



# HP Pavilion dv7 Notebook PC

Maintenance and Service Guide

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## Safety warning notice

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**⚠ WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device 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 device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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# Table of contents

<b>1 Product description .....</b>	<b>1</b>
<b>2 External component identification .....</b>	<b>10</b>
Top .....	11
Buttons .....	11
Keys .....	12
Lights .....	14
TouchPad .....	15
Display .....	16
Front .....	17
Left side .....	18
Right side .....	19
Bottom .....	20
<b>3 Illustrated parts catalog .....</b>	<b>21</b>
Service tag .....	22
Computer major components .....	23
Display assembly subcomponents .....	30
Mass storage devices .....	31
Miscellaneous parts .....	32
Sequential part number listing .....	33
<b>4 Removal and replacement procedures .....</b>	<b>41</b>
Preliminary replacement requirements .....	41
Tools required .....	41
Service considerations .....	41
Plastic parts .....	41
Cables and connectors .....	41
Drive handling .....	42
Grounding guidelines .....	42
Electrostatic discharge damage .....	42

Packaging and transporting guidelines .....	44
Component replacement procedures .....	46
Service tag .....	46
Computer feet .....	47
Battery .....	47
Optical drive .....	48
Hard drive .....	51
RTC battery .....	54
Memory module .....	55
WLAN module .....	56
Keyboard .....	59
Top cover .....	62
Fingerprint reader board .....	66
Power button board .....	68
Display lid switch board .....	70
SD Card reader board .....	72
Bluetooth module .....	74
USB board .....	76
Front speakers .....	78
Power connector cable .....	80
System board .....	81
Fan/heat sink assembly .....	85
Processor .....	89
Optical drive cable .....	93
Rear speakers .....	94
Subwoofer .....	96
Display assembly .....	97
<b>5 Setup Utility (BIOS) and System Diagnostics .....</b>	<b>105</b>
Using Setup Utility .....	105
Starting Setup Utility .....	105
Changing the language of Setup Utility .....	105
Navigating and selecting in Setup Utility .....	106
Displaying system information .....	106
Restoring factory settings in Setup Utility .....	107
Exiting Setup Utility .....	107
Updating the BIOS .....	107
Determining the BIOS version .....	108
Downloading a BIOS update .....	108
Using System Diagnostics .....	109

<b>6 Specifications .....</b>	<b>110</b>
Device specifications .....	110
17.3-inch display specifications .....	111
Hard drive specifications .....	112
<b>7 Backup and recovery .....</b>	<b>113</b>
Restore .....	113
Creating restore media .....	114
Performing a system restore .....	115
Restoring using the dedicated recovery partition (select models only) .....	115
Restoring using the restore media .....	116
Changing the computer boot order .....	116
Backing up and recovering your information .....	117
Using Windows Backup and Restore .....	118
Using Windows system restore points .....	118
When to create restore points .....	118
Create a system restore point .....	119
Restore to a previous date and time .....	119
<b>8 Power cord set requirements .....</b>	<b>120</b>
Requirements for all countries .....	120
Requirements for specific countries and regions .....	121
<b>9 Recycling .....</b>	<b>123</b>
<b>Index .....</b>	<b>124</b>



# 1 Product description

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Product Name</b>	HP Pavilion dv7 Notebook PC	√	√
<b>Processors</b>	AMD® A8-3550MX 2.70-GHz processor (2.00-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	√	
	AMD A8-3530MX 2.60-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	√	
	AMD A8-3520M 2.50-GHz processor (1.60-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	√	
	AMD A8-3510MX 2.50-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	√	
	AMD A8-3500M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 35 W)	√	
	AMD A6-3430MX 2.40-GHz processor (1.70-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	√	
	AMD A6-3420M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	√	
	AMD A6-3410MX 2.30-GHz processor (1.60-GHz FSB, 2.0-MB L2 cache, quad core, 45 W)	√	
	AMD A6-3400M 2.30-GHz processor (1.40-GHz FSB, 4.0-MB L2 cache, quad core, 35 W)	√	
	AMD A4-3330MX 2.60-GHz processor (2.40-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	√	
	AMD A4-3320MX 2.60-GHz processor (2.00-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	√	
	AMD A4-3310MX 2.50-GHz processor (2.10-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	√	
	AMD A4-3305M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 45 W)	√	
	AMD A4-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W)	√	

<b>Category</b>	<b>Description</b>	<b>Computer models equipped with an AMD processor</b>	<b>Computer models equipped with an Intel processor</b>
	AMD E2-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W)	√	
	Intel® Core® i7-2860QM 2.50-GHz (SC turbo up to 3.60-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W)		√
	Intel Core i7-2820QM 2.30-GHz (SC turbo up to 3.10-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W)		√
	Intel Core i7-2760QM 2.40-GHz (SC turbo up to 3.50-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)		√
	Intel Core i7-2720QM 2.20-GHz (SC turbo up to 3.00-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)		√
	Intel Core i7-2670QM 2.20-GHz (SC turbo up to 3.10-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)		√
	Intel Core i7-2640M 2.80-GHz (SC turbo up to 3.50-GHz) processor (1333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W)		√
	Intel Core i7-2630QM 2.00-GHz (SC turbo up to 2.90-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)		√
	Intel Core i7-2620M 2.70-GHz (SC turbo up to 3.40-GHz) processor (1333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W)		√
	Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (1333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W)		√
	Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (1333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W)		√
	Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W)		√
	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W)		√
	Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, dual core, 35 W)		√
	Intel Pentium B960 TJ85 2.20-GHz processor (2.0-MB L3 cache, dual core, 35 W)		√
	Intel Pentium B950 TJ85 2.10-GHz processor (2.0-MB L3 cache, dual core, 35 W)		√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Chipset</b>	AMD A70M fusion controller hub (FCH)	√	
	Intel HM65 Express chipset		√
<b>Graphics</b>	<b>Internal graphics:</b>	√	
	<ul style="list-style-type: none"> <li>• AMD Radeon™ HD 6620G graphics on computer models equipped with an AMD A8 processor</li> <li>• AMD Radeon HD 6520G graphics on computer models equipped with an AMD A6 processor</li> <li>• AMD Radeon HD 6480G graphics on computer models equipped with an AMD A4 processor</li> <li>• AMD Radeon HD 6380G graphics on computer models equipped with an AMD E2 processor</li> </ul>		
	<b>Switchable discrete graphics:</b>	√	
	<ul style="list-style-type: none"> <li>• AMD Radeon HD 6755G2 graphics subsystem on computer models equipped with an AMD A8 or A6 processor, with 1024-MB of dedicated video memory (64-MB × 16 GDDR5 × 8 PCs, 3.2 GBPS), utilize VRAM component GDDR5 32-MB × 32 with 5GBPS capability</li> <li>• AMD Radeon HD 6750M graphics subsystem on computer models equipped with an AMD A4 processor, with 1024-MB of dedicated video memory (64-MB × 16 GDDR5 × 8 PCs, 3.2 GBPS), utilize VRAM component GDDR5 32-MB × 32 with 5GBPS capability</li> </ul>		
	<b>Supports dual graphics:</b>	√	
	<ul style="list-style-type: none"> <li>• AMD Radeon HD 6755G2 graphics subsystem on computer models equipped with an AMD A8 or A6 processor</li> <li>• AMD Radeon HD 6645G2 graphics subsystem on computer models equipped with an AMD A8 processor</li> <li>• AMD Radeon HD 6545M graphics subsystem on computer models equipped with an AMD A6 processor</li> <li>• AMD Radeon HD 6515G2 graphics subsystem on computer models equipped with an AMD A4 processor</li> </ul>		

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	<p><b>Internal graphics:</b></p> <ul style="list-style-type: none"> <li>Intel HD Graphics 3000 on computer models equipped with an Intel Core i7, i5, or i3 processor</li> <li>Intel HD Graphics on computer models equipped with an Intel Pentium processor</li> </ul>		√
	<p><b>Switchable discrete graphics:</b></p> <ul style="list-style-type: none"> <li>ATI XT Radeon HD 6770M M2 package with 2048-MB (64-MB × 32 GDDR5 × 8 PCs, 5GBPS) or 1024-MB (32-MB × 32 GDDR5 × 8 PCs, 5GBPS) of graphics subsystem discrete memory, muxless</li> <li>ATi XT Radeon HD 6490M M2 package with 1024-MB of graphics subsystem discrete memory (64-MB × 32 GDDR5 × 4 PCs, 5GBPS), muxless</li> </ul>		√
	Supports BACO, HD Decode, DX11, and HDMI (only on computer models equipped with a graphics subsystem with discrete memory)	√	√
<b>Panel</b>	17.3-in, full high-definition (FHD), light-emitting diode (LED), WVA AntiGlare (1920×1080) display; typical brightness: 300 nits		√
	17.3-in, high-definition+ (HD+), LED, SVA BrightView (1600×900) display; typical brightness: 200 nits	√	√
	All display assemblies include 2 wireless local area network (WLAN) antenna cables	√	√
	Supports 16:9 ultra wide aspect ratio	√	√
	Supports low-voltage differential signalling (LVDS)	√	√
	Lighted logo on top bezel	√	√
<b>Memory</b>	2 customer-accessible/upgradable memory module slots	√	√
	Supports dual-channel memory	√	√
	Supports up to 8192 GB of system RAM	√	
	Supports up to 16384 GB of system RAM		√
	DDR3/1333-MHz	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	<p>Supports the following configurations:</p> <ul style="list-style-type: none"> <li>8192-MB total system memory (8192×1 or 4096×2)</li> <li>6144-MB total system memory (4096×1 + 2048×1)</li> <li>4096-MB total system memory (4096×1 or 2048×2)</li> <li>2048-MB total system memory (2048×1)</li> </ul>	√	
	<p>Supports the following configurations:</p> <ul style="list-style-type: none"> <li>16384-MB total system memory (8192×2)</li> <li>12288-MB total system memory (8192×1 + 4096×1)</li> <li>8192-MB total system memory (8192×1 or 4096×2)</li> <li>6144-MB total system memory (4096×1 + 2048×1)</li> <li>4096-MB total system memory (4096×1 or 2048×2)</li> <li>2048-MB total system memory (2048×1)</li> </ul>		√
<b>Hard drives</b>	Supports <b>6.35-cm</b> (2.5-in) hard drives in <b>12.7-mm</b> (.50-in), <b>9.5-mm</b> (.37-in), and <b>7.0-mm</b> (.28-in) thicknesses	√	√
	Customer-accessible	√	√
	Accelerometer hard drive protection support	√	√
	Supports up to 2 hard drives	√	√
	Supports 160-GB solid-state drive (solid-state drive)		√
	Serial ATA	√	√
	Supports 500-GB, 7200-rpm, 9.5-mm hard drive + 160-GB solid-state drive combination		√
	<p>Supports the following double hard drive configurations:</p> <ul style="list-style-type: none"> <li>2 TB: (1 TB, 5400 rpm, 12.5 mm × 2)</li> <li>1500 GB: (750 GB, 7200 rpm, 9.5 mm × 2)</li> <li>1500 GB: (750 GB, 5400 rpm, 9.5 mm × 2)</li> <li>1 TB: (500 GB, 5400 rpm, 9.5 mm × 2)</li> </ul>	√	√
<b>Optical drive</b>	Fixed	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	Serial ATA	√	√
	12.7-mm tray load	√	√
	Supports Blu-ray Disc ROM FX SuperMulti DVD±R/RW Double-Layer Drive		√
	Supports Blu-ray Disc R/RW FX SuperMulti Drive	√	√
	Supports DVD±RW Double-Layer FX SuperMulti Drive		√
<b>Audio and video</b>	Dual array digital microphones with appropriate beamforming, echo-cancellation, noise-suppression software	√	√
	HD audio	√	√
	HP-branded Altec/Lansing quad Beats Audio speakers (select models only)	√	√
	HP TrueVision HD webcam (fixed, integrated, lowlight)	√	√
<b>Ethernet</b>	Integrated 10/100/1000 network interface card (NIC)	√	√
<b>Wireless</b>	Integrated wireless local area network (WLAN) options by way of wireless module	√	√
	Two WLAN antennas built into display assembly	√	√
	Support for the following WLAN formats:	√	√
	<ul style="list-style-type: none"> <li>Ralink 5390GN 802.11B/G/N 1×1 WiFi Adapter</li> <li>Realtek 8188GN 802.11b/g/n 1×1 WiFi Adapter</li> </ul>		
	Support for the following WLAN formats:	√	
	<ul style="list-style-type: none"> <li>Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter</li> <li>Atheros AR9002WB-1NGB 802.11B/G/N 1×1 WiFi and Bluetooth 2.1EDR+ Combo Adapter (BT3.0+HS ready)</li> <li>Broadcom 4313 802.11B/G/N 1×1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)</li> <li>Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter</li> </ul>		

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	<p>Support for the following WLAN formats:</p> <ul style="list-style-type: none"> <li>• Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter</li> <li>• Broadcom 4313 802.11B/G/N 1×1 WiFi Adapter</li> <li>• Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter</li> <li>• Intel Centrino Advanced-N 6230 WLAN module</li> <li>• Intel Centrino Wireless-N + WiMAX 6150 WLAN module</li> <li>• Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module</li> <li>• Ralink RT3090BC4 802.11B/G/N 1×1 WiFi and Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)</li> </ul>		√
<b>External media card</b>	<p>Digital Media Slot supports the following digital card formats:</p> <ul style="list-style-type: none"> <li>• MultiMediaCard</li> <li>• Secure Digital (SD) Memory Card</li> <li>• Secure Digital High Capacity Memory card</li> <li>• Secure Digital Extended Capacity Memory Card</li> </ul>	√	√
	<p>HP Multi-Format digital Media Reader support SD/SDHC/SDXC with UHS104 support, MMC push-push insertion and removal</p>	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Ports</b>	<ul style="list-style-type: none"> <li>3-pin AC power</li> <li>Audio-in (mono microphone)</li> <li>Audio-out (stereo headphone)</li> <li>HDMI version 1.4 supporting 1920×1200 @ 60Hz</li> <li>RJ-45 (Ethernet, includes link and activity lights)</li> <li>USB 2.0 (3 ports)</li> <li>On computer models equipped with an AMD processor: VGA (Dsub 15 pin) supporting 2048×1536 external resolution @ 85 Hz, 1920×1600 external resolution @ 60Hz, hot plug and unplug and auto-detection for correct output to wide-aspect vs. standard aspect video</li> <li>On computer models equipped with an Intel processor: VGA (Dsub 15 pin) supporting 2048×1536 external resolution @ 75 Hz, 1920×1200 external resolution @ 60Hz, hot plug and unplug and auto-detection for correct output to wide-aspect vs. standard aspect video</li> </ul>	√	√
<b>Keyboard/ pointing devices</b>	Full-size, Dura-coat, island-style keyboard with full numeric keypad	√	√
	TouchPad with multi-touch gestures, 2-finger scrolling, and pinch-zoom enabled	√	√
	Taps enabled by default	√	√
<b>Power requirements</b>	90W slim travel AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)	√	√
	65W slim travel AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)		
	120W slim travel AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)		√
	<b>Support for the following batteries:</b>	√	√
	<ul style="list-style-type: none"> <li>9-cell, 3.00-Ah (100-Wh) Li-ion battery</li> <li>6-cell, 2.80-Ah (62-Wh) Li-ion battery</li> <li>6-cell, 2.55-Ah (55-Wh) Li-ion battery</li> </ul>		
	Supports fast charge		

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
Security	Security cable slot	√	√
	Fingerprint reader with Digital Persona software support		
	Supports Intel AT-p Ready		√
Operating system	<b>Preinstalled:</b> <ul style="list-style-type: none"> <li>Windows 7 Home Premium (64- and 32-bit)</li> <li>Windows 7 Home Premium (64- and 32-bit)</li> </ul>	√	
	<b>Preinstalled:</b> <ul style="list-style-type: none"> <li>Windows 7 Home Basic (64- and 32-bit)</li> <li>Windows 7 Home Premium (64- and 32-bit)</li> <li>Windows 7 Professional (64- and 32-bit)</li> <li>Windows 7 Starter (64- and 32-bit)</li> <li>Windows 7 Ultimate (64-bit)</li> <li>RedFlag</li> <li>FreeDOS</li> </ul>		√
Serviceability	<b>End-user replaceable parts:</b> <ul style="list-style-type: none"> <li>AC adapter</li> <li>Battery</li> <li>Hard drives (2)</li> <li>Memory modules (2)</li> <li>Optical drive</li> <li>WLAN module</li> </ul>	√	√

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## **2 External component identification**

# Top

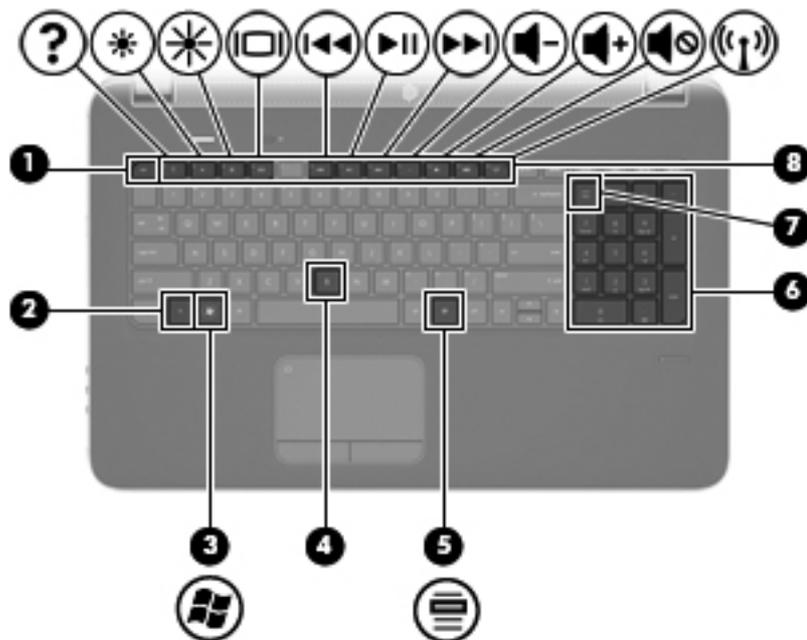
## Buttons



Item	Component	Description
(1)	Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button briefly to initiate Sleep.</li><li>• When the computer is in the Sleep state, press the button briefly to exit Sleep.</li><li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li></ul> <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select <b>Start &gt; Control Panel &gt; System and Security &gt; Power Options</b>, or refer to the <i>HP Notebook Reference Guide</i>.</p>

Item	Component	Description
(2)	Web browser	Opens a Web browser.  <b>NOTE:</b> Until you set up your Internet or network services, this button opens the Internet Connection Wizard.
(3)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows instead of a password logon.

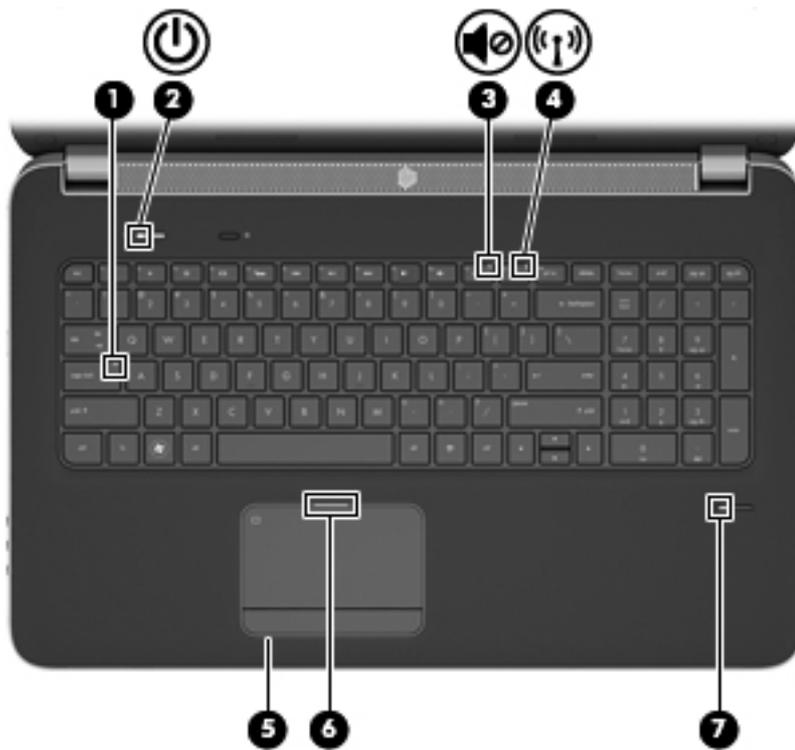
## Keys



Item	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 the <code>b</code> key, the <code>esc</code> key, or the <code>num lk</code> key.
(3)	Windows logo key	Displays the Windows Start menu.

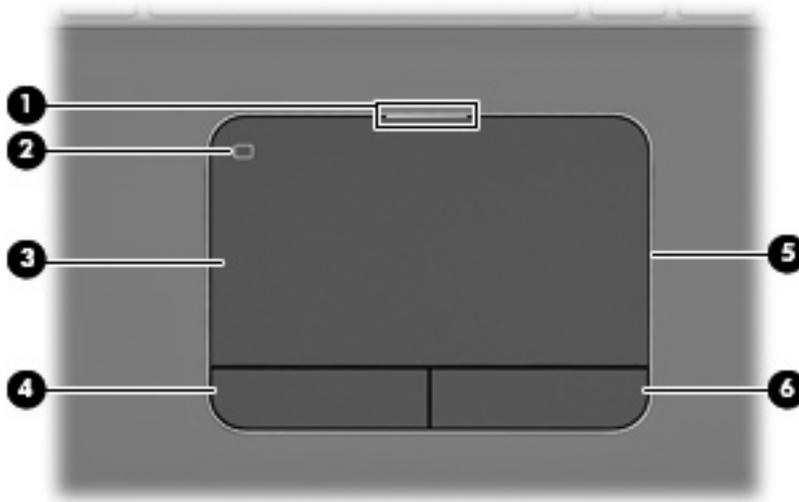
Item	Component	Description
(4)	b key	<p>Increases or decreases the Beats Audio bass settings.</p> <p>Beats Audio is an enhanced audio profile that provides a deep, controlled bass while maintaining a clear sound. Beats Audio is enabled by default.</p> <p>You can also view and control the bass settings through the Windows operating system. To view and control the bass properties:</p> <ul style="list-style-type: none"> <li>• Select <b>Start &gt; Programs &gt; Beats Audio Control Panel &gt; Listening Experience.</b></li> <li>– or –</li> <li>• Select <b>Start &gt; Control Panel &gt; Hardware and Sound &gt; Beats Audio Control Panel &gt; Listening Experience.</b></li> </ul>
(5)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(6)	Integrated numeric keypad	When the keypad has been enabled, the keys can be used like an external numeric keypad.
(7)	num lk key	Enables/disables the integrated numeric keypad when pressed in combination with the fn key.
(8)	Action keys	Execute frequently used system functions.

## Lights



Item	Component	Description
(1)	Caps lock light	<ul style="list-style-type: none"> <li>White: Caps lock is on.</li> <li>Off: Caps lock is off.</li> </ul>
(2)	Power light	<ul style="list-style-type: none"> <li>White: The computer is on.</li> <li>Blinking white: The computer is in the Sleep state.</li> <li>Off: The computer is off or in Hibernation.</li> </ul>
(3)	Mute light	<ul style="list-style-type: none"> <li>White: Computer sound is on.</li> <li>Amber: Computer sound is off.</li> </ul>
(4)	Wireless light	<ul style="list-style-type: none"> <li>White: 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>
(5)	TouchPad on light	<ul style="list-style-type: none"> <li>On: The TouchPad is on.</li> <li>Off: The TouchPad is off.</li> </ul>
(6)	TouchPad off light	<ul style="list-style-type: none"> <li>Off: The TouchPad is on.</li> <li>On: The TouchPad is off.</li> </ul>
(7)	Fingerprint reader light (select models only)	<ul style="list-style-type: none"> <li>White: The fingerprint was read.</li> <li>Amber: The fingerprint was not read.</li> </ul>

## TouchPad



Item	Component	Description
(1)	TouchPad off light	<ul style="list-style-type: none"><li>• Off: The TouchPad is on.</li><li>• On: The TouchPad is off.</li></ul> <p><b>NOTE:</b> Press <b>fn+space</b> to turn off the TouchPad light.</p>
(2)	TouchPad icon	Turns the TouchPad on and off. Quickly double-tap the TouchPad icon to turn the TouchPad on and off.
(3)	TouchPad zone	Moves the pointer and selects or activates items on the screen.
(4)	Left TouchPad button	Functions like the left button on an external mouse.
(5)	TouchPad on light	<ul style="list-style-type: none"><li>• On: The TouchPad is on.</li><li>• Off: The TouchPad is off.</li></ul> <p><b>NOTE:</b> Press <b>fn+space</b> to turn off the TouchPad light.</p>
(6)	Right TouchPad button	Functions like the right button on an external mouse.

