



HP Pavilion dm3 Entertainment PC

Maintenance and Service Guide

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This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; on troubleshooting computer problems; and on performing computer disassembly procedures.

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Safety warning notice

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

Category	Description
Product Name	HP Pavilion dm3 Entertainment PC
Processors	AMD Athlon™ II Neo Processor K125 (1.7GHz, 1M L2 cache) AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache) AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache)
Chipset	ATI Mobility Radeon™ HD 4225 Graphics Southbridge SB820M AMD RS880MD
Graphics	ATI Mobility Radeon™ HD 4225 Graphics with 128MB sideport memory (64Mx16 DDR3 800MHz) ATi Park LP (ATI Mobility Radeon™ HD5430) with 512MB of dedicated video memory (64Mx16 DDR3 800MHz x 4 PCs) Support Blu-ray playback with HD Decode, DX10.1 and DX11 Support and HDMI Support
Panels	33.8-cm (13.3-in) HD LED BrightView (1366x768) (5.2mm) SVA
Memory	2 customer-accessible/upgradable memory module slots Supports up to 8GB memory . Supports the following DDR3 configurations at 800 MHz: <ul style="list-style-type: none">• 8192-MB total system memory (4096 × 2)• 6144-MB total system memory (2048 × 1 + 4096 × 1)• 4096-MB total system memory (2048 × 2)• 4096-MB total system memory (4096 × 1)• 3072-MB total system memory (1024 × 1 + 2048 × 1)• 2048-MB total system memory (1024 × 2)• 2048-MB total system memory (2048 × 1)• 1024-MB total system memory (1024 × 1)

Category	Description
Hard drives	<ul style="list-style-type: none"> Supports 9.5-mm, 6.35-cm (2.5-inch) hard drives Serial ATA (SATA) HP ProtectSmart Hard Drive Protection Customer-accessible
	640-GB, 5400-rpm
	500-GB, 7200-rpm
	320-GB, 7200-rpm
	250-GB, 7200-rpm
	160-GB, 7200-rpm
	Support for 128-GB SSD in single HDD configurations
Optical drives	Supports only external optical drives
	<ul style="list-style-type: none"> 12.7-mm tray load Serial ATA (SATA) DVD±RW SuperMulti Double-Layer Drive with LightScribe External USB: Blu-ray ROM DVD±R/RW SuperMulti Double-Layer Drive with LightScribe
Webcam	Low-light VGA camera with fixed focus and microphone
Audio	<ul style="list-style-type: none"> 2 Altec/Lansing stereo speakers with enclosures Headphone jack Microphone jack
Ethernet	<ul style="list-style-type: none"> Integrated 10/100 network interface card (NIC) Ethernet cable not included
Wireless	Integrated wireless local-area network (WLAN) options via Half-Mini Card
	<ul style="list-style-type: none"> 802.11b/g WLAN with 2 antennas 802.11n WLAN + Bluetooth Combo with 2 antennas (electromagnetic only) 802.11n (low cost) 1x1+Bluetooth combo half-minicard with 2 antennas 802.11b/g/n with 2 antennas
	Integrated WWAN and GPS function (FMC):
	<ul style="list-style-type: none"> Qualcomm Gobi2/Birlion with 2 antennas 5 band antenna support: 2100/1800/1900/800/900 with additional GPS band x.x GHz antennas in display enclosure

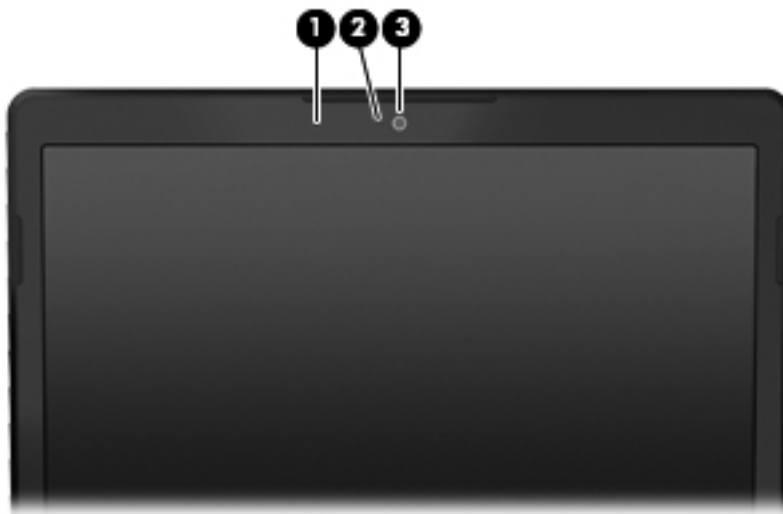
Category	Description
External media card	<p>Digital Media Slot, supporting the following optional digital card formats:</p> <ul style="list-style-type: none"> • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Memory Stick (MS) • Memory Stick Pro (MSP) • xD-Picture Card (XD) (also types H and M) <hr/> <p>SIM card slot:</p> <ul style="list-style-type: none"> • Populated with WWAN • User accessible
Ports	<p>Audio-in (stereo microphone)</p> <hr/> <p>Audio-out (stereo headphone)</p> <hr/> <p>Hot Plug/Unplug and auto detector for correct output to wide-aspect vs. standard-aspect video</p> <hr/> <p>HDMI v. 1.3b supporting 1080p with HDCP key</p> <hr/> <p>Multi-pin AC power (non-smart pin)</p> <hr/> <p>RJ-45 (Ethernet, includes link and activity lights)</p> <hr/> <p>USB 2.0 (4)</p> <hr/> <p>VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75 GHz and 1920 × 1200 external resolution at 60Hz</p>
Keyboard/pointing devices	<p>Full size keyboard</p> <hr/> <p>TouchPad with TouchPad buttons</p> <hr/> <p>Supports 2-way scroll with legend</p> <hr/> <p>Taps enabled by default</p> <hr/> <p>Touchpad on/off capability</p> <hr/> <p>Touchpad gesture to be default on; rotate gesture default off</p>
Power requirements	<p>65-W AC adapter (Non-smart ID Pin supported) with localized cable plug support</p> <hr/> <p>6-cell, 2.58-Ah (57-Wh) polymer battery</p>
Security	<p>Security cable slot</p>
Operating system	<p>Preinstalled:</p> <ul style="list-style-type: none"> • Windows® 7 Basic (32-bit) • Windows 7 Basic (64-bit) • Windows 7 Premium (32-bit)

Category	Description
	<ul style="list-style-type: none"> • Windows 7 Premium (64-bit)
	<ul style="list-style-type: none"> • Windows 7 Professional (32-bit)
	<ul style="list-style-type: none"> • Windows 7 Professional (64-bit)
	Microsoft® Office preinstalled on:
	<ul style="list-style-type: none"> • Windows 7 Home Basic (32-bit and 64-bit)
	<ul style="list-style-type: none"> • Windows 7 Home Premium (32-bit and 64-bit)
	<ul style="list-style-type: none"> • Windows 7 Professional (32-bit and 64-bit)
Serviceability	End-user replaceable parts:
	AC adapter
	Battery (system)
	Hard drive
	Memory modules
	Wireless modules
	RTC battery
	MiniCard components

2 External component identification

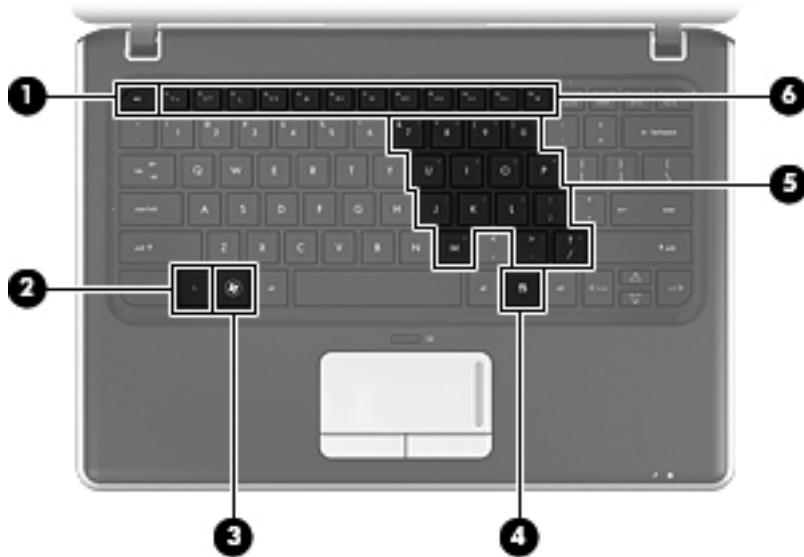
Top components

Display components



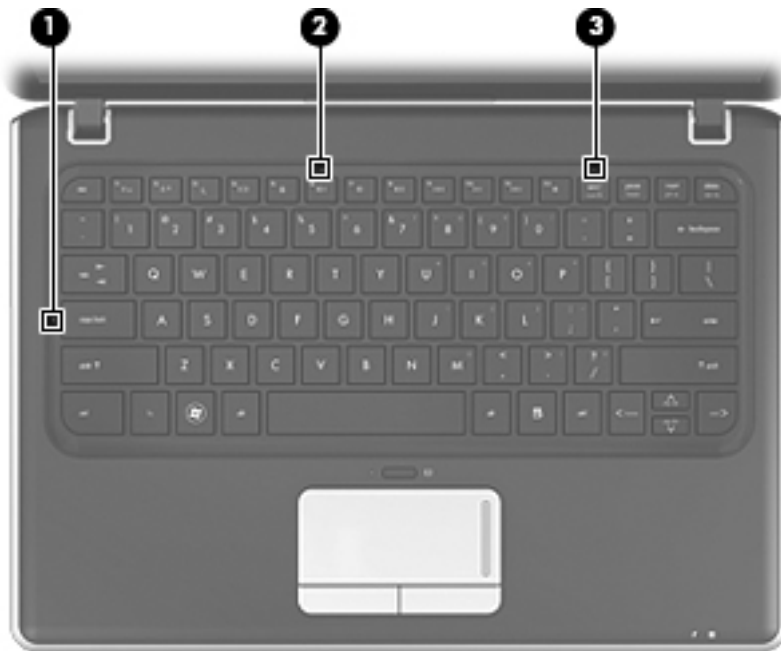
Item	Component	Function
(1)	Internal microphones (2)	Record sound.
(2)	Webcam light	On: The webcam is in use.
(3)	Webcam	Records video and captures still photographs.

Keys



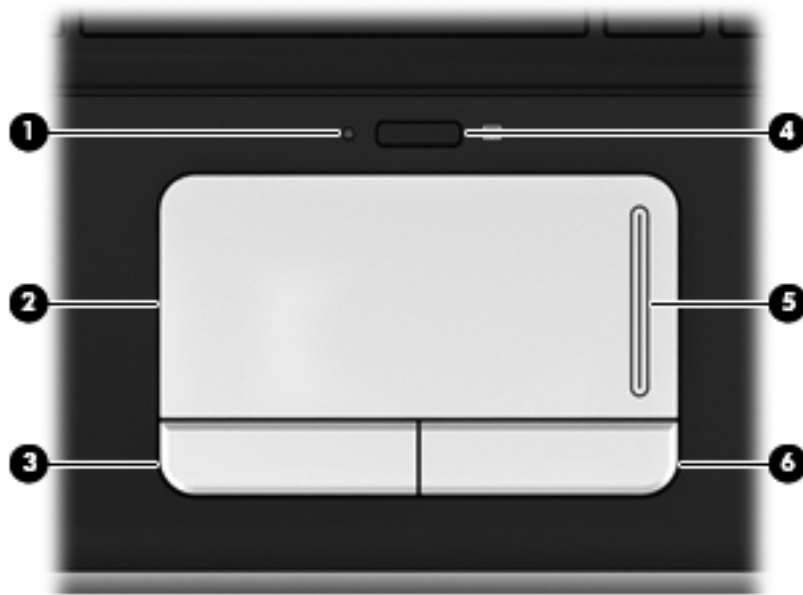
Item	Component	Function
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	Action keys	Execute frequently used system functions.
(3)	num lk key	Enables/disables the embedded numeric keypad when pressed in combination with the fn key.
(4)	Embedded numeric keypad keys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

Lights



Item	Component	Description
(1)	Caps lock light	On: Caps lock is on.
(2)	Mute light	On: Computer sound is off.
(3)	Num lk light	On: The embedded numeric keypad is enabled or num lock is on for an optional external numeric keypad.

TouchPad components



Item	Component	Function
(1)	TouchPad light	<ul style="list-style-type: none">• White: TouchPad is enabled.• Amber: TouchPad is disabled.
(2)	TouchPad zone	Moves the pointer and selects or activates items on the screen.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	TouchPad off indicator	To turn the TouchPad zone on and off, quickly double-tap the TouchPad off indicator. NOTE: When the TouchPad zone is active, the light is off.
(5)	TouchPad scroll zone	Scrolls up or down.
(6)	Right TouchPad button	Functions like the right button on an external mouse.

Front components



Item	Component	Function
(1)	Speakers (2)	Produce sound.
(2)	Battery light	<ul style="list-style-type: none"> On: A battery is charging. Blinking: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. Off: If the computer is plugged into an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.
	Drive light	<ul style="list-style-type: none"> White: The hard drive is being accessed. Blinking: The hard drive or an optional external optical drive is being accessed. Amber: HP ProtectSmart has temporarily parked the drive.

Left-side components



Item	Component	Function
(1)	Power connector	Connects an AC adapter.
(2)	AC adapter light	<ul style="list-style-type: none"> On: The computer is connected to external power. Off: The computer is not connected to external power.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	External monitor port	Connects an external VGA monitor or projector.

Item	Component	Function
(5)	HDMI port	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. NOTE: Select models can be configured with an optional external USB optical disc drive. For more information, refer to the printed Quick Setup poster.
(7)	Digital Media Slot	Supports the following digital card formats: <ul style="list-style-type: none"> • Memory Stick • Memory Stick Pro • MultiMediaCard • Secure Digital Memory Card • Secure Digital High Capacity Memory Card • xD-Picture Card • xD-Picture Card Type H • xD-Picture Card Type M
(8)	Audio-out (headphone) jack/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. NOTE: When a device is connected to the jack, the device speakers are disabled.
(9)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

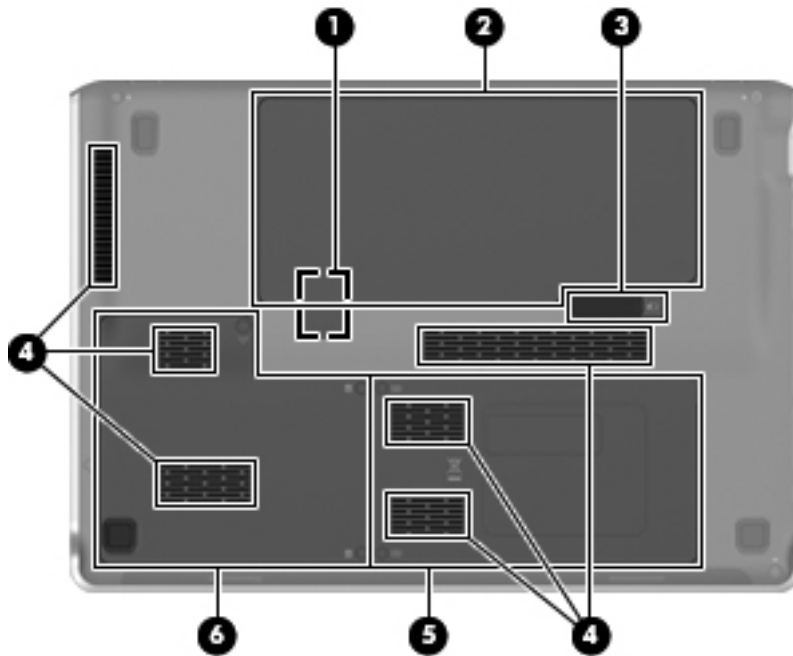
Right-side components



Item	Component	Function
(1)	Power light	<ul style="list-style-type: none"> • On: The computer is on. • Blinking: The computer is in the Sleep state. • Off: The computer is off or in Hibernation.

