



HP Pavilion dv6 Entertainment PC

Maintenance and Service Guide

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Safety warning notice


 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the 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 dv6 Entertainment PC |
| Processors | Intel® Core™ 2 Quad Intel Core i7 Processors |
| | Intel Core i7-2820QM 2.30-GHz processor (SC turbo up to 3.40-GHz, 1600-MHz, 8-MB L2 cache) |
| | Intel Core i7-2720QM 2.20-GHz processor (SC turbo up to 3.30-GHz, 1600-MHz, 6-MB L2 cache) |
| | Intel Core i7-2630QM 2.00-GHz processor (SC turbo up to 2.90-GHz, 1600-MHz, 6-MB L2 cache) |
| Chipset | Intel HM65 Express chipset |
| Graphics | Intel HD Graphics 3000 |
| | Switchable discrete graphics |
| | ATI Mobility Radeon™ HD 6570 Radeon with 1-GB GDDR5 5-GBPS (32M×32×8) |
| | Supports Blu-ray and/or HD-DVD playback with HD decode, DX11, and HDMI |
| Panels | 39.6-cm (15.6-inch) SVA HD LED BrightView (1366×768) (5.5 mm max) |
| | Wacom Touchscreen, Multitouch enabled |
| | Supports lighted logo on top bezel |
| Memory | Two customer-accessible/upgradeable SODIMM slots |
| | DDR3, 1333 MHz |
| | Supports dual channel |
| | Supports up to 8 GB system memory in the following configurations: |
| | 1024-MB total system memory (1024 MB x 1) |
| | 2048-MB total system memory (1024 MB x 2, dual-channel) |
| | 2048-MB total system memory (2048 MB x 1) |
| | 3072-MB total system memory (1024 MB x 1 + 2048 MB x 1) |
| | 4096-MB total system memory (2048 MB x 2, dual-channel) |
| | 6144-MB total system memory (2048 MB x 1 + 4096 MB x 1) |

| Category | Description |
|-----------------------|---|
| | 8192-MB total system memory (4096 MB x 2, dual-channel) |
| Hard drives | Supports all Serial ATA (SATA) 12.7-mm, 9.5-mm, and 7.0-cm (2.5-inch) hard drives |
| | Supports two hard drives |
| | Supports solid state drives (SSD) |
| | Supports Accelerometer Hard Drive Protection |
| | Single hard drive configurations: |
| | 160-GB SSD |
| | 250 GB (7200 rpm, 9.5 mm) |
| | 320 GB (7200 rpm, 9.5 mm) |
| | 500 GB (7200 rpm, 9.5 mm) |
| | 640 GB (7200 rpm, 9.5 mm) |
| Optical drives | 750 GB (5200 rpm, 12.5 mm) |
| | 1 TB (5200 rpm, 12.5 mm) |
| | 12.7-mm tray load |
| | Serial ATA (SATA) |
| | Fixed (removal of one screw required) |
| | Supports the following optical drives: |
| | LightScribe DVD±R/RW SuperMulti DL Drive |
| | Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL Drive |
| | |
| | |
| Webcam | Low-light VGA camera |
| | Fixed (no tilt) |
| | Activity LED |
| | 640 × 480 by 24 frames per second |
| Microphone | 2 omnidirectional microphones, dual-array with appropriate software (supports beam forming, echo cancellation, and noise suppression) |
| Audio | HD Audio |
| | Dolby advance audio |
| | Integrated subwoofer |
| | Supports Microsoft® Premium Requirements |
| | Pavilion-branded Altec Lansing speakers |
| Ethernet | Integrated 10/100/1000 network interface card (NIC) |
| Wireless | Integrated wireless local area network (WLAN) options by way of wireless module: |

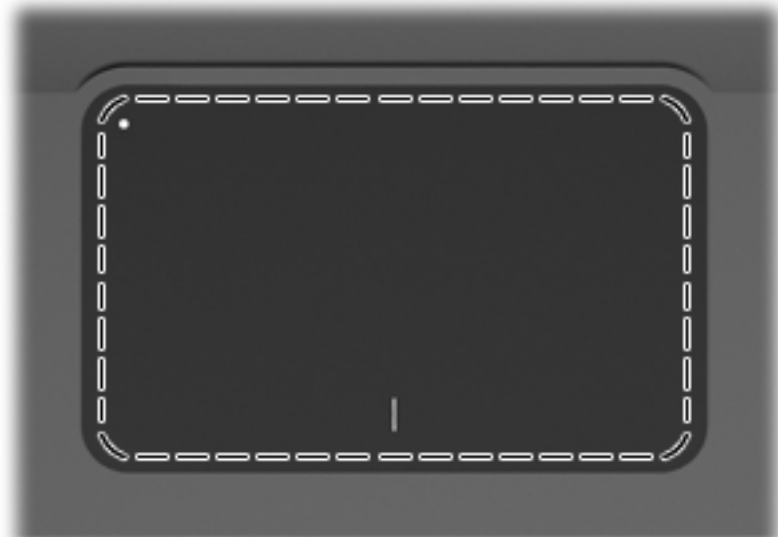
| Category | Description |
|----------------------------------|--|
| | Intel Centrino Advanced-N + WiMax 6250 WLAN module for use in the United States |
| | Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module |
| | Ralink 5390GN 802.11b/g/n 1x1 WiFi Adapter |
| | Ralink 8190BC8 802.11b/g/n 1x1 WiFi and Bluetooth 3.0+HS Combo Adapter |
| | Ralink RT3090BC4 802.11b/g/n 1x1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) |
| TV tuner | DVB-T TV tuner module (select models only) |
| | DVB-T TV tuner antenna (select models only) |
| | Remote control (full-function with teletext) (select models only) |
| External media card | 5-in-1 Digital Media Reader |
| | Digital Media Slot supports Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Secure Digital High Capacity (SDHC), Memory Stick (MS), Memory Stick Pro (MSP), xD-Picture Card (XD) |
| | Supports mini versions with adapter (adapter not included) |
| Internal card expansion | One half-size mini-card slot for WLAN |
| Ports | VGA, 15-pin supporting 1920 × 1200 resolution at 75 Hz |
| | VGA, 15-pin supporting 1600 × 1200 resolution at 75 Hz |
| | Hot Plug/Unplug and auto detect for correct output to wide-aspect versus standard aspect video |
| | High-Definition Multimedia Interface (HDMI) v1.3 supporting 1080p and 1920 × 1080 at 60 Hz and 1920 × 1200 at 60 Hz DVI Mode |
| | eSATA port combo with fourth USB port |
| | USB 2.0 (three ports) |
| | RJ-45 Ethernet |
| | Headphone/line out |
| | Microphone input (audio-in) |
| | AC Smart Pin adapter plug |
| Keyboard/pointing devices | 38.1-cm (15-inch) full-size keyboard |
| | Dura-coat, island-style |
| | Backlit dura-coat, island-style (select models only) |
| | Mylar clickpad cover |
| | Clickpad |
| | Multitouch gestures enabled as default |
| | Taps enabled as default |

| Category | Description |
|--------------------|---|
| Power requirements | 6-cell, 55-Wh, 2.55-Ah Li-ion battery |
| | 6-cell, 62-Wh, 2.8-Ah Li-ion battery |
| | 9-cell, 93-Wh, 2.8-Ah Li-ion battery |
| | 65-W AC adapter |
| | 90-W AC adapter |
| | 120-W AC adapter |
| | 65-W slim travel adapter (smart-pin) |
| Security | Kensington security lock |
| | Fingerprint reader with Digital Persona software support (select models only) |
| Operating system | Preinstalled: |
| | Windows® 7 Professional (32 and 64 bit) |
| | Windows 7 Home Premium (32 and 64 bit) |
| | Windows 7 Home Basic (32 and 64 bit) |
| | FreeDOS |
| Serviceability | AC adapter |
| | Battery (system) |
| | Hard drive |
| | Memory module |
| | Optical drive |
| | Mini Card components |

2 External component identification

Top components

TouchPad

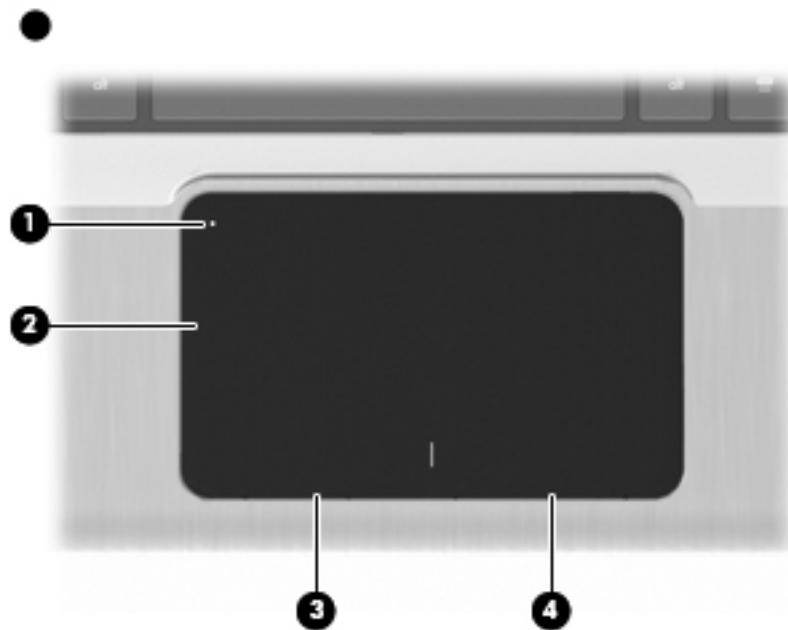


| Component | Function |
|-----------|---|
| TouchPad | Moves the pointer and selects or activates items on the screen. |

To view or change the pointing device preferences:

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

TouchPad buttons

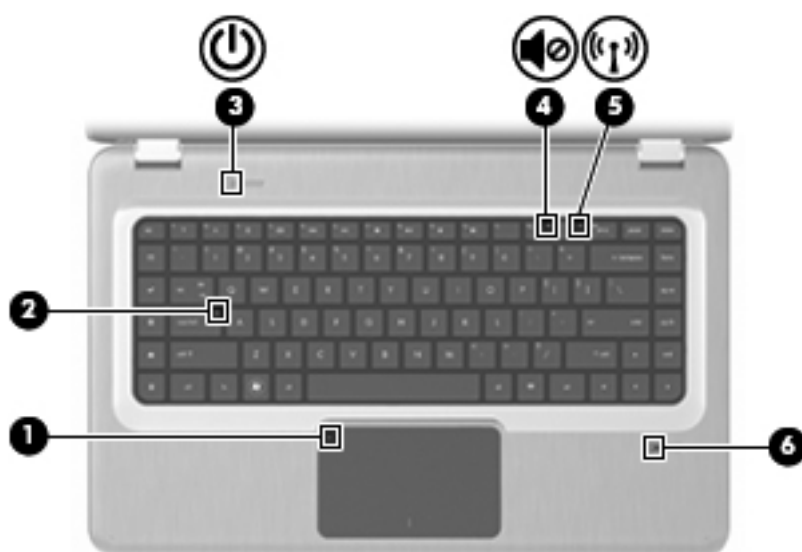


| Item | Description | Function |
|------|------------------------|--|
| 1 | TouchPad On/Off button | Turns the TouchPad on and off. Quickly double-tap to turn the TouchPad on and off. |
| 2 | Left TouchPad button | Functions like the left button on an external mouse. |
| 3 | Right TouchPad button | Functions like the right button on an external mouse. |

To view or change pointing device preferences:

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

Lights



| Item | Description | Function |
|------|--------------------------|--|
| 1 | TouchPad light | Amber—The TouchPad is disabled. |
| 2 | Caps Lock light | On—The Caps Lock is on. |
| 3 | Power light | <ul style="list-style-type: none"> On—The computer is on. Flashing—The computer is in Sleep. Off—The computer is off or in Hibernation. |
| 4 | Volume Mute light | Amber—The computer sound is off. |
| 5 | Wireless light | <ul style="list-style-type: none"> White—An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is detected. Amber—No wireless devices are detected. |
| 6 | Fingerprint Reader light | <ul style="list-style-type: none"> White—The fingerprint was read. Amber—The fingerprint was not read. |

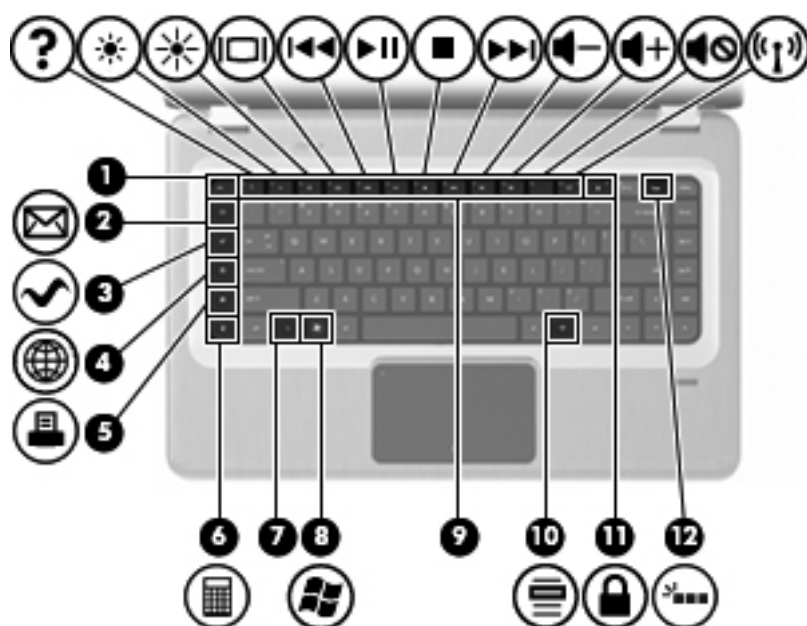
Buttons and Fingerprint Reader (select models only)



| Item | Description | Function |
|------|---|---|
| 1 | Power button | <p>Press the Power button to:</p> <ul style="list-style-type: none">• Turn on the computer.• Initiate Sleep.• Exit Sleep.• Exit Hibernation. <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the Power button for at least five seconds to shut down the computer.</p> <p>For more information about the power settings, select Start > Control Panel > System and Security > Power Options.</p> |
| 2 | Fingerprint Reader (select models only) | <p>Allows a fingerprint logon to Windows, instead of a password logon.</p> |

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

Keys



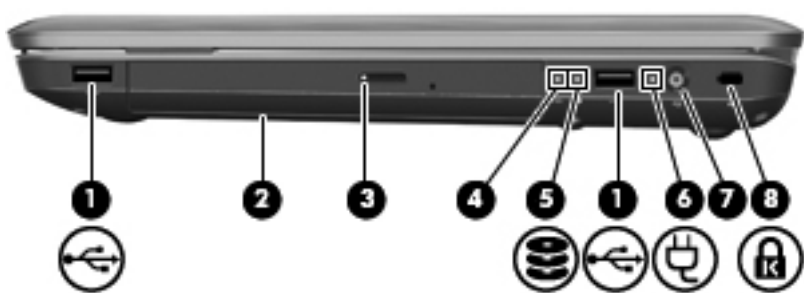
| Item | Description | Function |
|------|-------------------------|---|
| 1 | esc key | Press the esc and fn keys at the same time to display system information. |
| 2 | E-mail key | Opens a new e-mail in the default e-mail client. |
| 3 | Media Application key | Launches the MediaSmart application. |
| 4 | Web Browser key | Launches the default web browser. |
| 5 | Print key | Sends the currently-active document to the default printer. |
| 6 | Calculator key | Launches the Calculator application. |
| 7 | fn key | Press the fn key at the same time as a function key or the esc key to execute frequently used system functions. |
| 8 | Windows Logo key | Displays the Windows Start menu. |
| 9 | Function keys | Press a function key and the fn key at the same time to execute frequently used system functions. |
| 10 | Windows Application key | Displays a shortcut menu for items beneath the pointer. |
| 11 | QuickLock key | Initiates QuickLock. |
| 12 | Backlight key | Turns the backlit keyboard on or off. |

Front components



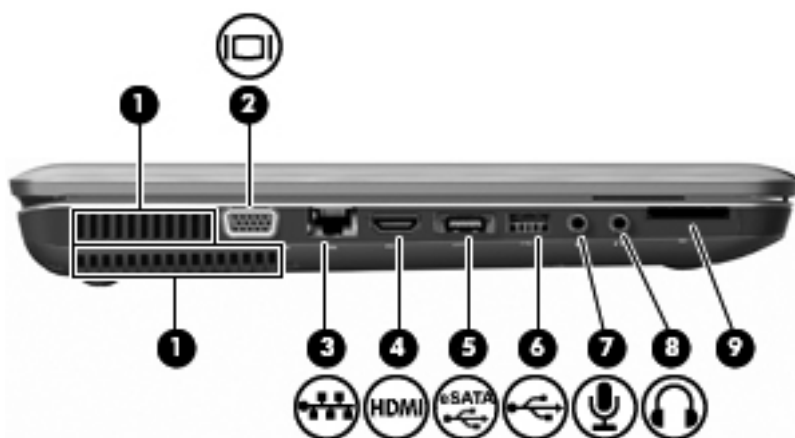
| Description | Function |
|-------------|----------------|
| Speakers | Produce sound. |

Right-side components



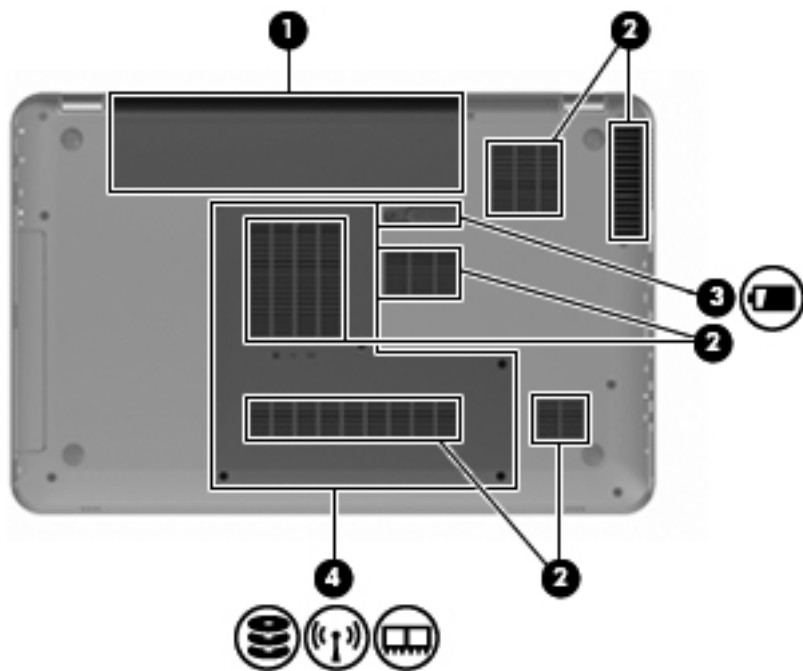
| Item | Description | Function |
|------|-----------------------|--|
| 1 | USB ports (2) | Connect optional USB devices. |
| 2 | Optical drive | Reads optical discs and, on select models, writes to optical discs. |
| 3 | Optical Drive light | Flashing—Accessing the optical drive. |
| 4 | Hibernate light | White—The computer is in Hibernate. |
| 5 | Hard Disk Drive light | <ul style="list-style-type: none">White—The hard disk drive is active.Amber—The hard disk drive is parked. |
| 6 | AC Adapter light | <ul style="list-style-type: none">On—The computer is connected to external power.Off—The computer is not connected to external power. |
| 7 | Power connector | Connects an AC adapter. |
| 8 | Security Cable slot | Connects an optional security cable. The security cable is designed to act as a deterrent, but might not prevent the computer from being mishandled or stolen. |

Left-side components



| Item | Description | Function |
|------|-------------------------------------|---|
| 1 | Vents (2) | Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| 2 | External Monitor port | Connects an external VGA monitor or projector. |
| 3 | RJ-45 (network) jack | Connects a network cable. |
| 4 | HDMI port | Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component. |
| 5 | eSATA/USB port (select models only) | Connects an optional high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device. NOTE: Depending on the computer model, the computer might include only a USB port. |
| 6 | USB port | Connects an optional USB device. |
| 7 | Audio-in (microphone) jack | Connects an optional computer headset microphone, stereo array microphone, monaural microphone. |
| 8 | Audio-out (headphone) jack | Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. |
| 9 | SD card reader | Reads SD cards that are inserted into the reader. |

Bottom components



| Item | Description | Function |
|------|------------------------|--|
| 1 | Battery bay | Holds the battery. |
| 2 | Vents (6) | Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| 3 | Battery Release latch | Releases the battery from the battery bay. |
| 4 | Primary Hard Drive bay | Holds the primary hard drive, the memory module slots, and the WLAN module (select models only). CAUTION: To prevent an unresponsive system, replace the wireless module with a wireless module authorized for use by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support. |

Display components



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

Wireless antennas

Two antennas send and receive signals from one or more wireless devices. These antennas are not visible from the outside of the computer.



NOTE: For optimal transmission, keep the areas immediately around the antennas free from obstructions.

