



Maintenance and Service Guide

HP Pavilion zd7000 Series Notebook PC
HP Media Center zd7000 Series
Notebook PC
HP Compaq nx9500 Series
Business Notebook

Document Part Number: 333621-003

August 2004

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 2003, 2004 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. SD Logo is a trademark of its proprietor. Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license.

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 zd7000 Series Notebook PC

HP Media Center zd7000 Series Notebook PC

HP Compaq nx9500 Series Business Notebook

Third Edition August 2004

First Edition August 2003

Document Part Number: 333621-003

Contents

1 Product Description

- 1.1 Models 1–2
- 1.2 Features 1–13
- 1.3 Clearing a Password 1–16
- 1.4 Power Management 1–16
- 1.5 External Components 1–17
- 1.6 Design Overview 1–27

2 Troubleshooting

- 2.1 Computer Setup and Diagnostics Utilities 2–2
 - Using Computer Setup 2–3
 - Selecting from the File Menu 2–4
 - Selecting from the Security Menu 2–5
 - Selecting from the Advanced Menu 2–7
- 2.2 Using Diagnostics for Windows 2–9
 - Obtaining, Saving or Printing Configuration Information 2–9
 - Obtaining, Saving or Printing Diagnostic Test Information 2–10
- 2.3 Troubleshooting Flowcharts 2–12

3 Illustrated Parts Catalog

- 3.1 Serial Number Location 3–2
- 3.2 Notebook Major Components 3–3
- 3.3 Miscellaneous Plastics Kit Components 3–17
- 3.4 Miscellaneous Cable Kit Components 3–18

3.5 Mass Storage Devices	3–19
3.6 Personal Video Recorder Devices.	3–21
3.7 Miscellaneous	3–23

4 Removal and Replacement Preliminaries

4.1 Tools Required	4–1
4.2 Service Considerations	4–2
Plastic Parts	4–2
Cables and Connectors	4–2
4.3 Preventing Damage to Removable Drives	4–3
4.4 Preventing Electrostatic Damage	4–4
4.5 Packaging and Transporting Precautions	4–4
4.6 Workstation Precautions	4–5
4.7 Grounding Equipment and Methods	4–5

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	5–4
5.4 Notebook Feet	5–9
5.5 Memory Module	5–10
5.6 Mini PCI Communications Card.	5–13
5.7 Optical Drive.	5–15
5.8 Keyboard.	5–17
5.9 Keyboard Cover	5–22
5.10 Display Assembly	5–24
5.11 Top Cover	5–26
5.12 System Board	5–30
5.13 RTC Battery	5–34
5.14 Heat Sink.	5–35
5.15 Processor	5–39
5.16 SD Card Slot/Infrared Module	5–41
5.17 Speakers	5–43

6 Specifications

A Connector Pin Assignments

B Power Cord Set Requirements

3-Conductor Power Cord Set	B-1
General Requirements	B-1
Country-Specific Requirements	B-2

C Screw Listing

Index

1

Product Description

The HP Pavilion zd7000 Series Notebook PC, the HP Media Center zd7000 Series Notebook PC, and the HP Compaq nx9500 Series Business Notebook offer advanced modularity, Intel® Pentium® processors with 64-bit architecture, industry-leading NVIDIA graphics controllers, and extensive multimedia support.



*HP Pavilion zd7000 Series Notebook PC,
HP Media Center zd7000 Series Notebook PC, and
HP Compaq nx9500 Series Business Notebook*

1.1 Models

Notebook model information is shown in Tables 1-1 and 1-2.

Table 1-1

**HP Pavilion zd7000 Series Notebook PC,
HP Media Center zd7000 Series Notebook PC, and
HP Compaq nx9500 Series Business Notebook
Model Naming Conventions**

Key										
V	P	32 0	Y7	80	Y	Gg	10	H	a	XXXXXX-XXX
1	2	3	4	5	6	7	8	9	10	11
Key	Description			Options						
1	Brand/Series designator			V = Pavilion C = Compaq						
2	Processor type			P = Intel Pentium 4						
3	Processor speed			340 = 3.40 GHz 320 = 3.20 GHz 306 = 3.06 GHz				280 = 2.80 GHz 266 = 2.66 GHz		
4	Display type/size/resolution			Y = wide SXGA+ (1680 × 1050) W = wide XGA (1280 × 800) H = wide SXGA+ WVA				7 = 17.1 in 5 = 15.4 in		
5	Hard drive size*			80 = 80 GB				60 = 60 GB		
6	Optical drive designator			Y = DVD+RW/R and CD-RW Combo Drive				W = DVD/CD-RW Combo Drive		
7	Integrated communication/wireless device			G = combination modem + GB NIC g = 802.11g Bluetooth® N = none						

Table 1-1
HP Pavilion zd7000 Series Notebook PC,
HP Media Center zd7000 Series Notebook PC, and
HP Compaq nx9500 Series Business Notebook
Model Naming Conventions (*Continued*)

Key	Description	Options	
8	RAM	10 = 1024 MB 76 = 768 MB	51 = 512 MB
9	Operating system	H = Microsoft® Windows® XP Home C = Microsoft Windows XP Media Center P = Microsoft Windows XP Professional	
10	Warranty	a = 1/1/0 (1 year parts, 1 year labor, no onsite support)	
11	SKU#		

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

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7001	P	320	Y7	80	Y	Gg	76	H	
France			DP353E ABF			Spain		DP353E ABE	
Germany			DP763E ABD			Switzerland		DP353E UUZ	
Italy			DP353E ABZ			United Kingdom		DP353E ABU	
V7066	P	320	Y7	80	Y	Gg	51	H	
Switzerland			DV277E UUZ						
V7070	P	320	Y7	80	Y	Gg	10	H	
United Kingdom			DP766E ABU						
V7080	P	320	Y7	80	Y	Gg	10	H	
United Kingdom			DY626E ABU						
V7168	P	320	Y7	80	Y	Gg	51	H	
Germany			PB941EA ABD						
V7169	P	320	Y7	80	Y	Gg	10	H	
Sweden/Finland			PB943EA AK8						
V7170	P	320	Y7	80	Y	Gg	51	H	
Spain			PB942EA ABE			United Kingdom		PB942 EA ABU	
V7180	P	320	Y7	80	Y	Gg	10	C	
United States			DS492U ABA						

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (Continued)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7188	P	320	Y7	80	Y	Gg	51	H	
United States			DS492U ABA						
V7198	P	320	Y7	80	Y	Gg	51	C	
United States			DV601U ABA						
V7260	P	320	Y7	80	Y	Gg	51	H	a
United States			PF163UA ABA						
V7269	P	320	W7	80	Y	Gg	10	H	a
United States			PF167UA ABA						
V7280	P	320	Y7	80	Y	Gg	10	C	
United States			PF164UA ABA						
V7999	P	320	Y7	80	Y	Gg	10	H	
United States			DP446U ABA						
V7167	P	320	Y7	60	Y	Gg	51	H	
Germany			PB952EA ABD						
V7001	P	306	Y7	80	W	GN	51	H	
United States			DM793A ABA						
7030	P	306	Y7	80	Y	Gg	51	C	
United States			DM790A ABA						

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (Continued)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

7065	P	306	Y7	80	Y	Gg	51	H	
United Kingdom		DY624E ABU							
V7168	P	306	Y7	80	W	Gg	51	H	
United States		DS491U ABA							
V7015	P	306	Y7	60	Y	Gg	51	C	
United States		DT859U ABA							
V7055	P	306	Y7	80	Y	Gb	51	H	
Spain		DV274E ABE							
V7060	P	306	Yu	60	Y	Gg	51	H	
Switzerland		DV271E UUZ				United Kingdom		DV271E ABU	
V7063	P	300	Y7	80	Y	Gg	51	H	
United States		DS488U ABA							
V7141	P	300	Y7	80	Y	Gb	51	H	
Italy		PB949EA ABZ							
V7143	P	300	Y7	80	Y	Gb	51	H	
United Kingdom		PB944EA ABU							
V7144	P	300	Y7	80	Y	Gb	51	H	
France		PB947EA ABF							

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (Continued)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7145	P	300	Y7	80	Y	Gb	51	H	
United Kingdom		PB950EA ABU							
V7150	P	300	Y7	80	Y	Gg	51	H	
United States		DS488U ABA							
V7160	P	300	Y7	80	Y	Gg	51	H	
United States		DS488U ABA							
V7249	P	300	W7	80	Y	Gg	51	P	a
United States		PF166UA ABA							
V7139	P	300	Y7	60	Y	Gg	51	H	
Sweden/Finland		PB951EA AK8							
V7140	P	300	Y7	60	W	Gg	51	H	
United States		DS487U ABA							
V7160	P	300	Y7	60	W	Gg	51	H	
United States		DZ379U ABC							
V7020	P	280	Y7	80	Y	Gg	51	H	
United States		DR089 ABA							
V7045	P	280	Y7	80	Y	Gg	51	H	
France		DY625E ABF							

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (Continued)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7058	P	280	Y7	80	W	Gg	51	H	
United States			DP791A ABA						
V7131	P	280	Y7	80	Y	Gg	51	H	
France			PB946EA ABF						
V7005	P	280	Y7	60	Y	Gg	51	C	
United States			DP448U ABA						
V7038	P	280	Y7	60	W	GN	51	H	
Italy			DR770E ABZ						
V7040	P	280	Yu	60	Y	GN	51	H	
France			DP761E ABT			Spain		DP761E ABE	
Germany			DP652E ABD			Switzerland		DP761E UUZ	
Italy			DP761E ABZ			United Kingdom		DP761E ABU	
v7040	P	280	Y7	60	Y	Gg	51	H	
United States			DM789A ABA						
v7040	P	280	Y7	60	Y	Gg	51	H	
United States			DM789A ABA						
V7048	P	280	Y7	60	y	Gg	51	H	
United States			DV275E ABZ						
V7049	P	280	Y7	60	Y	Gg	51	H	
Switzerland			DY627E UUZ						

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (*Continued*)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7050	P	280	Y7	60	Y	Gg	51	H	
Germany			DP770E ABD			Spain			DP767E ABE
Italy			DP767E ABZ			United Kingdom			DP767E ABU
V7101	P	280	Y7	60	W	Gg	51	H	
United States			DP684AS ABA						
V7112	P	280	Y7	60	W	GN	51	H	
France			PB945EA ABF						
V7120	P	280	Y7	60	W	Gg	51	H	
Sweden			DV287E AK8						
V7128	P	280	Y7	60	W	Gg	51	H	
Italy			PB948EA ABZ						
V7020	P	280	Y7	40	W	Gg	51	H	
Germany			DV268E ABD						
V7102	P	280	Y7	40	W	Gg	51	H	
United States			DZ378U ABA						
V7128	P	280	Y7	40	W	Gg	51	H	
Italy			PB948EA ABZ						
V7035	P	280	Y7	40	W	GN	51	H	
Italy			DP768E ABZ			United Kingdom			DP768E ABU

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (Continued)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7101	P	280	Y7	40	W	GN	51	H	
United States			DS490U ABA						
V7005	P	266	Y7	60	W	GN	25	H	
France			DV269E ABF						
V7010	P	266	Y7	60	W	Gg	51	H	
United States			DM788A ABA						
V7030	P	266	Y7	60	Y	Gg	51	H	
France			DP765E ABF			Switzerland		DP765E UUZ	
V7050	P	266	Y7	60	Y	Gg	51	H	
United States			DT860U ABA						
V7129	P	266	Y7	60	Y	GN	51	H	
France			DV270E ABF						
v7998	P	266	W5	60	W	Gg	51	H	
United States			DP447U ABA						
V7005	P	266	W5	40	W	Gg	51	H	
United States			DR341U ABA						
V7009	P	266	Y7	40	W	GN	51	H	
France			DR768E ABF						

Table 1-2
HP Pavilion zd7000 Series Notebook PC and
HP Media Center zd7000
Series Notebook PC Models (*Continued*)

All HP Pavilion zd7000 Series Notebook PC and HP Media Center zd7000 Series Notebook PC models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

V7010	P	266	Y7	40	W	Gg	51	H	
Canada/English			DR340U ABL			Canada/French			DR340U ABC
V7010	P	266	Y7	40	W	GN	51	H	
Italy			DP764E ABZ			Switzerland			DP764E UUZ
Spain			DP764E ABE			United Kingdom			DP764E ABU
V7012	P	266	Y7	40	Y	GN	51	H	
France			DR769E ABF						
V7015	P	266	Y7	40	Y	GN	51	H	
Germany			DP769E ABD						

Table 1-3


HP Compaq nx9500 Series Business Notebook Models

All HP Compaq nx9500 Series Business Notebook models feature

- TouchPad pointing device.
- 12-cell lithium-ion (Li-Ion) battery pack.
- 1-year warranty on parts and labor.

C9500	P	320	W7	80	Y	Gg	10	P	
Canada - French			PF032UA ABC			United States			PF032UA ABA
C9500	P	300	W7	60	Y	Gg	51	P	
Canada - French			PF031UA ABC			United States			PF031UA ABA
C9500	P	300	W7	60	W	Gg	51	P	
Canada - French			PF030UA ABC			United States			PF030UA ABA

1.2 Features

- The following processors, all with 512-KB L2 cache, are available, varying by notebook model:
 - ❑ Intel® Pentium® 4 3.4-, 3.2-, 3.0-, and 2.8-GHz processors with 800-MHz FSB and Hyper-Threading
 - ❑ Intel Pentium 4 3.06-, 2.8-, and 2.66-GHz processors with 533-MHz FSB
- 17.0-inch wide XGA (1440 × 900), 15.4-inch wide XGA (1280 × 800) TFT display with over 16.7 million colors, or 17.0-inch wide WSXGA (1680 x 1050) TFT display, varying by notebook model
- NVIDIA GeForce FX Go5200 Ultra with 128-MB video memory, NVIDIA GeForce FX Go5200 Ultra with 64-MB video memory, NVIDIA GeForce FX Go5600 Ultra with 128-MB video memory, NVIDIA GeForce FX Go5600 Ultra with 64-MB video memory, NVIDIA GeForce FX Go5700 with 128-MB video memory, or NVIDIA GeForce FX Go5700 with 64-MB video memory, varying by notebook model
- 100-, 80-, 60-, or 40-GB high-capacity 4200-rpm hard drive, 80-, 60-, or 40-GB high-capacity 5400-rpm hard drive, or 60-GB high-capacity 7200-rpm hard drive, varying by notebook model
 -  1 GB = one billion bytes when referring to hard drive storage capacity. Accessible capacity is less.

- 1024-, 512-, or 256-MB DDR synchronous DRAM (SDRAM) at 333 MHz, expandable to 2.0 GB
- Microsoft® Windows® XP Home Edition, Microsoft Windows XP Professional, or Microsoft Windows XP Media Center Edition, varying by notebook model
- Full-size Windows keyboard with integrated numeric keypad
- TouchPad pointing device with on/off button and dedicated vertical scroll up/down pad
- Integrated Secure Digital (SD) Memory Card slot
- Integrated 10/100BASE-T Ethernet local area network (LAN) network interface card (NIC) with RJ-45 (network) connector
- Integrated wireless support for Mini PCI 802.11b/g and Bluetooth® LAN devices
- One Type II PC Card slot with support for both 32-bit (CardBus) and 16-bit PC Cards
- External 135- or 120-watt AC adapter with power cord
- 12-cell Li-Ion battery pack
- Harman/Kardon stereo speakers

- Support for the following optical drives:
 - ❑ 24X Max DVD/CD-RW Combo Drive
 - ❑ 8X Max DVD-ROM Drive
 - ❑ Generic multi-speed DVD+RW/R and CD-RW Combo Drive
 - ❑ 8X Max DVD+RW/R and CD-RW Combo Drive
 - ❑ 4X Max DVD+RW/R and CD-RW Combo Drive
 - ❑ 2X Max DVD+RW/R and CD-RW Combo Drive
- Connectors:
 - ❑ SD Card slot
 - ❑ Infrared port
 - ❑ One Type II PC Card slot
 - ❑ RJ-11 (modem) jack
 - ❑ RJ-45 (network) jack
 - ❑ 4 Universal Serial Bus (USB) v. 2.0 ports
 - ❑ S-Video jack
 - ❑ Parallel port
 - ❑ External monitor port
 - ❑ Power connector
 - ❑ Docking connector
 - ❑ IEEE 1394 digital port
 - ❑ Audio-in (microphone) jack
 - ❑ Audio-out (headphone) jack

1.3 Clearing a Password

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 5.13, “RTC Battery,”](#) for more information).
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.

1.4 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

1.5 External Components

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



The notebook component locations are identical for all models of the HP Pavilion zd7000 Series Notebook PC, HP Media Center zd7000 Series Notebook PC, and HP Compaq nx9500 Series Business Notebook. Plastic components of the HP Compaq nx9500 Series Business Notebook appear different from the HP Pavilion and HP Media Center zd7000 models only by color.

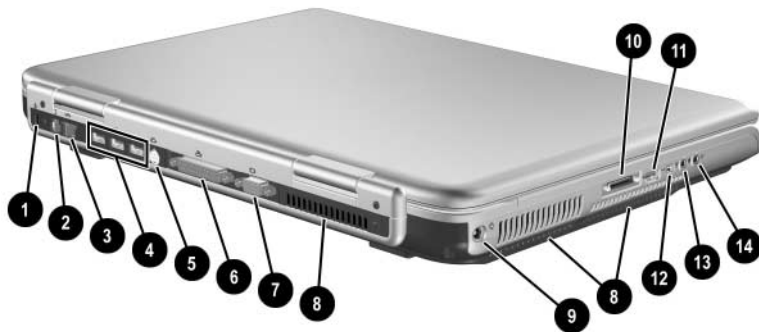


Front Panel and Right-Side Components

Table 1-4
Front and Right Side Components

Item	Component	Function
1	Display release latch	Opens the notebook.
2	Stereo speakers (2)	Produce stereo sound.
3	Integrated Drive Electronics (IDE) drive LED	On: The internal hard drive or optical drive is being accessed.
4	Battery LED	<ul style="list-style-type: none">■ On: The notebook is receiving battery power.■ Amber: A battery pack is charging.■ Green: A battery pack is fully charged.■ Flashing: A battery pack is malfunctioning and might need to be replaced.
5	Power LED	On: The notebook is receiving AC power.
6	Power/standby LED	On: Notebook is turned on. Flashing: Notebook is in Standby.
7	Digital Media Slot	Supports SD Card, MultiMediaCard, Memory Stick, and SmartMedia digital memory cards.
8	Infrared port	Provides wireless communication between the notebook and an optional IrDA-compliant device.
9	Optical drive	Supports an optical disc.
10	PC Card eject button	Ejects an optional PC Card from the PC Card slot.
11	PC Card slot	Supports an optional Type I or Type II 32-bit (CardBus) or 16-bit PC Card.

The external components on the rear panel and left side are shown below and described in Table 1-5.



Rear Panel and Left-Side Components

Table 1-5

Rear Panel and Left-Side Components



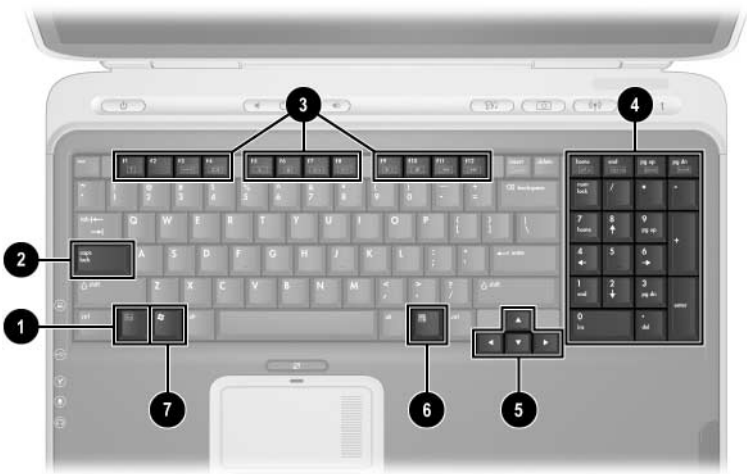
Item	Component	Function
1	Security cable slot	Attaches an optional security cable to the notebook.  The purpose of security solutions is to act as a deterrent. These solutions do not prevent the product from being mishandled or stolen.
2	RJ-11 (modem) jack	Connects a modem cable.
3	RJ-45 (network) jack	Connects an Ethernet network cable.
4	USB ports (3)	Connect optional USB 2.0-compliant devices.
5	S-Video jack	Connects an optional S-Video device, such as a television, VCR, camcorder, projector, or video capture card.

Table 1-5
Rear Panel and Left-Side Components (Continued)

Item	Component	Function
6	Parallel port	Connects an optional parallel device such as a printer.
7	External monitor port	Connects an optional VGA external monitor or projector.
8	Vents (3)	Allow airflow to cool internal components.  To prevent overheating, use the notebook only on hard surfaces that cannot obstruct the vents. Do not allow a soft surface, such as bedding, clothing, or a thick rug, to block airflow.
9	Power connector	Connects an AC adapter cable.
10	HP Notebook Expansion Base connector	Connects to an optional expansion base.
11	USB port	Connects optional USB 2.0-compliant devices.
12	1394 port	Connects an optional 1394 device such as a camcorder or digital camera.
13	Audio-in (microphone) jack	Connects an optional monaural or stereo microphone.
14	Audio-out (headphone) jack	Connects optional headphone or powered stereo speakers. Also connects the audio function of an audio/video device such as a television or VCR.

The notebook keyboard components are shown below and described in Table 1-6.

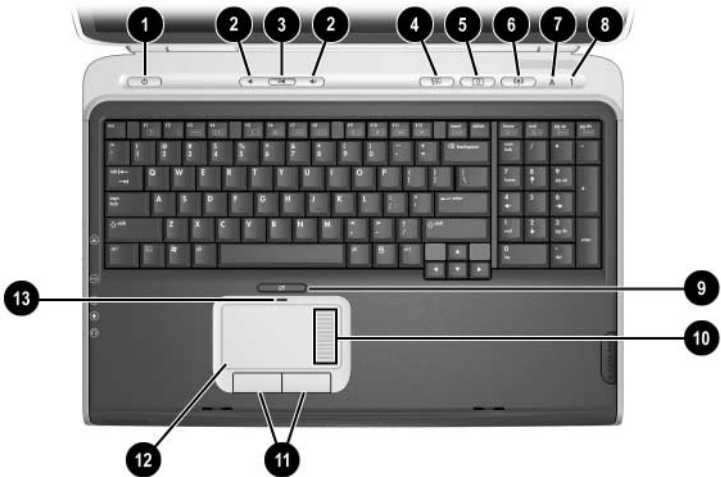


Keyboard Components

Table 1-6
Keyboard Components

Item	Component	Function
1	fn key	Executes frequently used system functions when pressed in combination with another key.
2	caps lock key	Enables caps lock and turns on the caps lock LED.
3	f1 through f12 function keys	Perform system and application tasks. When combined with the fn key, the function keys f1 and f3 through f12 perform additional tasks as hotkeys.
4	Keypad keys (17)	Standard numeric keypad.
5	Cursor control keys	Move the cursor around the screen.
6	Windows applications key	Displays a shortcut menu for items beneath the pointer.
7	Windows logo key	Displays the Windows Start menu.

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




Top Components

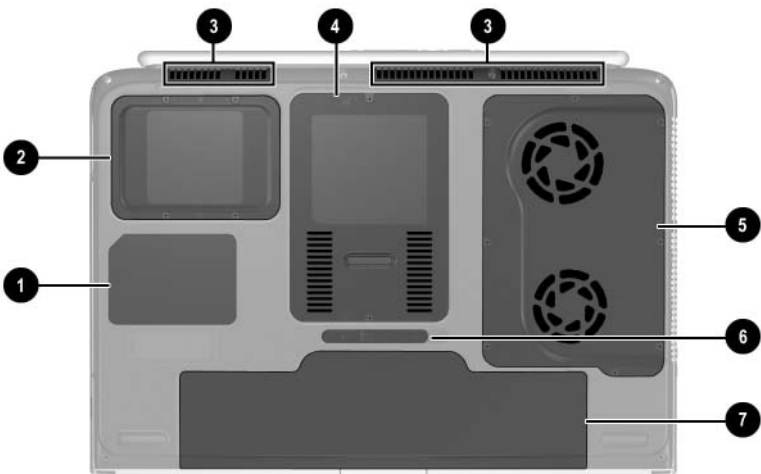
Table 1-7
Top Components

Item	Component	Function
1	Power button	When the notebook is: <ul style="list-style-type: none"> ■ Off, press to turn on the notebook. ■ On, briefly press to initiate Hibernation. ■ In Standby, briefly press to resume from Standby. ■ In Hibernation, briefly press to restore from Hibernation.
	Power/standby LED	<ul style="list-style-type: none"> ■ On: Notebook is turned on. ■ Flashing: Notebook is in Standby.
2	Volume control buttons (2)	Increase or decrease system volume.

Table 1-7
Top Components (Continued)

Item	Component	Function
3	Mute button	Mutes or restores volume.
	Mute LED	On: Volume is muted.
4	Media button	Launches a multimedia application.
5	Picture button	Launches a digital imaging application.
		 The settings for the media and picture buttons can be changed. Refer to the “Using Custom Assignments and Schemes” section in Chapter 3 of the <i>Startup and Reference Guide</i> for information on reassigning these buttons to other applications.
6	Wireless button	Turns the wireless network device on and off.
	Wireless LED	On: an integrated wireless device has been enabled.
7	Caps lock LED	On: Caps lock is on.
8	Num lock LED	On: Num lock is on.
9	TouchPad on/off button	Enables/disables the TouchPad.
10	TouchPad scroll zone	Scrolls upward or downward.
11	Left and right TouchPad buttons	Function like the left and right buttons on an external mouse.
12	TouchPad	Moves the pointer and selects or activates items on the screen.
13	TouchPad LED	On: TouchPad is enabled.

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	Labels area	Contains the notebook serial number and other applicable regulatory labels.
2	Hard drive bay	Holds the internal hard drive.

Table 1-8
Bottom Components (*Continued*)

Item	Component	Function
3	Vents (3)	Allow airflow to cool internal components.  To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, can block airflow.
4	Memory module/Mini PCI compartment	Contains 2 memory slots for optional 256-, 512-, or 1024-MB memory modules and 1 slot for a Mini PCI wireless card.
5	Fan compartment	Contains the heat sink and the 2 system fans.
6	Battery release latch	Releases a battery pack from the battery bay.
7	Battery bay	Holds the battery pack.

1.6 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
- Fan
- 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 turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software applications. Exhaust air is displaced through the ventilation grill located on the left side of the notebook.

2

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 and Diagnostics Utilities

The notebook features 2 system management utilities:

- **Computer Setup**—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.
- **Diagnostics for Windows**—A system information and diagnostic utility that is used within the Windows operating system. Use this utility whenever possible to
 - ❑ Display system information.
 - ❑ Test system components.
 - ❑ Troubleshoot a device configuration problem in Windows XP Professional, Windows XP Home, or Windows Media Center.



It is not necessary to configure a device connected to a USB port on the notebook or to an optional docking device.

Using Computer Setup

Information and settings in Computer Setup are accessed from the File, Security, or Advanced 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, press **f2**.
 - ❑ To view navigation information, press **f1**.
 - ❑ To return to the Computer Setup menu, press **esc**.
2. Select the **File**, **Security**, or **Advanced** menu.
3. To close Computer Setup and restart the notebook:
 - ❑ Select **File > Save Changes and Exit** and press **enter**.
 - or -
 - ❑ Select **File > Ignore Changes and Exit** and press **enter**.
4. When you are prompted to confirm your action, press **f10**.

