

Compaq Presario F500 Notebook PC

Maintenance and Service Guide

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

First Edition: January 2007

Document Part Number: 440524-001

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1 Product description

Category	Description
Product Name	Compaq Presario F500 Notebook PC
Processors	AMD Turion™ 64 Mobile Technology processors <ul style="list-style-type: none">• TL-52 (1.6-GHz, 1-MB L2 cache)• TL-50 (1.6-GHz, 512-KB L2 cache)• MK-36 (2.0-GHz, 1-MB L2 cache) Mobile AMD Sempron™ processors <ul style="list-style-type: none">• 3500+ (1.8-GHz, 512-KB L2 cache)• 3400+ (1.8-GHz, 256-KB L2)
Chipset	NVIDIA Northbridge C51MV (Mobile Integrated Graphics) NVIDIA Southbridge MCP51
Graphics	UMA (integrated) with shared video memory: up to 64 MB on computers with 512 MB or less of system memory; up to 128 MB on computers with 512 MB or more of system memory (memory size is dynamic change)
Panels	15.4-inch, WXGA (16:10 wide aspect Ratio) BrightView
Memory	<ul style="list-style-type: none">• Two SODIMM slots• Customer-accessible/upgradable• DDRII PC2-5300 (667 MHz) Memory configurations: <ul style="list-style-type: none">• 1024-MB total system memory (512 MB × 2)• 512-MB total system memory (512 MB × 1)
Hard drives	<ul style="list-style-type: none">• Supports all 9.5-mm, SATA, 2.5-inch hard drives• Parallel ATA• 120-GB, 5400-rpm• 100-GB, 5400-rpm• 80-GB, 5400-rpm
Optical drives	<ul style="list-style-type: none">• 12.7-mm tray load, fixed• Parallel ATA

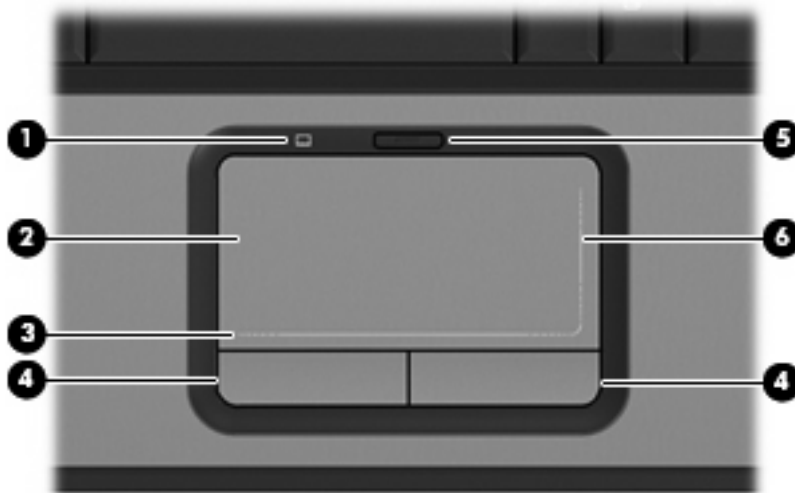
Category	Description
	<ul style="list-style-type: none"> DVD-RW and CD-RW Combo Drive DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
Diskette drive	Supports external USB drive only
Audio	<ul style="list-style-type: none"> Supports Microsoft Gold requirements Presario-branded Altec Lansing speakers
Modem	<ul style="list-style-type: none"> 56K V.92 data/fax modem Supports all world-wide certification requirements Modem cable not included
Ethernet	<ul style="list-style-type: none"> Integrated 10/100 network interface card Realtek 8201CL Ethernet cable not included
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module: <ul style="list-style-type: none"> 54g wireless 802.11a/b/g 54g 802.11b/g 2.4- and 5.0-GHz antennae included in display assembly Mechanical design supports 3 antennae
Ports	<ul style="list-style-type: none"> Audio-in (mono microphone) Audio-out (stereo headphone) RJ-11 (modem) RJ-45 (Ethernet, includes link and activity lights) S-Video-out USB (3) VGA (Dsub 15 pin) 2-pin AC power
Keyboard/ pointing devices	<ul style="list-style-type: none"> 15.4-inch keyboard with embedded numeric keypad TouchPad with 2 buttons and four-way scroll
Power requirements	<ul style="list-style-type: none"> 6-cell 2.2-Ah Li-ion battery 65-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector)
Security	Security cable slot

Category	Description
Operating system	Preinstalled: <ul style="list-style-type: none">• Windows Vista™ Premium• Windows Vista Home Basic• Free DOS
Serviceability	End-user replaceable parts: <ul style="list-style-type: none">• AC adapter• Battery (system)• Hard drive• Memory module• WLAN module• Optical drive

2 External component identification

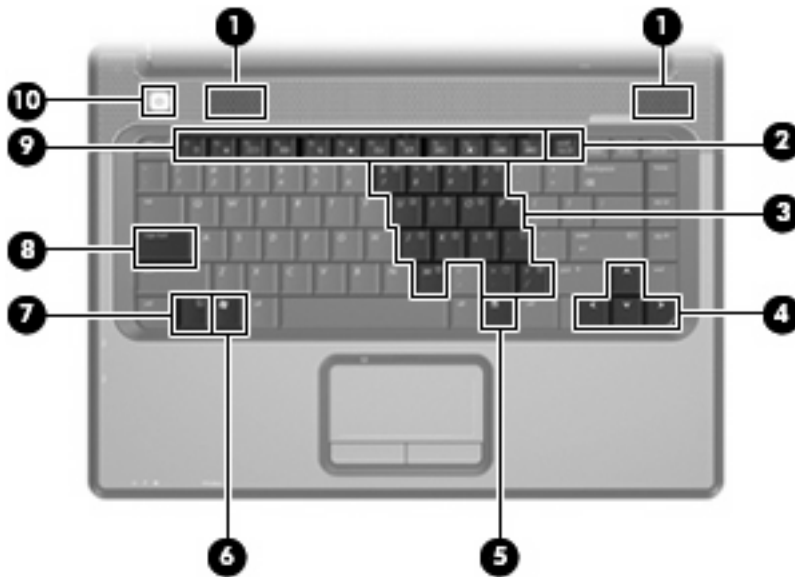
Top components

Pointing devices



Item	Component	Function
(1)	TouchPad light	<ul style="list-style-type: none">• Blue: TouchPad is enabled.• Amber: TouchPad is disabled.
(2)	TouchPad	Moves the pointer and selects or activates items on the screen.
(3)	TouchPad horizontal scroll zone	Allows you to scroll left or right.
(4)	Left and right TouchPad buttons	Function like the left and right buttons on an external mouse.
(5)	TouchPad on/off button	Enables/disables the TouchPad.
(6)	TouchPad vertical scroll zone	Allows you to scroll up or down.


Keys



Item	Component	Function
(1)	Speakers	Produce sound.
(2)	num lock key	Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light.
(3)	Embedded numeric keypad keys	Can be used like the keys on an external numeric keypad.
(4)	Arrow keys	Move the cursor around the screen.
(5)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(6)	Windows logo key	Displays the Windows® Start menu.
(7)	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
(8)	caps lock key	Enables caps lock and turns on the caps lock light.
(9)	Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(10)	Power button	<ul style="list-style-type: none"> • When the computer is off, press the button to turn on the computer. • When the computer is on, press the button to initiate Hibernation. • When the computer is in the Sleep state, briefly press the button to exit Hibernation. • When the computer is in Hibernation, briefly press the button to exit Hibernation. <p>If the computer has stopped responding and Windows shutdown procedures cannot be used, press and hold the power button for at least 5 seconds to turn off the computer.</p>

Front components




Item	Component	Function
(1)	Power light	<ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state. Off: The computer is off or in Hibernation.
(2)	Battery light	<ul style="list-style-type: none"> On: A battery is charging. Blinking: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical low battery level, the battery light begins blinking rapidly. Off: If the computer is plugged into an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
(3)	Drive light	Blinks when the hard drive or optical drive is being accessed.
(4)	Wireless switch	Turns the wireless feature on or off, but does not create a wireless connection.
		 NOTE: A wireless network must be set up in order to establish a wireless connection.
(5)	Wireless light	<ul style="list-style-type: none"> Blue: An integrated wireless device, such as a wireless local area network (LAN) device and/or a Bluetooth® device, is turned on. Amber: All wireless devices are turned off.
(6)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(7)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.

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

Right-side components



Item	Component	Function
(1)	Optical drive	Reads an optical disc.
(2)	USB port (select models only)	Connects an optional USB device.
(3)	Power connector	Connects an AC adapter.
(4)	Security cable slot	Attaches an optional security cable to the computer.

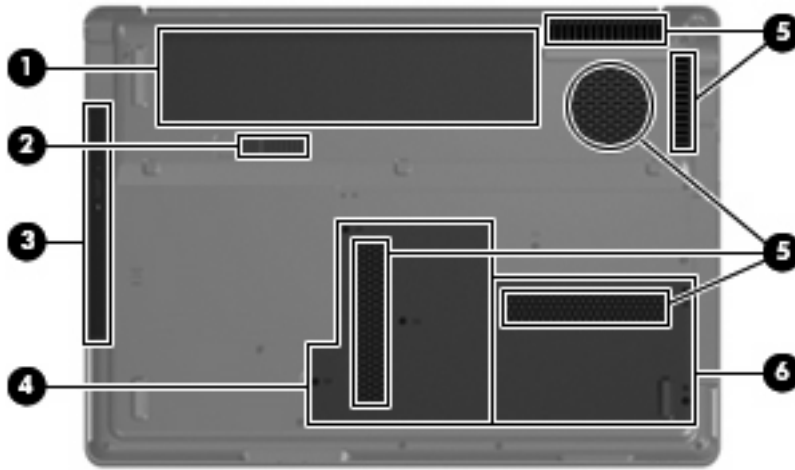
 **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.




Left-side components



Item	Component	Function
(1)	S-Video-out jack	Connects an optional S-Video device, such as a television, VCR, camcorder, overhead projector, or video capture card.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	RJ-11 (modem) jack	Connects a modem cable.
(5)	USB ports (select models only)	Connect optional USB devices.

Bottom components



Item	Component	Function
(1)	Battery bay	Holds the battery.
(2)	Battery release latch	Releases the battery from the battery bay.
(3)	Optical drive	Reads an optical disc.
(4)	Memory module compartment	Contains the memory module slots, the WLAN module slot, and the RTC battery.
		<p> NOTE: To prevent an unresponsive system and the display of a warning message, replace with only a WLAN device authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care through Help and Support.</p>
(5)	Vents (5)	Enable airflow to cool internal components.
		<p> CAUTION: To prevent overheating, do not obstruct 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 thick rugs or clothing, to block airflow.</p>
		<p> NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.</p>
(6)	Hard drive bay	Holds the hard drive.

3 Unknown user password

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



NOTE: These steps also clear CMOS.

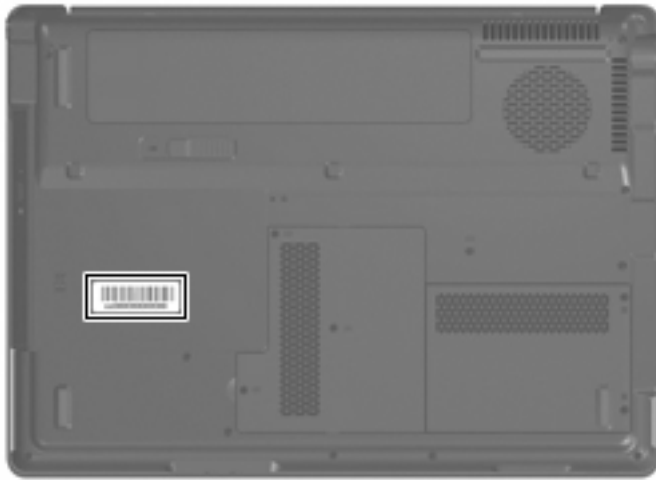
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the real-time clock (RTC) battery (see [RTC battery on page 33](#)).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

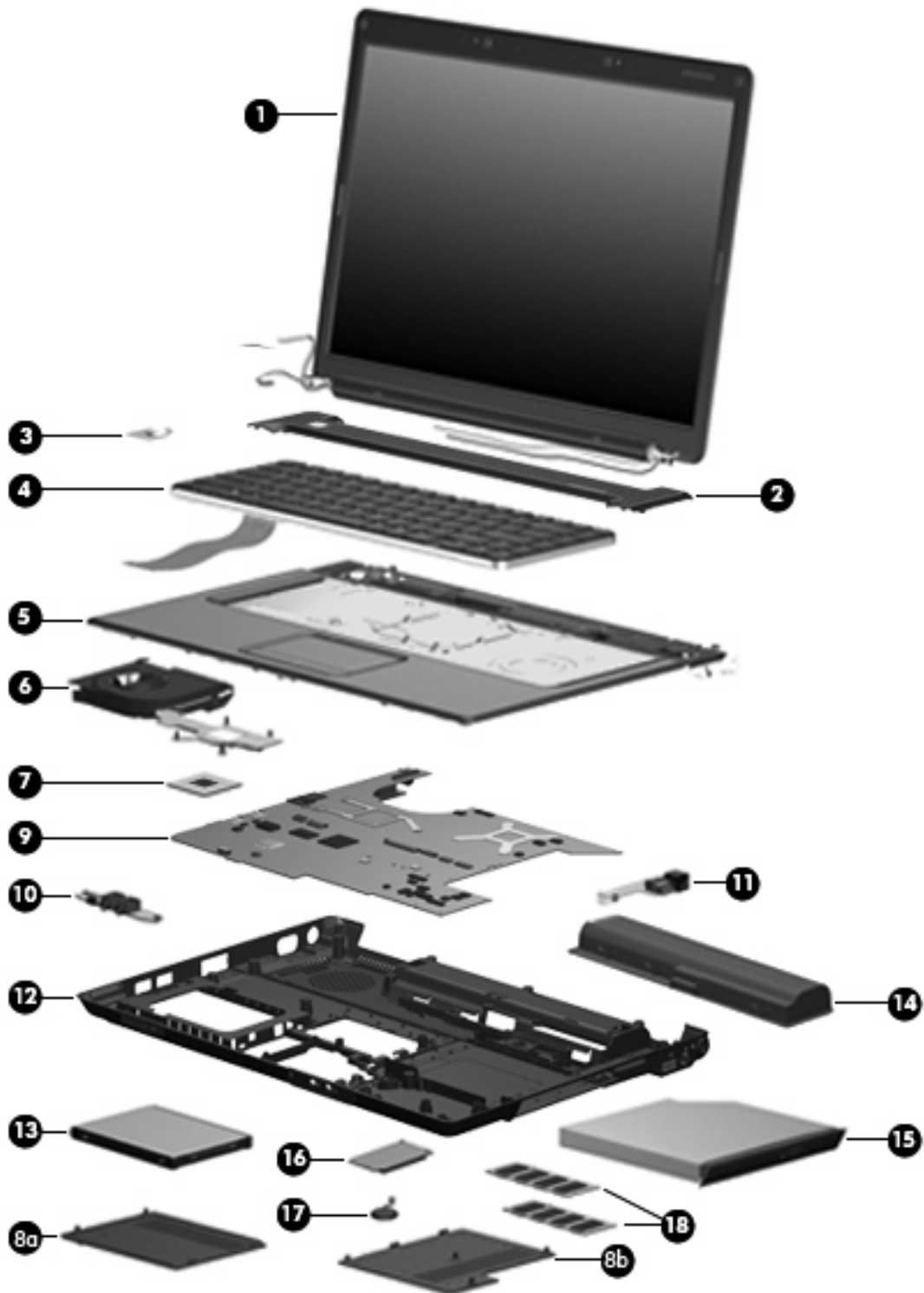
4 Illustrated parts catalog

Serial number location

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



Computer major components

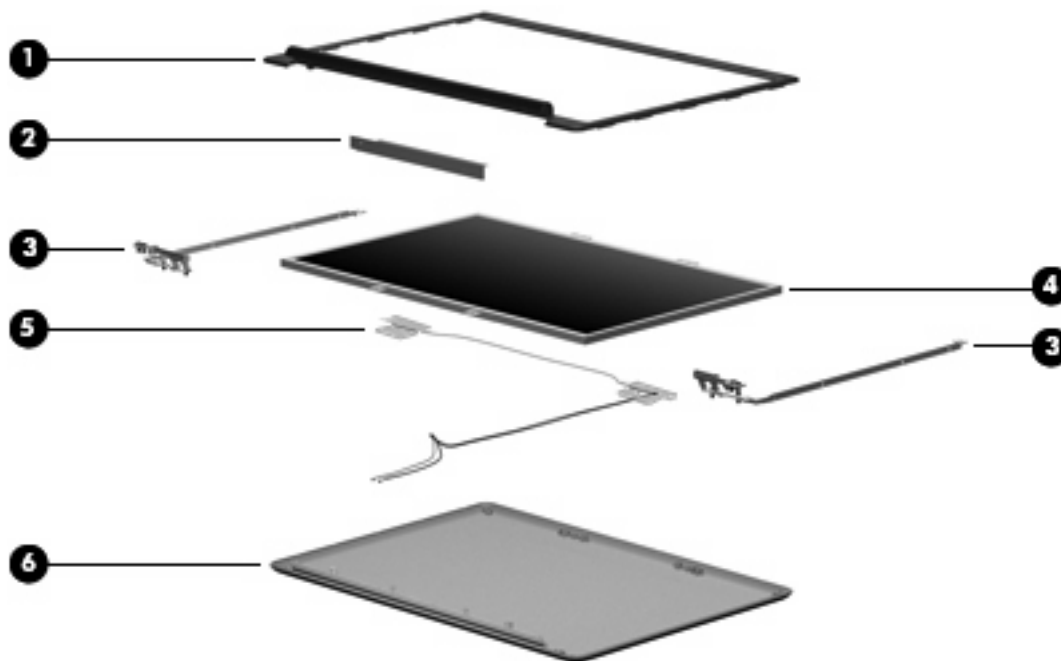


Item	Description	Spare part number
(1)	15.4-inch, WXGA, BrightView display assembly (includes display panel cable and wireless antenna transceivers and cables)	442876-001

