

HP Compaq 8710p Notebook PC and
HP Compaq 8710w Mobile Workstation
Maintenance and Service Guide

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Third Edition: July 2008

First Edition: June 2007

Document Part Number: 453579-003

Safety warning notice

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

| Category | Description | HP Compaq 8710w Mobile Workstation | HP Compaq 8710p Notebook PC |
|---------------------|--|------------------------------------|-----------------------------|
| Product Name | HP Compaq 8710w Mobile Workstation | √ | |
| | HP Compaq 8710p Notebook PC | | √ |
| Processors | Intel® Core™ 2 Duo processors | | |
| | T9500 2.6-GHz processor 6-MB L2 cache, 800-MHz FSB | √ | √ |
| | T9300 2.5-GHz processor 6-MB L2 cache, 800-MHz FSB | √ | √ |
| | T8300 2.4-GHz processor 3-MB L2 cache, 800-MHz FSB | √ | √ |
| | T8100 2.1-GHz processor 3-MB L2 cache, 800-MHz FSB | √ | √ |
| | T7800 2.5-GHz processor 4-MB L2 cache, 800-MHz FSB | √ | √ |
| | T7700 2.4-GHz processor 4-MB L2 cache, 800-MHz FSB | √ | √ |
| | T7500 2.2-GHz processor 4-MB L2 cache, 800-MHz FSB | √ | √ |
| | T7300 2.0-GHz processor 4-MB L2 cache, 800-MHz FSB | √ | √ |
| | T7250 2.0-GHz processor 2-MB L2 cache, 800-MHz FSB | √ | √ |
| | T7100 1.8-GHz processor 2-MB L2 cache, 800-MHz FSB | √ | √ |
| Chipset | Northbridge: Intel 965PM with iAMT support | √ | √ |
| | Southbridge: Intel ICH8M-enhanced | √ | √ |
| Graphics | nVidia NB8E-GLM (G84GLM-UU) graphics card with 512-MB graphics subsystem memory operating at 800 MHz | √ | |
| | nVidia NB8P-NVS2 (G84M-GT) graphics card with 256-MB graphics | | √ |

| Category | Description | HP Compaq 8710w Mobile Workstation | HP Compaq 8710p Notebook PC |
|---------------|--|---------------------------------------|--------------------------------|
| | subsystem memory operating at 700 MHz (supports TurboCache) | | |
| | OpenGL driver support | √ | |
| Panel | All display assemblies include 3 wireless local area network (WLAN) antennae | √ | √ |
| | 17.0-inch WUXGA WVA AntiGlare | √ | √ |
| | 17.0-inch WSXGA+ WVA AntiGlare | √ | √ |
| | 17.0-inch WXGA+ AntiGlare | √ | √ |
| | 17.0-inch WSXGA+ Bright View | √ | √ |
| | Supports privacy film | √ | √ |
| Memory | 2 customer-accessible/upgradable memory module slots | √ | √ |
| | Supports dual-channel memory | √ | √ |
| | Supports up to 8 GB of system RAM | √ | √ |
| | PC2-5300, 667-MHz, DDR2 | √ | √ |
| | Supports the following configurations: | √ | √ |
| | <ul style="list-style-type: none"> • 8192-MB total system memory (4096 × 2, dual-channel) • 6144-MB total system memory (4096 + 2048) • 5120-MB total system memory (4096 + 1024) • 4608-MB total system memory (4096 + 512) • 4096-MB total system memory (2048 × 2, dual channel) • 4096-MB total system memory (4096 × 1) • 3072-MB total system memory (2048 + 1024) • 2560-MB total system memory (2048 + 512) • 2048-MB total system memory (1024 × 2, dual-channel) • 2048-MB total system memory (2048 × 1) • 1536-MB total system memory (1024 + 512) • 1024-MB total system memory (512 × 2, dual-channel) | | |

| Category | Description | HP Compaq 8710w Mobile Workstation | HP Compaq 8710p Notebook PC |
|-----------------------|---|---------------------------------------|--------------------------------|
| | <ul style="list-style-type: none"> 1024-MB total system memory (1024 × 1) 512-MB total system memory (512 × 1) | | |
| Hard drives | Supports 9.5-mm, 2.5-inch hard drives | √ | √ |
| | Customer-accessible | √ | √ |
| | Serial ATA | √ | √ |
| | Supports the following drives: | √ | √ |
| | <ul style="list-style-type: none"> 250-GB, 5400-rpm 200-GB, 7200-rpm 160-GB, 7200- and 5400-rpm 120-GB, 7200- and 5400-rpm 100-GB, 7200-rpm 80-GB, 7200- and 5400-rpm | | |
| | HP 3D DriveGuard | √ | √ |
| Optical drives | Fixed (removal of 1 screw required) | √ | √ |
| | Customer-accessible | √ | √ |
| | Parallel ATA | √ | √ |
| | 12.7-mm tray load | √ | √ |
| | Supports the following drives: | √ | √ |
| | <ul style="list-style-type: none"> DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe DVD±RW and CD-RW Super Multi Double-Layer Combo Drive DVD-CD/RW Combo Drive Blu-Ray DVD-RW Combo Drive DVD-ROM Drive | | |
| Diskette drive | Supports external USB diskette drive only | √ | √ |
| | Supports boot from external USB diskette drive | √ | √ |
| | Supports 3-mode diskette drive | √ | √ |
| Microphone | Integrated microphone | √ | √ |
| Audio | HD audio - ADI1981 | √ | √ |
| Modem | 56K V.92 1.5-inch data/fax modem with digital line guard | √ | √ |

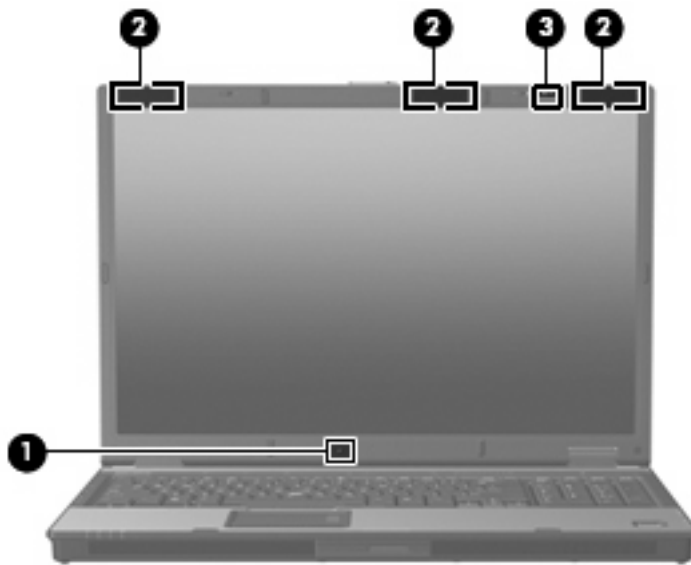
| Category | Description | HP Compaq 8710w Mobile Workstation | HP Compaq 8710p Notebook PC |
|----------------------------|--|---------------------------------------|--------------------------------|
| | HD audio interface | √ | √ |
| | Modem cable included in Brazil, the Czech Republic, Europe, France, Greece, Hungary, Israel, Latin America, Poland, Russia, Saudi Arabia, Slovakia, Slovenia, South Africa, Turkey, and the United Kingdom | √ | √ |
| Ethernet | Intel 82566MM 10/100/1000 network interface card (NIC) with iAMT | √ | √ |
| | S3/S4/S5 wake on LAN: DC - no | √ | √ |
| | S3/S4/S5 wake on LAN: AC - yes | √ | √ |
| | NIC power-down technology | √ | √ |
| Wireless | Integrated WLAN options by way of wireless module: | | |
| | Three WLAN antennae built into display assembly | √ | √ |
| | Support for no-WLAN option | √ | √ |
| | Support for the following WLAN formats: | √ | √ |
| | <ul style="list-style-type: none"> • Intel 802.11a/b/g/n with iAMT support • Broadcom 802.11a/b/g • Intel 802.11a/b/g with iAMT support • Broadcom 802.11b/g | | |
| | Integrated personal area network (PAN) options by way of Bluetooth® module: | | |
| | Support for no-WPAN option | √ | √ |
| | Broadcom Bluetooth | √ | √ |
| External media card | One Type I/II PC Card slot, supporting 16-bit and 32-bit (Cardbus) PC Card modules | √ | √ |
| | Media Card Reader slot supporting SD, MMC, MS, MSP, xD, and Memory Stick Duo | √ | √ |
| Ports | Audio-in (mono microphone) | √ | √ |
| | Audio-out (stereo headphone) | √ | √ |
| | High-Definition Multimedia Interface (HDMI) | √ | √ |
| | RJ-11 (modem) | √ | √ |
| | RJ-45 (Ethernet, includes link and activity lights) | √ | √ |
| | USB (6) | √ | √ |

| Category | Description | HP Compaq 8710w Mobile Workstation | HP Compaq 8710p Notebook PC |
|----------------------------------|---|---------------------------------------|--------------------------------|
| | VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect) | √ | √ |
| | 3-pin AC power | √ | √ |
| Docking | HP 3-in-1 NAS Docking Station, HP Advanced Docking Station, and HP Docking Station | √ | √ |
| Keyboard/pointing devices | 14.4-inch keyboard with separate numeric keypad | √ | √ |
| | Dual point (pointing stick and TouchPad) with 3 pointing stick buttons and 3 TouchPad buttons and vertical scrolling (taps enabled as default) | √ | √ |
| | TouchPad only, with 2 TouchPad buttons and vertical scrolling (taps enabled as default) | | √ |
| | Windows Vista™ Hardware Start Button | √ | √ |
| Power requirements | The following AC adapters with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector): <ul style="list-style-type: none"> • 180-W PFC AC adapter • 135-W PFC AC adapter • 120-W non-PFC and PFC AC adapters • 90-W non-PFC and PFC AC adapters | √ | √ |
| | 8-cell, 2.55-Ah (73-Wh) Li-ion battery | √ | √ |
| | Support for 8-cell Extended Life Battery | √ | √ |
| | Support for 12-cell Ultra Capacity Battery | √ | √ |
| Security | Full volume encryption | √ | √ |
| | Integrated fingerprint reader | √ | √ |
| | Integrated smart card reader | √ | √ |
| | Preboot authentication (password, smart card) | √ | √ |
| | Security cable slot | √ | √ |
| | Trusted platform module (TPM) V.1.2 | √ | √ |
| Operating system | Preinstalled: | | |
| | Windows Vista Business 32/64 | √ | √ |
| | Windows Vista Home Basic 32 | √ | √ |

| Category | Description | HP Compaq 8710w Mobile Workstation | HP Compaq 8710p Notebook PC |
|-----------------------|--|---------------------------------------|--------------------------------|
| | Windows® XP Professional | √ | √ |
| | FreeDOS | √ | √ |
| | Preinstalled with Microsoft® Office: | | |
| | Windows Vista Business 32/64 with Office 2007 Ready | √ | √ |
| | Windows Vista Business 32/64 with Office 2007 Personal | | √ |
| | Windows XP Professional with Office 2007 Ready | √ | √ |
| | Windows XP Professional with Office 2007 Personal | √ | √ |
| | Restore media: | | |
| | Windows Vista Business 32/64 | √ | √ |
| | Windows Vista Home Basic 32 | √ | √ |
| | Windows XP Professional | √ | √ |
| | DRDVD XP | √ | √ |
| | DRDVD Vista | √ | √ |
| | Supported: | | |
| | Windows® 2000 | √ | √ |
| | Certified: | | |
| | Linux | √ | √ |
| Serviceability | End-user replaceable parts: | | |
| | AC adapter | √ | √ |
| | Battery (system) | √ | √ |
| | Battery (RTC) | √ | √ |
| | Hard drive | √ | √ |
| | Memory module | √ | √ |
| | Modem module | √ | √ |
| | Optical drive | √ | √ |
| | WLAN module | √ | √ |

2 External component identification

Display components



| Item | Component | Function |
|------|----------------------------|---|
| (1) | Ambient light sensor | When activated, the sensor automatically adjusts the display brightness based on the surrounding lighting conditions. |
| (2) | Wireless antenna locations | Send and receive wireless signals to communicate with WLANs. |
| (3) | Internal microphone | Records sound. |

Top components

Buttons, switches, and fingerprint reader

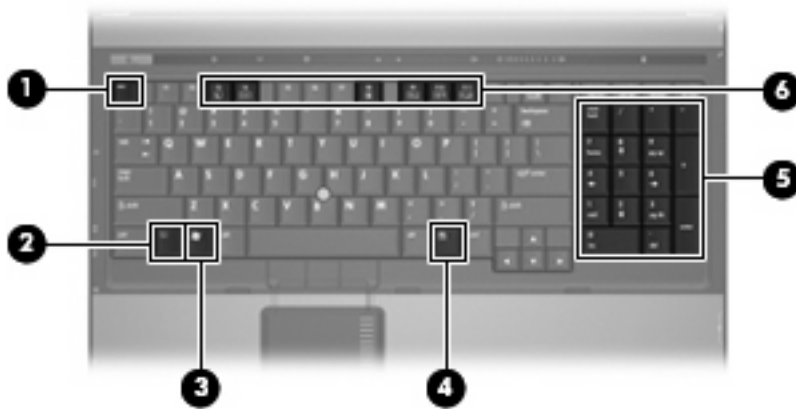


| Item | Component | Function |
|------|---------------------|--|
| (1) | Power button | <ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button to shut down the computer.• When the computer is in the Sleep state (Windows Vista) or in Standby (Windows XP), press the button briefly to exit the Sleep state or Standby.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about power settings, follow these steps:</p> <ul style="list-style-type: none">• In Windows Vista, select Start > Control Panel > System and Maintenance > Power Options.• In Windows XP, select Start > Control Panel > Performance and Maintenance > Power Options. |
| (2) | Info button | Launches Info Center, which enables you to open various software solutions. |
| (3) | Wireless button | Turns the wireless feature on or off, but does not establish a wireless connection. NOTE: A wireless network must be set up in order to establish a wireless connection. |
| (4) | Presentation button | Starts the presentation feature. |
| (5) | Volume mute button | Mutes and restores speaker sound. |

| Item | Component | Function |
|------|--|--|
| (6) | Volume scroll zone | Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume. You can also press the left side of the volume slider to decrease volume, or press the right side of the volume slider to increase volume. |
| (7) | Calculator button | Turns on the Windows calculator function. |
| (8) | HP Fingerprint Sensor (fingerprint reader) | Allows a fingerprint logon to Windows, instead of a password logon. |

Keys

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



| Item | Component | Function |
|------|---------------------------|--|
| (1) | esc key | Displays system information when pressed in combination with the fn key. |
| (2) | fn key | Executes frequently used system functions when pressed in combination with a function key or the esc key. |
| (3) | Windows logo key | Displays the Windows Start menu. |
| (4) | Windows applications key | Displays a shortcut menu for items beneath the pointer. |
| (5) | Integrated numeric keypad | Can be used like the keys on an external numeric keypad. |
| (6) | Function keys | Execute frequently used system functions when pressed in combination with the fn key. |

Lights



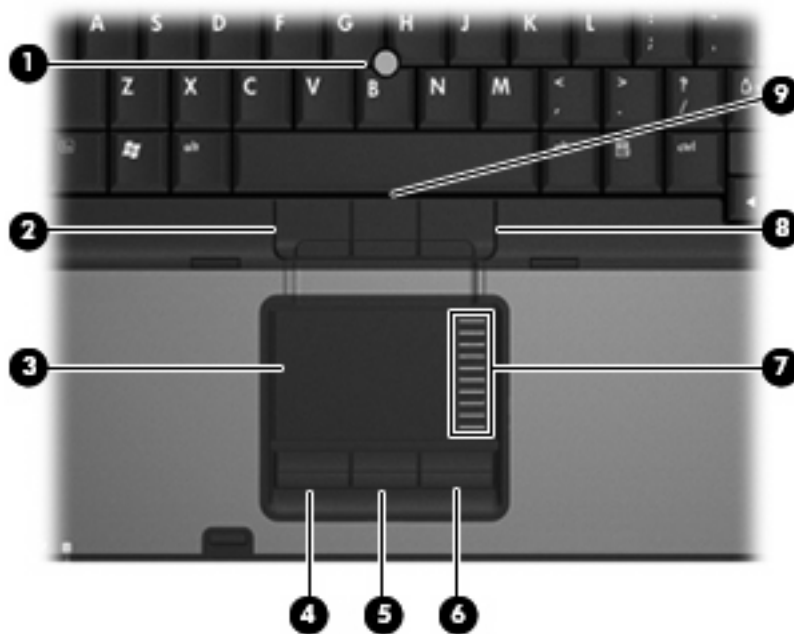
| Item | Component | Function |
|------|----------------------|--|
| (1) | Wireless lights (2)* | <ul style="list-style-type: none"> On: An integrated wireless device, such as a WLAN device and/or a Bluetooth® device, is on. Off: All wireless devices are off. |
| (2) | Power lights (2)† | <ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP). Blinking rapidly: An AC adapter with a higher power rating should be connected. Off: The computer is off or in Hibernation. |
| (3) | Battery light | <ul style="list-style-type: none"> Amber: A battery is charging. Green: A battery is close to full charge capacity. Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level. |
| (4) | Drive light | <ul style="list-style-type: none"> Blinking green: The hard drive or optical drive is being accessed. Amber: HP 3D DriveGuard has temporarily parked the internal hard drive. |
| (5) | Caps lock light | On: Caps lock is on. |
| (6) | Num lock light | On: Num lock is on or the integrated numeric keypad is enabled. |

| Item | Component | Function |
|------|-------------------|--|
| (7) | Volume mute light | <ul style="list-style-type: none"> • Amber: Computer sound is turned off. • On: Computer sound is turned on. |
| (8) | Volume down light | On: The volume scroll zone is being used to decrease speaker volume. |
| (9) | Volume up light | On: The volume scroll zone is being used to increase speaker volume. |

*The 2 wireless lights display the same information. The light on the wireless button is visible only when the computer is open. The wireless light on the front of the computer is visible whether the computer is open or closed.

†The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.

Pointing devices

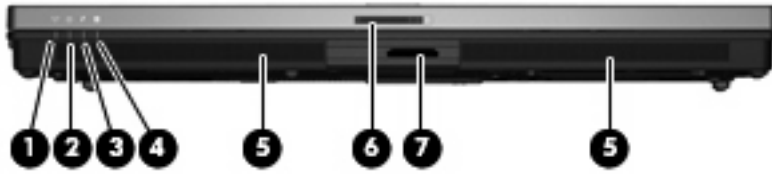


| Item | Component | Function |
|------|-------------------------------|---|
| (1) | Pointing stick* | Moves the pointer and selects or activates items on the screen. |
| (2) | Left pointing stick button* | Functions like the left button on an external mouse. |
| (3) | TouchPad* | Moves the pointer and selects or activates items on the screen. |
| (4) | Left TouchPad button* | Functions like the left button on an external mouse. |
| (5) | Center TouchPad button* | Functions like the center button on an external mouse. |
| (6) | Right TouchPad button* | Functions like the right button on an external mouse. |
| (7) | TouchPad scroll zone | Scrolls up or down. |
| (8) | Right pointing stick button* | Functions like the right button on an external mouse. |
| (9) | Center pointing stick button* | Functions like the center button on an external mouse. |

*This table describes factory settings. View or change pointing device preferences as follows:

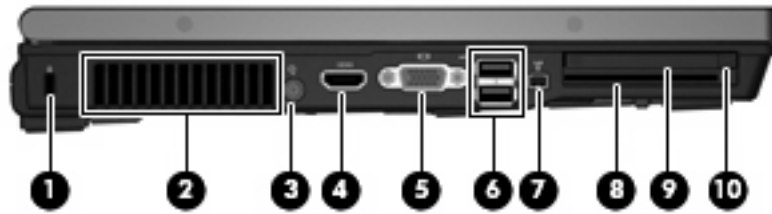
- In Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**.
- In Windows XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

Front components



| Item | Component | Function |
|------|-----------------------|--|
| (1) | Wireless light | <ul style="list-style-type: none"> On: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on. Off: All wireless devices are off. |
| (2) | Power light | <ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state (Windows Vista) or in Standby (Windows XP). Blinking rapidly: An AC adapter with a higher power rating should be connected. Off: The computer is off or in Hibernation. |
| (3) | Battery light | <ul style="list-style-type: none"> Amber: A battery is charging. Green: A battery is close to full charge capacity. Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly. Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level. |
| (4) | Drive light | <ul style="list-style-type: none"> Blinking green: The hard drive or optical drive is being accessed. Amber: HP 3D DriveGuard has temporarily parked the hard drive. |
| (5) | Speakers (2) | Produce sound. |
| (6) | Display release latch | Opens the computer. |
| (7) | Media Card Reader | Supports the following optional digital card formats: Secure Digital (SD) Memory Card, Memory Stick Pro, Memory Stick Duo, xD-Picture Card, and MultiMediaCard (MMC). |

Left-side components



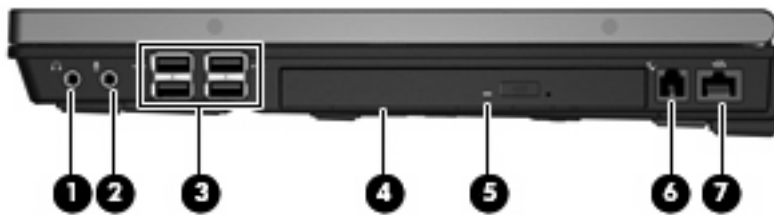
| Item | Component | Function |
|------|-----------------------|--|
| (1) | Security cable slot | Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. |
| (2) | Vent | Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| (3) | Power connector | Connects an AC adapter. |
| (4) | HDMI port | Connects an optional HDMI device. |
| (5) | External monitor port | Connects an external VGA monitor or projector. |
| (6) | USB ports (2) | Connect optional USB devices. |
| (7) | 1394 port | Connects an optional IEEE 1394 or 1394a device, such as a camcorder. |
| (8) | Smart card reader | Supports smart cards and Java™ cards. |
| (9) | PC Card slot | Supports optional Type I or Type II 32-bit (CardBus) or 16-bit PC Cards. |
| (10) | PC Card eject button | Ejects a PC Card from the PC Card slot. |

Rear component



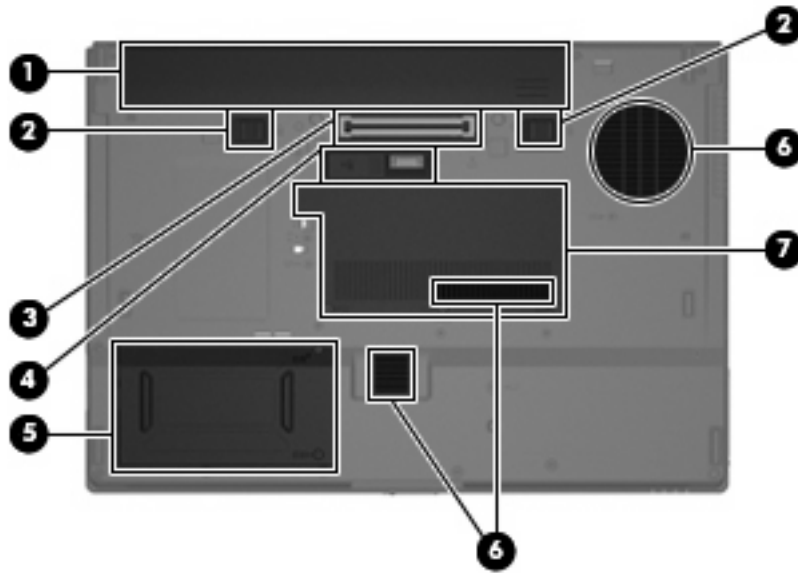
| Component | Function |
|-----------|--|
| Vent | Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |

Right-side components



| Item | Component | Function |
|------|----------------------------|--|
| (1) | Audio-out (headphone) jack | Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. |
| (2) | Audio-in (microphone) jack | Connects an optional computer headset microphone, stereo array microphone, or monaural microphone. |
| (3) | USB ports (4) | Connects up to 4 optional USB devices. |
| (4) | Optical drive | Reads an optical disc. |
| (5) | Optical drive button | Releases the media tray. |
| (6) | RJ-11 (modem) jack | Connects a modem cable. |
| (7) | RJ-45 (network) jack | Connects a network cable. |

Bottom components

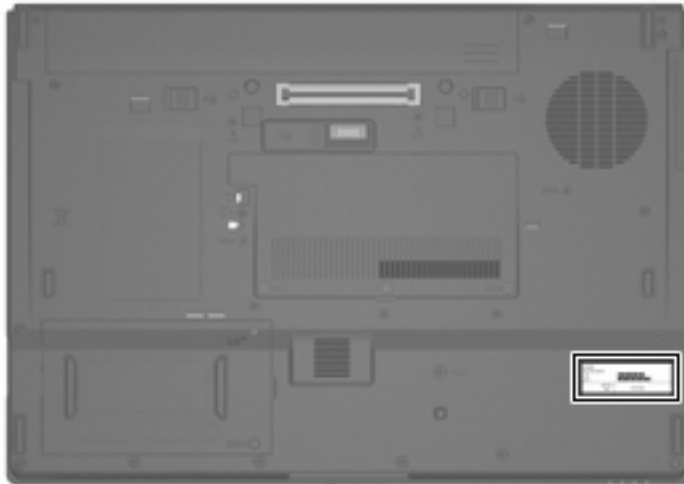


| Item | Component | Function |
|------|--|--|
| (1) | Battery bay | Holds the battery. |
| (2) | Battery release latches (2) | Release the battery from the battery bay. |
| (3) | Docking connector | Connects an optional docking device. |
| (4) | Accessory battery connector (slide open to expose) | Connects an optional accessory battery. |
| (5) | Hard drive bay | Contains the hard drive and the Bluetooth module. |
| (6) | Vents (3) | 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. |
| (7) | Memory module/WLAN module compartment | Contains the expansion memory module slot, the WLAN module slot, and the RTC battery. CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support. |

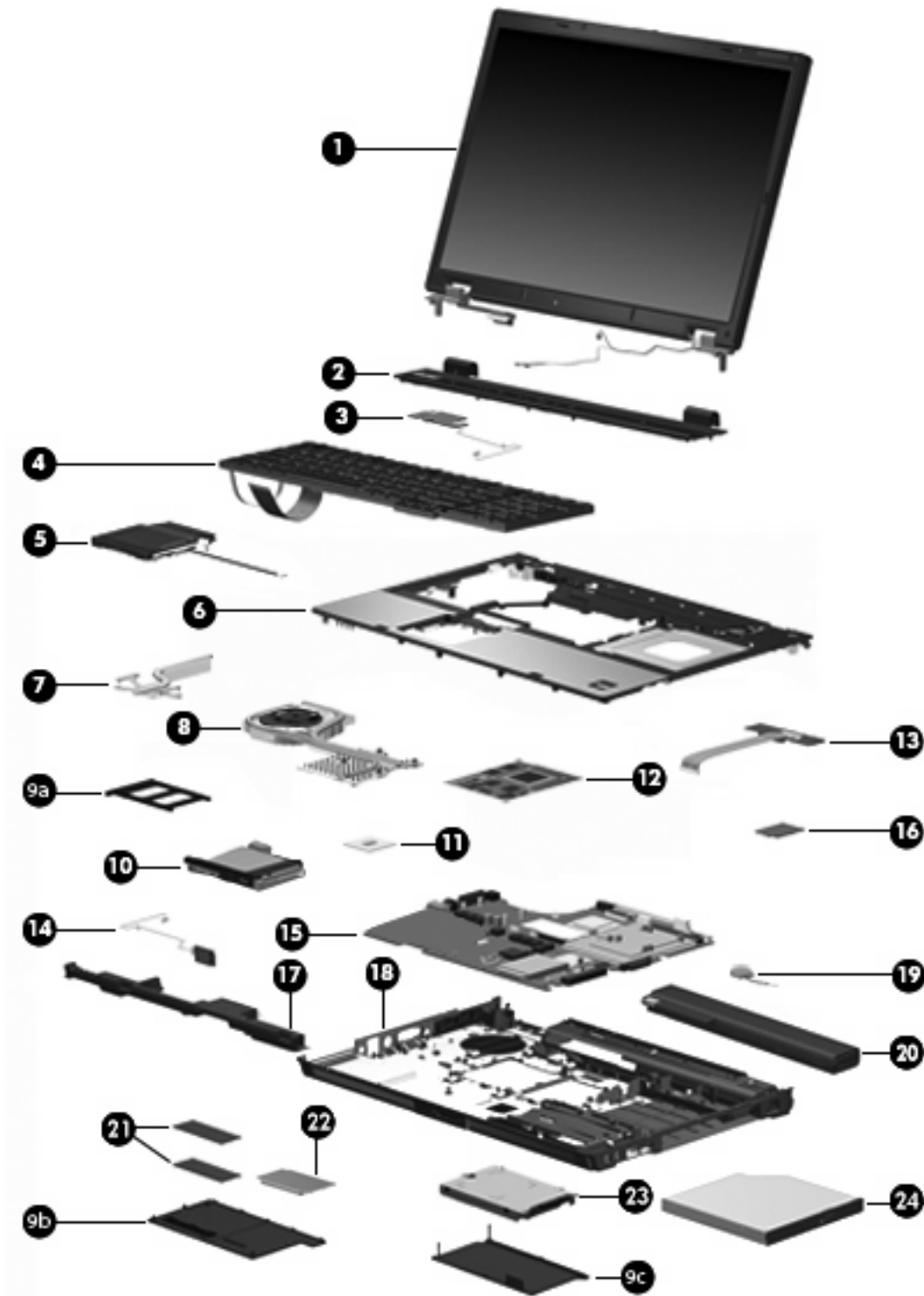
3 Illustrated parts catalog

Serial number location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer.



