

# HP Pavilion dx6500 Entertainment PC

## Maintenance and Service Guide



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## Safety warning notice

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

## 1 Product description

## 2 External component identification

Display components .....	4
Top components .....	6
Lights .....	6
Buttons and speakers .....	7
Keys .....	9
TouchPad .....	10
Front components .....	11
Left-side components .....	12
Right-side components .....	13
Rear component .....	14
Bottom components .....	15

## 3 Illustrated parts catalog

Serial number location .....	16
Computer major components .....	17
Display assembly components .....	20
Plastics Kit .....	21
Cable Kit .....	22
Mass storage devices .....	23
Miscellaneous parts .....	24
Sequential part number listing .....	25

## 4 Removal and replacement procedures

Preliminary replacement requirements .....	28
Tools required .....	28
Service considerations .....	28
Plastic parts .....	28
Cables and connectors .....	29
Drive handling .....	29
Grounding guidelines .....	30
Electrostatic discharge damage .....	30
Packaging and transporting guidelines .....	31
Workstation guidelines .....	31
Equipment guidelines .....	32
Unknown user password .....	33

Component replacement procedures .....	34
Serial number .....	34
Computer feet .....	35
Battery .....	36
Camera module .....	37
Display inverter .....	39
Hard drives .....	41
Memory module .....	43
RTC battery .....	45
WLAN module .....	46
Optical drive .....	47
Switch cover .....	49
Speaker assembly .....	51
Power button board .....	52
Keyboard .....	53
Display assembly .....	55
Top cover .....	61
Bluetooth module .....	65
USB/power connector board .....	67
System board .....	68
Audio board .....	71
ExpressCard assembly .....	72
Fan/heat sink assembly .....	74
Processor .....	77

## 5 Setup Utility

Starting the Setup Utility .....	79
Changing the language of the Setup Utility .....	79
Navigating and selecting in the Setup Utility .....	80
Displaying system information .....	80
Restoring default settings in the Setup Utility .....	80
Using advanced Setup Utility features .....	81
Closing the Setup Utility .....	81
Setup Utility menus .....	81

## 6 Specifications

Computer specifications .....	83
15.4-inch, WXGA, BrightView display specifications .....	84
Hard drive specifications .....	85
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive specifications .....	86
System DMA specifications .....	87
System interrupt specifications .....	88
System I/O address specifications .....	89
System memory map specifications .....	91

## 7 Screw listing

Phillips PM2.5×5.0 captive screw .....	93
Phillips PM3.0×4.0 screw .....	94
Phillips PM2.0×4.0 screw .....	95

Phillips PM2.5×8.0 screw .....	96
Phillips PM2.0×4.0 screw .....	99
Phillips PM2.0×3.0 broad-head screw .....	102
Phillips PM2.5×6.0 screw .....	103
Phillips PM2.5×3.0 broad-head screw .....	105
Hex HM5.0×9.0 standoff .....	106
Phillips PM2.5×5.0 screw .....	107
Phillips 2.0×7.0 screw .....	109
Phillips PM2.5×4.0 captive screw .....	110

## 8 Backup and recovery

Recovering system information .....	111
Backing up your information .....	111
When to back up .....	111
Back up suggestions .....	112
Using system restore points .....	112
When to create restore points .....	112
Create a system restore point .....	112
Restore to a previous date and time .....	113
Creating recovery discs .....	113
Reinstalling software programs and drivers .....	114
Reinstalling preinstalled programs and drivers .....	114
Reinstalling programs from discs .....	114
Performing a recovery .....	115
Recovering from the recovery discs .....	115
Recovering from the partition on the hard drive .....	115
Deleting the recovery partition on the hard drive .....	116
Updating reinstalled software .....	116

## 9 Connector pin assignments

Audio-in (microphone) .....	117
Audio-out (headphone) .....	117
External monitor .....	118
RJ-45 (network) .....	119
S-Video-out .....	120
Universal Serial Bus .....	120

## 10 Power cord set requirements

Requirements for all countries or regions .....	121
Requirements for specific countries or regions .....	122

## 11 Recycling

Battery .....	123
Display .....	123

<b>Index .....</b>	<b>129</b>
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# 1 Product description

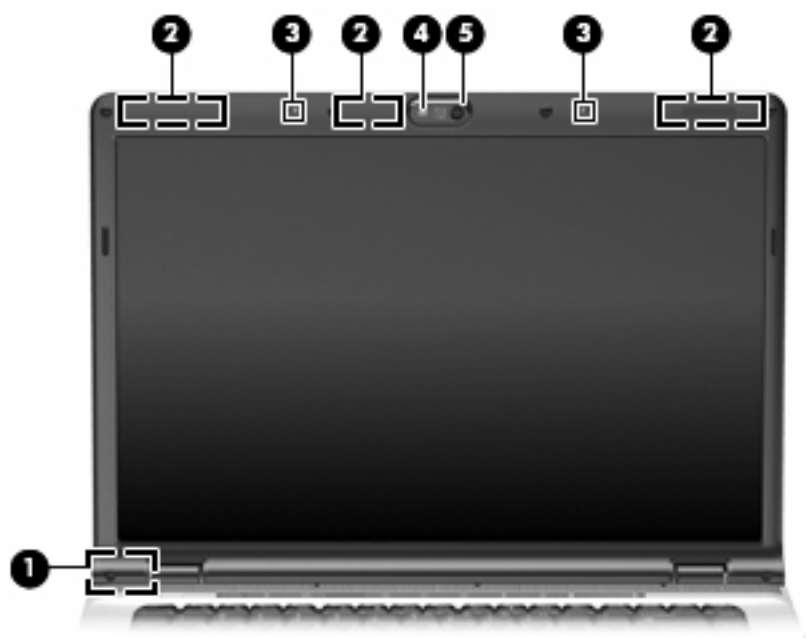
Category	Description
<b>Product Name</b>	<b>HP Pavilion dx6500 Entertainment PC</b>
<b>Processors</b>	<b>Intel® Core™ 2 Duo processors</b>
	T7700 2.40-GHz processor, 4-MB L2 cache, 800-MHz FSB
	T7500 2.20-GHz processor, 4-MB L2 cache, 800-MHz FSB
	T7250 2.00-GHz processor, 2-MB L2 cache, 800-MHz FSB
	T5550 1.83-GHz processor, 2-MB L2 cache, 667-MHz FSB
	T5450 1.67-GHz processor, 2-MB L2 cache, 667-MHz FSB
	T5250 1.50-GHz processor, 2-MB L2 cache, 667-MHz FSB
<b>Chipset</b>	Northbridge: Intel GM965
	Southbridge: Intel ICH8m
<b>Graphics</b>	Unified memory architecture (UMA) integrated with system memory, and: <ul style="list-style-type: none"><li>• Up to 64 MB on computer models with 512 MB of system RAM</li><li>• or, up to 251 MB on computer models with 1024 MB or more of system RAM</li><li>• or, up to 358 MB on computer models with 2048 MB or more of system RAM</li></ul> Memory size is a dynamic change.
<b>Panel</b>	15.4-inch, WXGA BrightView
<b>Memory</b>	2 SODIMM slots
	Customer-accessible/upgradable
	Supports up to 4 GB of system RAM
	PC2-5300, DDRII (667-MHz) dual-channel support
	Supports the following configurations: <ul style="list-style-type: none"><li>• 4096 MB (2048 × 2)</li><li>• 2048 MB (1024 × 2)</li><li>• 1024 MB (512 × 2)</li></ul>
<b>Hard drives</b>	Supports 9.5-mm (2.5-inch), serial advanced technology attachment (SATA) hard drives

Category	Description
	Supports the following dual hard drive configurations: <ul style="list-style-type: none"> <li>320-GB, 5400-rpm (160 GB × 2)</li> <li>160-GB, 5400-rpm (80 GB × 2)</li> </ul>
<b>Optical drives</b>	Fixed (removal of 1 screw required)
	Parallel ATA (PATA)
	12.7-mm tray load
	Supports the following drives: <ul style="list-style-type: none"> <li>DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe</li> <li>DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive</li> </ul>
<b>Diskette drive</b>	Supports external USB drive only
<b>Camera</b>	Low-light, VGA camera (fixed; no tilt)
	Activity light
	640 × 480 by 24 frames per second
<b>Microphone</b>	2 omnidirectional, dual-array microphones, with beam-forming, echo-cancellation, noise-suppression software
<b>Audio</b>	HD audio (Realtek ALC268)
	Supports Microsoft® Premium requirements
	Pavilion-branded Altec Lansing speakers
<b>Modem</b>	56K V.92 data/fax AMoM modem (SilonLab ML 3080)
	Supports all world-wide certification requirements
	Modem cable not included
<b>Ethernet</b>	Integrated Realtek RT8101e 10/100 network interface card (NIC)
	Ethernet cable not included
<b>Wireless</b>	<b>Integrated wireless local area network (WLAN) options by way of wireless module:</b>
	Intel PRO Wireless 4965 802.11a/g/n with 3 antennae integrated into the display assembly and Bluetooth
	Intel PRO Wireless 4965 802.11a/g/n with 3 antennae integrated into the display assembly
	Intel PRO Wireless 3945 802.11a/b/g with 2 antennae integrated into the display assembly and Bluetooth
	Intel PRO Wireless 3945 802.11a/b/g with 2 antennae integrated into the display assembly
<b>External media card</b>	One ExpressCard34 slot
	Digital Media Slot, supports SD, MMC, SDIO, MS, MSpro, and xD
	Supports miniature versions of SD, MMC, and MSDuo with adapter (not included)
<b>Ports</b>	Audio-in (mono microphone)
	Audio-out (stereo headphone, 2)

Category	Description
	Consumer infrared
	RJ-45 (Ethernet; includes link and activity lights)
	S-Video-out
	USB (2)
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution @ 75 Hz (disabled when computer is connected to devices through the expansion port 3), with hot plug/unplug and automatic detection for correct output to wide-aspect vs. standard aspect video devices
	1394
	2-pin AC power
<b>Docking</b>	Expansion port 3 supports HP xb3000 Notebook Expansion Base and HP Notebook QuickDock
<b>Keyboard/pointing devices</b>	12.0-inch keyboard
	TouchPad with 2 buttons and two-way scroll (taps enabled as default)
<b>Power requirements</b>	12-cell 2.20-Ah, 95-Wh, Li-ion battery
	6-cell 2.55-Ah, 55-Wh, Li-ion battery
	6-cell 2.20-Ah 47-Wh, Li-ion battery
	65-W AC adapter with localized cable plug support (2-wire plug with ground pin; supports 2-pin DC connector)
<b>Security</b>	Security cable slot
<b>Operating system</b>	<b>Preinstalled:</b>
	Windows Vista® Business (32-bit)
	Windows Vista Ultimate (64-bit)
	Windows Vista Premium (32- and 64-bit)
<b>Serviceability</b>	<b>End-user replaceable parts:</b>
	AC adapter
	Battery (system)
	Hard drive
	Memory module
	RTC battery
	Optical drive
	WLAN module

# 2 External component identification

## Display components



Item	Component	Description
(1)	Internal display switch	Turns off the display if the display is closed while the computer is on.  <b>NOTE:</b> The location of the internal display switch varies by computer model.
(2)	Wireless antennae (2 or 3, varying by computer model)	Send and receive signals from one or more wireless devices. These antennae are not visible from the outside of the computer.  <b>NOTE:</b> For optimal transmission, keep the areas immediately around the antennae free from obstructions.  To see wireless regulatory notices, refer to the section of the <i>Regulatory, Safety, and Environmental Notices</i> that applies to your country or region. These notices are located in Help and Support.
(3)	Internal microphones (2) (select models only)	Record sound.

Item	Component	Description
		<b>NOTE:</b> If there is a microphone icon next to each microphone opening, the computer has internal microphones.
(4)	Integrated camera light	On: The integrated camera is in use.
(5)	Integrated camera	Records video and captures still photographs.

# Top components

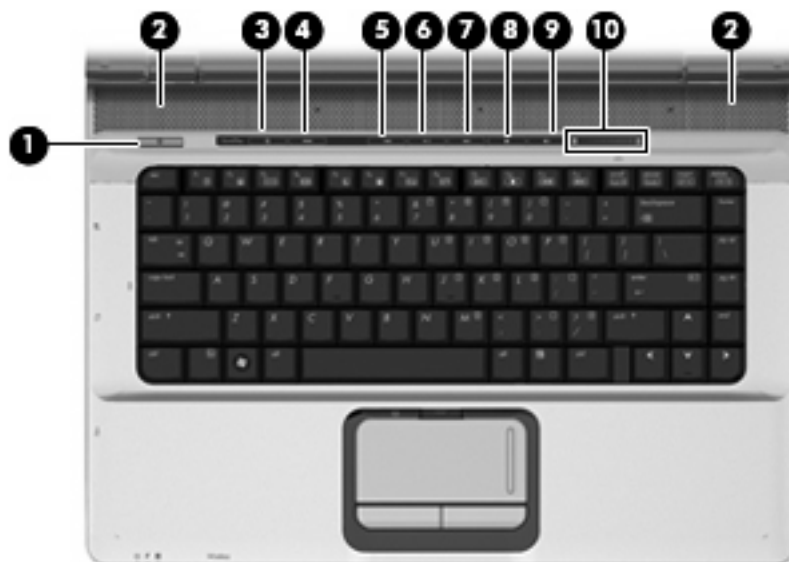
## Lights



Item	Component	Description
(1)	Power lights (2)*	<ul style="list-style-type: none"><li>On: The computer is on.</li><li>Blinking: The computer is in the Sleep state.</li><li>Off: The computer is off or in Hibernation.</li></ul>
(2)	Battery light	<ul style="list-style-type: none"><li>On: A battery is charging.</li><li>Blinking: A battery that is the only available power source has reached a low battery level or a critical battery level.</li><li>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.</li></ul>
(3)	Drive light	Blinking: The hard drive or optical drive is being accessed.
(4)	Caps lock light	On: Caps lock is on.
(5)	Volume mute light	<ul style="list-style-type: none"><li>Blue: Computer sound is turned on.</li><li>Amber: Computer sound is turned off.</li></ul>
(6)	Volume down light	Blinking: The volume scroll zone is being used to decrease speaker volume.
(7)	Volume up light	Blinking: The volume scroll zone is being used to increase speaker volume.
(8)	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.

\*The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.

## Buttons and speakers

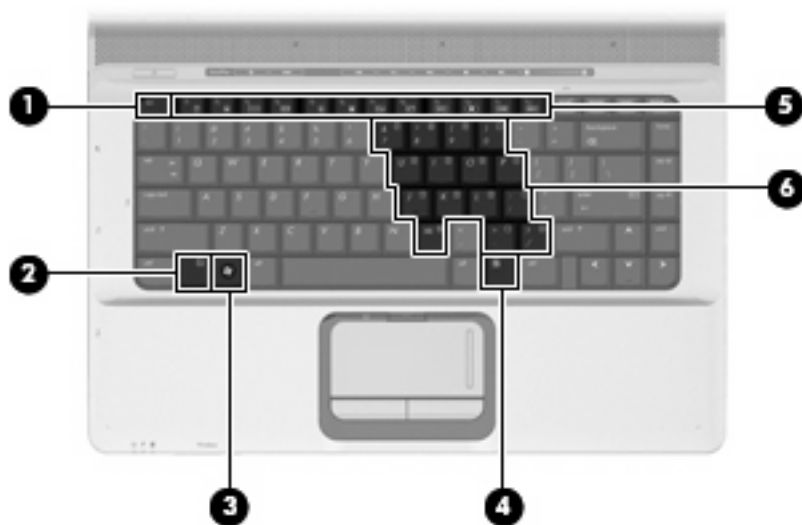


Item	Component	Description
(1)	Power button*	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button to shut down the computer.</li><li>• When the computer is in the Sleep state, press the button briefly to exit Sleep.</li><li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li></ul> <p>If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about power settings, select <b>Start &gt; Control Panel &gt; System and Maintenance &gt; Power Options</b>.</p>
(2)	Speakers (2)	Produce sound.
(3)	Media button	<p>Opens the QuickPlay program.</p> <p><b>NOTE:</b> If the computer has been set up to require a logon password, you may be asked to log on to Windows. QuickPlay opens after you log on. Refer to the QuickPlay software Help for more information.</p>
(4)	DVD button	<p>Opens the DVD playback feature of the QuickPlay program.</p> <p><b>NOTE:</b> If the computer has been set up to require a logon password, you may be asked to log on to Windows. QuickPlay opens after you log on. Refer to the QuickPlay software Help for more information.</p>

Item	Component	Description
(5)	Previous/rewind button	<ul style="list-style-type: none"> <li>Plays the previous track or chapter when pressed once.</li> <li>Rewinds media when pressed simultaneously with the <b>fn</b> key.</li> </ul>
(6)	Play/pause button	Plays or pauses the disc.
(7)	Next/fast forward button	<ul style="list-style-type: none"> <li>Plays the next track or chapter when pressed once.</li> <li>Fast forwards media when pressed simultaneously with the <b>fn</b> key.</li> </ul>
(8)	Stop button	Stops the disc.
(9)	Volume mute button	Mutes and restores the speaker sound.
(10)	Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume. You can also tap the minus sign on the scroll zone to decrease volume, or tap the plus sign on the scroll zone to increase volume.
*This table describes factory settings. For information about changing factory settings, refer to the user guides located in Help and Support.		

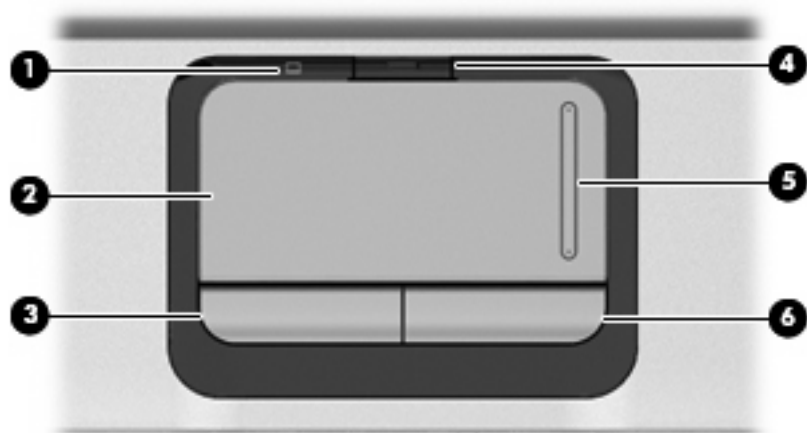


## Keys



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

# TouchPad



Item	Component	Function
(1)	TouchPad light	<ul style="list-style-type: none"><li>• Blue: TouchPad is enabled.</li><li>• Amber: TouchPad is disabled.</li></ul>
(2)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button*	Functions like the left button on an external mouse.
(4)	TouchPad on/off button	Enables/disables the TouchPad.
(5)	TouchPad scroll zone*	Scrolls up or down.
(6)	Right TouchPad button*	Functions like the right button on an external mouse.
*This table describes factory settings. To view or change pointing device preferences, select <b>Start &gt; Control Panel &gt; Hardware and Sound &gt; Mouse</b> .		

# Front components



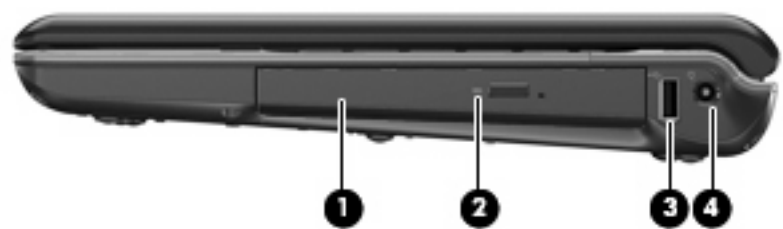
Item	Component	Function
(1)	Power light	<ul style="list-style-type: none"> <li>On: The computer is on.</li> <li>Blinking: The computer is in the Sleep state.</li> <li>Off: The computer is off or in Hibernation.</li> </ul>
(2)	Battery light	<ul style="list-style-type: none"> <li>On: A battery is charging.</li> <li>Blinking: A battery that is the only available power source has reached a low battery level or a critical battery level.</li> <li>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.</li> </ul>
(3)	Drive light	Blinking: The hard drive or optical drive is being accessed.
(4)	Wireless switch	<p>Turns the wireless feature on or off, but does not create a wireless connection.</p> <p><b>NOTE:</b> To establish a wireless connection, a wireless network must already be set up.</p>
(5)	Wireless light	<ul style="list-style-type: none"> <li>Blue: An integrated wireless device, such as a WLAN device and/or a Bluetooth® device, is turned on.</li> <li>Amber: An integrated wireless device is turned off.</li> </ul>
(6)	Consumer infrared lens	Receives a signal from a remote control device, such as the HP Remote Control.
(7)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(8)	Audio-out (headphone) jacks (2)	Produce sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.

## Left-side components



Item	Component	Function
(1)	Security cable slot	Attaches an optional security cable to the computer.  <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	S-Video-out jack	Connects an optional S-Video device such as a television, VCR, camcorder, overhead projector, or video capture card.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	Expansion port 3	Connects the computer to an optional docking device or expansion product.  <b>NOTE:</b> The computer has only one expansion port. The term <i>expansion port 3</i> describes the type of expansion port.
(5)	ExpressCard slot	Supports optional ExpressCard/34 cards.
(6)	RJ-45 (network) jack	Connects a network cable.  <b>NOTE:</b> On select computer models, the network jack provides Gigabit Ethernet functionality.
(7)	USB port	Connects an optional USB device.
(8)	1394 port (select models only)	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(9)	Digital Media Slot light (select models only)	On: A digital card is being accessed.
(10)	Digital Media Slot (select models only)	Supports the following optional digital card formats: <ul style="list-style-type: none"><li>• Memory Stick (MS)</li><li>• Memory Stick Pro (MSP)</li><li>• MultiMediaCard (MMC)</li><li>• Secure Digital Input/Output (SD I/O)</li><li>• Secure Digital (SD) Memory Card</li><li>• xD-Picture Card (XD)</li><li>• xD-Picture Card (XD) Type H</li><li>• xD-Picture Card (XD) Type M</li></ul>

# Right-side components



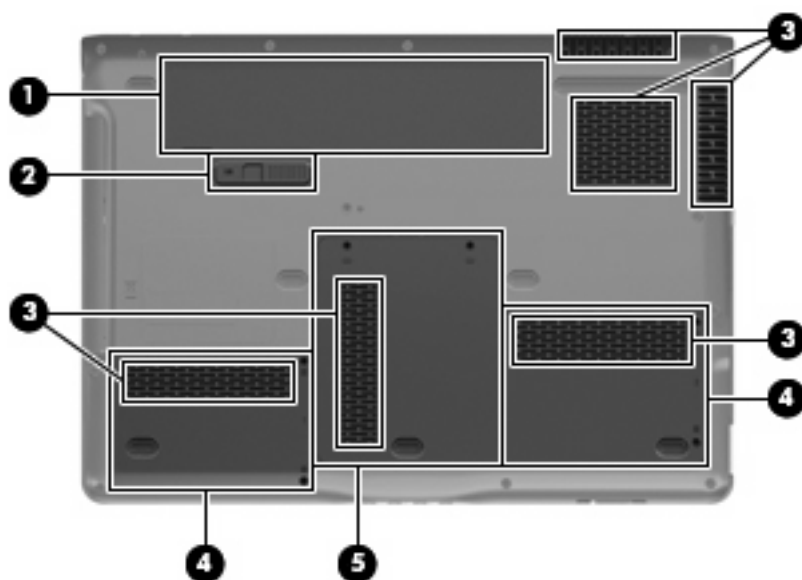
Item	Component	Function
(1)	Optical drive	Reads optical discs, and, on select models, also writes to optical discs.
(2)	Optical drive light	Blinking: The optical drive is being accessed.
(3)	USB port	Connects an optional USB device.
(4)	Power connector	Connects an AC adapter.

