Maintenance and Service Guide

HP Compaq Business Notebook nc4010

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

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1

Product Description

The HP Compaq Notebook nc4010 Series of personal notebooks offer advanced modularity, Intel® Pentium®-M processors with 64-bit architecture, industry-leading Accelerated Graphics Port (AGP) implementation, and extensive multimedia support.

HP Compaq Notebook nc4010 Series

1.1 Models

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

Table 1-1
HP Compaq Notebook nc4010
Model Naming Conventions

Key									
Cnc4010	UP	160	X2	60	N	G	T	51	P
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Key	Description	Options	
1	Brand/Series designator	C = Compaq	nc4010 = nc4010
2	Processor type	UP = Intel Pentium-M	
3	Processor speed	170 = 1.7 GHz 160 = 1.6 GHz 150 = 1.5 GHz	140 = 1.4 GHz 130 = 1.3 GHz
4	Display type/ size/resolution	X = XGA (1024 × 768)	2 = 12.x in
5	Hard drive size	80 = 80 GB 60 = 60 GB	40 = 40 GB 30 = 30 GB

Table 1-1
HP Compaq Notebook nc4010
Model Naming Conventions *(Continued)*

6	Optical drive designator	N = None	
7	Integrated communication/ wireless device	G = Combination modem and GB NIC	i = 802.11b + Bluetooth® j = 802.11g + Bluetooth k = 802.11a/b + Bluetooth m = 802.11a/b/g + Bluetooth p = Bluetooth N = none
8	TPM Security Module	T = included	
9	RAM	51 = 512 MB	25 = 256 MB
10	Operating system	P = Microsoft® Windows® XP Pro	

Table 1-2
HP Compaq Notebook nc4010 Models

All HP Compaq Notebook nc4010 models feature:
- Dual-point pointing device (TouchPad and pointing stick)
- 6-cell, 4.0-wH lithium ion (Li-Ion) battery pack
- 3-year warranty on parts and labor

Cnc4010	UP	160	X2	40	N	Gm	25	P	
Korea	PB694PA AB1								
Cnc4010	UP	170	X2	60	N	Gi	T	51	P
United States	PA742AA ABA								
Cnc4010	UP	170	X2	60	N	Gm	51	P	
French Canada	PA741AA ABC			United States			PA741AA ABA		
Cnc4010	UP	160	X2	40	N	GN	51	P	
French Canada	DV103U ABC			United States			DV103U ABA		
Cnc4010	UP	170	X2	60	N	Gi	T	51	P
United States	DY888AA ABA								
Cnc4010	UP	150	X2	30	N	Gp	25	P	
Saudi Arabia	DY886AA ABV								
Cnc4010	UP	170	X2	60	N	Gm	T	51	P
French Canada	DY884AA ABC			United States			DY884AA ABA		
Cnc4010	UP	160	X2	40	N	Gk	51	P	
Saudi Arabia	DY883AA ABV								
Cnc4010	UP	150	X2	30	N	GN	25	P	
Australia	DY887AA ABG			Korea			DY887AA AB1		
Hong Kong	DY887AA AB5			People's			DY887AA AB2		
India	DY887AA ACJ			Republic of China					
France	DG989A ABF								
Japan	DY887AA ABJ			Taiwan			DY887AA AB0		
Japan (English)	DY887AA ACF			Thailand			DY887AA AKL		

Table 1-2
HP Compaq Notebook nc4010 Models *(Continued)*

Cnc4010	UP	150	X2	30	N	Gp	25	P	
Belgium	DY886AA UUG			The Netherlands			DY886AA ABH		
Czech Republic	DY886AA AKB			Norway			DY886AA ABN		
Denmark	DY886AA ABY			Poland			DY886AA AKD		
Europe	DY886AA ABB			Portugal			DY886AA AB9		
France	DY886AA ABF			Russia			DY886AA ACB		
Germany	DY886AA ABD			Slovenia			DY866AA AKN		
Greece	DY866AA AB7			Spain			DY886AA ABE		
Hungary	DY886AA AKC			Sweden/Finland			DY886AA AK8		
Iceland	DY886AA A2M			Switzerland			DY886AA UUZ		
Israel	DY886AA ABT			Turkey			DY886AA AB8		
Italy	DY886AA ABZ			United Kingdom			DY886AA ABU		

