



HP Pavilion dv4 Entertainment PC

Maintenance and Service Guide

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Safety warning notice

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

Table of contents

1 Product description	1
2 External component identification	8
Front	8
Display	9
Buttons	10
Keys	11
Lights	12
TouchPad	13
Left side	14
Right side	15
Bottom	16
3 Illustrated parts catalog	17
Service tag	18
Computer major components	19
Display assembly subcomponents	24
Cable Kit	25
Mass storage devices	26
Miscellaneous parts	27
Plastics Kit	28
Sequential part number listing	29
4 Removal and replacement procedures	34
Preliminary replacement requirements	34
Tools required	34
Service considerations	34
Plastic parts	34
Cables and connectors	34
Drive handling	35
Grounding guidelines	35

Electrostatic discharge damage	35
Packaging and transporting guidelines	37
Component replacement procedures	39
Service tag	39
Computer feet	40
Battery	41
SIM	42
WLAN module	44
WWAN module	47
RTC battery	49
Memory module	50
Optical drive	52
Hard drive	55
Keyboard	57
Top cover	60
Power button board	65
TouchPad LED board	67
TouchPad button board	69
Optical drive connector cable	71
Audio/USB board	73
Power connector cable	74
System board	76
Heat sink	80
Processor	85
Fan	88
Speakers	90
Display assembly	91
5 Setup Utility (BIOS) and System Diagnostics	99
Using Setup Utility	99
Starting Setup Utility	99
Changing the language of Setup Utility	99
Navigating and selecting in Setup Utility	100
Displaying system information	100
Restoring factory settings in Setup Utility	101
Exiting Setup Utility	101
Updating the BIOS	101
Determining the BIOS version	102
Downloading a BIOS update	102
Using System Diagnostics	103

6 Specifications	104
Computer specifications	104
14.0-inch display specifications	105
Hard drive specifications	106
Hard drive specifications (continued)	107
7 Backup and recovery	108
Restore	108
Creating restore media	109
Performing a system restore	110
Restoring using the dedicated recovery partition (select models only)	110
Restoring using the restore media	111
Changing the computer boot order	111
Backing up and recovering your information	112
Using Windows Backup and Restore	113
Using Windows system restore points	113
When to create restore points	113
Create a system restore point	114
Restore to a previous date and time	114
8 Power cord set requirements	115
Requirements for all countries	115
Requirements for specific countries and regions	116
9 Recycling	117
Battery	117
Display	117
Index	123

1 Product description

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
Product Name	HP Pavilion dv4 Entertainment PC	√	√
Processors	AMD® Sabine A8-3530MX 2.6-GHz processor (1.9-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	√	
	AMD Sabine A8-3510MX 2.5-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	√	
	AMD Sabine A8-3500M 2.4-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W)	√	
	AMD Sabine A6-3410MX 2.3-GHz processor (1.6-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	√	
	AMD Sabine A6-3400M 2.3-GHz processor (1.4-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W)	√	
	AMD Sabine A4-3310MX 2.5-GHz processor (2.1-GHz FSB, 2.0-MB L2 cache, Dual Core, 45 W)	√	
	AMD Sabine A4-3300M 2.5-GHz processor (1.9-GHz FSB, 2.0-MB L2 cache, Dual Core, 35 W)	√	
	Intel® Core® i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)		√
	Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)		√
	Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W)		√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	Intel Core i5-2410M 2.30-GHz (SC turbo up to 2.90-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)		√
	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)		√
	Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)		√
	Intel Core i3-2310M 2.10-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)		√
	Intel Pentium B960 2.20-GHz processor (TJ85, 2.0-MB L3 cache, dual core, 35 W, TDP)		√
	Intel Pentium B950 2.10-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP)		√
	Intel Pentium B940 2.00-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP)		√
Chipset	AMD A60M fusion controller hub (FCH)	√	
	Intel HM65 Express Chipset		√
Graphics	Discrete graphics: AMD Radeon™ HD 6470M discrete-class graphics with 1024- MB of dedicated video memory (128 MB × 16 DDR3 900 MHz 4 PCs); 64-bit S3 package; muxless switchable	√	
	Supports HD decode, DX11, and HDMI, BACO, and dual graphics	√	
	UMA graphics:	√	
	<ul style="list-style-type: none"> • AMD Radeon HD 6620M graphics (for use with computer models equipped with an A8 processor) • AMD Radeon HD 6520M graphics (for use with computer models equipped with an A6 processor) • AMD Radeon HD 6480M graphics (for use with computer models equipped with an A4 processor) 		
	Supports HD decode, DX11, and HDMI	√	
	Discrete graphics: AMD Radeon HD 6470M with discrete-class graphics 1024- MB of dedicated video memory (128 MB × 16 DDR3 900 MHz × 4 PCs); 64-bit S3 package; muxless switchable		√
	Supports HD decode, DX11, HDMI, and BACO		√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	<p>UMA graphics:</p> <ul style="list-style-type: none"> Intel HD 3000 GT2 graphics (for use with computer models equipped with an Intel i5 or i3 processor) Intel HD GT1 graphics (for use with computer models equipped with an Intel Pentium processor) 		√
	Supports HD decode, DX10, and HDMI		√
Panel	14.0-in, high-definition (HD), light-emitting diode (LED), SVA BrightView (1366×768) display; typical brightness: 200 nits	√	√
	All display assemblies include 2 wireless local area network (WLAN) antenna cables	√	√
	Supports 16:9 ultra wide aspect ratio	√	√
	Select computer model display assemblies include 2 wireless wide area network (WWAN) antenna cables		√
Memory	2 customer-accessible/upgradable memory module slots	√	√
	Supports dual-channel memory	√	√
	Supports up to 8192 GB of system RAM	√	√
	DDR3/1333-MHz	√	√
	Supports the following configurations:	√	√
	<ul style="list-style-type: none"> 8192-MB total system memory (4096×2; not supported on a 32-bit operating system) 6144-MB total system memory (4096×1 + 2048×1; not supported on a 32-bit operating system) 4096-MB total system memory (4096×1 or 2048×2) 3072-MB total system memory (2048×1 + 1024×1) 2048-MB total system memory (2048×1 or 1024×2) 1024-MB total system memory (1024×1; not supported on a 64-bit operating system) 		
Hard drives	Supports 6.35-cm (2.5-in) hard drives in 12.7-mm (.50-in), 9.5-mm (.37-in), and 7.0-mm (.28-in) thicknesses	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	Customer-accessible	√	√
	Supports Accelerometer hard drive protection		√
	Serial ATA	√	√
	Supports the following hard drives:	√	√
	<ul style="list-style-type: none"> • 1-TB, 5400-rpm, 12.7-mm • 750-GB, 7200-rpm, 7.0-mm • 750-GB, 5400-rpm, 7.0-mm • 640-GB, 7200-rpm, 7.0-mm • 500-GB, 7200-rpm, 7.0-mm • 320-GB, 7200-rpm, 7.0-mm 		
Optical drive	Fixed	√	√
	Serial ATA	√	√
	12.7-mm tray load	√	√
	Supports zero-power optical drive	√	√
	Blu-ray ROM DVD±R/RW FX Super Multi Double-Layer Drive	√	√
	Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive	√	√
	DVD±RW and CD-RW FX Super Multi Double-Layer Combo Drive	√	√
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	√	√
Audio and video	Dual digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software	√	√
	High-definition Dolby Home Theater version 4 Audio	√	√
	Two HP Pavilion-branded Altec/ Lansing speakers	√	√
	Supports Microsoft Premium requirements	√	√
	HP TrueVision high-definition webcam (fixed, no tilt with activity LED, 1280×800 by 30 frames per second)	√	√
Ethernet	Integrated 10/100/1000 network interface card (NIC)	√	√
Wireless	Integrated WLAN options by way of wireless module	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	Two WLAN antennas built into display assembly	√	√
	Supports the following WLAN formats: <ul style="list-style-type: none"> Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter Atheros AR9002WB-1NGB 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter Ralink 5390GN 802.11b/g/n 1x1 WiFi Adapter Realtek 8188BC8 802.11a/b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter Realtek 8188GN 802.11b/g/n 1x1 WiFi Adapter 	√	√
	Supports the following WLAN formats: <ul style="list-style-type: none"> Intel Centrino Advanced-N 6230 WLAN module Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module 		√
	Integrated WWAN options by way of wireless module		√
	Two WWAN antennas built into display assembly		√
	Supports the following WWAN formats: <ul style="list-style-type: none"> HP hs2340 HSPA+ Mobile Broadband Module HP un2420 EV-DO/HSPA Mobile Broadband Module 		√
External media card	HP Multi-Format Digital Media Reader supports the following digital card formats: <ul style="list-style-type: none"> MultiMediaCard (MMC) Secure Digital (SD) Memory Card 	√	√
	Subscriber identity module (SIM) slot (populated with WWAN; tool-less user accessible)		√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
Ports	<ul style="list-style-type: none"> • 3-pin AC power • Audio-in (mono microphone) • Audio-out (stereo headphone) • HDMI version 1.4 supporting 1920 × 1200 @ 60Hz • RJ-45 (Ethernet, includes link and activity lights) • USB 2.0 (3 ports) • VGA (Dsub 15 pin) supporting 2048×1536 external resolution @ 75 Hz, hot plug and unplug and auto-detection for correct output to wide-aspect vs. standard aspect video 	√	√
Keyboard/pointing devices	Full-size 14-in, DuraCoat, island-style keyboard (in black and silver)	√	√
	TouchPad with multi-touch gestures, 2-finger scrolling, and pinch-zoom enabled	√	√
	Taps enabled by default	√	√
Power requirements	Supports the following HP Smart AC adapters: <ul style="list-style-type: none"> • 90-W PFC RC V 3-wire HP Smart AC adapter • 65-W RC V 3-wire HP Smart AC adapter 	√	√
	Supports the following batteries: <ul style="list-style-type: none"> • 9-cell, 100-Whr, 3.00-Ah Li-ion battery • 6-cell, 62-Whr, 2.80-Ah Li-ion battery • 6-cell, 55-Whr, 2.55-Ah Li-ion battery 	√	√
Security	Security cable slot	√	√
	Supports Intel AT-p		√
Operating system	Preinstalled: <ul style="list-style-type: none"> • Windows 7 Home Basic (64- and 32-bit) • Windows 7 Home Premium (64- and 32-bit) • Windows 7 Professional (64- and 32-bit) • Windows 7 Starter 32-bit • FreeDOS 	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
Serviceability	End-user replaceable parts:	√	
	<ul style="list-style-type: none"> • AC adapter • Battery • Hard drive • Memory modules (2) • Optical drive • WLAN module 		
	End-user replaceable parts:		√
	<ul style="list-style-type: none"> • AC adapter • Battery • Hard drive • Memory modules (2) • Optical drive • SIM • WLAN module • WWAN module 		

2 External component identification

Front



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

Display



Item	Component	Description
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with WWANs.
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs.
(3)	Internal microphones	Record sound.
(4)	Webcam light	On: The webcam is in use.
(5)	Webcam	Records video and captures still photographs. To use the webcam, select Start > All Programs > CyberLink YouCam > CyberLink YouCam .

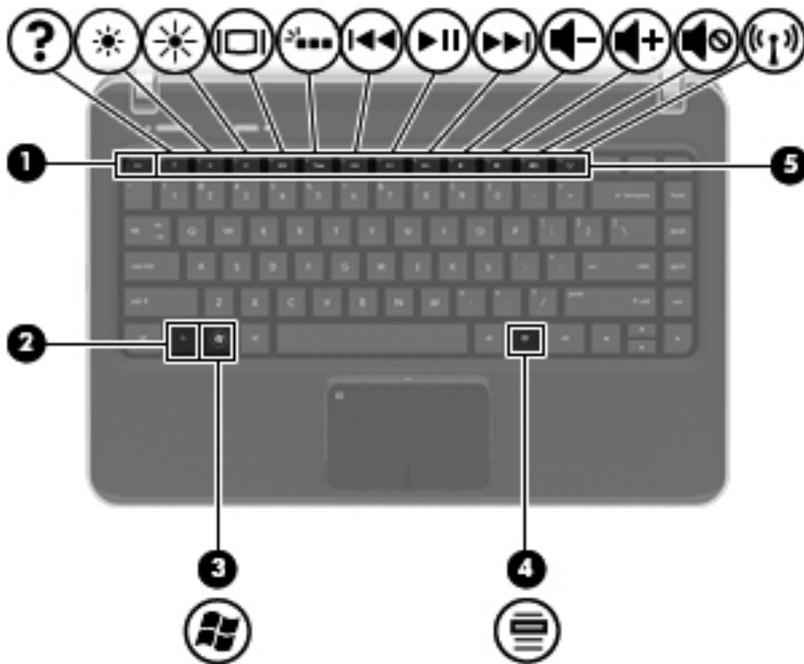
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country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

Buttons



Item	Component	Description
(1)	Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to 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 turn off the computer.</p> <p>To learn more about your power settings, select Start > Control Panel > System and Security > Power Options, or refer to the <i>HP Notebook Reference Guide</i>.</p>
(2)	Web browser button	<p>Opens a Web browser.</p> <p>NOTE: Until you set up your Internet or network services, this button opens the Internet Connection Wizard.</p>

Keys



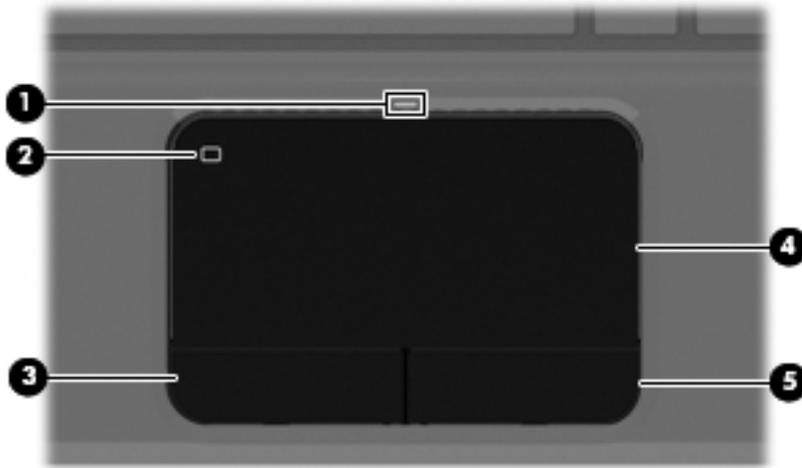
Item	Component	Description
(1)	<code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2)	<code>fn</code> key	Displays system information when pressed in combination with the <code>esc</code> key.
(3)	Windows logo key	Displays the Windows Start menu.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

Lights



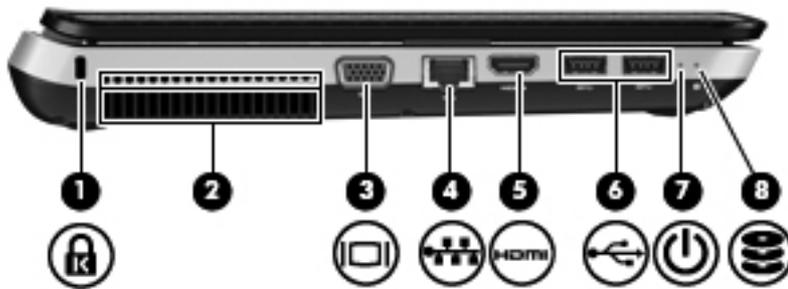
Item	Component	Description
(1)	Power light	<ul style="list-style-type: none">• White: The computer is on.• Blinking white: The computer is in the Sleep state.• Off: The computer is off or in Hibernation.
(2)	Mute light	<ul style="list-style-type: none">• Amber: Computer sound is off.• Off: Computer sound is on.
(3)	Wireless light	<ul style="list-style-type: none">• White: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on.• Amber: All wireless devices are off.
(4)	Caps lock light	<ul style="list-style-type: none">• White: Caps lock is on.• Off: Caps lock is off.

TouchPad



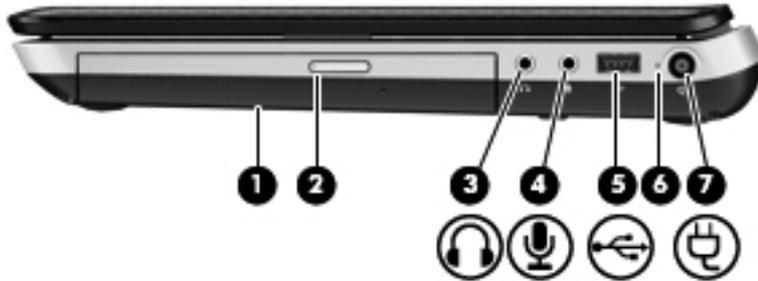
Item	Component	Description
(1)	TouchPad light	<ul style="list-style-type: none">• Amber: The TouchPad is off.• On: The TouchPad is on.
(2)	TouchPad on/off button	Turns the TouchPad on and off. Quickly double-tap the TouchPad on/off button to turn the TouchPad on and off.
(3)	Left TouchPad button	Functions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

Left side



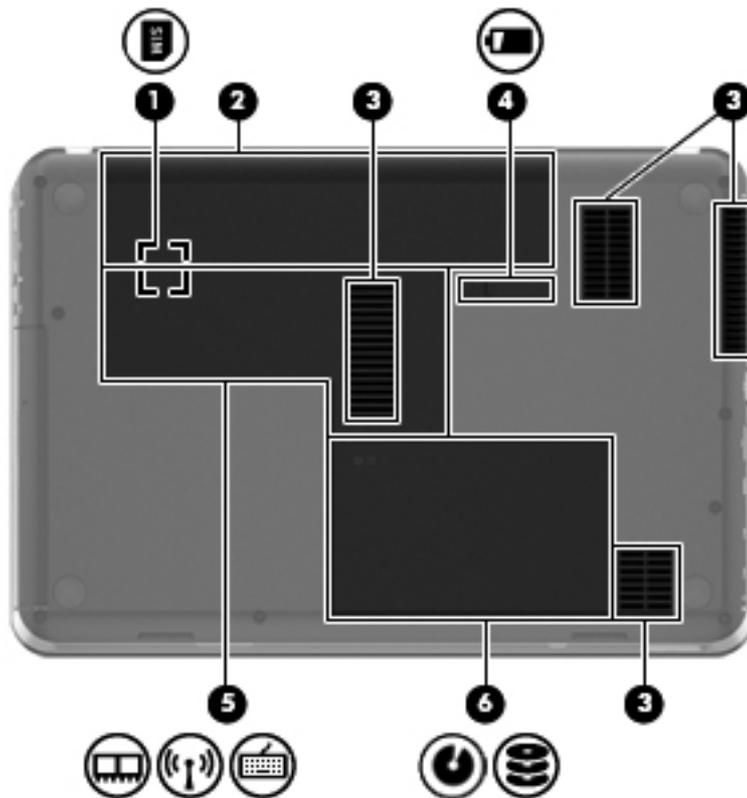
Item	Component	Description
(1)	Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Vents (2)	Enable airflow to cool internal components. NOTE: The 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.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	HDMI port (select models only)	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(6)	USB ports (2)	Connect optional USB devices.
(7)	Power light	<ul style="list-style-type: none"> • White: The computer is on. • Blinking white: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.
(8)	Hard drive light	<ul style="list-style-type: none"> • White: The computer is on. • Blinking white: The computer is in the Sleep state. <p>NOTE: For information on HP ProtectSmart Hard Drive Protection, refer to the <i>HP Notebook Reference Guide</i>.</p>

Right side



Item	Component	Description
(1)	Optical drive	Reads and writes to an optical disc.
(2)	Optical drive light	<ul style="list-style-type: none"> Green: The optical drive is being accessed. Off: The optical drive is idle.
(3)	Audio-out (headphone) jack	<p>Produce sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>
(4)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(5)	USB port	Connects optional USB devices.
(6)	AC adapter light	<ul style="list-style-type: none"> White: The computer is connected to external power and the battery is fully charged. Amber: The battery is charging. Off: The computer is not connected to external power.
(7)	Power connector	Connects an AC adapter.

Bottom

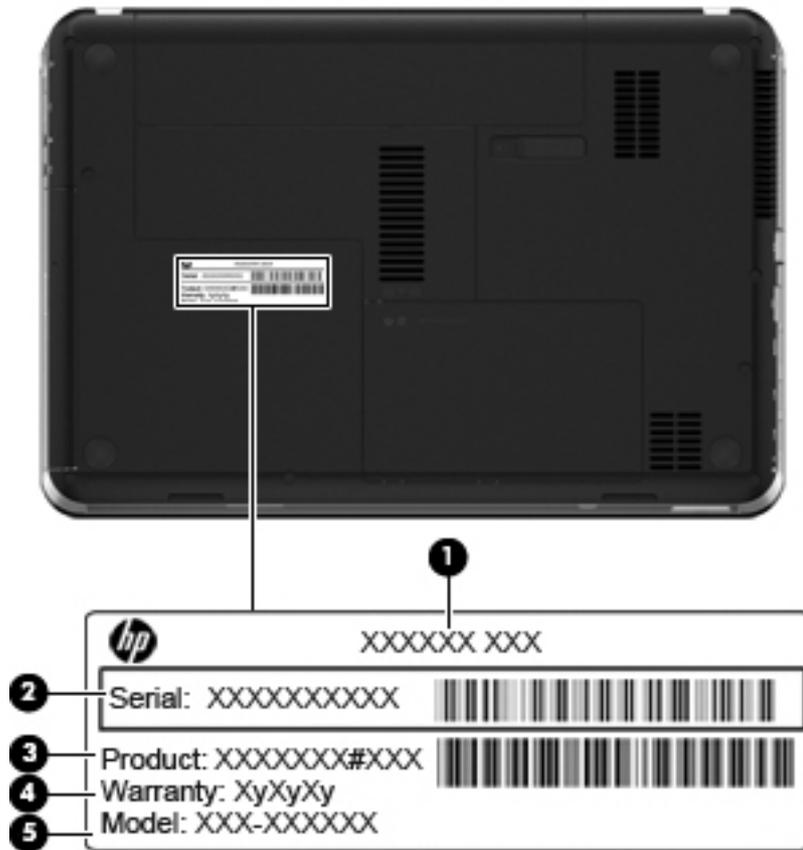


Item	Component	Description
(1)	SIM slot (select models only)	Supports a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(2)	Battery bay	Holds the battery.
(3)	Vents (5)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Battery release latch	Releases the battery from the battery bay.
(5)	Memory module/wireless module compartment	Contains the memory module slots, the WLAN and WWAN devices, and the keyboard access screw. 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.
(6)	Hard drive bay	Holds the hard drive and the optical drive access screw.