## Rear component



Component	Description
Vent	<p>Enables airflow to cool internal components.</p> <p><b>NOTE:</b> 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>

## Bottom components



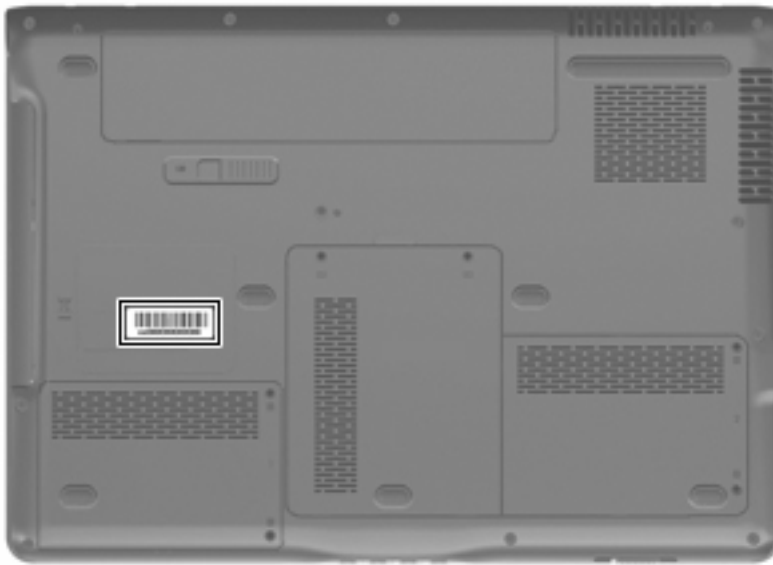
Item	Component	Function
(1)	Battery bay	Holds the battery.
(2)	Battery release latch	Releases the battery from the battery bay.
(3)	Vents (6)	Enable airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Hard drive bays (2)	Hold the hard drives.
(5)	Memory/WLAN module compartment	Contains the memory module slots, the WLAN module slot, and the RTC battery.  <b>CAUTION:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

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## 3 Illustrated parts catalog

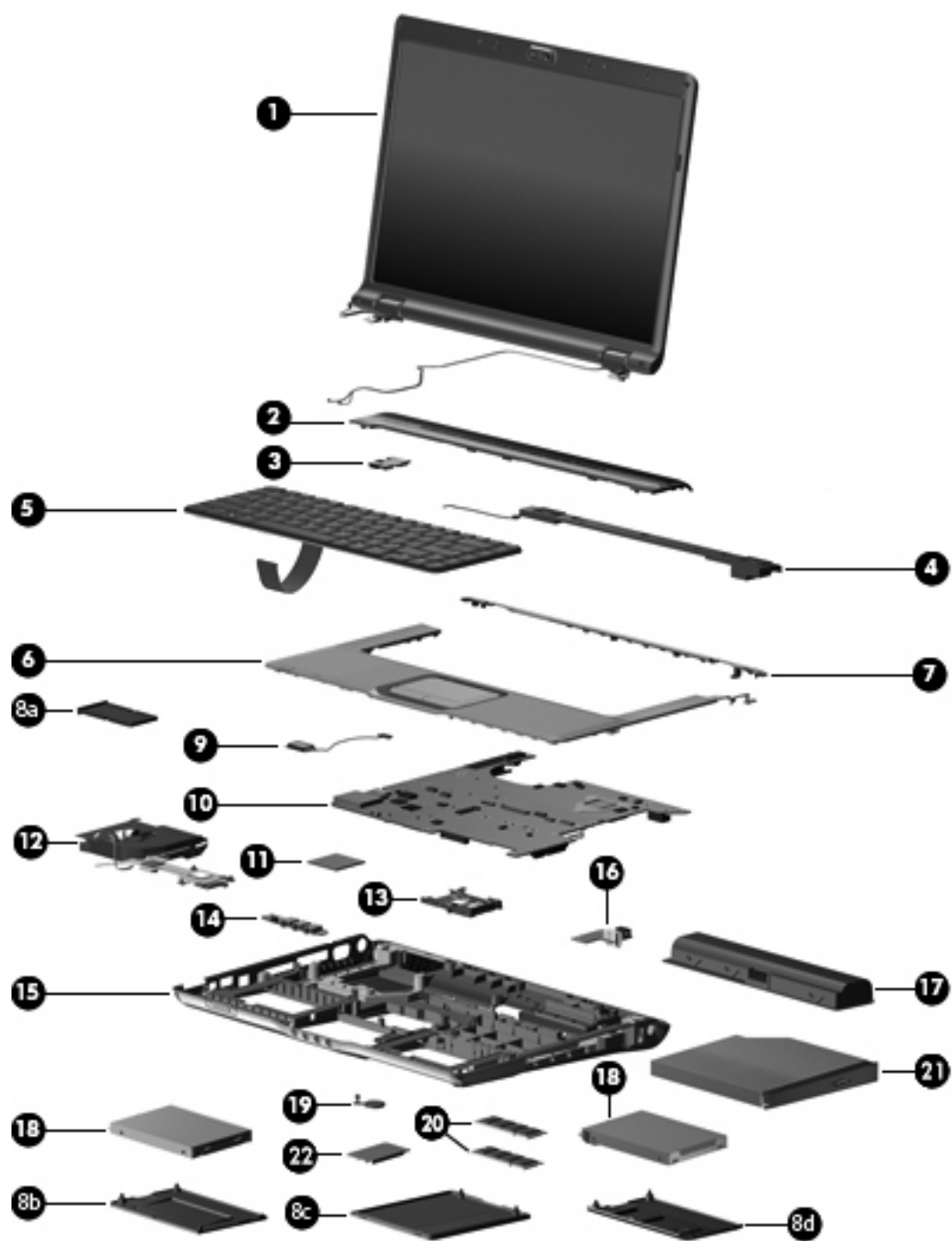
### Serial number location

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





# Computer major components

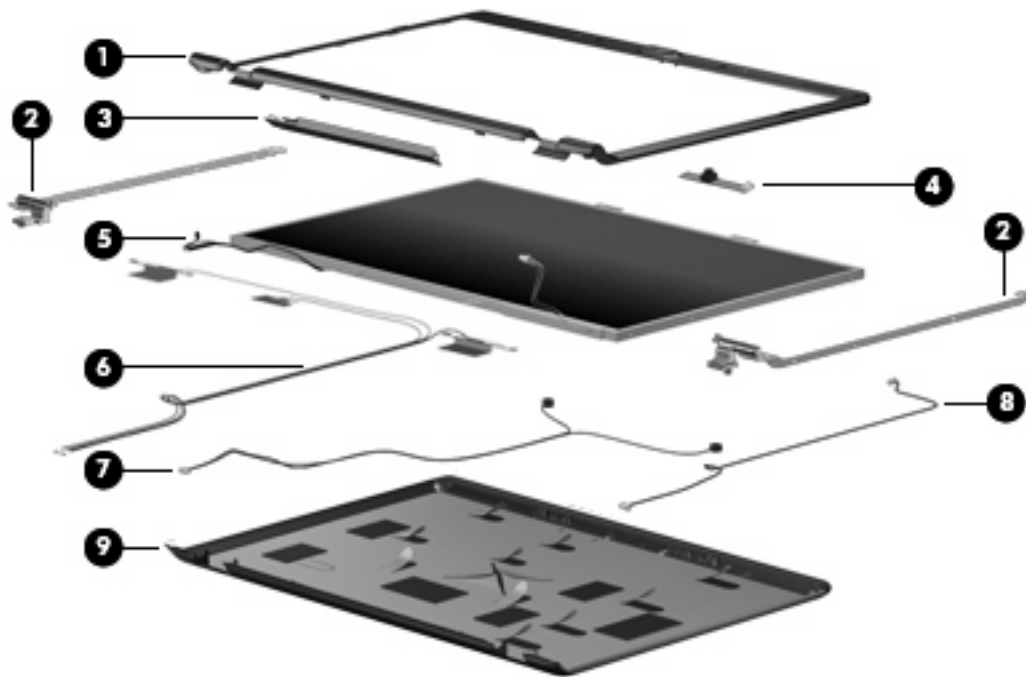


Item	Description	Spare part number
(1)	<b>Display assemblies</b>	
	15.4-inch, WXGA, BrightView display assembly for use only with computer models equipped with a camera and microphones (includes camera, microphones, and WLAN transceivers and antenna cables)	446481-001

Item	Description	Spare part number
	15.4-inch, WXGA, BrightView display assembly for use only with computer models equipped with microphones (includes microphones and WLAN transceivers and antenna cables)	446482-001
	<b>NOTE:</b> See <a href="#">Display assembly components on page 20</a> for more information on display assembly spare part numbers.	
(2)	<b>Switch cover</b> (includes LED board and cable)	446512-001
(3)	<b>Power button board</b> (includes power button board cable)	431437-001
(4)	<b>Speaker assembly</b>	431447-001
(5)	<b>Keyboards</b>	
	For use in French Canada	441427-121
	For use in Canada and the United States	441427-001
(6)	<b>Top cover</b> (includes TouchPad and cable)	446508-001
(7)	<b>Top cover trim</b>	431421-001
	<b>Plastics Kit</b> (see <a href="#">Plastics Kit on page 21</a> for more Plastics Kit component information):	438368-001
(8a)	ExpressCard slot bezel	
(8b)	Left hard drive cover (includes 2 captive screws, secured by C-clips)	
(8c)	Memory/WLAN module compartment cover (includes 2 captive screws, secured by C-clips)	
(8d)	Right hard drive cover (includes 2 captive screws, secured by C-clips)	
(9)	<b>Bluetooth module</b> (includes Bluetooth module cable)	412766-002
(10)	<b>System board</b> (includes replacement thermal material)	459251-001
(11)	<b>Intel Core 2 Duo processors</b> (include replacement thermal material)	
	T7700 2.40-GHz processor (4-MB L2 cache, 800-MHz FSB)	458801-001
	T7500 2.20-GHz processor (4-MB L2 cache, 800-MHz FSB)	458796-001
	T7250 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB)	458797-001
	T5550 1.83-GHz processor (2-MB L2 cache, 667-MHz FSB)	458798-001
	T5450 1.67-GHz processor (2-MB L2 cache, 667-MHz FSB)	458799-001
	T5250 1.50-GHz processor (2-MB L2 cache, 667-MHz FSB)	458800-001
(12)	<b>Fan/heat sink assembly</b> (includes replacement thermal material)	446521-001
	<b>Processor brackets</b> (not illustrated; include replacement thermal material)	
	For use only with computer models equipped with T7250, T5550, T5450, and T5250 processors	450371-001
	For use only with computer models equipped with T7700 and T7500 processors	450370-001
(13)	<b>ExpressCard assembly</b>	431439-001
(14)	<b>Audio board</b> (includes infrared lens and audio board cable)	446523-001
(15)	<b>Base enclosure</b> (includes wireless on/off switch)	460319-001

Item	Description	Spare part number
	<b>Rubber Kit</b> (not illustrated; includes base enclosure rubber feet and display bezel screw covers)	431430-001
(16)	<b>USB/power connector board</b> (includes USB/power connector board cable)	449454-001
(17)	<b>Batteries</b>	
	12-cell, 2.55-Ah Li-ion	451864-001
	6-cell, 2.55-Ah Li-ion	446507-001
	6-cell, 2.20-Ah Li-ion	446506-001
(18)	<b>Hard drives</b> (include hard drive bracket and hard drive connector)	
	160-GB, 5400-rpm	458803-001
	80-GB, 5400-rpm	458804-001
(19)	<b>RTC battery</b> (includes double-sided tape)	449729-001
(20)	<b>Memory modules</b> (667-MHz, PC2-5300, 1-DIMM)	
	2048-MB	453774-001
	1024-MB	446495-001
	512-MB	446494-001
(21)	<b>Optical drives</b> (include bezel)	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	459253-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	459252-001
(22)	<b>WLAN modules</b>	
	Intel 802.11a/b/g/n WLAN module	441086-001
	Intel 802.11a/b/g WLAN module	451861-001
	<b>Cable Kit</b> (not illustrated; see <a href="#">Cable Kit on page 22</a> for more Cable Kit component information)	446519-001

# Display assembly components



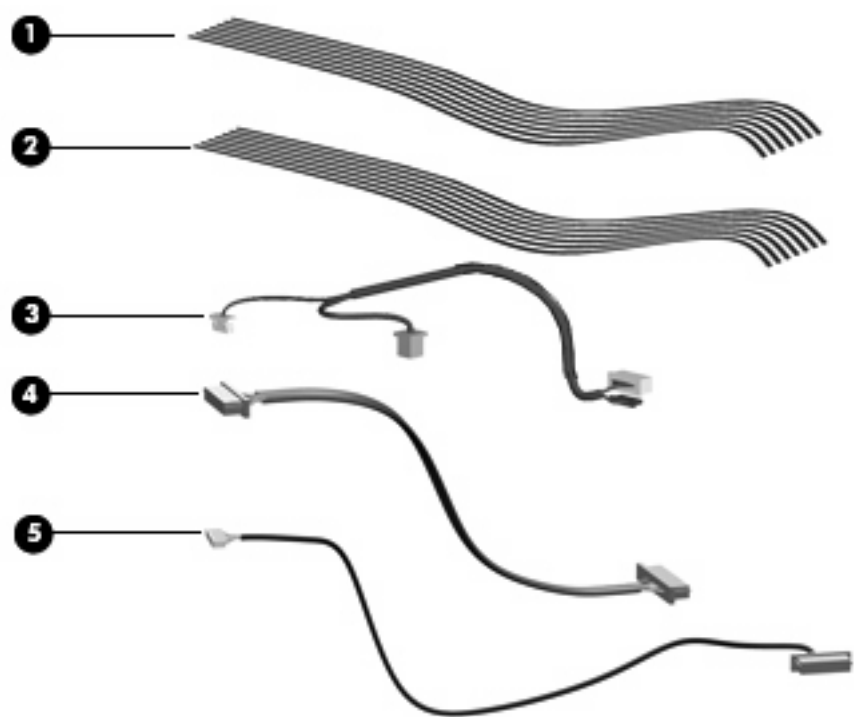
Item	Description	Spare part number
(1)	<b>Display bezels</b>	
	For use with computer models equipped with a camera and microphones (includes openings for camera and microphones)	446483-001
	For use with computer models equipped with microphone (includes openings for microphones)	433281-001
(2)	<b>Display Hinge Kit</b> (includes left and right display hinges)	431395-001
(3)	<b>Display inverter</b> (includes Mylar shield)	431391-001
(4)	<b>Camera module</b> (includes cable)	446486-001
(5)	<b>Display panel</b> (15.4-inch, WXGA, BrightView; includes cable)	446480-001
(6)	<b>Wireless Antenna Kits</b>	
	For use only with computer models equipped with an 802.11a/g/n WLAN module (includes 3 transceivers and cables)	449727-001
	For use only with computer models equipped with an 802.11a/b/g WLAN module (includes 2 transceivers and cables)	431398-001
(7)	<b>Microphone</b>	431393-001
(8)	<b>Display Cable Kit</b> (includes camera module cable)	431394-001
(9)	<b>Display enclosure</b> (includes logo double-sided tape for camera module)	446487-001
	<b>Display hinge covers</b> (not illustrated)	431396-001
	<b>Display Screw Kit</b> (not illustrated, includes screws and display bezel rubber screw covers)	431399-001

## Plastics Kit



Item	Description	Spare part number
<b>Plastics Kit:</b>		438368-001
(1)	ExpressCard slot bezel	
(2)	Left hard drive cover (includes 2 captive screws, secured by C-clips)	
(3)	Right hard drive cover (includes 2 captive screws, secured by C-clips)	
(4)	Memory/WLAN module compartment cover (includes 2 captive screws, secured by C-clips)	

# Cable Kit



Item	Description	Spare part number
<b>Cable Kit:</b>		446519-001
(1)	LED board cable	
(2)	Power button board cable	
(3)	USB/power connector board cable	
(4)	Audio board cable	
(5)	Bluetooth module cable	

## Mass storage devices



Item	Description	Spare part number
(1)	<b>Hard drives</b> (include hard drive bracket)	
	160-GB, 5400-rpm	458803-001
	80-GB, 5400-rpm	458804-001
(2)	<b>Optical drives</b> (include bezel and bracket)	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	459253-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	459252-001

## Miscellaneous parts

Description	Spare part number
<b>65-W PFC AC adapter</b>	453199-001
<b>ATSC/NTSC TV tuner antenna</b>	439131-001
<b>ATSC/NTSC/PAL TV tuner</b>	439130-001
<b>Composite video cable</b>	407939-001
<b>DVB-T tuner</b>	412175-001
<b>DVB-T antenna adapter</b>	412176-001
<b>ExpressCard Kit</b> (includes software CD)	445170-001
<b>HP backpack</b>	405527-001
<b>HP carrying case</b>	418162-001
<b>HP lady's slim bag</b>	418163-001
<b>HP Remote Control</b>	435743-001
<b>Infrared emitter with cable</b>	439129-001
<b>Optical wired mouse</b>	436238-001
<b>Power cord</b>	394279-001
<b>RF input adapter cable</b> (without ferrite)	407940-001
<b>USB digital drive</b>	364727-002
<b>Windows Vista remote control</b> (fits into ExpressCard slot)	439128-001
<b>Windows Vista remote control</b> (does not fit into ExpressCard slot)	439254-001
<b>Wired headset</b>	371693-003
<b>Wireless laser mouse with cable adapter</b>	430958-001
<b>Screw Kit</b>	434747-001
<ul style="list-style-type: none"> <li>• Hex HM5.0×9.0 standoff</li> <li>• Phillips PM3.0×4.0 screw</li> <li>• Phillips PM2.5×7.0 screw</li> <li>• Phillips PM2.5×5.0 screw</li> <li>• Phillips PM2.5×5.0 captive screw</li> <li>• Phillips PM2.5×4.0 screw</li> <li>• Phillips PM2.5×4.0 captive screw</li> <li>• Phillips PM2.5×2.0 screw</li> <li>• Phillips PM2.0×5.0 captive screw</li> <li>• Phillips PM2.0×3.0 screw</li> <li>• Phillips PM2.0×2.0 screw</li> </ul>	



# Sequential part number listing

Spare part number	Description
364727-002	USB digital drive
371693-003	Wired headset with volume control
394279-001	Power cord
405527-001	HP backpack
407939-001	Composite video cable
407940-001	RF input adapter cable (without ferrite)
412175-001	DVB-T tuner
412176-001	DVB-T antenna adapter
412766-002	Bluetooth module (includes Bluetooth module cable)
418162-001	HP carrying case
418163-001	HP lady's slim bag
430958-001	Wireless laser mouse (includes cable adapter)
431391-001	Display inverter
431393-001	Microphone (includes receiver and cable)
431394-001	Display Cable Kit
431395-001	Display Hinge Kit (includes left and right display hinges)
431396-001	Display Hinge Cover Kit
431398-001	Wireless Antenna Kit for use only with computer models equipped with an 802.11a/b/g WLAN module (includes 2 transceivers and cables)
431399-001	Display Screw Kit
431421-001	Top cover trim
431430-001	Rubber Kit
431437-001	Power button board (includes power button board cable)
431439-001	ExpressCard assembly
431447-001	Speaker assembly
433281-001	Display bezel for use with computer models equipped with microphones
434747-001	Screw Kit
436238-001	Optical wired mouse
438368-001	Plastics Kit (see <a href="#">Plastics Kit on page 21</a> for more Plastics Kit component information)
439128-001	Windows Vista remote control (fits into ExpressCard slot)
439129-001	Infrared emitter with cable
439130-001	ATSC/NTSC/PAL TV tuner

Spare part number	Description
439131-001	ATSC/NTSC TV tuner antenna
439254-001	Windows Vista remote control (does not fit into ExpressCard slot)
441086-001	Intel 802.11a/g/n WLAN module
441427-001	Keyboard for use in the United States and Canada
441427-121	Keyboard for use in French Canada
446480-001	15.4-inch, WXGA, BrightView display panel
446481-001	15.4-inch, WXGA, BrightView display assembly for use only with computer models equipped with a camera and microphones
446482-001	15.4-inch, WXGA, BrightView display assembly for use only with computer models equipped with microphones
446483-001	Display bezel for use with computer models equipped with a camera and microphones
446486-001	Camera module (includes cable)
446487-001	Display enclosure (includes double-sided tape for camera module)
446494-001	512-MB memory module (667-MHz, PC2-5300, 1-DIMM)
446495-001	1024-MB memory module (667-MHz, PC2-5300, 1-DIMM)
446506-001	6-cell, 2.20-Ah Li-ion battery
446507-001	6-cell, 2.55-Ah Li-ion battery
446508-001	Top cover (includes TouchPad and cable)
446512-001	Switch cover (includes LED board and cable)
446519-001	Cable Kit (see <a href="#">Cable Kit on page 22</a> for more Cable Kit component information)
446521-001	Fan/heat sink assembly (includes replacement thermal material)
446523-001	Audio board (includes audio connectors, audio board cable, and infrared lens)
449454-001	USB/power connector board (includes USB/power connector board cable)
449727-001	Wireless Antenna Kit for use only with computer models equipped with an 802.11a/g/n WLAN module (includes 3 transceivers and cables)
449729-001	RTC battery (includes double-sided tape)
450370-001	Processor bracket for use only with computer models equipped with T7700 and T7500 processors (includes replacement thermal material)
450371-001	Processor bracket for use only with computer models equipped with T7250, T5550, T5450, and T5250 processors (includes replacement thermal material)
451861-001	Intel 802.11a/b/g WLAN module
451864-001	12-cell, 2.55-Ah Li-ion battery
453199-001	65-watt PFC AC adapter
453774-001	2048-MB memory module (667-MHz, PC2-5300, 1-DIMM)
458796-001	Intel Core 2 Duo T7500 2.20-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
458797-001	Intel Core 2 Duo T7250 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB; includes replacement thermal material)
458798-001	Intel Core 2 Duo T5550 1.83-GHz processor (2-MB L2 cache, 667-MHz FSB; includes replacement thermal material)
458799-001	Intel Core 2 Duo T5450 1.67-GHz processor (2-MB L2 cache, 667-MHz FSB; includes replacement thermal material)
458800-001	Intel Core 2 Duo T5250 1.50-GHz processor (2-MB L2 cache, 667-MHz FSB; includes replacement thermal material)
458801-001	Intel Core 2 Duo T7700 2.40-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material)
458803-001	160-GB, 5400-rpm hard drive (includes Mylar tab and bracket)
458804-001	80-GB, 5400-rpm hard drive (includes Mylar tab and bracket)
459251-001	System board (includes replacement thermal material)
459252-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive
459253-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
460319-001	Base enclosure (includes rubber feet and wireless on/off switch)

---

## 4 Removal and replacement procedures

### Preliminary replacement requirements

#### Tools required

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

- Flat-bladed screwdriver
- Hex 5.0-mm nut driver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers

#### Service considerations

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



**NOTE:** As you remove each subassembly from the 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



## Unknown user password

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



**NOTE:** These steps also clear CMOS.

Before disassembling the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the RTC battery (see [RTC battery on page 45](#)).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

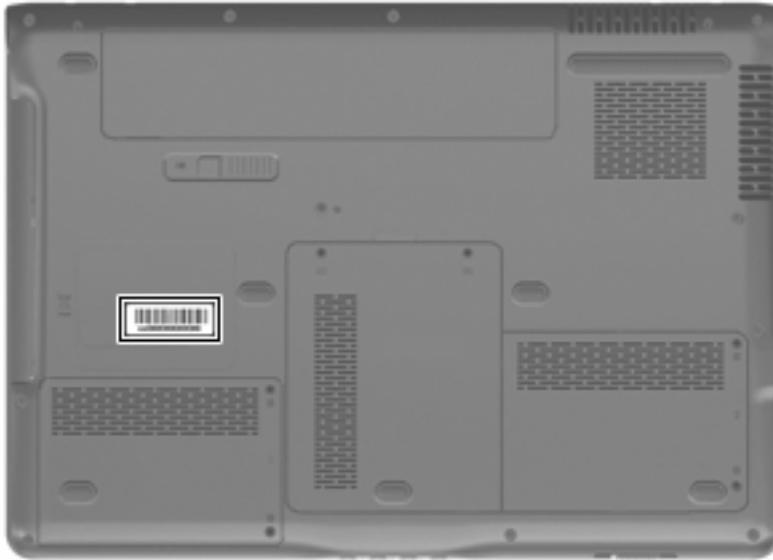
# Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 87 screws and standoffs, in 13 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

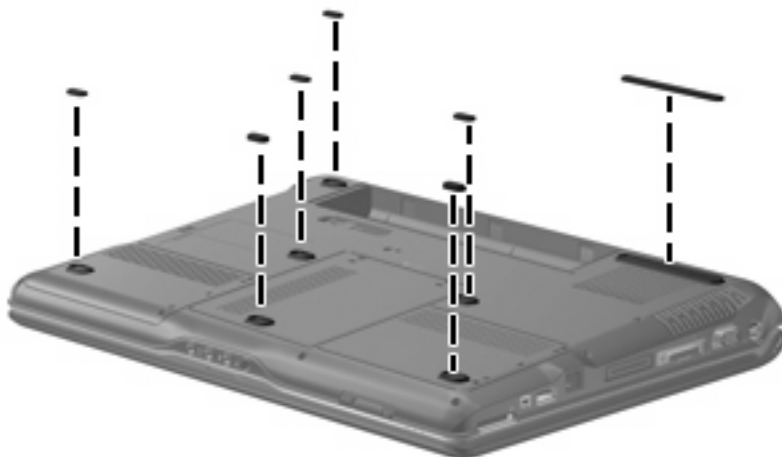
Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



## Computer feet

Description	Spare part number
Rubber Kit (includes base enclosure rubber feet)	431430-001

The computer feet are adhesive-backed rubber pads. The 7 feet attach to the base enclosure in the locations illustrated below.



## Battery

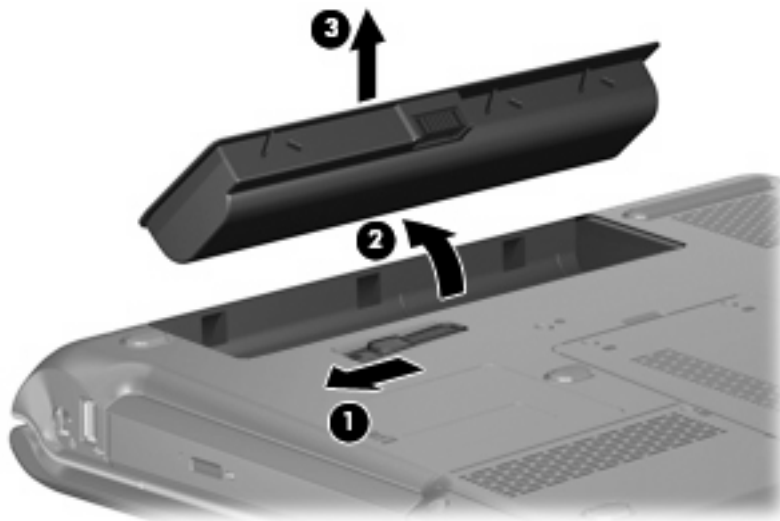
Description	Spare part number
12-cell, 2.55-Ah Li-ion battery	451864-001
6-cell, 2.55-Ah Li-ion battery	446507-001
6-cell, 2.20-Ah Li-ion battery	446506-001

Before disassembling the computer, follow these steps:

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


Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the battery **(2)** upward and remove it **(3)** from the computer.



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

## Camera module

 **NOTE:** If it has been determined that the camera module is the component that must be replaced to complete the computer repair, the display assembly does not have to be removed. Follow the procedures in this section to replace the camera module. For information on replacing the display assembly and other display assembly internal components, see [Display assembly on page 55](#).

