



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 |
| | |
| | |
| | |

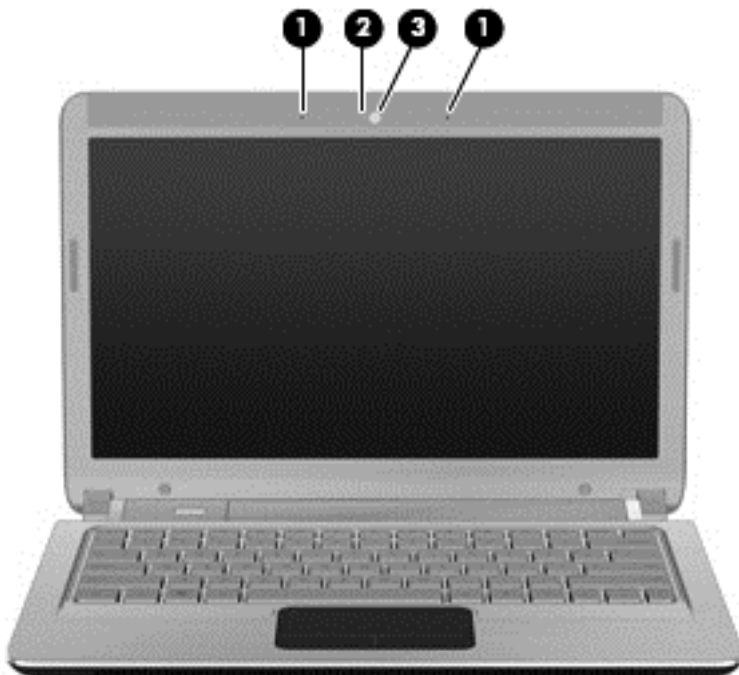
| Category | Description |
|----------------------------------|--|
| External media card | Digital Media Slot, supporting the following optional digital card formats: <ul style="list-style-type: none"> • MultiMediaCard (MMC) • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Memory Stick (MS) • Memory Stick Pro (MSP) • xD-Picture Card (XD) (also types H and M) |
| | SIM card slot: <ul style="list-style-type: none"> • Populated with WWAN • User accessible |
| Ports | Audio-in (stereo microphone) |
| | Audio-out (stereo headphone) |
| | Hot Plug/Unplug and auto detector for correct output to wide-aspect vs. standard-aspect video |
| | HDMI v.1.3b supporting 1080p with HDCP key |
| | Multi-pin AC power (non-smart pin) |
| | RJ-45 (Ethernet, includes link and activity lights) |
| | USB 2.0 (3) |
| Keyboard/pointing devices | VGA (Dsub 15-pin) supporting 1920 × 1200 external resolution at 75 GHz |
| | Full size keyboard |
| | TouchPad with TouchPad buttons |
| | Supports 2-way scroll with legend |
| | Taps enabled by default |
| | Touchpad on/off capability |
| Power requirements | Touchpad gesture to be default on; rotate gesture default off |
| | 65-W AC adapter (Non-smart ID Pin supported) with localized cable plug support |
| Security | 6-cell, 2.8-Ah (62-Wh) polymer battery |
| | Security cable slot |
| Operating system | Preinstalled: |
| | • 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

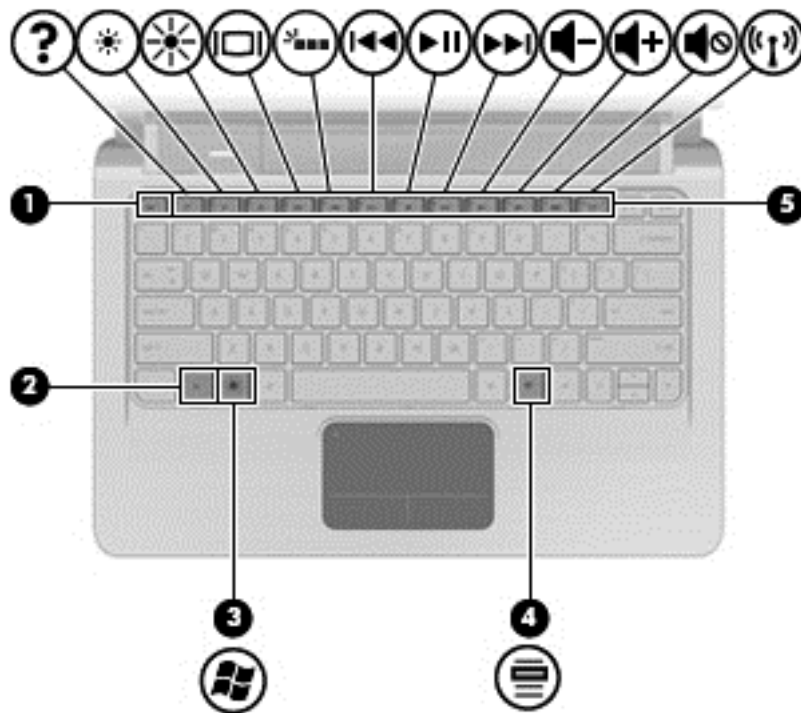
Top components

Display components



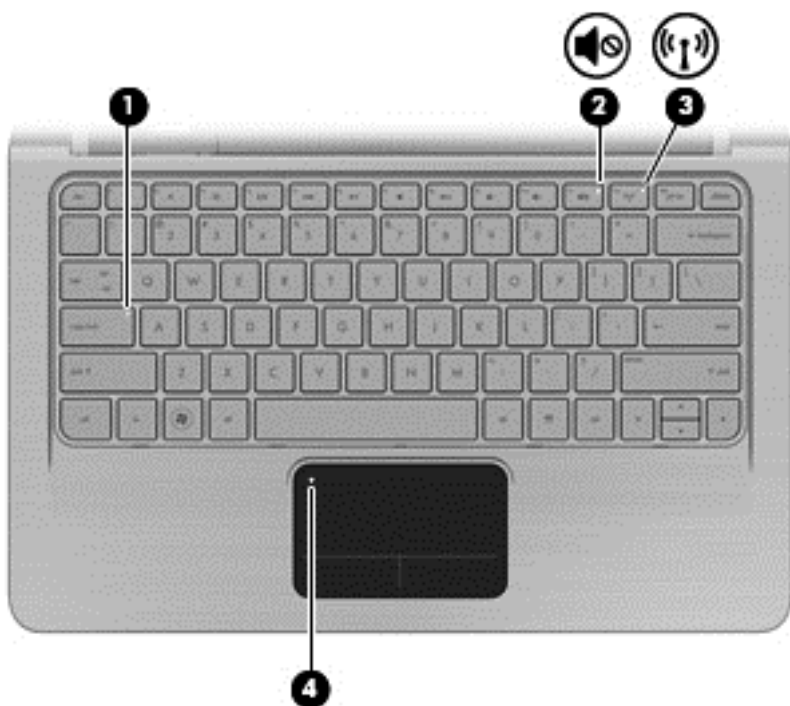
| Item | Component | Function |
|------|--------------------------|---|
| (1) | Internal microphones (2) | Record sound. |
| (2) | Webcam light | On—The webcam is in use. |
| (3) | Webcam | Records video and captures still photographs. |

Keys



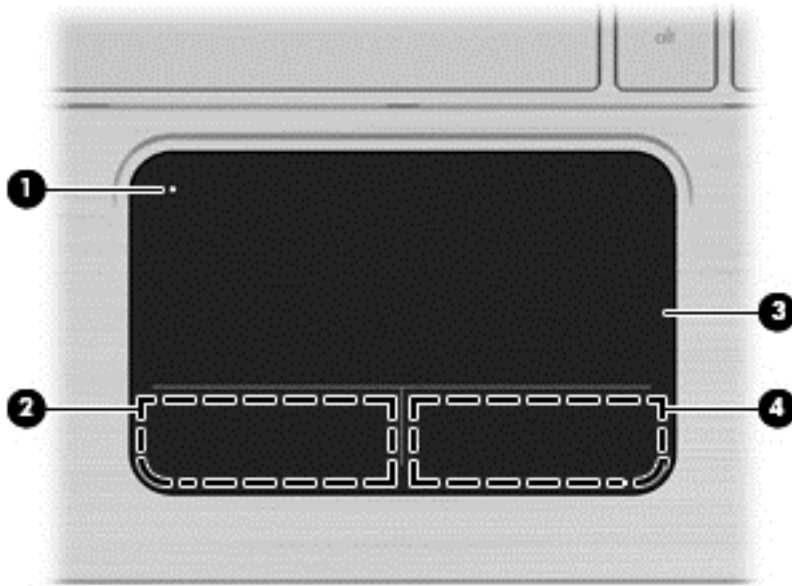
| Item | Component | Function |
|------|--------------------------|--|
| (1) | <code>esc</code> key | Displays system information when pressed in combination with the <code>fn</code> key. |
| (2) | <code>fn</code> key | Executes frequently used system functions when pressed in combination with an arrow 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



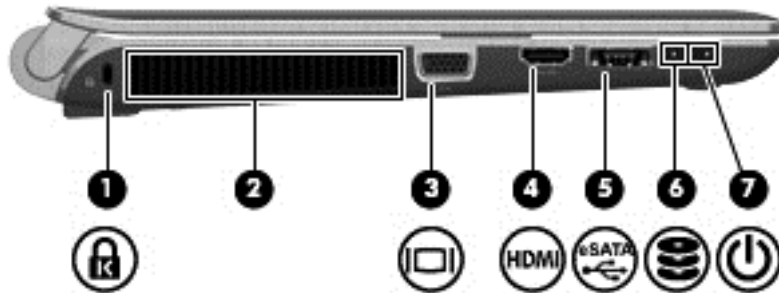
| Item | Component | Function |
|------|-----------------------|--|
| (1) | TouchPad light | <ul style="list-style-type: none">• Off—TouchPad is enabled.• Amber—TouchPad is disabled. |
| (2) | Left TouchPad button | Functions like the left button on an external mouse. |
| (3) | TouchPad scroll zone |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

Front components



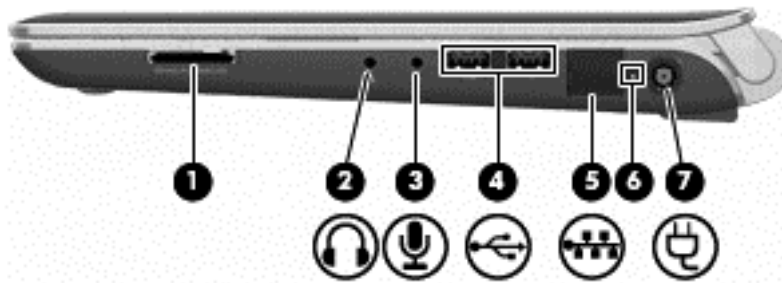
| Item | Component | Function |
|------|--------------|----------------|
| (1) | Speakers (2) | Produce sound. |

Left-side components



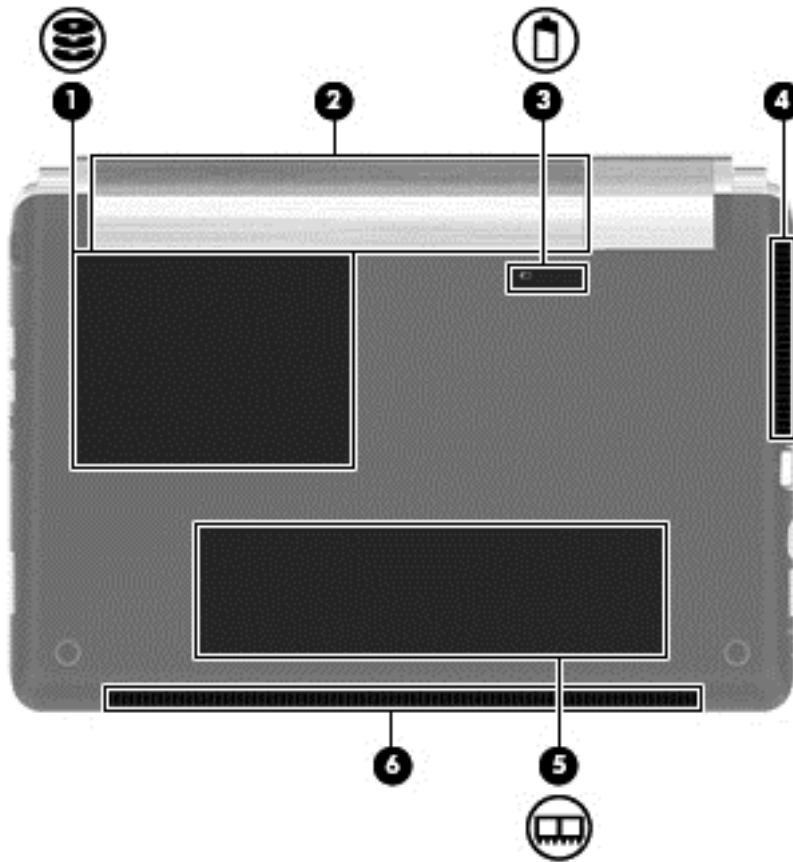
| Item | Component | Function |
|------|-----------------------|--|
| (1) | Security cable slot | Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen. |
| (2) | Vent | Enables 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

