

HP Pavilion dv6 Entertainment PC

Maintenance and Service Guide

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MSG revision history

Revision	Publication date	Description
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A	August 2010	<ul style="list-style-type: none"> • Updated commodities in the following location: Product description on page 1. • Added newly supported processors to spare parts listings in the following locations: Computer major components on page 22, Sequential part number listing on page 36, and Processor on page 94. • Added newly supported hard drives to spare parts listings in the following locations: Computer major components on page 22, Sequential part number listing on page 36, and Mass storage devices on page 30, Hard drive on page 52. • Updated memory module spare part numbers in the following locations: Computer major components on page 22, Sequential part number listing on page 36, and Memory module on page 56. • Added newly supported optical drives to spare parts listings in the following locations: Computer major components on page 22, Sequential part number listing on page 36, and Optical drive on page 60. • Removed obsolete WLAN modules from spare parts listings in the following locations: Computer major components on page 22, Sequential part number listing on page 36 and WLAN module on page 57. • Updated hard drive specifications in the following location: Hard drive specifications on page 107.
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B	November 2010	<ul style="list-style-type: none"> • Added newly supported Thermal Pad Kit to spare parts listings in the following locations: Miscellaneous parts on page 34 and Sequential part number listing on page 36. • Added newly supported processors to spare parts listings in the following locations: Product description on page 1, Computer major components on page 22, Sequential part number listing on page 36, and Processor on page 94. • Added newly supported hard drives and removed obsolete hard drives from spare parts listings in the following locations: Product description on page 1, Computer major components on page 22, Sequential part number listing on page 36, Mass storage devices on page 30, and Hard drive on page 52. • Added newly supported system boards and removed obsolete system boards from spare parts listings in the following locations: Computer major components on page 22, Sequential part number listing on page 36, and System board on page 86. • Added newly supported WLAN modules to spare parts listings in the following locations: Product description on page 1, Computer major components on page 22, Sequential part number listing on page 36, and WLAN module on page 57. • Updated display assembly spare part numbers in the following locations: Computer major components on page 22, Sequential part number listing on page 36, and Display assembly on page 74. • Updated hard drive specifications in the following location: Hard drive specifications on page 107.

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP Pavilion dv6 Entertainment PC

Category	Description
Processors	<ul style="list-style-type: none"> • AMD Phenom II N970 Quad 2.20-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N950 Quad 2.10-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N930 Quad 2.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N870 Triple 2.30-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N850 Triple 2.20-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N830 Triple 2.10-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second) • AMD Phenom II N660 Dual 3.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N640 Dual 2.90-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second) • AMD Phenom II N620 Dual 2.80-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second) • AMD Phenom II P960 Quad 1.80-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second) • AMD Phenom II P940 Quad 1.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second) • AMD Phenom II P920 Quad 1.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second) • AMD Phenom II P860 Triple 2.00-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second) • AMD Phenom II P840 Triple 1.90-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second) • AMD Phenom II P820 Triple 1.80-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second) • AMD Phenom II P650 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)

Category	Description
	<ul style="list-style-type: none"> • AMD Turion II N570 Dual 2.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second) • AMD Turion II N550 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second) • AMD Turion II N530 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second) • AMD Turion II P560 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second) • AMD Turion II P540 Dual 2.40-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second) • AMD Turion II P520 Dual 2.30-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)
	<ul style="list-style-type: none"> • AMD Athlon II N370 Dual 2.50-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second) • AMD Athlon II N350 Dual 2.40-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second) • AMD Athlon II N330 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second) • AMD Athlon II P360 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second) • AMD Athlon II P340 Dual 2.20-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second) • AMD Athlon II P320 Dual 2.10-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)
	<ul style="list-style-type: none"> • AMD V-Series V160 Single 2.40-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second) • AMD V-Series V140 Single 2.30-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second) • AMD V-Series V120 Single 2.20-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)
Chipset	<ul style="list-style-type: none"> • AMD M880G • AMD RS880MD Northbridge chipset • AMD SB820 Southbridge chipset

Category	Description
Graphics	<p>ATI Capilano Pro (ATI Mobility Radeon™ HD 6550) graphics with 1024-MB of dedicated video memory (64MB x 16 DDR3 @ 800 MHz x 8 pcs) and 128-MB of sideport video memory</p> <p>ATI Robson XT (ATI Mobility Radeon HD 6370) graphics with 512-MB of dedicated video memory (64MB x 16 DDR3 @ 800 MHz x 4 pcs) and 128-MB of sideport video memory</p> <p>ATI Madison Pro (ATI Mobility Radeon HD 5650) graphics with 1024-MB of dedicated video memory (64MB x 16 DDR3 @ 800 MHz x 8 pcs) and 128-MB of sideport video memory</p> <p>ATI Park XT (ATI Mobility Radeon HD 5470) graphics with 512-MB of dedicated video memory (64MB x 16 DDR3 @ 800 MHz x 4 pcs) and 128-MB of sideport video memory</p> <p>Supports BD playback with HD decode, and DX11 support and HDMI support</p>
Panel	<p>15.6-in, high-definition (HD), LED, BrightView (1366x768) display; typical brightness: 200 nits</p> <p>All display assemblies include 2 wireless local area network (WLAN) antenna cables</p> <p>Supports 16:9 ultra wide aspect ratio</p> <p>Wacom TouchScreen, MultiTouch-enabled</p> <p>Lighted logo on top bezel</p>
Memory	<p>2 customer-accessible/upgradable memory module slots</p> <p>DDR3 PC3-10600 1333-MHz memory</p> <p>Supports dual-channel memory</p> <p>Supports up to 8192 MB of system RAM</p> <p>DDR3/1333-MHz and DDR3/1066-MHz (only computer models equipped with the AMD Phenom II N970 Quad 2.20-GHz processor, the AMD Phenom II N950 Quad 2.10-GHz processor, the AMD Phenom II N930 Quad 2.00-GHz processor, the AMD Phenom II N870 Triple 2.30-GHz processor, the AMD Phenom II N850 Triple 2.20-GHz processor, the AMD Phenom II N830 Triple 2.10-GHz processor, the AMD Phenom II N660 Dual 3.00-GHz processor, the AMD Phenom II N640 Dual 2.90-GHz processor, and the AMD Phenom II N620 Dual 2.80-GHz processor run at DDR3/1333-MHz; all other computer models run at DDR3/1066-MHz)</p> <p>Supports the following configurations:</p> <ul style="list-style-type: none"> • 8192-MB total system memory (4096x2) • 6144-MB total system memory (4096x1 + 2148x1) • 4096-MB total system memory (4096x1, 1024x2) • 3072-MB total system memory (2048x1 + 1024x1) • 2048-MB total system memory (2048x1, 1024x2) • 1024-MB total system memory (1024x1)
Hard drives	<p>Supports 6.35-cm (2.5-in) hard drives (HD), 12.7-mm (.50-in), 12.5-mm (.49-in) and 9.5-mm (.37-in) thicknesses</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Accelerometer (HP Mobile Data Protection System 3D)</p>

Category	Description
	<p>Supports the following single hard drive configurations:</p> <ul style="list-style-type: none"> • 1-TB (5400-rpm, 12.7-mm) • 1-TB (5200-rpm, 12.5-mm, non-brominated flame retardant (BFR), polyvinyl chloride (PVC) free) • 750-GB (7200-rpm and 5400 rpm, 9.5-mm) • 640-GB (7200 rpm and 5400-rpm, 9.5-mm) • 500-GB (7200-rpm, 9.5-mm) • 320-GB (7200-rpm, 9.5-mm) • 250-GB (7200-rpm, 9.5-mm)
Optical drives	<p>Fixed</p> <p>Serial ATA</p> <p>12.7-mm tray load</p> <p>Supports the following drives:</p> <ul style="list-style-type: none"> • Blu-ray ROM DVD±RW Super Multi Double-Layer Drive • Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive • DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
Audio and video	<p>Integrated microphones with beam-forming, echo-cancellation, noise-suppression software</p> <p>HD audio</p> <p>Supports Microsoft Premium Requirements</p> <p>Dolby advanced audio</p> <p>2 Pavilion-branded Altec Lansing speakers</p> <p>Integrated HP triple bass reflex subwoofer</p> <p>HP TrueVision low-light VGA webcam (fixed, no tilt) with activity LED, 640×480 by 24 frames per second</p>
Ethernet	<p>Integrated Realtek 10/100/1000 GB network interface card (NIC)</p>
Wireless	<p>Integrated wireless local area network (WLAN) options by way of wireless module:</p> <p>Two WLAN antennas built into display assembly</p>

Category	Description
	Support for the following WLAN formats: <ul style="list-style-type: none"> Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter Atheros 9280AGN 802.11a/b/g/draft-n WiFi Adapter Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter
	Integrated personal area network (PAN) options by way of Bluetooth® module:
	Support for no-WPAN option
	Bluetooth
External media card	Digital Media Slot supporting the following optional digital card formats: <ul style="list-style-type: none"> Secure Digital (SD) Memory Card MultiMediaCard (MMC) Memory Stick (MS) Memory Stick Pro (MSP) xD-Picture Card (XD)
Ports	<ul style="list-style-type: none"> 3-pin AC power Audio-in (mono microphone) Audio-out (stereo headphone) eSATA combo with 4th USB port HDMI version 1.3 supporting 1080p with HDCP key, supporting 1920×1080 at 60 Hz and 1920×1200 at 60 Hz in DVI mode Mini Display Port RJ-45 (Ethernet, includes link and activity lights) USB 2.0 (4) VGA (Dsub 15-pin) supporting 1920×1200 and 1600×1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)
Docking	Supports HP Notebook USB Dock
Keyboard/ pointing devices	Full-size (15.6 in), island-style keyboard with DuraCoat
	Full-size (15.6 in), backlit, island-style keyboard with DuraCoat available in Europe, the Middle East, Africa, and North America
	ClickPad Touchpad with 2-way scroll and legend gesture support
	Taps enabled by default

Category	Description
Power requirements	<p>EM 90-W and 65-W AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)</p> <p>Support for the following batteries:</p> <ul style="list-style-type: none">• 9-cell, 2.80-Ah (93-Wh) Li-ion battery• 6-cell, 2.80-Ah (62-Wh) Li-ion battery• 6-cell, 2.55-Ah (55-Wh) Li-ion battery
Security	<p>Security cable slot</p> <p>Fingerprint reader with Digital Persona software support</p>
Operating system	<p>Preinstalled:</p> <ul style="list-style-type: none">• Windows® 7 Home Basic 32- and 64-bit• Windows 7 Home Premium 32- and 64-bit• Windows 7 Professional 64
Serviceability	<p>End-user replaceable parts:</p> <ul style="list-style-type: none">• AC adapter• Battery• Hard drive• Memory modules (2)• Optical drive• RTC battery• WLAN module

2 External component identification

Identifying hardware

To refer to a list of hardware installed on the computer:

1. Select **Start > Control Panel > System and Security**.
2. In the System area, click **Device Manager**. Use Device Manager to add hardware or modify device configurations.

 **NOTE:** Windows includes the User Account Control feature that improves the security of the computer. You might be prompted for your permission or password for tasks such as installing applications, running utilities, or changing Windows settings. For more information, refer to Help and Support.

Top components

Display components



Item	Component	Description
(1)	Internal microphones (2)	Record sound.
(2)	Webcam light	On—The webcam is in use.
(3)	Webcam	Records video and captures still photographs.

Wireless antenna locations



Component	Description
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WLAN antennas (2)*

On select computer models, at least two antennas send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer.

NOTE: For optimal transmission, keep the areas immediately around the antennas free from obstructions.

To review wireless regulatory notices, refer to the country- or region-specific section of *Regulatory, Safety and Environmental Notices* in Help and Support.

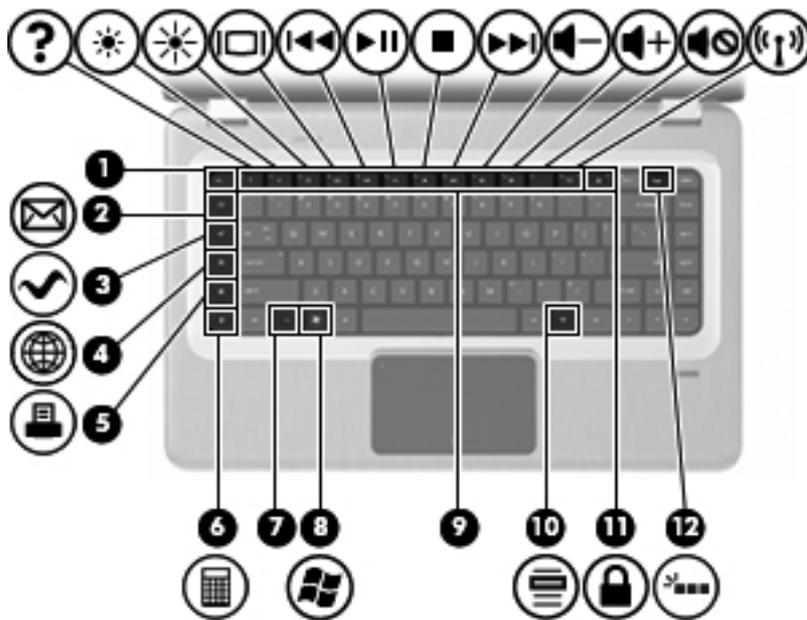
Buttons and Fingerprint Reader (select models only)



Item	Component	Description
(1)	Power button*	<p>Press the Power button to:</p> <ul style="list-style-type: none">• Turn on the computer.• Initiate Sleep.• Exit Sleep.• Exit Hibernation. <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 shut down the computer.</p> <p>For more information about the power settings, select Start > Control Panel > System and Security > Power Options.</p>
(2)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

For more information about changing factory settings, refer to Help and Support

Keys

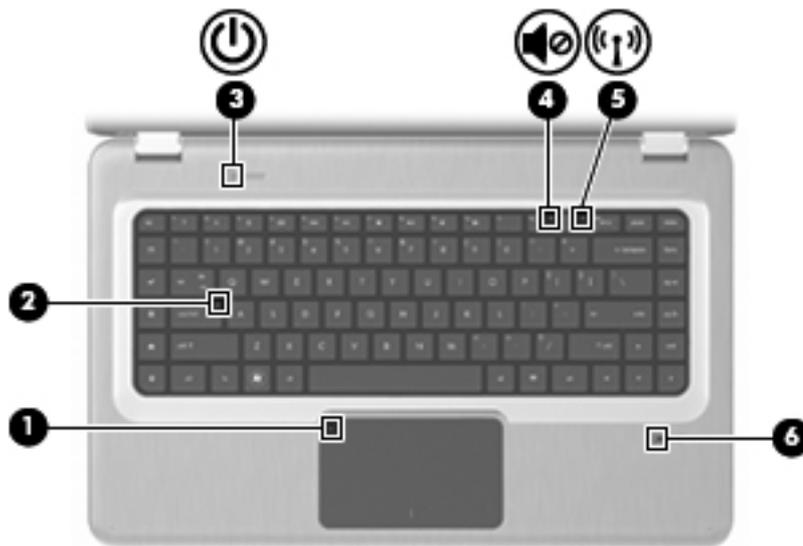


Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	E-mail key	Opens a new e-mail in the default e-mail client.
(3)	Media application key	Launches the MediaSmart application (or the TouchSmart application for select models equipped with a TouchScreen display assembly).
(4)	Web browser key	Launches the default Web browser.
(5)	Print key	Sends the currently active document to the default printer.
(6)	Calculator key	Launches the Calculator application.
(7)	fn key	Displays system information when pressed in combination with the esc key. NOTE: If your keyboard has a backlight key (select models only), the fn key pressed in combination with the right shift key initiates the Pause function.
(8)	Windows logo key	Displays the Windows Start menu.
(9)	Action keys	Execute frequently used system functions.
(10)	Windows applications key	Displays a shortcut menu for items beneath the pointer.

Item	Component	Description
(11)	QuickLock key	Initiates QuickLock.
(12)	Backlight key (select models only)	Turns the keyboard backlight on or off.

NOTE: Keyboards without the backlight key have the standard Pause function in this location. To initiate the Pause function for keyboards with the backlight key, hold down the **fn** key while pressing the right **shift** key.

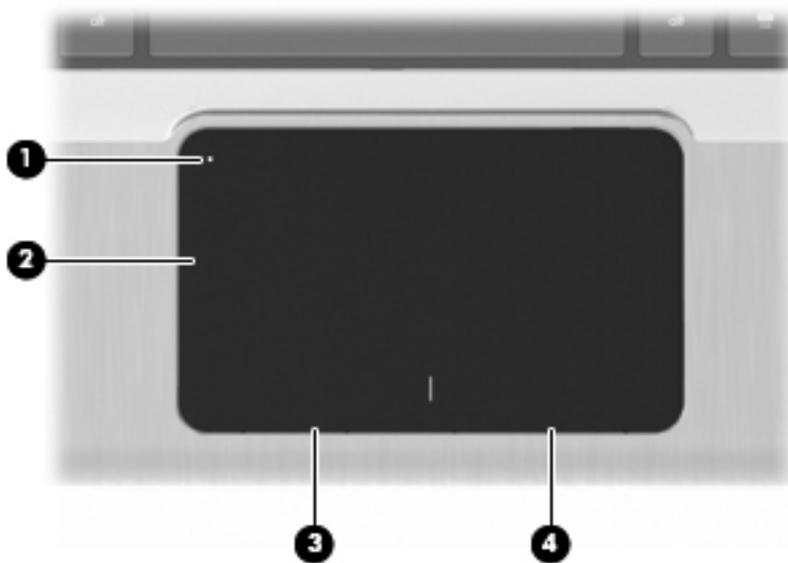
Lights



Item	Component	Description
(1)	TouchPad light	<ul style="list-style-type: none"> Off—The TouchPad is enabled. Amber—The TouchPad is disabled.
(2)	Caps lock light	On—Caps Lock is on.
(3)	Power light	<p>NOTE: The computer has two power lights. The other power light is on the right side of the computer.</p> <ul style="list-style-type: none"> On—The computer is on. Flashing—The computer is in Sleep. Off—The computer is off or in Hibernation.
(4)	Volume mute light	Amber—Computer sound is off.

Item	Component	Description
(5)	Wireless light	<ul style="list-style-type: none"> White—An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is detected.. Amber—No wireless devices are detected.
(6)	Fingerprint reader light (select models only)	<ul style="list-style-type: none"> White—The fingerprint was read. Amber—The fingerprint was not read.

TouchPad

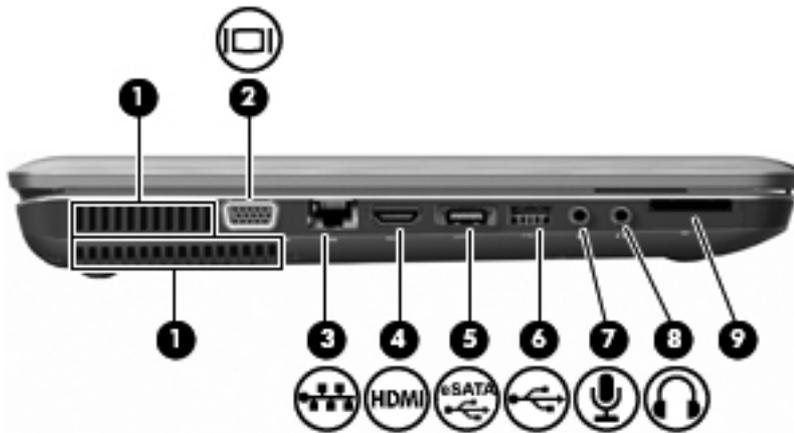


Item	Component	Description
(1)	TouchPad off indicator	To switch the TouchPad on and off, quickly double-tap the TouchPad off indicator.
(2)	TouchPad zone	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

To view or change pointing device preferences:

1. Select **Start > Devices and Printers**.
2. Right-click the device representing your computer.
3. Select **Mouse settings**.

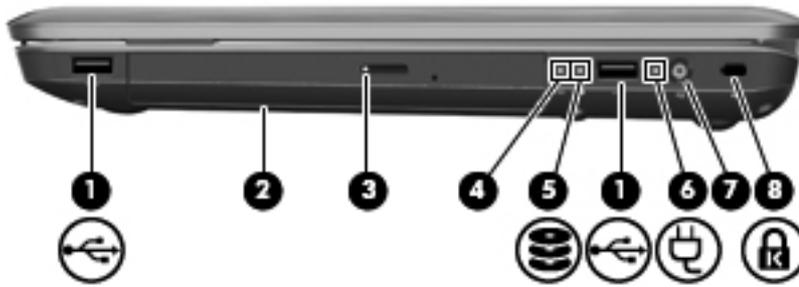
Left-side components



Item	Component	Description
(1)	Vent (2)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(5)	eSATA/USB port	Connects an optional high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device. NOTE: Depending on the computer model, the computer might include only a USB port.
(6)	USB port	Connects an optional USB device.
(7)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Item	Component	Description
(8)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(9)	Digital Media Slot	Supports the following optional digital card formats: <ul style="list-style-type: none">• Secure Digital (SD) Memory Card• MultiMediaCard (MMC)• Memory Stick (MS)• Memory Stick Pro (MSP)• xD-Picture Card (XD)

Right-side components



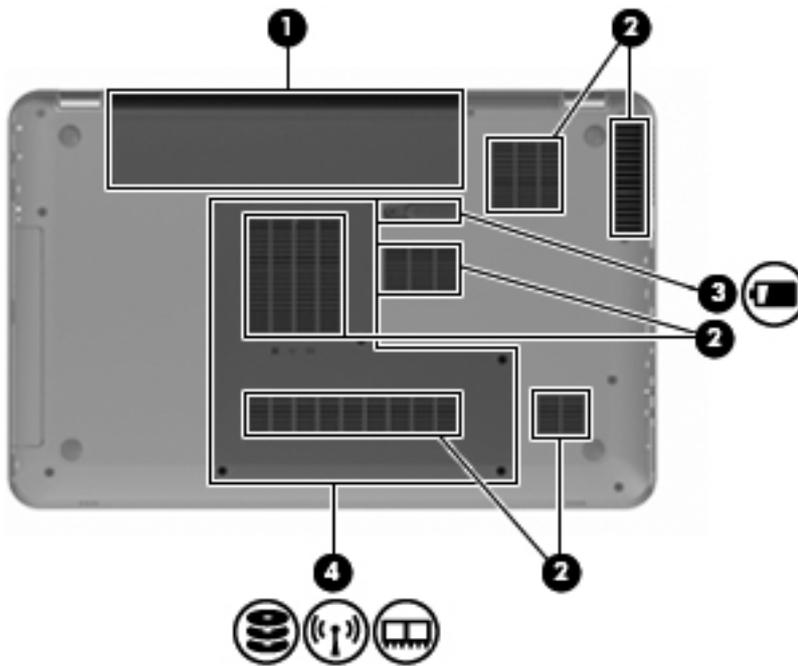
Item	Component	Description
(1)	USB ports (2)	Connect optional USB devices.
(2)	Optical drive	Reads optical discs and, on select models, writes to optical discs.
(3)	Optical drive light	Flashing—Accessing the optical drive.
(4)	Power light	<p>NOTE: The computer has two power lights. The other power light is on the right side of the computer.</p> <ul style="list-style-type: none"> On—The computer is on. Flashing—The computer is in Sleep. Off—The computer is off or in Hibernation.
(5)	Hard drive light	<ul style="list-style-type: none"> White—The hard disk drive is active. Amber—The hard disk drive is parked.
(6)	AC adapter light	<ul style="list-style-type: none"> White—The computer is connected to external power and the battery is fully charged. Amber—The computer is connected to external power and the battery is charging. Off—The computer is not connected to external power.
(7)	Power connector	Connects an AC adapter.
(8)	Security cable slot	Connects an optional security cable. The security cable is designed to act as a deterrent, but might not prevent the computer from being mishandled or stolen.