3 Illustrated parts catalog

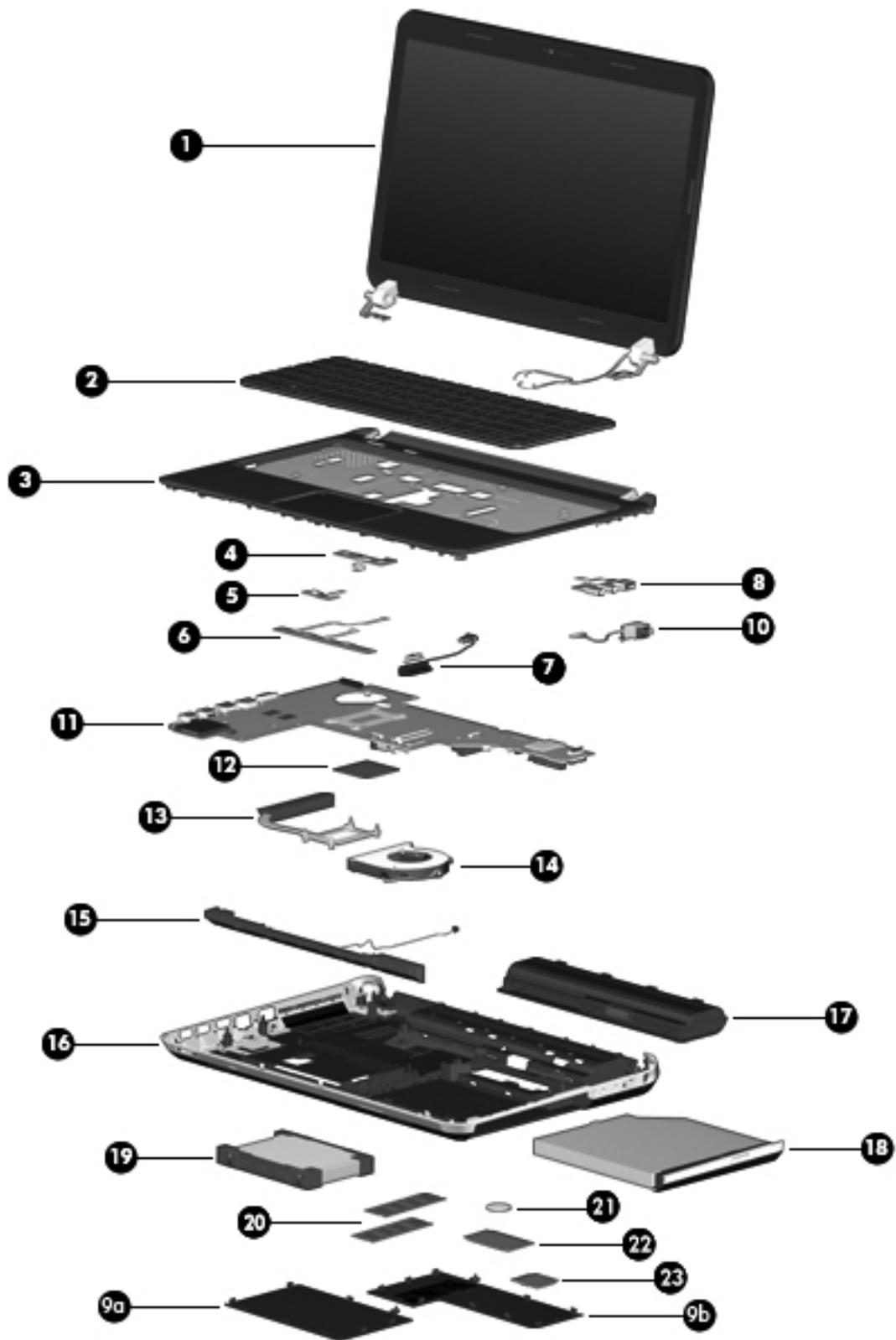
Service tag

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



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

Computer major components



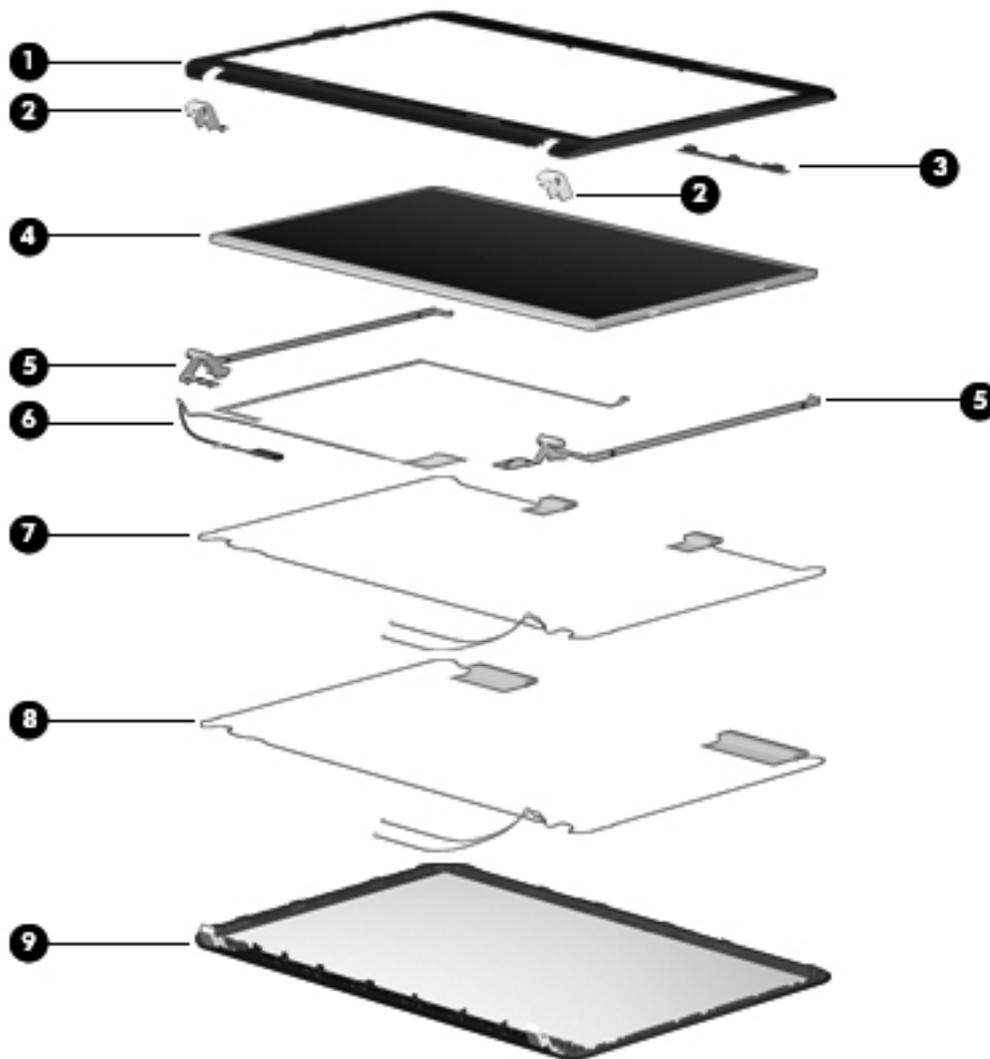
Item	Component	Spare part number
(1)	14.0-in, high definition (HD), light-emitting diode (LED), BrightView SVA display assembly (includes microphone and wireless antenna transceivers and cables):	
	In espresso black finish	650463-001
	In Pacific blue finish	650465-001
	In ruby red finish	650467-001
	NOTE: For more display assembly spare part information, see Display assembly subcomponents on page 24 .	
(2)	Keyboard (includes keyboard cable):	
	Black keyboard for use with all computer models in Latin America	650470-161
	Black keyboard for use only with computer models equipped with an Intel processor:	
	For use in Brazil	650470-201
	For use in Canada	650470-121
	For use in the United States	650470-001
	Silver keyboard for use with all computer models in Latin America	654484-161
	Silver keyboard for use only with computer models equipped with an Intel processor:	
	For use in Brazil	654484-201
	For use in French Canada	654484-121
	For use in the United States	654484-001
	Silver keyboard with backlight for use only with computer models equipped with an Intel processor (includes backlight cable):	
	For use in Canada	650471-121
	For use in the United States	650471-001
(3)	Top cover (includes TouchPad and TouchPad cable)	
	In espresso black finish	650487-001
	In Pacific blue finish	650490-001
	In ruby red finish	650489-001
(4)	Power button board (includes cable)	650475-001
(5)	TouchPad LED board (includes cable)	650477-001
(6)	TouchPad button board (includes bracket and cable)	650476-001
(7)	Optical drive connector cable (includes bracket)	650456-001
(8)	Audio/USB board:	
	For use only on computer models equipped with a graphics subsystem with discrete memory	660308-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	650474-001

Item	Component	Spare part number
	NOTE: The audio/USB board spare part kit does not include the audio/USB board cable. The audio/USB board cable is included in the Cable Kit, spare part number 652696-001.	
	Plastics Kit , includes:	650478-001
(9a)	Hard drive compartment cover (includes one captive screw, secured by a C-clip)	
(9b)	Memory module/wireless module compartment cover (includes one captive screw, secured by a C-clip)	
	NOTE: See Plastics Kit on page 28 for more Plastics Kit spare part information.	
(10)	Power connector cable (includes bracket)	650457-001
(11)	System board (includes replacement thermal material):	
	For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete video memory (includes 1-GB of graphics subsystem memory)	653427-001
	For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA video memory	653428-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with discrete video memory (includes 1-GB of graphics subsystem memory)	650486-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with UMA video memory	650485-001
	Thermal Material Kit (includes replacement thermal paste and pads)	651046-001
(12)	Processor (includes replacement thermal material):	
	AMD Sabine A8-3530MX 2.6-GHz processor (1.9-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	653364-001
	AMD Sabine A8-3510MX 2.5-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	653358-001
	AMD Sabine A8-3500M 2.4-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W)	653350-001
	AMD Sabine A6-3410MX 2.3-GHz processor (1.6-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	653357-001
	AMD Sabine A6-3400M 2.3-GHz processor (1.4-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W)	653349-001
	AMD Sabine A4-3310MX 2.5-GHz processor (2.1-GHz FSB, 2.0-MB L2 cache, Dual Core, 45 W)	653356-001
	AMD Sabine A4-3300M 2.5-GHz processor (1.9-GHz FSB, 2.0-MB L2 cache, Dual Core, 35 W)	653348-001
	Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)	631253-001
	Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)	631255-001
	Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W)	653341-001

Item	Component	Spare part number
	Intel Core i5-2410M 2.30-GHz (SC turbo up to 2.90-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)	638039-001
	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)	653340-001
	Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)	653339-001
	Intel Core i3-2310M 2.10-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)	638037-001
	Intel Pentium B960 2.20-GHz processor (TJ85, 2.0-MB L3 cache, dual core, 35 W, TDP)	664662-001
	Intel Pentium B950 2.10-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP)	653338-001
	Intel Pentium B940 2.00-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP)	653337-001
(13)	Heat sink (includes replacement thermal material):	
	For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete video memory	653426-001
	For use only with computer models equipped with an Intel processor and a graphics subsystem with discrete video memory	650459-001
	For use only with computer models equipped with a graphics subsystem with UMA video memory	650458-001
(14)	Fan:	
	For use only with computer models equipped with a graphics subsystem with discrete video memory	654465-001
	For use only with computer models equipped with a graphics subsystem with UMA video memory	650460-001
(15)	Speakers (includes cables)	650484-001
(16)	Base enclosure (includes battery release latch, heat sink, replacement thermal material, and 4 rubber feet)	650453-001
	Rubber Feet Kit (not illustrated, includes four rubber feet)	650480-001
(17)	Battery:	
	9-cell, 100-Whr, 3.00-Ah Li-ion battery	636631-001
	6-cell, 62-Whr, 2.80-Ah Li-ion battery	593562-001
	6-cell, 55-Whr, 2.55-Ah Li-ion battery	593554-001
(18)	Optical drive (includes bezel and bracket):	
	Blu-ray ROM DVD±R/RW FX Super Multi Double-Layer Drive	659870-001
	Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive	650473-001
	DVD±RW and CD-RW FX Super Multi Double-Layer Combo Drive	659869-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	650472-001
	Optical drive bay space saver (not illustrated)	659630-001

Item	Component	Spare part number
(19)	Hard drive (SATA; does not include hard drive connector cable, hard drive bracket, or screws):	
	NOTE: The hard drive connector cable is included in the Cable Kit, spare part number 652696-001.	
	1-TB, 5400-rpm, 12.7-mm	638974-001
	750-GB, 7200-rpm, 7.0-mm	633252-001
	750-GB, 5400-rpm, 7.0-mm	634250-001
	640-GB, 7200-rpm, 7.0-mm	621046-001
	500-GB, 7200-rpm, 7.0-mm	634925-001
	320-GB, 7200-rpm, 7.0-mm	634862-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and screws)	653525-001
	NOTE: See Mass storage devices on page 26 for more Hard Drive Hardware Kit information.	
(20)	Memory modules (2, PC3, 10600, 1333-MHz):	
	4 GB	621569-001
	2 GB	621565-001
	1 GB	639738-001
(21)	RTC battery	449137-001
(22)	WWAN module (for use only with computer models equipped with an Intel processor):	
	HP un2420 EV-DO/HSPA Mobile Broadband Module	531993-001
	HP hs2340 HSPA+ Mobile Broadband Module	632155-001
(23)	WLAN module:	
	For use with all computer models:	
	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
	Atheros AR9002WB-1NGB 802.11b/g/n 1×1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready)	593127-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
	Ralink 5390GN 802.11b/g/n 1×1 WiFi Adapter	630703-001
	Realtek 8188BC8 802.11a/b/g/n 2×2 WiFi and Bluetooth 3.0+HS Combo Adapter	602993-001
	Realtek 8188GN 802.11b/g/n 1×1 WiFi Adapter	640926-001
	For use only with computer models equipped with an Intel processor:	
	Intel Centrino Advanced-N 6230 WLAN module	631956-001
	Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module	572520-001

Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel	650454-001
(2)	Display hinge covers (2)	650462-001
(3)	Webcam/microphone module	650494-001
(4)	14.0-in, HD, LED, BrightView SVA display panel	650479-001
(5)	Display Hinge Kit (includes left and right display hinges and brackets)	650461-001
(6)	Display Cable Kit (includes display panel cable and webcam/microphone module cable)	650455-001
(7)	WLAN Antenna Kit (includes left and right WLAN antenna cables and transceivers)	650444-001
(8)	WWAN Antenna Kit (includes left and right WLAN antenna cables and transceivers)	650445-001
(9)	Display enclosure:	

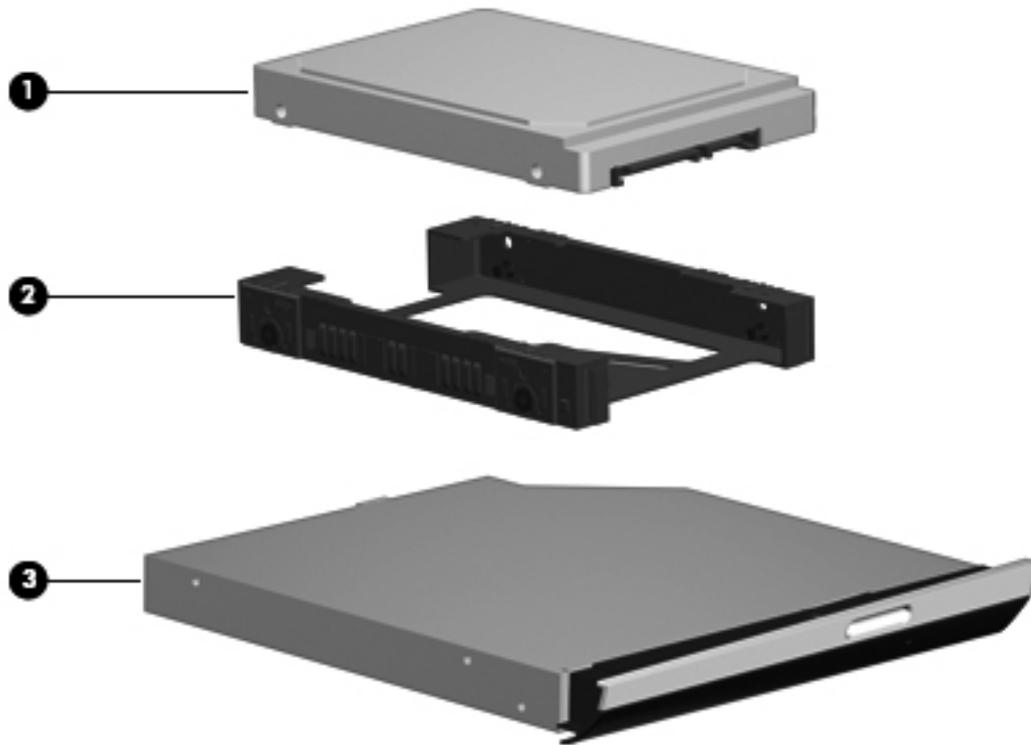
Item	Component	Spare part number
	In espresso black finish	650446-001
	In Pacific blue finish	650449-001
	In ruby red finish	650448-001
	Display Screw Kit (not illustrated)	650483-001
	Display Rubber Kit (not illustrated, includes 2 rubber screw covers)	650481-001

Cable Kit



Item	Component	Spare part number
	Cable Kit , includes:	652696-001
(1)	Audio/USB board cable	
(2)	Hard drive connector cable	

Mass storage devices



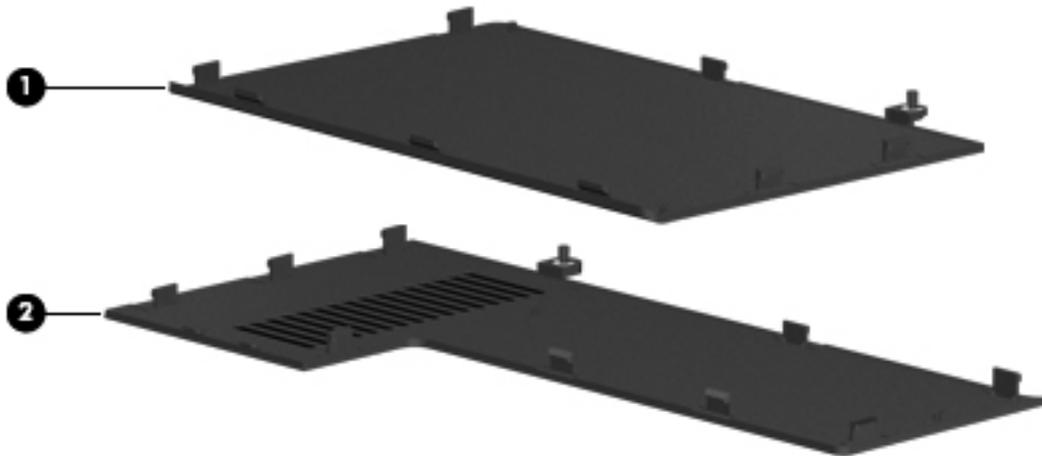
Item	Component	Spare part number
(1)	Hard drive (SATA, does not include the hard drive connector cable, hard drive bracket, or screws):	
	NOTE: The hard drive connector cable is included in the Cable Kit, spare part number 652696-001.	
	1-TB, 5400-rpm, 12.7-mm	638974-001
	750-GB, 7200-rpm, 7.0-mm	633252-001
	750-GB, 5400-rpm, 7.0-mm	634250-001
	640-GB, 7200-rpm, 7.0-mm	621046-001
	500-GB, 7200-rpm, 7.0-mm	634925-001
	320-GB, 7200-rpm, 7.0-mm	634862-001
	Hard Drive Hardware Kit , includes:	653525-001
(2)	Hard drive bracket	
	Screws (not illustrated)	
(3)	Optical drive (includes bezel and bracket):	
	Blu-ray ROM DVD±R/RW FX Super Multi Double-Layer Drive	659870-001
	Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive	650473-001

Item	Component	Spare part number
	DVD±RW and CD-RW FX Super Multi Double-Layer Combo Drive	659869-001
	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	650472-001

Miscellaneous parts

Component	Spare part number
HP Smart AC adapter:	
90-W PFC RC V 3-wire HP Smart AC adapter	609940-001
65-W RC V 3-wire HP Smart AC adapter	609939-001
Power cord (3-pin, black, 1.83-m):	
Power cord for use in North America	490371-001
For use only with computer models equipped with an Intel processor:	
For use in Argentina	490371-D01
For use in Brazil	490371-202
For use in Italy	490371-061
Screw Kit	650482-001

Plastics Kit



Item	Component	Spare part number
	Plastics Kit , includes:	650478-001
(1)	Hard drive compartment cover (includes one captive screw, secured by a C-clip)	
(2)	Memory module/wireless module compartment cover (includes one captive screw, secured by a C-clip)	

Sequential part number listing

Spare part number	Description
449137-001	RTC battery
490371-001	Power cord for use in North America (for use with all computer models; 3-pin, black, 1.83-m)
490371-061	Power cord for use in Italy (for use only with computer models equipped with an Intel processor; 3-pin, black, 1.83-m)
490371-202	Power cord for use in Brazil (for use only with computer models equipped with an Intel processor; 3-pin, black, 1.83-m)
490371-D01	Power cord for use in Argentina (for use only with computer models equipped with an Intel processor; 3-pin, black, 1.83-m)
531993-001	HP un2420 EV-DO/HSPA Mobile Broadband Module (for use only with computer models equipped with an Intel processor)
572520-001	Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module (for use only with computer models equipped with an Intel processor)
593127-001	Atheros AR9002WB-1NGB 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready)
593554-001	6-cell, 55-Whr, 2.55-Ah Li-ion battery
593562-001	6-cell, 62-Whr, 2.80-Ah Li-ion battery
602993-001	Realtek 8188BC8 802.11a/b/g/n 2x2 WiFi and Bluetooth 3.0+HS Combo Adapter
609939-001	65-W RC V 3-wire HP Smart AC adapter
609940-001	90-W PFC RC V 3-wire HP Smart AC adapter
621046-001	640-GB, 7200-rpm, 7.0-mm, SATA hard drive (does not include hard drive connector cable, hard drive bracket, or screws)
621565-001	2-GB memory module (PC3, 10600, 1333-MHz)
621569-001	4-GB memory module (PC3, 10600, 1333-MHz)
630703-001	Ralink 5390GN 802.11b/g/n 1x1 WiFi Adapter
631253-001	Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W; includes replacement thermal material)
631255-001	Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W; includes replacement thermal material)
631956-001	Intel Centrino Advanced-N 6230 WLAN module (for use only with computer models equipped with an Intel processor)
632155-001	HP hs2340 HSPA+ Mobile Broadband Module (for use only with computer models equipped with an Intel processor)
633252-001	750-GB, 7200-rpm, 7.0-mm, SATA hard drive (does not include hard drive connector cable, hard drive bracket, or screws)
634250-001	750-GB, 5400-rpm, 7.0-mm, SATA hard drive (does not include hard drive connector cable, hard drive bracket, or screws)

Spare part number	Description
634862-001	320-GB, 7200-rpm, 7.0-mm, SATA hard drive (does not include hard drive connector cable, hard drive bracket, or screws)
634925-001	500-GB, 7200-rpm, 7.0-mm, SATA hard drive (does not include hard drive connector cable, hard drive bracket, or screws)
636631-001	9-cell, 100-Whr, 3.00-Ah Li-ion battery
638037-001	Intel Core i3-2310M 2.10-GHz processor (3.0-MB L3 cache, Dual Core, 35 W; includes replacement thermal material)
638039-001	Intel Core i5-2410M 2.30-GHz (SC turbo up to 2.90-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W; includes replacement thermal material)
638974-001	1-TB, 5400-rpm, 12.7-mm, SATA hard drive (does not include hard drive connector cable, hard drive bracket, or screws)
639738-001	1-GB memory module (PC3, 10600, 1333-MHz)
640926-001	Realtek 8188GN 802.11b/g/n 1x1 WiFi Adapter
650444-001	WLAN Antenna Kit (includes left and right WLAN antenna cables and transceivers)
650445-001	WWAN Antenna Kit (includes left and right WWAN antenna cables and transceivers)
650446-001	Display enclosure in espresso black finish
650448-001	Display enclosure in ruby red finish
650449-001	Display enclosure in Pacific blue finish
650453-001	Base enclosure (includes battery release latch, heat sink, replacement thermal material, and 4 rubber feet)
650454-001	Display bezel
650455-001	Display Cable Kit (includes display panel cable and webcam/microphone module cable)
650456-001	Optical drive connector cable
650457-001	Power connector cable
650458-001	Heat sink for use only with computer models equipped with a graphics subsystem with UMA video memory (includes replacement thermal material)
650459-001	Heat sink for use only with computer models equipped with an Intel processor and a graphics subsystem with discrete video memory (includes replacement thermal material)
650460-001	Fan for use only with computer models equipped with a graphics subsystem with UMA video memory
650461-001	Display Hinge Kit (includes left and right display hinges and brackets)
650462-001	Display hinge covers
650463-001	14.0-in, HD, LED, BrightView SVA display assembly in espresso black finish (includes microphone and wireless antenna transceivers and cables)
650465-001	14.0-in, HD, LED, BrightView SVA display assembly in Pacific blue finish (includes microphone and wireless antenna transceivers and cables)

