



Maintenance and Service Guide

HP Pavilion zd8000 Notebook PC

Document Part Number: 372712-001

January 2005

This guide is a troubleshooting reference used for maintaining and servicing the notebook. It provides comprehensive information on identifying notebook features, components, and spare parts; troubleshooting notebook problems; and performing notebook disassembly procedures.

© Copyright 2005 Hewlett-Packard Development Company, L.P.

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation. Intel and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. SD logo is a trademark of its proprietor.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Maintenance and Service Guide
HP Pavilion zd8000 Notebook PC
First Edition January 2005
Document Part Number: 372712-001

Contents

1 Product Description

| | |
|--------------------------------------|------|
| 1.1 Features | 1-2 |
| 1.2 Resetting the Notebook | 1-4 |
| 1.3 Power Management | 1-4 |
| 1.4 External Components | 1-5 |
| 1.5 Design Overview | 1-18 |

2 Troubleshooting

| | |
|--|-----|
| 2.1 Computer Setup | 2-1 |
| 2.2 Troubleshooting Flowcharts | 2-5 |

3 Illustrated Parts Catalog

| | |
|--|------|
| 3.1 Serial Number Location | 3-1 |
| 3.2 Notebook Major Components | 3-2 |
| 3.3 Miscellaneous Plastics Kit | 3-8 |
| 3.4 Mass Storage Devices | 3-9 |
| 3.5 Media Center Edition Accessories | 3-10 |
| 3.6 Miscellaneous (Not Illustrated) | 3-11 |
| 3.7 Sequential Part Number Listing | 3-14 |

4 Removal and Replacement Preliminaries

| | |
|--|-----|
| 4.1 Tools Required | 4-1 |
| 4.2 Service Considerations | 4-2 |
| 4.3 Preventing Damage to Removable Drives | 4-3 |
| 4.4 Preventing Electrostatic Damage | 4-4 |
| 4.5 Packaging and Transporting Precautions | 4-5 |
| 4.6 Workstation Precautions | 4-6 |
| 4.7 Grounding Equipment and Methods | 4-7 |

5 Removal and Replacement Procedures

| | | |
|------|--|------|
| 5.1 | Serial Number | 5-2 |
| 5.2 | Disassembly Sequence Chart | 5-3 |
| 5.3 | Preparing the Notebook for Disassembly | 5-5 |
| 5.4 | Notebook Feet | 5-10 |
| 5.5 | Optical Drive | 5-10 |
| 5.6 | Memory Module | 5-12 |
| 5.7 | Mini PCI Communications Card | 5-15 |
| 5.8 | Switch Cover | 5-17 |
| 5.9 | LED Board | 5-19 |
| 5.10 | Keyboard | 5-21 |
| 5.11 | Display Assembly | 5-26 |
| 5.12 | Top Cover | 5-30 |
| 5.13 | Infrared Board | 5-36 |
| 5.14 | Audio/USB Board | 5-38 |
| 5.15 | Bluetooth Board | 5-40 |
| 5.16 | System Board | 5-42 |
| 5.17 | Speakers | 5-49 |
| 5.18 | Digital Drive Board | 5-52 |
| 5.19 | Base Enclosure Fans | 5-54 |
| 5.20 | Modem Board | 5-56 |
| 5.21 | Heat Sink Module | 5-58 |
| 5.22 | Processor | 5-60 |

6 Specifications

A Connector Pin Assignments

B Power Cord Set Requirements

C Screw Listing

Index

Product Description

The HP Pavilion zd8000 Notebook PC offers advanced modularity, Intel® Mobile Pentium® 4 processors, and extensive multimedia support.



HP Pavilion zd8000 Notebook PC

1.1 Features

- The following processors are available, varying by notebook model:
 - ❑ Intel Pentium 4 560 (3.6-GHz) with 800-MHz front side bus (FSB) with HT Technology
 - ❑ Intel Pentium 4 550 (3.4-GHz) with 800-MHz FSB with HT Technology
 - ❑ Intel Pentium 4 540 (3.2-GHz) with 800-MHz FSB with HT Technology
 - ❑ Intel Pentium 4 530 (3.0-GHz) with 800-MHz FSB with HT Technology
 - ❑ Intel Pentium 4 520 (2.8-GHz) with 800-MHz FSB with HT Technology
- The following displays are available, varying by notebook model:
 - ❑ 17.0-inch WSXGA+WVA (1680 × 1050) with Brightview TFT display with over 16.7 million colors
 - ❑ 17.0-inch WXGA+WVA (1440 × 900) with Brightview TFT display with over 16.7 million colors
 - ❑ 17.0-inch WXGA+WVA (1440 × 900) TFT display with over 16.7 million colors
- 100-, 80-, 60-, or 40-GB high-capacity hard drive, varying by notebook model
- 256-MB DDR2 synchronous DRAM (SDRAM) at 400 and 533 MHz, expandable to 2.0 GB
- Microsoft® Windows® XP Home Edition or Windows XP Professional, varying by notebook model
- Full-size Windows keyboard with full-size numeric keypad
- TouchPad pointing device, including a dedicated vertical scroll region and a button that enables/disables TouchPad operation.
- Integrated 10 Base-T/100 Base-TX Ethernet local area network (LAN) network interface card (NIC) with RJ-45 jack

- Integrated high-speed 56K modem with RJ-11 jack
- Integrated wireless support for Mini PCI IEEE 802.11b and 802.11b/g WLAN device
- Support for one Type II PC Card slot, with support for both 32-bit (CardBus) and 16-bit PC Cards
- External 180- and 135-watt AC adapter with 3-wire power cord, varying by notebook model
- 12-cell Li-Ion battery pack
- Stereo speakers with volume up, volume mute, and volume down buttons
- Support for the following optical drives:
 - ❑ 8X Max DVD±RW/R and CD-RW Combo Drive
 - ❑ 24X Max DVD/CD-RW Combo Drive
- Connectors:
 - ❑ External monitor
 - ❑ Universal Serial Bus (USB) v. 2.0 (four ports)
 - ❑ RJ-11 (modem)
 - ❑ RJ-45 (network)
 - ❑ Audio-out (headphone)
 - ❑ Audio-in (microphone)
 - ❑ Power
 - ❑ IEEE 1394 (select models only)
 - ❑ S-Video-out (select models only)
 - ❑ Infrared
 - ❑ Expansion port 2
 - ❑ Digital Media Slot
 - ❑ Digital drive bay
 - ❑ ExpressCard

1.2 Resetting the Notebook

If the notebook you are servicing has an unknown password, follow these steps to clear the password. These steps also clear CMOS:

1. Prepare the notebook for disassembly (refer to [Section 5.3, “Preparing the Notebook for Disassembly,”](#) for more information).
2. Remove the real time clock (RTC) battery (refer to [Section 5.16, “System Board,”](#) for more information on removing and replacing the RTC battery).
3. Wait approximately 5 minutes.
4. Replace the RTC battery and reassemble the notebook.
5. Connect AC power to the notebook. Do not reinsert any battery packs at this time.
6. Turn on the notebook.

All passwords and all CMOS settings have been cleared.

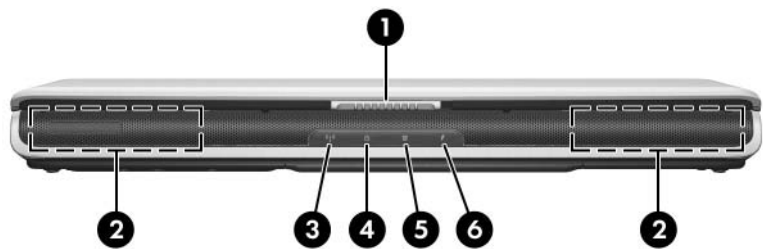
1.3 Power Management

The notebook comes with power management features that extend battery operating time and conserve power. The notebook supports the following power management features:

- Standby
- Hibernation
- Setting customization by the user
- Hotkeys for setting the level of performance
- Battery calibration
- Lid switch standby/resume
- Power/standby button
- Advanced Configuration and Power Management (ACPM) compliance

1.4 External Components

The external components on the front of the notebook are shown below and described in Table 1-1.

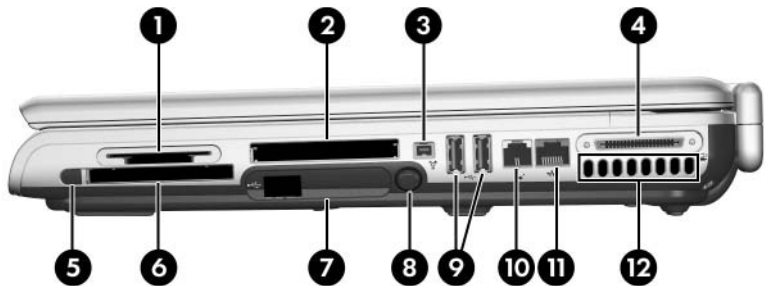


Front Components

Table 1-1
Front Components

| Item | Component | Function |
|------|---------------------------|--|
| 1 | Display release latch | Opens the notebook. |
| 2 | Stereo speakers (2) | Produce stereo sound. |
| 3 | Power/standby light | ■ On: Notebook is turned on. ■ Blinking: Notebook is in standby. ■ Off: Notebook is off. |
| 4 | Battery light | ■ On: Battery pack is charging. ■ Blinking: Battery pack has reached a low-battery condition. |
| 5 | AC power light | On: Notebook is receiving AC power. |
| 6 | Hard drive activity light | On: A notebook drive is being accessed. |

The external components on the right side of the notebook are shown below and described in Table 1-2.




Right-Side Components

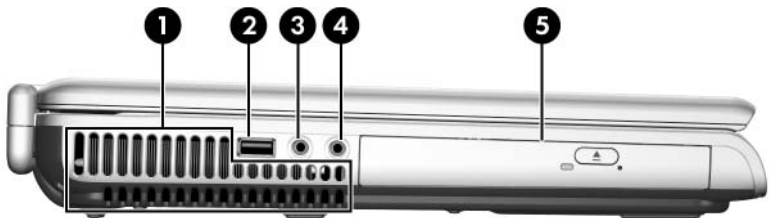
Table 1-2
Right-Side Components

| Item | Component | Function |
|------|--------------------|---|
| 1 | Digital Media Slot | Supports the following optional digital media: Secure Digital (SD) Memory Card, Secure Digital Input/Output (SD I/O), Memory Stick, Memory Stick Pro, MultiMediaCard, xD-Picture Card, and SmartMedia card. |
| 2 | ExpressCard slot | Supports an optional ExpressCard. |
| 3 | 1394 port | Connects an optional 1394a device such as a scanner, digital camera, or digital camcorder. |

Table 1-2
Right-Side Components (Continued)

| Item | Component | Function |
|------|----------------------------|---|
| 4 | Expansion port 2 | Connects to an optional notebook expansion product. |
| 5 | PC Card eject button | Ejects an optional PC Card from the PC Card slot. |
| 6 | PC Card slot | Supports an optional Type I or Type II 32-bit (CardBus) or 16-bit PC Card. Also serves as a storage location for the optional mobile remote control. |
| 7 | Digital drive bay | Supports an optional USB digital drive. |
| 8 | Digital drive eject button | Ejects an optional USB digital drive from the digital drive bay. |
| 9 | USB ports (2) | Connect an optional 1.1- or 2.0-compliant USB device. |
| 10 | RJ-11 (modem) jack | Connects the modem cable. |
| 11 | RJ-45 (network) jack | Connects an optional network cable. |
| 12 | Exhaust vent | Provides airflow to cool internal components. |
| | |  To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs or clothing, to block airflow. |

The external components on the left side of the notebook are shown below and described in Table 1-3.

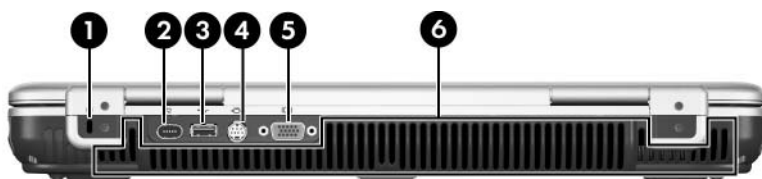


Left-Side Components

Table 1-3
Left-Side Components

| Item | Component | Function |
|------|--------------------------------|---|
| 1 | Exhaust vent | Provides airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs or clothing, to block airflow. |
| 2 | USB port | Connects an optional 1.1- or 2.0-compliant USB device. |
| 3 | Audio-in (microphone) jack | Connects an optional monaural microphone. |
| 4 | Audio-out (headphone) jack (2) | Connect optional headphones or powered stereo speakers. Also connects the audio function of an audio/video device such as a television or VCR. |
| 5 | Optical drive | Supports an optical disc. The type of optical drive, such as a combination CD-ROM/DVD-ROM, varies by model. |

The external components on the rear panel of the notebook are shown below and described in Table 1-4.



Rear Panel Components

Table 1-4
Rear Panel Components

| Item | Component | Function |
|------|-----------------------|--|
| 1 | Security cable slot | Attaches an optional security cable to the notebook. |
| 2 | Power connector | Connects an AC adapter. |
| 3 | USB port | Connects an optional 1.1- or 2.0-compliant USB device. |
| 4 | S-Video-out jack | Connects an optional S-Video device, such as a television, VCR, camcorder, projector, or video capture card. |
| 5 | External monitor port | Connects an optional VGA external monitor or projector. |
| 6 | Exhaust vent | Provides airflow to cool internal components. |
| | | △ To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs or clothing, to block airflow. |

The standard keyboard components of the notebook are shown below and described in Table 1-5.

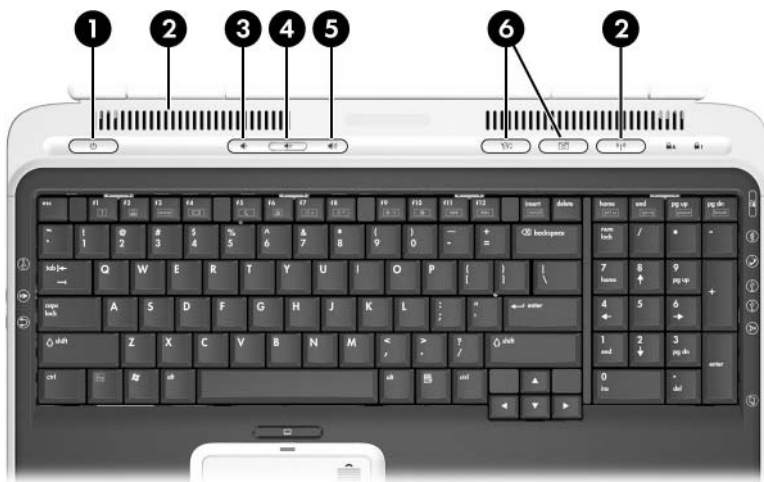


Standard Keyboard Components

Table 1-5
Standard Keyboard Components



| Item | Component | Function |
|-------------|-----------------------------------|---|
| 1 | caps lock key | Enables caps lock and turns on the caps lock light. |
| 2 | f1 to f12 keys (12) | Perform system and application tasks. When combined with the fn key, several keys and buttons perform additional tasks as hotkeys. |
| 3 | num lock key | Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light. |
| 4 | Keypad keys (15) | In Windows, can be used like the keys on an external numeric keypad. |
| 5 | Arrow keys | Moves the cursor around the screen. |
| 6 | Windows applications key | In Windows, displays a shortcut menu for items beneath the pointer. |
| 7 | Windows logo key | In Windows, displays the Windows Start menu. |
| 8 | fn key | Combines with other keys to perform system tasks. For example, pressing fn+f7 decreases screen brightness. |

The upper components of the keyboard are shown below and on the following page and described in Tables 1-6 and 1-7.



Upper Keyboard Components

Table 1-6
Upper Keyboard Components

| Item | Component | Function |
|------|--------------------------|--|
| 1 | Power/standby button | <p>When the notebook is:</p> <ul style="list-style-type: none"> ■ Off, press to turn on the notebook. ■ On, briefly press to initiate standby. ■ In standby, briefly press to resume from standby. ■ In hibernation, briefly press to restore from hibernation. <p> If the system has stopped responding and Microsoft Windows shutdown procedures cannot be used, press and hold the power/standby button for at least 4 seconds to turn off the notebook.</p> |
| 2 | Exhaust vents | <p>Provide airflow to cool internal components.</p> <p> To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs or clothing, to block airflow.</p> |
| 3 | Volume down button | Decreases system volume. |
| 4 | Volume mute button | Mutes or restores system volume. |
| 5 | Volume up button | Increases system volume. |
| 6 | Quick Launch buttons (2) | <p>Launch default multimedia, digital imaging, or music applications (varies by model).</p> <p>To reassign another application to a Quick Launch button, refer to “Using Custom Assignments and Schemes” in Chapter 2 of the <i>Hardware and Software Guide</i> included with the notebook.</p> |

The top components of the notebook are shown below and described in Table 1-7.

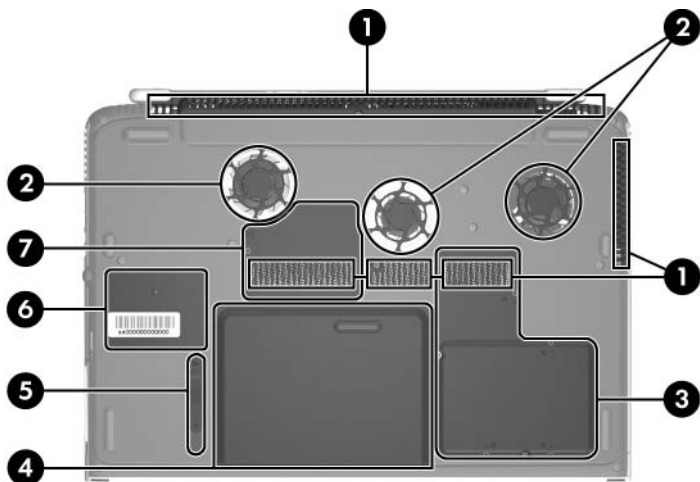


Notebook Top Components

Table 1-7
Notebook Top Components

| Item | Component | Function |
|------|---------------------------------|--|
| 1 | TouchPad | Moves the pointer and selects or activates items on the screen. |
| 2 | TouchPad light | On: TouchPad is enabled. |
| 3 | TouchPad button | Enables/disables the TouchPad. |
| 4 | Wireless button | Turns the wireless network device on and off (select models only). |
| | Wireless light | On: An integrated wireless device has been enabled. |
| 5 | Caps lock light | On: caps lock is on. |
| 6 | Num lock light | On: num lock or the numeric keypad is on. |
| 7 | TouchPad scroll zone | Scrolls up or down. |
| 8 | Left and right TouchPad buttons | Function like the left and right buttons on an external mouse. |

The external components on the bottom of the notebook are shown below and described in Table 1-8.



Bottom Components

Table 1-8
Bottom Components




| Item | Component | Function |
|------|-------------------|---|
| 1 | Exhaust vents (4) | Provide airflow to cool internal components. <div> To prevent overheating, do not obstruct vents. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs or clothing, to block airflow.</div> |

Table 1-8
Bottom Components (Continued)

| Item | Component | Function |
|------|--|--|
| 2 | Fans (2) | <p>Provide airflow to cool internal components.</p> <p> To prevent overheating, do not obstruct fans. Do not allow a hard surface, such as a printer, or a soft surface, such as pillows, thick rugs or clothing, to block airflow.</p> |
| 3 | Hard drive bay Mini PCI compartment | <p>Holds the internal hard drive.</p> <p>Holds an optional wireless LAN device.</p> <p> To prevent an unresponsive system and the display of a warning message, install only a Mini PCI device authorized for use in your notebook by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore notebook functionality. Then contact Customer Care.</p> |
| 4 | Battery bay | Holds a battery pack. |
| 5 | Battery pack release latch | Releases a battery pack from the battery bay. |
| 6 | Label areas (2) | Contains the notebook serial number and other applicable regulatory labels. |
| 7 | Memory module compartment | Contains two memory slots that support replaceable memory modules. The number of preinstalled memory modules varies by notebook model. |

1.5 Design Overview

This section presents a design overview of key parts and features of the notebook. Refer to [Chapter 3, “Illustrated Parts Catalog,”](#) to identify replacement parts, and [Chapter 5, “Removal and Replacement Procedures,”](#) for disassembly steps.

The system board provides the following device connections:

- Memory module
- Mini PCI communications devices
- Hard drive
- Display
- Keyboard and TouchPad
- Audio
- Intel Pentium 4 processors
- PC Card



CAUTION: To properly ventilate the notebook, allow at least a 7.6-cm (3-inch) clearance on the left and right sides of the notebook.

The notebook uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to be turned on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software applications. Exhaust air is displaced through the ventilation grill located on the left side of the notebook.

Troubleshooting



WARNING: Only authorized technicians trained by HP should repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly-/module-level repair. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

2.1 Computer Setup

Computer Setup is a system information and customization utility that can be used even when your operating system is not working or will not load. This utility includes settings that are not available in Windows.

Using Computer Setup

Information and settings in Computer Setup are accessed from the Main, Security, Advanced, or Tools menus:

1. Turn on or restart the notebook. Press **f10** while the F10 = ROM-Based Setup message is displayed in the lower-left corner of the screen.
 - ❑ To change the language, use the cursor control keys to navigate to the **Advanced** menu.
 - ❑ To view navigation information, press **f1**.
 - ❑ To return to the Computer Setup menu, press **esc**.

2. Select the **Main**, **Security**, **Advanced**, or **Tools** menu.
3. To close Computer Setup and restart the notebook:
 - ❑ Select **Exit > Exit Saving Changes**, and then press **enter**.
– or –
 - ❑ Select **Exit > Exit Discarding Changes**, and then press **enter**.
– or –
 - ❑ Select **Exit > Load Setup Defaults**, and then press **enter**.
4. When you are prompted to confirm your action, press **f10**.




Selecting from the Main Menu

Table 2-1
Main Menu

| Select | To Do This |
|--------------------|--|
| System Information | <ul style="list-style-type: none">■ Change the system time and system date.■ View identification information about the notebook.■ View specification information about the processor, memory and cache size, and system ROM. |

Selecting from the Security Menu

Table 2-2
Security Menu

| Select | To Do This |
|--|--|
| Administrator Password | Enter, change, or delete an Administrator password. |
| Power-on Password | Enter, change, or delete a power-on password. |
| DriveLock Passwords | <p>Enable/disable DriveLock; change a DriveLock user or master password.</p> <p> DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the notebook.</p> |
| Password Options (Password options can be selected only when a power-on password has been set.) | <p>Enable/disable:</p> <ul style="list-style-type: none"> ■ QuickLock ■ QuickLock on standby ■ QuickBlank <p> To enable QuickLock on standby or QuickBlank, you must first enable QuickLock.</p> |
| Device Security | <p>Enable/disable:</p> <ul style="list-style-type: none"> ■ Diskette drive startup* ■ CD-ROM or diskette startup <p> Settings for a DVD-ROM can be entered in the CD-ROM field.</p> |

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Advanced Menu

Table 2-3
Advanced Menu

| Select | To Do This |
|-----------------------|---|
| Language | Change the Computer Setup language. |
| Boot Order | Enable/disable MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system. |
| Accessibility Options | Allows electronic and information technology to be accessible to people with varying ranges of abilities. |
| Video Memory | Displays the amount of video memory available on the notebook. |

Selecting from the Tools Menu

Table 2-4
Tools Menu

| Select | To Do This |
|----------------------|--|
| Hard Drive Self Test | Run a quick comprehensive self test on hard drives in the system that support the test features. |

2.2 Troubleshooting Flowcharts

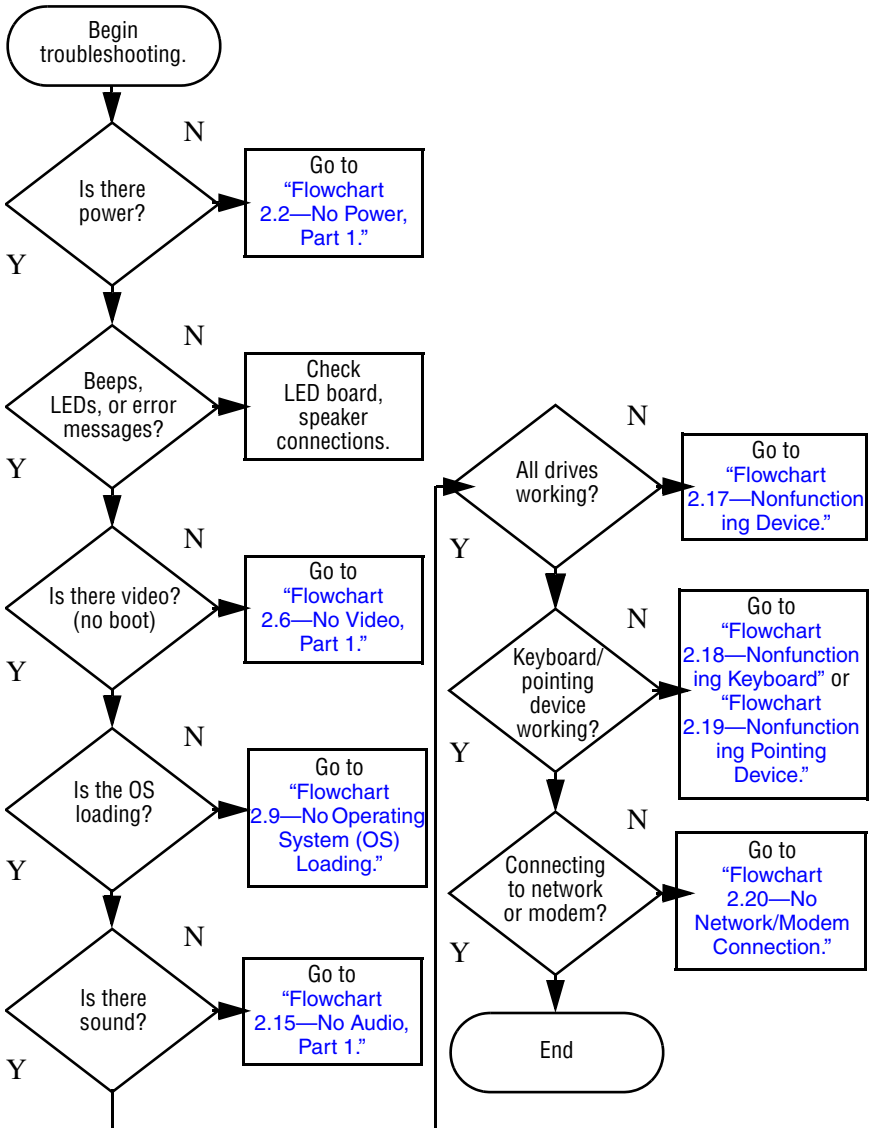
Table 2-5
Troubleshooting Flowcharts Overview

| Flowchart | Description |
|-----------|---|
| 2.1 | "Flowchart 2.1—Initial Troubleshooting" |
| 2.2 | "Flowchart 2.2—No Power, Part 1" |
| 2.3 | "Flowchart 2.3—No Power, Part 2" |
| 2.4 | "Flowchart 2.4—No Power, Part 3" |
| 2.5 | "Flowchart 2.5—No Power, Part 4" |
| 2.6 | "Flowchart 2.6—No Video, Part 1" |
| 2.7 | "Flowchart 2.7—No Video, Part 2" |
| 2.8 | "Flowchart 2.8—Nonfunctioning Expansion Base (if applicable)" |
| 2.9 | "Flowchart 2.9—No Operating System (OS) Loading" |
| 2.10 | "Flowchart 2.10—No OS Loading, Hard Drive, Part 1" |
| 2.11 | "Flowchart 2.11—No OS Loading, Hard Drive, Part 2" |
| 2.12 | "Flowchart 2.12—No OS Loading, Hard Drive, Part 3" |
| 2.13 | "Flowchart 2.13—No OS Loading, Diskette Drive" |