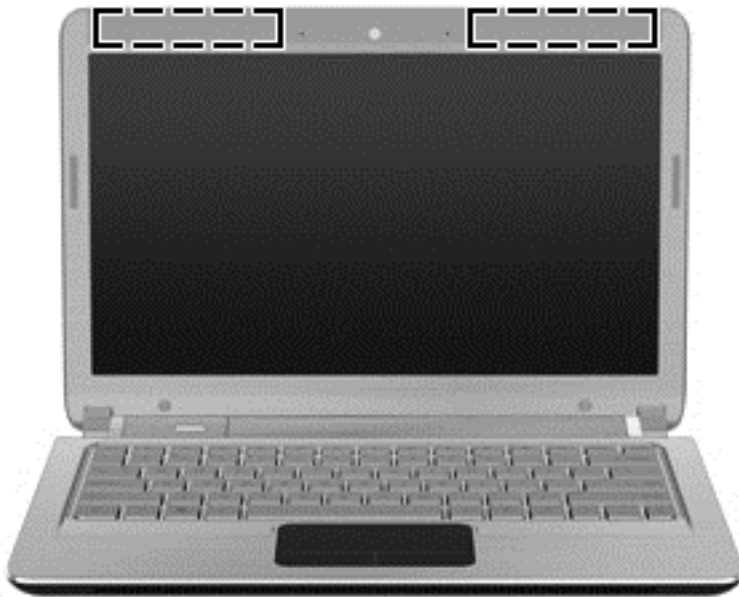


| Item | Component | Function |
|------|-----------------------|--|
| (1) | Hard drive bay | <p>Holds the hard drive and wireless wide area network (WWAN) module (select models only).</p> <p>NOTE: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for 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. |

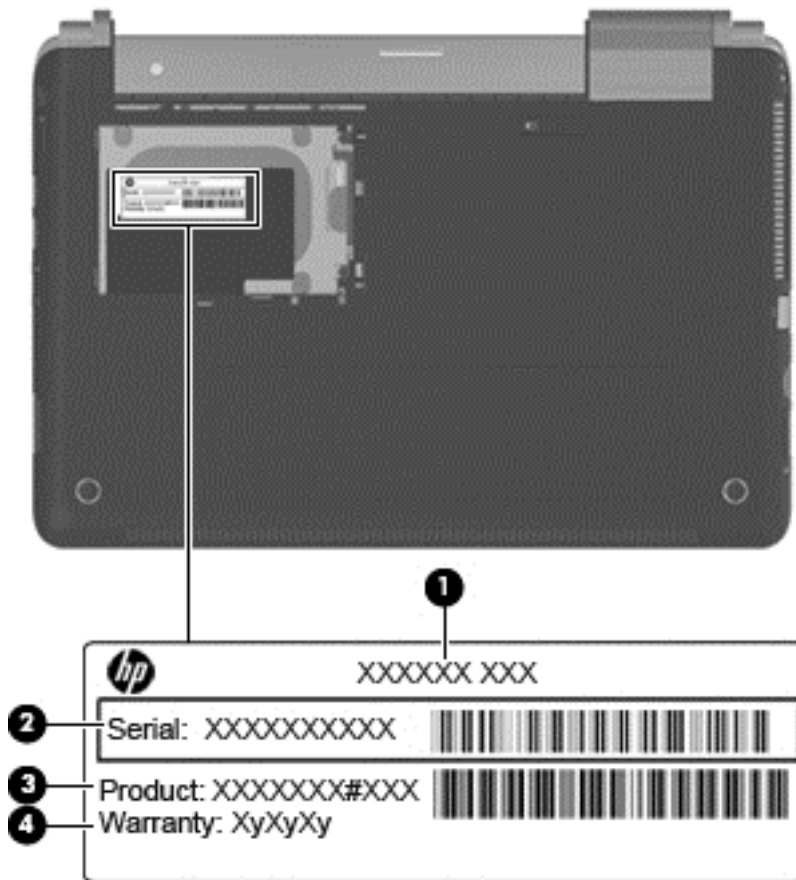
*Batteries and power cords vary in appearance by region or country.

3 Illustrated parts catalog

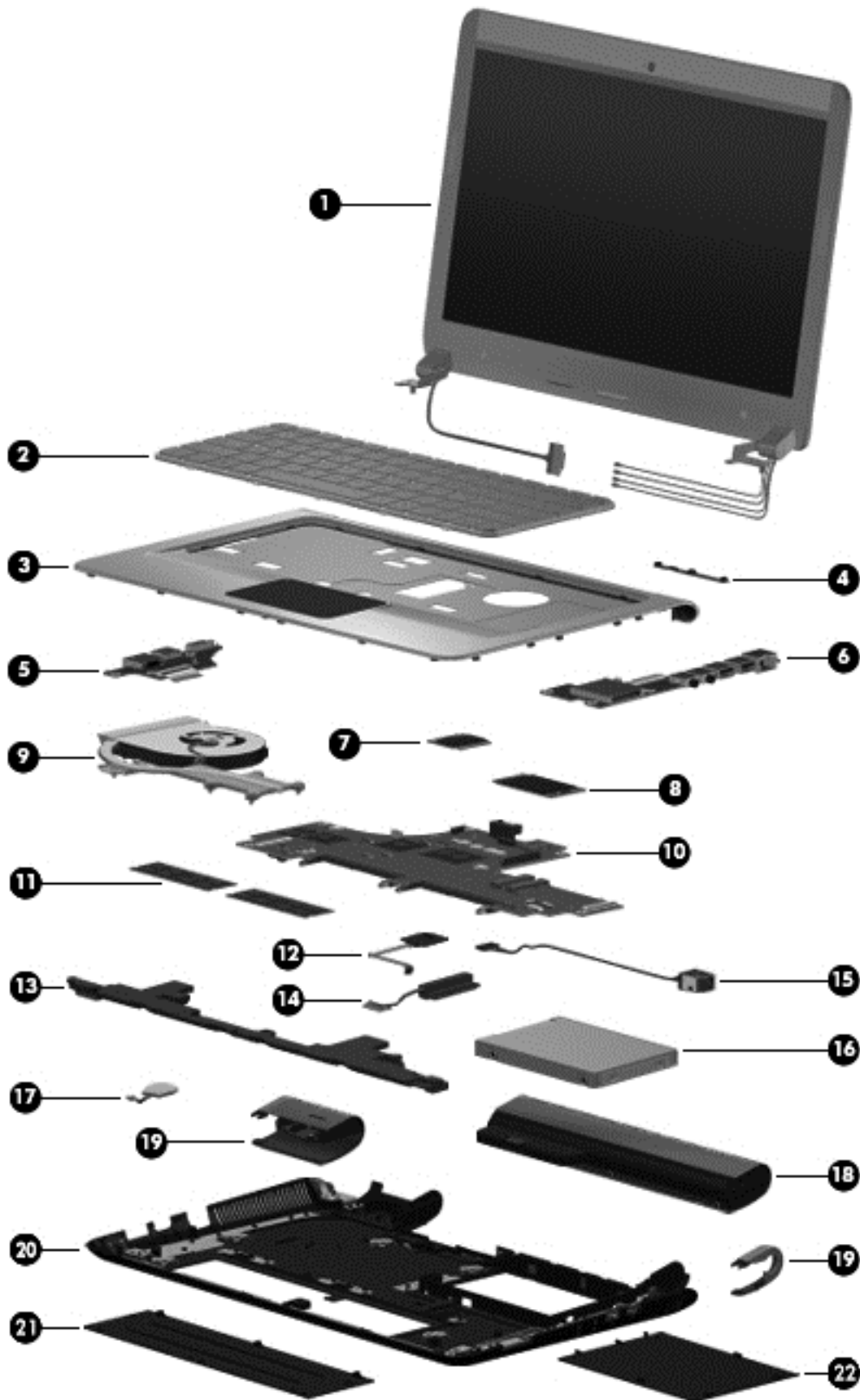
Serial number label

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.



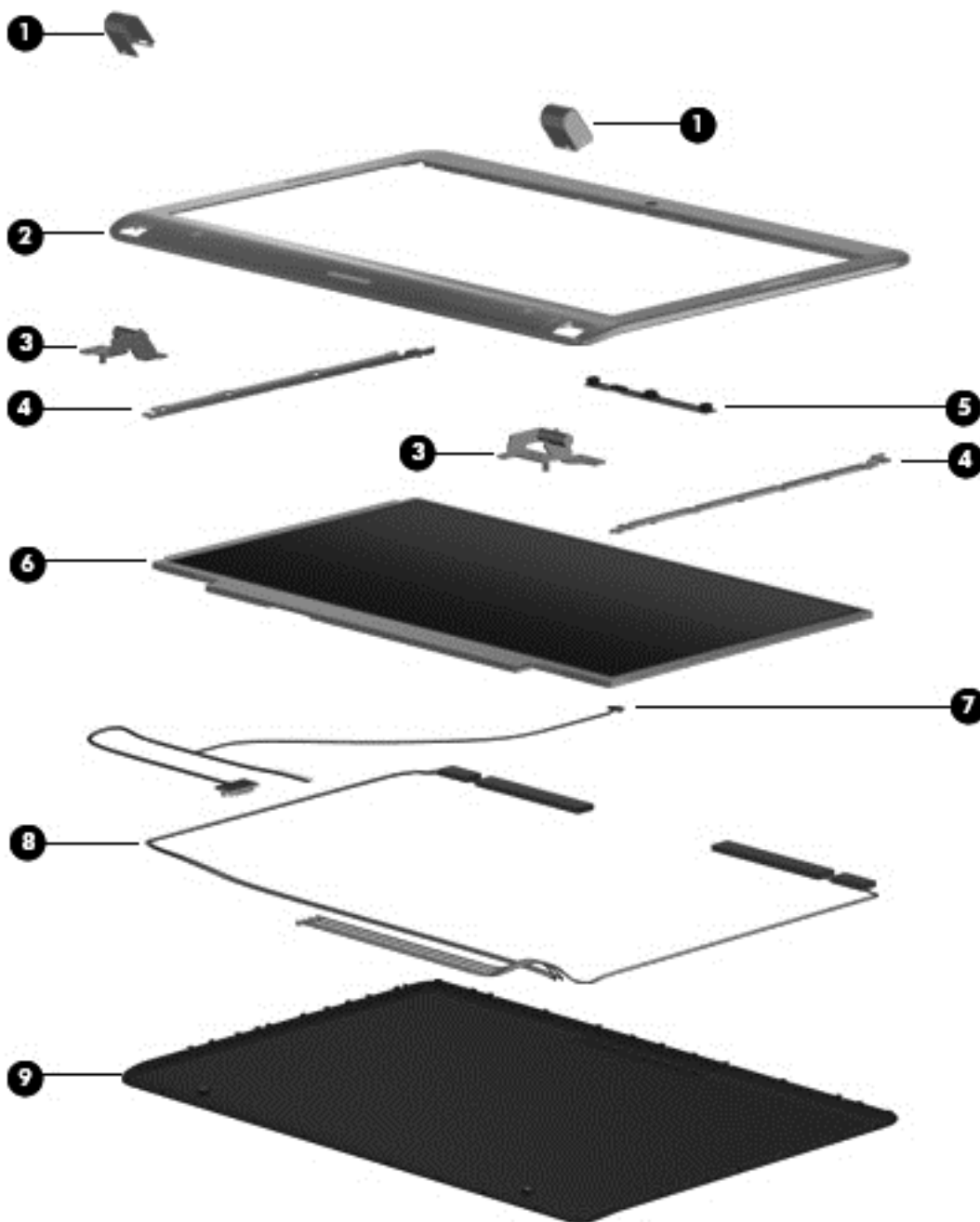
Computer major components



| 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

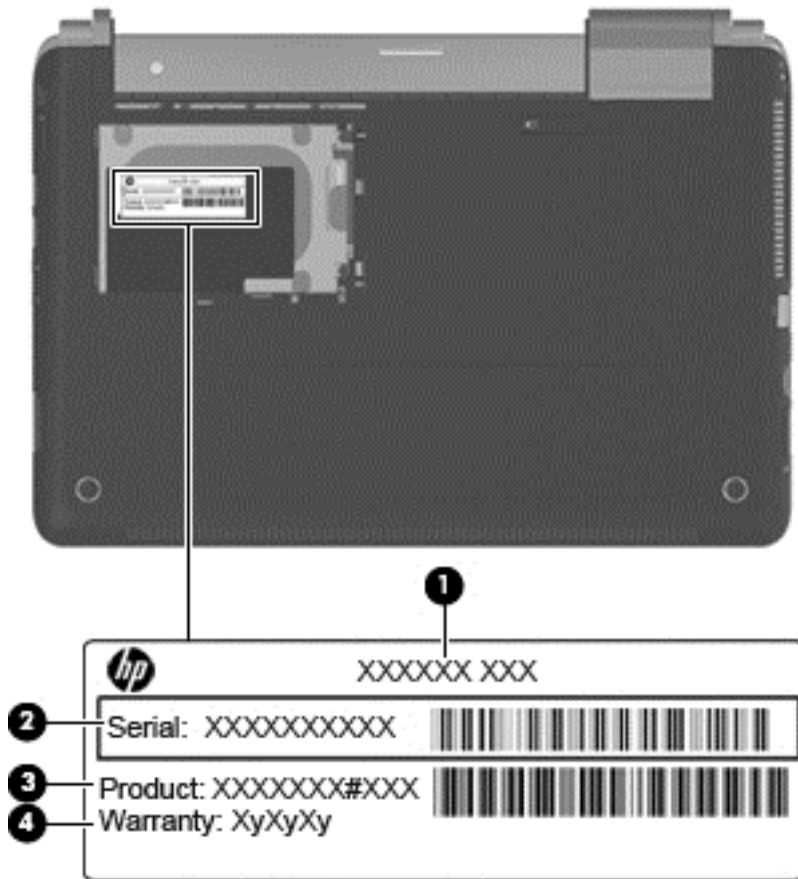
This chapter provides removal and replacement procedures.

