



HP ProBook 4415s Notebook PC

HP ProBook 4416s Notebook PC

HP ProBook 4515s Notebook PC

Maintenance and Service Guide

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

AMD Athlon, AMD Sempron, AMD Turion,  
and ATI Radeon are trademarks of  
Advanced Micro Devices, Inc. Bluetooth is a  
trademark owned by its proprietor and used  
by Hewlett-Packard Company under license.  
Intel is a registered trademark of Intel  
Corporation in the United States 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: May 2009

Document Part Number: 536499-001

## MSG revision history

Revision	Publication date	Description
A	October 2009	<ul style="list-style-type: none"><li>• Updated commodities in the following location: <a href="#">Product description on page 1</a>.</li><li>• Added screw covers to the screw removal images and procedures in the following location: <a href="#">Switch cover and keyboard on page 61</a></li><li>• Updated descriptions to hard drive spare parts listings in the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">Mass storage devices on page 44</a>, <a href="#">Hard drive on page 74</a></li><li>• Updated descriptions to Bluetooth module spare parts listings in the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">Bluetooth module on page 96</a></li><li>• Added a newly supported WWAN module to spare parts listings in the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">WWAN module on page 70</a></li><li>• Added newly supported processors to spare parts listings in the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">Processor on page 104</a></li><li>• Added newly supported system boards to spare parts listings in the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">System board on page 106</a></li><li>• Deleted a system board spare part from the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">System board on page 106</a></li><li>• Deleted a processor spare part from the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">Processor on page 104</a></li><li>• Deleted a display assembly spare part from the following locations: <a href="#">Computer major components on page 34</a>, <a href="#">Sequential part number listing on page 46</a>, <a href="#">Display assembly on computers with 14.0-in displays on page 91</a></li></ul>



## Safety warning notice

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



---

# Table of contents

## 1 Product description

## 2 External component identification

Windows Vista and Windows XP .....	10
Display .....	10
Top components .....	11
Pointing devices .....	11
Lights .....	12
Buttons, switches, and speakers .....	13
Keys .....	14
Front components .....	16
Right-side components .....	17
Left-side components .....	18
Bottom components .....	19
Wireless antennas .....	19
Additional hardware components .....	20
Linux .....	21
Display .....	21
Top components .....	22
Pointing devices .....	22
Lights .....	23
Buttons, switch, and speakers .....	24
Keys .....	25
Front components .....	27
Right-side components .....	28
Left-side components .....	29
Bottom components .....	30
Wireless antennas .....	31
Additional hardware components .....	32

## 3 Illustrated parts catalog

Service tag .....	33
Computer major components .....	34
Display assembly components .....	40

Plastics Kit .....	42
Cable Kit .....	43
Mass storage devices .....	44
Miscellaneous parts .....	45
Sequential part number listing .....	46

#### 4 Removal and replacement procedures

Preliminary replacement requirements .....	53
Tools required .....	53
Service considerations .....	53
Plastic parts .....	53
Cables and connectors .....	54
Drive handling .....	54
Grounding guidelines .....	55
Electrostatic discharge damage .....	55
Packaging and transporting guidelines .....	56
Workstation guidelines .....	56
Equipment guidelines .....	57
Component replacement procedures .....	58
Service tag .....	58
Computer feet .....	59
Battery .....	60
Switch cover and keyboard .....	61
Memory module .....	65
Optical drive .....	66
Speakers .....	69
WWAN module .....	70
Palm rest .....	71
Hard drive .....	74
WLAN module .....	76
Display assembly on computers with 15.6-in displays .....	78
Top cover .....	84
Power button board .....	88
RTC battery .....	90
Display assembly on computers with 14.0-in displays .....	91
Bluetooth module .....	96
Modem module .....	97
USB connector assembly .....	98
Heat sink and fan .....	100
Processor .....	104
System board .....	106
SIM .....	108



## 5 Computer Setup

Computer Setup in Windows Vista and Windows XP .....	110
Starting Computer Setup .....	110
Using Computer Setup .....	110
Navigating and selecting in Computer Setup .....	110
Restoring factory settings in Computer Setup .....	111
Computer Setup menus .....	111
File menu .....	112
Security menu .....	113
Diagnostics menu .....	114
System Configuration menu .....	115
Computer Setup in Linux .....	117
Starting Computer Setup .....	117
Using Computer Setup .....	118
Navigating and selecting in Computer Setup .....	118
Restoring factory settings in Computer Setup .....	118
Computer Setup menus .....	119
File menu .....	119
Security menu .....	120
Diagnostics menu .....	120
System Configuration menu .....	121

## 6 Specifications

Computer specifications .....	123
14.0-in WXGA display specifications .....	124
15.6-in WXGA display specifications .....	125
Hard drive specifications .....	126
DVD±RW Double-Layer Combo Drive specifications .....	127
Blu-ray ROM DVD+/-RW SuperMulti DL Drive .....	128
DVD-ROM Drive .....	129
System DMA specifications, Windows Vista and XP .....	130
System interrupt specifications, Windows Vista .....	130
System interrupt specifications, Windows XP .....	131
System I/O address specifications, Windows Vista .....	132
System I/O address specifications, Windows XP .....	134
System memory map specifications, Windows Vista .....	136
System memory map specifications, Windows XP .....	137

## 7 Screw listing

Torx T8M2.5×6.0 screw .....	139
Torx T8M2.5×4.0 screw .....	140
Phillips PM2.0×2.0 screw .....	141
Phillips PM2.0×3.0 screw .....	142

Phillips PM2.0×3.0 screw .....	144
Phillips PM2.5×6.0 screw .....	145
Phillips PM2.5×11.0 captive screw .....	146
Phillips PM3.0×4.0 screw .....	147
Phillips PM2.0×4.0 screw .....	148
Phillips PM2.5×3.0 screw .....	149
Phillips PM2.5×4.5 screw .....	153
Phillips PM2.5×3.0 broadhead screw .....	155
Phillips PM2.5×7.0 screw .....	157
Phillips PM2.5×9.0 captive screw .....	158

## 8 Backup and recovery

Backup and recovery in Windows Vista .....	160
Overview .....	160
Backing up your information .....	160
Performing a recovery .....	161
Using the Windows recovery tools .....	162
Using f11 .....	162
Using a Windows Vista operating system DVD (purchased separately) .....	163
Backup and recovery in Windows XP .....	164
Overview .....	164
Backing up your information .....	164
Performing a recovery .....	165
Recovering your information .....	165
Recovering the operating system and programs .....	165

## 9 Connector pin assignments

Audio-in (microphone) .....	166
Audio-out (headphone) .....	166
External monitor .....	167
RJ-11 (modem) .....	168
RJ-45 (network) .....	169
Universal Serial Bus .....	169

## 10 Power cord set requirements

Requirements for all countries and regions .....	170
Requirements for specific countries and regions .....	171

## 11 Recycling

Battery .....	172
Display .....	172

Index .....	178
-------------	-----



# 1 Product description

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
<b>Product Name</b>	HP ProBook 4415s Notebook PC	√		√	
	HP ProBook 4416s Notebook PC		√		
	HP ProBook 4515s Notebook PC			√	√
<b>Processors</b>	AMD Turion™ II Ultra Dual-Core Mobile M600 2.4-GHz processor, 2-MB L2 cache	√	√	√	√
	AMD Turion II Dual-Core Mobile M520 2.3-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Turion II Dual-Core Mobile M500 2.2-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Turion Ultra Dual-Core ZM-86 2.4-GHz processor, 2-MB L2 cache	√	√	√	√
	AMD Turion X2 Ultra Dual-Core ZM-84 2.3-GHz processor, 2-MB L2 cache	√	√	√	√
	AMD Turion X2 Dual-Core RM-70 2.0-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Turion X2 Dual-Core RM-72 2.1-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Turion X2 Dual-Core RM-74 2.2-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Turion X2 Dual-Core RM-76 2.3-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Athlon™ II Dual-Core M320 2.1-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Athlon II Dual-Core M300 2.0-GHz processor, 1-MB L2 cache for use only in Japan, South Korea, Taiwan, and Thailand	√	√	√	√
	AMD Athlon QL-62 2.0-GHz processor, 1-MB L2 cache	√	√	√	√

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	AMD Athlon QL-64 2.1GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Athlon QL-66 2.2-GHz processor, 1-MB L2 cache	√	√	√	√
	AMD Sempron™ M100 2.0-GHz processor, 512-GB L2 cache	√	√	√	√
	AMD Sempron SI-42 2.1GHz processor, 512KB L2 cache	√	√	√	√
Chipset	Northbridge: RS780MN (UMA; system boards that support AMD ZM, RM, QL, or SI processors)	√		√	
	Northbridge: RX781 (discrete; system boards that support AMD ZM, RM, QL, or SI processors)		√		√
	Northbridge: AMD RS880M (UMA; system boards that support AMD Mxxx processors)	√		√	
	Northbridge: AMD RX881 (discrete; system boards that support AMD Mxxx processors)		√		√
	Southbridge: AMD SB700 (system boards that support AMD Mxxx processors)	√	√	√	√
	Southbridge: AMD SB710 (system boards that support AMD Mxxx processors)	√	√	√	√
Graphics	ATI Radeon™ HD 3200 (UMA)	√		√	
	ATI Mobility Radeon HD 4330 (discrete)		√		√
	ATI-M92S2LP with hypermemory support				
	512-MB DDR2 – 500 MHz (64M×16, Qty 4)				
Panels	All display assemblies include 2 wireless local area network (WLAN) antennas	√	√	√	√
	14.0-in HD AntiGlare without webcam	√	√		
	14.0-in HD AntiGlare with webcam	√	√		
	14.0-in HD BrightView with webcam	√	√		
	14.0-in HD BrightView without webcam	√	√		
	14.0-in HD BrightView with webcam and WWAN	√			

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	15.6-in HD AntiGlare without webcam			√	√
	15.6-in HD AntiGlare with webcam			√	√
	15.6-in HD AntiGlare with webcam and WWAN			√	√
	15.6-in HD BrightView without webcam			√	√
	15.6-in HD BrightView with webcam			√	√
	15.6-in HD BrightView with webcam and WWAN			√	√
<b>Memory</b>	2 customer-accessible/upgradable memory module slots	√	√		
	Supports up to 8 GB of DDR2, PC2-6400, 800-MHz system RAM	√	√	√	√
	Supports the following configurations:	√	√	√	√
	<ul style="list-style-type: none"> <li>8192-MB total system memory (4096 × 2, dual-channel)</li> <li>4096-MB total system memory (4096 × 1, dual-channel)</li> <li>4096-MB total system memory (2048 × 2, dual-channel)</li> <li>3072-MB total system memory (2048 + 1024, dual-channel)</li> <li>2048-MB total system memory (2048 × 1, dual-channel)</li> <li>2048-MB total system memory (1024 × 2, dual-channel)</li> <li>1024-MB total system memory (1024 × 1, dual-channel)</li> </ul>				
<b>Hard drives</b>	Supports 9.5-mm, 6.35-cm (2.5-in) hard drives	√	√	√	√
	Customer-accessible, Serial ATA (SATA)	√	√	√	√

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	Supports the following drives:	√	√	√	√
	<ul style="list-style-type: none"> <li>160-GB, 5400-rpm</li> <li>160-GB, 7200-rpm</li> <li>250-GB, 5400-rpm</li> <li>250-GB, 7200-rpm</li> <li>320-GB, 5400-rpm</li> <li>320-GB, 7200-rpm</li> <li>500-GB, 5400-rpm</li> <li>500-GB, 7200-rpm</li> </ul>				
	HP 3D DriveGuard	√	√	√	√
<b>Optical drives</b>	Fixed (removal of 1 screw required)	√	√	√	√
	Supports no optical drive option	√	√	√	√
	12.7-mm tray load, SATA	√	√	√	√
	Supports the following drives:	√	√	√	√
	<ul style="list-style-type: none"> <li>DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe</li> <li>DVD-ROM Drive</li> <li>Blu-ray ROM DVD+/-RW SuperMulti DL Drive</li> </ul>				
<b>Diskette drive</b>	Supports external USB diskette drive only	√	√	√	√
<b>Webcam</b>	Integrated 2 MP webcam	√	√	√	√
<b>Audio</b>	ADI 1984JCPZ	√	√	√	√
	IDT High Definition audio	√	√	√	√
	Integrated microphone	√	√	√	√
	Stereo speakers	√	√	√	√
	Headphone and microphone jacks	√	√	√	√
<b>Modem</b>	56K v.92 MDC data/fax modem	√	√	√	√
	Supports no modem option	√	√	√	√
	Modem cable not included	√	√	√	√
<b>Ethernet</b>	Marvell 10/100/1000 Ethernet 88E8072-B1 network interface card (NIC)	√	√	√	√
	Ethernet cable not included	√	√	√	√



Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	S3/S4/S5 wake on LAN (AC mode only)	√	√	√	√
<b>Wireless</b>	Integrated WLAN options by way of MiniPCI card	√	√	√	√
	2 WLAN antennas built into display assembly	√	√	√	√
	Support for no-WLAN option	√	√	√	√
	Support for the following WLAN formats:	√	√	√	√
	<ul style="list-style-type: none"> <li>• Broadcom 802.11a/b/g/n</li> <li>• Broadcom 802.11b/g</li> </ul>				
	<b>Wireless personal area network (WPAN) by way of Bluetooth® module:</b>	√	√	√	√
	Support for no-WPAN option	√	√	√	√
	Bluetooth 2.0 module	√	√	√	√
	Bluetooth 2.1 module	√	√	√	√
	<b>Wireless Wide Area Network (WWAN)</b>	√	√	√	√
	Subscriber Identity Module (SIM)			√	√
	WWAN module UNDP, GPS			√	√
	WWAN module 3G	√			
	2 WWAN antennas (world-wide 5 panel, configured with panel)			√	√
	No support for WWAN after market option	√	√	√	√
<b>External Media Cards</b>	One ExpressCard – 34 mm	√	√	√	√
	Media Card Reader supporting Memory Stick (MS), MultiMediaCard (MMC), Secure Digital (SD) Memory Card, xD-Picture Card (XD)	√	√	√	√
<b>Ports</b>	Audio-in (stereo microphone)	√	√	√	√
	Audio-out (stereo headphone)	√	√	√	√
	RJ-11 (modem)	√	√	√	√
	RJ-45 (Ethernet, includes link and activity lights)	√	√	√	√
	USB 2.0 (4)	√	√	√	√

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)	√	√	√	√
	High-Definition Multimedia Interface (HDMI)	√	√	√	√
	Multi-pin AC power	√	√	√	√
<b>Keyboard/ pointing devices</b>	14.0-in keyboard with TouchPad	√	√		
	15.6-in/17.3-in keyboard with TouchPad			√	√
	TouchPad supports 2-way scroll (taps enabled as default)	√	√	√	√
<b>Power requirements</b>	90-W Smart AC adapter (discrete models)		√		√
	65-W Smart AC adapter (UMA models)	√		√	
	6-cell, 47-Wh Li-ion battery (L-cavity for 14.0-in models)	√	√		
	8-cell, 63-Wh Li-ion battery (in-line cavity for 15.6-in models)			√	√
	6-cell, 47-Wh Li-ion battery (in-line cavity for 15.6-in models)			√	√
<b>Security</b>	Supports Kensington security lock	√	√	√	√
	No TPM support	√	√	√	√
<b>Operating system</b>	<b>Preinstalled:</b>				
	• Windows® 7 Pro 32 with Microsoft® Basics	√	√	√	√
	• Windows 7 Home Premium 32 with Microsoft Basics	√	√	√	√
	• Windows Vista® Home Basic 32 with MS Basics (Japan only)	√	√	√	√
	• Windows Vista Business 32 with MS Basics (Japan only)	√	√	√	√
	• Windows Vista Business 32 (with Windows® XP Pro images) with MS Basics	√	√	√	√
	• Windows Vista Home Basic 32 with Office 2007 Personal (Japan only)	√	√	√	√
	• Windows XP Professional with Microsoft Basics (with Windows 7 Professional COA)	√	√	√	√

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	<ul style="list-style-type: none"> <li>Red Flag Linux (in the People's Republic of China only)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>SuSE Linux</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>FreeDOS</li> </ul>	√	√	√	√
	<b>Preinstalled with Office:</b>				
	<ul style="list-style-type: none"> <li>Windows 7 Home Basic 32 with Office 2007 Ready (for use in all countries or regions except Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Home Premium 32 with Office 2007 Ready (for use in all countries or regions except Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Home Premium 32 with Office 2007 Personal (for use only in Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Home Premium 32 with Office 2007 Personal with Powerpoint (for use in all countries or regions except Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Home Premium 32 with Office 2007 Professional (for use only in Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Pro 32 with Office 2007 Ready (for use in all countries or regions except Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Pro 32 with Office 2007 Personal (for use only in Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Pro 32 with Office 2007 Personal with Powerpoint (for use only in Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows 7 Pro 32 with Office 2007 Professional (for use only in Japan)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows Vista Basic 32 with Office 2007 Professional (Japan only)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows Vista Basic 32 with Office 2007 Personal (Japan only)</li> </ul>	√	√	√	√
	<ul style="list-style-type: none"> <li>Windows Vista Basic 32 with Office 2007 Personal with PP (Japan only)</li> </ul>	√	√	√	√


Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	• Windows Vista Basic 32 with Office 2007 Ready (except Japan)	√	√	√	√
	• Windows Vista Basic 32 with Office 2007 Ready – China Mobile	√	√	√	√
	• Windows Vista Home Premium 32 with Office 2007 Ready (except Japan)	√	√	√	√
	• Windows Vista Business 32 with Office 2007 Ready (except Japan)	√	√	√	√
	• Windows Vista Business 32 with Office 2007 Personal with PP (Japan only)	√	√	√	√
	• Windows Vista Business 32 (with XP Pro images) with Office 2007 Ready (except Japan)	√	√	√	√
	• Windows Vista Business 32 (with XP Pro images) with Office 2007 Personal (Japan only)	√	√	√	√
	• Windows Vista Business 32 (with XP Pro images) with Office 2007 Personal with PP (Japan only)	√	√	√	√
	• Windows Vista Business 32 (with XP Pro images) with Office 2007 (Japan only)	√	√	√	√
	• Windows Vista Business 32 with Office 2007 Professional (Japan only)	√	√	√	√
	• Windows Vista Business 32 with Office 2007 Personal (Japan only)	√	√	√	√
<b>Restore media:</b>					
	• <i>Windows 7</i>	√	√	√	√
	• <i>Windows 7 Home Basic 32</i>	√	√	√	√
	• <i>Windows 7 Home Premium 32</i>	√	√	√	√
	• <i>Windows 7 Professional 32</i>	√	√	√	√
	• Windows Vista 32 Home Basic	√	√	√	√
	• Windows Vista Business 32	√	√	√	√
	• Windows Vista Business 64	√	√	√	√

Category	Description	14.0-in UMA 4415s	14.0-in Discrete 4416s	15.6-in UMA 4515s	15.6-in Discrete 4515s
	• Windows Vista (Office Ready DVD)	√	√	√	√
	• Windows Vista Home Premium	√	√	√	√
	• Windows Vista (DRDVD)	√	√	√	√
	• Windows XP Professional	√	√	√	√
	• Windows XP Pro (DRDVD)	√	√	√	√
	• Red Flag Linux (in the People's Republic of China only)	√	√	√	√
	• SuSE Linux	√	√	√	√
	<b>Certified:</b> Microsoft® WHQL	√	√	√	√
	<b>Web-only Support:</b>	√	√	√	√
	• Windows Vista Business 64	√	√	√	√
	• <i>Windows 7 Professional 64</i>	√	√	√	√
<b>Serviceability</b>	<b>End-user replaceable parts:</b>				
	AC adapter	√	√	√	√
	Battery (system)	√	√	√	√
	Hard drive	√	√	√	√
	Memory module	√	√	√	√
	Optical drive	√	√	√	√
	WLAN module	√	√	√	√
	WWAN module	√	√	√	√
	SIM	√	√	√	√

## 2 External component identification

### Windows Vista and Windows XP

#### Display

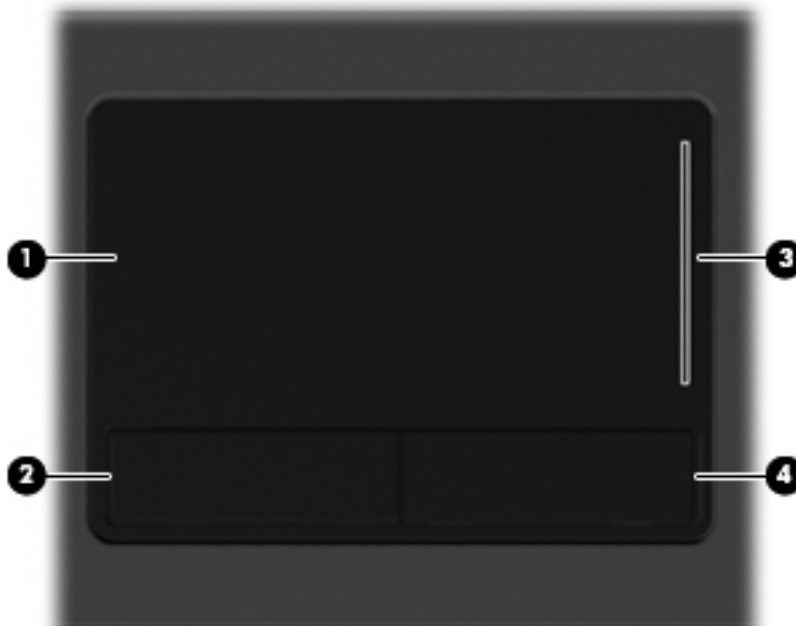
 **NOTE:** Your computer may look slightly different from the illustration in this section.



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

## Top components

### Pointing devices




Component		Description
(1)	TouchPad*	Moves the pointer and selects or activates items on the screen.
(2)	Left TouchPad button*	Functions like the left button on an external mouse.
(3)	TouchPad scroll zone	Scrolls up or down.
(4)	Right TouchPad button*	Functions like the right button on an external mouse.

\*This table describes factory settings.

To view or change pointing device preferences in Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**.

To view or change pointing device preferences in Windows XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

# Lights


 **NOTE:** Your computer may look slightly different from the illustration in this section.

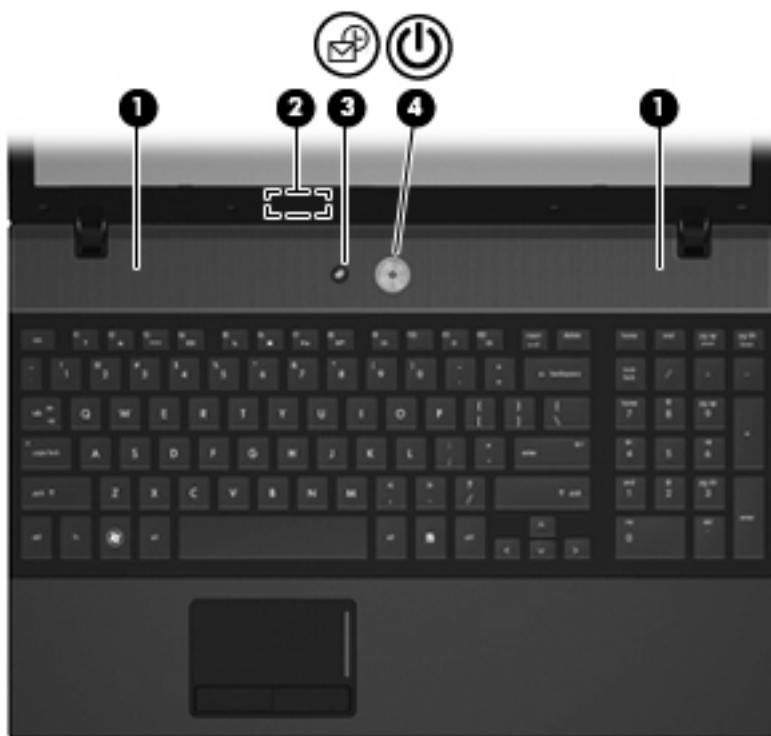


Component		Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Info Center/QuickLook light	<ul style="list-style-type: none"><li>On: The computer is on.</li><li>Blinking (5 times):<ul style="list-style-type: none"><li>When the computer is on, press button to launch Info Center.</li><li>When the computer is off or in Hibernation, press button to launch QuickLook.</li></ul></li><li>Off: The computer is in Hibernation, or in the Sleep state (Windows Vista) or Standby (Windows XP).</li></ul>
(3)	Power light	<ul style="list-style-type: none"><li>On: The computer is on.</li><li>Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP).</li><li>Off: The computer is off or in Hibernation.</li></ul>




## Buttons, switches, and speakers

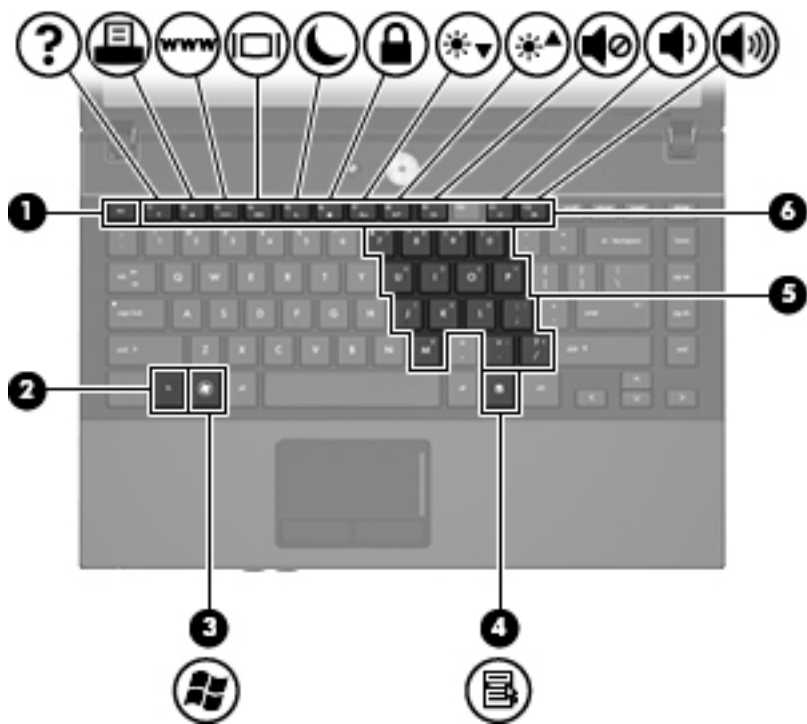
 **NOTE:** Your computer may look slightly different from the illustration in this section.



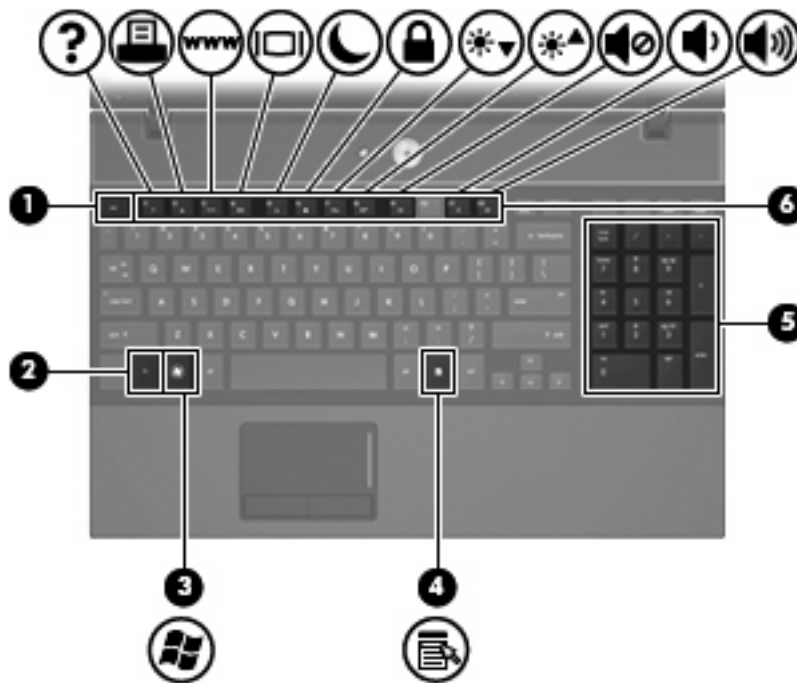
Component	Description
(1) Speakers (2)	Produce sound.
(2) Internal display switch	Turns off the display if the display is closed while the power is on.
(3) Info Center/Quick Look button	Launches Info Center or QuickLook.
(4) Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button to shut down the computer.</li><li>• When the computer is in the Sleep state (Windows Vista) or Standby (Windows XP), press the button briefly to exit Sleep or Standby.</li><li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li></ul>
If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.	
To learn more about your power settings and how to change them, select <b>Start &gt; Control Panel &gt; System and Maintenance &gt; Power Options</b> .	

Keys

 **NOTE:** Refer to the illustration that most closely matches your computer.



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



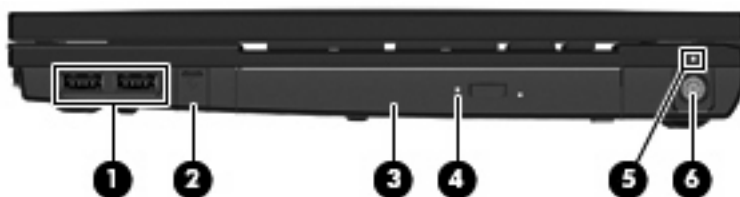
Component	Description
(1) <a href="#">esc</a> key	Displays system information when pressed in combination with the <a href="#">fn</a> key.
(2) <a href="#">fn</a> key	Executes frequently used system functions when pressed in combination with a function key or the <a href="#">esc</a> key.
(3) Windows logo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

## Front components



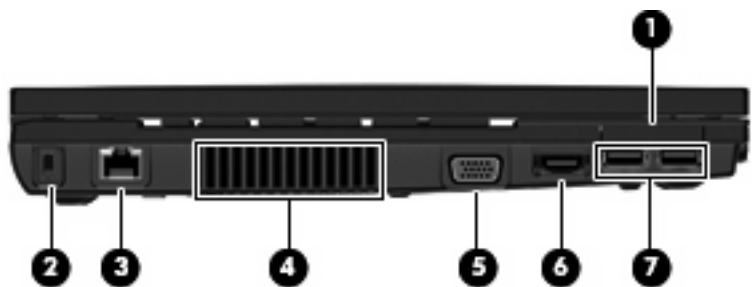
Component	Description
(1) Drive light	<ul style="list-style-type: none"> <li>Blinking turquoise: The hard drive or optical drive is being accessed.</li> <li>Amber: HP 3D DriveGuard has temporarily parked the hard drive.</li> </ul>
(2) Wireless switch	<p>Turns the wireless feature on or off but does not establish a wireless connection.</p> <p><b>NOTE:</b> You must set up or access a wireless network to establish a wireless connection.</p>
(3) Wireless light	<ul style="list-style-type: none"> <li>Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on.</li> <li>Amber: All wireless devices are off.</li> </ul>
(4) Media Card Reader	<p>Supports the following optional digital card formats:</p> <ul style="list-style-type: none"> <li>Memory Stick (MS)</li> <li>Memory Stick Pro (MSP)</li> <li>MultiMediaCard (MMC)</li> <li>MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC)</li> <li>Secure Digital (SD) Memory Card</li> <li>Secure Digital High Capacity (SDHC) Memory Card</li> <li>Secure Digital High Speed (SDHS) Memory Card</li> <li>xD-Picture Card (XD)</li> <li>xD-Picture Card (XD) Type H</li> <li>xD-Picture Card (XD) Type M</li> </ul>
(5) Audio-out (headphone) jack	<p>Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.</p> <p><b>NOTE:</b> When a device is connected to the headphone jack, the computer speakers are disabled.</p>
(6) Audio-in (microphone) jack	<p>Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.</p>

## Right-side components



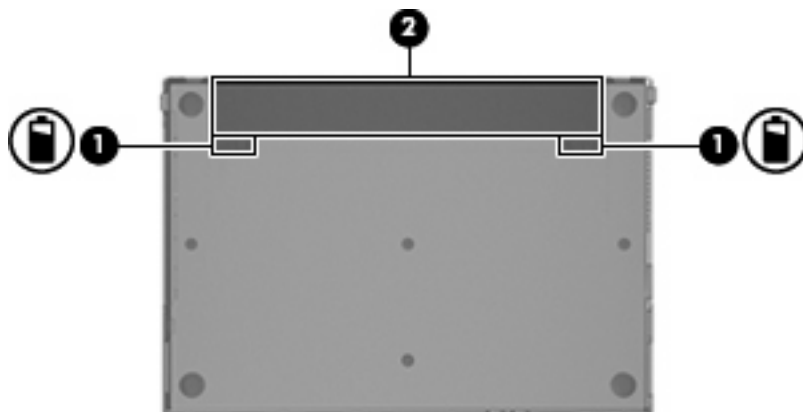
Component		Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	Optical drive (select models only)	Reads optical discs and, on select models, also writes to optical discs.
(4)	Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(5)	Battery light	<ul style="list-style-type: none"><li>• Amber: A battery is charging.</li><li>• Turquoise: A battery is close to full charge capacity.</li><li>• Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</li><li>• Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.</li></ul>
(6)	Power connector	Connects an AC adapter.

# Left-side components



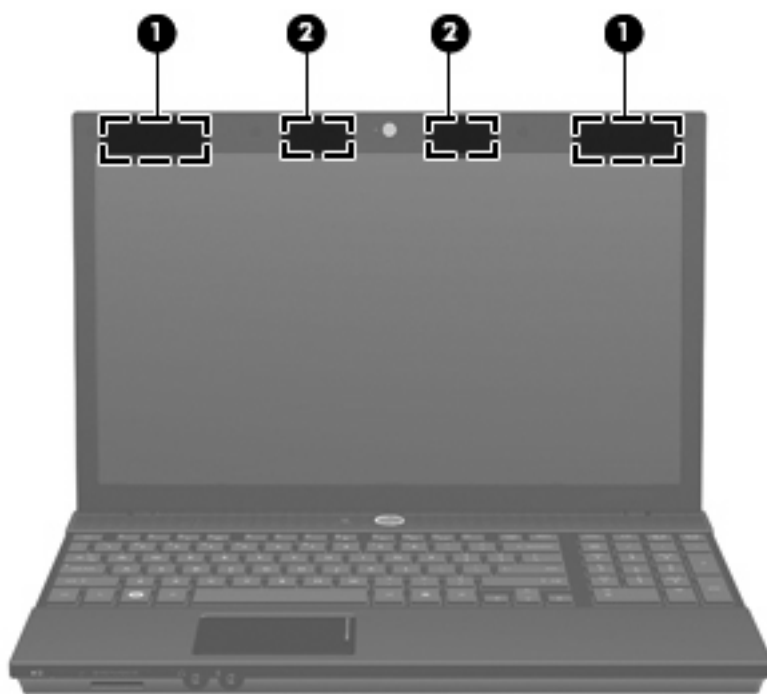
Component		Description
(1)	ExpressCard slot	Supports optional ExpressCards.
(2)	Security cable slot	Attaches an optional security cable to the computer. <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	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.
(5)	External monitor port	Connects an external VGA monitor or projector.
(6)	HDMI port	Connect an optional HDMI device.
(7)	USB ports (2)	Connect optional USB devices.

## Bottom components




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

## Wireless antennas

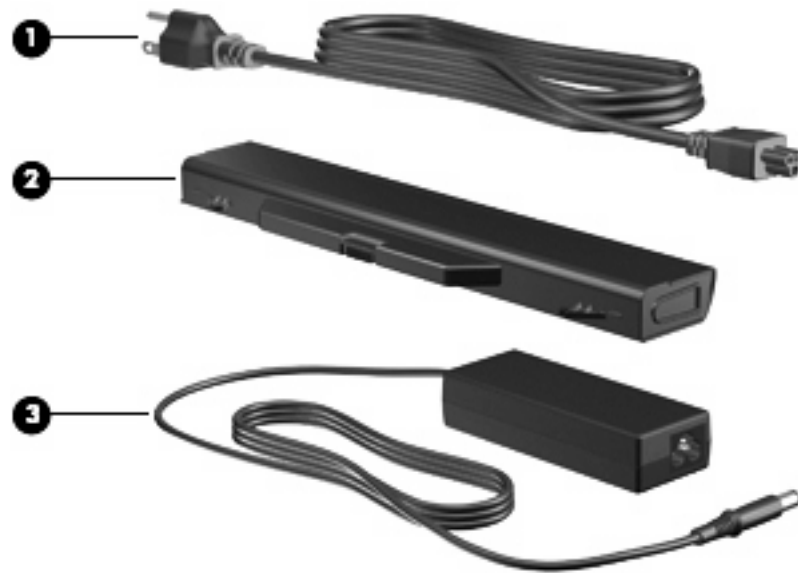


Component	Description
(1) WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).

Component	Description
(2) WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
*To see wireless regulatory notices, refer to the section of the <i>Regulatory, Safety and Environmental Notices</i> that applies to your country or region. These notices are located in Help and Support.	

 **NOTE:** The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

## Additional hardware components




Component	Description
(1) Power cord*	Connects an AC adapter to an AC outlet.
(2) Battery*	Powers the computer when the computer is not plugged into external power.
(3) AC adapter	Converts AC power to DC power.
*Batteries and power cords vary in appearance by country or region.	