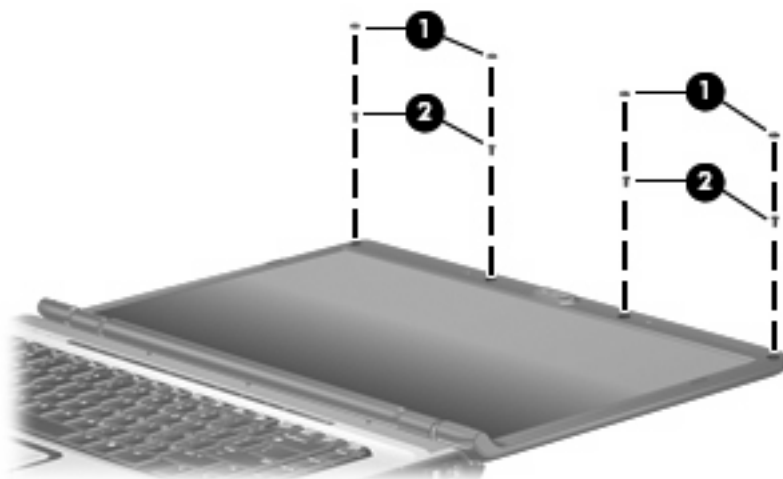
Description	Spare part number
Camera module (includes 2-sided tape)	446486-001

Before removing the camera module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).

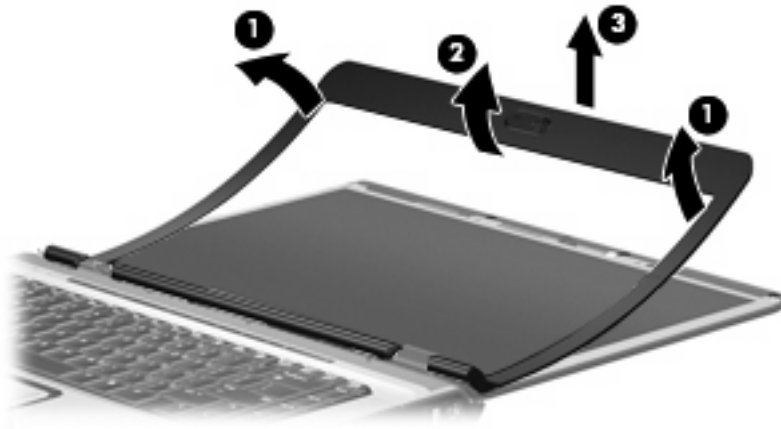
Remove the camera module:

1. Turn the computer display-side up, with the front toward you.
2. Open the computer as far as possible.
3. Remove the four rubber screw covers **(1)** on the display bezel top edge. The display rubber screw covers are included in the Display Screw Kit, spare part number 431399-001.
4. Remove the four Phillips PM2.5×6.0 screws **(2)** on the display bezel top edge.

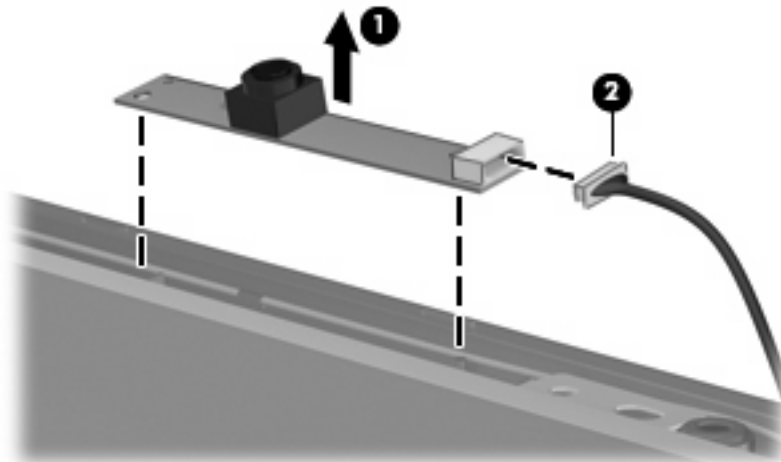


5. Flex the inside edges of the left and right sides **(1)** and the top edge **(2)** of the display bezel until the bezel disengages from the display enclosure.

6. Release the display bezel top edge **(3)**.




7. Release the camera module **(1)** from the display enclosure as far as the camera module cable allows.
8. Disconnect the camera module cable **(2)** from the camera module.



9. Remove the camera module.

Reverse this procedure to install the camera module.

## Display inverter

 **NOTE:** If it has been determined that the display inverter is the component that must be replaced to complete the computer repair, the display assembly does not have to be removed. Follow the procedures in this section to replace the display inverter. For information on replacing the display assembly and other display assembly internal components, see [Display assembly on page 55](#).

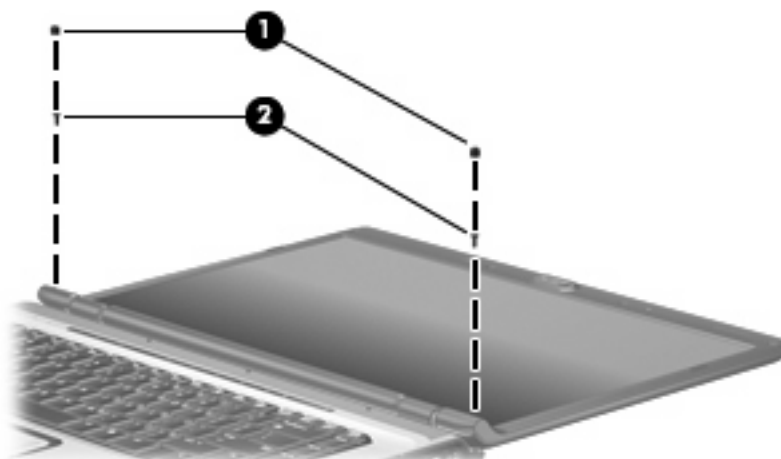
Description	Spare part number
Display inverter	431391-001

Before removing the display inverter, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).

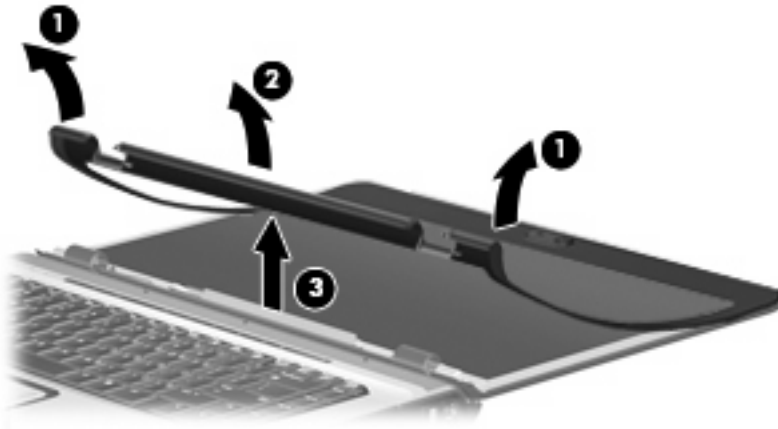
Remove the display inverter:

1. Turn the computer display-side up, with the front toward you.
2. Open the computer as far as possible.
3. Remove the two rubber screw covers **(1)** on the display bezel bottom edge. The display rubber screw covers are included in the Display Screw Kit, spare part number 431399-001.
4. Remove the two Phillips PM2.5×8.0 screws **(2)** that secure the display bezel bottom edge to the display assembly.

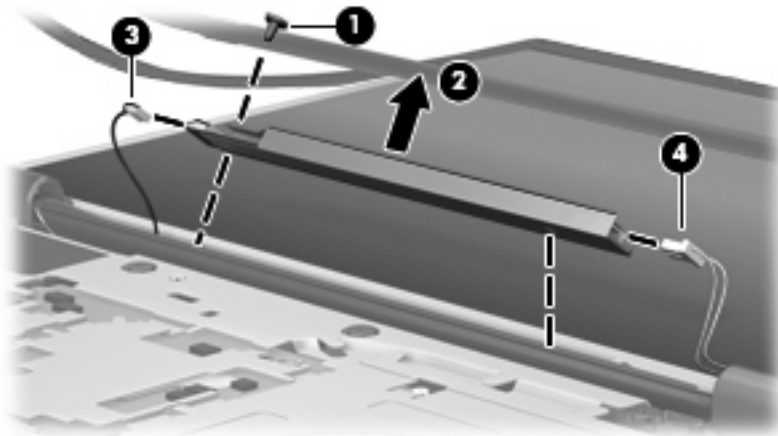


5. Flex the inside edges of the left and right sides **(1)** and the bottom edge **(2)** of the display bezel until the bezel disengages from the display enclosure.

6. Release the display bezel bottom edge **(3)**.



7. Remove the Phillips PM2.0×4.0 screw **(1)** that secures the display inverter to the display enclosure.
8. Release the display inverter **(2)** as far as the display panel cable and the backlight cable allow.
9. Disconnect the display panel cable **(3)** and the backlight cable **(4)** from the display inverter.



10. Remove the display inverter.

Reverse this procedure to install the display inverter.



## Hard drives



**NOTE:** All hard drive spare part kits include a hard drive bracket.

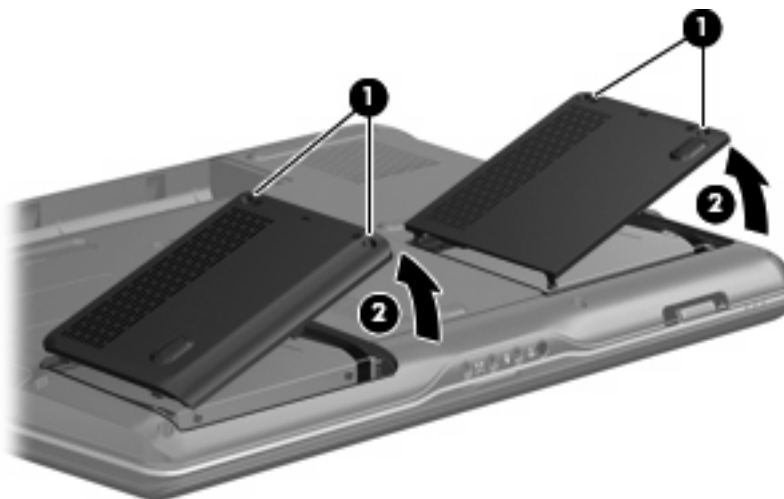
Description	Spare part number
160-GB, 5400-rpm	458803-001
80-GB, 5400-rpm	458804-001

Before removing the hard drive, follow these steps:

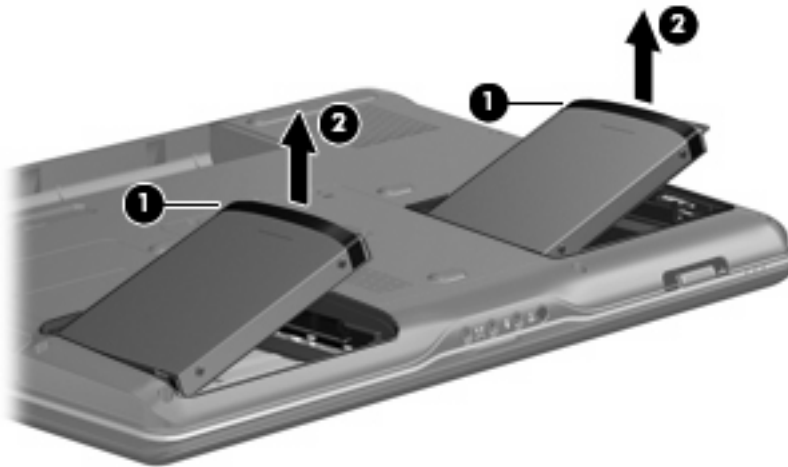
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).

Remove the hard drives:

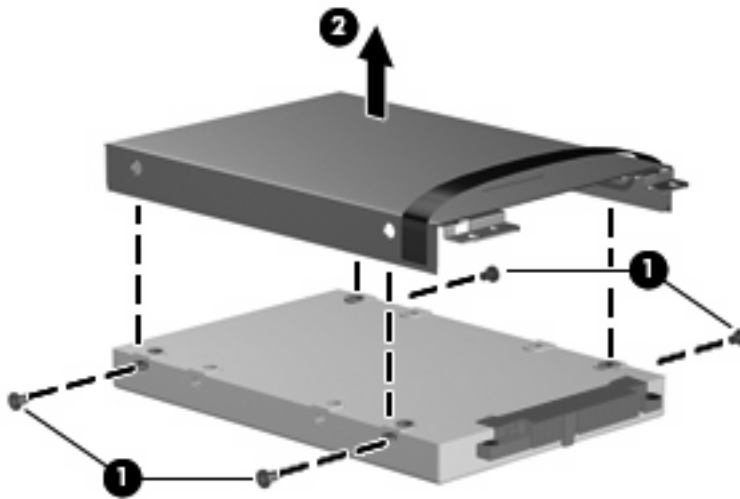
1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.5×5.0 screws **(1)** that secure each hard drive cover to the computer.
3. Lift the right side of the hard drive covers **(2)**, swing them up and to the left, and remove the covers. The hard drive covers are included in the Plastics Kit, spare part number 438368-001.



4. Use the Mylar straps **(1)** to lift the hard drives **(2)** until they disconnect from the computer.



5. Remove the hard drives from the hard drive bays.
6. If it is necessary to remove the hard drive bracket, remove the four Phillips PM3.0×4.0 hard drive bracket screws **(1)** that secure the hard drive bracket to the hard drive.
7. Lift the bracket **(2)** straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

## Memory module

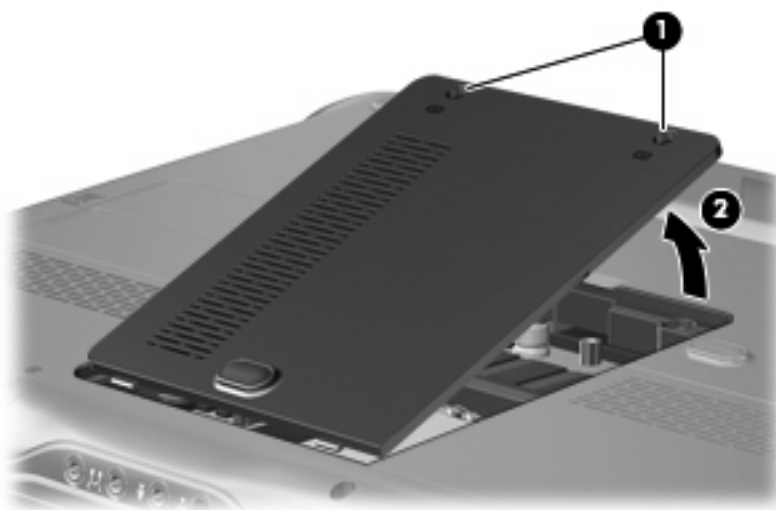
Description	Spare part number
2048-MB (PC2-5300, 667-MHz, DDR2)	453774-001
1024-MB (PC2-5300, 667-MHz, DDR2)	446495-001
512-MB (PC2-5300, 667-MHz, DDR2)	446494-001

Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).


Remove the memory module:

1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.5×5.0 screws **(1)** that secure the memory/WLAN module compartment cover to the computer.
3. Lift the rear edge of the cover **(2)**, swing it up and forward, and remove the cover. The memory/WLAN module compartment cover is included in the Plastics Kit, spare part number 438368-001.

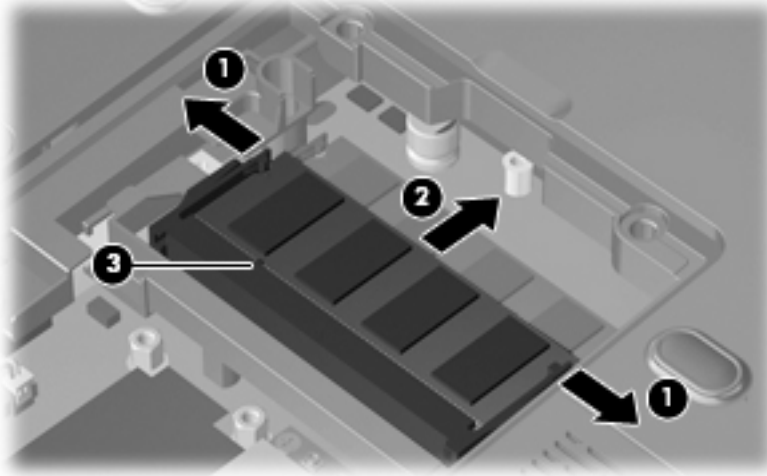


4. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

5. Remove the module **(2)** by pulling it away from the slot at an angle.


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

---



Reverse this procedure to install a memory module.

## RTC battery

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

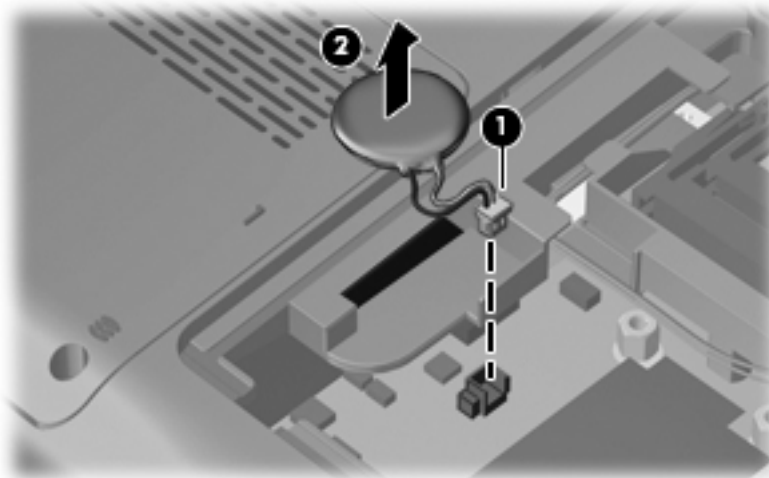
Description	Spare part number
RTC battery (includes double-sided tape)	449729-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the memory/WLAN module compartment cover (see [Memory module on page 43](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Remove the RTC battery **(2)** from the clip built into the base enclosure.



Reverse this procedure to install the RTC battery.

## WLAN module


Description	Spare part number
Intel 802.11a/g/n WLAN module	441086-001
Intel 802.11a/b/g WLAN module	451861-001

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the memory/WLAN module compartment cover (see [Memory module on page 43](#)).


Remove the WLAN module:

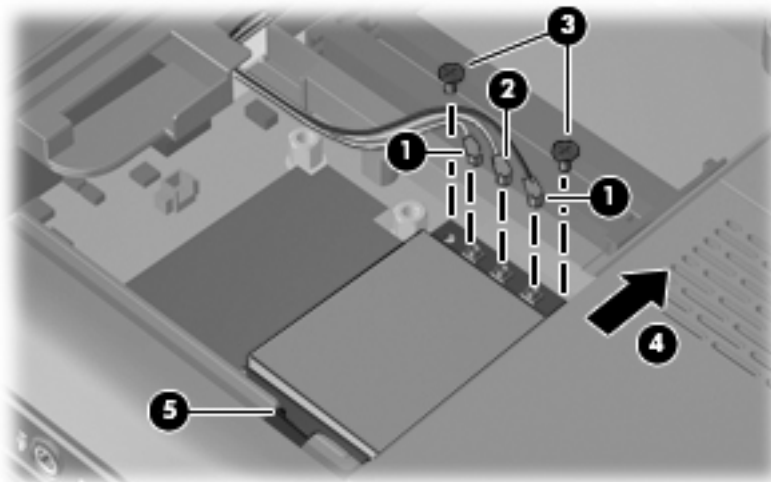
1. Disconnect the two WLAN antenna cables **(1)** from the WLAN module.

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

**NOTE:** Computer models equipped with an 802.11a/g/n WLAN module will have an additional wireless antenna cable **(2)**, yellow in color. Disconnect the yellow WLAN antenna cable from the WLAN module middle terminal.


2. Remove the two Phillips PM2.0×4.0 screws **(3)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)
3. Remove the WLAN module **(4)** by pulling it away from the slot at an angle.

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



Reverse this procedure to install a WLAN module.

## Optical drive

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

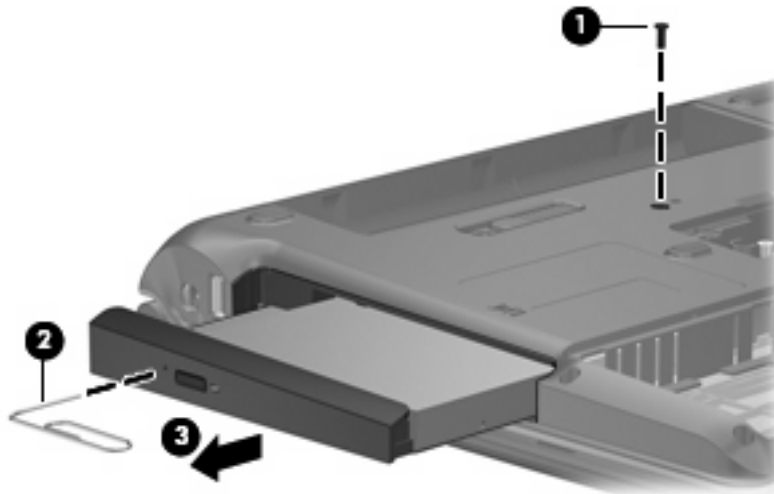
Description	Spare part number
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	459253-001
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	459252-001

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 from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).

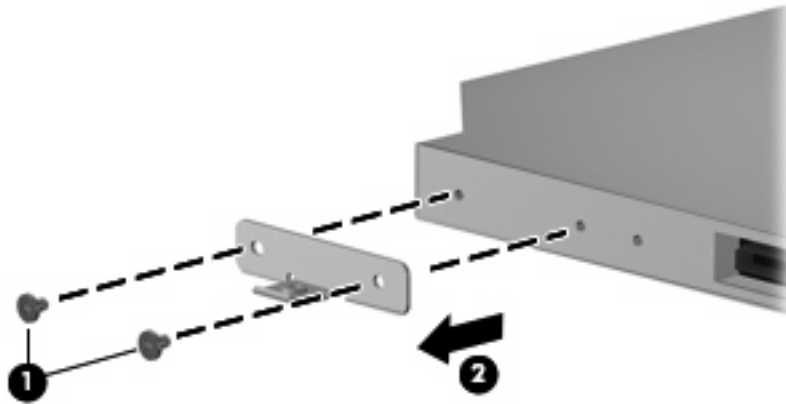
Remove the optical drive:

1. Position the computer with right side toward you.
2. Remove the Phillips PM2.5×8.0 screw **(1)** that secures the optical drive to the computer.
3. Insert a thin tool, such as a paper clip **(2)**, into the release access. (The optical drive disc tray is partially ejected from the optical drive.)
4. Use the disc tray frame to slide the optical drive **(3)** out of the computer.



5. If it is necessary to replace the optical drive bracket, position the optical drive with the optical drive bracket toward you.

6. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the optical drive bracket to the optical drive.
7. Remove the optical drive bracket **(2)**.



Reverse the above procedure to reassemble and install the optical drive.



## Switch cover

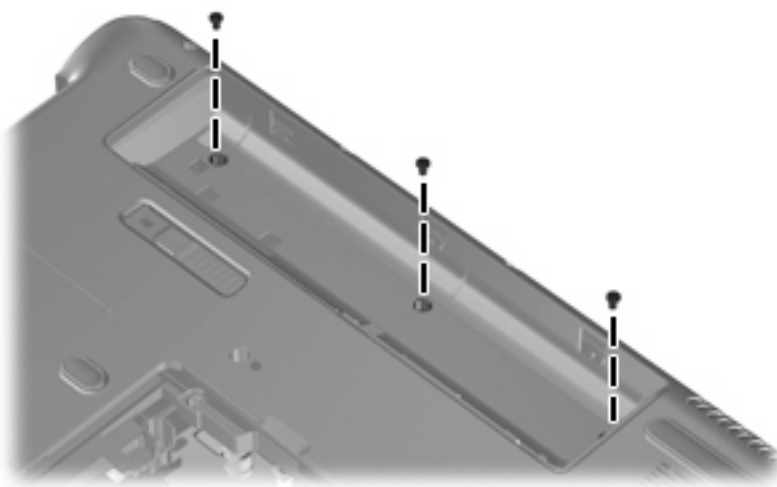
Description	Spare part number
Switch cover (includes LED board and cable)	446512-001

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 from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).

Remove the switch cover:

1. Remove the three Phillips PM2.5×8.0 screws that secure the switch cover to the computer.

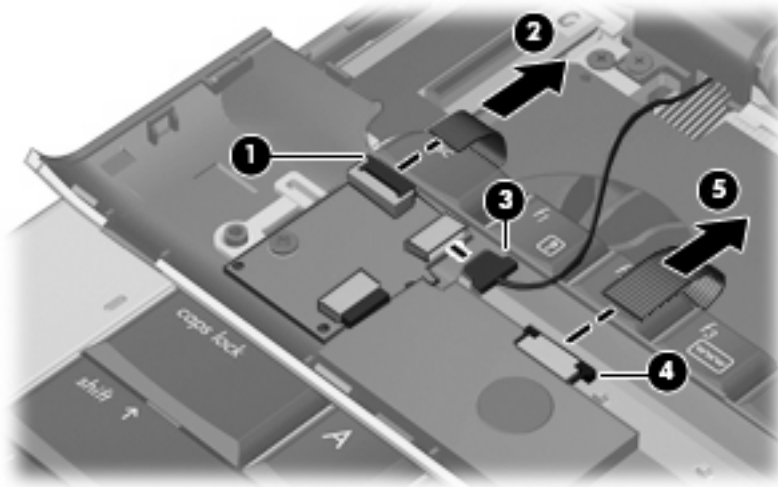


2. Turn the computer display-side up, with the front toward you.
3. Open the computer as far as possible.

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



5. Release the zero insertion force (ZIF) connector **(1)** to which the power button board is connected, and disconnect the cable **(2)** from the power button board.
6. Disconnect the microphone cable **(3)** from the power button board.
7. Release the ZIF connector **(4)** to which the LED board is connected and disconnect the cable **(5)** from the power button board.