Selecting from the File Menu

Table 2-1
File Menu

Select	To Do This
System Information	<ul style="list-style-type: none">■ View identification information about the notebook, an expansion base, and any battery packs in the system.■ View specification information about the processor, memory and cache size, and system ROM.
Save to Floppy	Save system configuration settings to a diskette.
Restore from Floppy	Restore system configuration settings from a diskette.
Restore Defaults	Replace configuration settings in Computer Setup with factory default settings. Identification information is retained.
Ignore Changes and Exit	Cancel changes entered during the current session, and then exit and restart the notebook.
Save Changes and Exit	Save changes entered during the current session, and then exit and restart the notebook.

Selecting from the Security Menu

Table 2-2
Security Menu




Select	To Do This
Setup Password	Enter, change, or delete a Setup password. The Setup password is called an administrator password in Computer Security, a program accessed from the Windows Control Panel.
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>

Table 2-2
Security Menu (*Continued*)

Select	To Do This
Device Security	Enable/disable: <ul style="list-style-type: none">■ Ports or diskette drives*■ Diskette write*■ CD-ROM or diskette startup <p> Settings for a DVD-ROM can be entered in the CD-ROM field.</p>
System IDs	Enter identification numbers for the notebook, a docking device, and all battery packs in the system.

*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 Options	<p>Enable/disable:</p> <ul style="list-style-type: none"> ■ QuickBoot, which starts the notebook more quickly by eliminating some startup tests. (If you suspect a memory failure and want to test memory automatically during startup, disable QuickBoot.) ■ MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.
Device Options	<ul style="list-style-type: none"> ■ Enable/disable the embedded numeric keypad at startup. ■ Enable/disable multiple standard pointing devices at startup. (To set the notebook to support only a single, usually nonstandard, pointing device at startup, select Disable.) ■ Enable/disable USB legacy support for a USB keyboard. (When USB legacy support is enabled, the keyboard works even when a Windows operating system is not loaded.) ■ Set an optional external monitor or overhead projector connected to a video card in an expansion base as the primary device. (When the notebook display is set as secondary, the notebook must be shut down before undocking from a docking device.)

Table 2-3
Advanced Menu (*Continued*)

Select	To Do This
Device Options (<i>continued</i>)	<ul style="list-style-type: none"> ■ Change the parallel port mode from Enhanced Parallel Port (EPP, the default setting) to standard, bidirectional, EPP, or Enhanced Capabilities Port (ECP). ■ Set video-out mode to NTSC (default), PAL, NTSC-J, or PAL-M.* ■ Enable/disable all settings in the SpeedStep window. (When Disable is selected, the notebook runs in Battery Optimized mode.) ■ Specify how the notebook recognizes multiple identical docking devices that are identically equipped. Select Disable to recognize the docking device as a single docking device; select Enable to recognize the docking devices individually, by serial number. ■ Enable/disable the reporting of the processor serial number by the processor to the software.
HDD Self Test Options	Run a quick comprehensive self test on hard drives in the system that support the test features.

*Video modes vary even within regions. However, NTSC is common in North America; PAL, in Europe, Africa, and the Middle East; NTSC-J, in Japan; and PAL-M, in Brazil. Other South and Central American regions can use NTSC, PAL, or PAL-M.

2.2 Using Diagnostics for Windows

When you access Diagnostics for Windows, a scan of all system components is displayed on the screen before the diagnostics window opens.

You can display more or less information from anywhere within Diagnostics for Windows by selecting Level on the menu bar.

Diagnostics for Windows is designed to test HP components. If non-HP components are tested, the results might be inconclusive.

Obtaining, Saving or Printing Configuration Information

1. Access Diagnostics for Windows by selecting **Start > Settings > Control Panel > Diagnostics for Windows**.
2. Select **Categories**, and then select a category from the drop-down list.
 - ❑ To save the information, select **File > Save As**.
 - ❑ To print the information, select **File > Print**.
3. To close Diagnostics for Windows, select **File > Exit**.

Obtaining, Saving or Printing Diagnostic Test Information

1. Access Diagnostics for Windows by selecting **Start > Settings > Control Panel > Diagnostics for Windows**.
2. Select the **Test** tab.
3. In the scroll box, select the category or device you want to test.
4. Select a test type:
 - ❑ **Quick Test**—Runs a quick, general test on each device in a selected category.
 - ❑ **Complete Test**—Performs maximum testing on each device in a selected category.
 - ❑ **Custom Test**—Performs maximum testing on a selected device.
 - ◆ To run all tests for your selected device, select the **Check All** button.
 - ◆ To run only the tests you select, select the **Uncheck All** button, and then select the check box for each test you want to run.
5. Select a test mode:
 - ❑ **Interactive Mode**—Provides maximum control over the testing process. You determine whether the test was passed or failed. You might be prompted to insert or remove devices.
 - ❑ **Unattended Mode**—Does not display prompts. If errors are found, they are displayed when testing is complete.

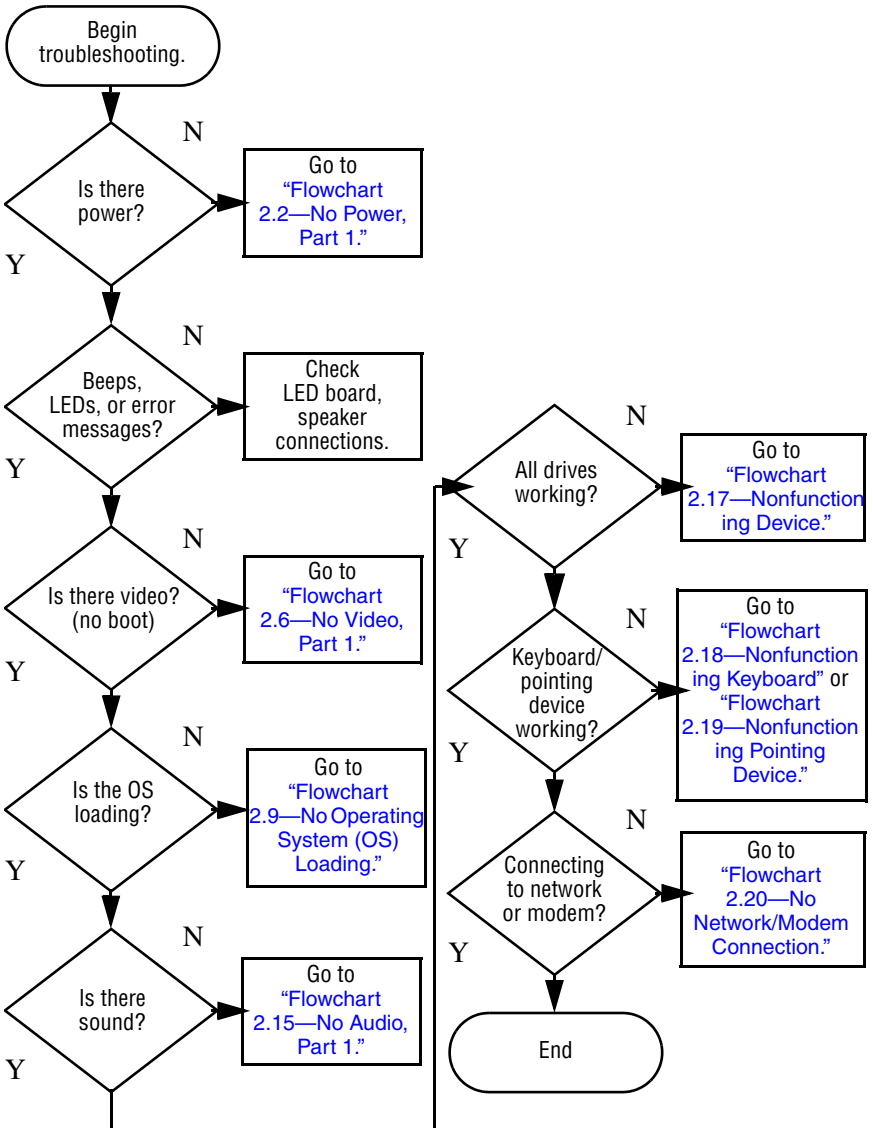
6. Select the **Begin Testing** button.
7. Select a tab to view a test report:
 - ❑ **Status tab**—Summarizes the tests run, passed, and failed during the current testing session.
 - ❑ **Log tab**—Lists tests run on the system, the number of times each test has run, the number of errors found on each test, and the total run time of each test.
 - ❑ **Error tab**—Lists all errors found in the notebook with the corresponding error codes.
8. Select a tab to save the report:
 - ❑ **Log tab**—Select the **Log** tab **Save** button.
 - ❑ **Error tab**—Select the **Error** tab **Save** button.
9. To print the report, select **File > Save As**, and then print the file from your folder.

2.3 Troubleshooting Flowcharts

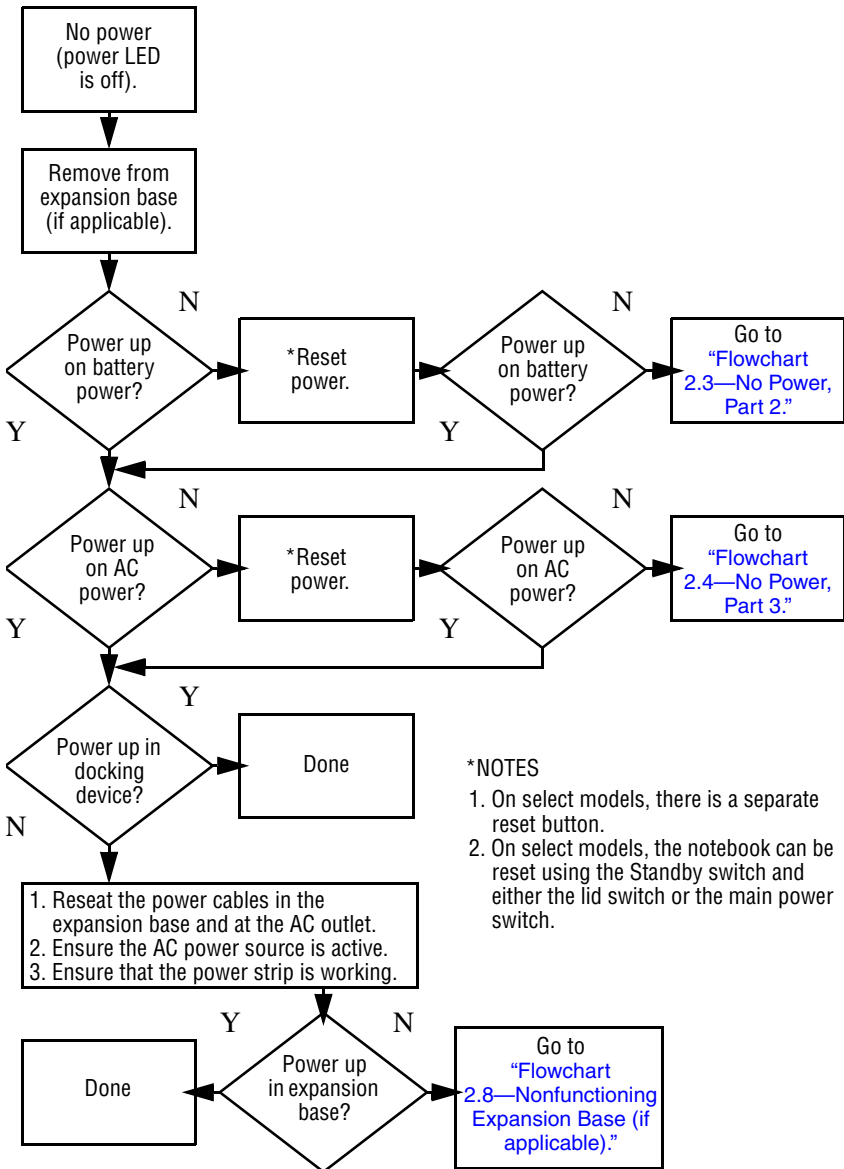
Table 2-4
Troubleshooting Flowcharts Overview

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"
2.14	"Flowchart 2.14—No OS Loading, CD-ROM or DVD-ROM 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"

