Maintenance and Service Guide

HP Compaq nc6000 Business Notebook

Document Part Number: 335167-003

February 2005

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

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HP Compaq nc6000 Business Notebook
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Contents

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Product Description

The HP Compaq nc6000 Business Notebook offers advanced modularity, a Mobile Intel® Pentium® 4 Processor-M with 64-bit architecture, an ATI MOBILITY RADEON 9600 graphics controller with 64 or 32 MB of discrete video memory, and extensive multimedia support.

HP Compaq nc6000 Business Notebook

1.1 Models

Notebook models are shown in Tables 1-1 and 1-2.

Table 1-1
HP Compaq nc6000 Model Naming Conventions

Key									
C	P	180	S4	60	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 nc6000	
2	Processor type	P = Mobile Intel Pentium 4 Processor-M	
3	Processor speed	180 = 1.8-GHz 170 = 1.7-GHz 160 = 1.6-GHz	150 = 1.5-GHz 140 = 1.4-GHz
4	Display type/ size/resolution	S = SXGA+ X = XGA	4 = 14.x-in
5	Hard drive size	80 = 80-GB 60 = 60-GB	40 = 40-GB 30 = 30-GB
6	Optical drive designator	C = CD-ROM drive Y = DVD+RW/R and CD-RW combo drive	W = DVD/CD-RW combo drive
7	Integrated communication/ wireless device	G = combination modem + GB NIC N = no modem or NIC	m = 802.11a/b/g + Bluetooth® n = no wireless device
8	RAM	51= 512-MB	25 = 25-MB
9	Operating system	P = Microsoft® Windows® XP Pro	2 = Windows 2000
10	SKU#		

Table 1-2
HP Compaq nc6000 Models

All HP Compaq nc6000 models feature:

- Dual Stick (TouchPad and pointing stick) pointing device
- 8- or 6-cell lithium ion (Li-Ion) battery pack
- 3-year warranty on parts and labor

Cnc6000	P	170	S4	60	Y	Gm	51	P	
United States			DQ882A ABA						
Cnc6000	P	170	S4	60	W	Gp	51	P	
Australia			DS804P ABG						
Cnc6000	P	170	S4	60	W	Gp	51	2	
Australia			DS803P ABG						
Cnc6000	P	170	X4	60	D	Gn	51	P	
Latin America			DT486A ABM						
Cnc6000	P	160	S4	60	W	Gj	51	P	
Norway			DJ299A ABN						
Cnc6000	P	160	X4	60	Y	Gm	51	P	
French Canada			DQ880A ABC			United States			DQ880A ABA
Cnc6000	P	160	X4	60	W	Gm	51	P	
French Canada			DH915U ABC			United States			DH915U ABA
Cnc6000	P	160	X4	60	W	Gb	25	P	
Korea			DT645P AB1						
Cnc6000	P	160	X4	60	W	Gg	51	P	
Brazil Latin America			DT483A AC4 DT483A ABM			United States			DT483A ABA
Cnc6000	P	160	X4	40	W	Gd	51	P	
The Netherlands			DJ311S ABH						

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	160	X4	40	W	Gj	51	P	
Belgium			DJ256A UUG			The Netherlands			DJ256A ABH
Denmark			DJ256A ABY			Norway			DJ256A ABN
Europe			DJ256A ABB			Portugal			DJ256A AB9
France			DJ256A ABF			Spain			DJ256A ABE
Germany			DJ256A ABD			Sweden			DJ256A AK8
Greece			DJ256A AB7			Switzerland			DJ256A UUZ
Iceland			DJ256A A2M			United Kingdom			DJ256A ABU
Italy			DJ256A ABZ						
Cnc6000	P	160	X4	40	W	Gj	51	2	
Belgium			DJ257A UUG			The Netherlands			DJ257A ABH
Denmark			DJ257A ABY			Norway			DJ257A ABN
Europe			DJ257A ABB			Portugal			DJ257A AB9
France			DJ257A ABF			Spain			DJ257A ABE
Germany			DJ257A ABD			Sweden			DJ257A AK8
Greece			DJ257A AB7			Switzerland			DJ257A UUZ
Iceland			DJ257A A2M			United Kingdom			DJ257A ABU
Italy			DJ257A ABZ						

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	160	X4	40	W	Gn	51	P	
Asia Pacific			DP894A UUF			Korea			DP894A AB1
Australia			DP894A ABG and DS860P ABG			Latin America			DP894A ABM
						The Netherlands			DP894A ABH
						Norway			DP894A ABN
Belgium			DP894A UUG			People's Republic of China			DP894A AB2
Brazil			DP894A AC4						
Czech Republic			DP894A AKB						
Denmark			DP894A ABY			Poland			DP894A AKD
Europe International			DP894A ABB			Portugal			DP894A AB9
France			DP894A ABF			Russia			DP894A ACB
French Canada			DP894A ABC and DH914U ABC			Saudi Arabia			DP894A ABV
						Slovenia			DP894A AKN
						Spain			DP894A ABE
Germany			DP894A ABD			Sweden/Finland			DP894A AK8
Greece			DP894A AB7			Switzerland			DP894A UUZ
Hong Kong			DP894A AB5			Taiwan			DP894A AB0
Hungary			DP894A AKC			Thailand			DP894A AKL
Iceland			DP894A A2M			Turkey			DP894A AB8
India			DP894A ACJ			United Kingdom			DP894A ABU
Israel			DP894A ABT			United States			DP894A ABA, DH915U ABA, and DH916U ABA
Italy			DP894A ABZ						
Japan			DP894A ABJ						
Japan - English			DP894A ACF						

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	160	X4	40	W	Gn	51	2	
Asia Pacific			DP895A UUF			Korea			DP895A AB1
Australia			DP895A ABG and DS859P ABG			Latin America			DP895A ABM
						The Netherlands			DP895A ABH
						Norway			DP895A ABN
Belgium			DP895A UUG			People's Republic of China			DP895A AB2
Brazil			DP895A AC4						
Czech Republic			DP895A AKB						
Denmark			DP895A ABY			Poland			DP895A AKD
Europe International			DP895A ABB			Portugal			DP895A AB9
France			DP895A ABF			Russia			DP895A ACB
French Canada			DP895A ABC			Saudi Arabia			DP895A ABV
Germany			DP895A ABD			Slovenia			DP895A AKN
Greece			DP895A AB7			Spain			DP895A ABE
Hong Kong			DP895A AB5			Sweden/Finland			DP895A AK8
Hungary			DP895A AKC			Switzerland			DP895A UUZ
Iceland			DP895A A2M			Taiwan			DP895A AB0
India			DP895A ACJ			Thailand			DP895A AKL
Israel			DP895A ABT			Turkey			DP895A AB8
Italy			DP895A ABZ			United Kingdom			DP895A ABU
Japan			DP895A ABJ			United States			DP895A ABA
Japan - English			DP895A ACF						
Cnc6000	P	160	X4	40	W	Gn	25	P	
Hong Kong			DS808P AB5						
Cnc6000	P	160	X4	40	D	Gd	51	P	
Germany			DJ330S ABD						
Cnc6000	P	150	X4	60	W	Gb	25	P	
Korea			DT644P AB1						
Cnc6000	P	150	X4	60	W	Gn	51	P	
Asia Pacific			DS805P UUF						
Cnc6000	P	150	X4	60	D	Gb	25	P	
Taiwan			DT812P AB0						

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	150	X4	40	W	Gn	25	P	
Hong Kong			DS807P AB5						
Cnc6000	P	150	X4	30	W	Gg	10	H	
Germany			DJ324S ABD						
Cnc6000	P	150	X4	30	D	Gm	25	P	
Europe International			DQ881A ABB			United States			DQ881A ABA
Cnc6000	P	140	X4	40	W	Gm	25	P	
Japan			DT641P ABJ			Japan/English			DT641P ACF
Cnc6000	P	140	X4	40	W	Gp	25	P	
Australia			DS802P ABG						
Cnc6000	P	140	X4	40	W	Gp	25	2	
Australia			DS801P ABG						
Cnc6000	P	140	X4	40	W	Gb	25	P	
Asia Pacific Korea			DT636P UUF DT643P AB1			Taiwan			DT811P AB0
Cnc6000	P	140	X4	40	W	Gn	25	H	
People's Republic of China			DS796P AB2						
Cnc6000	P	140	X4	40	D	Gb	76	P	
United States			DT611C ABA and DT610C ABA						
Cnc6000	P	140	X4	40	D	Gb	25	P	
People's Republic of China			DS795P AB2			Taiwan			DT809P AB0

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	140	X4	40	D	Gn	25	H	
People's Republic of China			DS794P AB2						
Cnc6000	P	140	X4	40	D	Mn	51	P	
United States			DT868A ABA						
Cnc6000	P	140	X4	40	C	Gn	51	P	
Asia Pacific			DS652C UUF						
Cnc6000	P	140	X4	30	Y	Gn	25	P	
United States			DS825C ABA						
Cnc6000	P	140	X4	30	W	Gi	25	P	
Belgium			DJ333A UUG			Norway			DJ333A ABN
Denmark			DJ333A ABY			Poland			DJ333A AKD
France			DJ333A ABF			Portugal			DJ333A AB9
Germany			DJ333A ABG			Spain			DJ333A ABE
Greece			DJ333A AB7			Sweden			DJ333A AK8
Iceland			DJ333A A2M			Switzerland			DJ333A UUF
Italy			DJ333A ABZ			United Kingdom			DJ333A ABU
The Netherlands			DJ333A ABH						
Cnc6000	P	140	X4	30	W	Gg	25	P	
Europe			DJ323S ABB						
Cnc6000	P	140	X4	30	D	Gb	25	P	
Asia Pacific			DT640P UUF			Taiwan			DT810P AB0
Australia			DS800P ABG			United States			DH930U ABA
French Canada			DH930U ABC						
Cnc6000	P	140	X4	30	D	Gb	25	2	
Australia			DS799P ABG			Japan/English			DT642P ACF
Japan			DT642P ABJ						

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	140	X4	30	D	Gp	25	P	
Asia Pacific			DT412C UUF			The Netherlands			DJ254A ABH and DT412C ABH
Belgium			DJ254A UUG						
Czech Republic			DJ254A AKB						
Denmark			DJ254A ABY			Norway			DJ254A ABN
Europe			DJ254A ABB			People's Republic of China			DT412C AB2
France			DJ254A ABF and DT412C ABF			Poland			DJ254A AKD
French Canada			DT412C ABC			Portugal			DJ254A AB9
Germany			DJ254A ABD, DT412C ABD, and DJ326S ABD			Russia			DJ254A ACB
						Slovenia			DJ254A AKN
						Spain			DJ254A ABE
						Sweden			DJ254A AK8 and DT412C AK8
Greece			DJ254A AB7						
Hungary			DJ254A AKC						
Iceland			DJ254A A2M			Switzerland			DJ254A UUZ
Israel			DT412C ABT			Taiwan			DT412C AB0
Italy			DJ254A ABZ			Turkey			DJ254A AB8
Japan			DT412C ABJ			United Kingdom			DJ254A ABU and DT412C ABU
Japan/English			DT412C ACF						
Korea			DT412C AB1						
						United States			DT412C ABA

Cnc6000	P	140	X4	30	D	Gp	25	2	
Belgium			DJ255A UUG			Norway			DJ255A ABN
Czech Republic			DJ255A AKB			Poland			DJ255A AKD
Denmark			DJ255A ABY			Portugal			DJ255A AB9
Europe			DJ255A ABB			Russia			DJ255A ACB
France			DJ255A ABF			Slovenia			DJ255A AKN
Germany			DJ255A ABD			Spain			DJ255A ABE
Greece			DJ255A AB7			Sweden			DJ255A AK8
Hungary			DJ255A AKC			Switzerland			DJ255A UUZ
Iceland			DJ255A A2M			Turkey			DJ255A AB8
Italy			DJ255A ABZ			United Kingdom			DJ255A ABU
The Netherlands			DJ255A ABH						

Table 1-2
HP Compaq nc6000 Models *(Continued)*

Cnc6000	P	140	X4	30	D	Gn	25	P	
Australia French Canada Hong Kong			DS798P ABG DH913U ABC DS806P AB5			United States			DH913U ABA and DS847C ABA
Cnc6000	P	140	X4	30	D	Gn	25	2	
Australia			DS797P ABG						

1.2 Features

- Mobile Intel Pentium 4 1.8-GHz Processor-M, with 2.0-MB L2 cache, varying by notebook model
- Mobile Intel Pentium M 1.7-, 1.6-, 1.5-, and 1.4-GHz processors, all with 1.0-MB L2 cache, varying by notebook model
- 14.1-inch SXGA+ (1400 × 1050) or XGA (1024 × 768) TFT displays with over 16.7 million colors, varying by notebook model
- ATI MOBILITY RADEON 9600 graphics controller with 64 or 32 MB of video memory, varying by notebook model
- 60-, 40-, or 30-GB high-capacity hard drive, varying by notebook model
- 256-MB DDR synchronous DRAM (SDRAM) at 333 MHz, expandable to 2.0 GB
- Microsoft® Windows® 2000 or Windows XP Pro, varying by notebook model
- Full-size Windows 98 keyboard with integrated numeric keypad
- Dual pointing devices (TouchPad and pointing stick)
- Integrated Secure Digital (SD) Memory Card flash media slot
- Support for MultiBay device
- Integrated 10/100/1000BASE-T Ethernet local area network (LAN) NIC with RJ-45 connector
- Integrated wireless support for Bluetooth® LAN and Mini PCI 802.11a/b/g LAN devices
- Support for two Type II or one Type III PC Card slots with support for both 32-bit (CardBus) and 16-bit PC Cards
- Integrated smart card slot
- External 65-watt AC adapter with power cord
- 8- or 6-cell Li-Ion battery pack

- Stereo speakers
- Support for the following devices in the MultiBay:
  - 24X Max CD-ROM drive
  - 24X Max DVD/CD-RW combo drive
  - 8X Max DVD-ROM drive
  - DVD+RW/R and CD-RW combo drive
  - 8-cell Prismatic battery pack
- Connectors for:
  - SD Card
  - Infrared
  - One Type III PC Card slot
  - Two Type II PC Card slots
  - RJ-11 (modem)
  - RJ-45 network interface card (NIC)
  - Universal Serial Bus (USB) v. 2.0
  - S-Video
  - Parallel
  - External monitor
  - DC power
  - Docking
  - Microphone
  - Stereo speaker/headphone

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 "5.20 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 any battery packs at this time.
6. Turn on the notebook.

All passwords and all CMOS settings have been cleared.

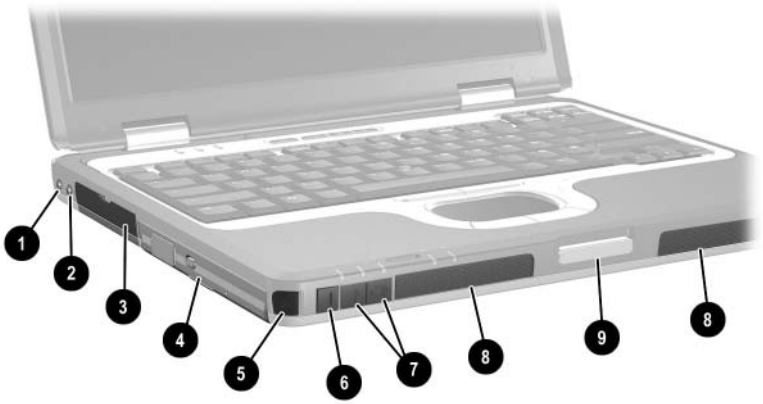
1.4 Power Management

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

- Standby
- Hibernation
- Customization of settings by the user
- Hotkeys for setting level of performance
- Lid switch Standby/resume
- Power/Standby button
- Advanced Configuration and Power Management (ACPM) compliance

1.5 External Components

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

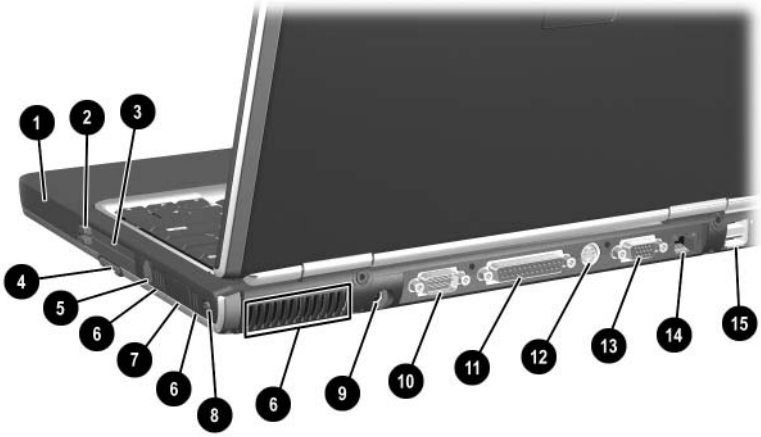


Front and Left-Side Components

Table 1-3
Front and Left-Side Components

Item	Component	Function
1	Audio line-out jack	Produces system sound when connected to optional powered stereo speakers, headphones, headset, or television audio.
2	Microphone jack	Connects an optional monaural microphone.
3	Hard drive bay	Holds the primary hard drive.
4	MultiBay device slot	Holds a MultiBay device.
5	Infrared port	Provides wireless communication between the notebook and an optional IrDA-compliant device.
6	Mute button	On: Mutes the system volume. A light comes on when the button is pushed in and the sound is muted.
7	Volume control buttons	Increase and decrease system volume. Press the volume up button to increase sound. Press the volume down button to decrease sound.
8	Stereo speakers (2)	Produce stereo sound.
9	Display release latch	Opens the notebook.

The notebook rear panel and right-side components are shown below and described in Table 1-4.



Rear Panel and Right Side Components

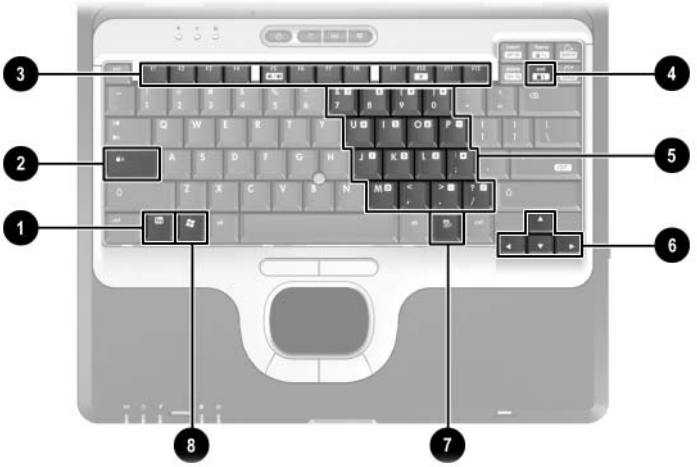
Table 1-4
Rear Panel and Right-Side Components

Item	Component	Function
1	Battery slot	Holds the primary battery.
2	PC Card eject buttons	Release PC Card devices from the PC Card slots.
3	PC Card slots (2)	Support optional Type I, Type II, or Type III 32-bit (CardBus) or 16-bit PC Cards.
4	Secure Digital (SD) Memory Card slot	Accepts SD Cards and MultiMedia Cards.
5	RJ-11 telephone jack	Connects a modem cable.

Table 1-4
Rear Panel and Right-Side Components *(Continued)*

Item	Component	Function
6	Vents (3)	Allow airflow to cool internal components. ⚠ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, may block airflow.
7	Bluetooth compartment	Holds a Bluetooth wireless device.
8	Security cable slot	Attaches an optional security cable to the notebook. ✎ The purpose of security solutions is to act as a deterrent. These solutions do not prevent the product from being mishandled or stolen.
9	AC power connector	Connects an AC adapter or an optional Automobile Power Adapter/Charger, or Aircraft Power Adapter.
10	Serial connector	Connects an optional serial device.
11	Parallel connector	Connects an optional parallel device, such as an external diskette drive bay or a printer.
12	S-Video connector	Connects an optional S-Video device, such as a television, VCR, camcorder, overhead projector, or video capture card.
13	External monitor connector	Connects an optional external monitor or overhead projector.
14	RJ-45 network jack	Connects a network cable.
15	USB connectors (2)	Connect USB 1.1- and 2.0-compliant devices to the notebook, using a standard USB cable.

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

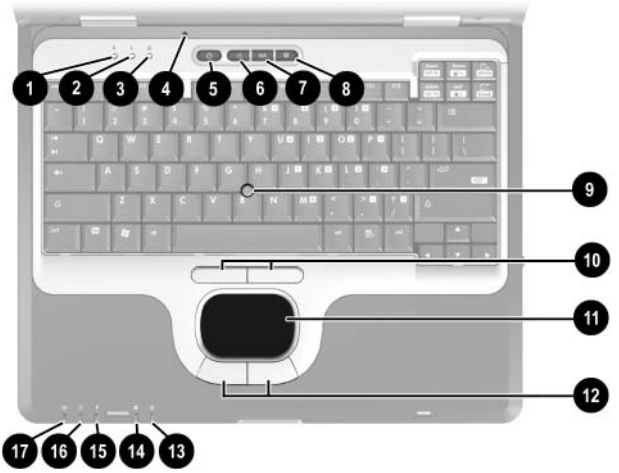


Keyboard Components

Table 1-5
Keyboard Components

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

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



Top Components

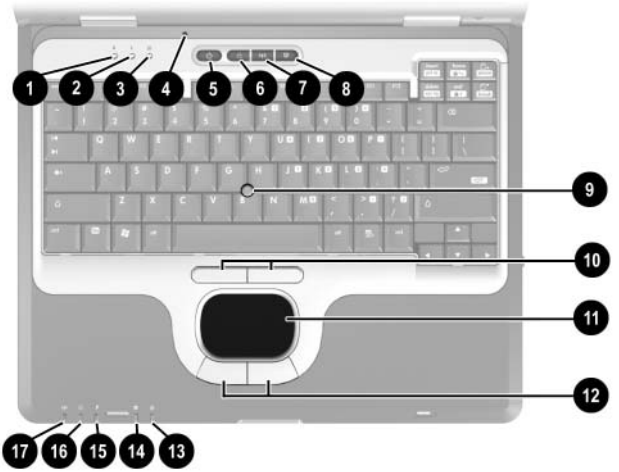
Table 1-6
Top Components

Item	Component	Function
1	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
2	Caps lock light	On: Caps lock is on.
3	Scroll lock light	On: Scroll lock is on.

Table 1-6
Top Components *(Continued)*

Item	Component	Function
4	Display lid switch*	■ If the notebook is closed while on, turns off the display. ■ If the notebook is opened while on, turns on the display.
5	Power button*	When the notebook is: ■ Off, press and release to turn on the notebook. ■ In Standby, press and release to exit Standby. ■ In Hibernation, press and release to exit Hibernation. If the system has stopped responding and Windows shutdown procedures cannot be used, press and hold for 5 seconds to turn off the notebook.
6	QuickLock button	Disables the keyboard and pointing device and clears the display.
7	Wireless On/Off button	Enables and disables the integrated wireless device(s) on the notebook. ✎ When using the Wireless On/Off button to enable integrated WLAN or Bluetooth, first ensure that WLAN or Bluetooth has been enabled in the software and that the wireless on/off light is on before attempting to make a connection.

*This table describes default settings. For information about changing the functions of the display lid switch and power button and about using Standby and Hibernation, refer to the "Power" chapter in the *Software Guide* on the *Documentation Library CD*.

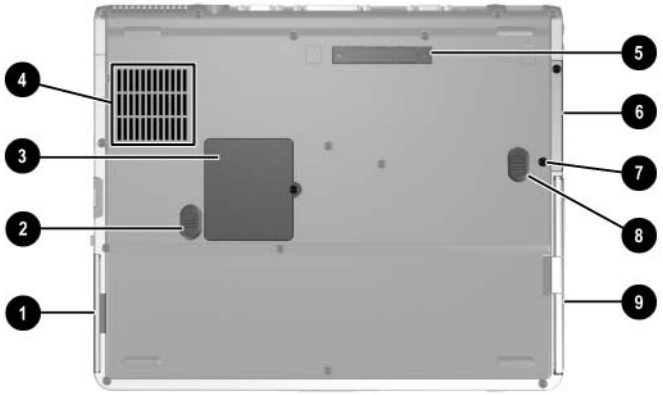


Top Components (Continued)

Table 1-6
Top Components *(Continued)*

Item	Component	Function
8	Presentation Mode button	Alternates between presentation modes.
9	Pointing stick	Moves the pointer and selects or activates items on the screen.
10	Left and right pointing stick buttons	Function like the left and right mouse buttons on an external mouse.
11	TouchPad	Moves the pointer and selects or activates items on the screen.
12	Left and right TouchPad buttons	Function like the left and right buttons on an external mouse.
13	MultiBay light	On: A device in the MultiBay is being accessed.
14	Hard drive light	On: Hard drive in the hard drive bay is being accessed.
15	Battery light	On: A battery pack is charging. Blinking: A battery pack that is the only available power source has reached a low-battery condition. When the battery reaches a critical low-battery condition, the battery light begins blinking more quickly.
16	Power/Standby light	On: Power is turned on. Blinking: Notebook is in Standby. The power/Standby light also blinks when a battery pack that is the only available power source reaches a critical low-battery condition. The light goes off when the system enters Hibernation or shuts down.
17	Wireless on/off light	On: An integrated wireless device has been enabled.