Item	Component	Function
(2)	Power switch	<ul style="list-style-type: none"> When the computer is off, slide the power switch to turn on the computer. When the computer is on, briefly slide the power switch to exit Sleep. When the computer is in the Sleep state, briefly slide the power switch to exit Sleep. When the computer is in Hibernation, briefly slide the power switch to exit Hibernation. <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, slide and hold the power switch 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.</p>
(3)	Wireless light	<ul style="list-style-type: none"> Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, a wireless wide area network (WWAN) device, and/or a Bluetooth® device, is on. Amber: All wireless devices are off.
(4)	Wireless button	<p>Turns the wireless feature on or off, but does not establish a wireless connection.</p> <p>NOTE: A wireless network must be set up in order to establish a wireless connection.</p>
(5)	USB ports (2)	Connect optional USB devices.
(6)	Vent	<p>Enables airflow to cool internal components.</p> <p>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.</p>
(7)	Security cable slot	<p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p>


Bottom components

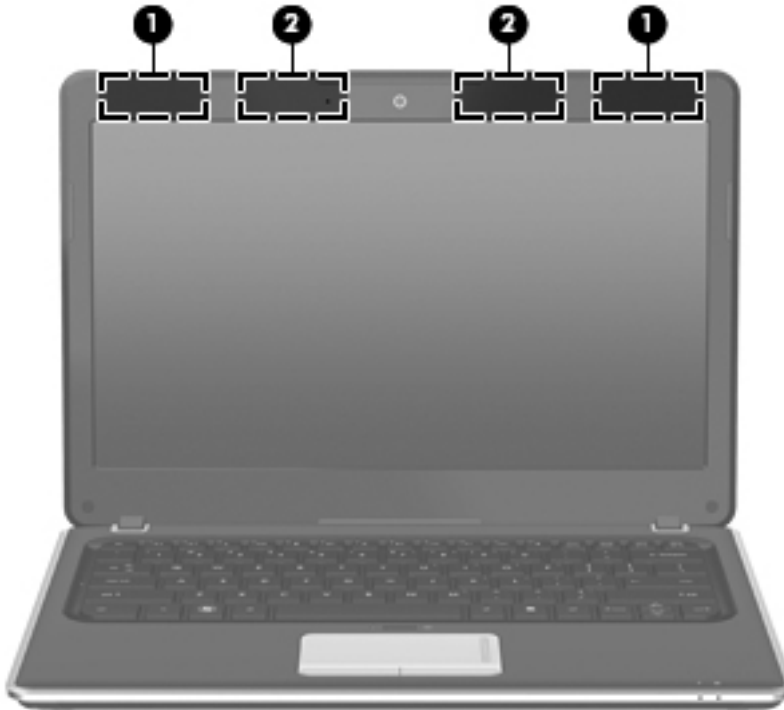


Item	Component	Function
(1)	Subscriber identity module (SIM) slot (select models only)	Located inside the battery bay.
(2)	Battery bay	Holds the battery and contains the SIM slot. NOTE: The battery is preinstalled in the battery bay at the factory.
(3)	Battery release latch	Releases the battery from the battery bay.
(4)	Vents (6)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Item	Component	Function
(5)	Memory module compartment	<p>Contains the memory module slot (2 slots on select models) and a wireless LAN module.</p> <p>NOTE: 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.</p>
(6)	Hard drive bay	<p>Holds the hard drive and wireless wide area network (WWAN) module (select models only).</p> <p>NOTE: 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.</p>

Wireless antennas

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



Item	Component	Function
(1)	WWAN antennas (2)*(select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN). Holds the battery and contains the SIM slot.

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

To see wireless regulation 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.

Additional hardware components



Item	Component	Function
(1)	Power cord*	Connects the AC adapter.
(2)	AC adapter	Converts AC power to DC power.
(3)	Battery*	Powers the computer when the computer is not plugged into external power.

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

3 Illustrated parts catalog

Serial number label

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

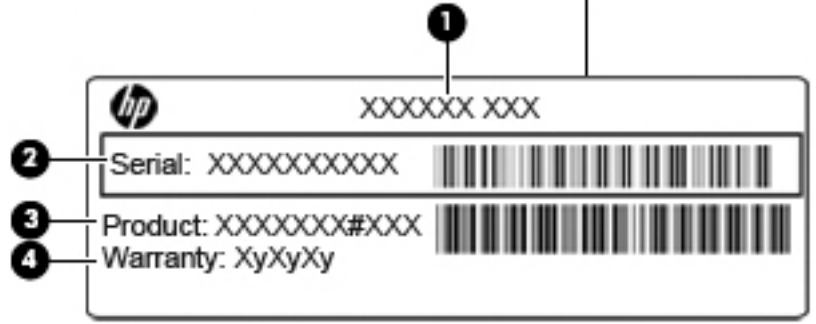
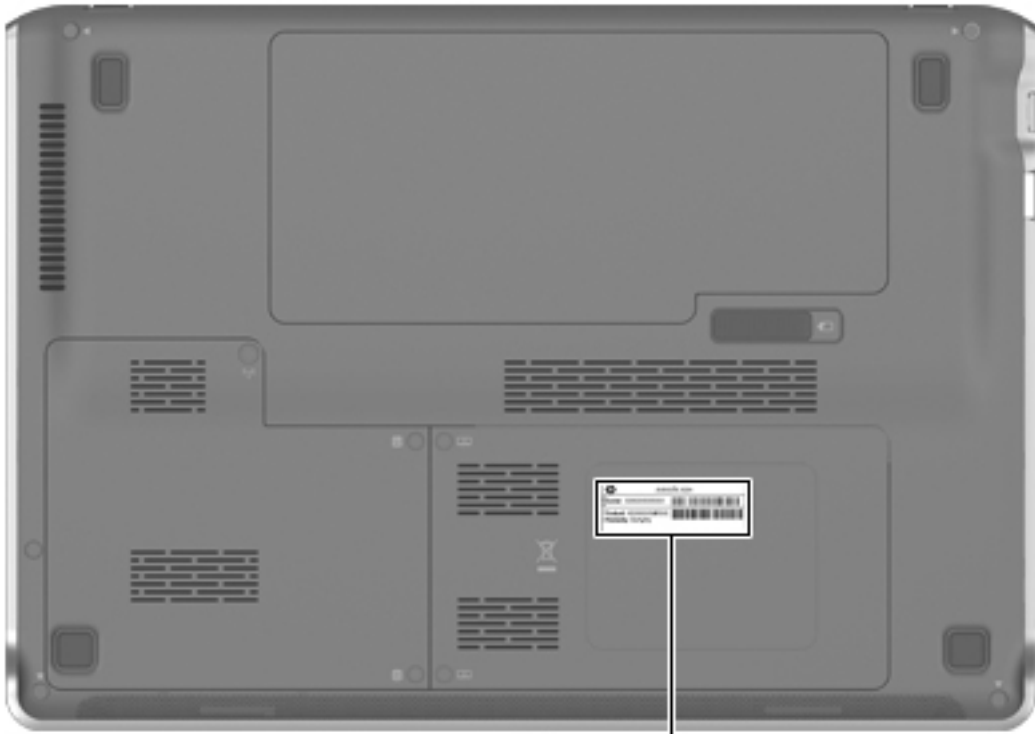
(1) Product name: This is the product name affixed to the front of the computer.

(2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.

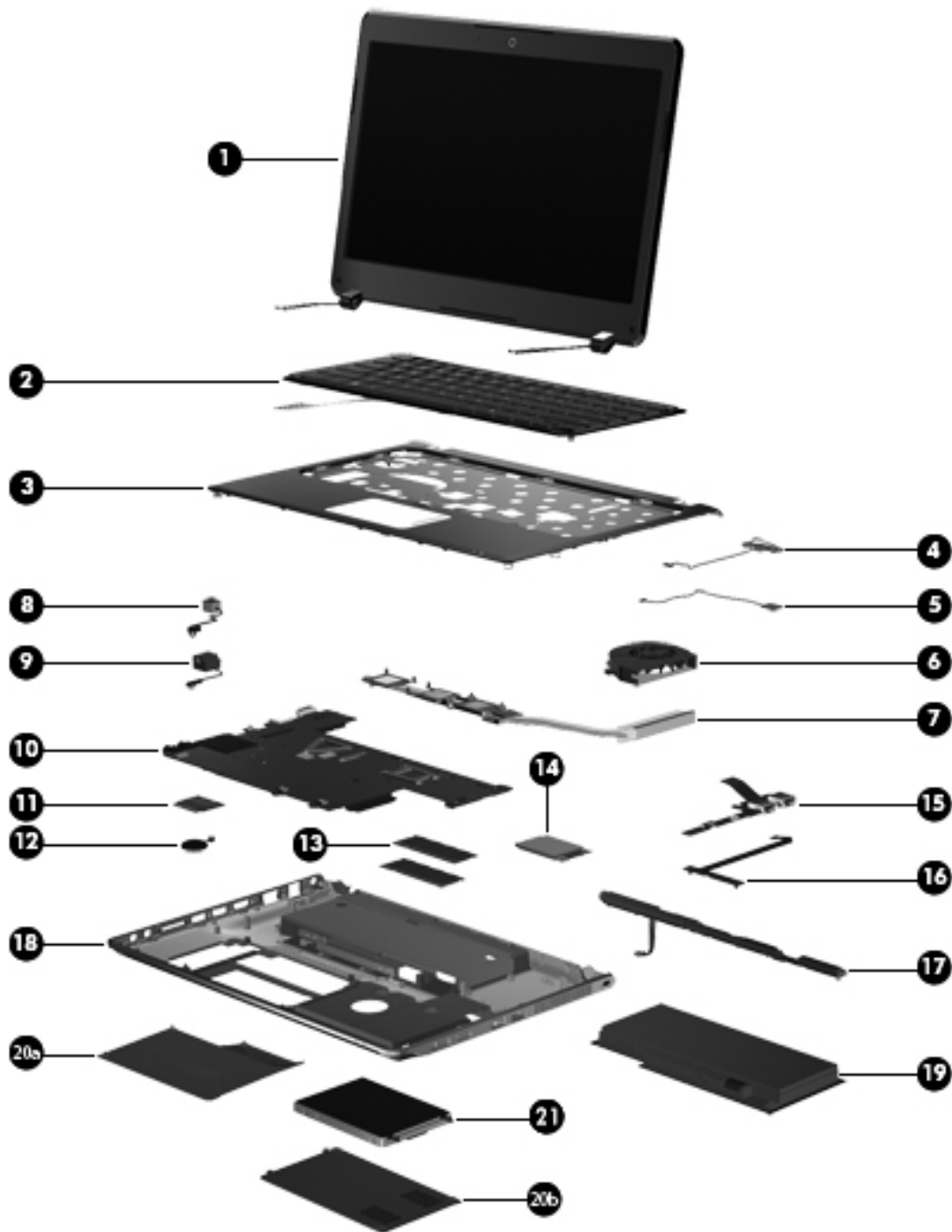
(3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

(4) Model description: This is the number used to locate documents, drivers, and support for the computer.

(5) Warranty period: This number describes the duration of the warranty period for the computer.



Computer major components



Item	Description	Spare part number
(1)	Display assembly	
	33.8-cm (13.3-in) HD Brightview (1366x768) IMR/MA	600823-001
	33.8-cm (13.3-in) HD Brightview (1366x768) IMR/MA WWAN	618438-001

Item	Description	Spare part number
	Display assembly internal components (not illustrated):	
	Display bezel	600824-001
	Display hinges	589629-001
	33.8-cm (13.3-in) HD LED Brightview 5.2mm	588160-001
	33.8-cm 913.3-in) HD LED Brightview WWAN	618439-001
(2)	Keyboard (includes keyboard cable)	
	For use in the United States	605630-001
	For use in the United Kingdom	605630-031
	For use in Germany	605630-041
	France	605630-051
	For use in Italy	605630-061
	For use in Spain	605630-071
	French Canada	605630-121
	For use in Portugal	605630-131
	For use in Turkey	605630-141
	For use in Saudi Arabia	605630-171
	For use in the Czech Republic	605630-221
	Russia	605630-251
	For use in Thailand	605630-281
	For use in Japan	605630-291
	For use in Belgium	605630-A41
	For use in Taiwan	605630-AB1
	For use in South Korea	605630-AD1
	For use in the Netherlands	605630-B31
	For use in Switzerland	605630-BG1
	For use in Denmark, Norway, Sweden	605630-DH1
(3)	Top cover (includes TouchPad) IMR/MA	600830-001
(4)	Bluetooth module	537921-001
(5)	Front LED board	611214-001
(6)	Fan	611219-001
(7)	Heat sink (includes replacement thermal material)	

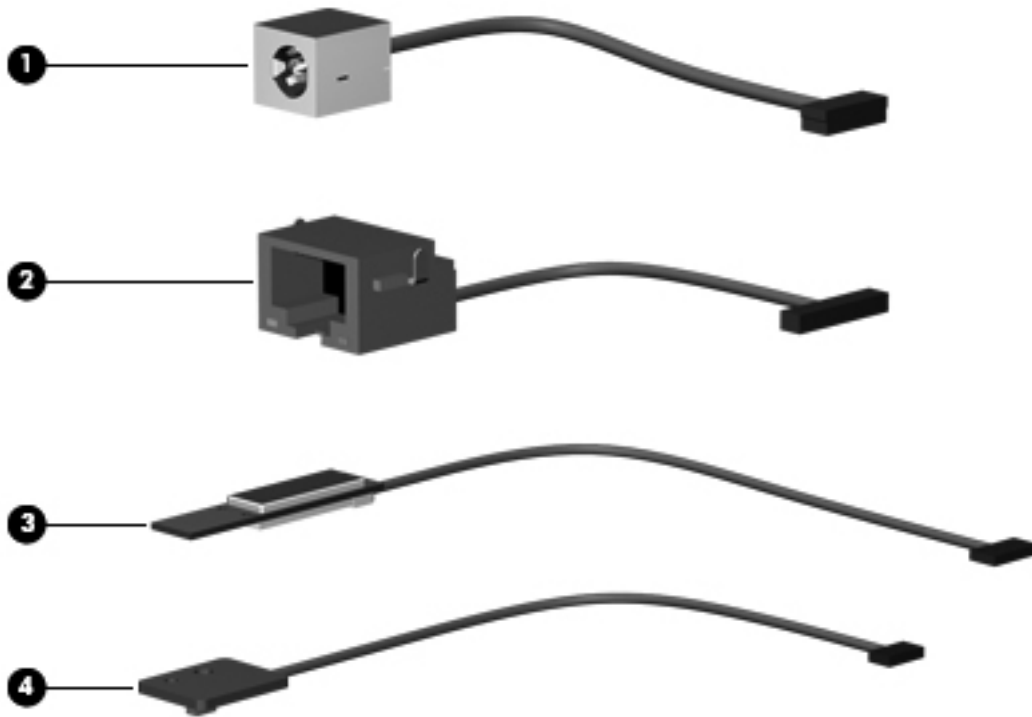
Item	Description	Spare part number
	UMA	581186-001
	Discrete	581187-001
(8)	USB/Power switch board (with cable)	611212-001
(9)	Power and RJ-45 connector and cable	611214-001
(10)	System board (includes embedded processor and replacement thermal)	
	AMD Athlon™ II Neo Processor K125 (1.7GHz, 1M L2 cache) UMA	600818-001
	AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache) UMA	600819-001
	AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache) UMA	600820-001
	AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache) Discrete	600821-001
	AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache) Discrete	600822-001
(11)	WLAN module	
	WLAN 802.11bgn HLFre Medoc MOW	580101-001
	WLAN 802.11bgn HLFre Medoc ROW	580101-002
	WLAN 802.11 bgn Shiraz HMC	593836-001
	WLAN b/g/n + Bluetooth HMC Combo Matador	600370-001
	WLAN b/g/n (1x1) + Bluetooth HMC Combo Rashi	602992-001
(12)	RTC battery (includes cable and 2-sided tape)	611221-001
(13)	Memory modules (PC3, 1066-MHz)	
	2GB PC3 10600 SHARED	598856-001
	1GB PC3 10600 SHARED	598859-001
	4GB PC3 10600 SHARED	599092-001
(14)	HSPA EV-DO Birlion MiniCard UNDP WWAN module	531993-001
(15)	Webcam with cable	611217-001
(16)	Display cable	611216-001
(17)	Speakers	611220-001
(18)	Base enclosure	605180-001
(19)	Battery 6C 57Whr 2.58Ah LI FD06057	577093-001
(20a)	Hard drive bay access cover	605181-001
(20b)	Memory module compartment access cover	605181-001
(21)	Hard drive	
	Hard Drive Hardware Kit (not illustrated; includes hard drive bracket and hard drive screws)	611218-001

Plastics kit



Item	Description	Spare part number
	Plastics Kit	605181-001
(1)	Hard drive bay access cover	
(2)	Memory module compartment cover (includes 2 captive screws, secured with C-clips)	