# Linux

## Display

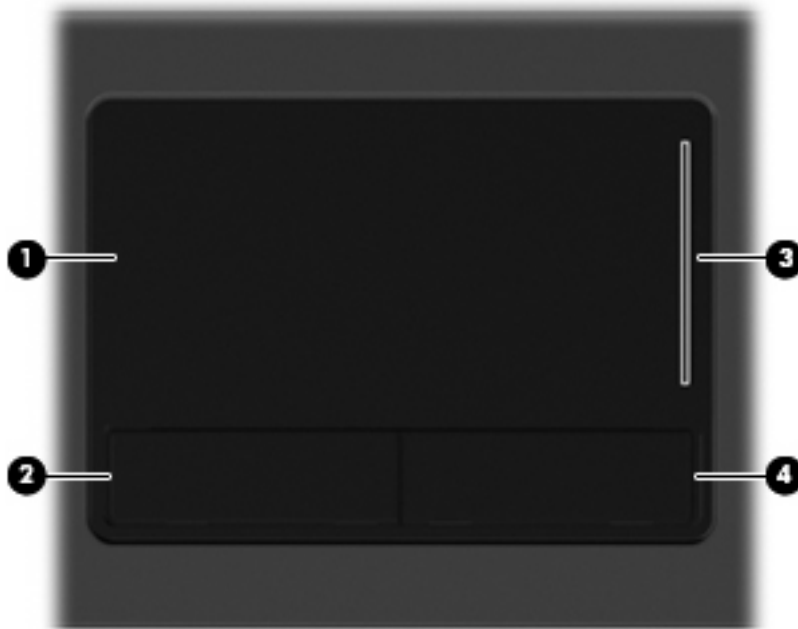
 **NOTE:** Your computer may look slightly different from the illustration in this section.



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

## Top components

### Pointing devices



Component		Description
(1)	TouchPad	Moves the pointer and selects or activates items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	TouchPad scroll zone	Scrolls up or down.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

## Lights




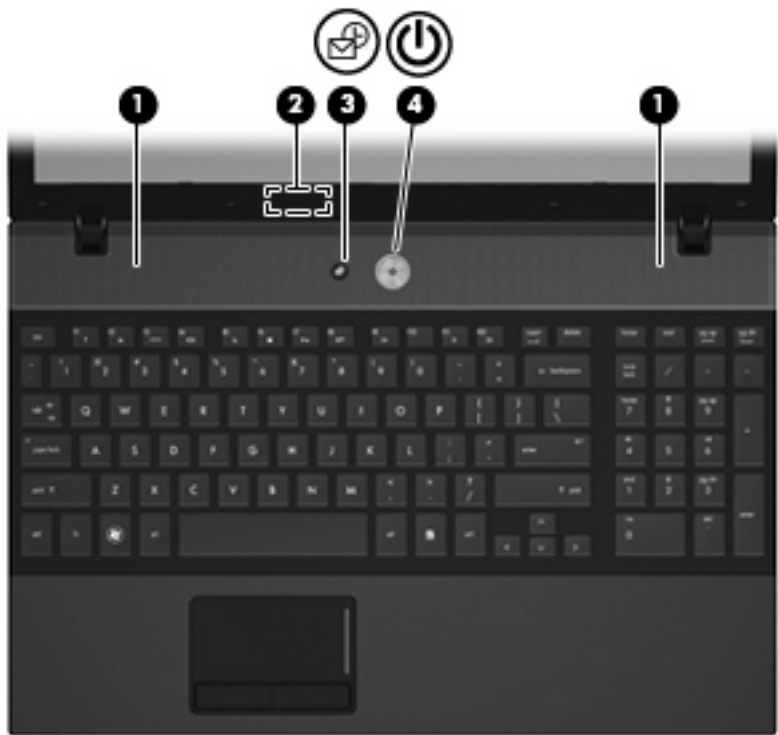
**NOTE:** Your computer may look slightly different from the illustration in this section.



Component		Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Info Center/QuickLook light	<ul style="list-style-type: none"><li>On: The computer is on.</li><li>Blinking (5 times):<ul style="list-style-type: none"><li>When the computer is on, press button to launch Info Center.</li><li>When the computer is off or in Hibernation, press button to launch QuickLook.</li></ul></li><li>Off: The computer is off or in the Suspend or Hibernation state.</li></ul>
(3)	Power light	<ul style="list-style-type: none"><li>On: The computer is on.</li><li>Blinking: The computer is in Suspend.</li><li>Off: The computer is off or in Hibernation.</li></ul>


Buttons, switch, and speakers

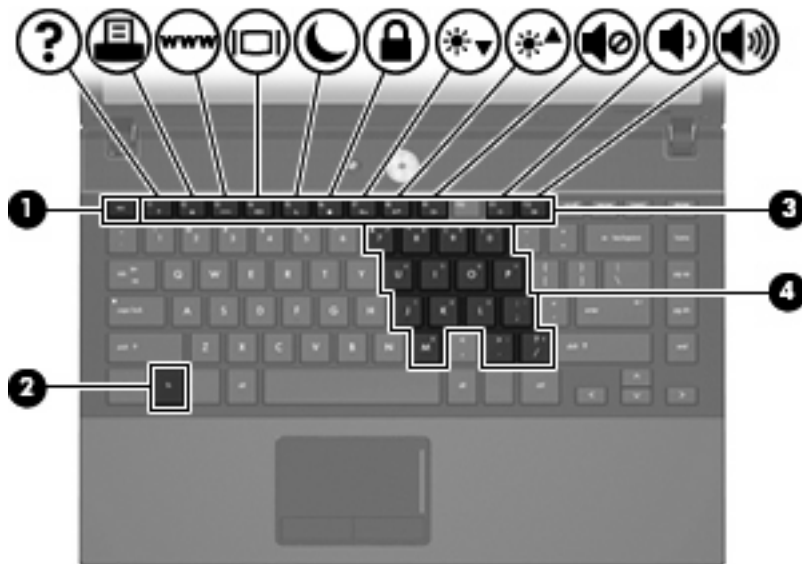
 **NOTE:** Your computer may look slightly different from the illustration in this section.



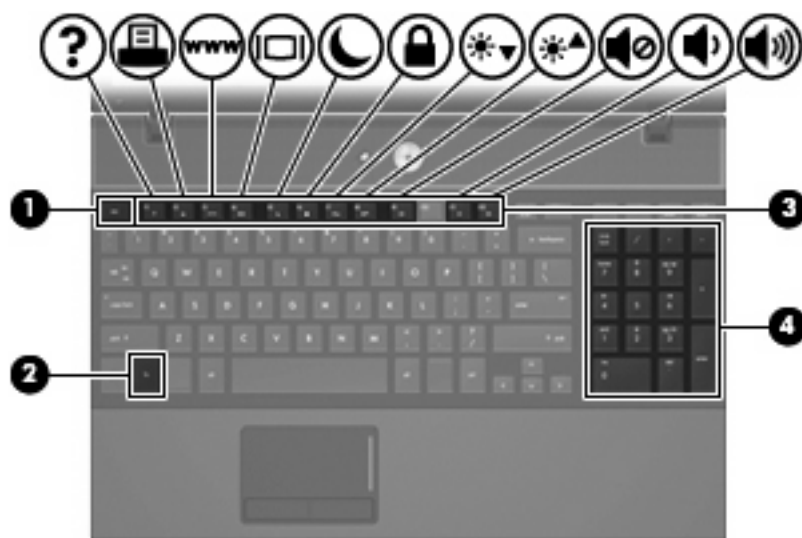
Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Internal display switch	Turns off the display if the display is closed while the power is on.
(3)	Info Center/QuickLook button	Launches Info Center or QuickLook.
(4)	Power button	<ul style="list-style-type: none"><li>When the computer is off, press the button to turn on the computer.</li><li>When the computer is on, press the button to shut down the computer.</li><li>When the computer is in Suspend, press the button briefly to exit Suspend.</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 operating system 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 and how to change them, select <b>Computer &gt; Control Center &gt; System &gt; Power Management</b>.</p>

## Keys

 **NOTE:** Refer to the illustration that most closely matches your computer.



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, the <code>num lk</code> key, or the <code>esc</code> key.
(3) Function keys	Execute frequently used system functions when pressed in combination with the <code>fn</code> key.
(4) Embedded numeric keypad keys	When the keypad has been enabled, the keys can be used like the keys on an external numeric keypad when pressed in combination with the <code>fn</code> and <code>num lk</code> keys.



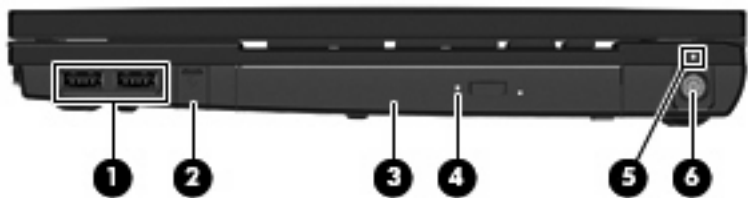
Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes frequently used system functions when pressed in combination with a function key or the <code>esc</code> key.
(3) Function keys	Execute frequently used system functions when pressed in combination with the <code>fn</code> key.
(4) Integrated numeric keypad keys	Can be used like the keys on an external numeric keypad.

## Front components



Component		Description
(1)	Drive light	Blinking turquoise: The hard drive or optical drive is being accessed.
(2)	Wireless switch	Turns the wireless feature on or off but does not establish a wireless connection.  <b>NOTE:</b> You must set up or access a wireless network to establish a wireless connection.
(3)	Wireless light	<ul style="list-style-type: none"><li>Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on.</li><li>Amber: All wireless devices are off.</li></ul>
(4)	Media Card Reader	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>MultiMediaCard 4.2 (MMC Plus, including MMC Plus HC)</li><li>Secure Digital (SD) Memory Card</li><li>Secure Digital High Capacity (SDHC) Memory Card</li><li>Secure Digital High Speed (SDHS) Memory Card</li><li>xD-Picture Card (XD)</li><li>xD-Picture Card (XD) Type H</li><li>xD-Picture Card (XD) Type M</li></ul>
(5)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.  <b>NOTE:</b> When a device is connected to the headphone jack, the computer speakers are disabled.
(6)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

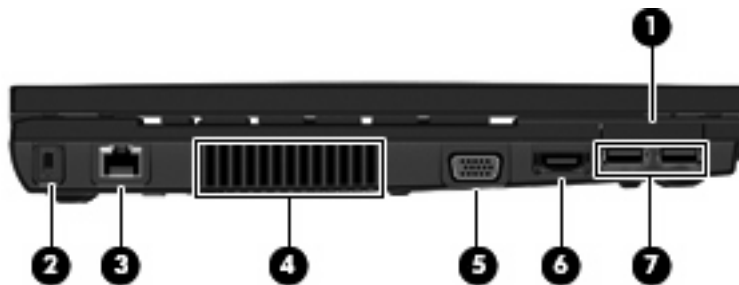
# Right-side components



Component		Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	RJ-11 (modem) jack (select models only)	Connects a modem cable.
(3)	Optical drive (select models only)	Reads optical discs and, on select models, also writes to optical discs.
(4)	Optical drive light (select models only)	Blinking: The optical drive is being accessed.
(5)	Battery light	<ul style="list-style-type: none"><li>Amber: A battery is charging.</li><li>Turquoise: A battery is close to full charge capacity.</li><li>Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</li><li>Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.</li></ul>
(6)	Power connector	Connects an AC adapter.

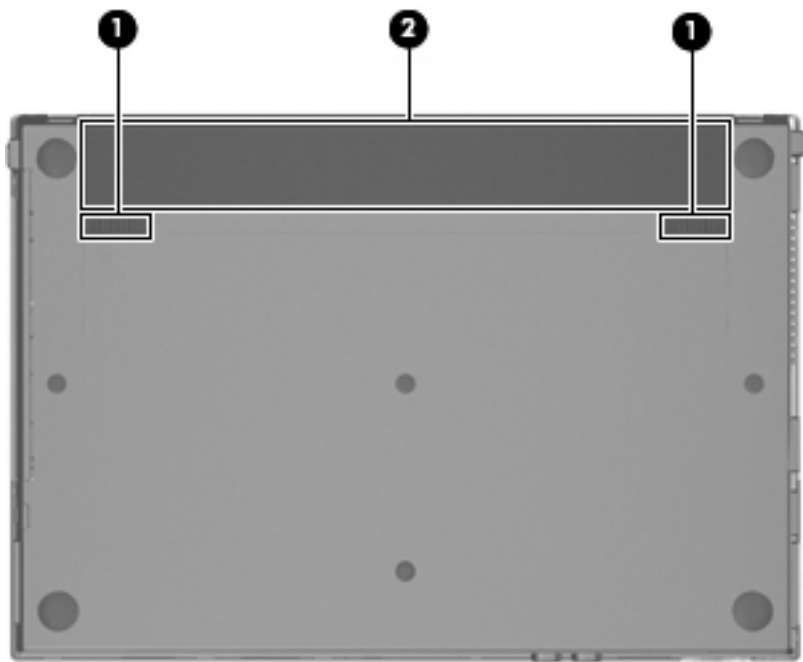


## Left-side components



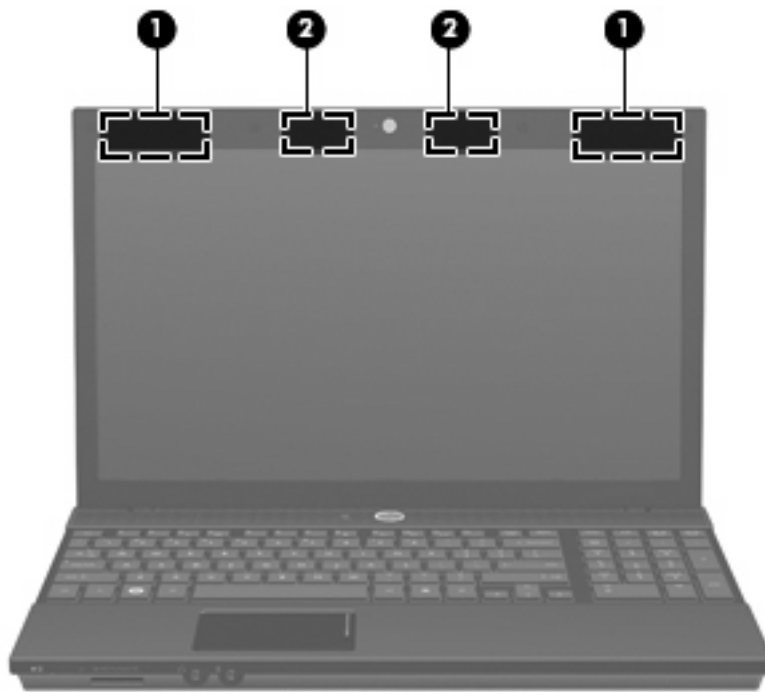
Component		Description
(1)	ExpressCard slot	Supports optional ExpressCards.
(2)	Security cable slot	Attaches an optional security cable to the computer. <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	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.
(5)	External monitor port	Connects an external VGA monitor or projector.
(6)	HDMI port	Connects an optional HDMI device
(7)	USB ports (2)	Connect optional USB devices.

Bottom components




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

## Wireless antennas



Component		Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).

\*To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located on the *User Guide* disc that has be provided with your computer.

 **NOTE:** The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

Additional hardware components



Component		Description
(1)	Power cord*	Connects an AC adapter to an AC outlet.
(2)	Battery*	Powers the computer when the computer is not plugged into external power.
(3)	AC adapter	Converts AC power to DC power.
*Batteries and power cords vary in appearance by country or region.		

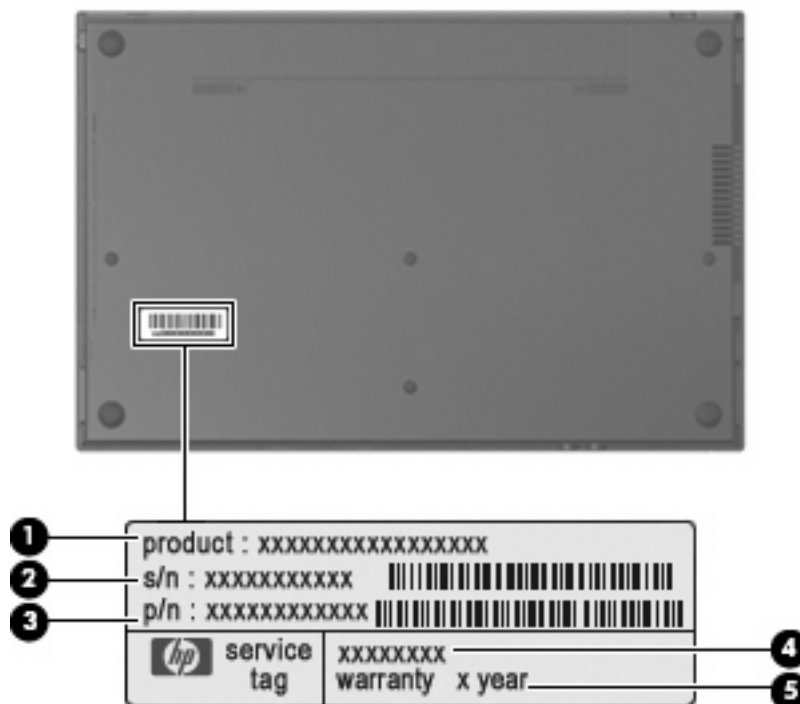
## 3 Illustrated parts catalog

### Service tag

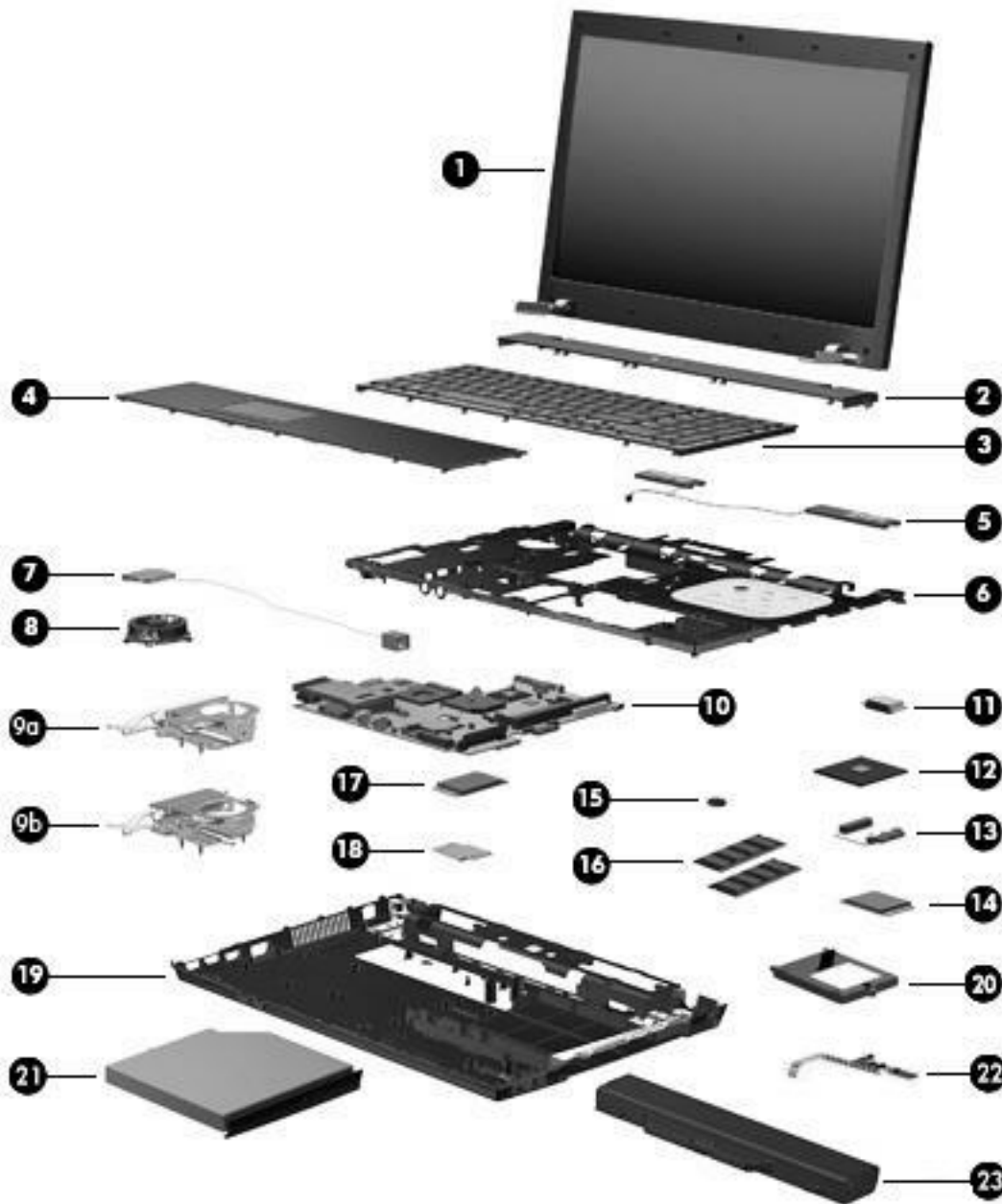
The service tag, affixed to the bottom of the computer, provides information that may be needed when troubleshooting system problems. The service tag provides the following information:

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

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



# Computer major components



Item	Description	Spare part number
(1)	<b>Display assembly</b> (includes 2 WLAN antenna transceivers and cables)	
	<b>For use only with black computers with 15.6-in HD LED displays</b>	
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers not equipped with a webcam</li> </ul>	536790-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers equipped with a webcam</li> </ul>	536791-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers not equipped with a webcam</li> </ul>	536792-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers equipped with a webcam</li> </ul>	536793-001

Item	Description	Spare part number
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use on computers equipped with a webcam and WWAN module</li> </ul>	536794-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use on computers equipped with a webcam and WWAN module</li> </ul>	536795-001
<b>For use only with red computers with 15.6-in HD displays</b>		
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers not equipped with a webcam</li> </ul>	572936-001
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers equipped with a webcam</li> </ul>	572937-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers not equipped with a webcam</li> </ul>	572938-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers equipped with a webcam</li> </ul>	572939-001
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers equipped with a webcam and WWAN module</li> </ul>	572940-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use on computers equipped with a webcam and WWAN module</li> </ul>	572941-001
<b>For use only with black computers with 14.0-in HD displays</b>		
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers not equipped with a webcam</li> </ul>	536784-001
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers equipped with a webcam</li> </ul>	536785-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers not equipped with a webcam</li> </ul>	536786-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers equipped with a webcam</li> </ul>	536787-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers equipped with a webcam and WWAN module</li> </ul>	578366-001
<b>For use only with red computers with 14.0-in HD displays</b>		
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers not equipped with a webcam</li> </ul>	572932-001
	<ul style="list-style-type: none"> <li>AntiGlare display assembly for use in computers equipped with a webcam</li> </ul>	572933-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers not equipped with a webcam</li> </ul>	572934-001
	<ul style="list-style-type: none"> <li>BrightView display assembly for use in computers equipped with a webcam</li> </ul>	572935-001
<b>(2)</b>	<b>Switch cover</b>	
	For use in black computers with 15.6-in displays	535861-001
	For use in red computers with 15.6-in displays	572726-001
	For use in black computers with 14.0-in displays	535860-001
	For use in red computers with 14.0-in displays	572725-001
<b>(3)</b>	<b>Keyboard</b>	
	<b>NOTE:</b> For a detailed list of available keyboards, see <a href="#">Sequential part number listing on page 46</a> .	
	For use in computers with 15.6-in displays	536537-xxx
	For use in computers with 14.0-in displays	536410-xxx
<b>(4)</b>	<b>Palm rest (includes TouchPad)</b>	
	For use in black computers with 15.6-in displays	535868-001

Item	Description	Spare part number
	For use in red computers with 15.6-in displays	572728-001
	For use in black computers with 14.0-in displays	535867-001
	For use in red computers with 14.0-in displays	572727-001
<b>(5)</b>	<b>Speakers</b>	
	For use in computers with 15.6-in displays	536598-001
	For use in computers with 14.0-in displays	536420-001
<b>(6)</b>	<b>Top cover</b>	
	For use in computers with 15.6-in displays	535866-001
	For use in computers with 14.0-in displays	535865-001
<b>(7)</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 numbers 536539-001 (for computers with 15.6-in displays) and 536538-001 (for computers with 14.0-in displays). See <a href="#">Cable Kit on page 43</a> for more Cable Kit spare part information.	
	For use in all countries and regions except Australia and New Zealand	510100-001
	For use only in Australia and New Zealand	510100-011
<b>(8)</b>	<b>Fan</b>	535766-001
	<b>Heat sink</b>	
<b>(9a)</b>	For use in computers with discrete graphics subsystems	535805-001
<b>(9b)</b>	For use in computers with UMA graphics subsystems	535804-001
<b>(10)</b>	<b>System board</b> (includes replacement thermal material)	
	<b>For use in computers without a WWAN module that use AMD Mxxx processors:</b>	
	• <i>UMA graphics subsystem memory</i>	585219-001
	• <i>Discrete graphics subsystem memory</i>	585221-001
	<b>For use in computers with a WWAN module that use AMD Mxxx processors:</b>	
	• <i>UMA graphics subsystem memory</i>	585218-001
	• <i>Discrete graphics subsystem memory</i>	585220-001
	<b>For use in computers without a WWAN module that use AMD ZM, RM, QL, or SI processors:</b>	
	• <i>UMA graphics subsystem memory</i>	574505-001
	• <i>Discrete graphics subsystem memory</i>	574506-001
	<b>For use in computers with a WWAN module that use AMD ZM, RM, QL, or SI processors:</b>	
	• <i>Discrete graphics subsystem memory</i>	535803-001
<b>(11)</b>	<b>Bluetooth module</b>	
	For use only in models with the following system boards: 535803-001, 574505-001, 574506-001	398393-002

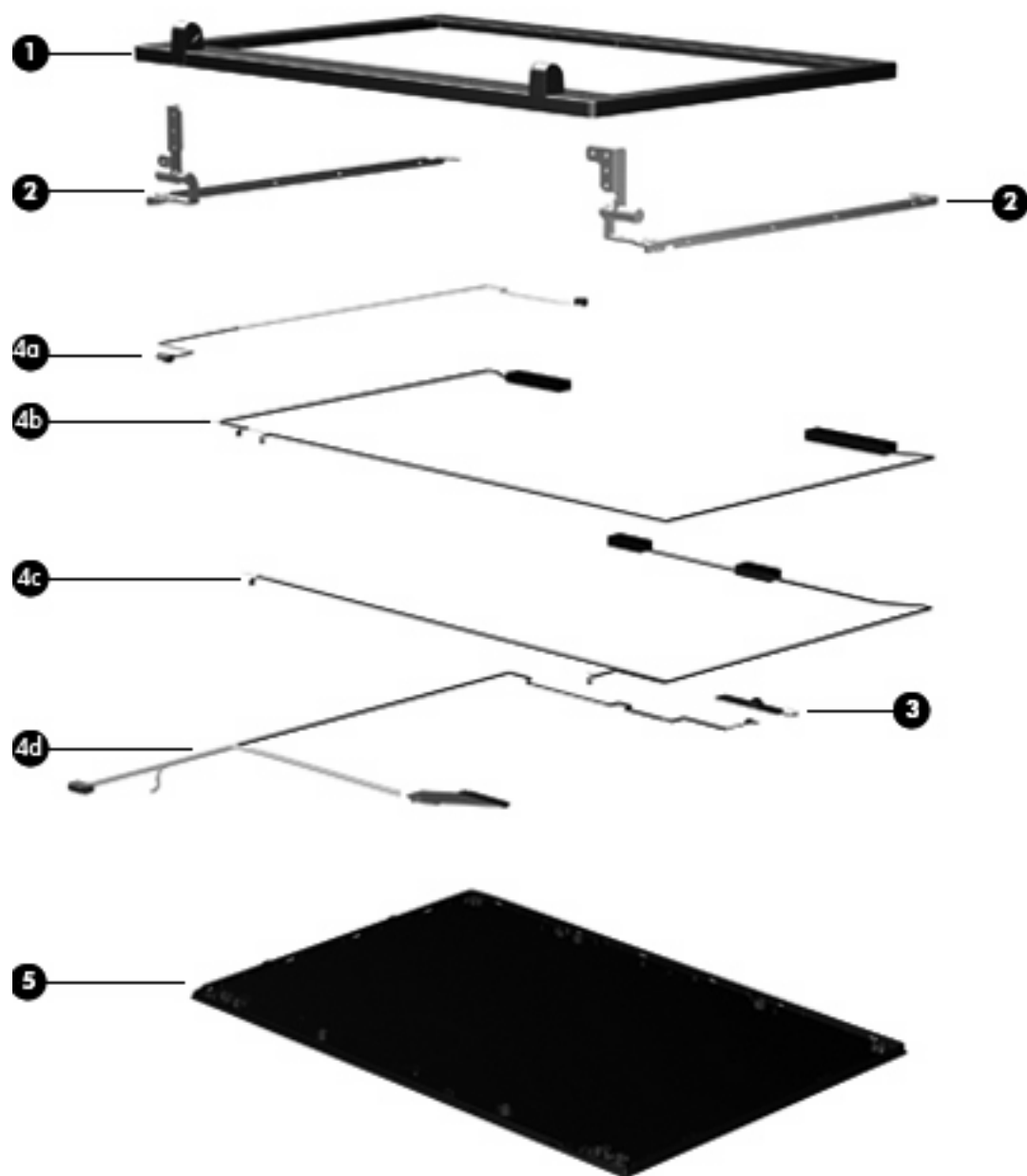


Item	Description	Spare part number
	For use only in models with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001	537921-001
(12)	<b>Processor</b> (includes replacement thermal material) (not illustrated)	
	<b>AMD Turion II Ultra Dual-Core processors</b> (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)	
	• M500 (2.2-GHz with 1-MB L2 cache)	576253-001
	• M520 (2.3-GHz with 1-MB L2 cache)	583055-001
	• M600 (2.4-GHz with 2-MB L2 cache)	576254-001
	<b>AMD Turion Ultra Dual-Core processors</b> (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	
	• ZM-84 (2.3-GHz with 2-GB L2 cache)	507975-001
	• ZM-86 (2.4-GHz with 2-GB L2 cache)	507974-001
	<b>AMD Turion Dual-Core processors</b> (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	
	• RM-70 (2.0-GHz with 1-GB L2 cache)	507977-001
	• RM-72 (2.1-GHz with 1-GB L2 cache)	507978-001
	• RM-74 (2.2-GHz with 1-GB L2 cache)	507979-001
	• RM-76 (2.3-GHz with 1-GB L2 cache)	572748-001
	<b>AMD Athlon II Dual-Core processors</b> (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)	
	• M300 (2.0-GHz with 1-MB L2 cache)	578024-001
	• M320 (2.1-GHz with 1-MB L2 cache)	576252-001
	<b>AMD Athlon Dual-Core processors</b> (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	
	• QL-62 (2.0-GHz with 1-GB L2 cache)	506052-001
	• QL-66 (2.2-GHz with 1-GB L2 cache)	572747-001
	<b>AMD Sempron processors</b>	
	• M100 (2.0-GHz with 512-GB L2 cache; for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)	576251-001
	• SI-42 (2.1-GHz with 512-KB L2 cache; for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	508102-001
(13)	<b>Optical drive connector</b>	535862-001
(14)	<b>WLAN module</b>	
	<b>Broadcom 4322 802.11a/b/g/n WLAN modules</b>	
	• 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
	<ul style="list-style-type: none"> <li>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</li> </ul>	504664-002
<b>Broadcom BCM4312 802.11b/g WLAN modules:</b>		
	<ul style="list-style-type: none"> <li>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</li> </ul>	504593-003
	<ul style="list-style-type: none"> <li>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</li> </ul>	504593-004
(15)	<b>RTC battery</b>	449137-001
(16)	<b>Memory modules (PC2-6400, 800-MHz, DDR2)</b>	

Item	Description	Spare part number
	1-GB	535809-001
	2-GB	535810-001
<b>(17)</b>	<b>WWAN module</b>	
	For use in all countries and regions except China	483377-002
	For use in China	571888-001
	<i>Including GPS, UNDP (United Nations Development Program; not available with Linux)</i>	531993-001
<b>(18)</b>	<b>Subscriber identification module (SIM)</b>	536599-001
<b>(19)</b>	<b>Base enclosure</b>	
	For use in computers with 15.6-in displays	535864-001
	For use in computers with 14.0-in displays	535863-001
<b>(20)</b>	<b>Hard drive</b> (includes hard drive bracket)	
	500-GB, 7200-rpm	575125-001
	500-GB, 5400-rpm	535814-001
	320-GB, 7200-rpm	575124-001
	320-GB, 5400-rpm <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>	535813-001
	250-GB, 7200-rpm	536783-001
	250-GB, 5400-rpm <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>	535812-001
	160-GB, 7200-rpm	536782-001
	160-GB, 5400-rpm <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>	535811-001
<b>(21)</b>	<b>Optical drive</b> (includes bezel)	
	DVD-ROM Drive	535815-001
	DVD±RW Double-Layer Drive with LightScribe	535816-001
	Blu-ray ROM DVD+/-RW SuperMulti DL Drive	535817-001
<b>(22)</b>	<b>Power button board</b> (includes cable)	
	For use in computers with 15.6-in displays	574513-001
	For use in computers with 14.0-in displays	574514-001
<b>(23)</b>	<b>Battery</b>	
	8-cell, 63-Wh for use in computers with 15.6-in displays	535753-001
	6-cell, 47-Wh for use in computers with 15.6-in displays	536418-001
	6-cell, 47-Wh for use in computers with 14.0-in displays	572032-001
	<b>Rubber Kit</b> (not illustrated, contains 8 computer feet and 8 display bezel screw covers)	535793-001

# Display assembly components



Item	Description	Spare part number
(1)	Display bezel	
	For use in computers with 15.6-in displays with a webcam	536421-001
	For use in computers with 15.6-in displays without a webcam	536424-001
	For use in computers with 14.0-in displays with a webcam	536423-001
	For use in computers with 14.0-in displays without a webcam	536422-001
(2)	Display Hinge Kit	
	For use in computers with 15.6-in displays	535872-001

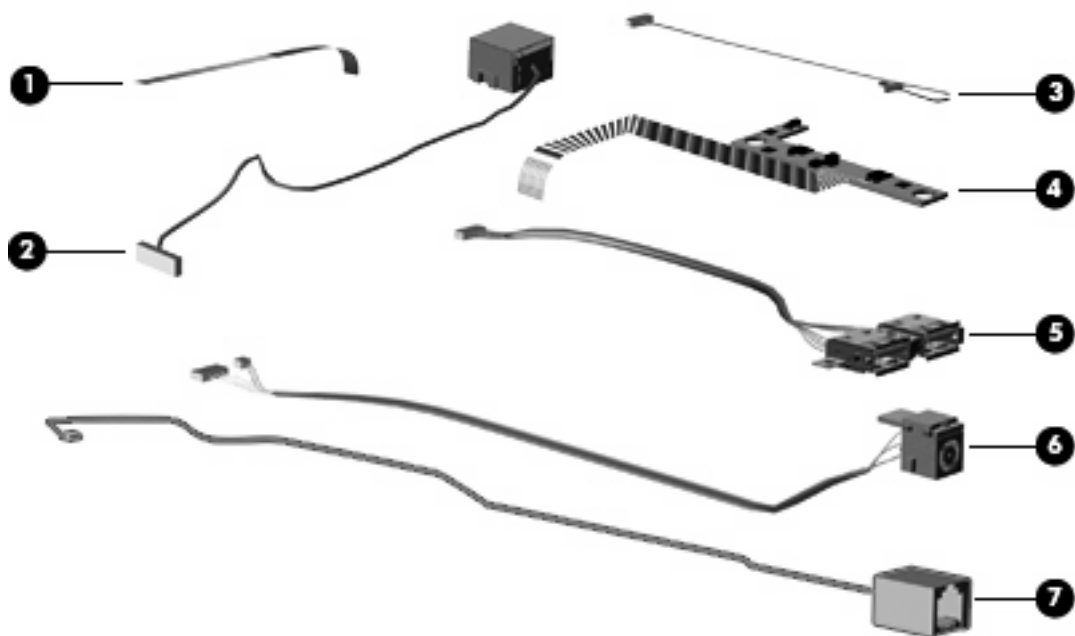
Item	Description	Spare part number
	For use in computers with 14.0-in displays	535871-001
<b>(3)</b>	<b>Webcam module</b>	535797-001
	<b>Display Cable Kit</b>	
	For use in computers with 15.6-in HD displays	536433-001
	For use in computers with 14.0-in displays	536430-001
<b>(4a)</b>	Microphone cable	
<b>(4b)</b>	WLAN antenna receivers and cables	
<b>(4c)</b>	WWAN antenna receivers and cables	
<b>(4d)</b>	Display/webcam cable	
	<b>Display/webcam cable</b> for use in computers with 15.6-in HD+displays	536432-001
	<b>NOTE:</b> This spare includes only the cable.	
	<b>Display/webcam cable</b> for use in computers with 14.0-in HD displays	536429-001
	<b>NOTE:</b> This spare includes only the cable.	
<b>(5)</b>	<b>Display enclosure</b>	
	For use in black computers with 15.6-in displays	536426-001
	For use in red computers with 15.6-in displays	572724-001
	For use in black computers with 14.0-in displays	536425-001
	For use in red computers with 14.0-in displays	572723-001