Front components



Component	Description
Speakers (2)	Produce sound.

Bottom components

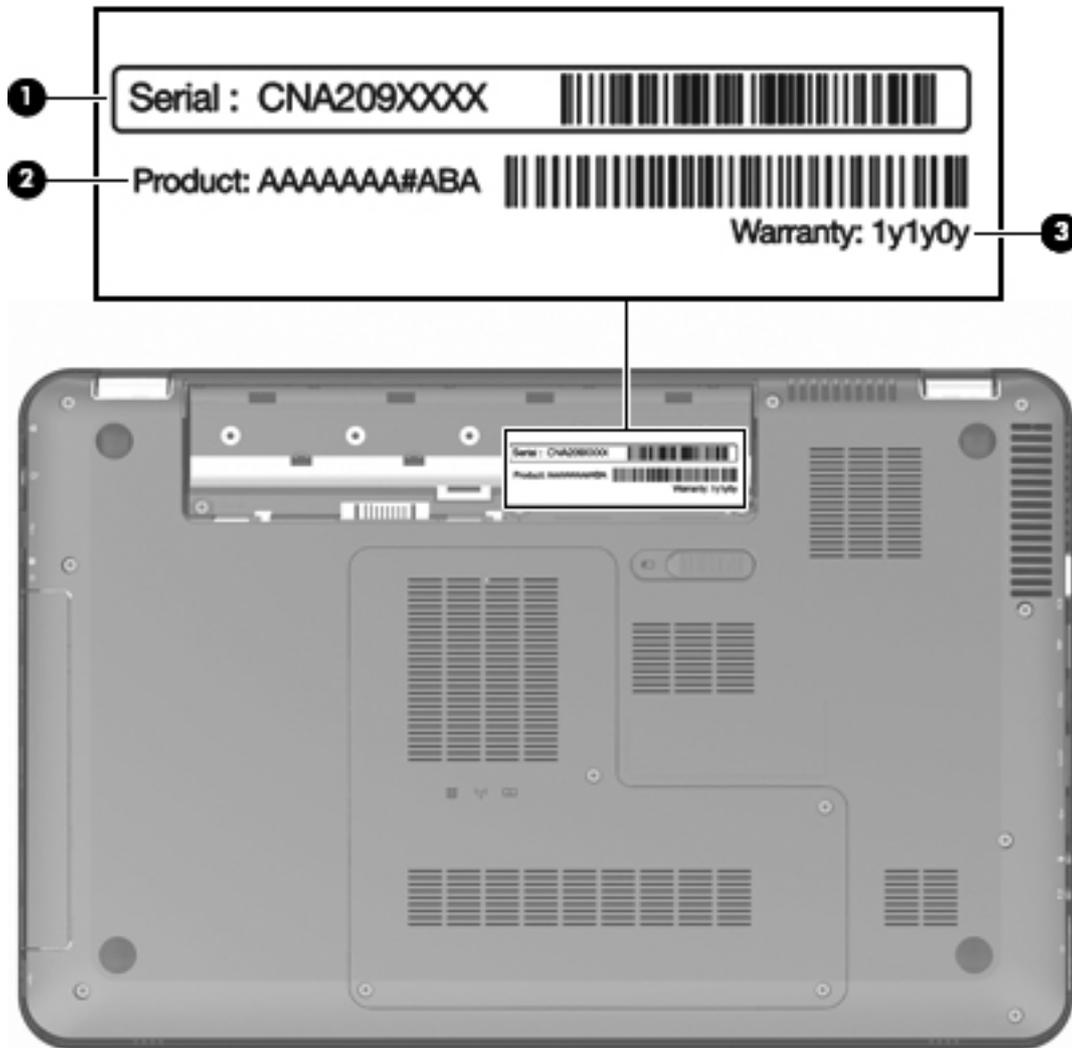


Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	Vents (6)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	Battery release latch	Releases the battery from the battery bay.
(4)	Hard drive bay	Holds the hard drive, the memory module slots, and the WLAN module. CAUTION: To prevent an unresponsive system, replace the wireless module with a wireless module authorized for use 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.

3 Illustrated parts catalog

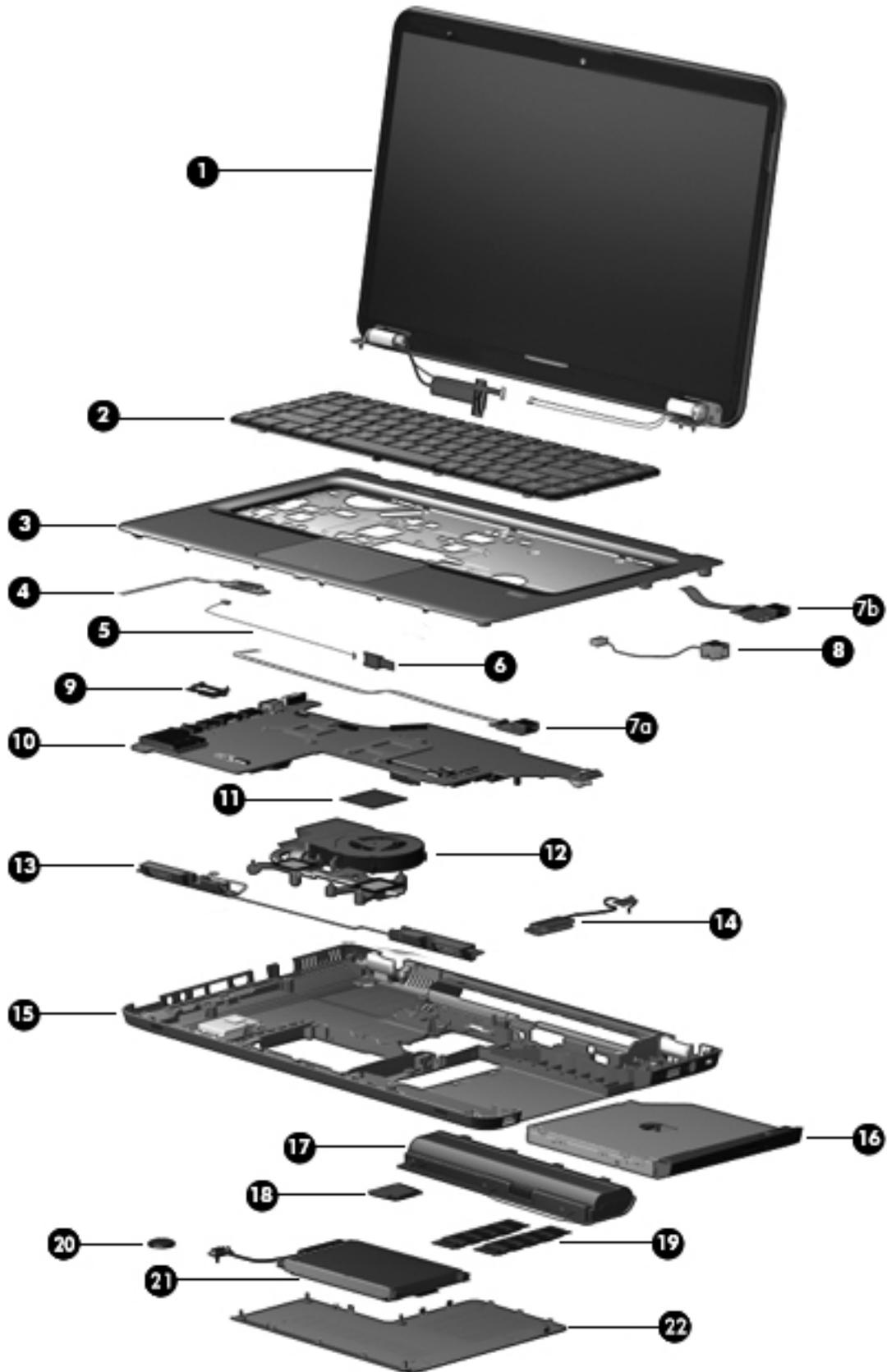
Service tag

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



Item	Component	Description
(1)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(2)	Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician determine what components and parts are needed.
(3)	Warranty period	This number describes the duration of the warranty period for the computer.

Computer major components



Item	Description	Spare part number
(1)	Display assembly (includes display panel cable, webcam/microphone module and cable, and 2 wireless antenna cables and transceivers):	
	15.6-in TouchScreen HD, LED, BrightView display assembly in brushed aluminum (includes TouchScreen cable)	631019-001
	15.6-in traditional HD, LED, BrightView display assembly in black cherry	603647-001
	15.6-in traditional HD, LED, BrightView display assembly in brushed aluminum	595131-001
	15.6-in traditional HD, LED, BrightView display assembly in champagne	603650-001
	15.6-in traditional HD, LED, BrightView display assembly in midnight blue	615932-001
	15.6-in traditional HD, LED, BrightView display assembly in shell white	603648-001
	15.6-in traditional HD, LED, BrightView display assembly in Sonoma red	603649-001
	NOTE: See Display assembly subcomponents - traditional on page 33 and Display assembly subcomponents - TouchScreen on page 32 for more display component information and spare part numbers.	
(2)	Keyboard:	
	Keyboard with backlight (includes keyboard cable and keyboard light cable):	
	• For use in Belgium	597630-A41
	• For use in Canada	597630-121
	• For use in the Czech Republic	597630-221
	• For use in Denmark, Finland, and Norway	597630-DH1
	• For use in France	597630-051
	• For use in Germany	597630-041
	• For use in Greece	597630-DJ1
	• For use in Hungary	597630-211
	• For use in Israel	597630-BB1
	• For use in Italy	597630-061
	• For use in the Netherlands	597630-B31
	• For use in Portugal	597630-131
	• For use in Russia	597630-251
	• For use in Saudi Arabia	597630-171
	• For use in Slovenia	597630-BA1
	• For use in Spain	597630-071
	• For use in Switzerland	597630-BG1
	• For use in Turkey	597630-141
	• For use in the United Kingdom and Singapore	597630-031

Item	Description	Spare part number
	<ul style="list-style-type: none"> • For use in the United States 	597630-001
	Keyboard without backlight (includes keyboard cable):	
	<ul style="list-style-type: none"> • For use in Belgium 	597635-A41
	<ul style="list-style-type: none"> • For use in Brazil 	597635-201
	<ul style="list-style-type: none"> • For use in Canada 	597635-121
	<ul style="list-style-type: none"> • For use in the Czech Republic 	597635-221
	<ul style="list-style-type: none"> • For use in Denmark, Finland, and Norway 	597635-DH1
	<ul style="list-style-type: none"> • For use in France 	597635-051
	<ul style="list-style-type: none"> • For use in Germany 	597635-041
	<ul style="list-style-type: none"> • For use in Greece 	597635-DJ1
	<ul style="list-style-type: none"> • For use in Hungary 	597635-211
	<ul style="list-style-type: none"> • For use in Israel 	597635-BB1
	<ul style="list-style-type: none"> • For use in Italy 	597635-061
	<ul style="list-style-type: none"> • For use in Japan 	597635-291
	<ul style="list-style-type: none"> • For use in Latin America 	597635-161
	<ul style="list-style-type: none"> • For use in the Netherlands 	597635-B31
	<ul style="list-style-type: none"> • For use in Portugal 	597635-131
	<ul style="list-style-type: none"> • For use in Russia 	597635-251
	<ul style="list-style-type: none"> • For use in Saudi Arabia 	597635-171
	<ul style="list-style-type: none"> • For use in Slovenia 	597635-BA1
	<ul style="list-style-type: none"> • For use in South Korea 	597635-AD1
	<ul style="list-style-type: none"> • For use in Spain 	597635-071
	<ul style="list-style-type: none"> • For use in Switzerland 	597635-BG1
	<ul style="list-style-type: none"> • For use in Taiwan 	597635-AB1
	<ul style="list-style-type: none"> • For use in Thailand 	597635-281
	<ul style="list-style-type: none"> • For use in Turkey 	597635-141
	<ul style="list-style-type: none"> • For use in the United Kingdom and Singapore 	597635-031
	<ul style="list-style-type: none"> • For use in the United States 	597635-001
(3)	Top cover (includes TouchPad and cable):	
	For use on computer models equipped with a fingerprint reader, in brushed aluminum (includes fingerprint reader board, bracket, and cable)	619249-001
	For use on computer models not equipped with a fingerprint reader:	

Item	Description	Spare part number
	<ul style="list-style-type: none"> In black cherry 	619245-001
	<ul style="list-style-type: none"> In champagne 	619248-001
	<ul style="list-style-type: none"> In midnight blue 	619250-001
	<ul style="list-style-type: none"> In shell white 	619246-001
	<ul style="list-style-type: none"> In Sonoma red 	619247-001
(4)	Power button board (includes cable)	603682-001
(5)	Bluetooth module cable	603645-001
(6)	Bluetooth module (includes the Bluetooth module rubber sleeve)	537921-001
	NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is available using spare part number 603645-001.	
	USB Board Kit , includes:	603683-001
(7a)	Front USB board and cable	
(7b)	Rear USB board and cable	
(8)	Power connector cable	603692-001
(9)	Display cable channel	603697-001
(10)	System board (includes replacement thermal material):	
	For use on computer models equipped with a graphics subsystem with discrete memory and the HD 5650 chipset	603939-001
	For use on computer models equipped with a graphics subsystem with discrete memory and the HD 5470 chipset	595133-001
	For use on computer models equipped with a graphics subsystem with dedicated memory and the HD 6370 chipset	631081-001
	For use on computer models equipped with a graphics subsystem with dedicated memory and the HD 6550 chipset	631082-001
	For use on computer models equipped with a graphics subsystem with UMA memory	595135-001
(11)	Processor (includes replacement thermal material):	
	AMD Phenom II N970 Quad 2.20-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	635496-001
	AMD Phenom II N950 Quad 2.10-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	616346-001
	AMD Phenom II N930 Quad 2.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	594169-001
	AMD Phenom II N870 Triple 2.30-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	635495-001
	AMD Phenom II N850 Triple 2.20-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	616345-001

Item	Description	Spare part number
	AMD Phenom II N830 Triple 2.10-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second)	594168-001
	AMD Phenom II N660 Dual 3.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	635494-001
	AMD Phenom II N640 Dual 2.90-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	616344-001
	AMD Phenom II N620 Dual 2.80-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second)	594166-001
	AMD Phenom II P960 Quad 1.80-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	634689-001
	AMD Phenom II P940 Quad 1.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	616336-001
	AMD Phenom II P920 Quad 1.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	594170-001
	AMD Phenom II P860 Triple 2.00-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	634688-001
	AMD Phenom II P840 Triple 1.90-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	616335-001
	AMD Phenom II P820 Triple 1.80-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	594167-001
	AMD Phenom II P650 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	634687-001
	AMD Turion II N570 Dual 2.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	634690-001
	AMD Turion II N550 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	616337-001
	AMD Turion II N530 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	594172-001
	AMD Turion II P560 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	634691-001
	AMD Turion II P540 Dual 2.40-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	616347-001
	AMD Turion II P520 Dual 2.30-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	594173-001
	AMD Athlon II N370 Dual 2.50-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	634686-001
	AMD Athlon II N350 Dual 2.40-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	616334-001
	AMD Athlon II N330 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	594164-001

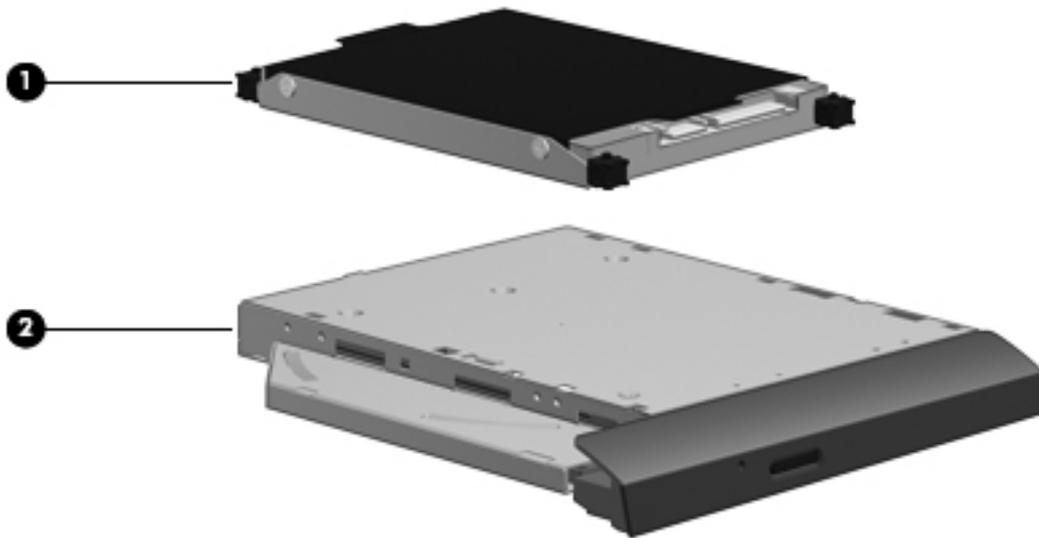
Item	Description	Spare part number
	AMD Athlon II P360 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	636635-001
	AMD Athlon II P340 Dual 2.20-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	616343-001
	AMD Athlon II P320 Dual 2.10-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	594165-001
	AMD V-Series V160 Single 2.40-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	636634-001
	AMD V-Series V140 Single 2.30-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	616333-001
	AMD V-Series V120 Single 2.20-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	594171-001
(12)	Fan/heat sink assembly (includes replacement thermal material):	
	For use on computer models equipped with graphics subsystems with discrete memory	606575-001
	For use on computer models equipped with graphics subsystems with UMA memory	606574-001
(13)	Speakers (include cable)	603694-001
	Cable Kit , includes:	603680-001
(14)	Optical drive connector board (includes cable)	
(15)	Base enclosure (includes 4 rubber feet and power connector bracket)	603689-001
	Rubber Feet Kit (not illustrated, includes 4 rubber feet)	603696-001
(16)	Optical drive:	
	Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive	603678-001
	Blu-ray ROM DVD±RW Super Multi Double-Layer Drive	614333-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	603677-001
(17)	Battery:	
	9-cell, 93-Wh, 2.80-Ah, Li-ion battery	593550-001
	6-cell, 62-Wh, 2.80-Ah, Li-ion battery	593562-001
	6-cell, 55-Wh, 2.55-Ah, Li-ion battery	593554-001
(18)	WLAN module:	
	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter	605560-005
	Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter	593836-001
	Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter	600370-001
	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	582564-001

Item	Description	Spare part number
	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	582564-002
	Atheros 9280AGN 802.11a/b/g/n-draft WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	580102-001

Item	Description	Spare part number
	Atheros 9280AGN 802.11a/b/g/n-draft WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	580102-002
	Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter	602992-001
(19)	Memory modules (DDR3 PC3-10600 1333-MHz)	
	4096-MB	599092-001
	2048-MB	598856-001
	1024-MB	598859-001
(20)	RTC battery	599516-001
(21)	Hard drive (includes hard drive bracket, cable, and isolators):	
	1-TB, 5400-rpm	603788-001
	1-TB, 5200-rpm	603672-001
	750-GB, 7200-rpm	633252-001
	750-GB, 5400-rpm	603787-001
	640-GB, 7200-rpm	621046-001
	640-GB, 5400-rpm	603785-001
	500-GB, 7200-rpm	608218-001
	320-GB, 7200-rpm	603668-001
	250-GB, 7200-rpm	603667-001

Item	Description	Spare part number
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, cable, and 4 isolators)	603676-001
	Plastics Kit , includes:	603679-001
(22)	Hard drive cover (includes 4 captive screws, secured by C-clips)	

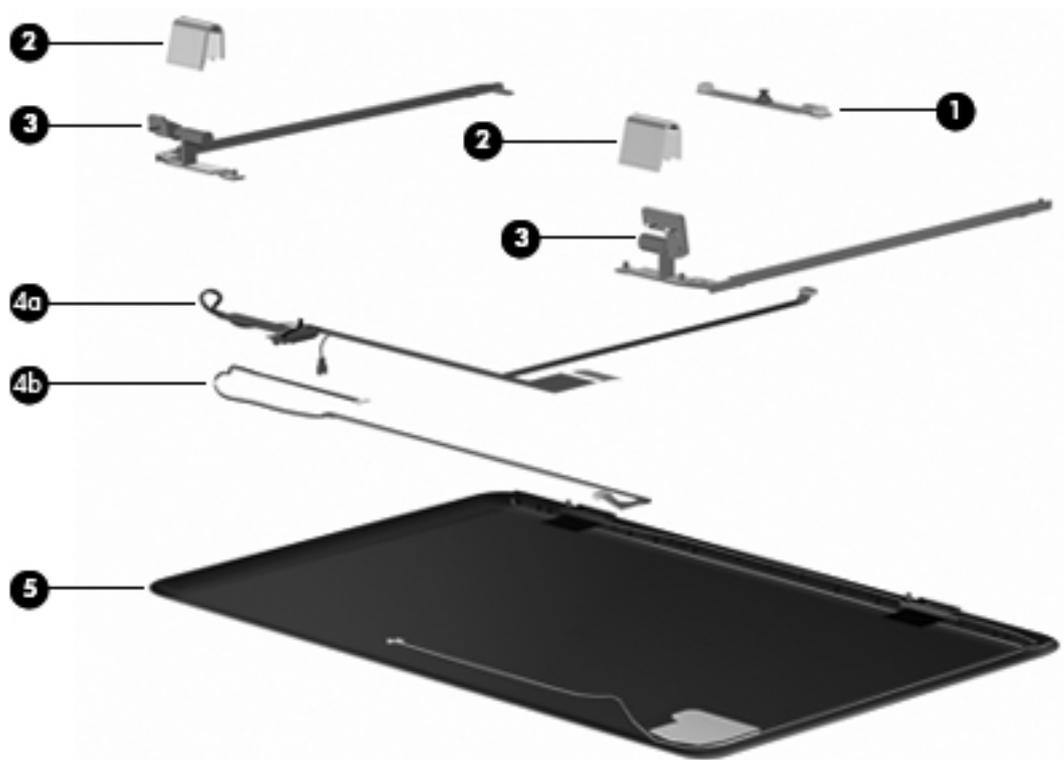
Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (includes hard drive bracket, cable, and isolators):	
	1-TB, 5400-rpm	603788-001
	1-TB, 5200-rpm	603672-001
	750-GB, 7200-rpm	633252-001
	750-GB, 5400-rpm	603787-001
	640-GB, 7200-rpm	621046-001
	640-GB, 5400-rpm	603785-001
	500-GB, 7200-rpm	608218-001
	320-GB, 7200-rpm	603668-001
	250-GB, 7200-rpm	603667-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, cable, and 4 isolators)	603676-001

