

# HP Pavilion dv7 Entertainment PC

## Maintenance and Service Guide



© Copyright 2009 Hewlett-Packard  
Development Company, L.P.

Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel and Core are trademarks of Intel Corporation in the U.S. and other countries. Microsoft, Windows, and Windows Vista are U.S. registered trademarks of Microsoft Corporation. SD Logo is a trademark of its proprietor.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: March 2009

Document Part Number: 515798-001

## Safety warning notice

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



---

# Table of contents

## 1 Product description

## 2 Components

Top components .....	6
TouchPad .....	6
Lights .....	7
Buttons and fingerprint reader (select models only) .....	9
Keys .....	11
Front components .....	12
Rear component .....	13
Right-side components .....	13
Left-side components .....	14
Bottom components .....	15
Display components .....	16

## 3 Illustrated parts catalog

Service tag .....	17
Computer major components .....	18
Display assembly components .....	24
Flush glass display assembly spare parts .....	24
BrightView panel .....	25
Mass storage devices .....	26
Miscellaneous parts .....	27
Sequential part number listing .....	28

## 4 Removal and replacement procedures

Preliminary replacement requirements .....	36
Tools required .....	36
Service considerations .....	36
Plastic parts .....	36
Cables and connectors .....	37
Drive handling .....	37
Grounding guidelines .....	38

Electrostatic discharge damage .....	38
Packaging and transporting guidelines .....	39
Workstation guidelines .....	39
Equipment guidelines .....	40
Component replacement procedures .....	41
Service tag .....	41
Computer feet .....	42
Battery .....	43
Optical drive .....	44
Primary hard drive cover .....	45
Secondary hard drive cover .....	46
Hard drive .....	48
WLAN module .....	50
RTC battery .....	53
Memory module .....	54
TV tuner module .....	55
Switch cover and keyboard .....	57
Power button board .....	61
Speaker assembly .....	62
Bluetooth module .....	63
Display assembly .....	64
Top cover .....	74
Modem module .....	77
System board .....	79
Audio/infrared board .....	82
USB board .....	83
Subwoofer .....	84
TV tuner module cable .....	86
Modem module cable .....	87
Power connector cable .....	88
Fan/heat sink assembly .....	89
Processor .....	93

## 5 Setup Utility

Starting the Setup Utility .....	95
Using the Setup Utility .....	96
Changing the language of the Setup Utility .....	96
Display system information .....	96
Restoring default settings in the Setup Utility .....	97
Exiting the Setup Utility .....	97
Setup Utility menus .....	98
Main menu .....	98
Security menu .....	98

System Configuration menu .....	98
Diagnostics menu .....	99

## 6 Specifications

Computer specifications .....	100
17.3-inch, HD+ flush glass AntiGlare display specifications .....	101
17.3-inch HD+ BrightView display specifications .....	102
Hard drive specifications .....	103
Blu-ray ROM DVD±R/RW SuperMulti DL Drive .....	104
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive specifications .....	105
System DMA specifications .....	105
System interrupt specifications .....	107
System I/O address specifications .....	108
System memory map specifications .....	110

## 7 Screw listing

Phillips PM2.5×3.0 screw (black) .....	111
Phillips PM2.5×3.0 screw (silver) .....	112
Phillips PM2.5×7.0 screw .....	114
Phillips PM2.5×6.0 captive screw .....	117
Phillips PM2.0×4.0 screw (black) .....	119
Phillips PM2.0×4.0 screw (silver) .....	122
Phillips PM2.5×4.0 screw (silver) .....	124
Phillips PM2.5×4.0 screw (black) .....	125
Phillips PM2.5×4.0 broadhead screw .....	126
Phillips PM2.5×5.0 screw .....	127
Phillips PM2.5×5.0 broadhead screw .....	129
Phillips PM2.5×6.5 screw .....	130
Phillips PM2.5×14.0 captive screw .....	131

## 8 Backup and Recovery

Recovering system information .....	133
Creating recovery discs .....	134
Backing up your information .....	135
When to back up .....	135
Backup suggestions .....	135
Using system restore points .....	135
When to create restore points .....	136
Create a system restore point .....	136
Restore to a previous date and time .....	136
Performing a recovery .....	137
Recovering from the recovery discs .....	137
Recovering from the dedicated recovery partition (select models only) .....	137

## 9 Connector pin assignments

1394 .....	138
Audio-in (microphone) .....	138
Audio-out (headphone) .....	139
External monitor .....	139
HDMI .....	140
RJ-11 (modem) .....	141
RJ-45 (network) .....	141
Universal Serial Bus .....	142

## 10 Power cord set requirements

Requirements for all countries or regions .....	143
Requirements for specific countries or regions .....	144

## 11 Recycling

Battery .....	145
Display .....	145

<b>Index .....</b>	<b>151</b>
--------------------	------------

# 1 Product description

Category	Description
<b>Product Name</b>	HP Pavilion dv7 Entertainment PC
<b>Processors</b>	Intel® Core™2 Quad Q9100 2.26-GHz with 12-MB L2 cache and 1066-MHz front side bus (FSB)
	Intel Core2 Quad Q9000 2.00-GHz with 12-MB L2 cache and 1066-MHz FSB
	Intel Core2 Duo T9800 2.93-GHz with 6-MB L2 cache and 1066-MHz FSB
	Intel Core2 Duo T9550 2.66-GHz with 6-MB L2 cache and 1066-MHz FSB
	Intel Core2 Duo P8700 2.53-GHz with 3-MB L2 cache and 1066-MHz FSB
	Intel Core2 Duo P8600 2.40-GHz with 3-MB L2 cache and 1066-MHz FSB
	Intel Core2 Duo P7450 2.13-GHz with 3-MB L2 cache and 1066-MHz FSB
	Intel Core2 Duo T6600 2.20-GHz with 2-MB L2 cache and 800-MHz FSB
	Intel Core2 Duo T6400 2.00-GHz with 2-MB L2 cache and 800-MHz FSB
	Intel Pentium® Dual Core T4200 2.00-GHz with 1-MB L2 cache and 800-MHz FSB
<b>Chipset</b>	Northbridge: Intel PM45 (Discrete models)
	Northbridge: Intel GM45 (UMA models)
	Southbridge: Intel ICH9M
<b>Graphics</b>	Intel Extreme Graphics with unified memory architecture (UMA), ATI Discrete PCI Express Graphics with discrete graphics subsystem memory
	Intel GMA 4700MHD (UMA) with shared video memory:
	<ul style="list-style-type: none"><li>• Up to 1759 MB of graphics subsystem memory on computer models equipped with 4096 MB of main system memory (64-bit OS)</li><li>• Up to 1294 MB of graphics subsystem memory on computer models equipped with 4096 MB of main system memory (32-bit OS)</li><li>• Up to 1294 MB of graphics subsystem memory on computer models equipped with 3072 MB of main system memory</li><li>• Up to 782 MB of graphics subsystem memory on computer models equipped with 2048 MB of main system memory</li><li>• Up to 270 MB of graphics subsystem memory on computer models equipped with 1024 MB of main system memory</li><li>• Memory size is dynamic change</li></ul>

Category	Description
	Discrete graphics subsystem memory <ul style="list-style-type: none"> <li>ATI Mobility Radeon HD 4650 (M96) with 1024 MB (64 MB × 16 DDR3 × 8 PCs)</li> <li>ATI Mobility Radeon HD 4530 (M92) with 512 MB (64 MB × 16 DDR3 × 4 PCs)</li> </ul>
<b>Panels</b>	<ul style="list-style-type: none"> <li>17.3-inch, HD+ (1600 × 900) flush glass</li> <li>17.3-inch, HD+ (1600 × 900) BrightView</li> <li>Flush glass panel cover support</li> <li>Support for lighted logo on top bezel</li> <li>Typical brightness 200 nits</li> </ul>
<b>Memory</b>	<p>2 SODIMM slots</p> <p>Customer-accessible/upgradable</p> <p>PC2-6400, 800-MHz, DDR2</p> <p>Dual-channel support</p> <p>Supports up to 8192-MB system memory</p> <ul style="list-style-type: none"> <li>8192-MB total system memory (4096 MB × 2, dual-channel)</li> <li>6144-MB total system memory (2048 MB × 1 + 4096 MB × 1)</li> <li>4096-MB total system memory (2048 MB × 2, dual-channel)</li> <li>3072-MB total system memory (2048 MB × 1 + 1024 MB × 1)</li> <li>2048-MB total system memory (1024 MB × 2, dual-channel)</li> <li>2048-MB total system memory (2048 MB × 1)</li> <li>1024-MB total system memory (1024 MB × 1)</li> </ul>
<b>Hard drives</b>	<p>Supports all Serial ATA (SATA) 9.5-mm, 6.35-cm (2.50-inch) hard drives</p> <p>Supports up to 2 hard drives</p> <p>Support for Accelerometer Hard Drive Protection</p> <p>Dual hard drive configurations:</p> <ul style="list-style-type: none"> <li>1-TB (500-GB, 5400-rpm × 2)</li> <li>640-GB (320-GB, 7200-rpm × 2)</li> <li>640-GB (320-GB, 5400-rpm × 2)</li> <li>500-GB (250-GB, 7200-rpm × 2)</li> <li>500-GB (250-GB, 5400-rpm × 2)</li> </ul>

Category	Description
	<p>Single hard drive configurations:</p> <ul style="list-style-type: none"> <li>• 500-GB, 5400-rpm</li> <li>• 320-GB, 7200-rpm</li> <li>• 320-GB, 5400-rpm</li> <li>• 250-GB, 7200-rpm</li> <li>• 250-GB, 5400-rpm</li> </ul>
<b>Optical drives</b>	<p>12.7-mm tray load</p> <p>Serial ATA</p> <p>Fixed (1 screw for removal)</p> <p>Support for the following optical drives:</p> <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> <li>• Blu-ray ROM DVD±R/RW SuperMulti DL Drive</li> </ul>
<b>Webcam</b>	<p>Low-light VGA camera</p> <p>Fixed (no tilt)</p> <p>Activity LED</p> <p>640 × 480 by 24 frames per second</p>
<b>Microphone</b>	<p>2 omnidirectional microphones, dual-array with appropriate software (supports beam forming, echo cancellation, and noise suppression)</p>
<b>Audio</b>	<p>HD Audio (IDT)</p> <p>Integrated subwoofer</p> <p>Supports Microsoft® Premium Requirements</p> <p>Pavilion-branded Altec Lansing speakers</p>
<b>Modem</b>	<p>56K V.92 data/fax modem</p> <p>Supports all worldwide certification requirements</p>
<b>Ethernet</b>	<p>Integrated 10/100/1000 network interface card (NIC) (Discrete models)</p> <p>Integrated 10/100 NIC (UMA models)</p>
<b>Wireless</b>	<p><b>Integrated wireless local area network (WLAN) options by way of wireless module:</b></p> <p>Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module</p> <p>Intel Wi-Fi Link 5100 802.11a/b/g WLAN module</p> <p>Broadcom 4322 802.11a/b/g/n WLAN module</p> <p>Broadcom BCM4312 802.11b/g WLAN module</p>
<b>Wireless</b>	<p>Integrated ATSC/NTSC/QAM hybrid TV tuner module</p> <p>Integrated worldwide analog DVB-T TV tuner module</p>

<b>Category</b>	<b>Description</b>
	Support for TV tuner antennas for both DVB-T and ATSC/NTSC
<b>External media card</b>	One ExpressCard 54 slot
	Digital Media Slot supports Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Memory Stick (MS), Memory Stick Pro (MSP), xD Picture Card (XD)
<b>Ports</b>	Audio-in (stereo microphone)
	Two audio-out (stereo headphone)
	Consumer infrared
	eSATA
	High-Definition Multimedia Interface (HDMI) v1.3 supporting 1080p with HDCP key
	IEEE 1394a
	RJ-11 (modem; select models only)
	RJ-45 (Ethernet, includes link and activity lights)
	TV tuner antenna (select models only)
	USB 2.0
	VGA (Dsub 15-pin)
	2-pin AC power for 90-W AC adapter
<b>Docking</b>	Expansion port 3 supports the HP Notebook Expansion Base and HP Notebook QuickDock
<b>Keyboard/pointing devices</b>	17-inch full-size keyboard with numeric keypad
	TouchPad supports 2-way scrolling
	Taps enabled as default
<b>Power requirements</b>	8-cell 2.55-Ah Li-ion battery
	6-cell 2.20-Ah Li-ion battery
	90-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector) (UMA models)
	65-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector) (Discrete models)
<b>Security</b>	Kensington Security Lock
	Fingerprint reader with Digital Persona software support
<b>Operating system</b>	<b>Preinstalled:</b>
	FreeDOS
	Linux Red Flag
	Windows Vista® Business (32 bit)
	Windows Vista Home Basic (32 bit)
	Windows Vista Premium (32 & 64 bit)
	Windows Vista Ultimate (64 bit)

<b>Category</b>	<b>Description</b>
<b>Serviceability</b>	AC adapter
	Battery (system)
	Hard drives (2)
	Memory module
	Optical drive

## 2 Components

### Top components

#### TouchPad



Component	Description
(1) TouchPad light	<ul style="list-style-type: none"><li>• White: 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 and change pointing device preferences, select **Start > Control Panel > Hardware and Sound > Mouse**.

## Lights



Component	Description
(1) Caps lock light	On: Caps lock is on.
(2) 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>
(3) Volume mute light	<ul style="list-style-type: none"> <li>White: Computer sound is on.</li> <li>Amber: Computer sound is off.</li> </ul>
(4) Volume down light	On: The volume scroll zone is being used to decrease speaker volume.
(5) Volume up light	On: The volume scroll zone is being used to increase speaker volume.
(6) Wireless light	<ul style="list-style-type: none"> <li>On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.</li> <li>Off: All wireless devices are off.</li> </ul>
(7) Num lock light	The integrated numeric keypad is enabled, or num lock is enabled on a connected optional numeric keypad.

Component	Description
(8) 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. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</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>
(9) Drive light	<ul style="list-style-type: none"> <li>• Blinking: The hard drive or optical drive is being accessed.</li> <li>• Amber: HP 3D DriveGuard has temporarily parked the hard drive.</li> </ul>

\*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 fingerprint reader (select models only)

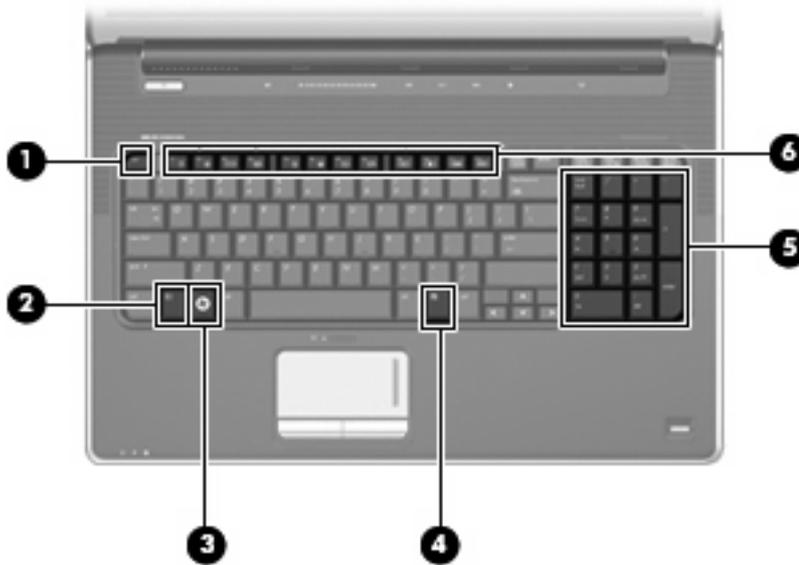


Component	Description
(1) Power button*	<ul style="list-style-type: none"> <li>• When the computer is off, press the button to turn on the computer.</li> <li>• When the computer is on, press the button briefly to initiate Sleep.</li> <li>• When the computer is in the Sleep state, press the button briefly 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 your power settings, select <b>Start &gt; Control Panel &gt; System and Maintenance &gt; Power Options</b>.</p>
(2) Speakers (2)	Produce sound.
(3) Volume mute button	Mutes and restores speaker sound.
(4) 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.
(5) Previous/rewind button	<ul style="list-style-type: none"> <li>• Plays the previous track or chapter when the button is pressed once.</li> <li>• Rewinds media when the button is pressed in combination with the <b>fn</b> key.</li> </ul>
(6) Play/pause button	Plays or pauses media.

Component	Description
(7) Next/fast forward button	<ul style="list-style-type: none"> <li>Plays the next track or chapter when the button is pressed once.</li> <li>Fast forwards media when pressed in combination with the <b>fn</b> key.</li> </ul>
(8) Stop button	Stops playback.
(9) Wireless button	<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>
(10) Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

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

## Keys



Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes frequently used system functions when pressed in combination with a function key or the <code>esc</code> key.
(3) Windows logo key	Displays the Windows Start menu.
(4) Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5) Integrated 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 <code>fn</code> key.

## Front components



Component	Description
(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. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</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	<ul style="list-style-type: none"><li>Blinking: The hard drive or optical drive is being accessed.</li><li>Amber: HP 3D DriveGuard has temporarily parked the hard drive.</li></ul>
(4) Consumer infrared lens	Receives a signal from the remote control.
(5) Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(6) Audio-out (headphone) jacks (2)	Produce sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.

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

## Rear component



Component	Description
Vent	Enables 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.

## Right-side components



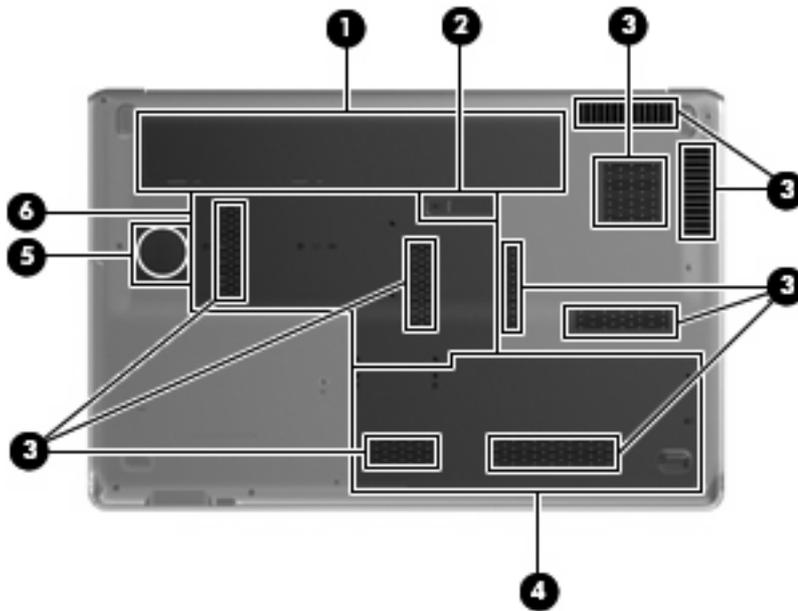
Component	Description
(1) Optical drive	Reads optical discs and, on select models, also writes to optical discs.
(2) Optical drive light	Blinking: The optical drive is being accessed.
(3) USB ports (2)	Connect optional USB devices.
(4) TV antenna/cable jack (select models only)	Connects a TV antenna, a digital cable device, or a satellite device that receives standard or high-definition TV broadcasts.
(5) RJ-11 (modem) jack (select models only)	Connects a modem cable.
(6) 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.
(7) AC adapter light	<ul style="list-style-type: none"><li>On: The computer is connected to external power.</li><li>Off: The computer is not connected to external power.</li></ul>
(8) Power connector	Connects an AC adapter.

## Left-side components



Component	Description
(1) External monitor port	Connects an external VGA monitor or projector.
(2) Expansion port 3	Connects the computer to an optional docking device or an optional 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.
(3) RJ-45 (network) jack	Connects a network cable.
(4) HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(5) eSATA/USB port (select models only)	Connects an optional high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.  <b>NOTE:</b> Depending on your computer model, the computer may include a USB port only.
(6) USB port	Connects an optional USB device.
(7) 1394 port (select models only)	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(8) Digital Media Slot light	On: A digital card is being accessed.
(9) Digital Media Slot	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 (SD) Memory Card</li> <li>• xD-Picture Card (XD)</li> </ul>
(10) ExpressCard slot	Supports optional ExpressCard/54 cards.

## Bottom components



Component	Description
(1) Battery bay	Holds the battery.
(2) Battery release latch	Releases the battery from the battery bay.
(3) Vents (9)	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) Secondary hard drive bay	Holds an optional secondary hard drive.
(5) Integrated subwoofer	Contains the subwoofer speaker.
(6) Primary hard drive bay	Holds the primary hard drive, the memory module slots, and the WLAN module (select models only).  <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.

## Display components



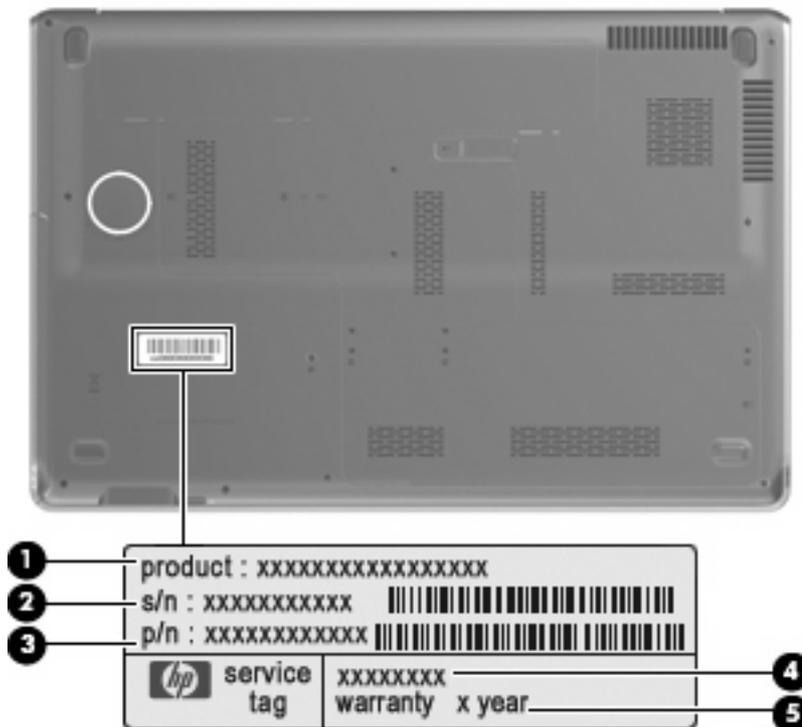
Component	Description
(1) Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on.
(2) Internal microphones (2)	Record sound.
(3) Webcam light	On: The webcam is in use.
(4) Webcam	Records audio and video and captures still photographs.

# 3 Illustrated parts catalog

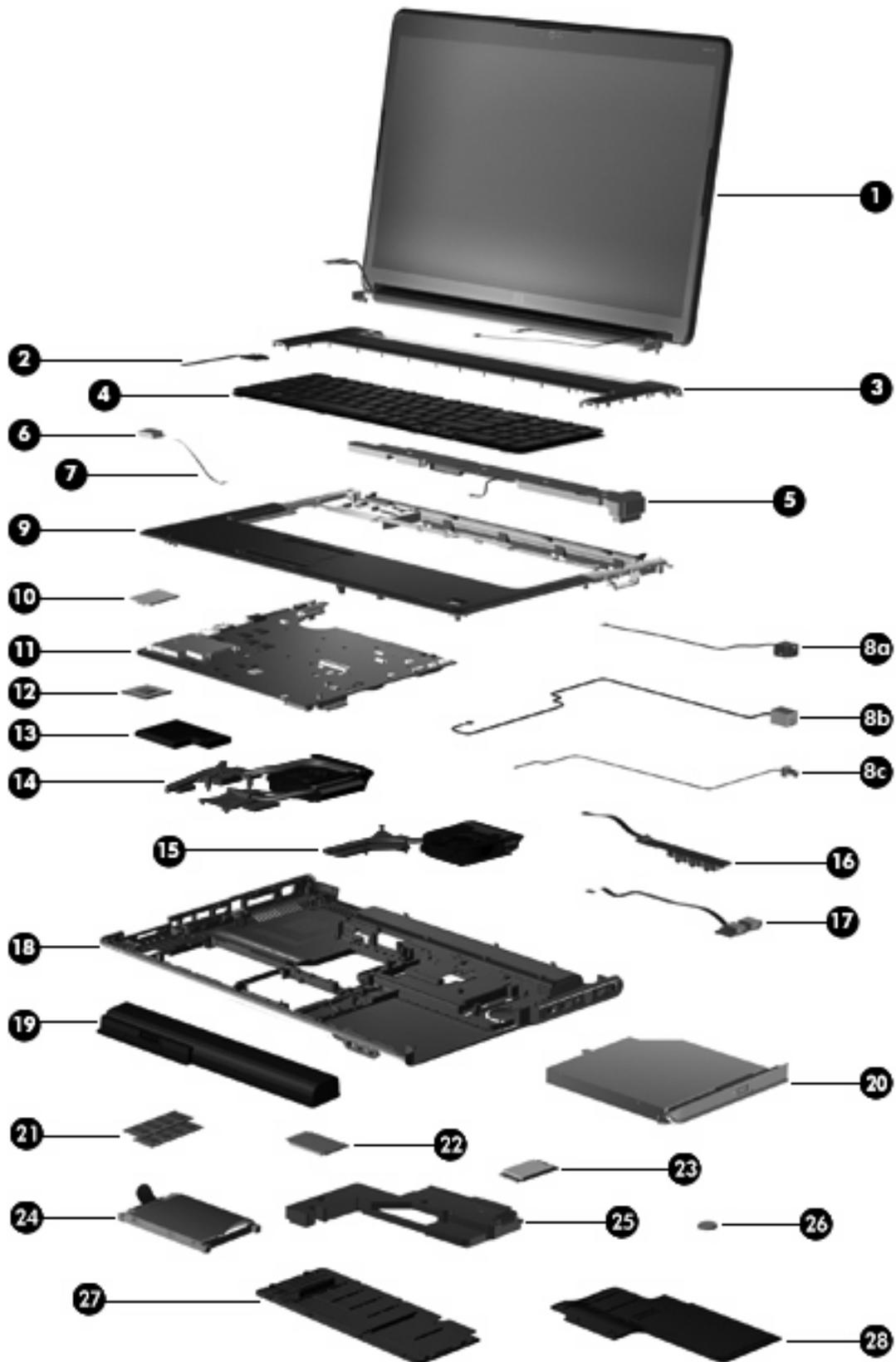
## Service tag

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

- (1) Product name: This is the product name affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- (4) Model description: This is the alphanumeric identifier needed to locate documents, drivers, and support for the computer.
- (5) Warranty period: This number describes the duration of the warranty period for the computer.



