



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

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- ⚠ **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	Intel Pentium® U5400 (1.2 GHz, 3M L3 cache) UMA Intel Pentium U5400 (1.2 GHz, 3M L3 cache) Discrete Intel Core i3–330UM (1.2 GHz, 3M L3 cache) UMA Intel Core i3–330UM (1.2 GHz, 3M L3 cache) Discrete Intel Dual Core i5–430UM (1.2 GHz SC turbo up to 1.73GHz, 3M L3 cache) Discrete Intel Core i3–380UM (1.33 GHz, 3M L3 cache) UMA Intel Core i3–380UM (1.33 GHz, 3M L3 cache) Discrete Intel Core i5–470UM (1.33 GHz SC turbo, 3M L3 cache) Discrete
Chipset	Intel HM55 Express Chipset
Graphics	Intel HD Graphics ATi Park LP (ATI Mobility Radeon™ HD5430) with 1024MB of dedicated video memory (128Mx16 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) (3.6mm) SVA
Memory	2 customer-accessible/upgradable memory module slots Supports up to 8 GB 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, 7200-rpm
	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	<p>Supports only external optical drives</p> <ul style="list-style-type: none"> 12.7-mm tray load Serial ATA (SATA) External USB: 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 10/100/1000 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"> Broadcom 802.11 bgn WLAN + Bluetooth® Combo card Broadcom 802.11 bgn WLAN card Atheros 802.11 bgn WLAN card Ralink 802.11 bgn WLAN + Bluetooth Combo card
	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

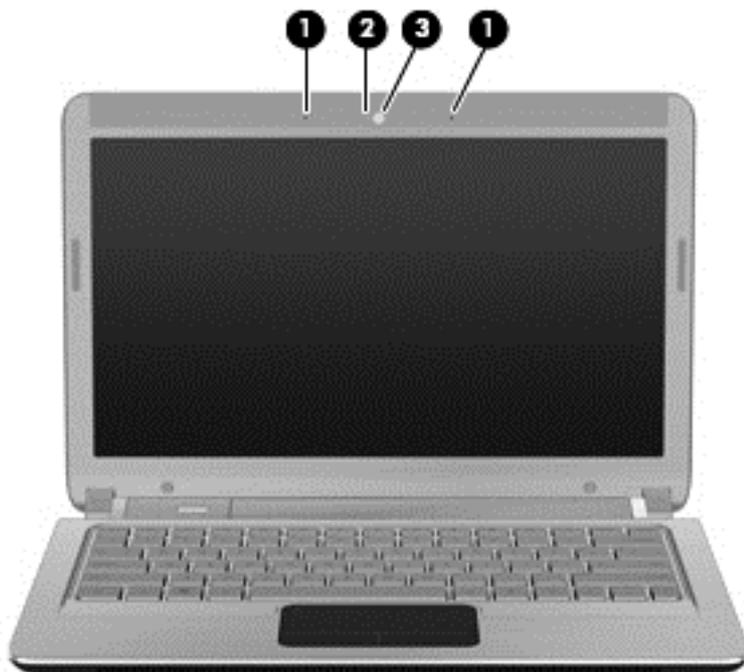
Category	Description
External media card	<p>Digital Media Slot, supporting the following optional digital card formats:</p> <ul style="list-style-type: none"> • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Memory Stick (MS) • Memory Stick Pro (MSP) • xD-Picture Card (XD) (also types H and M) <p>SIM card slot:</p> <ul style="list-style-type: none"> • Populated with WWAN • User accessible
Ports	<p>Audio-in (stereo microphone)</p> <p>Audio-out (stereo headphone)</p> <p>Hot Plug/Unplug and auto detector for correct output to wide-aspect vs. standard-aspect video</p> <p>HDMI v.1.3b supporting 1080p with HDCP key</p> <p>Multi-pin AC power (non-smart pin)</p> <p>RJ-45 (Ethernet, includes link and activity lights)</p> <p>USB 2.0 (3)</p> <p>VGA (Dsub 15-pin) supporting 1920 × 1200 external resolution at 75 GHz</p>
Keyboard/pointing devices	<p>Full size keyboard</p> <p>TouchPad with TouchPad buttons</p> <p>Supports 2-way scroll with legend</p> <p>Taps enabled by default</p> <p>Touchpad on/off capability</p> <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> <p>6-cell, 2.8-Ah (62-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) • Windows 7 Premium (64-bit) • Windows 7 Professional (32-bit)

Category	Description
	<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
	RTC battery
	SIM card (for WWAN)

2 External component identification

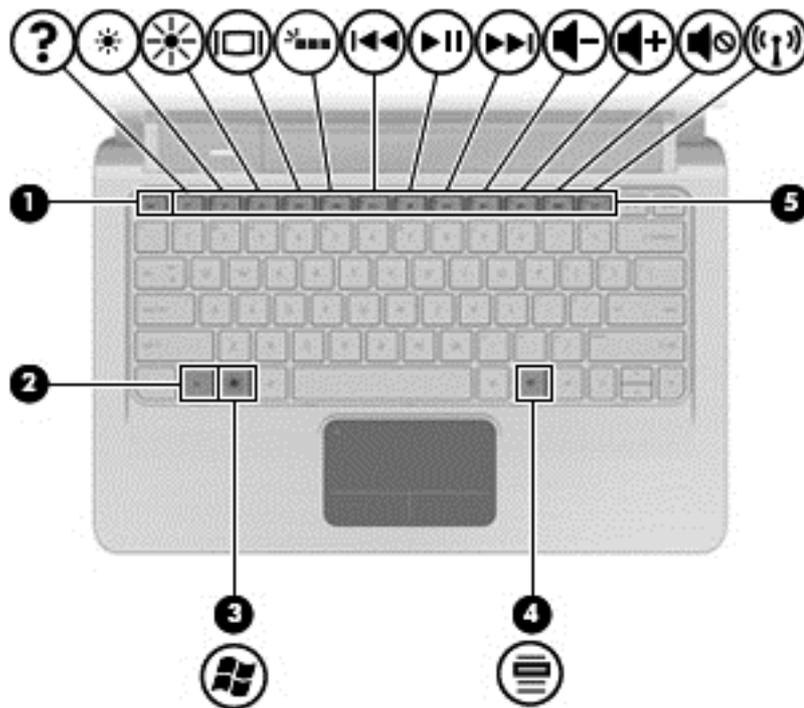
Top components

Display components



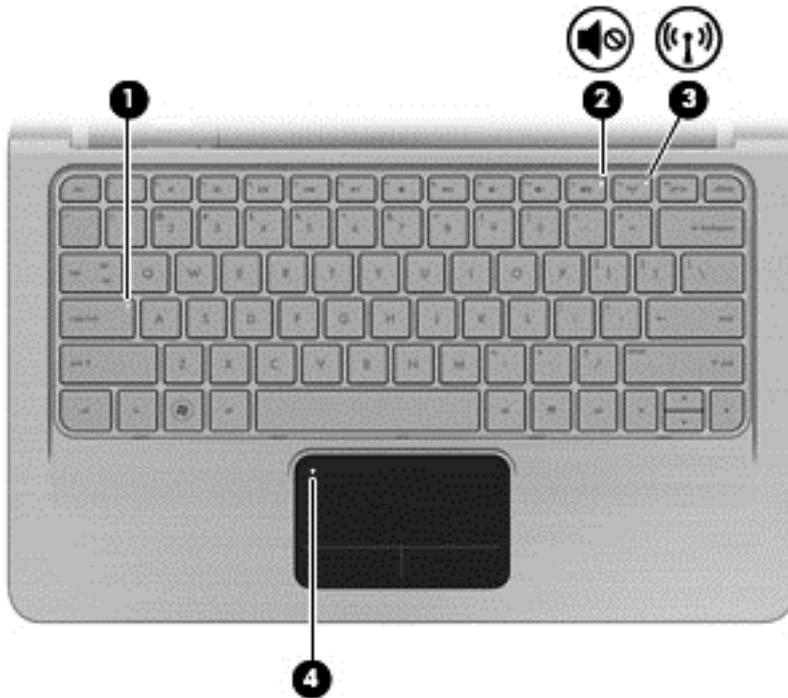
Item	Component	Function
(1)	Internal microphones (2)	Record sound.
(2)	Webcam light	On—The webcam is in use.
(3)	Webcam	Records video and captures still photographs.

Keys



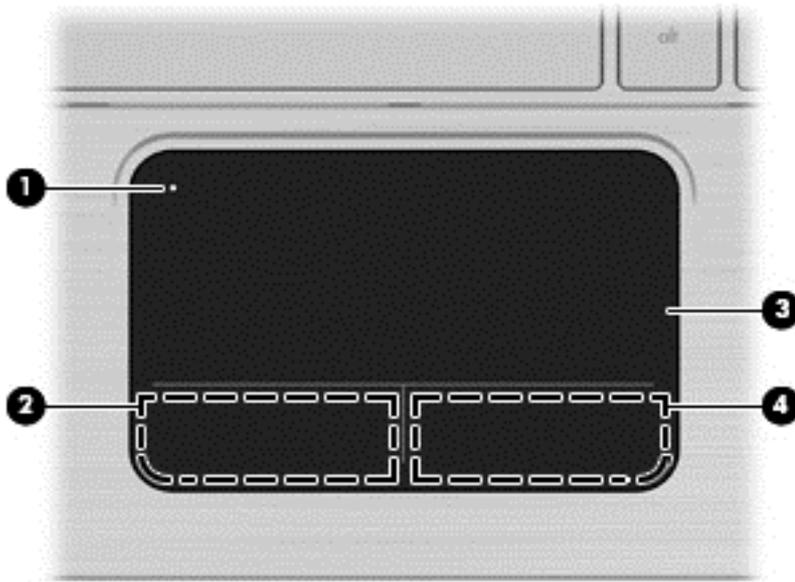
Item	Component	Function
(1)	<code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2)	<code>fn</code> key	Executes frequently used system functions when pressed in combination with an arrow key or the <code>esc</code> key.
(3)	Windows logo key	Displays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

Lights



Item	Component	Description
(1)	Caps lock light	On—Caps lock is on.
(2)	Mute light	On—Computer sound is off.
(3)	Wireless light	<ul style="list-style-type: none">• White—An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.• Amber—No wireless devices are detected.
(4)	TouchPad light	<ul style="list-style-type: none">• Off—TouchPad is enabled.• Amber—TouchPad is disabled.

TouchPad components



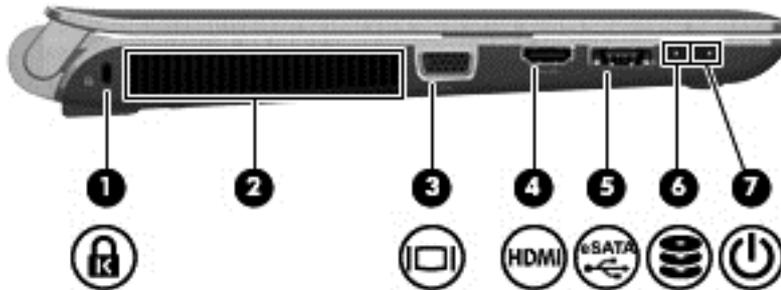
Item	Component	Function
(1)	TouchPad light	<ul style="list-style-type: none">• Off—TouchPad is enabled.• Amber—TouchPad is disabled.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	TouchPad scroll zone	Scrolls up or down.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

Front components



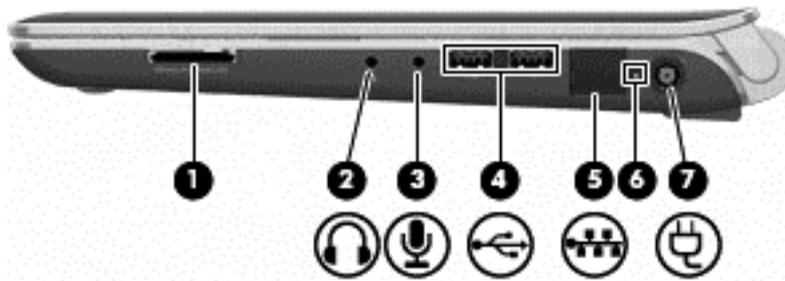
Item	Component	Function
(1)	Speakers (2)	Produce sound.

Left-side components



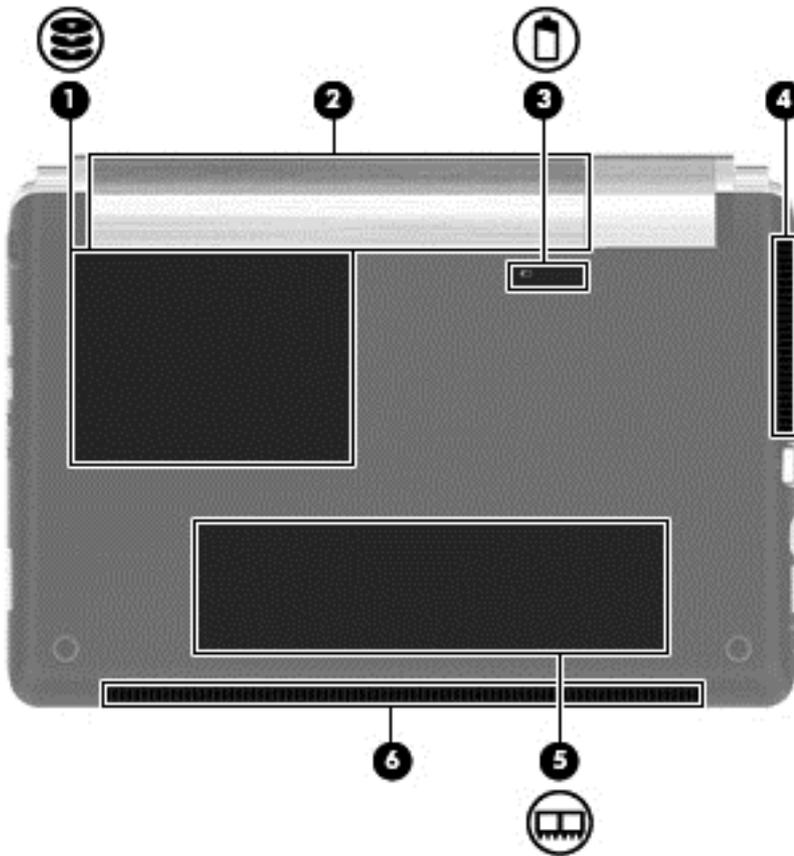
Item	Component	Function
(1)	Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen.
(2)	Vent	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	External monitor port	Connects an external VGA monitor or projector.
(4)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(5)	USB port	Connects an optional USB device.
(6)	Drive light	On—The hard drive is in use.
(7)	Power light	Supports the following digital card formats: <ul style="list-style-type: none"> • On—The computer is on. • Flashing—The computer is in Sleep. • Off—The computer is off or in Hibernation.

Right-side components



Item	Component	Function
(1)	Digital Media Slot (select models only)	Supports the following optional digital card formats: <ul style="list-style-type: none"> • Memory Stick (MS) • Memory Stick Pro (MSP) • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card • xD-Picture Card (XD)
(2)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio.
(3)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(4)	USB ports (2)	Connects optional USB devices.
(5)	RJ-45 (network) jack (optional)	Connects a network cable.
(6)	AC adapter light	<ul style="list-style-type: none"> • Flashing white—The computer is in Sleep. • On white—The computer is connected to external power. • Flashing amber—The computer is charged. • Off—The computer is not connected to external power.
(7)	Power connector	Connects an AC adapter.