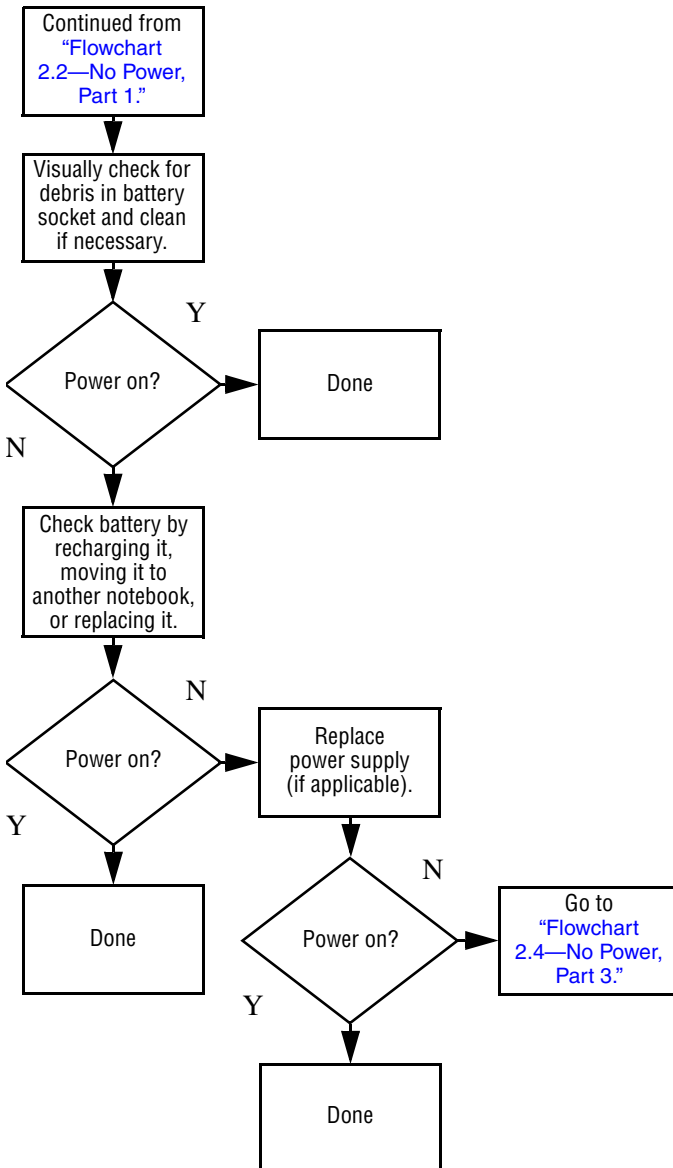
Flowchart 2.1 – Initial Troubleshooting



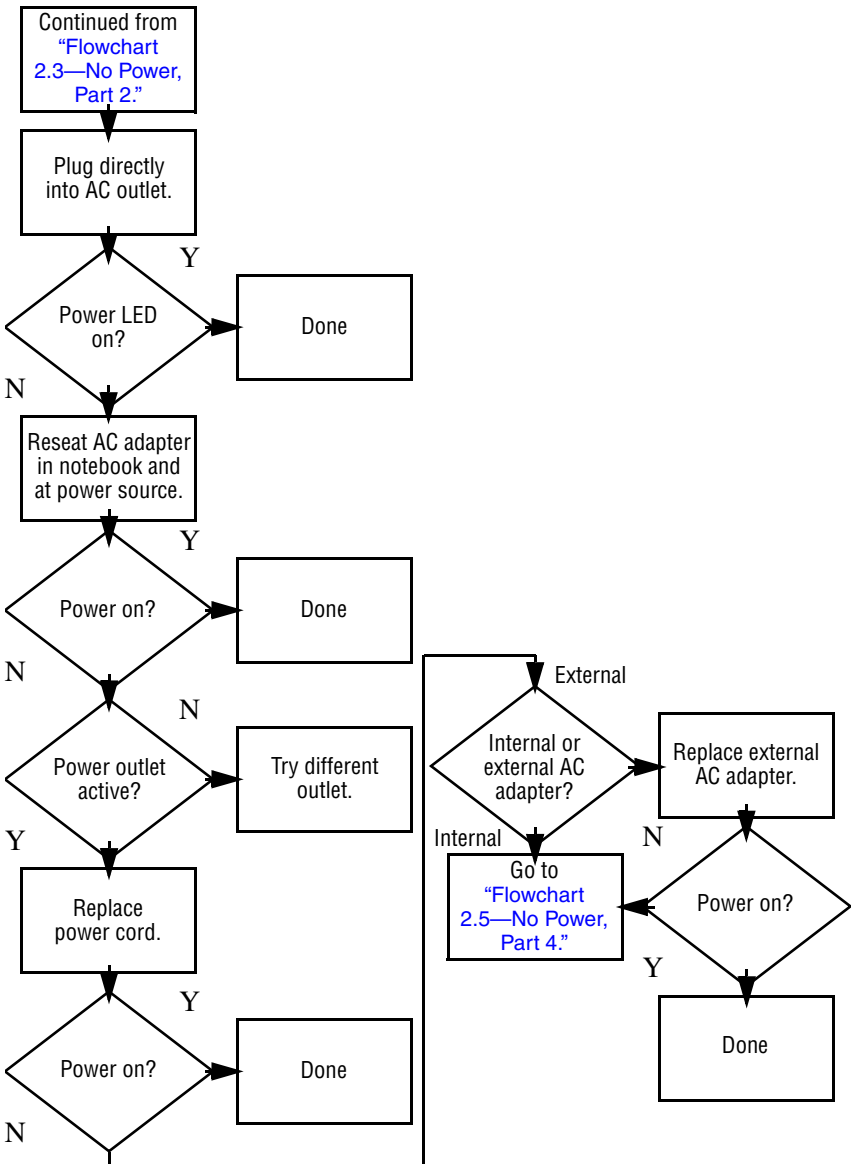
Flowchart 2.2—No Power, Part 1



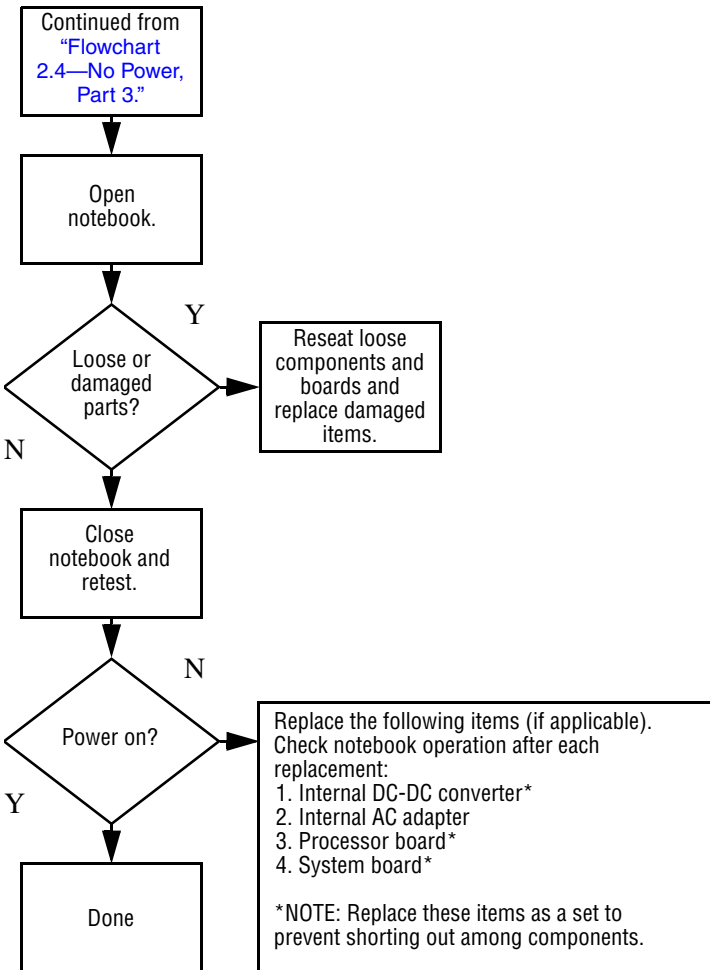
Flowchart 2.3—No Power, Part 2



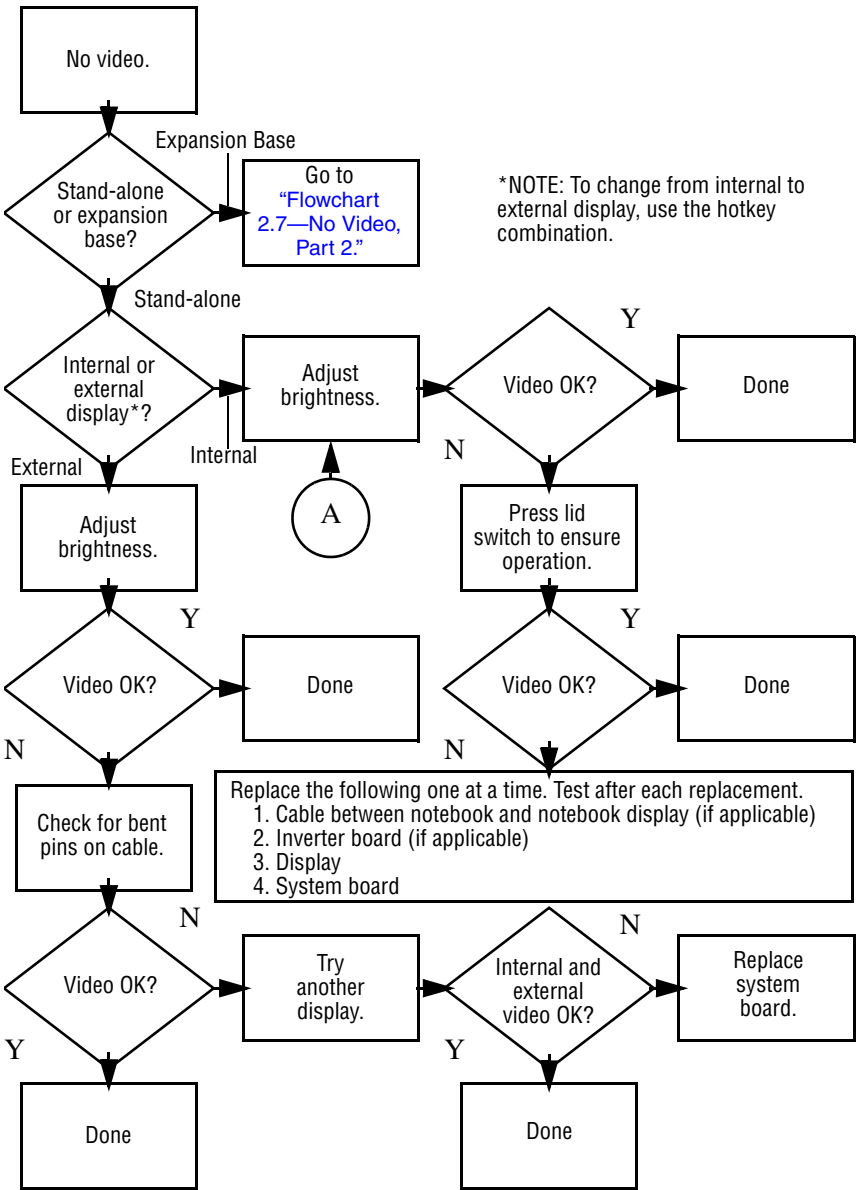
Flowchart 2.4—No Power, Part 3



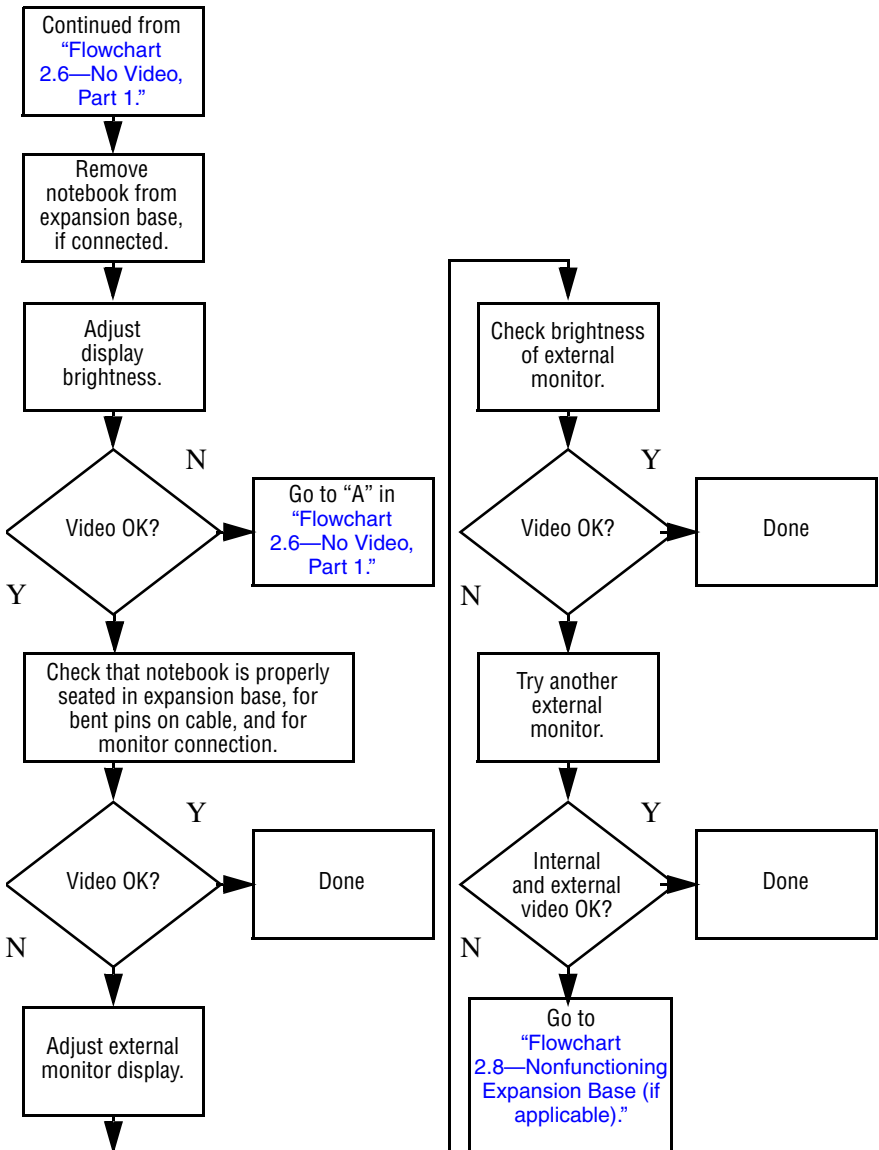
Flowchart 2.5—No Power, Part 4



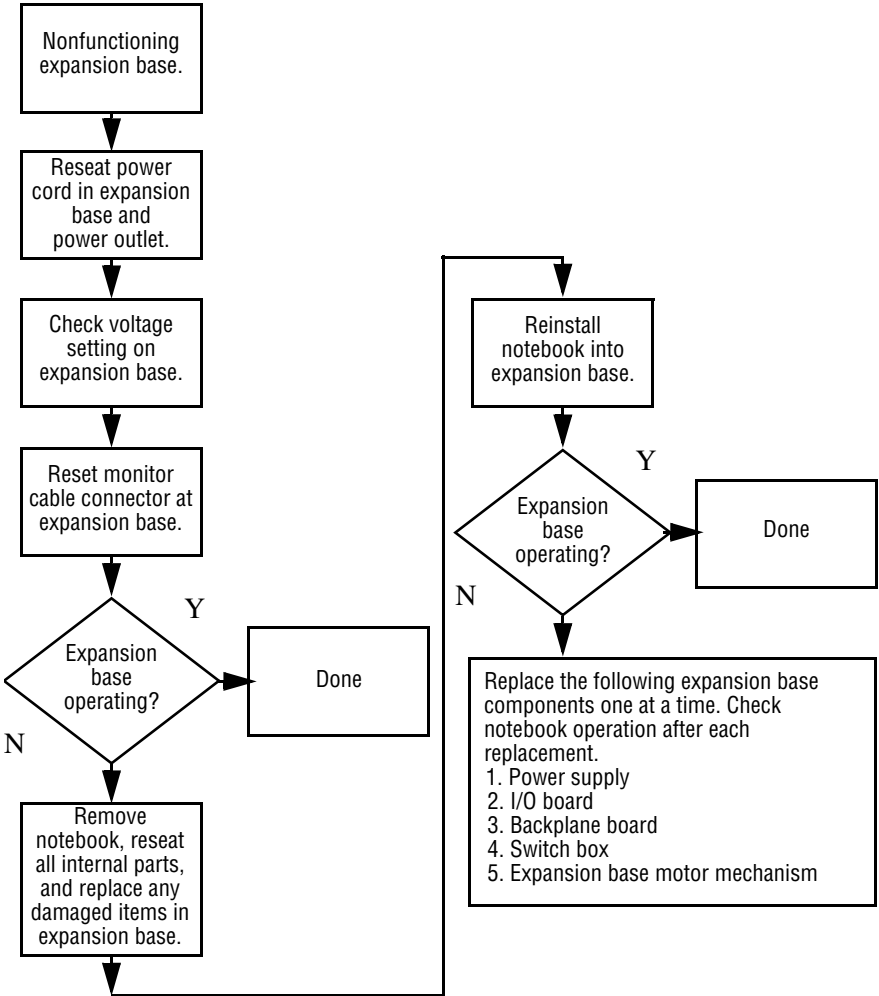
Flowchart 2.6—No Video, Part 1



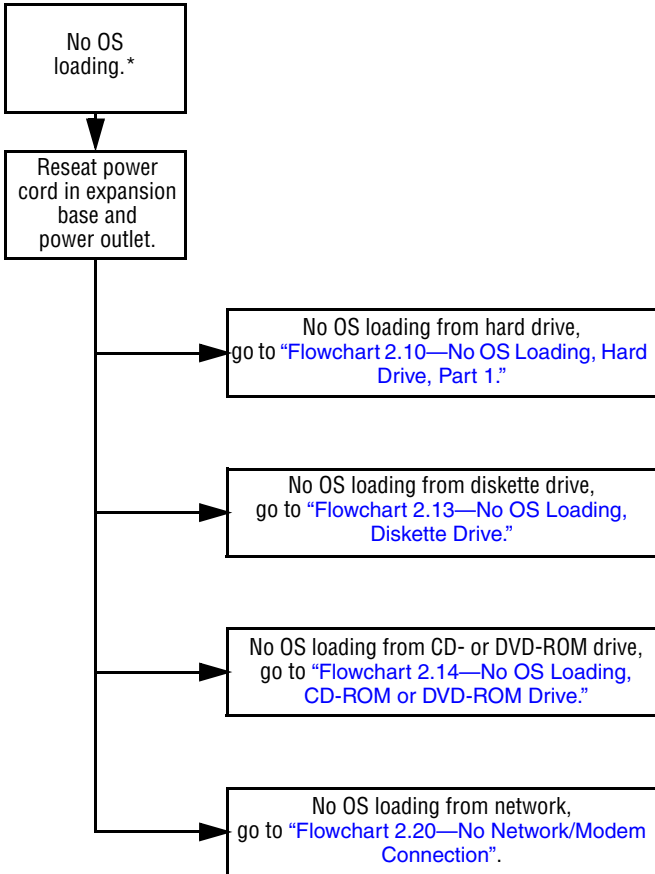
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Expansion Base (if applicable)

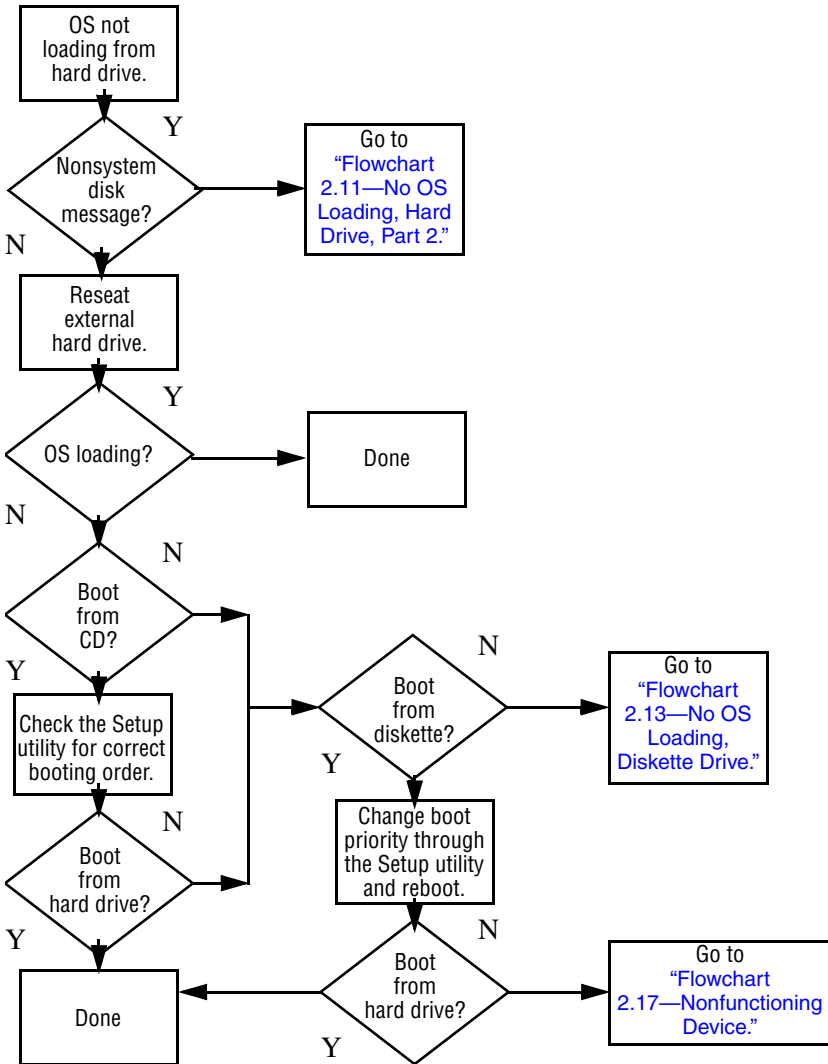


Flowchart 2.9—No Operating System (OS) Loading

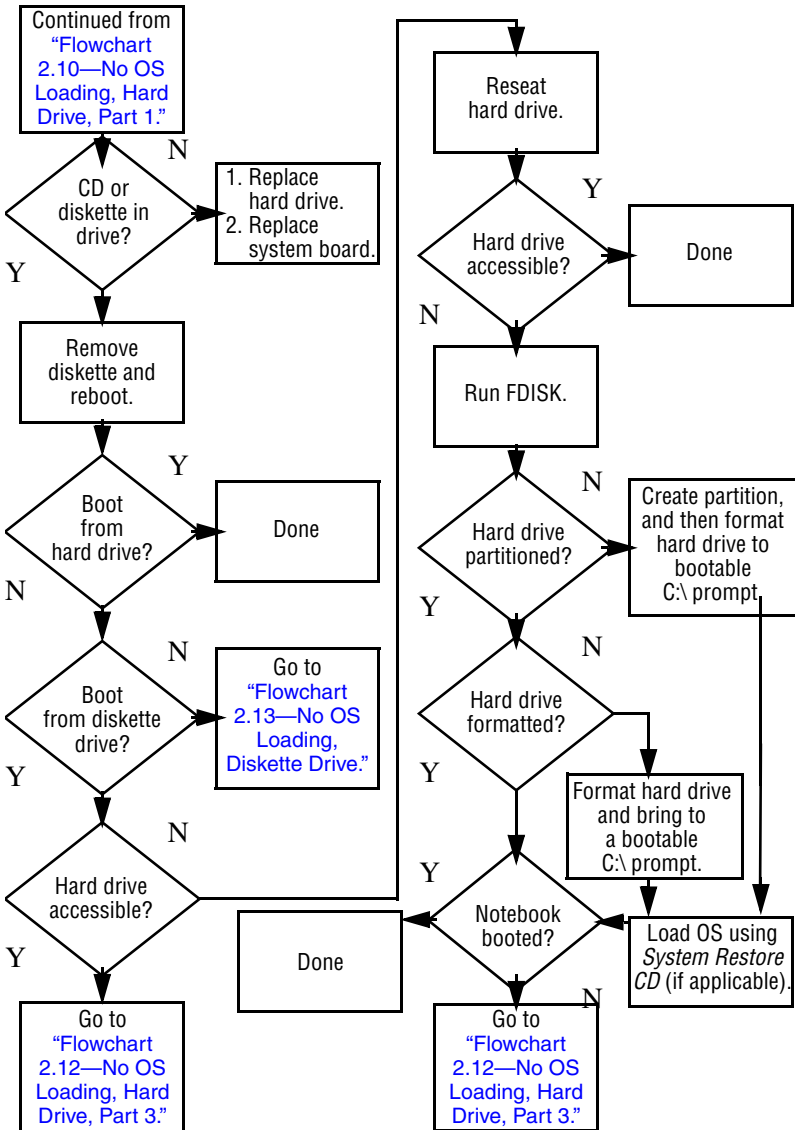


*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

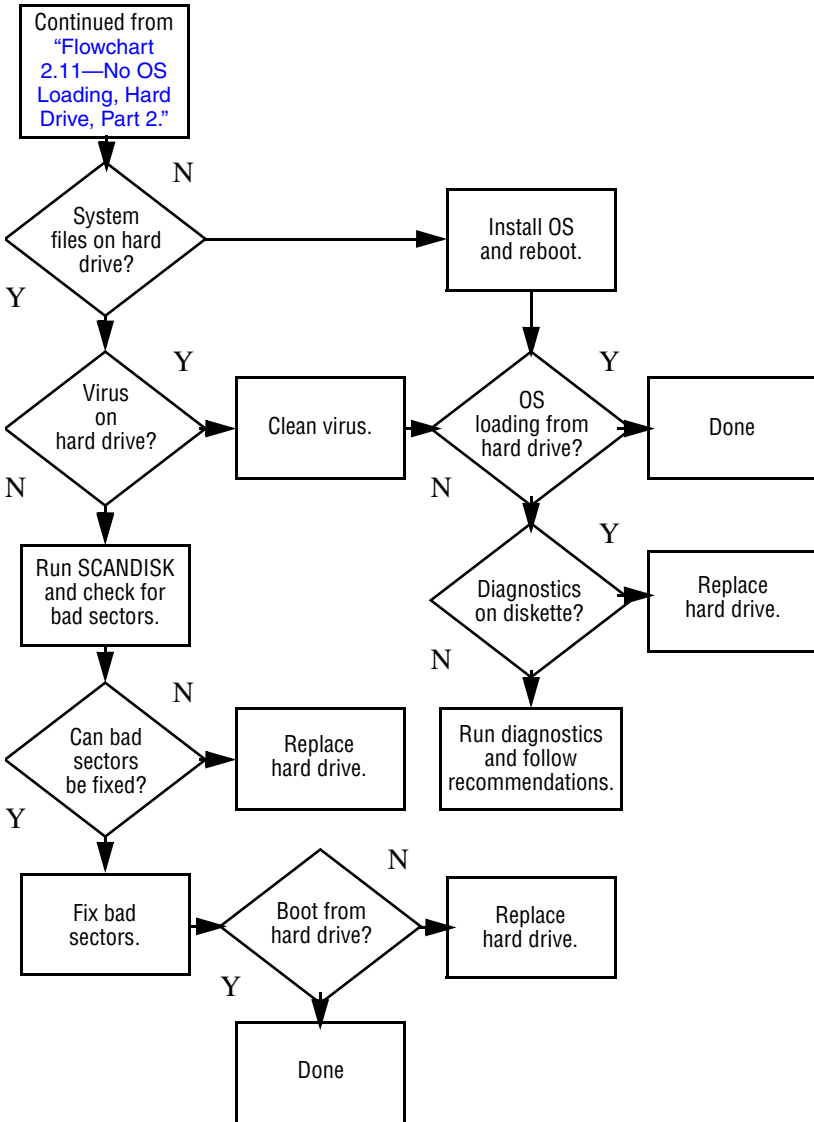
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



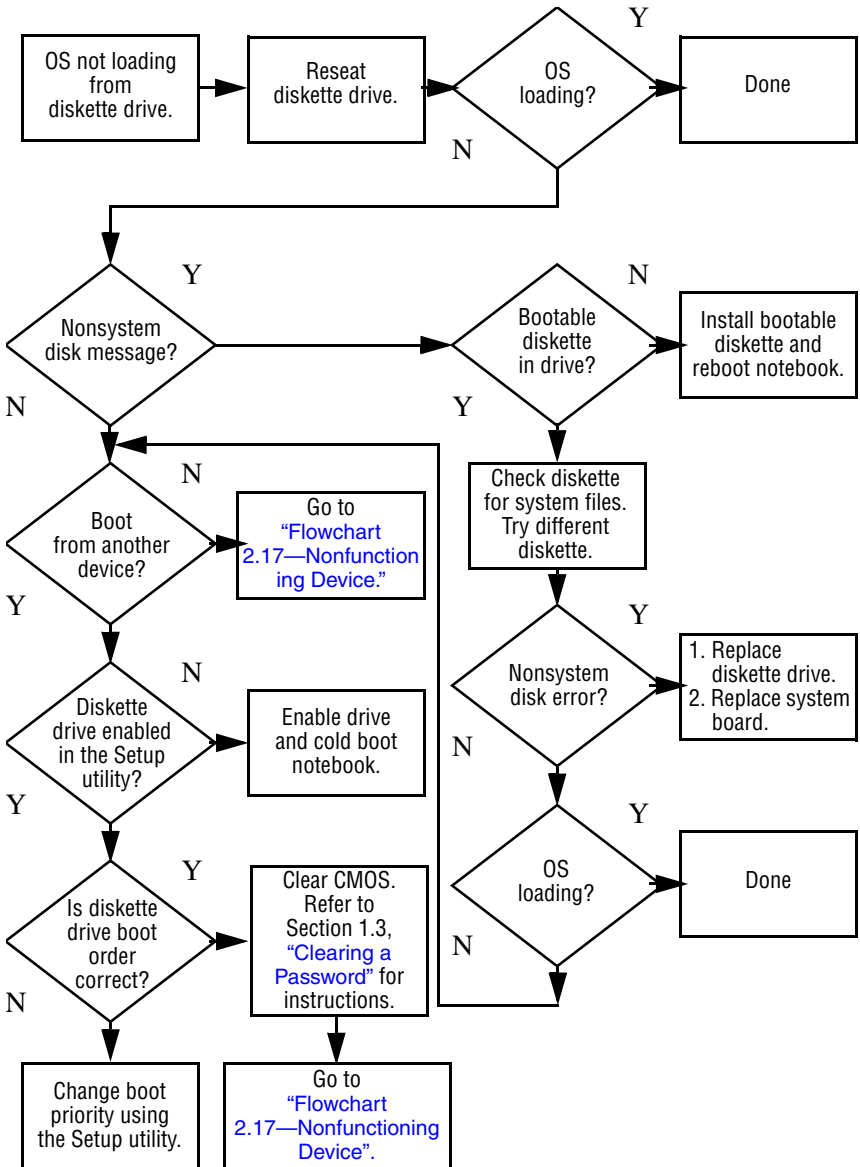
Flowchart 2.11 – No OS Loading, Hard Drive, Part 2



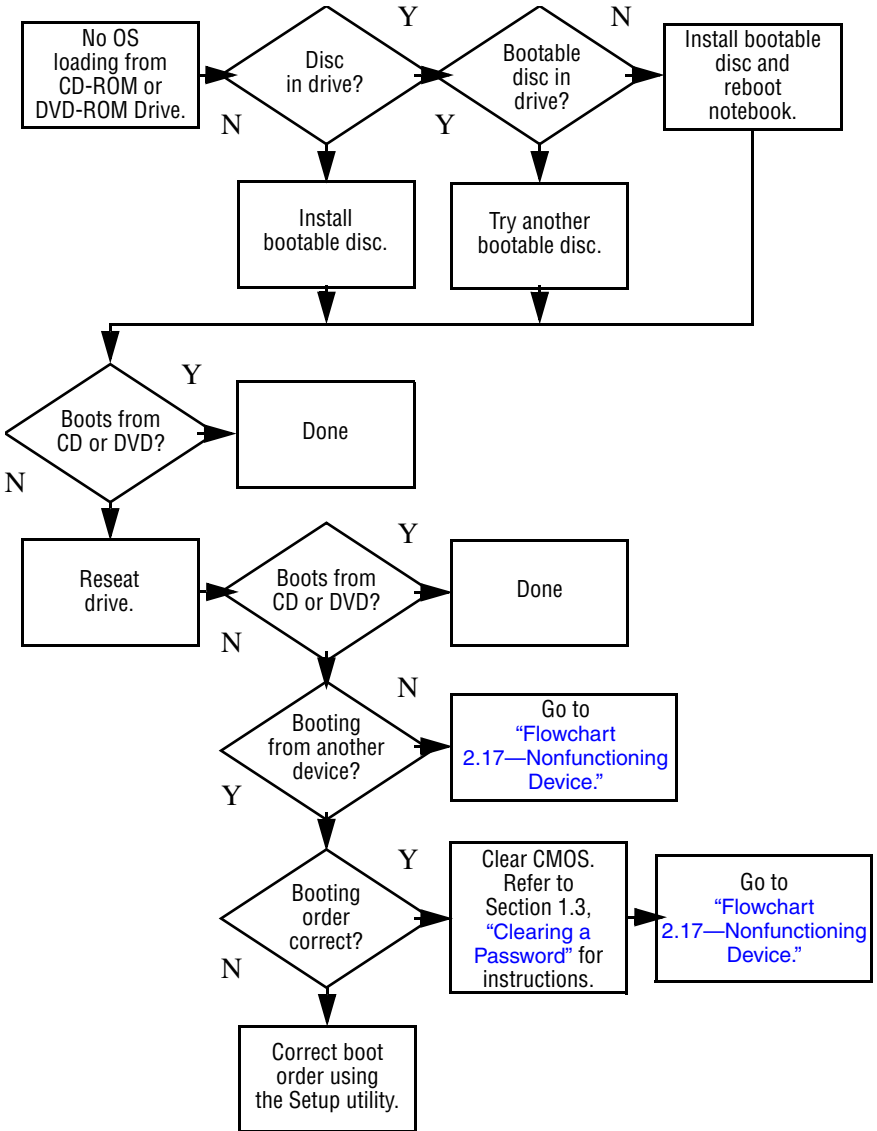
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



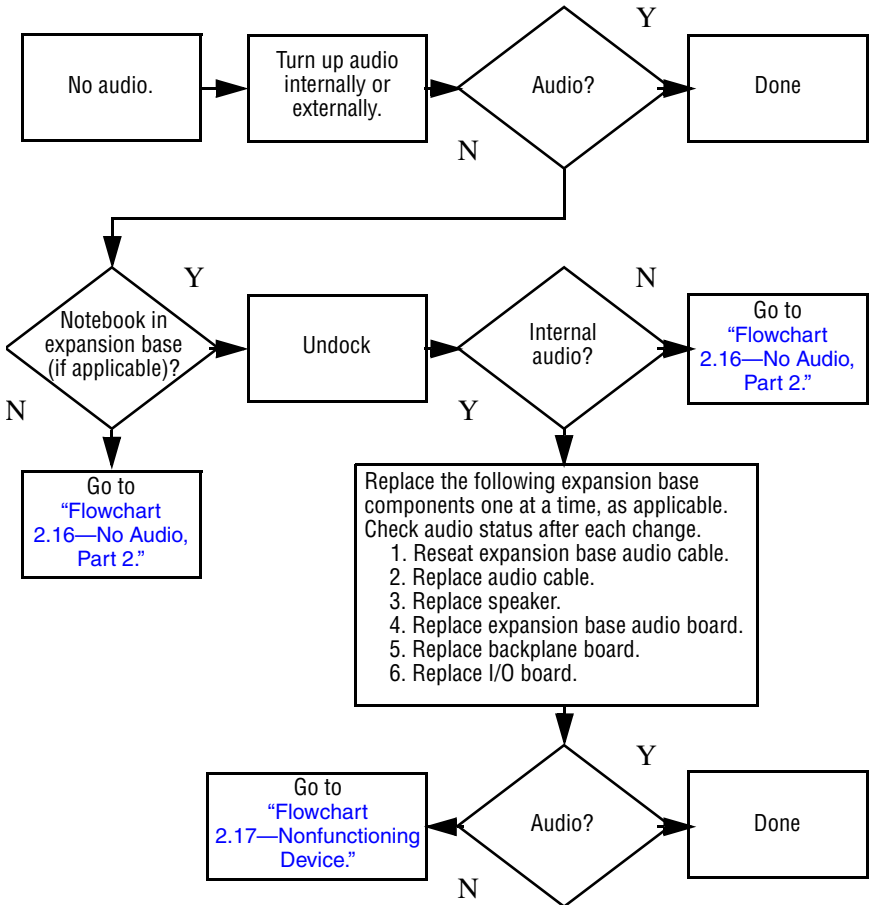
Flowchart 2.13—No OS Loading, Diskette Drive



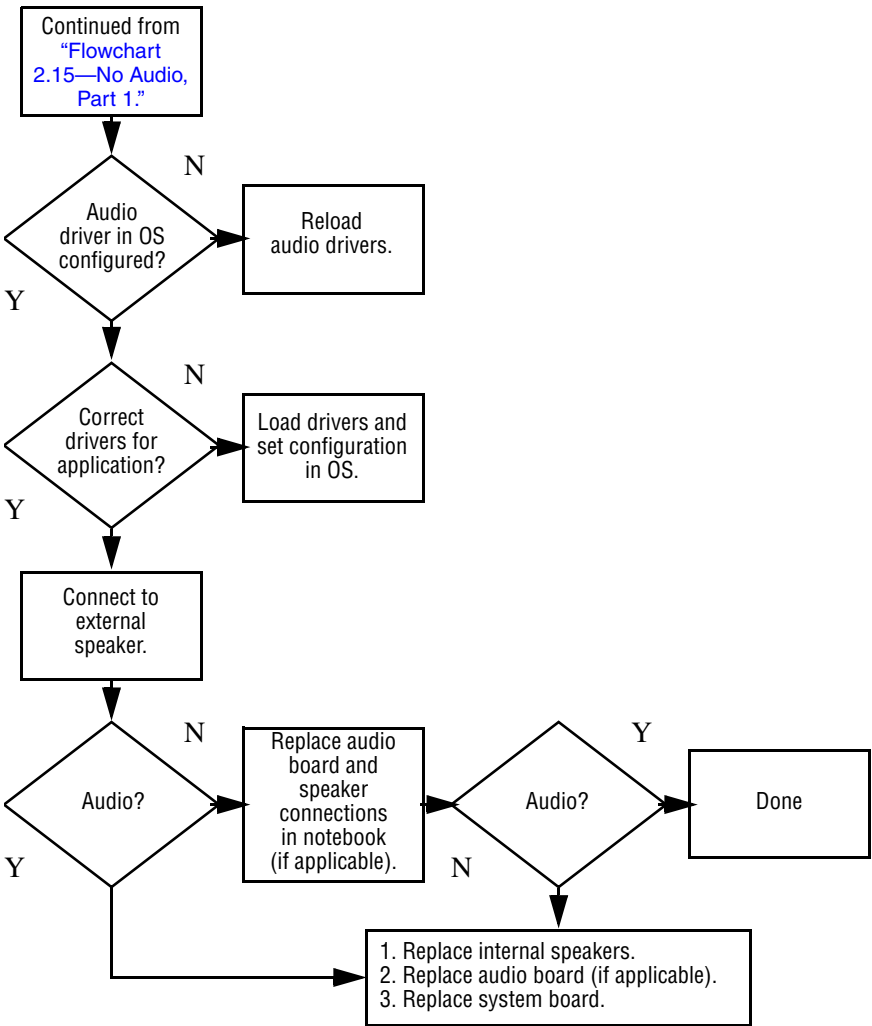
Flowchart 2.14—No OS Loading, CD-ROM or DVD-ROM Drive



