



Compaq Presario CQ58

Maintenance and Service Guide

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Safety warning notice

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

Table of contents

| | |
|--|-----------|
| 1 Product description | 1 |
| 2 External component identification | 5 |
| Finding your hardware and software information | 5 |
| Display | 5 |
| Button | 7 |
| Keys | 8 |
| Lights | 9 |
| TouchPad | 10 |
| Front | 10 |
| Left side | 11 |
| Right side | 13 |
| Bottom | 14 |
| 3 Illustrated parts catalog | 15 |
| Service tag | 16 |
| Computer major components | 17 |
| Display assembly subcomponents | 21 |
| Mass storage devices | 23 |
| Miscellaneous parts | 24 |
| Sequential part number listing | 25 |
| 4 Removal and replacement procedures | 28 |
| Preliminary replacement requirements | 28 |
| Tools required | 28 |
| Service considerations | 28 |
| Plastic parts | 28 |
| Cables and connectors | 29 |
| Drive handling | 29 |
| Grounding guidelines | 30 |
| Electrostatic discharge damage | 30 |

| | |
|--|-----------|
| Packaging and transporting guidelines | 31 |
| Component replacement procedures | 33 |
| Service tag | 33 |
| Computer feet | 34 |
| Battery | 35 |
| Memory module | 36 |
| WLAN module | 37 |
| Keyboard | 39 |
| Optical drive | 43 |
| Hard drive | 45 |
| RTC battery | 48 |
| Top cover | 49 |
| Power button board | 52 |
| TouchPad button board | 53 |
| Optical drive connector cable | 56 |
| Speakers | 58 |
| USB board | 60 |
| System board | 62 |
| Fan/heat sink assembly | 65 |
| Display assembly | 67 |
| Power connector cable | 76 |
| 5 Using Setup Utility (BIOS) and System Diagnostics | 78 |
| Starting Setup Utility (BIOS) | 78 |
| Updating the BIOS | 78 |
| Determining the BIOS version | 78 |
| Downloading a BIOS update | 79 |
| Using System Diagnostics | 80 |
| 6 Specifications | 81 |
| Computer specifications | 81 |
| 15.6-in, SVA, display panel display specifications | 82 |
| Hard drive specifications | 83 |
| 7 Backing up, restoring, and recovering | 84 |
| Creating recovery media and backups | 84 |
| Creating HP Recovery media | 85 |
| Restore and recovery | 86 |
| Using Windows Refresh for quick and easy recovery | 87 |
| Remove everything and reinstall Windows | 88 |

| | |
|--|-----------|
| Recovering using HP Recovery Manager | 88 |
| What you need to know | 89 |
| Using the HP Recovery partition to recover a minimized image (select models only) | 89 |
| Using HP Recovery media to recover | 90 |
| Changing the computer boot order | 90 |
| Removing the HP Recovery partition | 90 |
| 8 Power cord set requirements | 91 |
| Requirements for all countries | 91 |
| Requirements for specific countries and regions | 92 |
| 9 Recycling | 93 |
| Index | 94 |

1 Product description

| Category | Description |
|---------------------|---|
| Product Name | Compaq Presario CQ58 |
| Processors | <ul style="list-style-type: none">• AMD® E2-2000 processor (1.75-GHz, 1333-MHz, 18 W, dual core) and a UMA graphics subsystem memory• AMD E1-1500 processor (1.48-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory• AMD E1-1200 processor (1.40-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory <p>Processor is soldered to the system board</p> |
| Chipset | AMD A68M fusion controller hub (FCH) |
| Graphics | Internal graphics: <ul style="list-style-type: none">• AMD Radeon™ 7340 Series Graphics on computer models equipped with an AMD E2-1800 processor• AMD Radeon 7310 Series Graphics on computer models equipped with an AMD E1-1500 or AMD E1-1200 processor• AMD Radeon HD 6310M Discrete-Class Graphics on computer models equipped with an AMD E-300 processor <p>Supports HD decode, DX11, and HDMI</p> |
| Panel | <p>15.6-in, light-emitting diode (LED), SVA, HD, BrightView (1366×768) display; typical brightness: 200 nits</p> <p>All display assemblies include one or two wireless local area network (WLAN) antenna cables</p> <p>Supports low voltage differential signalling (LVDS)</p> |

| Category | Description |
|------------------------|--|
| Memory | <p>Two customer-accessible/upgradable memory module slots</p> <p>DDR3-1333-MHz single channel support (DDR3-1600 downgrade to DDR3-1333) on computer models equipped with an AMD E2-1800 processor</p> <p>DDR3-1066-MHz single channel support (DDR3-1600 downgrade to DDR3-1066) on computer models equipped with an AMD E1-1200 or E-300 processor</p> <p>Supports 8192-MB of system RAM in the following configurations:</p> <ul style="list-style-type: none"> • 8192-MB (4096-MB×2; not supported on computer models equipped with a 32-bit operating system) • 6144-MB (4096-MB+2048×1; not supported on computer models equipped with a 32-bit operating system) • 4086-MB (4096-MB×1 or 2048×2; not supported on computer models equipped with Windows 7, 32-bit operating system) • 2048-MB (2048×1; not supported on computer models equipped with Windows 7, 32-bit operating system) |
| Hard drive | <p>Supports 6.35-cm (2.5-in) hard drives in 9.5-mm (.37-in) and 7.0-mm (.28-in) thicknesses (all hard drives use the same bracket)</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> • 750-GB, 5400-rpm, 9.5-mm • 640-GB, 5400-rpm, 9.5-mm • 500-GB, 5400-rpm, 9.5-mm • 320-GB, 5400-rpm, 9.5-mm |
| Optical drive | <p>Fixed</p> <p>Serial ATA</p> <p>12.7-mm tray load</p> <p>Supports DVD±RW Double-Layer with SuperMulti Drive</p> <p>Supports zero power optical drive</p> |
| Audio and video | <p>Two Altec-Lansing speakers</p> <p>HD audio</p> <p>Supports Microsoft premium requirements</p> <p>VGA webcam (fixed, no tilt with activity LED; 640×480 by 24 frames per second)</p> <p>One digital microphone</p> |
| Ethernet | <p>Integrated 10/100 network interface card (NIC)</p> |
| Wireless | <p>Integrated wireless local area network (WLAN) options by way of wireless module</p> |

| Category | Description |
|----------------------------------|--|
| | <p>One or two WLAN antennas built into display assembly, varying by computer model</p> <p>Support for the following WLAN formats:</p> <ul style="list-style-type: none"> • Atheros AR9565 802.11b/g/n 1×1 WiFi + BT4.0 Combo Adapter • Atheros HB125 802.11b/g/n 1×1 WLAN module • Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter • Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter • Ralink RT5390F 802.11b/g/n 1×1 WLAN module • Ralink RT5390R 802.11bg/n 1×1 WiFi Adapter • Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter |
| External media cards | <p>HP Multi-Format Digital Media reader with push-push technology, supporting:</p> <ul style="list-style-type: none"> • Secure Digital (SD) Memory Card • Secure Digital Extended Capacity (SDxC) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • MultiMediaCard (MMC) |
| Ports | <ul style="list-style-type: none"> • Audio-in (mono microphone) • Audio-out (stereo headphone) • HDMI v1.4 supporting: up to 1920×1200 @ 60Hz • HP Smart AC adapter • RJ-45 (Ethernet Gigabit support with LED indicators) • USB 2.0 ports on computer: 3 (2 on one side, 1 on other; USB port allocation: 3 for the computer, 1 for camera 1 for MiniCard) • VGA (Dsub 15 pin) supporting: 2048×1536 external resolution @ 60 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video |
| Keyboard/pointing devices | <p>Full-size (15.6-in.), textured, pocket keyboard, no numeric keypad</p> <p>Gesture support: MultiTouch gestures enabled, two-finger scrolling, and pinch-zoom as default</p> <p>Taps enabled by default</p> |
| Power requirements | <p>65W RC, V, EM, 3-wire HP Smart AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)</p> <p>Supports the following batteries:</p> <ul style="list-style-type: none"> • 6-cell, 55-Wh, 2.55-Ah, Li-ion battery • 6-cell, 47-Wh, 2.20-Ah, Li-ion battery |

| Category | Description |
|-------------------------|---|
| Security | Supports security cable lock |
| Operating system | Preinstalled: <ul style="list-style-type: none">• Windows® 8 Standard• FreeDOS |
| Serviceability | End user replaceable parts: <ul style="list-style-type: none">• AC adapter• Battery• Hard drive• Memory module• Optical drive• WLAN module |

2 External component identification

Finding your hardware and software information

- ▲ Select **Start > Computer**.

A list displays all the devices installed in your computer, including hard drive, optical drives, solid-state drives (SSD), or a secondary hard drive.

To find out what software is included on your computer, select **Start > All Programs**.

Display



| Item | Component | Description |
|------|---------------------|--|
| (1) | WLAN antennas (2)* | Send and receive wireless signals to communicate with WLANs. |
| (2) | Internal microphone | Records sound. |

| Item | Component | Description |
|------|--------------|--|
| (3) | Webcam | <p>Records video, captures still photographs, and allows video conferences and online chat by means of streaming video.</p> <p>To use the webcam, select Start > All Programs > Communication and Chat > CyberLink YouCam.</p> |
| (4) | Webcam light | On: The webcam is in use. |

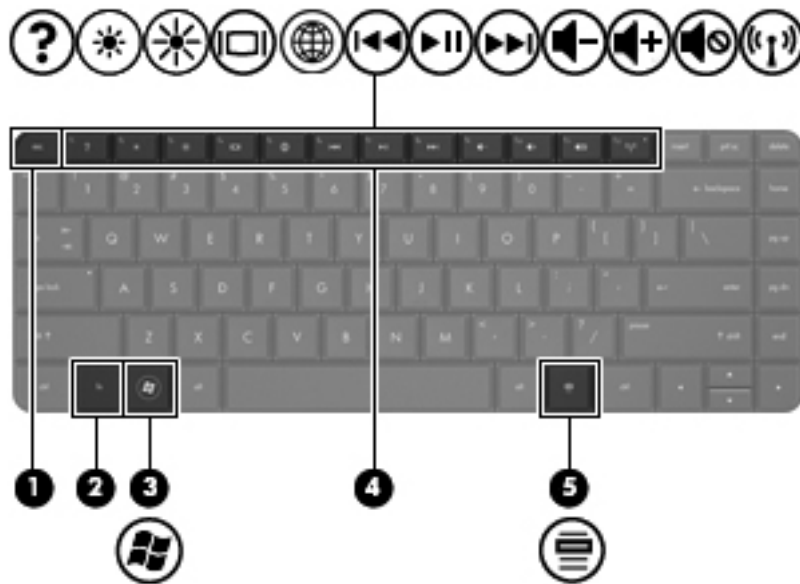
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.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

Button



| Component | Description |
|--------------|---|
| Power button | <ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding down the power button will result in the loss of unsaved information.</p> <p>If the computer has stopped responding and Microsoft Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select Start > Control Panel > System and Security > Power Options.</p> |

Keys



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

Lights



| Item | Component | Description |
|------|-----------------|---|
| (1) | Caps lock light | On: Caps lock is on, which switches the keys to all capital letters. |
| (2) | Power light | <ul style="list-style-type: none">• White: The computer is on.• Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components.• Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power. |
| (3) | Wireless light | <ul style="list-style-type: none">• White: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on.• Amber: All wireless devices are off. |

TouchPad



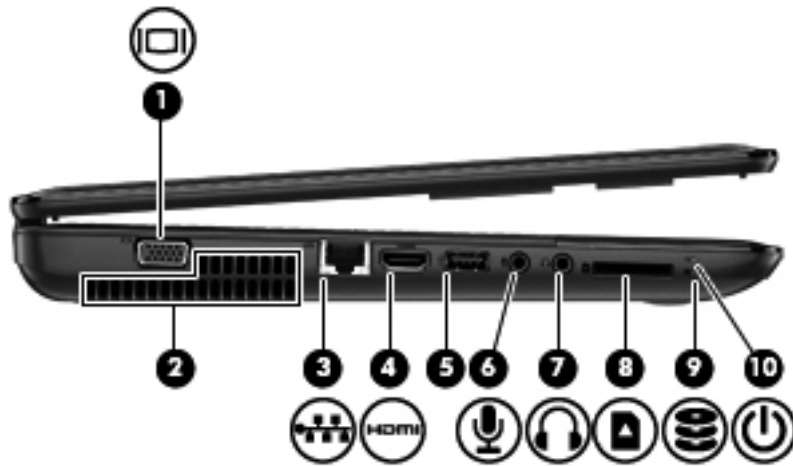
| Item | Component | Description |
|------|------------------------|---|
| (1) | TouchPad on/off button | Turns the TouchPad on or off. |
| (2) | TouchPad light | <ul style="list-style-type: none">• On: The TouchPad is off.• Off: The TouchPad is on. |
| (3) | TouchPad zone | Moves the on-screen pointer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

Front



| Component | Description |
|-----------|----------------|
| Speakers | Produce sound. |

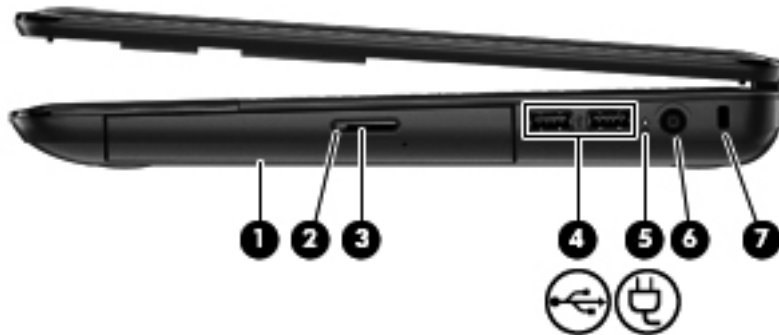
Left side



| Item | Component | Description |
|------|----------------------------|---|
| (1) | External monitor port | Connects an external VGA monitor or projector. |
| (2) | Vents (2) | Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| (3) | RJ-45 (network) jack | Connects a network cable. |
| (4) | HDMI port | Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio device. |
| (5) | USB port | Connects an optional USB device. |
| (6) | Audio-in (microphone) jack | Connects an optional computer headset microphone, stereo array microphone, or monaural microphone. |
| (7) | Audio-out (headphone) jack | Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i> . NOTE: When a device is connected to the jack, the computer speakers are disabled. |

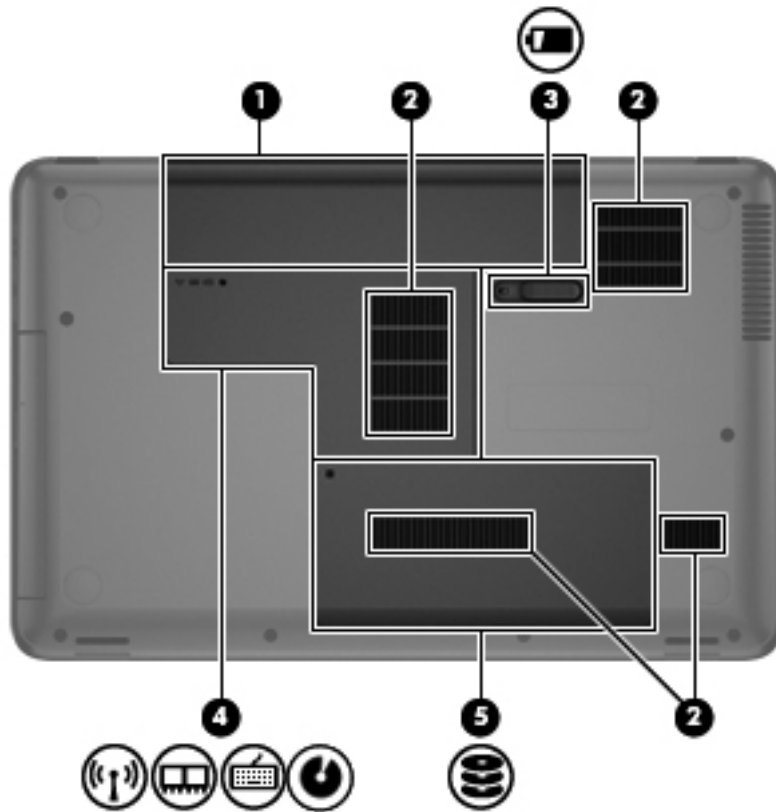
| Item | Component | Description |
|-------------|--------------------|---|
| (8) | Digital Media slot | Supports the following digital card formats: <ul style="list-style-type: none">• Secure Digital (SD) Memory Card• Secure Digital Extended Capacity (SDxC) Memory Card• Secure Digital High Capacity (SDHC) Memory Card• MultiMediaCard (MMC) |
| (9) | Hard drive light | Blinking white: The hard drive is being accessed. |
| (10) | Power light | <ul style="list-style-type: none">• White: The computer is on.• Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components. |

Right side



| Item | Component | Description |
|------|----------------------------|---|
| (1) | Optical drive | Reads and writes (select models only) to an optical disk. |
| (2) | Optical drive light | <ul style="list-style-type: none"> Green: The optical drive is being accessed. Off: The optical drive is idle. |
| (3) | Optical drive eject button | Releases the disc tray. |
| (4) | USB port | <p>Connects an optional USB device.</p> <p>CAUTION: While there are multiple USB ports on the same side, only one USB port will be able to support a high power device at a time.</p> |
| (5) | AC adapter light | <ul style="list-style-type: none"> White: The AC adapter is connected and the battery is charged. Amber: The AC adapter is connected and the battery is charging. Off: The computer is using DC power. |
| (6) | Power connector | Connects an AC adapter. |
| (7) | Security cable slot | <p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p> |

