



HP Pavilion dv7 Entertainment PC

Maintenance and Service Guide

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B	December 2010	<ul style="list-style-type: none">• Chapter 1 — added new descriptions for the following components:<ul style="list-style-type: none">◦ Processor◦ Chipset• Chapter 3 and Chapter 4 — added new spare part numbers and descriptions for the following components:<ul style="list-style-type: none">◦ Hard drive◦ Processor◦ System board◦ Replacement Thermal Material Kit

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 dv7 Entertainment PC
Processors	AMD Phenom™ processors
	AMD Phenom X2 Dual-Core N970 Quad-Core, 35W, 2.20-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core N950 Quad-Core, 35W, 2.10-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core N930 Quad-Core, 35W, 2.00-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core N870 Tri-Core, 35W, 2.30-GHz with 1.5-MB L2 cache
	AMD Phenom X2 Dual-Core N850 Tri-Core, 35W, 2.20-GHz with 1.5-MB L2 cache
	AMD Phenom X2 Dual-Core N830 Tri-Core, 35W, 2.10-GHz with 1.5-MB L2 cache
	AMD Phenom X2 Dual-Core N660 Dual-Core, 35W, 3.00-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core N640 Dual-Core, 35W, 2.90-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core N620 Dual-Core, 35W, 2.80-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core P960 Quad-Core, 25W, 1.80-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core P940 Quad-Core, 25W, 1.70-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core P920 Quad-Core, 25W, 1.60-GHz with 2.0-MB L2 cache
	AMD Phenom X2 Dual-Core P860 Tri-Core, 25W, 2.00-GHz with 1.5-MB L2 cache
	AMD Phenom X2 Dual-Core P840 Tri-Core, 25W, 1.90-GHz with 1.5-MB L2 cache
	AMD Phenom X2 Dual-Core P820 Tri-Core, 25W, 1.80-GHz with 1.5-MB L2 cache
	AMD Phenom X2 Dual-Core P650 Tri-Core, 25W, 2.60-GHz with 2.0-MB L2 cache

Category	Description
	AMD Turion™ processors
	AMD Turion X2 Dual-Core N570 Dual-Core, 35W, 2.70-GHz with 2.0-MB L2 cache
	AMD Turion X2 Dual-Core N550 Dual-Core, 35W, 2.50-GHz with 2.0-MB L2 cache
	AMD Turion X2 Dual-Core N530 Dual-Core, 35W, 2.50-GHz with 2.0-MB L2 cache
	AMD Turion X2 Dual-Core N350 Dual-Core, 35W, 2.40-GHz with 1.0-MB L2 cache
	AMD Turion X2 Dual-Core N330 Dual-Core, 35W, 2.30-GHz with 1.0-MB L2 cache
	AMD Turion X2 Dual-Core P560 Dual-Core, 25W, 2.50-GHz with 2.0-MB L2 cache
	AMD Turion X2 Dual-Core P540 Dual-Core, 25W, 2.40-GHz with 2.0-MB L2 cache
	AMD Turion X2 Dual-Core P520 Dual-Core, 25W, 2.30-GHz with 2.0-MB L2 cache
	AMD Athlon™ processors
	AMD Athlon X2 Dual-Core N370 Dual-Core, 35W, 2.50-GHz with 1.0-MB L2 cache
	AMD Athlon X2 Dual-Core P360 Dual-Core, 35W, 2.30-GHz with 1.0-MB L2 cache
	AMD Athlon X2 Dual-Core P340 Dual-Core, 25W, 2.20-GHz with 1.0-MB L2 cache
	AMD Athlon X2 Dual-Core P320 Dual-Core, 25W, 2.10-GHz with 1.0-MB L2 cache
Chipset	Northbridge: AMD RS880MD chipset
	Southbridge: AMD SB820M chipset
Graphics	AMD HD Graphics
	Switchable discrete graphics memory (select models only)
	<ul style="list-style-type: none"> • ATI Mobility Radeon HD 6550 with 1024-MB of dedicated video memory (64-MB × 16 DDR3 × 800MHz × 4 PCs) • ATI Mobility Radeon HD 6370 with 512-MB of dedicated video memory (64-M × 16 DDR3 × 800MHz × 4 PCs) • ATI Mobility Radeon HD 5650 with 1024-MB of dedicated video memory (64-MB × 16 DDR3 × 800MHz × 4 PCs) • ATI Mobility Radeon HD 5470 with 512-MB of dedicated video memory (64-MB × 16 DDR3 × 800MHz × 4 PCs)
	UMA graphics memory (select models only)
	<ul style="list-style-type: none"> • ATI Mobility Radeon HD 4250 with 128-MB (64-MB × 16 DDR3 × 800MHz)

Category	Description
	Supports Blu-ray and/or HD-DVD playback with HD Decode, DX11 support and HDMI support
Panels	<ul style="list-style-type: none"> • 17.3-inch, SVA HD+ (1600 x 900) LED BrightView • 17.3-inch, SVA HD+ (1600 x 900) LED flush glass AntiGlare • Flush glass panel cover support • Support for lighted logo on top bezel
Memory	<p>2 customer-accessible/upgradeable SODIMM slots</p> <p>DDR3, 1333-MHz</p> <p>Supports dual-channel support</p> <p>Supports up to 8 GB of system RAM in the following configurations</p> <ul style="list-style-type: none"> • 8192-MB total system memory (4096-MB x 2, dual-channel) • 6144-MB total system memory (4096-MB x 1 + 2048-MB x 1) • 4096-MB total system memory (2048-MB x 2, dual-channel) • 4096-MB total system memory (4096-MB x 1) • 3072-MB total system memory (2048-MB x 1 + 1024-MB x 1) • 2048-MB total system memory (2048-MB x 1) • 2048-MB total system memory (1024-MB x 2, dual-channel) • 1024-MB total system memory (1024-MB x 1)
Hard drives	<p>Supports all Serial ATA (SATA) 9.5-mm/12.5-mm, 6.35-cm (2.50-inch) hard drives</p> <p>Supports up to 2 hard drives</p> <p>Support for Accelerometer Hard Drive Protection</p> <p>Dual hard drive configurations:</p> <ul style="list-style-type: none"> • 2-TB (1-TB, 5200-rpm x 2) • 1500-GB (750-GB, 5200-rpm x 2) • 1280-GB (640-GB, 7200-rpm x 2) • 1280-GB (640-GB, 5400-rpm x 2) • 1000-GB (500-GB, 7200-rpm x 2) • 640-GB (320-GB, 7200-rpm x 2) • 500-GB (250-GB, 7200-rpm x 2)

Category	Description
	<p>Single hard drive configurations:</p> <ul style="list-style-type: none"> • 1-TB, 5200-rpm • 750-GB, 5200-rpm • 640-GB, 7200-rpm • 640-GB, 5400-rpm • 500-GB, 7200-rpm • 320-GB, 7200-rpm • 250-GB, 7200-rpm
Optical drives	<p>12.7-mm tray load</p> <p>Serial ATA</p> <p>Fixed (1 screw for removal)</p> <p>Support for the following optical drives:</p> <ul style="list-style-type: none"> • DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe • DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive (via software) • Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Combo Drive • Blu-ray ROM DVD±R/RW SuperMulti Double-Layer Combo Drive (via software)
Webcam	<p>Low-light VGA camera</p> <p>Fixed (no tilt)</p> <p>Activity LED</p> <p>640 × 480 by 24 frames per second</p>
Microphone	<p>2 omnidirectional microphones, dual-array with appropriate software (supports beam forming, echo cancellation, and noise suppression)</p>
Audio	<p>HD Audio (IDT)</p> <p>Dolby advance audio (select models only)</p> <p>Beats audio (select models only)</p> <p>Integrated subwoofer (select models only)</p> <p>Supports Microsoft® Premium Requirements</p> <p>Pavilion-branded Altec Lansing speakers</p>
Ethernet	<p>Integrated 10/100/1000 network interface card (NIC)</p>
Wireless	<p>Integrated wireless local area network (WLAN) options by way of wireless module:</p> <p>Atheros AR9280 802.11a/b/g/n 2x2 WiFi Adapter</p>

Category	Description
	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter
	Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)
	Broadcom 4322 802.11a/b/g/n WLAN module
	Broadcom BCM94313 802.11b/g/n WLAN module
	Realink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo adapter
External media card	5-in-1 Digital Media Reader
	Digital Media Slot supports Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Secure Digital High Capacity (SDHC), Memory Stick (MS), Memory Stick Pro (MSP), xD Picture Card (XD)
Internal media card	One half-size mini-card slot for WLAN
Ports	Audio-in (stereo microphone)
	Headphone/line out (stereo)
	eSATA (combined with USB)
	High-Definition Multimedia Interface (HDMI) v1.3 supporting 1080p and 1920x1080 at 60Hz and 1920x1200 at 60Hz DVI Mode
	Hot Plug/Unplug and auto detect for correct output to wide-aspect
	RJ-45 (Ethernet, includes link and activity lights)
	USB 2.0 (four ports; one port combined with eSATA)
	VGA (Dsub 15-pin) <ul style="list-style-type: none"> • 1600 x 1200 external resolution at 75Hz • 1920 x 1200 external resolution at 75Hz
	AC Smart Pin adapter
Keyboard/pointing devices	17.3-inch full-size keyboard with numeric keypad
	Dura-coat, Island style
	Mylar clickpad cover
	Clickpad
	TouchPad supports 2-way scrolling
	Multitouch gestures enabled as default
	Taps enabled as default
Power requirements	6-cell 2.55-Ah Li-ion battery
	6-cell 2.8-Ah Li-ion battery
	9-cell 2.8-Ah Li-ion battery

Category	Description
	90-W AC adapter (discrete models)
	65-W AC adapter with (UMA models)
Security	Kensington Security Lock
	Fingerprint reader with Digital Persona software support (select models only)
Operating system	Preinstalled:
	Windows® 7 Professional (64 bit)
	Windows 7 Home Premium (32 and 64 bit)
	Windows 7 Home Basic (32 and 64 bit)
Serviceability	AC adapter
	Battery (system and RTC)
	Hard drives (2)
	Memory module
	Optical drive
	Mini card components

2 Components

Top components

TouchPad

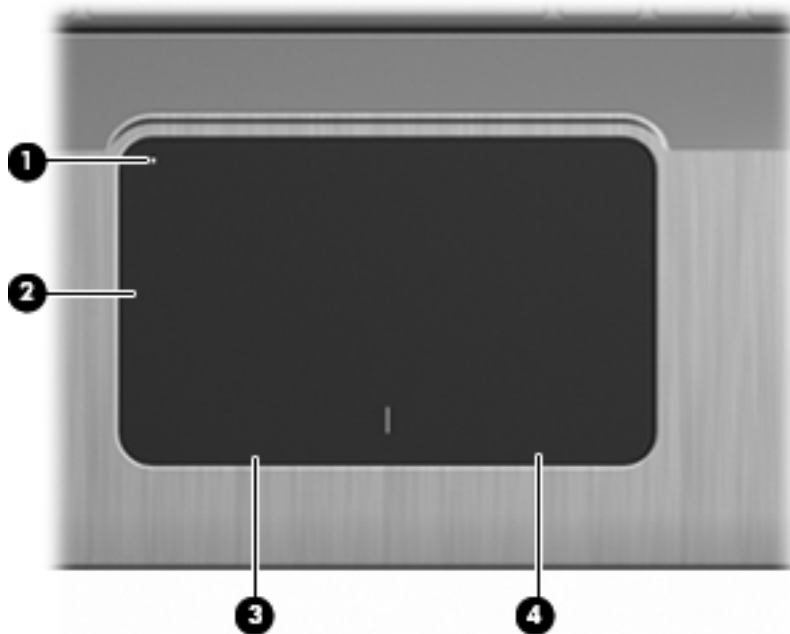


Component	Function
TouchPad	Moves the pointer and selects or activates items on the screen.

To view or change the pointing device preferences:

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

TouchPad buttons

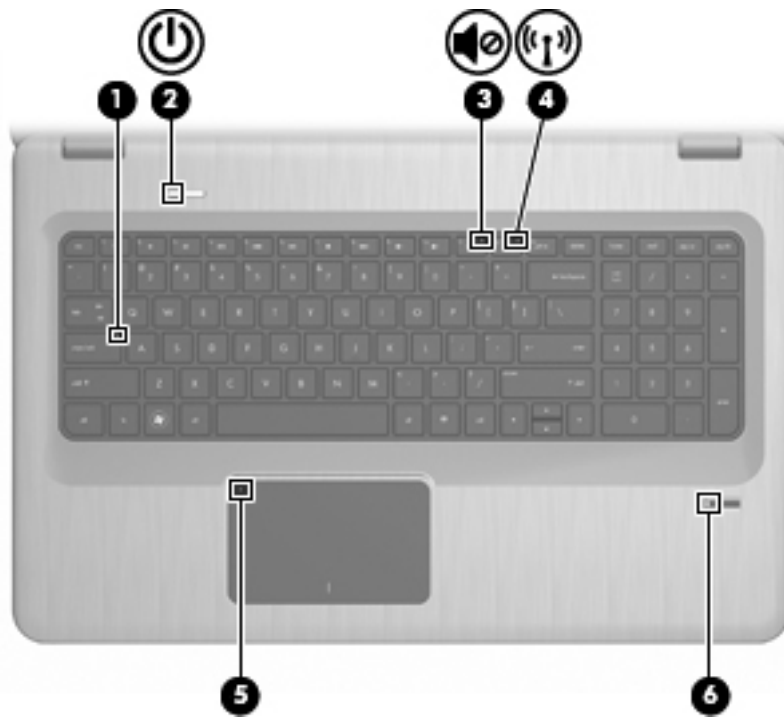


Item	Description	Function
1	TouchPad On/Off button	Turns the TouchPad on and off. Quickly double-tap the button to turn the TouchPad on and off.
2	TouchPad zone*	Moves the pointer and selects or activates items on the screen.
3	Left TouchPad button	Functions like the left button on an external mouse.
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**.

Lights



Item	Description	Function
1	Caps Lock light	On—The Caps Lock is on.
2	Power light	<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.
3	Volume Mute light	Amber—The computer sound is off.
4	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.
5	TouchPad light	Amber—The TouchPad is disabled.
6	Fingerprint Reader light	<ul style="list-style-type: none"> White—The fingerprint was read. Amber—The fingerprint was not read.

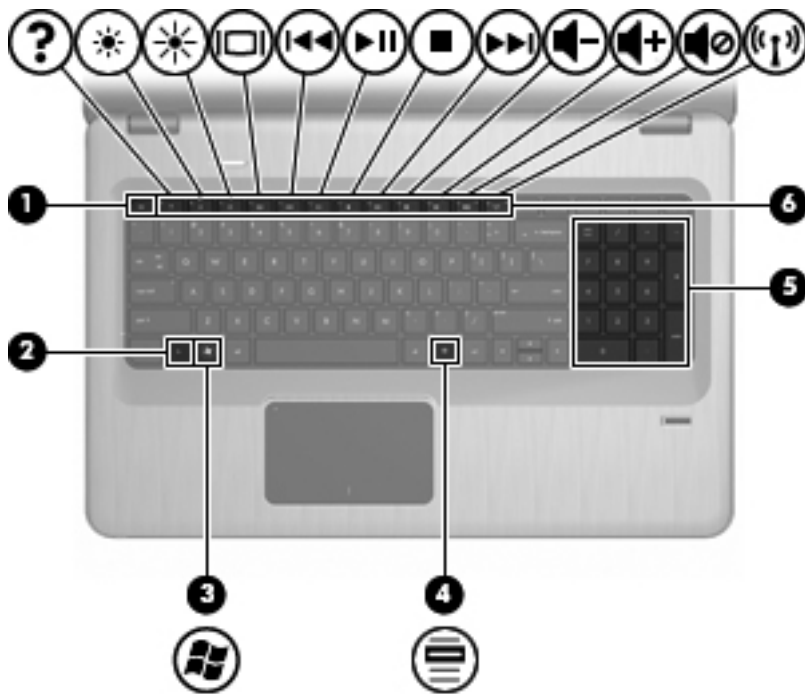
Buttons and Fingerprint Reader (select models only)



Item	Description	Function
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.

This table describes the factory settings. For information about changing the factory settings, see Help and Support.

Keys



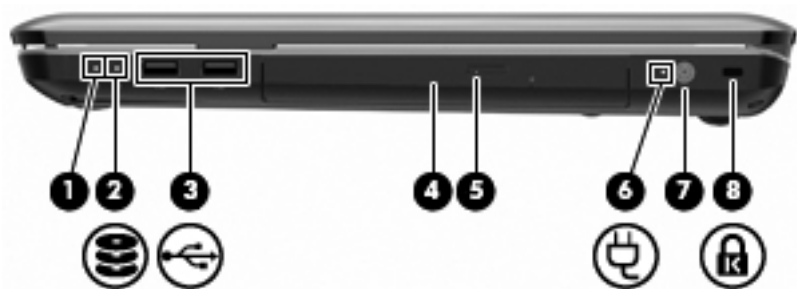
Item	Description	Function
1	esc key	Press the esc and fn keys at the same time to display system information.
2	fn key	Press the at the same time as a function key or the esc key to execute frequently used system functions.
3	Windows Logo key	Displays the Windows Start menu.
4	Windows Applications key	Displays a shortcut menu for items beneath the cursor.
5	Integrated numeric keypad	Functions like the keys on an external numeric keypad.
6	Function keys	Press a function key and the fn key at the same time to execute frequently used system functions.

Front components



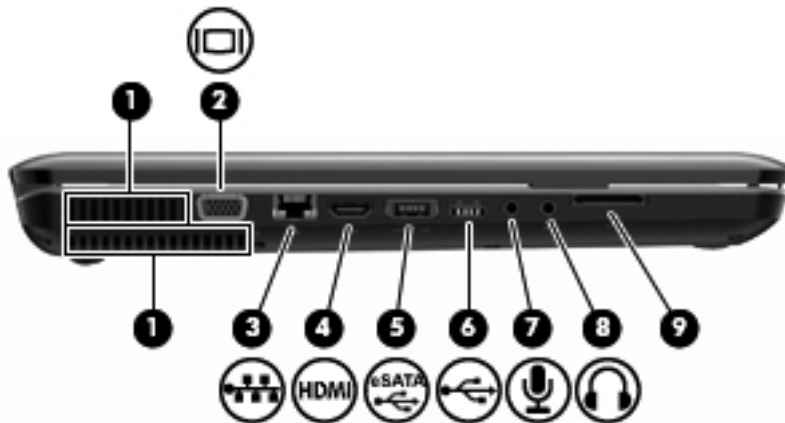
Description	Function
Speakers	Produce sound.

Right-side components



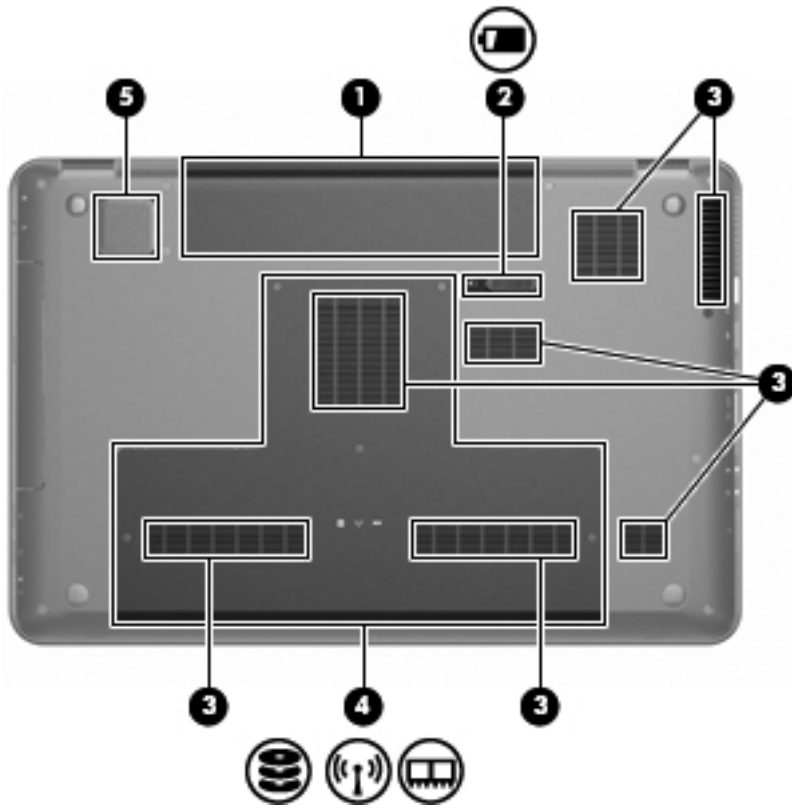
Item	Description	Function
1	Power light	<ul style="list-style-type: none"> On—The computer is on. Flashing—The computer is in Sleep. Off—The computer is off or in Hibernation.
2	Hard Disk Drive light	<ul style="list-style-type: none"> White—The hard disk drive is active. Amber—The hard disk drive is parked.
3	USB ports (2)	Connect optional USB devices.
4	Optical Drive light	Flashing—Accessing the optical drive.
5	Optical drive	Reads optical discs and, on select models, writes to optical discs.
6	AC Adapter light	<ul style="list-style-type: none"> On—The computer is connected to external power. 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.

Left-side components



Item	Description	Function
1	Vents (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.
6	USB port	Connects an optional USB device.
7	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, monarural microphone.
8	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
9	SD card reader	Reads SD cards that are inserted into the reader.

Bottom components



Item	Description	Function
1	Battery bay	Holds the battery.
2	Battery Release latch	Releases the battery from the battery bay.
3	Vents (7)	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.
4	Primary Hard Drive bay	Holds the primary hard drive, the memory module slots, and the WLAN module (select models only). 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.
5	Integrated subwoofer	Provides superior bass sound.

Display components




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

Wireless antennas

On select computer models, at least 2 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, see the country-specific section of the Regulatory, Safety and Environmental Notices chapter in Help and Support.