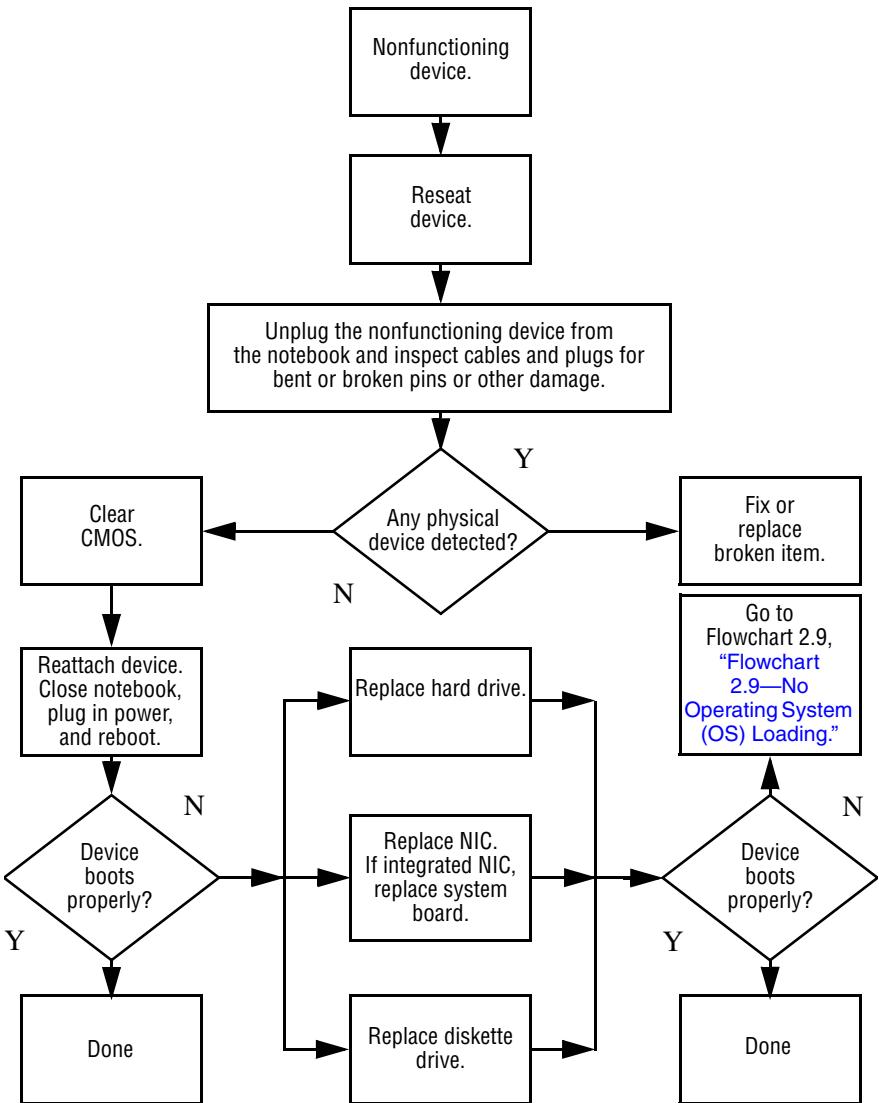
Flowchart 2.15—No Audio, Part 1



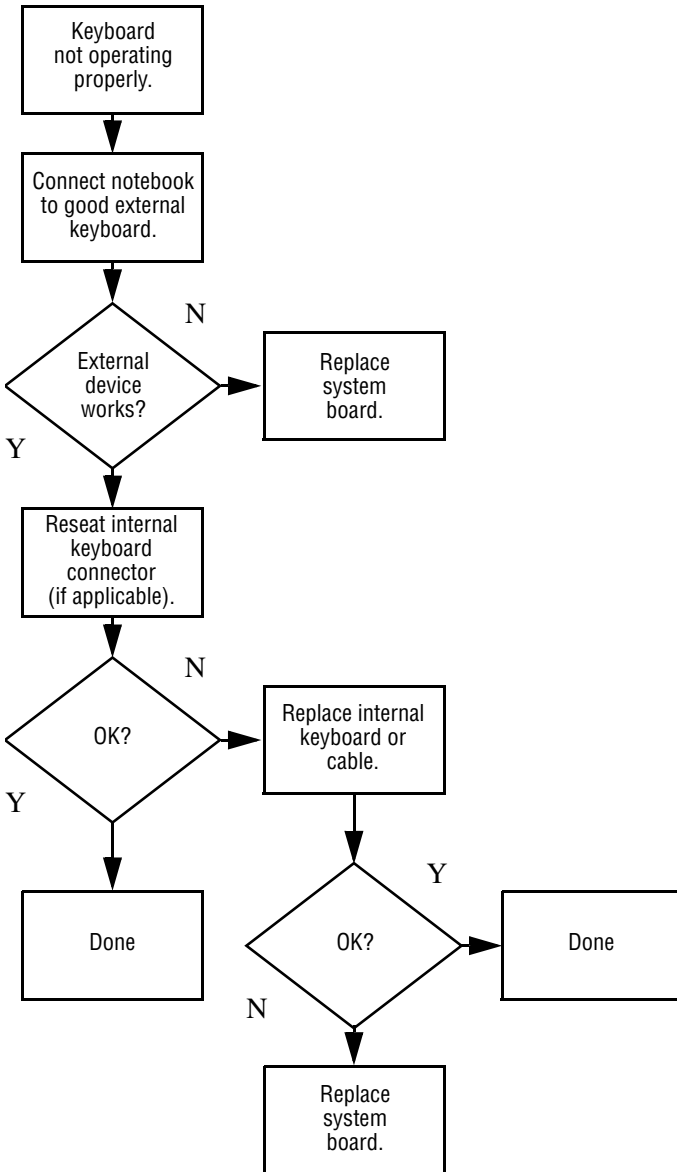
Flowchart 2.16—No Audio, Part 2



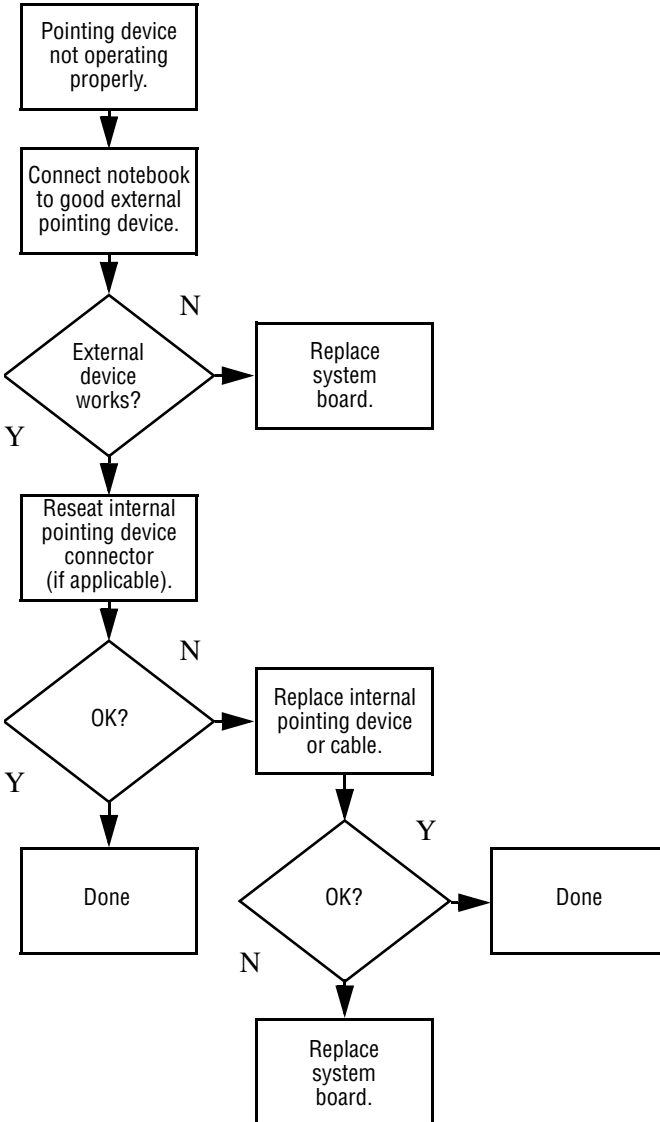
Flowchart 2.17—Nonfunctioning Device



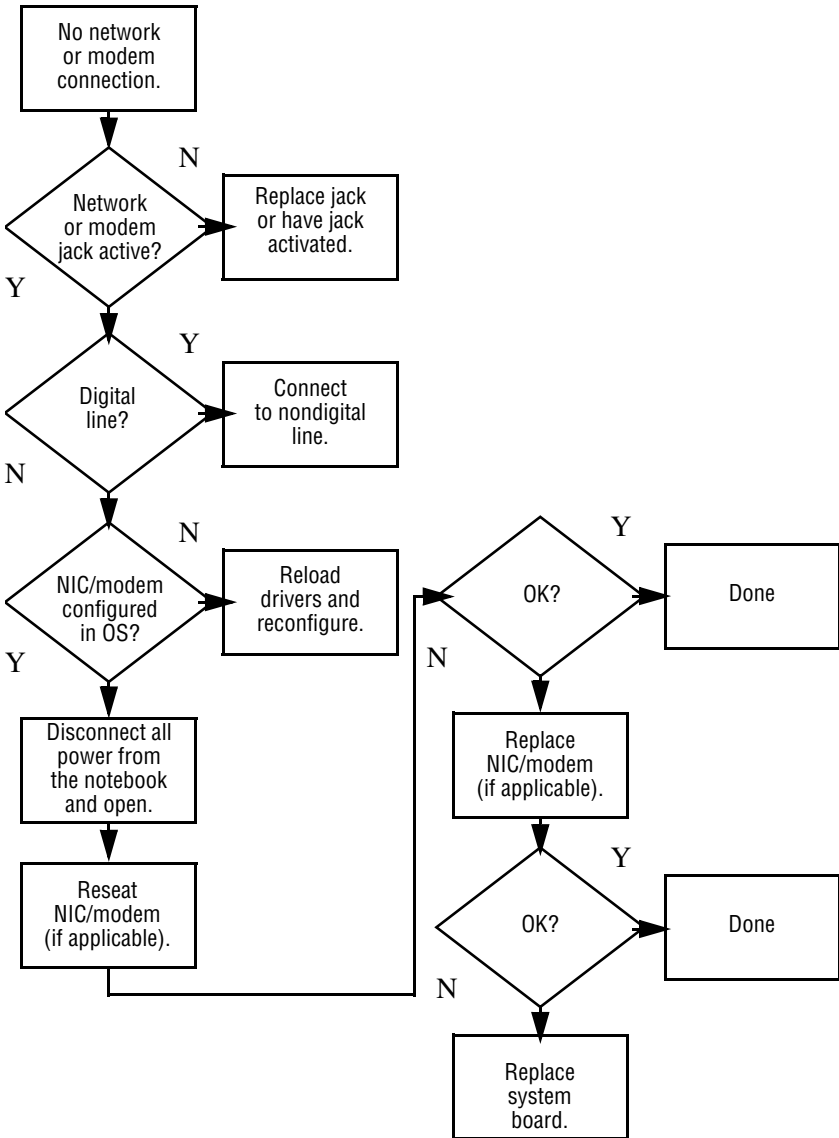
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



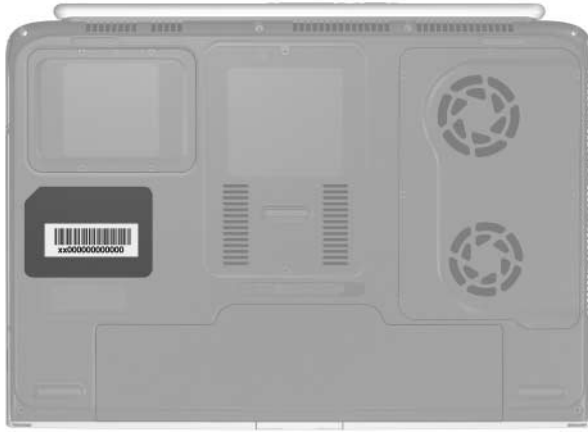
3

Illustrated Parts Catalog

This chapter provides an illustrated parts breakdown and a reference for spare part numbers and option part numbers. Spare part numbers are for use with all models of the HP Pavilion zd7000 Series Notebook PC, the HP Media Center zd7000 Series Notebook PC, and the HP Compaq nx9500 Series Business Notebook unless otherwise noted.

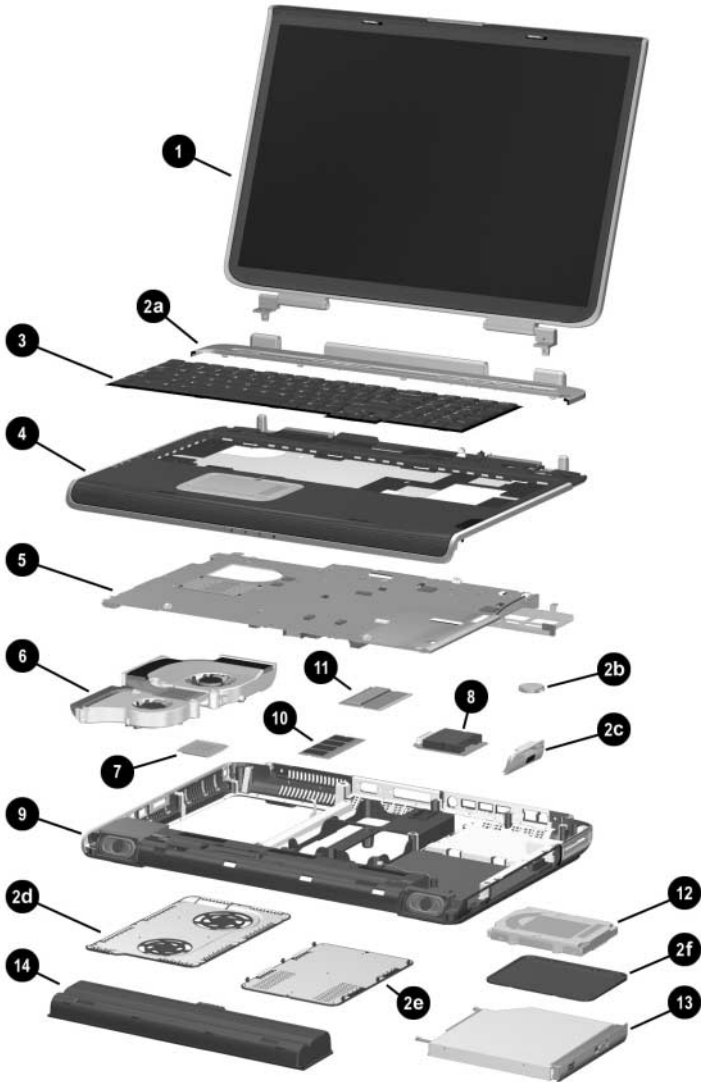
3.1 Serial Number Location

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



Serial Number Location

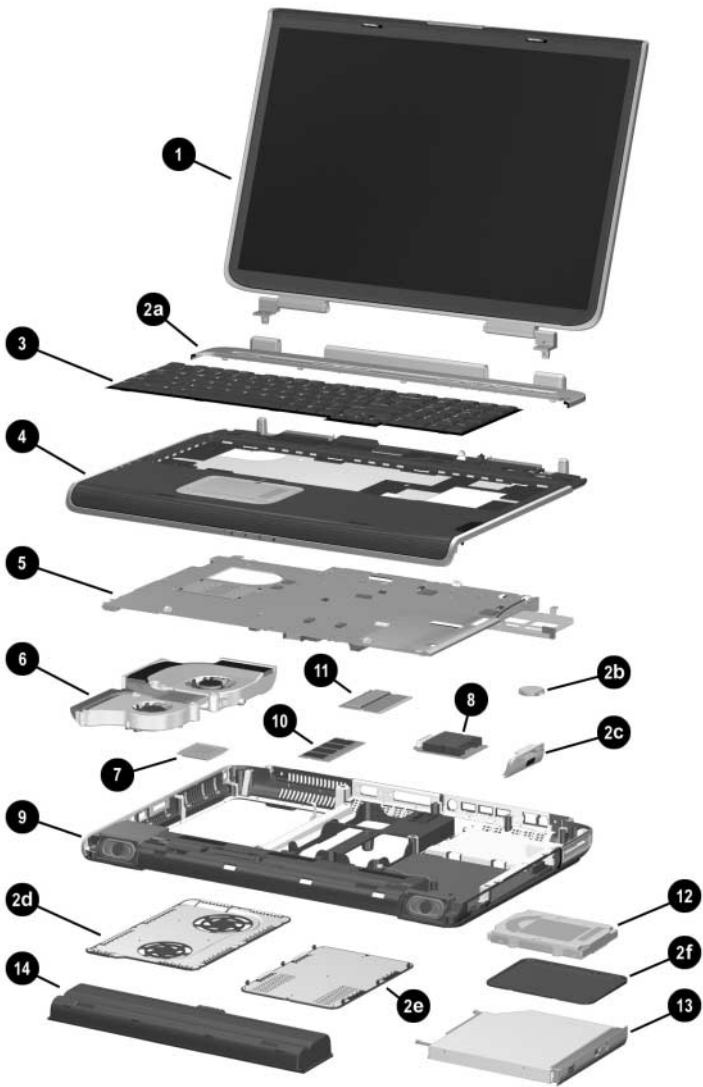
3.2 Notebook Major Components



Notebook Major Components

Table 3-1
Spare Parts: Notebook Major Components

Item	Description	Spare Part Number
1	Display assemblies	
	For use with all models	
	17.0-inch, WXGA+	344894-001
	15.4-inch, WXGA	344893-001
	For use with HP zd7000 models	
	17.0-inch, WSXGA+	365895-001
	Miscellaneous Plastics Kit	
	For use with HP zd7000 models	344852-001
	For use with HP Compaq nx9500 models	370805-001
	Each kit includes the following components:	
2a	Keyboard cover	
2b	RTC battery	
2c	SD Card slot/infrared module bezel	
2d	Fan cover	
2e	Memory module/Mini PCI compartment cover	
2f	Hard drive cover	
	Notebook feet (not illustrated)	
	Optical disk drive cover (not illustrated)	

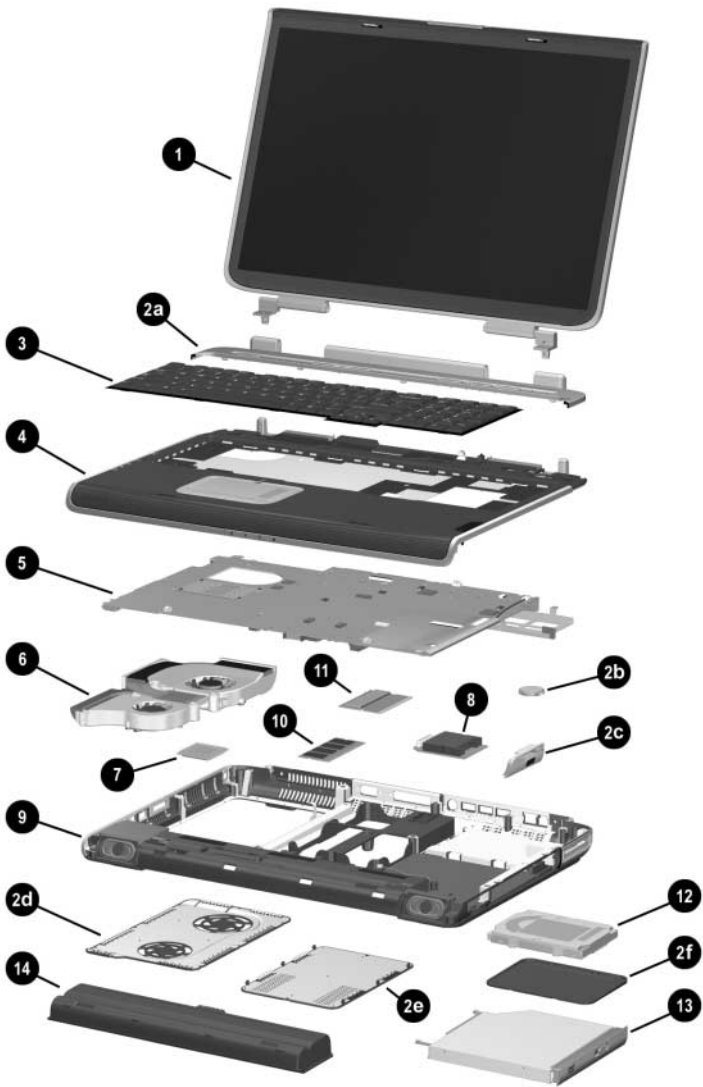


Notebook Major Components (Continued)

Table 3-1

Spare Parts: Notebook Major Components (Continued)

Item	Description			Spare Part Number
3	Keyboards			
	For use with all models			
	France	344898-051	United Kingdom	344898-031
	French Canada	344898-121	United States	
	Germany	344898-041	and Canada	344898-001
	For use with HP zd7000 models			
	Italy	344898-061	Sweden	344898-101
	Spain	344898-071	Switzerland	344898-111
4	Top cover			
	For use with HP zd7000 models			344876-001
	For use with HP Compaq nx9500 models			370803-001

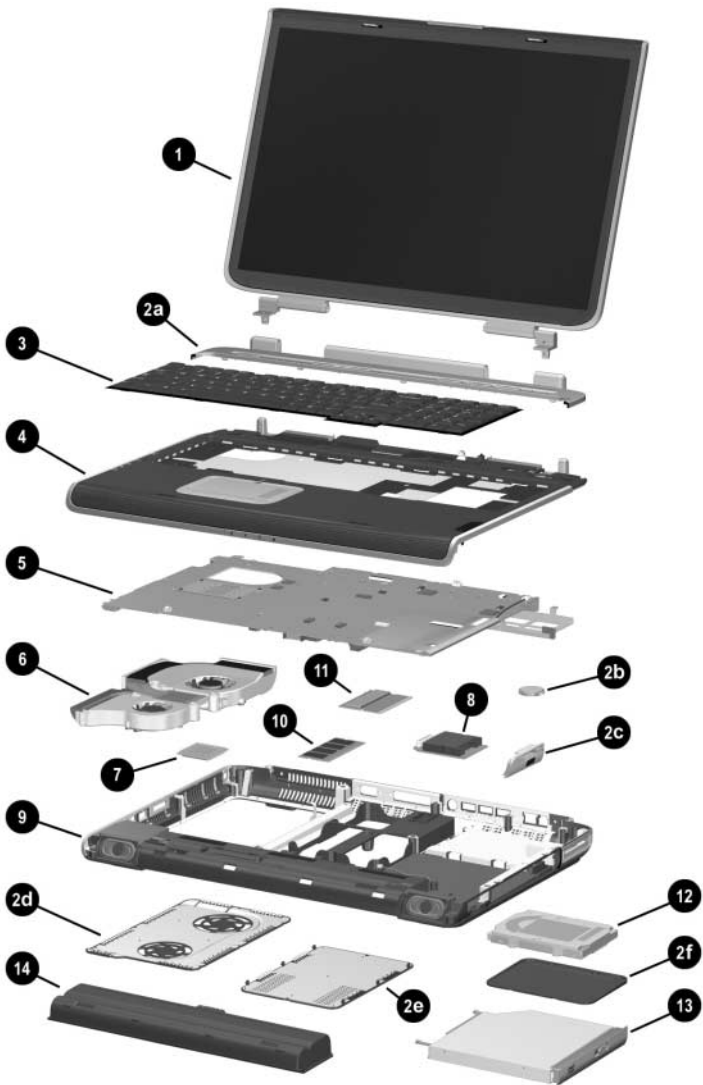


Notebook Major Components (Continued)

Table 3-1

Spare Parts: Notebook Major Components (Continued)

Item	Description	Spare Part Number
5	System boards (include thermal paste and the following video controllers and video memory)	
	For use with HP zd7000 models	
	NVIDIA GeForce FX Go5600 Ultra with 64-MB video memory	356668-001
	NVIDIA GeForce FX Go5600 Ultra with 128-MB video memory	356669-001
	NVIDIA GeForce FX Go5200 Ultra with 64-MB video memory	356670-001
	NVIDIA GeForce FX Go5200 Ultra with 128-MB video memory	365892-001
	NVIDIA GeForce FX Go5700 with 64-MB video memory	365893-001
	NVIDIA GeForce FX Go5700 with 128-MB video memory	365894-001
	For use with HP zd7000 and HP Compaq nx9500 models	
	NVIDIA GeForce FX Go5700 with 64-MB video memory	365893-001
	NVIDIA GeForce FX Go5700 with 128-MB video memory	365894-001
6	Heat sink (includes large and small fans and thermal paste)	344872-001
	Thermal Paste Kit (not illustrated)	346178-001

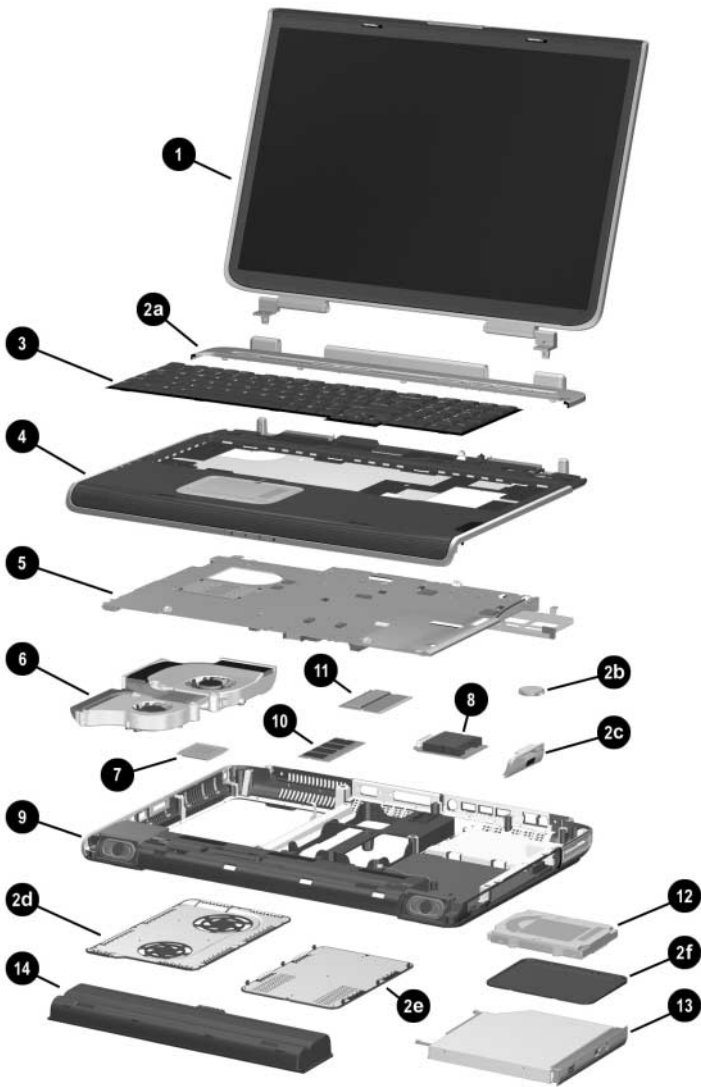


Notebook Major Components (Continued)

Table 3-1

Spare Parts: Notebook Major Components (Continued)

Item	Description	Spare Part Number
7	Processors (includes thermal paste)	
	For use with all models	
	Intel Pentium 4 with 800-MHz FSB and Hyper-Threading Technology (HT Technology)	
	3.2-GHz	344890-001
	Intel Pentium 4 with 800-MHz FSB	
	3.4-GHz	370958-001
	3.2-GHz	344889-001
	3.0-GHz	344888-001
	2.8-GHz	344887-001
	For use with HP zd7000 notebook models	
	Intel Pentium 4 with 800-MHz FSB and Hyper-Threading Technology (HT Technology)	
	Extreme Edition	
	3.2-GHz	361672-001
	Intel Pentium 4 with 533-MHz FSB and HT Technology	
	3.06-GHz	344886-001
	Mobile Intel Pentium 4 with 533-MHz FSB and HT Technology	
	3.2-GHz	356962-001
	3.06-GHz	356673-001
	2.8-GHz	356672-001
	Intel Pentium 4 with 533-MHz FSB	
	2.8-GHz	344885-001
	2.66-GHz	344884-001

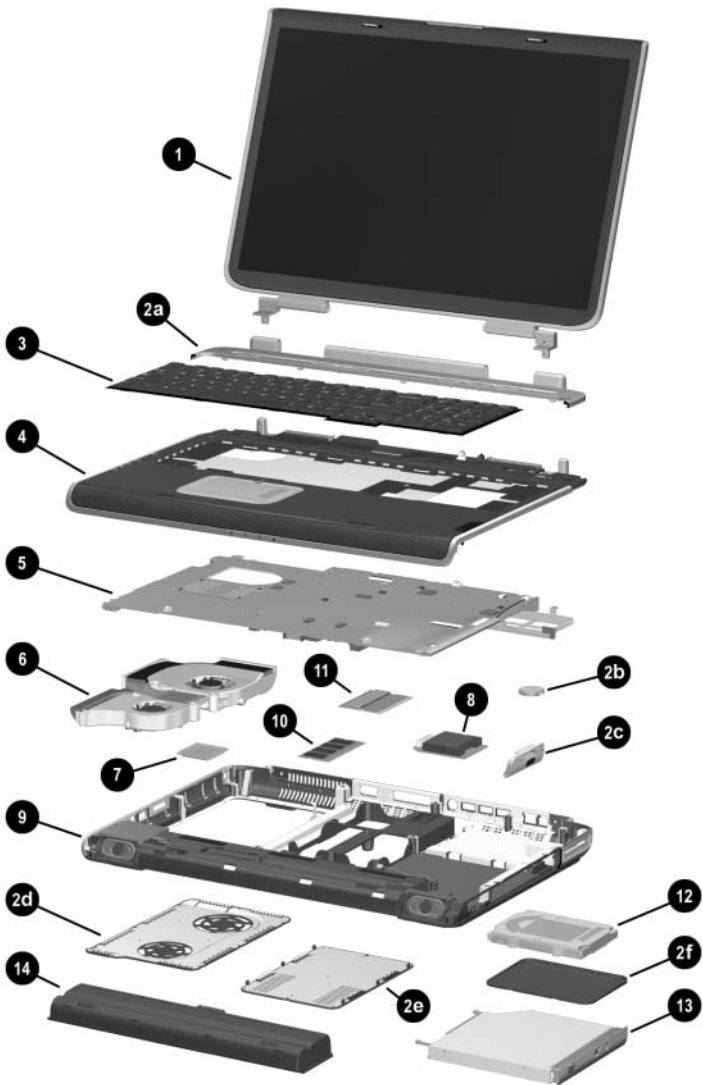


Notebook Major Components (Continued)

