Maintenance and Service Guide

HP Compaq Business Notebook nx7000
Compaq Presario Widescreen Notebook PC X1000

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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.

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Product Description

The HP Compaq Business Notebook nx7000 and Compaq Presario Widescreen Notebook PC X1000 offer advanced modularity, Intel Mobile Pentium-M processors with 64-bit architecture, industry-leading ATI Mobility Radeon Accelerated Graphics Port (AGP) implementation, and extensive multimedia support.

HP Compaq Business Notebook nx7000 and Compaq Presario Widescreen Notebook PC X1000

1.1 Models

Notebook models are shown in Tables 1-1 through 1-3.

Table 1-1
HP Compaq nx7000 and Compaq Presario X1000 Model Naming Conventions

Key									
C	P	160	Y5	80	Y	Ci	10	P	XXXXXX-XXX
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Key	Description	Options	
1	Brand/Series designator	C = HP Compaq nx7000	P = Compaq Presario X1000
2	Processor type	P = Intel Pentium-M	
3	Processor speed	160 = 1.6 GHz 150 = 1.5 GHz	140 = 1.4 GHz 130 = 1.3 GHz
4	Display type/ size/resolution	Z = wide UXGA (1920 × 1200) Y = wide SXGA+ (1680 × 1050) W = wide XGA (1280 × 800)	5 = 15.4 in
5	Hard drive size	80 = 80 GB 60 = 60 GB	40 = 40 GB
6	Optical drive designator	C = CD-ROM D = DVD-ROM Y = DVD-RW	W = DVD-ROM/ CD-RW combo
7	Integrated communication/ wireless device	C = combination LAN/modem b = 802.11b i = 802.11b + Bluethumb	
8	RAM	10 = 1024 MB 51 = 512 MB	25 = 256 MB
9	Operating system	H = Windows XP Home	P = Windows XP Pro
10	SKU#		

Table 1-2
HP Compaq nx7000 Models

All HP Compaq nx7000 models feature:

- TouchPad pointing device
- 8-cell, 4.4 wH lithium ion (Li ion) battery pack
- 1-year warranty on parts and labor

C	P	160	Y5	80	W	Cb	51	P	
Korea			DM942A AB5						
C	P	160	Y5	60	Y	Ci	51	P	
France			DG706T ABF						
C	P	160	Y5	60	W	Cb	51	P	
Belgium			DG706A UUG			Norway			DG706A ABN
Czech Republic			DG706A AKB			Poland			DG706A AKD
Denmark			DG706A ABY			Portugal			DG706A AB9
European International			DG706A ABB			Russia			DG706A ACB
						Saudi Arabia			DG706A ABV
France			DG706A ABF			Slovenia			DG706A AKN
Germany			DG706A ABD			Spain			DG706A ABE
Greece			DG706A AB7			Sweden/Finland			DG706A AK8
Hungary			DG706A AKC			Switzerland			DG706A UUZ
Israel			DG706A ABT			Turkey			DG706A AB8
Italy			DG706A ABZ			United Kingdom			DG706A ABU
The Netherlands			DG706A ABH						
C	P	160	W5	60	Y	Cb	51	P	
Thailand			DM434A AKL						
C	P	160	W5	60	W	Cb	51	P	
Asia Pacific			DM945A UUF			Thailand			DM945A AKL
C	P	160	W5	60	W	Cb	51	P	
Brazil			DL855A AC4			Latin America			DL855A ABM
French Canada			DL855A ABC			United States			DL855A ABA
Japan			DM436A ABJ						
C	P	150	Y5	60	W	Cb	51	P	
Korea			DM941A AB5						

Table 1-2
HP Compaq nx7000 Models *(Continued)*

C	P	150	Y5	40	W	Ci	51	P	
Belgium			DG705A UUG			Norway			DG705A ABN
Czech Republic			DG705A AKB			Poland			DG705A AKD
Denmark			DG705A ABY			Portugal			DG705A AB9
European International			DG705A ABB			Russia			DG705A ACB
						Saudi Arabia			DG705A ABV
France			DG705A ABF			Slovenia			DG705A AKN
Germany			DG705A ABD			Spain			DG705A ABE
Greece			DG705A AB7			Sweden/Finland			DG705A AK8
Hungary			DG705A AKC			Switzerland			DG705A UUZ
Israel			DG705A ABT			Turkey			DG705A AB8
Italy			DG705A ABZ			United Kingdom			DG705A ABU
The Netherlands			DG705A ABH						
C	P	150	Y5	40	W	Ci	51	P	
France			DG705T ABF						
C	P	150	Y5	40	C	Cb	51	P	
Korea			DM940A AB5						
C	P	150	W5	80	W	Cb	51	H	
Asia Pacific			DL848A UUF			Korea			DL848A AB1
Australia/New Zealand			DL848A ABG			Thailand			DL848A AKL
Japan			DL848A ABJ						
C	P	150	W5	80	W	Cb	51	H	
Taiwan			DL850A AB0						
C	P	150	W5	80	W	Cb	51	P	
Asia Pacific			DL847A UUF			Korea			DL847A AB1
Australia/New Zealand			DL847A ABG			Thailand			DL847A AKL
Japan			DL847A ABJ						
C	P	150	W5	80	W	Cb	51	P	
Taiwan			DL849A AB0						
C	P	150	W5	80	W	Cb	25	P	
Asia Pacific			DM943A UUF						

Table 1-2
HP Compaq nx7000 Models *(Continued)*

C	P	150	W5	40	W	Cb	51	P	
Asia Pacific			DN728A UUF						
C	P	150	W5	40	W	Cb	25	P	
Asia Pacific			DM944A UUF						
C	P	150	W5	40	D	Cb	25	H	
Taiwan			DL842A AB0						
C	P	150	W5	40	D	Cb	25	P	
People's Republic of China			DL838A AB2						
C	P	140	Y5	40	W	Cb	51	P	
Korea			DM939A AB5						
C	P	140	W5	60	W	Ci	51	P	
Hong Kong			DL853A AB5						
C	P	140	W5	60	W	Cb	25	H	
Asia Pacific Australia/New Zealand Japan			DL844A UUF DL844A ABG DL844A ABJ			Korea Thailand			DL844A AB1 DL844A AKL
C	P	140	W5	60	W	Cb	25	H	
Hong Kong			DL846A AB5			Taiwan			DL846A AB0
C	P	140	W5	60	W	Cb	25	H	
Hong Kong			DM437A AB5						
C	P	140	W5	60	W	Cb	25	P	
Asia Pacific Australia/New Zealand Japan			DL843A UUF DL843A ABG DL843A ABJ			Korea Thailand			DL843A AB1 DL843A AKL
C	P	140	W5	60	W	Cb	25	P	
Taiwan			DL845A AB0						

Table 1-2
HP Compaq nx7000 Models *(Continued)*

C	P	140	W5	40	W	Ci	25	P	
Belgium			DG704A UUG			Norway			DG704A ABN
Czech Republic			DG704A AKB			Poland			DG704A AKD
Denmark			DG704A ABY			Portugal			DG704A AB9
European International			DG704A ABB			Russia			DG704A ACB
						Saudi Arabia			DG704A ABV
France			DG704A ABF			Slovenia			DG704A AKN
Germany			DG420A ABD			Spain			DG704A ABE
Greece			DG704A AB7			Sweden/Finland			DG704A AK8
Hungary			DG704A AKC			Switzerland			DG704A UUZ
Israel			DG704A ABT			Turkey			DG704A AB8
Italy			DG704A ABZ			United Kingdom			DG704A ABU
The Netherlands			DG704A ABH						
C	P	140	W5	40	W	Ci	25	P	
France			DG704T ABF						
C	P	140	W5	40	W	Cb	25	H	
Japan			DM435A ABJ						
C	P	140	W5	40	W	Cb	25	P	
Thailand			DM433A AKL						
C	P	140	W5	40	D	Cb	51	P	
Brazil			DL854A AC4			Latin America			DL854A ABM
French Canada			DL854A ABC			United States			DL854A ABA
C	P	140	W5	40	D	Cb	25	P	
People's Republic of China			DL837A AB2						
C	P	140	W5	40	D	Cb	25	P	
Asia Pacific			DM438A UUF			People's Republic of China			DM438A AB2
						Thailand			DM438A AKL

Table 1-2
HP Compaq nx7000 Models *(Continued)*

C	P	140	W5	40	D	Cb	25	P	
Korea			DM938A AB5						
C	P	140	W5	40	C	Cb	25	P	
Korea			DM937A AB5						
C	P	130	W5	40	W	Ci	25	P	
Hong Kong			DL852A AB5						
C	P	130	W5	40	D	Ci	25	P	
Asia Pacific			DL851A UUF			Hong Kong			DL851A AB5
C	P	130	W5	40	D	Cb	25	H	
Asia Pacific Australia/New Zealand Hong Kong			DL840A UUF DL840A ABG DL840A AB5			Japan Korea Thailand			DL840A ABJ DL840A AB1 DL840A AKL
C	P	130	W5	40	D	Cb	25	P	
Asia Pacific Australia/New Zealand Hong Kong Japan			DL839A UUF DL839A ABG DL839A AB5 DL839A ABJ			Japan (English) Korea Thailand			DL839A ACF DL839A AB1 DL839A AKL
C	P	130	W5	40	D	Cb	25	P	
Taiwan			DL841A AB0						
C	P	130	W5	40	D	Cb	25	P	
Korea			DM936A AB5						
C	P	130	W5	40	C	Cb	25	P	
Korea			DM935A AB5						

Table 1-3
Compaq Presario X1000 Models

All Compaq Presario X1000 models feature:

- TouchPad pointing device
- 8-cell, 4.4 wH Li ion battery pack
- 1-year warranty on parts and labor

X1045	P	160	Y5	80	W	Cb	51	H	
Korea			DN606A AB1						
X1030	P	160	Y5	60	Y	Cb	51	H	
Australia/New Zealand			DN591A ABG						
X1046	P	160	Y5	60	W	Cb	51	H	
Korea			DN607A AB1						
X1029	P	160	Y5	60	W	Cb	25	H	
Australia/New Zealand			DN600A ABG						
X1015	P	150	Y5	80	Y	Cb	10	H	
United States			DN624A ABA						
X1056	P	150	Y5	60	Y	Cb	25	H	
People's Republic of China			DN617A AB2						
X1049	P	150	Y5	60	W	Cb	51	H	
Hong Kong			DN610A AB5						
X1023	P	150	Y5	60	W	Cb	51	H	
Asia Pacific			DN584A UUF						
X1055	P	150	Y5	60	D	Cb	25	H	
People's Republic of China			DN616A AB2						
X1020	P	150	W5	60	Y	Cb	51	H	
The Netherlands			DM416A ABH						

Table 1-3
Compaq Presario X1000 Models *(Continued)*

X1050	P	150	W5	60	Y	Cb	51	H	
Hong Kong			DN611A AB5						
X1044	P	150	W5	60	W	Cb	51	H	
Korea			DN605A AB1						
X1032	P	150	W5	60	W	Cb	51	H	
Asia Pacific			DN593A UUF						
X1058	P	150	W5	60	W	Cb	25	H	
Korea			DN619A AB1						
X1054	P	150	W5	60	W	Cb	25	H	
People's Republic of China			DN615A AB2						
X1010	P	150	W5	40	W	Cb	51	H	
Denmark			DL963A ABY			Spain			DL963A ABE
Portugal			DL963A AB9			United Kingdom			DL963A ABU
X1028	P	150	W5	40	W	Cb	25	H	
Asia Pacific			DN589A UUF						
X1020	P	140	Y5	80	Y	Cb	10	P	
United States			DK572A ABA						
X1063	P	140	Y5	60	W	Cb	25	H	
People's Republic of China			DN623A AB2						
X1022	P	140	Y5	60	W	Cb	25	H	
Asia Pacific			DN583A UUF						
X1048	P	140	Y5	40	W	Cb	25	H	
Hong Kong			DN609A AB5						
X1028	P	140	W5	80	Y	Cb	51	P	
United States			DL898A ABA						

Table 1-3
Compaq Presario X1000 Models *(Continued)*

X1037	P	140	W5	60	W	Cb	51	H	
Thailand			DN598A AKL						
X1036	P	140	W5	60	W	Cb	51	H	
Taiwan			DN597A AB0						
X1018	P	140	W5	60	W	Cb	51	H	
United States			DK574A ABA						
X1010	P	140	W5	60	W	Cb	51	H	
Canada (English)			DL857A ABL			French Canada			DL857A ABC
X1007	P	140	W5	60	W	Cb	51	H	
Sweden/Finland			DL964A AK8						
X1001	P	140	W5	60	W	Cb	51	H	
United States			DK575A ABA						
X1057	P	140	W5	60	W	Cb	25	H	
Korea			DN618A AB1						
X1043	P	140	W5	40	Y	Cb	51	H	
Korea			DN604A AB1						
X1016	P	140	W5	40	Y	Cb	51	H	
France			DM415A ABF			Italy			DM415A ABZ
X1062	P	140	W5	40	W	Cb	51	H	
Asia Pacific			DN622A UUF						
X1012	P	140	W5	40	W	Cb	51	H	
France			DL965A ABF						
X1052	P	140	W5	40	W	Cb	25	H	
People's Republic of China			DN613A AB2						

Table 1-3
Compaq Presario X1000 Models *(Continued)*

X1042	P	140	W5	40	W	Cb	25	H	
Korea			DN603A AB1						
X1051	P	140	W5	40	D	Cb	25	H	
People's Republic of China			DN612A AB2						
X1021	P	130	Y5	40	D	Cb	25	H	
Asia Pacific			DN582A UUF						
X1038	P	130	W5	60	W	Cb	51	H	
Thailand			DN599A AKL						
X1010	P	130	W5	60	W	Cb	51	H	
United States			DK571A ABA						
X1035	P	130	W5	60	D	Cb	51	H	
Taiwan			DN596A AB0						
X1006	P	130	W5	40	Y	Cb	51	H	
France			DM933A ABF						
X1060	P	130	W5	40	W	Cb	51	H	
Thailand			DN620A AKL						
X1012	P	130	W5	40	W	Cb	51	H	
United States			DN585A ABA						
X1061	P	130	W5	40	W	Cb	25	H	
Asia Pacific			DN621A UUF						
X1047	P	130	W5	40	W	Cb	25	H	
Hong Kong			DN608A AB5						
X1041	P	130	W5	40	W	Cb	25	H	
Korea			DN602A AB1						

Table 1-3
Compaq Presario X1000 Models *(Continued)*

X1031	P	130	W5	40	W	Cb	25	H	
Asia Pacific			DN592A UUF						
X1005	P	130	W5	40	W	Cb	25	H	
Belgium			DL681A UUG			The Netherlands			DL681A ABH
Denmark			DL681A ABY			Portugal			DL681A AB9
France			DL681A ABF			Spain			DL681A ABE
Italy			DL681A ABZ			Sweden/Finland			DL681A AK8
Latin America			DL858A ABM			United Kingdom			DL681A ABU
X1034	P	130	W5	40	D	Cb	25	H	
Taiwan			DN595A AB0						
X1033	P	130	W5	40	D	Cb	25	H	
Asia Pacific			DN594A UUF			Thailand			DN594A AKL
X1027	P	130	W5	40	D	Cb	25	H	
Asia Pacific			DN588A UUF			Thailand			DN588A AKL
Australia/New Zealand			DN588A ABG						
X1040	P	130	W5	40	C	Cb	25	H	
Korea			DN601A AB1						
X1026	P	130	W5	40	C	Cb	25	H	
Asia Pacific			DN587A UUF			Thailand			DN587A AKL
Australia/New Zealand			DN587A ABG						

1.2 Features

- Intel Mobile Pentium-M 1.6-, 1.5-, 1.4-, or 1.3-GHz processors with 400-MHz processor side bus and 512-KB L2 cache, varying by notebook model
- 15.4-inch wide UXGA (1920 × 1200), wide SXGA+ (1680 × 1050), or wide XGA (1280 × 800) TFT display with over 16.7 million colors, varying by notebook model

- ATI Mobility Radeon graphics with 32- or 64-MB DDR SDRAM
- 80-, 60-, or 40-GB high-capacity hard drive, varying by notebook model
- 256-MB high-performance Synchronous DRAM (SDRAM), expandable to 2.0 GB
- Microsoft Windows XP Home or XP Pro, varying by notebook model
- Full-size Windows 98 keyboard
- TouchPad pointing device with on/off button and dedicated scroll up/down surface
- 56-Kbps V.92 modem integrated on the system board
- Integrated Secure Digital (SD) flash media slot
- Integrated 10/100 network interface card (NIC)
- Integrated wireless support for mini PCI 802.11a/b/g and Bluethumb local area network (LAN) devices
- Support for one Type II PC Card slot with support for both 32-bit CardBus and 16-bit PC Cards
- External 65 watt AC adapter with power cord
- 8-cell Li ion battery pack
- JBL Pro speakers
- Support for the following optical drives:
  - 24X Max DVD/CD-RW combination drive
  - 8X Max DVD-RW drive
  - 24X Max CD-ROM drive

- Connectors for:
  - Microphone
  - Stereo speaker/headphone
  - Infrared
  - DC power
  - External monitor
  - S-Video
  - USB (3)
  - RJ-45 (network interface card, [NIC])
  - RJ-11 (modem)
  - Parallel
  - 1394 digital
  - One Type II PC Card slot
  - Docking

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 5.7, "RTC Battery").
3. Wait approximately five minutes.
4. Replace the RTC battery and reassemble the notebook.
5. Connect AC power to the notebook. Do **not** reinsert the battery pack at this time.
6. Turn on the notebook.

All passwords and all CMOS settings have been cleared.

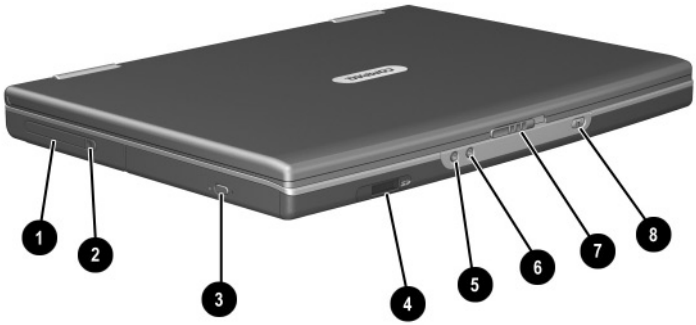
1.4 Power Management

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 level of performance
- Battery calibration
- Lid switch Standby/resume
- Power/Standby button
- Advanced Configuration and Power Management (ACP) compliance

1.5 External Components

The external components on the front and left side of the notebook are shown in the following illustration and described in Table 1-4.

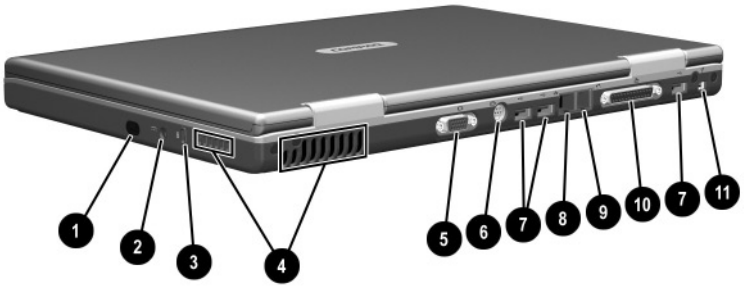


Front and Left Side Components

Table 1-4
Front and Left Side Components

Item	Component	Function
1	PC Card slot	Supports an optional Type I or Type II 32-bit (CardBus) or 16-bit PC Card.
2	PC Card eject button	Ejects an optional PC Card from the PC Card slot.
3	Optical drive	Supports an optical disc.
4	SD (Secure Digital) Card slot	Supports SD cards and multimedia cards.
5	Microphone jack	Connects an optional monaural or stereo microphone.
6	Audio line-out jack	Connects optional headphone or powered stereo speakers. Also connects the audio function of an audio/video device such as a television or VCR.
7	Display release latch	Opens the notebook.
8	Wireless device button	Turns an optional internal wireless device on or off.

The notebook rear panel and right side components are shown in the following illustration and described in Table 1-5.



Rear Panel and Right Side Components

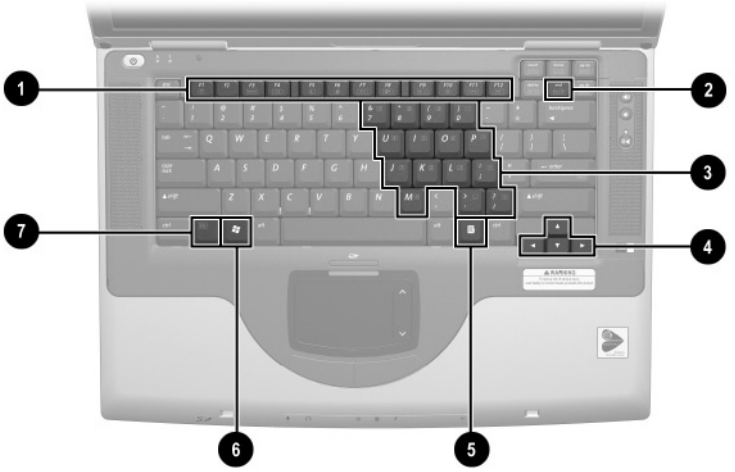
Table 1-5
Rear Panel and Right Side Components

Item	Component	Function
1	Infrared port	Provides wireless communication between the notebook and an optional IrDA-compliant device.
2	Power connector	Connects an AC adapter cable.

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

Item	Component	Function
3	Security cable slot	Attaches an optional security cable to the notebook.
4	Vents (2)	Allow airflow to cool internal components.
△	**CAUTION:** To prevent overheating, use the notebook only on hard surfaces which cannot obstruct the vents. Do not allow a soft surface, such as bedding, clothing, or a thick rug, to block airflow.	
5	External monitor connector	Connects an optional VGA external monitor or projector.
6	S-Video jack	Connects an optional S-Video device, such as a television, VCR, camcorder, projector, or video capture card.
7	USB connectors (3)	Connect optional 2.0-compliant USB devices.
8	RJ-45 network jack	Connects an Ethernet network cable.
9	RJ-11 telephone jack	Connects a modem cable.
10	Parallel connector	Connects an optional parallel device such as a printer.
11	1394 connector	Connects an optional 1394 device such as a camcorder or digital camera.

The notebook keyboard components are shown in the following illustration and described in Table 1-6.

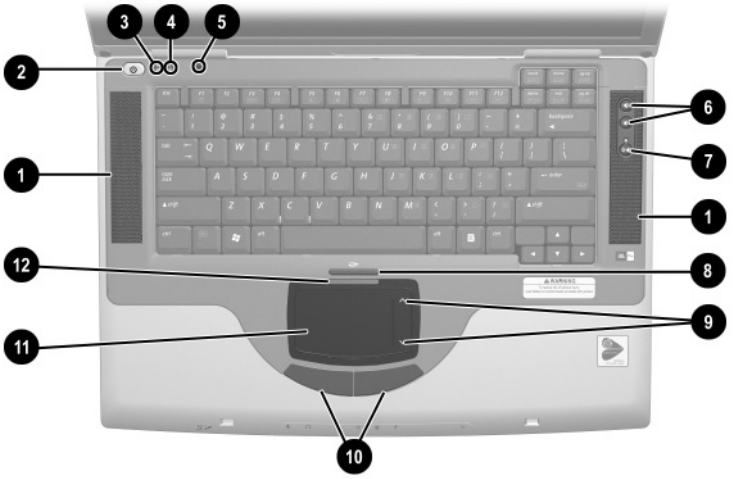


Keyboard Components

Table 1-6
Keyboard Components

Item	Component	Function
1	**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.
2	**num lk** key	Enables numeric lock and the internal keypad.
3	Internal keypad	Can be used like the keys on an external numeric keypad.
4	Cursor control keys	Move the cursor around the screen.
5	Applications key	Displays a shortcut menu for items beneath the pointer.
6	Microsoft logo key	Display the Windows Start menu.
7	**Fn** key	Executes frequently used system functions when pressed in combination with another key.

The notebook top components are shown in the following illustration and described in Table 1-7.