# Plastics Kit



Item	Description	Spare part number
<b>Plastics Kit:</b>		535780-001
(1)	ExpressCard slot bezel	
(2)	Optical drive bezel	

# Cable Kit



Item	Description	Spare part number
<b>Cable Kit</b>		
	For use only with computers with 14.0-in displays	536538-001
	For use only with computers with 15.6-in displays	536539-001
(1)	TouchPad cable	
(2)	RJ-45 (network) cable	
(3)	Bluetooth cable	
(4)	Power button board and cable	
(5)	USB cable	
(6)	Power cable	
(7)	RJ-11 (modem) jack cable	

## Mass storage devices



Item	Description	Spare part number
(1)	<b>Hard drives</b> (include bracket)	
	500-GB, 7200-rpm	575125-001
	500-GB, 5400-rpm	535814-001
	320-GB, 7200-rpm	575124-001
	320-GB, 5400-rpm (for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)	535813-001
	250-GB, 7200-rpm	536783-001
	250-GB, 5400-rpm (for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)	535812-001
	160-GB, 7200-rpm	536782-001
	160-GB, 5400-rpm (for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)	535811-001
(2)	<b>Optical drives</b> (include bezel)	
	DVD-ROM Drive	535815-001
	DVD±RW Double-Layer Drive with LightScribe	535816-001
	Blu-ray ROM DVD±RW SuperMulti DL Drive	535817-001



## Miscellaneous parts

Description	Spare part number
<b>AC adapters</b>	
65-W AC adapter	463958-001
90-W AC adapter (for use in all countries and regions except India)	463955-001
90-W non-PFC AC adapter (for use only in India)	463956-001
90-W PFC AC adapter (for use only in India)	535593-001
<b>Power cords:</b>	
For use in the United States	246959-001
For use in Australia and New Zealand	246959-011
For use in Europe, the Middle East, and Africa	246959-021
For use in the United Kingdom	246959-031
For use in Italy	246959-061
For use in Denmark	246959-081
For use in Switzerland	246959-AG1
For use in Brazil	246959-201
For use in Japan	246959-291
For use in Taiwan	394279-AB1
For use in South Korea	246959-AD1
For use in Israel	246959-BB1
<b>Screw Kit</b>	535870-001
Screw kits include:	
<ul style="list-style-type: none"> <li>• Phillips PM2.0×2.0 screw</li> <li>• Phillips PM2.0×3.0 screw</li> <li>• Phillips PM2.0×4.0 screw</li> <li>• Phillips PM2.5×6.0 screw</li> <li>• Phillips PM2.5×11.0 captive screw</li> <li>• Phillips PM3.0×4.0 screw</li> <li>• Phillips PM2.0×4.0 screw</li> <li>• Phillips PM2.5×3.0 screw</li> <li>• Phillips PM2.5×4.5 screw</li> <li>• Phillips PM2.5×3.0 broadhead screw</li> <li>• Phillips PM2.5×7.0 screw</li> <li>• Phillips PM2.5×9.0 captive screw</li> </ul>	

## Sequential part number listing

Spare part number	Description
246959-001	Power cord for use in the United States
246959-011	Power cord for use in Australia and New Zealand
246959-021	Power cord for use in Europe, the Middle East, and Africa
246959-031	Power cord for use in the United Kingdom
246959-061	Power cord for use in Italy
246959-081	Power cord for use in Denmark
246959-201	Power cord for use in Brazil
246959-291	Power cord for use in Japan
246959-AD1	Power cord for use in Korea
246959-AG1	Power cord for use in Switzerland
246959-BB1	Power cord for use in Israel
394279-AB1	Power cord for use in Taiwan
398393-002	Bluetooth module <i>for use only in models with the following system boards: 535803-001, 574505-001, 574506-001</i>
463955-001	90-W AC adapter (for use in all countries except for India)
463956-001	90-W non-PFC NPFC AC adapter (for use in India)
463958-001	65-W AC adapter
449137-001	RTC battery
483377-002	WWAN module for use in all countries and regions except China
504593-003	Broadcom 4312AG 802.11a/b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
504593-004	Broadcom 4312AG 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe

Spare part number	Description
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
506052-001	AMD Athlon QL-62, 2.0-GHz processor with 1-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
507974-001	AMD Turion Ultra ZM-86, 2.4-GHz processor with 2-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
507975-001	AMD Turion Ultra ZM-84, 2.3-GHz processor with 2-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
507977-001	AMD Turion RM-70, 2.0-GHz processor with 1-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
507978-001	AMD Turion RM-72, 2.1-GHz processor with 1-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
507979-001	AMD Turion RM-74, 2.2-GHz processor with 1-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
508102-001	AMD Sempron SI-42, 2.1-GHz processor with 512-KB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
510100-001	Modem module for use in all countries and regions except Australia and New Zealand
510100-011	Modem module for use in Australia and New Zealand
531993-001	<i>WWAN module, including GPS, UNDP (United Nations Development Program)(not available with Linux)</i>
535593-001	90-W PFC AC adapter (for use only in India)
535766-001	Fan
535780-001	Plastics Kit
535793-001	Rubber Kit
535797-001	Webcam module
535803-001	System board for use in computers with a WWAN module and discrete graphics subsystem memory <i>that use AMD ZM, RM, QL, or SI processors</i>

Spare part number	Description
535804-001	Heat sink for use in computers with UMA graphics subsystems
535805-001	Heat sink for use in computers with discrete graphics subsystems
536418-001	6-cell, 47-Wh Li-ion battery for use in computers with 15.6-in displays
535753-001	8-cell, 63-Wh Li-ion battery for use in computers with 15.6-in displays
535809-001	1-GB memory module (PC2-6400,800-MHz, DDR2)
535810-001	2-GB memory module (PC2-6400,800-MHz, DDR2)
535811-001	160-GB, 5400-rpm hard drive <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>
535812-001	250-GB, 5400-rpm hard drive <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>
535813-001	320-GB, 5400-rpm hard drive <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>
535814-001	500-GB, 5400-rpm hard drive
535815-001	DVD-ROM Drive (includes bezel)
535817-001	Blu-ray ROM DVD+/-RW SuperMulti DL Drive (includes bezel)
535816-001	DVD±RW Double-Layer Drive with LightScribe (includes bezel)
535860-001	Switch cover for use in black computers with 14.0-in displays
535861-001	Switch cover for use in black computers with 15.6-in displays
535862-001	Optical drive connector
535863-001	Base enclosure for use in computers with 14.0-in displays
535864-001	Base enclosure for use in computers with 15.6-in displays
535865-001	Top cover for use in computers with 14.0-in displays
535866-001	Top cover for use in computers with 15.6-in displays
535867-001	Palm rest for use in black computers with 14.0-in displays (includes TouchPad)
535868-001	Palm rest for use in black computers with 15.6-in displays (includes TouchPad)
535870-001	Screw Kit
535871-001	Display Hinge Kit for use in computers with 14.0-in displays
535872-001	Display Hinge Kit for use in computers with 15.6-in displays
536410-001	Keyboard for use in the United States on computers with 14.0-in displays
536410-121	Keyboard for use in French Canada on computers with 14.0-in displays
536410-161	Keyboard for use in Latin America on computers with 14.0-in displays
536410-201	Keyboard for use in Brazil on computers with 14.0-in displays
536410-281	Keyboard for use in Thailand on computers with 14.0-in displays
536410-291	Keyboard for use in Japan on computers with 14.0-in displays
536410-AB1	Keyboard for use in Taiwan on computers with 14.0-in displays

Spare part number	Description
536410-AD1	Keyboard for use in Korea on computers with 14.0-in
536420-001	Speakers for use in computers with 14.0-in displays
536421-001	Display bezel for use on computers with 15.6-in displays with a webcam
536422-001	Display bezel for use on computers with 14.0-in displays without a webcam
536423-001	Display bezel for use on computers with 14.0-in displays with a webcam
536424-001	Display bezel for use on computers with 15.6-in display without a webcam
536425-001	Display enclosure for use on black computers with 14.0-in displays
536426-001	Display enclosure for use in black computers with 15.6-in displays
536429-001	Display cable for use in computers with 14.0-in displays
536430-001	Display Cable Kit for use in computers with 14.0-in displays
536432-001	Display cable for use in computers with 15.6-in HD+ displays
536433-001	Display Cable Kit for use in computers with 15.6-in HD displays
536537-001	Keyboard for use in the United States on computers with 15.6-in displays
536537-031	Keyboard for use in the United Kingdom on computers with 15.6-in displays
536537-041	Keyboard for use in Germany on computers with 15.6-in displays
536537-051	Keyboard for use in France on computers with 15.6-in displays
536537-061	Keyboard for use in Italy on computers with 15.6-in displays
536537-071	Keyboard for use in Spain on computers with 15.6-in displays
536537-081	Keyboard for use in Denmark on computers with 15.6-in displays
536537-091	Keyboard for use in Norway on computers with 15.6-in displays
536537-121	Keyboard for use in French Canada on computers with 15.6-in displays
536537-131	Keyboard for use in Portugal only on computers with 15.6-in displays
536537-141	Keyboard for use in Turkey only on computers with 15.6-in displays
536537-161	Keyboard for use in Latin America on computers with 15.6-in displays
536537-171	Keyboard for use in Saudi Arabia on computers with 15.6-in displays
536537-201	Keyboard for use in Brazil on computers with 15.6-in displays
536537-211	Keyboard for use in Hungary on computers with 15.6-in displays
536537-221	Keyboard for use in the Czech Republic on computers with 15.6-in displays
536537-231	Keyboard for use in Slovakia on computers with 15.6-in displays
536537-251	Keyboard for use in Russia on computers with 15.6-in displays)
536537-261	Keyboard for use in Bulgaria on computers with 15.6-in displays
536537-281	Keyboard for use in Thailand on computers with 15.6-in displays
536537-291	Keyboard for use in Japan on computers with 15.6-in displays

Spare part number	Description
536537-A41	Keyboard for use in Europe on computers with 15.6-in displays
536537-AB1	Keyboard for use in Taiwan on computers with 15.6-in displays
536537-AD1	Keyboard for use in South Korea on computers with 15.6-in displays
536537-B31	Keyboard for International use on computers with 15.6-in displays
536537-B71	Keyboard for use in Europe on computers with 15.6-in displays
536537-BA1	Keyboard for Slovenia use on computers with 15.6-in displays
536537-BB1	Keyboard for use in Israel on computers with 15.6-in displays
536537-BG1	Keyboard for use in Switzerland on computers with 15.6-in displays
536537-DD1	Keyboard for use in Iceland on computers with 15.6-in displays
536537-DJ1	Keyboard for use in Greece on computers with 15.6-in displays
536538-001	Cable Kit for use in computers with 14.0-in displays
536539-001	Cable Kit for use in computers with 15.6-in displays
536598-001	Speakers for use in computers with 15.6-in displays
536599-001	SIM
536782-001	160-GB, 7200-rpm hard drive
536783-001	250-GB, 7200-rpm hard drive
536784-001	14.0-in AntiGlare display assembly for use in black computers not equipped with a webcam
536785-001	14.0-in AntiGlare display assembly for use in black computers equipped with a webcam
536786-001	14.0-in BrightView display assembly for use in black computers not equipped with a webcam
536787-001	14.0-in BrightView display assembly for use in black computers equipped with a webcam
536790-001	15.6-in AntiGlare display assembly for use in black computers not equipped with a webcam
536791-001	15.6-in AntiGlare display assembly for use in black computers equipped with a webcam
536792-001	15.6-in BrightView display assembly for use in black computers not equipped with a webcam
536793-001	15.6-in BrightView display assembly for use in black computers equipped with a webcam
536794-001	15.6-in AntiGlare display assembly for use in black computers equipped with a webcam and WWAN module
536795-001	15.6-in BrightView display assembly for use in black computers equipped with a webcam and WWAN module
537921-001	Bluetooth module, WPAN (for use only in models with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
571888-001	WWAN module for use in China
572032-001	6-cell, 47-Wh Li-ion battery for use in computers with 14.0-in displays
572723-001	Display enclosure for use in red computers with 14.0-in displays
572724-001	Display enclosure for use in red computers with 15.6-in displays
572725-001	Switch cover for use in red computers with 14.0-in displays
572726-001	Switch cover for use in red computers with 15.6-in displays

Spare part number	Description
572727-001	Palm rest for use in red computers with 14.0-in displays (includes TouchPad)
572728-001	Palm rest for use in red computers with 15.6-in displays (includes TouchPad)
572747-001	AMD Athlon QL-66, 2.2-GHz processor with 1-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
572748-001	AMD Turion RM-76, 2.3-GHz processor with 1-GB L2 cache (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)
572932-001	14.0-in AntiGlare display assembly for use in red computers not equipped with a webcam
572933-001	14.0-in AntiGlare display assembly for use in red computers equipped with a webcam
572934-001	14.0-in BrightView display assembly for use in red computers not equipped with a webcam
572935-001	14.0-in BrightView display assembly for use in red computers equipped with a webcam
572936-001	15.6-in AntiGlare display assembly for use in red computers not equipped with a webcam
572937-001	15.6-in AntiGlare display assembly for use in red computers equipped with a webcam
572938-001	15.6-in BrightView display assembly for use in red computers not equipped with a webcam
572939-001	15.6-in BrightView display assembly for use in red computers equipped with a webcam
572940-001	15.6-in AntiGlare display assembly for use in red computers equipped with a webcam and WWAN module
572941-001	15.6-in BrightView display assembly for use in red computers equipped with a webcam and WWAN module
574505-001	System board for use in computers with UMA graphics subsystem memory that do not include a WWAN module <i>that use AMD ZM, RM, QL, or SI processors</i>
574506-001	System board for use in computers with discrete graphics subsystem memory that do not include a WWAN module <i>that use AMD ZM, RM, QL, or SI processors</i>
574513-001	Power button board for use in computers with 15.6-in displays (includes cable)
574514-001	Power button board for use in computers with 14.0-in displays (includes cable)
575124-001	320-GB, 7200-rpm hard drive
575125-001	500-GB, 7200-rpm hard drive
576251-001	AMD Sempron M100, 2.0-GHz processor with 512-GB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
576252-001	AMD Athlon II M320, 2.1-GHz processor with 1-MB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
576253-001	AMD Turion II Ultra M500, 2.2-GHz processor with 1-MB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
576254-001	AMD Turion II Ultra M600, 2.4-GHz processor with 2-MB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
578024-001	AMD Athlon II M300, 2.0-GHz processor with 1-MB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)
578366-001	14.0-in HD BrightView display assembly for use in black computers equipped with a webcam and WWAN module
583055-001	AMD Turion II Ultra M520, 2.3-GHz processor with 1-MB L2 cache (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)

<b>Spare part number</b>	<b>Description</b>
585218-001	<i>System board for use in computers with a WWAN module and UMA graphics subsystem memory that use AMD Mxxx processors</i>
585219-001	<i>System board for use in computers without a WWAN module and UMA graphics subsystem memory that use AMD Mxxx processors</i>
585220-001	<i>System board for use in computers with a WWAN module and discrete graphics subsystem memory that use AMD Mxxx processors</i>
585221-001	<i>System board for use in computers without a WWAN module and discrete graphics subsystem memory that use AMD Mxxx processors</i>



---

## 4 Removal and replacement procedures

### Preliminary replacement requirements

#### Tools required


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

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

#### Service considerations

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

---

 **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

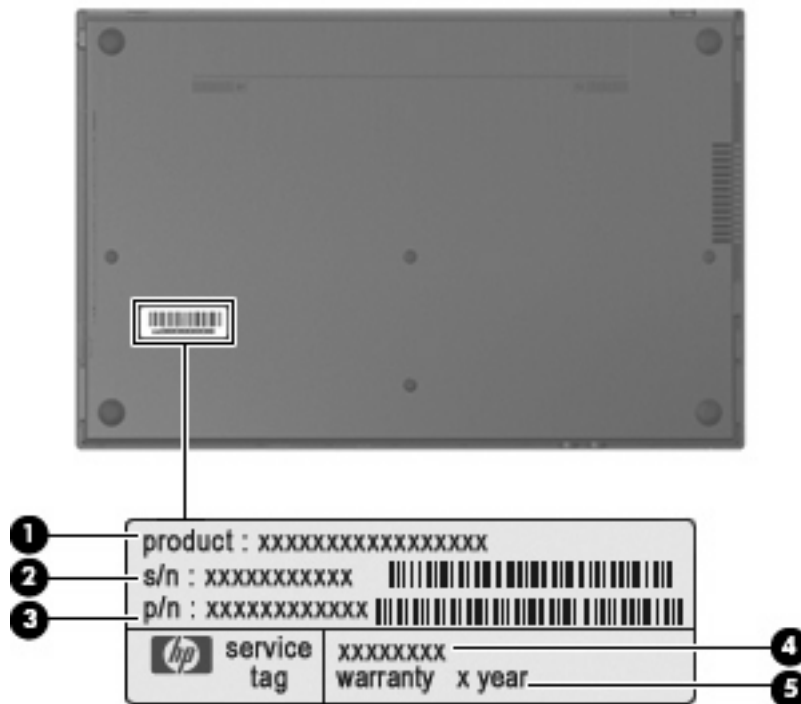
This section provides removal and replacement procedures.

There are as many as 121 screws, in 12 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

### Service tag

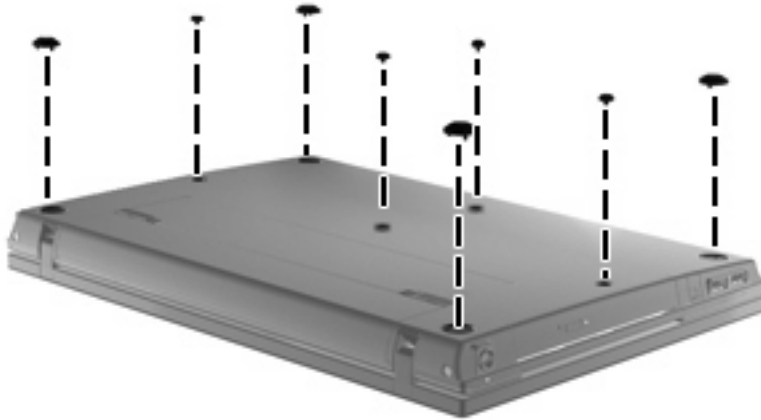
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag:

- (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 used to locate documents, drivers, and support for the computer.
- (5) Warranty period: This number describes the duration of the warranty period for this computer.



## Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 535793-001. There are 8 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

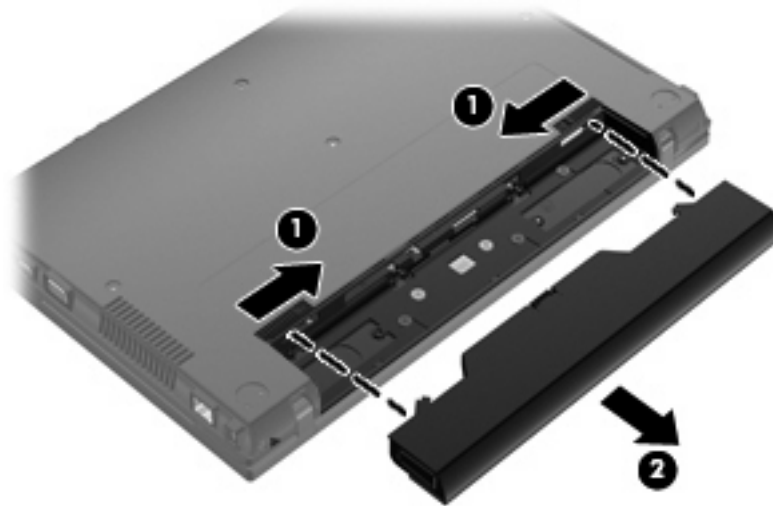
Description	Spare part number
8-cell, 63-Wh Li-on battery for use in computers with 15.6-in displays	535753-001
6-cell, 47-Wh Li-on battery for use in computers with 15.6-in displays	536418-001
6-cell, 47-Wh Li-on battery for use in computers with 14.0-in displays	572032-001

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 with the battery bay toward you.
2. Slide the battery release latches **(1)** to release the battery.
3. Remove the battery **(2)** from the computer.



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



## Switch cover and keyboard

Description	Spare part number
<b>Switch covers</b>	
For use in black computers with 15.6-in displays	535861-001
For use in red computers with 15.6-in displays	572726-001
For use in black computers with 14.0-in displays	535860-001
For use in red computers with 14.0-in displays	572725-001
<b>Keyboards for use in computers with 15.6-in displays</b>	536537-xxx
<b>Keyboards for use in computers with 14.0-in displays</b>	536410-xxx
<b>NOTE:</b> For a detailed list of available keyboards, see <a href="#">Sequential part number listing on page 46</a> .	

Before removing the switch cover and keyboard, follow these steps:

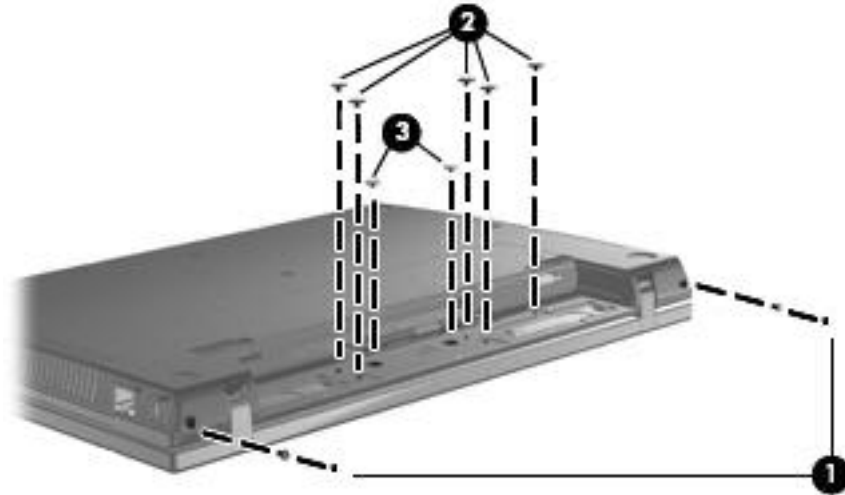
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 60](#)).

Remove the switch cover and keyboard:

1. Position the computer right-side up with the front toward you.

2. To remove the switch cover on 15.6-in models, remove the following screws:

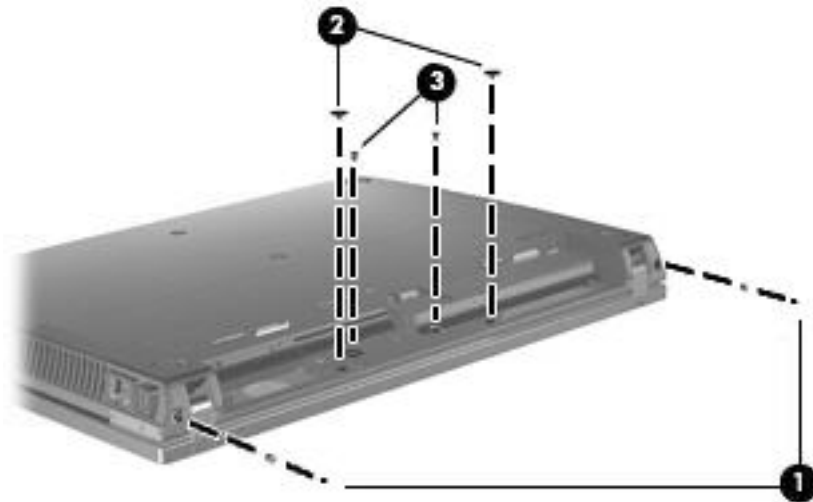
- (1) *Two screw covers* and two PM2.5×3.0 screws
- (2) Five PM2.5×3.0 broadhead screws (15.6-in models)
- (3) Two PM2.0×3.0 screws



– or –

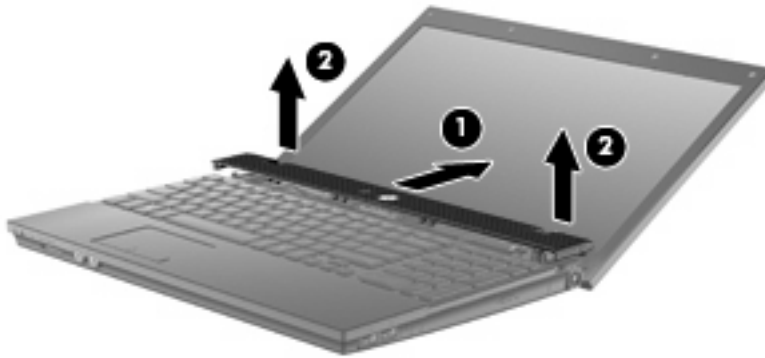
To remove the switch cover on 14.0-in models, remove the following screws:

- (1) *Two screw covers* and two PM2.5×3.0 screws
- (2) Two PM2.5×3.0 broadhead screws
- (3) Two PM2.0×3.0 screws



3. Turn the computer right-side up and open the computer as far as possible.

4. Slide the switch cover back (1), and then lift it off the computer (2).



5. On computers with 15.6-in displays, remove the two Phillips PM2.5×3.0 screws that secure the keyboard to the computer.



– or –

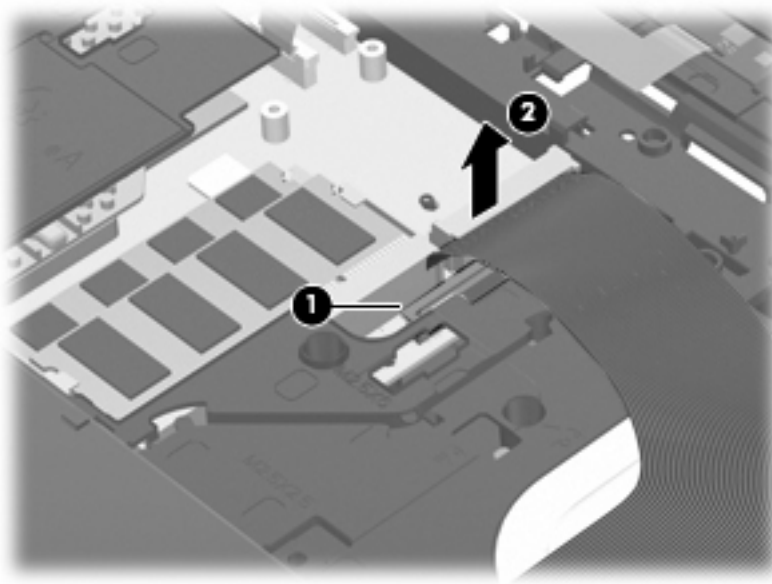
On computers with 14.0-in displays, remove the three Phillips PM2.5×3.0 screws that secure the keyboard to the computer.



6. Slide the keyboard back toward the display (1), and then rotate it forward (2) to gain access to the keyboard cable connector.



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



8. Remove the keyboard.

Reverse this procedure to install the switch cover and keyboard.

## Memory module


Description	Spare part number
2-GB (PC2-6400, 800-MHz, DDR2)	535810-001
1-GB (PC2-6400,800-MHz, DDR2)	535809-001

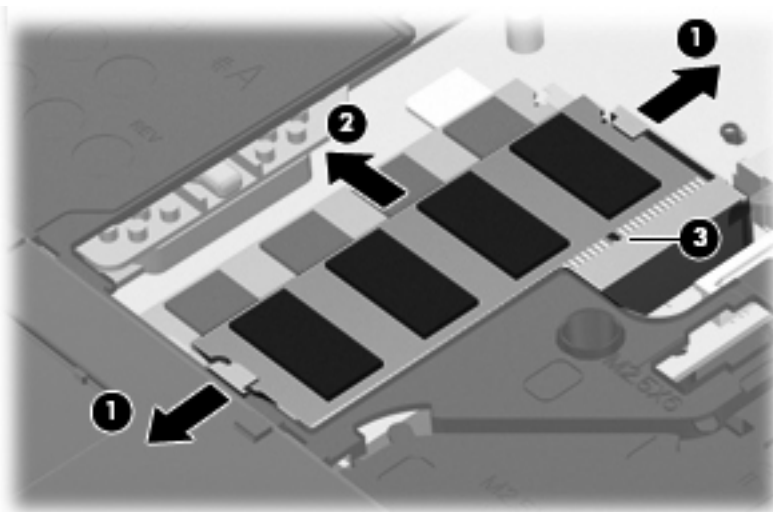
Before removing the memory module, follow these steps:

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 60](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 61](#)).

Remove the memory module:

1. Position the computer right-side up with the front toward you.
2. 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.)
3. Remove the memory module **(2)** by pulling the module 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 a memory module.

## Optical drive



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

Description	Spare part number
DVD±RW Double-Layer Drive with LightScribe	535816-001
Blu-ray ROM DVD+/-RW SuperMulti DL Drive	535817-001
DVD-ROM Drive	535815-001

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 60](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 61](#)).

Remove the optical drive:

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




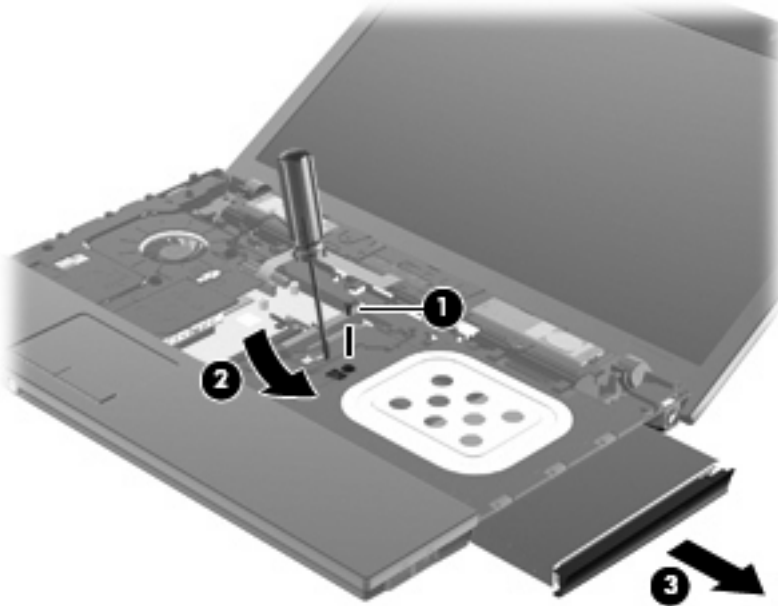
**NOTE:** On 15.6-in models, the screw is located in a hole in the top cover.


**NOTE:** On 14.0-in models, the screw is located directly below the keyboard ZIF connector. The screw is not located in a hole in the top cover.

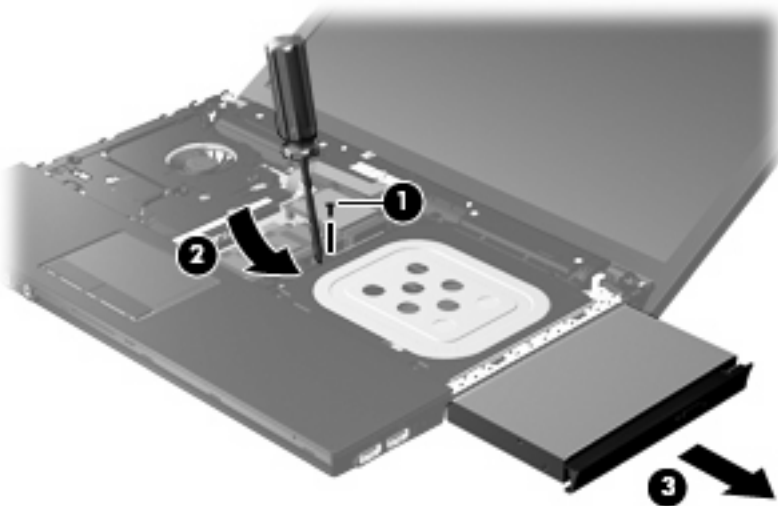
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access **(2)** and press the tab to the right to release the optical drive from the computer.

4. Remove the optical drive (3) from the computer.

 **NOTE:** 15.6-in model shown below

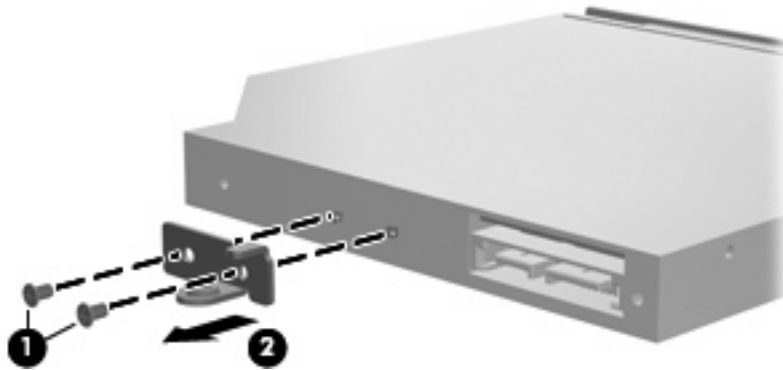


 **NOTE:** 14.0-in model shown below



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

7. Remove the optical drive bracket (2).



Reverse this procedure to reassemble and install the optical drive.



## Speakers


Description	Spare part number
For use in computers with 15.6-in displays	536598-001
For use in computers with 14.0-in displays	536420-001

Before removing the speaker, follow these steps:

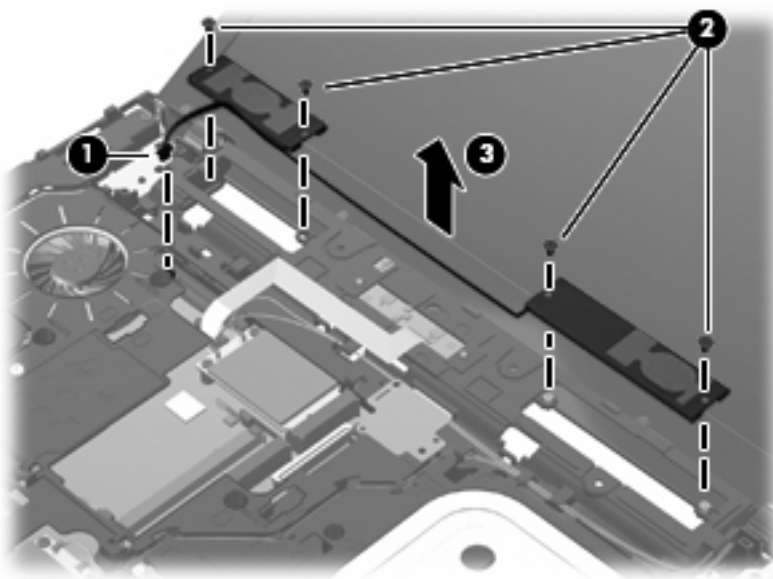
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 60](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 61](#)).

Remove the speakers:

1. Position the computer right-side up with the front toward you.
2. Disconnect the speaker cable (1) from the system board.

 **NOTE:** The two speakers are connected with a single cable.

3. Remove the four Phillips PM2.5×3.0 screws (2) that secure the speakers to the top cover.
4. Remove the speaker cable from the clips and routing channel, and then remove the speakers from the computer (3).



Reverse this procedure to install the speakers.

## WWAN module

Description	Spare part number
WWAN module for use in all countries and regions except China	483377-002
WWAN module for use in China	571888-001
WWAN module, including GPS, UNDP (United Nations Development Program; not available with Linux)	531993-001


- △ **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.

Before removing the WWAN 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 60](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 61](#)).


To remove the WWAN module:

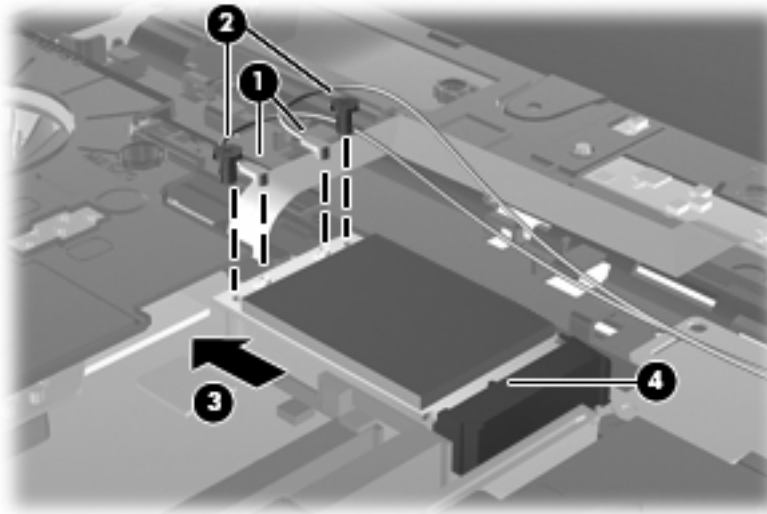
1. Position the computer right-side up with the front toward you.
2. Disconnect the WWAN antenna cables **(1)** from the terminals on the WWAN module.