Cable kit



Item	Description	Spare part number
(1)	Cable kit	611214-001
	Power DC cable	
	RJ-45 cable	
	Lid sensor cable	
	LED board with cable	

Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (includes hard drive bracket and Mylar cover)	
	320GB 7200RPM	600827-001
	500GB 7200RPM	600828-001
	640G 5400RPM	605631-001
	250GB, 7200RPM	580680-001
	160GB,INTERNAL, 7200RPM	581181-001
	SSD 128GB	600829-001

Miscellaneous parts

Description	Spare part number
AC adapter	609936-001
Power cords:	
For use in Australia	490371-011
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Italy	490371-061
For use in Japan	490371-291
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the People's Republic of China	490371-AA1
For use in the United Kingdom and Singapore	490371-031
For use in the United States	490371-001
Screw Kit	580698-001
<ul style="list-style-type: none"> • Phillips PM2.5×2.5 screw • Phillips PM2.0×2.5 screw • Phillips PM2.0×5.0 screw • Phillips PM2.0×3.5 screw • Phillips PM2.5×4.0 screw • Phillips PM2.5×6.0 screw • Phillips PM2.5×10.0 screw • Phillips PM2.5×3.0 screw • Phillips PM2.0×3.0 broadhead screw • Phillips PM2.0×2.0 broadhead screw • Phillips PM2.5×5.0 screw 	

Sequential part number listing

Spare part number	Description
490371-001	Power cord for use in North America
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa (excluding South Africa)
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-D61	Power cord for use in India
531993-001	HSPA EV-DO Birlion MiniCard UNDP WWAN module
537921-001	Bluetooth module
577093-001	6-cell, 57-WHr 2.58Ah LI FD06057 battery
580101-001	WLAN 802.11b/g/n HLFre Medoc MOW
580101-002	WLAN 802.11b/g/n HLFre Medoc ROW
580698-001	Screw Kit
581181-001	160-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
581186-001	Heat sink for use only with computer models equipped with UMA graphics subsystem (includes replacement thermal material)
581187-001	Heat sink for use only with computer models equipped with discrete graphics subsystem (includes replacement thermal material)
584382-001	Hard Drive Hardware Kit (includes hard drive bracket, Mylar cover, and hard drive screws)
584383-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe external drive (includes bezel, bracket, and cable)
584384-001	Blu-ray ROM DVD±RW SuperMulti Double-Layer Drive with LightScribe external drive (includes bezel, bracket, and cable)
588160-001	33.8-cm (13.3-in) HD LED BrightView (1366x768) (5.2mm) SVA display assembly
593836-001	WLAN 802.11b/g/n Shiraz HMC
598856-001	4096-MB memory module (PC3, 1066-MHz)

Spare part number	Description
598859-001	2048-MB memory module (PC3, 1066-MHz)
599092-001	1024-MB memory module (PC3, 1066-MHz)
600370-002	WLAN b/g/n + Bluetooth HMC Combo Matador
600818-001	System board equipped with UMA graphics subsystem and AMD Athlon™ II Neo Processor K125 (1.7GHz, 1M L2 cache); includes replacement thermal material)
600819-001	System board equipped with UMA graphics subsystem and AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache); includes replacement thermal material)
600820-001	System board equipped with UMA graphics subsystem and AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache); includes replacement thermal material)
600821-001	System board equipped with discrete graphics subsystem and AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache); includes replacement thermal material)
600822-001	System board equipped with discrete graphics subsystem and AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache); includes replacement thermal material)
600823-001	33.8-cm (13.3-) HD LED BrightView IMR/MA display assembly
600824-001	Display assembly bezel
600827-001	320-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
600828-001	500-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
600829-001	128-GB, SSD
600830-001	Top cover (includes TouchPad and TouchPad cable, caps lock light board and cable, and top cover bumper pads)
602992-002	WLAN b/g/n (1x1) + Bluetooth HMC Combo Rashi
605180-001	Base enclosure
605181-001	Plastics Kit
	NOTE: See Plastics kit on page 21 for more Plastics Kit information.
605630-001	Keyboard for use in the United States (includes cable and 2 retention clips)
605630-031	Keyboard for use in the United Kingdom (includes cable and 2 retention clips)
605630-041	Keyboard for use in Germany (includes cable and 2 retention clips)
605630-051	Keyboard for use in France (includes cable and 2 retention clips)
605630-061	Keyboard for use in Italy (includes cable and 2 retention clips)
605630-071	Keyboard for use in Spain (includes cable and 2 retention clips)
605630-121	Keyboard for use in French Canada (includes cable and 2 retention clips)
605630-131	Keyboard for use in Portugal (includes cable and 2 retention clips)
605630-141	Keyboard for use in Turkey (includes cable and 2 retention clips)
605630-171	Keyboard for use in Saudi Arabia (includes cable and 2 retention clips)

Spare part number	Description
605630-221	Keyboard for use in the Czech Republic (includes cable and 2 retention clips)
605630-251	Keyboard for use in Russia (includes cable and 2 retention clips)
605630-281	Keyboard for use in Thailand (includes cable and 2 retention clips)
605630-291	Keyboard for use in Japan (includes cable and 2 retention clips)
605630-A41	Keyboard for use in Belgium (includes cable and 2 retention clips)
605630-AB1	Keyboard for use in Taiwan (includes cable and 2 retention clips)
605630-AD1	Keyboard for use in South Korea (includes cable and 2 retention clips)
605630-B31	Keyboard for use in the Netherlands (includes cable and 2 retention clips)
605630-BG1	Keyboard for use in Switzerland (includes cable and 2 retention clips)
605630-DH1	Keyboard for use in Denmark, Finland, and Norway (includes cable and 2 retention clips)
605631-001	640-GB, 5400-rpm hard drive (includes hard drive bracket and Mylar cover)
609936-001	65-W RC/V AC adapter
611211-001	Rubber Kit
611212-001	USB/Power switch board (with cable)
611214-001	Cable kit
611214-001	Power and RJ-45 connector and cable
611216-001	Display cable
611217-001	Webcam
611219-001	Fan
611220-001	Speakers
611221-001	RTC battery
618438-001	33.8-cm (13.3-in) HD LED BrightView IMR/MA WWAN display assembly
618439-001	33.8-cm (13.3-in) HD LED BrightView (1366x768) WWAN display assembly
680680-001	250-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)

4 Removal and replacement procedures

Preliminary replacement requirements


Tools required

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


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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Use nonmagnetic tools.

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

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

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

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

Component replacement procedures

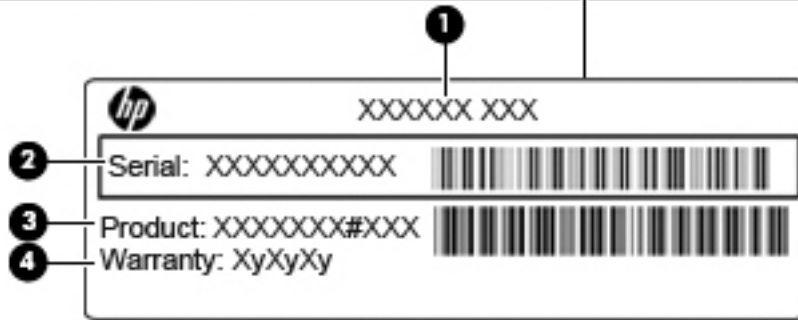
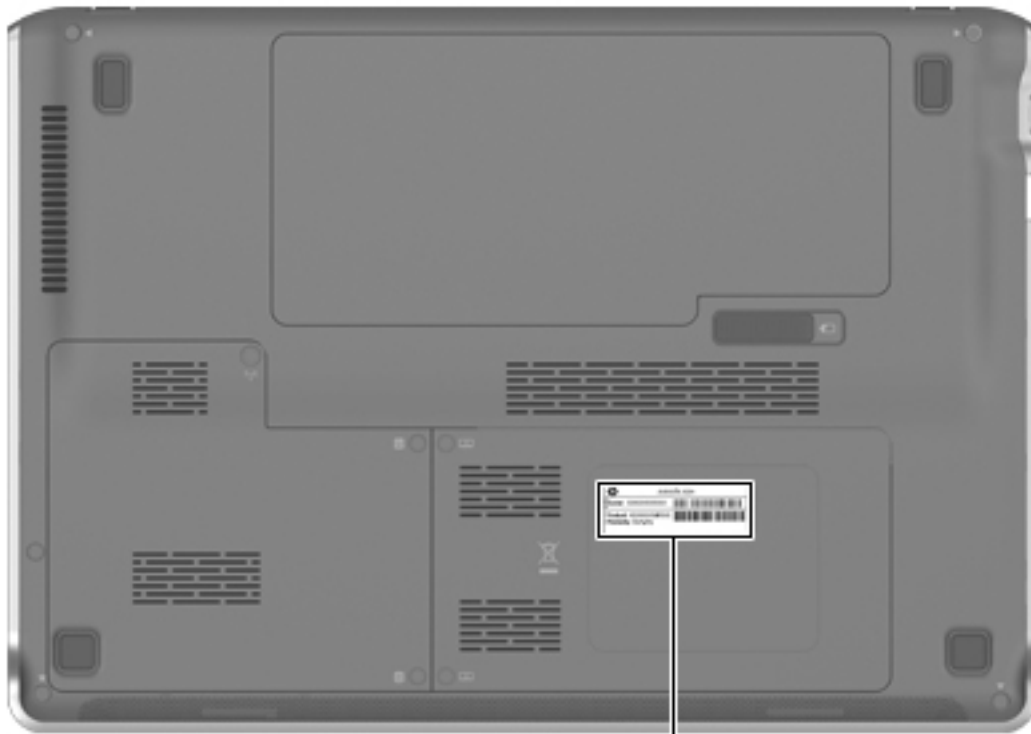
This chapter provides removal and replacement procedures.

There are as many as 56 screws, in 6 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Serial number label

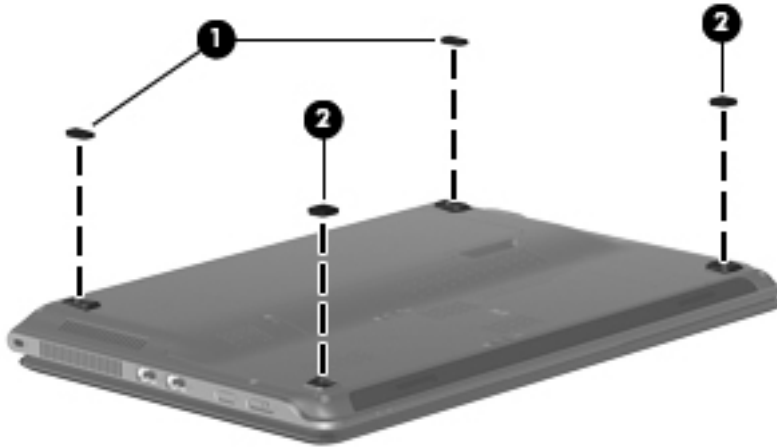
When ordering parts or requesting information, provide the computer serial number and model description provided on the serial number label.

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



Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 580697-001. There are 4 rubber feet that attach to the base enclosure in the locations shown in the following illustration.



Battery

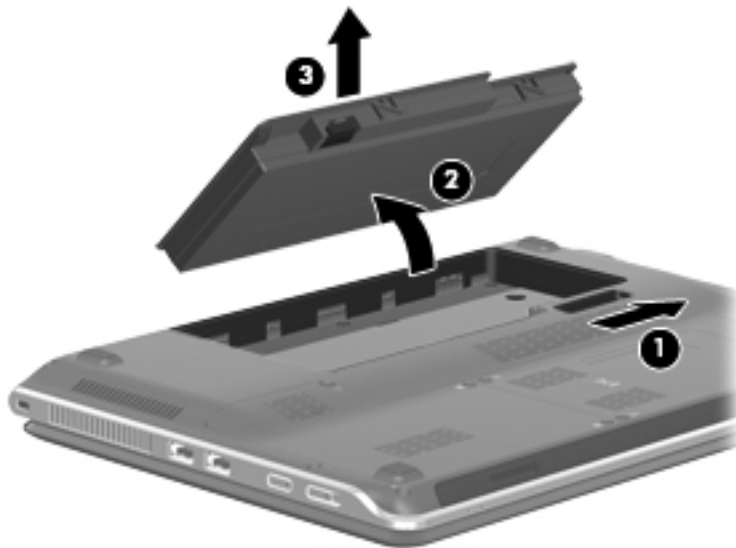
Description	Spare part number
Battery 6-cell, 2.58-Ah (57-Wh) polymer battery	577093-001

Before disassembling the computer, follow these steps:

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


Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latch **(1)**, to release the battery.
3. Rotate the battery toward you and up **(2)**.
4. Remove the battery **(3)**.



To install a battery, slide the battery into the battery bay until you hear a click.

SIM

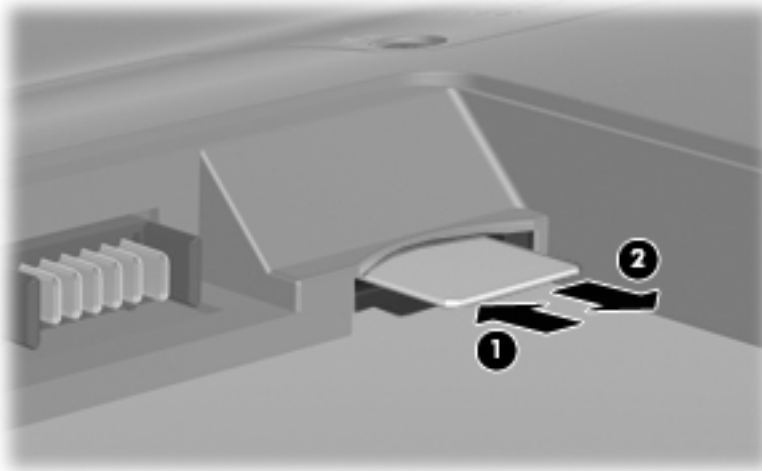
 **NOTE:** The SIM is provided by the end user as a security measure for the WWAN module. The SIM should be removed, placed into a static-dissipative container, and then replaced when the computer is reassembled.

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 36](#))


Remove the SIM:

1. Press in on the SIM **(1)** to release it from the SIM slot.
2. Remove the SIM **(2)** from the computer.



Reverse this procedure to install the SIM.

Hard drive

 **NOTE:** The hard drive spare part kit includes a hard drive bracket, hard drive connector, and Mylar cover.

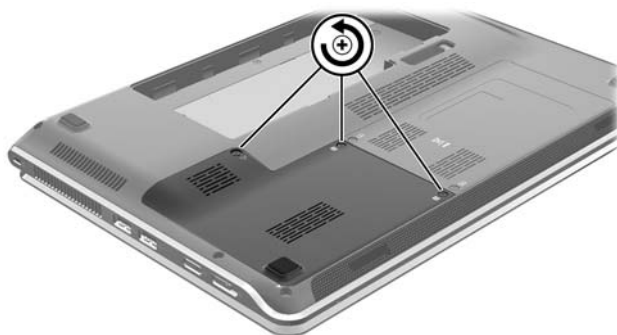
Description	Spare part number
250GB,7200RPM	580680-001
320GB,7200RPM	600827-001
500GB,7200RPM	600828-001
640GB,5400RPM	605631-001
160GB,INTERNAL, 7200RPM	581181-001
128GB, SSD	600829-001
Hard Drive Hardware Kit (includes hard drive bracket and hard drive screws)	611218-001

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 36](#)).

Remove the hard drive:

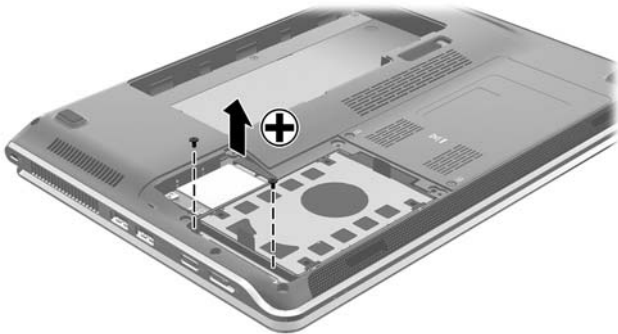
1. Position the computer with the front toward you.
2. Loosen the three Phillips PM2.0×5.0 captive screws that secure the hard drive cover to the computer.