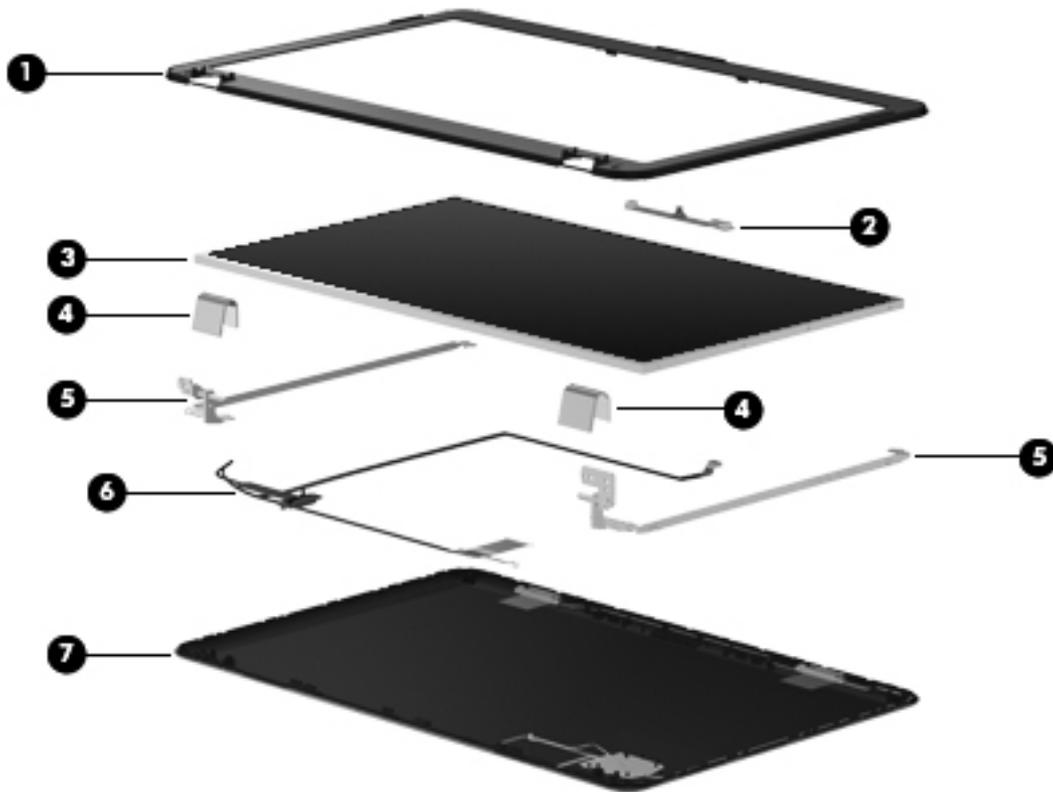
Item	Description	Spare part number
(2)	Optical drive:	
	Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive	603678-001
	Blu-ray ROM DVD±RW Super Multi Double-Layer Drive	614333-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	603677-001

Display assembly subcomponents - TouchScreen



Item	Description	Spare part number
(1)	Webcam/microphone module	603660-001
(2)	Display hinge covers (2)	603666-001
(3)	Display Hinge Kit (includes left and right display hinges)	603664-001
	Display Cable Kit , includes:	603665-001
(4a)	Display panel cable (includes webcam/microphone module cable)	
(4b)	TouchScreen cable	
(5)	Display enclosure (includes logo light and cable and 2 WLAN transceivers and cables)	603663-001
	Display Miscellaneous Kit (not illustrated, includes Mylar screw covers)	603659-001
	Display Screw Kit (not illustrated, includes Mylar screw covers)	603658-001

Display assembly subcomponents - traditional



Item	Description	Spare part number
(1)	Display bezel	603651-001
(2)	Webcam/microphone module	603660-001
(3)	15.6-in HD, LED, BrightView display panel	595130-001
(4)	Display hinge covers (2)	603661-001
(5)	Display Hinge Kit (includes left and right display hinges)	603656-001
(6)	Display Cable Kit (includes display panel cable and webcam/microphone module cable)	603657-001
(7)	Display enclosure (includes logo light and cable and 2 WLAN transceivers and cables)	
	In black cherry	603652-001
	In brushed aluminum	604804-001
	In champagne	603655-001
	In midnight blue	615933-001
	In shell white	603653-001
	In Sonoma red	603654-001

Item	Description	Spare part number
	Display Miscellaneous Kit (not illustrated, includes Mylar screw covers)	603659-001
	Display Screw Kit (not illustrated, includes Mylar screw covers)	603658-001

Miscellaneous parts

Description	Spare part number
HP Smart AC adapter:	
90-W RC/V EM PFC	613160-001
90-W RC/V PFC	613153-001
65-W RC/V EM PFC	613161-001
65-W RC/V PFC	613152-001
Power cord:	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Thailand	490371-201
For use in Brazil	490371-202
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom and Singapore	490371-031
For use in the United States and Canada	490371-001
Full-function remote control with teletext	465541-004
Screw Kit	603681-001
Thermal Pad Kit	634433-001

Description	Spare part number
USB DVB-T antenna	581223-001
USB DVB-T TV tuner	581222-001

Sequential part number listing

Spare part number	Description
465541-004	Full-function remote control with teletext
490371-001	Power cord for use in the United States and Canada
490371-011	Power cord for use in Australia and New Zealand
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Thailand
490371-202	Power cord for use in Brazil
490371-291	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
537921-001	Bluetooth module
580102-001	Atheros 9280AGN 802.11a/b/g/n-draft WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States

Spare part number	Description
580102-002	Atheros 9280AGN 802.11a/b/g/n-draft WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
581222-001	USB DVB-T TV tuner
581223-001	USB DVB-T antenna
582564-001	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
582564-002	Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
593550-001	9-cell, 93-Wh, 2.80-Ah, Li-ion battery

Spare part number	Description
593554-001	6-cell, 55-Wh, 2.55-Ah, Li-ion battery
593562-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
593836-001	Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter
594164-001	AMD Athlon II N330 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second; includes replacement thermal material)
594165-001	AMD Athlon II P320 Dual 2.10-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second; includes replacement thermal material)
594166-001	AMD Phenom II N620 Dual 2.80-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second; includes replacement thermal material)
594167-001	AMD Phenom II P820 Triple 1.80-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second; includes replacement thermal material)
594168-001	AMD Phenom II N830 Triple 2.10-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second; includes replacement thermal material)
594169-001	AMD Phenom II N930 Quad 2.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second; includes replacement thermal material)
594170-001	AMD Phenom II P920 Quad 1.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second; includes replacement thermal material)
594171-001	AMD V-Series V120 Single 2.20-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second; includes replacement thermal material)
594172-001	AMD Turion II N530 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second; includes replacement thermal material)
594173-001	AMD Turion II P520 Dual 2.30-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second; includes replacement thermal material)
595130-001	15.6-in HD, LED, BrightView display panel for use only with traditional display assemblies
595131-001	15.6-in traditional HD, LED, BrightView display assembly in brushed aluminum (includes display panel cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
595133-001	System board for use on computer models equipped with a graphics subsystem with discrete memory and the HD 5470 chipset (includes replacement thermal material)
595135-001	System board for use on computer models equipped with a graphics subsystem with UMA memory (includes replacement thermal material)
597630-001	Keyboard with backlight for use in the United States and Canada (includes keyboard cable and keyboard light cable)
597630-031	Keyboard with backlight for use in the United Kingdom and Singapore (includes keyboard cable and keyboard light cable)
597630-041	Keyboard with backlight for use in Germany (includes keyboard cable and keyboard light cable)
597630-051	Keyboard with backlight for use in France (includes keyboard cable and keyboard light cable)
597630-061	Keyboard with backlight for use in Italy (includes keyboard cable and keyboard light cable)
597630-071	Keyboard with backlight for use in Spain (includes keyboard cable and keyboard light cable)

Spare part number	Description
597630-121	Keyboard with backlight for use in French Canada (includes keyboard cable and keyboard light cable)
597630-131	Keyboard with backlight for use in Portugal (includes keyboard cable and keyboard light cable)
597630-141	Keyboard with backlight for use in Turkey (includes keyboard cable and keyboard light cable)
597630-171	Keyboard with backlight for use in Saudi Arabia (includes keyboard cable and keyboard light cable)
597630-211	Keyboard with backlight for use in Hungary (includes keyboard cable and keyboard light cable)
597630-221	Keyboard with backlight for use in the Czech Republic (includes keyboard cable and keyboard light cable)
597630-251	Keyboard with backlight for use in Russia (includes keyboard cable and keyboard light cable)
597630-A41	Keyboard with backlight for use in Belgium (includes keyboard cable and keyboard light cable)
597630-B31	Keyboard with backlight for use in the Netherlands (includes keyboard cable and keyboard light cable)
597630-BA1	Keyboard with backlight for use in Slovenia (includes keyboard cable and keyboard light cable)
597630-BB1	Keyboard with backlight for use in Israel (includes keyboard cable and keyboard light cable)
597630-BG1	Keyboard with backlight for use in Switzerland (includes keyboard cable and keyboard light cable)
597630-DH1	Keyboard with backlight for use in Denmark, Finland, and Norway (includes keyboard cable and keyboard light cable)
597630-DJ1	Keyboard with backlight for use in Greece (includes keyboard cable and keyboard light cable)
597635-001	Keyboard without backlight for use in the United States and Canada (includes keyboard cable)
597635-031	Keyboard without backlight for use in the United Kingdom and Singapore (includes keyboard cable)
597635-041	Keyboard without backlight for use in Germany (includes keyboard cable)
597635-051	Keyboard without backlight for use in France (includes keyboard cable)
597635-061	Keyboard without backlight for use in Italy (includes keyboard cable)
597635-071	Keyboard without backlight for use in Spain (includes keyboard cable)
597635-121	Keyboard without backlight for use in French Canada (includes keyboard cable)
597635-131	Keyboard without backlight for use in Portugal (includes keyboard cable)
597635-141	Keyboard without backlight for use in Turkey (includes keyboard cable)
597635-161	Keyboard without backlight for use in Latin America (includes keyboard cable)
597635-171	Keyboard without backlight for use in Saudi Arabia (includes keyboard cable)
597635-201	Keyboard without backlight for use in Brazil (includes keyboard cable)
597635-211	Keyboard without backlight for use in Hungary (includes keyboard cable)
597635-221	Keyboard without backlight for use in the Czech Republic (includes keyboard cable)
597635-251	Keyboard without backlight for use in Russia (includes keyboard cable)
597635-281	Keyboard without backlight for use in Thailand (includes keyboard cable)
597635-291	Keyboard without backlight for use in Japan (includes keyboard cable)

Spare part number	Description
597635-A41	Keyboard without backlight for use in Belgium (includes keyboard cable)
597635-AB1	Keyboard without backlight for use in Taiwan (includes keyboard cable)
597635-AD1	Keyboard without backlight for use in South Korea (includes keyboard cable)
597635-B31	Keyboard without backlight for use in the Netherlands (includes keyboard cable)
597635-BA1	Keyboard without backlight for use in Slovenia (includes keyboard cable)
597635-BB1	Keyboard without backlight for use in Israel (includes keyboard cable)
597635-BG1	Keyboard without backlight for use in Switzerland (includes keyboard cable)
597635-DH1	Keyboard without backlight for use in Denmark, Finland, and Norway (includes keyboard cable)
597635-DJ1	Keyboard without backlight for use in Greece (includes keyboard cable)
598856-001	2048-MB memory module (DDR3 PC3-10600 1333-MHz)
598859-001	1024-MB memory module (DDR3 PC3-10600 1333-MHz)
599092-001	4096-MB memory module (DDR3 PC3-10600 1333-MHz)
599516-001	RTC battery
600370-001	Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter
602992-001	Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter
603645-001	Bluetooth module cable
603647-001	15.6-in traditional HD, LED, BrightView display assembly in black cherry (includes display panel cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
603648-001	15.6-in traditional HD, LED, BrightView display assembly in shell white (includes display panel cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
603649-001	15.6-in traditional HD, LED, BrightView display assembly in Sonoma red (includes display panel cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
603650-001	15.6-in traditional HD, LED, BrightView display assembly in champagne (includes display panel cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
603651-001	Display bezel for use only with traditional display assemblies
603652-001	Display enclosure for use only with traditional display assemblies in black cherry (includes logo light and cable and 2 WLAN transceivers and cables)
603653-001	Display enclosure for use only with traditional display assemblies in shell white (includes logo light and cable and 2 WLAN transceivers and cables)
603654-001	Display enclosure for use only with traditional display assemblies in Sonoma red (includes logo light and cable and 2 WLAN transceivers and cables)
603655-001	Display enclosure for use only with traditional display assemblies in champagne (includes logo light and cable and 2 WLAN transceivers and cables)
603656-001	Display Hinge Kit for use only with traditional display assemblies (includes left and right display hinges)
603657-00	Display Cable Kit for use only with traditional display assemblies (includes display panel cable and webcam/microphone module cable)

Spare part number	Description
603658-001	Display Screw Kit
603659-001	Display Miscellaneous Kit (includes Mylar screw covers)
603660-001	Webcam/microphone module
603661-001	Display hinge covers for use only with traditional display assemblies
603663-001	Display enclosure for use only with the TouchScreen display assembly (includes logo light and cable and 2 WLAN transceivers and cables)
603664-001	Display Hinge Kit for use only with the TouchScreen display assembly (includes left and right display hinges)
603665-001	Display Cable Kit for use only with the TouchScreen display assembly (includes display panel cable, TouchScreen cable, and webcam/microphone module cable)
603666-001	Display hinge covers for use only with the TouchScreen display assembly
603667-001	250-GB, 7200-rpm (includes hard drive bracket, cable, and isolators)
603668-001	320-GB, 7200-rpm (includes hard drive bracket, cable, and isolators)
603672-001	1-TB, 5200-rpm (includes hard drive bracket, cable, and isolators)
603676-001	Hard Drive Hardware Kit (includes hard drive bracket, cable, and 4 isolators)
603677-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe
603678-001	Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive
603679-001	Plastics Kit (includes the accessory cover, which includes 4 captive screws, secured by C-clips)
603680-001	Cable Kit (includes the optical drive connector board and cable)
603681-001	Screw Kit
603682-001	Power button board (includes cable)
603683-001	USB Board Kit (includes the front USB board and cable and the rear USB board and cable)
603689-001	Base enclosure (includes 4 rubber feet and power connector bracket)
603692-001	Power connector cable
603694-001	Speakers (include cable)
603696-001	Rubber Feet Kit (includes 4 rubber feet)
603697-001	Display cable channel
603785-001	640-GB, 5400-rpm (includes hard drive bracket, cable, and isolators)
603787-001	750-GB, 5400-rpm (includes hard drive bracket, cable, and isolators)
603788-001	1-TB, 5400-rpm (includes hard drive bracket, cable, and isolators)
603939-001	System board for use on computer models equipped with a graphics subsystem with discrete memory and the HD 5650 chipset (includes replacement thermal material)
604804-001	Display enclosure for use only with traditional display assemblies in brushed aluminum (includes logo light and cable and 2 WLAN transceivers and cables)

Spare part number	Description
605560-005	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter
606574-001	Fan/heat sink assembly for use only on computer models equipped with graphics subsystems with UMA memory (includes replacement thermal material)
606575-001	Fan/heat sink assembly for use only on computer models equipped with graphics subsystems with discrete memory (includes replacement thermal material)
608218-001	500-GB, 7200-rpm (includes hard drive bracket, cable, and isolators)
613152-001	65-W RC/V PFC HP Smart AC adapter
613153-001	90-W RC/V PFC HP Smart AC adapter
613160-001	90-W RC/V EM PFC HP Smart AC adapter
613161-001	65-W RC/V EM PFC HP Smart AC adapter
614333-001	Blu-ray ROM DVD±RW Super Multi Double-Layer Drive
615932-001	15.6-in traditional HD, LED, BrightView display assembly in midnight blue (includes display panel cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
615933-001	Display enclosure for use only with traditional display assemblies in midnight blue (includes logo light and cable and 2 WLAN transceivers and cables)
616333-001	AMD V-Series V140 Single 2.30-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second); includes replacement thermal material)
616334-001	AMD Athlon II N350 Dual 2.40-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second); includes replacement thermal material)
616335-001	AMD Phenom II P840 Triple 1.90-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second); includes replacement thermal material)
616336-001	AMD Phenom II P940 Quad 1.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second); includes replacement thermal material)
616337-001	AMD Turion II N550 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second); includes replacement thermal material)
616343-001	AMD Athlon II P340 Dual 2.20-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second); includes replacement thermal material)
616344-001	AMD Phenom II N640 Dual 2.90-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second); includes replacement thermal material)
616345-001	AMD Phenom II N850 Triple 2.20-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second); includes replacement thermal material)
616346-001	AMD Phenom II N950 Quad 2.10-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second); includes replacement thermal material)
616347-001	AMD Turion II P540 Dual 2.40-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second); includes replacement thermal material)
619245-001	Top cover for use on computer models not equipped with a fingerprint reader in black cherry (includes TouchPad and cable)
619246-001	Top cover for use on computer models not equipped with a fingerprint reader in shell white (includes TouchPad and cable)

Spare part number	Description
619247-001	Top cover for use on computer models not equipped with a fingerprint reader in Sonoma red (includes TouchPad and cable)
619248-001	Top cover for use on computer models not equipped with a fingerprint reader in champagne (includes TouchPad and cable)
619249-001	Top cover for use on computer models equipped with a fingerprint reader, in brushed aluminum (includes fingerprint reader board, bracket, and cable, TouchPad, and cable)
619250-001	Top cover for use on computer models not equipped with a fingerprint reader in midnight blue (includes TouchPad and cable)
621046-001	640-GB, 7200-rpm (includes hard drive bracket, cable, and isolators)
631019-001	15.6-in TouchScreen HD, LED, BrightView display assembly in brushed aluminum (includes display panel cable, TouchScreen cable, webcam/microphone module, and 2 wireless antenna cables and transceivers)
631081-001	System board for use on computer models equipped with a graphics subsystem with dedicated memory and the HD 6370 chipset (includes replacement thermal material)
631082-001	System board for use on computer models equipped with a graphics subsystem with dedicated memory and the HD 6550 chipset (includes replacement thermal material)
633252-001	750-GB, 7200-rpm (includes hard drive bracket, cable, and isolators)
634433-001	Thermal Pad Kit
634686-001	AMD Athlon II N370 Dual 2.50-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second); includes replacement thermal material)
634687-001	AMD Phenom II P650 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)
634688-001	AMD Phenom II P860 Triple 2.00-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second); includes replacement thermal material)
634689-001	AMD Phenom II P960 Quad 1.80-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second); includes replacement thermal material)
634690-001	AMD Turion II N570 Dual 2.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second); includes replacement thermal material)
634691-001	AMD Turion II P560 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second); includes replacement thermal material)
635494-001	AMD Phenom II N660 Dual 3.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)
635495-001	AMD Phenom II N870 Triple 2.30-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)
635496-001	AMD Phenom II N970 Quad 2.20-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)
636634-001	AMD V-Series V160 Single 2.40-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)
636635-001	AMD Athlon II P360 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)

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.

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

Avoid exposing 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."

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.

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

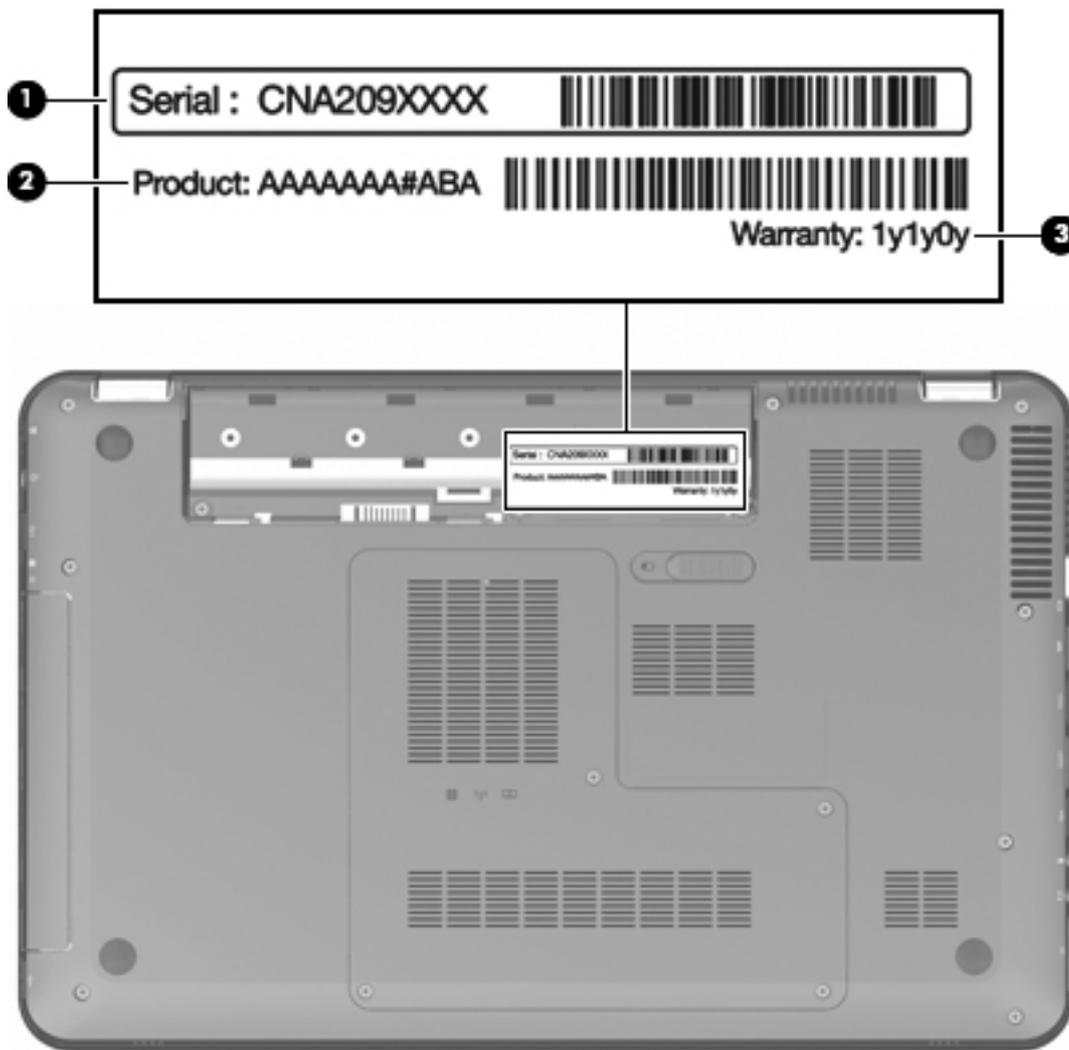
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 62 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 number provided on the service tag.