Item	Description	Spare part number
(2)	Switch cover (includes LED board and LED board cable)	442889-001
(3)	Power button board (includes power button board and cable)	443153-001
(4)	Keyboards	
	Denmark, Norway, and Sweden	442887-DH1
	France	442887-051
	French Canada	442887-121
	International	442887-B31
	Italy	442887-061
	Korea	442887-AD1
	Latin America	442887-161
	Saudi Arabia	442887-171
	Spain	442887-071
	Taiwan	442887-AB1
	Thailand	442887-281
	The United Kingdom	442887-031
	The United States	442887-001
(5)	Top cover (includes speakers, TouchPad, and TouchPad cable)	442888-001
(6)	Fan/heat sink assembly (includes thermal pads)	431450-001
(7)	Processors (include thermal pad)	
	AMD Turion TL-52 (1.6-GHz, 1-MB L2 cache)	431372-001
	AMD Turion TL-50 (1.6-GHz, 512-KB L2 cache)	431371-001
	AMD Turion MK-36 (2.0-GHz, 512-KB L2 cache)	437803-001
	Mobile AMD Sempron 3500+ (1.8-GHz, 1-MB L2 cache)	434414-001
	Mobile AMD Sempron 3400+ (1.8-GHz, 512-KB L2 cache)	431375-001
	Plastics Kit	442891-001
(8a)	Hard drive cover (includes one rubber foot and 2 captive screws, secured by C-clips)	
(8b)	Memory module compartment cover (includes 3 captive screws, secured by C-clips)	
(9)	System board	
(10)	Audio board	431444-001
(11)	USB/power connector board (includes USB/power connector board cable)	431445-001
(12)	Base enclosure (include wireless switch and 4 rubber feet, not illustrated)	442890-001
	Rubber Feet Kit (includes computer feet, not illustrated)	431431-001
(13)	Hard drives (all 5400-rpm, include hard drive bracket and hard drive connector)	
	120-GB	442882-001

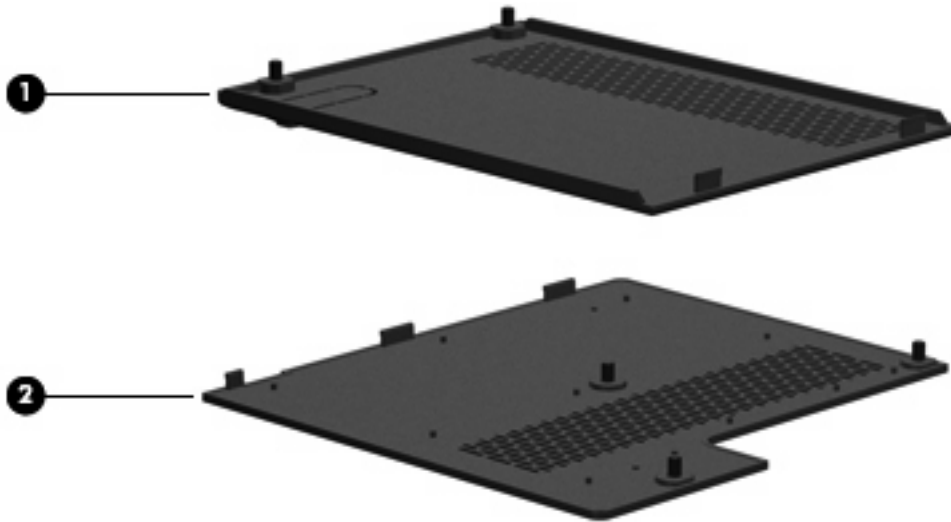
Item	Description	Spare part number
	100-GB	444003-001
	80-GB	442881-001
(14)	6-cell, 2.20-Ah battery	441425-001
(15)	Optical drives (include bezel)	
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	442883-001
	DVD-RW and CD-RW Combo Drive	442884-001
(16)	WLAN modules	
	802.11a/b/g WLAN module for use in Canada and the United States.	407160-001
	802.11a/b/g WLAN module for use in China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, and Venezuela.	407160-002
	802.11b/g WLAN module for use in Argentina, Brazil, Canada, Chile, Mexico, Taiwan, and the United States.	407159-001
	802.11b/g WLAN module for use in China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, and Venezuela.	407159-002
(17)	RTC battery (includes 2-sided tape)	431436-001
(18)	Memory modules	
	1024-MB (PC2-4200, 533-MHz, 1-DIMM)	443489-001
	512-MB (PC2-5300, 667-MHz, 1-DIMM)	442879-001
	Cable Kit (not illustrated)	

Display assembly components



Item	Description	Spare part number
(1)	Display bezel	433284-001
(2)	Display inverter (includes Mylar shield)	431391-001
(3)	Display Hinge Kit	433288-001
(4)	15.4-inch, WXGA, BrightView display panel (includes display panel cable and wireless antenna transceivers and cables)	442887-001
(5)	Wireless Antenna Kit (includes wireless antenna transceivers and cables)	431398-001
(6)	Display enclosure (includes wireless antenna transceivers and cables)	442878-001
	Display Cable Kit (not illustrated)	433287-001
	Display Logo Kit (not illustrated)	442892-001
	Display Screw Kit (not illustrated)	431400-001

Plastics Kit



Item	Description	Spare part number
	Plastics Kit	442891-001
(1)	Hard drive cover (includes 2 captive screws, secured by C-clips)	
(2)	Memory module compartment cover (includes 2 captive screws, secured by C-clips)	

Mass storage devices



Item	Description	Spare part number
(1)	Hard drives (all 5400-rpm, include frame and hard drive connector)	
	120-GB	442882-001
	100-GB	444003-001
	80-GB	442881-001
(2)	Optical drives (include bezel and bracket)	
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	442884-001
	DVD-RW and CD-RW Combo Drive	442883-001

Miscellaneous parts

Description	Spare part number
65-watt AC adapter	402018-001
Analog TV tuner	407941-001
Backpack	405527-001
Carrying case	418162-001
Composite S-Video and audio input cable	407939-001
Headset	371693-001
HP Remote Control	407313-001

Description	Spare part number
HP Remote Control II Plus	435743-001
RF cable	408485-001
RF input adapter cable	407940-001
TV tuner remote control	408479-001
USB infrared emitter	408483-001
USB travel mouse	309674-001
Wired optical mouse	436238-001
Power cords:	
Australia	394279-011
Canada, French Canada, Latin America, Thailand, and the United States	394279-001
Denmark	394279-081
Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden	394279-021
India	394279-D61
Italy	394279-061
Korea	394279-AD1
Taiwan	394279-AB1
The United Kingdom	394279-031
Screw Kit (includes the screws listed below)	431433-001
<ul style="list-style-type: none"> • Phillips PM3.0×3.0 screw • Phillips PM2.5×10.0 screw • Phillips PM2.5×7.0 screw • Phillips PM2.5×5.0 screw • Phillips PM2.5×4.0 screw • Phillips PM2.0×6.0 screw • Phillips PM2.0×5.0 captive screw • Phillips PM2.0×4.0 screw • Phillips PM2.0×3.0 screw 	

Sequential part number listing

Spare part number	Description
309674-001	USB travel mouse
364727-001	USB digital drive
371693-001	Wired headset with volume control
394279-001	Power cord for use in Canada, French Canada, Latin America, Thailand, and the United States
394279-011	Power cord for use in Australia
394279-021	Power cord for use in Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden
394279-031	Power cord for use in the United Kingdom
394279-061	Power cord for use in Italy
394279-081	Power cord for use in Denmark
394279-AB1	Power cord for use in Taiwan
394279-AD1	Power cord for use in Korea
394279-D61	Power cord for use in India
402018-001	65-watt AC adapter
405527-001	Backpack
407159-001	802.11b/g WLAN module for use in the MOW countries or regions listed below: Argentina, Brazil, Canada, Chile, Mexico, Taiwan, the United States
407159-002	802.11b/g WLAN module for use in the ROW countries or regions listed below: China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, Venezuela
407160-001	802.11a/b/g WLAN module for use in Canada and the United States
407160-002	802.11a/b/g WLAN module for use in the ROW countries or regions listed below: China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, Venezuela
407313-001	HP Remote Control
407939-001	Composite S-Video and audio input cable
407940-001	RF input adapter cable
407941-001	Analog TV tuner
408479-001	TV tuner remote control
408483-001	USB infrared emitter
408485-001	RF cable
418162-001	HP carrying case
431371-001	AMD Turion TL-50 processor (1.6-GHz, 1-MB L2 cache)
431372-001	AMD Turion TL-52 processor (1.6-GHz, 1-MB L2 cache)
431375-001	Mobile AMD Sempron 3400+ processor (1.8-GHz, 512-KB L2 cache)

Spare part number	Description
431391-001	Display inverter
431398-001	Wireless Antenna Kit
431400-001	Display Screw Kit
431431-001	Rubber Feet Kit (includes computer feet)
431433-001	Screw Kit
431436-001	RTC battery (includes 2-sided tape)
431444-001	Audio board (includes audio board cable)
431445-001	USB/power connector board (includes USB/power connector board cable)
431450-001	Fan/heat sink assembly (includes thermal pads)
433284-001	Display bezel
433287-001	Display Cable Kit
433288-001	Display Hinge Kit
434414-001	Mobile AMD Sempron 3500+ processor (1.8-GHz, 1-MB L2 cache)
435743-001	HP Remote Control II Plus
437803-001	AMD Turion MK-36 processor (2.0-GHz, 512-KB L2 cache)
441425-001	6-cell, 2.20-Ah battery
442875-001	System board
442876-001	15.4-inch, WXGA, BrightView, display assembly (includes wireless antenna transceivers and cables)
442877-001	15.4-inch, WXGA, BrightView, display panel
442878-001	Display enclosure (includes wireless antenna transceivers and cables)
442879-001	512-GB memory module (PC2-5300, 667-GHz, 1 DIMM)
442881-001	80-GB, 5400-rpm hard drive
442882-001	120-GB, 5400-rpm hard drive
442883-001	DVD-RW and CD-RW Combo Drive
442884-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
442887-001	Keyboard for use in the United States
442887-031	Windows Vista keyboard for use in the United Kingdom
442887-051	Windows Vista keyboard for use in France
442887-061	Windows Vista keyboard for use in Italy
442887-071	Windows Vista keyboard for use in Spain
442887-121	Windows Vista keyboard for use in French Canada
442887-161	Windows Vista keyboard for use in Latin America
442887-171	Windows Vista keyboard for use in Saudi Arabia
442887-281	Windows Vista keyboard for use in Thailand

Spare part number	Description
442887-AB1	Windows Vista keyboard for use in Taiwan
442887-AD1	Windows Vista keyboard for use in Korea
442887-B31	Windows Vista keyboard for international use
442887-DH1	Windows Vista keyboard for use in Denmark, Norway, and Sweden
442888-001	Top cover (includes speakers and TouchPad)
442889-001	Switch cover (includes LED board and LED board cable)
442890-001	Base enclosure (includes wireless switch and 4 computer feet)
442891-001	Plastics Kit
442892-001	Logo Kit
443153-001	Power button board (includes power button board cable)
443489-001	1024-MB memory module (PC2-4200, 533-MHz, 1 DIMM)
444003-001	100-GB, 5400-rpm hard drive

5 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
- Hex 5.0-mm nutdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers

Service considerations

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



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

Plastic parts

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

Cables and connectors



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

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

Drive handling



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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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



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

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

Use nonmagnetic tools.

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

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

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

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



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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 82 screws and standoffs, in 11 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and standoff size and location during removal and replacement.

Serial number

Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



Battery

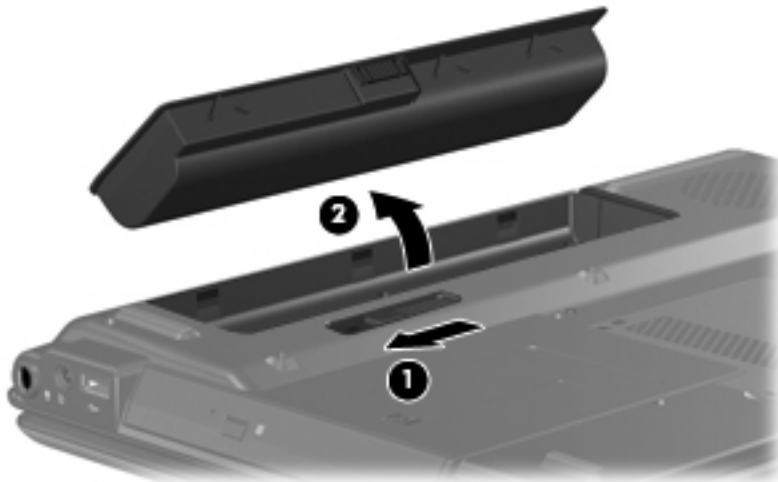
Description	Spare part number
6-cell, 2.20-Ah battery	441425-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside down, with the front toward you.
2. Slide and hold the battery release latch **(1)** toward the outside of the computer. (The battery disengages from the computer.)
3. Lift the front edge of the battery **(2)**, swing it back, and remove the battery.



Reverse this procedure to install the battery.

Hard drive

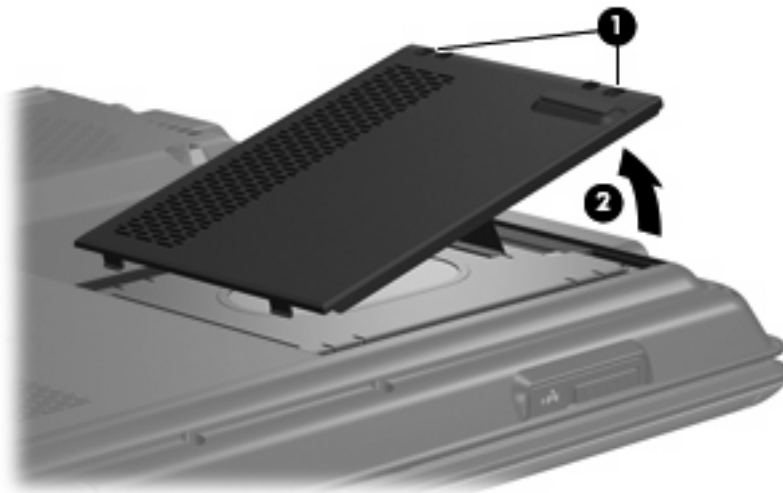
Description	Spare part number
5400-rpm, 120-GB	442882-001
5400-rpm, 100-GB	444003-001
5400-rpm, 80-GB	442881-001

Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).

Remove the hard drive:

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



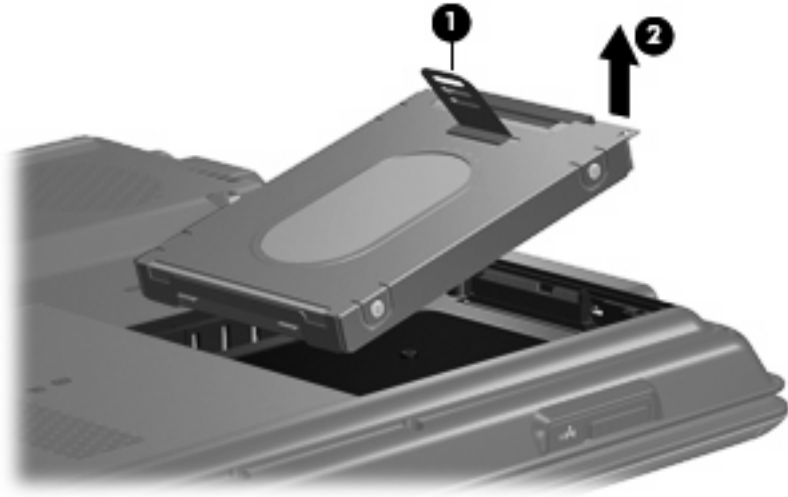
4. Remove the hard drive cover.



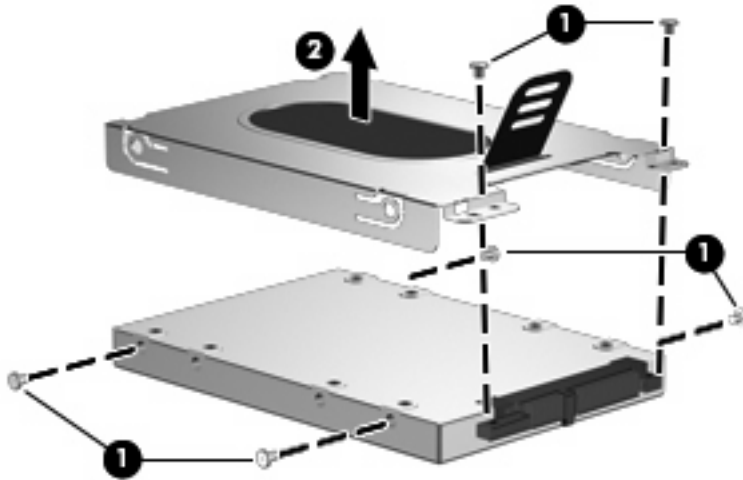
NOTE: The hard drive cover is included in the Plastics Kit, spare part number 442891-001.

5. Use the Mylar tab **(1)** to lift the hard drive until it disconnects it from the system board.

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



7. If it is necessary to remove the hard drive bracket and connector, remove the six Phillips PM3.0×3.0 screws **(1)** that secure the bracket to the hard drive.
8. Lift the bracket **(2)** straight up to remove it from the hard drive.

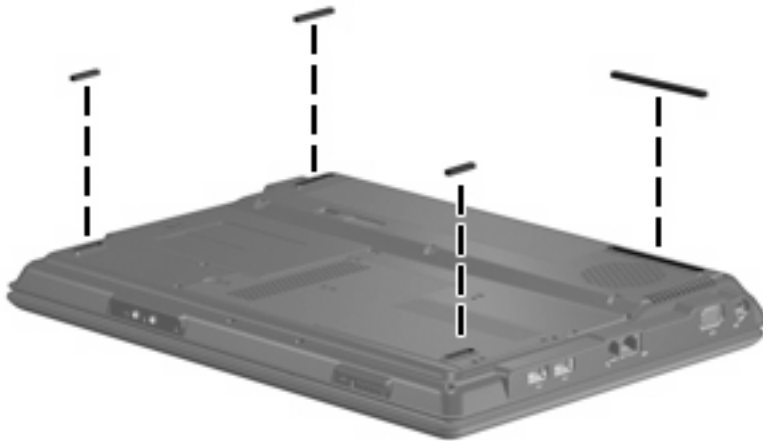


Reverse this procedure to reassemble and install the hard drive.

Computer feet

Description	Spare part number
Rubber Feet Kit (includes 4 base enclosure rubber feet)	431431-001

The computer feet are adhesive-backed rubber pads. The feet attach to the base enclosure in the locations shown below.



Memory module

Description	Spare part number
1024-MB (PC2-4200, 533-MHz, 1-DIMM)	443489-001
512-MB (PC2-5300, 667-MHz, 1-DIMM)	428879-001

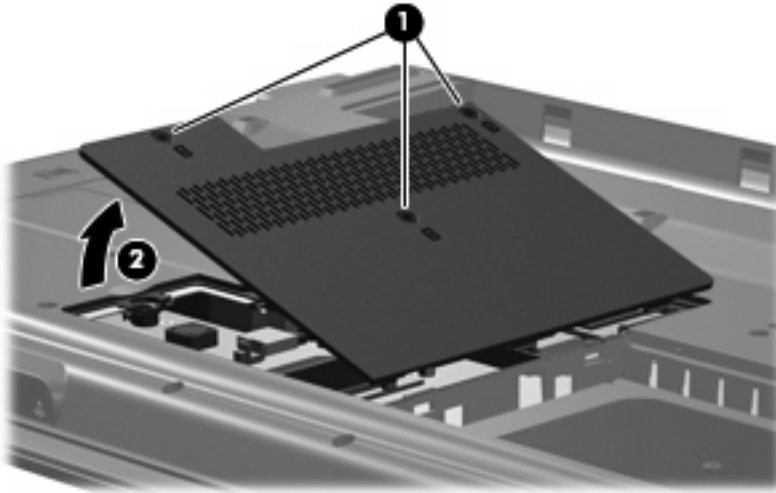
Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).