Bottom

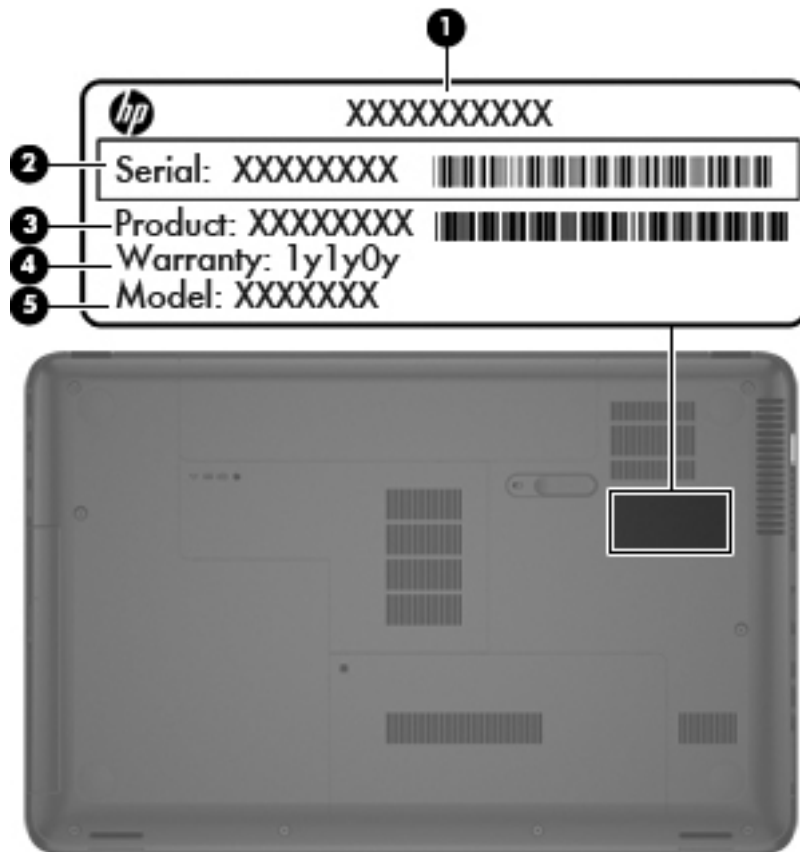


| Item | Component | Description |
|------|---|---|
| (1) | Battery bay | Holds the battery. |
| (2) | Vents (4) | Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| (3) | Battery release latch | Releases the battery from the battery bay. |
| (4) | Memory module/wireless module compartment cover | The memory module/wireless module compartment cover provides access to the memory module compartment, wireless module compartment, keyboard retention screw, and optical drive bay. 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 customer support through Help and Support. |
| (5) | Hard drive compartment cover | The hard drive compartment cover provides access to the hard drive bay and the RTC battery. |

3 Illustrated parts catalog

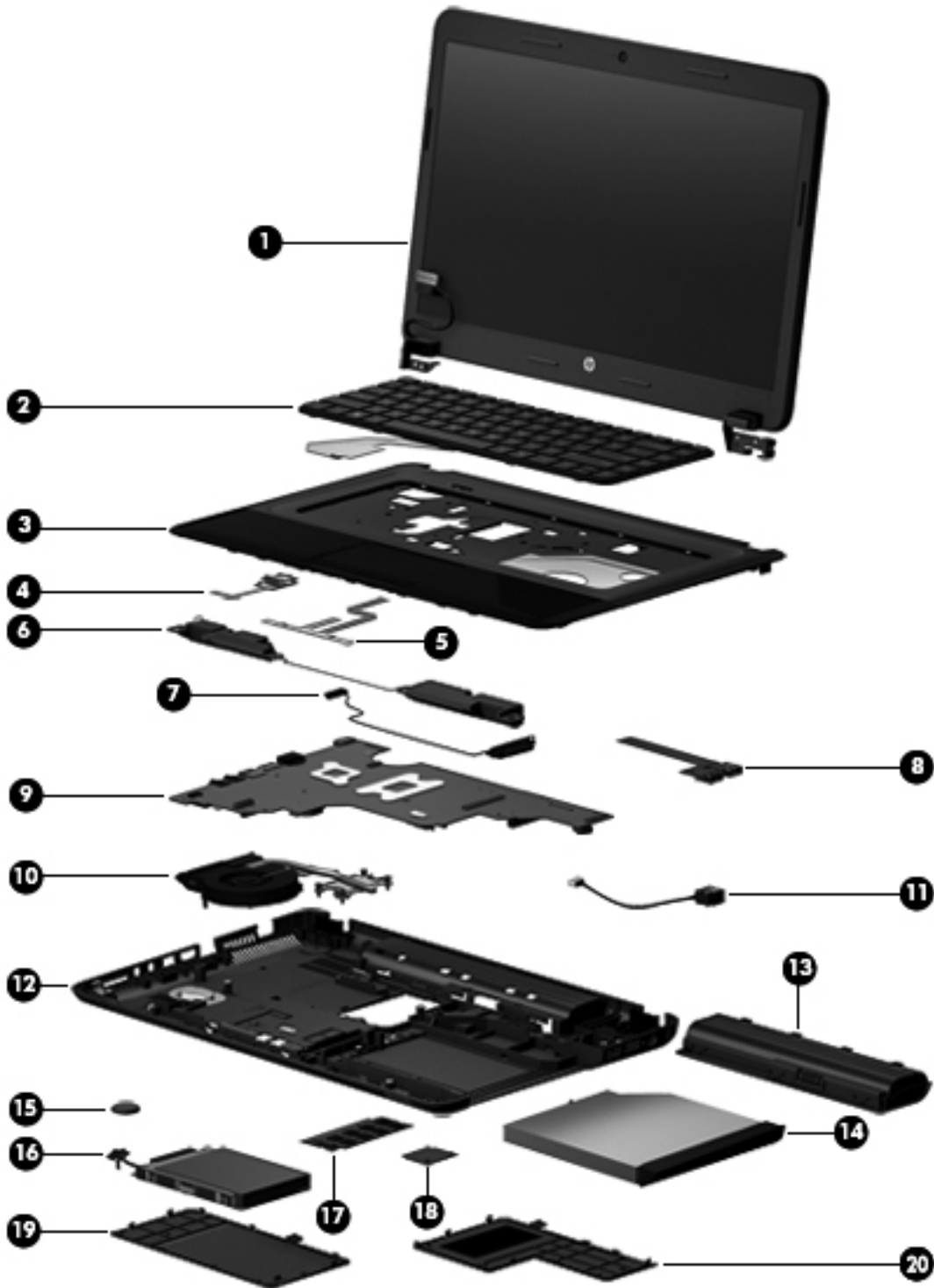
Service tag

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



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

Computer major components



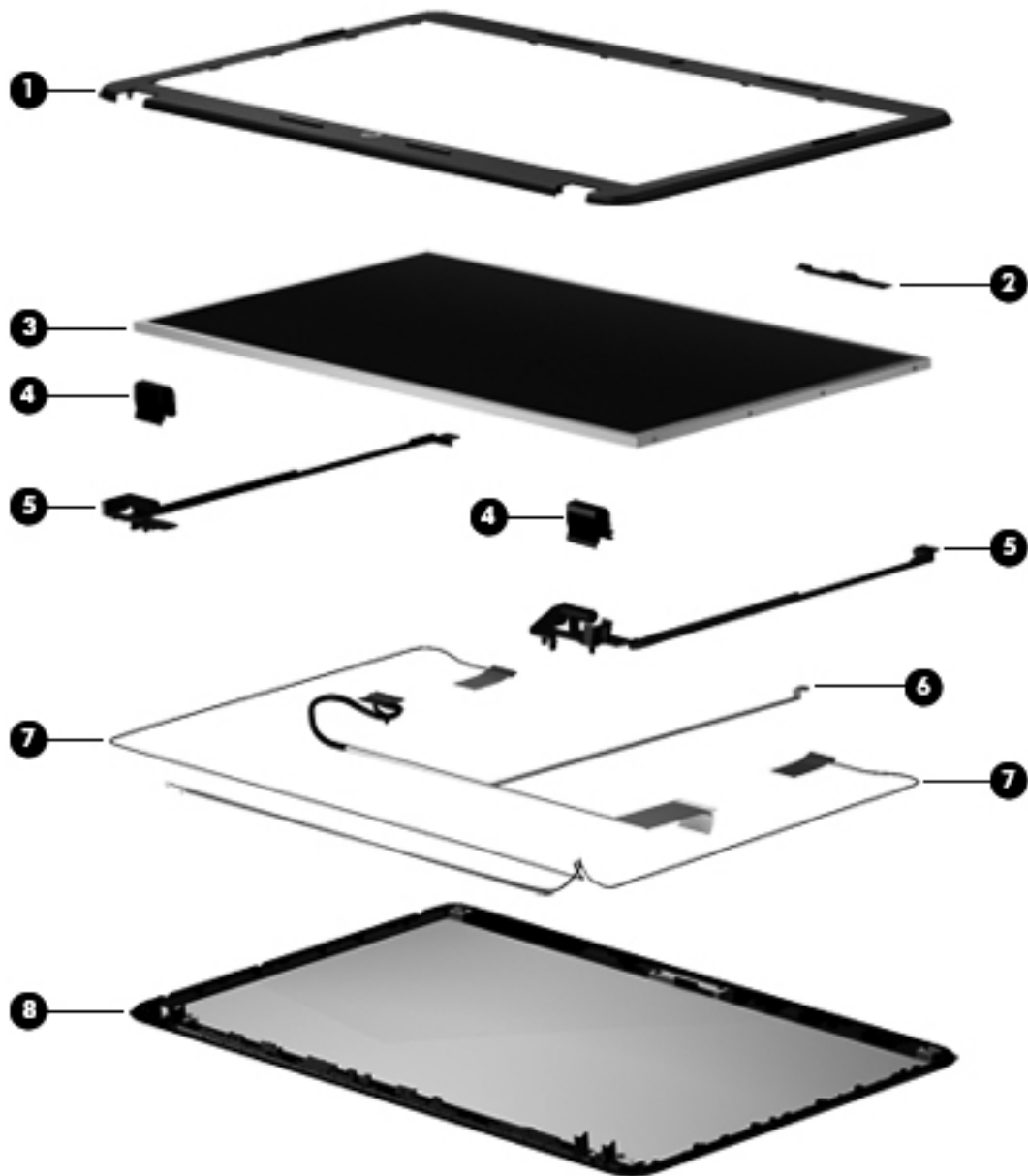
| Item | Component | Spare part number |
|------|---|-------------------|
| (1) | Display assembly: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 21 . | |

| Item | Component | Spare part number |
|-------------|---|--------------------------|
| (2) | Keyboard (includes keyboard cable): | |
| | For use in Belgium | 698694-A41 |
| | For use in Bulgaria | 698694-261 |
| | For use in the Czech Republic and Slovakia | 698694-FL1 |
| | For use in Denmark, Finland, and Norway | 698694-DH1 |
| | For use in France | 698694-051 |
| | For use in Germany | 698694-041 |
| | For use in Greece | 698694-151 |
| | For use in Hungary | 698694-211 |
| | For use in Israel | 698694-BB1 |
| | For use in Italy | 698694-061 |
| | For use in the Netherlands | 698694-B31 |
| | For use in Portugal | 698694-131 |
| | For use in Romania | 698694-271 |
| | For use in Russia | 698694-251 |
| | For use in Saudi Arabia | 698694-171 |
| | For use in Slovenia | 698694-BA1 |
| | For use in Spain | 698694-071 |
| | For use in Switzerland | 698694-BG1 |
| | For use in Turkey | 698694-141 |
| | For use in the United Kingdom and Singapore | 698694-131 |
| (3) | Top cover (includes the TouchPad board) | 686283-001 |
| (4) | Power button board (includes cable) | 686270-001 |
| (5) | TouchPad button board (includes bracket, TouchPad button board cable, and TouchPad cable) | 686271-001 |
| (6) | Speakers (include speaker cables) | 686279-001 |
| (7) | Optical drive connector cable (includes bracket) | 686257-001 |
| (8) | USB board (includes cable) | 686269-001 |
| (9) | System board (includes processor and replacement thermal material): | |
| | For use on computer models equipped with an AMD E2-2000 processor (1.75-GHz, 1333-MHz, 18 W, dual core) and a UMA graphics subsystem memory | 716019-501 |
| | For use on computer models equipped with an AMD E1-1500 processor (1.48-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory | 703563-501 |

| Item | Component | Spare part number |
|------|---|-------------------|
| | For use on computer models equipped with an AMD E1-1200 processor (1.40-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory | 688303-501 |
| (10) | Fan/heat sink assembly (includes replacement thermal material) | 688306-001 |
| (11) | Power connector cable (includes bracket) | 686258-001 |
| (12) | Base enclosure (includes battery cover lock latch, battery cover release latch, power connector barrel, and RJ45 cover): | 708523-001 |
| | Rubber Kit (not illustrated, includes front and rear rubber feet, display bezel rubber bumpers, and display bezel rubber screw covers) | 686276-001 |
| (13) | Battery: | |
| | 6-cell, 55-Wh, 2.55-Ah, Li-ion battery | 593554-001 |
| | 6-cell, 47-Wh, 2.20-Ah, Li-ion battery | 593553-001 |
| (14) | DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket) | 686268-001 |
| (15) | RTC battery | 686274-001 |
| (16) | Hard drive (does not include hard drive bracket, hard drive connector cable, or screws): | |
| | 750-GB, 5400-rpm, 9.5-mm | 634250-001 |
| | 640-GB, 5400-rpm, 9.5-mm | 669300-001 |
| | 500-GB, 5400-rpm, 9.5-mm | 669299-001 |
| | 500-GB, 5400-rpm, 7.0-mm | 683802-001 |
| | 320-GB, 5400-rpm, 9.5-mm | 622643-001 |
| | 320-GB, 5400-rpm, 7.0-mm | 645193-001 |
| | Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, hard drive connector cable, and screws) | 686261-001 |
| (17) | Memory module (PC3, 12800, 1600-MHz): | |
| | 4-GB memory module | 652972-001 |
| | 2-GB memory module | 641369-001 |
| (18) | WLAN module: | |
| | Atheros AR9565 802.11b/g/n 1×1 WiFi + BT4.0 Combo Adapter | 690019-001 |
| | Atheros HB125 802.11b/g/n 1×1 WLAN module | 675794-001 |
| | Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter | 655795-001 |
| | Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter | 657325-001 |
| | Ralink RT5390F 802.11b/g/n 1×1 WLAN module | 670691-001 |
| | Ralink RT5390R 802.11bg/n 1×1 WiFi Adapter | 691415-001 |
| | Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter | 690020-001 |

| Item | Component | Spare part number |
|-------------|---|--------------------------|
| | Cover Kit , includes: | 686272-001 |
| (19) | Hard drive compartment cover (includes one captive screw, secured by a C-clip) | |
| (20) | Memory module/wireless module compartment cover (includes one captive screw, secured by a C-clip) | |

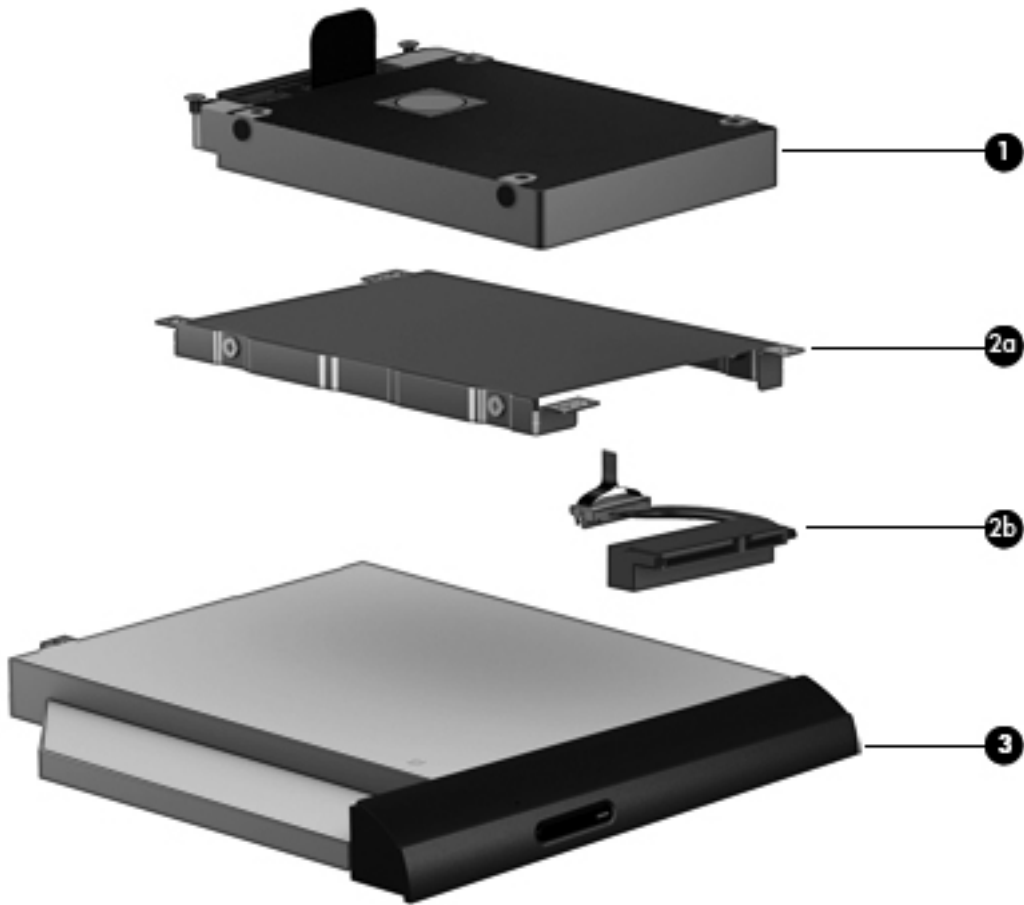
Display assembly subcomponents



| Item | Component | Spare part number |
|------|---|-------------------|
| (1) | Display bezel | 686255-001 |
| (2) | Webcam/microphone module (includes double-sided adhesive): | |
| | HD webcam/microphone module | 703461-001 |
| | Non-HD webcam/microphone module | 686285-001 |
| (3) | 15.6-in, LED, SVA, HD, BrightView display panel | 686273-001 |
| | Display Hinge Kit , includes: | 686262-001 |

| Item | Component | Spare part number |
|-------------|---|--------------------------|
| (4) | Left and right display hinge covers | |
| (5) | Left and right display hinges and vertical support brackets | |
| (6) | Display panel cable (includes webcam/microphone module cable) | 686256-001 |
| (7) | Antenna Kit (includes wireless antenna left and right (main and auxiliary) cables and transceivers) | 686249-001 |
| (8) | Display enclosure | 686251-001 |
| | Rubber Kit (not illustrated, includes front and rear rubber feet, display bezel rubber bumpers, and display bezel rubber screw covers) | 686276-001 |