Bottom components

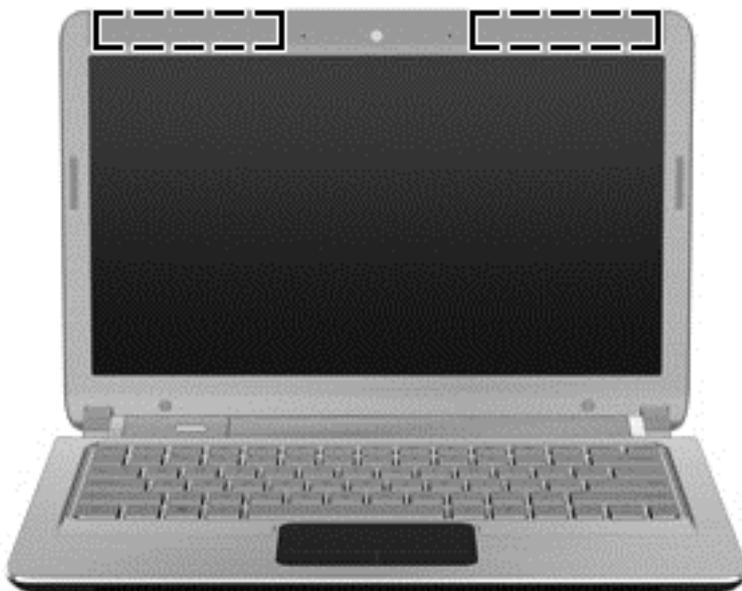


Item	Component	Function
(1)	Hard drive bay	<p>Holds the hard drive and wireless wide area network (WWAN) module (select models only).</p> <p>NOTE: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that 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>
(2)	Battery bay	<p>Holds the battery and contains the SIM slot.</p> <p>NOTE: The battery is preinstalled in the battery bay at the factory.</p>
(3)	Battery release latch	Releases the battery from the battery bay.
(4)	Vent	<p>Enable 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>

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)	Speakers (2)	Produce sounds.

Wireless antennas

 **NOTE:** Your computer might look 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).
	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, see 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.

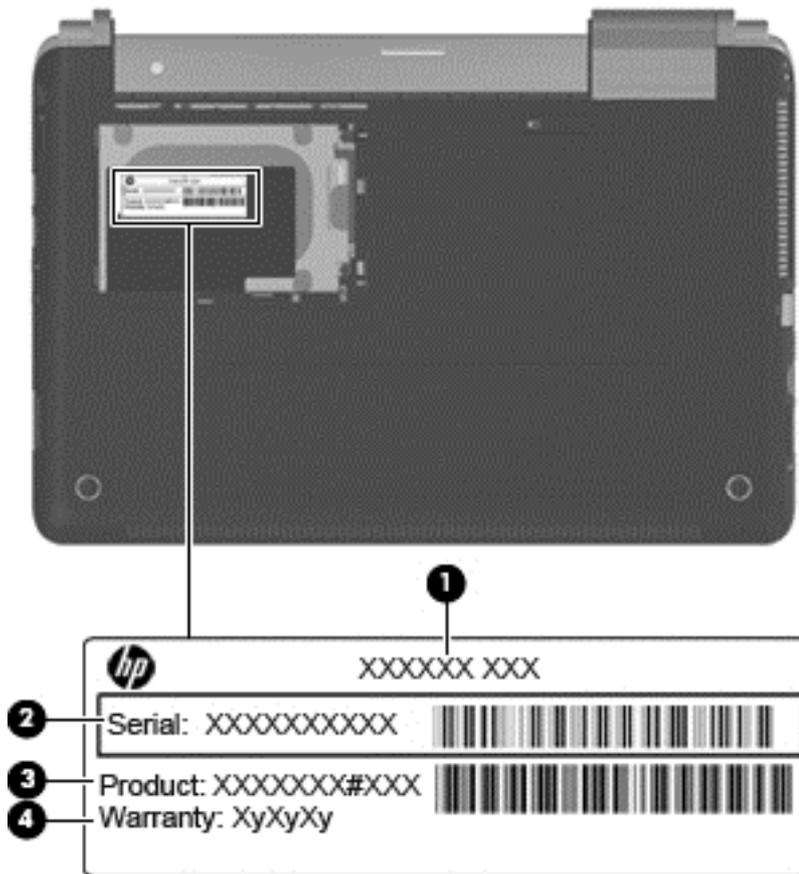
*Batteries and power cords vary in appearance by region or country.

3 Illustrated parts catalog

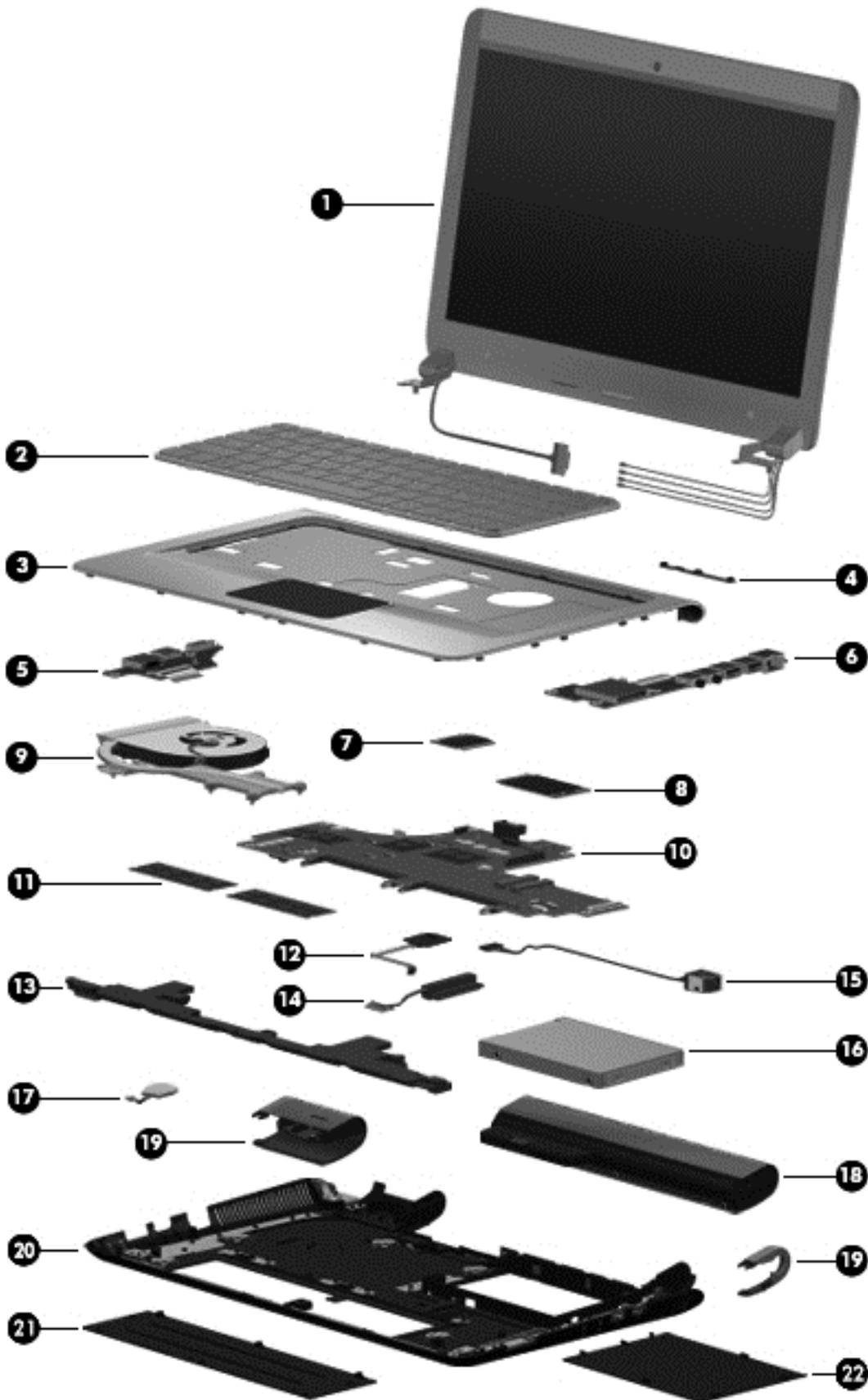
Serial number label

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) Warranty period—This number describes the duration of the warranty period for the computer.



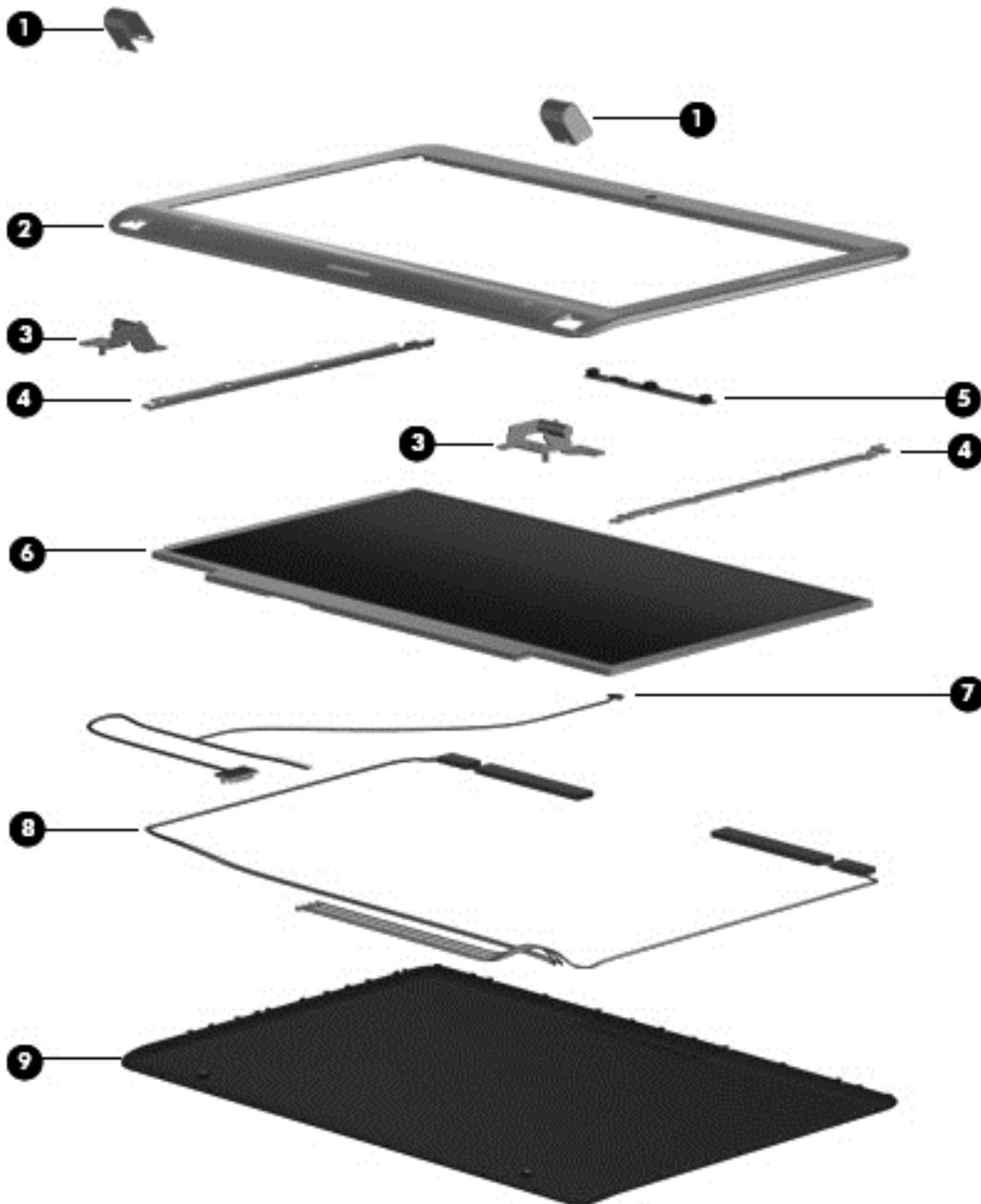
Computer major components



Item	Description	Spare part number
(1)	Display assembly	
	33.8-cm (13.3-in) HD LED Brightview SVA	633279-001
	NOTE: For more information on the display assembly internal component spare part information, see Display assembly components on page 19 .	
(2)	Keyboard (includes keyboard cable) for use in the:	
	United States	619433-001
	French Canada	619433-121
	Thailand	619433-281
	Japan	619433-291
	Taiwan	619433-AB1
	South Korea	619433-AD1
	Backlit Keyboard (includes keyboard cable) for use in the:	
	United States	619434-001
	French Canada	619434-121
	Thailand	619434-281
	Japan	619434-291
	Taiwan	619434-AB1
	South Korea	619434-AD1
(3)	Top cover (includes TouchPad)	626743-001
(4)	Webcam module	619459-001
(5)	Left mini system board	626740-001
(6)	Right mini system board	626739-001
(7)	WLAN module	
	Broadcom 802.11 bgn WLAN + Bluetooth Combo card	621184-001
	Broadcom 802.11 bgn WLAN card	621751-001
	Atheros 802.11 bgn WLAN card	621752-001
	Ralink 802.11 bgn WLAN + Bluetooth Combo card	621753-001
(8)	HSPA EV-DO Birlion MiniCard UNDP WWAN module (optional)	621185-001
(9)	Heat sink (includes replacement thermal material)	
	UMA	619440-001
	Discrete	626735-001
(10)	System board (includes embedded processor and replacement thermal)	
	Intel Pentium U5400 (1.2 GHz, 3M L3 cache) UMA	619456-001
	Intel Pentium U5400 (1.2 GHz, 3M L3 cache) Discrete	619457-001

Item	Description	Spare part number
	Intel Core i3–330UM (1.2 GHz, 3M L3 cache) UMA	621560-001
	Intel Core i3–330UM (1.2 GHz, 3M L3 cache) Discrete	621561-001
	Intel Dual Core i5–430UM (1.2 GHz SC turbo up to 1.73GHz, 3M L3 cache) Discrete	621562-001
	Intel Core i3–380UM (1.33 GHz, 3M L3 cache) UMA	626598-001
	Intel Core i3–380UM (1.33 GHz, 3M L3 cache) Discrete	626599-001
	Intel Core i5–470UM (1.33 GHz SC turbo, 3M L3 cache) Discrete	626600-001
(11)	Memory modules (PC3, 1066 MHz)	
	2GB	598856-001
	1GB	598859-001
	4GB	599092-001
(12)	Power button board	626742–001
(13)	Speakers	619454-001
(14)	Hard drive cable (included in cable kit)	626734-001
(15)	Power and RJ-45 connector and cable (included in cable kit)	
(16)	Hard drive (includes hard drive bracket and Mylar cover)	
	640 GB, 7200 RPM	619445-001
	500 GB, 7200 RPM	619444-001
	320 GB, 7200 RPM	619443-001
	250 GB, 7200 RPM	619442-001
	160 GB, 7200 RPM	619441-001
	640 GB, INTERNAL, 7200 RPM	621046-001
	SSD 160 GB	619445-001
	Hard Drive Hardware Kit (not illustrated; includes hard drive bracket and hard drive screws)	619446-001
(17)	RTC battery (includes cable)	619451-001
(18)	Battery 6C 62Whr 2.8Ah LI	619438-001
(19)	Hinge covers	626737-001
(20)	Base enclosure	619437-001
	Plastics kit	619450-001
(21)	Memory module compartment access cover	
(22)	Hard drive bay access cover	

Display assembly components



Item	Description	Spare part number
(1)	Display hinge covers	626637-001
(2)	Display bezel (includes WLAN and WWAN antennas)	619499-001
(3)	Display hinges (with hinges)	619477-001
(5)	Webcam module	619549-001
(6)	33.8-cm (13.3-in) HD LED Brightview SVA panel	619448-001

Item	Description	Spare part number
(7)	Display cable (includes microphone)	619439-001
(8)	Wireless antenna (includes WLAN and WWAN antenna transceivers and cable)	619435-001
(9)	Display back cover (includes logo) for use with:	619436-001
	Display EMI shield (not illustrated)	626736-001

Plastics kit



Item	Description	Spare part number
	Plastics Kit	619450-001
(1)	Memory module compartment cover	
(2)	Hard drive bay access cover	

Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (includes hard drive bracket and Mylar cover)	
	640 GB, 7200 RPM	619445-001
	500 GB, 7200 RPM	619444-001
	320 GB, 7200 RPM	619443-001
	250 GB, 7200 RPM	619442-001
	160 GB, 7200 RPM	619441-001
	640 GB, INTERNAL, 7200 RPM	621046-001
	SSD 160 GB	619455-001
	Hard Drive Hardware Kit (not illustrated; includes hard drive bracket and hard drive screws)	619446-001
(2)	External Optical drive (optional)	
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	584383-001
	Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Drive	584384-001