 **NOTE:** The red WWAN antenna cable is connected to the WWAN module “Main” terminal. The blue WWAN antenna cable is connected to the WWAN module “Aux” terminal.

3. Remove the two Phillips PM2.5×3.0 screws **(2)** that secure the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

4. Remove the WWAN module (3) by pulling the module away from the slot at an angle.

 **NOTE:** WWAN modules are designed with a notch (4) to prevent incorrect insertion.



Reverse this procedure to install the WWAN module.

## Palm rest

Description	Spare part number
Palm rest for use in black computers with 15.6-in displays (includes TouchPad)	535868-001
Palm rest for use in red computers with 15.6-in displays (includes TouchPad)	572728-001
Palm rest for use in black computers with 14.0-in displays (includes TouchPad)	535867-001
Palm rest for use in red computers with 14.0-in displays (includes TouchPad)	572727-001

Before removing the palm rest, follow these steps:

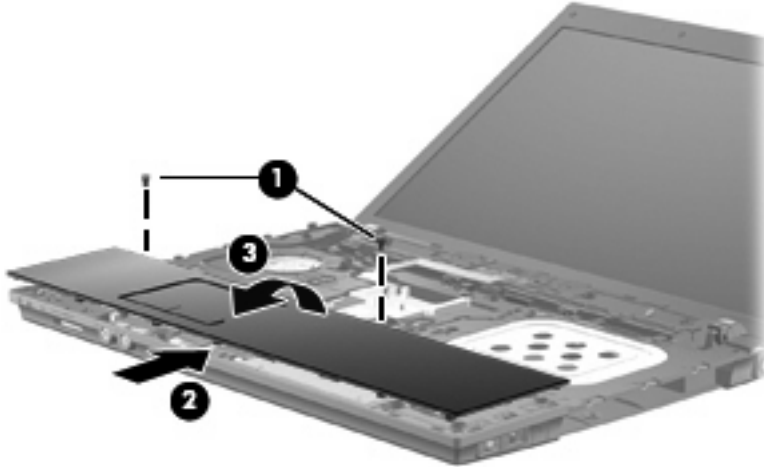
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 60](#)).
5. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 61](#)).

To remove the palm rest:

1. Position the computer right-side up with the front toward you.

**2.** On 15.6-in models:

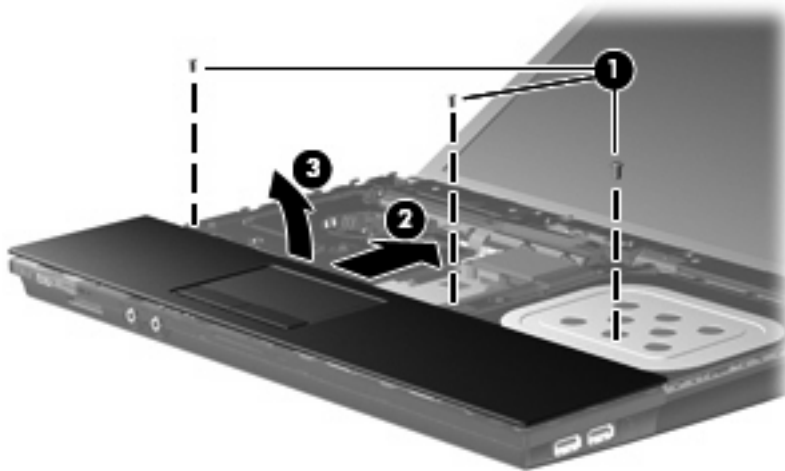
- a.** Remove the two Phillips PM2.5×3.0 broadhead screws **(1)** that secure the palm rest to the computer.
- b.** Slide the palm rest back toward the display **(2)**, and then lift and rotate the front edge **(3)** to gain access to the TouchPad cable.



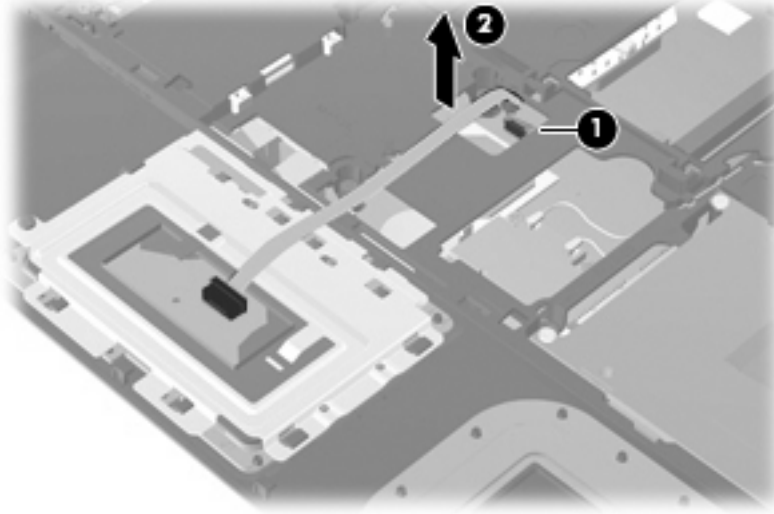
– or –

On 14.0-in models:

- a.** Remove the three Phillips PM2.5×3.0 broadhead screws **(1)** that secure the palm rest to the computer.
- b.** Slide the palm rest back toward the display **(2)**, and then lift the front edge **(3)** to gain access to the TouchPad cable.



3. Release the ZIF connector (1) to which the TouchPad cable is connected, and then disconnect the TouchPad cable (2) from the system board.



4. Remove the palm rest.

Reverse this procedure to install the palm rest.

## Hard drive



**NOTE:** The hard drive spare part kit includes a hard drive bracket.

Description	Spare part number
500-GB, 7200-rpm hard drive <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>	575125-001
500-GB, 5400-rpm hard drive	535814-001
320-GB, 7200-rpm hard drive	575124-001
320-GB, 5400-rpm hard drive <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>	535813-001
250-GB, 7200-rpm hard drive	538972-001
250-GB, 5400-rpm hard drive <i>(for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)</i>	535812-001
160-GB, 7200-rpm hard drive	536782-001
160-GB, 5400-rpm hard drive	535811-001

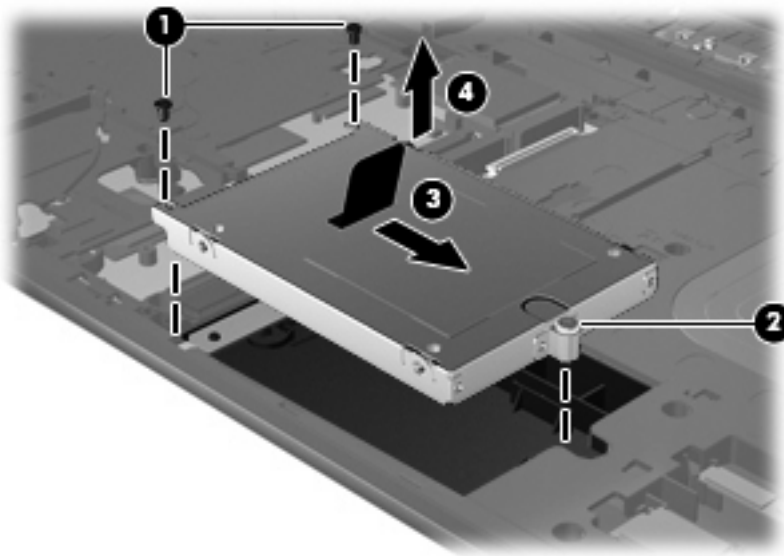
Before removing the hard drive, follow these steps:

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Palm rest (see [Palm rest on page 71](#))

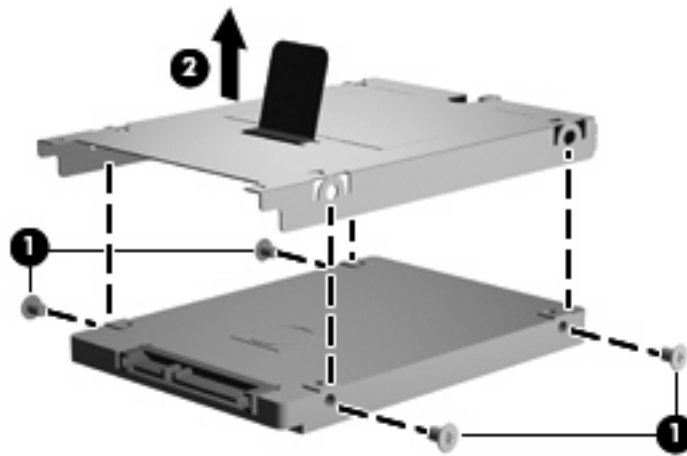
Remove the hard drive:

1. Position the computer right-side up with the front toward you.
2. Remove the two Phillips PM2.0×4.0 screws **(1)** and loosen the Phillips PM2.5×11.0 captive screw **(2)** that secures the hard drive to the computer.
3. Grasp the Mylar tab on the hard drive and slide the hard drive **(3)** to the left to disconnect it from the system board.

4. Remove the hard drive (4) from the hard drive bay.



5. If it is necessary to replace the hard drive bracket, remove the two Phillips PM3.0×4.0 hard drive bracket screws (1) from each side of the hard drive.
6. Lift the bracket (2) straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

## WLAN module

Description	Spare part number
Broadcom 4322 802.11a/b/g/n WLAN modules:	
<ul style="list-style-type: none"> <li>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</li> </ul>	504664-001
<ul style="list-style-type: none"> <li>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</li> </ul>	504664-002
Broadcom BCM4312 802.11b/g WLAN modules:	
<ul style="list-style-type: none"> <li>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</li> </ul>	504593-003
<ul style="list-style-type: none"> <li>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</li> </ul>	504593-004




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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Palm rest (see [Palm rest on page 71](#))

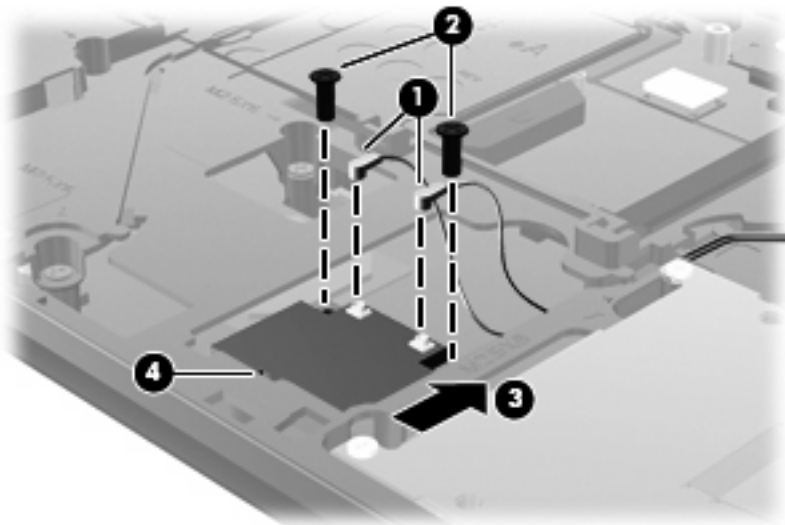
Remove the WLAN module:

1. Position the computer right-side up with the front toward you.
2. Disconnect the WLAN antenna cables (1) from the terminals on 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.


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

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



Reverse this procedure to install the WLAN module.

## Display assembly on computers with 15.6-in displays

 **NOTE:** For information about removing the display from 14.0-in models, see [Display assembly on computers with 14.0-in displays on page 91](#).

**NOTE:** The display assembly spare part kit includes 2 WLAN antenna transceivers and cables.

Description	Spare part number
<b>For use only with black computers with 15.6-in HD displays</b>	
AntiGlare display assembly for use in computers not equipped with a webcam	536790-001
AntiGlare display assembly for use in models equipped with a webcam	536791-001
AntiGlare display assembly for use in computers equipped with a webcam and WWAN module	536794-001
BrightView display assembly for use in computers not equipped with a webcam	536792-001
BrightView display assembly for use in computers equipped with a webcam	536793-001
BrightView display assembly for use in computers equipped with a webcam and WWAN module	536795-001
<b>For use only with red computers with 15.6-in HD displays</b>	
AntiGlare display assembly for use in computers not equipped with a webcam	572936-001
AntiGlare display assembly for use in computers equipped with a webcam	572937-001
AntiGlare display assembly for use on computers equipped with a webcam and WWAN module	572940-001
BrightView display assembly for use in computers not equipped with a webcam	572938-001
BrightView display assembly for use in computers equipped with a webcam	572939-001
BrightView display assembly for use in computers with a webcam and WWAN module	572941-001

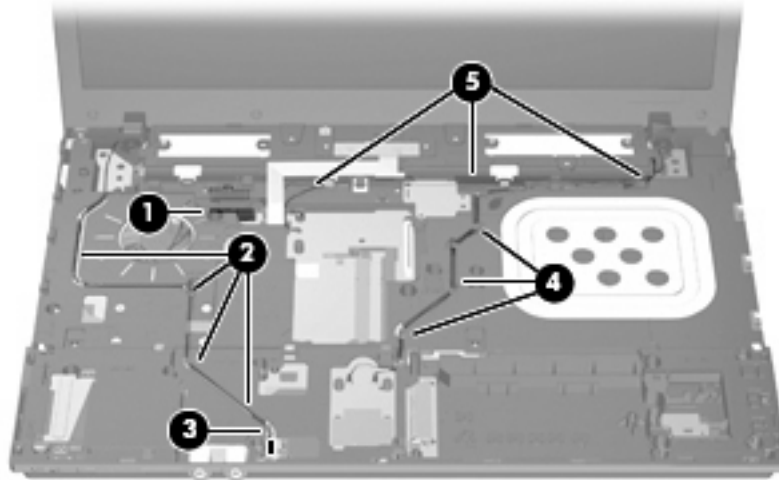
△ **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Speakers (see [Speakers on page 69](#))

Remove the display cables:

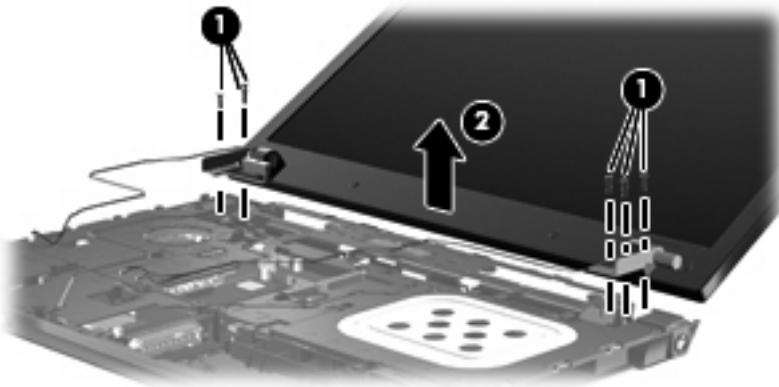
1. Position the computer right-side up with the front toward you.
2. Open the computer as far as possible.
3. Disconnect the display panel/webcam cable assembly (1) from the system board.
4. Remove the microphone module cable from the routing path (2), and then disconnect the cable (3) from the system board.
5. Remove the WLAN wireless antenna cables (4) from the tape, clips and routing channels built into the top cover.
6. On models with a WWAN module, remove the WWAN wireless antenna cables (5) from the tape, clips and routing channels built into the top cover.



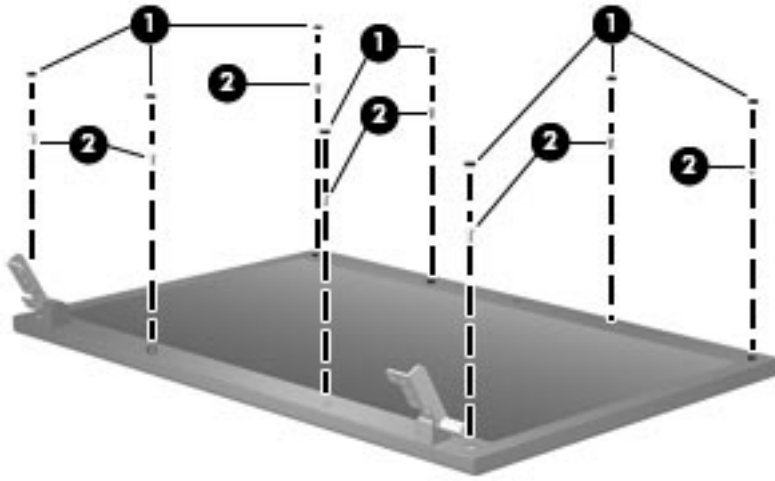
Remove the display assembly:

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

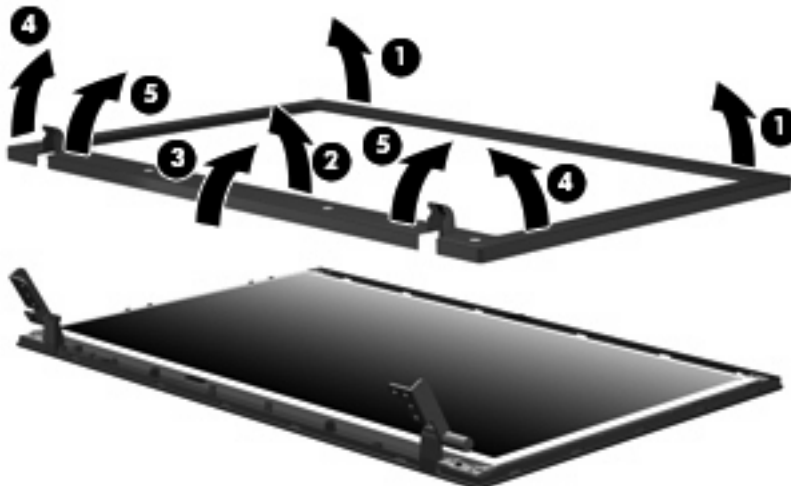
1. Remove the six Phillips PM2.5×6.0 screws (1) that secure the display assembly to the computer.
2. Lift the display assembly (2) straight up and remove it.



3. If it is necessary to replace the display bezel, display enclosure, or display hinges, remove the eight rubber screw covers **(1)** and the eight Phillips PM2.0×6.0 screws **(2)** that secure the display bezel to the display assembly. The rubber screw covers are available in the Rubber Kit, spare part number 535793-001.

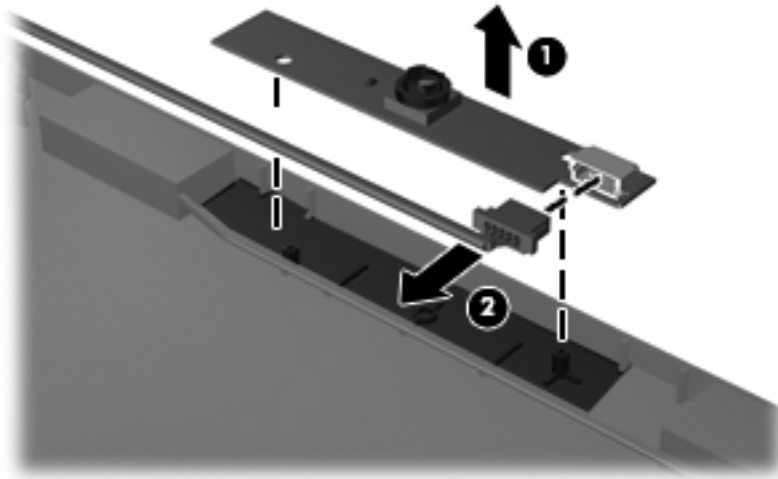



4. Remove the bezel:
- Flex the top of the bezel until it disengages from the display enclosure **(1)**.
  - Flex the inside bottom of the bezel until it disengages from the display enclosure **(2)**.
  - Flex the outside bottom of the bezel until it disengages from the display enclosure **(3)**.
  - Lift the bottom corners of the bezel until they disengage from the display enclosure **(4)**.
  - Lift the bezel at the seam in the hinges until it disengages from the display enclosure **(5)**.
  - Remove the bezel from the display enclosure.



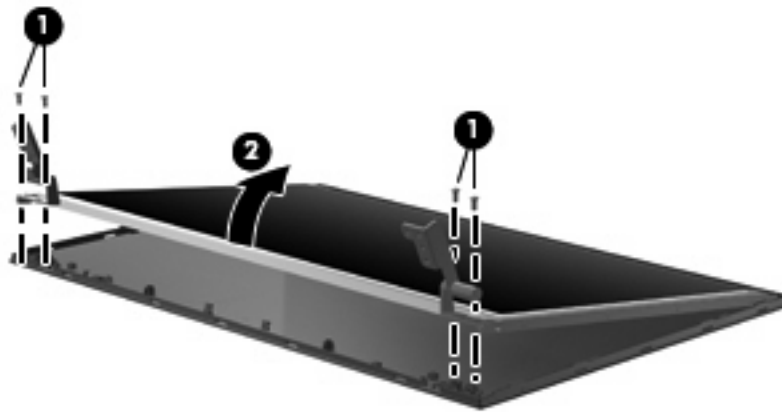
The display bezel is available using spare part number 536421-001 on computers with 15.6-in displays and a webcam and 536424-001 for computers with 15.6-in displays and no webcam.

5. If it is necessary to replace the webcam module from the display enclosure, gently pull the webcam module away from the double-sided tape on the display enclosure (1), disconnect the webcam cable from the module (2), and then remove the webcam. The webcam module is available using spare part number 535797-001.



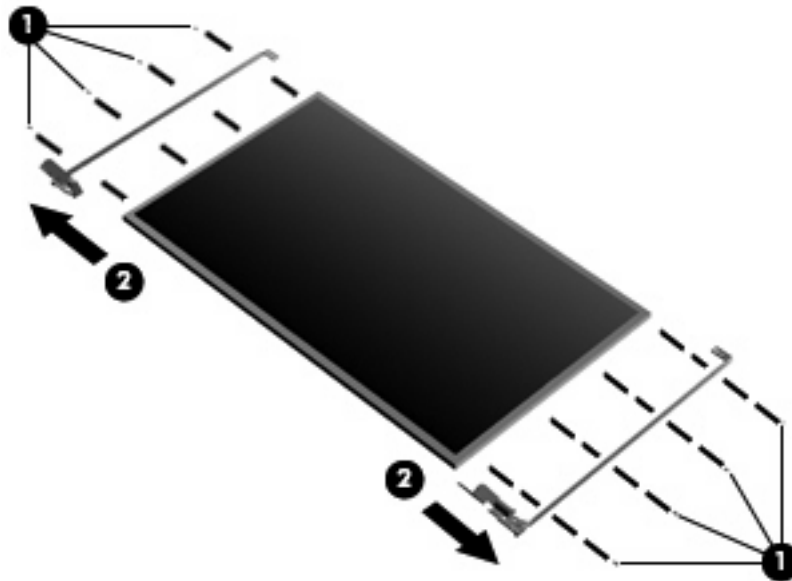
 **NOTE:** To replace the webcam module in the display enclosure, align the holes on the webcam module with the pins on the display enclosure and press onto the double-sided tape.

6. If it is necessary to replace the display hinges:
- Remove the display panel by removing the four Phillips PM2.5×4.5 screws (1) that secure the panel to the display enclosure.
  - Lift the panel from the enclosure (2).




- Remove the eight Phillips PM2.0×3.0 screws (1) that secure the display hinges to the display panel.

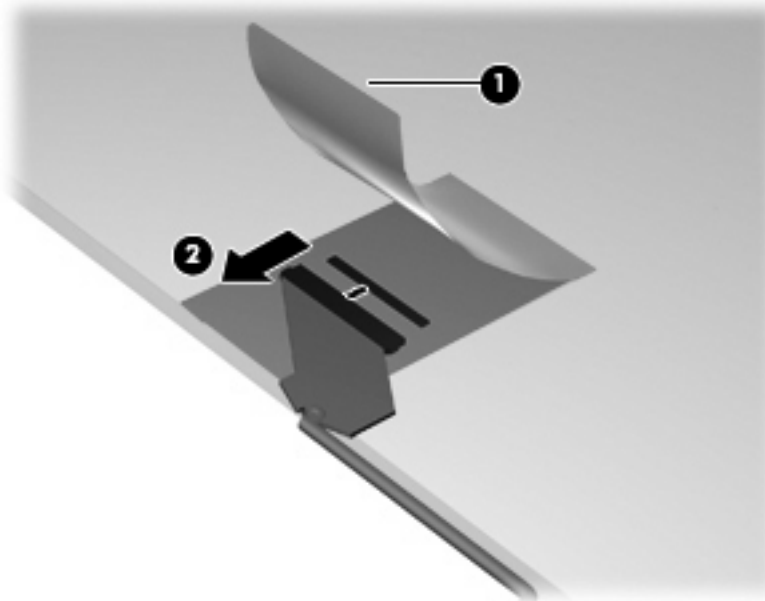
- d. Remove the display hinges (2). The left and right display hinges are available in the Display Hinge Kit, spare part number 535872-001 for computers with 15.6-in displays.



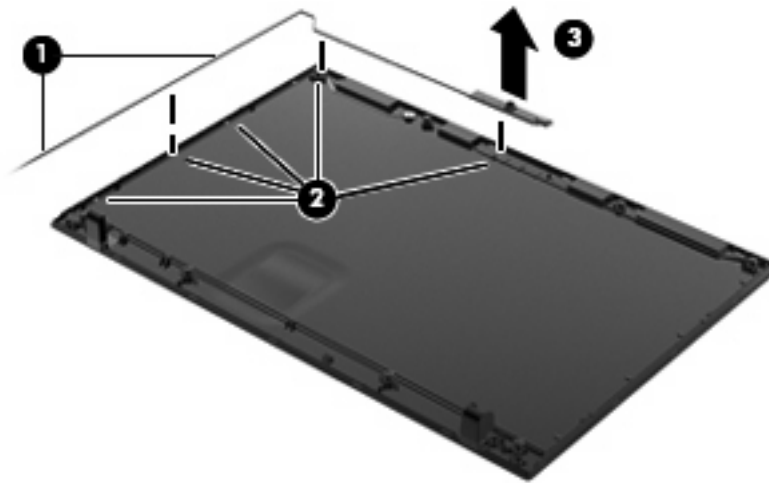
7. If it is necessary to replace the display/webcam cable:

 **NOTE:** The display cable and webcam cable are bound together as one cable assembly.

- a. On the back of the display panel, peel back the tape that secures the display cable to the display panel (1), and then disconnect the cable from the connector on the back of the display panel (2).



- b. Gently pull the webcam cable (1) from the clips and routing channels (2) built into the top cover. The display/webcam cable is included in the Display Cable Kit, spare part numbers 536433-001 for computers with 15.6-in HD displays and 536432-001 for computers with 15.6-in HD+ displays.



Reverse this procedure to reassemble and install the display assembly.

## Top cover



**NOTE:** The top cover removal procedures differ for 15.6-in computers from those of 14.0-in computers.

**NOTE:** You must remove the top cover before you can remove the display assembly on computers with 14.0-in displays. You do not have to remove the top cover to remove the display assembly on computers with 15.6-in displays.

Description	Spare part number
Top cover for use in computers with 15.6-in displays	535866-001
Top cover for use in computers with 14.0-in displays	535865-001

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Speakers (see [Speakers on page 69](#))
  - c. Palm rest (see [Palm rest on page 71](#))

Remove the top cover:

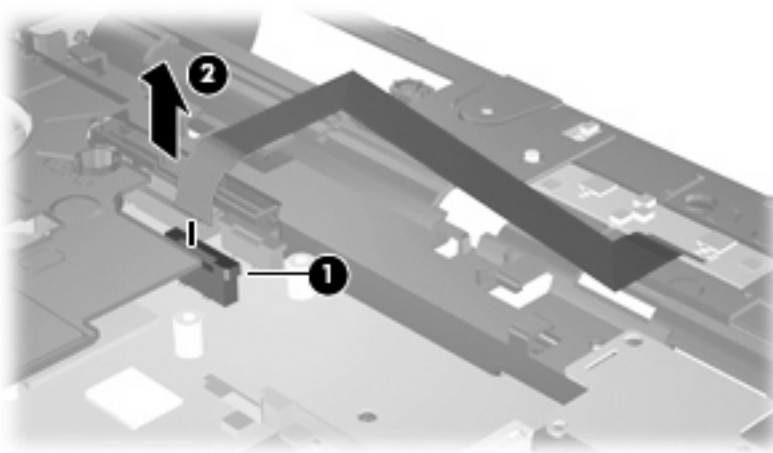


**NOTE:** Steps 1 through 5 illustrate how to remove the top cover from computers with 15.6-in displays. Steps 6 through 10 illustrate how to remove the top cover from computers with 14.0-in displays.

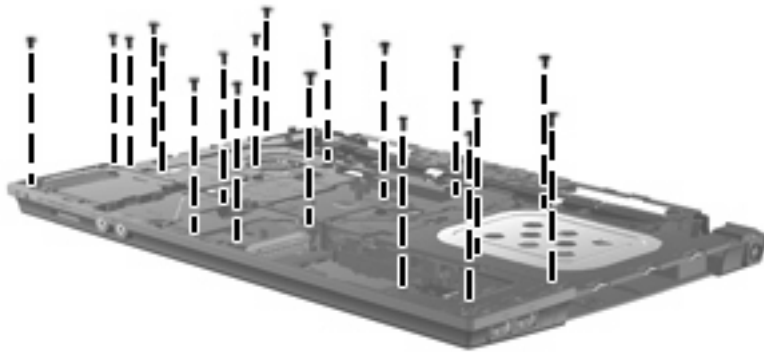
1. Position the computer right-side up with the front toward you.



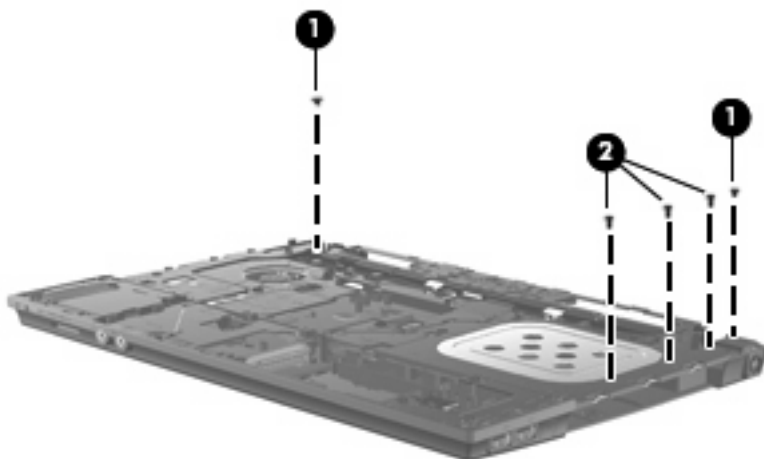
2. Disconnect the power button board cable from the system board by releasing the ZIF connector (1), and then disconnecting the cable (2).



3. Remove the 19 Phillips PM2.5×6.0 screws that secure the top cover to the computer.




4. Remove the two Phillips PM2.0×4.0 screws (1) and the three Phillips PM2.0×2.0 screws (2) that secure the top cover to the computer.



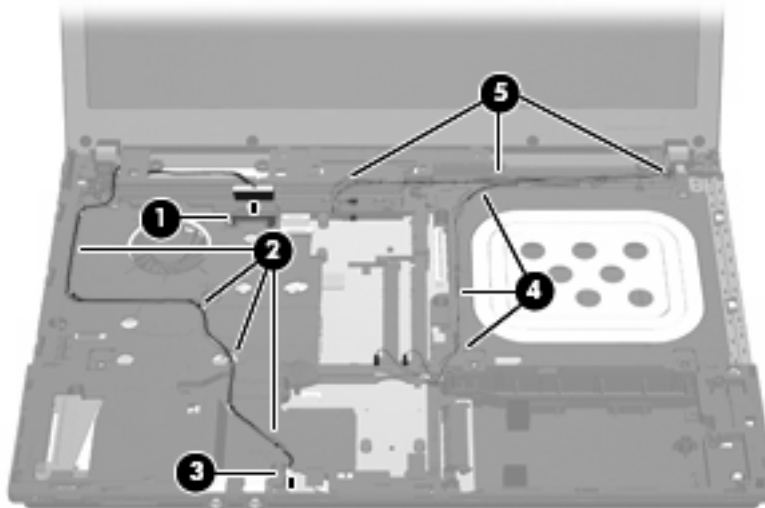
5. Lift the front edge (1) of the top cover until it disengages from the base enclosure, release the top cover from the sides and rear of the base enclosure, and then remove the top cover (2).




6. Remove the top cover.

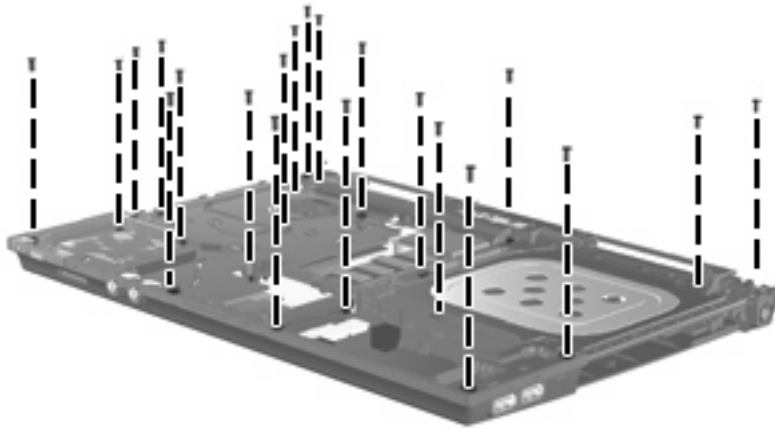
 **NOTE:** Steps 6 through 10 illustrate how to remove the top cover from computers with 14.0-in displays. Steps 1 through 5 illustrate how to remove the top cover from computers with 15.6-in displays.

7. Position the computer right-side up with the front toward you.
8. Disconnect the display panel cable (1) from the system board.
9. Remove the microphone module cable from the routing path (2), and then disconnect the cable (3) from the system board.
10. Remove the WLAN wireless antenna cables (4) and WWAN wireless antenna cables (5) from the clips and routing channels built into the top cover.

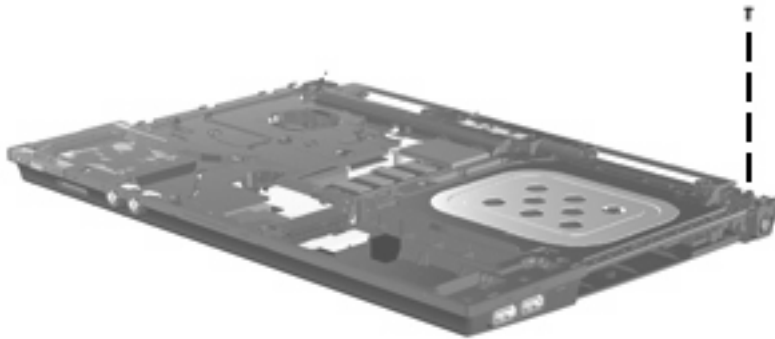


11. Remove the 21 PM2.5×6.0 screws that secure the top cover to the computer.

 **NOTE:** Two of these screws (one of each side) also secure the display panel to the computer.

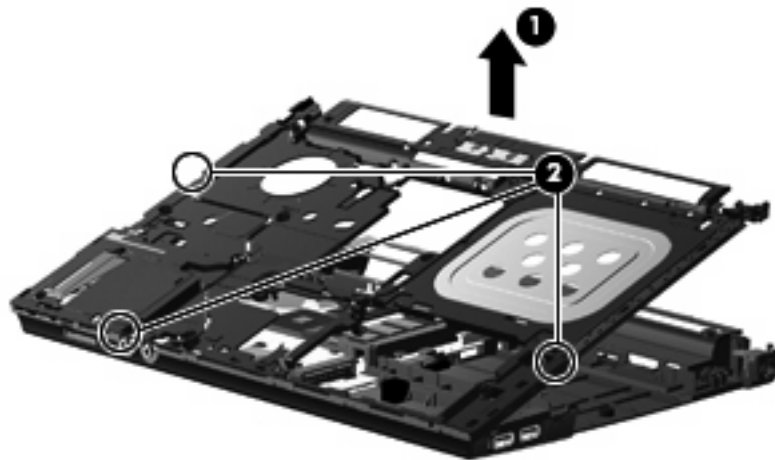


12. Remove the Phillips PM2.0×4.5 screw that secures the top cover to the computer.



13. Lift the top cover until it disengages from the base enclosure (1). Locations at which the top cover more securely connects to the base enclosure are indicated by callout (2).

14. Remove the top cover.



Reverse this procedure to install the top cover.