8. Remove the switch cover.

Reverse this procedure to install the switch cover.

## Speaker assembly

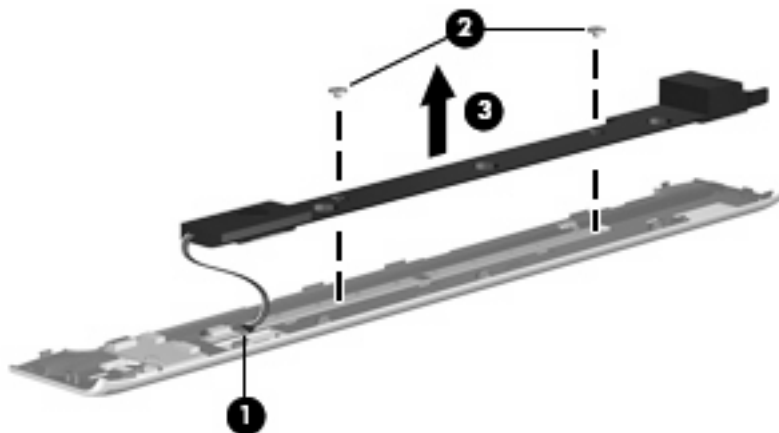
Description	Spare part number
Speaker assembly (includes cables)	431447-001

Before removing the speaker assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the switch cover (see [Switch cover on page 49](#)).

Remove the speaker assembly:

1. Disconnect the speaker assembly cable **(1)** from the power button board.
2. Remove the two Phillips PM2.5×2.0 broad-head screws **(2)** that secure the speaker assembly to the switch cover.
3. Remove the speaker assembly **(3)**.



Reverse this procedure to install the speaker assembly.

## Power button board

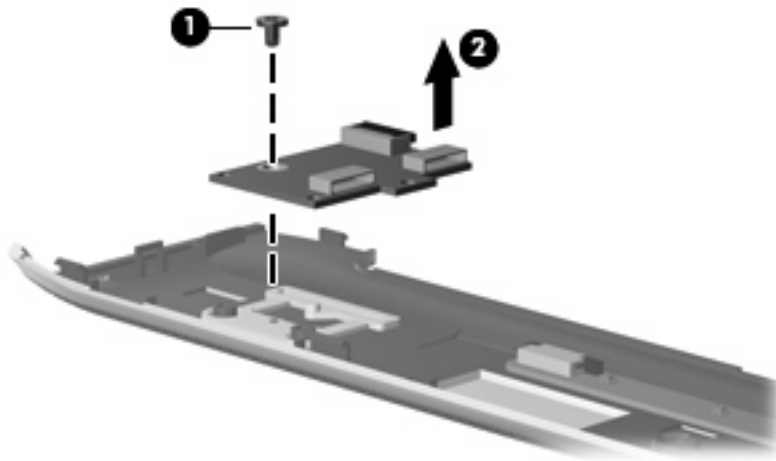
Description	Spare part number
Power button board (includes power button board cable)	431437-001

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 from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the switch cover (see [Switch cover on page 49](#)).

Remove the power button board:

1. Remove the Phillips PM2.0×4.0 screw **(1)** that secures the power button board to the switch cover.
2. Remove the power button board **(2)** from the switch cover.



3. Remove the power button board.

Reverse this procedure to install the power button board.

# Keyboard

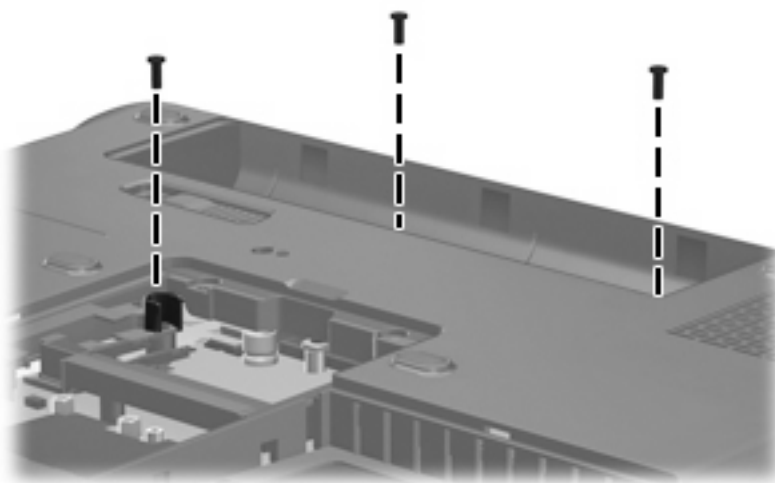
Description	Spare part number
Keyboard for use in Canada and the United States	441127-001
Keyboard for use in French Canada	441127-121

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the switch cover (see [Switch cover on page 49](#)).

Remove the keyboard:

1. Turn the computer upside down, with the front toward you.
2. Remove the three Phillips PM2.5×8.0 screws that secure the keyboard to the computer.

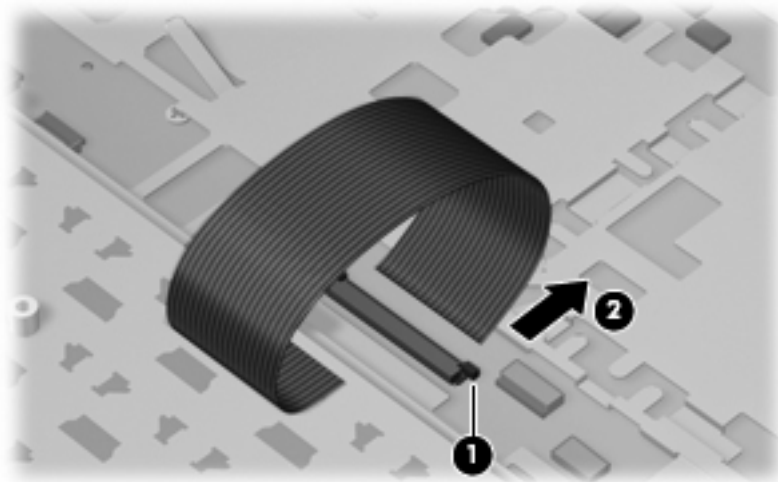


3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Lift the rear edge of the keyboard **(1)** until it rests at an angle.
6. Release the keyboard **(2)** by sliding it back to disengage the tabs on the front edge of the keyboard from the top cover.

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.

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 **NOTE:** The power button board cable and LED board cable are included in the Cable Kit, spare part number 446519-001.

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## Display assembly

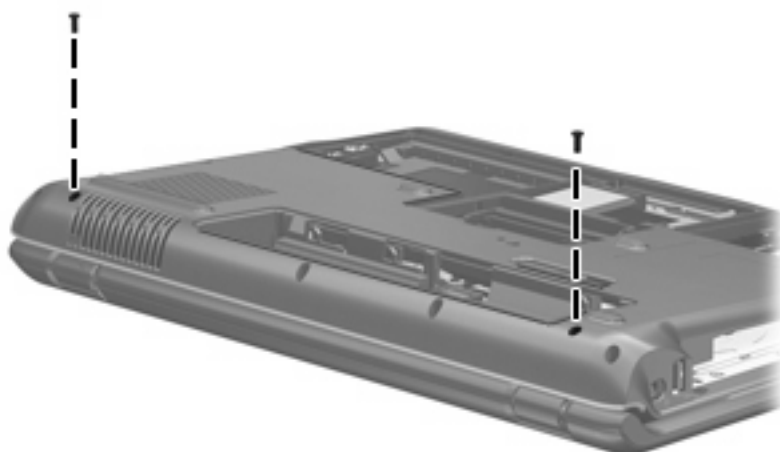
Description	Spare part number
15.4-inch, WXGA, BrightView display assembly for use with computer models equipped with a camera and microphones (includes camera, microphones, and WLAN transceivers and antenna cables)	446481-001
15.4-inch, WXGA, BrightView display assembly for use with computer models equipped with microphones (includes microphones and WLAN transceivers and antenna cables)	446482-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the memory/WLAN module compartment cover (see [Memory module on page 43](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 46](#)).
7. Remove the keyboard (see [Keyboard on page 53](#)).
8. Remove the switch cover (see [Switch cover on page 49](#)).

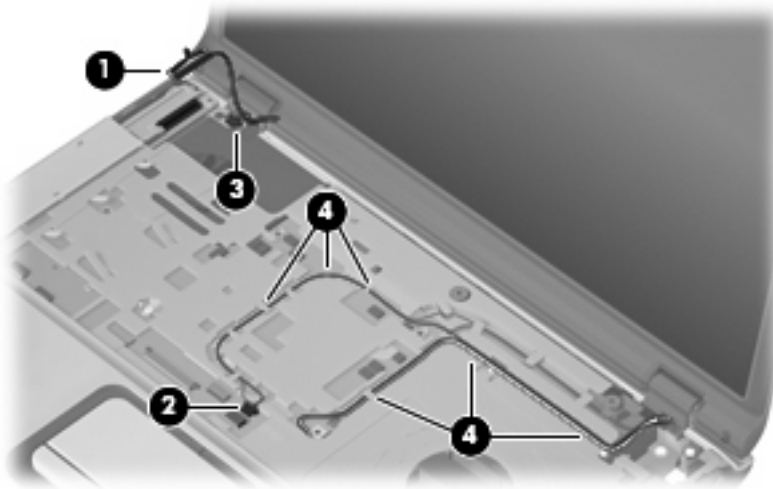
Remove the display assembly:

1. Close the computer and turn it upside down, with the rear panel toward you.
2. Remove the Phillips PM2.5×8.0 screws that secure the display assembly to the computer.



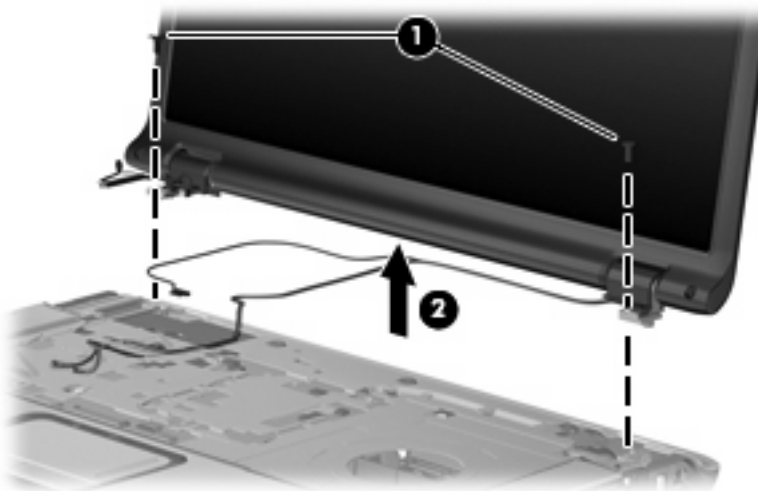
3. Turn the computer display-side up, with the front toward you.
4. Open the computer to an upright position.

5. Disconnect the following cables:
  - (1) Display panel cable
  - (2) Camera cable
  - (3) Microphone cable
6. Remove the wireless antenna cables (4) from the routing channels built into the top cover.



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

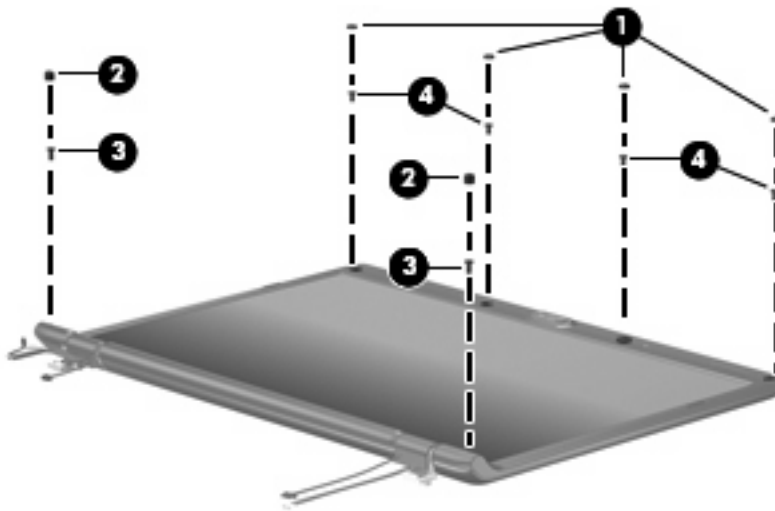
7. Remove the two Phillips PM2.5×8.0 screws (1) that secure the display assembly to the computer.
8. Remove the display assembly (2).



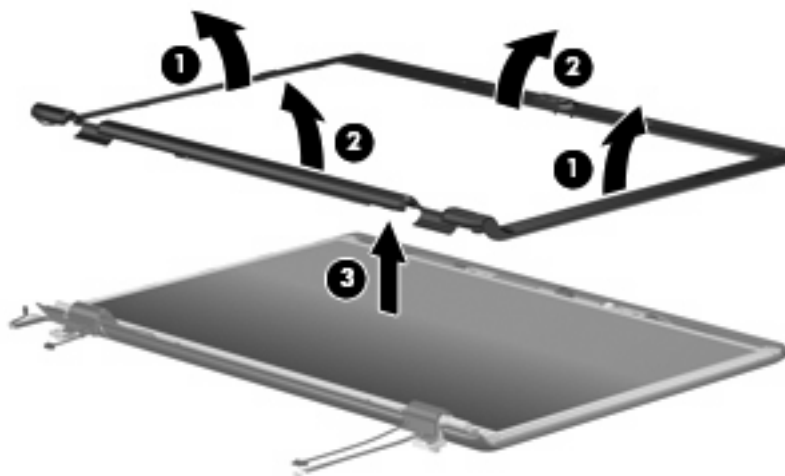



9. If it is necessary to replace the display bezel or any of the display assembly internal components, remove the following:

- (1) Four rubber screw covers on the display bezel top edge. The display rubber screw covers are included in the Display Screw Kit, spare part number 431399-001.
- (2) Two rubber screw covers on the display bezel bottom edge.
- (3) Two Phillips PM2.5×8.0 screws on the display bezel bottom edge.
- (4) Four Phillips PM2.5×6.0 screws on the display bezel top edge.

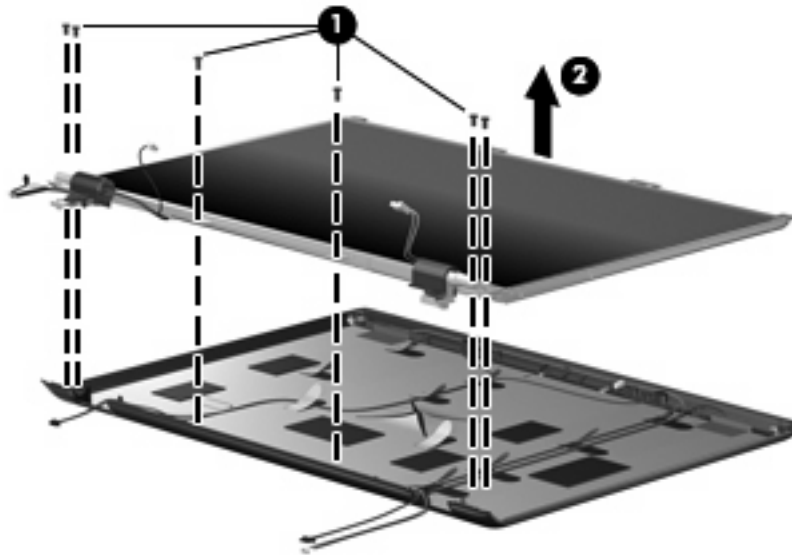


10. Flex the inside edges of the left and right sides (1) and the top and bottom sides (2) of the display bezel until the bezel disengages from the display enclosure.
11. Remove the display bezel (3). Display bezels are available using spare part numbers 446483-001 (for use with computer models equipped with a camera and microphones) and 433281-001 (for use with computer models equipped with microphones).

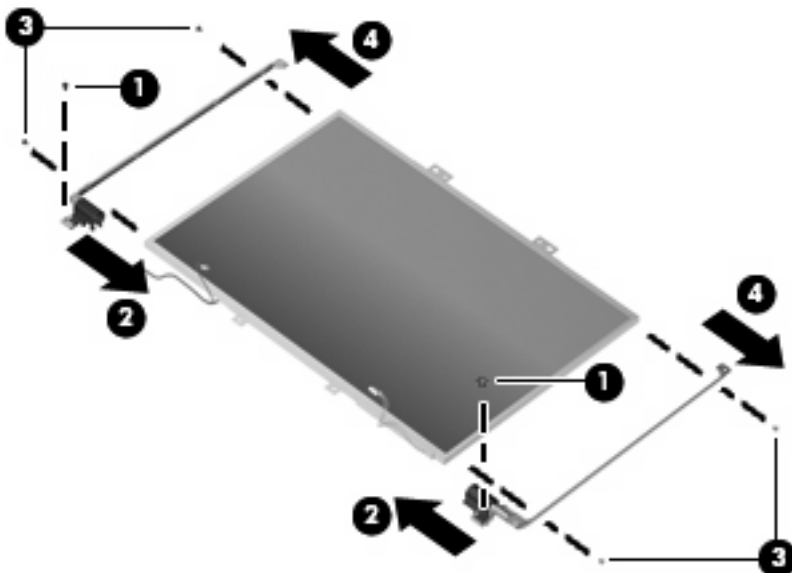


 **NOTE:** See [Camera module on page 37](#) for camera module replacement instructions. See [Display inverter on page 39](#) for display inverter replacement instructions.

12. If it is necessary to replace the display panel, remove the six Phillips PM2.5×6.0 screws **(1)** that secure the display panel to the display enclosure.
13. Remove the display panel **(2)**. The display panel is available using the spare part number 446480-001.

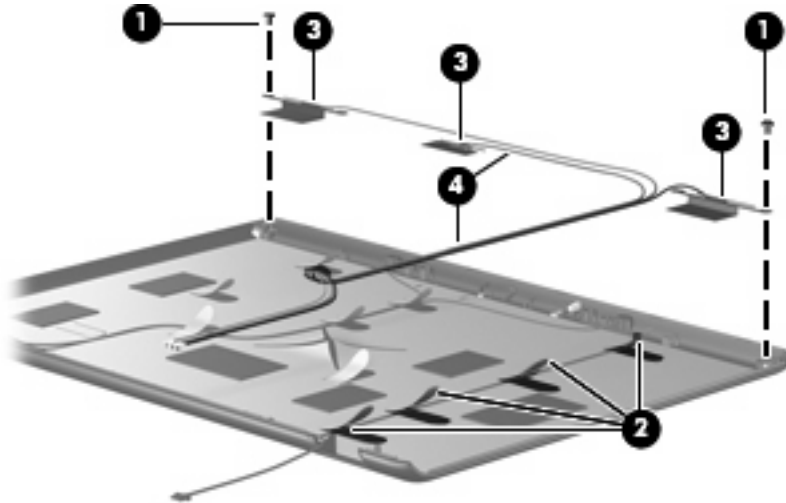


14. If it is necessary to replace the display hinges and hinge covers, remove the Phillips PM2.5×6.0 screws **(1)** that secure the each hinge cover to the hinges and remove the covers **(2)** by sliding them off the hinges. The display hinge covers are available using spare part number 431396-001.
15. Remove the two Phillips PM2.0×4.0 screws that secure each display hinge **(3)** to the display panel.
16. Remove the display hinges **(4)**. The display hinges are available using spare part number 431395-001.

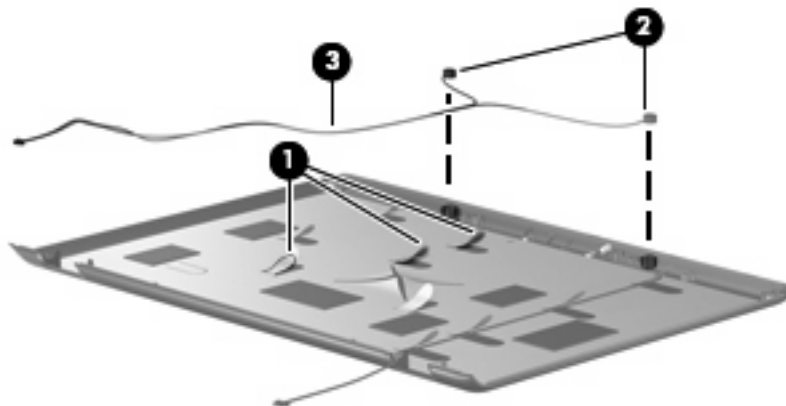


17. If it is necessary to replace the wireless antenna transceivers and cables, remove the two Phillips PM2.0×4.0 screws **(1)** that secure the outside transceivers to the display enclosure.

18. Remove the wireless antenna cables from the clips **(2)** built into the display enclosure.
19. Detach the wireless antenna transceivers **(3)** from the display enclosure and remove the transceivers and cables **(4)**. The wireless antenna transceivers and cables are available using the spare part numbers 449727-001 (for use with computer models equipped with an 802.11a/b/g/n WLAN module) and 431398-001 (for use with computer models equipped with an 802.11a/b/g WLAN module).

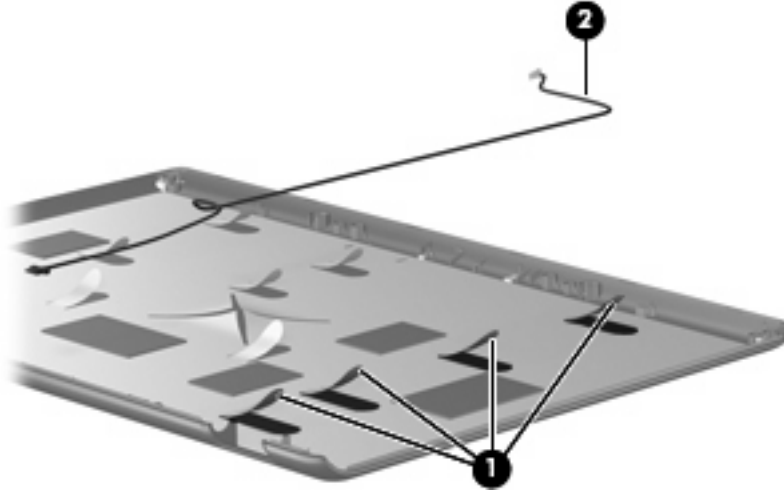


20. If it is necessary to replace the microphones and cables, release the retention tabs **(1)** built into the display enclosure that secure the microphone cables to the display enclosure
21. Remove the microphone receivers **(2)** from the clips in the display enclosure.
22. Remove the microphone cables **(3)** from the display enclosure. The microphones and cables are available using spare part number 431393-001.



23. If it is necessary to replace the camera cable, release the retention tabs **(1)** built into the display enclosure that secure the camera cable to the display enclosure.

24. Remove the camera cable **(2)** from the display enclosure. The camera cable is included in the Display Cable Kit, spare part number 431394-001.



Reverse this procedure to reassemble and install the display assembly.

## Top cover

Description	Spare part number
Top cover (includes TouchPad and cable)	446508-001

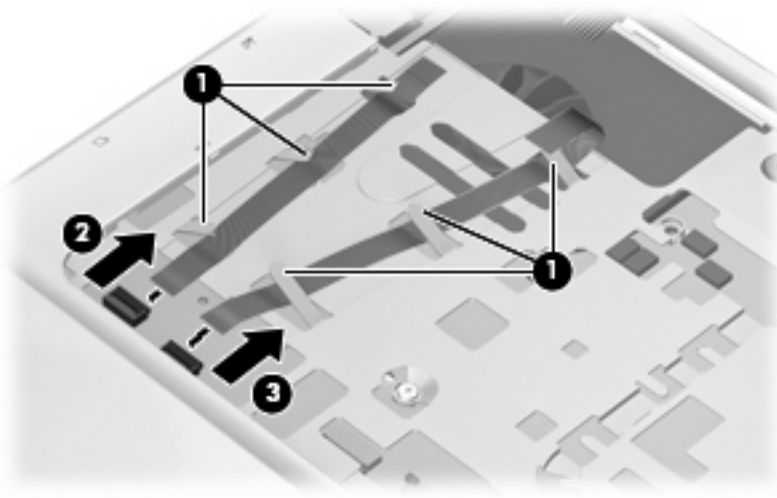
Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Disconnect the power button board cable and the LED board cables from the system board (see [Keyboard on page 53](#)).
6. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))

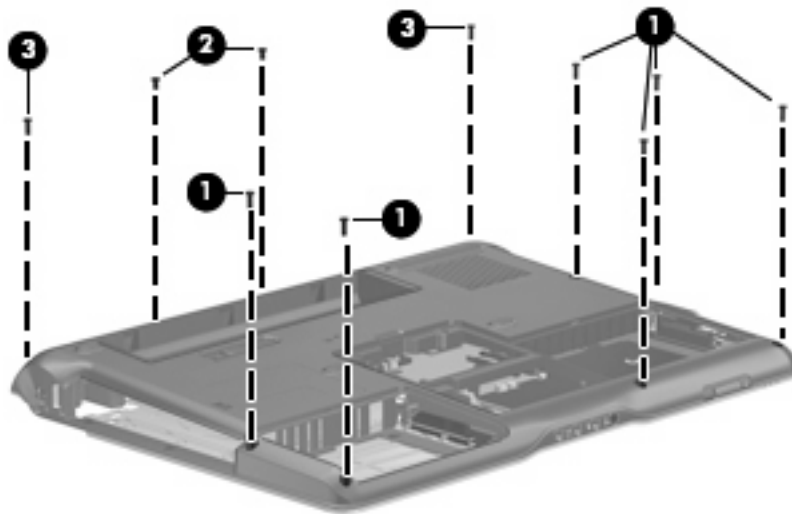
Remove the top cover:

1. Remove the power button board cable and LED button board cable from the clips **(1)** built into the top cover.

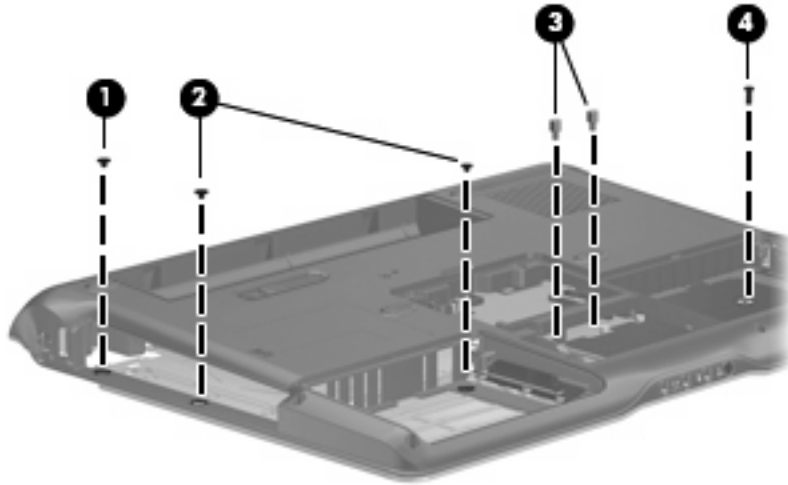
2. Disconnect the power button board cable **(2)** and the LED button board cable **(3)** from the low insertion force (LIF) connectors on the system board.



