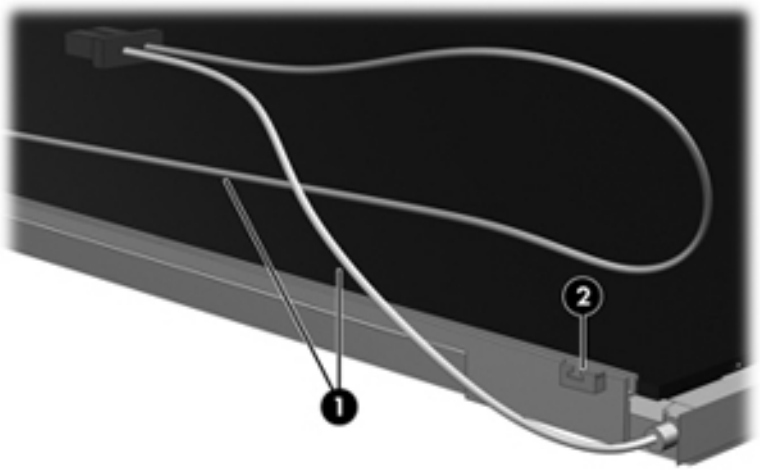
9. Use a sharp-edged tool to cut the tape ❶ that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



11. Remove the screws ❶ that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover ❷ and swing it outward.

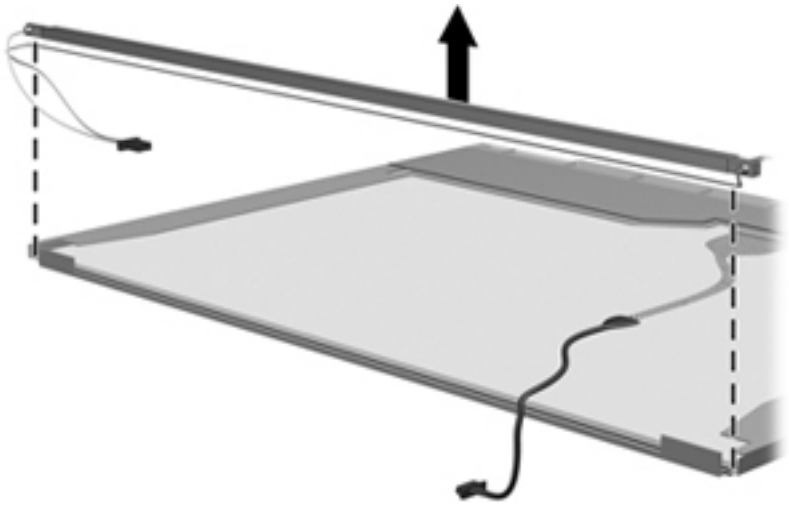


13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables ❶ from the clip ❷ in the display panel.

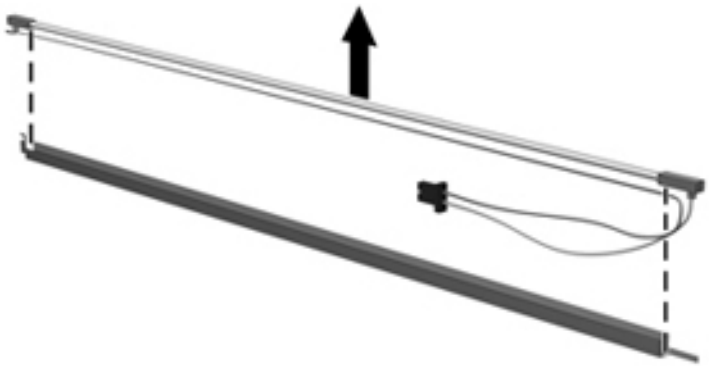


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

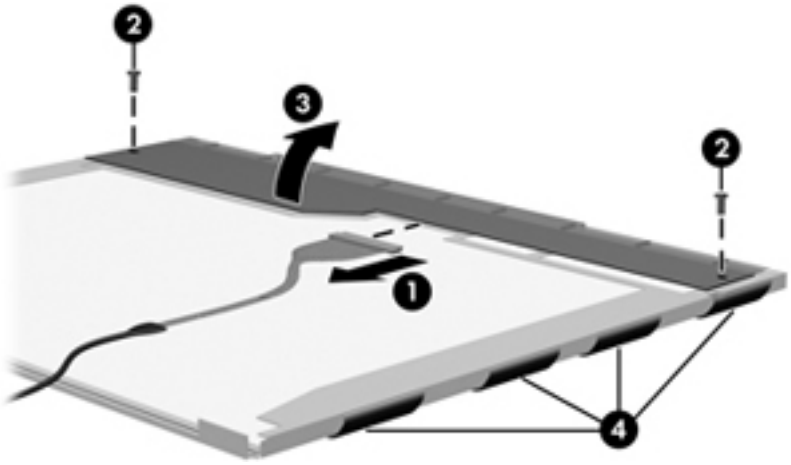
WARNING: The backlight contains mercury. Exercise caution when removing and handling the backlight, to avoid damaging this component and causing exposure to the mercury.



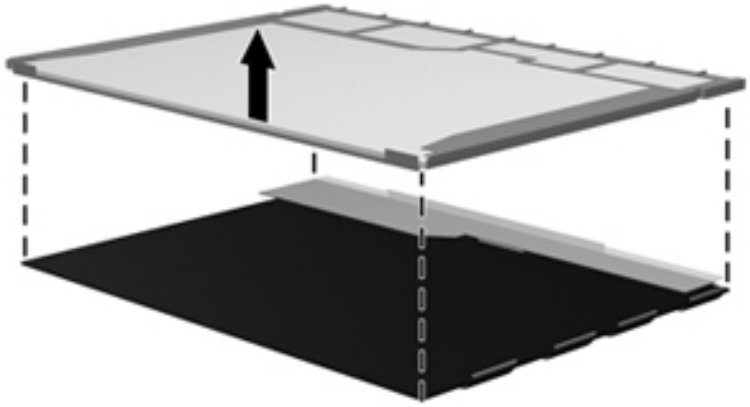
18. Remove the backlight from the backlight frame.



19. Disconnect the display cable ❶ from the LCD panel.
20. Remove the screws ❷ that secure the LCD panel to the display rear panel.
21. Release the LCD panel ❸ from the display rear panel.
22. Release the tape ❹ that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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