Top Components

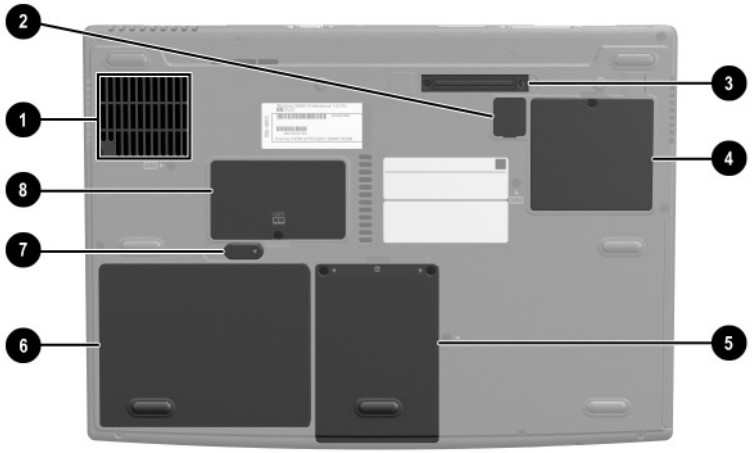
Table 1-7
Top Components

Item	Component	Function
1	Stereo speakers (2)	Produce stereo sound.
2	Power button	When the notebook is: ■ 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.

Table 1-7
Top Components *(Continued)*

Item	Component	Function
3	Caps lock light	On: Caps lock is on.
4	Num lock light	On: Num lock or the internal keypad is on.
5	Display lid switch	■ If the notebook is closed while on, turns off the display. ■ If the notebook is opened while in Standby, turns on the notebook (resumes from Standby).
6	Volume buttons (2)	Increase or decrease system volume.
7	Mute button	Mutes or restores volume.
8	TouchPad on/off button	Enables/disables the TouchPad.
9	TouchPad scroll zones (2)	Scroll upward or downward.
10	Left and right TouchPad buttons	Function like the left and right buttons on an external mouse.
11	TouchPad	Moves the pointer and selects or activates items on the screen.
12	TouchPad light	On: TouchPad is enabled.

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



Bottom Components

Table 1-8
Bottom Components

Item	Component	Function
1	Fan vent	Allow airflow to cool internal components.
△	**CAUTION:** To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing may block airflow.	
2	RTC battery compartment	Contains the RTC battery.

Table 1-8
Bottom Components *(Continued)*

Item	Component	Function
3	Docking connector	Connects the notebook to an optional port replicator.
4	Mini PCI compartment	Contains the mini PCI wireless card.
5	Hard drive bay	Holds the internal hard drive.
6	Battery bay	Holds the battery pack.
7	Battery pack release latch	Releases a battery pack from the battery bay.
8	Memory expansion compartment	Contains one memory slot for an optional 128-, 256-, 512-, or 1024-MB memory module.

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 expansion board
- Hard drive
- Display
- Keyboard and TouchPad
- Audio
- Intel Mobile Pentium-M processors
- Fan
- PC Card
- Modem, NIC, and wireless devices

The notebook uses an electrical 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.

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.

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 two 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 your Windows operating system. Use this utility whenever possible to:
  - ❏ Display system information.
  - ❏ Test system components.
  - ❏ Troubleshoot a device configuration problem in Windows 2000, Windows XP Professional, or Windows XP Home.

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

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	■ View identification information about the notebook, a docking 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, then exit and restart the notebook.
Save Changes and Exit	Save changes entered during the current session, 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	Enable/disable DriveLock; change a DriveLock User or Master password. ✎ DriveLock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the notebook.
Password Options (Password options can be selected only when a power-on password has been set.)	Enable/disable: ■ QuickLock ■ QuickLock on Standby ■ QuickBlank ✎ To enable QuickLock on Standby or QuickBlank, you must first enable QuickLock.
Device Security	Enable/disable: ■ Ports or diskette drives* ■ Diskette write* ■ CD-ROM or diskette startup ✎ Settings for a DVD-ROM can be entered in the CD-ROM field.
System IDs	Enter identification numbers for the notebook, a docking base, 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	Enable/disable: ■ 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	■ 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 a docking base as the primary device. (When the notebook display is set as secondary, the notebook must be shut down before undocking from a docking base.)

Table 2-3
Advanced Menu *(Continued)*

Select	To Do This
Device Options *(continued)*	■ 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 bases that are identically equipped. Select Disable to recognize the docking bases as a single docking base; select Enable to recognize the docking bases 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 may 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, 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, then select the checkbox 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 and 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.

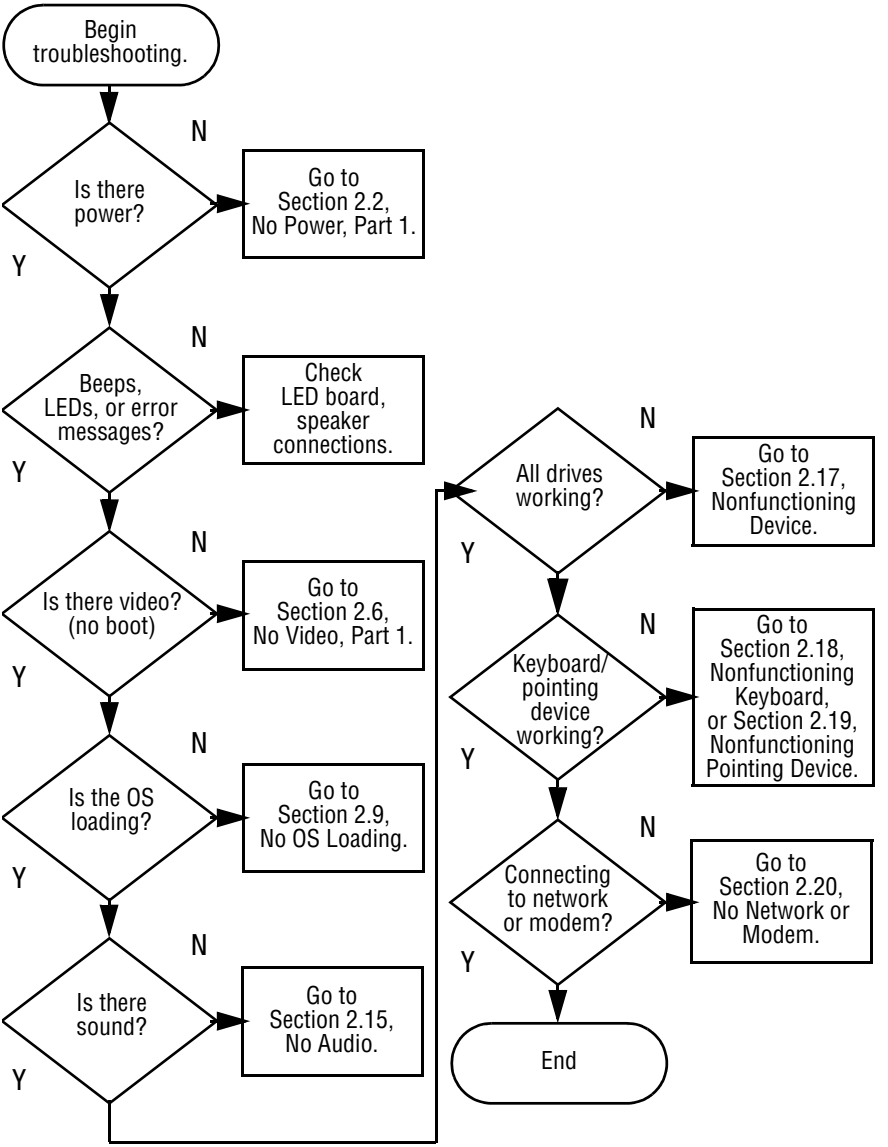
6. Select the Begin Testing button.
7. Select a tab to view a test report:
   - ❏ **Status tab**—Summarizes the tests run, passed, and failed during the current testing session.
   - ❏ **Log tab**—Lists tests run on the system, the number of times each test has run, the number of errors found on each 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. Select a tab to print the report:
   - ❏ **Log tab**—Select File > Save As, then print the file from your folder.

2.3 Troubleshooting Flowcharts

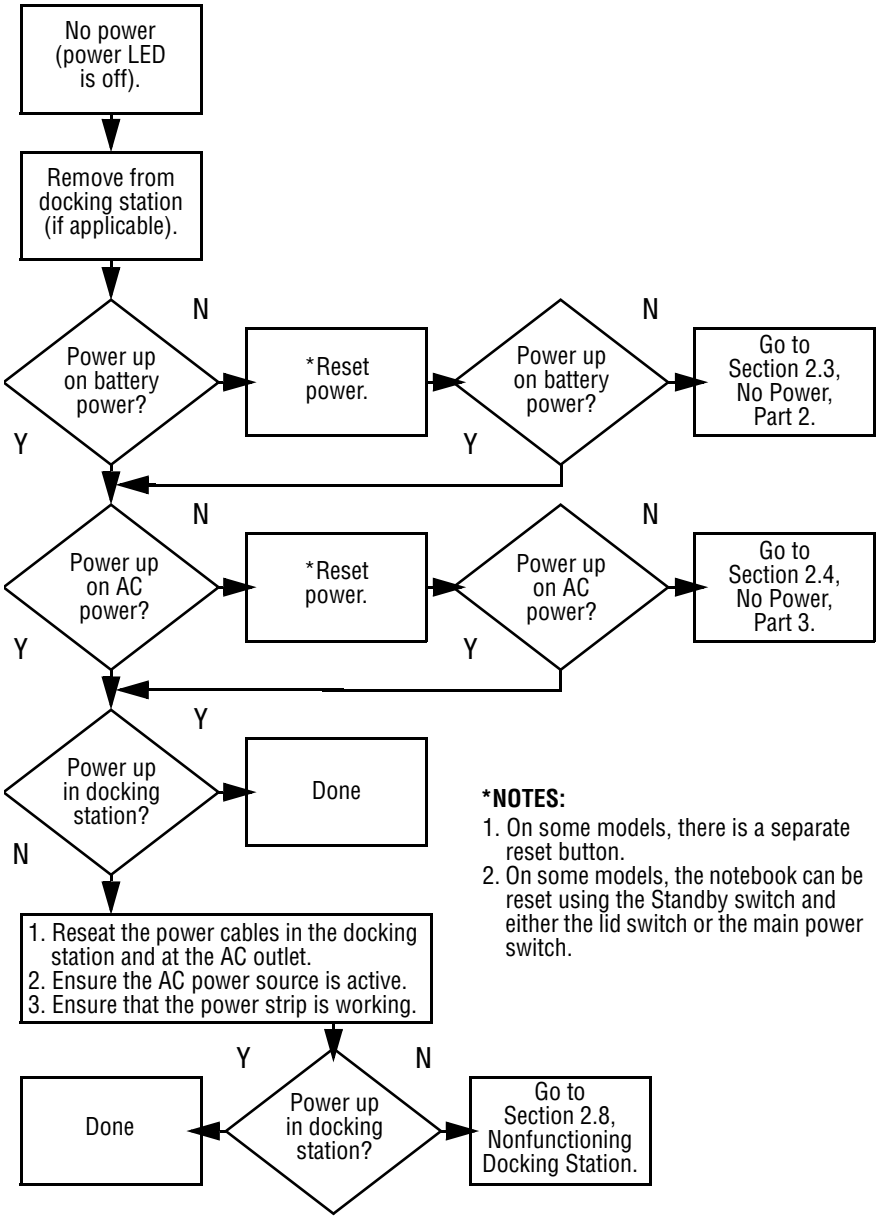
Table 2-4
Troubleshooting Flowcharts

Flowchart	Description
2.1	Initial troubleshooting
2.2	No power, part 1
2.3	No power, part 2
2.4	No power, part 3
2.5	No power, part 4
2.6	No video, part 1
2.7	No video, part 2
2.8	Nonfunctioning docking station
2.9	No operating system (OS) loading
2.10	No OS loading from hard drive, part 1
2.11	No OS loading from hard drive, part 2
2.12	No OS loading from hard drive, part 3
2.13	No OS loading from diskette drive
2.14	No OS loading from CD- or DVD-ROM drive
2.15	No audio, part 1
2.16	No audio, part 2
2.17	Nonfunctioning device
2.18	Nonfunctioning keyboard
2.19	Nonfunctioning pointing device
2.20	No network or modem connection