Miscellaneous parts

Description	Spare part number
AC adapter	609939-001
AC adapter (for use in emerging markets)	609948-001
Power cords for use in:	
Australia	490371-011
India	490371-D61
Japan	490371-291
South Korea	490371-AD1
Taiwan	490371-AB1
Thailand	490371-201
the People's Republic of China	490371-AA1
the United Kingdom and Singapore	490371-031
the United States	490371-001
Cable Kit	626734-001
<ul style="list-style-type: none"> • Power cable • hard drive cable 	
Rubber Kit	619452-001
Screw Kit	619453-001
<ul style="list-style-type: none"> • Phillips PM2.0×3.0 screw • Phillips PM2.5×4.0 screw • Phillips PM2.5×6.0 screw • Phillips PM2.5×12.0 screw • Phillips PM3.0×4.0 screw • Phillips PM1.6×2.5 screw • Phillips PM2.5×.5 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
490371-031	Power cord for use in the United Kingdom and Singapore
490371-201	Power cord for use in Thailand

Spare part number	Description
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
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)
598856-001	4096-MB memory module (PC3, 1066 MHz)
598859-001	2048-MB memory module (PC3, 1066 MHz)
599092-001	1024-MB memory module (PC3, 1066 MHz)
609939-001	65-W RC/V AC adapter
609948-001	65-W RC/V AC adapter (for use in emerging markets)
619433-001	Keyboard for use in the United States (includes cable and 2 retention clips)
619433-121	Keyboard for use in French Canada (includes cable and 2 retention clips)
619433-281	Keyboard for use in Thailand (includes cable and 2 retention clips)
619433-291	Keyboard for use in Japan (includes cable and 2 retention clips)
619433-AB1	Keyboard for use in Taiwan (includes cable and 2 retention clips)
619433-AD1	Keyboard for use in South Korea (includes cable and 2 retention clips)
619434-001	Backlit keyboard for use in the United States (includes cable and 2 retention clips)
619434-121	Backlit keyboard for use in French Canada (includes cable and 2 retention clips)
619434-281	Backlit Keyboard for use in Thailand (includes cable and 2 retention clips)
619434-291	Backlit Keyboard for use in Japan (includes cable and 2 retention clips)
619434-AB1	Backlit keyboard for use in Taiwan (includes cable and 2 retention clips)
619434-AD1	Backlit keyboard for use in South Korea (includes cable and 2 retention clips)
619435-001	Antennas (includes WLAN and WWAN antennas)
619436-001	Display back cover
619437-001	Base enclosure
619438-001	6-cell, 62-WHr 2.8Ah LI battery
619439-001	Display cable
619440-001	Heat sink for use only with computer models equipped with UMA graphics subsystem (includes replacement thermal material)
619441-001	160-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
619442-001	250-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)

Spare part number	Description
619443-001	320-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
619444-001	500-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
619445-001	640-GB, 7200-rpm hard drive (includes hard drive bracket and Mylar cover)
619446-001	Hard Drive Hardware Kit (includes hard drive bracket, Mylar cover, and hard drive screws)
619447-001	Display hinges (includes left and right display hinges)
619448-001	33.8-cm (13.3-in) HD LED BrightView display panel (includes display panel and backlight cables)
619449-001	Display assembly bezel (includes WLAN and WWAN antennas)
619450-001	Plastics Kit NOTE: For more Plastics Kit information, see Plastics kit on page 21 .
619451-001	RTC battery
619452-001	Rubber Kit
619453-001	Screw Kit
619454-001	Speakers
619455-001	128-GB, SSD
619456-001	System board equipped with UMA graphics subsystem and Intel Pentium U5400 (1.2 GHz, 3M L3 cache); includes replacement thermal material)
619457-001	System board equipped with discrete graphics subsystem and Intel Pentium U5400 (1.2 GHz, 3M L3 cache); includes replacement thermal material)
619459-001	Webcam
621046-001	160-GB, 7200-rpm internal hard drive (includes hard drive bracket and Mylar cover)
621184-001	Broadcom 802.11 bgn WLAN + Bluetooth Combo card
621185-001	HSPA EV-DO Birlion MiniCard UNDP WWAN module
621560-001	System board equipped with UMA graphics subsystem and Intel Core i3-330UM (1.2 GHz, 3M L3 cache); includes replacement thermal material)
621561-001	System board equipped with discrete graphics subsystem and Intel Core i3-330UM (1.2 GHz, 3M L3 cache); includes replacement thermal material)
621562-001	System board equipped with discrete graphics subsystem and Intel Dual Core i5-430UM (1.2 GHz SC turbo up to 1.73GHz, 3M L3 cache; includes replacement thermal material)
621751-001	Broadcom 802.11 bgn WLAN card
621752-001	Atheros 802.11 bgn WLAN card
621753-001	Ralink 802.11 bgn WLAN + Bluetooth Combo card
626598-001	System board equipped with UMA graphics subsystem and Intel Core i3-380UM (1.33 GHz, 3M L3 cache; includes replacement thermal material)
626599-001	System board equipped with discrete graphics subsystem and Intel Core i3-380UM (1.33 GHz, 3M L3 cache; includes replacement thermal material)
626600-001	System board equipped with discrete graphics subsystem and Intel Core i5-470UM (1.33 GHz SC turbo, 3M L3 cache; includes replacement thermal material)

Spare part number	Description
626734-001	Cable kit
626735-001	Heat sink for use only with computer models equipped with discrete graphics subsystem (includes replacement thermal material)
626736-001	Display EMI shield
626737-001	Display hinge covers
626739-001	Right mini system board
626740-001	Left mini system board
626742-001	Power button board
626743-001	Top cover (includes TouchPad and TouchPad cable)
633279-001	33.8-cm (13.3-in) HD LED BrightView display assembly

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

Use 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

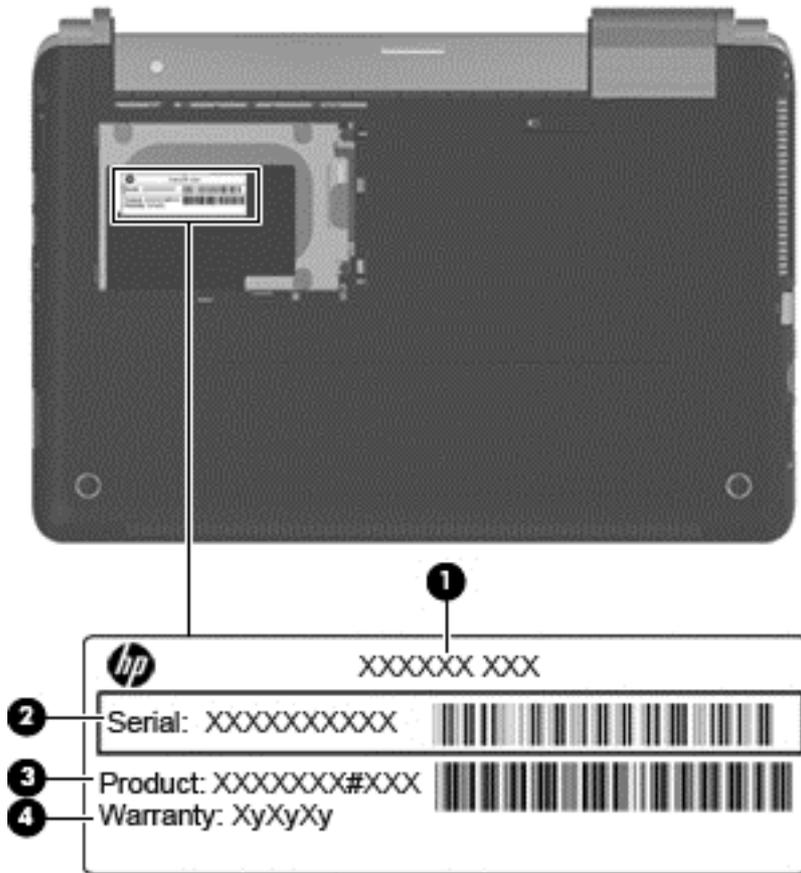
This chapter provides removal and replacement procedures.

There are as many as 56 screws, in 7 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.

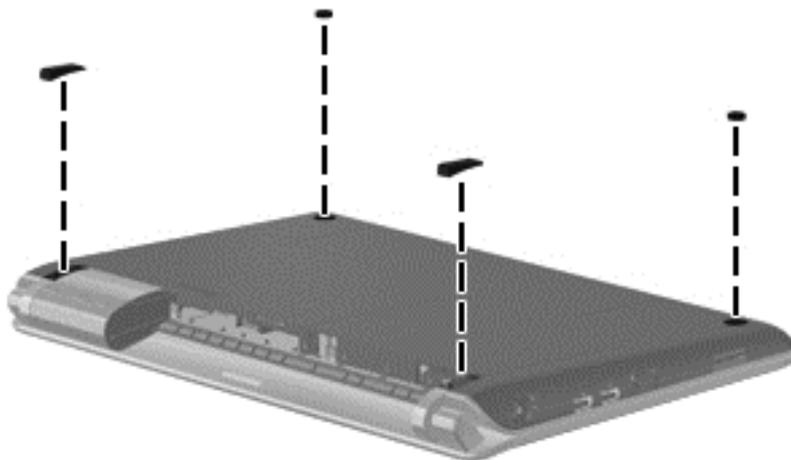
- (1) Product name: This is the product name affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The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



Computer feet

Description	Spare part number
Rubber Kit	619452-001

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



Battery

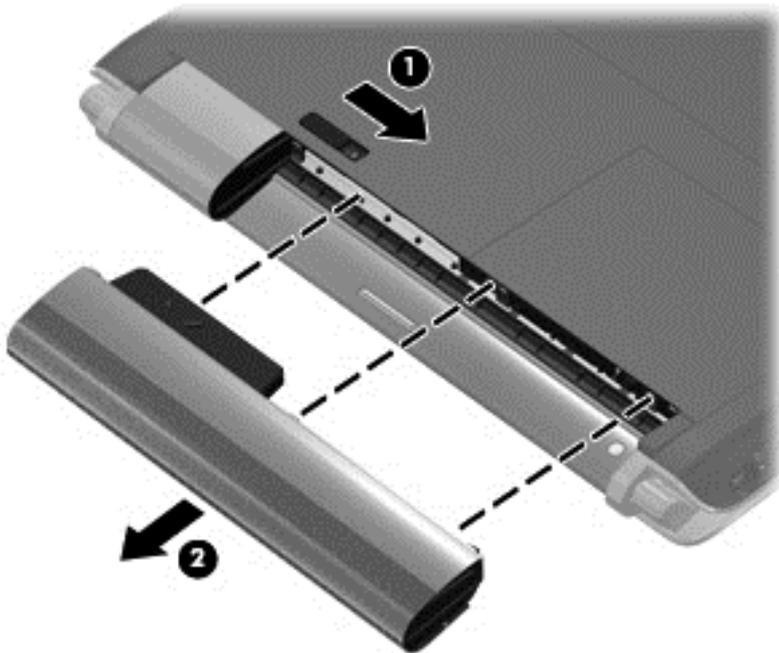
Description	Spare part number
6 cell, 2.80 Ah, 62 Wh	619438-001

Before disassembling the computer:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.

Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.
3. Slide the battery out of the computer **(2)**.



To insert the battery, insert the bottom edge of the battery into the battery bay until the battery is seated. The battery release latch automatically locks the battery into place.

SIM

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

Before removing the SIM:

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 disconnecting the power cord from the AC outlet, and then disconnecting the AC adapter from the computer.
4. Remove the battery (see [Battery on page 34](#)).

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 and hard drive connector. The hard drive bracket and hard drive connector, as well as the hard drive bracket screws, are also available in the Hard Drive Hardware Kit.

Description	Spare part number
640 GB, 7200 rpm	619445-001
500 GB, 7200 rpm	619444-001
320 GB, 7200 rpm	619443-001
250 GB, 7200 rpm	619442-001
160 GB, 7200 rpm	619441-001
640 GB, INTERNAL, 7200 rpm	621046-001
SSD 160GB	619455-001
Hard drive hardware kit (not illustrated, includes connector, bracket, and screws)	619446-001

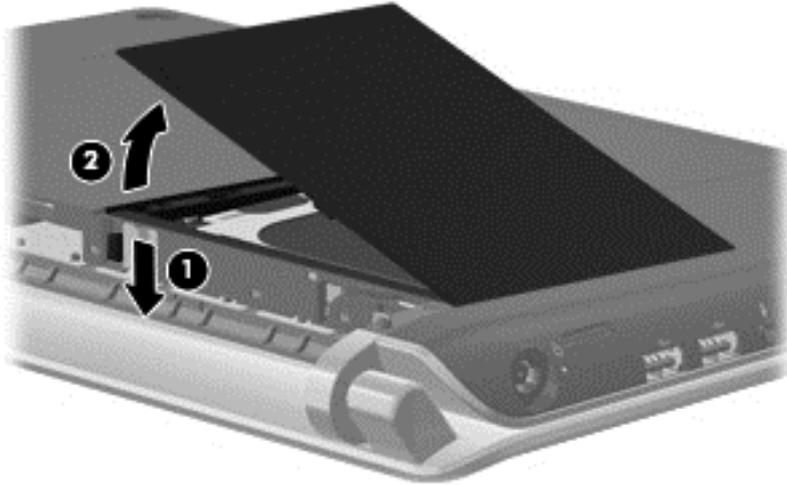
Before removing the hard drive:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the battery (see [Battery on page 34](#)).

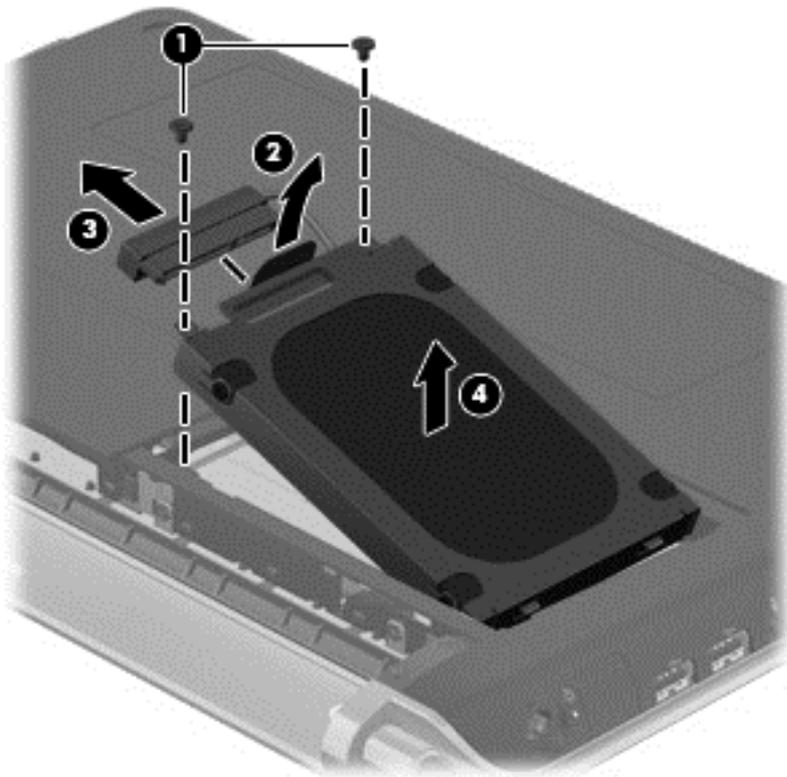
Remove the hard drive:

1. Position the computer with the back toward you.
2. Press the orange hard drive release latch that located in the battery bay **(1)** and secures the hard drive cover to the computer.

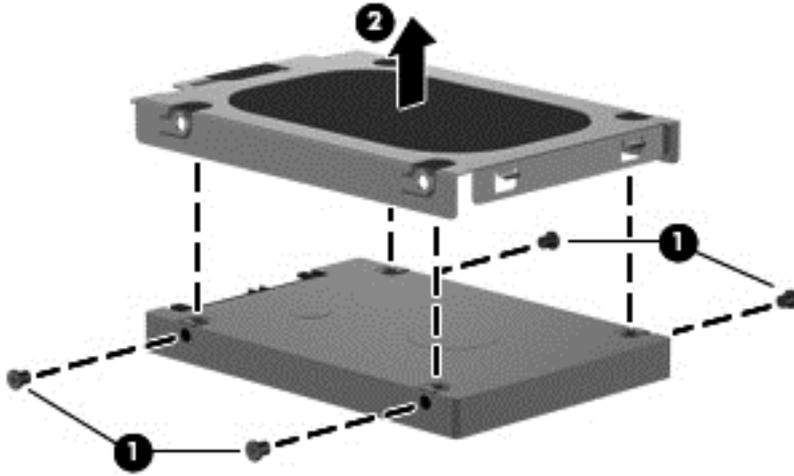
3. Lift the left side of the hard drive cover and remove the cover (2). The hard drive cover is included in the plastics kit, spare part number 619450-001.