# Computer major components



Item	Description	Spare part number
<b>(1)</b>	<b>17.3-inch display assembly</b> (includes wireless antenna transceivers and cables)	
	HD+ flush glass AntiGlare display assembly with webcam and 2 microphones for use in white computers	516296-001
	HD+ BrightView display assembly with webcam and 2 microphones for use in white computers	516295-001
	HD+ flush glass AntiGlare display assembly with webcam and 2 microphones for use in black computers	519260-001
	HD+ BrightView display assembly with webcam and 2 microphones for use in black computers	519259-001
	<b>NOTE:</b> See <a href="#">Display assembly components on page 24</a> for more information on display assembly spare part numbers.	
<b>(2)</b>	<b>Power button board</b> (includes cable)	
	For use in computers with discrete graphics subsystems	516329-001
	For use in computers with UMA graphics subsystems	518165-001
<b>(3)</b>	<b>Switch cover</b> (includes LED board and cable)	
	For use in white computers	516300-001
	For use in black computers	519269-001
<b>(4)</b>	<b>Keyboard</b> (includes keyboard cable)	
	<b>NOTE:</b> For a detailed list of available keyboards, see <a href="#">Sequential part number listing on page 28</a> .	
	White keyboard	516357-xxx
	Black molded keyboard	519265-xxx
	Black painted keyboard	519266-xxx
<b>(5)</b>	<b>Speaker assembly</b>	516323-001
<b>(6)</b>	<b>Bluetooth® module</b> (does not include a Bluetooth module cable)	483113-001
<b>(7)</b>	<b>Bluetooth module cable</b>	517638-001
	<b>Cable Kit</b> , includes:	516328-001
<b>(8a)</b>	Power connector cable	
<b>(8b)</b>	Modem module cable	
<b>(8c)</b>	TV tuner module antenna cable	
<b>(9)</b>	<b>Top cover</b> (includes TouchPad and TouchPad buttons)	
	For use only with white computer models equipped with a fingerprint reader; includes fingerprint reader board	516299-001
	For use only with white computer models not equipped with a fingerprint reader	516360-001
	For use only with black computer models equipped with a fingerprint reader; includes fingerprint reader board	519267-001
	For use only with black computer models not equipped with a fingerprint reader	519268-001

<b>Item</b>	<b>Description</b>	<b>Spare part number</b>
<b>(10)</b>	<b>Modem module</b>	
	<b>NOTE:</b> The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 516328-001.	
	For use in all countries and regions except Australia and New Zealand	461749-001
	For use only in Australia and New Zealand	461749-011
<b>(11)</b>	<b>System board</b> (includes replacement thermal material)	
	With ATI Mobility Radeon HD 4650 discrete graphics subsystem and 1-GB of dedicated memory	516294-001
	With ATI Mobility Radeon HD 4650 discrete graphics subsystem and 1-GB of dedicated memory	516293-001
	With ATI Mobility Radeon HD 4530 discrete graphics subsystem and 512-MB of dedicated memory	516292-001
	With Intel GMA 4700MHD UMA graphics subsystem and shared memory	516291-001
	System board bracket (not illustrated)	516334-001
<b>(12)</b>	<b>Processor</b> (includes replacement thermal material)	
	Intel Core™2 Quad Q9100 2.26-GHz with 12-MB L2 cache and 1066-MHz FSB	507947-001
	Intel Core2 Quad Q9000 2.00-GHz with 12-MB L2 cache and 1066-MHz FSB	507948-001
	Intel Core2 Duo T9800 2.93-GHz with 6-MB L2 cache and 1066-MHz FSB	507951-001
	Intel Core2 Duo T9550 2.66-GHz with 6-MB L2 cache and 1066-MHz FSB	507953-001
	Intel Core2 Duo P8700 2.53-GHz with 3-MB L2 cache and 1066-MHz FSB	507960-001
	Intel Core2 Duo P8600 2.40-GHz with 3-MB L2 cache and 1066-MHz FSB	507963-001
	Intel Core2 Duo P7450 2.13-GHz with 3-MB L2 cache and 1066-MHz FSB	507965-001
	Intel Core2 Duo T6600 2.20-GHz with 2-MB L2 cache and 800-MHz FSB	513593-001
	Intel Core2 Duo T6400 2.00-GHz with 2-MB L2 cache and 800-MHz FSB	513592-001
	Intel Pentium Dual Core T4200 2.00-GHz with 1-MB L2 cache and 800-MHz FSB	513599-001
<b>(13)</b>	<b>ExpressCard module</b>	516324-001
	<b>Fan/heat sink assembly</b> (includes replacement thermal material)	
<b>(14)</b>	For use only with computer models equipped with graphics subsystems with discrete memory	516876-001
<b>(15)</b>	For use only with computer models equipped with graphics subsystems with UMA memory	516331-001
	<b>Optical drive bracket (not illustrated)</b>	
	For use in computers with discrete graphics subsystems	519481-001
	For use in computers with UMA graphics subsystems	535085-001
<b>(16)</b>	<b>Audio/infrared board</b> (includes cable)	
	For use in computers with discrete graphics subsystems	516330-001
	For use in computers with UMA graphics subsystems	518166-001

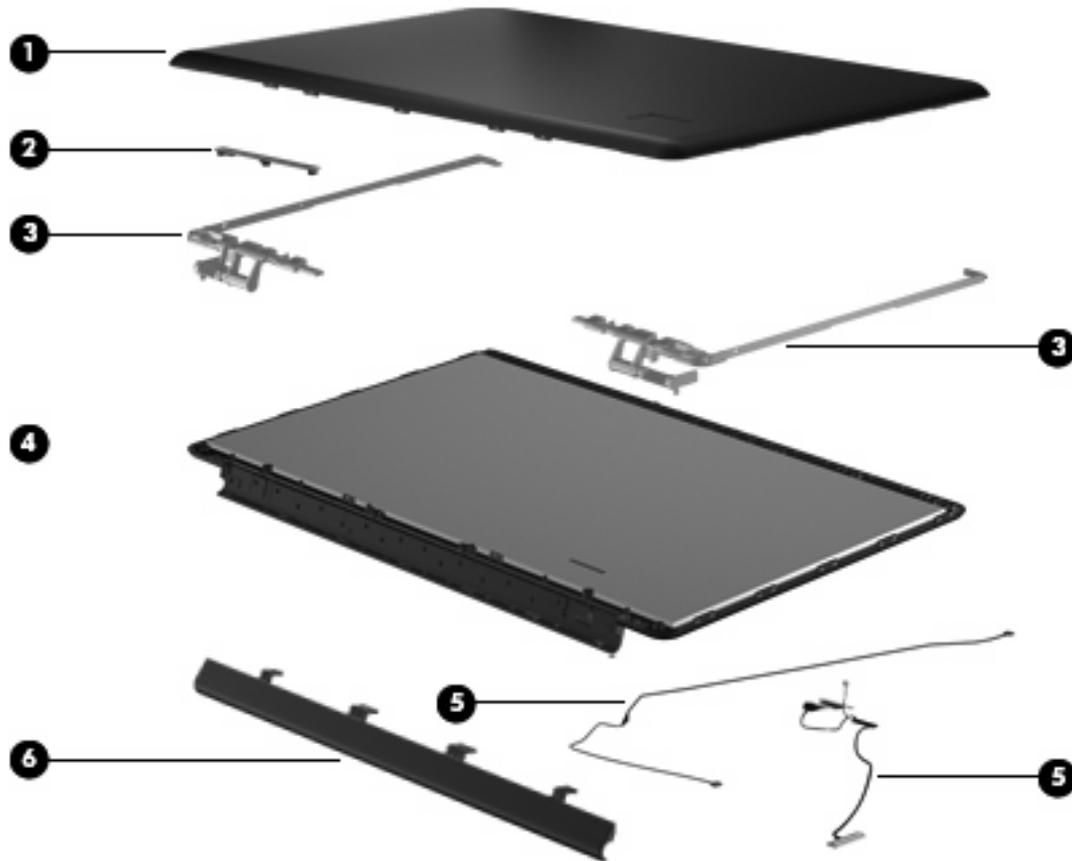
Item	Description	Spare part number
<b>(17)</b>	<b>USB board</b> (includes cable)	
	For use in computers with discrete graphics subsystems	516332-001
	For use in computers with UMA graphics subsystems	518168-001
<b>(18)</b>	<b>Base enclosure</b> (includes rubber feet)	
	For use only with computer models equipped with an Intel Core2 Quad processor	516298-001
	For use only in defeatured computer models equipped with an Intel Core2 Duo processor	516297-001
	For use only in full-featured computer models equipped with an Intel Core2 Duo processor	535086-001
	<b>Rubber Feet Kit</b> (not illustrated, includes 4 base enclosure rubber feet)	516326-001
<b>(19)</b>	<b>Battery</b>	
	8-cell, 73-Wh, 2.55-Ah Li-ion battery for use with all computer models	516355-001
	6-cell, 47-Wh, 2.55-Ah Li-ion battery for use with all computer models	516354-001
<b>(20)</b>	<b>Optical drive</b> (includes bezel and bracket):	
	Blu-ray ROM DVD±R/RW SuperMulti DL Drive with LightScribe	516352-001
	Blu-ray ROM DVD±R/RW SuperMulti DL Drive	516351-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	516353-003
<b>(21)</b>	<b>Memory modules</b> (800-MHz, PC2-6400, 1-DIMM)	
	4096-MB memory module	516337-001
	2048-MB memory module	516336-001
	1024-MB memory module	516335-001
<b>(22)</b>	<b>TV tuner module</b>	
	<b>NOTE:</b> The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 516328-001.	
	DVB-T TV tuner module	482899-003
	DVB-T/ANG TV tuner module	482899-002
	ATSC/NTSC/QAM hybrid TV tuner module	482899-001
	<b>TV tuner external antenna cable</b> (not illustrated)	
	With F-PAL jack	482900-001
	With PAL jack	482900-002
<b>(23)</b>	<b>WLAN module</b>	
	Intel Wi-Fi Link 5100 802.11a/b/g WLAN module for use in all countries and regions	482957-001
	Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions	480985-001
	Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504664-001

Item	Description	Spare part number
	Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504664-002
	Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	459263-002
	Broadcom BCM4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-001

Item	Description	Spare part number
	Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-002
<b>(24)</b>	<b>Hard drive</b> (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	
	500-GB, 5400-rpm	516350-001
	320-GB, 7200-rpm	516349-001
	320-GB, 5400-rpm	516346-001
	250-GB, 7200-rpm	516348-001
	250-GB, 5400-rpm	516345-001
	<b>Hard Drive Hardware Kit</b> (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	517639-001
<b>(25)</b>	<b>Subwoofer</b>	516333-001
<b>(26)</b>	<b>RTC battery</b>	449729-001
<b>(27)</b>	Primary hard drive cover	518162-001
<b>(28)</b>	Secondary hard drive cover	518164-001

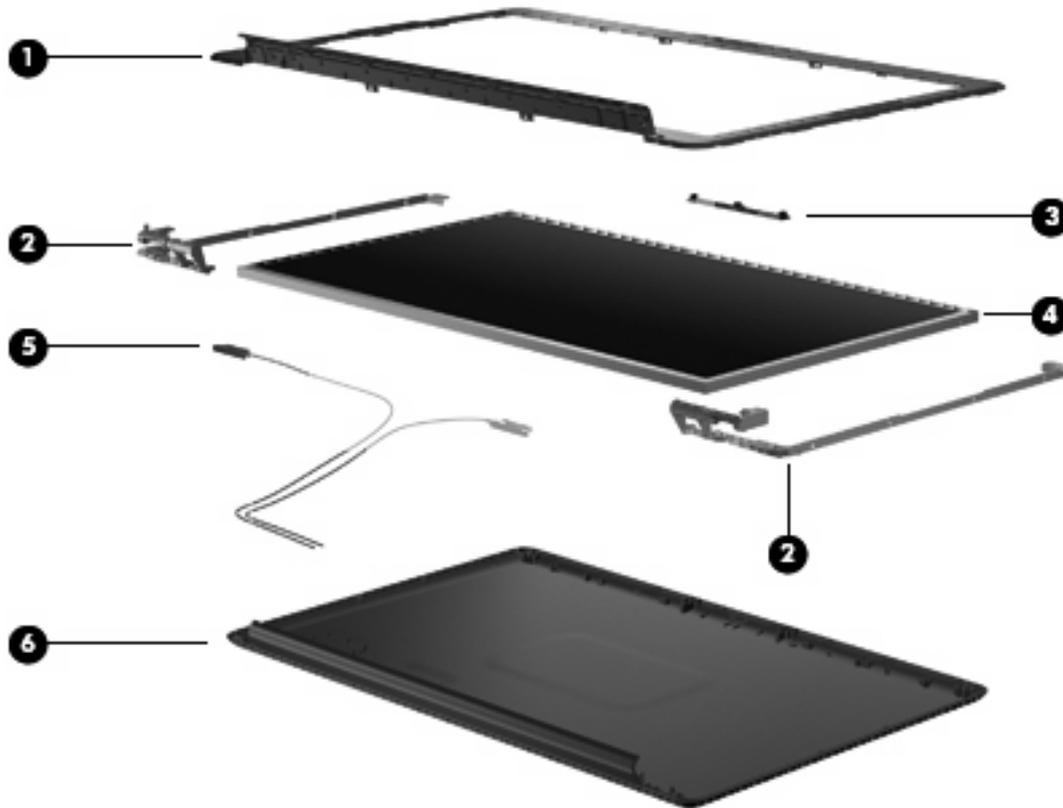
# Display assembly components

## Flush glass display assembly spare parts



Item	Description	Spare part number
(1)	<b>Display enclosure</b> (includes wireless antenna transceivers and cables and logo LED board and cable)	
	For use in white computers	516443-001
	For use in black computers	519262-001
(2)	<b>Webcam/microphone module</b>	516312-001
(3)	<b>Display Hinge Kit</b> (includes right and left hinges)	516444-001
(4)	<b>Flush glass display panel</b> (includes display panel cable)	
	For use in white computers	516443-001
	For use in black computers	519262-001
(5)	<b>Display Cable Kit</b> (includes display panel cable, and microphone receiver and cable)	516307-001
(6)	<b>Display hinge cover</b>	537844-001
	<b>Display Screw Kit</b> (not illustrated)	531764-001

## BrightView panel



Item	Description	Spare part number
(1)	<b>Display bezel</b>	516305-001
(2)	<b>Display Hinge Kit</b> (includes left and right hinges)	516306-001
(3)	<b>Webcam/microphone module</b>	516312-001
(4)	<b>Display panel</b> (includes display panel cable)	516303-001
(5)	<b>Display Cable Kit</b> (includes display panel cable, and microphone receiver and cable)	516307-001
(6)	<b>Display enclosure</b> (includes wireless antenna transceivers and cables and logo LED board and cable)	
	For use in white computers	516304-001
	For use in black computers	519261-001
	<b>Display Rubber Kit</b> (not illustrated, includes display bezel rubber screw covers)	516308-001
	<b>Display Screw Kit</b> (not illustrated)	516309-001

## Mass storage devices



Item	Description	Spare part number
(1)	<b>Hard drive</b> (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators):	
	• 500-GB, 5400-rpm	516350-001
	• 320-GB, 7200-rpm	516349-001
	• 320-GB, 5400-rpm	516346-001
	• 250-GB, 7200-rpm	516348-001
	• 250-GB, 5400-rpm	516345-001
	<b>Hard Drive Hardware Kit</b> (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	517639-001
(2)	<b>Optical drive</b> (includes bezel and bracket)	
	Blu-ray ROM DVD±R/RW SuperMulti DL Drive with LightScribe	516352-001
	Blu-ray ROM DVD±R/RW SuperMulti DL Drive	516351-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	516353-001

## Miscellaneous parts

Description	Spare part number
<b>AC adapters</b>	
120-W AC adapter	463953-001
90-W AC adapter	463955-001
65-W AC adapter	463958-001
<b>Wired headset with volume control</b>	371693-001
<b>Wireless laser mouse</b> (includes infrared transceiver)	430958-001
<b>Power cords:</b>	
Australia and New Zealand	490371-011
Belgium, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Iceland, the Netherlands, northwest Africa, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, and Turkey	490371-021
Asia/Pacific region, French Canada, Latin America, Thailand, and the United States	490371-001
Brazil	490371-201
India	490371-D61
Israel	490371-BB1
Italy	490371-061
Japan	490371-291
The People's Republic of China	490371-AA1
South Africa	490371-AR1
South Korea	490371-AD1
Switzerland	490371-111
The United Kingdom and Hong Kong	490371-031
<b>Remote controls:</b>	
Full-function remote control	465540-001
Full-function remote control with teletext	465541-001
<b>Screw Kit</b>	516327-001
<ul style="list-style-type: none"> <li>• Phillips PM3.0×4.0 screw</li> <li>• Phillips PM2.5×7.0 screw</li> <li>• Phillips PM2.5×6.0 screw</li> <li>• Phillips PM2.5×6.0 captive screw</li> <li>• Phillips PM2.5×4.0 screw</li> <li>• Phillips PM2.0×10.0 captive screw</li> <li>• Phillips PM2.0×4.0 screw</li> </ul>	

## Sequential part number listing

Spare part number	Description
371693-003	Wired headset with volume control
430958-001	Wireless laser mouse (includes infrared transceiver)
449729-001	RTC battery
459263-002	Broadcom BCM4312 802.11b/g WLAN module for use only with computer models equipped with Intel processors in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
461749-001	Modem module for use in all countries and regions except Australia and New Zealand  <b>NOTE:</b> The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 501891-001.
461749-011	Modem module for use only in Australia and New Zealand  <b>NOTE:</b> The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 501891-001.
463953-001	120-W AC adapter
463955-001	90-W AC adapter
463958-001	65-W AC adapter
465540-001	Full-function remote control
465541-001	Full-function remote control with teletext
480985-001	Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use only with computer models equipped with Intel processors
482899-001	ATSC/NTSC/QAM hybrid TV tuner module  <b>NOTE:</b> The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 501891-001.

Spare part number	Description
482899-002	DVB-T/ANG TV tuner module  <b>NOTE:</b> The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 501891-001.
482899-003	DVB-T TV tuner module  <b>NOTE:</b> The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 501891-001.
482900-001	TV tuner external antenna cable with F-PAL jack
482900-002	TV tuner external antenna cable with PAL jack
482957-001	Intel Wi-Fi Link 5100 802.11a/b/g WLAN module for use only with computer models equipped with Intel processors
483113-001	Bluetooth module for use only with computer models equipped with Intel processors (does not include a Bluetooth module cable)  <b>NOTE:</b> The Bluetooth module cable is available using spare part number 489822-001.
490371-001	Power cord for use in the Asia/Pacific region, French Canada, Latin America, Thailand, and the United States
490371-011	Power cord for use in Australia and New Zealand
490371-021	Power cord for use in Belgium, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Iceland, the Netherlands, northwest Africa, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, and Turkey
490371-031	Power cord for use in the United Kingdom and Hong Kong
490371-061	Power cord for use in Italy
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D61	Power cord for use in India
504593-001	Broadcom BCM4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States

Spare part number	Description
504593-002	Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
504664-001	Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
504664-002	Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
507947-001	Intel Core™2 Quad Q9100 processor (2.26-GHz with 12-MB L2 cache and 1066-MHz FSB)
507948-001	Intel Core2 Quad Q9000 processor (2.00-GHz with 12-MB L2 cache and 1066-MHz FSB)
507951-001	Intel Core2 Duo T9800 processor (2.93-GHz with 6-MB L2 cache and 1066-MHz FSB)
507953-001	Intel Core2 Duo T9550 processor (2.66-GHz with 6-MB L2 cache and 1066-MHz FSB)
507960-001	Intel Core2 Duo P8700 processor (2.53-GHz with 3-MB L2 cache and 1066-MHz FSB)
507963-001	Intel Core2 Duo P8600 processor (2.40-GHz with 3-MB L2 cache and 1066-MHz FSB)
507965-001	Intel Core2 Duo P7450 processor (2.13-GHz with 3-MB L2 cache and 1066-MHz FSB)

<b>Spare part number</b>	<b>Description</b>
513592-001	Intel Core2 Duo T6400 processor (2.00-GHz with 2-MB L2 cache and 800-MHz FSB)
513593-001	Intel Core2 Duo T6600 processor (2.20-GHz with 2-MB L2 cache and 800-MHz FSB)
513599-001	Intel Pentium Dual Core T4200 processor (2.00-GHz with 1-MB L2 cache and 800-MHz FSB)
516291-001	System board with Intel GMA 4700MHD UMA graphics subsystem and shared memory
516292-001	System board with ATI Mobility Radeon HD 4530 discrete graphics subsystem and 512 MB of dedicated memory
516293-001	System board with ATI Mobility Radeon HD 4650 discrete graphics subsystem and 1 GB of dedicated memory
516294-001	System board with ATI Mobility Radeon HD 4650 discrete graphics subsystem and 1 -GB of dedicated memory
516295-001	17.3-inch HD+ BrightView display assembly for use in white computers
516296-001	17.3-inch HD+ flush glass AntiGlare display assembly for use in white computers
516297-001	Base enclosure for use only in defeatured computer models equipped with an Intel Core2 Duo processor
516298-001	Base enclosure for use only with computer models equipped with an Intel Core2 Quad processor
516299-001	Top cover for use only with white computer models equipped with a fingerprint reader; includes fingerprint reader board
516300-001	Switch cover for use in white computers (includes LED board and cable)
516303-001	Flush glass display panel (includes display panel cable)
516304-001	Display enclosure for use in white computers with BrightView displays (includes wireless antenna transceivers and cables and logo LED board and cable)
516305-001	Display bezel for use in computers with BrightView displays
516306-001	Display Hinge Kit for use in computers with BrightView displays (includes left and right hinges)
516307-001	Display Cable Kit for use in computers with BrightView displays (includes display panel cable, and microphone receiver and cable)
516308-001	Display Rubber Kit for use in computers with BrightView displays (includes display bezel rubber screw covers)
516309-001	Display Screw Kit for use in computers with BrightView displays
516312-001	Webcam/microphone module for use in computers with BrightView displays
516323-001	Speaker assembly
516324-001	ExpressCard module
516326-001	Rubber Feet Kit (not illustrated, includes 4 base enclosure rubber feet)
516327-001	Screw Kit
516328-001	Cable Kit
516329-001	Power button board for use in computers with discrete graphics subsystems (includes cable)
516330-001	Audio/infrared board for use in computers with discrete graphics subsystems (includes cable)
516331-001	Fan/heat sink assembly for use in computers with UMA graphics subsystems

<b>Spare part number</b>	<b>Description</b>
516332-001	USB board for use in computers with discrete graphics subsystems (includes cable)
516333-001	Subwoofer
516334-001	System board bracket
516335-001	1-GB memory module (800-MHz, PC2-6400, 1-DIMM)
516336-001	2-GB memory module (800-MHz, PC2-6400, 1-DIMM)
516337-001	4-GB memory module (800-MHz, PC2-6400, 1-DIMM)
516345-001	250-GB, 5400-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
516346-001	320-GB, 5400-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
516348-001	250-GB, 7200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
516349-001	320-GB, 7200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
516350-001	500-GB, 5400-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
516351-001	Blu-ray ROM DVD±R/RW SuperMulti DL Drive
516352-001	Blu-ray ROM DVD±R/RW SuperMulti DL Drive with LightScribe
516353-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
516354-001	6-cell, 47-Wh, 2.55-Ah Li-ion battery
516355-001	8-cell, 73-Wh, 2.55-Ah Li-ion battery
516357-001	Keyboard for use in the United States
516357-031	Keyboard for use in white computers in the United Kingdom
516357-041	Keyboard for use in white computers in Germany
516357-051	Keyboard for use in white computers in France
516357-061	Keyboard for use in white computers in Italy
516357-071	Keyboard for use in white computers in Spain
516357-121	Keyboard for use in white computers in French Canada
516357-141	Keyboard for use in white computers in Turkey
516357-151	Keyboard for use in white computers in Greece
516357-171	Keyboard for use in white computers in Saudi Arabia
516357-211	Keyboard for use in white computers in Hungary
516357-221	Keyboard for use in the white computers in the Czech Republic
516357-251	Keyboard for use in white computers in Russia
516357-281	Keyboard for use in white computers in Thailand
516357-291	Keyboard for use in white computers in Japan

<b>Spare part number</b>	<b>Description</b>
516357-A41	Keyboard for use in white computers in Belgium
516357-AD1	Keyboard for use in white computers in South Korea
516357-B31	Keyboard for use white computers internationally
516357-BB1	Keyboard for use in white computers in Israel
516357-DH1	Keyboard for use in white computers in Denmark, Norway, and Sweden
516357-DJ1	Keyboard for use in white computers in Greece
516360-001	Top cover for use only with white computer models not equipped with a fingerprint reader
516443-001	Display enclosure for use in white computers with flush glass displays (includes wireless antenna transceivers and cables and logo LED board and cable)
516444-001	Display Hinge Kit for use in computers with flush glass displays
516876-001	Fan/heat sink assembly for use in computers with discrete graphics subsystems
517638-001	Bluetooth module cable
517639-001	Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
518162-001	Primary hard drive cover
518164-001	Secondary hard drive cover
518165-001	Power button board for use in computers with UMA graphics subsystems
518166-001	Audio/infrared board for use in computers with UMA graphics subsystems (includes cable)
518168-001	USB board for use in computers with UMA graphics subsystems (includes cable)
519259-001	17.3-inch HD+ BrightView display assembly for use in black computers
519260-001	17.3-inch HD+ flush glass AntiGlare display assembly for use in black computers
519261-001	Display enclosure for use in black computers with BrightView displays (includes wireless antenna transceivers and cables and logo LED board and cable)
519262-001	Display enclosure for use in black computers with flush glass displays (includes wireless antenna transceivers and cables and logo LED board and cable)
519265-001	Black molded keyboard for use in the United States
519265-031	Black molded keyboard for use in the United Kingdom
519265-041	Black molded keyboard for use in Germany
519265-051	Black molded keyboard for use in France
519265-061	Black molded keyboard for use in Italy
519265-071	Black molded keyboard for use in Spain
519265-111	Black molded keyboard for use in Switzerland
519265-131	Black molded keyboard for use in Portugal
519265-141	Black molded keyboard for use in Turkey
519265-211	Black molded keyboard for use in Hungary

<b>Spare part number</b>	<b>Description</b>
519265-221	Black molded keyboard for use in the Czech Republic
519265-251	Black molded keyboard for use in Russia
519265-A41	Black molded keyboard for use in Belgium
519265-B31	Black molded keyboard for use internationally
519265-BB1	Black molded keyboard for use in Israel
519265-DJ1	Black molded keyboard for use in Greece
519266-001	Black painted keyboard for use in the United States
519266-031	Black painted keyboard for use in the United Kingdom
519266-041	Black painted keyboard for use in Germany
519266-051	Black painted keyboard for use in France
519266-061	Black painted keyboard for use in Italy
519266-071	Black painted keyboard for use in Spain
519266-121	Black painted keyboard for use in French Canada
519266-131	Black painted keyboard for use in Portugal
519266-141	Black painted keyboard for use in Turkey
519266-171	Black painted keyboard for use in Saudi Arabia
519266-211	Black painted keyboard for use in Hungary
519266-221	Black painted keyboard for use in the Czech Republic
519266-251	Black painted keyboard for use in Russia
519266-281	Black painted keyboard for use in Thailand
519266-291	Black painted keyboard for use in Japan
519266-A41	Black painted keyboard for use in Belgium
519266-AD1	Black painted keyboard for use in South Korea
519266-B31	Black painted keyboard for use internationally
519266-BB1	Black painted keyboard for use in Israel
519266-BG1	Black painted keyboard for use in Switzerland
519266-DH1	Black painted keyboard for use in the Netherlands
519266-DJ1	Black painted keyboard for use in Greece
519267-001	Top cover for use only with black computer models equipped with a fingerprint reader; includes fingerprint reader board
519268-001	Top cover for use only with black computer models not equipped with a fingerprint reader
519269-001	Switch cover for use in black computers (includes LED board and cable)
519481-001	Optical drive board for computers with discrete graphics subsystems
531764-001	Display Screw Kit for use in computers with flush glass displays

<b>Spare part number</b>	<b>Description</b>
535085-001	Optical drive board for computers with UMA graphics subsystems
535086-001	Base enclosure for use only in full-featured computer models equipped with an Intel Core2 Duo processor
536857-001	Power connector cable
537844-001	Display hinge cover for use in computers with a flush glass display

---

# 4 Removal and replacement procedures

## Preliminary replacement requirements

### Tools required

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

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

### Service considerations

The following sections include some of the considerations that you 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

---

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

---

## Cables and connectors

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

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

## Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

---

## Grounding guidelines

### Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

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

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

## Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

## Workstation guidelines

Follow these grounding workstation guidelines:

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

## Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

# Component replacement procedures

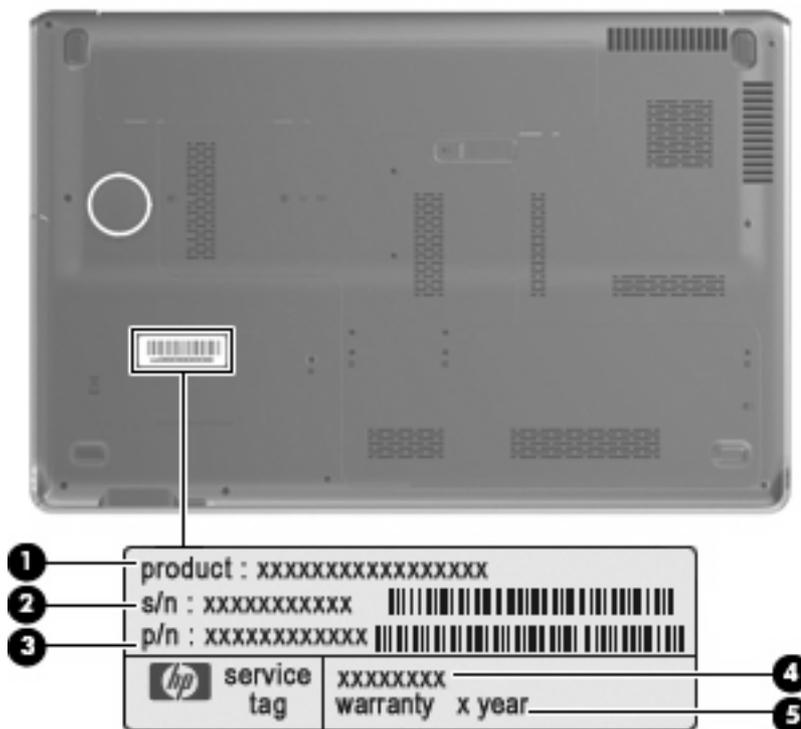
This chapter provides removal and replacement procedures.

There are as many as 110 screws, in 13 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

## Service tag

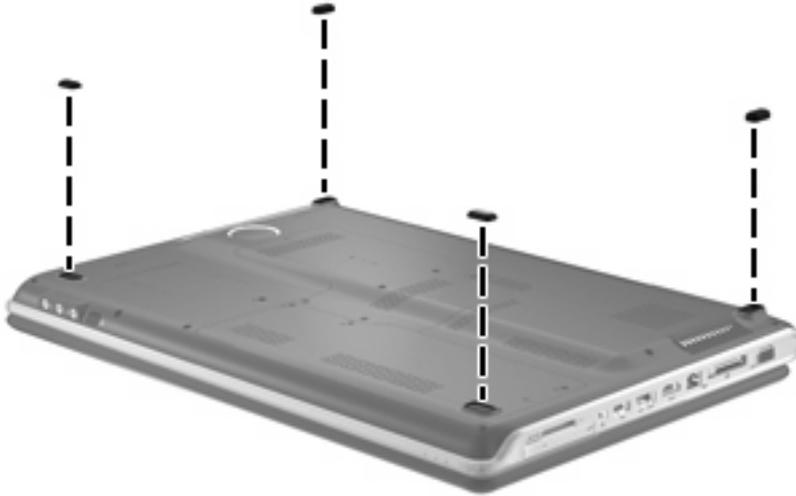
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.

- (1) Product name: This is the product name affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- (4) Model description: This is the alphanumeric identifier needed to locate documents, drivers, and support for the computer.
- (5) Warranty period: This number describes the duration of the warranty period for the computer.



## Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 516326-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

Description	Spare part number
8-cell, 73-Wh, 2.55-Ah Li-ion battery	516355-001
6-cell, 47-Wh, 2.55-Ah Li-ion battery	516354-001

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 from the computer.



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

## Optical drive

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

Description	Spare part number
Blu-ray ROM DVD±R/RW SuperMulti DL Drive with LightScribe	516352-001
Blu-ray ROM DVD±R/RW SuperMulti DL Drive	516351-001
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	516353-001

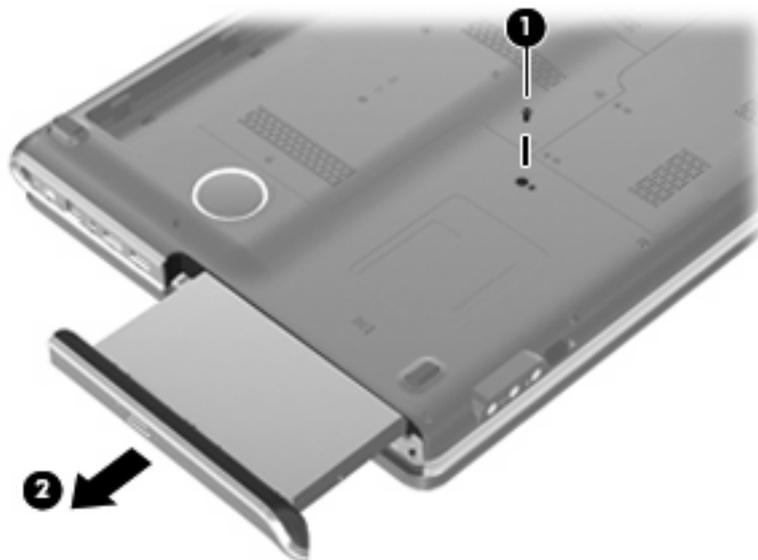
 **NOTE:** If it is necessary to remove the optical drive board, see [System board on page 79](#).