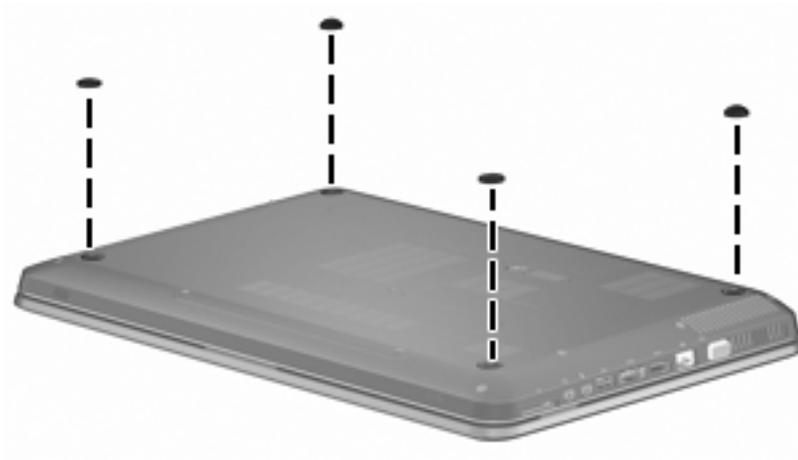


Item	Component	Description
(1)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.

Item	Component	Description
(2)	Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician determine what components and parts are needed.
(3)	Warranty period	This number describes the duration of the warranty period for the computer.

Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 603696-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

Description	Spare part number
9-cell, 93-Wh, 2.80-Ah, Li-ion battery	593550-001
6-cell, 62-Wh, 2.80-Ah, Li-ion battery	593562-001
6-cell, 55-Wh, 2.55-Ah, Li-ion battery	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. Turn the computer upside down on a flat surface, with the front toward you.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the front edge of the battery **(2)** upward.



4. Remove the battery from the computer.

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

Hard drive

 **NOTE:** The hard drive spare part kit includes a hard drive bracket, cable, and isolators.

Description	Spare part number
1-TB, 5400-rpm	603788-001
1-TB, 5200-rpm	603672-001
750-GB, 7200-rpm	633252-001
750-GB, 5400-rpm	603787-001
640-GB, 7200-rpm	621046-001
640-GB, 5400-rpm	603785-001
500-GB, 7200-rpm	608218-001
320-GB, 7200-rpm	603668-001
250-GB, 7200-rpm	603667-001
Hard Drive Hardware Kit (includes hard drive bracket, cable, and 4 isolators)	603676-001

Before removing the hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 51](#)).

Remove the hard drive:

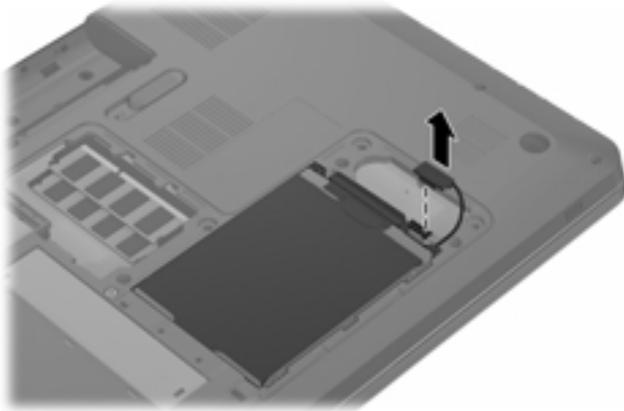
1. Loosen the four captive screws that secure the accessory cover to the computer.



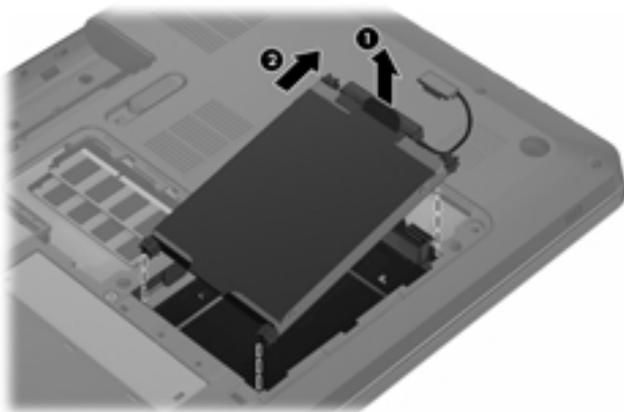
2. Lift the right side of the accessory cover until it detaches from the computer.



3. Remove the accessory cover. The accessory cover is included in the Plastics Kit, spare part number 603679-001.
4. Disconnect the hard drive cable from the system board.



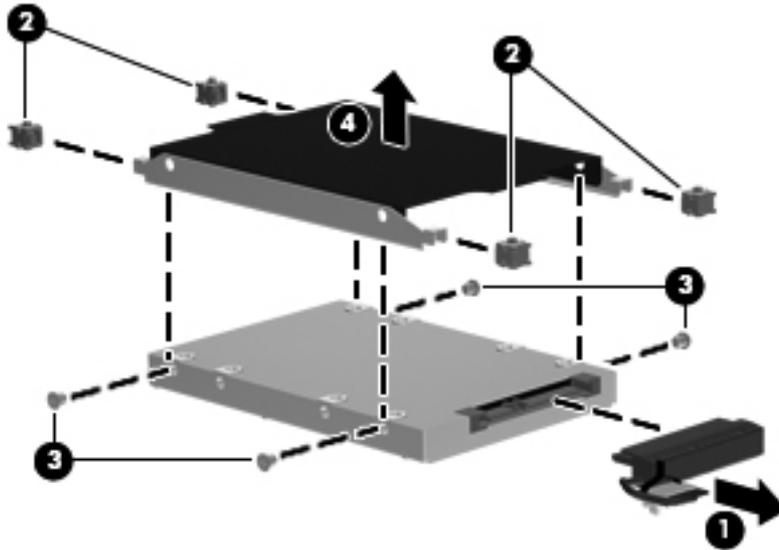
5. Use the Mylar tab **(1)** to lift the right side of the hard drive until it rests at an angle.
6. Slide the hard drive **(2)** up and to the right and remove it from the hard drive bay.



7. If it is necessary to replace the hard drive connector **(1)**, disconnect the connector from the hard drive.
8. If it is necessary to replace the hard drive isolators **(2)**, remove the isolators from the hard drive bracket.

9. If it is necessary to replace the hard drive bracket, remove the four Phillips PM3.0×3.0 screws **(3)** that secure the bracket to the hard drive.
10. Lift the hard drive bracket straight up **(4)** and remove the bracket from the hard drive.

 **NOTE:** The hard drive connector, isolators, bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 603676-001.



Reverse this procedure to reassemble and install the hard drive.

RTC battery

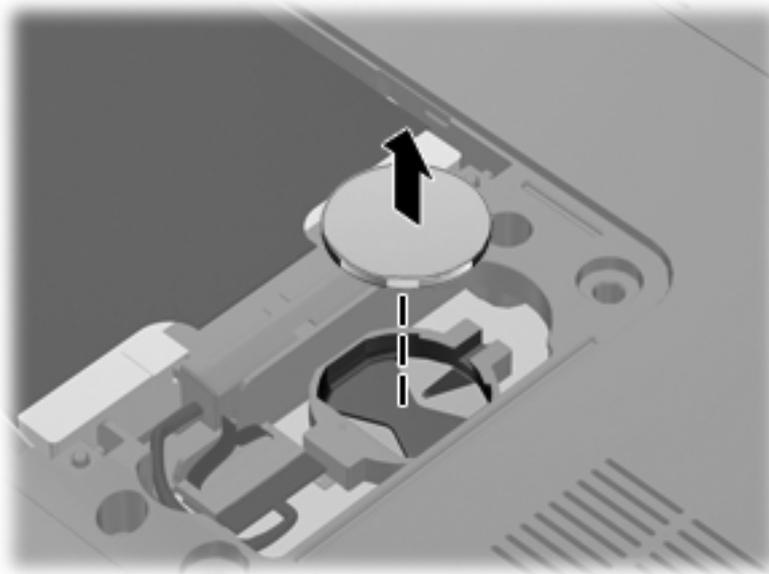
Description	Spare part number
RTC battery	599516-001

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 51](#)).
5. Remove the accessory cover (see [Hard drive on page 52](#)).

Remove the RTC battery:

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



Reverse this procedure to install the RTC battery. When installing the RTC battery, make sure the “+” sign faces up.

Memory module

Description	Spare part number
4096-MB memory module (DDR3 PC3-10600 1333-MHz)	599092-001
2048-MB memory module (DDR3 PC3-10600 1333-MHz)	598856-001
1024-MB memory module (DDR3 PC3-10600 1333-MHz)	598859-001

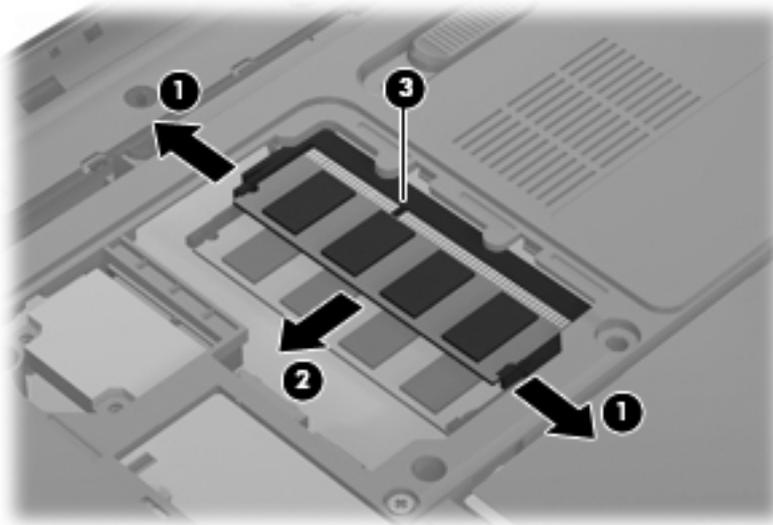
Before removing a memory module, follow these steps:

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 51](#)).
5. Remove the accessory cover (see [Hard drive on page 52](#)).

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

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



Reverse this procedure to install a memory module.

WLAN module

Description	Spare part number
Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter	605560-005
Broadcom 4313 802.11b/g/n 1x1 WiFi Adapter	593836-001
Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter	600370-001
Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	582564-001
Broadcom 43224 802.11a/b/g/n 2x2 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	582564-002
Atheros 9280AGN 802.11a/b/g/n-draft WiFi Adapter for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	580102-001

Description	Spare part number
Atheros 9280AGN 802.11a/b/g/n-draft WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	580102-002
Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter	602992-001

△ **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 51](#)).
5. Remove the accessory cover (see [Hard drive on page 52](#)).

Remove the WLAN module:

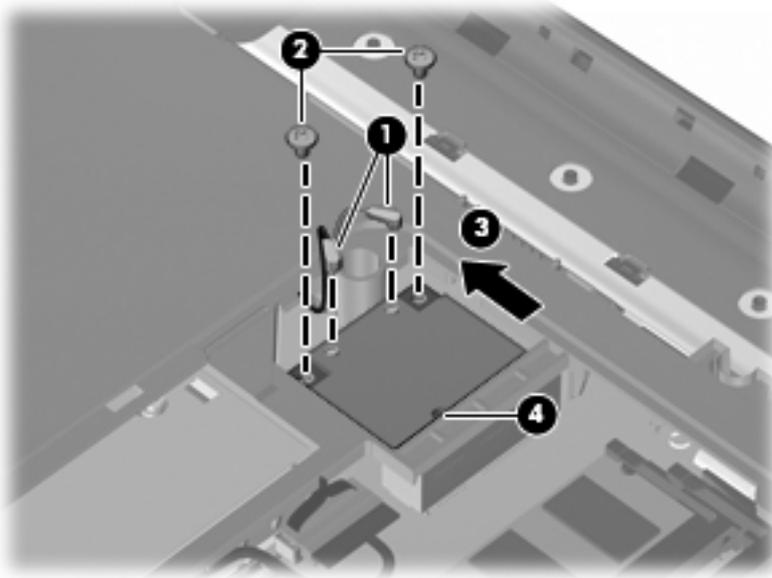
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

 **NOTE:** The 1/black WLAN antenna cable is connected to the WLAN module 1/Main terminal. The 2/gray WLAN antenna cable is connected to the WLAN module 2/Aux terminal.

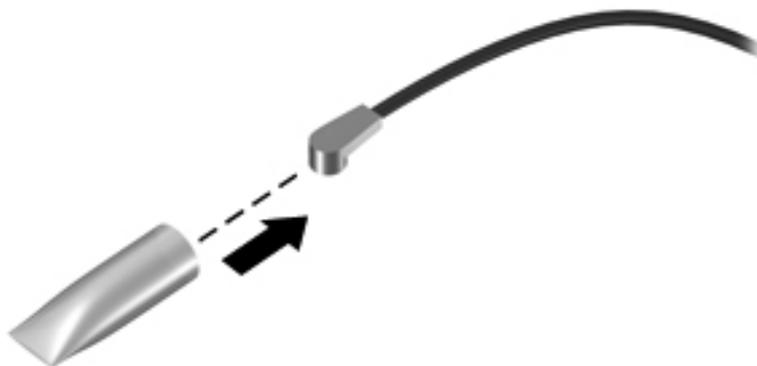
2. Remove the two Phillips PM2.0x4.0 screws **(2)** that secure the WLAN module to the system board. (The WLAN module tilts up.)

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

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



 **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.

Optical drive

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

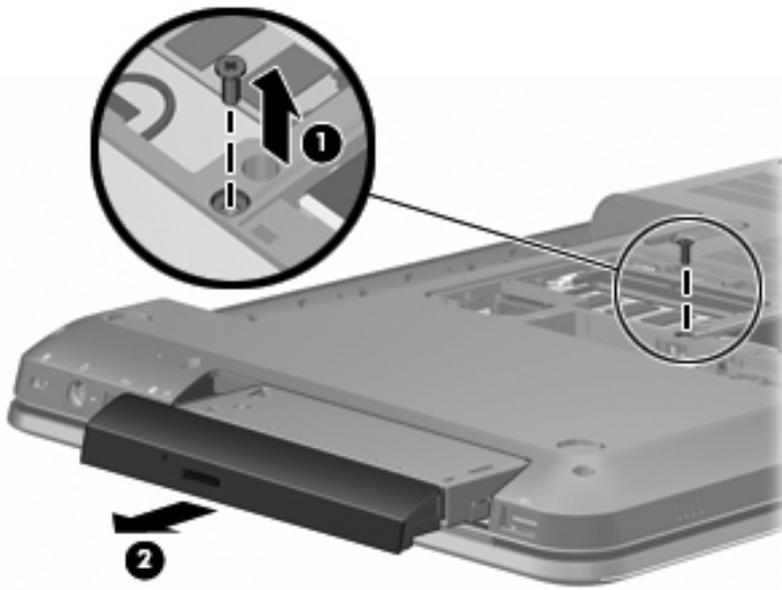
Description	Spare part number
Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive	603678-001
Blu-ray ROM DVD±RW Super Multi Double-Layer Drive	614333-001
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe	603677-001

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 51](#)).
5. Remove the accessory cover (see [Hard drive on page 52](#)).

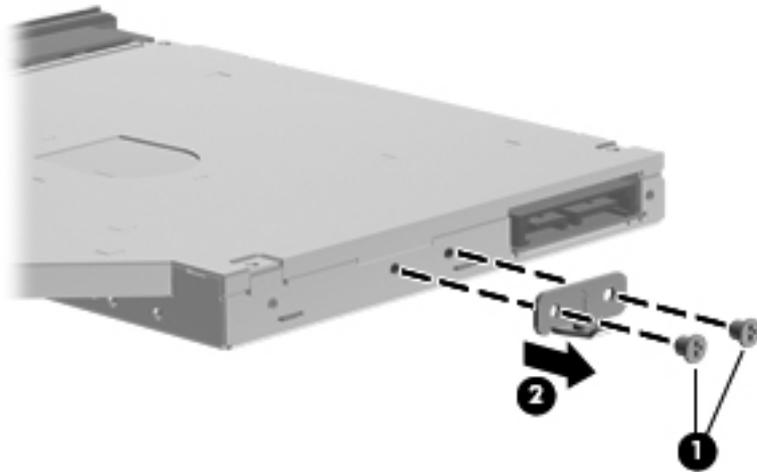
Remove the optical drive:

1. Remove the Phillips PM2.5×4.0 screw **(1)** that secures the optical drive to the computer.
2. Slide the optical drive **(2)** to the left to disconnect it from the system board.



3. Remove the optical drive.

4. If it is necessary to replace the optical drive bracket, remove the two Phillips PM2.0×4.0 screws **(1)** that secure the bracket to the optical drive.
5. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Keyboard

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

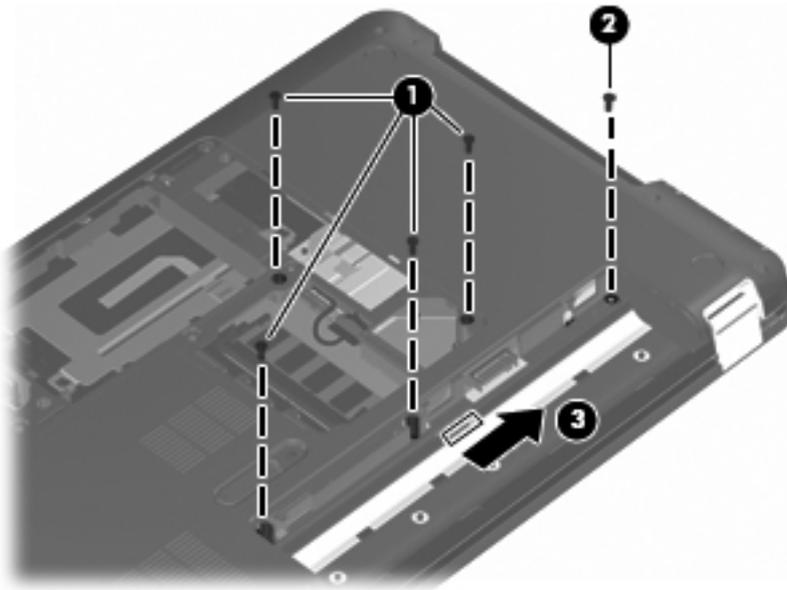
For use in country or region:	Spare part number	For use in country or region:	Spare part number
Keyboard with backlight (includes keyboard cable and keyboard light cable):			
• For use in Belgium	597630-A41	• For use in the Netherlands	597630-B31
• For use in Canada	597630-121	• For use in Portugal	597630-131
• For use in the Czech Republic	597630-221	• For use in Russia	597630-251
• For use in Denmark, Finland, and Norway	597630-DH1	• For use in Saudi Arabia	597630-171
• For use in France	597630-051	• For use in Slovenia	597630-BA1
• For use in Germany	597630-041	• For use in Spain	597630-071
• For use in Greece	597630-DJ1	• For use in Switzerland	597630-BG1
• For use in Hungary	597630-211	• For use in Turkey	597630-141
• For use in Israel	597630-BB1	• For use in the United Kingdom and Singapore	597630-031
• For use in Italy	597630-061	• For use in the United States	597630-001
Keyboard without backlight (includes keyboard cable):			
• For use in Belgium	597635-A41	• For use in the Netherlands	597635-B31
• For use in Brazil	597635-201	• For use in Portugal	597635-131
• For use in Canada	597635-121	• For use in Russia	597635-251
• For use in the Czech Republic	597635-221	• For use in Saudi Arabia	597635-171
• For use in Denmark, Finland, and Norway	597635-DH1	• For use in Slovenia	597635-BA1
• For use in France	597635-051	• For use in South Korea	597635-AD1
• For use in Germany	597635-041	• For use in Spain	597635-071
• For use in Greece	597635-DJ1	• For use in Switzerland	597635-BG1
• For use in Hungary	597635-211	• For use in Taiwan	597635-AB1
• For use in Israel	597635-BB1	• For use in Thailand	597635-281
• For use in Italy	597635-061	• For use in Turkey	597635-141
• For use in Japan	597635-291	• For use in the United Kingdom and Singapore	597635-031
• For use in Latin America	597635-161	• For use in the United States	597635-001

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 51](#)).
5. Remove the memory accessory cover (see [Hard drive on page 52](#)).

Remove the keyboard:

1. Position the computer with rear toward you.
2. Remove the four Phillips PM 2.5×6.0 screws **(1)** and the Phillips PM 2.5×4.0 **(2)** screw that secure the keyboard to the computer.
3. Slide the keyboard retention latch **(3)** to the right to release the keyboard.

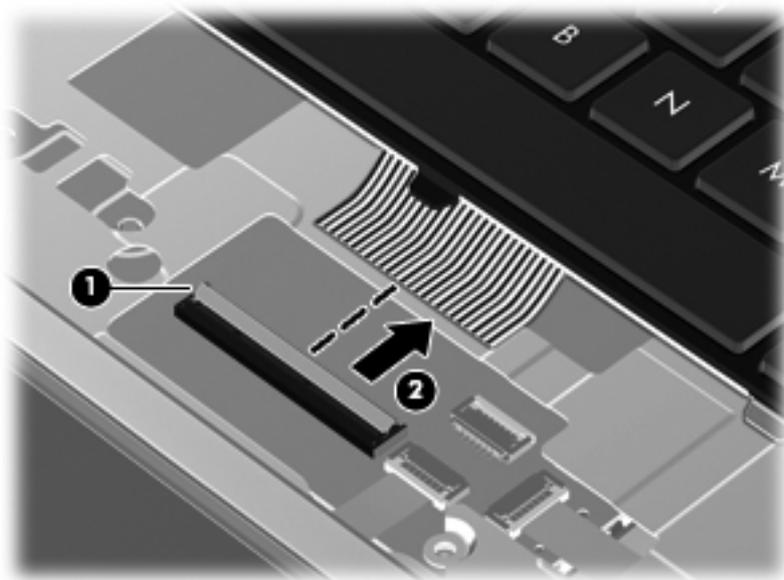


4. Turn the computer display side up, with the front toward you.
5. Open the computer as far as it will open.
6. Lift the rear edge of the keyboard **(1)** until it rests at an angle.

7. Slide the keyboard **(2)** toward the display until the tabs on the front edge of keyboard disengage from the slots in the top cover.



8. 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.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover

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

Description	Spare part number
For use on computer models equipped with a fingerprint reader, in brushed aluminum (includes fingerprint reader board, bracket, and cable)	619249-001
For use on computer models not equipped with a fingerprint reader:	
<ul style="list-style-type: none">In black cherry	619245-001
<ul style="list-style-type: none">In champagne	619248-001
<ul style="list-style-type: none">In midnight blue	619250-001
<ul style="list-style-type: none">In shell white	619246-001
<ul style="list-style-type: none">In Sonoma red	619247-001

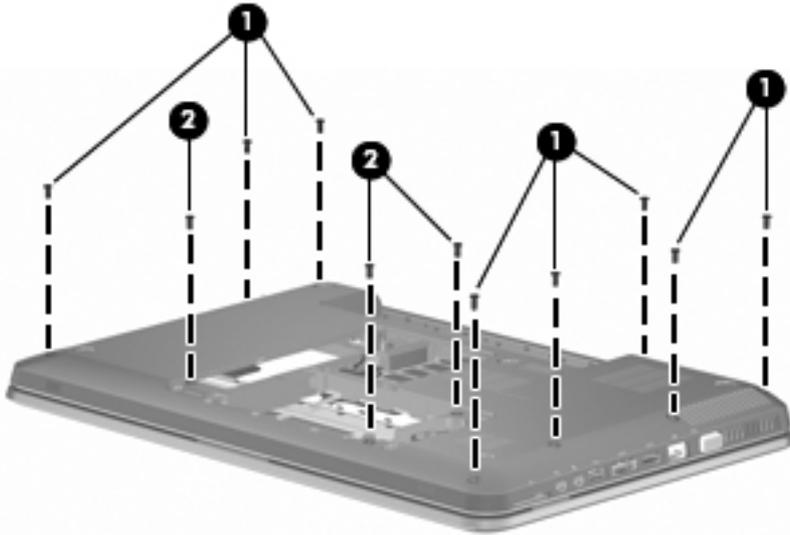
Before removing the top cover, follow these steps:

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 51](#)).
5. Remove the accessory cover (see [Hard drive on page 52](#)).
6. Remove the keyboard (see [Keyboard on page 62](#)).