4. Remove the two Phillips PM2.5×4.0 screws (1) that secure the hard drive to the system board.
5. Use the mylar tab to lift the hard drive out of the computer at an angle (2).
6. Disconnect the hard drive cable from the hard drive (3).
7. Use the mylar tab on the hard drive bracket to lift the hard drive out (4) of the hard drive bay.



8. To replace the hard drive bracket, remove the four Phillips PM3.0×4.0 screws (1) that secure the hard drive bracket to the hard drive
9. Grasp the two attached Mylar tabs and pull the bracket straight up to remove it from the hard drive (2).



Reverse this procedure to install the hard drive.

Memory module

Description	Spare part number
1 GB, 1066 MHz DDR3	598859-001
2 GB, 1066 MHz DDR3	598856-001
4 GB, 1066 MHz DDR3	599092-001

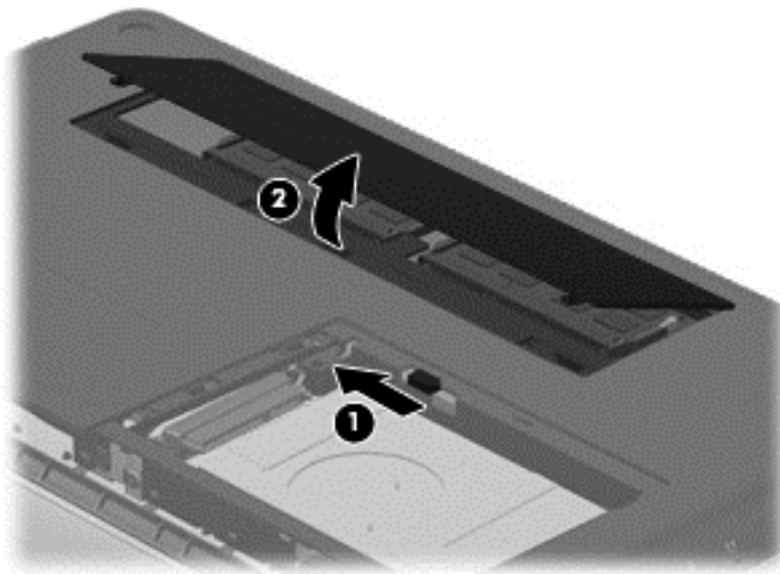
Before removing the memory module:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the battery (see [Battery on page 34](#)).

Remove the memory module:

1. Turn the computer upside down with the front toward you.
2. Slide the orange memory module cover release latch that located in the battery bay **(1)** and secures the memory module cover to the computer.
3. Lift the cover off the computer **(2)**. The mini-card compartment cover is included in the plastics kit, spare part number 619450-001.

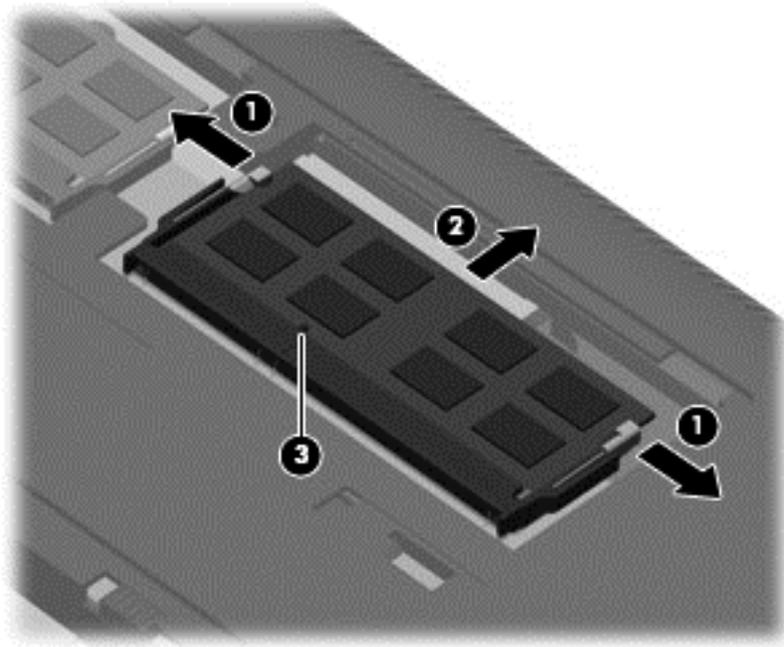
 **NOTE:** Small tabs hold the cover in place. Firmly pull up on the cover to release the tabs.



4. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

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

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



Reverse this procedure to install a memory module.

RTC battery

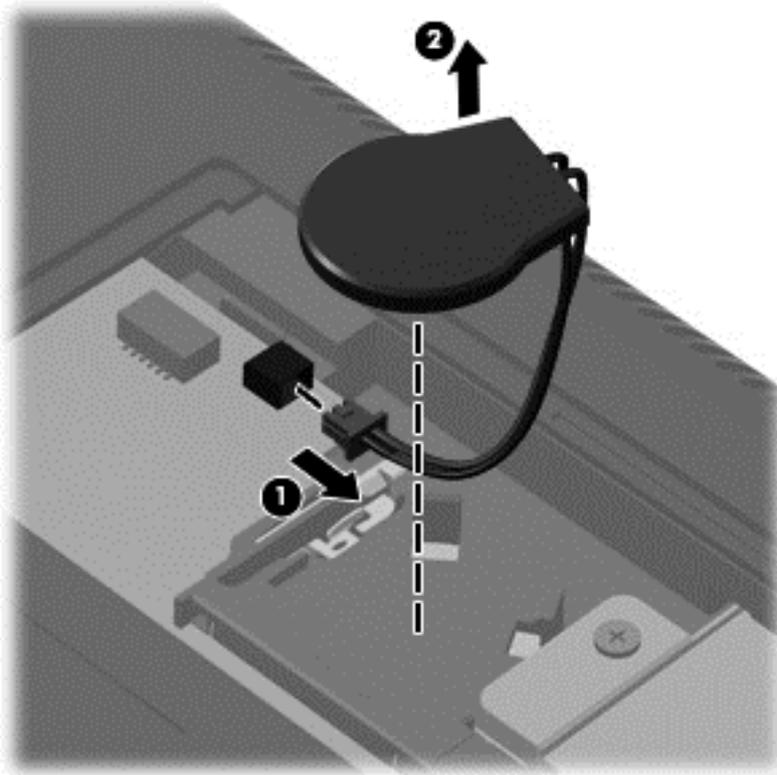
Description	Spare part number
RTC battery	619451-001

Before removing the RTC battery:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the battery (see [Battery on page 34](#)).
5. Remove the memory module cover (see [Memory module on page 39](#)).

Remove the RTC battery:

1. Unplug the RTC battery from the system board (1).
2. Lift the battery (2) out of the computer.



Reverse this procedure to install the RTC battery.

Keyboard

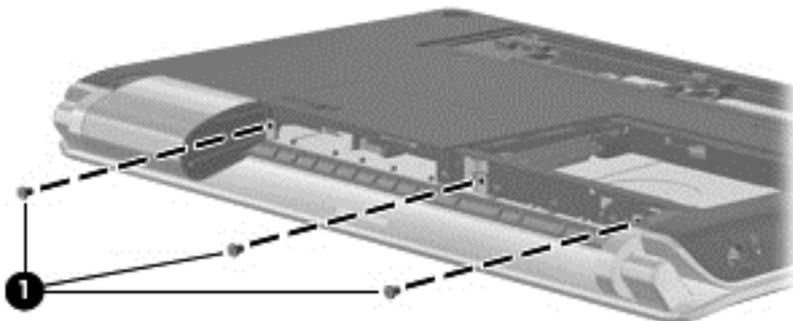
Description	Spare part number
For use in French Canada	619433-121
For use in Japan	619433-291
For use in the South Korea	619433-AD1
For use in Taiwan	619433-AB1
For use in Thailand	619433-281
For use in the United States	619433-001
For use in French Canada with backlight	619434-121
For use in Japan with backlight	619434-291
For use in South Korea with backlight	619434-AD1
For use in Taiwan with backlight	619434-AB1
For use in Thailand with backlight	619434-281
For use in the United States with backlight	619434-001

Before removing the keyboard:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the battery (see [Battery on page 34](#)).
5. Remove the hard drive (see [Hard drive on page 36](#)).
6. Remove the Memory Module compartment cover (see [Memory module on page 39](#)).

Remove the keyboard:

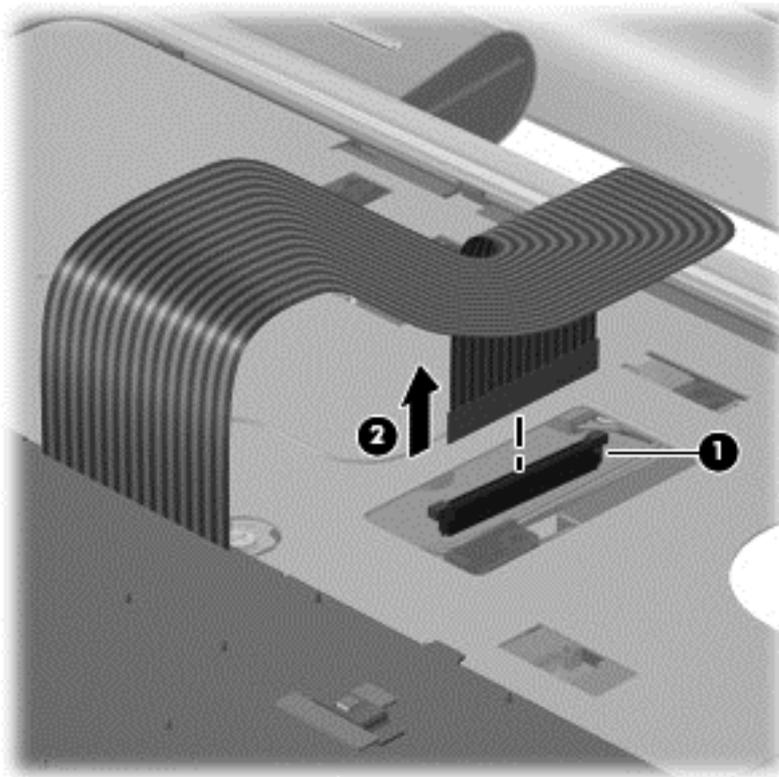
1. Turn the computer upside down with the front toward you.
2. Remove the three Phillips PM2.5×5.0 screws that secure the keyboard to the computer.



3. Turn the computer display-side up with the front toward you.
4. Open the computer as far as possible.
5. Release the tabs along the top (1) edge of the keyboard using a thin flat-bladed screwdriver.
6. Lift the top edge of the keyboard, and set the keyboard back towards the display (2).



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



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

Top cover

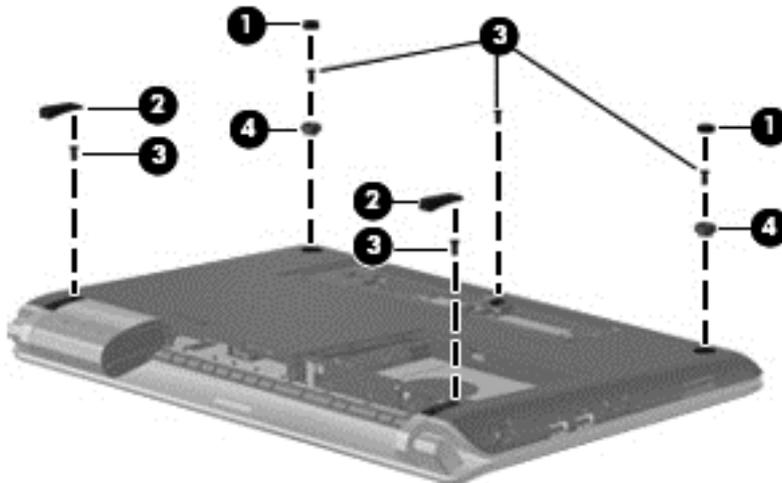
Description	Spare part number
Top cover (includes TouchPad)	626743-001

Before removing the top cover:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (See [Hard drive on page 36](#))
 - c. Memory module (see [Memory module on page 39](#))
 - d. Keyboard (see [Keyboard on page 42](#))

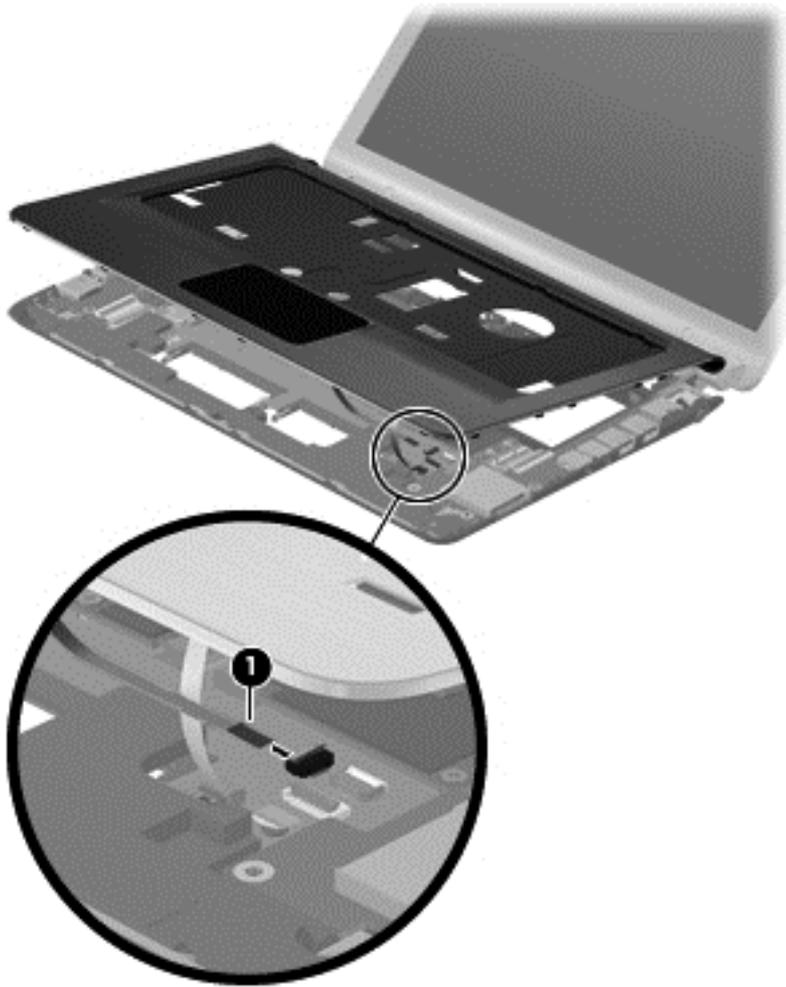
Remove the top cover:

1. Turn the computer upside down with the front toward you.
2. Remove two rubber feet **(1)** and two rubber rectangles **(2)** that are located on the bottom of the computer.
3. Remove the two Phillips PM2.5x3 and three Phillips PM2.5x6.5 screws on the base enclosure **(3)**. Remove the two silver trim rings **(4)** from the base enclosure.