Computer major components



| Item | Description | Spare part number |
|------|---|-------------------|
| (1) | Display assemblies (include 3 WLAN antenna transceivers and cables) 17.0-inch, WUXGA WVA AntiGlare | 450582-001 |

| Item | Description | Spare part number |
|------|--|-------------------|
| | 17.0-inch, WSXGA+ WVA AntiGlare | 450580-001 |
| | 17.0-inch, WSXGA+ WVA BrightView | 450581-001 |
| | 17.0-inch, WXGA+ AnitGlare | 450583-001 |
| | Display internal components (not illustrated): | |
| | Ambient light sensor board | 450480-001 |
| | Display bezel | 450500-001 |
| | Display inverter | 450498-001 |
| | Display Bracket Kit (includes left and right display hinges) | 450570-001 |
| | Display panel cable | 450571-001 |
| | Wireless Antenna Kit (includes 3 WLAN antenna transceivers and cables) | 450475-001 |
| | Display enclosure for use with WUXGA display assemblies (includes 3 WLAN antenna transceivers and cables) | 456223-001 |
| | Display enclosure for use with WSXGA+ and WXGA+ display assemblies (includes 3 WLAN antenna transceivers and cables) | 450572-001 |
| | Display Rubber Kit (includes display bezel rubber screw covers) | 450573-001 |
| | Display Screw Kit | 450574-001 |
| (2) | Switch cover (includes LED board and cable) | 450479-001 |
| (3) | Power button board (includes cable) | 450481-001 |
| (4) | Keyboards with pointing stick (include pointing stick cable) | |
| | For use in Belgium | 450471-A41 |
| | For use in Brazil | 450471-201 |
| | For use in the Czech Republic | 450471-221 |
| | For use in Denmark | 450471-081 |
| | For use in France | 450471-051 |
| | For use in French Canada | 450471-121 |
| | For use in Germany | 450471-041 |
| | For use in Greece | 450471-151 |
| | For use in Hungary | 450471-211 |
| | For use in Iceland | 450471-DD1 |
| | For use in Israel | 450471-BB1 |
| | For use in Italy | 450471-061 |
| | For use in Japan | 450471-291 |
| | For use in Latin America | 450471-161 |
| | For use in the Netherlands and Europe | 450471-021 |
| | For use in Norway | 450471-091 |

| Item | Description | Spare part number |
|------|---|-------------------|
| | For use in Portugal | 450471-131 |
| | For use in Russia | 450471-251 |
| | For use in Saudi Arabia | 450471-171 |
| | For use in Slovakia | 450471-231 |
| | For use in Slovenia | 450471-BA1 |
| | For use in South Korea | 450471-AD1 |
| | For use in Spain | 450471-071 |
| | For use in Sweden and Finland | 450471-B71 |
| | For use in Switzerland | 450471-111 |
| | For use in Taiwan | 450471-AB1 |
| | For use in Thailand | 450471-281 |
| | For use in Turkey | 450471-141 |
| | For use in the United Kingdom | 450471-031 |
| | For use in the United States | 450471-001 |
| | Keyboards without pointing stick | |
| | For use in Belgium | 450472-A41 |
| | For use in Brazil | 450472-201 |
| | For use in the Czech Republic | 450472-221 |
| | For use in Denmark | 450472-081 |
| | For use in France | 450472-051 |
| | For use in French Canada | 450472-121 |
| | For use in Germany | 450472-041 |
| | For use in Greece | 450472-151 |
| | For use in Hungary | 450472-211 |
| | For use in Iceland | 450472-DD1 |
| | For use in Israel | 450472-BB1 |
| | For use in Italy | 450472-061 |
| | For use in Japan | 450472-291 |
| | For use in Latin America | 450472-161 |
| | For use in the Netherlands and Europe | 450472-021 |
| | For use in Norway | 450472-091 |
| | For use in Portugal | 450472-131 |
| | For use in Russia | 450472-251 |
| | For use in Saudi Arabia | 450472-171 |

| Item | Description | Spare part number |
|-------------|---|-------------------|
| | For use in Slovakia | 450472-231 |
| | For use in Slovenia | 450472-BA1 |
| | For use in South Korea | 450472-AD1 |
| | For use in Spain | 450472-071 |
| | For use in Sweden and Finland | 450472-B71 |
| | For use in Switzerland | 450472-111 |
| | For use in Taiwan | 450472-AB1 |
| | For use in Thailand | 450472-281 |
| | For use in Turkey | 450472-141 |
| | For use in the United Kingdom | 450472-031 |
| | For use in the United States | 450472-001 |
| (5) | TouchPads (include TouchPad cable) | |
| | For use with keyboards with a pointing stick, includes 3 pointing stick buttons and 3 TouchPad buttons | 450597-001 |
| | For use with keyboards without a pointing stick, includes 2 TouchPad buttons | 450596-001 |
| (6) | Top covers (include fingerprint reader board and cable) | |
| | For use with HP Compaq 8710w computer models | 451379-001 |
| | For use with HP Compaq 8710p computer models | 450595-001 |
| (7) | Graphics card fan/heat sink (includes replacement thermal material) | 450594-001 |
| (8) | Heat sink assemblies (include replacement thermal material) | |
| | For use only with computer models equipped with processors with 3- or 6-MB L2 cache | 468593-001 |
| | For use only with computer models equipped with processors with 2- or 4-MB L2 cache | 450593-001 |
| | Plastics Kit (see Plastics Kit on page 26 for more Plastics Kit spare part information): | 450585-001 |
| (9a) | PC Card slot bezel | |
| (9b) | Memory module/WLAN module compartment cover (includes 3 captive screws, secured by C-clips) | |
| | Computer feet (not illustrated; 9 feet in 4 different sizes) | |
| (9c) | Hard drive cover (includes 2 captive screws, secured by C-clips) | |
| (10) | PC Card assembly | 450584-001 |
| (11) | Intel Core 2 Duo processors (include replacement thermal material) | |
| | T9500 2.6-GHz processor (6-MB L2 cache, 800-MHz FSB) | 463051-001 |
| | T9300 2.5-GHz processor (6-MB L2 cache, 800-MHz FSB) | 463050-001 |
| | T8300 2.4-GHz processor (3-MB L2 cache, 800-MHz FSB) | 463049-001 |
| | T8100 2.1-GHz processor (3-MB L2 cache, 800-MHz FSB) | 463048-001 |
| | T7800 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB) | 458218-001 |
| | T7700 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB) | 450589-001 |

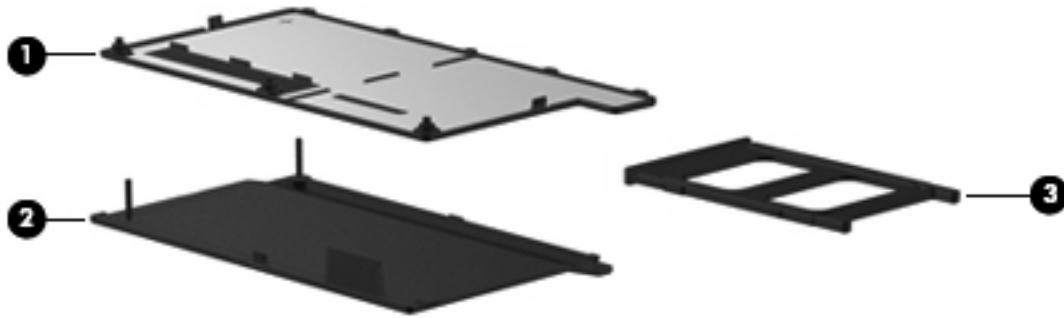
| Item | Description | Spare part number |
|-------------|---|-------------------|
| | T7500 2.2-GHz processor (4-MB L2 cache, 800-MHz FSB) | 450588-001 |
| | T7300 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB) | 450587-001 |
| | T7250 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB) | 460283-001 |
| | T7100 1.8-GHz processor (2-MB L2 cache, 800-MHz FSB) | 450586-001 |
| (12) | Graphics cards (include replacement thermal material) | |
| | For use only with computer models equipped with processors with 3- or 6-MB L2 cache | 468592-001 |
| | For use only with HP Compaq 8710w computer models (nVidia NB8E-GLM graphics card with 512-MB graphics subsystem memory operating at 800 MHz) | 451377-001 |
| | For use only with HP Compaq 8710p computer models (nVidia NB8P-NVS2 graphics card with 256-MB graphics subsystem memory operating at 700 MHz; supports TurboCache) | 450484-001 |
| (13) | USB/audio board (includes 2-into-1 USB board cable and audio board cable) | 450483-001 |
| (14) | Bluetooth module (includes Bluetooth module cable) | 450485-001 |
| (15) | System boards (include replacement thermal material) | |
| | For use only with computer models equipped with processors with 3- or 6-MB L2 cache | 468591-001 |
| | For use only with computer models equipped with processors with 2- or 4-MB L2 cache | 450482-001 |
| (16) | Modem module | 443899-001 |
| (17) | Speaker assembly | 450592-001 |
| (18) | Base enclosure (includes rubber feet) | 450476-001 |
| | Rubber Kit (includes 9 feet in 4 different sizes) | 450590-001 |
| (19) | RTC battery | 450478-001 |
| (20) | 8-cell, 5.1-Ah, Li-ion battery | 450477-001 |
| (21) | Memory modules | |
| | 4096-MB memory module (PC2-5300, 667-MHz, DDR2) | 469650-001 |
| | 2048-MB memory module (PC2-5300, 667-MHz, DDR2) | 450576-001 |
| | 1024-MB memory module (PC2-5300, 667-MHz, DDR2) | 450575-001 |
| | 512-MB memory module (PC2-5300, 667-MHz, DDR2) | 450577-001 |
| (22) | WLAN modules | |
| | Intel 802.11a/b/g/n WLAN modules: | |
| | <ul style="list-style-type: none"> For use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam | 441086-001 |
| | <ul style="list-style-type: none"> For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan | 441086-002 |

| Item | Description | Spare part number |
|------|---|---------------------------|
| | <ul style="list-style-type: none"> For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea | 441086-003 |
| | <ul style="list-style-type: none"> For use in Japan | 441086-291 |
| | <ul style="list-style-type: none"> For use in South Korea | 441086-AD1 |
| | Broadcom 802.11a/b/g WLAN modules: | |
| | <ul style="list-style-type: none"> For use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States | 441075-001 |
| | <ul style="list-style-type: none"> For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe | 441075-002 |
| | <ul style="list-style-type: none"> For use in Japan | 441075-291 |
| | Intel 802.11a/b/g WLAN modules: | |
| | <ul style="list-style-type: none"> For use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam | 441082-001 |
| | <ul style="list-style-type: none"> For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan | 441082-002 |
| | <ul style="list-style-type: none"> For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea | 441082-003 |
| | <ul style="list-style-type: none"> For use in Japan | 441082-291 and 441082-292 |
| | Broadcom 802.11b/g WLAN modules: | |

| Item | Description | Spare part number |
|-------------|---|-------------------|
| | <ul style="list-style-type: none"> For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States | 441090-001 |
| | <ul style="list-style-type: none"> For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe | 441090-002 |
| | <ul style="list-style-type: none"> For use in Japan | 441090-291 |
| | Intel 802.11b/g WLAN module for use in Japan | 448675-004 |
| (23) | Hard drives (include hard drive bracket) | |
| | 250-GB, 5400-rpm | 458219-001 |
| | 200-GB, 7200-rpm | 461876-001 |
| | 160-GB, 7200-rpm | 460282-001 |
| | 160-GB, 5400-rpm | 450495-001 |
| | 120-GB, 7200-rpm | 454487-001 |
| | 120-GB, 5400-rpm | 450494-001 |
| | 100-GB, 7200-rpm | 450493-001 |
| | 80-GB, 7200-rpm | 450497-001 |
| | 80-GB, 5400-rpm | 450496-001 |
| (24) | Optical drives | |
| | DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe | 450490-001 |
| | DVD±RW and CD-RW Super Multi Double-Layer Combo Drive | 450491-001 |
| | DVD/CD-RW Combo Drive | 450492-001 |
| | Blu-ray DVD-RW Drive | 450489-001 |

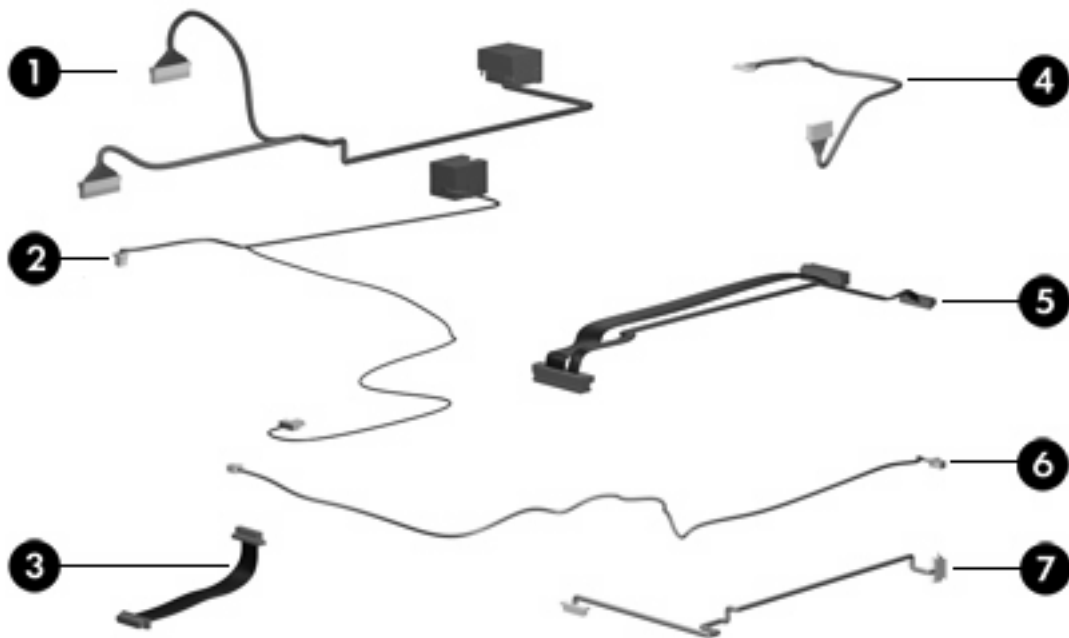
| Item | Description | Spare part number |
|------|---|-------------------|
| | DVD-ROM Drive | 450488-001 |
| | Cable Kit (not illustrated; see Cable Kit on page 27 for more Cable Kit spare part number information) | 450486-001 |

Plastics Kit



| Item | Description | Spare part number |
|------|---|-------------------|
| | Plastics Kit: | 450585-001 |
| (1) | Memory module/WLAN module compartment cover (includes 3 captive screws, secured by C-clips) | |
| (2) | Hard drive cover (includes 2 captive screws, secured by C-clips) | |
| (3) | PC Card slot bezel | |

Cable Kit



| Item | Description | Spare part number |
|-------------------|----------------------------|-------------------|
| Cable Kit: | | 450486-001 |
| (1) | RJ-45 jack cable | |
| (2) | RJ-11 jack cable | |
| (3) | TouchPad cable | |
| (4) | Bluetooth module cable | |
| (5) | USB/audio board cable | |
| (6) | Microphone extension cable | |
| (7) | Power button board cable | |

Mass storage devices



| Item | Description | Spare part number |
|------------|--|-------------------|
| (1) | Hard drives (include frame) | |
| | 250-GB, 5400-rpm | 458219-001 |
| | 200-GB, 7200-rpm | 461876-001 |
| | 160-GB, 7200-rpm | 460282-001 |
| | 160-GB, 5400-rpm | 450495-001 |
| | 120-GB, 7200-rpm | 454987-001 |
| | 120-GB, 5400-rpm | 450494-001 |
| | 100-GB, 7200-rpm | 450493-001 |
| | 80-GB, 7200-rpm | 450497-001 |
| | 80-GB, 5400-rpm | 450496-001 |
| (2) | Optical drives (include bezel) | |
| | DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe | 450490-001 |
| | DVD±RW and CD-RW Super Multi Double-Layer Combo Drive | 450491-001 |
| | DVD/CD-RW Combo Drive | 450492-001 |
| | Blu-ray DVD-RW Drive | 450489-001 |
| | DVD-ROM Drive | 450488-001 |

Miscellaneous parts

| Description | Spare part number |
|----------------------|-------------------|
| AC adapters | |
| 180-W PFC AC adapter | 463952-001 |
| 135-W PFC AC adapter | 468590-001 |

| Description | Spare part number |
|---|-------------------|
| 120-W non-PFC AC adapter | 416391-001 |
| 120-W PFC AC adapter | 391174-001 |
| 90-W non-PFC AC adapter | 418873-001 |
| 90-W PFC AC adapter | 418875-001 |
| External MultiBay II | 366143-001 |
| External MultiBay II power cable and stand | 366144-001 |
| HP Extended Life Battery | 367456-001 |
| Label Kit | 450499-001 |
| MultiBay 8X DVD-ROM Drive | 373314-001 |
| MultiBay 24X DVD/CD-RW Combo Drive | 373315-001 |
| Nylon carrying case | 325814-001 |
| USB 1.1 diskette drive | 359118-001 |
| Power cords: | |
| For use in Australia | 403811-011 |
| For use in Brazil | 403811-201 |
| For use in Denmark | 403811-081 |
| For use in Europe, the Middle East, and Africa | 403811-021 |
| For use in India | 403811-D61 |
| For use in Israel | 403811-BB1 |
| For use in Italy | 403811-061 |
| For use in Japan | 403811-291 |
| For use in the People's Republic of China | 403811-AA1 |
| For use in South Korea | 403811-AD1 |
| For use in Switzerland | 403811-111 |
| For use in Taiwan | 403811-AB1 |
| For use in the United Kingdom | 403811-031 |
| For use the United States | 403811-001 |
| Screw Kit | 450591-001 |
| <ul style="list-style-type: none"> • Phillips PM2.5×4.0 screw • Phillips PM2.0×10.0 screw • Phillips PM2.0×5.0 captive screw • Phillips PM2.0×5.0 screw • Phillips PM2.0×4.0 screw • Phillips PM2.0×3.0 screw | |

| Description | Spare part number |
|---------------------------------------|-------------------|
| • Phillips PM2.0×2.0 broad-head screw | |
| • Phillips PM2.0×2.0 screw | |
| • Phillips PM1.5×3.0 screw | |
| • Torx T8M2.5×7.0 screw | |
| • Torx T8M2.5×4.0 screw | |
| • Torx T6M2.0×5.0 screw | |

Sequential part number listing

| Spare part number | Description |
|-------------------|--|
| 391174-001 | 120-W PFC AC adapter |
| 325814-001 | Nylon carrying case |
| 359118-001 | USB 1.1 diskette drive |
| 366143-001 | External MultiBay II |
| 366144-001 | External MultiBay II power cable and stand |
| 367456-001 | HP Extended Life Battery |
| 373314-001 | MultiBay 8X DVD-ROM Drive |
| 373315-001 | MultiBay 24X DVD/CD-RW Combo Drive |
| 403811-001 | Power cord (3-wire) for use in North America |
| 403811-011 | Power cord (3-wire) for use in Australia |
| 403811-021 | Power cord (3-wire) for use in Europe, the Middle East, and Africa |
| 403811-031 | Power cord (3-wire) for use in the United Kingdom |
| 403811-061 | Power cord (3-wire) for use in Italy |
| 403811-081 | Power cord (3-wire) for use in Denmark |
| 403811-111 | Power cord (3-wire) for use in Switzerland |
| 403811-291 | Power cord (3-wire) for use in Japan |
| 403811-AA1 | Power cord (3-wire) for use in the People's Republic of China |
| 403811-AB1 | Power cord (3-wire) for use in Taiwan |
| 403811-AD1 | Power cord (3-wire) for use in South Korea |
| 403811-BB1 | Power cord (3-wire) for use in Israel |
| 403811-D61 | Power cord (3-wire) for use in India |
| 416931-001 | 120-W non-PFC AC adapter |
| 418873-001 | 90-W non-PFC AC adapter |

| Spare part number | Description |
|-------------------|--|
| 418875-001 | 90-W PFC AC adapter |
| 441075-001 | Broadcom 802.11a/b/g WLAN module for use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States |
| 441075-002 | Broadcom 802.11a/b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe |
| 441075-291 | Broadcom 802.11a/b/g WLAN module for use in Japan |
| 441082-001 | Intel 802.11a/b/g WLAN module for use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam |
| 441082-002 | Intel 802.11a/b/g WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan |
| 441082-003 | Intel 802.11a/b/g WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea |
| 441082-291 | Intel 802.11a/b/g WLAN module for use in Japan |
| 441082-292 | Intel 802.11a/b/g WLAN module for use in Japan |
| 441086-001 | Intel 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam |
| 441086-002 | Intel 802.11a/b/g/n WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan |
| 441086-003 | Intel 802.11a/b/g/n WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea |

| Spare part number | Description |
|-------------------|--|
| 441086-291 | Intel 802.11a/b/g/n WLAN module for use in Japan |
| 441086-AD1 | Intel 802.11a/b/g/n WLAN module for use in South Korea |
| 441090-001 | Broadcom 802.11b/g WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States |
| 441090-002 | Broadcom 802.11b/g WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe |
| 441090-291 | Broadcom 802.11b/g WLAN module for use in Japan |
| 443899-001 | Modem module |
| 448675-004 | Intel 802.11b/g WLAN module for use in Japan |
| 450471-001 | Keyboard with pointing stick for use in the United States (includes keyboard and pointing stick cable) |
| 450471-021 | Keyboard with pointing stick for use in Europe (includes keyboard and pointing stick cable) |
| 450471-031 | Keyboard with pointing stick for use in the United Kingdom (includes keyboard and pointing stick cable) |
| 450471-041 | Keyboard with pointing stick for use in Germany (includes keyboard and pointing stick cable) |
| 450471-051 | Keyboard with pointing stick for use in France (includes keyboard and pointing stick cable) |
| 450471-061 | Keyboard with pointing stick for use in Italy (includes keyboard and pointing stick cable) |
| 450471-071 | Keyboard with pointing stick for use in Spain (includes keyboard and pointing stick cable) |
| 450471-081 | Keyboard with pointing stick for use in Denmark (includes keyboard and pointing stick cable) |
| 450471-091 | Keyboard with pointing stick for use in Norway (includes keyboard and pointing stick cable) |
| 450471-111 | Keyboard with pointing stick for use in Switzerland (includes keyboard and pointing stick cable) |
| 450471-121 | Keyboard with pointing stick for use in French Canada (includes keyboard and pointing stick cable) |
| 450471-131 | Keyboard with pointing stick for use in Portugal (includes keyboard and pointing stick cable) |
| 450471-141 | Keyboard with pointing stick for use in Turkey (includes keyboard and pointing stick cable) |
| 450471-151 | Keyboard with pointing stick for use in Greece (includes keyboard and pointing stick cable) |
| 450471-161 | Keyboard with pointing stick for use in Latin America (includes keyboard and pointing stick cable) |

| Spare part number | Description |
|-------------------|---|
| 450471-171 | Keyboard with pointing stick for use in Saudi Arabia (includes keyboard and pointing stick cable) |
| 450471-201 | Keyboard with pointing stick for use in Brazil (includes keyboard and pointing stick cable) |
| 450471-211 | Keyboard with pointing stick for use in Hungary (includes keyboard and pointing stick cable) |
| 450471-221 | Keyboard with pointing stick for use in the Czech Republic (includes keyboard and pointing stick cable) |
| 450471-231 | Keyboard with pointing stick for use in Slovakia (includes keyboard and pointing stick cable) |
| 450471-251 | Keyboard with pointing stick for use in Russia (includes keyboard and pointing stick cable) |
| 450471-281 | Keyboard with pointing stick for use in Thailand (includes keyboard and pointing stick cable) |
| 450471-291 | Keyboard with pointing stick for use in Japan (includes keyboard and pointing stick cable) |
| 450471-A41 | Keyboard with pointing stick for use in Belgium (includes keyboard and pointing stick cable) |
| 450471-AB1 | Keyboard with pointing stick for use in Taiwan (includes keyboard and pointing stick cable) |
| 450471-AD1 | Keyboard with pointing stick for use in South Korea (includes keyboard and pointing stick cable) |
| 450471-B71 | Keyboard with pointing stick for use in Sweden and Finland (includes keyboard and pointing stick cable) |
| 450471-BA1 | Keyboard with pointing stick for use in Slovenia (includes keyboard and pointing stick cable) |
| 450471-BB1 | Keyboard with pointing stick for use in Israel (includes keyboard and pointing stick cable) |
| 450471-DD1 | Keyboard with pointing stick for use in Iceland (includes keyboard and pointing stick cable) |
| 450472-001 | Keyboard without pointing stick for use in the United States (includes keyboard cable) |
| 450472-021 | Keyboard without pointing stick for use in Europe (includes keyboard cable) |
| 450472-031 | Keyboard without pointing stick for use in the United Kingdom (includes keyboard cable) |
| 450472-041 | Keyboard without pointing stick for use in Germany (includes keyboard cable) |
| 450472-051 | Keyboard without pointing stick for use in France (includes keyboard cable) |
| 450472-061 | Keyboard without pointing stick for use in Italy (includes keyboard cable) |
| 450472-071 | Keyboard without pointing stick for use in Spain (includes keyboard cable) |
| 450472-081 | Keyboard without pointing stick for use in Denmark (includes keyboard cable) |
| 450472-091 | Keyboard without pointing stick for use in Norway (includes keyboard cable) |
| 450472-111 | Keyboard without pointing stick for use in Switzerland (includes keyboard cable) |
| 450472-121 | Keyboard without pointing stick for use in French Canada (includes keyboard cable) |
| 450472-131 | Keyboard without pointing stick for use in Portugal (includes keyboard cable) |
| 450472-141 | Keyboard without pointing stick for use in Turkey (includes keyboard cable) |
| 450472-151 | Keyboard without pointing stick for use in Greece (includes keyboard cable) |
| 450472-161 | Keyboard without pointing stick for use in Latin America (includes keyboard cable) |
| 450472-171 | Keyboard without pointing stick for use in Saudi Arabia (includes keyboard cable) |
| 450472-201 | Keyboard without pointing stick for use in Brazil (includes keyboard cable) |
| 450472-211 | Keyboard without pointing stick for use in Hungary (includes keyboard cable) |
| 450472-221 | Keyboard without pointing stick for use in the Czech Republic (includes keyboard cable) |

| Spare part number | Description |
|-------------------|--|
| 450472-231 | Keyboard without pointing stick for use in Slovakia (includes keyboard cable) |
| 450472-251 | Keyboard without pointing stick for use in Russia (includes keyboard cable) |
| 450472-281 | Keyboard without pointing stick for use in Thailand (includes keyboard cable) |
| 450472-291 | Keyboard without pointing stick for use in Japan (includes keyboard cable) |
| 450472-A41 | Keyboard without pointing stick for use in Belgium (includes keyboard cable) |
| 450472-AB1 | Keyboard without pointing stick for use in Taiwan (includes keyboard cable) |
| 450472-AD1 | Keyboard without pointing stick for use in South Korea (includes keyboard cable) |
| 450472-B71 | Keyboard without pointing stick for use in Sweden (includes keyboard cable) |
| 450472-BA1 | Keyboard without pointing stick for use in Slovenia (includes keyboard cable) |
| 450472-BB1 | Keyboard without pointing stick for use in Israel (includes keyboard cable) |
| 450472-DD1 | Keyboard without pointing stick for use in Iceland (includes keyboard cable) |
| 450475-001 | Wireless Antenna Kit (includes 3 WLAN antenna transceivers and cables) |
| 450476-001 | Base enclosure (includes rubber computer feet) |
| 450477-001 | 8-cell, 5.1-Ah battery |
| 450478-001 | RTC battery |
| 450479-001 | Switch cover (includes LED board and cable) |
| 450480-001 | Ambient light sensor board |
| 450481-001 | Power button board (includes cable) |
| 450482-001 | System board for use only with computer models equipped with processors with 2- or 4-MB L2 cache (includes replacement thermal material) |
| 450483-001 | USB/audio board (includes 2-into-1 USB board cable and audio board cable) |
| 450484-001 | Graphics card for use only with HP Compaq 8710p computer models (nVidia NB8P-NVS2 with 256 MB of graphics subsystem memory operating at 700 MHz, supporting TurboCache; includes replacement thermal material) |
| 450485-001 | Bluetooth module (includes Bluetooth module cable) |
| 450486-001 | Cable Kit (see Cable Kit on page 27 for more Cable Kit spare part information) |
| 450488-001 | DVD-ROM Drive |
| 450489-001 | Blu-ray DVD-RW Drive |
| 450490-001 | DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe |
| 450491-001 | DVD±RW and CD-RW Super Multi Double-Layer Combo Drive |
| 450492-001 | DVD/CD-RW Combo Drive |
| 450493-001 | 100-GB, 7200-rpm hard drive |
| 450494-001 | 120-GB, 5400-rpm hard drive |
| 450495-001 | 160-GB, 5400-rpm hard drive |
| 450496-001 | 80-GB, 5400-rpm hard drive |

| Spare part number | Description |
|-------------------|---|
| 450497-001 | 80-GB, 7200-rpm hard drive |
| 450498-001 | Display inverter |
| 450499-001 | Label Kit |
| 450500-001 | Display bezel |
| 450570-001 | Display Bracket Kit (includes left and right display hinges) |
| 450571-001 | Display cable |
| 450572-001 | Display enclosure for use with WSXGA+ and WXGA+ display assemblies (includes 3 WLAN antenna transceivers and cables) |
| 450573-001 | Display Rubber Kit (includes display bezel rubber screw covers) |
| 450574-001 | Display Screw Kit |
| 450575-001 | 1024-MB memory module (PC-5300, 667-GHz, DDR2) |
| 450576-001 | 2048-MB memory module (PC-5300, 667-GHz, DDR2) |
| 450577-001 | 512-MB memory module (PC-5300, 667-GHz, DDR2) |
| 450578-001 | Microphone extension cable |
| 450580-001 | 17.0-inch, WSXGA+ WVA AntiGlare display assembly (includes 3 WLAN antenna transceivers and cables) |
| 450581-001 | 17.0-inch, WSXGA+ WVA BrightView display assembly (includes 3 WLAN antenna transceivers and cables) |
| 450582-001 | 17.0-inch, WUXGA+ WVA AntiGlare display assembly (includes 3 WLAN antenna transceivers and cables) |
| 450583-001 | 17.0-inch, WXGA+ AntiGlare display assembly (includes 3 WLAN antenna transceivers and cables) |
| 450584-001 | PC Card assembly |
| 450585-001 | Plastics Kit (see Plastics Kit on page 26 for more Plastics Kit spare part information) |
| 450586-001 | Intel Core 2 Duo T7100 1.8-GHz processor (2-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 450587-001 | Intel Core 2 Duo T7300 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 450588-001 | Intel Core 2 Duo T7500 2.2-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 450589-001 | Intel Core 2 Duo T7700 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 450590-001 | Rubber Kit (includes base enclosure rubber feet) |
| 450591-001 | Screw Kit |
| 450592-001 | Speaker assembly |
| 450593-001 | Heat sink for use only with computer models equipped with processors with 2- or 4-MB L2 cache (includes replacement thermal material) |
| 450594-001 | Fan/heat sink assembly (includes replacement thermal material) |
| 450595-001 | Top cover for use with 8710p computer models (includes fingerprint reader board and cable) |
| 450596-001 | TouchPad with 2 TouchPad buttons (for use with keyboards without a pointing stick; includes TouchPad cable) |

| Spare part number | Description |
|-------------------|---|
| 450597-001 | TouchPad with 3 pointing stick buttons and 3 TouchPad buttons (for use with keyboards with a pointing stick; includes TouchPad cable) |
| 451377-001 | Graphics card for use only with HP Compaq 8710w computer models (nVidia NB8E-GLM with 512 MB graphics subsystem memory operating at 800 MHz; includes replacement thermal material) |
| 451379-001 | Top cover for use with 8710w computer models (includes fingerprint reader board and cable) |
| 416931-001 | 120-W non-PFC AC adapter |
| 391174-001 | 120-W PFC AC adapter |
| 454987-001 | 120-GB, 7200-rpm hard drive |
| 456223-001 | Display enclosure for use with WUXGA display assemblies (includes 3 WLAN antenna transceivers and cables) |
| 458218-001 | Intel Core 2 Duo T7800 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 458219-001 | 250-GB, 5400-rpm hard drive |
| 460282-001 | 160-GB, 7200-rpm hard drive |
| 460283-001 | Intel Core 2 Duo T7250 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 461876-001 | 200-GB, 7200-rpm hard drive |
| 463048-001 | Intel Core 2 Duo T8100 2.1-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 463049-001 | Intel Core 2 Duo T8300 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 463050-001 | Intel Core 2 Duo T9300 2.8-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 463051-001 | Intel Core 2 Duo T9500 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB; includes replacement thermal material) |
| 463952-001 | 180-W PFC AC adapter |
| 468590-001 | 135-W PFC AC adapter |
| 468591-001 | System board for use only with computer models equipped with processors with 3- or 6-MB L2 cache (includes replacement thermal material) |
| 468592-001 | Graphics card for use only with computer models equipped with processors with 3- or 6-MB L2 cache |
| 468593-001 | Heat sink for use only with computer models equipped with processors with 3- or 6-MB L2 cache (includes replacement thermal material) |
| 469650-001 | 4096-MB memory module (PC-5300, 667-GHz, DDR2) |

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
- Torx T8 screwdriver

Service considerations

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

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

Plastic parts

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 pointing stick connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated and pointing stick 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 and pointing stick can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

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

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

Use nonmagnetic tools.

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

Avoid touching pins, leads, and pointing stick 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 and pointing stick contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved and pointing stick 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 pointing stick 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 and pointing stick 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 and pointing stick cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.


The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

Unknown user password

 **NOTE:** This process will not work if Stringent Security is enabled in F10 Setup. Stringent Security installs passwords into the ROM so that it is not affected when the RTC battery is removed.