Mass storage devices



| Item | Component | Spare part number |
|------|---|-------------------|
| (1) | Hard drive (does not include hard drive bracket, hard drive connector cable, or screws): | |
| | 750-GB, 5400-rpm, 9.5-mm | 634250-001 |
| | 640-GB, 5400-rpm, 9.5-mm | 669300-001 |
| | 500-GB, 5400-rpm, 9.5-mm | 669299-001 |
| | 500-GB, 5400-rpm, 7.0-mm | 683802-001 |
| | 320-GB, 5400-rpm, 9.5-mm | 622643-001 |
| | 320-GB, 5400-rpm, 7.0-mm | 645193-001 |
| | Hard Drive Hardware Kit , includes: | 686261-001 |
| (2a) | Hard drive bracket | |
| (2b) | Hard drive connector cable | |

| Item | Component | Spare part number |
|-------------|---|--------------------------|
| | Hard drive bracket screws (not illustrated) | |
| (3) | DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket) | 686268-001 |

Miscellaneous parts

| Component | Spare part number |
|---|--------------------------|
| 65-W HP Smart AC adapter (non-PFC, 3-wire) | 693711-001 |
| Power cord (3-pin, black, 1.83-m): | |
| For use in Denmark | 490371-081 |
| For use in Europe | 490371-021 |
| For use in Israel | 490371-BB1 |
| For use in North America | 490371-001 |
| For use in South Africa | 490371-AR1 |
| For use in Switzerland | 490371-111 |
| For use in the United Kingdom and Singapore | 490371-031 |
| Screw Kit | 686278-001 |

Sequential part number listing

| Spare part number | Description |
|-------------------|--|
| 490371-001 | Power cord for use in North America (3-pin, black, 1.83-m) |
| 490371-021 | Power cord for use in Europe (3-pin, black, 1.83-m) |
| 490371-031 | Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.83-m) |
| 490371-081 | Power cord for use in Denmark (3-pin, black, 1.83-m) |
| 490371-111 | Power cord for use in Switzerland (3-pin, black, 1.83-m) |
| 490371-AR1 | Power cord for use in South Africa (3-pin, black, 1.83-m) |
| 490371-BB1 | Power cord for use in Israel (3-pin, black, 1.83-m) |
| 593553-001 | 6-cell, 47-Wh, 2.20-Ah, Li-ion battery |
| 593554-001 | 6-cell, 55-Wh, 2.55-Ah, Li-ion battery |
| 622643-001 | 320-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686261-001. |
| 634250-001 | 750-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686261-001. |
| 641369-001 | 4-GB memory module (PC3, 12800, 1600-MHz) |
| 645193-001 | 320-GB, 5400-rpm, 7.0-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686261-001. |
| 652972-001 | 2-GB memory module (PC3, 12800, 1600-MHz) |
| 655795-001 | Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter |
| 657325-001 | Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter |
| 669299-001 | 500-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686261-001. |
| 669300-001 | 640-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686261-001. |
| 670691-001 | Ralink RT5390F 802.11b/g/n 1×1 WLAN module |
| 675794-001 | Atheros HB125 802.11b/g/n 1×1 WLAN module |

| Spare part number | Description |
|-------------------|--|
| 683802-001 | 500-GB, 5400-rpm, 7.0-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686261-001. |
| 686249-001 | Antenna Kit (includes wireless antenna left and right (main and auxiliary) cables and transceivers) |
| 686251-001 | Display enclosure |
| 686255-001 | Display bezel |
| 686256-001 | Display panel cable (includes webcam/microphone module cable) |
| 686257-001 | Optical drive connector cable (includes bracket) |
| 686258-001 | Power connector cable |
| 686261-001 | Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector cable, and screws) |
| 686262-001 | Display Hinge Kit (includes left and right display hinges and vertical support brackets and left and right display hinge covers) |
| 686268-001 | DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket) |
| 686269-001 | USB board (includes cable) |
| 686270-001 | Power button board (includes cable) |
| 686271-001 | TouchPad button board (includes bracket, TouchPad button board cable, and TouchPad cable) |
| 686272-001 | Cover Kit (includes hard drive compartment cover and memory module/wireless module compartment cover) |
| 686273-001 | 15.6-in, LED, SVA, HD, BrightView display panel |
| 686274-001 | RTC battery |
| 686276-001 | Rubber Kit (includes front and rear rubber feet, display bezel rubber bumpers, and display bezel rubber screw covers) |
| 686278-001 | Screw Kit |
| 686279-001 | Speakers (include speaker cables) |
| 686283-001 | Top cover (includes the TouchPad board) |
| 686285-001 | Non-HD webcam/microphone module (includes double-sided adhesive) |
| 688303-501 | System board for use on computer models equipped with an AMD E1-1200 processor (1.40-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory (includes processor and replacement thermal material) |
| 688306-001 | Fan/heat sink assembly (includes replacement thermal material) |
| 690019-001 | Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter |
| 690020-001 | Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter |
| 691415-001 | Ralink RT5390R 802.11bg/n 1×1 WiFi Adapter |
| 693711-001 | 65-W HP Smart AC adapter (non-PFC, 3-wire) |

| Spare part number | Description |
|--------------------------|--|
| 698694-031 | Keyboard for use in the United Kingdom and Singapore (includes keyboard cable) |
| 698694-041 | Keyboard for use in Germany (includes keyboard cable) |
| 698694-051 | Keyboard for use in France (includes keyboard cable) |
| 698694-061 | Keyboard for use in Italy (includes keyboard cable) |
| 698694-071 | Keyboard for use in Spain (includes keyboard cable) |
| 698694-131 | Keyboard for use in Portugal (includes keyboard cable) |
| 698694-141 | Keyboard for use in Turkey (includes keyboard cable) |
| 698694-151 | Keyboard for use in Greece (includes keyboard cable) |
| 698694-171 | Keyboard for use in Saudi Arabia (includes keyboard cable) |
| 698694-211 | Keyboard for use in Hungary (includes keyboard cable) |
| 698694-251 | Keyboard for use in Russia (includes keyboard cable) |
| 698694-261 | Keyboard for use in Bulgaria (includes keyboard cable) |
| 698694-271 | Keyboard for use in Romania (includes keyboard cable) |
| 698694-A41 | Keyboard for use in Belgium (includes keyboard cable) |
| 698694-B31 | Keyboard for use in the Netherlands (includes keyboard cable) |
| 698694-BA1 | Keyboard for use in Slovenia (includes keyboard cable) |
| 698694-BB1 | Keyboard for use in Israel (includes keyboard cable) |
| 698694-BG1 | Keyboard for use in Switzerland (includes keyboard cable) |
| 698694-DH1 | Keyboard for use in Denmark, Finland, and Norway (includes keyboard cable) |
| 698694-FL1 | Keyboard for use in the Czech Republic and Slovakia (includes keyboard cable) |
| 703461-001 | HD webcam/microphone module (includes double-sided adhesive) |
| 703563-501 | System board for use on computer models equipped with an AMD E1-1500 processor (1.48-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory (includes processor and replacement thermal material) |
| 708523-001 | Base enclosure for use (includes battery cover lock latch, battery cover release latch, power connector barrel, and RJ45 cover) |
| 716019-501 | System board for use on computer models equipped with an AMD E2-2000 processor (1.75-GHz, 1333-MHz, 18 W, dual core) and a UMA graphics subsystem memory (includes processor and replacement thermal material) |

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

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



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

Plastic parts



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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

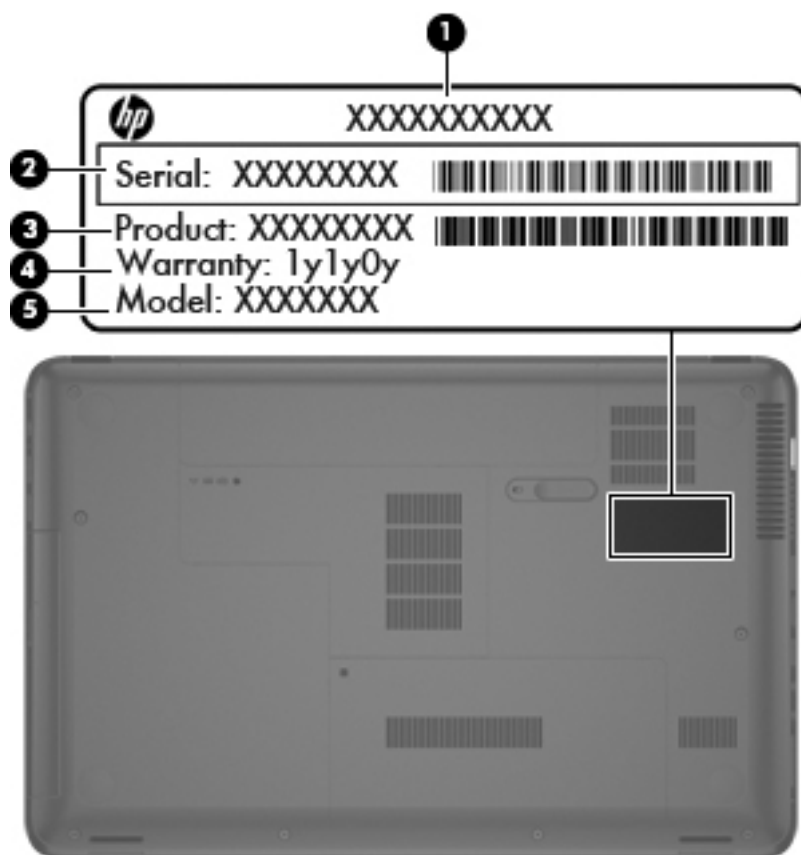
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 72 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag. It is necessary to remove the battery to obtain these numbers. See [Battery on page 35](#) for battery removal instructions.



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

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


Computer feet

The computer feet are adhesive-backed rubber pads. There are 4 rubber feet that attach to the base enclosure, as indicated in the illustration below. These rubber feet are available in the Rubber Kit, spare part number 686276-001.



Battery

| Description | Spare part number |
|--|-------------------|
| 6-cell, 55-Wh, 2.55-Ah, Li-ion battery | 593554-001 |
| 6-cell, 47-Wh, 2.20-Ah, Li-ion battery | 593553-001 |

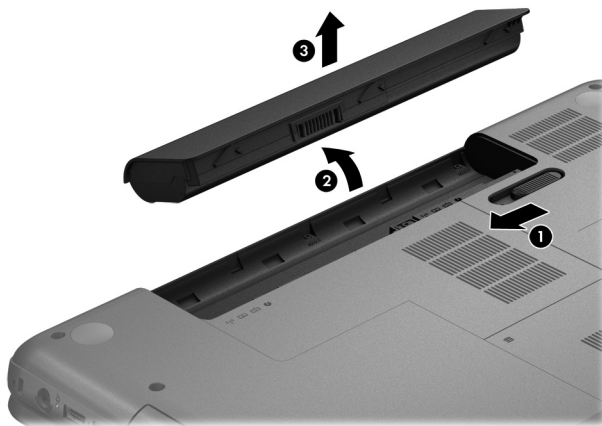
 **IMPORTANT:** The customer should not attempt to replace the computer battery, which is installed and sealed at the factory. A broken battery seal voids the computer and battery warranties. The computer has an internal rechargeable battery that can be replaced only by an authorized service provider.

Before disassembling the computer, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the front edge of the battery **(2)** up and back.
4. Remove the battery **(3)** from the computer.



To insert the battery:

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

Memory module

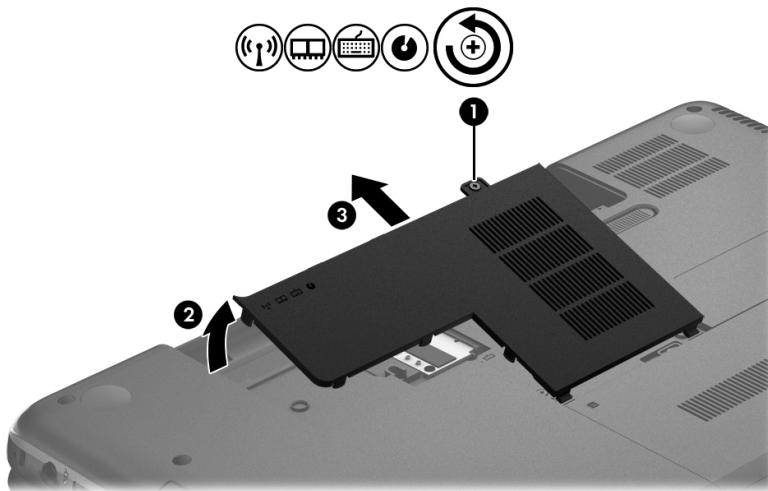
| Description | Spare part number |
|---|-------------------|
| 4-GB memory module (PC3, 12800, 1600-MHz) | 652972-001 |
| 2-GB memory module (PC3, 12800, 1600-MHz) | 641369-001 |

Before removing the memory module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)).

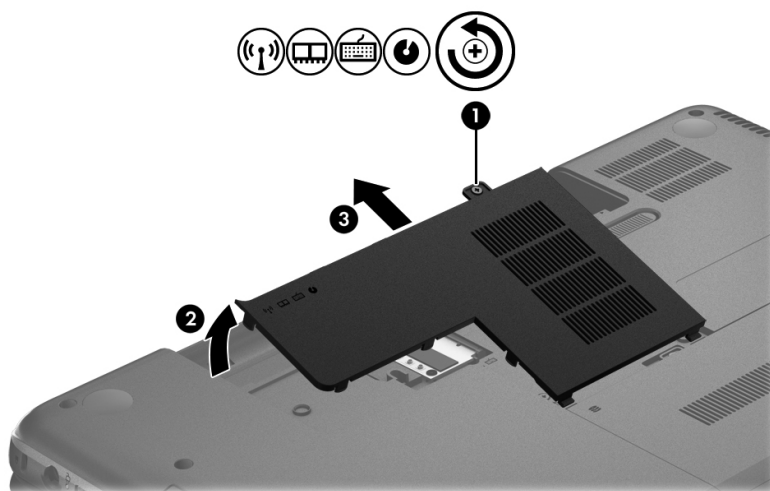
Remove the memory module:

1. Loosen the captive screw **(1)** that secures the memory module/wireless module compartment cover to the computer.
2. Lift the rear edge of the memory module/wireless module compartment cover **(2)** up and forward until it rests at an angle.
3. Remove the memory module/wireless module compartment cover **(3)** by sliding it away from the computer at an angle. The memory module/wireless module compartment cover is available in the Cover Kit, spare part number 686272-001.



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

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



Reverse this procedure to install a memory module.

WLAN module

| Description | Spare part number |
|--|-------------------|
| Atheros AR9565 802.11b/g/n 1x1 WiFi + BT4.0 Combo Adapter | 690019-001 |
| Atheros HB125 802.11b/g/n 1x1 WLAN module | 675794-001 |
| Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter | 655795-001 |
| Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter | 657325-001 |
| Ralink RT5390F 802.11b/g/n 1x1 WLAN module | 670691-001 |
| Ralink RT5390R 802.11bg/n 1x1 WiFi Adapter | 691415-001 |
| Ralink RT3290LE 802.11b/g/n 1x1 WiFi and Bluetooth 4.0 Combo Adapter | 690020-001 |

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

Before removing the WLAN module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

4. Remove the battery (see [Battery on page 35](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 36](#)).


Remove the WLAN module:

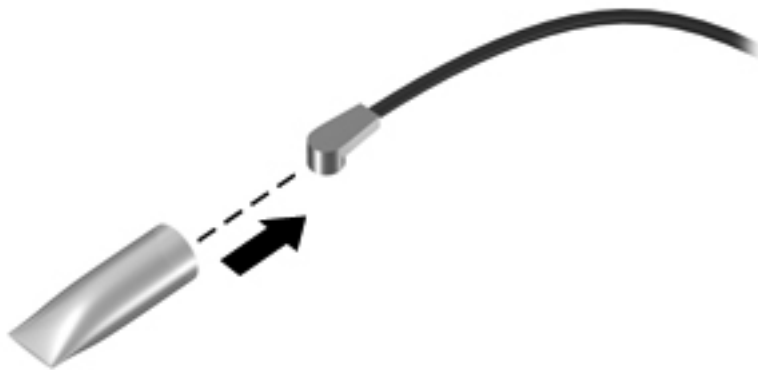
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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

2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)
3. Remove the WLAN module by pulling the module away from the slot at an angle **(3)**.