# Display



Item	Component	Description
(1)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(2)	Internal microphones (2)	Record sound.
(3)	Webcam light	On: The webcam is in use.
(4)	Webcam	Records video and captures still photographs. To use the webcam, select <b>Start &gt; All Programs &gt; CyberLink YouCam &gt; CyberLink YouCam</b> .

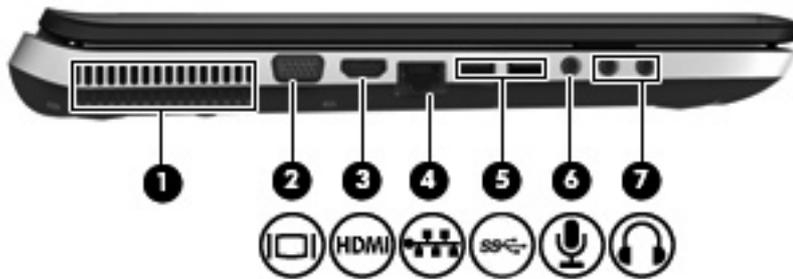
\*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

## Front



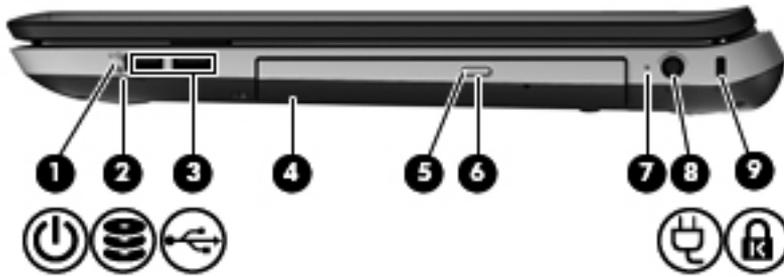
Item	Component	Description
(1)	Speakers (2)	Produce sound.
(2)	Digital Media Slot	Supports the following digital card formats: <ul style="list-style-type: none"><li>• MultiMediaCard</li><li>• Secure Digital (SD) Card</li></ul>

## Left side



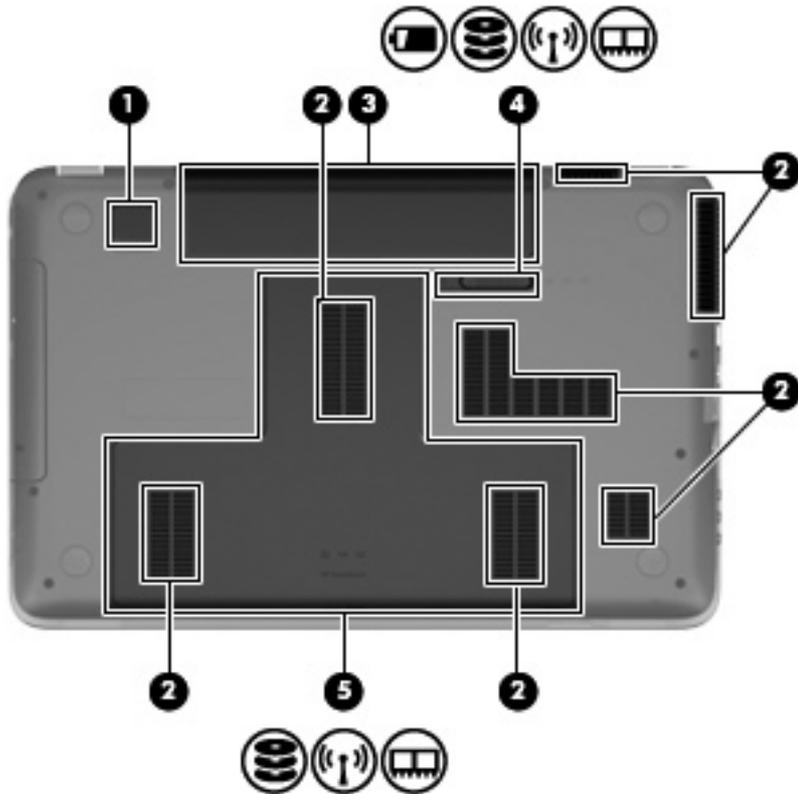
Item	Component	Description
(1)	Vent	Enables airflow to cool internal components. <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	SuperSpeed USB ports (2)	Connect optional USB 3.0 devices and provide enhanced USB power performance. <b>NOTE:</b> The SuperSpeed USB ports are also compatible with USB 1.0 and 2.0 devices.
(6)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(7)	Audio-out (headphone) jacks (2)	Produce sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. <b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices. <b>NOTE:</b> When a device is connected to a jack, the computer speakers are disabled.

## Right side



Item	Component	Description
(1)	Power light	<ul style="list-style-type: none"> <li>White: The computer is on.</li> <li>Blinking white: The computer is in the Sleep state.</li> <li>Off: The computer is off or in Hibernation.</li> </ul>
(2)	Drive light	<ul style="list-style-type: none"> <li>Blinking white: The hard drive is being accessed.</li> <li>Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.</li> </ul> <p><b>NOTE:</b> For information on HP ProtectSmart Hard Drive Protection, refer to the <i>HP Notebook Reference Guide</i>.</p>
(3)	USB ports (2)	Connect optional USB devices.
(4)	Optical drive	Reads and writes to an optical disc.
(5)	Optical drive light	<ul style="list-style-type: none"> <li>White: The optical drive is being accessed.</li> <li>Amber: The optical drive is off.</li> </ul>
(6)	Optical drive eject button	Ejects the optical disc.
(7)	AC adapter light	<ul style="list-style-type: none"> <li>White: The computer is connected to external power and the battery is fully charged.</li> <li>Amber: The battery is charging.</li> <li>Off: The computer is not connected to external power.</li> </ul>
(8)	Power connector	Connects an AC adapter.
(9)	Security cable slot	Attaches an optional security cable to the computer.
		<p><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.</p>

# Bottom



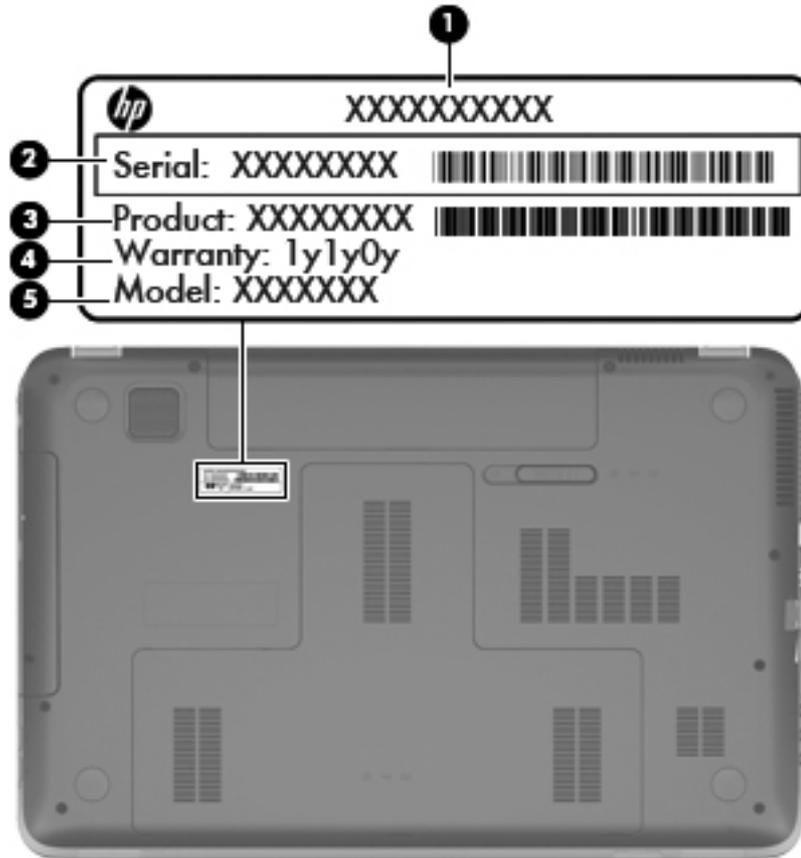
Item	Component	Description
(1)	Integrated subwoofer	Provides superior bass sound.
(2)	Vents (7)	Enable airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	Battery bay	Holds the battery.
(4)	Battery release latch	Releases the battery from the battery bay, and releases the hard drive/memory module compartment cover.
(5)	Hard drive bay	Holds the hard drive and wireless LAN (WLAN) device, and contains the memory module slots.  <b>CAUTION:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

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## **3 Illustrated parts catalog**

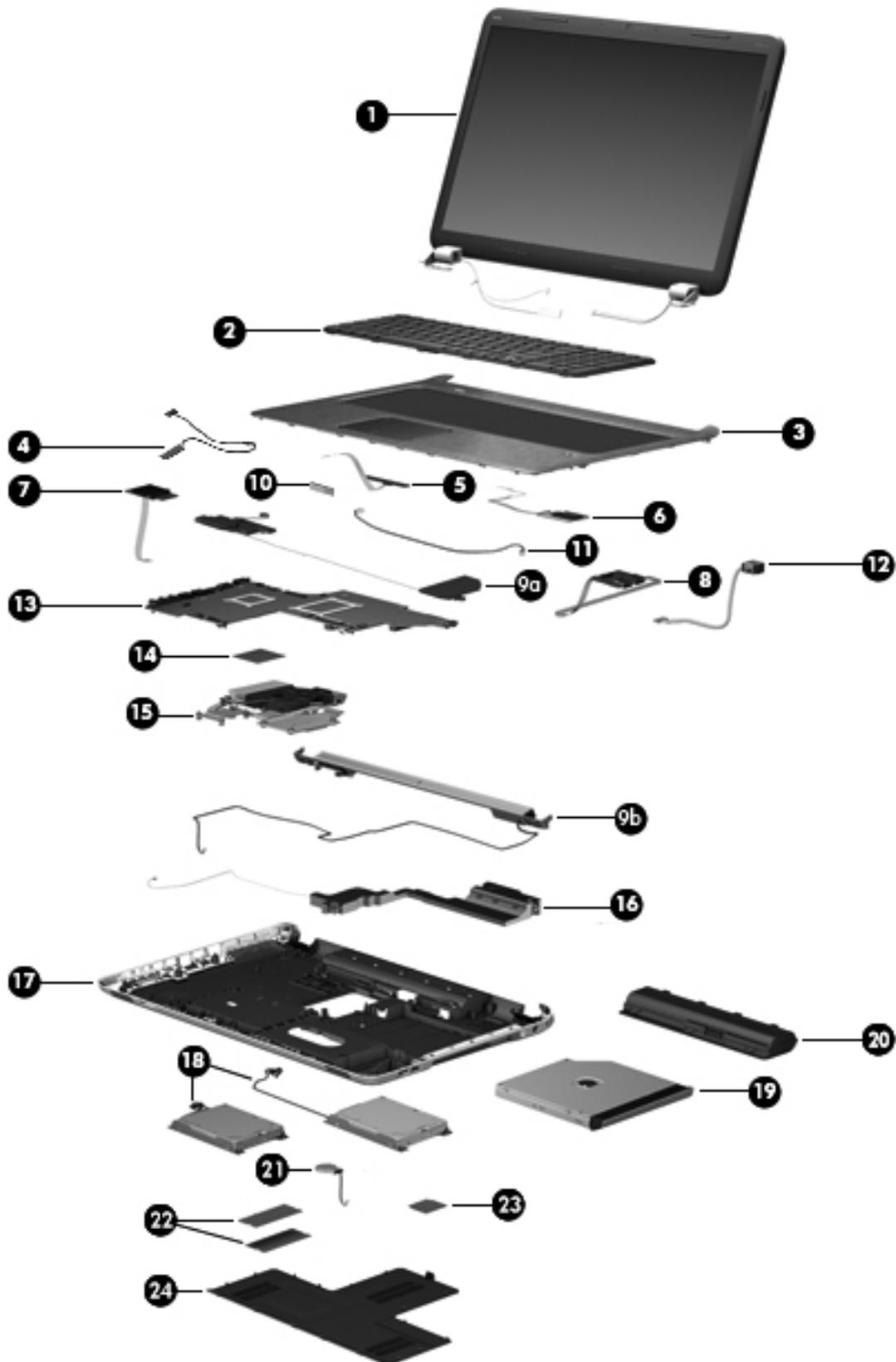
## Service tag

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



Item	Description	Function
(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)	Warranty period:	This number describes the duration of the warranty period for the computer.
(5)	Model description:	This is the alphanumeric identifier needed to locate documents, drivers, and support for the computer.

# Computer major components



<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
<b>(1)</b>	<b>Display assembly:</b> The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see <a href="#">Display assembly subcomponents on page 30</a> .	
<b>(2)</b>	<b>Keyboard</b> (includes keyboard cable):	
	For use with all computer models:	
	For use in Belgium	666001-A41
	For use in Canada	666001-121
	For use in the Czech Republic and Slovakia	666001-FL1
	For use in Denmark, Finland, and Norway	666001-DH1
	For use in France	666001-051
	For use in Germany	666001-041
	For use in Greece	666001-DJ1
	For use in Hungary	666001-211
	For use in Italy	666001-061
	For use in the Netherlands	666001-B31
	For use in Portugal	666001-131
	For use in Russia	666001-251
	For use in Slovenia	666001-BA1
	For use in Spain	666001-071
	For use in Switzerland	666001-BG1
	For use in Turkey	666001-141
	For use in the United Kingdom and Singapore	666001-031
	For use in the United States	666001-001
	For use only with computer models equipped with an Intel processor:	
	For use in India	666001-D61
	For use in Israel	666001-BB1
	For use in Japan	666001-291
	For use in Saudi Arabia	666001-171
	For use in South Korea	666001-AD1
	For use in Taiwan	666001-AB1
	For use in Thailand	666001-281
<b>(3)</b>	<b>Top cover</b> (includes TouchPad and TouchPad cable and TouchPad button board and TouchPad button board cable):	
	In dark umber finish	665998-001

Item	Component	Spare part number
	In steel gray finish	665999-001
(4)	<b>Display lid switch board</b> (includes cable)	665603-001
(5)	<b>Power button board</b> (does not include cable)	665600-001
(6)	<b>Fingerprint reader board</b> (includes bracket, but does not include cable)	665310-001
(7)	<b>SD Card reader board</b> (does not include cable)	665602-001
(8)	<b>USB board</b> (does not include cable)	665331-001
	<b>Speaker Kit</b> , includes:	665610-001
(9a)	Front speakers (includes front left and right speakers and cables)	
(9b)	Rear speakers (includes rear left and right speakers, grill, and cable)	
(10)	<b>Bluetooth module</b> (EDR v.3.0, for use only with computer models equipped with an Intel processor, does not include cable)	537921-001
(11)	<b>Bluetooth module cable</b> (for use only with computer models equipped with an Intel processor)	665595-001
(12)	<b>Power connector cable</b>	665596-001
(13)	<b>System board</b> (includes replacement thermal material):	
	For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory	666520-001
	For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory	666518-001
	For use only with computer models equipped with the Intel 6770 chipset, a quad core processor, and a graphics subsystem with 2048-MB of discrete memory	665991-001
	For use only with computer models equipped with the Intel 6770 chipset, a dual core processor, and a graphics subsystem with 2048-MB of discrete memory	665992-001
	For use only with computer models equipped with the Intel 6770 chipset, a quad core processor, and a graphics subsystem with 1024-MB of discrete memory	665988-001
	For use only with computer models equipped with the Intel 6770 chipset, a dual core processor, and a graphics subsystem with 1024-MB of discrete memory	665989-001
	For use only with computer models equipped with the Intel 6490 chipset, a quad core processor, and a graphics subsystem with 1024-MB of discrete memory	665986-001
	For use only with computer models equipped with the Intel 6490 chipset, a dual core processor, and a graphics subsystem with 1024-MB of discrete memory	665987-001
	For use only with computer models equipped with the Intel HM65 chipset, a quad core processor, and a graphics subsystem with UMA memory	665993-001
	For use only with computer models equipped with the Intel HM65 chipset, a dual core processor, and a graphics subsystem with UMA memory	665990-001
	<b>Thermal Material Kit</b> (includes replacement thermal pads and paste):	
	For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory	665286-001

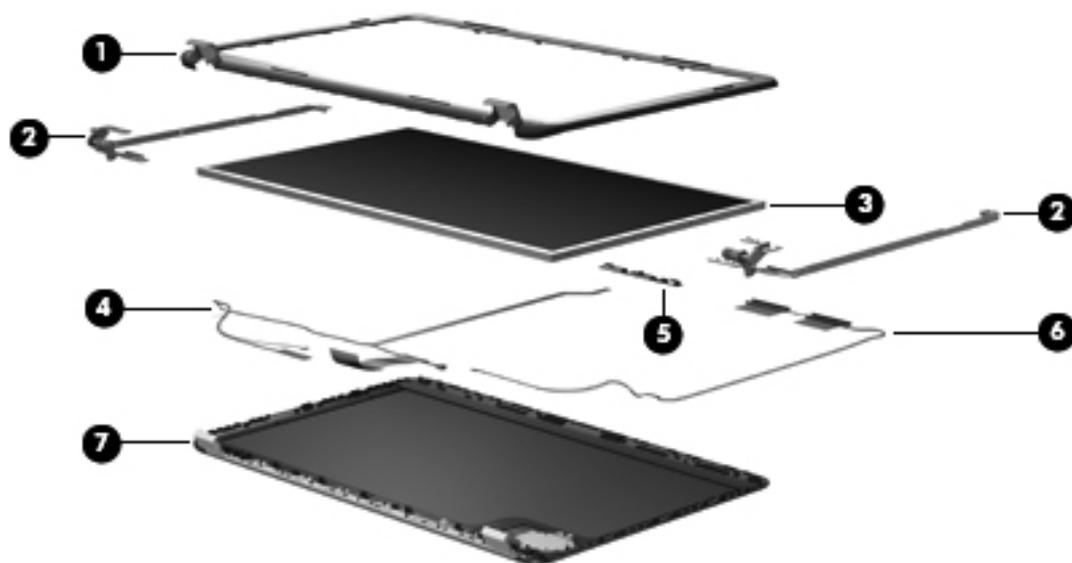
<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory	665285-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with 2048-MB of discrete memory	665355-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with 1024-MB of discrete memory	665354-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with UMA memory	665353-001
<b>(14)</b>	<b>Processor</b> (includes replacement thermal material)	
	AMD A8-3550MX 2.70-GHz processor (2.00-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669691-001
	AMD A8-3530MX 2.60-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	653364-001
	AMD A8-3520M 2.50-GHz processor (1.60-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669690-001
	AMD A8-3510MX 2.50-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	653358-001
	AMD A8-3500M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 35 W)	653350-001
	AMD A6-3430MX 2.40-GHz processor (1.70-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669689-001
	AMD A6-3420M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669688-001
	AMD A6-3410MX 2.30-GHz processor (1.60-GHz FSB, 2.0-MB L2 cache, quad core, 45 W)	653357-001
	AMD A6-3400M 2.30-GHz processor (1.40-GHz FSB, 4.0-MB L2 cache, quad core, 35 W)	653349-001
	AMD A4-3330MX 2.60-GHz processor (2.40-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	669687-001
	AMD A4-3320MX 2.60-GHz processor (2.00-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	669686-001
	AMD A4-3310MX 2.50-GHz processor (2.10-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	653356-001
	AMD A4-3305M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 45 W)	672093-001
	AMD A4-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W)	653348-001
	AMD E2-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W)	653351-001
	Intel Core i7-2860QM 2.50-GHz (SC turbo up to 3.60-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W)	666175-001

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	Intel Core i7-2820QM 2.30-GHz (SC turbo up to 3.10-GHz) processor (1 600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W)	634694-001
	Intel Core i7-2760QM 2.40-GHz (SC turbo up to 3.50-GHz) processor (1 600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	666174-001
	Intel Core i7-2720QM 2.20-GHz (SC turbo up to 3.00-GHz) processor (1 600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	631254-001
	Intel Core i7-2670QM 2.20-GHz (SC turbo up to 3.10-GHz) processor (1 600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	665116-001
	Intel Core i7-2640M 2.80-GHz (SC turbo up to 3.50-GHz) processor (1 333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W)	666173-001
	Intel Core i7-2630QM 2.00-GHz (SC turbo up to 2.90-GHz) processor (1 600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	635501-001
	Intel Core i7-2620M 2.70-GHz (SC turbo up to 3.40-GHz) processor (1 333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W)	631252-001
	Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (1 333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W)	631255-001
	Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (1 333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W)	631253-001
	Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W)	653341-001
	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W)	653340-001
	Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, dual core, 35 W)	653339-001
	Intel Pentium B960 TJ85 2.20-GHz processor (2.0-MB L3 cache, dual core, 35 W)	664662-001
	Intel Pentium B950 TJ85 2.10-GHz processor (2.0-MB L3 cache, dual core, 35 W)	653338-001
<b>(15)</b>	<b>Fan/heat sink assembly</b> (includes replacement thermal material):	
	For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory	666527-001
	For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory	666526-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with 2048-MB of discrete memory	666391-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with 1024-MB of discrete memory	666390-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with UMA memory	666392-001
<b>(16)</b>	<b>Subwoofer</b> (includes isolators and cable)	665611-001
<b>(17)</b>	<b>Base enclosure</b> (includes battery release latch and 4 rubber feet)	665978-001
<b>(18)</b>	<b>Hard drive</b> (2, 2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws):	
	1-TB, 5400-rpm, 12.7-mm	638974-001

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	750-GB, 7200-rpm, 9.5-mm	633252-001
	750-GB, 5400-rpm, 9.5-mm	634250-001
	640-GB, 5400-rpm, 9.5-mm	603785-001
	500-GB, 7200-rpm, 9.5-mm	608218-001
	500-GB, 5400-rpm, 9.5-mm	634932-001
	320-GB, 7200-rpm, 9.5-mm	634862-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
	<b>Hard Drive Hardware Kit</b> (not illustrated, includes bracket, connector cable, Mylar shield, and screws)	665597-001
	<b>160-GB solid-state drive</b> for use only with computer models equipped with an Intel processor (not illustrated, does not include bracket, connector cable, Mylar shield, or screws)	665985-001
<b>(19)</b>	<b>Optical drive</b> (includes bezel, bracket, cable, and screws):	
	Blu-ray Disc ROM FX SuperMulti DVD±R/RW Double-Layer Drive	666394-001
	Blu-ray Disc R/RW FX SuperMulti Drive	666393-001
	DVD±RW Double-Layer FX SuperMulti Drive (for use only with computer models equipped with an Intel processor)	666395-001
<b>(20)</b>	<b>Battery</b>	
	9-cell, 100-WHr, 3.00-AHr, LI	636631-001
	6-cell, 62-WHr, 2.80-AHr, LI	593562-001
	6-cell, 55-WHr, 2.55-AHr, LI	593554-001
<b>(21)</b>	<b>RTC battery</b> (includes cable and double-sided tape)	665606-001
<b>(22)</b>	<b>Memory modules</b> (2)	
	For use with all computer models:	
	4-GB memory module (DDR3, 10600, 1333-MHz)	621569-001
	2-GB memory module (DDR3, 10600, 1333-MHz)	621565-001
	For use only with computer models equipped with an AMD processor:	
	4-GB memory module (DDR3, 12800, 1600-MHz)	641369-001
	2-GB memory module (DDR3, 12800, 1600-MHz)	652972-001
	1-GB memory module (DDR3, 12800, 1600-MHz)	651188-001
	8-GB memory module for use only with computer models equipped with an Intel processor (DDR3, 10600, 1333-MHz)	634091-001
<b>(23)</b>	<b>WLAN module:</b>	
	For use with all computer models:	