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 43](#)).

Remove the optical drive:

1. Position the computer with the front toward you.
2. Remove the Phillips PM2.5×7.0 screw (1) that secures the optical drive to the computer.
3. Remove the optical drive (2).



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

5. Remove the two Phillips PM2.0×4.0 screws that secure the optical drive bracket to the optical drive and remove the bracket.



Reverse this procedure to reassemble and install the optical drive.

## Primary hard drive cover

Description	Spare part number
Primary hard drive cover	518162-001

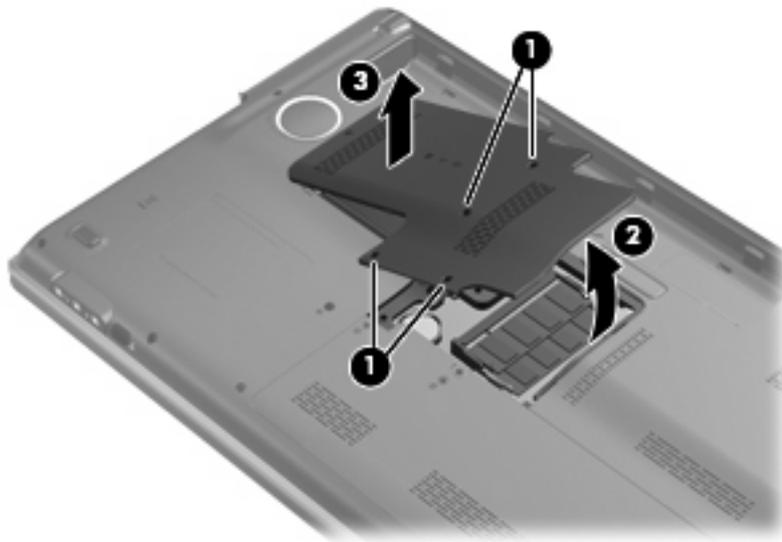
Before removing the primary hard drive cover, follow these steps:

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 43](#)).

Remove the primary hard drive cover:

1. Loosen the four Phillips PM2.5×6.0 captive screws **(1)** that secure the primary hard drive cover to the computer.

2. Lift the right side (2) of the primary hard drive cover, and then remove the cover (3).



Reverse this procedure to install the primary hard drive cover.

## Secondary hard drive cover

Description	Spare part number
Secondary hard drive cover	518164-001

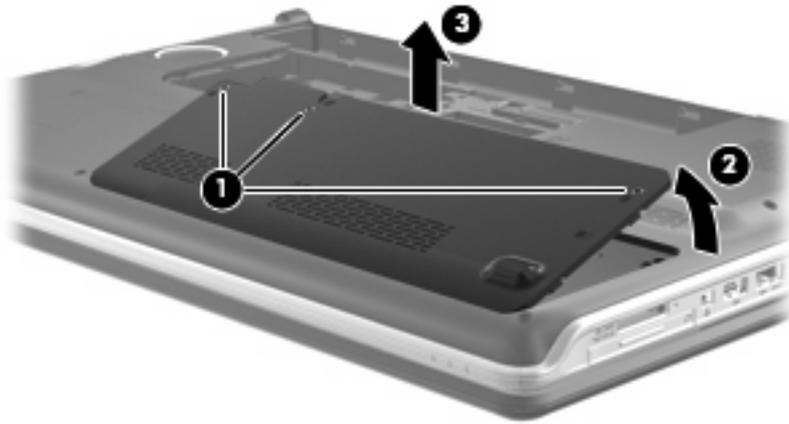
Before removing the secondary hard drive cover, follow these steps:

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 43](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 45](#)).

Remove the secondary hard drive cover:

1. Loosen the three Phillips PM2.5×6.0 captive screws (1) that secure the secondary hard drive cover to the computer.

2. Lift the rear edge (2), and remove the cover (3).



Reverse this procedure to install the secondary hard drive cover.

## Hard drive

 **NOTE:** The hard drive spare part kit includes left and right bracket rails, a connector cable, Mylar cover with tab, and 4 rubber isolators.

Description	Spare part number
500-GB, 5400-rpm	516350-001
320-GB, 7200-rpm	516349-001
320-GB, 5400-rpm	516346-001
250-GB, 7200-rpm	516348-001
250-GB, 5400-rpm	516345-001
Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	517639-001

Before removing the hard drive, follow these steps:

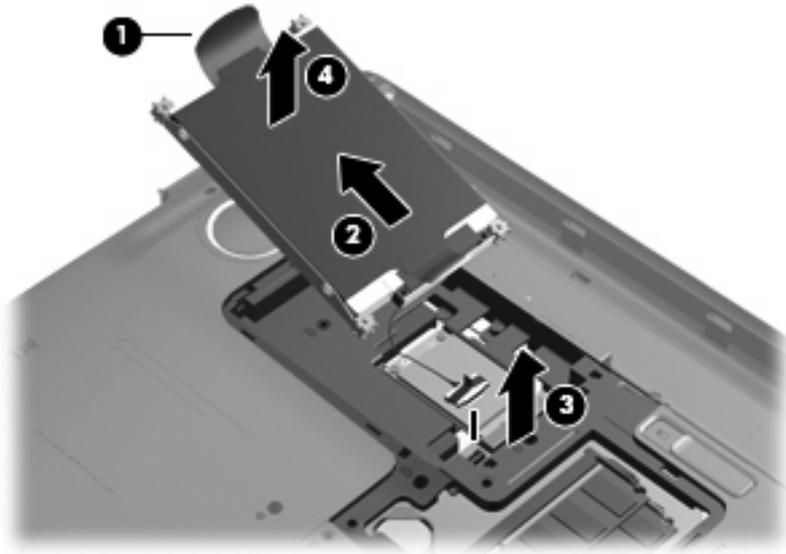
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 43](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 45](#))

 **NOTE:** Remove the secondary hard drive cover (see [Secondary hard drive cover on page 46](#)) when removing the secondary hard drive.

Remove the hard drive:

1. Use the Mylar tab **(1)** to slide the hard drive to the left **(2)**, and then lift it to release it from the hard drive bay.
2. Disconnect the hard drive cable **(3)** from the system board.

3. Remove the hard drive (4).



Reverse this procedure to install the hard drive.

## WLAN module

Description	Spare part number
Intel Wi-Fi Link 5100 802.11a/b/g WLAN module for use in all countries and regions	482957-001
Intel Wi-Fi Link 5100 802.11a/b/g/n WLAN module for use in all countries and regions	480985-001
Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504664-001
Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504664-002
Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	459263-002

Description	Spare part number
Broadcom BCM4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-001
Broadcom BCM4312 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	504593-002

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power 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 43](#)).
5. Remove the primary hard drive (see [Hard drive on page 48](#)).

Remove the WLAN module:

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

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

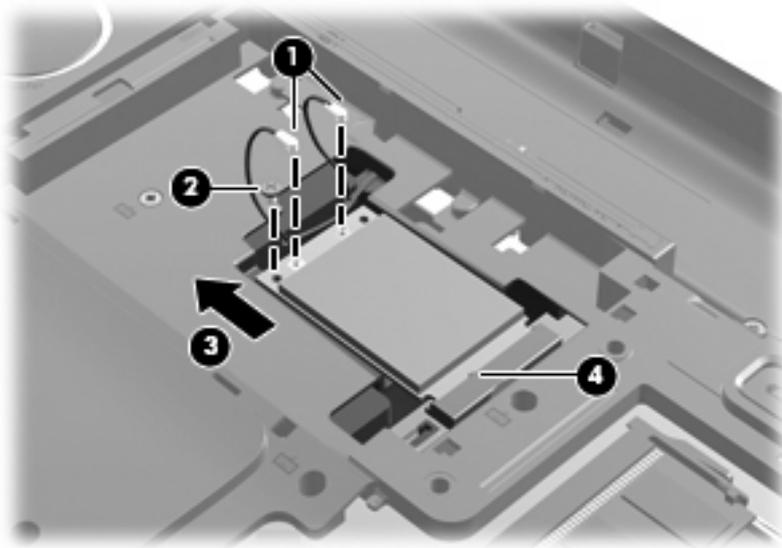
 **NOTE:** The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The white WLAN antenna cable is connected to the WLAN module “Aux” terminal.

2. Remove the Phillips PM2.0×4.0 screws (2) 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 (3) by pulling it away from the slot at an angle.

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

---



Reverse this procedure to install a WLAN module.

## RTC battery

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

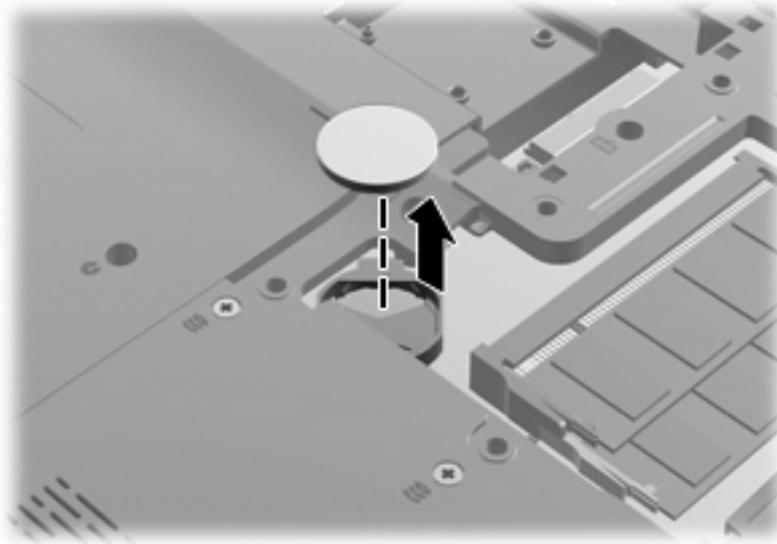
Description	Spare part number
RTC battery	449729-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power 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 43](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 45](#)).

Remove the RTC battery:

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



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

## Memory module

Description	Spare part number
4096-MB	516337-001
2048-MB	516336-001
1024-MB	516335-001

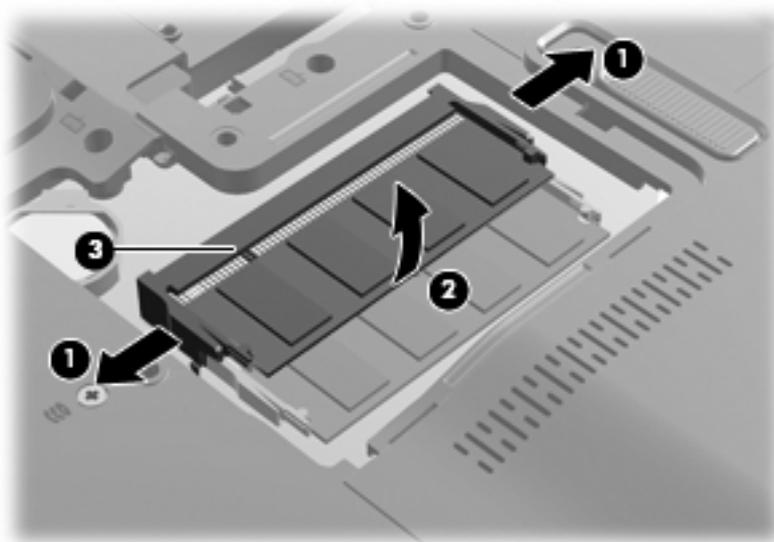
Before removing the memory module, follow these steps:

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 43](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 45](#)).

Remove the memory module:

1. 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.)
2. 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 insertion into the memory module slot.



Reverse this procedure to install the memory module.

## TV tuner module

 **NOTE:** The TV tuner module spare part kits do not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 516328-001.

**NOTE:** The TV tuner external antenna cables are available using spare part numbers 482900-001 (with F-PAL jack) and 482900-002 (with PAL jack).

Description	Spare part number
DVB-T TV tuner module	482899-003
DVB-T/ANG TV tuner module	482899-002
ATSC/NTSC/QAM hybrid TV tuner module	482899-001

Before removing the TV tuner 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 43](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 45](#)).
6. Remove the secondary hard drive cover (see [Secondary hard drive cover on page 46](#)).

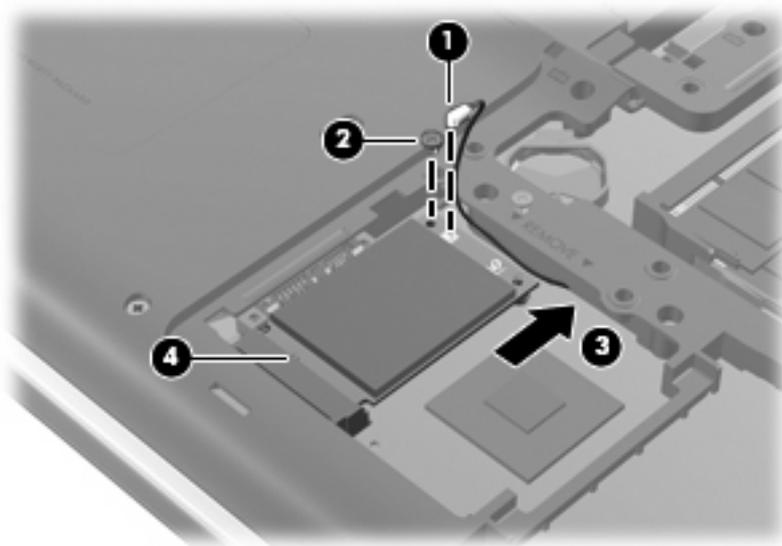
Remove the TV tuner module:

1. Disconnect the TV tuner module antenna cable **(1)** from the terminal on the TV tuner module.
2. Remove the Phillips PM2.0×4.0 screw **(2)** that secures the TV tuner module to the computer. (The edge of the module opposite the slot rises away from the computer.)

3. Remove the TV tuner module (3).

 **NOTE:** The TV tuner module is designed with a notch (4) to prevent incorrect insertion into the TV tuner module slot.

---



Reverse this procedure to install the TV tuner module.

## Switch cover and keyboard

Description	Spare part number
Switch cover, for use in white computers (includes LED board and cable)	516300-001
Switch cover, for use in black computers (includes LED board and cable)	519269-001
White keyboard	516357-xxx
Black molded keyboard	519265-xxx
Black painted keyboard	519266-xxx

**NOTE:** For a detailed list of available keyboards, see [Sequential part number listing on page 28](#).

Before removing the switch cover and 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 43](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 45](#)).

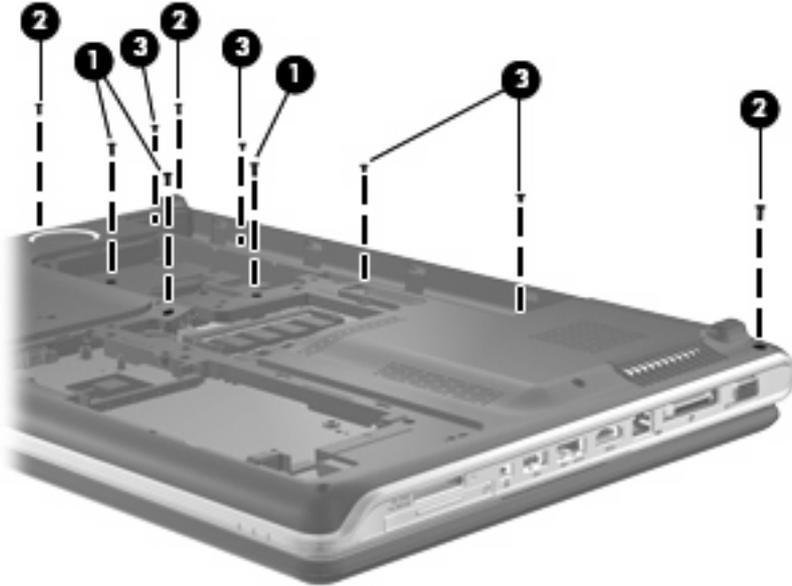
Remove the switch cover and keyboard:

1. Remove the following screws:

(1) Three Phillips PM2.5×7.0 screws that secure the keyboard to the computer

(2) Three Phillips PM2.5×7.0 screws that secure the switch cover to the computer

(3) Four Phillips PM2.5×3.0 screws that secure the switch cover to the computer



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

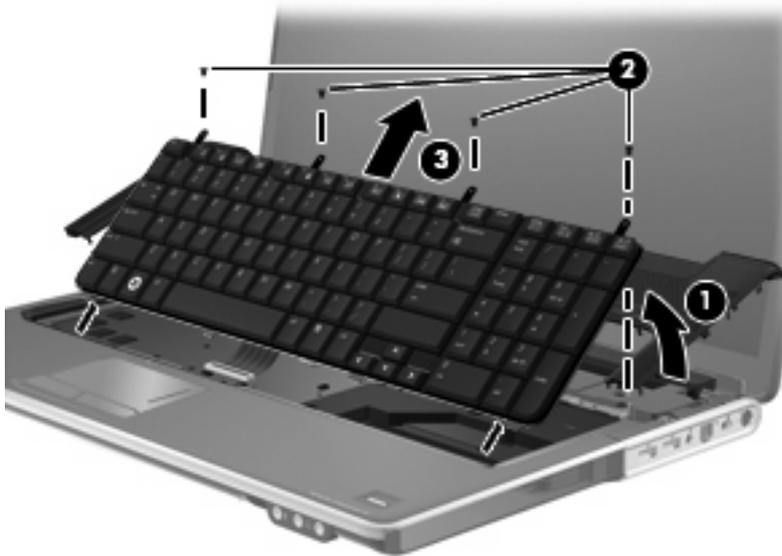
3. Open the computer as far as possible.

4. Lift the rear edge of the switch cover until it detaches from the computer.

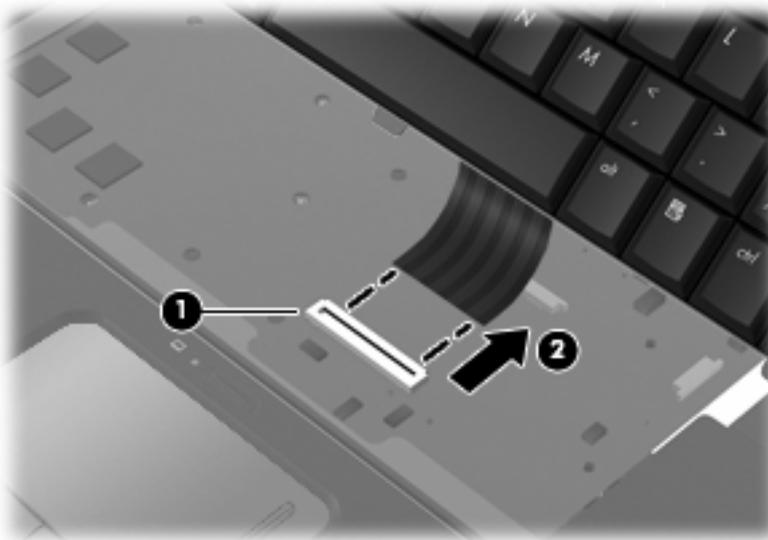


5. Lift the switch cover (1) to access the keyboard screws.

6. Remove the four Phillips PM2.0×4.0 screws (2) that secure the keyboard to the computer.
7. Lift the keyboard (3) until the keyboard connector on the system board is accessible.

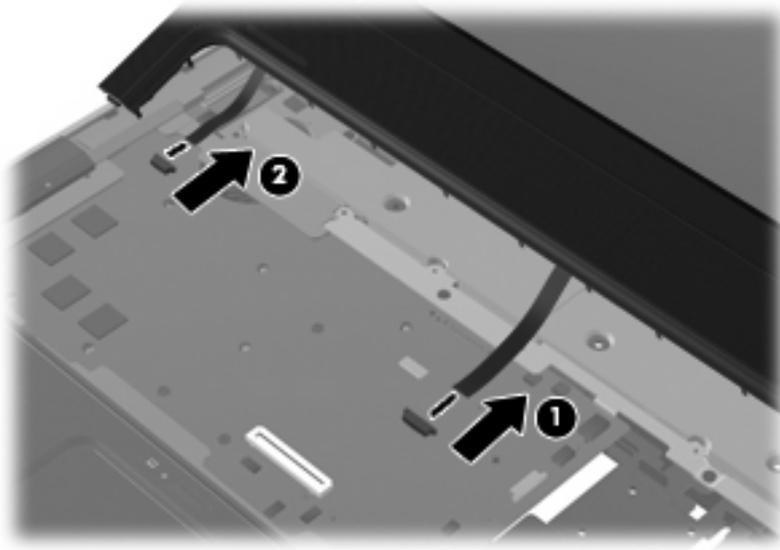


8. Release the zero insertion force (ZIF) connector (1) to which the keyboard cable is connected and disconnect the cable (2) from the system board.



9. Remove the keyboard.
10. Disconnect the power button board cable (1) from the low insertion force (LIF) connector on the system board.

11. Disconnect the LED board cable (2) from the LIF connector on the system board.



12. Remove the switch cover.

Reverse this procedure to install the switch cover and keyboard.

## Power button board

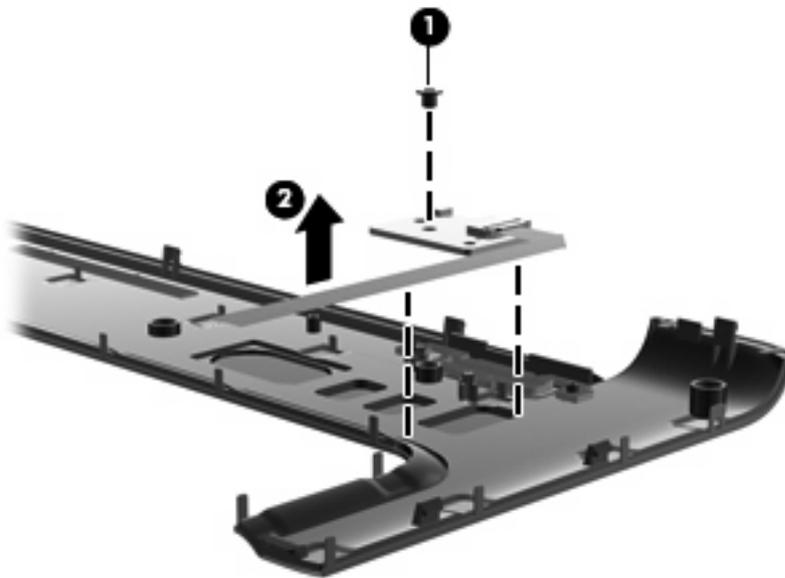
Description	Spare part number
Power button board for use in computers with discrete graphics subsystems (includes cable)	516329-001
Power button board for use in computers with UMA graphics subsystems (includes cable)	518165-001

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 43](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).

Remove the power button board:

1. Turn the switch cover upside down with the front toward you.
2. Remove the Phillips PM2.0×4.0 screw (1) that secures the power button board to the switch cover.
3. Remove the power button board (2) and cable.



Reverse this procedure to install the power button board.

## Speaker assembly

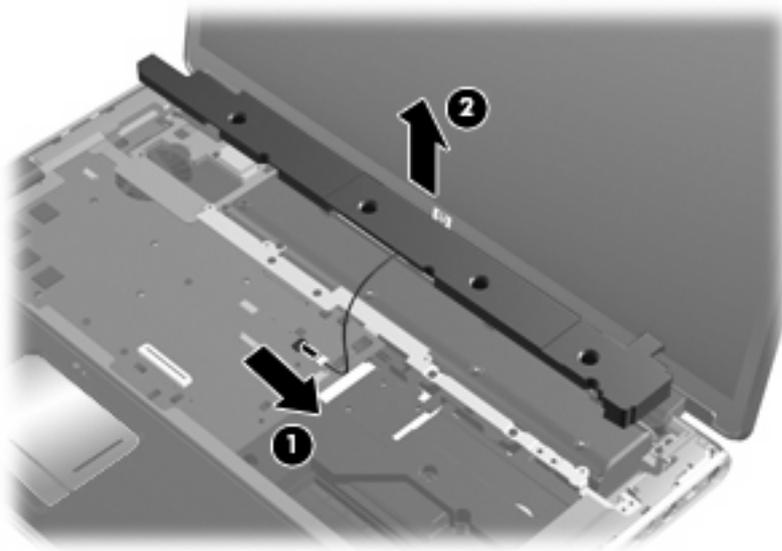
Description	Spare part number
Speaker assembly	516323-001

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 43](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).

Remove the speaker assembly:

1. Disconnect the speaker assembly cable (1) from the system board.
2. Remove the speaker assembly (2).



Reverse this procedure to install the speaker assembly.

## Bluetooth module

 **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is available using spare part number 517638-001.

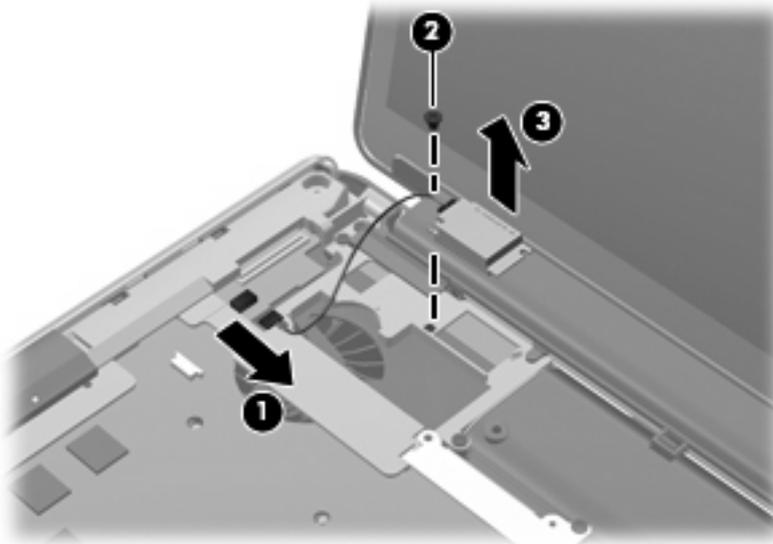
Description	Spare part number
Bluetooth module	483113-001

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC Adapter from the computer.
4. Remove the battery (see [Battery on page 43](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
6. Remove the speaker assembly (see [Speaker assembly on page 62](#)).

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable (1) from the Bluetooth module.
2. Remove the Phillips PM2.0×4.0 screw (2) that secures the Bluetooth module to the computer.
3. Remove the Bluetooth module (3).



Reverse this procedure to install the Bluetooth module.

## Display assembly

 **NOTE:** The display assembly includes a webcam, 2 microphones, and 2 wireless antenna transceivers and cables.

Description	Spare part number
17.3-inch HD+ flush glass AntiGlare display assembly for use in white computers	516296-001
17.3-inch HD+ BrightView display assembly for use in white computers	516295-001
17.3-inch HD+ flush glass AntiGlare display assembly for use in black computers	519260-001
17.3-inch HD+ BrightView display assembly for use in black computers	519259-001

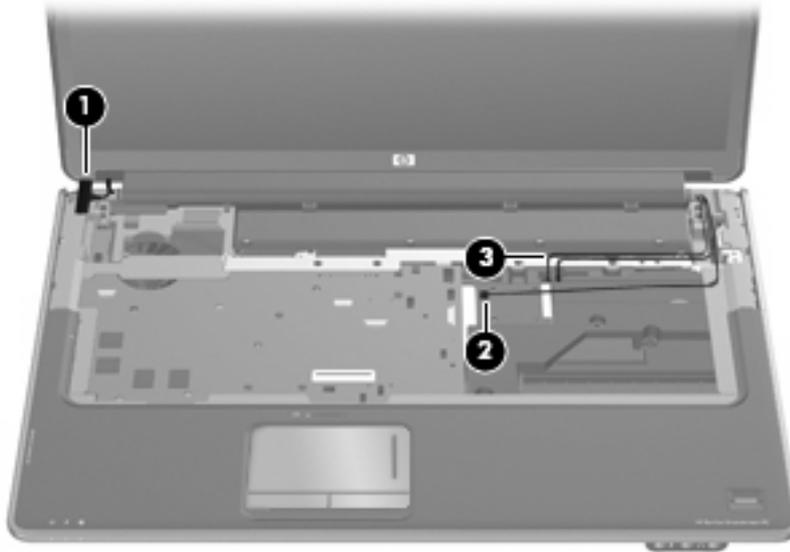
Before removing the display assembly, follow these steps:

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 43](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 50](#)).
6. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
7. Remove the speaker assembly (see [Speaker assembly on page 62](#)).

Remove the display assembly:

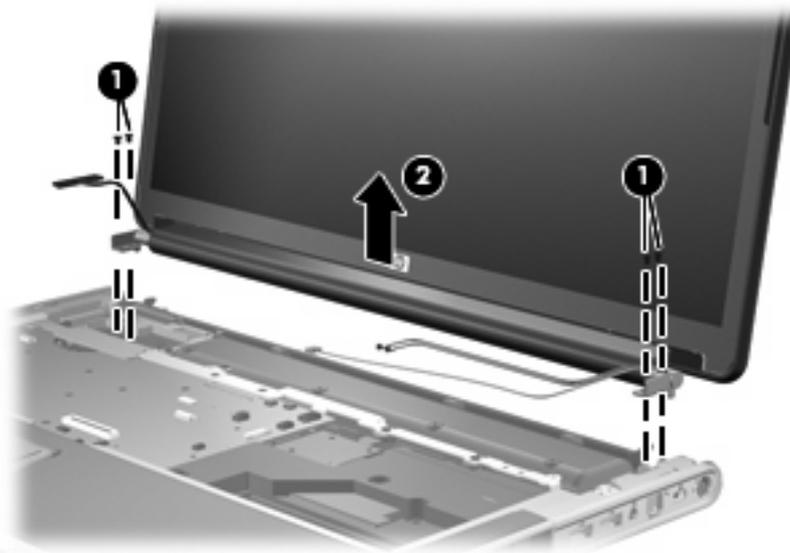
1. Disconnect the display panel cable **(1)** and the webcam/microphone cable **(2)** from the system board.