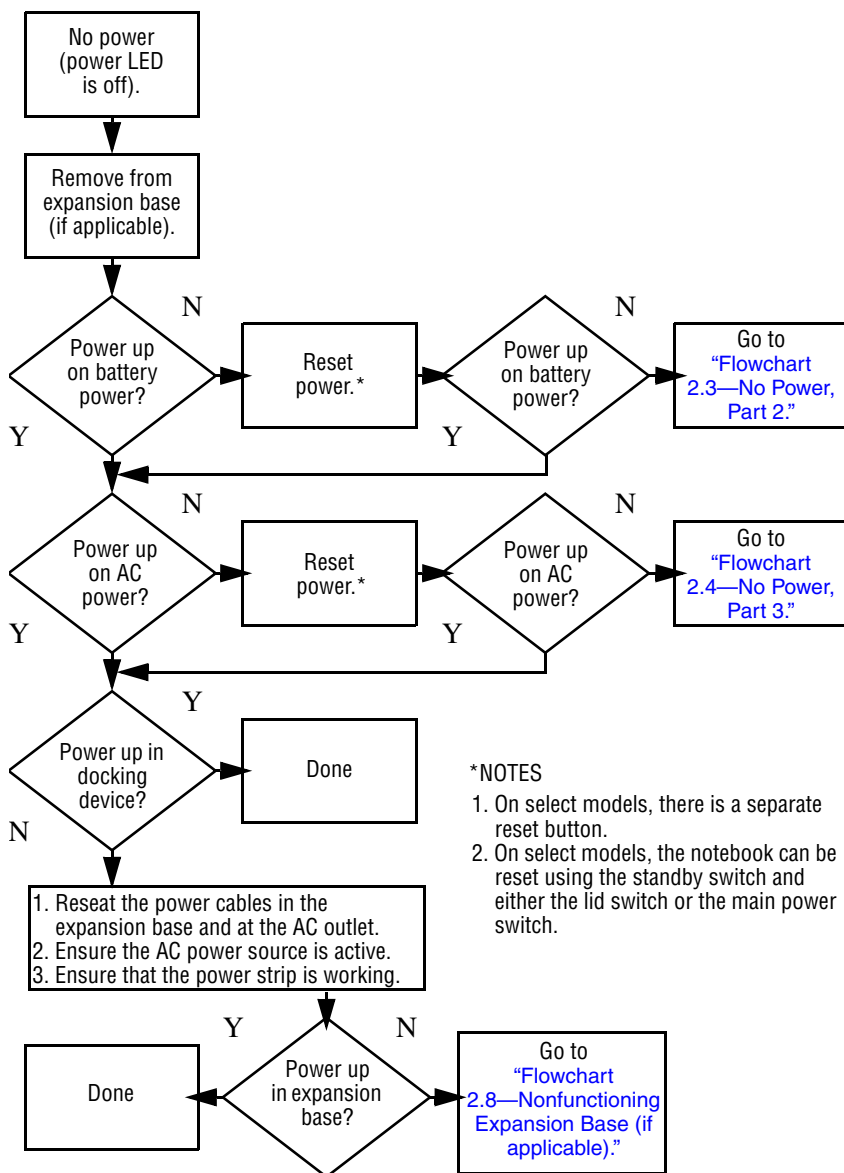
Table 2-5
Troubleshooting Flowcharts Overview (*Continued*)

| Flowchart | Description |
|-----------|---|
| 2.14 | "Flowchart 2.14—No OS Loading, Optical Drive" |
| 2.15 | "Flowchart 2.15—No Audio, Part 1" |
| 2.16 | "Flowchart 2.16—No Audio, Part 2" |
| 2.17 | "Flowchart 2.17—Nonfunctioning Device" |
| 2.18 | "Flowchart 2.18—Nonfunctioning Keyboard" |
| 2.19 | "Flowchart 2.19—Nonfunctioning Pointing Device" |
| 2.20 | "Flowchart 2.20—No Network/Modem Connection" |

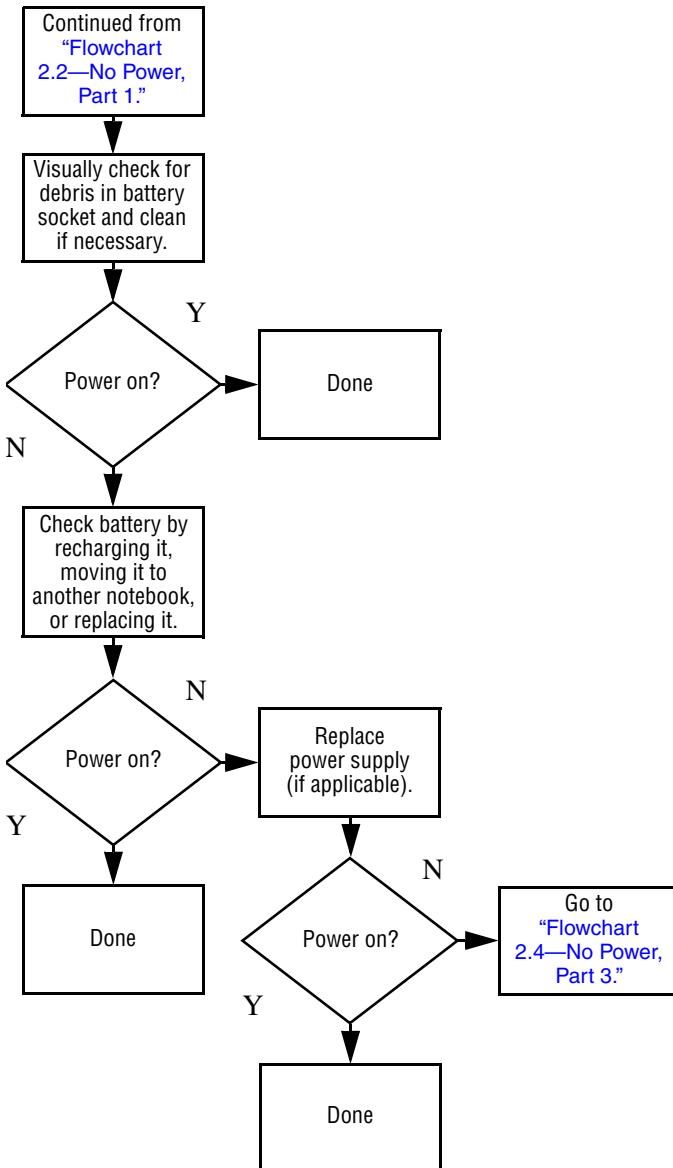
Flowchart 2.1 —Initial Troubleshooting



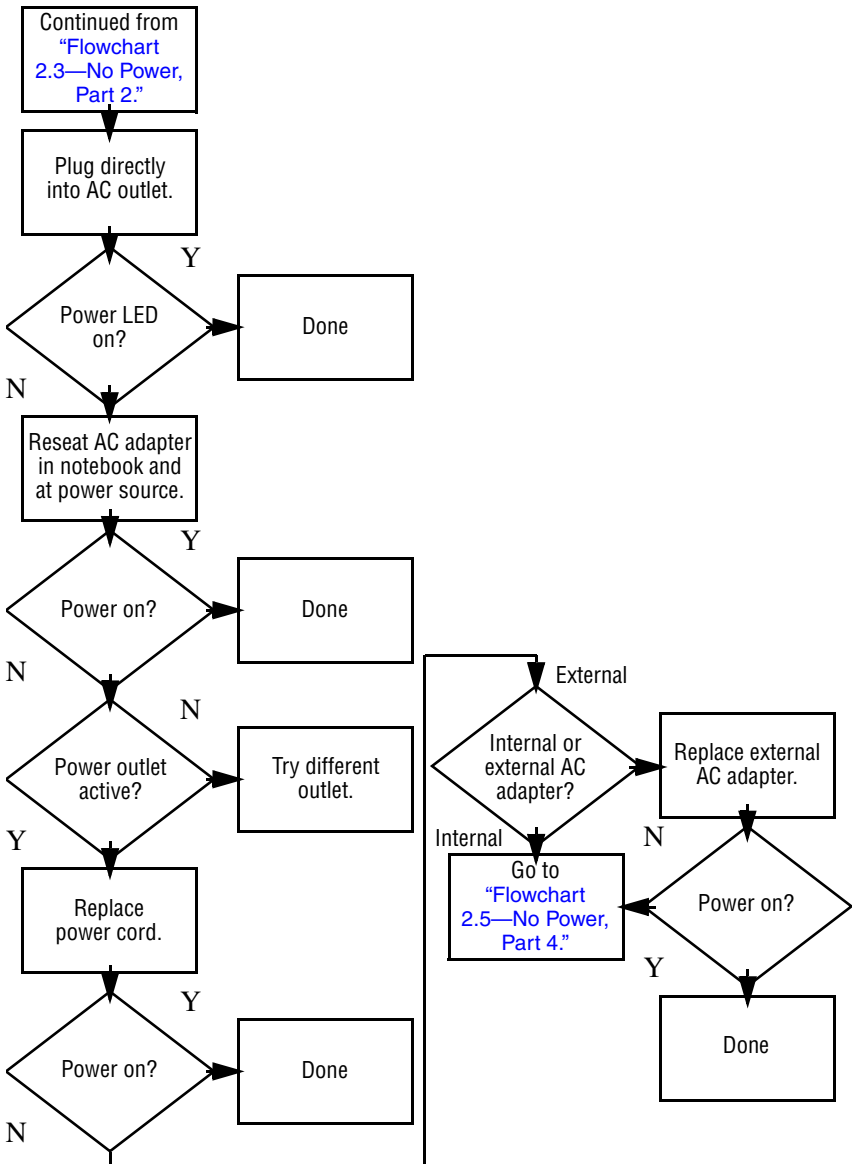
Flowchart 2.2—No Power, Part 1



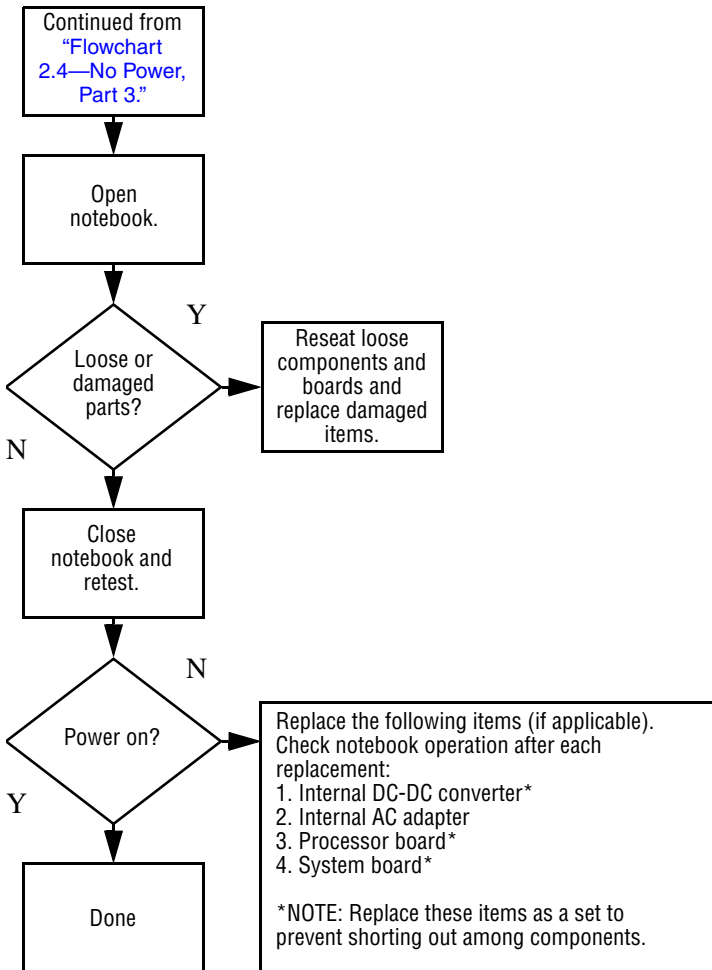
Flowchart 2.3—No Power, Part 2



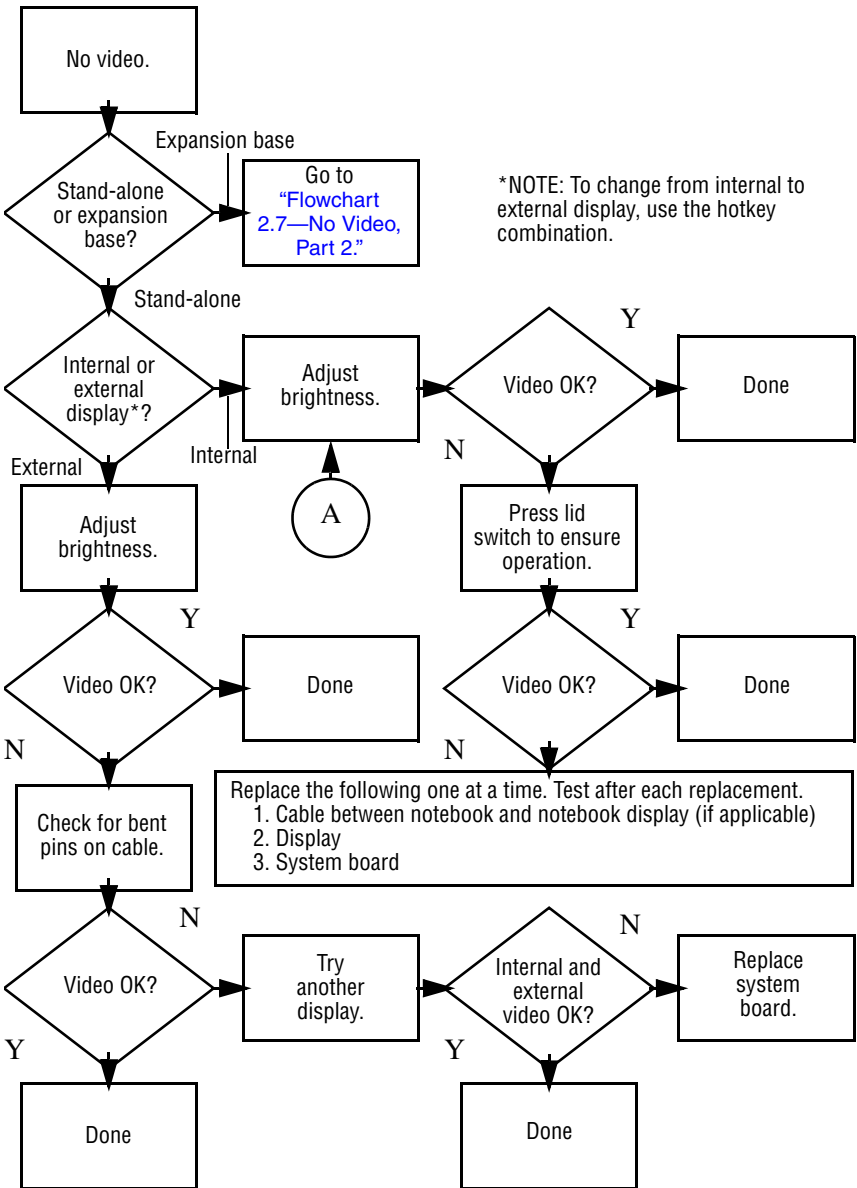
Flowchart 2.4—No Power, Part 3



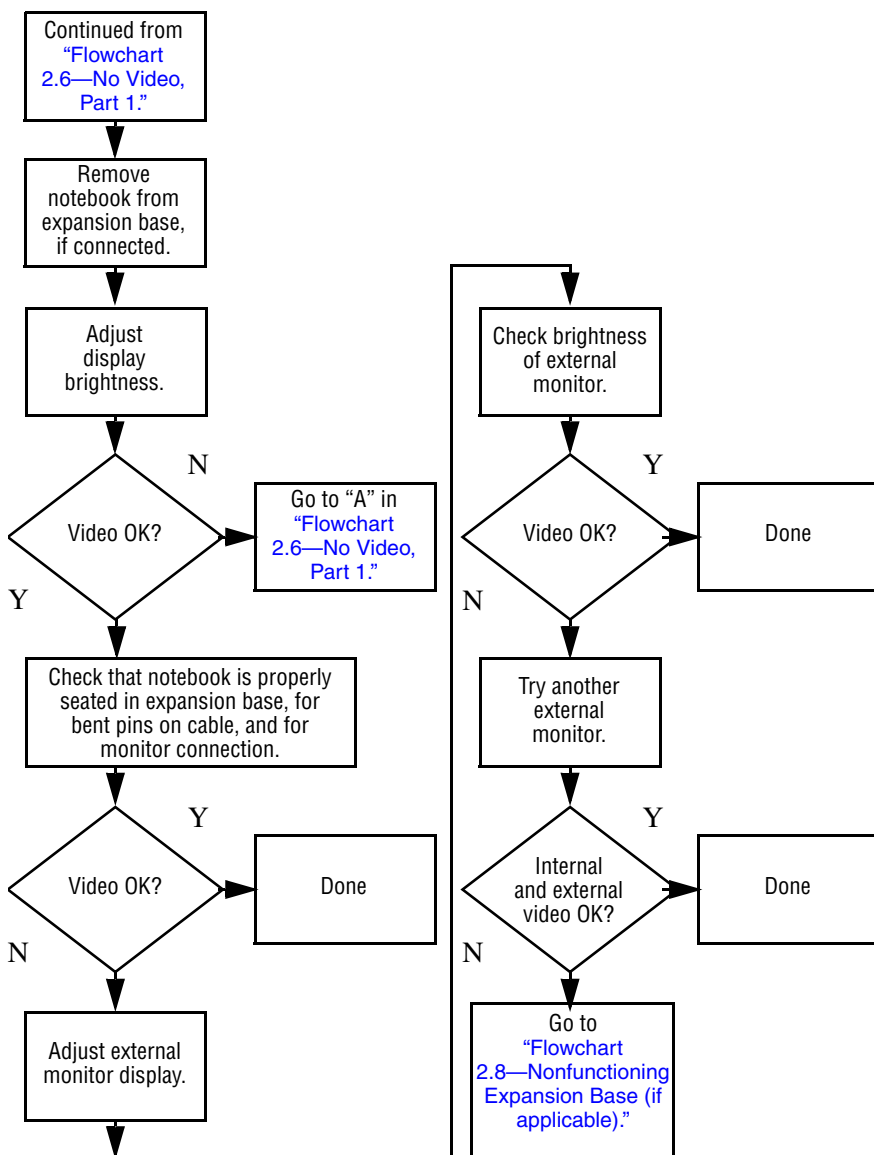
Flowchart 2.5—No Power, Part 4



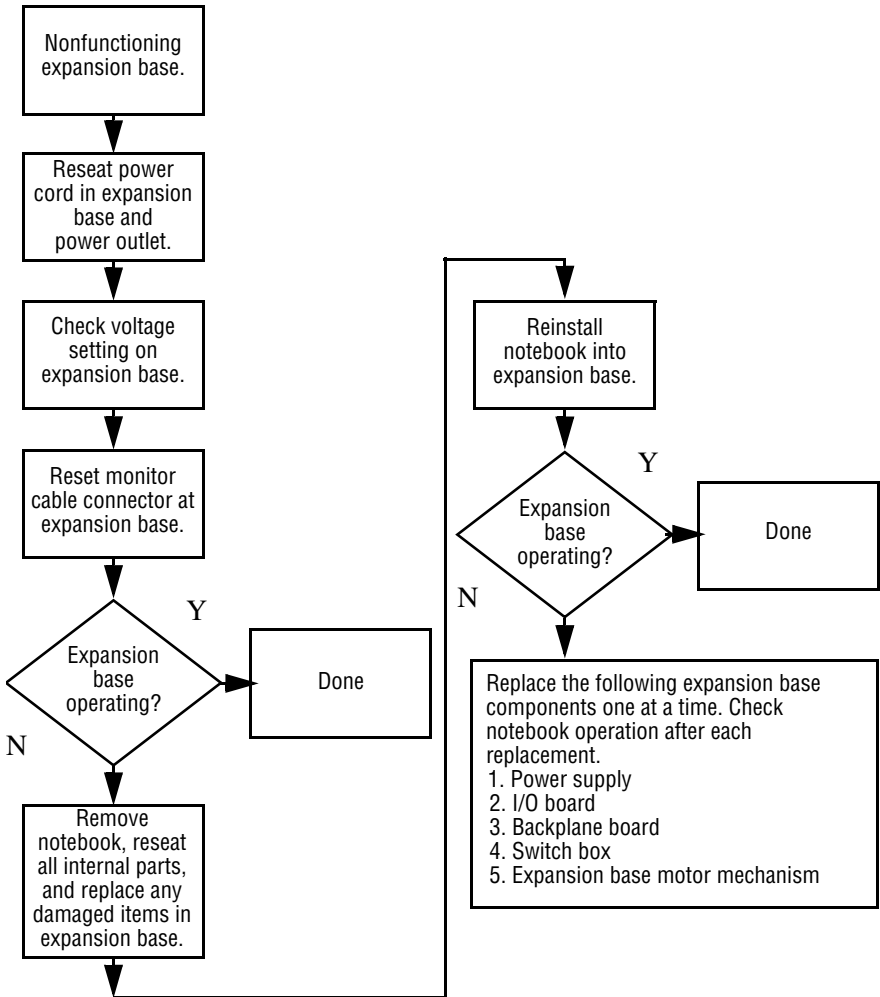
Flowchart 2.6—No Video, Part 1



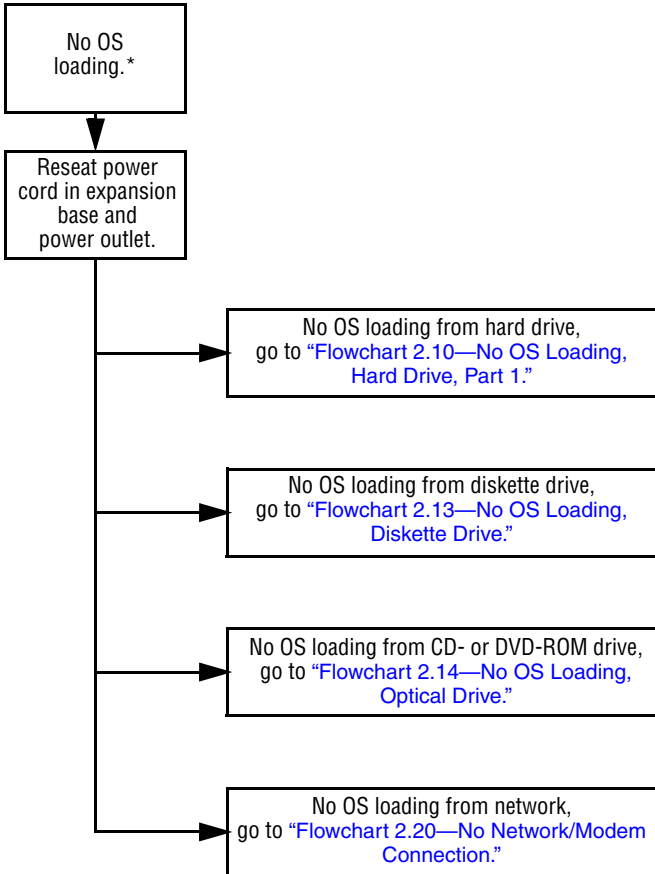
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Expansion Base (if applicable)