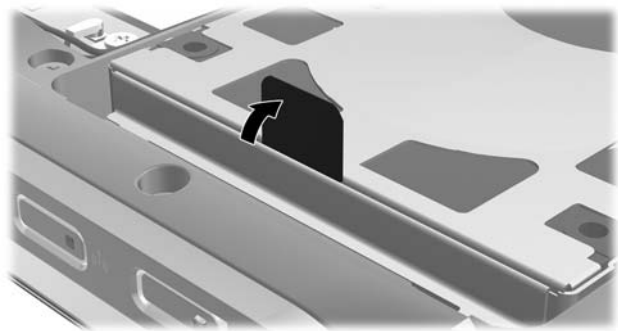
3. Lift the right side **(2)** of the hard drive cover to detach it from the computer.



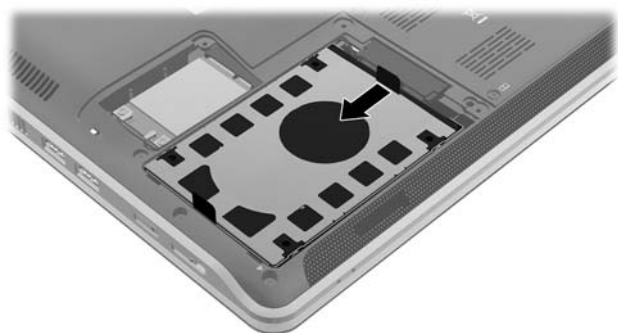
4. Remove the two Phillips PM2.0x4.0 screws that secure the hard drive to the computer.



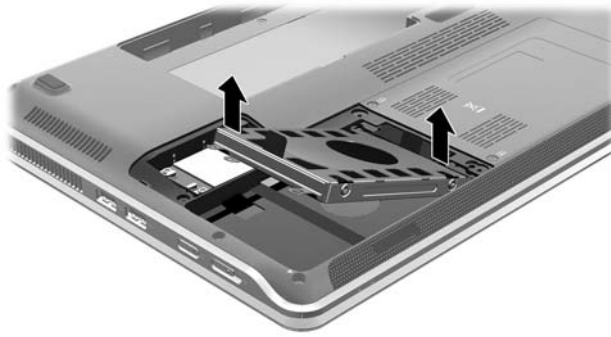
5. Lift up the hard drive tab from the tucked-in position.



6. Pull the tabs to the left to disconnect the hard drive.



7. Grasp both tabs and lift straight up to remove it.



Reverse this procedure to reassemble and install the hard drive.

WWAN module

Description	Spare part number
UNDP HSPA EVDO Birlion MINICARD WWAN module	531993-001


Before removing the WWAN module, follow these steps:

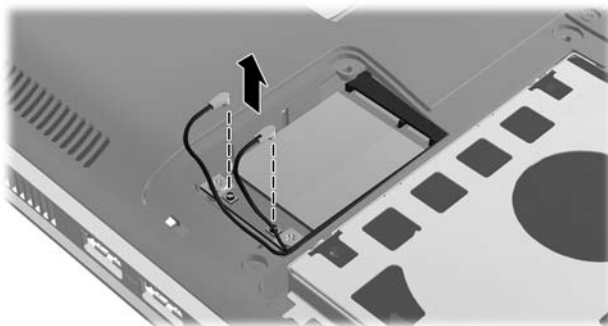
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the hard drive bay access cover (see [Hard drive on page 38](#)).

Remove the WWAN module:

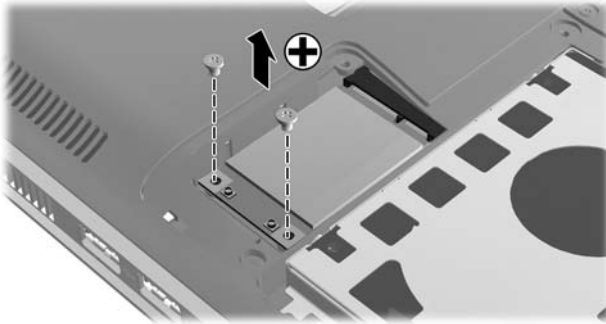
△ **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

1. Position the computer with the front toward you.
2. Disconnect the WWAN antenna cables from the WWAN module.


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

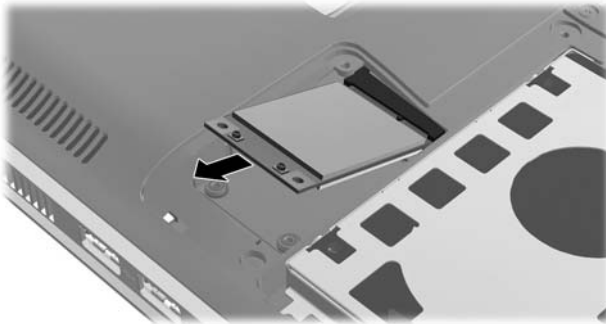


3. Remove the two Phillips PM2.5x3.0 screws that secure the WWAN module to the computer. (The WWAN module tilts up.)



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

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



Reverse this procedure to install the WWAN module.

WLAN module

Description	Spare part number
WLAN 802.11b/g/n HLFre Medoc MOW	580101-001
WLAN 802.11b/g/n HLFre Medoc ROW	580101-002
WLAN 802.11 b/g/n Shiraz HMC	593836-001
WLAN b/g/n + Bluetooth HMC Combo Matador	600370-001
WLAN b/g/n (1x1) + Bluetooth HMC Combo Rashi	602992-001

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).


Remove the WLAN module:

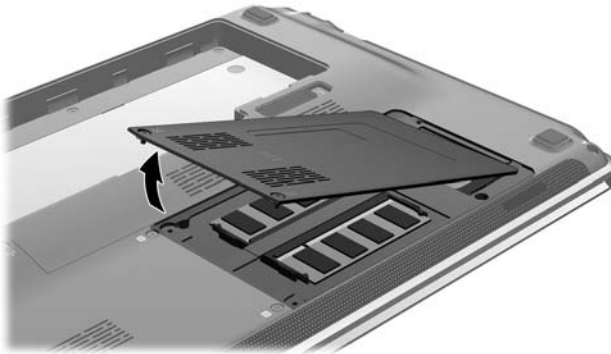
△ **CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.5x5.0 captive screws that secure the memory module compartment access cover to the computer.




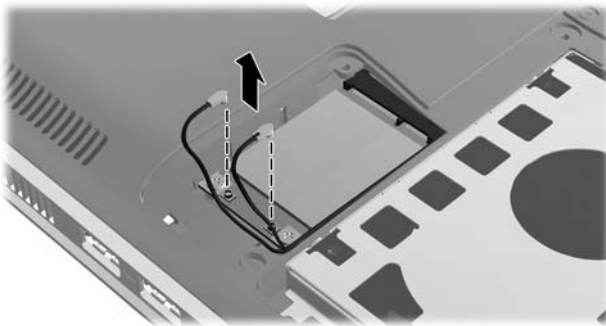
3. Lift the left side of the cover **(3)** to detach it from the computer.

 **NOTE:** The memory/wireless module compartment cover is included in the Plastics Kit, spare part number 605181-001.

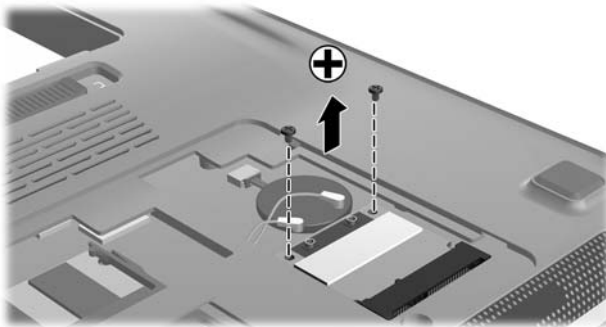


4. Disconnect the WLAN antenna cables from the terminals on the WLAN module.


 **NOTE:** The black WLAN antenna cable is connected to the WLAN module "Main" terminal. The white WLAN antenna cable is connected to the WLAN module "Aux" terminal.

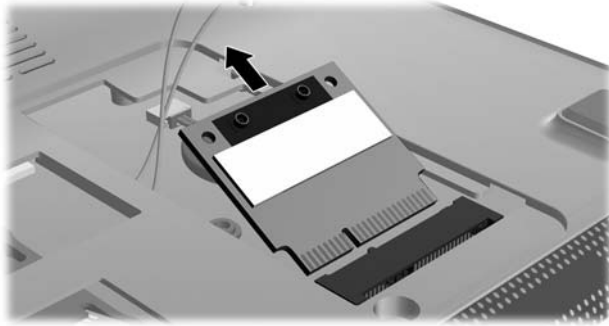


5. Remove the two Phillips PM2.5x3.0 screws that secure the WLAN module to the computer. (The WLAN module tilts up.)



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

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



Reverse this procedure to install a WLAN module.


Memory module

Description	Spare part number
1-GB 800-MHz DDR2	598856-001
2-GB 800-MHz DDR2	598859-001
4-GB 800-MHz DDR2	599092-001


Before removing the memory module, follow these steps:

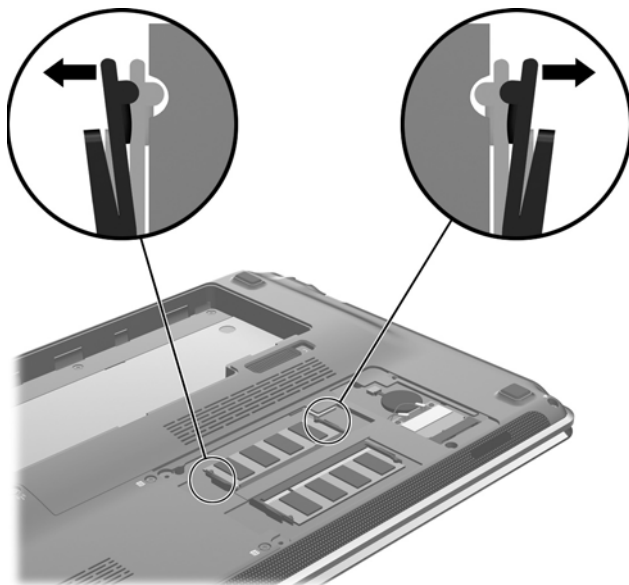
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the memory/wireless module compartment cover [WLAN module on page 43](#)

Remove the memory module:


 **NOTE:** The slot nearest the front edge of the computer is for primary memory. The slot next to it is for expansion memory.

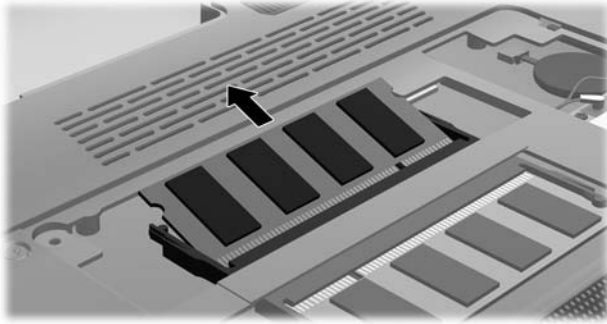
1. Pull away the retention clips on each side of the memory module to release the memory module. (The memory module tilts up.)

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



2. Grasp the edge of the memory module **(2)**, and then pull it out of the memory module slot.

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



Reverse this procedure to install a memory module.

RTC battery

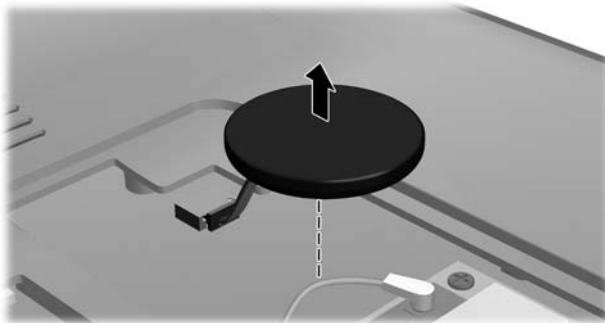
Description	Spare part number
RTC battery (includes cable and 2-sided tape)	611221-001

Before removing the RTC battery, follow these steps:

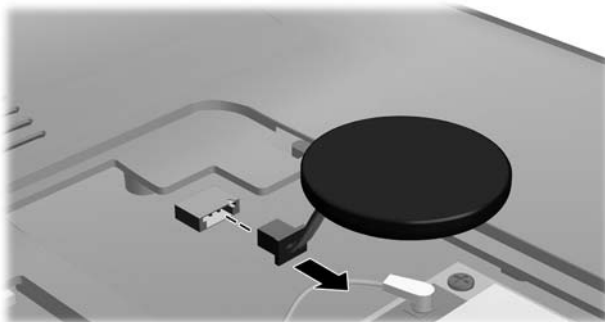
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the memory/wireless module compartment cover (see [WLAN module on page 43](#)).
6. Remove the WLAN module [WLAN module on page 43](#)

Remove the RTC battery:

1. Turn the system board upside down, with the audio connectors toward you.
2. The RTC battery has adhesive holding it down. Lift up slightly on the battery to break the adhesion.



3. Disconnect the RTC battery cable from the system board, and then remove the RTC battery from the unit.



Reverse this procedure to install the RTC battery.

Keyboard

 **NOTE:** The keyboard spare part kit includes a cable and 2 retention clips.

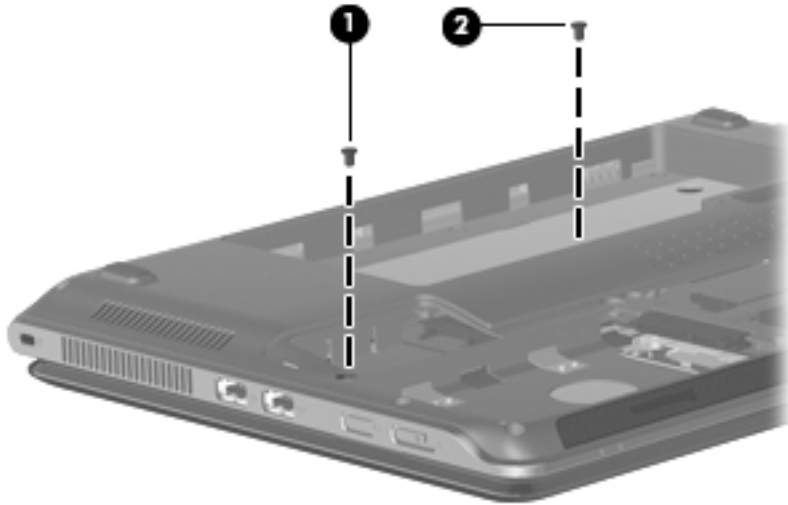
Country or region	Spare part number	Country or region	Spare part number
For use in the United States	605630-001	For use in the United Kingdom	605630-031
For use in Germany	605630-041	For use in France	605630-051
For use in Italy	605630-061	For use in Spain	605630-071
French Canada	605630-121	For use in Portugal	605630-131
For use in Turkey	605630-141	For use in Russia	605630-251
For use in Saudi Arabia	605630-171	For use in Japan	605630-291
For use in the Czech Republic	605630-221	For use in Taiwan	605630-AB1
For use in Thailand	605630-281	For use in the Netherlands	605630-B31
For use in Belgium	605630-A41	For use in Denmark, Norway, Sweden	605630-DH1
For use in South Korea	605630-AD1		
For use in Switzerland	605630-BG1		

Before removing the keyboard, follow these steps:

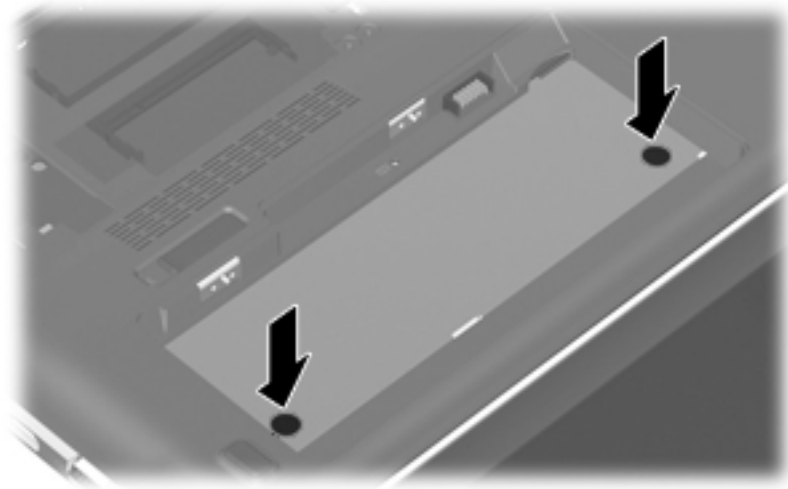
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).