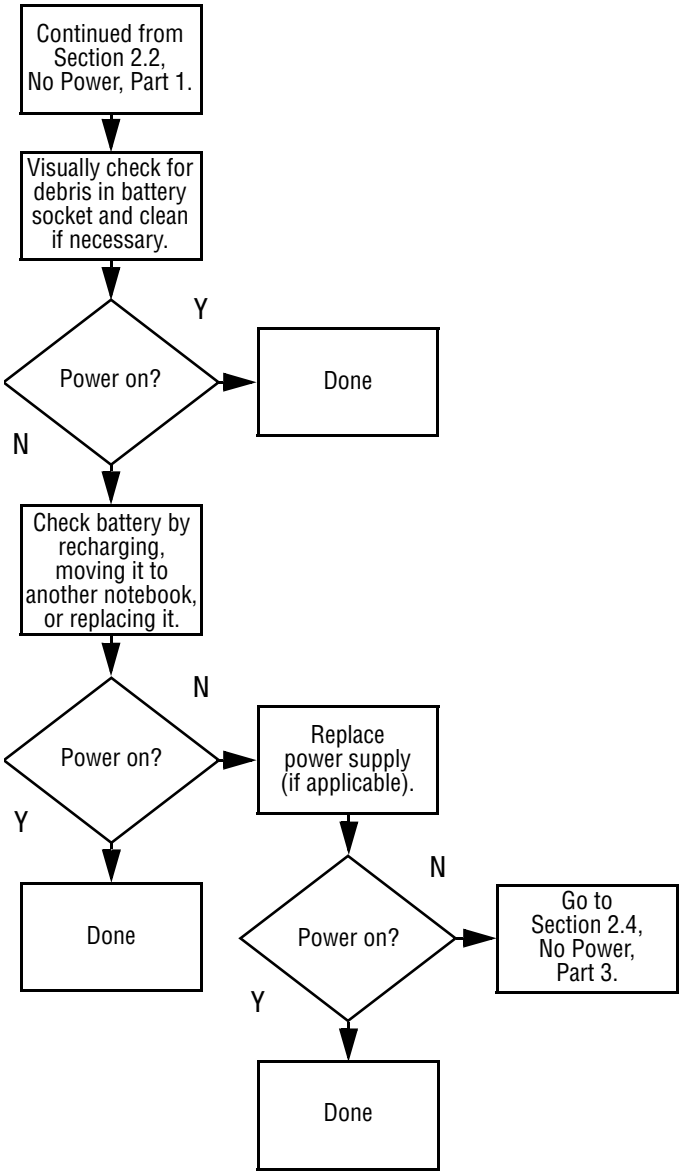
Flowchart 2.1—Initial Troubleshooting



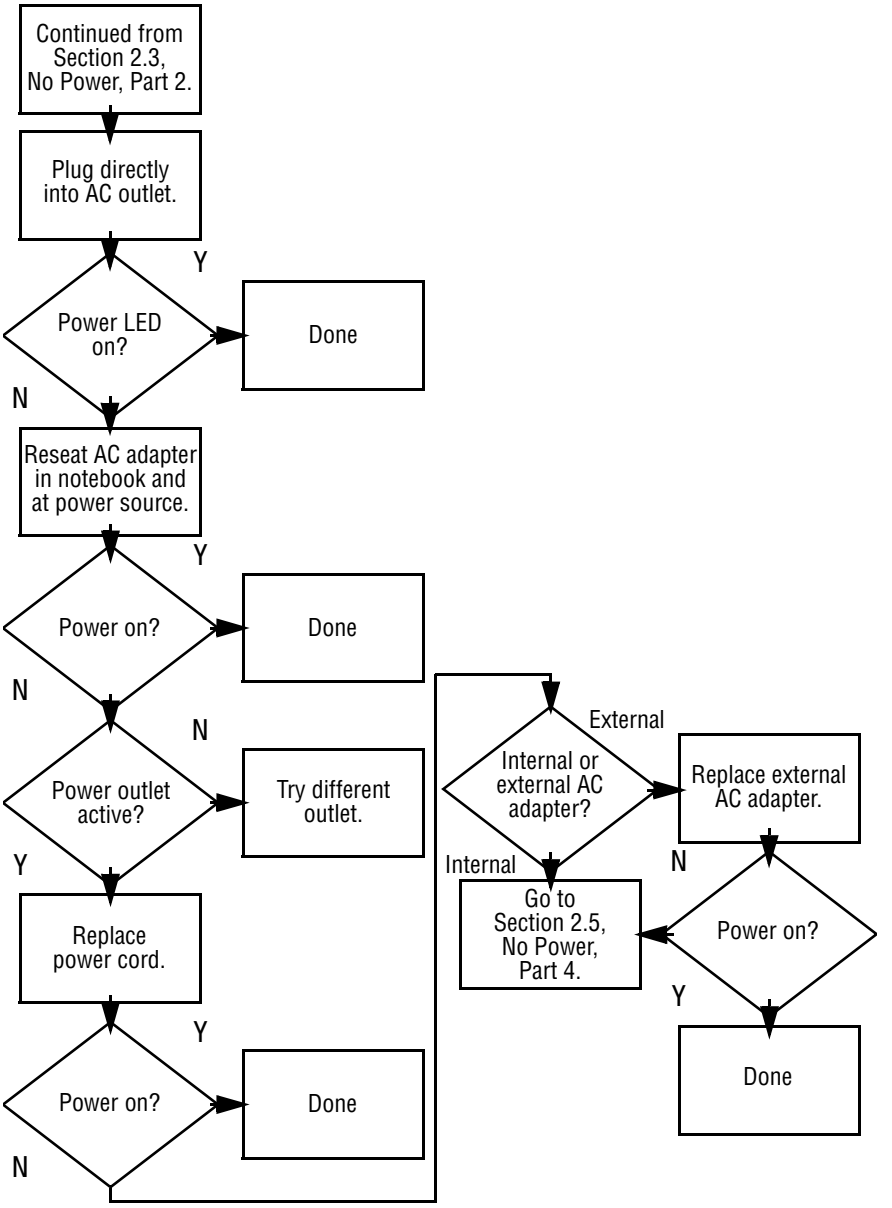
Flowchart 2.2—No Power, Part 1



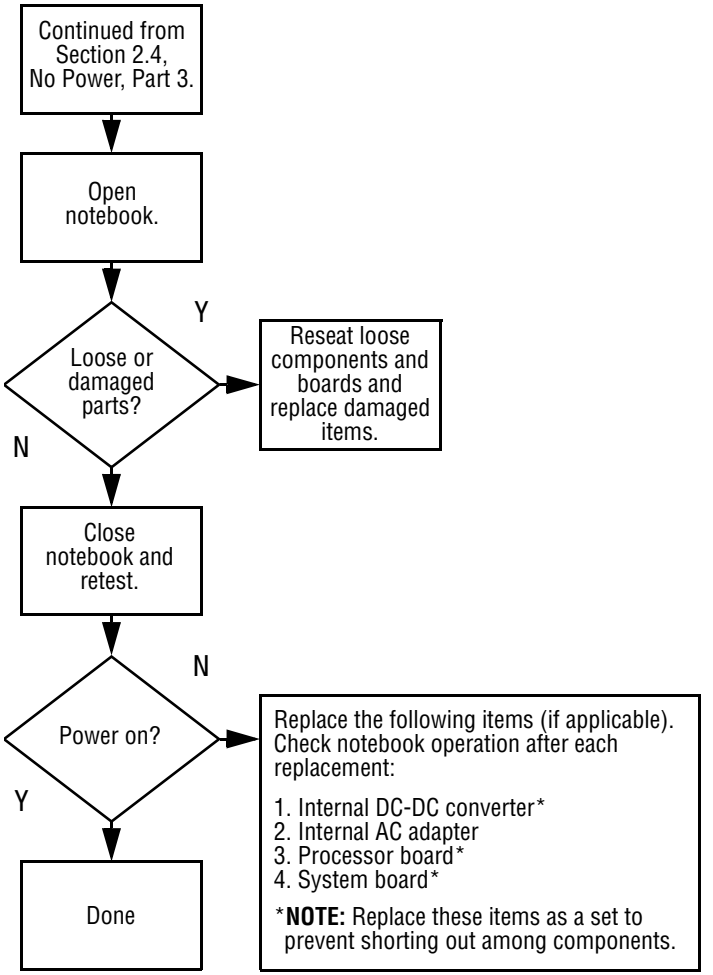
Flowchart 2.3—No Power, Part 2



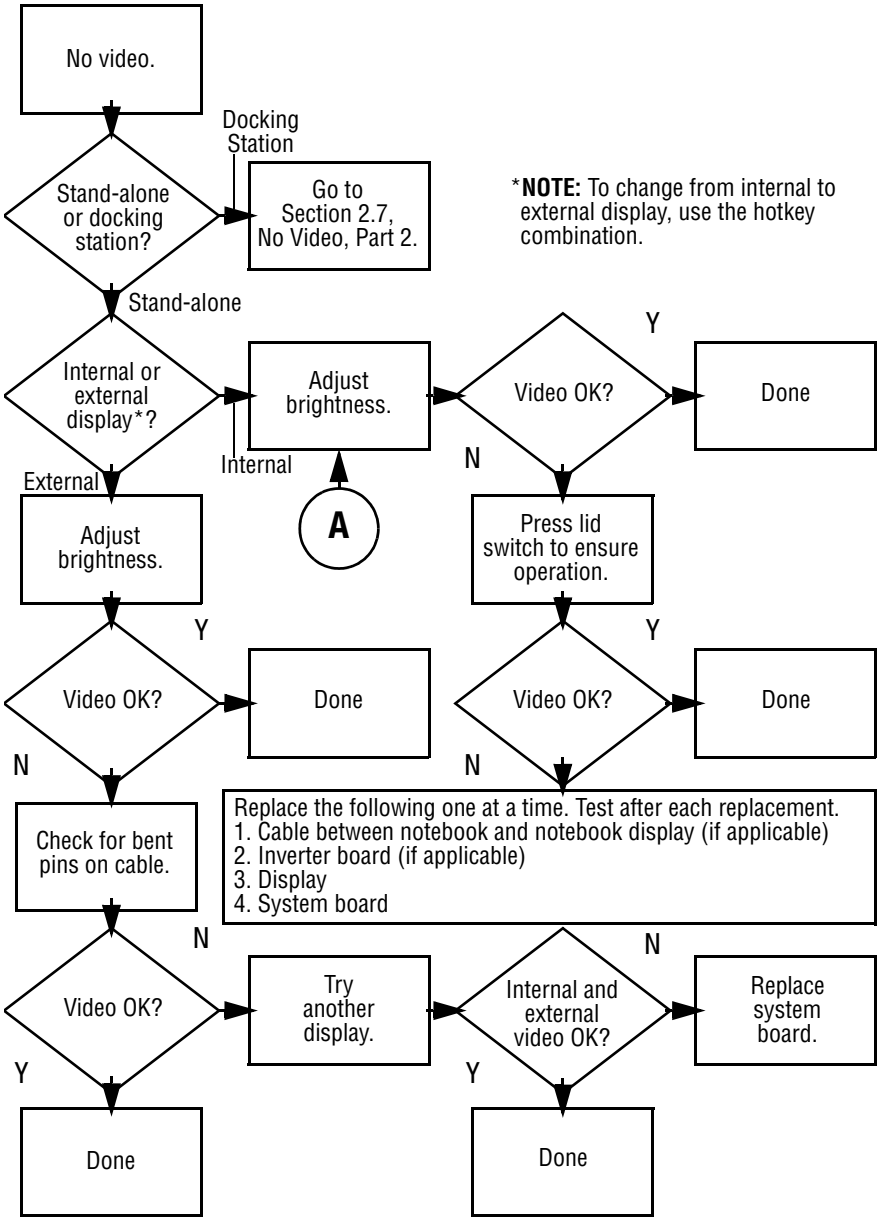
Flowchart 2.4—No Power, Part 3



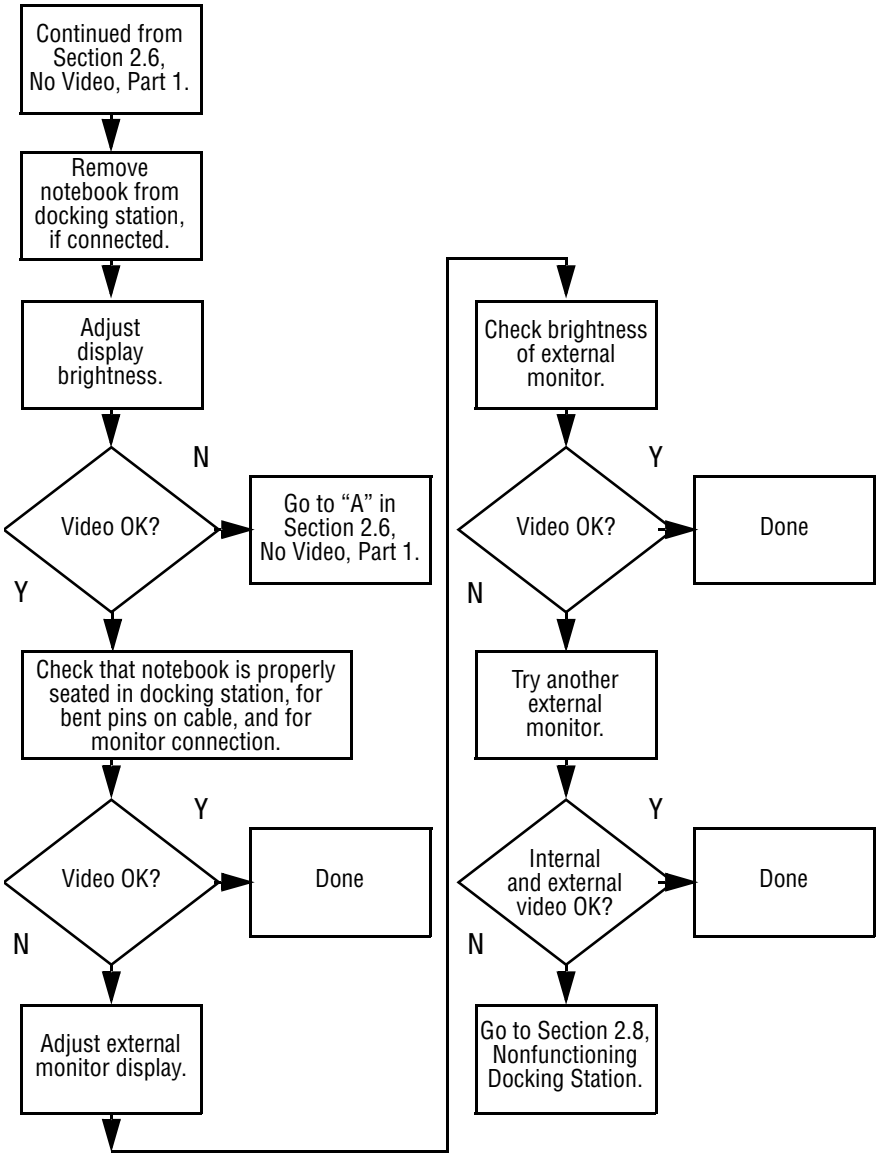
Flowchart 2.5—No Power, Part 4



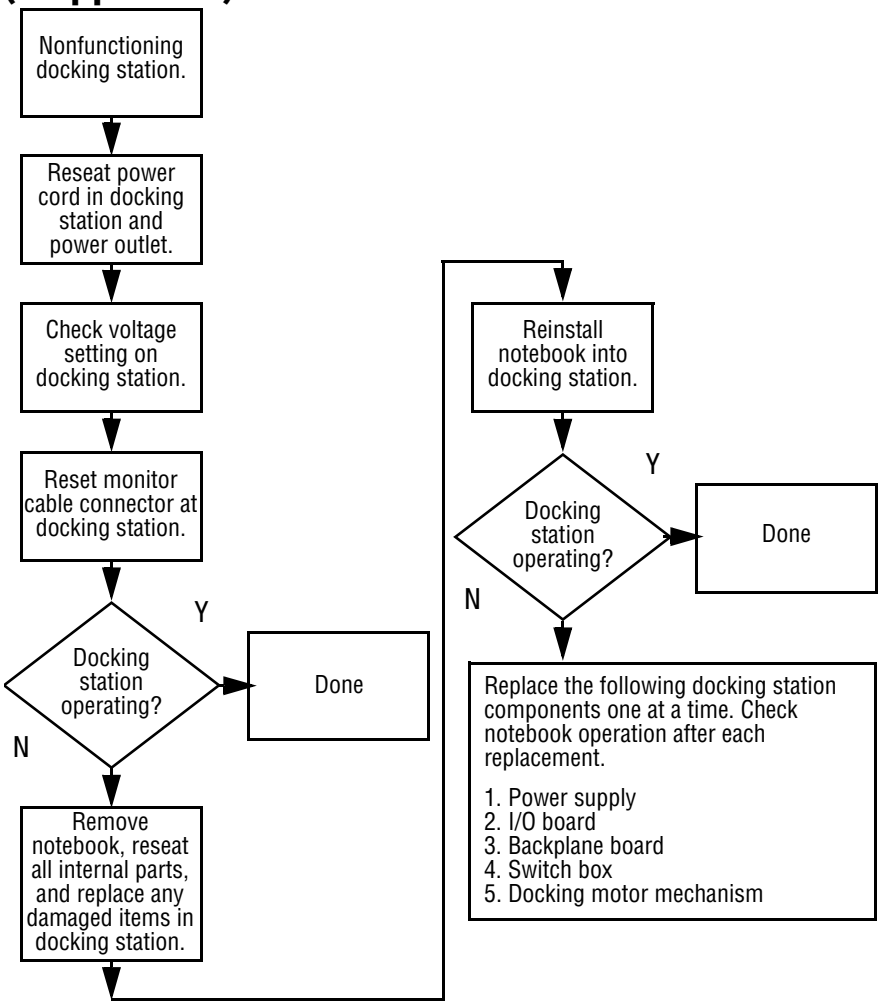
Flowchart 2.6—No Video, Part 1



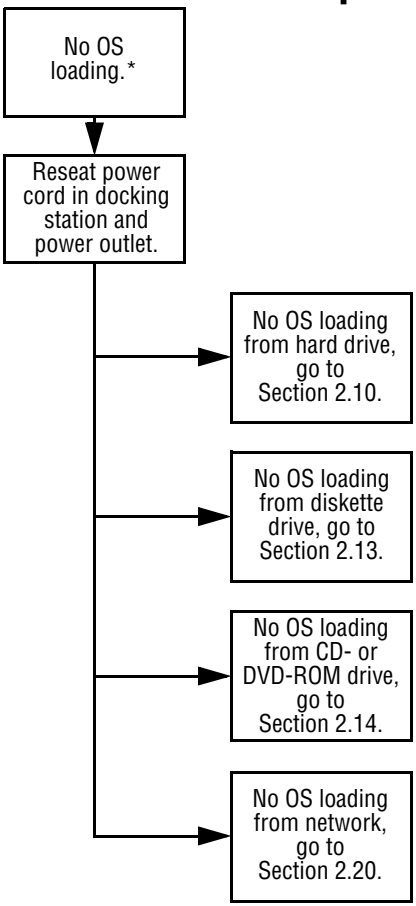
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Docking Station (if applicable)

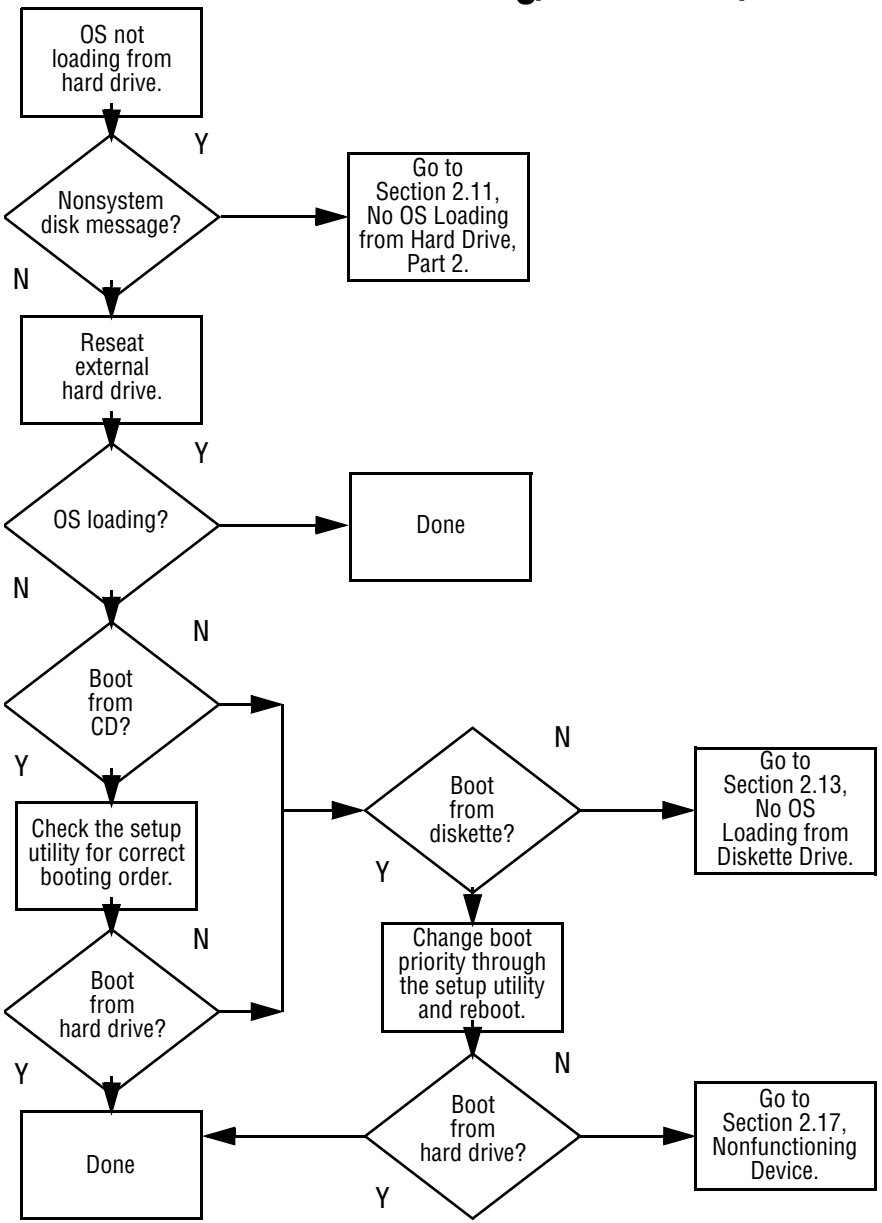


Flowchart 2.9—No Operating System (OS) Loading

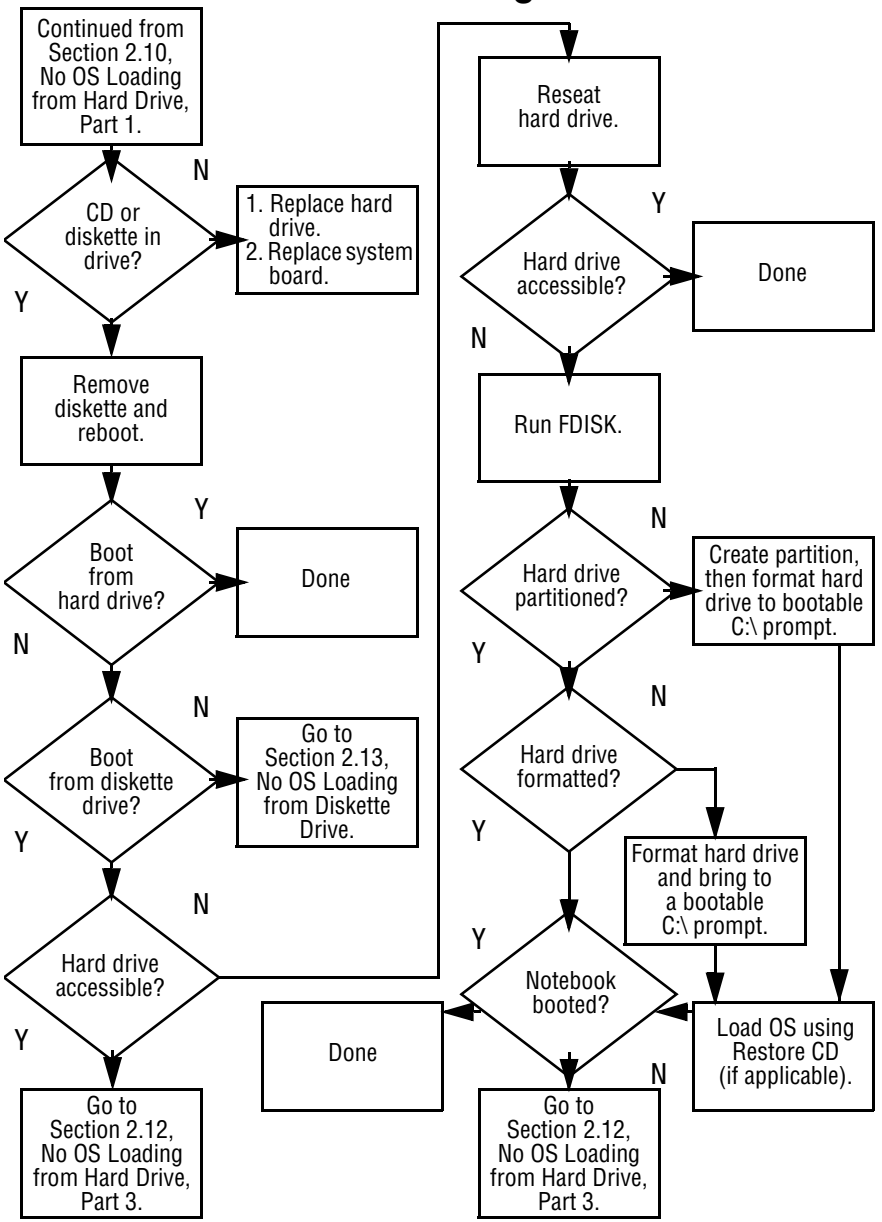


*__NOTE:__ Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

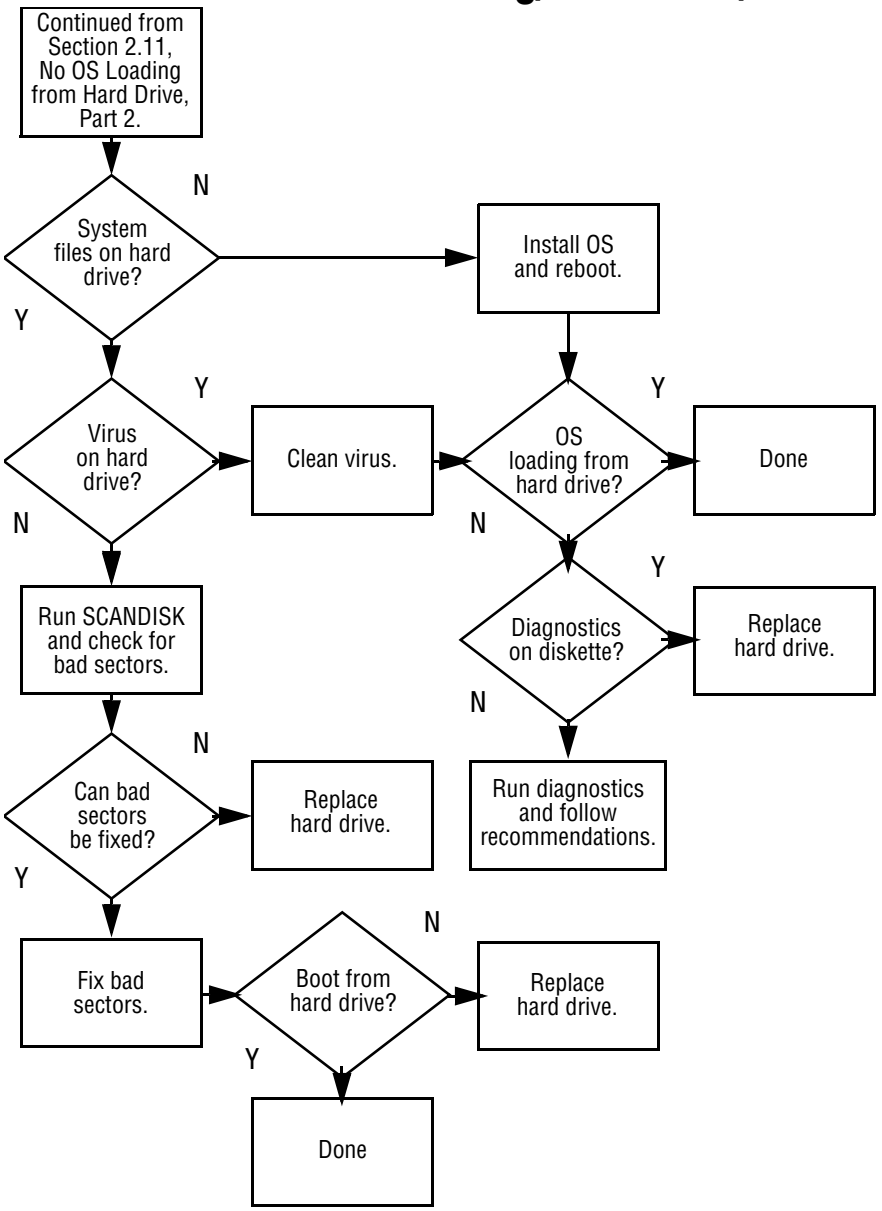
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



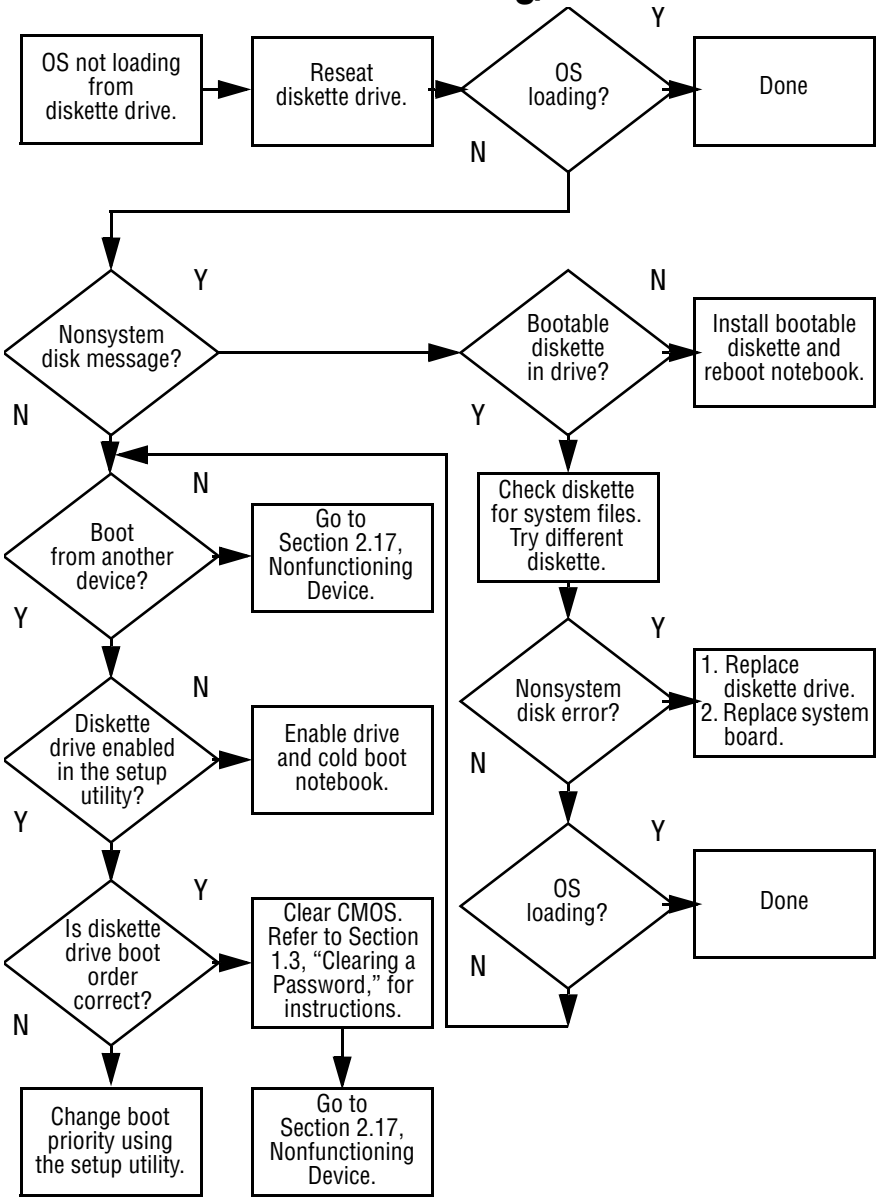
Flowchart 2.11—No OS Loading, Hard Drive, Part 2



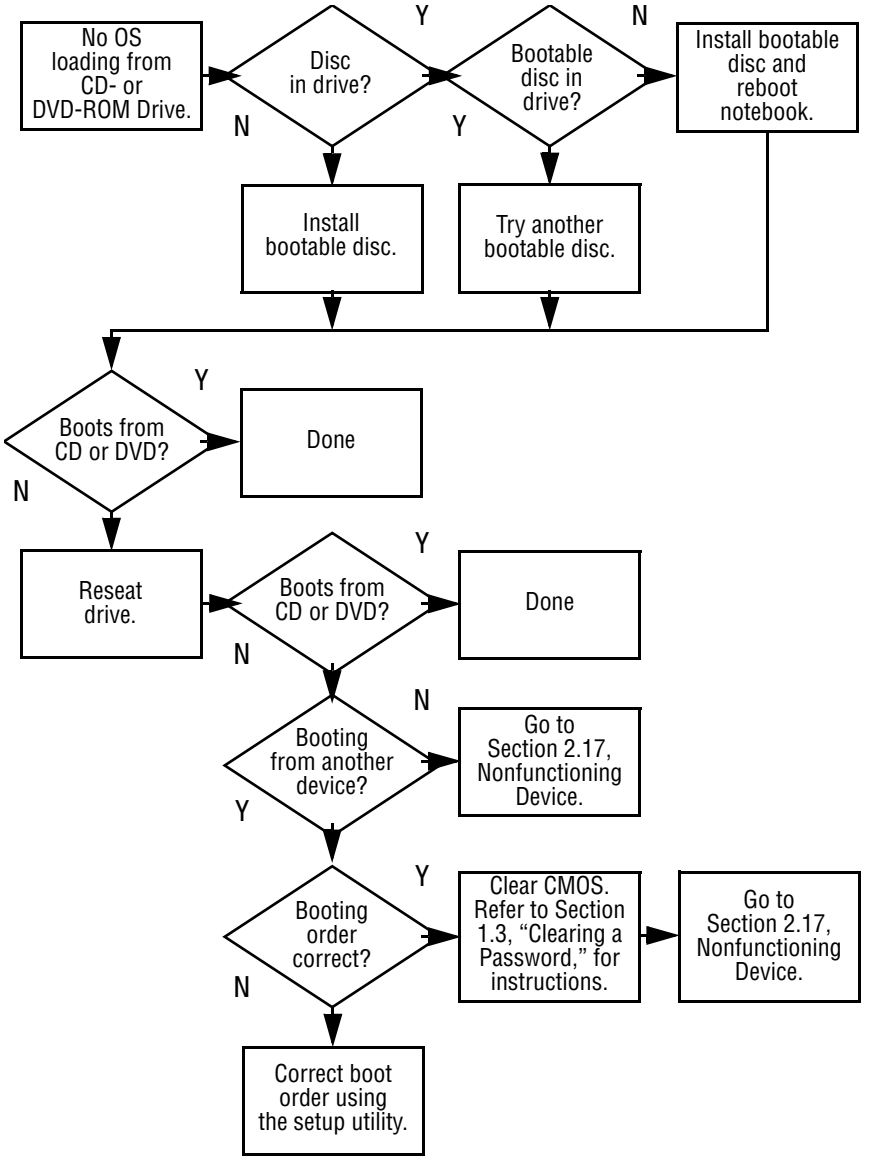
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