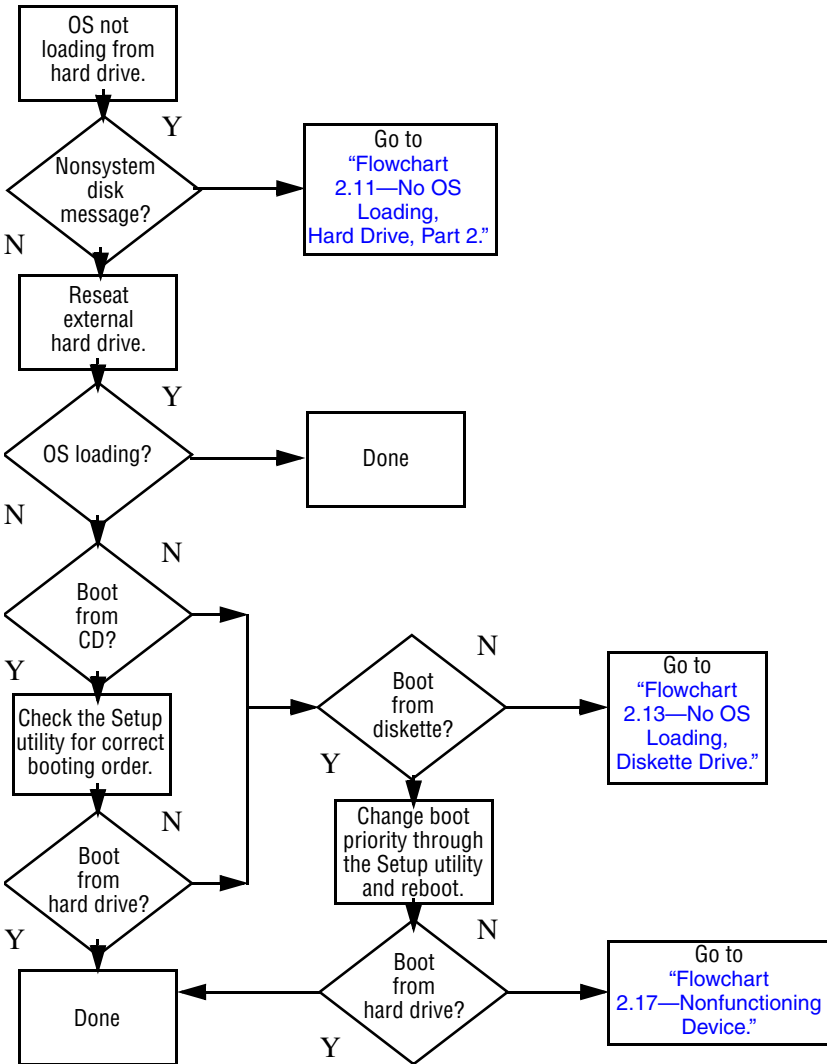


Flowchart 2.9—No Operating System (OS) Loading

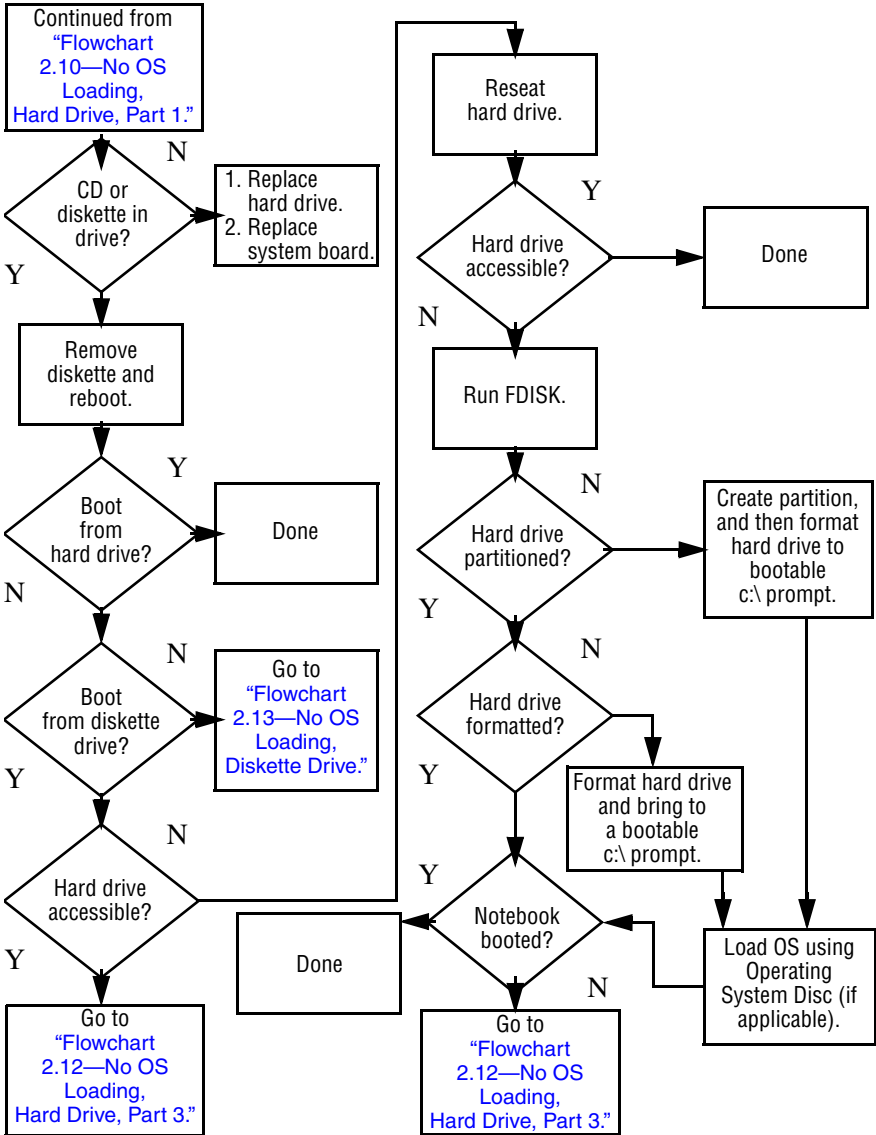


*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

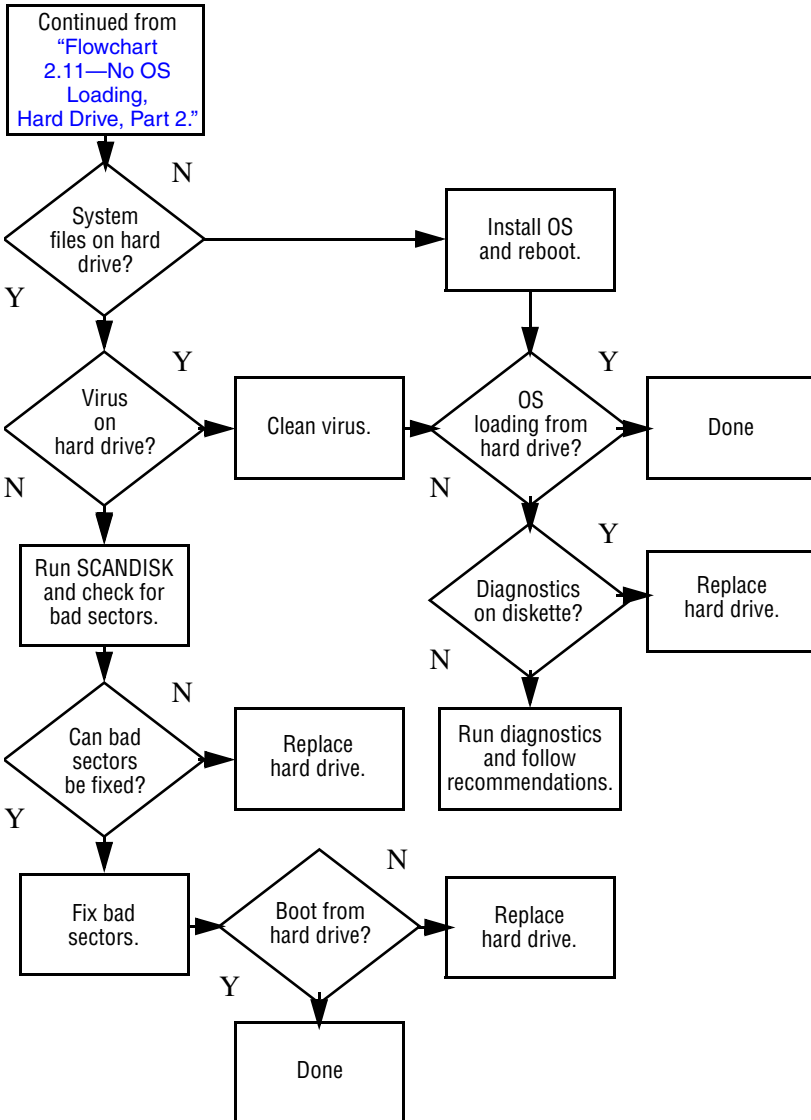
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



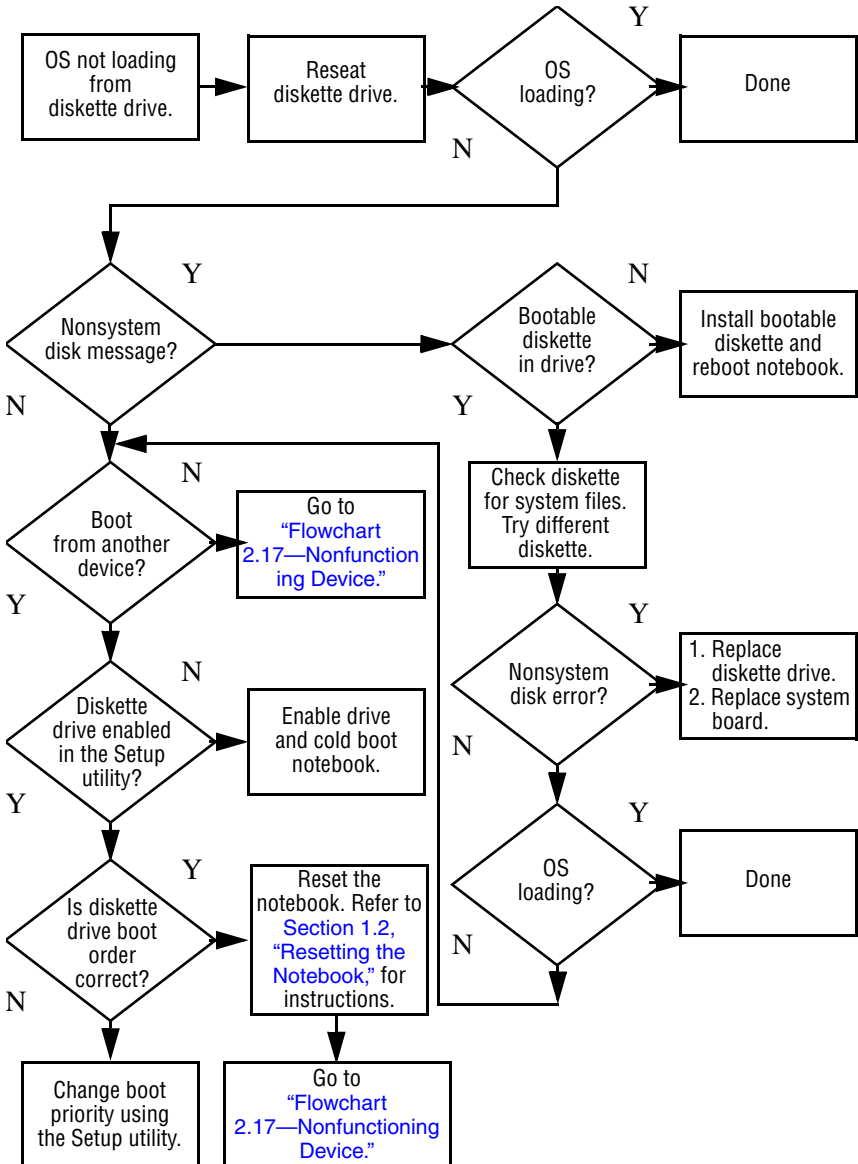
Flowchart 2.11 —No OS Loading, Hard Drive, Part 2



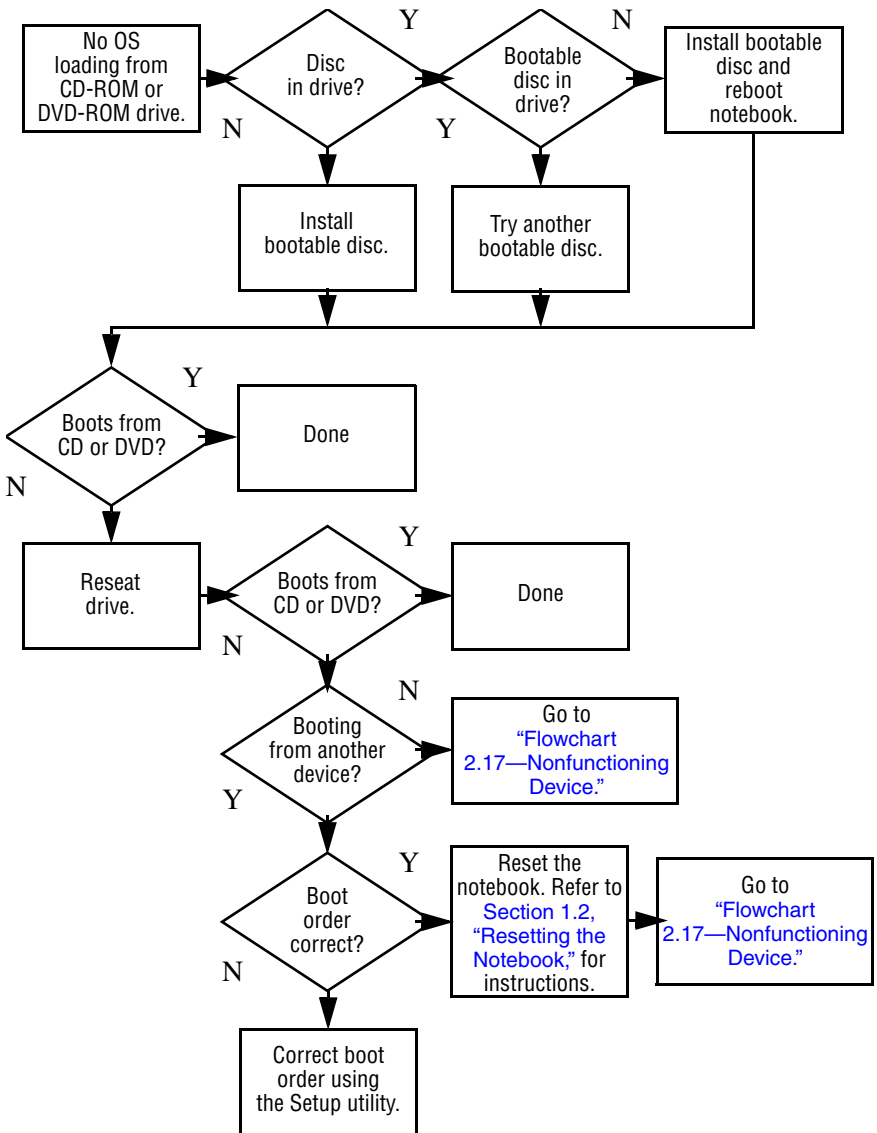
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



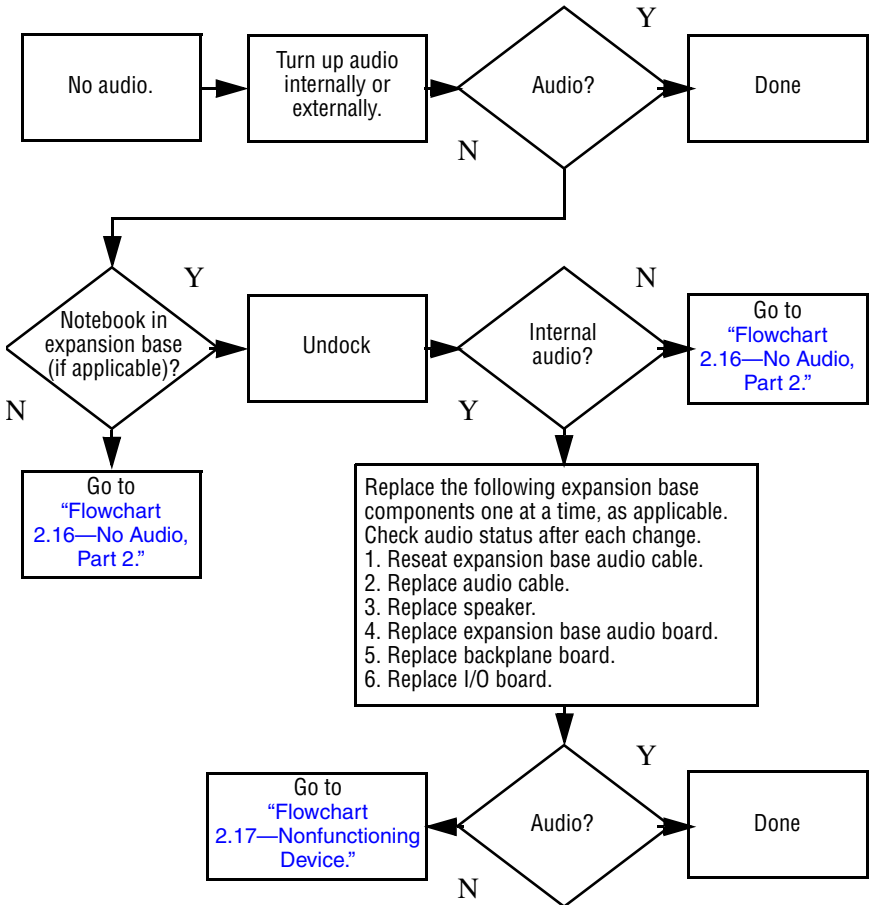
Flowchart 2.13—No OS Loading, Diskette Drive



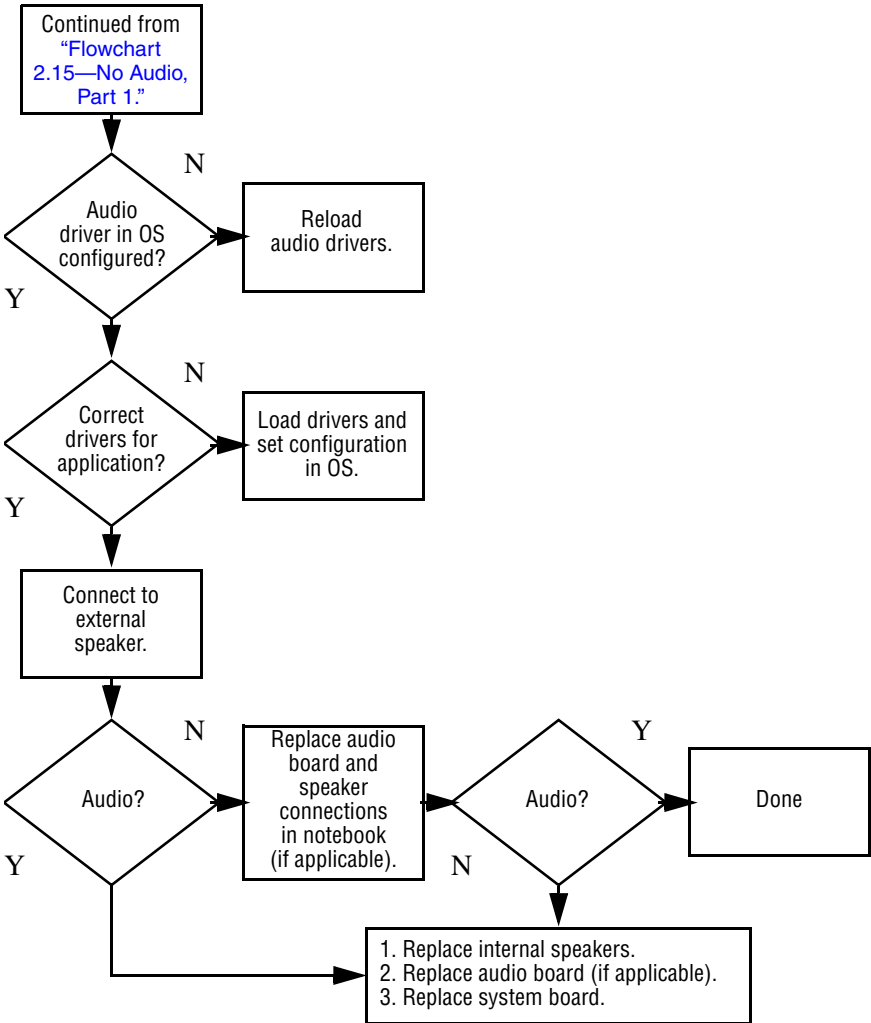
Flowchart 2.14—No OS Loading, Optical Drive



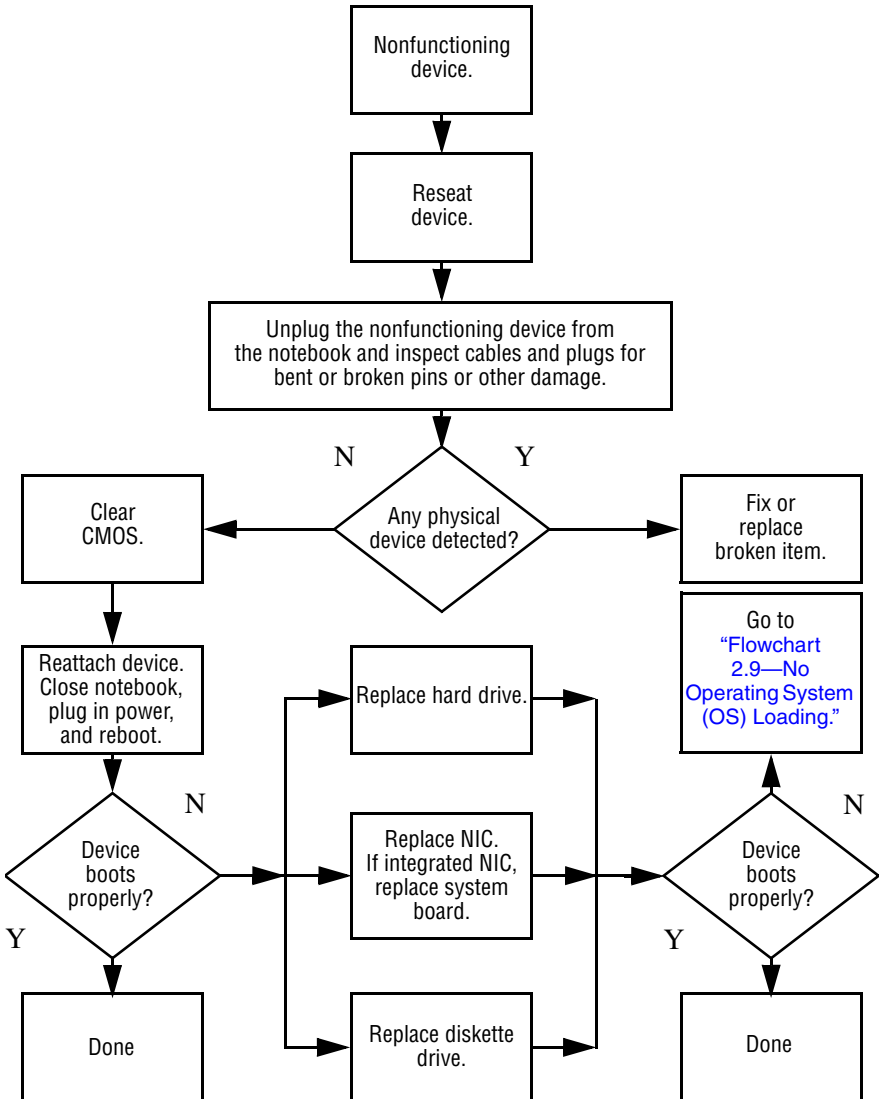
Flowchart 2.15—No Audio, Part 1



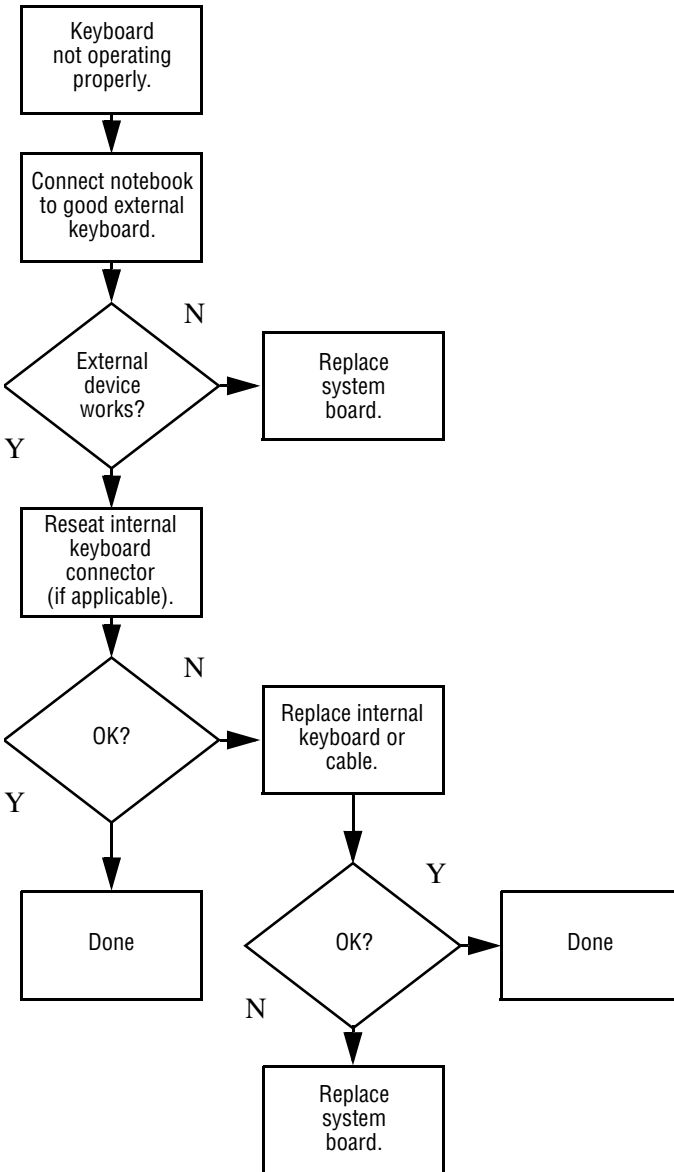
Flowchart 2.16—No Audio, Part 2



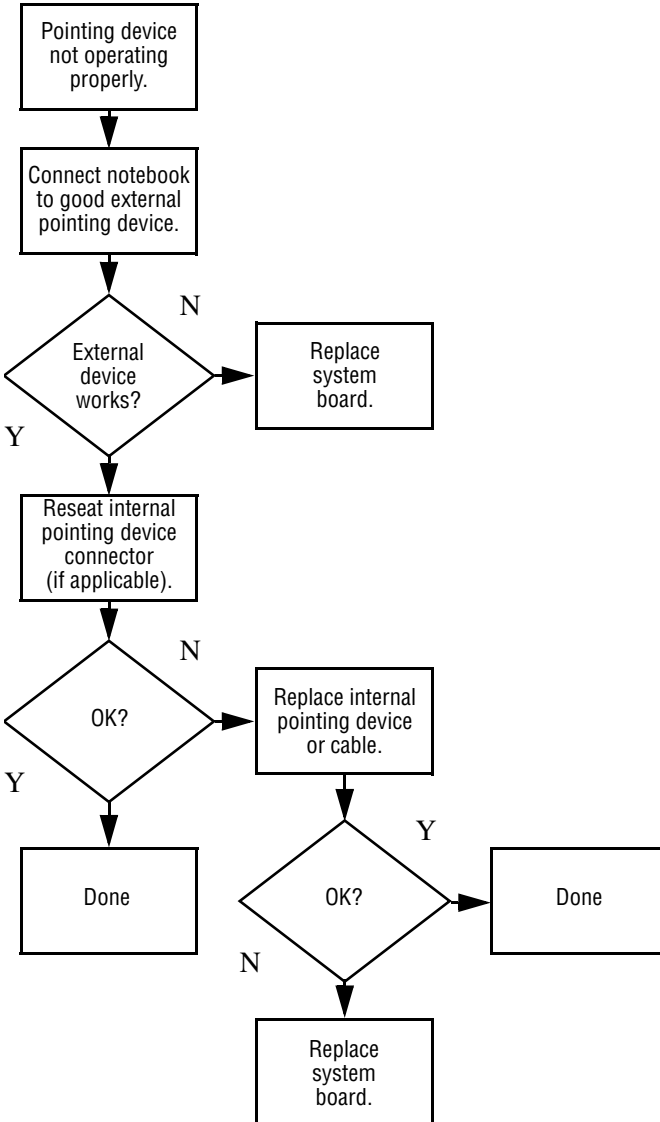
Flowchart 2.17—Nonfunctioning Device



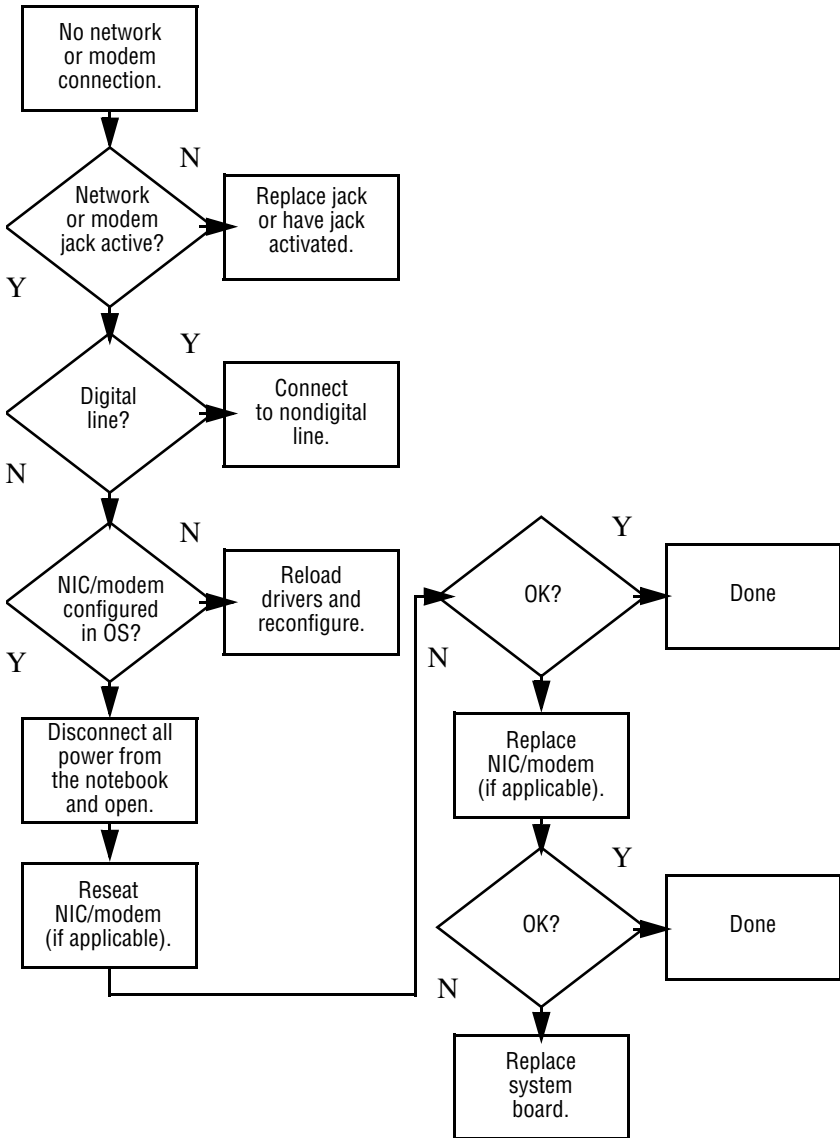
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection

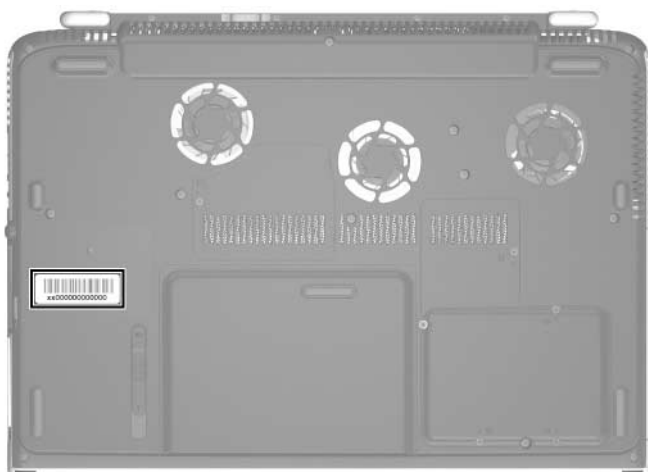


Illustrated Parts Catalog

This chapter provides an illustrated parts breakdown and a reference for spare part numbers and option part numbers.