If the computer you are servicing has an unknown user password, follow these steps to clear the password:

 **NOTE:** These steps also clear CMOS.

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the real-time clock (RTC) battery (see [RTC battery on page 57](#)).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

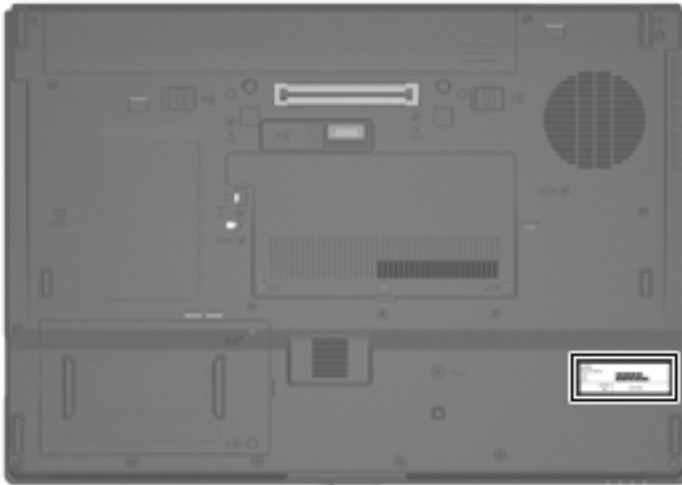
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 97 screws and screw locks, in 18 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

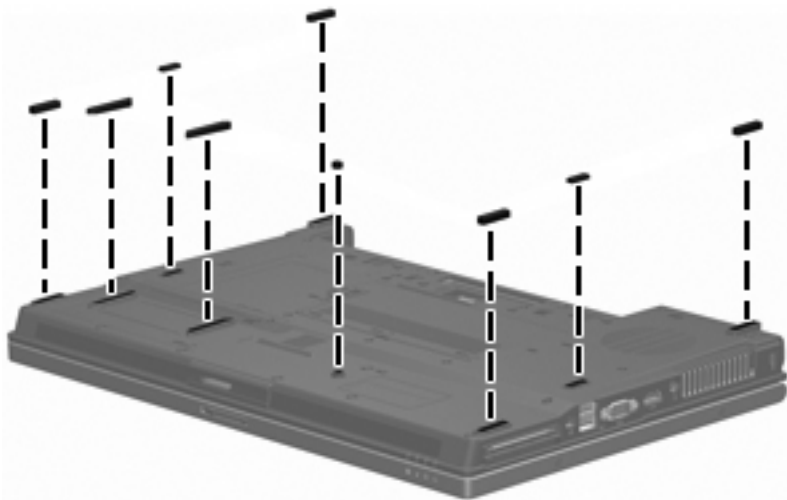
Serial number

Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 450590-001. There are 9 rubber feet, in 4 different sizes, that attach to the base enclosure in the locations illustrated below.



Battery

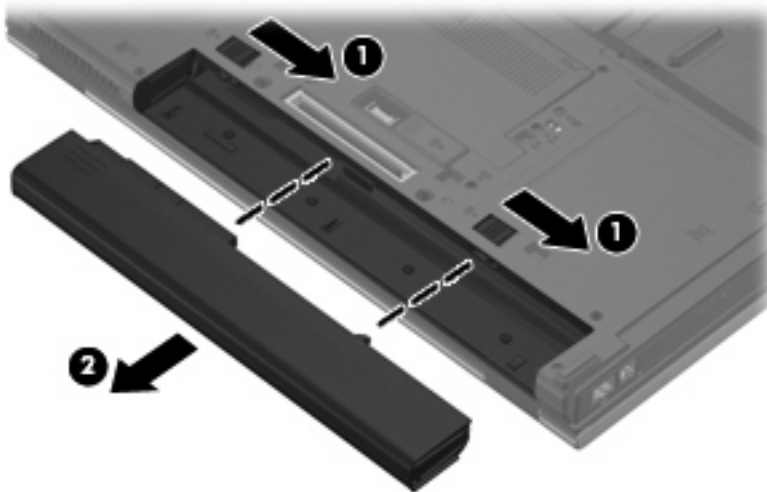
| Description | Spare part number |
|--------------------------------|-------------------|
| 8-cell, 5.1-Ah, Li-ion battery | 450477-001 |

Before disassembling the computer, follow these steps:

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


Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latches (1) to release the battery.
3. Remove the battery (2) from the computer.



Install the battery by inserting it into the battery bay until you hear a click.

Display inverter and ambient light sensor board

 **NOTE:** If it has been determined that the display inverter or the ambient light sensor board are the components that must be replaced to complete the computer repair, the display assembly does not have to be removed. Follow the procedures in this section to replace the display inverter or ambient light sensor board. For information on replacing the display assembly, the display hinges, or the display bezel, see [Display assembly on page 77](#).

| Description | Spare part number |
|----------------------------|-------------------|
| Display inverter | 450498-001 |
| Ambient light sensor board | 450480-001 |

Before removing the display inverter, follow these steps:

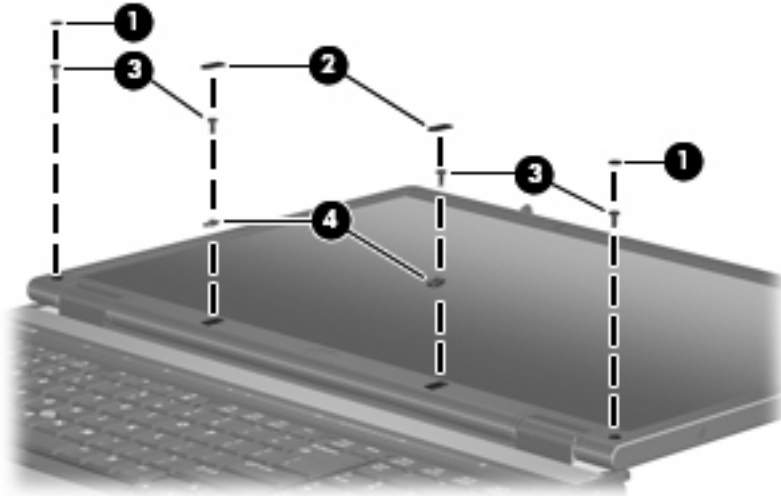
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).

Remove the display inverter:

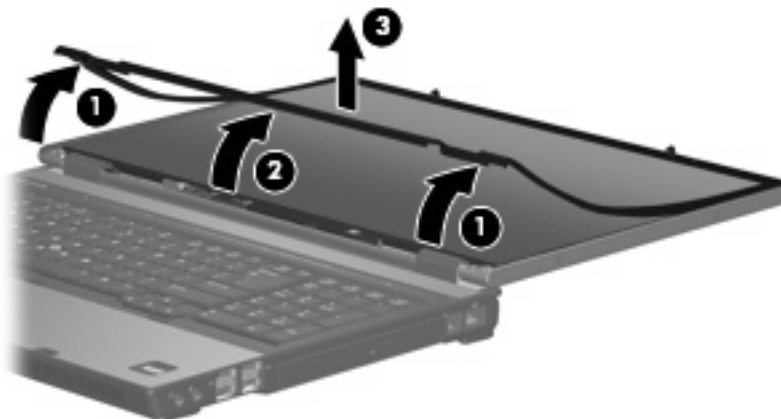
1. Turn the computer right-side up, with the front toward you.
2. Open the computer as far as possible.

3. Remove the screw covers, screws, and stabilizer clips listed below. All rubber screw covers are included in the Display Rubber Kit, spare part number 450573-001.

- (1) Two flat rubber screw covers
- (2) Two small oblong rubber screw covers
- (3) Four Phillips PM2.0×6.0 screws
- (4) Two stabilizer clips

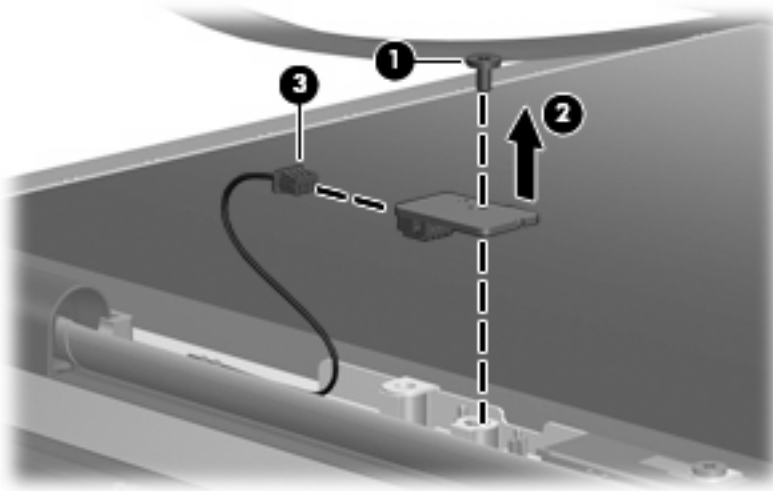


4. Flex the inside edges of the left and right sides (1) and the display bezel bottom edge (2) until the bezel disengages from the display assembly.
5. Release the display bezel bottom edge (3) from the display assembly.

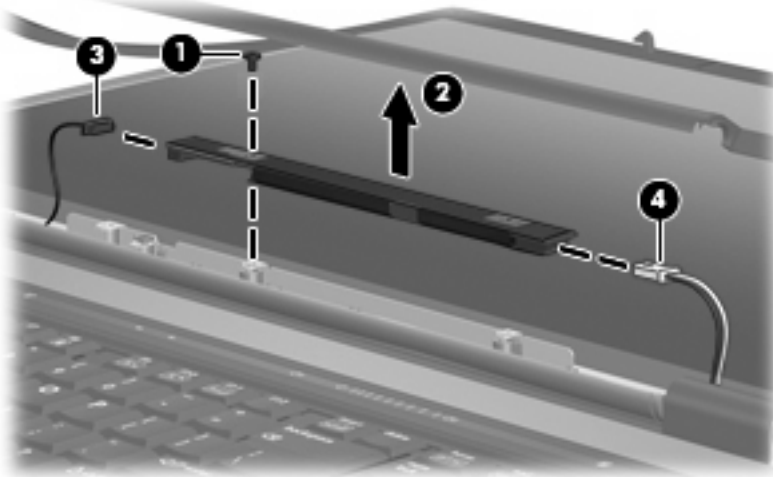


6. Remove the Torx T8M2.5×4.0 screw (1) that secures the ambient light sensor board to the display enclosure.
7. Release the ambient light sensor board (2) from the display enclosure as far as the ambient light sensor board cable allows.

8. Disconnect the ambient light sensor board cable (3) from the ambient light sensor board.



9. Remove the Torx T8M2.5×4.0 screw (1) that secures the display inverter to the display enclosure.
10. Release the inverter (2) from the display enclosure as far as the display panel cable and backlight cable allow.
11. Disconnect the display panel cable (3) and the backlight cable (4) from the display inverter.



12. Remove the display inverter.

Reverse this procedure to install the display inverter.

Hard drive

| Description | Spare part number |
|-----------------------------|-------------------|
| 250-GB, 5400-rpm hard drive | 458219-001 |
| 200-GB, 7200-rpm hard drive | 461876-001 |
| 160-GB, 7200-rpm hard drive | 460282-001 |
| 160-GB, 5400-rpm hard drive | 450495-001 |
| 120-GB, 7200-rpm hard drive | 454987-001 |
| 120-GB, 5400-rpm hard drive | 450494-001 |
| 100-GB, 7200-rpm hard drive | 450493-001 |
| 80-GB, 7200-rpm hard drive | 450497-001 |
| 80-GB, 5400-rpm hard drive | 450496-001 |

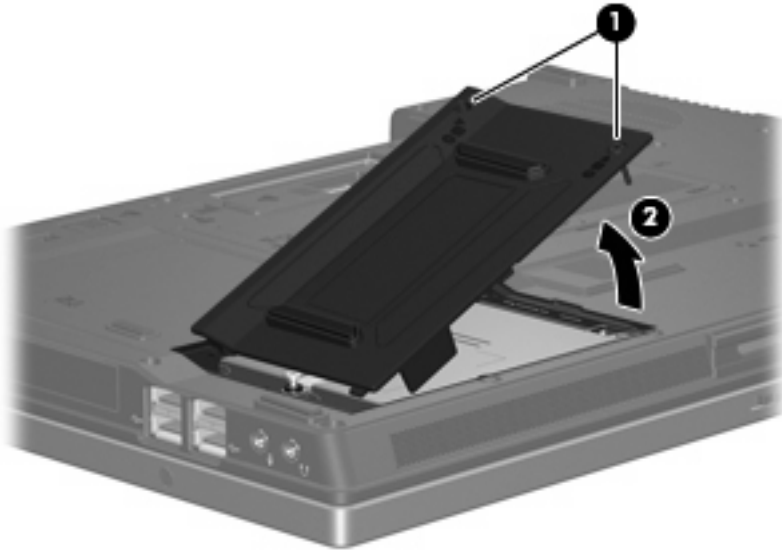
Before disassembling the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).

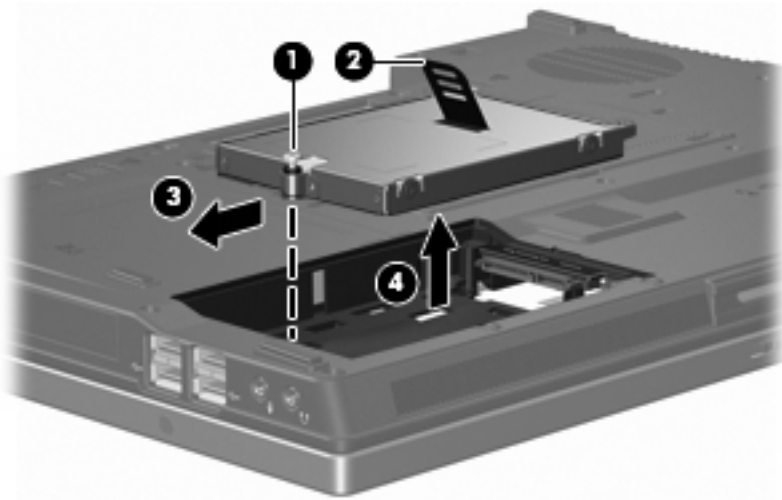
Remove the hard drive:

1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.0×17.0 captive screws **(1)** that secure the hard drive cover to the computer.

3. Lift the right side of the hard drive cover (2), swing it to left, and remove the cover. The hard drive cover is included in the Plastics Kit, spare part number 450585-001.

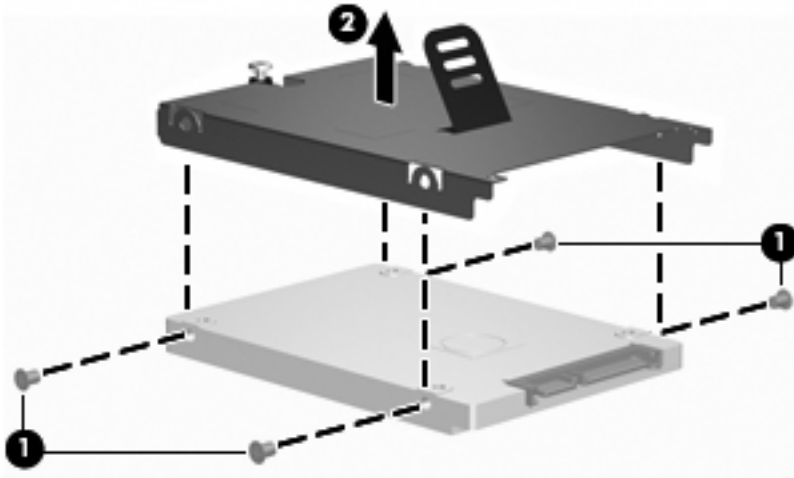


4. Loosen the Phillips PM2.5×13.0 captive screw (1) that secures the hard drive to the computer.
5. Grasp the Mylar tab (2) on the hard drive and slide the hard drive (3) to the left to disconnect it from the system board.
6. Remove the hard drive (4) from the hard drive bay.



7. If it is necessary to replace the hard drive bracket, remove the two Phillips PM3.0×4.0 hard drive bracket screws (1) from each side of the hard drive.

- Lift the bracket (2) straight up to remove it from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

Bluetooth module

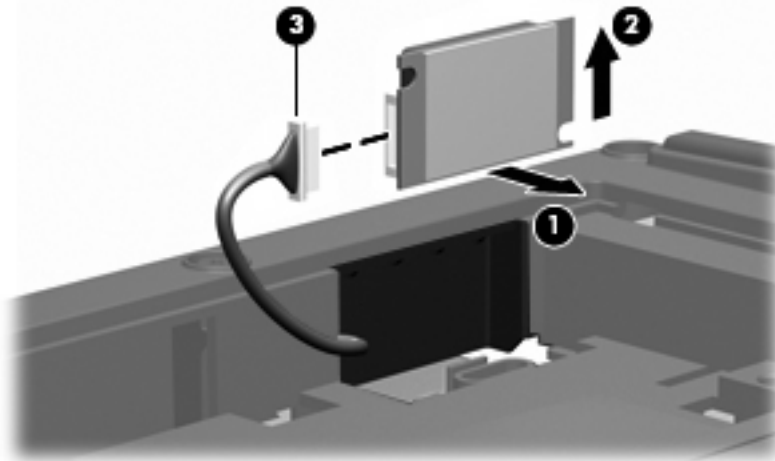
| Description | Spare part number |
|--|-------------------|
| Bluetooth module (includes Bluetooth module cable) | 450485-001 |

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the hard drive (see [Hard drive on page 48](#)).

Remove the Bluetooth® module:

1. Position the computer with the rear panel toward you.
2. Release the Bluetooth module **(1)** from the clip in the hard drive bay by sliding it forward.
3. Remove the Bluetooth module **(2)** from the hard drive bay by lifting it straight up.
4. Disconnect the Bluetooth module cable **(3)** from the Bluetooth module.



Reverse this procedure to reassemble and install the Bluetooth module.

Primary memory module

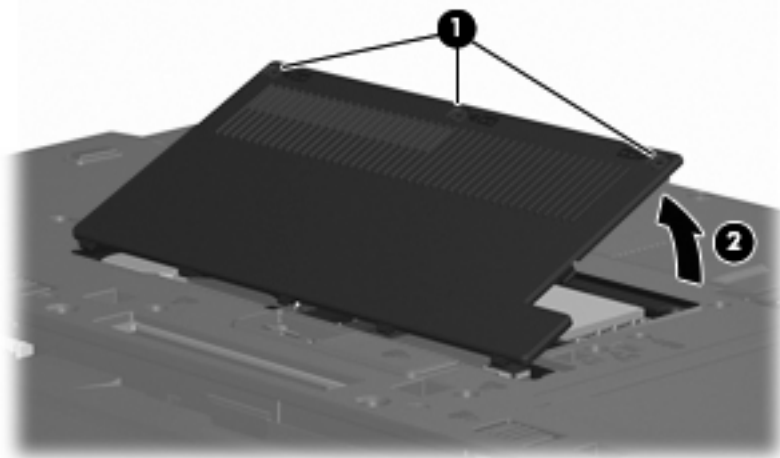
| Description | Spare part number |
|-----------------------------------|-------------------|
| 4096-MB (PC2-5300, 667-MHz, DDR2) | 469650-001 |
| 2048-MB (PC2-5300, 667-MHz, DDR2) | 450576-001 |
| 1024-MB (PC2-5300, 667-MHz, DDR2) | 450575-001 |
| 512-MB (PC2-5300, 667-MHz, DDR2) | 450577-001 |

Before removing the primary memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).


Remove the primary memory module:

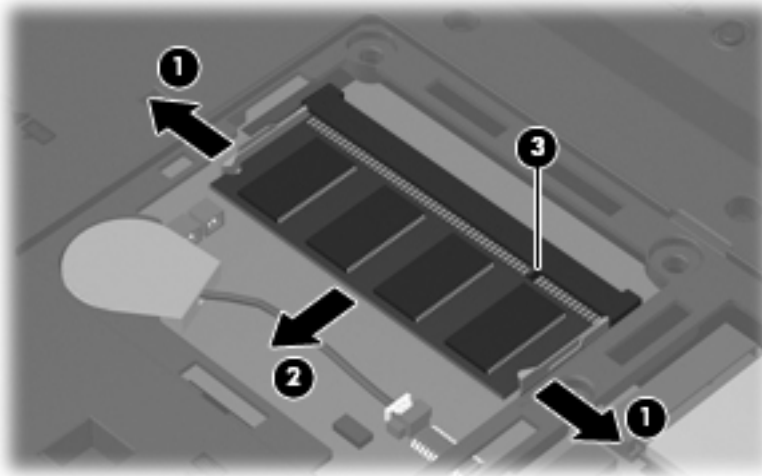
1. Loosen the three Phillips PM2.5×5.0 captive screws **(1)** that secure the memory module/WLAN module compartment cover to the computer.
2. Lift the front edge of the cover **(2)**, swing it up and forward, and remove the cover. The memory module/WLAN module compartment cover is included in the Plastics Kit, spare part number 450585-001.



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

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

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



Reverse this procedure to install the primary memory module.

WLAN module

| Description | Spare part number |
|---|-------------------|
| Intel 802.11a/b/g/n WLAN modules: | |
| <ul style="list-style-type: none"> For use in Antigua and Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam | 441086-001 |
| <ul style="list-style-type: none"> For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan | 441086-002 |
| <ul style="list-style-type: none"> For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea | 441086-003 |
| <ul style="list-style-type: none"> For use in Japan | 441086-291 |
| <ul style="list-style-type: none"> For use in South Korea | 441086-AD1 |
| Broadcom 802.11a/b/g WLAN modules: | |
| <ul style="list-style-type: none"> For use in Canada, Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States | 441075-001 |
| <ul style="list-style-type: none"> For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, China, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe | 441075-002 |
| <ul style="list-style-type: none"> For use in Japan | 441075-291 |
| Intel 802.11a/b/g WLAN modules: | |
| <ul style="list-style-type: none"> For use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, the United States, Uruguay, Venezuela, and Vietnam | 441082-001 |


| Description | Spare part number |
|---|------------------------------|
| <ul style="list-style-type: none"> For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan | 441082-002 |
| <ul style="list-style-type: none"> For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea | 441082-003 |
| <ul style="list-style-type: none"> For use in Japan | 441082-291 and 441082-292 |
| 802.11b/g Broadcom WLAN modules: | |
| <ul style="list-style-type: none"> For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States | 441090-001 |
| <ul style="list-style-type: none"> For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe | 441090-002 |
| <ul style="list-style-type: none"> For use in Japan | 441090-291 |
| 802.11b/g Intel WLAN module for use in Thailand | 448675-004 |

Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the memory module/WLAN module compartment cover (see [Primary memory module on page 52](#)).


Remove the WLAN module:

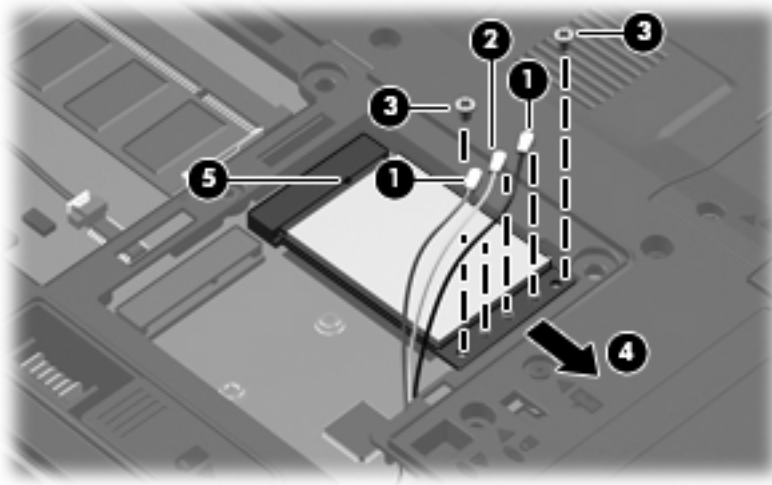
1. Disconnect the WLAN antenna cables (1) from the terminals on the WLAN module.

 **NOTE:** The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The white WLAN antenna cable is connected to the WLAN module “Aux” terminal. If the computer is equipped with an 802.11a/b/g/n WLAN module, the yellow WLAN antenna cable (2) is connected to the middle terminal on the WLAN module.

2. Remove the two Phillips PM2.0×3.0 screws (3) that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)


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

 **NOTE:** WLAN modules are designed with a notch (5) to prevent incorrect installation.



Reverse this procedure to install the WLAN module.

RTC battery

 **NOTE:** Removing the RTC battery and leaving it uninstalled for 5 or more minutes causes all passwords and CMOS settings to be cleared.

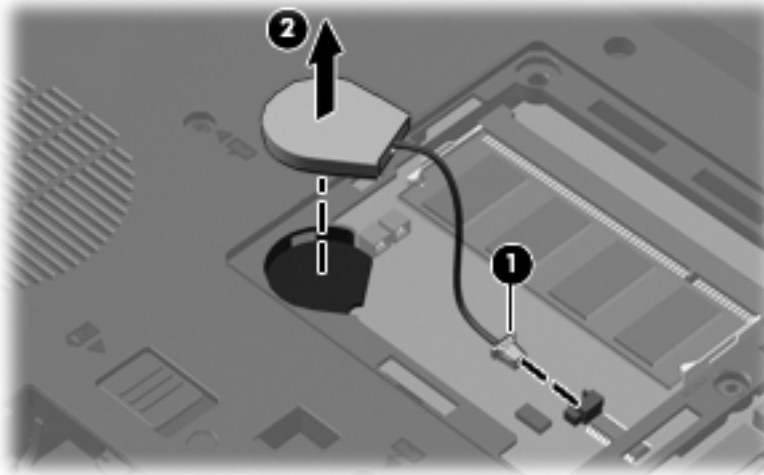
| Description | Spare part number |
|-------------|-------------------|
| RTC battery | 450478-001 |

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the memory module/WLAN module compartment cover (see [Primary memory module on page 52](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable (1) from the system board.
2. Remove the RTC battery (2) from the clip built into the base enclosure.



Reverse this procedure to install the RTC battery.

Optical drive

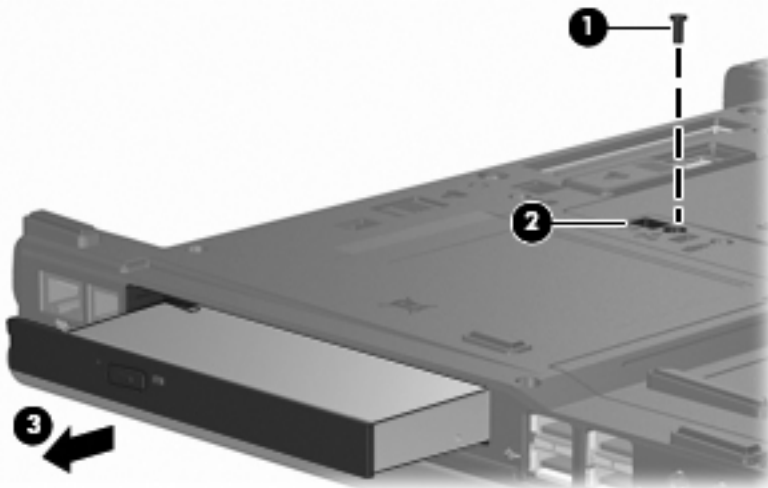
| Description | Spare part number |
|--|-------------------|
| DVD±RW and CD-RW Super Multi Double-Layer Combo Drive with LightScribe | 450490-001 |
| DVD±RW and CD-RW Super Multi Double-Layer Combo Drive | 450491-001 |
| DVD/CD-RW Combo Drive | 450492-001 |
| Blu-ray DVD-RW Drive | 450489-001 |
| DVD-ROM Drive | 450488-001 |

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).

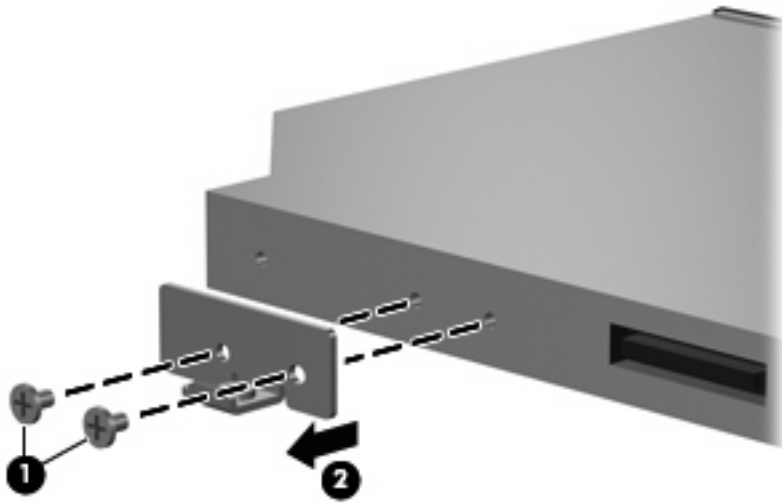
Remove the optical drive:

1. Position the computer with the left side toward you.
2. Remove the Phillips PM2.5×9.0 screw (1) that secures the optical drive to the computer.
3. Insert a flat-bladed screwdriver or similar tool into the optical drive tab access (2) and press the tab to the left to release the optical drive from the computer.
4. Remove the optical drive (3).



5. If it is necessary to replace the optical drive bracket, position the optical drive with the rear toward you.

6. Remove the two Phillips PM2.0×4.0 screws (1) that secure the optical drive bracket to the optical drive.
7. Remove the optical drive bracket (2).



Reverse this procedure to install an optical drive.

Keyboard

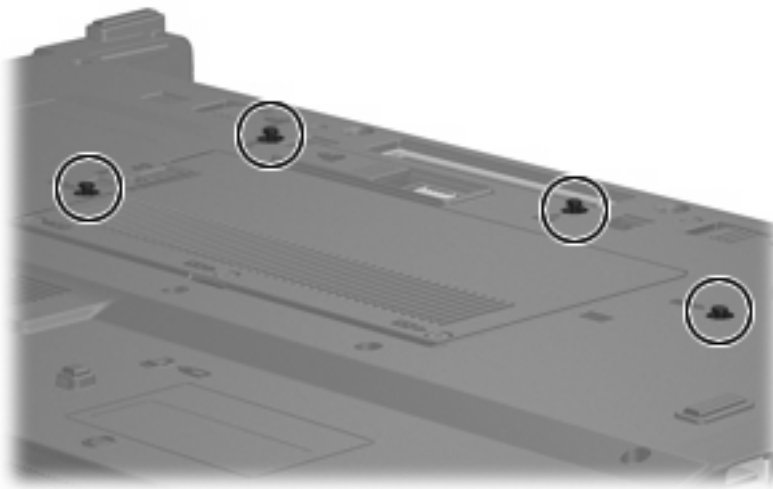
| For use in: | Spare part number | For use in: | Spare part number |
|--|-------------------|--------------------|-------------------|
| Keyboards with pointing stick (includes pointing stick cable): | | | |
| Belgium | 450471-A41 | Norway | 450471-091 |
| Brazil | 450471-201 | Portugal | 450471-131 |
| The Czech Republic | 450471-221 | Russia | 450471-251 |
| Denmark | 450471-081 | Saudi Arabia | 450471-171 |
| France | 450471-051 | Slovakia | 450471-231 |
| French Canada | 450471-121 | Slovenia | 450471-AD1 |
| Germany | 450471-041 | South Korea | 450471-BA1 |
| Greece | 450471-151 | Spain | 450471-071 |
| Hungary | 450471-211 | Sweden and Finland | 450471-B71 |
| Iceland | 450471-DD1 | Switzerland | 450471-111 |
| Israel | 450471-BB1 | Taiwan | 450471-AB1 |
| Italy | 450471-061 | Thailand | 450471-281 |
| Japan | 450471-291 | Turkey | 450471-141 |
| Latin America | 450471-161 | The United Kingdom | 450471-031 |
| The Netherlands and Europe | 450471-021 | The United States | 450471-001 |
| Keyboards without pointing stick: | | | |
| Belgium | 450472-A41 | Norway | 450472-091 |
| Brazil | 450472-201 | Portugal | 450472-131 |
| The Czech Republic | 450472-221 | Russia | 450472-251 |
| Denmark | 450472-081 | Saudi Arabia | 450472-171 |
| France | 450472-051 | Slovakia | 450472-231 |
| French Canada | 450472-121 | Slovenia | 450472-AD1 |
| Germany | 450472-041 | South Korea | 450472-BA1 |
| Greece | 450472-151 | Spain | 450472-071 |
| Hungary | 450472-211 | Sweden and Finland | 450472-B71 |
| Iceland | 450472-DD1 | Switzerland | 450472-111 |
| Israel | 450472-BB1 | Taiwan | 450472-AB1 |
| Italy | 450472-061 | Thailand | 450472-281 |
| Japan | 450472-291 | Turkey | 450472-141 |
| Latin America | 450472-161 | The United Kingdom | 450472-031 |
| The Netherlands and Europe | 450472-021 | The United States | 450472-001 |

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).

Remove the keyboard:

1. Position the computer with the front toward you.
2. Loosen the four Phillips PM2.5×9.0 captive screws that secure the keyboard to the computer.