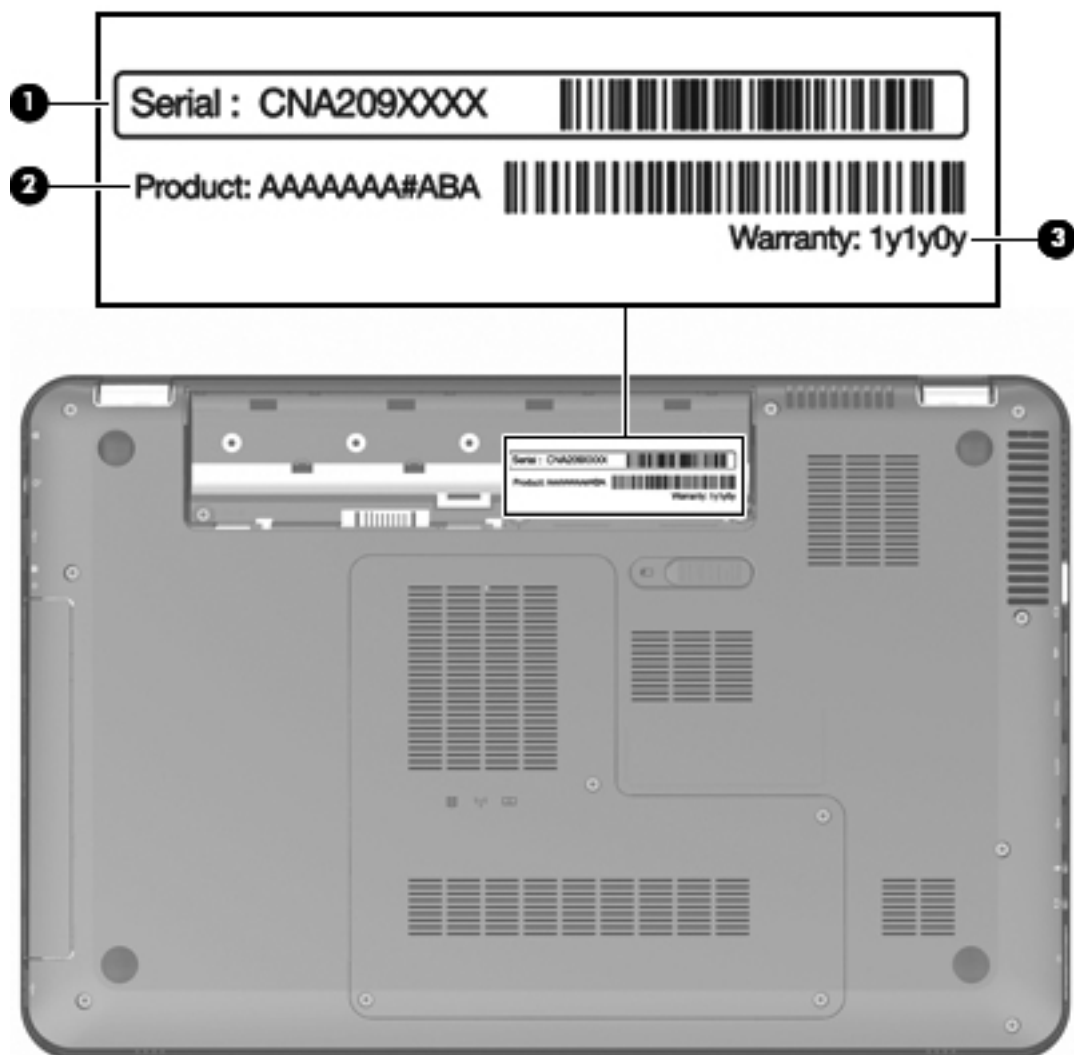
To review wireless regulatory notices, see the country-specific section of the Regulatory, Safety and Environmental Notices chapter in Help and Support.



3 Illustrated parts catalog

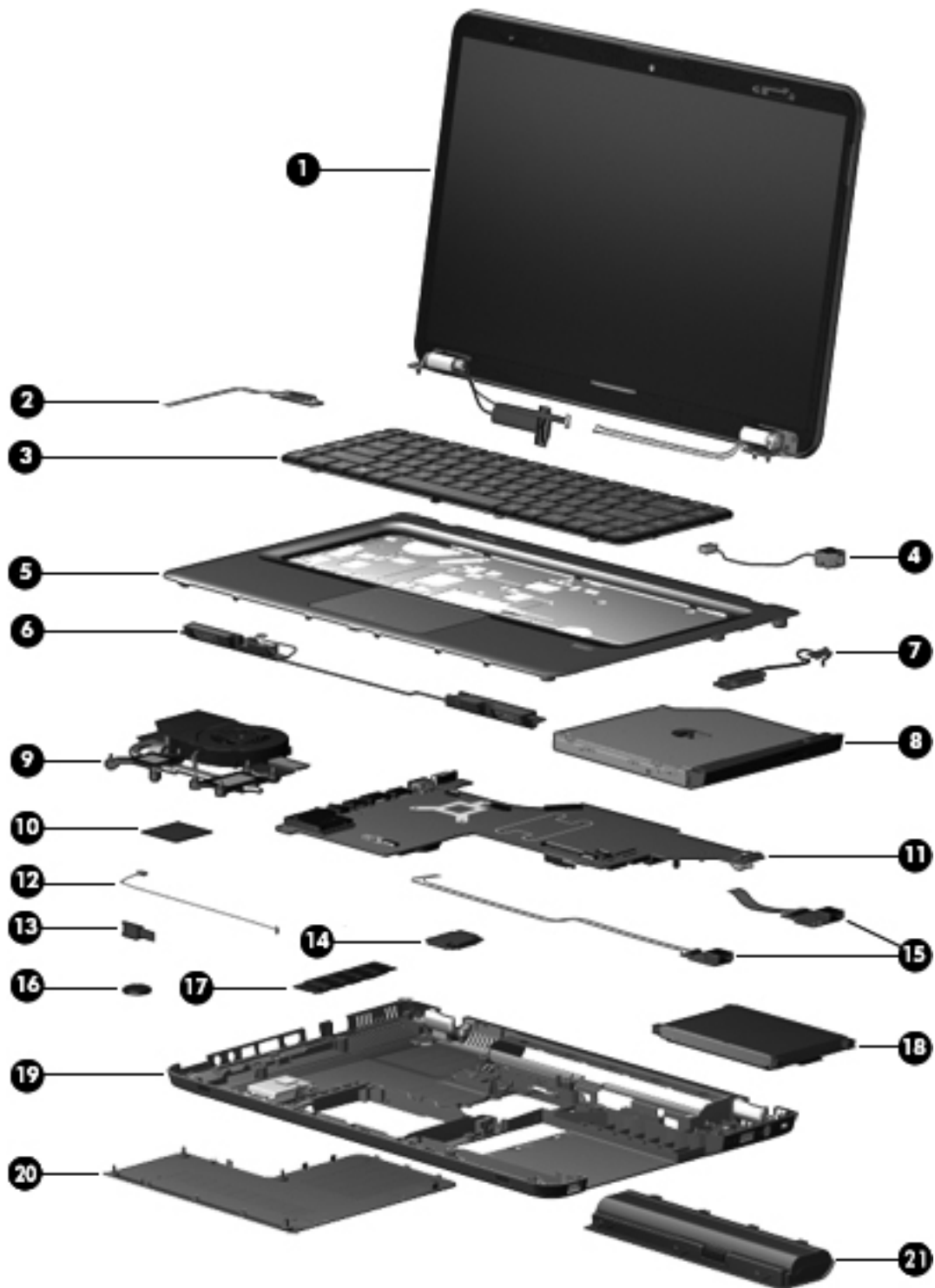
Service tag

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



| Item | Description | Function |
|------|----------------------------------|--|
| 1 | Serial number (s/n) | This is an alphanumeric identifier that is unique to each product. |
| 2 | 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. |
| 3 | 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, 15.6-in, high definition (HD) with webcam and two microphones (includes wireless antenna transceivers and cables): | |
| | TouchScreen display assembly with etched finish | 631019-001 |
| | For use with computer models with black finish and WiMax | 629279-001 |
| | For use with computer models with etched finish and WiMax | 629280-001 |
| | For use with computer models with black finish | 603647-001 |
| | For use with computer models with chrome finish | 603650-001 |
| | For use with computer models with etched finish | 595131-001 |
| | For use with computer models with midnight blue finish | 615932-001 |
| | For use with computer models with shell white finish | 603648-001 |
| | For use with computer models with Sonoma red finish | 603649-001 |
| | NOTE: For more information about display assembly spare part numbers, see Display assembly components on page 21 . | |
| 2 | Power button board (includes cable) | 603682-001 |
| 3 | Keyboard with backlight (dura-coat, island-style, includes keyboard cable): | |
| | For use in Brazil | 597630-201 |
| | For use in Canada | 597630-121 |
| | For use in Japan | 597630-291 |
| | For use in Latin America | 597630-161 |
| | For use in Taiwan | 597630-AD1 |
| | For use in South Korea | 597630-AB1 |
| | For use in Thailand | 597630-281 |
| | For use in the United States | 597630-001 |
| | Keyboard with backlight (dura-coat, island-style, includes keyboard cable): | |
| | For use in Brazil | 597635-201 |
| | For use in Canada | 597635-121 |
| | For use in Japan | 597635-291 |
| | For use in Latin America | 597635-161 |
| | For use in Taiwan | 597635-AD1 |
| | For use in South Korea | 597635-AB1 |
| | For use in Thailand | 597635-281 |
| | For use in the United States | 597635-001 |
| 4 | Power connector | 603692-001 |

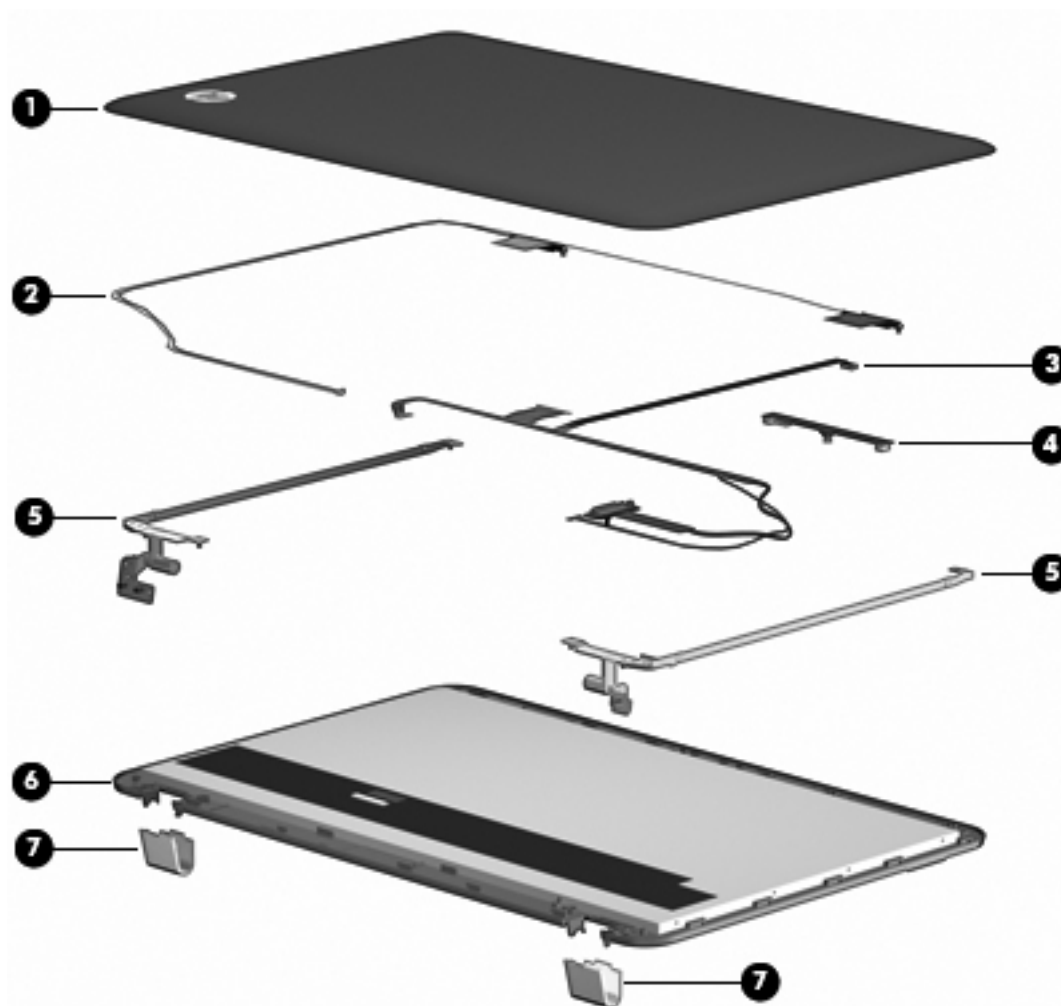
| Item | Description | Spare part number |
|------|---|-------------------|
| 5 | Top cover (includes TouchPad): | |
| | For use with computer models in etched finish equipped with fingerprint reader | 603684-001 |
| | For use with computer models with black finish | 603685-001 |
| | For use with computer models with chrome finish | 603688-001 |
| | For use with computer models with midnight blue finish | 615934-001 |
| | For use with computer models with shell white finish | 603686-001 |
| | For use with computer models with Sonoma red finish | 603687-001 |
| 6 | Speaker assembly | 603694-001 |
| 7 | Optical drive cable | 603680-001 |
| 8 | Optical drive (includes bezel and bracket) | |
| | Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive | 614332-001 |
| | Blu-ray ROM with LightScribe Combo Drive | 603678-001 |
| | DVD±RW SuperMulti Double-Layer Drive with LightScribe | 603677-001 |
| 9 | Fan/heat sink assembly (includes replacement thermal material): | |
| | For use with computer models equipped with a graphics subsystem with discrete memory | 634454-001 |
| | For use with computer models equipped with a graphics subsystem with UMA memory | 634455-001 |
| 10 | Processor (includes replacement thermal material): | |
| | Intel Core i7-2820QM 2.30-GHz (turbo up to 3.40-GHz) processor, 8-MB L2 cache, 1600 MHz, 45 W | 634694-001 |
| | Intel Core i7-2720QM 2.20-GHz (turbo up to 3.30-GHz) processor, 6-MB L2 cache, 1600 MHz, 45 W | 631254-001 |
| | Intel Core i7-2630QM 2.00-GHz (turbo up to 2.90-GHz) processor, 6-MB L2 cache, 1600 MHz, 45 W | 635501-001 |
| 11 | System board (includes replacement thermal material): | |
| | For use with computer models equipped with a graphics subsystem with discrete memory | 633554-001 |
| | For use with computer models equipped with a graphics subsystem with UMA memory | 633555-001 |
| 12 | Bluetooth module cable | 603645-001 |
| 13 | Bluetooth module | 537921-001 |
| 14 | WLAN module: | |
| | Intel Centrino Advanced-N + WiMax 6250 WLAN module for use in the United States | 619997-001 |
| | Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module | 593530-001 |
| | Ralink 5390GN 802.11b/g/n 1×1 WiFi Adapter | 630703-001 |

| Item | Description | Spare part number |
|------|---|-------------------|
| | Ralink 8190BC8 802.11b/g/n 1×1 WiFi and Bluetooth 3.0+HS Combo Adapter | 630813-001 |
| | Ralink RT3090BC4 802.11b/g/n 1×1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) | 630705-001 |
| 15 | USB board (includes cable) | 603683-001 |
| 16 | RTC battery | 599516-001 |
| 17 | Memory module (PC3-10600, SO-DIMM) | |
| | 4 GB | 599092-001 |
| | 2 GB | 598956-001 |
| | 1 GB | 598859-001 |
| 18 | Hard drive kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws and 4 rubber isolators): | |
| | 750-GB, 5200-rpm | 633252-001 |
| | 500-GB, 7200-rpm | 603669-001 |
| | 250-GB, 7200-rpm | 603667-001 |
| | Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or isolators): | |
| | 1-TB, 5200-rpm | 603788-001 |
| | 640-GB, 7200-rpm | 621046-001 |
| | 320-GB, 7200-rpm | 603783-001 |
| | 160-GB solid state drive (SSD, includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws and 4 rubber isolators) | 603673-001 |
| | Hard Drive Hardware Kit (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, and four rubber isolators) | 603676-001 |
| 19 | Base enclosure (includes four rubber feet) | 640296-001 |
| | Rubber feet (not illustrated, includes 4 base enclosure rubber feet) | 603696-001 |
| 20 | Plastics Kit (includes hard drive bay cover) | 603679-001 |
| | NOTE: For more information, see Plastics Kit on page 26 . | |
| 21 | Battery | |
| | 9-cell, 93-Whr, 2.80-Ah Li-ion battery for use with all computer models | 593550-001 |
| | 6-cell, 62-Whr, 2.80-Ah Li-ion battery for use with all computer models | 593562-001 |
| | 6-cell, 55-Whr, 2.55-Ah Li-ion battery for use with all computer models | 593554-001 |

Display assembly components

The HP Pavilion dv6 Entertainment PC offers two types of display assemblies. Component spare parts are listed in this section for TouchScreen and BrightView display assemblies.

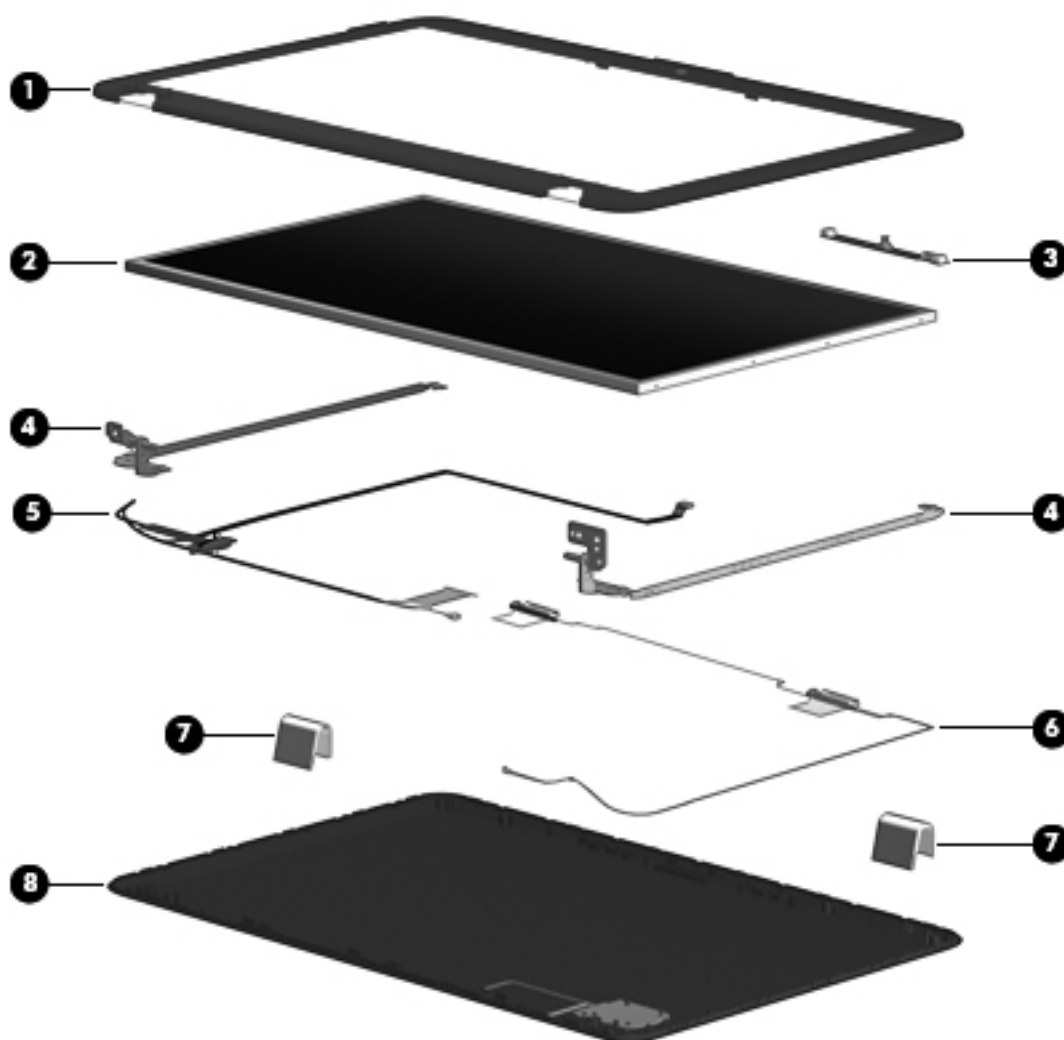
TouchScreen display assembly spare parts



| Item | Description | Spare part number |
|------|--|-------------------------------------|
| 1 | Display enclosure with etched finish (includes wireless antenna transceivers and cables and logo LED board and cable) | 603663-001 |
| 2 | Wireless antenna transceivers and cables | Included with the display enclosure |
| 3 | Display Cable Kit | 603665-001 |
| 4 | Webcam/microphone module (includes cable) | 603660-001 |
| 5 | Display Hinge Kit (includes left and right hinges) | 603664-001 |

| Item | Description | Spare part number |
|------|---|------------------------------------|
| 6 | TouchScreen display panel | Included with the display assembly |
| 7 | Display hinge cover (includes left and right covers) | 603666-001 |
| | Display Rubber Kit (not illustrated, includes display bezel rubber screw covers) | 603659-001 |
| | Display Screw Kit (not illustrated) | 603658-001 |

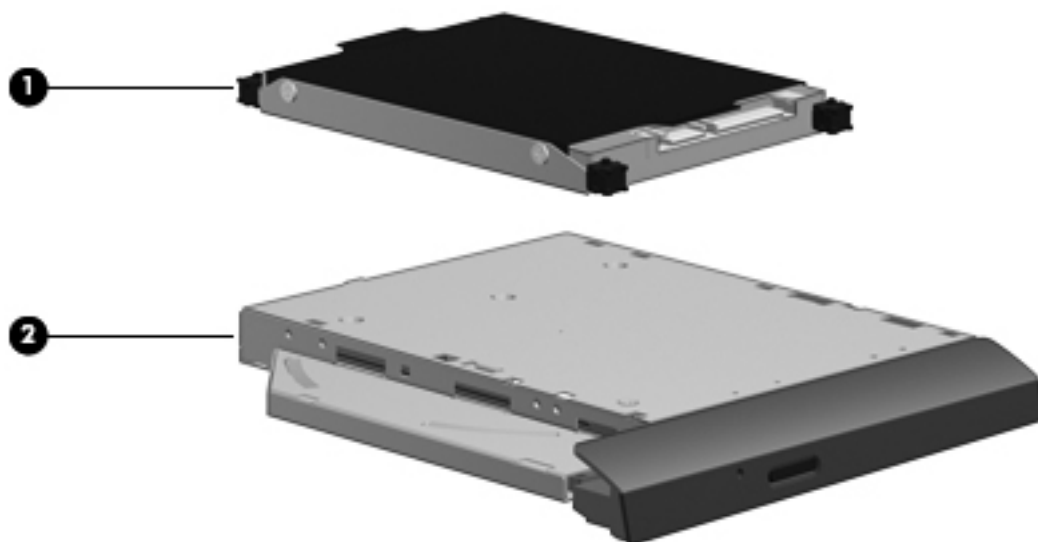
BrightView display assembly spare parts



| Item | Description | Spare part number |
|------|---|-------------------|
| 1 | Display bezel | 603651-001 |
| 2 | BrightView display panel | 595130-001 |
| 3 | Display Hinge Kit (includes left and right hinges) | 603656-001 |
| 4 | Webcam/microphone module (includes cable) | 603660-001 |
| 5 | Display Cable Kit | 603657-001 |
| | Display Cable Kit for use only with computer models equipped with WiMax | 629284-001 |
| 6 | Display hinge cover | 603661-001 |
| 7 | Display enclosure (includes wireless antenna transceivers and cables and logo LED board and cable) | |
| | With black finish for use with computer models equipped with WiMax | 629282-001 |
| | With etched finish for use with computer models equipped with WiMax | 629283-001 |