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.

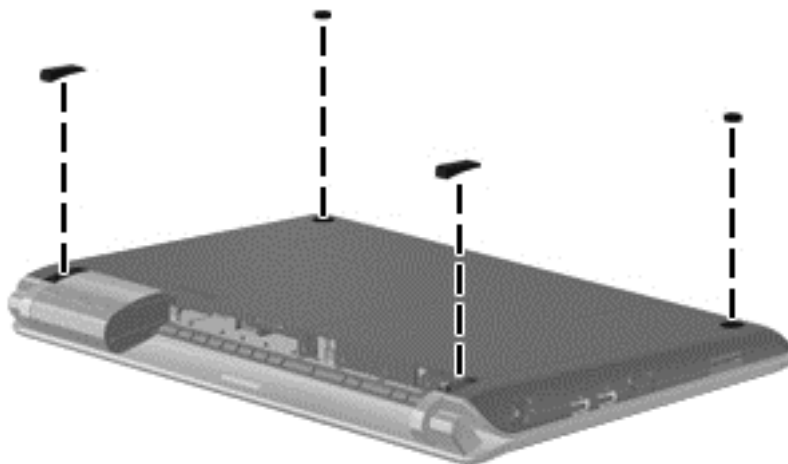
- (1) Product name: This is the product name affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The 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

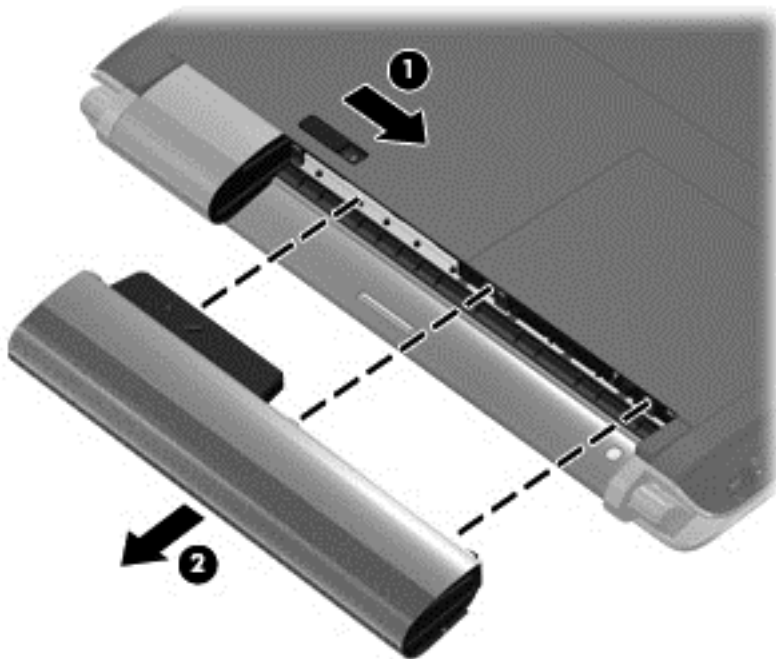
| Description | Spare part number |
|------------------------|-------------------|
| 6 cell, 2.80 Ah, 62 Wh | 619438-001 |

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 |

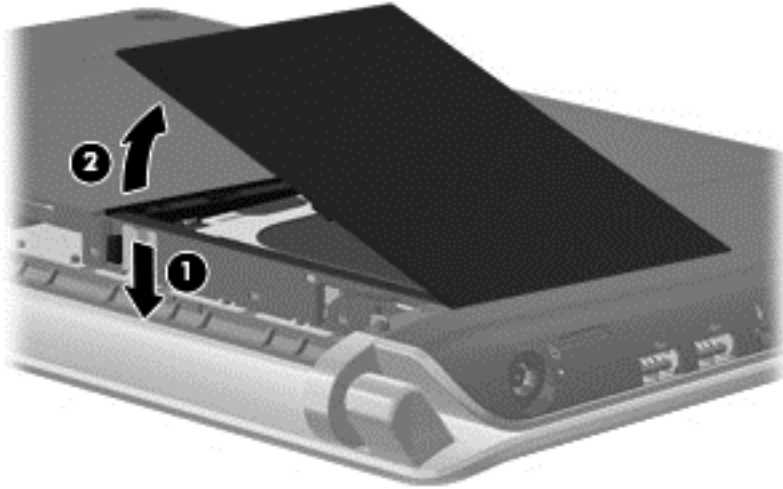
Before removing the hard drive:

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](#)).

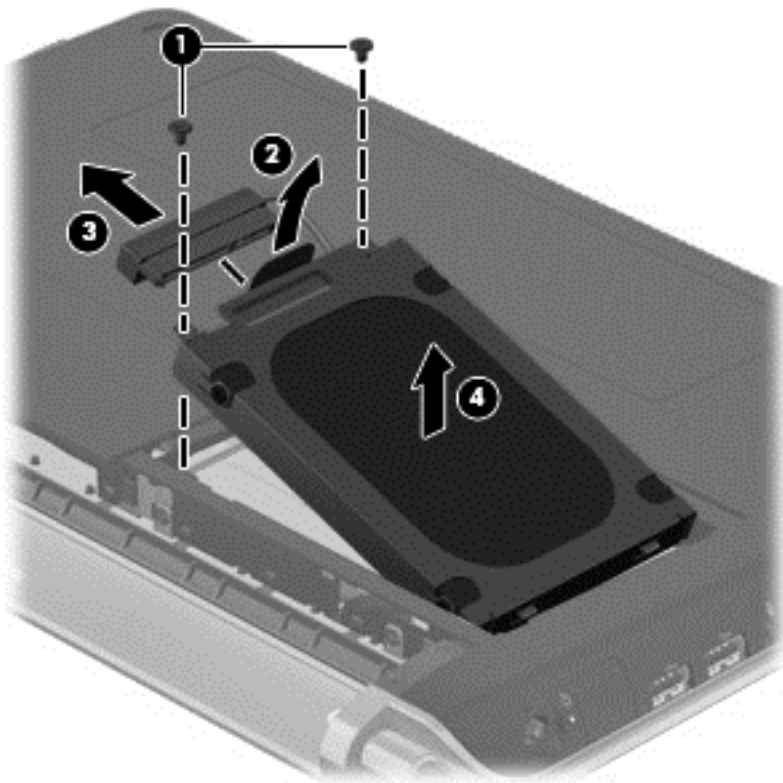
Remove the hard drive:

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.

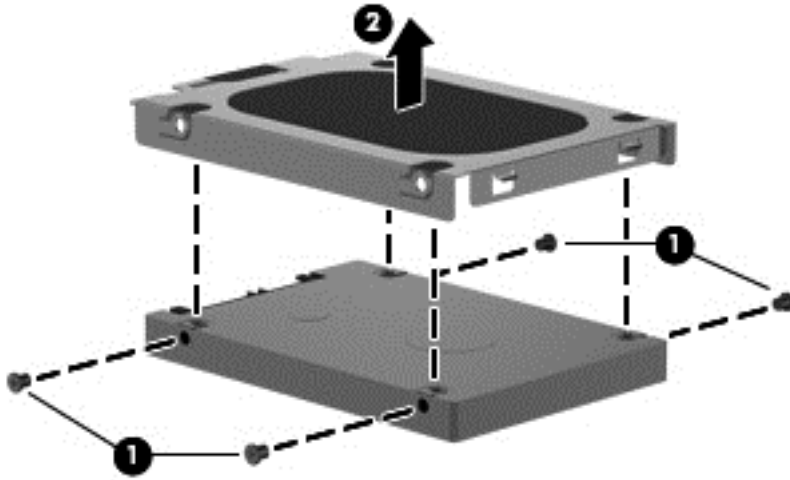
3. Lift the left side of the hard drive cover and remove the cover (2). The hard drive cover is included in the plastics kit, spare part number 619450-001.



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 |

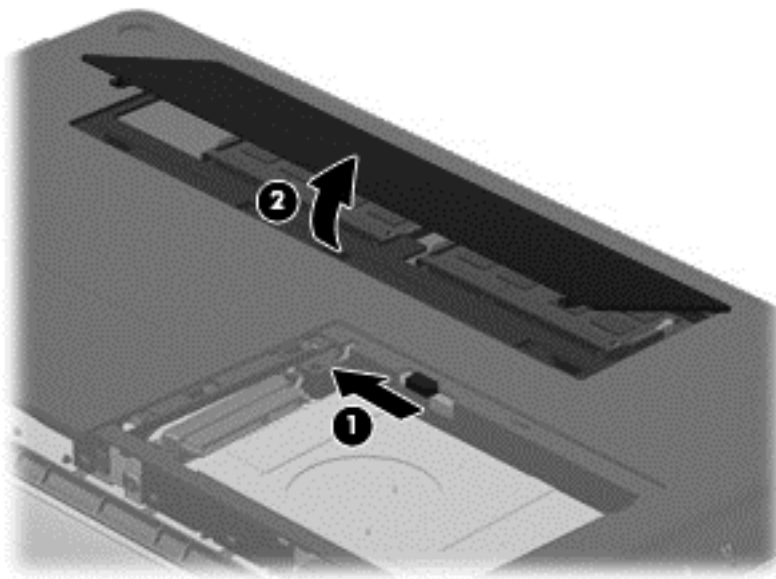
Before removing the memory module:

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.

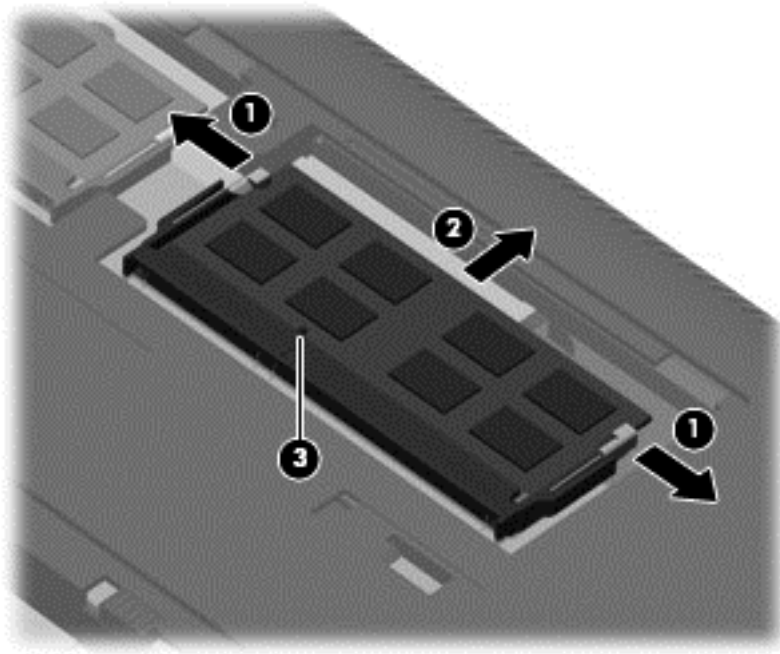
 **NOTE:** Small tabs hold the cover in place. Firmly pull up on the cover to release the tabs.