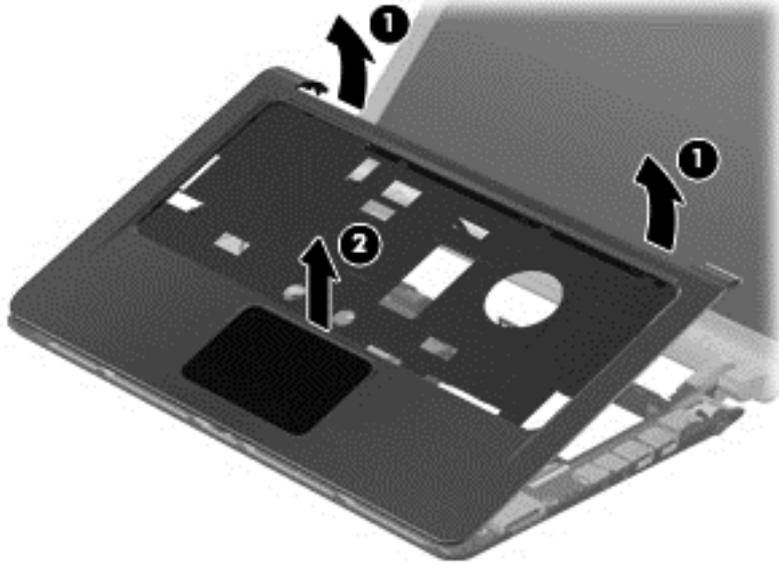


4. Turn the computer display-side up with the front toward you.
5. Open the computer as far as possible.

6. Remove the three Phillips PM2.5×6.0 screw that secures the top cover to the computer.
7. Release the touchpad ZIF connector (1).



8. Lift the rear edge of the top cover (1) until the top cover disengages from the base enclosure. Remove the top cover (2).



 **NOTE:** The TouchPad is glued to the top cover and is included with the top cover spare part.

Reverse this procedure to install the top cover.

Speaker assembly

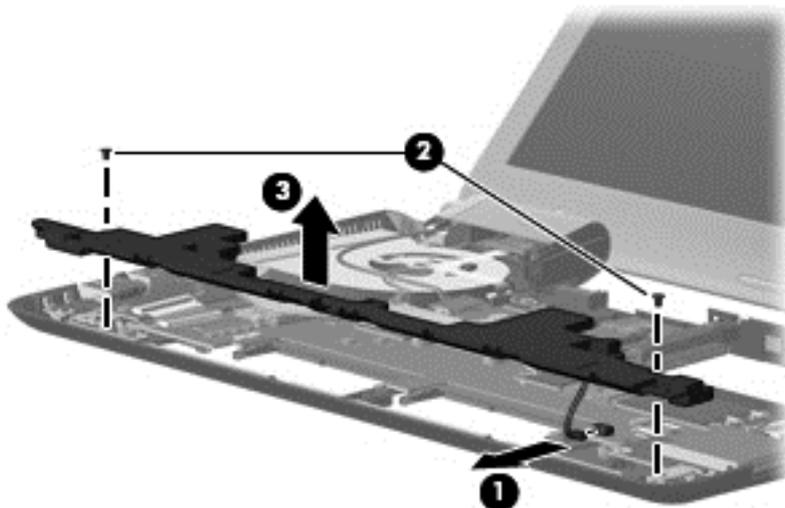
Description	Spare part number
Speaker assembly (includes cable)	619454-001

Before removing the speaker assembly:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

Remove the speaker assembly:

1. Position the base enclosure with the front edge towards you.
2. Disconnect the speaker cable **(1)** from the system board.
3. Remove the two Phillips PM2.5×3.0 screws **(2)** that secure the speaker assembly to the top cover.
4. Lift up and remove the speakers **(3)**.



Reverse this procedure to install the speaker assembly.

Mini system board (left)

Description	Spare part number
Mini system board (left)	626740-001

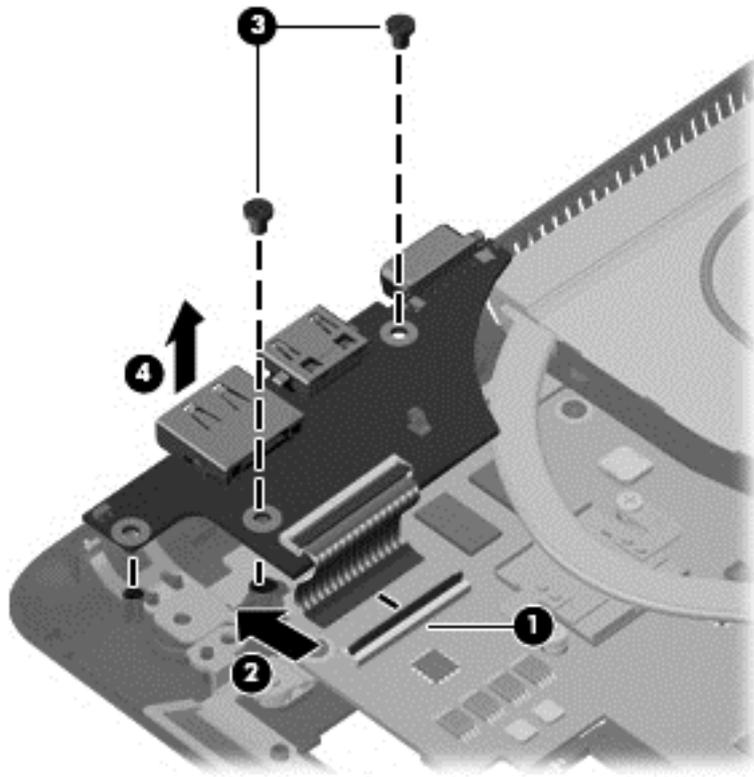
Before removing the mini system board:

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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

Remove the mini system board (left):

1. Position the base enclosure with the front edge towards you.
2. Locate the ZIF connector **(1)** and disconnect it from the system board **(2)**.
3. Remove the two Phillips PM2.0×3.0 screws **(3)** that secure the mini system board to the base enclosure cover.

4. Lift up and remove the mini system board (4).



Reverse this procedure to install the mini system board (left).

Mini system board (right)

Description	Spare part number
Mini system board (right)	626739-001

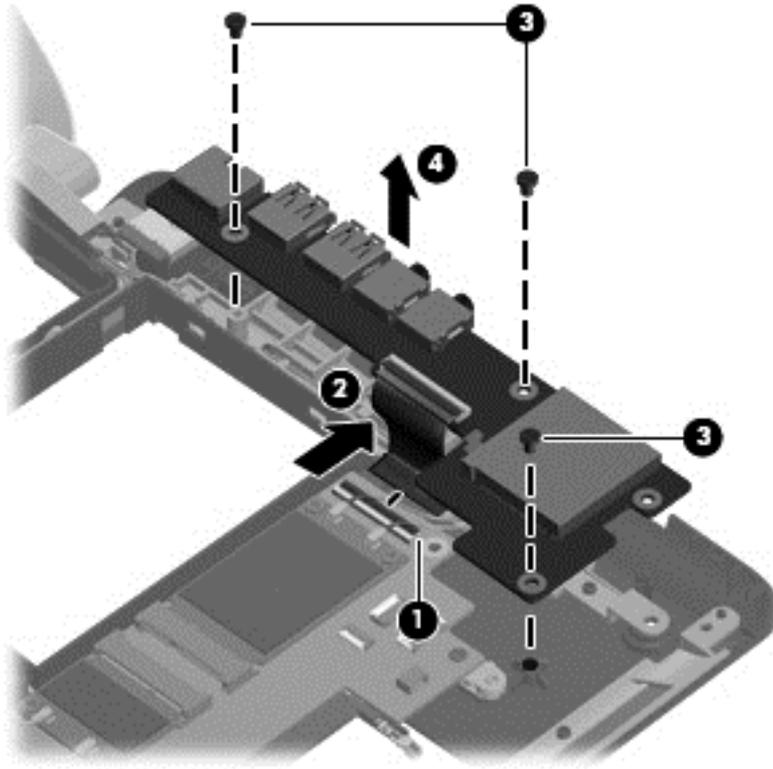
Before removing the mini system board:

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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

Remove the mini system board (right):

1. Position the base enclosure with the front edge towards you.
2. Locate the ZIF connector **(1)** and disconnect it from the system board **(2)**.
3. Remove the three Phillips PM2.0×3.0 screws **(3)** that secure the mini system board to the base enclosure cover.

4. Lift up and remove the mini system board (4).



Reverse this procedure to install the mini system board (right).

Power cable

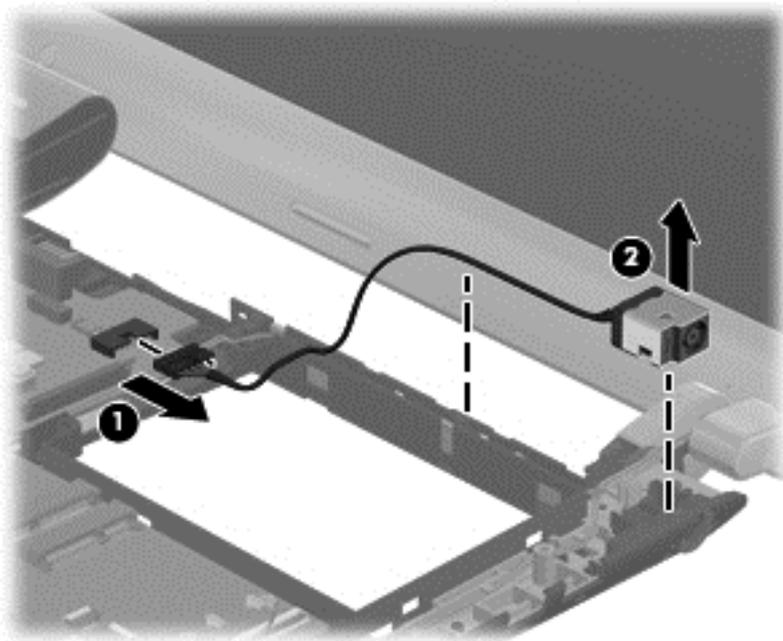
Description	Spare part number
The power cable is included in the Cable Kit	626734-001

Before removing the power cable:

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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

Remove the power cable:

1. Position the base enclosure with the front edge towards you.
2. Lift up on the power cable (1) and disconnect the cable from its routing (2) to remove the power cable.



Reverse this procedure to install the power cable.

WLAN module

Description	Spare part number
Broadcom 802.11 bgn WLAN + Bluetooth Combo card	621184-001
Broadcom 802.11 bgn WLAN card	621751-001
Atheros 802.11 bgn WLAN card	621752-001
Ralink 802.11 bgn WLAN + Bluetooth Combo card	621753-001

Before removing the WLAN module:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

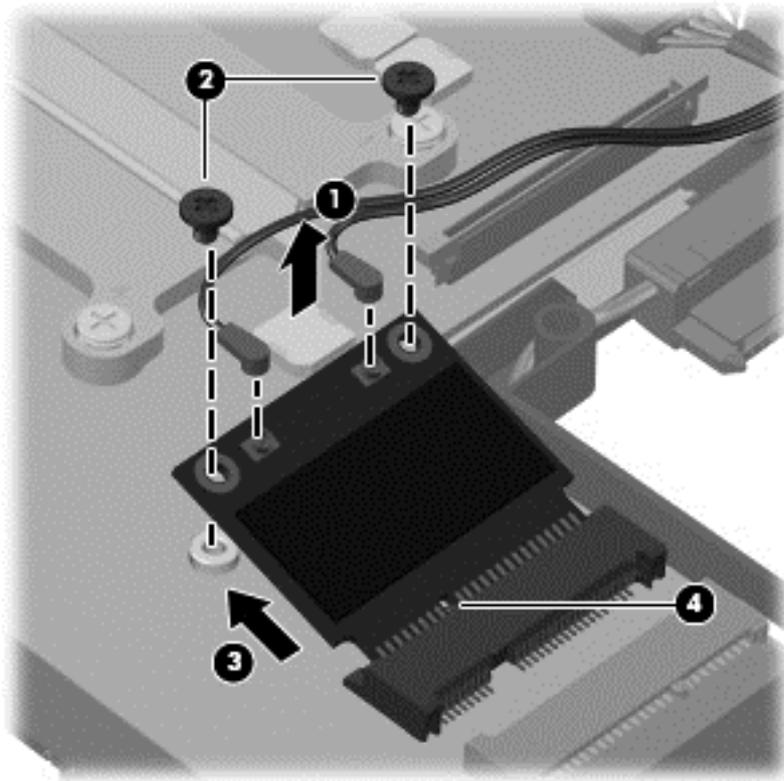
Remove the WLAN module:

1. Position the base enclosure with the front edge towards you.
2. Disconnect the main antenna cable and the auxiliary antenna cable **(1)** from the wireless module.
3. Remove the two Phillips PM2.0×3.0 screws **(2)** that secures the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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

△ **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.

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



Reverse this procedure to install a WLAN module.

WWAN module

Description	Spare part number
HSPA EV-DO Birlion MiniCard UNDP WWAN module (optional)	621185-001

Before removing the WWAN module:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, 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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

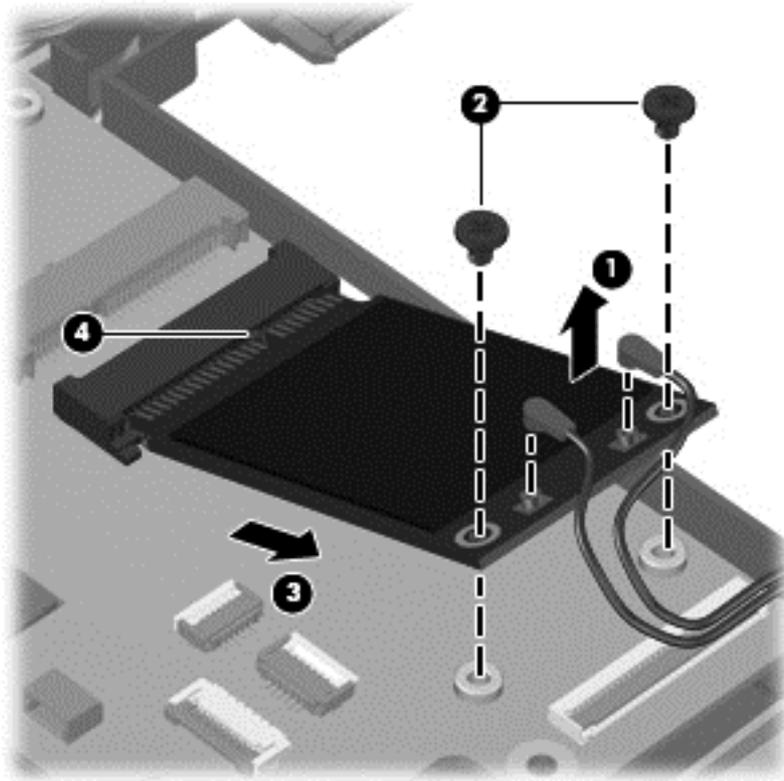
Remove the WWAN module:

1. Position the base enclosure with the front edge towards you.
2. Disconnect the WWAN antenna cables **(1)** 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 PM2.0×3.0 screws **(2)** that secures the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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

△ **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.

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



Reverse this procedure to install a WWAN module.

Power button board

Description	Spare part number
Power button board	626742-001

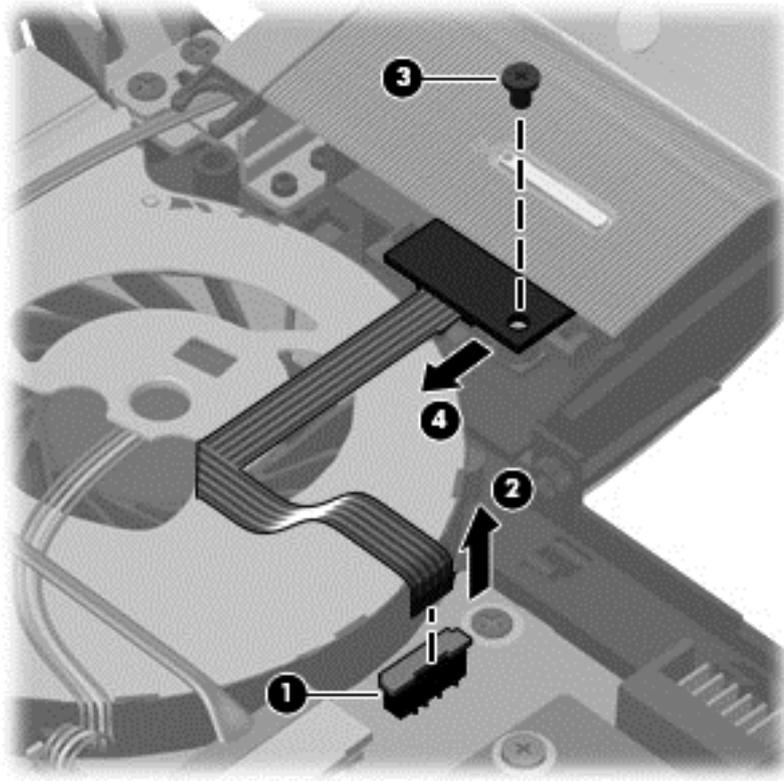
Before removing the power button board:

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 disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))

Remove the power button board:

1. Position the base enclosure with the front edge towards you.
2. Locate the power button board cable **(1)** and disconnect the cable from the system board **(2)**.
3. Remove the Phillips PM2.0×3.0 screw **(3)** that secures the power button board to the system board.