Additional hardware components



Item	Description	Function
1	Power cord*	Connects an AC adapter to an AC outlet.
2	AC adapter	Converts AC power to DC power.
3	Battery*	Provides power when the computer is not connected to an external power source.

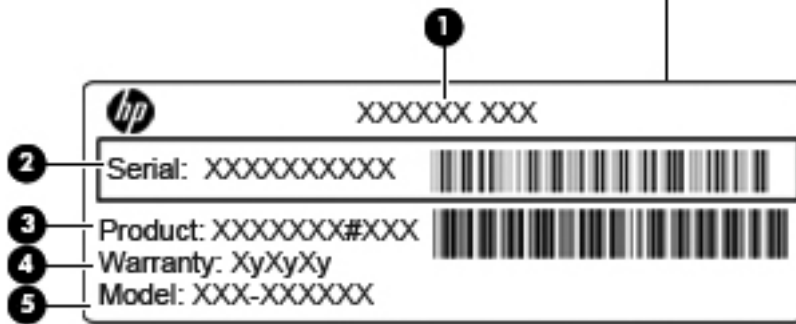
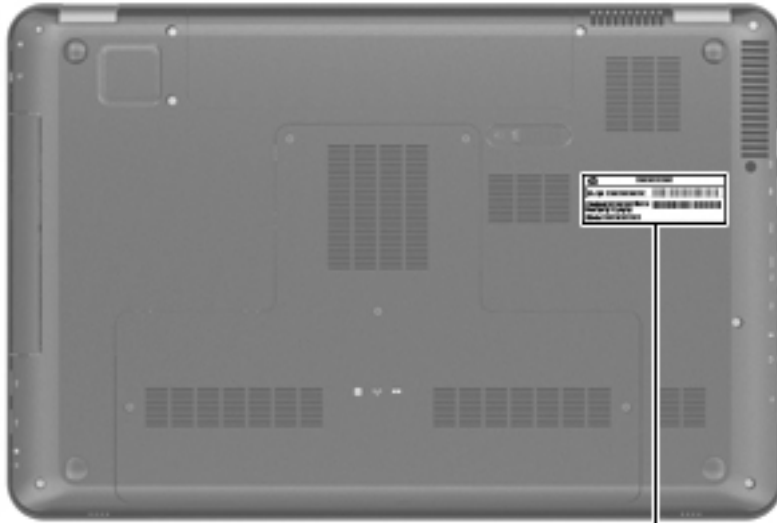
* Batteries and power cords vary in appearance by region and country.

3 Illustrated parts catalog

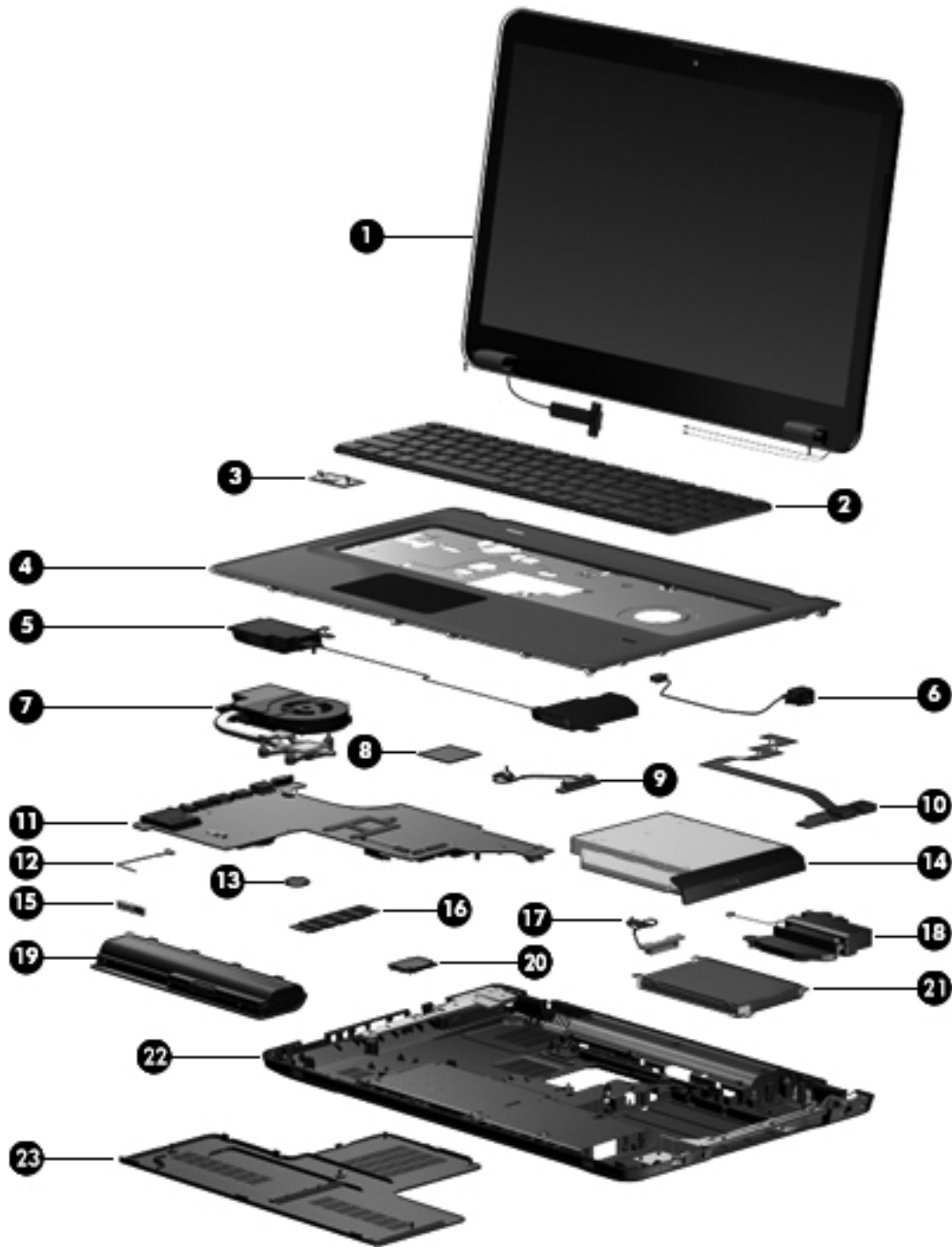
Service tag

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

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



Computer major components



Item	Description	Spare part number
(1)	17.3-inch display assembly	
	HD+ BrightView display assembly with webcam and 2 microphones for use in silver computers (includes wireless antenna transceivers and cables)	605324-001

Item	Description	Spare part number
	HD+ flush glass AntiGlare display assembly with webcam and 2 microphones for use in silver computers	605325-001
	HD+ BrightView display assembly with webcam and 2 microphones for use in black computers	605327-001
	HD+ Brightview display assembly with webcam and 2 microphones for use in white computers	609788-001
	NOTE: See Display assembly components on page 27 for more information on display assembly spare part numbers.	
(2)	Keyboard (includes keyboard cable)	605344-xxx
	NOTE: For a detailed list of available keyboards, see Sequential part number listing on page 31 .	
(3)	Power button board (includes cable)	605358-001
(4)	Top cover (includes TouchPad and TouchPad buttons and fingerprint reader)	
	For use only with silver computer models	605346-001
	For use only with black computer models	605347-001
	For use only with white computer models	609789-001
(5)	Speaker assembly	605356-001
(6)	Power connector and cable	605364-001
(7)	Fan/heat sink assembly (includes replacement thermal material)	
	For use only with computer models equipped with graphics subsystems with discrete memory	606575-001
	For use only with computer models equipped with graphics subsystems with UMA memory	606574-001
	Thermal Material Kit (not illustrated, includes thermal pads and thermal paste syringe)	634433-001
(8)	Processor (includes replacement thermal material)	
	AMD Athlon X2 Dual-Core N370 Dual-Core, 35W, 2.50-GHz with 1.0-MB L2 cache	634686-001
	AMD Athlon X2 Dual-Core P360 Dual-Core, 35W, 2.30-GHz with 1.0-MB L2 cache	636635-001
	AMD Athlon X2 Dual-Core P340 Dual-Core, 25W, 2.20-GHz with 1.0-MB L2 cache	616343-001
	AMD Athlon X2 Dual-Core P320 Dual-Core, 25W, 2.10-GHz with 1.0-MB L2 cache	594165-001
	AMD Phenom X2 Dual-Core N970 Quad-Core, 35W, 2.20-GHz with 2.0-MB L2 cache	616346-001
	AMD Phenom X2 Dual-Core N950 Quad-Core, 35W, 2.10-GHz with 2.0-MB L2 cache	616346-001
	AMD Phenom X2 Dual-Core N930 Quad-Core, 35W, 2.00-GHz with 2.0-MB L2 cache	594169-001
	AMD Phenom X2 Dual-Core N870 Tri-Core, 35W, 2.30-GHz with 1.5-MB L2 cache	635495-001

Item	Description	Spare part number
	AMD Phenom X2 Dual-Core N850 Tri-Core, 35W, 2.20-GHz with 1.5-MB L2 cache	616345-001
	AMD Phenom X2 Dual-Core N830 Tri-Core, 35W, 2.10-GHz with 1.5-MB L2 cache	594168-001
	AMD Phenom X2 Dual-Core N660 Dual-Core, 35W, 3.00-GHz with 2.0-MB L2 cache	635494-001
	AMD Phenom X2 Dual-Core N640 Dual-Core, 35W, 2.90-GHz with 2.0-MB L2 cache	616344-001
	AMD Phenom X2 Dual-Core N620 Dual-Core, 35W, 2.80-GHz with 2.0-MB L2 cache	594166-001
	AMD Phenom X2 Dual-Core P960 Quad-Core, 25W, 1.80-GHz with 2.0-MB L2 cache	634689-001
	AMD Phenom X2 Dual-Core P940 Quad-Core, 25W, 1.70-GHz with 2.0-MB L2 cache	616336-001
	AMD Phenom X2 Dual-Core P920 Quad-Core, 25W, 1.60-GHz with 2.0-MB L2 cache	594170-001
	AMD Phenom X2 Dual-Core P860 Tri-Core, 25W, 2.00-GHz with 1.5-MB L2 cache	634688-001
	AMD Phenom X2 Dual-Core P840 Tri-Core, 25W, 1.90-GHz with 1.5-MB L2 cache	616335-001
	AMD Phenom X2 Dual-Core P820 Tri-Core, 25W, 1.80-GHz with 1.5-MB L2 cache	594167-001
	AMD Phenom X2 Dual-Core P650 Tri-Core, 25W, 2.60-GHz with 2.0-MB L2 cache	634687-001
	AMD Turion X2 Dual-Core N570 Dual-Core, 35W, 2.70-GHz with 2.0-MB L2 cache	634690-001
	AMD Turion X2 Dual-Core N550 Dual-Core, 35W, 2.50-GHz with 2.0-MB L2 cache	616337-001
	AMD Turion X2 Dual-Core N530 Dual-Core, 35W, 2.50-GHz with 2.0-MB L2 cache	594172-001
	AMD Turion X2 Dual-Core N350 Dual-Core, 35W, 2.40-GHz with 1.0-MB L2 cache	616334-001
	AMD Turion X2 Dual-Core N330 Dual-Core, 35W, 2.30-GHz with 1.0-MB L2 cache	594164-001
	AMD Turion X2 Dual-Core P560 Dual-Core, 25W, 2.50-GHz with 2.0-MB L2 cache	634691-001
	AMD Turion X2 Dual-Core P540 Dual-Core, 25W, 2.40-GHz with 2.0-MB L2 cache	616347-001
	AMD Turion X2 Dual-Core P520 Dual-Core, 25W, 2.30-GHz with 2.0-MB L2 cache	594173-001
	Thermal Material Kit (not illustrated, includes thermal pads and thermal paste syringe)	634433-001
(9)	Optical drive connector	603680-001
(10)	USB board (includes cable)	605348-001
(11)	System board (includes replacement thermal material)	
	For ATI Mobility Radeon HD 6550 discrete graphics with 1-GB of dedicated memory without subwoofer	630831-001
	For ATI Mobility Radeon HD 6550 discrete graphics and 1-GB of dedicated memory with subwoofer	630834-001
	For ATI Mobility Radeon HD 6370 discrete graphics with 512-KB of dedicated memory without subwoofer	630830-001

Item	Description	Spare part number
	For ATI Mobility Radeon HD 6370 discrete graphics and 512-KB of dedicated memory with subwoofer	630833-001
	For ATI Mobility Radeon HD 5650 discrete graphics with 1-GB of dedicated memory without subwoofer	605498-001
	For ATI Mobility Radeon HD 5650 discrete graphics and 1-GB of dedicated memory with subwoofer	615687-001
	For ATI Mobility Radeon HD 5470 discrete graphics with 512-MB of dedicated memory without subwoofer	605497-001
	For ATI Mobility Radeon HD 5470 discrete graphics and 512-MB of dedicated memory with subwoofer	615686-001
	For use on computer models equipped with UMA graphics subsystem memory and subwoofer v.1.2	630832-001
	For use on computer models equipped with UMA graphics subsystem memory and subwoofer v.1.0	605496-001
	For use on computer models equipped with UMA graphics subsystem memory, but no subwoofer v.1.2	630829-001
	For use on computer models equipped with UMA graphics subsystem memory, but no subwoofer v.1.0	615688-001
	Thermal Material Kit (not illustrated, includes thermal pads and thermal paste syringe)	634433-001
(12)	Bluetooth module cable	605323-001
(13)	RTC battery	599516-001
(14)	Optical drive (includes bezel and bracket):	
	<ul style="list-style-type: none"> DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe 	605416-001
	<ul style="list-style-type: none"> DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive (via software) 	
	<ul style="list-style-type: none"> Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Combo Drive 	605417-001
	<ul style="list-style-type: none"> Blu-ray ROM DVD±R/RW SuperMulti Double-Layer Combo Drive (via software) 	
(15)	HP Bluetooth 2.1 integrated module with wireless technology (does not include a Bluetooth module cable)	537921-001
(16)	Memory modules DDR3, 1333-MHz	
	1-GB memory module	598859-001
	2-GB memory module	598856-001
	4-GB memory module	599092-001
(17)	Hard drive cable	605415-001
(18)	Subwoofer	605357-001
(19)	Battery	

Item	Description	Spare part number
	6-cell, 55-Wh, 2.55-Ah Li-ion battery for use with all computer models	593554-001
	6-cell, 62-Wh, 2.8-Ah Li-ion battery for use with all computer models	593562-001
	9-cell, 93-Wh, 2.8-Ah Li-ion battery for use with all computer models	593550-001
(20)	WLAN module	
	Atheros AR9280 802.11a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenada., Suriname, and the United States	580101-002
	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenada., Suriname, and the United States	580102-001
	Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Zaire, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Korea-South, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Martinique, Nether Antilles, French Guiana, Aruba, British Virgin Islands, Bermuda, Syria, Guadeloupe, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, and Zimbabwe	580102-002
	Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, and the United States	582564-001

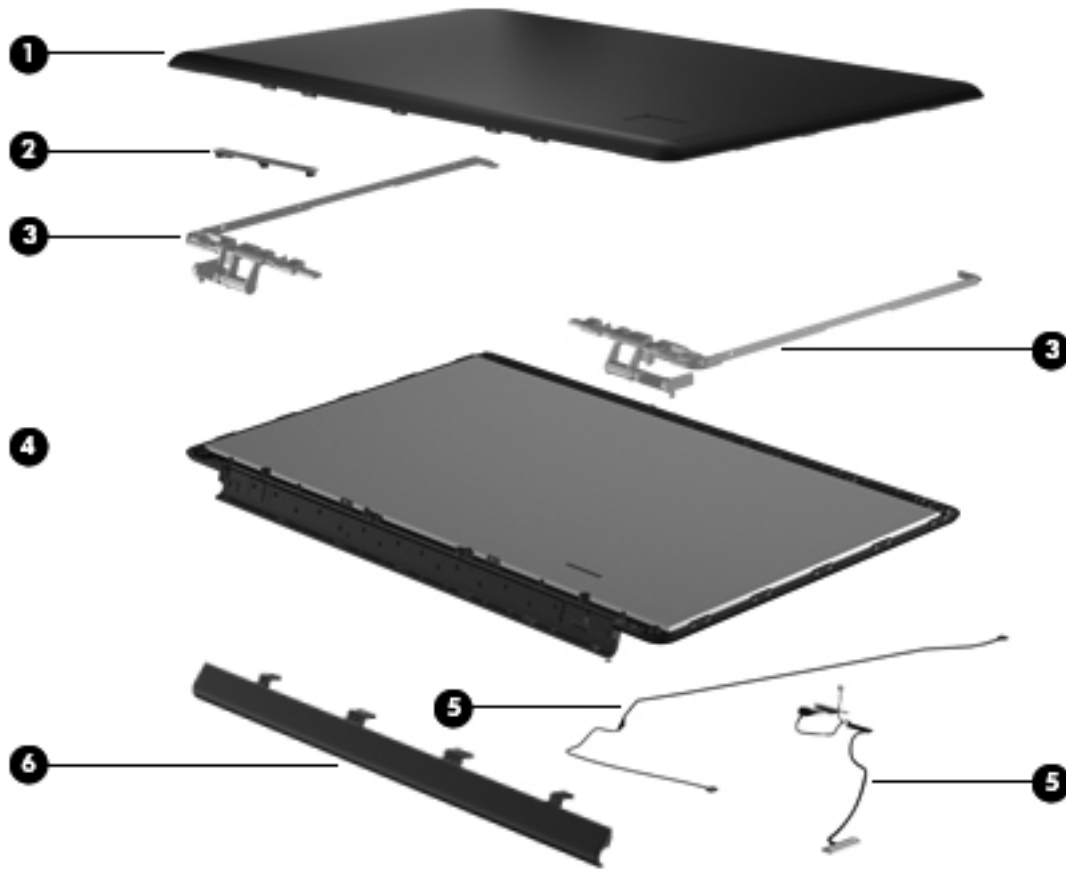
Item	Description	Spare part number
	Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Cayman Islands, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Zaire, Denmark, Djibouti, Dominica, Dominican Republic, 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-Bissa, Guyana, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe	582564-002
	Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	600370-001
	Broadcom BCM94313 802.11b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Cayman Islands, Chile, China Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, Nether Antilles, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uruguay, USA, Uzbekistan, US Virgin Islands, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, Zimbabwe	593836-001

Item	Description	Spare part number
	Realink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, the Cayman Islands, Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, 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, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, the US Virgin Islands, the United States, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	602992-001
(21)	Hard drive kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	
	1-TB, 5200-rpm	603788-001
	750-GB, 72-rpm	633252-001
	750-GB, 5200-rpm	603787-001
	500-GB, 7200-rpm	603784-001
	250-GB, 7200-rpm	605606-001
	Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)	
	640-GB, 7200-rpm	621046-001
	640-GB, 5400-rpm	603785-001
	500-GB, 5400-rpm	634638-001 and 634921-001
	320-GB, 7200-rpm	603783-001
	Hard Drive Hardware Kit (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	605415-001
(22)	Base enclosure (includes rubber feet)	605345-001

Item	Description	Spare part number
	Base enclosure for use with silver computer models (includes rubber feet)	615443-001
(23)	Primary hard drive cover	605360-001

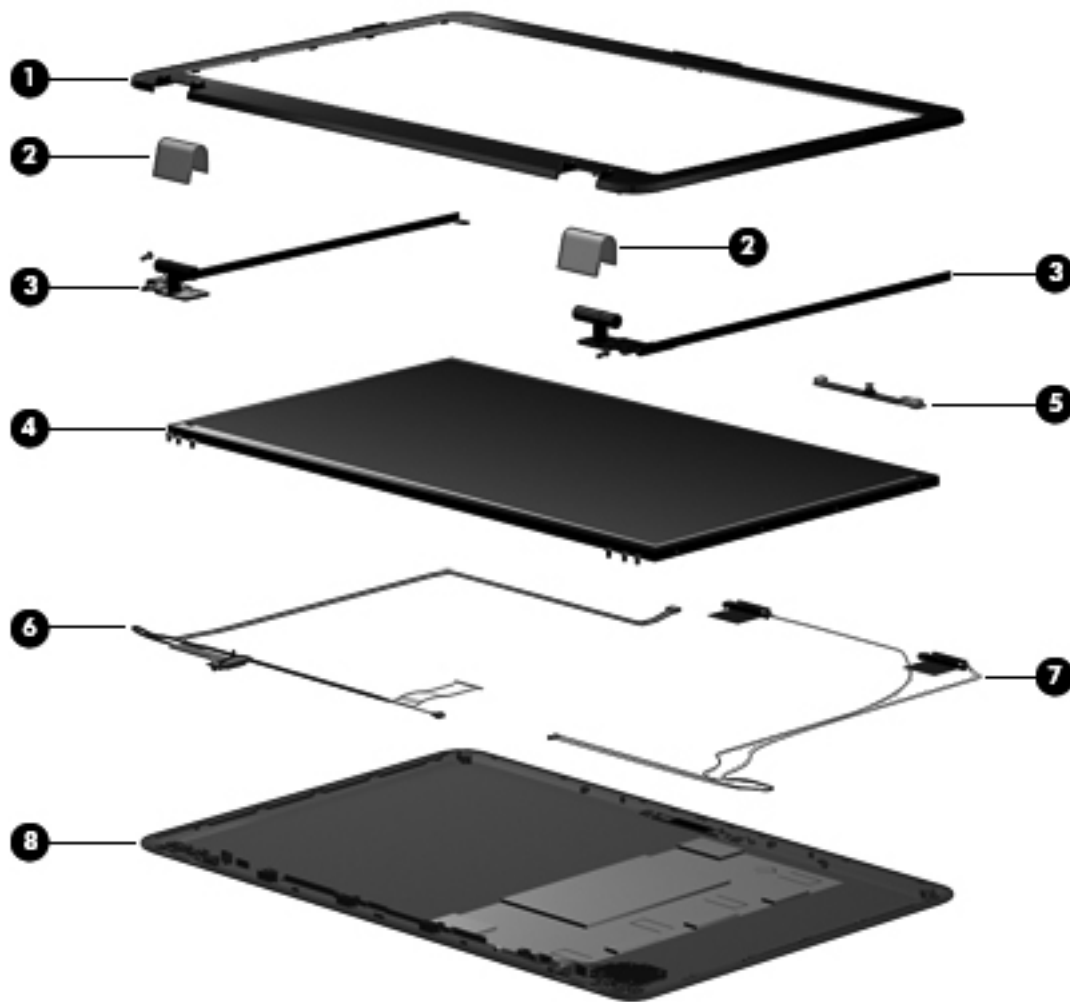
Display assembly components

Flush glass display assembly spare parts



Item	Description	Spare part number
(1)	Display enclosure (includes wireless antenna transceivers and cables and logo LED board and cable)	605330-001
(2)	Webcam/microphone module	603660-001
(3)	Display Hinge Kit (includes right and left hinges)	605334-001
(4)	Flush glass display assembly (includes display panel cable)	605325-001
(5)	Display Cable Kit (includes display panel cable and Webcam cable)	605333-001
(6)	Display hinge cover	605336-001
	Display Screw Kit (not illustrated)	611251-001