## Power button board

Description	Spare part number
Power button board for use in computers with 15.6-in displays (includes cable)	574513-001
Power button board for use in computers with 14.0-in displays (includes cable)	574514-001


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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Optical drive (see [Optical drive on page 66](#))
  - c. Speakers (see [Speakers on page 69](#))
  - d. Palm rest (see [Palm rest on page 71](#))
  - e. Hard drive (see [Hard drive on page 74](#))
  - f. Top cover (see [Top cover on page 84](#))
  - g. Display assembly (see [Display assembly on computers with 15.6-in displays on page 78](#) or [Display assembly on computers with 14.0-in displays on page 91](#))

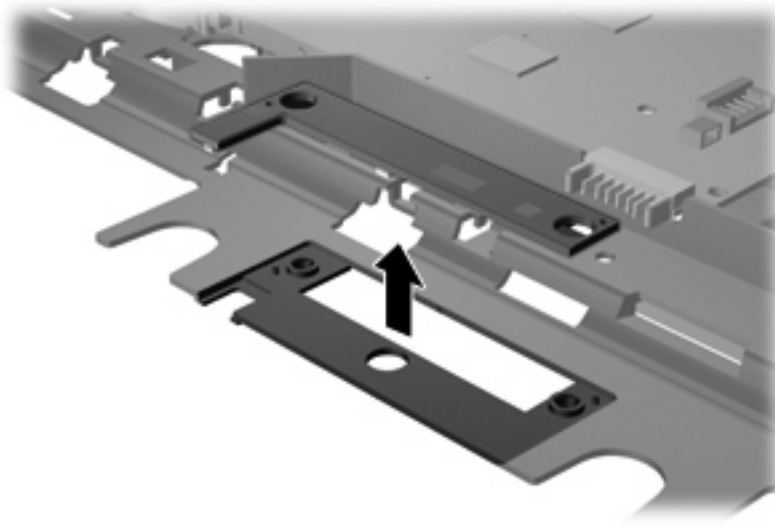
To remove the power button board:

1. Position the top cover upside down with the rear toward you.

2. Lift the board straight up and off the top cover.

 **NOTE:** Computer with 15.6-in display shown.

---



Reverse this procedure to install the power button board.

## RTC battery

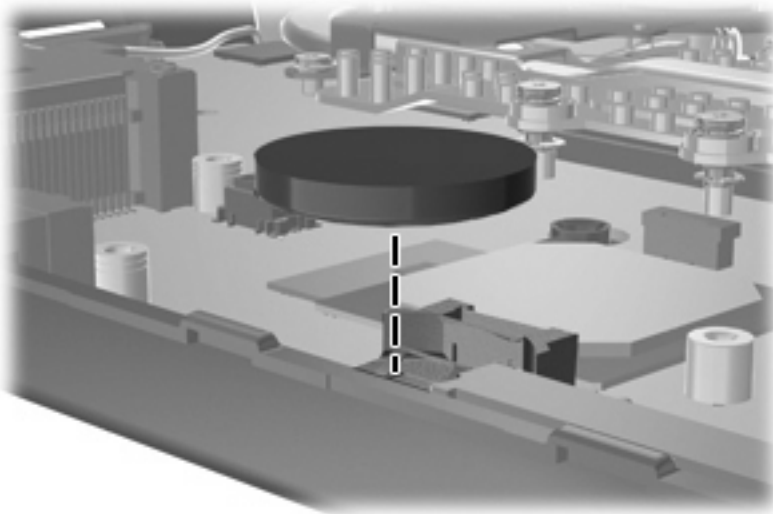
Description	Spare part number
RTC battery	449137-001

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Palm rest (see [Palm rest on page 71](#))
  - c. Top cover on 14.0-in models (see [Top cover on page 84](#))


Remove the RTC battery:

1. Position the computer right-side up with the front toward you.
2. Remove the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery.

## Display assembly on computers with 14.0-in displays

 **NOTE:** For information about removing the display from 15.6-in models, see [Display assembly on computers with 15.6-in displays on page 78](#).

**NOTE:** The display assembly spare part kit includes two WLAN antenna transceivers and cables.

Description	Spare part number
<b>For use only with black computers with 14.0-in HD displays</b>	
AntiGlare display assembly for use in computers not equipped with a webcam	536784-001
AntiGlare display assembly for use in computers equipped with a webcam	536785-001
BrightView display assembly for use in computers not equipped with a webcam	536786-001
BrightView display assembly for use in computers equipped with a webcam	536787-001
BrightView display assembly for use in computers equipped with a webcam and WWAN module	578366-001
<b>For use only with red computers with 14.0-in HD displays</b>	
AntiGlare display assembly for use in computers not equipped with a webcam	572932-001
AntiGlare display assembly for use in computers equipped with a webcam	572933-001
BrightView display assembly for use in computers not equipped with a webcam	572934-001
BrightView display assembly for use in computers equipped with a webcam	572935-001

Before removing the 14.0-in 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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Optical drive (see [Optical drive on page 66](#))
  - c. Speakers (see [Speakers on page 69](#))
  - d. Top cover (see [Top cover on page 84](#))
  - e. Palm rest (see [Palm rest on page 71](#))

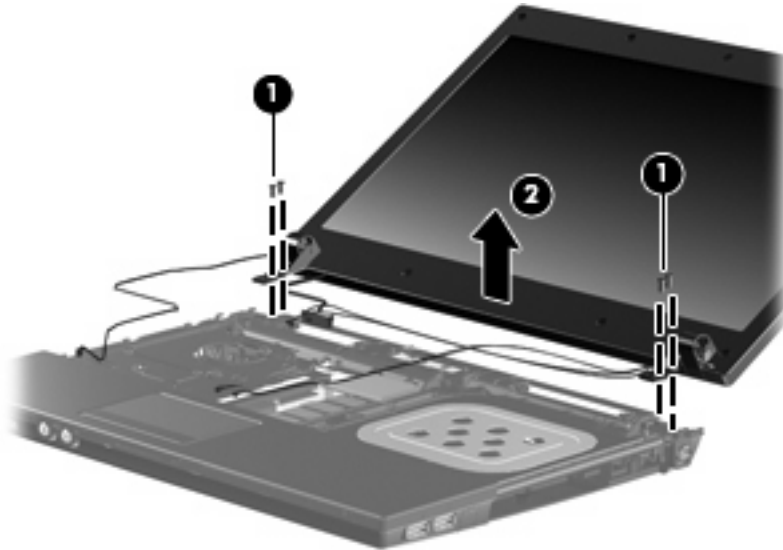
Remove the 14.0-in display assembly:

1. Position the computer right-side up with the front toward you.
2. Open the computer as far as possible.
3. Remove the four Phillips PM2.5×4.5 screws (1) that secure the display assembly to the computer.

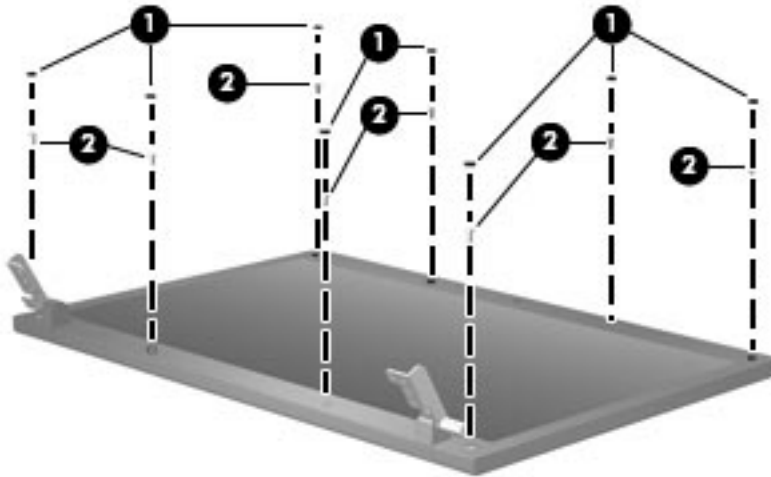


**NOTE:** When replacing the display assembly, only replace the four bottom screws in the display brackets. The top screw on the bracket on each side is replaced when you install the top cover.

4. Lift the display assembly up and off the computer (2).



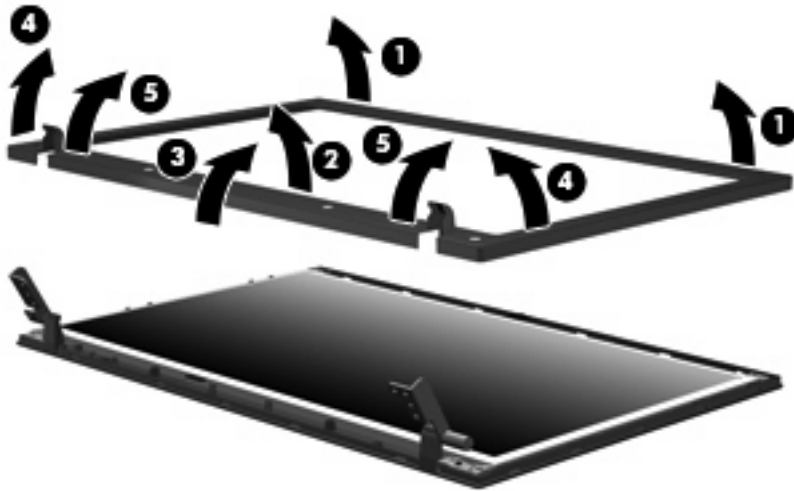
5. If it is necessary to replace the display bezel, display enclosure, or display hinges, remove the eight rubber screw covers (1) and the eight Phillips PM2.5×6.0 screws (2) that secure the display bezel to the display assembly. The rubber screw covers are available in the Rubber Kit, spare part number 535793-001.



6. To remove the bezel:
  - a. Flex the top of the bezel until it disengages from the display enclosure (1).
  - b. Flex the inside bottom of the bezel until it disengages from the display enclosure (2).
  - c. Flex the outside bottom of the bezel until it disengages from the display enclosure (3).
  - d. Lift the bottom corners of the bezel until they disengage from the display enclosure (4).

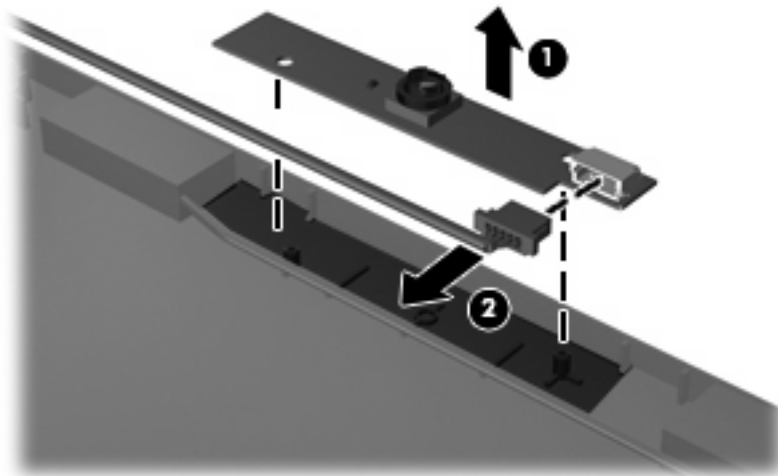


- e. Lift the bezel at the seam in the hinges until it disengages from the display enclosure (5).
- f. Remove the bezel from the display enclosure.



The display bezel is available using spare part numbers 536423-001 on computers with 14.0-in displays and a webcam and 536422-001 on computers with 14.0-in displays and no webcam.

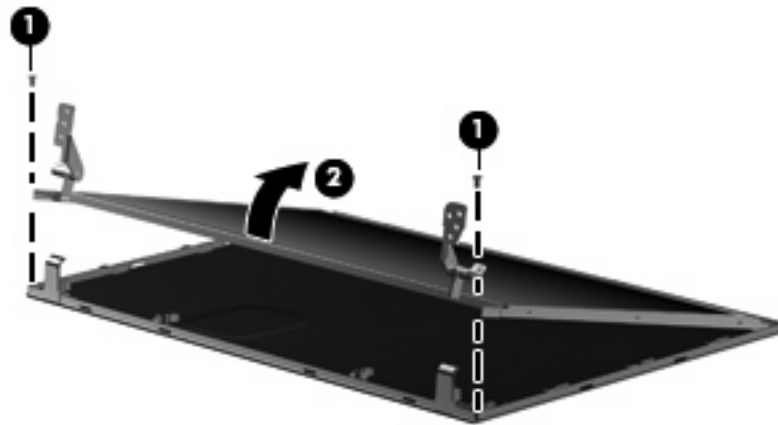
7. If it is necessary to replace the webcam module from the display enclosure, gently pull the webcam module away from the double-sided tape on the display enclosure (1) and disconnect the webcam cable from the module (2). The webcam module is available using spare part number 535797-001.



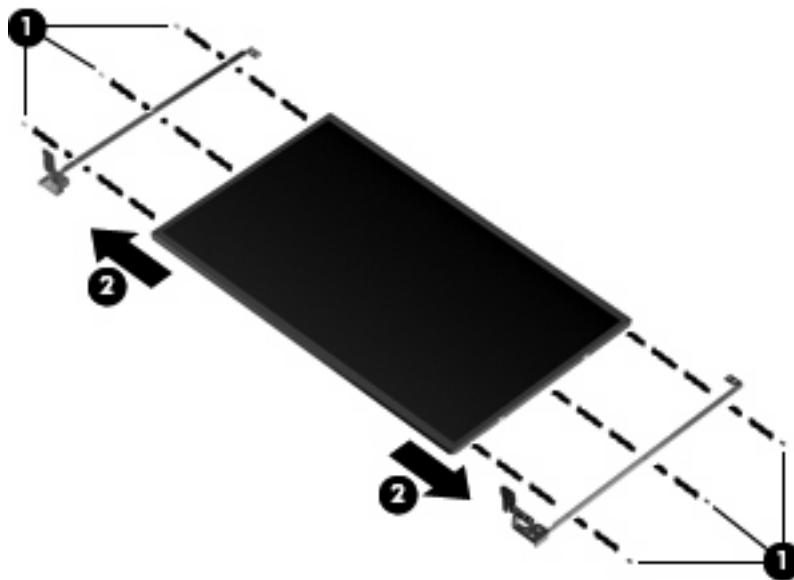
**NOTE:** To replace the webcam module in the display enclosure, align the holes on the webcam module with the pins on the display enclosure and press onto the double-sided tape.

8. If it is necessary to replace the display hinges:
  - a. Remove the display panel by removing the two Phillips PM2.5×4.5 screws (1) that secure the panel to the display enclosure.

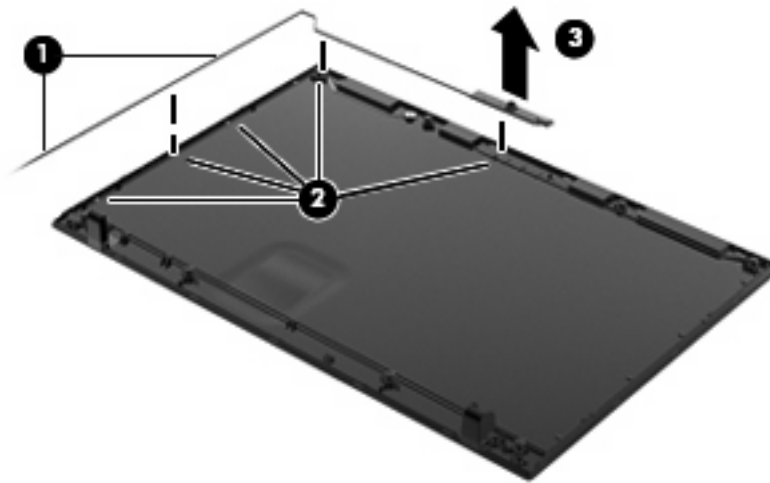
- b. Lift the bottom of the panel **(2)** to remove it from the enclosure.



- c. Remove the six Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel.
- d. Remove the display hinges **(2)**. The left and right display hinges are available in the Display Hinge Kit, spare part number 535871-001 for computers with 14.0-in displays.



9. If it is necessary to replace the webcam cable from the display enclosure, gently pull the webcam cable **(1)** from the clips and routing channels **(2)** built into the top cover. The webcam cable is included in the Display Cable Kit, spare part numbers 536430-001 for computers with 14.0-in displays.



Reverse this procedure to install the display assembly.

## Bluetooth module



**NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 536539-001 for computers with 15.6-in displays, 536538-001 for computers with 14.0-in displays. See [Cable Kit on page 43](#) for more Cable Kit spare part number information.

Description	Spare part number
Bluetooth module, Broadcom (for use only in models with the following system boards: 535803-001, 574505-001, 574506-001)	398393-002
Bluetooth module, WPAN (for use only in models with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)	537921-001

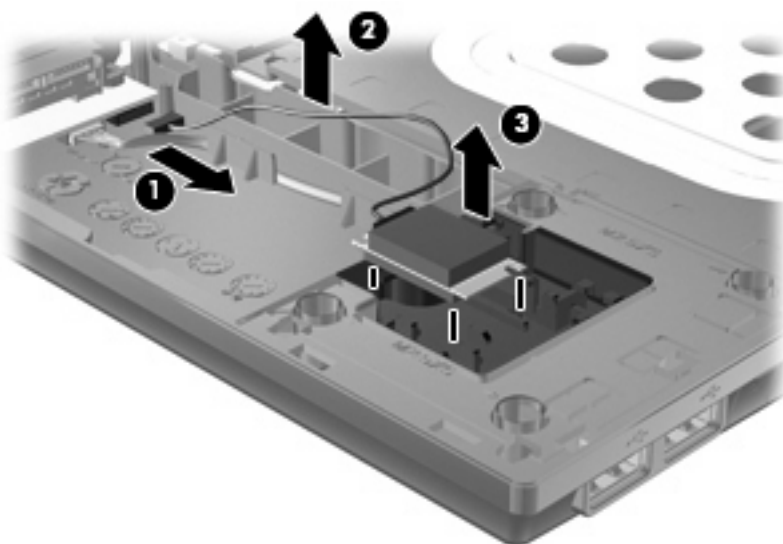
Before removing the Bluetooth module, follow these steps:

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Palm rest (see [Palm rest on page 71](#))
  - c. Hard drive (see [Hard drive on page 74](#))

Remove the Bluetooth module:

1. Position the computer right-side up with the front toward you.
2. Disconnect the Bluetooth module cable from the system board **(1)**.
3. Remove the Bluetooth module cable from the routing path **(2)**.

4. Remove the Bluetooth module (3) from the base enclosure.



Reverse this procedure to install the Bluetooth module.

## Modem module

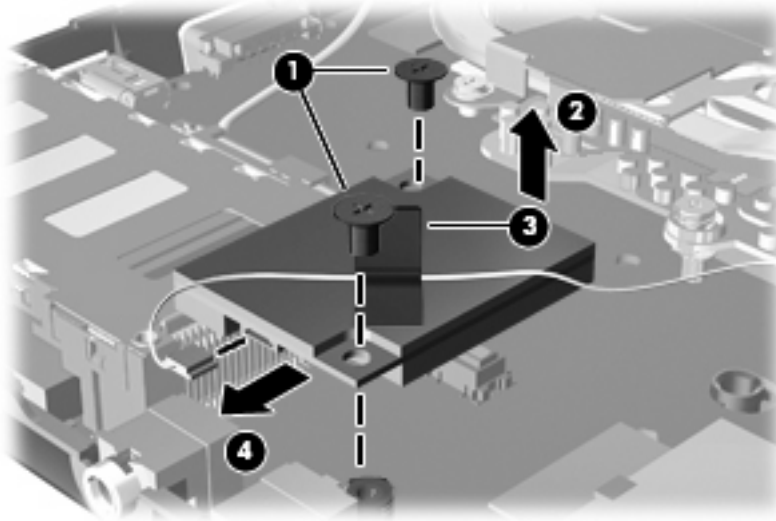
Description	Spare part number
For use in all countries and regions except Australia and New Zealand	510100-001
For use only in Australia and New Zealand	510100-011

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Optical drive (see [Optical drive on page 66](#))
  - c. Speakers (see [Speakers on page 69](#))
  - d. Palm rest (see [Palm rest on page 71](#))
  - e. Top cover (see [Top cover on page 84](#))

Remove the modem module:


1. Position the computer right-side up with the front toward you.
2. Remove the two Phillips PM2.5×3.0 screws (1) that secure the modem module to the system board.
3. Lift the modem module (2) straight up to disconnect it from the system board.
4. Remove the tape (3) that secures the cable to the modem module, and then disconnect the modem module cable (4).



5. Remove the modem module.

Reverse this procedure to install the modem module.

## USB connector assembly

 **NOTE:** The USB connector assembly is included in the Cable Kit, spare part number 536539-001 for computers with 15.6-in displays or 536538-001 for computers with 14.0-in displays.

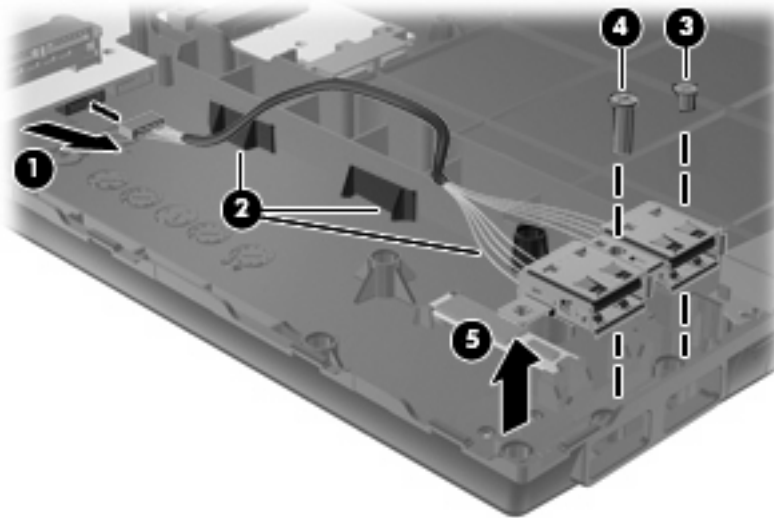
Before removing the USB connector assembly, follow these steps:

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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Optical drive (see [Optical drive on page 66](#))
  - c. Speakers (see [Speakers on page 69](#))
  - d. Palm rest (see [Palm rest on page 71](#))

- e. Hard drive (see [Hard drive on page 74](#))
- f. Display assembly (see [Display assembly on computers with 15.6-in displays on page 78](#) or [Display assembly on computers with 14.0-in displays on page 91](#))
- g. Top cover (see [Top cover on page 84](#))

Remove the USB connector assembly:

1. Position the computer right-side up with the right side toward you.
2. Disconnect the cable from the system board (1) and remove the cable from the routing path in the base enclosure (2).
3. Remove the Phillips PM2.5×3.0 screw (3) and the Phillips PM2.5×7.0 screw (4) that secures the USB connector assembly to the base enclosure.
4. Remove the USB connector assembly (5) from the base enclosure.



Reverse this procedure to install the USB connector assembly.

## Heat sink and fan



**NOTE:** The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
Heat sink for use in computers with UMA graphics subsystems	535804-001
Heat sink for use in computers with discrete graphics subsystems	535805-001
Fan	535766-001

Before removing the heat sink, 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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Speakers (see [Speakers on page 69](#))
  - c. Optical drive (see [Optical drive on page 66](#))
  - d. Palm rest (see [Palm rest on page 71](#))
  - e. Top cover (see [Top cover on page 84](#))

Remove the heat sink:

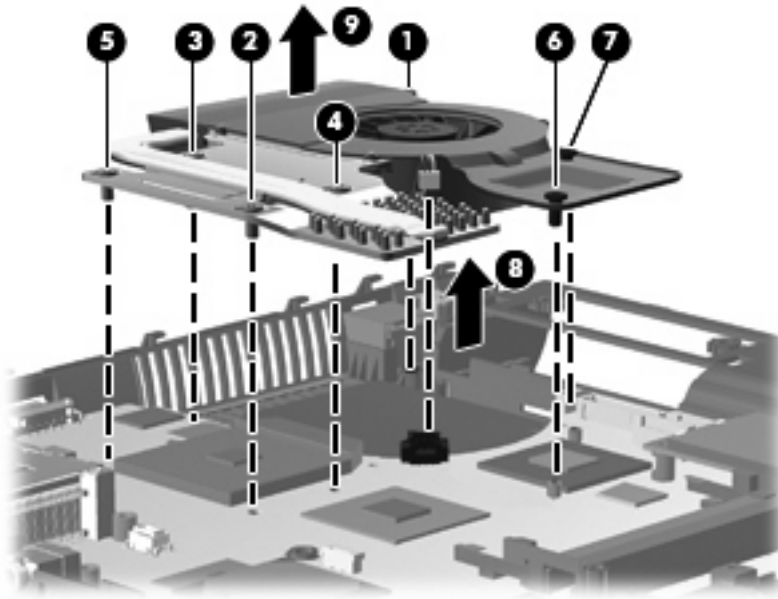



**NOTE:** Steps 1 through 4 apply to computers with discrete subsystem memory on the system board. Steps 5 through 8 apply to computers with UMA subsystem memory.

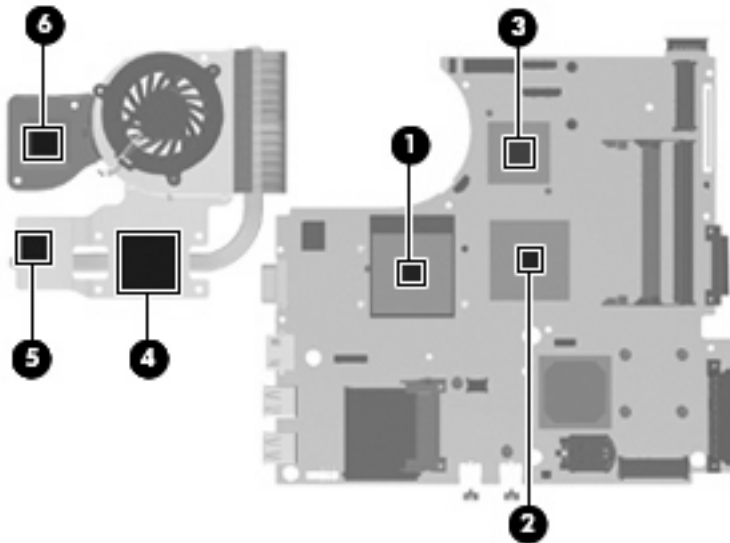
1. Position the computer right-side up with the front toward you.
2. Following the sequence stamped into the heat sink, loosen the seven screws **(1)**, **(2)**, **(3)**, **(4)**, **(5)**, **(6)**, **(7)** around the processor.
3. Disconnect the fan cable from the system board **(8)**.




4. Remove the heat sink (9).



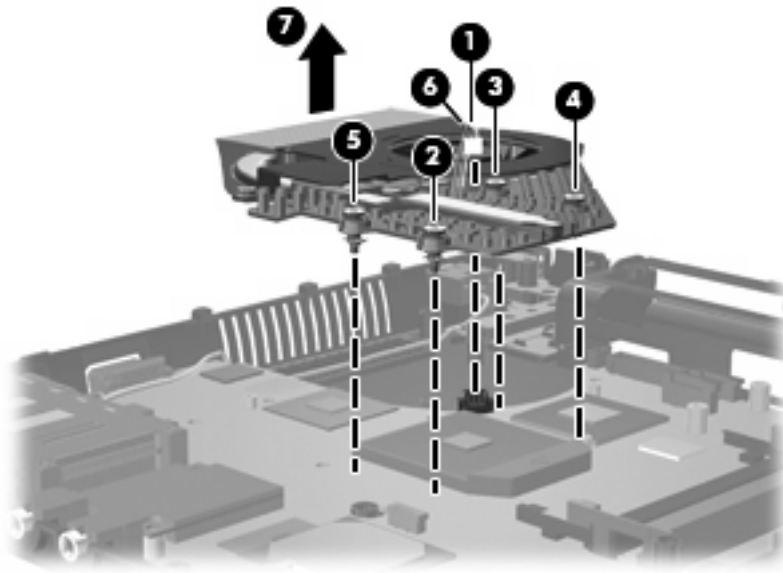
 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the system board (1), (2), and (3), and the heat sink components (4), (5), and (6) each time the heat sink is removed. Replacement thermal material is included with all heat sink, system board, and processor spare part kits.



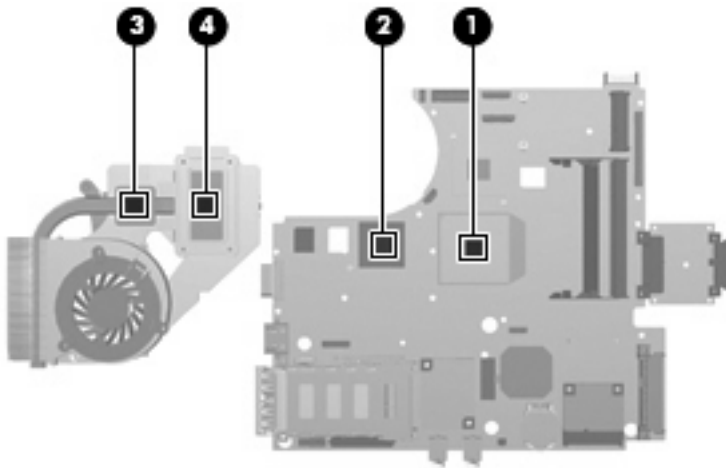
 **NOTE:** Steps 5 through 8 apply to computers with UMA subsystem memory. Steps 1 through 4 apply to computers with discrete subsystem memory.

5. Position the computer right-side up with the front toward you.
6. Following the sequence stamped into the heat sink, loosen the five screws (1), (2), (3), (4), (5) around the processor.
7. Disconnect the fan cable from the system board (6).

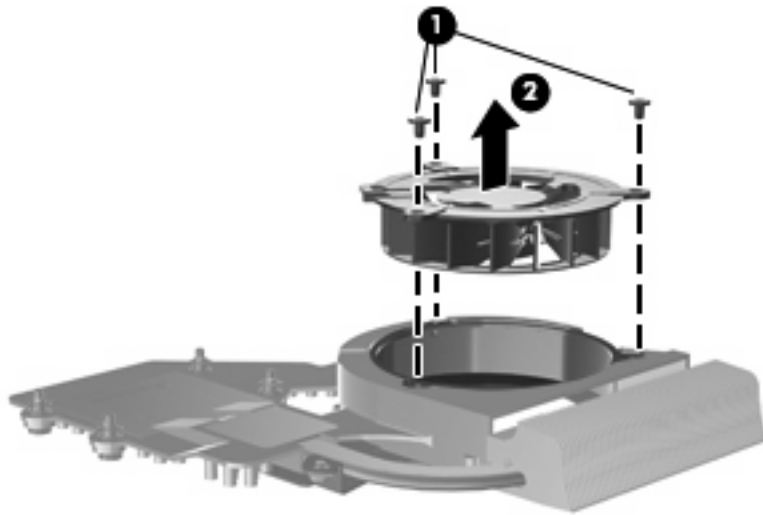
8. Remove the heat sink (7).



**NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the system board (1) and (2) and the heat sink components (3) and (4) each time the heat sink is removed. Replacement thermal material is included with all heat sink, system board, and processor spare part kits.



9. If it is necessary to remove the fan from the heat sink, remove the three Phillips PM2.0×3.0 screws (1) that secure the fan to the heat sink, and then remove the fan from the heat sink (2).



Reverse this procedure to install the heat sink.

## Processor



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

Description	Spare part number
<b>AMD Turion II Ultra Dual-Core processors</b> (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)	
<i>M500 (2.2-GHz with 1-MB L2 cache)</i>	576253-001
<i>M520 (2.3-GHz with 1-MB L2 cache)</i>	583055-001
<i>M600 (2.4-GHz with 2-MB L2 cache)</i>	576254-001
<b>AMD Turion Ultra Dual-Core processors</b> (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	
ZM-84 (2.3-GHz with 2-GB L2 cache)	507975-001
ZM-86 (2.4-GHz with 2-GB L2 cache)	507974-001
<b>AMD Turion Dual-Core processors</b> (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	
RM-70 (2.0-GHz with 1-GB L2 cache)	507977-001
RM-72 (2.1-GHz with 1-GB L2 cache)	507978-001
RM-74 (2.2-GHz with 1-GB L2 cache)	507979-001
RM-76 (2.3-GHz with 1-GB L2 cache)	572748-001
<b>AMD Athlon II Dual-Core processors</b> (for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)	
<i>M300 (2.0-GHz with 1-MB L2 cache)</i>	578024-001
<i>M320 (2.1-GHz with 1-MB L2 cache)</i>	576252-001
<b>AMD Athlon Dual-Core processors</b> (for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	
QL-62 (2.0-GHz with 1-GB L2 cache)	506052-001
QL-66 (2.2-GHz with 1-GB L2 cache)	572747-001
<b>AMD Sempron processor</b>	
<i>M100 (2.0-GHz with 512-KB L2 cache; for use only with the following system boards: 585218-001, 585219-001, 585220-001, 585221-001)</i>	576251-001
SI-42 (2.1-GHz with 512-KB L2 cache; for use only with the following system boards: 574505-001, 574506-001, 585802-001, 585803-001)	508102-001


Before removing the processor, follow these steps:

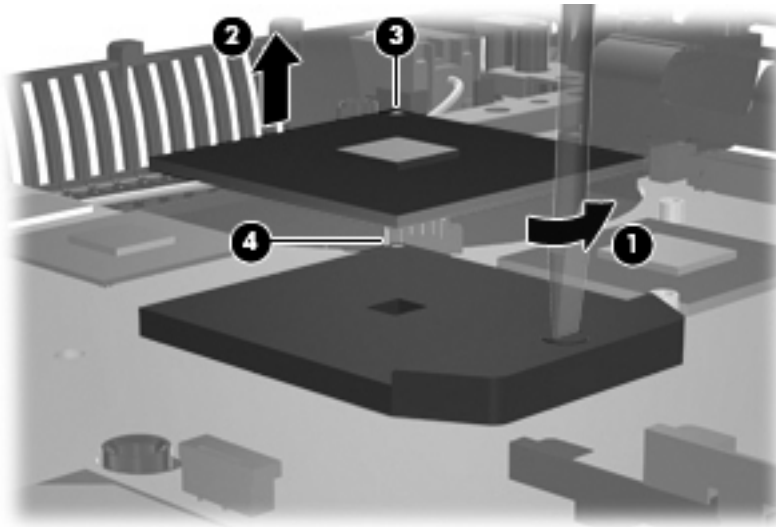
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

4. Remove the battery (see [Battery on page 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Optical drive (see [Optical drive on page 66](#))
  - c. Speakers (see [Speakers on page 69](#))
  - d. Palm rest (see [Palm rest on page 71](#))
  - e. Top cover (see [Top cover on page 84](#))

Remove the processor:

1. Position the computer right-side up with the front toward you.
2. Use a flat-bladed screwdriver to turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.
3. 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 **(4)** embossed on the processor socket.



Reverse this procedure to install the processor.