Spare part number	Description
650467-001	14.0-in, HD, LED, BrightView SVA display assembly in ruby red finish (includes microphone and wireless antenna transceivers and cables)
650470-001	Black keyboard for use in North America (for use only with computer models equipped with an Intel processor; includes keyboard cable)
650470-121	Black keyboard for use in Canada (for use only with computer models equipped with an Intel processor; includes keyboard cable)
650470-161	Black keyboard for use in Latin America (includes keyboard cable)
650470-201	Black keyboard for use in Brazil (for use only with computer models equipped with an Intel processor; includes keyboard cable)
650471-001	Silver keyboard with backlight for use in North America (for use only with computer models equipped with an Intel processor; includes keyboard cable and backlight cable)
650471-121	Silver keyboard with backlight for use in French Canada (for use only with computer models equipped with an Intel processor; includes keyboard cable and backlight cable)
650472-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
650473-001	Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive
650474-001	Audio/USB board for use on computer models equipped with a graphics subsystem with UMA memory
	NOTE: The audio/USB board spare part kit does not include the audio/USB board cable. The audio/USB board cable is included in the Cable Kit, spare part number 652696-001.
650475-001	Power button board (includes cable)
650476-001	TouchPad button board (includes bracket and cable)
650477-001	TouchPad LED board (includes bracket and cable)
650478-001	Plastics Kit (includes hard drive compartment cover and memory module/wireless module compartment cover)
	NOTE: See Plastics Kit on page 28 for more Plastics Kit spare part information.
650479-001	14.0-in, HD, LED, BrightView SVA display panel
650480-001	Rubber Feet Kit (includes four rubber feet)
650481-001	Display Rubber Kit (includes 2 rubber screw covers)
650482-001	Screw Kit
650483-001	Display Screw Kit
650484-001	Speaker (includes cable)
650485-001	System board for use only with computer models equipped with an Intel processor and a graphics subsystem with UMA video memory (includes replacement thermal material)
650486-001	System board for use only with computer models equipped with an Intel processor and a graphics subsystem with discrete video memory (includes replacement thermal material)
650487-001	Top cover in espresso black finish (includes TouchPad and TouchPad cable)
650489-001	Top cover in ruby red finish (includes TouchPad and TouchPad cable)

Spare part number	Description
650490-001	Top cover in Pacific blue finish (includes TouchPad and TouchPad cable)
650494-001	Webcam/microphone module
651046-001	Thermal Material Kit for use only with computer models equipped with a graphics subsystem with UMA video memory (includes replacement thermal paste and pads)
652696-001	Cable Kit (includes the hard drive connector cable and the audio/USB board cable)
	NOTE: See Cable Kit on page 25 for more Cable Kit spare part information.
653337-001	Intel Pentium B940 2.00-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP; includes replacement thermal material)
653338-001	Intel Pentium B950 2.10-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP; includes replacement thermal material)
653339-001	Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, Dual Core, 35 W; includes replacement thermal material)
653340-001	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
653341-001	Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
653348-001	AMD Sabine A4-3300M 2.5-GHz processor (1.9-GHz FSB, 2.0-MB L2 cache, Dual Core, 35 W; includes replacement thermal material)
653349-001	AMD Sabine A6-3400M 2.3-GHz processor (1.4-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W; includes replacement thermal material)
653350-001	AMD Sabine A8-3500M 2.4-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W; includes replacement thermal material)
653356-001	AMD Sabine A4-3310MX 2.5-GHz processor (2.1-GHz FSB, 2.0-MB L2 cache, Dual Core, 45 W; includes replacement thermal material)
653357-001	AMD Sabine A6-3410MX 2.3-GHz processor (1.6-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W; includes replacement thermal material)
653358-001	AMD Sabine A8-3510MX 2.5-GHz processor (1.8-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W; includes replacement thermal material)
653364-001	AMD Sabine A8-3530MX 2.6-GHz processor (1.9-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W; includes replacement thermal material)
653426-001	Heat sink for use only with computer models equipped with an AMD processor and a graphics subsystem with discrete video memory (includes replacement thermal material)
653427-001	System board for use only with computer models equipped with an AMD processor and a graphics subsystem with discrete video memory (includes 1-GB of graphics subsystem memory and replacement thermal material)
653428-001	System board for use only with computer models equipped with an AMD processor and a graphics subsystem with UMA video memory (includes replacement thermal material)
653525-001	Hard Drive Hardware Kit (includes hard drive bracket and screws)
	NOTE: See Mass storage devices on page 26 for more Hard Drive Hardware Kit information.

Spare part number	Description
654465-001	Fan for use only on computer models equipped with a graphics subsystem with discrete video memory
654484-001	Silver keyboard for use in the United States (for use only with computer models equipped with an Intel processor; includes keyboard cable)
654484-121	Silver keyboard for use in Canada (for use only with computer models equipped with an Intel processor; includes keyboard cable)
654484-161	Silver keyboard for use in Latin America (includes keyboard cable)
654484-201	Silver keyboard for use in Brazil (for use only with computer models equipped with an Intel processor; includes keyboard cable)
655795-001	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter
657325-001	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter
659630-001	Optical drive bay space saver
659869-001	DVD±RW and CD-RW FX Super Multi Double-Layer Combo Drive
659870-001	Blu-ray ROM DVD±R/RW FX Super Multi Double-Layer Drive
660308-001	Audio/USB board for use on computer models equipped with a graphics subsystem with discrete memory
	NOTE: The audio/USB board spare part kit does not include the audio/USB board cable. The audio/USB board cable is included in the Cable Kit, spare part number 652696-001.
664662-001	Intel Pentium B960 2.20-GHz processor (TJ85, 2.0-MB L3 cache, dual core, 35 W, TDP; 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:

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

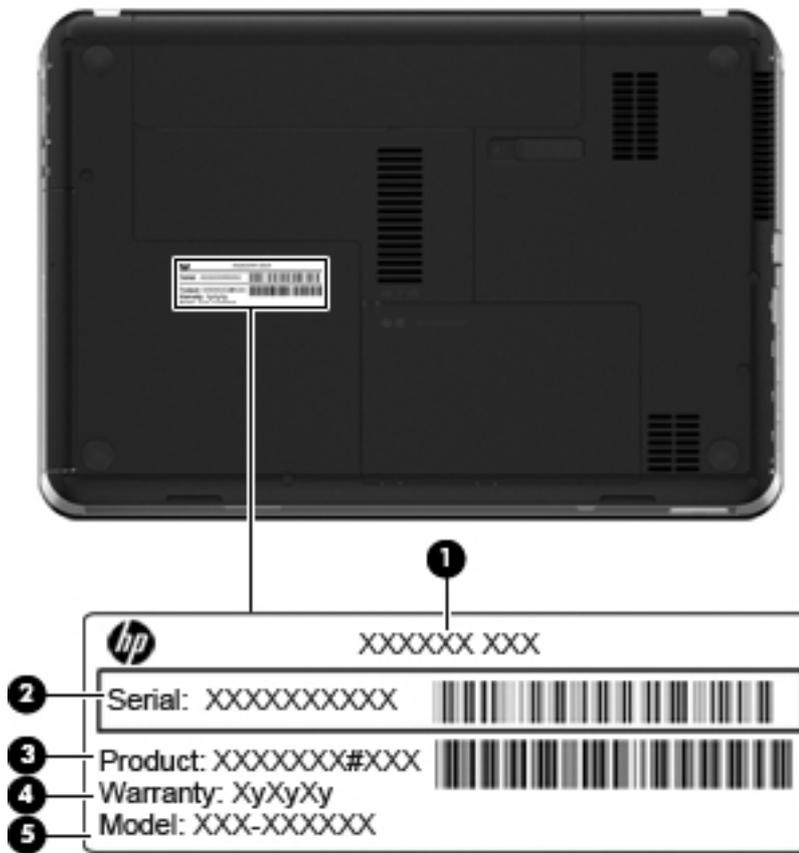
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 77 screws 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 number provided on the service tag.

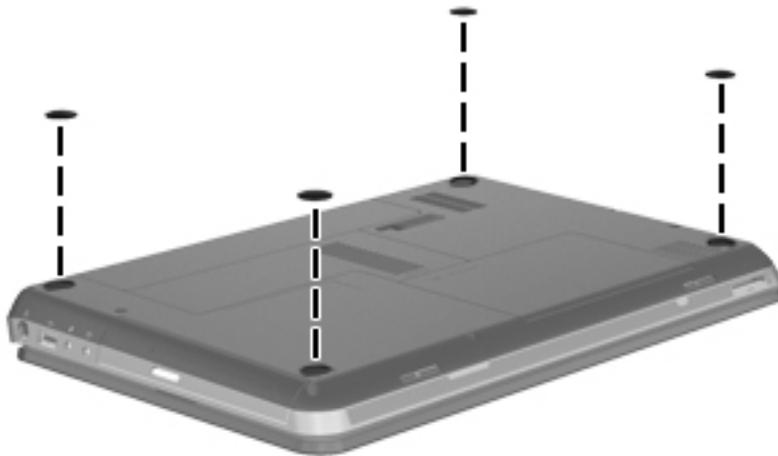


Item	Component	Description
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware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

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

Computer feet

The computer feet are adhesive-backed rubber pads. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below. The feet are available in the Rubber Feet Kit, spare part number 650480-001.



Battery

Description	Spare part number
9-cell, 100-Whr, 3.00-Ah Li-ion battery	636631-001
6-cell, 62-Whr, 2.80-Ah Li-ion battery	593562-001
6-cell, 55-Whr, 2.55-Ah Li-ion battery	593554-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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



To insert the battery:

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

SIM

 **NOTE:** The SIM is provided by the end-user as a security measure for the WWAN module. The SIM should be removed, placed into a static-dissipative container, and then replaced when the computer is reassembled.

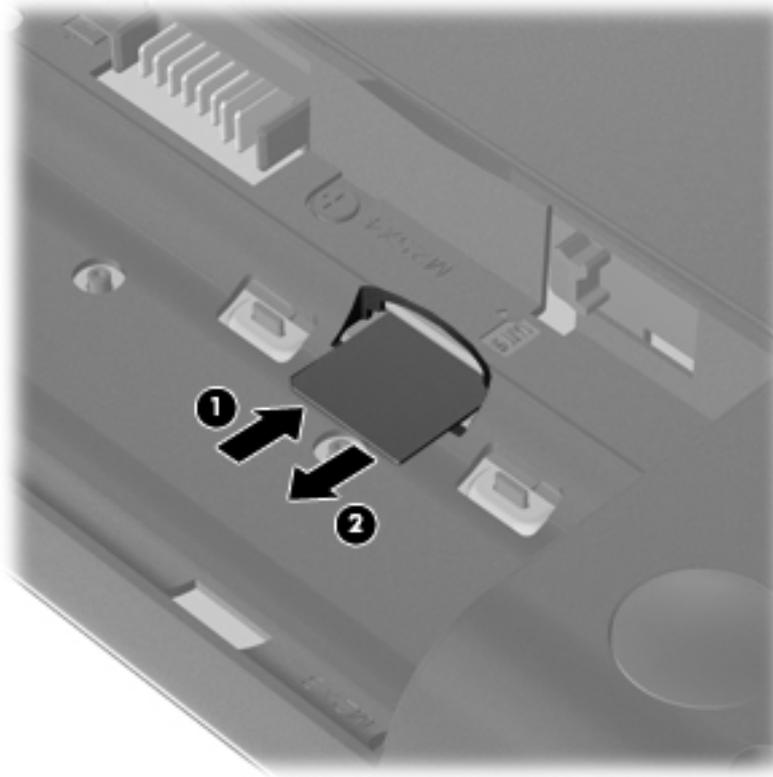
Before removing the SIM, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).

Remove the SIM:

1. Press in on the SIM **(1)** to release it from the SIM slot.

2. Remove the SIM **(2)** from the SIM slot.



Insert the SIM into the SIM slot, and gently push the SIM into the slot until it is firmly seated.

WLAN module

Description	Spare part number
For use with all computer models:	
Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
Atheros AR9002WB-1NGB 802.11b/g/n 1×1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready)	593127-001
Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
Ralink 5390GN 802.11b/g/n 1×1 WiFi Adapter	630703-001
Realtek 8188BC8 802.11a/b/g/n 2×2 WiFi and Bluetooth 3.0+HS Combo Adapter	602993-001
Realtek 8188GN 802.11b/g/n 1×1 WiFi Adapter	640926-001
For use only with computer models equipped with an Intel processor:	
Intel Centrino Advanced-N 6230 WLAN module	631956-001
Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module	572520-001

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

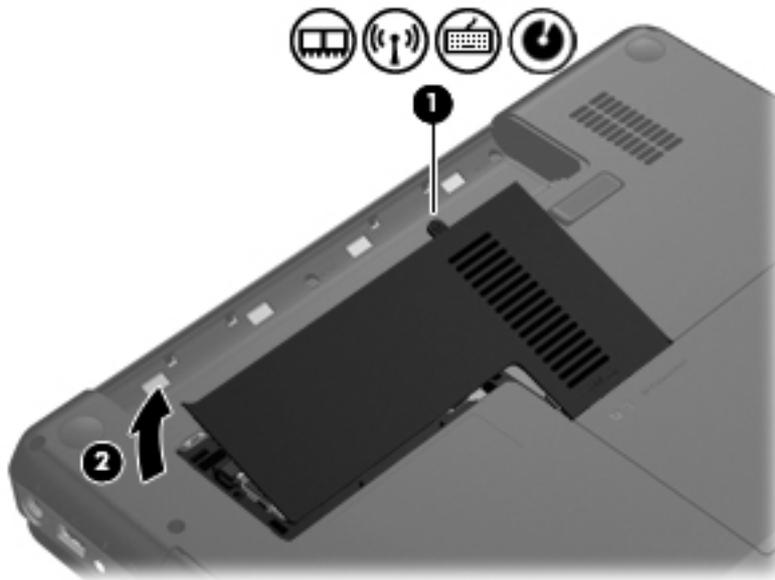
Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).

Remove the WLAN module:

1. Loosen the captive screw **(1)** that secures the memory module/wireless module compartment cover to the computer.

2. Lift the rear edge of the cover **(2)** up and forward until it rests at an angle.



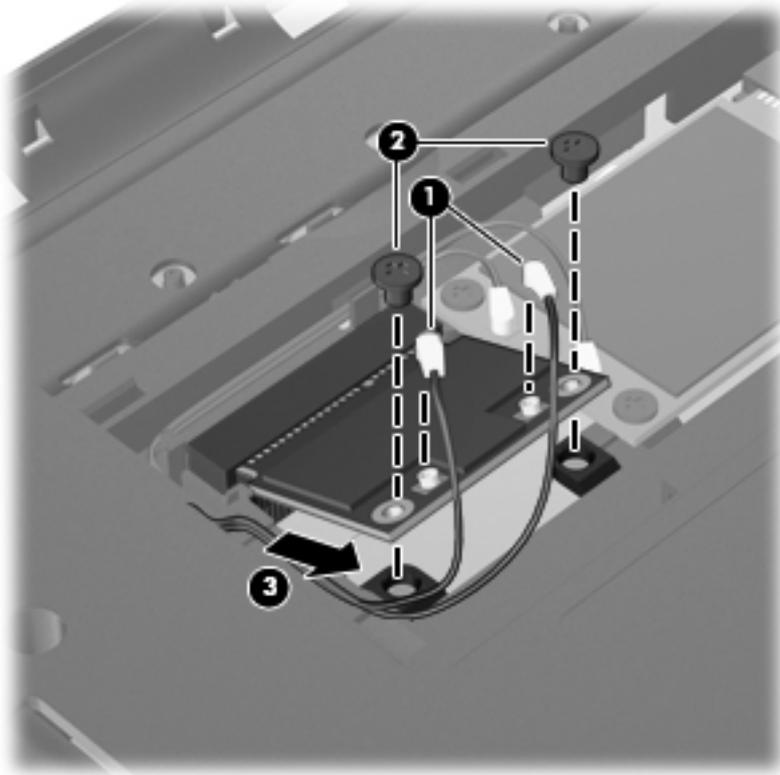
3. Remove the memory module/wireless module compartment cover. The memory module/wireless module compartment cover is available in the Plastics Kit, spare part number 650478-001.
4. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.



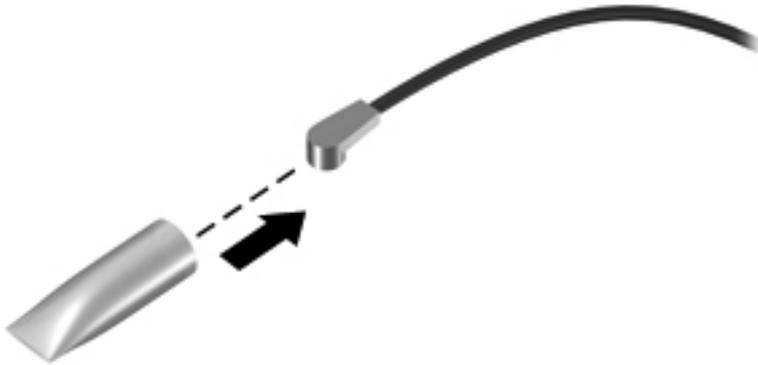
NOTE: The #1 WLAN antenna cable is connected to the WLAN module #1 terminal. The #2 WLAN antenna cable is connected to the WLAN module #2 terminal.

5. Remove the two Phillips PM2.0x3.0 screws **(2)** that secure the WLAN module to the system board. (The WLAN module tilts up.)

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



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



Reverse this procedure to install the WLAN module.

WWAN module

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

Description	Spare part number
HP un2420 EV-DO/HSPA Mobile Broadband Module	531993-001
HP hs2340 HSPA+ Mobile Broadband Module	632155-001

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

Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 44](#)).

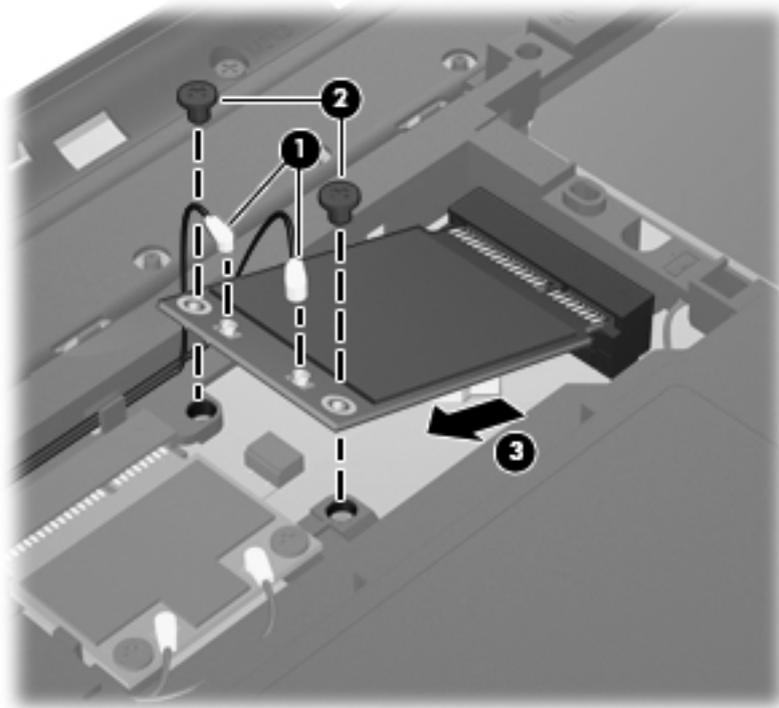
Remove the WWAN module:

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

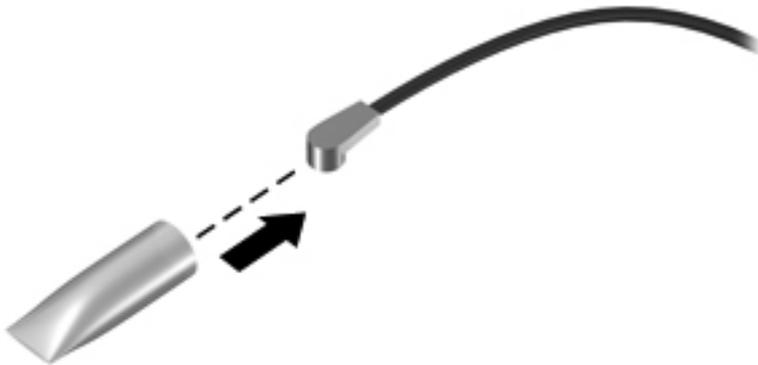
 **NOTE:** The red WLAN antenna cable is connected to the WWAN module #1 terminal. The blue WWAN antenna cable is connected to the WWAN module #2 terminal.

2. Remove the two Phillips PM2.0x3.0 screws **(2)** that secure the WWAN module to the system board. (The WWAN module tilts up.)

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



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



Reverse this procedure to install the WLAN module.

RTC battery

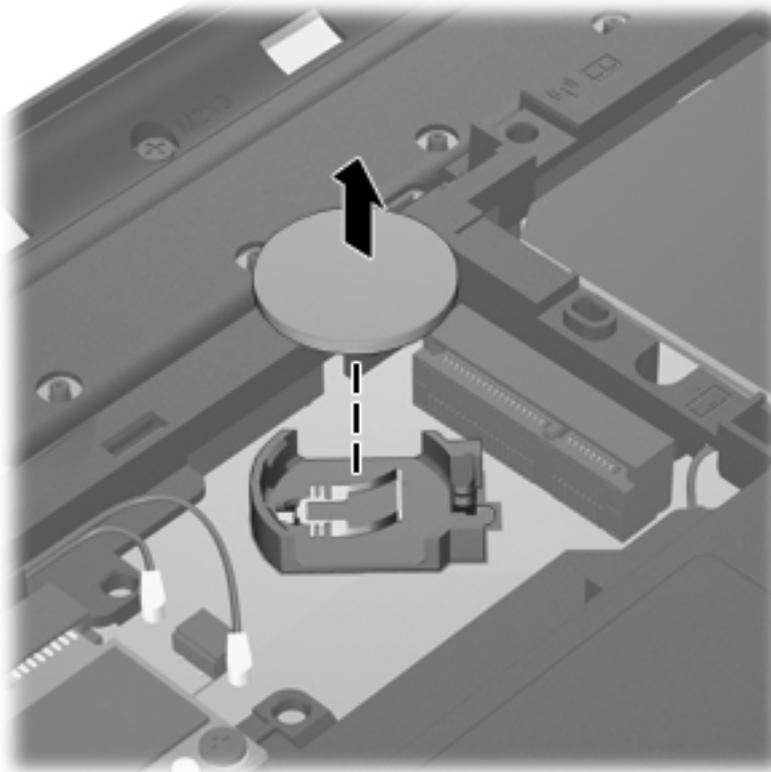
Description	Spare part number
RTC battery	44913-001

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 41](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 44](#)).
6. Remove the WWAN module (see [WWAN module on page 47](#)).

Remove the RTC battery:

- ▲ Use a thin, non-conductive tool to remove the RTC battery from the socket on the system board.



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

Memory module

Description	Spare part number
4-GB (PC3, 10600, 1333-MHz)	621569-001
2-GB (PC3, 10600, 1333-MHz)	621565-001
1-GB (PC3, 10600, 1333-MHz)	639738-001

Before removing a memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 44](#)).