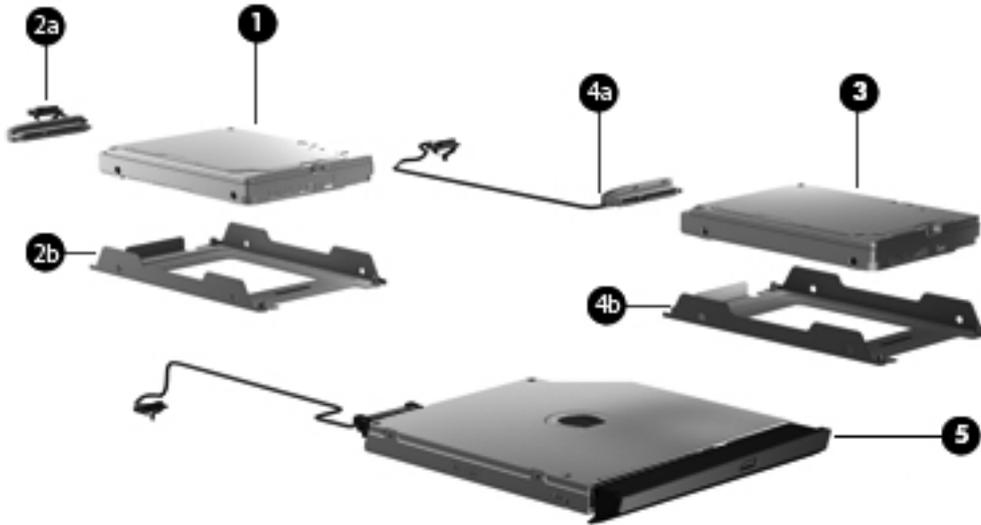
<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	Ralink 5390GN 802.11B/G/N 1×1 WiFi Adapter	630703-001
	Realtek 8188GN 802.11b/g/n 1×1 WiFi Adapter	640926-001
	For use only with computer models equipped with an AMD processor:	
	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
	Atheros AR9002WB-1NGB 802.11B/G/N 1×1 WiFi and Bluetooth 2.1EDR+ Combo Adapter (BT3.0+HS ready)	593127-001
	Broadcom 4313 802.11B/G/N 1×1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	600370-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
	For use only with computer models equipped with an Intel processor:	
	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	654825-001
	Broadcom 4313 802.11B/G/N 1×1 WiFi Adapter	593836-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657308-001
	Intel Centrino Advanced-N 6230 WLAN module	631956-001
	Intel Centrino Wireless-N + WiMAX 6150 WLAN module	633817-001
	Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module	593530-001
	Ralink RT3090BC4 802.11B/G/N 1×1 WiFi and Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	630705-001
<b>(24)</b>	<b>Service cover</b> — available in the Plastics Kit, spare part number 665604-001)	

## Display assembly subcomponents



Item	Component	Spare part number
(1)	<b>Display bezel</b>	665592-001
(2)	<b>Display Hinge Kit</b> (includes left and right display hinges and brackets)	665599-001
(3)	<b>Display panel:</b>	
	17.3-in, FHD, LED, AntiGlare display panel for use only with computer models equipped with an Intel processor	666397-001
	17.3-in, HD+, LED, BrightView display panel for use with all computer models	666396-001
(4)	<b>Display Cable Kit</b> (includes display panel cable and webcam/microphone module cable)	665594-001
(5)	<b>Webcam/microphone module</b>	665365-001
(6)	<b>Antenna Kit</b> (includes left and right wireless antenna cables and transceivers)	665591-001
(7)	<b>Display enclosure:</b>	
	In dark umber finish	665976-001
	In steel gray finish	665977-001
	<b>Display Rubber Kit</b> (not illustrated, include Mylar screw covers)	665607-001
	<b>Display Screw Kit</b> (not illustrated)	665609-001

# Mass storage devices



Item	Component	Spare part number
(1)	<b>Hard drive</b> (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws):	
	1-TB, 5400-rpm, 12.7-mm	638974-001
	750-GB, 7200-rpm, 9.5-mm	633252-001
	750-GB, 5400-rpm, 9.5-mm	634250-001
	640-GB, 5400-rpm, 9.5-mm	603785-001
	500-GB, 7200-rpm, 9.5-mm	608218-001
	500-GB, 5400-rpm, 9.5-mm	634932-001
	320-GB, 7200-rpm, 9.5-mm	634862-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
	<b>Hard Drive Hardware Kit</b> , includes:	665597-001
(2a)	Primary hard drive connector cable	
(2b)	Primary hard drive bracket	
(4a)	Secondary hard drive connector cable	
(4b)	Secondary hard drive bracket	
	Screws (not illustrated)	
(3)	<b>160-GB solid-state drive</b> (does not include bracket, connector cable, Mylar shield, or screws)	665985-001
(5)	<b>Optical drive</b> (includes bezel, bracket, cable, and screws):	
	Blu-ray Disc ROM FX SuperMulti DVD±R/RW Double-Layer Drive	666394-001

Item	Component	Spare part number
	Blu-ray Disc R/RW FX SuperMulti Drive	666393-001
	DVD±RW Double-Layer FX SuperMulti Drive (for use only with computer models equipped with an Intel processor)	666395-001

## Miscellaneous parts

Component	Spare part number
<b>HP Smart AC adapter</b>	
120-W, PFC, RC, V HP Smart AC adapter for use with all computer models	609941-001
90-W, PFC, RC, V HP Smart AC adapter for use with all computer models	609940-001
65-W RC, V HP Smart AC adapter for use with all computer models	609939-001
90-W, PFC, RC, V, EM HP Smart AC adapter for use only with computer models equipped with an Intel processor	609947-001
65-W, PFC, RC, V, EM HP Smart AC adapter for use only with computer models equipped with an Intel processor	609948-001
<b>Power cord</b> (3-pin, black, 1.83-meter):	
For use with all computer models:	
For use in Denmark	490371-081
For use in Europe	490371-021
For use in Italy	490371-061
For use in North America	490371-001
For use in South Africa	490371-AR1
For use in Switzerland	490371-111
For use in the United Kingdom and Singapore	490371-031
For use only with computer models equipped with an Intel processor:	
For use in Australia	490371-011
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Japan	490371-291
For use in South Korea	490371-AD1
For use in Taiwan	490371-AB1
For use in Thailand	490371-201
<b>Remote control</b> (full-function with teletext)	465541-004

Component	Spare part number
<b>Screw Kit</b>	665608-001
<b>USB DVB-T dipole antenna</b>	581223-001
<b>USB DVB-T TV tuner</b>	581222-001

## Sequential part number listing

Spare part number	Description
465541-004	Remote control (full-function with teletext)
490371-001	Power cord for use with all computer models in North America (3-pin, black, 1.83-meter)
490371-011	Power cord for use only with computer models equipped with an Intel processor in Australia (3-pin, black, 1.83-meter)
490371-021	Power cord for use with all computer models in Europe (3-pin, black, 1.83-meter)
490371-031	Power cord for use with all computer models in the United Kingdom and Singapore (3-pin, black, 1.83-meter)
490371-061	Power cord for use with all computer models in Italy (3-pin, black, 1.83-meter)
490371-081	Power cord for use with all computer models in Denmark (3-pin, black, 1.83-meter)
490371-111	Power cord for use with all computer models in Switzerland (3-pin, black, 1.83-meter)
490371-201	Power cord for use only with computer models equipped with an Intel processor in Brazil (3-pin, black, 1.83-meter)
490371-291	Power cord for use only with computer models equipped with an Intel processor in Japan (3-pin, black, 1.83-meter)
490371-AB1	Power cord for use only with computer models equipped with an Intel processor in Taiwan (3-pin, black, 1.83-meter)
490371-AD1	Power cord for use only with computer models equipped with an Intel processor in South Korea (3-pin, black, 1.83-meter)
490371-AR1	Power cord for use with all computer models in South Africa (3-pin, black, 1.83-meter)
490371-BB1	Power cord for use only with computer models equipped with an Intel processor in Israel (3-pin, black, 1.83-meter)
490371-D61	Power cord for use only with computer models equipped with an Intel processor in India (3-pin, black, 1.83-meter)
581222-001	USB DVB-T TV tuner
581223-001	USB DVB-T dipole antenna
593127-001	Atheros AR9002WB-1NGB 802.11B/G/N 1x1 WiFi and Bluetooth 2.1EDR+ Combo Adapter (BT3.0+HS ready) for use only with computer models equipped with an AMD processor
593530-001	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module for use only with computer models equipped with an Intel processor

<b>Spare part number</b>	<b>Description</b>
593554-001	6-cell, 55-WHr, 2.55-AHr, Li battery
593562-001	6-cell, 62-WHr, 2.80-AHr, Li battery
593836-001	Broadcom 4313 802.11B/G/N 1×1 WiFi Adapter for use only with computer models equipped with an Intel processor
537921-001	Bluetooth module (EDR v.3.0, for use only with computer models equipped with an Intel processor, does not include cable)
600370-001	Broadcom 4313 802.11B/G/N 1×1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready) for use only with computer models equipped with an AMD processor
603785-001	640-GB, 5400-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
608218-001	500-GB, 7200-rpm hard drive for use only with computer models equipped with an Intel processor (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
609939-001	65-W RC, V HP Smart AC adapter for use with all computer models
609940-001	90-W, PFC, RC, V HP Smart AC adapter for use with all computer models
609941-001	120-W, PFC, RC, V HP Smart AC adapter for use with all computer models
609947-001	90-W, PFC, RC, V, EM HP Smart AC adapter for use only with computer models equipped with an Intel processor
609948-001	65-W, PFC, RC, V, EM HP Smart AC adapter for use only with computer models equipped with an Intel processor
621565-001	2-GB memory module for use with all computer models (DDR3, 10600, 1333-MHz)
621569-001	4-GB memory module for use with all computer models (DDR3, 10600, 1333-MHz)
622643-001	320-GB, 5400-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
630703-001	Ralink 5390GN 802.11B/G/N 1×1 WiFi Adapter for use with all computer models
630705-001	Ralink RT3090BC4 802.11B/G/N 1×1 WiFi and Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready) for use only with computer models equipped with an Intel processor
631252-001	Intel Core i7-2620M 2.70-GHz (SC turbo up to 3.40-GHz) processor (1333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W, includes replacement thermal material)
631253-001	Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (1333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W, includes replacement thermal material)
631254-001	Intel Core i7-2720QM 2.20-GHz (SC turbo up to 3.00-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W, includes replacement thermal material)
631255-001	Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (1333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W, includes replacement thermal material)
631956-001	Intel Centrino Advanced-N 6230 WLAN module for use only with computer models equipped with an Intel processor
633252-001	750-GB, 7200-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)

<b>Spare part number</b>	<b>Description</b>
633817-001	Intel Centrino Wireless-N + WiMAX 6150 WLAN module for use only with computer models equipped with an Intel processor
634091-001	8-GB memory module for use only with computer models equipped with an Intel processor (DDR3, 10600, 1333-MHz)
634250-001	750-GB, 5400-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
634694-001	Intel Core i7-2820QM 2.30-GHz (SC turbo up to 3.10-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W, includes replacement thermal material)
634862-001	320-GB, 7200-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
634932-001	500-GB, 5400-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
635501-001	Intel Core i7-2630QM 2.00-GHz (SC turbo up to 2.90-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W, includes replacement thermal material)
636631-001	9-cell, 100-WHr, 3.00-AHr, Li battery
638974-001	1-TB, 5400-rpm hard drive (2.5-in, SATA, does not include bracket, connector cable, Mylar shield, or screws)
640926-001	Realtek 8188GN 802.11b/g/n 1×1 WiFi Adapter for use with all computer models
641369-001	4-GB memory module for use only with computer models equipped with an AMD processor (DDR3, 12800, 1600-MHz)
651188-001	1-GB memory module for use only with computer models equipped with an AMD processor (DDR3, 12800, 1600-MHz)
652972-001	2-GB memory module for use only with computer models equipped with an AMD processor (DDR3, 12800, 1600-MHz)
653338-001	Intel Pentium B950 TJ85 2.10-GHz processor (2.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
653339-001	Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
653340-001	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
653341-001	Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
653348-001	AMD A4-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W; includes replacement thermal material)
653349-001	AMD A6-3400M 2.30-GHz processor (1.40-GHz FSB, 4.0-MB L2 cache, dual core, 35 W; includes replacement thermal material)
653350-001	AMD A8-3500M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 35 W; includes replacement thermal material)
653351-001	AMD E2-3000M 2.40-GHz processor (1.80-GHz FSB, 2.0-MB L2 cache, dual core, 35 W; includes replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
653356-001	AMD A4-3310MX 2.50-GHz processor (2.10-GHz FSB, 2.0-MB L2 cache, dual core, 45 W; includes replacement thermal material)
653357-001	AMD A6-3410MX 2.30-GHz processor (1.60-GHz FSB, 2.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
653358-001	AMD A8-3510MX 2.50-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
653364-001	AMD A8-3530MX 2.60-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
654825-001	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter for use only with computer models equipped with an Intel processor
655795-001	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter for use only with computer models equipped with an AMD processor
657308-001	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter for use only with computer models equipped with an Intel processor
657325-001	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter for use only with computer models equipped with an AMD processor
664662-001	Intel Pentium B960 TJ85 2.20-GHz processor (2.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
665116-001	Intel Core i7-2670QM 2.20-GHz (SC turbo up to 3.10-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W; includes replacement thermal material)
665285-001	Thermal Material Kit for use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal pads and paste)
665286-001	Thermal Material Kit for use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal pads and paste)
665310-001	Fingerprint reader board (includes bracket, but does not include cable)
665331-001	USB board (does not include cable)
665353-001	Thermal Material Kit for use only with computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal pads and paste)
665354-001	Thermal Material Kit for use only with computer models equipped with an Intel processor and a graphics subsystem with 1024-MB of discrete memory (includes replacement thermal pads and paste)
665355-001	Thermal Material Kit for use only with computer models equipped with an Intel processor and a graphics subsystem with 2048-MB of discrete memory (includes replacement thermal pads and paste)
665365-001	Webcamera/microphone module
665591-001	Antenna Kit (includes left and right wireless antenna cables and transceivers)
665592-001	Display bezel
665593-001	Cable Kit (includes fingerprint reader board cable, power button board cable, SD Card reader board cable, TouchPad cable, TouchPad button board cables, and USB board cable)
665594-001	Display Cable Kit (includes display panel cable and webcamera/microphone module cable)

<b>Spare part number</b>	<b>Description</b>
665595-001	Bluetooth module cable (for use only with computer models equipped with an Intel processor)
665596-001	Power connector cable
665597-001	Hard Drive Hardware Kit (includes hard drive bracket and screws)
665599-001	Display Hinge Kit (includes left and right display hinges and brackets)
665599-001	Power button board (does not include cable)
665602-001	SD Card reader board (does not include cable)
665603-001	Display lid switch board (includes cable)
665604-001	Plastics Kit (includes the service cover)
665606-001	RTC battery (includes cable and double-sided tape)
665607-001	Display Rubber Kit
665608-001	Screw Kit
665609-001	Display Screw Kit
665610-001	Speaker Kit (includes front speakers and cables, rear speakers and cables, and rear speaker grill)
665611-001	Subwoofer (includes isolators and cable)
665976-001	Display enclosure in dark umber finish
665977-001	Display enclosure in steel gray finish
665978-001	Base enclosure (includes battery release latch and 4 rubber feet)
665985-001	160-GB solid-state drive (does not include bracket, connector cable, shield, or screws)
665986-001	System board for use only with computer models equipped with the Intel 6490 chipset, a quad core processor, and a graphics subsystem with 1024-MB of discrete memory (includes replacement thermal material)
665987-001	System board for use only with computer models equipped with the Intel 6490 chipset, a dual core processor, and a graphics subsystem with 1024-MB of discrete memory (includes replacement thermal material)
665988-001	System board for use only with computer models equipped with the Intel 6770 chipset, a quad core processor, and a graphics subsystem with 1024-MB of discrete memory (includes replacement thermal material)
665989-001	System board for use only with computer models equipped with the Intel 6770 chipset, a dual core processor, and a graphics subsystem with 1024-MB of discrete memory (includes replacement thermal material)
665990-001	System board for use only with computer models equipped with the Intel HM65 chipset, a dual core processor, and a graphics subsystem with UMA memory (includes replacement thermal material)
665991-001	System board for use only with computer models equipped with the Intel 6770 chipset, a quad core processor, and a graphics subsystem with 2048-MB of discrete memory (includes replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
665992-001	System board for use only with computer models equipped with the Intel 6770 chipset, a dual core processor, and a graphics subsystem with 2048-MB of discrete memory (includes replacement thermal material)
665993-001	System board for use only with computer models equipped with the Intel HM65 chipset, a quad core processor, and a graphics subsystem with UMA memory (includes replacement thermal material)
665998-001	Top cover in dark umber finish (includes TouchPad and TouchPad cable and TouchPad button board and TouchPad button board cable)
665999-001	Top cover in steel gray finish (includes TouchPad and TouchPad cable and TouchPad button board and TouchPad button board cable)
666001-001	Keyboard for use with all computer models in the United States (includes keyboard cable)
666001-031	Keyboard for use with all computer models in the United Kingdom and Singapore (includes keyboard cable)
666001-041	Keyboard for use with all computer models in Germany (includes keyboard cable)
666001-051	Keyboard for use with all computer models in France (includes keyboard cable)
666001-061	Keyboard for use with all computer models in Italy (includes keyboard cable)
666001-071	Keyboard for use with all computer models in Spain (includes keyboard cable)
666001-121	Keyboard for use with all computer models in Canada (includes keyboard cable)
666001-131	Keyboard for use with all computer models in Portugal (includes keyboard cable)
666001-141	Keyboard for use with all computer models in Turkey (includes keyboard cable)
666001-171	Keyboard for use only with computer models equipped with an Intel processor in Saudi Arabia (includes keyboard cable)
666001-211	Keyboard for use with all computer models in Hungary (includes keyboard cable)
666001-251	Keyboard for use with all computer models in Russia (includes keyboard cable)
666001-281	Keyboard for use only with computer models equipped with an Intel processor in Thailand (includes keyboard cable)
666001-291	Keyboard for use only with computer models equipped with an Intel processor in Japan (includes keyboard cable)
666001-A41	Keyboard for use with all computer models in Belgium (includes keyboard cable)
666001-AB1	Keyboard for use only with computer models equipped with an Intel processor in Taiwan (includes keyboard cable)
666001-AD1	Keyboard for use only with computer models equipped with an Intel processor South Korea (includes keyboard cable)
666001-B31	Keyboard for use with all computer models in the Netherlands (includes keyboard cable)
666001-BA1	Keyboard for use with all computer models in Slovenia (includes keyboard cable)
666001-BB1	Keyboard for use only with computer models equipped with an Intel processor in Israel (includes keyboard cable)
666001-BG1	Keyboard for use with all computer models in Switzerland (includes keyboard cable)

<b>Spare part number</b>	<b>Description</b>
666001-D61	Keyboard for use only with computer models equipped with an Intel processor in India (includes keyboard cable)
666001-DH1	Keyboard for use with all computer models in Denmark, Finland, and Norway (includes keyboard cable)
666001-DJ1	Keyboard for use with all computer models in Greece (includes keyboard cable)
666001-FL1	Keyboard for use with all computer models in the Czech Republic and Slovakia (includes keyboard cable)
666173-001	Intel Core i7-2640M 2.80-GHz (SC turbo up to 3.50-GHz) processor (1333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
666174-001	Intel Core i7-2760QM 2.40-GHz (SC turbo up to 3.50-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W; includes replacement thermal material)
666175-001	Intel Core i7-2860QM 2.50-GHz (SC turbo up to 3.60-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W; includes replacement thermal material)
666390-001	Fan/heat sink assembly for use only with computer models equipped with an Intel processor and a graphics subsystem with 1024-MB discrete memory (includes replacement thermal material)
666391-001	Fan/heat sink assembly for use only with computer models equipped with an Intel processor and a graphics subsystem with 2048-MB discrete memory (includes replacement thermal material)
666392-001	Fan/heat sink assembly for use only with computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
666393-001	Blu-ray Disc R/RW FX SuperMulti Drive for use with all computer models (includes bezel, bracket, cable, and screws)
666394-001	Blu-ray Disc ROM FX SuperMulti DVD±R/RW Double-Layer Drive (includes bezel, bracket, cable, and screws)
666395-001	DVD±RW Double-Layer FX SuperMulti Drive for use only with computer models equipped with an Intel processor (includes bezel, bracket, cable, and screws)
666396-001	17.3-in, HD+, LED, BrightView display panel for use with all computer models
666397-001	17.3-in, FHD, LED, AntiGlare display panel for use only with computer models equipped with an Intel processor
666518-001	System board for use only with computer models equipped with an AMD processor, a graphics subsystem with UMA memory, and USB version 3.0 (includes replacement thermal material)
666520-001	System board for use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
666526-001	Fan/heat sink assembly for use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
666527-001	Fan/heat sink assembly for use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
669686-001	AMD A4-3320MX 2.60-GHz processor (2.00-GHz FSB, 2.0-MB L2 cache, dual core, 45 W; includes replacement thermal material)
669687-001	AMD A4-3330MX 2.60-GHz processor (2.40-GHz FSB, 2.0-MB L2 cache, dual core, 45 W; includes replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
669688-001	AMD A6-3420M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
669689-001	AMD A6-3430MX 2.40-GHz processor (1.70-GHz FSB, 4.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
669690-001	AMD A8-3520M 2.50-GHz processor (1.60-GHz FSB, 4.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
669691-001	AMD A8-3550MX 2.70-GHz processor (2.00-GHz FSB, 4.0-MB L2 cache, quad core, 45 W; includes replacement thermal material)
672093-001	AMD A4-3305M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 45 W; includes replacement thermal material)

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# 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
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers

### Service considerations

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

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

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### 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.

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### 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.

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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

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**⚠ 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 an internal 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."

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## 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.

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.

<b>Typical electrostatic voltage levels</b>			
<b>Event</b>	<b>Relative humidity</b>		
	<b>10%</b>	<b>40%</b>	<b>55%</b>
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 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.

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

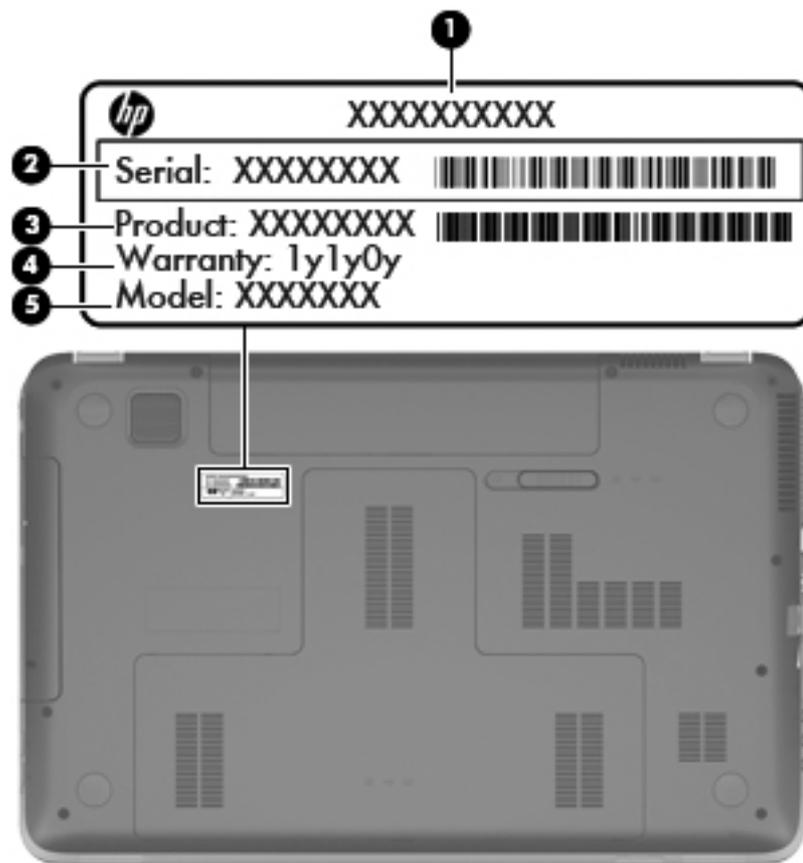
# Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 103 screws that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock 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. When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.