BrightView panel



Item	Description	Spare part number
(1)	Display bezel	
	For use in silver computer models	605340-001
	For use in all other computer models	615442-001
(2)	Display hinge cover	605343-001
(3)	Display Hinge Kit (includes left and right hinges)	605342-001
(4)	Display panel (includes display panel cable)	605337-001
(5)	Webcam/microphone module	603660-001
(6)	Display Cable Kit (includes display panel cable and Webcam cable)	605333-001
(7)	Wireless antenna (select models only)	605359-001
(8)	Display enclosure	
	For use in silver computers	605338-001

Item	Description	Spare part number
	For use in white computers	605339-001
	For use in black computers	605331-001
	Display Rubber Kit (not illustrated, includes display bezel rubber screw covers)	605341-001
	Display Screw Kit (not illustrated)	605332-001

Mass storage devices



Item	Description	Spare part number
(1)	Optical drive (includes bezel and bracket)	
	<ul style="list-style-type: none"> Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Combo Drive Blu-ray ROM DVD±R/RW SuperMulti Double-Layer Combo Drive (via software) 	605417-001
	<ul style="list-style-type: none"> DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive (via software) 	605416-001
(2)	Hard drive kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	
	1-TB, 5200-rpm	603788-001
	750-GB, 72-rpm	633252-001
	750-GB, 5200-rpm	603787-001

Item	Description	Spare part number
	500-GB, 7200-rpm	603784-001
	250-GB, 7200-rpm	605606-001
	Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)	
	640-GB, 7200-rpm	621046-001
	640-GB, 5400-rpm	603785-001
	500-GB, 5400-rpm	634638-001 and 634921-001
	320-GB, 7200-rpm	603783-001
	Hard Drive Hardware Kit (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	605415-001

Miscellaneous parts

Description	Spare part number
AC adapter:	
65-W AC adapter	609939-001
90-W AC adapter PFC	609940-001
Full-function remote control with teletext	465541-004
Power cord:	
Asia/Pacific region, French Canada, Latin America, Thailand, and the United States	490371-001
Belgium, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Iceland, the Netherlands, northwest Africa, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, and Turkey	490371-021
The United Kingdom and Hong Kong	490371-031
Italy	490371-061
Denmark	490371-081
Switzerland	490371-111
Rubber feet	605644-001
Screw Kit	605643-001

Sequential part number listing

Spare part number	Description
465541-004	Full-function remote control with teletext
490371-001	Power cord for use in the Asia/Pacific region, French Canada, Latin America, Thailand, and the United States
490371-021	Power cord for use in Belgium, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Iceland, the Netherlands, northwest Africa, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, and Turkey
490371-031	Power cord for use in the United Kingdom and Hong Kong
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
537921-001	HP Integrated module with Bluetooth 2.1 wireless technology (does not include a Bluetooth module cable)
580101-002	Atheros AR9280 802.11 a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenada., Suriname, and the United States
580102-001	Atheros AR9285G 802.11 a/b/g/n 2x2 WiFi module for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, and the United States
580102-002	Atheros AR9285G 802.11 a/b/g/n 2x2 WiFi module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Zaire, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Korea-South, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Martinique, Nether Antilles, French Guiana, Aruba, British Virgin Islands, Bermuda, Syria, Guadeloupe, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, and Zimbabwe
582564-001	Broadcom 4322 802.11 a/b/g/n WLAN module for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, and the United States

Spare part number	Description
582564-002	Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Cayman Islands, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Zaire, Denmark, Djibouti, Dominica, Dominican Republic, 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-Bissa, Guyana, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe
593550-001	9-cell, 93-Wh, 2.8-Ah Li-ion battery for use with all computer models
593554-001	6-cell, 55-Wh, 2.55-Ah Li-ion battery for use with all computer models
593562-001	6-cell, 62-Wh, 2.8-Ah Li-ion battery for use with all computer models
593836-001	Broadcom BCM94313 802.11b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Cayman Islands, Chile, China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, Nether Antilles, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uruguay, USA, Uzbekistan, US Virgin Islands, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, Zimbabwe
594164-001	AMD Athlon X2 Dual-Core N330 Dual-Core, 35W, 2.3-GHz processor with 1-MB L2 cache (includes replacement thermal material)
594165-001	AMD Athlon X2 Dual-Core P320 Dual-Core, 25W, 2.1-GHz processor with 1-MB L2 cache (includes replacement thermal material)

Spare part number	Description
594166-001	AMD Phenom X2 Dual-Core N620 Dual-Core, 35W, 2.8-GHz processor with 2-MB L2 cache (includes replacement thermal material)
594167-001	AMD Phenom X2 Dual-Core P820 Tri-Core, 25W, 1.8-GHz processor with 1.5-MB L2 cache (includes replacement thermal material)
594168-001	AMD Phenom X2 Dual-Core N830 Tri-Core, 35W, 2.1-GHz processor with 1.5-MB L2 cache (includes replacement thermal material)
594169-001	AMD Phenom X2 Dual-Core N930 Quad-Core, 35W, 2.0-GHz processor with 2-MB L2 cache (includes replacement thermal material)
594170-001	AMD Phenom X2 Dual-Core P920 Quad-Core, 25W, 1.6-GHz processor with 2-MB L2 cache (includes replacement thermal material)
594172-001	AMD Turion X2 Dual-Core N530 Dual-Core, 35W, 2.5-GHz processor with 2-MB L2 cache (includes replacement thermal material)
594173-001	AMD Turion X2 Dual-Core P520 Dual-Core, 25W, 2.3-GHz processor with 2-MB L2 cache (includes replacement thermal material)
598856-001	2-GB memory module
598859-001	1-GB memory module
599092-001	4-GB memory module
599516-001	RTC battery
600370-001	Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)
602992-001	Realink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, the Cayman Islands, Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, 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, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, the US Virgin Islands, the United States, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
603660-001	Webcam/microphone module

Spare part number	Description
603680-001	Optical drive cable
603783-001	320-GB, 7200-rpm hard drive only (does not include left and right bracket rails, connector cable, Mylar cover with tab, screws or rubber isolators)
603784-001	500-GB, 7200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)
603785-001	640-GB, 5400-rpm hard drive only (does not include left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, or rubber isolators)
603787-001	750-GB, 5200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)
603788-001	1-TB, 5200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)
605323-001	Bluetooth module cable
605324-001	17.3-inch HD+ BrightView display assembly with webcam and 2 microphones for use in silver computers (includes wireless antenna transceivers and cables)
605325-001	17.3-inch HD+ flush glass AntiGlare display assembly with webcam and 2 microphones for use in silver computers
605327-001	17.3-inch HD+ BrightView display assembly with webcam and 2 microphones for use in black computers
605330-001	Display enclosure for use with flush glass displays in silver computers (includes wireless antenna transceivers and cables and logo LED board and cable)
605331-001	Display enclosure for use with BrightView displays in black computers (includes wireless antenna transceivers and cables and logo LED board and cable)
605332-001	Display Screw Kit
605333-001	Display Cable Kit (includes display panel cable and Webcam cable)
605334-001	Display Hinge Kit (includes right and left hinges) for use with flush glass displays
605336-001	Display hinge cover for use with flush glass displays
605337-001	BrightView display panel (includes display panel cable)
605338-001	Display enclosure for use in silver computer models with BrightView displays (includes wireless antenna transceivers and cables and logo LED board and cable)
605339-001	Display enclosure for use in white computer models with BrightView displays (includes wireless antenna transceivers and cables and logo LED board and cable)
605340-001	Display bezel for use with BrightView displays
605341-001	Display Rubber Kit (includes display bezel rubber screw covers)
605342-001	Display Hinge Kit (includes left and right hinges) for BrightView displays
605343-001	Display hinge cover for BrightView displays
605344-001	Keyboard for use in the United States
605344-031	Keyboard for use in the United Kingdom

Spare part number	Description
605344-041	Keyboard for use in Germany
605344-051	Keyboard for use in France
605344-061	Keyboard for use in Italy
605344-071	Keyboard for use in Spain
605344-121	Keyboard for use in French Canada
605344-131	Keyboard for use in Portugal
605344-211	Keyboard for use in Hungary
605344-221	Keyboard for use in the Czech Republic
605344-251	Keyboard for use in Russia
605344-A41	Keyboard for use in Belgium
605344-B31	Keyboard for use internationally
605344-BA1	Keyboard for use in Slovenia
605344-BG1	Keyboard for use in Switzerland
605344-DH1	Keyboard for use in Denmark, Norway, and Sweden
605344-DJ1	Keyboard for use in Greece
605345-001	Base enclosure (includes rubber feet)
605346-001	Top cover for use only with silver computer models equipped with a fingerprint reader; and includes fingerprint reader board (includes TouchPad and TouchPad buttons)
605347-001	Top cover for use only with black computer models not equipped with a fingerprint reader
605348-001	USB board (includes cable)
605356-001	Speaker assembly
605357-001	Subwoofer
605358-001	Power button board (includes cable)
605359-001	Wireless antenna
605360-001	Plastic Kit
605364-001	Power connector and cable
605415-001	Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)
605416-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
605417-001	Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Combo Drive
605496-001	System board for AMD UMA graphics subsystem and shared memory
605497-001	System board for ATI Mobility Radeon HD 5470 discrete graphics with 512-MB of dedicated memory without subwoofer

Spare part number	Description
605498-001	System board for ATI Mobility Radeon HD 5650 discrete graphics with 1-GB of dedicated memory without subwoofer
605560-005	Atheros AR9285 802.11b/g/n module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cayman Islands, Canada, Cape Verde, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, 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, Guam, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Neither Antilles, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uruguay, the United States, Uzbekistan, US Virgin Islands, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, Zimbabwe
605606-001	250-GB, 7200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)
605643-001	Screw Kit
605644-001	Rubber feet
606574-001	Fan/heat sink assembly for use only with computer models equipped with graphics subsystems with UMA memory (includes replacement thermal material)
606575-001	Fan/heat sink assembly for use only with computer models equipped with graphics subsystems with discrete memory (includes replacement thermal material)
609788-001	17.3-inch HD+ BrightView display assembly with webcam and 2 microphones for use in white computers
609789-001	Top cover for use only with white computer models not equipped with a fingerprint reader
609939-001	65-W AC adapter
609940-001	90-W AC adapter PFC
611251-001	Display Screw Kit for flush glass display
615442-001	Base enclosure for use with non-silver computer models (includes rubber feet)
615443-001	Base enclosure for use with silver computer models (includes rubber feet)
615686-001	System board for ATI Mobility Radeon HD 5470 discrete graphics and 512-MB of dedicated memory with subwoofer (includes replacement thermal material)
615687-001	System board for ATI Mobility Radeon HD 5650 discrete graphics and 1-GB of dedicated memory with subwoofer (includes replacement thermal material)

Spare part number	Description
615688-001	System board for use on computer models equipped with UMA graphics subsystem memory, but no subwoofer v.1.0 (includes replacement thermal material)
616334-001	AMD Turion X2 Dual-Core N350 Dual-Core 2.40-GHz, 35W processor with 1-MB L2 cache (includes replacement thermal material)
616335-001	AMD Phenom X2 Dual-Core P840 Tri-Core 1.90-GHz 25W processor with 1.5-MB L2 cache (includes replacement thermal material)
616336-001	AMD Phenom X2 Dual-Core P940 Quad-Core 1.70-GHz 25W processor with 2-MB L2 cache (includes replacement thermal material)
616337-001	AMD Turion X2 Dual-Core N550 Dual-Core 2.5-GHz 35W processor with 2-MB with L2 cache (includes replacement thermal material)
616343-001	AMD Athlon X2 Dual-Core P340 Dual-Core 2.20-GHz 25W processor with 1-MB L2 cache (includes replacement thermal material)
616344-001	AMD Phenom X2 Dual-Core N640 Dual-Core 2.90-GHz 35W processor with 2-MB L2 cache (includes replacement thermal material)
616345-001	AMD Phenom X2 Dual-Core N850 Tri-Core 2.20-GHz 35W processor with 1.5-MB L2 cache (includes replacement thermal material)
616346-001	AMD Phenom X2 Dual-Core N950 Quad-Core 2.10-GHz 35W processor with 2-MB L2 cache (includes replacement thermal material)
616347-001	AMD Turion X2 Dual-Core P540 Dual-Core 2.4-GHz 25W processor with 2-MB L2 cache (includes replacement thermal material)
621046-001	640-GB, 7200-rpm hard drive only (does not include left and right bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)
630829-001	System board for use on computer models equipped with UMA graphics subsystem memory, but without subwoofer v.1.2 (includes replacement thermal material)
630830-001	System board for use on computer models equipped with ATI Mobility Radeon HD 6370 discrete graphics with 512-KB of dedicated memory without subwoofer (includes replacement thermal material)
630831-001	System board for use on computer models equipped with ATI Mobility Radeon HD 6550 discrete graphics with 1-GB of dedicated memory without subwoofer (includes replacement thermal material)
630832-001	System board for use on computer models equipped with UMA graphics subsystem memory and subwoofer v.1.2 (includes replacement thermal material)
630833-001	System board for use on computer models equipped with ATI Mobility Radeon HD 6370 discrete graphics and 512-KB of dedicated memory with subwoofer (includes replacement thermal material)
630834-001	System board for use on computer models equipped with ATI Mobility Radeon HD 6550 discrete graphics and 1-GB of dedicated memory with subwoofer (includes replacement thermal material)
633252-001	750-GB, 7200-rpm hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)
634433-001	Thermal Material Kit (includes thermal pads and thermal paste syringe)
634638-001	500-GB, 5400-rpm hard drive only (does not include left and right bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)

Spare part number	Description
634686-001	AMD Athlon X2 Dual-Core N370 Dual-Core 2.50-GHz 35W processor with 1-MB L2 cache (includes replacement thermal material)
634687-001	AMD Phenom X2 Dual-Core P650 Dual-Core 2.60-GHz 25W processor with 2-MB L2 cache (includes replacement thermal material)
634688-001	AMD Phenom X2 Dual-Core P860 Dual-Core 2.00-GHz 25W processor with 1.5-MB L2 cache (includes replacement thermal material)
634689-001	AMD Phenom X2 Dual-Core P960 Dual-Core 1.80-GHz 25W processor with 2-MB L2 cache (includes replacement thermal material)
634690-001	AMD Turion X2 Dual-Core P570 Dual-Core 2.7-GHz 35W processor with 2-MB L2 cache (includes replacement thermal material)
634691-001	AMD Turion X2 Dual-Core P560 Dual-Core 2.5-GHz 35W processor with 2-MB L2 cache (includes replacement thermal material)
634921-001	500-GB, 5400-rpm hard drive only (does not include left and right bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)
635494-001	AMD Phenom X2 Dual-Core N660 Dual-Core 3.00-GHz 35W processor with 2-MB L2 cache (includes replacement thermal material)
635495-001	AMD Phenom X2 Dual-Core N870 Dual-Core 2.30-GHz 25W processor with 1.5-MB L2 cache (includes replacement thermal material)
635496-001	AMD Phenom X2 Dual-Core N970 Dual-Core 2.2-GHz 35W processor with 2-MB L2 cache (includes replacement thermal material)
636635-001	AMD Athlon X2 Dual-Core P360 Dual-Core 2.30-GHz 35W processor with 1-MB L2 cache (includes replacement thermal material)

4 Removal and replacement procedures

Preliminary replacement requirements


Tools required

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


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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

⚠ CAUTION: A product can be degraded by as little as 700 V.

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

Component replacement procedures

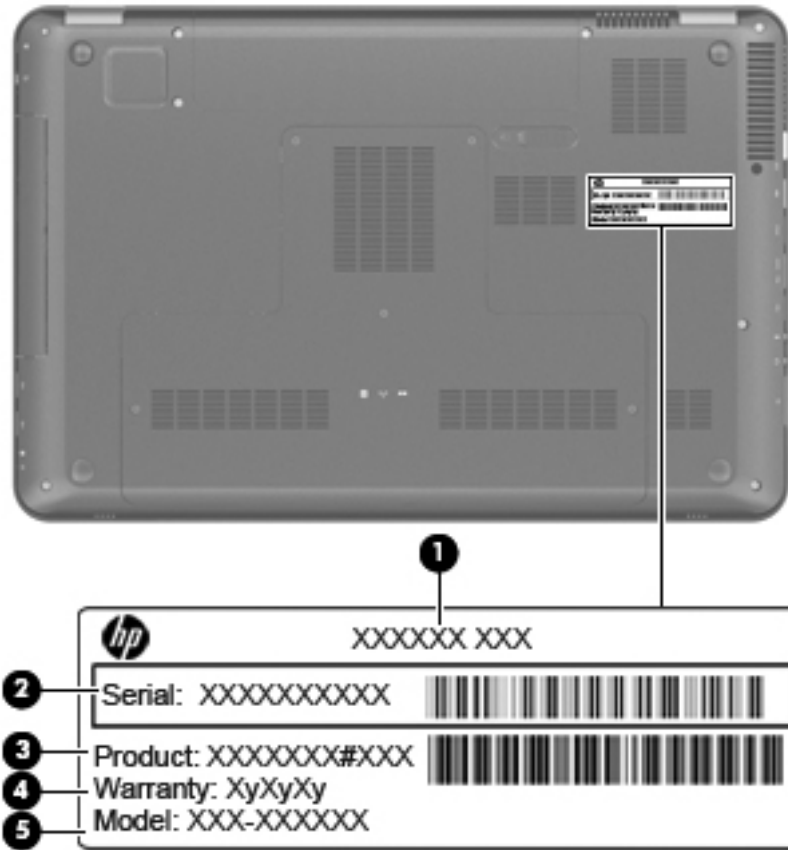
This chapter provides removal and replacement procedures.

There are as many as 78 screws, in 13 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

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

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



Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 605644-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

Description	Spare part number
6-cell, 55-Wh, 2.55-Ah Li-ion battery for use with all computer models	593554-001
6-cell, 62-Wh, 2.8-Ah Li-ion battery for use with all computer models	593562-001
9-cell, 93-Wh, 2.8-Ah Li-ion battery for use with all computer models	593550-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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



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.

Primary hard drive cover

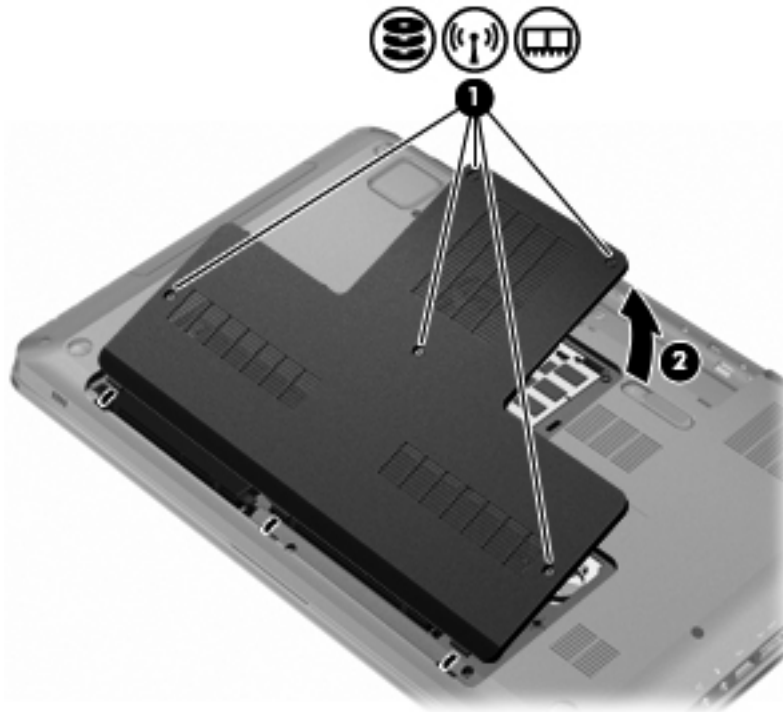
Description	Spare part number
Primary hard drive cover	605360-001

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

Remove the primary hard drive cover:

1. Loosen the five Phillips PM2.5×6.0 captive screws **(1)** that secure the primary hard drive cover to the computer.
2. Lift the primary hard drive cover **(2)** away from the computer.



Reverse this procedure to install the primary hard drive cover.