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

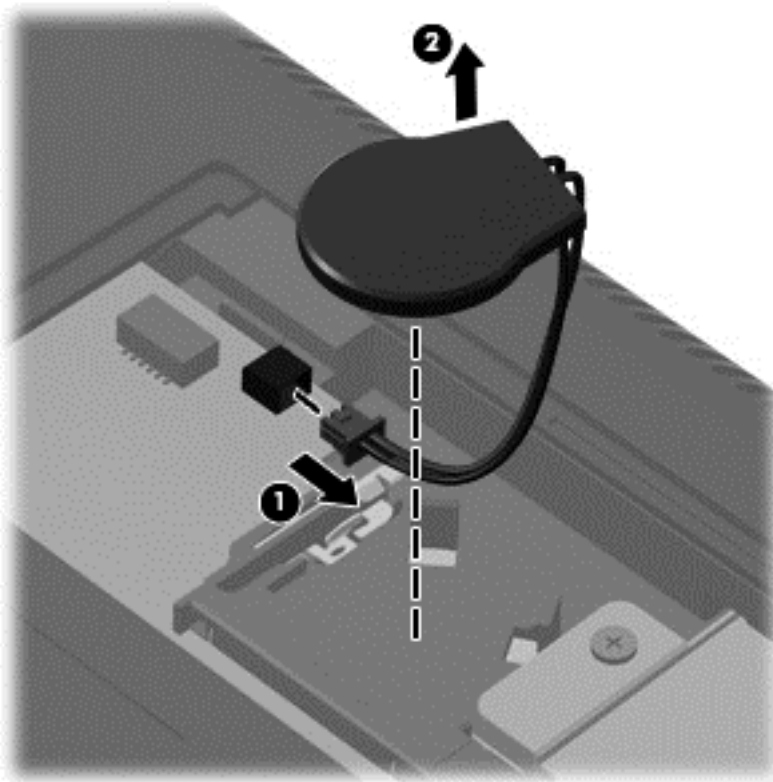
| Description | Spare part number |
|-------------|-------------------|
| RTC battery | 619451-001 |

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

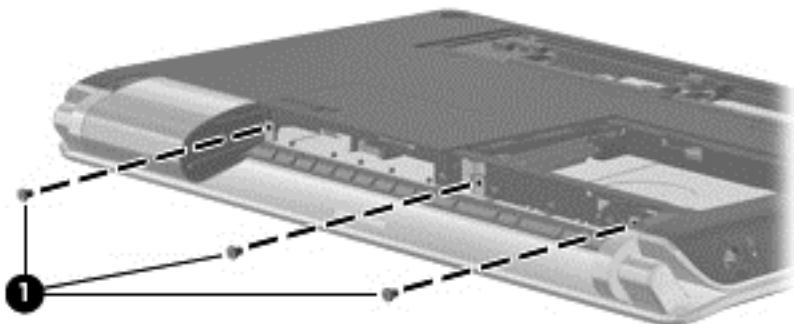
| Description | Spare part number |
|---|-------------------|
| For use in French Canada | 619433-121 |
| For use in Japan | 619433-291 |
| For use in the South Korea | 619433-AD1 |
| For use in Taiwan | 619433-AB1 |
| For use in Thailand | 619433-281 |
| For use in the United States | 619433-001 |
|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

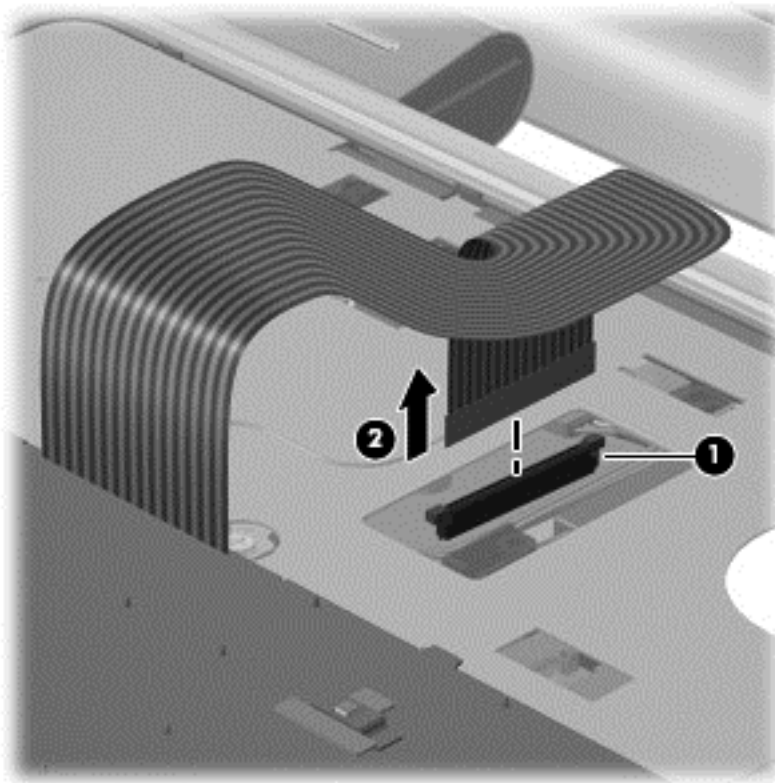
1. Turn the computer upside down with the front toward you.
2. Remove the three Phillips PM2.5×5.0 screws that secure the keyboard to the computer.



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

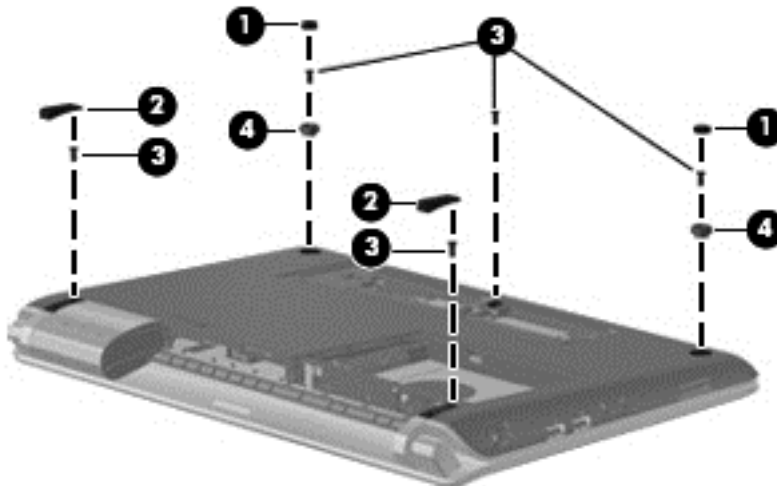
| Description | Spare part number |
|-------------------------------|-------------------|
| Top cover (includes TouchPad) | 626743-001 |

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](#))

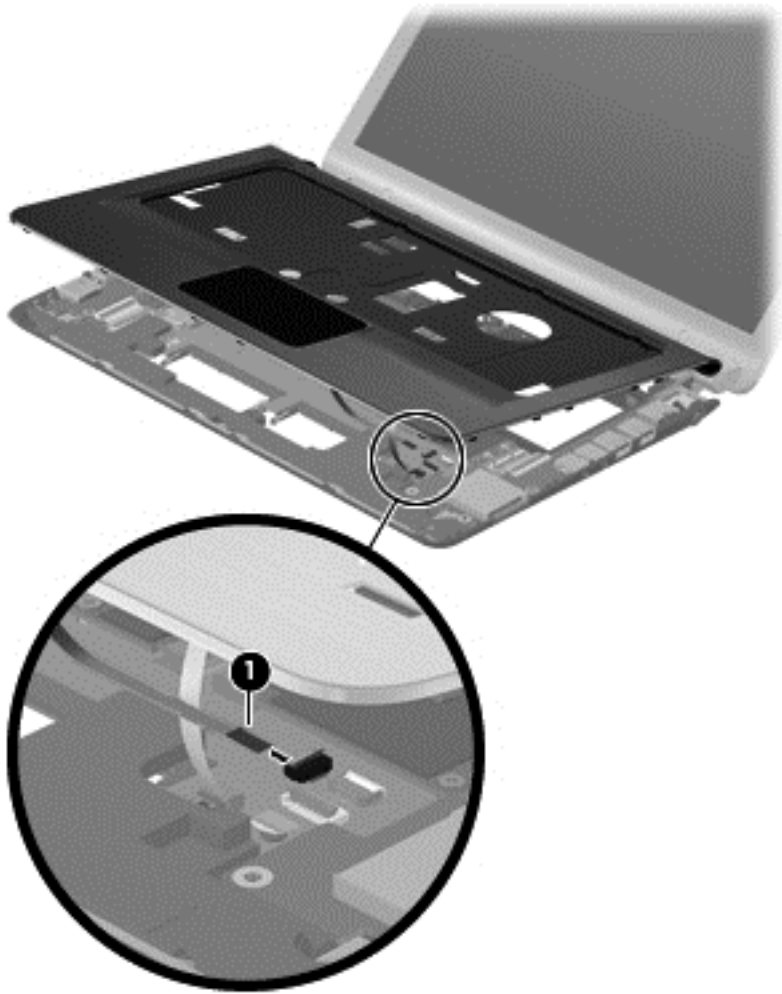
Remove the top cover:

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.

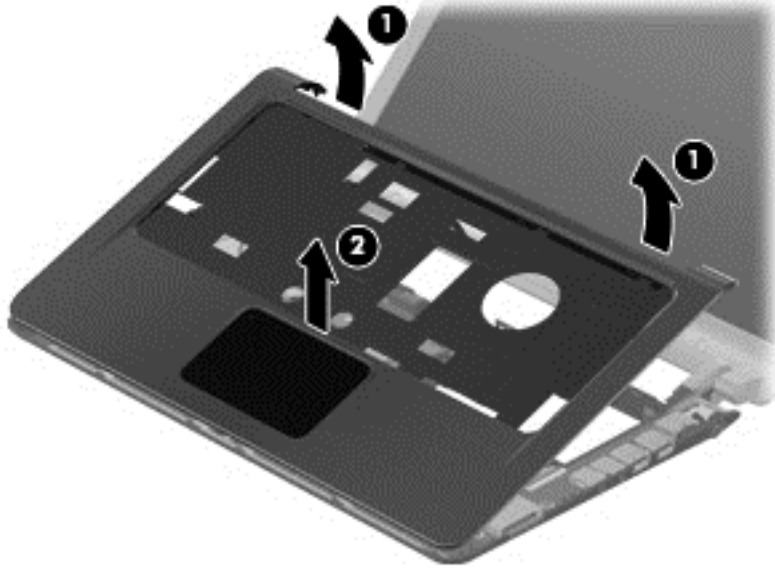



4. Turn the computer display-side up with the front toward you.
5. Open the computer as far as possible.

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

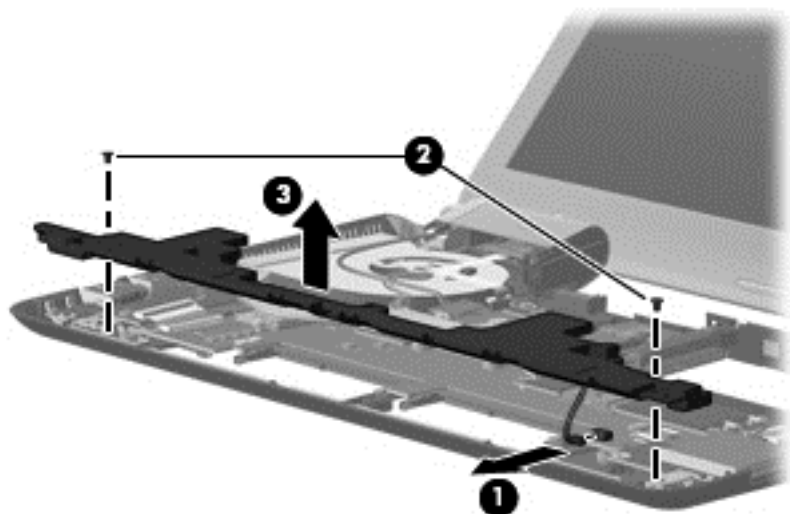
| Description | Spare part number |
|-----------------------------------|-------------------|
| Speaker assembly (includes cable) | 619454-001 |

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 |

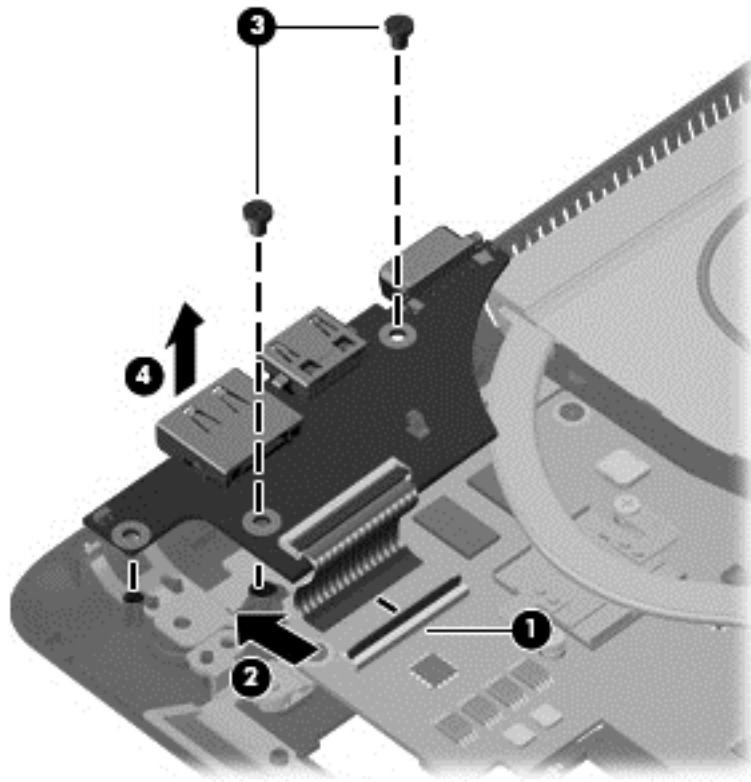
Before removing the mini system board:

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 |

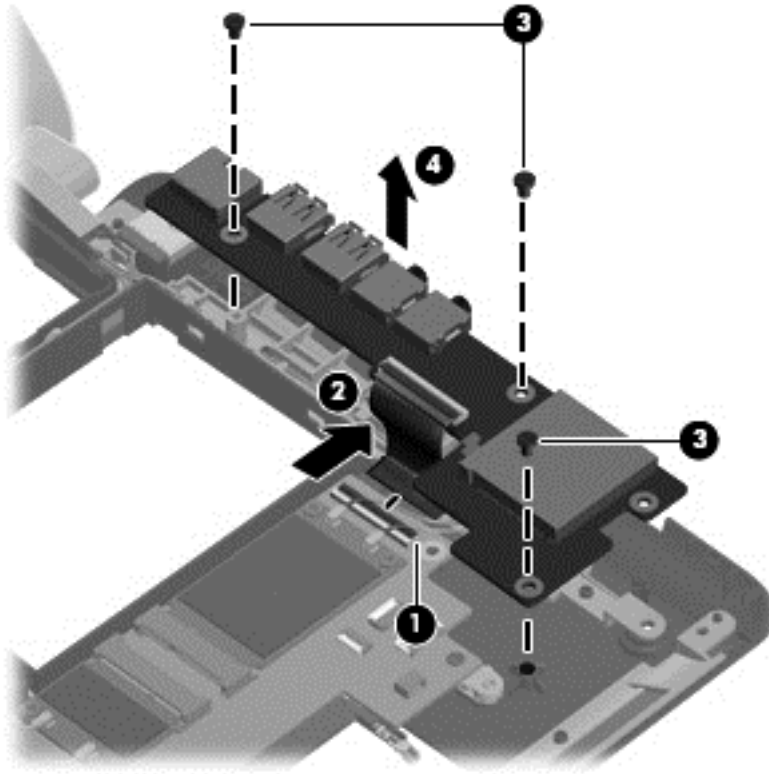
Before removing the mini system board:

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

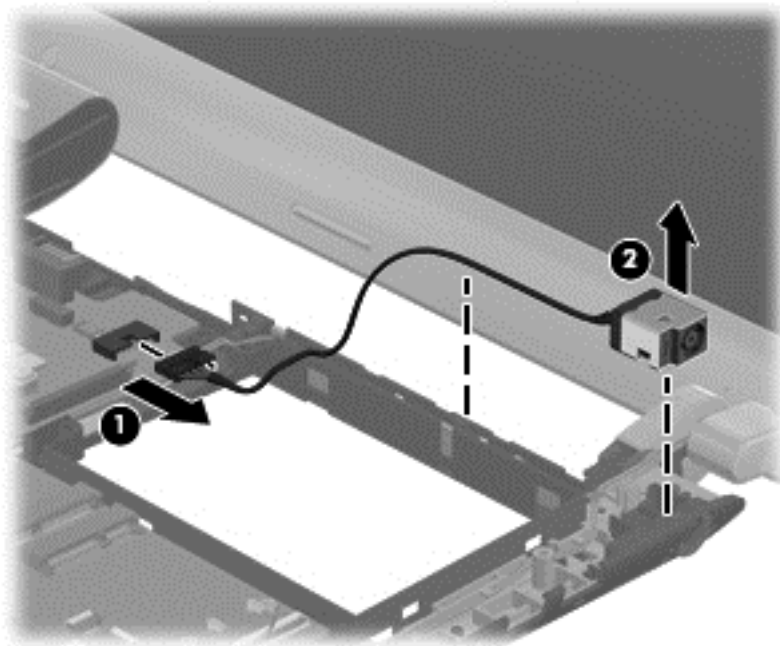
| Description | Spare part number |
|--|-------------------|
| The power cable is included in the Cable Kit | 626734-001 |

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](#))

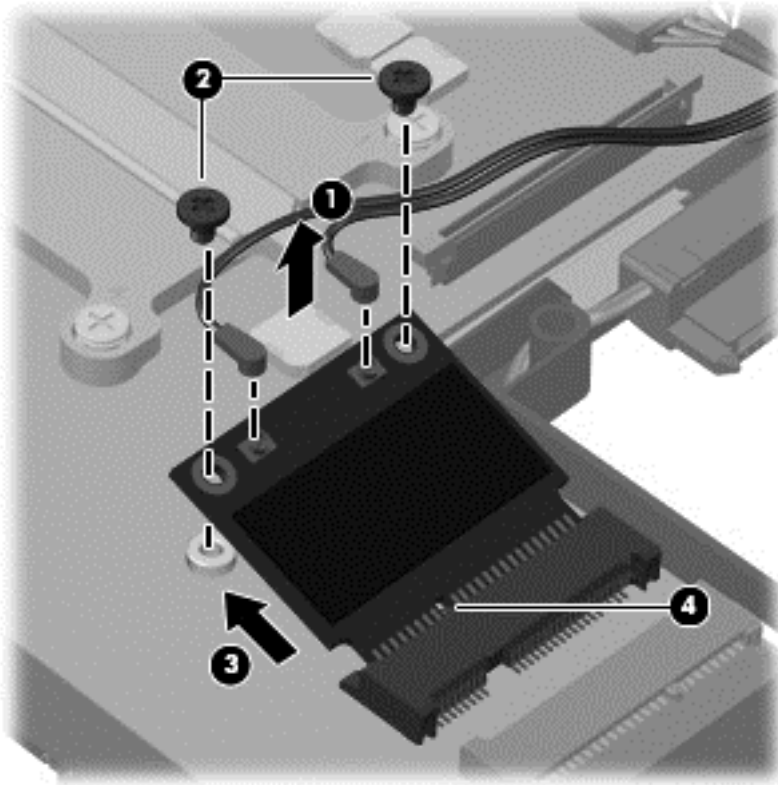
Remove the WLAN module:

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](#))

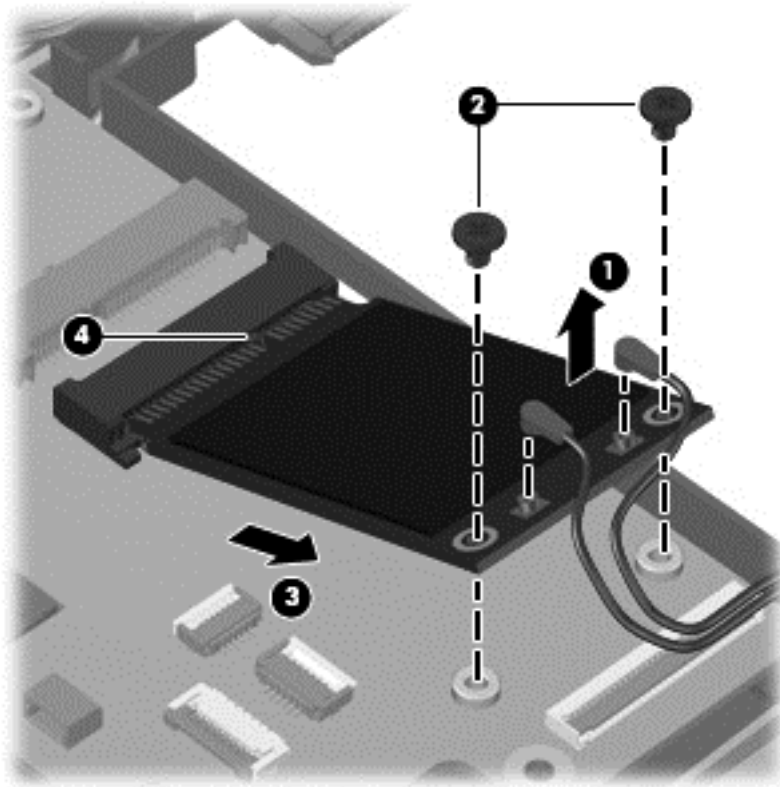
Remove the WWAN module:

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 |

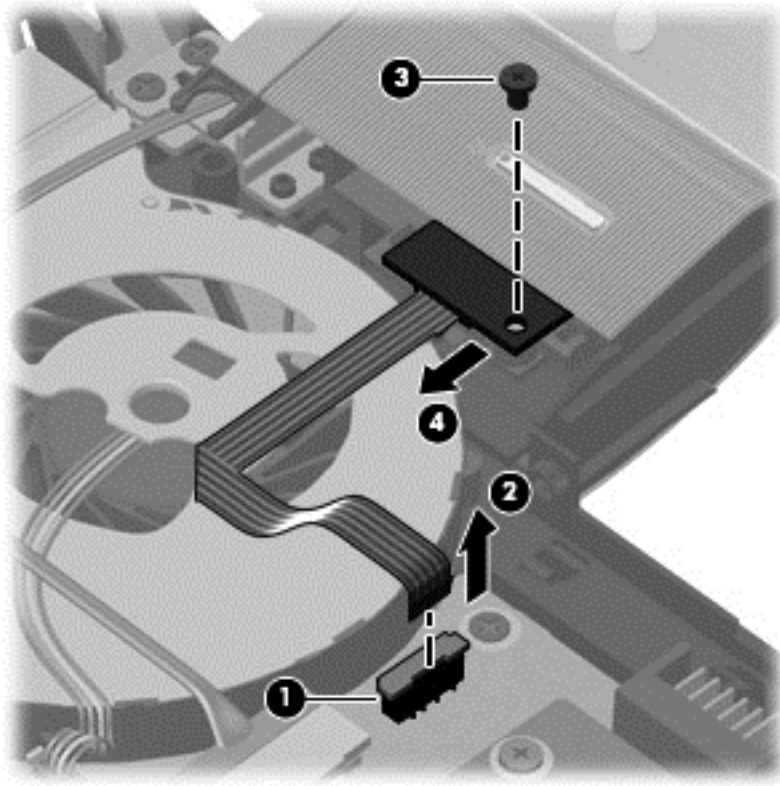
Before removing the power button board:

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:

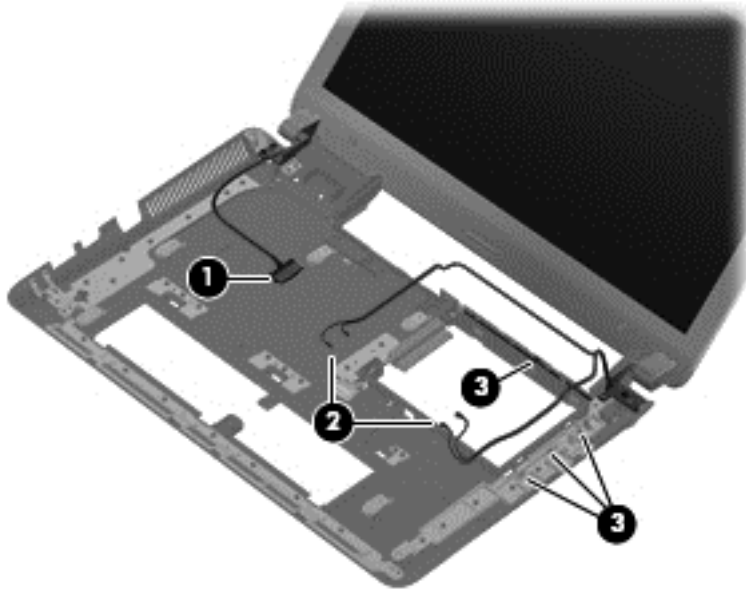
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power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

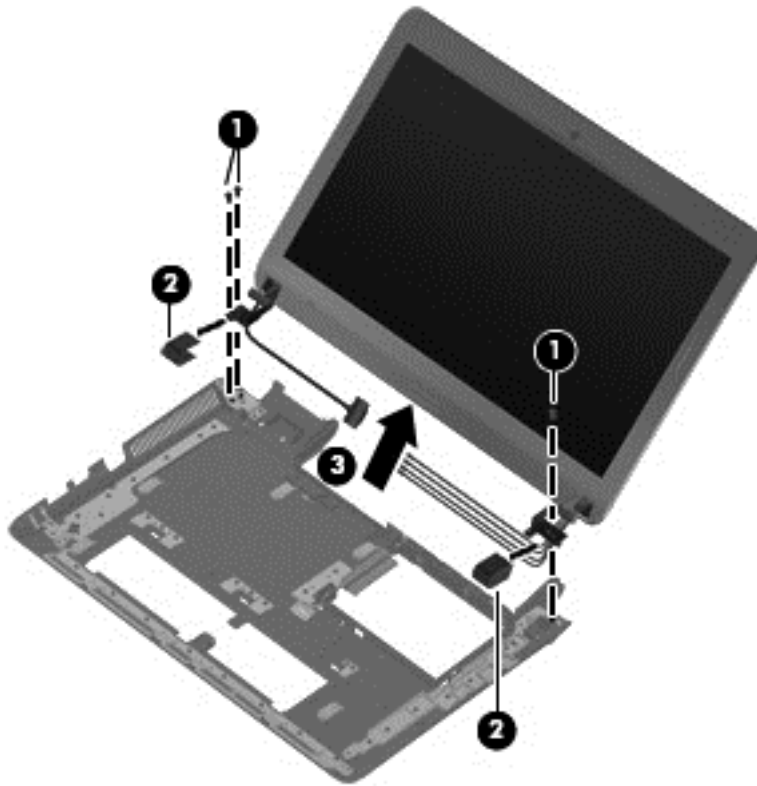
4. Pull the WLAN and WWAN antenna cables (2) from the clip in the routing channel leading to the display hinge (3).