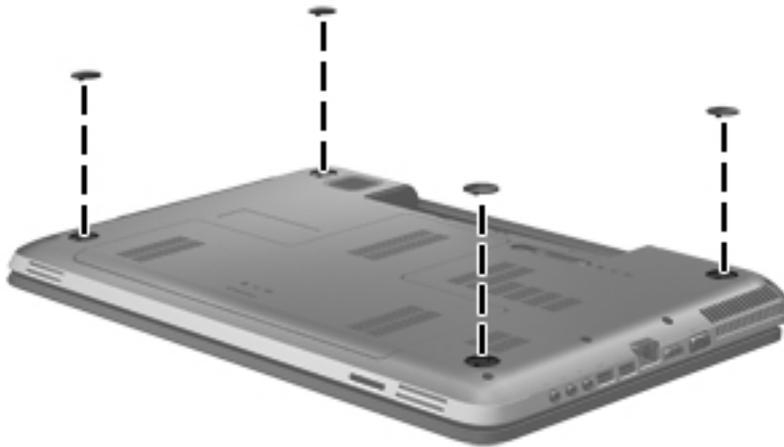


Item	Description	Function
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

Item	Description	Function
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description	This is the alphanumeric identifier needed to locate documents, drivers, and support for the computer.

## Computer feet

The computer feet are adhesive-backed rubber pads. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

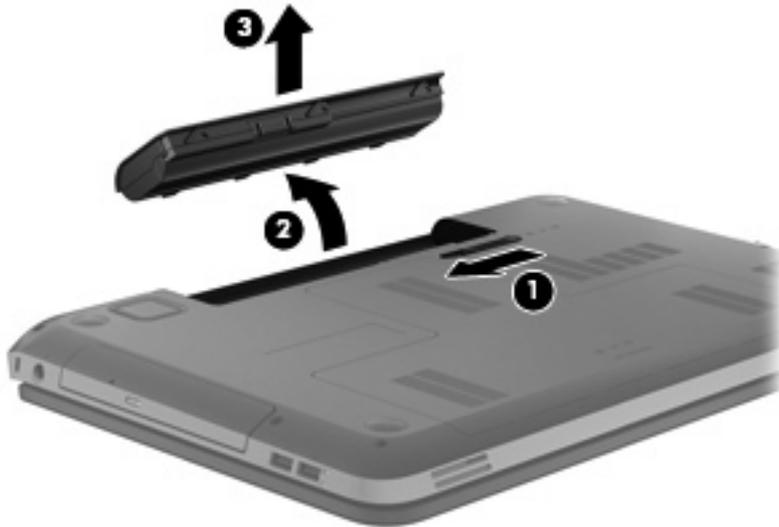
Description	Spare part number
9-cell, 100-WHr, 3.00-AHr, LI	636631-001
6-cell, 62-WHr, 2.80-AHr, LI	593562-001
6-cell, 55-WHr, 2.55-AHr, LI	593554-001

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. Slide the release latch **(1)** to release the battery.
2. Pivot the front edge of the battery **(2)** up and back.
3. Remove the battery **(3)** from the computer.



To insert the battery:

1. Align the tabs on the rear edge of the battery with the notches on the rear edge of the battery bay.
2. Pivot the front edge of the battery down into the battery bay until it is seated. (The battery release latch will automatically lock into place.)

## Optical drive



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

Description	Spare part number
Blu-ray Disc ROM FX SuperMulti DVD±R/RW Double-Layer Drive	666394-001
Blu-ray Disc R/RW FX SuperMulti Drive	666393-001
DVD±RW Double-Layer FX SuperMulti Drive (for use only with computer models equipped with an Intel processor)	666395-001

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.

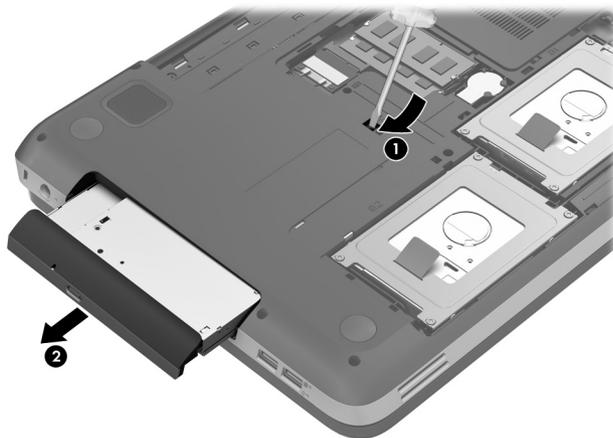
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)).

Remove the optical drive:

1. Slide the release latch **(1)** to release the service cover from the computer.
2. Lift the rear edge of the service cover **(2)** up and forward until it rests at an angle.

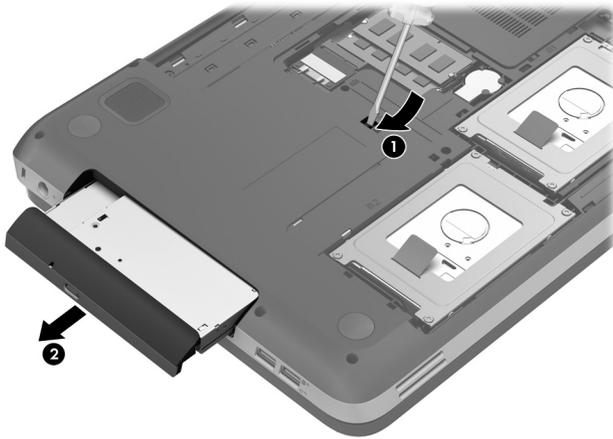


3. Remove the service cover. The service cover is available in the Plastics Kit, spare part number 665604-001.
4. Remove the Phillips PM2.5×5.0 screw that secures the optical drive to the computer.



5. Push on the hard drive bracket **(1)** to release the optical drive.

6. Remove the optical drive **(2)** from the computer.



7. If it is necessary to replace the optical drive bracket, position the optical drive with the rear panel toward you.
8. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the bracket to the optical drive.
9. Remove the optical drive bracket **(2)**. The optical drive bracket is included in the optical drive spare part kit.



Reverse this procedure to reassemble and install the optical drive.

## Hard drive

 **NOTE:** The hard drive spare part kit does not include the bracket, connector cable, Mylar shield, or screws. The bracket, connector cable, Mylar shield, and screws are included in the Hard Drive Hardware Kit, spare part number 665597-001.

 **NOTE:** The computer can be equipped with up to two hard drives. The primary hard drive is installed in the right hard drive bay. The secondary hard drive is installed in the left hard drive bay.

Description	Spare part number
1-TB, 5400-rpm, 12.7-mm	638974-001
750-GB, 7200-rpm, 9.5-mm	633252-001
750-GB, 5400-rpm, 9.5-mm	634250-001
640-GB, 5400-rpm, 9.5-mm	603785-001
500-GB, 7200-rpm, 9.5-mm	608218-001
500-GB, 5400-rpm, 9.5-mm	634932-001
320-GB, 7200-rpm, 9.5-mm	634862-001
320-GB, 5400-rpm, 9.5-mm	622643-001
160-GB solid-state drive (does not include bracket, connector cable, Mylar shield, or screws)	665985-001

Before removing a hard drive, follow these steps:

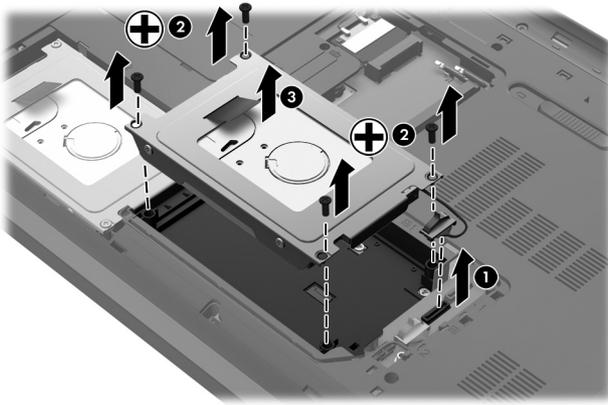
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)).
5. Remove the service cover (see [Optical drive on page 48](#)).

Remove the hard drive:

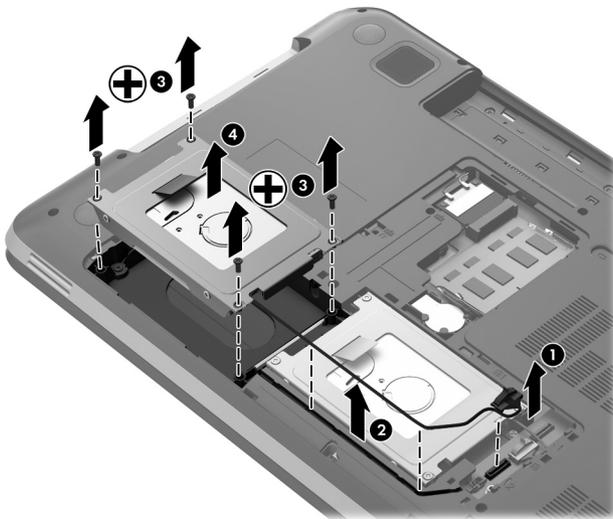
 **NOTE:** Steps 1 through 3 apply to the primary hard drive. See steps 4 through 7 for secondary hard drive removal information.

1. Disconnect the hard drive cable **(1)** from the system board.
2. Remove the four Phillips PM2.5×5.0 screws **(2)** that secure the hard drive to the computer.

3. Remove the hard drive **(3)**.

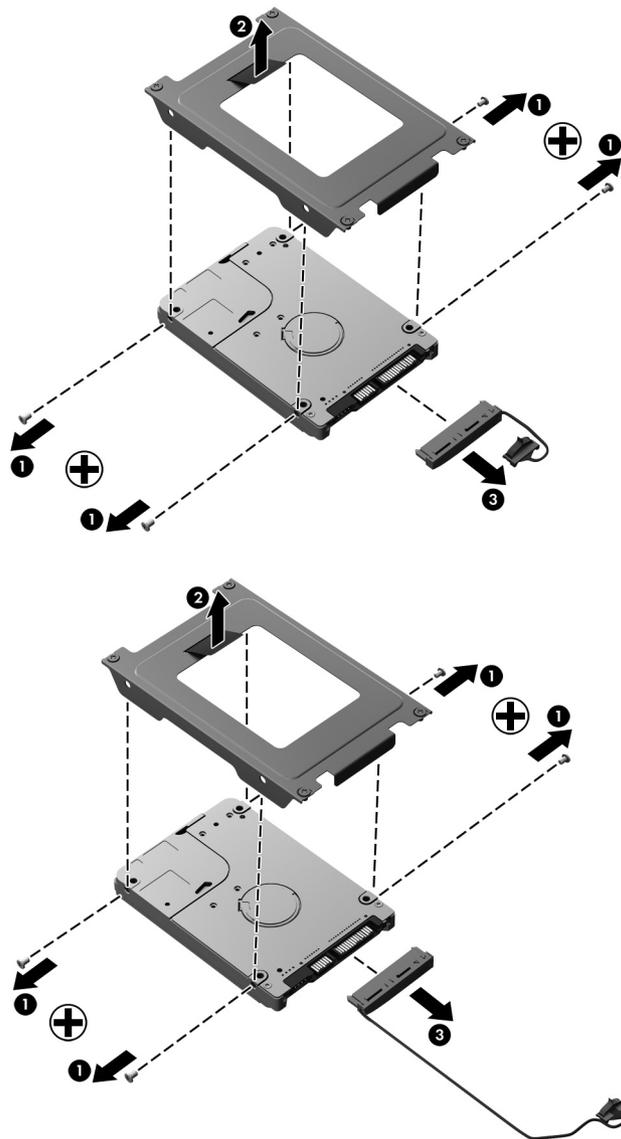


4. Disconnect the hard drive cable **(1)** from the system board.
5. Release the hard drive cable **(2)** from the routing channel built into the base enclosure.
6. Remove the four Phillips PM2.5×5.0 screws **(3)** that secure the hard drive to the computer.
7. Remove the hard drive **(4)**.



8. If it is necessary to replace the hard drive bracket or hard drive connector cable:
  - a. Remove the four Phillips PM3.0×4.0 screws **(1)** that secure the hard drive bracket to the hard drive.
  - b. Remove the hard drive bracket **(2)** from the hard drive.

- c. Disconnect the hard drive connector cable **(3)** from the hard drive.



 **NOTE:** The hard drive connector cable used on the secondary hard drive has a longer cable.

Reverse this procedure to reassemble and install the mass storage device.

## RTC battery

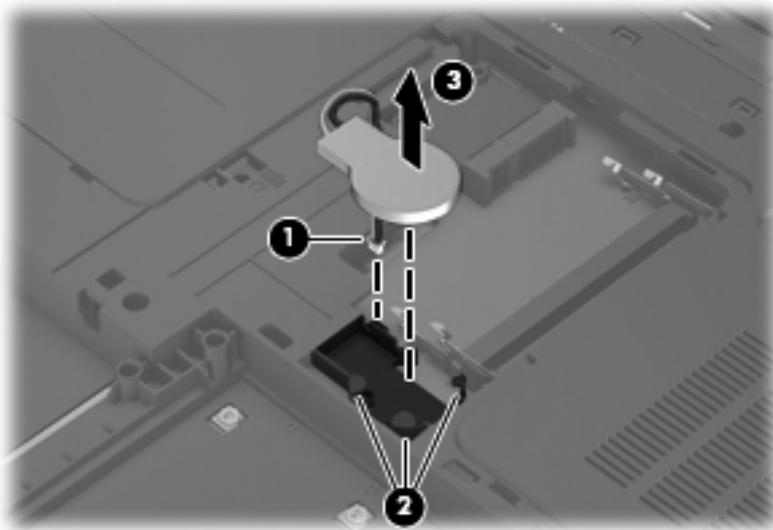
Description	Spare part number
RTC battery (includes cable and double-sided tape)	665606-001

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 47](#)).
5. Remove the service cover (see [Optical drive on page 48](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Release the clips **(2)** built into the base enclosure that secure the RTC battery.
3. Remove the RTC battery **(3)**. (The RTC battery is attached to the base enclosure with double-sided tape.)



Reverse this procedure to install the RTC battery.

## Memory module



**NOTE:** The computer can be equipped with up to two memory modules. The primary memory module is installed in the memory module socket closest to the system board. The expansion memory module is installed in the memory module socket farthest from the system board.

Description	Spare part number
For use with all computer models:	
4-GB memory module (DDR3, 10600, 1333-MHz)	621569-001
2-GB memory module (DDR3, 10600, 1333-MHz)	621565-001
For use only with computer models equipped with an AMD processor:	
4-GB memory module (DDR3, 12800, 1600-MHz)	641369-001
2-GB memory module (DDR3, 12800, 1600-MHz)	652972-001
1-GB memory module (DDR3, 12800, 1600-MHz)	651188-001
8-GB memory module for use only with computer models equipped with an Intel processor (DDR3, 10600, 1333-MHz)	634091-001

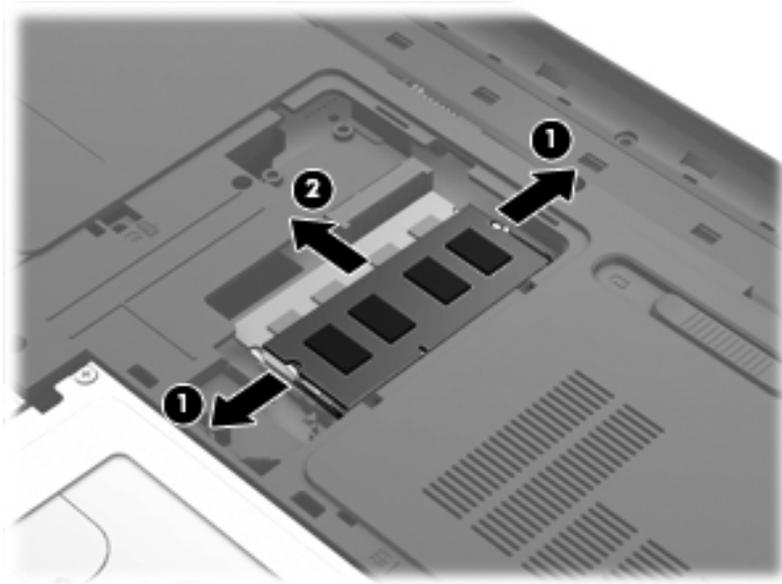
Before removing a memory module, follow these steps:

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 47](#)).
5. Remove the service cover (see [Optical drive on page 48](#)).

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

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



Reverse this procedure to install a memory module.

## WLAN module

Description	Spare part number
For use with all computer models:	
Ralink 5390GN 802.11B/G/N 1x1 WiFi Adapter	630703-001
Realtek 8188GN 802.11b/g/n 1x1 WiFi Adapter	640926-001
For use only with computer models equipped with an AMD processor:	
Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
Atheros AR9002WB-1NGB 802.11B/G/N 1x1 WiFi and Bluetooth 2.1EDR+ Combo Adapter (BT3.0+HS ready)	593127-001
Broadcom 4313 802.11B/G/N 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	600370-001
Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
For use only with computer models equipped with an Intel processor:	
Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	654825-001
Broadcom 4313 802.11B/G/N 1x1 WiFi Adapter	593836-001
Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657308-001
Intel Centrino Advanced-N 6230 WLAN module	631956-001
Intel Centrino Wireless-N + WiMAX 6150 WLAN module	633817-001

Description	Spare part number
Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module	593530-001
Ralink RT3090BC4 802.11B/G/N 1×1 WiFi and Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	630705-001

**⚠ 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 device functionality, and then contact technical support.

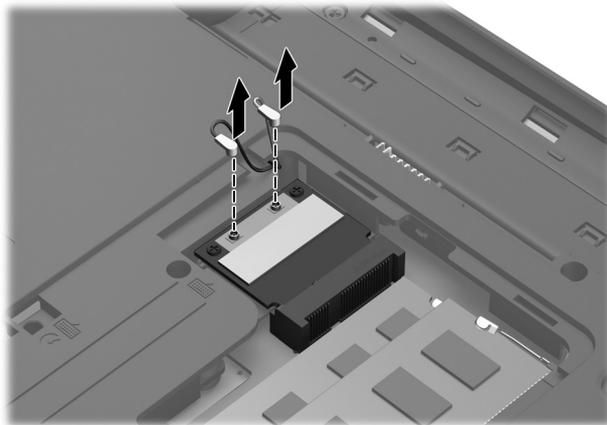
Before removing the WLAN module, follow these steps:

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 47](#)).
5. Remove the service cover (see [Optical drive on page 48](#)).

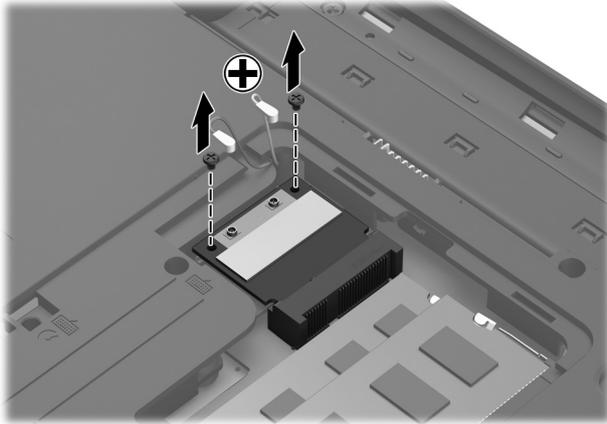
Remove the WLAN module:

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

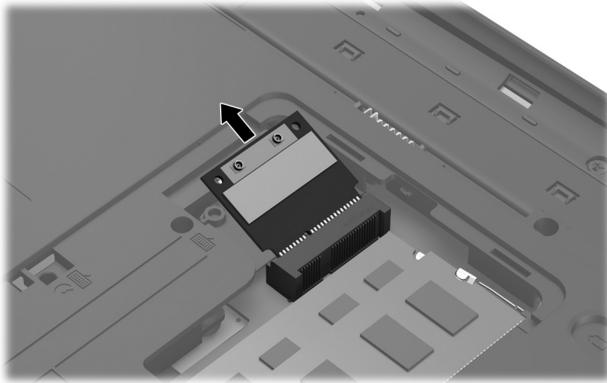
**📝 NOTE:** The #1 WLAN antenna cable is connected to the WLAN module Main terminal. The #2 WLAN antenna cable is connected to the WLAN module Aux terminal.



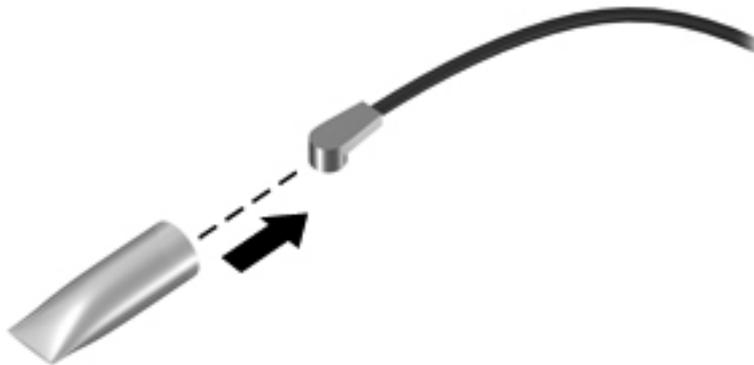
2. Remove the two Phillips PM2.0×4.0 screws that secure the WLAN module to the system board. (The WLAN module tilts up.)



3. Remove the WLAN module by pulling the module away from the slot at an angle.



 **NOTE:** If the WLAN antennas are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

# Keyboard



**NOTE:** The keyboard spare part kit includes a keyboard cable.

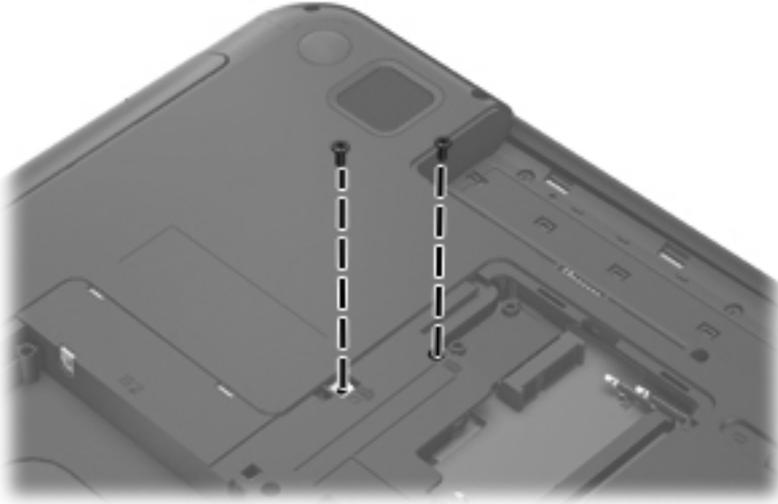
Description	Spare part number	Description	Spare part number
For use with all computer models:			
For use in Belgium	666001-A41	For use in the Netherlands	666001-B31
For use in Canada	666001-121	For use in Portugal	666001-131
For use in the Czech Republic and Slovakia	666001-FL1	For use in Russia	666001-251
For use in Denmark, Finland, and Norway	666001-DH1	For use in Slovenia	666001-BA1
For use in France	666001-051	For use in Spain	666001-071
For use in Germany	666001-041	For use in Switzerland	666001-BG1
For use in Greece	666001-DJ1	For use in Turkey	666001-141
For use in Hungary	666001-211	For use in the United Kingdom and Singapore	666001-031
For use in Italy	666001-061	For use in the United States	666001-001
For use only with computer models equipped with an Intel processor:		For use in Saudi Arabia	666001-171
For use in India	666001-D61	For use in South Korea	666001-AD1
For use in Israel	666001-BB1	For use in Taiwan	666001-AB1
For use in Japan	666001-291	For use in Thailand	666001-281

Before removing the keyboard, follow these steps:

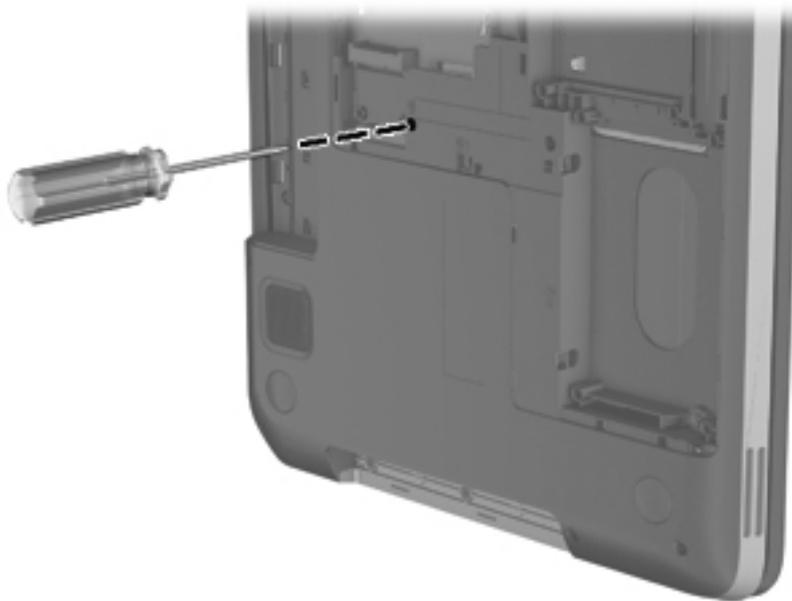
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)).
5. Remove the optical drive (see [Optical drive on page 48](#)).