Hard drive

Description	Spare part number
Hard Drive Kits (include left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	
1-TB. 5200-rpm	603788-001
750-GB, 72-rpm	633252-001
750-GB, 5200-rpm	603787-001
500-GB, 7200-rpm	603784-001
250-GB, 7200-rpm	605606-001
Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)	
640-GB, 7200-rpm	621046-001
640-GB, 5400-rpm	603785-001
500-GB, 5400-rpm	634638-001 and 634921-001
320-GB, 7200-rpm	603783-001
Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	605415-001

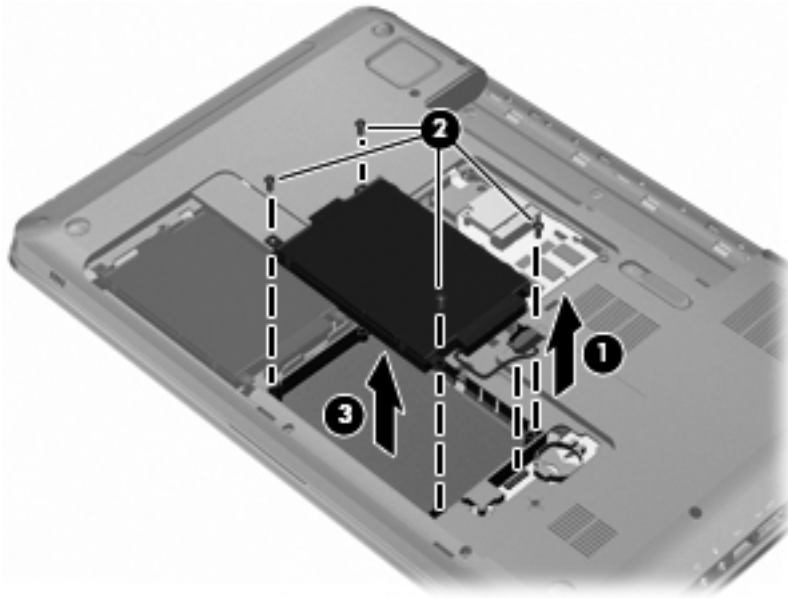
Before removing the hard drive, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).

Remove the hard drive:

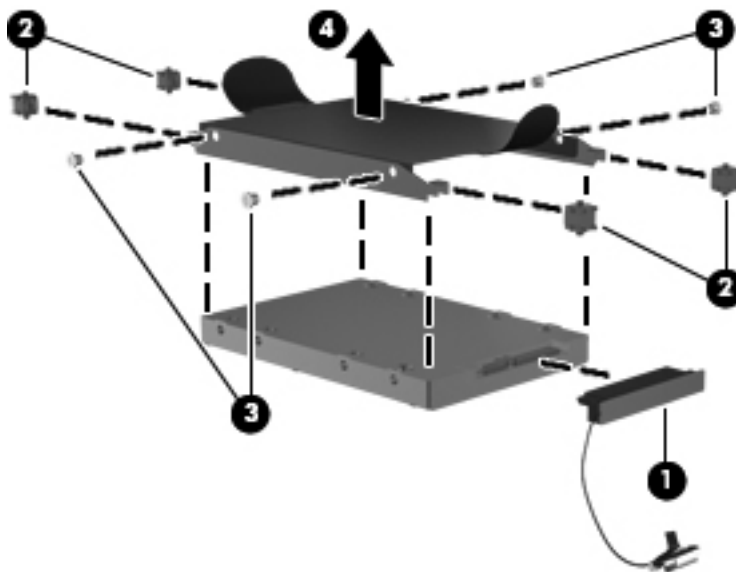
1. Disconnect the hard drive cable connector from the system board **(1)**.
2. Remove the four Phillips PM2.5×3.0 screws **(2)**.

3. Remove the hard drive vertically **(3)** from the computer.



4. If it is necessary to replace the hard drive bracket or any of the hard drive bracket components, remove the following:

- **(1)** Hard drive adapter cable
- **(2)** Four rubber isolators
- **(3)** Four Phillips PM3.0×3.5 screws that secure the hard drive bracket rails and Mylar cover to the hard drive
- **(4)** Left and right hard drive bracket rails with Mylar cover



Reverse this procedure to install the hard drive.

Secondary hard drive

Description	Spare part number
Hard Drive Kits (include left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	
1-TB, 5200-rpm	603788-001
750-GB, 7200-rpm	633252-001
750-GB, 5200-rpm	603787-001
500-GB, 7200-rpm	603784-001
250-GB, 7200-rpm	605606-001
Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators)	
640-GB, 7200-rpm	621046-001
640-GB, 5400-rpm	603785-001
500-GB, 5400-rpm	634638-001 and 634921-001
320-GB, 7200-rpm	603783-001
Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and 4 rubber isolators)	605415-001

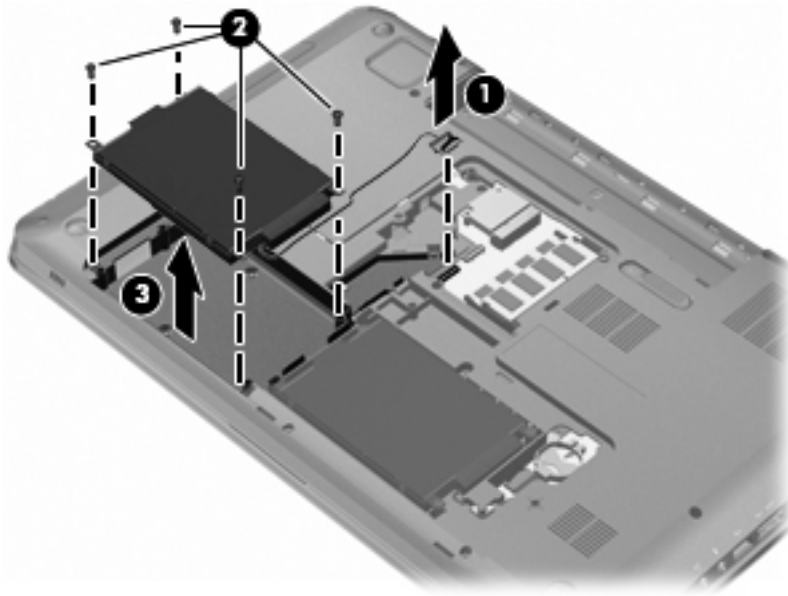
Before removing the hard drive, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).

Remove the secondary hard drive:

1. Disconnect the hard drive cable connector from the system board **(1)**.
2. Remove the four hard drive screws **(2)**.

3. Remove the hard drive vertically **(3)** from the computer.



Reverse this procedure to install the secondary hard drive.

WLAN module

Description	Spare part number
Atheros AR9280 802.11a/b/g/n 2x2 WiFi Adapter for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenada., Suriname, and the United States	580101-002
Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenada., Suriname, and the United States	580102-001
Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belgium, Belize, Benin, Bhutan, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, People's Republic of China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Zaire, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Korea-South, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Martinique, Nether Antilles, French Guiana, Aruba, British Virgin Islands, Bermuda, Syria, Guadeloupe, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, and Zimbabwe	580102-002
Broadcom 4322 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Canada, Guinea, Haiti, Jamaica, Guam, Nether Antilles, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, and the United States	582564-001

Description	Spare part number
Broadcom 4322 802.11a/b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Australia, Austria, Azerbaijan, Bahrain, Belarus, Belgium, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Cayman Islands, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Zaire, Denmark, Djibouti, Dominica, Dominican Republic, 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-Bissa, Guyana, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, Ivory Coast, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of Moldova, Romania, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, United Arab Emirates, United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe	582564-002
Broadcom 4313 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo adapter (BT3.0+HS ready)	600370-001

Description	Spare part number
<p>Broadcom BCM94313 802.11b/g/n WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Central African Republic, Chad, Cayman Islands, Chile, China Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iraq, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, Netherlands, Nether Antilles, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Puerto Rico, Qatar, Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Gren., Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Timor (East), Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, United Arab Emirates, United Kingdom, Uruguay, USA, Uzbekistan, US Virgin Islands, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, Zimbabwe</p>	593836-001
<p>Realink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo adapter for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, the Cayman Islands, Central African Republic, Chad, Chile, the People's Republic of China, Colombia, Comoros, 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, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Ivory Coast, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia and Montenegro, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, the US Virgin Islands, the United States, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe</p>	602992-001

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the primary hard drive (see [Hard drive on page 48](#)).

Remove the WLAN module:

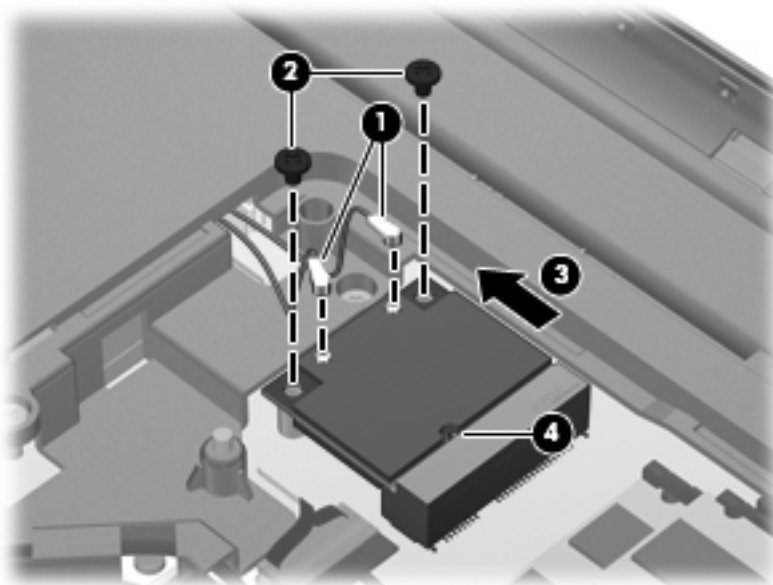
⚠ CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

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

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


2. Remove the two Phillips PM2.5×3.5 screws **(2)** that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)
3. Remove the WLAN module **(3)** by pulling it away from the slot.

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



Reverse this procedure to install a WLAN module.

RTC battery

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

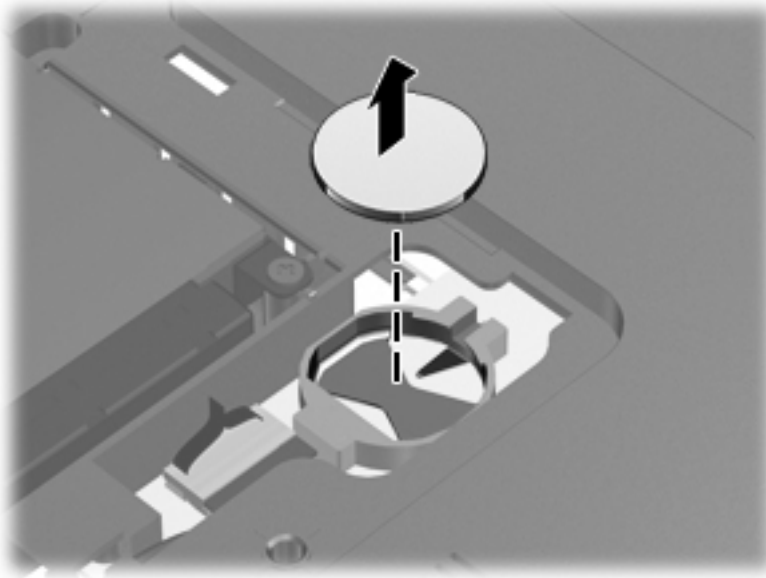
Description	Spare part number
RTC battery	599516-001

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).

Remove the RTC battery:

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



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

Memory module


Description	Spare part number
1-GB memory module	598859-001
2-GB memory module	598856-001
4-GB memory module	599092-001

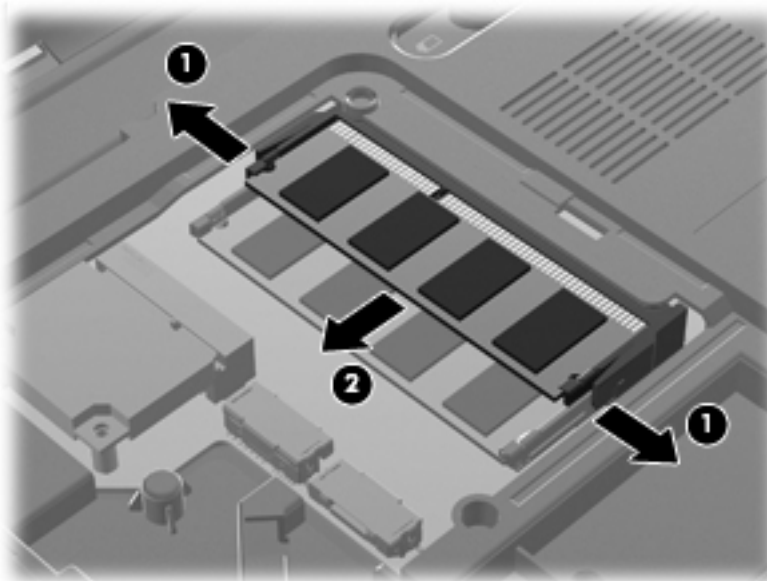
Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
2. Remove the module **(2)** by pulling it away from the slot at an angle.

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



Reverse this procedure to install the memory module.

Optical drive



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

Description	Spare part number
<ul style="list-style-type: none">• Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive	605417-001
<ul style="list-style-type: none">• Blu-ray ROM DVD±R/RW SuperMulti Double-Layer Combo Drive (via software)	
<ul style="list-style-type: none">• DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	605416-001
<ul style="list-style-type: none">• DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive (via software)	

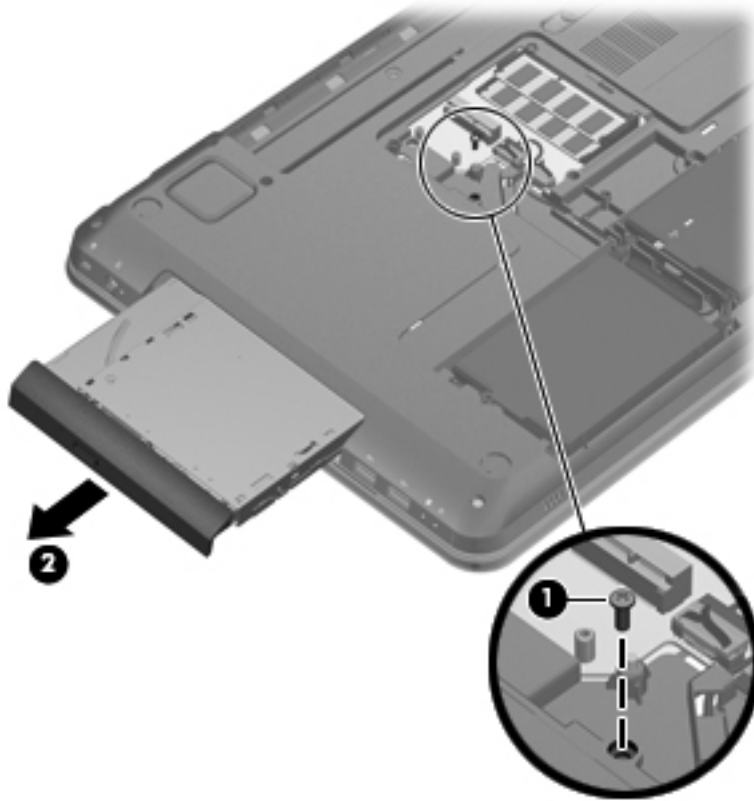
Before removing the optical drive, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).

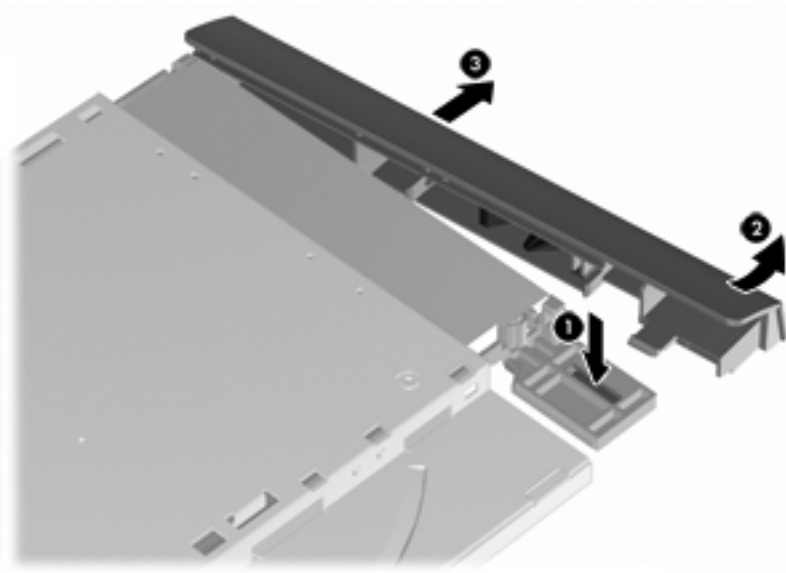
Remove the optical drive:

1. Position the computer with the front toward you.
2. Remove the Phillips PM2.5×3.0 screw **(1)** that secures the optical drive to the computer.

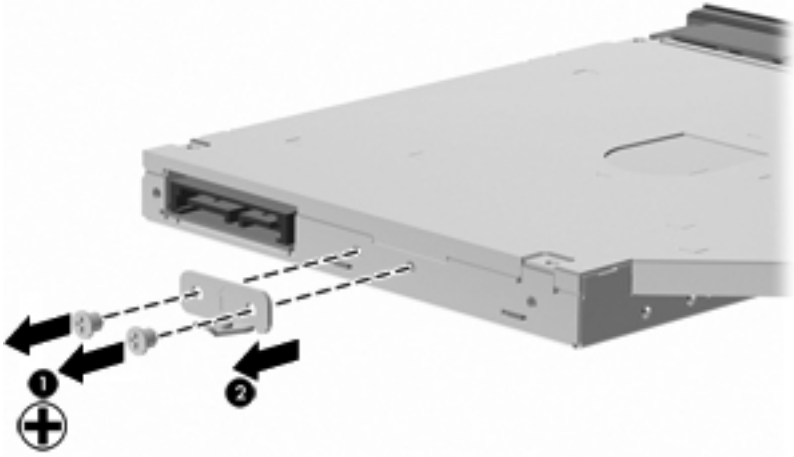
3. Remove the optical drive **(2)**.



4. To remove the bezel from the optical drive, push down to release the corner of the front bezel (not the cover) **(1)**.
5. Use the holding tabs to rotate **(2)** the bezel, and then remove the bezel by pulling the it away from the remaining holding tabs **(3)**.



- Using a small Phillips screwdriver, loosen the security bracket screws on the rear of the optical drive **(1)**, and then remove the security bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Keyboard

Description	Spare part number
Keyboard (includes keyboard cable)	605344-xxx

NOTE: For a detailed list of available keyboards, see [Sequential part number listing on page 31](#).

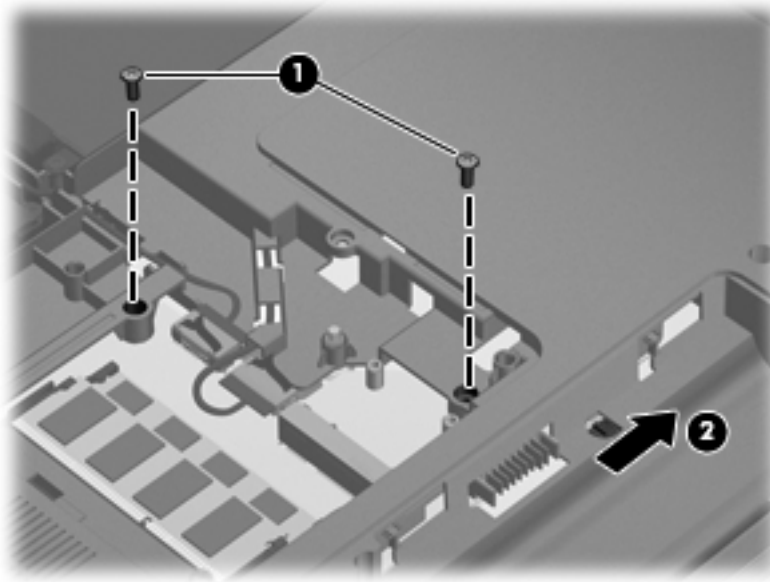
Before removing the keyboard, follow these steps:

- 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.
- Disconnect all external devices connected to the computer.
- 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 (see [Battery on page 46](#)).
- Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).

Remove the keyboard:

- Remove the two Phillips PM2.5×6.5 screws **(1)** that secure the keyboard to the computer.

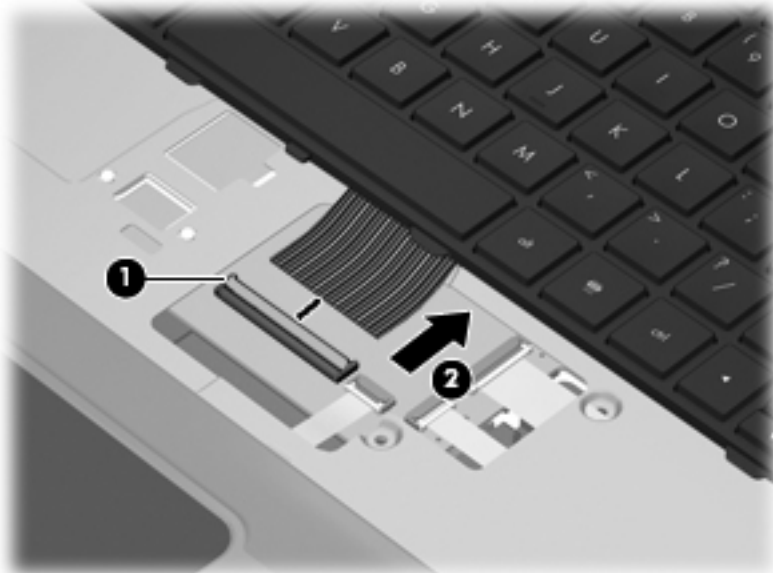
2. Slide the keyboard release switch **(2)** (in the battery bay) to the right.



3. Turn the computer display-side up, with the front toward you, and open the computer as far as possible.
4. Lift **(1)** and release **(2)** the keyboard until the keyboard connector on the system board is accessible.