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



Bottom Components

Table 1-7
Bottom Components

Item	Component	Function
1	Battery bay	Holds the primary battery pack.
2	Battery release latch	Releases a battery pack from the battery bay.

Table 1-7
Bottom Components *(Continued)*

Item	Component	Function
3	Mini PCI compartment	Holds an optional wireless LAN or ISDN device. ✎ The FCC does not allow unauthorized Mini PCI devices to be used in the notebook. Installing an unauthorized Mini PCI device can prevent the notebook from operating properly and might result in a warning message. To resume proper notebook operation, remove the unauthorized device. Contact the HP Customer Care Center if a warning message about the Mini PCI device displays in error.
4	Intake vent	Allows airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing, may block airflow.
5	Docking connector	Connects the notebook to an optional HP Port Replicator.
6	Hard drive bay	Holds the internal hard drive.
7	Hard drive security screw	Secures the hard drive.
8	MultiBay release latch	Releases the MultiBay device.
9	MultiBay	Holds the MultiBay device.

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
- Mini PCI communications device
- Hard drive
- Display
- Keyboard and TouchPad
- Audio
- Mobile Intel Pentium 4 Processor-M
- Fan
- PC Card

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

The notebook uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to come on automatically when high temperature conditions exist. These conditions can be caused by high external temperatures, heavy system power consumption, certain power management/battery conservation configurations, battery fast charging, and some software applications. Exhaust air is displaced through the ventilation grill located on the notebook rear panel.

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

It is not necessary to configure a device connected to a USB connector on the notebook or to an optional HP Port Replicator.

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 Port Replicator, 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 Port Replicator, 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 Port Replicator as the primary device. (When the notebook display is set as secondary, the notebook must be shut down before it is undocked from a Port Replicator.)

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, bi-directional 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 Intel SpeedStep window. (When Disable is selected, the notebook runs in Battery Optimized mode.) ■ Specify how the notebook recognizes multiple identical Port Replicators that are identically equipped. Select **Disable** to recognize the Port Replicators as a single Port Replicator; select **Enable** to recognize the Port Replicators individually, by serial number. ■ Enable/disable the reporting of the processor serial number by the processor to the software.
HDD Self Test Options	Run a quick comprehensive self test on hard drives in the system that support the test features.

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

2.2 Using Diagnostics for Windows

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

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

Diagnostics for Windows is designed to test HP components. If other 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 check box for each test you want to run.
5. Select a test mode:
   - ❏ **Interactive Mode**—Provides maximum control over the testing process. You determine whether the test was passed or failed. You might be prompted to insert or remove devices.
   - ❏ **Unattended Mode**—Does not display prompts. If errors are found, they are displayed when testing is complete.

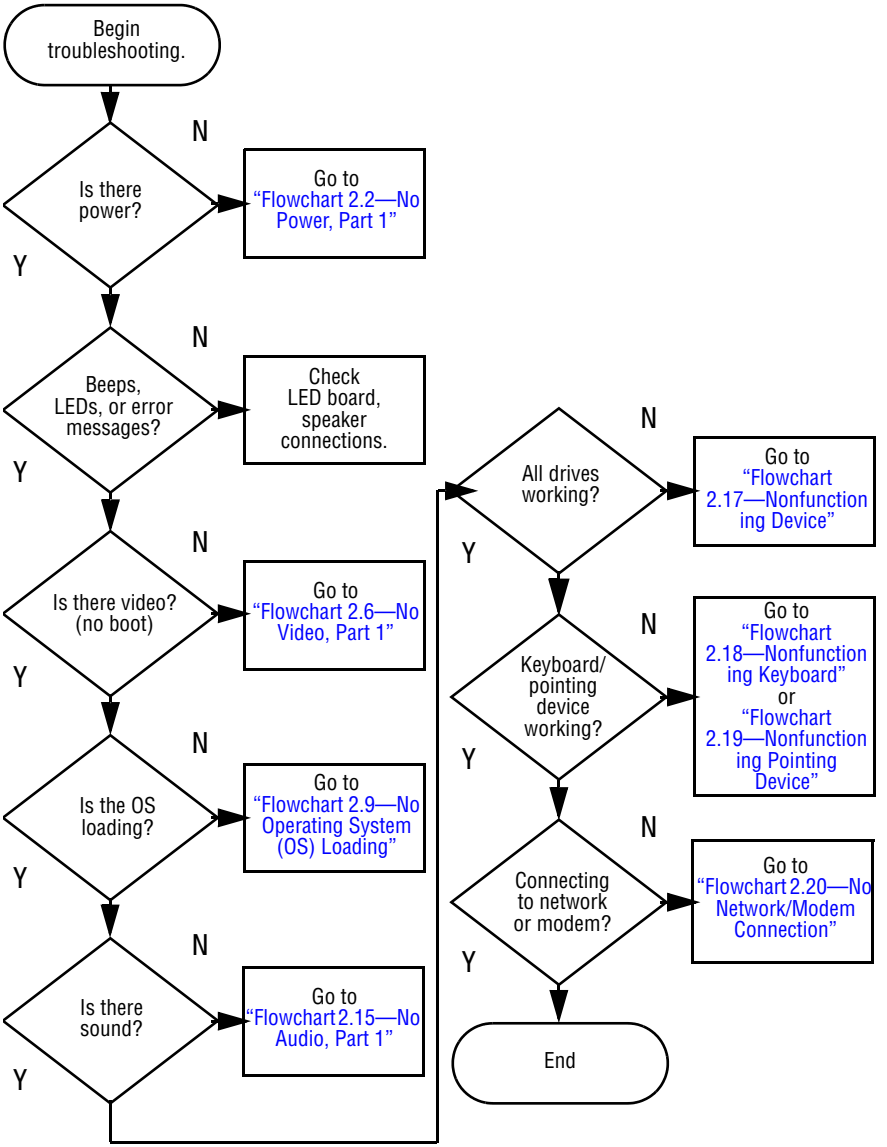
6. Select the **Begin Testing** button.
7. Select a tab to view a test report:
   - ❏ **Status tab**—Summarizes the tests run, passed, and failed during the current testing session.
   - ❏ **Log tab**—Lists tests run on the system, the number of times each test has run, the number of errors found on each test, and the total run time of each test.
   - ❏ **Error tab**—Lists all errors found in the notebook, along with the corresponding error codes.
8. Select a tab to save the report:
   - ❏ **Log tab**—Select the Save button.
   - ❏ **Error tab**—Select the 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

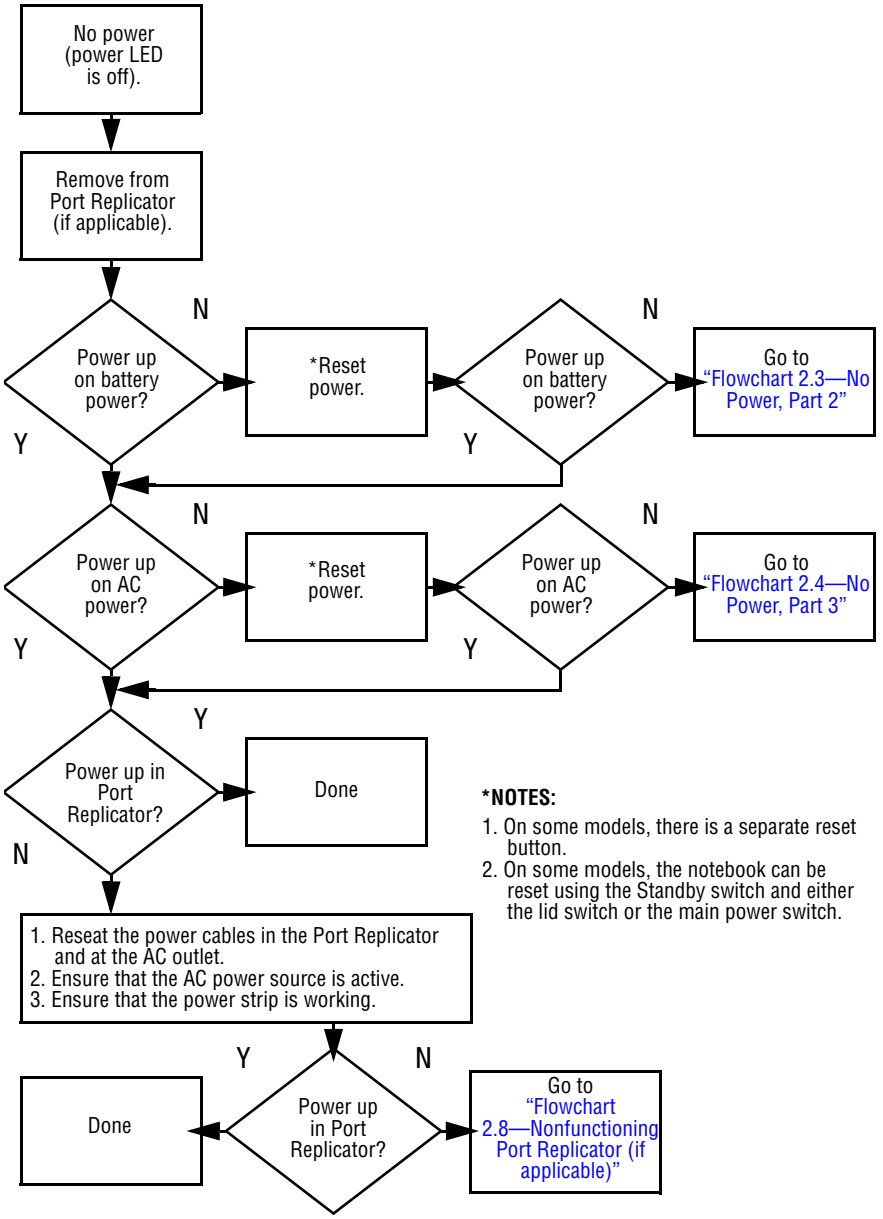
Table 2-4
Troubleshooting Flowcharts Overview

Flowchart	Description
2.1	“Flowchart 2.1—Initial Troubleshooting”
2.2	“Flowchart 2.2—No Power, Part 1”
2.3	“Flowchart 2.3—No Power, Part 2”
2.4	“Flowchart 2.4—No Power, Part 3”
2.5	“Flowchart 2.5—No Power, Part 4”
2.6	“Flowchart 2.6—No Video, Part 1”
2.7	“Flowchart 2.7—No Video, Part 2”
2.8	“Flowchart 2.8—Nonfunctioning Port Replicator (if applicable)”
2.9	“Flowchart 2.9—No Operating System (OS) Loading”
2.10	“Flowchart 2.10—No OS Loading, Hard Drive, Part 1”
2.11	“Flowchart 2.11—No OS Loading, Hard Drive, Part 2”
2.12	“Flowchart 2.12—No OS Loading, Hard Drive, Part 3”
2.13	“Flowchart 2.13—No OS Loading, Diskette Drive”
2.14	“Flowchart 2.14—No OS Loading, CD- or DVD-ROM Drive”
2.15	“Flowchart 2.15—No Audio, Part 1”
2.16	“Flowchart 2.16—No Audio, Part 2”
2.17	“Flowchart 2.17—Nonfunctioning Device”
2.18	“Flowchart 2.18—Nonfunctioning Keyboard”
2.19	“Flowchart 2.19—Nonfunctioning Pointing Device”
2.20	“Flowchart 2.20—No Network/Modem Connection”

Flowchart 2.1—Initial Troubleshooting



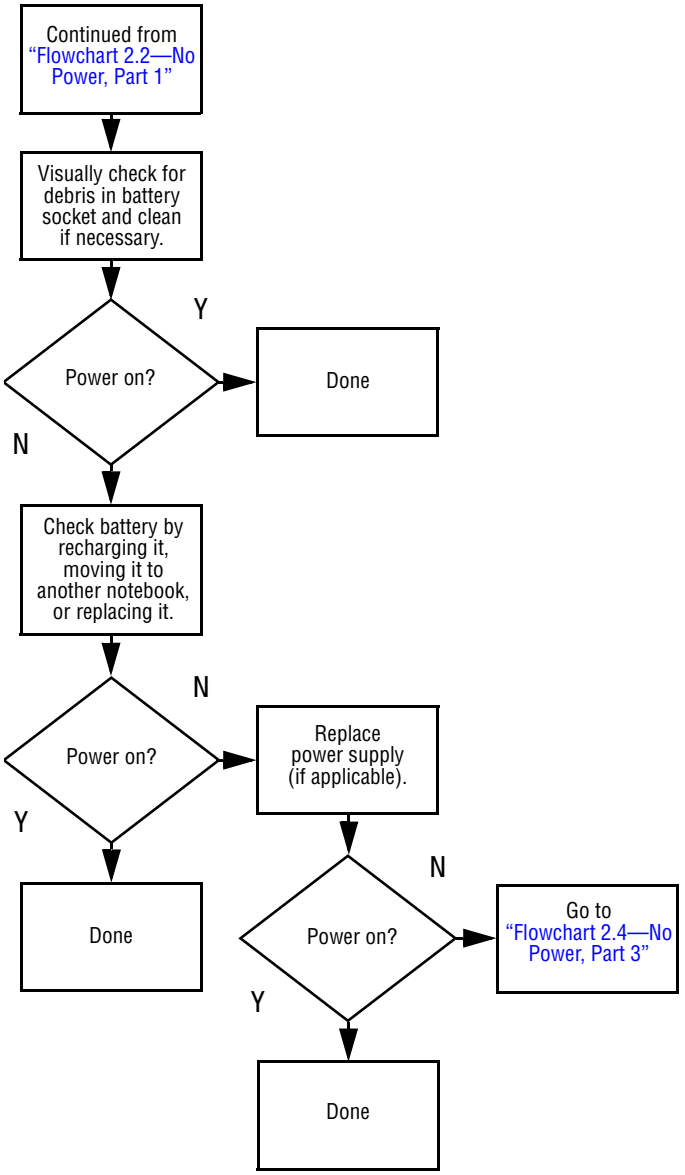
Flowchart 2.2—No Power, Part 1



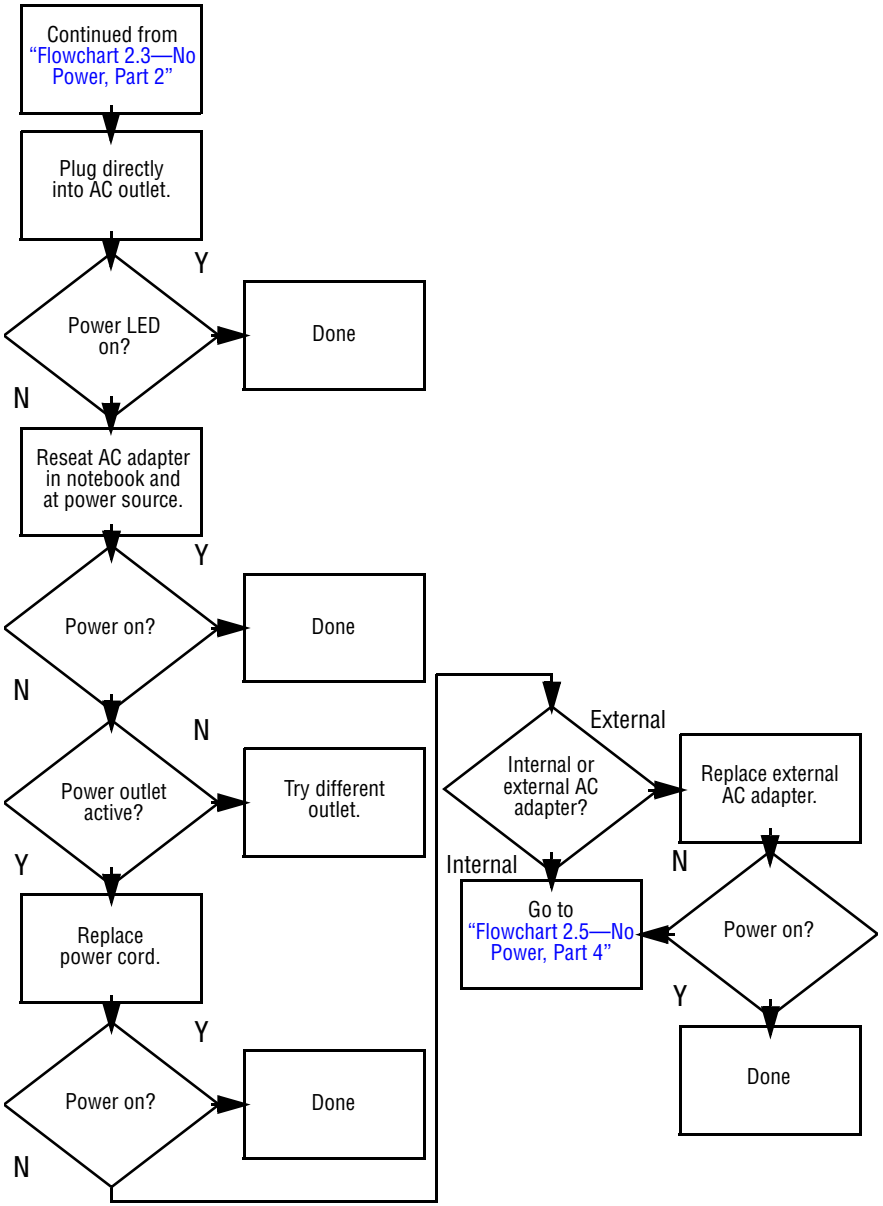
***NOTES:**

1. On some models, there is a separate reset button.
2. On some models, the notebook can be reset using the Standby switch and either the lid switch or the main power switch.