Remove the memory module:

1. Position the computer with the front toward you.
2. Loosen the three Phillips PM2.0×5.0 screws **(1)** that secure the memory module compartment cover to the computer.

3. Lift the left side of the cover **(2)** and swing it to the right.



4. Remove the memory module compartment cover.

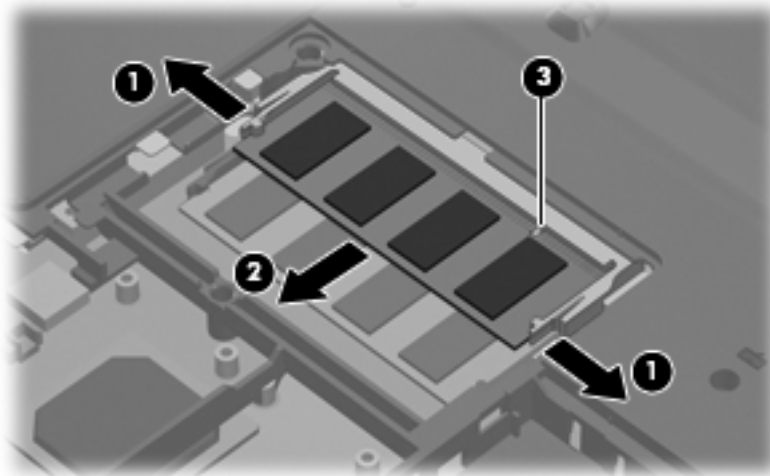


NOTE: The memory module compartment cover is included in the Plastics Kit, spare part number 442891-001.

5. Spread the retaining tabs **(1)** on each side of the memory module socket to release the memory module. (The edge of the module opposite the socket rises away from the computer.)
6. Remove the memory module **(2)** by pulling it away from the socket at an angle.



NOTE: Memory modules are designed with a notch **(3)** to prevent incorrect installation into the memory module socket.



7. Remove the memory module.

Reverse this procedure to install a memory module.

RTC battery

Description	Spare part number
RTC battery	431436-001

Before removing the RTC battery, follow these steps:

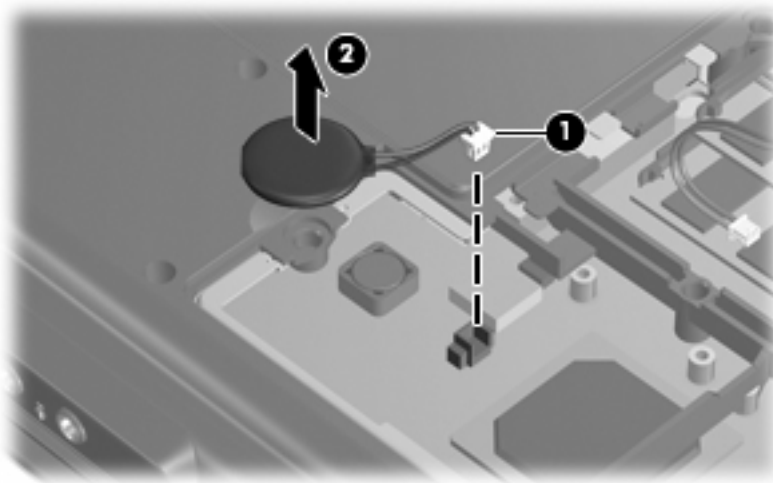
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the memory module compartment cover (see [Memory module on page 31](#)).

Remove the RTC battery:

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



NOTE: The RTC battery is secured to the computer by 2-sided tape. All replacement RTC battery spare part kits include 2-sided tape.



Reverse this procedure to install the RTC battery.

WLAN module

Description	Spare part number
802.11a/b/g WLAN module for use in Canada and the United States.	407160-001
802.11a/b/g WLAN module for use in China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, and Venezuela.	407160-002
802.11b/g WLAN module for use in Argentina, Brazil, Canada, Chile, Mexico, Taiwan, and the United States.	407159-001
802.11b/g WLAN module for use in China, Ecuador, Haiti, Honduras, Pakistan, Peru, Qatar, South Korea, Uruguay, and Venezuela.	407159-002

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the memory module compartment cover (see [Memory module on page 31](#)).

Remove the WLAN module:

1. Position the computer with the front toward you.
2. Disconnect the WLAN antenna cables **(1)** from the WLAN module.



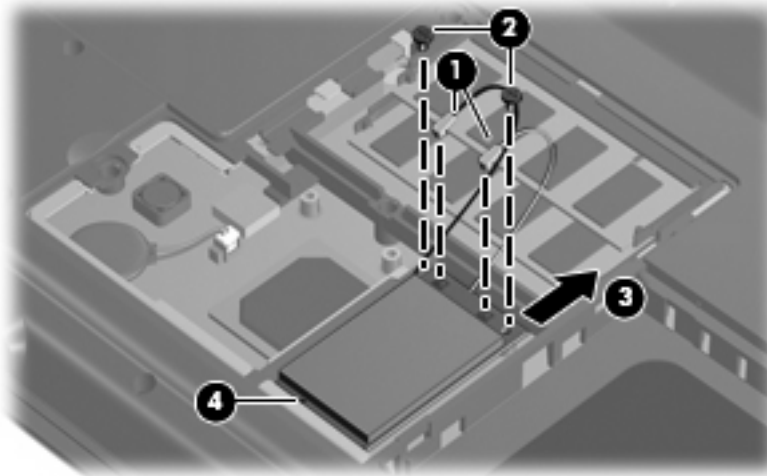
NOTE: The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The gray WLAN antenna cable is connected to the WLAN module “Aux” terminal.

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

4. Remove the WLAN module **(3)** by pulling it away from the socket at an angle .



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



Reverse this procedure to install a WLAN module.

Optical drive



NOTE: All optical drive spare part kits include an optical drive bezel.

Description	Spare part number
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	442883-001
DVD-RW and CD-RW Combo Drive	442884-001

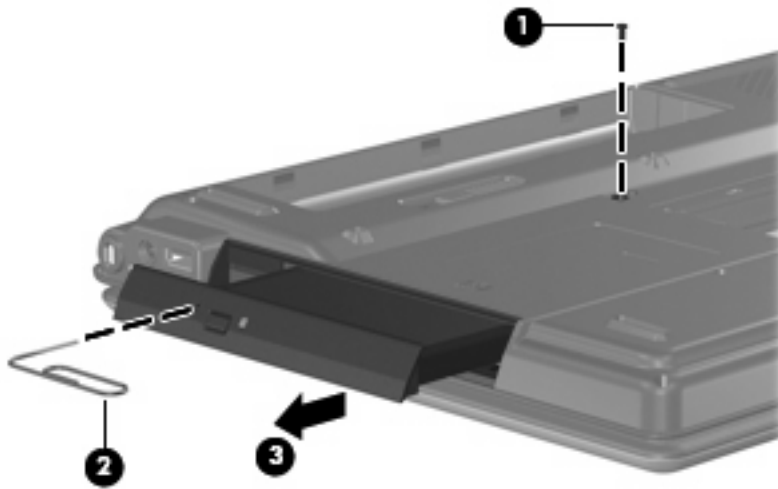
Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).

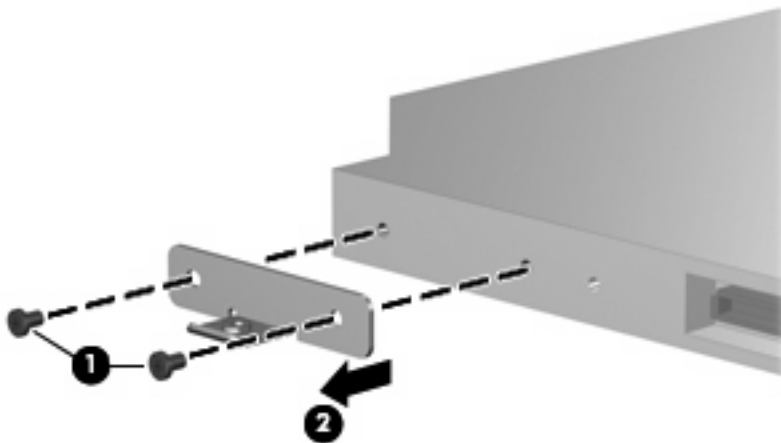
Remove the optical drive:

1. Position the computer with the left side toward you.
2. Remove the Phillips PM2.5×7.0 screw **(1)** that secures the optical drive to the computer.
3. Insert a thin tool, such as a paper clip **(2)**, into the media tray release hole. (The optical drive media tray is partially ejected from the optical drive bay.)

4. Use the media tray frame to slide the optical drive **(3)** out of the computer.



5. Remove the optical drive.
6. If it is necessary to replace the optical drive bracket, position the optical drive with the bracket toward you.
7. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the bracket to the optical drive.
8. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Switch cover

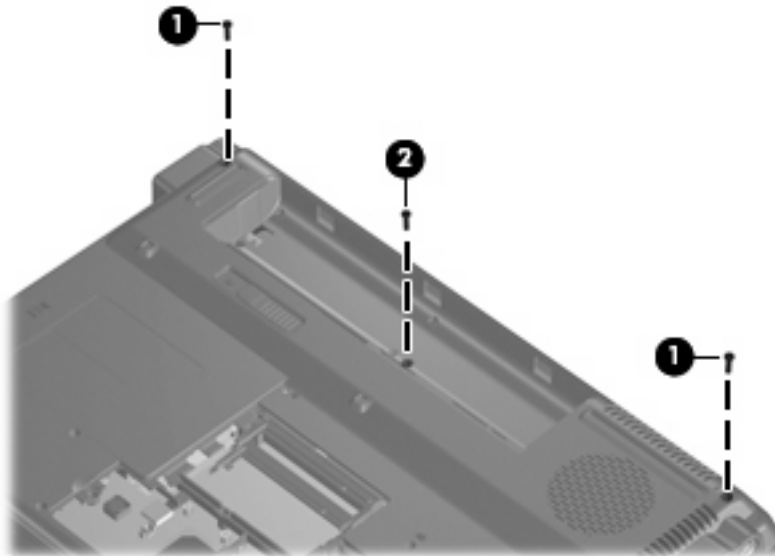
Description	Spare part number
Switch cover (includes display convertible hinge base cover)	442889-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).

Remove the switch cover:

1. Turn the computer upside down, with the rear panel toward you.
2. Remove the two Phillips PM2.5×10.0 screws **(1)** and the Phillips PM2.5×5.0 screw **(2)** that secure the switch cover to the computer.



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

5. Lift the rear edge of the switch cover and swing it forward until it rests on the keyboard.



6. Release the ZIF connector **(1)** to which the LED board cable is attached and disconnect the cable **(2)**.



7. Remove the switch cover.

Reverse this procedure to install the switch cover.

Keyboard

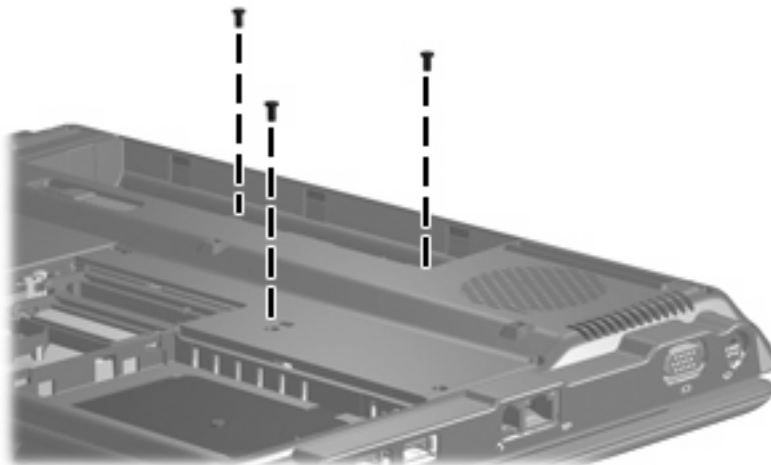
Country or region	Spare part number	Country or region	Spare part number
Denmark, Norway, and Sweden	442887-DH1	Saudi Arabia	442887-171
France	442887-051	Spain	442887-071
French Canada	442887-121	Taiwan	442887-AB1
International	442887-B31	Thailand	442887-281
Italy	442887-061	The United Kingdom	442887-031
Latin America	442887-161	The United States	442887-001
Korea	442887-AD1		

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the switch cover (see [Switch cover on page 37](#)).

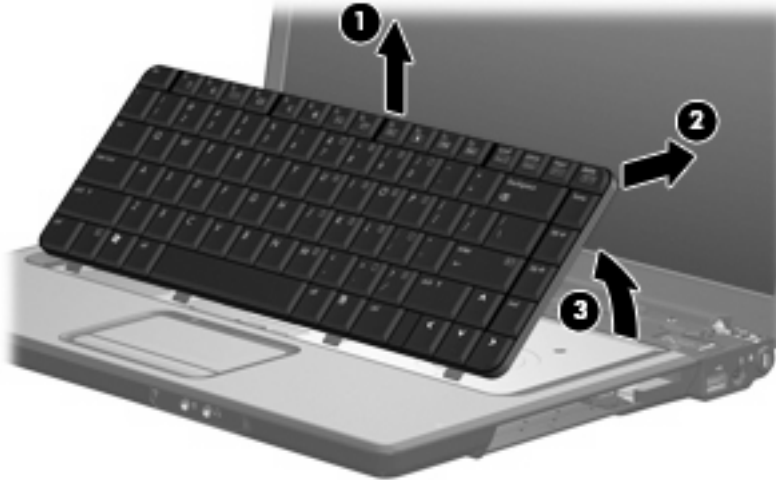
Remove the keyboard:

1. Position the computer with the front toward you.
2. Remove the three Phillips PM2.5×7.0 screws that secure the keyboard to the computer.

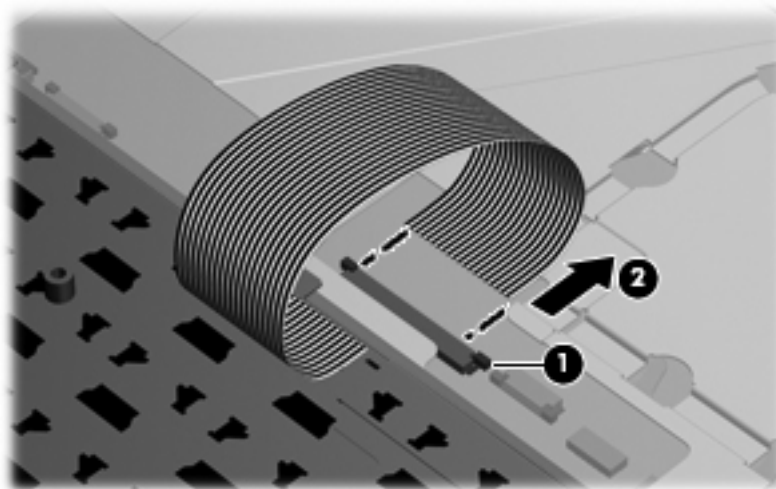


3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.

5. Lift the rear edge of the keyboard **(1)** until it rests at an angle.
6. Slide the keyboard **(2)** back to disengage the tabs on the front edge of the keyboard from the top cover
7. Swing the keyboard **(3)** up and forward until it rests on the palm rest.



8. Release the ZIF connector **(1)** to which the keyboard cable is attached and disconnect the keyboard cable **(2)** from the system board.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

Power button board

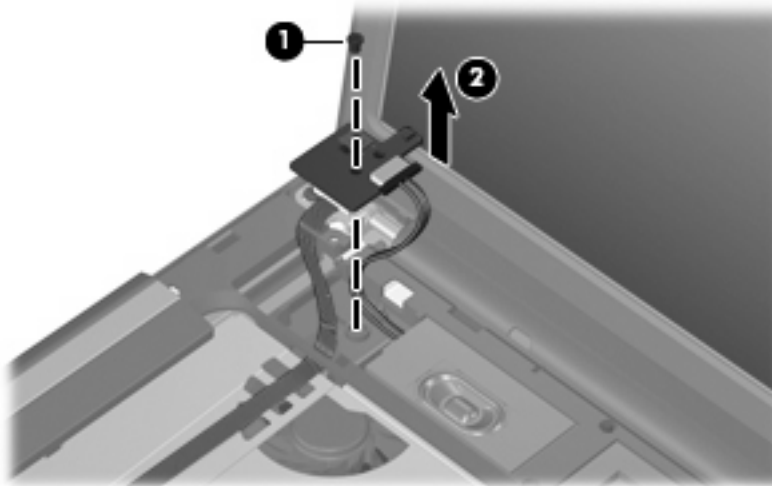
Description	Spare part number
Power button board (includes power button board cable)	443153-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Switch cover (see [Switch cover on page 37](#))
 - b. Keyboard (see [Keyboard on page 39](#))

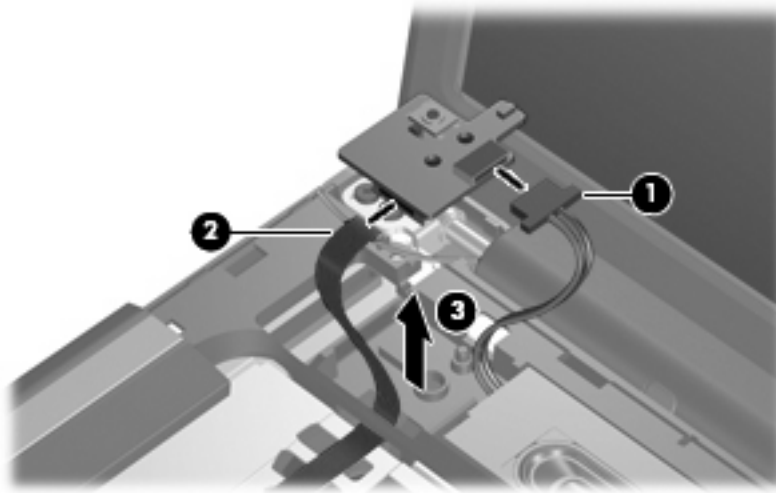
Remove the switch cover:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the power button board to the computer.
2. Release the power button board **(2)** from the computer as far as the cables attached to the board allow.