2. Remove the WLAN antenna cables from the clips (3) built into the top cover.



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

3. Remove the four Phillips PM2.5×7.0 screws (1) that secure the display assembly to the computer.
4. Remove the display assembly (2).

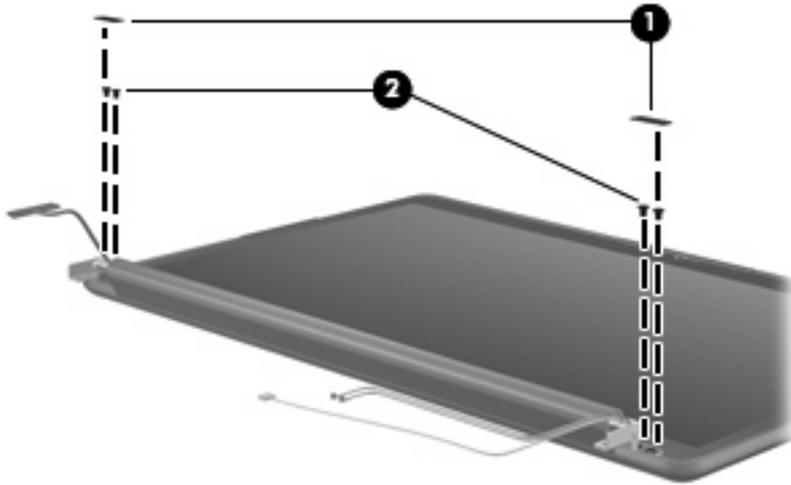


📄 **NOTE:** Steps 5 through 18 provide display assembly internal component removal information for computer models equipped with flush glass display assemblies. See steps 19 through 28 for display assembly internal component removal information for computer models equipped with BrightView display assemblies.

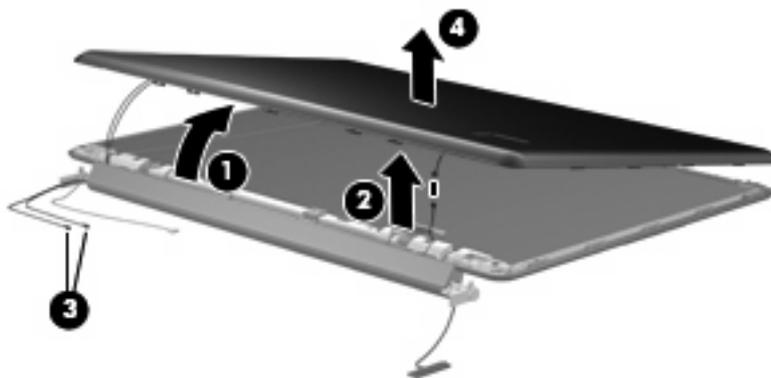
5. If it is necessary to replace the display enclosure or any of the display assembly internal components, remove the following screw covers and screws:

(1) Two rubber screw covers on the display bezel bottom edge. The display rubber screw covers are included in the Display Rubber Kit, spare part number 516446-001.

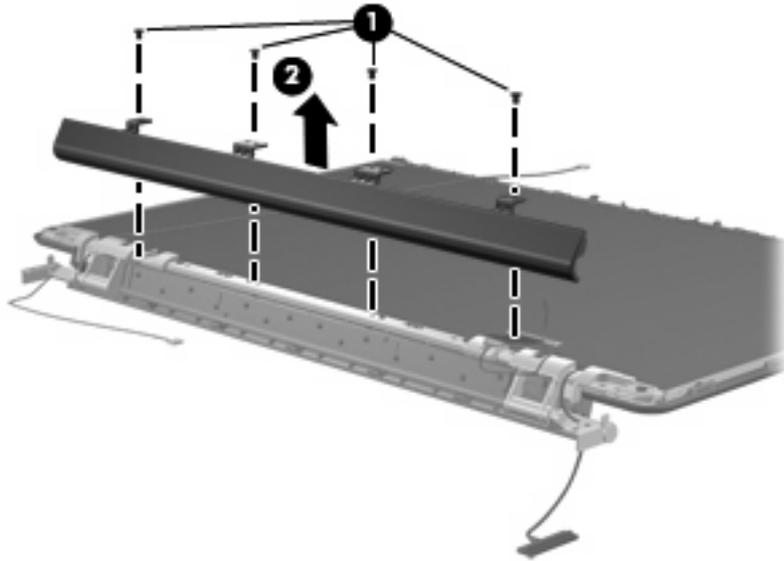
(2) Four Phillips PM2.5×7.0 screws.



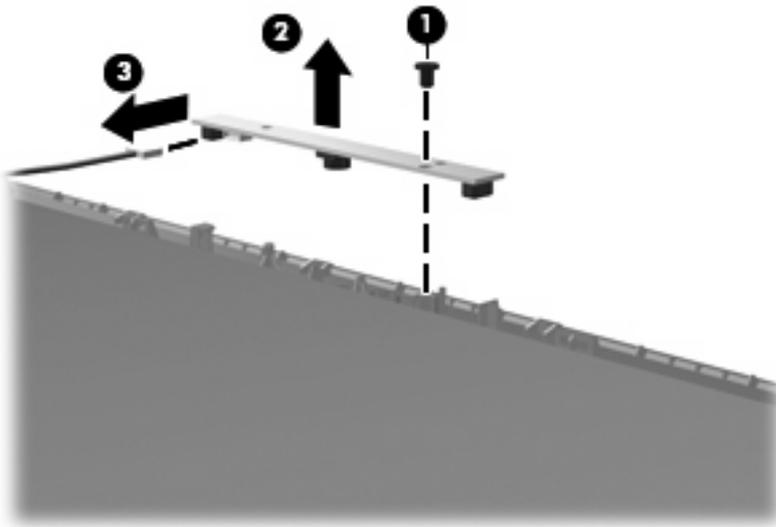
6. Turn the display assembly upside down, with the bottom toward you.
7. Lift and release the bottom of the display enclosure (1).
8. Disconnect the display logo cable (2) from the display panel cable.
9. Route the webcam cable and antenna cables (3) through the hinge channel.
10. Remove the display enclosure (4). The display enclosure is available using spare part number 516443-001, and includes the display logo LED board and the wireless antenna transceivers and cables.



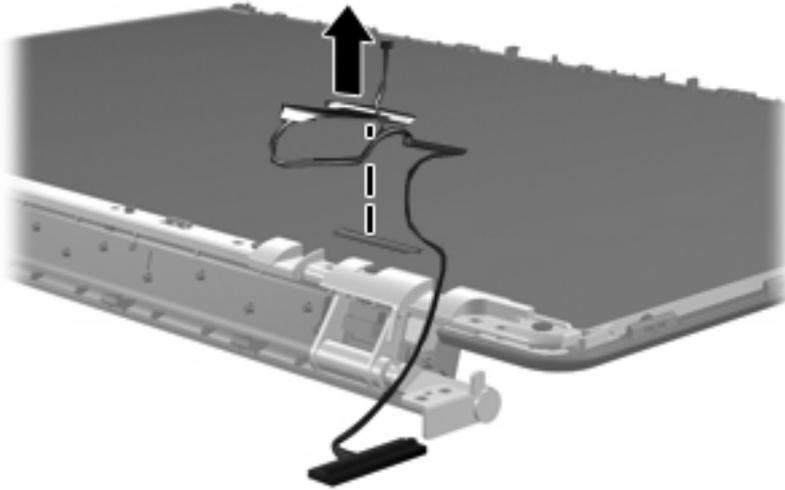
11. If it is necessary to remove the hinge cover, remove the four Phillips PM2.5×5.0 screws **(1)** that secure the hinge cover to the display assembly, and then remove the cover **(2)**. The hinge cover is available using spare part number 537844-001.



12. If it is necessary to replace the webcam/microphone module, remove the Phillips PM2.0×4.0 screw **(1)** that secures the module to the display bezel.
13. Release the webcam/microphone module **(2)** as far as the webcam/microphone module cable allows.
14. Disconnect the webcam/microphone module cable **(3)** and remove the webcam/microphone module. The webcam/microphone module is available using spare part number 516312-001.

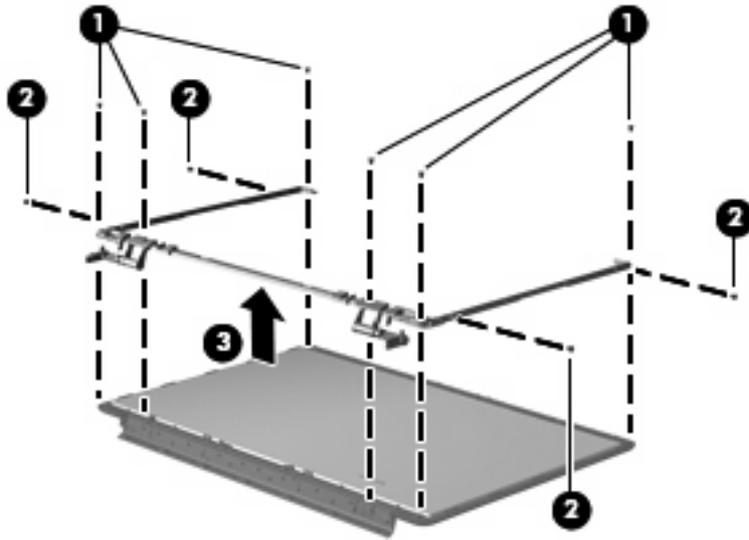


15. Disconnect the display panel cable from the display panel. The display panel cable is available using spare part number 516307-001.

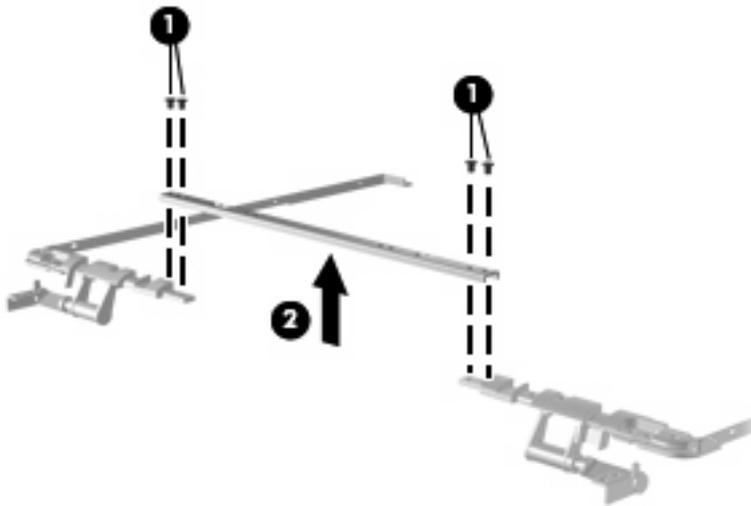


16. If it is necessary to replace the display hinges, remove the six Phillips PM2.5×4.0 screws **(1)** that secure the display hinges to the top of the display panel.
17. Remove the four Phillips PM 2.0×3.0 screws that secure the hinges to the sides of the display panel **(2)**.

18. Remove the display hinge assembly (3) by lifting it straight up. The display hinges are available using spare part number 516444-001. The display screw kit is available using spare part kit 531764-001.



The left and right sides of the display hinge assembly are secured using four PM 2.5x4.0 screws (1) to a bracket (2) as shown in the following image.

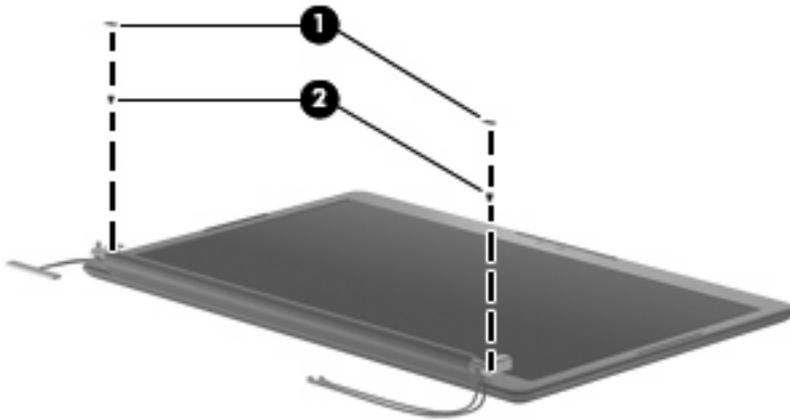


**NOTE:** Steps 19 through 28 provide display assembly internal component removal information for computer models equipped with BrightView display assemblies. See steps 5 through 18 for display assembly internal component removal information for computer models equipped with flush glass display assemblies.

19. If it is necessary to replace the display bezel or any of the display assembly internal components, remove the following screw covers and screws:

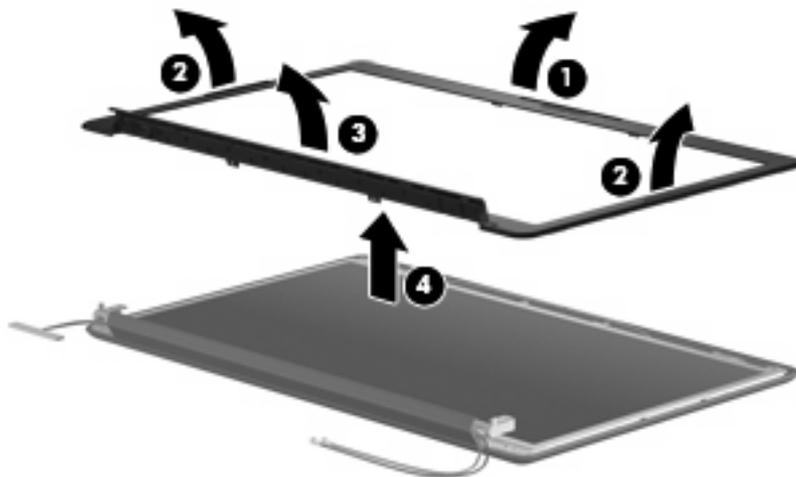
(1) Two rubber screw covers on the display bezel bottom edge. The display rubber screw covers are included in the Display Rubber Kit, spare part number 516308-001.

(2) Two Phillips PM2.5×6.5 screws



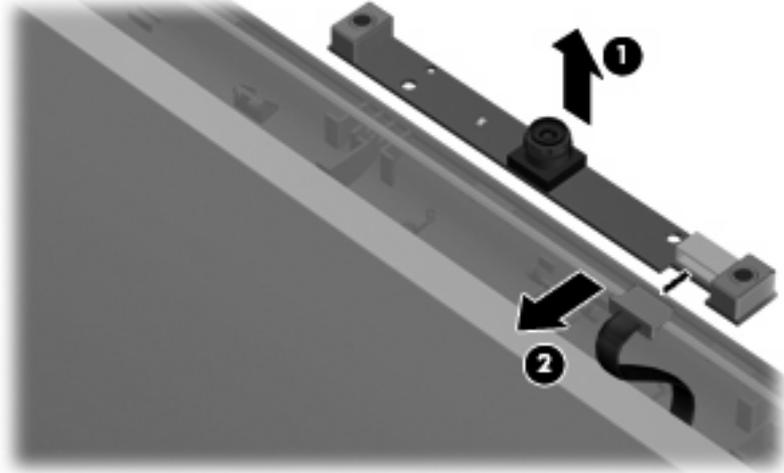
20. Flex the inside edges of the top edge (1), the left and right sides (2), and the bottom edge of the display bezel (3) until the bezel disengages from the display enclosure.

21. Remove the display bezel (4). The display bezel is available using the spare part number 516305-001.

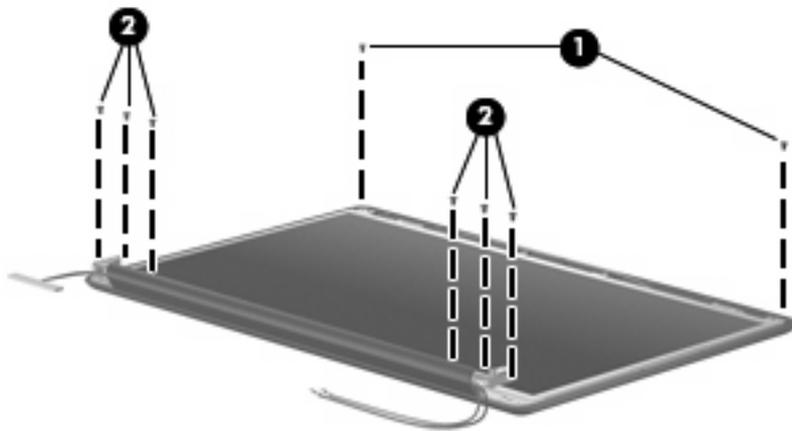


22. If it is necessary to replace webcam/microphone module, release the module from the display bezel (1) as far as the webcam/microphone module cable allows.

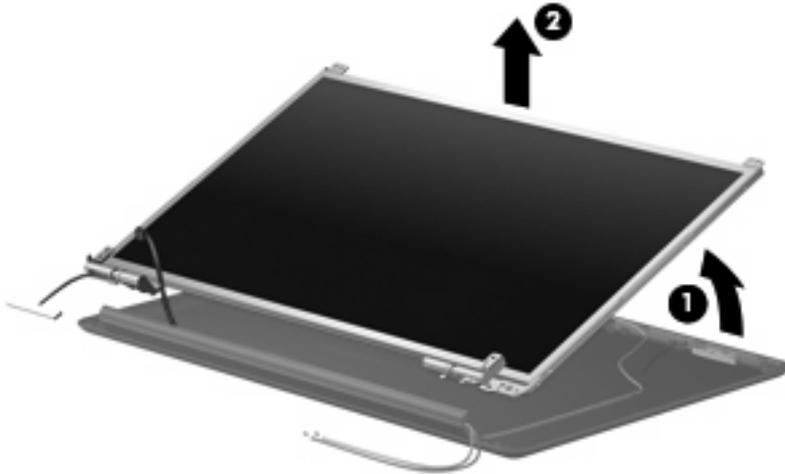
23. Disconnect the webcam/microphone module cable (2) and remove the webcam/microphone module. The webcam/microphone module is available using spare part number 516312-001.



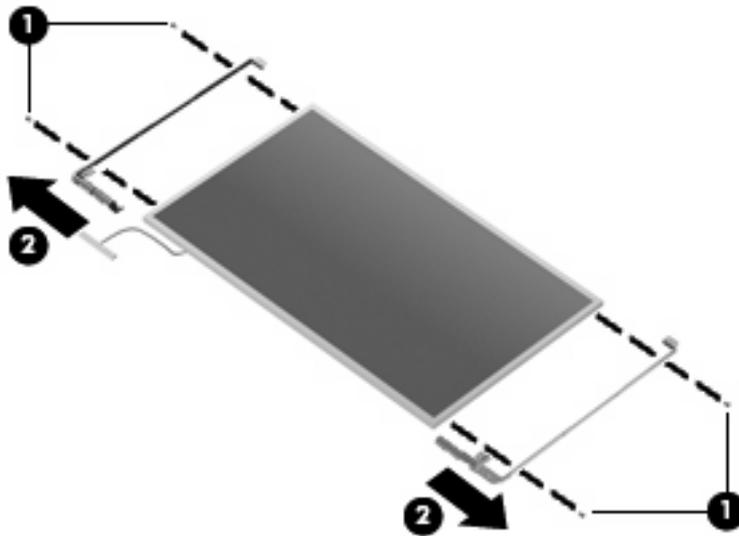
24. If it is necessary to replace the display panel, remove the two Phillips PM2.5×5.0 screws (1) from the top corners and the six Phillips PM2.5×5.0 screws (2) from the display hinges. The display panel is available using spare part number 516303-001.



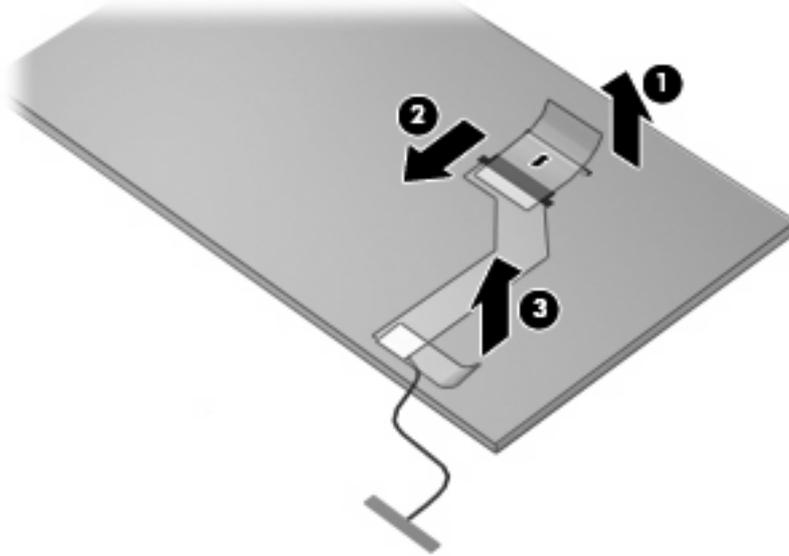
25. Flex the bottom of the display panel (1) back and release the display hinges. Remove the display panel (2).



26. If it is necessary to replace the display hinges, remove the four Phillips PM2.0×3.0 screws (1) that secure each display hinge to the display panel.
27. Remove the display hinges (2). The display hinges are available in the Display Hinge Bracket Kit, spare part 516306-001. The display hinge screws are available in the Display Screw Kit, spare part number 516309-001.



28. If it is necessary to remove the display panel cable, remove the adhesive plastic strip (1) from the display panel cable, and lift up the display panel cable (2). Remove the tape (3) that secures the cable to the display panel. The display panel cable is available using spare part number 516307-001.



Reverse this procedure to reassemble and install the display assembly.

## Top cover

Description	Spare part number
For use only with white computer models equipped with a fingerprint reader; includes fingerprint reader board	516299-001
For use only with white computer models not equipped with a fingerprint reader	516360-001
For use only with black computer models equipped with a fingerprint reader; includes fingerprint reader board	519267-001
For use only with black computer models not equipped with a fingerprint reader	519268-001

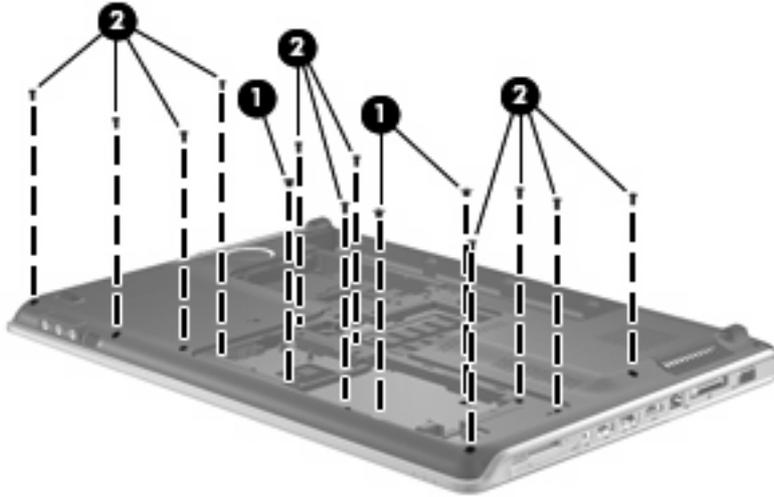
Before removing the top cover, follow these steps:

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#))
  - b. Optical drive (see [Optical drive on page 44](#))
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#))
  - d. Speaker assembly (see [Speaker assembly on page 62](#))
  - e. Display assembly (see [Display assembly on page 64](#))

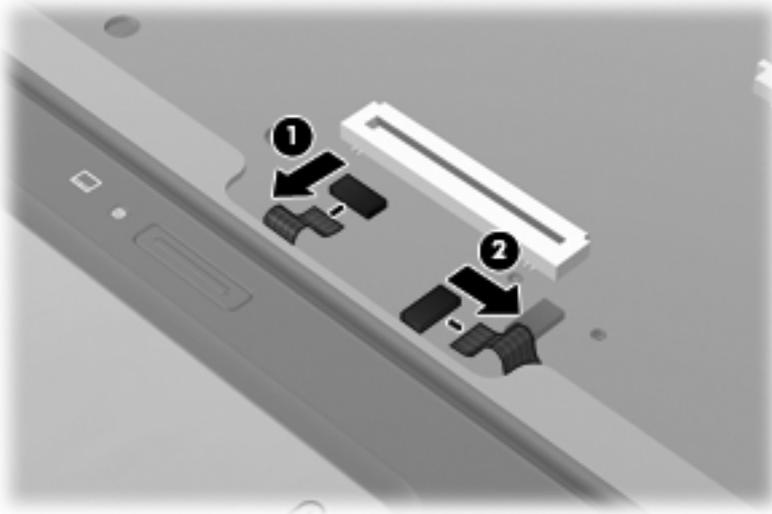
Remove the top cover:

1. Turn the computer upside down, with the front toward you.

2. Remove the 3 Phillips 2.5×4.0 silver broadhead screws (1) and 11 Phillips PM2.5×7.0 screws (2) that secure the top cover to the bottom of the computer.



3. Disconnect the following cables from the system board:
  - (1) TouchPad board cable
  - (2) Fingerprint reader board cable

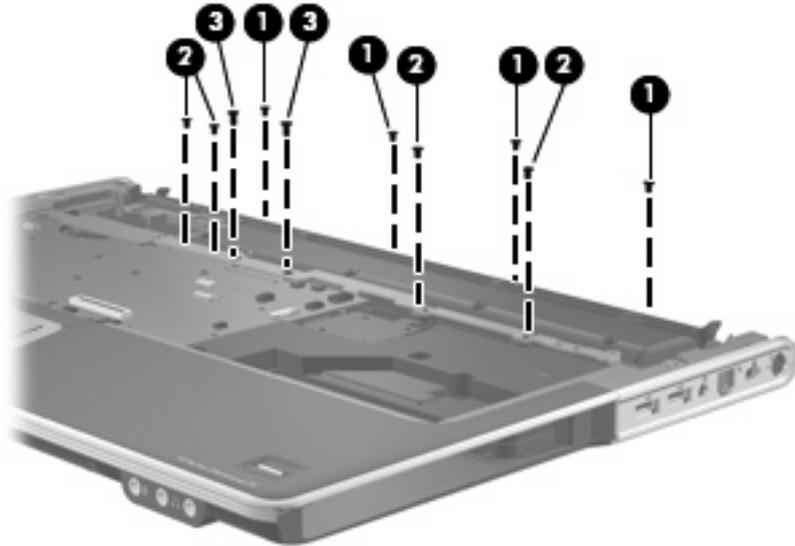


4. Remove the following screws that secure the top cover to the computer:

(1) 4 black PM2.0×4.0 screws

(2) 4 silver PM2.0×4.0 screws

(3) 2 black PM2.5×7.0 screws



5. Remove the top cover by lifting it straight up.

Reverse this procedure to install the top cover.

## Modem module

 **NOTE:** The modem module spare part kits do not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 516328-001.

Description	Spare part number
Modem module for use in all countries and regions except Australia and New Zealand	461749-001
For use only in Australia and New Zealand	461749-011

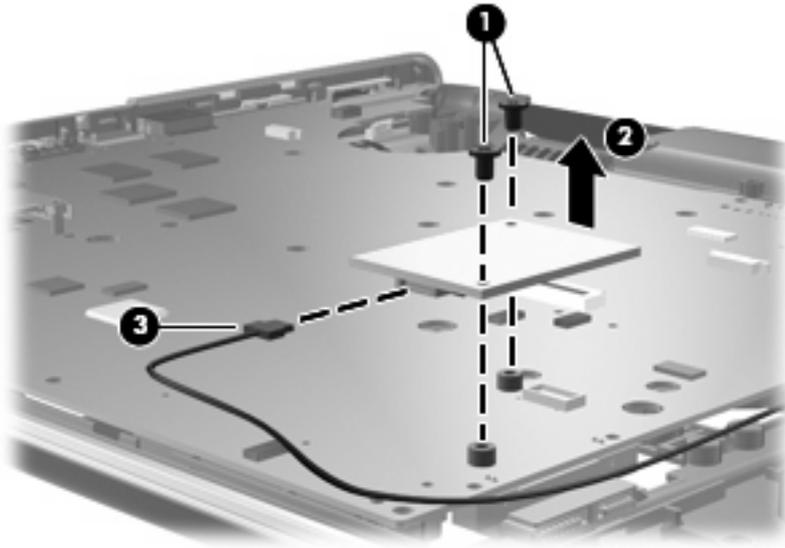
Before removing the modem module, follow these steps:

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).

Remove the modem module:

1. Remove the two Phillips PM2.5×3.0 screws **(1)** that secure the modem module to the system board.
2. Lift the modem module **(2)**.

3. Disconnect the modem module cable (3) and remove the modem module from the system board.



Reverse this procedure to install the modem module.