Remove the keyboard:

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



2. Rest the computer on its right side.
3. Open the computer.
4. Insert a screw driver or similar thin tool into the keyboard screw hole, and then press on the back of the keyboard until the keyboard disengages from the computer.

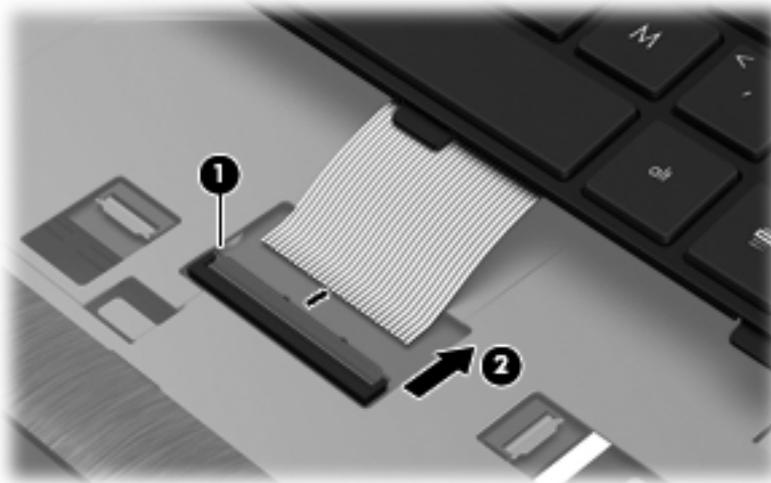


5. Turn the computer right-side up with the front toward you.

6. Lift the rear edge of the keyboard **(1)**, and then slide the keyboard **(2)** back until the keyboard cable connector is accessible.



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



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

## Top cover



**NOTE:** The top cover spare part kit includes the TouchPad and TouchPad cable and the TouchPad button board and TouchPad button board cable.

Description	Spare part number
In dark umber finish	665998-001
In steel gray finish	665999-001

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))

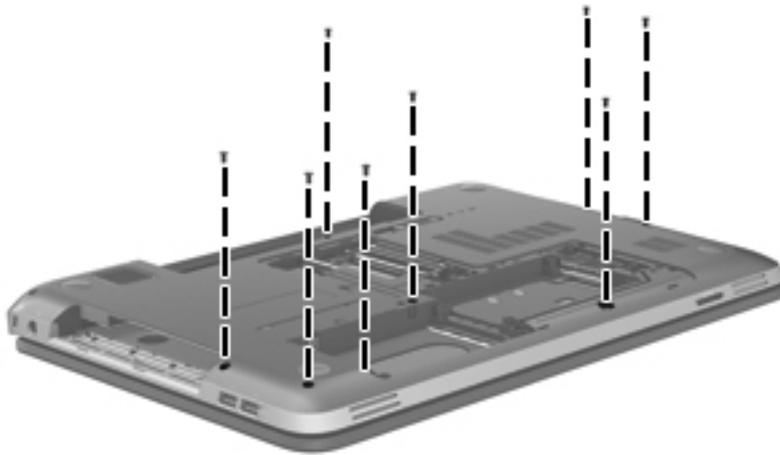
When replacing the top cover, be sure that the following components are removed from the defective top cover and installed on the replacement top cover:

- Fingerprint reader board and cable (see [Fingerprint reader board on page 66](#))
- Power button board and cable (see [Power button board on page 68](#))
- Display lid switch board and cable (see [Display lid switch board on page 70](#))

Remove the top cover:

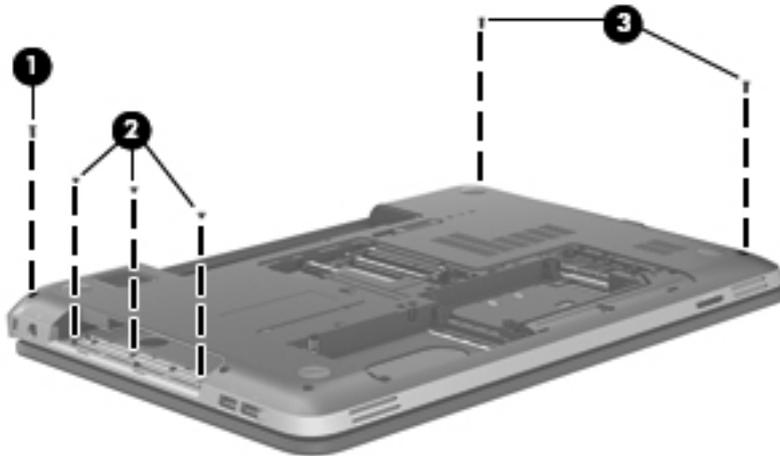
1. Close the computer.
2. Turn the computer upside down, with the front toward you.

3. Remove the eight Phillips PM2.5×5.0 screws that secure the top cover to the computer.



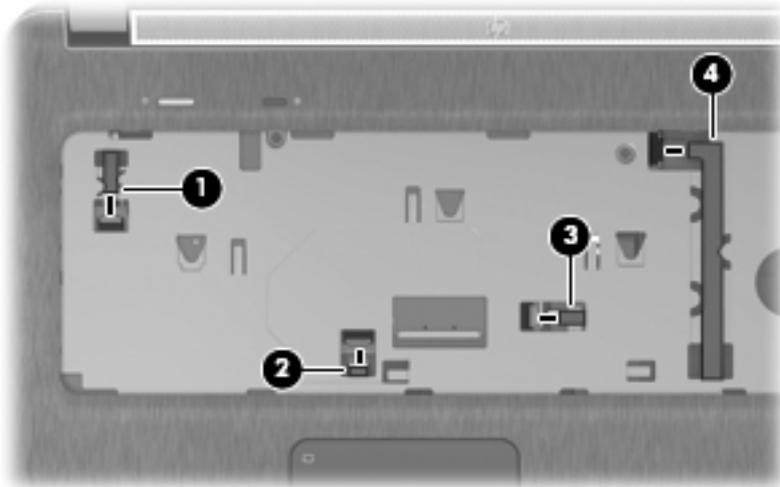
4. Remove the following screws:

- (1) One Phillips PM2.5×7.0 screw in the rear left corner of the base enclosure
- (2) Three Phillips PM2.5×3.0 screws in the optical drive bay
- (3) Two Phillips PM2.5×9.0 screws on the right side of the base enclosure



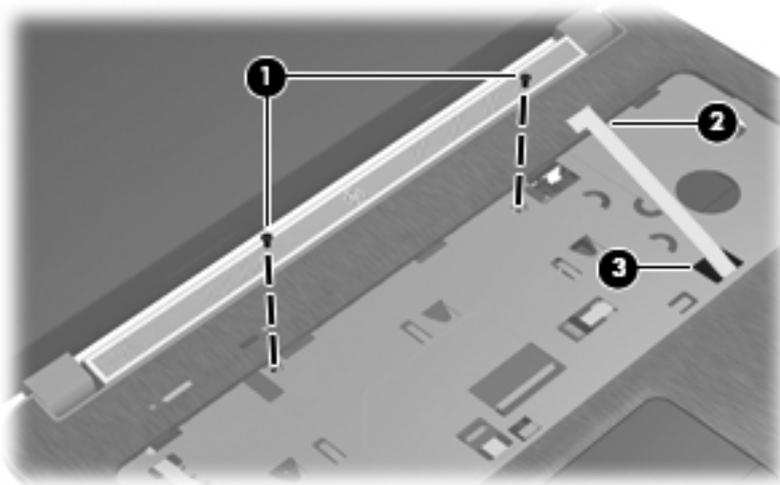
5. Turn the computer right-side up, with the front toward you.
6. Open the computer.

7. Release the ZIF connectors to which the following cables are attached, and then disconnect the cables from the system board:
  - (1) Power button board cable
  - (2) TouchPad button board cable
  - (3) Fingerprint reader board cable
  - (4) USB board cable



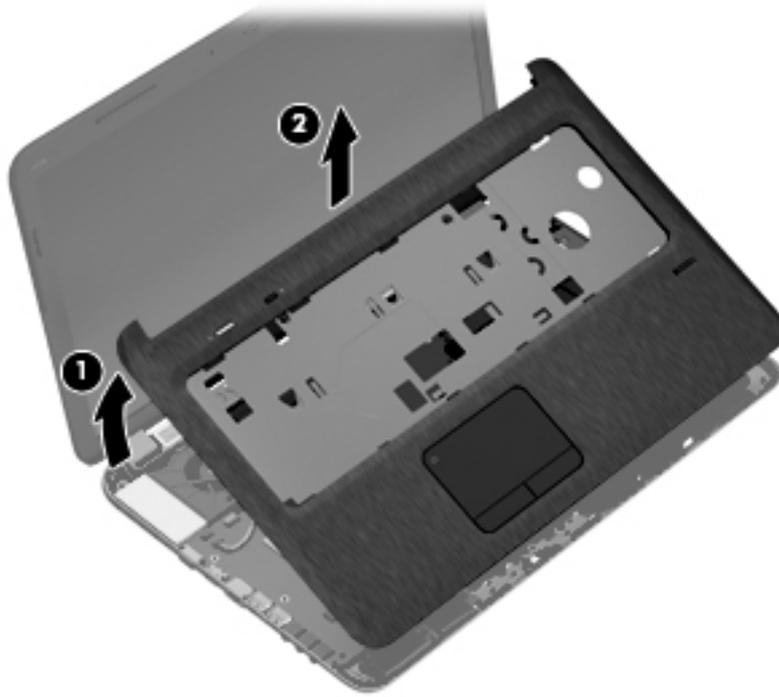
8. Remove the two Phillips PM2.5×5.0 screws that secure the top cover to the computer.

 **NOTE:** As you prepare to release the top cover, make sure the USB board (2) cable feeds freely through the opening (3) in the top cover.



9. Lift the rear edge of the top cover (1) until the left and right sides disengage from the base enclosure.

10. Remove the top cover (2).



Reverse this procedure to install the top cover.

## Fingerprint reader board

 **NOTE:** The fingerprint reader board does not include the fingerprint reader board cable. The fingerprint reader board cable is included in the Cable Kit, spare part number 665593-001.

Description	Spare part number
Fingerprint reader board (includes bracket)	665310-001

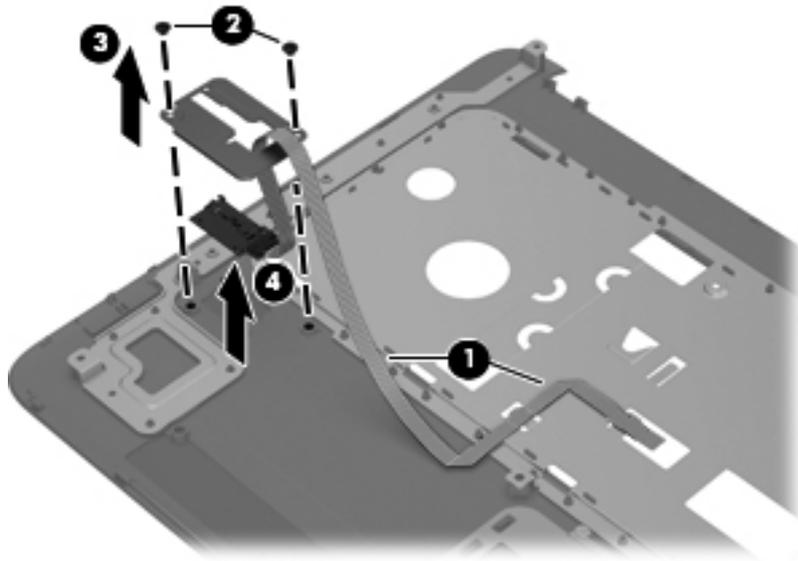
Before removing the fingerprint reader board, follow these steps:

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

Remove the fingerprint reader board, bracket, and cable:

1. Turn the top cover upside down, with the front toward you.
2. Release the fingerprint reader board cable **(1)** from the surface of the top cover. Remove the two Phillips PM2.0×2.0 screws **(2)** that secure the fingerprint reader board and bracket to the top cover.

3. Remove the fingerprint reader board bracket **(3)**, board **(4)**, and cable.



Reverse this procedure to install the fingerprint reader board, bracket, and cable.

## Power button board



**NOTE:** The power button board does not include the power button board cable. The power button board cable is included in the Cable Kit, spare part number 665593-001.

Description	Spare part number
Power button board	665600-001

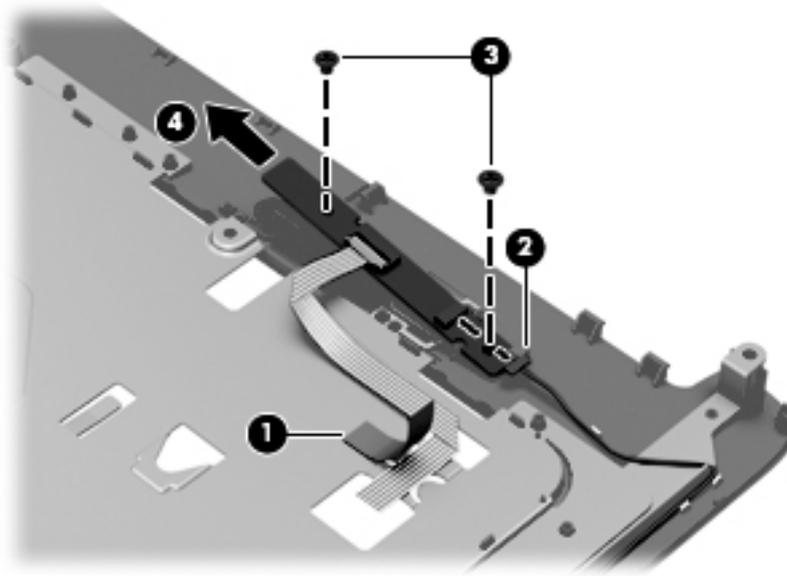
Before removing the power button board, follow these steps:

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

Remove the power button board:

1. Turn the top cover upside down, with the front toward you.
2. Release the power button board cable from the tab **(1)** on the top cover.
3. Disconnect the display lid switch board cable **(2)** from the power button board.
4. Remove the two Phillips PM2.0×4.0 screws **(3)** that secure the power button board to the top cover.

5. Remove the power button board and cable (4).



Reverse this procedure to install the power button board.

## Display lid switch board

Description	Spare part number
Display lid switch board (includes cable)	665603-001

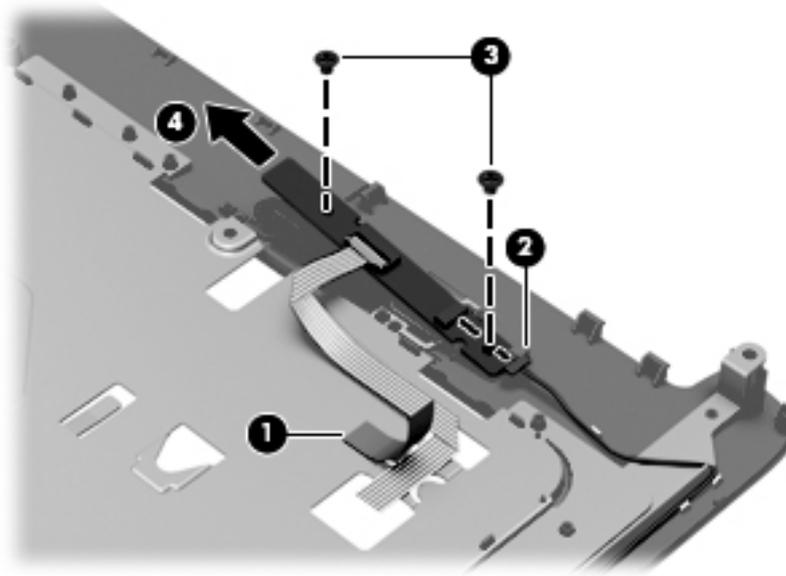
Before removing the display lid switch board, follow these steps:

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

Remove the display lid switch board:

1. Turn the top cover upside down, with the front toward you.
2. Disconnect the display lid switch cable **(1)** from the power button board.
3. Release the display lid switch board cable from the clips **(2)** built into the top cover.

4. Release the display lid switch board from the clips **(3)** built into the top cover.



5. Remove the display lid switch board and cable.

Reverse this procedure to install the display lid switch board and cable.

## SD Card reader board



**NOTE:** The SD Card reader board does not include the SD Card reader board cable. The SD Card reader board cable is included in the Cable Kit, spare part number 665593-001.

Description	Spare part number
SD Card reader board	665602-001

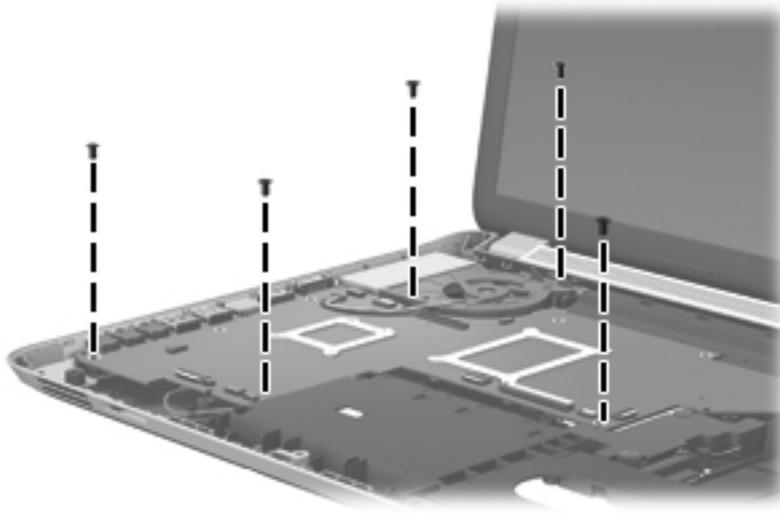
Before removing the SD Card reader board, follow these steps:

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

Remove the SD Card reader board and cable:

1. Release the ZIF connector to which the SD Card reader board cable is connected, and then disconnect the SD Card reader board cable **(1)** from the system board.
2. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the SD Card reader board to the base enclosure.

3. Remove the SD Card reader board **(3)** and cable.



Reverse this procedure to install the SD Card reader board and cable.

## Bluetooth module

 **NOTE:** This section applies only to computer models equipped with an Intel processor.

 **NOTE:** The Bluetooth module does not include the Bluetooth module cable. The Bluetooth module cable is available using spare part number 665595-001.

Description	Spare part number
Bluetooth module	537921-001

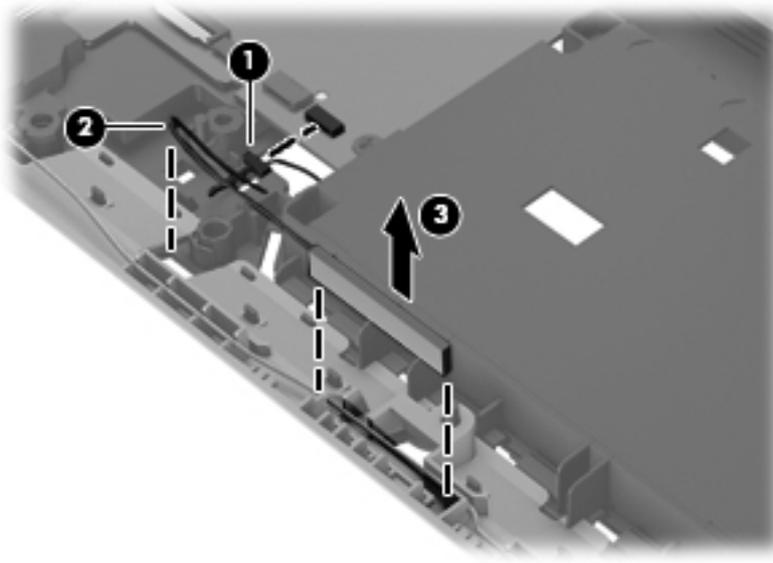
Before removing the Bluetooth module and cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

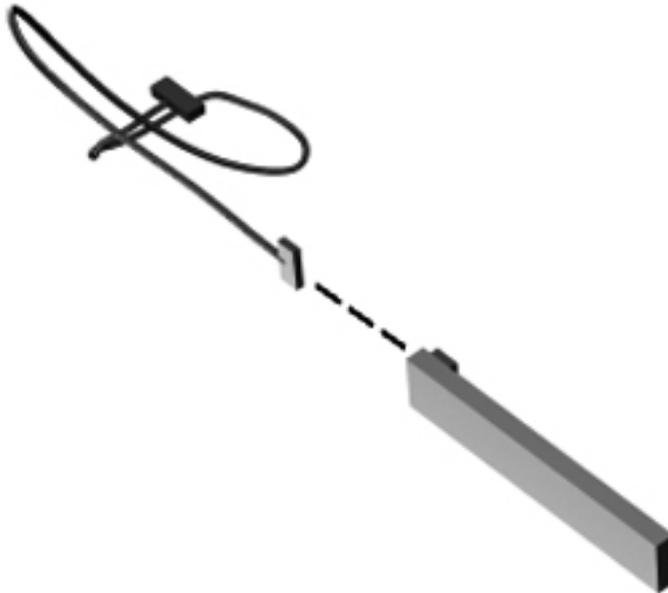
Remove the Bluetooth module and cable:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Release the Bluetooth module cable **(2)** from the clips built into the speaker and base enclosure.

3. Release the Bluetooth module **(3)** from the clip built into the base enclosure.



4. Remove the Bluetooth module and cable.
5. If it is necessary to replace the Bluetooth module cable, disconnect the cable from the Bluetooth module.



Reverse this procedure to install the Bluetooth module and cable.

## USB board



**NOTE:** The USB board does not include the USB board cable. The USB board cable is included in the Cable Kit, spare part number 665593-001.

Description	Spare part number
USB board	665331-001

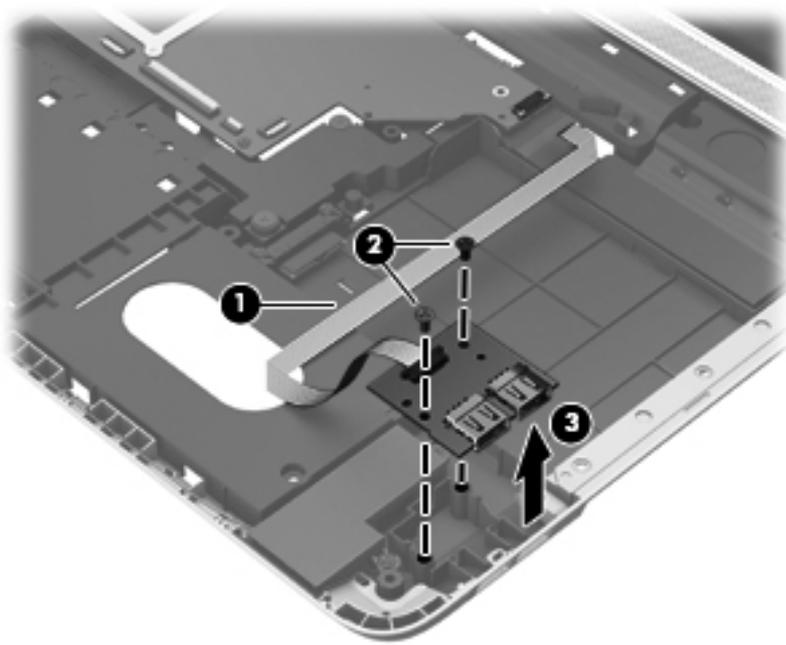
Before removing the USB board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

Remove the USB board:

1. Detach the USB board cable **(1)** from the base enclosure. (The USB board cable is attached to the base enclosure with double-sided tape.)
2. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the USB board to the base enclosure.