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



Top cover

Description	Spare part number
Top cover (includes TouchPad and TouchPad buttons) for use only with silver computer models equipped with a fingerprint reader; and includes fingerprint reader board	605346-001
Top cover (includes TouchPad and TouchPad buttons) for use in black computers not equipped with a fingerprint reader	605347-001
Top cover (includes TouchPad and TouchPad buttons) for use only with white computer models not equipped with a fingerprint reader	609789-001

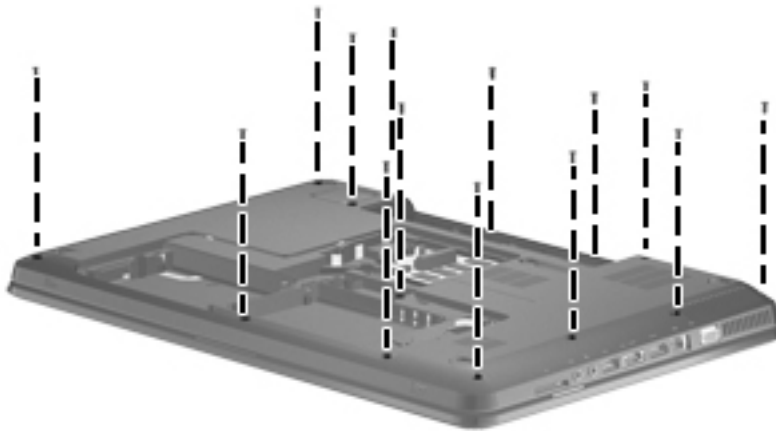
Before removing the top cover, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the hard drive (see [Hard drive on page 48](#)).
7. Remove the secondary hard drive (see [Secondary hard drive on page 50](#)).

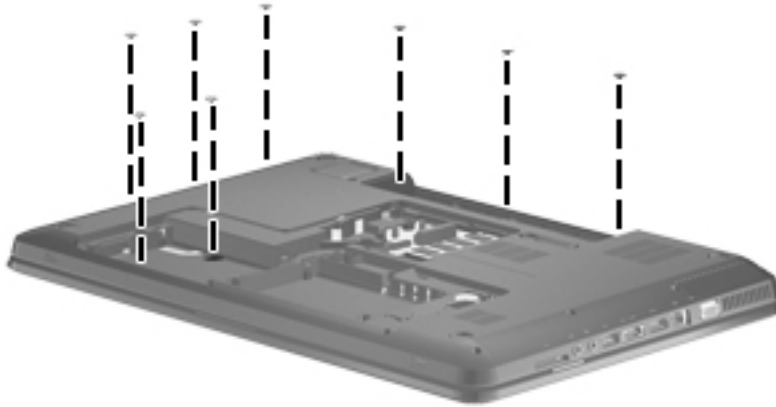
8. Remove the optical drive (see [Optical drive on page 58](#)).
9. Remove the keyboard (see [Keyboard on page 60](#)).

Remove the top cover:

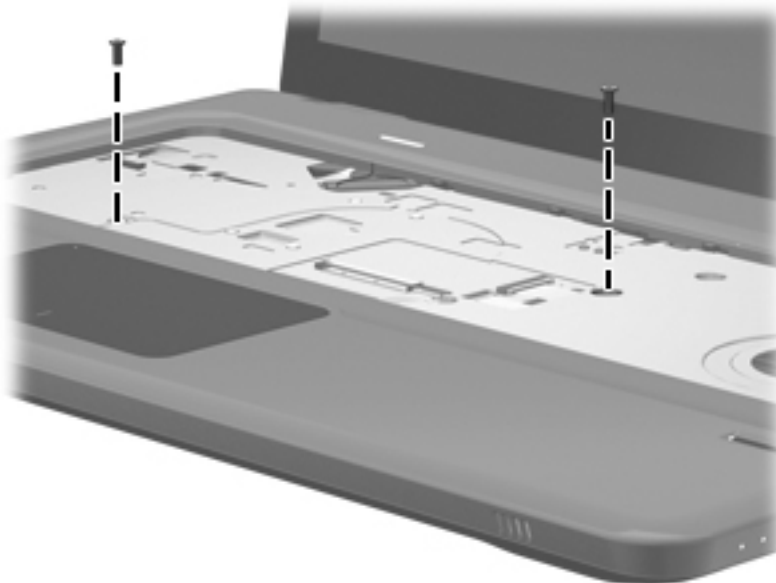
1. Turn the computer display-side down, with the front toward you.
2. Remove the following screws:
 - 4 Phillips 2.5×6.5 screws (one in each corner)
 - 2 Phillips 2.5×6.5 screws (left side)
 - 2 Phillips 2.5×6.5 screws (front side)
 - 1 Phillips 2.5×6.5 screws (center)
 - 5 Phillips 2.0×1.5 screws (in battery bay)



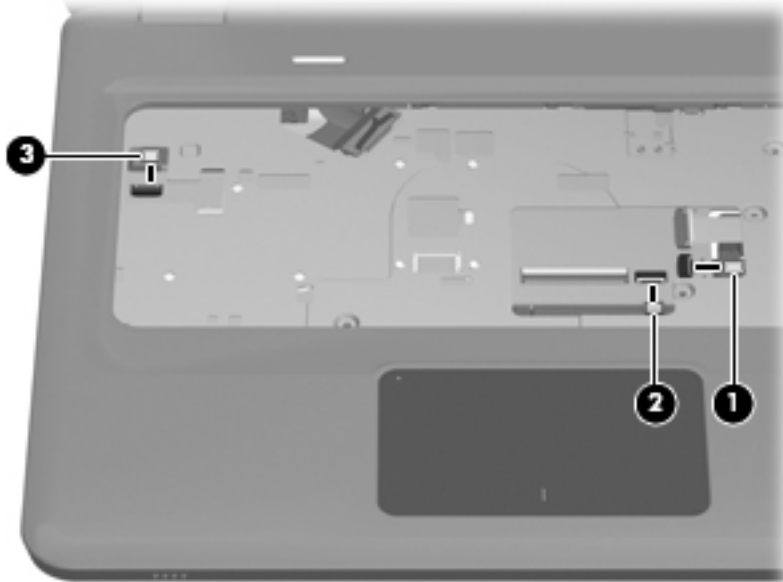
3. Remove the following screws:
 - 3 Phillips 2.5×2.0 screws (in the optical drive bay)
 - 2 Phillips 2.5×1.5 screws (in secondary hard drive bay)
 - 3 Phillips 2.5×6.5 screws (battery bay)



4. Turn the computer display-side up, with the front toward you.
5. Open the computer as far as possible.
6. Remove 2 Phillips 2.5×6.5 screws (under keyboard).



7. Disconnect the fingerprint reader ribbon cable **(1)**, TouchPad ribbon cable **(2)**, and power button ribbon cable **(3)** from system board.



8. Lift **(1)** and 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)	605358-001

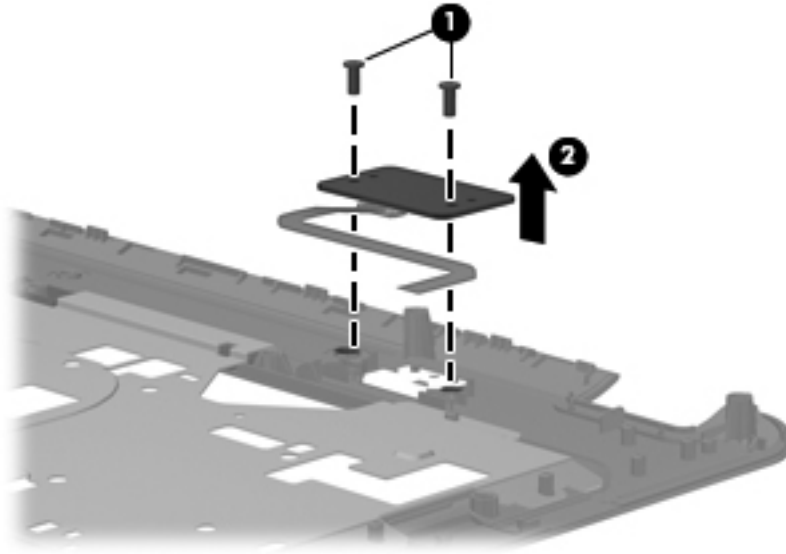
Before removing the power button board, follow these steps:

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 46](#)).
5. Remove the primary hard drive (see [Primary hard drive cover on page 47](#)).
6. Remove the hard drive (see [Hard drive on page 48](#)).
7. Remove the secondary hard drive (see [Secondary hard drive on page 50](#)).
8. Remove the optical drive (see [Optical drive on page 58](#)).
9. Remove the keyboard (see [Keyboard on page 60](#)).
10. Remove the top cover (see [Top cover on page 62](#)).

Remove the power button board:

1. Turn the top cover upside down with the front toward you.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the power button board to the top cover.

3. Remove the power button board **(2)** and cable.



Reverse this procedure to install the power button board.

Display assembly

Description	Spare part number
17.3-inch HD+ BrightView display assembly with webcam and 2 microphones for use in silver computers (includes wireless antenna transceivers and cables)	605324-001
17.3-inch HD+ flush glass AntiGlare display assembly with webcam and 2 microphones for use in silver computers	605325-001
17.3-inch HD+ BrightView display assembly with webcam and 2 microphones for use in black computers	605327-001
17.3-inch HD+ BrightView display assembly with webcam and 2 microphones for use in white computers	609788-001

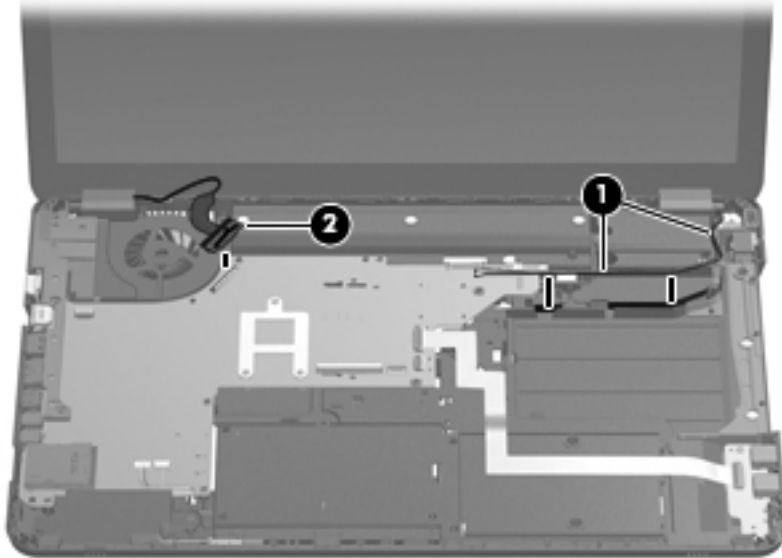
Before removing the display assembly, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the hard drive (see [Hard drive on page 48](#)).
7. Remove the secondary hard drive (see [Secondary hard drive on page 50](#)).
8. Remove the optical drive (see [Optical drive on page 58](#)).
9. Remove the keyboard (see [Keyboard on page 60](#)).
10. Remove the top cover (see [Top cover on page 62](#)).

Remove the display assembly:

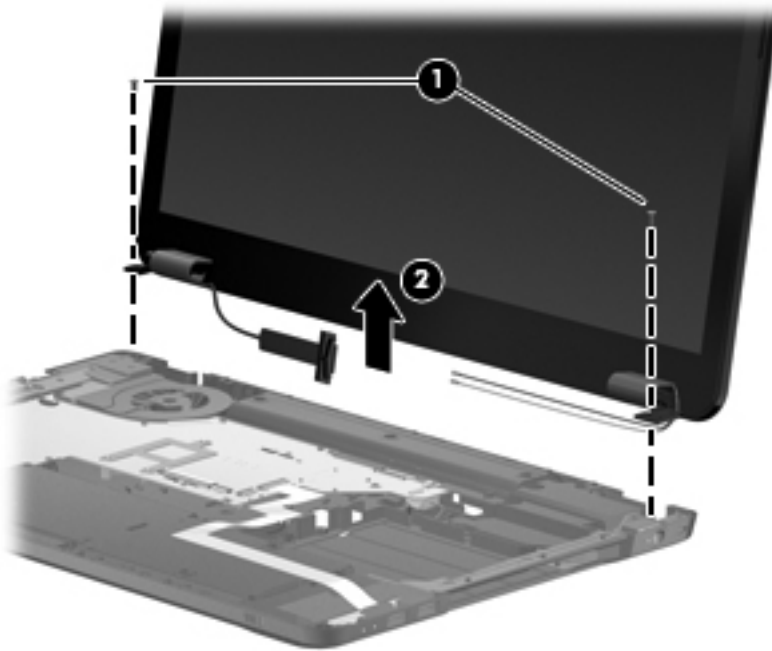
1. Disconnect the WLAN cables **(1)** from under the system board and the display panel cable **(2)** from the system board.


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



2. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the display assembly to the computer.

3. Remove the display assembly **(2)**.

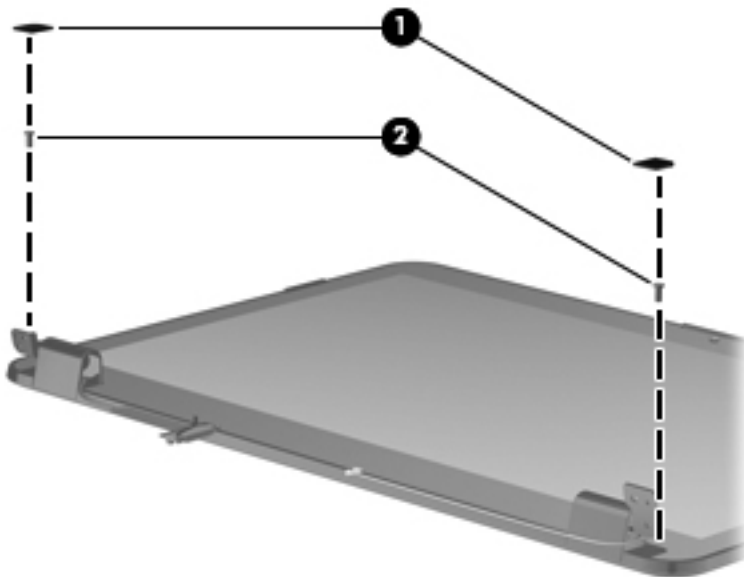


 **NOTE:** Steps 4 through 16 provide display assembly internal component removal information for computer models equipped with flush glass display assemblies. See steps 17 through 28 for display assembly internal component removal information for computer models equipped with BrightView display assemblies.

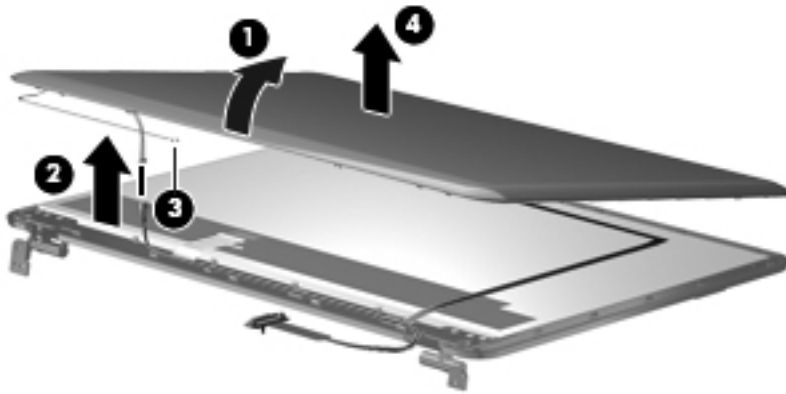
4. If it is necessary to replace the display enclosure or any of the display assembly internal components, remove the following screw covers and screws:

(1) Two screw covers on the display bezel bottom edge. The rubber screw covers are included in the Display Rubber Kit, spare part number 605341-001.

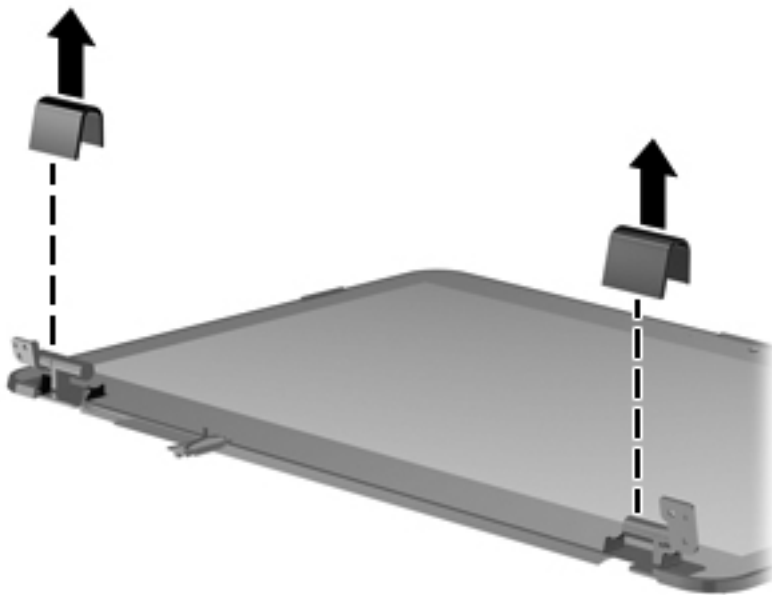
(2) Two Phillips PM2.5×7.0 screws.



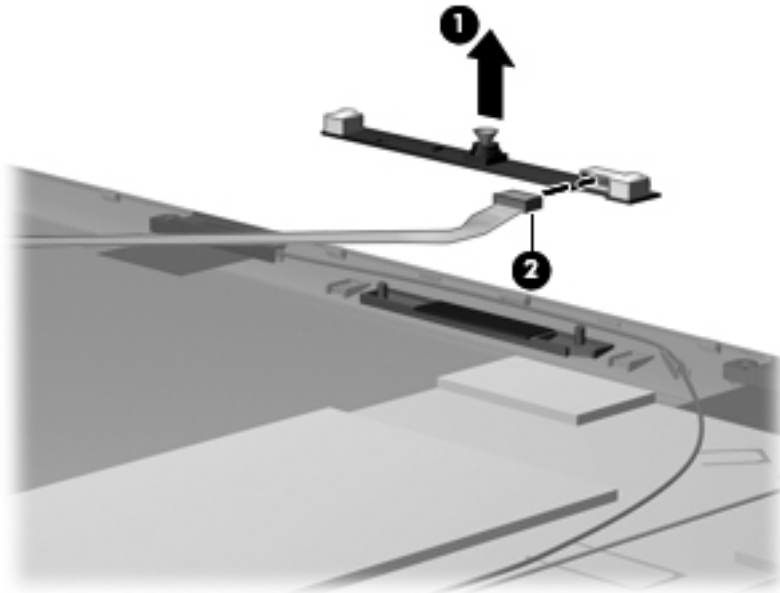
5. Turn the display assembly upside down, with the bottom toward you.
6. Lift and release the bottom of the display enclosure (1).
7. Disconnect the display logo cable (2) from the display panel cable.
8. Route the webcam cable and antenna cables (3) through the hinge channel.
9. Remove the display enclosure (4). The display enclosure is available using spare part number 605330-001.



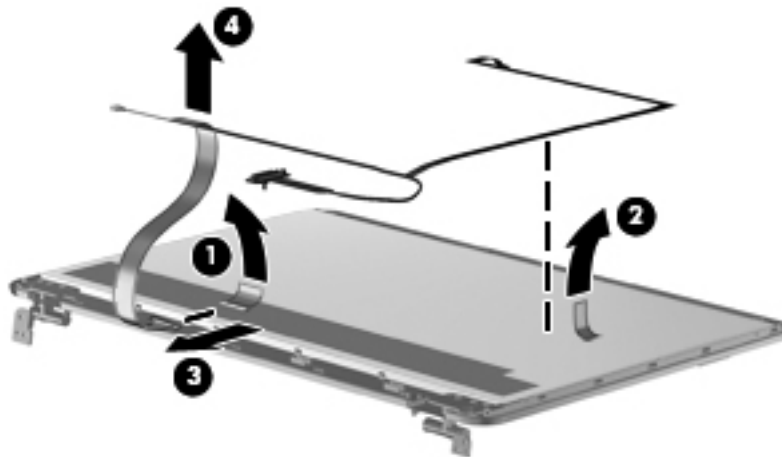
10. Slide off each hinge cover to remove from the display assembly.



11. If it is necessary to replace the webcam/microphone module, remove the Phillips PM2.0×4.0 screw **(1)** that secures the module to the display bezel.
12. Disconnect the webcam/microphone module cable **(2)** and remove the webcam/microphone module. The webcam/microphone module is available using spare part number 603660-001.

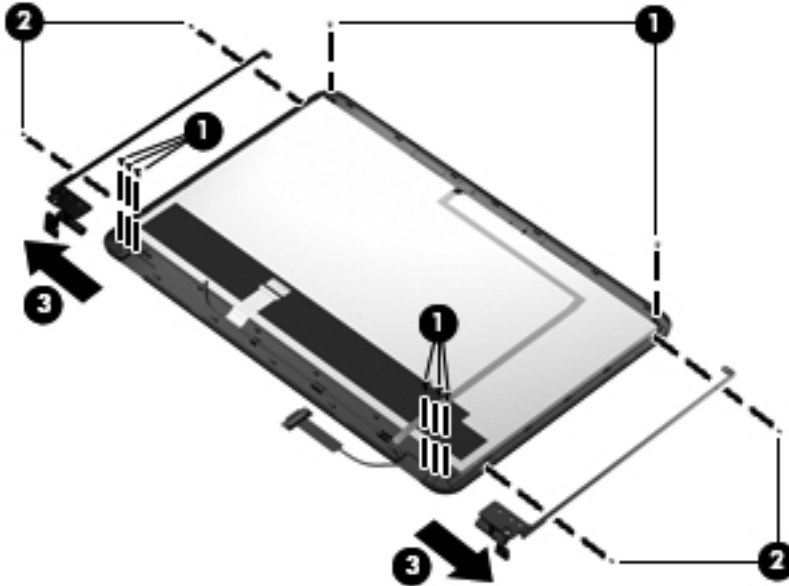



13. If it is necessary to remove the display power panel which includes display panel cable and Webcam cable, remove the adhesive plastic strip **(1)** from the display panel cable, and lift the cable **(2)**. Disconnect **(3)** the cable from the display panel and remove the cable **(4)**. The display panel cable is available in the Display Cable Kit using spare part number 605333-001.



14. If it is necessary to replace the display hinges, remove the eight Phillips PM2.5×5.0 screws **(1)** that secure the display hinges to the top of the display panel.
15. Remove the four Phillips PM 2.0×5.0 screws that secure the hinges to the sides of the display panel **(2)**.