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



Reverse this procedure to install the WLAN module.

Keyboard

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

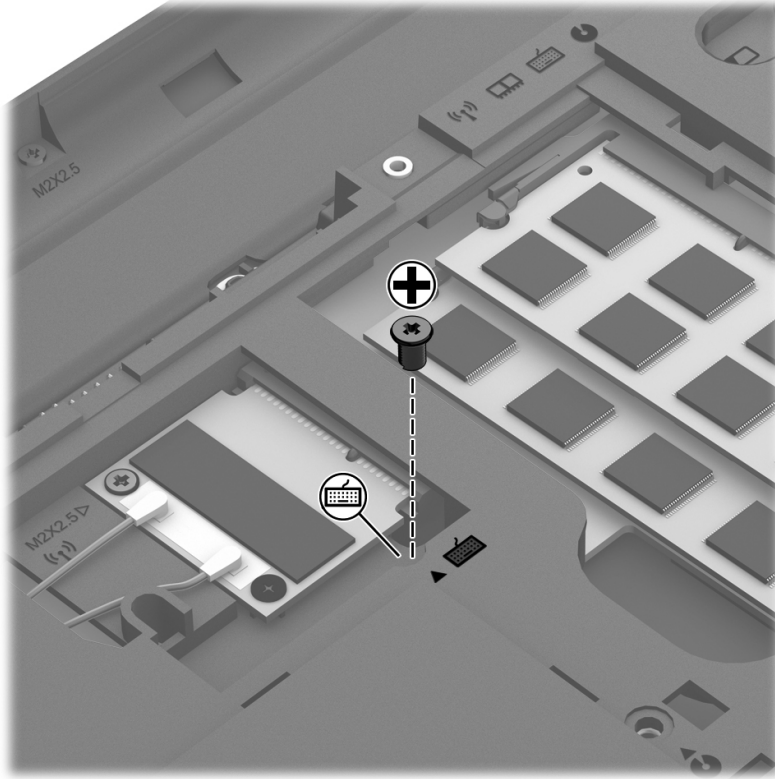
| For use in country/region | Spare part number | For use in country/region | Spare part number |
|--|-------------------|---|-------------------|
| For use in Belgium | 698694-A41 | For use in the Netherlands | 698694-B31 |
| For use in Bulgaria | 698694-261 | For use in Portugal | 698694-131 |
| For use in the Czech Republic and Slovakia | 698694-FL1 | For use in Romania | 698694-271 |
| For use in Denmark, Finland, and Norway | 698694-DH1 | For use in Russia | 698694-251 |
| For use in France | 698694-051 | For use in Saudi Arabia | 698694-171 |
| For use in Germany | 698694-041 | For use in Slovenia | 698694-BA1 |
| For use in Greece | 698694-151 | For use in Spain | 698694-071 |
| For use in Hungary | 698694-211 | For use in Switzerland | 698694-BG1 |
| For use in Israel | 698694-BB1 | For use in Turkey | 698694-141 |
| For use in Italy | 698694-061 | For use in the United Kingdom and Singapore | 698694-031 |

Before removing the keyboard, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 36](#)).

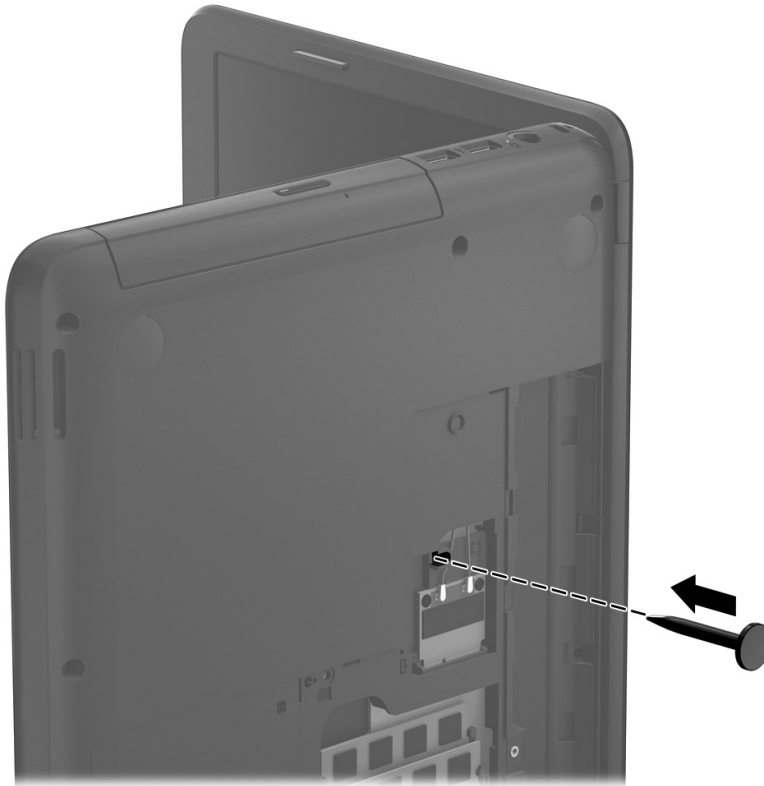
Remove the keyboard:

1. Remove the Phillips PM2.5×4.0 screw that secures the keyboard to the computer.



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

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



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



7. Release the zero insertion force (ZIF) connector **(1)** to which the keyboard cable is attached, and then disconnect the keyboard cable **(2)** from the system board.
8. Remove the keyboard **(3)**.



Reverse this procedure to install the keyboard.

Optical drive

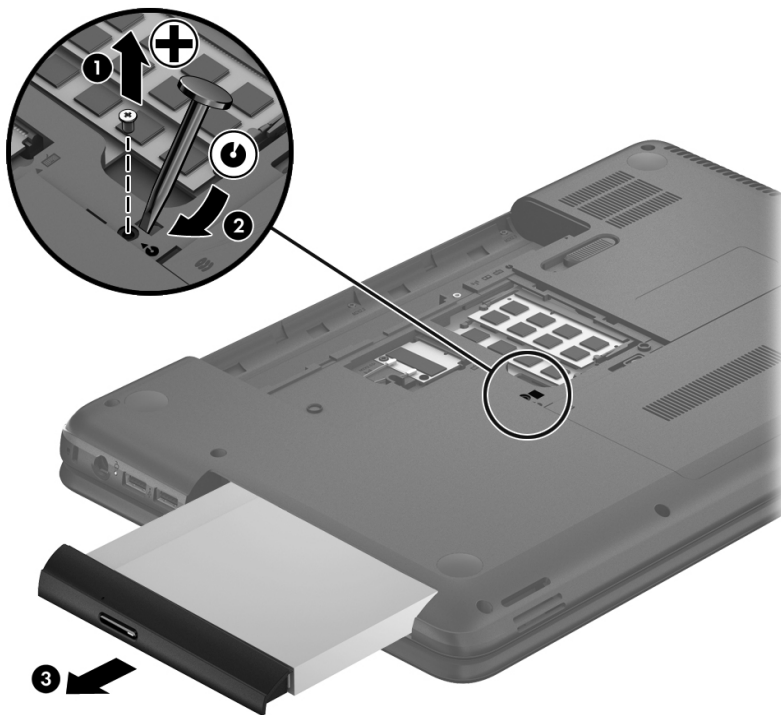
| Description | Spare part number |
|--|-------------------|
| DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket) | 686268-001 |

Before removing the optical drive, follow these steps:

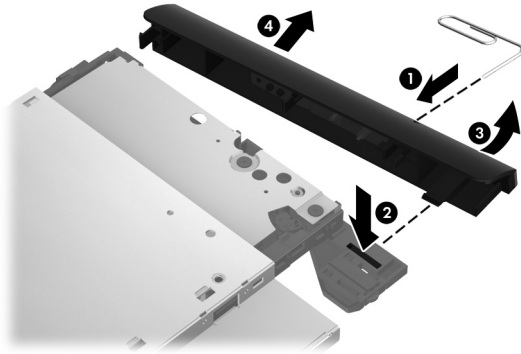
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 36](#)).

Remove the optical drive:

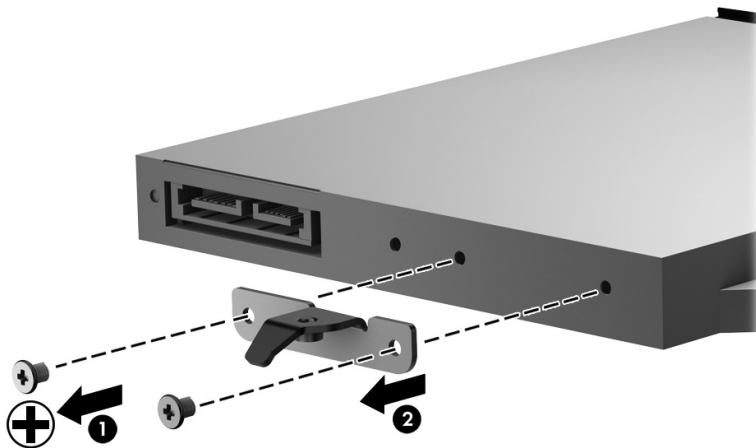
1. Remove the Phillips PM2.5×4.0 screw **(1)** that secures the optical drive to the computer.
2. Use a flat-blade screw driver or similar tool to press on the optical drive bracket tab **(2)** to release the optical drive.
3. Remove the optical drive **(3)** from the computer.



4. If it is necessary to replace the optical drive bezel, use a thin tool or an unbent paper clip **(1)** to release the optical drive tray.
5. Use a flat-blade screw driver or similar tool to press on the optical drive bezel tab **(2)** to release the optical drive bezel.
6. Release the left side of the optical drive bezel **(3)**.
7. Remove the optical drive bezel **(4)**.



8. If it is necessary to replace the optical drive bracket, position the optical drive with the rear panel toward you.
9. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.
10. Remove the optical drive bracket **(2)**.



Reverse this procedure to install the optical drive.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive bracket, hard drive connector cable, or screws.

| Description | Spare part number |
|---|-------------------|
| 750-GB, 5400-rpm, 9.5-mm | 634250-001 |
| 640-GB, 5400-rpm, 9.5-mm | 669300-001 |
| 500-GB, 5400-rpm, 9.5-mm | 669299-001 |
| 500-GB, 5400-rpm, 7.0-mm | 683802-001 |
| 320-GB, 5400-rpm, 9.5-mm | 622643-001 |
| 320-GB, 5400-rpm, 7.0-mm | 645193-001 |
| Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector cable, and screws) | 686261-001 |

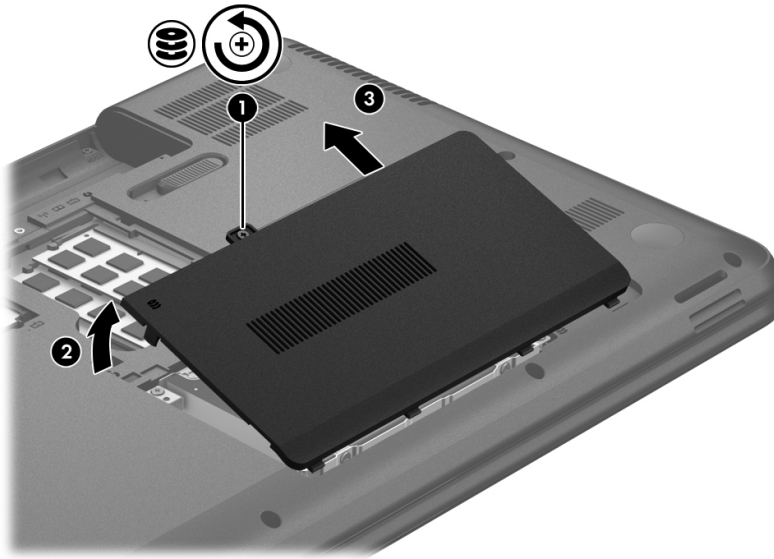
Before removing the hard drive, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 36](#)).

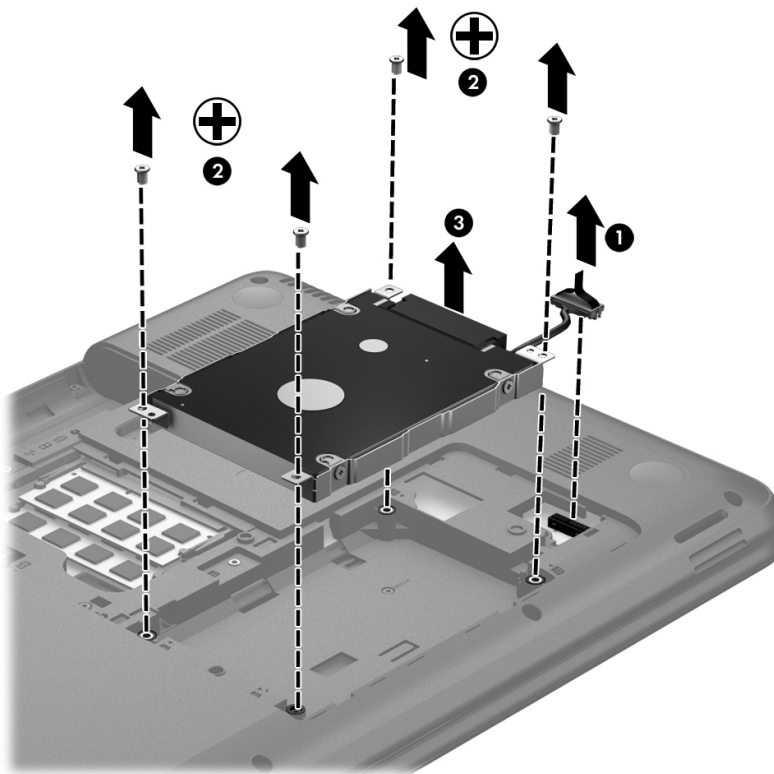
Remove the hard drive:

1. Loosen the captive screw **(1)** that secures the hard drive compartment cover to the computer.
2. Lift the rear edge of the hard drive compartment cover **(2)** up and forward until it rests at an angle.

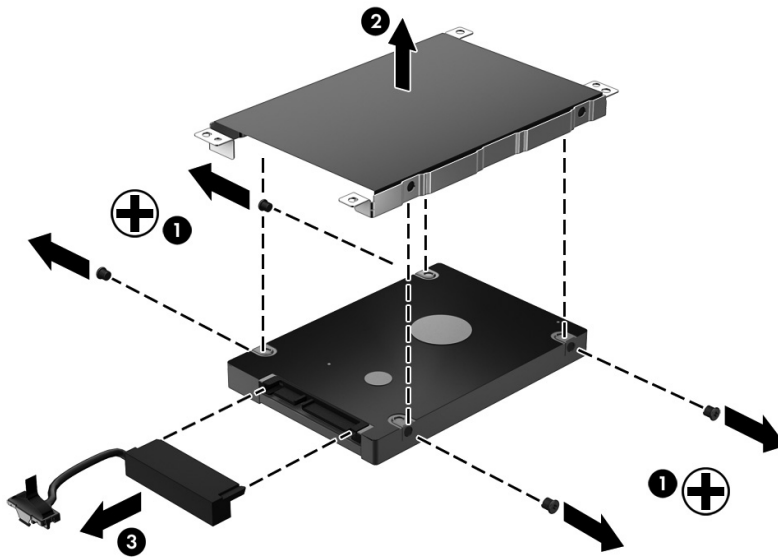
3. Remove the hard drive compartment cover **(3)** by sliding it away from the computer at an angle. The hard drive compartment cover is available in the Cover Kit, spare part number 686272-001.



4. Disconnect the hard drive connector cable **(1)** from the system board, and then release the cable from the clip **(2)** built into the base enclosure.
5. Remove the four Phillips PM2.5×4.0 screws **(3)** that secure the hard drive to the computer.
6. Remove the hard drive **(4)** from the hard drive bay.



- 7.** If it is necessary to disassemble the hard drive, perform the following steps:
- a.** Remove the four Phillips PM3.0×3.0 screws **(1)** that secure the hard drive bracket to the hard drive.
 - b.** Remove the hard drive bracket **(2)** from the hard drive.
 - c.** Disconnect the hard drive connector cable **(3)** from the hard drive. The hard drive bracket, hard drive connector cable, and screws are available in the Hard Drive Hardware Kit, spare part number 686261-001.



Reverse this procedure to reassemble and install the hard drive.

RTC battery

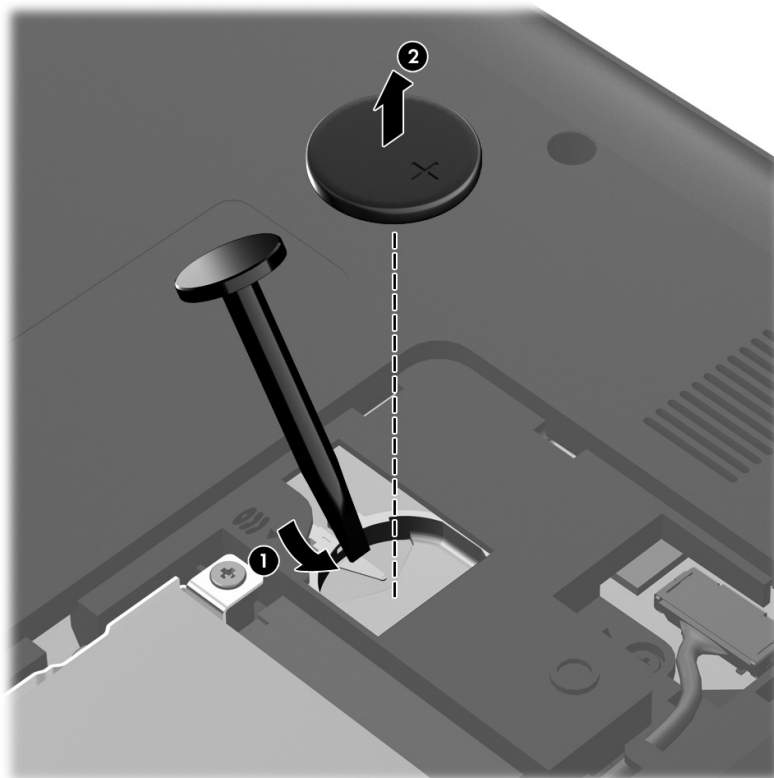
| Description | Spare part number |
|-------------|-------------------|
| RTC battery | 686274-001 |

Before removing the RTC battery, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Remove the memory module/wireless module compartment cover (see [Memory module on page 36](#)).
6. Remove the hard drive compartment cover (see [Hard drive on page 45](#)).