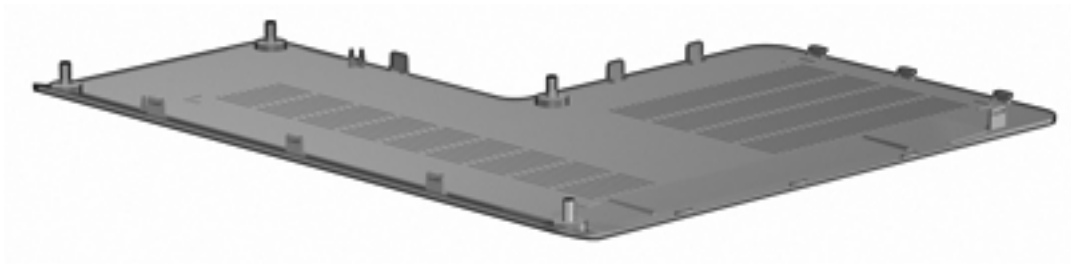
| Item | Description | Spare part number |
|------|--|-------------------------------------|
| | With black finish | 603652-001 |
| | With chrome finish | 603655-001 |
| | With etched finish | 604804-001 |
| | With midnight blue finish | 615933-001 |
| | With shell white finish | 603653-001 |
| | With Sonoma red finish | 603654-001 |
| 8 | Wireless antenna transceivers and cables | Included with the display enclosure |
| | Display Rubber Kit (includes display bezel rubber screw covers) | 603659-001 |
| | Display Screw Kit | 603658-001 |

Mass storage devices



| Item | Description | Spare part number |
|------|---|-------------------|
| 1 | Hard drive kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws and 4 rubber isolators): | |
| | 750-GB, 5200-rpm | 633252-001 |
| | 500-GB, 7200-rpm | 603669-001 |
| | 250-GB, 7200-rpm | 603667-001 |
| | Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or isolators): | |
| | 1-TB, 5200-rpm | 603788-001 |
| | 640-GB, 7200-rpm | 621046-001 |
| | 320-GB, 7200-rpm | 603783-001 |
| | 160-GB solid state drive (SSD, includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws and 4 rubber isolators) | 603673-001 |
| | Hard Drive Hardware Kit (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, and four rubber isolators) | 603676-001 |
| 2 | Optical drive (includes bezel and bracket) | |
| | Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive | 614332-001 |
| | Blu-ray ROM with LightScribe Combo Drive | 603678-001 |
| | DVD±RW SuperMulti Double-Layer Drive with LightScribe | 603677-001 |

Plastics Kit



| Item | Description | Spare part number |
|------|---|-------------------|
| 1 | Hard drive bay cover (includes four captive screws) | 603679-001 |

Miscellaneous parts

| Description | Spare part number |
|---|-------------------|
| AC adapter: | |
| 120W HP Smart AC adapter PFC RC V 3W | 609941-001 |
| 90W HP Smart AC adapter PFC RC V 3W | 609940-001 |
| 90W HP Smart AC adapter PFC RC V EM 3W | 609947-001 |
| Cable housing | 603697-001 |
| Power cord (1.83-m (6-foot), 3-wire): | |
| For use in Argentina | 490371-D01 |
| For use in Australia | 490371-011 |
| For use in Brazil | 490371-202 |
| For use in Europe | 490371-021 |
| For use in India | 490371-D61 |
| For use in Italy | 490371-061 |
| For use in Japan | 490371-291 |
| For use in Canada, Mexico, and North America | 490371-001 |
| For use in the People's Republic of China | 490371-AA1 |
| For use in South Korea | 490371-AD1 |
| For use in Taiwan | 490371-AB1 |
| For use in Thailand | 490371-281 |
| For use in Singapore and the United Kingdom | 490371-031 |
| Remote control (full-function with teletext, select models only) | 465541-004 |
| Screw Kit | 603681-001 |
| USB DVB-T TV dipole antenna | 581222-001 |
| USB DVB-T TV tuner antenna (select models only) | 581223-001 |

Sequential part number listing

| Spare part number | Description |
|-------------------|---|
| 465541-004 | Remote control (full-function with teletext, select models only) |
| 490371-001 | Power cord for use in Canada, French Canada, Latin America, and the United States |
| 490371-011 | Power cord for use in Australia and New Zealand |

| Spare part number | Description |
|--------------------------|--|
| 490371-021 | Power cord for use in Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden |
| 490371-031 | Power cord for use in the United Kingdom and Hong Kong |
| 490371-061 | Power cord for use in Italy |
| 490371-201 | Power cord for use in Thailand |
| 490371-202 | Power cord for use in Brazil |
| 490371-291 | Power cord for use in Japan |
| 490371-AA1 | Power cord for use in the People's Republic of China |
| 490371-AB1 | Power cord for use in Taiwan |
| 490371-AD1 | Power cord for use in South Korea |
| 490371-D01 | Power cord for use in Argentina |
| 490371-D61 | Power cord for use in India |
| 537921-001 | Bluetooth module (does not include Bluetooth module cable) |
| 581222-001 | DVB-T TV tuner (select models only) |
| 581223-001 | DVB-T TV tuner antenna (select models only) |
| 593530-001 | Intel Centrino Wireless-N 1000 802.11b/g/n 1x2 WLAN module |
| 593550-001 | 9-cell, 93-Whr, 2.8-Ah Li-ion battery |
| 593554-001 | 6-cell, 55-Whr, 2.55-Ah Li-ion battery |
| 593562-001 | 6-cell, 62-Whr, 2.8-Ah Li-ion battery |
| 595130-001 | Display panel for use with computer models equipped with BrightView panel (includes display panel cable) |
| 595131-001 | Display assembly with etched finish, 15.6-in, BrightView, HD, LED, equipped with webcam module, and 2 microphones (includes display panel cable, WLAN antenna transceivers and cables) |
| 597630-001 | Backlit keyboard for use in the United States |
| 597630-121 | Backlit keyboard for use in French Canada |
| 597630-161 | Backlit keyboard for use in Latin America |
| 597630-201 | Backlit keyboard for use in Brazil |
| 597630-281 | Backlit keyboard for use in Thailand |
| 597630-291 | Backlit keyboard for use in Japan |
| 597630-AB1 | Backlit keyboard for use in Taiwan |
| 597630-AD1 | Backlit keyboard for use in South Korea |
| 597635-001 | Keyboard for use in the United States |
| 597635-121 | Keyboard for use in French Canada |

| Spare part number | Description |
|--------------------------|--|
| 597635-161 | Keyboard for use in Latin America |
| 597635-201 | Keyboard for use in Brazil |
| 597635-281 | Keyboard for use in Thailand |
| 597635-291 | Keyboard for use in Japan |
| 597635-AB1 | Keyboard for use in Taiwan |
| 597635-AD1 | Keyboard for use in Korea |
| 598856-001 | 2-GB memory module |
| 598859-001 | 1-GB memory module |
| 599092-001 | 4-GB memory module |
| 599516-001 | RTC battery |
| 603645-001 | Bluetooth module cable and rubber kit |
| 603647-001 | 39.6-cm (15.6-inch) HD BrightView display assembly with low light VGA webcam and two microphones, Black (includes wireless antenna transceivers and cables) |
| 603648-001 | 39.6-cm (15.6-inch) HD BrightView display assembly with low light VGA webcam and two microphones, White (includes wireless antenna transceivers and cables) |
| 603649-001 | 39.6-cm (15.6-inch) HD BrightView display assembly with low light VGA webcam and two microphones, Red (includes wireless antenna transceivers and cables) |
| 603650-001 | 39.6-cm (15.6-inch) HD BrightView display assembly with low light VGA webcam and two microphones, Chrome (includes wireless antenna transceivers and cables) |
| 603651-001 | BrightView display bezel |
| 603652-001 | Black display enclosure (includes wireless antenna transceivers and cables and LED board and cable) |
| 603653-001 | White display enclosure (includes wireless antenna transceivers and cables and LED board and cable) |
| 603654-001 | Red display enclosure (includes wireless antenna transceivers and cables and LED board and cable) |
| 603655-001 | Chrome display enclosure (includes wireless antenna transceivers and cables and LED board and cable) |
| 603656-001 | BrightView Display Hinge Kit (includes left and right hinges) |
| 603657-001 | BrightView Display Cable Kit (includes display panel cable) |
| 603658-001 | Display Screw Kit |
| 603659-001 | Display Rubber Kit (includes display bezel rubber screw covers) |
| 603660-001 | Webcam/microphone module (includes cable) |
| 603661-001 | BrightView display hinge covers |
| 603663-001 | TouchScreen display enclosure (includes wireless antenna transceivers and cables LED board and cable) |
| 603664-001 | TouchScreen Display Hinge Kit |
| 603665-001 | TouchScreen Display Cable Kit |

| Spare part number | Description |
|--------------------------|---|
| 603666-001 | TouchScreen display hinge covers |
| 603667-001 | 250-GB, 7200 RPM hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and four rubber isolators) |
| 603669-001 | 500-GB, 5400 RPM or 500-GB, 7200 RPM hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, and four rubber isolators) |
| 603673-001 | 160-GB solid state drive (SSD) (includes left and right bracket rails, connector cable, Mylar cover with tab, and four rubber isolators) |
| 603676-001 | Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, and four rubber isolators) |
| 603677-001 | DVD±RW SuperMulti Double-Layer Drive with LightScribe |
| 603678-001 | Blu-ray ROM with LightScribe Combo Drive |
| 603679-001 | Plastics Kit |
| 603680-001 | Optical drive cable |
| 603681-001 | Screw Kit |
| 603682-001 | Power button board (includes cable) |
| 603683-001 | USB board (includes cable) |
| 603684-001 | Top cover with etched finish for use only with computer models equipped with a fingerprint reader |
| 603685-001 | Top cover with black finish for use only with computer models not equipped with a fingerprint reader |
| 603686-001 | Top cover with shell white finish for use only with computer models not equipped with a fingerprint reader |
| 603687-001 | Top cover with Sonoma red finish for use only with computer models not equipped with a fingerprint reader |
| 603688-001 | Top cover with chrome finish for use only with computer models not equipped with a fingerprint reader |
| 603692-001 | Power connector and cable |
| 603694-001 | Speaker assembly |
| 603696-001 | Rubber feet |
| 603697-001 | Cable housing |
| 603783-001 | 320-GB, 7200 RPM hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or and rubber isolators) |
| 603788-001 | 1-TB, 5200 RPM hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or and rubber isolators) |
| 604804-001 | Display enclosure with etched finish (includes wireless antenna transceivers and LED board and cable) |
| 609940-001 | 90-W HP Smart AC adapter PFC RC V 3W |
| 609941-001 | 120-W HP Smart AC adapter PFC RC V 3W |
| 609947-001 | 90-W HP Smart AC adapter PFC RC V EM 3W |

| Spare part number | Description |
|--------------------------|---|
| 614332-001 | Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive |
| 615932-001 | Display assembly 15.6-in HD BrightView in midnight blue finish with webcam and two microphones |
| 615933-001 | Display enclosure in midnight blue finish (includes wireless antenna transceivers and cables and LED board and cable) |
| 615934-001 | Top cover with midnight blue finish for use only with computer models not equipped with a fingerprint reader |
| 619997-001 | Intel Centrino Advanced-N + WiMax 6250 WLAN module for use in the United States |
| 621046-001 | 640-GB, 7200 RPM hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or rubber isolators) |
| 629279-001 | Display assembly with chrome finish, 15.6-in, BrightView, HD, LED, equipped with webcam module, 2 microphones, and WiMax (includes display panel cable, WLAN, and WWAN antenna transceivers and cables) |
| 629280-001 | Display assembly with etched finish, 15.6-in, BrightView, HD, LED, equipped with webcam module, 2 microphones, and WiMax (includes display panel cable, WLAN, and WWAN antenna transceivers and cables) |
| 629282-001 | Display enclosure with black finish (includes wireless antenna transceivers and cables and LED board and cable) with WiMax |
| 629283-001 | Display enclosure with etched finish (includes wireless antenna transceivers and cables and LED board and cable) with WiMax |
| 629284-001 | Display Cable Kit for use only on computer models equipped with a BrightView display assembly with WiMax (includes display panel cable) |
| 630703-001 | Ralink 5390GN 802.11b/g/n 1×1 WiFi Adapter |
| 630705-001 | Ralink RT3090BC4 802.11b/g/n 1×1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) |
| 630813-001 | Ralink 8190BC8 802.11b/g/n 1×1 WiFi and Bluetooth 3.0+HS Combo Adapter |
| 631019-001 | TouchScreen display assembly, 15.6-in, LED, HD, BrightView, equipped with webcam module and microphone (includes display panel cable and WLAN antenna transceivers and cables) |
| 631254-001 | Intel Core i7-2720QM 2.20-GHz (turbo up to 3.30-GHz) processor, 6-MB L2 cache, 1600 MHz, 45 W |
| 633252-001 | 750-GB, 7200 RPM hard drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws, or 4 rubber isolators) |
| 633554-001 | System board (Intel HM65 Express chipset) for use only with computer models equipped with a graphics subsystem with discrete memory (includes 1-GB of graphics subsystem memory) |
| 633555-001 | System board (HM65 chipset) for use only with computer models equipped with a graphics subsystem with UMA memory |
| 634454-001 | Thermal module for use only with computer models equipped with a graphics subsystem with discrete memory |
| 634455-001 | Thermal module for use only with computer models equipped with a graphics subsystem with UMA memory |
| 634694-001 | Intel Core i7-2820QM 2.30-GHz (turbo up to 3.40-GHz) processor, 8-MB L2 cache, 1600 MHz, 45 W |

| Spare part number | Description |
|--------------------------|---|
| 635501-001 | Intel Core I7-2630QM 2.00-GHz (turbo up to 2.90-GHz) processor, 6-MB L2 cache, 1600 MHz, 45 W |
| 640296-001 | Base enclosure (includes rubber feet and battery release latch) |

4 Removal and replacement procedures

Preliminary replacement requirements


Tools required

Use the following tools to complete the removal and replacement procedures:


- Non-magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Flat-bladed screwdriver

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

An electronic device exposed to ESD might not be affected at all and can work perfectly throughout a normal cycle. Or the device might 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.
- Shut down 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 |

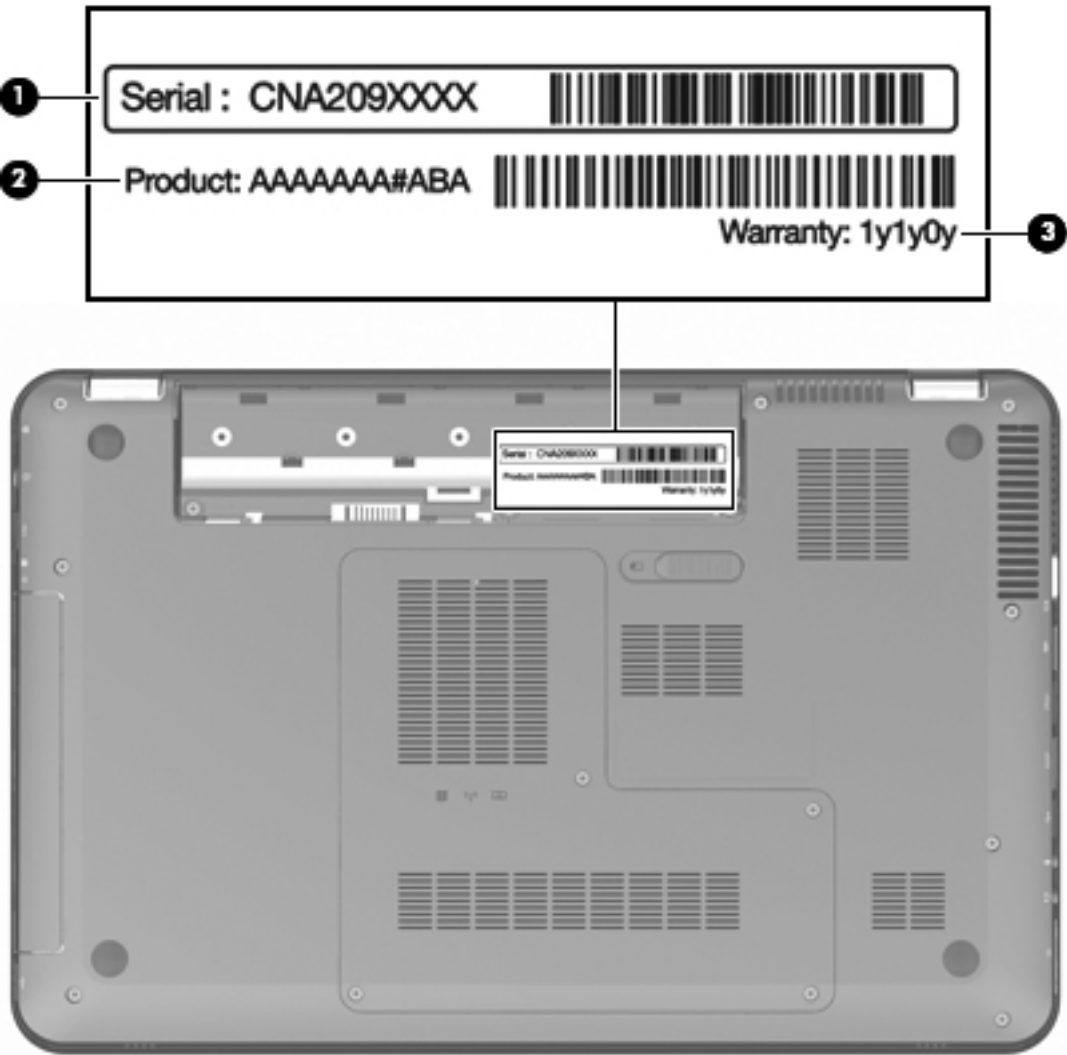
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 90 screws, in ten different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

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

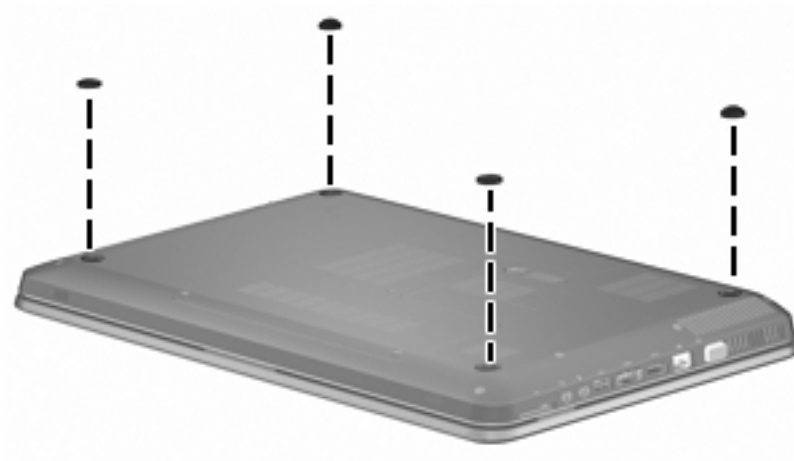


| Item | Description | Function |
|------|---------------------|--|
| 1 | Serial number (s/n) | An alphanumeric identifier that is unique to each product. |

| Item | Description | Function |
|------|----------------------------------|--|
| 2 | Part number/Product number (p/n) | Provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed. |
| 3 | Warranty period | Describes the duration of the warranty period for the computer. |

Computer feet

The computer feet are adhesive-backed rubber pads (spare part number 603696-001). There are four rubber feet that attach to the base enclosure.



Battery

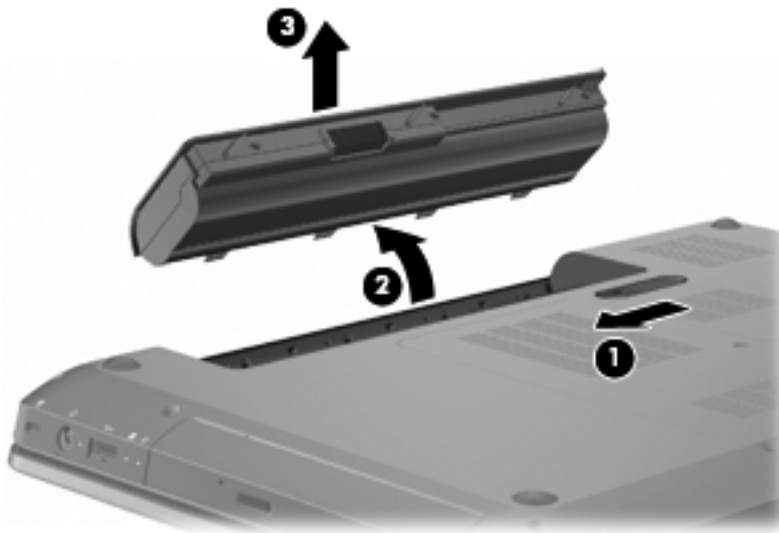
| Description | Spare part number |
|---------------------------------------|-------------------|
| 9-cell, 93-Wh, 2.80-Ah Li-ion battery | 593550-001 |
| 6-cell, 62-Wh, 2.80-Ah Li-ion battery | 593652-001 |
| 6-cell, 55-Wh, 2.55-Ah Li-ion battery | 593554-001 |

Before disassembling the computer:

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.

To remove the battery:

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



To insert the battery, insert the rear edge of the battery into the battery bay and pivot the front edge of the battery downward until it is seated. The battery release latch automatically locks the battery into place.

Hard drive cover

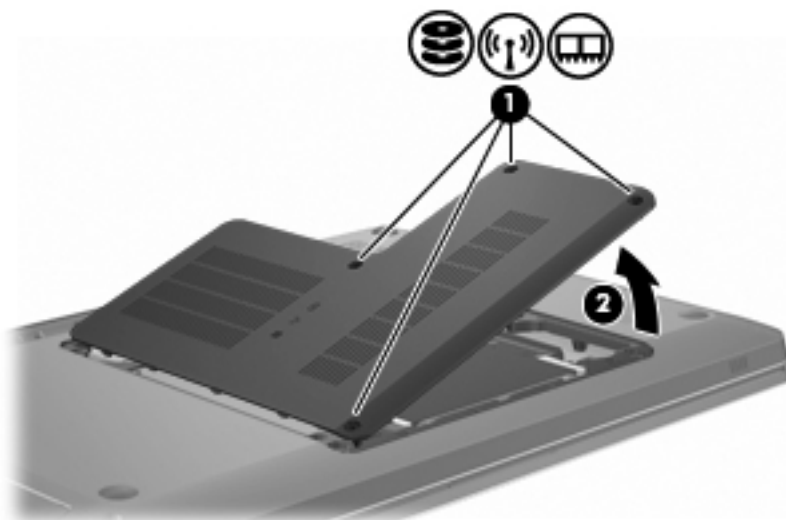
| Description | Spare part number |
|---|-------------------|
| Hard drive cover (included in the Plastics Kit) | 603679-001 |

Before removing the hard drive cover:

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 on page 40](#).

To remove the hard drive cover:

1. Loosen the four captive screws (1) that secure the hard drive cover to the computer.
2. Lift the hard drive cover (2) away from the computer.



Reverse this procedure to install the hard drive cover.