Remove the keyboard:

1. Position the computer with the front toward you.
2. Remove the following screws:
 - a. The Phillips PM2.0x6.0 screw **(1)** that is near the hard drive bay
 - b. The Phillips PM2.0x4.0 screw **(2)** in the battery bay



3. Turn the computer right-side, up and open the display panel to a 90-degree angle.
4. Then position the computer so that the display is its base and the keyboard is in the upright position.
5. On the bottom of the computer, press in on the keyboard release tabs.



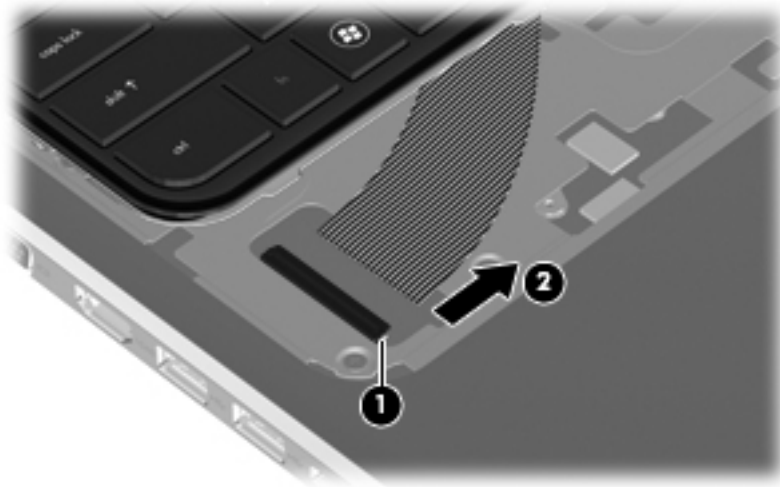
6. Return the computer to its upright position.
7. Lift the rear edge of the keyboard until it rests at an angle.

8. Slide the keyboard back until it rests on the switch cover and display.



9. Carefully 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:** Take care when releasing the ZIF connector. The connector can be easily damaged if handled incorrectly.



10. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover

 **NOTE:** The top cover spare part kit includes a palm rest, TouchPad and cable, and TouchPad button board and cable.

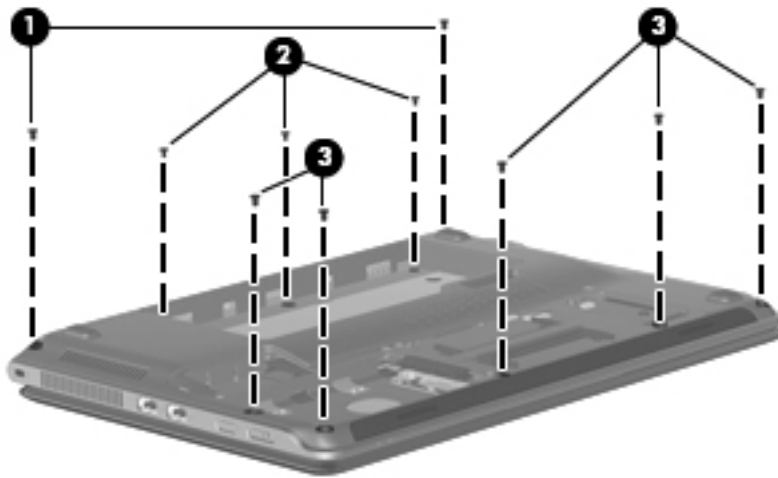
Description	Spare part number
Top cover (includes TouchPad and TouchPad cable, caps lock light board and cable, and top cover bumper pads)	600830-001

Before removing the top cover, follow these steps:

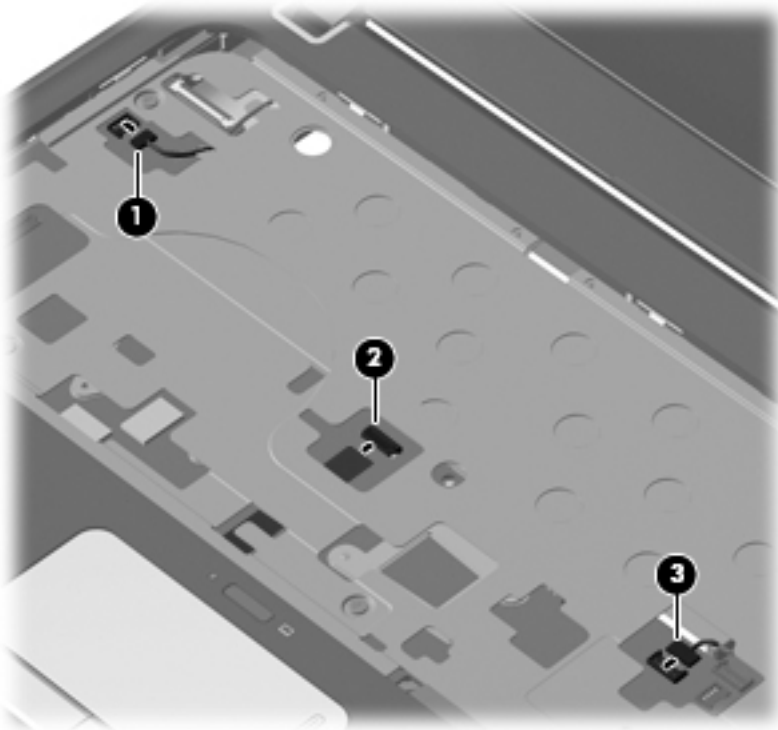
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the hard drive (see [Hard drive on page 38](#)).
6. Remove the memory/wireless module compartment cover (see [WLAN module on page 43](#)).
7. Remove the Keyboard (see [Keyboard on page 50](#)).

Remove the top cover:

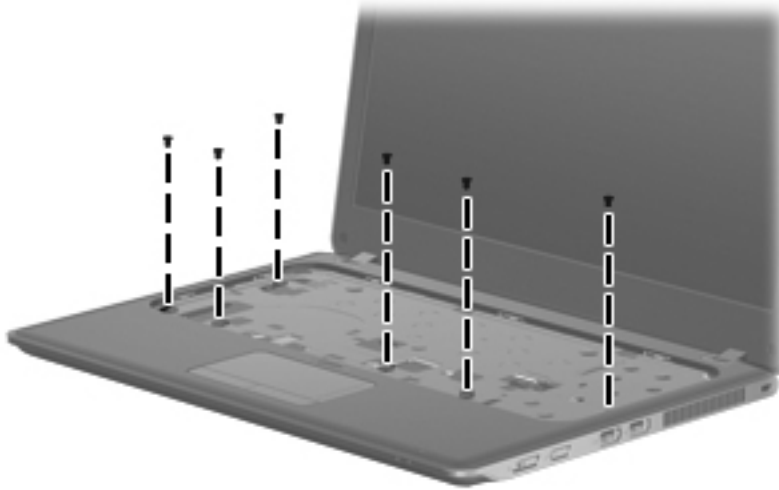
1. Turn the unit upside down with the front facing you.
2. Remove the two front rubber feet **(1)**.
3. Remove the following screws:
 - a. Two Phillips PM2.5x10.0 screws **(1)** on the top right and left hand corners
 - b. Three Phillips PM2.0x4.0 screws **(2)** in the battery bay
 - c. Five Phillips PM2.5x6.0 screws on the front edge



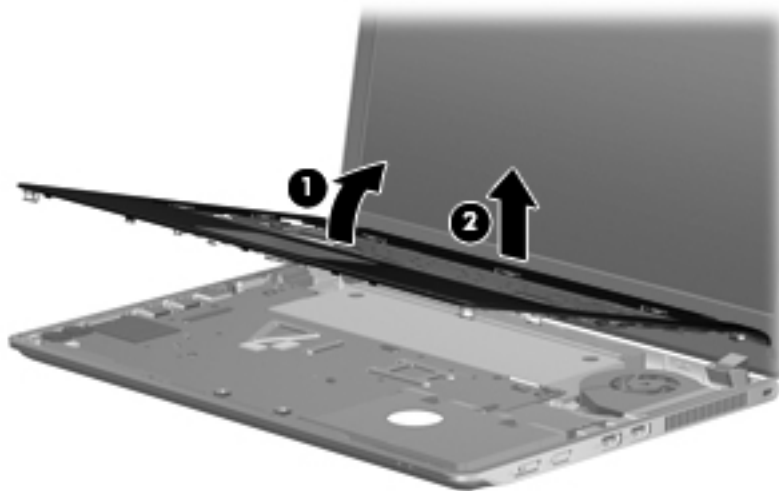
4. Turn the computer right-side up, and disconnect the following cables:
 - a. Top cover cable **(1)** from the board
 - b. TouchPad cable **(2)** from the board
 - c. Bluetooth module cable **(3)** from the board



5. Remove the six Phillips PM2.5x6.0 screws from the sheet metal.




6. Lift up on the front edge **(1)** of the top cover.
7. Pull up on the back edge **(2)** of the top cover to remove from the unit.



Reverse this procedure to install the top cover.

Bluetooth module

 **NOTE:** The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is available using spare part number 580702-001.

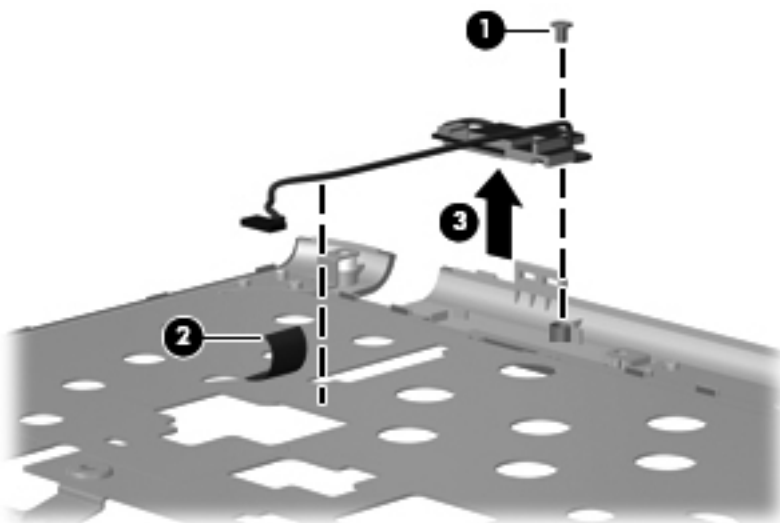
Description	Spare part number
Bluetooth module	537921-001

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the top cover (see [Top cover on page 53](#)).

Remove the Bluetooth module and cable:

1. Remove the Phillips 2.0×4.0 screw **(1)** to release the Bluetooth module.
2. Lift the cable tape **(2)** to release the Bluetooth cable.
3. Remove the Bluetooth module **(3)**.
4. If you are replacing the Bluetooth cable, disconnect the Bluetooth module cable from the Bluetooth module.



Reverse this procedure to install the Bluetooth module.

Display assembly

Description	Spare part number
33.8-cm (13.3-in) HD Brightview IMR/MA	600823-001
33.8-cm (13.3-in) HD Brightview IMR/MA WWAN	618438-001

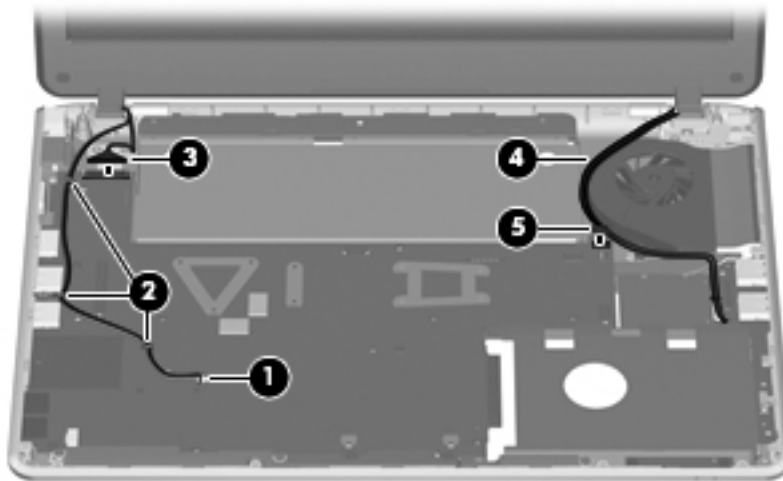
Before removing the display assembly, follow these steps:

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 36](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 43](#)) and WWAN module (see [WWAN module on page 41](#)).
6. Remove the keyboard (see [Keyboard on page 50](#)).
7. Remove the top cover (see [Top cover on page 53](#)).

Remove the display assembly:

1. Close the computer.
2. Turn the computer display-side up, with the front toward you.
3. Disconnect and remove the WLAN cables **(1)** from the clips **(2)** built into the base enclosure.
4. Disconnect the display panel cable **(3)** from the system board.
5. Disconnect and remove the WWAN cables **(4)** from the system board.

6. Disconnect and remove the camera cable (5) from the system board.



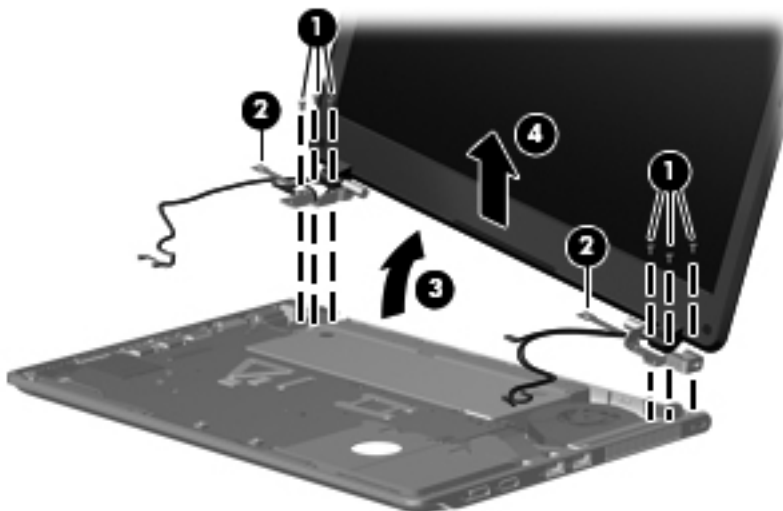
△ **CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

7. Remove the display hinge cover (2).

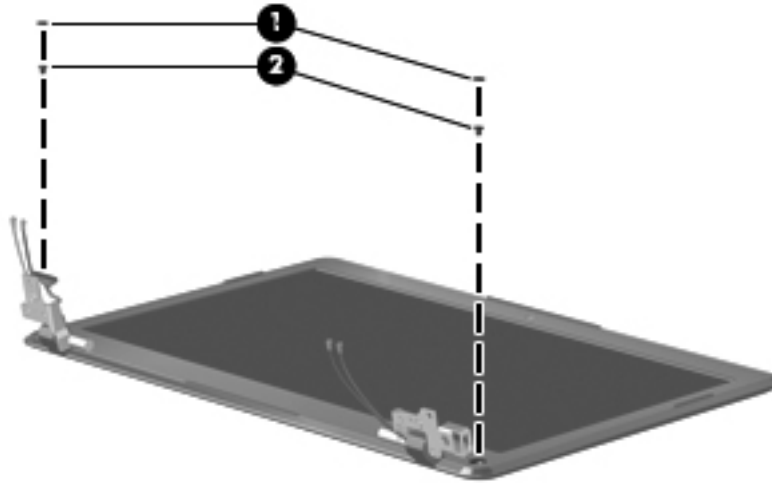
Release the hinges by removing the six Phillips PM2.5x5.0 screws 1 that secure it to the base enclosure. First remove the left hinge and then the right.

📝 **NOTE:** On the left side, one of the screws secures a display support strap. On the right side, the left-most screw secures a ground strap for the wireless cables.

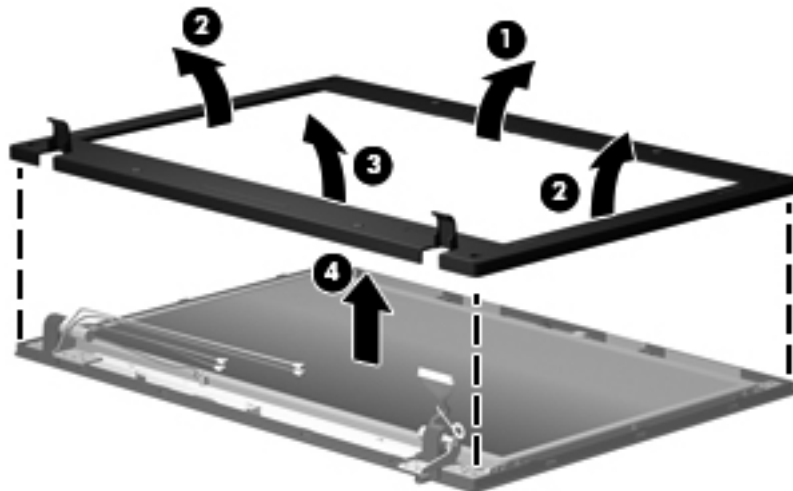
After removing all six screws (1), note that the cables on the hinges (2) may interfere with the removal of the display. Simply move the panel (3) around the cables and then lift (4). On the right side, there is a metal plate that you must work around to remove the display.