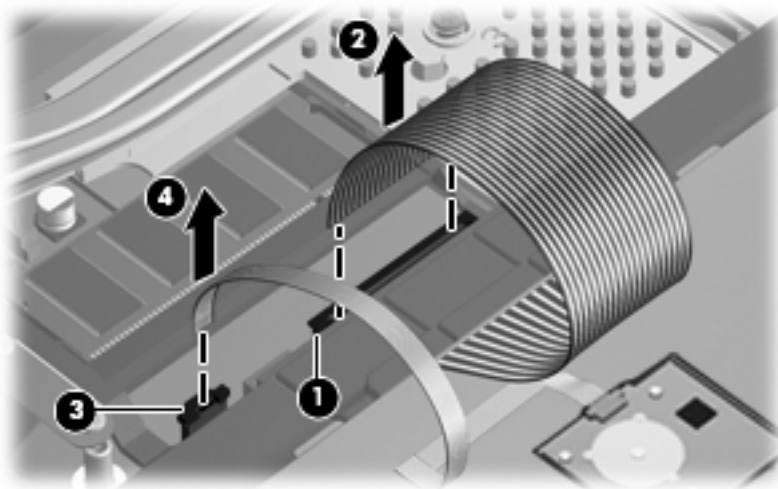


3. Open the computer, and rest it on its right side.

4. Lift the upper left corner of the keyboard (1) and swing the left side of the keyboard (2) forward.



5. Turn the computer right-side up, with the front toward you.
6. Release the zero insertion force (ZIF) connector (1) to which the keyboard cable is attached, and disconnect the keyboard cable (2) from the system board.
7. Release the ZIF connector (3) to which the pointing stick cable is attached, and disconnect the pointing stick cable (4) from the system board.



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

Expansion memory module


| Description | Spare part number |
|-----------------------------------|-------------------|
| 4096-MB (PC2-5300, 667-MHz, DDR2) | 469650-001 |
| 2048-MB (PC2-5300, 667-MHz, DDR2) | 450576-001 |
| 1024-MB (PC2-5300, 667-MHz, DDR2) | 450575-001 |
| 512-MB (PC2-5300, 667-MHz, DDR2) | 450577-001 |

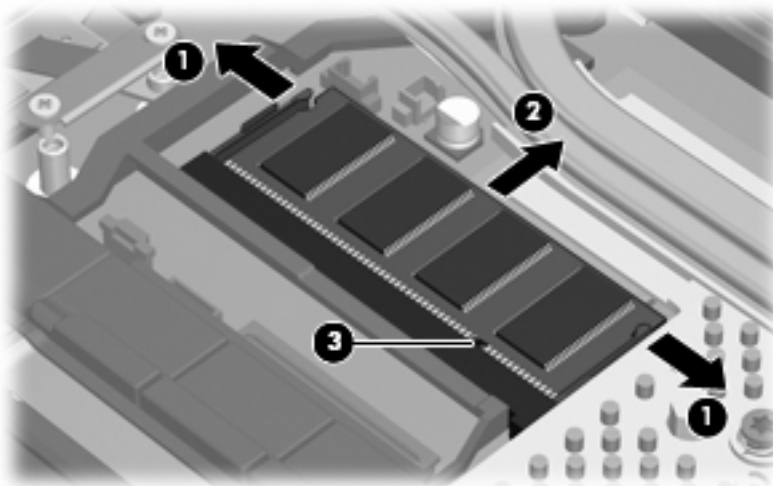
Before removing the expansion memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).

Remove the expansion memory module:


1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the expansion memory module.

TouchPad

 **NOTE:** All TouchPad spare part kits include a TouchPad cable.

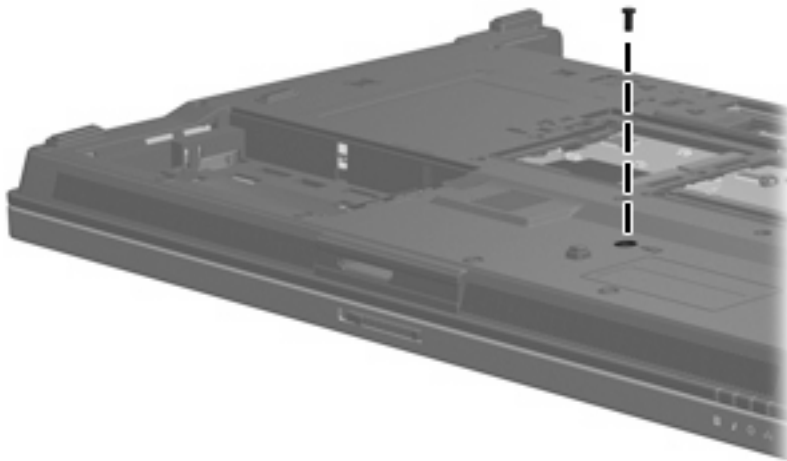
| Description | Spare part number |
|--|-------------------|
| For use with keyboards with a pointing stick, includes 3 pointing stick buttons and 3 TouchPad buttons | 450597-001 |
| For use with keyboards without a pointing stick, includes 2 TouchPad buttons | 450596-001 |

Before removing the TouchPad, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).

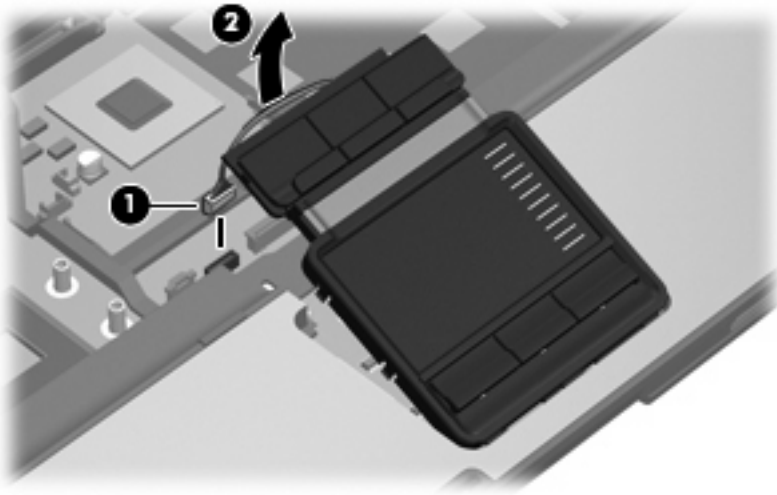
Remove the TouchPad:

1. Turn the computer upside down, with the front toward you.
2. Remove the Torx T8M2.5×9.0 screw that secures the TouchPad to the computer.



3. Turn the computer right-side up, with the front toward you.
4. Disconnect the TouchPad cable **(1)** from the system board.

5. Lift the rear edge of the TouchPad (2) until it disengages from the top cover.



6. Remove the TouchPad.

Reverse this procedure to install the TouchPad.

Modem module

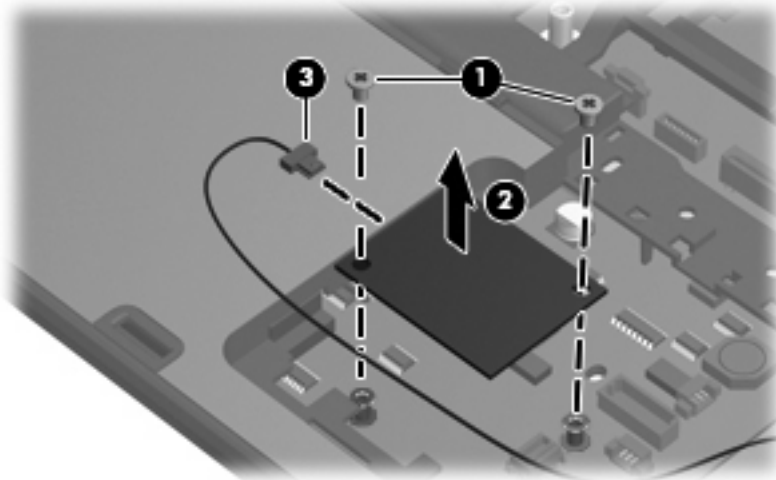
| Description | Spare part number |
|--------------|-------------------|
| Modem module | 443899-001 |

Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).
6. Remove the TouchPad (see [TouchPad on page 64](#)).

Remove the modem module:

1. Remove the two Phillips PM2.0×4.0 screws (1) that secure the modem module to the system board.
2. Disconnect the modem module (2) from the system board by lifting it straight up.
3. Disconnect the modem module cable (3) from the modem module.



4. Remove the modem module.

Reverse this procedure to install the modem module.

Switch cover

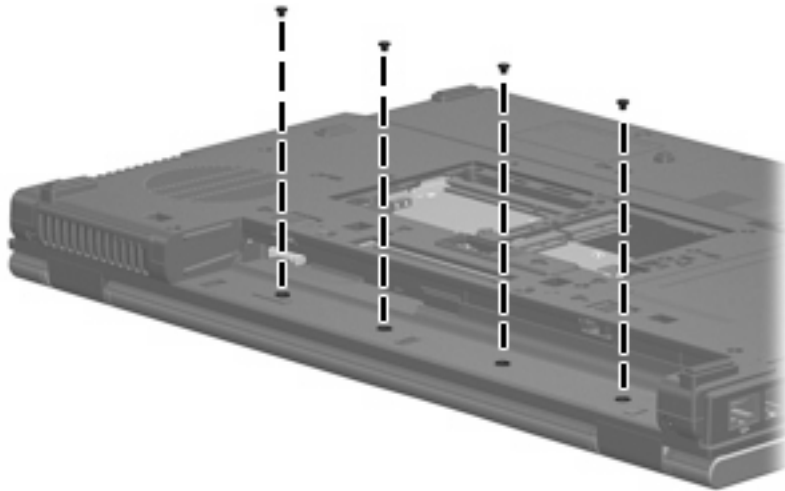
| Description | Spare part number |
|---|-------------------|
| Switch cover (includes LED board and cable) | 450479-001 |

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).

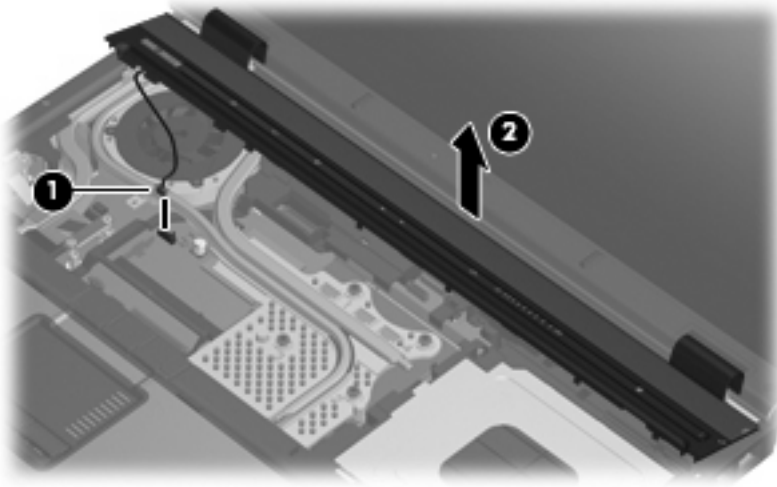
Remove the switch cover:

1. Turn the computer upside down, with the rear panel toward you.
2. Remove the four Torx T8M2.5×4.0 screws that secure the switch cover to the computer.

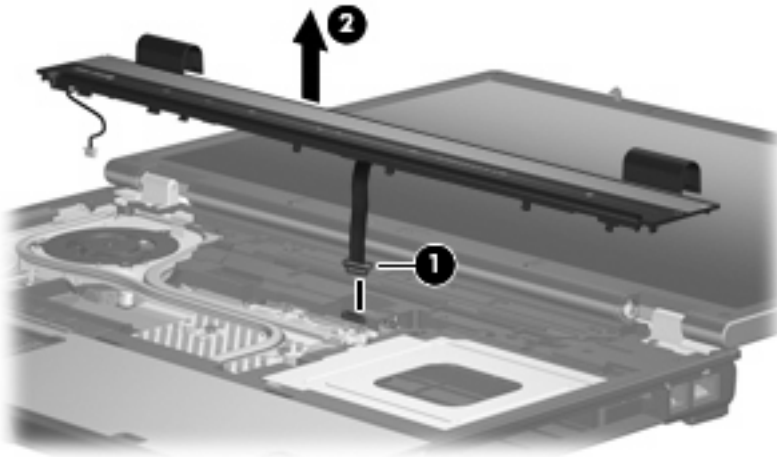


3. Turn the computer right-side up, with the front toward you.
4. Open the computer as far as possible.
5. Disconnect the power button board cable **(1)** from the system board.

6. Lift the front edge of the switch cover (2) until it disengages from the computer.



7. Release the ZIF connector (1) to which the LED board cable is connected and disconnect the cable from the system board.
8. Remove the switch cover (2).



Reverse this procedure to install the switch cover.

Power button board

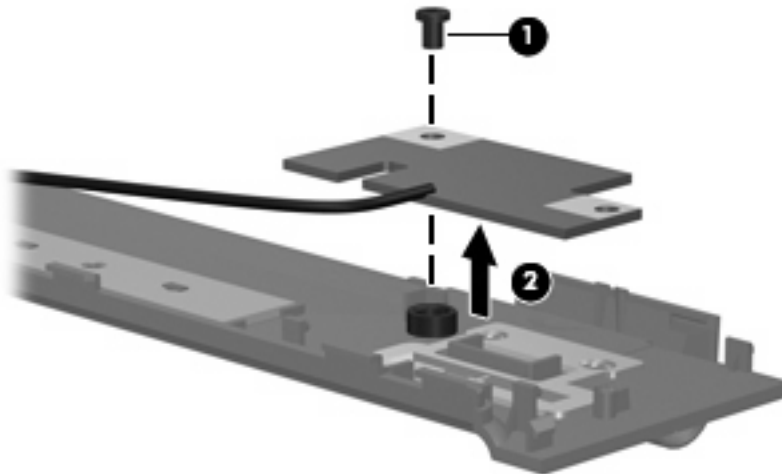
| Description | Spare part number |
|-------------------------------------|-------------------|
| Power button board (includes cable) | 450481-001 |

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).
6. Remove the switch cover (see [Switch cover on page 67](#)).

Remove the power button board:

1. Turn the switch cover upside down, with the front toward you.
2. Remove the Torx T8M2.5×4.0 screw (1) that secures the power button board to the switch cover.
3. Remove the power button board (2).



Reverse this procedure to install the power button board.

Fan/heat sink assembly

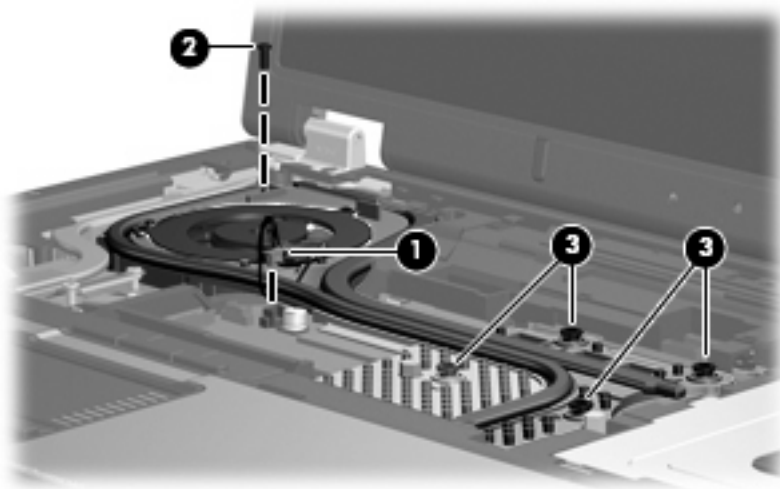
| Description | Spare part number |
|--|-------------------|
| Fan/heat sink assembly (includes replacement thermal material) | 450594-001 |

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).
6. Remove the switch cover (see [Switch cover on page 67](#)).

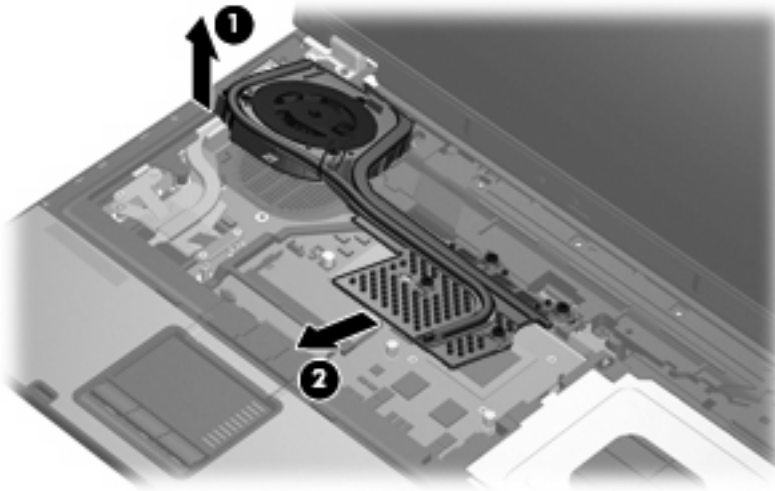
Remove the fan/heat sink assembly:


1. Disconnect the fan cable (1) from the system board.
2. Remove the Torx T8M2.5×7.0 screw (2) that secures the fan/heat sink assembly to the computer.
3. Loosen the four Torx T8M2.0×10.0 screws (3) that secure the fan/heat sink assembly to the computer.

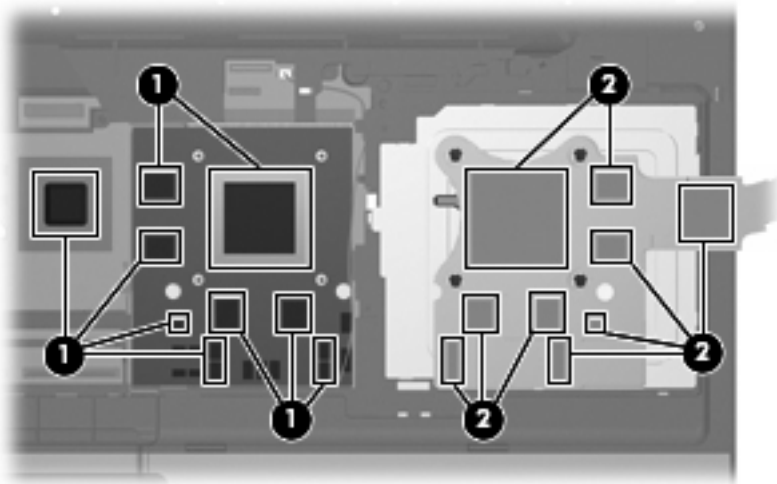


4. Lift the front edge of the fan/heat sink assembly (1) to disengage it from the system board and graphics card.

5. Remove the fan/heat sink assembly (2) by sliding it forward.




 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the graphics card (1) and fan/heat sink assembly(2) each time the fan/heat sink assembly is removed. Thermal material is included with all fan/heat sink assembly and graphics card spare part kits.



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

Graphics card

 **NOTE:** All graphics card spare part kits include replacement thermal material.

| Description | Spare part number |
|--|-------------------|
| For use only with computer models equipped with processors with 3- or 6-MB L2 cache | 468952-001 |
| For use only with HP Compaq 8710w computer models with processors with 2- or 4-MB L2 cache (nVidia NB8E-GLM graphics card with 512 MB graphics subsystem memory operating at 800 MHz) | 451377-001 |
| For use only with HP Compaq 8710p computer models with processors with 2- or 4-MB L2 cache (nVidia NB8P-NVS2 graphics card with 256 MB of graphics subsystem memory operating at 700 MHz; supports TurboCache) | 450484-001 |

Before removing the graphics card, follow these steps:

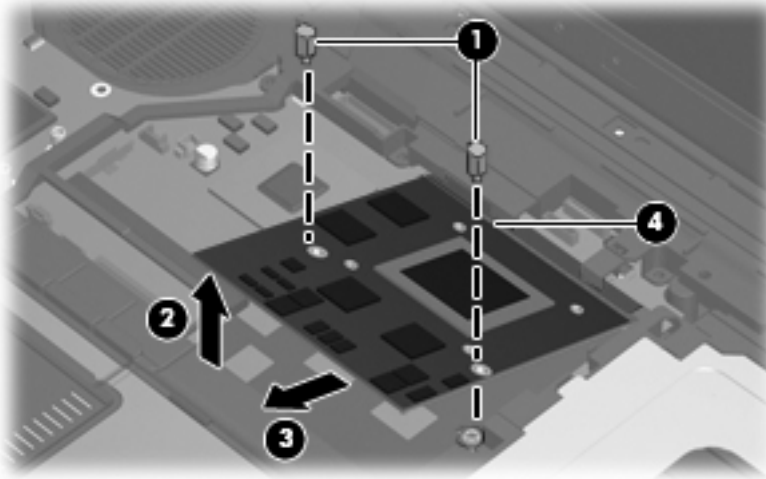
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the following components:
 - a. Keyboard (see [Keyboard on page 60](#))
 - b. Switch cover (see [Switch cover on page 67](#))
 - c. Fan/heat sink assembly (see [Fan/heat sink assembly on page 70](#))


Remove the graphics card:

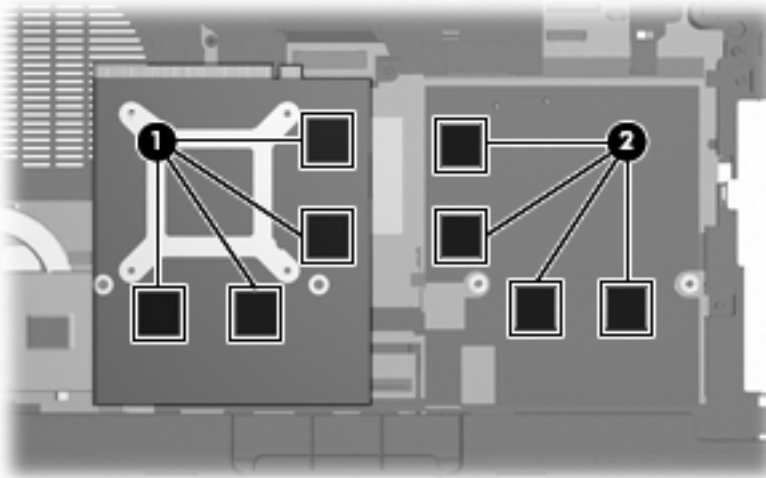
1. Remove the two HM5.0×10.0 standoffs **(1)** that secure the graphics card to the system board.
2. Lift the front edge of the graphics card **(2)** until it clears the adjacent edge of the top cover.

3. Remove the graphics card (3) by sliding it away from the graphics card slot at an angle.

 **NOTE:** The graphics card is designed with a notch (4) to prevent incorrect installation.




 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the graphics card (1) and fan/heat sink assembly(2) each time the fan/heat sink assembly is removed. Thermal material is included with all fan/heat sink assembly and graphics card spare part kits.



Reverse this procedure to install the graphics card.

Heat sink

 **NOTE:** Replacement thermal material is included with all heat sink spare part kits.

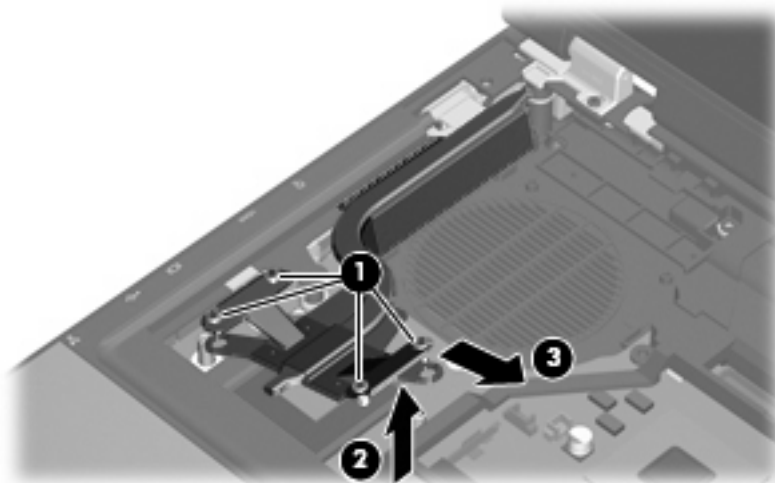
| Description | Spare part number |
|---|-------------------|
| For use only with computer models equipped with processors with 3- or 6-MB L2 cache | 468593-001 |
| For use only with computer models equipped with processors with 2- or 4-MB L2 cache | 450593-001 |

Before removing the processor heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the following components:
 - a. Keyboard (see [Keyboard on page 60](#))
 - b. Switch cover (see [Switch cover on page 67](#))
 - c. Fan/heat sink assembly (see [Fan/heat sink assembly on page 70](#))


Remove the processor heat sink:

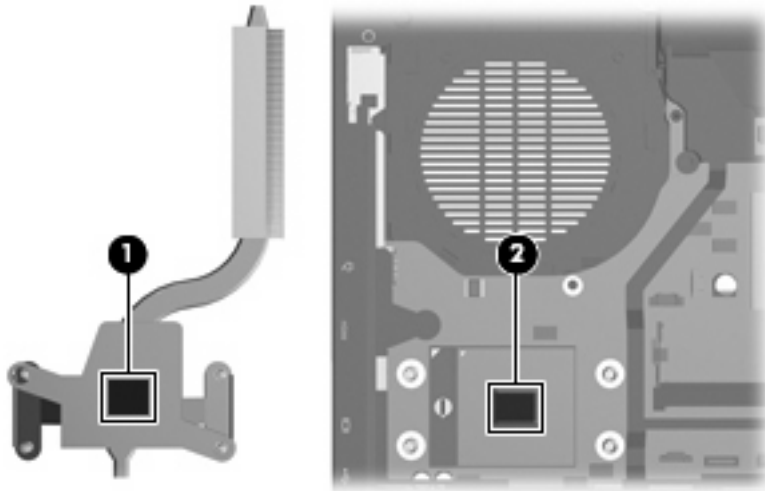
1. Loosen the four Phillips PM2.5×7.0 screws (1) that secure the processor heat sink to the base enclosure.
2. Lift the right side of the processor heat sink (2) until it disengages from the processor.
3. Release the processor heat sink (3) by sliding it to the right until it clears the base enclosure.




4. Remove the processor heat sink.

Reverse this procedure to install the processor heat sink.

 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the processor heat sink (1) and the processor (2) each time the processor heat sink is removed. Thermal material is included with all processor heat sink and processor spare part kits.



Processor

 **NOTE:** Replacement thermal material is included with all processor spare part kits.

| Description | Spare part number |
|---|-------------------|
| Intel Core 2 Duo T9500 2.6-GHz processor (6-MB L2 cache, 800-MHz FSB) | 463051-001 |
| Intel Core 2 Duo T9300 2.5-GHz processor (6-MB L2 cache, 800-MHz FSB) | 463050-001 |
| Intel Core 2 Duo T8300 2.4-GHz processor (3-MB L2 cache, 800-MHz FSB) | 463049-001 |
| Intel Core 2 Duo T8100 2.1-GHz processor (3-MB L2 cache, 800-MHz FSB) | 463048-001 |
| Intel Core 2 Duo T7800 2.6-GHz processor (4-MB L2 cache, 800-MHz FSB) | 458218-001 |
| Intel Core 2 Duo T7700 2.4-GHz processor (4-MB L2 cache, 800-MHz FSB) | 450589-001 |
| Intel Core 2 Duo T7500 2.2-GHz processor (4-MB L2 cache, 800-MHz FSB) | 450588-001 |
| Intel Core 2 Duo T7300 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB) | 450587-001 |
| Intel Core 2 Duo T7250 2.0-GHz processor (4-MB L2 cache, 800-MHz FSB) | 460283-001 |
| Intel Core 2 Duo T7100 1.8-GHz processor (2-MB L2 cache, 800-MHz FSB) | 450586-001 |


Before removing the processor, follow these steps:

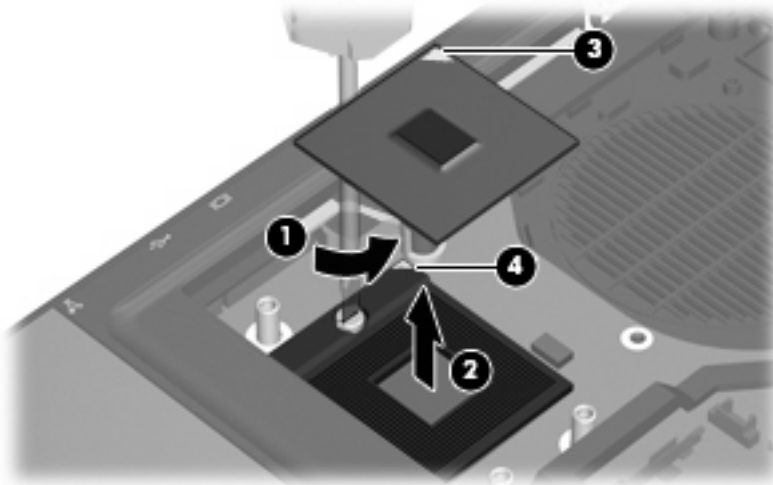
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

4. Remove the battery (see [Battery on page 44](#)).
5. Remove the following components:
 - a. Keyboard (see [Keyboard on page 60](#))
 - b. Switch cover (see [Switch cover on page 67](#))
 - c. Fan/heat sink assembly (see [Fan/heat sink assembly on page 70](#))
 - d. Processor heat sink (see [Heat sink on page 74](#))

Remove the processor:


1. Use a flat-bladed screwdriver to turn the processor locking screw (1) one-half turn counterclockwise until you hear a click.
2. Lift the processor (2) straight up and remove it.

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



Reverse this procedure to install the processor.

Display assembly

 **NOTE:** All display assembly spare part kits include 3 WLAN antenna transceivers and cables.

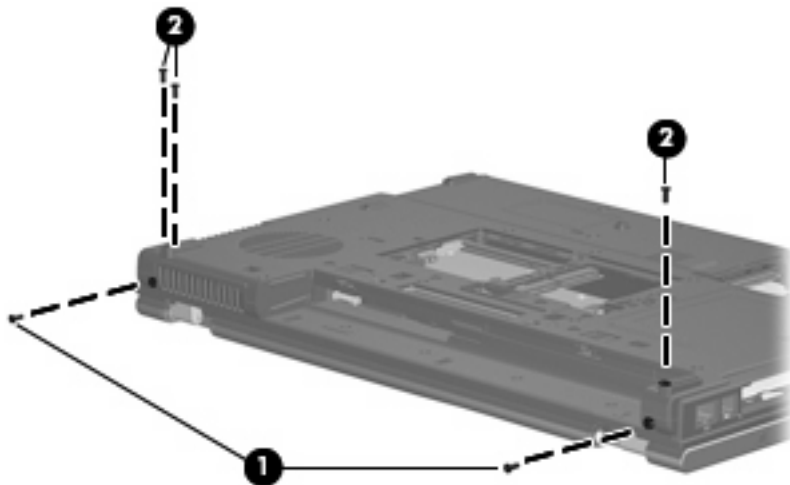
| Description | Spare part number |
|---|-------------------|
| 17.0-inch, WUXGA+ WVA AntiGlare display assembly | 450582-001 |
| 17.0-inch, WSXGA+ WVA AntiGlare display assembly | 450580-001 |
| 17.0-inch, WSXGA+ WVA BrightView display assembly | 450581-001 |
| 17.0-inch, WXGA+ AntiGlare display assembly | 450583-001 |

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 44](#)).
5. Remove the keyboard (see [Keyboard on page 60](#)).
6. Remove the switch cover (see [Switch cover on page 67](#)).

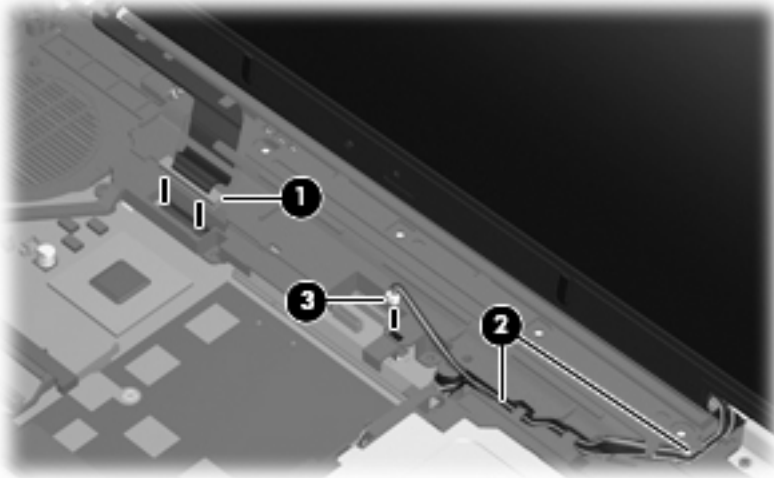
Remove the display assembly:

1. Turn the computer upside down, with the rear panel toward you.
2. Remove the two Torx T8M2.5×9.0 screws (1) from the rear panel that secure the display assembly to the computer.
3. Remove the three Torx T8M2.5×9.0 screws (2) from the base enclosure that secure the display assembly to the computer.