Table 3-1

Spare Parts: Notebook Major Components (Continued)

Item	Description	Spare Part Number
8	SD Card slot/infrared module (includes cable)	344880-001
9	Base enclosure (includes right and left speakers)	
	For use with HP zd7000 models	344883-001
	For use with HP Compaq nx9500 models	370804-001
10	Memory modules, 333-MHz	
	For use with all models	
	512-MB DDR (includes one dual inline memory module, or DIMM)	344867-001
	For use with HP zd7000 models	
	1024-MB DDR (includes one DIMM)	344868-001
	256-MB DDR (includes one DIMM)	344866-001
	For use with HP Compaq nx9500 models	
	1024-MB DDR (includes 2 DIMMs)	370809-001
11	Mini PCI communications cards	
	For use with all models	
	Mini PCI 802.11g wireless LAN	344863-001
	Mini PCI 802.11g wireless LAN	356667-001
	For use with HP zd7000 models	
	Mini PCI 802.11b wireless LAN	344864-001

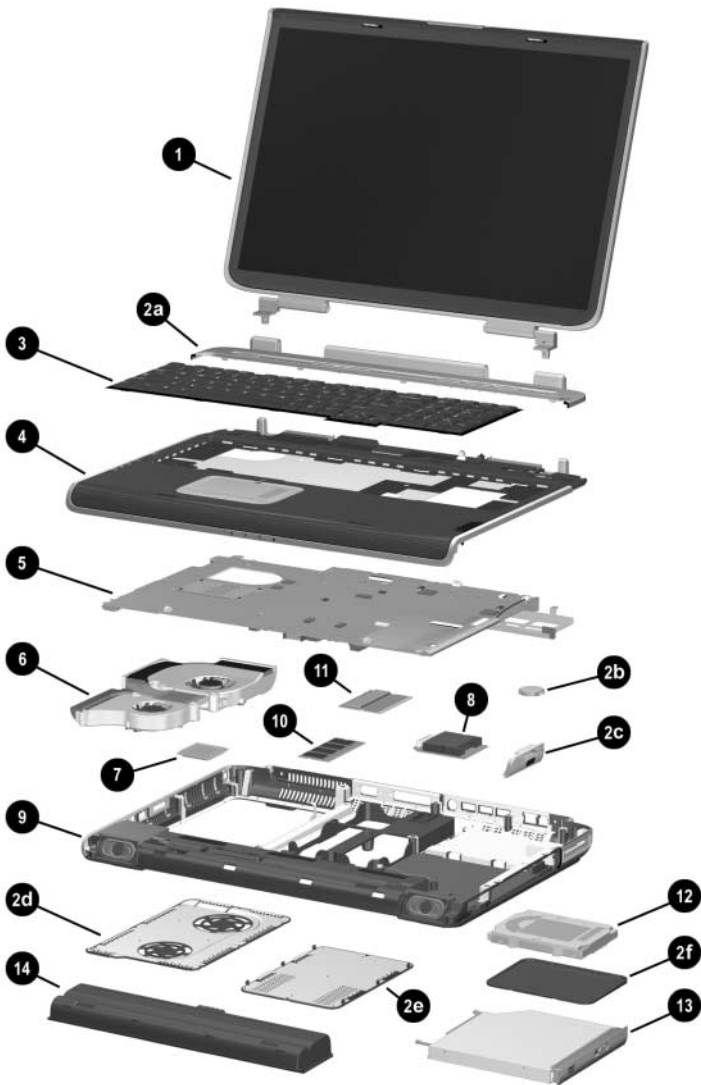


Notebook Major Components (Continued)

Table 3-1

Spare Parts: Notebook Major Components (Continued)

Item	Description	Spare Part Number
12	Hard drives	
	For use with all models	
	80-GB (5400-rpm)	344858-001
	For use with HP zd7000 models	
	100-GB (4200-rpm)	368144-001
	80-GB (4200-rpm)	344856-001
	60-GB (7200-rpm)	372685-001
	60-GB (5400-rpm)	344857-001
	60-GB (4200-rpm)	344855-001
	40-GB (5400-rpm)	368145-001
	40-GB (4200-rpm)	344854-001
13	Optical drives	
	For use with HP zd7000 models	
	24X Max DVD/CD-RW Combo Drive	344860-001
	8X Max DVD-ROM Drive	344859-001
	Generic multi-speed DVD+RW/R and CD-RW Combo Drive	344861-001
	8X Max DVD+RW/R and CD-RW Combo Drive	372931-001
	4X Max DVD+RW/R and CD-RW Combo Drive	360602-001
	2X Max DVD+RW/R and CD-RW Combo Drive	370957-001
	For use with HP Compaq nx9500 models	
	24X Max DVD/CD-RW Combo Drive	344860-001
	4X Max DVD+RW/R and CD-RW Combo Drive	360602-001
14	Battery pack, 12-cell, 14.8-volt	342661-001



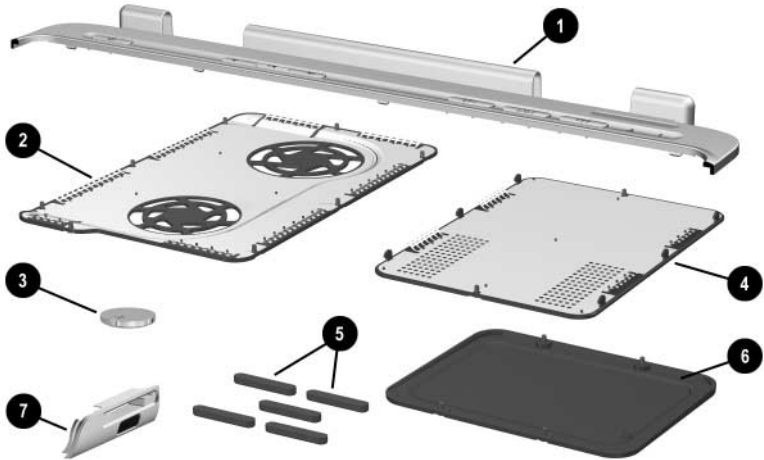
Notebook Major Components (Continued)

Table 3-1

Spare Parts: Notebook Major Components (Continued)

Item	Description	Spare Part Number
	Wireless LAN antennae (not illustrated)	344875-001
	Miscellaneous Cable Kit (not illustrated), includes SD Card slot/infrared module cable Display cable LED board cable	344851-001
	Thermal Paste Fixture (not illustrated)	347577-001

3.3 Miscellaneous Plastics Kit Components



Miscellaneous Plastics Kit Components

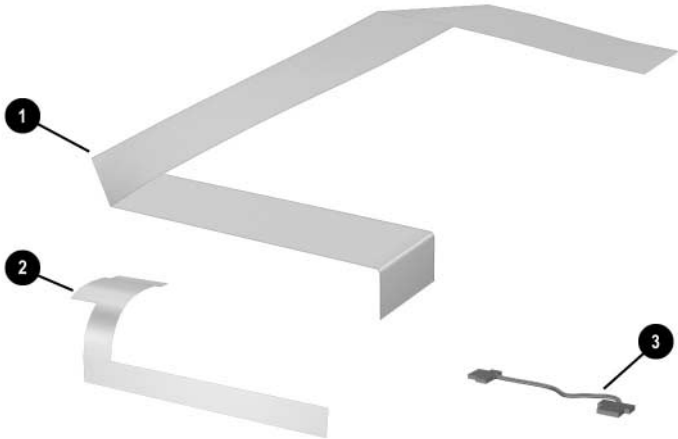
Table 3-2

Miscellaneous Plastics Kit Components

Spare Part Number 344852-001 or 370803-001

Item	Description
1	Keyboard cover
2	Fan cover
3	RTC battery
4	SD Card slot/infrared module bezel
5	Feet (5)
6	Hard drive cover
7	Memory module/Mini PCI compartment cover
	Optical disk drive cover (not illustrated)

3.4 Miscellaneous Cable Kit Components



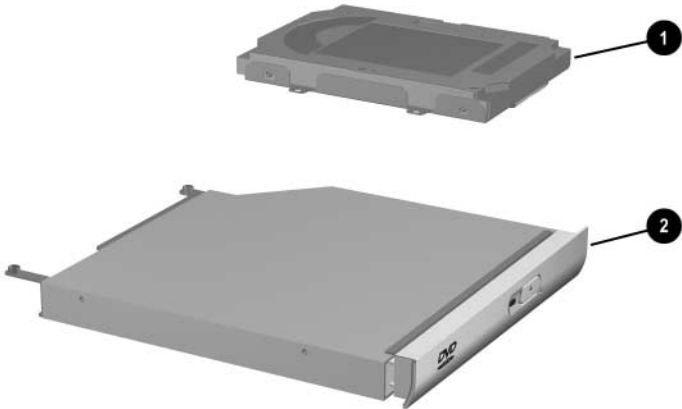
Miscellaneous Cable Kit Components

Table 3-3

Miscellaneous Cable Kit Components
Spare Part Number 344851-001

Item	Description
1	SD Card slot/infrared module cable
2	Display cable
3	LED board cable

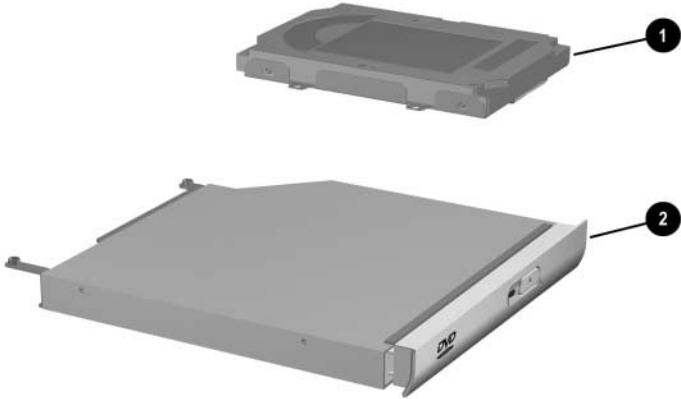
3.5 Mass Storage Devices



Mass Storage Devices

Table 3-4
Mass Storage Devices Spare
Part Number Information

Item	Description	Spare Part Number
1	Hard drives (include hard drive bezel and frame)	
	For use with all models	
	80-GB (5400-rpm)	344858-001
	For use with HP zd7000 models	
	100-GB (4200-rpm)	368144-001
	80-GB (4200-rpm)	344856-001
	60-GB (7200-rpm)	372685-001
	60-GB (5400-rpm)	344857-001
	60-GB (4200-rpm)	344855-001
	40-GB (5400-rpm)	368145-001
	40-GB (4200-rpm)	344854-001

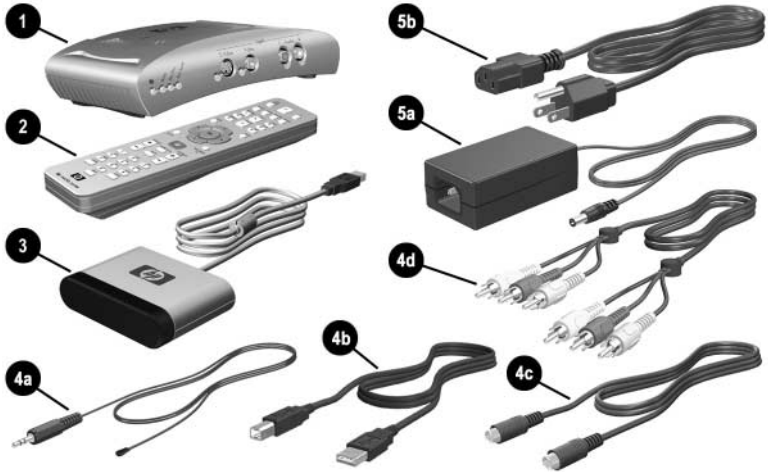


Mass Storage Devices (Continued)

Table 3-4
Mass Storage Devices Spare
Part Number Information (Continued)

Item	Description	Spare Part Number
2	Optical drives	
	For use with HP zd7000 models	
	24X Max DVD/CD-RW Combo Drive	344860-001
	8X Max DVD-ROM Drive	344859-001
	Generic multi-speed DVD+RW/R and CD-RW Combo Drive	344861-001
	8X Max DVD+RW/R and CD-RW Combo Drive	372931-001
	4X Max DVD+RW/R and CD-RW Combo Drive	360602-001
	2X Max DVD+RW/R and CD-RW Combo Drive	370957-001
	For use with HP Compaq nx9500 models	
	24X Max DVD/CD-RW Combo Drive	344860-001
	4X Max DVD+RW/R and CD-RW Combo Drive	360602-001
	USB v.1.1 diskette drive (not illustrated)	344897-001

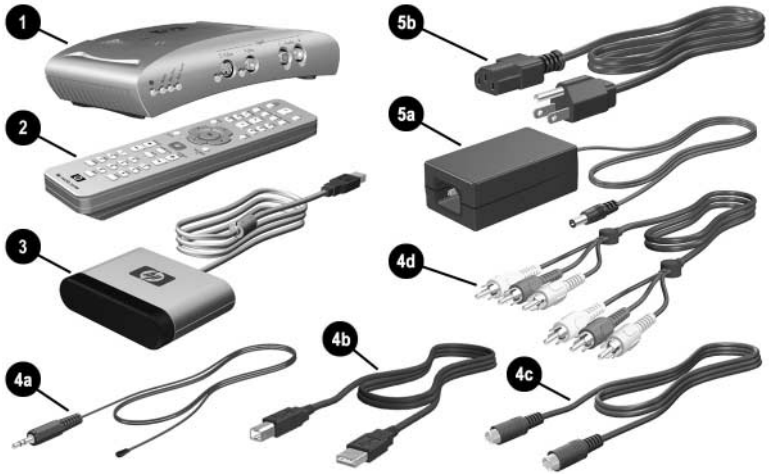
3.6 Personal Video Recorder Devices



Personal Video Recorder Devices

Table 3-5
Personal Video Recorder Devices
Spare Part Number Information

Item	Description	Spare Part Number
1	Personal video recorder	352950-001
2	Remote control	352951-001
3	Remote sensor	353449-001
	Personal Video Recorder cable kit	353450-001
4a	Remote sensor emitter cable	
4b	USB cable	
4c	S-Video cable	
4d	Composite Audio-Video cable	



Personal Video Recorder Devices (Continued)

Table 3-5
Personal Video Recorder Devices
Spare Part Number Information (Continued)

Item	Description	Spare Part Number
	Personal Video Recorder power cord components	360555-001
5a	AC adapter	
5b	Power cord	

3.7 Miscellaneous

Table 3-6

Spare Parts: Miscellaneous (not illustrated)

Description	Spare Part Number
Logo Kit	
For use with HP zd7000 models	347990-001
For use with HP Compaq nx9500 models	370806-001
120-watt AC adapter with power cord	
For use with all models	
Euro	344895-021
United Kingdom	344895-031
United States/Canada	344895-001
For use with HP zd7000 models	
Italy	344895-061
Euro	344895-021
Sweden	344895-101
Switzerland	344895-111
135-watt AC adapter with power cord	
For use with all models	
United States/Canada	361072-001
For use with HP zd7000 models	
Euro	361072-021
Italy	361072-061
Switzerland	361072-111
United Kingdom	361072-031

Table 3-6

Spare Parts: Miscellaneous (not illustrated) (Continued)

Description	Spare Part Number
Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing," for more information on screw specifications and usage.)	344850-001
■ PM2.5×8.0 screw	■ PM1.5×4.0 screw
■ PM2.5×6.0 screw	■ Slotted M1.5×10.0 shoulder screw
■ PM2.5×5.0 screw	■ HM5.0×9.0 standoffs
■ PM2.5×4.0 screw	■ PM1.5×12.0 spring-loaded shoulder screw
Thermal paste fixture tool	347577-001
Entertainment cable and Y-cable	359680-001

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 standoffs
- 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.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive. 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 that have at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, CD-ROM 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 using fixtures that must directly contact dissipative surfaces, only use fixtures made 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


 A product can be degraded by as little as 700 V.

Table 4-1
Typical Electrostatic Voltage Levels (Continued)

Event	Relative Humidity		
	10%	40%	55%
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

5

Removal and Replacement Procedures

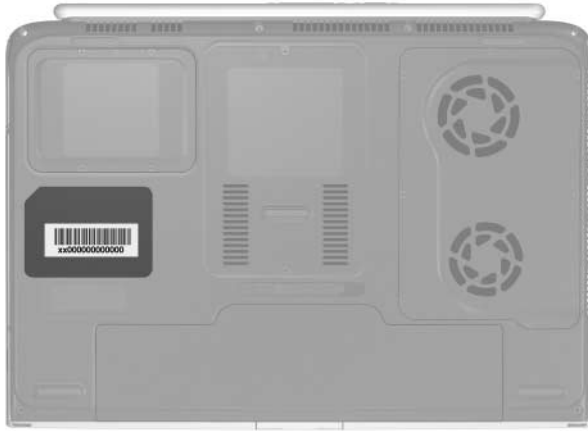
This chapter provides removal and replacement procedures.

There are 67 screws and standoffs, in 8 different sizes, that must be removed, replaced, and 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 loosened
5.4	Notebook feet	0
5.5	Memory module	2 loosened
5.6	Mini PCI communications card	2 loosened (same screws loosened for Memory module)
5.7	Optical drive	2
5.8	Keyboard	8 loosened on fan cover, 2 removed for keyboard
5.9	Keyboard cover	6
5.10	Display assembly	4
5.11	Top cover	13
5.12	System board	6 screws, 4 standoffs
5.13	RTC battery	0
5.14	Heat sink Fans	4 loosened 6 removed
5.15	Processor	0
5.16	SD Card slot/infrared module	3
5.17	Speakers	3

5.3 Preparing the Notebook for Disassembly

Before you begin any removal or installation procedures:

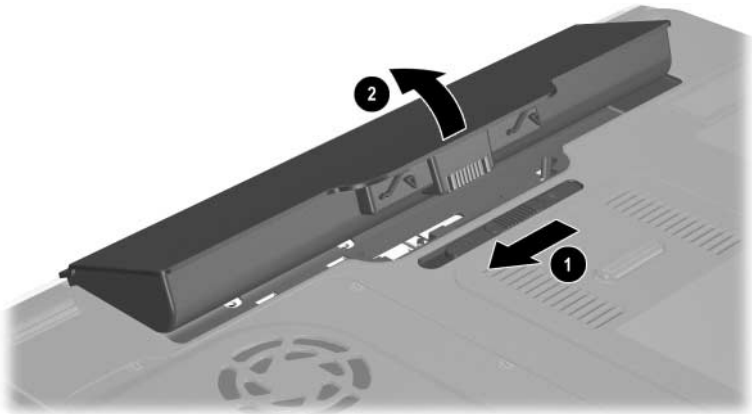
1. Shut down the notebook. If you are not sure whether the notebook is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the notebook.
3. Disconnect the power cord.

Spare Part Number Information

Battery pack, 12-cell, 14.8-volt

342661-001

4. Remove the battery pack by following these steps:
 - a. Turn the notebook upside down with the rear panel toward you.
 - b. Slide and hold the battery release latch **1** to the left. The rear edge of the battery pack releases from the notebook.
 - c. Lift the rear edge of the battery pack up **2**, and then swing it toward you.
 - d. Remove the battery pack.



Removing the Battery Pack

Reverse the above procedure to install the battery pack.

Spare Part Number Information

Hard drives

For use with all models

80-GB (5400-rpm) 344858-001

For use with HP zd7000 models

100-GB (4200-rpm) 368144-001

80-GB (4200-rpm) 344856-001

60-GB (7200-rpm) 372685-001

60-GB (5400-rpm) 344857-001

60-GB (4200-rpm) 344855-001

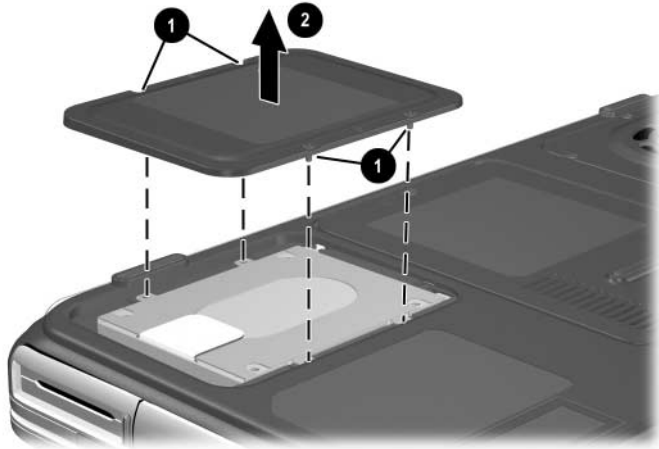
40-GB (5400-rpm) 368145-001

40-GB (4200-rpm) 344854-001

5. Remove the hard drive by following these steps:
 - a. Turn the notebook upside down with the rear panel toward you.
 - b. Loosen the 4 PM2.5×4.0 screws ❶ that secure the hard drive cover to the notebook.
 - c. Lift the cover ❷ straight up to remove it from the notebook.

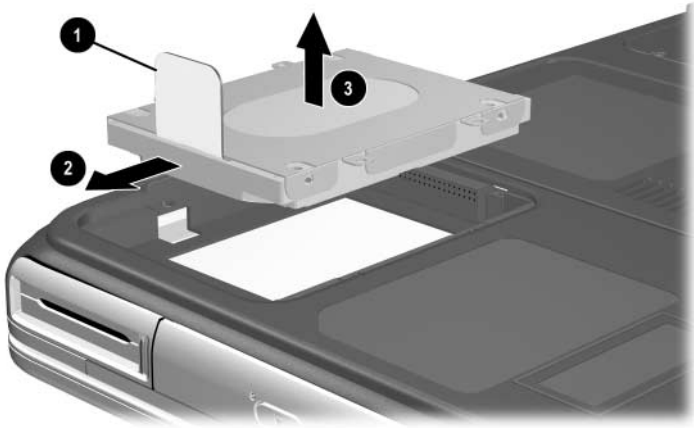


The hard drive cover is included in the Miscellaneous Plastics Kit, spare part number 344852-001 for use with HP zd7000 models, and spare part number 370805-001 for use with HP Compaq nx9500 models.



Removing the Hard Drive Cover

- d. Use the Mylar tab ❶ to slide the hard drive ❷ to the right to disconnect it from the system board.
- e. Lift the hard drive straight up ❸.
- f. Remove the hard drive.



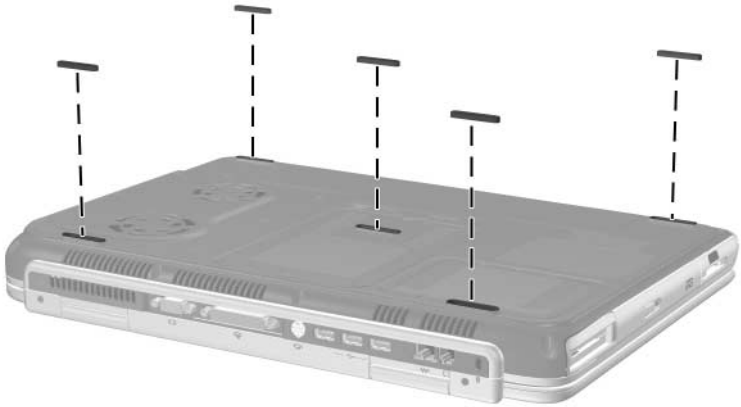
Removing the Hard Drive

Reverse the above procedure to install 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 344852-001 for use with models, or spare part number 370805-001 for use with HP Compaq nx9500 models.

- » Attach the feet to the base enclosure as illustrated below.



Replacing the Notebook Feet

5.5 Memory Module

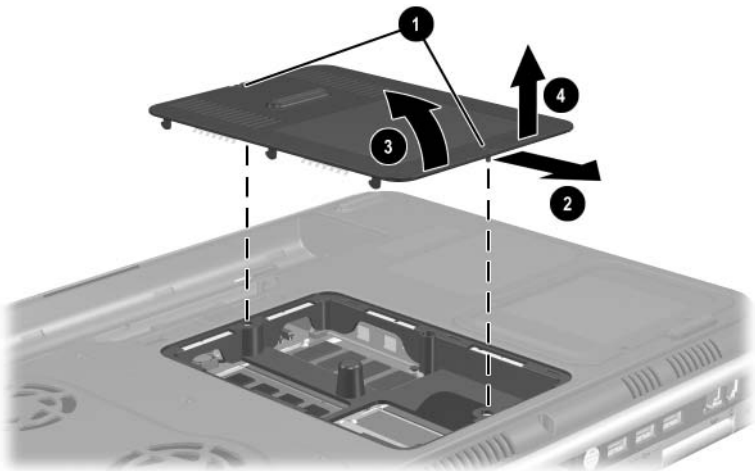
Spare Part Number Information

For use with all models	
512-MB DDR (includes one dual inline memory module, or DIMM)	344867-001
For use with HP zd7000 models	
1024-MB DDR (includes one DIMM)	344868-001
256-MB DDR (includes one DIMM)	344866-001
For use with HP Compaq nx9500 models	
1024-MB DDR (includes 2 DIMMs)	370809-001

1. Prepare the notebook for disassembly (refer to [Section 5.3](#)).
 2. Turn the notebook upside down with the rear panel toward you.
 3. Loosen the 2 PM2.5×4.0 screws ❶ that secure the memory module/Mini PCI compartment cover to the notebook.
 4. Slide the cover ❷ toward you, and then lift the cover up ❸.
 5. Remove the cover ❹.
-

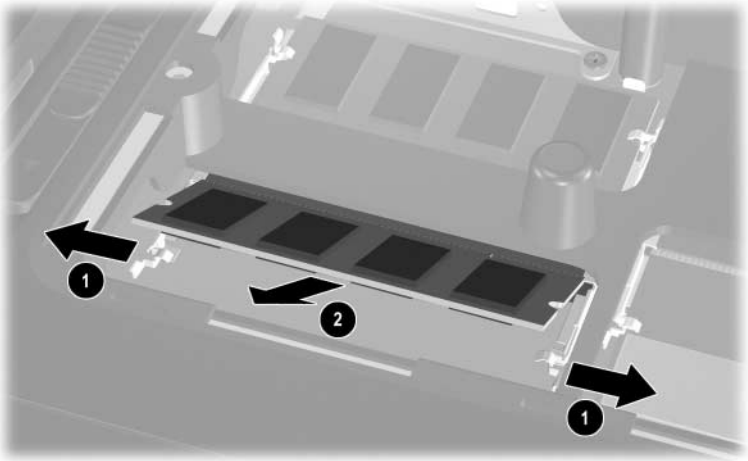


The memory module/Mini PCI compartment cover is included in the Miscellaneous Plastics Kit, spare part number 344852-001 for use with HP zd7000 models, or spare part number 370805-001 for use with HP Compaq nx9500 models.