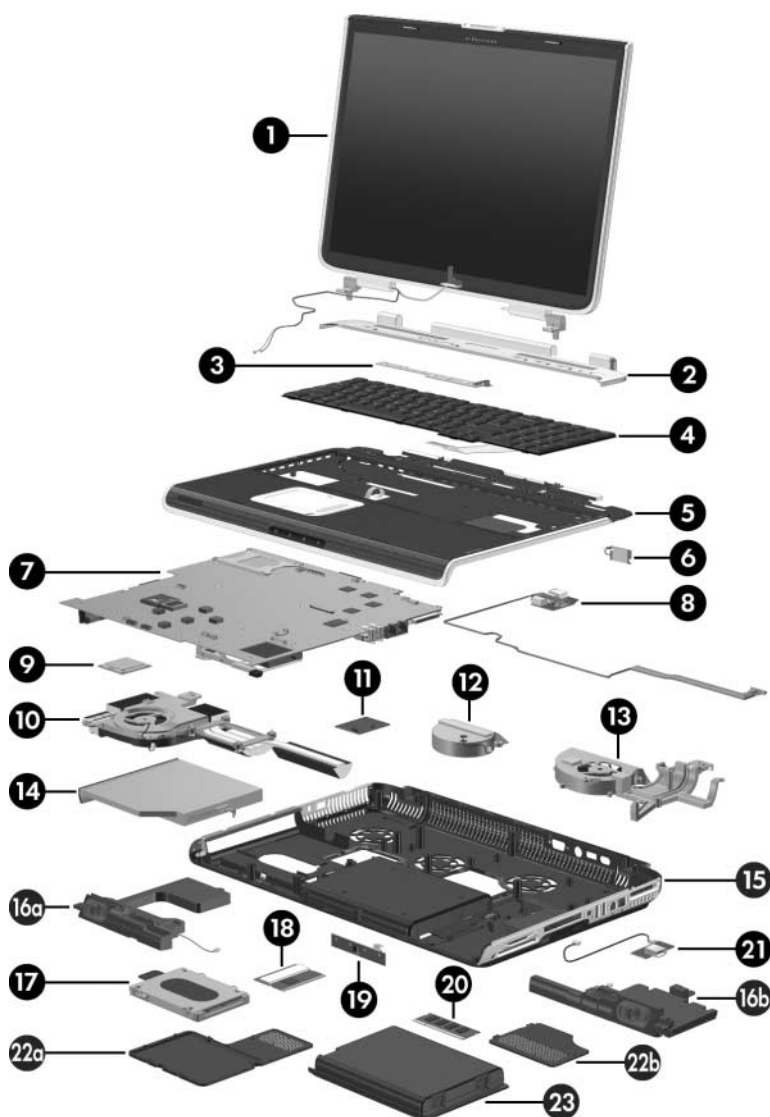
3.1 Serial Number Location

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



Serial Number Location

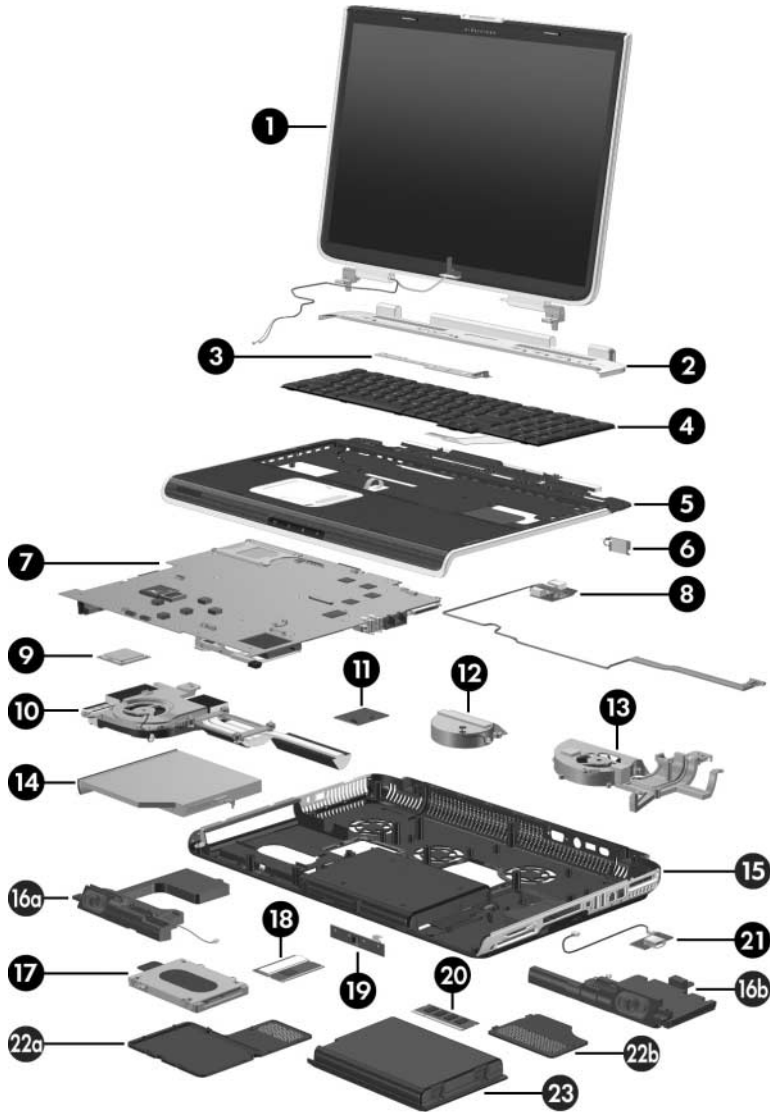
3.2 Notebook Major Components



Notebook Major Components

Table 3-1
Spare Parts: Notebook Major Components

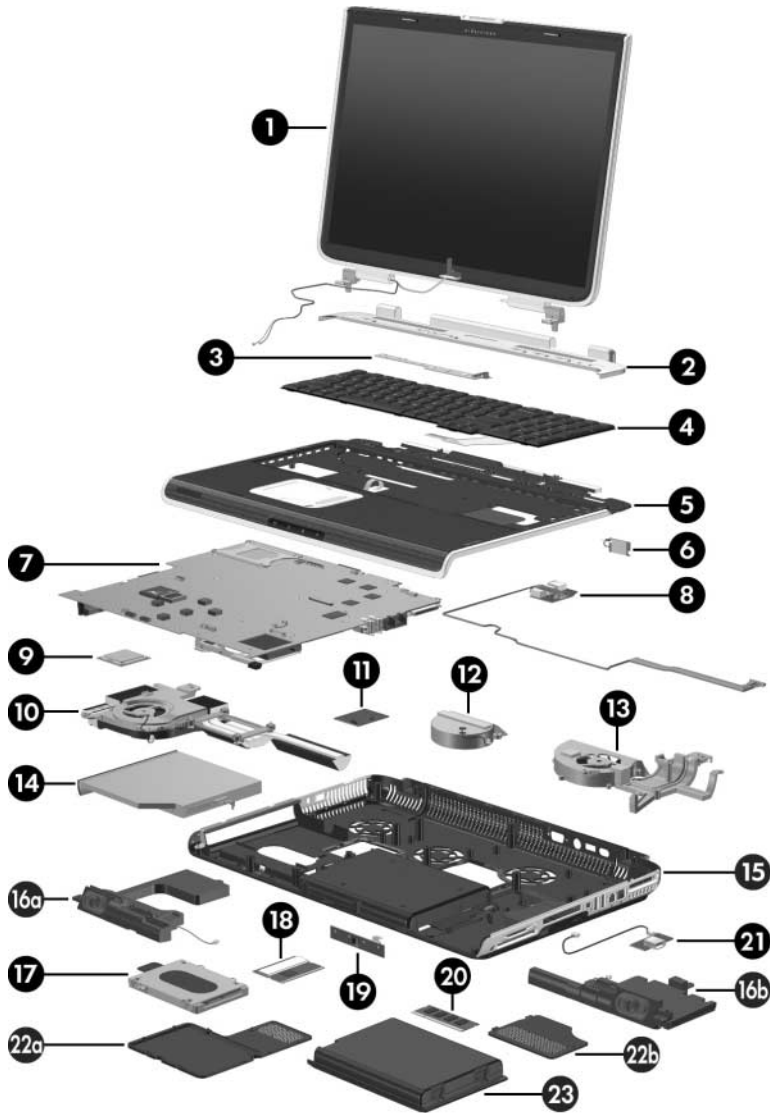
| Item | Description | Spare Part Number |
|-------------|--|---------------------------|
| 1 | Display assemblies (include wireless antenna boards and cables) | |
| | 17.0-inch, WSXGA+WVA with Brightview | 374723-001 |
| | 17.0-inch, WXGA+WVA with Brightview | 374722-001 |
| | 17.0-inch, WXGA+WVA | 374721-001 |
| 2 | Switch cover | |
| | For use on notebook models with wireless | 374754-001 |
| | For use on notebook models without wireless | 380444-001 |
| 3 | LED Board (includes cable) | 378771-001 |
| 4 | Keyboards | |
| | Belgium 374741-181 | Spain 374741-071 |
| | Brazil 374741-201 | Sweden/Finland 374741-101 |
| | Denmark 374741-081 | Switzerland 374741-111 |
| | France 374741-051 | United Kingdom 374741-031 |
| | French Canada 374741-121 | Asia Pacific, 374741-001 |
| | Germany 374741-041 | Australia, |
| | Greece 374741-151 | Canada, |
| | International 374741-B31 | Hong Kong, |
| | Italy 374741-061 | People's |
| | Latin America 374741-161 | Republic of |
| | Norway 374741-091 | China, and |
| | Portugal 374741-131 | the United |
| | Saudi Arabia 374741-171 | States |
| 5 | Top cover (includes TouchPad) | 374750-001 |
| 6 | Broadcomm Bluetooth® wireless board | 376651-001 |



Notebook Major Components

Table 3-1
Spare Parts: Notebook Major Components (Continued)

| Item | Description | Spare Part Number |
|-------------|---|--------------------------|
| 7 | System boards (include disk cell RTC battery) | |
| | M24P with 256 MB RAM | 374711-001 |
| | M24P with 128 MB RAM | 374709-001 |
| | M22P with 64 MB RAM | 374707-001 |
| 8 | Audio/USB board (includes cable) | 374761-001 |
| 9 | Processors (include thermal pad) | |
| | Intel Pentium 4 560 (3.6-GHz) | 377213-001 |
| | Intel Pentium 4 550 (3.4-GHz) | 374718-001 |
| | Intel Pentium 4 540 (3.2-GHz) | 374717-001 |
| | Intel Pentium 4 530 (3.0-GHz) | 374716-001 |
| | Intel Pentium 4 520 (2.8-GHz) | 374715-001 |
| 10 | Heat sink module (includes left fan and thermal paste) | 380030-001 |
| 11 | Modem board | 374758-001 |
| 12 | Base enclosure middle fan | 380029-001 |
| 13 | Base enclosure right fan | 380027-001 |
| 14 | Optical drives (include bezel) | |
| | Dual Format, Double Layer | 382079-001 |
| | 8X Dual Format, Light Scribe | 383608-001 |
| | 8X DVD±RW/R and CD-RW Combo Drive | 374737-001 |
| | 24X DVD/CD-RW Combo Drive | 374735-001 |
| 15 | Base enclosure | 374752-001 |
| | Speakers | 378521-001 |
| 16a | Left | |
| 16b | Right | |



Notebook Major Components

Table 3-1**Spare Parts: Notebook Major Components (Continued)**

| Item | Description | Spare Part Number |
|-------------|---|--------------------------|
| 17 | Hard drives (include frame) | |
| | 7200-rpm | 4200-rpm |
| | 60-GB 374732-001 | 100-GB 374730-001 |
| | 5400-rpm | 80-GB 374729-001 |
| | 100-GB 380258-001 | 60-GB 374728-001 |
| | 80-GB 374731-001 | 40-GB 378767-001 |
| 18 | Mini PCI communications cards | |
| | 802.11b/g, for use in most of the world (MOW) | 373047-001 |
| | 802.11b/g, for use in the rest of the world (ROW) | 373048-001 |
| | 802.11a/b/g combination card, for use in the United States | 376650-001 |
| 19 | Infrared board (includes cable) | 374760-001 |
| 20 | Memory modules (400-MHz DDR2) | |
| | 1024 MB | 374726-001 |
| | 512 MB | 374725-001 |
| | 256 MB | 374724-001 |
| 21 | Digital drive board (includes cable) | 374759-001 |
| | Miscellaneous Plastics Kit | 374746-001 |
| | Includes: | |
| 22a | Hard drive cover (includes 4 captive screws) | |
| 22b | Memory module compartment cover (includes 2 captive screws) | |
| | Not illustrated: | |
| | Notebook feet | |
| | SD Card slot space saver | |
| | PC Card slot space saver | |
| 23 | Battery pack, 12-cell, 2.2-AHr | 374762-001 |

3.3 Miscellaneous Plastics Kit

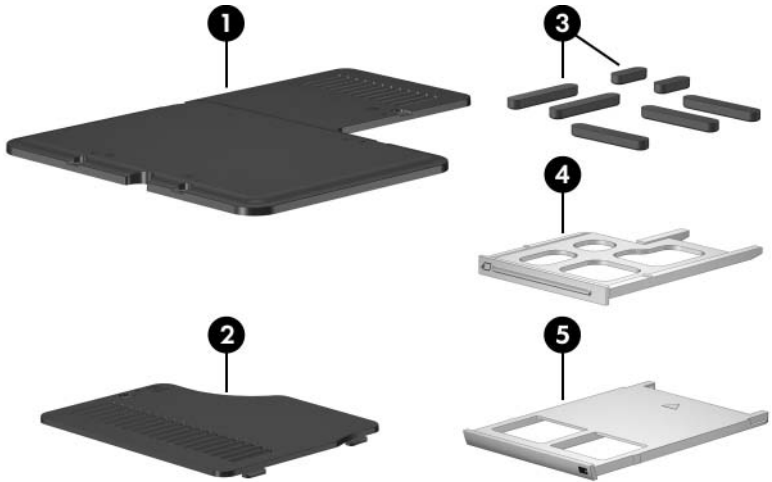


Table 3-2
Spare Part Number 374746-001

| Item | Description | Spare Part Number |
|------|---|-------------------|
| 1 | Hard drive cover (includes 4 captive screws) | |
| 2 | Memory module compartment cover (includes 2 captive screws) | |
| 3 | Notebook feet (7) | |
| 4 | SD Card slot space saver | |
| 5 | PC Card slot space saver | |

3.4 Mass Storage Devices



Table 3-3
Spare Part Number Information

| Item | Description | | Spare Part Number |
|------|------------------------------------|----------|-------------------|
| 1 | Optical drives | | |
| | Dual Format, Double Layer | | 382079-001 |
| | 8X Dual Format, Light Scribe | | 383608-001 |
| | 8X DVD±RW/R and CD-RW Combo Drive | | 374737-001 |
| | 24X DVD/CD-RW Combo Drive | | 374735-001 |
| 2 | Hard drives (include frame) | | |
| | 7200-rpm | 4200-rpm | |
| | 60-GB | 100-GB | 374732-001 |
| | 5400-rpm | 80-GB | 374730-001 |
| | 100-GB | 60-GB | 374729-001 |
| | 80-GB | 40-GB | 374728-001 |
| | | | 378767-001 |

3.5 Media Center Edition Accessories



Table 3-4
Spare Part Number Information

| Item | Description | Spare Part Number |
|------------------|--------------------------------------|-------------------|
| 1 | Dual TV Tuner/Digital Video Recorder | 377553-001 |
| 2 | TV tuner stand | 377559-001 |
| 3 | TV tuner AC adapter | 377555-001 |
| 4 | Media Center mini remote control | 375705-001 |
| Not illustrated: | | |
| | Audio/Video Cable Kit | 377557-001 |
| | Coaxial Cable Kit | 377556-001 |
| | Entertainment Y-cable | 375759-001 |
| | Miscellaneous Cable Kit | 377558-001 |

3.6 Miscellaneous (Not Illustrated)

Table 3-5
Spare Part Information

| Description | Spare Part Number |
|--|----------------------------|
| AC adapters | |
| 180 watt, 3-wire plug—for use on all notebook models | 374743-001 |
| 135 watt, 3-wire plug—for use only on notebook models with Intel Pentium 4 530 (3.0-GHz) and Intel Pentium 4 520 (2.8-GHz) processors | 378768-001 |
| HP remote control | 371694-001 |
| Logo Kit | 374748-001 |
| Wired headset with volume control | 371693-001 |
| USB 1.1 digital drive | 364727-001 |
| USB 1.1 diskette drive | 344897-001 |
| USB travel mouse | 309674-001 |
| Screw Kit (includes the following screws; refer to Appendix C, “Screw Listing,” for more information on screw specifications and usage) | 374744-001 |
| ■ Phillips PM2.5×4.0 screw | ■ Phillips PM2.0×4.0 screw |
| ■ Phillips PM2.0×7.0 round head screw | ■ Phillips PM2.0×3.0 screw |
| ■ Phillips PM2.0×7.0 screw | ■ Phillips PM1.5×2.0 screw |
| ■ Phillips PM2.0×5.0 screw | |

Table 3-5
Spare Part Information (*Continued*)

| Description | Spare Part Number |
|---|-------------------|
| Power cords (3-wire plug, for use with 135-watt AC adapters) | |
| For use in: | |
| Australia and New Zealand | 373979-011 |
| Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden | 373979-021 |
| Canada, French Canada, Latin America, Taiwan, Thailand, and the United States | 373979-001 |
| Denmark | 373979-081 |
| Hong Kong and the United Kingdom | 373979-031 |
| Italy | 373979-061 |
| People's Republic of China | 373979-AA1 |
| Switzerland | 373979-111 |

Table 3-5
Spare Part Information (*Continued*)

| Description | Spare Part Number |
|--|--------------------------|
| Power cords (3-wire plug, for use with 180-watt AC adapters) | |
| For use in: | |
| Australia and New Zealand | 345252-011 |
| Brazil | 345252-201 |
| Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden | 345252-021 |
| Canada, French Canada, Latin America, Taiwan, Thailand, and the United States | 345252-001 |
| Denmark | 345252-081 |
| Hong Kong and the United Kingdom | 345252-031 |
| Italy | 345252-061 |
| People's Republic of China | 345252-AA1 |
| Switzerland | 345252-111 |

3.7 Sequential Part Number Listing

Table 3-6
Sequential Part Number Listing

| Spare Part Number | Description |
|--------------------------|--|
| 309674-001 | USB travel mouse |
| 344897-001 | USB 1.1 diskette drive |
| 345252-001 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Canada, French Canada, Latin America, Taiwan, Thailand, and the United States |
| 345252-011 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Australia and New Zealand |
| 345252-021 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden |
| 345252-031 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Hong Kong and the United Kingdom |
| 345252-061 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Italy |
| 345252-081 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Denmark |
| 345252-111 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Switzerland |
| 345252-201 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in Brazil |

Table 3-6
Sequential Part Number Listing (*Continued*)

| Spare Part Number | Description |
|--------------------------|--|
| 345252-AA1 | Power cord, with 3-wire plug, for use with 180-watt AC adapters in the People's Republic of China |
| 364727-001 | USB digital drive |
| 371693-001 | Wired headset with volume control |
| 371694-001 | HP remote control |
| 373047-001 | 802.11b/g Mini PCI communications card, for use in most of the world (MOW) |
| 373048-001 | 802.11b/g Mini PCI communications card, for use in the rest of the world (ROW) |
| 373979-001 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Canada, French Canada, Latin America, Taiwan, Thailand, and the United States |
| 373979-011 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Australia and New Zealand |
| 373979-021 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden |
| 373979-031 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Hong Kong and the United Kingdom |
| 373979-061 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Italy |

Table 3-6
Sequential Part Number Listing (*Continued*)

| Spare Part Number | Description |
|--------------------------|---|
| 373979-081 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Denmark |
| 373979-111 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in Switzerland |
| 373979-AA1 | Power cord, with 3-wire plug, for use with 135-watt AC adapters in the People's Republic of China |
| 374707-001 | System board M22P with 64 MB RAM (includes disk cell RTC battery) |
| 374709-001 | System board M24P with 128 MB RAM (includes disk cell RTC battery) |
| 374711-001 | System board M24P with 256 MB RAM (includes disk cell RTC battery) |
| 374715-001 | Intel Pentium 4 520 (2.8-GHz) processor, includes thermal pad |
| 374716-001 | Intel Pentium 4 530 (3.0-GHz) processor, includes thermal pad |
| 374717-001 | Intel Pentium 4 540 (3.2-GHz) processor, includes thermal pad |
| 374718-001 | Intel Pentium 4 550 (3.4-GHz) processor, includes thermal pad |
| 374721-001 | Display assembly, 17.0-inch, WXGA+WVA, includes wireless antenna boards and cables |

Table 3-6
Sequential Part Number Listing (*Continued*)

| Spare Part Number | Description |
|--------------------------|---|
| 374722-001 | Display assembly, 17.0-inch, WXGA+WVA with Brightview, includes wireless antenna boards and cables |
| 374723-001 | Display assembly, 17.0-inch, WSXGA+WVA with Brightview, includes wireless antenna boards and cables |
| 374724-001 | 256-MB memory module, 400 MHz DDR2 |
| 374725-001 | 512-MB memory module, 400 MHz DDR2 |
| 374726-001 | 1024-MB memory module, 400 MHz DDR2 |
| 374728-001 | 4200-rpm, 60-GB hard drive, includes frame and connector |
| 374729-001 | 4200-rpm, 80-GB hard drive, includes frame and connector |
| 374730-001 | 4200-rpm, 100-GB hard drive, includes frame and connector |
| 374731-001 | 5400-rpm, 80-GB hard drive, includes frame and connector |
| 374732-001 | 7200-rpm, 60-GB hard drive, includes frame and connector |
| 374735-001 | 24X DVD/CD-RW Combo Drive |
| 374737-001 | 8X DVD±RW/R and CD-RW Combo Drive |
| 374741-001 | Keyboard for use in Asia Pacific, Australia, Canada, Hong Kong, People's Republic of China, and the United States |
| 374741-002 | Keyboard for use in International |
| 374741-031 | Keyboard for use in United Kingdom |
| 374741-041 | Keyboard for use in Germany |

Table 3-6
Sequential Part Number Listing (*Continued*)

| Spare Part Number | Description |
|--------------------------|--|
| 374741-051 | Keyboard for use in France |
| 374741-061 | Keyboard for use in Italy |
| 374741-071 | Keyboard for use in Spain |
| 374741-081 | Keyboard for use in Denmark |
| 374741-091 | Keyboard for use in Norway |
| 374741-101 | Keyboard for use in Sweden/Finland |
| 374741-111 | Keyboard for use in Switzerland |
| 374741-121 | Keyboard for use in French Canada |
| 374741-131 | Keyboard for use in Portugal |
| 374741-151 | Keyboard for use in Greece |
| 374741-161 | Keyboard for use in Latin America |
| 374741-171 | Keyboard for use in Saudi Arabia |
| 374741-181 | Keyboard for use in Belgium |
| 374743-001 | AC adapter, 180 watt, 3-wire plug—for use on all notebook models |
| 374744-001 | Miscellaneous Screw Kit |
| 374746-001 | Miscellaneous Plastics Kit |
| 374748-001 | Logo Kit |
| 374750-001 | Top cover (includes TouchPad) |

Table 3-6
Sequential Part Number Listing (*Continued*)

| Spare Part Number | Description |
|--------------------------|---|
| 374752-001 | Base enclosure |
| 374754-001 | Switch cover for use with notebook models with wireless |
| 380030-001 | Heat sink module (includes left fan and thermal paste) |
| 374758-001 | Modem board |
| 374759-001 | USB Digital Drive board |
| 374760-001 | Infrared board with cable |
| 374761-001 | Audio/USB board |
| 374762-001 | Battery pack, 12-cell, 2.2-AHr |
| 374774-001 | Screw Kit |
| 377553-001 | HP Dual TV Tuner/Digital Video Recorder |
| 376650-001 | 802.11a/b/g combination card, for use in the United States |
| 376651-001 | Broadcomm Bluetooth wireless card |
| 377213-001 | Intel Pentium 4 560 (3.6-GHz) processor, includes thermal pad |
| 375705-001 | HP Media Center mini remote control |
| 377555-001 | Dual Tuner AC adapter |
| 377556-001 | Dual Tuner Coaxial Cable Kit |

Table 3-6
Sequential Part Number Listing (*Continued*)

| Spare Part Number | Description |
|--------------------------|--|
| 377557-001 | Dual Tuner Cable Kit |
| 377558-001 | Dual Tuner Miscellaneous Cable Kit |
| 377559-001 | Dual Tuner Plastic Stand |
| 378521-001 | Speakers, left and right |
| 378767-001 | 4200-rpm, 40-GB hard drive, includes frame and connector |
| 378768-001 | AC adapters, 135 watt, 2-wire plug—for use only on notebook models with Intel Pentium 4 530 (3.0-GHz) and Intel Pentium 4 520 (2.8-GHz) processors |
| 378771-001 | LED board |
| 380258-001 | 5400-rpm, 100-GB hard drive, includes frame and connector |
| 380444-001 | Switch cover for use with notebook models without wireless |
| 380027-001 | Base enclosure right fan |
| 380029-001 | Base enclosure middle fan |
| 382079-001 | Dual Format, Double Layer |
| 383608-001 | 8X Dual Format, Light Scribe |

Removal and Replacement Preliminaries

This chapter provides essential information for proper and safe removal and replacement service.

4.1 Tools Required

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

- Magnetic screwdriver
- Phillips P0 screwdriver
- 5.0-mm socket for system board screwlocks
- Flat-bladed screwdriver
- Tool kit—includes connector removal tool, loopback plugs, and case utility tool

4.2 Service Considerations

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



As you remove each subassembly from the notebook, 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 Connectors



CAUTION: When servicing the notebook, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the notebook.

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. Ensure 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.

4.3 Preventing Damage to Removable Drives

Removable drives are fragile components that must be handled with care. To prevent damage to the notebook, damage to a removable drive, or loss of information, observe the following precautions:

- Before removing or inserting a hard drive, shut down the notebook. If you are unsure whether the notebook is off or in hibernation, turn the notebook on, and then shut it down through the operating system.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive and ensure that the optical drive tray is closed.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- 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: Handle With Care."

4.4 Preventing Electrostatic Damage

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

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs.

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

4.5 Packaging and Transporting Precautions

Use the following grounding precautions when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe containers, such as tubes, bags, or boxes.
- Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-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 sensitive component or assembly.
- Store reusable electrostatic-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Ensure 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.

4.6 Workstation Precautions

Use the following grounding precautions at workstations:

- Cover the workstation with approved static-shielding material (refer to [Table 4-2, "Static-Shielding Materials"](#)).
- 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 electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

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

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

Other grounding equipment recommended for use in preventing electrostatic damage includes:

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

Table 4-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

Table 4-1
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 |
|  A product can be degraded by as little as 700 V. | | | |

Table 4-2 lists the shielding protection provided by antistatic bags and floor mats.