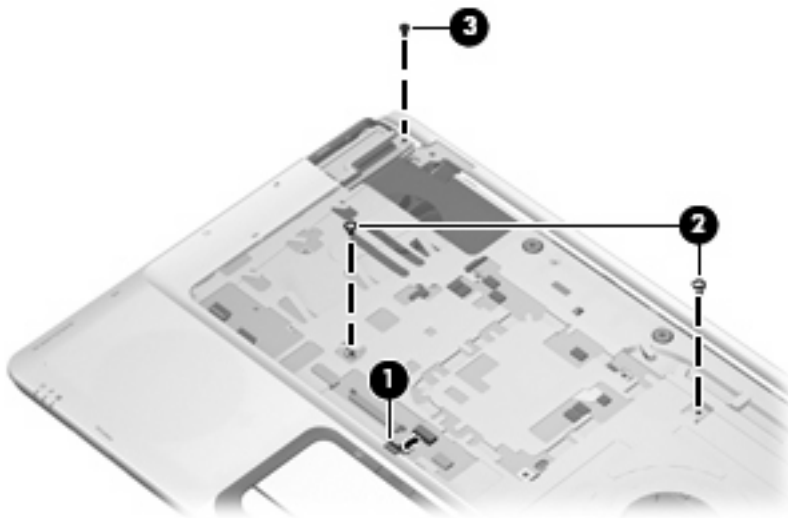
3. Remove the power button board cable and LED board cable.
4. Turn the computer upside down, with the front toward you.
5. Remove the following screws:
  - (1)** Six Phillips PM2.5×8.0 screws that secure the top cover to the computer
  - (2)** Two Phillips PM2.5×6.0 screws that secure the top cover trim to the computer
  - (3)** Two Phillips PM2.5×8.0 screws that secure the top cover trim to the computer



6. Remove the following:
- (1)** One Phillips PM2.0×3.0 broad-head screw
  - (2)** Two Phillips PM2.5×3.0 broad-head screws
  - (3)** Two Hex HM5.0×9.0 standoffs
  - (4)** One Phillips PM2.5×6.0 screw

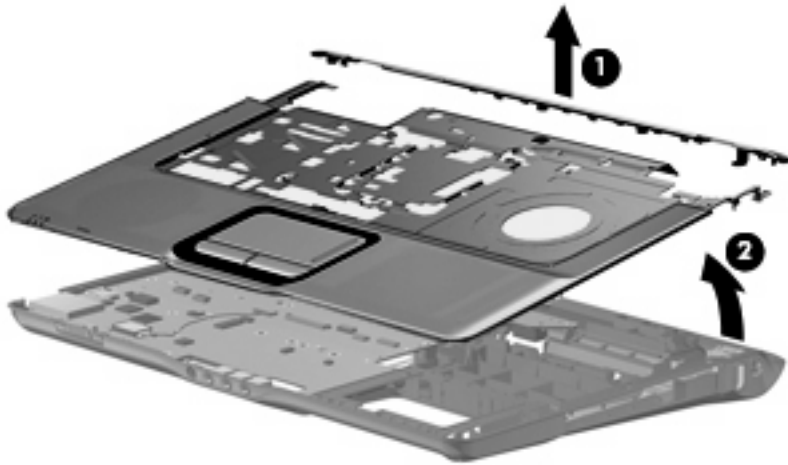


7. Turn the computer right-side up, with the front toward you.
8. Release the ZIF connector to which the TouchPad cable is connected and disconnect the TouchPad cable **(1)** from the system board.
9. Remove the following screws:
- (2)** Two Phillips PM2.5×5.0 screws that secure the top cover to the computer
  - (3)** One Phillips PM2.5×6.0 screw that secures the top cover trim to the computer



10. Remove the top cover trim **(1)**. The top cover trim is available using spare part number 431421-001.

11. Lift the rear edge of the top cover **(2)** until it disengages from the computer.



12. Remove the top cover.

Reverse this procedure to install the top cover and top cover trim.



## Bluetooth module

Description	Spare part number
Bluetooth module (includes Bluetooth module cable)	412766-002

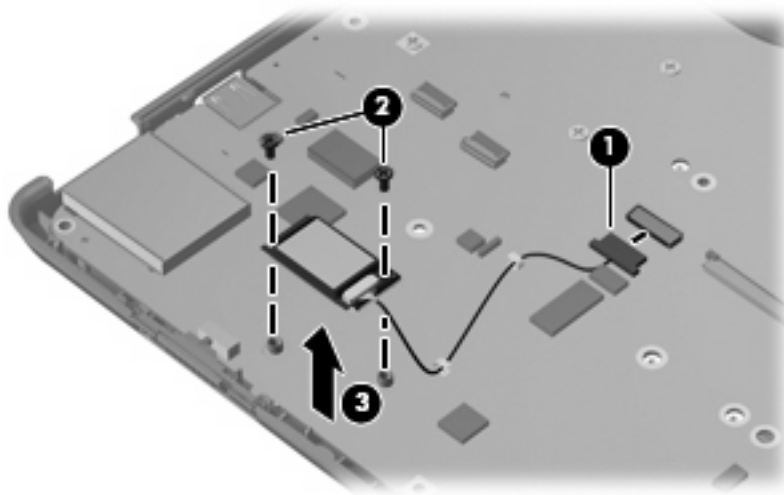
Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Remove the two Phillips PM2.0×4.0 screws **(2)** that secure the Bluetooth module to the system board.

3. Remove the Bluetooth module **(3)**.



Reverse this procedure to install the Bluetooth module.

## USB/power connector board

Description	Spare part number
USB/power connector board	449454-001

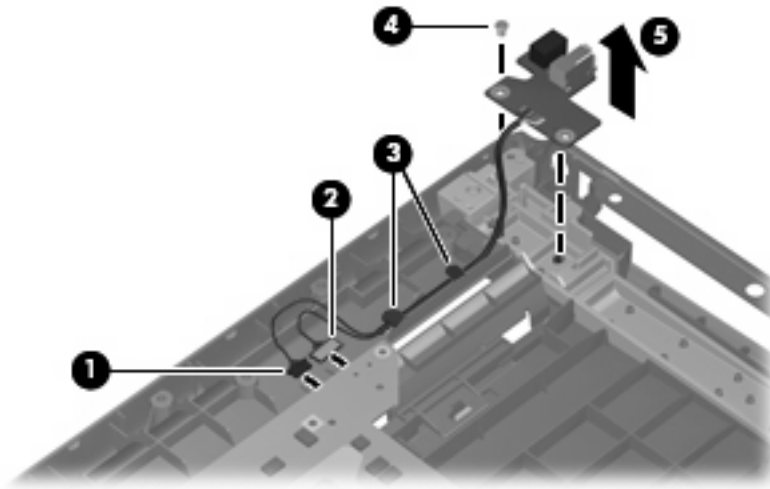
Before removing the USB/power connector board, follow these steps:

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 from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))

Remove the USB/power connector board:

1. Disconnect the USB cable **(1)** and power connector cable **(2)** from the system board.
2. Remove the USB/power connector board cable from the clips **(3)** built into the base enclosure.
3. Remove the Phillips PM2.5×5.0 screw **(4)** that secures the USB/power connector board to the base enclosure.

4. Remove the USB/power connector board **(5)** and cable from the base enclosure.



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

## System board

Description	Spare part number
System board (includes replacement thermal material)	459251-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))

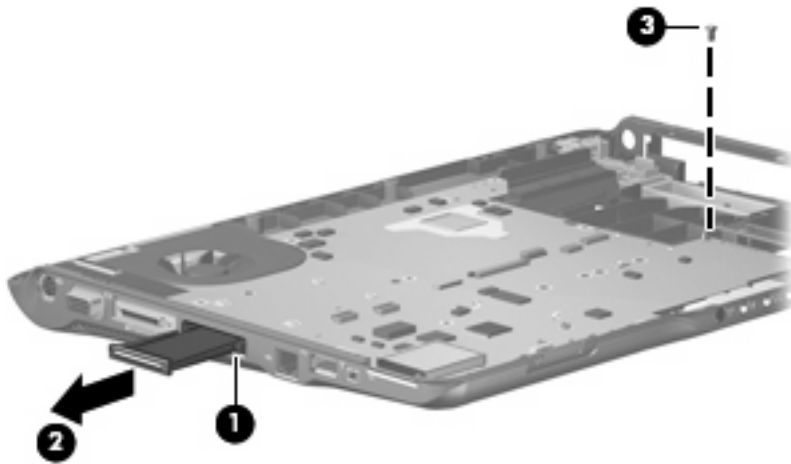
- h. Audio board (see [Audio board on page 71](#))
- i. USB/power connector board (see [USB/power connector board on page 67](#))

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

- Memory modules (see [Memory module on page 43](#))
- RTC battery (see [RTC battery on page 45](#))
- WLAN module (see [WLAN module on page 46](#))
- Bluetooth module (see [Bluetooth module on page 65](#))
- ExpressCard assembly (see [ExpressCard assembly on page 72](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 74](#))
- Processor (see [Processor on page 77](#))

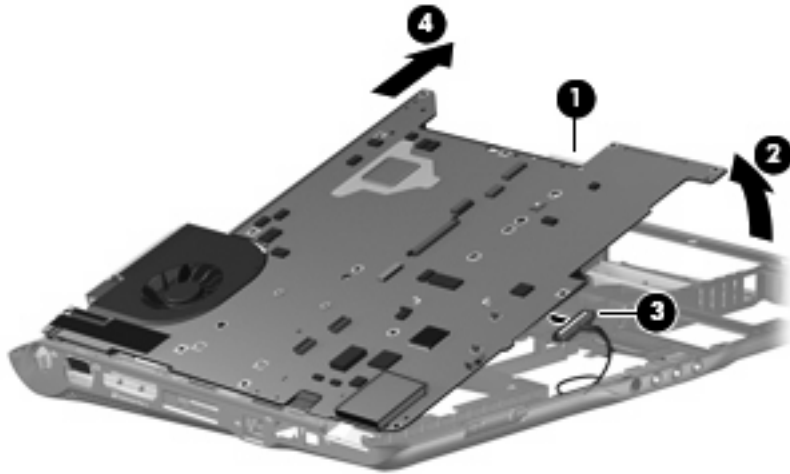
Remove the system board:

1. Press the ExpressCard slot bezel **(1)** to eject the bezel from the slot.
2. Remove the ExpressCard slot bezel **(2)** from the slot.
3. Remove the Phillips PM2.5×5.0 screw **(3)** that secures the system board to the base enclosure.



4. Use the optical drive connector **(1)** to lift the right side of the system board **(2)** until it rests at an angle.
5. Disconnect the audio board cable **(3)** from the system board.

6. Remove the system board **(4)** by sliding it to the right until the connectors on the left side of the system board disengage from the base enclosure.



Reverse the above procedure to install the system board.

## Audio board

Description	Spare part number
Audio board (includes audio connectors, audio board cable, and infrared lens)	446523-001

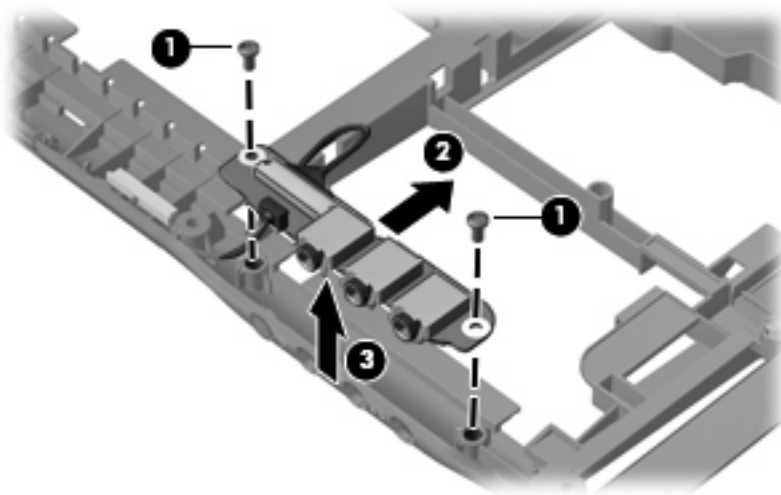
Before removing the audio board, follow these steps:

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 from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))
  - h. System board (see [System board on page 68](#))

Remove the audio board:

1. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the audio board to the computer.
2. Release the audio board **(2)** by sliding it back to disengage the audio connectors from the openings in the base enclosure.

3. Remove the audio board **(3)** by lifting it straight up.



Reverse this procedure to install the audio board.

## ExpressCard assembly

Description	Spare part number
ExpressCard assembly	431439-001

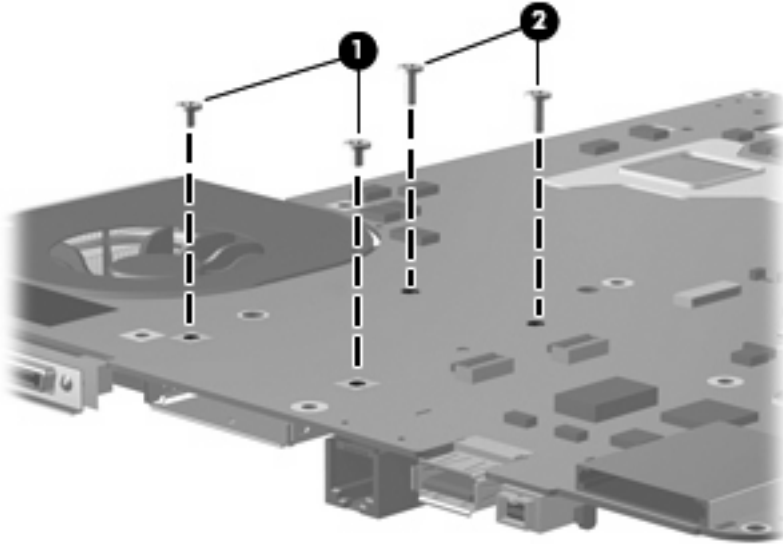
Before removing the ExpressCard assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))

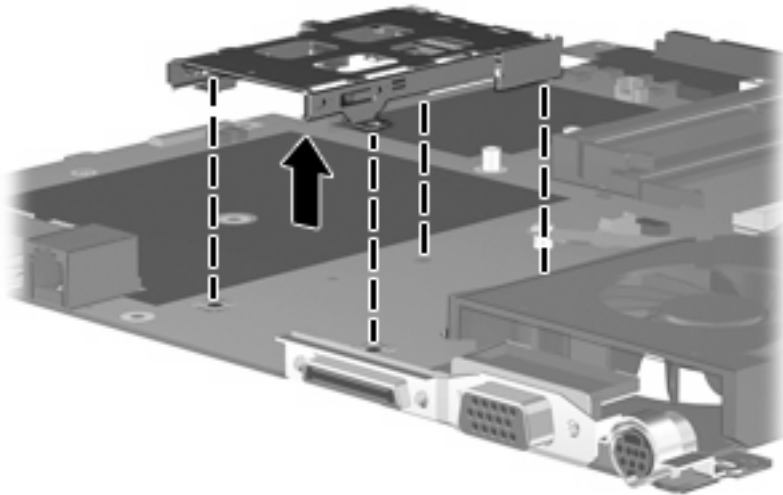


Remove the ExpressCard assembly:

1. Position the system board with the RJ-45 jack toward you.
2. Remove the two Phillips PM2.0×4.0 screws **(1)** and the two Phillips PM2.0×7.0 screws **(2)** that secure the ExpressCard assembly to the system board.




3. Turn the system board upside down with the RJ-45 jack toward you.
4. Remove the ExpressCard assembly from the system board.



Reverse this procedure to install the ExpressCard assembly.

## Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes replacement thermal material)	446521-001
<b>Processor brackets</b>	
For use only with computer models equipped with T7250, T5550, T5450, and T5250 processors	450371-001
For use only with computer models equipped with T7700 and T7500 processors	450370-001

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


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

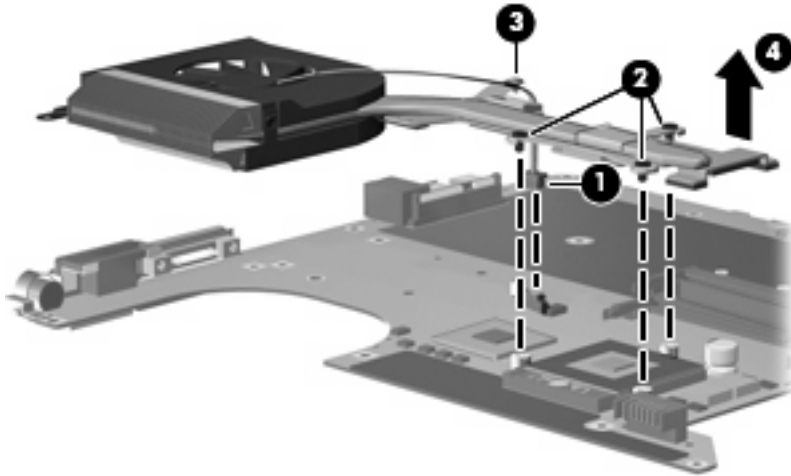
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))
  - h. Audio board (see [Audio board on page 71](#))
  - i. USB/power connector board (see [USB/power connector board on page 67](#))
  - j. System board (see [System board on page 68](#))


Remove the fan/heat sink assembly:

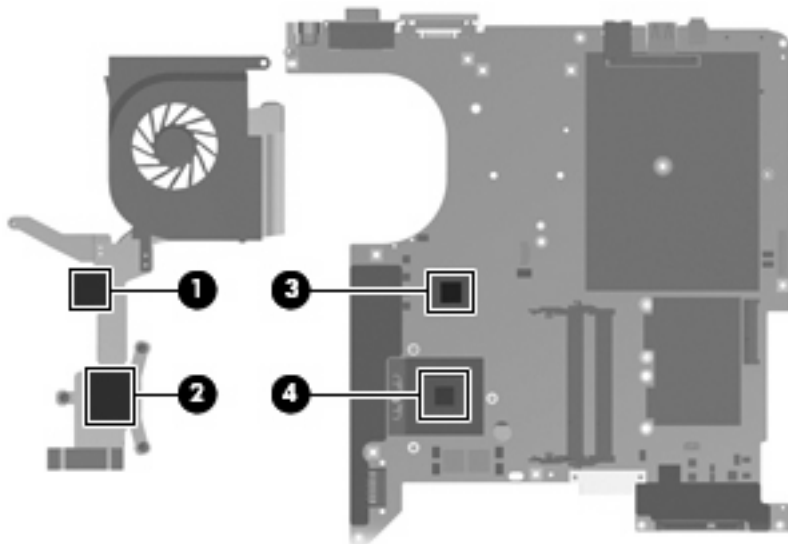
1. Turn the system board upside down with the expansion port 3 and external monitor port toward you.
2. Disconnect the fan cable **(1)** from the system board.

3. Loosen the three Phillips PM2.5×5.0 screws **(2)** and the Phillips PM2.5×4.0 screw **(3)** that secure the fan/heat sink assembly to the system board.
4. Remove the fan/heat sink assembly **(4)**.

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

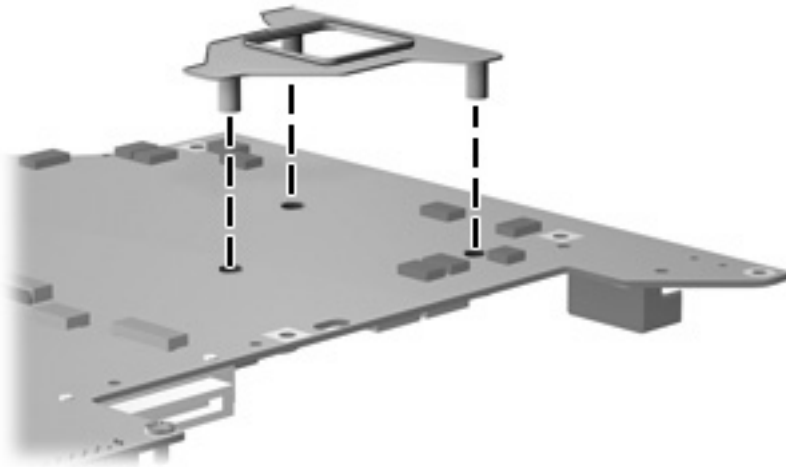


 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly **(1)** and **(2)**, the Northbridge chip **(3)**, and the processor **(4)** each time the fan/heat sink assembly is removed. Thermal material must be installed on all surfaces before the fan/heat sink assembly is reinstalled. Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



5. If it is necessary to replace the processor bracket, turn the system board upside down, with the expansion port 3 and external monitor port toward you.

6. Remove the processor bracket from the system board.



7. Align the threaded posts on the processor bracket with the screw holes in the system board and install the bracket.

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

## Processor



**NOTE:** All processor and processor bracket spare part kits include replacement thermal material.

Description	Spare part number
Intel Core 2 Duo T7700 2.40-GHz processor (4-MB L2 cache, 800-MHz FSB)	458801-001
Intel Core 2 Duo T7500 2.20-GHz processor (4-MB L2 cache, 800-MHz FSB)	458796-001
Intel Core 2 Duo T7250 2.00-GHz processor (2-MB L2 cache, 800-MHz FSB)	458797-001
Intel Core 2 Duo T5550 1.83-GHz processor (2-MB L2 cache, 667-MHz FSB)	458798-001
Intel Core 2 Duo T5450 1.67-GHz processor (2-MB L2 cache, 667-MHz FSB)	458799-001
Intel Core 2 Duo T5250 1.50-GHz processor (2-MB L2 cache, 667-MHz FSB)	458800-001


Before removing the processor, follow these steps:

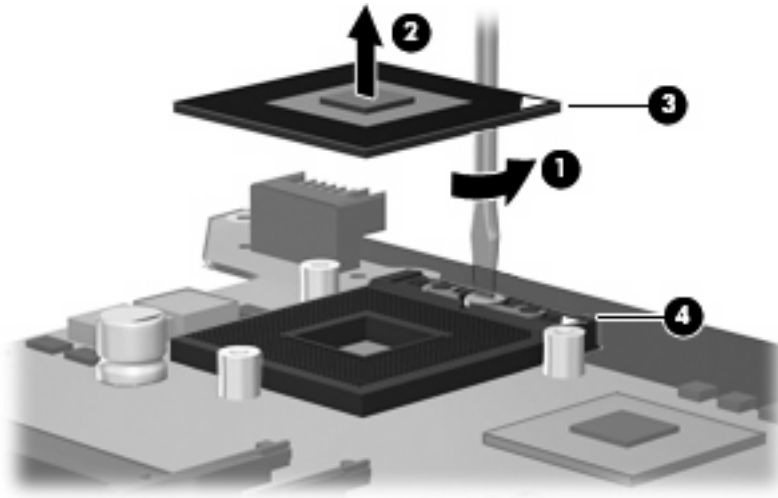
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
  - a. Hard drives (see [Hard drives on page 41](#))
  - b. Optical drive (see [Optical drive on page 47](#))
  - c. Switch cover (see [Switch cover on page 49](#))
  - d. Keyboard (see [Keyboard on page 53](#))
  - e. Speaker assembly (see [Speaker assembly on page 51](#))
  - f. Display assembly (see [Display assembly on page 55](#))
  - g. Top cover (see [Top cover on page 61](#))
  - h. Audio board (see [Audio board on page 71](#))
  - i. USB/power connector board (see [USB/power connector board on page 67](#))
  - j. System board (see [System board on page 68](#))
  - k. Fan/heat sink assembly (see [Fan/heat sink assembly on page 74](#))

Remove the processor:

1. 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 must be aligned with the triangle icon **(4)** embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

---

# 5 Setup Utility

## 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.

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## Using advanced Setup Utility features

This chapter 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"><li>• View and change the system time and date.</li><li>• View identification information about the computer.</li><li>• View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).</li></ul>

## 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	<p>Set the following boot options:</p> <ul style="list-style-type: none"><li>• <b>f10</b> and <b>f12</b> Delay (sec.)—Set the delay for the <b>f10</b> and <b>f12</b> functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20).</li><li>• CD-ROM boot—Enable/disable boot from CD-ROM.</li><li>• Floppy boot—Enable/disable boot from Floppy.</li><li>• Internal Network Adapter boot—Enable/disable boot from Internal Network Adapter.</li><li>• Boot Order—Set the boot order for:<ul style="list-style-type: none"><li>◦ USB Floppy</li><li>◦ ATAPI CD/DVD ROM Drive</li><li>◦ Hard drive</li><li>◦ USB Diskette on Key</li><li>◦ USB Hard drive</li><li>◦ Network adapter</li></ul></li></ul>
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	<p>Run a comprehensive self-test on the hard drive.</p> <p><b>NOTE:</b> On models equipped with two hard drives, this menu option is called the <b>Primary Hard Disk Self Test</b>.</p>
Secondary Hard Disk Self Test (select models only)	Run a comprehensive self-test on a secondary hard drive.