Removing the Memory Module/Mini PCI Compartment Cover

6. Spread the retaining tabs ❶ that secure the memory module to the socket. The board tilts up.
7. Pull the board away from the socket at a 45-degree angle ❷.



Removing a Memory Module

Reverse the above procedure to install a memory module.

5.6 Mini PCI Communications Card

Spare Part Number Information

For use with all models

Mini PCI 802.11g wireless LAN

344863-001

Mini PCI 802.11g wireless LAN

355667-001

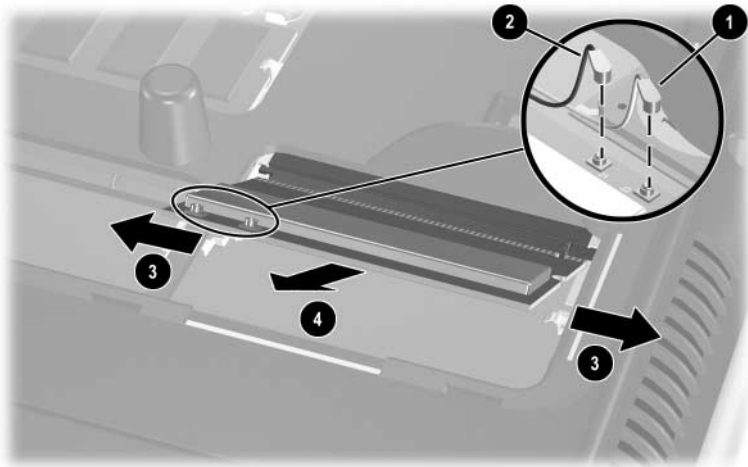
For use with HP zd7000 models

Mini PCI 802.11g wireless LAN

344864-001

1. Prepare the notebook for disassembly ([Section 5.3](#)).
2. Remove the memory module/Mini PCI compartment cover ([Section 5.5](#)).

3. Disconnect the 2 antenna cables ❶ and ❷ from the Mini PCI communications card.
4. Spread the retaining tabs ❸ that secure the Mini PCI communications card to the socket. The board tilts up.
5. Pull the card away from the socket at a 45-degree angle ❹.



Removing a Mini PCI Communications Card

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

CAUTION: When reattaching the cables to the board, place a finger behind the board to protect it from breakage.

CAUTION: 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.

5.7 Optical Drive

Spare Part Number Information

For use with HP zd7000 models

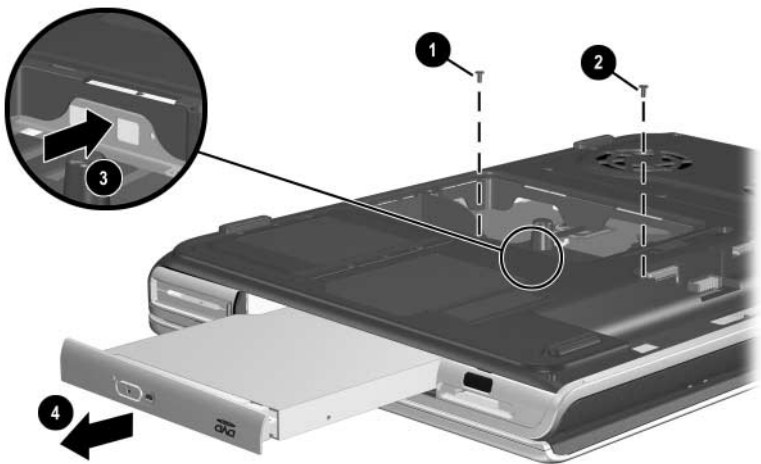
24X Max DVD/CD-RW Combo Drive	344860-001
8X Max DVD-ROM Drive	344859-001
Generic multi-speed DVD+RW/R and CD-RW Combo Drive	344861-001
8X Max DVD+RW/R and CD-RW Combo Drive	359680-001
4X Max DVD+RW/R and CD-RW Combo Drive	360602-001
2X Max DVD+RW/R and CD-RW Combo Drive	370957-001

For use with HP Compaq nx9500 models

24X Max DVD/CD-RW Combo Drive	344860-001
4X Max DVD+RW/R and CD-RW Combo Drive	360602-001

1. Prepare the notebook for disassembly ([Section 5.3](#)).
2. Remove the memory module/Mini PCI compartment cover ([Section 5.5](#)).
3. Position the notebook with the front panel facing you.

4. Remove the PM2.5×5.0 screw ❶ that secures the optical drive in the memory module/Mini PCI compartment.
5. Remove the PM2.5×8.0 screw ❷ that secures the optical drive in the battery bay.
6. Push on the back of the optical drive ❸ through the opening on the left side of the memory expansion/Mini PCI compartment.
7. Remove the optical drive ❹.



Removing the Optical Drive

Reverse the above procedure to install an optical drive.

5.8 Keyboard

Spare Part Number Information

For use with all models


France	344898-051
French Canada	344898-121
Germany	344898-041
United Kingdom	344898-031
United States and Canada	344898-001

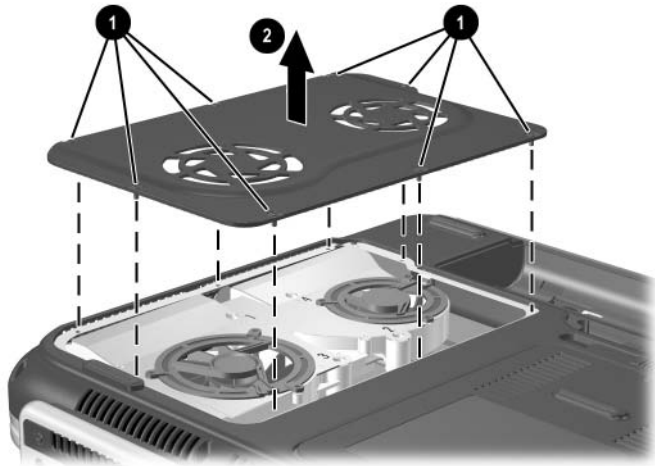
For use with HP zd7000 models

Italy	344898-061
Spain	344898-071
Sweden/Finland	344898-101
Switzerland	344898-111

1. Prepare the notebook for disassembly ([Section 5.3](#)).
2. Remove the memory module/Mini PCI compartment cover ([Section 5.5](#)).
3. Turn the notebook upside down with the rear panel toward you.

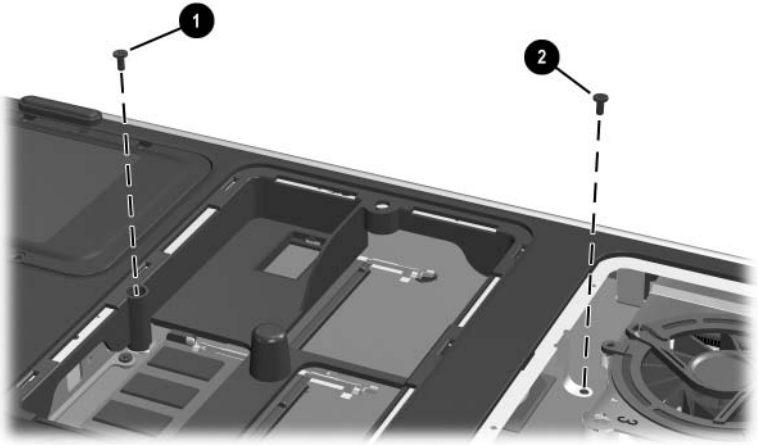
4. Loosen the 8 PM2.5×5.0 screws ❶ that secure the fan cover to the notebook.
5. Remove the fan cover ❷.

 The fan cover is included in the Miscellaneous Plastics Kit, spare part number 344852-001 or 370805-001.



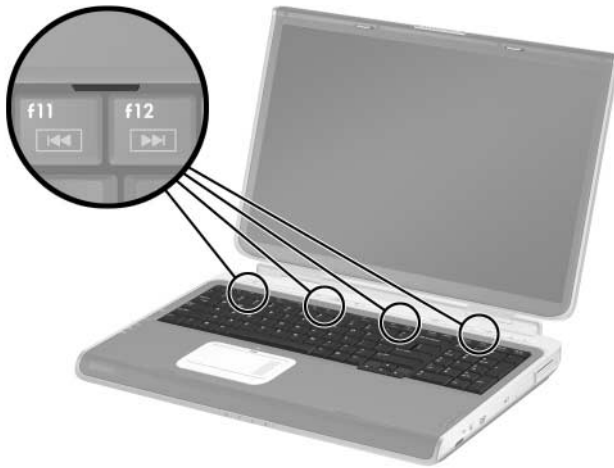
Removing the Fan Cover

6. Position the notebook with the front panel toward you.
7. Remove the PM2.5×8.0 screw ❶ that secures the keyboard in the memory expansion/Mini PCI compartment.
8. Remove the PM2.5×5.0 screw ❷ that secures the keyboard in the fan compartment.



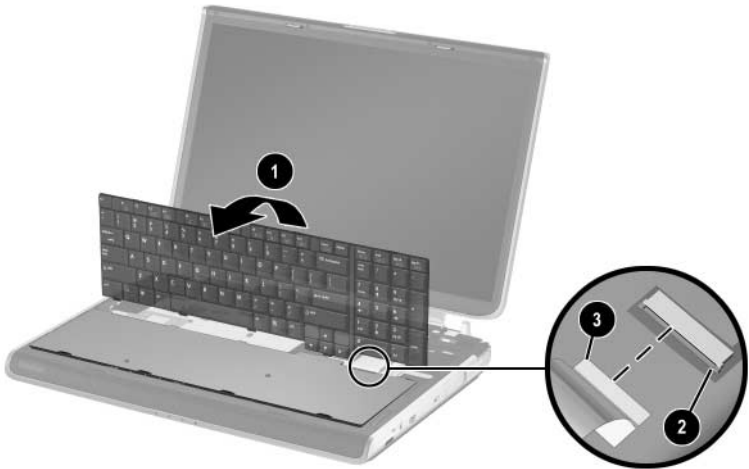
Removing the Keyboard Screws

9. Turn the notebook right-side up with the front toward you.
10. Open the computer.
11. Use a flat-bladed tool to pry the 6 keyboard retaining tabs toward you. The tabs are located above the **f1** and **f2** keys, above the **f6** and **f7** keys, above the **f11** and **f12** keys, above the **end** and **pg up** keys, to the left of the **Tab** and **Caps Lock** keys, and to the right of the numeric keypad - and + keys.



Releasing the Keyboard

12. Lift up on the back of the keyboard, and then swing it **1** toward you until it rests on the palm rest.
13. Release the zero insertion force (ZIF) connector **2** to which the keyboard cable is connected and disconnect the cable **3**.
14. Remove the keyboard.



Removing the Keyboard

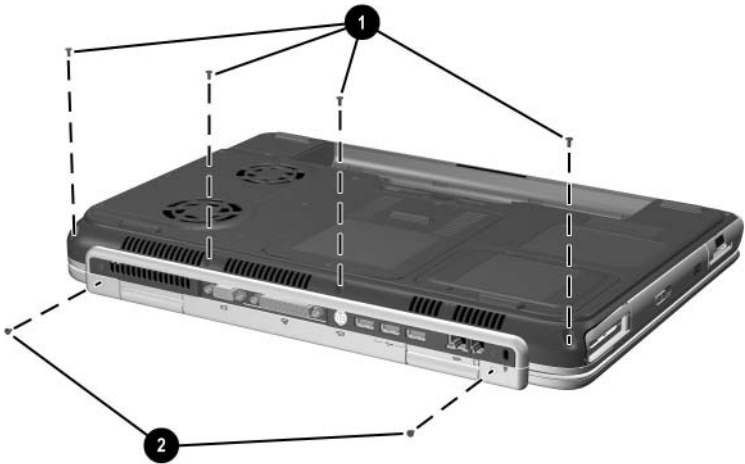
Reverse the above procedure to install the keyboard.

5.9 Keyboard Cover



The keyboard cover is included in the Miscellaneous Plastics Kit, spare part number 344852-001 or 370805-001.

1. Prepare the notebook for disassembly ([Section 5.3](#)).
2. Remove the keyboard ([Section 5.8](#)).
3. Turn the notebook upside down with the rear panel toward you.
4. Remove the 4 PM2.5×8.0 screws **1** that secure the keyboard cover to the notebook.
5. Remove the 2 PM2.5×8.0 screws **2** that secure the keyboard cover to the notebook through the rear panel.



Removing the Keyboard Cover Screws

6. Turn the notebook right-side up with the front toward you.
7. Open the notebook as far as it will open.
8. Lift up on the left and right sides ❶ of the keyboard cover to detach it from the notebook.
9. Lift the keyboard cover up, and then swing it toward you ❷ to remove it.



Removing the Keyboard Cover

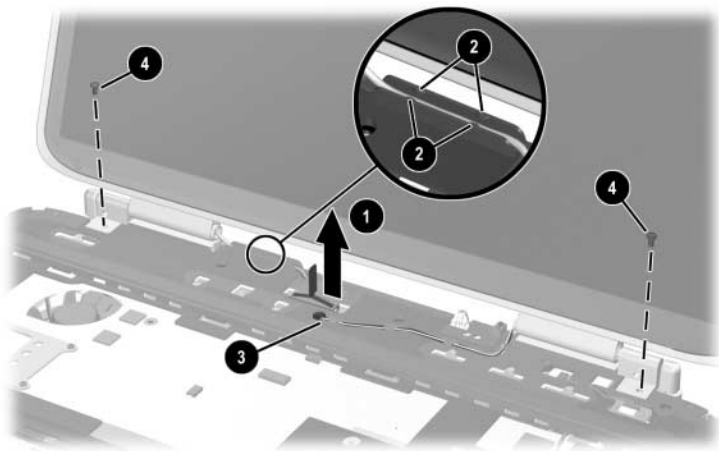
Reverse the above procedure to install the keyboard cover.

5.10 Display Assembly

Spare Part Number Information

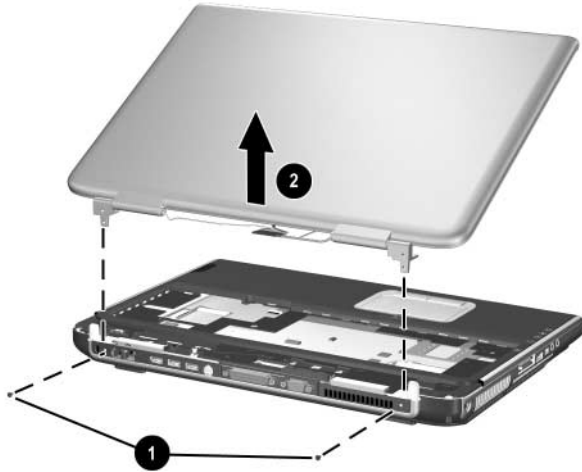
For use with all models	
17.0-inch, WXGA+	344894-001
15.4-inch, WXGA	344893-001
For use with HP zd7000 models	
17.0-inch, WSXGA+	365895-001

1. Prepare the notebook for disassembly ([Section 5.3](#)).
2. Remove the keyboard ([Section 5.8](#)).
3. Remove the keyboard cover ([Section 5.9](#)).
4. Disconnect the display cable **1**, and then remove it from the retaining clip **2** in the top cover.
5. Remove the 2 antenna cables from the hole and routing channel in the top cover **3**.
6. Remove the 2 PM2.5×8.0 screws **4** that secure the display assembly to the notebook.



Removing the Display Assembly Screws

7. Position the notebook with the rear panel toward you and the display in an upright position.
8. Remove the 2 PM2.5×8.0 screws ❶ that secure the display assembly to the notebook through the rear panel.
9. Lift the display assembly ❷ straight up to remove it.



Removing the Display Assembly

Reverse the above procedure to install the display assembly.

5.11 Top Cover

Spare Part Number Information

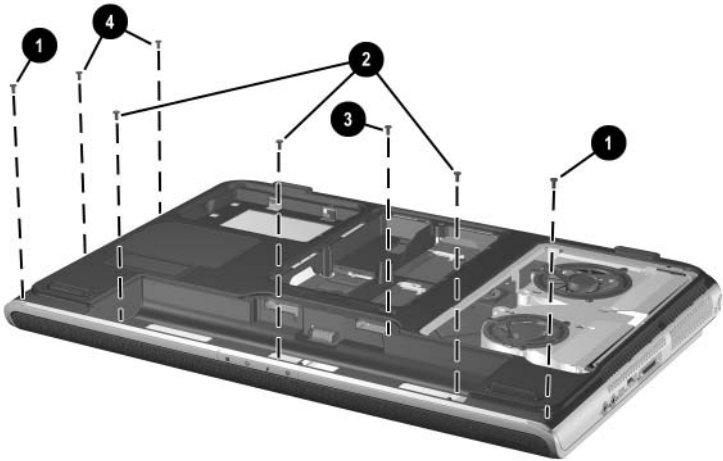
Top cover

For use with HP zd7000 models	344876-001
For use with HP Compaq nx9500 models	370803-001

1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - ❑ Optical drive ([Section 5.7](#))
 - ❑ Keyboard ([Section 5.8](#))
 - ❑ Keyboard cover ([Section 5.9](#))
 - ❑ Display assembly ([Section 5.10](#))
2. Turn the notebook upside down with the front toward you.

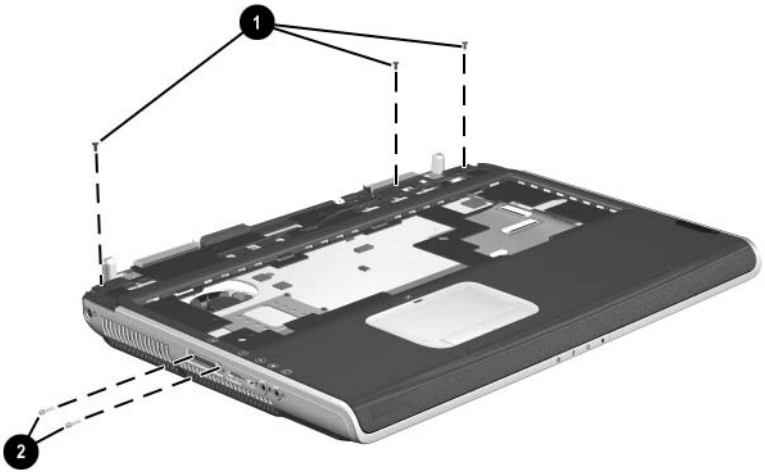
3. Remove the following screws:

- ❑ 2 PM2.5×8.0 screws ❶ on the notebook front edge
- ❑ 3 PM2.5×5.0 screws ❷ in the battery bay
- ❑ 1 PM2.5×8.0 screw ❸ in the rear/right corner of the battery bay
- ❑ 2 PM2.5×8.0 screws ❹ in the optical drive bay




Removing the Top Cover Screws

4. Turn the notebook right-side up with the front toward you.
5. Remove the 3 PM2.5×8.0 screws **1** that secure the top cover to the notebook.
6. Remove the 2 slotted M1.5×10.0 shoulder screws **2** that secure the top cover to the notebook on each side of the expansion port.

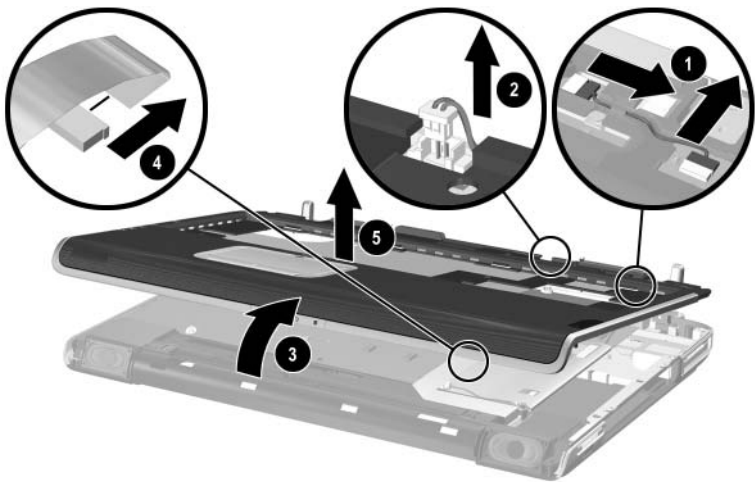


Removing the Top Cover Screws (Continued)

7. Disconnect the LED board cable ❶ from the system board and remove the cable from the clip in the top cover.

 The LED board cable is included in the Miscellaneous Cable Kit, spare part number 344851-001. The LED board is included with the top cover.

8. Disconnect the display lid switch module cable ❷ from the display lid switch module.
9. Lift the front edge of the top cover ❸ until the TouchPad cable ❹ is accessible.
10. Disconnect the TouchPad cable from the low insertion force (LIF) connector on the system board.
11. Remove the top cover ❺.



Removing the Top Cover

Reverse the above procedure to install the top cover.

5.12 System Board

Spare Part Number Information

For use with HP zd7000 models

NVIDIA GeForce FX Go5600 Ultra with 64-MB video memory	356668-001
NVIDIA GeForce FX Go5600 Ultra with 128-MB video memory	356669-001
NVIDIA GeForce FX Go5200 Ultra with 64-MB video memory	356670-001
NVIDIA GeForce FX Go5200 Ultra with 128-MB video memory	365892-001
NVIDIA GeForce FX Go5700 with 64-MB video memory	365893-001
NVIDIA GeForce FX Go5700 with 128-MB video memory	365894-001

For use with HP Media Center zd7000 and HP Compaq nx9500
models

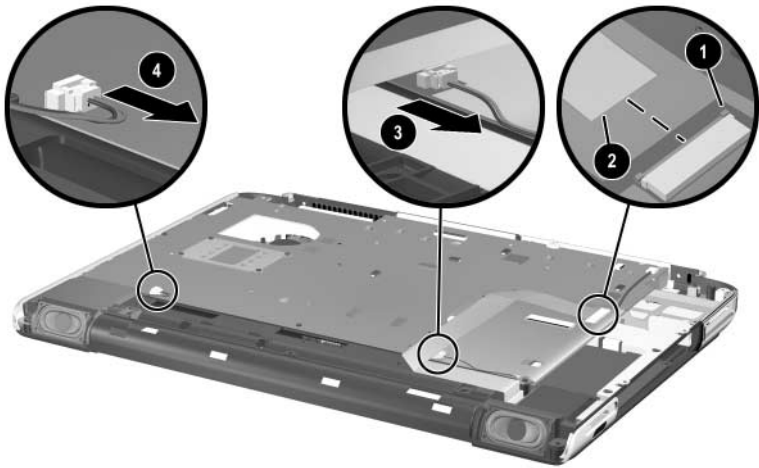
NVIDIA GeForce FX Go5700 with 64-MB video memory	365893-001
NVIDIA GeForce FX Go5700 with 128-MB video memory	365894-001



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

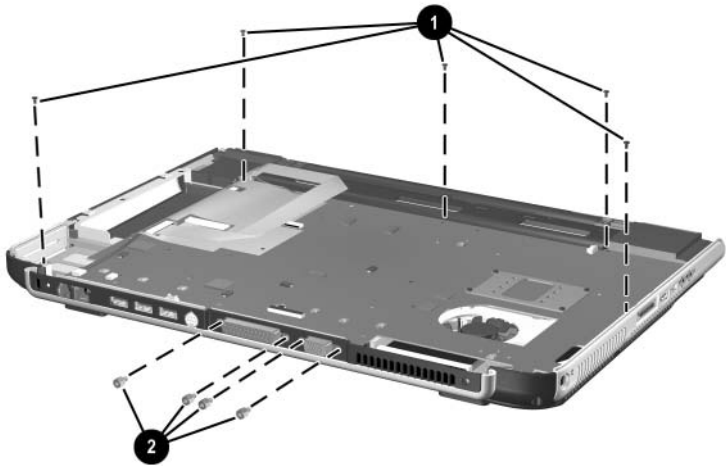
- Memory modules ([Section 5.5](#))
 - Mini PCI communications board ([Section 5.6](#))
 - Real time clock battery ([Section 5.13](#))
 - Heat sink ([Section 5.14](#))
 - Processor ([Section 5.15](#))
-

1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - ❑ Optical drive ([Section 5.7](#))
 - ❑ Keyboard ([Section 5.8](#))
 - ❑ Keyboard cover ([Section 5.9](#))
 - ❑ Display assembly ([Section 5.10](#))
 - ❑ Top cover ([Section 5.11](#))
2. Release the ZIF connector **1** to which the SD Card slot/infrared module cable is attached, and then disconnect the cable **2**.
3. Disconnect the right **3** and left **4** speaker cables from the system board.



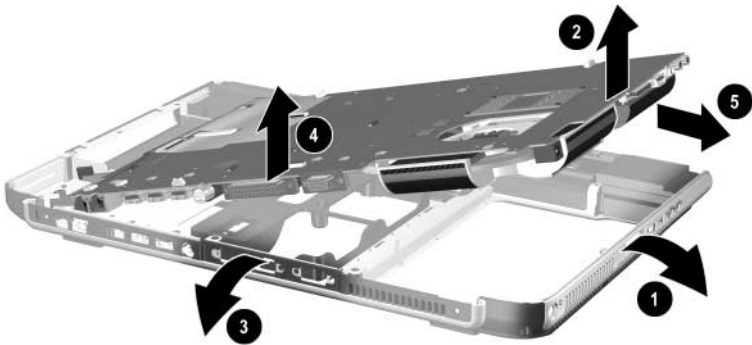
Disconnecting the SD Card Slot/Infrared Module and Speaker Cables from the System Board

4. Position the notebook with the rear panel toward you.
5. Remove the 6 PM2.5×8.0 screws ❶ that secure the system board to the notebook.
6. Use a 5.0-mm socket to remove the 4 HM5.0×9.0 standoffs ❷ that secure the system board to the notebook on each side of the parallel and external monitor ports.



Removing the System Board Screws and Standoffs

7. Flex the right side of the base enclosure **1** to the right.
8. Lift the right side of the system board **2** until the connectors on the right side of the board clear the base enclosure.
9. Flex the rear edge of the system board **3** toward you.
10. Lift the rear edge of the system board **4** until the connectors on the rear panel of the board clear the base enclosure.
11. Slide the system board to the right at an angle **5** and remove it.



Removing the System Board

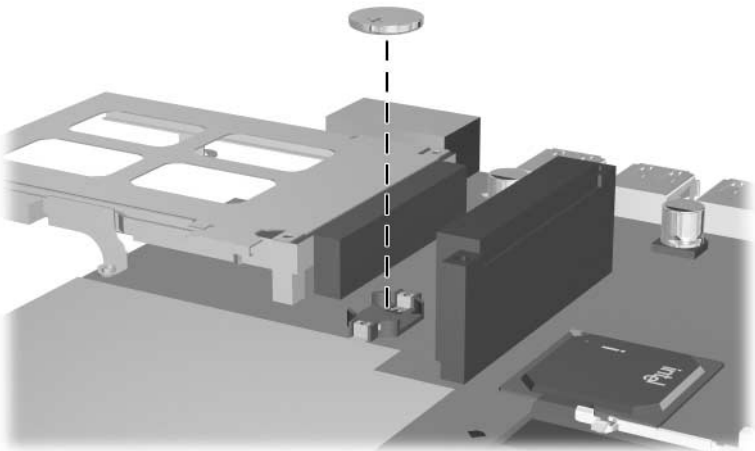
Reverse the above procedure to install the system board.