3. Remove the USB board **(3)** and cable.



Reverse this procedure to install the USB board and cable.

## Front speakers

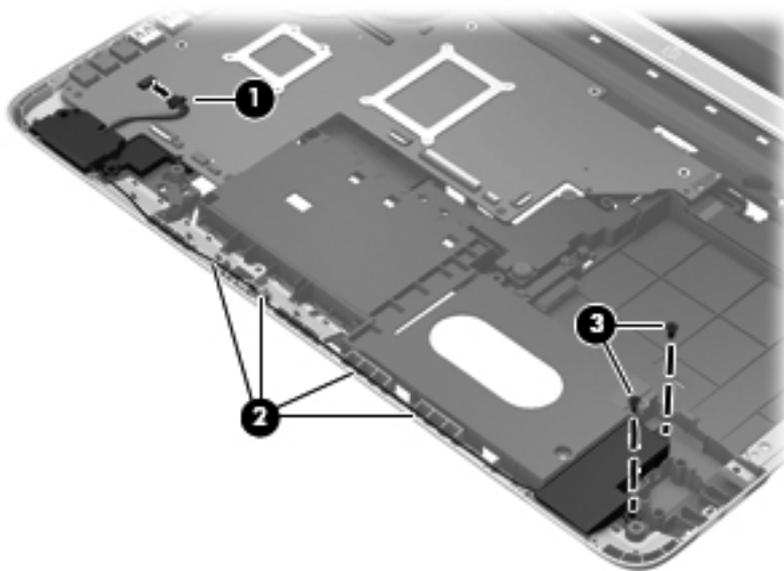
 **NOTE:** The front speakers are included in the Speaker Kit, spare part number 665610-001.

Before removing the front speakers, 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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))
  - USB board (see [USB board on page 76](#))

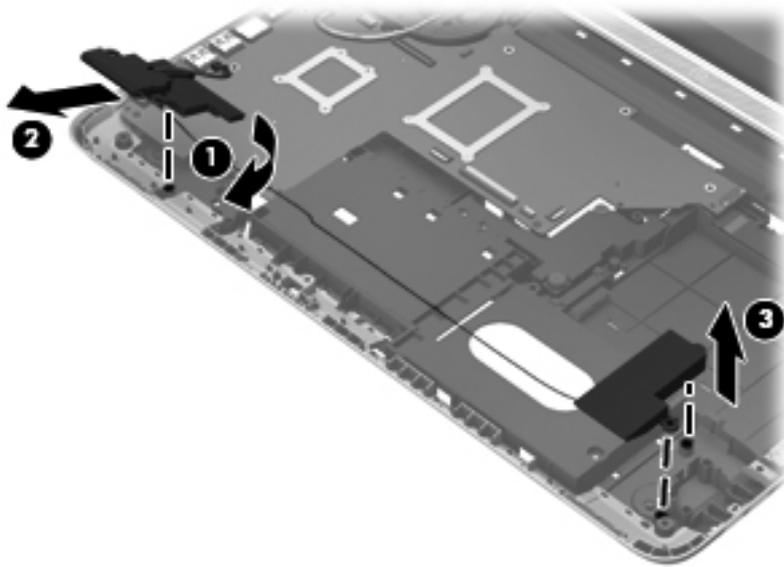
Remove the front speakers and cables:

1. Disconnect the front speaker cable **(1)** from the system board.
2. Release the front speaker cable from the clips **(2)** and routing channel built into the base enclosure.
3. Remove the two Phillips PM2.5×5.0 screws **(3)** that secure the front right speaker to the base enclosure.



4. Rotate the front left speaker **(1)** clockwise to release it from under the system board.

5. Remove the front left speaker **(2)**.
6. Remove the front right speaker **(3)**.



Reverse this procedure to install the front speakers and cables.

## Power connector cable

Description	Spare part number
Power connector cable	665596-001

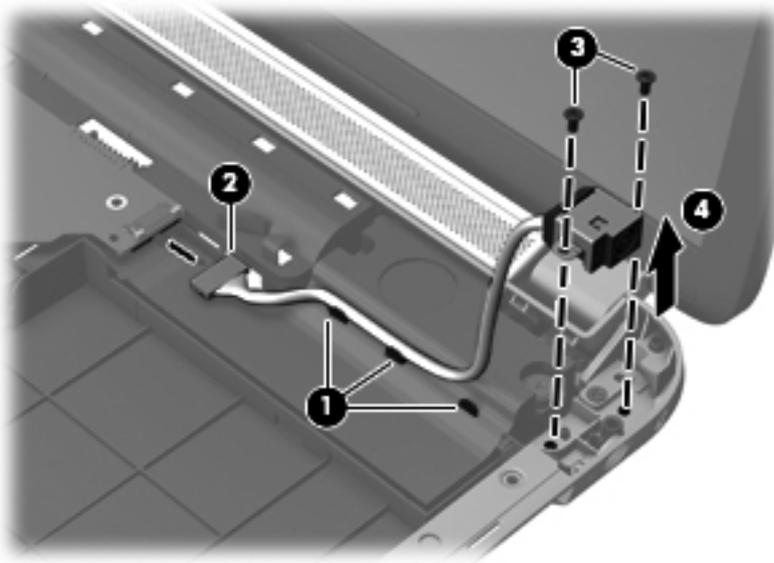
Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

Remove the power connector cable:

1. Release the power connector cable from the clips **(1)** built into the base enclosure.
2. Disconnect the power connector cable **(2)** from the system board.
3. Remove the two Phillips PM2.0×4.0 screws **(3)** that secure the power connector to the base enclosure.

- Remove the power connector **(4)** from the base enclosure.



Reverse this procedure to install the power connector cable.

## System board

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

Description	Spare part number
For use only with computer models equipped with an AMD processor:	
For use only with computer models equipped with a graphics subsystem with discrete memory	666520-001
For use only with computer models equipped with a graphics subsystem with UMA memory	666518-001
For use only with computer models equipped with an Intel processor:	
For use only with computer models equipped with the Intel 6770 chipset, a quad core processor, and a graphics subsystem with 2048-MB of discrete memory	665991-001
For use only with computer models equipped with the Intel 6770 chipset, a dual core processor, and a graphics subsystem with 2048-MB of discrete memory	665992-001
For use only with computer models equipped with the Intel 6770 chipset, a quad core processor, and a graphics subsystem with 1024-MB of discrete memory	665988-001
For use only with computer models equipped with the Intel 6770 chipset, a dual core processor, and a graphics subsystem with 1024-MB of discrete memory	665989-001
For use only with computer models equipped with the Intel 6490 chipset, a quad core processor, and a graphics subsystem with 1024-MB of discrete memory	665986-001
For use only with computer models equipped with the Intel 6490 chipset, a dual core processor, and a graphics subsystem with 1024-MB of discrete memory	665987-001
For use only with computer models equipped with the Intel HM65 chipset, a quad core processor, and a graphics subsystem with UMA memory	665993-001

Description	Spare part number
For use only with computer models equipped with the Intel HM65 chipset, a dual core processor, and a graphics subsystem with UMA memory	665990-001
Thermal Material Kit (includes replacement thermal pads and paste):	
For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory	665286-001
For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory	665285-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with 2048-MB of discrete memory	665355-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with 1024-MB of discrete memory	665354-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with UMA memory	665353-001

Before removing the system board, follow these steps:

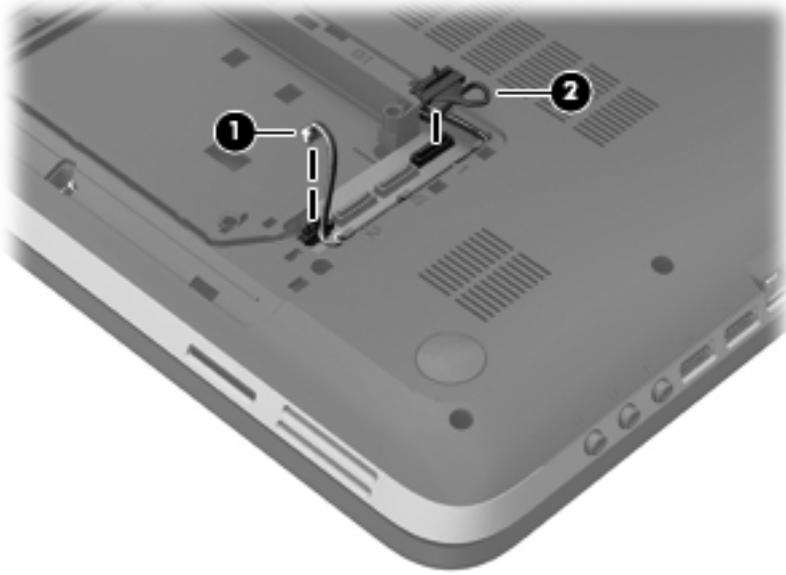
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - WLAN module (see [WLAN module on page 56](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))

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 55](#))
- RTC battery (see [RTC battery on page 54](#))
- Fan and heat sink (see [Fan/heat sink assembly on page 85](#))
- Processor (see [Processor on page 89](#))

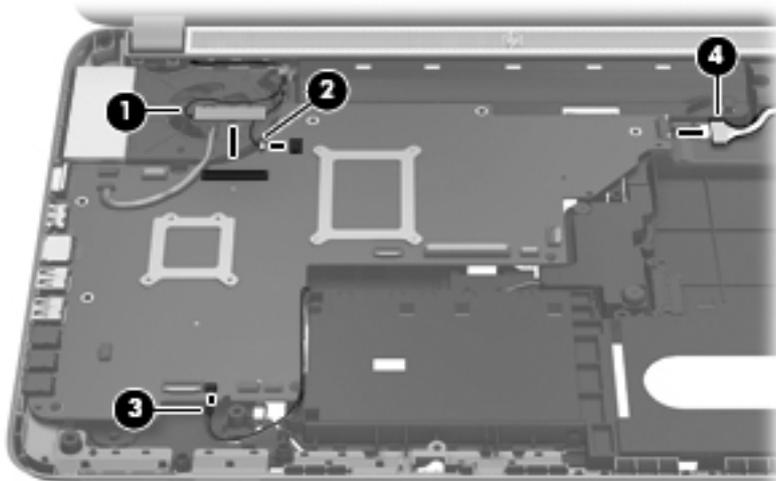
Remove the system board:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the rear speaker cable **(1)** and the optical drive cable **(2)** from the system board.

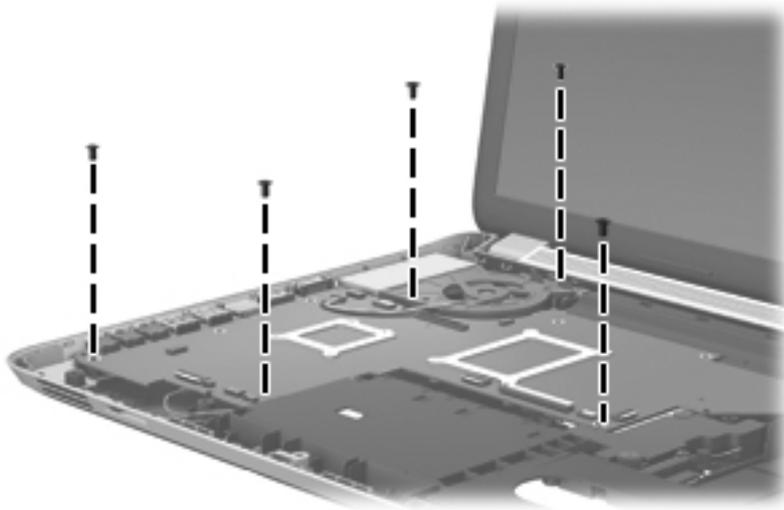


4. Turn the computer right side up, with the front toward you.
5. Open the computer.

6. Disconnect the following cables from the system board:
  - (1) Display panel cable
  - (2) Webcam/microphone cable
  - (3) Subwoofer cable
  - (4) Power connector cable

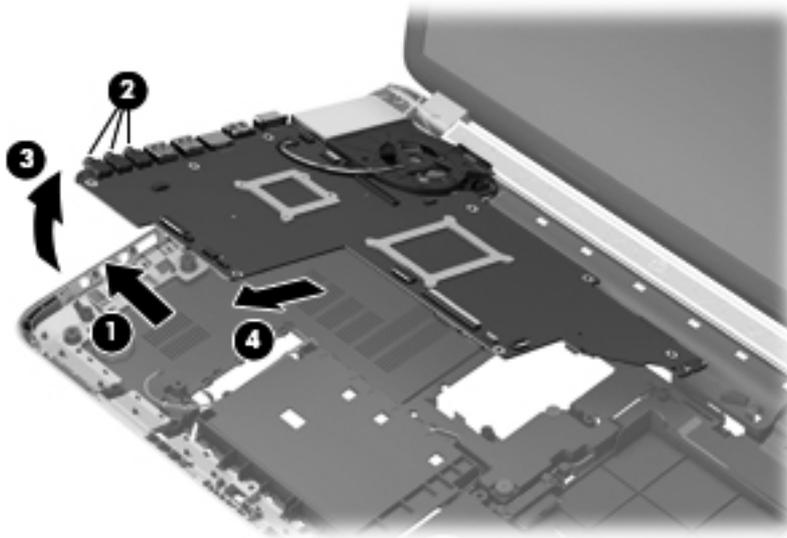


7. Remove the five Phillips PM2.5×5.0 screws that secure the system board to the base enclosure.



8. Flex the left side (1) of the base enclosure outward to allow the audio connectors (2) to clear the openings in the base enclosure.
9. Lift the front edge of the system board (3) until it rests at an angle.

10. Remove the system board (4) by sliding it up and forward at an angle.



Reverse this procedure to install the system board.

## Fan/heat sink assembly

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

Description	Spare part number
For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete memory	666527-001
For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA memory	666526-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with 2048-MB of discrete memory	666391-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with 1024-MB of discrete memory	666390-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with UMA memory	666392-001

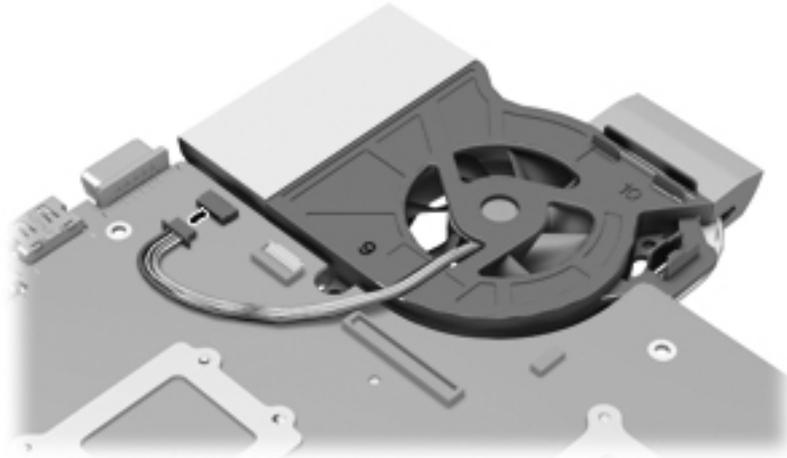
 **NOTE:** To properly ventilate the computer, allow at least 7.6 cm (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These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

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - WLAN module (see [WLAN module on page 56](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))
  - System board (see [System board on page 81](#))

Remove the fan/heat sink assembly:

1. Disconnect the fan cable from the system board.



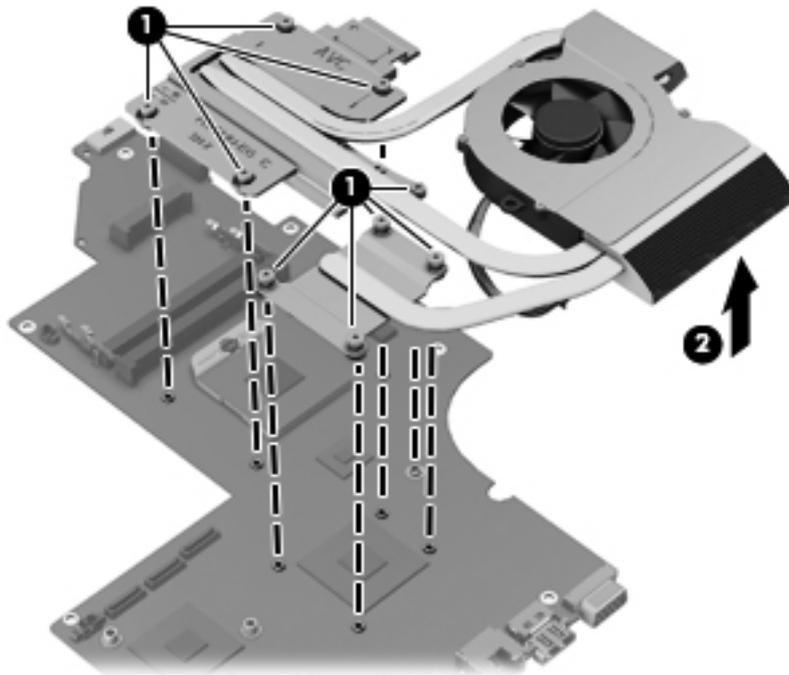
2. Turn the system board upside down, with the front toward you.

 **NOTE:** Steps 3 and 4 apply to computer models equipped with an AMD processor. See steps 5 and 6 for fan/heat sink assembly removal information for computer models equipped with an Intel processor.

3. Following the 1 through 9 sequence indicated on the heat sink, loosen the nine captive screws (**1**) that secure the fan/heat sink assembly to the system board.

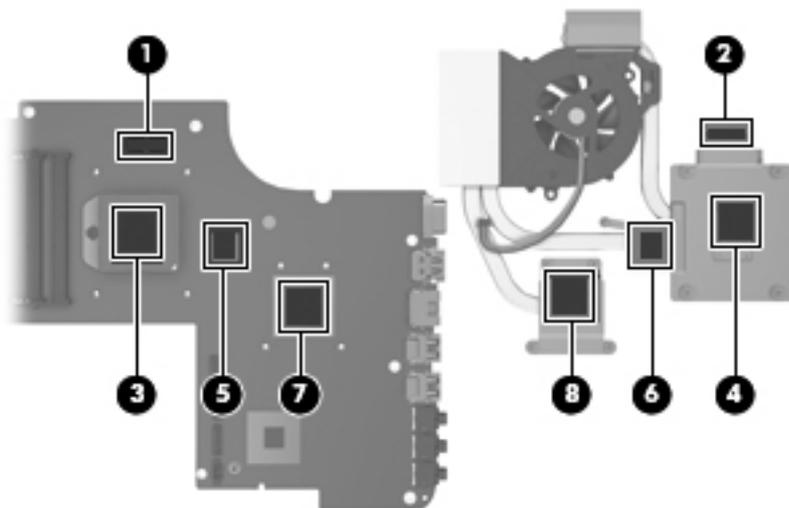
 **NOTE:** Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the fan/heat sink assembly from side to side to detach it.

4. Remove the fan/heat sink assembly **(2)**.



**NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is included with the fan/heat sink assembly, processor, and system board spare part kits.

- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- A thermal pad is used on the Northbridge chip **(3)** and the heat sink section **(4)** that services it
- A thermal pad is used on the graphics subsystem chip **(5)** and the heat sink section **(6)** that services it (only on computer models equipped with a graphics subsystem with discrete memory)



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 **NOTE:** Steps 5 and 6 apply to computer models equipped with an Intel processor. See steps 3 and 4 for fan and heat sink removal information for computer models equipped with an AMD processor.

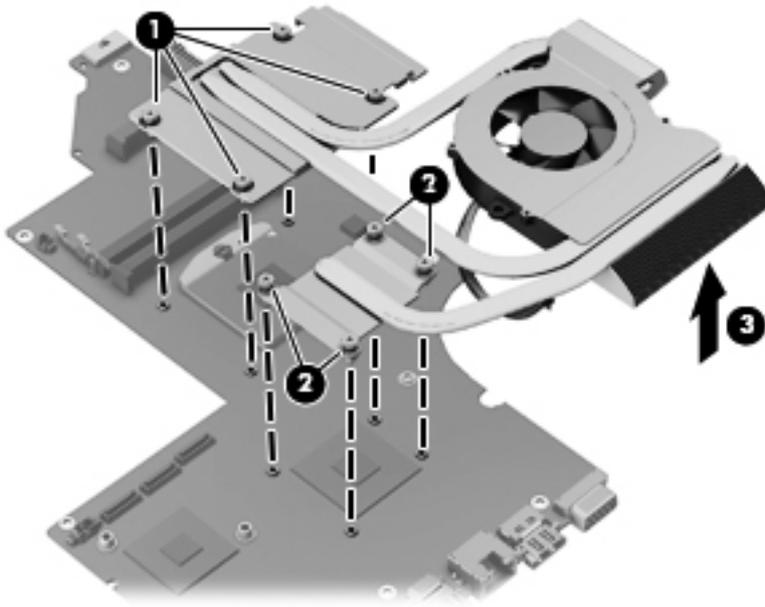
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5. Following the 1 through 8 sequence indicated on the heat sink, loosen the eight screws **(1)** that secure the fan/heat sink assembly to the system board.

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

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6. Remove the fan/heat sink assembly **(2)**.

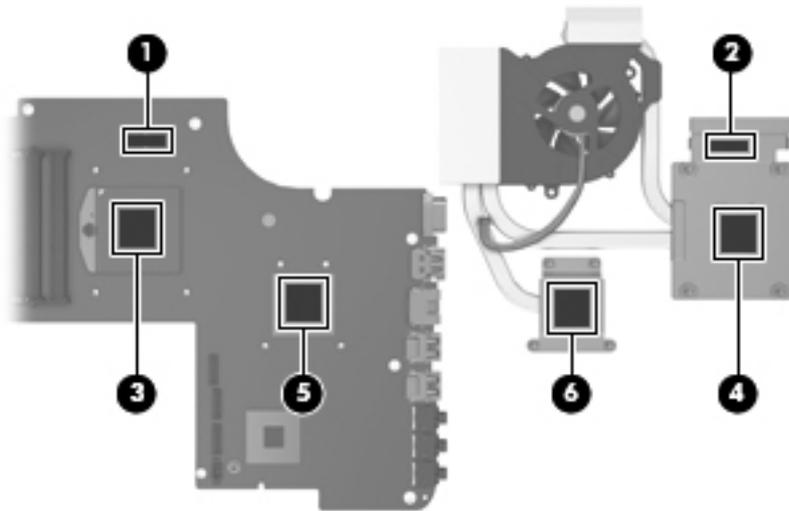


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 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is included with the fan/heat sink assembly, processor, and system board spare part kits.