Remove the RTC battery:

1. Use a flat-bladed, non-metallic tool **(1)** to release the RTC battery from the socket on the system board.
2. Remove the RTC battery **(2)**.




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

Top cover

| Description | Spare part number |
|---|-------------------|
| Top cover (includes the TouchPad board) | 686283-001 |

Before removing the top cover, follow these steps:

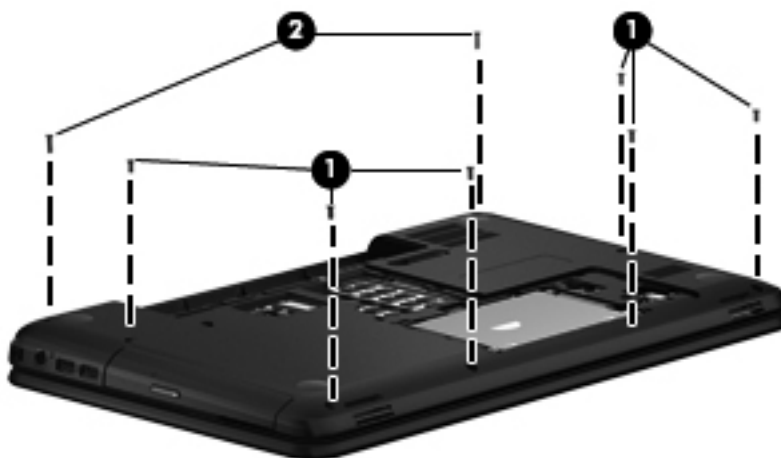
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))

 **NOTE:** When replacing the top cover, be sure to remove the following components from the defective top cover and install them on the replacement top cover:

- Power button board (see [Power button board on page 52](#))
- TouchPad button board (see [TouchPad button board on page 53](#))

Remove the top cover:

1. Remove the six Phillips PM2.5×6.5 screws **(1)** and the two Phillips PM2.5×10.0 screws **(2)** that secure the top cover to the computer.



2. Remove the four Phillips PM2.0×2.5 screws on the rear edge of the battery bay and in the hard drive bay that secure the top cover to the computer.

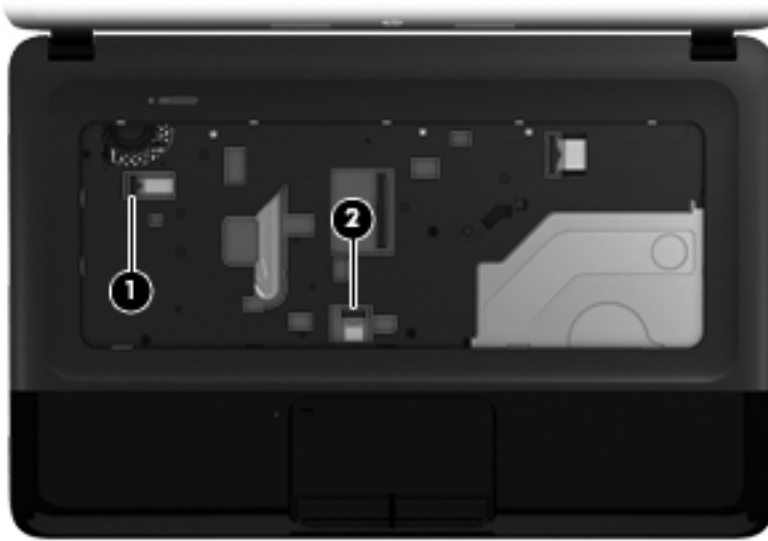


3. Remove the four Phillips PM2.5×4.0 screws on the front edge of the battery bay and near the hard drive connector that secure the top cover to the computer.

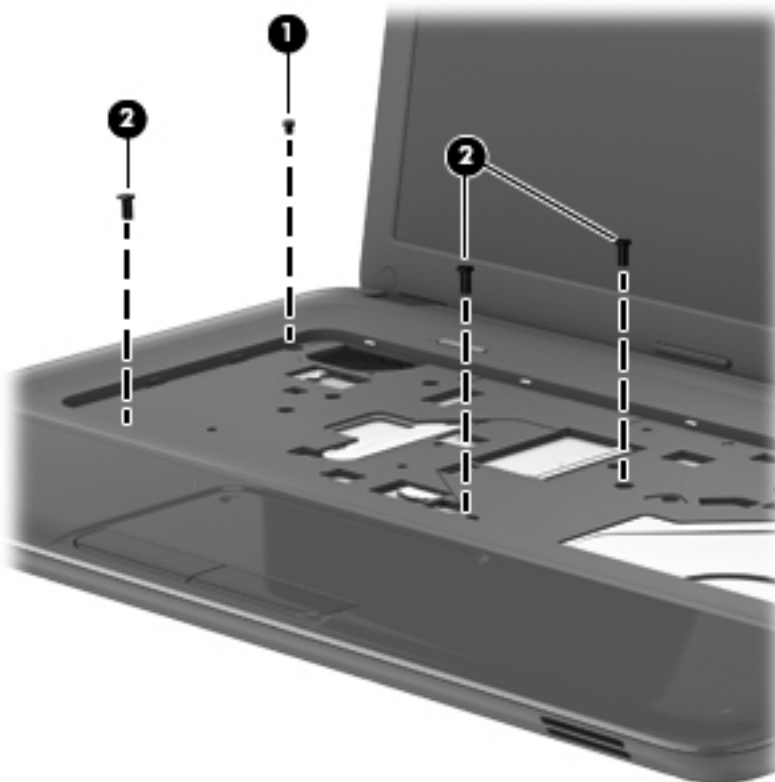


4. Turn the computer right side up, with the front toward you.
5. Open the computer.
6. Release the ZIF connector to which the power button board cable is connected, and then disconnect the power button board cable **(1)** from the system board.

7. Release the ZIF connector to which the TouchPad button board cable is connected, and then disconnect the TouchPad button board cable **(2)** from the system board.



8. Remove the Phillips PM2.0x2.5 screw **(1)** and the three Phillips PM2.5x6.5 screws **(2)** that secure the top cover to the computer.



9. Lift the rear edge of the top cover **(1)** and swing it up and forward until the left and right sides of the top cover detach from the base enclosure.

10. 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) | 686270-001 |

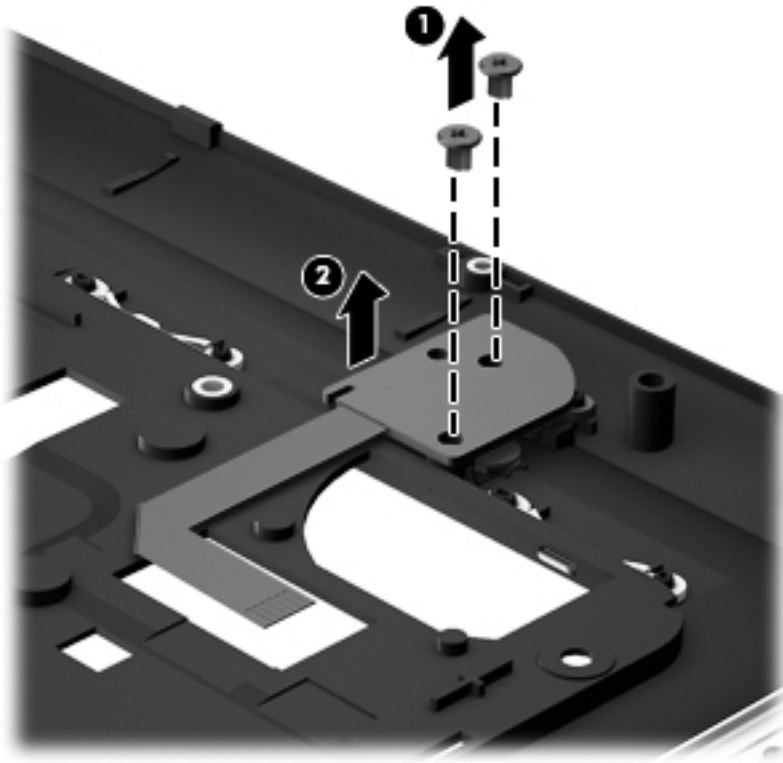
Before removing the power button board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))

Remove the power button board:

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

3. Remove the power button board (2).



Reverse this procedure to install the power button board.

TouchPad button board

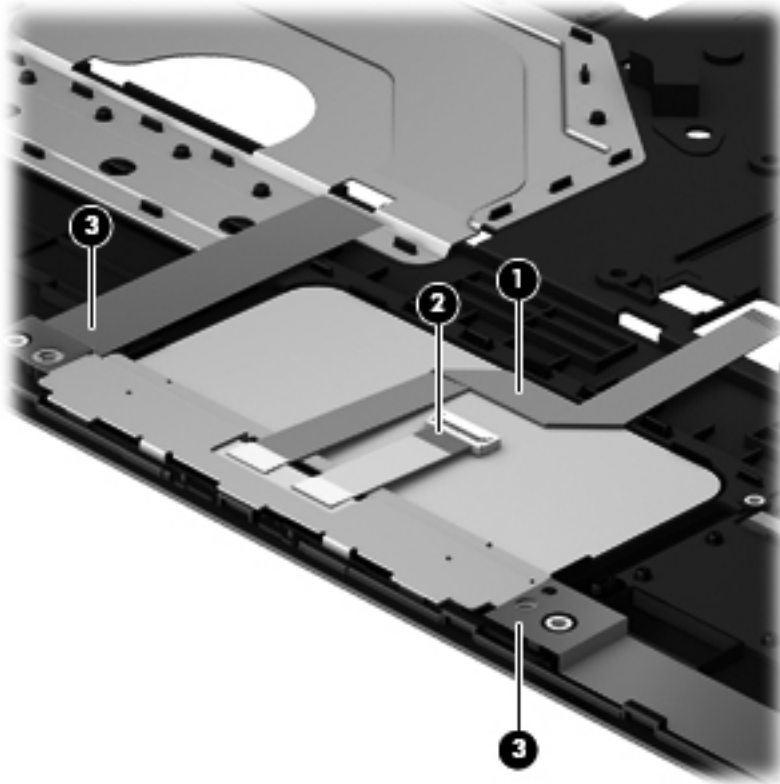
| Description | Spare part number |
|---|-------------------|
| TouchPad button board (includes bracket, TouchPad button board cable, and TouchPad cable) | 686271-001 |

Before removing the TouchPad button board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))

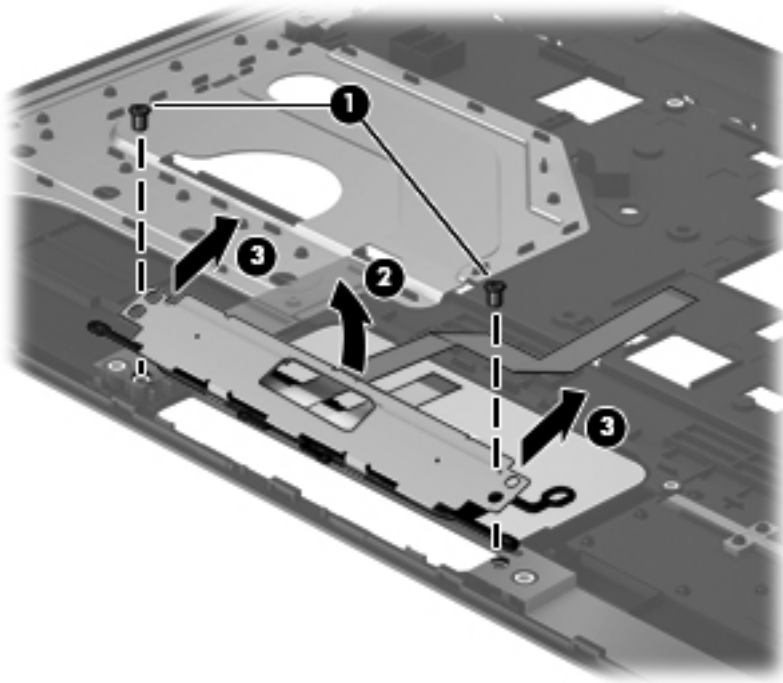
Remove the TouchPad button board:

1. Turn the top cover upside down, with the front toward you.
2. Detach the TouchPad button board cable **(1)** from the TouchPad. (The TouchPad button board cable is attached to the TouchPad with double-sided tape).
3. Release the ZIF connector to which the TouchPad board cable is connected, and then disconnect the TouchPad board cable **(2)** from the TouchPad board.
4. Release the two pieces of shielding tape that cover the left and right sides of the TouchPad button board **(3)**.



5. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the TouchPad button board to the top cover. Lift the rear edge of the TouchPad button board **(2)** until it rests at an angle.

6. Remove the TouchPad button board (3) by sliding it away from the top cover at an angle.



Reverse this procedure to install the TouchPad button board.

Optical drive connector cable

| Description | Spare part number |
|-------------------------------|-------------------|
| Optical drive connector cable | 686257-001 |

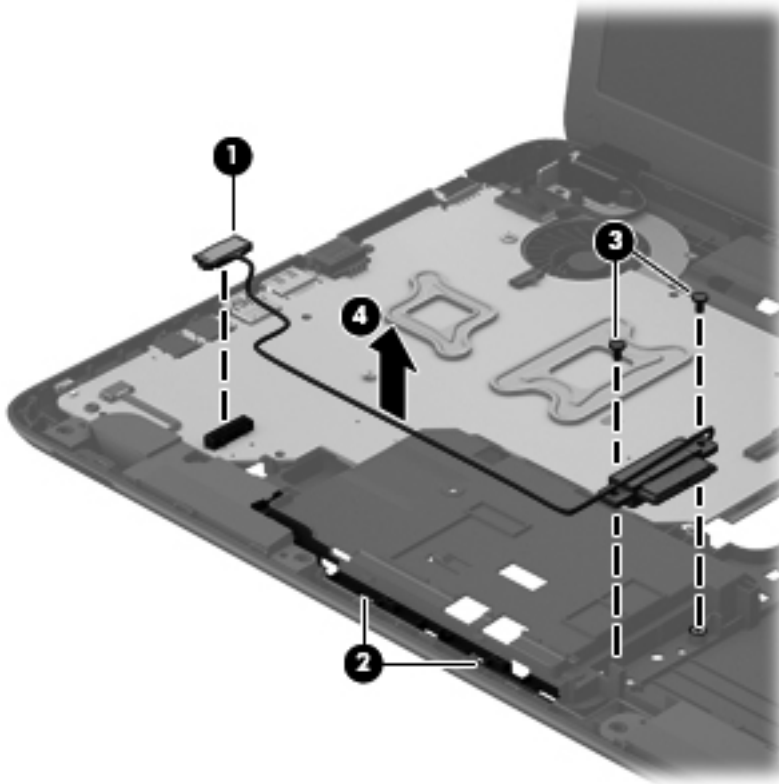
Before removing the optical drive connector cable, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))

Remove the optical drive connector cable:

1. Disconnect the optical drive connector cable **(1)** from the system board.
2. Release the optical drive connector cable from the clips **(2)** and routing channel built into the base enclosure.
3. Remove the two Phillips PM2.0×4.5 screws **(3)** that secure the optical drive connector to the base enclosure.

4. Remove the optical drive connector cable (4).



Reverse this procedure to install the optical drive connector cable.

Speakers

| Description | Spare part number |
|-----------------------------------|-------------------|
| Speakers (include speaker cables) | 686279-001 |

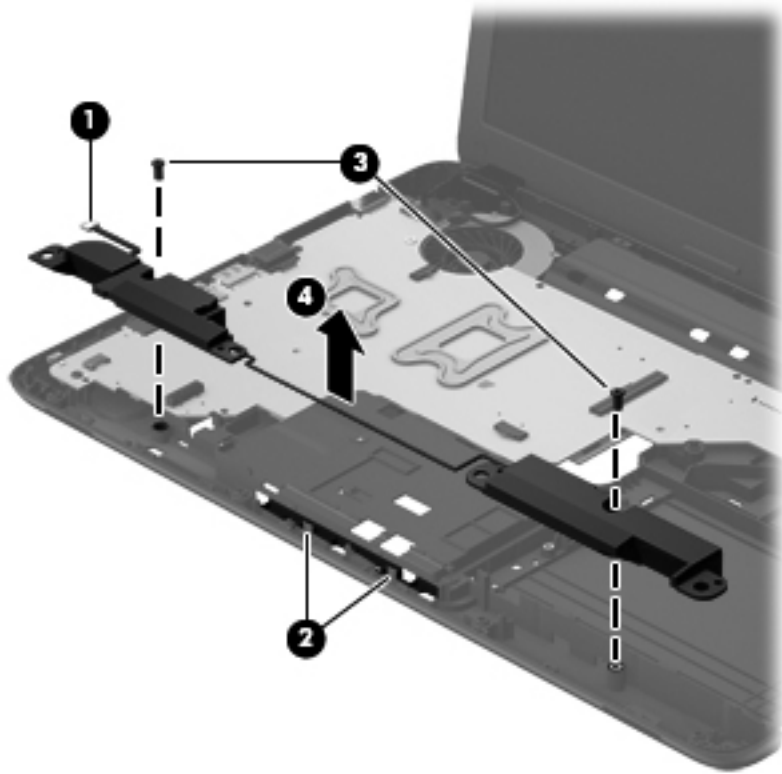
Before removing the speakers, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the system board.
2. Release the speaker cable from the clips **(2)** and routing channel built into the base enclosure.
3. Remove the two Phillips PM2.5×4.0 screws **(3)** that secure the speakers to the base enclosure.