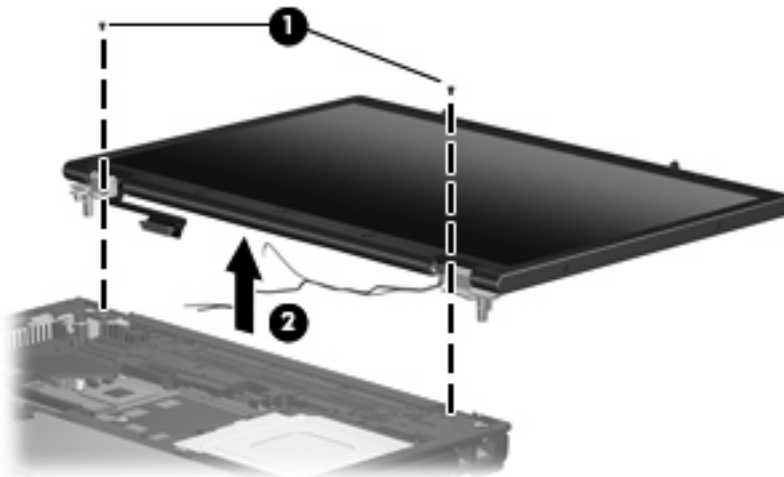


4. Turn the computer right-side up, with the front toward you.


5. Disconnect the display panel cable (1) from the system board.
6. Remove the wireless antenna cables, the microphone cable, and the microphone extension cable from the clips (2) and routing channels built into the top cover.
7. Disconnect the microphone cable (3) from the microphone extension cable.



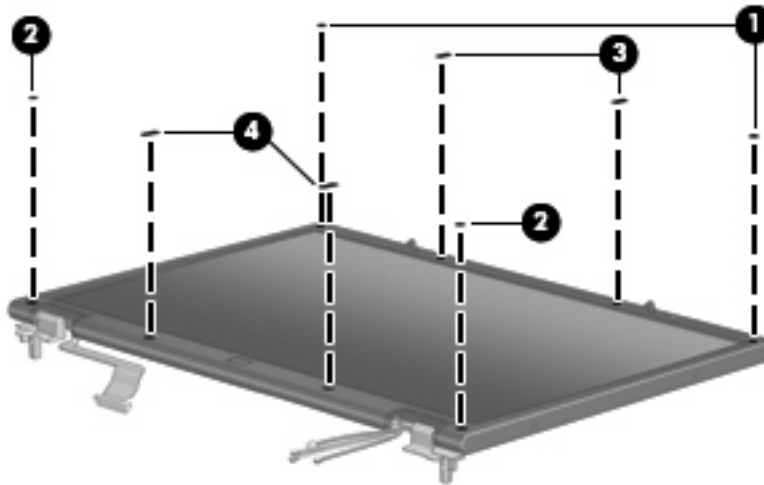
8. Open the computer as far as possible.
9. Remove the two Torx T8M2.5×4.0 screws (1) that secure the display assembly to the computer.
10. Lift the display assembly (2) straight up and remove it.



11. If it is necessary to replace the display bezel or display hinges, remove the rubber screw covers listed below. All rubber screw covers are included in the Display Rubber Kit, spare part number 450573-001.

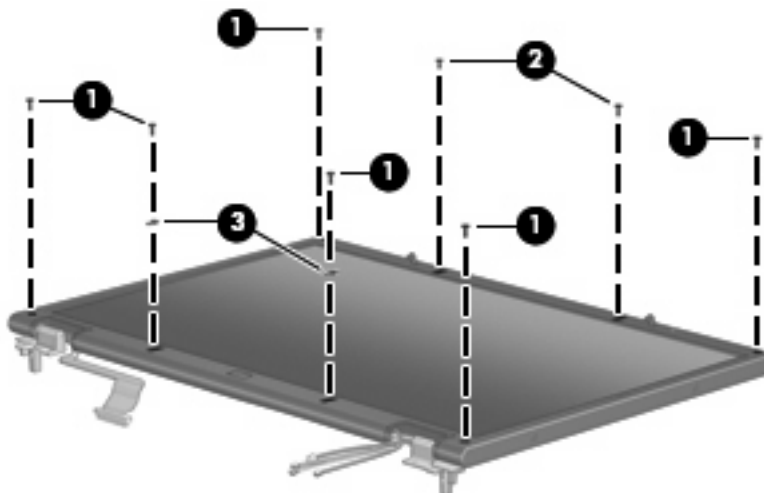
 **NOTE:** See [Display inverter and ambient light sensor board on page 45](#) for display inverter and ambient light sensor board replacement instructions.

- (1) Two rounded rubber screw covers on the display bezel top edge corners
- (2) Two flat rubber screw covers on the display bezel bottom edge corners
- (3) Two small oblong rubber screw covers on the display bezel top edge
- (4) Two large oblong rubber screw covers on the display bezel top edge

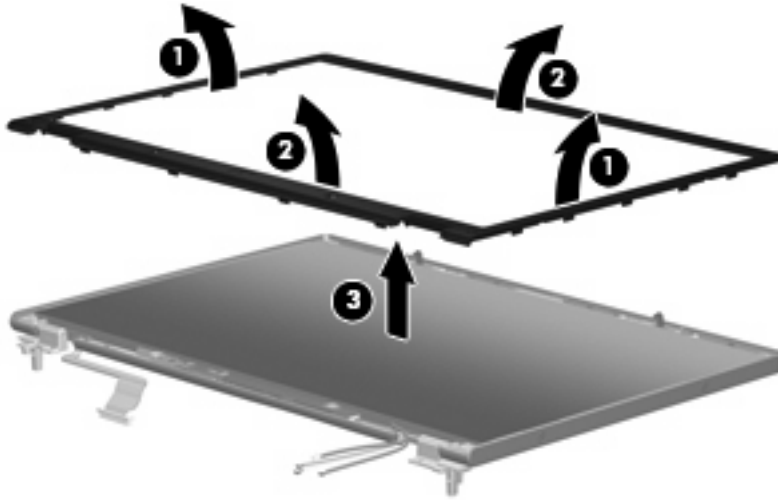


12. Remove the following screws:

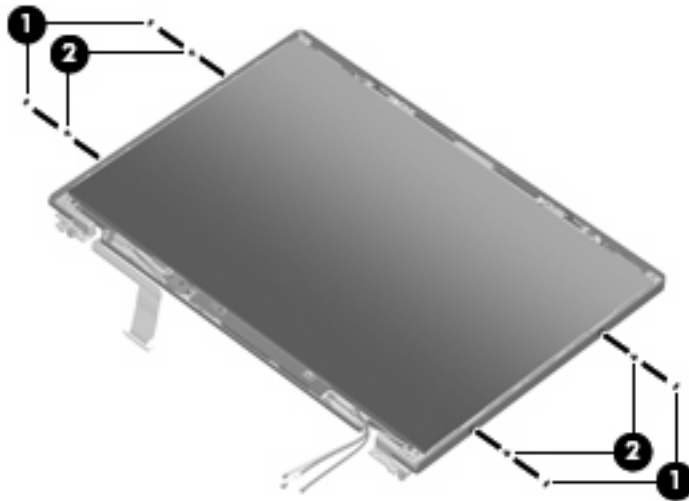
- (1) Six Phillips PM2.5×7.0 screws
- (2) Two Phillips PM2.0×6.0 screws
- (3) Two stabilizer clips



13. Flex the inside edges of the left and right sides (1) and the top and bottom sides (2) of the display bezel until the bezel disengages from the display enclosure.
14. Remove the display bezel (3). The display bezel is available using spare part number 450500-001.

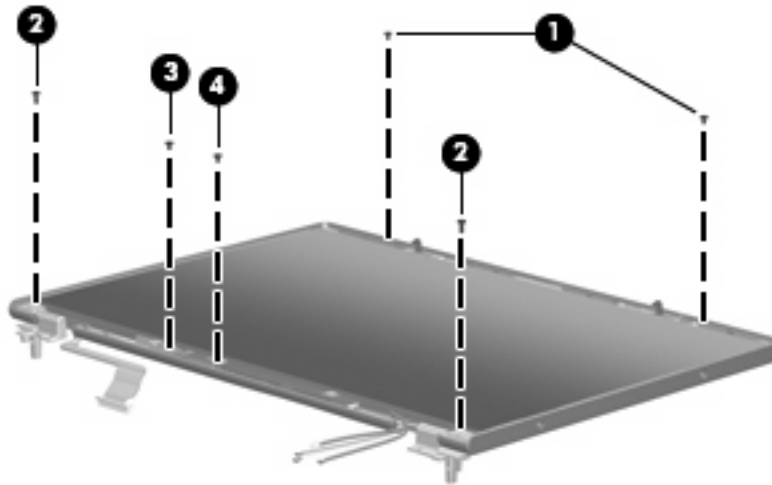


15. Remove the four mylar screw covers (1) from the left and right sides of the display enclosure.
16. Remove the four Torx T8M2.5×4.0 screws (2) that secure the display panel to the display enclosure.

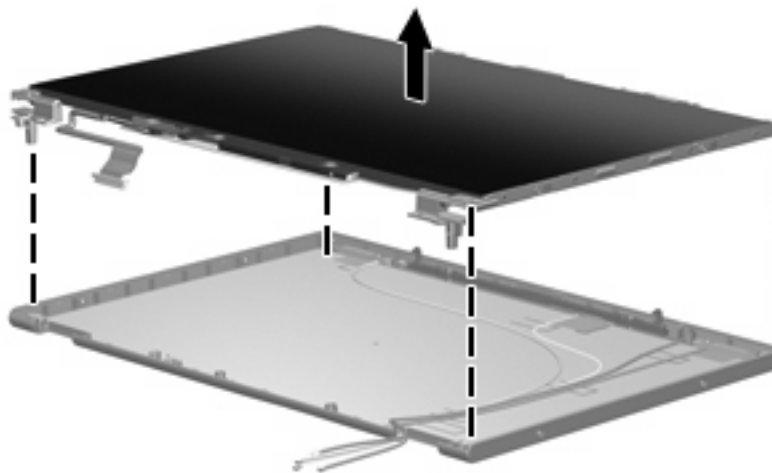


17. Remove the following screws:

- (1) Two Torx T8M2.5×4.0 screws on the display panel top edge
- (2) Two Torx T8M2.5×7.0 screws on the display panel bottom edge
- (3) One Torx T8M2.5×4.0 screw that secures the ambient light sensor to the display enclosure
- (4) One Torx T8M2.5×4.0 screw that secures the display inverter to the display enclosure

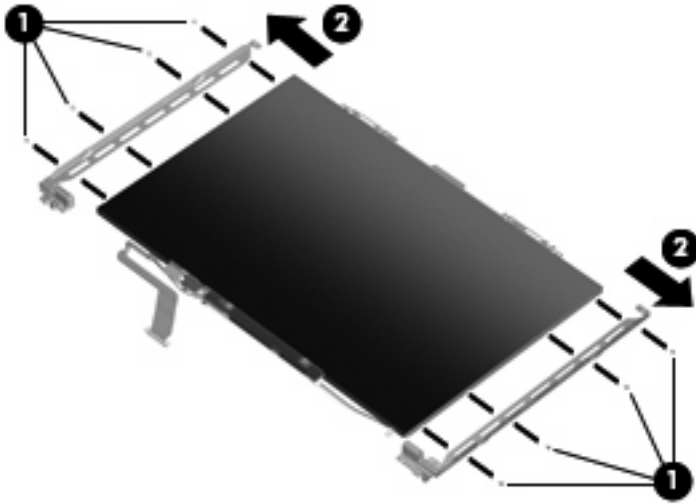


18. Remove the display panel from the display enclosure.




19. Remove the four Phillips PM2.0×4.0 screws (1) that secure each display hinge to the display panel.

20. Remove the display hinges (2). The left and right display hinges are included in the Display Bracket Kit, spare part number 450570-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover

 **NOTE:** All top cover spare part kits include a fingerprint reader board and cable.

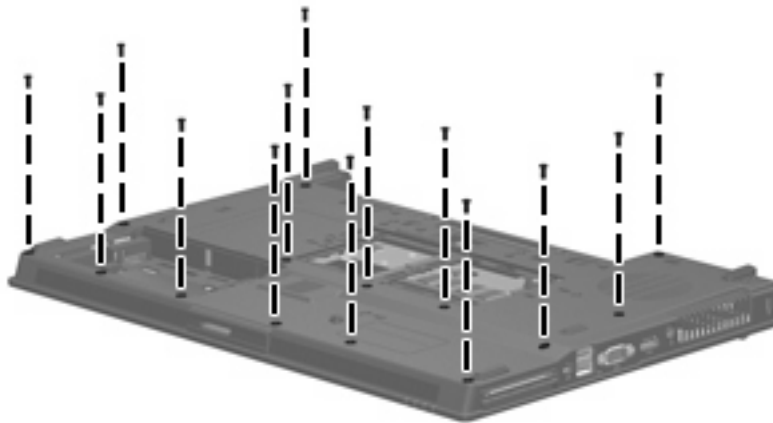
| Description | Spare part number |
|---|-------------------|
| For use only with HP Compaq 8710w computer models | 451379-001 |
| For use only with HP Compaq 8710p computer models | 450595-001 |

Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 44](#))
 - b. Keyboard (see [Keyboard on page 60](#))
 - c. Switch cover (see [Switch cover on page 67](#))
 - d. Display assembly (see [Display assembly on page 77](#))

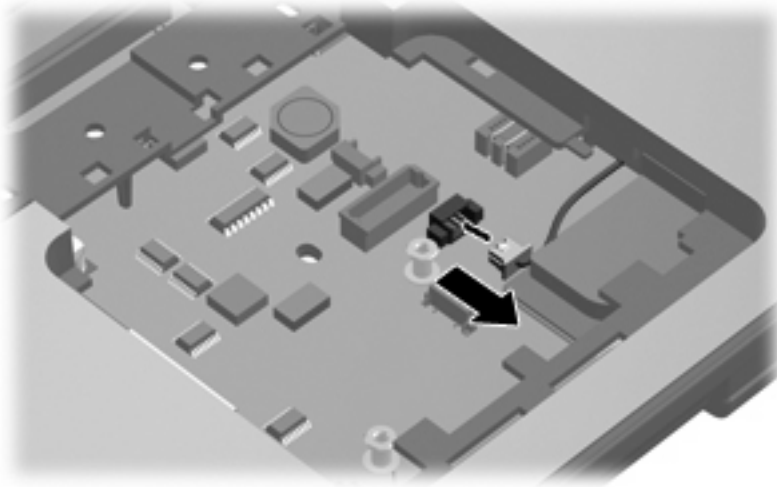
Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the fourteen Torx T8M2.5×9.0 screws that secure the top cover to the base enclosure.

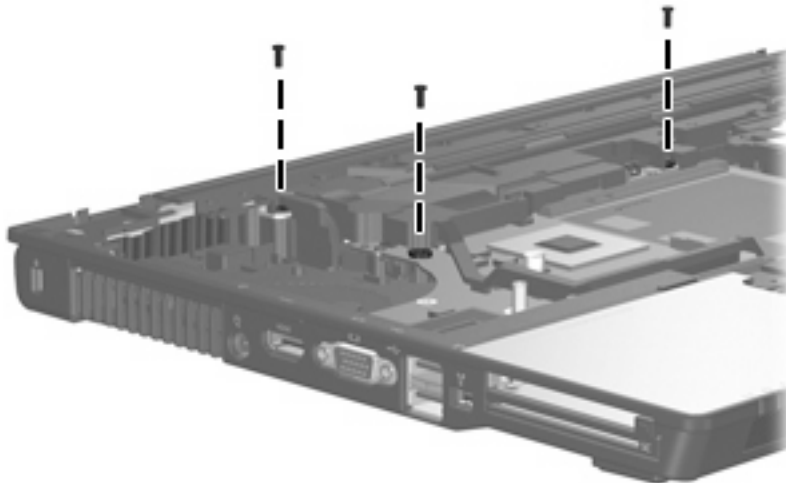


3. Turn the computer right-side up, with the front toward you.

4. Disconnect the fingerprint reader board cable from the system board.

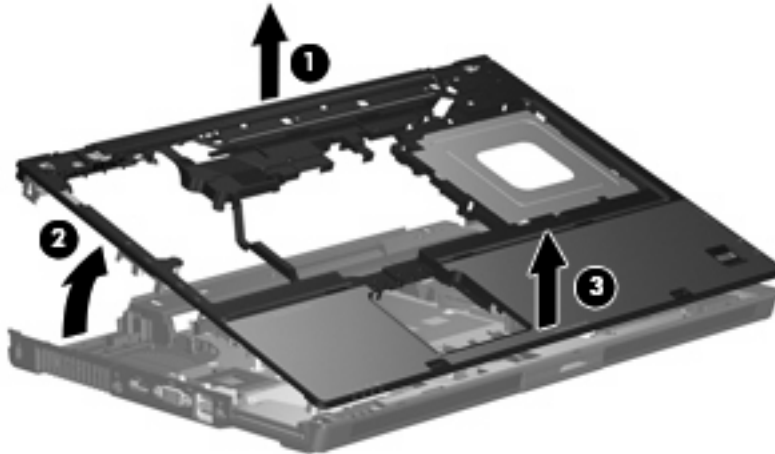


5. Remove the three Torx T8M2.5×7.0 screws that secure the top cover to the computer.



6. Lift the rear edge of the top cover (1) until it rests at an angle.
7. Swing the rear edge of the top cover (2) up and forward until it disengages from the base enclosure.

8. Remove the top cover (3).



Reverse this procedure to install the top cover.

Speaker assembly

| Description | Spare part number |
|------------------|-------------------|
| Speaker assembly | 450592-001 |

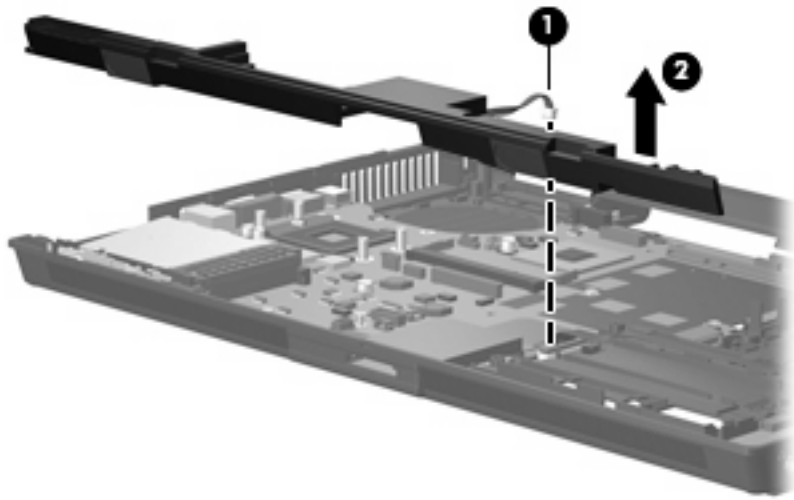
Before removing the speaker assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 44](#))
 - b. Keyboard (see [Keyboard on page 60](#))
 - c. Switch cover (see [Switch cover on page 67](#))
 - d. Display assembly (see [Display assembly on page 77](#))
 - e. Top cover (see [Top cover on page 83](#))

Remove the speaker assembly:


1. Disconnect the speaker cable (1) from the system board.

2. Remove the speaker assembly (2) from the base enclosure.



Reverse this procedure to install the speaker assembly.

System board

 **NOTE:** Replacement thermal material is included with all system board spare part kits.

| Description | Spare part number |
|---|-------------------|
| For use only with computer models equipped with processors with 3- or 6-MB L2 cache | 468591-001 |
| For use only with computer models equipped with processors with 2- or 4-MB L2 cache | 450482-001 |

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the following components:
 - a. Battery (see [Battery on page 44](#))
 - b. Hard drive (see [Hard drive on page 48](#))
 - c. Bluetooth module (see [Bluetooth module on page 51](#))
 - d. Optical drive (see [Optical drive on page 58](#))
 - e. Keyboard (see [Keyboard on page 60](#))
 - f. TouchPad (see [TouchPad on page 64](#))
 - g. Switch cover (see [Switch cover on page 67](#))
 - h. Fan/heat sink assembly (see [Fan/heat sink assembly on page 70](#))
 - i. Graphics card (see [Graphics card on page 72](#))
 - j. Processor heat sink (see [Heat sink on page 74](#))
 - k. Display assembly (see [Display assembly on page 77](#))
 - l. Top cover (see [Top cover on page 83](#))
 - m. Speaker assembly (see [Speaker assembly on page 85](#))

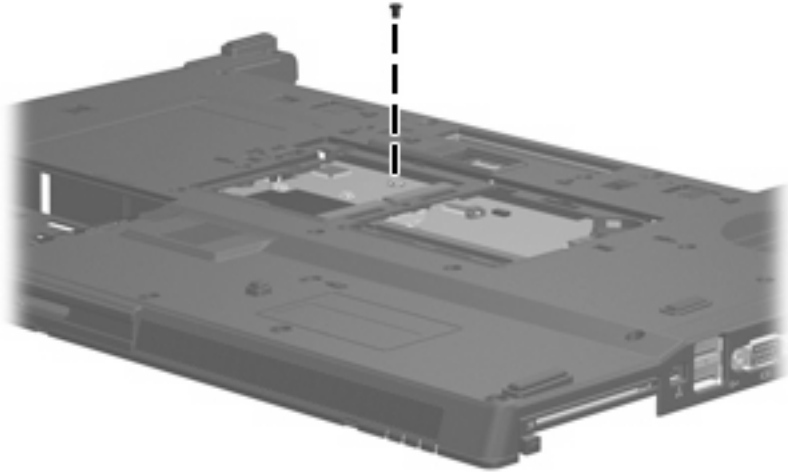
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory modules (see [Primary memory module on page 52](#) and [Expansion memory module on page 63](#))
- WLAN module (see [WLAN module on page 54](#))
- RTC battery (see [RTC battery on page 57](#))
- Modem module (see [Modem module on page 66](#))

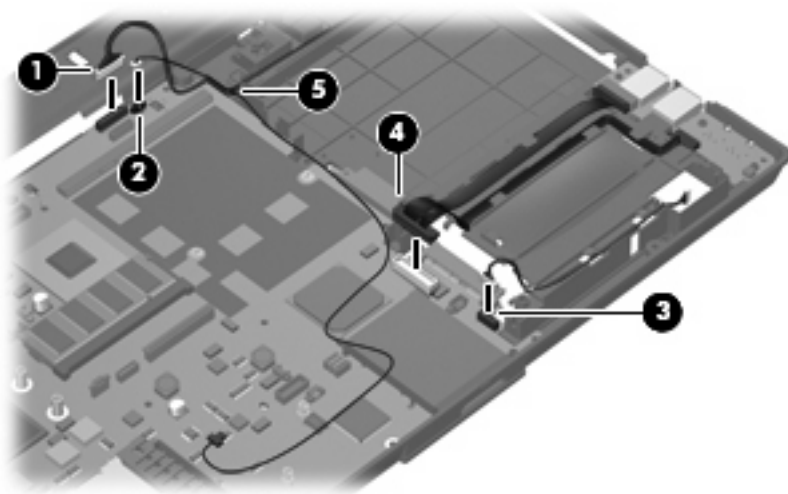
- Processor (see [Processor on page 75](#))
- PC Card assembly (see [PC Card assembly on page 92](#))

Remove the system board:

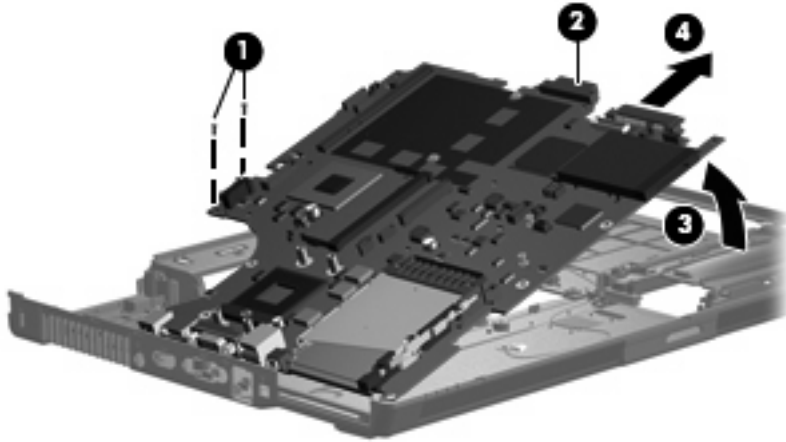
1. Turn the computer upside down, with the front toward you.
2. Remove the Torx T8M2.5×4.0 screw that secures the system board to the base enclosure.



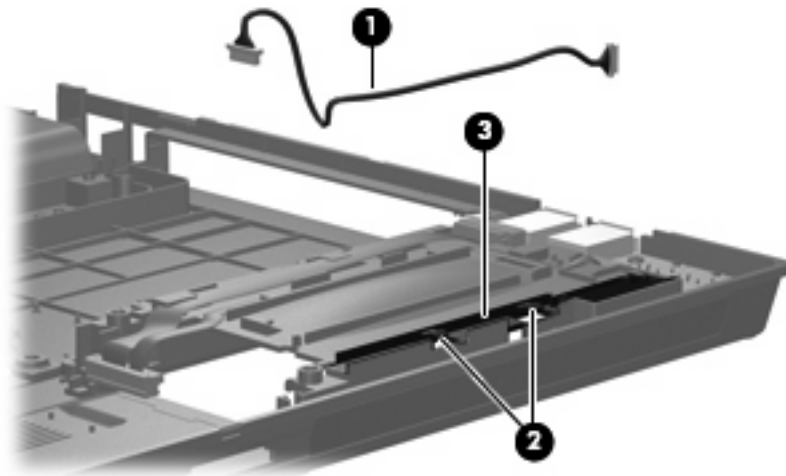
3. Turn the computer right-side up, with the front toward you.
4. Disconnect the following cables from the system board:
 - (1) RJ-45 connector cable
 - (2) Modem module cable
 - (3) Bluetooth module cable
 - (4) USB/audio board cable
5. Remove the modem module cable (5) from the clip in the system board.



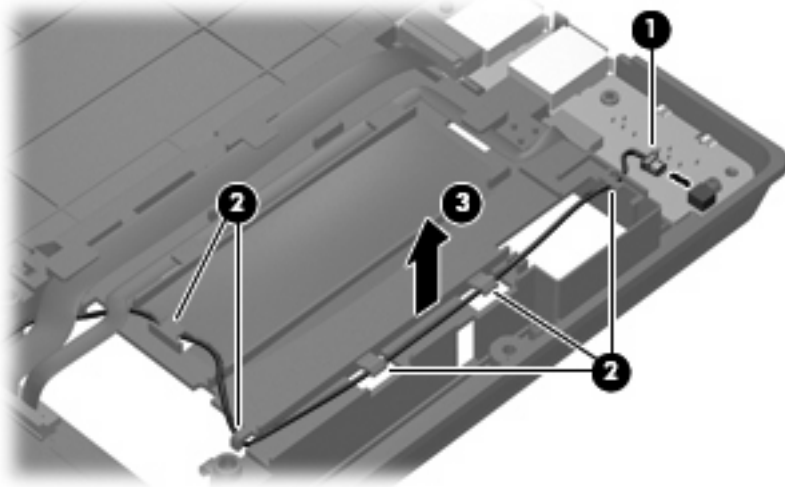
6. Remove the two Torx T8M2.5×7.0 screws (1) that secure the system board to the base enclosure.
7. Use the optical drive connector (2) to lift the right side of the system board (3) until it rests at an angle.
8. Remove the system board (4) by sliding it away from the base enclosure at an angle.



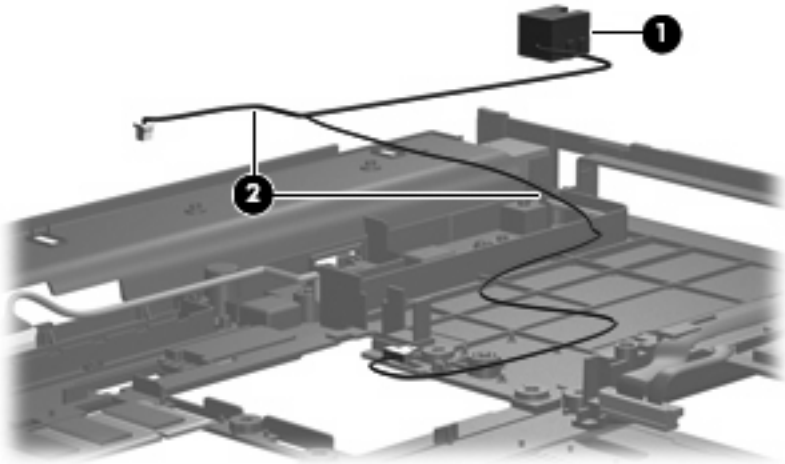
9. If it is necessary to replace the Bluetooth module cable, remove the cable (1) from the clips (2) and (3) built into the base enclosure. The Bluetooth module cable is included in the Cable Kit, spare part number 450486-001.



10. If it is necessary to replace the microphone extension cable, disconnect the cable (1), push the cable from the clips (2), and remove the cable (3). The microphone extension cable is available using spare part number 450578-001.

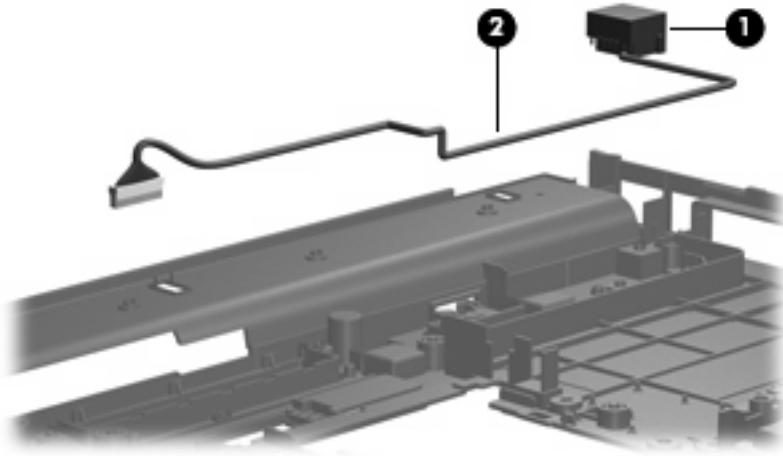


11. If it is necessary to replace the RJ-11 connector cable, remove the RJ-11 connector (1) from the clip built into the base enclosure.
12. Remove the RJ-11 connector cable (2) from the clips and routing channel built into the base enclosure. The RJ-11 connector cable is included in the Cable Kit, spare part number 450486-001.



13. If it is necessary to replace the RJ-45 connector cable, remove the RJ-45 connector (1) from the clip built into the base enclosure. The RJ-45 connector cable is included in the Cable Kit, spare part number 450486-001

14. Remove the RJ-45 connector cable (2) from the clips and routing channel built into the base enclosure.



Reverse the preceding procedure to install the system board, Bluetooth module cable, microphone extension cable, RJ-11 cable, and RJ-45 cable.