△ **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.

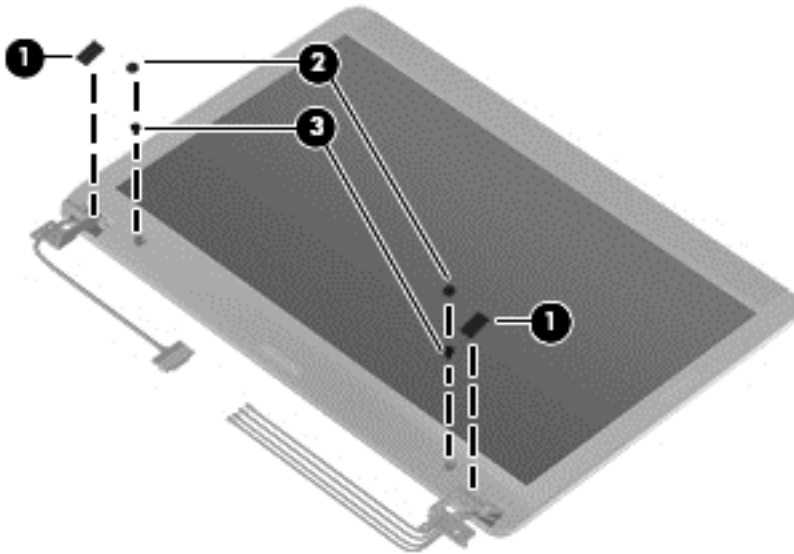
8. To replace any of the display assembly internal components, remove the following screw covers and screws:

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

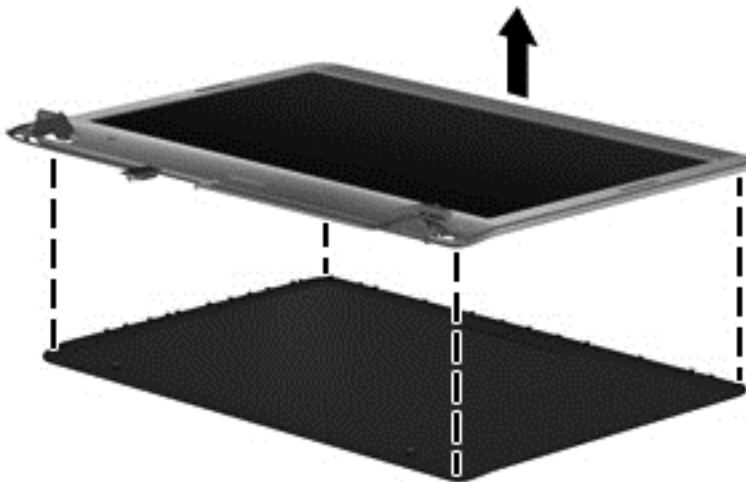
(2) Two round mylar screw covers on the display bezel bottom edge

(3) Two Phillips PM2.5×4.0 screws

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



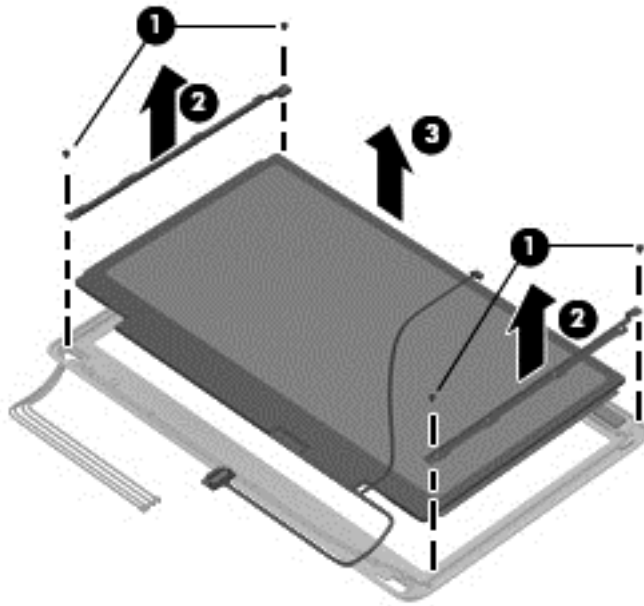
9. Lift up and remove the display back cover. The back cover is available using spare part number 619436-001.



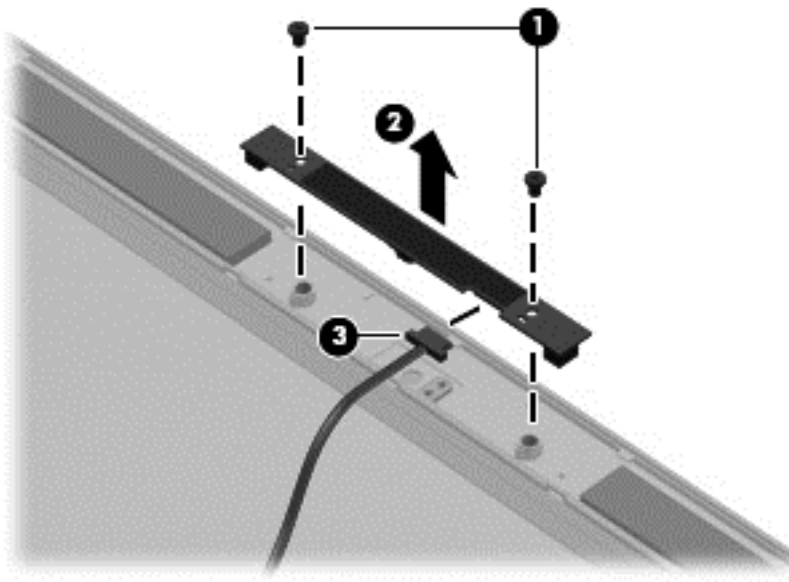
Reverse this procedure to install the display back cover.

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.



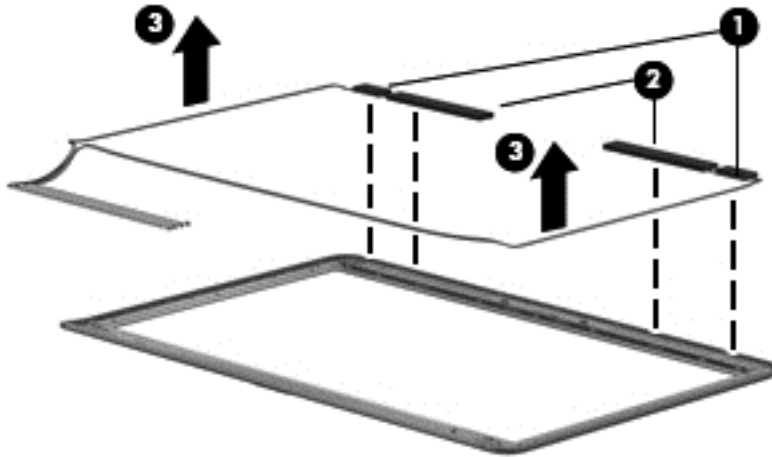
12. To replace the webcam module (select models only), remove the two Phillips 2.0×3.0 (1) screws.
13. Disconnect the webcam module cable (2) from the webcam module, and remove the webcam module (3). The webcam module is available using spare part number 619459-001.



Reverse this procedure to install the webcam module.

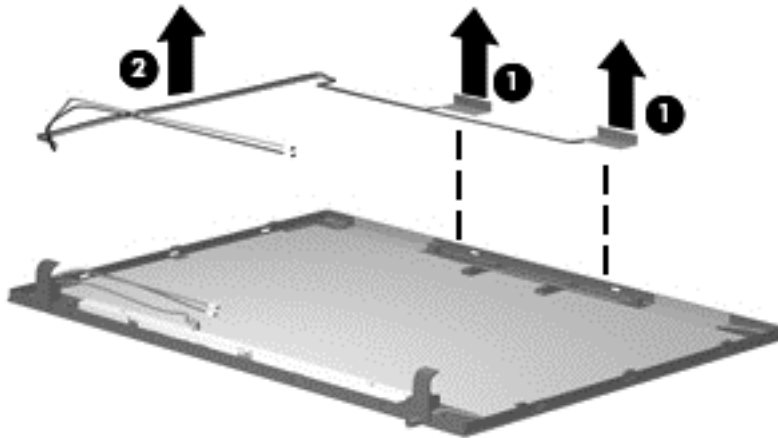
14. To replace the wireless antenna transceivers, lift up on the silver transceiver (1) and release the adhesive material from the display cover (2).

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:

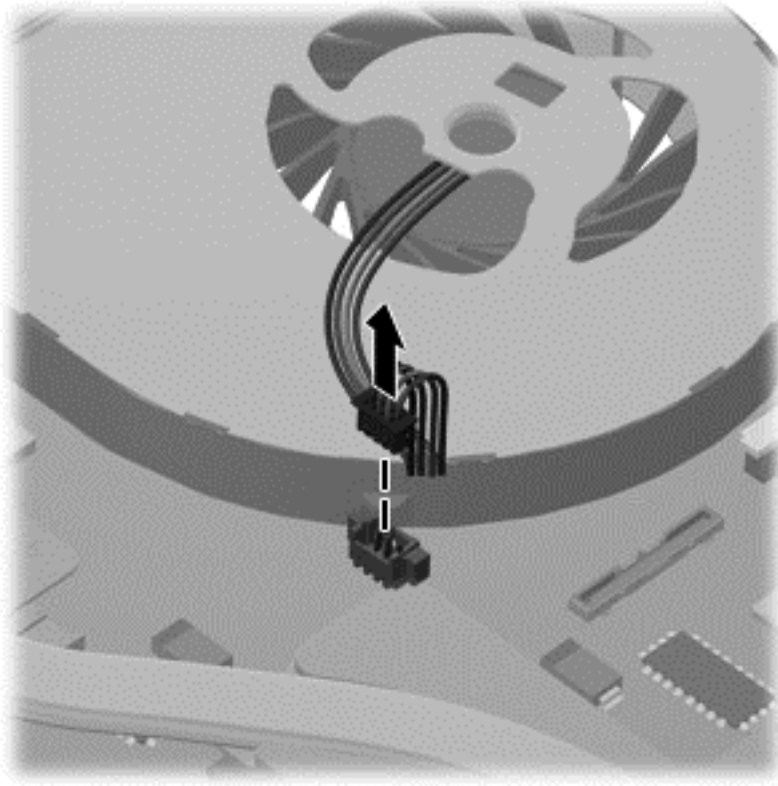
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power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

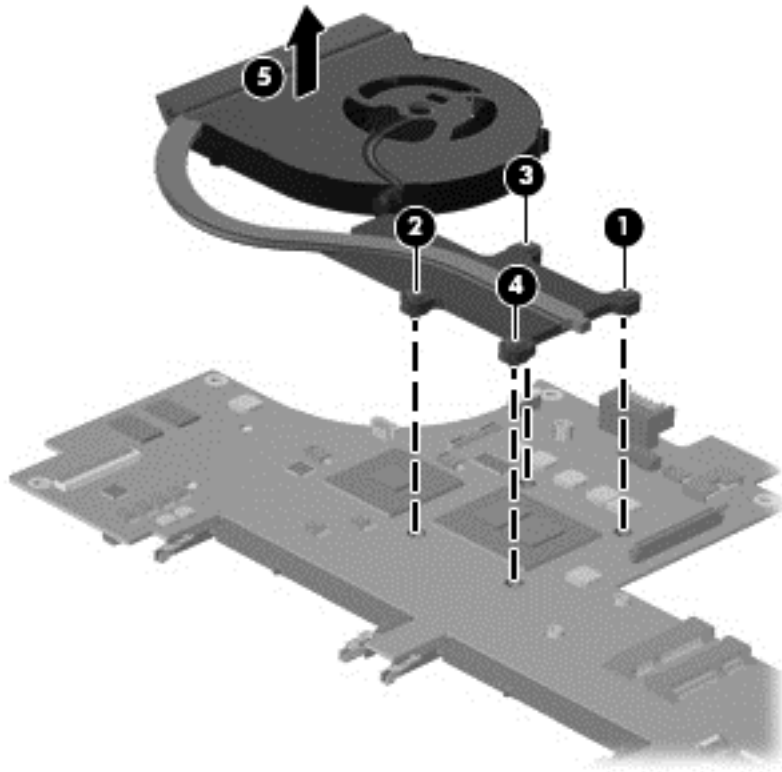



3. Follow the sequence embossed on heat sink to loosen the four Phillips PM2.5×7.0 captive screws (1–4) that secure the fan/heat sink assembly to the system board.



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.