Cnc4010	UP	160	X2	40	N	Gk	51	P	
Belgium	DY883AA UUG			Norway			DY883AA ABN		
Czech Republic	DY883AA AKB			Poland			DY883AA AKD		
Denmark	DY883AA ABY			Portugal			DY883AA AB9		
Europe	DY883AA ABB			Russia			DY883AA ACB		
France	DY883AA ABF			Slovenia			DY883AA AKN		
Germany	DY883AA ABD			Spain			DY883AA ABE		
Greece	DY883AA AB7			Sweden/Finland			DY883AA AK8		
Iceland	DY883AA A2M			Switzerland			DY883AA UUZ		
Israel	DY883AA ABT			Turkey			DY883AA AB8		
Italy	DY883AA ABZ			United Kingdom			DY883AA ABU		
The Netherlands	DY883AA ABH								

Table 1-2
HP Compaq Notebook nc4010 Models *(Continued)*

Cnc4010	UP	160	X2	40	N	Gm	51	P	
United States	DY882AA ABA								
Cnc4010	UP	160	X2	40	N	GN	51	P	

Asia Pacific	DY881AA UUF	Latin America	DY881AA ABM
Australia	DY881AA ABG	The Netherlands	DY881AA ABH
Belgium	DY881AA UUG	Norway	DY881AA ABN
Brazil	DY881AA AC4	People's	DY881AA AB2
Czech Republic	DY881AA AKB	Republic of	
Denmark	DY881AA ABY	China	
Europe	DY881AA ABB	Poland	DY881AA DKD
France	DY881AA ABF	Portugal	DY881AA AB9
French Canada	DY881AA ABC	Russia	DY881AA ACB
Germany	DY881AA ABD	Saudi Arabia	DY881AA ABV
Greece	DY881AA AB7	Slovenia	DY881AA AKN
Hong Kong	DY881AA AB5	Spain	DY881AA ABE
Hungary	DY881AA AKC	Sweden/Finland	DY881AA AK8
Iceland	DY881AA A2M	Switzerland	DY881AA UUZ
India	DY881AA ACJ	Taiwan	DY881AA AB0
Israel	DY881AA ABT	Thailand	DY881AA AKL
Italy	DY881AA ABZ	Turkey	DY881AA AB9
Japan	DY881AA ABJ	United Kingdom	DY881AA ABU
Japan (English)	DY881AA ACF	United States	DY881AA ABA
Korea	DY881AA AB1		

1.2 **Features**

- Intel Pentium-M 1.7-, 1.6-, 1.5-, 1.4-, or 1.3-GHz processor with 400-MHz processor side bus and 1024-KB L2 cache, varying by notebook model

- 12.1-inch XGA (1024 × 768) TFT display with over 16.7 million colors, varying by notebook model

- ATI MOBILITY RADEON graphics with user selectable 32- or 64-MB DDR synchronous DRAM (SDRAM)

- 80-, 60-, 40-, or 30-GB high-capacity hard drive, varying by notebook model

- 256-MB high-performance SDRAM, expandable to 1.0 GB

- Microsoft® Windows® XP Pro, varying by notebook model

- Full-size Windows 98 keyboard with dual-point (TouchPad and pointing stick) pointing device

- 56-Kbps V.92 modem integrated on the system board

- Integrated Secure Digital (SD) slot

- Integrated wireless support of 802.11a/b/g and Bluetooth® devices

- Integrated support for ISDN

- Support for Trusted Platform Module (TPM) based security [Also called Trusted Computing Group (TCG) module]

- Support for one Type I or II PC Card slot with support for both 32-bit (CardBus) and 16-bit PC Cards