8. If it is necessary to replace the display bezel or any of the display assembly internal components:
- a. Remove the two rubber screw covers **(1)** and the two Phillips 2.0×5.0 screws **(2)** that secure the display bezel to the display assembly.

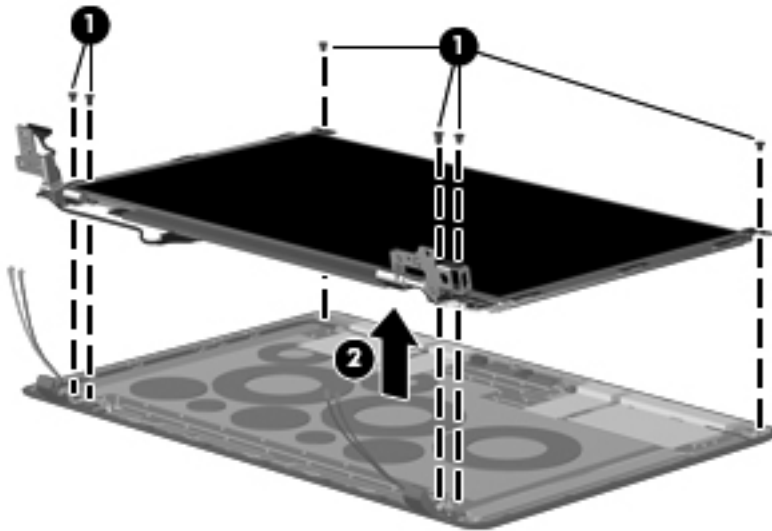


- b. Flex the inside edges of the top **(1)**, the left and right sides **(2)**, and the bottom **(3)** of the display bezel until the bezel disengages from the display enclosure.
- c. Remove the display bezel **(4)**.

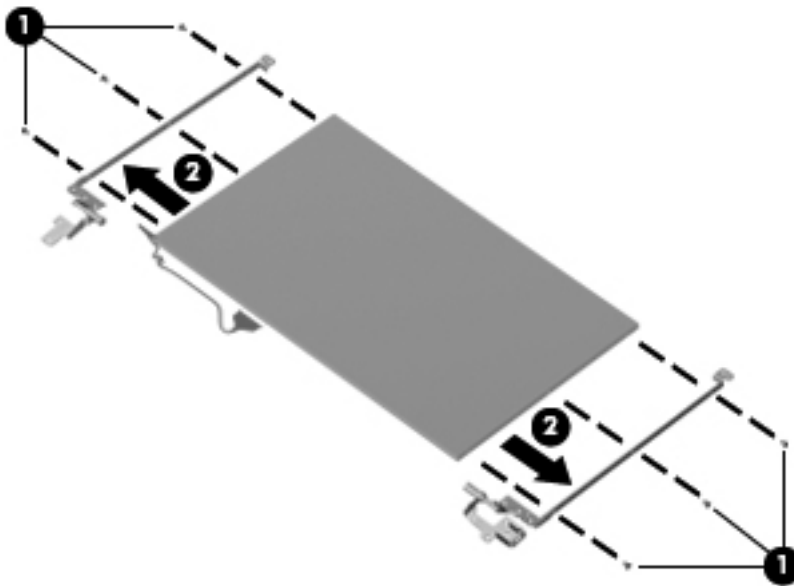


9. Remove the six screws Phillips 2.0×3.0 screws **(1)** on top that secure the display panel to the display enclosure.

10. Remove the panel (2) from the enclosure.

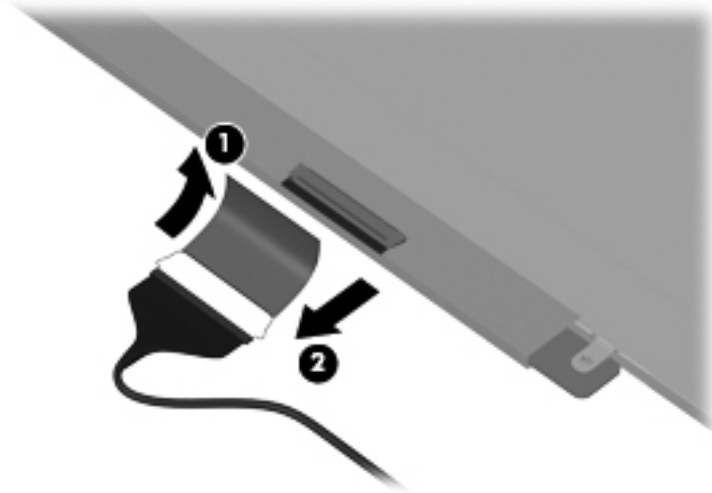


11. If it is necessary to replace the display hinges, remove the six Phillips 2.5x3.0 screws (1), and then slide the hinges (2) outward from the panel.



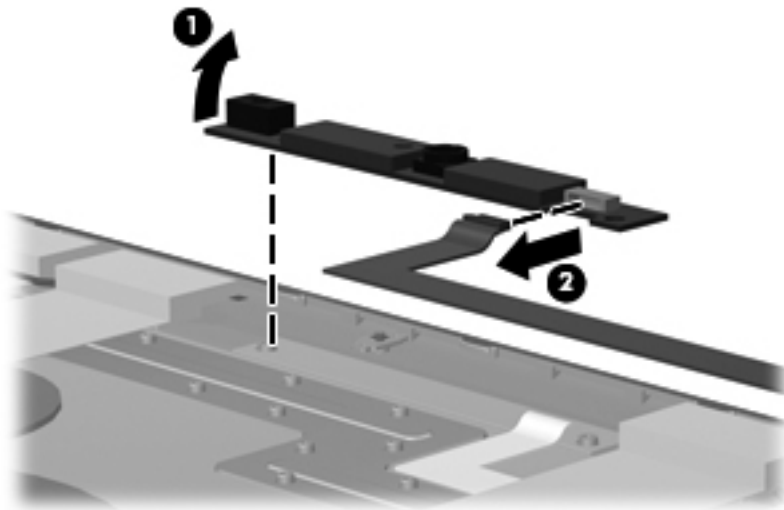
12. If it is necessary to replace the display panel cable:
- Turn the display panel upside down, with the bottom edge toward you.
 - Release the adhesive support strip (1).

- c. Disconnect the display panel cable **(2)** from the connector on the back of the display panel. The display panel cable is available using the spare part number 611216-001.



Reverse the procedure to replace the display cable.

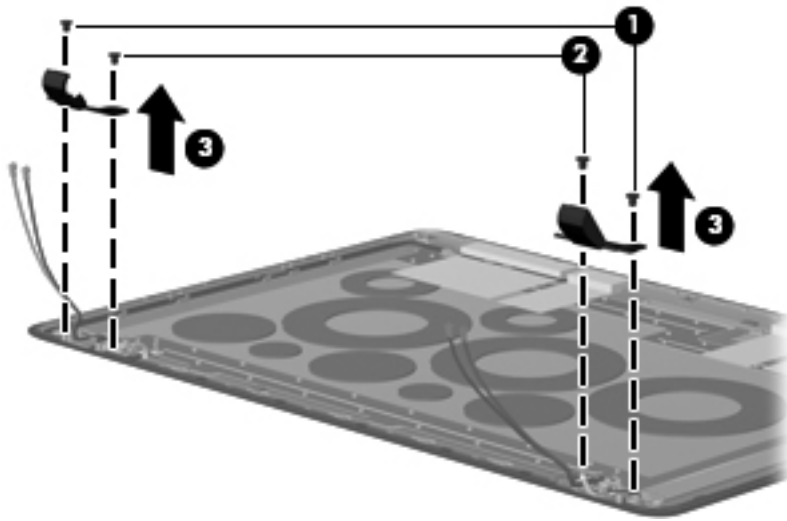
- 13.** If it is necessary to replace the webcam, which is spared as 611217-001 and includes the cable:
 - a. Place the panel enclosure flat on the table with the webcam furthest away from you.
 - b. Loosen the webcam **(1)** up by pulling on it to break the adhesive bond and pull up.
 - c. Disconnect the camera module **(2)** from the camera cable.



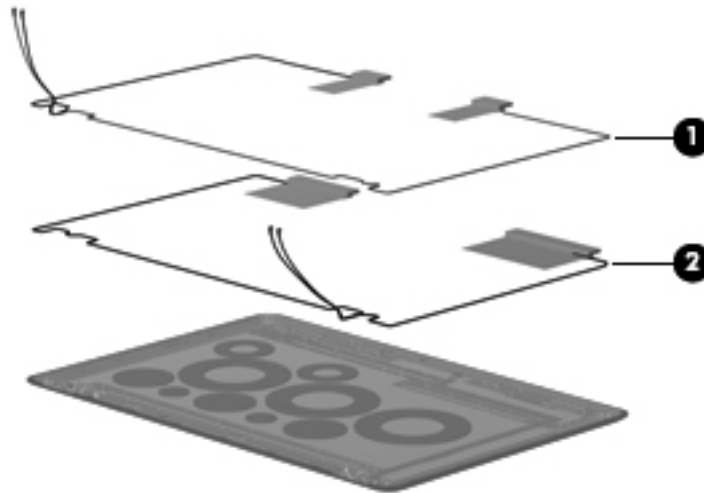
Reverse the procedure to install the webcam module.

- 14.** If it is necessary to replace the wireless antennas:
 - a. Remove the hinge covers from the enclosure by removing the two silver broadhead Phillips 2.0×3.0 screws **(1)** and the two black broadhead Phillips 2.0×3.0 screws **(2)**.

- b. Lift up on the hinge covers (3).



- c. Remove the WLAN (1) and the WWAN (2) antennas from the enclosure.



Reverse this procedure to install the wireless antennas.

Speakers


Description	Spare part number
Speakers (include cables)	611220-001

Before removing the speakers, follow these steps:

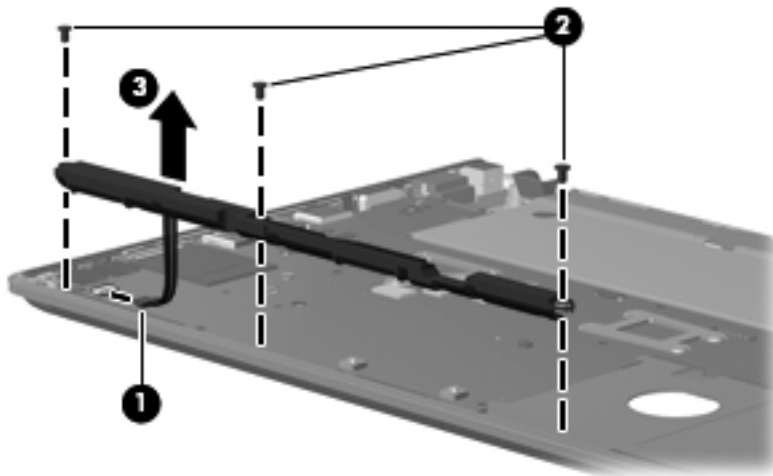
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the keyboard (see [Keyboard on page 50](#)).
6. Remove the top cover (see [Top cover on page 53](#)).

Remove the speakers:

1. Position the base enclosure with the front edge toward you.
2. Disconnect the speaker cable **(1)** from the system board.
3. Remove the three silver Phillips 2.0×6.0 screws **(2)** that secure the speakers to the enclosure.

 **NOTE:** There are rubber grommets on each of the three screw holes. If you need to replace the speakers, confirm that these rubber grommets are also replaced before installing another speakers.

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



Front LED board

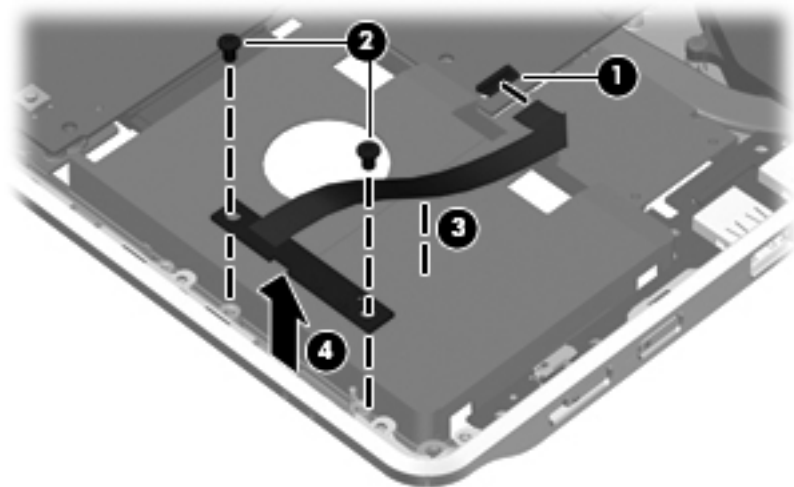
Description	Spare part number
Front LED board with cable (part of cables kit)	611214-001

Before removing the front 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 36](#)).
5. Remove the keyboard (see [Keyboard on page 50](#)).
6. Remove the top cover (see [Top cover on page 53](#)).

Remove the front LED board:

1. Position the base enclosure with the front edge toward you.
2. Disconnect the LED board cable **(1)** from the system board.
3. Remove the two Phillips 2.5×4.0 screws **(2)** that secure the LED board to the enclosure.
4. Lift the cable **(3)** to disengage the adhesive bond between the cable and the enclosure.
5. Remove the speakers **(4)**.



USB/power switch board

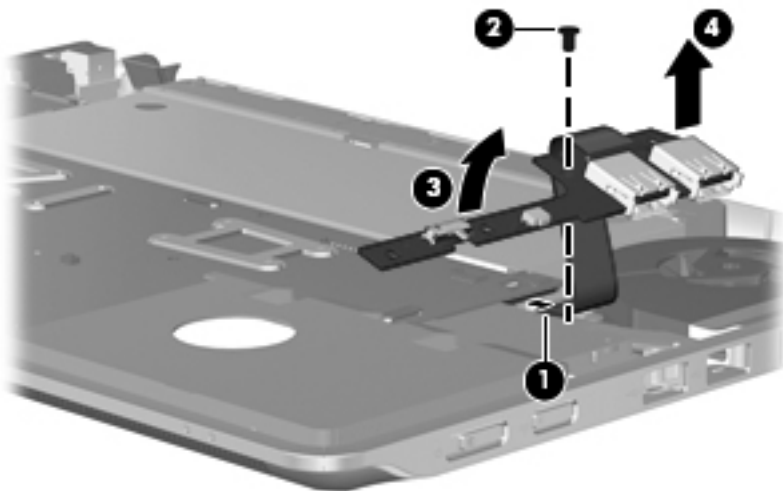
Description	Spare part number
USB/power switch board (includes cable)	611212-001

Before removing the USB/power switch board, follow these steps:


1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 38](#))
 - b. Memory module compartment access cover (see [WLAN module on page 43](#))
 - c. Keyboard (see [Keyboard on page 50](#))
 - d. Display assembly (see [Display assembly on page 57](#))
 - e. Top cover (see [Top cover on page 53](#))

Remove the USB board:

1. Disconnect the USB board cable **(1)** from the system board.
2. Remove the Phillips 2.5×4.0 screw **(2)** to disengage the USB board from the system board.
3. Remove the USB board **(3)** and cable.



Reverse this procedure to install the USB/power switch board.

 **NOTE:** When replacing the USB board, make sure that the wireless and power actuators on the board, line up with the wireless and power switches on the base enclosure.