Hard drive

| Description | Spare part number |
|--|-------------------|
| Hard drive kit (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws and 4 rubber isolators): | |
| 750-GB, 5200-rpm | 633252-001 |
| 500-GB, 7200-rpm | 603669-001 |
| 250-GB, 7200-rpm | 603667-001 |
| Hard drive only (does not include bracket rails, connector cable, Mylar cover with tab, screws, or isolators): | |
| 1-TB, 5200-rpm | 603788-001 |
| 640-GB, 7200-rpm | 621046-001 |
| 320-GB, 7200-rpm | 603783-001 |
| 160-GB solid state drive (includes left and right bracket rails, connector cable, Mylar cover with tab, 4 screws and 4 rubber isolators) | 603783-001 |
| Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, and four rubber isolators) | 603673-001 |

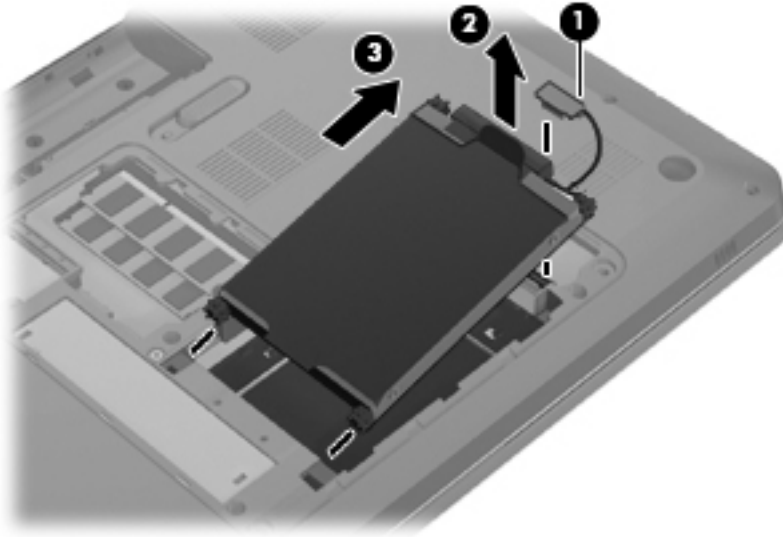
Before removing the hard drive:

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 on page 40](#).
5. Remove the [Hard drive cover on page 41](#).

To remove the hard drive:

1. Position the computer with the front toward you.
2. Disconnect the hard drive cable (1) from the system board.

3. Use the Mylar tab to lift the hard drive up (2), and then slide it to the right (3) to release it from the hard drive bay.



4. Remove the hard drive from the hard drive bay.

Reverse this procedure to reassemble and install the hard drive.


WLAN module

| Description | Spare part number |
|--|-------------------|
| Intel Centrino Advanced-N + WiMax 6250 WLAN module for use in the United States | 619997-001 |
| Intel Centrino Wireless-N 1000 802.11b/g/n 1×2 WLAN module | 593530-001 |
| Ralink 5390GN 802.11b/g/n 1×1 WiFi Adapter | 630703-001 |
| Ralink 8190BC8 802.11b/g/n 1×1 WiFi and Bluetooth 3.0+HS Combo Adapter | 630813-001 |
| Ralink RT3090BC4 802.11b/g/n 1×1 WiFi and Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) | 630705-001 |


Before removing the WLAN module:

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 on page 40](#).
5. Remove the [Hard drive cover on page 41](#).

To remove the WLAN module:


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

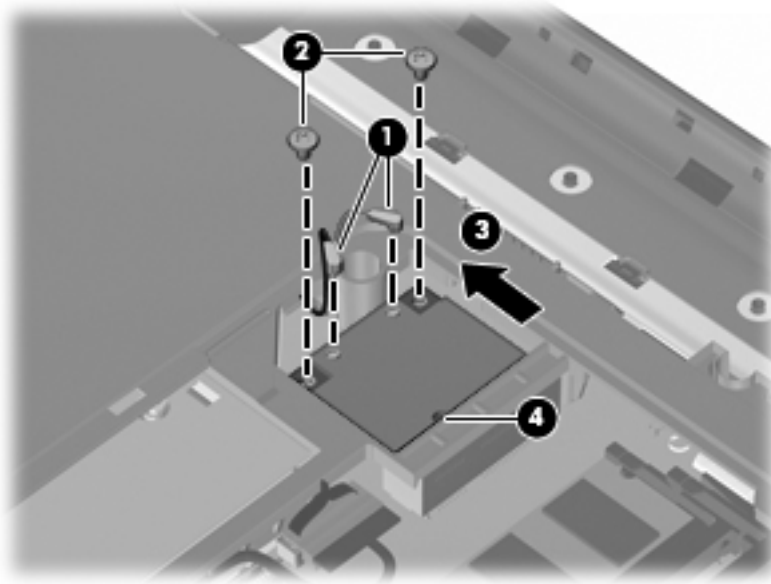
1. Disconnect the WLAN antenna cables (1) from the WLAN module.

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

2. Remove the two screws (2) that secure the WLAN module to the computer. The edge of the module opposite the slot rises away from the computer.

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

 **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.

Memory module

| Description | Spare part number |
|-------------|-------------------|
| 4 GB | 599092-001 |
| 2 GB | 598956-001 |
| 1 GB | 598859-001 |

Before removing the memory module:

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 on page 40](#).
5. Remove the [Hard drive cover on page 41](#).

To remove the memory module:

1. Position the computer with the front toward you.
2. 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.

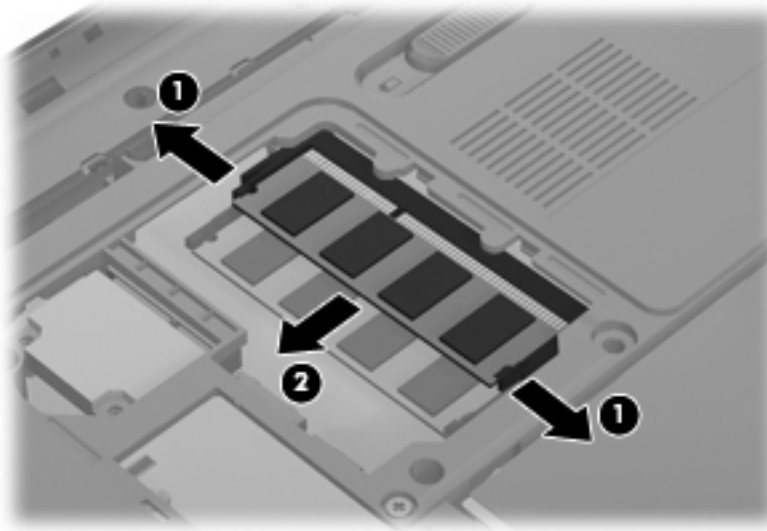


NOTE: If necessary, use a non-conductive pointed tool to spread the retaining tabs.

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



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



Reverse this procedure to install a memory module.

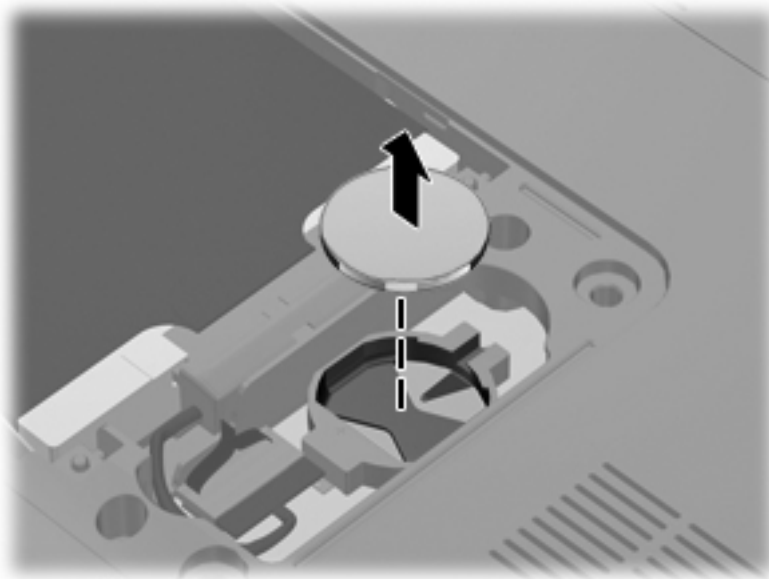
RTC battery

| Description | Spare part number |
|-------------|-------------------|
| RTC battery | 491571-001 |

Before removing the RTC battery:


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 on page 40](#).
5. Remove the [Hard drive cover on page 41](#).

To remove the RTC battery, use a non-conductive pointed tool to pry the RTC battery from the socket on the system board.



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

Optical drive

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

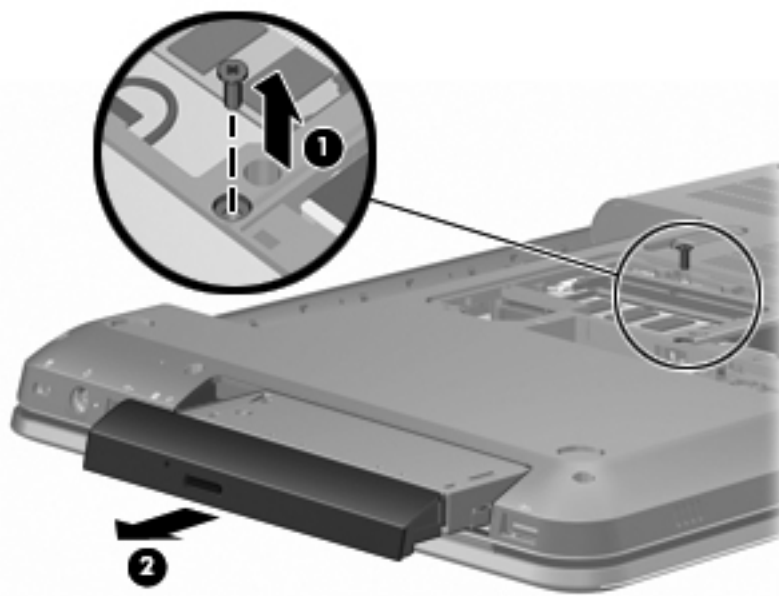
| Description | Spare part number |
|---|-------------------|
| Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive | 614332-001 |
| Blu-ray ROM with LightScribe Combo Drive | 603678-001 |
| DVD±RW SuperMulti Double-Layer Drive with LightScribe | 603677-001 |

Before removing the optical drive:

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 on page 40](#).
5. Remove the [Hard drive cover on page 41](#).

To remove the optical drive:

1. Position the computer with the front toward you.
2. Remove the screw (1) that secures the optical drive to the computer.
3. Remove the optical drive (2).



Reverse this procedure to install the optical drive.

Keyboard

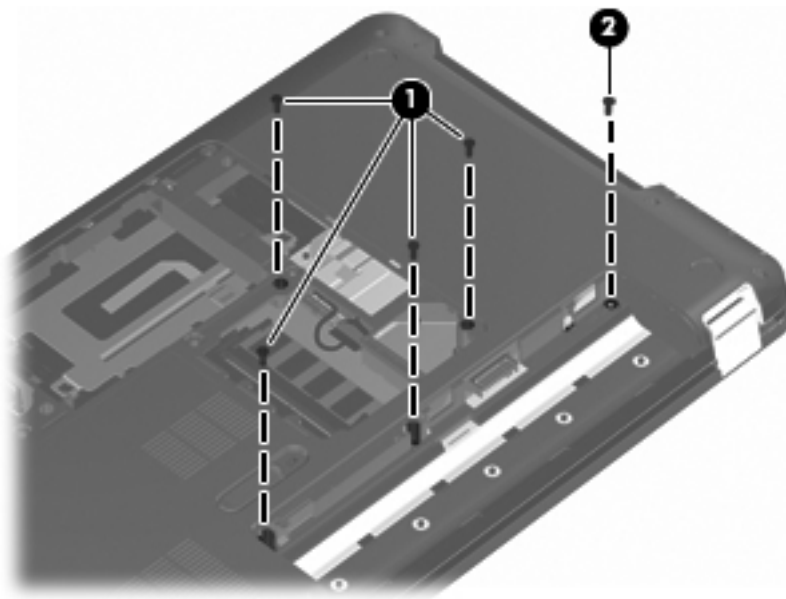
For a list of keyboards available for your country or region and their spare part numbers, see Computer major components.

Before removing the keyboard:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)

To remove the keyboard:

1. Position the computer upside down with the front toward you.
2. Remove the four Phillips PM2.5×5.0 screws (1) and the Phillips PM2.5×4.0 screw (2) that secure the keyboard to the computer.

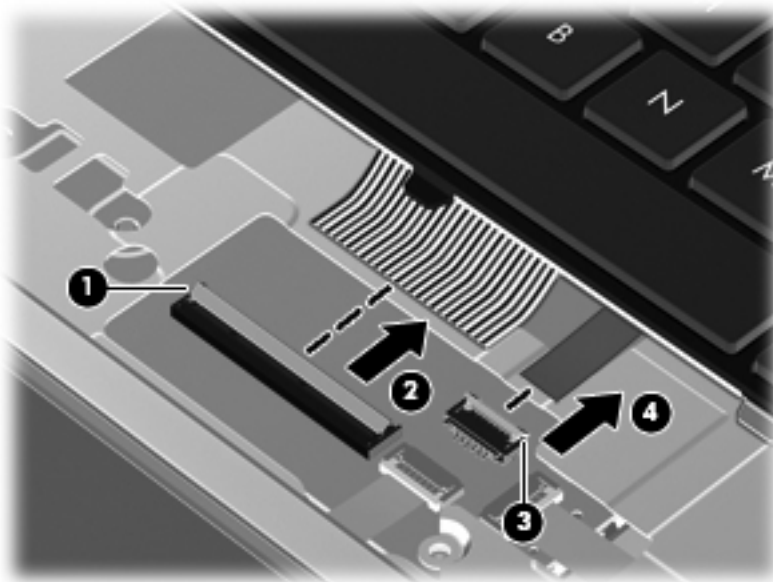


3. Turn the computer display-side up, with the front toward you, and open the computer as far as possible.

4. Lift (1) and release (2) the keyboard until the keyboard connector on the system board is accessible.



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



Reverse this procedure to install the switch cover and keyboard.

Top cover



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

| Description | Spare part number |
|--|-------------------|
| For use with computer models in etched finish equipped with fingerprint reader | 603684-001 |
| For use with computer models with black finish | 603685-001 |
| For use with computer models with chrome finish | 603688-001 |
| For use with computer models with midnight blue finish | 615934-001 |
| For use with computer models with shell white finish | 603686-001 |
| For use with computer models with Sonoma red finish | 603687-001 |

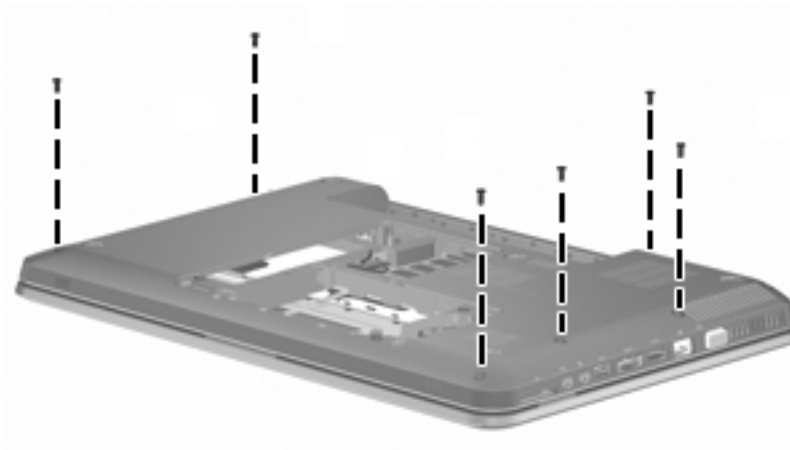
Before removing the top cover:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)

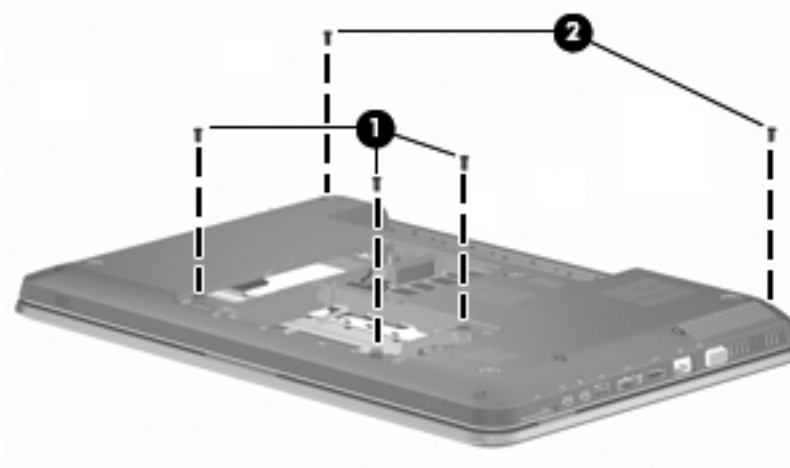
To remove the top cover:

1. Turn the computer upside down, with the front toward you.

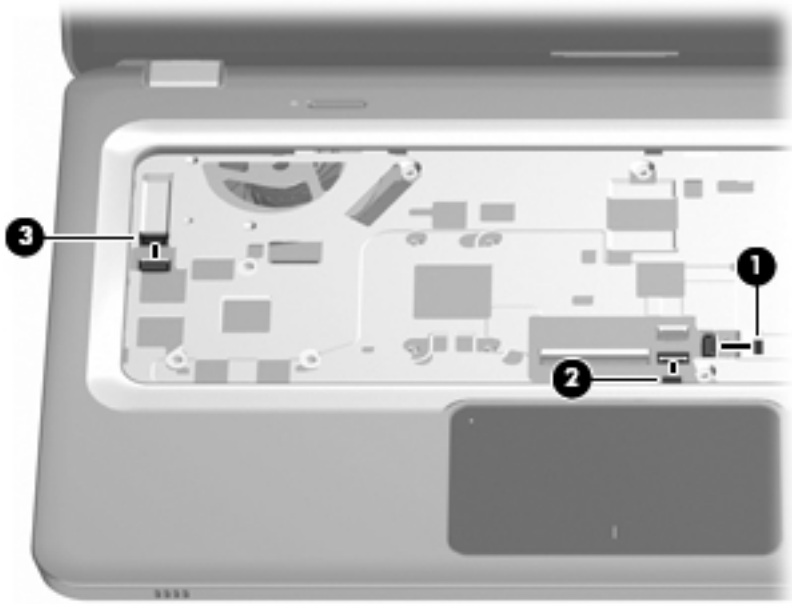
- 2.** Remove the six Phillips PM2.5×7.0 screws that secure the top cover to the computer.



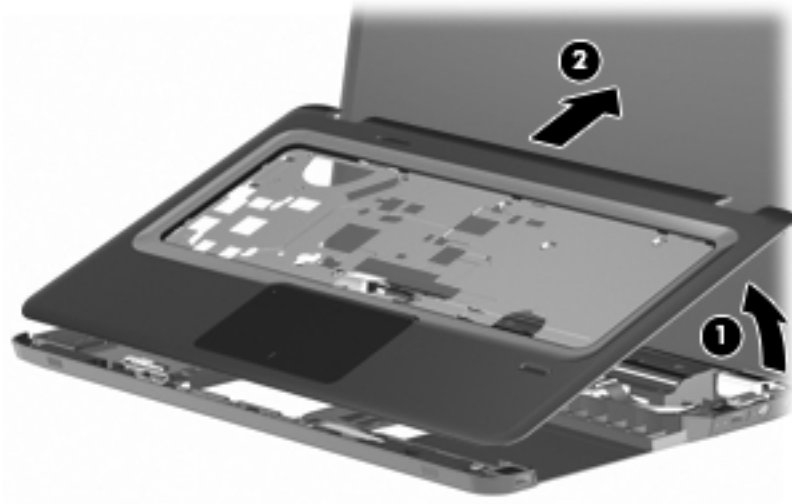
- 3.** Remove the three Phillips PM2.5×5.0 screws (1) and the two Phillips PM2.5×9.0 screws (2) that secure the top cover to the computer.



- 4.** Turn the computer right-side up, with the front toward you.
- 5.** Disconnect the following cables from the system board:
- Fingerprint reader board cable (1)
 - TouchPad cable (2)
 - Power button cable (3)



6. Lift the rear edge of the top cover (1) until it rests at an angle, and then remove the top cover (2).



Reverse this procedure to install the top cover.

Power button board

| Description | Spare part number |
|-------------------------------------|-------------------|
| Power button board (includes cable) | 603682-001 |

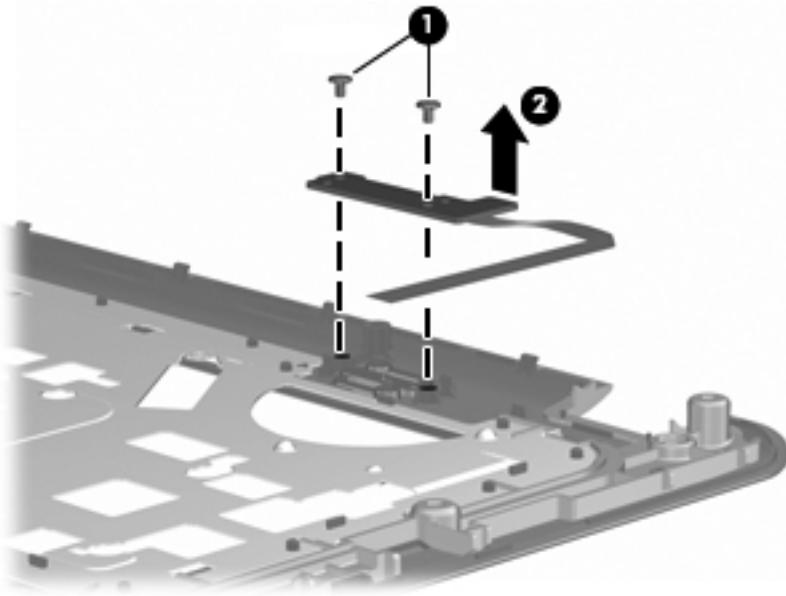
Before removing the power button board:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)

To remove the power button board:

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

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



Reverse this procedure to install the power button board.