Table 4-2
Static-Shielding Materials

| 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 |

Removal and Replacement Procedures

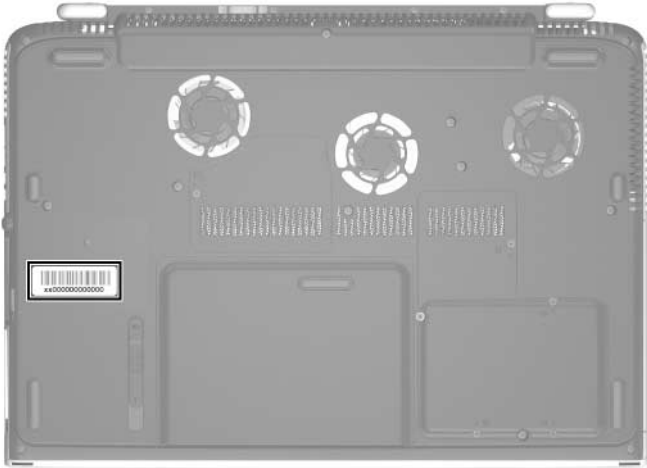
This chapter provides removal and replacement procedures.

There are 69 screws and screw locks, in 9 different sizes, that must be removed, replaced, or loosened when servicing the notebook. Make special note of each screw size and location during removal and replacement.

Refer to [Appendix C, “Screw Listing.”](#) for detailed information on screw sizes, locations, and usage.

5.1 Serial Number

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




Serial Number Location

5.2 Disassembly Sequence Chart

Use the chart below to determine the section number to be referenced when removing notebook components.

Disassembly Sequence Chart

| Section | Description | # of Screws Removed |
|---------|---|---|
| 5.3 | Preparing the notebook for disassembly | |
| | Battery pack | 0 |
| | Hard drive | 4 to remove hard drive cover 0 to remove hard drive 4 to disassemble hard drive |
| 5.4 | Notebook feet | 0 |
| 5.5 | Optical drive | 1 |
| 5.6 | Memory module | 1 loosened |
| 5.7 | Mini PCI communications card | 4 to remove hard drive cover |
| |  To prevent an unresponsive system and the display of a warning message, install only a Mini PCI device authorized for use in your notebook by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore notebook functionality. Then contact Customer Care. | |
| 5.8 | Switch cover | 5 |

Disassembly Sequence Chart (*Continued*)

| Section | Description | # of Screws Removed |
|----------------|---------------------|---|
| 5.9 | LED board | 1 |
| 5.10 | Keyboard | 2 |
| 5.11 | Display assembly | 4 |
| 5.12 | Top cover | 20 |
| 5.13 | Infrared board | 1 |
| 5.14 | Audio/USB board | 1 |
| 5.15 | Bluetooth board | 0 |
| 5.16 | System board | 2 screw locks 7 screws |
| 5.17 | Speakers | 2 on left speaker 1 on right speaker |
| 5.18 | Digital drive board | 2 |
| 5.19 | Base enclosure fans | 2 on left fan 4 on right fan |
| 5.20 | Modem board | 1 |
| 5.21 | Heat sink module | 4 |
| 5.22 | Processor | 0 |

5.3 Preparing the Notebook for Disassembly

Before you begin any removal or installation procedures:

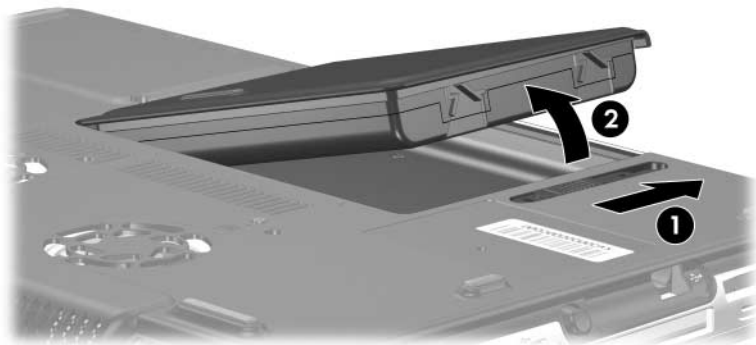
1. Shut down the notebook. If you are unsure whether the notebook is off or in hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the notebook.
3. Disconnect the power cord.

Battery Pack Spare Part Number Information

| | |
|--------------------------------|------------|
| Battery pack, 12-cell, 2.2-AHr | 374762-001 |
|--------------------------------|------------|

4. Remove the battery pack by following these steps:
 - a. Turn the notebook upside down with the front panel toward you.

- b. Slide and hold the battery release latch **1** toward the front of the notebook. (The left edge of the battery pack disengages from the notebook.)
- c. Lift the right edge of the battery pack up and swing it to the left **2**.
- d. Remove the battery pack.



Removing the Battery Pack

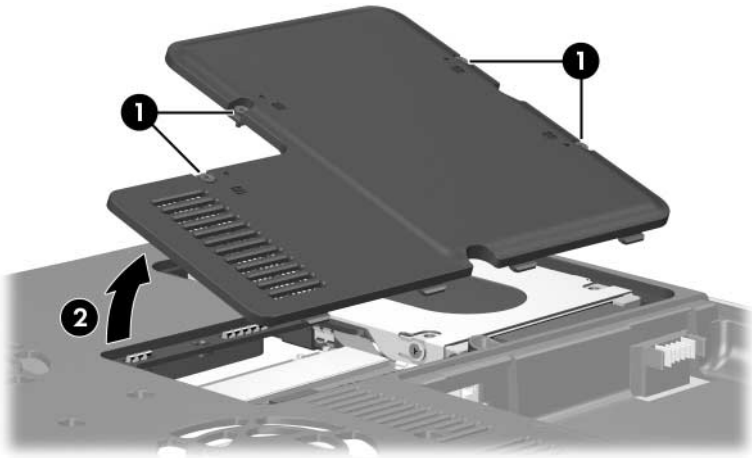
Reverse the above procedure to install the battery pack.

5. Remove the hard drive by following these steps:

- a. Loosen the four PM2.0×5.0 screws ❶ that secure the hard drive cover to the notebook.
- b. Remove the hard drive cover ❷.



The hard drive cover is included in the Miscellaneous Plastics Kit, spare part number 374746-001.

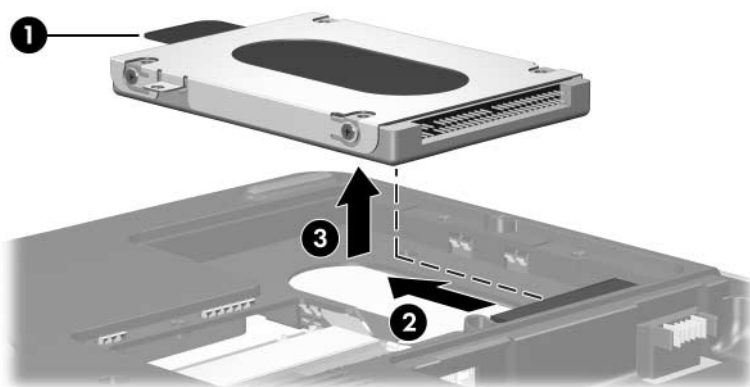


Removing the Hard Drive Cover

Hard Drive Spare Part Number Information

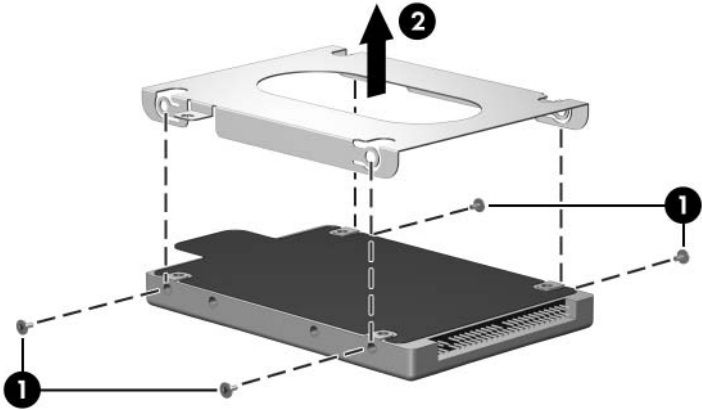
| | |
|----------|------------|
| 7200-rpm | |
| 60-GB | 374732-001 |
| 5400-rpm | |
| 100-GB | 380258-001 |
| 80-GB | 374731-001 |
| 4200-rpm | |
| 100-GB | 374730-001 |
| 80-GB | 374729-001 |
| 60-GB | 374728-001 |
| 40-GB | 378767-001 |

- c. Grasp the mylar tab ❶ on the left side of the hard drive and slide the hard drive to the left ❷ to disconnect it from the system board.
- d. Remove the hard drive ❸.



Removing the Hard Drive

- e. Remove the four PM2.5×4.0 screws ❶ that secure the hard drive frame to the hard drive.
- f. Lift the frame straight up ❷ to remove it from the hard drive.

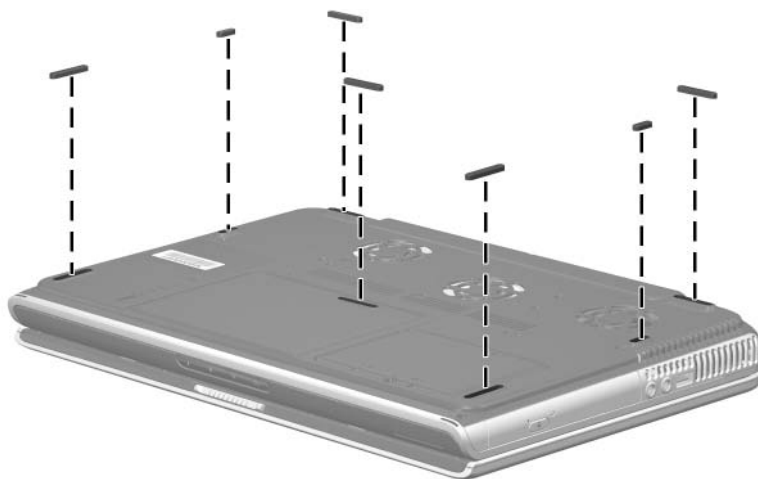


Removing the Hard Drive Frame and Connector

Reverse the above procedure to install and reassemble the hard drive.

5.4 Notebook Feet

The notebook feet are adhesive-backed rubber pads. The feet are included in the Miscellaneous Plastics Kit, spare part number 374746-001.



Replacing the Notebook Feet

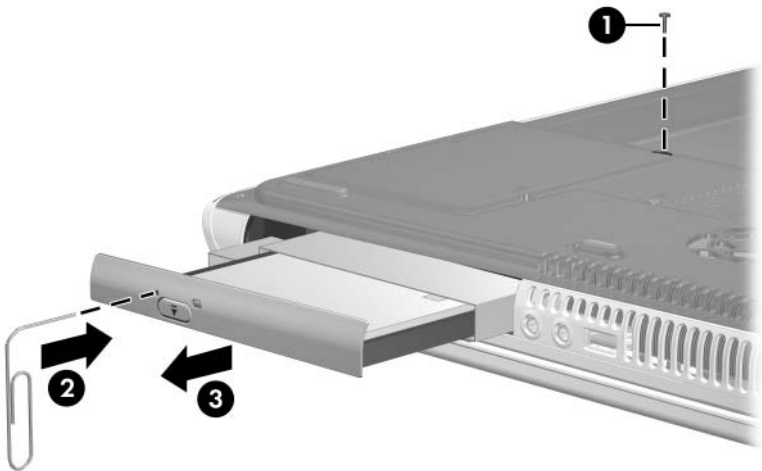
5.5 Optical Drive

Spare Part Number Information

| | |
|-----------------------------------|------------|
| Dual Format, Double Layer | 382079-001 |
| 8X Dual Format, Light Scribe | 383608-001 |
| 8X DVD±RW/R and CD-RW Combo Drive | 374737-001 |
| 24X DVD/CD-RW Combo Drive | 374735-001 |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).

2. Remove the PM2.0x8.0 screw ❶ that secures the optical drive to the notebook.
3. Insert a thin tool, such as a paper clip, into the media tray release hole ❷. (The optical drive media tray releases from the optical drive.)
4. Use the media tray frame to slide the optical drive outward ❸.
5. Remove the optical drive.



Removing the Optical Drive

Reverse the above procedure to install an optical drive.

5.6 Memory Module

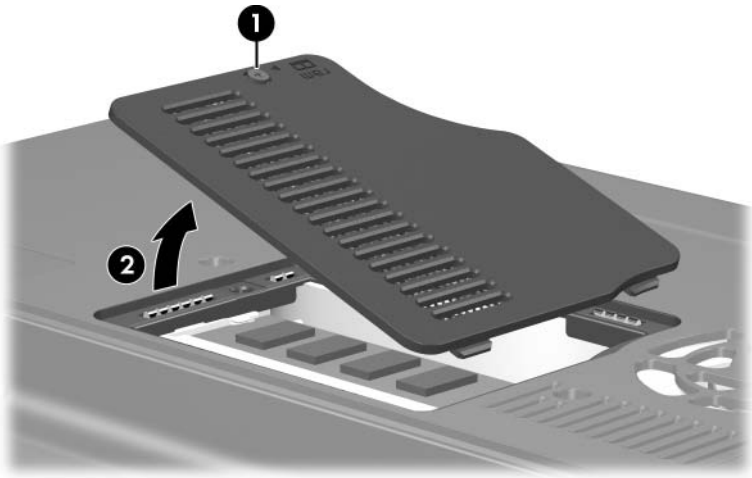
| Spare Part Number Information | |
|-------------------------------|------------|
| 1024-MB, 400 MHz DDR2 | 374726-001 |
| 512-MB, 400 MHz DDR2 | 374725-001 |
| 256-MB, 400 MHz DDR2 | 374724-001 |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).

2. Loosen the PM2.0×5.0 screw ❶ that secures the memory module compartment cover to the notebook.
3. Lift the left edge of the cover up and swing it to the right ❷.
4. Remove the memory module compartment cover.



The memory module compartment cover is included in the Miscellaneous Plastics Kit, spare part number 374746-001.

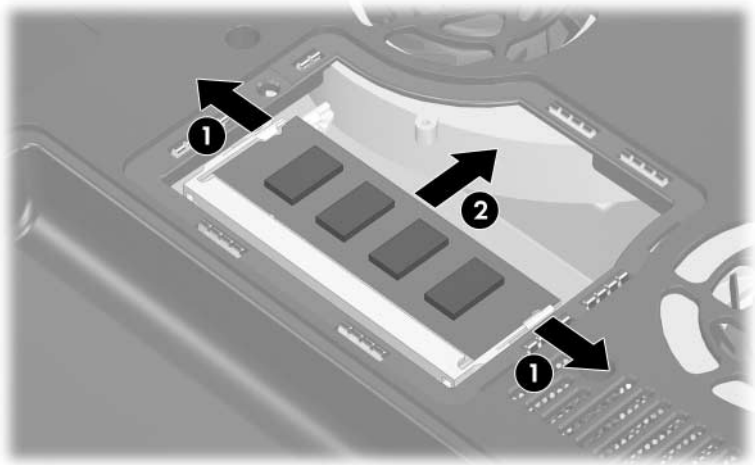


Removing the Memory Module Compartment Cover

5. Spread the retaining tabs ❶ on each side of the memory module socket to release the memory module board. (The back edge side of the board rises away from the notebook.)
6. Slide the module away from the socket at an angle ❷.
7. Remove the memory module board.



Note that memory modules are slotted to prevent incorrect installation into the memory module socket.



Removing the Memory Module

Reverse the above procedure to install a memory module.

5.7 Mini PCI Communications Card

Spare Part Number Information

| | |
|--|------------|
| 802.11b/g, for use in most of the world (MOW) | 373047-001 |
| 802.11b/g, for use in the rest of the world (ROW) | 373048-001 |
| 802.11a/b/g combination card, for use in the United States | 376650-001 |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the hard drive cover (refer to [Section 5.3](#)).

3. Disconnect the auxiliary and main ❶ antenna cables from the Mini PCI communications card.

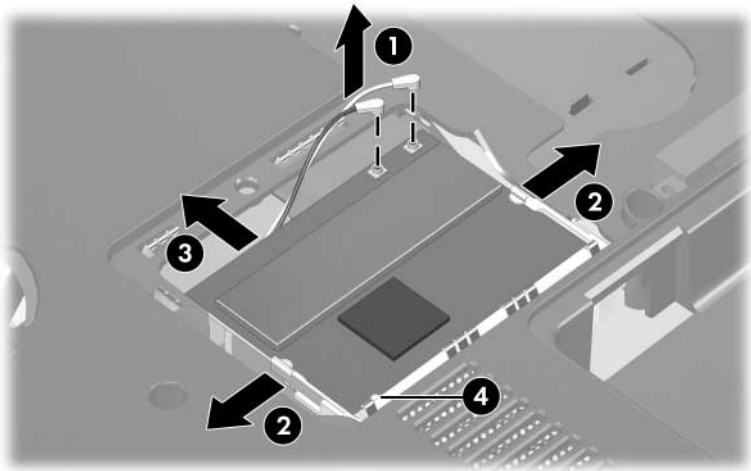


Make note of which wireless antenna cable is attached to which antenna clip on the Mini PCI communications card before disconnecting the cables.

4. Spread the two retaining tabs ❷ on each side of the Mini PCI socket to release the Mini PCI card. (The right edge of the card rises away from the notebook.)
5. Remove the wireless communications card by pulling the board away from the socket at a 45-degree angle ❸.



Note that the Mini PCI communications card is slotted ❹ to prevent incorrect installation.



Removing a Mini PCI Communications Card

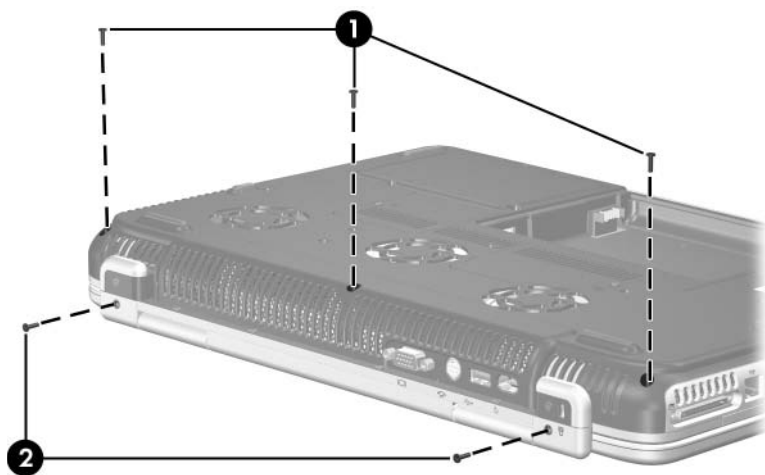
Reverse the above procedure to install a Mini PCI communications card.

5.8 Switch Cover

Spare Part Number Information

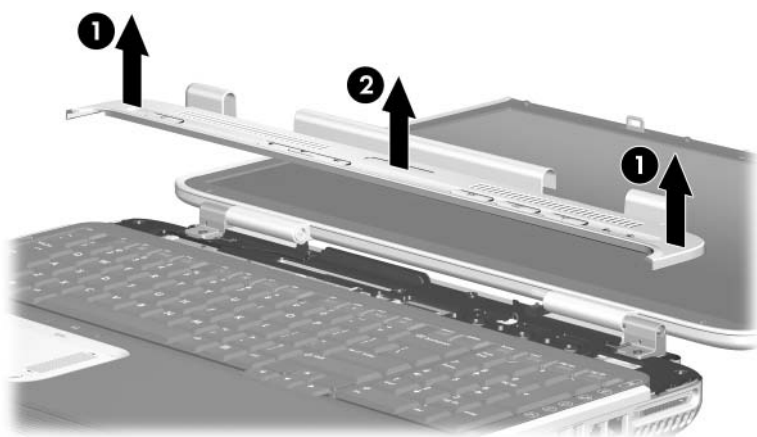
| | |
|---|------------|
| For use on notebook models with wireless | 374754-001 |
| For use on notebook models without wireless | 380444-001 |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Position the notebook with the rear panel toward you.
3. Remove the three PM2.0×8.0 screws ❶ from the bottom of the notebook that secure the switch cover to the notebook.
4. Remove the two PM2.0×8.0 screws ❷ from the notebook rear panel that secure the switch cover to the notebook.



Removing the Switch Cover Screws

5. Turn the notebook display-side up with the front panel toward you.
6. Open the notebook as far as possible.
7. Lift up the left and right sides of the switch cover ❶ to detach it from the notebook.
8. Remove the switch cover ❷.



Removing the Switch Cover

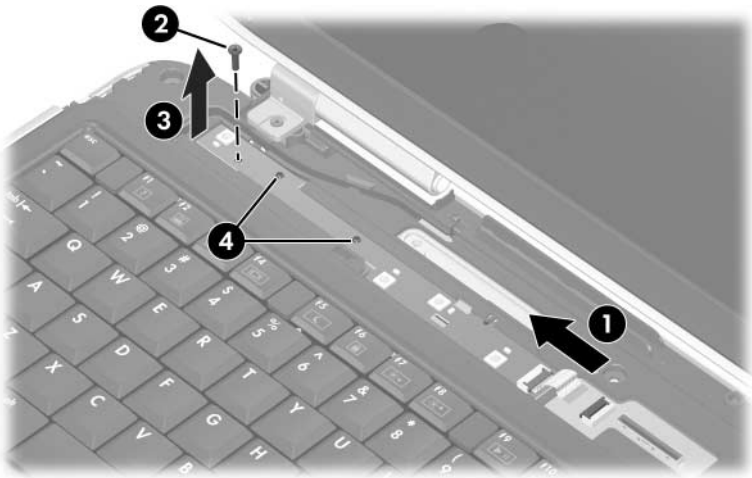
Reverse the above procedure to install the switch cover.

5.9 LED Board

Spare Part Number Information

| | |
|----------------------------|------------|
| LED board (includes cable) | 378771-001 |
|----------------------------|------------|

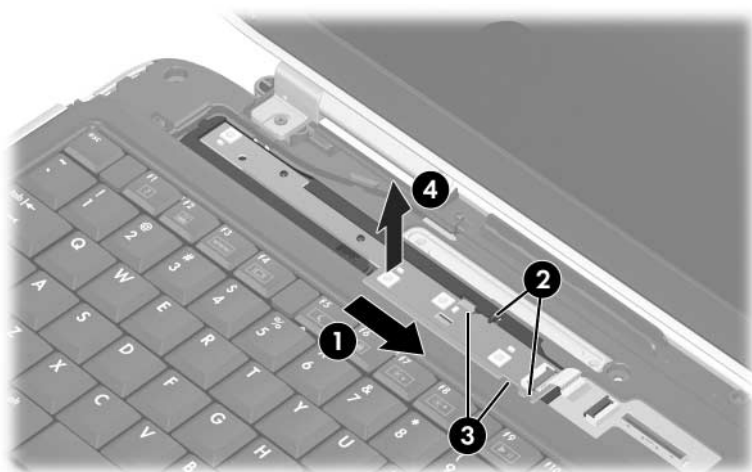
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the switch cover (refer to [Section 5.8](#)).
3. Release the zero insertion force (ZIF) connector ❶ to which the LED board cable is connected and disconnect the cable.
4. Remove the PM2.0×4.0 screw ❷ that secures the LED board to the top cover.
5. Lift the left side of the LED board ❸ until the board disengages from the alignment pins ❹ on the top cover.



Releasing the LED Board

6. Slide the LED board to the right **①** until the tabs **②** on the top cover are aligned with the notches **③** on the LED board.

7. Remove the LED board **④**.



Removing the LED Board

Reverse the above procedure to install the LED board.

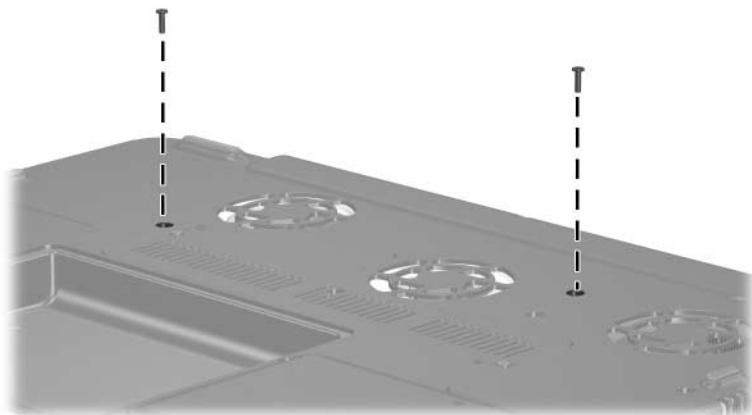
5.10 Keyboard

Spare Part Number Information

| | | | |
|---------------|------------|--------------------------|------------|
| Belgium | 374741-181 | Portugal | 374741-131 |
| Denmark | 374741-081 | Saudi Arabia | 374741-171 |
| France | 374741-051 | Spain | 374741-071 |
| French Canada | 374741-121 | Sweden/Finland | 374741-101 |
| Germany | 374741-041 | Switzerland | 374741-111 |
| Greece | 374741-151 | United Kingdom | 374741-031 |
| International | 374741-B31 | Asia Pacific, Australia, | 374741-001 |
| Italy | 374741-061 | Canada, | |
| Latin America | 374741-161 | Hong Kong, People's | |
| Norway | 374741-091 | Republic of China, and | |
| | | the United States | |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
2. Remove the switch cover (refer to [Section 5.8](#)).
3. Turn the notebook upside down with the front panel toward you.

4. Remove the two PM2.0×8.0 screws that secure the keyboard to the notebook.



Removing the Keyboard Screws

5. Turn the notebook display-side up with the front panel toward you.
6. Open the notebook as far as possible.
7. Use a flat-bladed tool to push back the four keyboard retention tabs. The tabs are located above the **f1** and **f2** keys, above the **f6** and **f7** keys, above the **f11** and **f12** keys, and above the **end** and **pg up** keys.



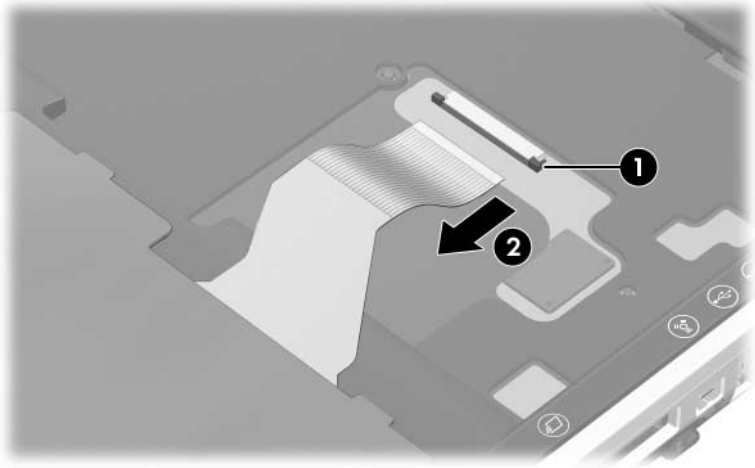
Releasing the Keyboard

8. Lift the rear edge of the keyboard and swing it forward until it rests on the palm rest.



Removing the Keyboard

9. Release the zero insertion force (ZIF) connector ❶ to which the keyboard cable is connected and disconnect the keyboard cable ❷ from the system board.
10. Remove the keyboard.



Removing the Keyboard

Reverse the above procedure to install the keyboard.