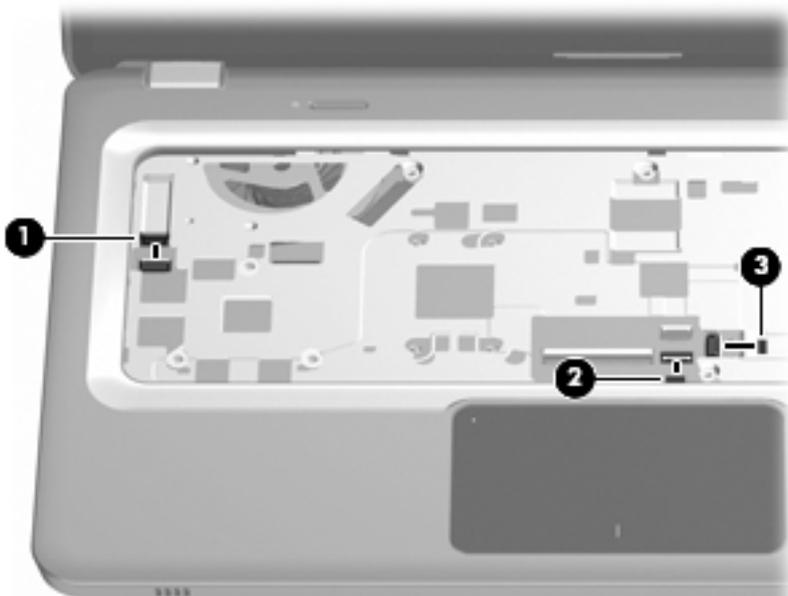
Remove the top cover:

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

3. Remove the eight Phillips PM2.5×7.0 screws **(1)** and the three Phillips PM2.5×6.0 screws **(2)** that secure the top cover to the computer.

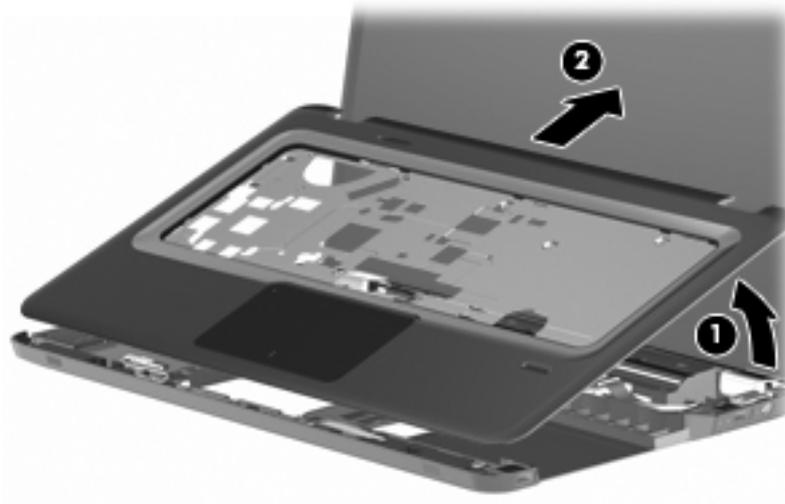


4. Release the ZIF connector to which the power button board cable is attached, and then disconnect the power button board cable **(1)** from the system board.
5. Release the ZIF connector to which the TouchPad cable is attached, and then disconnect the TouchPad cable **(2)** from the system board.
6. Release the ZIF connector to which the fingerprint reader board cable is attached, and then disconnect the fingerprint reader board cable **(3)** from the system board.



7. Lift the rear edge of the top cover **(1)** until it rests at an angle.

8. Remove the top cover **(2)**.



Reverse this procedure to install the top cover.

Power button board

Description	Spare part number
Power button board (includes cable)	603682-001

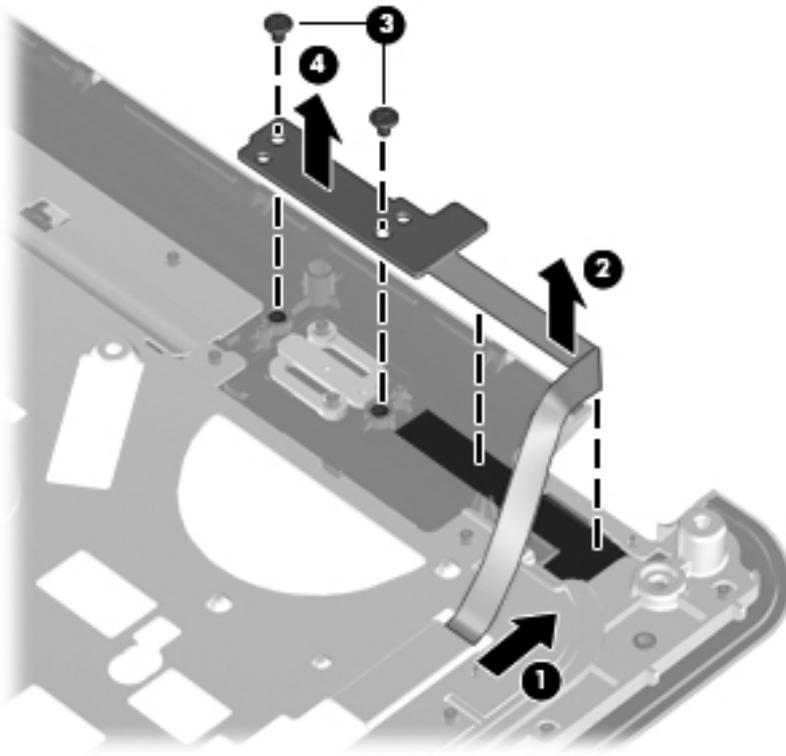
Before removing the power button board, follow these steps:

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 51](#)), and then remove the following components:
 - a. Accessory cover (see [Hard drive on page 52](#))
 - b. Keyboard (see [Keyboard on page 62](#))
 - c. Top cover (see [Top cover on page 65](#))

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 opening in the top cover **(1)**.
3. Detach the power button board cable **(2)** from the top cover. (The power button board cable is attached to the top cover with double-sided tape.)
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 (4).



Reverse this procedure to install the power button board.

Front USB board

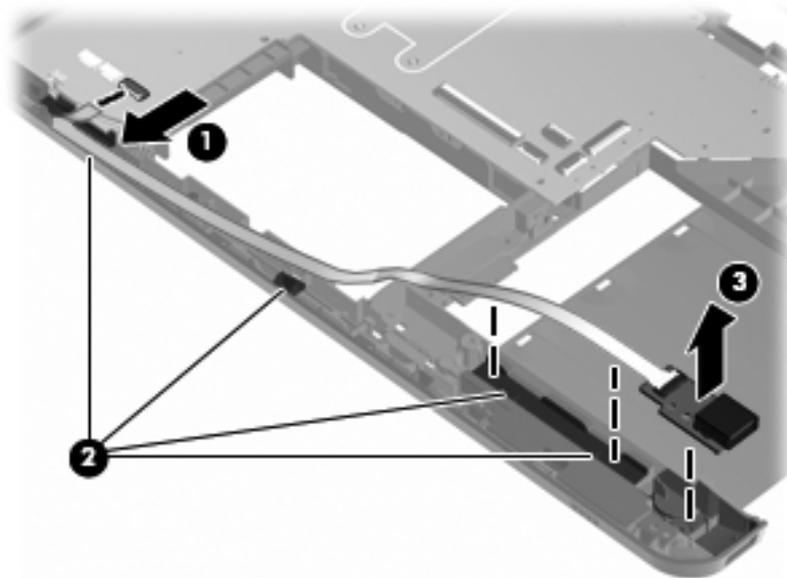
 **NOTE:** The front USB board and cable are included in the USB Board Kit, spare part number 603683-001.

Before removing the front 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 51](#)), and then remove the following components:
 - a. Accessory cover (see [Hard drive on page 52](#))
 - b. Keyboard (see [Keyboard on page 62](#))
 - c. Top cover (see [Top cover on page 65](#))

Remove the front USB board:

1. Release the ZIF connector to which the front USB board cable is connected, and then disconnect the front USB board cable **(1)** from the system board.
2. Detach the front USB board cable from the clips **(2)** built into the base enclosure. (The front USB board cable is also attached to the base enclosure with double-sided tape.)
3. Remove the front USB board **(3)**.



Reverse this procedure to install the front USB board.

Bluetooth module

 **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is included in the Cable Kit, spare part number 603645-001.

Description	Spare part number
Bluetooth module (includes the Bluetooth module rubber sleeve)	537921-001

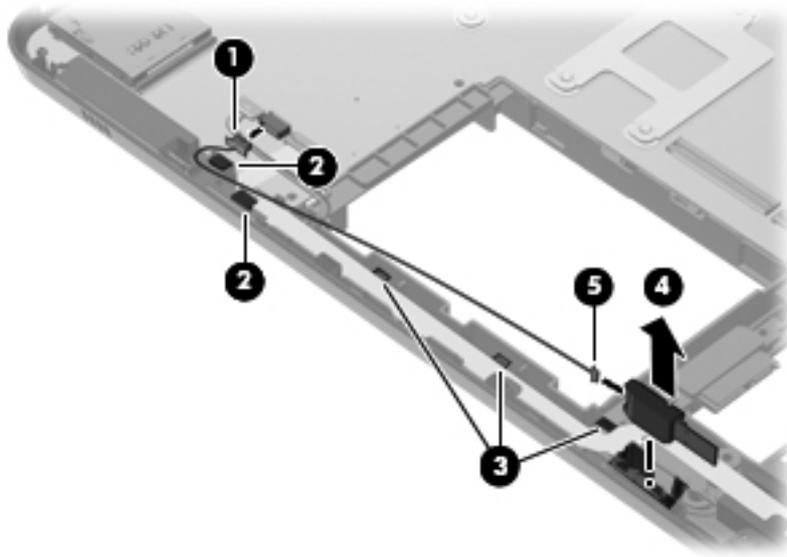
Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 51](#)), and then remove the following components:
 - a. Accessory cover (see [Hard drive on page 52](#))
 - b. Keyboard (see [Keyboard on page 62](#))
 - c. Top cover (see [Top cover on page 65](#))
 - d. Front USB board (see [Front USB board on page 70](#))

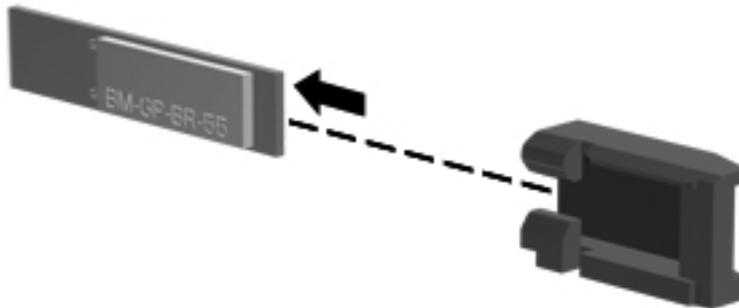
Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Release the Bluetooth module cable from the clips **(2)** built into the left speaker.
3. Release the Bluetooth module cable from the clips **(3)** built into the base enclosure.
4. Detach the Bluetooth module **(4)** and sleeve from the base enclosure. (The Bluetooth module and sleeve are attached to the base enclosure with double-sided tape).

5. Disconnect the Bluetooth module cable (5) from the Bluetooth module.



6. Remove the Bluetooth module from the sleeve.



Reverse this procedure to install the Bluetooth module, cable, and sleeve.

Rear USB board

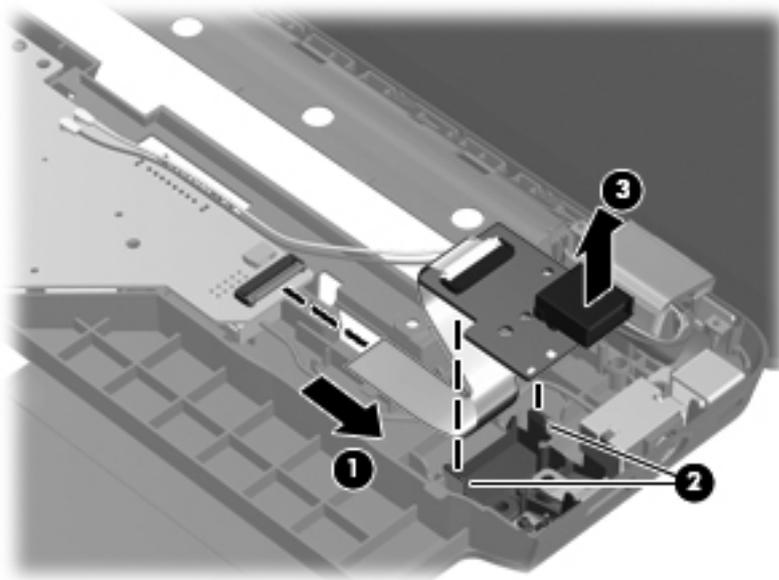
 **NOTE:** The rear USB board and cable are included in the USB Board Kit, spare part number 603683-001.

Before removing the rear 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 51](#)), and then remove the following components:
 - a. Accessory cover (see [Hard drive on page 52](#))
 - b. Keyboard (see [Keyboard on page 62](#))
 - c. Top cover (see [Top cover on page 65](#))

Remove the rear USB board:

1. Release the ZIF connector to which the rear USB board cable is connected, and then disconnect the rear USB board cable **(1)** from the system board.
2. Release the clips **(2)** built into the base enclosure that secure the rear USB board to the base enclosure.
3. Remove the rear USB board **(3)**.



Reverse this procedure to install the rear USB board.

Display assembly

 **NOTE:** The display assembly spare part kit includes a display panel cable, webcam/microphone module and cable, and 2 wireless antenna cables and transceivers.

Description	Spare part number
15.6-in TouchScreen HD, LED, BrightView display assembly in brushed aluminum (includes TouchScreen cable)	631019-001
15.6-in traditional HD, LED, BrightView display assembly in black cherry	603647-001
15.6-in traditional HD, LED, BrightView display assembly in brushed aluminum	595131-001
15.6-in traditional HD, LED, BrightView display assembly in champagne	603650-001
15.6-in traditional HD, LED, BrightView display assembly in midnight blue	615932-001
15.6-in traditional HD, LED, BrightView display assembly in shell white	603648-001
15.6-in traditional HD, LED, BrightView display assembly in Sonoma red	603649-001

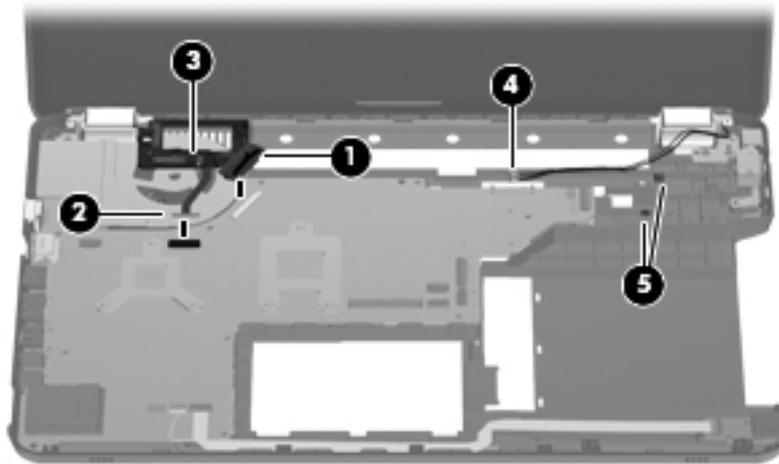
Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 51](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 57](#)).
6. Remove the following components:
 - a. Accessory cover (see [Hard drive on page 52](#))
 - b. Keyboard (see [Keyboard on page 62](#))
 - c. Top cover (see [Top cover on page 65](#))

Remove the display assembly:

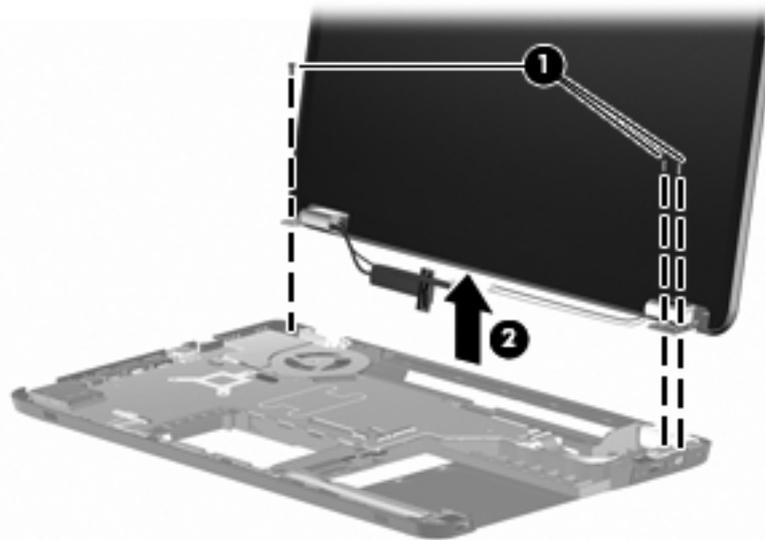
1. Disconnect the display panel cable **(1)** from the system board.
2. Disconnect the TouchScreen cable **(2)** from the system board (TouchScreen computer models only).
3. Release the display panel cable and the TouchScreen cable from the routing channel **(3)** built into the base enclosure.
4. Release the wireless antenna cables **(4)** from the opening in the base enclosure.

5. Release the wireless antenna cables from the clips built into the base enclosure **(5)**.



△ **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.

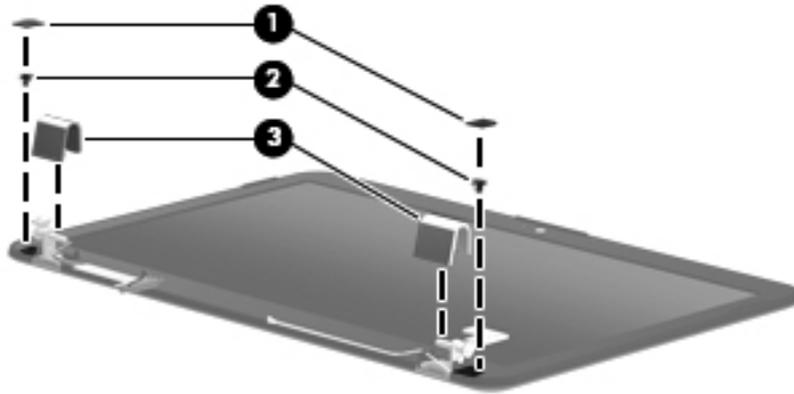
6. Remove the three Phillips PM2.5×7.0 screws **(1)** that secure the display assembly to the computer.
7. Remove the display assembly **(2)**.



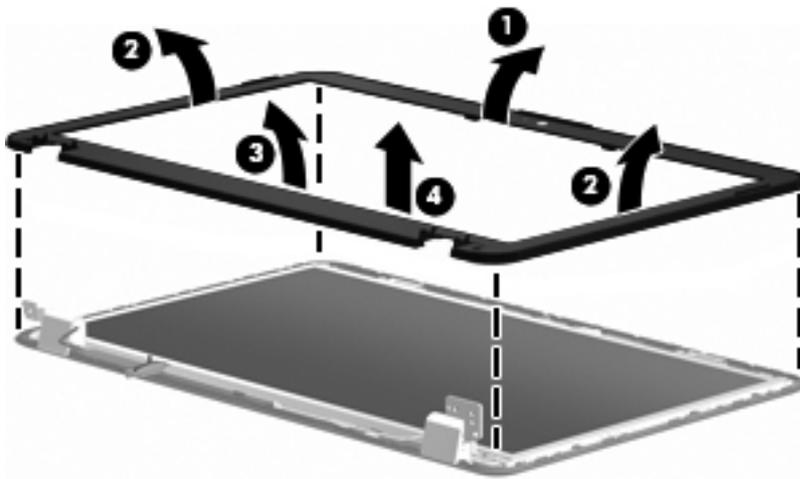
📄 **NOTE:** Steps 8 through 12 apply to computer models equipped with traditional display assemblies. Refer to steps 13 through 17 for disassembly information for computer models equipped with the TouchScreen display assembly.

8. If it is necessary to replace the display bezel or any of the traditional display assembly internal components:
 - a. Remove the Mylar screw covers **(1)**. The screw covers are included in the Display Miscellaneous Kit, spare part number 603659-001.
 - b. Remove the two Phillips PM2.5×7.0 screws **(2)** that secure the display bezel to the display assembly.

- c. Remove the hinge covers **(3)**. The hinge covers are available using spare part number 603661-001.

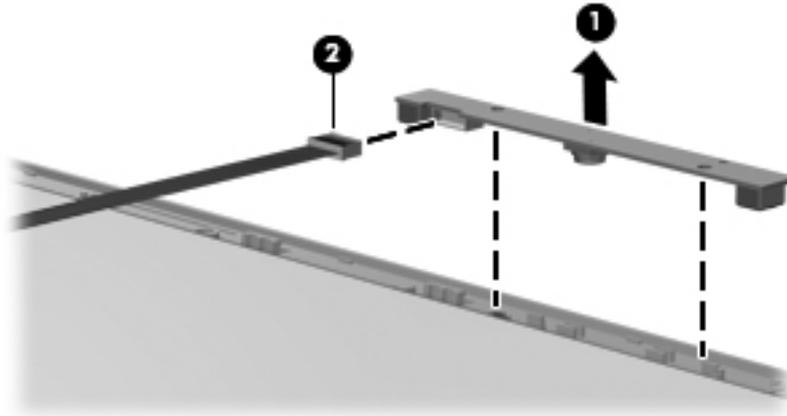


- d. Flex the inside edges of the top edge **(1)**, the left and right sides **(2)**, and the bottom edge **(3)** of the display bezel until the bezel disengages from the display enclosure.
- e. Remove the display bezel **(4)**. The display bezel is available using spare part number 603651-001.



- 9. If it is necessary to replace the webcam/microphone module:
 - a. Release the webcam/microphone module **(1)** as far as the webcam/microphone module allows.