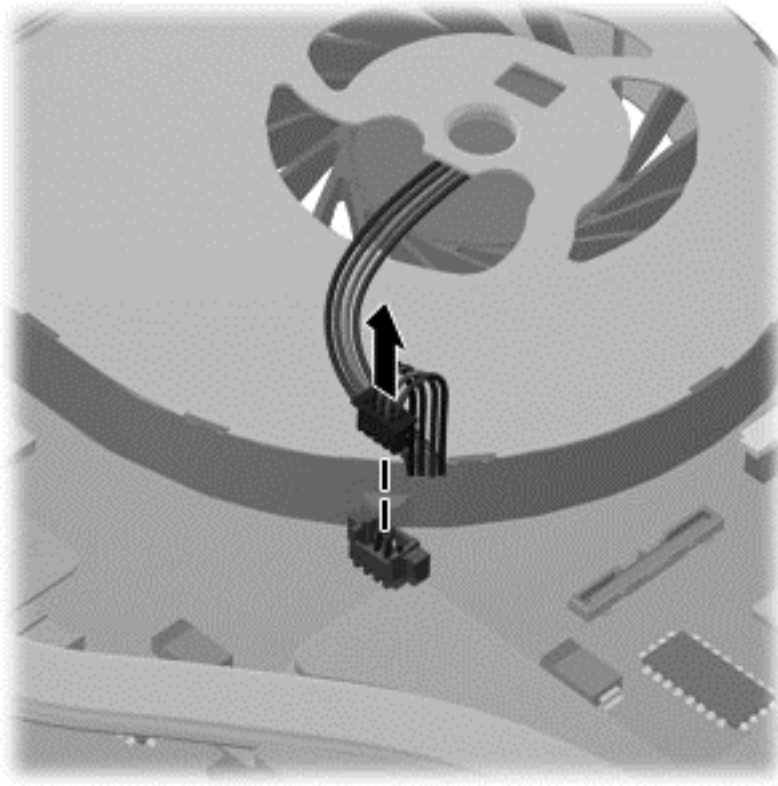
4. Remove the fan/heat sink assembly (5) by lifting straight up.



 **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.

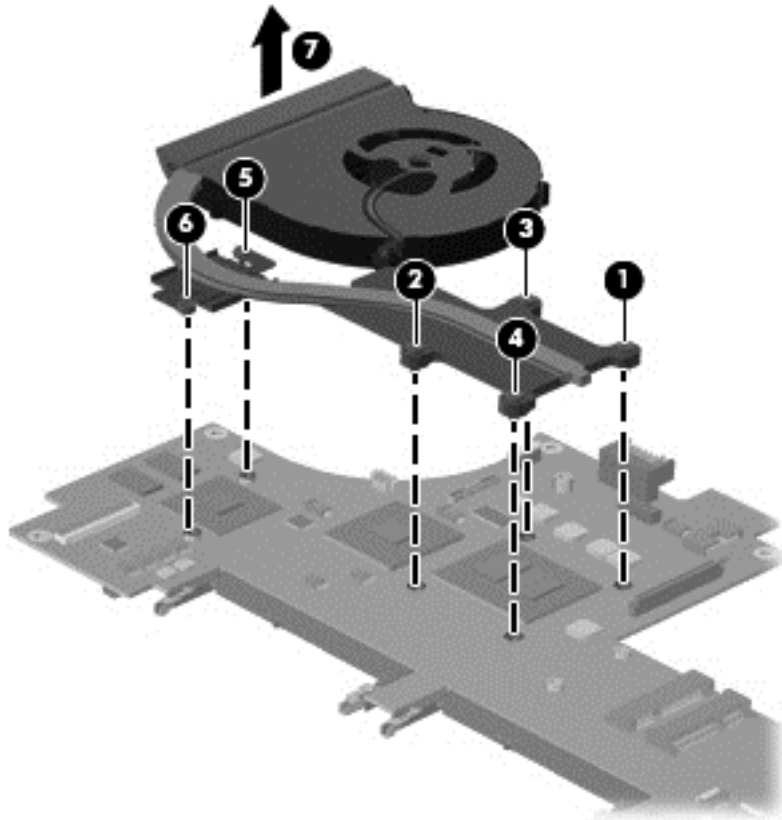


3. Loosen the four Phillips captive screws (1–4) and two Phillips spring-loaded captive screws (5–6) that secure the fan/heat sink assembly.




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.

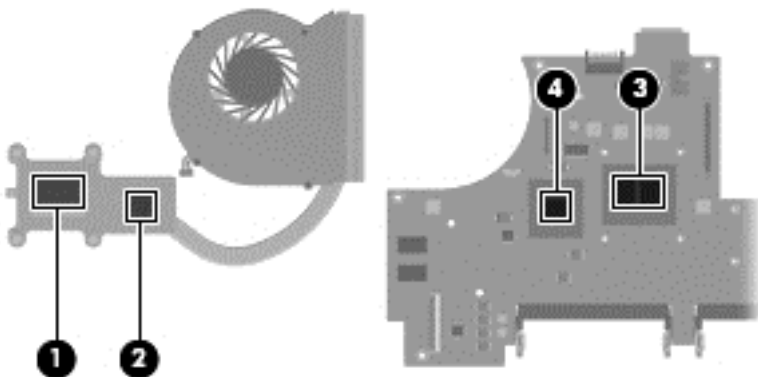


Reverse this procedure to install the fan/heat sink assembly.

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.

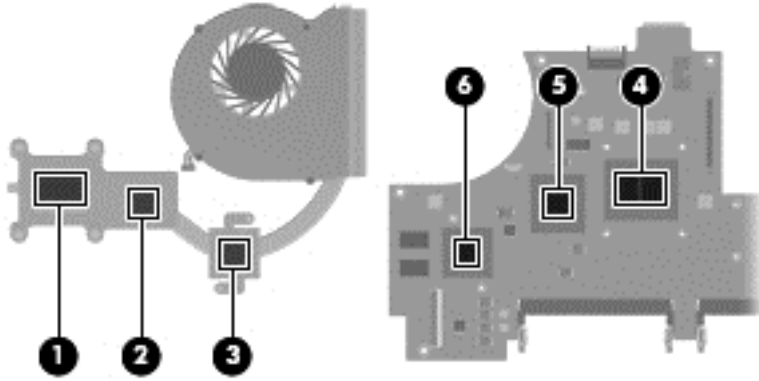
The following illustration shows the locations for thermal material on systems with UMA graphics subsystems.




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:

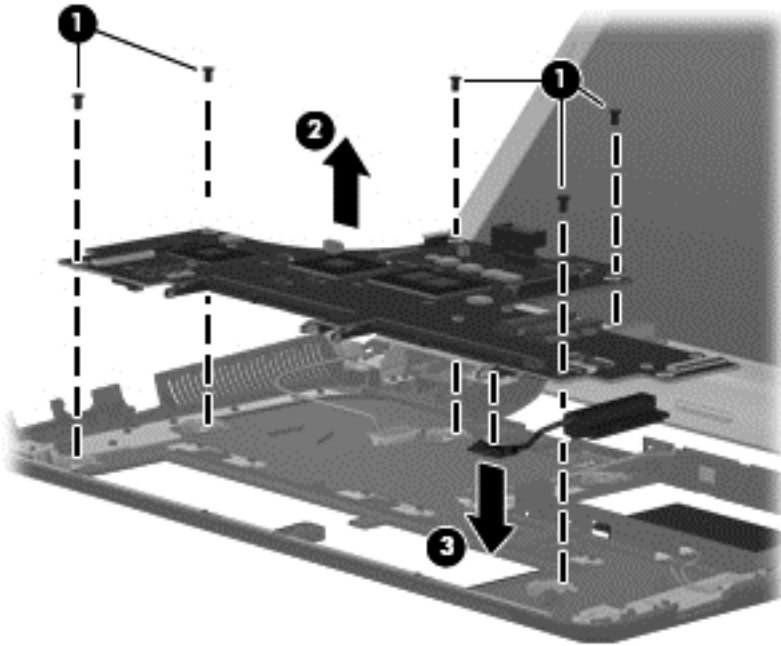
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn on the computer, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power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

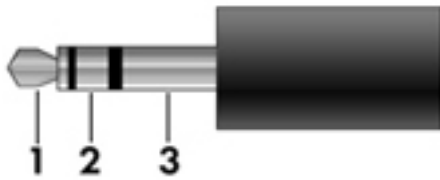
On some models, you can perform a recovery from the partition on the hard drive, accessed by pressing either the Start button or **f11**. This restores the computer to its factory condition.

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.

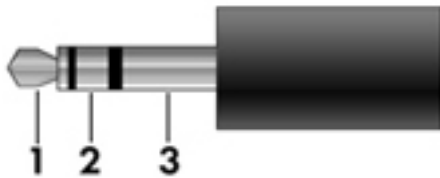
8 Connector pin assignments

Audio-in (microphone)



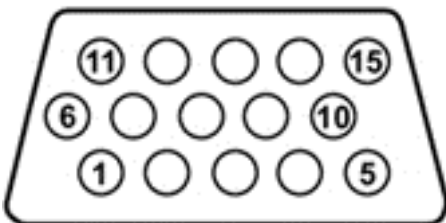
| Pin | Signal |
|-----|-----------------|
| 1 | Audio signal in |
| 2 | Audio signal in |
| 3 | Ground |

Audio-out (headphone)



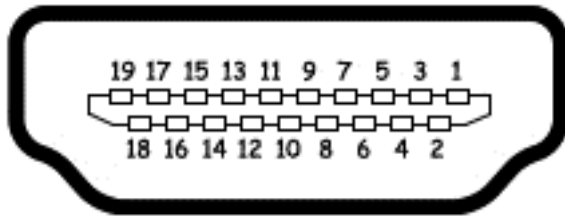
| Pin | Signal |
|-----|--------------------------|
| 1 | Audio out, left channel |
| 2 | Audio out, right channel |
| 3 | Ground |

External monitor



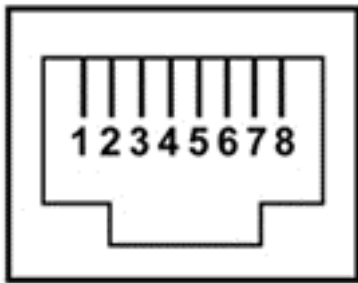
| Pin | Signal |
|------------|-----------------|
| 1 | Red analog |
| 2 | Green analog |
| 3 | Blue analog |
| 4 | Not connected |
| 5 | Ground |
| 6 | Ground analog |
| 7 | Ground analog |
| 8 | Ground analog |
| 9 | +5 VDC |
| 10 | Ground |
| 11 | Monitor detect |
| 12 | DDC 2B data |
| 13 | Horizontal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

HDMI



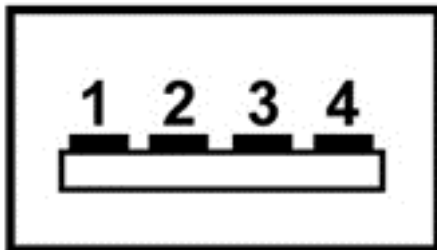
| Pin | Signal | Pin | Signal |
|-----|--------------------|-----|-------------------|
| 1 | TMDS data 2+ | 11 | TMDS clock shield |
| 2 | TMDS data 2 shield | 12 | TMDS clock- |
| 3 | TMDS data 2- | 13 | CEC |
| 4 | TMDS data 1+ | 14 | No connect |
| 5 | TMDS data 1 shield | 15 | DDC clock |
| 6 | TMDS 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

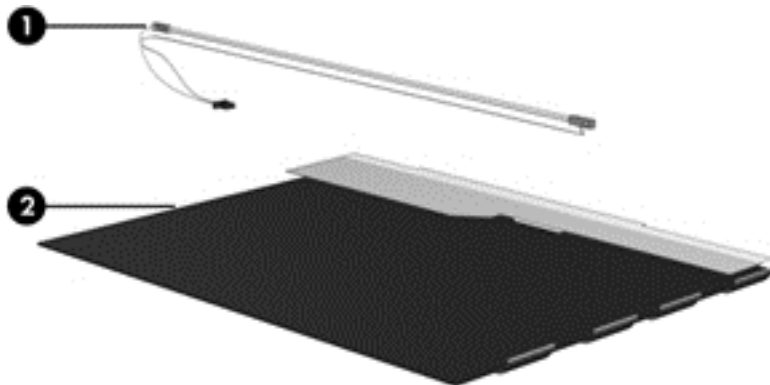
Battery

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>.
-

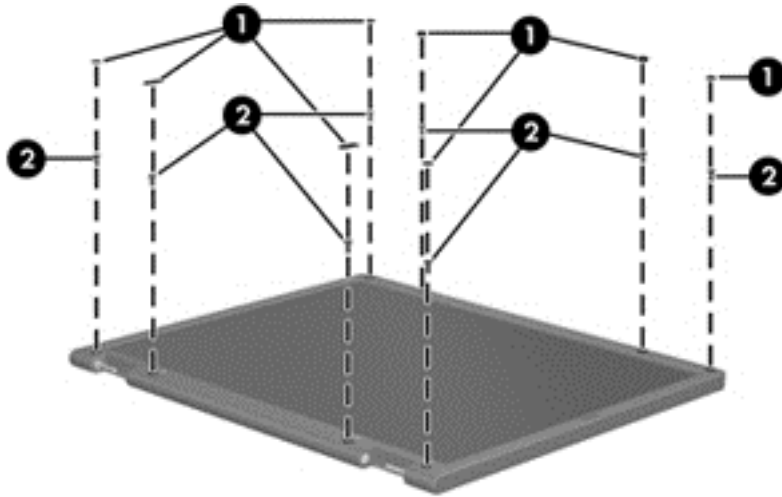
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