USB/audio board

| Description | Spare part number |
|---|-------------------|
| USB/audio board (includes 2-into-1 USB board cable and audio board cable) | 450483-001 |

Before removing the USB/audio board, follow these steps:

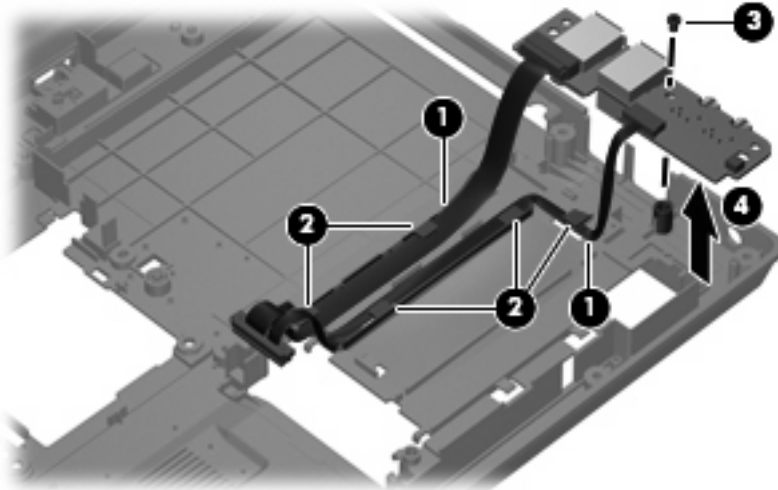
1. Battery (see [Battery on page 44](#))
2. Hard drive (see [Hard drive on page 48](#))
3. Bluetooth module (see [Bluetooth module on page 51](#))
4. Optical drive (see [Optical drive on page 58](#))
5. Keyboard (see [Keyboard on page 60](#))
6. TouchPad (see [TouchPad on page 64](#))
7. Switch cover (see [Switch cover on page 67](#))
8. Fan/heat sink assembly (see [Fan/heat sink assembly on page 70](#))
9. Graphics card (see [Graphics card on page 72](#))
10. Processor heat sink (see [Heat sink on page 74](#))
11. Display assembly (see [Display assembly on page 77](#))
12. Top cover (see [Top cover on page 83](#))

13. Speaker assembly (see [Speaker assembly on page 85](#))

14. System board (see [System board on page 87](#))

Remove the USB/audio board:

1. Remove the USB/audio board cables (1) from the clips (2) built into the base enclosure.
2. Remove the Torx T8M2.5×4.0 screw (3) that secures the USB/audio board to the base enclosure.
3. Lift the left side of the USB/audio board (4) until the USB and audio connectors disengage from the openings in the base enclosure.



4. Remove the USB/audio board and cables from the base enclosure.

Reverse this procedure to install the USB/audio board.

PC Card assembly

| Description | Spare part number |
|------------------|-------------------|
| PC Card assembly | 450584-001 |

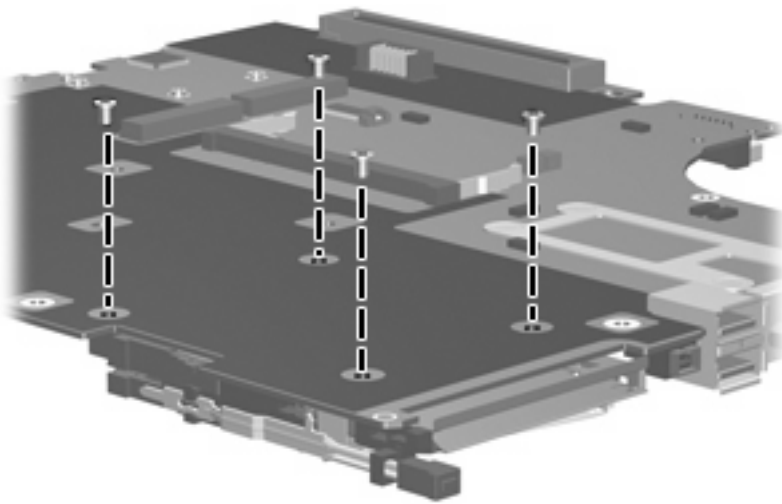
Before removing the PC Card assembly, follow these steps:

1. Battery (see [Battery on page 44](#))
2. Hard drive (see [Hard drive on page 48](#))
3. Bluetooth module (see [Bluetooth module on page 51](#))
4. Optical drive (see [Optical drive on page 58](#))
5. Keyboard (see [Keyboard on page 60](#))
6. TouchPad (see [TouchPad on page 64](#))
7. Switch cover (see [Switch cover on page 67](#))
8. Fan/heat sink assembly (see [Fan/heat sink assembly on page 70](#))

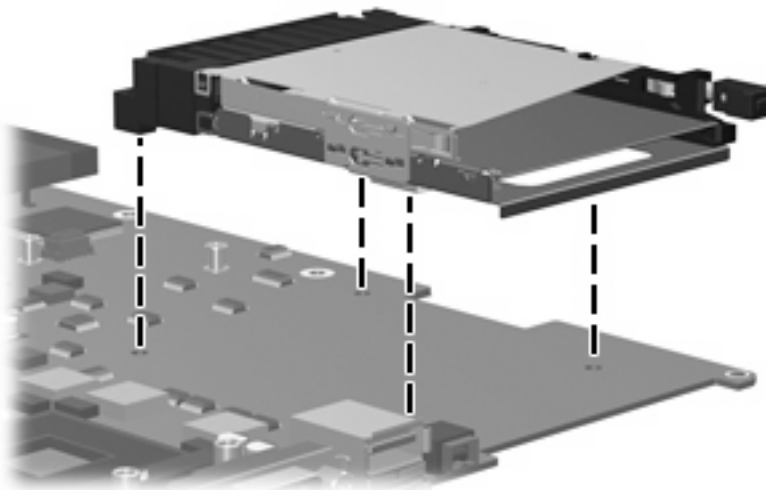
9. Graphics card (see [Graphics card on page 72](#))
10. Processor heat sink (see [Heat sink on page 74](#))
11. Display assembly (see [Display assembly on page 77](#))
12. Top cover (see [Top cover on page 83](#))
13. Speaker assembly (see [Speaker assembly on page 85](#))
14. System board (see [System board on page 87](#))

Remove the PC Card assembly:

1. Turn the system board upside down, with the PC Card eject button toward you.
2. Remove the four Phillips PM2.0×4.0 screws that secure the PC Card assembly to the system board.



3. Remove the PC Card assembly from the system board.




Reverse this procedure to install the PC Card assembly.

5 Computer Setup

Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

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

NOTE: Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

NOTE: An external keyboard and pointing stick connected by USB can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup:

1. Turn on or restart the computer.
2. Before Windows® opens and while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen, press **f10**.

Using Computer Setup

Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

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

- To choose a menu or a menu item, use the arrow keys.
 - To select an item, press **enter**.
 - To close open dialog boxes and return to the main Computer Setup screen, press **esc**.
 - To view navigation information, press **f1**.
 - To change the language, press **f2**.
2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
 3. To exit Computer Setup, choose one of the following methods:
 - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore Changes and Exit**. Then follow the instructions on the screen.
 - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then follow the instructions on the screen.


Your preferences go into effect when the computer restarts.

Restoring factory settings in Computer Setup

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:


1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore** defaults, and then press **enter**.
3. When the confirmation dialog box opens, press **f10**.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

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

Computer Setup menus

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

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

File menu

| Select | To do this |
|-------------------------|--|
| System information | <ul style="list-style-type: none">• View identification information for the computer and the batteries in the system.• View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard and pointing stick controller version. |
| Restore defaults | Replace the configuration settings in Computer Setup with the original factory settings. (Password settings and security settings are not changed when you restore the factory settings.) |
| Ignore changes and exit | Cancel any changes entered during the current session. Then exit and restart the computer. |
| Save changes and exit | Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts. |


Security menu

| Select | To do this |
|-----------------------|--|
| Setup password | Enter, change, or delete a setup password. |
| Power-On password | Enter, change, or delete a power-on password. |
| Password options | <ul style="list-style-type: none">• Enable/disable stringent security.• Enable/disable password requirement on computer restart. |
| DriveLock passwords | <ul style="list-style-type: none">• Enable/disable DriveLock on any computer hard drive.• Change a DriveLock user password or master password. <p>NOTE: DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p> |
| Smart Card security | Enable/disable support for smart card and Java™ Card power-on authentication. <p>NOTE: Power-on authentication for smart cards is supported only on computers with optional smart card readers.</p> <p>NOTE: You must have an administrator password to change this setting.</p> |
| TPM Embedded Security | Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help. <p>NOTE: You must have a setup password to change this setting.</p> |
| System IDs | Enter user-defined and pointing stick computer asset tracking number and ownership tag. |
| Disk Sanitizer | Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: <ul style="list-style-type: none">• Fast: Runs the Disk Sanitizer erase cycle once.• Optimum: Runs the Disk Sanitizer erase cycle 3 times.• Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list. <p>CAUTION: If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.</p> |

Diagnostics menu

| Select | To do this |
|------------------------------------|--|
| Hard Drive Self-Test options | Run a comprehensive self-test on any hard drive in the system. |
| Memory Check | Run a comprehensive check on system memory. |
| Startup Check (select models only) | Verify the system components needed for starting the computer. |

System Configuration menu

 **NOTE:** Some of the listed System Configuration options may not be supported by your computer.

| Select | To do this |
|------------------------|---|
| Language (or press f2) | Change the Computer Setup language. |
| Boot options | <ul style="list-style-type: none">• Set f9, f10, and f12 delay when starting up.• Enable/disable CD-ROM boot.• Enable/disable floppy boot.• Enable/disable internal network adapter boot and set the boot mode (PXE or RPL).• Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system.• Set the Express Boot Popup delay in seconds.• Set the boot order. |
| Device configurations | <ul style="list-style-type: none">• Swap the functions of the fn key and left ctrl key.• Enable/disable multiple standard pointing devices at startup. (To set the computer to support only a single, usually nonstandard, pointing device at startup, select Disable.)• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:<ul style="list-style-type: none">◦ Use a USB keyboard, mouse, and hub in Computer Setup even when a Windows operating system is not running.◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer or to an optional docking device (select models only).• Select a parallel port mode: EPP (Enhanced Parallel Port), standard, bidirectional, or ECP (Enhanced Capabilities Port).• Enable/disable BIOS DMA data transfers.• Enable/disable fan always on while connected to an AC outlet.• Enable/disable Intel® Data Execution Prevention or AMD® PSAA Execution Disable. When enabled, the processor can disable some virus code execution, which helps to improve computer security.• Enable/disable LAN Power Save. When enabled, saves power by turning off the LAN when not in use.• Enable/disable SATA Native Mode.• Enable/disable Dual Core CPU.• Enable/disable Secondary Battery Fast Charge.• Choose Bit-shift or LBA assisted HDD Translation Mode.• Enable/disable Windows direct application launcher.• Enable/disable HP Lockout. |

| Select | To do this |
|-------------------------|--|
| Built-In Device Options | <ul style="list-style-type: none"> • Enable/disable embedded WWAN Device Radio. • Enable/disable embedded WLAN Device Radio. • Enable/disable embedded Bluetooth® Device Radio. • Enable/disable LAN/WLAN Switching. When enabled, switches to a WLAN when a LAN is either unavailable or disconnected. • Enable/disable Wake on LAN from Off. • Enable/disable the ambient light sensor. |
| Port Options | <ul style="list-style-type: none"> • Enable/disable the serial port. • Enable/disable the parallel port. • Enable/disable the flash media reader. • Enable/disable the USB port. <p>CAUTION: Disabling the USB port also disables MultiBay II devices and ExpressCard devices on the advanced port replicator.</p> <ul style="list-style-type: none"> • Enable/disable the 1394 port. • Enable/disable the cardbus slot. • Enable/disable the ExpressCard slot. • Enable/disable the infrared port. • Enable/disable the optical disk drive. • Enable/disable the network controller. |

6 Specifications

Computer specifications

| | Metric | U.S. |
|--|---|---------------------|
| Dimensions | | |
| Length | 27.5 cm | 10.8 in |
| Width | 39.3 cm | 15.5 in |
| Height (front to rear) | 3.3 to 3.9 cm | 1.3 to 1.5 in |
| Weight (equipped with 8-cell battery, 80-GB/5400-rpm hard drive, optical drive, one 1024-MB memory module, WLAN module, pointing stick, TouchPad, and nVidia GM84 graphics card; varies by configuration) | 3.4 kg | 7.5 lbs |
| Input power | | |
| Operating voltage | 19.0 V dc @ 4.74 A – 120 W | |
| Operating current | 4.74 A | |
| Temperature | | |
| Operating (not writing to optical disc) | 0°C to 35°C | 32°F to 95°F |
| Operating (writing to optical disc) | 5°C to 35°C | 41°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Relative humidity | | |
| Operating | 10% to 90% | |
| Nonoperating | 5% to 95% | |
| Maximum altitude (unpressurized) | | |
| Operating (14.7 to 10.1 psia) | -15 m to 3,048 m | -50 ft to 10,000 ft |
| Nonoperating (14.7 to 4.4 psia) | -15 m to 12,192 m | -50 ft to 40,000 ft |
| Shock | | |
| Operating | 125 g, 2 ms, half-sine | |
| Nonoperating | 200 g, 2 ms, half-sine | |
| Random vibration | | |
| Operating | 0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate | |

| | Metric | U.S. |
|--------------|--|------|
| Nonoperating | 1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate | |

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

17.0-inch, WUXGA+WVA display specifications

| | Metric | U.S. |
|--------------------------------|---|---------|
| Dimensions | | |
| Height | 24.4 cm | 9.65 in |
| Width | 38.1 cm | 15.0 in |
| Diagonal | 43.2 cm | 17.0 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 200:1 (typical) | |
| Brightness | 180 nits (typical) | |
| Pixel resolution | | |
| Pitch | 0.172 × 0.172 mm | |
| Format | 1920 × 1200 | |
| Configuration | RGB vertical stripe | |
| Backlight | CCFT | |
| Character display | 80 × 25 | |
| Total power consumption | 6.0 W | |
| Viewing angle | +/-65 horizontal, +/-50° vertical (typical) | |

17.0-inch, WSXGA+WVA display specifications

| | Metric | U.S. |
|--------------------------------|---|---------|
| Dimensions | | |
| Height | 24.4 cm | 9.6 in |
| Width | 38.1 cm | 15.0 in |
| Diagonal | 43.2 cm | 17.0 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 200:1 (typical) | |
| Brightness | 180 nits (typical) | |
| Pixel resolution | | |
| Pitch | 0.172 × 0.172 mm | |
| Format | 1680 × 1050 | |
| Configuration | RGB vertical stripe | |
| Backlight | CCFT | |
| Character display | 80 × 25 | |
| Total power consumption | 7.0 W | |
| Viewing angle | +/-60 horizontal, +40/-50° vertical (typical) | |

17.0-inch, WXGA+WVA display specifications

| | Metric | U.S. |
|--------------------------------|--|---------|
| Dimensions | | |
| Height | 24.4 cm | 9.6 in |
| Width | 38.1 cm | 15.0 in |
| Diagonal | 43.2 cm | 17.0 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 200:1 (typical) | |
| Brightness | 180 nits (typical) | |
| Pixel resolution | | |
| Pitch | 0.259 × 0.259 mm | |
| Format | 1440× 900 | |
| Configuration | RGB vertical stripe | |
| Backlight | CCFT | |
| Character display | 80 × 25 | |
| Total power consumption | 6.5 W | |
| Viewing angle | +/-45° horizontal, +15/-35° vertical (typical) | |

Hard drive specifications

| | 250-GB* | 200-GB* | 160-GB* | 120-GB* | 100-GB* | 80-GB* |
|---|-----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Dimensions | | | | | | |
| Height | 9.5 mm | 9.5 mm | 9.5 mm | 9.5 mm | 9.5 mm | 9.5 mm |
| Width | 70 mm | 70 mm | 70 mm | 70 mm | 70 mm | 70 mm |
| Weight | 101 g | 101 g | 101 g | 101 g | 101 g | 101 g |
| Interface type | SATA | SATA | SATA | SATA | SATA | SATA |
| Transfer rate | 100 MB/sec | 100 MB/sec | 100 MB/sec | 100 MB/sec | 100 MB/sec | 100 MB/sec |
| Security | ATA security | ATA security | ATA security | ATA security | ATA security | ATA security |
| Seek times (typical read, including setting) | | | | | | |
| Single track | 3 ms | 3 ms | 3 ms | 3 ms | 3 ms | 3 ms |
| Average | 13 ms | 13 ms | 13 ms | 13 ms | 13 ms | 13 ms |
| Maximum | 24 ms | 24 ms | 24 ms | 24 ms | 24 ms | 24 ms |
| Logical blocks | 488,376,120 | 390,700,080 | 312,560,340 | 234,420,480 | 195,350,400 | 156,280,320 |
| Disk rotational speed | 5400 rpm | 7200 and 5400 rpm | 7200 and 5400 rpm | 7200 and 5400 rpm | 7200 and 5400 rpm | 7200 and 5400 rpm |
| Operating temperature | 5°C to 55°C (41°F to 131°F) | | | | | |
| *1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly. | | | | | | |
| NOTE: Certain restrictions and exclusions apply. Contact technical support for details. | | | | | | |

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

| Applicable disc | Read: | Write: |
|-----------------------------|--|---|
| | CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM | CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM |
| Center hole diameter | 1.5 cm (0.59 in) | |
| Disc diameter | | |
| Standard disc | 12 cm (4.72 in) | |
| Mini disc | 8 cm (3.15 in) | |
| Disc thickness | 1.2 mm (0.047 in) | |
| Track pitch | 0.74 μm | |
| Access time | CD | DVD |
| Random | < 175 ms | < 230 ms |
| Full stroke | < 285 ms | < 335 ms |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 2 MB | |
| Data transfer rate | | |
| 24X CD-ROM | 3,600 KB/sec | |
| 8X DVD-ROM | 10,800 KB/sec | |
| 24X CD-R | 3,600 KB/sec | |
| 16X CD-RW | 2,400 KB/sec | |
| 8X DVD+R | 10,800 KB/sec | |
| 4X DVD+RW | 5,400 KB/sec | |
| 8X DVD-R | 10,800 KB/sec | |
| 4X DVD-RW | 5,400 KB/sec | |
| 2.4X DVD+R(9) | 2,700 KB/sec | |
| 5X DVD-RAM | 6,750 KB/sec | |
| Transfer mode | Multiword DMA Mode | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

DVD/CD-RW Combo Drive specifications

| | | |
|-----------------------------|--|---------------------------------|
| Applicable disc | Read: CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM | Write: CD-R and CD-RW |
| Center hole diameter | 1.5 cm (0.59 in) | |
| Disc diameter | | |
| Standard disc | 12 cm (4.72 in) | |
| Mini disc | 8 cm (3.15 in) | |
| Disc thickness | 1.2 mm (0.047 in) | |
| Track pitch | 0.74 μ m | |
| Access time | CD | DVD |
| Random | < 110 ms | < 130 ms |
| Full stroke | < 210 ms | < 225 ms |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 2 MB | |
| Data transfer rate | | |
| 24X CD-ROM | 3,600 KB/sec | |
| 8X DVD | 3,600 KB/sec | |
| 24X CD-R | 3,600 KB/sec | |
| 24X CD-RW | 3,600 KB/sec | |
| Transfer mode | Multiword DMA mode 2 | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

DVD-ROM Drive

| | | |
|-----------------------------|---|------------|
| Applicable disc | DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18, CD-ROM (Mode 1 and 2), CD Digital Audio, CD-XA ready (Mode 2, Form 1 and Form 2), CD-I (Mode 2, Form 1 and Form 2), CD-R, CD-RW, Photo CD (single and multisession), CD-Bridge | |
| Center hole diameter | 1.5 cm (0.59 in) | |
| Disc diameter | | |
| Standard disc | 12 cm (4.72 in) | |
| Mini disc | 8 cm (3.15 in) | |
| Disc thickness | 1.2 mm (0.047 in) | |
| Track pitch | 0.74 μ m | |
| Access time | CD | DVD |
| Random | < 100 ms | < 125 ms |
| Full stroke | < 175 ms | < 225 ms |
| Audio output level | Line-out, 0.7 Vrms | |
| Cache buffer | 512 KB | |
| Data transfer rate | | |
| CD-R (24X) | 3600 KB/s (150 KB/s at 1X CD rate) | |
| CD-RW (10X) | 1500 KB/s (150 KB/s at 1X CD rate) | |
| CD-ROM (24X) | 3600 KB/s (150 KB/s at 1X CD rate) | |
| DVD (8X) | 10,800 KB/s (1,352 KB/s at 1X DVD rate) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 10 seconds | |
| Stop time | < 3 seconds | |

System DMA specifications

| Hardware DMA | System function |
|--------------|---------------------------------|
| DMA0 | Not applicable |
| DMA1* | Not applicable |
| DMA2* | Not applicable |
| DMA3 | Not applicable |
| DMA4 | Direct memory access controller |
| DMA5* | Available for PC Card |
| DMA6 | Not assigned |
| DMA7 | Not assigned |

*PC Card controller can use DMA 1, 2, or 5.

System memory map specifications

| Size | Memory address | System function |
|--------|--------------------|------------------------------|
| 640 KB | 00000000-0009FFFF | Base memory |
| 128 KB | 000A0000-000BFFFF | Video memory |
| 48 KB | 000C0000-000CBFFF | Video BIOS |
| 160 KB | 000C8000-000E7FFF | Unused |
| 64 KB | 000E8000-000FFFFFF | System BIOS |
| 15 MB | 00100000-00FFFFFF | Extended memory |
| 58 MB | 04800000-07FFFFFF | Super extended memory |
| 58 MB | 04800000-07FFFFFF | Unused |
| 2 MB | 08000000-08FFFFFF | Video memory (direct access) |
| 4 GB | 08200000-FFFFFF | Unused |
| 64 KB | FFFF0000-FFFFFFFF | System BIOS |

System interrupt specifications

| Hardware IRQ | System function |
|--------------|--|
| IRQ0 | System timer |
| IRQ1 | Standard 101-/102-Key or Microsoft® Natural Keyboard |
| IRQ2 | Cascaded |
| IRQ3 | Intel 82801DB/DBM USB2 Enhanced Host Controller—24CD |
| IRQ4 | COM1 |
| IRQ5* | Conexant AC—Link Audio Intel 82801DB/DBM SMBus Controller—24C3 Data Fax Modem with SmartCP |
| IRQ6 | Diskette drive |
| IRQ7* | Parallel port |
| IRQ8 | System CMOS/real-time clock |
| IRQ9* | Microsoft ACPI-compliant system |
| IRQ10* | Intel USB UHCI controller—24C2 Intel 82852/82855 GM/GME Graphic Controller Realtek RTL8139 Family PCI Fast Ethernet Controller |
| IRQ11 | Intel USB EHCI controller—24CD Intel USB UHCI controller—24C4 Intel USB UHCI controller—24C7 Intel Pro/Wireless 2200BG TI OHCI 1394 host controller TI PCI1410 CardBus controller |
| IRQ12 | Synaptics PS/2 TouchPad |
| IRQ13 | Numeric data processor |
| IRQ14 | Primary IDE channel |
| IRQ15 | Secondary IDE channel |

*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

NOTE: PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

System I/O address specifications

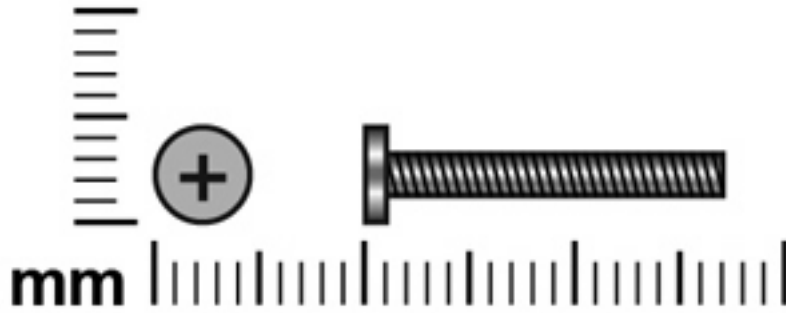
| I/O address (hex) | System function (shipping configuration) |
|-------------------|--|
| 000 - 00F | DMA controller no. 1 |
| 010 - 01F | Unused |
| 020 - 021 | Interrupt controller no. 1 |
| 022 - 024 | Opti chipset configuration registers |
| 025 - 03F | Unused |
| 02E - 02F | 87334 "Super I/O" configuration for CPU |
| 040 - 05F | Counter/timer registers |
| 044 - 05F | Unused |
| 060 | Keyboard controller |
| 061 | Port B |
| 062 - 063 | Unused |
| 064 | Keyboard controller |
| 065 - 06F | Unused |
| 070 - 071 | NMI enable/RTC |
| 072 - 07F | Unused |
| 080 - 08F | DMA page registers |
| 090 - 091 | Unused |
| 092 | Port A |
| 093 - 09F | Unused |
| 0A0 - 0A1 | Interrupt controller no. 2 |
| I/O Address (hex) | System Function (shipping configuration) |
| 0A2 - 0BF | Unused |
| 0C0 - 0DF | DMA controller no. 2 |
| 0E0 - 0EF | Unused |
| 0F0 - 0F1 | Coprocessor busy clear/reset |
| 0F2 - 0FF | Unused |
| 100 - 16F | Unused |
| 170 - 177 | Secondary fixed disk controller |
| 178 - 1EF | Unused |
| 1F0 - 1F7 | Primary fixed disk controller |
| 1F8 - 200 | Unused |
| 201 | JoyStick (decoded in ESS1688) |
| 202 - 21F | Unused |

| I/O address (hex) | System function (shipping configuration) |
|-------------------|--|
| 220 - 22F | Entertainment audio |
| 230 - 26D | Unused |
| 26E - 26 | Unused |
| 278 - 27F | Unused |
| 280 - 2AB | Unused |
| 2A0 - 2A7 | Unused |
| 2A8 - 2E7 | Unused |
| 2E8 - 2EF | Reserved serial port |
| 2F0 - 2F7 | Unused |
| 2F8 - 2FF | Infrared port |
| 300 - 31F | Unused |
| 320 - 36F | Unused |
| 370 - 377 | Secondary diskette drive controller |
| 378 - 37F | Parallel port (LPT1/default) |
| 380 - 387 | Unused |
| 388 - 38B | FM synthesizer—OPL3 |
| 38C - 3AF | Unused |
| 3B0 - 3BB | VGA |
| 3BC - 3BF | Reserved (parallel port/no EPP support) |
| 3C0 - 3DF | VGA |
| 3E0 - 3E1 | PC Card controller in CPU |
| 3E2 - 3E3 | Unused |
| 3E8 - 3EF | Internal modem |
| 3F0 - 3F7 | "A" diskette controller |
| 3F8 - 3FF | Serial port (COM1/default) |
| CF8 - CFB | PCI configuration index register (PCIDIVO-1) |
| CFC - CFF | PCI configuration data register (PCIDIVO-1) |

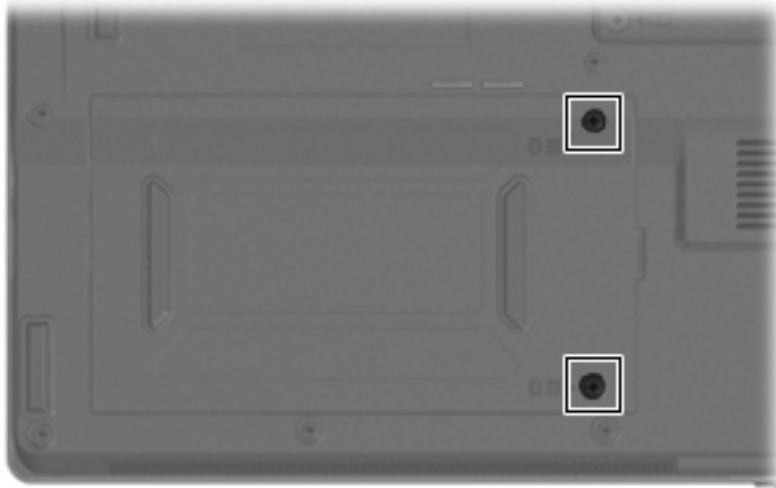
7 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws listed in this section are available in the Screw Kit, spare part number 450591-001, and the Display Screw Kit, spare part number 450574-001.

Phillips PM2.0×17.0 captive screw

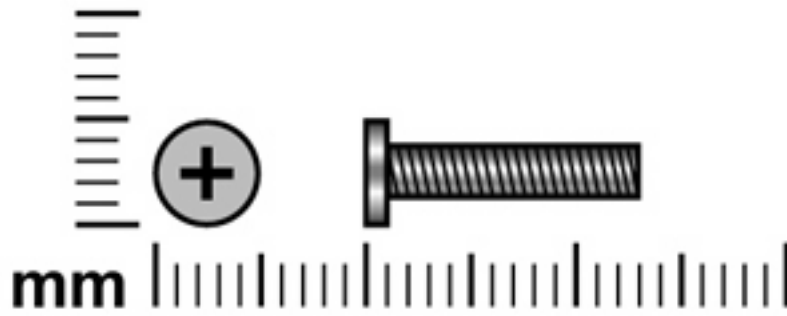


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|---------|--------|---------------|
| Black | 2 | 17.0 mm | 2.0 mm | 5.0 mm |

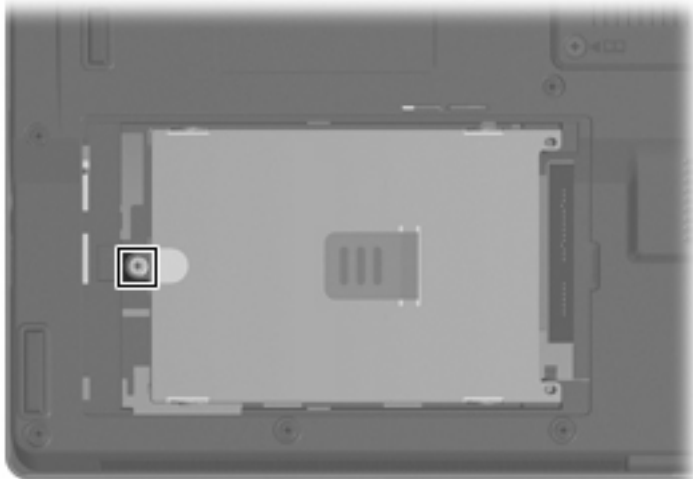


Where used: 2 captive screws that secure the hard drive cover to the computer (screws are captured on the cover by C-clips)

Phillips PM2.5×13.0 captive screw

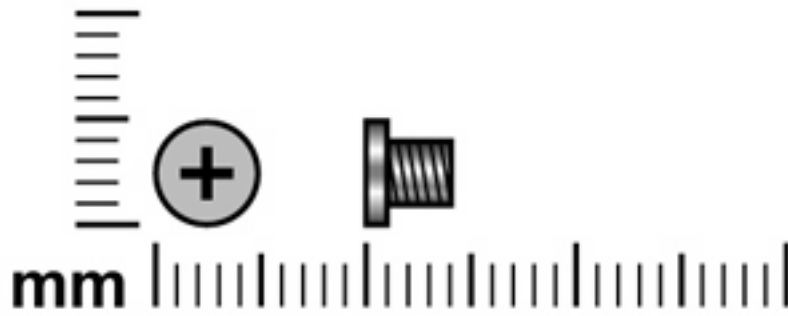


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|---------|--------|---------------|
| Black | 1 | 13.0 mm | 2.5 mm | 5.0 mm |

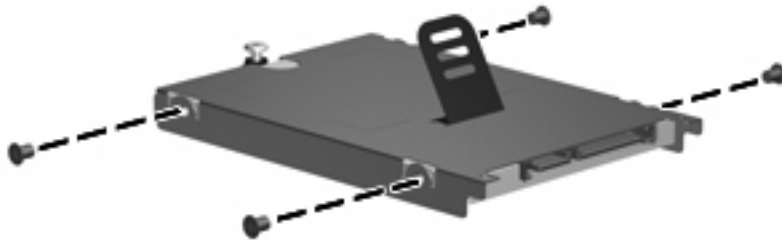


Where used: One captive screw that secures the hard drive to the computer (screw is captured on the hard drive bracket)

Phillips PM3.0×4.0 screw

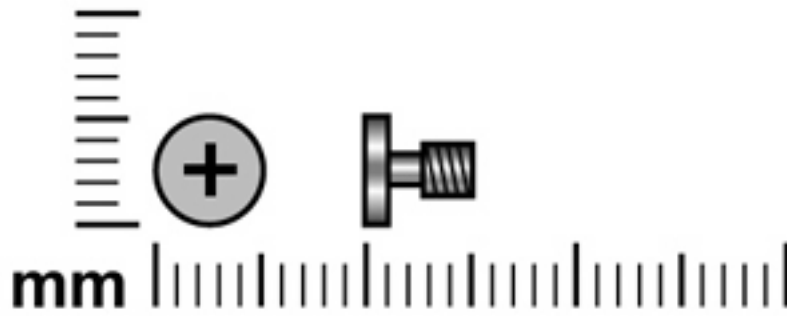


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 4 | 4.0 mm | 3.0 mm | 5.0 mm |