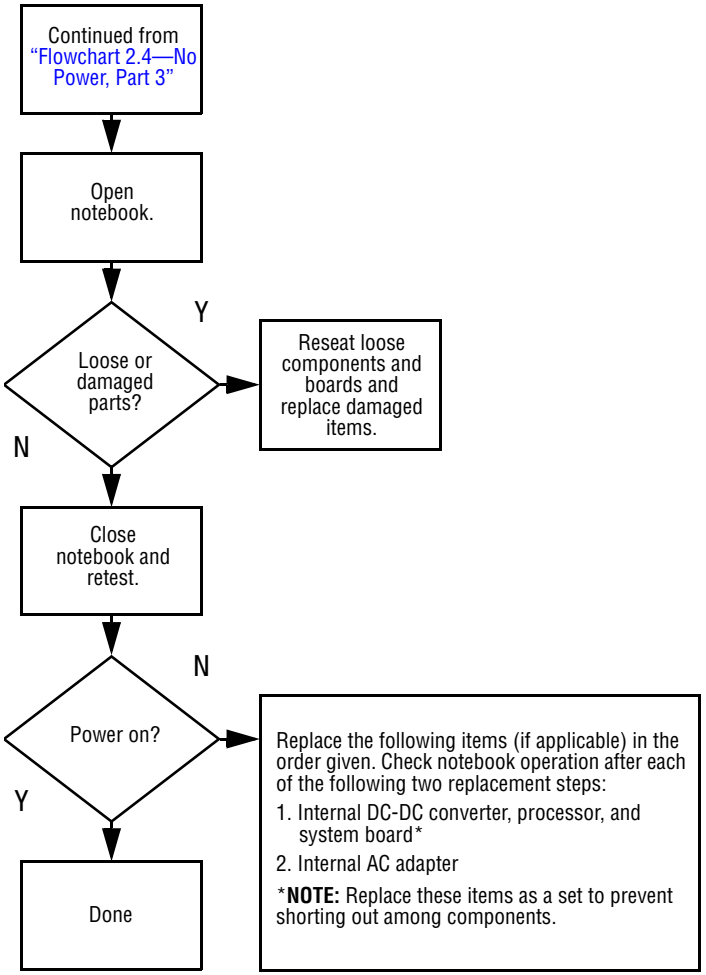
Flowchart 2.3—No Power, Part 2



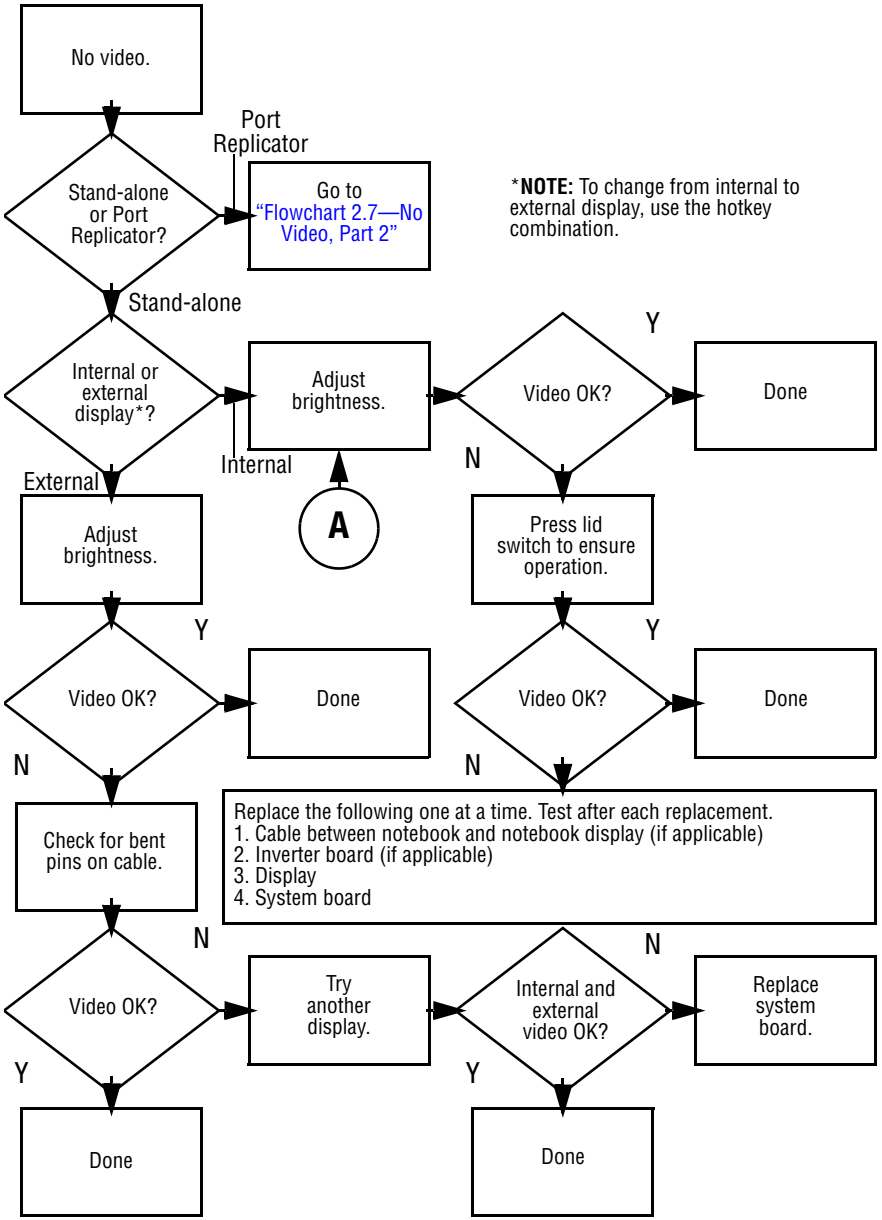
Flowchart 2.4—No Power, Part 3



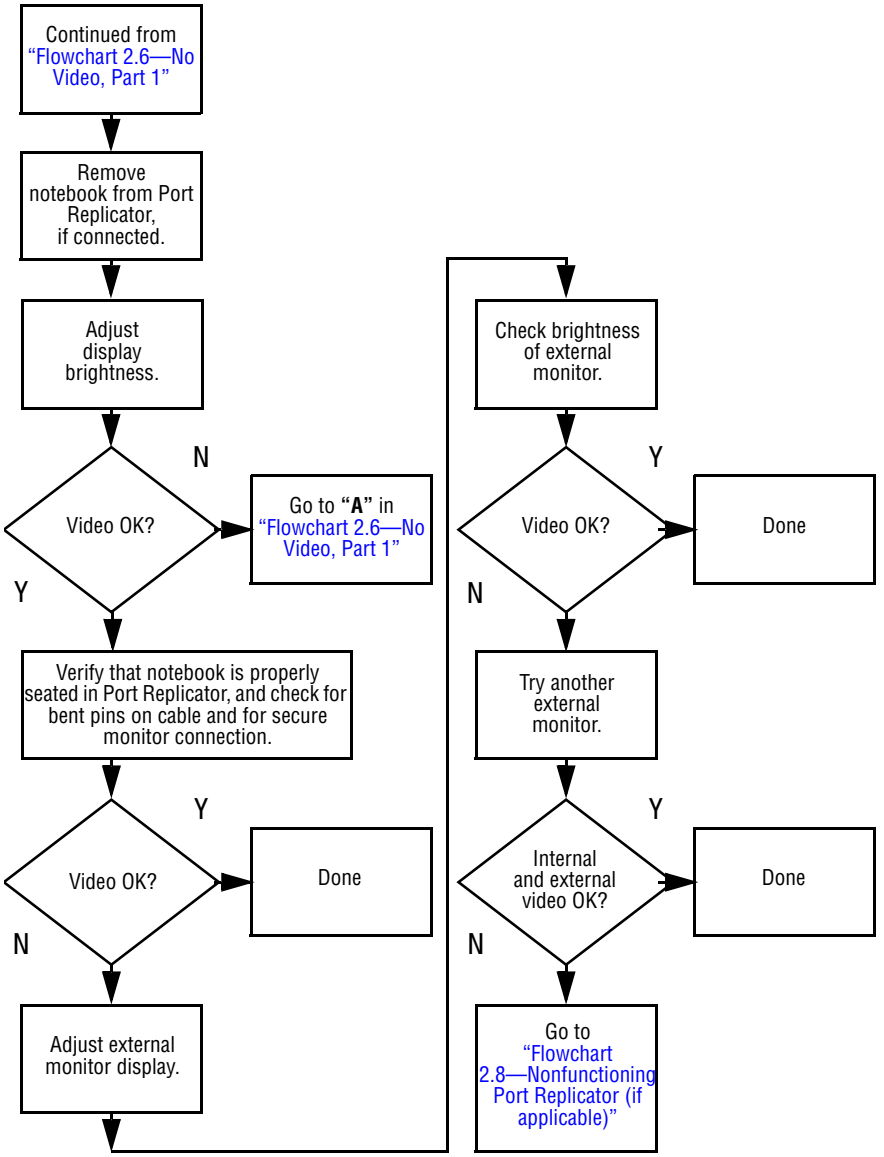
Flowchart 2.5—No Power, Part 4



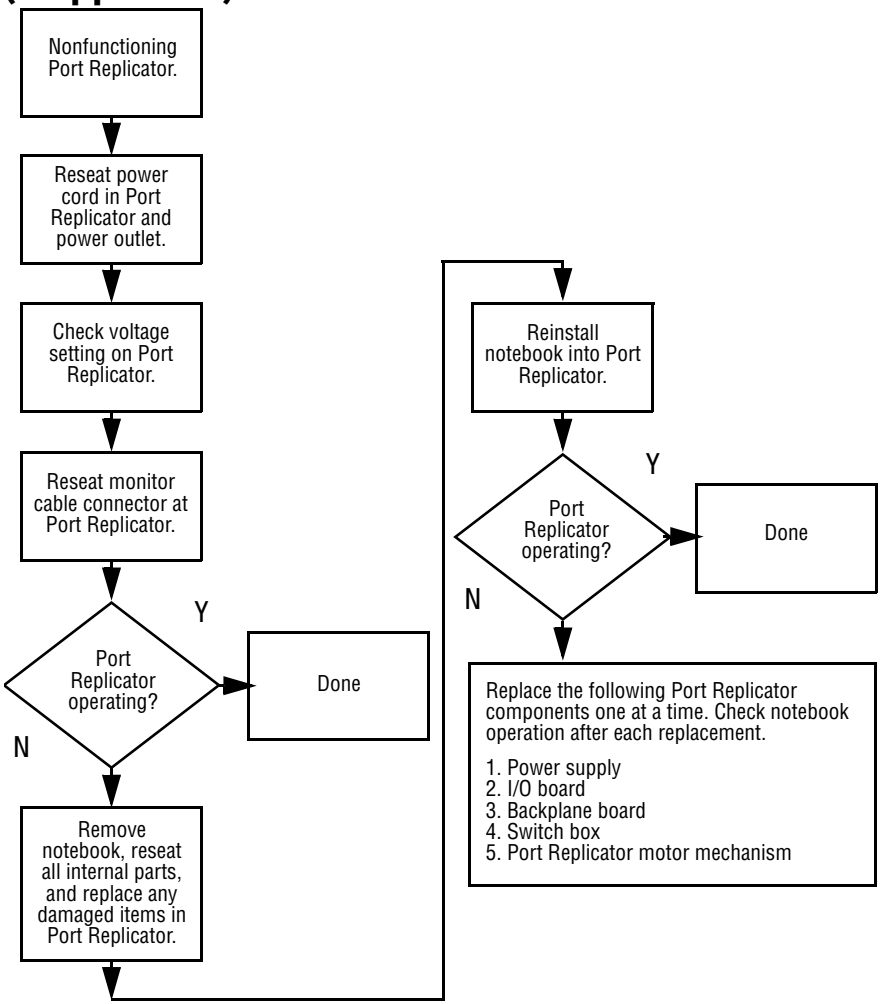
Flowchart 2.6—No Video, Part 1



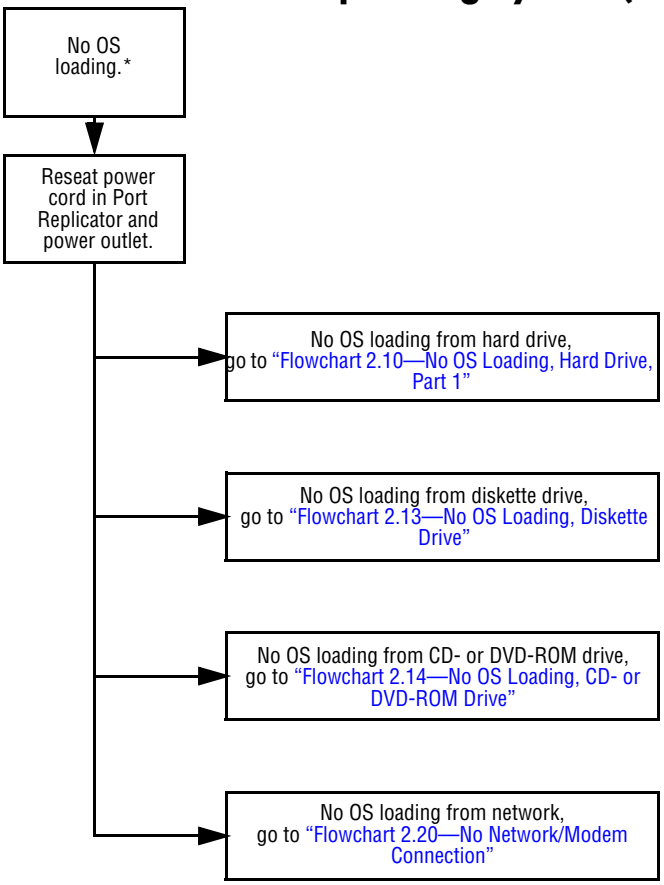
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Port Replicator (if applicable)

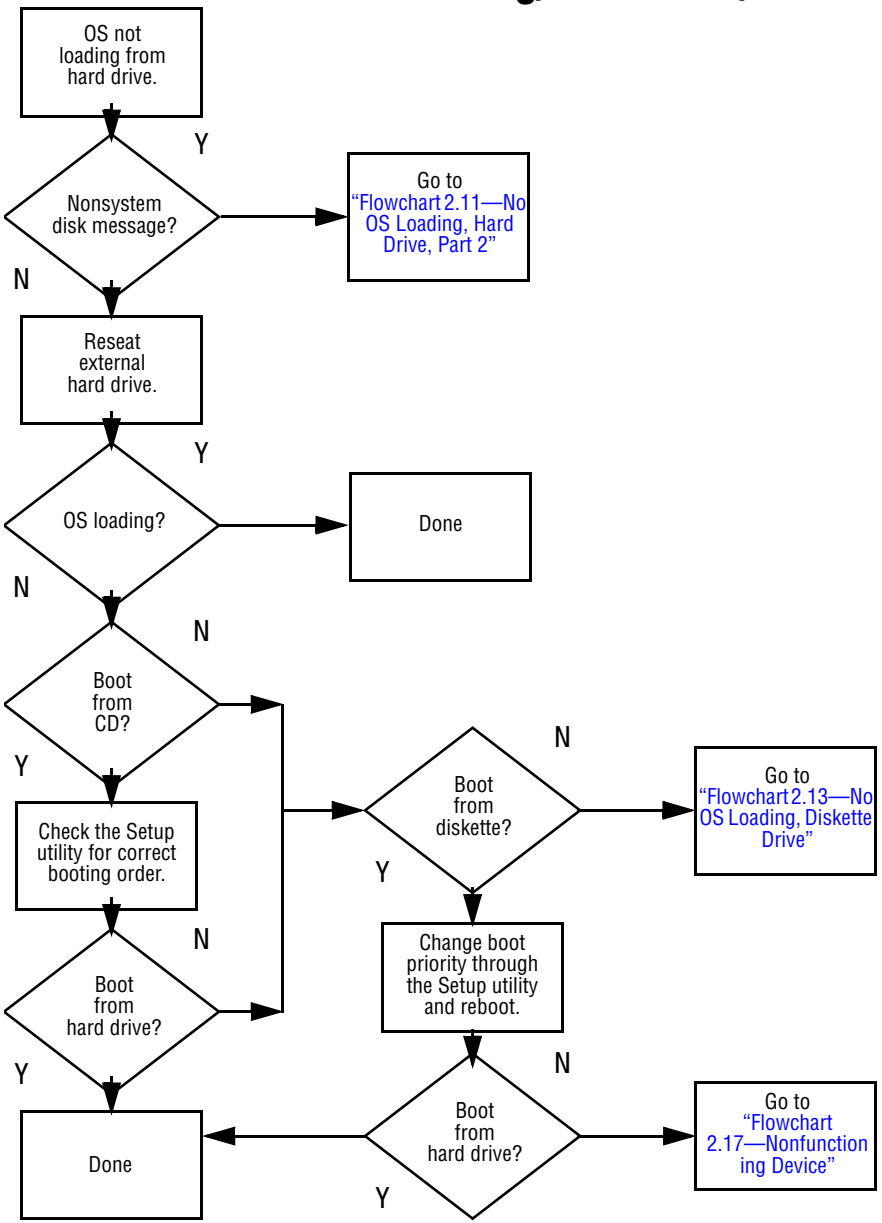


Flowchart 2.9—No Operating System (OS) Loading

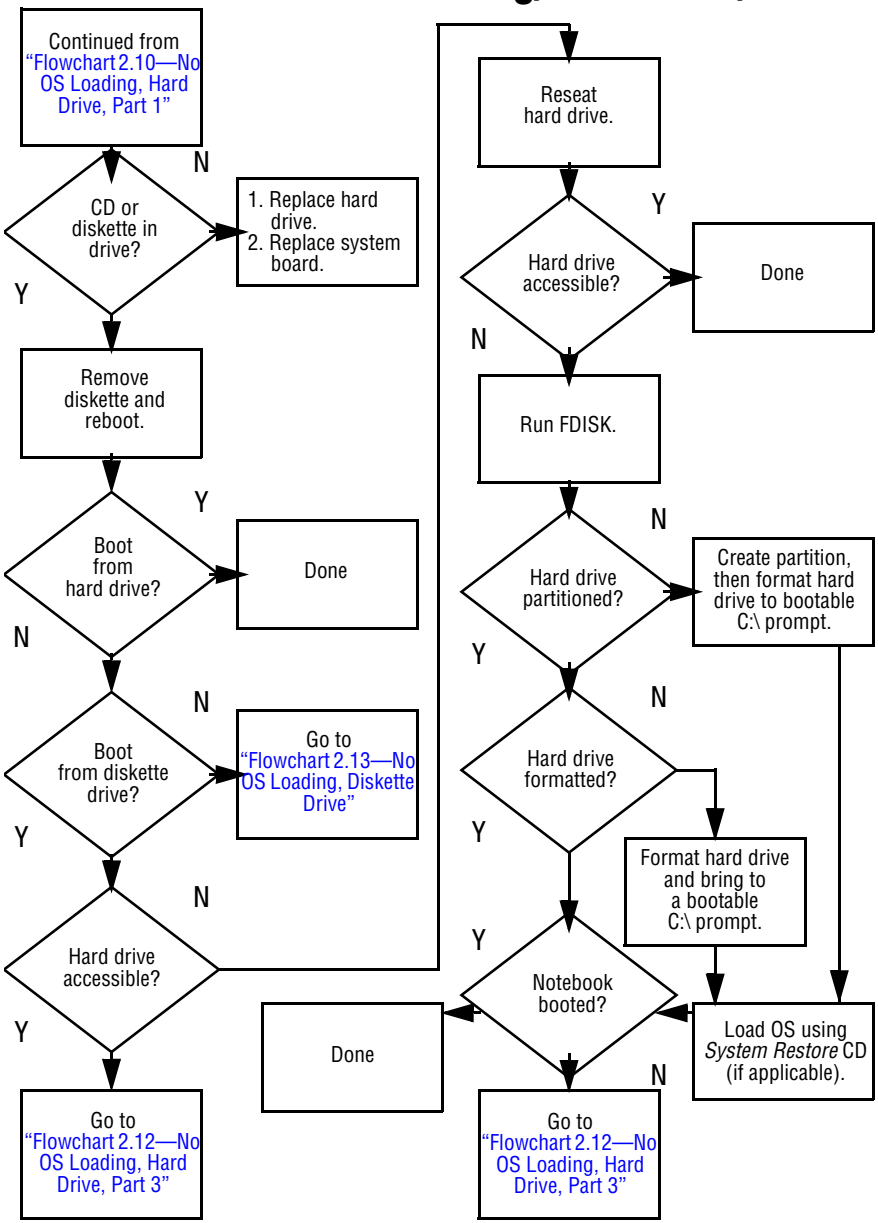


*__NOTE:__ Before beginning to troubleshoot, always check cable connections, cable ends, and drives for bent or damaged pins.

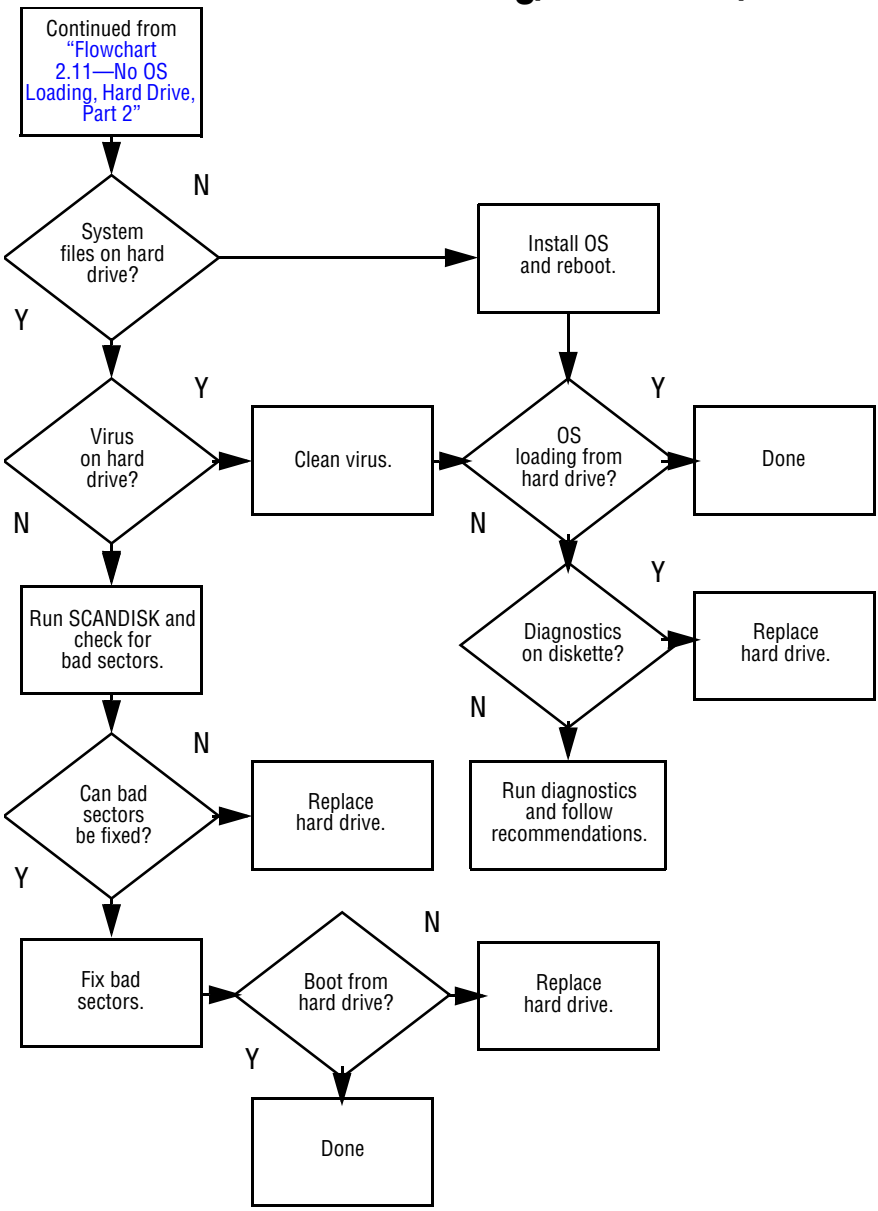
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



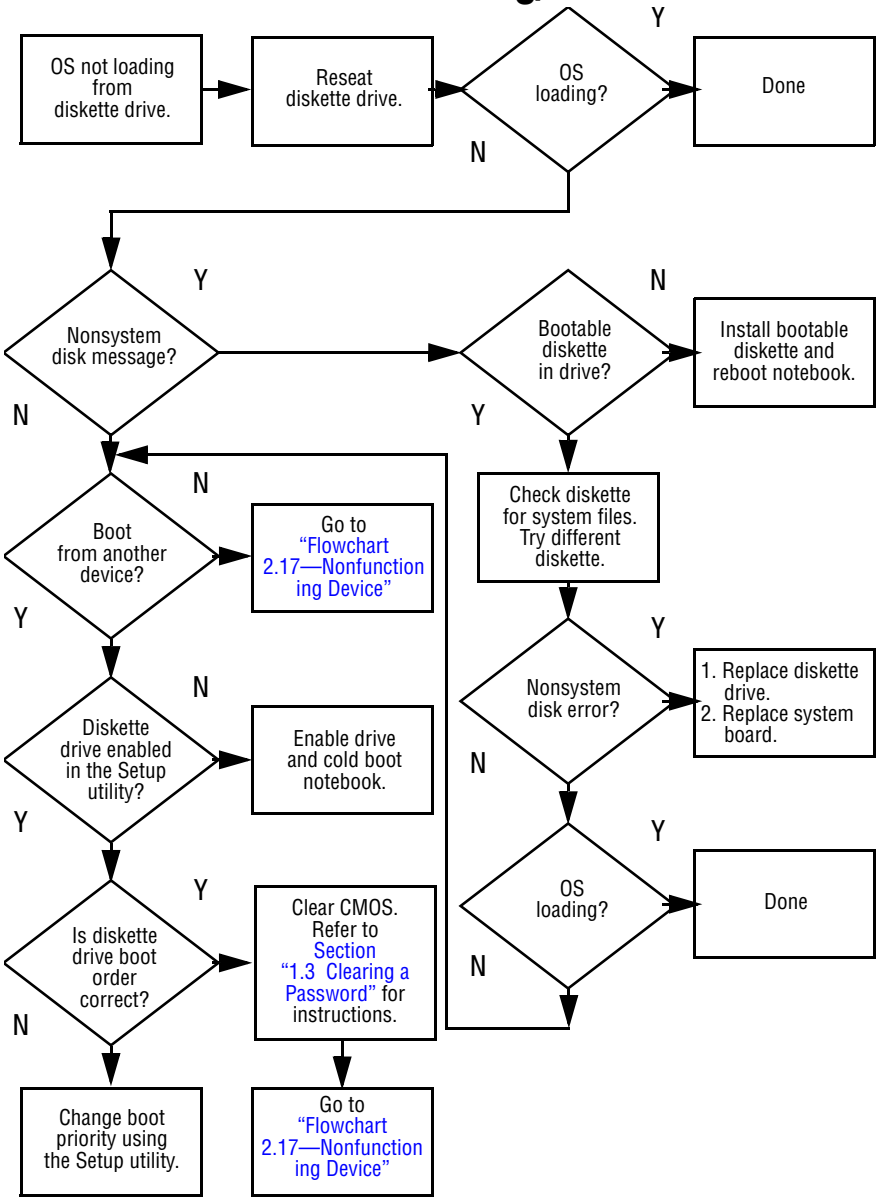
Flowchart 2.11—No OS Loading, Hard Drive, Part 2



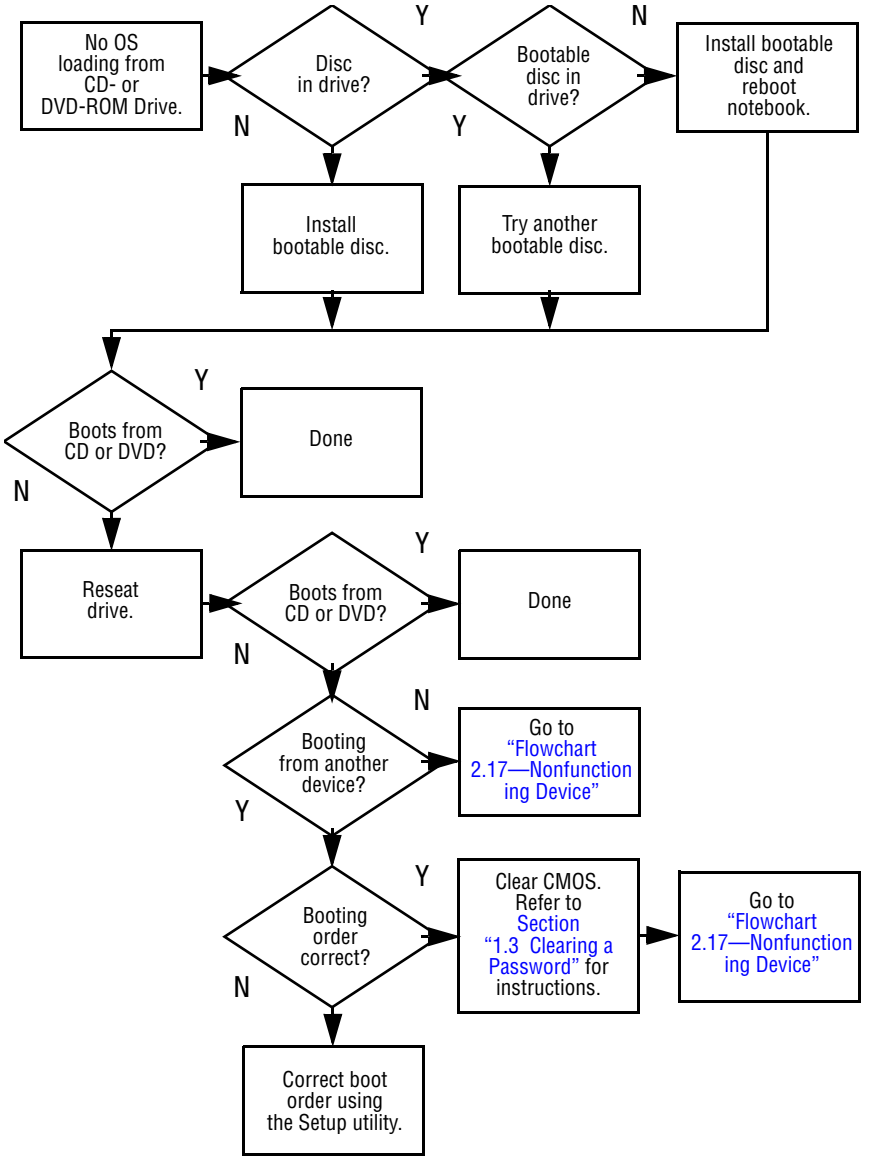
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