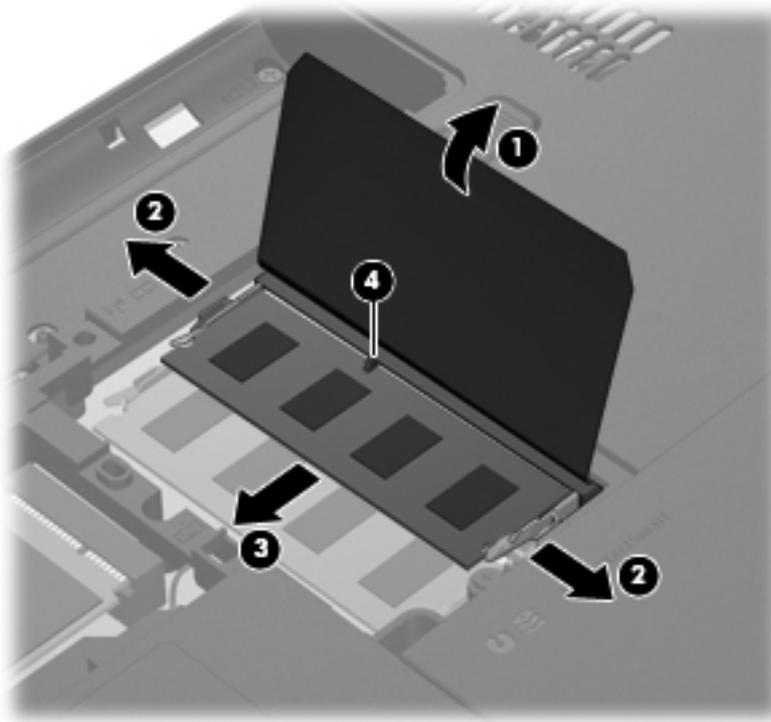
Remove the memory module:

1. Fold back the memory shield **(1)**.
2. Spread the retaining tabs **(2)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

 **CAUTION:** To prevent damage to the memory module, hold it by the edges only. Do not touch the components on the memory module.

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

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



Reverse this procedure to install a memory module.

Optical drive



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

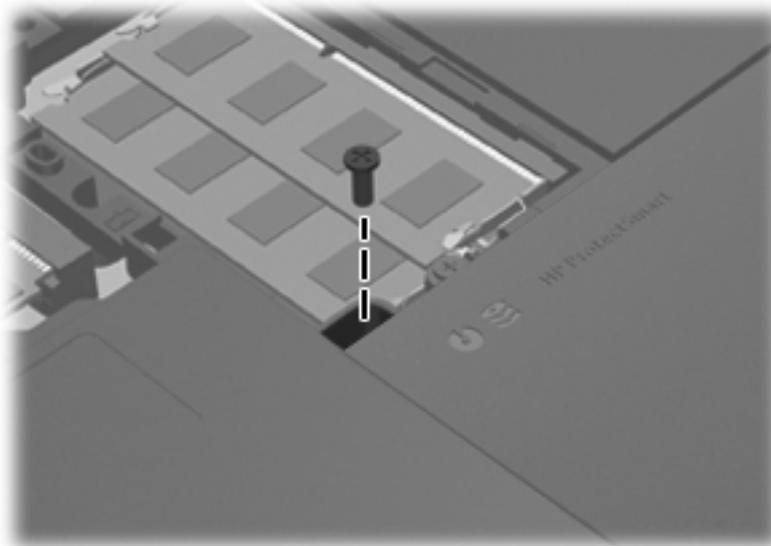
Description	Spare part number
Blu-ray ROM DVD±R/RW FX Super Multi Double-Layer Drive	659870-001
Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive	650473-001
DVD±RW and CD-RW FX Super Multi Double-Layer Combo Drive	659869-001
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	650472-001
Optical drive bay space saver	659630-001

Before removing the optical drive, follow these steps:

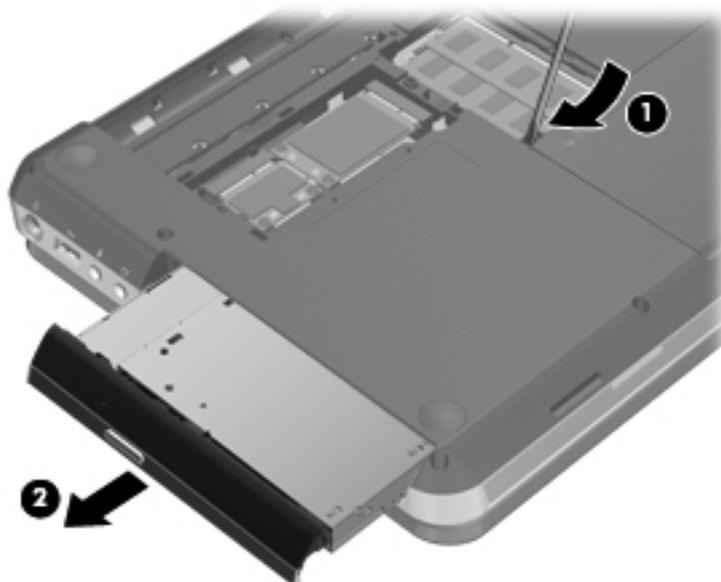
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 44](#)).

Remove the optical drive:

1. Remove the Phillips PM2.5×7.0 screw that secures the optical drive to the computer.

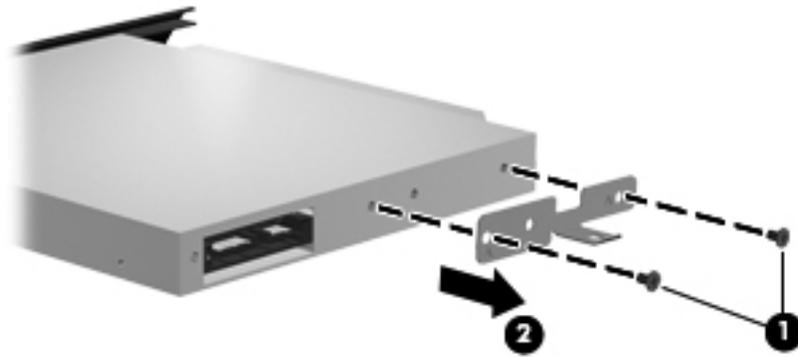


2. Use a flat blade screwdriver **(1)** or similar tool to press the back of the optical drive to release the drive from the computer.
3. Remove the optical drive **(2)** by sliding it out of the optical drive bay.



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

6. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive connector cable, hard drive bracket, or screws. The hard drive connector cable is included in the Cable Kit, spare part number 652696-001.

Description	Spare part number
1-TB, 5400-rpm, 12.7-mm	638974-001
750-GB, 7200-rpm, 7.0-mm	633252-001
750-GB, 5400-rpm, 7.0-mm	634250-001
640-GB, 7200-rpm, 7.0-mm	621046-001
500-GB, 7200-rpm, 7.0-mm	634925-001
320-GB, 7200-rpm, 7.0-mm	634862-001
Hard Drive Hardware Kit (includes hard drive bracket and screws)	653525-001

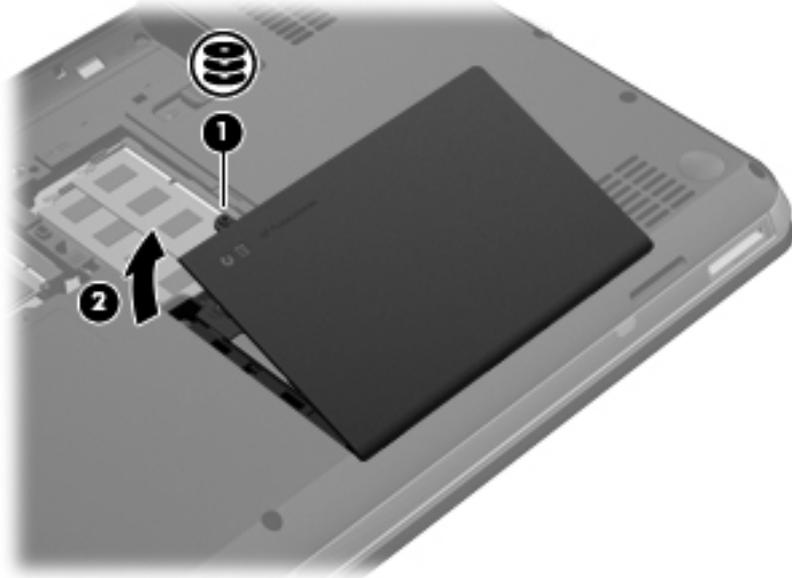
Before removing the hard drive, follow these steps:

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 41](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 44](#)).

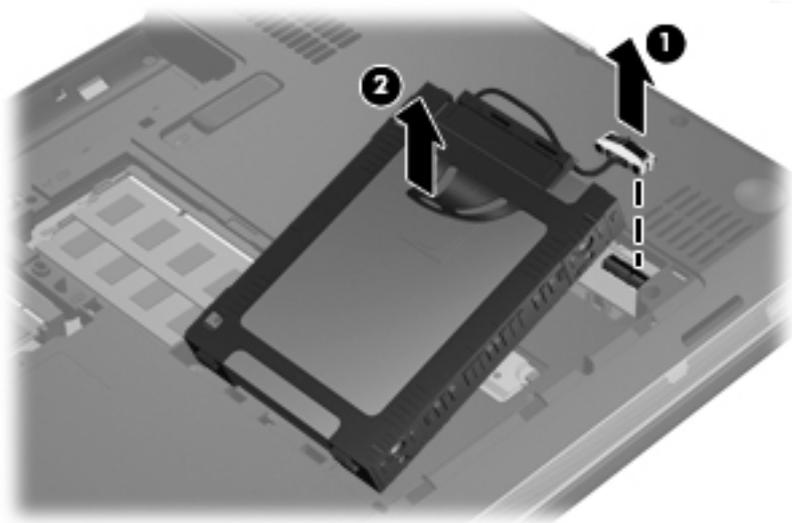
Remove the hard drive:

1. Loosen the captive screw **(1)** that secures the hard drive compartment cover to the computer.

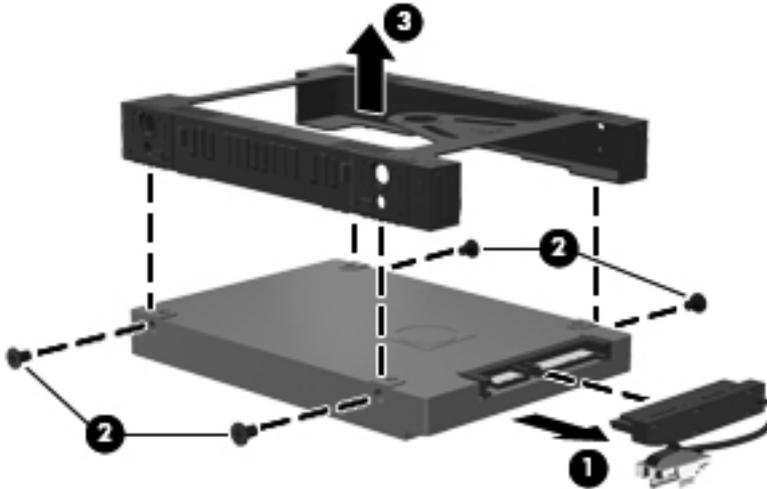
2. Lift the rear edge of the hard drive compartment cover **(2)** up and forward until it rests at an angle.



3. Remove the hard drive compartment cover. The hard drive compartment cover is available in the Plastics Kit, spare part number 650478-001.
4. Disconnect the hard drive connector cable **(1)** from the system board.
5. Remove the hard drive **(2)**.



6. If it is necessary to replace the hard drive connector cable (1), the hard drive screws (2), or the hard drive bracket (3), remove and replace the components.



Reverse this procedure to reassemble and install the hard drive.

Keyboard

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

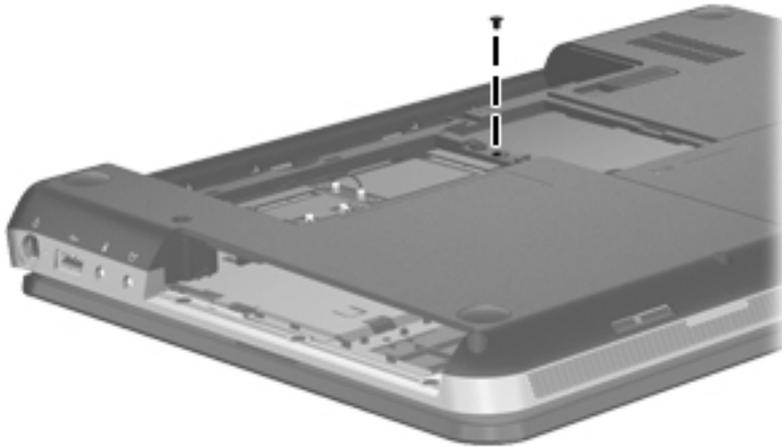
Description	Spare part number
Black keyboard for use with all computer models in Latin America	650470-161
Black keyboard for use only with computer models equipped with an Intel processor:	
For use in Brazil	650470-201
For use in Canada	650470-121
For use in the United States	650470-001
Silver keyboard for use with all computer models in Latin America	654484-161
Silver keyboard for use only with computer models equipped with an Intel processor:	
For use in Brazil	654484-201
For use in French Canada	654484-121
For use in the United States	654484-001
Silver keyboard with backlight for use only with computer models equipped with an Intel processor (includes backlight cable):	
For use in Canada	650471-121
For use in the United States	650471-001

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the memory module/wireless module compartment cover (see [WLAN module on page 44](#)).

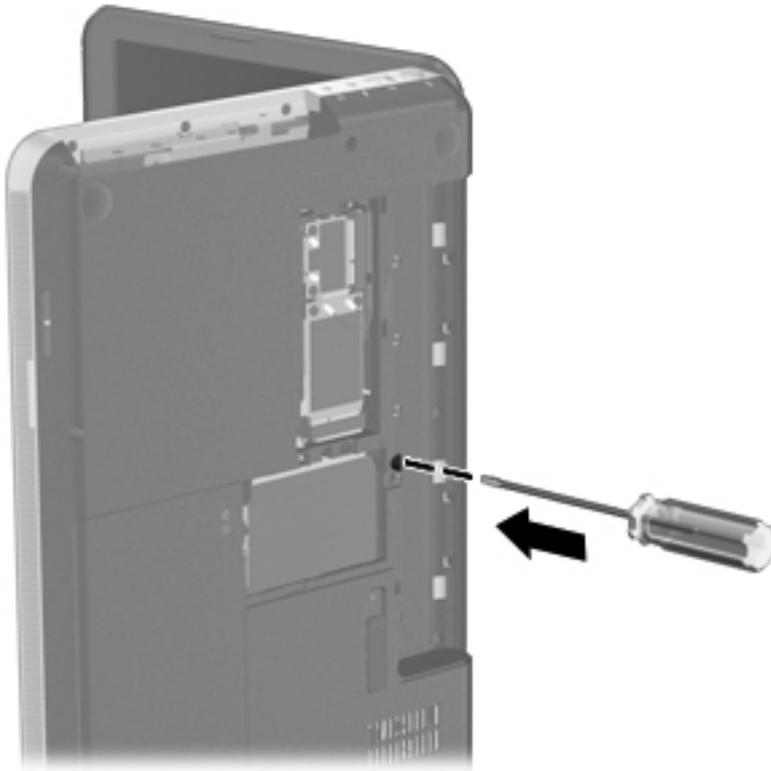
Remove the keyboard:

1. Remove the Phillips PM2.5×7.0 screw that secures the keyboard to the computer.

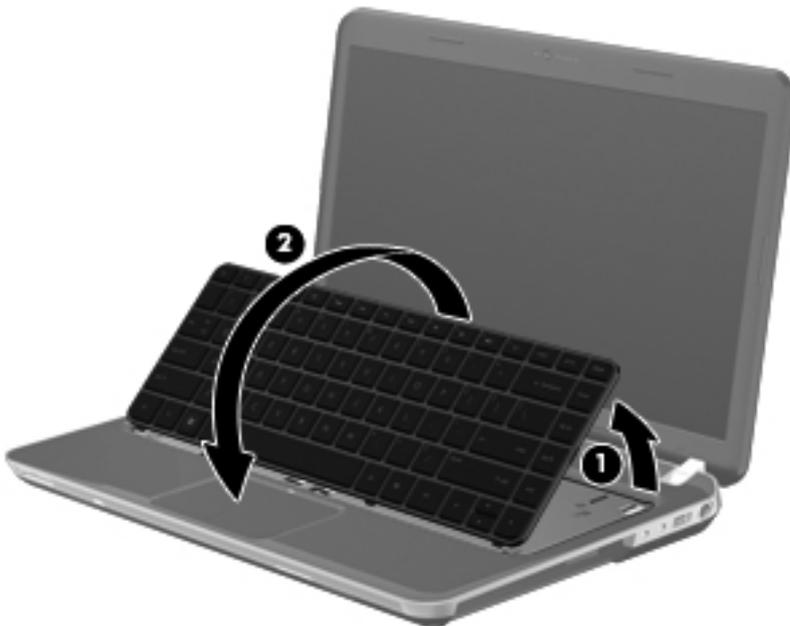


2. Rest and secure the computer on its left side.
3. Partially open the computer.

4. Insert a screwdriver or similar thin tool into the keyboard release hole, and then press on the back of the keyboard until the keyboard disengages from the computer.



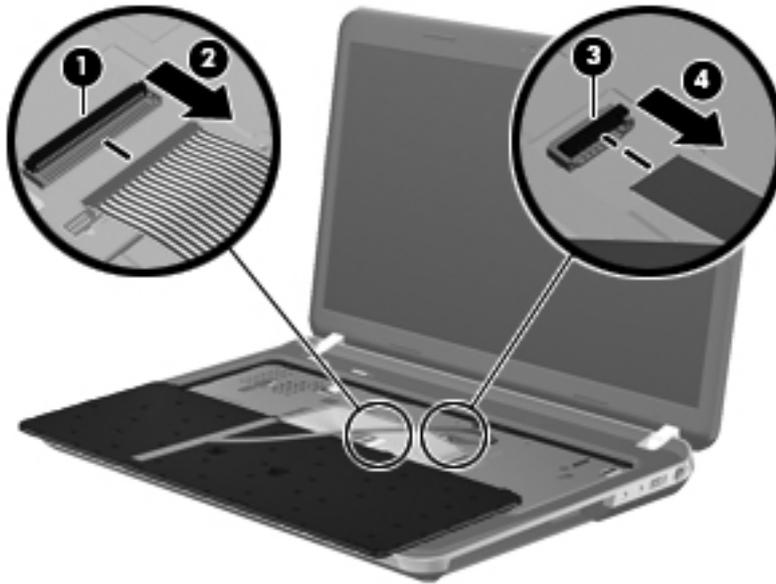
5. Turn the computer right-side up with the front toward you.
6. Lift the rear edge of the keyboard **(1)**, and then swing the keyboard up and forward **(2)** until it rests upside down on the palm rest.



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

⚠ CAUTION: Step 8 applies only to computer models equipped with a keyboard with backlight.

8. Release the ZIF connector **(3)** to which the keyboard backlight cable is attached, and then disconnect the keyboard backlight cable **(4)** from the system board.



9. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover

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

Description	Spare part number
In espresso black finish	650487-001
In Pacific blue finish	650490-001
In ruby red finish	650489-001

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.

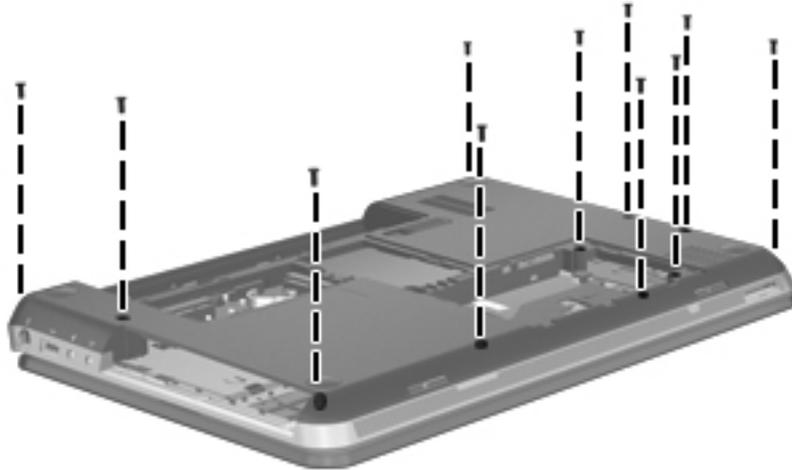
- 3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4.** Remove the battery (see [Battery on page 41](#)), and then remove the following components:
 - a.** Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b.** Optical drive (see [Optical drive on page 52](#))
 - c.** Hard drive (see [Hard drive on page 55](#))
 - d.** Keyboard (see [Keyboard on page 57](#))

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

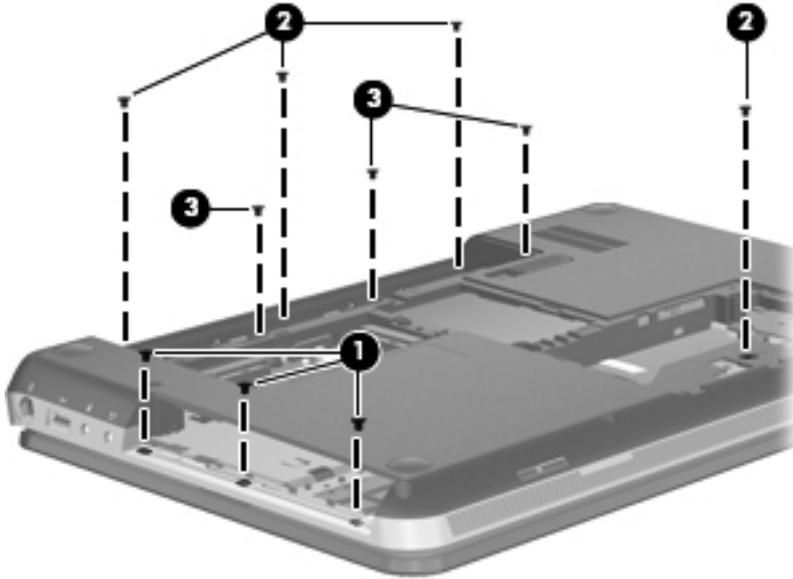
- Power button board and cable (see [Power button board on page 65](#))
- TouchPad LED board and cable (see [TouchPad LED board on page 67](#))
- TouchPad button board and cable (see [TouchPad button board on page 69](#))

Remove the top cover:

- 1.** Close the computer.
- 2.** Turn the computer upside down, with the front toward you.
- 3.** Remove the eleven Phillips PM2.5×7.0 screws that secure the top cover to the computer.



4. Remove the following screws that secure the top cover to the computer:
 - (1) Three Phillips PM2.0×2.0 screws in the optical drive bay
 - (2) Four Phillips PM2.0×3.0 screws on the rear edge of the battery bay and the hard drive bay
 - (3) Three Phillips PM2.5×5.0 screws on the front edge of the battery bay



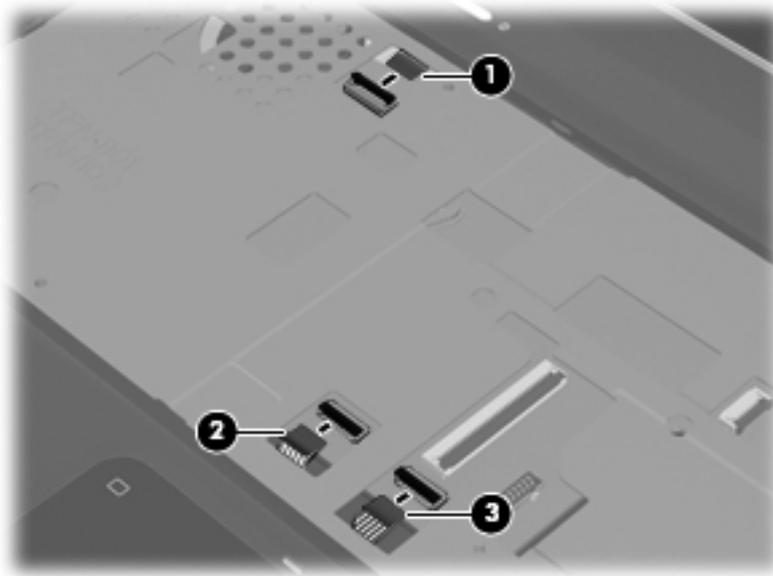
5. Turn the computer right-side up, with the front toward you.
6. Open the computer.