4. Remove the speakers (4).



Reverse this procedure to install the speakers.

USB board

| Description | Spare part number |
|----------------------------|-------------------|
| USB board (includes cable) | 686269-001 |

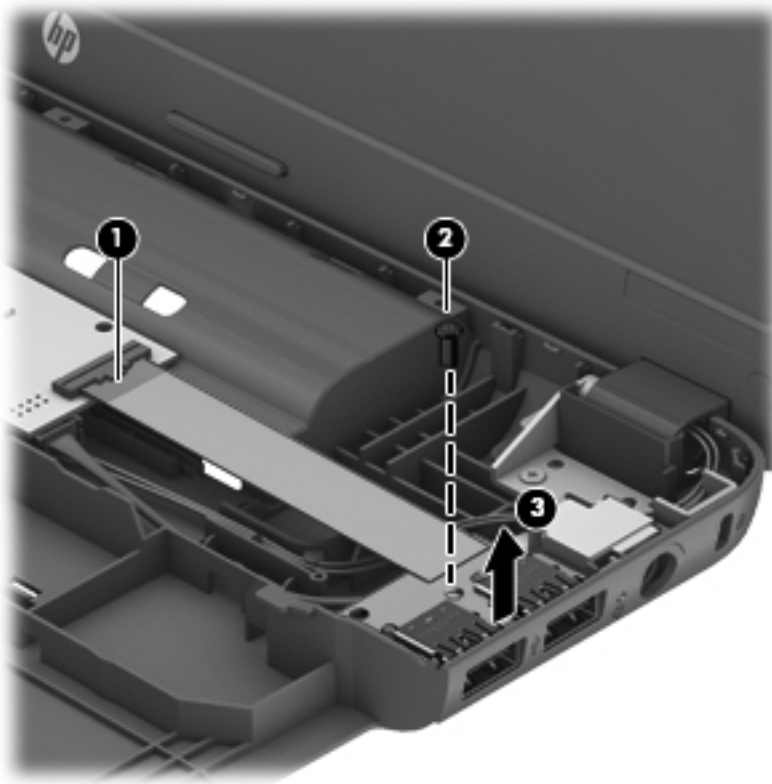
Before removing the USB board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))

Remove the USB board:

1. Release the ZIF connector to which the USB board cable is connected, and then disconnect the USB board cable **(1)** from the system board.
2. Remove the Phillips PM2.5×6.0 screw **(2)** that secures the USB board to the base enclosure.

3. Remove the USB board (3).



Reverse this procedure to install the USB board.

System board



NOTE: The system board spare part kit includes the processor and replacement thermal material.

| Description | Spare part number |
|---|-------------------|
| For use on computer models equipped with an AMD E2-2000 processor (1.75-GHz, 1333-MHz, 18 W, dual core) and a UMA graphics subsystem memory | 716019-501 |
| For use on computer models equipped with an AMD E1-1500 processor (1.48-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory | 703563-501 |
| For use on computer models equipped with an AMD E1-1200 processor (1.40-GHz, 1066-MHz, 18 W, dual core) and a UMA graphics subsystem memory | 688303-501 |

Before removing the system board, follow these steps:

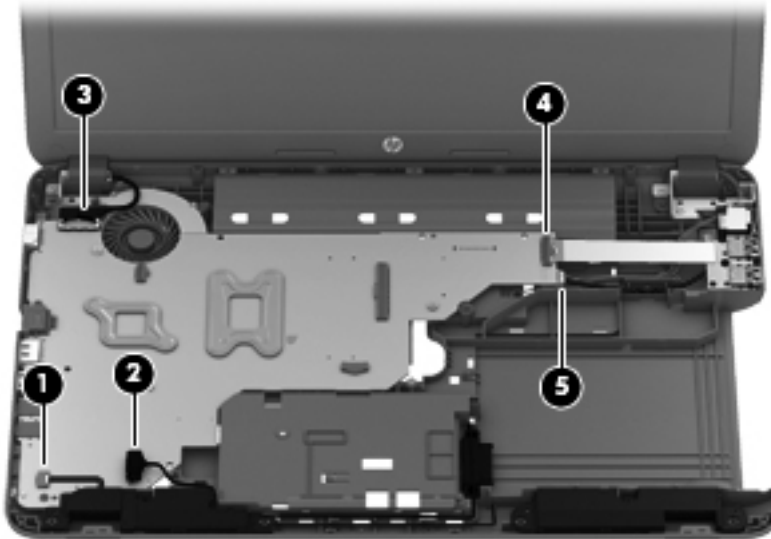
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Keyboard (see [Keyboard on page 39](#))
 - d. Optical drive (see [Optical drive on page 43](#))
 - e. Hard drive (see [Hard drive on page 45](#))
 - f. Top cover (see [Top cover on page 49](#))

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

- Memory module (see [Memory module on page 36](#))
- RTC battery (see [RTC battery on page 48](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 65](#))

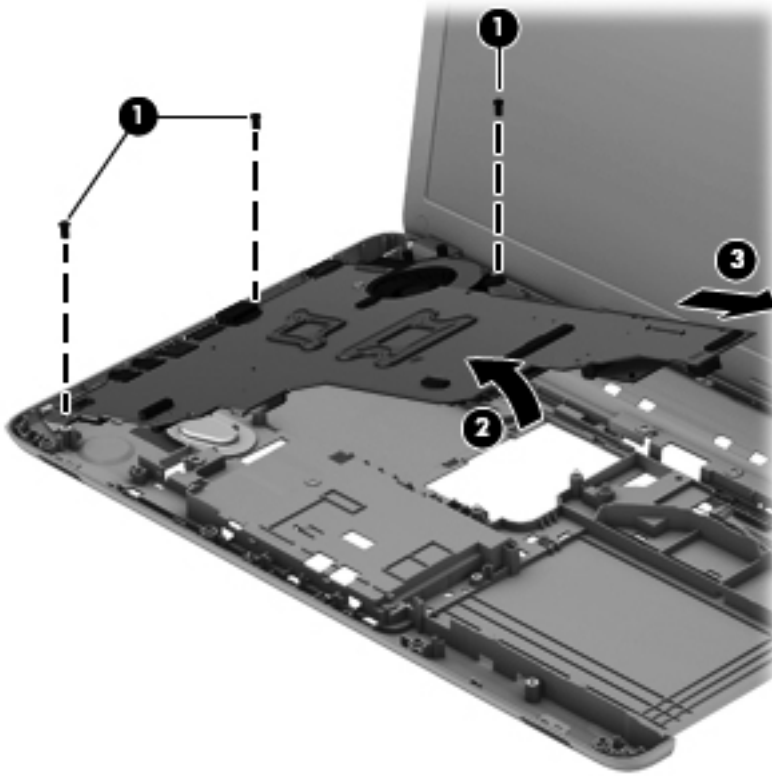
Remove the system board:

1. Disconnect the following cables from the system board.
 - (1) Speaker cable
 - (2) Optical drive connector cable
 - (3) Display panel cable
 - (4) USB board cable
 - (5) Power connector cable



2. Remove the three Phillips PM2.5×6.0 screws **(1)** that secure the system board to the base enclosure.
3. Lift the right side of the system board **(2)** until it rests at an angle.

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



Reverse this procedure to install the system board.

Fan/heat sink assembly

| Description | Spare part number |
|---|-------------------|
| Fan/heat assembly (includes replacement thermal material) | 688306-001 |


Before removing the fan/heat sink assembly, follow these steps:

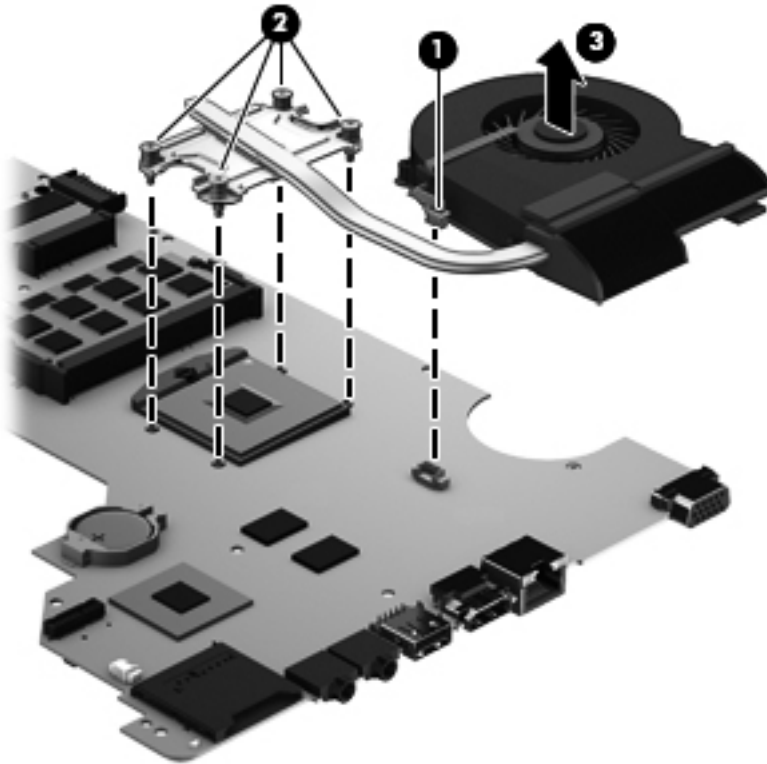
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))
 - e. System board (see [System board on page 62](#))

Remove the fan/heat sink assembly:


1. Turn the system board upside down, with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the four captive Phillips screws **(2)** that secure the fan/heat sink assembly to the system board.

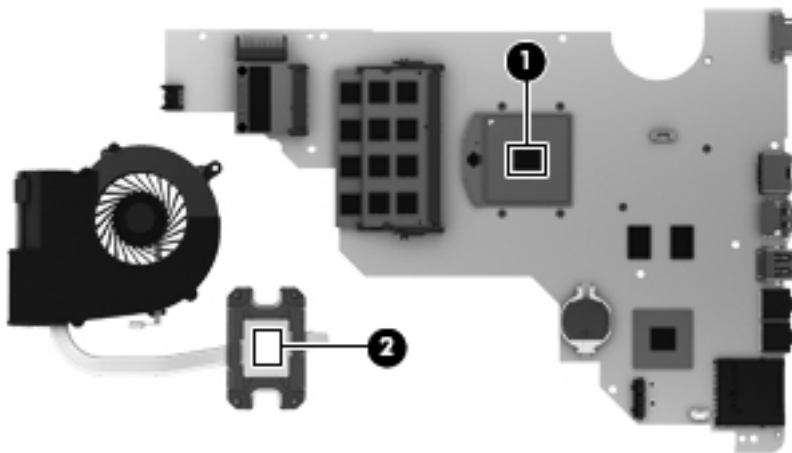
4. Remove the fan/heat sink assembly **(3)**.

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




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

 **NOTE:** The following illustration shows the replacement thermal material locations. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



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

Display assembly

 **NOTE:** The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

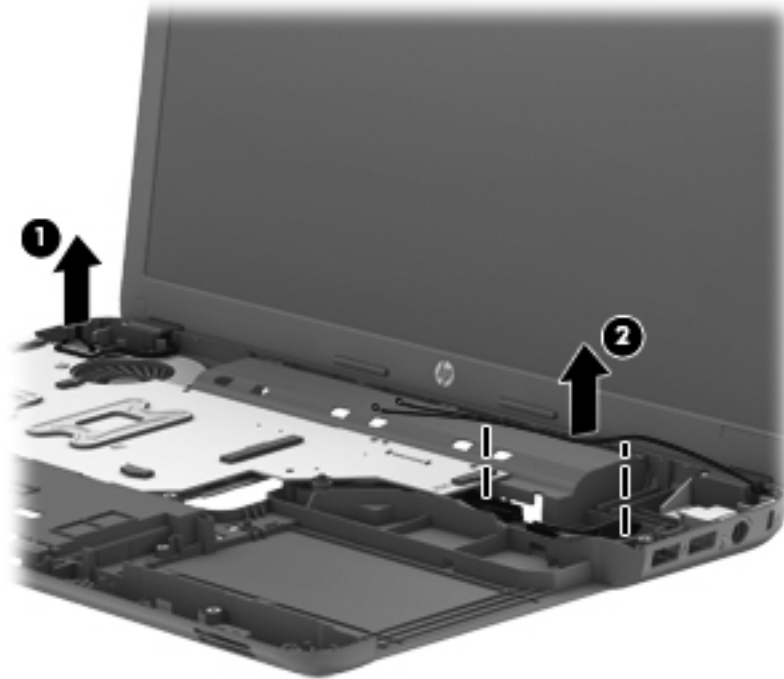
Before removing the display assembly, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [Memory module on page 36](#)).
6. Remove the following components:
 - a. Keyboard (see [Keyboard on page 39](#))
 - b. Hard drive (see [Hard drive on page 45](#))
 - c. Top cover (see [Top cover on page 49](#))

Remove the display assembly:

1. Disconnect the display panel cable **(1)** from the system board.

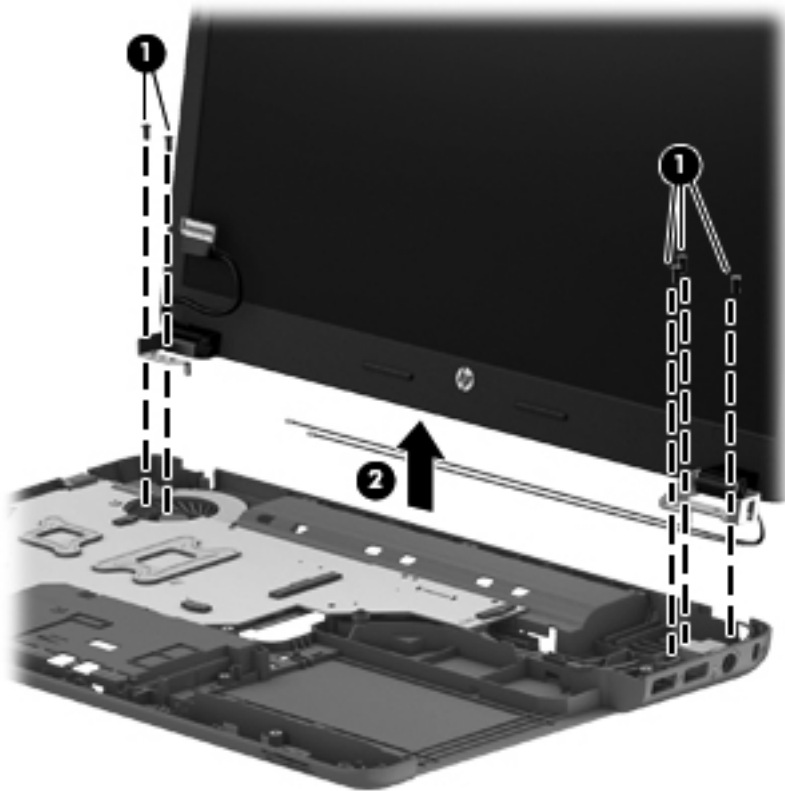
2. Release the wireless antenna cables **(2)** from the clips and routing channel built into the base enclosure.



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

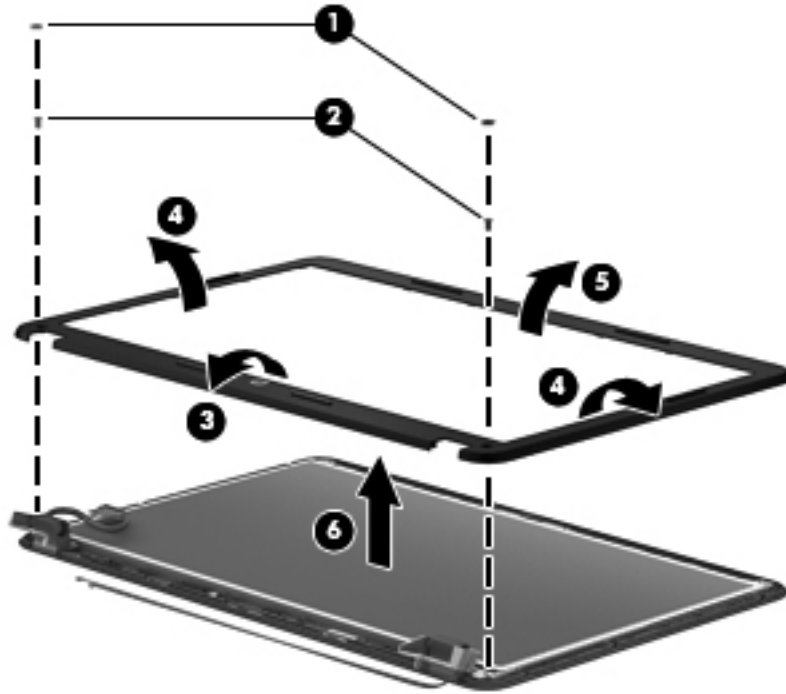
3. Remove the five Phillips PM2.5×6.5 screws **(1)** that secure the display assembly to the base enclosure.