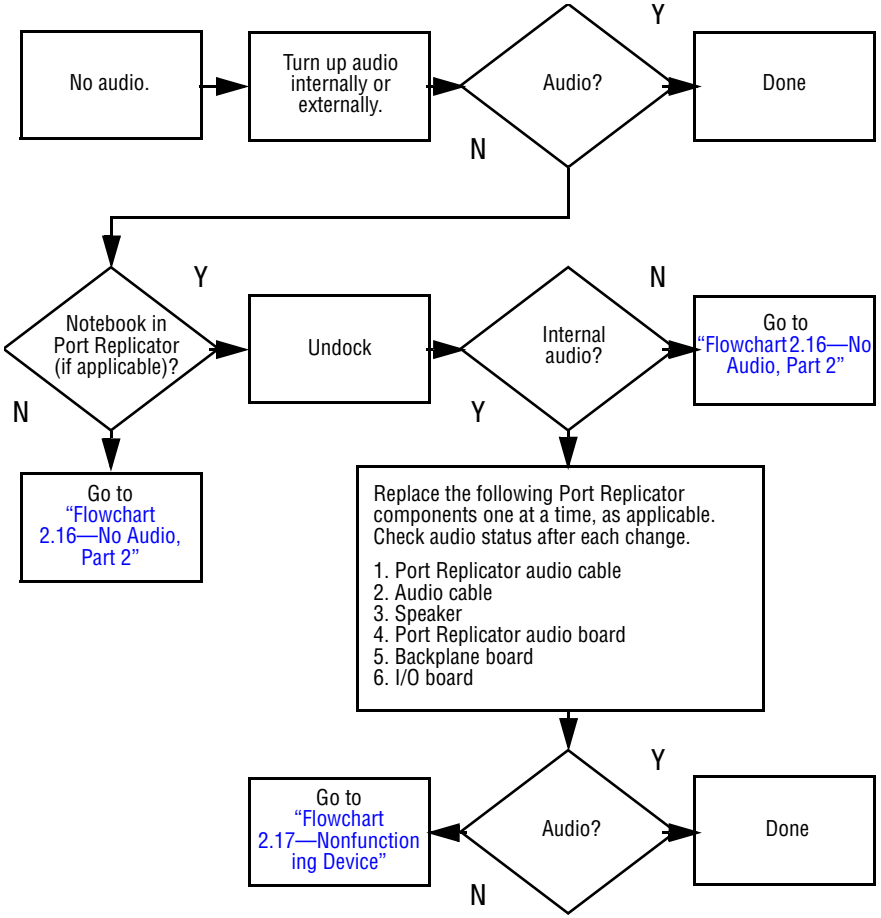
Flowchart 2.13—No OS Loading, Diskette Drive



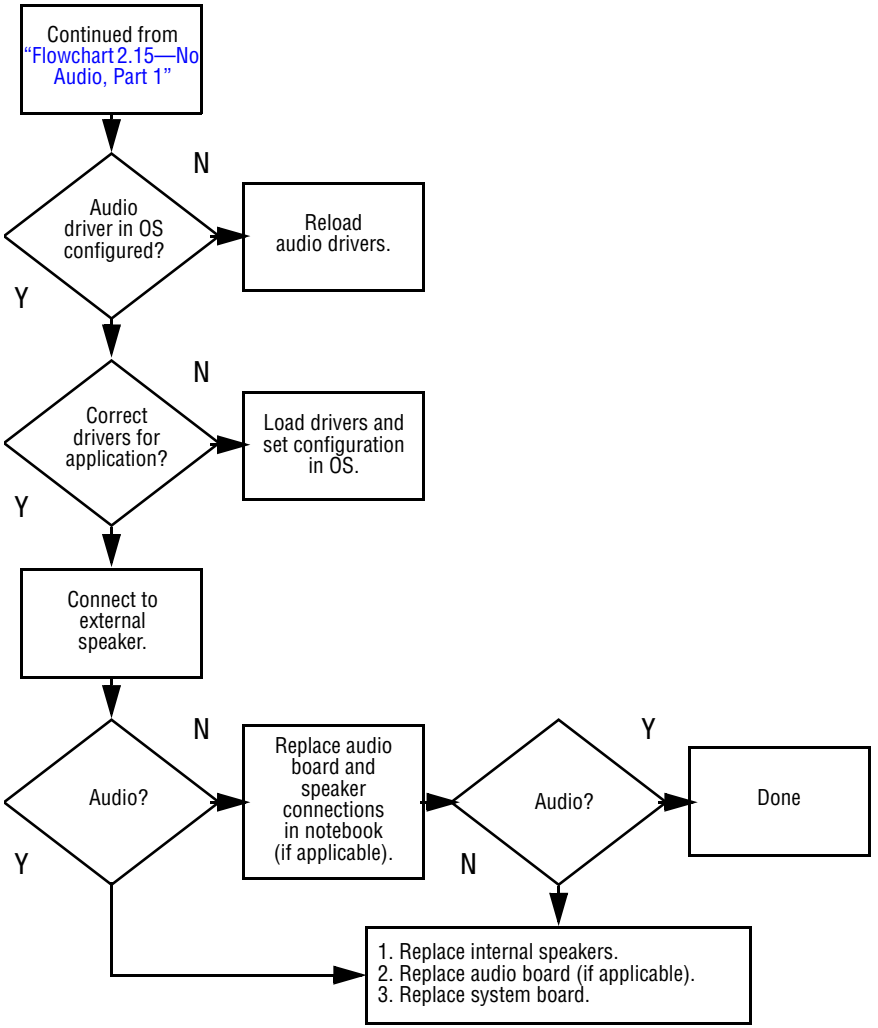
Flowchart 2.14—No OS Loading, CD- or DVD-ROM Drive



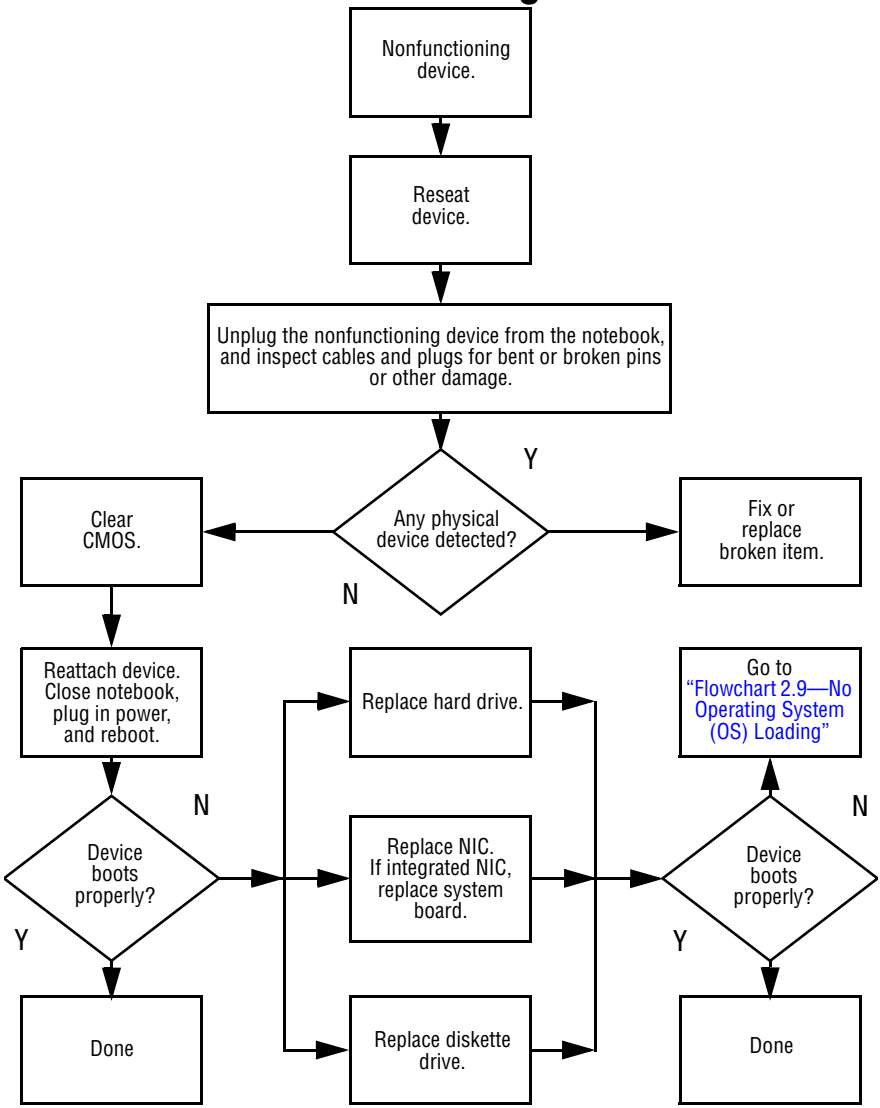
Flowchart 2.15—No Audio, Part 1



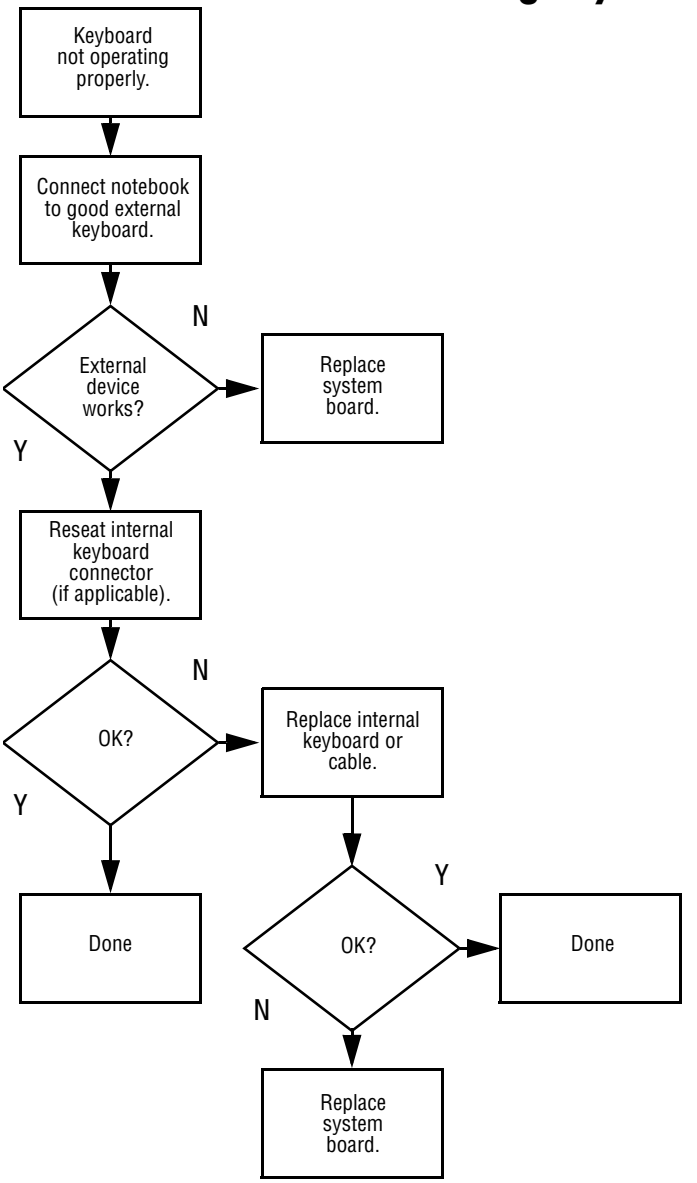
Flowchart 2.16—No Audio, Part 2



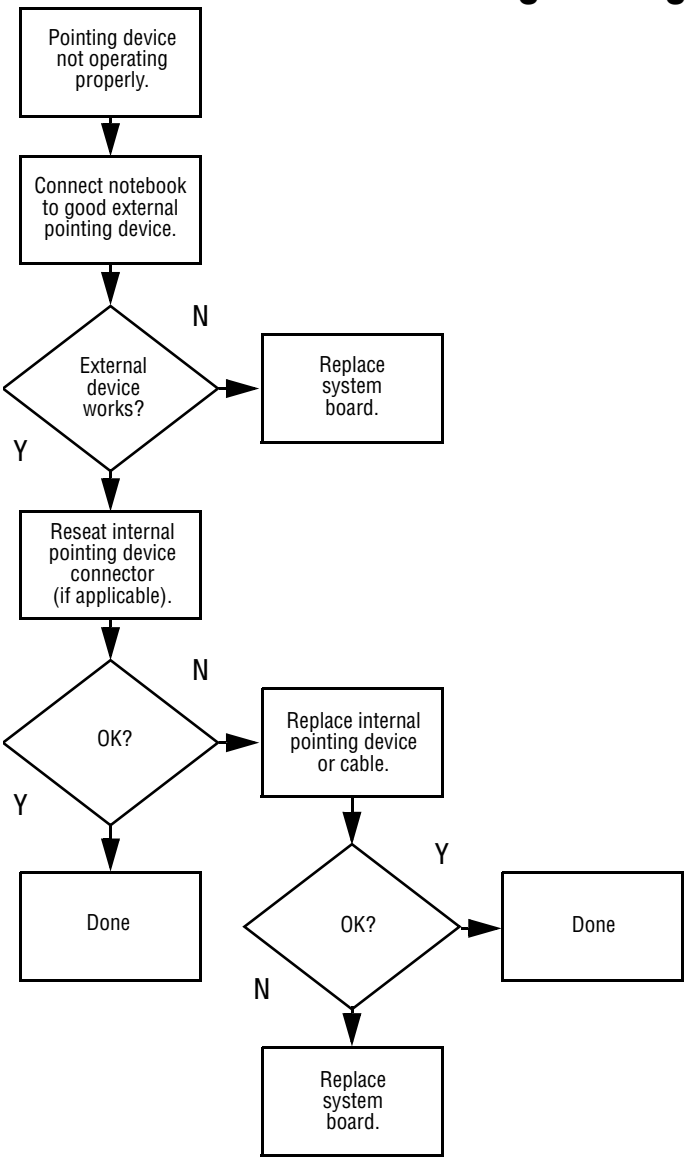
Flowchart 2.17—Nonfunctioning Device



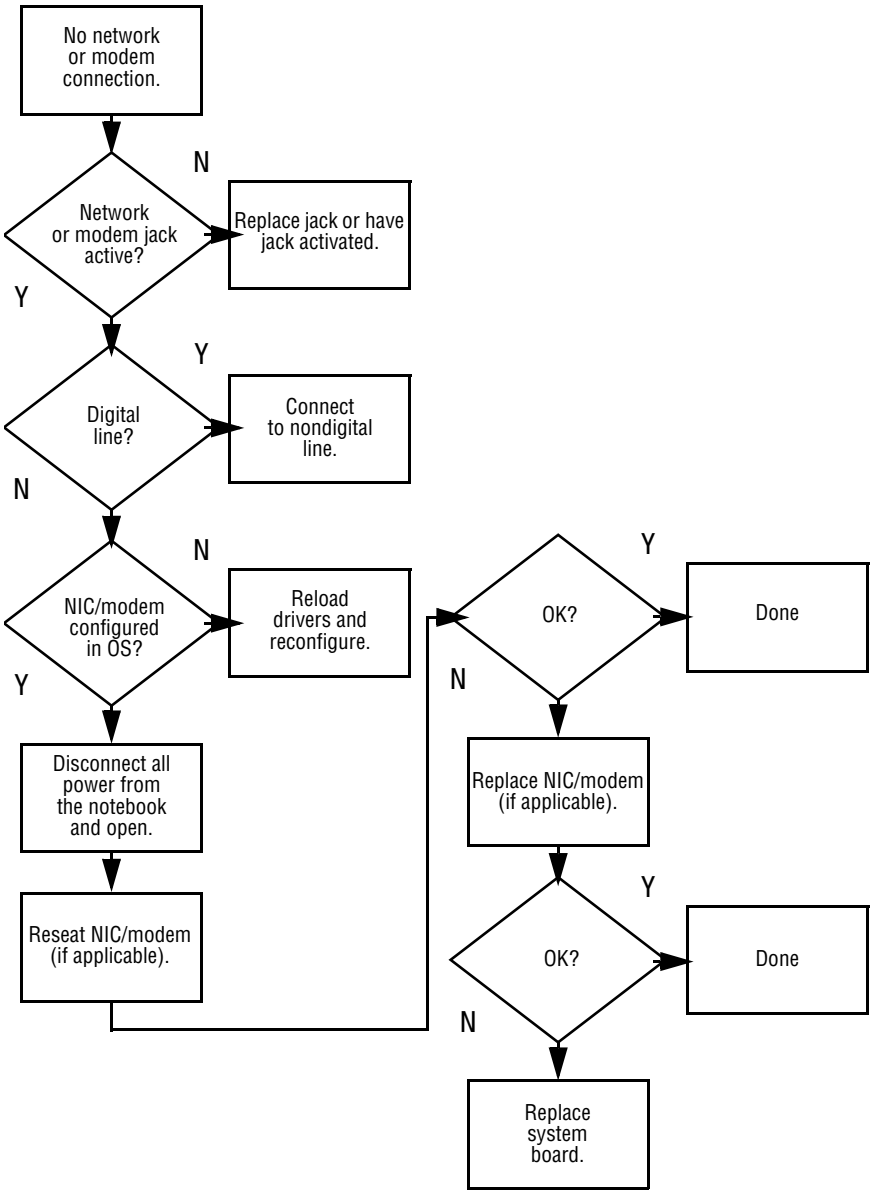
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



3

Illustrated Parts Catalog

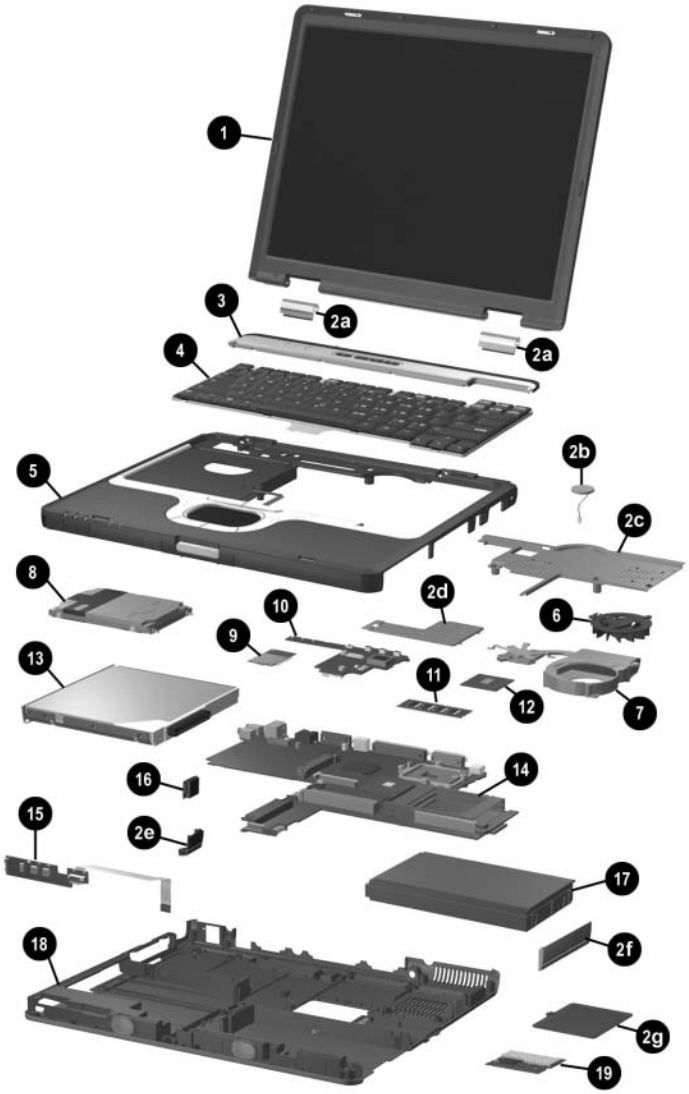
This chapter provides an illustrated parts breakdown and a reference for spare part numbers and option part numbers.

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

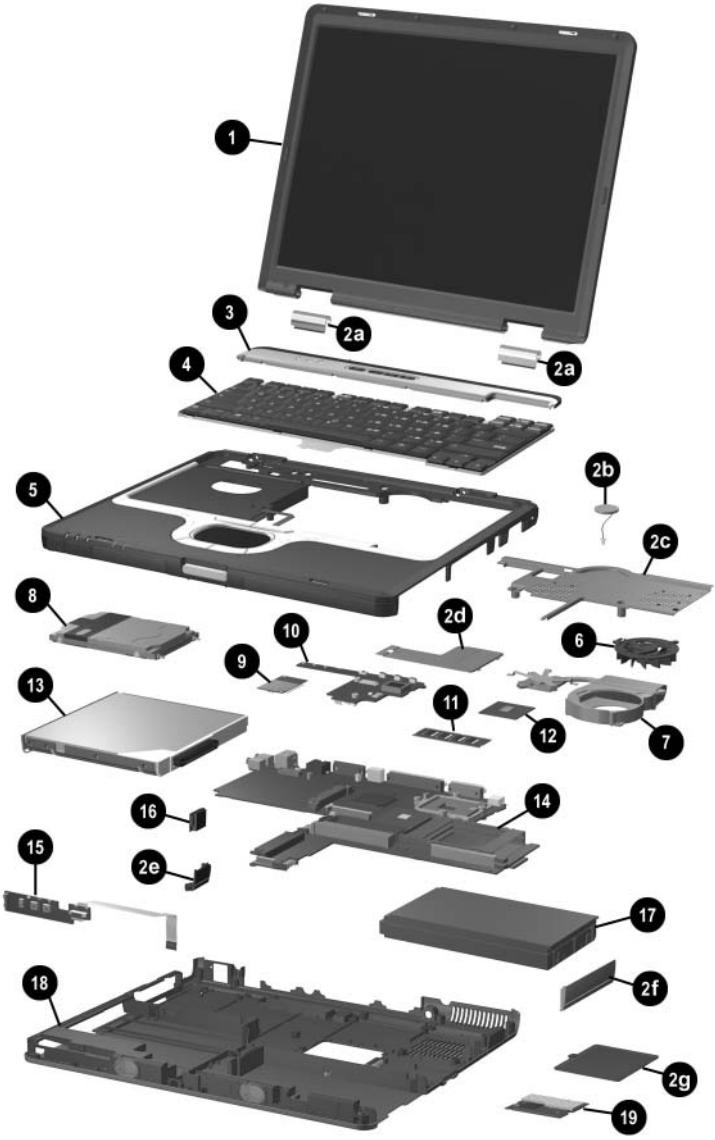


Notebook Major Components

Table 3-1
Spare Parts: Notebook Major Components

Item	Description	Spare Part Number
1	**Display assemblies**	
	14.1-inch, TFT, SXGA+	344397-001
	14.1-inch, TFT, XGA	344396-001
	Miscellaneous Plastics Kit (includes the following components)	344411-001
2a	Left and right display hinge covers	
2b	RTC battery	
2c	Keyboard plate	
2d	Memory shield	
2e	Bluetooth cover	
2f	Battery bezel	
2g	Mini PCI compartment cover	
	not illustrated:	
	Notebook feet (4)	
	PC Card slot space savers (2)	
3	**Switch cover**	344400-001
4	**Keyboards** (include pointing stick)	

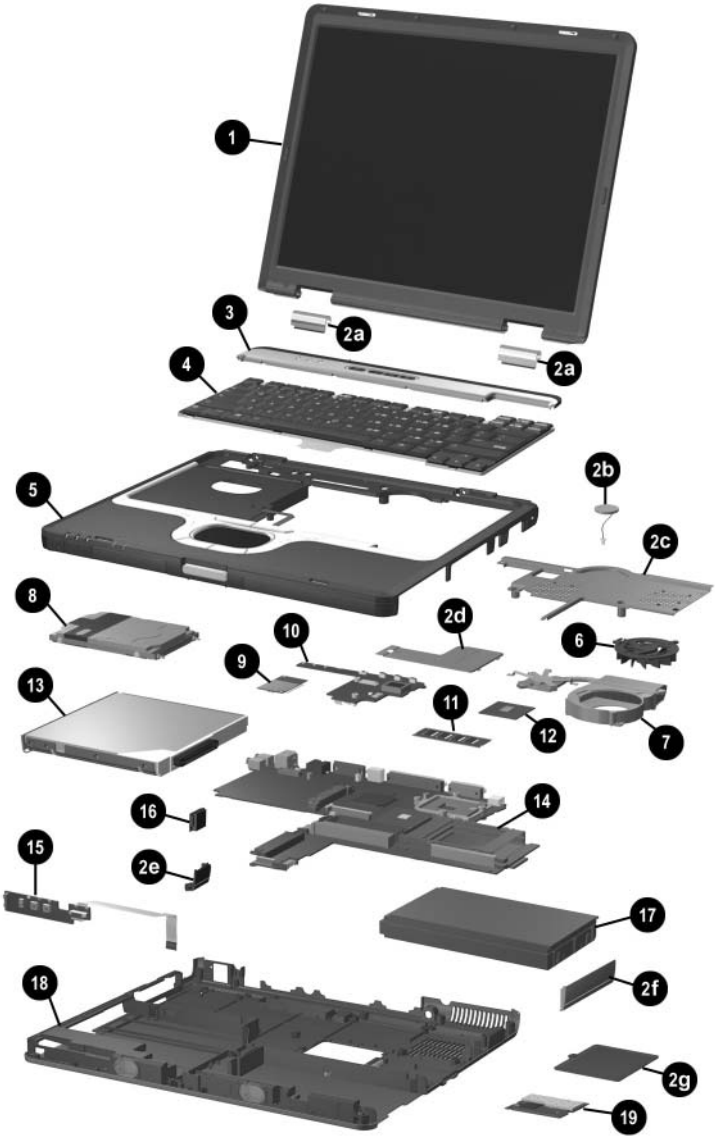
Brazil	344391-201	Japan	344391-291
Czech Republic	344391-221	Korea	344391-AD1
		Latin America	344391-161
Denmark	344391-081	Norway	344391-091
European	344391-A41	Portugal	344391-131
France	344391-051	Russia	344391-251
French Canada	344391-121	Saudi Arabia	344391-171
		Slovenia	344391-BA1
Germany	344391-041	Spain	344391-071
Greece	341520-151	Sweden/Finland	344391-B71
Greece - Bk	378538-151	Switzerland	344391-BG1
Hungary	344391-211	Taiwan	344391-AB1
Iceland	344391-DD1	Thailand	344391-281
India	344391-D61	Turkey	344391-141
International	344391-B31	United Kingdom	344391-031
Israel	344391-BB1	United States	344391-001
Italy	344391-061		