7. Release the ZIF connectors to which the following cables are attached, and then disconnect the cables from the system board:

(1) Power button board cable (included with the power button board spare part kit, spare part number 650475-001)

(2) TouchPad button board cable (included with the TouchPad button board spare part kit, spare part number 650476-001)

(3) TouchPad LED board cable (included with the TouchPad LED board spare part kit, spare part number 650477-001)



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

9. 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)	650475-001

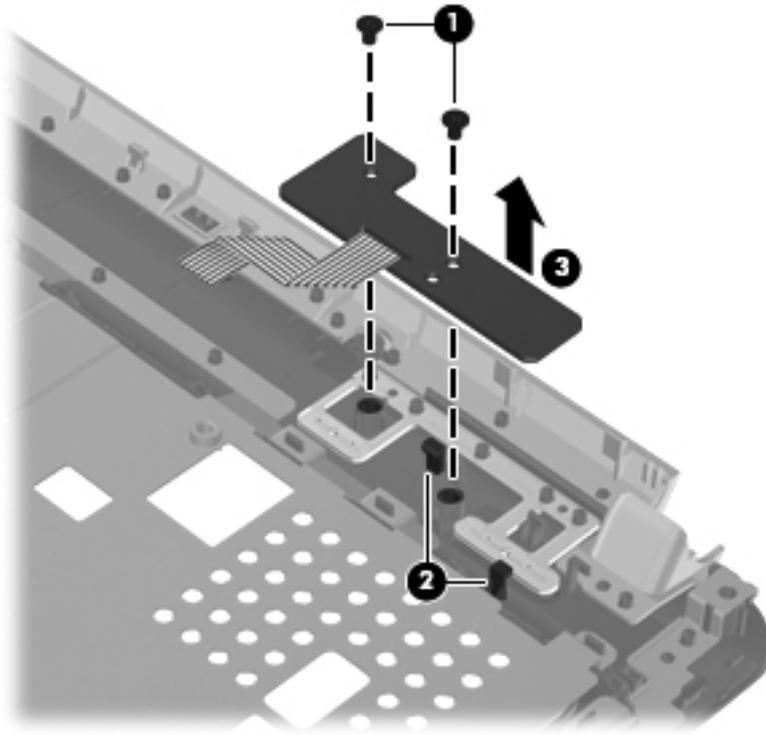
Before removing the power button board, follow these steps:

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 41](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Hard drive (see [Hard drive on page 55](#))
 - d. Keyboard (see [Keyboard on page 57](#))
 - e. Top cover (see [Top cover on page 60](#))

Remove the power button board:

1. Turn the top cover upside down, with the top toward you.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the power button board to the top cover.
3. Release the power button board from the two clips **(2)** built into the top cover.

4. Remove the power button board and cable (3).



Reverse this procedure to install the power button board and cable.

TouchPad LED board

Description	Spare part number
TouchPad LED board (includes cable)	650477-001

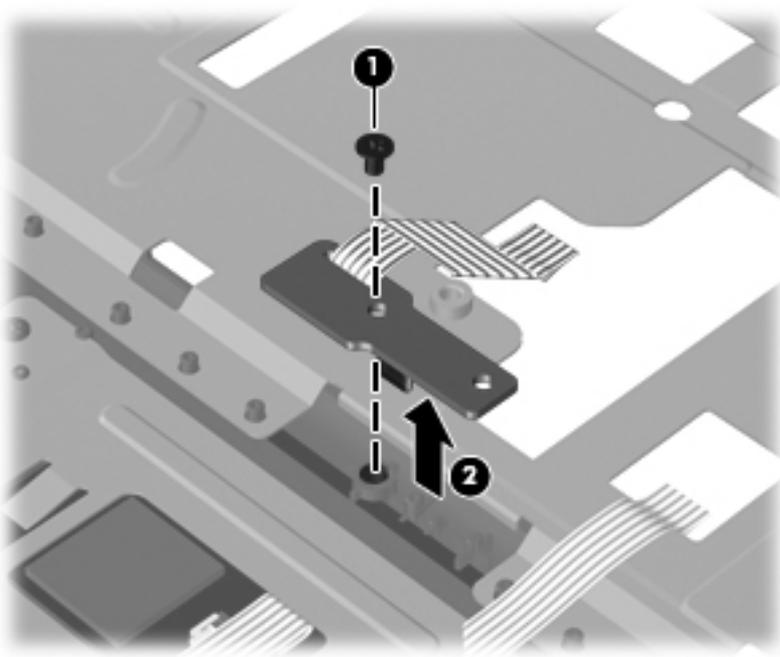
Before removing the TouchPad LED board, follow these steps:

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 41](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Hard drive (see [Hard drive on page 55](#))
 - d. Keyboard (see [Keyboard on page 57](#))
 - e. Top cover (see [Top cover on page 60](#))

Remove the TouchPad LED board and cable:

1. Turn the top cover upside down, with the top toward you.
2. Release the TouchPad board cable **(1)** and the TouchPad button board cable **(2)** from the top cover. (The TouchPad board cable and the TouchPad button board cable are attached to the top cover with double-sided tape.)
3. Remove the four Phillips PM2.0×4.0 screws **(3)** that secure the TouchPad button board to the top cover.

4. Remove the TouchPad button board (4) and cables from the top cover.



Reverse this procedure to install the TouchPad LED board and cable.

TouchPad button board

Description	Spare part number
TouchPad button board (includes cable)	650476-001

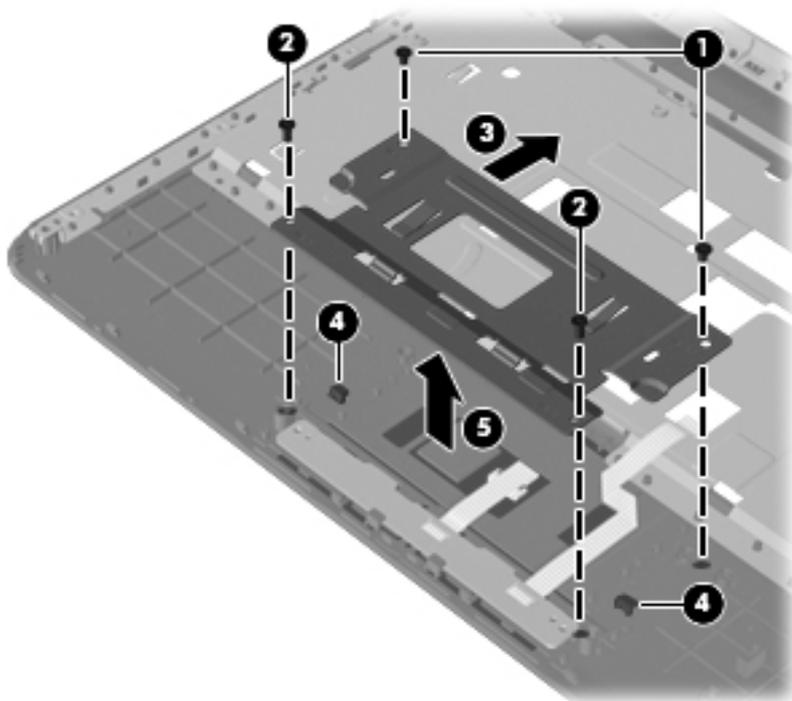
Before removing the TouchPad button board, follow these steps:

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 41](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Hard drive (see [Hard drive on page 55](#))
 - d. Keyboard (see [Keyboard on page 57](#))
 - e. Top cover (see [Top cover on page 60](#))

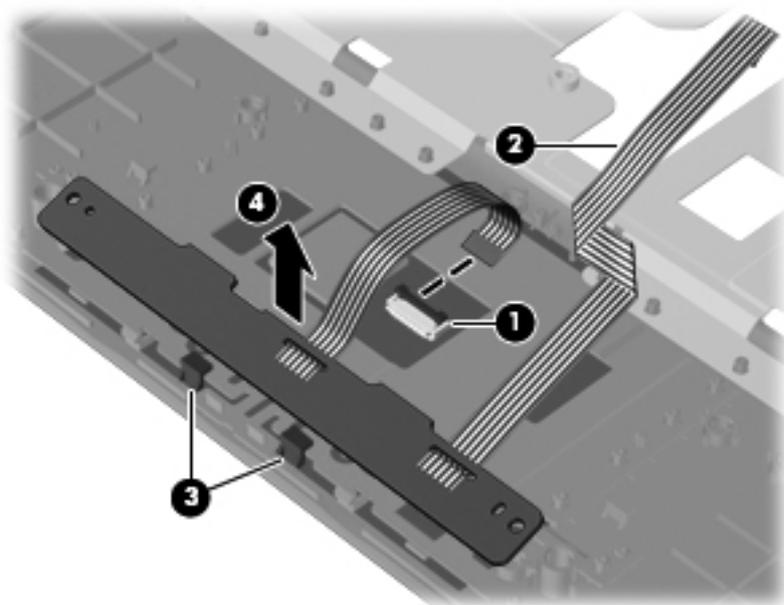
Remove the TouchPad button board, bracket, and cable:

1. Turn the top cover upside down, with the top toward you.
2. Remove the two Phillips PM2.0×3.0 screws **(1)** and two Phillips PM2.0×3.5 screws **(2)** that secure the TouchPad button board bracket to the top cover.
3. Slide the TouchPad button board bracket **(3)** back until it releases from the tabs **(4)** built into the top cover.

4. Remove the TouchPad button board bracket (5).



5. Release the ZIF connector to which the TouchPad board cable (1) is attached, and then disconnect the TouchPad board cable from the TouchPad board.
6. Release the TouchPad button board cable (2) from the top cover. (The TouchPad button board cable is attached to the top cover with double-sided tape.)
7. Release the TouchPad button board from the clips (3) built into the top cover.
8. Remove the TouchPad button board (4) and cables from the top cover.



Reverse this procedure to install the TouchPad button board and cable.

Optical drive connector cable



NOTE: The optical drive connector cable is included in the Cable Kit, spare part number 652696-001.

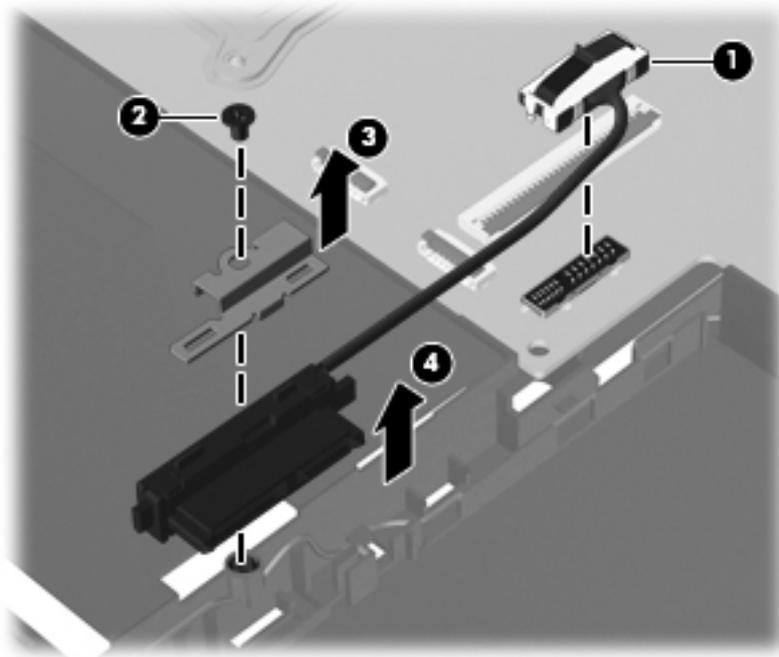
Before removing the optical drive connector cable, follow these steps:

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 41](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Hard drive (see [Hard drive on page 55](#))
 - d. Keyboard (see [Keyboard on page 57](#))
 - e. Top cover (see [Top cover on page 60](#))

Remove the optical drive connector cable:

1. Disconnect the optical drive connector cable **(1)** from the system board.
2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the optical drive connector and bracket to the base enclosure.

3. Remove the optical drive connector bracket **(3)** and the optical drive connector **(4)** from the base enclosure.



Reverse this procedure to install the optical drive connector cable.

Audio/USB board

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	660308-001
For use only on computer models equipped with a graphics subsystem with UMA memory	650474-001

NOTE: The audio/USB board spare part kit does not include the audio/USB board cable. The audio/USB board cable is included in the Cable Kit, spare part number 652696-001.

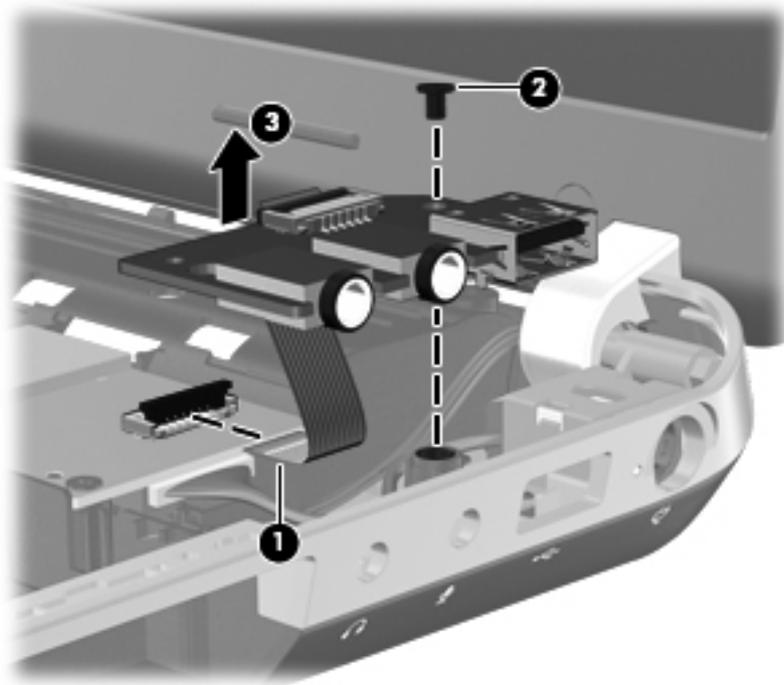
Before removing the audio/USB board, follow these steps:

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 41](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Hard drive (see [Hard drive on page 55](#))
 - d. Keyboard (see [Keyboard on page 57](#))
 - e. Top cover (see [Top cover on page 60](#))

Remove the audio/USB board:

1. Release the ZIF connector to which the audio/USB board cable is connected, and then disconnect the audio/USB board cable **(1)** from the system board.
2. Remove the Phillips PM2.5×5.0 screw **(2)** that secures the audio/USB board to the base enclosure.

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



Reverse this procedure to install the audio/USB board.

Power connector cable

Description	Spare part number
Power connector cable	650457-001

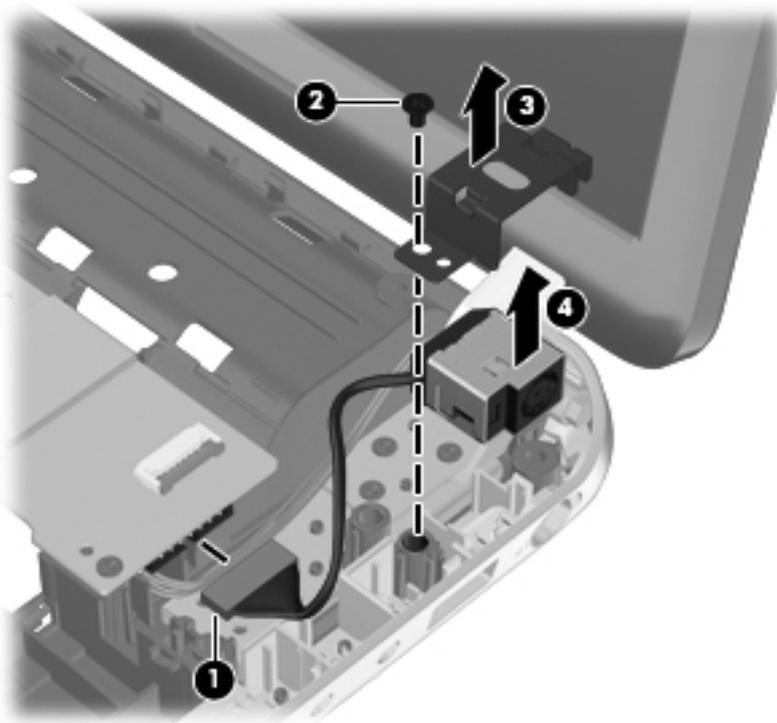
Before removing the power connector cable, follow these steps:

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 41](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [WLAN module on page 44](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Hard drive (see [Hard drive on page 55](#))
 - d. Keyboard (see [Keyboard on page 57](#))

- e. Top cover (see [Top cover on page 60](#))
- f. Audio/USB board (see [Audio/USB board on page 73](#))

Remove the power connector cable:

1. Disconnect the power cable **(1)** from the system board.
2. Remove the Phillips PM2.5×5.0 screw **(2)** that secures the power connector and bracket to the computer.
3. Remove the power connector bracket **(3)**.
4. Remove the power connector cable **(4)**.



Reverse this procedure to install the power connector cable.

System board

 **NOTE:** The system board spare part kit includes replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 651046-001.

Description	Spare part number
For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete video memory (includes 1-GB of graphics subsystem memory)	653427-001
For use only with computer models equipped with an AMD processor and a graphics subsystem with UMA video memory	653428-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with discrete video memory (includes 1-GB of graphics subsystem memory)	650486-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with UMA video memory	650485-001

Before removing the system board, follow these steps:

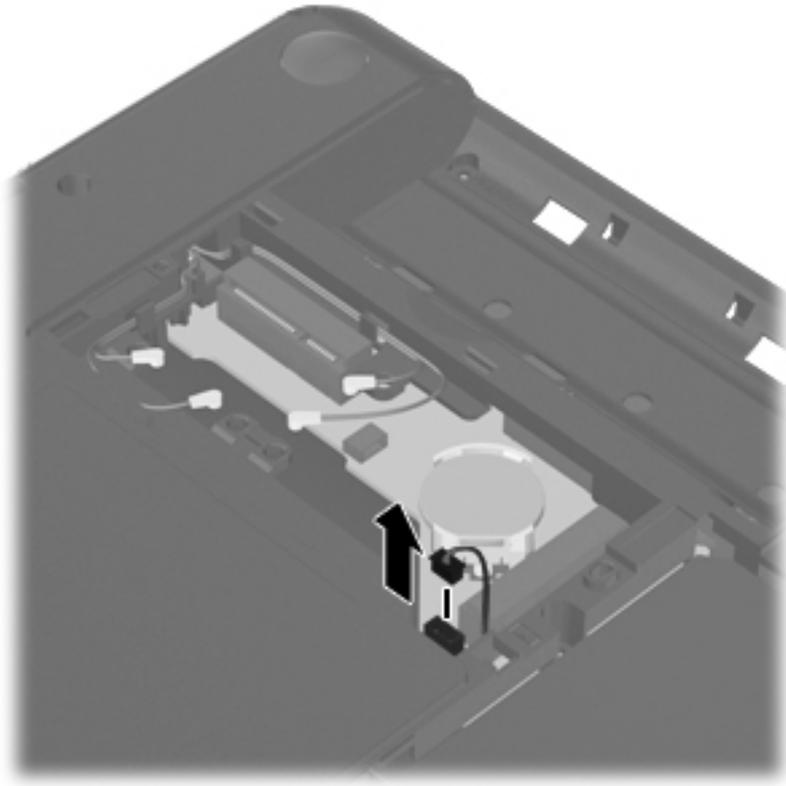
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 44](#))
 - b. WWAN module (see [WWAN module on page 47](#))
 - c. Optical drive (see [Optical drive on page 52](#))
 - d. Hard drive (see [Hard drive on page 55](#))
 - e. Keyboard (see [Keyboard on page 57](#))
 - f. Top cover (see [Top cover on page 60](#))

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:

- SIM (see [SIM on page 42](#))
- RTC battery (see [RTC battery on page 49](#))
- Memory module (see [Memory module on page 50](#))
- Heat sink (see [Heat sink on page 80](#))
- Fan (see [Fan on page 88](#))
- Processor (see [Processor on page 85](#))

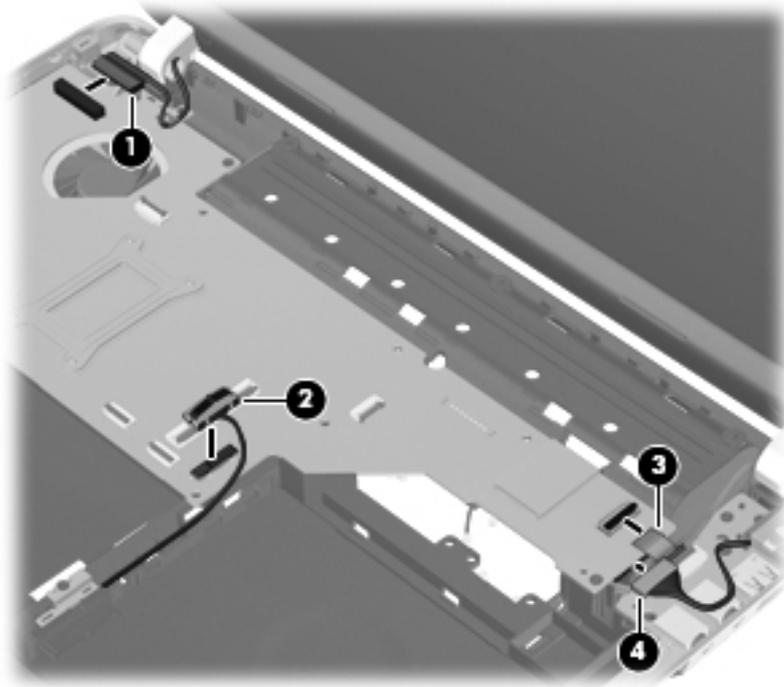
Remove the system board:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the speaker cable from the system board.



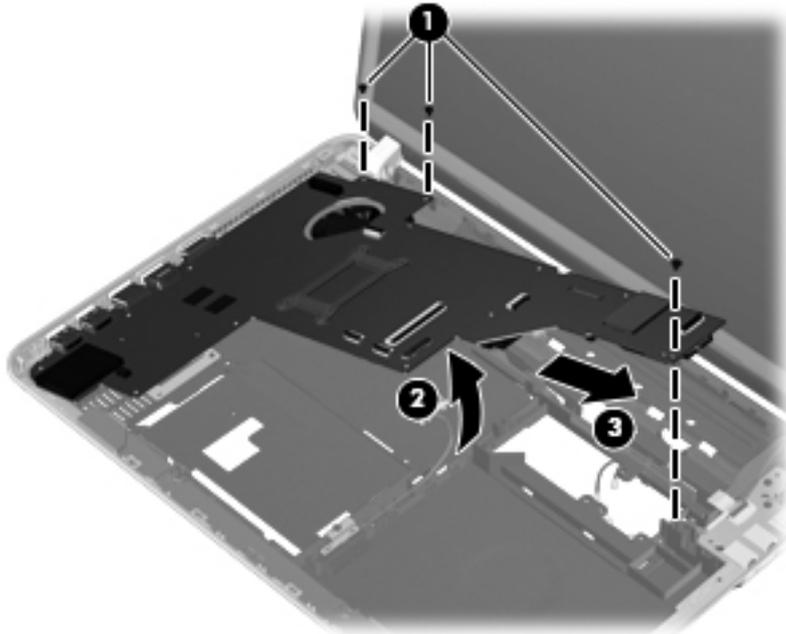
4. Turn the computer right-side up, with the front toward you.
5. Open the computer.