4. Remove the display assembly **(2)**.



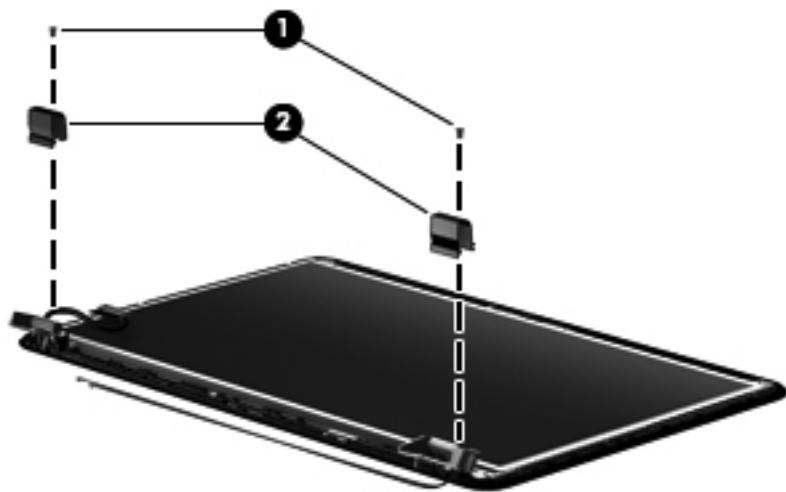
5. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
 - a. Remove the two display bezel screw covers **(1)** and the two Phillips PM2.5×5.5 screws **(2)** that secure the display bezel to the display assembly. The display bezel screw covers are available in the Rubber Kit, spare part number 686276-001.
 - b. Flex the inside edges of the bottom edge **(3)**, the left and right sides **(4)**, and the top edge **(5)** of the display bezel until the bezel disengages from the display enclosure.

- c. Remove the display bezel **(6)**. The display bezel is available using spare part number 686255-001.

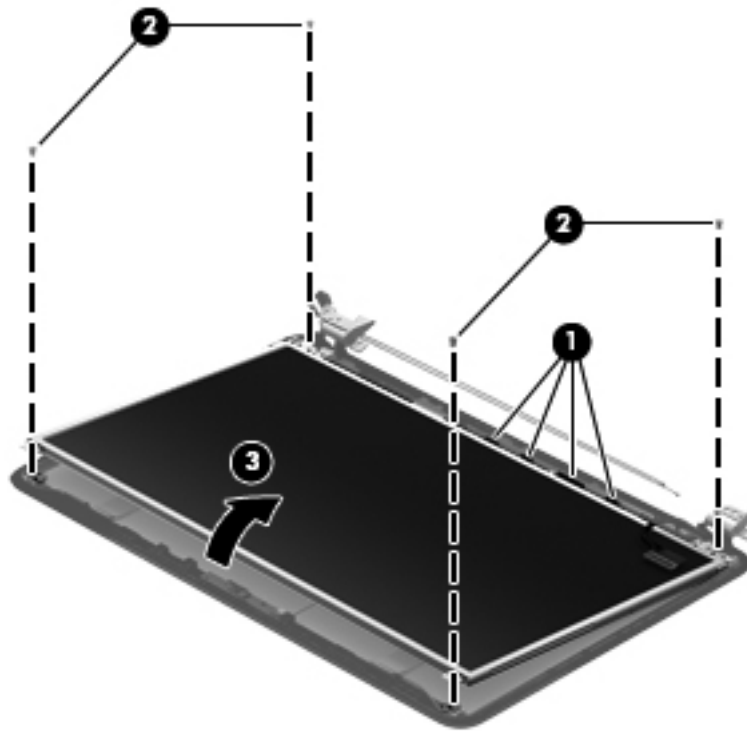


- 6. If it is necessary to replace the display hinge covers:

- a. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the display hinge covers to the display enclosure.
- b. Remove the display hinge covers **(2)**. The display hinge covers are available using spare part number 686262-001.

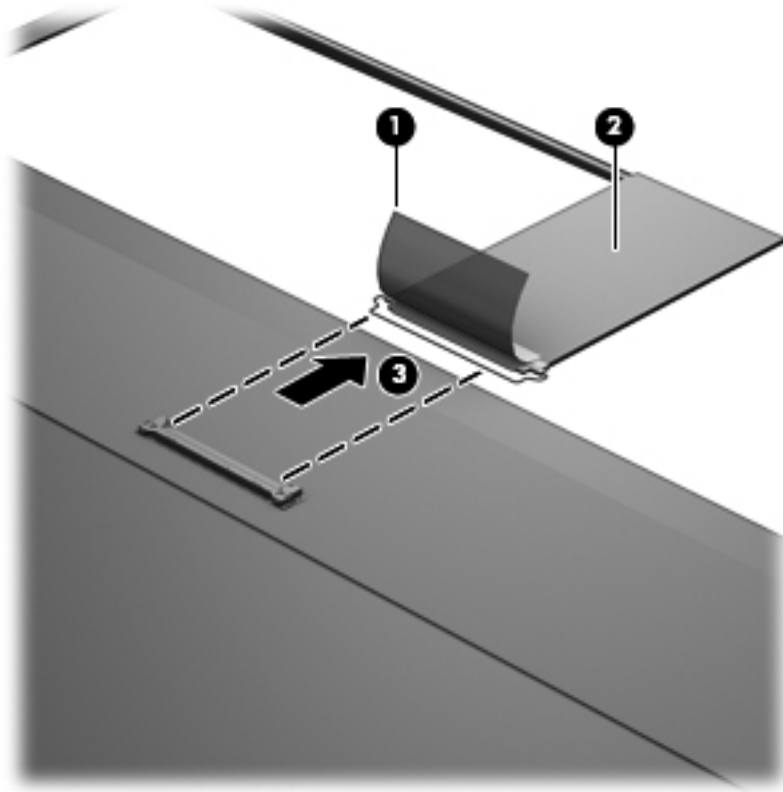


7. If it is necessary to replace the display panel:
- Release the display panel cable **(1)** from the clips built into the bottom edge of the display enclosure.
 - Remove the four Phillips PM2.5×4.0 screws **(2)** that secure the display panel to the display enclosure.
 - Lift the top edge of the display panel **(3)**, and then swing it up and forward until it rests upside down in front of the display enclosure.



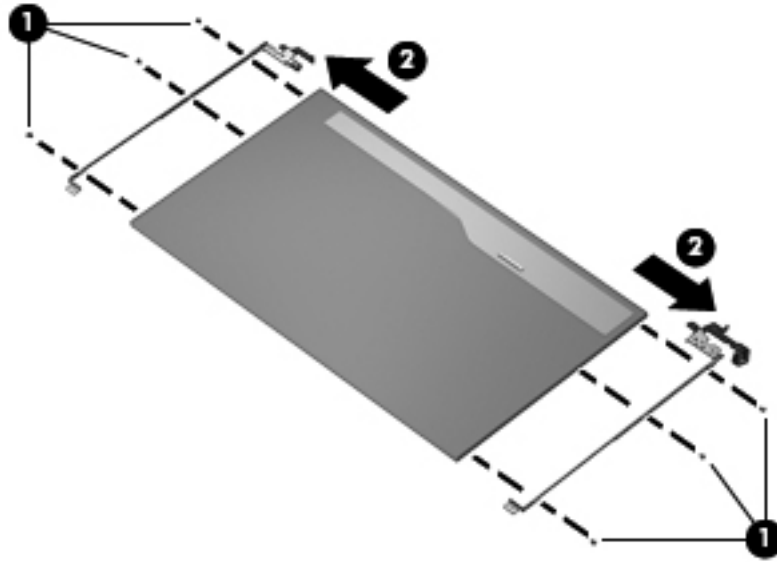
- Release the adhesive support strip **(1)** that secures the display panel cable to the display panel.
- Detach the display panel cable **(2)** from the display panel. (The display panel cable is attached to the display panel with double-sided tape.)

- f. Disconnect the display panel cable **(3)** from the display panel.



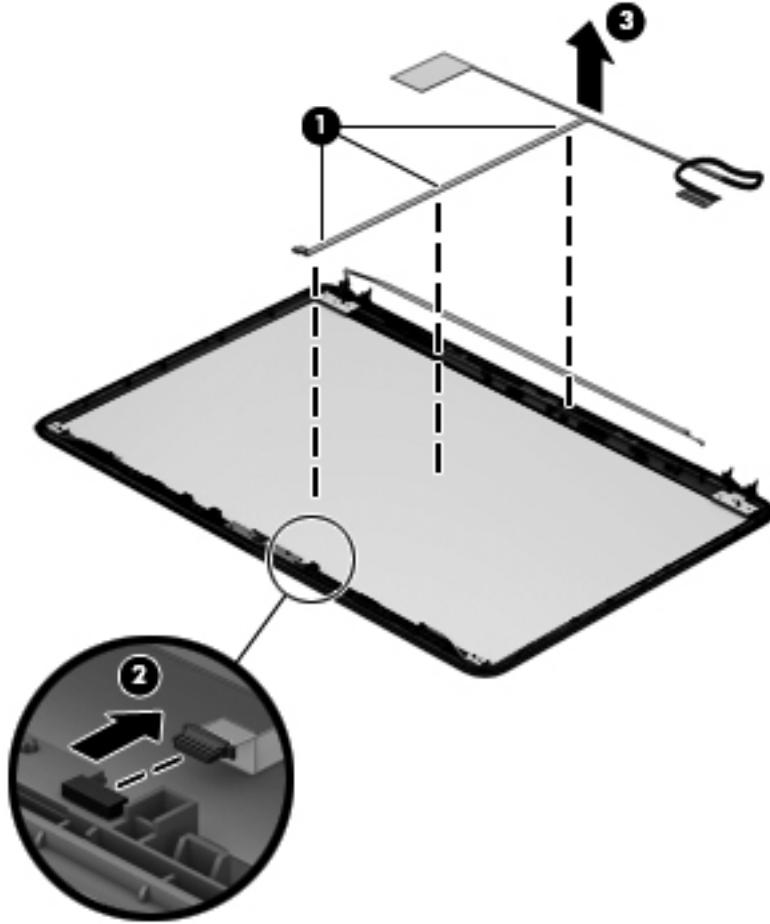
- g. Remove the display panel. The display panel is available using spare part number 686273-001.
- 8.** If it is necessary to replace the display hinges:
- a. Remove the six Phillips PM2.0×3.5 screws **(1)** that secure the display hinges to the display panel.

- b.** Remove the display hinges (**2**). The display hinges are available using spare part number 686262-001.



- 9.** If it is necessary to replace the display panel cable:
 - a.** Detach the display panel cable (**1**) from the display enclosure. (The display panel cable is attached to the display enclosure with double-sided tape in multiple locations.)
 - b.** Disconnect the webcam/microphone cable (**2**) from the webcam/microphone module.

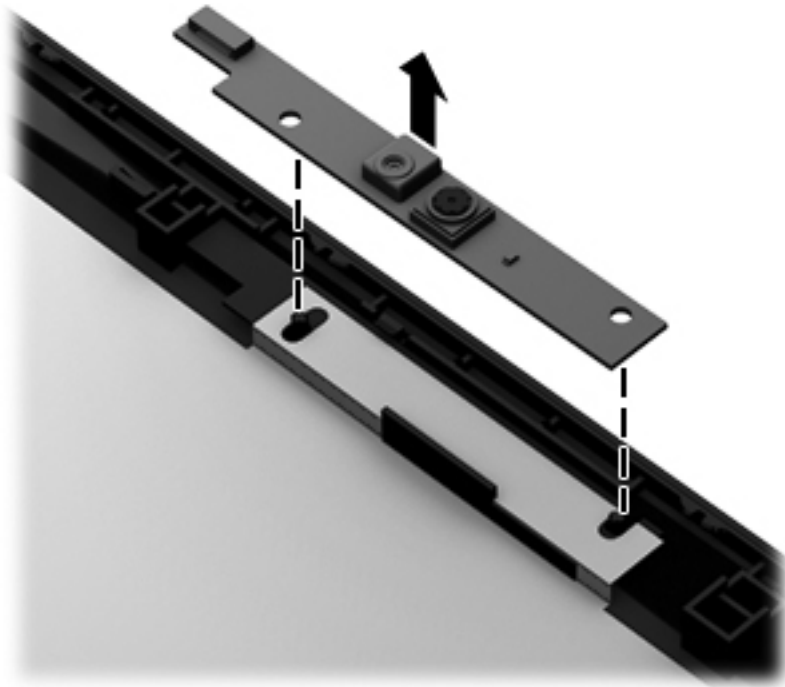
- c. Remove the display panel cable **(3)**. The display panel cable is available using spare part number 686256-001 and includes the webcam/microphone cable.



10. If it is necessary to replace the webcam/microphone module, gently detach the webcam/microphone module from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided tape.)

⚠ CAUTION: Due to the thin profile of the webcam/microphone module, it is easily damaged. Take extra precaution to ensure the webcam/microphone module is not damaged when removing and replacing the module.

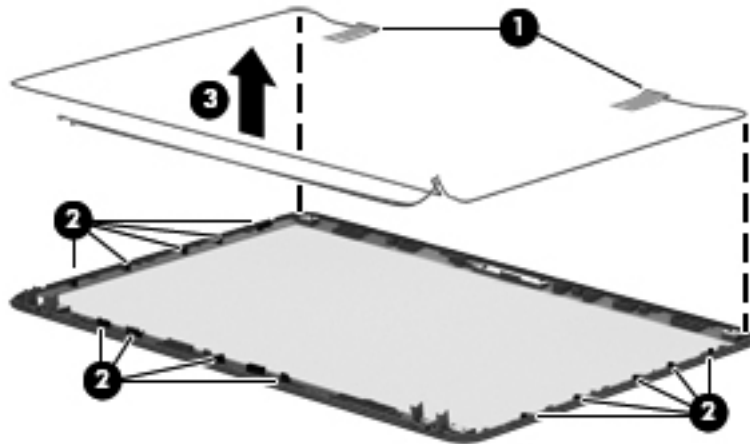
The webcam/microphone module is available using spare part numbers 703461-001 (HD webcam/microphone module) and 686285-001 (non-HD webcam/microphone module).



📄 NOTE: Depending on computer model, some computer models may be equipped one or two sets of wireless antenna cables and transceivers.

11. If it is necessary to replace the wireless antenna cables and transceivers:
 - a. Detach the wireless antenna transceivers **(1)** from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)
 - b. Release the wireless antenna cables from the clips and routing channels along the left, right, and bottom edges of the display enclosure **(2)**.

- c. Remove the wireless antenna cables and transceivers **(3)**. The wireless antenna cables and transceivers are available using spare part number 686249-001.



Reverse this procedure to install the display assembly.

Power connector cable

| Description | Spare part number |
|--|-------------------|
| Power connector cable (includes bracket) | 686258-001 |

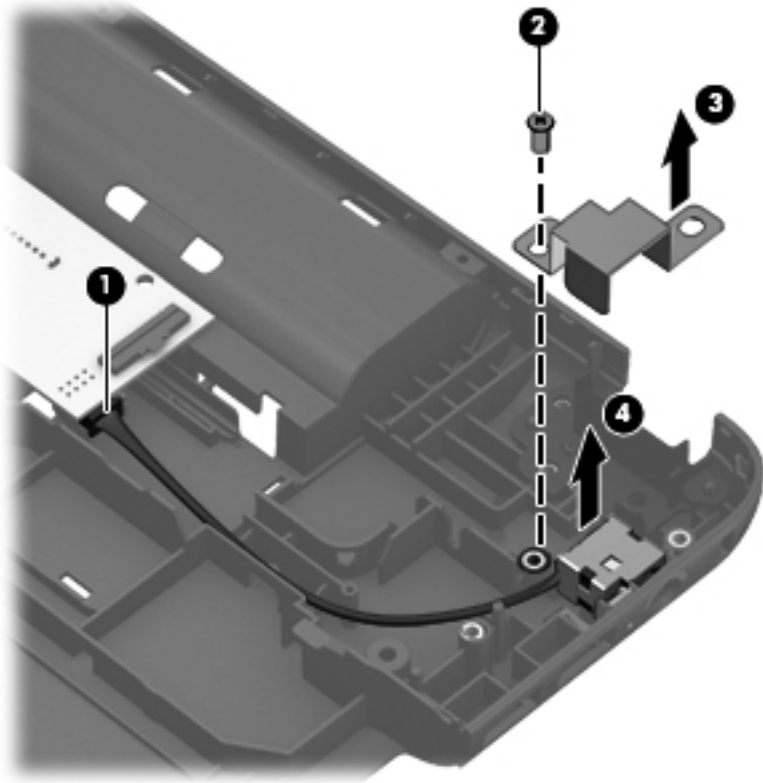
Before removing the power connector cable, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 35](#)), and then remove the following components:
 - a. Memory module/wireless module compartment cover (see [Memory module on page 36](#))
 - b. Keyboard (see [Keyboard on page 39](#))
 - c. Hard drive (see [Hard drive on page 45](#))
 - d. Top cover (see [Top cover on page 49](#))
 - e. Display assembly (see [Display assembly on page 67](#))

Remove the power connector cable:

1. Disconnect the power connector cable **(1)** from the system board.
2. Remove the Phillips PM2.5×6.5 screw **(2)** that secures the power connector and bracket to the base enclosure.

3. Remove the power connector bracket **(3)**.
4. Remove the power connector cable **(4)**.



Reverse this procedure to install the power connector cable.