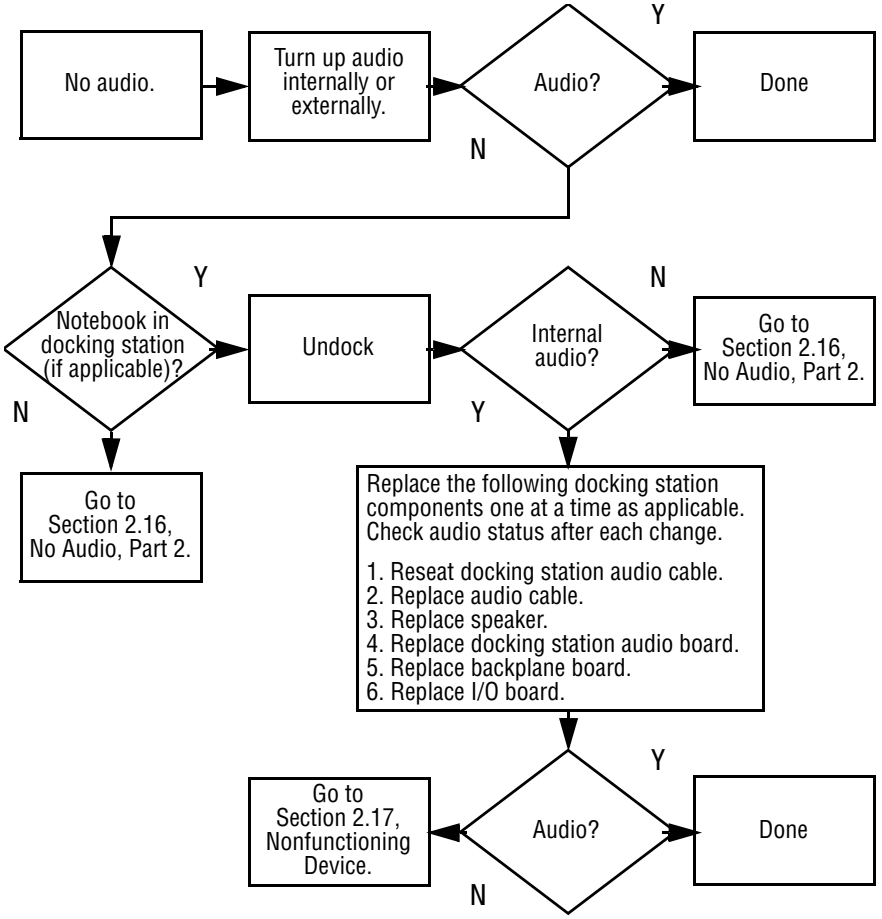
Flowchart 2.13—No OS Loading, Diskette Drive



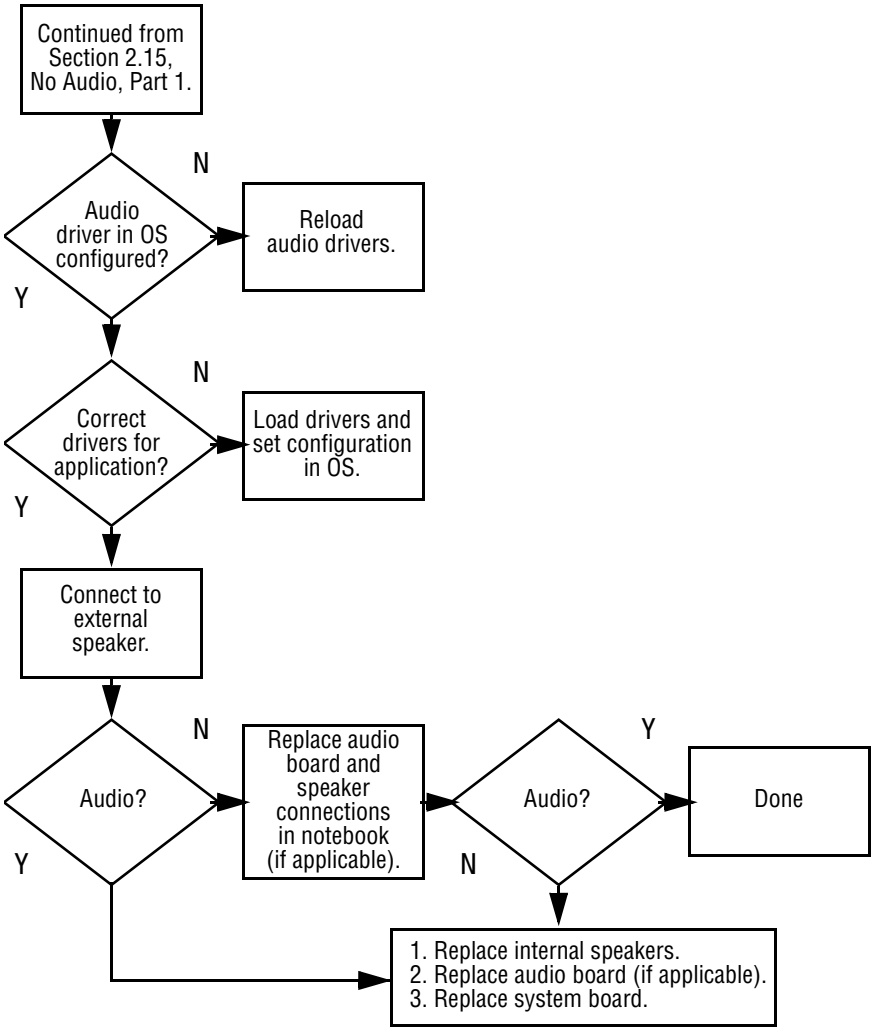
Flowchart 2.14—No OS Loading, CD- or DVD-ROM Drive



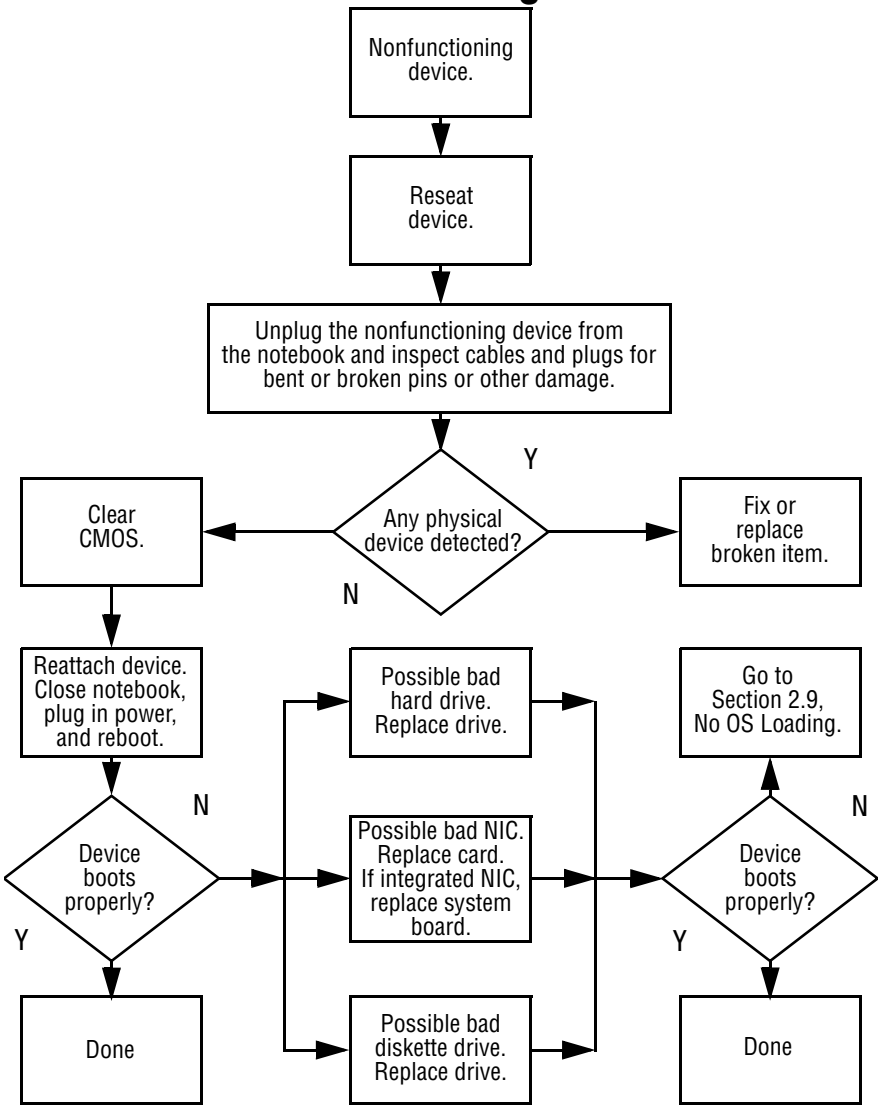
Flowchart 2.15—No Audio, Part 1



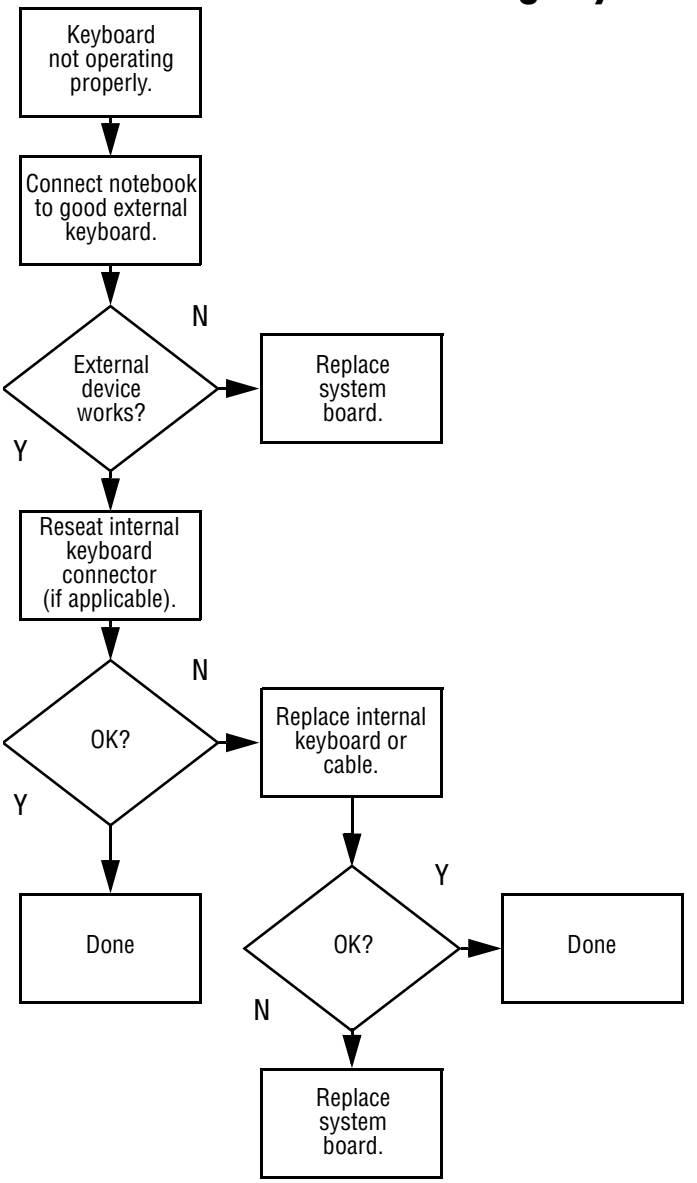
Flowchart 2.16—No Audio, Part 2



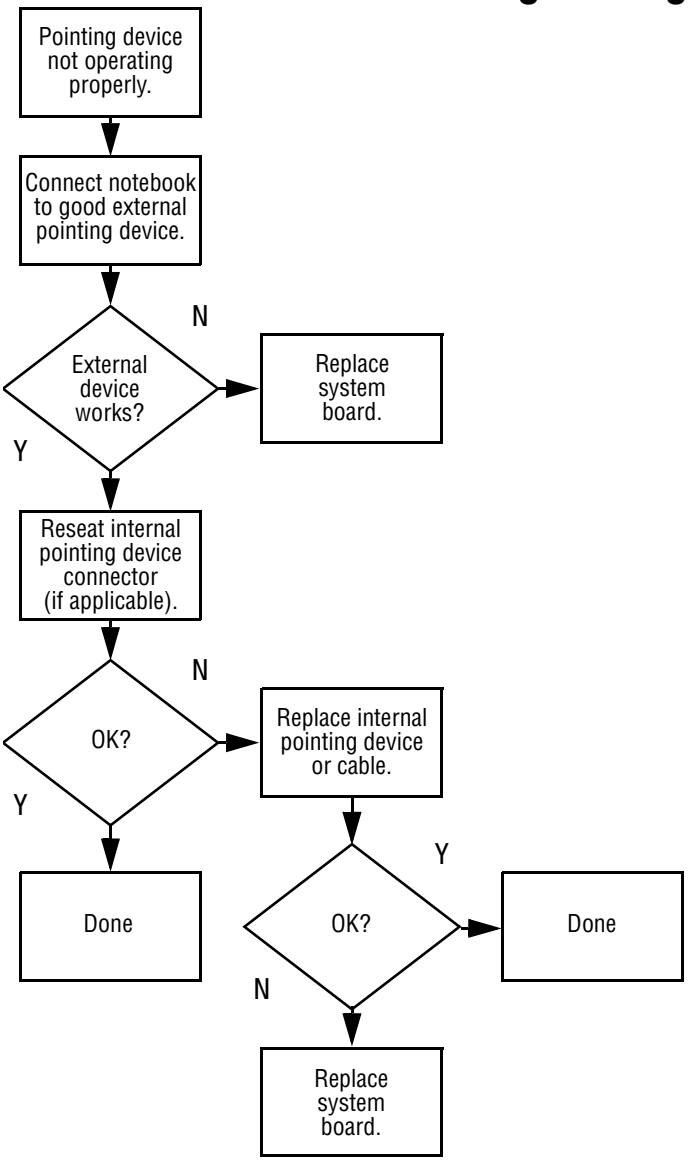
Flowchart 2.17—Nonfunctioning Device



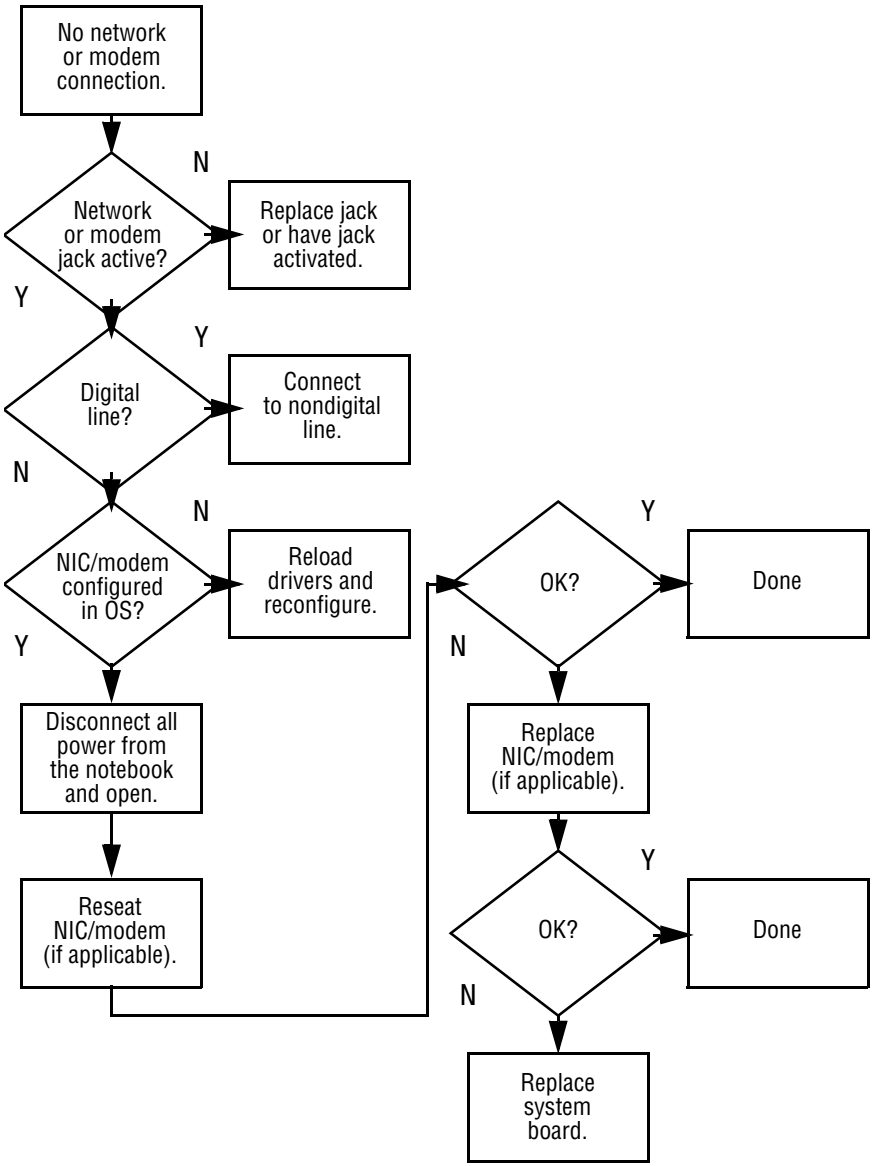
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



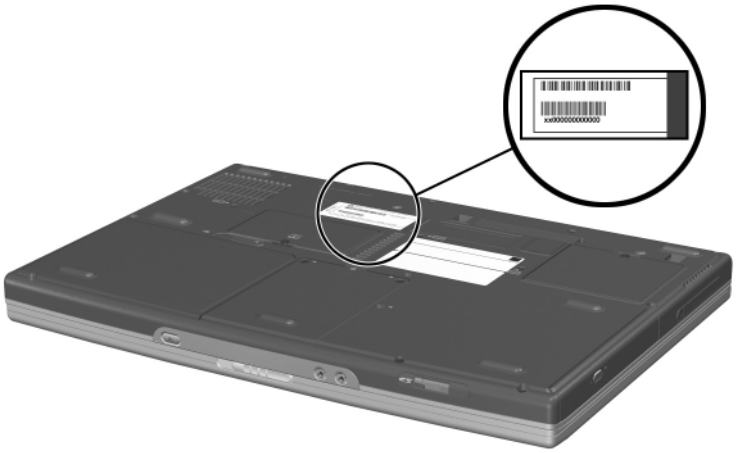
3

Illustrated Parts Catalog

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

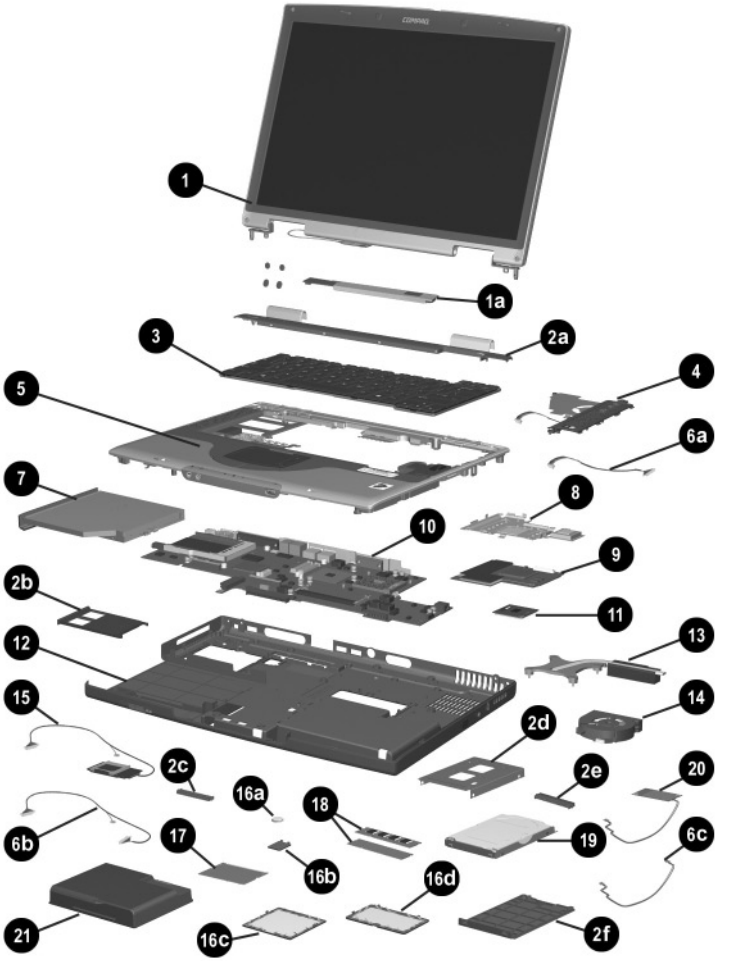
3.1 Serial Number Location

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



Serial Number Location

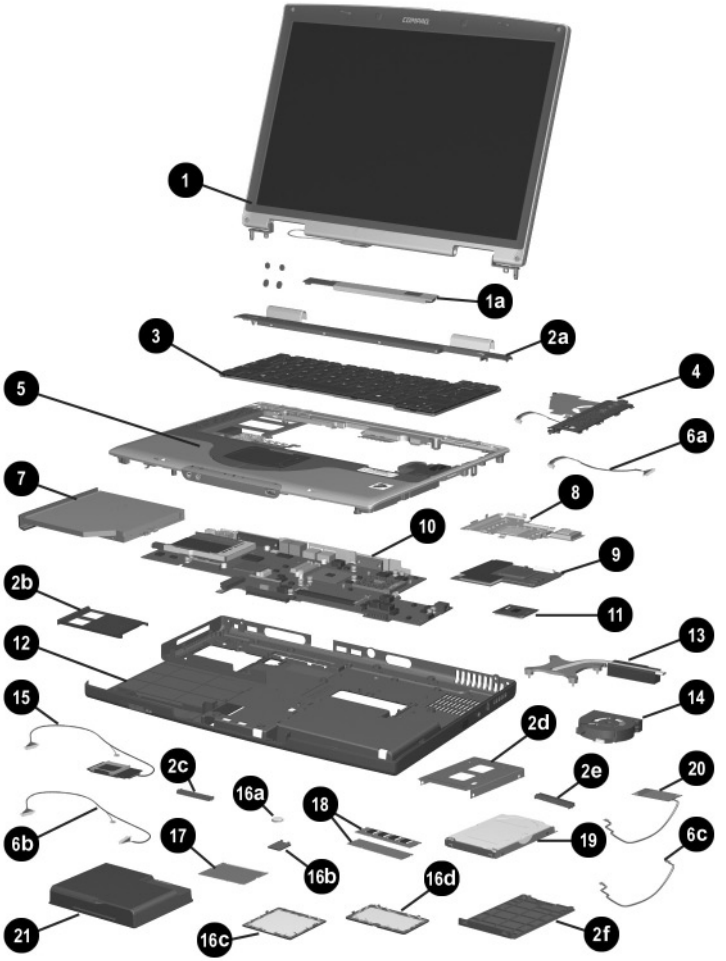
3.2 Notebook Major Components



Notebook Major Components

Table 3-1
Spare Parts: Notebook Major Components

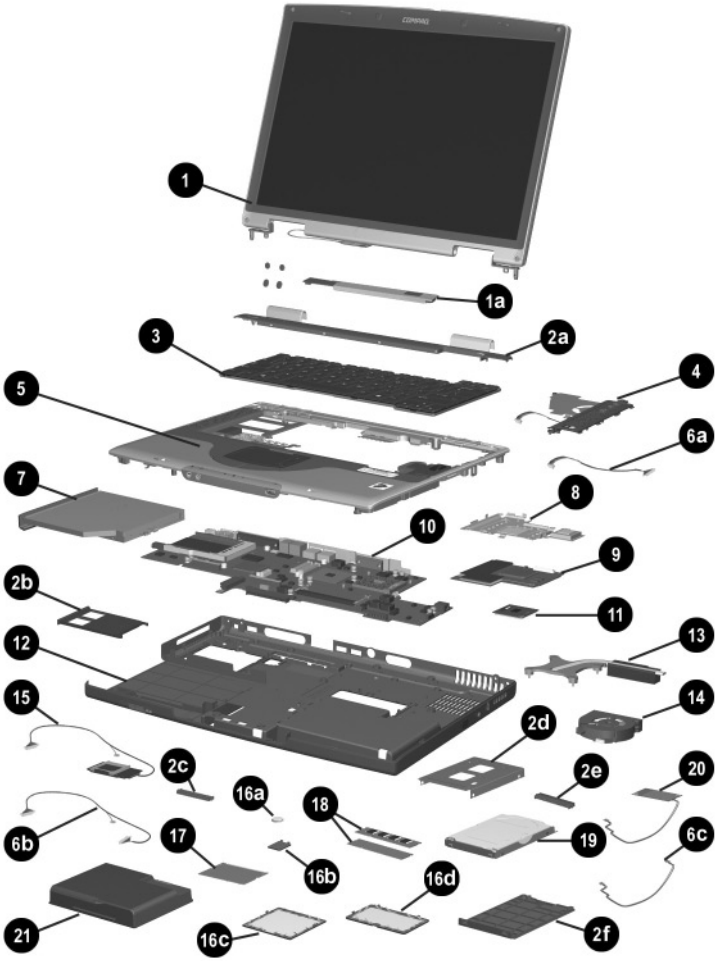
Item	Description	Spare Part Number
1	**Display assemblies**	
	With carbon finish for use with HP Compaq nx7000 models	
	15.4-inch, WUXGA	337006-001
	15.4-inch, WSXGA+	337003-001
	15.4-inch, WXGA	337008-001
	With silver finish for use with Compaq Presario X1000 models	
	15.4-inch, WUXGA	337005-001
	15.4-inch, WSXGA+	337004-001
	15.4-inch, WXGA	337007-001
1a	**Display inverter** (includes four display rubber screw covers)	336994-001
	Miscellaneous Plastics Kits	
	Contains parts with carbon finish for use with HP Compaq nx7000 models	338133-001
	Contains parts with silver finish for use with Compaq Presario X1000 models	337009-001
	Include:	
2a	Switch cover	
2b	PC Card slot space saver	
2c	Docking connector cover	
2d	Hard drive shield	
2e	Hard drive connector	
2f	Hard drive cover	
	Notebook feet (not illustrated)	