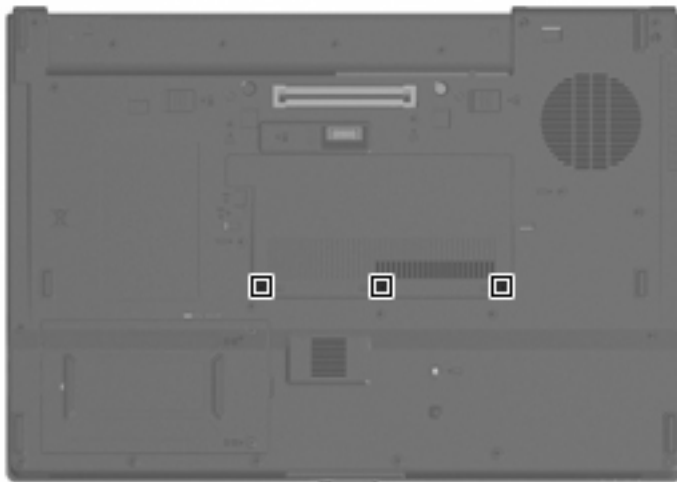


Where used: 4 screws that secure the hard drive bracket to the hard drive

Phillips PM2.5×5.0 captive screw

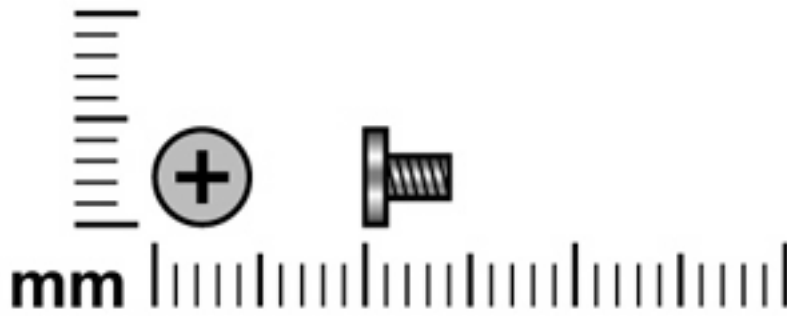


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 3 | 5.0 mm | 2.5 mm | 5.0 mm |

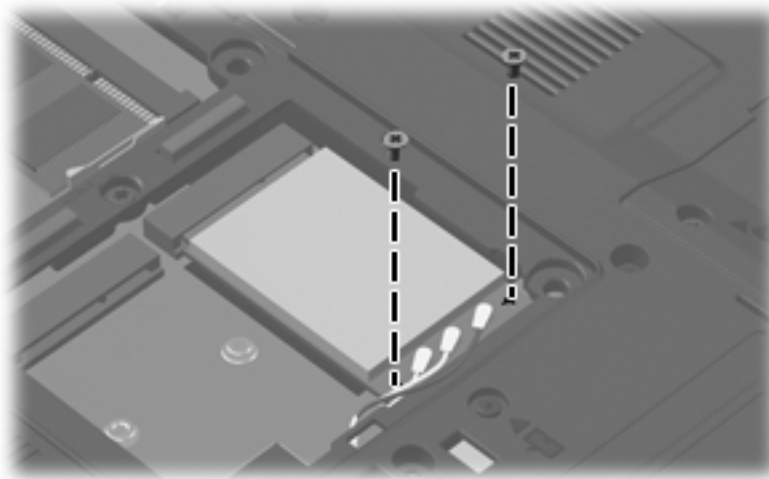


Where used: 3 captive screws that secure the memory module/WLAN module compartment cover to the computer (screws are captured on the cover by C-clips)

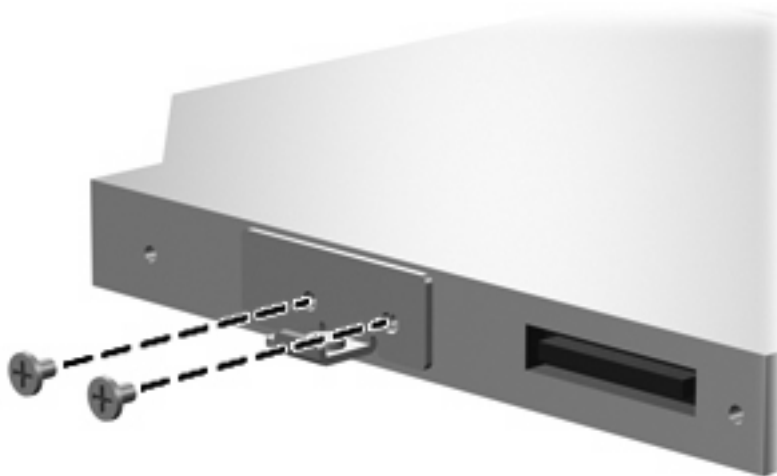
Phillips PM2.0×4.0 screw



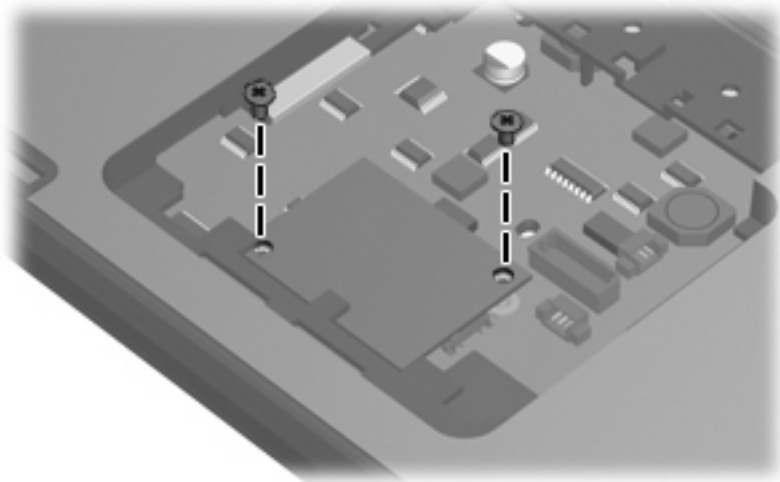
| Color | Quantity | Length | Thread | Head diameter |
|--------|----------|--------|--------|---------------|
| Silver | 18 | 4.0 mm | 2.0 mm | 4.5 mm |



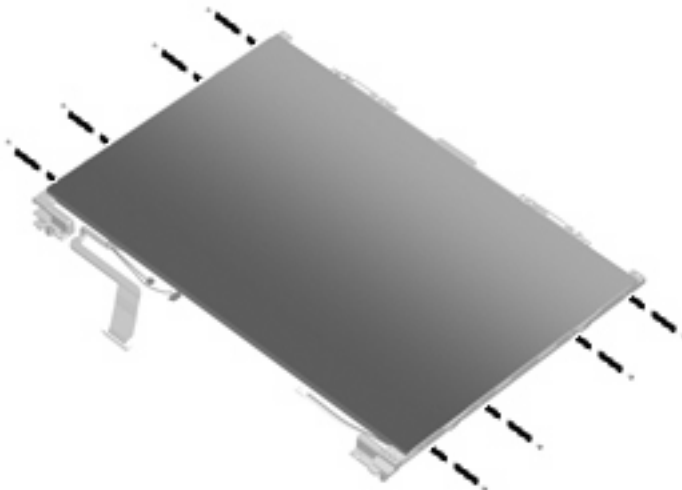
Where used: 2 screws that secure the WLAN module to the system board



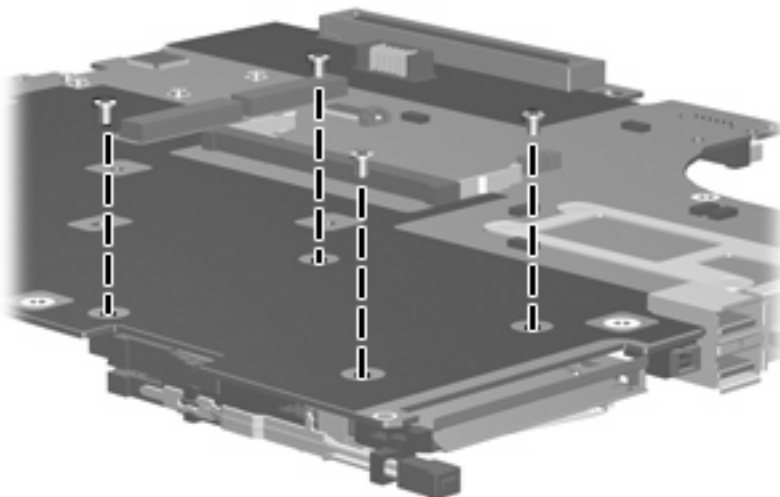
Where used: 2 screws that secure the optical drive bracket to the optical drive



Where used: 2 screws that secure the modem module to the system board

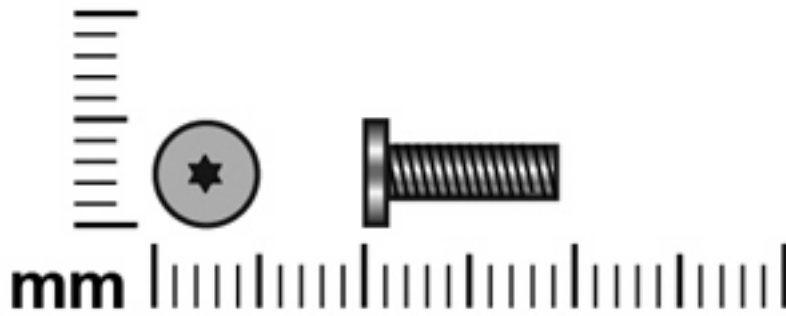


Where used: 8 screws that secure the display hinges to the display panel

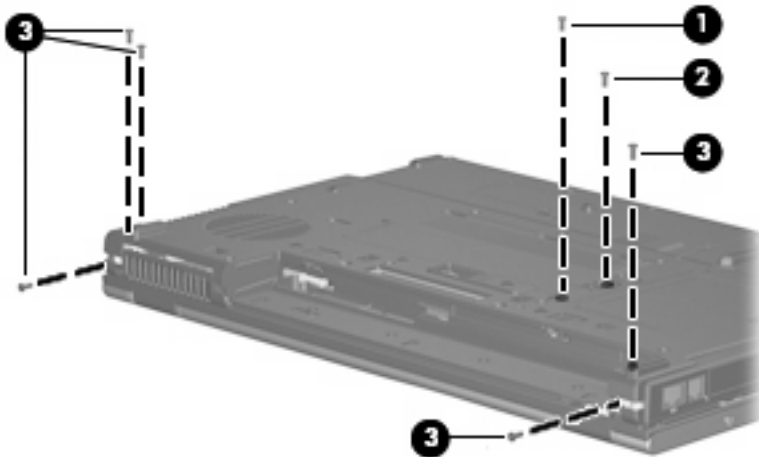


Where used: 4 screws that secure the PC Card assembly to the system board

Torx TM2.5×9.0 screw

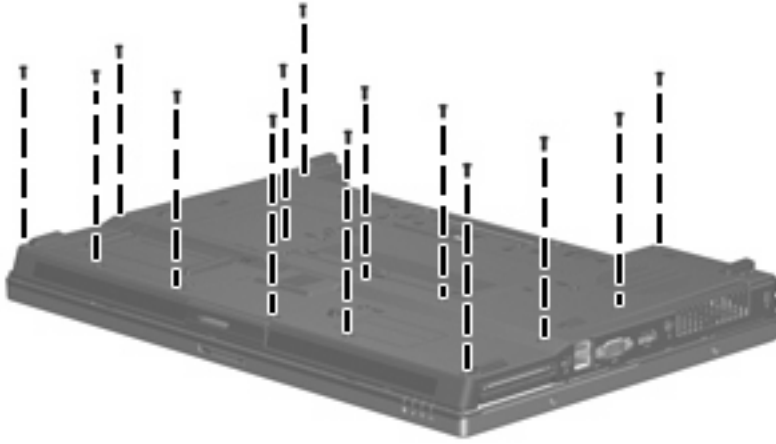


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 21 | 9.0 mm | 2.5 mm | 5.0 mm |



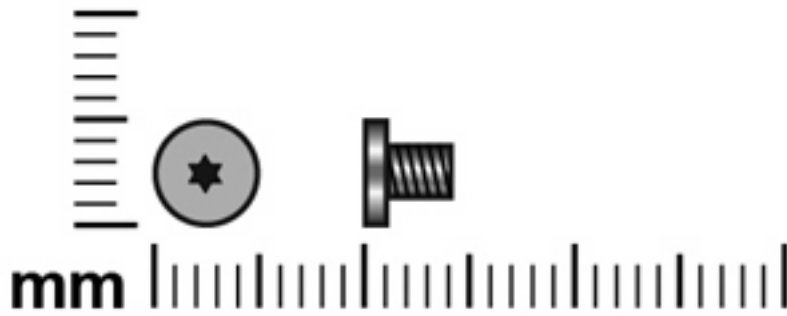
Where used:

- (1) One screw that secures the optical drive to the computer
- (2) One screw that secures the TouchPad to the computer
- (3) Five screws that secure the display assembly to the computer

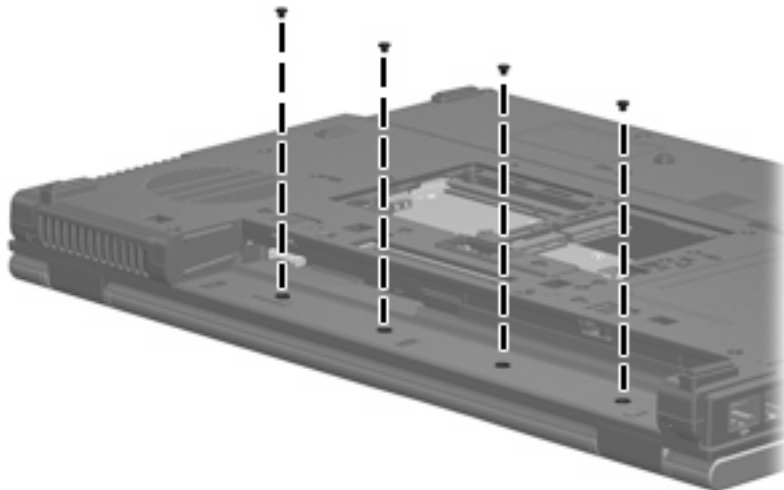


Where used: 14 screws that secure the top cover to the computer

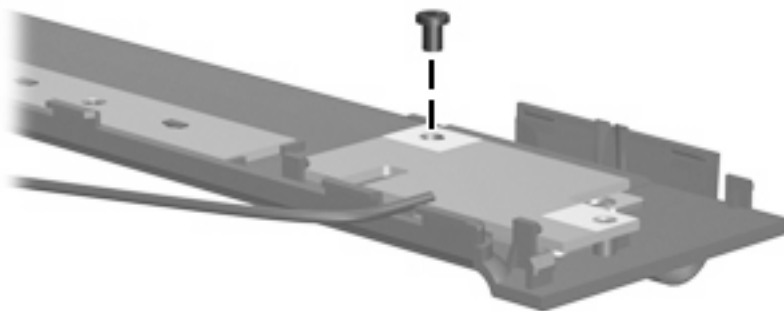
Torx TM2.5×4.0 screw



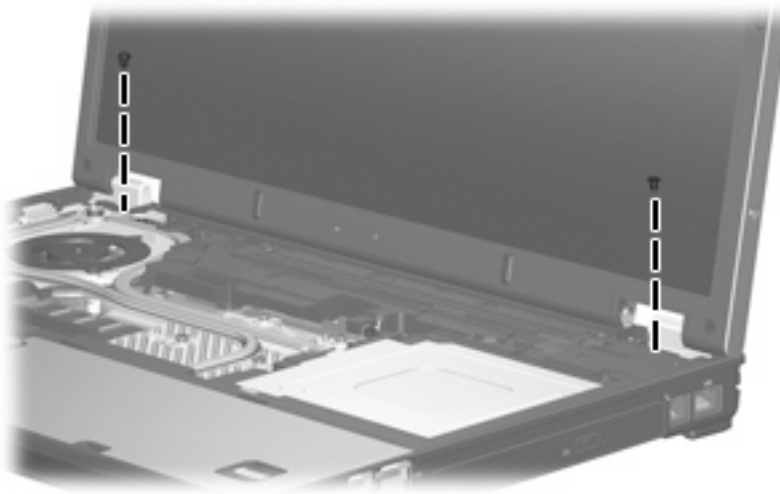
| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 16 | 4.0 mm | 2.5 mm | 4.5 mm |



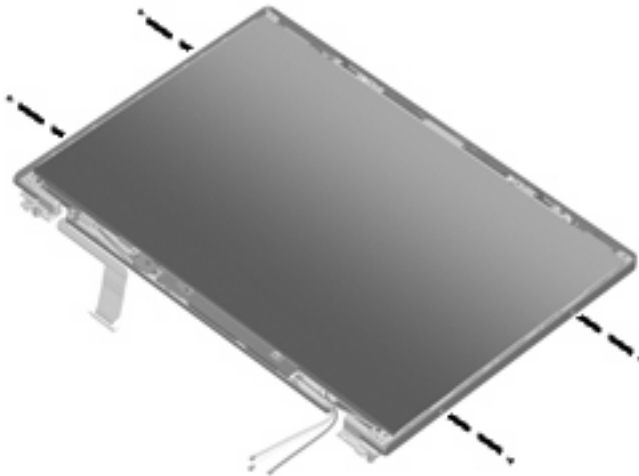
Where used: 4 screws that secure the switch cover to the base enclosure



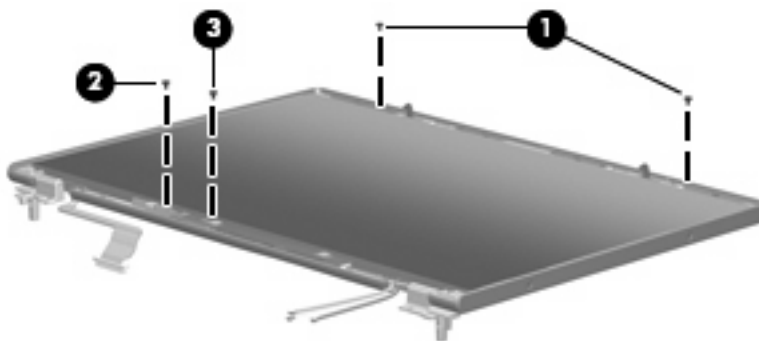
Where used: One screw that secures the power button board to the switch cover



Where used: 2 screws that secure the display assembly to the computer

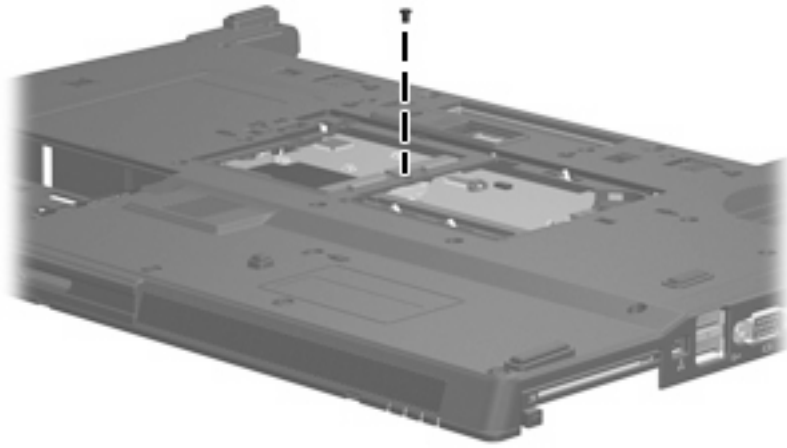


Where used: 4 screws that secure the display panel to the display enclosure



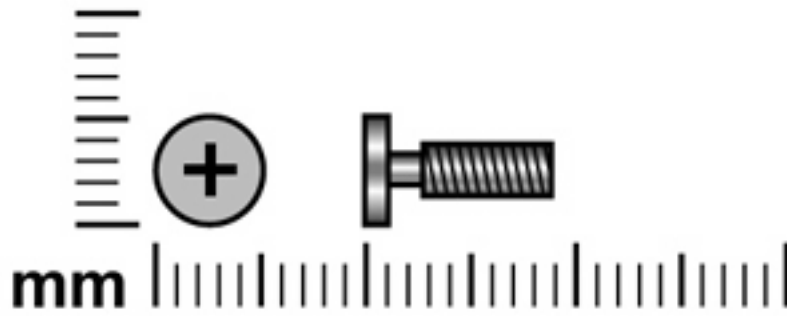
Where used:

- (1) Two screws that secure the display panel to the display enclosure
- (2) One screw that secures the ambient light sensor to the display enclosure
- (3) One screw that secures the display inverter to the display enclosure

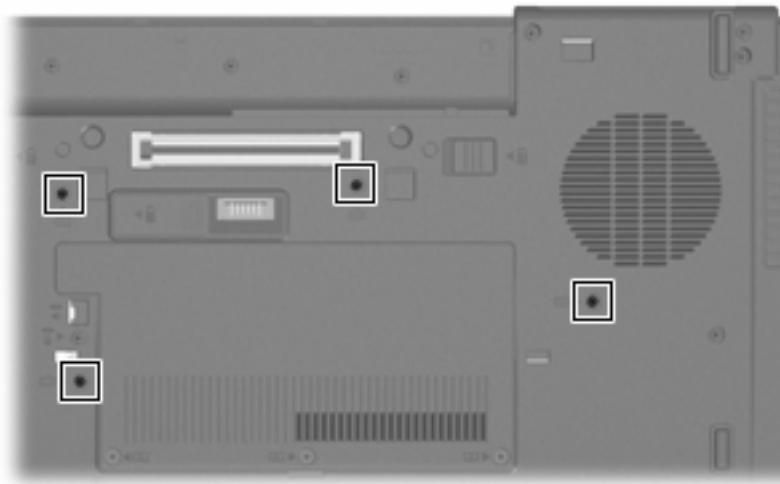


Where used: One screw that secures the system board to the base enclosure

Phillips PM2.5×9.0 captive screw

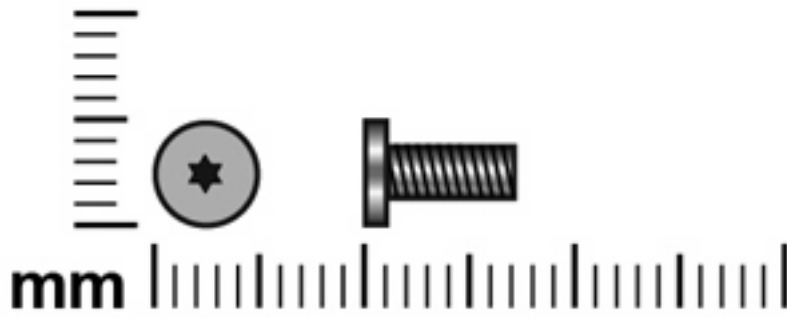


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 4 | 9.0 mm | 2.5 mm | 5.0 mm |

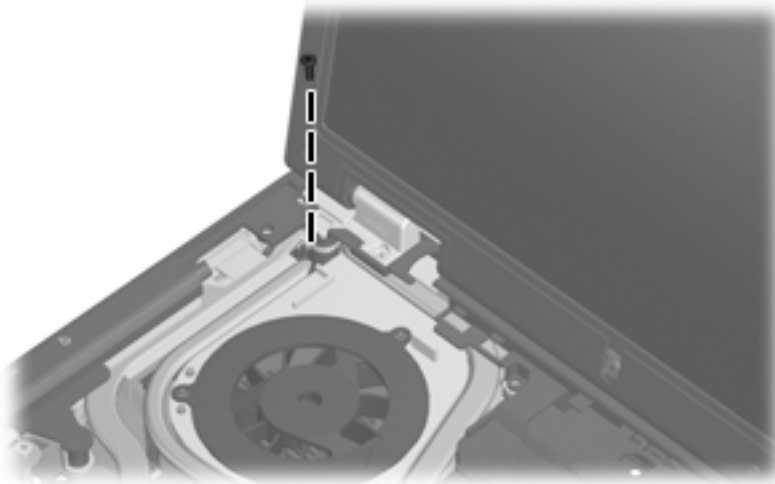


Where used: 3 captive screws that secure the keyboard to the computer

Torx T8M2.5×7.0 screw



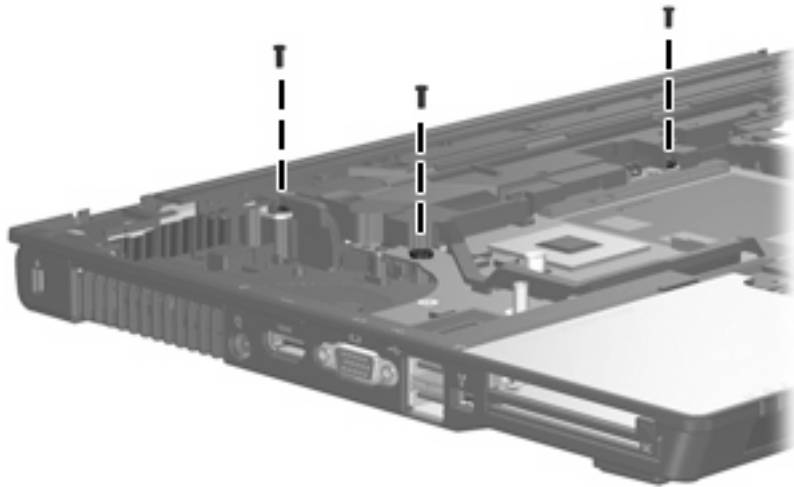
| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 9 | 7.0 mm | 2.5 mm | 5.0 mm |



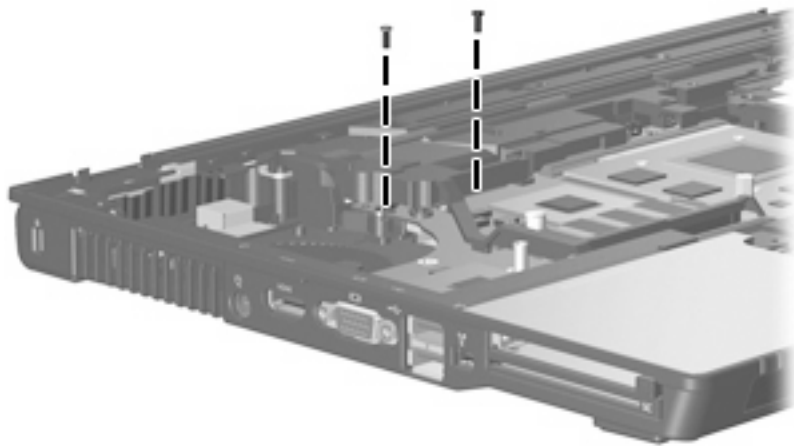
Where used: One screw that secures the fan/heat sink assembly to the computer



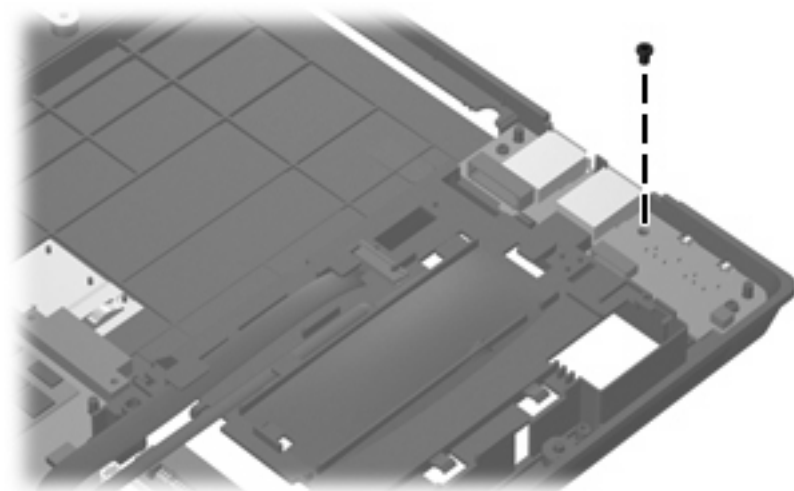
Where used: 2 screws that secure the display panel to the display enclosure



Where used: 3 screws that secure the top cover to the base enclosure

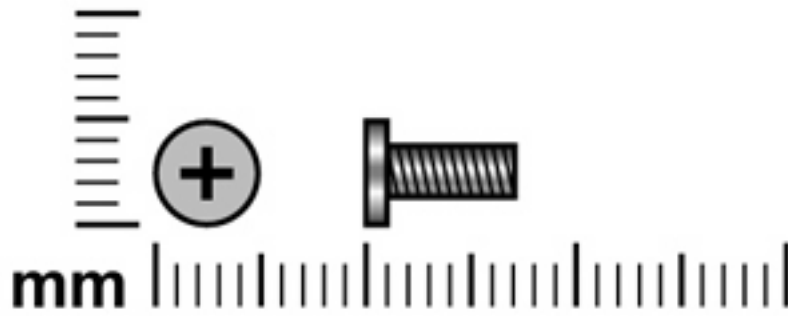


Where used: 2 screws that secure the system board to the base enclosure

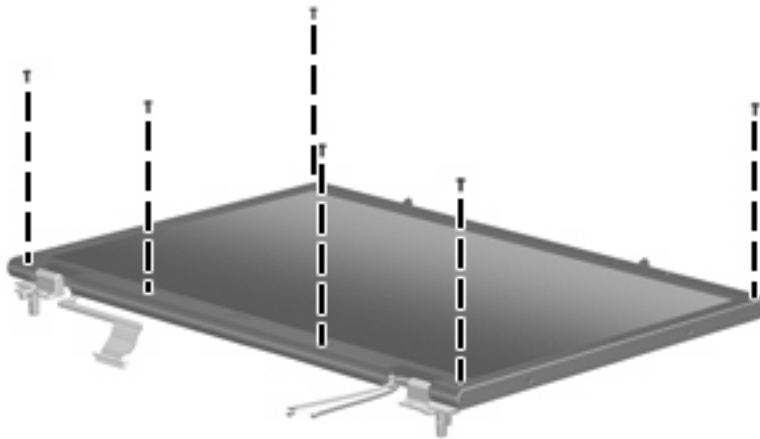


Where used: One screw that secures the USB/audio board to the base enclosure

Phillips PM2.5×7.0 screw

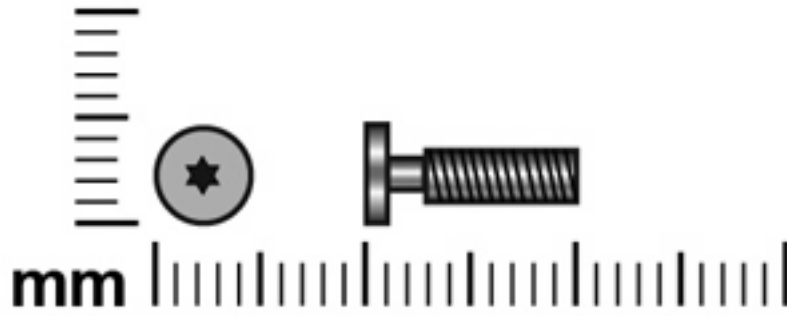


| Color | Quantity | Length | Thread | Head diameter |
|--------|----------|--------|--------|---------------|
| Silver | 6 | 7.0 mm | 2.5 mm | 5.0 mm |

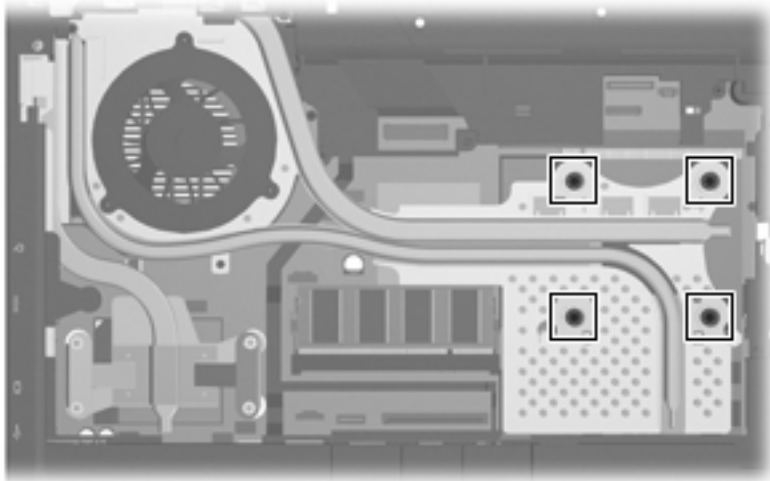


Where used: 6 screws that secure the display bezel to the display enclosure

Torx T8M2.0×10.0 captive screw

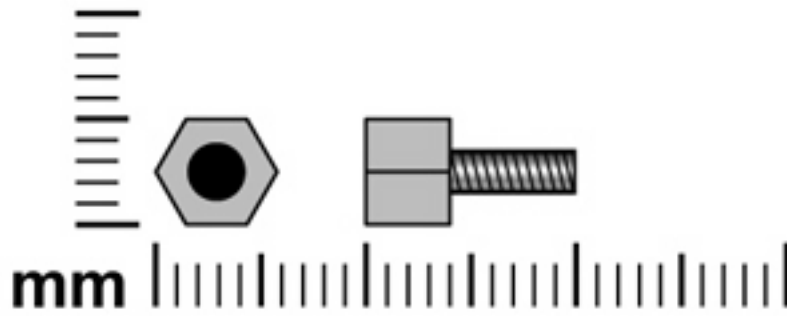


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|---------|--------|---------------|
| Black | 4 | 10.0 mm | 2.0 mm | 5.0 mm |