6. Disconnect the following cables from the system board:
 - (1) Display panel cable (included with the display assembly and display panel spare part kit)
 - (2) Optical drive connector cable (included with the optical drive connector cable spare part kit)
 - (3) Audio/USB board cable (included in the Cable Kit, spare part number 652696-001)
 - (4) Power connector cable (included in the power connector cable spare part kit)

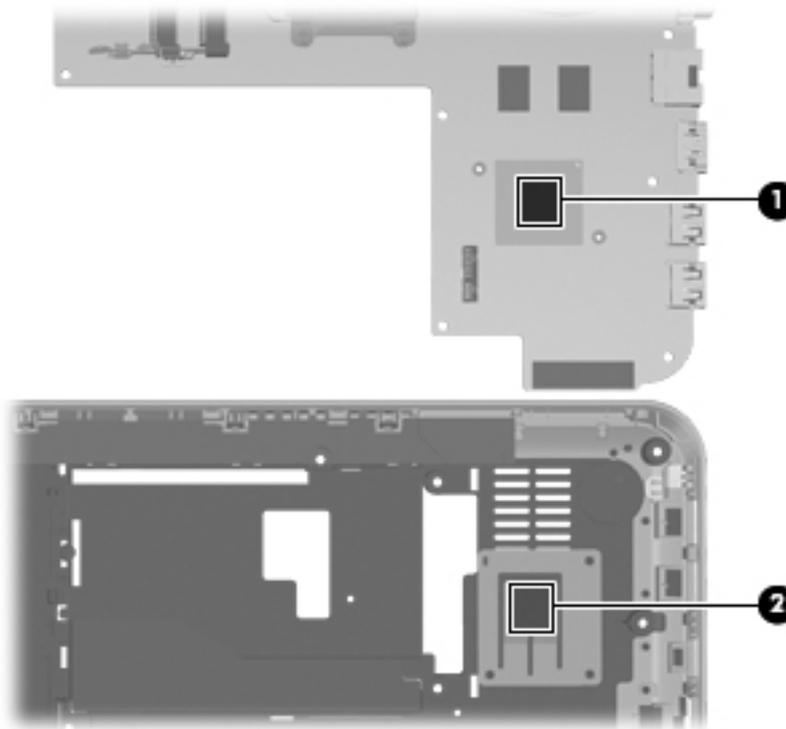


7. Remove the three Phillips PM2.5×5.0 screws (1) that secure the system board to the base enclosure.
8. Lift the right side of the system board (2) until it rests at an angle.

9. Remove the system board (3) by sliding it up and to the right at an angle.



NOTE: A heat sink is attached to the base enclosure to service the Southbridge component on the bottom of the system board on computer models equipped with an AMD processor and a graphics subsystem with discrete video memory. The thermal material must be thoroughly cleaned from the surfaces of the system board (1) and the heat sink (2) attached to the base enclosure each time the system board is removed. Replacement thermal material is included with all base enclosure and system board spare part kits.



Reverse this procedure to install the system board.

Heat sink



NOTE: The heat sink spare part kit includes replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 651046-001.

Description	Spare part number
For use only with computer models equipped with an AMD processor and a graphics subsystem with discrete video memory	653426-001
For use only with computer models equipped with an Intel processor and a graphics subsystem with discrete video memory	650459-001
For use only with computer models equipped with a graphics subsystem with UMA video memory	650458-001



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

Before removing the heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 44](#))
 - b. WWAN module (see [WWAN module on page 47](#))
 - c. Optical drive (see [Optical drive on page 52](#))
 - d. Hard drive (see [Hard drive on page 55](#))
 - e. Keyboard (see [Keyboard on page 57](#))
 - f. Top cover (see [Top cover on page 60](#))
 - g. System board ([System board on page 76](#))

Remove the heat sink:

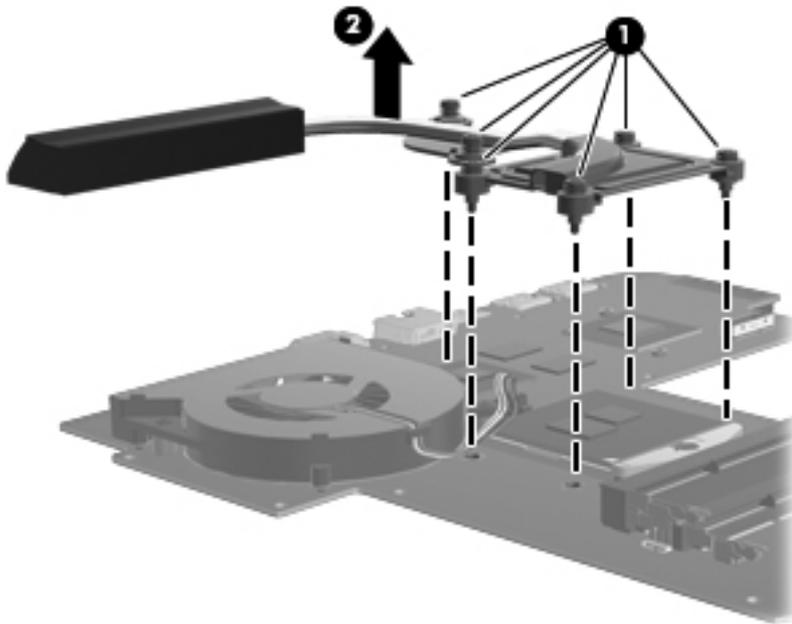
1. Turn the system board upside down, with the front toward you.
2. Loosen the captive screws **(1)** that secure the heat sink to the system board.

 **NOTE:** The number of screws used to secure the heat sink to the system board varies by computer model.

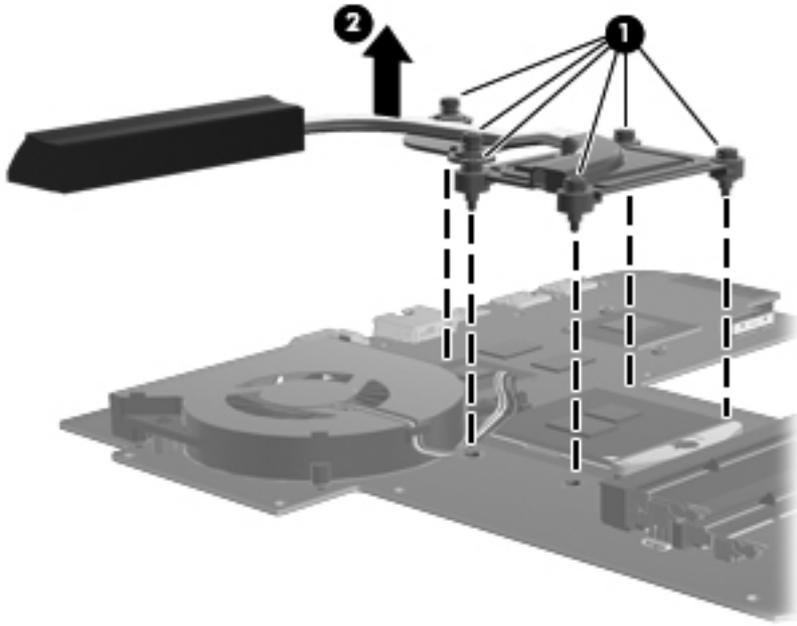
 **NOTE:** Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the heat sink from side to side to detach it.

3. Remove the heat sink **(2)**.

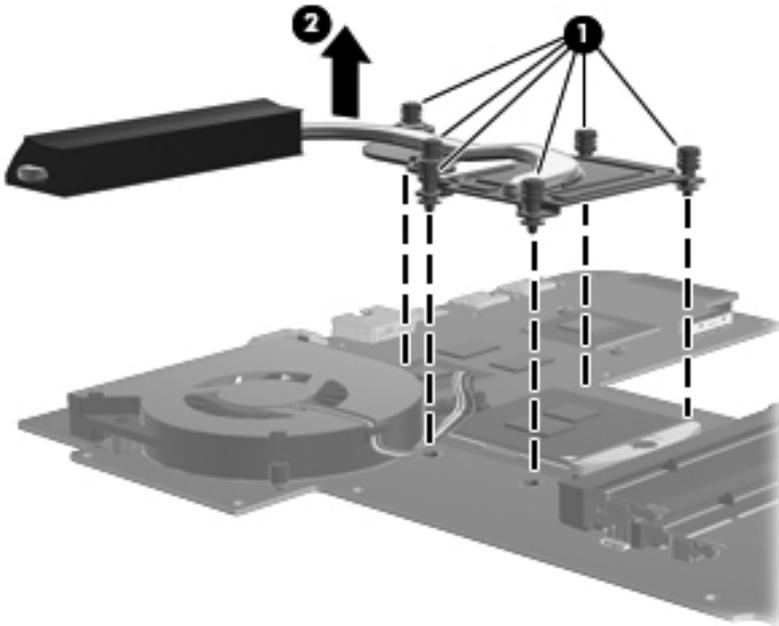
The following illustration shows the heat sink removal process on a computer model equipped with an AMD processor and a graphics subsystem with discrete memory.



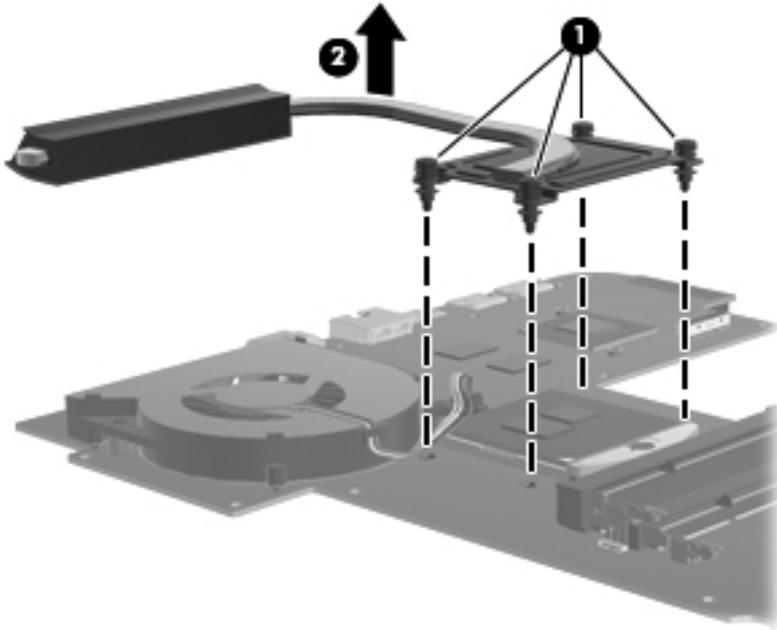
The following illustration shows the heat sink removal process on a computer model equipped with an AMD processor and a graphics subsystem with UMA memory.



The following illustration shows the heat sink removal process on a computer model equipped with an Intel processor and a graphics subsystem with discrete memory.



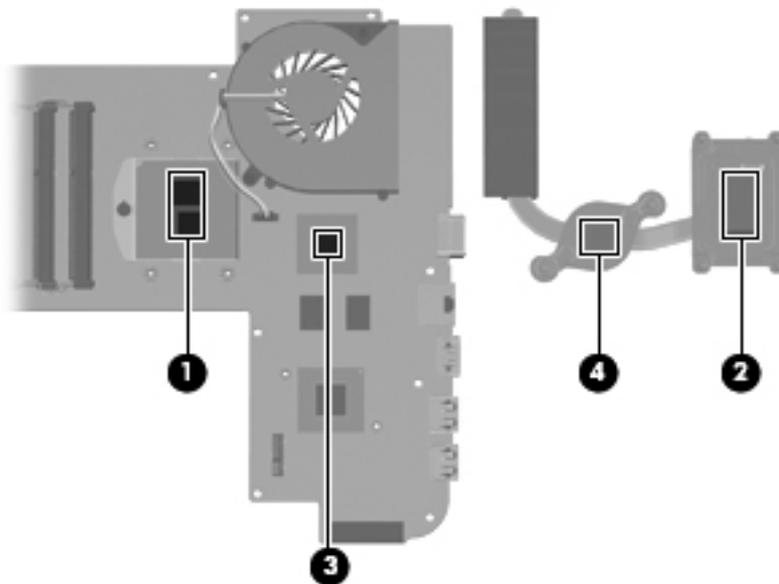
The following illustration shows the heat sink removal process on a computer model equipped with an Intel processor and a graphics subsystem with UMA memory.



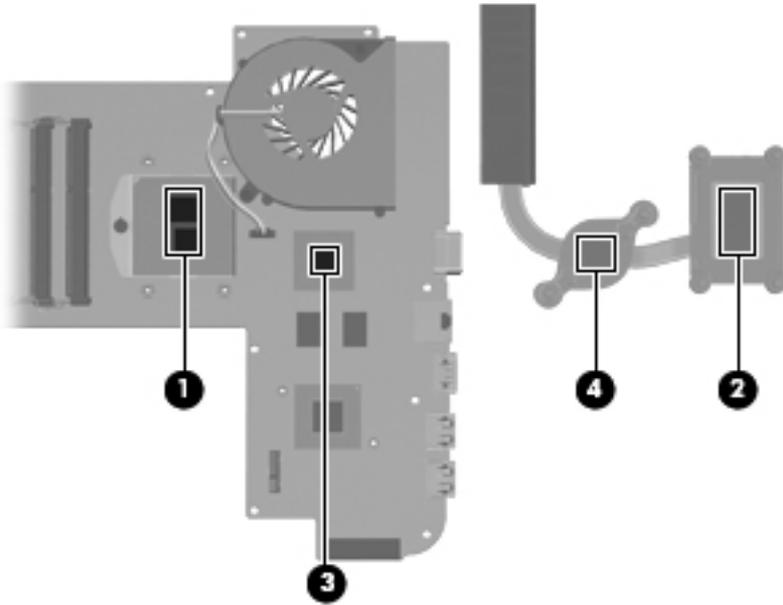
NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the base enclosure, heat sink, processor, and system board spare part kits.

The following illustration shows the replacement thermal material locations on a computer model equipped with an AMD processor and a graphics subsystem with discrete memory.

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

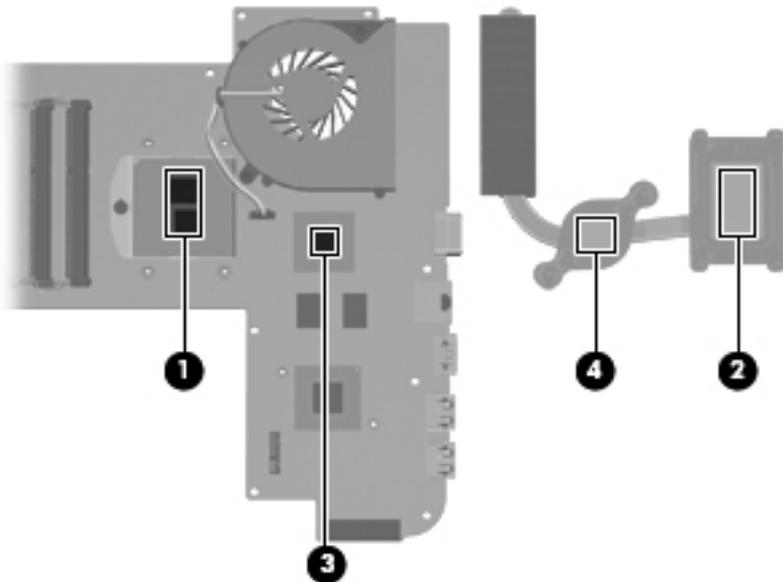


The following illustration shows the replacement thermal material locations on a computer model equipped with an AMD processor and a graphics subsystem with UMA memory.



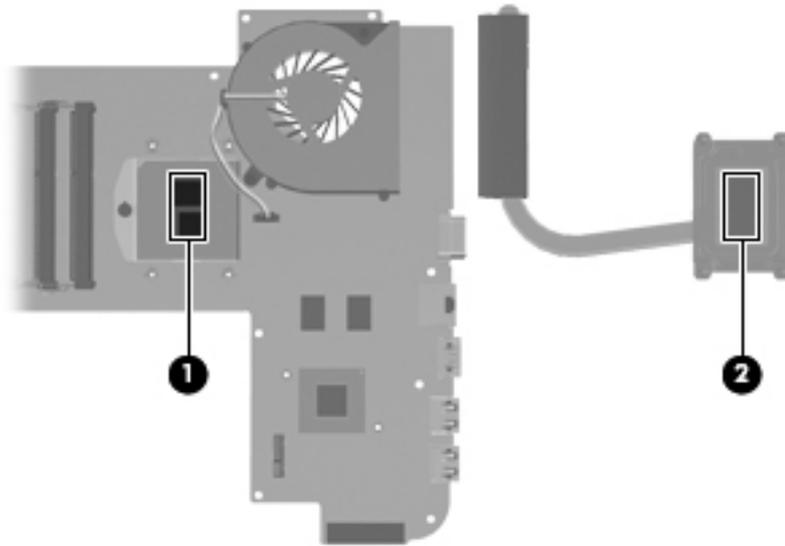
- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- A thermal pad is used on the graphics Southbridge chip **(3)** and the heat sink section **(4)** that services it

The following illustration shows the replacement thermal material locations on a computer model equipped with an Intel processor and a graphics subsystem with discrete memory.



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

The following illustration shows the replacement thermal material locations on a computer model equipped with an Intel processor and a graphics subsystem with UMA memory. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



Reverse this procedure to install the heat sink.

Processor

 **NOTE:** The heat sink spare part kit includes replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 651046-001.

Description	Spare part number
AMD Sabine A8-3530MX 2.6-GHz processor (1.9-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	653364-001
AMD Sabine A8-3510MX 2.5-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	653358-001
AMD Sabine A8-3500M 2.4-GHz processor (1.5-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W)	653350-001
AMD Sabine A6-3410MX 2.3-GHz processor (1.6-GHz FSB, 4.0-MB L2 cache, Quad Core, 45 W)	653357-001
AMD Sabine A6-3400M 2.3-GHz processor (1.4-GHz FSB, 4.0-MB L2 cache, Quad Core, 35 W)	653349-001
AMD Sabine A4-3310MX 2.5-GHz processor (2.1-GHz FSB, 2.0-MB L2 cache, Dual Core, 45 W)	653356-001
AMD Sabine A4-3300M 2.5-GHz processor (1.9-GHz FSB, 2.0-MB L2 cache, Dual Core, 35 W)	653348-001
Intel Core i5-2540M 2.60-GHz (SC turbo up to 3.30-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)	631253-001
Intel Core i5-2520M 2.50-GHz (SC turbo up to 3.20-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)	631255-001
Intel Core i5-2430M 2.40-GHz (SC turbo up to 3.00-GHz) processor (3.0-MB L3 cache, dual core, 35 W)	653341-001
Intel Core i5-2410M 2.30-GHz (SC turbo up to 2.90-GHz) processor (3.0-MB L3 cache, Dual Core, 35 W)	638039-001
Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)	653340-001
Intel Core i3-2330M 2.20-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)	653339-001
Intel Core i3-2310M 2.10-GHz processor (3.0-MB L3 cache, Dual Core, 35 W)	638037-001

Description	Spare part number
Intel Pentium B960 2.20-GHz processor (TJ85, 2.0-MB L3 cache, dual core, 35 W, TDP)	664662-001
Intel Pentium B950 2.10-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP)	653338-001
Intel Pentium B940 2.00-GHz processor (TJ85, 2.0-MB L2 cache, Dual Core, 35 W, TDP)	653337-001

Before removing the processor, follow these steps:

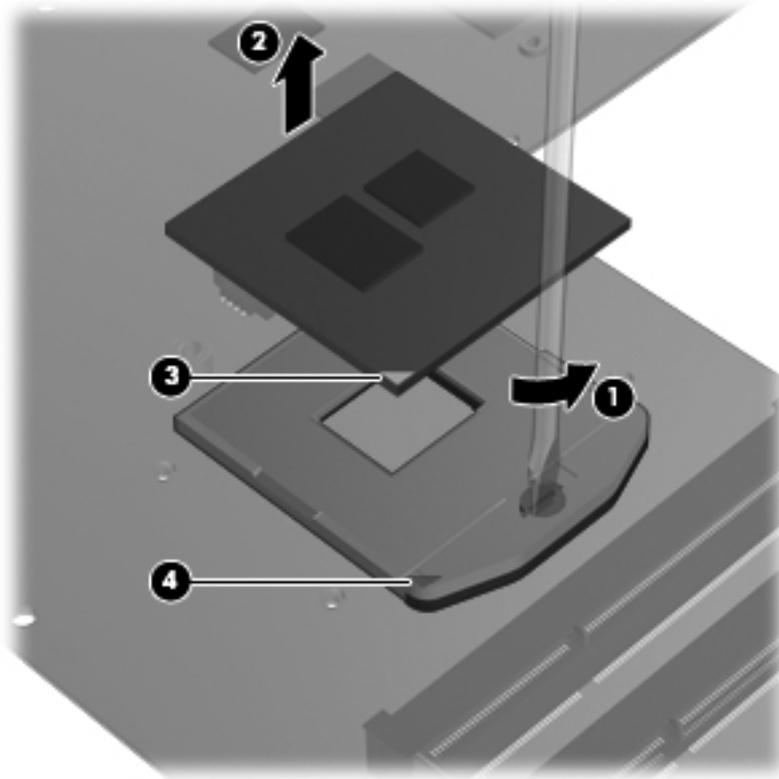
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 44](#))
 - b. WWAN module (see [WWAN module on page 47](#))
 - c. Optical drive (see [Optical drive on page 52](#))
 - d. Hard drive (see [Hard drive on page 55](#))
 - e. Keyboard (see [Keyboard on page 57](#))
 - f. Top cover (see [Top cover on page 60](#))
 - g. System board ([System board on page 76](#))
 - h. Heat sink ([Heat sink on page 80](#))

Remove the processor:

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

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

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



Reverse this procedure to install the processor.

Fan

Description	Spare part number
For use only with computer models equipped with a graphics subsystem with discrete video memory	654465-001
For use only with computer models equipped with a graphics subsystem with UMA video memory	650460-001

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

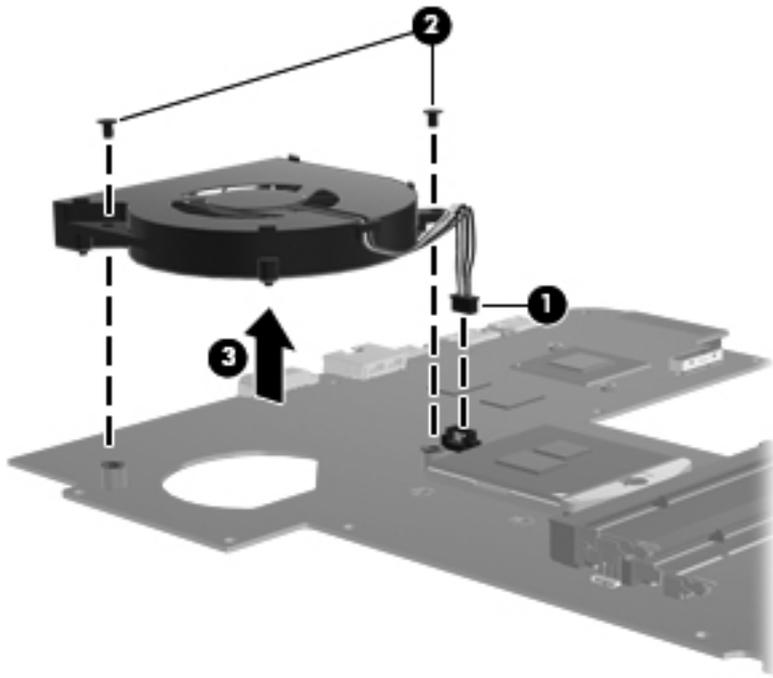
Before removing the fan, follow these steps:

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 41](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 44](#))
 - b. WWAN module (see [WWAN module on page 47](#))
 - c. Optical drive (see [Optical drive on page 52](#))
 - d. Hard drive (see [Hard drive on page 55](#))
 - e. Keyboard (see [Keyboard on page 57](#))
 - f. Top cover (see [Top cover on page 60](#))
 - g. System board (see [System board on page 76](#))

Remove the fan:

1. Turn the system board upside down, with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the fan to the system board.

4. Remove the fan **(3)**.



Reverse this procedure to install the fan.