3. Disconnect the speaker assembly cable **(1)** from the power button board.
4. Release the ZIF connector to which the power button board cable **(2)** is connected and disconnect the cable.

5. Remove the power button board (3).



Reverse this procedure to install the power button board.

Display assembly

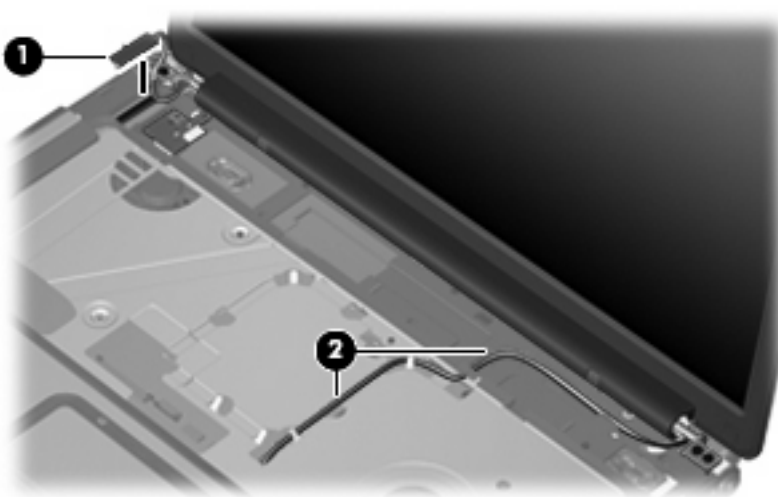
Description	Spare part number
15.4-inch, WXGA, BrightView display assembly (includes wireless antenna transceivers and cables)	442876-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the memory module compartment cover (see [Memory module on page 31](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 34](#)).
7. Remove the following components:
 - a. Switch cover (see [Switch cover on page 37](#))
 - b. Keyboard (see [Keyboard on page 39](#))

Remove the display assembly:

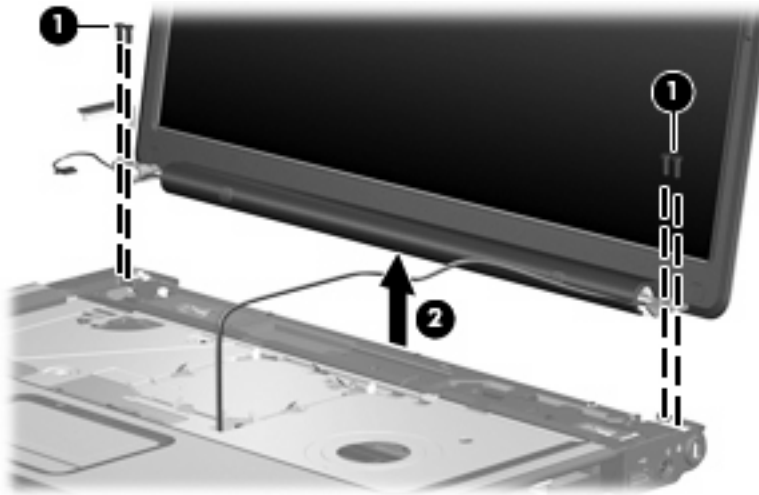
1. Disconnect the display cable **(1)** from the system board.
2. Remove the wireless antenna cables **(2)** from the clips built into the top cover.



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.

3. Remove the four Phillips PM2.5×7.0 screws **(1)** that secure the display assembly to the computer.

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



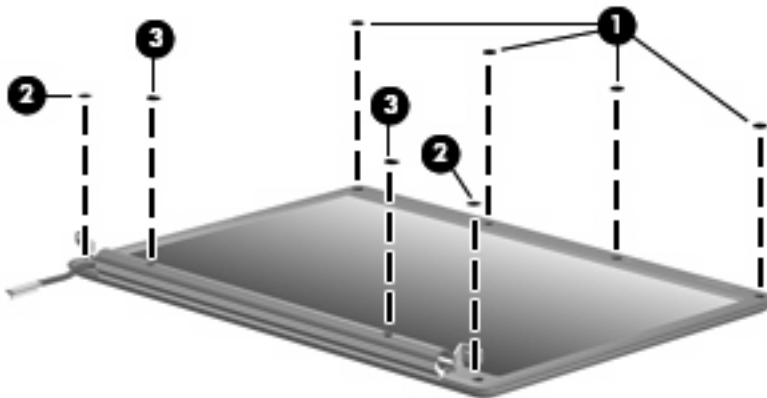
5. If it is necessary to replace any of the display assembly internal components, remove the eight rubber screw covers from the display bezel:



NOTE: There are three different sizes of rubber screw covers on the display bezel.

- (1)** Four covers on the top edge of the bezel
- (2)** Two covers on the lower bezel corners
- (3)** Two covers on the lower-inside edge of the bezel

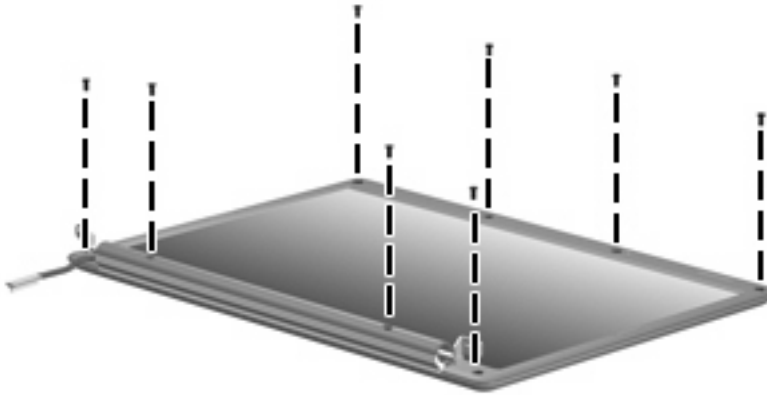
The display bezel rubber screw covers are included in the Display Screw Kit, spare part number 431400-001.



6. Remove the eight Phillips PM2.5×7.0 screws that secure the display bezel to the display assembly.



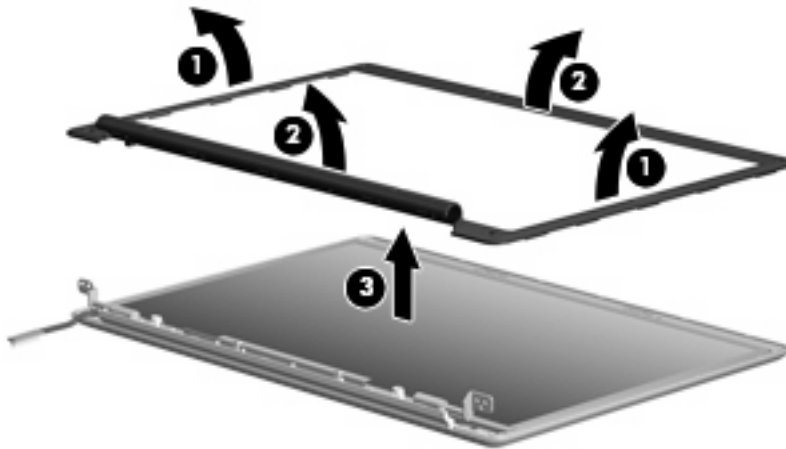
NOTE: All screws used to secure display assembly internal subcomponents are available in the Display Screw Kit, spare part number 431400-001.



7. Flex the inside edges of the left and right sides **(1)** and the top and bottom sides **(2)** of the display bezel until the bezel disengages from the display enclosure.
8. Remove the display bezel **(3)**.



NOTE: The display bezel is available using spare part number 433284-001.

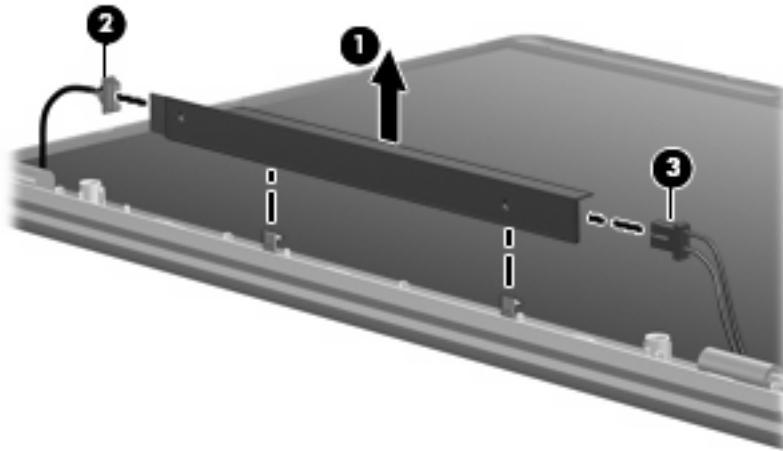


9. If it is necessary to replace the display inverter, release the inverter **(1)** from the display enclosure as far as the display panel cable and backlight cable will allow.

10. Disconnect the display panel cable **(2)** and the backlight cable **(3)** from the inverter.



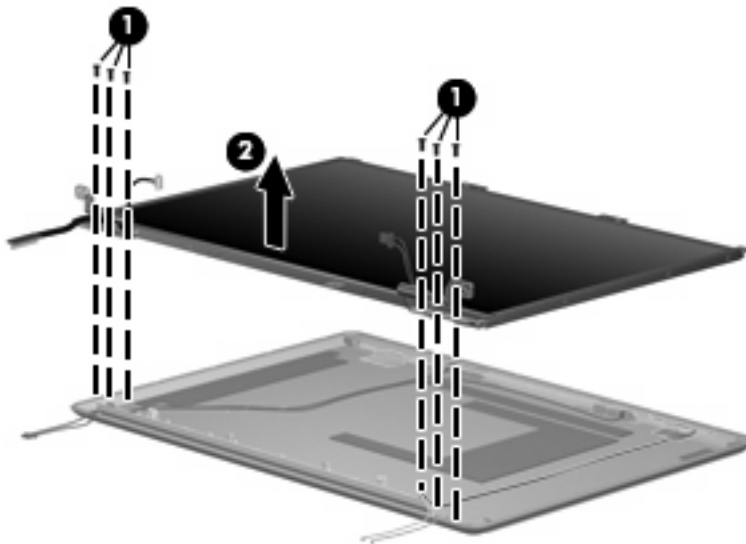
NOTE: The display inverter is available using spare part number 431391-001.



11. Remove the display inverter.
12. If it is necessary to remove the display panel, remove the six Phillips PM2.5×5.0 screws **(1)** that secure the display panel to the display enclosure.
13. Remove the display panel **(2)** from the display enclosure.



NOTE: The display panel is available using spare part number 442887-001.

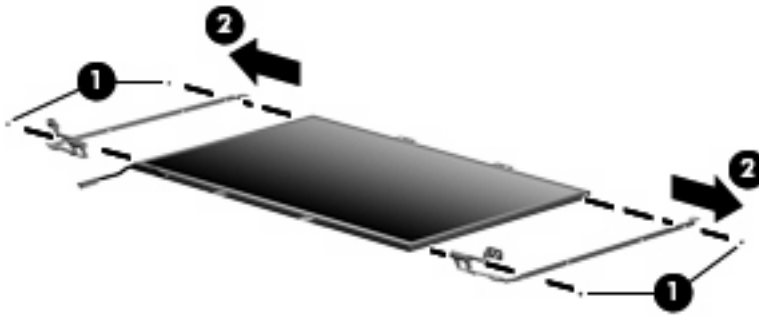


14. If it is necessary to remove the display hinges, remove the two Phillips PM2.0×3.0 screws **(1)** that secure each hinge to the display panel.

15. Remove the display hinges **(2)**.



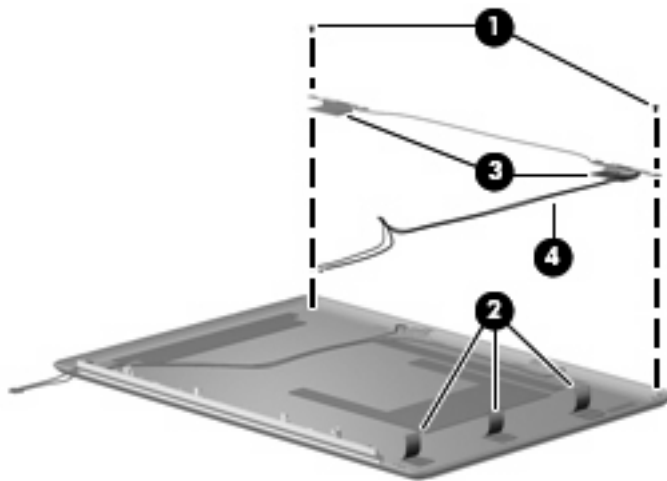
NOTE: The display hinges are available using spare part number 433288-001



16. If it is necessary to remove the wireless transceivers and cables, remove the Phillips PM2.0x4.0 screw **(1)** that secures each transceiver to the display enclosure.
17. Remove the wireless antenna cables from the clips **(2)** built into the display enclosure.
18. Detach the wireless antenna transceivers **(3)** from the display enclosure.
19. Remove the wireless antenna cables **(4)** from the display enclosure.



NOTE: The wireless antennae are included with the display enclosure and are also available using spare part number 431398-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover

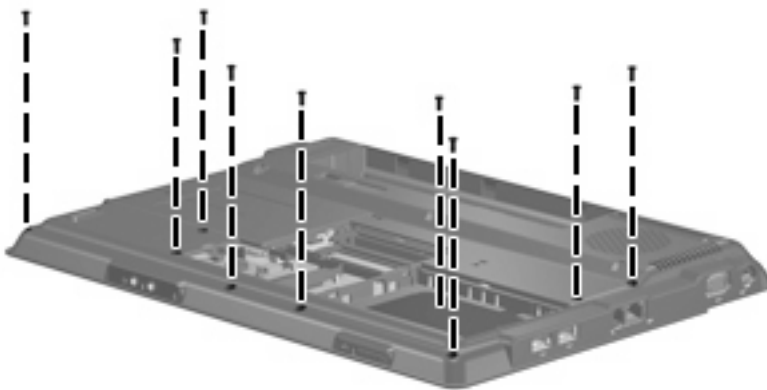
Description	Spare part number
Top cover (includes speakers, TouchPad, and TouchPad cable)	442888-001

Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 29](#))
 - b. Memory module compartment cover (see [Memory module on page 31](#))
 - c. Optical drive (see [Optical drive on page 35](#))
 - d. Switch cover (see [Switch cover on page 37](#))
 - e. Keyboard (see [Keyboard on page 39](#))
 - f. Display assembly (see [Display assembly on page 43](#))

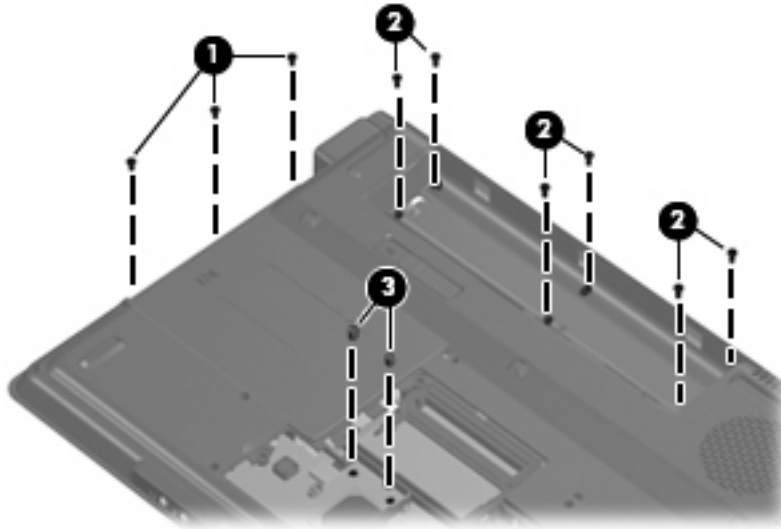
Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the nine Phillips PM2.5×7.0 screws that secure the top cover to the computer.

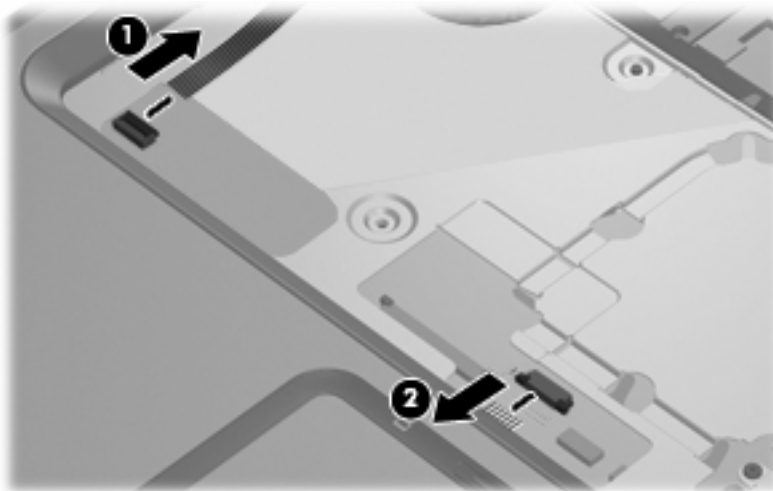


3. Remove the following screws and standoffs:

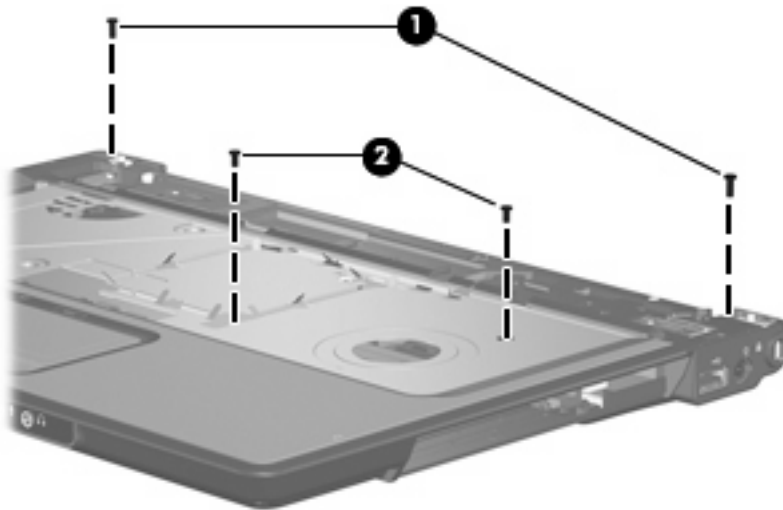
- (1) Three Phillips PM2.5×4.0 screws
- (2) Six Phillips PM2.5×5.0 screws
- (3) Two Hex HM5.0×7.0 standoffs



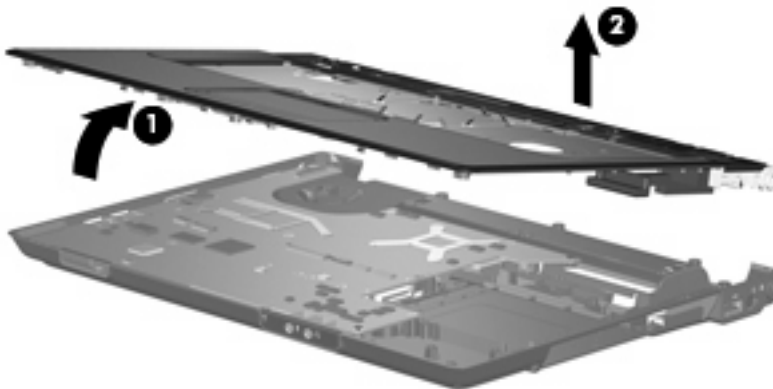
4. Turn the computer right-side up, with the front toward you.
5. Release and disconnect the following ZIF cables from the system board:
 - (1) Power button board cable
 - (2) TouchPad cable



6. Remove the two Phillips PM2.0×6.0 screws **(1)** and the two Phillips PM2.5×5.0 screws **(2)** that secure the top cover to the computer.