## System board

 **NOTE:** The system board spare kit includes replacement thermal material.

Description	Spare part number
System board with ATI Mobility Radeon HD 4650 discrete graphics subsystem and 1-GB of dedicated memory	516294-001
System board with ATI Mobility Radeon HD 4650 discrete graphics subsystem and 1-GB of dedicated memory	516293-001
System board with ATI Mobility Radeon HD 4530 discrete graphics subsystem and 512-MB of dedicated memory	516292-001
System board with Intel GMA 4700MHD UMA graphics subsystem and shared memory	516291-001
System board bracket	516334-001

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#))
  - b. Optical drive (see [Optical drive on page 44](#))
  - c. Switch cover (see [Switch cover and keyboard on page 57](#))
  - d. Speaker assembly (see [Speaker assembly on page 62](#))
  - e. Display assembly (see [Display assembly on page 64](#))
  - f. Top cover (see [Top cover on page 74](#))

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:

- TV tuner module (see [TV tuner module on page 55](#))
- RTC battery (see [RTC battery on page 53](#))
- Memory module (see [Memory module on page 54](#))
- WLAN module (see [Bluetooth module on page 63](#))
- Modem module (see [Modem module on page 77](#))

- Fan/heat sink assembly (see [System board on page 79](#))
- Processor (see [System board on page 79](#))

Remove the system board:

1. Disconnect the following cables from the system board:

(1) Audio/infrared board cable

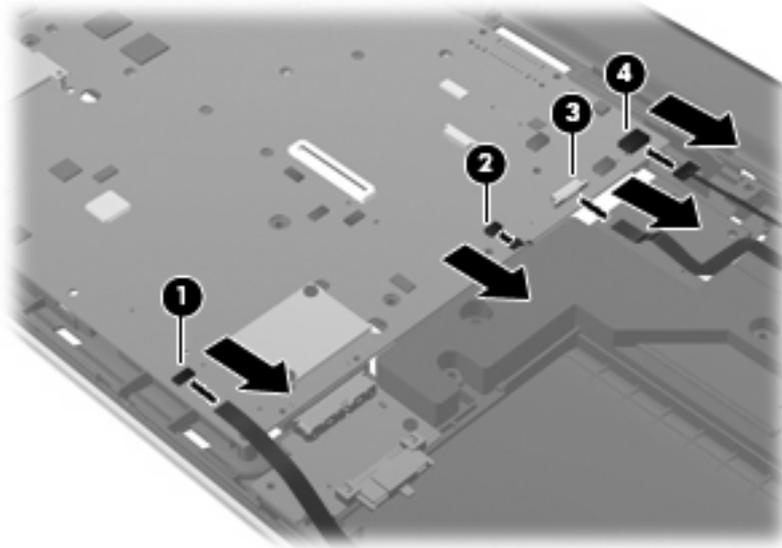
 **NOTE:** The audio/infrared board cable connects to a LIF connector on the system board.

(2) Subwoofer cable

(3) USB board cable

 **NOTE:** The USB board cable connects to a LIF connector on the system board.

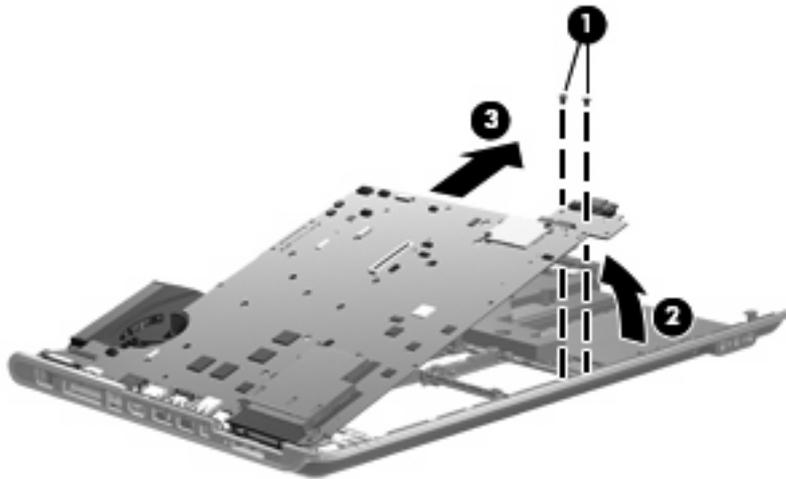
(4) Power connector cable



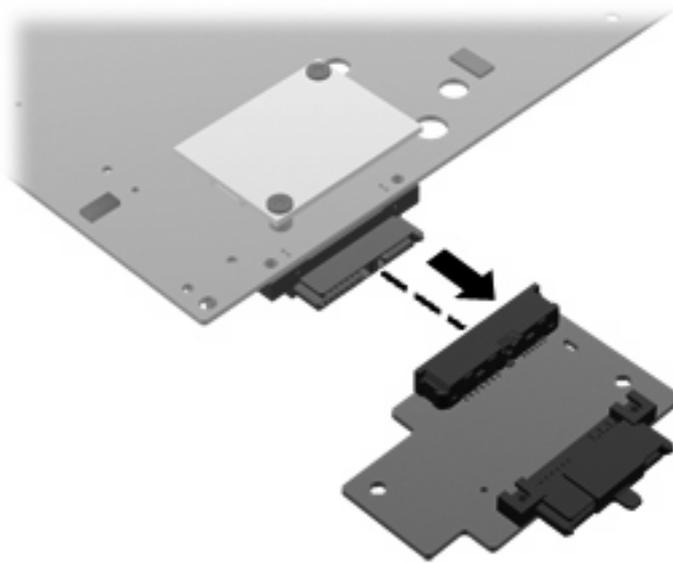
2. Disconnect the hard drive connector cables from the system board.



3. Remove the two Phillips PM2.5×5.0 screws (1) that secure the system board to the base enclosure.
4. Lift up on the right side of the system board until it is at approximately a 45-degree angle (2), and then lift the system board to the right and up and out of the base enclosure (3).



5. If it is necessary to remove the optical drive board from the system board, pull the optical drive board straight off the system board. The optical drive board is available using spare part number 519481-001 for computers with discrete graphics and 535805-001 for computers with UMA graphics.



Reverse this procedure to install the system board.

## Audio/infrared board

Description	Spare part number
Audio/infrared board for use in computers with discrete graphics subsystems (includes cable)	516330-001
Audio/infrared board for use in computers with UMA graphics subsystems (includes cable)	518166-001

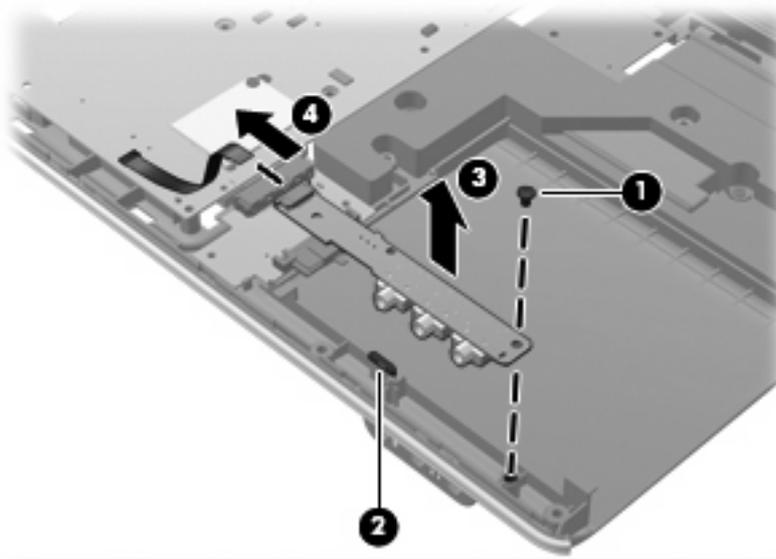
Before removing the audio/infrared board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power 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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).

- e. Display assembly (see [Display assembly on page 64](#)).
- f. Top cover (see [Top cover on page 74](#)).

Remove the audio/infrared board:

1. Remove the Phillips PM2.5×5.0 screw (1) that secures the audio/infrared board to the base enclosure.
2. Release the audio/infrared board cable from the clip (2) built into the base enclosure.
3. Lift the audio/infrared board (3) straight up.
4. Disconnect the audio/infrared board cable from the system board (4), and then remove the audio-infrared board from the base enclosure.



Reverse this procedure to install the audio/infrared board.

## USB board

Description	Spare part number
USB board for use in computers with discrete graphics subsystems (includes cable)	516332-001
USB board for use in computers with UMA graphics subsystems (includes cable)	518168-001

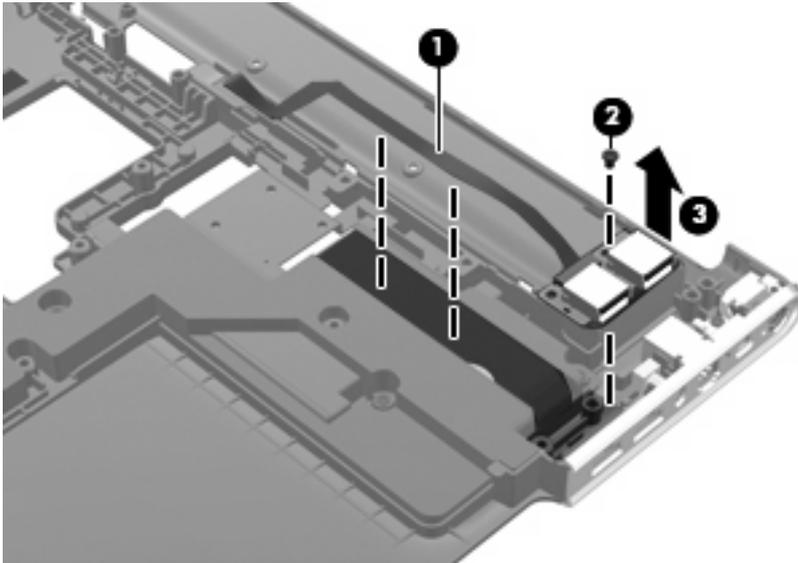
Before removing the USB board, follow these steps:

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).

Remove the USB board:

1. Disconnect the USB board cable (1) from the LIF connector on the system board.
2. Remove the Phillips PM2.5×5.0 screw (2) that secures the USB board to the base enclosure.
3. Remove the USB board (3) from the base enclosure.



Reverse this procedure to install the USB board.

## Subwoofer

Description	Spare part number
Subwoofer	516333-001

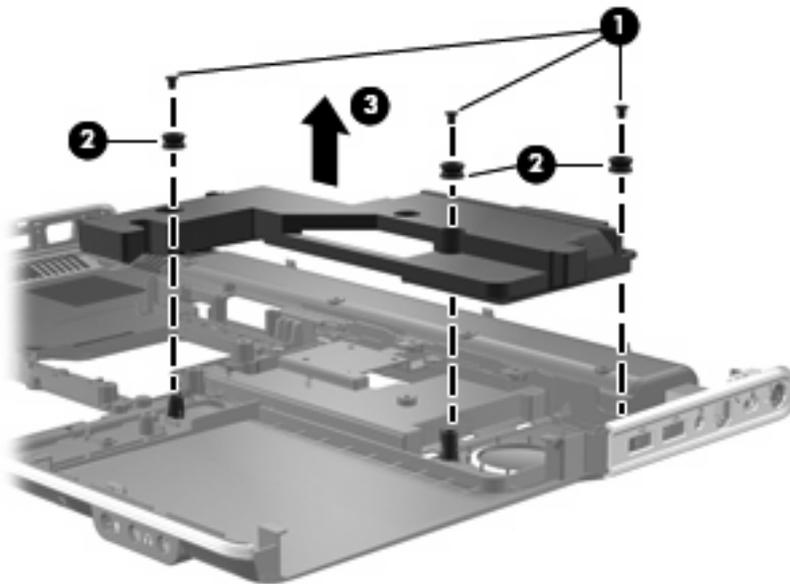
Before removing the subwoofer, follow these steps:

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).
  - g. USB board (see [USB board on page 83](#)).

Remove the Subwoofer:

1. Remove the three Phillips PM2.5×5.0 broadhead screws (1) that secure the subwoofer to the base enclosure.
2. Ensure the rubber grommets (2) that contained the broadhead screws are still in place.
3. Remove the subwoofer (3).



Reverse this procedure to install the subwoofer.

## TV tuner module cable

 **NOTE:** The TV tuner module cable is available in the Cable Kit, spare part number 516328-001.

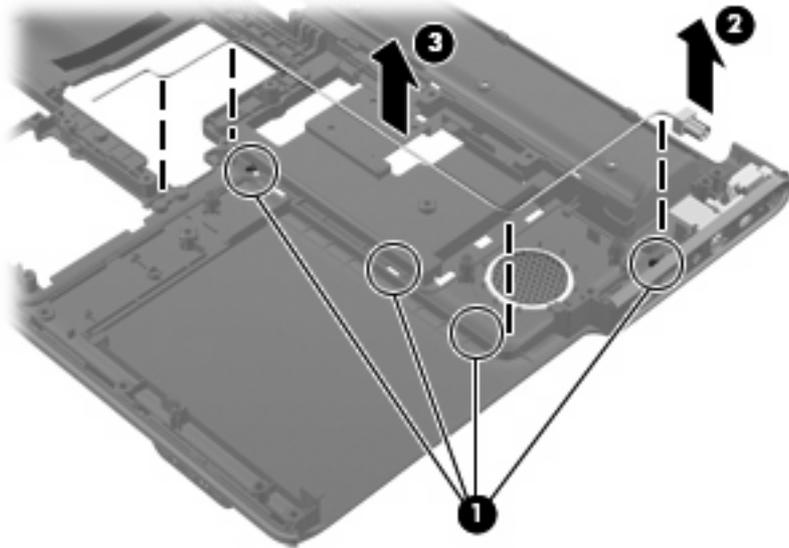
Before removing the TV tuner module cable, follow these steps:

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).
  - g. USB board (see [USB board on page 83](#)).
  - h. System board (see [System board on page 79](#)).

Remove the TV tuner module cable:

1. Remove the TV tuner module cable from the clips **(1)** built into the base enclosure.
2. Remove the TV tuner module connector **(2)** from the clip built into the side of the base enclosure.

3. Remove the assembly from the enclosure (3).



Reverse this procedure to install the TV tuner module cable.

## Modem module cable

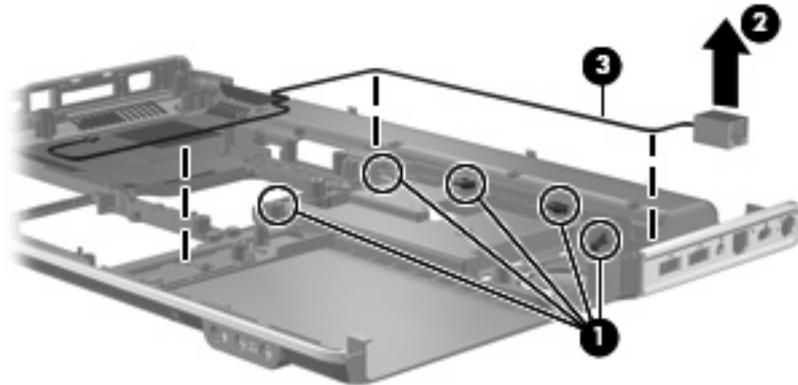
 **NOTE:** The modem module cable is available in the Cable Kit, spare part number 516328-001. The modem module cable includes the RJ-11 jack.

Before removing the modem module cable, 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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).
  - g. USB board (see [USB board on page 83](#)).
  - h. System board (see [System board on page 79](#)).

Remove the modem module cable:

1. Release the cable from the clips **(1)** built into the base enclosure.
2. Remove the RJ-11 jack **(2)** from the clip built into the base enclosure.
3. Remove the assembly from the base enclosure **(3)**.



Reverse this procedure to install the modem module cable.

## Power connector cable

Description	Spare part number
Power connector cable	536857-001

 **NOTE:** The power connector cable is available in the Cable Kit, spare part number 501891-001.

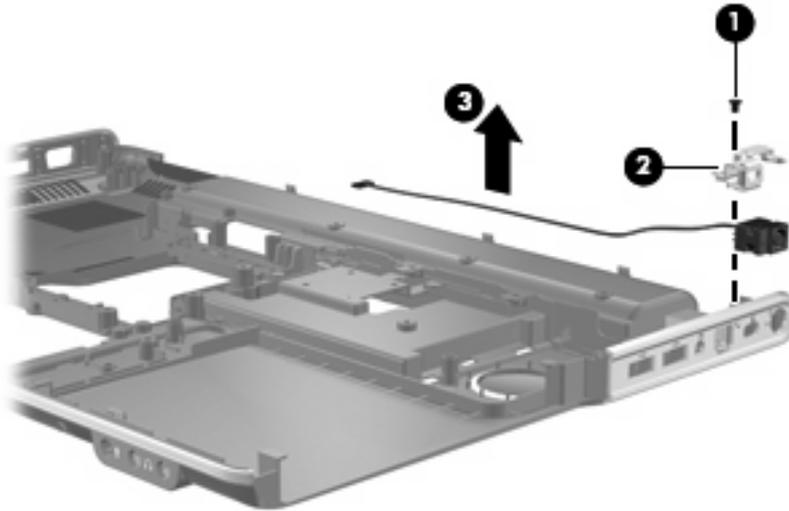
Before removing the power connector cable, follow these steps:

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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).

- g. USB board (see [USB board on page 83](#)).
- h. System board (see [System board on page 79](#)).

Remove the power connector cable:

1. Remove the Phillips PM2.5×7.0 screw (1) that secures the power connector and bracket (2) to the base enclosure.
2. Remove the power connector cable (3).



Reverse this procedure to install the power connector cable.

## Fan/heat sink assembly

 **NOTE:** The fan/heat sink assembly spare kit includes replacement thermal material.

Description	Spare part number
For use only with computer models equipped with graphics subsystems with discrete memory	516876-001
For use only with computer models equipped with graphics subsystems with UMA memory	516331-001

 **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 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).
  - g. USB board (see [USB board on page 83](#)).
  - h. System board (see [System board on page 79](#)).

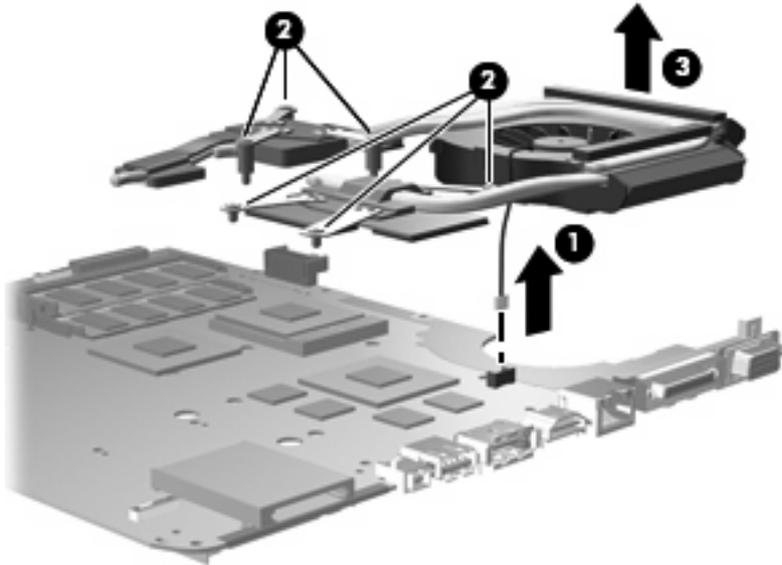
Remove the fan/heat sink assembly:

 **NOTE:** Steps 1 through 4 apply only to models with discrete subsystem memory on the system board. See steps 5 through 8 apply only to models with UMA subsystem memory on the system board.

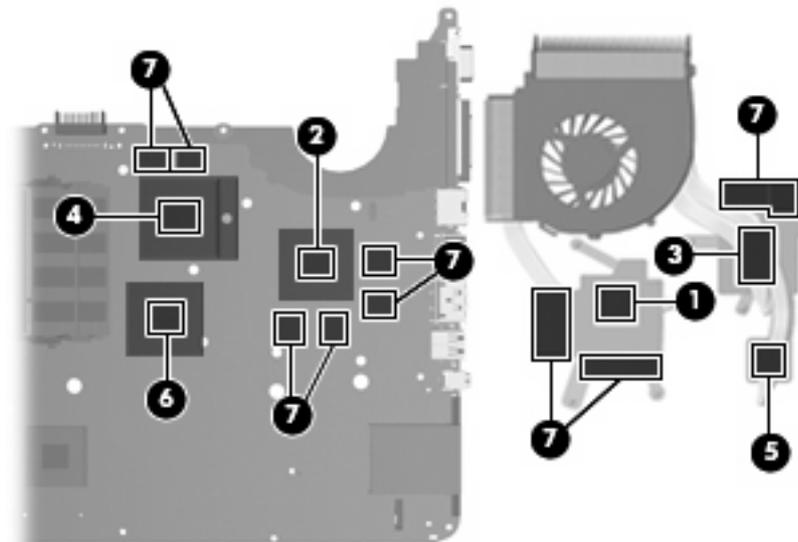
1. Turn the system board upside down, with the expansion port and external monitor port toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Loosen the six Phillips captive screws **(2)** that secure the fan/heat sink assembly to the system board.

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

 **NOTE:** Due to the adhesive quality of the thermal 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.



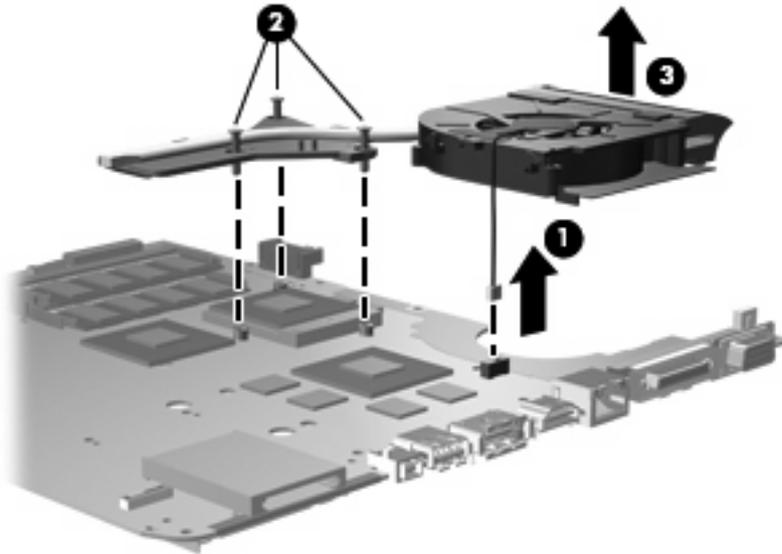
 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is used on the processor (1) and the heat sink section (2) that services it. Thermal pads are used on the Northbridge chip (3) and Northbridge contact (4), the graphics subsystem chip (5) and graphics/heat sink contact (6) and various capacitors and their contacts (7). Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



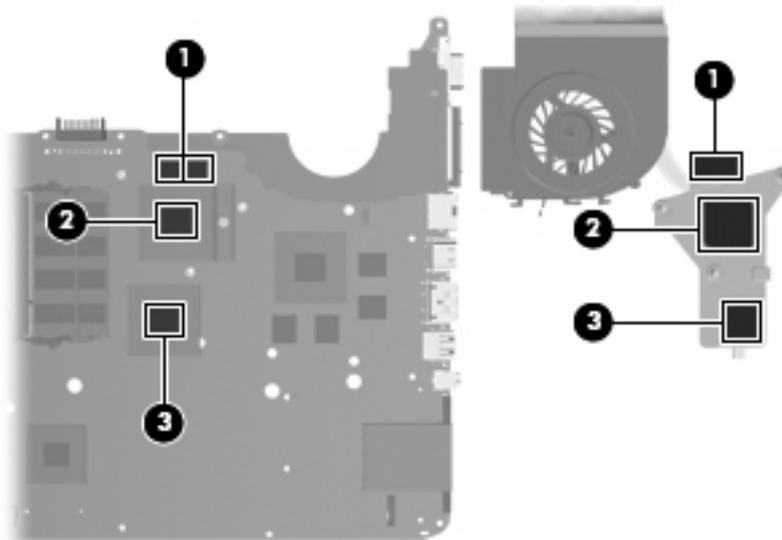
5. Turn the system board upside down, with the expansion port and external monitor port toward you.
6. Disconnect the fan cable (1) from the system board.
7. Loosen the three Phillips captive screws (2) that secure the fan/heat sink assembly to the system board.

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

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



The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is used on capacitors and their contacts (1), on the processor and contact (2), and on the Northbridge chip and contact (3).



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

## Processor

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

Description	Spare part number
Intel Core™2 Quad Q9100 2.26-GHz with 12-MB L2 cache and 1066-MHz FSB	507947-001
Intel Core2 Quad Q9000 2.00-GHz with 12-MB L2 cache and 1066-MHz FSB	507948-001
Intel Core2 Duo T9800 2.93-GHz with 6-MB L2 cache and 1066-MHz FSB	507951-001
Intel Core2 Duo T9550 2.66-GHz with 6-MB L2 cache and 1066-MHz FSB	507953-001
Intel Core2 Duo P8700 2.53-GHz with 3-MB L2 cache and 1066-MHz FSB	507960-001
Intel Core2 Duo P8600 2.40-GHz with 3-MB L2 cache and 1066-MHz FSB	507963-001
Intel Core2 Duo P7450 2.13-GHz with 3-MB L2 cache and 1066-MHz FSB	507965-001
Intel Core2 Duo T6600 2.20-GHz with 2-MB L2 cache and 800-MHz FSB	513593-001
Intel Core2 Duo T6400 2.00-GHz with 2-MB L2 cache and 800-MHz FSB	513592-001
Intel Pentium Dual Core T4200 2.00-GHz with 1-MB L2 cache and 800-MHz FSB	513599-001

Before removing the processor, follow these steps:

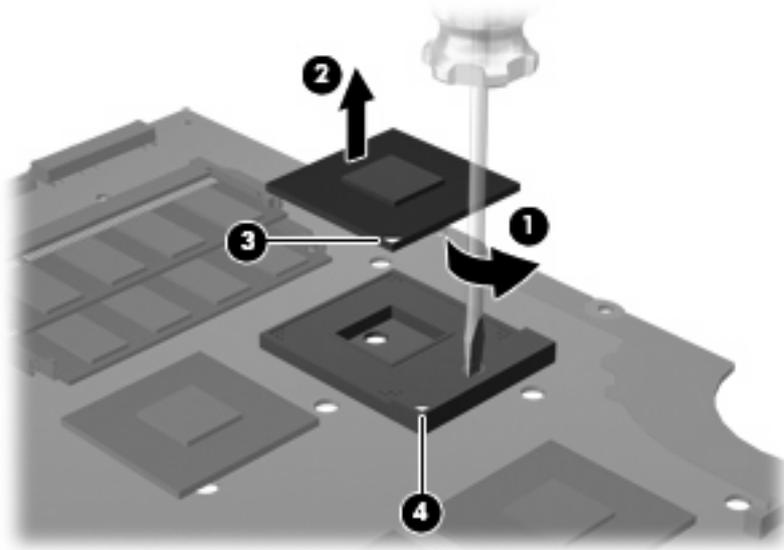
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 43](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 48](#)).
  - b. Optical drive (see [Optical drive on page 44](#)).
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 57](#)).
  - d. Speaker assembly (see [Speaker assembly on page 62](#)).
  - e. Display assembly (see [Display assembly on page 64](#)).
  - f. Top cover (see [Top cover on page 74](#)).
  - g. USB board (see [USB board on page 83](#)).
  - h. System board (see [System board on page 79](#)).
  - i. Fan/heat sink assembly (see [Fan/heat sink assembly on page 89](#)).

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:** When you install the processor, the gold triangle (3) on the processor must be aligned with the triangle icon (4) embossed on the processor socket.



Reverse this procedure to install the processor.

---

# 5 Setup Utility

---

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

---

## Starting the Setup Utility

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

---

**📝 NOTE:** The fingerprint reader (select models only) cannot be used to access the Setup Utility.

---

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

To start the Setup Utility:

- Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

1. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**.
2. When the Startup Menu is displayed, press **f10**.

# Using the Setup Utility

## 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. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Use the arrow keys to select a language, and then press **enter**.
4. When a confirmation prompt with your language selected is displayed, press **enter**.
5. To save your change and exit the Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your change goes into effect immediately.

## Display 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. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Select the **Main** menu. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit the Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## 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. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Use the arrow keys to select **Exit > Load Setup Defaults**, and then press **enter**.
3. When the Setup Confirmation is displayed, press **enter**.
4. To save your change and exit the Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

The Setup Utility default settings go into effect when the computer restarts.

---

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

---

## Exiting the Setup Utility

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

- To exit the Setup Utility and save 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 Saving Changes**, and then press **enter**.

- To exit 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 either choice, 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 chapter 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.
Button Sound (select models only)	Enable/disable the capacitive button tapping sound.
Virtualization Technology	Enable/disable the processor Virtualization Technology.
Processor C4 State (select models only)	Enable/disable the processor C4 sleep state.
LAN Power Saving (select models only)	Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode.
Card Reader/1394 Power Saving (select models only)	Enable/disable Card Reader/1394 Power Saving. When enabled, saves power when the computer is in DC mode.

Select	To do this
Fan Always On	Enabled/disable Fan Always On. When enabled, the computer fan will always be on.
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none"> <li>• f9 and f10 Delay (sec.)—Set the delay for the f9 and f10 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 diskette.</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>◦ Internal 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>

## 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 with two hard drives, this menu option is called the Primary Hard Disk Self Test.</p>
Secondary Hard Disk Self Test (select models only)	Run a comprehensive self-test on a secondary hard drive.
Memory Test	Run a diagnostic test on the system memory.

# 6 Specifications

## Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Width	46.60 cm	18.35 in
Depth	30.90 cm	12.16 in
Height (front to back)	3.90 to 4.70 cm	1.53 to 1.85 in
<b>Weight</b> (with optical drive, hard drive, and battery)	3.75 kg	8.26 lbs
Second hard drive adds:	0.13 kg	0.28 lbs
Camera adds:	0.009 kg	0.02 lbs
<b>Input power</b>		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
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	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
<b>NOTE:</b> Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

## 17.3-inch, HD+ flush glass AntiGlare display specifications

	Metric	U.S.
<b>Dimensions</b>		
Height	20.7 cm	12.15 in
Width	33.1 cm	17.03 in
Diagonal	43.9 cm	17.29 in
<b>Number of colors</b>	Up to 16.8 million	
<b>Contrast ratio</b>	200:1 (typical)	
<b>Brightness</b>	180 nits (typical)	
<b>Pixel resolution</b>		
Pitch	0.197 × 0.197 mm	
Format	1600 × 900	
Configuration	RGB vertical stripe	
<b>Backlight</b>	LED	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	2 W	
<b>Viewing angle</b>	+/-65° horizontal, +/-50° vertical (typical)	

## 17.3-inch HD+ BrightView display specifications

	Metric	U.S.
<b>Dimensions</b>		
Height	30.7 cm	12.15 in
Width	43.1 cm	17.03 in
Diagonal	43.9 cm	17.29 in
<b>Number of colors</b>	Up to 16.8 million	
<b>Contrast ratio</b>	200:1	
<b>Brightness</b>	150 nits typical	
<b>Pitch resolution</b>		
Pitch	0.259 × 0.259 mm	
Format	1600 × 900	
Configuration	RGB vertical stripe	
<b>Backlight</b>	LED	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	2 W	
<b>Viewing angle</b>	+/-65° horizontal, +/-50° vertical typical	

## Hard drive specifications

	500-GB*	320-GB*	250-GB*
<b>Dimensions</b>			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g
<b>Interface type</b>	ATA-7	ATA-7	ATA-7
<b>Transfer rate</b>			
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
<b>Logical blocks</b>	1,048,576,000	625,141,400	488,397,168
<b>Disc rotational speed</b>	5400-rpm	5400-rpm	5400-rpm
<b>Operating temperature</b>	5°C to 55°C (41°F to 131°F)		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.			