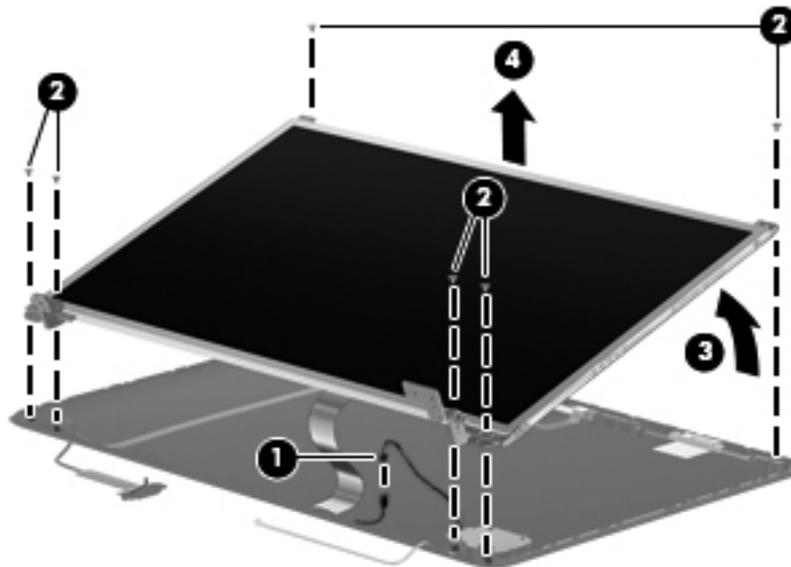
- b. Disconnect the webcam/microphone module cable (2) from the webcam/microphone module.



- c. Remove the webcam/microphone module. The webcam/microphone module is available using spare part number 603660-001.

10. If it is necessary to replace the display panel:

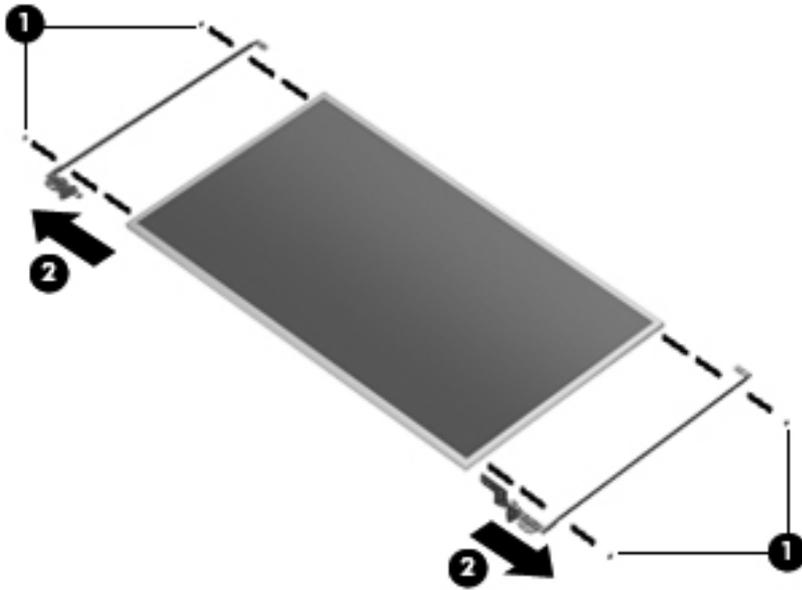
- a. Disconnect the logo light cable (1) from the display panel cable.
- b. Remove the six Phillips PM2.5×4.0 screws (2) that secure the display panel to the display enclosure.
- c. Lift the top edge of the display panel (3) until it rests at an angle.
- d. Remove the display panel (4). The display panel is available using spare part number 595130-001.



11. If it is necessary to replace the display hinges:

- a. Remove the four Phillips PM2.0×4.0 screws (1) that secure the hinges to the display panel.

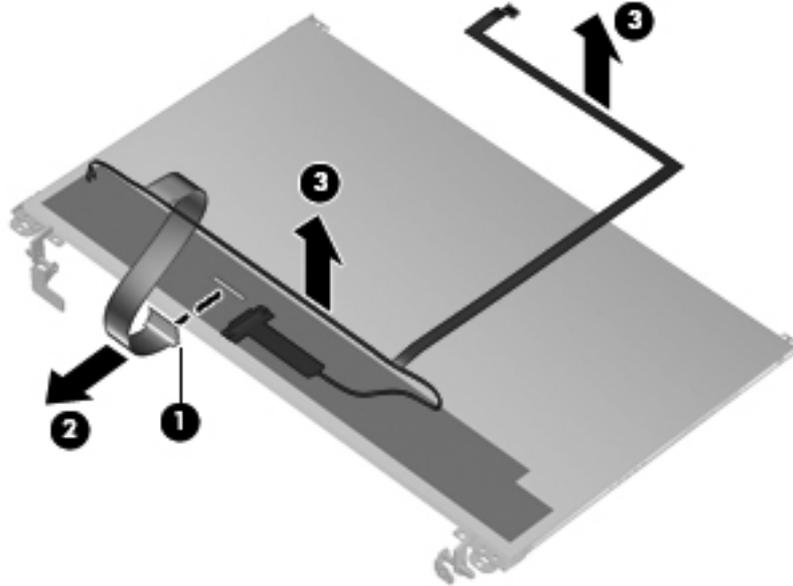
- b.** Remove the hinges **(2)**. The hinges are available using spare part number 603656-001.



- 12.** If it is necessary to replace the display panel cable:

- a.** Turn the display panel upside down, with the bottom toward you.
- b.** Release the support strip **(1)** that secures the display panel cable to the display panel.
- c.** Disconnect the display panel cable **(2)** from the display panel.

- d. Detach the display panel cable **(3)** from the display panel. (The display panel cable is attached to the display panel with double-sided tape.)

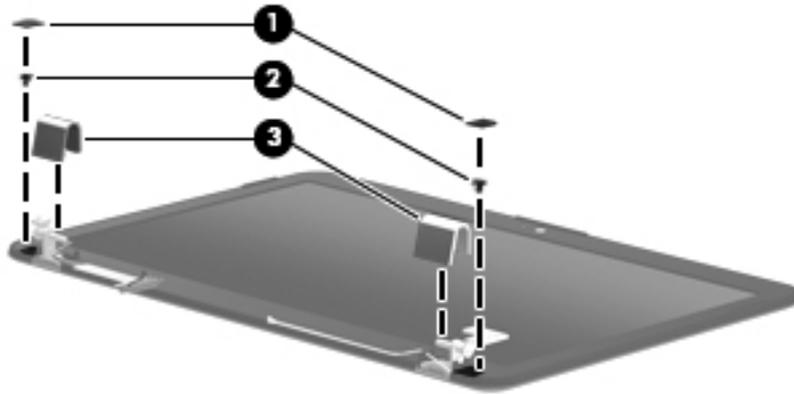


- e. Remove the display panel cable. The display panel cable is available using spare part number 603657-001, and includes the webcam/microphone module cable and logo light cable.

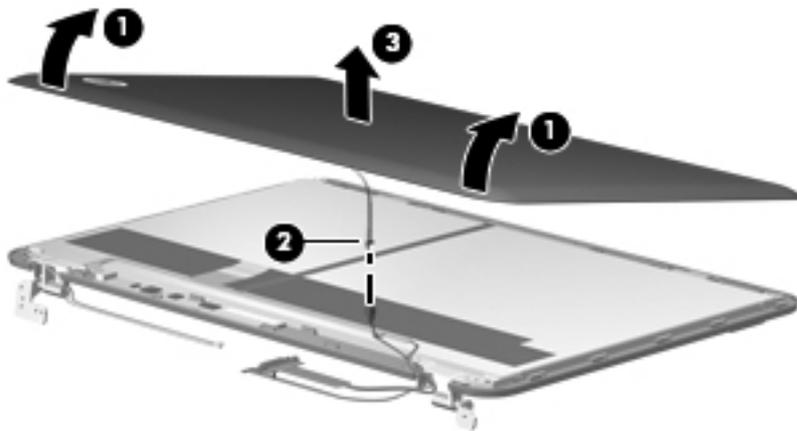
 **NOTE:** Steps 13 through 17 apply to computer models equipped with the TouchScreen display assembly. Refer to steps 8 through 12 for disassembly information for computer models equipped with traditional display assemblies.

- 13.** If it is necessary to replace the display enclosure or any of the display assembly internal components:
- a. Remove the Mylar screw covers **(1)**. The screw covers are included in the Display Miscellaneous Kit, spare part number 603659-001.
 - b. Remove the two Phillips PM2.5×7.0 screws **(2)** that secure the display enclosure to the display assembly.

- c. Remove the hinge covers (3). The hinge covers are available using spare part number 603666-001.



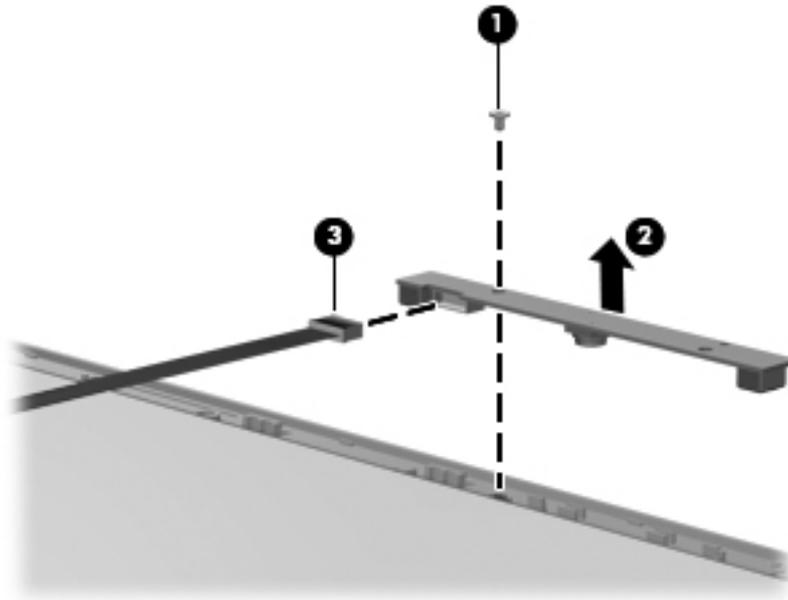
- d. Turn the display assembly upside down, with the hinges toward you.
- e. Lift the bottom edge of the display bezel/panel assembly (1) until it rests at an angle.
- f. Disconnect the logo light cable (2) from the display panel cable.
- g. Remove the display bezel/panel assembly (3).



14. If it is necessary to replace the webcam/microphone module:

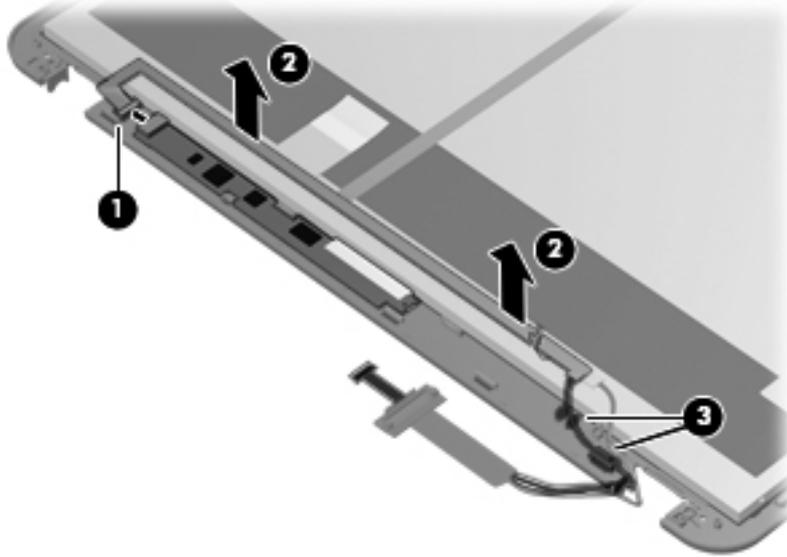
- a. Remove the Phillips PM2.0x4.0 screw (1) that secures the webcam/microphone module to the display bezel.
- b. Release the webcam/microphone module (2) as far as the webcam/microphone module allows.

- c. Disconnect the webcam/microphone module cable **(3)** from the webcam/microphone module.



- d. Remove the webcam/microphone module. The webcam/microphone module is available using spare part number 603660-001.
- 15.** If it is necessary to replace the TouchScreen cable:
- a. Disconnect the TouchScreen cable **(1)** from the TouchScreen board.
 - b. Detach the TouchScreen cable **(2)** from the display bezel/panel assembly. (The TouchScreen cable is attached to the display bezel/panel assembly with double-sided tape.)

- c. Release the TouchScreen cable from the clips **(3)** and routing channel built into the display bezel/panel assembly.

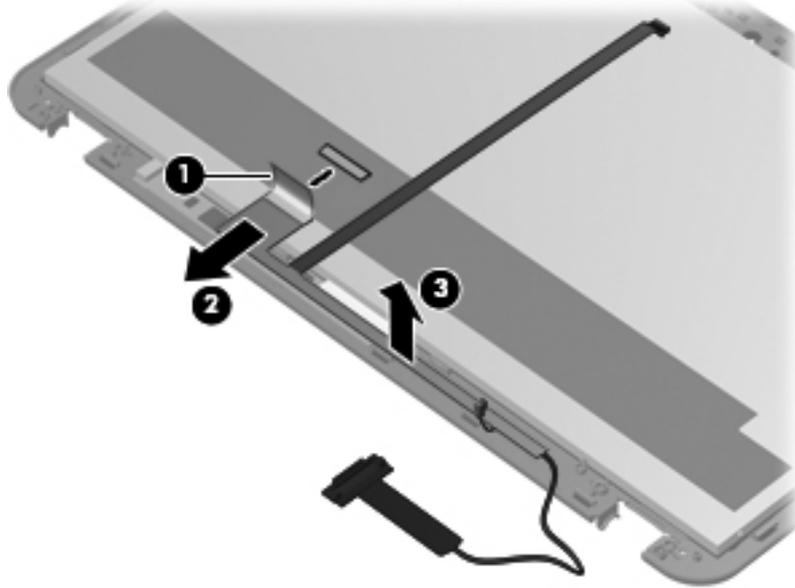


- d. Remove the TouchScreen cable. The TouchScreen cable is included in the Display Cable Kit, spare part number 603665-001.

16. If it is necessary to replace the display panel cable:

- a. Release the support strip **(1)** that secures the display panel cable to the display panel.
- b. Disconnect the display panel cable **(2)** from the display panel.

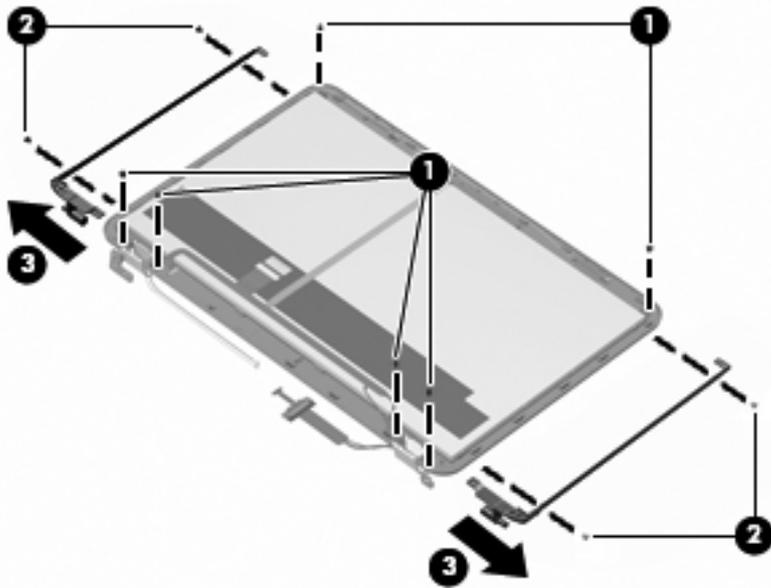
- c. Detach the display panel cable **(3)** from the display bezel/panel assembly. (The display panel cable is attached to the display bezel/panel assembly with double-sided tape.)



- d. Remove the display panel cable. The display panel cable is included in the Display Cable Kit, spare part number 603665-001, and includes the webcam/microphone module cable and logo light cable.

17. If it is necessary to replace the display hinges:

- a. Remove the six Phillips PM2.5×4.0 screws **(1)** and the four Phillips PM2.0×4.0 screws **(2)** that secure the hinges to the display bezel/panel assembly.
- b. Remove the hinges **(2)**. The hinges are available using spare part number 603664-001.



Reverse this procedure to reassemble and install the display assembly.

Power connector cable

Description	Spare part number
Power connector cable	603692-001

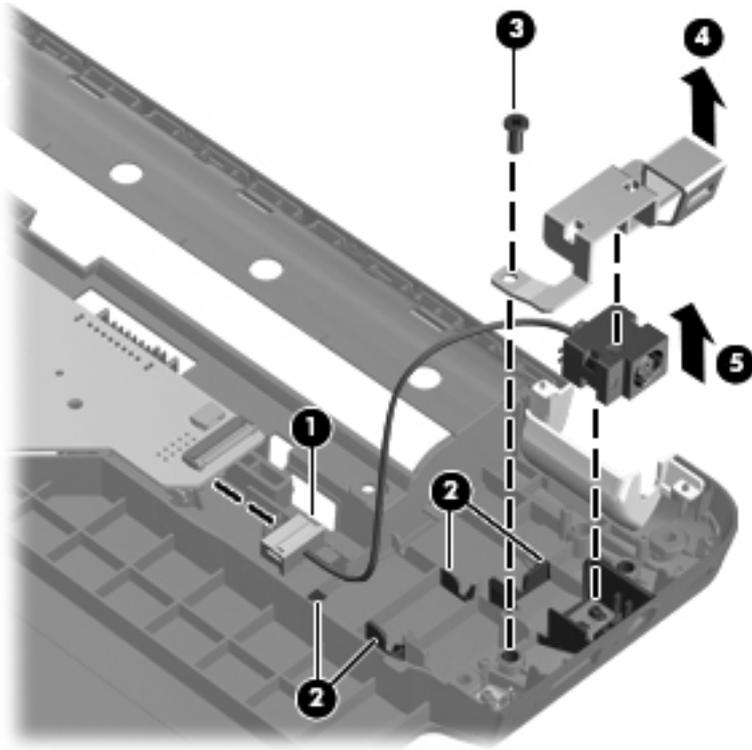
Before removing the power connector cable, follow these steps:

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 51](#)), and then remove the following components:
 - a. Accessory cover (see [Hard drive on page 52](#))
 - b. Keyboard (see [Keyboard on page 62](#))
 - c. Top cover (see [Top cover on page 65](#))
 - d. Display assembly (see [Display assembly on page 74](#))

Remove the power connector cable:

1. Disconnect the power cable **(1)** from the system board.
2. Release the power cable from the clips **(2)** built into the base enclosure.
3. Remove the Phillips PM2.5×4.0 screw **(3)** that secures the power connector to the base enclosure.
4. Remove the power connector bracket **(4)** The power connector bracket is included with the base enclosure spare part kit, spare part number 603689-001.

5. Remove the power connector cable (5) from the clip built into 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 on computer models equipped with a graphics subsystem with discrete memory and the HD 5650 chipset	603939-001
For use on computer models equipped with a graphics subsystem with discrete memory and the HD 5470 chipset	595133-001
For use on computer models equipped with a graphics subsystem with dedicated memory and the HD 6370 chipset	631081-001
For use on computer models equipped with a graphics subsystem with dedicated memory and the HD 6550 chipset	631082-001
For use on computer models equipped with a graphics subsystem with UMA memory	595135-001

Before removing the system board, follow these steps:

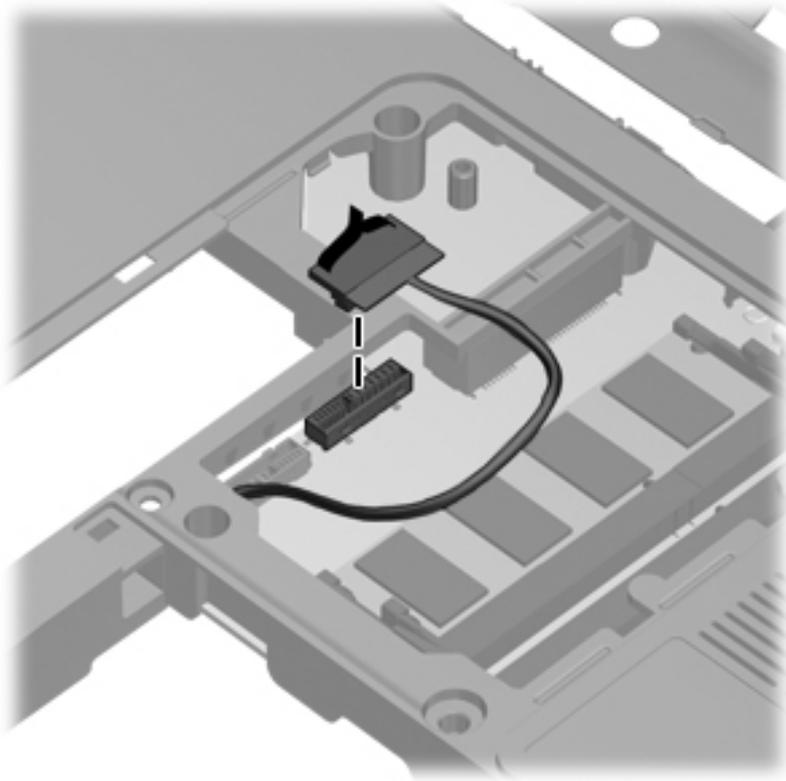
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 51](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 52](#))
 - b. Optical drive (see [Optical drive on page 60](#))
 - c. Keyboard (see [Keyboard on page 62](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Display assembly (see [Display assembly on page 74](#))

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

- RTC battery (see [RTC battery on page 55](#))
- Memory modules (see [Memory module on page 56](#))
- WLAN module (see [WLAN module on page 57](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 90](#))
- Processor (see [Processor on page 94](#))

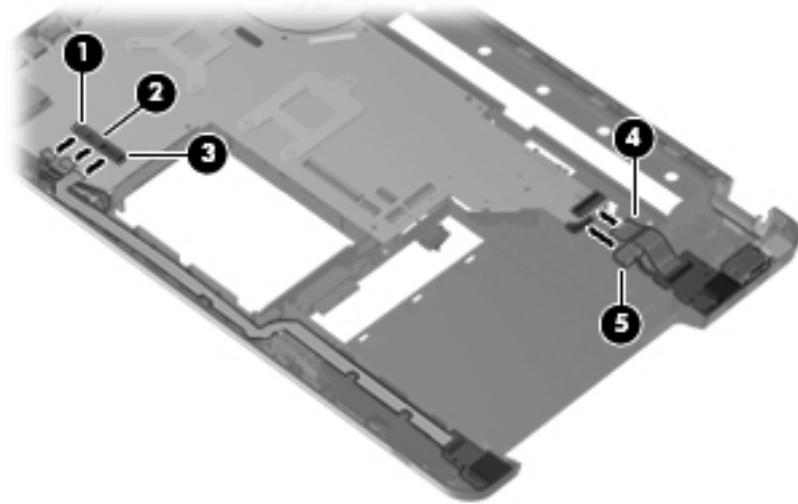
Remove the system board:

1. Turn the base enclosure upside down, with the front toward you.
2. Disconnect the optical drive board cable from the system board.