- 16.** Remove the display hinges (**3**). The Display Hinge Kit is available using spare part number 605334-001. The Display Screw Kit is available using spare part number 611251-001.

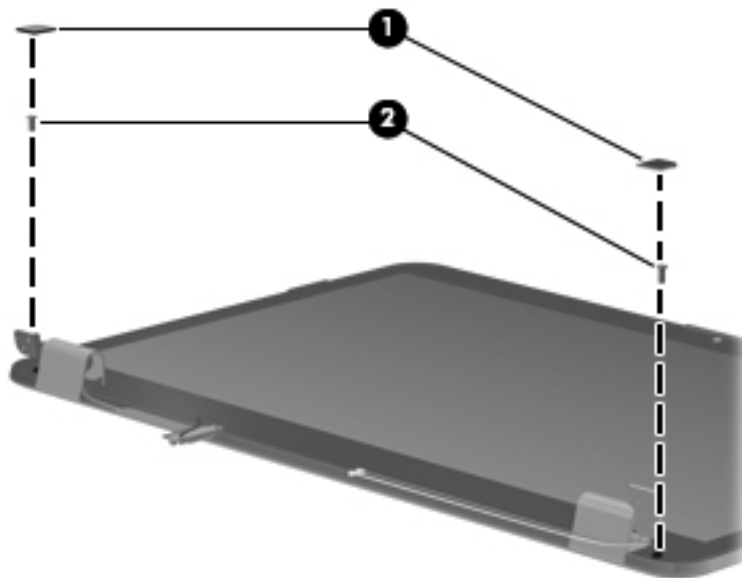


 **NOTE:** Steps 17 through 28 provide display assembly internal component removal information for computer models equipped with BrightView display assemblies.

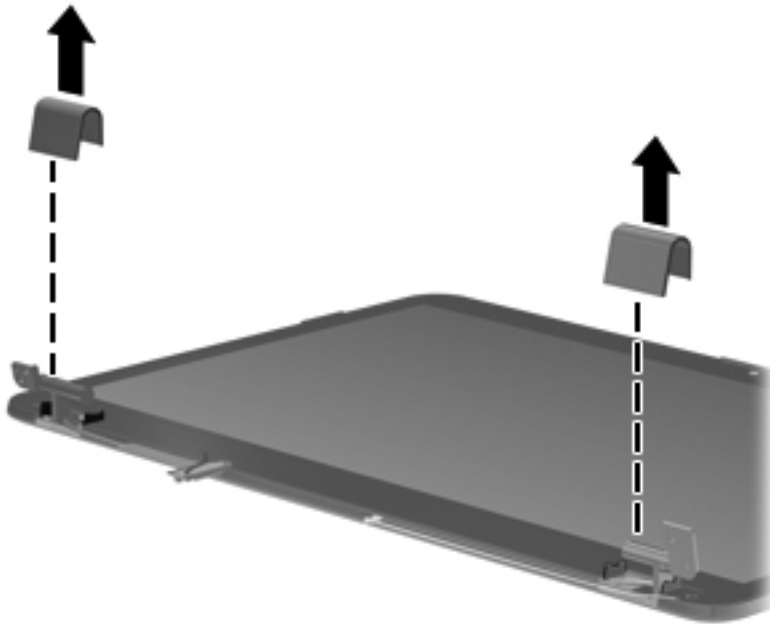
- 17.** If it is necessary to replace the display bezel or any of the display assembly internal components, remove the following screw covers and screws:

(1) Two rubber screw covers on the display bezel bottom edge. The display rubber screw covers are included in the Display Rubber Kit, spare part number 605341-001.

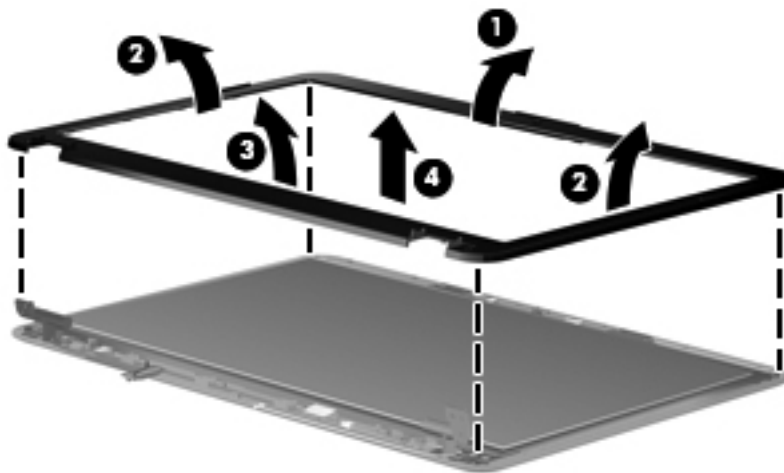
(2) Two Phillips PM2.5x5.0 screws



- 18.** Slide off each hinge cover to remove from the display assembly.

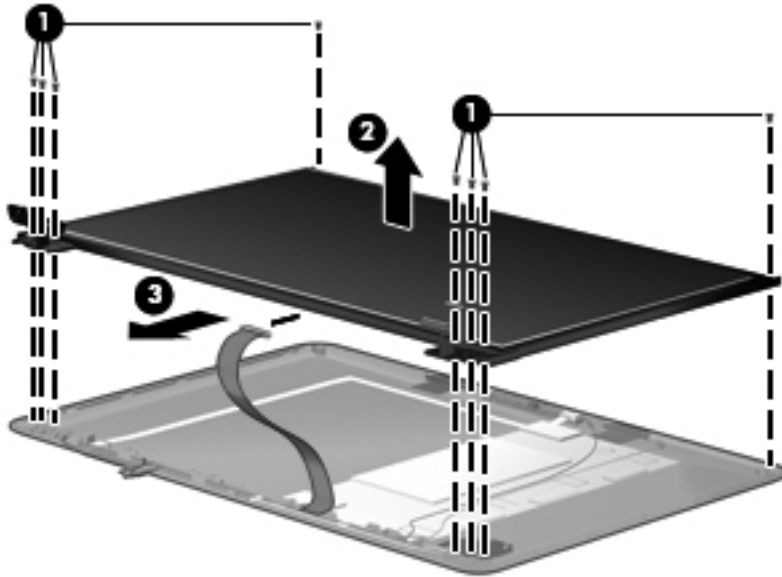


- 19.** Flex the inside edges of the top edge **(1)**, the left and right sides **(2)**, and the bottom edge of the display bezel **(3)** until the bezel disengages from the display enclosure.
- 20.** Remove the display bezel **(4)**. The display bezel is available using the spare part number 605340-001.

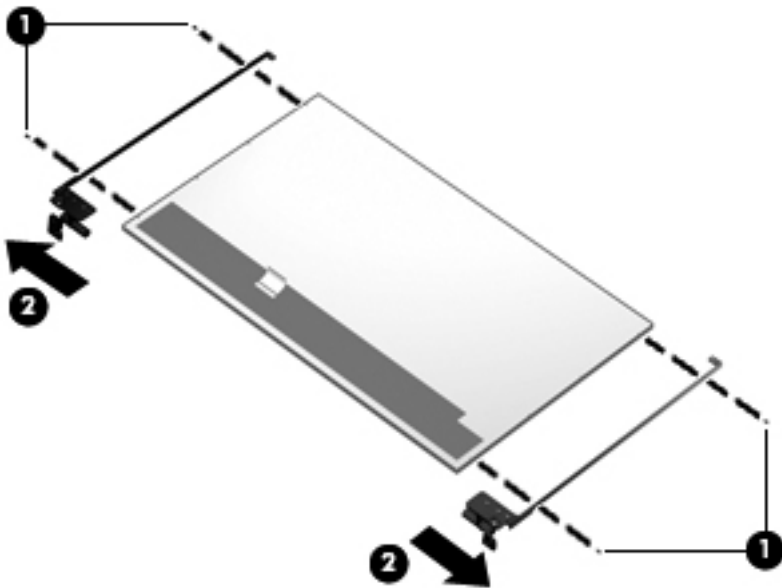


- 21.** If it is necessary to replace the display panel, remove the two Phillips PM2.5×5.0 screws from the top corners and the six Phillips PM2.5×5.0 screws **(1)** from the display hinges.
- 22.** Lift the top of the display panel **(2)** upward and release the display hinges.

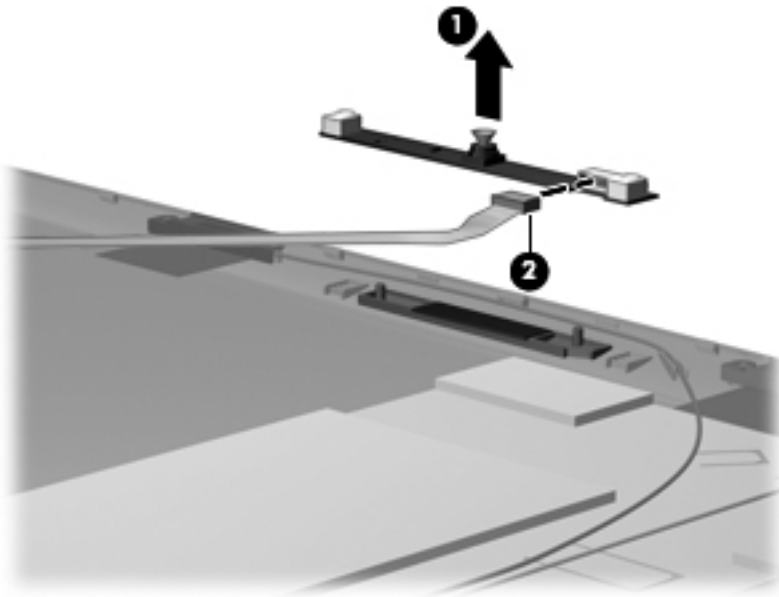
- 23.** Disconnect the display panel cable (**3**) from the back of the panel. The display panel is available using spare part number 605337-001.



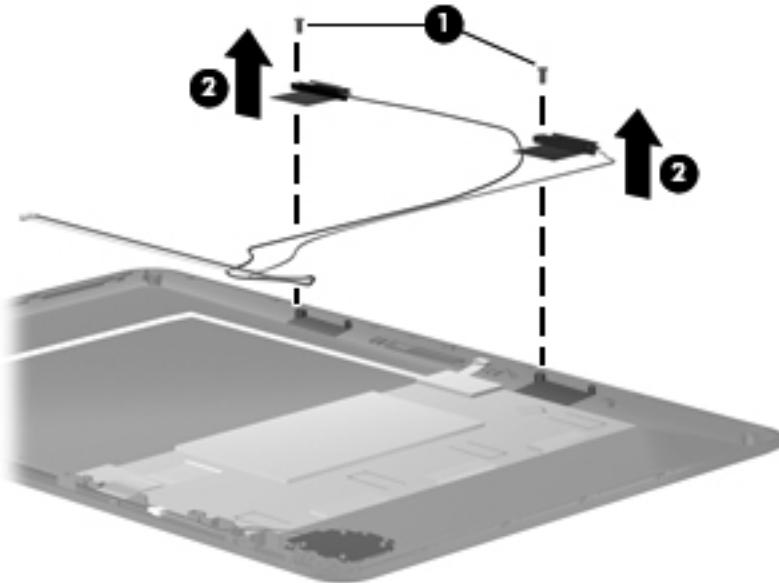
- 24.** Remove the four Phillips PM 2.0x3.0 screws that secure the hinges to the sides of the display panel (**1**).
- 25.** Remove the display hinges (**2**). The display hinges are available in the Display Hinge Kit, spare part 605342-001. The display hinge screws are available in the Display Screw Kit, spare part number 605332-001.



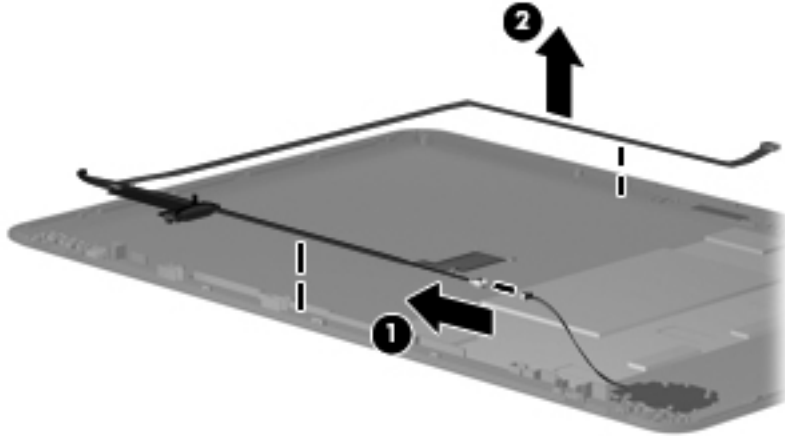
- 26.** If it is necessary to remove the webcam/microphone module, lift the module **(1)** and then disconnect the module cable **(2)**. The webcam/microphone module is available using spare part number 603660-001.



- 27.** If it is necessary to remove the wireless antennas, remove two Phillips PM2.0x3.0 screws **(1)** and lift **(2)** the antennas and cables to remove from the display enclosure. The wireless antennas are available using spare part number 605359-001.



- 28.** Disconnect the display panel cable **(1)** from the display panel, and lift the cable **(2)**. The display panel cable is available in the Display Cable Kit using spare part number 605333-001.



Reverse this procedure to reassemble and install the display assembly.

System board



NOTE: The system board spare kit includes replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 634433-001.

Description	Spare part number
For ATI Mobility Radeon HD 6550 discrete graphics with 1-GB of dedicated memory without subwoofer	630831-001
For ATI Mobility Radeon HD 6550 discrete graphics and 1-GB of dedicated memory with subwoofer	630834-001
For ATI Mobility Radeon HD 6370 discrete graphics with 512-KB of dedicated memory without subwoofer	630830-001
For ATI Mobility Radeon HD 6370 discrete graphics and 512-KB of dedicated memory with subwoofer	630833-001
For ATI Mobility Radeon HD 5650 discrete graphics with 1-GB of dedicated memory without subwoofer	605498-001
For ATI Mobility Radeon HD 5650 discrete graphics and 1-GB of dedicated memory with subwoofer	615687-001
For ATI Mobility Radeon HD 5470 discrete graphics with 512-MB of dedicated memory without subwoofer	605497-001
For ATI Mobility Radeon HD 5470 discrete graphics and 512-MB of dedicated memory with subwoofer	615686-001
For use on computer models equipped with UMA graphics subsystem memory and subwoofer v. 1.2	630832-001
For use on computer models equipped with UMA graphics subsystem memory and subwoofer v. 1.0	605496-001
For use on computer models equipped with UMA graphics subsystem memory, but no subwoofer v.1.2	630829-001
For use on computer models equipped with UMA graphics subsystem memory, but no subwoofer v.1.0	615688-001

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 46](#)).

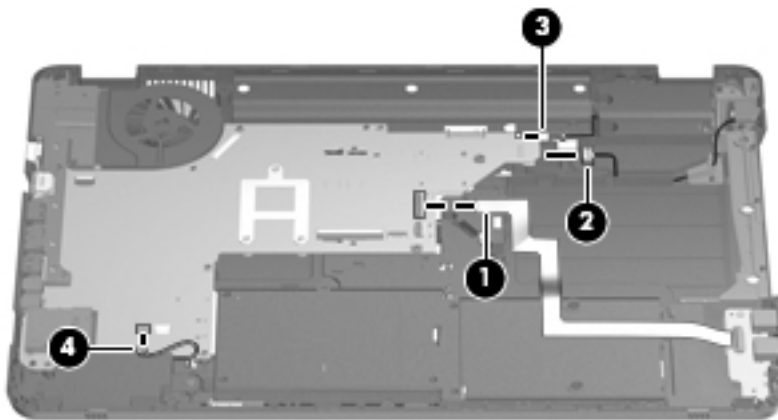
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Remove the secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#))
 - d. Keyboard (see [Keyboard on page 60](#))
 - e. Top cover (see [Top cover on page 62](#))
 - f. Display assembly (see [Display assembly on page 68](#))

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 56](#))
- Memory module (see [Memory module on page 57](#))
- WLAN module (see [WLAN module on page 52](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 88](#))
- Processor (see [Processor on page 93](#))

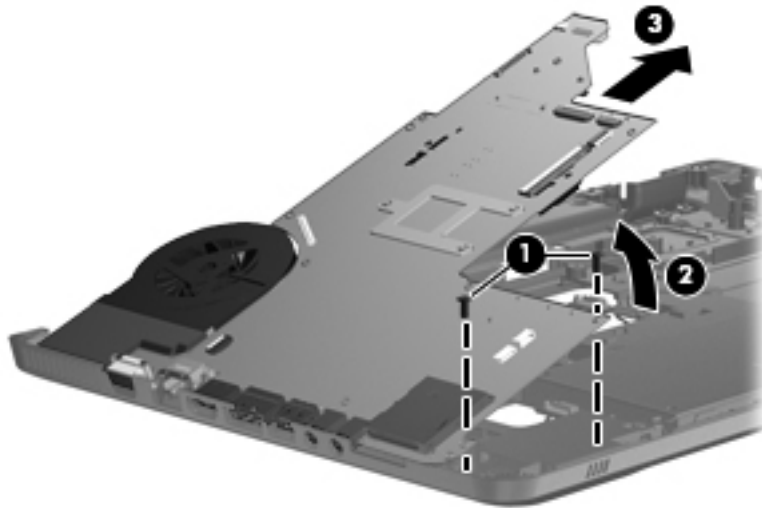
Remove the system board:

1. Disconnect the following cables from the system board:
 - (1) USB board cable
 - (2) Power connector cable
 - (3) Subwoofer cable
 - (4) Speaker cable



2. Remove the two Phillips PM2.5×5.0 screws **(1)** that secure the system board to the base enclosure.

3. Lift up on the right side of the system board until it is at approximately a 45-degree angle **(2)**, and then lift the system board to the right and up and out of the base enclosure **(3)**.



Reverse this procedure to install the system board.

USB board

Description	Spare part number
USB board (includes cable)	605348-001

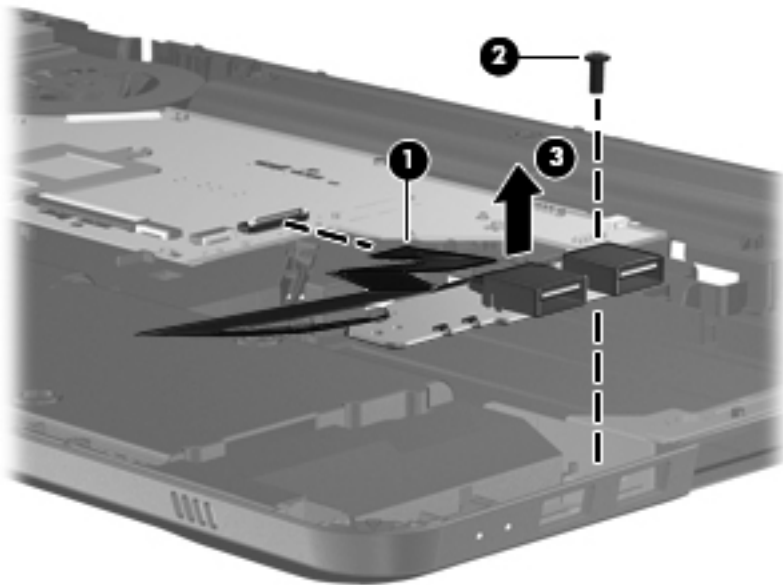
Before removing the USB board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC Adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#)).
 - d. Keyboard (see [Keyboard on page 60](#)).

- e. Top cover (see [Top cover on page 62](#)).
- f. Display assembly (see [Display assembly on page 68](#)).

Remove the USB board:

1. Disconnect the USB board cable **(1)** from the LIF connector on the system board.
2. Remove the Phillips PM2.5x5.0 screw **(2)** that secures the USB board to the base enclosure.
3. Remove the USB board **(3)** from the base enclosure.



Reverse this procedure to install the USB board.

Bluetooth module

Description	Spare part number
HP Integrated module with Bluetooth 2.1 wireless technology (does not include a Bluetooth module cable)	537921-001
Bluetooth module cable	605323-001

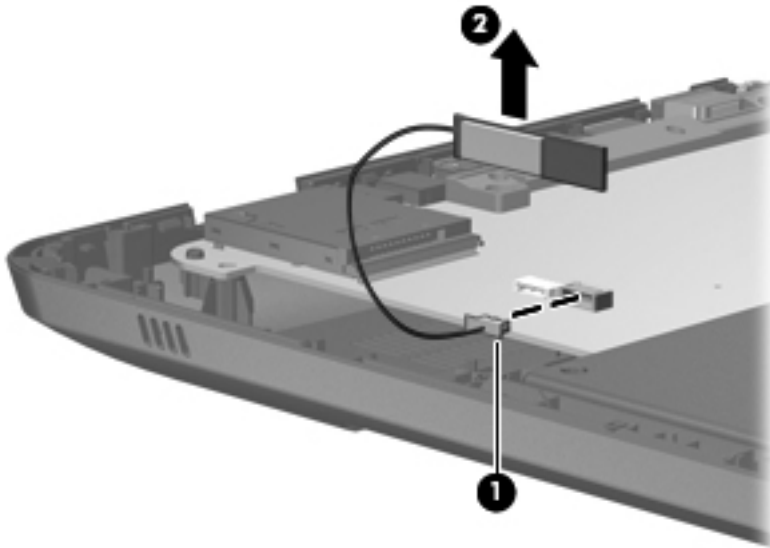
Before removing the Bluetooth module, follow these steps:

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 46](#)).

5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#)).
 - d. Keyboard (see [Keyboard on page 60](#)).
 - e. Top cover (see [Top cover on page 62](#)).
 - f. Display assembly (see [Display assembly on page 68](#)).

Remove the Bluetooth module:

1. Disconnect the Bluetooth module cable **(1)** from the system board.
2. Slide the Bluetooth module out of the slot and remove the module **(2)** from the computer .