- Support for integrated Smart Card Reader in the PC Card slot

- External 65-W AC adapter with power cord

- 6-cell Li-Ion battery pack

- PremierSound 16-bit sound

- ■ Support for the following drives through the optional Advanced or Common Port Replicators or the USB MultiBay cradle:
  - ❏ 1.44-MB Diskette Drive
  - ❏ 24X Max CD-ROM Drive
  - ❏ 8X Max CD-RW Drive
  - ❏ 8X Max DVD-ROM Drive
  - ❏ 8X Max DVD/CD-RW Combo Drive
- ■ Slots
  - ❏ One Type II PC Card
  - ❏ Secure Digital (SD)
- ■ Jacks
  - ❏ Microphone in
  - ❏ RJ-11 (modem)
  - ❏ RJ-45 (NIC)
- ■ Ports
  - ❏ Infrared
- ■ Connectors
  - ❏ External monitor
  - ❏ DC power
  - ❏ S-Video TV-out
  - ❏ Docking
  - ❏ Travel battery
  - ❏ USB

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 Chapter 5, in section "Preparing the Notebook for Disassembly" for more information).

2. Remove the real time clock (RTC) battery (refer to Chapter 5, in section " 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 are cleared.

1.4 **Power Management**

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

■ Standby

■ Hibernation

■ Setting customization by the user

■ Hotkeys for setting level of performance

■ Battery calibration

■ Display lid switch standby/resume

■ Power/standby button

■ Advanced Configuration and Power Management (ACP) compliance

1.5 **External Components**

The external components on the front and right side of the notebook are shown below and described in Table 1-3.
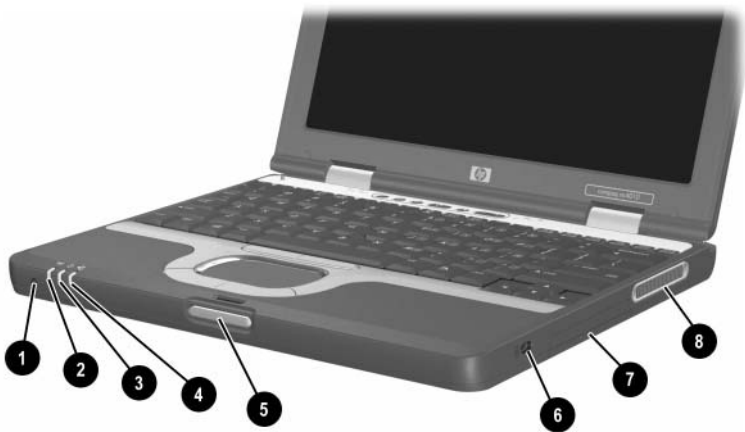
Front and Right-Side Components

Table 1-3
Front and Right-Side Components

Item	Component	Function
1	Microphone jack	Inputs single-channel sound.
2	Wireless light	On: The Mini PCI wireless LAN card and/or Bluetooth are on.
		Off: The Mini PCI wireless LAN card and Bluetooth are off.
3	Power/standby light	On: Power is turned on.
		Blinking: Notebook is in Standby.

Table 1-3
Front and Right-Side Components *(Continued)*

Item	Component	Function
4	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.
5	Display release latch	Opens the notebook.
6	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.
7	Hard drive bay	Holds the primary hard drive.
8	Exhaust vent	Enables airflow to cool internal components.
		⚠ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing can block airflow.

The notebook rear and left-side components are shown below and described in Table 1-4.
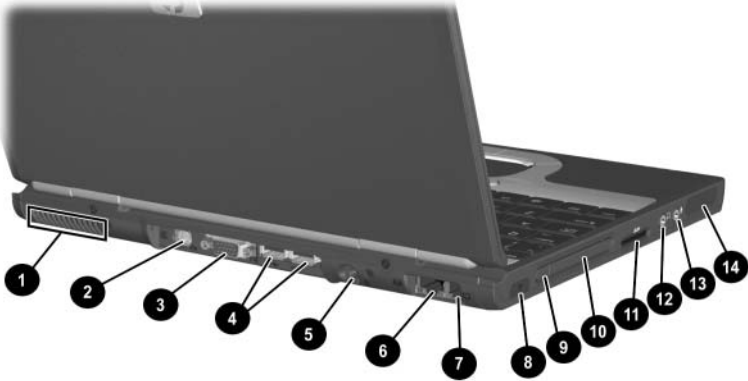
Rear and Left-Side Components

Table 1-4
Rear and Left-Side Components

Item	Component	Function
1	Exhaust vent	Enables airflow to cool internal components.
		⚠ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing can block airflow.
2	S-Video-out connector	Connects an optional S-Video device, such as a television, VCR, camcorder, overhead projector, or video capture card.
3	External monitor connector	Connects an optional external monitor or overhead projector.