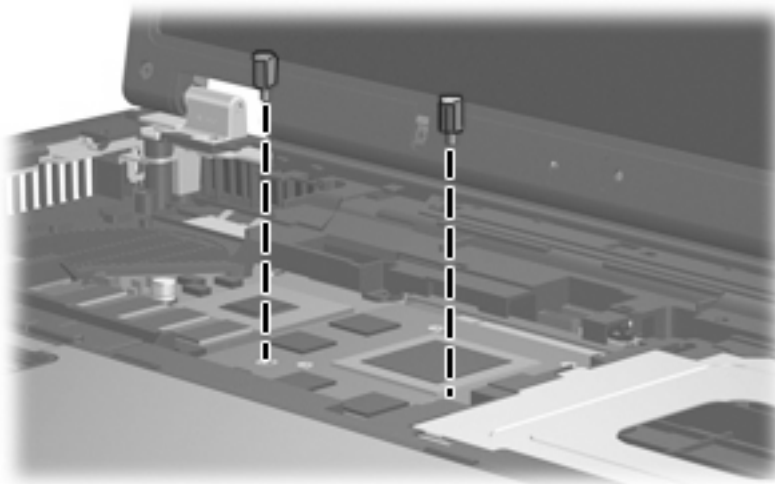


Where used: 4 captive screws that secure the fan/heat sink assembly to the system board

Hex Metric HM5.0×10.0 standoff

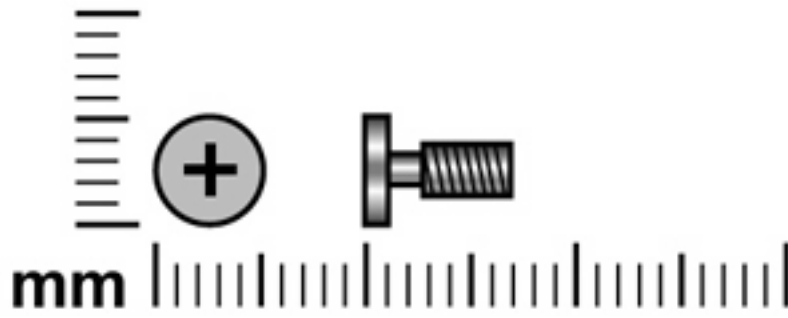


| Color | Quantity | Length | Thread | Head diameter |
|--------|----------|---------|--------|---------------|
| Silver | 2 | 10.0 mm | 2.5 mm | 5.0 mm |

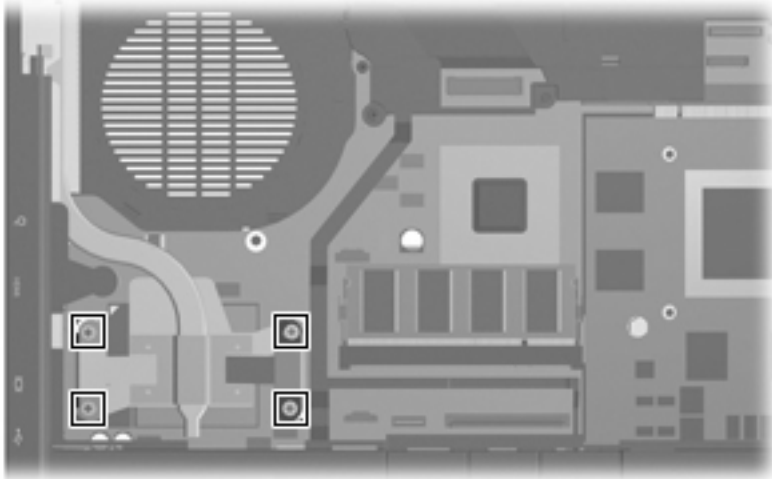


Where used: 2 standoffs that secure the graphics card to the system board

Phillips PM2.5×7.0 captive screw

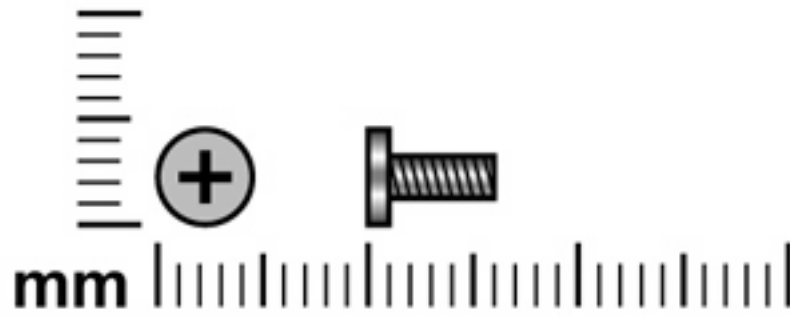


| Color | Quantity | Length | Thread | Head diameter |
|-------|----------|--------|--------|---------------|
| Black | 4 | 7.0 mm | 2.5 mm | 5.0 mm |

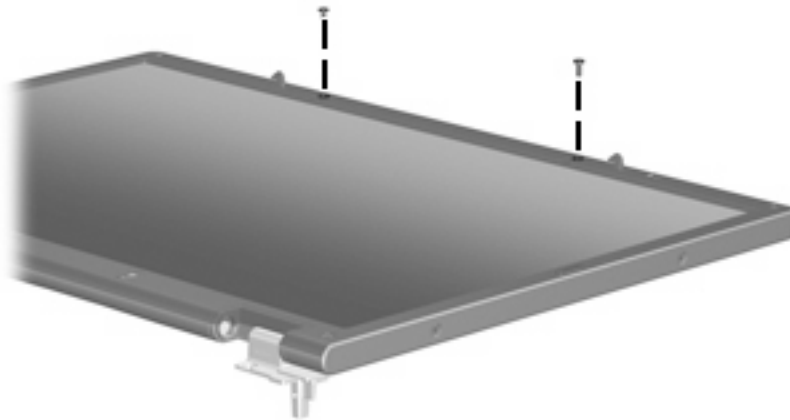


Where used: 4 captive screws that secure the processor heat sink to the base enclosure

Phillips PM2.0×6.0 screw



| Color | Quantity | Length | Thread | Head diameter |
|--------|----------|--------|--------|---------------|
| Silver | 2 | 6.0 mm | 2.0 mm | 5.0 mm |



Where used: 2 screws that secure the display bezel to the display enclosure

8 Backup and recovery


Backup and recovery using Windows Vista

Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed in your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.


 **NOTE:** Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the HP Backup & Recovery Manager software.

- The computer must be connected to AC power during the process.
- Only one set of the recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel the disc creation before you have finished and pointing stick creating the recovery discs. The next time you select **Create a set of recovery discs (Recommended)**, you will be prompted to continue the disc creation.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create a set of recovery discs (Recommended)**, and then click **Next**.
4. Follow the on-screen instructions.

Backing up your information


 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup & Recovery Manager to create an entire drive backup as soon as you set up your computer.

With HP Backup & Recovery Manager, you can perform the following tasks:

- Backing up your information regularly to protect your important system files
- Creating system recovery points that allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state
- Scheduling backups at specific intervals or events

When to back up

- On a regularly scheduled basis

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

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

Backup suggestions

- Create a set of recovery discs using HP Backup & Recovery Manager.
- Create system recovery points using HP Backup & Recovery Manager, and periodically copy them to disc.
- Store personal files in the Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings.


The screen shot can be a time saver if you have to reset your preferences.

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

- a. Display the screen.
- b. Copy the screen.

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


To copy the entire screen, press **fn+prt sc**.
- c. Open a word-processing document, and then select **Edit > Paste**.

 **NOTE:** Before you can perform backup and recovery procedures, the computer must be connected to external power.

NOTE: Drivers, utilities, and applications installed by HP can be copied to a CD or to a DVD using HP Backup & Recovery Manager.

Backing up specific files or folders

You can back up specific files or folders to the recovery partition on the hard drive, to an optional external hard drive, or to optical discs (CDs or DVDs).


 **NOTE:** This process will take several minutes, depending on the file size and the speed of the computer.

To back up specific files or folders:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Back up user created files and folders**, and then click **Next**.
5. Follow the on-screen instructions.

Backing up the entire hard drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows® operating system, software applications, and all personal files and folders.

 **NOTE:** A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.


NOTE: This process may take over an hour, depending on your computer speed and the amount of data being stored.

To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Create or manage Entire Drive Backups**, and then click **Next**.
5. Follow the on-screen instructions.


Creating recovery points

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

 **NOTE:** The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make copies of changes made after that time.

HP recommends that you create recovery points at the following times:

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

 **NOTE:** Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

To create a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.
5. Follow the on-screen instructions.


Scheduling backups

Use HP Backup Scheduler to schedule backups for the entire system, for recovery points, or for specific files and folders. With this tool, you can schedule backups at specific intervals (daily, weekly, or monthly) or at specific events, such as at system restart or when you dock to an optional docking station (select models only).

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.
2. Follow the on-screen instructions.

Performing a recovery

 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup & Recovery Manager to create an entire drive backup as soon as you set up your computer.

HP Backup & Recovery Manager helps you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Recovering important files—This feature helps you reinstall important files without performing a full system recovery.
- Performing a full system recovery—With HP Backup & Recovery Manager, you can recover your full factory image if you experience system failure or instability. HP Backup & Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

Performing a recovery from the recovery discs

To perform a recovery from the recovery discs, follow these steps:

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

Performing a recovery from the hard drive

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows
- From the recovery partition

Initiating a recovery in Windows

To initiate a recovery in Windows, follow these steps:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
3. Click **Next**.
4. Click **Perform a recovery**, and then click **Next**.
5. Follow the on-screen instructions.

Initiating a recovery from the hard drive recovery partition

To initiate a recovery from the hard drive recovery partition, follow these steps:

1. Back up all personal files.
2. Restart the computer, and then press **f11** before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.


Backup and recovery using Windows XP

Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed in your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.


 **NOTE:** Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the HP Backup and Recovery Manager software.

- The computer must be connected to AC power during the process.
- Only one set of the recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel the disc creation before you have finished and pointing stick creating the recovery discs. The next time you select **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, you will be prompted to continue the disc creation.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, and then click **Next**.
4. Follow the on-screen instructions.

Backing up your information


 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup and Recovery Manager to create an entire drive backup as soon as you set up your computer.

With HP Backup and Recovery Manager, you can perform the following tasks:

- Backing up your information regularly to protect your important system files
- Creating system recovery points that allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state
- Scheduling backups at specific intervals or events

When to back up

- On a regularly scheduled basis

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

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

Backup suggestions

- Create a set of recovery discs using HP Backup and Recovery Manager.
- Create system recovery points using HP Backup and Recovery Manager, and periodically copy them to disc.
- Store personal files in the My Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings.

The screen shot can be a time saver if you have to reset your preferences.


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

- a. Display the screen.
- b. Copy the screen.

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

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


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

 **NOTE:** Before you can perform backup and recovery procedures, the computer must be connected to external power.

NOTE: Drivers, utilities, and applications installed by HP can be copied to a CD or to a DVD using HP Backup and Recovery Manager.

Backing up specific files or folders

You can back up specific files or folders to the recovery partition on the hard drive, to an optional external hard drive, or to optical discs (CDs or DVDs).

 **NOTE:** This process will take several minutes, depending on the file size and the speed of the computer.


To back up specific files or folders:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.

4. Click **Back up individual files and folders**, and then click **Next**.
5. Follow the on-screen instructions.

Backing up the entire hard drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows® operating system, software applications, and all personal files and folders.

 **NOTE:** A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.


NOTE: This process may take over an hour, depending on your computer speed and the amount of data being stored.

To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Back up entire hard drive**, and then click **Next**.
5. Follow the on-screen instructions.


Creating recovery points

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

 **NOTE:** The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make copies of changes made after that time.

HP recommends that you create recovery points at the following times:

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

 **NOTE:** Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

To create a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.
5. Follow the on-screen instructions.


Scheduling backups

Use HP Backup Scheduler to schedule backups for the entire system, for recovery points, or for specific files and folders. With this tool, you can schedule backups at specific intervals (daily, weekly, or monthly) or at specific events, such as at system restart or when you dock to an optional docking station (select models only).

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.
2. Follow the on-screen instructions.

Performing a recovery

 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup and Recovery Manager to create an entire drive backup as soon as you set up your computer.

HP Backup and Recovery Manager helps you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Recovering important files—This feature helps you reinstall important files without performing a full system recovery.
- Performing a full system recovery—With HP Backup and Recovery Manager, you can recover your full factory image if you experience system failure or instability. HP Backup and Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

Performing a recovery from the recovery discs

To perform a recovery from the recovery discs, follow these steps:

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

Performing a recovery from the hard drive

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows
- From the recovery partition

Initiating a recovery in Windows

To initiate a recovery in Windows, follow these steps:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
3. Click **Next**.
4. Click **Recover important files or the entire system**, and then click **Next**.
5. Follow the on-screen instructions.

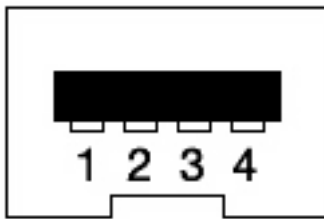
Initiating a recovery from the hard drive recovery partition

To initiate a recovery from the hard drive recovery partition, follow these steps:

1. Back up all personal files.
2. Restart the computer, and then press **f11** before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.

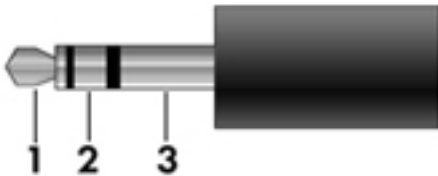
9 Connector pin assignments

1394



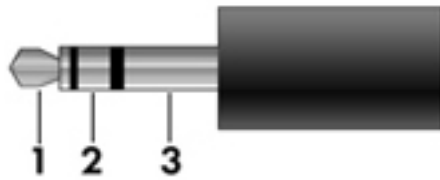
| Pin | Signal |
|-----|-----------------|
| 1 | Twisted pair B- |
| 2 | Twisted pair B+ |
| 3 | Twisted pair A- |
| 4 | Twisted pair A+ |

Audio-out (headphone)



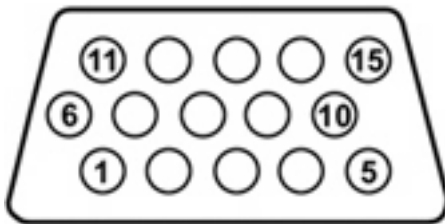
| Pin | Signal |
|-----|--------------------------|
| 1 | Audio out, left channel |
| 2 | Audio out, right channel |
| 3 | Ground |

Audio-in (microphone)



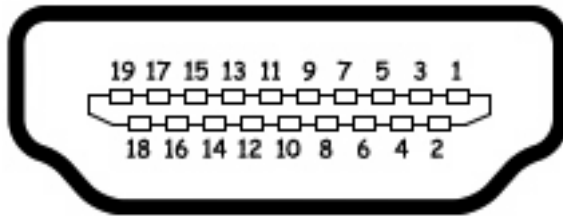
| Pin | Signal |
|-----|-----------------|
| 1 | Audio signal in |
| 2 | Audio signal in |
| 3 | Ground |

External monitor



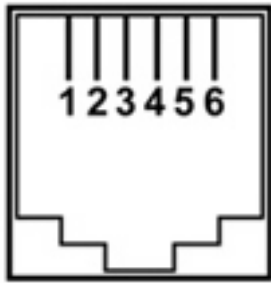
| Pin | Signal |
|-----|-----------------|
| 1 | Red analog |
| 2 | Green analog |
| 3 | Blue analog |
| 4 | Not connected |
| 5 | Ground |
| 6 | Ground analog |
| 7 | Ground analog |
| 8 | Ground analog |
| 9 | +5 VDC |
| 10 | Ground |
| 11 | Monitor detect |
| 12 | DDC 2B data |
| 13 | Horizontal sync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

HDMI



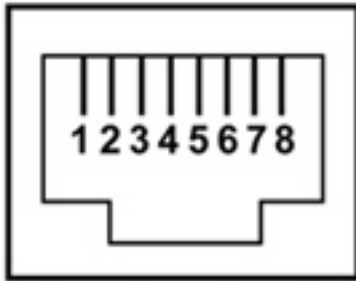
| Pin | Signal |
|-----|--------------------|
| 1 | TMDS data 2+ |
| 2 | TMDS data 2 shield |
| 3 | TMDS data 2- |
| 4 | TMDS data 1+ |
| 5 | TMDS data 1 shield |
| 6 | TMDS data 1- |
| 7 | TMDS data 0+ |
| 8 | TMDS data 0 shield |
| 9 | TMDS data 0- |
| 10 | TMDS clock+ |
| 11 | TMDS clock shield |
| 12 | TMDS clock- |
| 13 | CEC |
| 14 | No connect |
| 15 | DDC clock |
| 16 | DDC data |
| 17 | Ground |
| 18 | +5V power |
| 19 | Hot plug detect |
| 20 | Shell |

RJ-11 (modem)



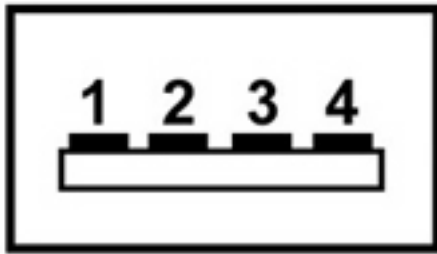
| Pin | Signal |
|-----|--------|
| 1 | Unused |
| 2 | Tip |
| 3 | Ring |
| 4 | Unused |
| 5 | Unused |
| 6 | Unused |

RJ-45 (network)



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

Universal Serial Bus



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

10 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 and regions

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

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

Requirements for specific countries and regions

| Country/region | Accredited agency | Applicable note number |
|--------------------------------|-------------------|------------------------|
| Australia | EANSW | 1 |
| Austria | OVE | 1 |
| Belgium | CEBC | 1 |
| Canada | CSA | 2 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |
| Italy | IMQ | 1 |
| Japan | METI | 3 |
| Korea | EK | 4 |
| The Netherlands | KEMA | 1 |
| Norway | NEMKO | 1 |
| The People's Republic of China | CCC | 5 |
| 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.

11 Recycling

Battery

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

Display

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

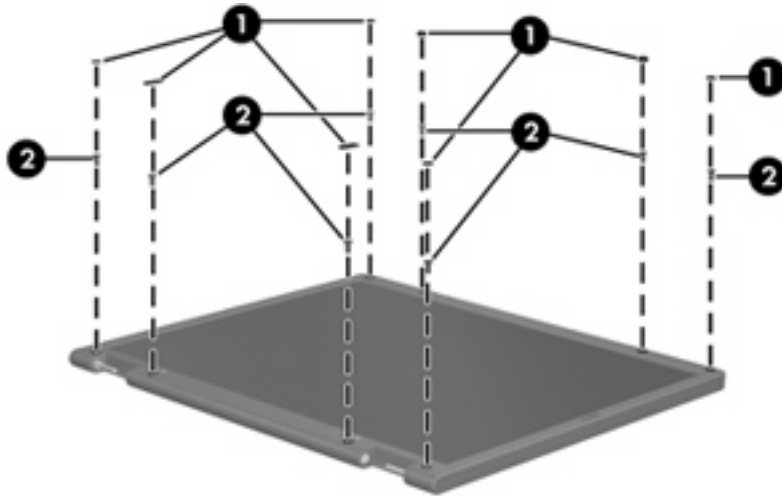
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



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

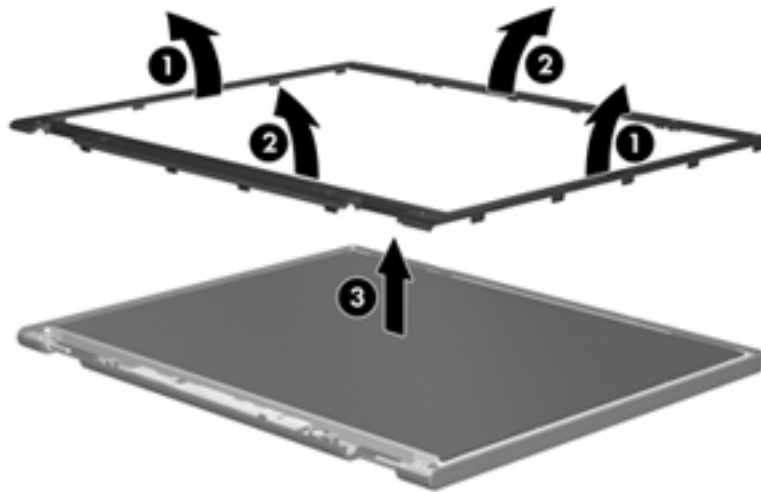
Perform the following steps to disassemble the display assembly:

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

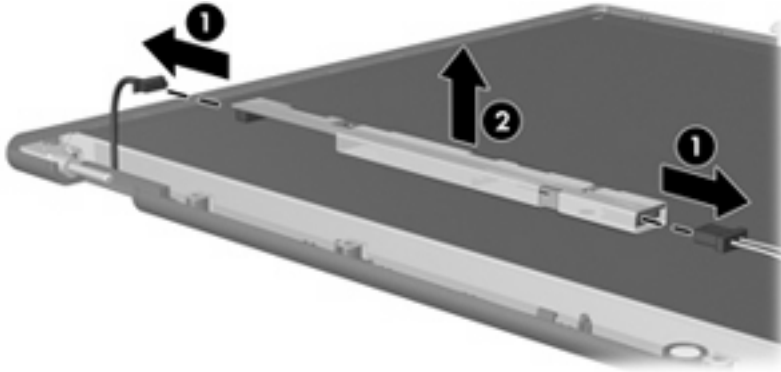


2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.

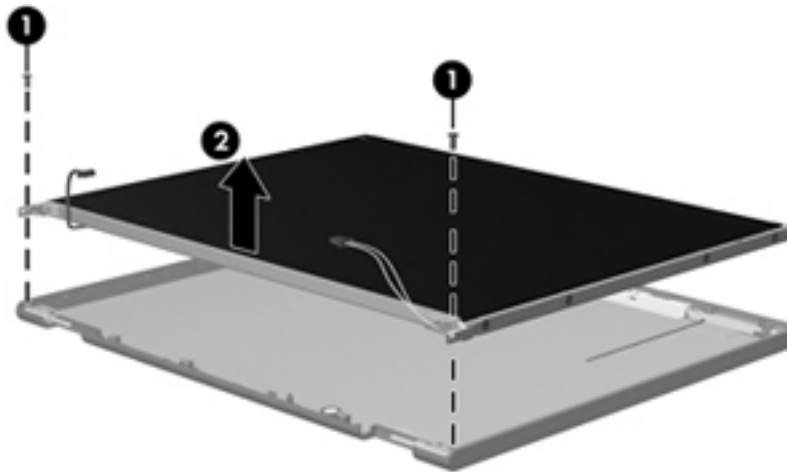
3. Remove the display bezel (3).



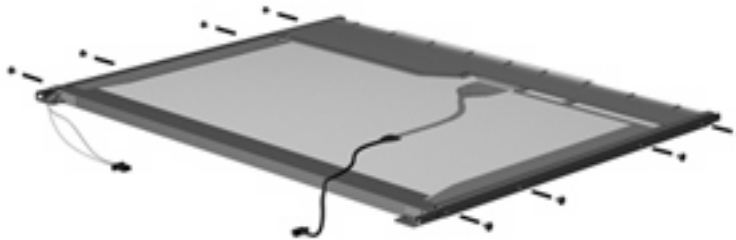
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



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

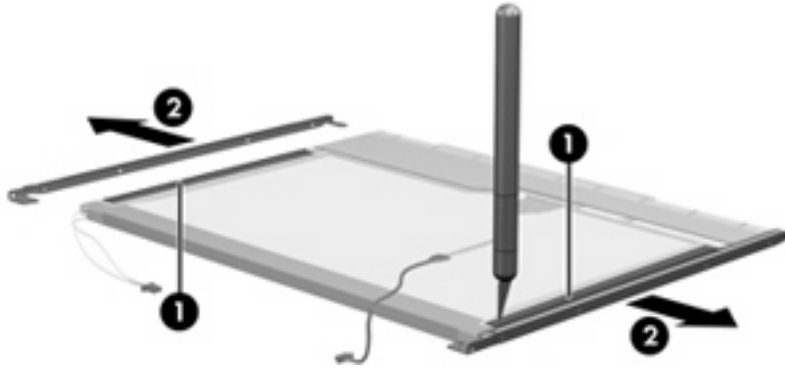


7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.

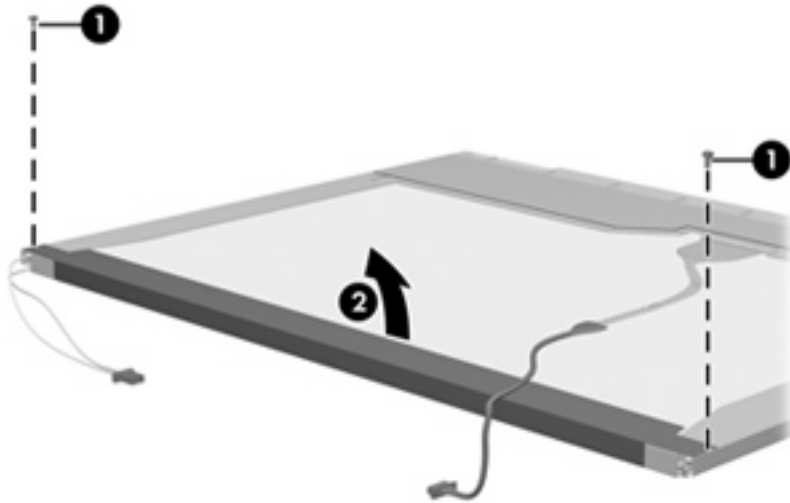


9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.

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

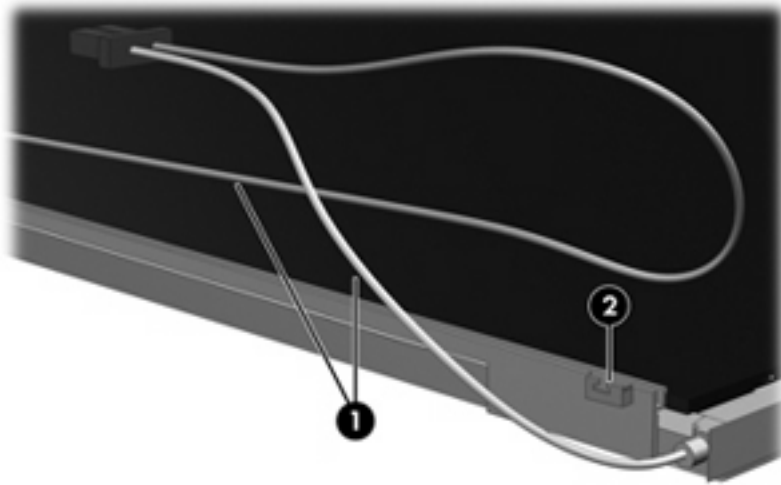


11. Remove the screws (1) that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover (2) and swing it outward.



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

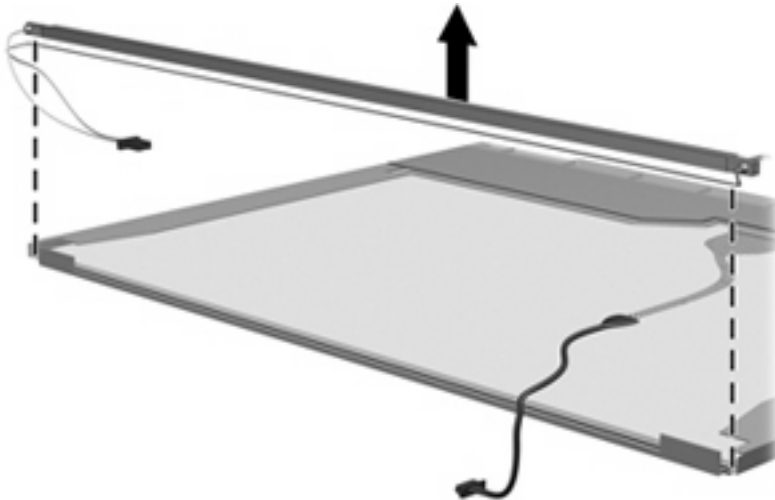
15. Remove the backlight cables (1) from the clip (2) in the display panel.



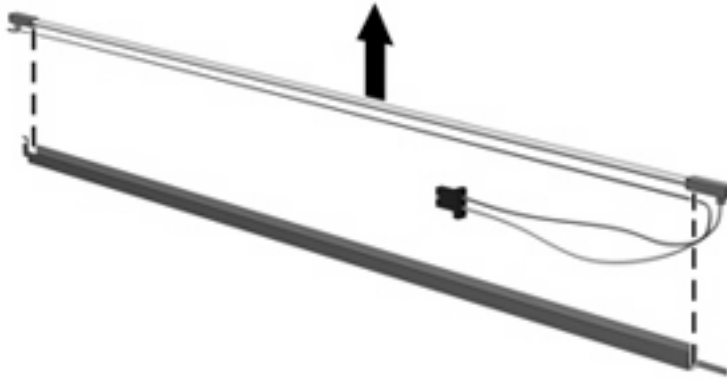
16. Turn the display panel upside down.

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

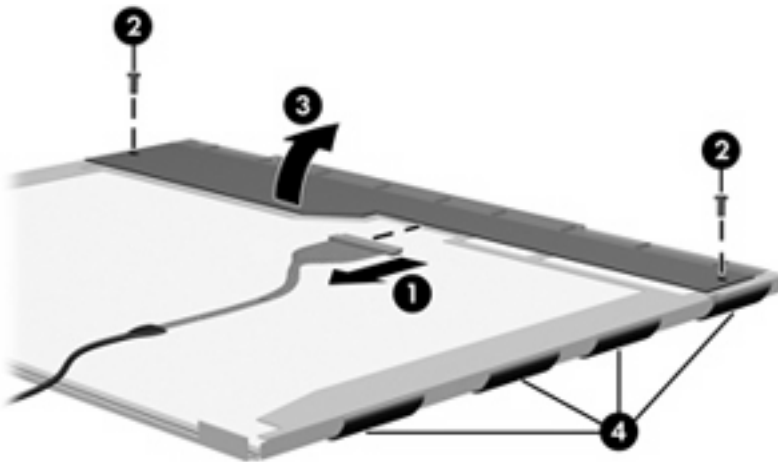
17. Remove the backlight frame from the display panel.



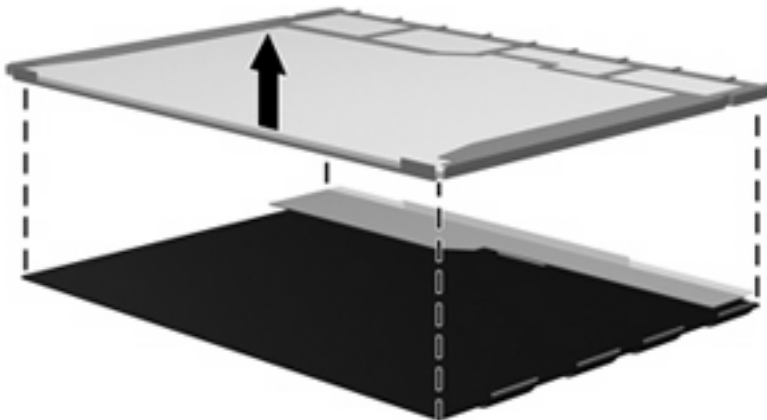
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel cable (1) from the LCD panel.
20. Remove the screws (2) that secure the LCD panel to the display rear panel.
21. Release the LCD panel (3) from the display rear panel.
22. Release the tape (4) that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

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