System board

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

Description	Spare part number
AMD Athlon™ II Neo Processor K125 (1.7GHz, 1M L2 cache), UMA	600818-001
AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache), UMA	600819-001
AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache), UMA	600820-001
AMD Athlon™ II Neo Dual-Core Processor K325 (1.3GHz, 2M L2 cache), discrete	600821-001
AMD Turion™ II Neo Dual-Core Mobile Processor K625 (1.5GHz, 2M L2 cache), discrete	600822-001

Before removing the system board, follow these steps:

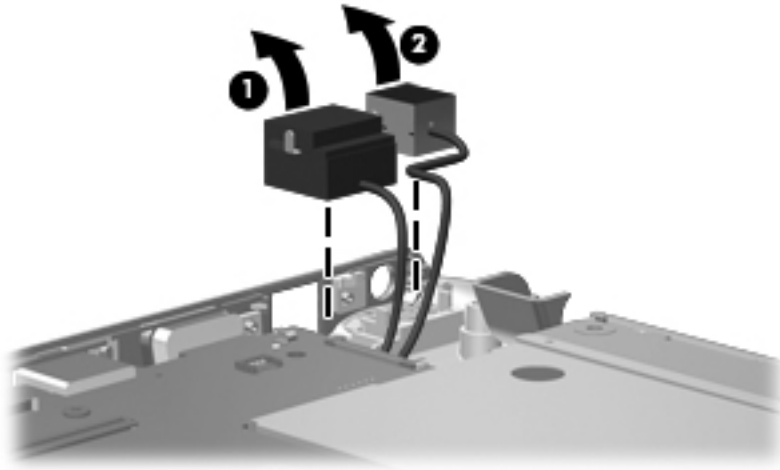
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 38](#)).
 - b. Memory/wireless module compartment cover (see [WLAN module on page 43](#))
 - c. Keyboard (see [Keyboard on page 50](#))
 - d. Display assembly (see [Display assembly on page 57](#))
 - e. Top cover (see [Top cover on page 53](#))

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:

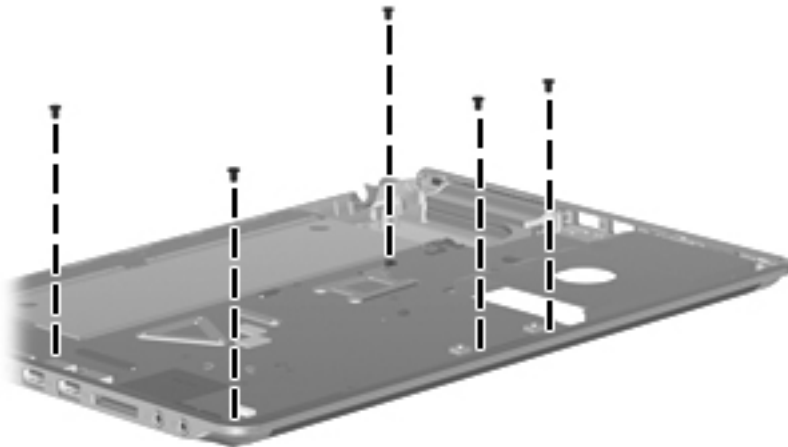
- SIM (see [SIM on page 37](#))
- WLAN module (see [WLAN module on page 43](#))
- Memory module (see [Memory module on page 46](#))
- WWAN module (see [WWAN module on page 41](#))
- Fan (see [Fan on page 71](#))
- RTC battery (see [RTC battery on page 48](#))

Remove the system board:

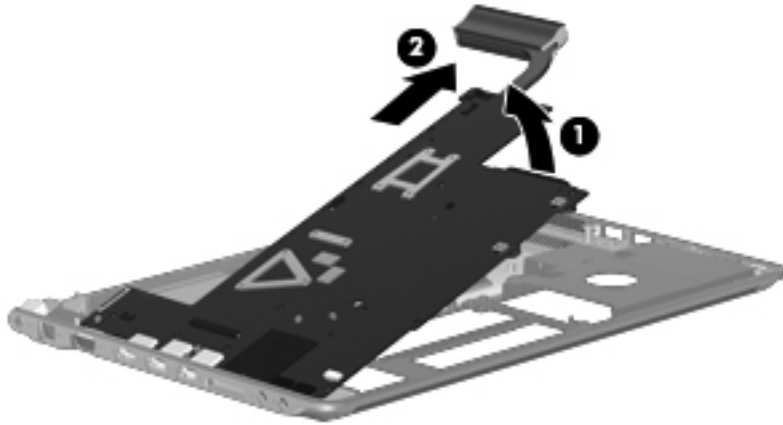
1. Disconnect the RJ-45 connector **(1)** from the enclosure.
2. Disconnect the power connector **(2)** from the enclosure.



3. Remove the five Phillips PM2.5×4.0 screws **(1)** that secure the system board to the base enclosure.




4. Lift up **(1)** on the right side of the system board, and then pull it to the right **(2)** to remove the system board from the base enclosure.



Reverse this procedure to install the system board.

Power and RJ-45 cable

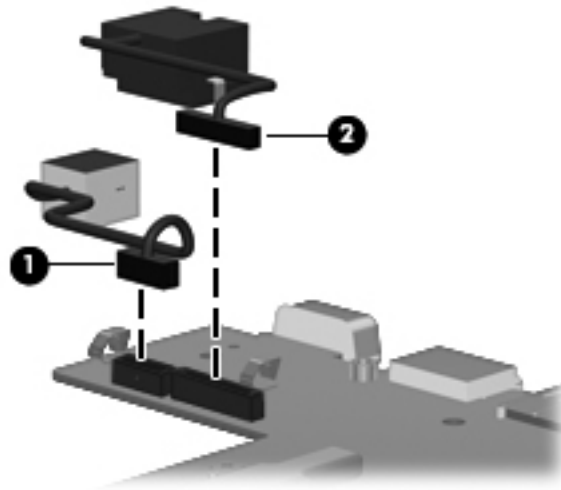
 **NOTE:** The power and RJ-45 cables are included in the Cable Kit, spare part number 611214-001.

Before removing the power and RJ-45 cables, 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 36](#)).
- 5.** Remove the following components:
 - a.** Hard drive (see [Hard drive on page 38](#))
 - b.** Memory module compartment cover (see [WLAN module on page 43](#))
 - c.** Keyboard (see [Keyboard on page 50](#))
 - d.** Display assembly (see [Display assembly on page 57](#))
 - e.** Top cover (see [Top cover on page 53](#))
 - f.** System board (see [System board on page 67](#))

Remove the power and RJ-45 cables:


- 1.** Release the power connector from the clip built into the system board and then remove it **(1)**.
- 2.** Release the RJ-45 connector from the clip built into the system board and then remove it **(2)**.



Reverse this procedure to install the power and RJ-45 and cables.

Fan

Description	Spare part number
Fan	611219-001

 **NOTE:** To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the right side and rear panel of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

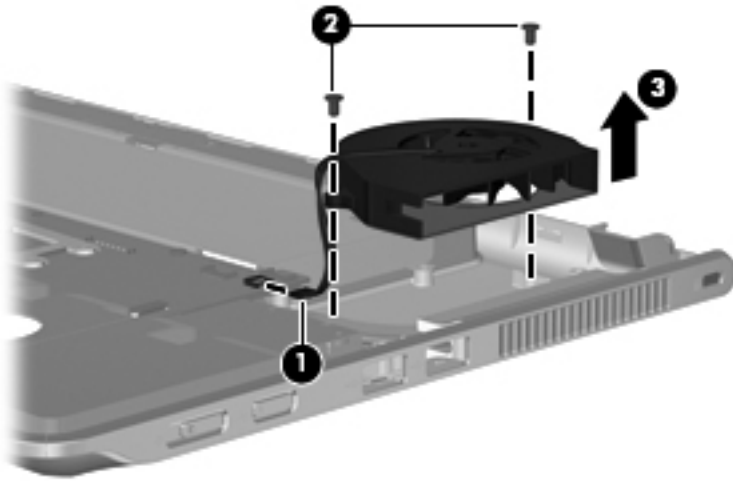
Before removing the fan, follow these steps:

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 36](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 38](#))
 - b. Memory module compartment cover (see [WLAN module on page 43](#))
 - c. Keyboard (see [Keyboard on page 50](#))
 - d. Display assembly (see [Display assembly on page 57](#))
 - e. Top cover (see [Top cover on page 53](#))

Remove the fan:


1. Disconnect the fan cable **(1)** from the system board.
2. Remove the two Phillips PM2.5×6.0 screws **(2)** that secure the fan to the system board.

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



Reverse this procedure to install the fan.

Heat sink

 **NOTE:** The processor is soldered onto the system board. Thermal grease has been applied between the heat sink and the processor, chipset, and graphics chipset.

Description	Spare part number
Heat sink for use only on computer models equipped with a graphics subsystem with discrete memory	581187-001
Heat sink for use only on computer models equipped with a graphics subsystem with UMA memory	581186-001

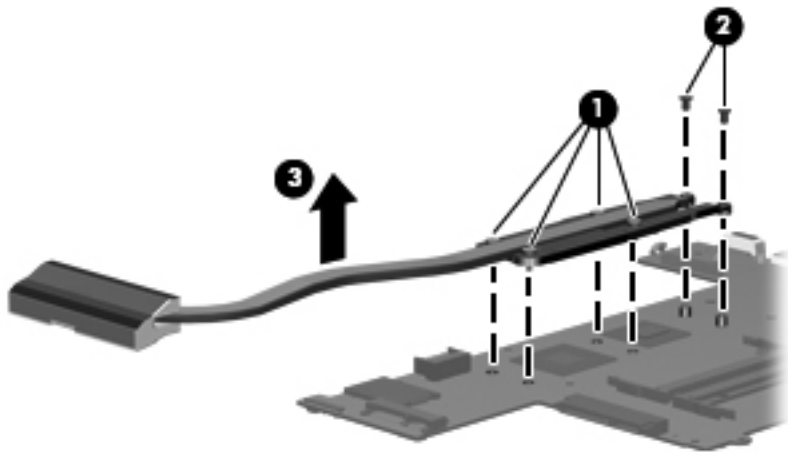
Before removing the heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 36](#)).
5. Remove the following components:
 - a. Hard drive (see [Hard drive on page 38](#))
 - b. Memory/wireless module compartment cover (see [WLAN module on page 43](#))
 - c. Keyboard (see [Keyboard on page 50](#))
 - d. Display assembly (see [Display assembly on page 57](#))
 - e. Top cover (see [Top cover on page 53](#))
 - f. System board (see [System board on page 67](#))

Remove the heat sink:

1. Loosen the four captive Phillips 2.0×8.0 screws 1 in the order sequence noted on the heat sink.
2. Remove the five Phillips 2.0×4.0 screws 2 holding the heat sink to the system board.

3. Remove the heat sink (3).



Reverse this procedure to install the heat sink.

5 Setup Utility (BIOS)

Starting Setup Utility

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

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

To start Setup Utility:

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

– or –

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

Using Setup Utility

Changing the language of Setup Utility

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

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

– or –

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

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

Your change goes into effect immediately.

Navigating and selecting in Setup Utility

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

- To choose a menu or a menu item, use the arrow keys.
- To choose an item in a list or to toggle a field, for example an Enable/Disable field, use either the arrow keys or **f5** or **f6**.
- To select an item, press **enter**.
- To close a text box or return to the menu display, press **esc**.
- To display additional navigation and selection information while Setup Utility is open, press **f1**.

Display system information

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

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

– or –

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

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

Restoring default settings in Setup Utility

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


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

– or –

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

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

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

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

Exiting Setup Utility

You can exit Setup Utility with or without saving changes.

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

If the Setup Utility menus are not visible, press `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`.

After either choice, the computer restarts in Windows.

Setup Utility menus

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

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

Main menu

Select	To do this
System information	<ul style="list-style-type: none">• View and change the system time and date.• View identification information about the computer.• View specification information, such as processor information, memory size, and system BIOS.

Security menu

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

System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Button Sound (select models only)	Enable/disable the capacitive button tapping sound.
Virtualization Technology (select models only)	Enable/disable the processor Virtualization Technology.
Processor C6 State (select models only)	Enable/disable the processor C6 sleep state.
LAN Power Saving	Enable/disable the LAN power saving. Reduces the power consumption of the LAN controller.
Card Reader/1394 Power Saving (select models only)	Enable/disable Card Reader/1394 Power Saving.
Fan Always On	Enabled/disable Fan Always On. When enabled, the computer fan will always be on.
Action Keys Mode	Enable/disable the Action Keys.
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none">• POST Hotkey Delay (seconds)—Set the delay for the user to press hot keys in intervals of 5 seconds each (0, 5, 10, 15, or 20)• QuickWeb Support—Enable/disable the QuickWeb Boot Menu during Setup Utility. Set the delay for the user to start Setup Utility in 5 or 10 second intervals.• Delay to boot Windows—Enable/disable the delay to boot Windows in 2, 3, 5, 10, 15, and 30 second intervals.• Floppy Boot - Enable/disable boot from diskette.• Internal Network Adapter Boot—Enable/disable boot from internal Network Adapter.• Boot Order—Set the boot order for:<ul style="list-style-type: none">◦ Notebook Hard Drive◦ USB Diskette on Key/USB Hard Disk◦ Internal CD/DVD ROM Drive◦ USB CD/DVD ROM Drive◦ USB Floppy◦ Network Adapter

Diagnostics menu

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

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

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 opening Setup Utility.

To use Setup Utility for displaying BIOS information:

1. Open Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.
2. If Setup Utility does not open with the system information displayed, use the arrow keys to select the **Main** menu.

When the Main menu is selected, BIOS and other system information is displayed.

3. To exit Setup Utility, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

Downloading a BIOS update

- △ **CAUTION:** To prevent 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.

To download a BIOS update:

1. Access the page on the HP Web site that provides software for your computer:
Select **Start > Help and Support > Maintain**.
2. Follow the instructions on the screen 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 instructions on the screen 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 will be 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. Open Windows Explorer by selecting **Start > 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 instructions on the screen.

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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	2340 cm	9.06 in
Width	32.6 cm	12.83 in
Height (front to back)	2.29 to 2.99 mm	0.90 to 1.18 in
Weight	1.9 kg	4.19 lbs
Input power		
Operating voltage	16.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 A or 4.74 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft

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

13.3-inch display specifications

	Metric	U.S.
Dimensions		
Height	17.8 cm	7.0 in
Width	28.4 cm	11.2 in
Diagonal	33.6 cm	13.3 in
Number of colors	Up to 16.8 million	
Contrast ratio	250:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1366 × 768 or 1280 × 720	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	4.0 W	
Viewing angle	±40° horizontal, +120°/-40° vertical (typical)	

Hard drive specifications

	640-GB*	500-GB*	320-GB*	250-GB*	160-GB*	128-GB* SSD	
Dimensions							
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm	
Width	70 mm	70 mm	70 mm	70 mm	70 mm	70 mm	
Weight	105 g	101 g	101 g	101 g	101 g	70 g	
Interface type	SATA	SATA	SATA	SATA	SATA	SATA	
Transfer rate	142 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	300 MB/sec	
Security	ATA security	ATA security	ATA security	ATA security	ATA security	ATA security	
Seek times (typical read, including setting)							
Single track	1.5 ms	1.0 ms	1.5 ms	2.0 ms	2.0 ms	—	
Average	12.0 ms	14.0 ms	12.0 ms	12.0 ms	12.0 ms	—	
Maximum	24.0 ms	22.0 ms	22.0 ms	22.0 ms	22.0 ms	—	
Logical blocks	1,250,263,768	976,785,075	625,142,448	488,397,168	312,581,808	250,069,680	
Disc rotational speed	5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm	—	
Operating temperature	0°C to 60°C (32°F to 140°F)	5°C to 55°C (41°F to 131°F)				0°C to 70°C (32°F to 158°F)	

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact technical support for details.

Blu-ray ROM DVD±RW SuperMulti Double-Layer Drive specifications

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

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


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

7 Backup and recovery

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

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


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

 **NOTE:** Computers with a solid-state drive (SSD) may not have a recovery partition. To check for the presence of a recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window. If a recovery partition is not present, use the recovery discs you created.

Creating recovery discs


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

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

 **NOTE:** 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.

Note the following guidelines before creating recovery discs:

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

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

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

To create a set of recovery discs:

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

Backing up your information

As you add new software and data files, you should back up your system on a regular basis to maintain a reasonably current backup. Back up your system at the following times:

- At regularly scheduled times

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

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

Note the following when backing up:

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

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


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

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

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

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


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

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

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


Using Windows Backup and Restore

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

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


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

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

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

Using system restore points


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

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

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

When to create restore points

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

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

Create a system restore point


1. Select **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Under **Protection Settings**, select the disk for which you want to create a restore point.
5. Click **Create**.
6. Follow the on-screen instructions.

Restore to a previous date and time

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

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

Performing a recovery

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

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

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


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

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the dedicated recovery partition (select models only)

 **NOTE:** Computers with an SSD may not have a recovery partition. If the computer does not have a recovery partition, you will not be able to recover using this procedure. Use the discs you created to recover your operating system and software.