## 6 Specifications

### Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Height (front to back)	4.09 cm	1.61 in
Width	35.71 cm	14.06 in
Depth	25.71 cm	10.12 in
<b>Weight</b> (with optical drive, hard drive, and battery)	2.86 kg	6.31 lbs
<b>Input power</b>		
Operating voltage	18.5 V dc — 19.0 V dc	
Operating current	3.5 A or 4.74 A	
<b>Temperature</b>		
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
<b>Relative humidity</b>		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (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
<b>Shock</b>		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
<b>Random vibration</b>		
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	
<b>NOTE:</b> 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	150 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-65° horizontal, +/-50° vertical (typical)	

# Hard drive specifications

	160-GB*	80-GB*
<b>Dimensions</b>		
Height	9.5 mm	9.5 mm
Width	70 mm	70 mm
Weight	102 g	102 g
<b>Interface type</b>	SATA	SATA
<b>Transfer rate</b>		
Synchronous (maximum)	100 MB/sec	100 MB/sec
Security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)		
Single track	3 ms	3 ms
Average	13 ms	13 ms
Maximum	24 ms	24 ms
<b>Logical blocks</b>	312,588,800	156,294,400
<b>Disk rotational speed</b>	5400 rpm	5400 rpm
<b>Operating temperature</b>	5°C to 55°C (41°F to 131°F)	
<b>NOTE:</b> Certain restrictions and exclusions apply. Consult technical support for details.		
* 1 GB = 1 billion bytes when referring to hard drive storage capacity. Accessible capacity is less. Actual drive specifications may differ slightly.		

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

<b>Applicable disc</b>	<b>Read:</b> 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	<b>Write:</b> CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
<b>Center hole diameter</b>	1.5 cm (0.59 in)	
<b>Disc diameter</b>		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
<b>Disc thickness</b>	1.2 mm (0.047 in)	
<b>Track pitch</b>	0.74 $\mu$ m	
<b>Access time</b>	<b>CD</b>	<b>DVD</b>
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
<b>Audio output level</b>	Audio-out, 0.7 Vrms	
<b>Cache buffer</b>	2 MB	
<b>Data transfer rate</b>		
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	
<b>Transfer mode</b>	Multiword DMA Mode	
<b>Startup time</b>	< 15 seconds	
<b>Stop time</b>	< 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
IRQ3	Intel 82801DB/DBM USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—Link Audio Intel 82801DB/DBM SMBus Controller—24C3 Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	Intel USB UHCI controller—24C2 Intel 82852/82855 GM/GME Graphic Controller Realtek RTL8139 Family PCI Fast Ethernet Controller
IRQ11	Intel USB EHCI controller—24CD Intel USB UHCI controller—24C4 Intel USB UHCI controller—24C7 Intel Pro/Wireless 2200BG TI OHCI 1394 host controller TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel
*Default configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.	
<b>NOTE:</b> 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

<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
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

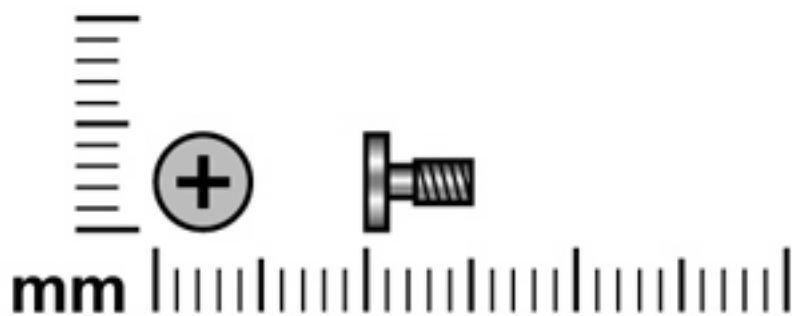
Size	Memory address	System function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58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

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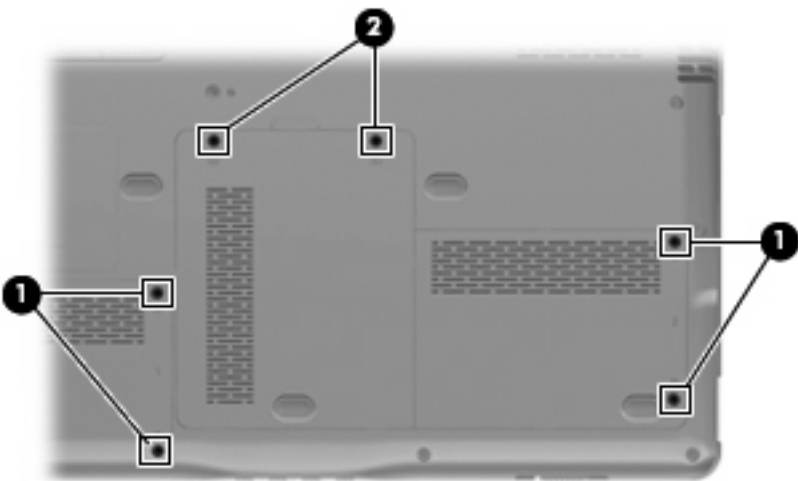
## 7 Screw listing

This section provides specification and reference information for the screws and standoffs used in the computer. All screws and standoffs listed in this section are available in the Screw Kit, spare part number 434747-001, and the Display Screw Kit, spare part number 431399-001.

# Phillips PM2.5×5.0 captive screw

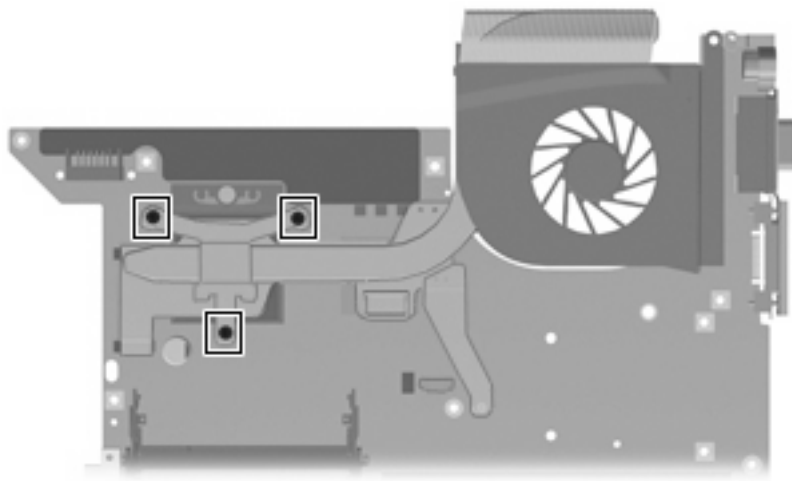


Color	Quantity	Length	Thread	Head diameter
Black	9	5.0 mm	2.5 mm	5.0 mm



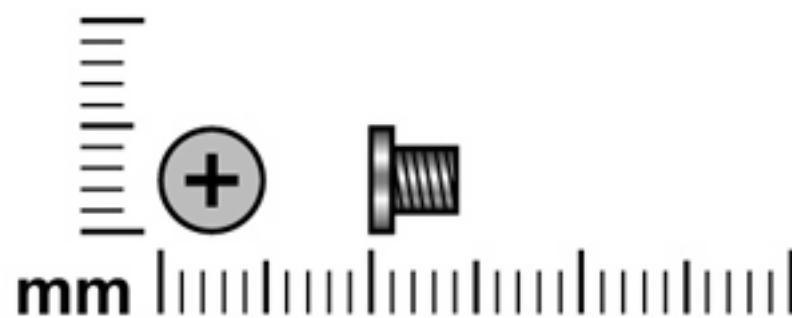
**Where used:**

- (1)** Four captive screws (secured by C-clips) that secure the hard drive covers to the computer
- (2)** Two captive screws (secured by C-clips) that secure the memory/WLAN module compartment cover to the computer

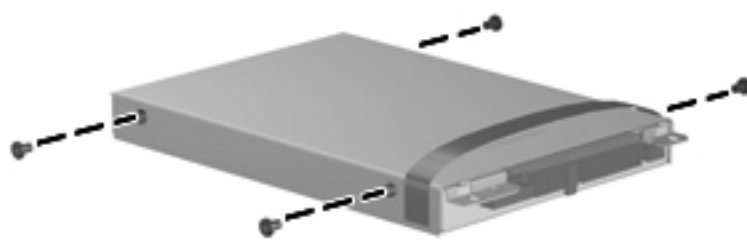


**Where used:** 3 captive screws (secured by C-clips) that secure the fan/heat sink assembly to the system board

# Phillips PM3.0×4.0 screw

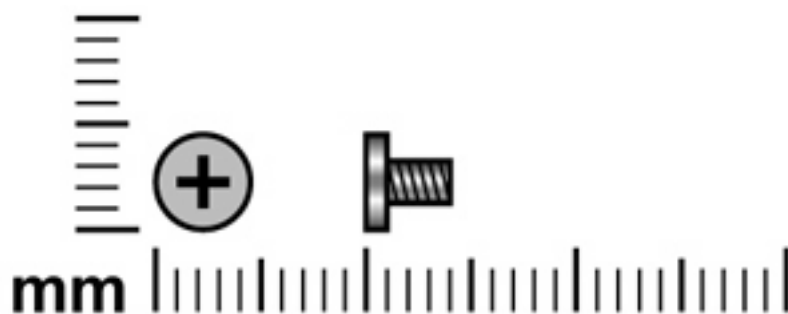


Color	Quantity	Length	Thread	Head diameter
Silver	8	4.0 mm	3.0 mm	5.0 mm

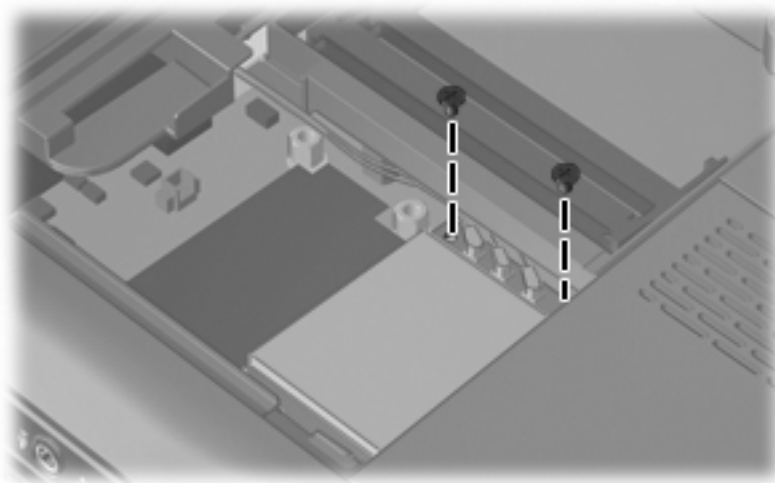


**Where used:** 4 screws that secure the hard drive bracket to each hard drive

## Phillips PM2.0×4.0 screw

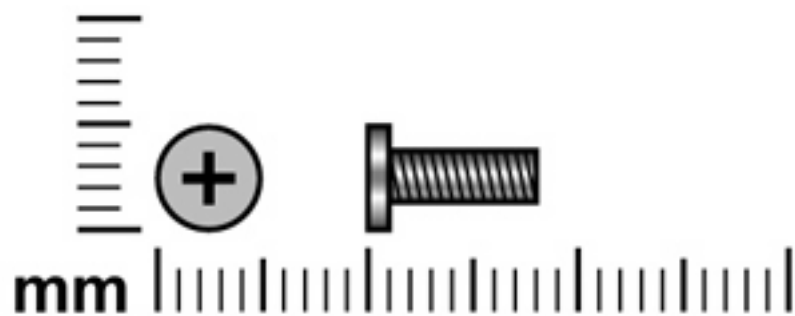


Color	Quantity	Length	Thread	Head diameter
Black	2	4.0 mm	2.0 mm	4.5 mm

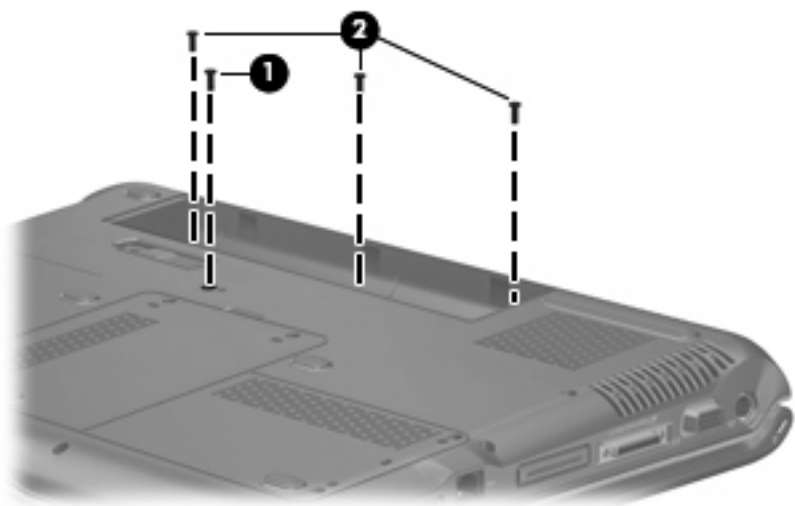


**Where used:** 2 screws that secure the WLAN module to the system board

# Phillips PM2.5×8.0 screw



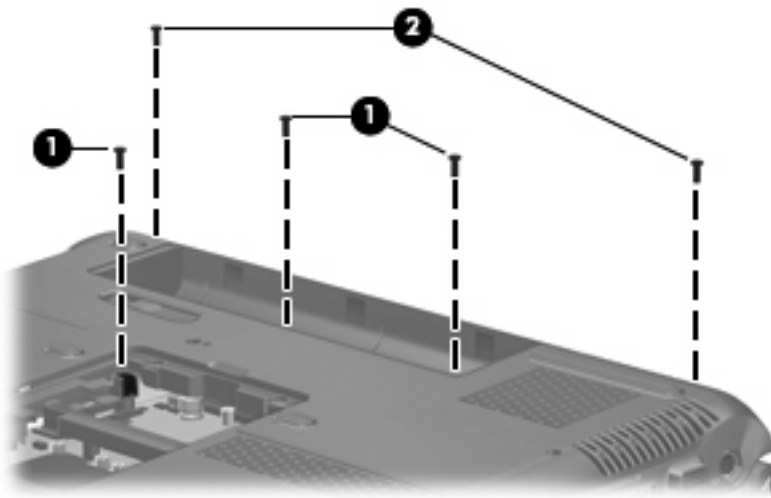
Color	Quantity	Length	Thread	Head diameter
Black	21	8.0 mm	2.5 mm	5.0 mm



**Where used:**

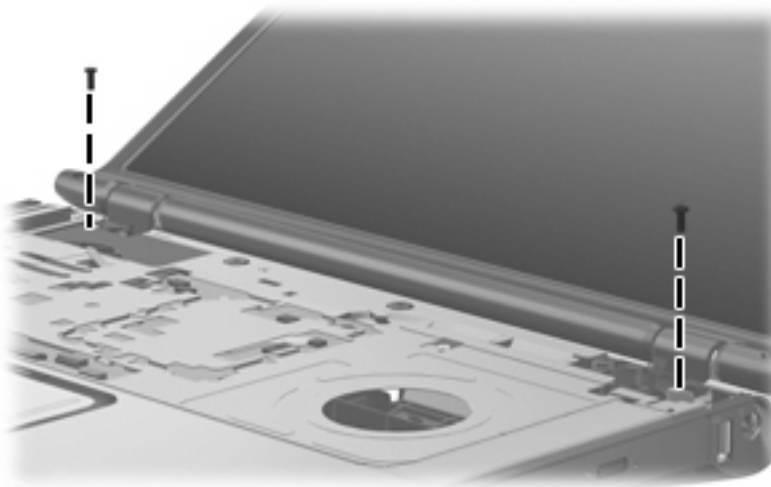
- (1) One screw that secures the optical drive to the computer
- (2) Three screws that secure the switch cover to the computer



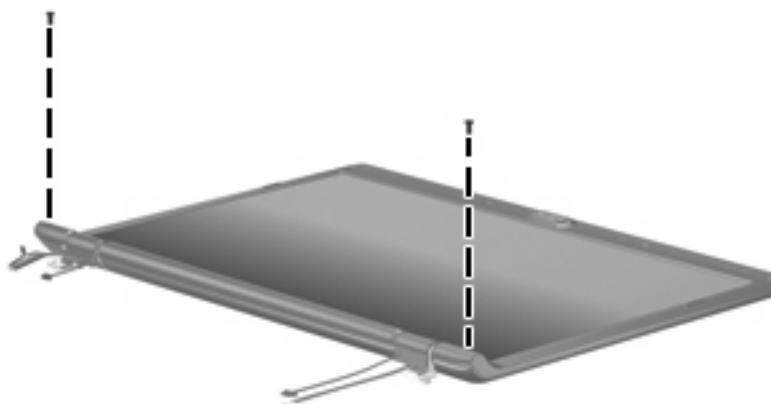


**Where used:**

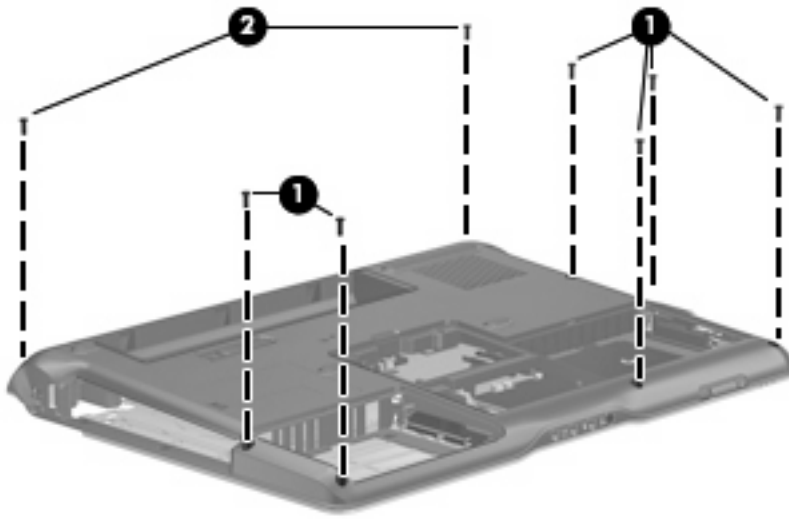
- (1) Three screws that secure the keyboard to the computer
- (2) Two screws that secure the display assembly to the computer



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



**Where used:** 2 screws that secure the display bezel to the display enclosure

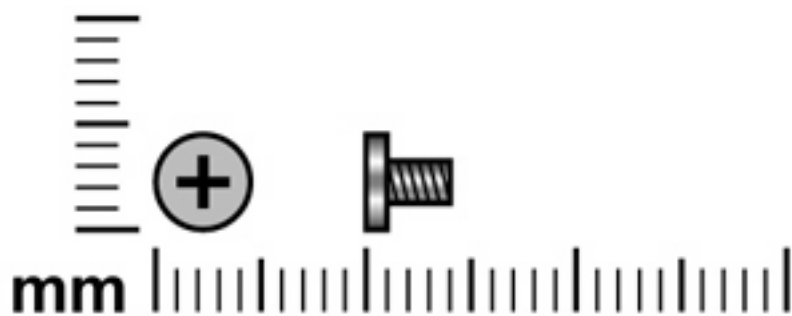


**Where used:**

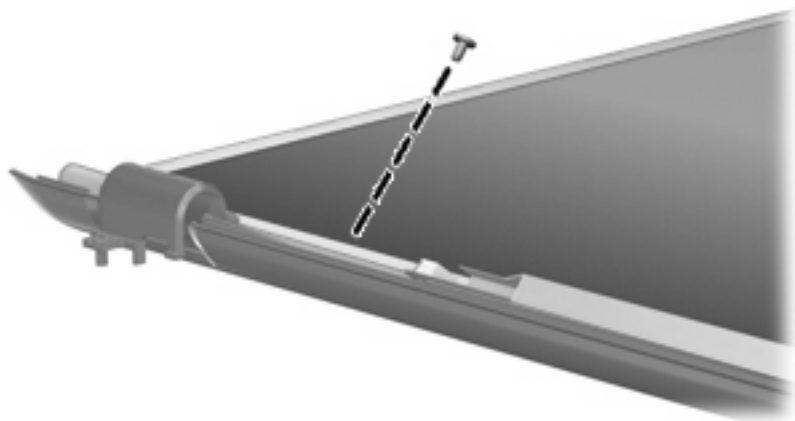
**(1)** Six screws that secure the top cover to the base enclosure

**(2)** Two screws that secure the top cover trim to the base enclosure

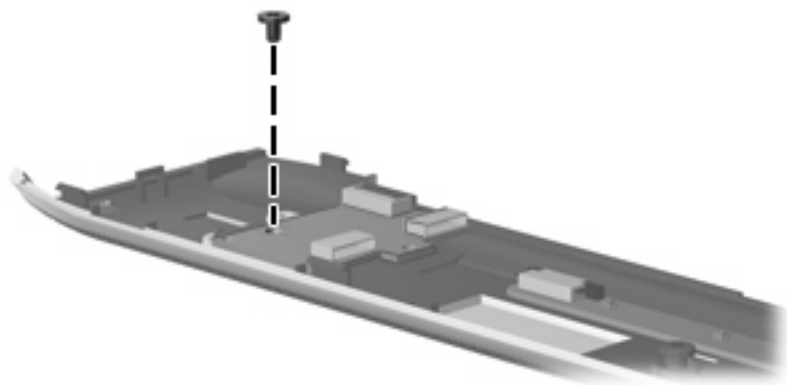
# Phillips PM2.0×4.0 screw



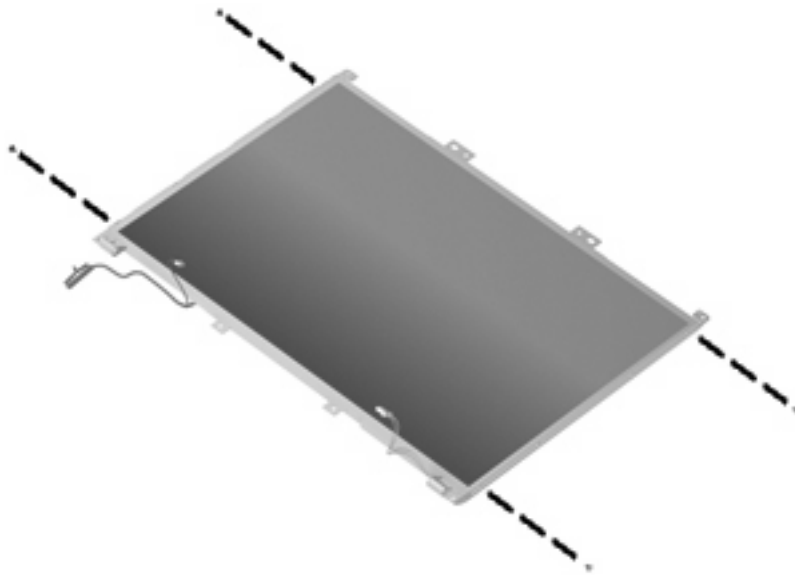
Color	Quantity	Length	Thread	Head diameter
Silver	12	4.0 mm	2.0 mm	4.0 mm



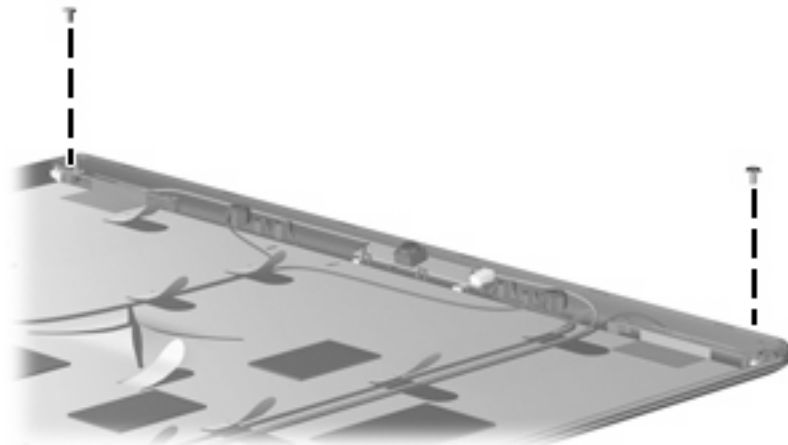
**Where used:** One screw that secures the display inverter to the display enclosure



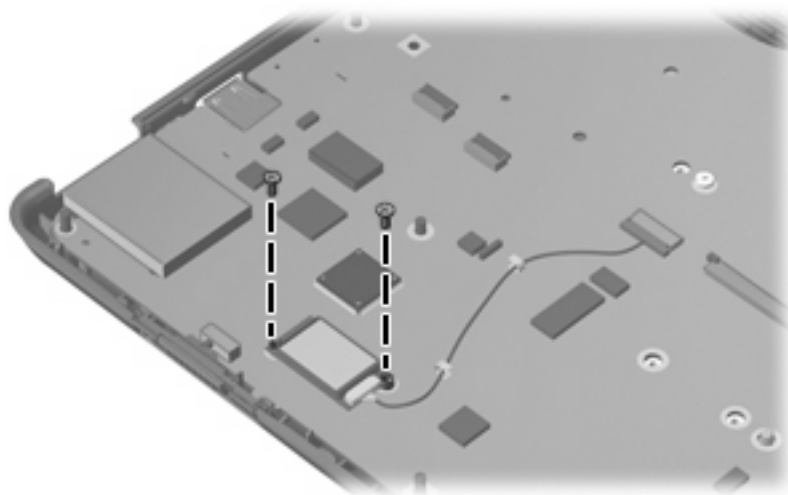
**Where used:** One screw that secures the power button board to the switch cover