Touchscreen display assembly



NOTE: The display assembly includes a webcam, two microphones, and two wireless antenna transceivers and cables.

| Description | Spare part number |
|--|-------------------|
| TouchScreen HD display assembly with etched finish with webcam and two microphones | 631019-001 |

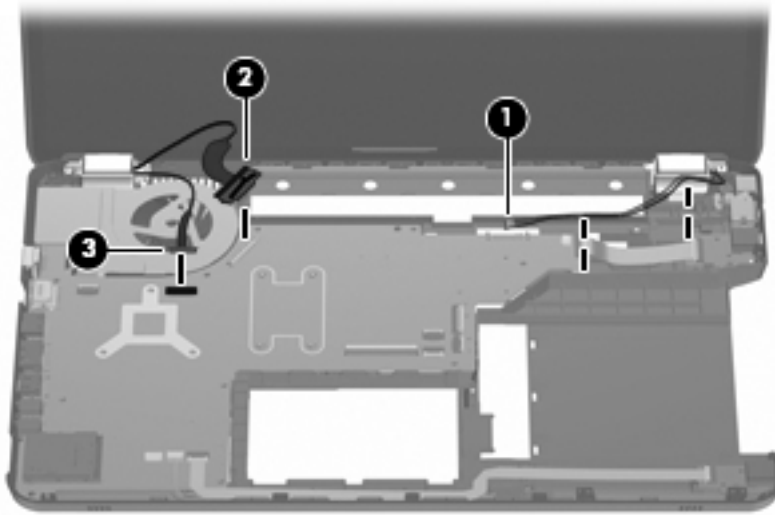
Before removing the display assembly:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [WLAN module on page 44](#)
 - e. [Optical drive on page 49](#)
 - f. [Keyboard on page 50](#)
 - g. [Top cover on page 52](#)

To remove the Touchscreen display assembly:

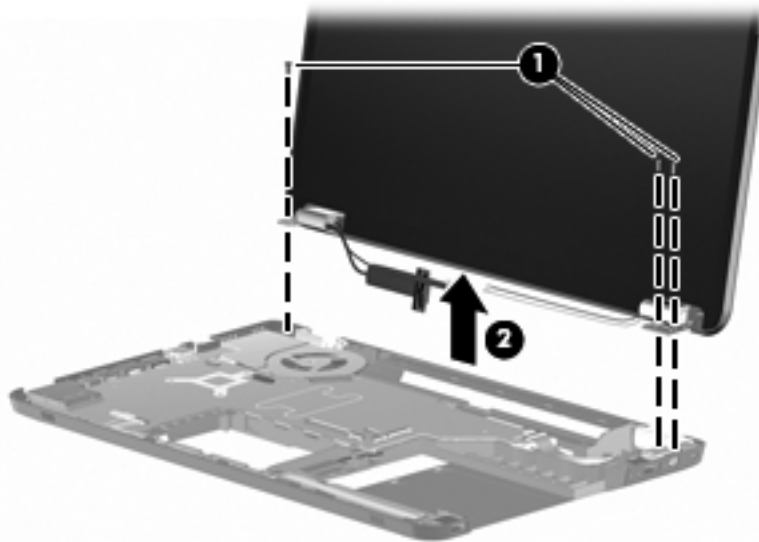
1. Remove the WLAN cables (1) from under the system board.
2. Disconnect the display panel cable (2) from the system board.

3. Disconnect the touchscreen cable (3) from the system board.

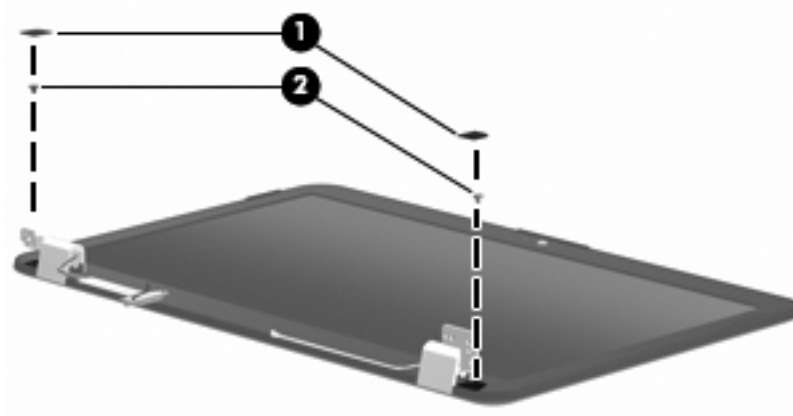


CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly might result in damage to the display assembly and other computer components.

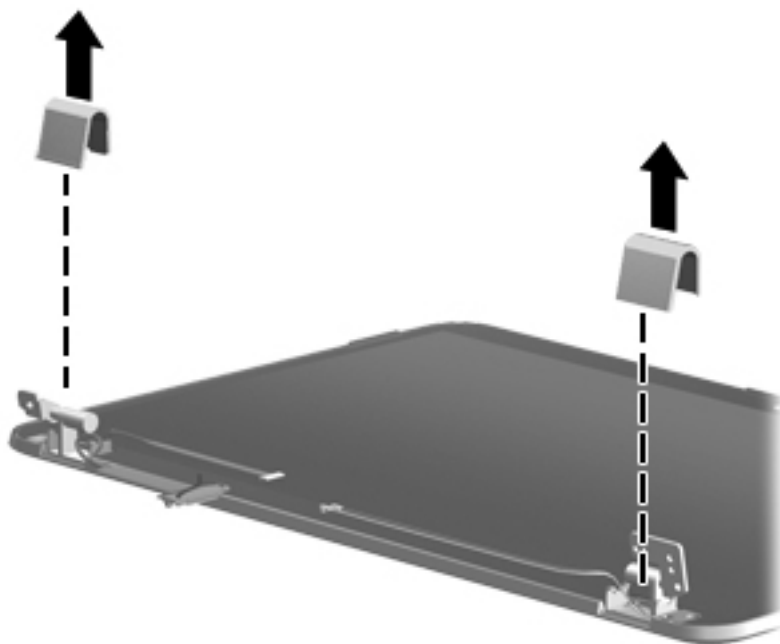
4. Remove the three screws (1) that secure the display assembly to the computer.
5. Remove the Touchscreen display assembly (2).



6. To replace the display enclosure or any of the display assembly internal components, remove the following:
 - Two rubber screw covers on the display bezel bottom edge (1). The display rubber screw covers are included in the Display Rubber Kit, spare part number 603659-001.
 - Two screws (2).

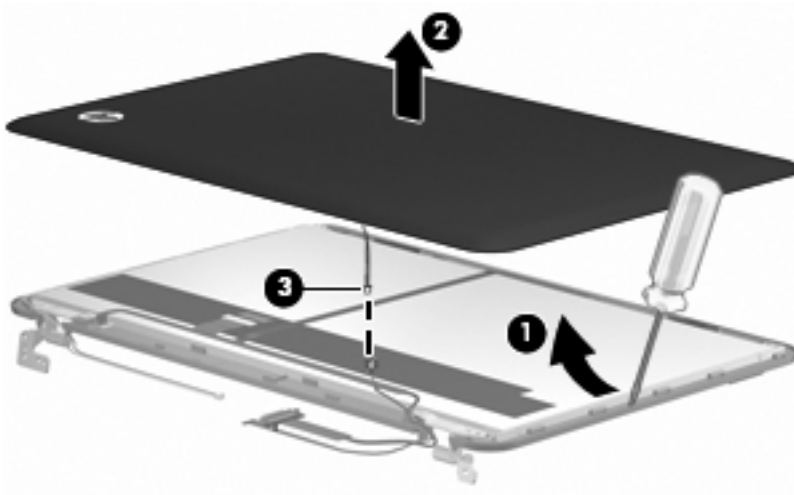


- 7.** To remove the hinge covers, pop off the cover from each hinge.

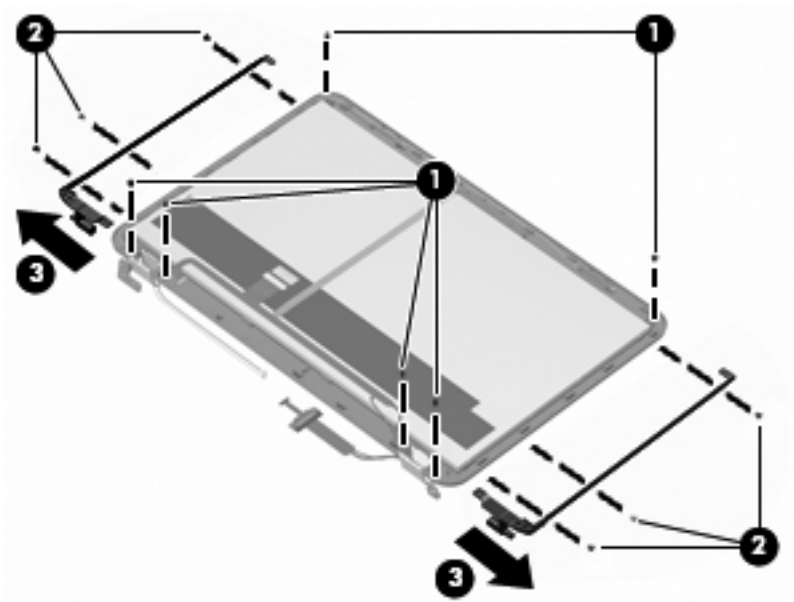


- 8.** Pry the display panel from the display enclosure (1) by working your way around the perimeter of the panel using a flat head screwdriver.
- 9.** Separate the display panel from the display enclosure (2).
- 10.** Disconnect the display logo cable (3) from the display panel cable.

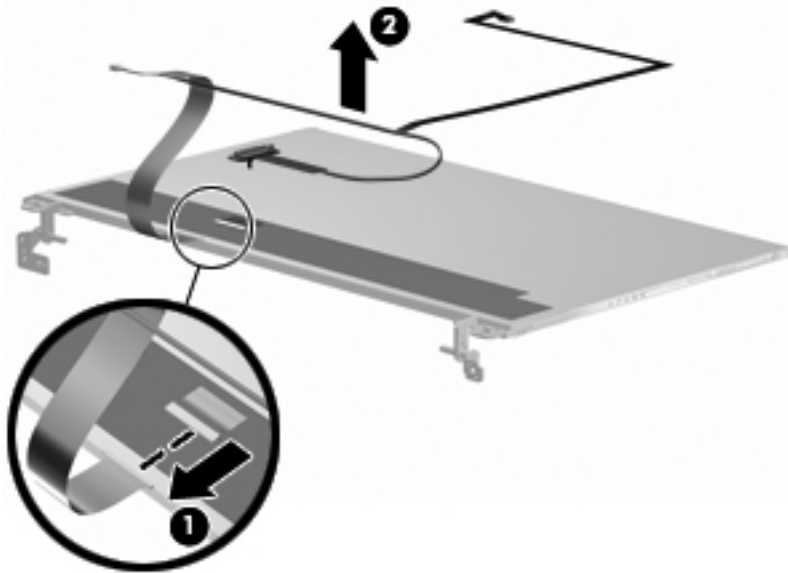
- 11.** Remove the display enclosure. The Touchscreen display enclosure spare part number is 603663-001.



- 12.** To replace the display hinges, remove the six screws (1) that secure the display hinges to the top of the display panel.
- 13.** Remove the three screws (2) on the side of each display hinge.
- 14.** Remove the display hinge (3). The display hinge is available in the Display Hinge Kit, spare part number 603664-001.



- 15.** To remove the display panel cable, remove the adhesive plastic strip (1) from the display panel cable, and then disconnect the cable (2). Lift and remove the cable (3). The Touchscreen Display Cable Kit is spare part number 603655-001.



Reverse this procedure to reassemble and install the display assembly.

BrightView display assembly



NOTE: The display assembly includes two wireless antenna transceivers and cables.

| Description | Spare part number |
|---|-------------------|
| For use with computer models with black finish and WiMax | 629279-001 |
| For use with computer models with etched finish and WiMax | 629280-001 |
| For use with computer models with black finish | 603647-001 |
| For use with computer models with chrome finish | 603650-001 |
| For use with computer models with etched finish | 595131-001 |
| For use with computer models with midnight blue finish | 615932-001 |
| For use with computer models with shell white finish | 603648-001 |
| For use with computer models with Sonoma red finish | 603649-001 |

Before removing the BrightView display assembly:

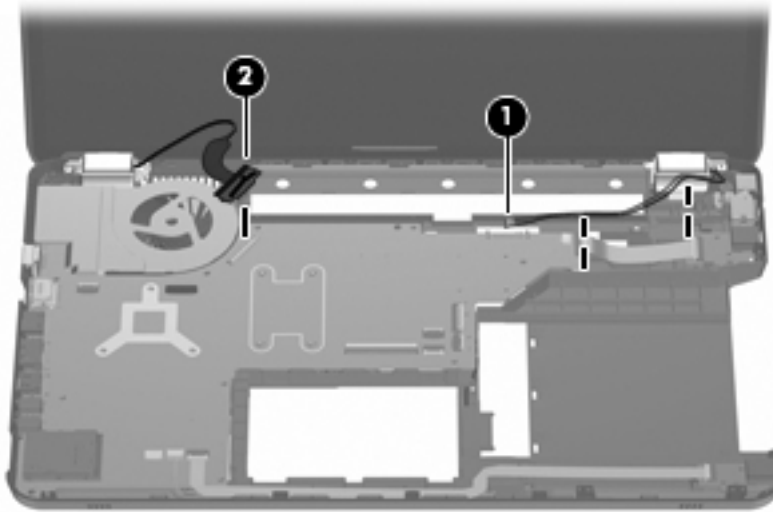
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. [Battery on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [WLAN module on page 44](#)
 - e. [Optical drive on page 49](#)
 - f. [Keyboard on page 50](#)
 - g. [Top cover on page 52](#)

To remove the BrightView display assembly:

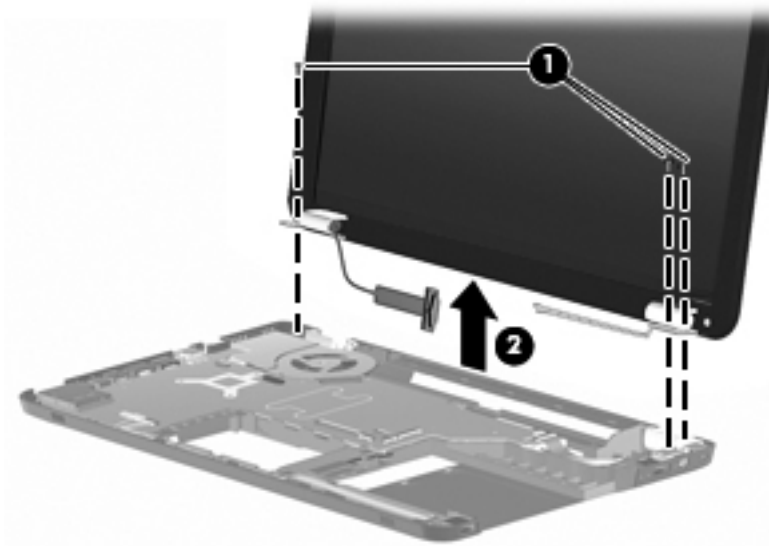
1. Remove the WLAN cables (1) from under the system board.

2. Disconnect the display panel cable (2) from the system board.

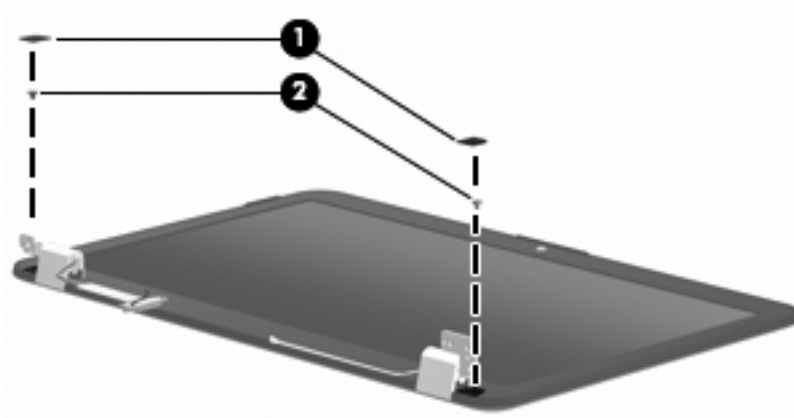
⚠ CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly might result in damage to the display assembly and other computer components.



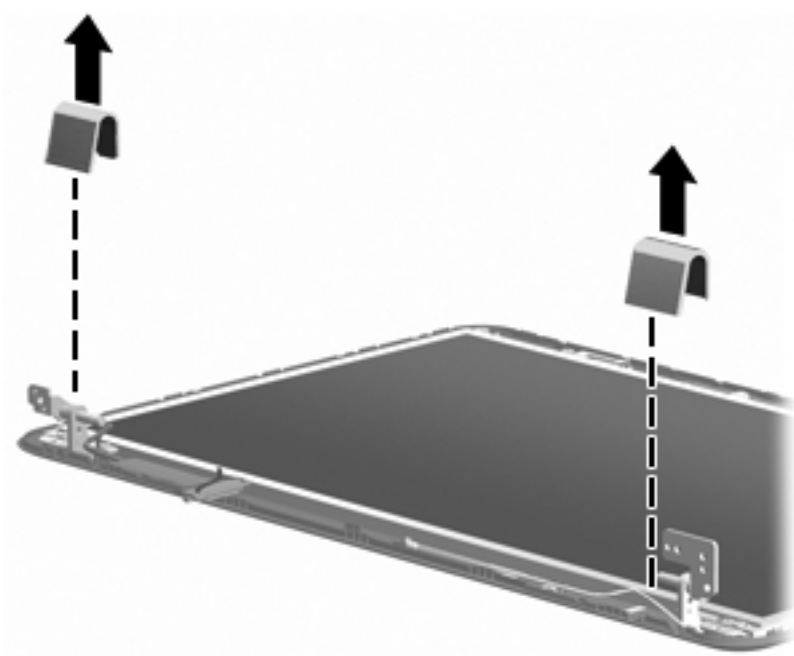
3. Remove the three screws (1) that secure the display assembly to the computer.
4. Remove the BrightView display assembly (2).



5. To replace the display bezel or any of the display assembly internal components, remove the following:
 - Two rubber screw covers on the display bezel bottom edge (1).
 - Two screws (2). The display rubber screw covers are included in the Display Rubber Kit, spare part number 603659-001.

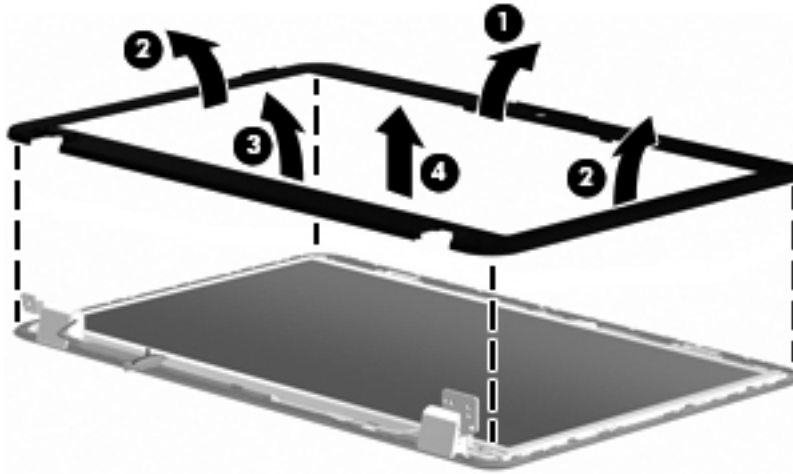


6. Remove the hinge covers by popping off the cover from each hinge.

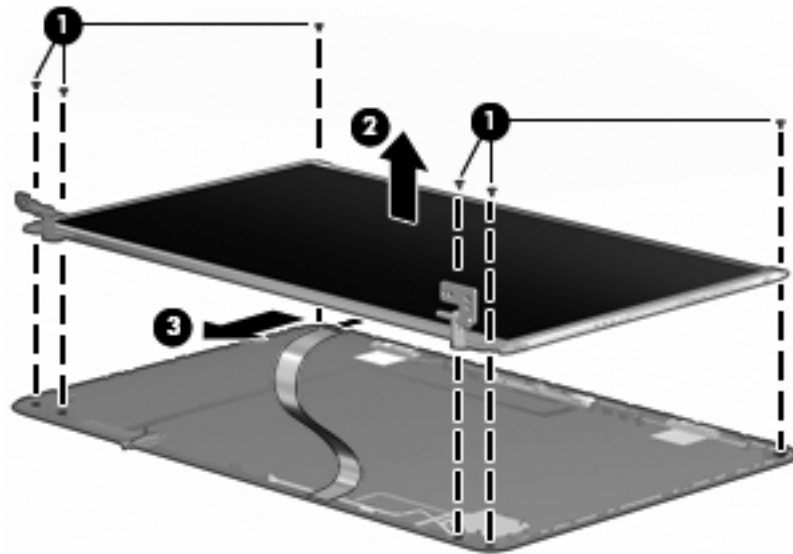


7. Flex the inside edges of the top edge (1), the left and right sides (2), and the bottom edge (3) of the display bezel until the bezel disengages from the display enclosure.

- 8.** Remove the display bezel (4). The display bezel is available using spare part number 603651-001.

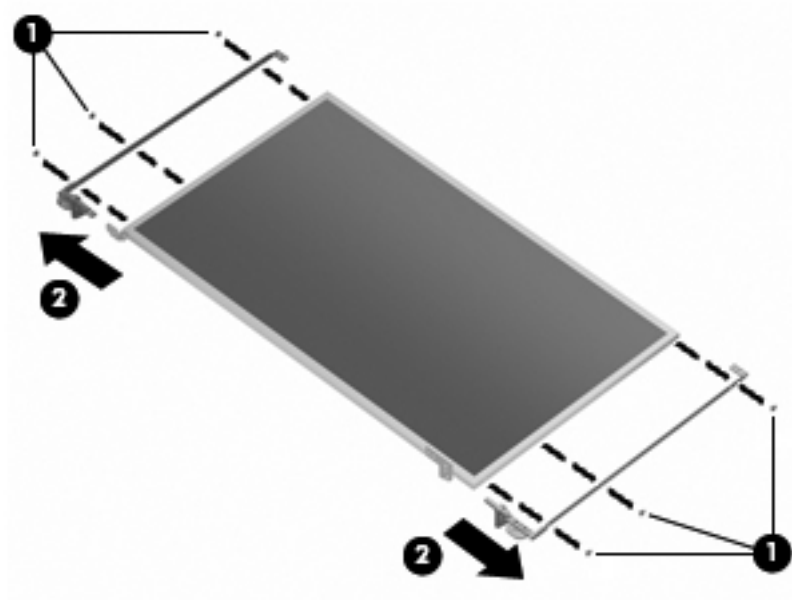


- 9.** To replace the display panel, remove the six screws (1) from the display hinges.
- 10.** Separate the display panel from the display enclosure (2), and then disconnect the display LED cable (3) from the display panel cable. The display panel spare part number is 559130-001.