Notebook Major Components

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

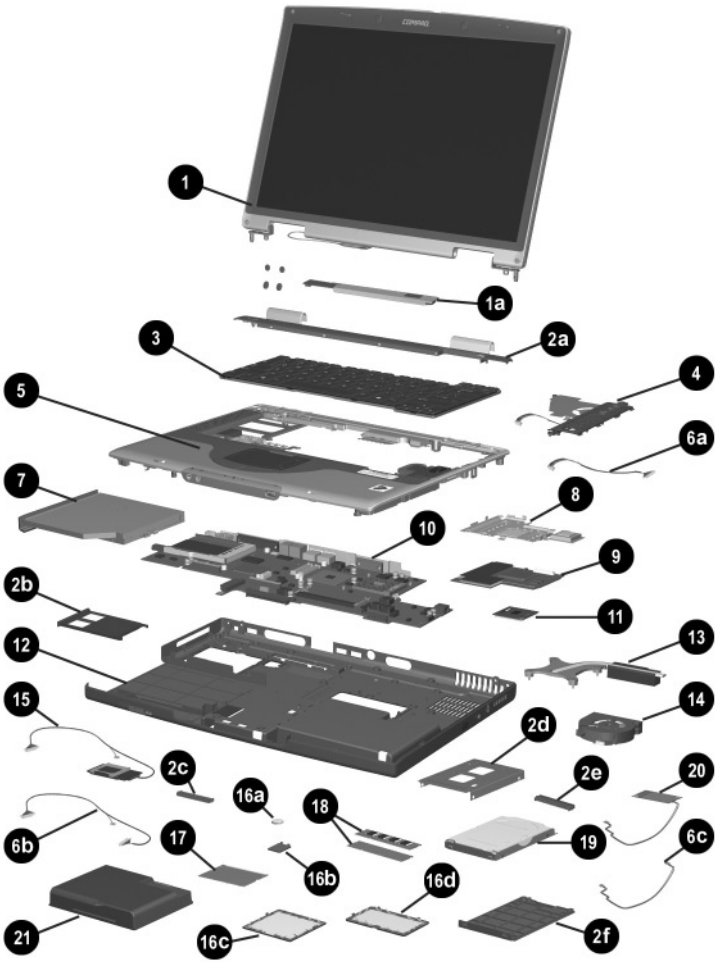
Item	Description			Spare Part Number
3	**Keyboards**			
	Belgium	337016-181	Norway	337016-091
	Denmark	337016-081	Portugal	337016-131
	France	337016-051	Saudi Arabia	337016-171
	French Canada	337016-121	Spain	337016-071
			Switzerland	337016-111
	Germany	337016-041	Taiwan	337016-AB1
	International	337016-B31	Thailand	337016-281
	Italy	337016-061	United Kingdom	337016-031
	Japan	337016-291	United States	337016-001
	Korea	337016-AD1		
4	**Speaker cover with cable**			336979-001
	Left and right speakers (not illustrated)			337015-001
5	**Top cover** (includes TouchPad and TouchPad shield)			336983-001
	Miscellaneous Cable Kit, includes			336973-001
6a	Speaker cover cable			
6b	SD Card slot board cable			
6c	Modem board cable			
7	**Optical drives**			
	24X Max DVD-ROM/CD-RW combination drive			336987-001
	8X Max DVD-ROM drive			336986-001
	24X Max CD-ROM drive			336985-001
8	**VGA board shield** (includes thermal pads)			337013-001



Notebook Major Components

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

Item	Description	Spare Part Number
9	**VGA boards** (includes thermal pads)	
	ATI Mobility Radeon 9200 with 64 MB video memory	336970-001
	ATI Mobility Radeon 9200 with 32 MB video memory	336969-001
	ATI Mobility Radeon 7500c with 32 MB video memory	336968-001
10	**System board** (includes thermal pads)	336964-001
	PC Card assembly (not illustrated)	337014-001
11	**Processors** (include thermal pads)	
	Intel Pentium-M 1.6 GHz	337011-001
	Intel Pentium-M 1.5 GHz	337023-001
	Intel Pentium-M 1.4 GHz	337024-001
	Intel Pentium-M 1.3 GHz	337010-001
12	**Base enclosure** (includes infrared lens)	336960-001
	Left and right wireless antenna with cables (not illustrated)	336959-001
13	**Heat sink with fan**	337000-001
	Thermal pad (not illustrated)	337001-001
14	**Fan**	336993-001
15	**SD Card slot board with cable**	336963-001

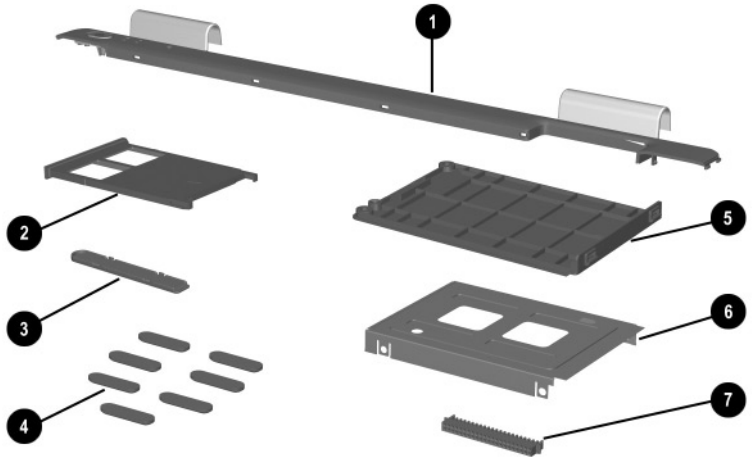


Notebook Major Components

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

Item	Description	Spare Part Number
	Miscellaneous Doors/Covers Kit, includes:	336984-001
16a	RTC battery	
16b	RTC battery cover	
16c	Mini PCI compartment cover	
16d	Memory expansion compartment cover	
17	**Mini PCI communications boards**	
	Mini PCI 802.11b wireless LAN	336976-001
	Mini PCI 802.11b wireless LAN	336977-001
	Mini PCI Bluethumb wireless LAN	338134-001
18	**Memory expansion boards**	
	1024 MB DDR	336909-001
	512 MB DDR	336998-001
	256 MB DDR	336997-001
	128 MB DDR	336996-001
19	**Hard drives** (hard drive cover, shield, and connector included with hard drive and in Miscellaneous Plastics Kits)	
	80 GB (4200 RPM)	336992-001
	60 GB (5400 RPM)	336991-001
	60 GB (4200 RPM)	336990-001
	40 GB (4200 RPM)	336989-001
20	**Modem board with cable**	336999-001
21	**Battery pack, 8 cell, 4.4 wH**	336962-001

3.3 Miscellaneous Plastics Kit Components



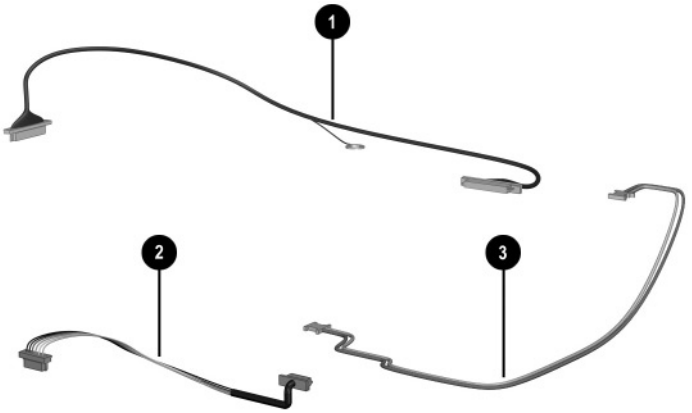
Miscellaneous Plastics Kit Components

Table 3-2
Miscellaneous Plastics Kit Components
Spare Part Number 338133-001
(contains parts with carbon finish for use with HP Compaq nx7000 models)

Spare Part Number 337009-001
(contains parts with silver finish for use with Compaq Presario X1000 models)

Item	Description
1	Switch cover
2	PC Card slot space saver
3	Docking connector cover
4	Notebook feet (7)
5	Hard drive cover
6	Hard drive shield
7	Hard drive connector

3.4 Miscellaneous Cable Kit Components

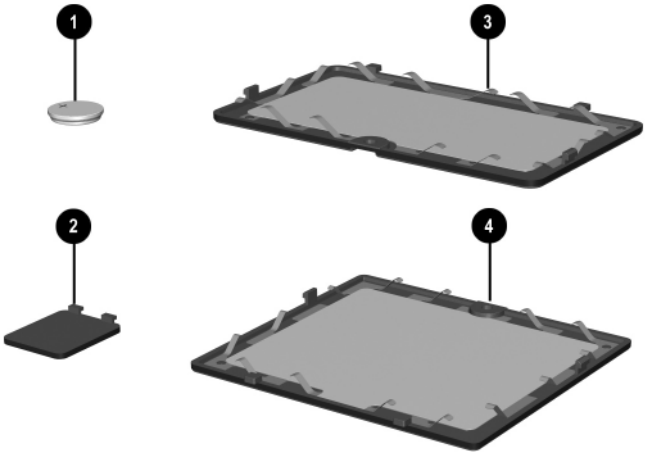


Miscellaneous Cable Kit Components

Table 3-3
Miscellaneous Cable Kit Components
Spare Part Number 336973-001

Item	Description
1	SD Card slot board cable
2	Speaker cover cable
3	Modem cable

3.5 Miscellaneous Doors/Covers Kit Components

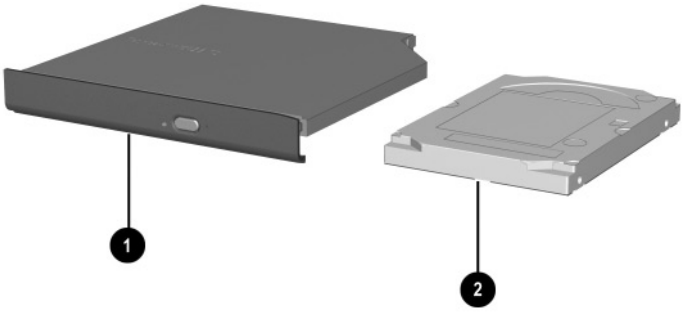


Miscellaneous Doors/Covers Kit Components

Table 3-4
Miscellaneous Doors/Covers Kit Components
Spare Part Number 336984-001

Item	Description
1	RTC battery
2	RTC battery cover
3	Memory expansion compartment cover
4	Mini PCI compartment cover

3.6 Mass Storage Devices



Mass Storage Devices

Table 3-5
Mass Storage Devices
Spare Part Number Information

Item	Description	Spare Part Number
1	**Optical drives**	
	24X Max DVD-ROM/CD-RW combination drive	336987-001
	8X Max DVD-ROM drive	336986-001
	24X Max CD-ROM drive	336985-001
2	**Hard drives** (include hard drive bezel and frame)	
	80 GB (4200 RPM)	336992-001
	60 GB (5400 RPM)	336991-001
	60 GB (4200 RPM)	336990-001
	40 GB (4200 RPM)	336989-001

3.7 Miscellaneous

Table 3-6
Spare Parts: Miscellaneous (not illustrated)

Description	Spare Part Number
AC adapter	338136-001
Logo Kits	
For use with HP Compaq nx7000 notebooks	336995-001
For use with Compaq Presario X1000 notebooks	338135-001
Power cord, 3-wire	
Australia	246959-011
Denmark	246959-081
Europe/Middle East/Africa	246959-021
Italy	246959-061
Japan	246959-291
Korea	246959-AD1
Switzerland	246959-AG1
United Kingdom	246959-031
United States	246959-001
Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing," for more information on screw specifications and usage.) ■ Phillips M2.5×15.0 screw ■ Phillips M2.5×7.0 screw ■ Phillips M2.5×5.0 screw ■ Spring-loaded Phillips M2.0×9.0 screw ■ Phillips M2.5×3.5 screw ■ Phillips M2.5×3.0 screw ■ Phillips M2.0×3.0 screw	337012-001

4

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
- Flat-bladed tool
- 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

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.

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.

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, 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).
- 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 ±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, connect a wrist strap with alligator clips.
- 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

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

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

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

Table 4-2
Static-Shielding Materials

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

5

Removal and Replacement Procedures

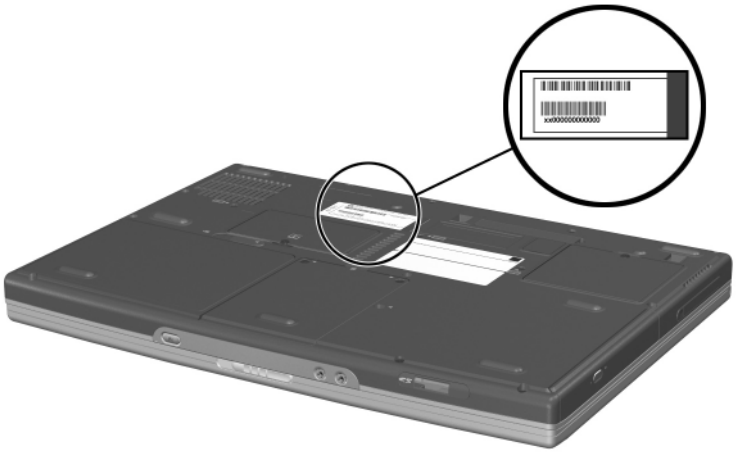
This chapter provides removal and replacement procedures.

There are 48 Phillips screws, in seven different sizes, that must be removed, replaced, and/or loosened when servicing the notebook. Make special note of each screw size and location during removal and replacement.

Refer to Appendix C, “Screw Listing,” for detailed information on screw sizes, locations, and usage.

5.1 Serial Number

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



Serial Number Location

5.2 Disassembly Sequence Chart

Use the following chart 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	2
	Hard drive cover and shield	4
5.4	Notebook feet	0
5.5	Memory expansion board	1
5.6	Mini PCI communications board	1
5.7	RTC battery	0
5.8	Optical drive	1
5.9	Keyboard	2
5.10	Switch cover	0
5.11	Speaker cover	4
5.12	Fan	1
5.13	Heat sink	4
5.14	Processor	0
5.15	Display assembly	7
5.16	Top cover	16
5.17	SD Card slot board and cable	2
5.18	VGA board and shield	2
5.19	Modem board and cable	0
5.20	System board	1

5.3 Preparing the Notebook for Disassembly

Perform the following steps before disassembling the notebook:

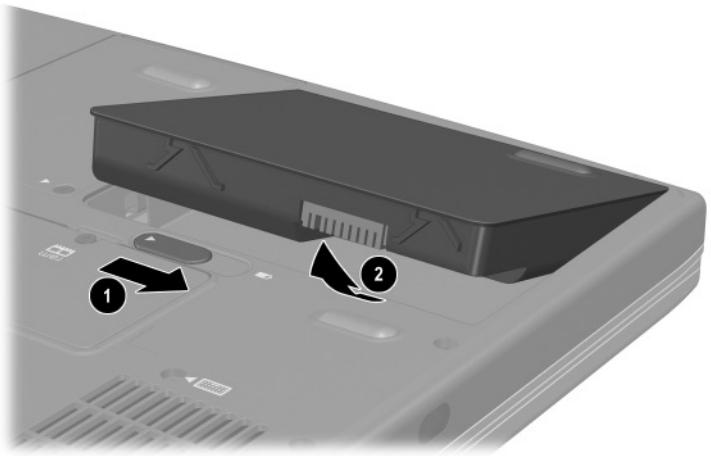
1. Turn off the notebook.
2. Disconnect the AC adapter and all external devices.

Spare Part Number Information	
Battery pack, 8 cell, 4.4 wH	336962-001

3. Remove the battery pack by following these steps:
   a. Turn the notebook bottom side up with the rear panel facing forward.

b. Slide and hold ❶ the battery release latch to the right. The front edge of the battery pack releases from the notebook.

c. Lift the front edge of the battery pack up and swing it back ❷.



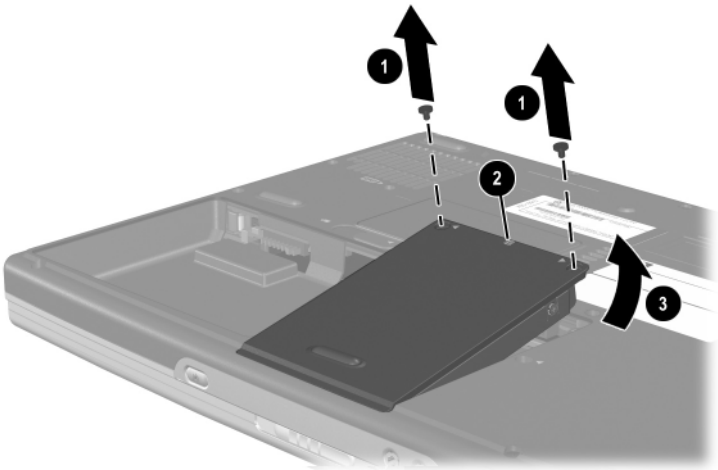
Removing the Battery Pack

d. Remove the battery pack.

Reverse the above procedure to install the battery pack.

Spare Part Number Information	
80 GB hard drive (4200 RPM)	336992-001
60 GB hard drive (5400 RPM)	336991-001
60 GB hard drive (4200 RPM)	336990-001
40 GB hard drive (4200 RPM)	336989-001

4. Remove the hard drive by following these steps:
   a. Turn the notebook bottom side up with the front facing forward.
   b. Remove the two PM2.5×7.0 screws ❶ that secure the hard drive to the notebook.
   c. Use the notch ❷ on the hard drive cover to lift the rear edge of the hard drive up and swing it forward ❸.



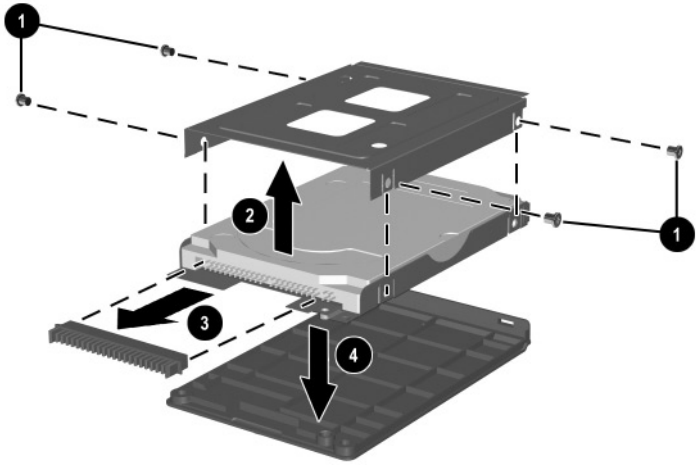
Removing the Hard Drive

   d. Remove the hard drive.

e. Remove the four PM2.5×3.5 screws ❶ that secure the hard drive to the hard drive cover and shield.

f. Remove the hard drive shield ❷ and connector ❸ from the hard drive.

g. Separate the hard drive from the hard drive cover ❹.



Removing the Hard Drive from the Hard Drive Cover

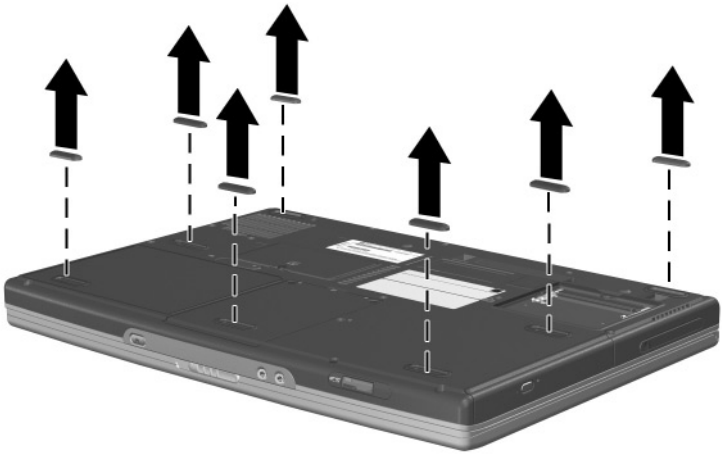
CAUTION: The hard drive cover should only be removed if it is damaged and must be replaced. Unnecessarily removing the cover can result in damage to the cover and hard drive and loss of information.

The hard drive cover, shield, and connector are included with the hard drive and also in the Miscellaneous Plastics Kits, spare part number 338133-001 for HP Compaq nx7000 models, and spare part number 337009-001 for Compaq Presario X1000 models.

Reverse the above procedure to install the hard drive.

5.4 Notebook Feet

The notebook feet are adhesive-backed rubber pads, and are included in the Miscellaneous Plastics Kits, spare part number 338133-001 for HP Compaq nx7000 models, and spare part number 337009-001 for Compaq Presario X1000 models. The notebook feet attach to the base enclosure as indicated in the following illustration.



Replacing the Notebook Feet

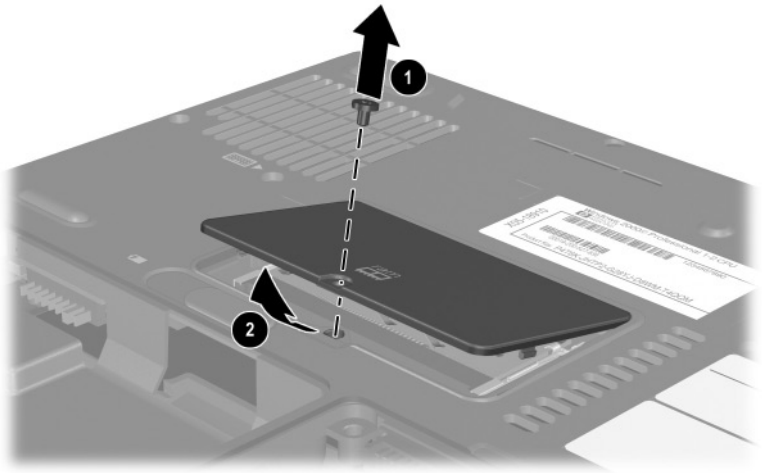
5.5 Memory Expansion Board

Spare Part Number Information

1024 MB DDR memory expansion board	336909-001
512 MB DDR memory expansion board	336998-001
256 MB DDR memory expansion board	336997-001
128 MB DDR memory expansion board	336996-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Turn the notebook bottom side up with the front facing forward.