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

Item	Component	Function
4	USB connectors (2)	Connect USB 1.1- and 2.0-compliant devices to the notebook using a standard USB cable.
		The right connector also functions as a self-powered USB connector and allows an optional External MultiBay to be connected to the notebook using the External MultiBay-Powered USB cable.
5	DC power connector	Connects an AC adapter or an optional Automobile power adapter/charger, aircraft power adapter, or DC cable.
6	RJ-45 network jack	Connects a network cable.
7	RJ-11 modem jack	Connects a modem cable.
8	Infrared port	Links another IrDA-compliant device for wireless communication.
9	PC Card eject button	Ejects an optional PC Card from the PC Card slot.
10	PC Card slot	Supports optional Type I or Type II 32-bit (CardBus) or 16-bit PC Cards. The PC Card slot also supports an optional Smart Card Reader.
11	Secure Digital (SD) slot	Supports SD Memory Cards and MultiMedia Cards.
12	Audio line-out jack	Connects optional powered stereo speakers, headphones, headset, or television audio.
13	Microphone input jack	Connects an optional monaural microphone.
14	Speaker	Produces system sound.

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	On: Caps lock is on.
3	**F1** through **F12** function keys	Execute frequently used system functions when pressed in combination with the **Fn** key.
4	**Num lock** key	On: Num lock is on and the internal keypad is enabled.

Table 1-5
Keyboard Components *(Continued)*

Item	Component	Function
5	Internal keypad	Converts keys to numeric keypad.
6	Cursor control keys	Move the cursor around the screen.
7	Windows applications key	Displays shortcut menu for items beneath the pointer.
8	Windows logo key	Displays the Windows Start menu.

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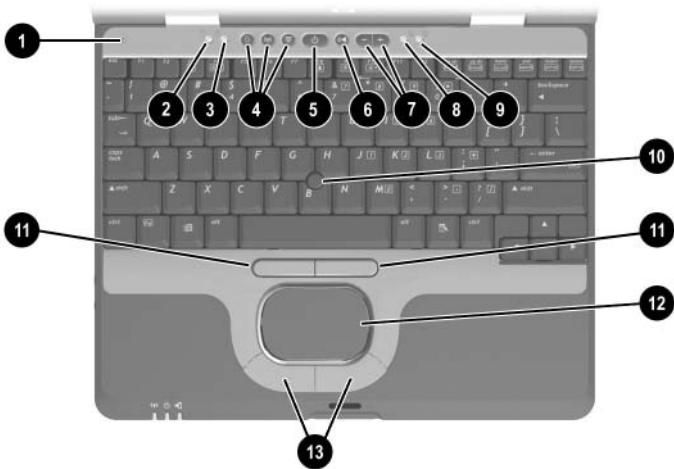
Top Components

Table 1-6
Top Components

Item	Component	Function
1	Display lid switch	Secures the display when it is closed.
2	Hard drive activity light	On: The hard drive is being accessed.
3	**Num lock** light	On: Num lock is on or the embedded numeric keypad is enabled.
4	Quick Launch buttons (3)	Enable you to access common functions with a single keystroke.

Table 1-6
Top Components *(Continued)*

Item	Component	Function
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	Mute button	Mutes system volume.
7	Volume buttons (2)	Adjust the system volume.
8	Caps lock light	On: Caps lock is on.
9	Scroll lock light	On: Scroll lock is on.
10	Pointing stick	Moves the pointer and selects or activates items on the screen.
11	Pointing stick buttons	Function like the left and right buttons on an external mouse.
12	TouchPad	Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling and double-clicking.
13	TouchPad buttons	Function like the left and right buttons on an external mouse.