Reverse this procedure to install the Bluetooth module.

Speaker assembly

Description	Spare part number
Speaker assembly	605356-001

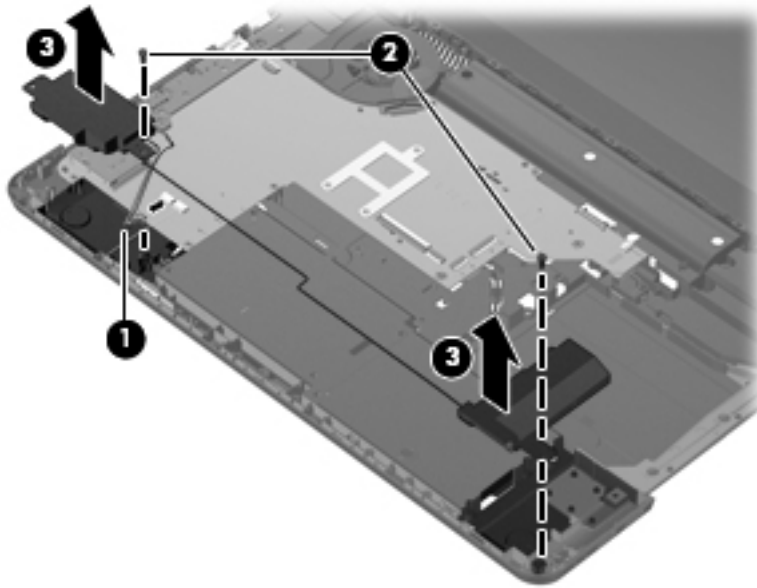
Before removing the speaker assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the hard drive (see [Hard drive on page 48](#)).
7. Remove the secondary hard drive (see [Secondary hard drive on page 50](#)).
8. Remove the optical drive (see [Optical drive on page 58](#)).
9. Remove the keyboard (see [Keyboard on page 60](#)).
10. Remove the top cover (see [Top cover on page 62](#)).

Remove the speaker assembly:

1. Disconnect the speaker assembly cable **(1)** from the system board.
2. Remove two Phillips PM2.5×5.0 screws **(2)**.

3. Remove the speaker assembly (3).



Reverse this procedure to install the speaker assembly.

Optical drive connector

Description	Spare part number
Optical drive connector	603680-001

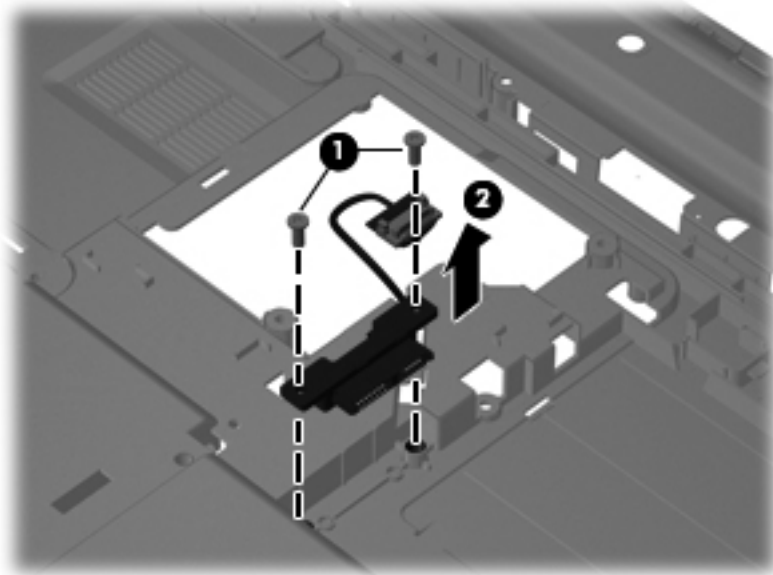
Before removing the optical drive connector, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#)).
 - d. Keyboard (see [Keyboard on page 60](#)).

- e. Top cover (see [Top cover on page 62](#)).
- f. Display assembly (see [Display assembly on page 68](#)).
- g. USB board (see [USB board on page 80](#)).

Remove the optical drive connector:

1. Remove the two Phillips PM2.5×3.0 screws **(1)** that secure the optical drive connector to the base enclosure.
2. Remove the optical drive connector **(2)** .



Reverse this procedure to install the optical drive connector.

Subwoofer

Description	Spare part number
Subwoofer	605357-001

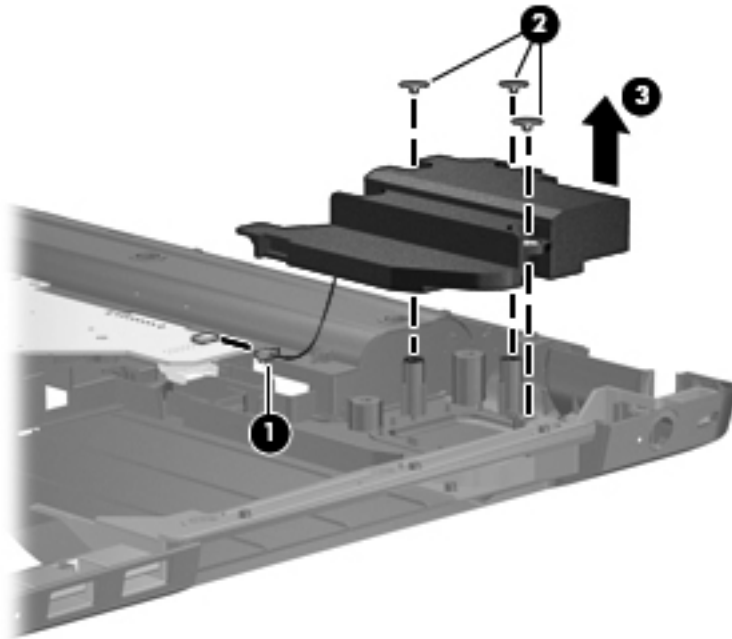
Before removing the subwoofer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#)).
 - d. Keyboard (see [Keyboard on page 60](#)).
 - e. Top cover (see [Top cover on page 62](#)).
 - f. Display assembly (see [Display assembly on page 68](#)).
 - g. USB board (see [USB board on page 80](#)).

Remove the subwoofer:

1. Disconnect the subwoofer cable from the system board **(1)**.
2. Remove the three Phillips PM2.5×4.0 broadhead screws **(2)** that secure the subwoofer to the base enclosure.
3. Remove the subwoofer **(3)**.



Reverse this procedure to install the subwoofer.

Power connector cable

Description	Spare part number
Power connector and cable	605364-001

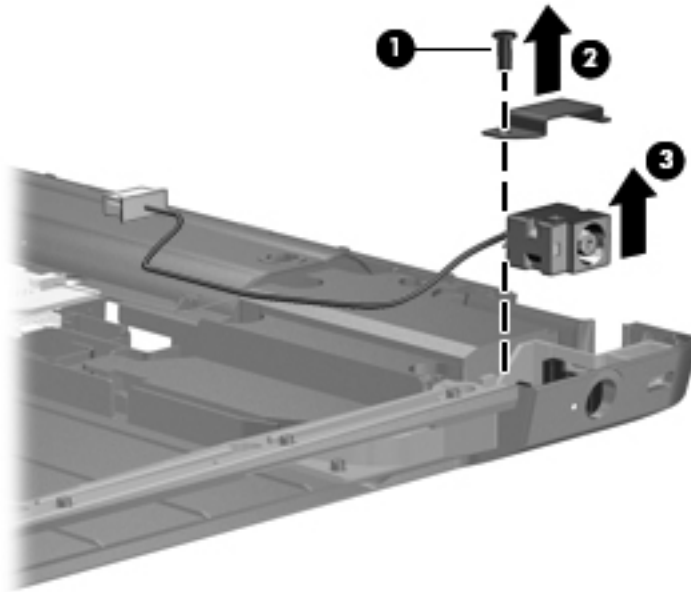
Before removing the power connector cable, follow these steps:

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 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#)).
 - d. Keyboard (see [Keyboard on page 60](#)).
 - e. Top cover (see [Top cover on page 62](#)).
 - f. Display assembly (see [Display assembly on page 68](#)).
 - g. System board (see [System board on page 78](#)).
 - h. USB board (see [USB board on page 80](#)).

Remove the power connector cable:


1. Remove the Phillips PM2.5×3.0 screw **(1)** that secures the power connector and bracket **(2)** to the base enclosure.

2. Remove the power connector cable (3).




Reverse this procedure to install the power connector cable.

Fan/heat sink assembly

 **NOTE:** The fan/heat sink assembly spare kit includes replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 634433-001.

Description	Spare part number
For use only with computer models equipped with graphics subsystems with discrete memory	606575-001
For use only with computer models equipped with graphics subsystems with UMA memory	606574-001

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

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

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

4. Remove the battery (see [Battery on page 46](#)).
5. Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
6. Remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#)).
 - b. Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c. Optical drive (see [Optical drive on page 58](#)).
 - d. Keyboard (see [Keyboard on page 60](#)).
 - e. Top cover (see [Top cover on page 62](#)).
 - f. Display assembly (see [Display assembly on page 68](#)).
 - g. System board (see [System board on page 78](#)).
 - h. USB board (see [USB board on page 80](#)).


Remove the fan/heat sink assembly:

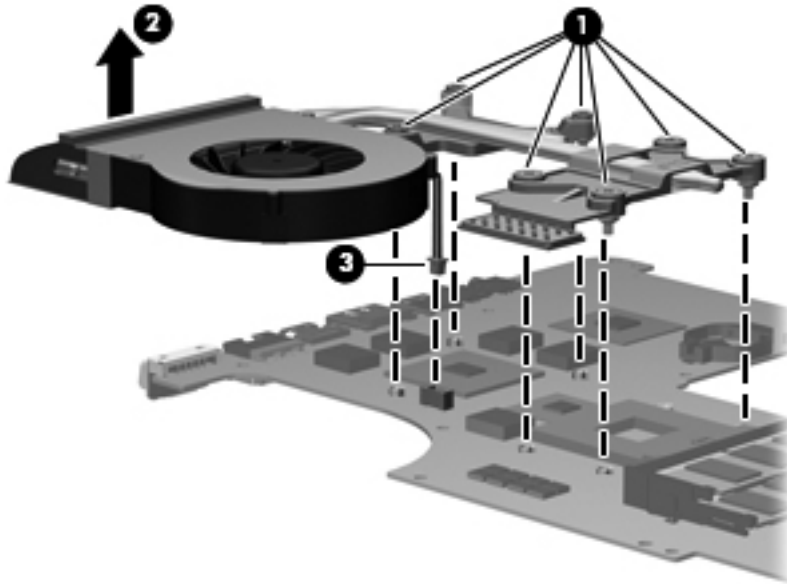



NOTE: Steps 1 through 4 apply only to models with discrete subsystem memory on the system board. See steps 5 through 8 apply only to models with UMA subsystem memory on the system board.

1. Turn the system board upside down, with the expansion port and external monitor port toward you.
2. Loosen the seven PM2.5×3.0 Phillips captive screws **(1)** that secure the fan/heat sink assembly to the system board.

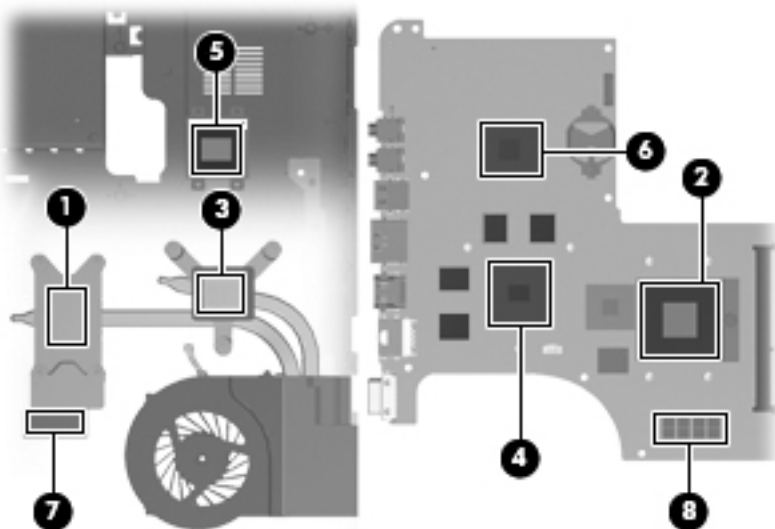
3. Remove the fan/heat sink assembly (2). Disconnect the fan cable (3) from the system board.

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




 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is used on the heat sink (1) and the processor (2). Thermal pads are used on the Northbridge contact (3) and Northbridge chip (4), the graphics/heat sink contact (5) and graphics subsystem chip (6), and graphics/heat sink contact (7) and capacitors (8). Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.

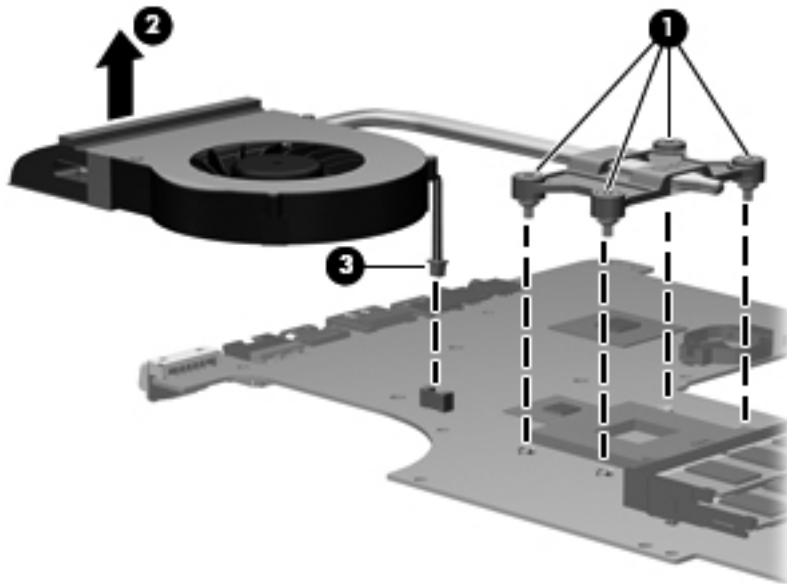
Replacement thermal pads and thermal paste is also available in the Replacement Thermal Material Kit, spare part number 634433-001



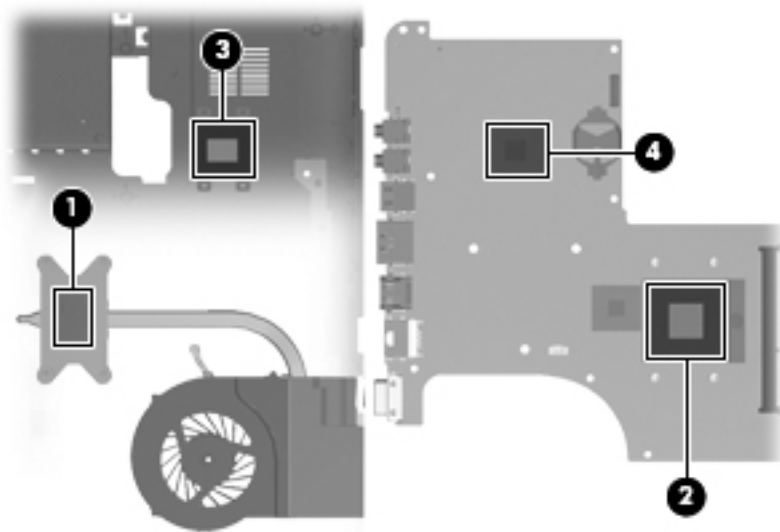
4. Turn the system board upside down, with the expansion port and external monitor port toward you.
5. Loosen the four Phillips PM2.5×3.0 captive screws **(1)** that secure the fan/heat sink assembly to the system board.

6. Remove the fan/heat sink assembly **(2)**. Disconnect the fan cable **(3)** from the system board.

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




The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is used on the heat sink **(1)** and the processor **(2)**. Thermal pads are used on the Northbridge contact **(3)** and Northbridge chip **(4)**.



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

Processor

 **NOTE:** The processor spare part kit includes thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 634433-001.

Description	Spare part number
AMD Athlon X2 Dual-Core N370 Dual-Core, 35W, 2.50-GHz with 1.0-MB L2 cache	634686-001
AMD Athlon X2 Dual-Core P360 Dual-Core, 35W, 2.30-GHz with 1.0-MB L2 cache	636635-001
AMD Athlon X2 Dual-Core P340 Dual-Core, 25W, 2.20-GHz with 1.0-MB L2 cache	616343-001
AMD Athlon X2 Dual-Core P320 Dual-Core, 25W, 2.10-GHz with 1.0-MB L2 cache	594165-001
AMD Phenom X2 Dual-Core N970 Quad-Core, 35W, 2.20-GHz with 2.0-MB L2 cache	616346-001
AMD Phenom X2 Dual-Core N950 Quad-Core, 35W, 2.10-GHz with 2.0-MB L2 cache	616346-001
AMD Phenom X2 Dual-Core N930 Quad-Core, 35W, 2.00-GHz with 2.0-MB L2 cache	594169-001
AMD Phenom X2 Dual-Core N870 Tri-Core, 35W, 2.30-GHz with 1.5-MB L2 cache	635495-001
AMD Phenom X2 Dual-Core N850 Tri-Core, 35W, 2.20-GHz with 1.5-MB L2 cache	616345-001
AMD Phenom X2 Dual-Core N830 Tri-Core, 35W, 2.10-GHz with 1.5-MB L2 cache	594168-001
AMD Phenom X2 Dual-Core N660 Dual-Core, 35W, 3.00-GHz with 2.0-MB L2 cache	635494-001
AMD Phenom X2 Dual-Core N640 Dual-Core, 35W, 2.90-GHz with 2.0-MB L2 cache	616344-001
AMD Phenom X2 Dual-Core N620 Dual-Core, 35W, 2.80-GHz with 2.0-MB L2 cache	594166-001
AMD Phenom X2 Dual-Core P960 Quad-Core, 25W, 1.80-GHz with 2.0-MB L2 cache	634689-001
AMD Phenom X2 Dual-Core P940 Quad-Core, 25W, 1.70-GHz with 2.0-MB L2 cache	616336-001
AMD Phenom X2 Dual-Core P920 Quad-Core, 25W, 1.60-GHz with 2.0-MB L2 cache	594170-001
AMD Phenom X2 Dual-Core P860 Tri-Core, 25W, 2.00-GHz with 1.5-MB L2 cache	634688-001
AMD Phenom X2 Dual-Core P840 Tri-Core, 25W, 1.90-GHz with 1.5-MB L2 cache	616335-001
AMD Phenom X2 Dual-Core P820 Tri-Core, 25W, 1.80-GHz with 1.5-MB L2 cache	594167-001
AMD Phenom X2 Dual-Core P650 Tri-Core, 25W, 2.60-GHz with 2.0-MB L2 cache	634687-001
AMD Turion X2 Dual-Core N570 Dual-Core, 35W, 2.70-GHz with 2.0-MB L2 cache	634690-001
AMD Turion X2 Dual-Core N550 Dual-Core, 35W, 2.50-GHz with 2.0-MB L2 cache	616337-001
AMD Turion X2 Dual-Core N530 Dual-Core, 35W, 2.50-GHz with 2.0-MB L2 cache	594172-001
AMD Turion X2 Dual-Core N350 Dual-Core, 35W, 2.40-GHz with 1.0-MB L2 cache	616334-001
AMD Turion X2 Dual-Core N330 Dual-Core, 35W, 2.30-GHz with 1.0-MB L2 cache	594164-001
AMD Turion X2 Dual-Core P560 Dual-Core, 25W, 2.50-GHz with 2.0-MB L2 cache	634691-001
AMD Turion X2 Dual-Core P540 Dual-Core, 25W, 2.40-GHz with 2.0-MB L2 cache	616347-001
AMD Turion X2 Dual-Core P520 Dual-Core, 25W, 2.30-GHz with 2.0-MB L2 cache	594173-001


Before removing the processor, follow these steps:

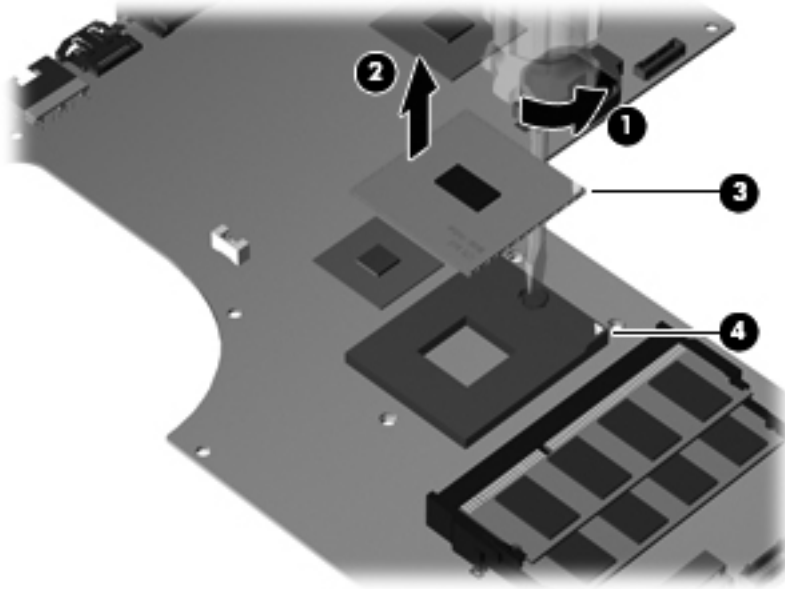
- 1.** Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2.** Disconnect all external devices connected to the computer.
- 3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4.** Remove the battery (see [Battery on page 46](#)).
- 5.** Remove the primary hard drive cover (see [Primary hard drive cover on page 47](#)).
- 6.** Remove the following components:
 - a.** Hard drive (see [Hard drive on page 48](#)).
 - b.** Secondary hard drive (see [Secondary hard drive on page 50](#)).
 - c.** Optical drive (see [Optical drive on page 58](#)).
 - d.** Keyboard (see [Keyboard on page 60](#)).
 - e.** Top cover (see [Top cover on page 62](#)).
 - f.** USB board (see [USB board on page 80](#)).
 - g.** Display assembly (see [Display assembly on page 68](#)).
 - h.** System board (see [System board on page 78](#)).
 - i.** Fan/heat sink assembly (see [Fan/heat sink assembly on page 88](#)).