7. Lift the front edge of the top cover **(1)** until it disengages from the computer.
8. Remove the top cover **(2)**.



Reverse this procedure to install the top cover.

Audio board

Description	Spare part number
Audio board (includes audio board cable)	431444-001

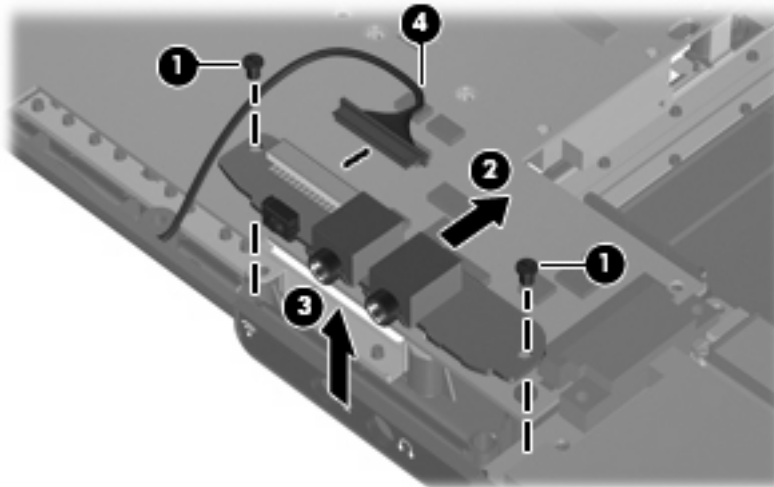
Before removing the audio board, follow these steps:

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

4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 29](#))
 - b. Memory module compartment cover (see [Memory module on page 31](#))
 - c. Optical drive (see [Optical drive on page 35](#))
 - d. Switch cover (see [Switch cover on page 37](#))
 - e. Keyboard (see [Keyboard on page 39](#))
 - f. Display assembly (see [Display assembly on page 43](#))
 - g. Top cover (see [Top cover on page 48](#))

Remove the audio board:

1. Remove the two Phillips PM2.5x5.0 screws **(1)** that secure the audio board to the computer.
2. Release the audio board **(2)** by sliding it away from you until the connectors on the front of the board disengage from the openings in the base enclosure.
3. Remove the audio board **(3)**.
4. Disconnect the audio board cable **(4)** from the audio board.



Reverse this procedure to install the audio board.

USB/power connector board

Description	Spare part number
USB/power connector board (includes USB/power connector board)	431445-001

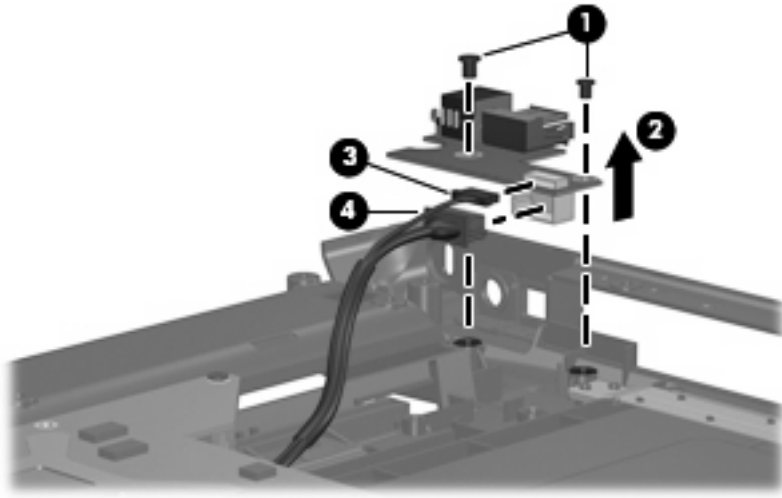
Before removing the USB/power connector board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 29](#))
 - b. Optical drive (see [Optical drive on page 35](#))
 - c. Keyboard (see [Keyboard on page 39](#))
 - d. Switch cover (see [Switch cover on page 37](#))
 - e. Display assembly (see [Display assembly on page 43](#))
 - f. Top cover (see [Top cover on page 48](#))

Remove the USB/power connector board:

1. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the USB/power connector board to the computer.
2. Release the USB/power connector board as far as the USB/power connector board **(2)** cable will allow.

3. Disconnect the USB board cable **(3)** and the power connector cable **(4)** from the USB/power connector board.



Reverse this procedure to install the USB/power connector board.

System board

Description	Spare part number
System board	442875-001

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

- Memory module (see [Memory module on page 31](#))
- RTC battery (see [RTC battery on page 33](#))
- WLAN module (see [WLAN module on page 34](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 57](#))
- Processor (see [Processor on page 59](#))

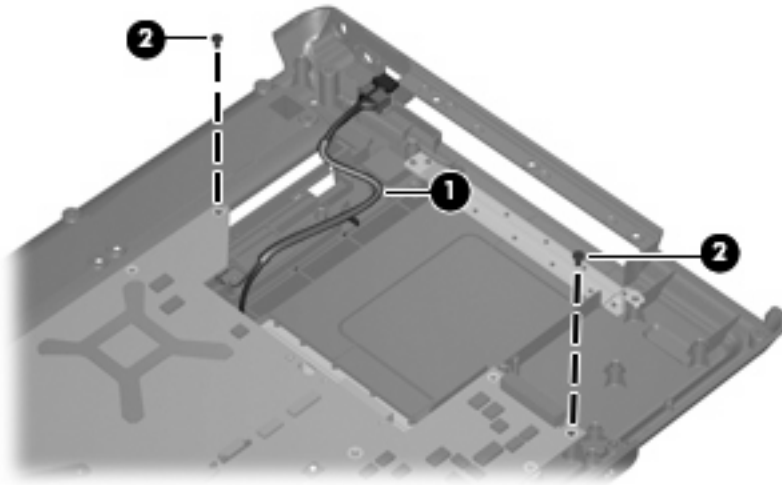
Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 29](#))
 - b. Optical drive (see [Optical drive on page 35](#))
 - c. Switch cover (see [Switch cover on page 37](#))
 - d. Keyboard (see [Keyboard on page 39](#))
 - e. Display assembly (see [Display assembly on page 43](#))
 - f. Top cover (see [Top cover on page 48](#))
 - g. USB/power connector board (see [USB/power connector board on page 52](#))

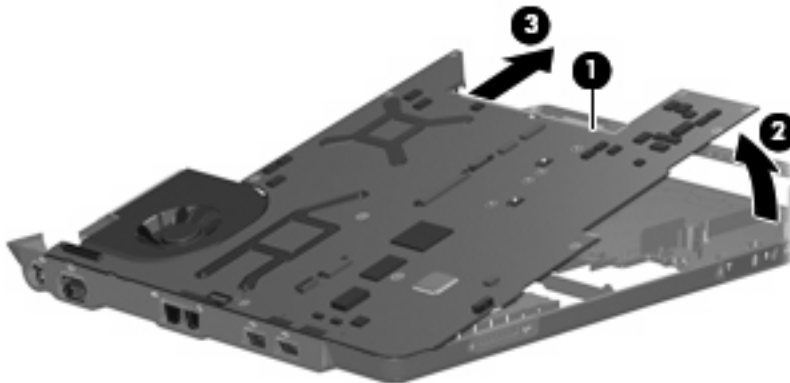
Remove the system board:

1. Remove the USB/power connector board cable (**1**) from the clips in the base enclosure.

2. Remove the two Phillips PM2.5×4.0 screws **(2)** that secure the system board to the base enclosure.

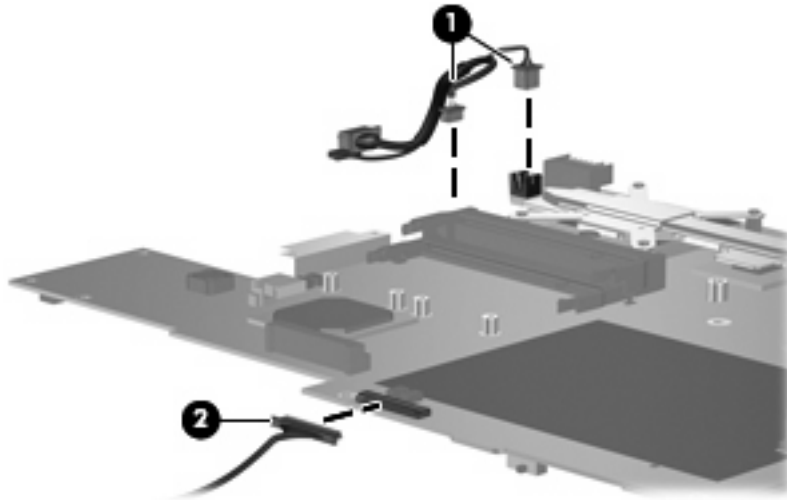


3. Use the optical drive connector **(1)** to lift the right side of the system board **(2)** until it rests at an angle.
4. Remove the system board **(3)** by sliding it away from the top cover at an angle.



5. If it is necessary to replace the USB/power connector board cable or the audio board cable, turn the system board upside down, with the front toward you.

6. Disconnect the USB/power connector board cable **(1)** and the audio board cable **(2)** from the system board.



Reverse this procedure to install the system board.

Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes thermal paste and thermal pads)	431450-001



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

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 29](#))
 - b. Memory module compartment cover (see [Memory module on page 31](#))
 - c. Optical drive (see [Optical drive on page 35](#))
 - d. Switch cover (see [Switch cover on page 37](#))
 - e. Keyboard (see [Keyboard on page 39](#))
 - f. Display assembly (see [Display assembly on page 43](#))
 - g. Top cover (see [Top cover on page 48](#))
 - h. System board (see [System board on page 54](#))

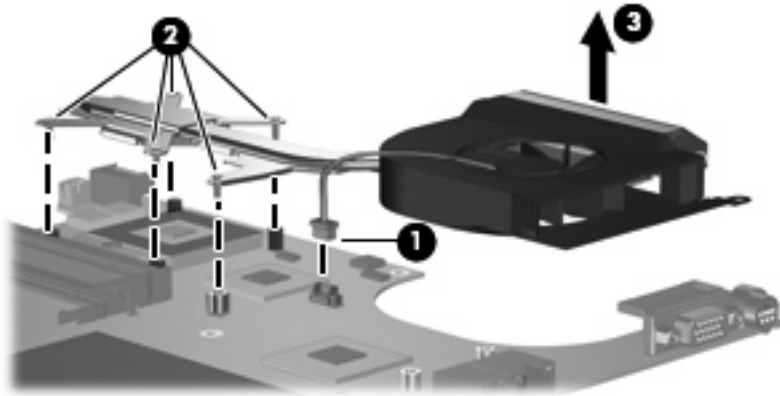
Remove the fan/heat assembly:

1. Turn the system board upside down, with the external monitor port toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Loosen the five Phillips PM2.5×5.0 screws **(2)** that secure the fan/heat sink assembly to the system board.

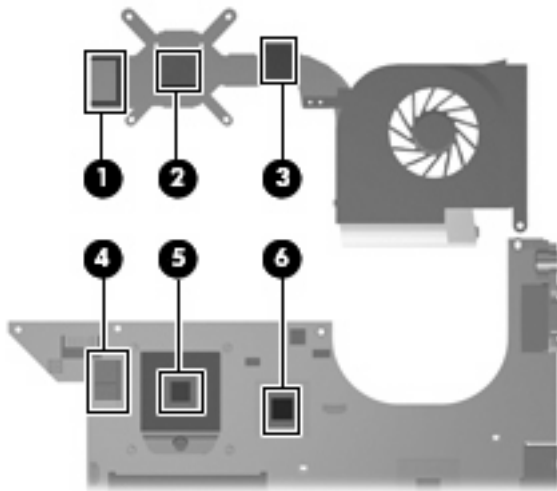
4. Remove the fan/heat sink assembly **(3)**.



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



NOTE: The thermal paste and thermal pads should be thoroughly cleaned from the surfaces of the fan/heat sink assembly **(1)**, **(2)**, and **(3)**, the system board components **(4)** and **(6)**, and the processor **(5)** each time the fan/heat sink assembly is removed. Thermal pads and thermal paste should be applied to all surfaces before the fan/heat sink assembly is reinstalled. Thermal pads and thermal paste are included with all fan/heat sink assembly, system board, and processor spare part kits.



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

Processor



NOTE: All processor spare part kits include thermal paste.

Description	Spare part number
AMD Turion 64 Mobile Technology TL-52 1.6-GHz processor (1-MB L2 cache)	431372-001
AMD Turion 64 Mobile Technology TL-50 1.6-GHz processor (512-KB L2 cache)	431371-001
AMD Turion 64 Mobile Technology MK-36 2.0-GHz processor (512-KB L2 cache)	437803-001
Mobile AMD Sempron 3500+ 1.8-GHz processor (1-MB L2 cache)	434414-001
Mobile AMD Sempron 3400+ 1.8-GHz processor (512-KB L2 cache)	431375-001

Before removing the processor, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power cord.
4. Remove the battery (see [Battery on page 28](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 29](#))
 - b. Memory module compartment cover (see [Memory module on page 31](#))
 - c. Optical drive (see [Optical drive on page 35](#))
 - d. Switch cover (see [Switch cover on page 37](#))
 - e. Keyboard (see [Keyboard on page 39](#))
 - f. Display assembly (see [Display assembly on page 43](#))
 - g. Top cover (see [Top cover on page 48](#))
 - h. System board (see [System board on page 54](#))
 - i. Fan/heat sink assembly (see [Fan/heat sink assembly on page 57](#))

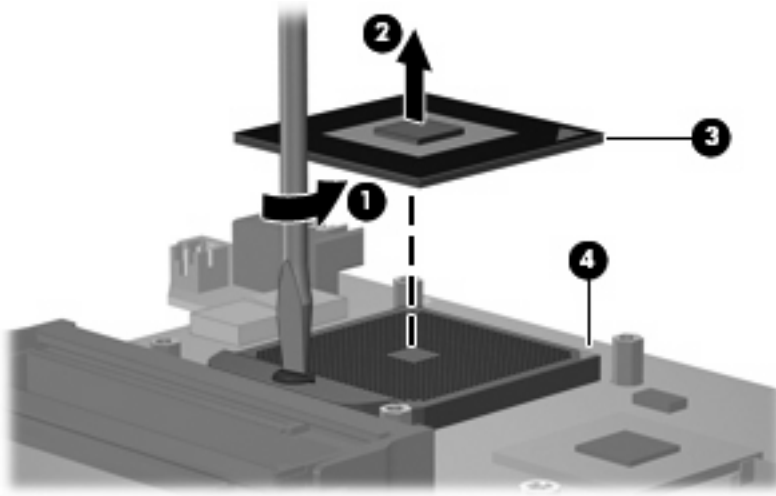
Remove the processor:

1. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.

2. Lift the processor (2) straight up and remove it.



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



Reverse this procedure to install the processor.

6 Setup Utility



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

Starting the Setup Utility

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



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

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

To start the Setup Utility:

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

Changing the language of the Setup Utility

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

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

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

Navigating and selecting in the Setup Utility

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

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

Displaying system information

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

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

Restoring default settings in the Setup Utility

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

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

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



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

Using advanced Setup Utility features

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

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

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

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

Closing the Setup Utility

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

- To close the Setup Utility and save your changes from the current session, use either of the following procedures:

- Press **f10**, and then follow the instructions on the screen.

— or —

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

When you use the **f10** procedure, you are offered an option to return to the Setup Utility. When you use the Exit Saving Changes procedure, the Setup Utility closes when you press **enter**.

- To close the Setup Utility without saving your changes from the current session:

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

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

Setup Utility menus

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



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

Main menu

Select	To do this
System information	<ul style="list-style-type: none">• View and change the system time and date.• View identification information about the computer.• View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).


Security menu

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

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Enhanced SATA support (select models only)	Enable/disable enhanced SATA mode.
Boot Options	Set the following boot options: <ul style="list-style-type: none">• f10 and f12 Delay (sec.) Set the delay for the f10 and f12 functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20).• CD-ROM boot Enable/disable boot from CD-ROM.• Floppy boot Enable/disable boot from Floppy.• Internal Network Adapter boot Enable/disable boot from Internal Network Adapter.• Boot Order Set the boot order for:<ul style="list-style-type: none">• USB Floppy• ATAPI CD/DVD ROM Drive• Hard drive• USB Diskette on Key• USB Hard drive• Network adapter
Button Sound (select models only)	Enable/disable the Quick Launch Button tapping sound.
Video memory up to (select models only)	Select the amount of video memory.


Diagnostics menu

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

7 Specifications

Computer specifications


	Metric	U.S.
Dimensions		
Length	35.7 cm	14.05 in
Width	25.7 cm	10.12 in
Height (varies front to rear)	4.1 cm	1.57 in
Weight (with optical drive, hard drive, and battery)	2.7 kg	5.47 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	

	Metric	U.S.
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	
 NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

15.4-inch, WXGA BrightView display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.15 in
Width	33.1 cm	13.03 in
Diagonal	39.1 cm	15.39 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	160 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Refresh rate	60 Hz	
Character display	80 × 25	
PPI	107	
Viewing angle	+/-65° horizontal, +/-50° vertical (typical)	

Hard drive specifications

	120-GB*	100-GB*	80-GB*
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g
Interface type			
	ATA-7	ATA-7	ATA-7
Transfer rate			
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
Logical blocks			
	234,420,360	195,365,233	156,280,320
Disc rotational speed			
	5400 rpm	5400 rpm	5400 rpm
Operating temperature			
	5°C to 55°C (41°F to 131°F)		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
	NOTE: Certain restrictions and exclusions apply. Consult technical support for details.		