5.13 RTC Battery



The RTC battery is included in the Miscellaneous Plastics Kit, spare part number 344852-001 or 370805-001.

1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - ❑ Optical drive ([Section 5.7](#))
 - ❑ Keyboard ([Section 5.8](#))
 - ❑ Keyboard cover ([Section 5.9](#))
 - ❑ Display assembly ([Section 5.10](#))
 - ❑ Top cover ([Section 5.11](#))
 - ❑ System board ([Section 5.12](#))
2. Turn the system board upside down with the rear panel toward you.
3. Remove the RTC battery from the socket.



Removing the RTC Battery

Reverse the above procedure to install the RTC battery.

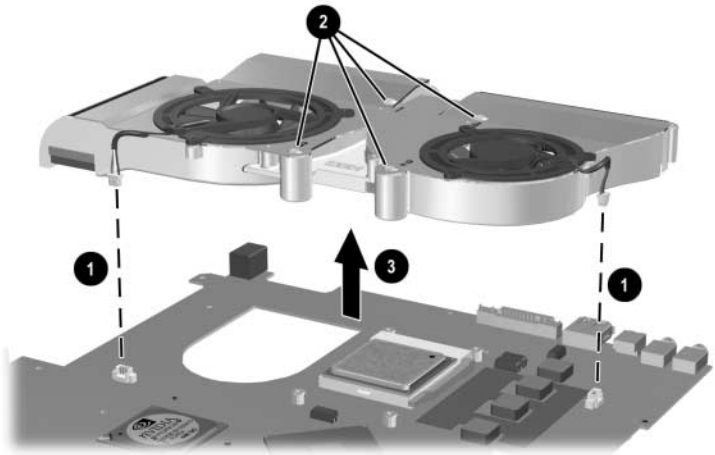
5.14 Heat Sink

Spare Part Number Information

Heat sink (includes large and small fans and thermal paste)	344872-001
Thermal Paste Kit	347577-001

1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - ❑ Optical drive ([Section 5.7](#))
 - ❑ Keyboard ([Section 5.8](#))
 - ❑ Keyboard cover ([Section 5.9](#))
 - ❑ Display assembly ([Section 5.10](#))
 - ❑ Top cover ([Section 5.11](#))
 - ❑ System board ([Section 5.12](#))
2. Turn the system board upside down with the rear panel facing you.

3. Disconnect the fan cables **1** from the system board.
4. Loosen the 4 PM1.5x12.0 spring-loaded heat sink shoulder screws **2**.
5. Remove the heat sink **3**.

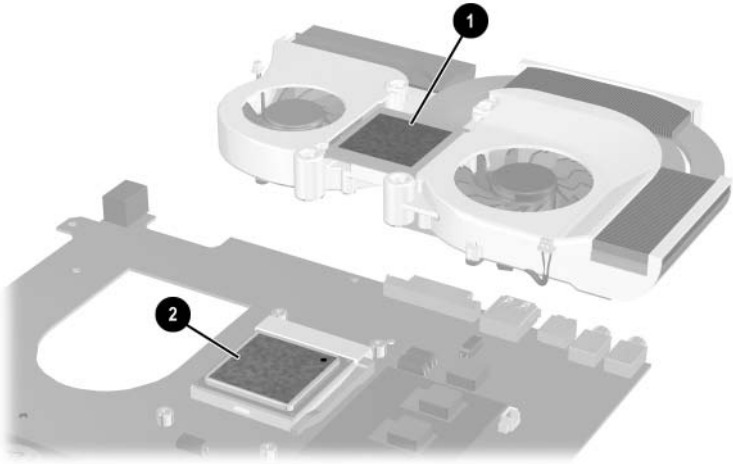


Removing the Heat Sink



Carefully clean any thermal paste residue from the heat sink **1** and processor surfaces **2** each time you remove the heat sink. Apply new thermal paste to both surfaces.

Thermal paste is included with the replacement heat sink and is also available in the Thermal Paste Kit, spare part number 346178-001.

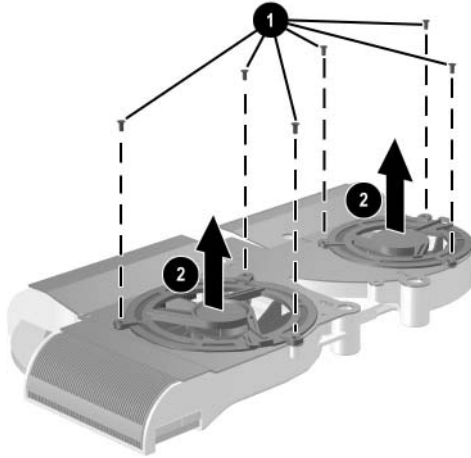


Removing the Thermal Paste from the Heat Sink and Processor

Reverse the above procedure to install the heat sink.

If it is necessary to remove one or both of the fans from the heat sink, follow these steps:

1. Remove the 6 PM1.5×4.0 screws **1** that secure the fans to the heat sink.
2. Remove the fans **2**.



Removing the Fans

Reverse the above procedure to install the fans.

5.15 Processor

Spare Part Number Information

For use with all models

Intel Pentium 4 with 800-MHz FSB and Hyper-Threading Technology (HT Technology)	
3.2-GHz	344890-001
Intel Pentium 4 with 800-MHz FSB	
3.4-GHz	370958-001
3.2-GHz	344889-001
3.0-GHz	344888-001
2.8-GHz	344887-001

For use with HP zd7000 models

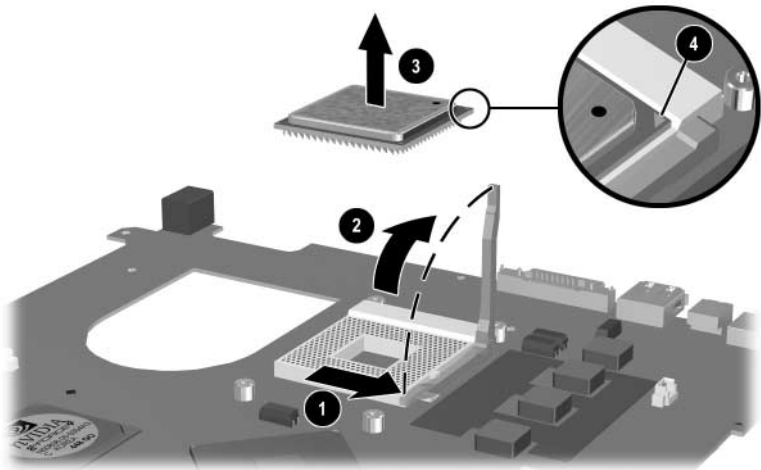
Intel Pentium 4 with 800-MHz FSB and Hyper-Threading Technology (HT Technology) Extreme Edition	
3.2-GHz	361672-001
Intel Pentium 4 with 533-MHz FSB and HT Technology	
3.06-GHz	344886-001
Mobile Intel Pentium 4 with 533-MHz FSB and HT Technology	
3.2-GHz	356962-001
3.06-GHz	356673-001
2.8-GHz	356672-001
Intel Pentium 4 with 533-MHz FSB	
2.8-GHz	344885-001
2.66-GHz	344884-001

1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - Optical drive ([Section 5.7](#))
 - Keyboard ([Section 5.8](#))
 - Keyboard cover ([Section 5.9](#))
 - Display assembly ([Section 5.10](#))
 - Top cover ([Section 5.11](#))
 - System board ([Section 5.12](#))
 - Heat sink ([Section 5.14](#))

2. Slide the processor release lever to the right **1** until it disengages from the clip on the back of the processor socket.
3. Lift the lever **2** up and swing it to the back until it is in an upright position.
4. Lift the processor **3** straight up to remove it.



Note that the gold triangle **4** on the processor should be aligned in the rear right corner when you install the processor.



Removing the Processor

Reverse the above procedure to install the processor.

5.16 SD Card Slot/Infrared Module


Spare Part Number Information

SD Card slot/infrared module (includes cable)	344880-001
---	------------




1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - ❑ Optical drive ([Section 5.7](#))
 - ❑ Keyboard ([Section 5.8](#))
 - ❑ Keyboard cover ([Section 5.9](#))
 - ❑ Display assembly ([Section 5.10](#))
 - ❑ Top cover ([Section 5.11](#))
 - ❑ System board ([Section 5.12](#))

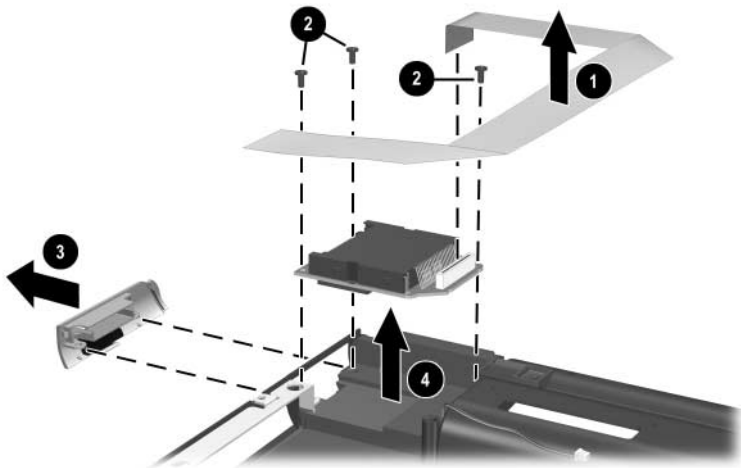
2. Disconnect the SD Card slot/infrared module cable **1** from the LIF connector on the module.

 The SD Card slot/infrared module cable is included with the SD Card slot/infrared module. It is also included in the Miscellaneous Cable Kit, spare part number 344851-001.

3. Remove the 3 PM2.5×8.0 screws **2** that secure the module to the notebook.
4. Remove the module bezel **3**.

 The SD Card slot/infrared module bezel is included in the Miscellaneous Plastics Kit, spare part number 344852-001 or 370805-001.

5. Remove the module **4**.



Removing the SD Card Slot/Infrared Module

Reverse the above procedure to install the SD Card slot/infrared module.

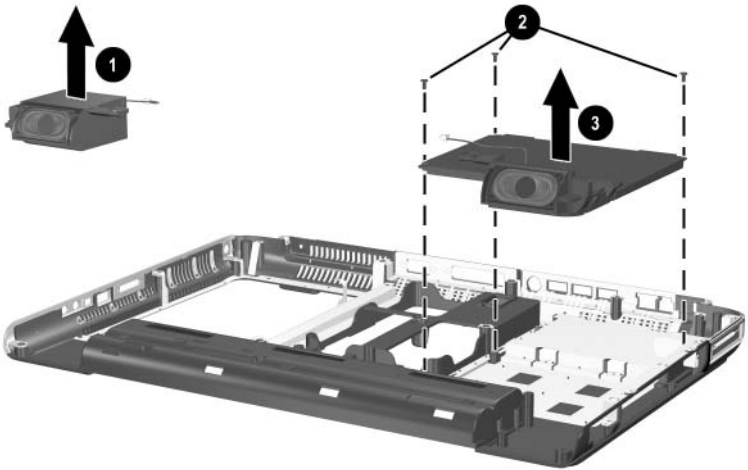
5.17 Speakers



The left and right speakers are included with the base enclosure, spare part number 344883-001 for HP zd7000 models, or spare part number 370804-001 for HP Compaq nx9500 models.

1. Prepare the notebook for disassembly ([Section 5.3](#)) and remove the following components:
 - ❑ Optical drive ([Section 5.7](#))
 - ❑ Keyboard ([Section 5.8](#))
 - ❑ Keyboard cover ([Section 5.9](#))
 - ❑ Display assembly ([Section 5.10](#))
 - ❑ Top cover ([Section 5.11](#))
 - ❑ System board ([Section 5.12](#))
 - ❑ SD Card slot/infrared module ([Section 5.16](#))

2. Remove the left speaker from the notebook ❶.
3. Remove the 3 PM2.5×5.0 screws ❷ that secure the right speaker to the notebook.
4. Remove the right speaker ❸.



Removing the Speakers

Reverse the above procedure to install the speakers.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Notebook

Dimensions		
Height	4.24 (front)/	1.67 (front)/
Width	4.70 (rear) cm	1.85 (rear) in
Depth	27.79	10.94
	(28.5 with hinge) cm	(11.34 with hinge) in
	39.8 cm	15.67 in
Weight (varies by configuration)	4.3 kg	9.5 lb
Stand-alone power requirements		
Nominal operating voltage	10.8 V (on 6-cell battery dc)	
	14.4 V (on 8-cell battery dc)	
Average operating power	10.5 W (on battery)	
	16 W (on AC power)	
Peak operating power	65 W	
Power in Standby mode	< 400 mW	
Power in Hibernation mode	< 50 mW	
Temperature		
Operating (not writing optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F

Table 6-1
Notebook (Continued)

Relative humidity (noncondensing)

Operating	10% to 90%
Nonoperating	5% to 95%, 38.7°C (101.6°F) maximum wet bulb temperature

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	50 g, 2 ms, half-sine
Nonoperating	175 g, 2 ms, half-sine

Random Vibration

Operating	0.75 g zero-to-peak, 10 to 500 Hz, 0.25 oct/min sweep rate
Nonoperating	1.5 g zero-to-peak, 10 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
15.4-inch, Wide SXGA+, TFT Display

Dimensions		
Height	20.7 cm	8.1 in
Width	33.1 cm	13.0 in
Diagonal	39.1 cm	15.4 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
Viewing angle		±65° horizontal, ±50° vertical typical

Table 6-3
17.0-inch Color TFT Wide XGA + Wide Viewing Angle 16:10
TFT Display

Dimensions		
Height	38.2 cm	15.0 in
Width	24.4 cm	9.6 in
Diagonal	43.1 cm	17.0 in
Number of colors	262,144	
Contrast ratio	250:1 typical	
Brightness	180 nits typical	
Refresh rate	60 Hz	
Brightness	160 nit typical	
Pixel resolution		
Pitch	0.255 × 0.255 mm	
Format	1440 × 900	
Configuration	RGB stripe	
Backlight	CCFT	
Character display	80 × 25	
Viewing angle	±60° horizontal, ±45°/-50° vertical typical	

Table 6-4
15.4-inch, Wide XGA+, TFT Display

Dimensions		
Height	20.7 cm	8.1 in
Width	33.1 cm	13.0 in
Diagonal	39.1 cm	15.4 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
Viewing angle		±65° horizontal, ±50° vertical typical

Table 6-5
5400-rpm Hard Drives

	80-GB	60-GB	40-GB
User capacity per drive*	80 GB	60 GB	40 GB
Dimensions			
Height	9.5 mm (0.74 in)	9.5 mm	9.5 mm
Width	70 mm (2.75 in)	70 mm	70 mm
Weight	102 g	102 g	99 g
Interface type	ATA-6	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	
Average	13 ms	13 ms	
Maximum	24 ms	24 ms	
Logical blocks†	156,301,488	117,210,240	78,140,160

NOTE: Certain restrictions and exclusions apply.

*1 GB = one billion bytes when referring to hard drive storage capacity.

Accessible capacity is less.

†Actual drive specifications may differ slightly.

Table 6-6
4200-rpm Hard Drives

	80-GB	60-GB	40-GB
User capacity per drive*	80 GB	60 GB	40 GB
Dimensions			
Height	9.5 mm (0.74 in)	9.5 mm (0.74 in)	9.5 mm (0.74 in)
Width	70 mm (2.75 in)	70 mm (2.75 in)	70 mm (2.75 in)
Weight	99 g	102 g (0.22 lb)	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†	156,301,488	117,210,240	78,140,160
Disk rotational speed	4200 rpm	4200 rpm	4200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)

NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Center for details.

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

†Actual drive specifications may differ slightly.

Table 6-7
External 120W AC Adapter

Weight	0.29 kg	0.65 lb
Power supply input		
Operating voltage	100 to 240 V ac RMS	
Operating current	1.6 A RMS	
Operating frequency range	47 to 63 Hz	
Maximum transient	4/50 kV	
Power supply output		
	120 W (NONPFC)	120 W (3.0-GHz processor)
	135 W (PFC)	135 W (3.2- or 3.4-GHz processor)

Table 6-8
135W AC Adapter (PFC)

Dimensions		
Height	16.9 cm	6.65 in
Width	6.5 cm	2.56 in
Depth	3.8 cm	1.50 in
Weight		
	700 g	1.54 lb
Input		
Operating voltage	100 to 240 V ac	
AC current	2.2 A at 90 V ac, 1.1 A at 180 V ac	
Frequency range	47 to 63 Hz	
Efficiency	83% min at 115 V ac	
Input efficiency	Input frequency range	
Output		
Output power	135 W	
DC output	19.0 V	
Hold-up time	5 msec at 115 V ac input	
Output current limit	< 9.5A, Over voltage protection - 29V max automatic shutdown	
Connector		
	3 pin/grounded, mates with interchangeable boards	
Environmental design		
Operating temperature	0°C to 35°C	32°F to 95°F
Non-operating temperature (storage)	-20°C to 65°C	-4°F to 149°F
Altitude	0 to 3,048 m	0 to 10,000 ft
Humidity	20% to 80%	
Storage humidity	10% to 90%	

Table 6-9
12-cell Li-Ion Battery Pack

Dimensions

Height	12.24 cm	6.0 in
Width	11.76 cm	4.63 in
Length	2.06 cm	0.81 in

Weight	0.59 kg	1.298 lb
---------------	---------	----------

Energy

Voltage	14.8 V
Amp-hour capacity	6.6 Ah
Watt-hour capacity	96 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 6-9
12-cell Li-Ion Battery Pack (Continued)

Recharge time	
System in off or Standby mode	2 to 3 3.5 - 4 hours
System on (depending on system power consumption)	2 to 5 3.5 - 8 hours
Run time	<p>HP tested on HP Compaq nx9500 Business Notebook running Windows XP Professional Edition, equipped with an Intel Pentium 4 3.2-GHz processor, 17-inch WXGA LCD, 1 GB RAM, 80-GB HDD, Lithium-Ion battery, NIC, and modem.</p> <p>This configuration achieved a MobileMark 2002 score of 1 hour 47 minutes.</p> <p>Test settings:</p> <ul style="list-style-type: none"> <input type="checkbox"/> LCD brightness set to half, but no less than 60 nits <input type="checkbox"/> Power management scheme: Laptop/Portable <input type="checkbox"/> Hard drive time set to 3 minutes <input type="checkbox"/> Standby and video timers set to Never <input type="checkbox"/> Wireless (802.11) turned off

Table 6-10
DVD/CD-RW Combo Drive

Dimensions		
Height	1.27 cm	0.5 in
Depth	13.25 cm	5.21 in
Width	12.61 cm	4.97 in
Weight		
	250 g	0.551 lb
Access times		
Random depth	<110 ms CD	<130 ms DVD
Full stroke	<210 ms CD	<225 ms DVD
Max data transfer rate		
	24X CD-ROM	3,600 KB/s
	24X CD-R	3,600 KB/s
	10X CD-RW	1,500 KB/s
	8X DVD-ROM	10,800 KB/s
Transfer mode		
	Multiword DMA Mode 2	
Interface		
	EIDE	
Supported media		
Read	CD Digital Audio (DA), CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, Mixed Mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM, DVD-R, DVD+R, DVD+RW, DVD-RAM	
Write	CD-R, CD-RW	
Max Media Capacity		
Read	4.7 GB	
Write	700 MB	
Transport		
	Tray loading	

Table 6-11
DVD+RW/R and CD-RW Combo Drive

Dimensions		
Height	1.27 cm	0.5 in
Depth	13.25 cm	5.21 in
Width	12.61 cm	4.97 in
Weight	250 g	0.551 lb
Access times		
Random depth	<175 ms CD	<230 ms DVD
Full stroke	<285 ms CD	<335 ms DVD
Max data transfer rate	24X CD-ROM	3,600 KB/s
	8X DVD-ROM	10,800 KB/s
	16X CD-R	2,400 KB/s
	8X CD-RW	1,200 KB/s
	2X DVD+R	2,700 KB/s
	2X DVD+RW	2,700 KB/s
Transfer mode	Multiword DMA Mode 2	
Interface	EIDE	
Supported media		
Read	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, Mixed Mode CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-Extra, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW	
Write	CD-R, CD-RW, DVD+R, DVD+RW	
Max Media Capacity		
Read	4.7 GB	
Write	700 MB	
Transport	Tray loading	

Table 6-12
8X MAX DVD-ROM Drive

Applicable disk	DVD-5, DVD-9, DVD-10 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 (read only) CD Plus Photo CD (single/multisession) CD-Bridge	
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
Disk thickness	1.2 mm	0.047 in
Track pitch	0.74 µm	
Access time		
Random DVD media	< 150 ms	
Full stroke DVD media	< 225 ms	
Random CD media	< 110 ms	
Full stroke CD media	< 200 ms	
Audio output level	Audio-out, 0.7 Vrms	
Cache buffer	512 KB/s	
Data transfer rate		
Max 24X CD	3600 KB/s (150 KB/s at 1X CD rate)	
Max 8X DVD	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 10 seconds	
Stop time	< 3 seconds	

Table 6-13
System DMA

Hardware DMA	System Function
DMA0	Available for audio
DMA1*	Entertainment audio (default; alternate = DMA0, DMA3, none)
DMA2*	Diskette drive
DMA3	ECP parallel port LPT1 (default; alternate = DMA0, none)
DMA4	DMA controller cascading (not available)
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned

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

Table 6-14
System Interrupts

Hardware IRQ	System Function
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Cascaded
IRQ3	COM2
IRQ4	COM1
IRQ5	Audio (default)*
IRQ6	Diskette drive
IRQ7	Parallel port
IRQ8	Real time clock (RTC)
IRQ9	Infrared
IRQ10	System use
IRQ11	System use
IRQ12	Internal point stick or external mouse
IRQ13	Coprocessor (not available to any peripheral)
IRQ14	IDE interface (hard drive and optical drive)
IRQ15	System use



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.

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

Table 6-15
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 6-15
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 6-15
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)

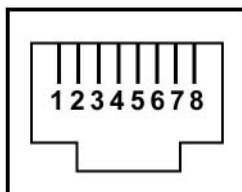
Table 6-16
System Memory Map

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

A

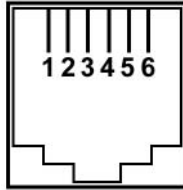
Connector Pin Assignments

Table A-1
RJ-45 (Network) Jack



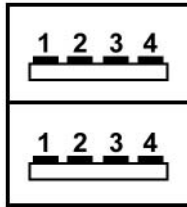
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-2
RJ-11 (Modem) Jack



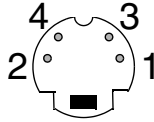
Pin	Signal	Pin	Signal
1	Unused	4	Unused
2	Tip	5	Unused
3	Ring	6	Unused

Table A-3
Universal Serial Bus Port



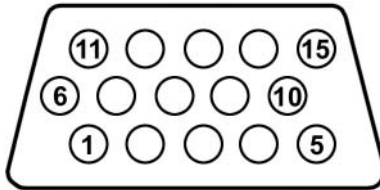
Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data -	4	Ground

Table A-4
S-Video Jack



Pin	Signal	Pin	Signal
1	Ground (Y)	3	Y-Luminance (Intensity)
2	Ground (C)	4	C-Chrominance (Color)

Table A-5
External Monitor Port

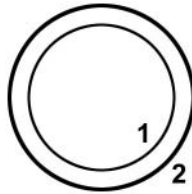


Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync

Table A-5
External Monitor Port (*Continued*)

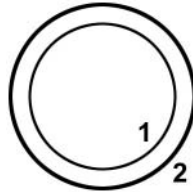
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table A-6
Audio-Out (Headphone) Jack



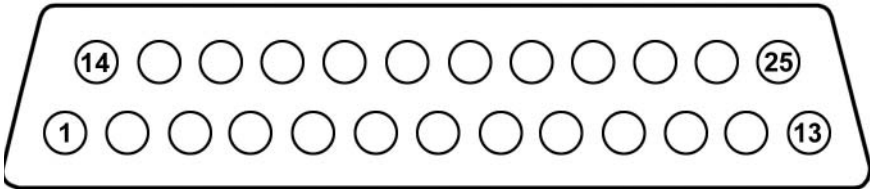
Pin	Signal	Pin	Signal
1	Audio-out	2	Ground

Table A-7
Audio-In (Microphone) Jack



Pin	Signal	Pin	Signal
1	Audio-in	2	Ground

Table A-8
Parallel Port



Pin	Signal	Pin	Signal
1	Strobe	14	Auto linefeed
2	Data bit 0	15	Error
3	Data bit 1	16	Initialize paper
4	Data bit 2	17	Select in
5	Data bit 3	18	Ground
6	Data bit 4	19	Ground
7	Data bit 5	20	Ground
8	Data bit 6	21	Ground
9	Data bit 7	22	Ground
10	Acknowledge	23	Ground
11	Busy	24	Ground
12	Paper end	25	Ground
13	Select		

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 shipped 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. For more information on power cord set requirements, contact a service partner.

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord set must be at least 1.5 meters (5.00 feet) and a maximum of 2.0 meters (6.50 feet).
- 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 set must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 volts 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

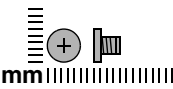
Notes

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 2-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 2-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

Screw Listing

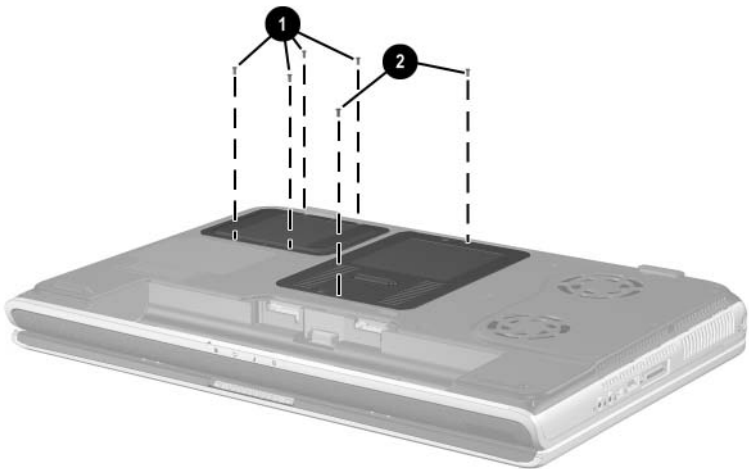
This appendix provides specification and reference information for the screws used in the notebook. All screws listed in this appendix are available in the Miscellaneous Screw Kit, spare part number 344850-001.