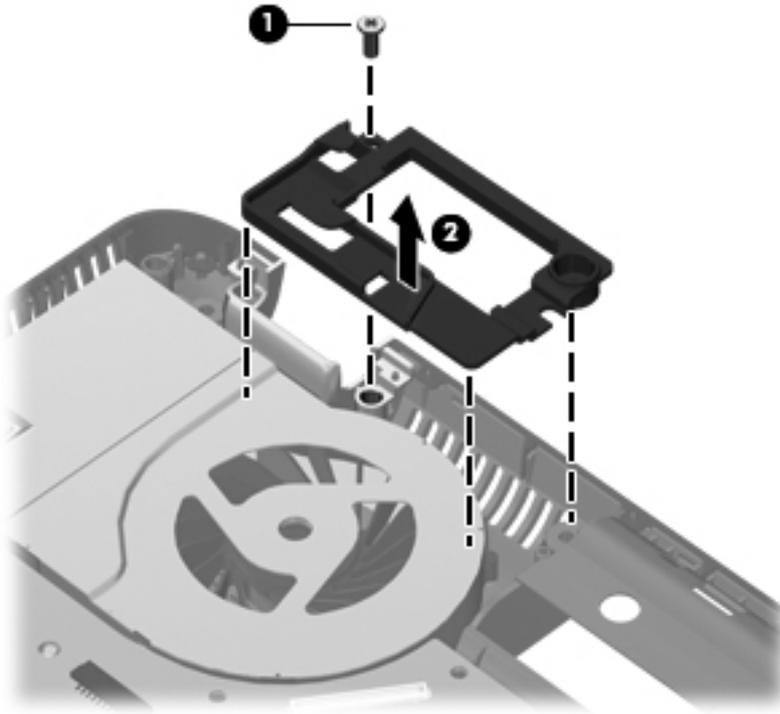
3. Turn the base enclosure right-side up, with the front toward you.

4. Disconnect the following cables from the system board:
 - (1) Speaker cable
 - (2) Bluetooth module cable
 - (3) Front USB board cable
 - (4) Rear USB board cable
 - (5) Power cable

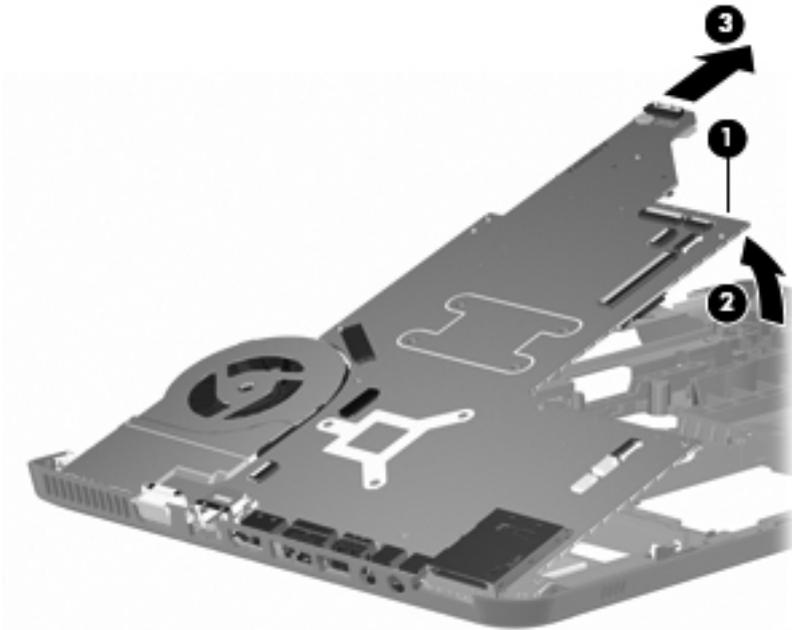


5. Remove the Phillips PM2.5×7.0 screw (1) that secures the display cable channel to the base enclosure.

6. Remove the display cable channel **(2)**. The display cable channel is available using spare part number 603697-001.



7. Use the front/right corner of the system board **(1)** to lift the right side of the system board **(2)** until it rests at an angle.
8. Remove the system board **(3)** by sliding it up and to the right 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 on computer models equipped with graphics subsystems with discrete memory	606575-001
For use on computer models equipped with graphics subsystems with UMA memory	606574-001

 **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 51](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 52](#))
 - b. Optical drive (see [Optical drive on page 60](#))
 - c. Keyboard (see [Keyboard on page 62](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Display assembly (see [Display assembly on page 74](#))
 - f. System board (see [System board on page 86](#))

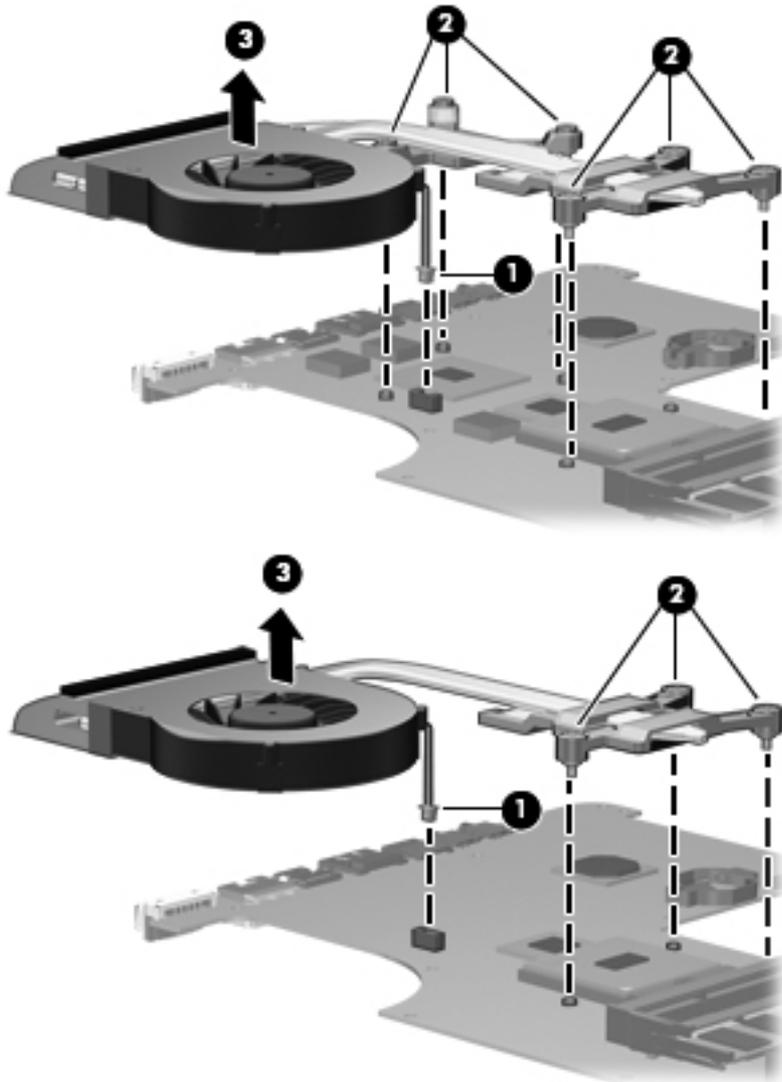
Remove the fan/heat sink assembly:

1. Turn the system board upside down with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Loosen the captive screws **(2)** that secure the fan/heat sink assembly to the system board.

 **NOTE:** The number of captive screws securing the fan/heat sink assembly to the system board vary by computer model. Computer models equipped with a graphics subsystem with discrete memory have six captive screws securing the fan/heat sink assembly to the system board, as shown in the first illustration below. Computer models equipped with a graphics subsystem with UMA memory have three captive screws securing the fan/heat sink assembly to the system board, as shown in the second illustration below.

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

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

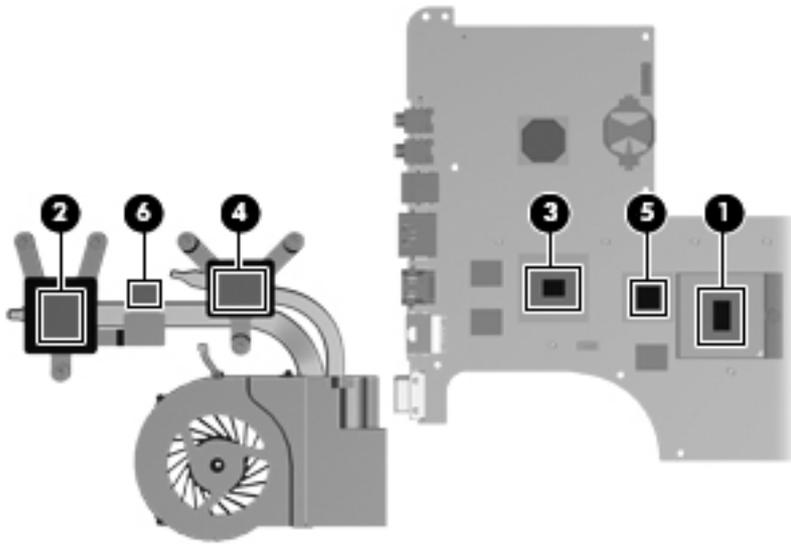


 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Replacement thermal material locations vary by computer model.

Computer models equipped with a graphics subsystem with discrete memory have replacement thermal material locations as shown in the following illustration:

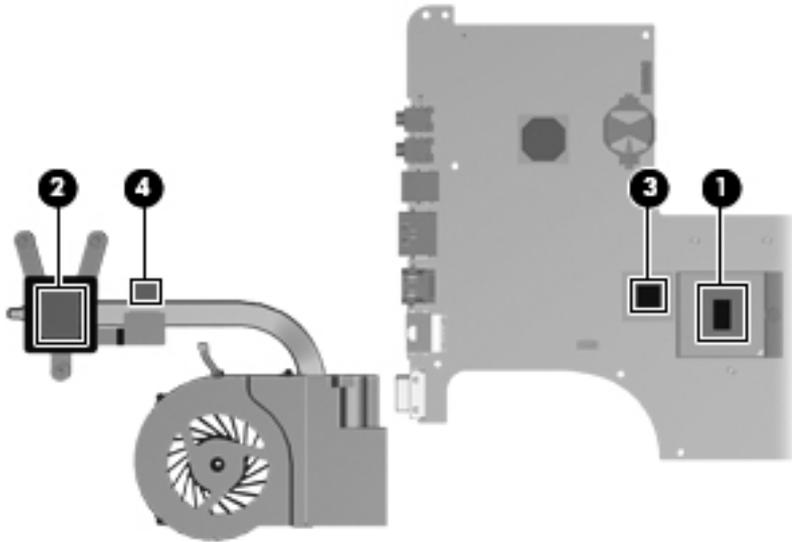
- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- Thermal paste is used on the graphics subsystem chip **(3)** and the heat sink section **(4)** that services it
- A thermal pad is used on the system board PCH chip **(5)** and the heat sink section **(6)** that services it

Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



 **NOTE:** Computer models equipped with a graphics subsystem with UMA memory have replacement thermal material locations as shown in the following illustration:

- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- A thermal pad is used on the system board PCH chip **(3)** and the heat sink section **(4)** that services it



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 Phenom II N970 Quad 2.20-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	635496-001
AMD Phenom II N950 Quad 2.10-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	616346-001
AMD Phenom II N930 Quad 2.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	594169-001
AMD Phenom II N870 Triple 2.30-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	635495-001
AMD Phenom II N850 Triple 2.20-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	616345-001
AMD Phenom II N830 Triple 2.10-GHz processor (1.5-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second)	594168-001
AMD Phenom II N660 Dual 3.00-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	635494-001
AMD Phenom II N640 Dual 2.90-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W, 3.6 gigatransfers/second)	616344-001
AMD Phenom II N620 Dual 2.80-GHz processor (2.0-MB L2 cache, 1333-MHz FSB, 35W 3.6 gigatransfers/second)	594166-001
AMD Phenom II P960 Quad 1.80-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	634689-001
AMD Phenom II P940 Quad 1.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	616336-001
AMD Phenom II P920 Quad 1.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	594170-001
AMD Phenom II P860 Triple 2.00-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	634688-001
AMD Phenom II P840 Triple 1.90-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W, 3.6 gigatransfers/second)	616335-001
AMD Phenom II P820 Triple 1.80-GHz processor (1.5-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	594167-001
AMD Phenom II P650 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	634687-001
AMD Turion II N570 Dual 2.70-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	634690-001
AMD Turion II N550 Dual 2.60-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	616337-001
AMD Turion II N530 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	594172-001

Description	Spare part number
AMD Turion II P560 Dual 2.50-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 35W 3.6 gigatransfers/second)	634691-001
AMD Turion II P540 Dual 2.40-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	616347-001
AMD Turion II P520 Dual 2.30-GHz processor (2.0-MB L2 cache, 1066-MHz FSB, 25W 3.6 gigatransfers/second)	594173-001
AMD Athlon II N370 Dual 2.50-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	634686-001
AMD Athlon II N350 Dual 2.40-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	616334-001
AMD Athlon II N330 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	594164-001
AMD Athlon II P360 Dual 2.30-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 35W 3.2 gigatransfers/second)	636635-001
AMD Athlon II P340 Dual 2.20-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	616343-001
AMD Athlon II P320 Dual 2.10-GHz processor (1.0-MB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	594165-001
AMD V-Series V160 Single 2.40-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	636634-001
AMD V-Series V140 Single 2.30-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	616333-001
AMD V-Series V120 Single 2.20-GHz processor (512-KB L2 cache, 1066-MHz FSB, 25W 3.2 gigatransfers/second)	594171-001

Before removing the processor, follow these steps:

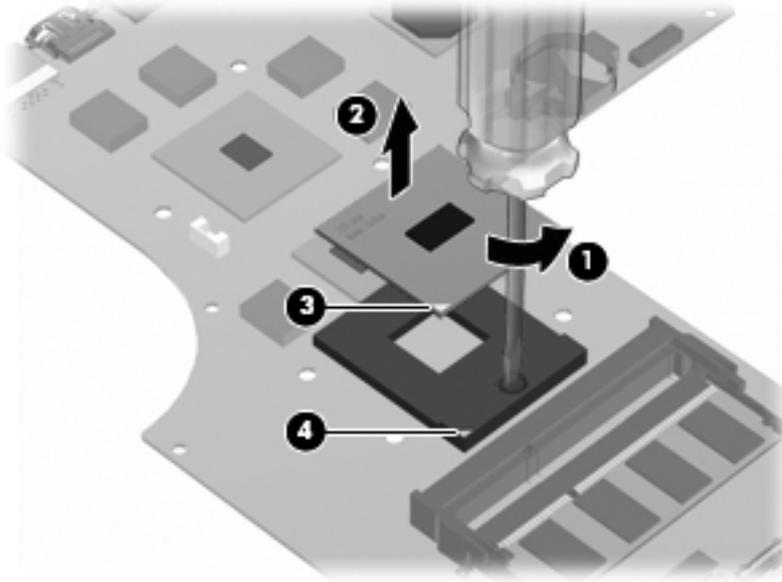
- 1.** Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2.** Disconnect all external devices connected to the computer.
- 3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4.** Remove the battery (see [Battery on page 51](#)), and then remove the following components:
 - a.** Hard drive (see [Hard drive on page 52](#))
 - b.** Optical drive (see [Optical drive on page 60](#))
 - c.** Keyboard (see [Keyboard on page 62](#))
 - d.** Top cover (see [Top cover on page 65](#))
 - e.** Display assembly (see [Display assembly on page 74](#))

- f. System board (see [System board on page 86](#))
- g. Fan/heat sink assembly (see [Fan/heat sink assembly on page 90](#))

Remove the processor:

1. Turn the processor locking screw **(1)** one-half turn counterclockwise, until you hear a click.
2. Lift the processor **(2)** straight up, and remove it.

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



Reverse this procedure to install the processor.

Speakers

Description	Spare part number
Speakers (include cable)	603694-001

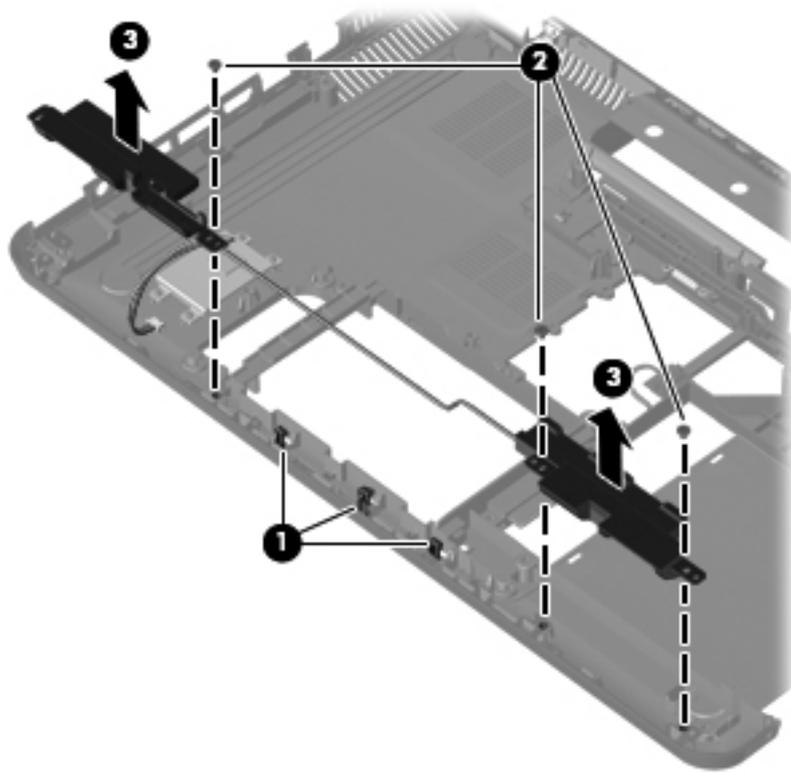
Before removing the speakers, follow these steps:

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 51](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 52](#))
 - b. Optical drive (see [Optical drive on page 60](#))
 - c. Keyboard (see [Keyboard on page 62](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Display assembly (see [Display assembly on page 74](#))
 - f. System board (see [System board on page 86](#))

Remove the speakers:

1. Release the speaker cables from the clips **(1)** built into the base enclosure.
2. Remove the three Phillips PM2.5×6.0 screws **(2)** that secure the speakers to the base enclosure.

3. Remove the speakers (3).



Reverse this procedure to install the speakers.

Optical drive connector board

 **NOTE:** The optical drive connector board and cable are included in the Cable Kit, spare part number 603680-001.

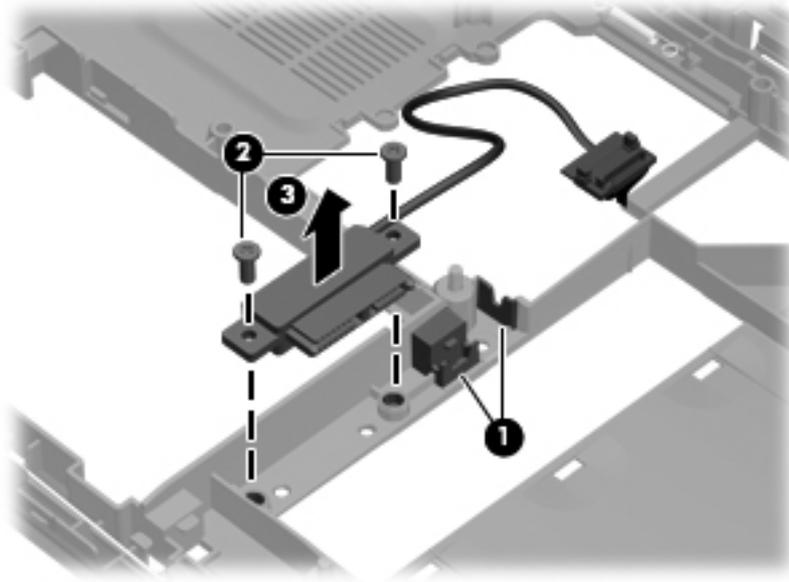
Before removing the optical drive connector board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 51](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 52](#))
 - b. Optical drive (see [Optical drive on page 60](#))
 - c. Keyboard (see [Keyboard on page 62](#))
 - d. Top cover (see [Top cover on page 65](#))

- e. Display assembly (see [Display assembly on page 74](#))
- f. System board (see [System board on page 86](#))

Remove the optical drive connector board:

1. Release the optical drive connector board cable from the clips **(1)** built into the base enclosure.
2. Remove the two Phillips PM2.5×6.0 screws **(2)** that secure the optical drive connector board to the base enclosure.
3. Remove the optical drive connector board **(3)**.



Reverse this procedure to install the optical drive connector board.

5 Setup Utility (BIOS)

Starting Setup Utility

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

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

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

To start Setup Utility:

1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message appears, press the **esc** key.

2. When the Startup Menu is displayed, press the **f10** key.

Using Setup Utility

Changing the language of Setup Utility

To change the language of Setup Utility:

1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” appears, press the **esc** key. When the Startup Menu appears, press the **f10** key.

2. Use the arrow keys to select **System Configuration > Language**, and then press the **enter** key.
3. Use the arrow keys to select a language, and then press the **enter** key.

4. When a confirmation prompt with your language selected is displayed, press the [enter](#) key.
5. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press the [enter](#) key.

Change goes into effect immediately.

Navigating and selecting in Setup Utility

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

To navigate Setup Utility:

- Use the arrow keys to choose a menu or a menu item.
- Use either the arrow keys or the [f5](#) or the [f6](#) keys to choose an item in a list or to toggle a field, for example an Enable/Disable field.
- Press the [enter](#) key to select an item.
- Press the [esc](#) key to close a text box or return to the menu display.
- Press the [f1](#) key to display additional navigation and selection information.

Displaying system information

Use Setup Utility to view the system time and date and information that identifies the computer.

To display the system information using Setup Utility:

 **NOTE:** If Setup Utility is running, begin at step 1. If Setup Utility is not running, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. When the “Press the ESC key for Startup Menu” appears, press the [f10](#) key.

– or –

Open Setup Utility by turning on or restarting the computer. When the “Press the ESC key for Startup Menu” message appears, press the [esc](#) key. When the Startup Menu appears, press the [f10](#) key.

2. Select the **Main** menu.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press the [enter](#) key.

Restoring default settings in Setup Utility

To restore Setup Utility default settings:

 **NOTE:** If Setup Utility is running, begin at step 1. If Setup Utility is not running, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. When the “Press the ESC key for Startup Menu” appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. When the “Press the ESC key for Startup Menu” message appears, press the **esc** key. When the Startup Menu appears, press the **f10** key.

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

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

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

Exiting Setup Utility

Exit Setup Utility with or without saving changes.

- To exit Setup Utility and save your changes from the current session:

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

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

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

After either choice, the computer restarts in Windows.

Setup Utility menus

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

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

Main menu

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

Security menu

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

System Configuration menu

Select	To do this
Language Support	Change the language of Setup Utility.
Virtualization Technology (select models only)	Enable/disable the processor Virtualization Technology.
LAN Power Saving (select models only)	Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode.
Fan Always On	Enable/disable Fan Always On. When enabled, the computer fan will always be on.