3. Remove the PM2.5×5.0 screw ❶ that secures the memory expansion compartment cover to the notebook.
4. Lift the front edge of the cover up ❷ and swing it back ❸.

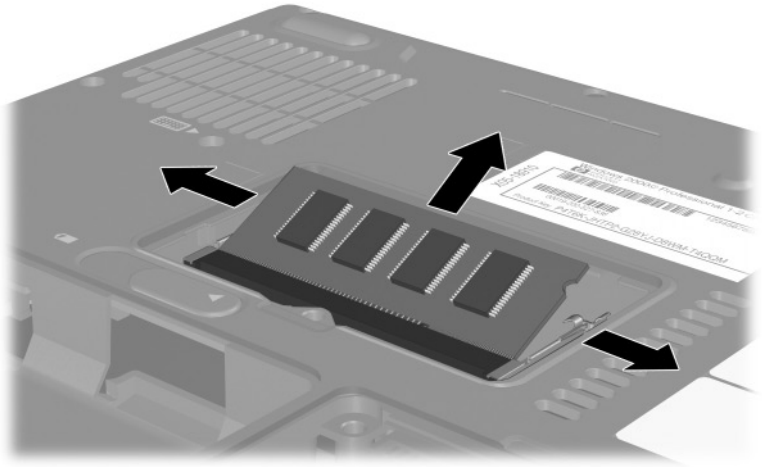


Removing the Memory Expansion Compartment Cover

5. Remove the cover.

The memory expansion compartment cover is included in the Miscellaneous Doors/Covers Kit, spare part number 336984-001.

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



Removing the Memory Expansion Board

Reverse the above procedure to install a memory expansion board.

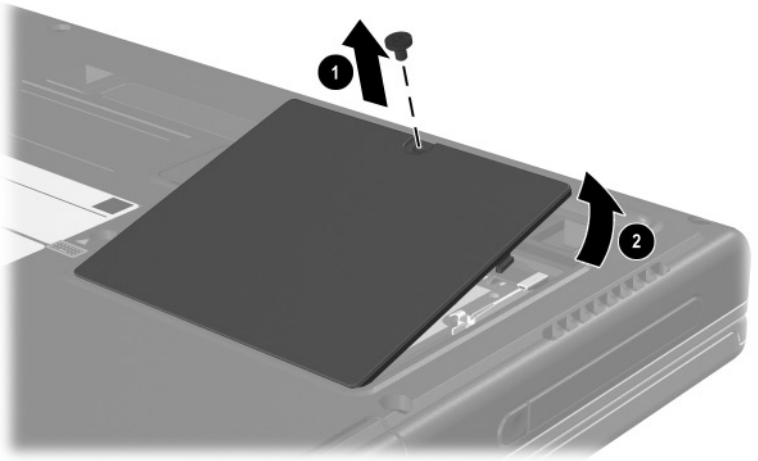
5.6 Mini PCI Communications Board

Spare Part Number Information

Mini PCI 802.11b wireless LAN	336976-001
Mini PCI 802.11b wireless LAN	336977-001
Mini PCI Bluethumb wireless LAN	338134-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Turn the notebook bottom side up with the front facing forward.

3. Remove the PM2.5×5.0 screw ❶ that secures the mini PCI compartment cover to the notebook.
4. Lift the rear edge of the cover up ❷ and swing it forward ❸.

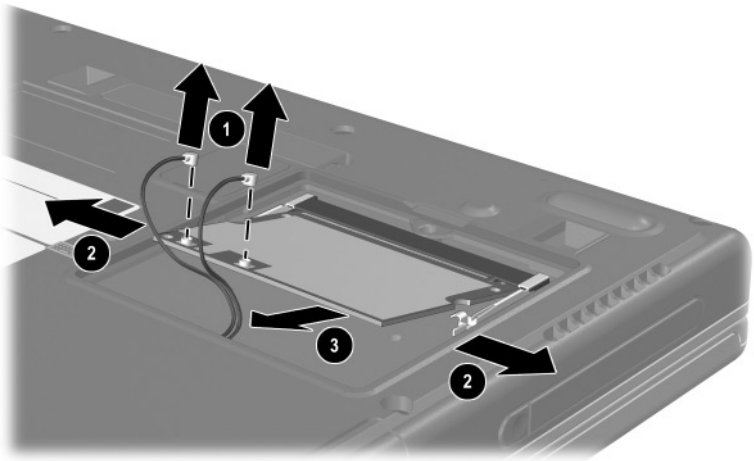


Removing the Mini PCI Compartment Cover

5. Remove the cover.

The mini PCI compartment cover is included in the Miscellaneous Doors/Covers Kit, spare part number 336984-001.

6. Disconnect the two antenna cables from the terminals on the mini PCI communications board ❶. Note that the longer of the two cables should be connected to the left antenna terminal (marked "AUX") and the shorter cable should be connected to the right terminal (marked "MAIN").
7. Spread the retaining tabs ❷ that secure the memory expansion board to the socket. The board rises up at a 45-degree angle.
8. Pull the board away from the socket at a 45-degree angle ❸.



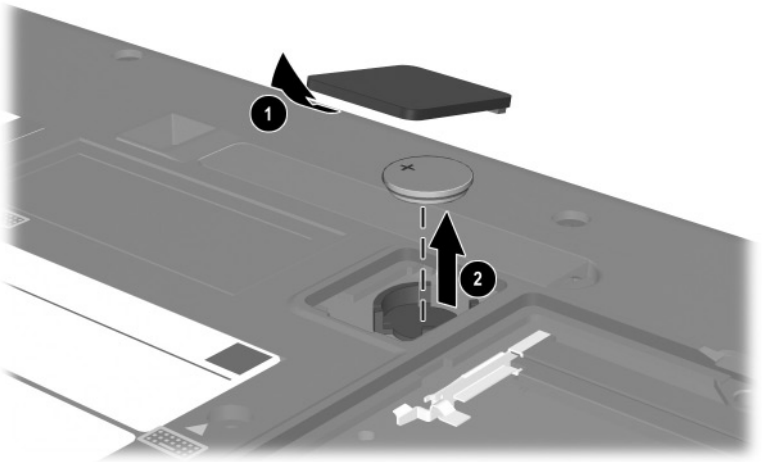
Removing the Mini PCI Communications Board

Reverse the above procedure to install a mini PCI communications board.

5.7 RTC Battery

The RTC battery and RTC battery cover are included in the Miscellaneous Doors/Covers Kit, spare part number 336984-001.

1. Prepare the notebook for disassembly (Section 5.3).
2. Turn the notebook bottom side up with the front facing forward.
3. Insert a flat-bladed tool into the notch ❶ on the front edge of the RTC battery cover and separate the front edge of the cover from the notebook.
4. Remove the RTC battery from the socket on the system board ❷.



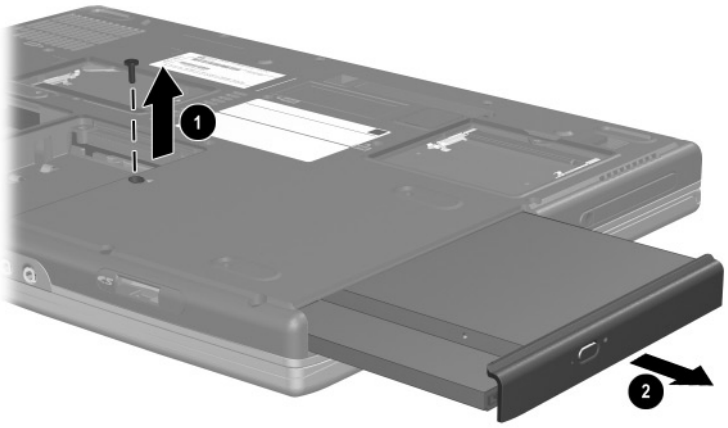
Removing the RTC battery

Reverse the above procedure to install an RTC battery.

5.8 Optical Drive

Spare Part Number Information	
24X Max DVD-ROM/CD-RW combination drive	336987-001
8X Max DVD-ROM drive	336986-001
24X Max CD-ROM drive	336985-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Turn the notebook bottom side up with the front facing forward.
3. Remove the PM2.5×7.0 screw ❶ that secures the optical drive to the notebook.
4. Insert a slender tool into the slot in the hard drive bay and push to the right to disengage the optical drive from the notebook ❷.



Removing the Optical Drive

5. Remove the optical drive.

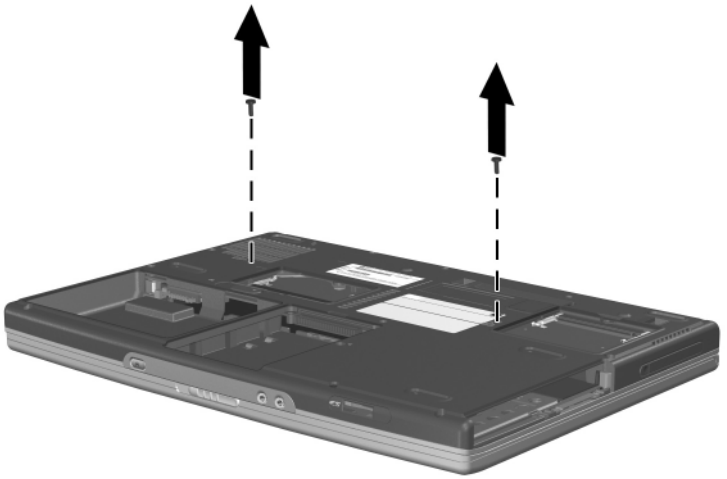
Reverse the above procedure to install an optical drive.

5.9 Keyboard

Spare Part Number Information

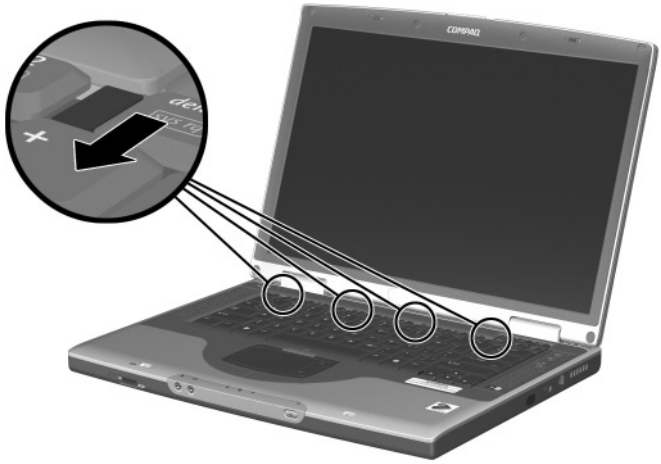
Belgium	337016-181	Norway	337016-091
Denmark	337016-081	Portugal	337016-131
France	337016-051	Saudi Arabia	337016-171
French Canada	337016-121	Spain	337016-071
Germany	337016-041	Switzerland	337016-111
International	337016-B31	Taiwan	337016-AB1
Italy	337016-061	Thailand	337016-281
Japan	337016-291	United Kingdom	337016-031
Korea	337016-AD1	United States	337016-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Turn the notebook bottom side up with the front facing forward.
3. Remove the two PM2.5×15.0 screws that secure the keyboard to the base enclosure.



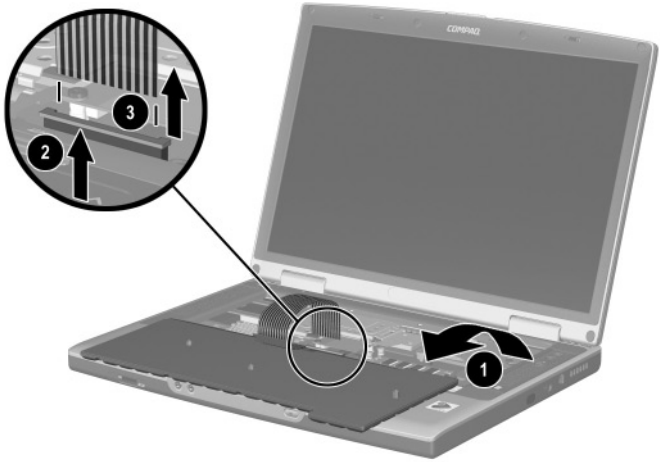
Removing the Keyboard Screws

4. Turn the notebook top side up with the front facing forward.
5. Open the notebook.
6. Slide the four notches on the top edge of the keyboard forward.



Releasing the Keyboard

7. Lift the rear edge of the keyboard, swing it up and forward ❶, and rest it on the top cover.
8. Release the ZIF connector ❷ to which the keyboard cable is attached and disconnect the keyboard cable ❸ from the system board.



Disconnecting the Keyboard Cable

9. Remove the keyboard.

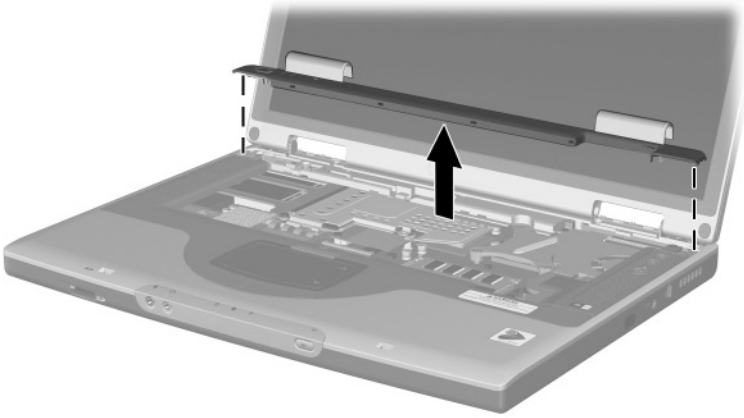
Reverse the above procedure to install the keyboard.

After the keyboard is removed, the internal memory expansion board connector is accessible. Refer to the "Memory Expansion Board" section for instructions on removing the internal memory expansion board.

5.10 Switch Cover

The switch cover is included in the Miscellaneous Plastics Kits, spare part number 338133-001 for HP Compaq nx7000 models, and spare part number 337009-001 for Compaq Presario X1000 models.

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.9).
3. Insert a flat-bladed tool under the outside edges of the hinge cover areas and lift up to disengage the left and right sides of the cover from the notebook.
4. Remove the switch cover.



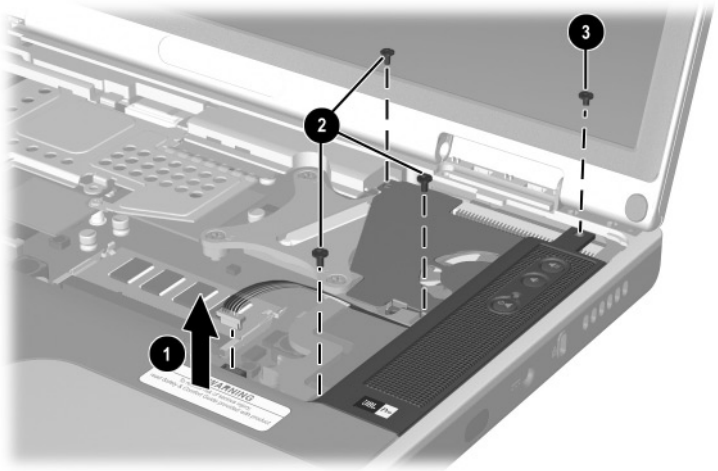
Removing the Switch Cover

Reverse the above procedure to install the switch cover.

5.11 Speaker Cover

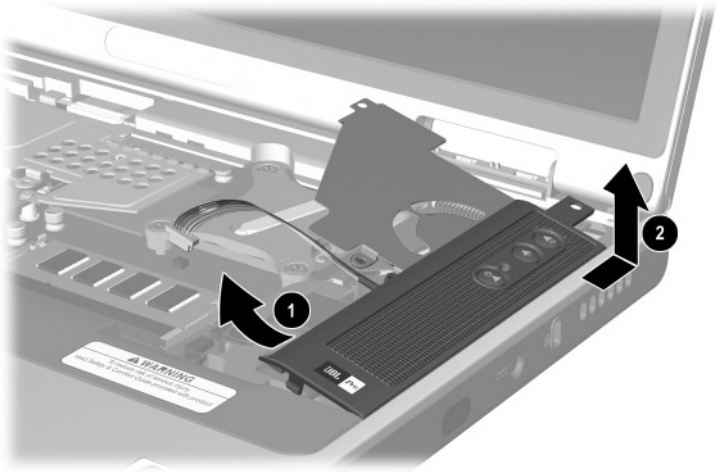
Spare Part Number Information	
Speaker cover with cable	336979-001
The speaker cover cable is also included in the Miscellaneous Cable Kit, spare part number 336973-001.	

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.9).
3. Remove the switch cover (Section 5.10).
4. Disconnect the audio cable ❶ from the system board.
5. Remove the three PM2.5×5.0 screws ❷ and the PM2.5×3.0 screw ❸ that secure the speaker cover to the notebook.



Removing the Speaker Cover Screws

6. Lift the left side of the speaker cover shield and swing it up and slightly to the right ❶.
7. Slide the speaker cover back ❷ to disengage it from the notebook.
8. Remove the speaker cover.



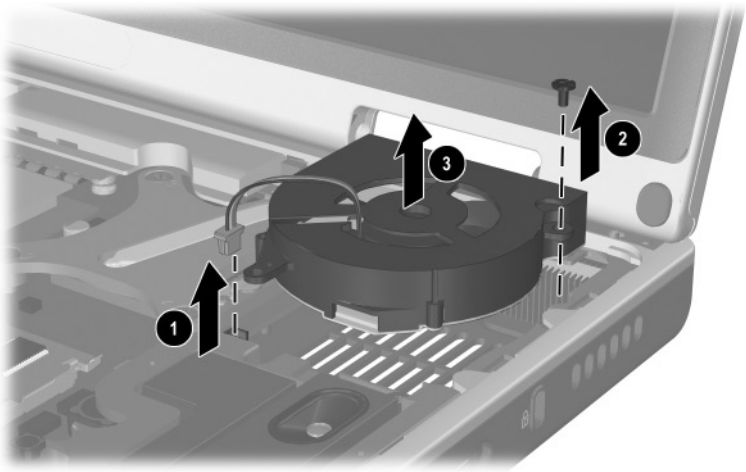
Removing the Speaker Cover

Reverse the above procedure to install the speaker cover.

5.12 Fan

Spare Part Number Information	
Fan	336993-001
The fan is also included with the heat sink, spare part number 337000-001.	

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.9).
3. Remove the switch cover (Section 5.10).
4. Remove the speaker cover (Section 5.11).
5. Disconnect the fan cable ❶ from the system board.
6. Remove the PM2.5×5.0 screw ❷ that secures the fan to the base enclosure.
7. Remove the fan ❸.



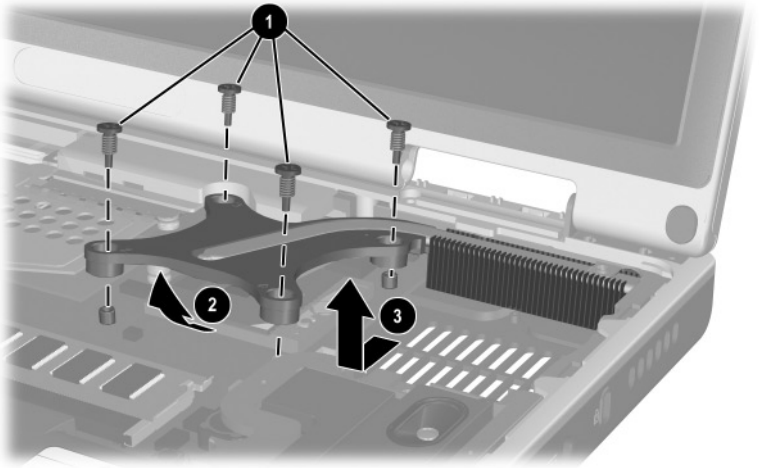
Removing the Fan

Reverse the above procedure to install the fan.

5.13 Heat Sink

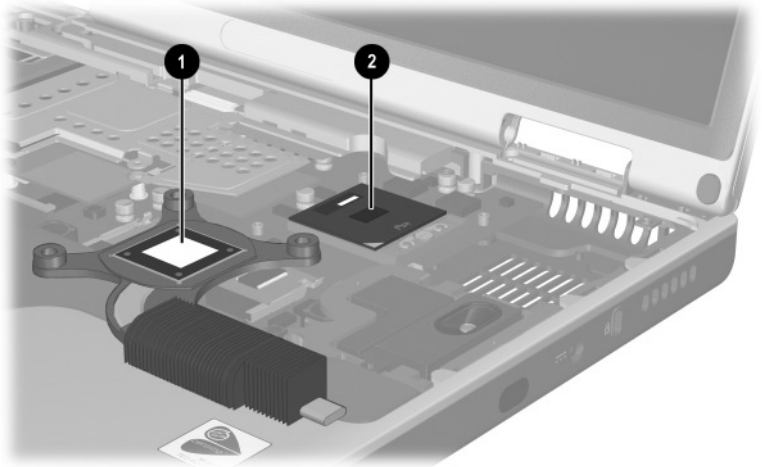
Spare Part Number Information	
Heat sink with fan	337000-001
Thermal pad	337001-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❏ Keyboard (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Speaker cover (Section 5.11)
   - ❏ Fan (Section 5.12)
2. Remove the four PM2.0×9.0 spring-loaded shoulder screws ❶ that secure the heat sink to the notebook.
3. Lift the front edge of the heat sink ❷ and slide the heat sink out of the notebook at an angle ❸.



Removing the Heat Sink

Carefully clean any thermal grease residue from the heat sink ❶ and processor surfaces ❷ each time you remove the heat sink. Apply new thermal grease to both surfaces.



Removing the Thermal Grease From the Heat Sink and Processor

Reverse the above procedure to install the heat sink.

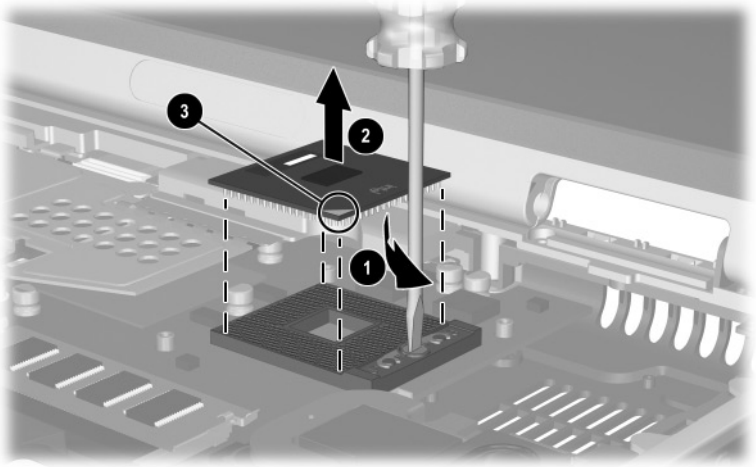
5.14 Processor

Spare Part Number Information	
Intel Pentium-M 1.6-GHz processor	337011-001
Intel Pentium-M 1.5-GHz processor	337023-001
Intel Pentium-M 1.4-GHz processor	337024-001
Intel Pentium-M 1.3-GHz processor	337010-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❏ Keyboard (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Speaker cover (Section 5.11)
   - ❏ Fan (Section 5.12)
   - ❏ Heat sink (Section 5.13)

2. Use a flat-bladed tool to turn the processor locking screw ❶ one-quarter turn counterclockwise.
3. Lift the processor straight up ❷ and remove it.

Note that the gold triangle ❸ should be in the lower right corner when installing the processor.



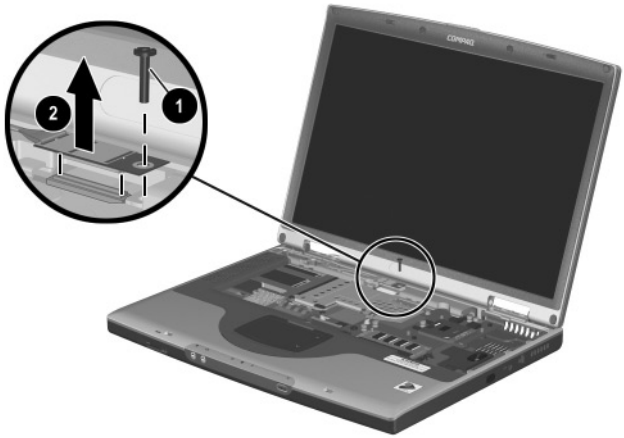
Removing the Processor

Reverse the above procedure to install the processor.