5 Using Setup Utility (BIOS) and System Diagnostics

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

Starting Setup Utility (BIOS)

To start Setup Utility (BIOS), turn on or restart the computer, quickly press **esc**, and then press **f10**.

Information about how to navigate in Setup Utility (BIOS) is located at the bottom of the screen.

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

Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called SoftPaqs.

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


Determining the BIOS version

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

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

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

Downloading a BIOS update

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


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

Do not shut down the computer or initiate Sleep.

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

1. From the Start screen, select the **HP Support Assistant** app.
2. Select **Updates and tune-ups**, and then select **Check for HP updates now**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
 - a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the on-screen instructions to download your selection to the hard drive.

Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.


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

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

1. From the Start screen, type *e*, and then select **File Explorer**.
2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename.exe*).

The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.

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

Using System Diagnostics

System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly.

To start System Diagnostics:

1. Turn on or restart the computer, quickly press `esc`, and then press `f2`.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



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

6 Specifications

Computer specifications

| | Metric | U.S. |
|---|---|---------------------|
| Dimensions | | |
| Width | 37.60 cm | 14.80 in |
| Depth | 24.70 cm | 9.72 in |
| Height (front to rear) | 3.05 to 3.58 cm | 1.20 to 1.41 in |
| Weight | 2.45 kg | 5.39 lb |
| Input power | | |
| Operating voltage and current | 18.5V/ 3.5A or 19.5V/ 3.33A – 65W 19V/ 4.74A or 19.5V/ 4.62A – 90W | |
| Temperature | | |
| Operating | 5°C to 35°C | 41°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Relative humidity (noncondensing) | | |
| Operating | 10% to 90% | |
| Nonoperating | 5% to 95% | |
| Maximum altitude (unpressurized) | | |
| Operating | -15 m to 3,048 m | -50 ft to 10,000 ft |
| Nonoperating | -15 m to 12,192 m | -50 ft to 40,000 ft |
| NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures. | | |

15.6-in, SVA, display panel display specifications

| | Metric | U.S. |
|--------------------------------|--|-------------|
| Dimensions | | |
| Height | 19.6 cm | 7.72 in |
| Width | 34.7 cm | 13.66 in |
| Diagonal | 39.8 cm | 15.67 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 200:1 (typical) | |
| Brightness | 250 nits (typical) | |
| Pixel resolution | | |
| Pitch | 0.197 × 0.197 mm | |
| Format | 1366 × 768 | |
| Configuration | RGB vertical stripe | |
| Backlight | LED | |
| Character display | 80 × 25 | |
| Total power consumption | 3.46 W | |
| Viewing angle | ±65° horizontal, +50° vertical (typical) | |

Hard drive specifications

| | 640-GB* | 500-GB* | 320-GB* |
|--|-----------------------------|----------------|----------------|
| Dimensions | | | |
| Height | 9.5 mm | 9.5 mm | 9.5 mm |
| Length | 100.4 mm | 100.4 mm | 100.4 mm |
| Width | 69.9 mm | 69.9 mm | 69.9 mm |
| Weight | 110 g | 110 g | 110 g |
| Interface type | SATA | SATA | SATA |
| Transfer rate | | | |
| Synchronous (maximum) | 1.1 GB/sec | 1.1 GB/sec | 1.1 GB/sec |
| Security | ATA security | ATA security | ATA security |
| Seek times (typical read, including setting) | | | |
| Single track | 1.5 ms | 1.5 ms | 1.5 ms |
| Average (read/write) | 11/13 ms | 11/13 ms | 11/13 ms |
| Maximum | 22 ms | 22 ms | 22 ms |
| Logical blocks | 1,250,269,655 | 976,773,168 | 628,142,448 |
| Disk rotational speed | 5400 rpm | 5400 rpm | 5400 rpm |
| Operating temperature | 0°C to 60°C (32°F to 140°F) | | |
| *1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. | | | |
| NOTE: Certain restrictions and exclusions apply. Contact technical support for details. | | | |

7 Backing up, restoring, and recovering

Your computer includes tools provided by HP and the operating system to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your computer to a proper working state or even back to the original factory state, all with simple steps.

This chapter provides information about the following processes:

- Creating recovery media and backups
- Restoring and recovering your system



NOTE: This guide describes an overview of backing up, restoring and recovering options. For more details about the tools provided, see Help and Support. From the Start screen, type **h**, and then select **Help and Support**.

Creating recovery media and backups

Recovery after a system failure is only as good as your most recent backup.

1. After you successfully set up the computer, create HP Recovery media. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced.

HP Recovery media you create will provide the following recovery options:

- System Recovery—Reinstalls the original operating system and the programs that were installed at the factory.
- Minimized Image Recovery—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.
- Factory Reset—Restores the computer to the state its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

See [Creating HP Recovery media on page 85](#).

2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows creates a system restore point for you automatically during a Windows update and during other system maintenance (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Windows Help and Support. From the Start screen, type **h**, and then select **Help and Support**.
3. As you add photos, video, music, and other personal files, create a backup of your personal information. Windows File History can be set to regularly and automatically back up files from libraries, Desktop, contacts, and favorites. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can restore the files that you backed up using File History. Restoring files is also useful if you ever choose to reset the computer by reinstalling Windows or choose to recover using HP Recovery Manager.



NOTE: File History is not enabled by default, so you must turn it on.

For more information and steps for enabling Windows File History, see Windows Help and Support. From the Start screen, type **h**, and then select **Help and Support**.

Creating HP Recovery media

HP Recovery Manager is a software program that offers a way to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and the software programs installed at the factory, and then configures the settings for the programs. HP Recovery media can also be used to customize the system or aid in the replacement of a hard drive.

- Only one set of HP Recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the blank USB flash drive or the number of blank DVD discs that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or instead you can use a high-quality blank USB flash drive.
- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.
- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Recovery Media Creation**, and follow the on-screen instructions to continue.

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 88](#).

Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:

- If you need to restore your personal files and data, you can use Windows File History to restore your information from the backups you created. For more information and steps for using File History, see Windows Help and Support. From the Start screen, type `h`, and then select **Help and Support**.
- If you need to correct a problem with a preinstalled application or driver, use the Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.

From the Start screen, type `recovery`, select **HP Recovery Manager**, and then select **Drivers and Applications Reinstall**, and follow the on-screen instructions.

- If you want to restore the system to a previous state without losing any personal information, Windows System Restore is an option. System Restore allows you to restore without the requirements of Windows Refresh or a reinstallation. Windows creates system restore points automatically during a Windows update and other system maintenance events. Even if you did not manually create a restore point, you can choose to restore to a previous point, automatically created. For more information and steps for using Windows System Restore, see Windows Help and Support. From the Start screen, type `h`, and then select **Help and Support**.
- If you want a quick and easy way to recover the system without losing your personal information, settings, or apps that came preinstalled on your computer or were purchased from the Windows Store, consider using Windows Refresh. This option does not require backing up data to another drive. See [Using Windows Refresh for quick and easy recovery on page 87](#).
- If you want to reset your computer to its original state, Windows provides an easy way to remove all personal data, apps, and settings, and reinstall Windows.

For more information, see [Remove everything and reinstall Windows on page 88](#).

- If you want to reset your computer using a minimized image, you can choose the HP Minimized Image Recovery option from the HP Recovery partition (select models only) or HP Recovery media.

Minimized Image Recovery installs only drivers and hardware-enabling applications. Other applications included in the image continue to be available for installation through the Drivers and Applications Reinstall option in HP Recovery Manager.


For more information, see [Recovering using HP Recovery Manager on page 88](#).


- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 88](#).
- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see [Recovering using HP Recovery Manager on page 88](#).
- If you wish to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.


For more information, see [Removing the HP Recovery partition on page 90](#).

Using Windows Refresh for quick and easy recovery

When your computer is not working properly and you need to regain system stability, the Windows Refresh option allows you to start fresh and keep what is important to you.

 **IMPORTANT:** Refresh removes any traditional applications that were not originally installed on the system at the factory.

 **NOTE:** During Refresh, a list of removed traditional applications will be saved so that you have a quick way to see what you might need to reinstall. See Help and Support for instructions on reinstalling traditional applications. From the Start screen, type **h**, and then select **Help and Support**.

 **NOTE:** You may be prompted for your permission or password when using Refresh. See Windows Help and Support for more information. From the Start screen, type **h**, and then select **Help and Support**.

To start Refresh:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Refresh your PC without affecting your files**, select **Get started**, and follow the on-screen instructions.

Remove everything and reinstall Windows

Sometimes you want to perform detailed reformatting of your computer, or you want to remove personal information before you give away or recycle your computer. The process described in this section provides a speedy, simple way to return the computer to its original state. This option removes all personal data, apps, and settings from your computer, and reinstalls Windows.



IMPORTANT: This option does not provide backups of your information. Before using this option, back up any personal information you wish to retain.

You can initiate this option by using the **F11** key or from the Start screen.

To use the **F11** key:

1. Press **F11** while the computer boots.
– or –
Press and hold **F11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Reset your PC**, and follow the on-screen instructions.

To use the Start screen:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state. Using the HP Recovery media you created, you can choose from one of the following recovery options:

- **System Recovery**—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- **Minimized Image Recovery**—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.
- **Factory Reset**—Restores the computer to the state its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select models only) allows Minimized Image Recovery.

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.
- Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.
- HP Recovery media must be used if the computer hard drive fails.
- To use the Factory Reset or System Recovery options, you must use HP Recovery media.
- If the HP Recovery media do not work, you can obtain recovery media for your system from the HP website. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.



IMPORTANT: HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you wish to retain.

Using the HP Recovery partition to recover a minimized image (select models only)

The HP Recovery partition (select models only) allows you to perform a minimized image recovery without the need for recovery discs or a recovery USB flash drive. This type of recovery can only be used if the hard drive is still working.

To start HP Recovery Manager from the HP Recovery partition:

1. Press **f11** while the computer boots.
– or –
Press and hold **f11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **HP Recovery Manager**, and follow the on-screen instructions.

Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

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

– or –

Insert the HP Recovery USB flash drive you created into a USB port on your computer, and then restart the computer.

 **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 90](#).

3. Follow the on-screen instructions.

Changing the computer boot order


If computer does not restart in HP Recovery Manager, you can change the computer boot order, which is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection for an optical drive or a USB flash drive.

To change the boot order:

1. Insert the HP Recovery media you created.
2. Restart the computer.
3. Press and hold **esc** while the computer is restarting, and then press **f9** for boot options.
4. Select the optical drive or USB flash drive you want to boot from.
5. Follow the on-screen instructions.

Removing the HP Recovery partition

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.

 **IMPORTANT:** Removing the HP Recovery partition means you can no longer use Windows Refresh, the Windows Remove everything and reinstall Windows option, or the HP Recovery Manager option for minimized image recovery. Create HP Recovery media before removing the Recovery partition to ensure you have recovery options; see [Creating HP Recovery media on page 85](#).

Follow these steps to remove the HP Recovery partition:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and follow the on-screen instructions to continue.

8 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

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

9 Recycling

When a non-rechargeable or rechargeable 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 battery disposal.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP Web site at <http://www.hp.com/recycle>.

Index

- A**
 - AC adapter light 13
 - AC adapter, spare part number 24, 26
 - Action keys 8
 - antenna
 - locations 5
 - removal 75
 - spare part number 22, 26, 76
 - Antenna Kit, spare part number 22, 26, 76
 - audio, product description 2
 - audio-in jack 11
 - audio-out jack 11
- B**
 - base enclosure, spare part number 19
 - base enclosure, spare part numbers 27
 - battery
 - removal 35
 - spare part numbers 19, 25, 35
 - battery bay 14
 - battery release latch 14
 - bottom components 14
 - button component 7
 - buttons
 - optical drive eject 13
 - power 7
 - TouchPad 10
 - TouchPad on/off 10
- C**
 - cables, service considerations 29
 - caps lock light 9
 - chipset, product description 1
 - components
 - bottom 14
 - button 7
 - display 5
 - front 10
 - keys 8
 - left-side 11
 - lights 9
 - right-side 13
 - TouchPad 10
 - computer feet
 - locations 34
 - spare part number 19, 22, 26
 - computer major components 17
 - computer part number 33
 - computer specifications 81
 - connectors, service considerations 29
 - Cover Kit, spare part number 20, 26, 36, 46
- D**
 - Digital Media slot 12
 - display
 - components 5
 - specifications 82
 - display assembly
 - removal 67
 - spare part number 67
 - subcomponents 21
 - display bezel
 - removal 69
 - spare part number 21, 26, 70
 - display enclosure, spare part number 22, 26
 - display hinge
 - removal 72
 - spare part number 22, 26, 73
 - display hinge cover
 - removal 70
 - spare part number 22, 70
 - Display Hinge Kit, spare part number 21, 26
 - display panel
 - product description 1
 - removal 71
 - spare part number 21, 26, 72
 - display panel cable
 - removal 73
 - spare part number 22, 26, 74
 - drives, preventing damage 29
 - DVD±RW Double-Layer with SuperMulti Drive
 - precautions 29
 - removal 43
 - spare part number 19, 24, 26, 43
- E**
 - electrostatic discharge 30
 - equipment guidelines 32
 - esc key 8
 - Ethernet, product description 2
 - external monitor port 11
- F**
 - fan/heat sink assembly
 - removal 65
 - spare part number 19, 26, 65
 - feet
 - locations 34
 - spare part number 19, 22, 26
 - fn key 8
 - front component 10
- G**
 - graphics, product description 1

grounding guidelines 30
guidelines

- equipment 32
- grounding 30
- packaging 31
- transporting 31
- workstation 31

H

hard drive

- precautions 29
- product description 2
- removal 45
- spare part numbers 19, 23, 25, 26, 45
- specifications 83

hard drive bracket

- illustrated 23
- removal 47

hard drive compartment cover

- location 14
- removal 46
- spare part number 26, 46

hard drive connector cable

- illustrated 23
- removal 47

Hard Drive Hardware Kit

- contents 23
- spare part number 19, 23, 26, 45

hard drive light 12

HDMI port 11

headphone jack 11

J

jacks

- audio-in 11
- audio-out 11
- headphone 11
- microphone 11
- network 11
- RJ-45 11

K

key components 8

keyboard

- product description 3
- removal 39
- spare part numbers 18, 27, 39

keys

- Action 8
- esc 8
- fn 8
- Windows applications 8
- Windows logo 8

L

left-side components 11

light components 9

lights

- AC adapter 13
- caps lock 9
- hard drive 12
- optical drive 13
- power 9, 12
- TouchPad 10
- webcam 6
- wireless 9

M

mass storage device

- illustrated 23
- precautions 29

memory module

- product description 2
- removal 36
- spare part numbers 19, 25, 36

memory module/wireless module

- compartment cover
- location 14
- removal 36
- spare part number 26, 36

microphone

- location 5
- product description 2

microphone jack 11

model description 34

model name 1

monitor port 11

N

network jack 11

O

operating system, product description 4

optical drive

- location 13
- precautions 29

product description 2

removal 43

spare part number 19, 24, 26, 43

optical drive connector cable

- removal 56
- spare part number 18, 26, 56

optical drive eject button 13

optical drive light 13

P

packaging guidelines 31

plastic parts, service considerations 28

pointing device, product description 3

ports

external monitor port 11

HDMI 11

monitor port 11

product description 3

USB 11, 13

power button 7

power button board

- removal 52
- spare part number 18, 26, 52

power connector 13

power connector cable

- removal 76
- spare part number 19, 26, 76

power cord

set requirements 91

spare part numbers 24, 25

power light 9, 12

power requirements, product description 3

processor

product description 1

product description

- audio 2
- chipset 1
- display panel 1
- Ethernet 2
- external media cards 3
- graphics 1
- hard drive 2
- keyboard 3
- memory module 2
- microphone 2
- operating system 4

- optical drive 2
- pointing device 3
- ports 3
- power requirements 3
- processors 1
- product name 1
- security 4
- serviceability 4
- video 2
- wireless 2
- product name 1, 33
- product number 33

R

- removal/replacement
 - preliminaries 28
 - procedures 33
- right-side components 13
- RJ-45 jack 11
- RTC battery
 - removal 48
 - spare part number 19, 26, 48
- Rubber Kit, spare part number 19, 22, 26

S

- Screw Kit, spare part number 24, 26
- security cable slot 13
- security, product description 4
- serial number 33
- service considerations
 - cables 29
 - connectors 29
 - plastic parts 28
- service tag 16, 33
- serviceability, product description 4
- speakers
 - location 10
 - removal 58
 - spare part number 18, 26, 58
- specifications
 - computer 81
 - display 82
 - hard drive 83
- system board
 - removal 62
 - spare part numbers 18, 26, 27, 62

T

- tools required 28
- top cover
 - removal 49
 - spare part number 18, 26, 49
- TouchPad button 10
- TouchPad button board
 - removal 53
 - spare part number 18, 26, 53
- TouchPad components 10
- TouchPad light 10
- TouchPad on/off button 10
- TouchPad zone 10
- transporting guidelines 31

U

- USB board
 - removal 60
 - spare part number 18, 26, 60
- USB port 11, 13

V

- vents 11, 14
- video, product description 2

W

- warranty period 34
- webcam 6
- webcam light 6
- webcam/microphone module
 - removal 75
 - spare part number 27, 75
 - spare part numberS 21
 - spare part numbers 26
- Windows applications key 8
- Windows logo key 8
- wireless antenna
 - locations 5
 - removal 75
 - spare part number 22, 26, 76
- wireless light 9
- wireless, product description 2
- WLAN module
 - removal 37
 - spare part numbers 19, 25, 26, 37
- workstation guidelines 31