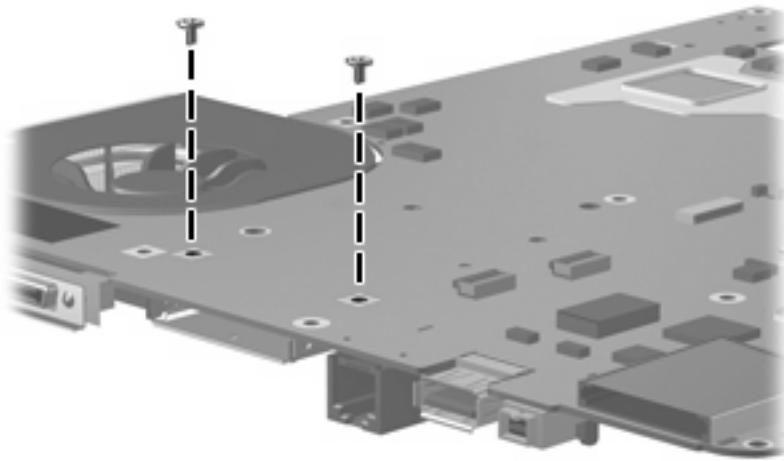
**Where used:** 4 screws that secure the display hinges to the display panel



**Where used:** 2 screws that secure the wireless antenna transceivers to the display enclosure

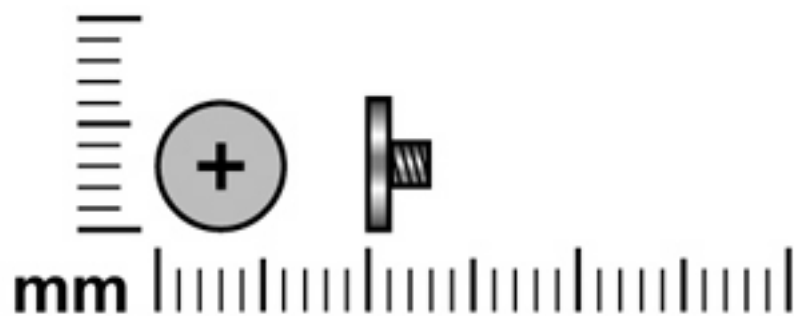


**Where used:** 2 screws that secure the Bluetooth module to the system board

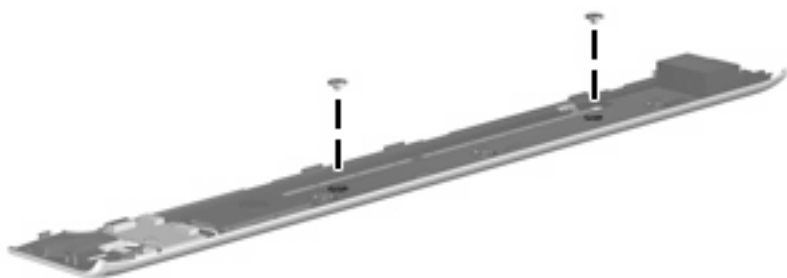


**Where used:** 2 screws that secure the ExpressCard assembly to the system board

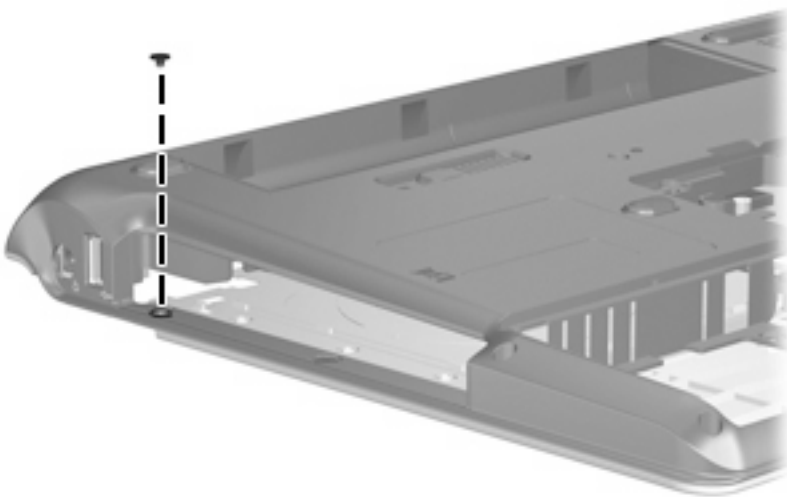
# Phillips PM2.0×3.0 broad-head screw



Color	Quantity	Length	Thread	Head diameter
Silver	3	3.0 mm	2.0 mm	7.0 mm

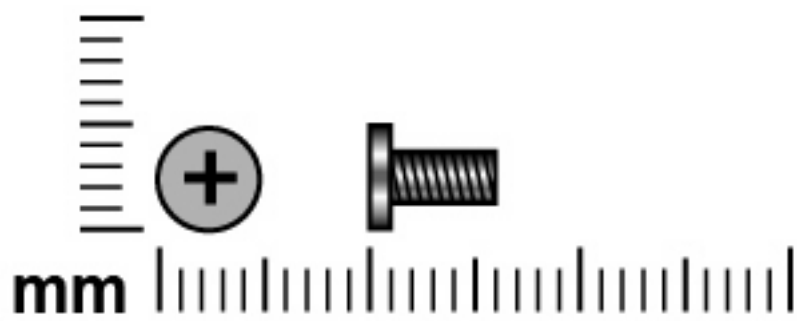


**Where used:** 2 screws that secure the speaker assembly to the computer

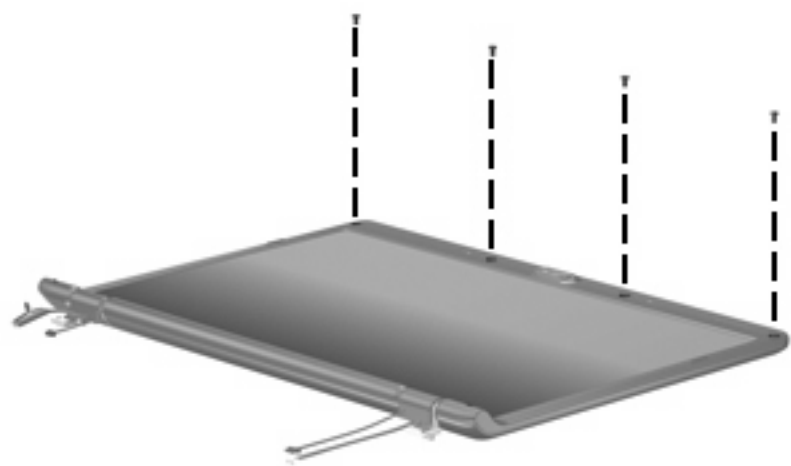


**Where used:** One screw that secures the top cover to the computer

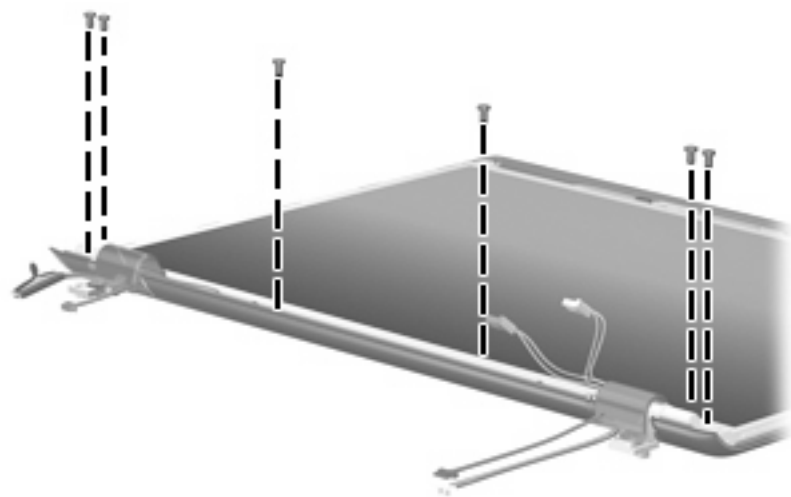
# Phillips PM2.5×6.0 screw



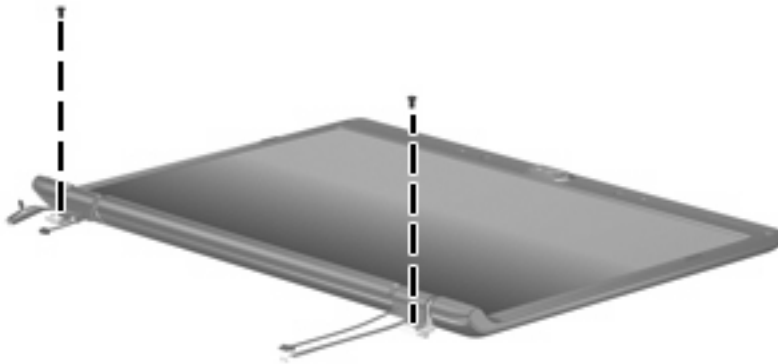
Color	Quantity	Length	Thread	Head diameter
Black	16	6.0 mm	2.5 mm	5.0 mm



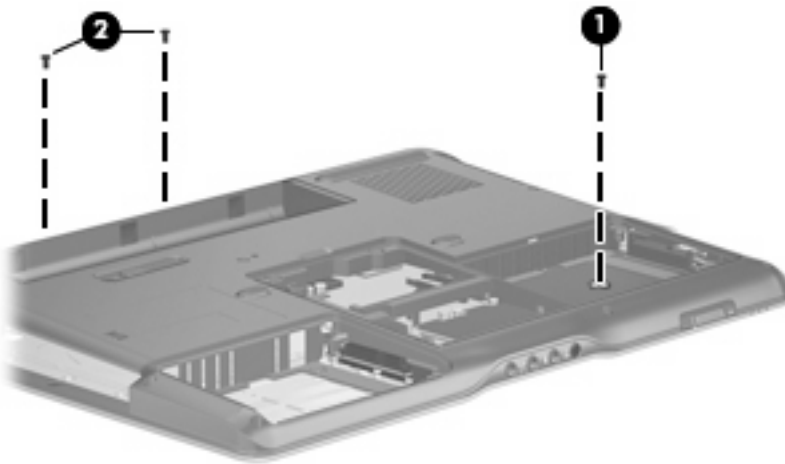
**Where used:** 4 screws that secure the display bezel to the display enclosure



**Where used:** 6 screws that secure the display panel to the display enclosure



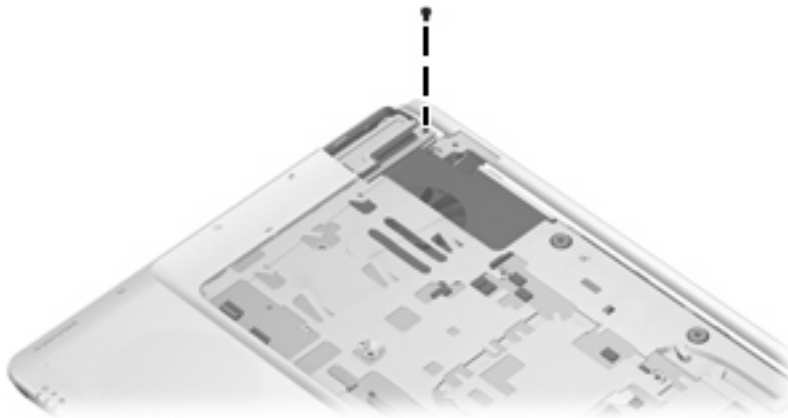
**Where used:** 2 screws that secure the display hinge covers to the display hinges



**Where used:**

(1) One screw that secures the top cover to the base enclosure

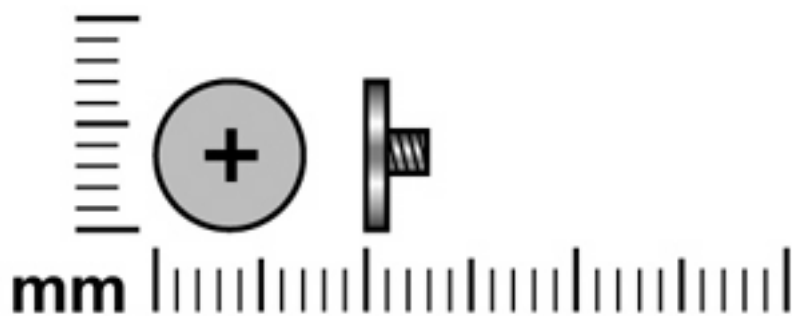
(2) Two screws that secure the top cover trim to the base enclosure



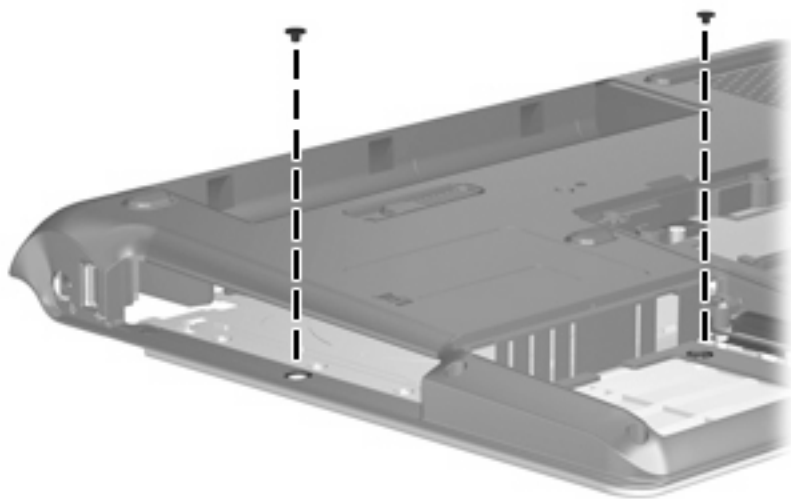
**Where used:** One screw that secures the top cover trim to the base enclosure



# Phillips PM2.5×3.0 broad-head screw

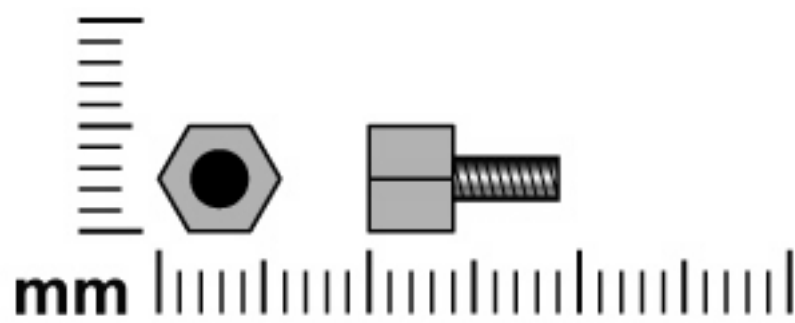


Color	Quantity	Length	Thread	Head diameter
Black	2	3.0 mm	2.5 mm	7.0 mm

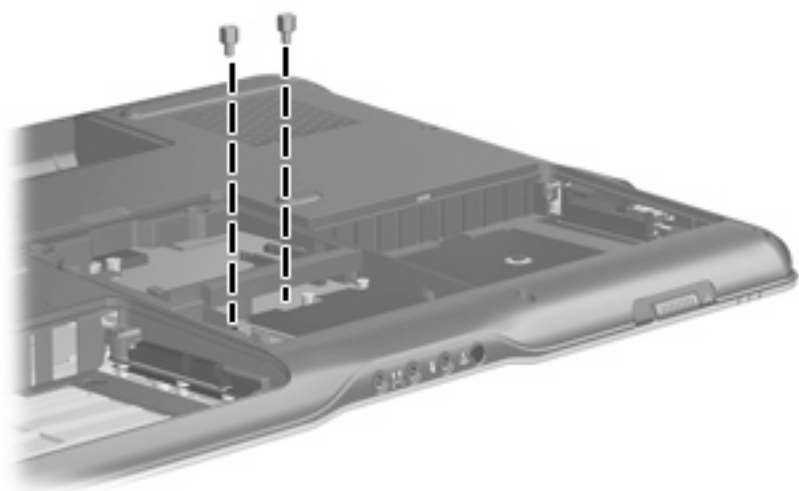


**Where used:** 2 screws that secure the top cover to the base enclosure

# Hex HM5.0x9.0 standoff

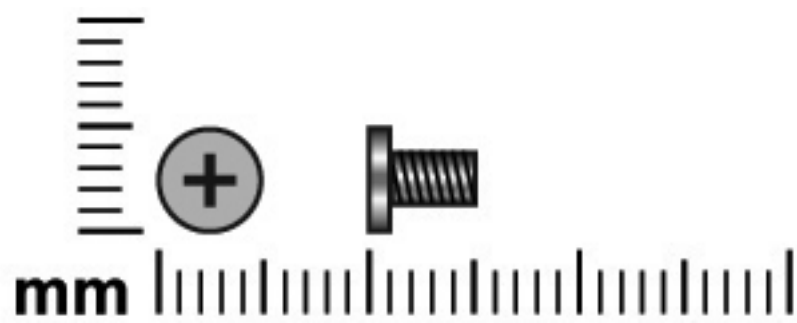


Color	Quantity	Length	Thread	Head diameter
Silver	2	9.0 mm	2.5 mm	5.0 mm

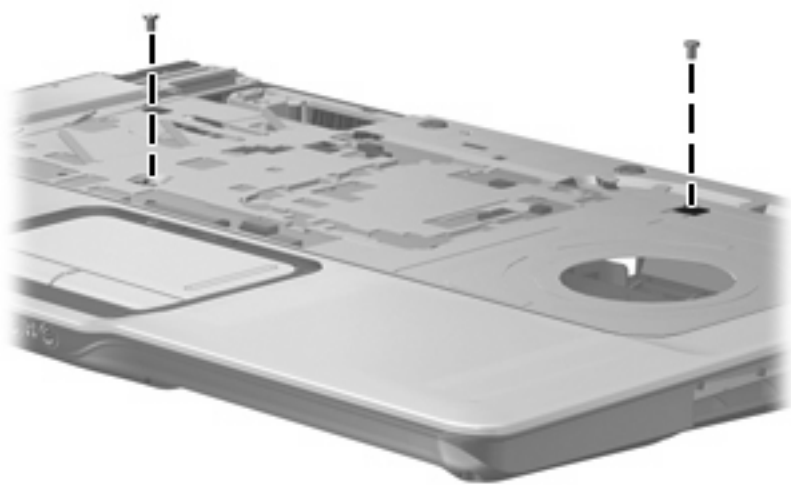


**Where used:** 2 standoffs that secure the top cover to the base enclosure

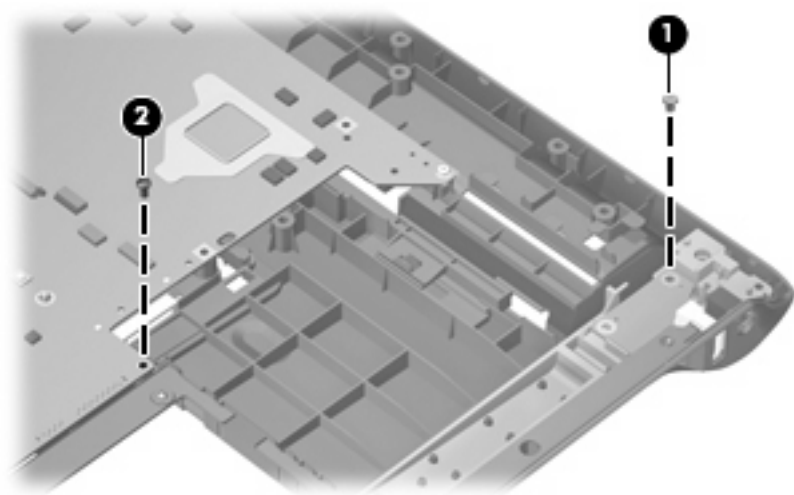
# Phillips PM2.5×5.0 screw



Color	Quantity	Length	Thread	Head diameter
Silver	6	5.0 mm	2.5 mm	5.0 mm

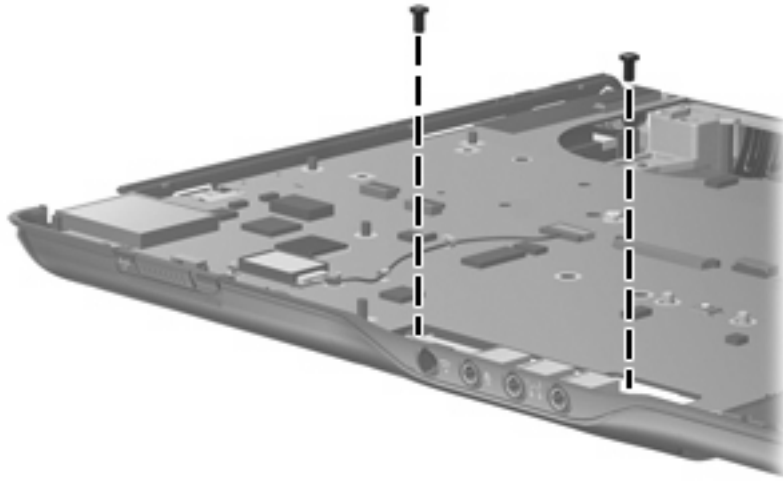


**Where used:** 2 screws that secure the top cover to the base enclosure



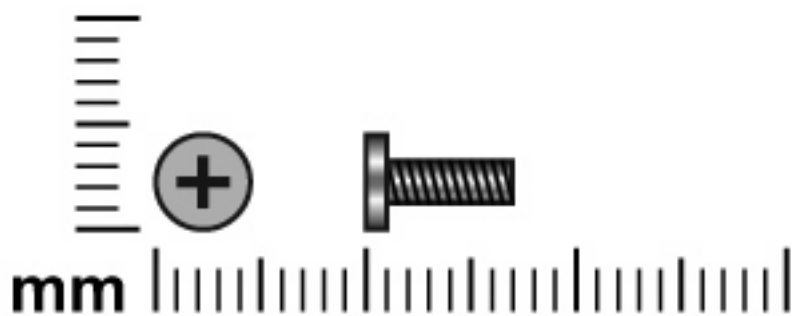
**Where used:**

- (1) One screw that secures the USB/power connector board to the base enclosure
- (2) One screw that secures the system board to the base enclosure

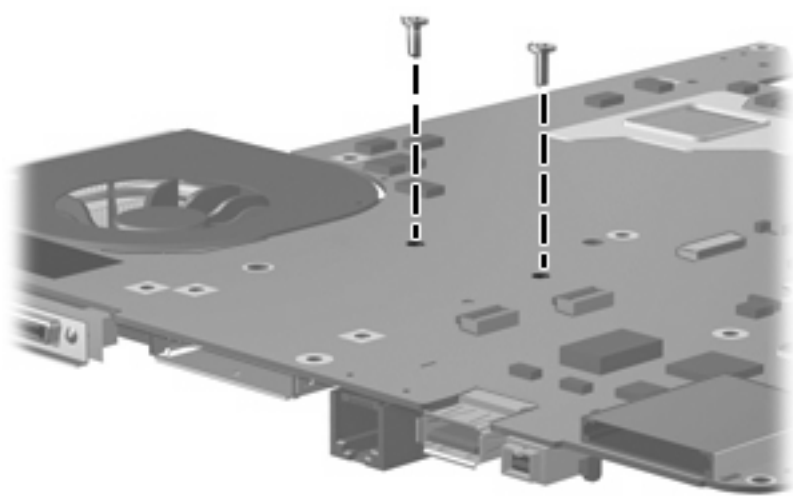


**Where used:** 2 screws that secure the audio board to the base enclosure

# Phillips 2.0×7.0 screw

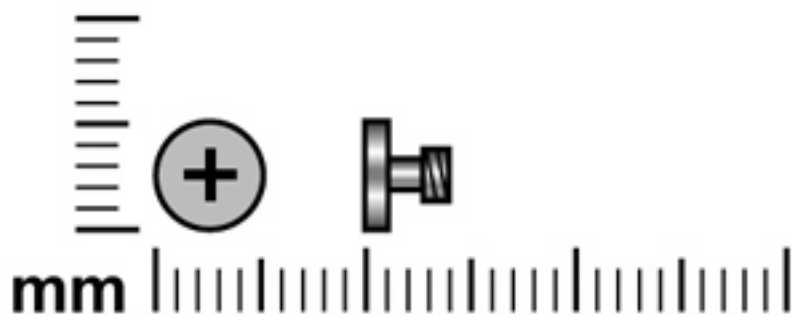


Color	Quantity	Length	Thread	Head diameter
Silver	2	7.0 mm	2.0 mm	5.0 mm

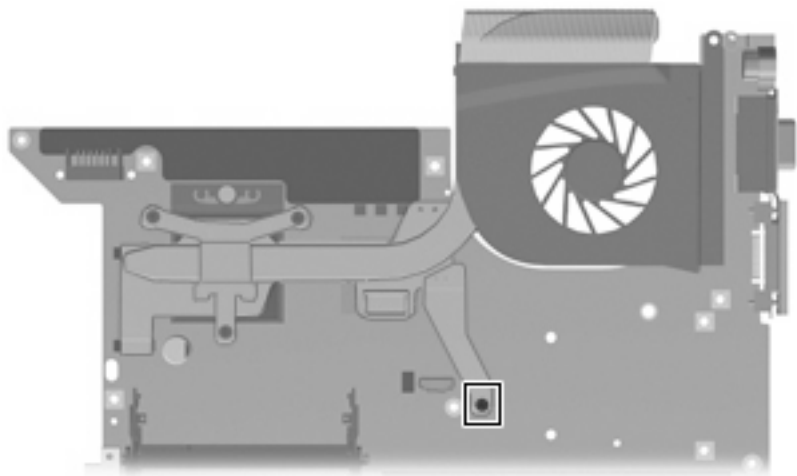


**Where used:** 2 screws that secure the ExpressCard assembly to the system board

# Phillips PM2.5×4.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Silver	1	4.0 mm	2.5 mm	5.0 mm



**Where used:** One captive screw (secured by a C-clip) that secures the fan/heat sink assembly to the system board

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# 8 Backup and recovery

## Recovering system information

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

- 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

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


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

The System Restore window opens.