## System board



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

Description	Spare part number
<b>System board for use in computers with a WWAN module that use AMD Mxxx processors</b>	
<i>UMA graphics subsystem memory</i>	585218-001
<i>Discrete graphics subsystem memory</i>	585220-001
<b>System board for use in computers without a WWAN module that use AMD Mxxx processors</b>	
<i>UMA graphics subsystem memory</i>	585219-001
<i>Discrete graphics subsystem memory</i>	585221-001
<b>System board for use in computers with a WWAN module that use AMD ZM, RM, QL, or SI processors:</b>	
<i>Discrete graphics subsystem memory</i>	535803-001
<b>System board for use in computers without a WWAN module that use AMD ZM, RM, QL, or SI processors:</b>	
<i>UMA graphics subsystem memory</i>	574505-001
<i>Discrete graphics subsystem memory</i>	574506-001

Before removing the system board, follow these steps:

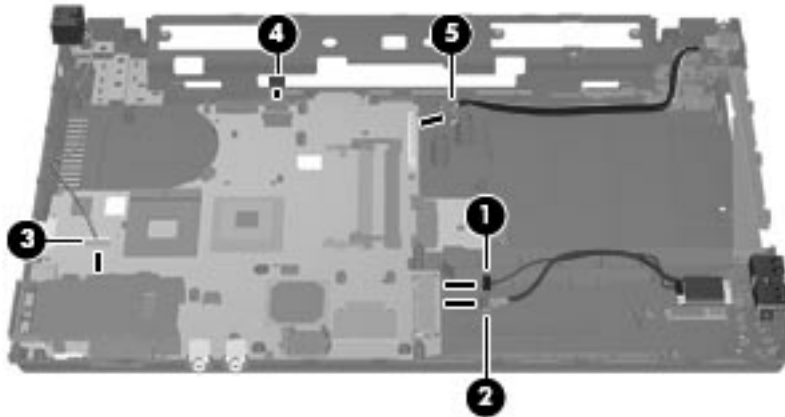
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Speakers (see [Speakers on page 69](#))
  - c. WWAN module (see [WWAN module on page 70](#))
  - d. Palm rest (see [Palm rest on page 71](#))
  - e. WLAN module (see [WLAN module on page 76](#))
  - f. Hard drive (see [Hard drive on page 74](#))
  - g. Optical drive (see [Optical drive on page 66](#))
  - h. Display assembly (see [Display assembly on computers with 15.6-in displays on page 78](#) or [Display assembly on computers with 14.0-in displays on page 91](#))
  - i. Top cover (see [Top cover on page 84](#))

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

- Memory module (see [Memory module on page 65](#))
- WLAN module (see [WLAN module on page 76](#))
- WWAN module (see [WWAN module on page 70](#))
- Modem module (see [Modem module on page 97](#))
- Processor (see [Processor on page 104](#))

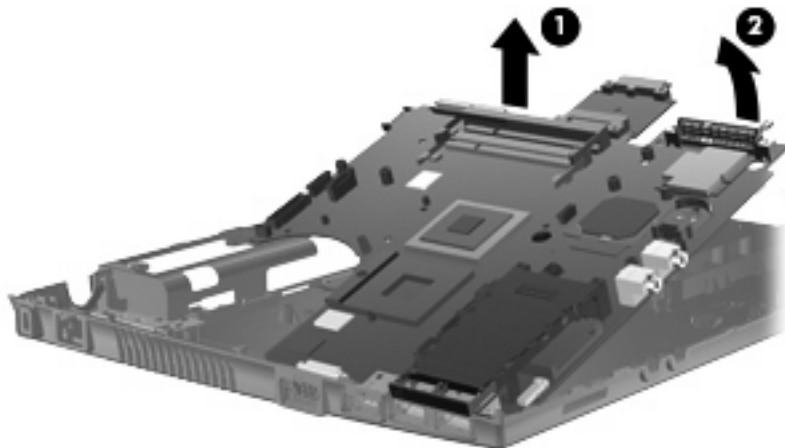
Remove the system board:

1. Position the computer right-side up with the front toward you.
2. Disconnect the following cables from the system board:
  - (1) Bluetooth module cable
  - (2) USB connector module cable
  - (3) RJ-45 cable
  - (4) SIM board cable
  - (5) Power cable

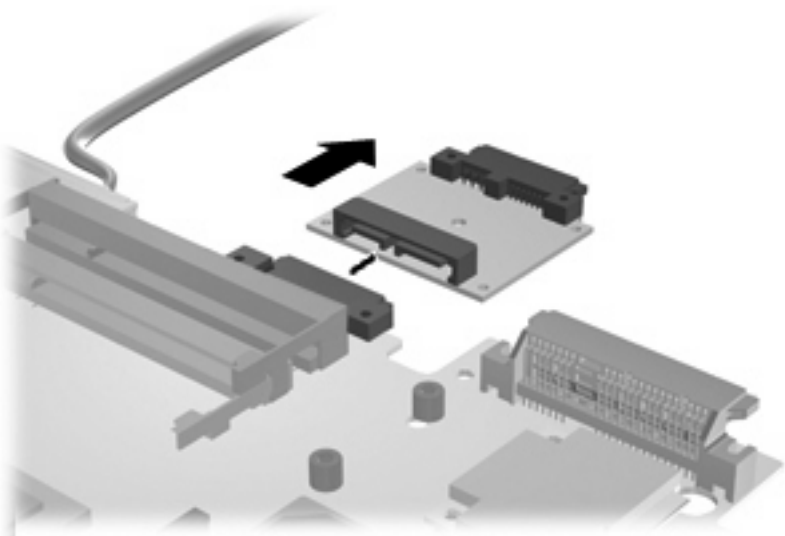


3. Lift the rear edge of the system board (1) until it rests at an angle.

4. Remove the system board from the base enclosure (2).



5. (15.6-in models only) If it is necessary to remove the optical drive connector board from the system board, pull the optical drive connector board straight off the system board. The optical drive connector board is available using spare part number 535862-001.



Reverse this procedure to install the system board.

## SIM

Description	Spare part number
SIM	536599-001

Before removing the SIM, follow these steps:

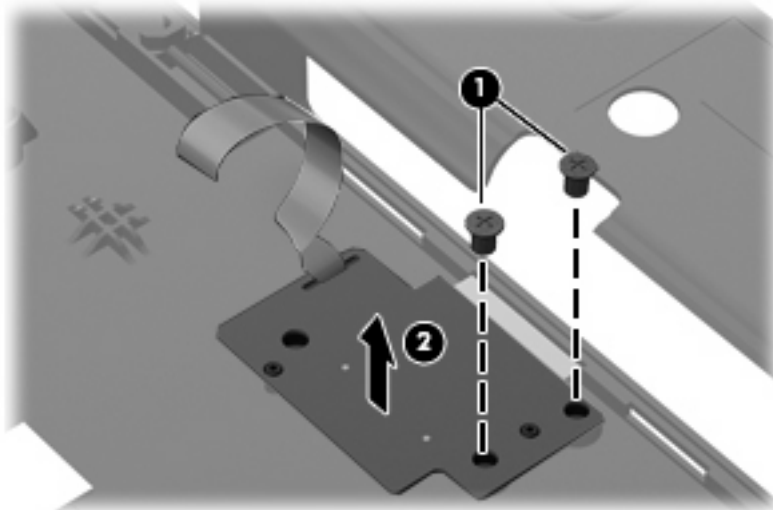
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.



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 60](#)).
5. Remove the following components:
  - a. Switch cover and keyboard (see [Switch cover and keyboard on page 61](#))
  - b. Optical drive (see [Optical drive on page 66](#))
  - c. Speakers (see [Speakers on page 69](#))
  - d. WWAN module (see [WWAN module on page 70](#))
  - e. Palm rest (see [Palm rest on page 71](#))
  - f. WLAN module (see [WLAN module on page 76](#))
  - g. Hard drive (see [Hard drive on page 74](#))
  - h. Top cover (see [Top cover on page 84](#))
  - i. Display assembly (see [Display assembly on computers with 15.6-in displays on page 78](#) or [Display assembly on computers with 14.0-in displays on page 91](#))
  - j. System board (see [System board on page 106](#))

To remove the SIM:

1. Position the computer right-side up with the front toward you.
2. Remove the two Phillips PM2.5×3.0 screws (1) that secure the SIM to the system board.
3. Remove the SIM (2) by pulling the module straight up and off the computer.



Reverse this procedure to install the SIM.

---

# 5 Computer Setup

## Computer Setup in Windows Vista and Windows XP

### Starting Computer Setup

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



**NOTE:** Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

**NOTE:** An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.


### Using Computer Setup

#### Navigating and selecting in Computer Setup

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

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
  - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
  - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
  - To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

 **NOTE:** You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

---


2. Press **f10** to enter BIOS Setup.
3. Select the **File, Security, Diagnostics, or System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.  
  
– or –  
  
Use the tab key and the arrow keys to select **File > Ignore changes and exit**, and then press **enter**.  
  
– or –
- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.  
  
– or –  
  
Use the tab key and the arrow keys to select **File > Save changes and exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Restoring factory settings in Computer Setup

 **NOTE:** Restoring defaults will not change the hard drive mode.

---


To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **File > Save changes and exit**, and then press **enter**.


Your changes go into effect when the computer restarts.

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

---

## Computer Setup menus

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

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

## File menu

Select	To do this
System Information	<ul style="list-style-type: none"><li>• View identification information for the computer and the batteries in the system.</li><li>• View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li></ul>
Set System Date and Time	Set or change the date and time on the computer.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

## Security menu



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

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	<ul style="list-style-type: none"><li>• Create a new BIOS user account.</li><li>• View a list of ProtectTools users.</li></ul>
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (disabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (disabled by default).
Allow Reset of HP ProtectTools security keys	Enable/disable reset of HP ProtectTools security keys.
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
DriveLock Passwords	<ul style="list-style-type: none"><li>• Enable/disable DriveLock on any computer hard drive (enabled by default).</li><li>• Change a DriveLock user password or master password.</li></ul> <p><b>NOTE:</b> DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>
Automatic DriveLock	Enable/disable Automatic DriveLock support.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay.  <b>CAUTION:</b> If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

## Diagnostics menu

Select	To do this
System Diagnostics Menu	<ul style="list-style-type: none"><li>• System Information—Displays the following information:<ul style="list-style-type: none"><li>◦ Identification information for the computer and the batteries in the system.</li><li>◦ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li></ul></li><li>• Start-up Test—Verifies the system components needed for starting the computer.</li><li>• Run-In Test—Runs a comprehensive check on system memory.</li><li>• Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system.</li><li>• Error Log—Displays a log file if any errors have occurred.</li></ul>

## System Configuration menu



**NOTE:** Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	<ul style="list-style-type: none"><li>• Set a Startup Menu delay (in seconds).</li><li>• Enable/disable Custom Logo (disabled by default).</li><li>• Enable/disable Display Diagnostic URL (enabled by default).</li><li>• Enable/disable CD-ROM boot (enabled by default).</li><li>• Enable/disable SD Card boot (enabled by default).</li><li>• Enable/disable floppy boot (enabled by default).</li><li>• Enable/disable PXE Internal NIC boot (disabled by default).</li><li>• Set the Express Boot Popup delay in seconds.</li><li>• Set the boot order.</li></ul>
Device Configurations	<ul style="list-style-type: none"><li>• Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following:<ul style="list-style-type: none"><li>◦ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running.</li><li>◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.</li></ul></li><li>• Enable/disable fan always on while connected to an AC outlet (disabled by default).</li><li>• Enable/disable Data Execution Prevention (select models only; disabled by default). When enabled, the processor can disable some virus code execution, which helps to improve computer security.</li><li>• SATA (Serial Advanced Technology Attachment) device mode. The following options are available:<ul style="list-style-type: none"><li>◦ AHCI (Advanced Host Controller Interface)</li><li>◦ IDE (Integrated Drive Electronics)</li></ul></li></ul> <p><b>NOTE:</b> Availability of the options above varies by computer model.</p> <ul style="list-style-type: none"><li>• Enable/disable HP QuickLook 2 (enabled by default).</li><li>• Enable/disable Virtualization Technology (select models only; disabled by default).</li><li>• Enable/disable Dual-Core CPU (enabled by default).</li><li>• Enable/Disable Unified Extensible Firmware Interface (UEFI) mode (enabled by default).</li></ul>

Select	To do this
Built-In Device Options	<ul style="list-style-type: none"> <li>• Enable/disable the wireless button state (enabled by default).</li> <li>• Enable/disable embedded WWAN device radio (enabled by default).</li> <li>• Enable/disable embedded Bluetooth® device radio (enabled by default).</li> <li>• Enable/disable the Network Interface Controller (LAN) (enabled by default).</li> <li>• Set the wake on LAN state. Options include the following: <ul style="list-style-type: none"> <li>◦ Disabled</li> <li>◦ Boot to Network (set by default)</li> <li>◦ Follow Boot Order</li> </ul> </li> <li>• Enable/disable the optical disc drive (enabled by default).</li> <li>• Enable/disable the microphone.</li> <li>• Enable/disable a modem device (enabled by default).</li> <li>• Enable/disable the embedded WLAN device (enabled by default).</li> <li>• Enable/disable LAN/WLAN switching (disabled by default).</li> <li>• Enable/disable the integrated camera (select models only; enabled by default).</li> </ul>
Port Options (all are enabled by default)	<p><b>NOTE:</b> All port options are enabled by default.</p> <ul style="list-style-type: none"> <li>• Enable/disable the ExpressCard slot.</li> <li>• Enable/disable the flash media reader.</li> <li>• Enable/disable the USB port.</li> </ul> <p><b>CAUTION:</b> Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator.</p>
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.



# Computer Setup in Linux

## Starting Computer Setup

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



**NOTE:** Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

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

**NOTE:** An external keyboard connected by USB can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

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

## Using Computer Setup

### Navigating and selecting in Computer Setup

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

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

Because Computer Setup is not operating system based, it does not support the TouchPad. Navigation and selection are by keystroke:

- To choose a menu or a menu item, use the arrow keys.
  - To select an item, press **enter**.
  - To close open dialog boxes and return to the main Computer Setup screen, press **esc**.
  - To view navigation information, press **f1**.
  - To change the language, press **f2**.
2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
  3. To exit Computer Setup, choose one of the following methods:
    - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore Changes And Exit**. Then follow the instructions on the screen.
    - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes And Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

### Restoring factory settings in Computer Setup

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore Defaults**, and then press **enter**.
3. When the confirmation dialog box opens, press **f10**.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes And Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.



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

## Computer Setup menus

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



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

### File menu

Select	To do this
System information	<ul style="list-style-type: none"><li>• View identification information for the computer.</li><li>• View specification information for the processor, cache and memory size, and system ROM.</li></ul>
Restore Defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.)
Ignore Changes And Exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save Changes And Exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

## Security menu



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

Select	To do this
Setup Password	Enter, change, or delete a setup password.
Power-On Password	Enter, change, or delete a power-on password.
Password Options	<ul style="list-style-type: none"><li>• Enable/disable stringent security.</li><li>• Enable/disable the password requirement on computer restart.</li></ul>
DriveLock Passwords	<ul style="list-style-type: none"><li>• Enable/disable DriveLock on any computer hard drive.</li><li>• Enter, change, or disable DriveLock on an optional MultiBay hard drive.</li></ul> <p><b>NOTE:</b> DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>
System IDs	Enter a user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	<p>Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available:</p> <ul style="list-style-type: none"><li>• Fast: Runs the Disk Sanitizer erase cycle once.</li><li>• Optimum: Runs the Disk Sanitizer erase cycle 3 times.</li><li>• Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list.</li></ul> <p><b>CAUTION:</b> If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.</p>

## Diagnostics menu

Select	To do this
HDD Self-Test Options	Run a comprehensive self-test on any hard drive in the system or on any optional MultiBay hard drive.
Memory Check	Run a comprehensive check on system memory.

## System Configuration menu



**NOTE:** Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot options	<ul style="list-style-type: none"><li>• Set an <b>f9</b>, <b>f10</b>, and <b>f12</b> delay when starting up.</li><li>• Enable/disable CD-ROM boot.</li><li>• Enable/disable floppy boot.</li><li>• Enable/disable internal network adapter boot.</li><li>• Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system.</li><li>• Set the Express Boot Popup delay in seconds.</li><li>• Set the boot order.<ul style="list-style-type: none"><li>◦ 1st boot device: USB CD-ROM</li><li>◦ 2nd boot device: USB floppy</li><li>◦ 3rd boot device: USB SuperDisk</li><li>◦ 4th boot device: Notebook hard drive</li><li>◦ 5th boot device: USB hard disk</li><li>◦ 6th boot device: Network controller</li></ul></li></ul>
Device Configurations	<ul style="list-style-type: none"><li>• Swap the functions of the <b>fn</b> key and left <b>ctrl</b> key.</li><li>• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:<ul style="list-style-type: none"><li>◦ Use of a USB keyboard in Computer Setup even when a your operating system is not running.</li><li>◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.</li></ul></li><li>• Enable/disable BIOS DMA data transfers.</li><li>• Enable/disable fan always on while connected to an AC outlet.</li><li>• Enable/disable data execution prevention.</li><li>• Enable/disable LAN power saving mode.</li><li>• Enable/disable SATA Native Mode.</li><li>• Enable/disable Dual-Core CPU.</li><li>• Enable/disable HDD translation mode.</li></ul>

Select	To do this
Built-in device options	<ul style="list-style-type: none"> <li>• Enable/disable embedded WLAN Device Radio.</li> <li>• Enable/disable embedded Bluetooth Device Radio.</li> <li>• Enable/disable Network Interface Controller (NIC)</li> <li>• Enable/disable LAN/WLAN Switching.</li> <li>• Enable/disable Wake on LAN.</li> <li>• Enable/disable the integrated camera (webcam)</li> </ul>
Port options	<ul style="list-style-type: none"> <li>• Enable/disable USB port.</li> <li>• Enable/disable ExpressCard slot.</li> </ul>

# 6 Specifications

## Computer specifications

	Metric	U.S.
Dimensions		
Depth (14.0-in models)	23.24 cm	9.15 in
Depth (15.6-in models)	24.96 cm	9.83 in
Width (14.0-in models)	33.60 cm	13.2 in
Width (15.6-in models)	37.18 cm	14.6 in
Height (front to rear) (14.0-in models)	3.10 to 3.58 cm	1.24 to 1.41 in
Height (front to rear) (15.6-in models)	3.15 to 3.63 cm	1.24 to 1.43 in
Weight (14.0-in models: 6-cell battery, no WWAN, no camera, no Bluetooth, no modem, one DIMM, with ODD)	< 2.27 kg	< 5.00 lbs
Weight (15.6-in models: 6-cell battery, no WWAN, no camera, no Bluetooth, no modem, one DIMM, with ODD)	< 2.59	< 5.7 lbs
Input power		
Operating voltage	18.5 V dc @ 4.74 A – 90 W	
Operating current	4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	

	Metric	U.S.
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

## 14.0-in WXGA display specifications

	Metric	U.S.
Dimensions		
Height	27.94 cm	11.0 in
Width	20.83 cm	8.2 in
Diagonal	35.56 cm	14.0 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1 (typical)	
Brightness	180 nits (typical)	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-40° horizontal, +20/-40° vertical (typical)	



## 15.6-in WXGA display specifications

	Metric	U.S.
Dimensions		
Height	20.7 cm	8.1 in
Width	33.1 cm	13.0 in
Diagonal	39.1 cm	15.6 in
Number of colors	Up to 16.8 million	
Contrast ratio	300:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.259 × 0.259 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
Backlight	CCFL	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	+/-30° horizontal, +10/-40° vertical (typical)	

## Hard drive specifications

	500-GB*	320-GB*	250-GB*	160-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks	1,048,576,000	625,141,400	488,376,280	312,560,640
Disc rotational speed	5400 rpm	5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)			
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.				
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.				

## DVD±RW 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
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD-ROM	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	

## Blu-ray ROM DVD+/-RW SuperMulti DL Drive

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, HD-ROM (Single Layer), HD-ROM (Dual Layer), HD DVD-R, HD DVD-R for Dual Layer, HD DVD-RW, BD-ROM, BD-R, BR-RE	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-ROM	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-ROM Drive

<b>Applicable disc</b>	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18, CD-ROM (Mode 1 and 2), CD Digital Audio, CD-XA ready (Mode 2, Form 1 and Form 2), CD-I (Mode 2, Form 1 and Form 2), CD-R, CD-RW, Photo CD (single and multisession), CD-Bridge	
<b>Access time</b>	<b>CD</b>	<b>DVD</b>
Random	< 100 ms	< 125 ms
<b>Cache buffer</b>	512 KB	
<b>Data transfer rate</b>		
CD-R (24X)	3600 KB/sec (150 KB/sec at 1X CD rate)	
CD-RW (10X)	1500 KB/sec (150 KB/sec at 1X CD rate)	
CD-ROM (24X)	3600 KB/sec (150 KB/sec at 1X CD rate)	
DVD (8X)	10,800 KB/sec (1,352 KB/sec at 1X DVD rate)	
Transfer Mode	Multiword DMA Mode	

## System DMA specifications, Windows Vista and XP

Hardware DMA	System function
DMA4	Direct memory access controller

## System interrupt specifications, Windows Vista

Hardware IRQ	System function
ISA0	System timer
ISA1	Standard 101-/102-Key or Microsoft Natural Keyboard
ISA8	System CMOS/real-time clock
ISA100 - ISA119	Microsoft ACPI-Compliant System
ISA12	Synaptics PS/2 TouchPad
ISA120 - ISA129	Microsoft ACPI-Compliant System
ISA13	Numeric data processor
ISA130 - ISA139	Microsoft ACPI-Compliant System
ISA14	ATA Channel 0
ISA140 - ISA149	Microsoft ACPI-Compliant System
ISA15	ATA Channel 1
ISA150 - ISA190	Microsoft ACPI-Compliant System
ISA23	HP Mobile Data Protection Sensor
ISA81 - ISA99	Microsoft ACPI-Compliant System
PCI16	Intel ICH9 Family USB Universal Host Controller – 2937
PCI16	Mobile Intel 4 Series Express Chipset Family
PCI17	Broadcom 802.11b/g WLAN
PCI17	High Definition Audio Controller
PCI17	Intel ICH9 Family USB Universal Host Controller – 2938
PCI17	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
PCI18	Intel ICH9 Family USB Universal Host Controller – 2939
PCI18	Intel ICH9 Family USB Universal Host Controller – 2936
PCI18	Standard Dual Channel PCI IDE Controller
PCI19	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
PCI-2	Intel ICH9 Family PCI Express Root Port 1 - 2940
PCI20	Intel ICH9 Family Universal Host Controller – 2934
PCI20	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
PCI22	Intel ICH9 Family Universal Host Controller – 2935

Hardware IRQ	System function
PCI-3	Intel ICH9 Family PCI Express Root Port 2 - 2942
PCI-4	Intel ICH9 Family PCI Express Root Port 3 - 2944
PCI-5	Intel ICH9 Family PCI Express Root Port 5 - 2948
PCI-6	Intel ICH9 Family PCI Express Root Port 6 - 294A

## System interrupt specifications, Windows XP

Hardware IRQ	System function
ISA0	System timer
ISA1	Standard 101-/102-Key or Microsoft Natural Keyboard
ISA8	System CMOS/real-time clock
ISA9	Microsoft ACPI-Compliant System
ISA12	Synaptics PS/2 TouchPad
ISA13	Numeric data processor
ISA23	HP Mobile Data Protection Sensor
PCI16	Intel ICH9 Family USB Universal Host Controller – 2937
PCI16	Mobile Intel 4 Series Express Chipset Family
PCI17	Broadcom 4322AG 802.11a/b/g/draft-n Wi-Fi Adapter
PCI17	Intel ICH9 Family PCI Express Root Port 1 - 2940
PCI17	Intel ICH9 Family PCI Express Root Port 5 - 2948
PCI17	Intel ICH9 Family USB Universal Host Controller – 2938
PCI17	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
PCI17	Microsoft UAA Bus Driver for High Definition Audio
PCI18	Intel ICH9 Family PCI Express Root Port 3 - 2944
PCI18	Intel ICH9 Family USB Universal Host Controller – 2939
PCI18	Intel ICH9 Family USB Universal Host Controller – 2936
PCI19	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
PCI20	Intel ICH9 Family Universal Host Controller – 2934
PCI20	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
PCI21	ICH9M-E/M SATA AHCI Controller
PCI22	Intel ICH9 Family Universal Host Controller – 2935

## System I/O address specifications, Windows Vista

I/O address (hex)	System function (shipping configuration)
000 - 01F	Direct memory access controller
000 - CF7	PCI bus
020 - 021	Programmable interrupt controller
024 - 025	Programmable interrupt controller
028 - 029	Programmable interrupt controller
02C - 02D	Programmable interrupt controller
02E - 02F	Motherboard resources
030 - 031	Programmable interrupt controller
034 - 035	Programmable interrupt controller
038 - 039	Programmable interrupt controller
03C - 03D	Programmable interrupt controller
040 - 043	System timer
04E - 04F	Motherboard resources
050 - 053	System timer
060 - 060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
061 - 061	Motherboard resources
062 - 062	Microsoft ACPI-Compliant Embedded Controller
063 - 063	Motherboard resources
064 - 064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
065 - 065	Motherboard resources
066 - 066	Microsoft ACPI-Compliant Embedded Controller
067 - 067	Motherboard resources
070 - 070	Motherboard resources
070 - 077	System CMOS/real time clock
080 - 080	Motherboard resources
081 - 091	Direct memory access controller
092 - 092	Motherboard resources
093 - 09F	Direct memory access controller
0A0 - 0A1	Programmable interrupt controller
0A4 - 0A5	Programmable interrupt controller
0A8 - 0A9	Programmable interrupt controller
0AC - 0AD	Programmable interrupt controller
0B0 - 0B1	Programmable interrupt controller



<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
0B2 - 0B3	Motherboard resources
0B4 - 0B5	Programmable interrupt controller
0B8 - 0B9	Programmable interrupt controller
0BC - 0BD	Programmable interrupt controller
0C0 - 0DF	Direct memory access controller
0F0 - 0F0	Numeric data processor
170 - 177	ATA Channel 1
1F0 - 1F7	ATA Channel 0
200 - 27F	Motherboard resources
376 - 376	ATA Channel 1
3B0 - 3BB	Mobile Intel 4 Series Express Chipset Family
3C0 - 3DF	Mobile Intel 4 Series Express Chipset Family
3F6 - 3F6	ATA Channel 0
400 - 47F	Motherboard resources
4D0 - 4D1	Programmable interrupt controller
500 - 57F	Motherboard resources
D00 - FFFF	PCI bus
1000 - 1003	Motherboard resources
1010 - 101F	Motherboard resources
2000 - 20FF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
2000 - 2FFF	Intel ICH9 Family PCI Express Root Port 6 – 294A
3000 - 4FFF	Intel ICH9 Family PCI Express Root Port 6 – 2948
5000 - 6FFF	Intel ICH9 Family PCI Express Root Port 6 – 2944
7000 - 701F	Intel ICH9 Family USB Universal Host Controller – 2936
7020 - 703F	Intel ICH9 Family USB Universal Host Controller – 2935
7040 - 705F	Intel ICH9 Family USB Universal Host Controller – 2934
7060 - 707F	Intel ICH9 Family USB Universal Host Controller – 2939
7080 - 709F	Intel ICH9 Family USB Universal Host Controller – 2938
70A0 - 70BF	Intel ICH9 Family USB Universal Host Controller – 2937
70C0 - 70CF	Standard Dual Channel PCI IDE Controller
70D0 - 70DF	Standard Dual Channel PCI IDE Controller
70E0 - 70EF	Standard Dual Channel PCI IDE Controller
70F0 - 70FF	Standard Dual Channel PCI IDE Controller
7100 - 7107	Standard Dual Channel PCI IDE Controller

<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
7108 - 710F	Standard Dual Channel PCI IDE Controller
7120 - 7127	Mobile Intel 4 Series Express Chipset Family
7128 - 712B	Standard Dual Channel PCI IDE Controller
712C - 712F	Standard Dual Channel PCI IDE Controller
EF80 - EF9F	Motherboard resources
FE00 - FE0F	Motherboard resources
FE80 - FE8F	Motherboard resources
FFFF - FFFF	Motherboard resources

## System I/O address specifications, Windows XP

<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
000 - 01F	Direct memory access controller
000 - CF7	PCI bus
020 - 021	Programmable interrupt controller
024 - 025	Programmable interrupt controller
028 - 029	Programmable interrupt controller
02C - 02D	Programmable interrupt controller
02E - 02F	Motherboard resources
030 - 031	Programmable interrupt controller
034 - 035	Programmable interrupt controller
038 - 039	Programmable interrupt controller
03C - 03D	Programmable interrupt controller
040 - 043	System timer
04E - 04F	Motherboard resources
050 - 053	System timer
060 - 060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
061 - 061	Motherboard resources
062 - 062	Microsoft ACPI-Compliant Embedded Controller
063 - 063	Motherboard resources
064 - 064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard with HP QLB
065 - 065	Motherboard resources
066 - 066	Microsoft ACPI-Compliant Embedded Controller
067 - 067	Motherboard resources

<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
070 - 070	Motherboard resources
070 - 077	System CMOS/real time clock
080 - 080	Motherboard resources
081 - 091	Direct memory access controller
092 - 092	Motherboard resources
093 - 09F	Direct memory access controller
0A0 - 0A1	Programmable interrupt controller
0A4 - 0A5	Programmable interrupt controller
0A8 - 0A9	Programmable interrupt controller
0AC - 0AD	Programmable interrupt controller
0B0 - 0B1	Programmable interrupt controller
0B2 - 0B3	Motherboard resources
0B4 - 0B5	Programmable interrupt controller
0B8 - 0B9	Programmable interrupt controller
0BC - 0BD	Programmable interrupt controller
0C0 - 0DF	Direct memory access controller
0F0 - 0F0	Numeric data processor
200 - 27F	Motherboard resources
2E4 - 2E7	ISAPNP Read Data Port
3B0 - 3BB	Mobile Intel 4 Series Express Chipset Family
3C0 - 3DF	Mobile Intel 4 Series Express Chipset Family
3F6 - 3F6	ATA Channel 0
400 - 47F	Motherboard resources
4D0 - 4D1	Programmable interrupt controller
500 - 57F	Motherboard resources
A79 - A79	ISAPNP Read Data Port
D00 - FFFF	PCI bus
1000 - 1003	Motherboard resources
1010 - 101F	Motherboard resources
2000 - 20FF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
2000 - 2FFF	Intel ICH9 Family PCI Express Root Port 6 – 294A
3000 - 4FFF	Intel ICH9 Family PCI Express Root Port 6 – 2948
5000 - 6FFF	Intel ICH9 Family PCI Express Root Port 6 – 2944
7000 - 701F	ICH9M-E/M SATA AHCI Controller

I/O address (hex)	System function (shipping configuration)
7020 - 703F	Intel ICH9 Family USB Universal Host Controller – 2936
7040 - 705F	Intel ICH9 Family USB Universal Host Controller – 2935
7060 - 707F	Intel ICH9 Family USB Universal Host Controller – 2934
7080 - 709F	Intel ICH9 Family USB Universal Host Controller – 2939
70A0 - 70BF	Intel ICH9 Family USB Universal Host Controller – 2938
70C0 - 70DF	Intel ICH9 Family USB Universal Host Controller – 2937
70E0 - 70E7	ICH9M-E/M SATA AHCI Controller
70E8 - 70EF	ICH9M-E/M SATA AHCI Controller
70F0 - 70F7	Mobile Intel 4 Series Express Chipset Family
70F8 - 70FB	ICH9M-E/M SATA AHCI Controller
70FC - 70FF	ICH9M-E/M SATA AHCI Controller
EF80 - EF9F	Motherboard resources
FE00 - FE0F	Motherboard resources
FE80 - FE8F	Motherboard resources
FFFF - FFFF	Motherboard resources

## System memory map specifications, Windows Vista

Memory address	System function
000A0000-000BFFFF	Mobile Intel 4 Series Express Chipset Family
000A0000-000BFFFF	PCI Bus
80000000-8FFFFFFF	Mobile Intel 4 Series Express Chipset Family
80000000-DFFFFFFF	PCI Bus
90000000-903FFFFF	Mobile Intel 4 Series Express Chipset Family
90400000-904FFFFF	Mobile Intel 4 Series Express Chipset Family
90500000-905FFFFF	Intel 82801 PCI Bridge – 2448
90600000-90603FFF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
90600000-906FFFFF	Intel ICH9 Family PCI Express Port 6 – 294A
90700000-946FFFFF	Intel ICH9 Family PCI Express Port 5 – 2948
94700000-986FFFFF	Intel ICH9 Family PCI Express Port 3 – 2944
98700000-98703FFF	Broadcom 802.11b/g WLAN
98700000-987FFFFF	Intel ICH9 Family PCI Express Port 2 – 2942
98800000-988FFFFF	Intel ICH9 Family PCI Express Port 1 – 2940
98900000-98903FFF	High Definition Audio Controller

Memory address	System function
98904000-989043FF	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
98904400-989047FF	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
E0000000-EFFFFFFF	Motherboard resources
F0000000-FEDFFFFF	High precision event timer
FEC00000-FEC00FFF	Motherboard resources
FED00000-FED003FF	Motherboard resources
FED10000-FED13FFF	Motherboard resources
FED18000-FED18FFF	Motherboard resources
FED1C000-FED1FFFF	Motherboard resources
FED20000-FED3FFFF	Motherboard resources
FED40000-FED44FFF	Motherboard resources
FED45000-FED8FFFF	Motherboard resources
FEE01000-FFFFFFF	PCI Bus
FF000000-FFFFFFFF	Intel 82802 Firmware Hub Device

## System memory map specifications, Windows XP

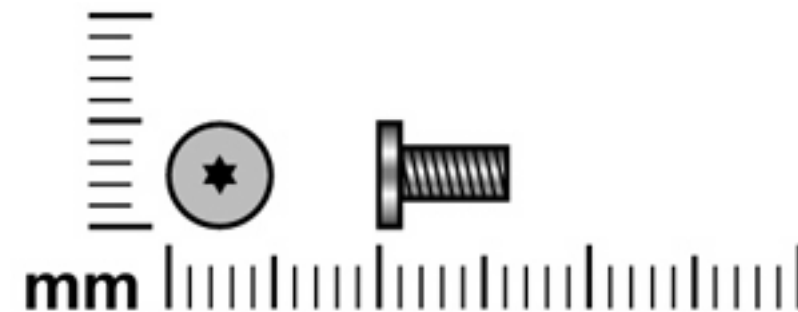
Memory address	System function
000A0000-000BFFFF	Mobile Intel 4 Series Express Chipset Family
000A0000-000BFFFF	PCI Bus
40000000-4FFFFFFF	Mobile Intel 4 Series Express Chipset Family
40000000-DFFFFFFF	PCI Bus
50000000-503FFFFF	Mobile Intel 4 Series Express Chipset Family
50400000-504FFFFF	Mobile Intel 4 Series Express Chipset Family
50600000-50603FFF	Marvell Yukon 88E8072 PCI-E Gigabit Ethernet Controller
50600000-506FFFFF	Intel ICH9 Family PCI Express Port 6 – 294A
50700000-546FFFFF	Intel ICH9 Family PCI Express Port 5 – 2948
54700000-586FFFFF	Intel ICH9 Family PCI Express Port 3 – 2944
58700000-58703FFF	Broadcom 4322AG 802.11a/b/g/draft-n Wi-Fi Adapter
58700000-587FFFFF	Intel ICH9 Family PCI Express Port 2– 2942
58800000-588FFFFF	Intel ICH9 Family PCI Express Port 1 – 2940
58900000-58903FFF	Microsoft UAA Bus Driver for High Definition Audio

Memory address	System function
58904000-589047FF	Intel ICM9M-E/M SATA AHCI Controller
58904800-58904BFF	Intel ICH9 Family USB2 Enhanced Host Controller – 293A
58904C00-58904FFF	Intel ICH9 Family USB2 Enhanced Host Controller – 293C
E0000000-EFFFFFFF	Motherboard resources
F0000000-FEDFFFFF	PCI Bus
FEC00000-FEC00FFF	Motherboard resources
FED00000-FED003FF	High Precision Event Timer
FED10000-FED13FFF	Motherboard resources
FED18000-FED18FFF	Motherboard resources
FED19000-FED19FFF	Motherboard resources
FED1C000-FED1FFFF	Motherboard resources
FED20000-FED3FFFF	Motherboard resources
FED40000-FED44FFF	Motherboard resources
FED45000-FED8FFFF	Motherboard resources
FEE01000-FFFFFFFF	PCI Bus
FF000000-FFFFFFFF	Intel 82802 Firmware Hub Device

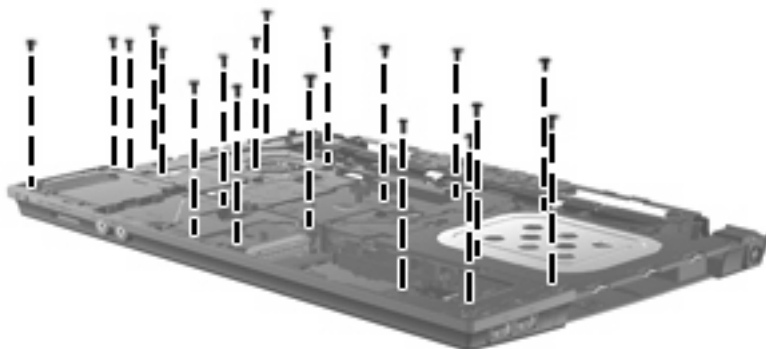
## 7 Screw listing

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

### Torx T8M2.5×6.0 screw

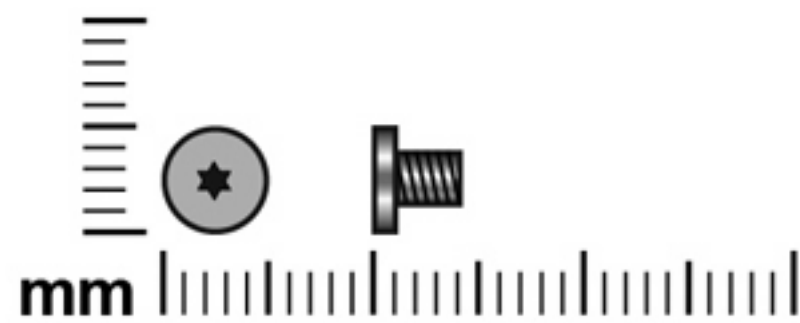


Color	Quantity	Length	Thread	Head diameter
Silver	19	6.0 mm	2.5 mm	5.0 mm



**Where used:** 19 screws that secure the top cover to computers equipped with 15-in displays

# Torx T8M2.5×4.0 screw




Color	Quantity	Length	Thread	Head diameter
Silver	2	4.0 mm	2.5 mm	5.0 mm



**Where used:** 2 screws that secure the top cover to computers equipped with 15-in displays



# Phillips PM2.0×2.0 screw



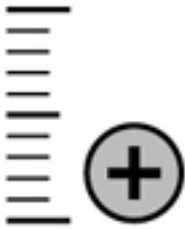


Color	Quantity	Length	Thread	Head diameter
Black	3	2.0 mm	2.0 mm	5.0 mm



**Where used:** 3 screws that secure the top cover to the computer

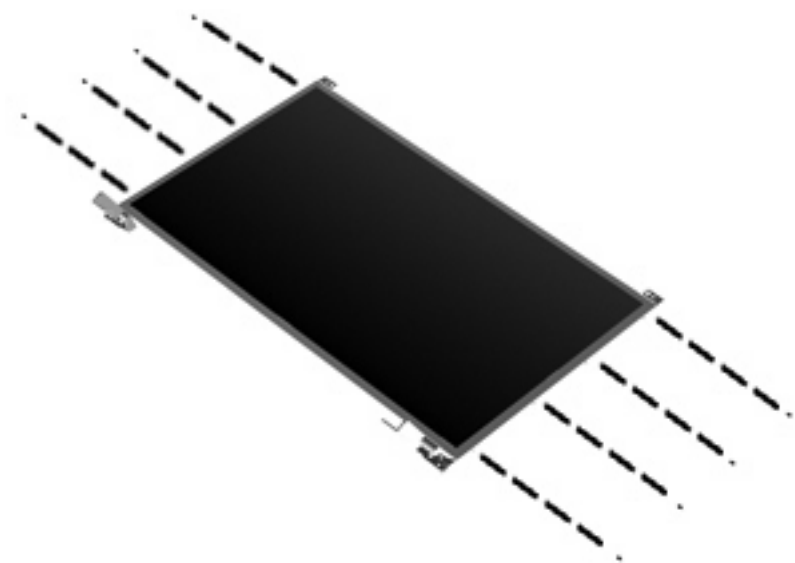
# Phillips PM2.0×3.0 screw



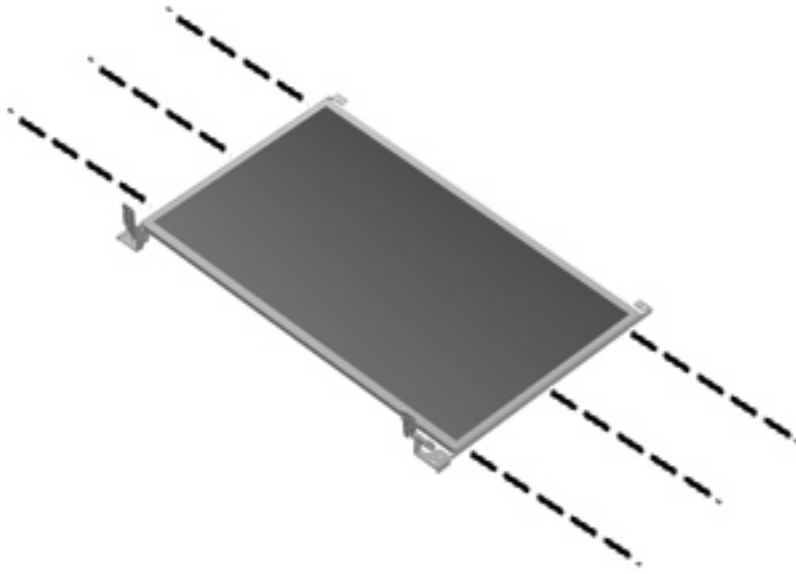
Color	Quantity	Length	Thread	Head diameter
Silver	19	3.0 mm	2.0 mm	5.0 mm