Remove the processor:

- 1.** Turn the processor locking screw **(1)** one-half turn counterclockwise until you hear a click.

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

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




Reverse this procedure to install the processor.

5 Setup Utility

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

Starting the Setup Utility

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

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

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

To start the Setup Utility:

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

– or –

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

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

Using the Setup Utility

Changing the language of the Setup Utility

The following procedure explains how to change the language of the Setup Utility. If the Setup Utility is not already running, begin at step 1. If the Setup Utility is already running, begin at step 2.

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

– or –

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

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

Your change goes into effect immediately.

Display system information

The following procedure explains how to display system information in the Setup Utility. If the Setup Utility is not open, begin at step 1. If the Setup Utility is open, begin at step 2.

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

– or –

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

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

Restoring default settings in the Setup Utility

The following procedure explains how to restore the Setup Utility default settings. If the Setup Utility is not already running, begin at step 1. If the Setup Utility is already running, begin at step 2.

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

– or –

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

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

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



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

Exiting the Setup Utility

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

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

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


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

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

After either choice, the computer restarts in Windows.

Setup Utility menus

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

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

Main menu

Select	To do this
System information	<ul style="list-style-type: none">• 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 Setup Utility language.
Button Sound (select models only)	Enable/disable the capacitive button tapping sound.
Virtualization Technology	Enable/disable the processor Virtualization Technology.
Processor C4 State (select models only)	Enable/disable the processor C4 sleep state.
LAN Power Saving (select models only)	Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode.
Card Reader/1394 Power Saving (select models only)	Enable/disable Card Reader/1394 Power Saving. When enabled, saves power when the computer is in DC mode.

Select	To do this
Fan Always On	Enabled/disable Fan Always On. When enabled, the computer fan will always be on.
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none"> • f9 and f10 Delay (sec.)—Set the delay for the f9 and f10 functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20). • CD-ROM boot—Enable/disable boot from CD-ROM. • Floppy boot—Enable/disable boot from diskette. • Internal Network Adapter boot—Enable/disable boot from Internal Network Adapter. • Boot Order—Set the boot order for: <ul style="list-style-type: none"> ◦ USB Floppy ◦ Internal CD/DVD ROM Drive ◦ Hard drive ◦ USB Diskette on Key ◦ USB Hard drive ◦ Network adapter

Diagnostics menu

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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	41.53 cm	16.35 in
Depth	27.42 cm	10.80 in
Height (front to back)	Flush glass display: 3.27 to 3.67 cm	1.29 to 1.44 in
	BrightView display: 3.18 to 3.58 cm	1.25 to 1.41 in
	DF (IMR): 3.30 to 3.70 cm	1.30 to 1.46 in
Weight (with optical drive, hard drive, and battery)	Flush glass display: 3.63 kg	7.99 lbs
	BrightView display: 3.41 kg	7.50 lbs
	DF (IMR): 3.25 kg	7.15 lbs
Second hard drive adds:	0.11 kg	0.24 lbs
Camera adds:	0.005 kg	0.01 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
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 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft

	Metric	U.S.
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

17.3-inch, HD+ flush glass AntiGlare display specifications

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

17.3-inch, HD+ BrightView display specifications

	Metric	U.S.
Dimensions		
Height	23.3 cm	9.17 in
Width	39.8 cm	15.67 in
Diagonal	43.9 cm	17.29 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1	
Brightness	200 nits typical	
Pitch resolution		
Pitch	0.23868 × 0.23868 mm	
Format	1600 × 900	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	2 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	9.5 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	ATA-7	ATA-7	ATA-7	ATA-7	ATA-7	ATA-7
Transfer rate						
Synchronous (maximum)	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				1,048,576,000	625,141,400	488,397,168
Disc rotational speed	5200-rpm	5200-rpm	5400-rpm	7200-rpm	7200-rpm	7200-rpm
Operating temperature	5°C to 55°C (41°F to 131°F)					
* 1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.						
** 1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.						
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.						

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

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


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

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	

Specification information in Device Manager

Device Manager allows you to view and control the hardware attached to the computer, as well as provides hardware specification information.

You can also add hardware or modify device configurations using Device Manager.

 **NOTE:** Windows 7 includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Windows Help and Support for more information.

After you open Device Manager, drill-down to a device and double-click it to access its properties.

To access Device Manager:


1. Select **Start > Computer > System properties**.
2. In the left pane, click **Device Manager**.

7 Backup and recovery

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

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

 **NOTE:** Computers with a solid-state drive (SSD) may not have a recovery partition. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window.

Creating recovery discs

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

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

 **NOTE:** You can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP Web site.

Note the following guidelines before creating recovery discs:



NOTE: The external hard drive must be connected to a USB port on the computer, not to a USB port on an external device such as a hub.

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



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

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

To create a set of recovery discs:

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

Backing up your information

As you add new software and data files, you should 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 you add or modify hardware or software

Note the following when backing up:

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

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

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

- You can 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 you use will depend on the type of optical drive installed in your 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, follow these steps:

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


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

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to set up and create a backup.

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

Using system restore points


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

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

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

When to create restore points

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

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

Create a system restore point


1. Select **Start > Control Panel > System and 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, follow these steps:

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

Performing a recovery

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

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

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


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

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the dedicated recovery partition (select models only)

 **NOTE:** Computers with an SSD may not have a recovery partition. If the computer does not have a recovery partition, you will not be able to recover using this procedure. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software.

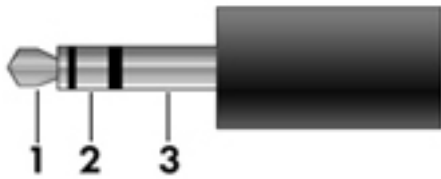
On some models, you can perform a recovery from the partition on the hard drive, accessed by pressing either the Start button or **F11**. This restores the computer to its factory condition.

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

1. Access Recovery Manager in either of the following ways:
 - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
 - or –
 - Turn on or restart the computer, and then press `esc` while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen. Then, press `f11` while the “Press <F11> for recovery” message is displayed on the screen.
2. Click **System Recovery** in the **Recovery Manager** window.
3. Follow the on-screen instructions.

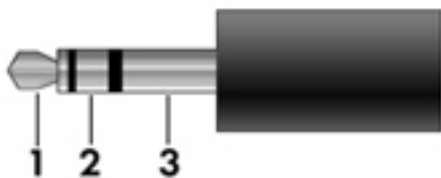
8 Connector pin assignments

Audio-in (microphone)



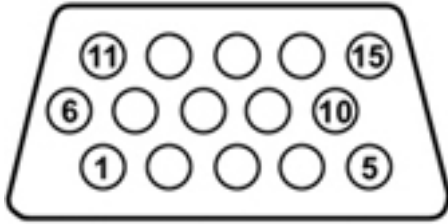
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



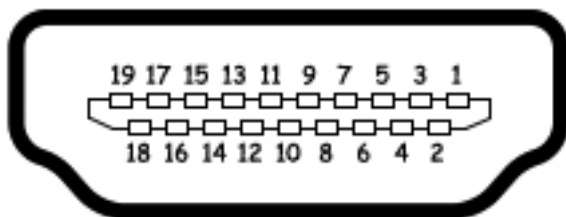
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



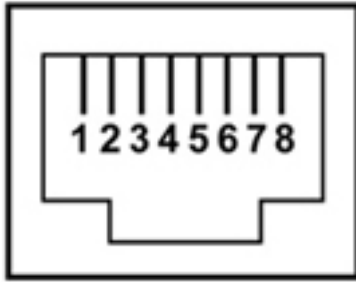
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



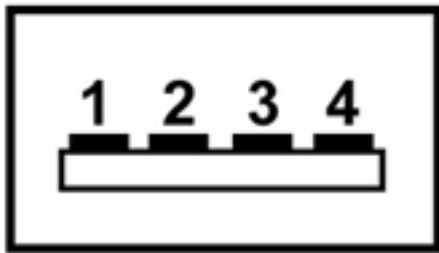
Pin	Signal
1	TMDS data 2+
2	TMDS data 2 shield
3	TMDS data 2-
4	TMDS data 1+
5	TMDS data 1 shield
6	TMDS data 1-
7	TMDS data 0+
8	TMDS data 0 shield
9	TMDS data 0-
10	TMDS clock+
11	TMDS clock shield
12	TMDS clock-
13	CEC
14	Not connected
15	DDC clock
16	DDC data
17	Ground
18	+5V power
19	Hot plug detect

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

Requirements for all countries or regions

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

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

Requirements for specific countries or regions

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-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.eiae.org>.

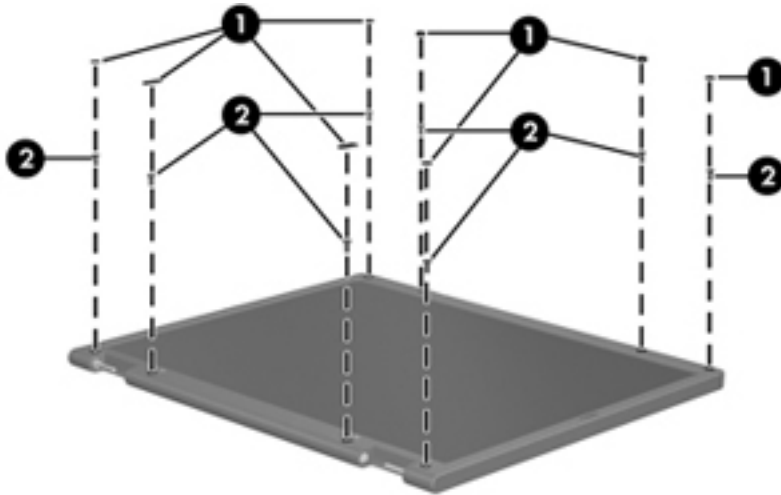
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



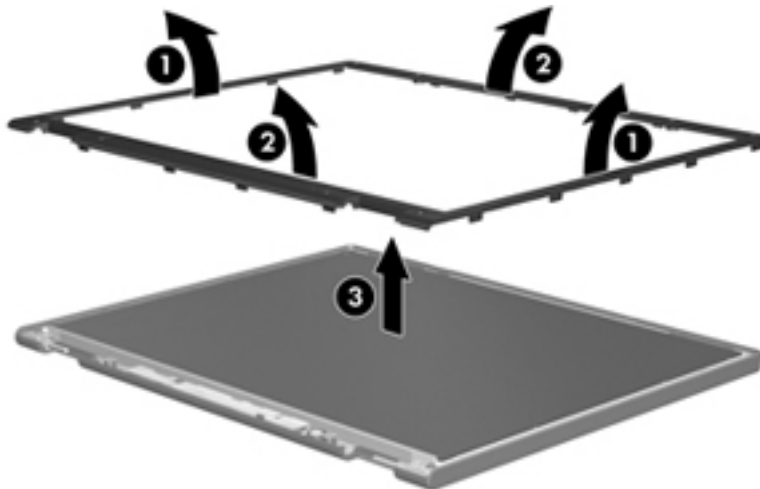
📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

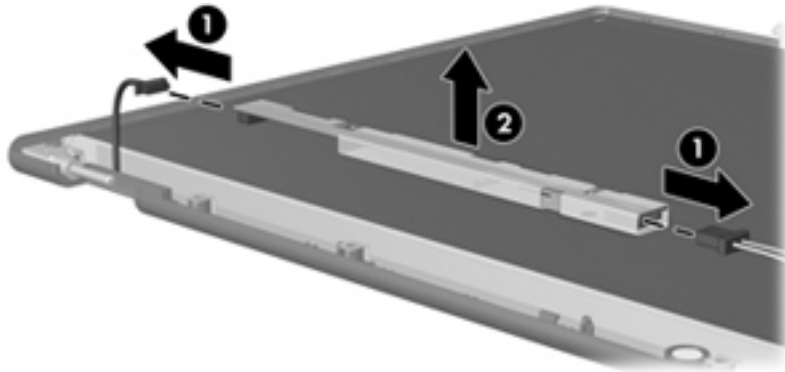
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



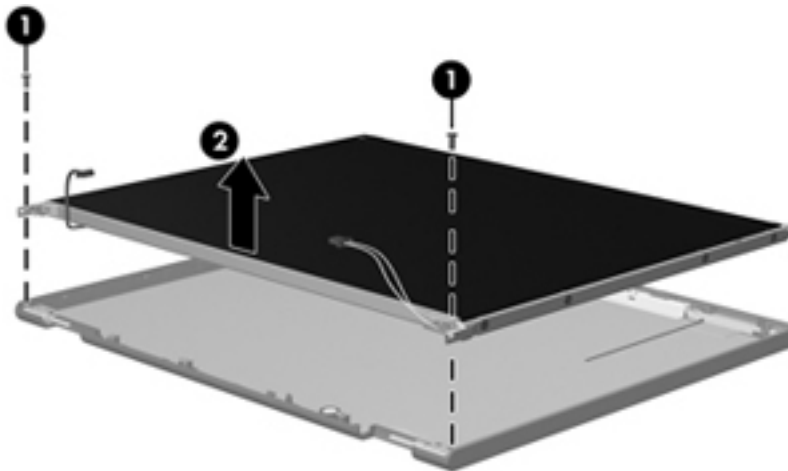
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



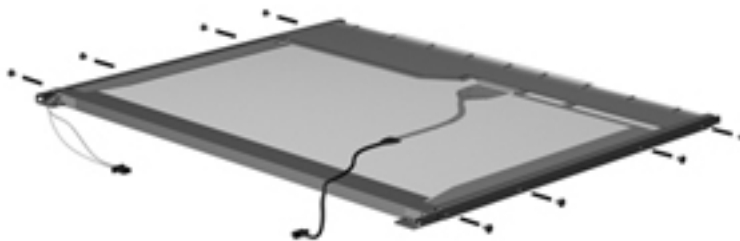
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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

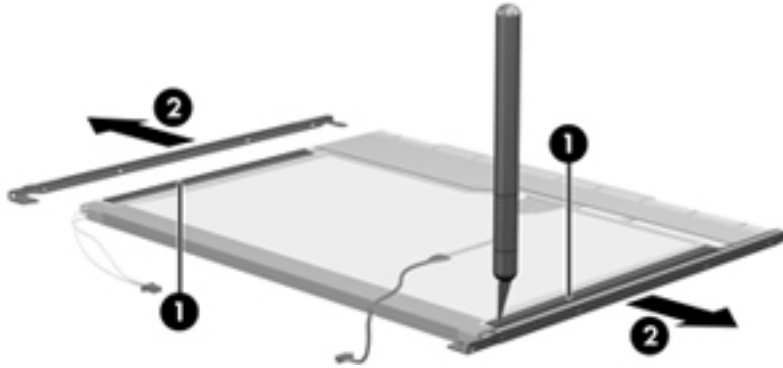


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



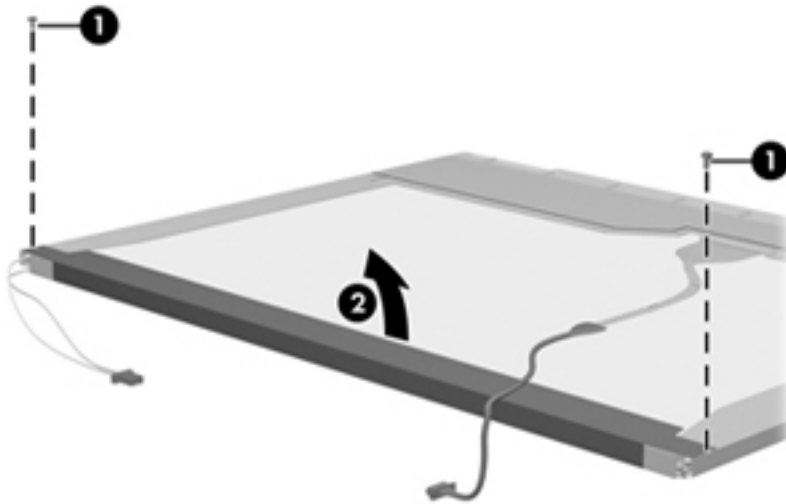
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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



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

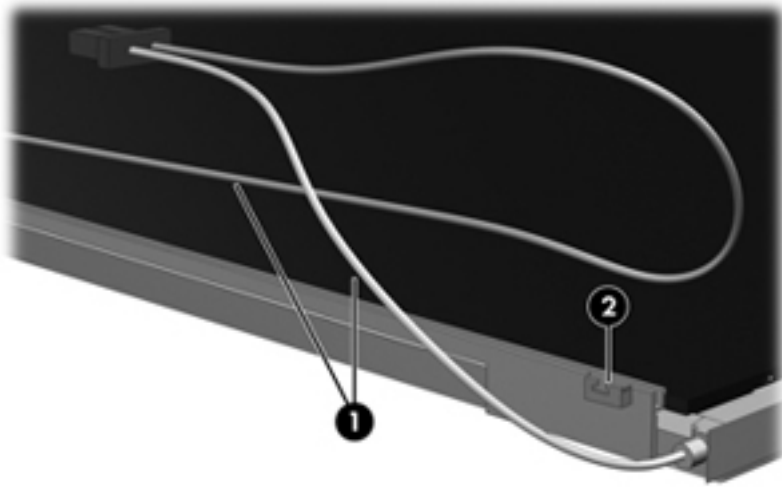
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



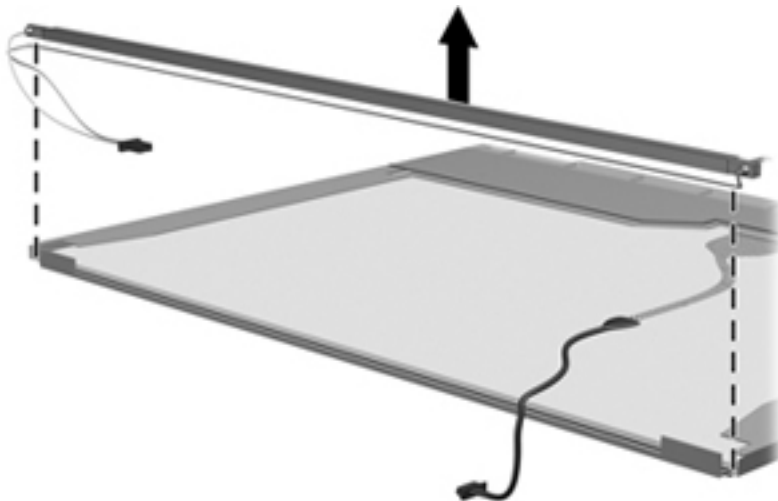
13. Remove the backlight cover.

14. Turn the display panel right-side up.

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

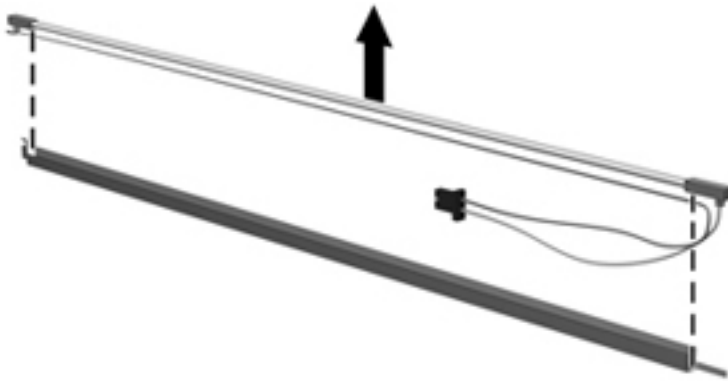


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



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

18. Remove the backlight from the backlight frame.

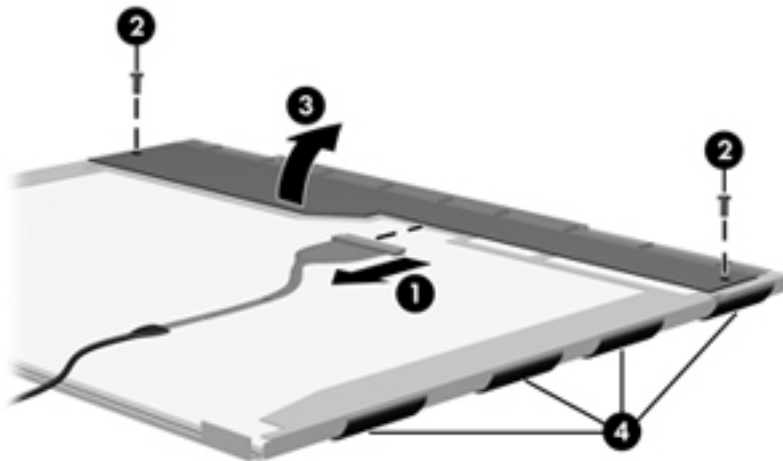


19. Disconnect the display cable **(1)** from the LCD panel.

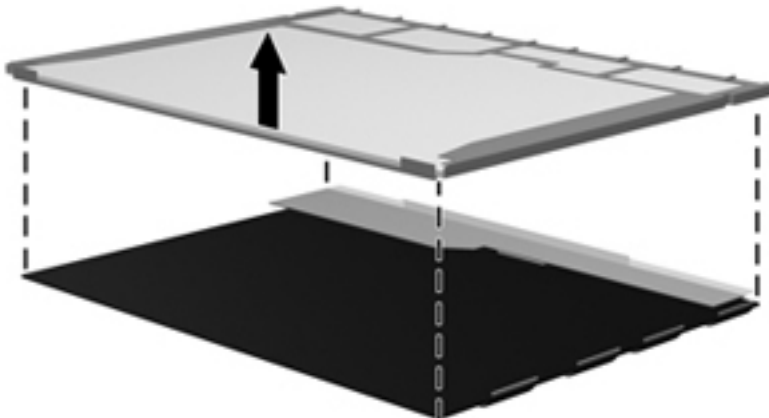
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.

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

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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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