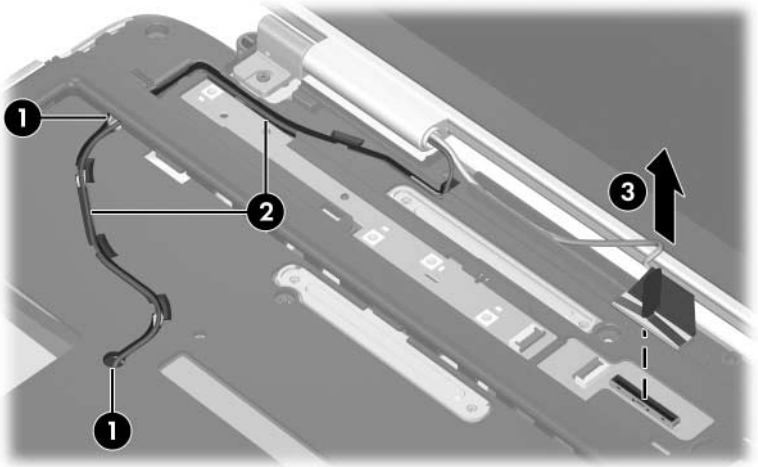
5.11 Display Assembly

Spare Part Number Information

| | |
|--------------------------------------|------------|
| 17.0-inch, WSXGA+WVA with Brightview | 374723-001 |
| 17.0-inch, WXGA+WVA with Brightview | 374722-001 |
| 17.0-inch, WXGA+WVA | 374721-001 |

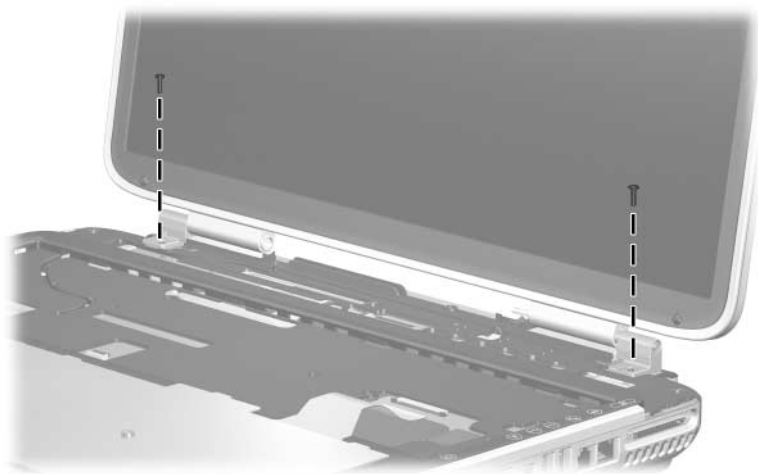
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))

2. Remove the wireless antenna cables from the top cover holes **1** and from the routing channels **2** through which the cables are routed.
3. Disconnect the display cable **3** from the system board.



Disconnecting the Display Cables

4. Remove the two PM2.0×8.0 screws that secure the display assembly to the notebook.



Removing the Display Screws

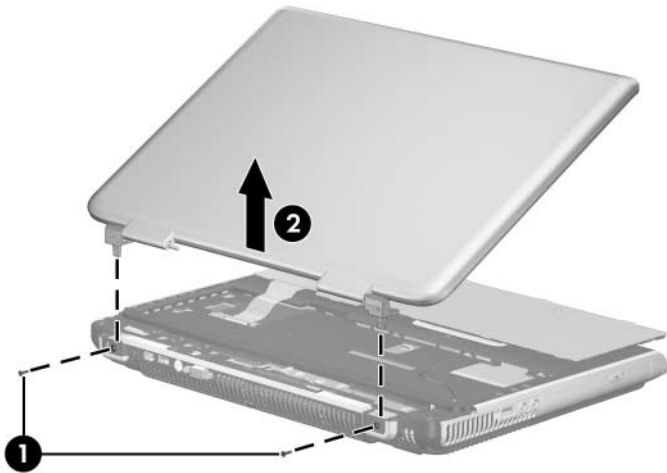
5. Position the notebook with the rear panel toward you.



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

6. Remove the two PM2.0×8.0 screws ❶ that secure the display assembly to the notebook.

7. Lift the display assembly straight up to remove it ❷.



Removing the Display Assembly

Reverse the above procedure to install the display assembly.

5.12 Top Cover

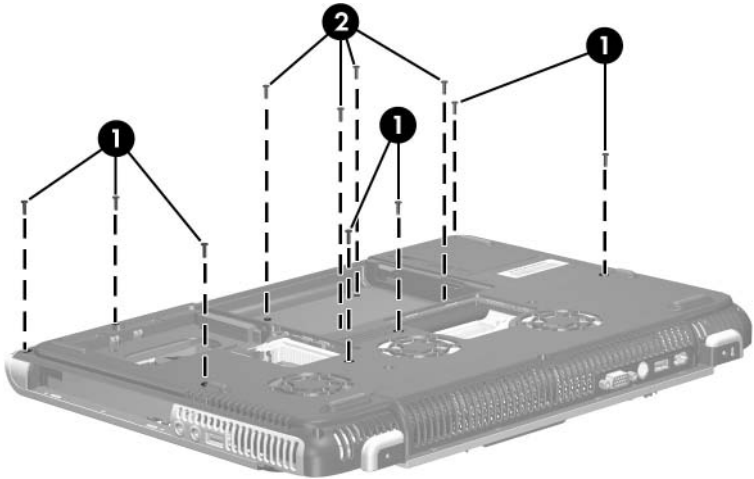
Spare Part Number Information

Top cover (includes TouchPad)

374750-001

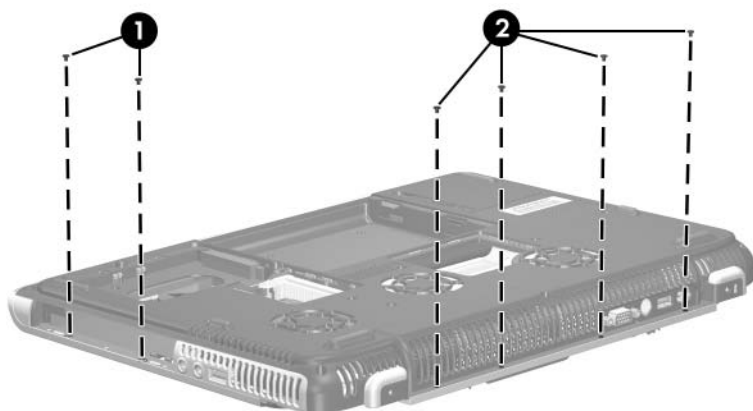
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
2. Turn the notebook upside down with the rear panel toward you.

3. Remove the seven PM2.0×8.0 screws ❶ on the surface of the base enclosure and the four PM2.0×8.0 screws ❷ in the battery bay.



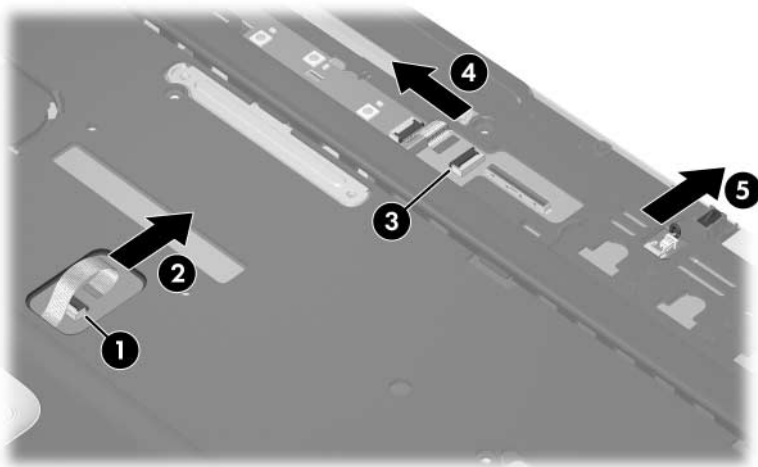
Removing the Top Cover Screws, Part 1

4. Remove the two PM2.0×3.0 screws ❶ in the optical drive bay and the four PM2.0×3.0 screws ❷ on the rear edge of the base enclosure.



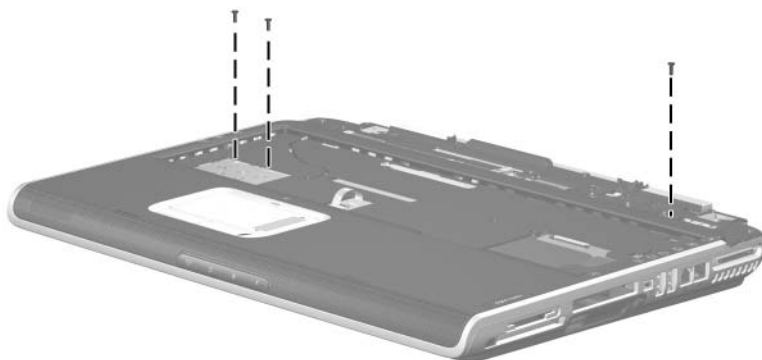
Removing the Top Cover Screws, Part 2

5. Turn the notebook top-side up with the front panel toward you.
6. Release the ZIF connector ❶ to which the TouchPad cable is connected and disconnect the TouchPad cable ❷ from the system board.
7. Release the ZIF connector ❸ to which the LED/button board cable is connected and disconnect the LED/button board cable ❹ from the system board.
8. Disconnect the display switch module cable ❺ from the system board.



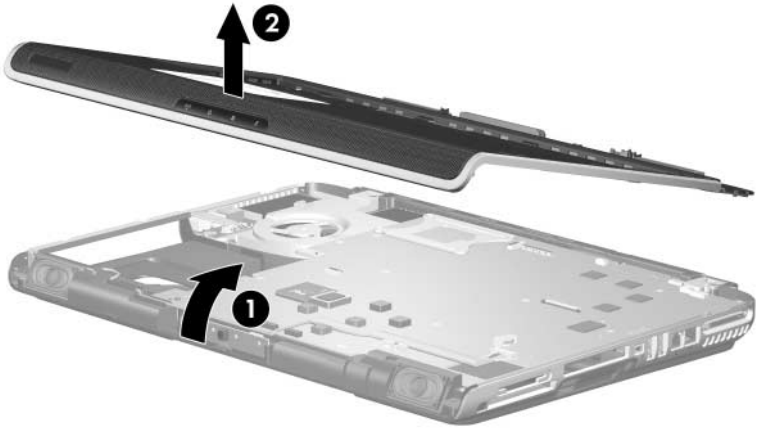
Disconnecting the TouchPad and LED Board Cables

9. Remove the three PM2.0×8.0 screws that secure the base enclosure to the notebook.



Removing the Top Cover Screws

10. Swing the front edge of the top cover up and back ❶ until it detaches from the notebook.
11. Lift the top cover straight up ❷ to remove it.



Removing the Top Cover

Reverse the above procedure to install the top cover.

5.13 Infrared Board

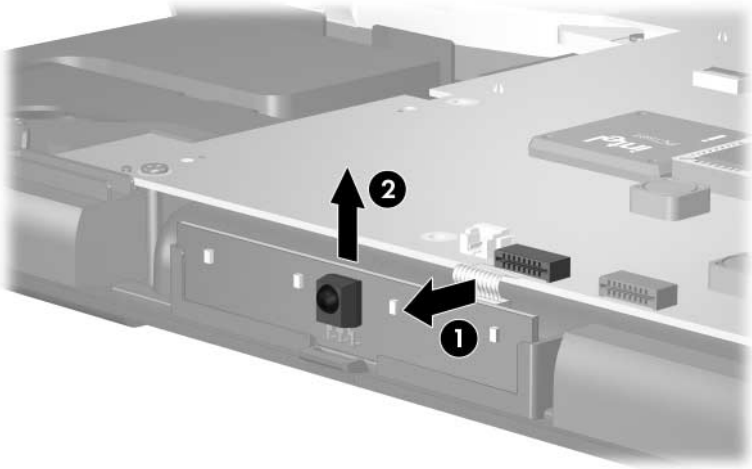
Spare Part Number Information

Infrared board with cable

374760-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))

2. Disconnect the infrared board cable ❶ from the low insertion force (LIF) connector on the system board.
3. Remove the infrared board ❷ from the clip in the base enclosure.



Removing the Infrared Board

Reverse the above procedure to install the infrared board.

5.14 Audio/USB Board

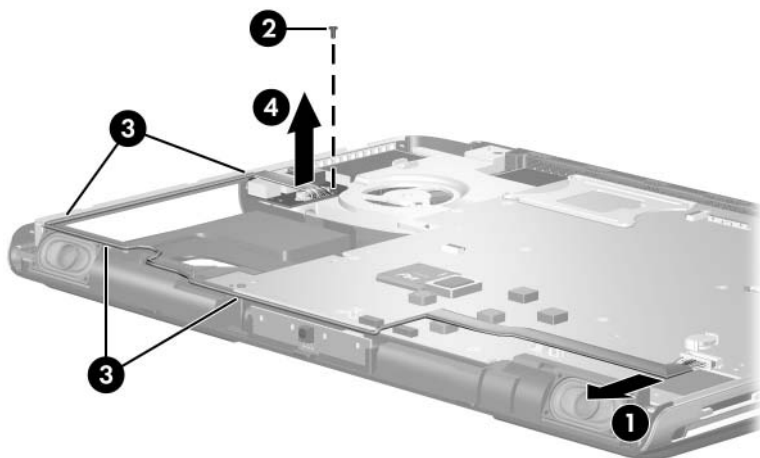
Spare Part Number Information

Audio/USB board (includes cable)

374761-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. Infrared board (refer to [Section 5.13](#))

2. Disconnect the audio/USB board cable ❶ from the system board.
3. Remove the PM2.0×6.0 screw ❷ that secures the audio/USB board to the base enclosure.
4. Remove the audio/USB board cable from the base enclosure clips ❸ through which it is routed.
5. Remove the audio/USB board ❹.



Removing the Audio/USB Board

Reverse the above procedure to install the audio/USB board.

5.15 Bluetooth Board

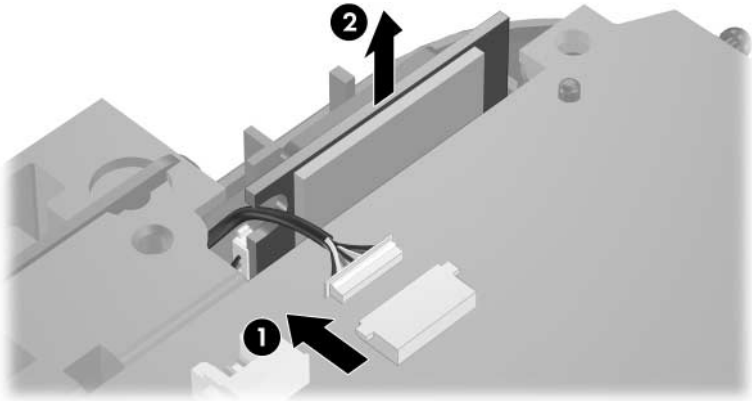
Spare Part Number Information

Broadcomm Bluetooth wireless card

376651-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))

2. Disconnect the Bluetooth board cable **1** from the system board.
3. Remove the Bluetooth board **2** from the clip in the base enclosure.



Removing the Bluetooth Board

Reverse the above procedure to install the Bluetooth board.

5.16 System Board

Spare Part Number Information

| | |
|---|------------|
| M24P with 256 MB RAM (includes RTC battery) | 374711-001 |
| M24P with 128 MB RAM (includes RTC battery) | 374709-001 |
| M22P with 64 MB RAM (includes RTC battery) | 374707-001 |



All system board spares kits include a disk cell RTC battery.

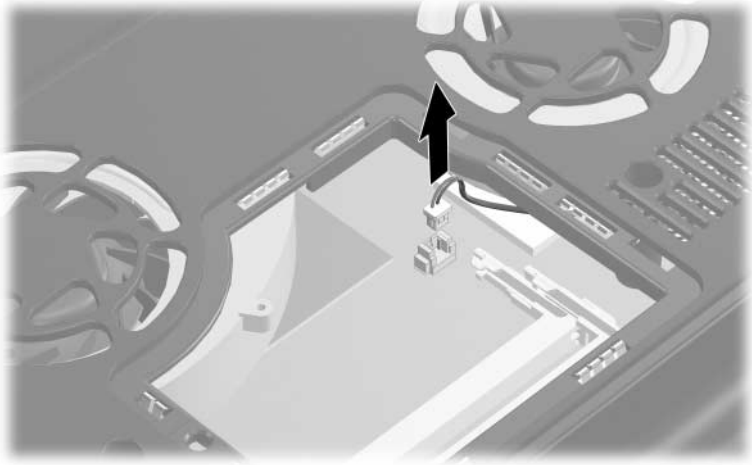


When replacing the system board, ensure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory modules (refer to [Section 5.6](#))
 - Mini PCI communications card (refer to [Section 5.7](#))
 - Modem board (refer to [Section 5.20](#))
 - Heat sink module (refer to [Section 5.21](#))
 - Processor (refer to [Section 5.22](#))
-

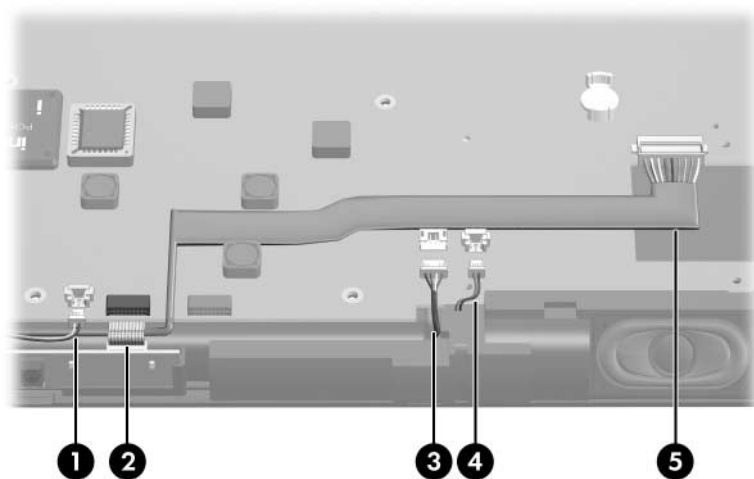
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Switch cover (refer to [Section 5.8](#))
 - c. Keyboard (refer to [Section 5.10](#))
 - d. Display assembly (refer to [Section 5.11](#))
 - e. Top cover (refer to [Section 5.12](#))
2. Turn the notebook upside down with the front toward you.

3. Disconnect the fan cable from the system board through the memory module compartment.



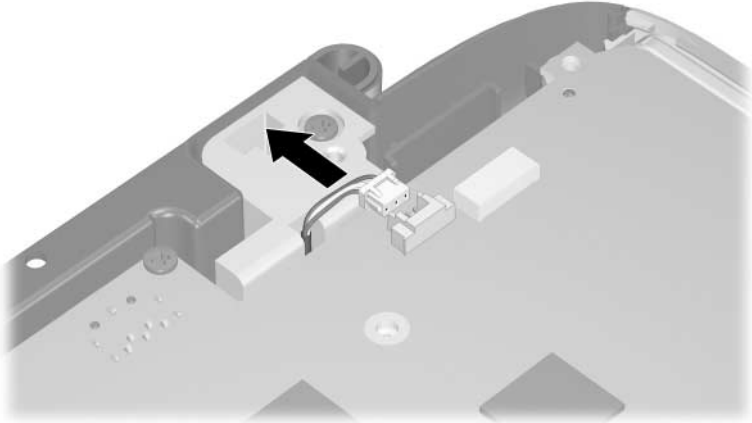
Disconnecting the Fan Cables

4. Turn the notebook top-side up with the front panel toward you.
5. Disconnect the following cables from the system board:
 - ❶ Left speaker cable
 - ❷ Front panel LED board cable
 - ❸ Digital drive board cable
 - ❹ Right speaker cable
 - ❺ Audio/USB board cable



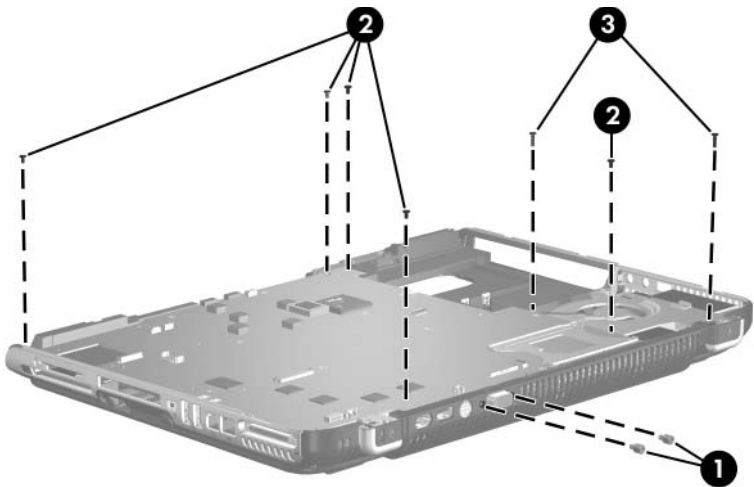
Disconnecting the System Board Cables, Part 1

6. Disconnect the fan cable from the system board.



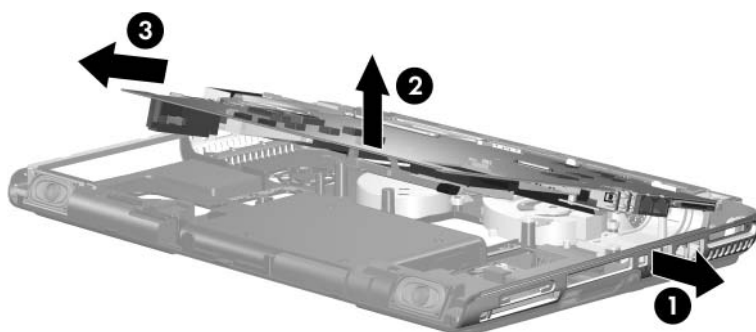
Disconnecting the System Board Cables, Part 2

7. Position the notebook with the rear panel toward you.
8. Remove the following:
 - ❶ Two HM5.0×9.0 screw locks on each side of the external monitor connector
 - ❷ Five PM2.0×4.0 screws that secure the system board to the base enclosure
 - ❸ Two PM2.0×8.0 screws that secure the heat sink module to the base enclosure



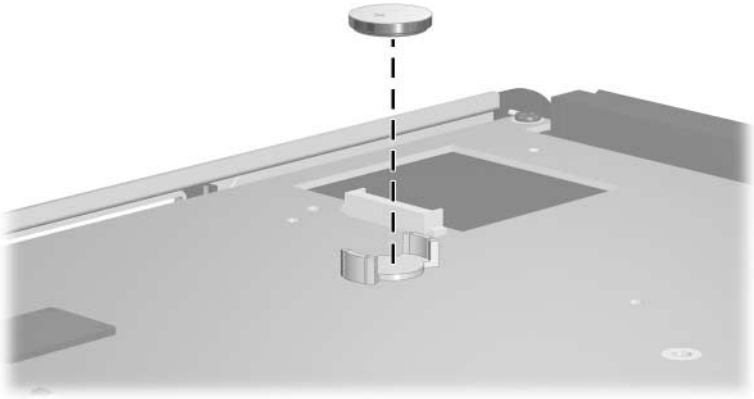
Removing the System Board Screws and Screw Locks

9. Position the notebook with the front panel toward you.
10. Flex the right rear edge of the base enclosure outward until the expansion port 2 is clear of the base enclosure ❶.
11. Lift the front edge of the system board until it clears the base enclosure ❷.
12. Slide the system board forward at an angle and remove it ❸.



Removing the System Board

13. If necessary, remove the RTC battery from the socket on the system board.



Removing the RTC Battery

Reverse the above procedures to install the system board and the RTC battery.

5.17 Speakers

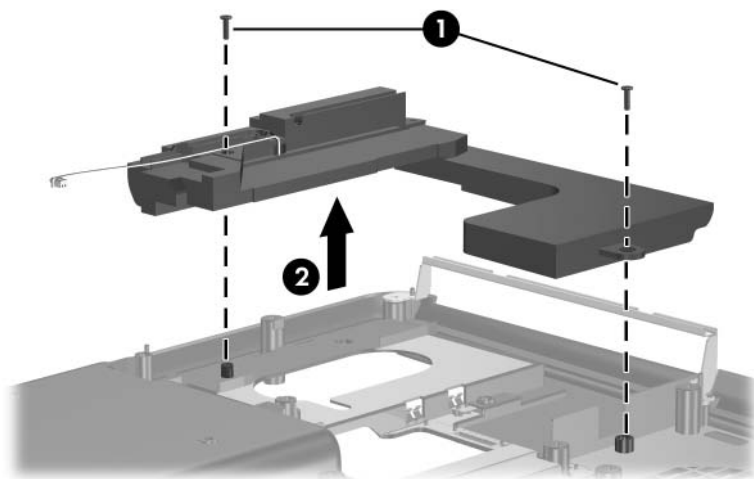
Spare Part Number Information

Left and right speakers

378521-001

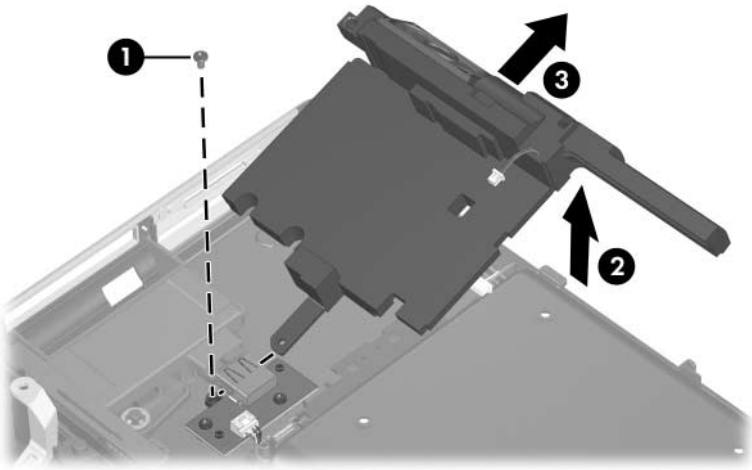
1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment cover (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. System board (refer to [Section 5.16](#))
2. Position the notebook with the rear panel toward you.

3. Remove the two PM2.0×4.0 ❶ screws that secure the left speaker to the base enclosure.
4. Remove the left speaker ❷.



Removing the Left Speaker

5. Remove the PM1.5×3.5 screw ❶ that secures the right speaker to the base enclosure.
6. Lift the right side of the right speaker ❷, then slide the speaker to the right to remove it ❸.



Removing the Right Speaker

Reverse the above procedure to install the speakers.

5.18 Digital Drive Board

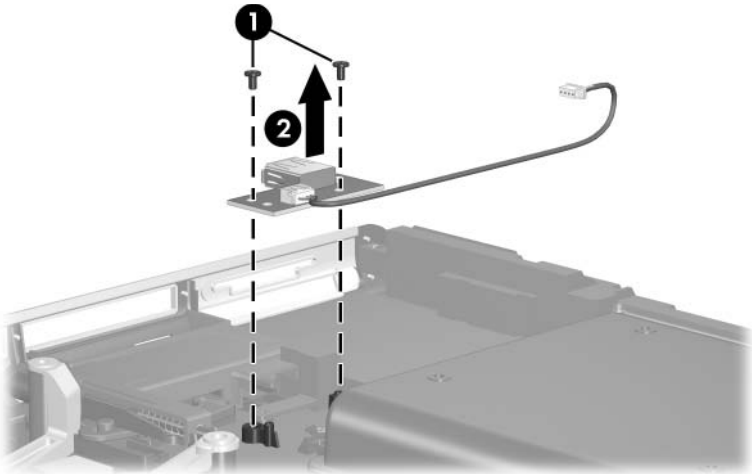
Spare Part Number Information

Digital drive board (includes cable)

374759-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment cover (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. System board (refer to [Section 5.16](#))

2. Remove the two PM2.0×4.0 screws ❶ that secure the digital drive board to the base enclosure.
3. Remove the digital drive board ❷.