DVD±RW and CD-RW Super Multi Double-Layer Combo Drive and DVD-RW and CD-RW Combo Drive specifications

Applicable disc	Read: CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, Mixed Mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	Write: CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Center hole diameter	1.5 cm (0.59 in)	
Disc diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disc thickness	1.2 mm (0.047 in)	
Track pitch	0.74 μm	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Audio output level	Audio-out, 0.7 Vrms	
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

System DMA specifications


Hardware DMA	System function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned

*PC Card controller can use DMA 1, 2, or 5.

System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft® Natural Keyboard
IRQ2	Cascaded
IRQ4	COM1
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel

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

 **NOTE:** PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

System I/O address specifications

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

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

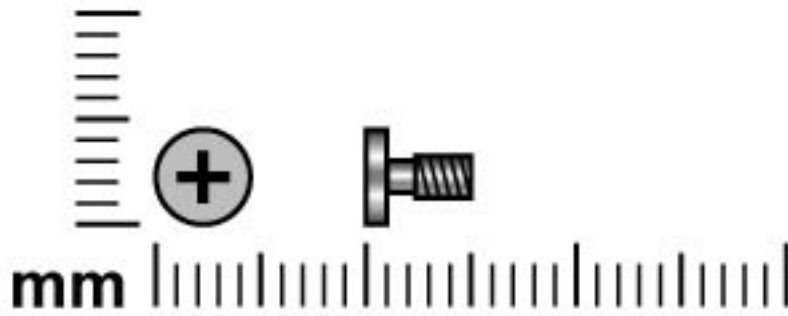
System memory map specifications

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

8 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws and screw locks listed in this section are available in the Screw Kit, spare part number 431433-001, and the Display Screw Kit, spare part number 431400-001.

Phillips PM2.0×5.0 captive screw

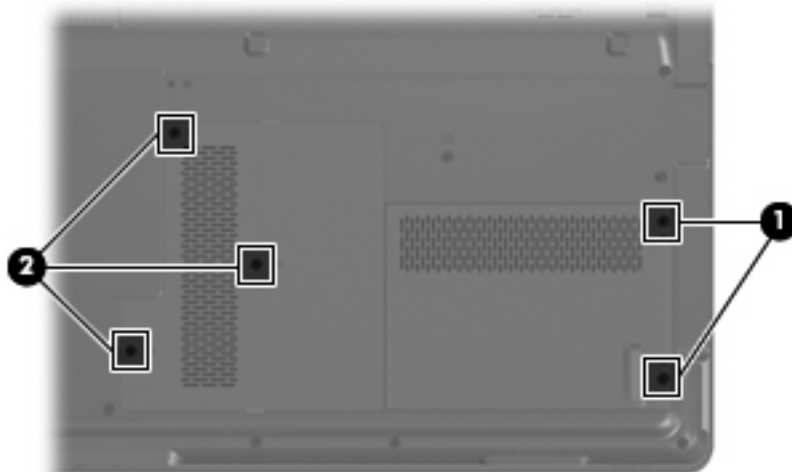


Color	Quantity	Length	Thread	Head width
Black	5	5.0 mm	2.0 mm	5.0 mm

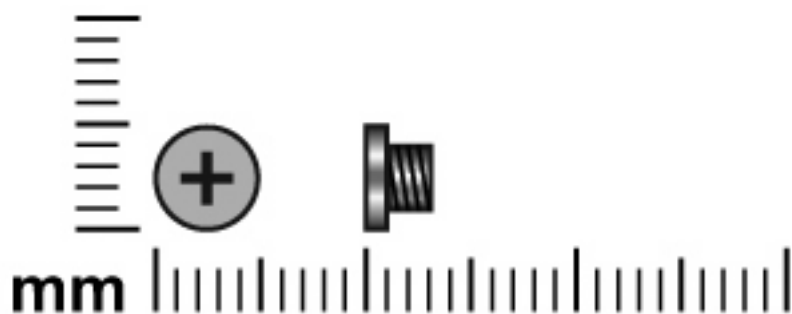
Where used:

(1) Two screws (secured by C-clips) that secure the hard drive cover to the computer (see [Hard drive on page 29](#))

(2) Three screws (secured by C-clips) that secure the memory module compartment cover to the computer (see [Memory module on page 31](#))

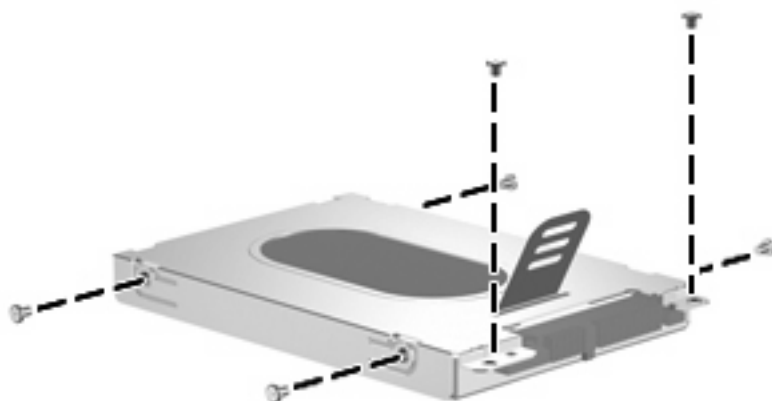


Phillips PM3.0×3.0 screw

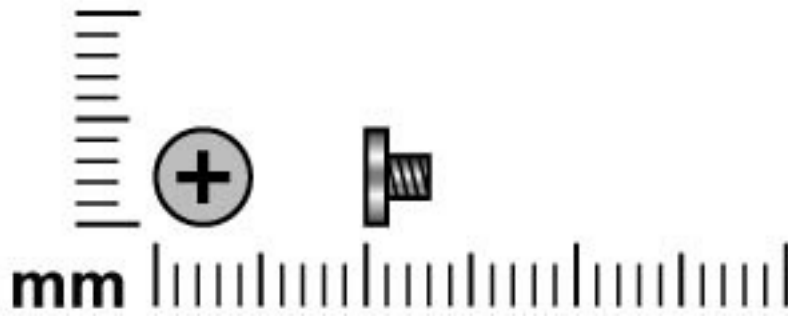


Color	Quantity	Length	Thread	Head width
Silver	6	3.0 mm	3.0 mm	5.0 mm

Where used: 6 screws that secure the hard drive bracket to the hard drive (see [Hard drive on page 29](#))

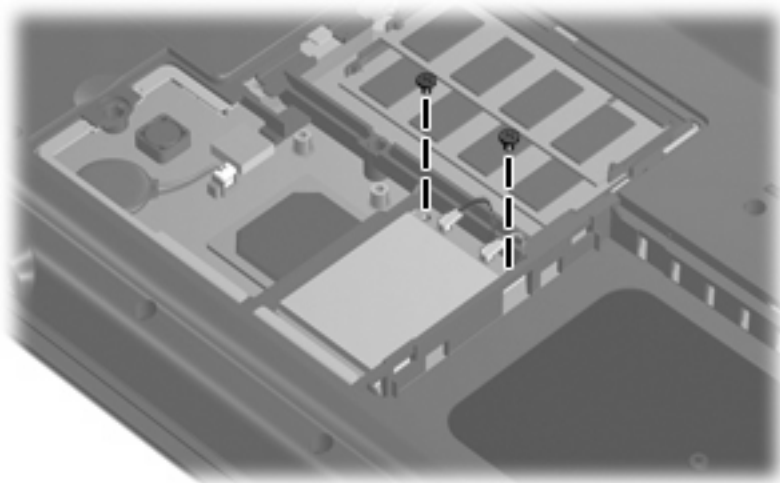


Phillips PM2.0×3.0 screw

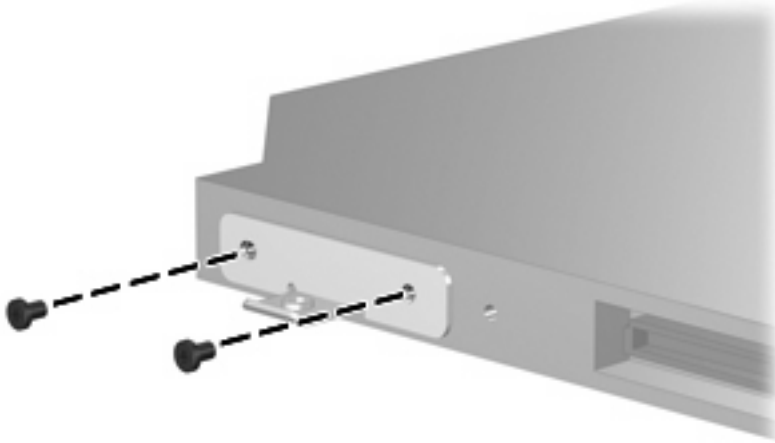


Color	Quantity	Length	Thread	Head width
Black	9	3.0 mm	2.0 mm	4.5 mm

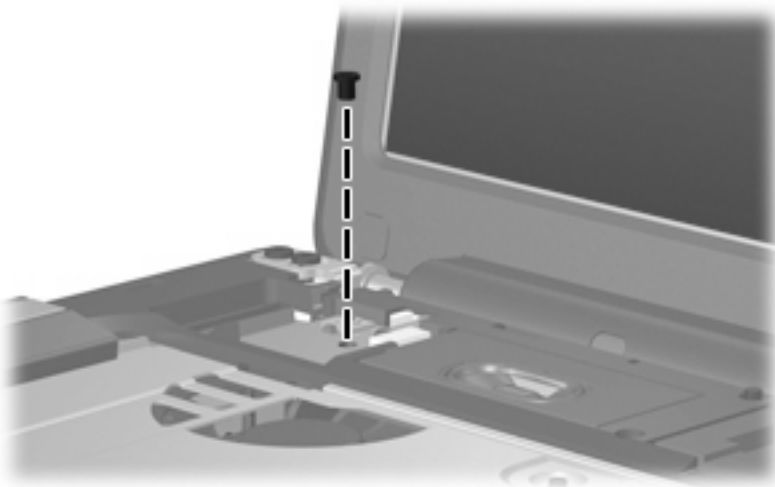
Where used: 2 screws that secure the WLAN module to the computer (see [WLAN module on page 34](#))



Where used: 2 screws that secure the optical drive bracket to the optical drive (see [Optical drive on page 35](#))



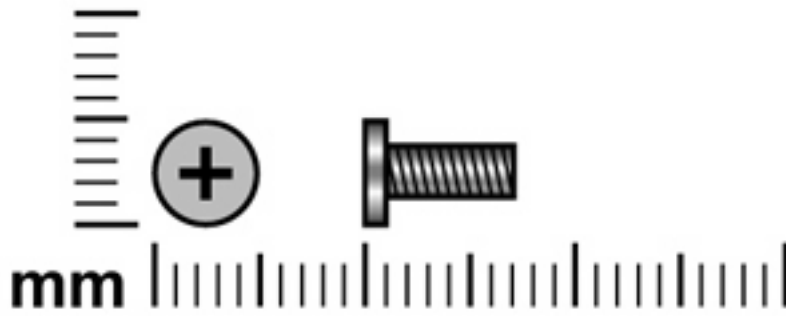
Where used: One screw that secures the power button board to the computer (see [Power button board on page 41](#))



Where used: 4 screws that secure the display hinges to the display panel (see [Display assembly on page 43](#))



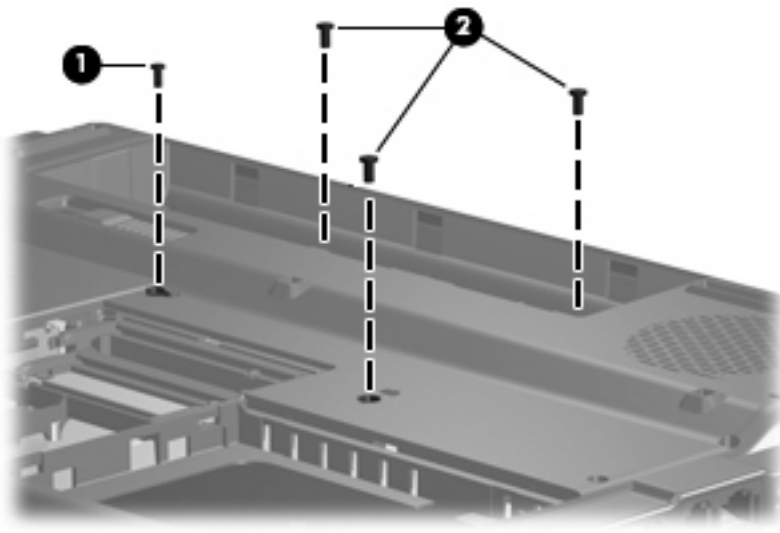
Phillips PM2.5×7.0 screw



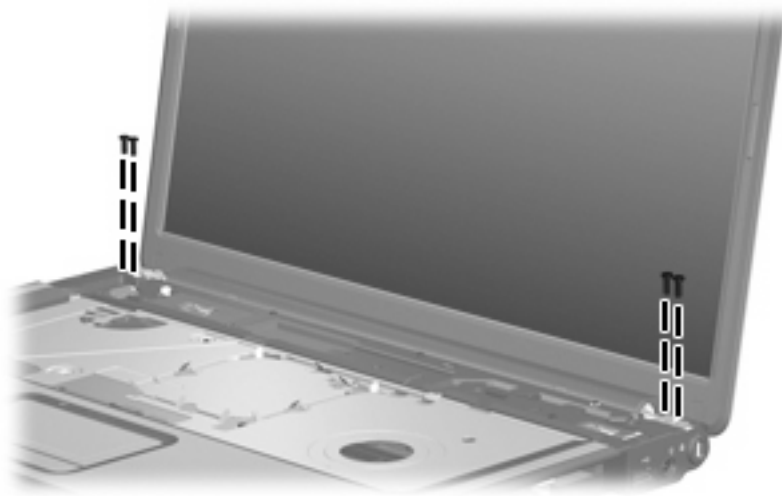
Color	Quantity	Length	Thread	Head width
Black	25	7.0 mm	2.5 mm	5.0 mm

Where used:

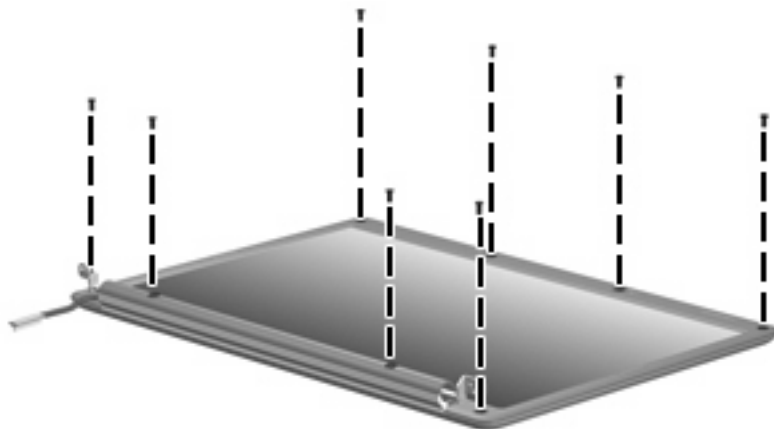
- (1) One screw that secures the optical drive to the computer (see [Optical drive on page 35](#))
- (2) Three screws that secure the keyboard to the computer (see [Keyboard on page 39](#))



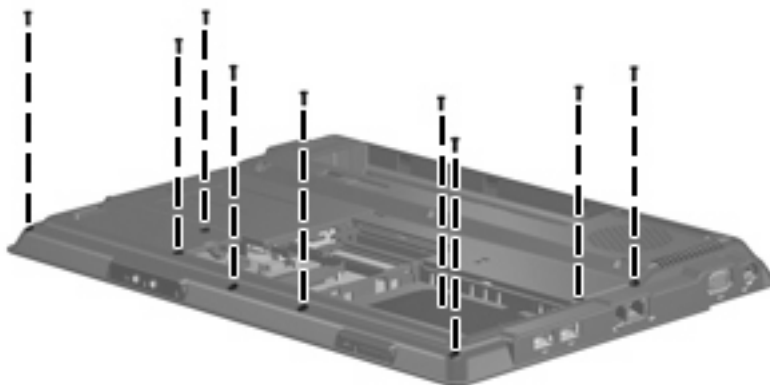
Where used: 4 screws that secure the display assembly to the computer (see [Display assembly on page 43](#))



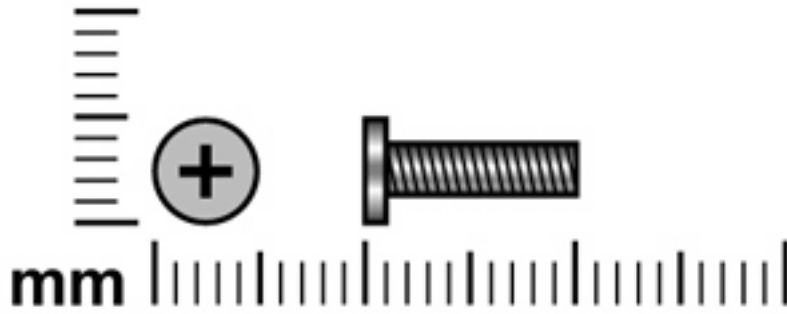
Where used: 8 screws that secure the display bezel to the display assembly (see [Display assembly on page 43](#))



Where used: 9 screws that secure the top cover to the computer (see [Top cover on page 48](#))



Phillips PM2.5×10.0 screw

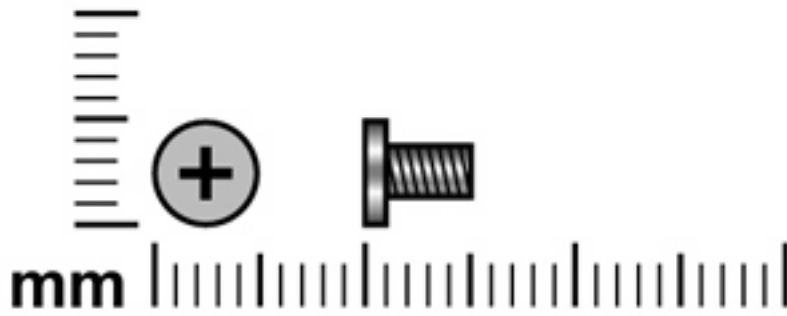


Color	Quantity	Length	Thread	Head width
Black	2	10.0 mm	2.5 mm	5.0 mm

Where used: 2 screws that secure the switch cover to the computer (see [Switch cover on page 37](#))