4. Lift out and remove the power button board (4).



Reverse this procedure to install the power button board.

Display assembly

Description	Spare part number
33.8-cm (13.3-in) HD LED BrightView display assembly	633279-001

Before removing the display assembly:

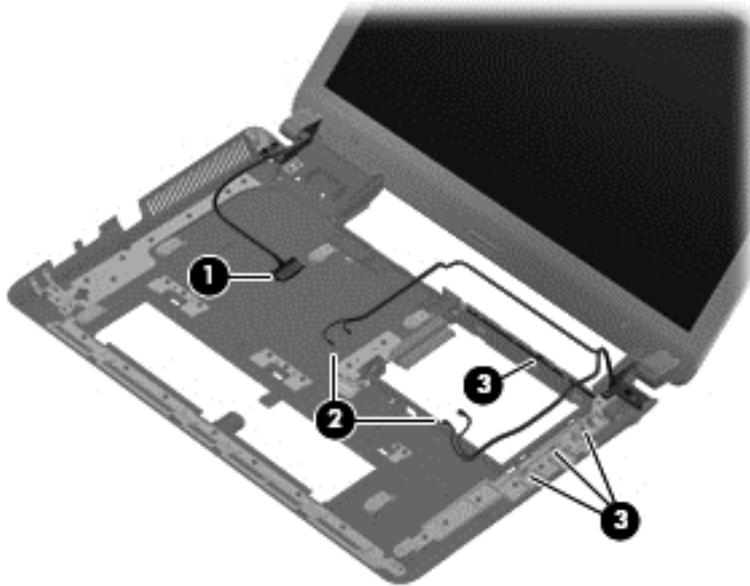
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Keyboard (see [Keyboard on page 42](#))
 - c. Top cover (see [Top cover on page 45](#))
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 55](#)).
6. Disconnect the wireless antenna cables from the WWAN module (see [WWAN module on page 57](#)).

Remove the display assembly:

1. Turn the computer display-side up, with the front toward you.
2. Open the display as far as possible.
3. Disconnect the display panel cable **(1)** from the system board and remove it from its routing channel.

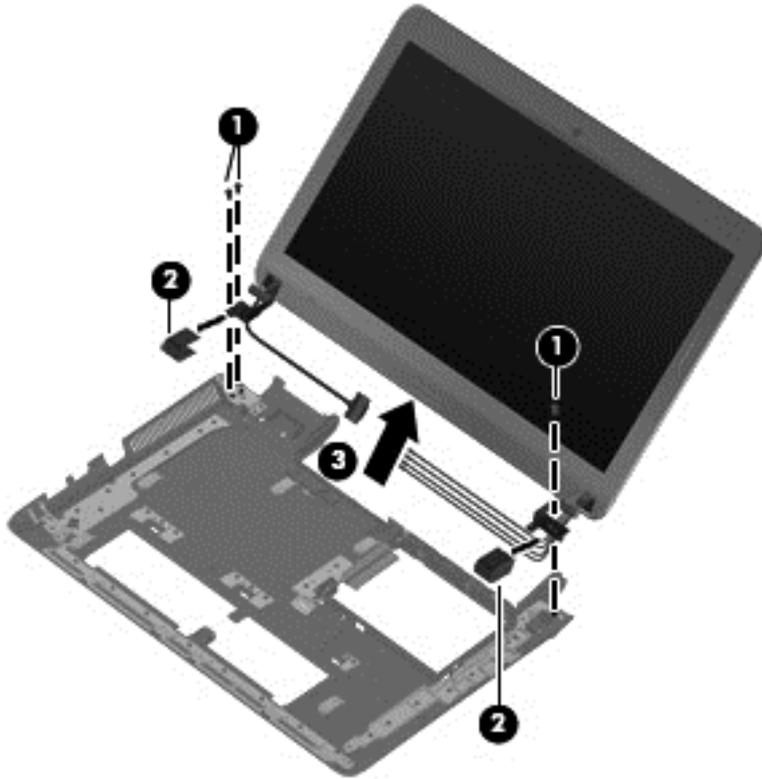
4. Pull the WLAN and WWAN antenna cables (2) from the clip in the routing channel leading to the display hinge (3).

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



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

7. Lift the display panel (3) straight up to remove it.



Reverse this procedure to install the display assembly.

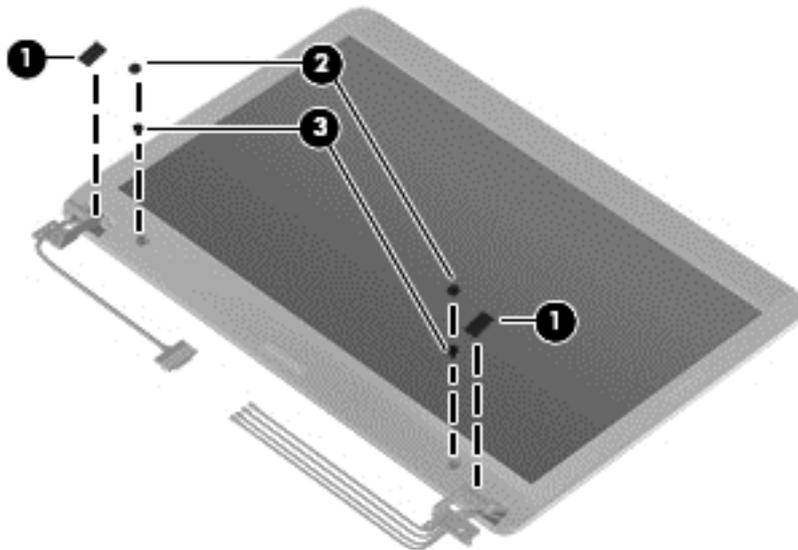
8. To replace any of the display assembly internal components, remove the following screw covers and screws:

- (1) Two rectangle mylar screw covers on the display bezel bottom edge

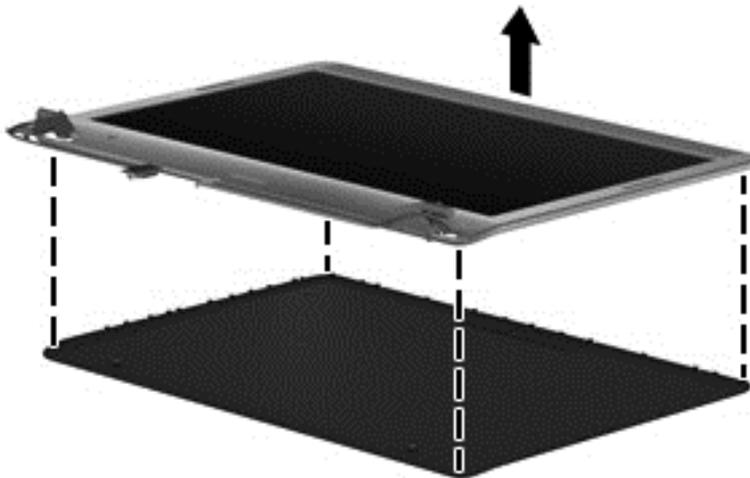
- (2) Two round mylar screw covers on the display bezel bottom edge

- (3) Two Phillips PM2.5×4.0 screws

The display screw covers are included in the rubber kit, spare part number 619452-001.



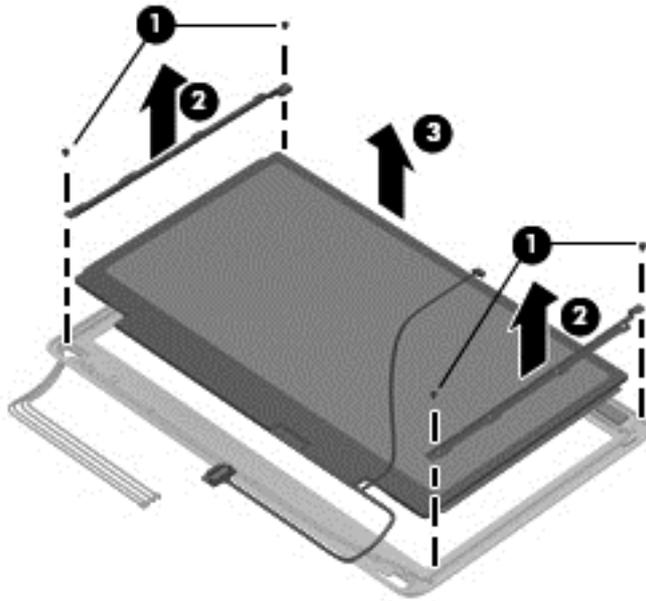
9. Lift up and remove the display back cover. The back cover is available using spare part number 619436-001.



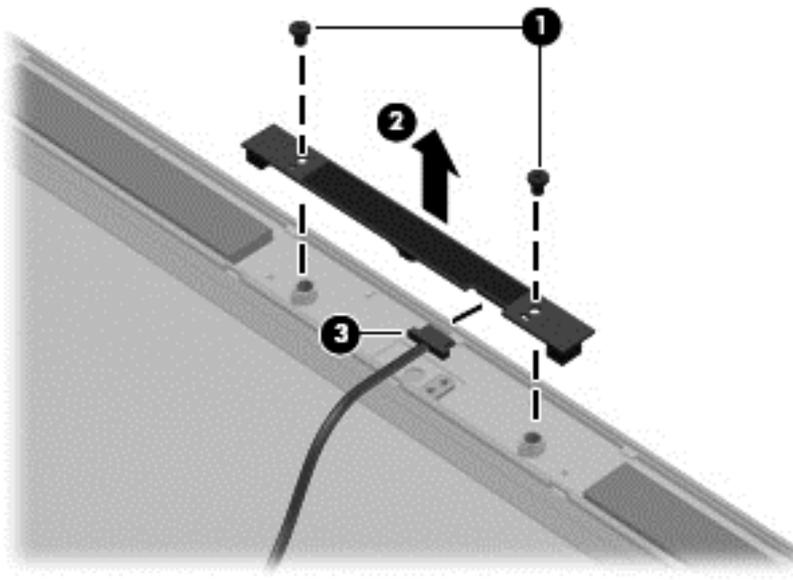
Reverse this procedure to install the display back cover.

10. To replace the display panel, remove the two Phillips 2.5x3.0 screws from each hinge (1) and lift up to remove each display panel hinge (2).

11. Lift up and remove the display panel (3). The display panel is available using spare part number 619448-001.



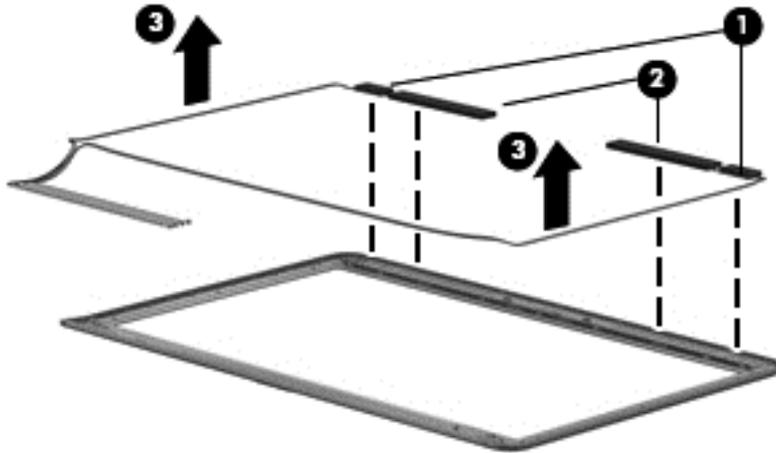
12. To replace the webcam module (select models only), remove the two Phillips 2.0×3.0 (1) screws.
13. Disconnect the webcam module cable (2) from the webcam module, and remove the webcam module (3). The webcam module is available using spare part number 619459-001.



Reverse this procedure to install the webcam module.

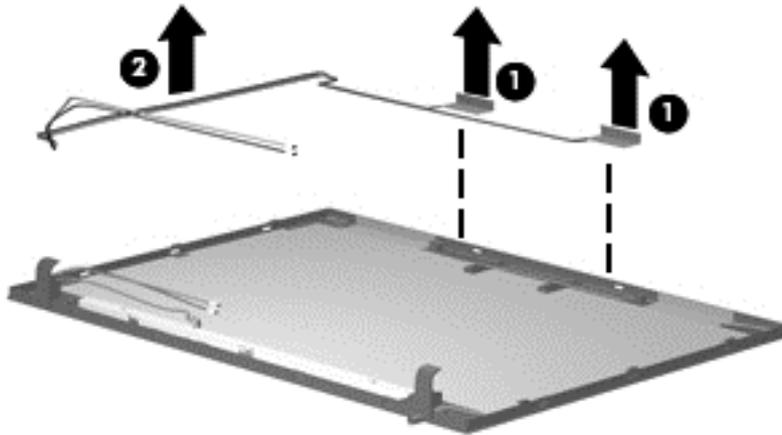
14. To replace the wireless antenna transceivers, lift up on the silver transceiver (1) and release the adhesive material from the display cover (2).

15. Lift up to remove the antenna transceivers (3). The wireless antenna transceivers with cable is available using spare part number 619435-001..



Reverse this procedure to install the display wireless antenna transceivers.

16. To replace the WWAN antenna transceivers, lift up on the silver transceiver and release the adhesive material from the display cover (1).
17. Lift up to remove the antenna transceivers (2). The wireless antenna transceivers with cable is available using spare part number 619435-001..



Reverse this procedure to install the display WWAN antenna transceivers.

Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes replacement thermal material) for use only with computer models with UMA graphics subsystem memory	619440-001
Fan/heat sink assembly (includes replacement thermal material) for use only with computer models with discrete graphics subsystem memory	626735-001

Before removing the fan/heat sink assembly:

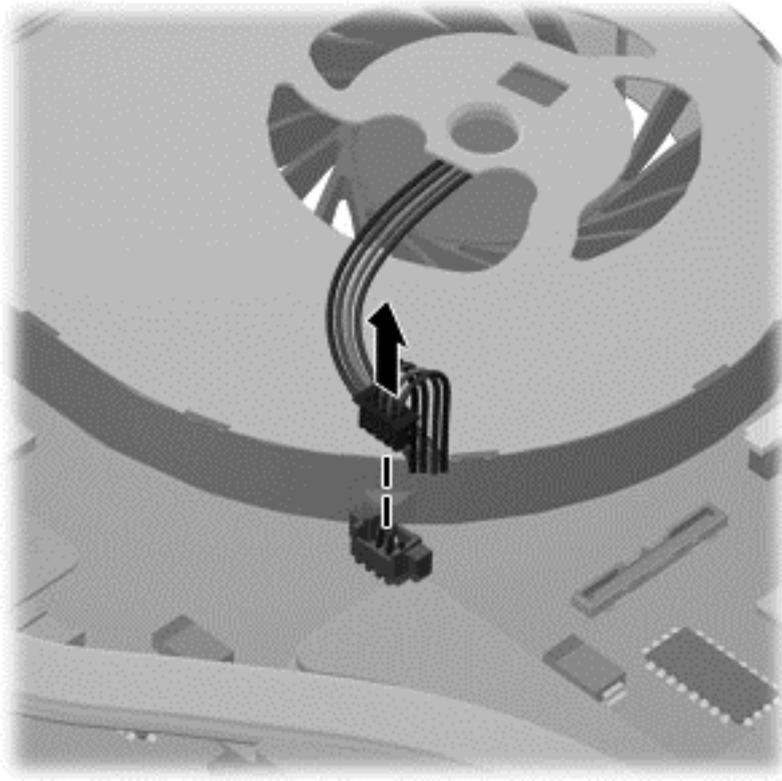
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. Keyboard (see [Keyboard on page 42](#))
 - d. Top cover (see [Top cover on page 45](#))
 - e. Display assembly (see [Display assembly on page 61](#))
 - f. System board (see [System board on page 73](#))

Remove the fan/heat assembly (fan/heat sink appearance may vary):

 **NOTE:** The following steps apply only to computer models equipped with graphics subsystems having UMA memory.

1. Turn the system board right-side up, with the front toward you.

2. Disconnect the fan cable from the system board.

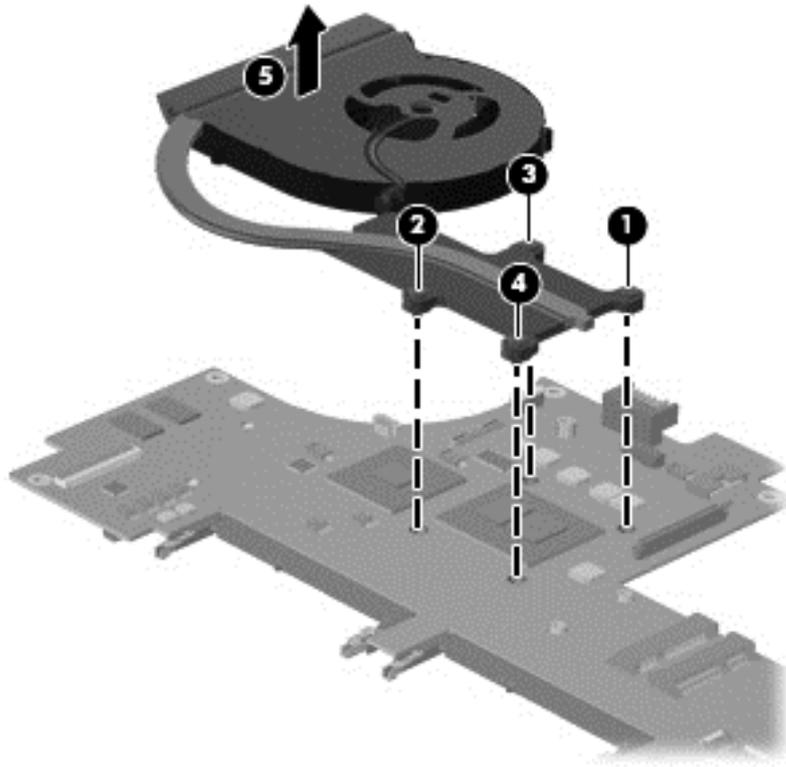


3. Follow the sequence embossed on heat sink to loosen the four Phillips PM2.5×7.0 captive screws (**1–4**) that secure the fan/heat sink assembly to the system board.