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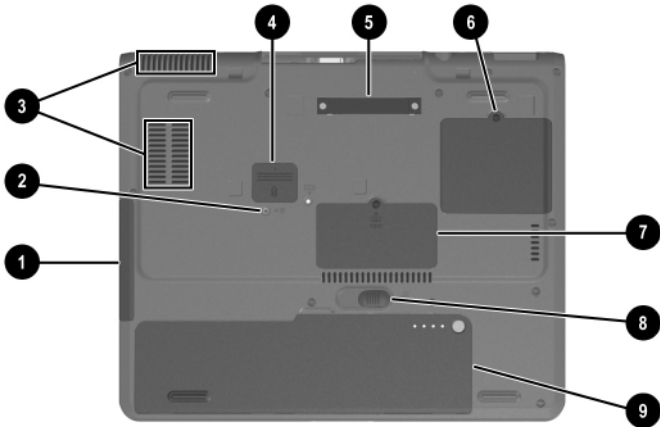
Bottom Components

Table 1-7
Bottom Components

Item	Component	Function
1	Hard drive bay	Supports the primary hard drive. The hard drive is secured to the notebook by one screw.
2	Hard drive retention screw	Secures the hard drive to the notebook.

Table 1-7
Bottom Components *(Continued)*

Item	Component	Function
3	Intake vents	Enable airflow to cool internal components.
		△ To prevent overheating, do not obstruct vents. Using the notebook on a soft surface, such as a pillow, blanket, rug, or thick clothing can block airflow.
4	Travel battery connector	Connects the optional travel battery bay. The travel battery connector has a plastic cover that must be opened before connecting the travel battery bay.
5	Docking connector	Connects the notebook to an optional port replicator.
6	Mini PCI compartment	Holds an optional wireless LAN or ISDN device.
		△ To prevent your notebook from operating improperly and a warning message from being displayed, install only an authorized Mini PCI device in your notebook. The FCC does not allow unauthorized Mini PCI devices to be used in this notebook. If a warning message is displayed after you install a Mini PCI device, remove the device and contact your HP Customer Care Center.

Table 1-7
Bottom Components *(Continued)*

Item	Component	Function
7	Memory expansion compartment	Contains 1 memory expansion slot for optional memory modules.
8	Battery release latch	Releases the primary battery pack from the battery bay.
9	Battery bay	Holds the primary battery pack.

1.6 **Design Overview**

This section presents a design overview of key parts and features of the notebook. Refer to Chapter 3, "Illustrated Parts Catalog," to identify replacement parts, and Chapter 5, "Removal and Replacement Procedures," for disassembly steps. The system board provides the following device connections:

■ Memory module

■ Hard drive

■ Display

■ Keyboard, TouchPad, and pointing stick

■ Audio

■ Intel Pentium-M processors

■ Fan

■ PC Card

■ Smart Card Reader

■ Modem, NIC, ISDN, and wireless devices

■ TPM security module

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

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

2

Troubleshooting

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

2.1 Computer Setup and Diagnostics Utilities

The notebook features two system management utilities:

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

Begin troubleshooting.

Is there power?
N → Go to "Flowchart 2.2—No Power, Part 1"
Y ↓

Beeps, LEDs, or error messages?
N → Check LED board, speaker connections.
Y ↓

All drives working?
N → Go to "Flowchart 2.17—Nonfunctioning Device"
Y ↓

Is there video? (no boot)
N → Go to "Flowchart 2.6—No Video, Part 1"
Y ↓

Keyboard/ pointing device working?
N → Go to "Flowchart 2.18—Nonfunctioning Keyboard" or "Flowchart 2.19—Nonfunctioning Pointing Device"
Y ↓

Is the OS loading?
N → Go to "Flowchart 2.9—No Operating System (OS) Loading"
Y ↓

Connecting to network or modem?
N → Go to "Flowchart 2.20—No Network/Modem Connection"
Y ↓

Is there sound?
N → Go to "Flowchart 2.15—No Audio, Part 1"
Y ↓

End

Flowchart 2.2—No Power, Part 1

No power
(power LED
is off).

↓

Remove from
Port Replicator
(if applicable).