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- A thermal pad is used on the capacitors **(1)** and the heat sink section **(2)** that services them
- Thermal paste is used on the processor **(3)** and the heat sink section **(4)** that services it
- A thermal pad is used on the graphics subsystem chip **(5)** and the heat sink section **(6)** that services it (only on computer models equipped with a graphics subsystem with discrete memory)



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

## Processor

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

Description	Spare part number
AMD A8-3550MX 2.70-GHz processor (2.00-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669691-001
AMD A8-3530MX 2.60-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	653364-001
AMD A8-3520M 2.50-GHz processor (1.60-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669690-001
AMD A8-3510MX 2.50-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	653358-001
AMD A8-3500M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 35 W)	653350-001
AMD A6-3430MX 2.40-GHz processor (1.70-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669689-001
AMD A6-3420M 2.40-GHz processor (1.50-GHz FSB, 4.0-MB L2 cache, quad core, 45 W)	669688-001
AMD A6-3410MX 2.30-GHz processor (1.60-GHz FSB, 2.0-MB L2 cache, quad core, 45 W)	653357-001
AMD A6-3400M 2.30-GHz processor (1.40-GHz FSB, 4.0-MB L2 cache, quad core, 35 W)	653349-001
AMD A4-3330MX 2.60-GHz processor (2.40-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	669687-001
AMD A4-3320MX 2.60-GHz processor (2.00-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	669686-001
AMD A4-3310MX 2.50-GHz processor (2.10-GHz FSB, 2.0-MB L2 cache, dual core, 45 W)	653356-001
AMD A4-3305M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 45 W)	672093-001
AMD A4-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W)	653348-001
AMD E2-3300M 2.50-GHz processor (1.90-GHz FSB, 4.0-MB L2 cache, dual core, 35 W)	653351-001
Intel Core i7-2860QM 2.50-GHz (SC turbo up to 3.60-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W)	666175-001

Description	Spare part number
Intel Core i7-2820QM 2.30-GHz (SC turbo up to 3.10-GHz) processor (1600-MHz FSB, 8.0-MB L3 cache, quad core, 45 W)	634694-001
Intel Core i7-2760QM 2.40-GHz (SC turbo up to 3.50-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	666174-001
Intel Core i7-2720QM 2.20-GHz (SC turbo up to 3.00-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	631254-001
Intel Core i7-2670QM 2.20-GHz (SC turbo up to 3.10-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	665116-001
Intel Core i7-2640M 2.80-GHz (SC turbo up to 3.50-GHz) processor (1333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W)	666173-001
Intel Core i7-2630QM 2.00-GHz (SC turbo up to 2.90-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad core, 45 W)	635501-001
Intel Core i7-2620M 2.70-GHz (SC turbo up to 3.40-GHz) processor (1333-MHz FSB, 4.0-MB L3 cache, dual core, 35 W)	631252-001
Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (1333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W)	631255-001
Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (1333-MHz FSB, 3.0-MB L3 cache, dual core, 35 W)	631253-001
Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W)	653341-001
Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W)	653340-001
Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, dual core, 35 W)	653339-001
Intel Pentium B960 TJ85 2.20-GHz processor (2.0-MB L3 cache, dual core, 35 W)	664662-001
Intel Pentium B950 TJ85 2.10-GHz processor (2.0-MB L3 cache, dual core, 35 W)	653338-001

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - WLAN module (see [WLAN module on page 56](#))
  - Keyboard (see [Keyboard on page 59](#))

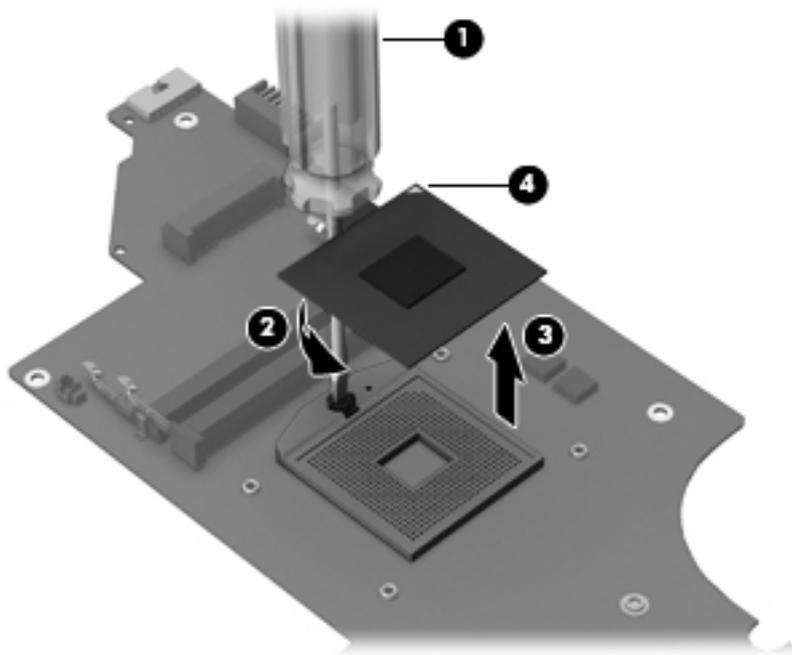
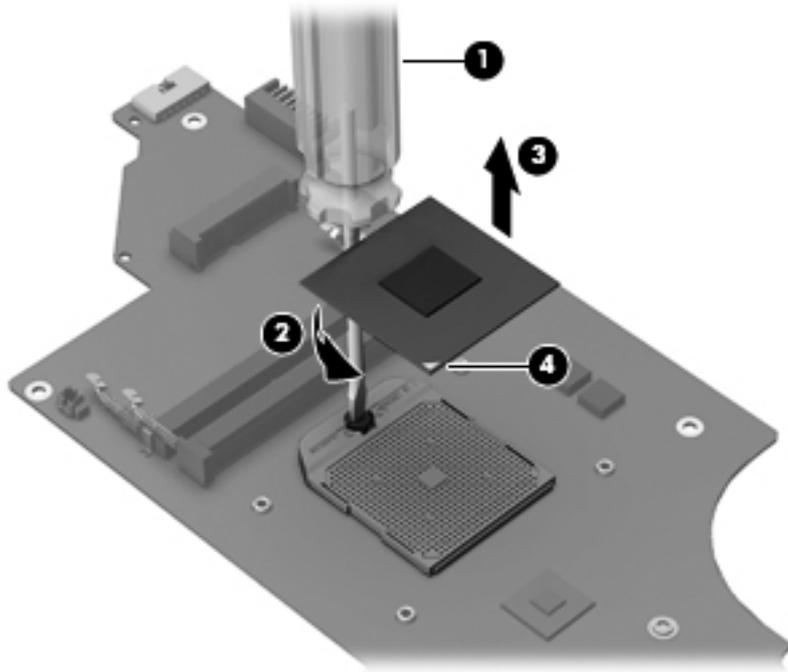
- Top cover (see [Top cover on page 62](#))
- System board (see [System board on page 81](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 85](#))

Remove the processor:

1. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise **(2)**, until you hear a click.

2. Lift the processor **(3)** straight up, and remove it.

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



Reverse this procedure to install the processor.

## Optical drive cable

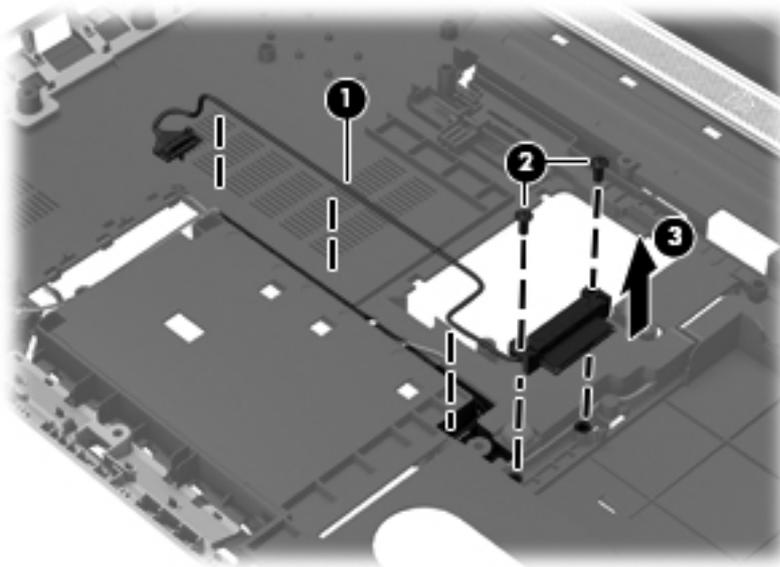
 **NOTE:** The optical drive cable is included in the optical drive spare part kit. The optical drive cable includes the optical drive connector.

Before removing the optical drive cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))
  - System board (see [System board on page 81](#))

Remove the optical drive cable:

1. Release the optical drive cable **(1)** from the clips and routing channel built into the base enclosure.
2. Remove the two Phillips PM2.0×7.0 screws **(2)** that secure optical drive connector to the base enclosure.
3. Remove the optical drive cable **(2)** from the base enclosure.



Reverse this procedure to install the optical drive cable.

## Rear speakers

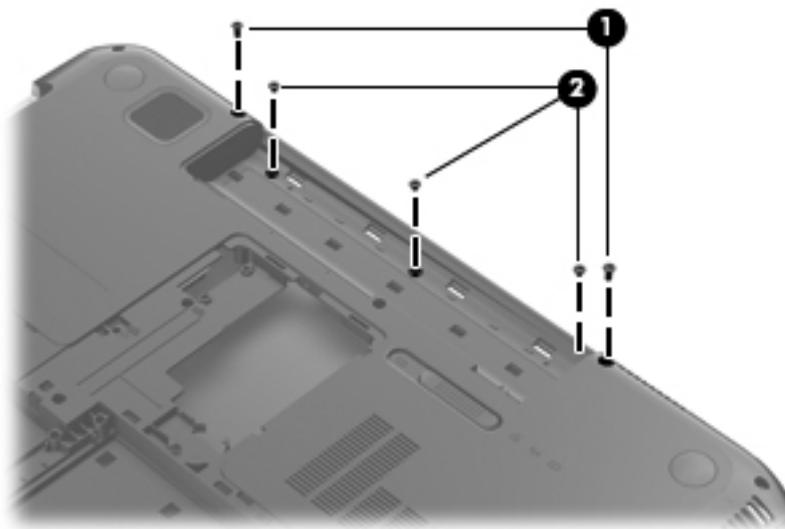
 **NOTE:** The rear speakers are included in the Speaker Kit, spare part number 665610-001.

Before removing the rear speakers, 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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - WLAN module (see [WLAN module on page 56](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))
  - System board (see [System board on page 81](#))

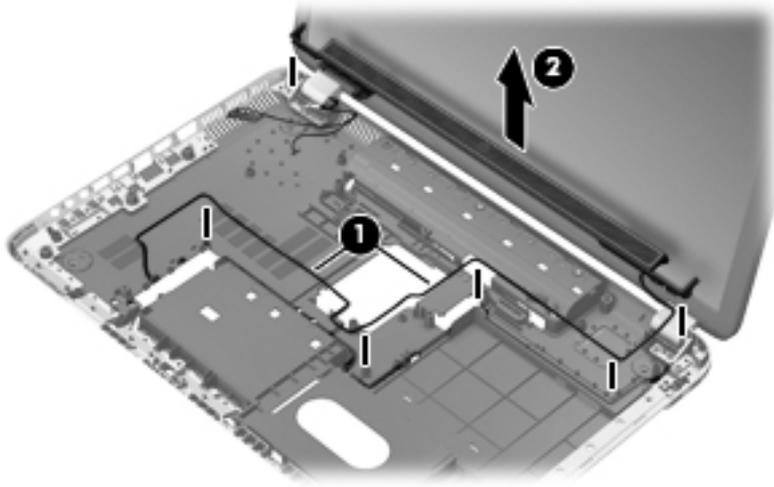
Remove the rear speakers and cables:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Remove the two Phillips PM2.5×5.0 screws **(1)** and the three Phillips PM2.5×3.0 screws **(2)** that secure the rear speakers to the computer.



4. Turn the computer right side up, with the front toward you.

5. Open the computer.
6. Release the rear speaker cable from the clips **(1)** and the routing channel built into the base enclosure. Remove the rear speaker **(2)**.



Reverse this procedure to install the rear speakers and cables.

## Subwoofer

Description	Spare part number
Subwoofer (includes isolators and cable)	665611-001

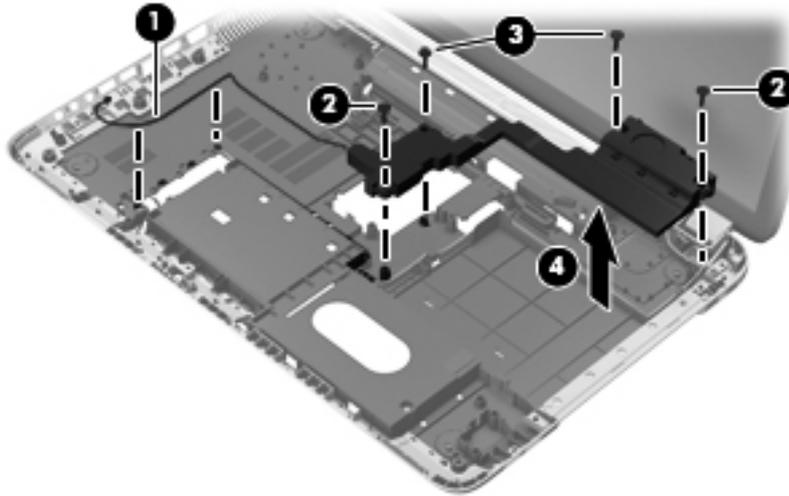
Before removing the subwoofer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - WLAN module (see [WLAN module on page 56](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))
  - System board (see [System board on page 81](#))
  - Rear speakers (see [Rear speakers on page 94](#))

Remove the rear subwoofer and cables:

1. Release the subwoofer cable **(1)** from the clips and routing channel built into the base enclosure.
2. Remove the two Phillips PM2.0×4.0 screws **(2)** and the two Phillips PM2.0×11.0 screws **(3)** that secure the subwoofer to the computer.

3. Remove the subwoofer **(4)** and cables.



Reverse this procedure to install the subwoofer and cables.

## Display assembly

 **NOTE:** The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

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 47](#)), and then remove the following components:
  - Optical drive (see [Optical drive on page 48](#))
  - Hard drive (see [Hard drive on page 51](#))
  - WLAN module (see [WLAN module on page 56](#))
  - Keyboard (see [Keyboard on page 59](#))
  - Top cover (see [Top cover on page 62](#))
  - System board (see [System board on page 81](#))
  - Rear speakers (see [Rear speakers on page 94](#))

Remove the display assembly:

1. Release the wireless antenna cables from the clips **(1)** and the opening in the base enclosure.

---

**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.

---

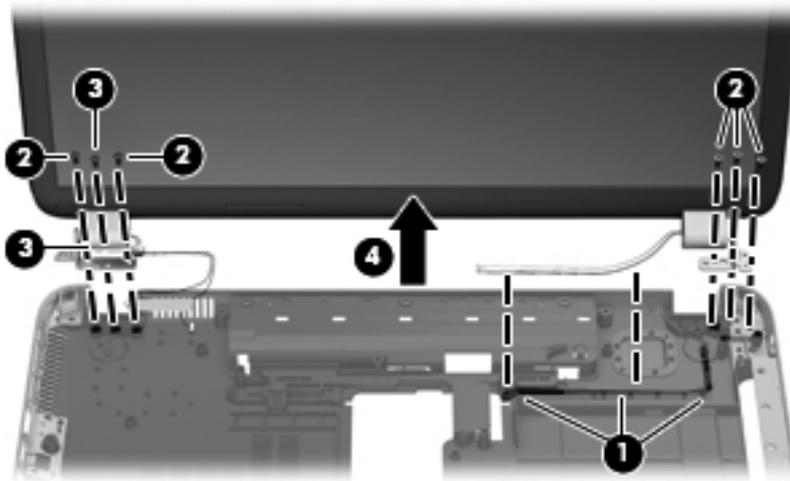
2. Remove the six Phillips PM2.5×5.0 screws **(2)** and **(3)** that secure the display assembly to the computer.

---

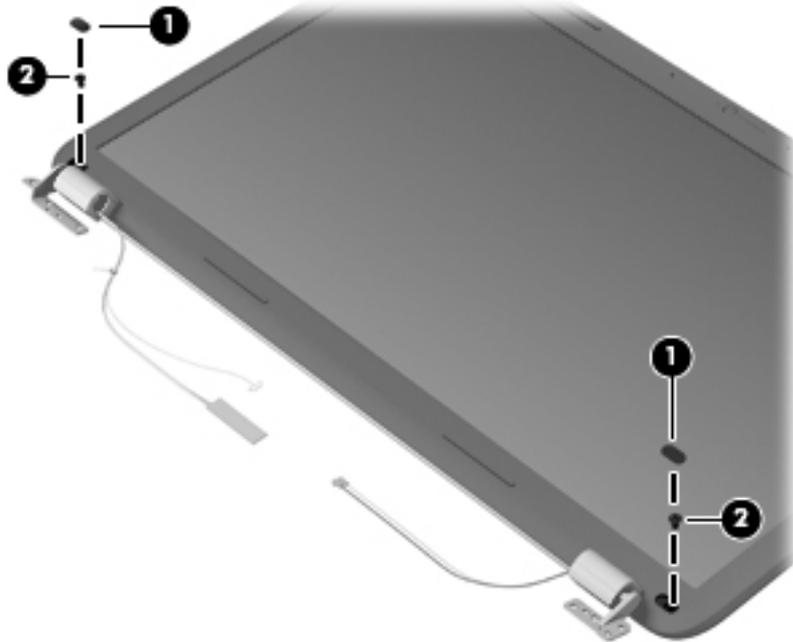
**NOTE:** The middle screw **(3)** on the left hinge secures the display panel cable ground loop to the hinge.

---

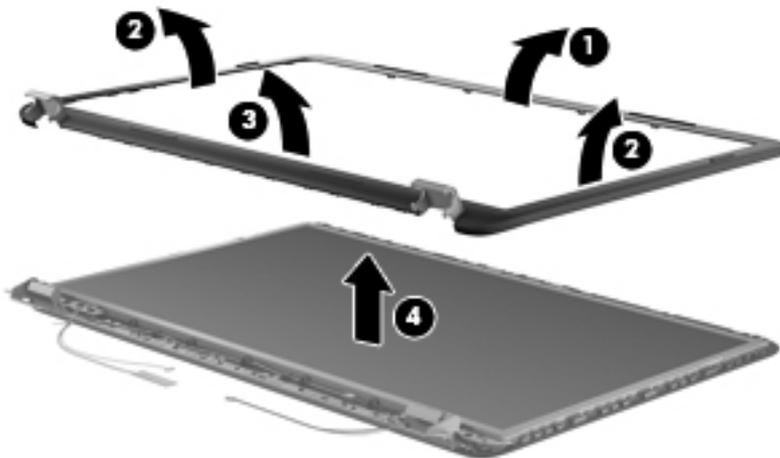
3. Remove the display assembly **(4)**.



4. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
- a. Remove the Mylar screw covers **(1)** and the two Phillips PM2.5×5.0 screws **(2)** that secure the display bezel to the display assembly.

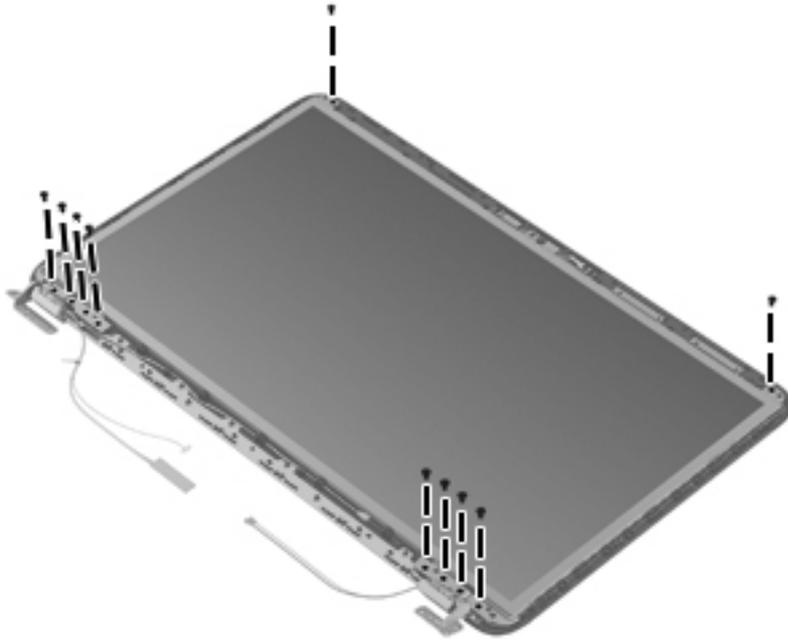


- b. Flex the inside edges of the top edge **(1)**, the left and right sides **(2)**, and the bottom edge **(3)** of the display bezel until the bezel disengages from the display enclosure.
- c. Remove the display bezel **(4)**. The display bezel is available using spare part number 665592-001.

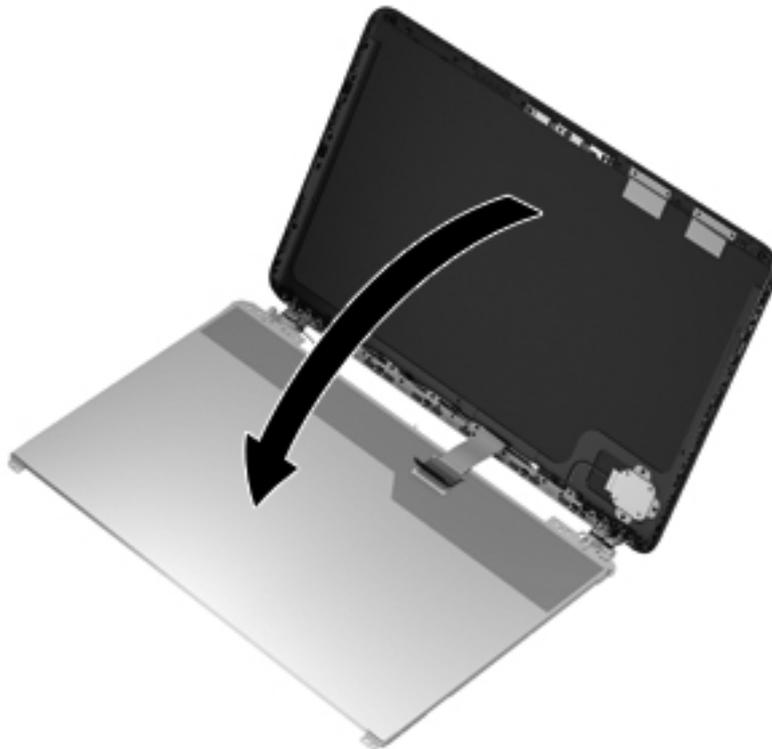


**5.** If it is necessary to replace the display panel:

- a.** Remove the ten Phillips PM2.5×5.0 screws that secure the display panel to the display enclosure.

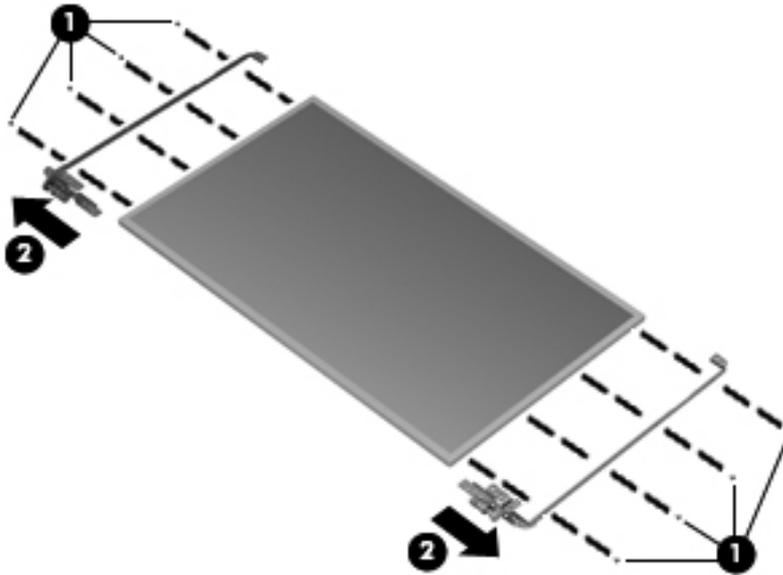


- b.** Lift the top edge of the display panel, and then swing it up and forward until it rests upside down in front of the display enclosure.



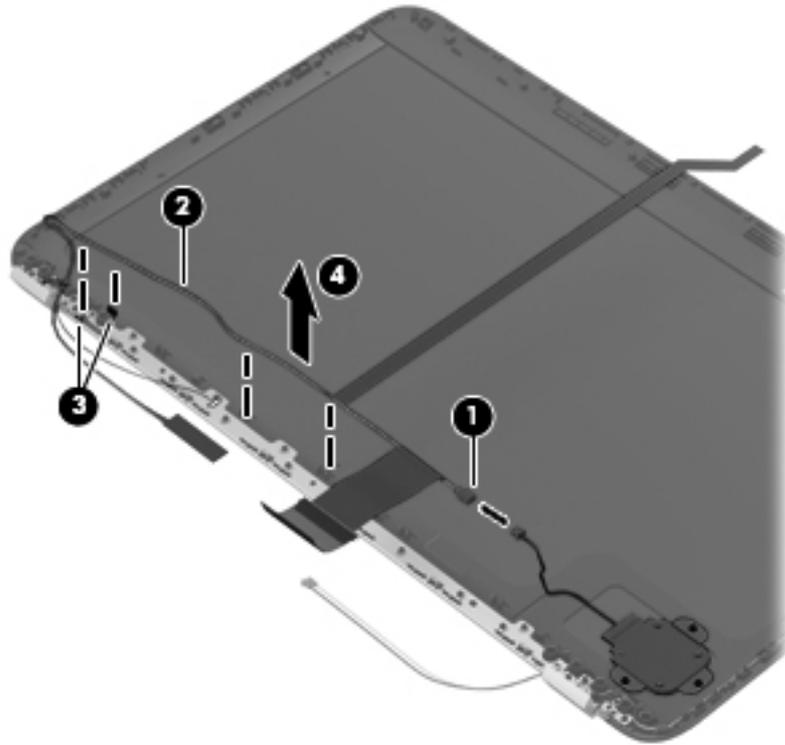


7. If it is necessary to replace the display hinges:
  - a. Remove the eight Phillips PM2.0×3.0 screws **(1)** that secure the display hinges to the display panel.
  - b. Remove the display hinges **(2)**. The display hinges include the display hinges and brackets and are available using spare part number 665599-001.