Removing the Digital Drive Board

Reverse the above procedure to install the digital drive board.

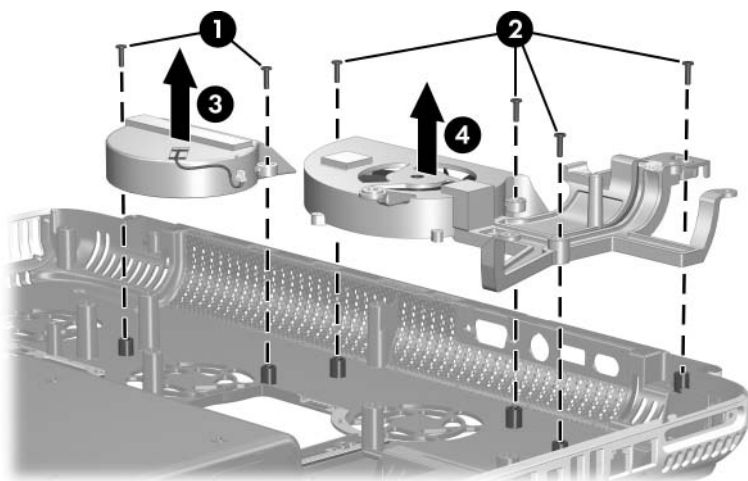
5.19 Base Enclosure Fans

Spare Part Number Information

| | |
|---------------------------|------------|
| Base enclosure middle fan | 380029-001 |
| Base enclosure right fan | 380027-001 |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment cover (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. System board (refer to [Section 5.16](#))

2. Remove the two PM2.0×8.0 screws ❶ that secure the middle fan to the base enclosure.
3. Remove the four PM2.0×8.0 screws ❷ that secure the right fan to the base enclosure.
4. Remove the base enclosure middle ❸ and right fans ❹.



Removing the Base Enclosure Fans

Reverse the above procedure to install the base enclosure fans.

5.20 Modem Board

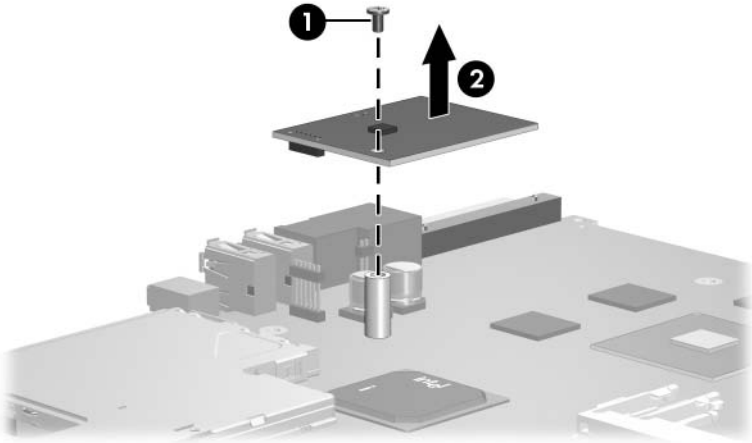
Spare Part Number Information

Modem board

374758-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment cover (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. System board (refer to [Section 5.16](#))
2. Turn the system board upside down with the external monitor connector toward you.

3. Remove the PM2.0×3.0 screw ❶ that secures the modem board to the system board.
4. Remove the modem board ❷.



Removing the Modem Board

Reverse the above procedure to install the modem board.

5.21 Heat Sink Module

Spare Part Number Information

Heat sink module (includes left fan and thermal paste)

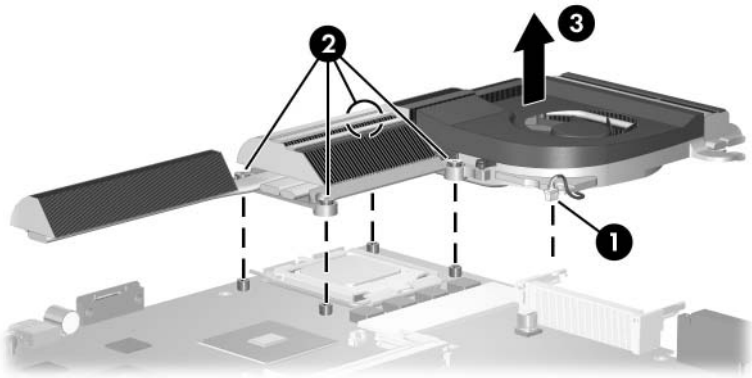
380030-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment cover (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. System board (refer to [Section 5.16](#))

2. Disconnect the fan cable from the system board ❶.
3. According to the 1, 2, 3, 4 sequence stamped into the heat sink module, loosen the four PM2.0×12.0 spring-loaded shoulder screws ❷ that secure the heat sink module to the system board.
4. Lift the heat sink module and remove it ❸.



Due to the adhesive quality of the thermal paste located between the heat sink module and processor, it may be necessary to move the module from side to side to detach the module from the processor.



Removing the Heat Sink Module

Reverse the above procedure to install the heat sink module.

5.22 Processor

Spare Part Number Information

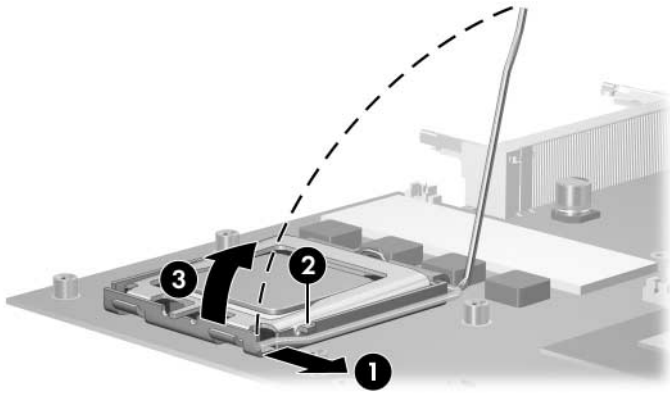
| | |
|-------------------------------|------------|
| Intel Pentium 4 560 (3.6-GHz) | 377213-001 |
| Intel Pentium 4 550 (3.4-GHz) | 374718-001 |
| Intel Pentium 4 540 (3.2-GHz) | 374717-001 |
| Intel Pentium 4 530 (3.0-GHz) | 374716-001 |
| Intel Pentium 4 520 (2.8-GHz) | 374715-001 |

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)) and remove the following components:
 - a. Optical drive (refer to [Section 5.5](#))
 - b. Memory module compartment cover (refer to [Section 5.6](#))
 - c. Mini PCI compartment cover (refer to [Section 5.7](#))
 - d. Switch cover (refer to [Section 5.8](#))
 - e. Keyboard (refer to [Section 5.10](#))
 - f. Display assembly (refer to [Section 5.11](#))
 - g. Top cover (refer to [Section 5.12](#))
 - h. System board (refer to [Section 5.16](#))
 - i. Heat sink module (refer to [Section 5.21](#))



CAUTION: The processor release arm is under spring tension. Do not let go of the arm when removing or installing the processor. Failure to follow this caution can result in damage to the processor and system board.

-
2. Slide the tip of the processor release arm to the right **1** until it clears the stop on the socket **2**.
3. Manually swing the arm up and back as far as it will freely go **3**.



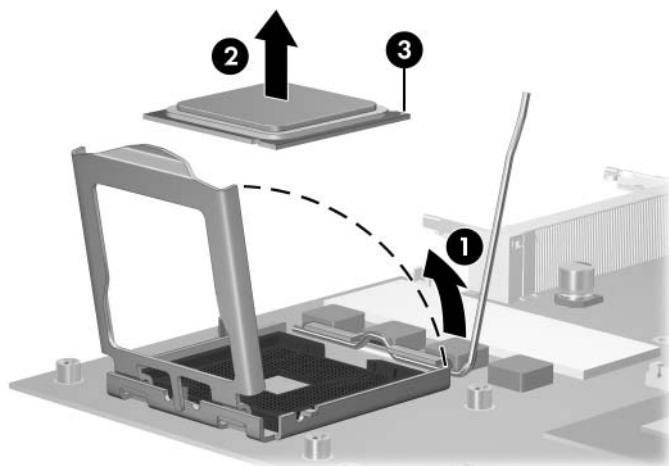
Disengaging the Processor Release Arm

4. Swing the processor socket cover up and forward ❶.

5. Lift the processor straight up to remove it ❷.



The gold triangle ❸ on the processor should be aligned in the front right corner when you install the processor.



Removing the Processor

Reverse the above procedure to install the processor.

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Notebook

| Dimensions | | |
|-----------------------------------|---------------------------------------|---------------|
| Height | | |
| Front | 4.51 cm | 1.78 in |
| Rear | 4.97 cm | 1.96 in |
| Width | 39.79 cm | 15.70 in |
| Depth | 28.81 cm | 11.34 in |
| Weight | 4.22 kg | 9.3 lb |
| Stand-alone power requirements | | |
| Operating voltage | 19.0 V dc @ 7.1 A/9.5 A – 135 W/180 W | |
| Operating current | 7.1 A/9.5 A | |
| Temperature | | |
| Operating | 10°C to 35°C | 5°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Relative humidity (noncondensing) | | |
| Operating | 10% to 90% | 10% to 90% |
| Nonoperating | 5% to 95% | 5% to 95% |

Table 6-1
Notebook (Continued)

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



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

Table 6-2
17.0-inch, WSXGA+WVA Brightview Display

| | | |
|-------------------------|---------------------|--|
| Dimensions | | |
| Height | 23.00 cm | 9.06 in |
| Width | 36.80 cm | 14.49 in |
| Diagonal | 43.40 cm | 17.09 in |
| Number of colors | | Up to 16.8 million |
| Contrast ratio | | 200:1 |
| Brightness | | 180 nits typical |
| Pixel resolution | | |
| Pitch | 0.197 × 0.197 mm | |
| Format | 1680 × 1050 | |
| Configuration | RGB vertical stripe | |
| Backlight | | Edge lit |
| Character display | | 80 × 25 |
| Total power consumption | | 4 W |
| Viewing angle | | +/-65° horizontal, +/-50° vertical typical |

Table 6-3
17.0-inch, WXGA+WVA Brightview Display

| | | | |
|-------------------------|---------------------|----------|--|
| Dimensions | | | |
| Height | 23.00 cm | 9.06 in | |
| Width | 36.80 cm | 14.49 in | |
| Diagonal | 43.40 cm | 17.09 in | |
| Number of colors | | | Up to 16.8 million |
| Contrast ratio | | | 200:1 |
| Brightness | | | 180 nits typical |
| Pixel resolution | | | |
| Pitch | 0.259 × 0.259 mm | | |
| Format | 1280 × 800 | | |
| Configuration | RGB vertical stripe | | |
| Backlight | | | Edge lit |
| Character display | | | 80 × 25 |
| Total power consumption | | | 4 W |
| Viewing angle | | | +/-40° horizontal, +20/-40° vertical typical |

Table 6-4
Hard Drives, Part 1

| | 100-GB* | 100-GB* | 80-GB* | 80-GB* |
|---|-----------------------------|--------------|--------------|--------------|
| Dimensions | | | | |
| Height | 9.5 mm | 9.5 mm | 9.5 mm | 9.5 mm |
| Width | 70 mm | 70 mm | 70 mm | 70 mm |
| Weight | 99 g | 102 g | 99 g | 99 g |
| Interface type | ATA-5 | ATA-5 | ATA-5 | ATA-5 |
| Transfer rate | | | | |
| Synchronous (maximum) | 100 MB/sec | 100 MB/sec | 100 MB/sec | 100 MB/sec |
| 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 |
| Average | 13 ms | 13 ms | 13 ms | 13 ms |
| Maximum | 24 ms | 24 ms | 24 ms | 24 ms |
| Logical blocks [†] | 195,364,233 | 195,364,233 | 156,301,488 | 156,301,488 |
| Disk rotational speed | 5400 rpm | 4200 rpm | 5400 rpm | 4200 rpm |
| Operating temperature | 5°C to 55°C (41°F to 131°F) | | | |




Certain restrictions and exclusions apply. Consult Customer Care for details.

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.

[†]Actual drive specifications may differ slightly.

Table 6-5
Hard Drives, Part 2

| | 60-GB* | 60-GB* | 40-GB* |
|---|-----------------------------|--------------|--------------|
| Dimensions | | | |
| Height | 9.5 mm | 9.5 mm | 9.5 mm |
| Width | 70 mm | 70 mm | 70 mm |
| Weight | 102 g | 99 g | 99 g |
| Interface type | ATA-5 | ATA-5 | ATA-5 |
| Transfer rate | | | |
| Synchronous (maximum) | 100 MB/sec | 100 MB/sec | 100 MB/sec |
| Security | ATA security | ATA security | ATA security |
| Seek times (typical read, including setting) | | | |
| Single track | 3 ms | 3 ms | 3 ms |
| Average | 13 ms | 13 ms | 13 ms |
| Maximum | 24 ms | 24 ms | 24 ms |
| Logical blocks [†] | 117,210,240 | 117,210,240 | 78,140,160 |
| Disk rotational speed | 7200 rpm | 4200 rpm | 4200 rpm |
| Operating temperature | 5°C to 55°C (41°F to 131°F) | | |
|  Certain restrictions and exclusions apply. Consult Customer Care for details. | | | |

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.

[†]Actual drive specifications may differ slightly.

Table 6-6
Primary 12-cell, Li-Ion Battery Pack

Dimensions

| | | |
|--------|----------|---------|
| Height | 2.00 cm | 0.79 in |
| Width | 15.80 cm | 6.22 in |
| Depth | 11.90 cm | 4.69 in |
| Weight | 0.34 kg | 0.75 lb |

Energy

| | |
|--------------------|--------|
| Voltage | 148. V |
| Amp-hour capacity | 6.6 Ah |
| Watt-hour capacity | 48 Wh |

Temperature

| | | |
|--------------|-------------|---------------|
| Operating | 5°C to 45°C | 41°F to 113°F |
| Nonoperating | 0°C to 60°C | 32°F to 140°F |

Table 6-7
24X DVD/CD-RW Combo Drive

| Applicable disk | Read: DVD-R, DVD-RW, 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 2) CD-I ready (Mode 2, Form 1 and 2) CD-R, CD-RW Photo CD (single and multisession) CD-Bridge | Write: CD-R and CD-RW |
|-----------------------------|--|---------------------------------|
| Center hole diameter | 1.5 cm (0.59 in) | |
| Disk diameter | | |
| Standard disc | 12 cm (4.72 in) | |
| Mini disc | 8 cm (3.15 in) | |

Table 6-7
24X DVD/CD-RW Combo Drive (Continued)

| | | |
|---------------------------|--|-----------|
| Disk thickness | 1.2 mm (0.047 in) | |
| Track pitch | 0.74 μ m | |
| Access time | CD media | DVD media |
| Random | < 110 ms | < 130 ms |
| Full stroke | < 210 ms | < 225 ms |
| Audio output level | Line-out, 0.7 V rms | |
| Cache buffer | 2 MB | |
| 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 (1352 KB/s at 1X DVD rate) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

Table 6-8
8X DVD±RW/R and CD-RW Combo Drive

| Applicable disk | Read: | Write: |
|-----------------------------|---|---------------------------------------|
| | DVD-R, DVD-RW, 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 2) CD-I ready (Mode 2, Form 1 and 2) CD-R, CD-RW Photo CD (single and multisession) CD-Bridge | CD-R and CD-RW DVD-R and DVD-RW |
| Center hole diameter | 1.5 cm (0.59 in) | |
| Disk diameter | | |
| Standard disc | 12 cm (4.72 in) | |
| Mini disc | 8 cm (3.15 in) | |

Table 6-8
8X DVD±RW/R and CD-RW Combo Drive (*Continued*)

| | | |
|---------------------------|---|----------|
| Disk 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 | Audio-out, 0.7 Vrms | |
| Cache buffer | 2 MB | |
| Data transfer rate | | |
| CD-R (16X) | 2,400 KB/s (150 KB/s at 1X CD rate) | |
| CD-RW (8X) | 1,200 KB/s (150 KB/s at 1X CD rate) | |
| CD-ROM (24X) | 3,600 KB/s (150 KB/s at 1X CD rate) | |
| DVD (8X) | 10,800 KB/s (1,352 KB/s at 1X DVD rate) | |
| DVD-R (4X) | 5,400 KB/s (1,352 KB/s at 1X DVD rate) | |
| DVD-RW (2X) | 2,700 KB/s (1,352 KB/s at 1X DVD rate) | |
| Multiword DMA mode 2 | 16.6 MB/s | |
| Startup time | < 15 seconds | |
| Stop time | < 6 seconds | |

Table 6-9
System DMA

| 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. | |

Table 6-10
System Interrupts

| 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 |

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

Table 6-10
System Interrupts (*Continued*)


| Hardware IRQ | System Function |
|---|--|
| 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 touch pad |
| IRQ13 | Numeric data processor |
| IRQ14 | Primary IDE channel |
| IRQ15 | Secondary IDE channel |
|  | 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. |

Table 6-11
System I/O Addresses

| 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 |

Table 6-11
System I/O Addresses (*Continued*)

| 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 |
| 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 |

Table 6-11
System I/O Addresses (*Continued*)

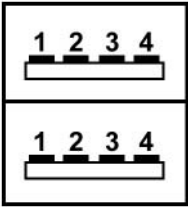
| I/O Address (hex) | System Function (shipping configuration) |
|--------------------------|---|
| 2F0 - 2F7 | Unused |
| 2F8 - 2FF | Infrared port |
| 300 - 31F | Unused |
| 320 - 36F | Unused |
| 370 - 377 | Secondary diskette drive controller |
| 378 - 37F | Parallel port (LPT1/default) |
| 380 - 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) |

Table 6-12
System Memory Map

| 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 | 000E8000-000FFFFFFF | System BIOS |
| 15 MB | 00100000-00FFFFFFF | Extended memory |
| 58 MB | 01000000-047FFFFFFF | Super extended memory |
| 58 MB | 04800000-07FFFFFFF | Unused |
| 2 MB | 08000000-080FFFFFFF | Video memory (direct access) |
| 4 GB | 08200000-FFFEFFFF | Unused |
| 64 KB | FFFF0000-FFFFFFFF | System BIOS |

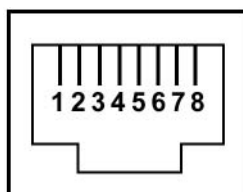
Connector Pin Assignments

Table A-1
Universal Serial Bus



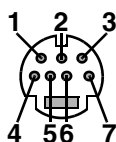
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | +5 VDC | 3 | Data + |
| 2 | Data – | 4 | Ground |

Table A-2
RJ-45 (Network)



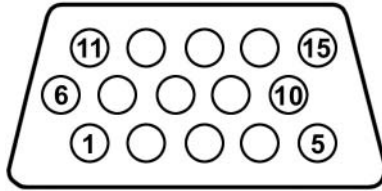
| Pin | Signal | Pin | Signal |
|-----|------------|-----|-----------|
| 1 | Transmit + | 5 | Unused |
| 2 | Transmit – | 6 | Receive – |
| 3 | Receive + | 7 | Unused |
| 4 | Unused | 8 | Unused |

Table A-3
S-Video-Out



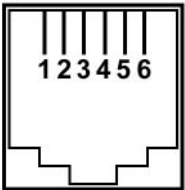
| Pin | Signal | Pin | Signal |
|-----|----------------------------|-----|------------------------|
| 1 | S-VHS color (C) signal | 5 | TV-CD |
| 2 | Composite video signal | 6 | S-VHS intensity ground |
| 3 | S-VHS intensity (Y) signal | 7 | Composite video ground |
| 4 | S-VHS color ground | | |

Table A-4
External Monitor



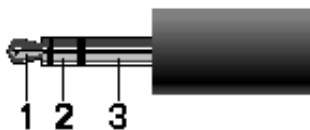
| Pin | Signal | Pin | Signal |
|-----|---------------|-----|-----------------|
| 1 | Red analog | 9 | +5 VDC |
| 2 | Green analog | 10 | Ground |
| 3 | Blue analog | 11 | Monitor detect |
| 4 | Not connected | 12 | DDC 2B data |
| 5 | Ground | 13 | Horizontal sync |
| 6 | Ground analog | 14 | Vertical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

Table A-5
RJ-11 (Modem)



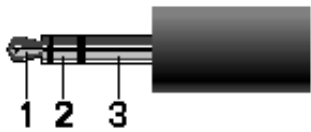
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | Unused | 4 | Unused |
| 2 | Tip | 5 | Unused |
| 3 | Ring | 6 | Unused |

Table A-6
Audio-In (Microphone)



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

Table A-7
Audio-Out (Headphone)



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

Power Cord Set Requirements

3-Conductor Power Cord Set

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

The power cord set included with the notebook meets the requirements for use in the country where the equipment is purchased.

Power cord sets for use in other countries must meet the requirements of the country where the notebook is used.

General Requirements

The requirements listed below are applicable to all countries.

- The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by each country's power system.
- 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 notebook.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

| Country | Accredited Agency | Applicable Note Number |
|-----------------|-------------------|------------------------|
| Australia | EANSW | 1 |
| Austria | OVE | 1 |
| Belgium | CEBC | 1 |
| Canada | CSA | 2 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |
| Italy | IMQ | 1 |
| Japan | METI | 3 |
| The Netherlands | KEMA | 1 |
| Norway | NEMKO | 1 |
| Sweden | SEMKO | 1 |
| Switzerland | SEV | 1 |

3-Conductor Power Cord Set Requirements (*Continued*)

| Country | Accredited Agency | Applicable Note Number |
|----------------|-------------------|------------------------|
| United Kingdom | BSI | 1 |
| United States | UL | 2 |



NOTES:

1. The flexible cord must be <HAR> 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 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.
-

Screw Listing

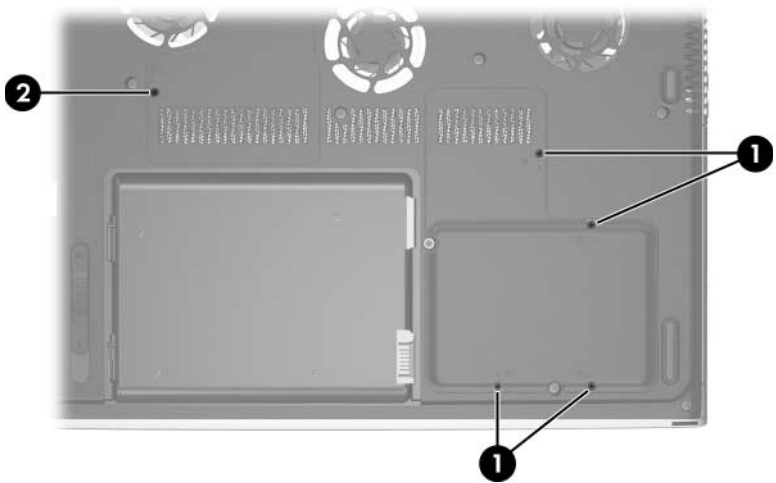
This appendix provides specification and reference information for the screws used in the notebook. All screws listed in this appendix are available in the Miscellaneous Screw Kit, spare part number 374744-001.

Table C-1
Phillips PM2.0x5.0 Screw

|  mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|  | Black | 5 | 5.0 mm | 2.0 mm | 4.0 mm |

Where used:

- ❶ Four screws that secure the hard drive cover to the notebook (screws are captured on the cover by C clips; documented in [Section 5.3](#))
- ❷ One screw that secures the memory module compartment cover to the notebook (screw is captured on the cover by a C clip; documented in [Section 5.6](#))



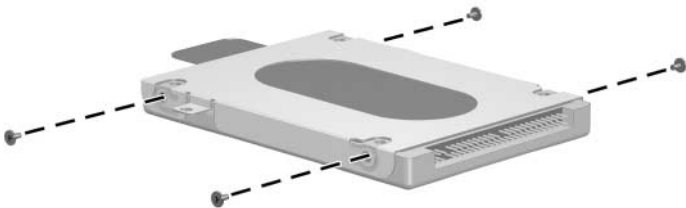
Phillips M2.0x5.0 Screw Locations

Table C-2
Phillips PM2.5×4.0 Screw

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
| | Silver | 4 | 4.0 mm | 2.5 mm | 4.0 mm |

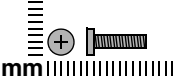
Where used:

Four screws that secure the hard drive frame to the hard drive (documented in [Section 5.3](#))



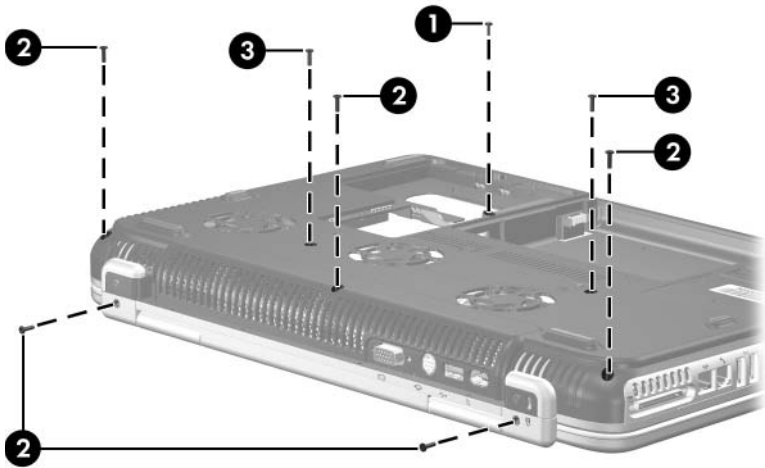
Phillips M2.5×4.0 Screw Locations

Table C-3
Phillips PM2.0x8.0 Screw

|  mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |

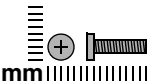
Where used:

- ❶ One screw that secures the optical drive to the notebook (documented in [Section 5.5](#))
- ❷ Five screws that secure the switch cover to the notebook (documented in [Section 5.8](#))
- ❸ Two screws that secure the keyboard to the notebook (documented in [Section 5.10](#))



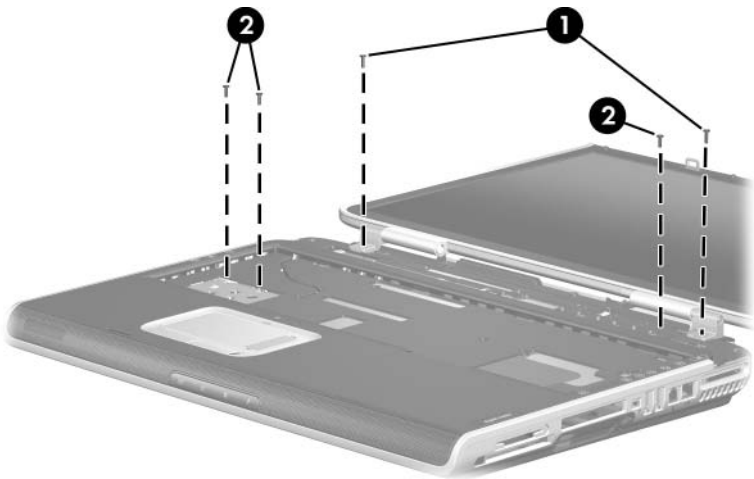
Phillips M2.0x8.0 Screw Location

Table C-3
Phillips PM2.0×8.0 Screw (Continued)

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |

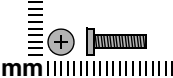
Where used:

- ❶ Two screws that secure the display assembly to the notebook (documented in [Section 5.11](#))
- ❷ Three screws that secure the top cover to the notebook (documented in [Section 5.12](#))



Phillips M2.0×8.0 Screw Locations

Table C-3
Phillips PM2.0×8.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |

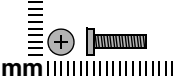
Where used:

Two screws that secure the display assembly to the notebook
(documented in [Section 5.11](#))



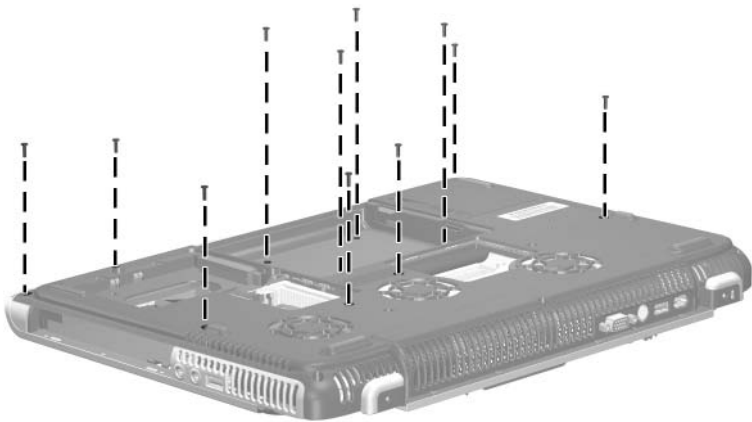
Phillips M2.0×8.0 Screw Locations

Table C-3
Phillips PM2.0×8.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |

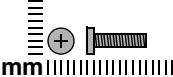
Where used:

Eleven screws that secure the top cover to the notebook
(documented in [Section 5.12](#))



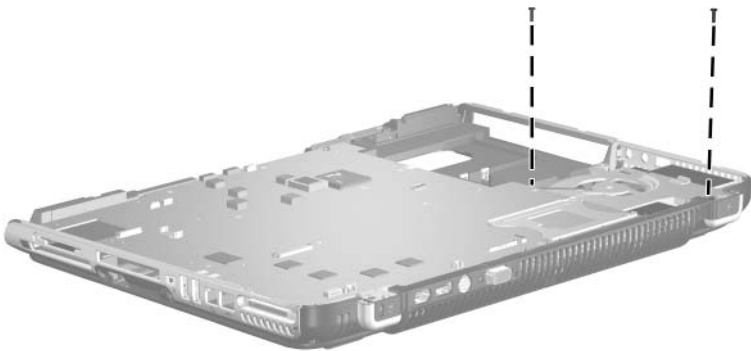
Phillips M2.0×8.0 Screw Locations

Table C-3
Phillips PM2.0×8.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |

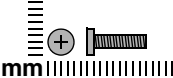
Where used:

Two screws that secure the heat sink module to the notebook
(documented in [Section 5.21](#))



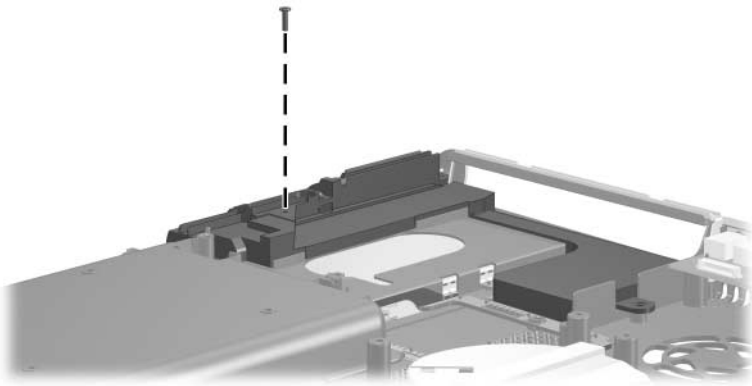
Phillips M2.0×8.0 Screw Locations

Table C-3
Phillips PM2.0×8.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |

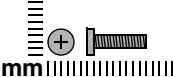
Where used:

One screw that secures the left speaker to the notebook
(documented in [Section 5.17](#))



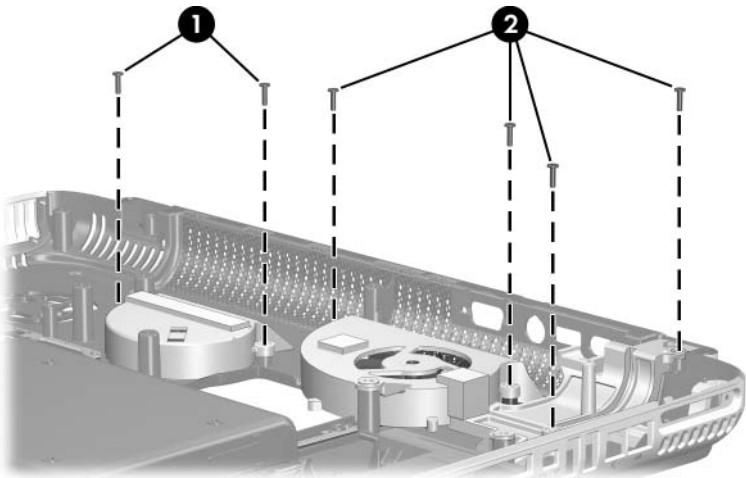
Phillips M2.0×8.0 Screw Location

Table C-3
Phillips PM2.0×8.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 35 | 8.0 mm | 2.0 mm | 4.0 mm |



Where used:

- ❶ Two screws that secure the base enclosure left fan to the notebook (documented in [Section 5.19](#))
- ❷ Four screws that secure the base enclosure right fan to the notebook (documented in [Section 5.19](#))



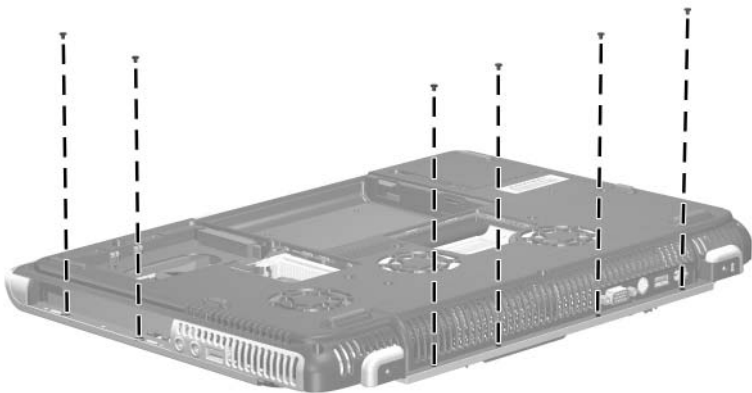
Phillips M2.0×8.0 Screw Locations

Table C-4
Phillips PM2.0×3.0 Screw

|  mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
|  | Black | 7 | 3.0 mm | 2.0 mm | 4.0 mm |

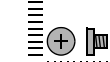
Where used:

Six screws that secure the top cover to the notebook
(documented in [Section 5.12](#))



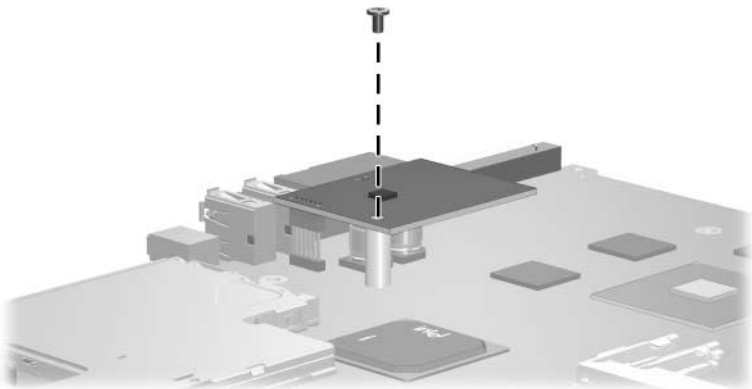
Phillips M2.0×3.0 Screw Locations

Table C-4
Phillips PM2.0×3.0 Screw (Continued)

|  mm | Color | Qty. | Length | Thread | Head Width |
|---|-------|------|--------|--------|------------|
| | Black | 7 | 3.0 mm | 2.0 mm | 4.0 mm |

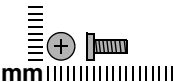
Where used:

One screw that secures the modem board to the notebook
(documented in [Section 5.20](#))



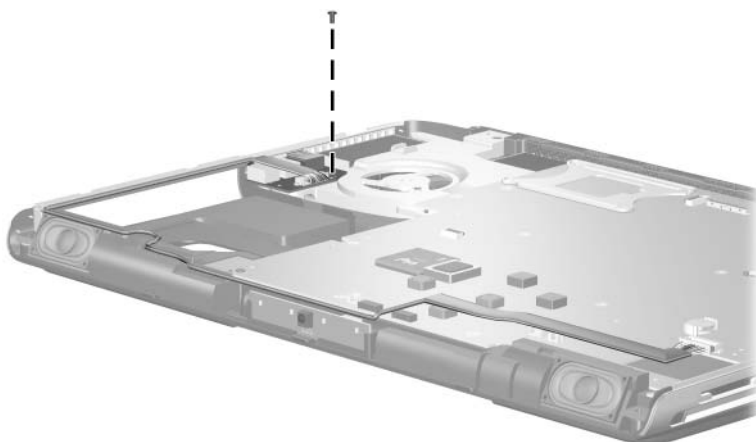
Phillips M2.0×3.0 Screw Location

Table C-5
Phillips PM2.0×6.0 Screw

|  | | | | | |
|---|-------|------|--------|--------|------------|
| | Color | Qty. | Length | Thread | Head Width |
| | Black | 1 | 6.0 mm | 2.0 mm | 4.0 mm |

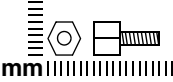
Where used:

One screw that secures the audio/USB board to the notebook
 (documented in [Section 5.14](#))



Phillips M2.0×6.0 Screw Location

Table C-6
Hex Socket HM5.0×9.0 Screw Lock

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
| | Silver | 2 | 9.0 mm | 2.5 mm | 5.0 mm |



Where used:

Two screw locks that secure the system board to the notebook
(documented in [Section 5.16](#))



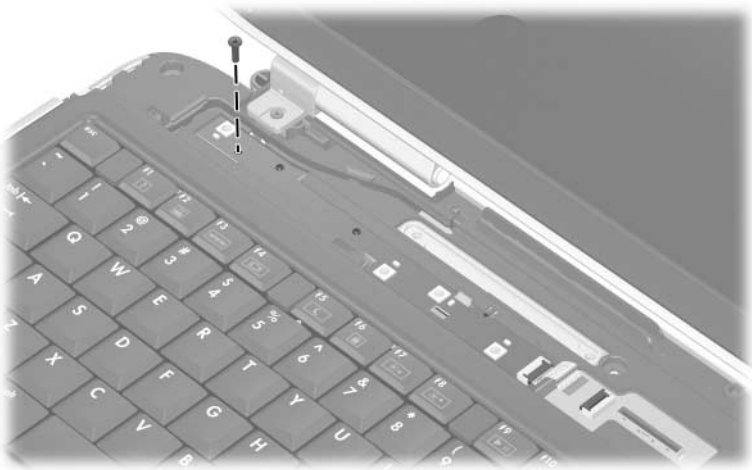
Hex Socket HM5.0×9.0 Screw Lock Locations

Table C-7
Phillips PM2.0x4.0 Screw

|  mm | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
|  | Silver | 10 | 4.0 mm | 2.0 mm | 4.0 mm |

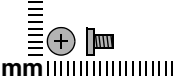
Where used:

One screw that secures the LED board to the notebook
(documented in [Section 5.9](#))



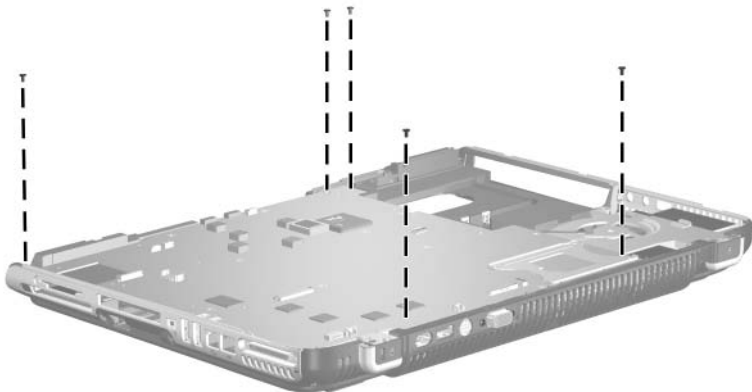
Phillips M2.0x4.0 Screw Locations

Table C-7
Phillips PM2.0x4.0 Screw (Continued)

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
| | Silver | 10 | 4.0 mm | 2.0 mm | 4.0 mm |

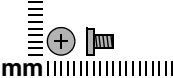
Where used:

Five screws that secure the system board to the notebook
(documented in [Section 5.16](#))



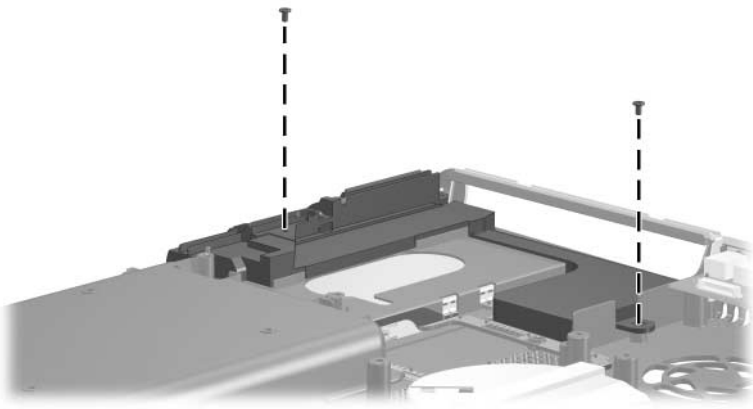
Phillips M2.0x4.0 Screw Locations

Table C-7
Phillips PM2.0×4.0 Screw (Continued)

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|--------|------|--------|--------|------------|
| | Silver | 10 | 4.0 mm | 2.0 mm | 4.0 mm |

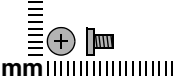
Where used:

Two screws that secure the left speaker to the notebook
(documented in [Section 5.17](#))



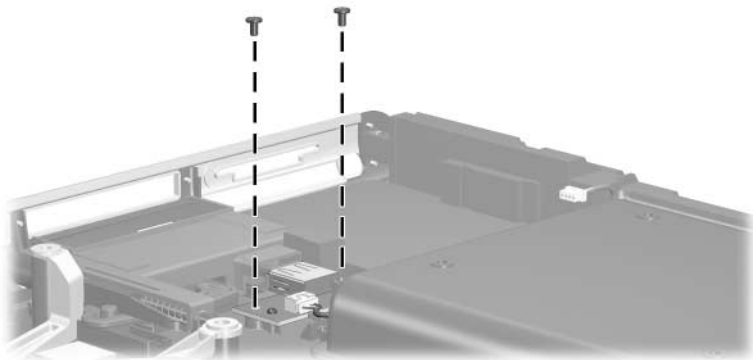
Phillips M2.0×3.0 Screw Location

Table C-7
Phillips PM2.0×4.0 Screw (Continued)

|  mm | Color | Qty. | Length | Thread | Head Width |
|--|--------|------|--------|--------|------------|
| | Silver | 10 | 4.0 mm | 2.0 mm | 4.0 mm |

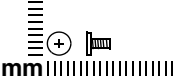
Where used:

Two screws that secure the digital drive board to the notebook
(documented in [Section 5.18](#))



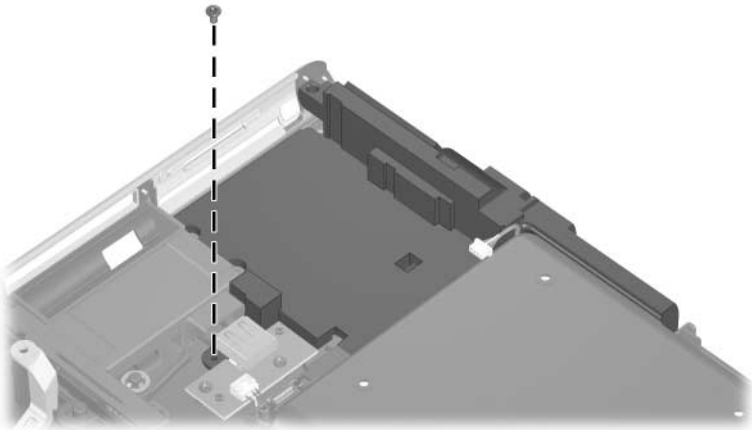
Phillips M2.0×4.0 Screw Locations

Table C-8
Phillips PM1.5×3.5 Screw

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|--------|--------|------------|
| | Silver | 1 | 3.5 mm | 1.5 mm | 3.5 mm |

Where used:

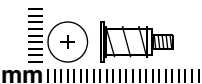
One screw that secures the right speaker to the notebook
(documented in [Section 5.17](#))



Phillips M1.5×3.5 Screw Location

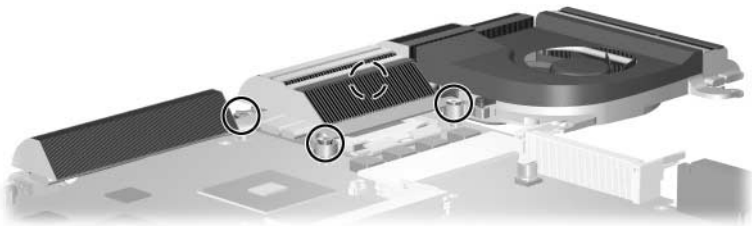
Table C-9

Phillips PM2.0×12.0 Spring-Loaded Shoulder Screw

|  | Color | Qty. | Length | Thread | Head Width |
|---|--------|------|---------|--------|------------|
| | Silver | 4 | 12.0 mm | 2.0 mm | 6.0 mm |

Where used:

Four screws that secure the heat sink module to the notebook
(documented in [Section 5.21](#))



Phillips M2.0×12.0 Spring-Loaded Shoulder Screw Locations

Index

1394 port 1–6

A

AC adapter, spare part
numbers 3–11, 3–18, 3–20

AC power light 1–5

arrow keys 1–11

audio troubleshooting 2–21

audio/USB board

removal 5–38

spare part number 3–5,
3–19, 5–38

Audio/Video Cable Kit, spare
part number 3–10

audio-in (microphone) jack

location 1–8

pin assignments A–5

audio-out (headphone) jack

location 1–8

pin assignments A–6

B

base enclosure, spare part
number 3–5, 3–19

battery bay 1–17

battery light 1–5

battery pack

removal 5–5

spare part number 3–7,
3–19, 5–5

specifications 6–7

battery pack release latch 1–17

Bluetooth board

removal 5–40

spare part number 3–3,
5–40

bottom components 1–16

C

cables, service considerations
4–2

caps lock key 1–11

caps lock light 1–15

CD-ROM drive

OS not loading 2–20

precautions 4–3

Coaxial Cable Kit, spare part
number 3–10

components

bottom 1–16

front 1–5

keyboard 1–9, 1–10

- left-side 1–8
- notebook top 1–14
- rear 1–8
- right-side 1–6
- upper keyboard 1–12
- Computer Setup
 - Advanced Menu 2–4
 - Main Menu 2–2
 - overview 2–1
 - Security Menu 2–3
 - Tools Menu 2–4
- connector pin assignments
 - external monitor A–3
 - headphone A–6
 - microphone A–5
 - monitor A–3
 - RJ-11 (modem) A–4
 - RJ-45 (network) A–2
 - S-Video-out A–2
 - Universal Serial Bus (USB) A–1
- connectors, service
 - considerations 4–2
- D**
- design overview 1–18
- digital drive bay 1–7
- digital drive board
 - removal 5–52
 - spare part number 3–7, 3–15, 3–19, 5–52
- digital drive eject button 1–7
- Digital Media Slot 1–6
- Digital Video Recorder
 - illustrated 3–10
 - spare part number 3–10
- disassembly sequence chart 5–3
- diskette drive, OS not loading 2–19
- diskette drive, USB, spare part number 3–14
- display assembly
 - removal 5–26, 5–52, 5–54, 5–56
 - spare part numbers 3–3, 3–16, 3–17, 5–26, 5–52, 5–54, 5–56
 - specifications 6–3, 6–4
- display release button 1–5
- DMA specifications 6–12
- drives, preventing damage 4–3
- Dual Format, Double Layer optical drive
 - spare part number 3–5, 3–20, 5–10
- Dual Format, Light Scribe optical drive
 - spare part number 3–5, 3–20, 5–10
- Dual Tuner AC adapter, spare part number 3–19
- Dual Tuner Cable Kit, spare part number 3–20
- Dual Tuner Coaxial Cable Kit, spare part number 3–19
- Dual Tuner Miscellaneous Cable Kit, spare part number 3–20
- Dual Tuner Plastic Stand, spare part number 3–20

Dual TV Tuner
 illustrated 3–10
 spare part number 3–10
DVD/CD-RW Combo Drive
 spare part number 3–5,
 3–9, 3–17, 5–10
 specifications 6–8
DVD±RW/R and CD-RW
 Combo Drive
 removal 5–10
 spare part number 3–5,
 3–9, 3–17, 5–10
 specifications 6–10
DVD-ROM drive
 OS not loading 2–20
 precautions 4–3

E

electrostatic discharge 4–4,
 4–8
Entertainment Y-cable, spare
 part number 3–10
exhaust vents 1–7, 1–8, 1–9,
 1–13, 1–16
expansion base,
 troubleshooting 2–14
expansion port 2 1–7
ExpressCard slot 1–6
external monitor port
 location 1–9
 pin assignments A–3

F

f1 to **f12** keys 1–11
fan
 locations 1–17
 removal 5–54

 spare part numbers 3–5,
 3–20, 5–54
features 1–2
flowcharts, troubleshooting
 no audio 2–21, 2–22
 no network/modem
 connection 2–26
 no OS loading 2–15
 no OS loading from
 CD-ROM/DVD-ROM
 Drive 2–20
 no OS loading from
 diskette drive 2–19
 no OS loading from hard
 drive 2–16, 2–17, 2–18
 no power 2–8, 2–10, 2–11
 no video 2–12, 2–13
nonfunctioning device
 2–23
nonfunctioning expansion
 base 2–14
nonfunctioning keyboard
 2–24
nonfunctioning pointing
 device 2–25
 OS not loading 2–15

fn key 1–11

front components 1–5

G

grounding equipment and
 methods 4–7

H

hard drive
 OS not loading 2–16
 precautions 4–3

- removal 5–7
- spare part numbers 3–7,
3–9, 3–17, 3–20
- specifications 6–5, 6–6
- hard drive activity light 1–5
- hard drive bay 1–17
- hard drive cover
 - removal 5–7
- headphone jack
 - location 1–8
 - pin assignments A–6
- headset, spare part number
3–11, 3–15
- heat sink module
 - removal 5–58
 - spare part number 3–5,
3–19, 5–58

I

- I/O address specifications
6–15
- infrared board
 - removal 5–36
 - spare part number 3–7,
3–19, 5–36
- interrupt specifications 6–13

K

- keyboard
 - removal 5–21
 - spare part numbers 3–3,
3–17, 3–18, 5–21
 - troubleshooting 2–24
- keyboard components 1–9,
1–10
- keypad keys 1–11

L

- label area 1–17
- LED board
 - removal 5–19
 - spare part number 3–3,
3–20, 5–19
- left-side components 1–8
- Logo Kit, spare part number
3–11, 3–18

M

- mass storage devices, spare
part numbers 3–9
- Media Center mini remote
control
 - illustrated 3–10
 - spare part number 3–10
- memory map specifications
6–18
- memory module
 - removal 5–12
 - spare part numbers 3–7,
3–17, 5–12
- memory module compartment
1–17
- memory module compartment
cover
 - removal 5–13
- microphone jack
 - location 1–8
 - pin assignments A–5
- Mini PCI communications
card
 - removal 5–15
 - spare part numbers 3–7,
3–15, 3–19, 5–15

Mini PCI compartment 1–17
Miscellaneous Cable Kit,
 spare part number 3–10
Miscellaneous Plastics Kit
 components 3–7, 3–8
 spare part number 3–7,
 3–18
Miscellaneous Screw Kit,
 spare part number 3–18
modem board
 removal 5–56
 spare part number 3–5,
 3–19, 5–56
modem jack
 location 1–7
 pin assignments A–4
modem, troubleshooting 2–26
monitor port
 location 1–9
 pin assignments A–3
mouse, spare part number
 3–11, 3–14

N

network jack
 location 1–7
 pin assignments A–2
network, troubleshooting 2–26
nonfunctioning device,
 troubleshooting 2–14, 2–23
notebook feet
 locations 5–10
notebook specifications 6–1
notebook top components
 1–14

num lock key 1–11
num lock light 1–15

O

operating system not loading,
 troubleshooting 2–15
optical drive
 location 1–8
 OS not loading 2–20
 removal 5–10
 spare part number 3–5,
 3–20, 5–10
 spare part numbers 3–5,
 3–9, 3–17, 3–20, 5–10

P

packing precautions 4–5
PC Card eject buttons 1–7
PC Card slots 1–7
plastic parts 4–2
pointing device,
 troubleshooting 2–25
power connector 1–9
power cord
 set requirements B–2
 spare part numbers 3–12,
 3–13, 3–14, 3–15, 3–16
power management features
 1–4
power, troubleshooting 2–8
power/standby button 1–13
power/standby light 1–5
processor
 removal 5–60
 spare part numbers 3–5,
 5–60

Q

Quick Launch buttons 1–13

R

rear components 1–8

remote control, spare part
number 3–11, 3–15

removal and replacement
preliminaries 4–1

removal and replacement
procedures 5–1

right-side components 1–6

RJ-11 (modem) jack
location 1–7

pin assignments A–4

RJ-45 (network) jack
location 1–7

pin assignments A–2

S

Screw Kit, spare part number
3–11, 3–19

screw listing C–1

security cable slot 1–9

serial number 3–1, 5–2

service considerations 4–2

speakers

location 1–5

removal 5–49

spare part number 3–5,
3–20, 5–49

specifications

battery pack 6–7

display 6–3, 6–4

DMA 6–12

DVD/CD-RW Combo
Drive 6–8

DVD±RW/R and CD-RW

Combo Drive 6–10

hard drive 6–5, 6–6

I/O addresses 6–15

interrupts 6–13

memory map 6–18

notebook 6–1

static shielding materials 4–8

S-Video-out jack

location 1–9

pin assignments A–2

switch cover

removal 5–17

spare part numbers 3–3,
3–19, 3–20, 5–17

system board

removal 5–42

spare part numbers 3–5,
5–42

system memory map 6–18

T

tools required 4–1

top cover

removal 5–30

spare part number 3–3,
3–18, 5–30

TouchPad 1–15

TouchPad button 1–15

TouchPad left/right buttons
1–15

TouchPad light 1–15

TouchPad scroll zone 1–15

transporting precautions 4–5

- troubleshooting
 - audio 2-21
 - Computer Setup 2-1
 - expansion base 2-14
 - flowcharts 2-5
 - keyboard 2-24
 - modem 2-26
 - network 2-26
 - nonfunctioning device 2-14, 2-23
 - OS not loading 2-15
 - overview 2-1
 - pointing device 2-25
 - power 2-8
 - video 2-12

- TV tuner AC adapter
 - illustrated 3-10
 - spare part number 3-10
- TV tuner stand
 - illustrated 3-10
 - spare part number 3-10

U

- Universal Serial Bus (USB)
 - port
 - location 1-7, 1-8, 1-9
 - pin assignments A-1

- upper keyboard components 1-12

- USB digital drive, spare part number 3-11

- USB diskette drive, spare part number 3-11

- USB travel mouse, spare part number 3-11, 3-14

V

- video troubleshooting 2-12

- volume buttons 1-13

W

- Windows applications key 1-11

- Windows logo key 1-11

- wireless button 1-15

- wireless light 1-15

- workstation precautions 4-6