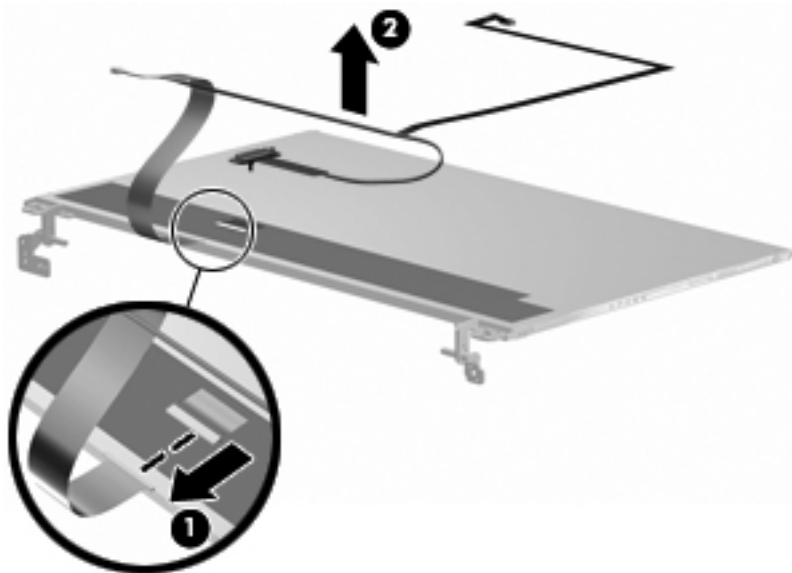


- 11.** To replace the display hinges, remove the three screws (1) that secure each display hinge to the display panel.

- 12.** Remove the display hinges (2). The display hinges are available in the BrightView Display Hinge Kit, spare part 603656-001. The display hinge screws are available in the Display Screw Kit, spare part number 603658-001.



- 13.** To remove the display panel cable, remove the adhesive plastic strip (1) from the display panel cable, and then disconnect the cable (2). Lift and remove the cable (3). The BrightView Display Cable Kit is spare part number 603657-001. The BrightView Display Cable Kit with WiMAX is spare part number 629284-001.



Webcam/microphone module

| Description | Spare part number |
|---|-------------------|
| Webcam/microphone module (includes cable) | 603660-001 |

Before removing the webcam/microphone module:

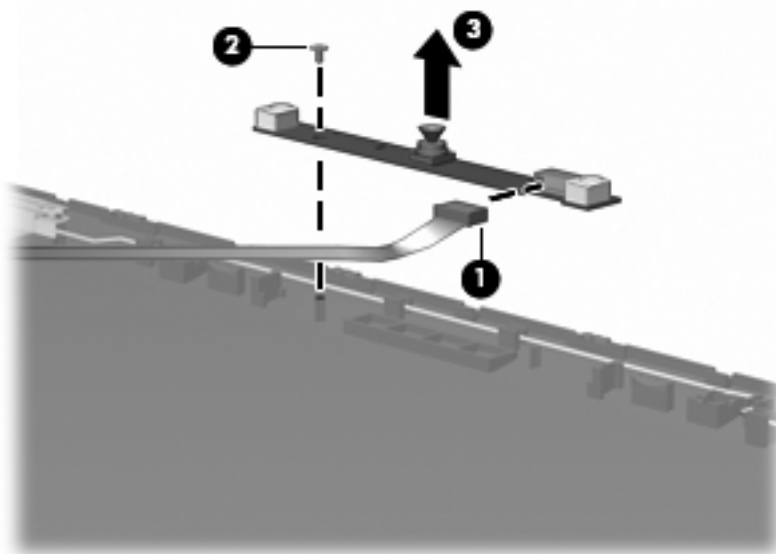
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power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

To access the BrightView webcam/microphone module, remove the display bezel. For instructions, see [BrightView display assembly on page 62](#).

To access the Touchscreen webcam/microphone module, remove the display panel from the display enclosure. For instructions, see [Touchscreen display assembly on page 57](#).

To replace the webcam/microphone module:

1. Disconnect the webcam/microphone module cable (1) from the webcam/microphone module.
2. Remove the screw securing the webcam/microphone module to the display enclosure (2).
3. Release the webcam/microphone module from the display enclosure (3).



Reverse this procedure to install the webcam/microphone module.

Bluetooth module



NOTE: The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable spare part number is 603645-001.

| Description | Spare part number |
|------------------|-------------------|
| Bluetooth module | 537921-001 |

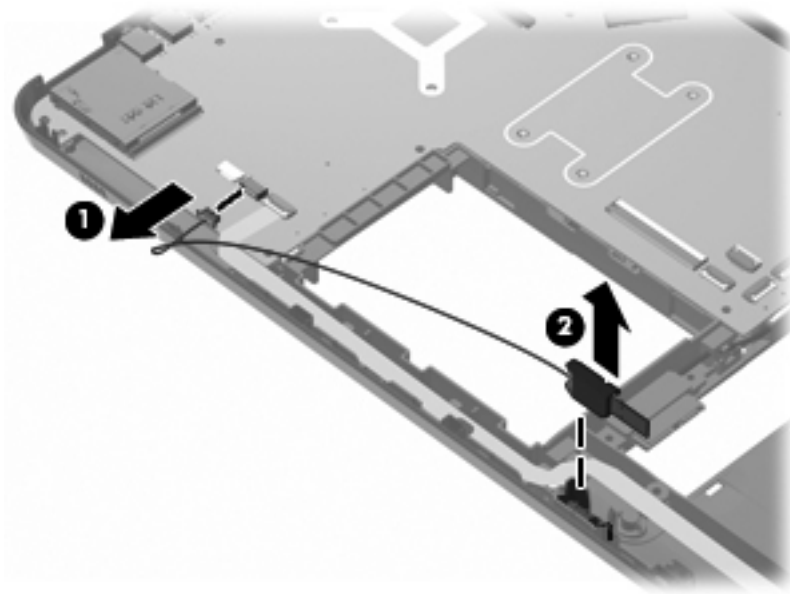
Before removing the Bluetooth module:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)

To remove the Bluetooth module:

1. Disconnect the Bluetooth module cable (1) from the system board.

2. Slide the Bluetooth module out of the slot and remove the module (2) from the computer.



Reverse this procedure to install the Bluetooth module.

USB board

| Description | Spare part number |
|----------------------------|-------------------|
| USB board (includes cable) | 603683-001 |

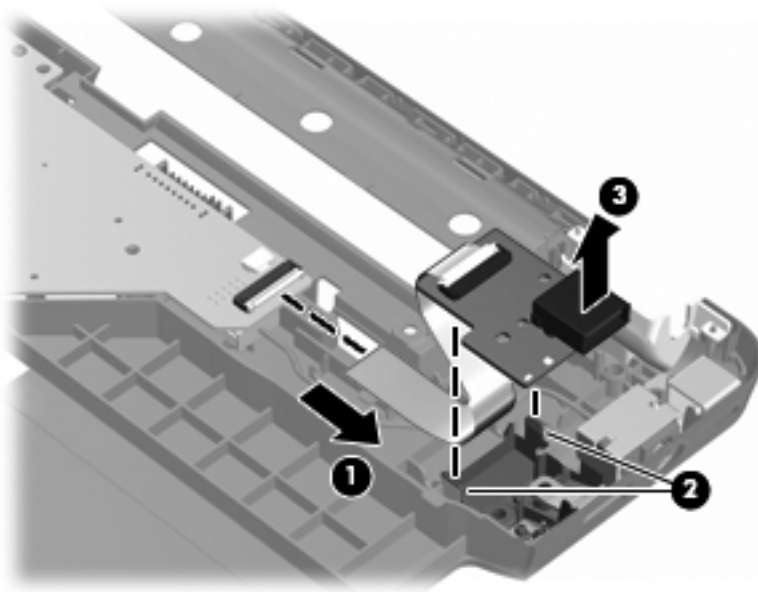
Before removing the USB board:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)

To remove the USB board (right-side):

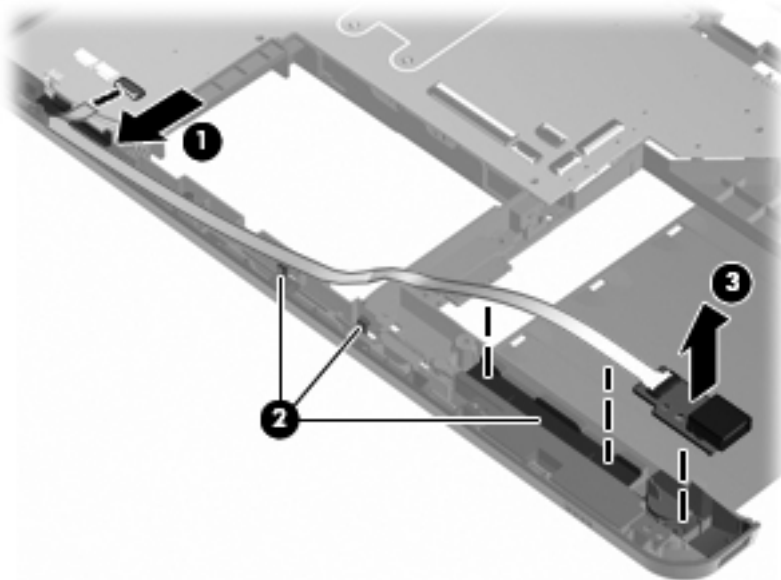
1. Disconnect the USB board cable (1) from the LIF connector on the system board.
2. Remove the screws (2) that secures the USB board to the base enclosure.

3. Remove the USB board (3) from the base enclosure.



To remove the USB board (left-side):

1. Disconnect the USB board cable (1) from the LIF connector on the system board
2. Remove the USB cable from the clips (2) attaching the cable to the base enclosure.
3. Remove the USB board from the base enclosure (3).



Reverse this procedure to install the USB board.

Power connector

| Description | Spare part number |
|-----------------|-------------------|
| Power connector | 603692-001 |

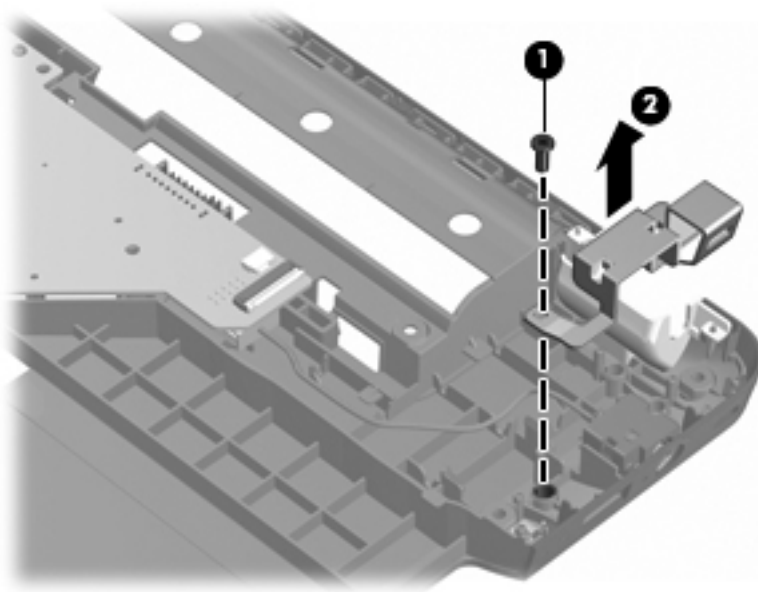
Before removing the power connector cable:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)
 - h. [USB board on page 70](#)

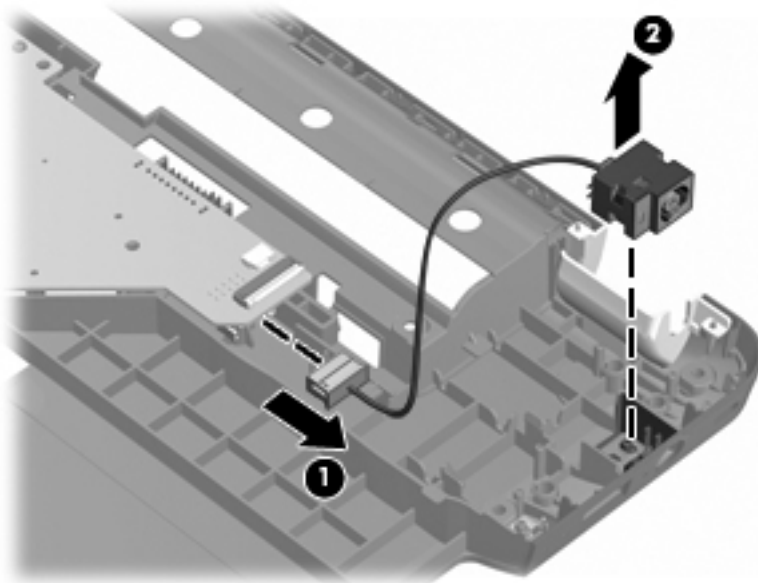
To remove the power connector cable:

1. Remove the screw (1) that secures the power connector and bracket to the base enclosure.

2. Remove the power connector bracket (2).



3. Disconnect the power cable (1) from the system board and release the cable from the clips built into the base enclosure.
4. Remove the power connector (2) from the clip built into the base enclosure.



Reverse this procedure to install the power connector and cable.

System board



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

| Description | Spare part number |
|--|-------------------|
| For use with computer models equipped with a graphics subsystem with discrete memory | 633554-001 |
| For use with computer models equipped with a graphics subsystem with UMA memory | 633555-001 |

Before removing the 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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)

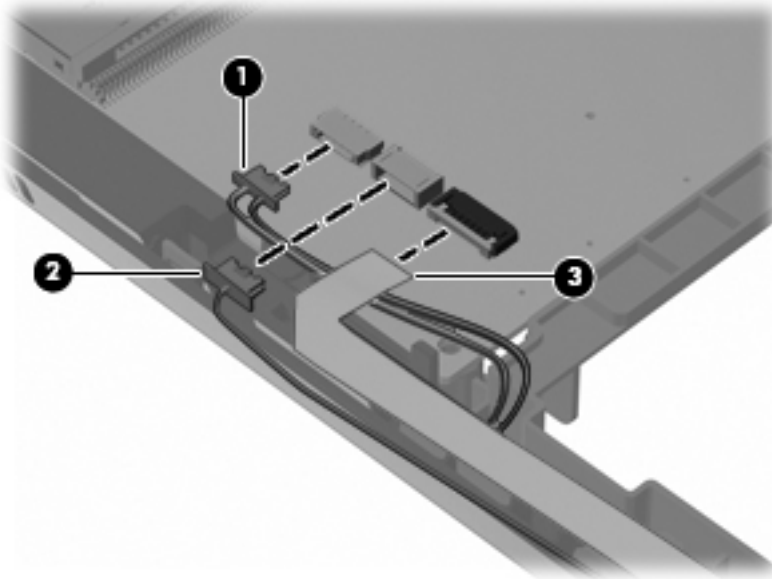
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- [RTC battery on page 48](#)
- [Memory module on page 46](#)
- [WLAN module on page 44](#)
- [Fan/heat sink assembly on page 77](#)
- [Processor on page 80](#)

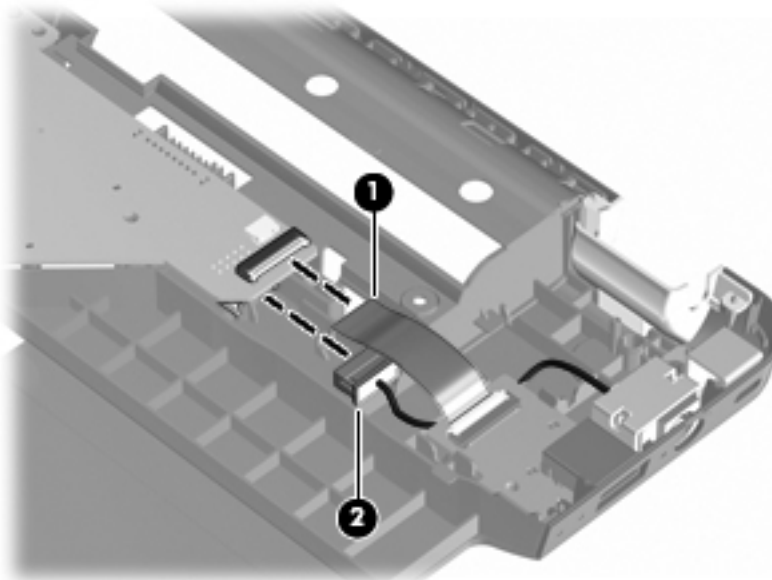
To remove the system board:

1. Disconnect the following cables from the system board:

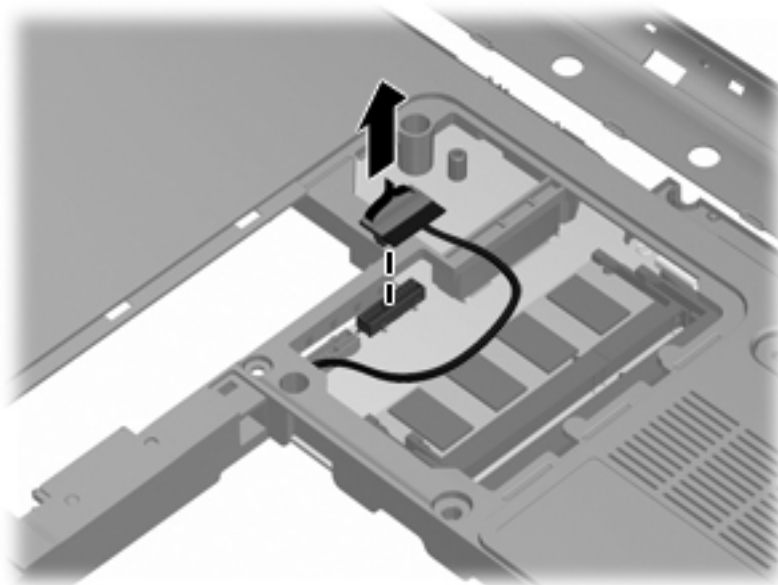
- Left-side USB board cable (1)
- Bluetooth cable (2)
- Speaker cable (3)



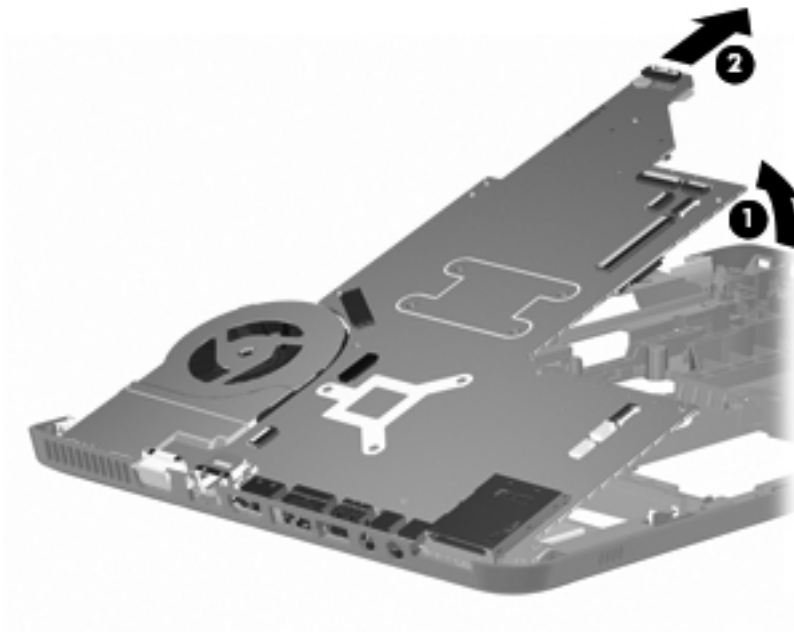
- Right-side USB board cable (1)
- Power connector cable (2)



- Optical drive cable



2. Lift up on the right side of the system board until it is at approximately a 45-degree angle (1).
3. Lift the system board to the right and up and out of the base enclosure (2).




Reverse this procedure to install the system board.

Fan/heat sink assembly

 **NOTE:** The fan/heat sink assembly spare kit includes replacement thermal material.

| Description | Spare part number |
|--|-------------------|
| For use with computer models equipped with a graphics subsystem with discrete memory | 634454-001 |
| For use with computer models equipped with a graphics subsystem with UMA memory | 634455-001 |

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

Before removing the fan/heat sink assembly:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)
 - h. [USB board on page 70](#)
 - i. [System board on page 74](#)

To remove the fan/heat sink assembly:

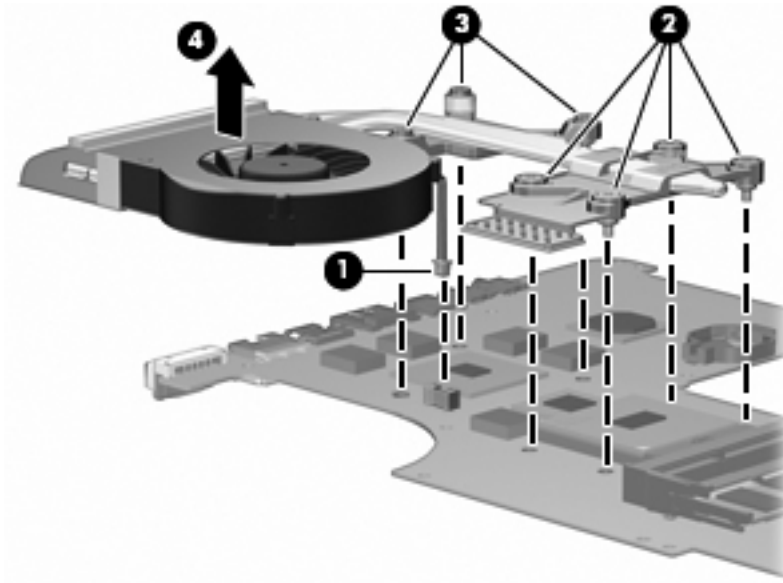
1. Turn the system board upside down, with the fan toward you
2. Disconnect the fan cable (1) from the system board.
3. Loosen the seven captive screws (2) and (3) that secure the fan/heat sink assembly to the system board.



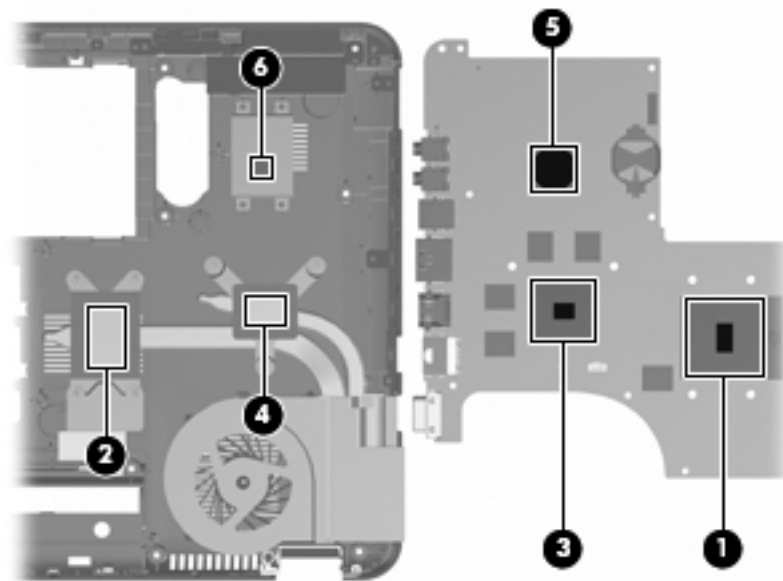
NOTE: The screws (3) that secure the section of the fan/heat sink assembly that services the graphics subsystem memory component are present only on computer models equipped with a graphics subsystem with discrete memory.