Phillips PM2.5×5.0 Screw

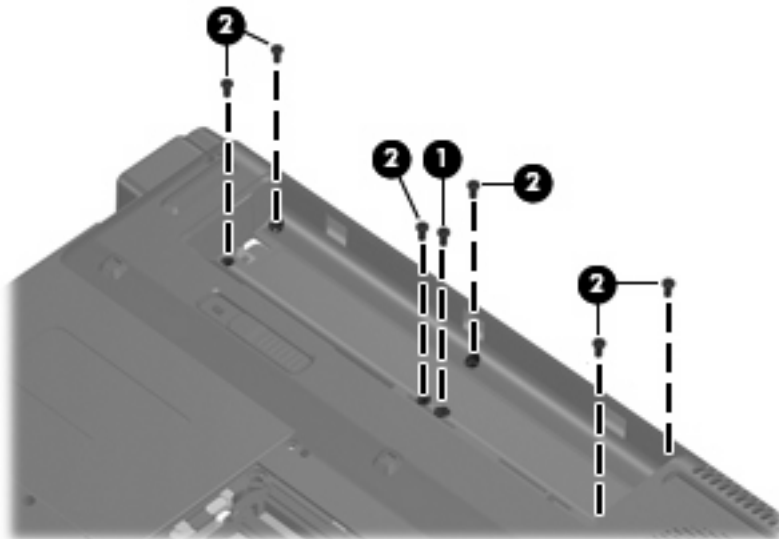


Color	Quantity	Length	Thread	Head Width
Silver	19	5.0 mm	2.5 mm	5.0 mm

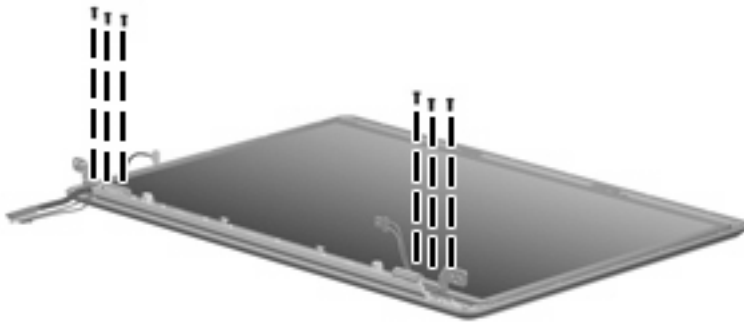
Where used:

(1) One screw that secures the switch cover to the computer (see [Switch cover on page 37](#))

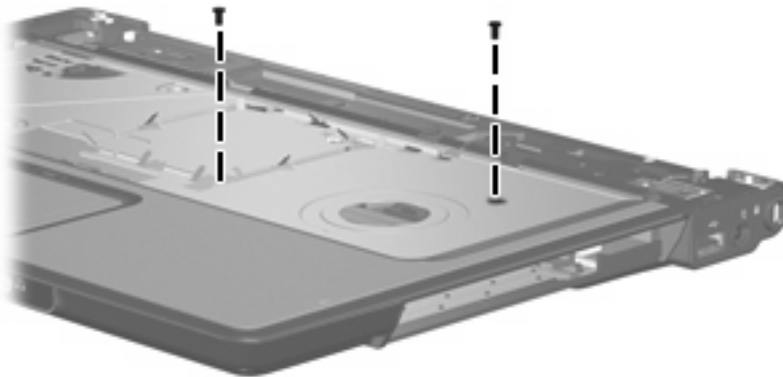
(2) Six screws that secure the top cover to the base enclosure (see [Top cover on page 48](#))



Where used: 6 screws that secure the display panel to the display enclosure (see [Display assembly on page 43](#))



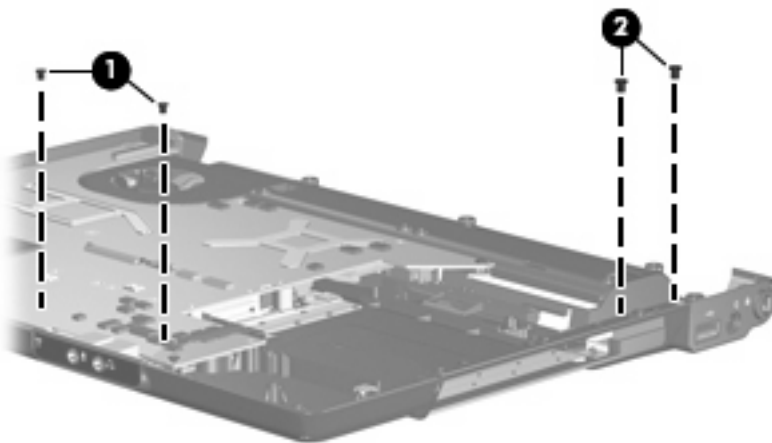
Where used: 2 screws that secure the top cover to the base enclosure (see [Top cover on page 48](#))



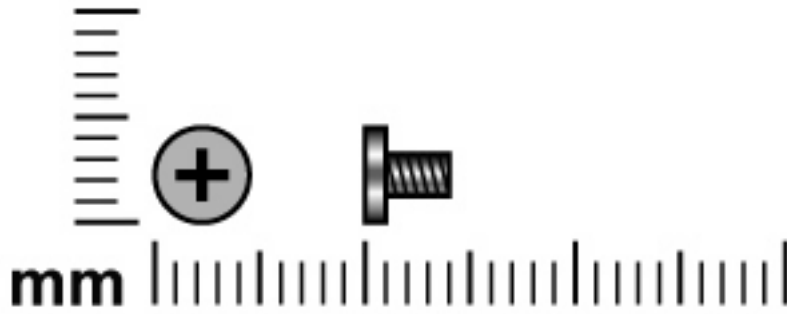
Where used:

(1) Two screws that secure the audio board to the base enclosure (see [Audio board on page 50](#))

(2) Two screws that secure the USB/power connector board to the base enclosure (see [USB/power connector board on page 52](#))

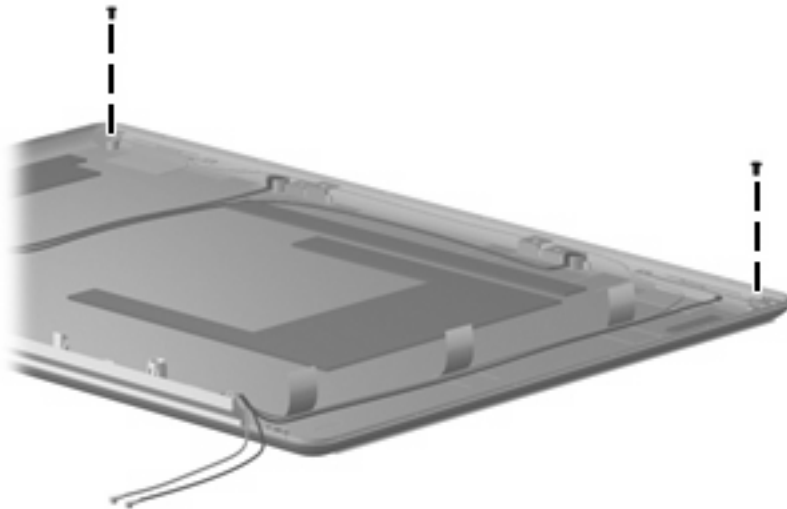


Phillips PM2.0×4.0 Screw

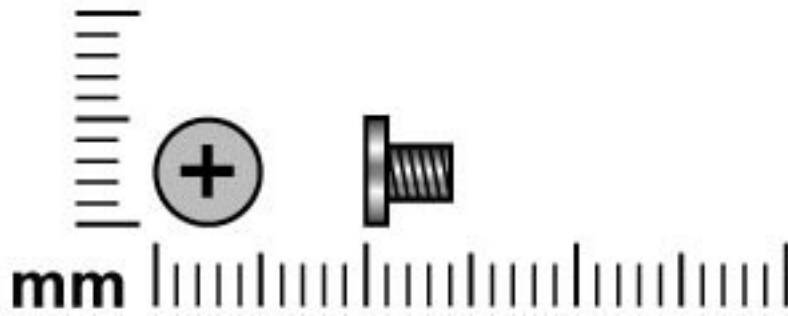


Color	Quantity	Length	Thread	Head width
Silver	2	4.0 mm	2.0 mm	5.0 mm

Where used: 2 screws that secure the wireless antenna transceivers to the display enclosure (see [Display assembly on page 43](#))

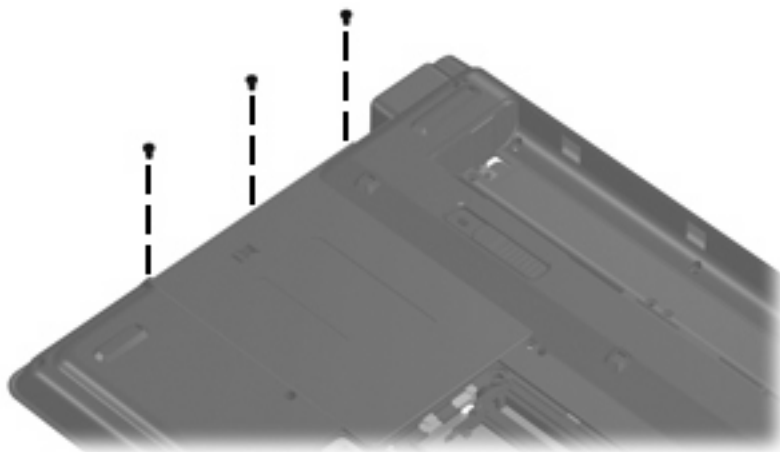


Phillips PM2.5×4.0 screw

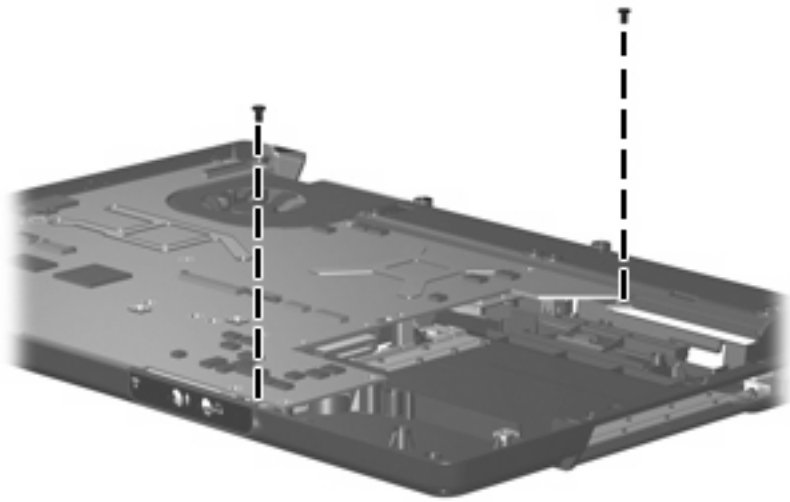


Color	Quantity	Length	Thread	Head width
Silver	5	4.0 mm	2.5 mm	5.0 mm

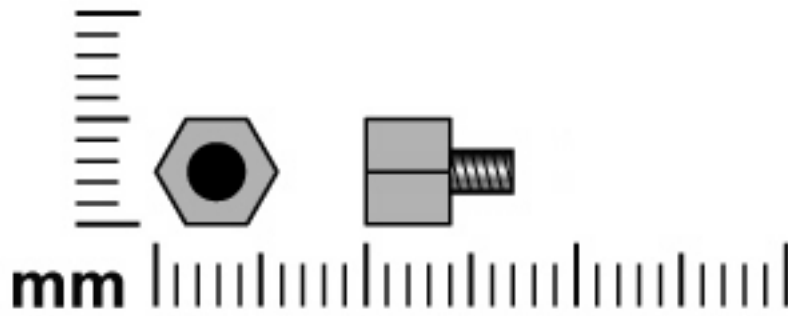
Where used: 3 screws that secure the top cover to the base enclosure (see [Top cover on page 48](#))



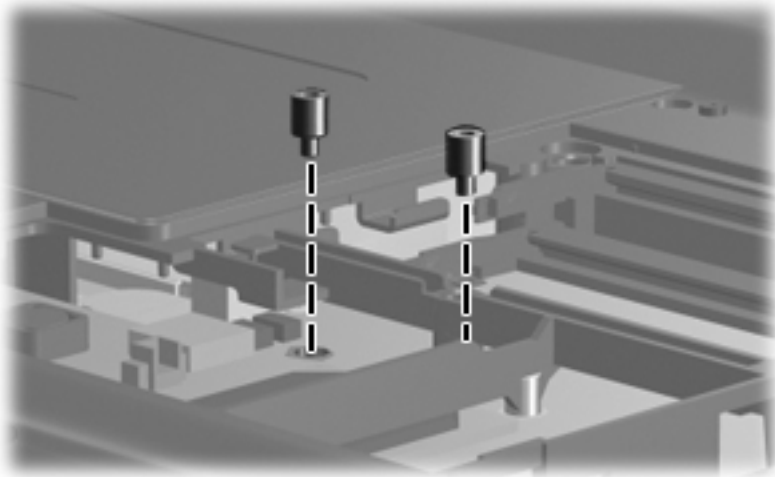
Where used: 2 screws that secure the system board to the base enclosure (see [Top cover on page 48](#))



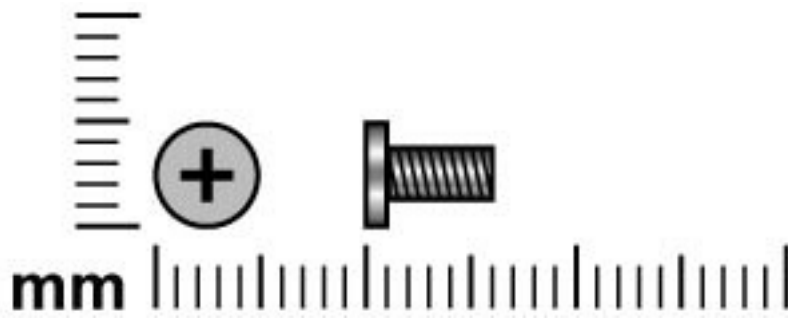
Hex HM5.0×7.0 Standoff



Color	Quantity	Length	Thread	Head width
Silver	2	7.0 mm	2.5 mm	5.0 mm

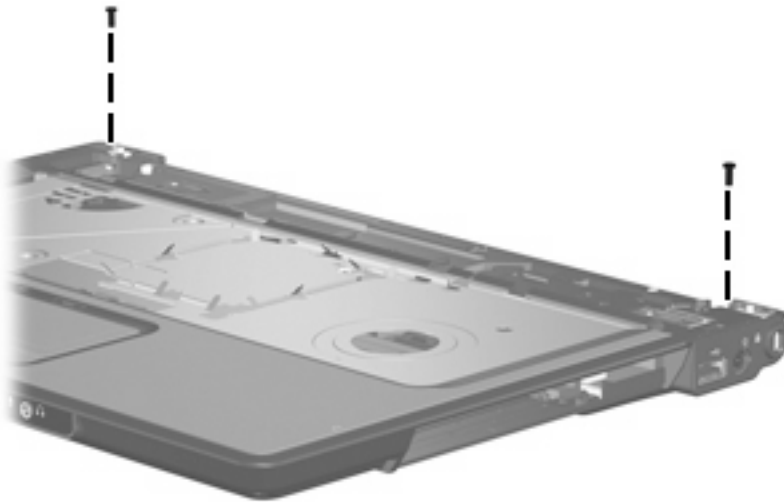


Phillips PM2.0×6.0 screw

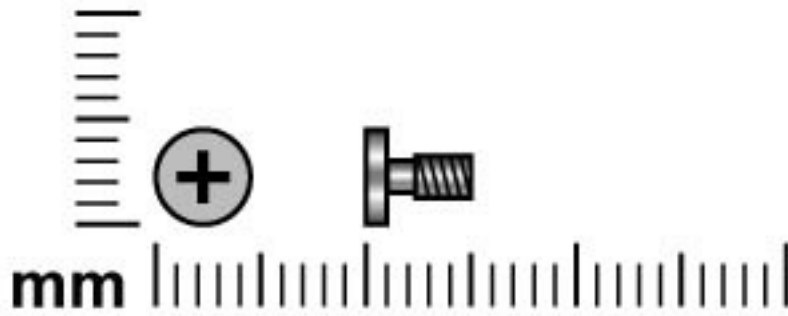


Color	Quantity	Length	Thread	Head width
Black	2	6.0 mm	2.0 mm	5.0 mm

Where used: 2 screws that secure the top cover to the base enclosure (see [Top cover on page 48](#))

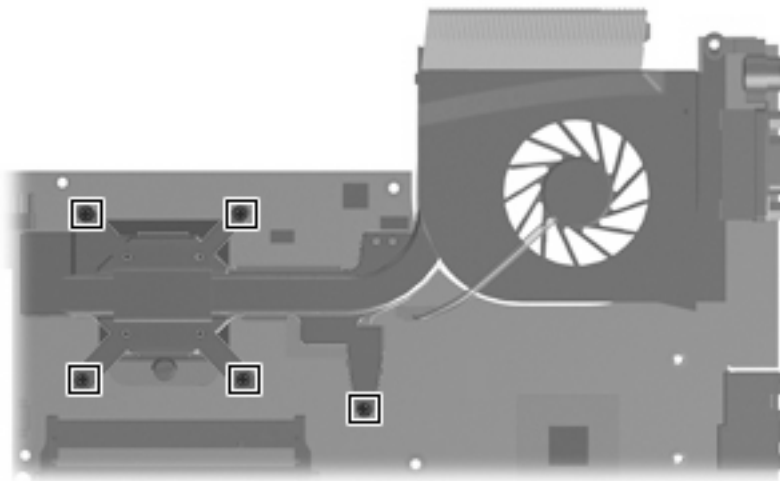


Phillips PM2.5×5.0 captive screw



Color	Quantity	Length	Thread	Head width
Silver	5	5.0 mm	2.5 mm	5.0 mm

Where used: 5 screws that secure the fan/heat sink assembly to the system board (see [Fan/heat sink assembly on page 57](#))



9 Backup and Recovery

Recovering system information

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

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

Backing up your information

When to back up

- On a regularly scheduled basis.



NOTE: Set reminders to back up your information periodically.

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

Back up suggestions

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

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

- a. Display the screen.
- b. Copy the screen:
To copy only the active window, press **alt+fn+prt sc**.
To copy the entire screen, press **fn+prt sc**.
- c. Open a word-processing document, and then select **Edit > Paste**.

Using system restore points

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



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

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

When to create restore points

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



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

Create a system restore point

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

Restore to a previous date and time

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

4. Click the **System Restore** button, and then click **Next**.

The System Restore window opens.

5. Follow the on-screen instructions.

Creating recovery discs

Recovery Manager creates a set of recovery CDs or DVDs for the computer. Use recovery discs to restore the operating system and software programs to factory settings, in case of system failure or instability.



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

Note the following guidelines before creating recovery discs:

- You will need high quality CD-R, DVD-R, or DVD+R media (purchased separately).



NOTE: Formatted DVD \pm RW discs and DVD \pm RW double-layer discs are not compatible with the Recovery Manager software.

- The computer must be connected to AC power during this process.
- Only one set of recovery discs can be created per computer.
- Number each disc before inserting it into the computer optical drive.
- If necessary, you can exit the program before you have finished creating the recovery discs. The next time you open Recovery Manager, you will be prompted to continue the disc creation process.