Table C-1
Phillips PM2.5×4.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	9	4.0 mm	2.5 mm	5.0 mm

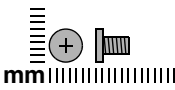
Where used:

- ❶ Four screws that secure the hard drive cover to the notebook (documented in [Section 5.3](#))
- ❷ Two screws that secure the memory module/Mini PCI compartment cover to the notebook (documented in [Section 5.6](#))



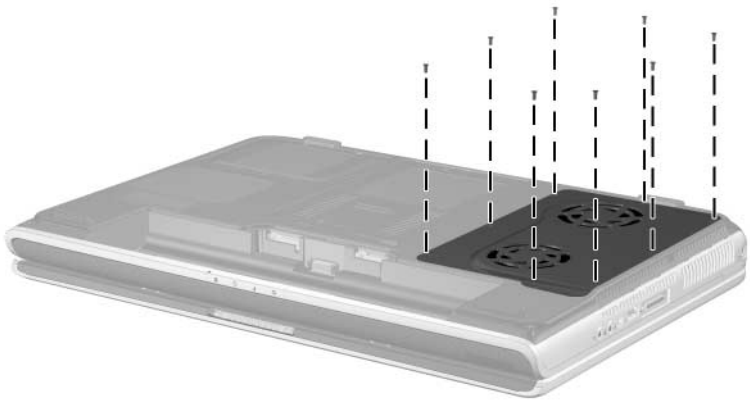
Phillips M2.5×4.0 Screw Locations

Table C-1
Phillips PM2.5x4.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	9	4.0 mm	2.5 mm	5.0 mm

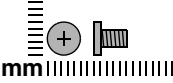
Where used:

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



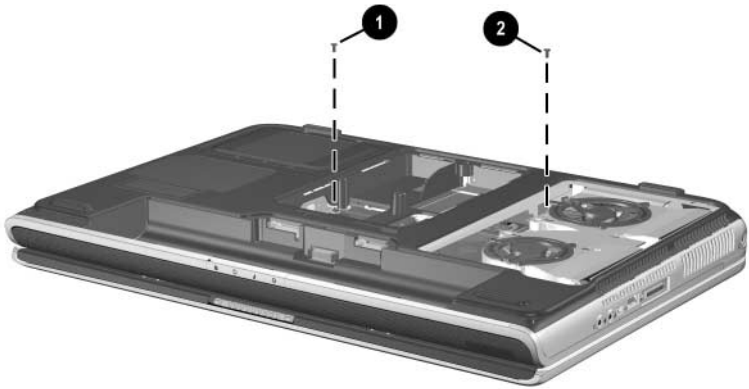
Phillips M2.5x4.0 Screw Locations

Table C-2
Phillips PM2.5x5.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	5.0 mm

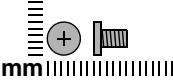
Where used:

8 screws that secure the fan cover to the notebook
(documented in [Section 5.8](#))



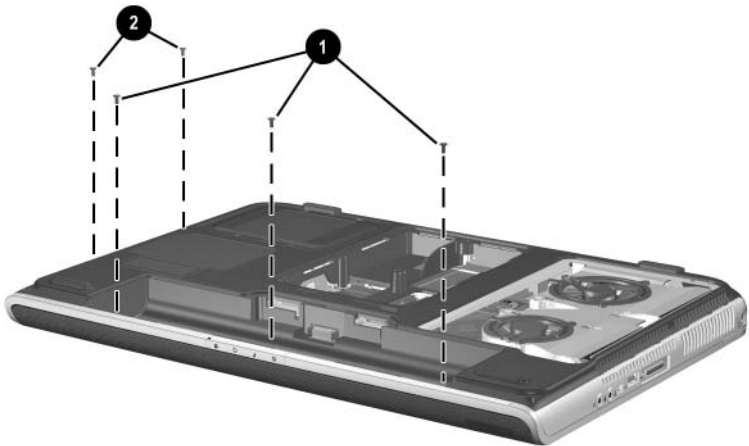
Phillips M2.5x5.0 Screw Locations

Table C-2
Phillips PM2.5x5.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	5.0 mm

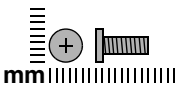
Where used:

- ❶ Three screws that secure the top cover to the notebook in the battery bay (documented in [Section 5.11](#))
- ❷ Two screws that secure the top cover to the notebook in the optical drive bay (documented in [Section 5.11](#))



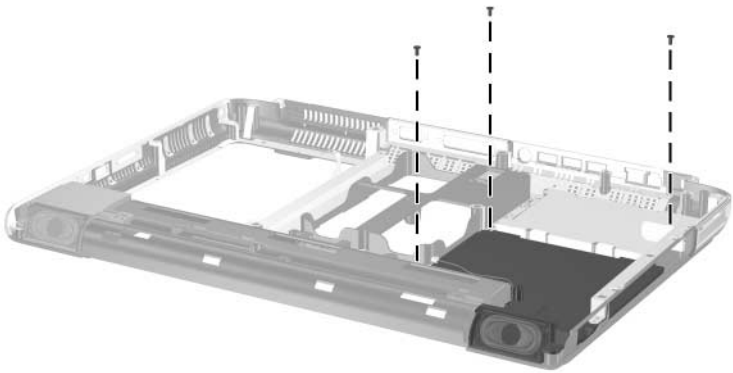
Phillips M2.5x5.0 Screw Locations

Table C-3
Phillips PM2.5x6.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	3	6.0mm	2.5 mm	5.0 mm

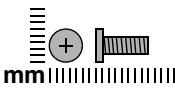
Where used:

3 screws that secure the SD Card slot/infrared module to the notebook (documented in [Section 5.16](#))



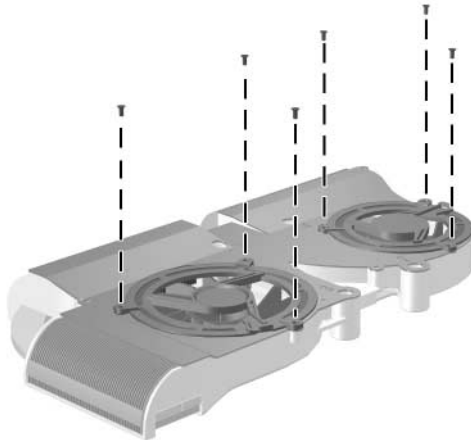
Phillips M2.5x6.0 Screw Locations

Table C-4
Phillips PM2.5×8.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	26	8.0 mm	2.5 mm	5.0 mm

Where used:

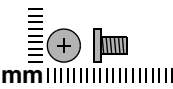
- ❶ One screw that secures the keyboard to the notebook in the memory module/Mini PCI compartment (documented in [Section 5.8](#))
- ❷ Three screws that secure the top cover to the notebook: 2 on the front edge of the notebook, one in the battery bay (documented in [Section 5.11](#))



Phillips M2.5×8.0 Screw Locations

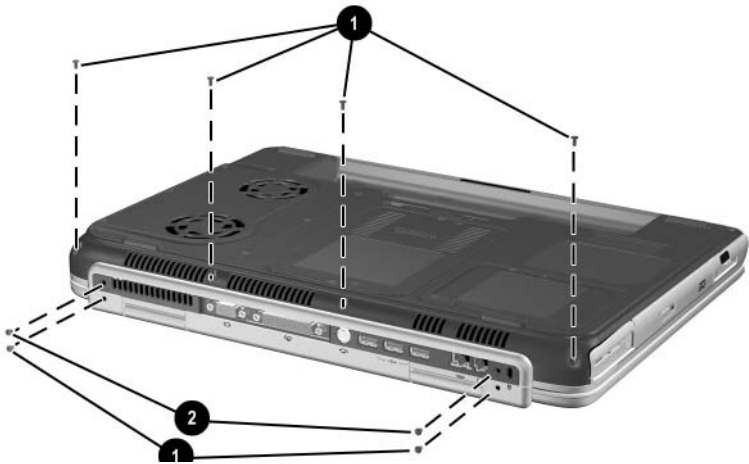
Table C-4

Phillips PM2.5×8.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
mm	Black	26	8.0 mm	2.5 mm	5.0 mm

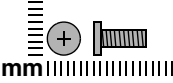
Where used:

- ❶ Two screws that secure the optical drive to the notebook: one in the memory module/Mini PCI compartment (documented in [Section 5.7](#)) and one in the battery bay (documented in [Section 5.11](#))
- ❷ One screw that secures the keyboard to the notebook in the heat sink compartment (documented in [Section 5.8](#))



Phillips M2.5×8.0 Screw Locations

Table C-4
Phillips PM2.5×8.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	26	8.0 mm	2.5 mm	5.0 mm

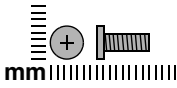
Where used:

- ❶ Six screws that secure the keyboard cover to the notebook (documented in [Section 5.9](#))
- ❷ Two screws that secure the display assembly to the notebook (documented in [Section 5.10](#))



Phillips M2.5×8.0 Screw Locations

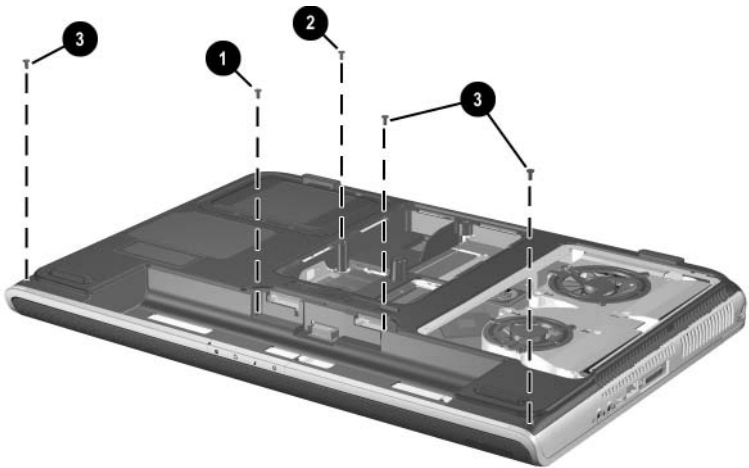
Table C-4
Phillips PM2.5×8.0 Screw (Continued)



Color	Qty.	Length	Thread	Head Width
Black	26	8.0 mm	2.5 mm	5.0 mm

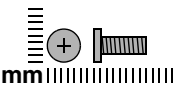
Where used:

2 screws that secure the display assembly to the notebook
 (documented in [Section 5.10](#))



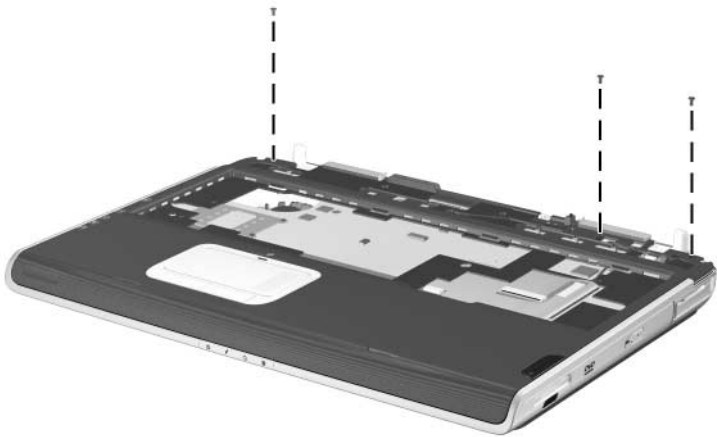
Phillips M2.5×8.0 Screw Location

Table C-4
Phillips PM2.5×8.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	26	8.0 mm	2.5 mm	5.0 mm

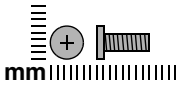
Where used:

3 screws that secure the top cover to the notebook
 (documented in [Section 5.11](#))



Phillips M2.5×8.0 Screw Locations

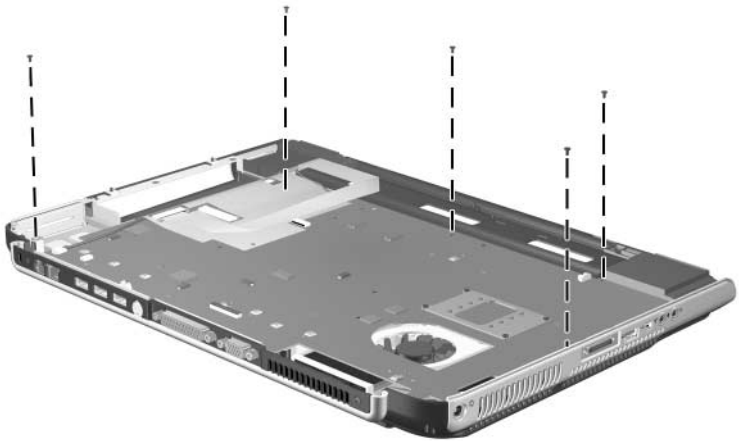
Table C-4
Phillips PM2.5×8.0 Screw (Continued)



Color	Qty.	Length	Thread	Head Width
Black	26	8.0 mm	2.5 mm	5.0 mm

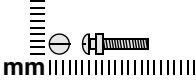
Where used:

6 screws that secure the system board to the notebook
 (documented in [Section 5.12](#))



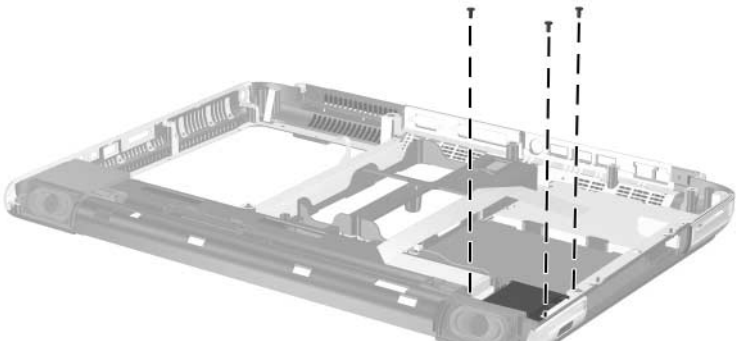
Phillips M2.5×8.0 Screw Location

Table C-5
Slotted M1.5×10.0 Shoulder Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	2	10.0 mm	1.5 mm	3.0 mm

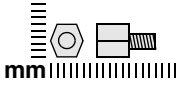
Where used:

2 screws that secure the top cover to the notebook
 (documented in [Section 5.11](#))



Slotted M1.5×10.0 Shoulder Screw Locations

Table C-6
HM5.0×9.0 Standoff



	Color	Qty.	Length	Thread	Head Width
	Silver	4	9.0 mm	2.5 mm	5.0 mm

Where used:

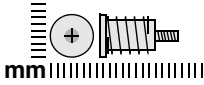
4 standoffs that secure the system board to the notebook (documented in [Section 5.12](#))



HM5.0×9.0 Standoff Location

Table C-7

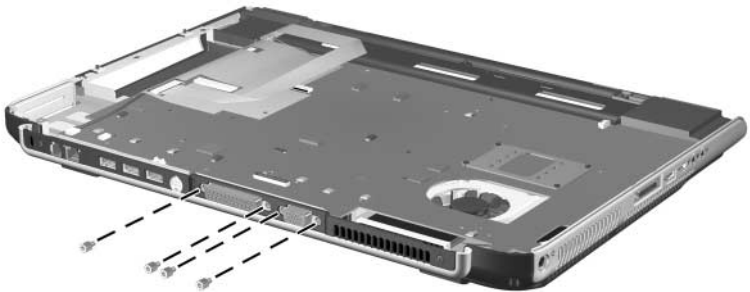
PM1.5×12.0 Spring-Loaded Shoulder Screw



Color	Qty.	Length	Thread	Head Width
Silver	4	12.0 mm	1.5 mm	6.5 mm

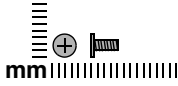
Where used:

4 screws that secure the heat sink to the system board
(documented in [Section 5.14](#))



Phillips M1.5×12.0 Spring-Loaded Shoulder Screw Location

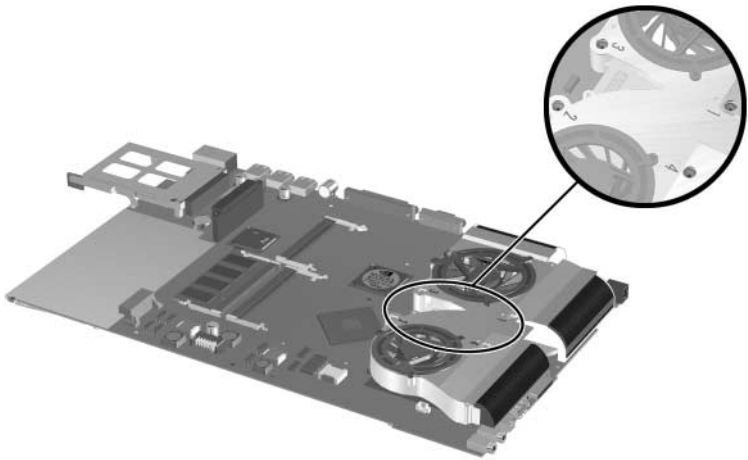
Table C-8
Phillips PM1.5x4.0 Screw



Color	Qty.	Length	Thread	Head Width
Black	6	4.0 mm	1.5 mm	3.5 mm

Where used:

6 screws that secure the fans to the heat sink (documented in [Section 5.14](#))



Phillips M1.5x4.0 Screw Locations

Index

1394 connector 1–20

A

AC adapter

 spare part numbers 3–23

 specifications 6–8, 6–9

audio troubleshooting 2–27

audio-in (microphone) jack

 location 1–20

 pin assignments A–5

audio-out (headphone) jack

 location 1–20

 pin assignments A–4

B

base enclosure, spare part

 number 3–12

battery bay 1–26

battery LED 1–18

battery pack

 removal 5–5

 spare part number 3–14,

 5–5

 specifications 6–10

battery release latch 1–26

Bluethumb wireless LAN,

 spare part number 3–12

bottom components 1–25

C

cables, service considerations
 4–2

caps lock key 1–22

caps lock LED 1–24

CD-ROM drive

 OS loading problems 2–26

 precautions 4–3

components

 bottom 1–25

 front 1–17

 keyboard 1–21

 left-side 1–19

 rear panel 1–19

 right-side 1–17, 1–19

 top 1–23

Computer Setup

 Advanced Menu 2–7

 File Menu 2–4

 overview 2–2

 Security Menu 2–5

configuration information 2–9

connector pin assignments

 audio-in (microphone) jack

 A–5

 audio-out (headphone) jack

 A–4

- modem jack A-2
- RJ-45 (network) jack A-1
- S-Video jack A-3
- Universal Serial Bus (USB)
 - port A-2
- connectors, service
 - considerations 4-2
- cursor control keys 1-22
- D**
- design overview 1-27
- diagnostics
 - configuration information 2-9
 - test information 2-10
- Diagnostics for Windows 2-2, 2-9
- Digital Media Slot 1-18
- disassembly
 - preparation procedures 5-4
 - sequence chart 5-3
- diskette drive
 - OS loading problems 2-25
 - spare part number 3-20
- display assembly
 - removal 5-24
 - spare part numbers 3-4, 5-24
 - specifications 6-3, 6-4, 6-5
- display cable, illustrated 3-18
- display release latch 1-18
- DMA specifications 6-15
- drives, preventing damage 4-3

- DVD+RW/R and CD-RW
 - Combo Drive, specifications 6-13
- DVD/CD-RW Combo Drive
 - OS loading problems 2-26
 - specifications 6-12
- DVD-ROM drive
 - OS loading problems 2-26
 - precautions 4-3
 - specifications 6-14

E

- electrostatic discharge 4-4, 4-6
- expansion base,
 - troubleshooting 2-20
- external monitor port
 - location 1-20
 - pin assignments A-3

F

- f1** through **f12** function keys 1-22
- fan compartment 1-26
- fan cover
 - illustrated 3-17
 - removal 5-18
- fan, removal 5-38
- features 1-13
- feet
 - illustrated 3-17
 - locations 5-9
 - replacement 5-9
 - spare part number 5-9

- flowcharts, troubleshooting
 - initial troubleshooting
 - 2–13
 - no audio 2–27, 2–28
 - no network/modem connection 2–32
 - no OS loading 2–21
 - no OS loading from CD/DVD drive 2–26
 - no OS loading from diskette drive 2–25
 - no OS loading from hard drive 2–22, 2–23, 2–24
 - no power 2–14, 2–15, 2–16, 2–17
 - no video 2–18, 2–19
 - nonfunctioning device 2–29
 - nonfunctioning expansion base 2–20
 - nonfunctioning keyboard 2–30
 - nonfunctioning pointing device 2–31
- fn** key 1–22
- front components 1–17
- G**
 - grounding equipment and methods 4–5
- H**
 - hard drive
 - illustrated 3–19
 - OS loading problems 2–22
 - precautions 4–3
 - removal 5–7
 - spare part numbers 3–14, 3–19, 5–6
 - specifications 6–6, 6–7
 - hard drive bay 1–25
 - hard drive cover
 - illustrated 3–17
 - removal 5–7
 - heat sink
 - removal 5–36
 - spare part number 3–8
- I**
 - I/O address specifications 6–17
 - infrared port 1–18
 - interrupt specifications 6–16
- K**
 - keyboard
 - removal 5–17
 - spare part numbers 3–6, 5–17
 - troubleshooting 2–30
 - keyboard components 1–21
 - keyboard cover
 - illustrated 3–17
 - removal 5–22
 - spare part numbers 5–22
 - keypad keys 1–22
- L**
 - labels area 1–25
 - LED board cable
 - illustrated 3–18
 - removal 5–29

left-side components 1–19
Logo Kit, spare part number
3–23

M

mass storage devices, spare
part numbers 3–19
media button 1–24
memory map specifications
6–20
memory module
removal 5–10
spare part numbers 3–12,
5–10
memory module/Mini PCI
compartment cover
illustrated 3–12, 3–17
location 1–26
removal 5–11
microphone jack
location 1–20
pin assignments A–5
Mini PCI communications
card
removal 5–13
spare part numbers 3–12,
5–13
Miscellaneous Cable Kit
components 3–16, 3–18
spare part number 3–16,
3–18
Miscellaneous Plastics Kit
components 3–4, 3–17
spare part number 3–4,
3–17

models 1–2
modem jack
location 1–19
pin assignments A–2
modem, troubleshooting 2–32
monitor port
location 1–20
pin assignments A–3
mute button 1–24
mute LED 1–24

N

network jack
location 1–19
pin assignments A–1
network, troubleshooting 2–32
nonfunctioning device,
troubleshooting 2–20, 2–29
notebook feet
illustrated 3–17
locations 5–9
notebook specifications 6–1
num lock LED 1–24

O

operating system loading,
troubleshooting 2–21
optical drive
illustrated 3–20
location 1–18
OS loading problems 2–26
removal 5–15
spare part numbers 3–14,
3–20

P

- packing precautions 4-4
- parallel port
 - location 1-20
 - pin assignments A-6
- password, clearing 1-16
- PC Card eject button 1-18
- PC Card slot 1-18
- personal video recorder
 - illustrated 3-21, 3-22
 - spare part number 3-21
- personal video recorder cable
 - kit, spare part number 3-21
- personal video recorder devices
 - illustrated 3-21
 - spare part numbers 3-21
- personal video recorder remote sensor, spare part number 3-21
- personal video recorder remote, spare part number 3-21
- picture button 1-24
- pin assignments
 - (RJ-11) modem jack A-2
 - external monitor port A-3
 - network jack A-1
 - S-Video jack A-3
 - USB port 1-19, A-2
- plastic parts 4-2
- pointing device,
 - troubleshooting 2-31
- power button 1-23
- power connector 1-20

- power cord set requirements
 - B-1
- power LED 1-18
- power management features 1-16
- power, troubleshooting 2-14
- power/standby LED 1-18, 1-23
- processor
 - removal 5-40
 - spare part numbers 3-10

R

- real time clock (RTC) battery
 - removal 5-34
 - spare part number 3-14, 3-17
- rear panel components 1-19
- removal
 - preliminaries 4-1
 - procedures 5-1
- replacement
 - preliminaries 4-1
 - procedures 5-1
- right-side components 1-17, 1-19
- RJ-11 (modem) jack
 - location 1-19
 - pin assignments A-2
- RJ-45 (network) jack
 - location 1-19
 - pin assignments A-1
- RTC battery
 - removal 5-34
 - spare part number 3-4, 3-17

S

Screw Kit, spare part number
3-24

screw listing C-1

SD Card slot/infrared module
removal 5-41, 5-42
spare part number 3-12

SD Card slot/infrared module
bezel
illustrated 3-17
removal 5-42

SD Card slot/infrared module
cable
disconnecting 5-31
illustrated 3-18

security cable slot 1-19

serial number 3-2, 5-2

service considerations 4-2

spare part numbers

battery pack 3-14

battery pack, 12-cell 5-5

diskette drive 3-20

display 3-4, 5-24

display cable 3-18

fan cover 3-17

feet 3-17, 5-9

hard drive 3-14, 3-19, 5-6

heat sink 3-8, 5-35

keyboard 3-6

keyboard cover 3-17

LED board cable 3-18

major components 3-4,
3-6, 3-8, 3-10, 3-12,
3-14, 3-16

mass storage devices 3-19

memory module 3-12,
5-10

memory module/Mini PCI
compartment cover 3-17

Mini PCI communications
cards 3-12

miscellaneous cable kit
3-16, 3-18

miscellaneous plastics kit
3-4, 3-17

optical drive 3-14, 3-20,
5-15

other miscellaneous 3-23

personal video recorder
3-21

personal video recorder
cable kit 3-21

personal video recorder
devices 3-21

personal video recorder
remote 3-21

personal video recorder
remote sensor 3-21

processor 3-10, 5-39

RTC battery 3-4, 3-17,
5-34

screw kit 3-24

SD Card slot/infrared
module 3-12, 5-41

SD Card slot/infrared
module cable 3-18

speakers 5-43

system board 3-8, 5-30

thermal paste fixture tool
3-24

thermal paste kit 3-8, 3-16

- top cover 3–6
 - wireless LAN antennae 3–16
 - speakers
 - location 1–18
 - removal 5–44
 - specifications
 - AC adapter 6–8, 6–9
 - battery pack 6–10
 - display 6–3, 6–4, 6–5
 - DMA 6–15
 - DVD+RW/R and CD-RW Combo Drive 6–13
 - DVD/CD-RW Combo Drive 6–12
 - DVD-ROM drive 6–14
 - hard drive 6–6, 6–7
 - I/O addresses 6–17
 - interrupts 6–16
 - memory map 6–20
 - notebook 6–1
 - static shielding materials 4–7
 - S-Video jack
 - location 1–19
 - pin assignments A–3
 - system board
 - removal 5–30
 - spare part numbers 3–8, 5–30
 - system memory map 6–20
- T**
- thermal paste fixture tool, spare part number 3–24
 - thermal paste kit, spare part number 3–8, 3–16
 - tools required 4–1
 - top components 1–23
 - top cover, spare part number 3–6
 - TouchPad 1–24
 - TouchPad buttons 1–24
 - TouchPad LED 1–24
 - TouchPad on/off button 1–24
 - TouchPad scroll zones 1–24
 - transporting precautions 4–4
 - troubleshooting
 - audio 2–27
 - Computer Setup 2–3
 - Diagnostics for Windows 2–9
 - expansion base 2–20
 - keyboard 2–30
 - modem 2–32
 - network 2–32
 - nonfunctioning device 2–20, 2–29
 - OS loading 2–21
 - overview 2–1
 - pointing device 2–31
 - power 2–14
 - video 2–18
 - troubleshooting flowcharts 2–12
- U**
- Universal Serial Bus (USB) port
 - location 1–19, 1–20
 - pin assignments A–2

V

- vent 1–20
- video troubleshooting 2–18
- volume buttons 1–23

W

- Windows applications key
1–22
- Windows logo key 1–22
- wireless button 1–24
- wireless LAN antennae, spare
part number 3–16
- wireless LAN card, spare part
numbers 3–12
- wireless LED 1–24
- workstation precautions 4–5