5.15 Display Assembly

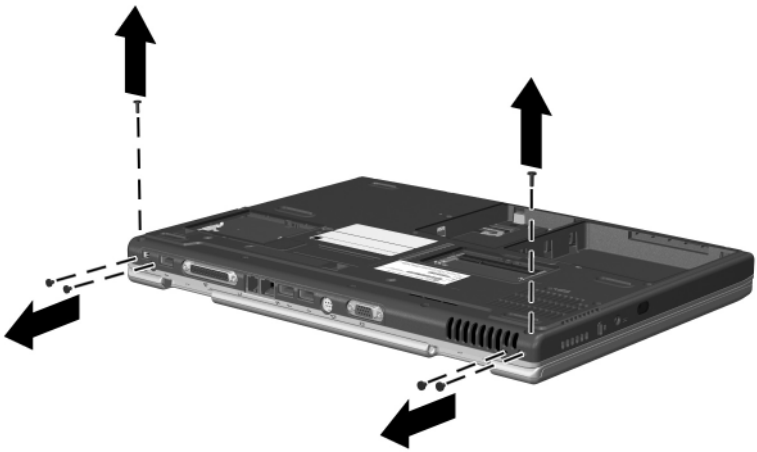
Spare Part Number Information	
With carbon finish for use with HP Compaq nx7000 models	
15.4-inch, WUXGA	337006-001
15.4-inch, WSXGA+	337003-001
15.4-inch, WXGA	337008-001
With silver finish for use with Compaq Presario X1000 models	
15.4-inch, WUXGA	337005-001
15.4-inch, WSXGA+	337004-001
15.4-inch, WXGA	337007-001
Display inverter (includes display rubber screw covers)	336994-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Remove the keyboard (Section 5.9).
3. Remove the switch cover (Section 5.10).
4. Remove the PM2.5×15.0 screw ❶ that secures the display cable to the base enclosure.
5. Disconnect the display video cable ❷ from the system board.



Disconnecting the Display Cable

6. Close the notebook and turn the notebook bottom side up with the rear panel facing forward.
7. Remove the six PM2.5×7.0 screws that secure the display assembly to the base enclosure.



Removing the Display Screws

8. Turn the notebook top side up with the front facing forward.
9. Open the display to the fully upright position.
10. Lift the display assembly straight up and remove it.

Removing the Display Assembly

Reverse the above procedure to install the display assembly.

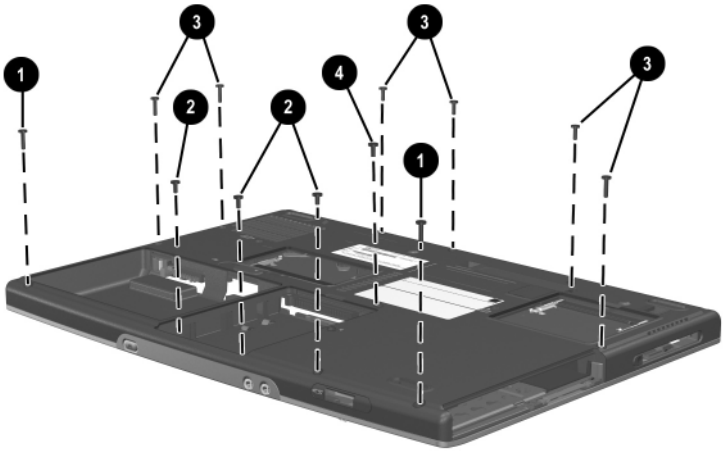
5.16 Top Cover

Spare Part Number Information

Top cover (includes TouchPad and TouchPad shield)	336983-001

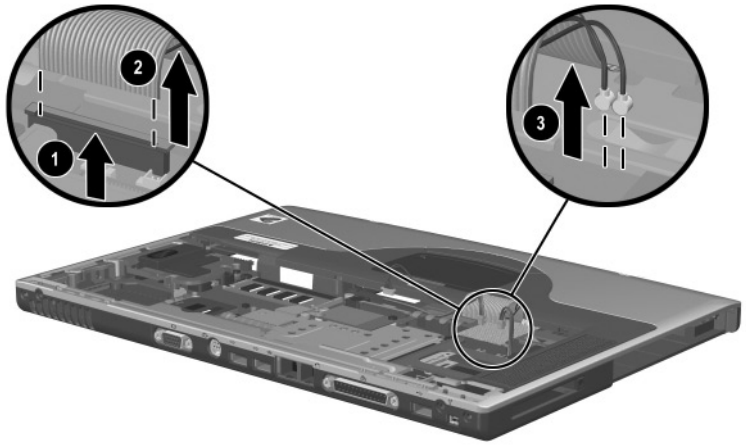
1. Prepare the notebook for disassembly (Section 5.3).
2. Disconnect the wireless antenna cables from the mini PCI communications board (Section 5.6).
3. Remove the following components:
   - ❏ Optical drive (Section 5.8)
   - ❏ Keyboard (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Speaker cover (Section 5.11)
   - ❏ Display assembly (Section 5.15)
4. Turn the notebook bottom side up with the front facing forward.

5. Remove the following screws:
   - ❏ Two PM2.5×7.0 screws in the front corners of the notebook ❶
   - ❏ Two PM2.5×5.0 screws in the hard drive bay and one PM2.5×5.0 screw on the right side of the hard drive bay ❷
   - ❏ Six PM2.5×15.0 screws ❸
   - ❏ One PM2.5×7.0 screw ❹ behind the hard drive bay



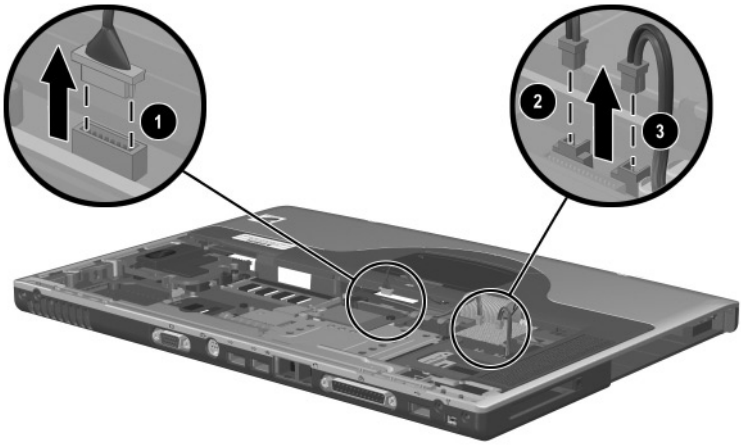
Removing the Top Cover Screws

6. Turn the notebook top side up with the rear panel facing forward.
7. Release the ZIF connector ❶ to which the TouchPad cable is attached and disconnect the TouchPad cable ❷ from the system board.
8. Route the two antenna cables ❸ out of the hole in the system board.



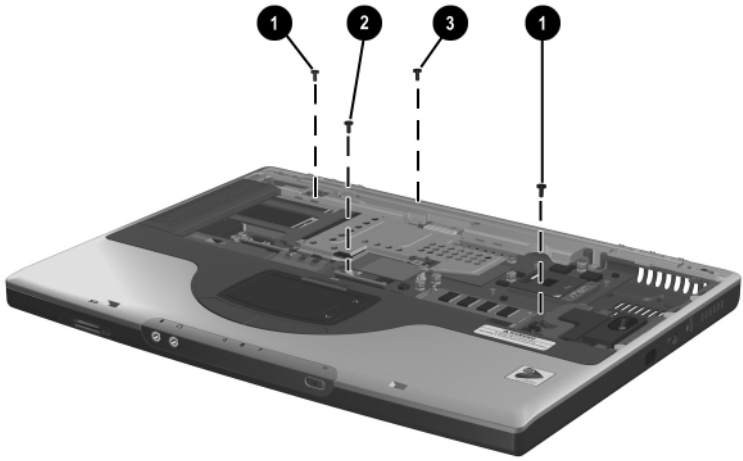
Disconnecting the TouchPad Cable and Routing the Wireless Antenna Cables

9. If connected, disconnect the Bluethumb wireless module cable ❶ from the system board.
10. Disconnect the left ❷ and right speaker cables ❸ from the system board.



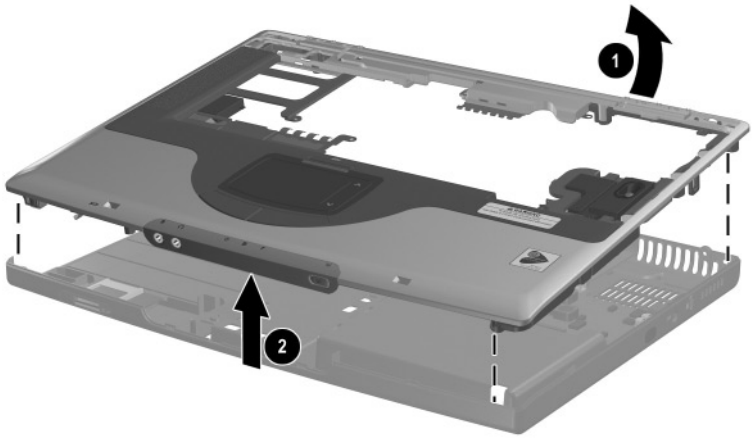
Disconnecting the Bluethumb Wireless Module and Speaker Cables

11. Remove the following screws:
    - ❏ Two PM2.5×7.0 screws ❶ that secure the top cover to the base enclosure
    - ❏ One PM2.0×3.0 screw ❷ that secures the top cover and modem to the base enclosure
    - ❏ One PM2.5×5.0 screw ❸ that secures the top cover to the base enclosure above the USB connector



Removing the Top Cover Screws

12. Position the notebook so the front faces forward.
13. Lift the back edge of the top cover ❶ and swing it forward ❷ to disengage it from the base enclosure.
14. Remove the top cover.



Removing the Top Cover

Reverse the above procedure to install the top cover.

5.17 SD Card Slot Board and Cable

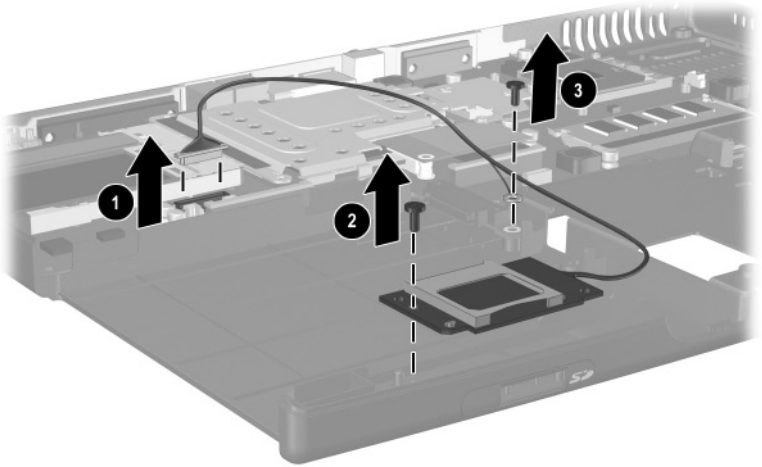
Spare Part Number Information

SD Card slot board with cable	336963-001

The SD Card slot board cable is also included in the Miscellaneous Cable Kit, spare part number 336973-001.

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❏ Mini PCI communications board (Section 5.6)
   - ❏ Optical drive (Section 5.8)
   - ❏ Keyboard (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Speaker cover (Section 5.11)
   - ❏ Display assembly (Section 5.15)
   - ❏ Top cover (Section 5.16)

2. Disconnect the SD Card slot board cable ❶ from the system board.
3. Remove the PM2.5×5.0 screw ❷ that secures the SD Card slot board to the notebook.
4. Remove the PM2.5×5.0 screw ❸ that secures the SD Card slot board cable ground loop to the notebook.
5. Remove the SD Card slot board and cable.



Removing the SD Card Slot Board and Cable

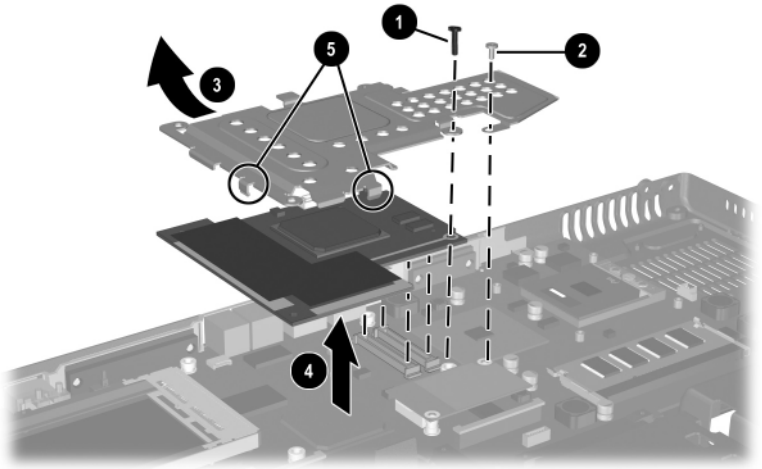
Reverse the above procedure to install the SD Card slot board and cable.

5.18 VGA Board and Shield

Spare Part Number Information	
VGA boards (include thermal pads)	
ATI Mobility Radeon 9200 with 64 MB video memory	336970-001
ATI Mobility Radeon 9200 with 32 MB video memory	336969-001
ATI Mobility Radeon 7500c with 32 MB video memory	336968-001
VGA board shield (includes thermal pads)	337017-001

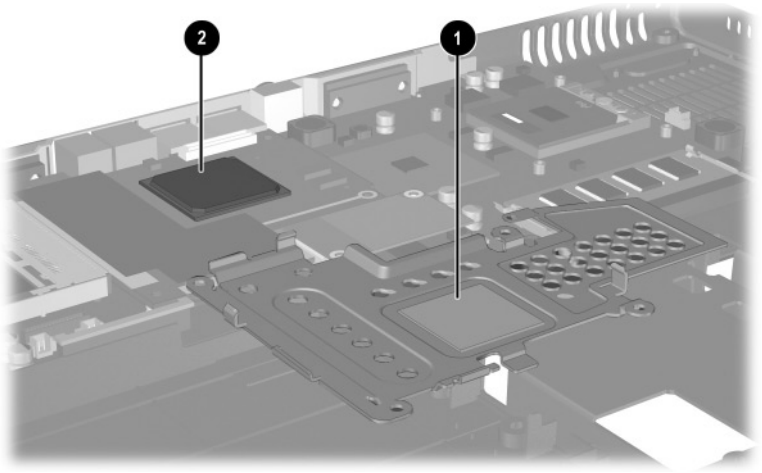
1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❏ Mini PCI communications board (Section 5.6)
   - ❏ Optical drive (Section 5.8)
   - ❏ Keyboard (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Speaker cover (Section 5.11)
   - ❏ Display assembly (Section 5.12)
   - ❏ Top cover (Section 5.16)

2. Remove the PM2.5×15.0 ❶ and PM2.0×3.0 ❷ screws that secure the VGA board shield to the base enclosure.
3. Lift the upper left corner of the VGA board ❸ to disconnect it from the system board.
4. Remove the VGA board and shield ❹.
5. Disengage the shield clips ❺ to remove the VGA board from the shield.



Removing the VGA Board and Shield

6. The VGA shield ❶ and board ❷ contain thermal pads that assist in cooling the notebook. Inspect these pads and replace if necessary each time the shield is removed.



Replacing the Thermal Pads on the VGA Board and Shield

Reverse the above procedure to install the VGA board and shield.

5.19 Modem and Cable

Spare Part Number Information

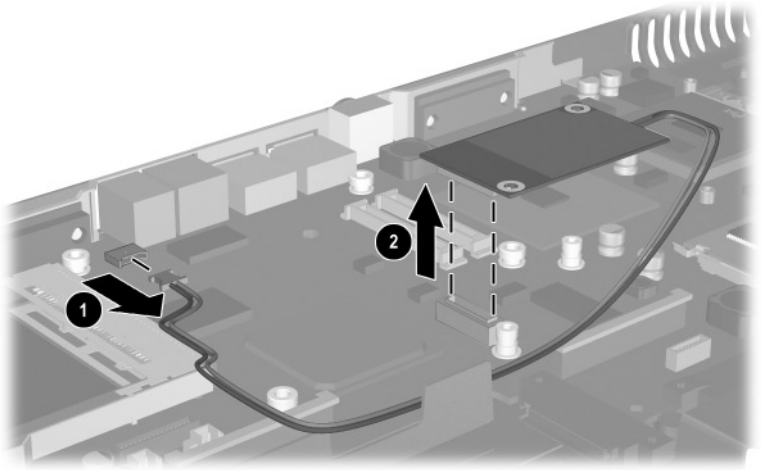
Modem board with cable	336999-001

The modem board cable is also included in the Miscellaneous Cable Kit, spare part number 336973-001.

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❑ Mini PCI communications board (Section 5.6)
   - ❑ Optical drive (Section 5.8)
   - ❑ Keyboard (Section 5.9)
   - ❑ Switch cover (Section 5.10)

- ❏ Speaker cover (Section 5.11)
- ❏ Display assembly (Section 5.15)
- ❏ Top cover (Section 5.16)
- ❏ VGA board and shield (Section 5.18)

2. Disconnect the modem cable ❶ from the system board.
3. Lift the left side of the modem board ❷ to disconnect it from the system board.
4. Remove the modem board.



Removing the Modem Board and Cable

Reverse the above procedure to install the modem and cable.

5.20 System Board

Spare Part Number Information

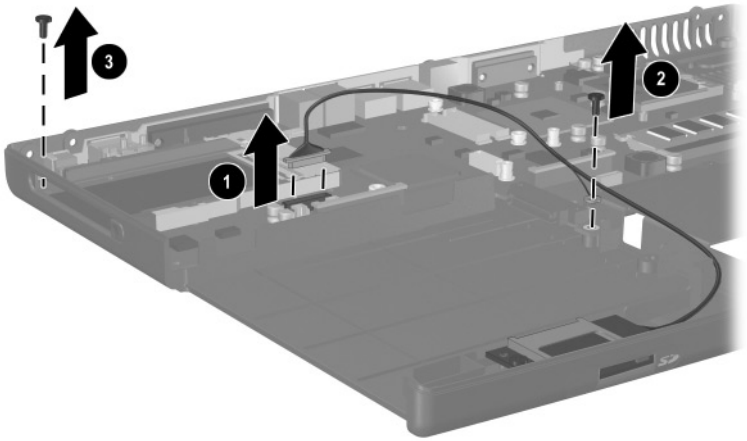
System board (includes thermal pads)	336964-001
PC Card assembly (removal not documented)	337014-001

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 expansion boards (Section 5.5)
- Mini PCI communications board (Section 5.6)
- RTC battery (Section 5.7)
- Processor (Section 5.14)
- VGA board and shield (Section 5.18)
- Modem and modem cable (Section 5.19)

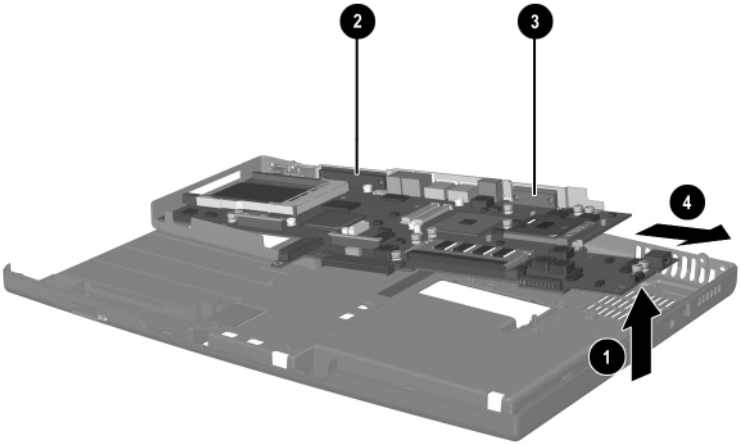
1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❏ Optical drive (Section 5.8)
   - ❏ Keyboard (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Speaker cover (Section 5.11)
   - ❏ Display assembly (Section 5.12)
   - ❏ Top cover (Section 5.16)

2. Disconnect the SD Card slot board cable ❶ from the system board.
3. Remove the PM2.5×5.0 screw ❷ that secures the SD Card slot board cable ground loop to the base enclosure and the PM2.5×5.0 screw ❸ that secures the system board to the base enclosure.



Removing the System Board Screws

4. Lift the right side of the system board approximately 1 inch ❶. If necessary, flex the back edge of the base enclosure out so the parallel ❷ and serial connectors ❸ can clear the base enclosure.
5. Slide the system board to the right an angle ❹.
6. Remove the system board.



Removing the System Board

Reverse the above procedure to install the system board.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Notebook

Dimensions		
Height	3.45 cm	1.4 in
Width	25.40 cm	10.0 in
Depth	35.56 cm	14.0 in
Weight (varies by configuration)		
	2.95 kg	6.5 lbs
Stand-alone power requirements		
Nominal operating voltage	14.4 VDC	
Average operating power	15.8 W	
Peak operating power	38.0 W	
Power in Standby mode	< 800 mW	
Power in Hibernation mode	< 100 mW	
Temperature		
Operating	10° to 35° C	50° to 95° F
Nonoperating	-10° to 60° C	14° to 140° F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 90%, 38.7° C (101.6° F) maximum wet bulb temperature	

Table 6-1
Notebook *(Continued)*

Altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	0 to 3,048 m	0 to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	0 to 9,144 m	0 to 30,000 ft
Shock		
Operating	10 G, 11 ms, half-sine	
Nonoperating	60 G, 11 ms, half-sine	
Vibration		
Operating	0.5 G zero-to-peak, 10 to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.0 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 UXGA, 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	300:1	
Brightness	170 nits typical	
Pixel resolution		
Pitch	0.173 × 0.173 mm	
Format	1920 × 1200	
Configuration	RGB vertical stripe	
Backlight	Edge lit	
Character display	80 × 25	
Viewing angle	+/- 55° degrees horizontal, +/- 45° vertical typical	

Table 6-3
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° degrees horizontal, +/- 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° degrees horizontal, +/- 50° vertical typical	

Table 6-5
Hard Drives

	80 GB	60 GB (5400 rpm)	60 GB (4200 rpm)	40 GB
User capacity per drive[1]	80 GB	60 GB	40 GB	30 GB
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	99 g	102 g	99 g	99 g
Interface type	ATA-5	ATA-5	ATA-5	ATA-5
Transfer rate				
Synchronous (maximum)	100 MB/ sec	100 MB/ sec	100 MB/ sec	100 MB/ sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks[2]	156,301,488	117,210,240	78,140,160	58,605,120
Disk rotational speed	4200 rpm	5400 rpm	4200 rpm	4200 rpm
Operating temperature	5° to 55° C (41° to 131° F)	5° to 55° C (41° to 131° F)	5° to 55° C (41° to 131° F)	5° to 55° C (41° to 131° F)

[1]1 GB = 1,073,741,824 bytes.

[2]Actual drive specifications may differ slightly.