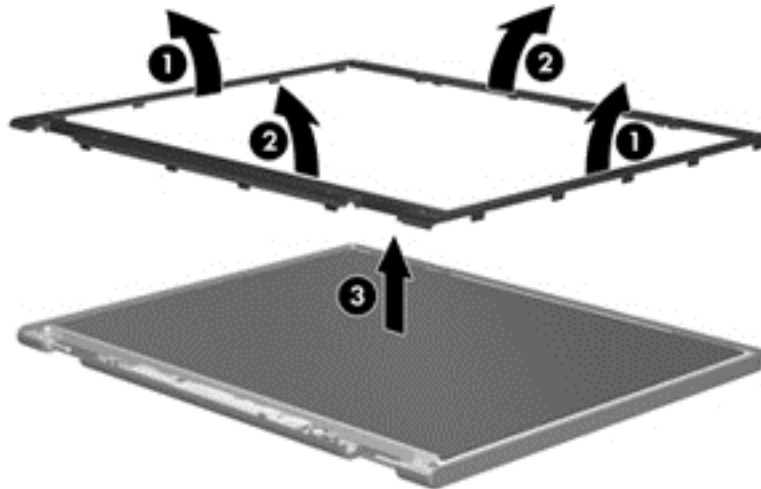
-
- 📄 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

Perform the following steps:

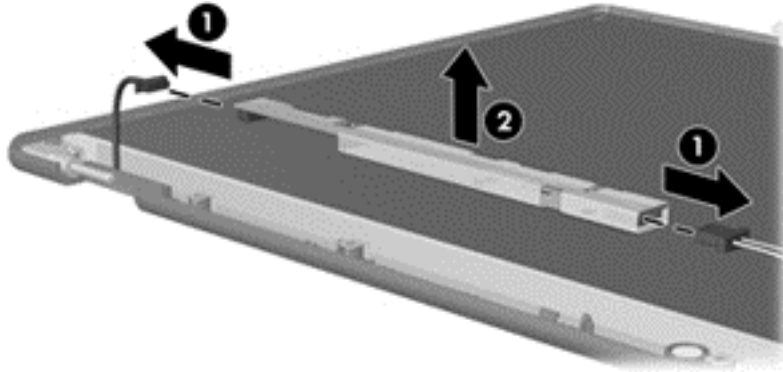
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



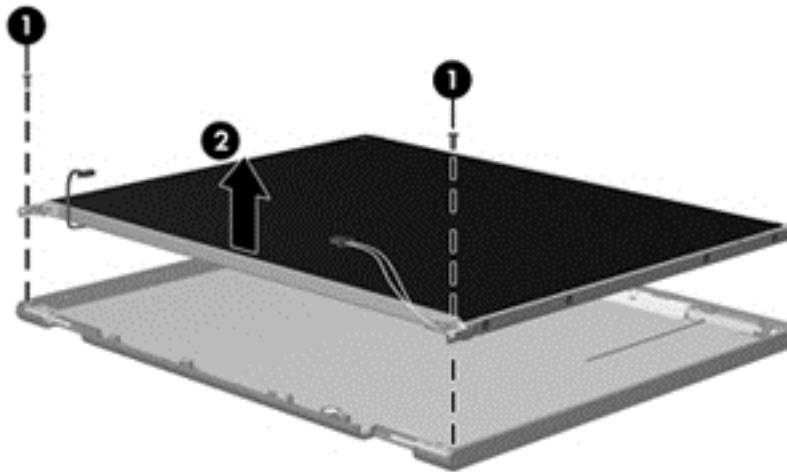
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel 3.



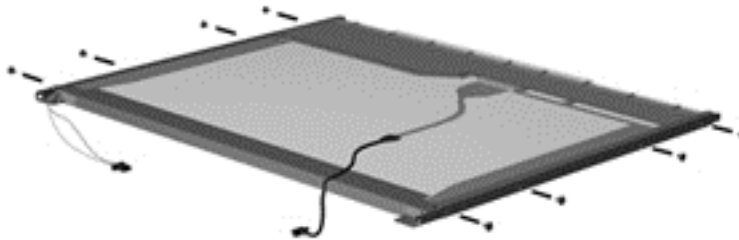
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter 2.



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.

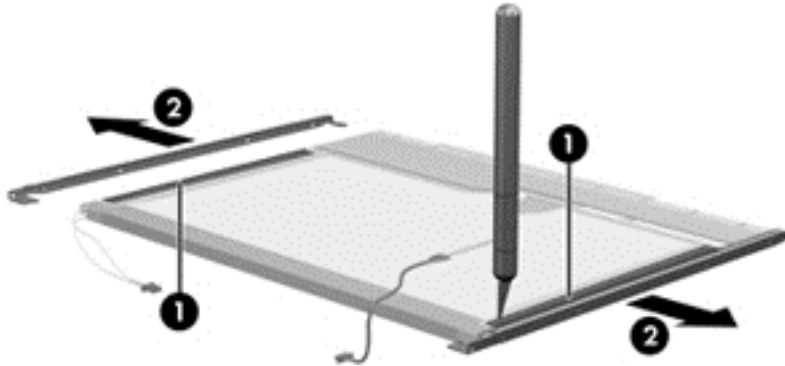


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



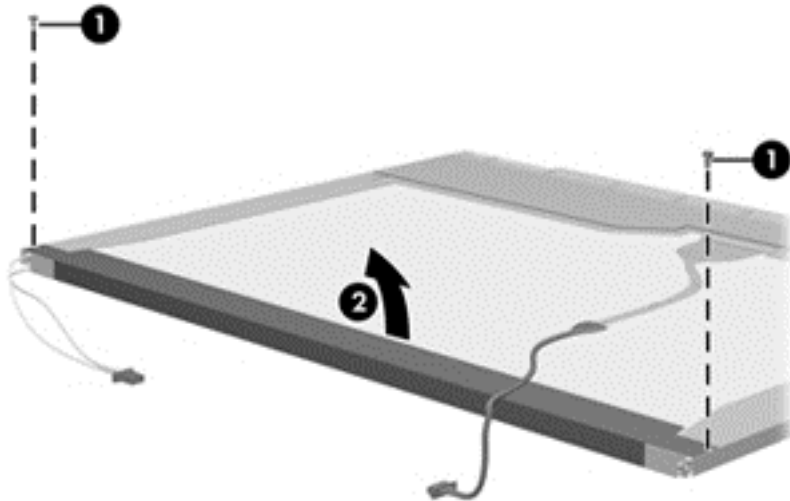
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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.

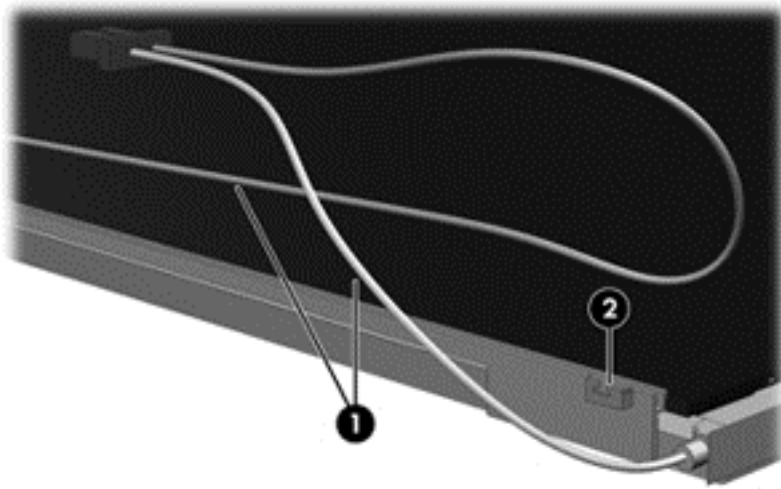
12. Lift the top edge of the backlight cover (2) and swing it outward.



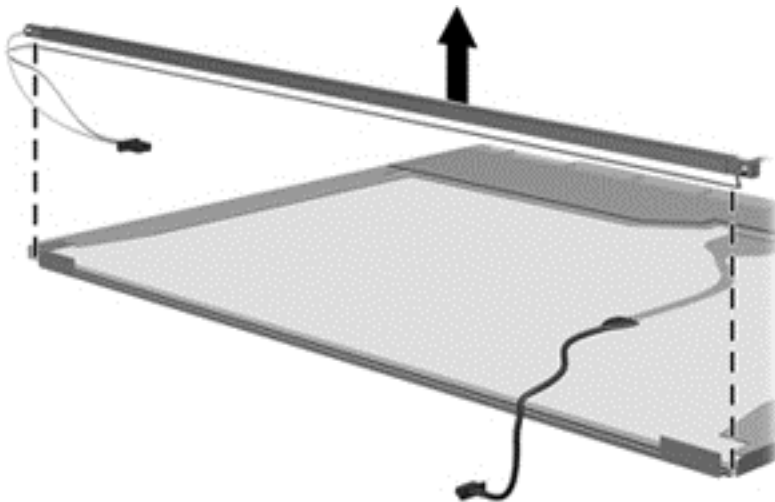
13. Remove the backlight cover.

14. Turn the display panel right-side up.

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

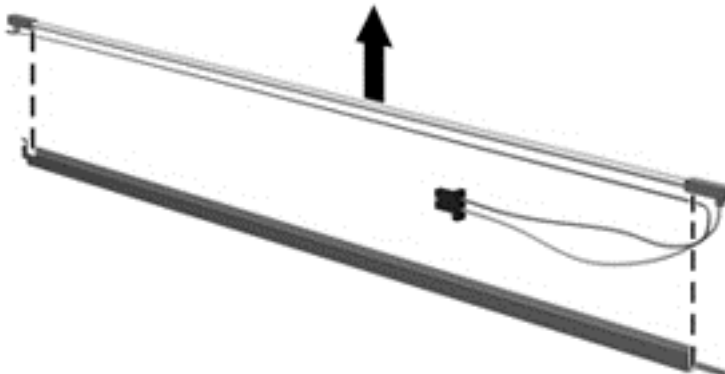


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

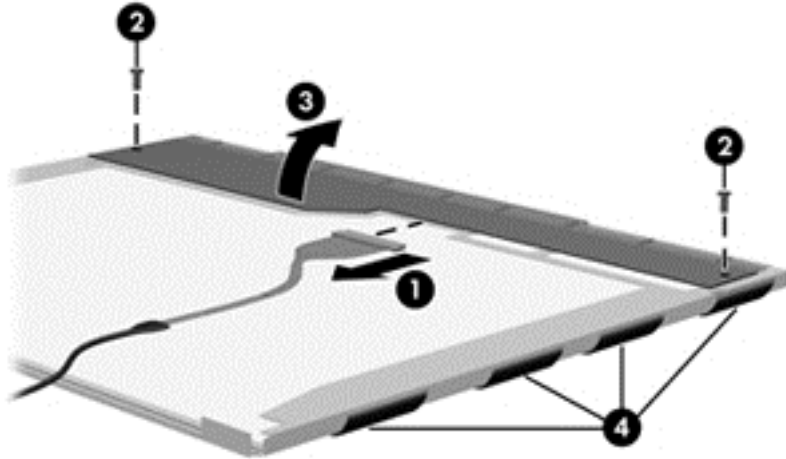


⚠ WARNING! The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

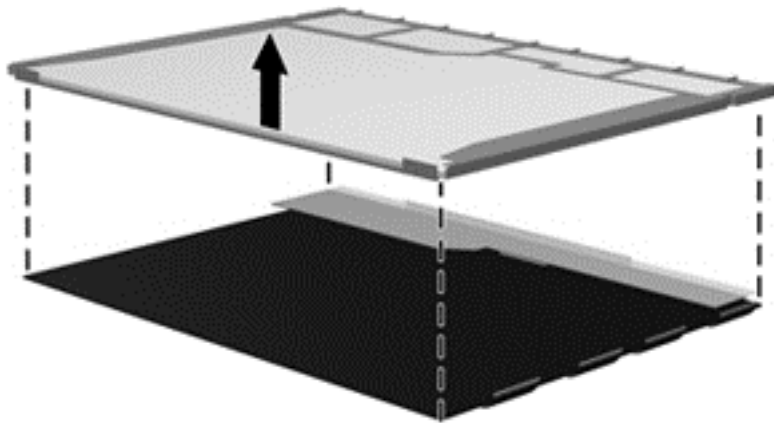
18. Remove the backlight from the backlight frame.



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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