Speakers

Description	Spare part number
Speaker Kit (includes cable)	650484-001

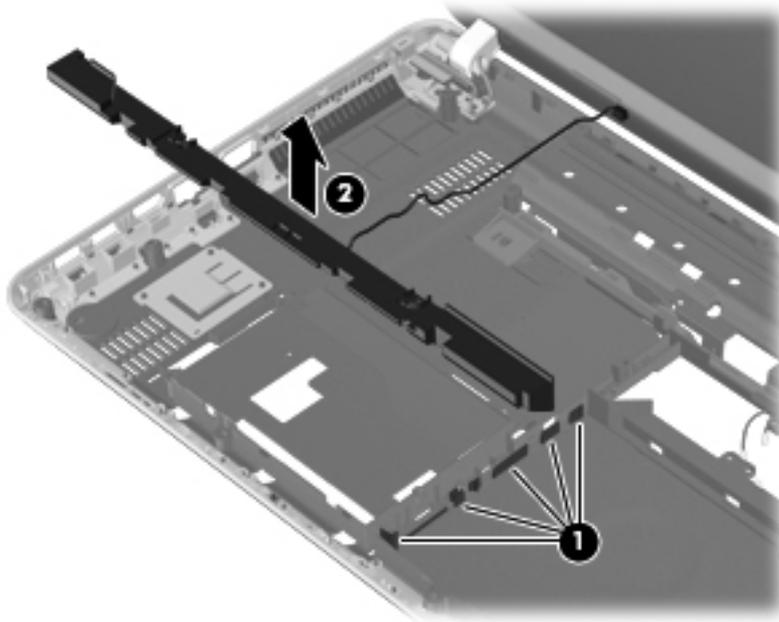
Before removing the speakers, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 44](#))
 - b. WWAN module (see [WWAN module on page 47](#))
 - c. Optical drive (see [Optical drive on page 52](#))
 - d. Hard drive (see [Hard drive on page 55](#))
 - e. Keyboard (see [Keyboard on page 57](#))
 - f. Top cover (see [Top cover on page 60](#))
 - g. System board (see [System board on page 76](#))

Remove the speakers:

1. Release the speaker cable **(1)** from the clips built into the base enclosure.

2. Remove the speakers (2).



Reverse this procedure to install the speakers.

Display assembly

Description	Spare part number
14.0-in, high definition (HD), light-emitting diode (LED), BrightView SVA display assembly (includes microphone and wireless antenna transceivers and cables):	
In espresso black finish	650463-001
In Pacific blue finish	650465-001
In ruby red finish	650467-001

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 41](#)), and then remove the following components:
 - a. WLAN module (see [WLAN module on page 44](#))
 - b. WWAN module (see [WWAN module on page 47](#))

- c. Optical drive (see [Optical drive on page 52](#))
- d. Hard drive (see [Hard drive on page 55](#))
- e. Keyboard (see [Keyboard on page 57](#))
- f. Top cover (see [Top cover on page 60](#))

Remove the display assembly:

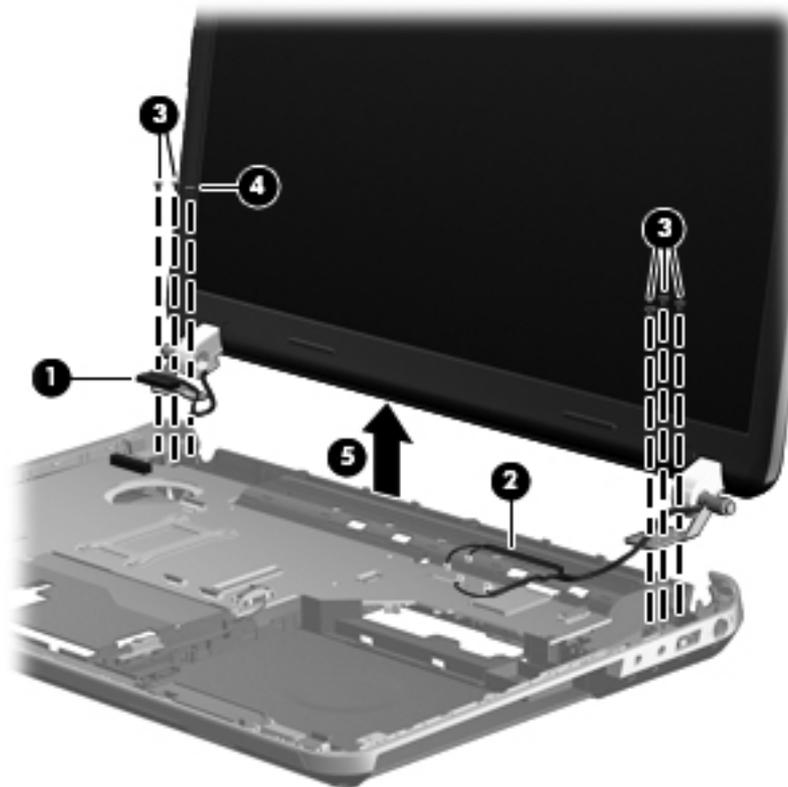
1. Disconnect the display panel cable **(1)** from the system board.
2. Release the wireless antenna cables from the clips **(2)** built into the base enclosure.

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

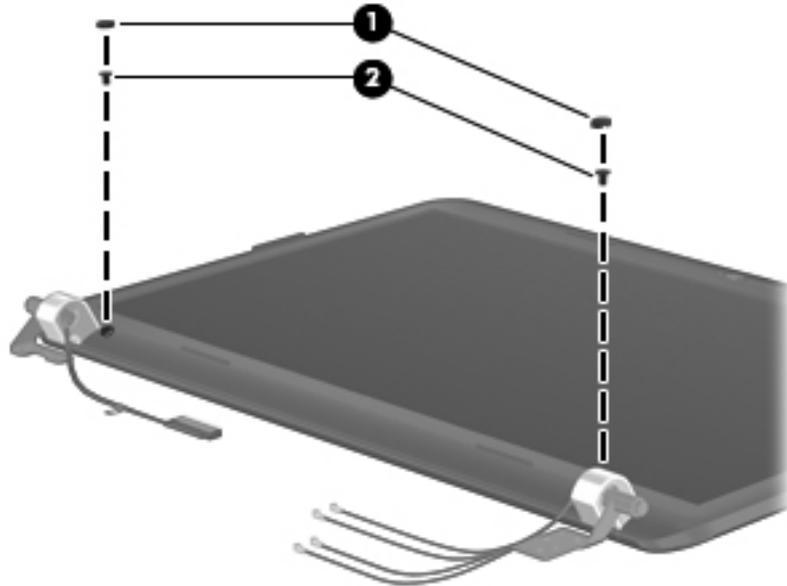
3. Remove the six Phillips PM2.5×7.0 screws **(3)** that secure the display assembly to the computer.

📝 NOTE: The right-most screw **(4)** on the left display hinge secures a ground loop on the display panel cable.

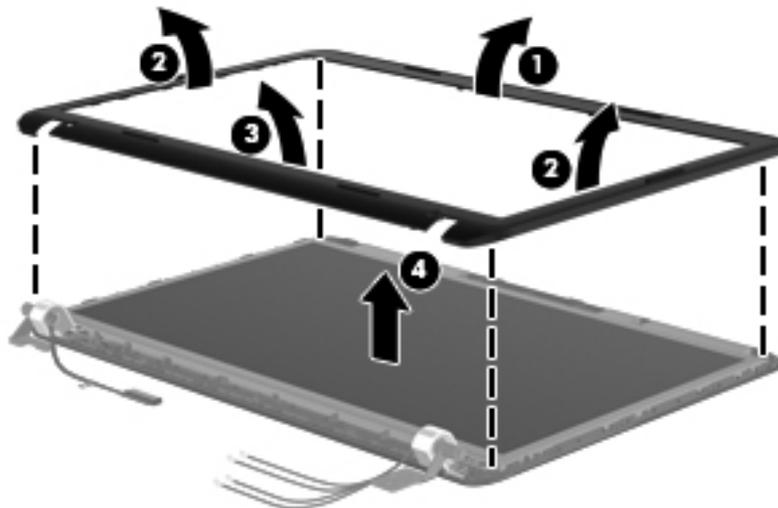
4. Remove the display assembly **(5)**.



5. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
- a. Remove the two screw covers **(1)** and the two Phillips PM2.5×4.5 screws **(2)** that secure the display bezel to the display assembly. The screw covers are available in the Display Rubber Kit, spare part number 650481-001.

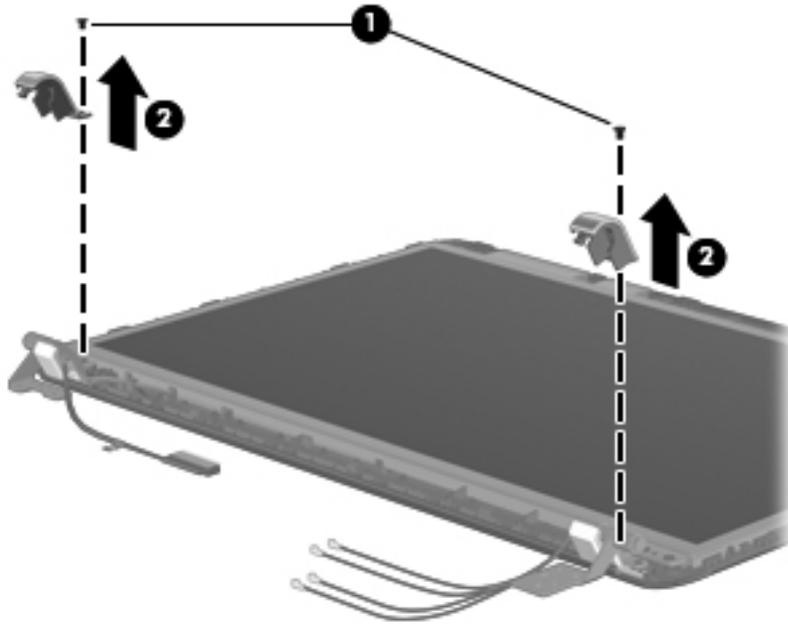


- b. Flex the inside edges of the top edge **(1)**, the left and right sides **(2)**, and the bottom edge **(3)** of the display bezel until the bezel disengages from the display enclosure.
- c. Remove the display bezel **(4)**. The display bezel is available using spare part number 650454-001.



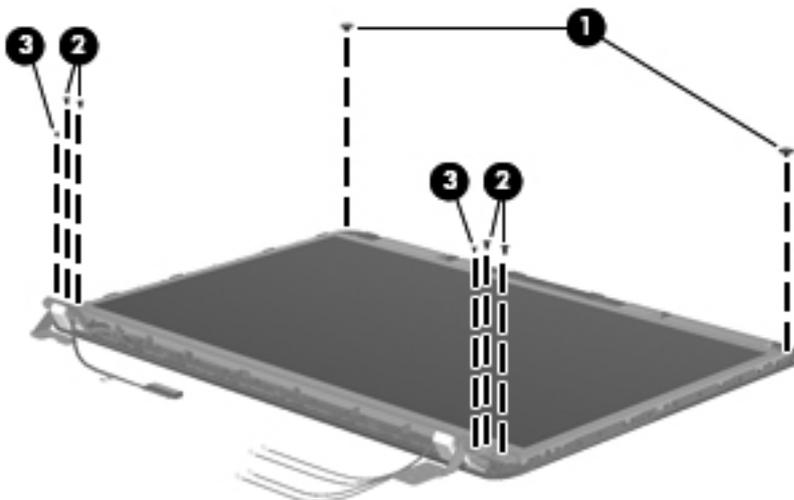
6. If it is necessary to replace the hinge covers:
- a. Remove the two Phillips PM2.5×4.0 **(1)** screws that secure the hinge covers to the display enclosure.

- b. Remove the hinge covers (2). The hinge covers are available using spare part number 650462-001.



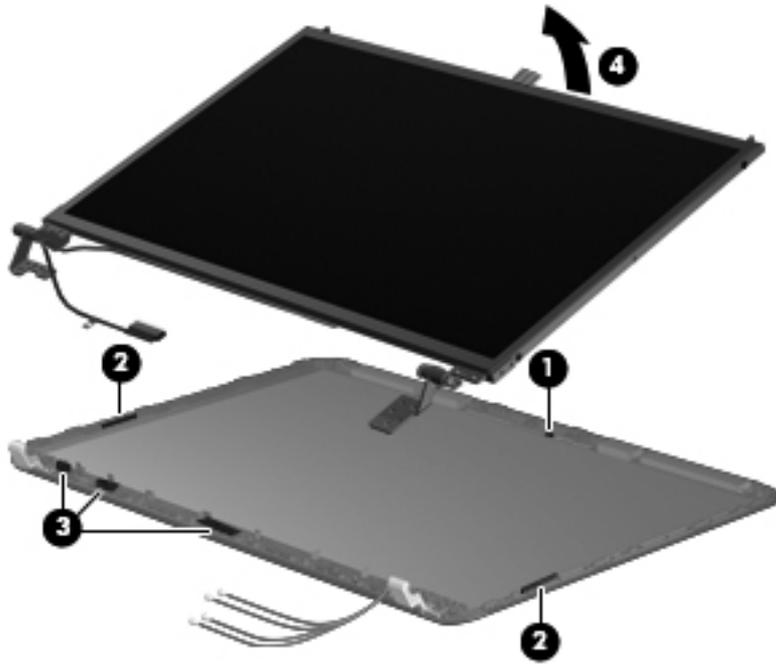
7. If it is necessary to replace the display panel:

- a. Remove the following screws that secure the display panel to the display enclosure:
- (1) Two Phillips PM2.5×3.5 broad head screws on the top edge of the display panel
 - (2) Four Phillips PM2.5×4.5 screws on the hinges
 - (3) Two Phillips PM2.0×3.0 screws on the bottom edge of the display panel



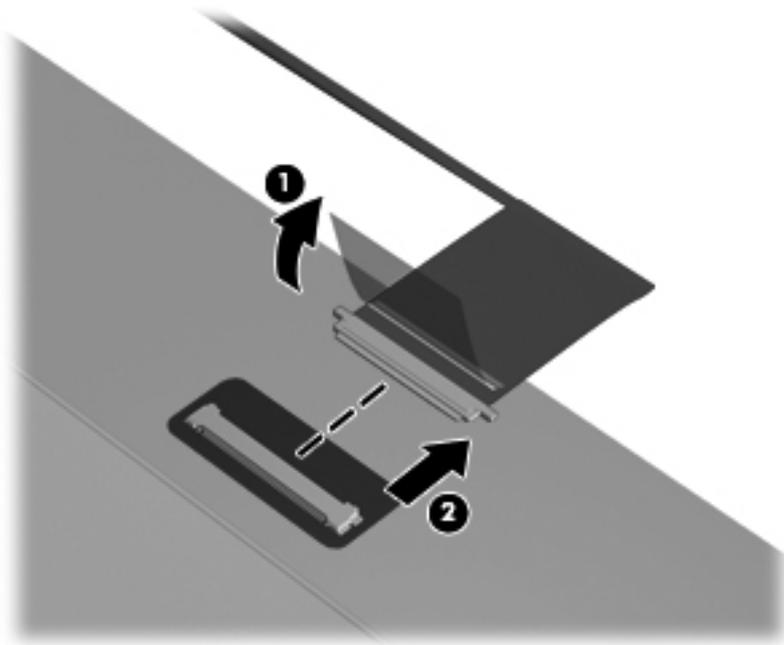
- b. Disconnect the webcam cable (1) from the webcam module.
- c. Release the tabs (2) on the left and right sides of the display panel.

- d. Release the display panel cable from the clips **(3)** and double-sided tape built into the bottom edge of the display enclosure.
- e. Lift the top edge of the display panel **(4)** until it rests at an angle.



- f. Remove the display panel. The display panel is available using spare part number 650479-001.
- 8.** If it is necessary to replace the display panel cable:
- a. Turn the display panel upside down, with the top toward you.
 - b. Release the adhesive strip **(1)** that secures the display panel cable to the display panel.

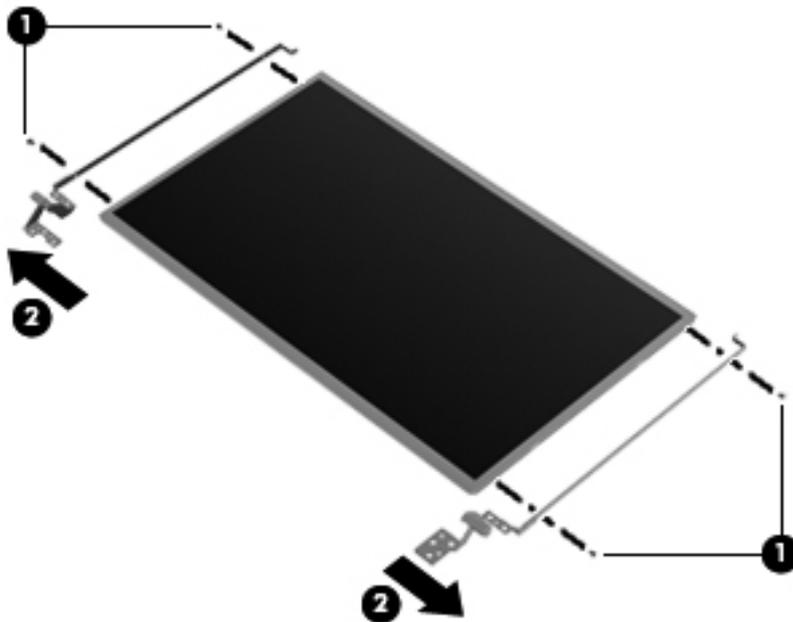
- c. Disconnect the display panel cable (2) from the display panel.



- d. Remove the display panel cable. The display panel cable is available using spare part number 650455-001.

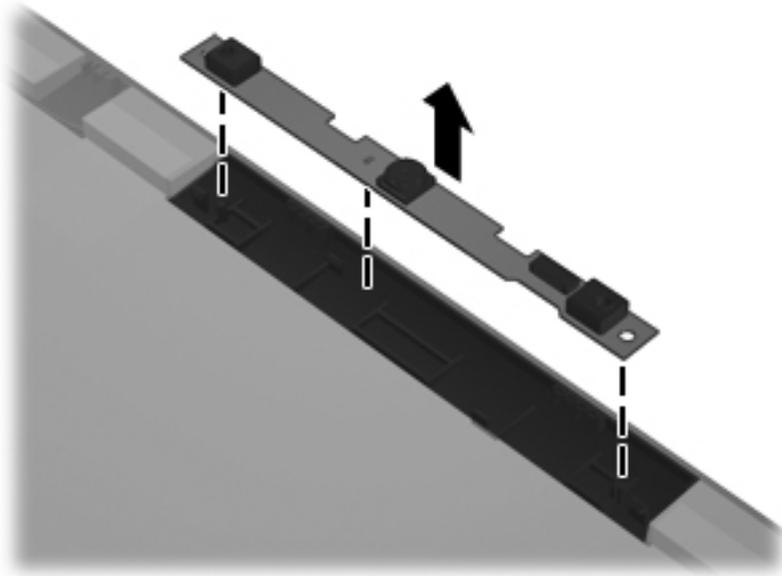
9. If it is necessary to replace the display hinges:

- a. Remove the four Phillips PM2.0×3.0 screws (1) that secure the display hinges to the display panel.
- b. Remove the display hinges (2). The display hinges include the display hinges and brackets and are available using spare part number 650461-001.



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

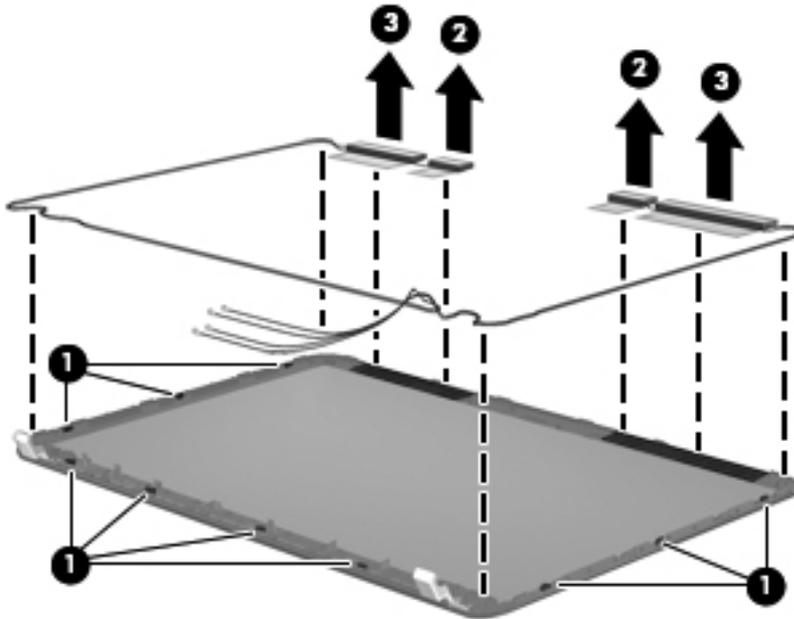
- ▲ Detach and remove the webcam/microphone module from the display enclosure. (The module is attached to the display enclosure with double-sided tape.) The webcam/microphone module is available using spare part number 650494-001.



11. If it is necessary to replace the wireless antenna cables and transceivers:

- a. Release the wireless antenna cables from the clips **(1)** and routing channels built into the display enclosure.

- b.** Detach the WLAN transceivers **(2)** and the WWAN transceivers **(3)** from the display enclosure. (The transceivers are attached to the display enclosure with doublesided tape.)



- c.** Remove the wireless antenna cables and transceivers. The WLAN antenna are available using spare part number 650444-001. The WWAN antenna are available using spare part number 650445-001.

Reverse this procedure to reassemble and install the display assembly.

5 Setup Utility (BIOS) and System Diagnostics

Using Setup Utility

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

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

Starting Setup Utility

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

To start Setup Utility, follow these steps:

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

Changing the language of Setup Utility

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

Your change takes effect immediately.

Navigating and selecting in Setup Utility

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

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
 - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
 - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
 - To close open dialog boxes and return to the main Setup Utility screen, press **esc**, and then follow the on-screen instructions.
2. Press **f10** to enter Setup Utility.

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

- To exit Setup Utility menus without saving your changes, press the **esc** key, and then follow the on-screen instructions.
– or –
Use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.
- To save your changes and exit Setup Utility menus, press **f10**, and then follow the on-screen instructions.
– or –
Use the tab key and the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your changes go into effect when the computer restarts.

Displaying system information

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

Restoring factory settings in Setup Utility

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

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

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Setup Utility.
3. Use the arrow keys to select **Exit > Load Setup Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, press **f10**, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your changes go into effect when the computer restarts.

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

Exiting Setup Utility

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

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

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

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Setup Utility (BIOS).
2. Use the arrow keys to select **Main**.
3. To exit Setup Utility (BIOS) without saving your changes, use the tab key and the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

Downloading a BIOS update

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

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

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

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

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

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

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

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

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

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



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

Using System Diagnostics

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

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

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

To start System Diagnostics:

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



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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Depth	23.56 cm	9.28 in
Width	33.92 cm	13.36 in
Height (front to back)	3.09 to 3.26 cm	1.22 to 1.28 in
Weight	2.26 kg	4.98 lb
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W or 19.0 V dc @ 4.74 A - 90 W	
Operating current	3.5 A - 65 W or 4.74 A - 90 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

14.0-inch display specifications

	Metric	U.S.
Dimensions		
Height	17.6 cm	6.93 in
Width	31.2 cm	12.28 in
Diagonal	35.7 cm	14.06 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	2.0 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

Hard drive specifications

	1-TB*	750-GB**	640-GB**
Dimensions			
Height	12.7 mm	7.0 mm	7.0 mm
Length	100.2 mm	100.2 mm	100.2 mm
Width	69.9 mm	69.9 mm	69.9 mm
Weight	152 g	110 g	98 g
Interface type	SATA	SATA	SATA
Transfer rate			
Synchronous (maximum)	97 MB/sec	97 MB/sec	106 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	2.0 ms	2.0 ms	1.5 ms
Average (read/write)	12/16 ms	12/16 ms	12/13 ms
Maximum	21 ms	21 ms	24 ms
Logical blocks	1,953,525,168	1,465,149,168	1,250,263,728
Disk rotational speed	5400 rpm	72 rpm	7200 rpm
Operating temperature	0°C to 60°C (32°F to 140°F)		
* 1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
** 1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.			