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 (4).



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. Thermal paste is applied to the fan/heat sink assembly to correspond with components on the system board as follows: the processor (1) and (2), the Northbridge chip (3) and (4), and the graphics subsystem chip (5) and (6). Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



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

Processor



NOTE: The processor spare part kit includes thermal material.

| Description | Spare part number |
|---|-------------------|
| Intel Core i7-2820QM 2.30-GHz (turbo up to 3.40-GHz) processor, 8-MB L2 cache, 1600 MHz, 45 W | 634694-001 |
| Intel Core i7-2720QM 2.20-GHz (turbo up to 3.30-GHz) processor, 6-MB L2 cache, 1600 MHz, 45 W | 631254-001 |
| Intel Core i7-2630QM 2.00-GHz (turbo up to 2.90-GHz) processor, 6-MB L2 cache, 1600 MHz, 45 W | 635501-001 |


Before removing the processor:

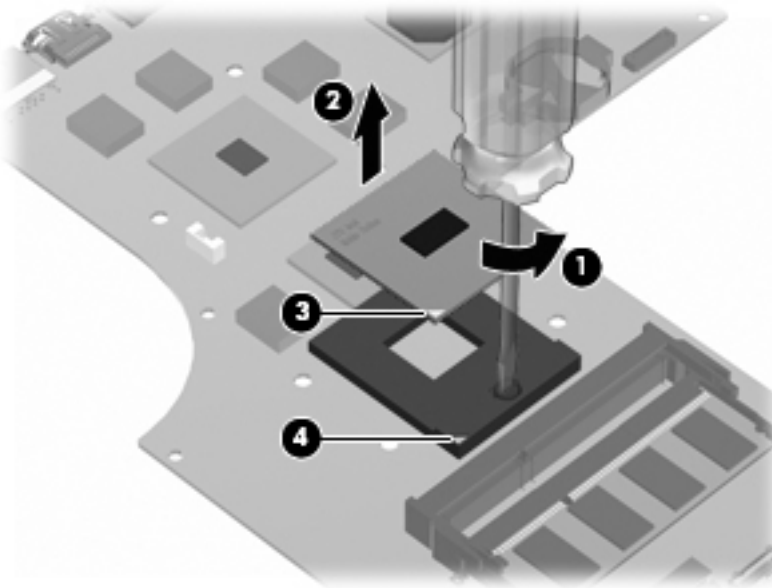
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first disconnecting the power cord from the AC outlet and then disconnecting the AC adapter from the computer.
4. Remove the following components:
 - a. [Battery on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)
 - h. [USB board on page 70](#)
 - i. [System board on page 74](#)
 - j. [Fan/heat sink assembly on page 77](#)

To replace the processor:

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

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

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



Reverse this procedure to install the processor.

Speaker assembly

| Description | Spare part number |
|------------------|-------------------|
| Speaker assembly | 603694-001 |

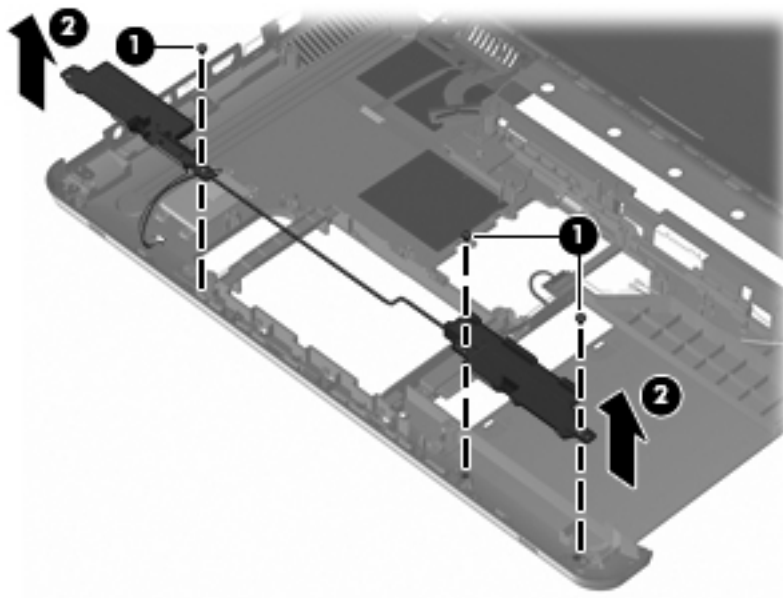
Before removing the speaker assembly:

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 on page 40](#)
 - b. [Hard drive cover on page 41](#)
 - c. [Hard drive on page 42](#)
 - d. [Optical drive on page 49](#)
 - e. [Keyboard on page 50](#)
 - f. [Top cover on page 52](#)
 - g. [Touchscreen display assembly on page 57](#) or [BrightView display assembly on page 62](#)
 - h. [System board on page 74](#)

To remove the speaker assembly:

1. Remove the three screws (1) securing the speaker assembly to the base enclosure.
2. Disconnect the speaker assembly cable (2) from the system board.

3. Remove the speaker assembly (3).



Reverse this procedure to install the speaker assembly.

5 Setup Utility (BIOS)

Starting Setup Utility

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



NOTE: The Fingerprint Reader (select models only) cannot be used to access Setup Utility.

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

To start Setup Utility:

1. Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **esc** key.
2. When the Startup Menu appears, press the **f10** key.

Using Setup Utility

Changing the language of Setup Utility

To change the language of Setup Utility:



NOTE: If Setup Utility is not running, begin at step 1. If Setup Utility is running, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **esc** key. When the Startup Menu appears, press the **f10** key.
2. Use the arrow keys to select **System Configuration > Language**, and then press the **enter** key.
3. Use the arrow keys to select a language, and then press the **enter** key.
4. When a confirmation prompt with your language selected is displayed, press the **enter** key.
5. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press the **enter** key.

Changes 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 navigate Setup Utility:

- Use the arrow keys to choose a menu or a menu item.
- Use either the arrow keys or the **f5** or **f6** keys to choose an item in a list or to toggle a field, for example an Enable/Disable field.
- Press the **enter** key to select an item.
- Press the **esc** key to close a text box or return to the menu display.
- Press the **f1** key to display additional navigation and selection information.

Displaying system information

Use Setup Utility to view the system time and date and information that identifies the computer.

To display the system information using Setup Utility:



NOTE: If Setup Utility is running, begin at step 1. If Setup Utility is not running, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **esc** key. When the Startup Menu appears, press the **f10** key.

2. Select the **Main** menu.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press the **enter** key.

Restoring default settings in Setup Utility

To restore Setup Utility default settings:



NOTE: If Setup Utility is not running, begin at step 1. If Setup Utility is running, begin at step 2.

1. Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **f10** key.

– or –

Open Setup Utility by turning on or restarting the computer. When the Press the ESC key for Startup Menu screen appears, press the **esc** key. When the Startup Menu appears, press the **f10** key.

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

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

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 the **esc** key to return to the menu display. Use the arrow keys to select **Exit > Exit Saving Changes**, and then press the **enter** key.

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

If the Setup Utility menus are not visible, press the [esc](#) key to return to the menu display. Use the arrow keys to select **Exit > Exit Discarding Changes**, and then press the [enter](#) key.

After either choice, the computer restarts in Windows.

Setup Utility menus

The menu tables provide an overview of Setup Utility options.



NOTE: Some Setup Utility menu items might not be supported by the computer.

Main menu

| Select | Function |
|--------------------|---|
| System information | <ul style="list-style-type: none">• View and change the system time and date.• View identification information about the computer.• View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only). |

Security menu

| Select | Function |
|------------------------|---|
| Administrator password | Enter, change, or delete an administrator password. |
| Power-On Password | Enter, change, or delete a power-on password. |

System Configuration menu

| Select | Function |
|--|---|
| Language Support | Change the language of Setup Utility. |
| Virtualization Technology (select models only) | Enable/disable the processor Virtualization Technology. |
| LAN Power Saving (select models only) | Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode. |
| Fan Always On | Enabled/disable Fan Always On. When enabled, the computer fan is always on. |

| Select | Function |
|------------------|---|
| Action Keys Mode | Enable/disable the Action Keys. |
| Boot Options | <ul style="list-style-type: none"> • POST (power-on self test) f10 and f12 Delay (sec.)—Set the delay for the f10 and f12 functions of Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20). • HP QuickWeb— <ul style="list-style-type: none"> ◦ Enable/disable the HP QuickWeb Boot Menu during POST. ◦ Delay to boot Windows—Set the delay for the HP QuickWeb Boot Menu to 2, 3, 5, 10, 15, or 30 seconds. • CD-ROM Boot—Enable/disable boot from CD-ROM. • Floppy Boot—Enable/disable boot from diskette. • Internal Network Adapter Boot—Enable/disable boot from the internal network adapter. • Boot Order—Set the boot order for: <ul style="list-style-type: none"> ◦ Hard Drive ◦ Internal CD/DVD ROM Drive ◦ USB Diskette on Key/USB Hard Drive ◦ USB CD/DVD ROM Drive ◦ USB Floppy ◦ Network Adapter |

Diagnostics menu

| Select | Function |
|--|--|
| Primary Hard Disk Self Test | Run a comprehensive self-test on the hard drive. |
| Secondary Hard Disk Self Test (select models only) | Run a comprehensive self-test on a secondary hard drive. |
| Memory Test | Run a diagnostic test on the system memory. |

6 Specifications

Computer specifications

| | Metric | U.S. |
|--|--------------------------|---------------------|
| Dimensions | | |
| Width | 37.8 cm | 14.9 in |
| Depth | 24.5 cm | 9.6 in |
| Height (front to back) | 3.2 to 3.5 cm | 1.3 to 1.4 in |
| Diagonal | 39.6 cm | 15.6 in |
| Weight (with optical drive, hard drive, and battery) | 2.5 g to 2.9 kg | 5.5 lbs to 6.5 lbs |
| Input power | | |
| Operating voltage | 18.5 V dc @ 3.5 A - 65 W | |
| Operating current | 3.5 A or 4.74 A | |
| Temperature | | |
| Operating (not writing to optical disc) | 0°C to 35°C | 32°F to 95°F |
| Operating (writing to optical disc) | 5°C to 35°C | 41°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Relative humidity | | |
| Operating | 10% to 90% | |
| Nonoperating | 5% to 95% | |
| Maximum altitude (unpressurized) | | |
| Operating | -15 m to 3,048 m | -50 ft to 10,000 ft |
| 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. | | |

39.6-cm (15.6-inch) display specifications

| | |
|--------------------------------|---|
| Number of colors | Up to 262,114 |
| Contrast ratio | 500:1 (typical) |
| Brightness | 220 nits (typical) |
| Pitch | 0.252 × 0.252 mm |
| Format | 1366 × 768 |
| Configuration | RGB vertical stripe |
| Backlight | Edge lit |
| Character display | 80 × 25 |
| Total power consumption | 4.7 W |
| Viewing angle | ±45° horizontal, ±15° upper vertical, ±35° lower vertical (typical) |

Hard drive specifications

| | 1-TB* | 750-GB** | 640-GB* | 500-GB** | 320-GB** | 250-GB** | 160-GB** |
|--|-----------------------------|-------------------|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Dimensions | | | | | | | |
| Height | 12.5 mm | 12.5 mm | 9.5 mm | 9.5 mm | 9.5 mm | 9.5 mm | 9.5 mm |
| Length | 100.2 mm | 100.2 mm | 100.2 mm | 100.35 mm | 100.35 mm | 100.35 mm | 100.35 mm |
| Width | 69.85 mm | 69.85 mm | 69.85 mm | 69.85 mm | 69.85 mm | 69.85 mm | 69.85 mm |
| Weight | 152 g | 152 g | 98 g | 110 g | 110 g | 105 g | 105 g |
| Interface type | SATA(3 GB/sec) | SATA (3 GB/sec) | SATA (3 GB/sec) | SATA | SATA | SATA | SATA |
| Transfer rate | | | | | | | |
| Synchronous (maximum) | 97 MB/sec | 97 MB/sec | 106 MB/sec | 1.1 GB/sec (internal) | 1.1 GB/sec (internal) | 1.1 GB/sec (internal) | 1.1 GB/sec (internal) |
| Security | ATA security | ATA security | ATA security | ATA security | ATA security | ATA security | ATA security |
| Seek times (typical read, including setting) | | | | | | | |
| Single track | 2 ms | 2 ms | 1.5 ms | 1.5 ms | 1.5 ms | 1.5 ms | 1.5 ms |
| Average (read/write) | 12/16 ms | 12/16 ms | 12/13 ms | 11/13 ms | 11/13 ms | 11/13 ms | 11/13 ms |
| Maximum | 21 ms | 21 ms | 24 ms | 22 ms | 22 ms | 22 ms | 22 ms |
| Logical blocks | 1,953,525,168 | 1,465,149,168 | 1,250,263,728 | 976,773,168 | 625,142,448 | 488,397,168 | 312,581,808 |
| Disc rotational speed | 5200 and 5400-rpm | 5200 and 5400-rpm | 5400 and 7200-rpm | 5400 and 7200-rpm | 7200-rpm | 7200-rpm | 7200-rpm |
| Operating temperature | 0°C to 60°C (32°F to 140°F) | | | | | | |
| * 1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. | | | | | | | |
| ** 1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. | | | | | | | |
| NOTE: Certain restrictions and exclusions apply. Contact technical support for details. | | | | | | | |

LightScribe DVD±R/RW SuperMulti DL Drive specifications

| Applicable disc | Read: | Write: |
|--------------------|--|--|
| | CD-DA, CD+(E)G, CD-MIDI, CDTEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CDR, 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 |
| Full stroke | < 285 ms | < 335 ms |
| Cache buffer | 2 MB | |
| Data transfer rate | | |
| 24X CD-ROM | 3,600 KB/sec | |
| 8X DVD | 10,800 KB/sec | |
| 24X CD-R | 3,600 KB/sec | |
| 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 | |

Blu-ray ROM with LightScribe DVD±R/RW SuperMulti DL 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-RW |
| Access time | BD | DVD |
| Random | < 230 ms | < 180 ms |
| Cache buffer | 8 MB | |
| Data transfer rate | | |
| 24X CD-ROM | 3,600 KB/sec | |
| 8X DVD | 10,800 KB/sec | |
| 24X CD-R | 3,600 KB/sec | |
| 16X CD-RW | 2,400 KB/sec | |
| 8X DVD+R | 10,800 KB/sec | |
| 4X DVD+RW | 5,400 KB/sec | |
| 8X DVD-R | 10,800 KB/sec | |
| 4X DVD-RW | 5,400 KB/sec | |
| 2.4X DVD+R(9) | 2,700 KB/sec | |
| 5X DVD-RAM | 6,750 KB/sec | |
| 1X BD-ROM | 4,500 KB/sec | |
| 1X BD-R read | 4,500 KB/sec | |
| 1X BD-RE read | 4,500 KB/sec | |
| Transfer mode | Multiword DMA Mode | |

System DMA specifications

| Hardware DMA | System function |
|--------------|---------------------------------|
| DMA0 | Not applicable |
| DMA1 | Not applicable |
| DMA2 | Not applicable |
| DMA3 | Not applicable |
| DMA4 | Direct memory access controller |

UMA system interrupt specifications

| Hardware IRQ | System function |
|--------------|--|
| IRQ0 | System timer |
| IRQ1 | Standard PS/2 keyboard |
| IRQ4 | ENE CIR receiver |
| IRQ8 | System CMOS/real-time clock |
| IRQ10 | Intel 5 series/3400 chipset family SMBus controller — 3B30 |
| IRQ12 | Synaptics PS/2 TouchPad |
| IRQ13 | Numeric data processor |
| IRQ16 | Intel 5 series/3400 chipset family USB enhanced host controller — 3B3C |
| | Intel 5 series/3400 chipset family PCI express root port 2 — 3B44 |
| | Intel management engine interface |
| IRQ17 | Intel 5 series/3400 chipset family PCI express root port 1 — 3B42 |
| IRQ19 | Intel 5 series 4 port SATA AHCI controller |
| | Intel turbo boost technology driver |
| IRQ21 | Intel 5 series/3400 chipset family USB enhanced host controller — 3B34 |
| IRQ22 | High definition audio controller |
| IRQ23 | HP mobile data protection sensor |
| IRQ81–190 | Microsoft ACPI-compliant system |
| IRQ-2 | Intel graphics media accelerator HD |

Discrete system interrupt specifications

| Hardware IRQ | System function |
|--------------|--|
| IRQ0 | System timer |
| IRQ1 | Standard PS/2 keyboard |
| IRQ4 | ENE CIR receiver |
| IRQ8 | System CMOS/real-time clock |
| IRQ10 | Intel 5 series/3400 chipset family SMBus controller — 3B30 |
| IRQ12 | Synaptics PS/2 TouchPad |
| IRQ13 | Numeric data processor |
| IRQ16 | Intel 5 series/3400 chipset family USB enhanced host controller — 3B3C |
| | Intel 5 series/3400 chipset family PCI express root port 2 — 3B44 |
| | Intel management engine interface |
| | Intel processor PCI express root port 1 — D138 |
| IRQ17 | High definition audio controller |
| | Intel 5 series/3400 chipset family PCI express root port 1 — 3B42 |
| IRQ19 | Intel 5 series 4 port SASTA AHCI controller |
| IRQ21 | Intel 5 series/3400 chipset family USB enhanced host controller — 3B34 |
| IRQ22 | High definition audio controller |
| IRQ23 | HP mobile data protection sensor |
| IRQ81–190 | Microsoft ACPI-compliant system |
| IRQ-2 | EG MADISON |

Switchable graphics system interrupt specifications

| Hardware IRQ | System function |
|--------------|--|
| IRQ0 | System timer |
| IRQ1 | Standard PS/2 keyboard |
| IRQ4 | ENE CIR receiver |
| IRQ8 | System CMOS/real-time clock |
| IRQ10 | Intel 5 series/3400 chipset family SMBus controller — 3B30 |
| IRQ12 | Synaptics PS/2 TouchPad |
| IRQ13 | Numeric data processor |
| IRQ16 | Intel 5 series/3400 chipset family USB enhanced host controller — 3B3C |
| | Intel 5 series/3400 chipset family PCI express root port 2 — 3B44 |
| | Intel management engine interface |
| | Intel Graphics Media Accelerator HD |
| | Intel processor PCI express root port 1 — 0045 |
| IRQ17 | High definition audio controller |
| | Intel 5 series/3400 chipset family PCI express root port 1 — 3B42 |
| IRQ19 | Intel 5 series 4 port SASTA AHCI controller |
| | Intel Turbo Boost technology drive |
| IRQ21 | Intel 5 series/3400 chipset family USB enhanced host controller — 3B34 |
| IRQ22 | High definition audio controller |
| IRQ23 | HP mobile data protection sensor |
| IRQ81–190 | Microsoft ACPI-compliant system |
| IRQ-3 | ATI Mobility Radeon HD 5470 |
| IRQ-2 | Intel Wifi Link 1000 BGN |

Switchable graphics system I/O address specifications

| I/O address (hex) | System function (shipping configuration) |
|-------------------|--|
| 00 - 1F | DMA controller |
| 00-1F | PCI bus |
| 20 - 21 | Programmable interrupt controller |
| 24 - 25 | Programmable interrupt controller |
| 28 - 29 | Programmable interrupt controller |
| 2C - 2D | Programmable interrupt controller |
| 2E - 2F | Motherboard resources |
| 30 - 31 | Programmable interrupt controller |
| 34 - 35 | Programmable interrupt controller |
| 38 - 39 | Programmable interrupt controller |
| 3C - 3D | Programmable interrupt controller |
| 40 - 43 | System Timer |
| 4E - 4F | Motherboard resources |
| 50 - 53 | System timer |
| 60 | Standard PS/2 keyboard |
| 61 | Motherboard resources |
| 62 | Microsoft ACPI-compliant embedded controller |
| 63 | Motherboard resources |
| 64 | Standard PS/2 keyboard |
| 65 | Motherboard resources |
| 66 | Microsoft ACPI-compliant embedded controller |
| 67 | Motherboard resources |
| 70 - 77 | System CMOS/real time clock |
| 70-77 | Motherboard resources |
| 80 | Motherboard resources |
| 81 - 91 | DMA controller |
| 92 | Motherboard resources |
| 93-9F | DMA controller |
| A0 - A1 | Programmable interrupt controller |

| I/O address (hex) | System function (shipping configuration) |
|--------------------------|--|
| A4 - A5 | Programmable interrupt controller |
| A8 - A9 | Programmable interrupt controller |
| AC - AD | Programmable interrupt controller |
| B0 - B1 | Programmable interrupt controller) |
| B2 - B3 | Motherboard resources |
| B4 - B5 | Programmable interrupt controller |
| B8 - B9 | Programmable interrupt controller |
| BC - BD | Programmable interrupt controller |
| C0 - DF | DMA controller |
| F0 | Numeric data processor |
| 380 - 38E | Motherboard resources |
| 3B0 - 3BB | Intel Graphics Media Accelerator HD |
| 3C0 - 3DF | Intel Graphics Media Accelerator HD |
| 400 - 47F | Motherboard resources |
| 4D0 - 4D1 | Programmable interrupt controller |
| 500 - 57F | Motherboard resources |
| 680 - 69F | Motherboard resources |
| 800 - 80F | Motherboard resources |
| D00 - FFFF | PCI bus |
| 164E - 164F | Motherboard resources |
| 2000 - 2FFF | Intel 5 Series/3400 Series Chipset Family PCI Express Root Port 2 - 3B44 |
| 3000 - 3FFF | Intel 5 Series/3400 Series Chipset Family PCI Express Root Port 2 - 3B42 |
| 4000 - 4FFF | Intel processor PCI Express Root Port - 0045 |
| 4F00 - 4FFF | ATI Mobility Radeon HD 5470 |
| 5000 - 501F | Intel 5 Series/3400 Series Chipset Family SMBus Controller - 3B42 |
| 5020 - 503F | Intel 5 Series 8 Port SATA AHCI controller |
| 5040 - 5047 | Intel 5 Series 6 Port SATA AHCI controller |
| 5048 - 504F | Intel 5 Series 4 Port SATA AHCI controller |
| 5050 - 5057 | Intel Graphics Media Accelerator HD |
| 5058 - 505B | Intel 5 Series 7 Port SATA AHCI controller |
| 505C - 505F | Intel 5 Series 5 Port SATA AHCI controller |

| I/O address (hex) | System function (shipping configuration) |
|--------------------------|---|
| FFFF - FFFF | Motherboard resources |
| FFFF - FFFF | Motherboard resources |