Notebook Major Components

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

Item	Description	Spare Part Number
5	**Top cover** (includes TouchPad)	344398-001
6	**Fan assembly**	345065-001
7	**Heat sink**	344410-001
8	**Hard drives**	
	80-GB (5400-rpm)	344407-001
	60-GB (7200-rpm)	365438-001
	60-GB (5400-rpm)	344406-001
	40-GB (5400-rpm)	344405-001
	30-GB (4200-rpm)	344404-001
9	**Modem board** (includes cable)	325521-001
10	**Button board**	346883-001
11	**Memory expansion boards, 333-MHz**	
	1024-MB DDR	336579-001
	512-MB DDR	336578-001
	256-MB DDR	336577-001
12	**Processors**	
	Intel Pentium M (Banias) processor, 1.7-GHz	340165-001
	Intel Pentium M (Banias) processor, 1.6-GHz	319777-001
	Intel Pentium M (Banias) processor, 1.5-GHz	347253-001
	Intel Pentium M (Banias) processor, 1.4-GHz	319775-001
	Intel Pentium M (Dothan) processor, 1.5 GHz	359636-001
	Intel Pentium M (Dothan) processor, 1.6 GHz	356596-001
	Intel Pentium M (Dothan) processor, 1.7 GHz	356597-001
	Intel Pentium M (Dothan) processor, 1.8 GHz	345857-001
	Intel Pentium M (Dothan) processor, 2.0 GHz	353395-001



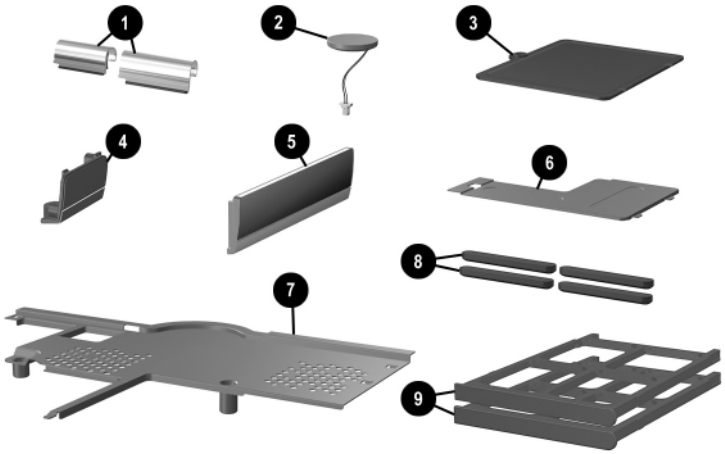
Notebook Major Components

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

Item	Description	Spare Part Number
13	**MultiBay devices**	
	24X Max CD-ROM drive	100044-001
	24X Max DVD/CD-RW combo drive	346789-001
	4X Max DVD+RW/R and CD-RW combo drive	344256-001
	8X Max DVD-ROM drive	173949-001
	Diskette drive	241995-001
	MultiBay battery pack	267747-001
14	**System boards**	
	Includes 64-MB discrete video memory	346885-001
	Includes 32-MB discrete video memory	344401-001
15	**LED board** (includes cable)	346884-001
16	**Bluetooth wireless communications board**	348276-001
17	**Battery packs**	
	Primary battery pack, Li-Ion, 8-cell, 3.6-Ah, 48-Wh	338669-001
	Battery pack, 6-cell	346886-001
18	**Base enclosure** (includes speakers)	344399-001
19	**Mini PCI communications boards**	
	802.11a/b/g LAN board	325525-001
	802.11b/g LAN board	325526-001
	802.11b/g, W400 modem board (for use in Japan)	325526-291
	802.11b W500 modem board (for use in Japan)	339742-291
	802.11b/g modem board (MOW)	368247-001
	802.11b/g modem board (ROW)	368248-001
	Wireless local area network (LAN) cards	
	802.11b wireless LAN (MOW)	345641-001
	802.11b wireless LAN (ROW)	345640-001
*	**Integrated smart card**	379336-001

*not illustrated

3.3 Miscellaneous Plastics Kit



Miscellaneous Plastics Kit Components

Table 3-2
Miscellaneous Plastics Kit Components
Spare Part Number 344411-001

Item	Description
1	Left and right display hinge covers
2	RTC battery
3	Mini PCI compartment cover
4	Bluetooth cover
5	Battery bezel
6	Memory shield
7	Keyboard plate
8	Notebook feet (4)
9	PC Card slot space savers (2)
*	Integrated smart card bezel

*not illustrated

3.4 Mass Storage Devices

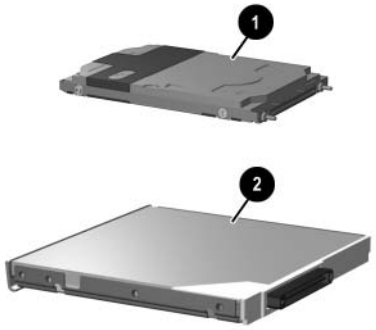


Table 3-3
Mass Storage Devices
Spare Part Number Information

Item	Description	Spare Part Number
1	**Hard drives** (include hard drive bezel and frame)	
	80-GB (5400-rpm)	344407-001
	60-GB (7200-rpm)	365438-001
	60-GB (5400-rpm)	344406-001
	40-GB (5400-rpm)	344405-001
	30-GB (4200-rpm)	344404-001
2	**MultiBay devices**	
	24X Max CD-ROM drive	100044-001
	24X Max DVD/CD-RW combo drive	346789-001
	4X Max DVD+RW/R and CD-RW combo drive	344256-001
	8X Max DVD-ROM Drive	173949-001
	Diskette drive	241995-001
	MultiBay battery pack	267747-001

3.5 Miscellaneous

Table 3-4
Misc

Carrying cases	
Leather, top load, Samsung	325817-001
Leather, top load, SG	325817-002
Nylon, top load, Samsung	325815-001
Nylon, top load, SG	325815-002
Nylon, entry level	325814-001
Port Replicators	
Advanced Port Replicator	339096-001
Simple Port Replicator	339097-001
Trusted Platform Module (TPM)	345856-001
Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing" for more information on screw specifications and usage.) ■ Phillips PM3.0×4.0 screw ■ Phillips PM3.0×3.5 screw ■ Phillips PM2.5×11.0 screw ■ Phillips PM2.5×9.0 screw ■ Phillips PM2.5×7.0 screw ■ Phillips PM2.5×3.5 screw ■ Phillips PM2.0×5.0 screw ■ Phillips PM2.0×3.0 screw ■ Phillips PM1.5×3.0 screw ■ Torx T8M2.5×5.5 screw ■ Torx T8M2.5×5.0 screw ■ Torx T8M2.5×3.5 flat-head screw ■ Torx T5M3.0×4.0 screw ■ Hex M2.5×9.0 screw ■ Hex M2.0×10.0 alignment pin	344412-001
Screw Kit (hard drive, retaining)	360670-001
USB mouse, carbon	164999-001

3.6 Sequential Part Number Listing

Table 3-5
Spare Parts: Sequential Part Number Listing

Spare Part Number	Description
100044-001	24X Max CD-ROM drive
164999-001	USB mouse, carbon
173949-001	8X Max DVD-ROM Drive
239704-001	65-watt AC adapter
241995-001	Diskette drive
246959-001	3-wire power cord - United States
246959-011	3-wire power cord - Australia
246959-021	3-wire power cord - Europe, Middle East, Africa
246959-031	3-wire power cord - United Kingdom
246959-061	3-wire power cord - Italy
246959-081	3-wire power cord - Denmark
246959-201	3-wire power cord - Brazil
246959-291	3-wire power cord - Japan
246959-AD1	3-wire power cord - Korea
246959-AG1	3-wire power cord - Switzerland
246959-BB1	3-wire power cord - Israel
267747-001	MultiBay battery pack
319775-001	Intel Pentium M (Banias) processor, 1.4-GHz
319777-001	Intel Pentium M (Banias) processor, 1.6-GHz
325521-001	Modem board (includes cable)
325525-001	802.11a/b/g LAN board mini PCI communications board

Table 3-5
Spare Parts: Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
325526-001	802.11b/g LAN board mini PCI communications board
325526-291	802.11b/g, W400 modem board (for use in Japan) mini PCI communications board
325814-001	Nylon, entry level
325815-001	Nylon, top load, Samsung
325815-002	Nylon, top load, SG
325817-001	Leather, top load, Samsung
325817-002	Leather, top load, SG
336577-001	Memory expansion board, 333 MHz, 256-MB DDR
336578-001	Memory expansion board, 333 MHz, 512-MB DDR
336579-001	Memory expansion board, 333 MHz, 1024-MB DDR
338669-001	Primary battery pack, Li-Ion, 8-cell, 3.6-Ah, 48-Wh
339096-001	Advanced Port Replicator
339097-001	Simple Port Replicator
339742-291	802.11b W500 modem board (for use in Japan) mini PCI communications board
340165-001	Intel Pentium M (Banias) processor, 1.7-GHz
341520-151	Keyboard (including pointing stick) - Greece
344256-001	4X Max DVD+RW/R and CD-RW combo drive
344391-001	Keyboard (including pointing stick) - United States
344391-031	Keyboard (including pointing stick) - United Kingdom
344391-041	Keyboard (including pointing stick) - Germany
344391-051	Keyboard (including pointing stick) - France

Table 3-5
Spare Parts: Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
344391-061	Keyboard (including pointing stick) - Italy
344391-071	Keyboard (including pointing stick) - Spain
344391-081	Keyboard (including pointing stick) - Denmark
344391-091	Keyboard (including pointing stick) - Norway
344391-121	Keyboard (including pointing stick) - French Canada
344391-131	Keyboard (including pointing stick) - Portugal
344391-141	Keyboard (including pointing stick) - Turkey
344391-161	Keyboard (including pointing stick) - Latin America
344391-171	Keyboard (including pointing stick) - Saudi Arabia
344391-201	Keyboard (including pointing stick) - Brazil
344391-211	Keyboard (including pointing stick) - Hungary
344391-221	Keyboard (including pointing stick) - Czech Republic
344391-251	Keyboard (including pointing stick) - Russia
344391-281	Keyboard (including pointing stick) - Thailand
344391-291	Keyboard (including pointing stick) - Japan
344391-A41	Keyboard (including pointing stick) - European
344391-AB1	Keyboard (including pointing stick) - Taiwan
344391-AD1	Keyboard (including pointing stick) - Korea
344391-B31	Keyboard (including pointing stick) - International
344391-B71	Keyboard (including pointing stick) - Sweden/Finland
344391-BA1	Keyboard (including pointing stick) - Slovenia
344391-BB1	Keyboard (including pointing stick) - Israel
344391-BG1	Keyboard (including pointing stick) - Switzerland

Table 3-5
Spare Parts: Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
344391-D61	Keyboard (including pointing stick) - India
344391-DD1	Keyboard (including pointing stick) - Iceland
344396-001	Display assembly - 14.1-inch, TFT, XGA
344397-001	Display assembly - 14.1-inch, TFT, SXGA+
344398-001	Top cover (includes TouchPad)
344399-001	Base enclosure (includes speakers)
344400-001	Switch cover
344401-001	System board (includes 64-MB discrete video memory)
344404-001	30-GB (4200-rpm) hard drive (includes bezel and frame)
344405-001	40-GB (5400-rpm) hard drive (includes bezel and frame)
344406-001	60-GB (5400-rpm) hard drive (includes bezel and frame)
344407-001	80-GB (5400-rpm) hard drive (includes bezel and frame)
344410-001	Heat sink
344411-001	Misc Plastics Kit
344412-001	Misc Screw Kit
345065-001	Fan assembly
345640-001	802.11b wireless LAN (ROW) Wireless LAN card
345641-001	802.11b wireless LAN (MOW) Wireless LAN card
345856-001	Trusted Platform Module (TPM)
345857-001	Intel Pentium M (Dothan) processor, 1.8 GHz
346789-001	24X Max DVD/CD-RW combo drive
346883-001	Button board
346884-001	LED board (includes cable)

Table 3-5
Spare Parts: Sequential Part Number Listing *(Continued)*

Spare Part Number	Description
346885-001	System board (includes 32-MB discrete video memory)
346886-001	Battery pack, 6-cell
347253-001	Intel Pentium M (Banias) processor, 1.5-GHz
348276-001	Bluetooth wireless communications board
353395-001	Intel Pentium M (Dothan) processor, 2.0 GHz
356596-001	Intel Pentium M (Dothan) processor, 1.6 GHz
356597-001	Intel Pentium M (Dothan) processor, 1.7 GHz
359636-001	Intel Pentium M (Dothan) processor, 1.5 GHz
360670-001	Screw Kit (hard drive, retaining)
365438-001	60-GB (7200-rpm) hard drive (includes bezel and frame)
368247-001	802.11b/g modem board (MOW) mini PCI communications board
368248-001	802.11b/g modem board (ROW) mini PCI communications board
378538-151	Keyboard (including pointing stick) - Greece Bk
379336-001	Integrated smart card

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
- 5.0-mm socket for system board standoffs
- Flat-bladed screwdriver
- Tool kit (includes connector removal tool, loopback plugs, and case utility tool)

4.2 Service Considerations

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

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

Plastic Parts

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

Cables and Connectors

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

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

4.3 Preventing Damage to Removable Drives

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

- Before removing or inserting a hard drive, shut down the notebook. If you are unsure whether the notebook is off or in Hibernation, turn the notebook on, 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, a 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 life 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 them 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, use only 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 volts.

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 fifty-seven screws and standoffs, in fifteen 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 chart below to determine the section number to be referenced when removing notebook components.

Disassembly Sequence Chart

Section	Description	# of Screws Removed
5.3	Preparing the notebook for disassembly	
	Battery pack	0
	Hard drive	2 to remove, 6 to disassemble
5.4	Notebook feet	0
5.5	Mini PCI communications board	1
5.6	MultiBay device	0
5.7	Bluetooth wireless communications board	3
5.8	Integrated smart card	0
5.9	Keyboard	2
5.10	Modem board	2
5.11	Memory expansion board	0
5.12	Switch cover	2
5.13	Keyboard plate	0
5.14	Security Module (TPM)	1
5.15	Fan assembly	5
5.16	Heat sink	4
5.17	Processor	0
5.18	Display assembly	4
5.19	Top cover	16
5.20	RTC battery	0

Disassembly Sequence Chart *(Continued)*

Section	Description	# of Screws Removed
5.21	LED board	0
5.22	Button board	2
5.23	System board	5 screws, 2 standoffs

5.3 Preparing the Notebook for Disassembly

Before you begin any removal or installation procedures:

1. Save your work, exit all applications, and shut down the notebook. If you are not sure whether the notebook is off or in Hibernation, briefly press the power button. If your work returns to the screen, save your work, exit all applications, and then shut down the notebook.
2. Disconnect all external devices connected to the notebook.
3. Disconnect the power cord.
4. Remove the battery pack by following these steps:

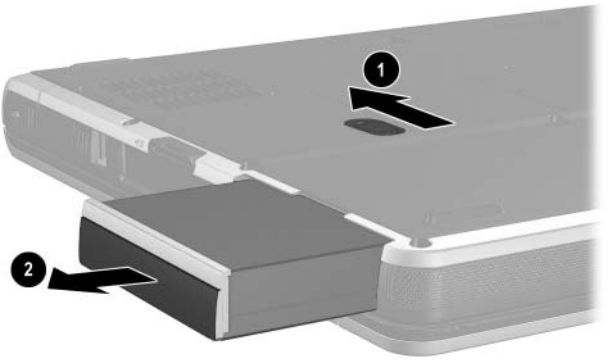
Spare Part Number Information	
Battery packs	
Primary battery pack, Li-Ion, 6-cell, 3.6-Ah, 48-Wh	338669-001
Battery pack, 6-cell	346886-001

   a. Turn the notebook upside down, with the front panel facing you.

b. Slide and hold the battery release latch ❶ toward the back of the notebook.

c. Use the notch in the battery pack to slide the battery pack to the left ❷.

d. Remove the battery pack.



Removing the Battery Pack

5. Remove the battery bezel by sliding it down and off of the battery pack.

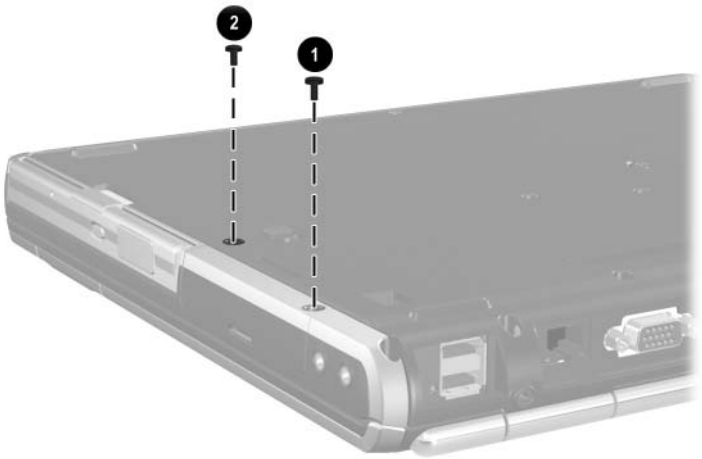
The battery bezel is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

Removing the Battery Bezel

Reverse the above procedure to install the battery pack and battery bezel.

Spare Part Number Information	
Hard drives (include hard drive frame and connector)	
80-GB (5400-rpm)	344407-001
60-GB (7200-rpm)	365438-001
60-GB (5400-rpm)	344406-001
40-GB (5400-rpm)	344405-001
30-GB (4200-rpm)	344404-001

6. Remove the hard drive by following these steps:
   a. Turn the notebook upside down, with the rear panel facing you.
   b. Remove the T8M2.5×5.0 screw ❶ that secures the hard drive door to the notebook.
   c. Remove the PM3.0×4.0 hard drive security screw ❷ that secures the hard drive to the notebook.

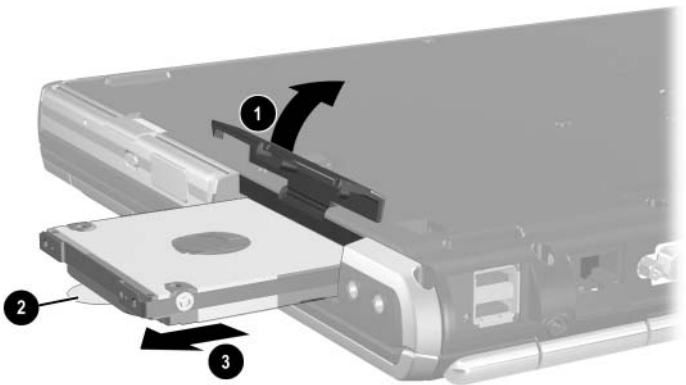


Removing the Hard Drive Screws

d. Lift the hard drive cover up and swing it back ❶.

e. Use the Mylar tab ❷ to slide the hard drive to the left ❸ to disconnect it from the system board.

f. Remove the hard drive.



Removing the Hard Drive

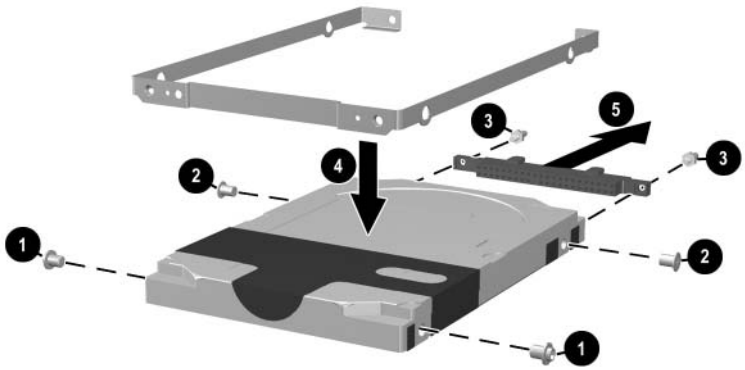
CAUTION: The hard drive should be disassembled only if it is damaged and must be repaired. Unnecessary disassembly of the hard drive can result in damage to the hard drive and loss of information.

g. Remove the two T5M3.0×4.0 screws ❶ and the two PM3.0×3.5 screws ❷ that secure the hard drive to the hard drive frame.

h. Use a 4.0-mm socket to remove the two M2.0×10.0 alignment pins ❸ that secure the hard drive to the hard drive frame.

i. Remove the hard drive from the hard drive frame ❹.

j. Remove the hard drive connector from the hard drive ❺.

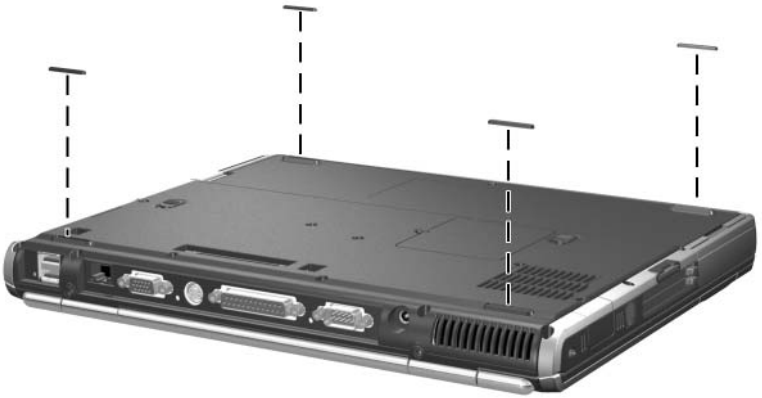


Removing the Hard Drive Bracket and Connector

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

5.4 Notebook Feet

The notebook feet are adhesive-backed rubber pads. The notebook feet are included in the Miscellaneous Plastics Kit, spare part number 344411-001. The notebook feet attach to the base enclosure as illustrated below.



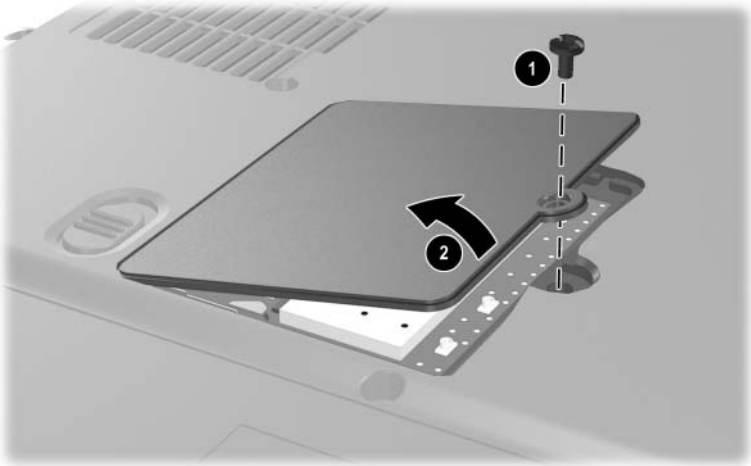
Replacing the Notebook Feet

5.5 Mini PCI Communications Board

Spare Part Number Information	
Mini PCI communications boards	
802.11a/b/g LAN board	325525-001
802.11b/g LAN board	325526-001
802.11b/g, W400 modem board (for use in Japan)	325526-291
802.11b W500 modem board (for use in Japan)	339742-291
802.11b/g modem board (MOW)	368247-001
802.11b/g modem board (ROW)	368248-001
Wireless LAN cards	
802.11b (MOW)	345641-001
802.11b (ROW)	345640-001

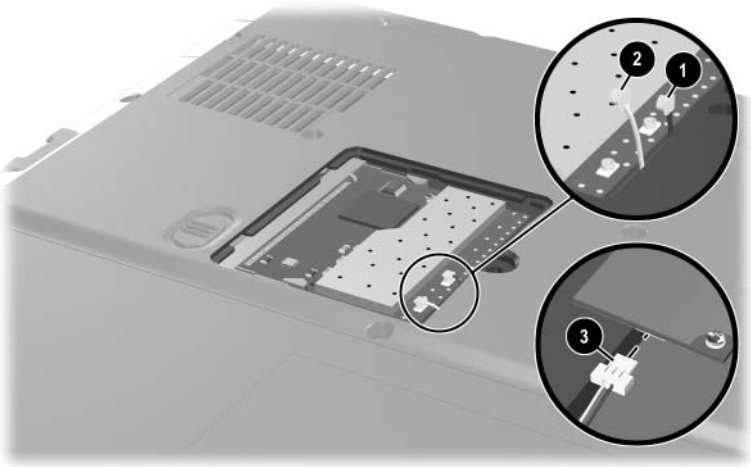
1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down, with the front facing you.
3. Remove the PM2.5×3.5 screw ❶ that secures the Mini PCI compartment cover to the notebook.
4. Lift the right side of the cover up and swing it to the left ❷.
5. Remove the cover.