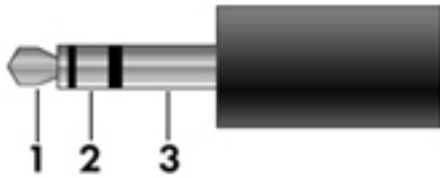
On some models, you can perform a recovery from the partition on the hard drive, accessed by pressing either the Start button or **f11**. This restores the computer to its factory condition.

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

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

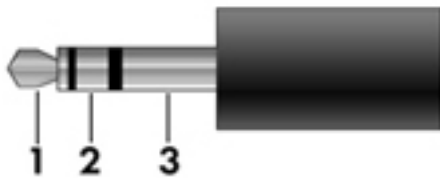
8 Connector pin assignments

Audio-in (microphone)



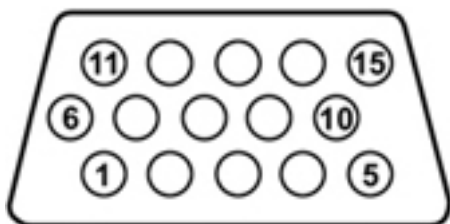
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



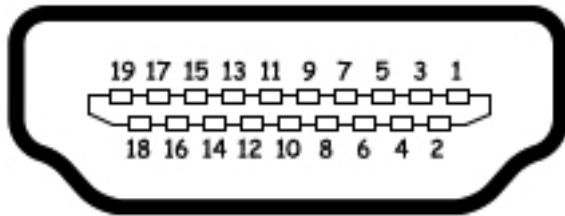
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



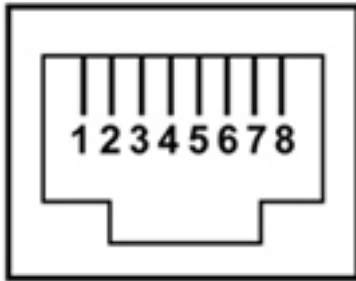
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



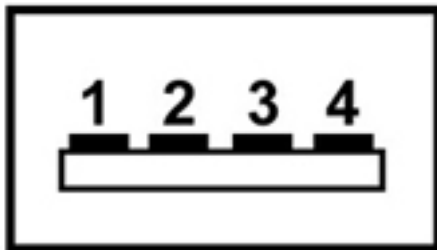
Pin	Signal	Pin	Signal
1	TMDS data 2+	11	TMDS clock shield
2	TMDS data 2 shield	12	TMDS clock-
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	No connect
5	TMDS data 1 shield	15	DDC clock
6	TMDS data 1-	16	DDC data
7	TMDS data 0+	17	Ground
8	TMDS data 0 shield	18	+5V power
9	TMDS data 0-	19	Hot plug detect
10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

RJ-45 (network)



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

Universal Serial Bus



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

9 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

10 Recycling

Battery

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

Display

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

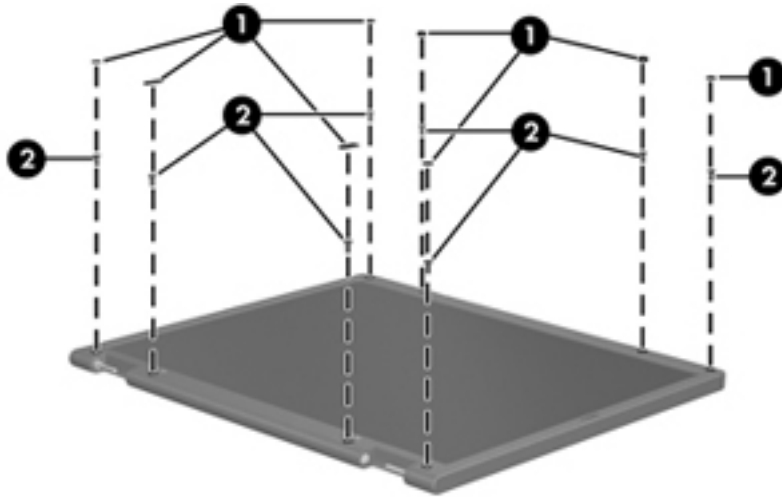
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



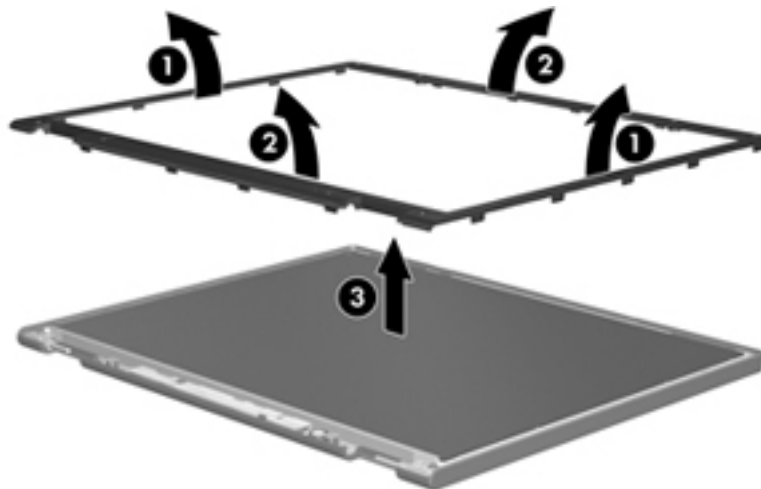
- 📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps:

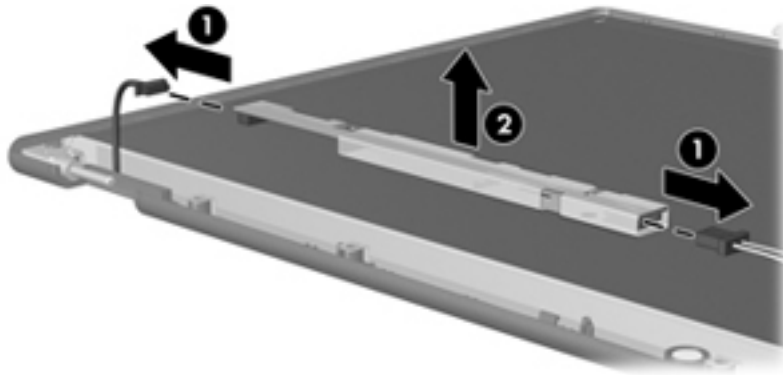
1. Remove all screw covers **(1)** and screws **(2)** that secure the display bezel to the display assembly.



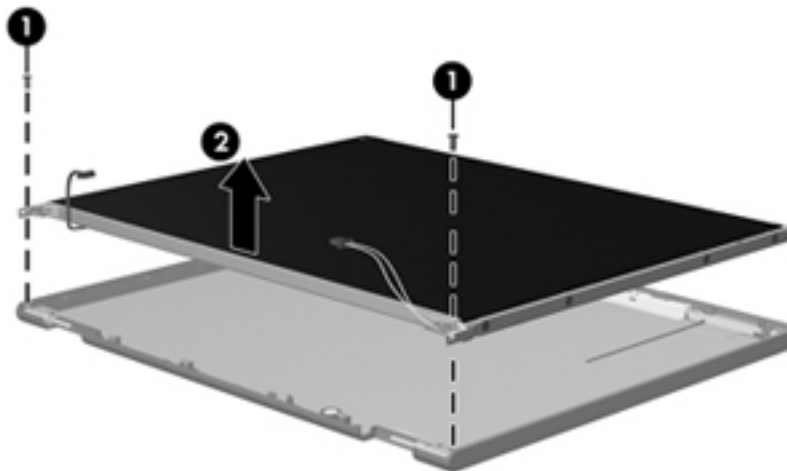
2. Lift up and out on the left and right inside edges **(1)** and the top and bottom inside edges **(2)** of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel 3.



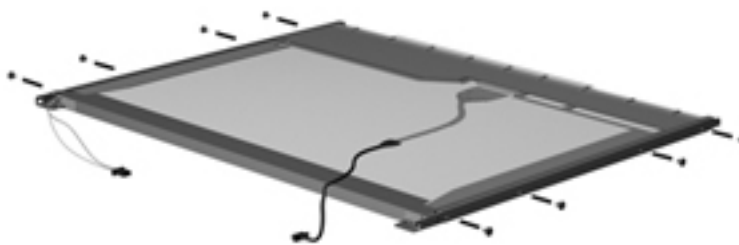
4. Disconnect all display panel cables **(1)** from the display inverter and remove the inverter **2**.



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

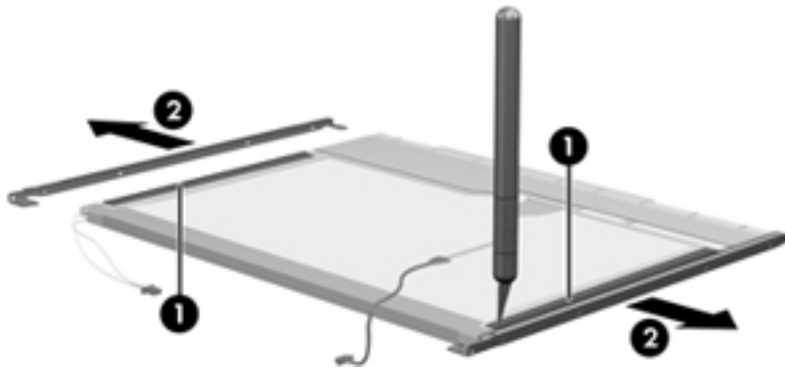


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



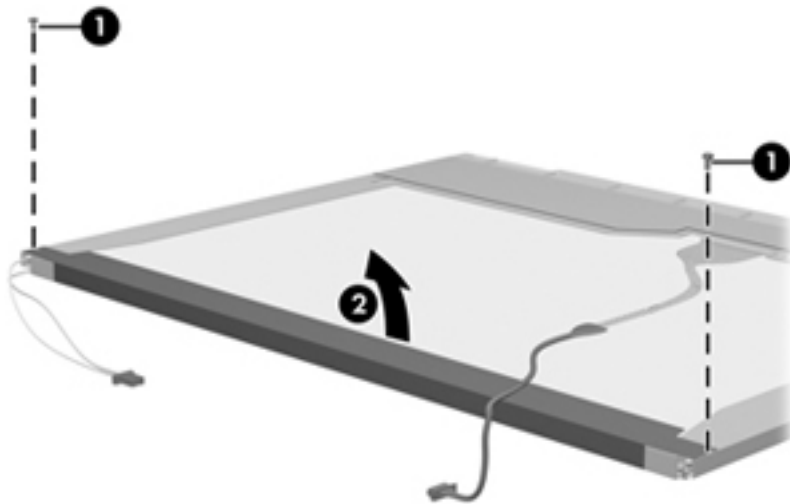
9. Use a sharp-edged tool to cut the tape **(1)** that secures the sides of the display panel to the display panel frame.

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



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

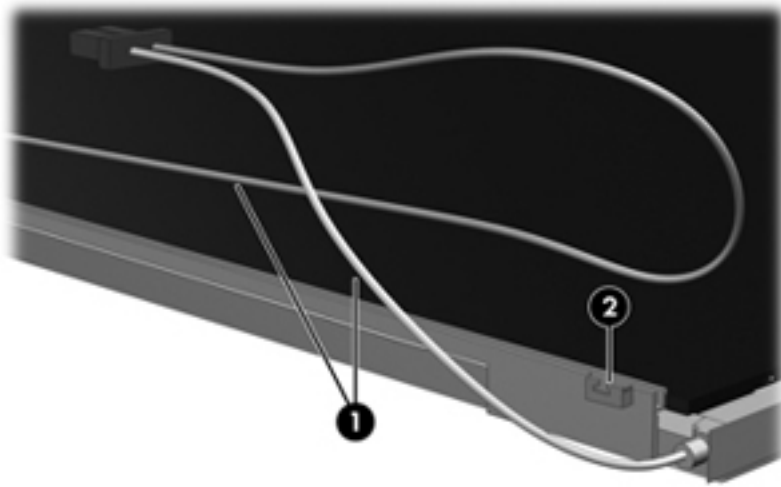
12. Lift the top edge of the backlight cover **(2)** and swing it outward.



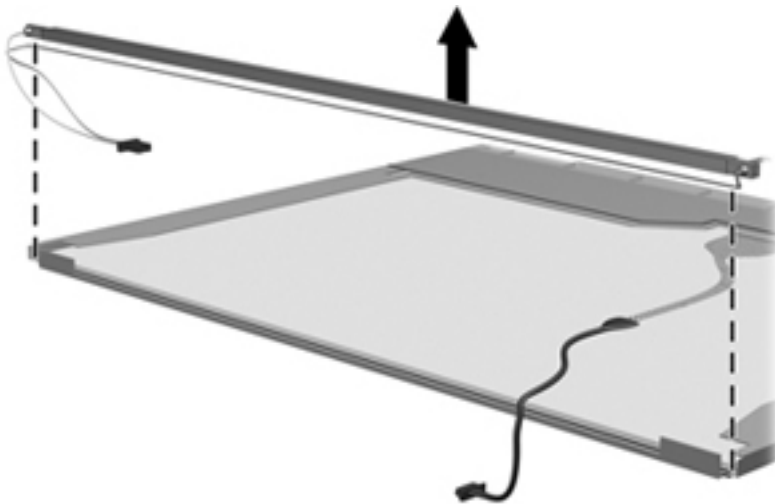
13. Remove the backlight cover.

14. Turn the display panel right-side up.

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

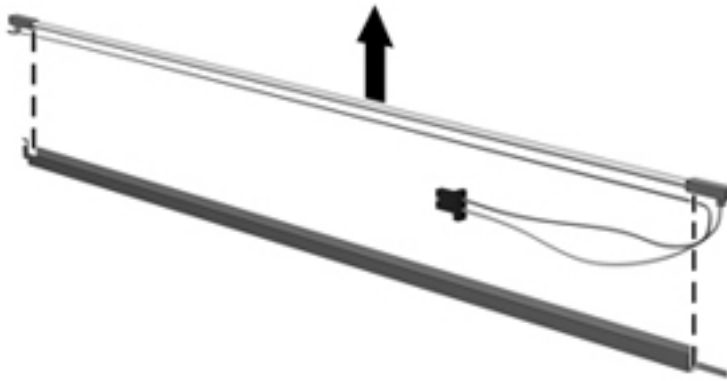


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



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

18. Remove the backlight from the backlight frame.

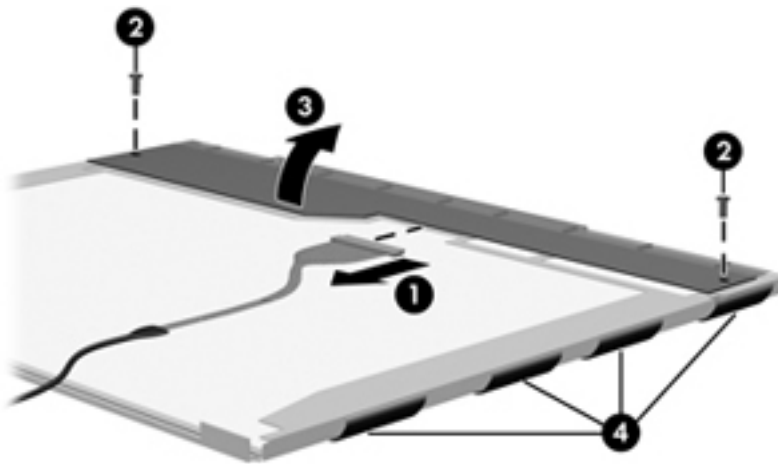


19. Disconnect the display cable **(1)** from the LCD panel.

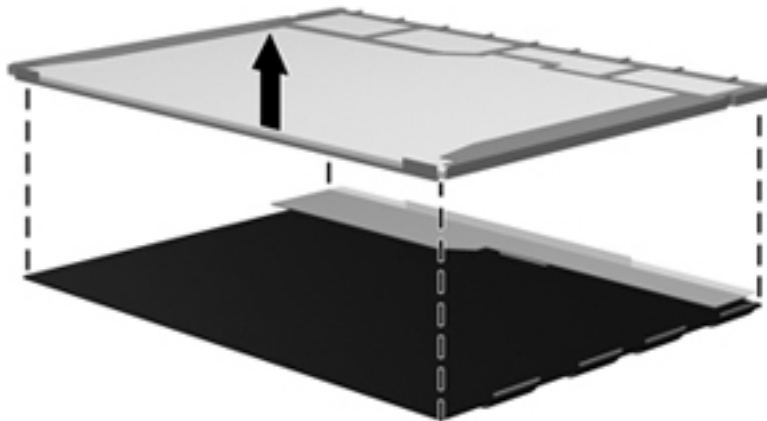
20. Remove the screws **(2)** that secure the LCD panel to the display rear panel.

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

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



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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