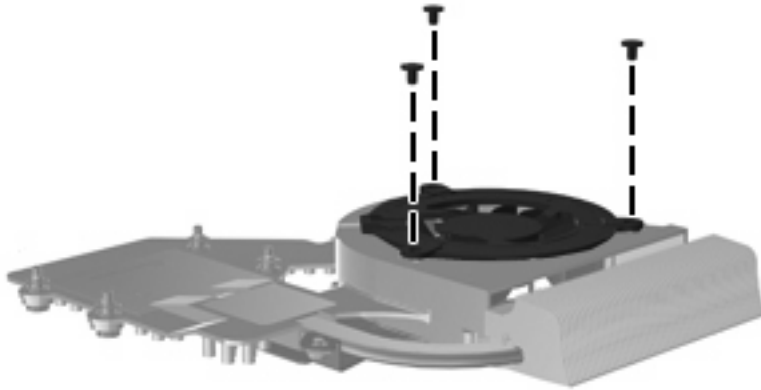
**Where used:** 2 screws that secure the optical drive bracket to the optical drive



**Where used:** 8 screws that secure the display hinges to the 15-in display assembly

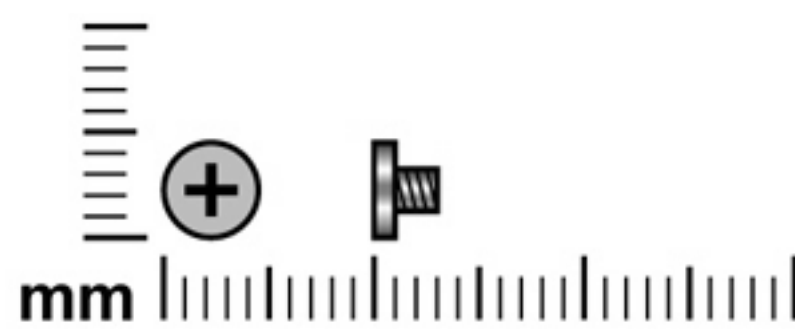


**Where used:** 6 screws that secure the display hinges to the 14-in display assembly



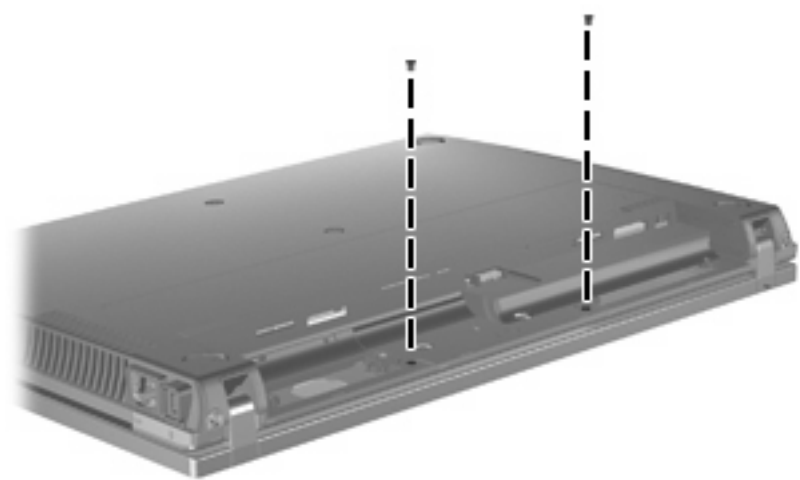
**Where used:** 3 screws that secure the fan to the heat sink

# Phillips PM2.0×3.0 screw



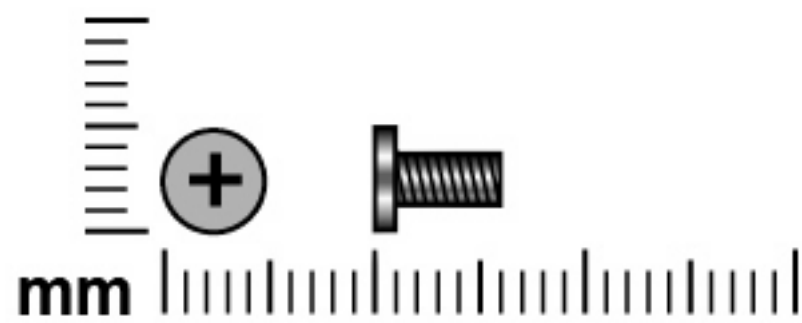
The diagram shows a Phillips PM2.0 screw and a millimeter scale. The scale has markings for millimeters, with a 'mm' label. The screw is shown in profile and from the top, highlighting the Phillips cross-head. The table below provides the specifications for this screw.

Color	Quantity	Length	Thread	Head diameter
Black	2	3.0 mm	2.0 mm	5.0 mm

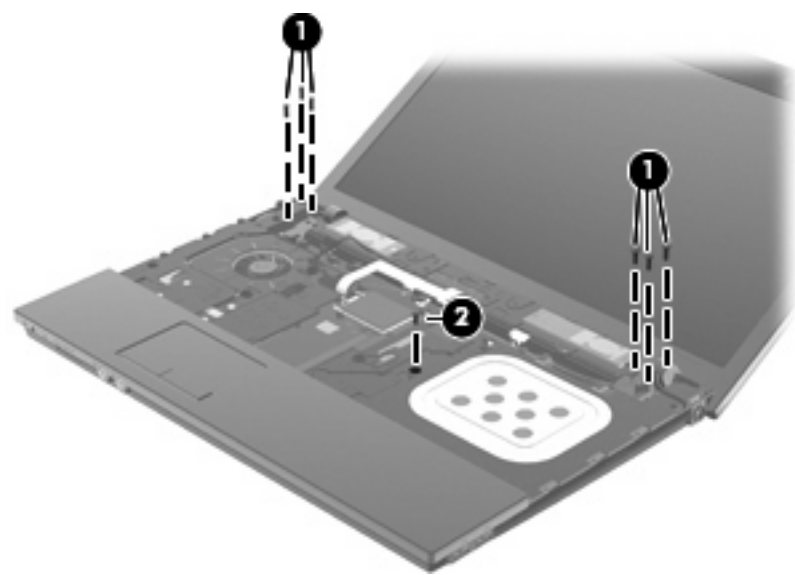


**Where used:** 2 screws that secure the switch cover to computers with 14-in displays

# Phillips PM2.5×6.0 screw

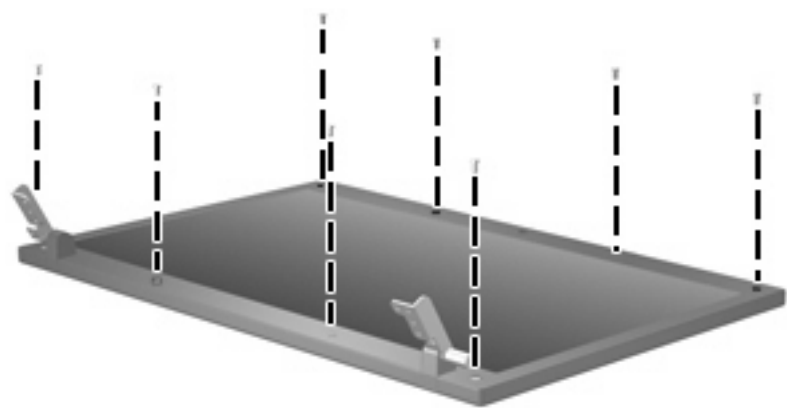


Color	Quantity	Length	Thread	Head diameter
Black	15 (15-in models) or 30 (14-in models)	6.0 mm	2.5 mm	5.0 mm

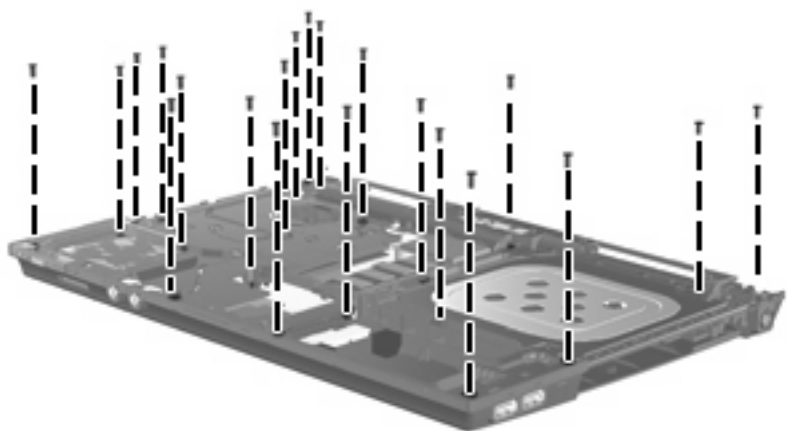


## Where used:

- (1) Six screws that secure the 15-in display to the computer
- (2) One screw that secures the optical drive to the computer

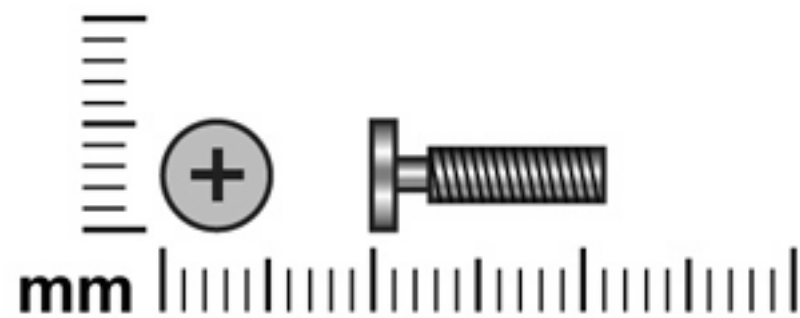


**Where used:** 8 screws that secure the display bezel to the display enclosure

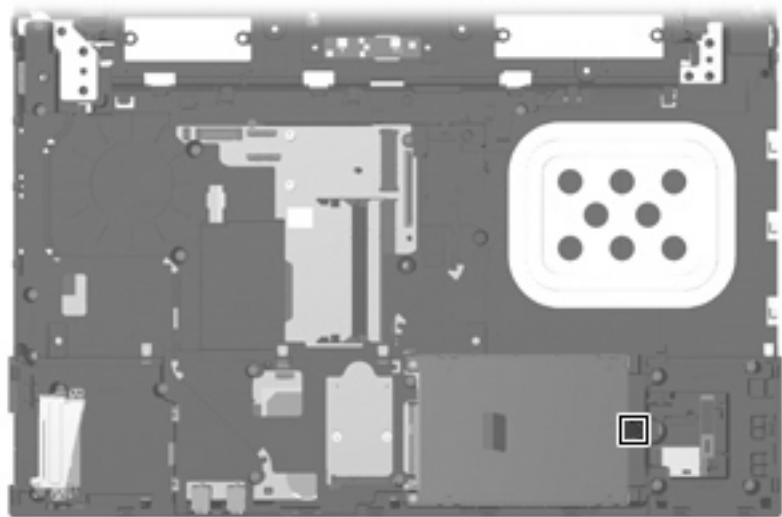


**Where used:** 21 screws that secure the top cover to the base enclosure on computers with 14-in displays

Phillips PM2.5×11.0 captive screw

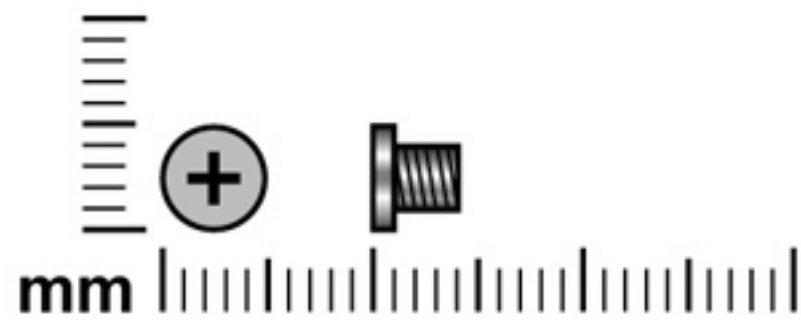


Color	Quantity	Length	Thread	Head diameter
Black	1	11.0 mm	2.5 mm	5.0 mm



**Where used:** One captive screw (secured by a C-clip) that secures the hard drive to the computer

# Phillips PM3.0×4.0 screw


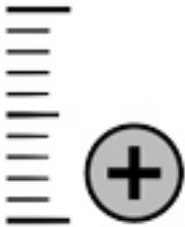


Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	3.0 mm	5.0 mm

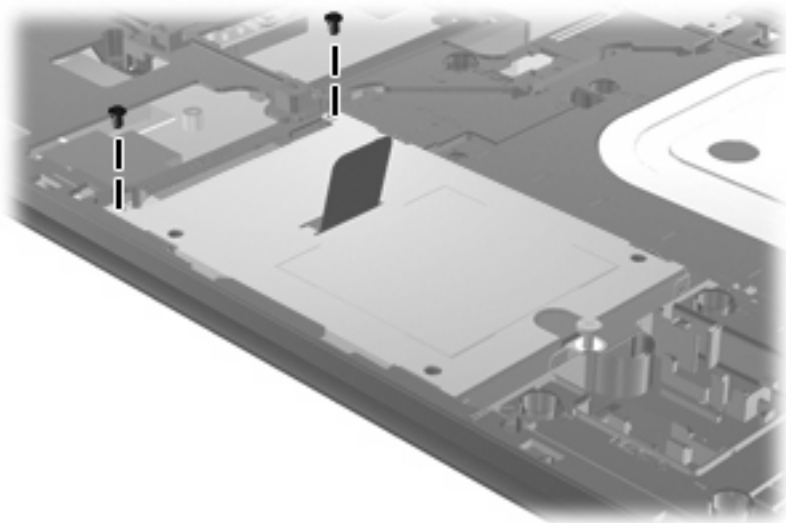


**Where used:** 4 screws that secure the hard drive bracket to the hard drive

# Phillips PM2.0×4.0 screw



mm				
Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	2.0 mm	5.0 mm



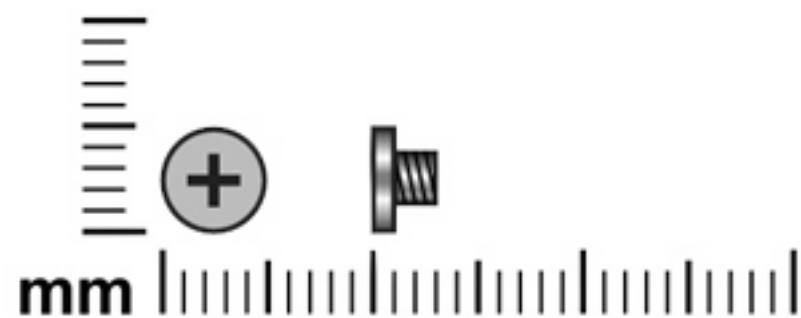
**Where used:** 2 screws that secure the hard drive to the computer



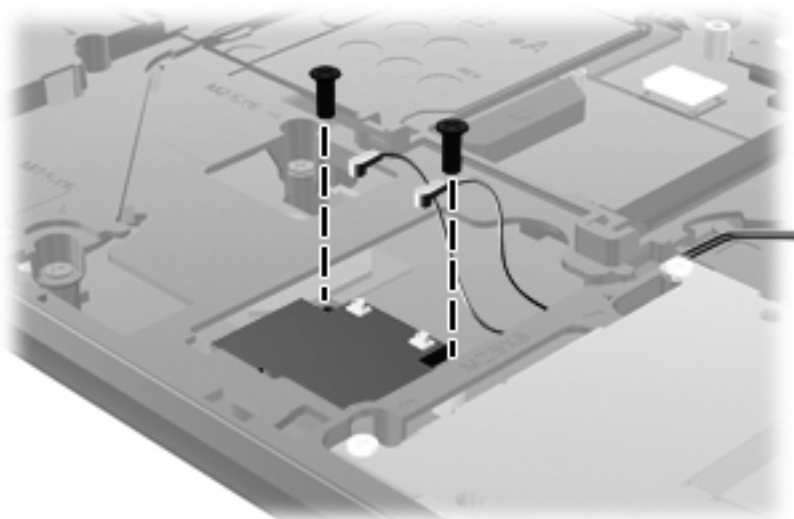
**Where used:** 2 screws that secure the top cover to the computer



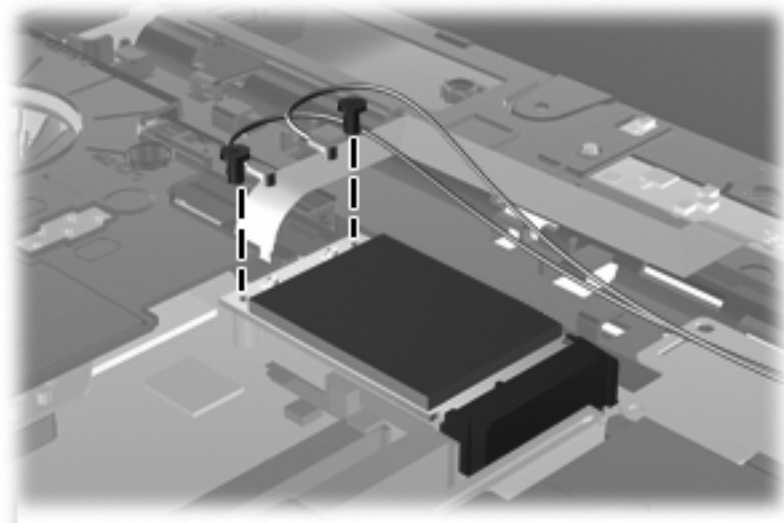
# Phillips PM2.5×3.0 screw



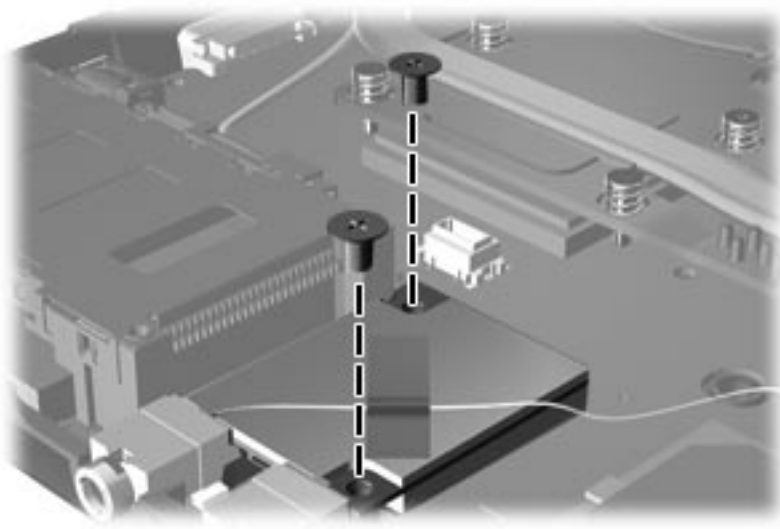
Color	Quantity	Length	Thread	Head diameter
Black	17 (15-in models) or 18 (14-in models)	3.0 mm	2.5 mm	5.0 mm



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



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



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



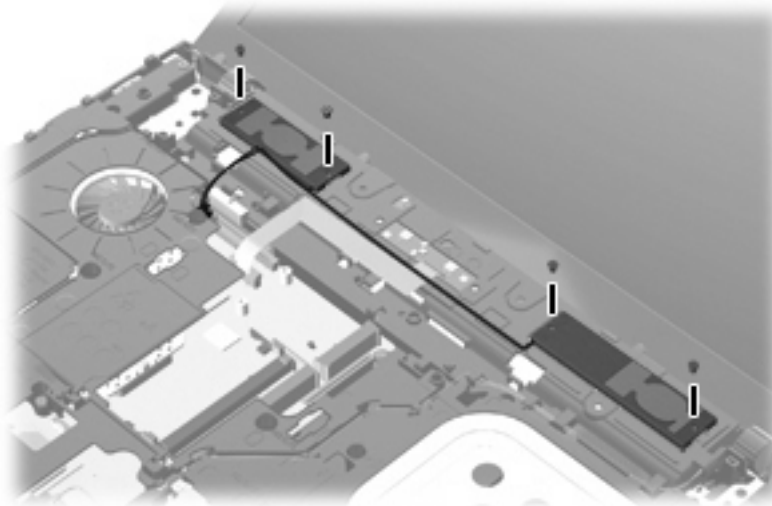
**Where used:** 2 screws that secure the switch cover to the computer



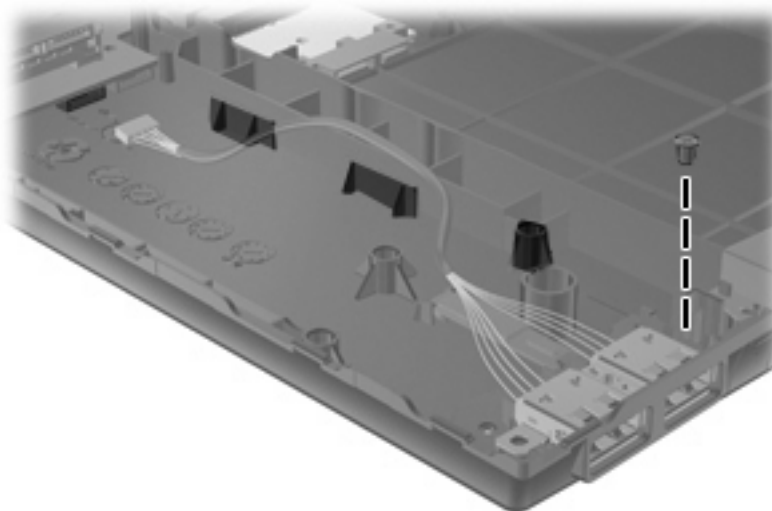
**Where used:** 2 screws that secure the keyboard to computers with 15-in displays



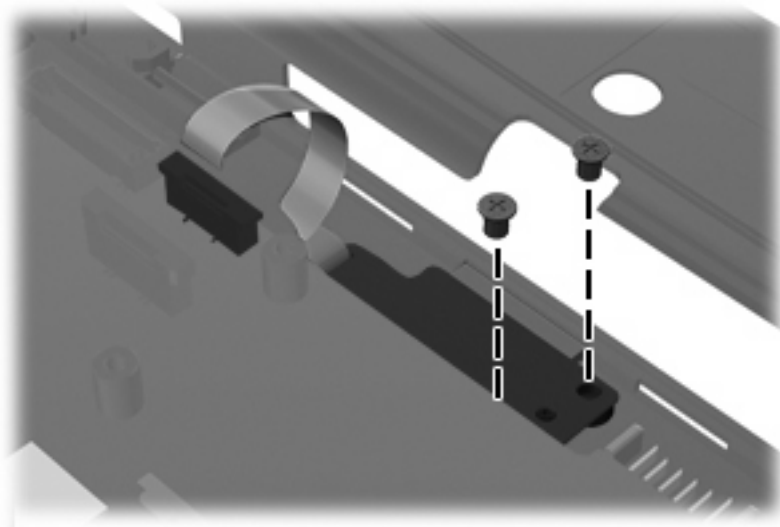
**Where used:** 3 screws that secure the keyboard to computers with 14-in displays



**Where used:** 4 screws that secure the speakers to the computer

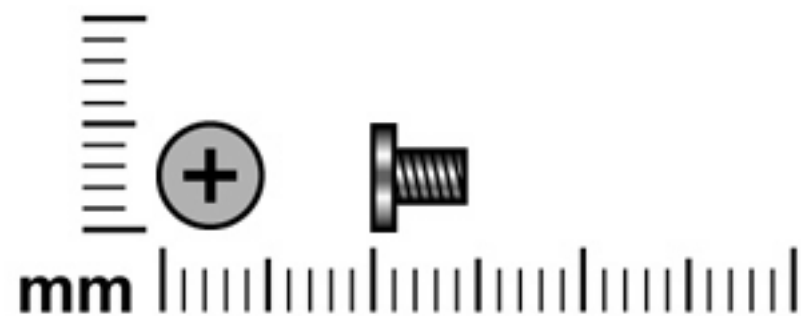


**Where used:** One screw that secures the USB connector assembly to the computer

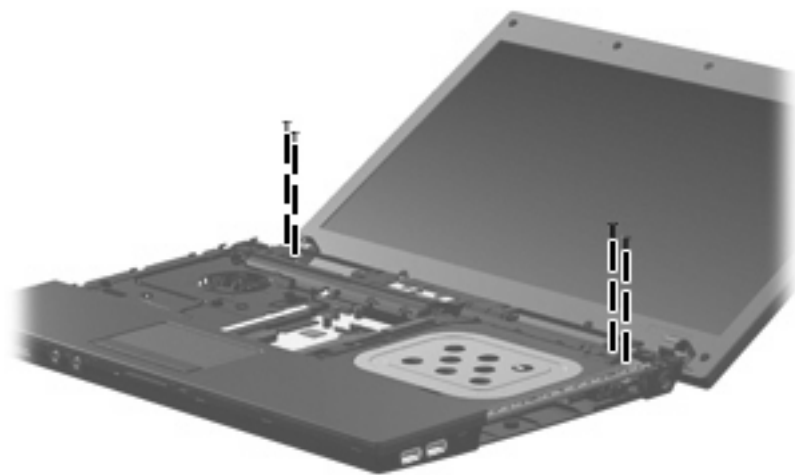


**Where used:** 2 screws that secure the SIM to the computer

# Phillips PM2.5×4.5 screw



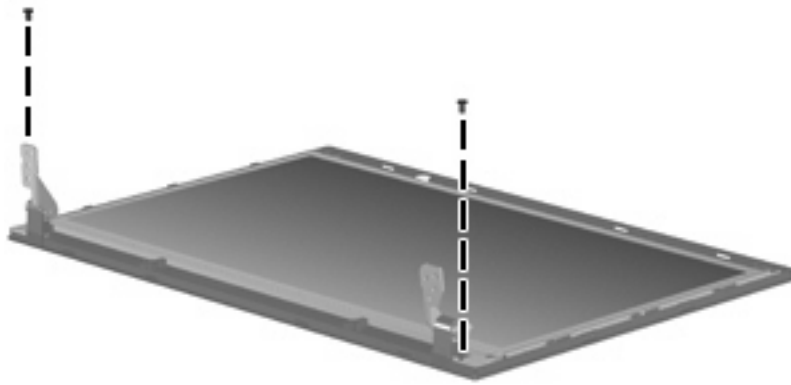
Color	Quantity	Length	Thread	Head diameter
Black	4 (15-in models) or 7 (14-in models)	4.5 mm	2.5 mm	5.0 mm



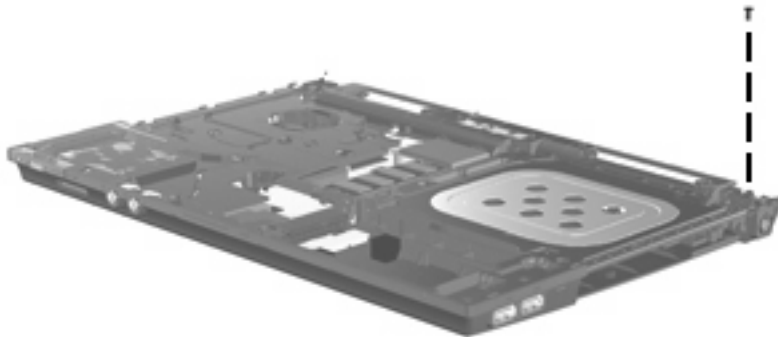
**Where used:** 4 screws that secure the display assembly to computers with 14-in displays



**Where used:** 4 screws that secure the display panel to the 15-in display enclosure

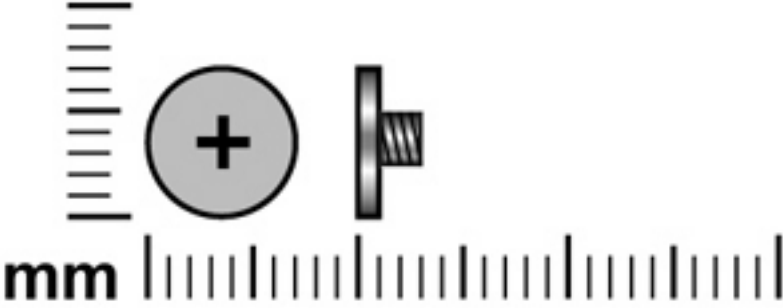


**Where used:** 2 screws that secure the display bezel to the 14-in display enclosure



**Where used:** One screw in the right rear that secures the top cover to computers with 14-in displays

# Phillips PM2.5×3.0 broadhead screw



mm

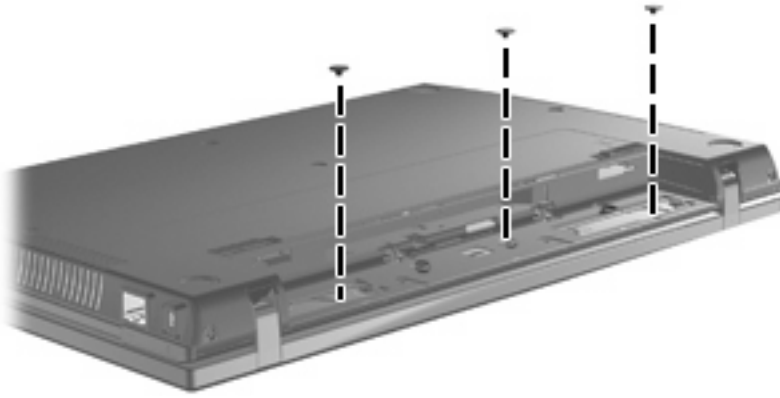
Color	Quantity	Length	Thread	Head diameter
Black	9 (15-in models) or 5 (14-in models)	3.0 mm	2.5 mm	7.0 mm



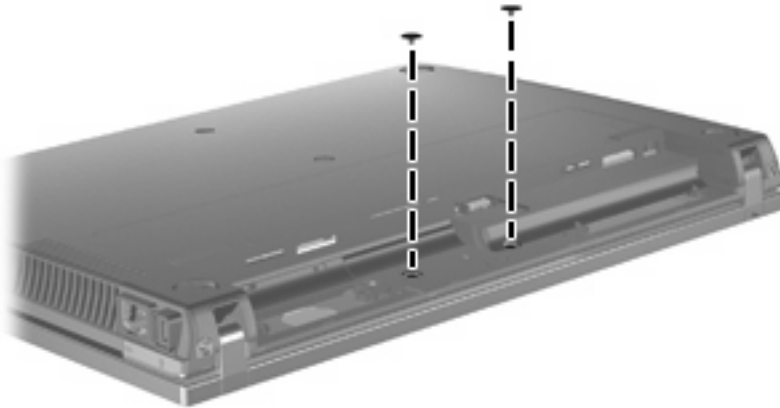
**Where used:** 2 screws that secure the system board to computers with 15-in displays



**Where used:** 3 screws that secure the system board to computers with 14-in displays



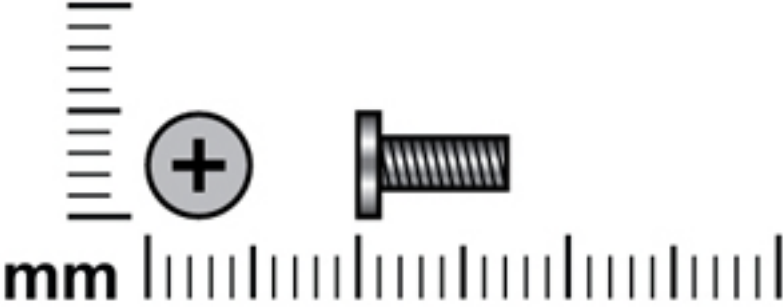
**Where used:** 5 screws that secure the switch cover to computers with 15-in displays

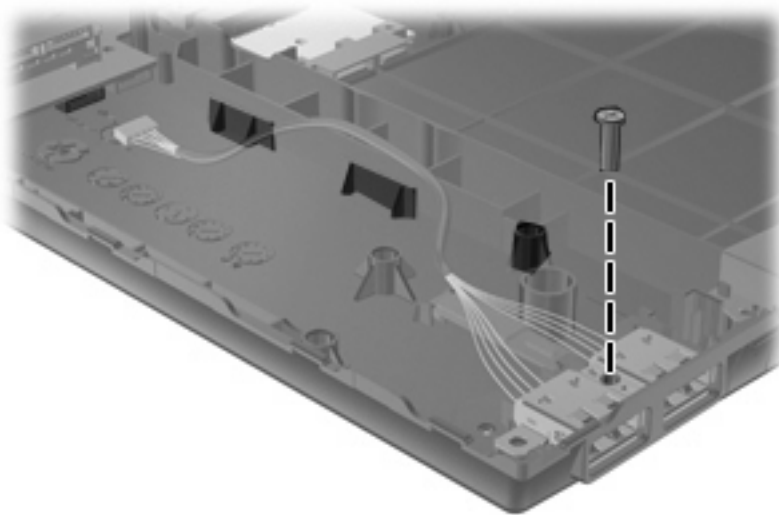


**Where used:** 2 screws that secure the switch cover and power button board to the computer



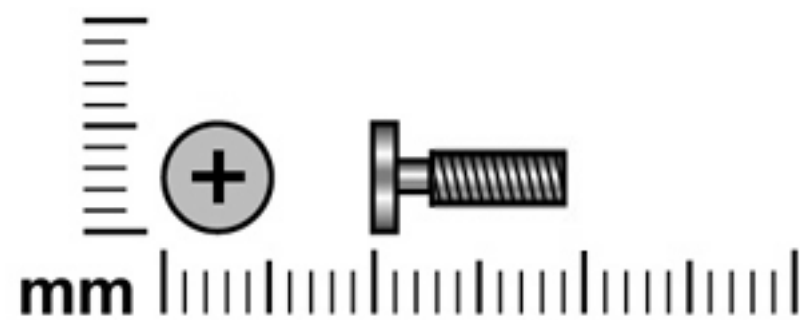
Phillips PM2.5×7.0 screw

				
Color	Quantity	Length	Thread	Head diameter
Black	1	7.0 mm	2.5 mm	5.0 mm

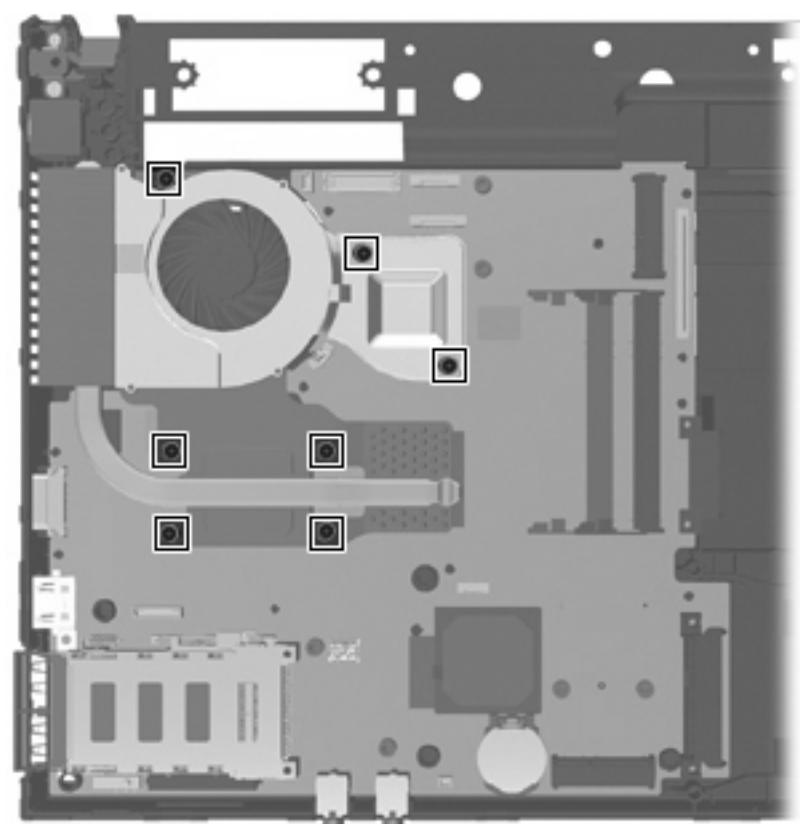


**Where used:** One screw that secures the USB connector assembly to the computer

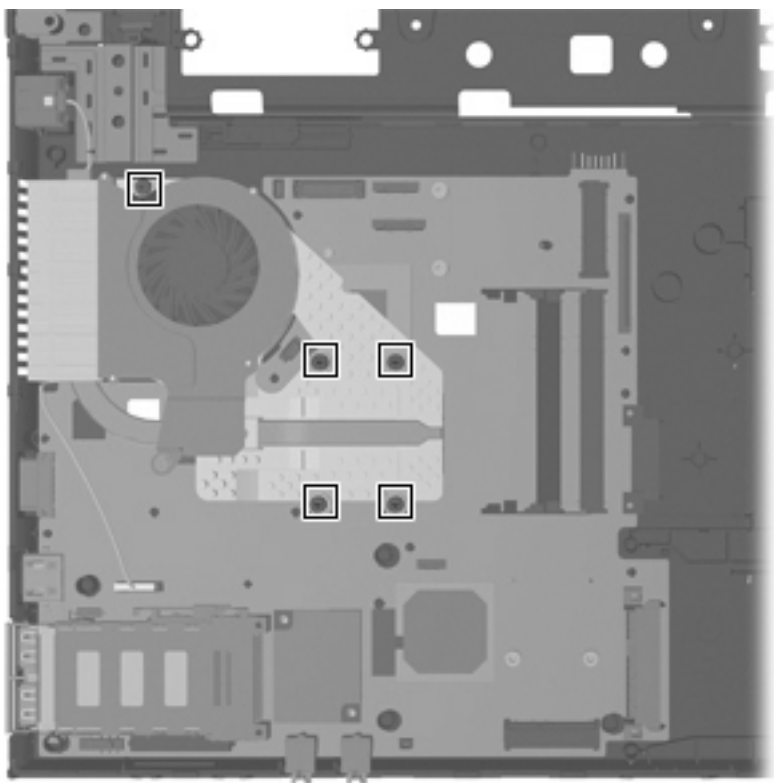
# Phillips PM2.5×9.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Silver	7 (discrete) or 5 (UMA)	9.0 mm	2.5 mm	5.0 mm



**Where used:** 7 screws that secure the heat sink to the system board for computers with discrete memory



**Where used:** 5 screws that secure the heat sink to the system board for computers with UMA memory

---

## 8 Backup and recovery

### Backup and recovery in Windows Vista


#### Overview

To protect your information, use the Backup and Restore Center to back up individual files and folders, back up your entire hard drive (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

The Backup and Restore Center provides the following options:

- Backing up individual files and folders
- Backing up the entire hard drive (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools

---

 **NOTE:** For detailed instructions, perform a search for these topics in Help and Support.

**NOTE:** In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

---

#### Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup 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.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear 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 create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:

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**.