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

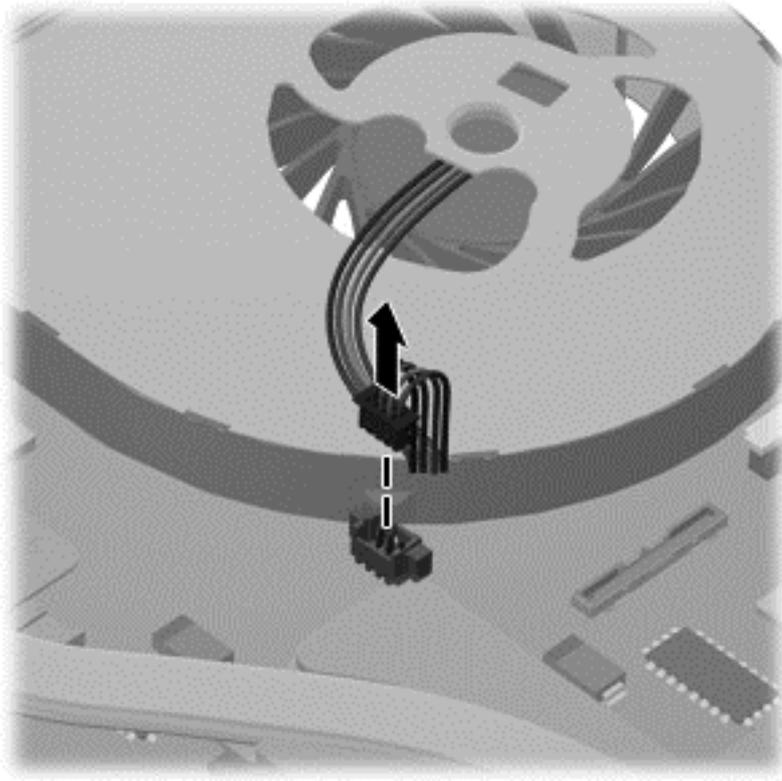
4. Remove the fan/heat sink assembly (5) by lifting straight up.



 **NOTE:** The following steps apply only to computer models equipped with graphics subsystems having discrete memory.

1. Turn the system board right-side up, with the front toward you.

2. Disconnect the fan cable from the system board.

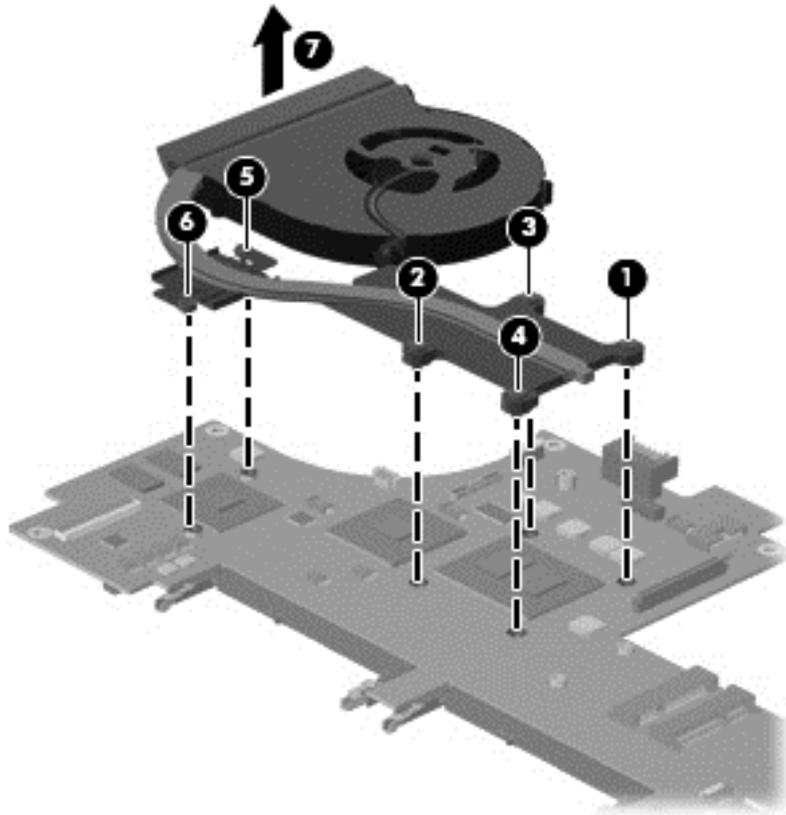


3. Loosen the four Phillips captive screws (1–4) and two Phillips spring-loaded captive screws (5–6) that secure the fan/heat sink assembly.



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

4. Remove the fan/heat sink assembly (7) by lifting straight up.

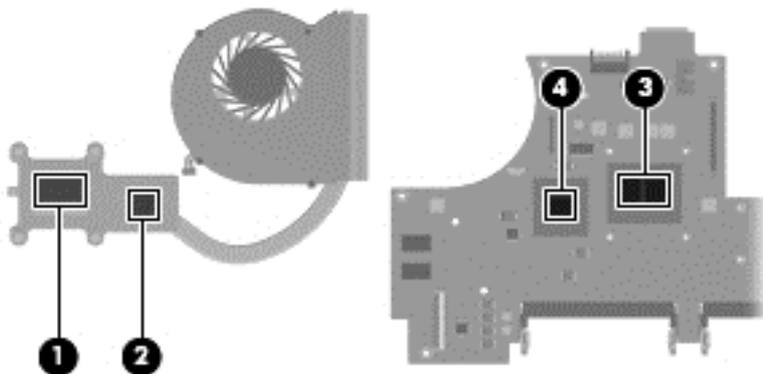


Reverse this procedure to install the fan/heat sink assembly.

The thermal material must be thoroughly cleaned from the surface of the fan/heat sink assembly (1), (3) and the processor (2) and video components (4) each time the fan/heat sink assembly is removed. Thermal pads and thermal paste must be installed on all surfaces before the fan/heat sink assembly is reinstalled.

 **NOTE:** Thermal pads and thermal paste are included with all fan/heat sink assembly, system board, and processor spare part kits.

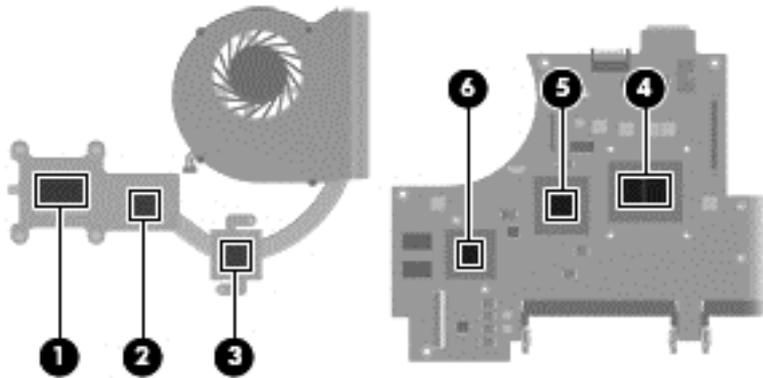
The following illustration shows the locations for thermal material on systems with UMA graphics subsystems.



The thermal material must be thoroughly cleaned from the surface of the fan/heat sink assembly (1) and (3), and the processor component (2), each time the fan/heat sink assembly is removed. Thermal

pads and thermal paste must be installed on all surfaces before the fan/heat sink assembly is reinstalled.

The following illustration shows the locations for thermal material on systems with discrete graphics subsystems.



System board

 **NOTE:** The system board spare part kit includes UMA or discrete graphics subsystem memory and replacement thermal material.

Description	Spare part number
Intel Pentium U5400 (1.2 GHz, 3M L3 cache) UMA	619456-001
Intel Pentium U5400 (1.2 GHz, 3M L3 cache) Discrete	619457-001
Intel Core i3-330UM (1.2 GHz, 3M L3 cache) UMA	621560-001
Intel Core i3-330UM (1.2 GHz, 3M L3 cache) Discrete	621561-001
Intel Dual Core i5-430UM (1.2 GHz SC turbo up to 1.73GHz, 3M L3 cache) Discrete	621562-001
Intel Core i3-380UM (1.33 GHz, 3M L3 cache) UMA	626598-001
Intel Core i3-380UM (1.33 GHz, 3M L3 cache) Discrete	626599-001
Intel Core i5-470UM (1.33 GHz SC turbo, 3M L3 cache) Discrete	626600-001

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

- Memory modules (see [Memory module on page 39](#))
- WLAN module (see [WLAN module on page 55](#))

Before removing the system board:

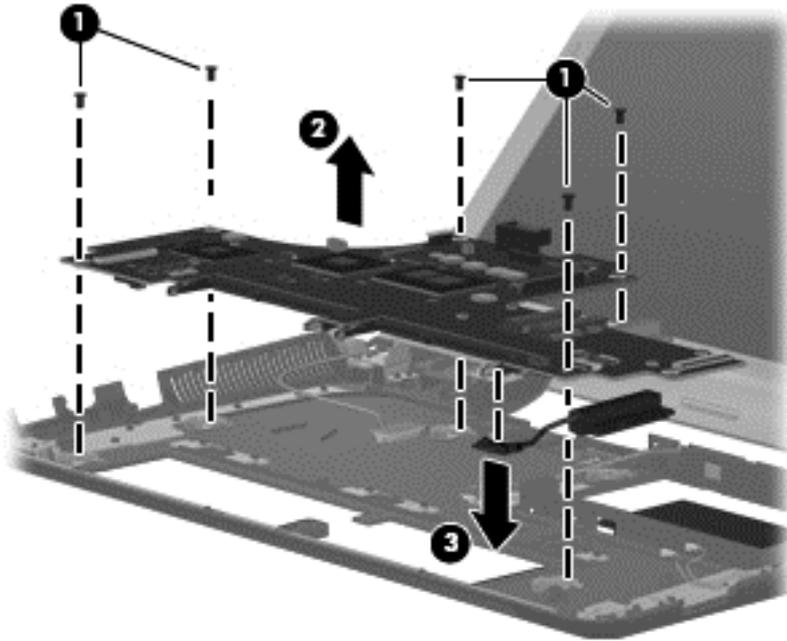
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 34](#))
 - b. Hard drive (see [Hard drive on page 36](#))
 - c. WLAN module (see [WLAN module on page 55](#))
 - d. Memory module (see [Memory module on page 39](#))
 - e. Keyboard (see [Keyboard on page 42](#))
 - f. Top cover (see [Top cover on page 45](#))
 - g. Display assembly (see [Display assembly on page 61](#))

Remove the following cables from the system board:

- Power connector cable (see [Power cable on page 54](#)).

Remove the system board:

1. Turn the computer upright with the right side toward you.
2. Remove the five Phillips PM2.5×4.0 (1) screws that secure the system board to the computer.
3. Lift the system board (2), and pull it away from the base enclosure.
4. Remove the hard drive cable (3) from the bottom of the system board.



Reverse this procedure to install the system board.

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:

- Fan/heat sink assembly (see [Fan/heat sink assembly on page 67](#)).

Reverse the preceding procedure to install the system board.

5 Setup Utility (BIOS)

Starting Setup Utility

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

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	Set the following boot options: <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.

Select	To do this
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 might 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*) is 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 the computer:
Select **Start > Help and Support > Maintain**.
2. Follow the instructions on the screen to identify the computer and access the BIOS update you want to download.
3. At the download area:
 - a. Identify the BIOS update that is later than the BIOS version currently installed on the computer. Make a note of the date, name, or other identifier. You might 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 the 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:

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 the 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, delete the downloaded file from the hard drive.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Length	23.233 cm	9.1 in
Width	32.6 cm	12.83 in
Height (front to back)	2.24 to 3.185 cm	0.90 to 1.3 in
Weight	1.8 kg	3.97 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 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	16.5 mm	6.5 in
Width	29.34 mm	11.6 in
Diagonal	33.66 mm	13.3 in
Number of colors	Up to 16.8 million	
Contrast ratio	500:1 (typical)	
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.2148 × 0.2148 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	LED	
Total power consumption	4.8 W	
Viewing angle	±40° horizontal, +15°/-30° vertical (typical)	

Hard drive specifications

	640-GB*	500-GB*	320-GB*	250-GB*	640-GB*	160-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	7200 rpm	7200 rpm	7200 rpm	7200 rpm	7200 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.

External 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	

External 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 creating 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 creating recovery discs to be sure that you can restore the 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 the computer does not include an integrated optical drive, use an optional external optical drive (purchased separately) to create recovery discs, or purchase recovery discs for the computer from the HP Web site.

Note the following guidelines before creating recovery discs:

- Use 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, exit the program before you have finished creating the recovery discs. The next time you open Recovery Manager, you are prompted to continue the disc creation process.

To create a set of recovery discs:

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

Backing up your information

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

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.

- 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 depend on the type of optical drive installed in the computer.

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

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

Using Windows Backup and Restore

To create a backup using Windows Backup and Restore:

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

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

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

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

Using system restore points

When backing up the 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.

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:

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

Performing a recovery

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

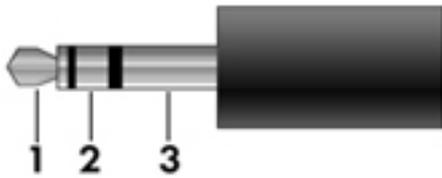
On some models, you can perform a recovery from the partition on the hard drive, accessed by pressing either the Start button or **f11**. This restores the computer to its factory condition.

To restore the system from the partition:

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.