## Blu-ray ROM DVD±R/RW SuperMulti DL Drive

Applicable disc	Read:	Write:	
	CD-DA, CD+(E)G, CD-MIDI, CDTEXT, 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, DVDROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM, HD-ROM (Single Layer), HD-ROM (Dual Layer), HD DVD-R, HD DVD-R for Dual Layer, HD DVD-RW	CD-R and CD-RW DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9),DVD-RW, DVD-RAM	
Access time	CD	DVD	HD
Random	170 ms	170 ms	230 ms
Cache buffer	8 MB		
Data transfer rate			
24X CD-ROM	3,600 KB/sec		
8X DVD	10,800 KB/sec		
24X CD-R	3,600 KB/sec		
16X CD-RW	2,400 KB/sec		
8X DVD+R	10,800 KB/sec		
4X DVD+RW	5,400 KB/sec		
8X DVD-R	10,800 KB/sec		
4X DVD-RW	5,400 KB/sec		
2.4X DVD+R(9)	2,700 KB/sec		
5X DVD-RAM	6,750 KB/sec		
1X BD-ROM	4,500 KB/sec		
1X BD-R read	4,500 KB/sec		
1X BD-RE read	4,500 KB/sec		
Transfer mode	Multiword DMA Mode		

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

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, 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	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	

## System DMA specifications

Hardware DMA	System function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable

<b>Hardware DMA</b>	<b>System function</b>
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 configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

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

## System I/O address specifications

I/O address (hex)	System function (shipping configuration)
00-1F	DMA Controller Channel 0-3
CF7	PCI Bus on MS ACPI-Compliant System
20 - 21	Programmable Interrupt Controller (Master Controller)
24 - 25	Programmable Interrupt Controller (Aliases)
28 - 29	Programmable Interrupt Controller (Aliases)
2C - 2D	Programmable Interrupt Controller (Aliases)
2E -2F	M/B Resource (LPC Controller)
30 - 31	Programmable Interrupt Controller (Aliases)
34 - 35	Programmable Interrupt Controller (Aliases)
38 - 39	Programmable Interrupt Controller (Aliases)
3C - 3D	Programmable Interrupt Controller (Aliases)
40 - 43	System Timer
4E - 4F	M/B Resource (LPC Controller)
50 - 53	System Timer
60	EC
61	LPC
62	EC
63	LPC
64	EC
65	LPC
66	EC
67	LPC
70 - 77	System CMOS/Real Time Clock
81 - 91	DMA Controller Channel 2
92	LPC
A0 - A1	Programmable Interrupt Controller (Slave Controller)
A4 - A5	Programmable Interrupt Controller (Aliases)
A8 - A9	Programmable Interrupt Controller (Aliases)
AC - AD	Programmable Interrupt Controller (Aliases)
B0 - B1	Programmable Interrupt Controller (Aliases)
B2 - B3	LPC
B4 - B5	Programmable Interrupt Controller (Aliases)
B8 - B9	Programmable Interrupt Controller (Aliases)

<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
BC - BD	Programmable Interrupt Controller (Aliases)
C0 - DF	DMA Controller Channel 4-7
F0	Numeric data processor
380 - 383	ENE CIR Receiver
384 - 38E	EC
3B0 - 3BB	VGA
3C0 - 3DF	VGA
400 - 47F	LPC
4D0 - 4D1	Programmable Interrupt Controller
500 - 53F	LPC
600 - 60F	LPC
610	LPC
800 - 80F	LPC
810 - 817	LPC
820 - 823	LPC
D00 - FFFF	PCI Bus on MS ACPI-Compliant System
164E - 164F	LPC
2000 - 2FFF	ICH9 Family PCI Express Root Port 6 (B0/D28/F5)
3000 - 3FFF	ICH9 Family PCI Express Root Port 5 (B0/D28/F4)
4000 - 4FFF	ICH9 Family PCI Express Root Port 4 (B0/D28/F3)
5000 - 50FF	Realtek RTL8168C/8111C PCI-E Gigabit Ethernet NIC (B3/D0/F0)
6000 - 6FFF	ICH9 Family PCI Express Root Port 1 (B0/D28/F0)
7000 - 70FF	VGA
7000 - 7FFF	PCI-E Root Port (B0/D1/F0)
8000 - 801F	SMBus Controller
8020 - 803F	SATA AHCI Controller - 2929
8040 - 805F	USB UHCI Controller - 2939
8060 - 807F	USB UHCI Controller - 2936
8080 - 809F	USB UHCI Controller - 2935
80A0 - 80BF	USB UHCI Controller - 2934
80C0 - 80DF	USB UHCI Controller - 3938
80E0 - 80FF	USB UHCI Controller - 2937
8100 - 8117	SATA AHCI Controller - 2929

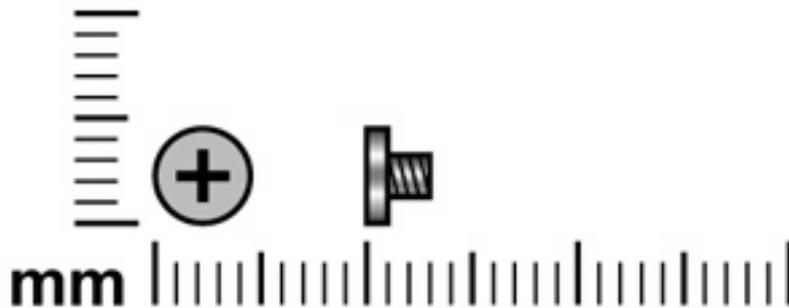
## System memory map specifications

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	000E8000-000FFFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFFF	Video memory (direct access)
4 GB	08200000-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

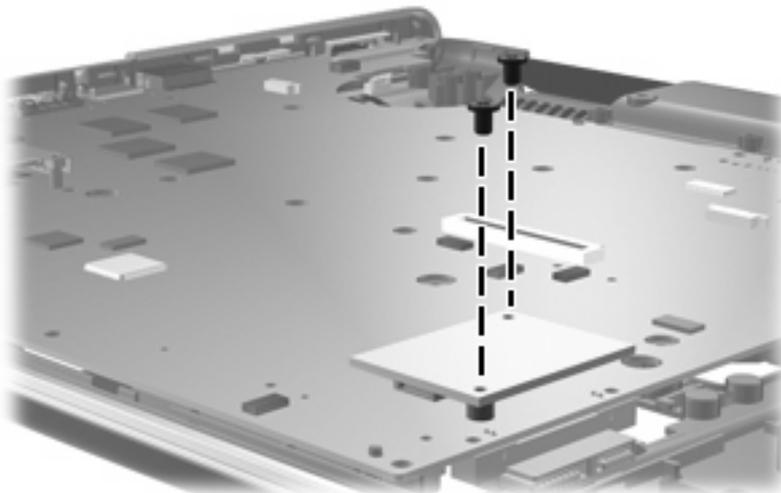
## 7 Screw listing

This section provides specification and reference information for the screws used in the computer. Screws listed in this section are available in the Screw Kit, spare part number 516327-001.

### Phillips PM2.5×3.0 screw (black)

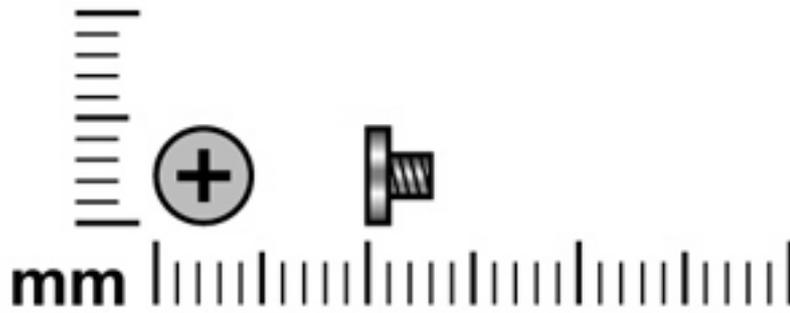


Color	Quantity	Length	Thread	Head diameter
Black	2	3.0 mm	2.5 mm	5.0 mm

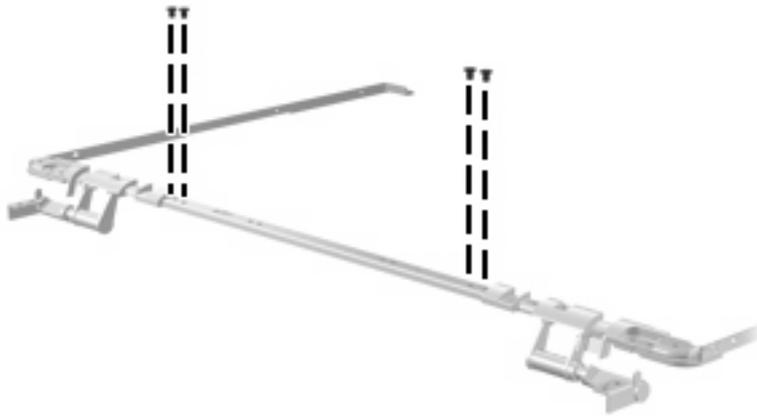


**Where used:** 2 screws that secure the modem to the system board

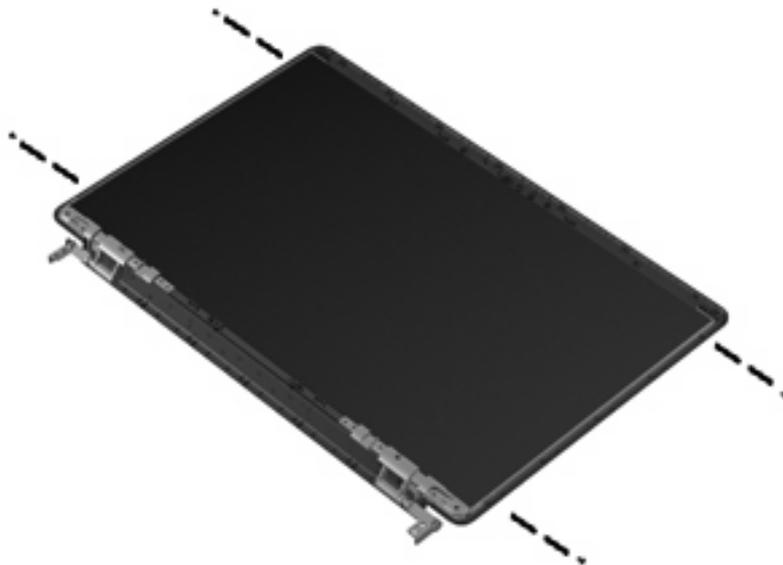
## Phillips PM2.5×3.0 screw (silver)



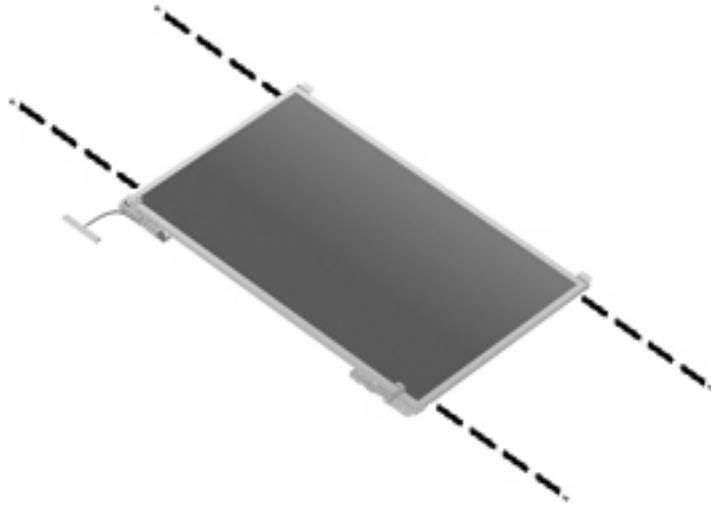
Color	Quantity	Length	Thread	Head diameter
Silver	12	3.0 mm	2.5 mm	5.0 mm



**Where used:** 4 screws that secure the display hinges to the hinge bracket on computer models equipped with flush glass display assemblies

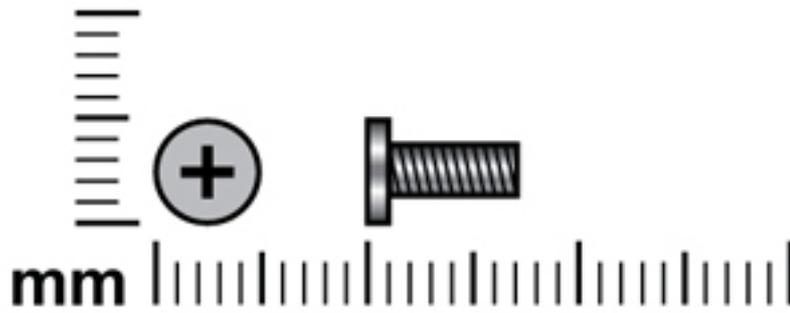


**Where used:** 4 screws that secure the display hinges to the display panel on computer models equipped with flush glass display assemblies



**Where used:** 4 screws that secure the display panel to the display enclosure on computer models equipped with BrightView display assemblies

## Phillips PM2.5×7.0 screw



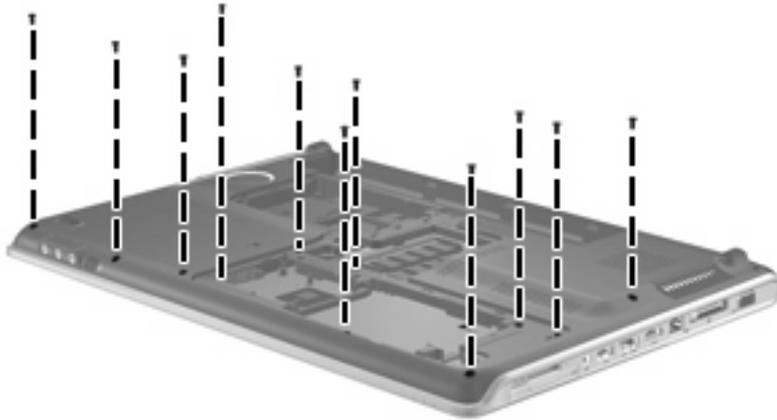
Color	Quantity	Length	Thread	Head diameter
Black	24	7.0 mm	2.5 mm	5.0 mm



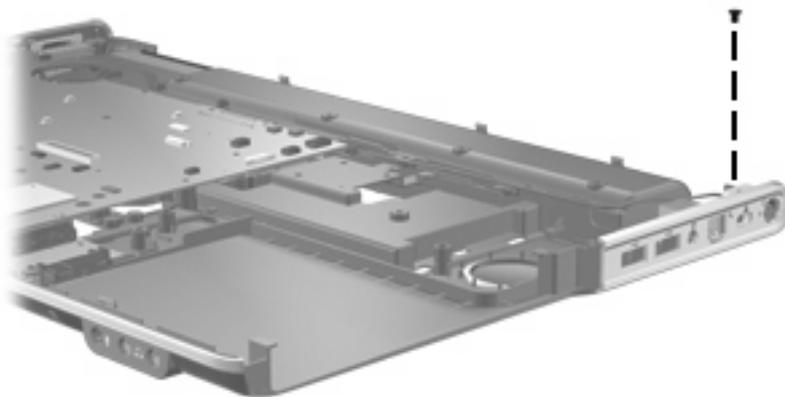
**Where used:** One screw that secures the optical drive to the computer



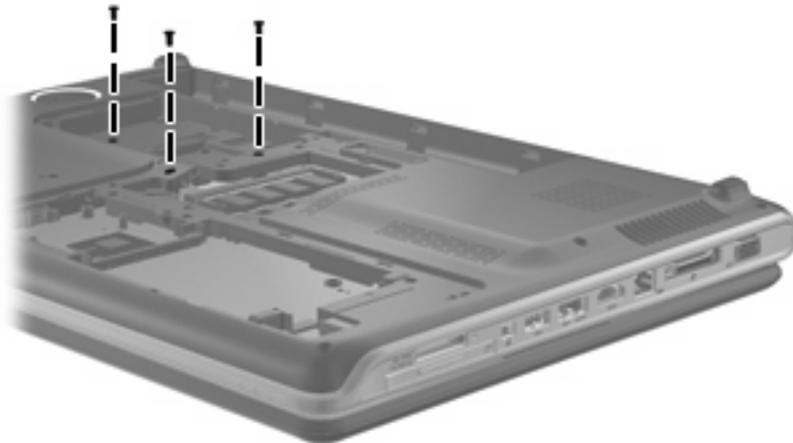
**Where used:** 4 screws that secure the display bezel to the display enclosure on computer models equipped with flush glass display assemblies



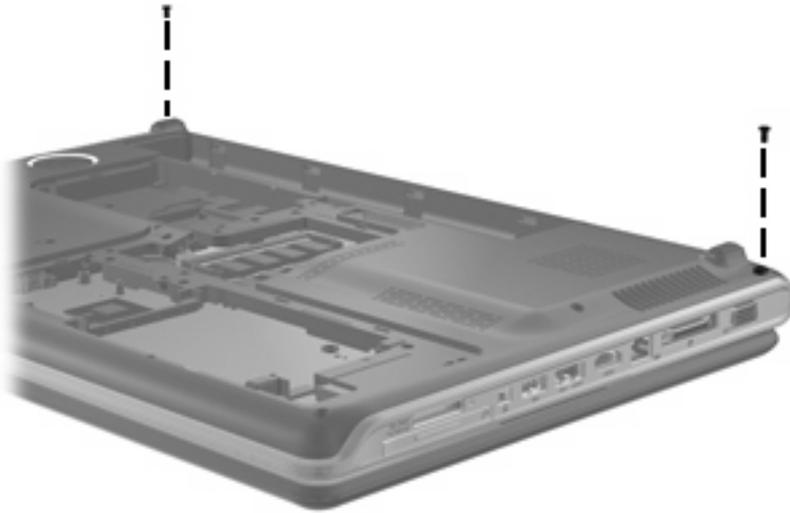
**Where used:** 11 screws that secure the top cover to the base enclosure



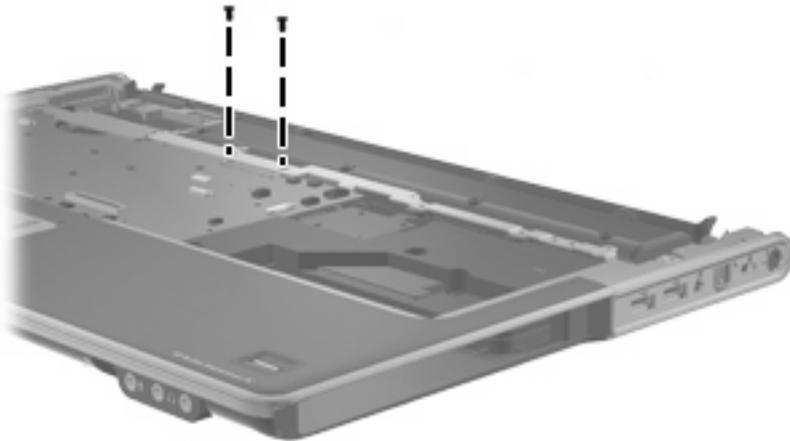
**Where used:** One screw that secures the power connector and bracket to the base enclosure



**Where used:** 3 screws that secure the keyboard to the base enclosure

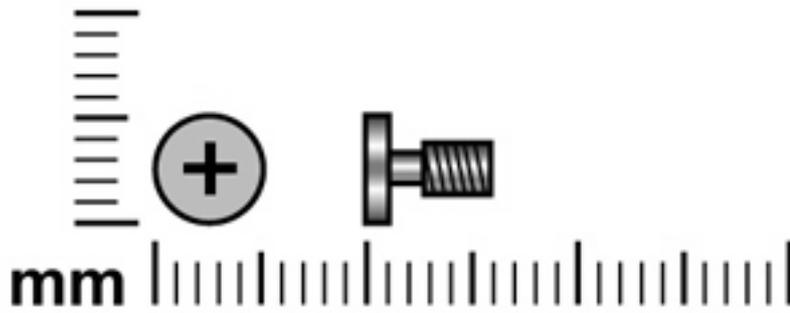


**Where used:** 2 screws that secure the switch cover to the computer

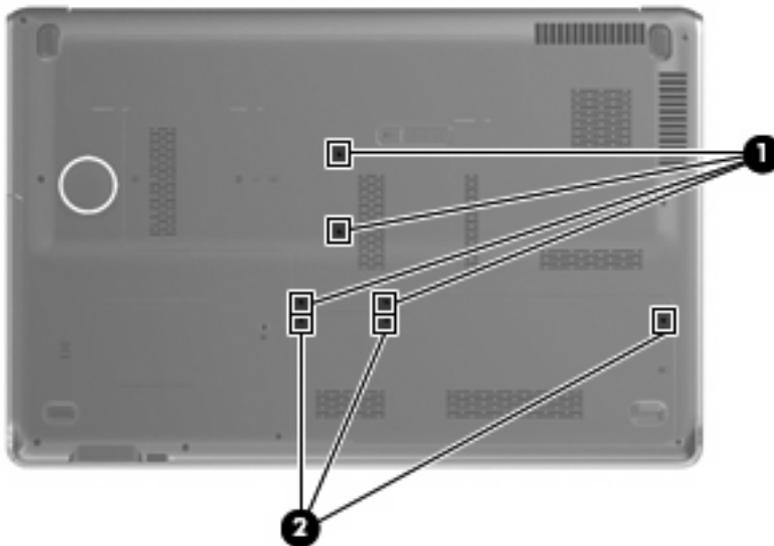


**Where used:** 2 screws that secure the top cover to top of the computer

## Phillips PM2.5×6.0 captive screw



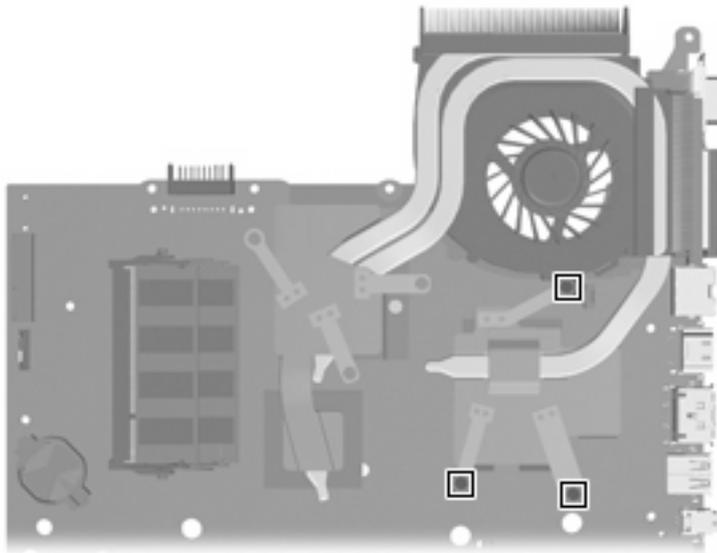
Color	Quantity	Length	Thread	Head diameter
Black	10	6.0 mm	2.5 mm	5.0 mm



### Where used:

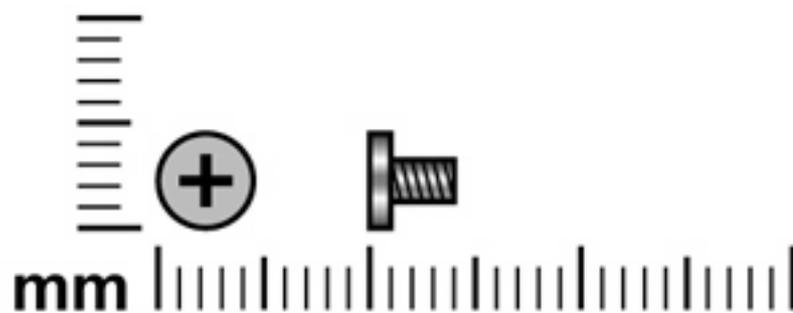
(1) 4 captive screws that secure the primary hard drive cover to the computer (screws are secured by a C-clip)

(2) 3 captive screws that secure the secondary hard drive cover to the computer (screws are secured by a C-clip)

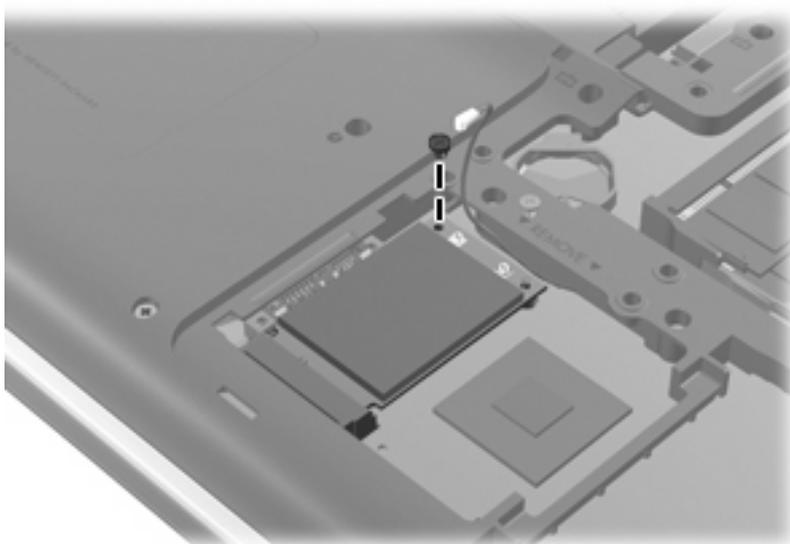


**Where used:** 3 screws that secure the fan/heat sink to the system board in computer models equipped with discrete graphics

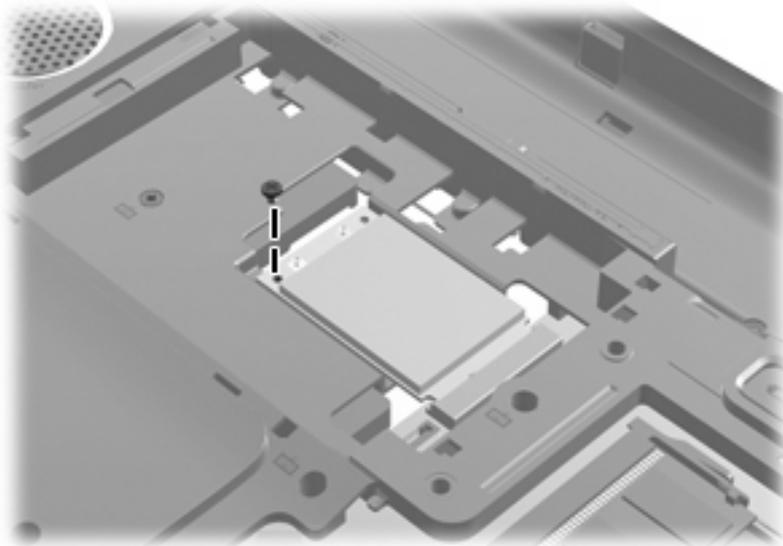
## Phillips PM2.0×4.0 screw (black)



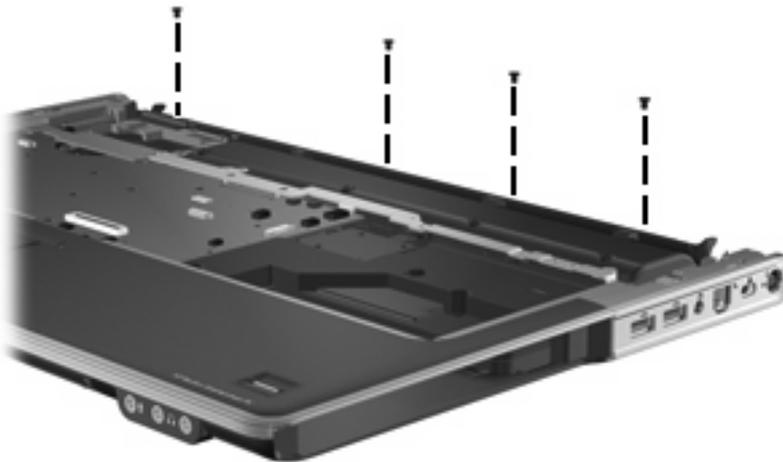
Color	Quantity	Length	Thread	Head diameter
Black	8	4.0 mm	2.0 mm	4.5 mm



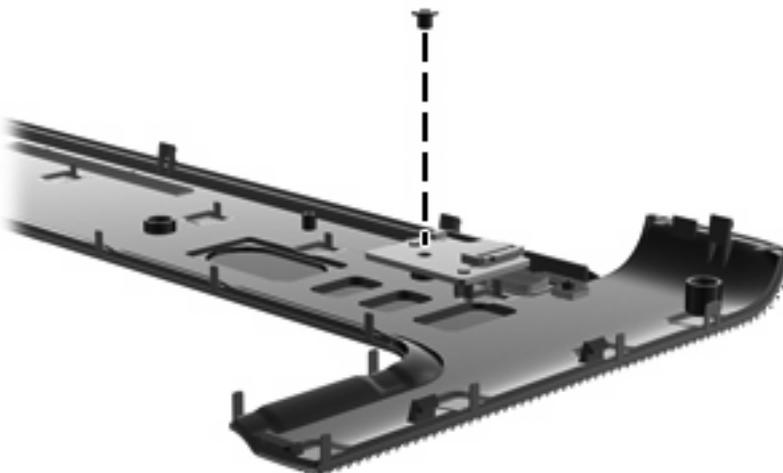
**Where used:** One screw that secures the TV tuner module to the system board