The Mini PCI compartment cover is included in the Miscellaneous Plastics Kit, spare part number 344411-001.



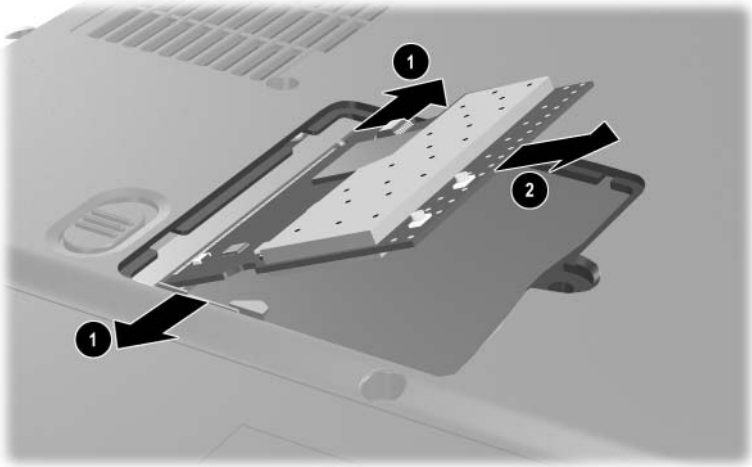
Removing the Mini PCI Compartment Cover

6. If a wireless communications device is installed in this compartment, disconnect the two antenna cables from the Mini PCI communications board. Note that the longer cable ❶ connects to the rear antenna terminal and the shorter antenna cable ❷ connects to the front antenna terminal.
7. If a modem is installed in this compartment, disconnect the modem cable from the modem ❸.



Disconnecting the Cables from the Mini PCI Communications Board

8. Spread the retaining tabs ❶ that secure the Mini PCI communications board to the socket. The board rises up.
9. Pull the board away from the socket at a 45-degree angle ❷.



Removing the Mini PCI Communications Board

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

5.6 MultiBay Device

Spare Part Number Information	
MultiBay devices	
24X Max CD-ROM drive	100044-001
24X Max DVD/CD-RW combo drive	346789-001
4X Max DVD+RW/R and CD-RW combo drive	344256-001
8X Max DVD-ROM Drive	173949-001
Diskette drive	241995-001
MultiBay battery pack	267747-001

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down, with the right side facing you.
3. Slide and hold the MultiBay release latch to the right ❶.
4. Remove the MultiBay device ❷.

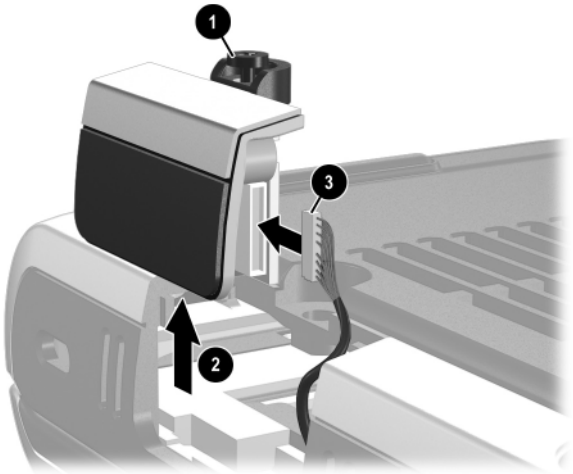
Removing a MultiBay Device

Reverse the above procedure to install a MultiBay device.

5.7 Bluetooth Wireless Communications Board

Spare Part Number Information	
Bluetooth wireless communications board	348276-001

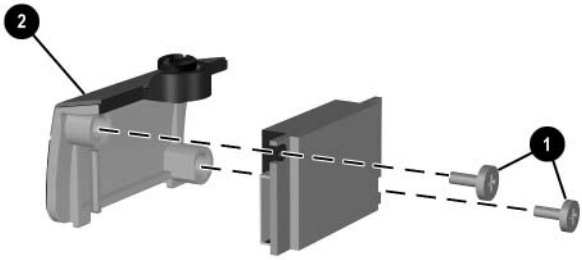
1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down, with the right side facing you.
3. Loosen the PM2.0×5.0 screw ❶ that secures the Bluetooth cover to the notebook.
4. Remove the cover from the notebook as far as the cable will allow ❷.
5. Disconnect the cable ❸ from the Bluetooth board.



Removing the Bluetooth Cover

6. Remove the two PM1.5×3.0 screws ❶ that secure the Bluetooth board to the Bluetooth cover ❷.
7. Remove the cover from the board.

The Bluetooth cover is included in the Miscellaneous Plastics Kit, spare part number 344411-001.



Removing the Bluetooth Board

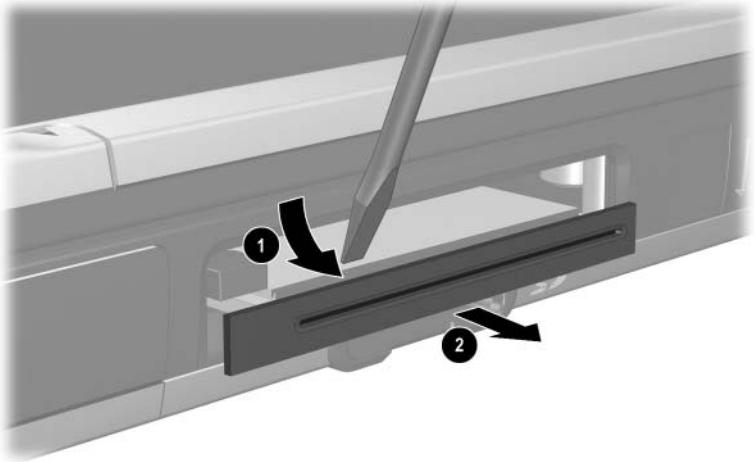
Reverse the above procedure to install a Bluetooth board.

5.8 Integrated Smart Card

Spare Part Number Information	
Integrated smart card	379336-001

The integrated smart card is located in the bottom PC Card slot.

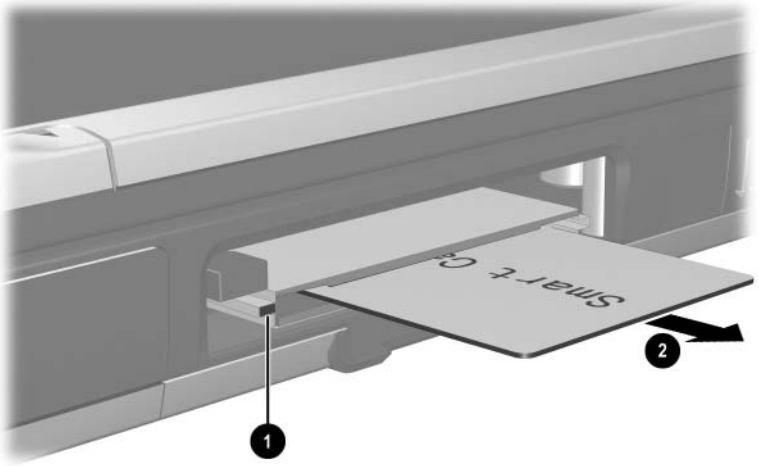
1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Remove any PC Card or spacer from the top PC Card slot.
3. Using a flat-bladed tool, pry the smart card bezel off of the notebook ❶. The bezel releases with a small amount of force.
4. Remove the bezel from the notebook ❷.



Removing the Smart Card Bezel

The integrated smart card bezel is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

5. Eject the smart card from the notebook using a flat-bladed tool to press the small metal eject tab ❶ to the left of the smart card.
6. Remove the card from the slot ❷.



Removing the Smart Card

Reverse the above procedure to install the integrated smart card.

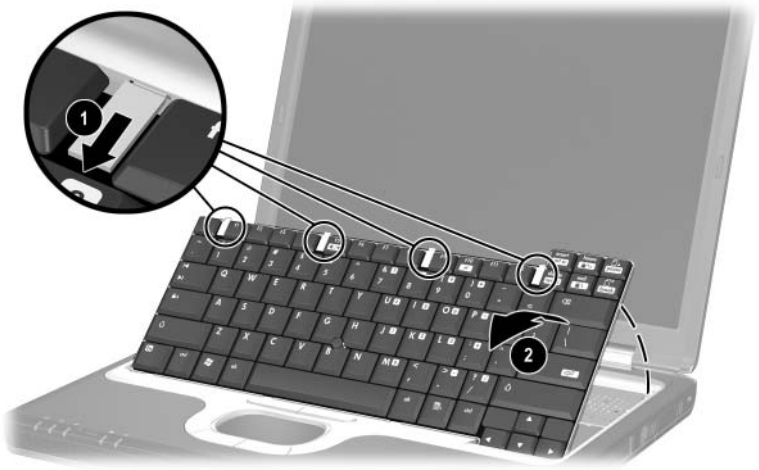
5.9 Keyboard

Spare Part Number Information			
Keyboards (include pointing stick)			
Brazil	344391-201	Korea	344391-AD1
Czech Republic	344391-221	Latin America	344391-161
Denmark	344391-081	Norway	344391-091
European	344391-A41	Portugal	344391-131
France	344391-051	Russia	344391-251
French Canada	344391-121	Saudi Arabia	344391-171
Germany	344391-041	Slovenia	344391-BA1
Greece	341520-151	Spain	344391-071
Greece - Bk	378538-151	Sweden/Finland	344391-B71
Hungary	344391-211	Switzerland	344391-BG1
Iceland	344391-DD1	Taiwan	344391-AB1
India	344391-D61	Thailand	344391-281
International	344391-B31	Turkey	344391-141
Israel	344391-BB1	United Kingdom	344391-031
Italy	344391-061	United States	344391-001
Japan	344391-291		

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Turn the notebook upside down, with the front facing you.
3. Remove the two T8M2.5×11.0 screws that secure the keyboard to the notebook.

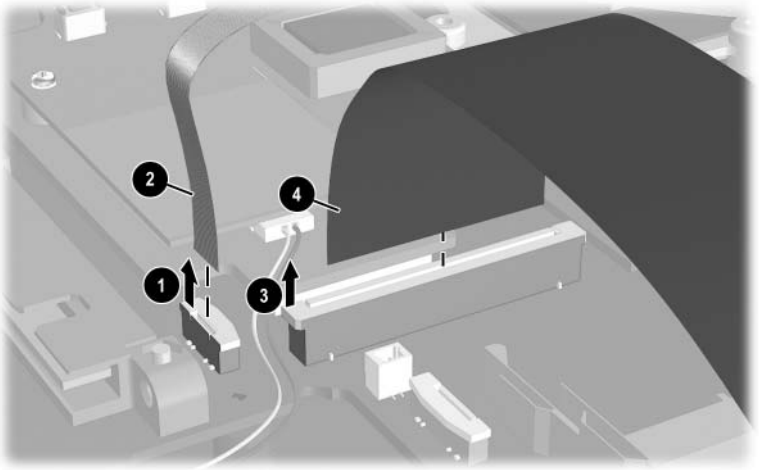
Removing the Keyboard Screws

4. Turn the notebook right-side up, with the front facing you.
5. Open the notebook.
6. Slide the four tabs on the top edge of the keyboard toward you ❶.
7. Lift the rear edge of the keyboard up and swing it forward ❷ until it rests on the palm rest.



Releasing the Keyboard

8. Release the zero insertion force (ZIF) connector ❶ to which the pointing stick cable is attached and disconnect the cable ❷.
9. Release the ZIF connector ❸ to which the keyboard cable is attached and disconnect the cable ❹.



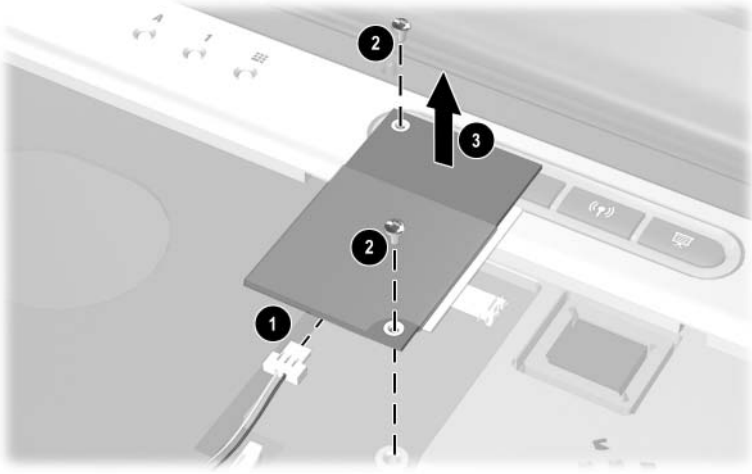
Disconnecting the TouchPad and Keyboard Cables

Reverse the above procedure to install the keyboard.

5.10 Modem Board

Spare Part Number Information	
Modem board (includes cable)	325521-001

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Release the keyboard (refer to Section 5.9).
3. Disconnect the modem cable ❶ from the modem board.
4. Remove the two PM2.5×3.5 screws ❷ that secure the modem board to the notebook.
5. Lift the rear edge of the modem board ❸ to disconnect it from the system board.
6. Remove the modem board.



Removing the Modem Board

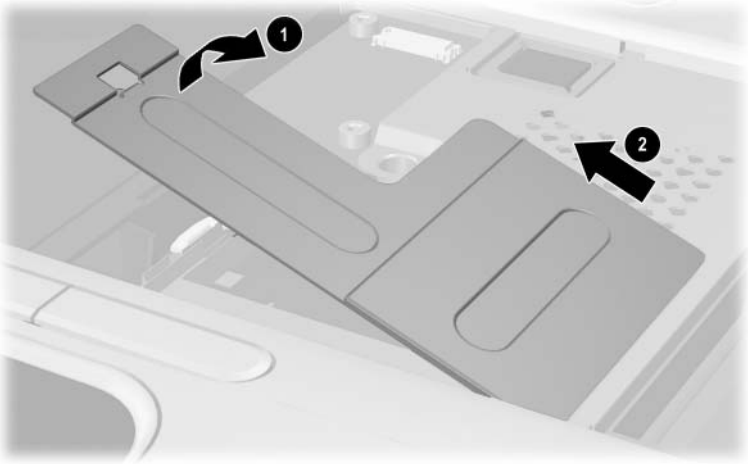
Reverse the above procedure to install the modem board.

5.11 Memory Expansion Board

Spare Part Number Information	
Memory expansion boards, 333-MHz	
1024-MB DDR	336579-001
512-MB DDR	336578-001
256-MB DDR	336577-001

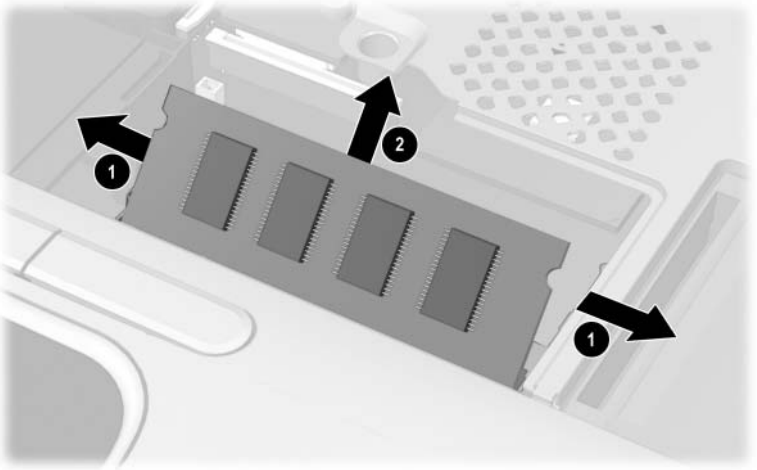
1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Remove the keyboard (refer to Section 5.9).
3. Lift the left side of the memory shield and swing it up and to the right ❶ until it rests at a 45-degree angle.
4. Slide the shield to the left ❷ to remove it.

The memory shield is included in the Miscellaneous Plastics Kit, spare part number 344411-001.



Removing the Memory Shield

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



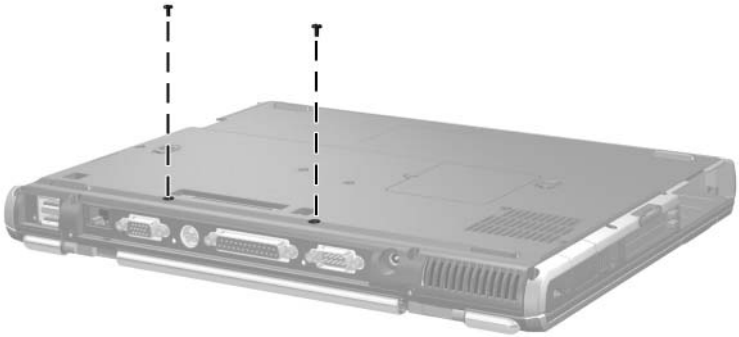
Removing a Memory Expansion Board

Reverse the above procedure to install a memory expansion board.

5.12 Switch Cover

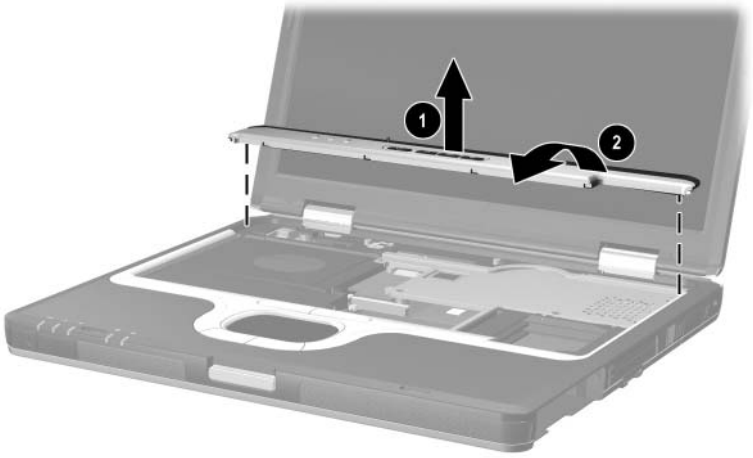
Spare Part Number Information	
Switch cover	344400-001

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Remove the keyboard (refer to Section 5.9).
3. Close the notebook.
4. Turn the notebook upside down, with the rear panel facing you.
5. Remove the two TM2.5×9.0 screws that secure the switch cover to the notebook.



Removing the Switch Cover Screws

6. Turn the notebook right-side up, with the front facing you.
7. Open the notebook.
8. Lift up on the middle of the switch cover ❶ to disengage it from the notebook.
9. Swing the rear edge of the switch cover up and forward ❷.
10. Remove the switch cover.



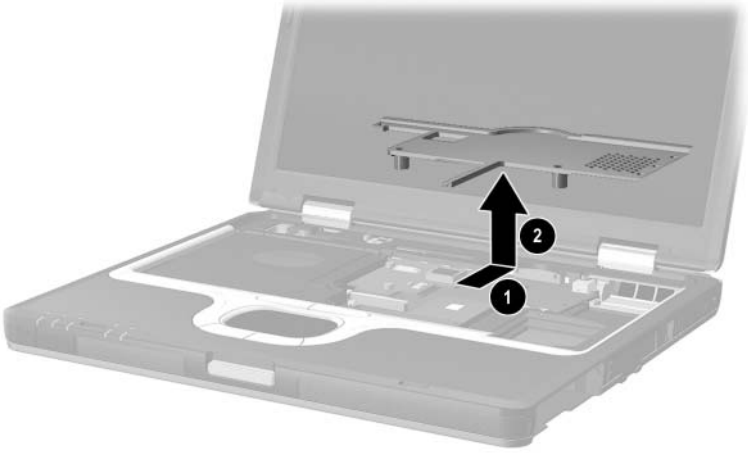
Removing the Switch Cover

Reverse the above procedure to install the switch cover.

5.13 Keyboard Plate

The keyboard plate is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Remove the keyboard (refer to Section 5.9).
3. Remove the switch cover (refer to Section 5.12).
4. Slide the keyboard plate toward the back of the notebook ❶ to disengage the plate tabs from the slots in the top cover, and then lift the plate straight up ❷ to remove it.



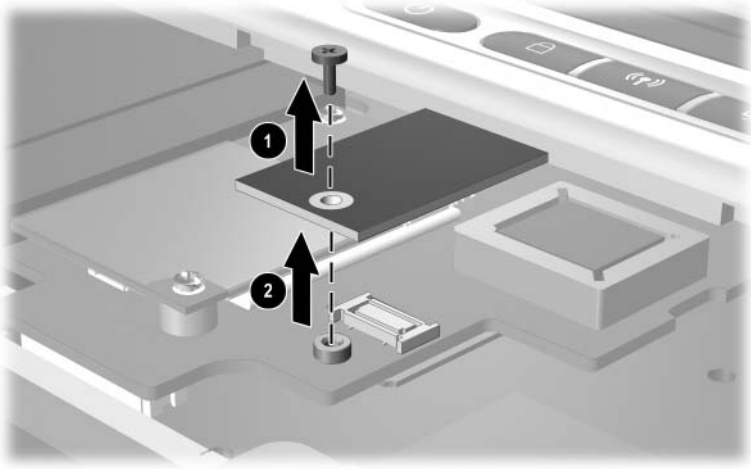
Removing the Keyboard Plate

Reverse the above procedure to install the keyboard plate.

5.14 Security Module (TPM)

Spare Part Number Information	
Security Module (TPM)	345856-001

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Remove the keyboard (refer to Section 5.9).
3. Remove the switch cover (refer to Section 5.12).
4. Remove the keyboard plate (refer to Section 5.13).
5. Remove the PM3.5×3.0 screw ❶ that secures the security card to the system board.
6. Lift the security module straight up ❷ to disconnect it from the system board.



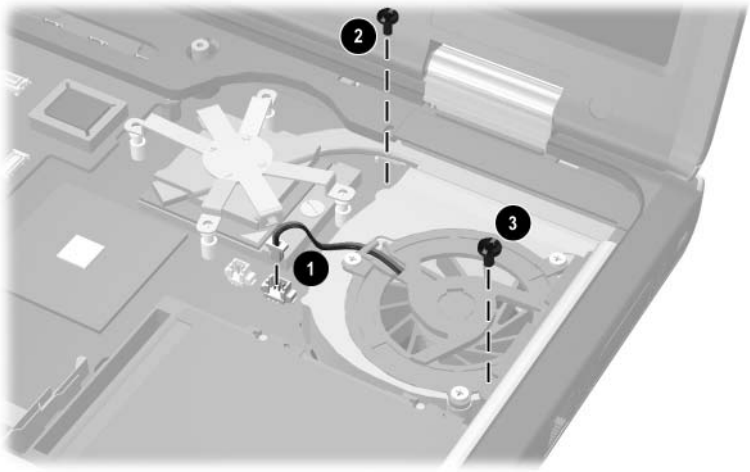
Removing the Security Module

Reverse the above procedure to install the security card.

5.15 Fan Assembly

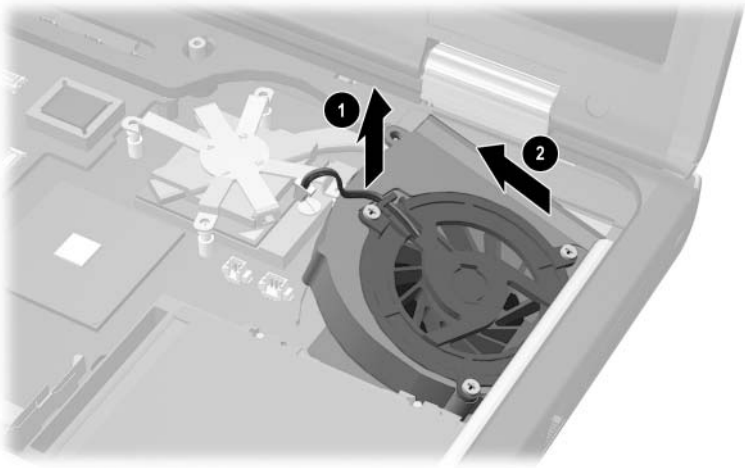
Spare Part Number Information	
Fan assembly	345065-001

1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Remove the keyboard (refer to Section 5.9).
3. Remove the switch cover (refer to Section 5.12).
4. Remove the keyboard plate (refer to Section 5.13).
5. Disconnect the fan cable ❶ from the system board.
6. Remove the T8M2.5×7.0 ❷ and T8M2.5×5.0 screws ❸ that secure the fan assembly to the notebook.