The screen image is added to the document.


4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

 **NOTE:** DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.


- When backing up to discs, number each disc before inserting it into the optical drive of the computer.

To create a backup using Backup and Restore Center, follow these steps:

 **NOTE:** Be sure that the computer is connected to AC power before you start the backup process.

**NOTE:** The backup process may take over an hour, depending on file size and the speed of the computer.


1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to back up your entire computer (select models only) or your files.

 **NOTE:** Windows® includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

## Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:


- Windows recovery tools: You can use the Backup and Restore Center to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- **f11** recovery tools: You can use the **f11** recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

 **NOTE:** If you are unable to boot (start up) your computer, you must purchase a Windows Vista® operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

## Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Click **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.

 **NOTE:** Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.


---

To recover your information using Startup Repair, follow these steps:

△ **CAUTION:** Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.


---

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition. To find the partitions, select **Start > Computer**.

 **NOTE:** If the Windows partition and the HP Recovery partition have been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

---

3. Restart the computer, and then press **f8** before the Windows operating system loads.
4. Select **Repair your computer**.
5. Follow the on-screen instructions.

 **NOTE:** For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

---


## Using f11

△ **CAUTION:** Using **f11** completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

---

To recover the original hard drive image using **f11**, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition. To find the partition, select **Start > Computer**.

 **NOTE:** If the HP Recovery partition has been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

---

3. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

4. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

## Using a Windows Vista operating system DVD (purchased separately)

If you are unable to boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows Vista operating system DVD, go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.


---

△ **CAUTION:** Using a Windows Vista operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

---

To initiate recovery using a Windows Vista operating system DVD, follow these steps:

---

 **NOTE:** This process takes several minutes.

---

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows Vista operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

# Backup and recovery in Windows XP


## Overview

To protect your information, use the Windows® Backup utility (select models only) to back up files and folders or create recovery points. In case of system failure, you can use the backup files to restore your computer.

Windows provides the following options:

- Backing up individual files and folders
- Backing up all files and folders
- Scheduling automatic backups
- Creating recovery points
- Recovering information

---

 **NOTE:** For detailed instructions, perform a search for these topics in Help and Support.

**NOTE:** In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

---

## Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup 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.

You can back up individual files or folders to an optional external hard drive or to a network drive.

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.
- Back up templates stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.


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

- a. Display the screen you want to save.
- b. Copy the screen image:  
To copy only the active window, press **alt+fn+prt sc**.  
To copy the entire screen, press **fn+prt sc**.
- c. Open a word-processing document, click **Edit > Paste**.  
The screen image is added to the document.
- d. Save the document.

To create a backup using the Windows Backup utility (select models only), follow these steps:



---

 **NOTE:** Be sure that the computer is connected to AC power before you start the backup process.

**NOTE:** The backup process may take over an hour, depending on file size and the speed of the computer.

---

1. Click **Start > All Programs > Accessories > System Tools > Backup**.
2. Follow the on-screen instructions.

## Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:


- Windows recovery tools (select models only): You can use the Windows Backup utility to recover information you have previously backed up.
- *Operating System* and *Driver Recovery* discs (included with your computer): You can use the discs to recover your operating system and programs installed at the factory.

## Recovering your information

To recover information you previously backed up, follow these steps:

1. If possible, back up all personal files.
2. Click **Start > All Programs > Accessories > System Tools > Backup**.  
The Backup or Restore Wizard opens.
3. Click **Restore files and settings**, and then click **Next**.
4. Follow the on-screen instructions.

---

 **NOTE:** For additional information on initiating a recovery in Windows, perform a search for this topic in Help and Support.

---

## Recovering the operating system and programs

△ **CAUTION:** The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled.

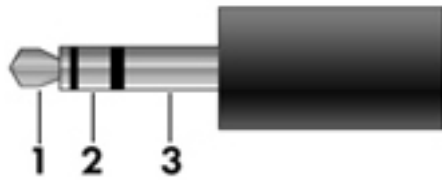
---

To recover your operating system and programs, follow these steps:

1. If possible, back up all personal files.
2. Insert the *Operating System* disc into the optical drive.
3. Shut down the computer.
4. Turn on the computer.
5. Follow the on-screen instructions to install the operating system.
6. After the operating system is installed, remove the *Operating System* disc and insert the *Driver Recovery* disc.
7. Follow the on-screen instructions to install the drivers and programs.

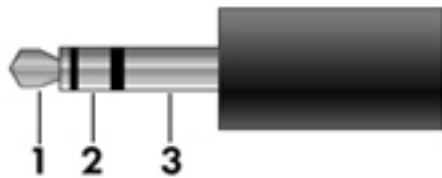
## 9 Connector pin assignments

### Audio-in (microphone)



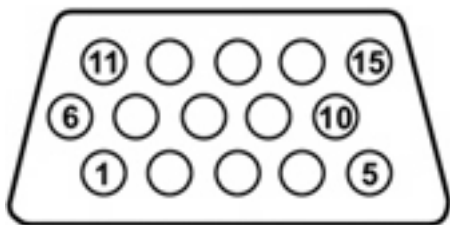
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

### Audio-out (headphone)



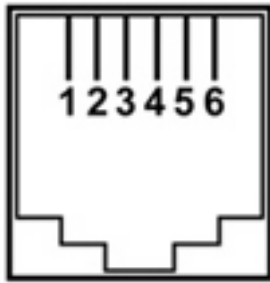
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

# External monitor



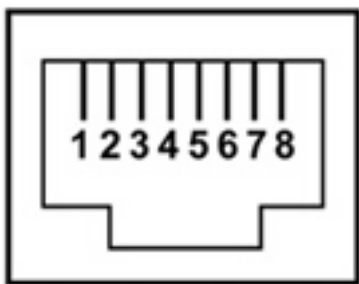
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

## RJ-11 (modem)



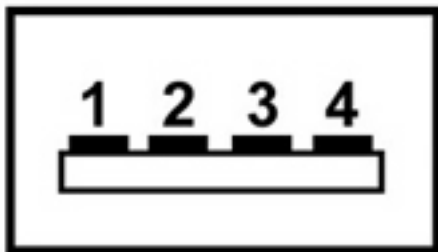
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

# RJ-45 (network)



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

# 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 and regions must meet the requirements of the country or region where the computer is used.

### Requirements for all countries and regions

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

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

## Requirements for specific countries and regions

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-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. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.
  - ⚠ **CAUTION:** The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.
  - 📝 **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)**.

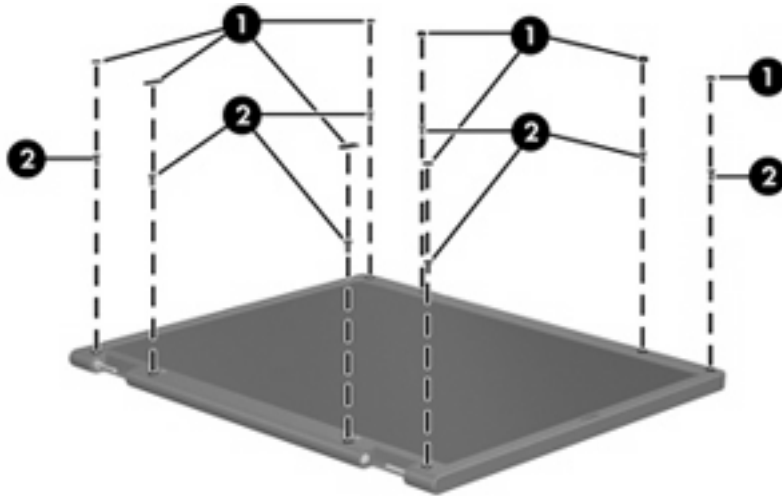


- 
- 📝 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

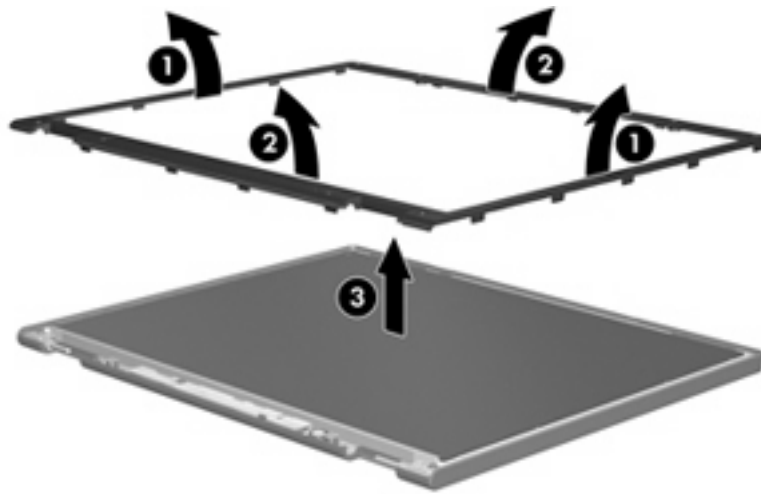


Perform the following steps to disassemble the display assembly:

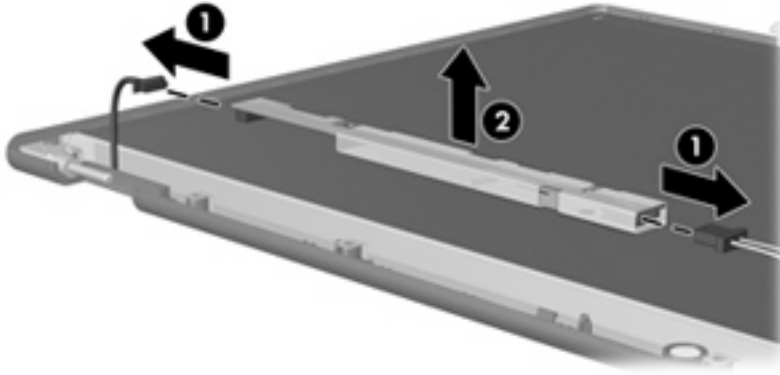
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



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).

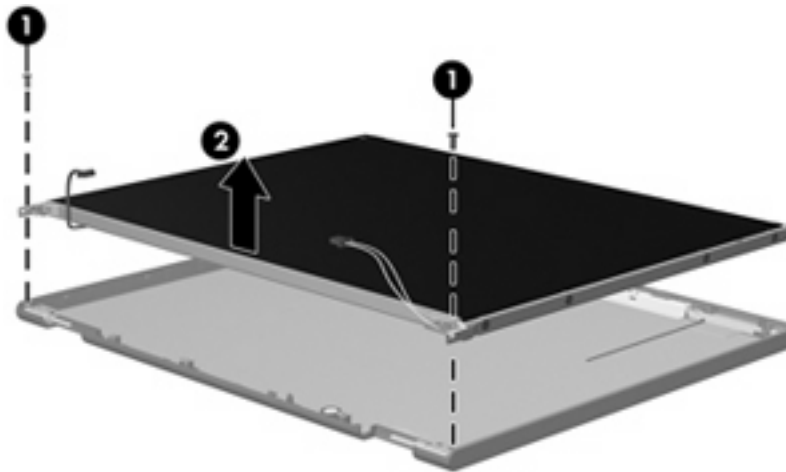


4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



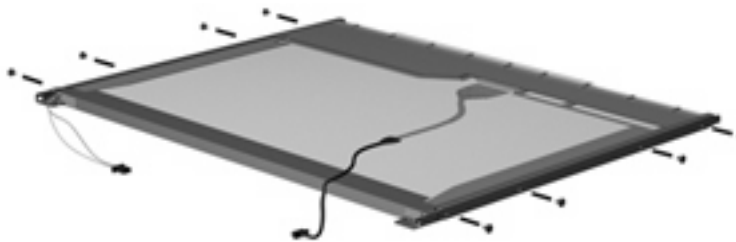
5. Remove all screws (1) that secure the display panel assembly to the display enclosure.

6. Remove the display panel assembly (2) from the display enclosure.



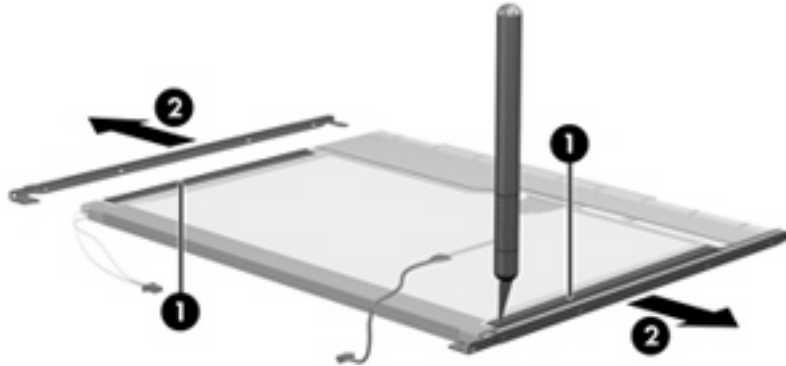
7. Turn the display panel assembly upside-down.

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



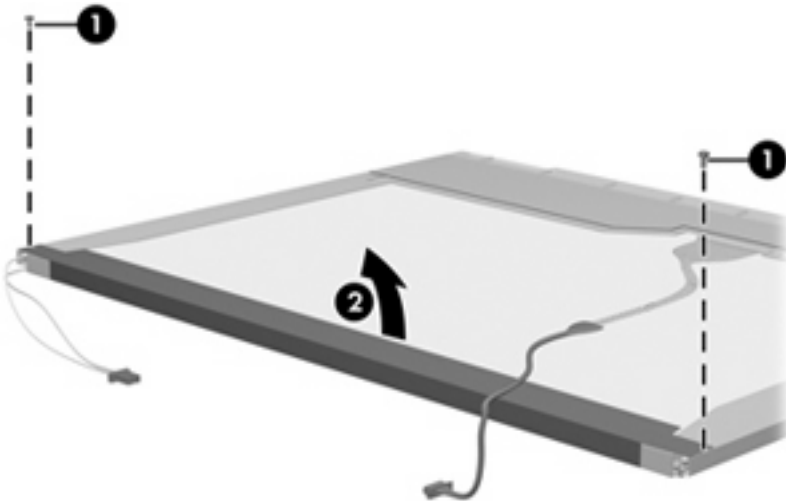
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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.

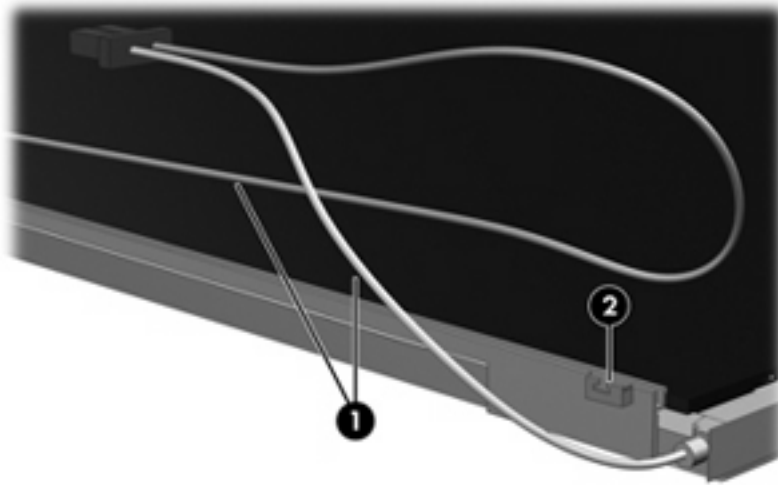
12. Lift the top edge of the backlight cover (2) and swing it outward.



13. Remove the backlight cover.

14. Turn the display panel right-side up.

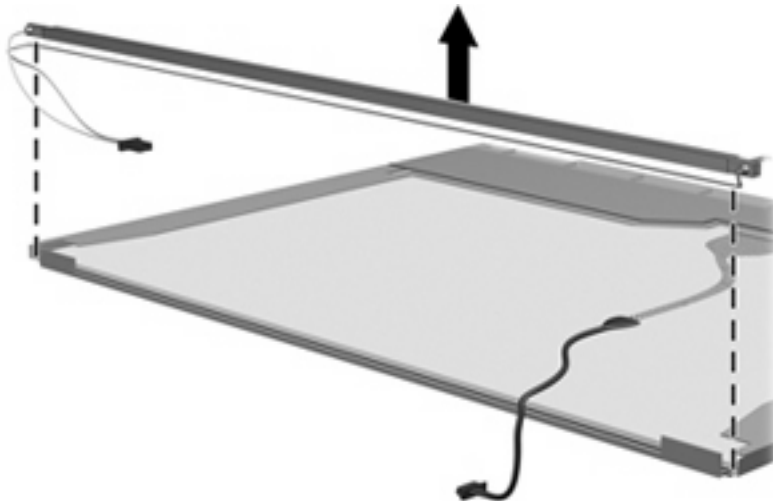
15. Remove the backlight cables (1) from the clip (2) in the display panel.



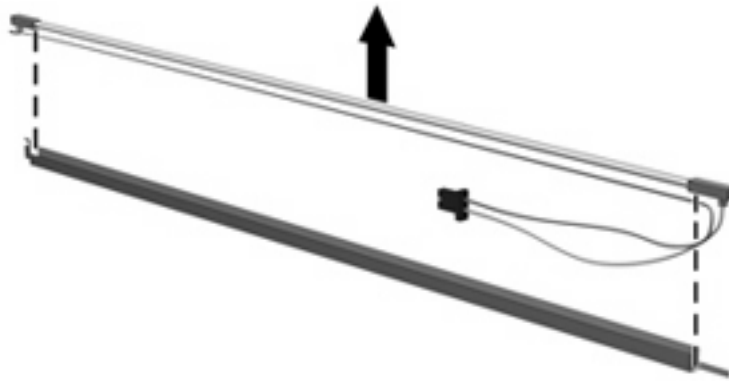
16. Turn the display panel upside-down.

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

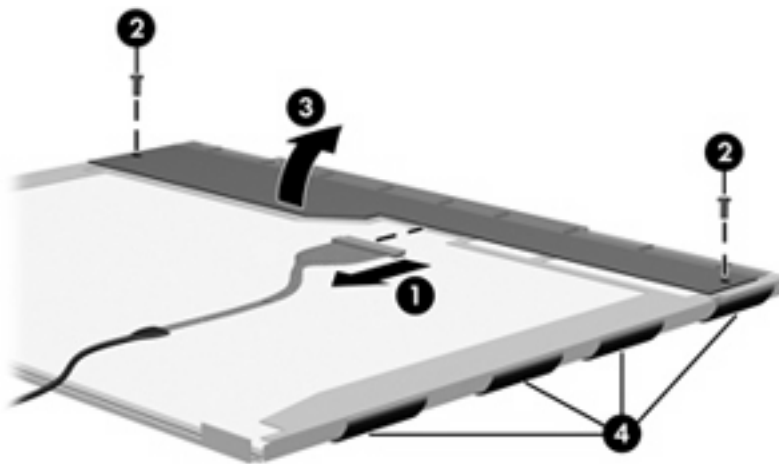
17. Remove the backlight frame from the display panel.



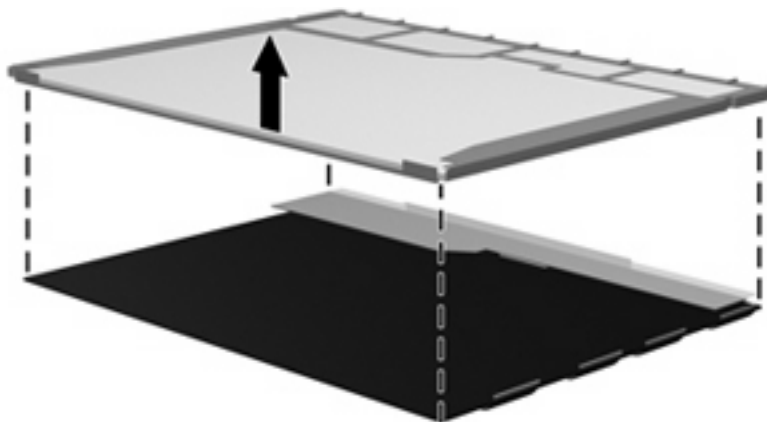
18. Remove the backlight from the backlight frame.



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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

---

# Index

- A**
- AC adapter
    - identifying 20, 32
    - spare part numbers 45, 46, 47
  - antenna, disconnecting 70, 77
  - applications key, Windows 14, 15
  - audio, product description 4
  - audio-in (microphone) jack
    - identifying 16, 27
    - pin assignments 166
  - audio-out (headphone) jack
    - identifying 16, 27
    - pin assignments 166
- B**
- backing up
    - Windows Vista 160
    - Windows XP 164
  - Backup and Restore Center 160, 161
  - base enclosure, spare part number 39, 48
  - battery
    - identifying 32, 60
    - removal 60
    - spare part number 39, 48, 50, 60
  - battery bay 19, 30
  - battery light, identifying 17, 28
  - battery release latches, identifying 19, 30
  - bezel, spare part numbers 49
  - BIOS administrator password 113
  - Blu-ray ROM DVD+/-RW SuperMulti DL Drive
    - spare part number 39, 48, 66
    - specifications 128
  - Bluetooth cable, illustrated 43
  - Bluetooth module
    - removal iii
    - spare part number 46, 50, iii
  - boot options 115, 121
  - boot order 115, 121
  - built-in device
    - Bluetooth device radio 116
    - embedded WLAN 116
    - integrated camera 116
    - LAN/WLAN switching 116
    - microphone 116
    - modem 116
    - Network Interface Controller (LAN) 116
    - optical disc drive 116
    - options 116
    - Wake on LAN 116
    - wireless button 116
    - WWAN device radio 116
  - buttons
    - Info Center 13, 24
    - power 13, 24
    - QuickLook 13, 24
    - TouchPad 11, 22
    - wireless 16
- C**
- Cable Kit
    - contents 43
    - spare part number 43, 49, 50
  - cables, service considerations 54
  - caps lock light, identifying 12, 23
  - chipset, product description 2
  - components
    - additional hardware 20, 32
    - bottom 19, 30
    - display 10, 21
    - front 16, 27
    - left-side 18, 29
    - right-side 17, 28
    - top 11, 22
    - wireless antennas 19, 31
  - computer feet
    - locations 59
    - spare part number 59
  - Computer Setup
    - accessing 110, 117
    - Diagnostics menu 114, 120
    - File menu 112, 119
    - navigating and selecting 110, 118
    - restoring factory settings 111, 118
    - Security menu 113, 120
    - System Configuration menu 115, 121
    - using 110, 118
  - computer specifications 123
  - connector, power 17, 28
  - connectors, service
    - considerations 54
  - cord, power 20, 32
- D**
- device configurations 115
  - Diagnostics menu 114, 120
  - discs
    - Driver Recovery 165
    - Operating System 165
  - Disk Sanitizer 113
  - diskette drive
    - precautions 54
    - product description 4

- display assembly
  - removal 78, iii
  - spare part numbers 34, 35, 50, 51, 78, iii
- display bezel
  - removal 80, 92
  - spare part number 40, 49, 80, 93
- Display Cable Kit, spare part number 41, 49
- display cable, spare part number 49
- display component recycling 172
- display enclosure
  - spare part numbers 49
- display enclosure, spare part number 41, 50
- Display Hinge Kit, spare part number 40, 48, 82, 94
- display panel
  - removal 81, 94
  - spare part numbers 51
- display specifications 124, 125
- drive light, identifying 16, 27
- DriveLock
  - automatic 113
  - password 113
- Driver Recovery disc 165
- drives
  - boot order 115, 121
  - optical 17, 28
  - preventing damage 54
- Dual-Core CPU 115
- DVD drives
  - spare part numbers 39, 44, 48, 66
  - specifications 129
- DVD±RW Double-Layer Drive with LightScribe
  - precautions 54
  - removal 48
  - spare part number 39, 44, 48, 66
  - specifications 127

## E

- electrostatic discharge 55
- error log 114
- esc key, identifying 14, 15, 25, 26

- Ethernet, product description 4
- Execution Disable 115
- ExpressCard slot bezel, illustrated 42
- ExpressCard slot, identifying 18, 29
- external media cards, product description 5
- external monitor port
  - identifying 18, 29
  - pin assignments 167

## F

- f11 recovery 162
- fan
  - removal 103
  - spare part number 36, 47, 100
- feet
  - locations 59
  - spare part number 59
- File menu 112, 119
- fn key, identifying 14, 15, 25, 26
- function keys, identifying 14, 15, 25, 26

## G

- graphics, product description 2
- grounding equipment and methods 57

## H

- hard disk test 114
- hard drive
  - precautions 54
  - product description 3
  - removal iii
  - spare part numbers 39, 44, 48, 50, 51, iii
  - specifications 126
- hard drive bracket, removal 75
- hard drive recovery 162
- headphone (audio-out) jack
  - identifying 16, 27
  - pin assignments 166
- heat sink
  - removal 100
  - spare part number 36, 48, 100
- hinge, spare part number 82, 94

- HP QuickLook 2 115
- HP SpareKey enrollment 113

## I

- I/O address specifications
  - Windows Vista 132
  - Windows XP 134
- identifying 20
- Info Center/QuickLook button, identifying 13, 24
- Info Center/QuickLook light, identifying 12, 23
- internal display switch, identifying 10, 13, 21, 24
- internal microphone, identifying 10, 21
- interrupt specifications
  - Windows Vista 130
  - Windows XP 131

## J

- jacks
  - audio-in (microphone) 16, 27
  - audio-out (headphone) 16, 27
  - RJ-11 (modem) 17, 28
  - RJ-45 (network) 18, 29

## K

- keyboard
  - product description 6
  - removal iii
  - spare part number 35, 48, 49, 50, iii
- keypad keys, identifying 14, 15, 25, 26
- keys
  - esc 14, 15, 25, 26
  - fn 14, 15, 25, 26
  - function 14, 15, 25, 26
  - keypad 14, 15, 25, 26
  - Windows applications 14, 15
  - Windows logo 14, 15

## L

- language, changing in Computer Setup 115
- latches, battery release 19, 30
- legacy support, USB 110, 115, 117, 121

lights  
  battery 17, 28  
  caps lock 12, 23  
  drive 16, 27  
  Info 12  
  Info Center/QuickLook 23  
  optical drive 17, 28  
  power 12, 23  
  QuickLook 12  
  QuickLook/Info Center 23  
  webcam 10, 21  
  wireless 16, 27

## M

mass storage devices, spare part numbers iii  
Media Card Reader, identifying 16, 27  
memory map specifications  
  Windows Vista 136  
  Windows XP 137  
memory module  
  product description 3  
  removal 65  
  spare part numbers 38, 48, 65  
microphone (audio-in) jack  
  identifying 16, 27  
  pin assignments 166  
model name 1  
modem jack, pin assignments 168  
modem module  
  product description 4  
  removal 97  
  spare part number 36, 47, 97  
monitor port  
  external 18, 29  
  pin assignments 167

## N

network jack, pin assignments 169

## O

operating system disc 165  
operating system, product description 6  
optical drive  
  identifying 17, 28

precautions 54  
product description 4  
removal 66  
spare part number 39, 44, 66  
specifications 127, 128, 129  
optical drive bezel, illustrated 42  
optical drive connector  
  removing 108  
  spare part number 37, 108  
  spare part numbers 48  
optical drive light, identifying 17, 28

## P

packing guidelines 56  
palm rest  
  removal 71  
  spare part numbers 35, 48, 51, 71  
panels, product description 2  
passwords 113, 120  
pin assignments 166  
  audio-in jack 166  
  external monitor port 167  
  headphone jack 166  
  microphone jack 166  
  modem jack 168  
  monitor port 167  
  network jack 169  
  RJ-11 168  
  RJ-45 jack 169  
  USB port 169  
plastic parts 53  
Plastics Kit  
  contents 42  
  spare part number 42, 47  
pointing devices, product description 6  
port options  
  ExpressCard slot 116  
  flash media reader 116  
  USB port 116  
ports  
  external monitor 18, 29  
  HDMI 18, 29  
  product description 5  
  USB 17, 18, 28, 29

power button board  
  illustrated 43  
  removal 88  
  spare part number 39, 51, 88  
power button, identifying 13, 24  
power cable, illustrated 43  
power connector, identifying 17, 28  
power cord  
  identifying 20, 32  
  set requirements 170  
  spare part numbers 45, 46  
  spare parts numbers 46  
power light, identifying 12, 23  
power requirements 6  
processor  
  product description 1  
  removal iii  
  spare part number 37, 47, 51, iii, 104  
product description  
  audio 4  
  chipset 2  
  diskette drive 4  
  Ethernet 4  
  external media cards 5  
  graphics 2  
  hard drives 3  
  keyboard 6  
  memory module 3  
  modem module 4  
  operating system 6  
  optical drives 4  
  panels 2  
  pointing devices 6  
  ports 5  
  power requirements 6  
  processors 1  
  product name 1  
  security 6  
  serviceability 9  
  wireless 5  
product name 1

## Q

QuickLook/Info Center button, identifying 13, 24  
QuickLook/Info Center light, identifying 12, 23



## R

- recovery partition 162
- release latches, battery 19, 30
- removal/replacement
  - preliminaries 53
  - procedures 58
- restore security defaults 116
- restore the factory settings 112
- restoring the hard drive 162
- RJ-11 (modem) cable,
  - illustrated 43
- RJ-11 (modem) jack
  - identifying 17, 28
  - pin assignments 168
- RJ-45 (network) cable,
  - illustrated 43
- RJ-45 (network) jack
  - identifying 18, 29
  - pin assignments 169
- RTC battery
  - removal 90
  - spare part number 38, 46, 90
- Rubber Kit, spare part number 39, 47
- run-in test 114

## S

- SATA (Serial Advanced Technology Attachment) devices
  - AHCI (Advanced Host Controller Interface) 115
  - IDE (Integrated Drive Electronics) 115
- Screw Kit
  - contents 139
  - spare part number 45, 48
- screw listing 139
- scroll zone, TouchPad 11, 22
- security cable slot, identifying 18, 29
- Security menu
  - allow reset of HP ProtectTools security keys 113
  - always prompt for HP SpareKey enrollment 113
  - Automatic DriveLock 113
  - change password 113
  - Disk Sanitizer 113
  - DriveLock 113

- HP Sparekey 113
- HP Sparekey enrollment 113
- password policy 113
- set up BIOS administrator password 113
- System IDs 113
- user management 113
- security, product description 6
- service considerations 53
- service tag 33, 58
- serviceability, product description 9
- set security level 116
- setup utility
  - Diagnostics menu 114, 120
  - File menu 112, 119
  - navigating and selecting 110, 118
  - restoring factory settings 111, 118
  - Security menu 113, 120
  - System Configuration menu 115, 121
- SIM
  - removal 108
  - spare part number 39, 50, 108
- slots
  - ExpressCard 18, 29
  - security cable 18, 29
- speakers
  - identifying 13, 24
  - removal 69
  - spare part number 36, 50, 69
- specifications
  - Blu-ray ROM DVD+/-RW SuperMulti DL Drive 128
  - computer 123
  - display 124, 125
  - DVD-ROM Drive 129
  - DVD±RW Double-Layer Drive with LightScribe 127
  - hard drive 126
  - I/O addresses, Windows Vista 132
  - I/O addresses, Windows XP 134
  - interrupts, Windows Vista 130
  - interrupts, Windows XP 131

- memory map, Windows Vista 136
- memory map, Windows XP 137
- optical drive 127, 128, 129
- system DMA 130
- start-up test 114
- static-shielding materials 57
- stringent security 120
- switch cover
  - removal iii
  - spare part number 35, 48, 50, iii
- switch, wireless 27
- system board
  - removal iii
  - spare part number 36, 51, iii
- System Configuration menu 115, 121
- system date and time 112
- System Diagnostics menu 114
- system DMA 130
- system fan 115, 121
- system IDs 113
- system information 112, 119
- system memory map 136, 137

## T

- thermal material,
  - replacement 101, 102
- tools required 53
- top cover
  - removal 84
  - spare part number 36, 48, 84
- TouchPad buttons,
  - identifying 11, 22
- TouchPad cable, illustrated 43
- TouchPad scroll zone,
  - identifying 11, 22
- TouchPad, identifying 11, 22
- transporting guidelines 56

## U

- Unified Extensible Firmware Interface (UEFI) mode 115
- USB cable, illustrated 43
- USB connector assembly
  - removal 98
  - spare part number 98

USB legacy support 110, 115,  
117, 121

USB port

identifying 17, 18, 28, 29  
pin assignments 169

## V

vents, identifying 18, 29

Virtualization Technology 115

## W

webcam

identifying 10, 21  
removing 81, 93  
spare part number 41, 47,  
81, 93

webcam light, identifying 10, 21

Windows applications key,  
identifying 14, 15

Windows Backup utility 164, 165

Windows logo key, identifying 14,  
15

Windows recovery 161, 165

Windows Vista operating system  
DVD 163

wireless antenna,

disconnecting 70, 77

wireless light, identifying 16, 27

wireless switch, identifying 16,  
27

wireless, product description 5

WLAN antennas, identifying 20,  
31

WLAN module

removal 76  
spare part number 37, 46,  
47, 76

workstation guidelines 56

WWAN antennas, identifying 19,  
31

WWAN module

removal iii  
spare part number 39, 46,  
50, iii