Select	To do this
Action Keys Mode	Enable/disable the Action Keys.
Boot Options	<ul style="list-style-type: none"> • POST (power-on self test) f10 and f12 Delay (sec.)—Set the delay for the f10 and f12 functions of Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20). • HP QuickWeb—Enable/disable the QuickWeb Boot menu in Setup Utility. <ul style="list-style-type: none"> ◦ Enable/disable the HP QuickWeb Boot Menu during POST. ◦ Delay to boot Windows—Set the delay for the HP QuickWeb Boot Menu to 2, 3, 5, 10, 15, or 30 seconds. • CD-ROM Boot—Enable/disable boot from CD-ROM. • Floppy Boot—Enable/disable boot from diskette. • Internal Network Adapter Boot—Enable/disable boot from the internal network adapter. • Boot Order—Set the boot order for: <ul style="list-style-type: none"> ◦ Notebook Hard Drive ◦ Internal CD/DVD ROM Drive ◦ USB Disk on Key/USB Hard Drive ◦ USB CD/DVD ROM Drive ◦ USB Floppy ◦ Network Adapter

Diagnostics menu

Select	To do this
Hard Disk Self Test	Run a comprehensive self-test on the hard drive.
Memory Test	Run a diagnostic test on the system memory.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions:		
Width	37.8 cm	14.9 in
Depth	24.5 cm	9.7 in
Height (front to back)	3.2 cm to 3.6 cm	1.3 in to 1.4 in
Weight:		
Computer model equipped with a hard drive, optical drive, and traditional display assembly:	2.8 kg	6.2 lbs
Computer model equipped with a hard drive, optical drive, and TouchScreen display assembly:	3.29 kg	7.3 lbs
Input power		
Operating voltage	18.5 V dc or 19.0 V dc	
Operating current	3.5 A or 4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 90%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	

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

15.6-inch, SVA display specifications

	Metric	U.S.
Dimensions		
Width	34.5 cm	13.6 in
Height	19.4 cm	7.6 in
Diagonal	39.4 cm	15.6 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 nits (typical)	
Backlight	LED	
Character display	80 × 25	
Total power consumption	6.0 W	
Viewing angle	+/-65 horizontal, +/-50° vertical (typical)	

Hard drive specifications

	1-TB*	750-GB*	640-GB*	500-GB*	320-GB*	250-GB*
Dimensions						
Height	12.7 mm and 12.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g	101 g	101 g	101 g
Interface type	SATA	SATA	SATA	SATA	SATA	SATA
Transfer rate	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)						
Single track	3 ms	3 ms	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms	24 ms	24 ms
Logical blocks	1,953,504,479	1,465,128,359	1,250,242,867	976,752,240	625,121.433	488,376,120
Disk rotational speed	5400 rpm and 5200 rpm	7200 rpm and 5400 rpm	7200 rpm and 5400 rpm	7200 rpm	7200 rpm	7200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)					
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.						
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.						

Blu-ray ROM with LightScribe DVD±RW Super Multi Double-Layer Drive specifications

Applicable disc	Read:	Write:
	BD-ROM, BD-ROM-DL, BD-R, BD-R-DL, BD-RE, BD-RE-DL, DVD-ROM, DVD+R, DVD+R-DL, DVD+RW, DVD-R, DVD-R-DL, DVD-RW, DVD-RAM (Ver.2), CD-DA, CD-ROM (mode 1 and mode 2), CD-ROM XA (mode 2, form 1 and form 2), Photo CD (single and multiple sessions), CD Extra, CD-R, CD-RW, and CD-TEXT	DVD-RAM (Ver.2), DVD+R, DVD-R, CD-R, and CD-ROM
Access time	BD	DVD
Random	< 230 ms	< 180 ms
Cache buffer	4.5 MB	
Data transfer rate		
2X BD-RAM	9 MB/sec	
8X DVD	2,400 KB/sec	
16X CD-R	2,400 KB/sec	
16X CD-RW	2,400 KB/sec	

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

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Cache buffer	2.5 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	

7 Backup and recovery

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

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

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



NOTE: Computers with an SSD might not have a recovery partition. If the computer does not have a recovery partition, you are not able to recover using this procedure. Recovery discs are included for computers that do not have a partition. Use these discs to recover the operating system and software. To check for the presence of a recovery partition, select **Start > Computer**. If the partition is present, an HP recovery drive is listed in the Hard Disk Drives section of the window.

Creating recovery discs

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

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

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

Before creating recovery discs::

- You need high-quality DVD-R, DVD+R, or CD-R discs. All these discs are purchased separately. DVDs have a much higher capacity than CDs. If you use CDs, up to 20 discs might be required, whereas only a few DVDs are required.

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

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

To create a set of recovery discs:

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

Backing up your information

As you add new software and data files, back up your system on a regular basis to maintain a reasonably current backup.

Back up your system at the following times:

- At regularly scheduled times

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

- Before the computer is repaired or restored
- Before adding or modifying hardware or software

When backing up:

- Create system restore points using the Windows System Restore feature, and periodically copy them disc.
- 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 is a time-saver if you have to reset your preferences.

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

1. Display the screen.
2. Copy the screen:

To copy only the active window, press **alt+fn+prt sc**.

To copy the entire screen, press **fn+prt sc**.

3. Open a word-processing document, and then select **Edit > Paste**.
4. Save the document.

- Back up your information to an optional external hard drive, a network drive, or discs.
- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD-R, or DVD±RW. The discs used depend on the type of optical drive installed in the computer.

 **NOTE:** DVDs store more information than CDs, so using them for backup reduces the number of recovery discs required.

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

Using Windows Backup and Restore

To create a backup using Windows Backup and Restore:

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

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

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions.

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

Using system restore points

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

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

Create additional restore points to provide increased protection for the system files and settings.

When to create restore points

Create restore points:

- Before adding or extensively modifying software or hardware
- Periodically, whenever the system 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

To 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. Under **Protection Settings**, select the disk for which you want to create a restore point.
5. Click **Create**.
6. Follow the on-screen instructions.

Restore to a previous date and time

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

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.

Performing a recovery

 **NOTE:** You can recover only files that you have previously backed up. HP recommends using HP Recovery Manager to create a set of recovery discs (entire drive backup) as soon as you set up the computer.

Recovery Manager software repairs or restores the system if you experience system failure or instability. Recovery Manager works from recovery discs or from a dedicated recovery partition (select models only) on the hard drive. However, if the computer includes a solid-state drive (SSD), you might not have a recovery partition. If that is the case, recovery discs are included with the computer. Use these discs to recover the operating system and software.

 **NOTE:** 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.

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

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the dedicated partition (select models only)

 **NOTE:** Computers with an SSD might not have a recovery partition. If the computer does not have a recovery partition, you are not able to recover using this procedure. Recovery discs are included for computers that do not have a partition. Use these discs to recover the operating system and software. To check for the presence of a recovery partition, select **Start > Computer**. If the partition is present, an HP recovery drive is listed in the Hard Disk Drives section of the window.

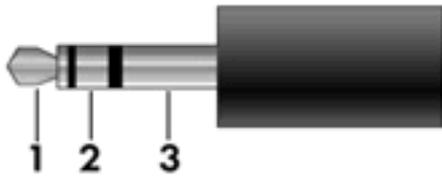
On some models, a recovery can be performed from the partition on the hard drive. This restores the computer to its factory condition.

To restore the computer from the partition:

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** (HP Recovery).
2. Click **System Recovery** in the **Recovery Manager** window.
3. Follow the on-screen instructions.

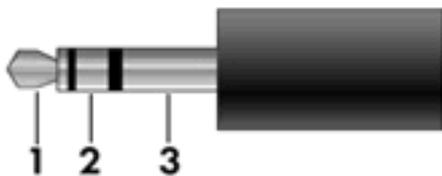
8 Connector pin assignments

Audio-in (microphone)



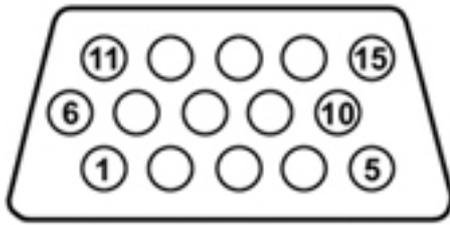
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



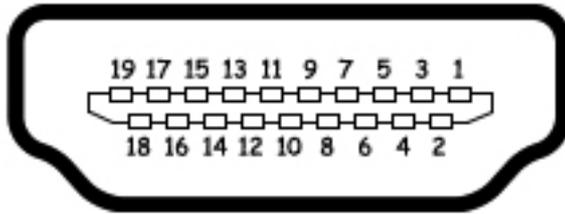
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



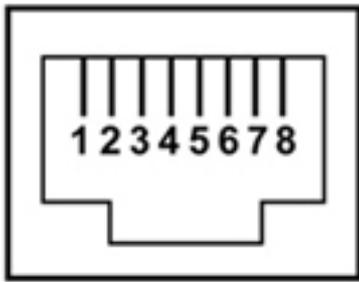
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



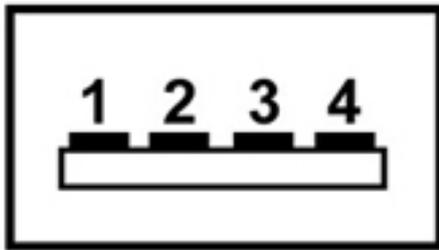
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2-
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1-
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0-
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	CEC
14	No connect
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect
20	Shell

RJ-45 (network)



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

Universal Serial Bus



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

9 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 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

10 Recycling

Battery

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

Display

-
- ⚠ **WARNING!** The backlight contains mercury. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.
 - ⚠ **CAUTION:** The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.
 - 📄 **NOTE:** Materials Disposal. This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see the Electronic Industries Alliance (EIA) Web site at <http://www.eiai.org>.
-

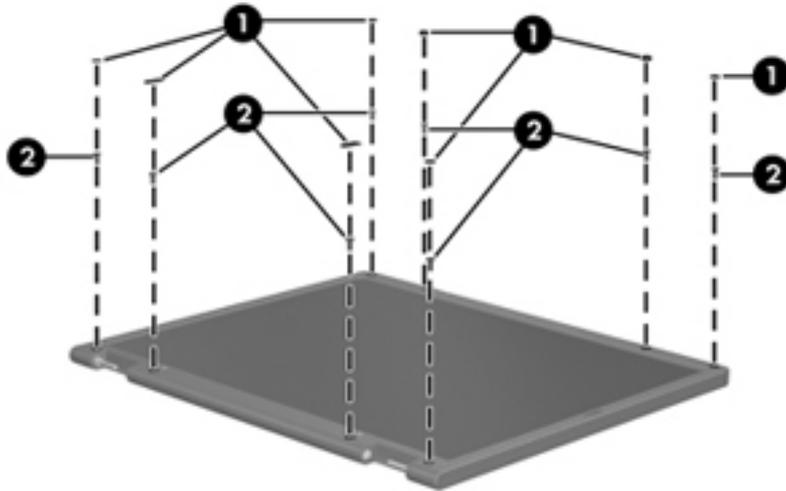
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



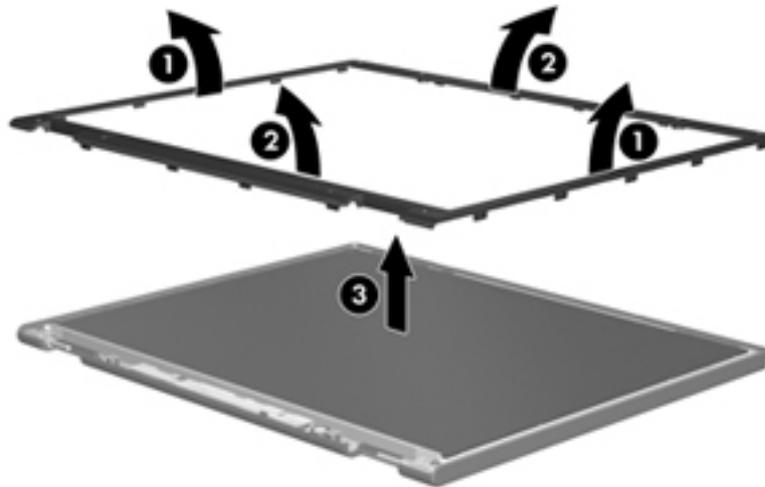
-
- 📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

Perform the following steps:

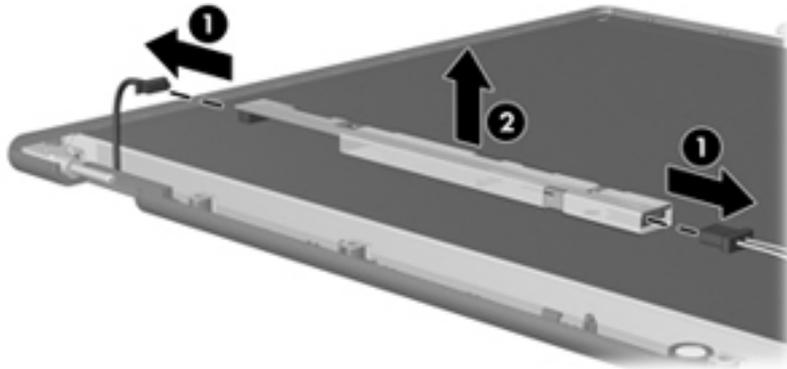
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



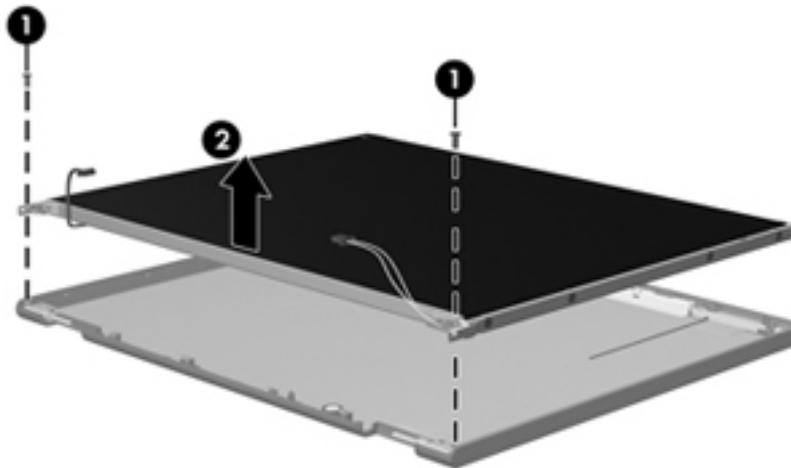
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel 3.



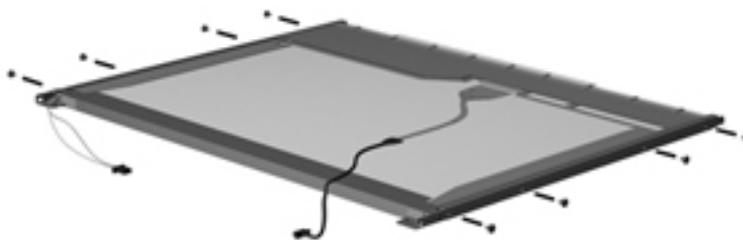
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter 2.



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

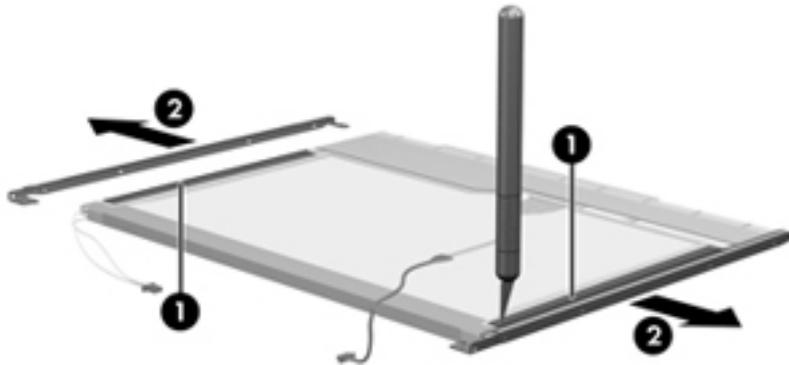


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



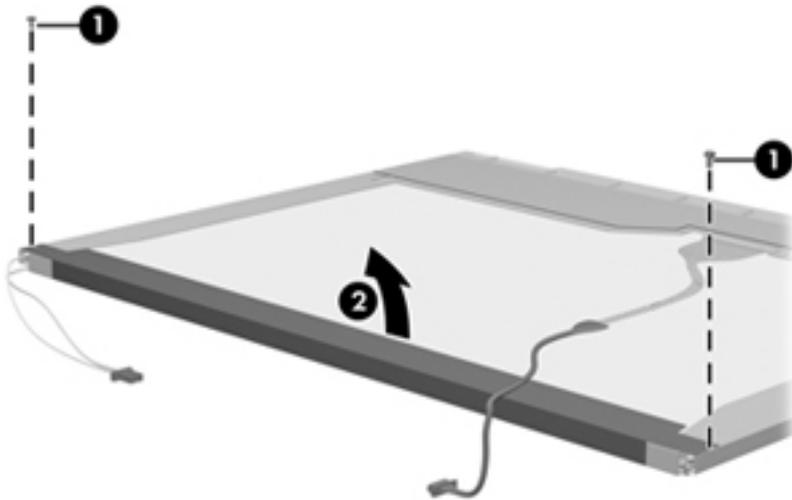
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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



- 11.** Remove the screws **(1)** that secure the backlight cover to the display panel.

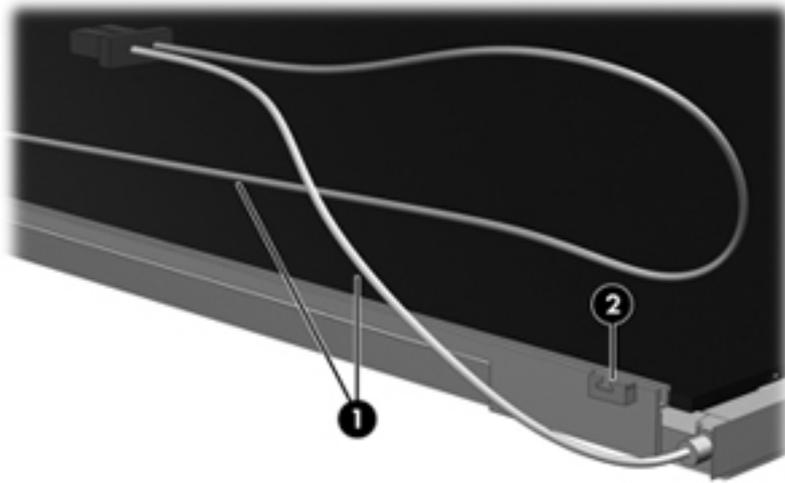
- 12.** Lift the top edge of the backlight cover **(2)** and swing it outward.



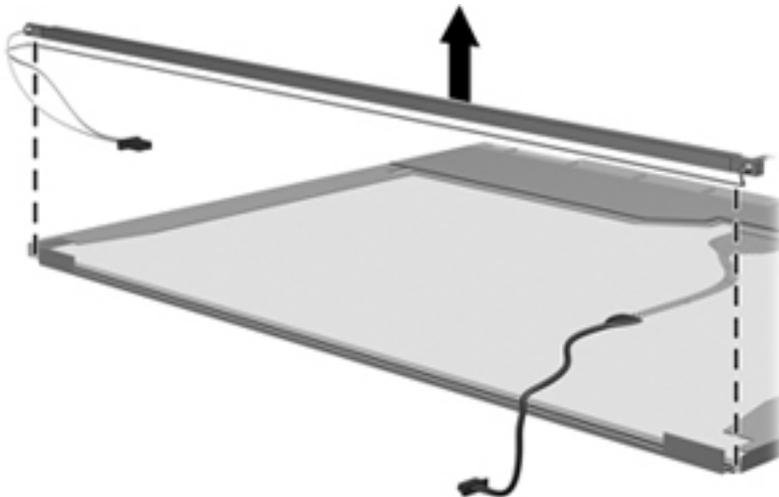
- 13.** Remove the backlight cover.

- 14.** Turn the display panel right-side up.

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

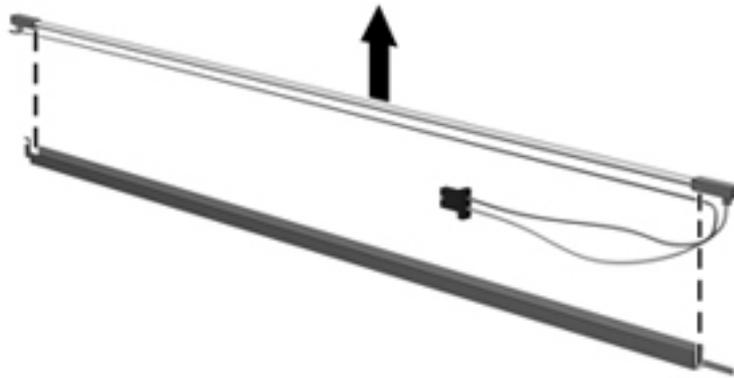


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



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

18. Remove the backlight from the backlight frame.

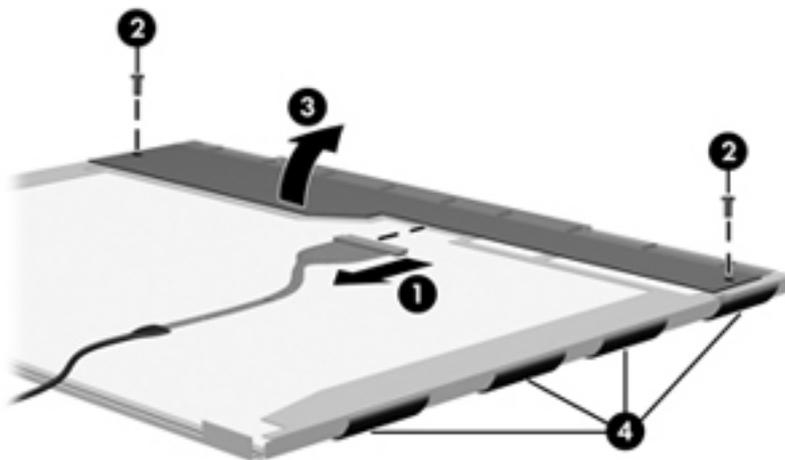


19. Disconnect the display cable **(1)** from the LCD panel.

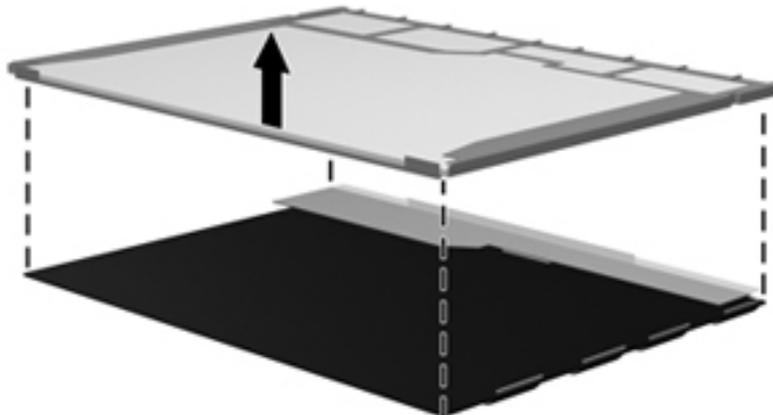
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.

21. Release the LCD panel **(3)** from the display rear panel.

22. Release the tape **(4)** that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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