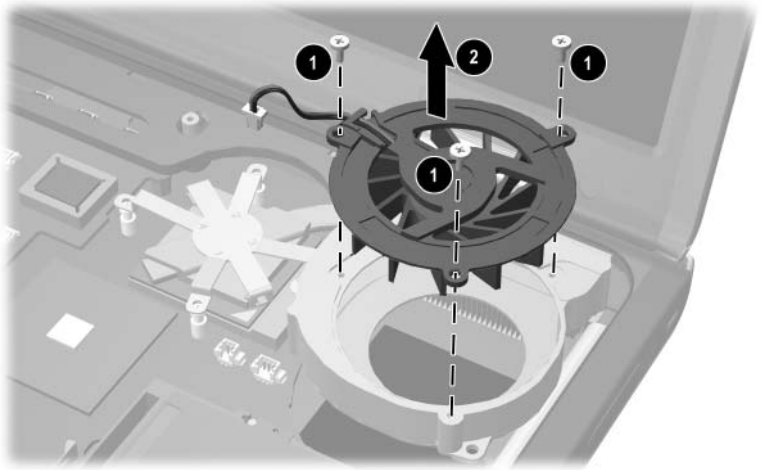
Removing the Fan Assembly Screws

7. Lift the left side of the fan assembly ❶ until it rests at an angle.
8. Slide the fan assembly up and to the left ❷ to remove it from the notebook.



Removing the Fan Assembly

9. Remove the three PM2.0×3.0 screws ❶ that secure the fan to the fan housing.
10. Remove the fan ❷.



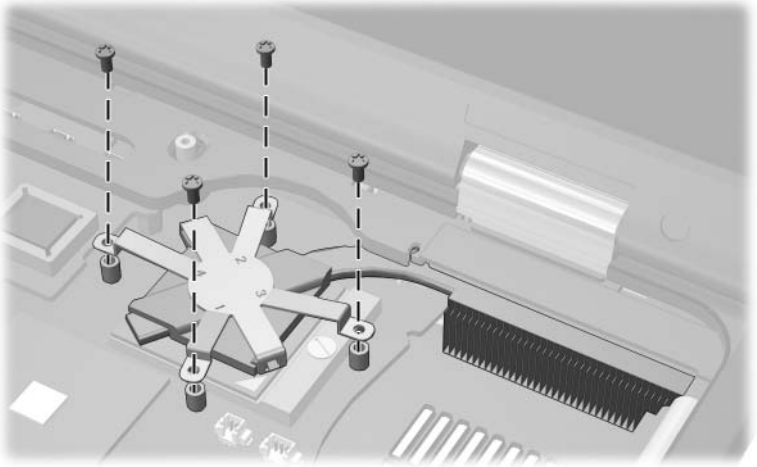
Removing the Fan from the Fan Assembly

Reverse the above procedure to install the fan assembly.

5.16 Heat Sink

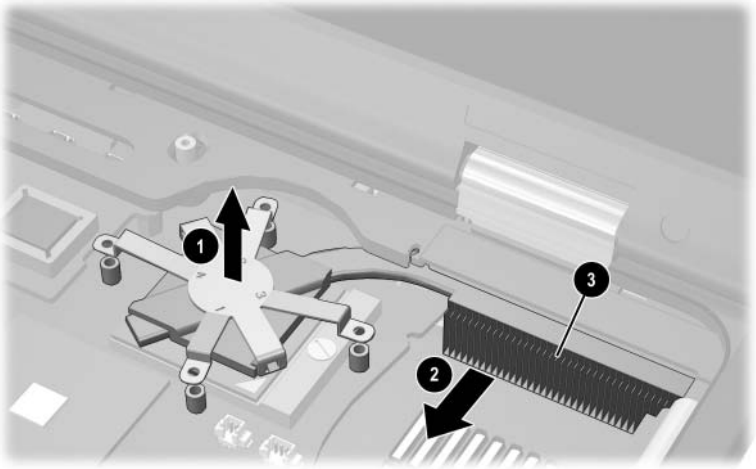
Spare Part Number Information	
Heat sink	344410-001

1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
2. Remove the four T8M2.5×5.0 screws that secure the heat sink bracket to the system board.



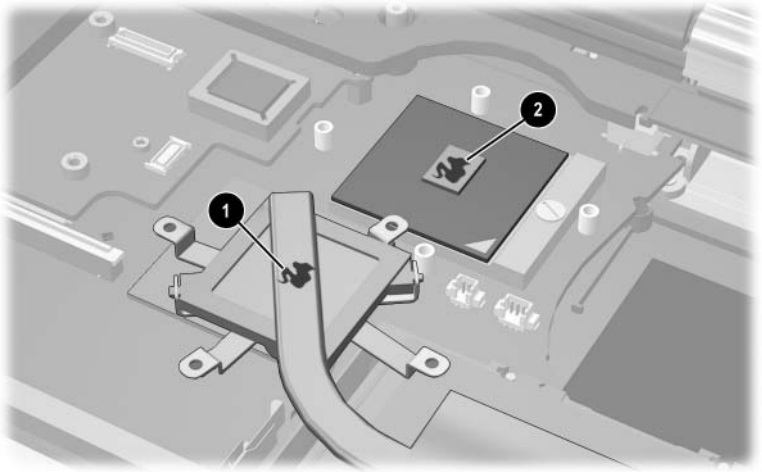
Removing the Heat Sink

3. Lift the left side of the heat sink up ❶ until the thermal grease bond between the heat sink and the processor disengages.
4. Slide the heat sink forward ❷ until the cooling fins ❸ clear the top cover.
5. Lift the heat sink straight up to remove it.



Removing the Heat Sink

Carefully clean any thermal grease residue from the underside of the heat sink ❶ and processor surfaces ❷ each time you remove the heat sink. Then 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.

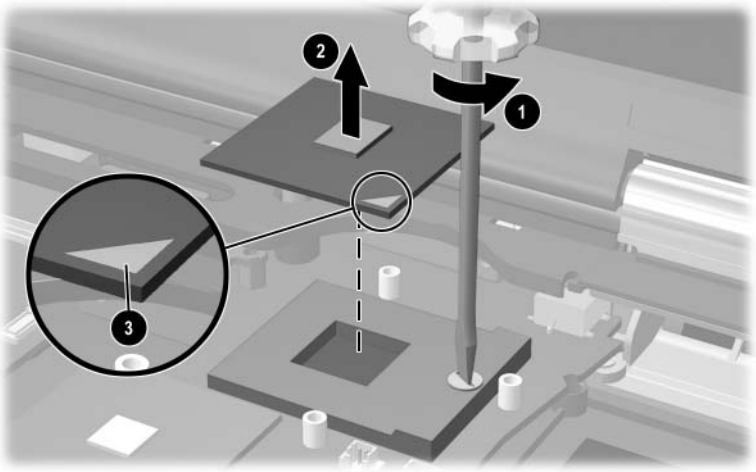
5.17 Processor

Spare Part Number Information	
Processors (include thermal grease)	
Intel Pentium M (Banias) processor, 1.7-GHz	340165-001
Intel Pentium M (Banias) processor, 1.6-GHz	319777-001
Intel Pentium M (Banias) processor, 1.5-GHz	347253-001
Intel Pentium M (Banias) processor, 1.4-GHz	319775-001
Intel Pentium M (Dothan) processor, 1.5 GHz	359636-001
Intel Pentium M (Dothan) processor, 1.6 GHz	356596-001
Intel Pentium M (Dothan) processor, 1.7 GHz	356597-001
Intel Pentium M (Dothan) processor, 1.8 GHz	345857-001
Intel Pentium M (Dothan) processor, 2.0 GHz	353395-001

1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)

2. Use a flat-bladed screwdriver to turn the processor lock screw one-quarter turn counterclockwise ❶ to release the processor from the socket.
3. Lift the processor straight up ❷ to remove it.

Note that the gold triangle ❸ on the processor should be aligned in the lower right corner when you install the processor.



Removing the Processor

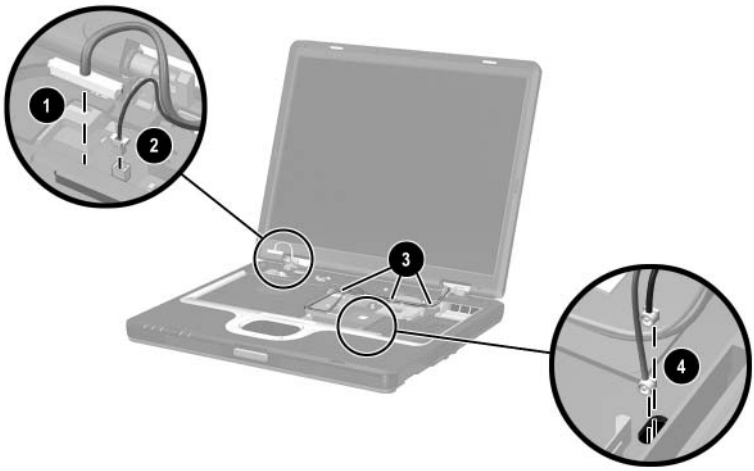
Reverse the above procedure to install the processor.

5.18 Display Assembly

Spare Part Number Information	
Display assemblies	
14.1-inch, TFT, SXGA+	344397-001
14.1-inch, TFT, XGA	344396-001

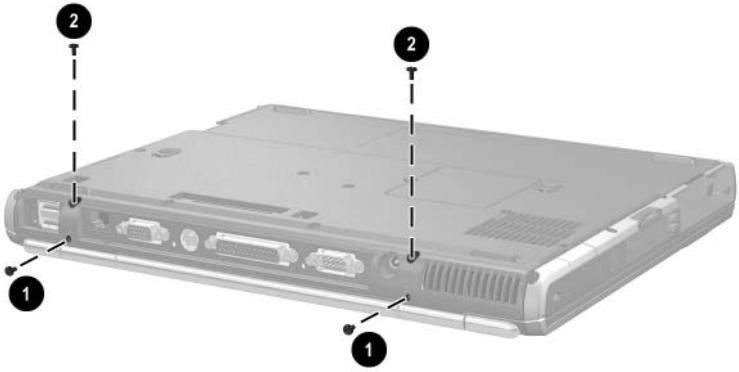
1. Prepare the notebook for disassembly (refer to Section 5.3).
2. Disconnect the wireless antenna cables from the Mini PCI communications board (refer to Section 5.5).
3. Remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Memory shield (refer to Section 5.11)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)

4. Disconnect the display cable ❶ and microphone cable ❷ from the system board.
5. Remove the left and right wireless antenna cables ❸ from the three clips in the top cover.
6. Remove the left and right wireless antenna cables from the hole ❹ in the system board.



Disconnecting the Display Cables

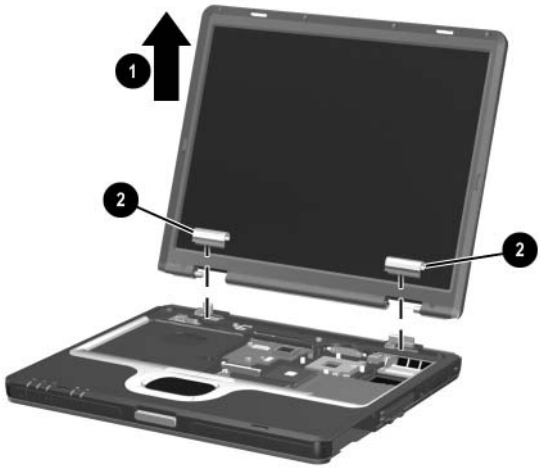
7. Close the notebook.
8. Turn the notebook upside down, with the rear panel facing you.
9. Remove the following screws:
   - ❶ Two T8M2.5×9.0 screws from the rear panel
   - ❷ Two T8M2.5×9.0 screws from the bottom of the notebook



Removing the Display Screws

10. Turn the notebook right-side up, with the front facing you.
11. Open the notebook until the display assembly is in an upright position.
12. Lift the display assembly straight up ❶ to remove it.
13. If necessary, remove the left ❷ and right ❷ display hinge covers from the display assembly.

The display hinge covers are included in the Miscellaneous Plastics Kit, spare part number 344411-001.



Removing the Display Assembly

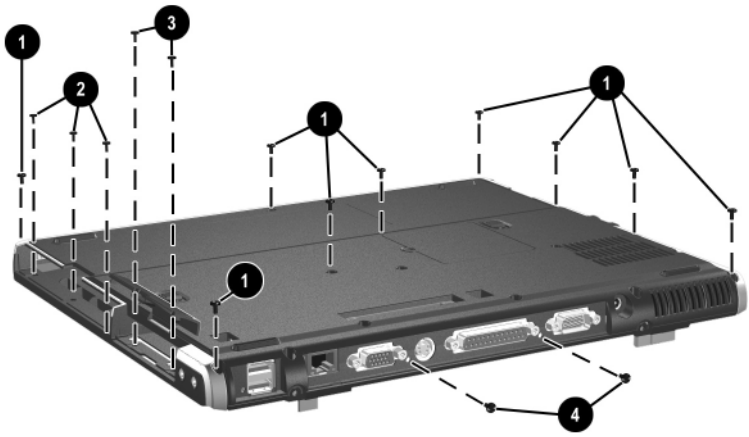
Reverse the above procedure to install the display assembly.

5.19 Top Cover

Spare Part Number Information	
Top cover (includes TouchPad)	344398-001

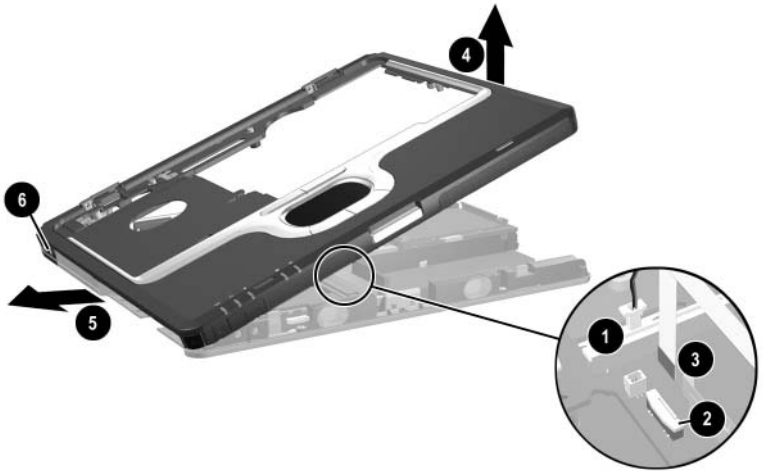
1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Memory shield (refer to Section 5.11)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)
   - ❏ Display assembly (refer to Section 5.18)
2. Turn the notebook upside down, with the rear panel facing you.

3. Remove the following screws:
   - ❶ Nine T8M2.5×9.0 screws from the bottom of the notebook
   - ❷ Three PM2.5×3.5 screws from the MultiBay
   - ❸ Two PM2.5×3.5 screws from the hard drive bay
   - ❹ Two T8M2.5×5.5 screws from the rear panel



Removing the Top Cover Screws

4. Turn the notebook right-side up, with the front facing you.
5. Disconnect the RTC battery cable ❶ from the system board.
6. Release the ZIF connector ❷ to which the TouchPad cable is attached and disconnect the TouchPad cable ❸.
7. Lift the right side of the top cover ❹ until it rests at a 45-degree angle.
8. Slide the top cover to the left ❺ to disengage the audio connectors ❻ from the top cover.
9. Remove the top cover.



Removing the Top Cover

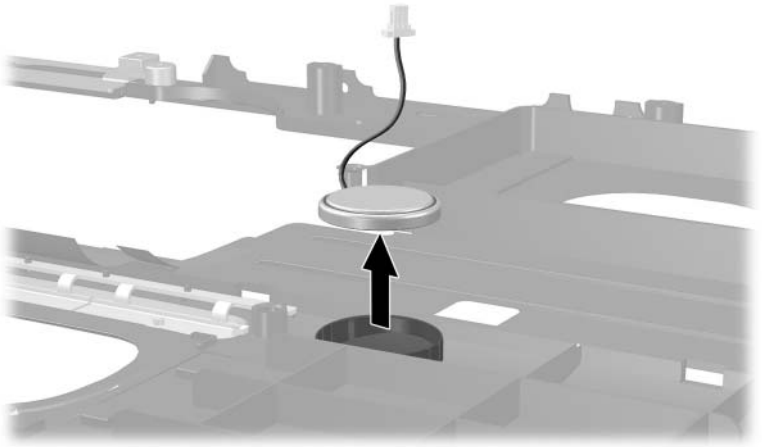
Reverse the above procedure to install the top cover.

5.20 RTC Battery

The RTC battery is included in the Miscellaneous Plastics Kit, spare part number 344411-001.

1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Memory shield (refer to Section 5.11)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)
   - ❏ Display assembly (refer to Section 5.18)
   - ❏ Top cover (refer to Section 5.19)
2. Turn the top cover upside down, with the front facing you.

3. Lift the RTC battery out of the top cover clip.



Removing the RTC Battery

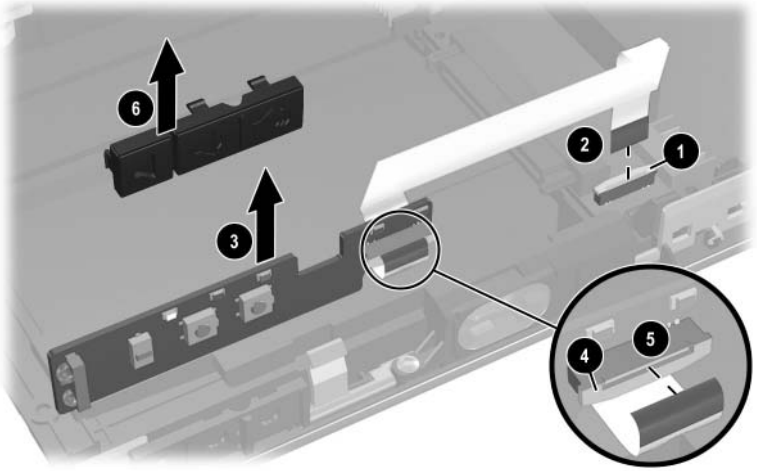
Reverse the above procedure to install the RTC battery.

5.21 LED Board

Spare Part Number Information	
LED board (includes cable)	346884-001

1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Memory shield (refer to Section 5.11)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)
   - ❏ Display assembly (refer to Section 5.18)
   - ❏ Top cover (refer to Section 5.19)
2. Turn the top cover upside down, with the front facing you.

3. Release the ZIF connector ❶ on the system board to which the LED board cable is attached, and then disconnect the cable ❷.
4. Lift the board straight up to remove it ❸.
5. Release the ZIF connector ❹ on the LED board to which the LED board cable is attached and disconnect the cable ❺.
6. Remove the LED board actuator ❻ from the notebook.



Removing the LED Board

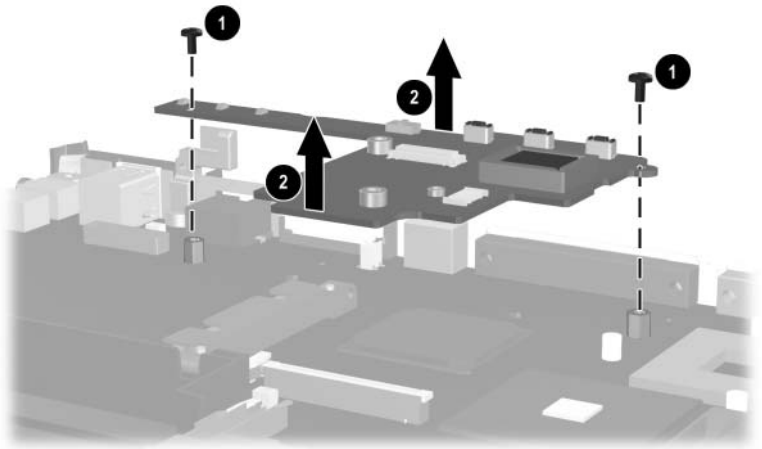
Reverse the above procedure to install the LED board.

5.22 Button Board

Spare Part Number Information	
Button board	346883-001

1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Memory shield (refer to Section 5.11)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)
   - ❏ Display assembly (refer to Section 5.18)
   - ❏ Top cover (refer to Section 5.19)
2. Turn the top cover upside down, with the front facing you.

3. Remove the two PM2.5×5.0 screws ❶ that secure the button board to the notebook.
4. Lift the front and rear edges of the button board to disconnect it from the system board ❷.
5. Remove the button board.



Removing the Button Board

Reverse the above procedure to install the button board.

5.23 System Board

Spare Part Number Information	
System boards	
Includes 64-MB discrete video memory	346885-001
Includes 32-MB discrete video memory	344401-001

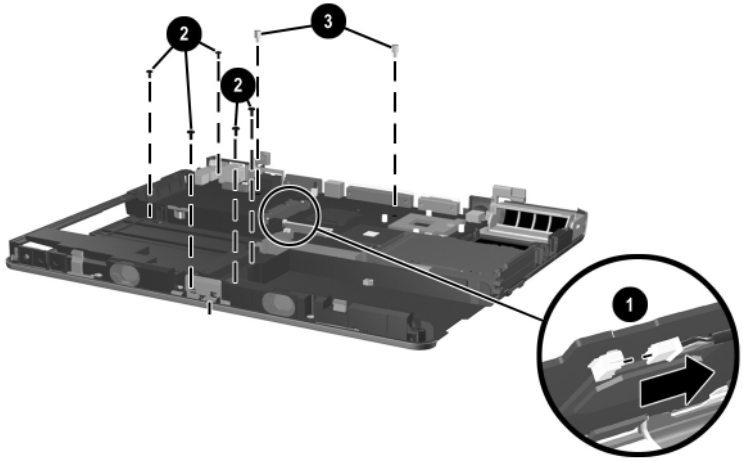
When replacing the system board, ensure that the following components are removed from the defective system board and installed on the replacement system board:

- Mini PCI communications board (refer to Section 5.5)
- Bluetooth wireless communications board (refer to Section 5.7)
- Modem board (refer to Section 5.10)
- Memory expansion boards (refer to Section 5.11)
- Processor (refer to Section 5.17)
- RTC battery (refer to Section 5.20)
- Button board (refer to Section 5.22)

1. Prepare the notebook for disassembly (refer to Section 5.3) and remove the following components:
   - ❏ MultiBay device (refer to Section 5.6)
   - ❏ Keyboard (refer to Section 5.9)
   - ❏ Memory shield (refer to Section 5.11)
   - ❏ Switch cover (refer to Section 5.12)
   - ❏ Keyboard plate (refer to Section 5.13)
   - ❏ Fan assembly (refer to Section 5.15)
   - ❏ Heat sink (refer to Section 5.16)
   - ❏ Display assembly (refer to Section 5.18)
   - ❏ Top cover (refer to Section 5.19)

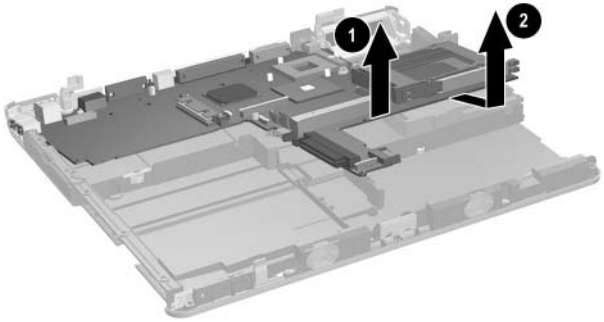
- ❏ LED board (refer to Section 5.21)
- ❏ Button board (refer to Section 5.22)

2. Disconnect the speaker cable ❶.
3. Remove the five T8M2.5×5.0 screws ❷ that secure the system board to the notebook.
4. Use a 5.0-mm socket to remove the two HM2.5×9.0 standoffs ❸ that secure the system board to the notebook.



Removing the System Board Screws and Standoffs

5. Lift the front edge of the system board ❶ until it rests at an angle.
6. Slide the system board forward at an angle, and then lift it straight up to remove it ❷.