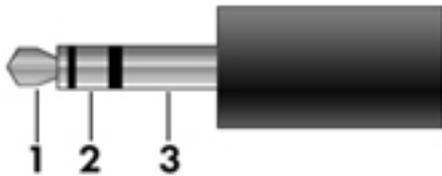
8 Connector pin assignments

Audio-in (microphone)



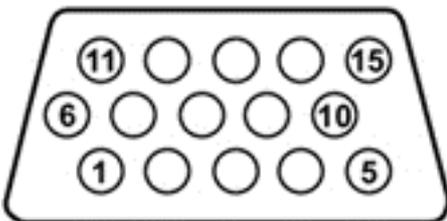
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

Audio-out (headphone)



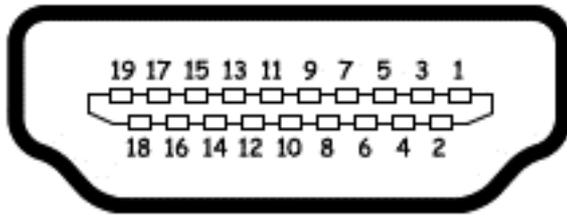
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

External monitor



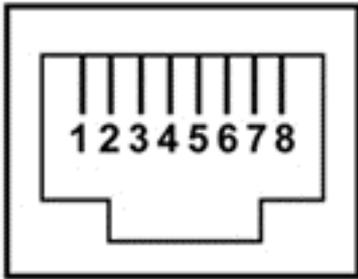
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

HDMI



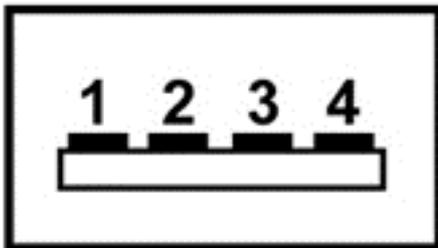
Pin	Signal	Pin	Signal
1	TMDS data 2+	11	TMDS clock shield
2	TMDS data 2 shield	12	TMDS clock-
3	TMDS data 2-	13	CEC
4	TMDS data 1+	14	No connect
5	TMDS data 1 shield	15	DDC clock
6	TMDS data 1-	16	DDC data
7	TMDS data 0+	17	Ground
8	TMDS data 0 shield	18	+5V power
9	TMDS data 0-	19	Hot plug detect
10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

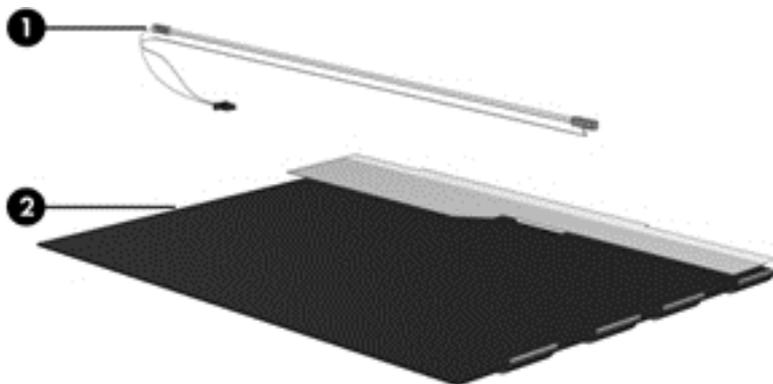
Battery

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>.
-

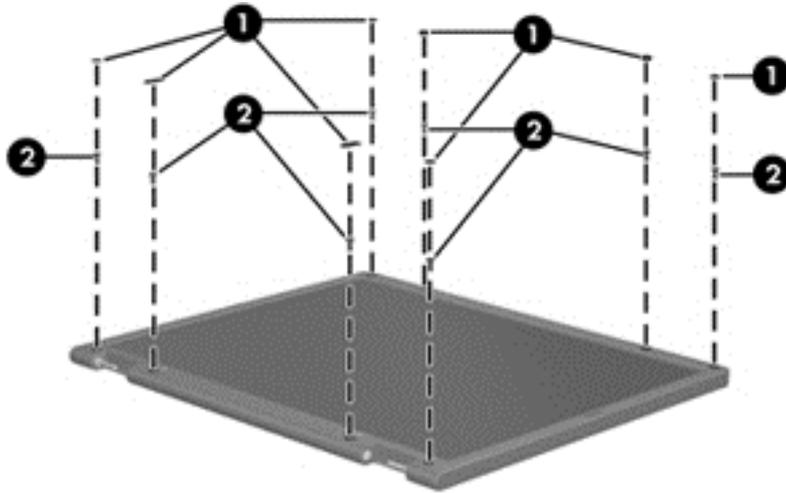
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



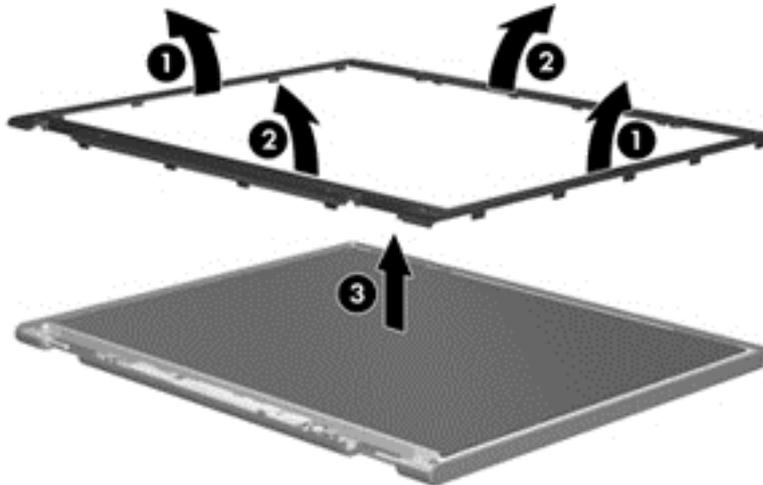
-
- 📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

Perform the following steps:

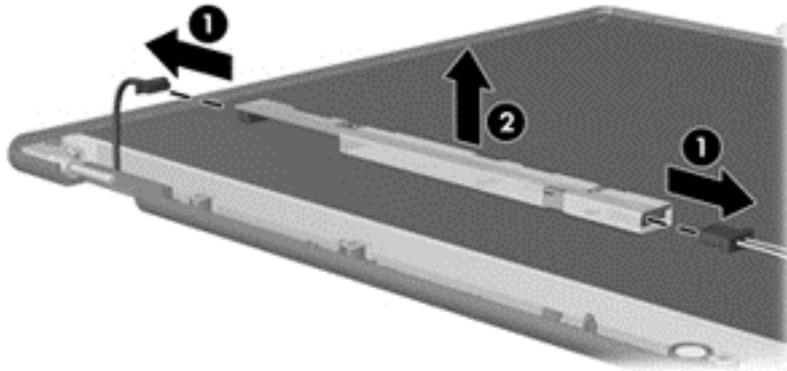
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



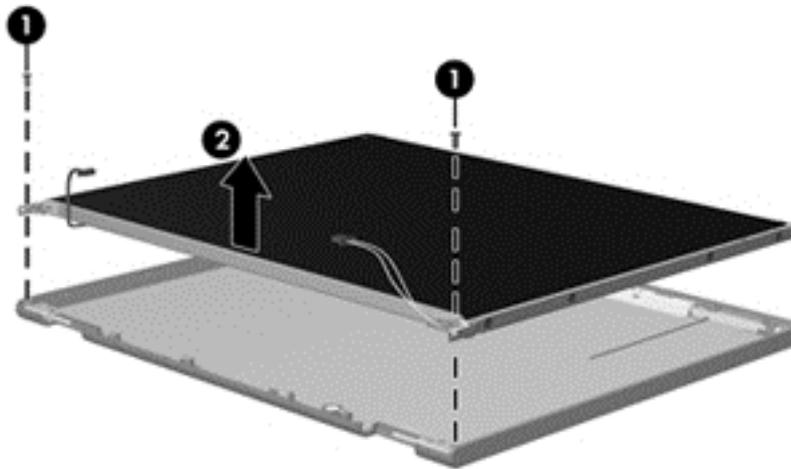
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel 3.



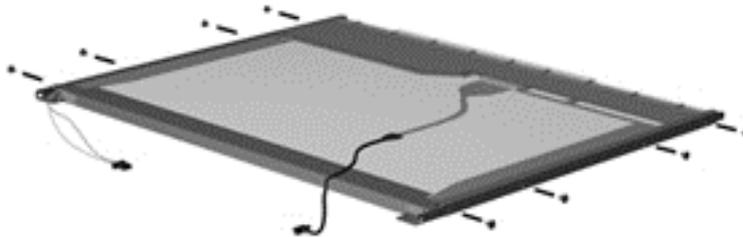
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter 2.



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.

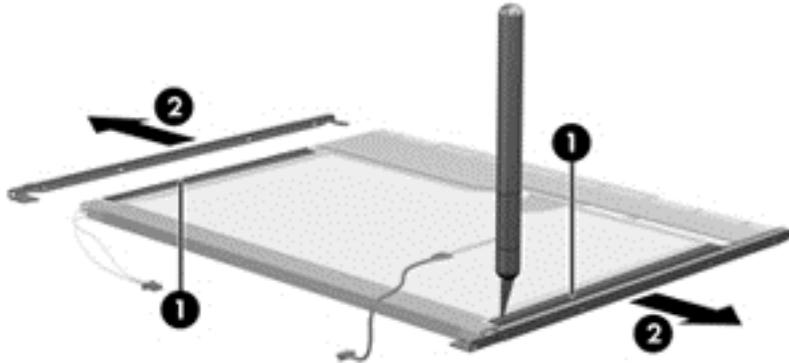


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

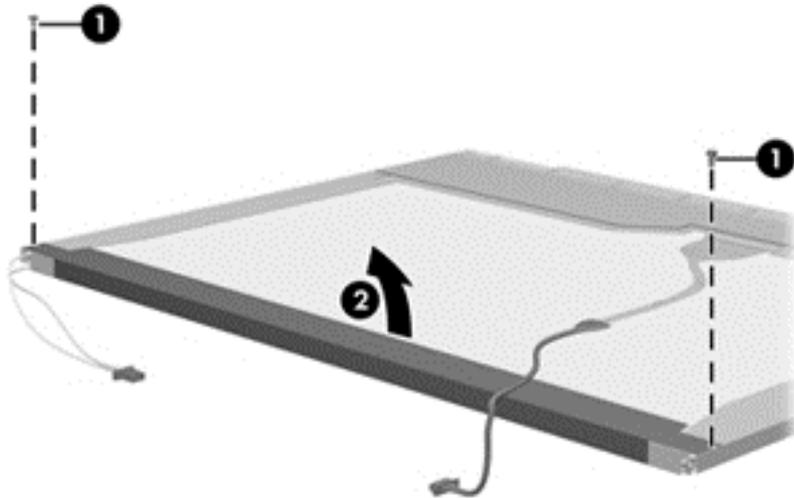


9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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

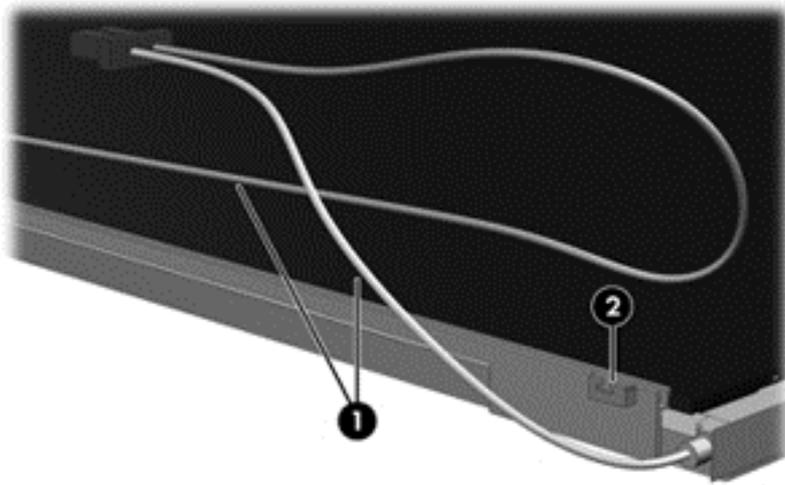


11. Remove the screws (1) that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover (2) and swing it outward.

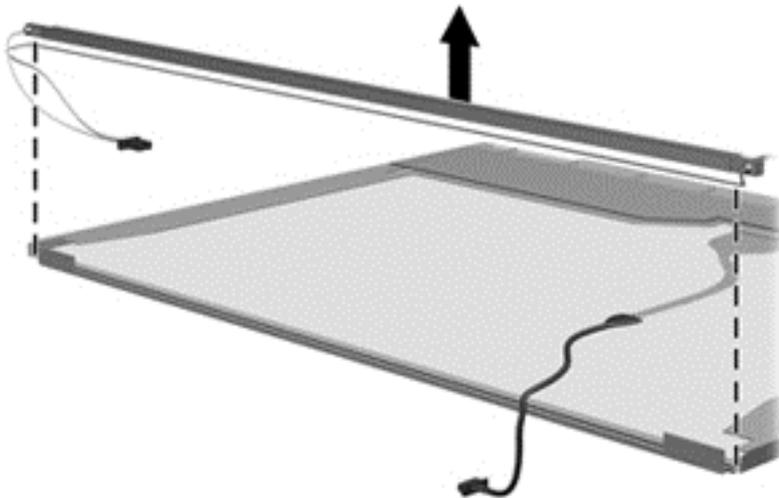


13. Remove the backlight cover.
14. Turn the display panel right-side up.

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

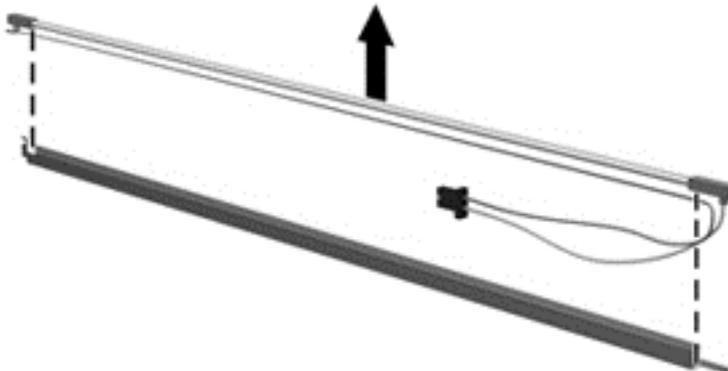


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

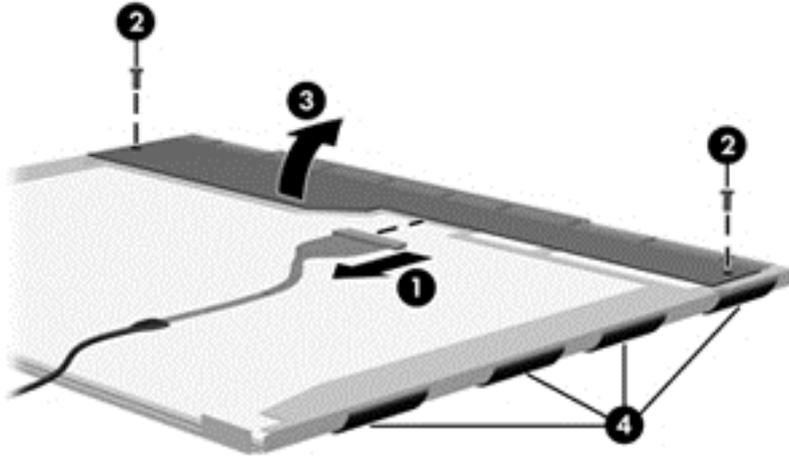


⚠ WARNING! The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

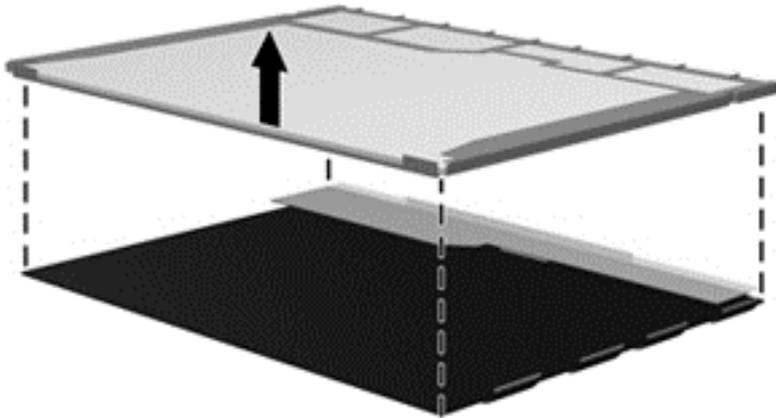
18. Remove the backlight from the backlight frame.



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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