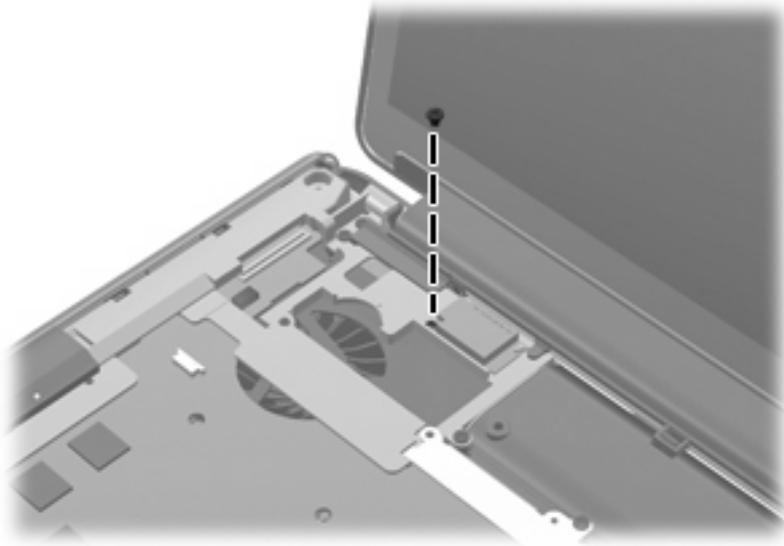
**Where used:** One screw that secures the WLAN module to the system board



**Where used:** 4 screws that secure the top cover to the base enclosure (along top of base enclosure)

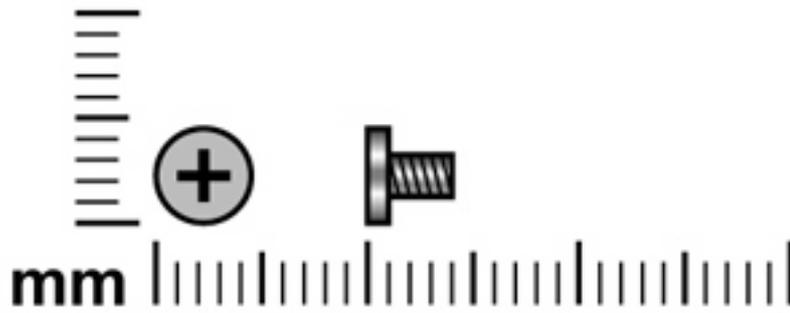


**Where used:** One screw that secures the power button board to the switch cover



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

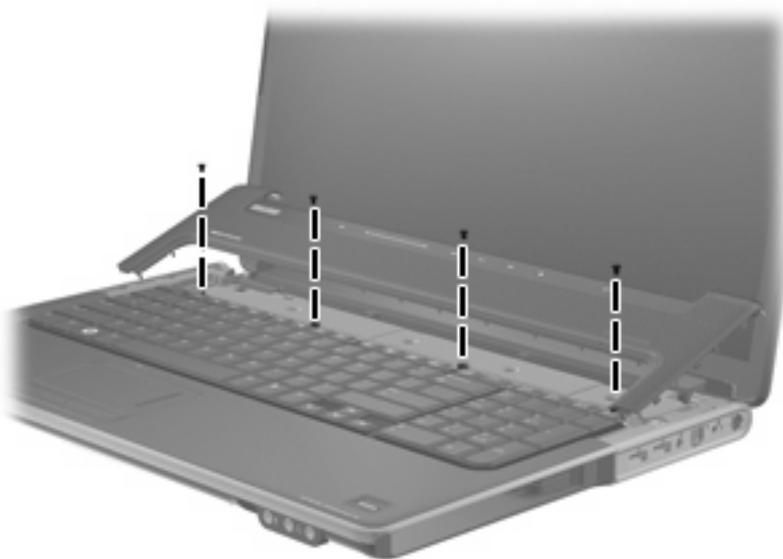
## Phillips PM2.0×4.0 screw (silver)



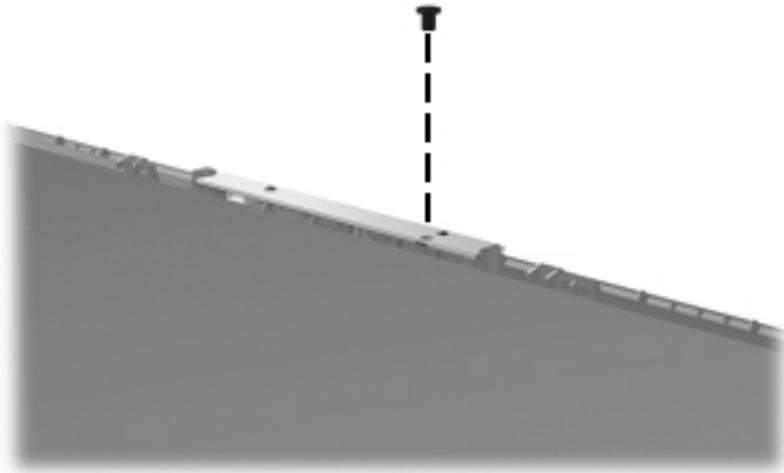
Color	Quantity	Length	Thread	Head diameter
Silver	11	4.0 mm	2.0 mm	4.5 mm



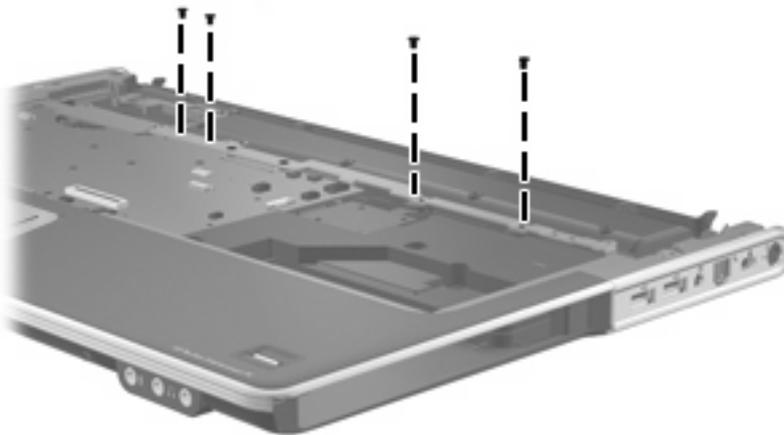
**Where used:** 2 screws that secure the optical drive bracket to the optical drive



**Where used:** 4 screws that secure the keyboard to the top of the computer

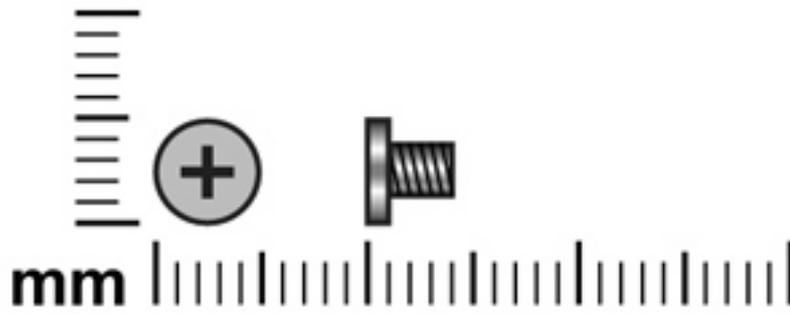


**Where used:** One screw that secures the webcam/microphone module to the display bezel on computer models equipped with flush glass display assemblies

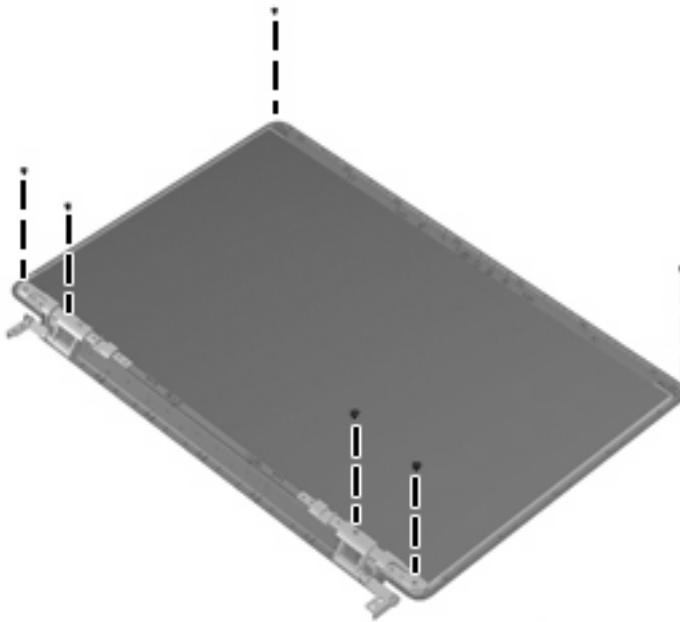


**Where used:** Four screws that secure the top cover to the top of the computer

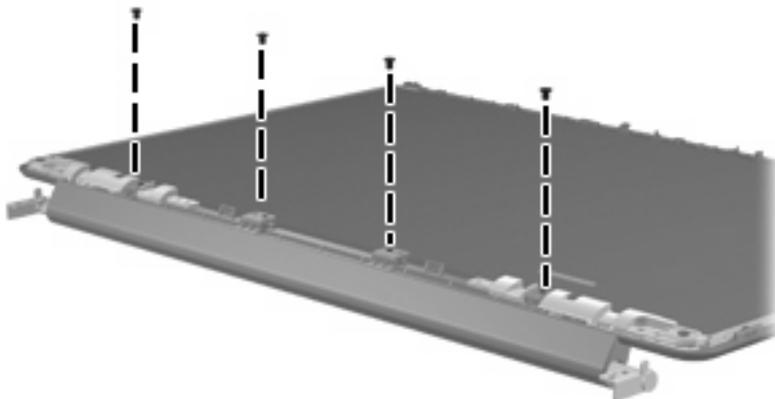
## Phillips PM2.5×4.0 screw (silver)



Color	Quantity	Length	Thread	Head diameter
Silver	10	4.0 mm	2.5 mm	5.0 mm

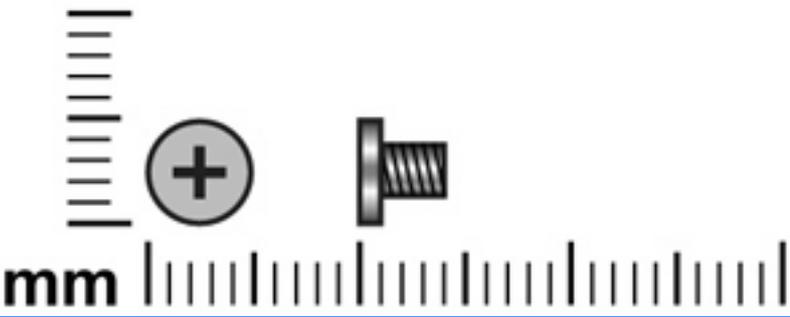


**Where used:** 6 screws that secure the display hinges to the display panel on computer models equipped with flush glass display assemblies

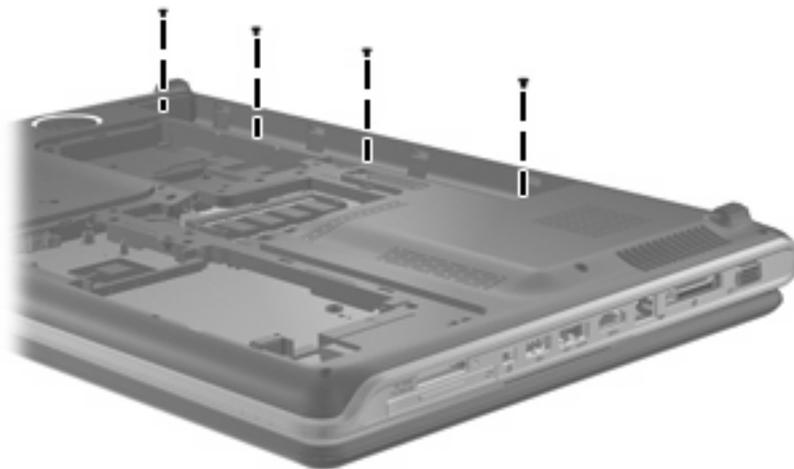


**Where used:** 4 screws that secure the hinge cover to the display enclosure on computer models equipped with flush glass display assemblies

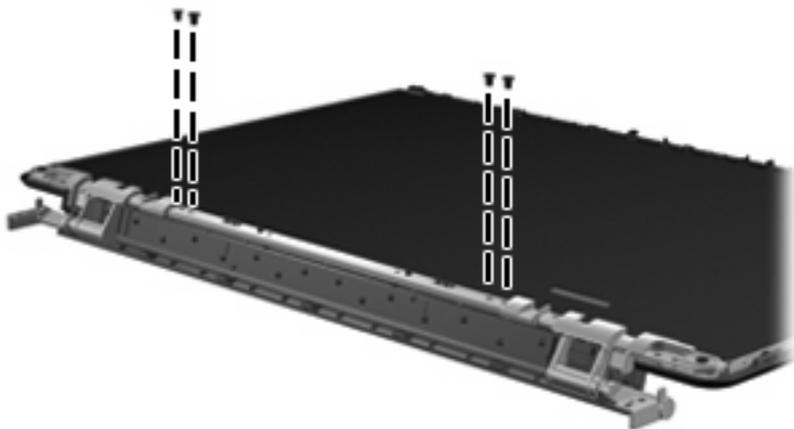
## Phillips PM2.5×4.0 screw (black)



Color	Quantity	Length	Thread	Head diameter
Black	8	4.0 mm	2.5 mm	4.5 mm

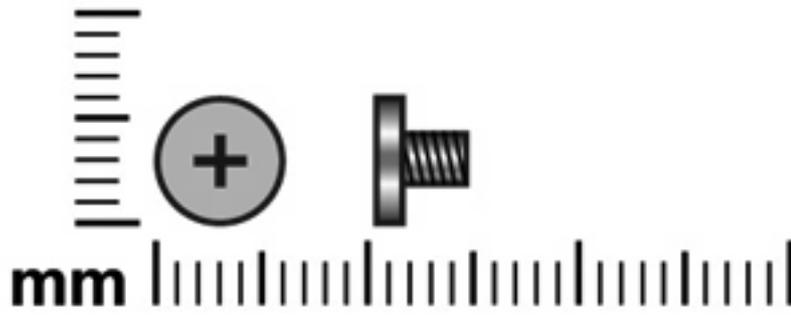


**Where used:** 4 screws, located inside the battery bay, that secure the switch cover to the computer

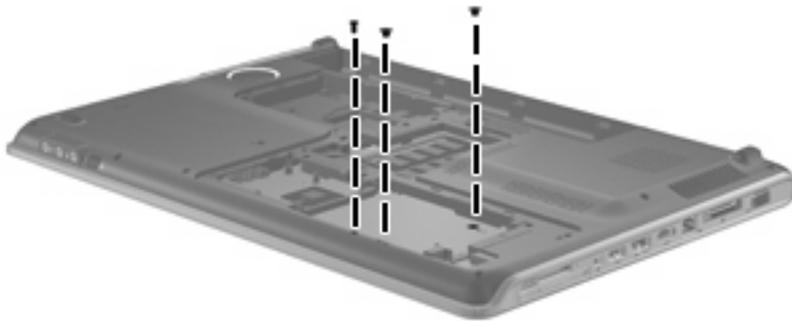


**Where used:** 4 screws that secure the display hinges to the display hinge bracket on computer models equipped with flush glass display assemblies

## Phillips PM2.5×4.0 broadhead screw

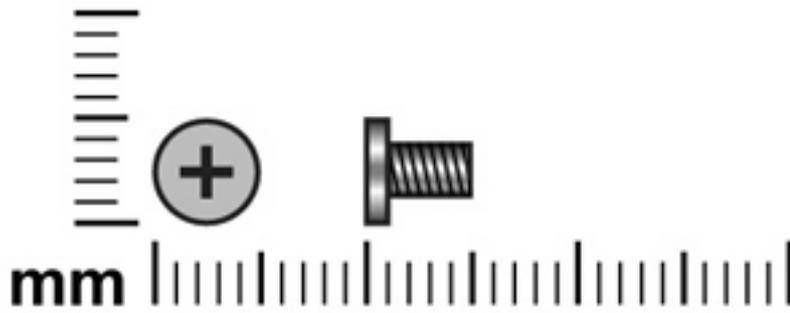


Color	Quantity	Length	Thread	Head diameter
Silver	3	4.0 mm	2.5 mm	8.0 mm

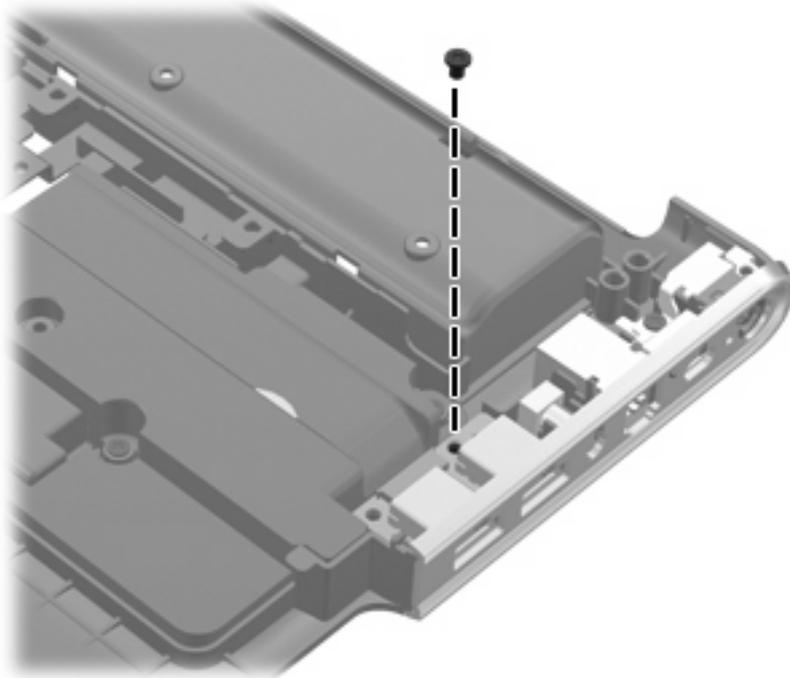


**Where used:** 3 screws, located inside the hard drive bay, that secure the top cover to the computer

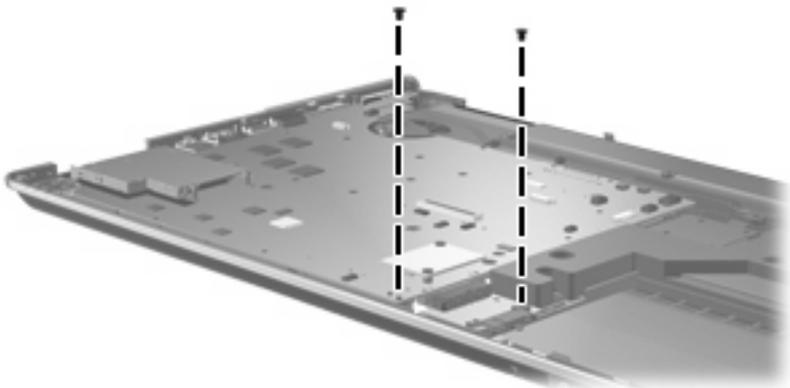
## Phillips PM2.5×5.0 screw



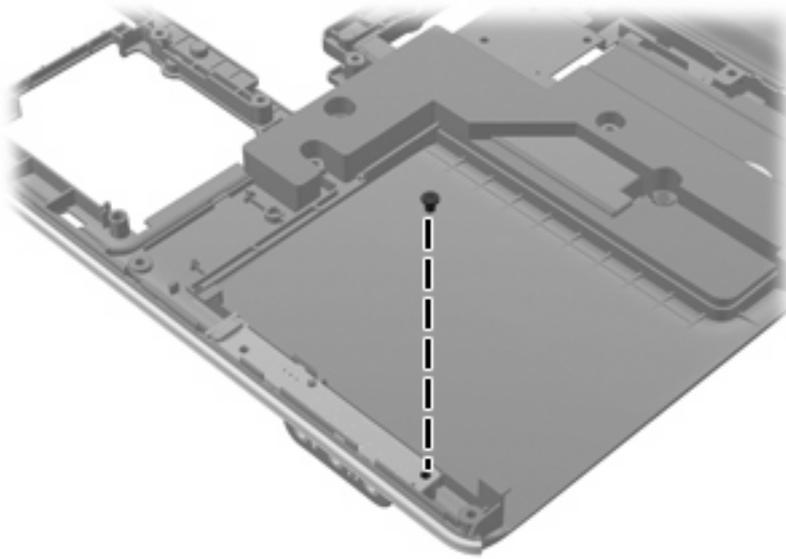
Color	Quantity	Length	Thread	Head diameter
Black	12	5.0 mm	2.5 mm	4.4 mm



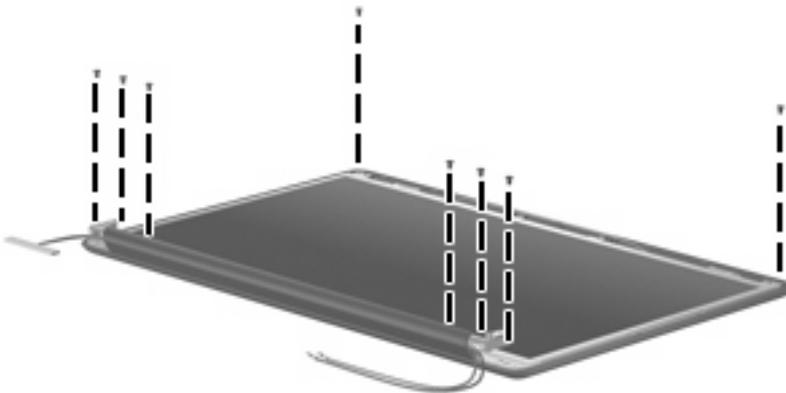
**Where used:** One screw that secures the USB board to the base enclosure



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

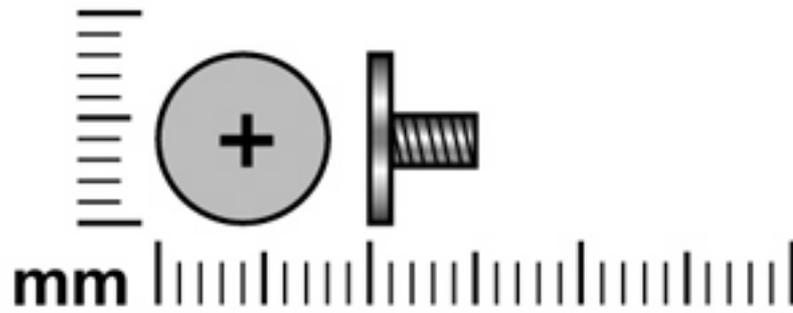


**Where used:** One screw that secures the audio/infrared board to the base enclosure

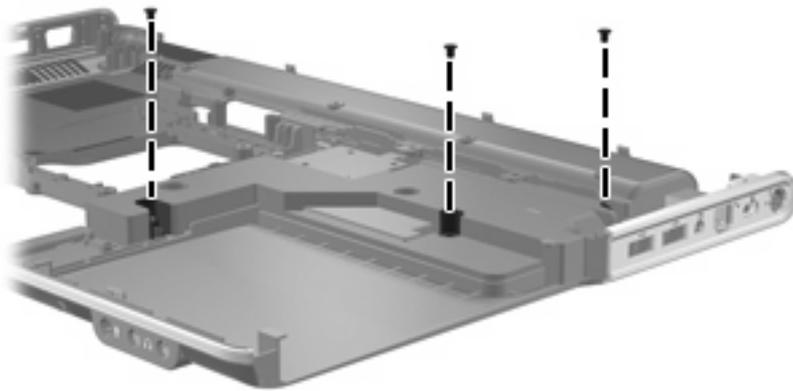


**Where used:** 8 screws that secure the display panel to the display enclosure on computer models equipped with BrightView display assemblies

## Phillips PM2.5×5.0 broadhead screw

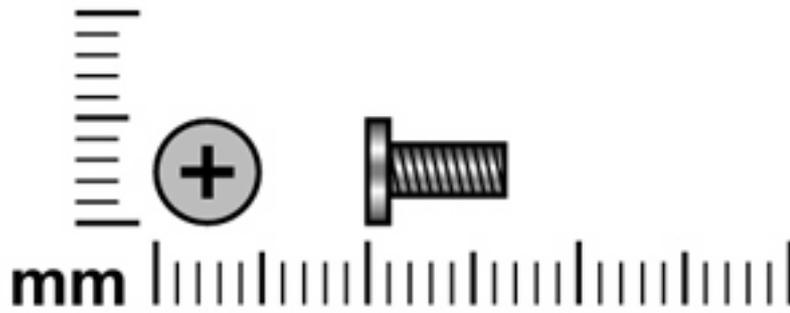


Color	Quantity	Length	Thread	Head diameter
Black	3	5.0 mm	2.5 mm	8.0 mm



**Where used:** 3 screws that secure the subwoofer to the computer

## Phillips PM2.5×6.5 screw

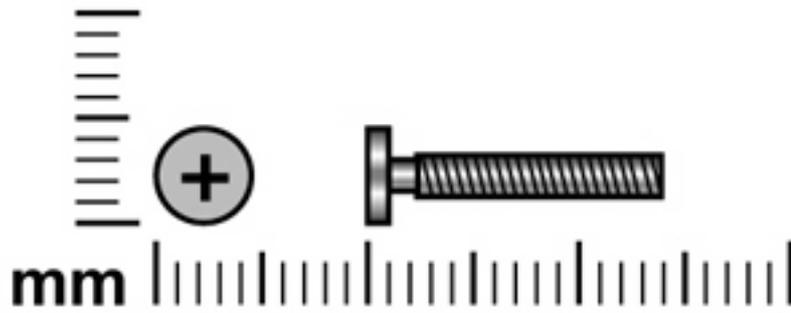


Color	Quantity	Length	Thread	Head diameter
Black	2	6.5 mm	2.5 mm	4.5 mm

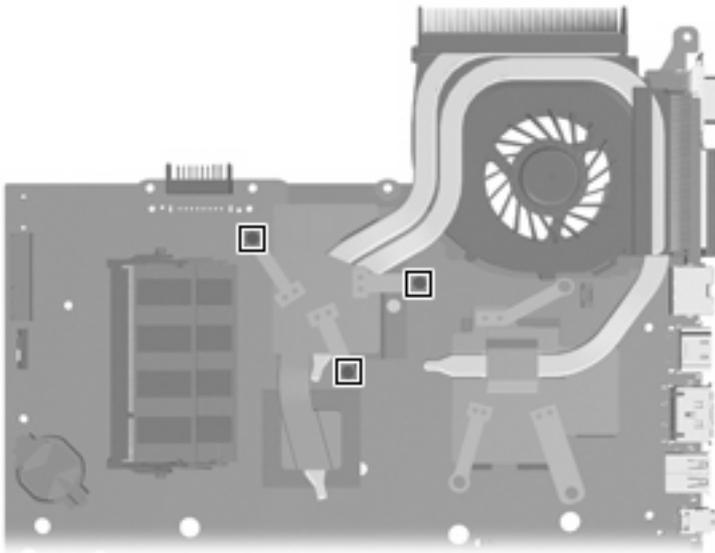


**Where used:** 2 screws that secure the display bezel to the display enclosure on computer models equipped with BrightView display assemblies

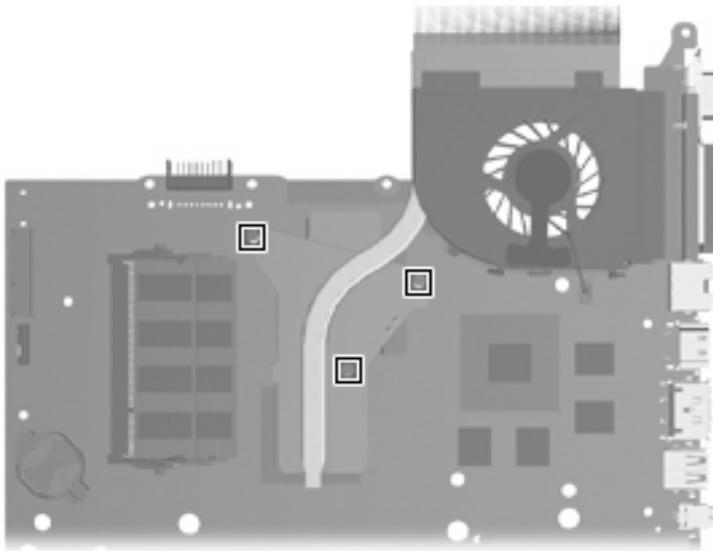
## Phillips PM2.5×14.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Silver	6	14.0 mm	2.5 mm	4.5 mm



**Where used:** 3 screws that secure the fan/heat sink to the system board in computer models equipped with discrete graphics



**Where used:** 3 screws that secure the fan/heat sink to the system board in computer models equipped with UMA graphics

---

# 8 Backup and Recovery

## Recovering system information

Recovery after a system failure is as complete as your most current backup. HP recommends that you create recovery discs immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

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:

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

---

 **NOTE:** If your computer includes a solid-state drive (SSD), you may not have a recovery partition. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, select **Start > Computer**. If the partition is present, an HP Recovery drive is listed in the Hard Disk Drives section of the window.

---

## Creating recovery discs

HP recommends that you create recovery discs to be sure that you can restore your system to its original factory state if you experience serious system failure or instability. Create these discs after setting up the computer for the first time.

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

---

 **NOTE:** If your computer does not include an internal optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP Web site.

---

Note the following guidelines before creating recovery discs:

- You will need high-quality DVD-R, double-layer DVD-R, DVD+R, double-layer DVD+R, BD-R (writable Blu-ray), or CD-R discs. All these discs are purchased separately. DVDs and BDs have a much higher capacity than CDs. If you use CDs, up to 20 discs may be required, whereas only a few DVDs or BDs are required.

---

 **NOTE:** Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) 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.

# Backing up your information

## When to back up

- On a regularly scheduled basis
- 
-  **NOTE:** Set reminders to back up your information periodically.
- 
- Before the computer is repaired or restored
  - Before you add or modify hardware or software

## Backup suggestions

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

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

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

## Using system restore points

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

---

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

---

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

## When to create restore points

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

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

## Create a system restore point

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

## Restore to a previous date and time

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

1. Select **Start > Control Panel > System and Maintenance > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Click the **System Restore** button, and then click **Next**.  
The System Restore window opens.
5. Follow the on-screen instructions.