5. Follow the on-screen instructions.


## 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 discs (purchased separately).

 **NOTE:** Formatted DVD±RW discs and DVD±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**.  
Recovery Manager opens.
- 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.

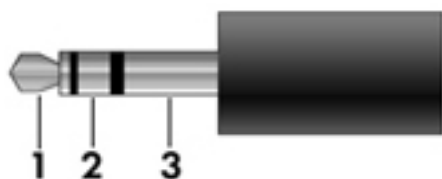
To access update links for the operating system and other software provided on your computer:

- ▲ 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.

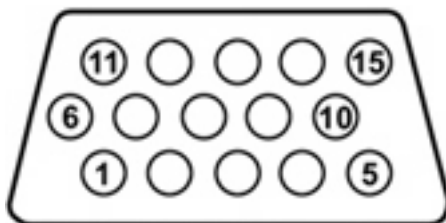
## 9 Connector pin assignments

### Audio-in (microphone)



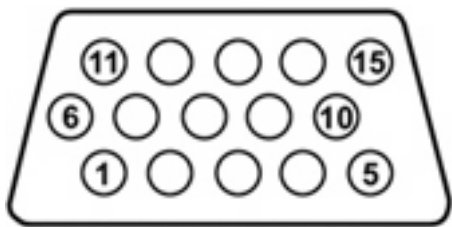
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

### Audio-out (headphone)



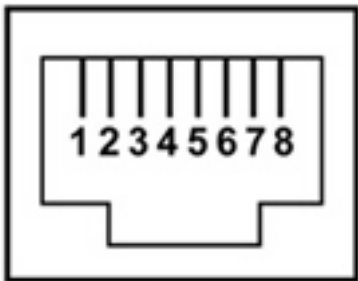
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

# External monitor



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

# RJ-45 (network)



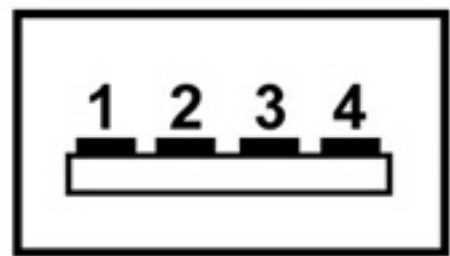
Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

# S-Video-out



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

# Universal Serial Bus



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



---

# 10 Power cord set requirements

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

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

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

## Requirements for all countries or regions

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

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

## Requirements for specific countries or regions

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
South 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-mm<sup>2</sup> 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-mm<sup>2</sup> 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-mm<sup>2</sup> 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-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

# 11 Recycling

## Battery

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

## Display

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

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

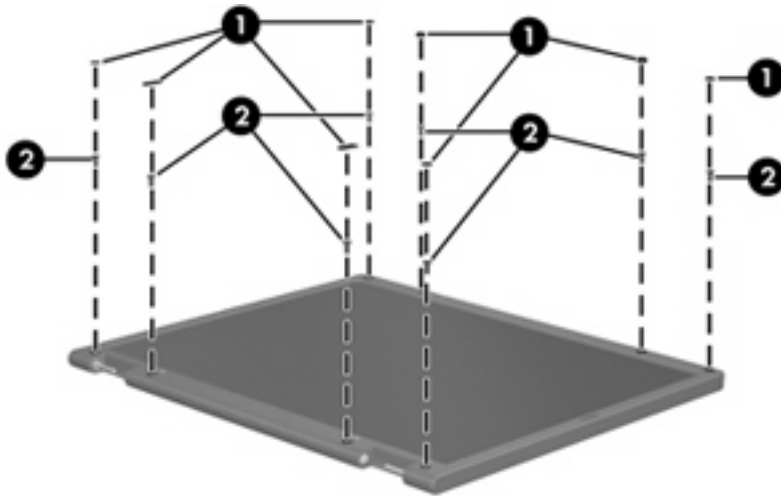
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



📋 **NOTE:** The procedures provided in this 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:

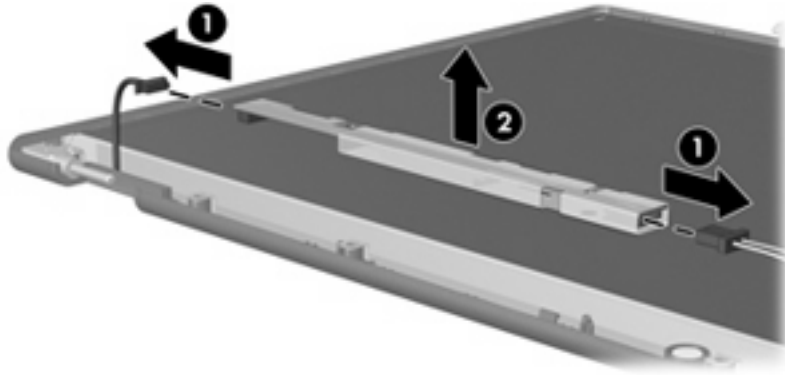
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



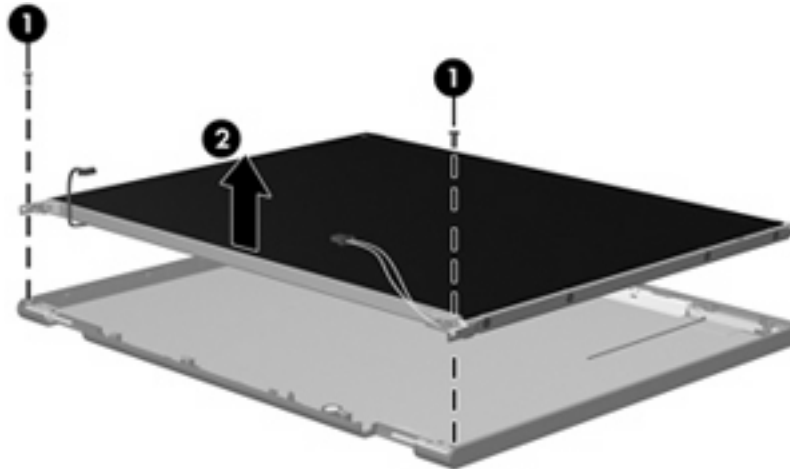
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



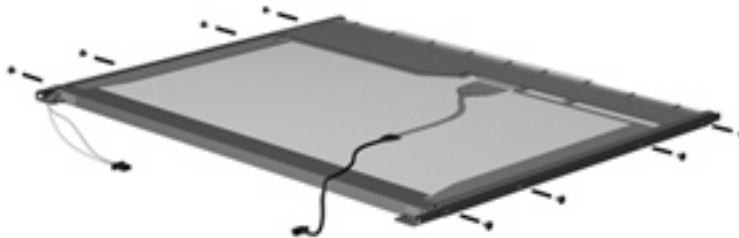
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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.

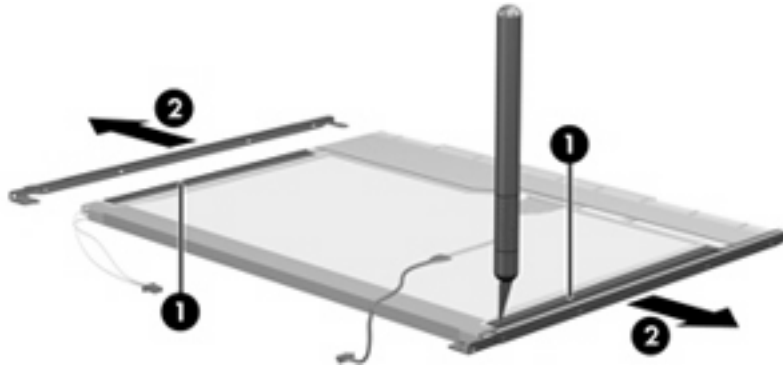


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



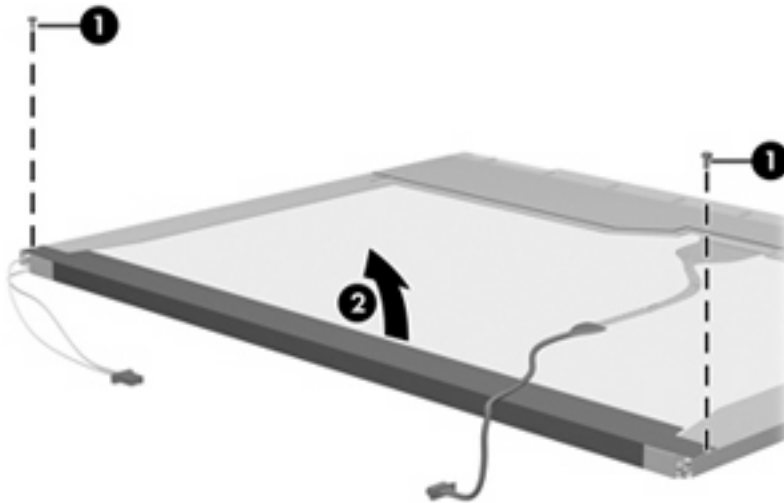
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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.

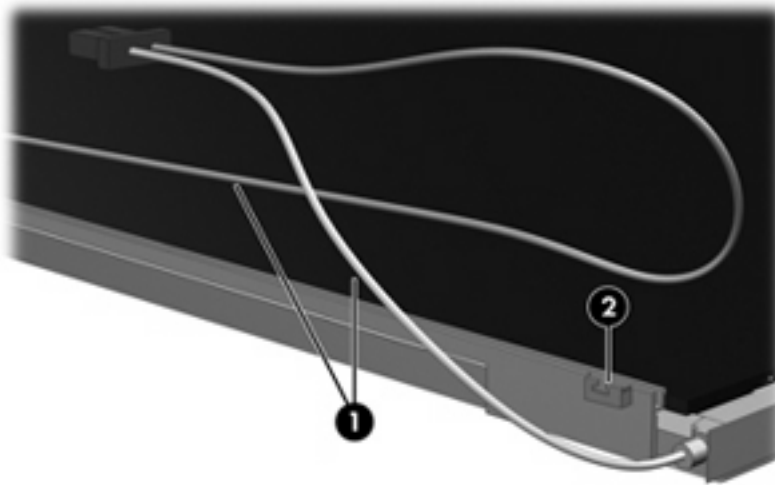
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



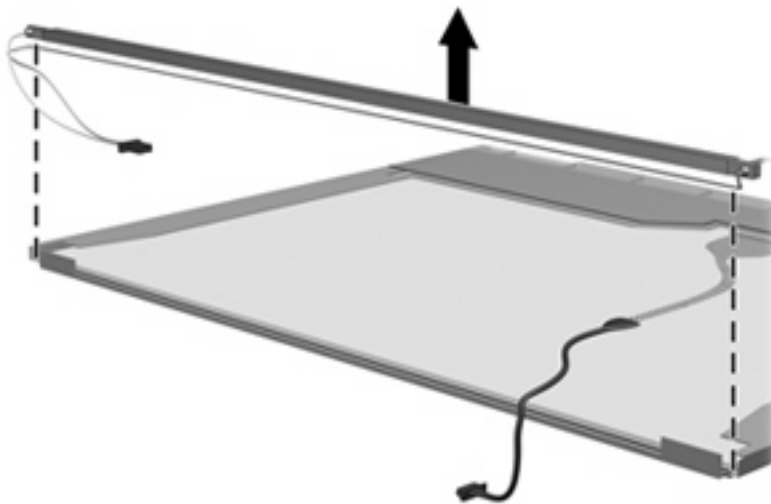
13. Remove the backlight cover.

14. Turn the display panel right-side up.

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

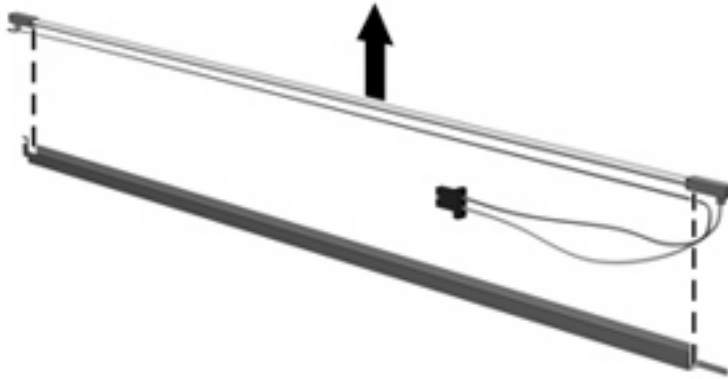


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

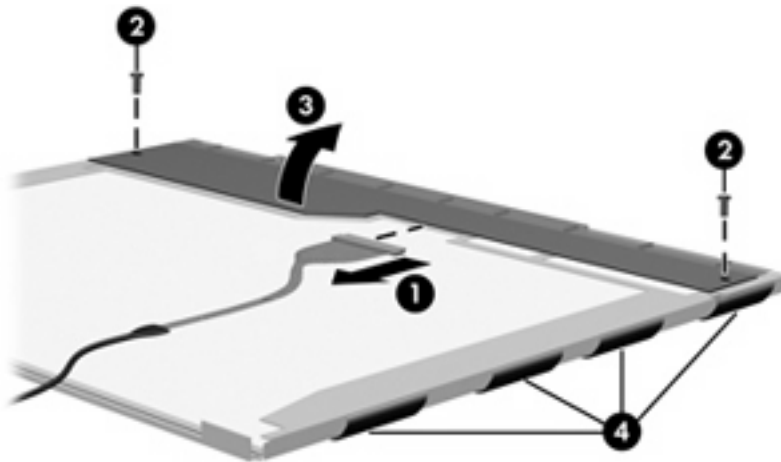


**⚠ WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

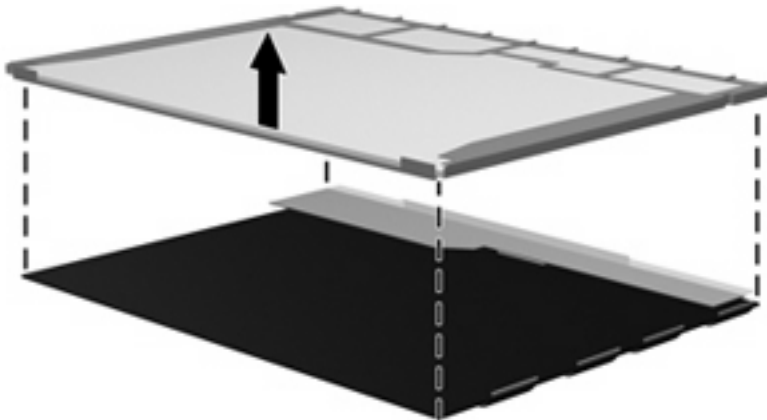
18. Remove the backlight from the backlight frame.



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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.



---

# Index

## Symbols/Numerics

1394 port, location 12

## A

AC adapter, spare part  
number 24, 26

administrator password 82

advanced Setup Utility  
features 81

antenna

locations 4

removal 58

spare part numbers 20, 25,  
26, 59

applications key, Windows 9

audio board

removal 71

spare part number 18, 26,  
71

audio board cable, illustrated 22

audio, product description 2

audio-in jack

location 11

pin assignments 117

audio-out jack

location 11

pin assignments 117

## B

backpack, spare part  
number 24, 25

backup 111

base enclosure, spare part  
number 18, 27

battery

removal 36

spare part numbers 19, 26,  
36

battery bay 15

battery light 6, 11

battery release latch 15

bezel

illustrated 20

spare part numbers 20, 57

Bluetooth module

removal 65

spare part number 18, 25,  
65

Bluetooth module cable,

illustrated 22

boot options 82

boot order 82

bottom components 15

button sound 82

buttons

DVD 7

media 7

next/fast forward 8

play/pause 8

power 7

previous/rewind 8

stop 8

volume mute 8

## C

Cable Kit

contents 22

spare part number 19, 22,  
26

cables, service considerations 29

camera

location 5

product description 2

camera cable

removal 59

spare part number 60

camera light 5

camera module

illustrated 20

removal 37

spare part number 20, 26,  
37

caps lock light 6

carrying bag, spare part  
number 24, 25

carrying case, spare part  
number 24, 25

changing the Setup Utility  
language 79

chipset, product description 1

closing the Setup Utility 81

CMOS clearing 33

components

bottom 15

display 4

front 11

keyboard 9

left-side 12

lights 6

rear 14

right-side 13

top 6

TouchPad 10

composite video cable, spare part  
number 24, 25

computer feet

locations 35

spare part number 19, 35

computer specifications 83

connector pin assignments

audio-in 117

audio-out 117

external monitor 118

headphone 117

microphone 117

monitor 118

network 119

RJ-45 119

- S-Video-out 120
- Universal Serial Bus (USB) 120
- connectors, service considerations 29

## D

- Diagnostics menu 82
- Digital Media Slot 12
- Digital Media Slot light 12
- diskette drive
  - precautions 29
  - product description 2
- display assembly
  - removal 55
  - spare part numbers 17, 26, 55
- display bezel
  - illustrated 20
  - release 37, 39
  - spare part numbers 20, 25, 26, 57
- Display Cable Kit, spare part number 20, 25
- display components
  - illustrated 20
  - recycling 123
  - spare part numbers 20
- display enclosure
  - illustrated 20
  - spare part number 20, 26
- display hinge
  - removal 58
  - spare part number 58
- display hinge cover
  - removal 58
  - spare part number 58
- Display Hinge Cover Kit, spare part number 25
- Display Hinge Kit, spare part number 20, 25
- display inverter
  - illustrated 20
  - removal 39, 40
  - spare part number 20, 25, 39
- display panel
  - illustrated 20
  - product description 1

- removal 58
- spare part number 20, 26, 58
- Display Screw Kit, spare part number 20, 25
- display specifications 84
- display switch 4
- docking support, product description 3
- drive light 6, 11
- drivers, reinstalling 114
- drives
  - boot order 82
  - preventing damage 29
- DVB-T antenna adapter, spare part number 24, 25
- DVB-T tuner, spare part number 24, 25
- DVD button 7
- DVD±RW and CD-RW Combo Drive
  - precautions 29
  - removal 47
  - spare part numbers 19, 23, 27, 47
  - specifications 86

## E

- electrostatic discharge 30
- enhanced SATA support 82
- esc key 9
- Ethernet, product description 2
- expansion port 3 12
- ExpressCard assembly
  - removal 72
  - spare part number 18, 25, 72
- ExpressCard Kit, spare part number 24
- ExpressCard slot 12
- ExpressCard slot bezel
  - illustrated 21
  - removal 69
- external media cards, product description 2
- external monitor port
  - location 12
  - pin assignments 118

## F

- fan/heat sink assembly
  - removal 74
  - spare part number 18, 26, 74
- feet
  - locations 35
  - spare part number 19, 35
- fingerprint reader 79
- fn key 9
- front components 11
- function keys 9

## G

- graphics, product description 1
- grounding equipment and methods 32

## H

- hard drive
  - precautions 29
  - product description 1
  - removal 41
  - spare part numbers 19, 23, 41
  - specifications 85
- hard drive bay 15
- hard drive cover
  - illustrated 21
  - removal 41
- hard drive self test 82
- headphone jack
  - location 11
  - pin assignments 117
- headset, spare part number 24, 25
- hinge
  - removal 58
  - spare part number 20, 25, 58
- hinge cover
  - removal 58
  - spare part number 20, 58

## I

- I/O address specifications 89
- infrared emitter, spare part number 24, 25
- infrared lens 11
- interrupt specifications 88

inverter  
  illustrated 20  
  removal 39, 40  
  spare part number 20, 25, 39

## J

jacks  
  audio-in 11  
  audio-out 11  
  headphone 11  
  microphone 11  
  network 12  
  RJ-45 12  
  S-Video-out jack 12

## K

keyboard  
  components 9  
  product description 3  
  removal 53  
  spare part numbers 18, 26, 53  
keypad keys 9  
keys  
  embedded numeric keypad 9  
  esc 9  
  fn 9  
  function 9  
  Windows applications 9  
  Windows logo 9

## L

language support 79, 82  
LED board cable, illustrated 22  
left-side components 12  
light components 6  
lights  
  battery 6, 11  
  caps lock 6  
  drive 6, 11  
  num lock 6  
  optical drive 13  
  power 6, 11  
  volume down 6  
  volume mute 6  
  volume up 6  
  wireless 11

## M

main menu 81

mass storage devices, spare part numbers 23  
media button 7  
memory map specifications 91  
memory module  
  product description 1  
  removal 43  
  spare part numbers 19, 26, 43  
memory/WLAN module  
  compartment 15  
memory/WLAN module  
  compartment cover  
    illustrated 21  
    removal 43  
microphone  
  location 4  
  product description 2  
  removal 59  
  spare part number 20, 25, 59  
microphone jack  
  location 11  
  pin assignments 117  
model name 1  
modem module, product description 2  
monitor port  
  location 12  
  pin assignments 118  
mouse, spare part numbers 24, 25

## N

navigating in the Setup Utility 80  
network jack  
  location 12  
  pin assignments 119  
next/fast forward button 8  
num lock light 6

## O

operating system, product description 3  
optical drive  
  location 13  
  precautions 29  
  product description 2  
  removal 47

  spare part numbers 19, 23, 47  
  specifications 86  
optical drive light 13

## P

packing guidelines 31  
password clearing 33  
passwords 82  
plastic parts 28  
Plastics Kit  
  contents 21  
  spare part number 18, 21, 25  
play/pause button 8  
pointing device  
  components 10  
  product description 3  
ports  
  1394 12  
  external monitor port 12  
  monitor port 12  
  product description 2  
  Universal Serial Bus (USB) 12, 13  
power button 7  
power button board  
  removal 52  
  spare part number 18, 25, 52  
power button board cable, illustrated 22  
power connector 13  
power cord  
  set requirements 121  
  spare part number 24, 25  
power light 6, 11  
power requirements, product description 3  
power-on password 82  
previous/rewind button 8  
processor  
  product description 1  
  removal 77  
  spare part numbers 18, 26, 77  
processor bracket  
  spare part numbers 18, 26  
processor bracket, spare part numbers 74

- product description
  - audio 2
  - camera 2
  - chipset 1
  - diskette drive 2
  - display panel 1
  - docking support 3
  - Ethernet 2
  - external media cards 2
  - graphics 1
  - hard drives 1
  - keyboard 3
  - memory module 1
  - microphone 2
  - modem module 2
  - operating system 3
  - optical drives 2
  - pointing devices 3
  - ports 2
  - power requirements 3
  - processors 1
  - product name 1
  - security 3
  - serviceability 3
  - wireless 2
- product name 1

## R

- rear component 14
- recovery discs 113
- recovery partition, deleting 116
- recovery, system 115
- remote control, spare part numbers 24, 25, 26
- removal/replacement
  - preliminaries 28
  - procedures 34
- restore points 112
- RF input adapter cable, spare part number 24, 25
- right-side components 13
- RJ-45 jack
  - location 12
  - pin assignments 119
- RTC battery
  - removal 45
  - spare part number 19, 26, 45
- Rubber Kit, spare part number 19, 25, 35

## S

- S-Video-out jack
  - location 12
  - pin assignments 120
- Screw Kit
  - contents 92
  - spare part number 24, 25
- screw listing 92
- secondary hard drive self test 82
- security cable slot 12
- Security menu 82
- security, product description 3
- selecting in the Setup Utility 80
- serial number 16, 34
- service considerations 28
- serviceability, product description 3
- Setup Utility
  - changing the language 79
  - Diagnostics menu 82
  - displaying system information 80
  - Main menu 81
  - navigating 80
  - overview 79
  - Security menu 82
  - selecting 80
  - starting 79
  - System Configuration menu 82
  - using advanced features 81
- software
  - reinstalling 114
  - updating 116
- speaker assembly
  - removal 51
  - spare part number 18, 25, 51
- speakers 7
- specifications
  - computer 83
  - display 84
  - DVD±RW and CD-RW Combo Drive 86
  - hard drive 85
  - I/O addresses 89
  - interrupts 88
  - memory map 91
  - optical drive 86
  - system DMA 87
- static-shielding materials 32

- stop button 8
- switch cover
  - removal 49
  - spare part number 18, 26, 49
- system board
  - removal 68
  - spare part number 18, 27, 68
- System Configuration menu 82
- system DMA 87
- system information 80, 81
- system memory map 91

## T

- thermal material, replacement 75
- tools required 28
- top components 6
- top cover
  - removal 61
  - spare part number 18, 26, 61
- top cover trim
  - removal 63
  - spare part number 18, 25, 63
- TouchPad 10
- TouchPad buttons 10
- TouchPad light 10
- TouchPad on/off button 10
- TouchPad scroll zone 10
- transporting guidelines 31
- TV tuner antenna, spare part number 24, 26
- TV tuner, spare part number 24, 25

## U

- Universal Serial Bus (USB) port
  - locations 12, 13
  - pin assignments 120
- unknown password 33
- USB digital drive, spare part number 24, 25
- USB/power connector board
  - removal 67
  - spare part number 19, 26, 67
- USB/power connector board cable, illustrated 22

## V

- vents 14, 15
- video memory 82
- volume down light 6
- volume mute button 8
- volume mute light 6
- volume scroll zone 8
- volume up light 6

## W

- Windows applications key 9
- Windows logo key 9
- wireless antenna
  - locations 4
  - removal 58
  - spare part numbers 20, 25, 26, 59
- Wireless Antenna Kit, spare part numbers 20, 25, 26, 59
- wireless light 11
- wireless switch 11
- wireless, product description 2
- WLAN module
  - removal 46
  - spare part numbers 19, 26, 46
- workstation guidelines 31