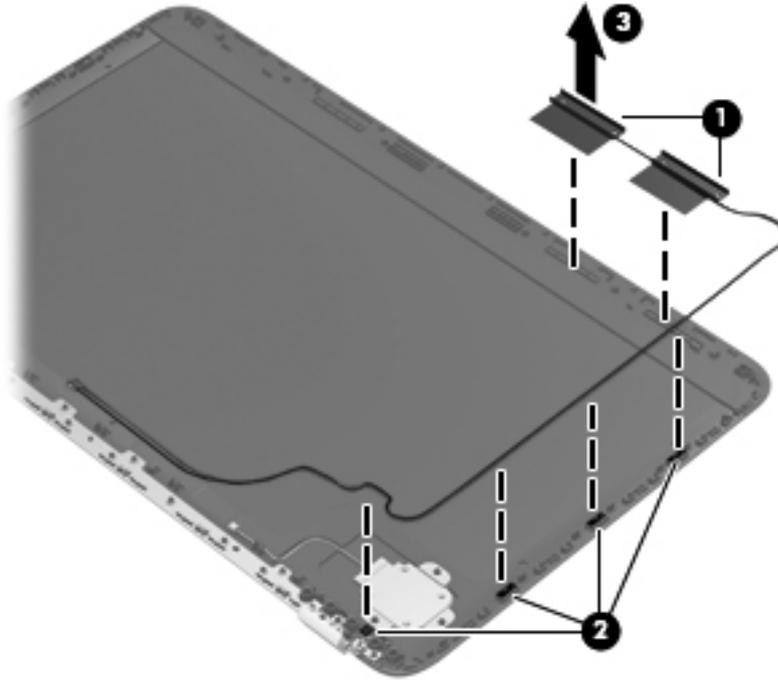
8. If it is necessary to replace the display panel cable:
  - a. Disconnect the display logo light cable **(1)** from the display panel cable.
  - b. Release the display panel cable **(2)** from the clips **(3)** built into the display enclosure.

- c. Remove the display panel cable **(4)**. The display panel cable includes the webcam/microphone module cable and is available in the Display Cable Kit, spare part number 665594-001.



- 9. If it is necessary to replace the wireless antenna cables and transceivers:
  - a. Release the wireless antenna transceivers **(1)** from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)
  - b. Release the wireless antenna cables from the clips **(2)** built into the display enclosure.

- c. Remove the wireless antenna cables and transceivers **(3)**. The wireless antenna cables and transceivers are available in the Antenna Kit, spare part number 665591-001.



Reverse this procedure to reassemble and install the display assembly.

---

# 5 Setup Utility (BIOS) and System Diagnostics

## Using Setup Utility

Setup Utility, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Setup Utility includes settings for the types of peripherals installed, the startup sequence of the computer, and the amount of system and extended memory.

 **NOTE:** Use extreme care when making changes in Setup Utility. Errors can prevent the computer from operating properly.

---

## Starting Setup Utility

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

---

To start Setup Utility, 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 Setup Utility.

## Changing the language of Setup Utility

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

Your change takes effect immediately.

## Navigating and selecting in Setup Utility

To navigate and select in Setup Utility, 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 Setup Utility 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 Setup Utility.

---

2. Press **f10** to enter Setup Utility.

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

- To exit Setup Utility 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**.

- To save your changes and exit Setup Utility 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.

## Displaying system information

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

## Restoring factory settings in Setup Utility

---

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

---

To return all settings in Setup Utility 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 Setup Utility.
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.

---

## Exiting Setup Utility

- To exit Setup Utility and save your changes from the current session:  
If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.
- To exit Setup Utility without saving your changes from the current session:  
If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## Updating the BIOS

Updated versions of the BIOS may be available on the HP Web site.

Most BIOS updates on the HP Web site are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named *Readme.txt*, which contains information regarding installing and troubleshooting the file.

## Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than those currently installed on the computer, you need to know the version of the system BIOS currently installed.

BIOS version information (also known as ROM date and System BIOS) can be displayed by pressing **fn +esc** (if you are already in Windows) or by using Setup Utility.

1. Start Setup Utility.
2. Use a pointing device or the arrow keys to select **File > System Information**.
3. To exit Setup Utility 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**.

## Downloading a BIOS update

 **CAUTION:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:

Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep or Hibernation.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

1. **Windows 7**—Select **Start > Help and Support > Maintain**.

**Windows XP**—Select **Start > Help and Support**, and then select the software and drivers update.

2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
  - a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
  - b. Follow the on-screen instructions to download your selection to the hard drive. Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

 **NOTE:** If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. **Windows 7**—Open Windows Explorer by selecting **Start > Computer**.  
**Windows XP**—Open Windows Explorer by selecting **Start > My Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename.exe*).  
The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.



---

**NOTE:** After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

---

## Using System Diagnostics

System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The following diagnostic tests are available in System Diagnostics:

- Start-up test—This test analyzes the main computer components that are required to start the computer.
- Run-in test—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.
- Hard disk test—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.
- Memory test—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.
- Battery test—This test analyzes the condition of the battery. If the battery fails the test, contact HP support to report the issue and purchase a replacement battery.

You can also view system information and error logs in the System Diagnostics window.

To start System Diagnostics:

1. Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



---

**NOTE:** If you need to stop a diagnostics test while it is running, press **esc**.

---

# 6 Specifications

## Device specifications

	Metric	U.S.
<b>Dimensions</b>		
Width	<b>41.6 cm</b>	16.4 in
Depth	<b>27.5 cm</b>	10.8 in
Height (front to rear)	<b>3.2-3.6 cm</b>	1.2-1.4 in
<b>Weight</b>	3.43 kg	7.57 lb
<b>Input power</b>		
Operating voltage	18.5 V dc @ 3.5 A - 65 W or 19 V dc @ 4.74 A - 90 W	
Operating current	3.5 A or 4.74 A	
<b>Temperature</b>		
Operating	<b>5°C to 35°C</b>	41°F to 95°F
Nonoperating	<b>-20°C to 6°C</b>	-4°F to 140°F
<b>Relative humidity</b> (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		
Operating	<b>-15 m to 3,048 m</b>	-50 ft to 10,000 ft
Nonoperating	<b>-15 m to 12,192 m</b>	-50 ft to 40,000 ft
<b>NOTE:</b> Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

## 17.3-inch display specifications

	<b>Metric</b>	<b>U.S.</b>
<b>Dimensions</b>		
Height	<b>21.7 cm</b>	8.54 in
Width	<b>38.4 cm</b>	15.12 in
Diagonal	<b>43.9 cm</b>	17.29 in
<b>Number of colors</b>	Up to 16.8 million	
<b>Contrast ratio</b>	200:1 (typical)	
<b>Brightness</b>	180 nits (typical)	
<b>Pixel resolution</b>		
Pitch	<b>0.197 × 0.197 mm</b>	
Format	1600 × 900	
Configuration	RGB vertical stripe	
<b>Backlight</b>	LED	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b> (varies by display)	2.0 W	
<b>Viewing angle</b>	±65° horizontal, ±50° vertical (typical)	

## Hard drive specifications

	1-TB*	750-GB**	640-GB**	500-GB**	320-GB**
<b>Dimensions</b>					
Height	12.7 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Length	100.2 mm	100.2 mm	100.2 mm	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm	69.9 mm	69.9 mm
Weight	152 g	98 g	98 g	110 g	110 g
<b>Interface type</b>	SATA (3 GB/sec)	SATA	SATA	SATA	SATA
<b>Transfer rate</b>					
Synchronous (maximum)	97 MB/sec	97 MB/sec	106 MB/sec	1.1 GB/sec (internal)	1.1 GB/sec (internal)
Security	ATA security	ATA security	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)					
Single track	2 ms	2 ms	1.5 ms	1.5 ms	1.5 ms
Average (read/write)	12/16 ms	12/16 ms	12/13 ms	11/13 ms	11/13 ms
Maximum	21 ms	21 ms	24 ms	22 ms	22 ms
<b>Logical blocks</b>	1,953,525,168	1,465,149,168	1,250,263,728	976,773,168	628,142,448
<b>Disk rotational speed</b>	5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm
<b>Operating temperature</b>	0°C to 60°C (32°F to 140°F)				
*1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.					
**1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.					
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.					

---

# 7 Backup and recovery

Your computer includes tools provided by the operating system and HP to help you safeguard your information and restore it if ever needed.

This chapter provides information on the following topics:

- Creating a set of recovery discs or a recovery flash drive (Recovery Manager software feature)
- Performing a system restore (from the partition, recovery discs, or a recovery flash drive)
- Backing up your information
- Recovering a program or driver

## Restore

In the event of hard drive failure, to restore your system to its factory image you will need a set of recovery discs or a recovery flash drive that you can create using HP Recovery Manager. HP recommends that you use this software to create either a set of recovery discs or a recovery flash drive immediately after software setup.

If for some other reason you need to restore your system, this can be achieved using the HP Recovery partition (select models only), without the need for recovery discs or a recovery flash drive. To check for the presence of a recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

---

 **CAUTION:** HP Recovery Manager (partition, or discs/flash drive) restores only software that was preinstalled at the factory. Software not provided with this computer must be reinstalled manually.

 **NOTE:** Recovery discs have been included if your computer does not have a recovery partition.

---

# Creating restore media

HP recommends that you create either a set of recovery discs or a recovery flash drive to be sure that you can restore your computer to its original factory state if the hard drive fails, or if for any reason you cannot restore using the recovery partition tools. Create these discs or the flash drive after setting up the computer for the first time.

---

 **NOTE:** HP Recovery Manager allows the creation of only one set of recovery discs or one recovery flash drive. Handle these discs or flash drive carefully and keep them in a safe place.

 **NOTE:** If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP Web site. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.

---

Guidelines:

- Purchase high-quality DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs.

---

 **NOTE:** Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs, are not compatible with the Recovery Manager software.

---

- The computer must be connected to AC power during this process.
- Only one set of recovery discs or one recovery flash drive can be created per computer.

---

 **NOTE:** If you are creating recovery discs, number each disc before inserting into the optical drive.

---

- If necessary, you can exit the program before you have finished creating the recovery discs or recovery flash drive. The next time you open Recovery Manager, you will be prompted to continue the backup creation process.

To create a set of recovery discs or a recovery flash drive:

1. Select **Start > All Programs > Recovery Manager > Recovery Media Creation**.
2. Follow the on-screen instructions.

# Performing a system restore

Recovery Manager software allows you to repair or restore the computer to its original factory state. Recovery Manager works from recovery discs, a recovery flash drive, or from a dedicated recovery partition (select models only) on the hard drive.

 **NOTE:** A system restore needs to be performed if the computer hard drive has failed or if all attempts to correct any functional computer issues fail.

A system restore should be used as a final attempt to correct computer issues.

Note the following when performing a system restore:

- You can restore only the system that you have previously backed up. HP recommends that you use HP Recovery Manager to create either a set of recovery discs or a recovery flash drive as soon as you set up the computer.
- Windows has its own built-in repair features, such as System Restore. If you have not already tried these features, try them before using Recovery Manager.
- Recovery Manager restores only software that was preinstalled at the factory. Software not provided with this computer must be downloaded from the manufacturer's Web site or reinstalled from the disc provided by the manufacturer.

## Restoring using the dedicated recovery partition (select models only)

When using the dedicated recovery partition, there is an option to back up pictures, music and other audio, videos and movies, recorded TV shows, documents, spreadsheets and presentations, e-mails, Internet favorites and settings during this process.

To restore the computer from the recovery partition, follow these steps:

1. Access Recovery Manager in either of the following ways:
  - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
  - or –
  - 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. Then, press **f11** while the “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **Recovery Manager** window.
3. Follow the on-screen instructions.

## Restoring using the restore media

1. If possible, back up all personal files.
2. Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.

– or –

Insert the recovery flash drive into a USB port on your computer, and then restart the computer.



---

**NOTE:** If the computer does not automatically restart in the Recovery Manager, the computer boot order needs to be changed.

---

3. Press **f9** at system bootup.
4. Select the optical drive or the flash drive.
5. Follow the on-screen instructions.

## Changing the computer boot order

To change the boot order for recovery discs:

1. Restart the computer.
2. Press **esc** while the computer is restarting, and then press **f9** for boot options.
3. Select **Internal CD/DVD ROM Drive** from the boot options window.

To change the boot order for recovery flash drive:

1. Insert the flash drive into a USB port.
2. Restart the computer.
3. Press **esc** while the computer is restarting, and then press **f9** for boot options.
4. Select the flash drive from the boot options window.

# Backing up and recovering your information

It is very important to back up your files and keep any new software in a safe place. As you add new software and data files, continue to create backups on a regular basis.

How completely you are able to recover your system depends on how recent your backup is.

---

 **NOTE:** A recovery from your most recent backup needs to be performed if the computer has a virus attack or if any major system components fail. In order to correct computer issues, a recovery should first be attempted before a system restore is attempted. You can back up your information to an optional external hard drive, a network drive, or discs.

---

Back up your system at the following times:

- At regularly scheduled times

---

 **TIP:** Set reminders to back up your information periodically.

---

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

Guidelines:

- Create system restore points using the Windows System Restore feature, and periodically copy them to an optical disc or an external hard drive. For more information on using system restore points, refer to **Using Windows system restore points**.
- Store personal files in the Documents library and back up this folder periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to re-enter 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 and print the document.

## Using Windows Backup and Restore

Guidelines:

- Be sure that the computer is connected to AC power before you start the backup process.
- Allow enough time to complete the backup process. Depending on file sizes, it may take over an hour.

To create a backup:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to schedule and create a backup.



---

**NOTE:** Windows includes the User Account Control feature to improve the security of the 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.

---

## Using Windows system restore points

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



---

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

---

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

## When to create restore points

- Before you add or modify software or hardware
- Periodically, whenever the computer is functioning optimally



---

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

---

## Create a system restore point

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Follow the on-screen instructions.

## Restore to a previous date and time

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

1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Click **System Restore**.
5. Follow the on-screen instructions.

---

## 8 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

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.5 m** (5.0 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A 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
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	ISI	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1

Country/region	Accredited agency	Applicable note number
The United States	UL	2
<ol style="list-style-type: none"> <li>1. The flexible cord must be Type HO5VV-F, 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.</li> <li>2. The flexible cord must be Type SVT/SJT 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 ac) configuration. CSA or C-UL mark. UL file number must be on each element.</li> <li>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 VCTF, 3-conductor, 0.75-mm<sup>2</sup> or 1.25-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 ac) configuration.</li> <li>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 CCC certification mark.</li> <li>5. The flexible cord must be Type H05VV-F 3X0.75-mm<sup>2</sup> conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.</li> <li>6. The flexible cord must be Type HVCTF 3x1.25-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.</li> <li>7. For 127 V ac, the flexible cord must be Type SVT or SJT 3 x 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3x0.75-/1.00-mm<sup>2</sup> conductor size, with plug BS 1363/A with BSI or ASTA marks.</li> </ol>		

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## 9 Recycling

When a non-rechargeable or rechargeable 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 battery disposal.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP Web site at <http://www.hp.com/recycle>.

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# Index

- A**
  - AC adapter light 19
  - AC adapter, spare part numbers 32, 34
  - Action keys 13
  - antenna
    - locations 16
    - removal 103
    - spare part number 30, 36, 104
  - Antenna Kit, spare part number 30, 36, 104
  - audio, product description 6
  - audio-in jack 18
  - audio-out jack 18
- B**
  - b key 13
  - base enclosure, spare part number 27, 37
  - battery
    - removal 47
    - spare part numbers 28, 34, 35, 47
  - battery bay 20
  - battery release latch 20
  - bezel
    - spare part number 36
  - Blu-ray Disc R/RW FX SuperMulti Drive
    - removal 48
    - spare part number 28, 32, 39, 48
  - Blu-ray Disc R/RW with SuperMulti DVD±R/RW Double-Layer Drive with LightScribe
    - precautions 42
- B**
  - Blu-ray Disc ROM FX SuperMulti DVD±R/RW Double-Layer Drive
    - removal 48
    - spare part number 28, 31, 39, 48
  - Blu-ray Disc ROM with SuperMulti DVD±R/RW Double-Layer Drive with LightScribe
    - precautions 42
  - Bluetooth module
    - removal 74
    - spare part number 25, 34, 74
  - Bluetooth module cable
    - removal 75
    - spare part number 25, 37, 74
  - bottom components 20
  - button components 11
  - buttons
    - optical drive eject 19
    - power 11
    - TouchPad 15
    - Web browser 12
- C**
  - Cable Kit, spare part number 36
  - cables, service considerations 41
  - caps lock light 14
  - chipset, product description 3
  - components
    - bottom 20
    - buttons 11
    - display 16
    - front 17
    - keys 12
    - left-side 18
    - lights 14
    - right-side 19
    - TouchPad 15
  - computer feet, locations 47
  - computer major components 23
  - connectors, service considerations 41
- D**
  - device specifications 110
  - Digital Media Slot 17
  - display assembly
    - removal 97
    - spare part number 97
    - subcomponents 30
  - display bezel
    - removal 99
    - spare part number 30, 99
  - Display Cable Kit, spare part number 30, 36, 103
  - display components 16
  - display enclosure, spare part numbers 30, 37
  - Display Hinge Kit, spare part number 30, 37, 102
  - display lid switch board
    - removal 70
    - spare part number 25, 37, 70
  - display panel
    - product description 4
    - removal 100
    - spare part numbers 30, 39, 101
  - display panel cable
    - removal 102
    - spare part number 30, 103
  - Display Rubber Kit, spare part number 30, 37
  - Display Screw Kit, spare part number 30, 37
  - display specifications 111
  - drive light 19
  - drives, preventing damage 42

- DVD±RW Double-Layer FX SuperMulti Drive
  - removal 48
  - spare part number 28, 32, 39, 48
- DVD±RW Double-Layer LightScribe SuperMulti Drive
  - precautions 42
- E**
  - electrostatic discharge 42
  - equipment guidelines 45
  - esc key 12
  - Ethernet, product description 6
  - external media cards, product description 7
  - external monitor port 18
- F**
  - fan/heat sink assembly
    - removal 85
    - spare part numbers 27, 39, 85
  - feet, locations 47
  - fingerprint reader board
    - removal 66
    - spare part number 25, 36, 66
  - fingerprint reader light 14
  - fingerprint reader, location 12
  - fn key 12
  - front components 17
  - front speakers
    - removal 78
    - spare part number 78
- G**
  - graphics, product description 3
  - grounding guidelines 42
  - guidelines
    - equipment 45
    - grounding 42
    - packaging 44
    - transporting 44
    - workstation 44
- H**
  - hard drive
    - precautions 42
    - product description 5
    - removal 51
  - spare part numbers 27, 31, 34, 35, 51
  - specifications 112
  - hard drive bay 20
  - Hard Drive Hardware Kit, spare part number 28, 31, 37, 51
  - HDMI port 18
  - headphone jack 18
  - hinge
    - removal 102
    - spare part number 30, 37, 102
- J**
  - jacks
    - audio-in 18
    - audio-out 18
    - headphone 18
    - microphone 18
    - network 18
    - RJ-45 18
- K**
  - key components 12
  - keyboard
    - product description 8
    - removal 59
    - spare part numbers 24, 38, 39, 59
  - keys
    - Action 13
    - b 13
    - esc 12
    - fn 12
    - num lk 13
    - numeric keypad 13
    - Windows applications 13
    - Windows logo 12
- L**
  - left-side components 18
  - light components 14
  - lights
    - AC adapter 19
    - caps lock 14
    - drive 19
    - fingerprint reader 14
    - mute 14
    - optical drive 19
    - power 14, 19
    - TouchPad off 14, 15
  - TouchPad on 14, 15
  - webcam 16
  - wireless 14
- M**
  - mass storage device
    - precautions 42
    - removal 48
    - spare part numbers 27, 28, 31, 48
  - memory module
    - product description 4
    - removal 55
    - spare part numbers 28, 34, 35, 55
  - microphone
    - locations 16
    - product description 6
  - microphone jack 18
  - model name 1
  - monitor port 18
  - mute light 14
- N**
  - network jack 18
  - num lk key 13
  - numeric keypad 13
- O**
  - operating system, product description 9
  - optical drive
    - location 19
    - precautions 42
    - product description 5
    - removal 48
    - spare part numbers 28, 31, 39, 48
  - optical drive bracket
    - removal 50
  - optical drive cable
    - removal 93
  - optical drive eject button 19
  - optical drive light 19
- P**
  - packaging guidelines 44
  - plastic parts, service considerations 41
  - Plastics Kit, spare part number 37

- pointing device, product description 8
- ports
  - external monitor 18
  - HDMI 18
  - monitor port 18
  - product description 8
  - SuperSpeed USB 18
  - USB 18, 19
- power button 11
- power button board
  - removal 68
  - spare part number 25, 37, 68
- power connector 19
- power connector cable
  - spare part number 25, 37, 80
- power connector cable, removal 80
- power cord
  - set requirements 120
  - spare part numbers 32, 33
- power light 14, 19
- power requirements, product description 8
- processor
  - product description 1
  - removal 89
  - spare part numbers 26, 34, 35, 36, 39, 40, 89
- product description
  - audio 6
  - chipset 3
  - display panel 4
  - Ethernet 6
  - external media cards 7
  - graphics 3
  - hard drives 5
  - keyboard 8
  - memory module 4
  - microphone 6
  - operating system 9
  - optical drive 5
  - pointing device 8
  - ports 8
  - power requirements 8
  - processors 1
  - product name 1
  - security 9
  - serviceability 9
  - video 6
  - wireless 6
- product name 1
- R**
  - rear speakers
    - removal 94
    - spare part number 94
  - remote control, spare part number 32, 33
  - removal/replacement
    - preliminaries 41
    - procedures 46
  - right-side components 19
  - RJ-45 jack 18
  - RTC battery
    - removal 54
    - spare part number 28, 37, 54
- S**
  - Screw Kit, spare part number 33, 37
  - SD Card reader board
    - removal 72
    - spare part number 25, 37, 72
  - security cable slot 19
  - security, product description 9
  - service considerations
    - cables 41
    - connectors 41
    - plastic parts 41
  - service cover
    - removal 49
    - spare part number 29
  - service tag 22, 46
  - serviceability, product description 9
  - Setup Utility (BIOS) 105
  - solid-state drive
    - precautions 42
    - spare part number 28, 31, 37, 51
  - Speaker Kit, spare part number 25, 37, 78
  - speakers
    - locations 17
    - removal 78, 94
    - spare part number 25, 37, 78, 94
- specifications
  - device 110
  - display 111
  - hard drive 112
- subwoofer
  - location 20
  - removal 96
  - spare part number 27, 37, 96
- SuperSpeed USB port 18
- system board
  - removal 81
  - spare part numbers 25, 37, 38, 39, 81
- System Diagnostics 105
- T**
  - Thermal Material Kit, spare part numbers 25, 36, 82
  - tools required 41
  - top cover
    - removal 62
    - spare part numbers 24, 38, 62
  - TouchPad button 15
  - TouchPad components 15
  - TouchPad icon 15
  - TouchPad off light 14, 15
  - TouchPad on light 14, 15
  - TouchPad zone 15
  - transporting guidelines 44
- U**
  - USB board
    - removal 76
    - spare part number 25, 36
  - USB DVB-T dipole antenna, spare part number 33
  - USB DVB-T TV tuner, spare part number 33
  - USB port 18, 19
- V**
  - vents 18, 20
  - video, product description 6
- W**
  - Web browser button 12
  - webcam 16
  - webcam light 16

- webcam/microphone module
  - removal 101
  - spare part number 101
- webcamera/microphone module
  - spare part number 30, 36
- Windows applications key 13
- Windows logo key 12
- wireless antenna
  - locations 16
  - removal 103
  - spare part number 30, 104
- wireless light 14
- wireless, product description 6
- WLAN module
  - removal 56
  - spare part numbers 28, 33, 34, 35, 36, 56
- workstation guidelines 44