To create a set of recovery discs:

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

Recovery Manager opens.

2. Click **Advanced Options**.



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

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

Reinstalling software programs and drivers

If a program or driver preinstalled at the factory is accidentally erased or is damaged, Recovery Manager allows you to reinstall it.



NOTE: Software not provided with this computer must be reinstalled from the disc provided by the manufacturer or downloaded from the manufacturer's Web site.

NOTE: Before reinstalling the program, be sure it is fully uninstalled.

Recovery Manager replaces corrupted system files and reinstalls deleted system files within the program.

- In most cases, if the program you are reinstalling is still on your computer, the reinstallation process does not affect your personal settings.
- In all cases, if a program has been deleted from your computer, the reinstallation process reinstalls the program or utility to the factory image but cannot restore your personal settings.

Reinstalling preinstalled programs and drivers

1. Remove the program or driver:



NOTE: In some cases, drivers are not listed in the Programs and Features list. If the driver is not listed, it does not need to be removed.

- a. Select **Start > Control Panel > Programs > Uninstall a program**.
 - b. Right-click the program or driver you want to remove, and then click **Uninstall**.
2. Reinstall the program or driver:
 - a. Select **Start > All Programs > Recovery Manager > Recovery Manager**.
 - b. Click **Advanced Options**.
 - c. Click either **Software program re-installation** or **Hardware driver re-installation**, and then click **Next**.
 - d. Follow the on-screen instructions.
 - e. Restart the computer if prompted.

Reinstalling programs from discs

1. Insert the disc into the optical drive.
2. When the installation wizard opens, follow the installation instructions on the screen.
3. Restart the computer if prompted.

Performing a recovery

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



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

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

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the partition on the hard drive

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

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

1. Access Recovery Manager in either of the following ways:
 - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
 - Restart the computer and press **f11** while the "Press <F11> for recovery" message is displayed on the screen. Then select **Recovery Manager**.

Recovery Manager opens.

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

Deleting the recovery partition on the hard drive

The Recovery Manager Advanced Options menu provides the option of deleting the recovery partition, which will increase space on the hard drive. Delete the recovery partition only if you have already created recovery discs.



CAUTION: After you create the recovery discs, you can increase space on the hard drive by deleting the recovery partition. However, doing this is not recommended. If you delete this partition, you will lose any information that is on the partition, including Recovery Manager software. Thereafter, you must use the recovery discs to access Recovery Manager software.

To delete the recovery partition:

1. If you have not already created recovery discs, create them now.
2. Select **Start > All Programs > Recovery Manager > Recovery Manager**.

Recovery Manager opens.

3. Click **Advanced Options**.
4. Click **Remove recovery partition**, and then click **Next**.
5. Follow the on-screen instructions.

Updating reinstalled software

After you perform a system recovery, connect to the Internet to update all reinstalled software.

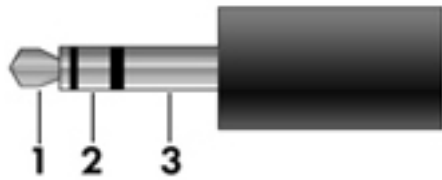
To access update links for the operating system and other software provided on your computer:

▲ Select **Start > Help and Support**.

To update optional software, follow the instructions provided by the software manufacturer. Some programs include an update feature you can access from a Help button or menu within the program.

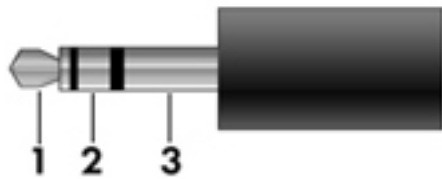
10 Connector pin assignments

Audio-out (headphone)



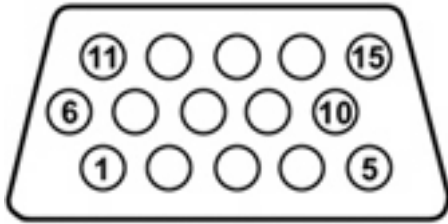
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

Audio-in (microphone)



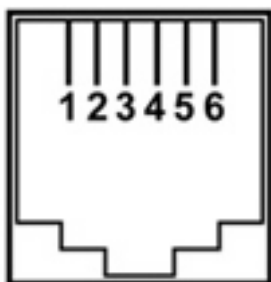
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

External monitor



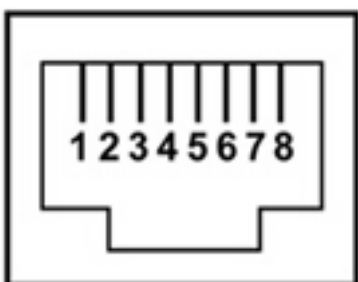
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

RJ-11 (modem)



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

RJ-45 (network)



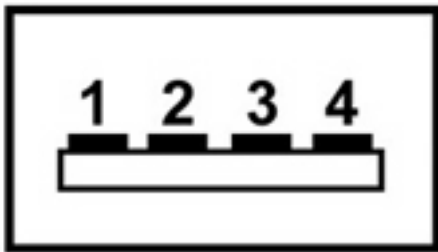
Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

S-Video-out



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

Universal Serial Bus



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

11 Power cord set requirements

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

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

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

Requirements for all countries or regions

The requirements listed below are applicable to all countries or regions.

- The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by each country or region's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries or regions

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
Korea	EK	4
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
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.

12 Recycling

Battery

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

Display



WARNING! The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.



CAUTION: The procedures in this appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling should be exercised when removing these components.



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

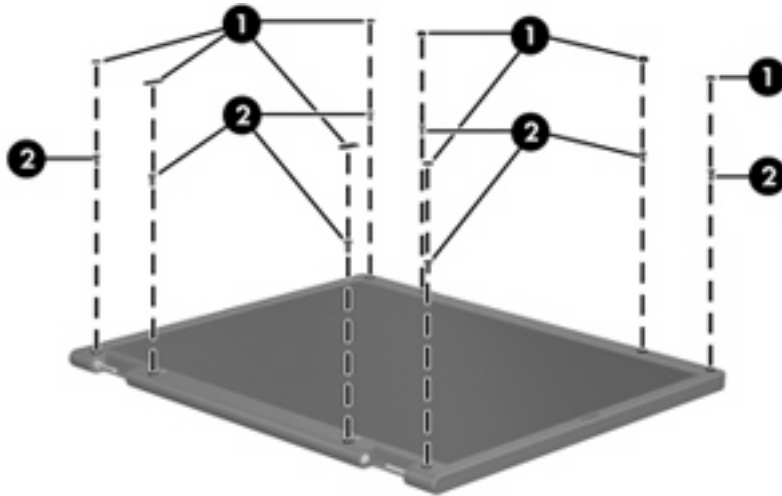
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



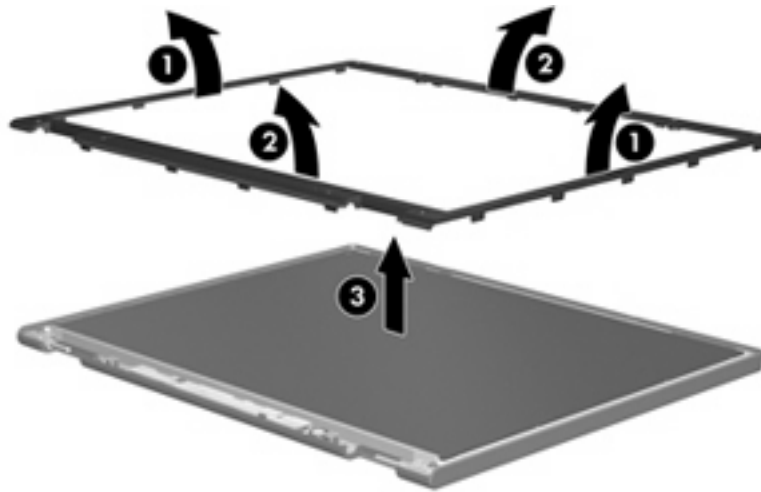
NOTE: Disassembly procedures differ from one display assembly to another. The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

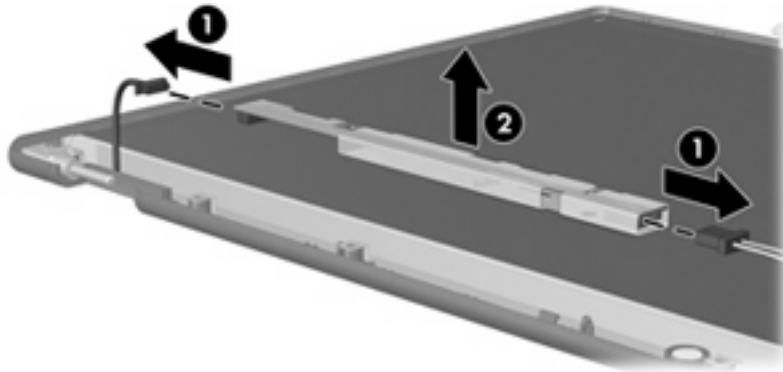
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



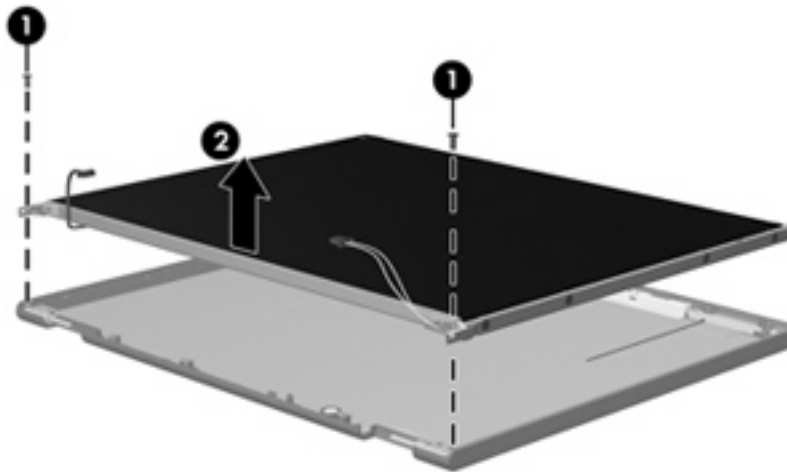
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



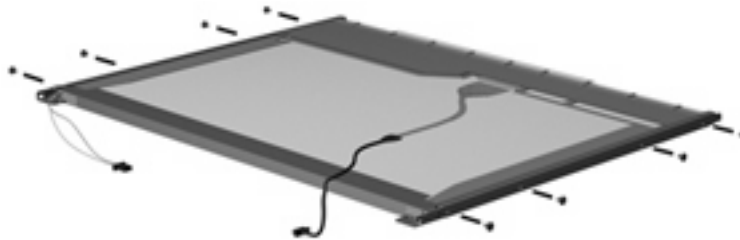
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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

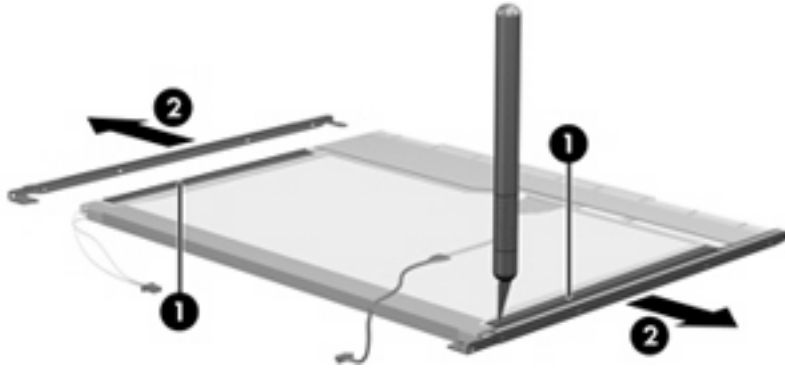


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

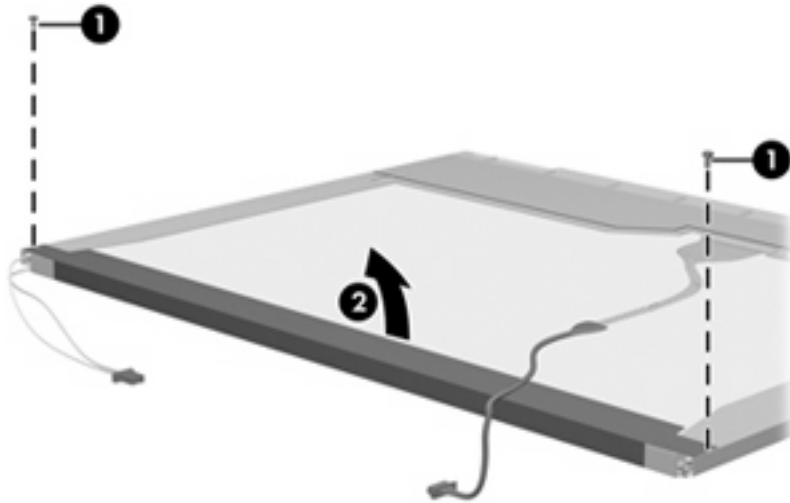


9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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

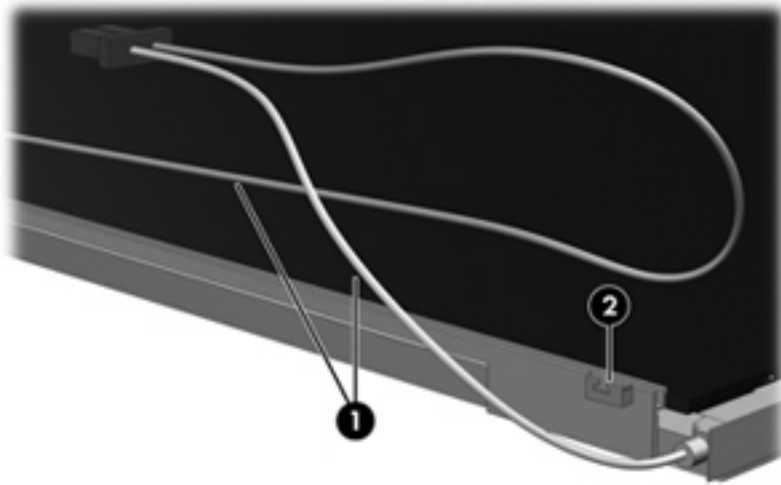


11. Remove the screws **(1)** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **(2)** and swing it forward.

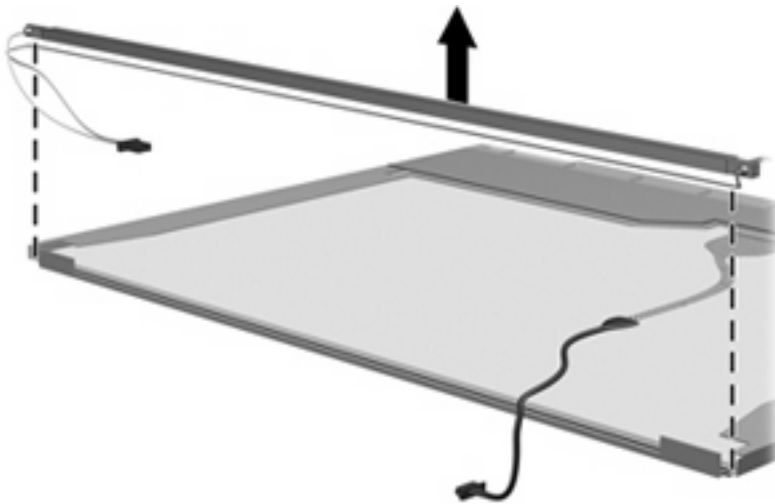



13. Remove the backlight cover.
14. Turn the display panel right-side up.

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

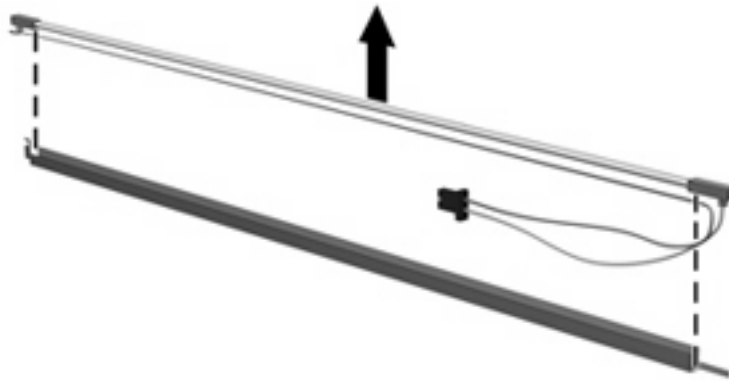


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

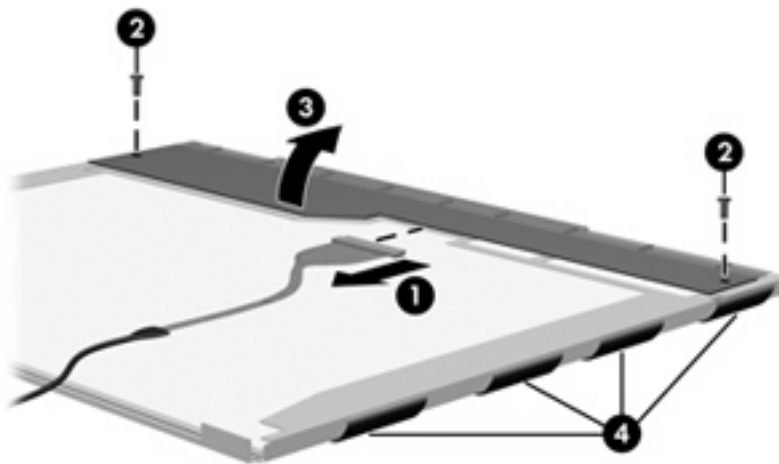


 **WARNING!** The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

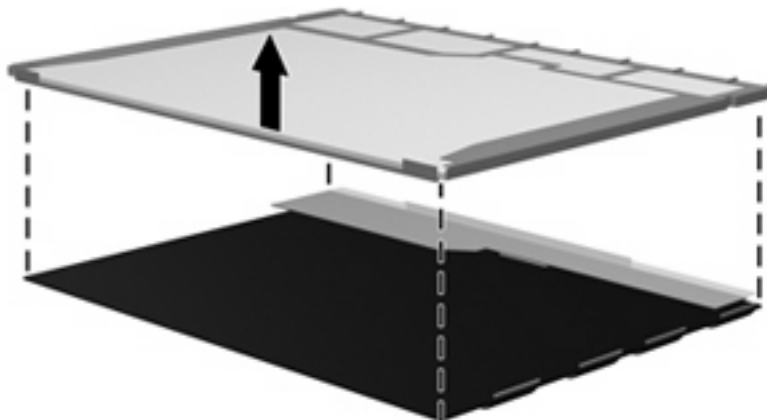
18. Slide the backlight out of the backlight frame.



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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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