Hard drive specifications *(continued)*

	500-GB**	320-GB**
Dimensions		
Height	7.0 mm	7.0 mm
Length	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm
Weight	110 g	110 g
Interface type	SATA	
Transfer rate		
Synchronous (maximum)	1.1 GB/sec	1.1 GB/sec
Security	ATA security	ATA security
Seek times (typical read, including setting)		
Single track	1.5 ms	1.5 ms
Average (read/write)	11/13 ns	11/13 ns
Maximum	22 ms	22 ms
Logical blocks	976,773,168	628,142,448
Disk rotational speed	7200 rpm	
Operating temperature	0°C to 60°C (32°F to 140°F)	
*1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.		
**1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.		
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.		

7 Backup and recovery

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

This chapter provides information on the following topics:

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

Restore

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

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

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

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

Creating restore media

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

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

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

Guidelines:

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

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

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

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

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

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

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

Performing a system restore

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

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

Note the following when performing a system restore:

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

Restoring using the dedicated recovery partition (select models only)

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

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

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

Restoring using the restore media

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

– or –

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

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

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

Changing the computer boot order

To change the boot order for recovery discs:

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

To change the boot order for recovery flash drive:

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

Backing up and recovering your information

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

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

 **NOTE:** A recovery from your most recent backup needs to be performed if the computer has a virus attack or if any major system components fail. In order to correct computer issues, a recovery should first be attempted before a system restore is attempted.

You can back up your information to an optional external hard drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times

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

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

Guidelines:

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

To create a screen shot:

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

To copy only the active window, press [alt+prt sc](#).

To copy the entire screen, press [prt sc](#).

3. Open a word-processing document, and then select **Edit > Paste**. The screen image is added to the document.
4. Save and print the document.

Using Windows Backup and Restore

Guidelines:

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

To create a backup:

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

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

Using Windows system restore points

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

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

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

When to create restore points

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

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

Create a system restore point

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

Restore to a previous date and time

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

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

8 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC, or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

9 Recycling

Battery

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

Display

⚠ WARNING! The backlight contains mercury. Caution must be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

⚠ CAUTION: The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

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

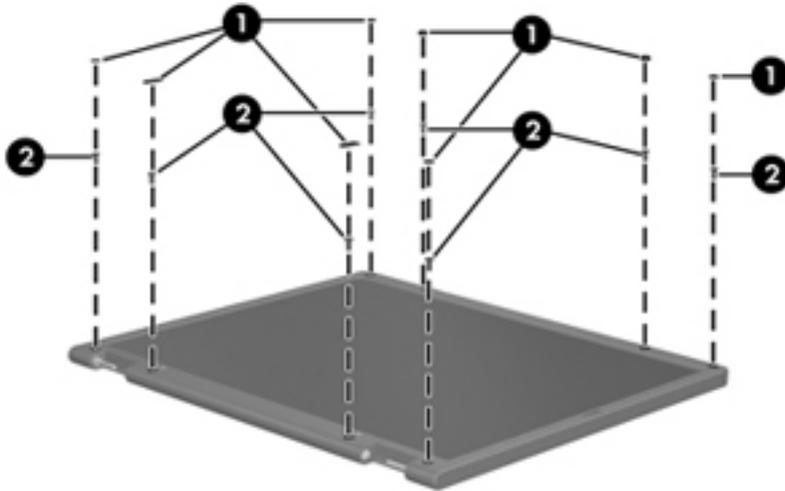
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



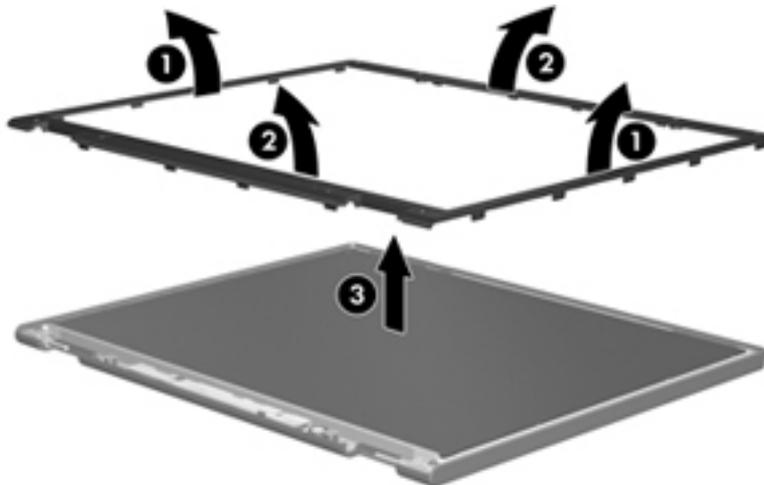
📄 NOTE: The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps:

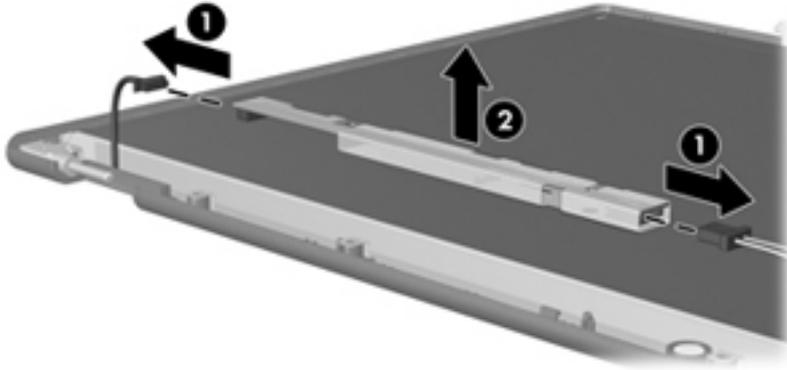
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



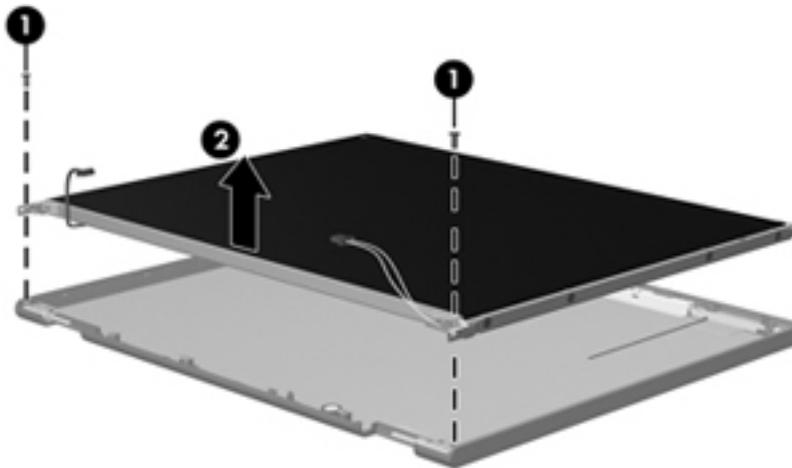
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel **(3)**.



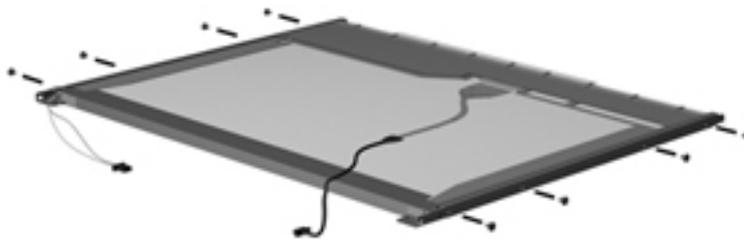
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **(2)**.



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

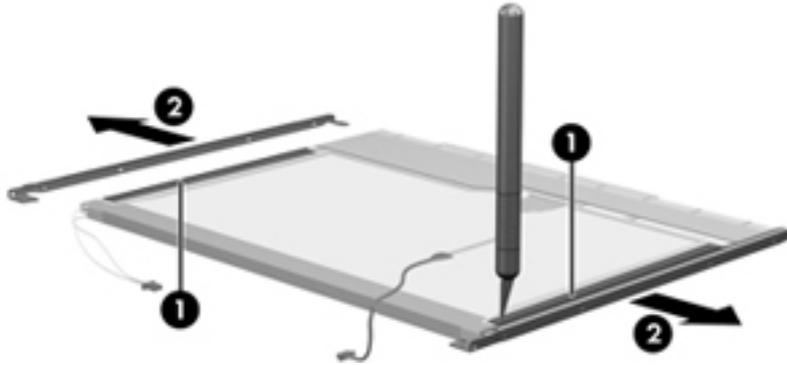


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



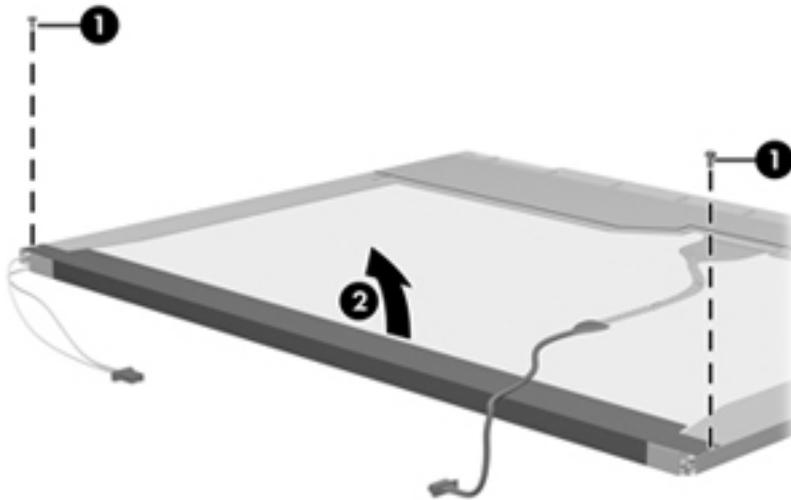
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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



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

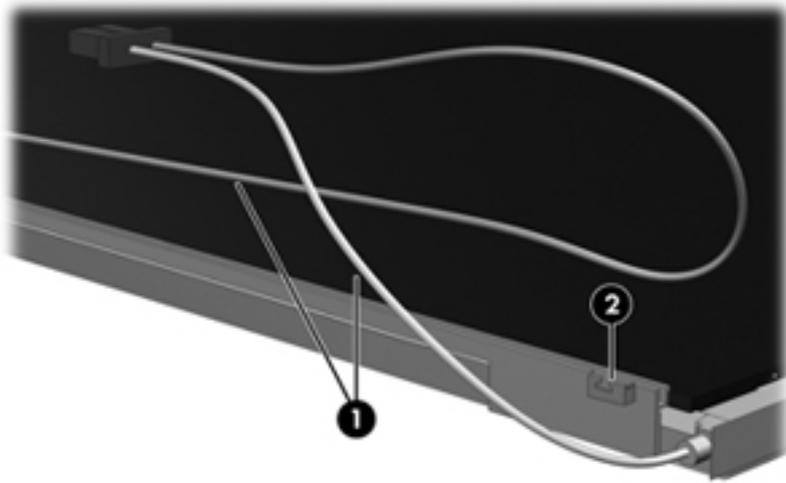
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



13. Remove the backlight cover.

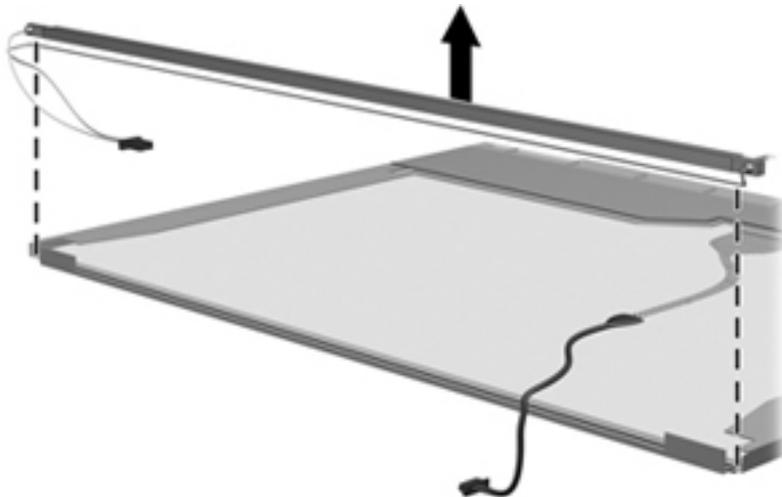
14. Turn the display panel right-side up.

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



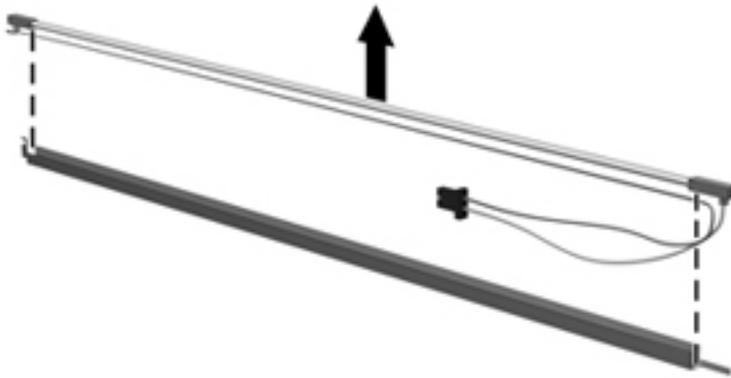
16. Turn the display panel upside down.

17. Remove the backlight frame from the display panel.



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

18. Remove the backlight from the backlight frame.

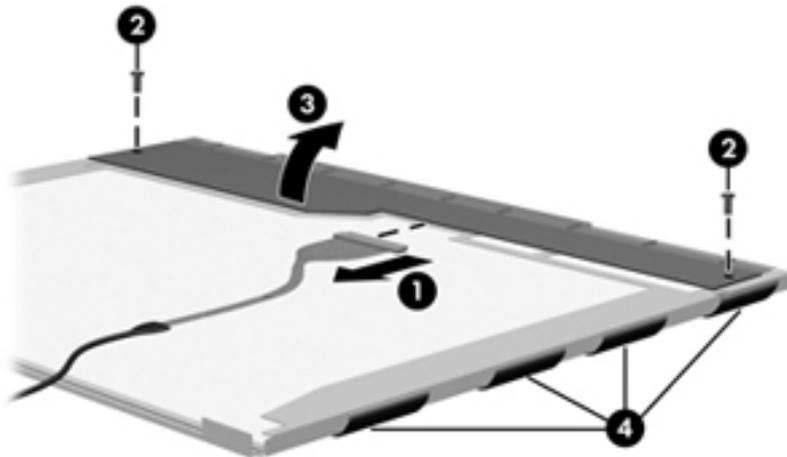


19. Disconnect the display cable **(1)** from the LCD panel.

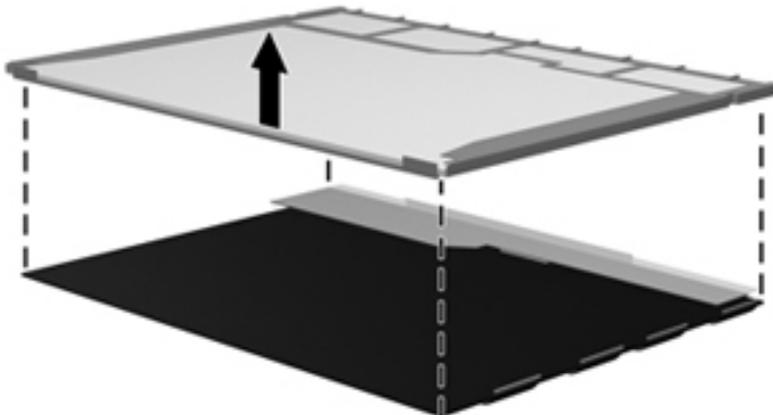
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.

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

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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

Index

A

- AC adapter light 15
- AC adapter, spare part numbers 27, 29
- Action keys 11
- antenna
 - locations 9
 - removal 97
 - spare part numbers 24, 30, 98
- Antenna Kit, spare part numbers 24, 98
- audio, product description 4
- audio-in jack 15
- audio-out jack 15
- audio/USB board
 - removal 73
 - spare part numbers 20, 31, 33
- audio/USB board cable, illustrated 25

B

- base enclosure, spare part number 22, 30
- battery
 - removal 41
 - spare part numbers 22, 29, 30, 41
- battery bay 16
- battery release latch 16
- Blu-ray ROM DVD±R/RW FX Super Multi Double-Layer Drive
 - precautions 35
 - removal 52
 - spare part number 22, 26, 33, 52

- Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive
 - precautions 35
 - removal 52
 - spare part number 22, 26, 31, 52
- bottom components 16
- button components 10
- buttons
 - power 10
 - TouchPad 13
 - TouchPad on/off 13
 - Web browser 10

C

- Cable Kit
 - contents 25
 - spare part number 25, 32
- cables, service considerations 34
- caps lock light 12
- chipset, product description 2
- components
 - bottom 16
 - buttons 10
 - display 9
 - front 8
 - keys 11
 - left-side 14
 - lights 12
 - right-side 15
 - TouchPad 13
- computer feet
 - locations 40
 - spare part number 40
- computer major components 19
- computer part number 39
- computer specifications 104
- connectors, service considerations 34

D

- Digital Media Slot 8
- display assembly
 - removal 91
 - spare part numbers 20, 30, 31, 91
 - subcomponents 24
- display bezel
 - removal 93
 - spare part number 24, 30, 93
- Display Cable Kit, spare part number 24, 30, 96
- display components 9
- display enclosure, spare part numbers 24, 30
- Display Hinge Kit, spare part number 24, 30
- display panel
 - product description 3
 - removal 94
 - spare part number 24, 31, 95
- display panel cable
 - removal 95
 - spare part number 24, 96
- Display Rubber Kit, spare part number 25, 31
- Display Screw Kit, spare part number 25, 31
- display specifications 105
- drives, preventing damage 35
- DVD±RW and CD-RW FX Super Multi Double-Layer Combo Drive
 - precautions 35
 - removal 52
 - spare part number 22, 27, 33, 52
- DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
 - precautions 35

- removal 52
- spare part number 22, 27, 31, 52

E

- electrostatic discharge 35
- equipment guidelines 38
- esc key 11
- Ethernet, product description 4
- external media cards, product description 5
- external monitor port 14

F

- fan
 - removal 88
 - spare part numbers 22, 30, 33, 88
- feet
 - locations 40
 - spare part number 40
- fn key 11
- front components 8

G

- graphics, product description 2
- grounding guidelines 35
- guidelines
 - equipment 38
 - grounding 35
 - packaging 37
 - transporting 37
 - workstation 37

H

- hard drive
 - precautions 35
 - product description 3
 - removal 55
 - spare part numbers 23, 26, 29, 30, 55
 - specifications 106
- hard drive bay 16
- hard drive bracket, removal 57
- hard drive compartment cover
 - illustrated 28
 - removal 55
- hard drive connector cable
 - illustrated 25
 - removal 57

- Hard Drive Hardware Kit, spare part number 23, 26, 32, 55
- hard drive light 14
- HDMI port 14
- headphone jack 15
- heat sink
 - removal 80
 - spare part numbers 22, 30, 32, 80
- hinge
 - removal 96
 - spare part number 24, 30
- hinge cover
 - removal 93
 - spare part number 24, 30, 94

J

- jacks
 - audio-in 15
 - audio-out 15
 - headphone 15
 - microphone 15
 - network 14
 - RJ-45 14

K

- key components 11
- keyboard
 - product description 6
 - removal 57
 - spare part numbers 20, 31, 33, 57

keys

- Action 11
- esc 11
- fn 11
- Windows applications 11
- Windows logo 11

L

- left-side components 14
- light components 12
- lights
 - AC adapter 15
 - caps lock 12
 - hard drive 14
 - mute 12
 - optical drive 15
 - power 12, 14
 - TouchPad 13

- webcam 9
- wireless 12

M

- mass storage device
 - precautions 35
 - removal 55
 - spare part numbers 26, 55
- memory module
 - product description 3
 - removal 50
 - spare part numbers 23, 29, 30, 50
- memory module/wireless module compartment 16
- memory module/wireless module compartment cover
 - illustrated 28
 - removing 45
- microphone
 - location 9
 - product description 4
- microphone jack 15
- model description 40
- model name 1
- monitor port 14
- mute light 12

N

- network jack 14

O

- operating system, product description 6
- optical drive
 - location 15
 - precautions 35
 - product description 4
 - removal 52
 - spare part numbers 22, 26, 31, 33, 52
- optical drive bay space saver, spare part number 22, 33, 52
- optical drive bracket, removal 53
- optical drive connector cable
 - removal 71
 - spare part number 20, 30
- optical drive light 15

P

- packaging guidelines 37

- plastic parts, service considerations 34
- Plastics Kit
 - contents 28
 - spare part number 21, 28, 31, 56
- pointing device, product description 6
- ports
 - external monitor 14
 - HDMI 14
 - monitor port 14
 - product description 6
 - USB 14, 15
- power button 10
- power button board
 - removal 65
 - spare part number 20, 31, 65
- power connector 15
- power connector cable
 - removal 74
 - spare part number 21, 30
- power cord
 - set requirements 115
 - spare part numbers 27, 29
- power light 12, 14
- power requirements, product description 6
- processor
 - product description 1
 - removal 85
 - spare part numbers 21, 29, 30, 32, 33, 85
- product description
 - audio 4
 - chipset 2
 - display panel 3
 - Ethernet 4
 - external media cards 5
 - graphics 2
 - hard drives 3
 - keyboard 6
 - memory module 3
 - microphone 4
 - operating system 6
 - optical drive 4
 - pointing device 6
 - ports 6
 - power requirements 6
 - processors 1
 - product name 1
 - security 6
 - serviceability 7
 - video 4
 - wireless 4
- product name 1, 39
- product number 39

R

- removal/replacement
 - preliminaries 34
 - procedures 39
- right-side components 15
- RJ-45 jack 14
- RTC battery
 - removal 49
 - spare part number 23, 29, 49
- Rubber Feet Kit, spare part number 22, 31, 40

S

- Screw Kit, spare part number 27, 31
- security cable slot 14
- security, product description 6
- serial number 39
- service considerations
 - cables 34
 - connectors 34
 - plastic parts 34
- service tag 18, 39
- serviceability, product description 7
- SIM slot 16
- SIM, removal 42
- Speaker Kit, spare part number 90
- speakers
 - location 8
 - removal 90
 - spare part number 22, 31, 90
- specifications
 - computer 104
 - display 105
 - hard drive 106
- system board
 - removal 76
 - spare part numbers 21, 31, 32, 76

T

- Thermal Material, spare part number 32
- tools required 34
- top cover
 - removal 60
 - spare part numbers 20, 31, 32, 60
- TouchPad button 13
- TouchPad button board
 - removal 69
 - spare part number 20, 31, 69
- TouchPad cable, disconnection 63
- TouchPad components 13
- TouchPad LED board
 - removal 67
 - spare part number 20, 31, 67
- TouchPad light 13
- TouchPad on/off button 13
- TouchPad zone 13
- transporting guidelines 37

U

- USB port 14, 15

V

- vents 14, 16
- video, product description 4

W

- warranty period 40
- Web browser button 10
- webcam 9
- webcam light 9
- webcam/microphone module
 - removal 97
 - spare part number 24, 32
- Windows applications key 11
- Windows logo key 11
- wireless antenna
 - locations 9
 - removal 97
 - spare part numbers 24, 30, 98
- wireless light 12
- wireless, product description 4
- WLAN Antenna Kit, spare part numbers 30

- WLAN module
 - removal 44
 - spare part numbers 23, 29, 30, 33, 44
- workstation guidelines 37
- WWAN Antenna Kit, spare part numbers 30
- WWAN module
 - removal 47
 - spare part numbers 23, 29, 47