UMA system I/O address specifications

| I/O address (hex) | System function (shipping configuration) |
|-------------------|--|
| 00 - 1F | DMA controller |
| 00-1F | PCI bus |
| 20 - 21 | Programmable interrupt controller |
| 24 - 25 | Programmable interrupt controller |
| 28 - 29 | Programmable interrupt controller |
| 2C - 2D | Programmable interrupt controller |
| 2E - 2F | Motherboard resources |
| 30 - 31 | Programmable interrupt controller |
| 34 - 35 | Programmable interrupt controller |
| 38 - 39 | Programmable interrupt controller |
| 3C - 3D | Programmable interrupt controller |
| 40 - 43 | System Timer |
| 4E - 4F | Motherboard resources |
| 50 - 53 | System timer |
| 60 | Standard PS/2 keyboard |
| 61 | Motherboard resources |
| 62 | Microsoft ACPI-compliant embedded controller |
| 63 | Motherboard resources |
| 64 | Standard PS/2 keyboard |
| 65 | Motherboard resources |
| 66 | Microsoft ACPI-compliant embedded controller |
| 67 | Motherboard resources |
| 70 - 77 | System CMOS/real time clock |
| 70-77 | Motherboard resources |
| 80 | Motherboard resources |
| 81 - 91 | DMA controller |
| 92 | Motherboard resources |
| 93-9F | DMA controller |
| A0 - A1 | Programmable interrupt controller |
| A4 - A5 | Programmable interrupt controller |

| I/O address (hex) | System function (shipping configuration) |
|--------------------------|--|
| A8 - A9 | Programmable interrupt controller |
| AC - AD | Programmable interrupt controller |
| B0 - B1 | Programmable interrupt controller |
| B2 - B3 | Motherboard resources |
| B4 - B5 | Programmable interrupt controller |
| B8 - B9 | Programmable interrupt controller |
| BC - BD | Programmable interrupt controller |
| C0 - DF | DMA controller |
| F0 | Numeric data processor |
| 380 - 38E | Motherboard resources |
| 3B0 - 3BB | Intel Graphics Media Accelerator HD |
| 3C0 - 3DF | Intel Graphics Media Accelerator HD |
| 400 - 47F | Motherboard resources |
| 4D0 - 4D1 | Programmable interrupt controller |
| 500 - 57F | Motherboard resources |
| 680 - 69F | Motherboard resources |
| 800 - 80F | Motherboard resources |
| D00 - FFFF | PCI bus |
| 164E - 164F | Motherboard resources |
| 2000 - 2FFF | Intel 5 Series/3400 Series Chipset Family PCI Express Root Port 2 - 3B44 |
| 3000 - 3FFF | Intel 5 Series/3400 Series Chipset Family PCI Express Root Port 2 - 3B42 |
| 4000 - 401F | Intel 5 Series/3400 Series Chipset Family SMBus Controller - 3B30 |
| 4020 - 403F | Intel 5 Series 8 Port SATA AHCI controller |
| 4040 - 4047 | Intel 5 Series 6 Port SATA AHCI controller |
| 4048 - 404F | Intel 5 Series 4 Port SATA AHCI controller |
| 4050 - 4057 | Intel Graphics Media Accelerator HD |
| 4058 - 405B | Intel 5 Series 7 Port SATA AHCI controller |
| 405C - 405F | Intel 5 Series 5 Port SATA AHCI controller |
| FFFF - FFFF | Motherboard resources |
| FFFF - FFFF | Motherboard resources |

Discrete system I/O address specifications

| I/O address (hex) | System function (shipping configuration) |
|-------------------|--|
| 00 - 1F | DMA controller |
| 00-1F | PCI bus |
| 20 - 21 | Programmable interrupt controller |
| 24 - 25 | Programmable interrupt controller |
| 28 - 29 | Programmable interrupt controller |
| 2C - 2D | Programmable interrupt controller |
| 2E - 2F | Motherboard resources |
| 30 - 31 | Programmable interrupt controller |
| 34 - 35 | Programmable interrupt controller |
| 38 - 39 | Programmable interrupt controller |
| 3C - 3D | Programmable interrupt controller |
| 40 - 43 | System Timer |
| 4E - 4F | Motherboard resources |
| 50 - 53 | System timer |
| 60 | Standard PS/2 keyboard |
| 61 | Motherboard resources |
| 62 | Microsoft ACPI-compliant embedded controller |
| 63 | Motherboard resources |
| 64 | Standard PS/2 keyboard |
| 65 | Motherboard resources |
| 66 | Microsoft ACPI-compliant embedded controller |
| 67 | Motherboard resources |
| 70 - 77 | System CMOS/real time clock |
| 70-77 | Motherboard resources |
| 80 | Motherboard resources |
| 81 - 91 | DMA controller |
| 92 | Motherboard resources |
| 93-9F | DMA controller |
| A0 - A1 | Programmable interrupt controller |
| A4 - A5 | Programmable interrupt controller |

| I/O address (hex) | System function (shipping configuration) |
|--------------------------|--|
| A8 - A9 | Programmable interrupt controller |
| AC - AD | Programmable interrupt controller |
| B0 - B1 | Programmable interrupt controller) |
| B2 - B3 | Motherboard resources |
| B4 - B5 | Programmable interrupt controller |
| B8 - B9 | Programmable interrupt controller |
| BC - BD | Programmable interrupt controller |
| C0 - DF | DMA controller |
| F0 | Numeric data processor |
| 380 - 38E | Motherboard resources |
| 3B0 - 3BB | ATI Mobility Radeon HD 5650 |
| 3B0 - 3BB | Intel processor PCI Express Root Port 1 - D138 |
| 3C0 - 3DF | ATI Mobility Radeon HD 5650 |
| 3C0 - 3DF | Intel processor PCI Express Root Port 1 - D138 |
| 400 - 47F | Motherboard resources |
| 4D0 - 4D1 | Programmable interrupt controller |
| 500 - 57F | Motherboard resources |
| 680 - 69F | Motherboard resources |
| 800 - 80F | Motherboard resources |
| D00 - FFFF | PCI bus |
| 164E - 164F | Motherboard resources |
| 2000 - 2FFF | Intel 5 Series/3400 Series Chipset Family PCI Express Root Port 2 - 3B44 |
| 3000 - 3FFF | Intel 5 Series/3400 Series Chipset Family PCI Express Root Port 2 - 3B42 |
| 4000 - 40FF | ATI Mobility Radeon HD 5650 |
| 4000 - 40FF | Intel Processor PCI Express Root Port 1 - D138 |
| 5000 - 501F | Intel 5 Series/3400 Series Chipset Family SMBus controller - 3B30 |
| 5020 - 503F | Intel 5 Series 4 Port SATA AHCI controller |
| 5040 - 5047 | Intel 5 Series 4 Port SATA AHCI controller |
| 5048 - 504F | Intel 5 Series 4 Port SATA AHCI controller |
| 5050 - 5053 | Intel 5 Series 4 Port SATA AHCI controller |
| 5054 - 5057 | Intel 5 Series 4 Port SATA AHCI controller |

| I/O address (hex) | System function (shipping configuration) |
|--------------------------|---|
| FFFF - FFFF | Motherboard resources |
| FFFF - FFFF | Motherboard resources |

System memory map specifications

| Size | Memory address | System function |
|--------|-------------------|------------------------------|
| 640 KB | 00000000-0009FFFF | Base memory |
| 128 KB | 000A0000-000BFFFF | Video memory |
| 64 KB | 000C0000-000CFFFF | Video BIOS |
| 96 KB | 000D0000-000E7FFF | Unused |
| 96 KB | 000E8000-000FFFFF | System BIOS |
| 15 MB | 00100000-00FFFFFF | Extended memory |
| 58 MB | 04800000-07FFFFFF | Super extended memory |
| 58 MB | 04800000-07FFFFFF | Unused |
| 2 MB | 08000000-080FFFFF | Video memory (direct access) |
| 4 GB | 08200000-FFFFFFF | Unused |
| 64 KB | FFFF0000-FFFFFFFF | System BIOS |

7 Backup and Recovery

Recovering system information

Recovery after a system failure is as complete as the most current backup. HP recommends creating recovery discs immediately after software setup. As you add new software and data files, 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) the 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 the 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 the 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: If the computer includes a solid-state drive (SSD), you might not have a recovery partition. Recovery discs are included for computers that do not have a partition. Use these discs to recover the operating system and software. To check for the presence of a recovery partition, select **Start > Computer**. If the partition is present, an HP Recovery drive is listed in the Hard Disk Drives section of the window.

Creating recovery discs


 **NOTE:** 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.

NOTE: 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 internal optical drive, use an optional external optical drive (purchased separately) to create recovery discs, or purchase the recovery discs for the computer from the HP Website.

Note the following guidelines before creating recovery discs:

- Use high-quality DVD-R, double-layer DVD-R, DVD+R, double-layer 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 using CDs, up to 20 discs might be required, whereas only a few DVDs or BDs are required.

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


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

To create a set of recovery discs:

1. Select **Start > All Programs > Recovery Manager > Recovery Manager**.

Recovery Manager opens.

2. Click **Advanced Options**.

 **NOTE:** If you are operating the computer on battery power, you are prompted to connect to AC power before you can go to the next step.

3. Click **Recovery disc creation**, and then click **Next**.
4. Follow the on-screen instructions.

Backing up your information

When to back up

- On a regularly scheduled basis



NOTE: Set reminders to back up your information periodically.

- Before the computer is repaired or restored
- Before adding or modifying hardware or software

Backup suggestions

- Create a set of recovery discs using Recovery Manager.
- Create system restore points using the Windows System Restore feature, and periodically copy them to disc.
- Store personal files in the Documents folder 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 is a time-saver if you have to reset your preferences.

To copy the screen and paste it into a word-processing document:

a. Display the screen.

b. Copy the screen:

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

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

c. Open a word-processing document, and then select **Edit > Paste**.

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 the 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 the 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 the system files and settings.

When to create restore points

- Before adding or extensively modifying 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 Maintenance > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Under **Automatic restore points**, select the disk for which you want to create a restore point.
5. Click **Create**.

The System Protection window opens.

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 Maintenance > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Click the **System Restore** button, and then click **Next**.

The System Restore window opens.

5. Follow the on-screen instructions.

Performing a recovery



NOTE: You can recover only files that you have previously backed up. HP recommends using Recovery Manager to create an entire drive backup as soon as you set up the 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, recovery discs are included with the computer. Use these discs to recover the operating system and software.



NOTE: Windows has its own built-in repair features, such as System Restore and driver roll-back capabilities. Try these features 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 Website or reinstalled from the disc provided by the manufacturer.

Recovering from the recovery discs

To restore the system from the recovery discs:

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

Recovering from the dedicated recovery partition (select models only)



NOTE: If the computer includes an SSD, you might not have a recovery partition. You cannot recover using this procedure. Recovery discs are included for computers that do not have a partition. Use these discs to recover the operating system and software.

On some models, you can perform a recovery from the partition on the hard drive from 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–
 - Restart the computer and press **F11** while the “Press <F11> for recovery” message appears on the screen, and then select **Recovery Manager**.

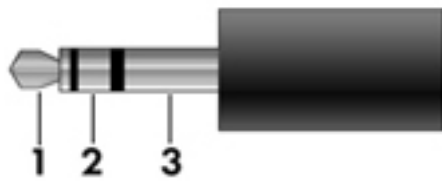
Recovery Manager opens.

2. Click **Advanced Options**.

3. Click **System recovery**, and then click **Next**.
4. Follow the on-screen instructions.

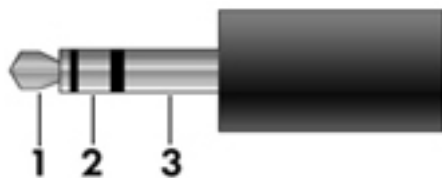
8 Connector pin assignments

Audio-in (microphone)



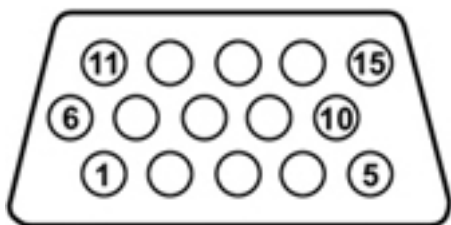
| Pin | Signal |
|-----|-----------------|
| 1 | Audio signal in |
| 2 | Audio signal in |
| 3 | Ground |

Audio-out (headphone)



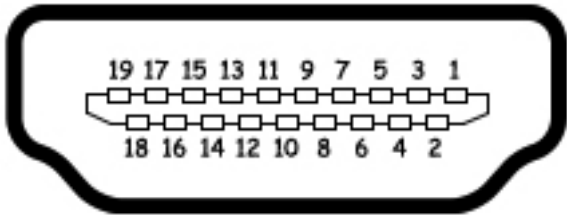
| Pin | Signal |
|-----|--------------------------|
| 1 | Audio out, left channel |
| 2 | Audio out, right channel |
| 3 | Ground |

External monitor



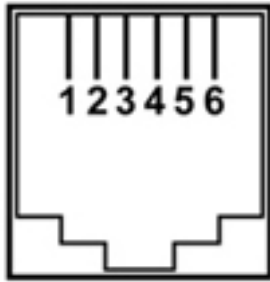
| Pin | Signal |
|-----|-----------------|
| 1 | Red analog |
| 2 | Green analog |
| 3 | Blue analog |
| 4 | Not connected |
| 5 | Ground |
| 6 | Ground analog |
| 7 | Ground analog |
| 8 | Ground analog |
| 9 | +5 VDC |
| 10 | Ground |
| 11 | Monitor detect |
| 12 | DDC 2B data |
| 13 | Horizontal sync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

HDMI



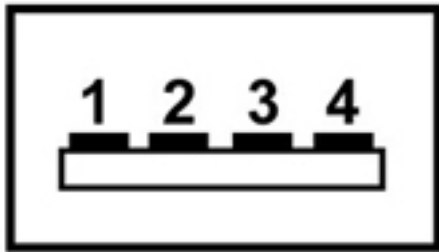
| Pin | Signal |
|-----|---|
| 1 | Transition minimized differential signal (TMDS) data 2+ |
| 2 | TMDS data 2 shield |
| 3 | TMDS data 2- |
| 4 | TMDS data 1+ |
| 5 | TMDS data 1 shield |
| 6 | TMDS data 1- |
| 7 | TMDS data 0+ |
| 8 | TMDS data 0 shield |
| 9 | TMDS data 0- |
| 10 | TMDS clock+ |
| 11 | TMDS clock shield |
| 12 | TMDS clock- |
| 13 | Consumer electric control (CEC) |
| 14 | Not connected |
| 15 | DDC clock |
| 16 | DDC data |
| 17 | Ground |
| 18 | +5V power |
| 19 | Hot plug detect |

RJ-11 (modem)



| Pin | Signal |
|-----|--------|
| 1 | Unused |
| 2 | Tip |
| 3 | Ring |
| 4 | Unused |
| 5 | Unused |
| 6 | Unused |

Universal Serial Bus



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

9 Power cord set requirements

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

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

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

Requirements for all countries or regions

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

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

Requirements for specific countries or regions

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

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

10 Recycling

Battery

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

Display

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

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

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

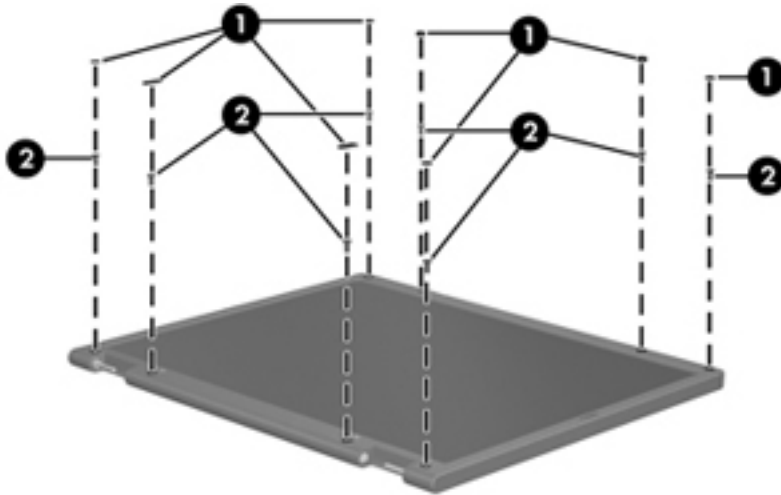
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight (1) and the liquid crystal display (LCD) panel (2).



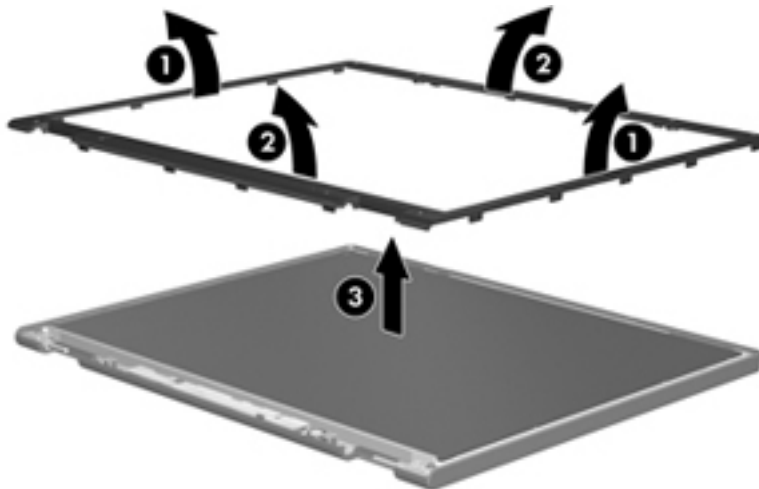
📝 **NOTE:** The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

Perform the following steps to disassemble the display assembly:

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

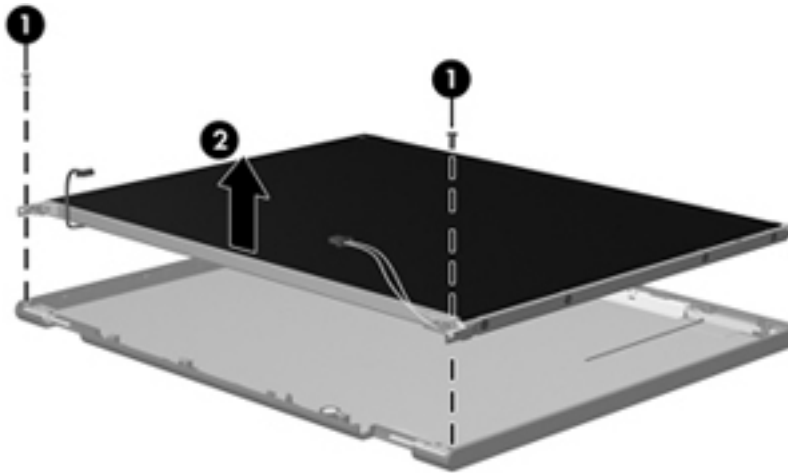


2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel (3).



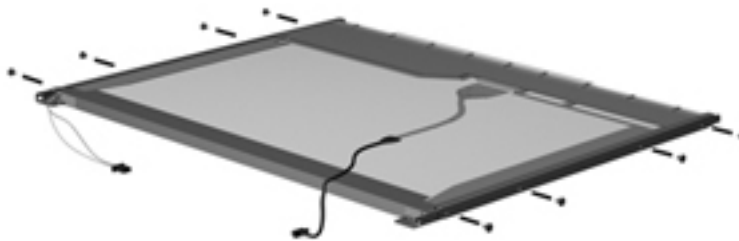
4. Remove all screws (1) that secure the display panel assembly to the display enclosure.

- 5.** Remove the display panel assembly (2) from the display enclosure.



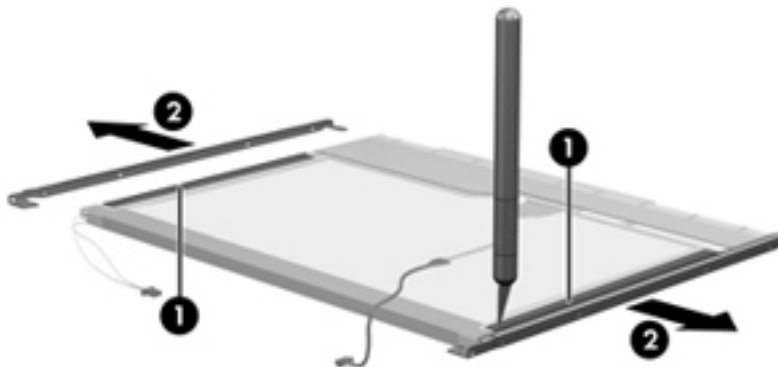
- 6.** Turn the display panel assembly upside down.

- 7.** Remove all screws that secure the display panel frame to the display panel.



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

- 9.** Remove the display panel frame (2) from the display panel.

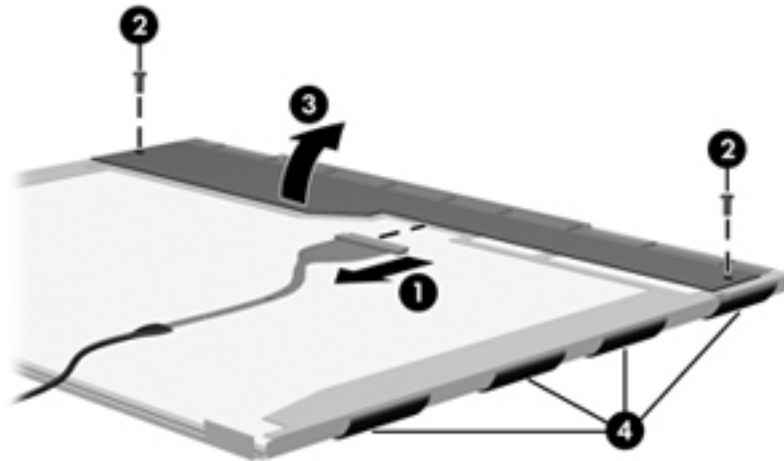


- 10.** Disconnect the display cable (1) from the LCD panel.

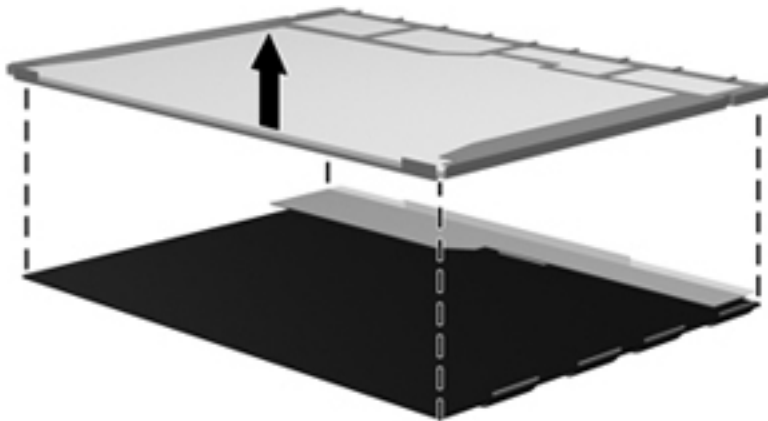
- 11.** Remove the screws (2) that secure the LCD panel to the display rear panel.

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

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



- 14.** Remove the LCD panel.



- 15.** Recycle the LCD panel and backlight.

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