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

Table 6-6
External AC Adapter

Weight	.304 kg	0.67 lb
Power supply		
Rated input voltage	100 to 240 VAC RMS	
Rated input current	1.7 A RMS	
Rated frequency	47 to 63 Hz	

Table 6-7
8-cell, Primary Li ion Battery Pack

Dimensions		
Height	13.4 cm	5.25 in
Width	9.2 cm	3.63 in
Depth	1.9 cm	.75 in
Weight	.43 kg	.96 lb
Energy		
Voltage	14.8 V	
Amp-hour capacity	4.4 aH	
Watt-hour capacity	64 wH	
Temperature		
Operating	0 to 60° C	32 to 140° F
Nonoperating	-20 to 60° C	-4 to 104° F
Recharge time		
System in off mode or Standby	2 to 3 hours	
System on (depending on system power consumption)	2 to 5 hours	

Table 6-8
24X DVD/CD-RW 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	12 cm, 8 cm	
Disk thickness	1.2 mm	0.047 in
Track pitch	0.74 µm	
Access time		
Random	< 150 ms	
Full stroke	< 225 ms	
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	128 KB/s	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-9
24X CD-RW 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	12 cm, 8 cm	
Disk thickness	1.2 mm	0.047 in
Track pitch	0.74 µm	
Access time		
Random	< 150 ms	
Full stroke	< 225 ms	
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	128 KB/s	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 6-10
8X 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	12 cm, 8 cm	
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	Line-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 6-11
24X CD-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	12 cm, 8 cm	
Disk thickness	1.2 mm	0.047 in
Track pitch	1.6 µm	
Access time		
Random	< 150 ms	
Full stroke	< 300 ms	
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	128 KB/s	
Data transfer rate		
Sustained (16X)	2400 KB/s	
Variable	1500 to 3600 KB/s (10X to 24X)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 8 seconds	
Stop time	< 4 seconds	

Table 6-12
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 6-13
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 6-14
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/real time clock (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 6-14
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 6-14
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)

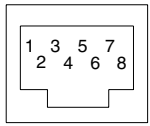
Table 6-15
System Memory Map

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

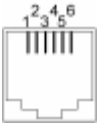
Connector Pin Assignments

Table A-1
RJ-45 Network Interface



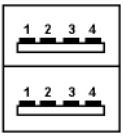
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-2
RJ-11 Modem



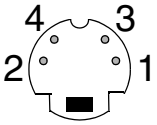
Pin	Signal	Pin	Signal
1	Unused	4	Unused
2	Tip	5	Unused
3	Ring	6	Unused

Table A-3
Universal Serial Bus



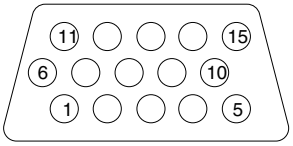
Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data –	4	Ground

Table A-4
S-Video



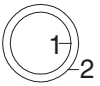
Pin	Signal	Pin	Signal
1	Ground (Y)	3	Y-Luminance (Intensity)
2	Ground (C)	4	C-Chrominance (Color)

Table A-5
External Monitor



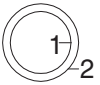
Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table A-6
Audio Line-Out



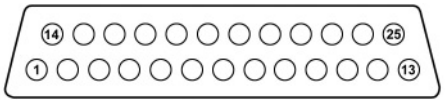
Pin	Signal	Pin	Signal
1	Audio out	2	Ground

Table A-7
Microphone



Pin	Signal	Pin	Signal
1	Audio in	2	Ground

Table A-8
Parallel



Pin	Signal	Pin	Signal
1	Strobe	14	Auto Linefeed
2	Data Bit 0	15	Error
3	Data Bit 1	16	Initialize Printer
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		

B

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 received 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 an HP authorized reseller or service provider.

General Requirements

The following requirements are applicable to all countries:

- The length of the power cord set must be at least 1.5 meters (5 feet) and a maximum of 2 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 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm^2 conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

C

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 337012-001.

Table C-1
Phillips PM2.5×7.0 Screw

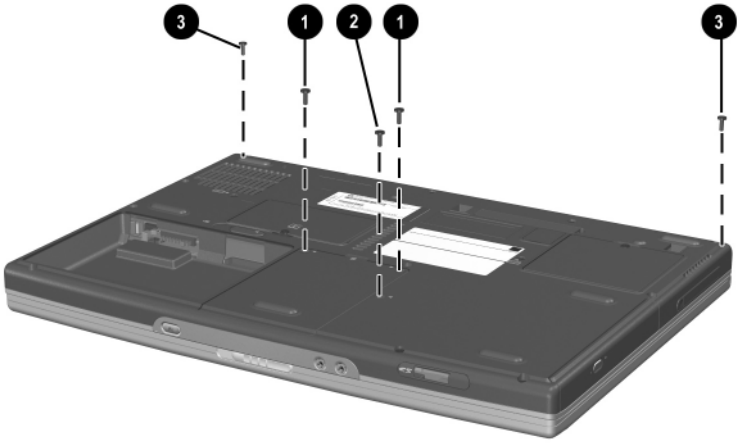
mm	Color	Qty.	Length	Thread	Head Width
	Black	14	7.0 mm	2.5 mm	5.0 mm

Where used:

❶ Two screws that secure the hard drive to the notebook (documented in Section 5.3)

❷ One screw that secures the optical drive to the notebook (documented in Section 5.8)

❸ Two screws that secure the display assembly to the notebook (documented in Section 5.15)



Phillips PM2.5×7.0 Screw Locations

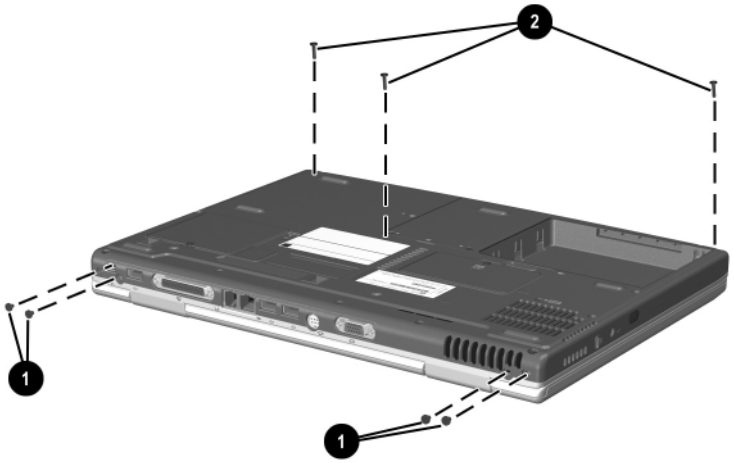
Table C-1
Phillips PM2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	14	7.0 mm	2.5 mm	5.0 mm

Where used:

❶ Four screws that secure the display assembly to the notebook through the rear panel (documented in Section 5.15)

❷ Three screws that secure the top cover to the notebook (documented in Section 5.16)

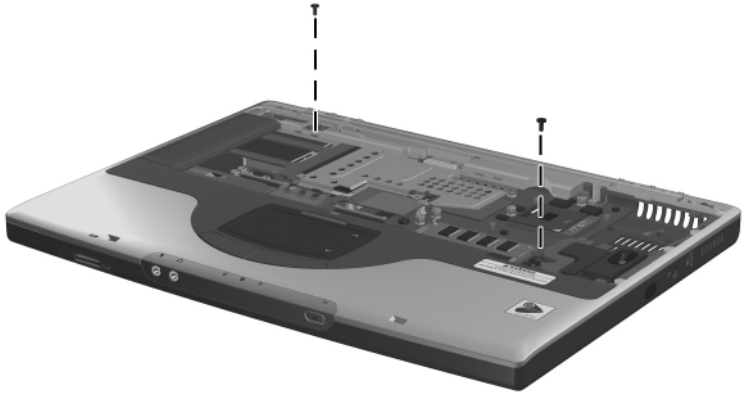


Phillips PM2.5×7.0 Screw Locations

Table C-1
Phillips PM2.5×7.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	14	7.0 mm	2.5 mm	5.0 mm

Where used:
Two screws that secure the top cover to the notebook (documented in Section 5.16)

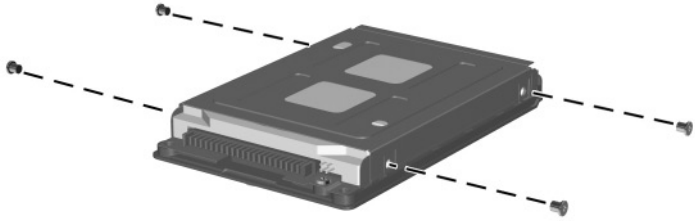


Phillips PM2.5×7.0 Screw Locations

Table C-2
Phillips PM2.5×3.5 Screw

	Color	Qty.	Length	Thread	Head Width
mm	Silver	4	3.5 mm	2.5 mm	5.0 mm

Where used:
Four screws that secure the hard drive to the hard drive cover and shield (documented in Section 5.3)



Phillips PM2.5×3.5 Screw Locations

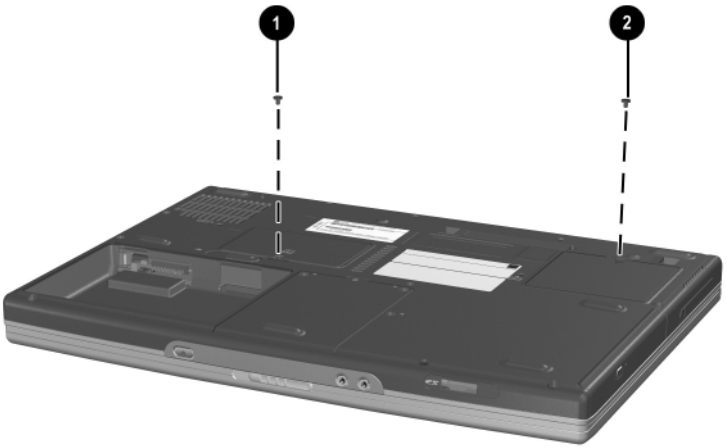
Table C-3
Phillips PM2.5×5.0 Screw

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

Where used:

❶ One screw that secures the memory expansion compartment cover to the notebook (documented in Section 5.5)

❷ One screw that secures the mini PCI compartment cover to the notebook (documented in Section 5.6)



Phillips PM2.5×5.0 Screw Locations

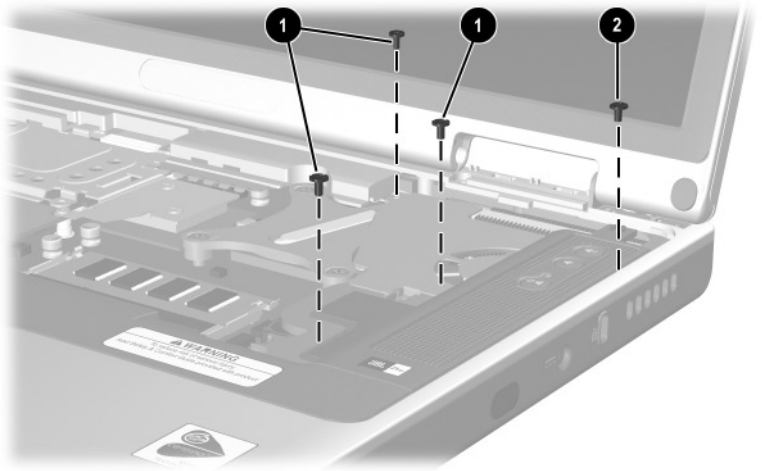
Table C-3
Phillips PM2.5×5.0 Screw *(Continued)*

mm	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 speaker cover to the notebook (documented in Section 5.11)

❷ One screw that secures the fan to the notebook (documented in Section 5.12)

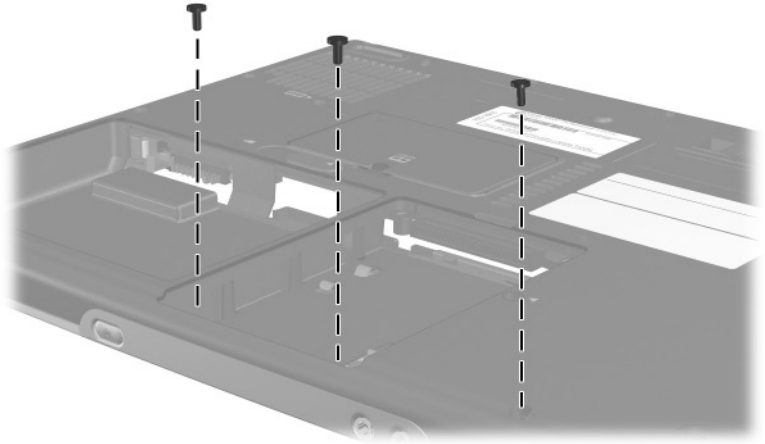


Phillips PM2.5×5.0 Screw Locations

Table C-3
Phillips PM2.5×5.0 Screw *(Continued)*

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

Where used:
Three screws that secure the top cover to the notebook (documented in Section 5.16)

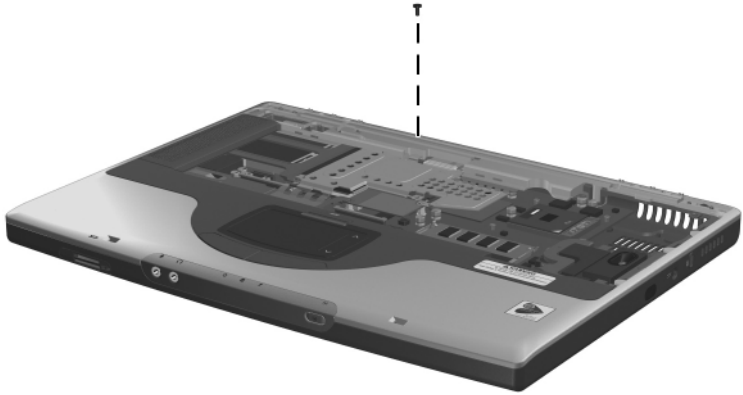


Phillips PM2.5×5.0 Screw Locations

Table C-3
Phillips PM2.5×5.0 Screw *(Continued)*

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

Where used:
One screw that secures the top cover to the notebook (documented in Section 5.16)

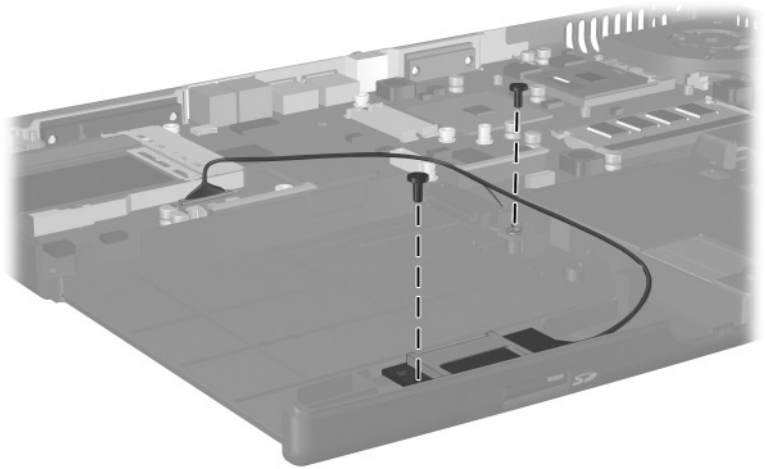


Phillips PM2.5×5.0 Screw Location

Table C-3
Phillips PM2.5×5.0 Screw *(Continued)*

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

Where used:
Two screws that secure the SD Card slot board and cable to the notebook (documented in Section 5.17)

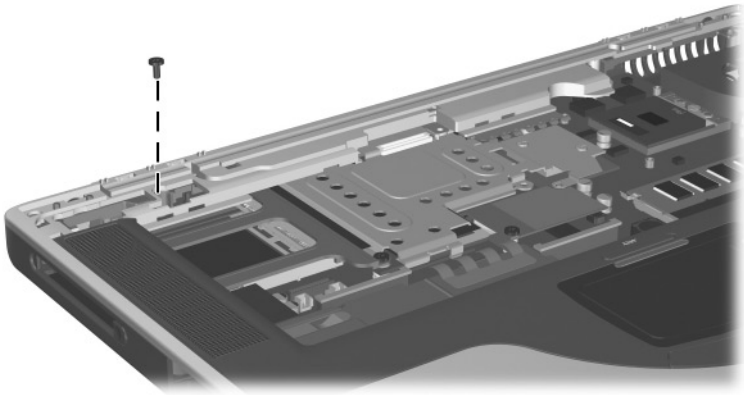


Phillips PM2.5×5.0 Screw Locations

Table C-3
Phillips PM2.5×5.0 Screw *(Continued)*

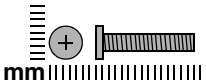
mm	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	5.0 mm

Where used:
One screw that secures the system board to the notebook (documented in Section 5.20)



Phillips PM2.5×5.0 Screw Location

Table C-4
Phillips PM2.5×15.0 Screw

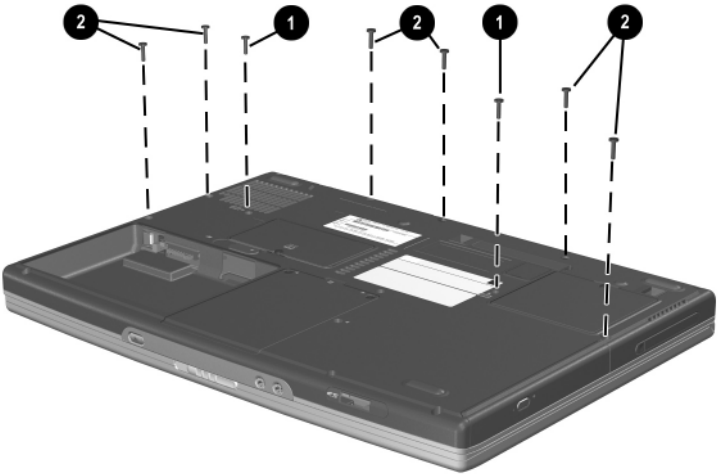


Color	Qty.	Length	Thread	Head Width
Black	10	15.0 mm	2.5 mm	5.0 mm

Where used:

❶ Two screws that secure the keyboard to the notebook (documented in Section 5.9)

❷ Six screws that secure the top cover to the notebook (documented in Section 5.16)

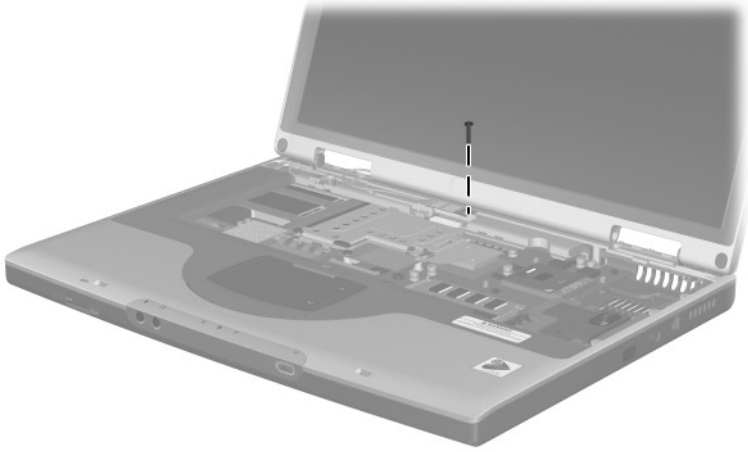


Phillips PM2.5×15.0 Screw Locations

Table C-4
Phillips PM2.5×15.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	10	15.0 mm	2.5 mm	5.0 mm

Where used:
One screw that secures the display assembly cable to the notebook (documented in Section 5.15)

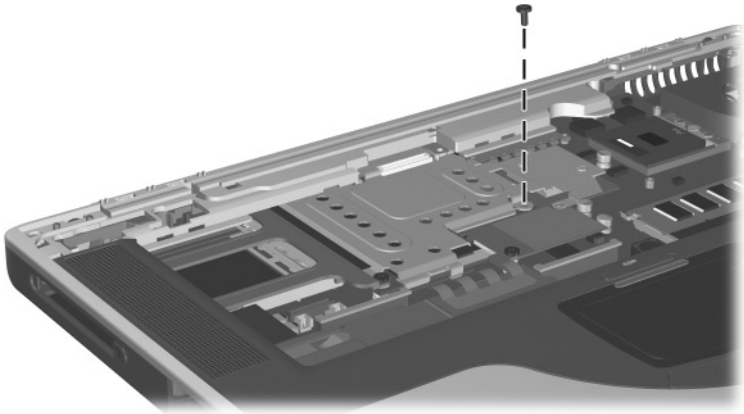


Phillips PM2.5×15.0 Screw Location

Table C-4
Phillips PM2.5×15.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	10	15.0 mm	2.5 mm	5.0 mm

Where used:
One screw that secures the VGA shield to the notebook (documented in Section 5.15)

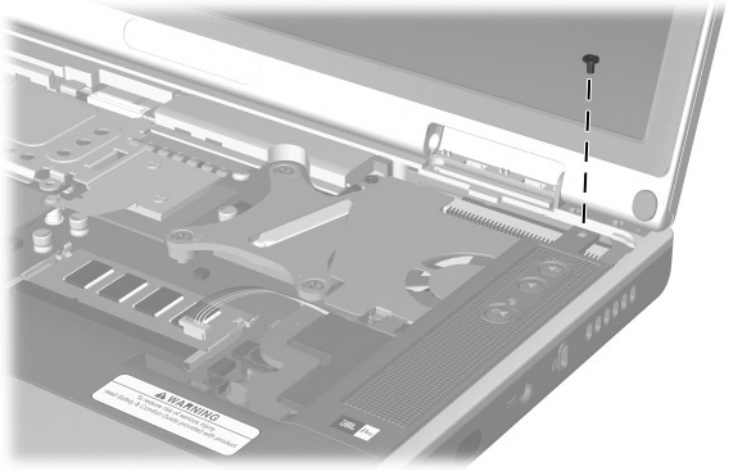


Phillips PM2.5×15.0 Screw Location

Table C-5
Phillips PM2.5×3.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	1	3.0 mm	2.5 mm	5.0 mm

Where used:
One screw that secures the speaker cover to the notebook (documented in Section 5.11)



Phillips PM2.5×3.0 Screw Location

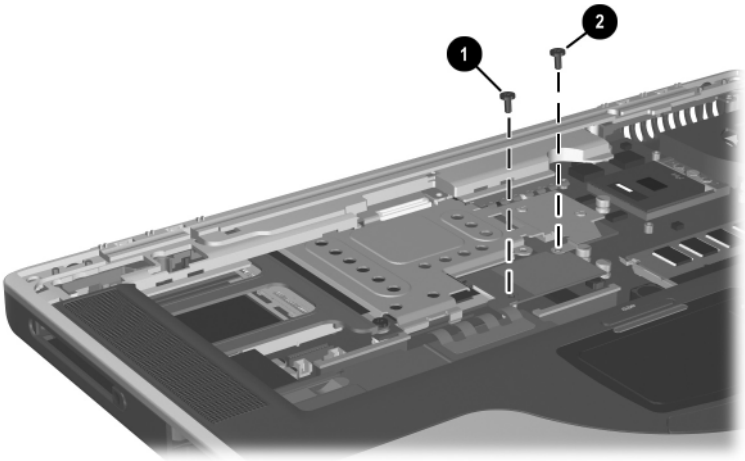
Table C-6
Phillips PM2.0×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	3.0 mm	2.0 mm	4.0 mm

Where used:

❶ One screw that secures the top cover to the notebook (documented in Section 5.16)

❷ One screw that secures the VGA shield to the notebook (documented in Section 5.18)

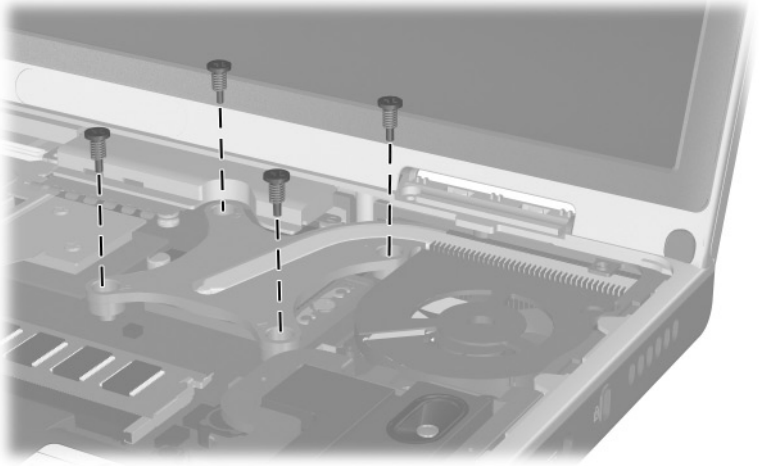


Phillips PM2.0×3.0 Screw Locations

Table C-7
Phillips PM2.0×9.0 Spring-Loaded Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	4	9.0 mm	2.0 mm	6.0 mm

Where used:
Four screws that secure the heat sink to the notebook (documented in Section 5.13)



Phillips PM2.0×9.0 Spring-Loaded Screw Locations

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