# Performing a recovery

 **NOTE:** You can recover only files that you have previously backed up. HP recommends that you use Recovery Manager to create an entire drive backup as soon as you set up your computer.

---

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 (select models only) on the hard drive. However, if your computer includes a solid-state drive (SSD), you may not have a recovery partition. If that is the case, recovery discs have been included with your computer. Use these discs to recover your operating system and software.

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

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

---

## Recovering from the recovery discs

To restore the system from the recovery discs:

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

## Recovering from the dedicated recovery partition (select models only)

 **NOTE:** If your computer includes a solid-state drive (SSD), you may not have a recovery partition. You will not be able to recover using this procedure. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software.

---

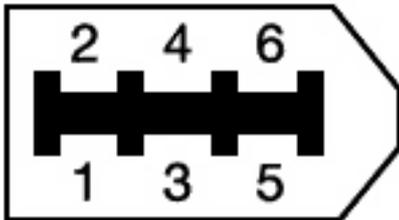
On some models, you can perform a recovery from the partition on the hard drive from either the Start button or **f11**.

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

1. Access Recovery Manager in either of the following ways:
  - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
  - or–
  - Restart the computer and press **f11** while the “Press <F11> for recovery” message is displayed on the screen. Then select **Recovery Manager**.
2. Click **Advanced Options**.
3. Click **System recovery**, and then click **Next**.
4. Follow the on-screen instructions.

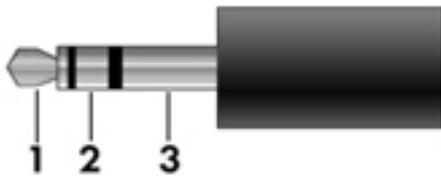
## 9 Connector pin assignments

1394



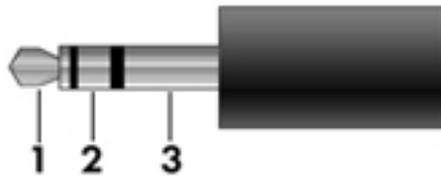
Pin	Signal
1	Power
2	Ground
3	TPB-
4	TPB+
5	TPA-
6	TPA+

### Audio-in (microphone)



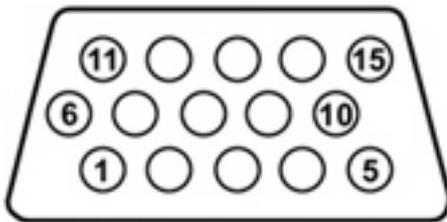
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

## Audio-out (headphone)



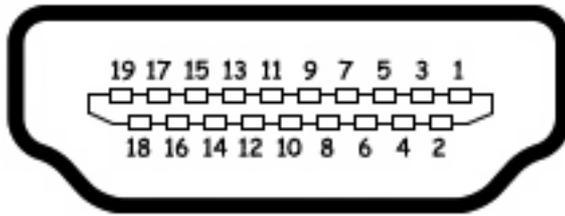
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

## External monitor



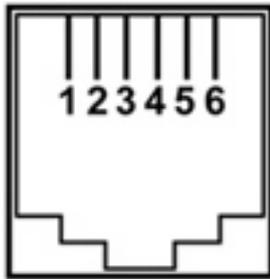
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

# HDMI



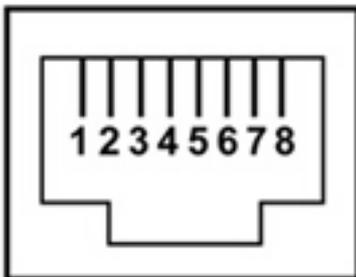
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2-
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1-
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0-
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	CEC
14	Not connected
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect

## RJ-11 (modem)



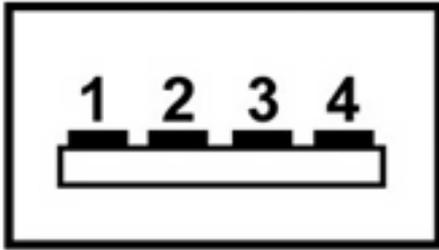
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

## RJ-45 (network)



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

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-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 chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

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

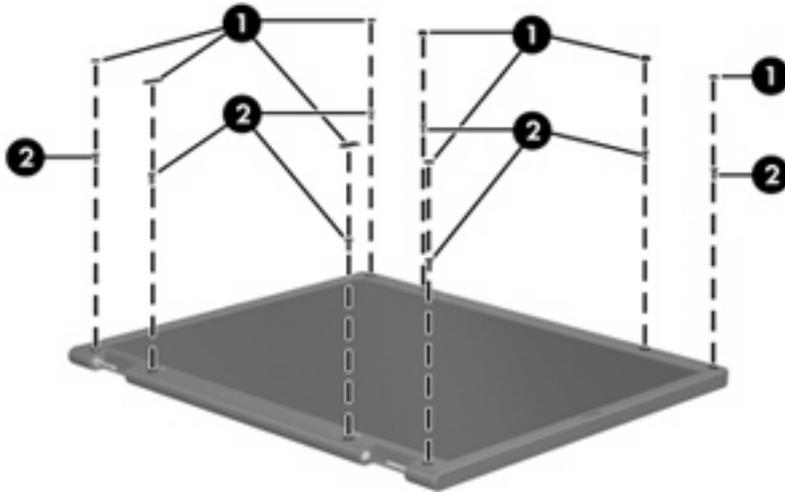
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight (1) and the liquid crystal display (LCD) panel (2).



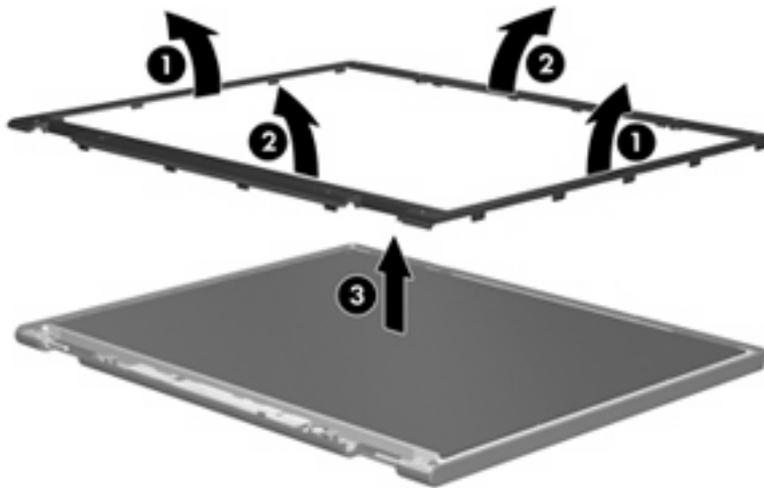
📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

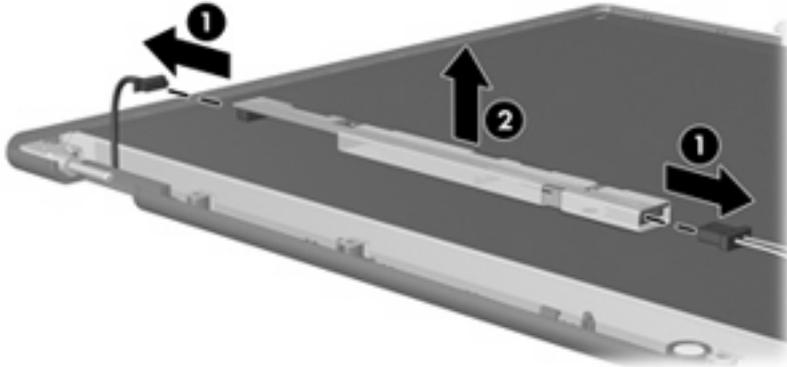
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



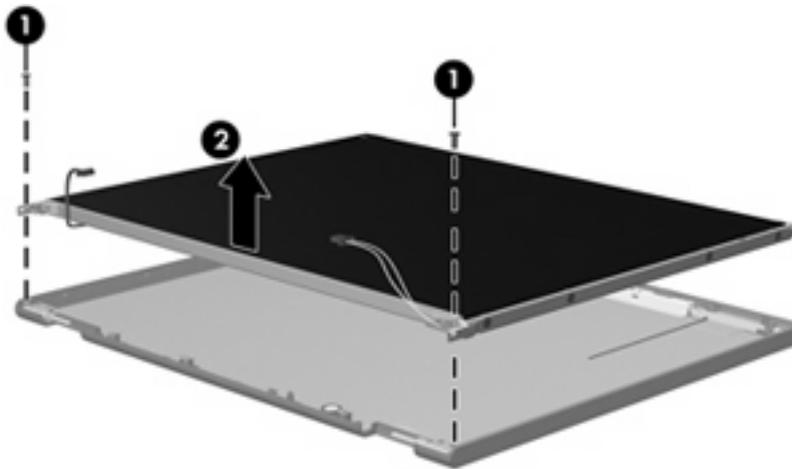
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel (3).



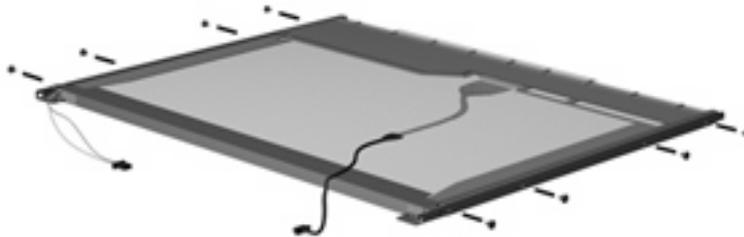
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



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

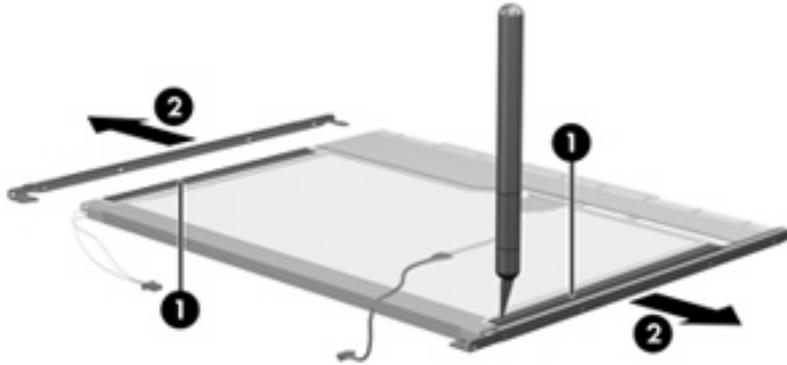


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

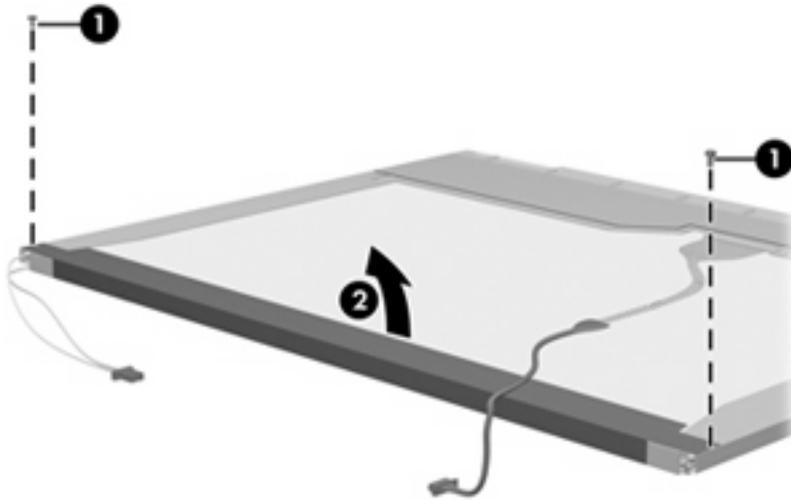


9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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

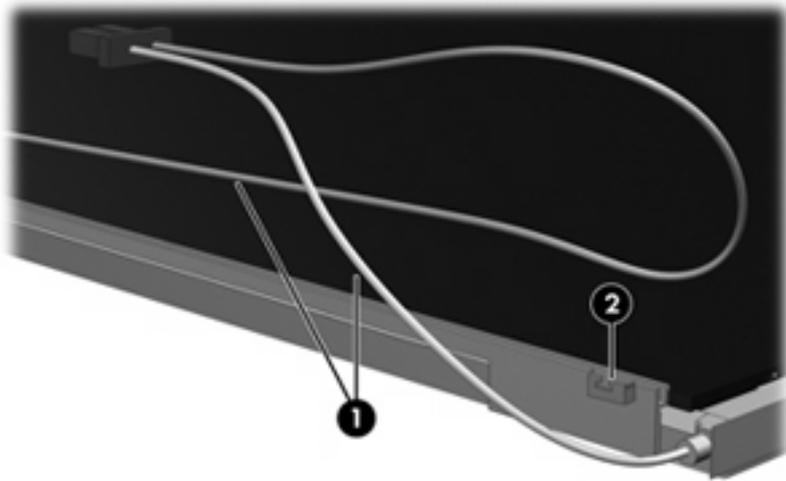


11. Remove the screws (1) that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover (2) and swing it outward.

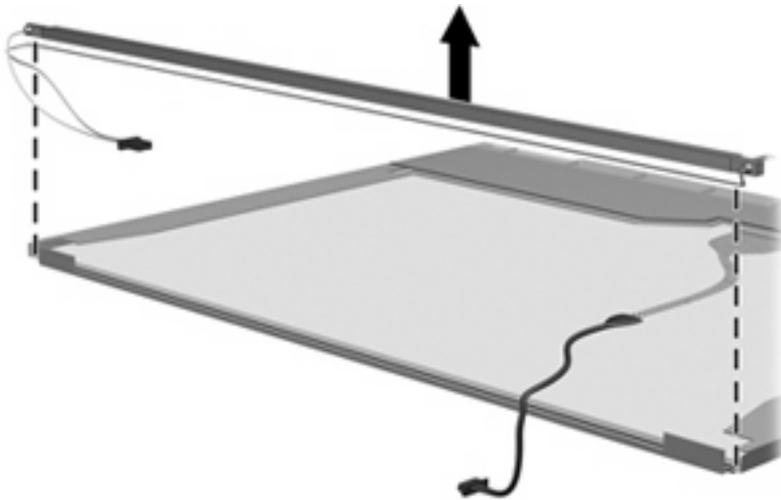


13. Remove the backlight cover.
14. Turn the display panel right-side up.

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

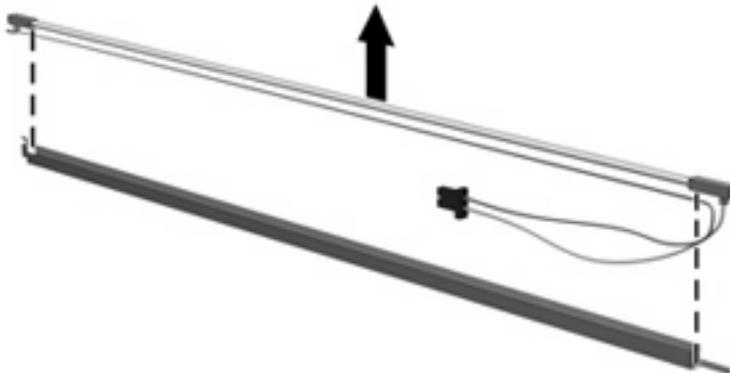


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

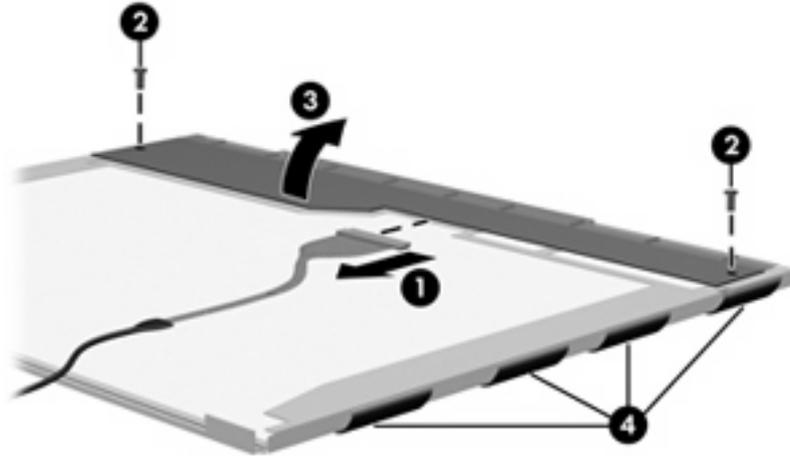


**⚠ WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

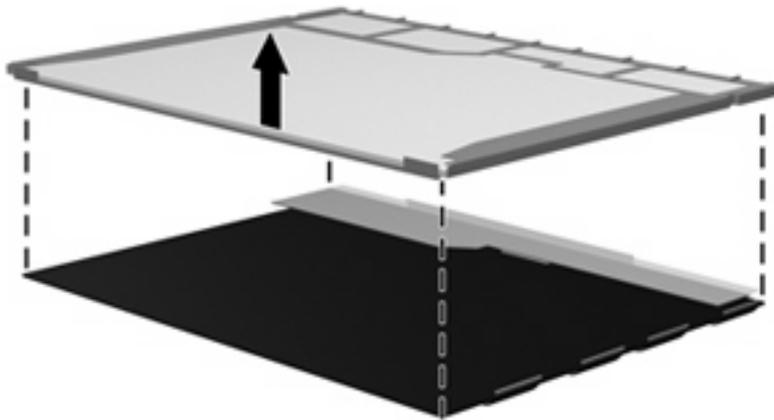
18. Remove the backlight from the backlight frame.



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
  - identifying 14
  - pin assignments 138
- 1394 Power Saving 98

## A

- AC adapter, spare part
  - numbers 27, 28
- administrator password 98
- applications key, Windows 11
- audio, product description 3
- audio-in (microphone) jack
  - identifying 12
  - pin assignments 138
- audio-out (headphone) jack
  - identifying 12
  - pin assignments 139
- audio/infrared board
  - removal 82
  - spare part number 20, 31, 82
  - spare part numbers 33

## B

- backup
  - customized window, toolbar, and menu bar settings 135
  - personal files 135
  - templates 135
- backup and recovery 133
- backup suggestions 135
- base enclosure, spare part
  - number 21, 31, 35
- battery
  - removal 43
  - spare part numbers 21, 32, 43
- battery bay, identifying 15
- battery light, identifying 8, 12

- battery release latch, identifying 15
- bays
  - battery 15
  - primary hard drive 15
  - secondary hard drive 15
- Blu-ray Disc ROM Drive
  - precautions 37
  - removal 44
  - spare part number 44
  - specifications 104
- Blu-ray ROM DVD±R/RW SuperMulti DL Drive with LightScribe, spare part
  - number 21, 26, 32
- Blu-ray ROM DVD±R/RW SuperMulti DL Drive, spare part
  - number 21, 26, 32
- Bluetooth module
  - removal 63
  - spare part numbers 19, 29, 63
- Bluetooth module cable, spare part
  - number 19, 33
- boot options 99
- boot order 99
- button sound 98
- buttons
  - next/fast forward 10
  - play/pause 9
  - power 9
  - previous/rewind 9
  - stop 10
  - TouchPad 6
  - TouchPad on/off 6
  - volume mute 9
  - wireless 10

## C

- Cable Kit, spare part number 19, 31
- cables, service considerations 37
- caps lock light, identifying 7
- Card Reader Power Saving 98
- changing the Setup Utility language 96
- chipset, product description 1
- components
  - bottom 15
  - display 16
  - front 12
  - left-side 14
  - rear 13
  - right-side 13
  - top 6
- computer feet
  - locations 42
  - spare part number 42
- computer specifications 100
- connectors
  - power 13
  - service considerations 37

## D

- Digital Media Slot light, identifying 14
- Digital Media Slot, identifying 14
- diskette drive, precautions 37
- display assembly
  - removal 64
  - spare part numbers 19, 31, 33, 64
- display bezel
  - illustrated 25
  - spare part numbers 25, 31
- Display Cable Kit, spare part
  - number 24, 25, 31

- display components
  - illustrated 24
  - recycling 145
- display enclosure
  - removal 66
- display enclosure, BrightView
  - illustrated 25
  - spare part numbers 25, 31, 33
- display enclosure, flush glass
  - illustrated 24
  - spare part numbers 24, 33, 66
- display hinge
  - illustrated 24, 25
  - removal 68
  - spare part numbers 24, 25, 69
- display hinge cover, spare part number 35
- Display Hinge Kit, spare part numbers 24, 25, 31, 33, 69
- display panel, BrightView
  - illustrated 25
  - spare part numbers 25
- display panel, flush glass
  - illustrated 24
  - spare part numbers 24, 31
- display panel, product
  - description 2
- Display Rubber Kit, spare part number 25, 31
- Display Screw Kit, spare part numbers 24, 25, 31, 34
- display specifications 101, 102
- displaying system information 96
- docking support, product
  - description 4
- drive light, identifying 8, 12
- drives
  - boot order 99
  - preventing damage 37
- DVD±RW and CD-RW Combo Drive
  - precautions 37
  - removal 44
  - spare part numbers 21, 26, 32, 44
  - specifications 105

- E**
  - electrostatic discharge 38
  - eSATA/USB port, identifying 14
  - esc key, identifying 11
  - Ethernet, product description 3
  - exiting the Setup Utility 97
  - expansion port, identifying 14
  - ExpressCard module, spare part number 20, 31
  - ExpressCard slot, identifying 14
  - external media cards, product description 4
  - external monitor port
    - identifying 14
    - pin assignments 139
- F**
  - f11 recovery 137
  - fan always on 99
  - fan/heat sink assembly
    - removal 89
    - spare part numbers 20, 31, 33, 89
  - feet
    - locations 42
    - spare part number 42
  - fingerprint reader, identifying 10
  - fn key, identifying 11
  - full system recovery 133
  - function keys, identifying 11
- G**
  - graphics, product description 1
  - grounding equipment and methods 40
- H**
  - hard drive
    - precautions 37
    - product description 2
    - removal 48
    - spare part numbers 23, 26, 32, 48
    - specifications 103
  - Hard Drive Hardware Kit, spare part number 23, 26, 33, 48
  - hard drive self test 99
  - HDMI port
    - identifying 14
    - pin assignments 140

- headphone (audio-out) jack
  - identifying 12
  - pin assignments 139
- headset, spare part number 27, 28
- heatsink, spare part numbers 20, 31, 33
- hinge
  - illustrated 24, 25
  - removal 68
  - spare part numbers 24, 25, 69

- I**
  - I/O address specifications 108
  - IEEE 1394 port, identifying 14
  - infrared lens, identifying 12
  - integrated webcam light, identifying 16
  - internal microphones, identifying 16
  - interrupt specifications 107
- J**
  - jacks
    - audio-in (microphone) 12
    - audio-out (headphone) 12
    - RJ-11 (modem) 13
    - RJ-45 (network) 14
    - TV antenna/cable 13

- K**
  - keyboard
    - product description 4
    - removal 57
    - spare part numbers 19, 32, 33, 34, 57
  - keypad keys, identifying 11
  - keys
    - esc 11
    - fn 11
    - function 11
    - keypad 11
    - Windows applications 11
    - Windows logo 11

- L**
  - LAN Power Saving 98
  - language support 98
  - latch, battery release 15

## lights

- battery 8, 12
- caps lock 7
- Digital Media Slot 14
- drive 8, 12
- mute 7
- num lock 7
- power 7, 12
- TouchPad 6
- volume down 7
- volume mute 7
- volume up 7
- webcam 16
- wireless 7

## M

- mass storage devices, spare part numbers 26
- media activity buttons, identifying 9
- memory map specifications 110
- memory module
  - identifying 15
  - product description 2
  - removal 54
  - spare part numbers 21, 32, 54
- memory test 99
- microphone (audio-in) jack
  - identifying 12
  - pin assignments 138
- microphone, product description 3
- model name 1
- modem jack, pin assignments 141
- modem module
  - removal 77
  - spare part numbers 20, 28, 77
- modem module cable, removal 87
- modem, product description 3
- monitor port
  - external 14
  - pin assignments 139
- mouse, spare part numbers 27, 28
- mute button, identifying 9
- mute light, identifying 7

## N

- network jack, pin assignments 141
- next/fast forward button, identifying 10
- num lock light, identifying 7

## O

- operating system, product description 4
- optical drive
  - identifying 13
  - precautions 37
  - product description 3
  - removal 44
  - spare part numbers 21, 26, 44
  - specifications 104, 105
- optical drive board
  - removal 82
  - spare part numbers 34
- optical drive bracket, spare part number 20

## P

- packing guidelines 39
- passwords 98
- performing a system recovery 137
- pin assignments
  - 1394 138
  - audio-in 138
  - audio-out 139
  - external monitor 139
  - HDMI 140
  - headphone 139
  - microphone 138
  - modem 141
  - monitor 139
  - network 141
  - RJ-11 141
  - RJ-45 141
  - Universal Serial Bus (USB) 142
- plastic parts 36
- play/pause button, identifying 9
- pointing device, product description 4
- ports
  - 1394 14

- eSATA/USB 14
- expansion 14
- external monitor 14
- HDMI 14
- product description 4
- USB 13, 14
- power button board
  - removal 61
  - spare part number 19, 31, 61
  - spare part numbers 33
- power button, identifying 9
- power connector cable
  - removal 88
  - spare part number 35
- power connector, identifying 13
- power cord
  - set requirements 143
  - spare part numbers 27, 29
- power lights, identifying 7, 12
- power requirements, product description 4
- power-on password 98
- previous/rewind button, identifying 9
- primary hard drive bay, identifying 15
- primary hard drive cover
  - removal 45
  - spare part number 23, 33
- processor
  - product description 1
  - removal 93
  - spare part numbers 20, 30, 31, 93
- Processor C4 State 98
- product description
  - audio 3
  - chipset 1
  - display panel 2
  - docking support 4
  - Ethernet 3
  - external media cards 4
  - graphics 1
  - hard drives 2
  - keyboard 4
  - memory module 2
  - microphone 3
  - modem 3
  - operating system 4

- optical drives 3
- pointing device 4
- ports 4
- power requirements 4
- processors 1
- product name 1
- security 4
- serviceability 5
- TV tuner 3
- webcam 3
- wireless 3
- product name 1

## R

- recovery
  - from the dedicated recovery partition 137
  - from the recovery discs 137
  - procedure 137
  - program or driver 133
  - system 133
- recovery discs 137
- Recovery Manager 133
- recovery partition 137
- remote control, spare part numbers 27, 28
- removal/replacement
  - preliminaries 36
  - procedures 41
- restore points 135
- RJ-11 (modem) jack
  - identifying 13
  - pin assignments 141
- RJ-45 (network) jack
  - identifying 14
  - pin assignments 141
- RTC battery
  - removal 53
  - spare part number 23, 28, 53
- Rubber Feet Kit, spare part number 21, 31, 42

## S

- safeguarding information 133
- Screw Kit
  - contents 111
  - spare part number 27, 31
- screw listing 111
- scrolling regions, TouchPad 6

- secondary hard drive bay, identifying 15
- secondary hard drive cover
  - removal 46
  - spare part number 23, 33
- secondary hard drive self test 99
- security cable slot, identifying 13
- security, product description 4
- service considerations 36
- service tag 17, 41
- serviceability, product description 5
- Setup Utility
  - changing the language 96
  - Diagnostics menu 99
  - display system information 96
  - exiting 97
  - Main menu 98
  - menus 98
  - restoring default settings 97
  - Security menu 98
  - starting 95
  - System Configuration menu 98
  - using 96
- slots
  - Digital Media Slot 14
  - ExpressCard 14
  - security cable 13
- solid-state drive (SSD) 133
- speaker assembly
  - removal 62
  - spare part number 19, 31, 62
- speakers, identifying 9
- specifications
  - Blu-ray Disc ROM Drive 104
  - computer 100
  - display 101, 102
  - DVD±RW and CD-RW Combo Drive 105
  - hard drive 103
  - I/O addresses 108
  - interrupts 107
  - memory map 110
  - optical drive 104, 105
  - system DMA 105
- static-shielding materials 40
- stop button, identifying 10

- subwoofer
  - removal 84
  - spare part number 23, 32
- supported discs 134
- switch cover
  - removal 57
  - spare part number 19, 57
  - spare part numbers 31, 34
- system board
  - removal 79
  - spare part numbers 20, 79
- system board bracket, spare part number 32
- system DMA 105
- system failure or instability 133
- system information 98
- system memory map 110
- system recovery 133

## T

- thermal material, replacement 91
- tools required 36
- top cover
  - removal 74
  - spare part numbers 19, 31, 33, 34, 74
- TouchPad
  - buttons 6
  - identifying 6
  - scrolling regions 6
- TouchPad light, identifying 6
- TouchPad on/off button 6
- transporting guidelines 39
- TV antenna/cable jack, identifying 13
- TV tuner external antenna cable, spare part numbers 21, 29, 55
- TV tuner module
  - removal 55
  - spare part numbers 21, 28, 55
- TV tuner module cable, removal 86
- TV tuner, product description 3

## U

- Universal Serial Bus (USB) port
  - pin assignments 142
- USB board
  - removal 83

- spare part number 21, 32, 83
- spare part numbers 33
- USB ports, identifying 13, 14
- using system restore points 135

## V

- vents, identifying 13, 15
- Virtualization Technology 98
- volume down light, identifying 7
- volume mute button, identifying 9
- volume mute light, identifying 7
- volume scroll zone, identifying 9
- volume up light, identifying 7

## W

- webcam
  - identifying 16
  - product description 3
- webcam/microphone module
  - illustrated 24, 25
  - removal 67, 70
  - spare part number 31
  - spare part numbers 24, 25, 67, 71
- Windows applications key, identifying 11
- Windows logo key, identifying 11
- wireless button, identifying 10
- wireless light, identifying 7
- wireless, product description 3
- WLAN module
  - removal 50
  - spare part numbers 21, 28, 29, 50
- workstation guidelines 39