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	3.40 cm	1.34 in
Width	31.78 cm	12.51 in
Depth	26.19 cm	10.31 in
Weight		
With 6-cell battery pack and MultiBay weight saver	2.25 kg	4.96 lb
With 6-cell battery pack and MultiBay DVD-ROM drive	2.46 kg	5.42 lb
Stand-alone power requirements		
Nominal operating voltage	14.4 VDC	
Maximum operating power	60 W	
Peak operating power	65 W	
Temperature		
Operating (not writing optical)	10°C to 35°C	50°F to 95°F
Operating (writing optical)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F

Table 6-1
Notebook *(Continued)*

Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%, 38.7°C (101.6°F) maximum wet bulb temperature	
Altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 to 3,048 m	-50 to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 to 12,192 m	-50 to 40,000 ft
Shock		
Operating	50 g, 2 ms, half-sine	
Nonoperating	175 g, 2 ms, half-sine	

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

Table 6-2
14.1-inch, SXGA+, TFT Display

Dimensions		
Height	28.6 cm	11.2 in
Width	21.4 cm	8.4 in
Diagonal	35.7 cm	14.1 in
Number of colors	up to 16.8 million	
Contrast ratio	250:1	
Refresh rate	60 Hz	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.204 × 0.204 mm	
Format	1400 × 1050	
Configuration	RGB stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-40° horizontal, +20/-40° vertical typical	

Table 6-3
14.1-inch, XGA, TFT Display

Dimensions		
Height	28.6 cm	11.2 in
Width	21.4 cm	8.4 in
Diagonal	35.7 cm	14.1 in
Number of colors	up to 16.8 million	
Contrast ratio	250:1	
Refresh rate	60 Hz	
Brightness	180 nits typical	
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1024 × 768	
Configuration	RGB stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	4 W	
Viewing angle	+/-40° horizontal, +20/-40° vertical typical	

Table 6-4
Hard Drives

	60-GB	40-GB	30-GB
User capacity per drive[1]	60 GB	40 GB	30 GB
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	99 g	99 g	99g
Interface type	ATA-5	ATA-5	ATA-5
Transfer rate			
Synchronous (maximum)	100 MB/ sec	100 MB/ sec	100 MB/ sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	2.5 ms
Average	13 ms	13 ms	12 ms
Maximum	24 ms	24 ms	23 ms
Logical blocks[2]	117,210,240	78,140,160	58,605,120
Disk rotational speed	5400 rpm	5400 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)

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

[2]Actual drive specifications may differ slightly.

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

Table 6-5
External AC Adapter

Weight	0.29 kg	0.65 lb
Power supply		
Operating voltage	90 to 264 VAC RMS	
Operating current	1.6 A RMS	
Operating frequency range	47 to 63 Hz AC	
Maximum transient	4/50 kV	

Table 6-6
Primary 6-Cell, Li-Ion Battery Pack

Dimensions		
Height	1.90 cm	0.75 in
Width	7.60 cm	3.00 in
Depth	14.70 cm	5.80 in
Weight	0.34 kg	0.75 lb
Energy		
Voltage	11.1 V	
Amp-hour capacity	3.6 Ah	
Watt-hour capacity	48 Wh	
Temperature		
Operating	5°C to 45°C	41°F to 113°F
Nonoperating	0°C to 60°C	32°F to 140°F
Recharge time		
System in off mode or Standby	2 to 3 hours	
System on (depending on system power consumption)	3 to 5 hours	

Table 6-7
Optional High-Capacity 8-Cell, Li-Ion Battery Pack

Dimensions		
Height	1.90 cm	0.75 in
Width	7.60 cm	3.00 in
Depth	14.70 cm	5.80 in
Weight	0.43 kg	0.94 lb
Energy		
Voltage	14.1 V	
Amp-hour capacity	4.4 Ah	
Watt-hour capacity	63 Wh	
Temperature		
Operating	5°C to 45°C	41°F to 113°F
Nonoperating	0°C to 60°C	32°F to 140°F
Recharge time		
System in off mode or Standby	2 to 3 hours	
System on (depending on system power consumption)	3 to 5 hours	

Table 6-8
Optional MultiBay 8-Cell, Li-Ion Battery Pack

Dimensions		
Height	1.30 cm	0.50 in
Width	13.20 cm	5.20 in
Depth	13.90 cm	5.45 in
Weight	0.39 kg	0.86 lb
Energy		
Voltage	14.8 V	
Amp-hour capacity	3.6 Ah	
Watt-hour capacity	52 Wh	
Temperature		
Operating	5°C to 45°C	41°F to 113°F
Nonoperating	0°C to 60°C	32°F to 140°F
Recharge time		
System in off mode or Standby	2 to 3 hours	
System on (depending on system power consumption)	3 to 5 hours	

Table 6-9
24X DVD/CD-RW Combo Drive and 24X CD-ROM Drive

Applicable disc	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
Disc diameter		
Standard disc	12 cm	4.72 in
Mini disc	8 cm	3.15 in
Disc thickness	1.2 mm	0.047 in
Track pitch	0.74 µm	
Access time		
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 and DVD+RW/R and CD-RW Combo Drive

Applicable disc	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
Disc diameter		
Standard disc	12 cm	4.72 in
Mini disc	8 cm	3.15 in
Disc thickness	1.2 mm	0.047 in
Track pitch	0.74 µm	
Access time		
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
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 6-12
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 6-13
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 6-13
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

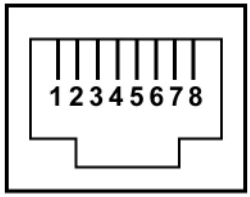
Table 6-13
System I/O Addresses *(Continued)*

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)

A

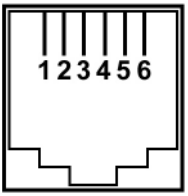
Connector Pin Assignments

Table A-1
RJ-45 Network Interface



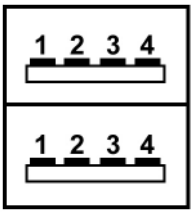
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

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

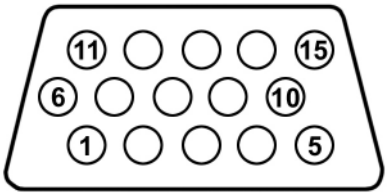


Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data –	4	Ground

Table A-4
S-Video

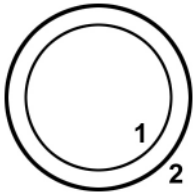
Pin	Signal	Pin	Signal
1	Ground (Y)	3	Y-Luminance (Intensity)
2	Ground (C)	4	C-Chrominance (Color)

Table A-5
External Monitor



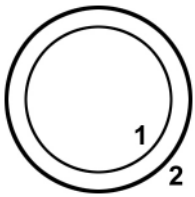
Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table A-6
Audio Line-Out



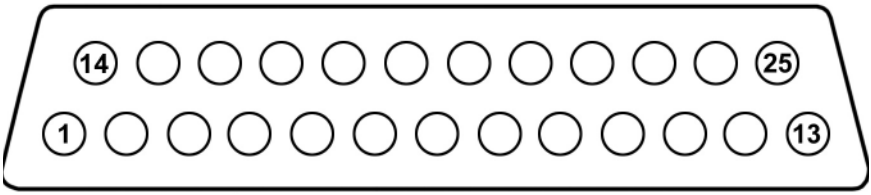
Pin	Signal	Pin	Signal
1	Audio out	2	Ground

Table A-7
Microphone



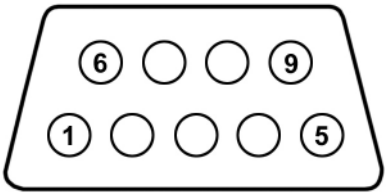
Pin	Signal	Pin	Signal
1	Audio in	2	Ground

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 paper
4	Data bit 2	17	Select in
5	Data bit 3	18	Ground
6	Data bit 4	19	Ground
7	Data bit 5	20	Ground
8	Data bit 6	21	+5VS
9	Data bit 7	22	PTF
10	Acknowledge	23	EXTFDD_VCC (+5V)
11	Busy	24	Ground
12	Paper end	25	Ground
13	Select		

Table A-9
Serial



Pin	Signal	Pin	Signal
1	Carrier detect	6	Data set ready
2	Receive data	7	Ready to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

B

Power Cord Requirements

3-Conductor Power Cord

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 included with the notebook meets the requirements for use in the country where the equipment is purchased.

Power cords for use in other countries must meet the requirements of the country where the notebook is used. For more information on power cord requirements, contact an HP authorized reseller or service provider.

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord must be at least 1.5 meters (5.00 feet) and a maximum of 2.0 meters (6.50 feet).
- All power cords must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord 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 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 Requirements *(Continued)*

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

Notes

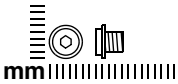
1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, 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 344412-001.

Table C-1
Torx T5M3.0×4.0 Screw

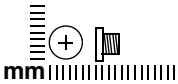


Color	Qty.	Length	Thread	Head Width
Silver	2	4.0 mm	3.0 mm	5.0 mm

Where used:

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

Table C-2
Phillips PM3.0×3.5 Screw

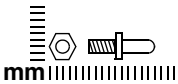


Color	Qty.	Length	Thread	Head Width
Silver	2	3.5 mm	3.0 mm	5.0 mm

Where used:

❷ Two screws that secure the hard drive frame to the hard drive (documented in Section 5.3)

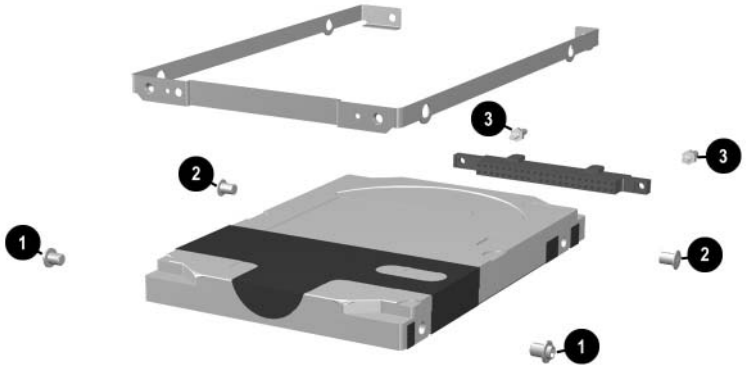
Table C-3
Hex M2.0×10.0 Alignment Pin



Color	Qty.	Length	Thread	Head Width
Silver	2	10.0 mm	2.0 mm	4.0 mm

Where used:

❸ Two alignment pins that secure the hard drive frame and connector to the hard drive (documented in Section 5.3)



Torx T5M3.0×4.0 Screw, Phillips PM3.0×3.5 Screw, and Hex M2.0×10.0 Alignment Pin Locations

Table C-4
Phillips PM3.0×4.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	1	4.0 mm	3.0 mm	4.0 mm

Where used:
One screw that secures the hard drive to the notebook (documented in Section 5.3)

Phillips PM3.0×4.0 Screw Location

Table C-5
Torx T8M2.5×5.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	4.0 mm

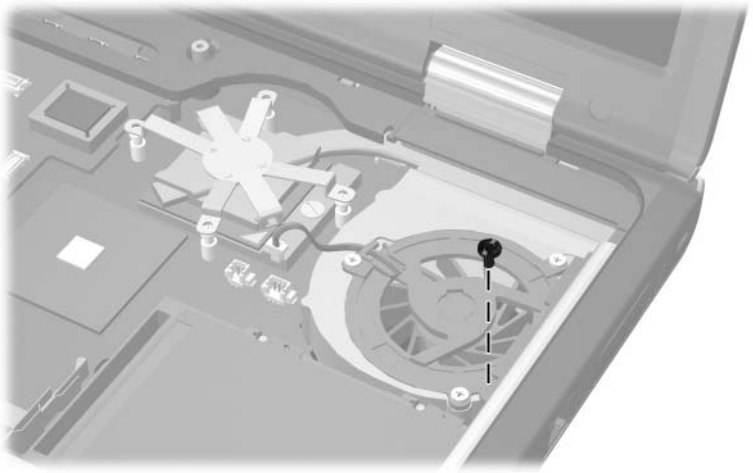
Where used:
One screw that secures the hard drive cover to the notebook (documented in Section 5.3)

Torx T8M2.5×5.0 Screw Location

Table C-5
Torx T8M2.5×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	4.0 mm

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

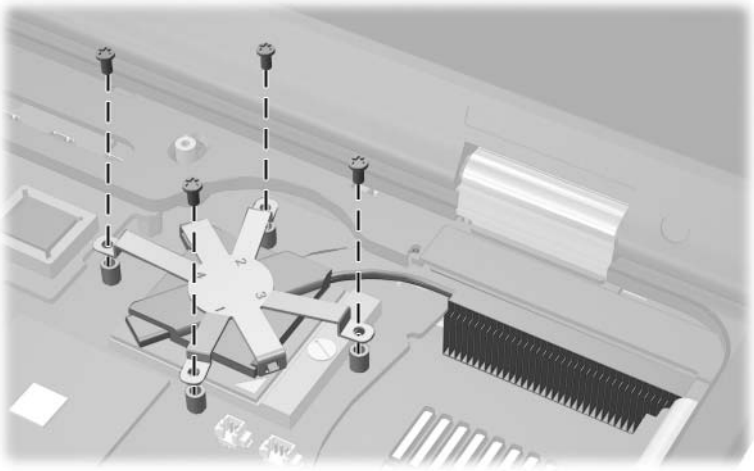


Torx T8M2.5×5.0 Screw Location

Table C-5
Torx T8M2.5×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	4.0 mm

Where used:
Four screws that secure the heat sink to the notebook (documented in Section 5.16)



Torx T8M2.5×5.0 Screw Locations

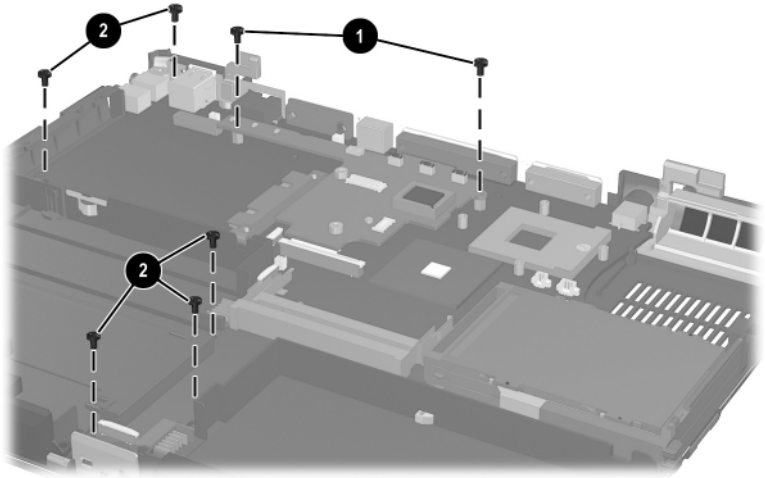
Table C-5
Torx T8M2.5×5.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	13	5.0 mm	2.5 mm	4.0 mm

Where used:

❶ Two screws that secure the button board to the notebook (documented in Section 5.22)

❷ Five screws that secure the system board to the notebook (documented in Section 5.23)



Torx T8M2.5×5.0 Screw Locations

Table C-6
Phillips PM2.5×3.5 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	3	3.5 mm	2.5 mm	4.0 mm

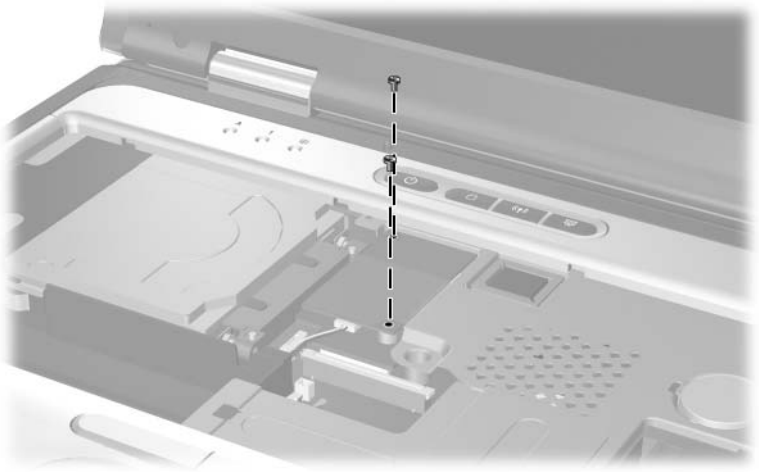
Where used:
One screw that secures the Mini PCI compartment cover to the notebook (documented in Section 5.5)

Phillips M2.5×3.5 Screw Location

Table C-6
Phillips PM2.5×3.5 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	3	3.5 mm	2.5 mm	4.0 mm

Where used:
Two screws that secure the modem board to the notebook (documented in Section 5.10)

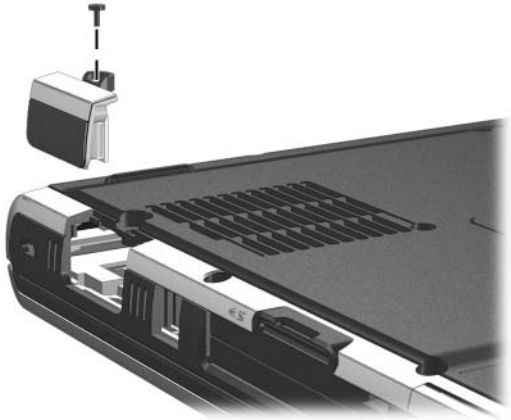


Phillips PM2.5×3.5 Screw Locations

Table C-7
Phillips PM2.0×5.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	1	5.0 mm	2.0 mm	4.0 mm

Where used:
One screw that secures the Bluetooth cover to the notebook (documented in Section 5.7)

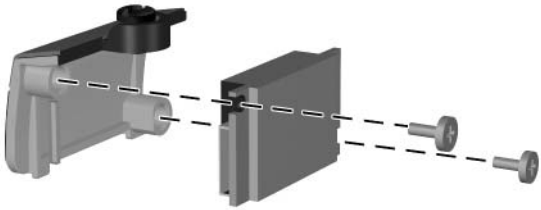


Phillips PM2.0×5.0 Screw Locations

Table C-8
Phillips PM1.5×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	5	3.0 mm	1.5 mm	3.5 mm

Where used:
Two screws that secure the Bluetooth board to the Bluetooth cover (documented in Section 5.7)

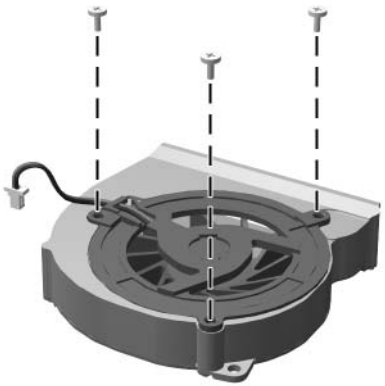


Phillips PM1.5×3.0 Screw Locations

Table C-8
Phillips PM1.5×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	5	3.0 mm	1.5 mm	3.5 mm

Where used:
Three screws that secure the fan to the fan housing (documented in Section 5.15)



Phillips PM1.5×3.0 Screw Locations

Table C-9
Torx T8M2.5×11.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	11.0 mm	2.5 mm	5.0 mm

Where used:
Two screws that secure the keyboard to the notebook (documented in Section 5.9)

Torx T8M2.5×11.0 Screw Locations

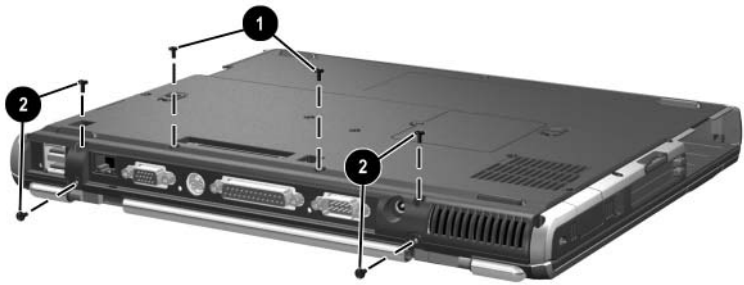
Table C-10
Torx T8M2.5×9.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	9.0 mm	2.5 mm	5.0 mm

Where used:

❶ Two screws that secure the switch cover to the notebook (documented in Section 5.12)

❷ Four screws that secure the display assembly to the notebook (documented in Section 5.18)

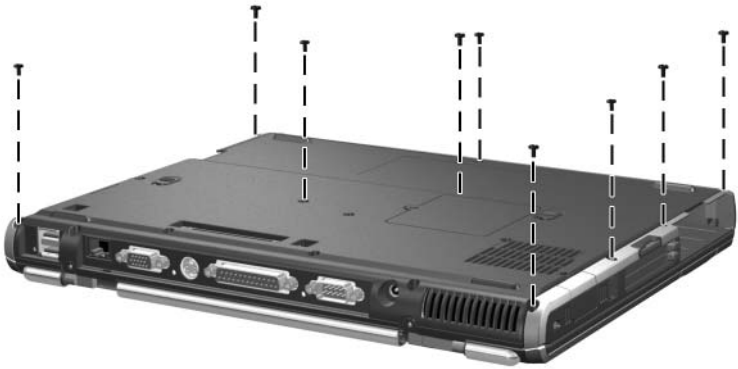


Torx T8M2.5×9.0 Screw Locations

Table C-10
Torx T8M2.5×9.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	9.0 mm	2.5 mm	5.0 mm

Where used:
Nine screws that secure the top cover to the notebook (documented in Section 5.19)

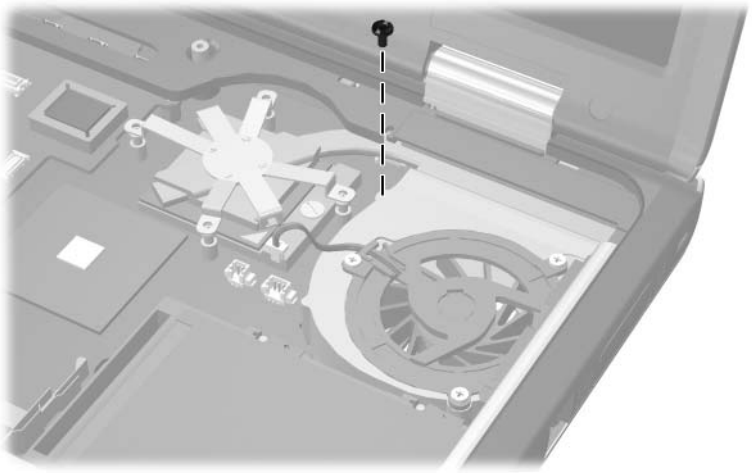


Torx T8M2.5×9.0 Screw Locations

Table C-11
Torx T8M2.5×7.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	1	7.0 mm	2.5 mm	5.0 mm

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



Torx T8M2.5×7.0 Screw Locations

Table C-12
Phillips M2.0×3.5 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	5	3.5 mm	2.5 mm	4.0 mm

Where used:
Five screws that secure the top cover to the notebook (three in the MultiBay, two in the hard drive bay; documented in Section 5.6)

Phillips M2.0×3.5 Screw Locations

Table C-13
Torx T8M2.5×5.5 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	5.5 mm	2.5 mm	5.0 mm

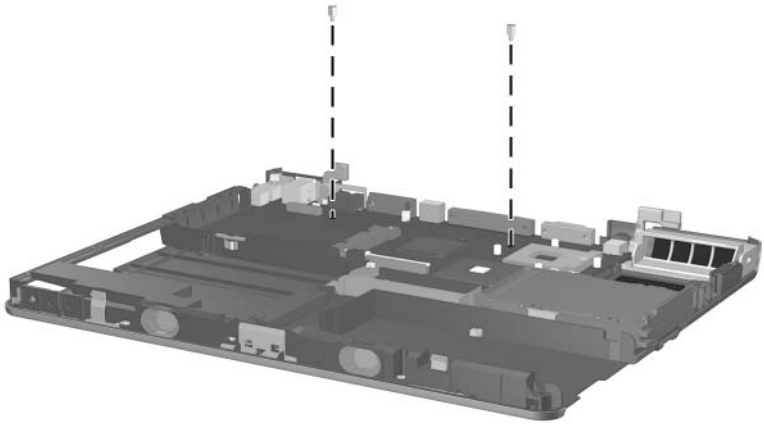
Where used:
Two screws that secure the top cover to the notebook (documented in Section 5.19)

Torx T8M2.5×5.5 Screw Locations

Table C-14
Hex M2.5×9.0 Standoffs

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

Where used:
Two standoffs that secure the system board to the notebook (documented in Section 5.23)

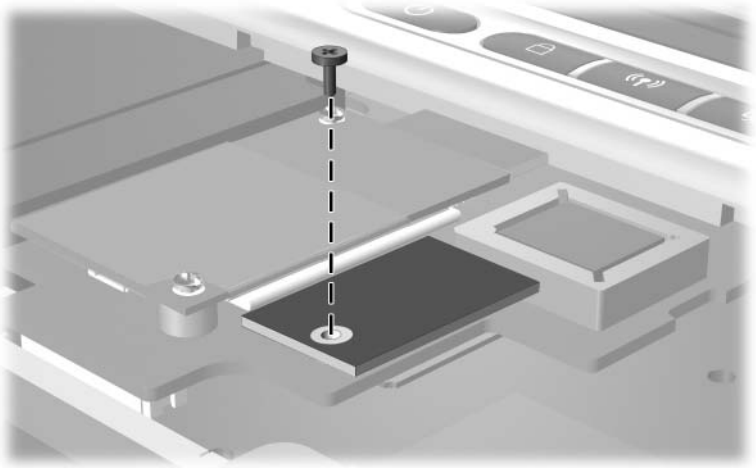


Hex M2.5×9.0 Standoff Locations

Table C-15
Phillips M3.5×3.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	1	3.0 mm	2.0 mm	3.5 mm

Where used:
One screw that secures the security card to the system board (documented in Section 5.14)



Phillips M3.5×3.0 Screw Location

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