↓

Power up
on battery
power? — N → *Reset power. → Power up on battery power? — N → Go to "Flowchart 2.3—No Power, Part 2"

Y ↓   Y ↓

Power up
on AC
power? — N → *Reset power. → Power up on AC power? — N → Go to "Flowchart 2.4—No Power, Part 3"

Y ↓   Y ↓

Power up in
Port
Replicator? — Y → Done

N ↓

1. Reseat the power cables in the Port Replicator and at the AC outlet.
2. Ensure that the AC power source is active.
3. Ensure that the power strip is working.

↓

Done ← Y — Power up in Port Replicator? — N → Go to "Flowchart 2.8—Nonfunctioning Port Replicator (if applicable)"

*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

```
┌─────────────────────┐
│   Continued from    │
│ "Flowchart 2.2—No   │
│   Power, Part 1"    │
└─────────────────────┘
           │
           ▼
┌─────────────────────┐
│ Visually check for  │
│  debris in battery  │
│  socket and clean   │
│   if necessary.     │
└─────────────────────┘
           │
           ▼          Y
      ◇ Power on? ────────►  ┌──────────┐
           │                 │   Done   │
          N│                 └──────────┘
           ▼
┌─────────────────────┐
│ Check battery by    │
│   recharging it,    │
│    moving it to     │
│ another notebook,   │
│  or replacing it.   │
└─────────────────────┘
           │
           ▼          N       ┌──────────────┐
      ◇ Power on? ──────────► │   Replace    │
           │                  │ power supply │
          Y│                  │(if applicable)│
           ▼                  └──────────────┘
     ┌──────────┐                    │
     │   Done   │                    ▼           N    ┌──────────────────┐
     └──────────┘               ◇ Power on? ─────────►│     Go to        │
                                      │                │"Flowchart 2.4—No │
                                     Y│                │ Power, Part 3"   │
                                      ▼                └──────────────────┘
                                ┌──────────┐
                                │   Done   │
                                └──────────┘
```

Flowchart 2.4—No Power, Part 3

Continued from
"Flowchart 2.3—No
Power, Part 2"

↓

Plug directly
into AC outlet.

↓

Power LED
on? → **Y** → Done

↓ **N**

Reseat AC adapter
in notebook and
at power source.

↓

Power on? → **Y** → Done

↓ **N**

Power outlet
active? → **N** → Try different
outlet.

↓ **Y**

Replace
power cord.

↓

Power on? → **Y** → Done

↓ **N**

Internal or
external AC
adapter? → **External** → Replace external
AC adapter.

↓ **Internal**

Go to
"Flowchart 2.5—No
Power, Part 4"

Power on? ← **N**

↓ **Y**

Done

Flowchart 2.5—No Power, Part 4

```
┌─────────────────────┐
│   Continued from    │
│ "Flowchart 2.4—No   │
│    Power, Part 3"   │
└─────────────────────┘
           │
           ▼
   ┌───────────────┐
   │     Open      │
   │   notebook.   │
   └───────────────┘
           │
           ▼
                         Y
        ◇                    ┌─────────────────┐
    Loose or                 │  Reseat loose   │
    damaged     ───────────► │ components and  │
     parts?                  │   boards and    │
        ◇                    │ replace damaged │
           │                 │     items.      │
         N │                 └─────────────────┘
           ▼
   ┌───────────────┐
   │     Close     │
   │  notebook and │
   │    retest.    │
   └───────────────┘
           │
           ▼
                 N
        ◇           ┌──────────────────────────────────────────┐
                    │ Replace the following items (if applicable) in the │
   Power on? ─────► │ order given. Check notebook operation after each  │
        ◇           │ of the following two replacement steps:           │
           │        │                                                  │
         Y │        │ 1. Internal DC-DC converter, processor, and      │
           ▼        │    system board*                                 │
   ┌───────────┐    │                                                  │
   │           │    │ 2. Internal AC adapter                           │
   │   Done    │    │                                                  │
   │           │    │ *NOTE: Replace these items as a set to prevent   │
   └───────────┘    │ shorting out among components.                   │
                    └──────────────────────────────────────────┘
```

Flowchart 2.6—No Video, Part 1

No video.

Stand-alone or Port Replicator?

Port Replicator → Go to "Flowchart 2.7—No Video, Part 2"

*NOTE: To change from internal to external display, use the hotkey combination.

Stand-alone

Internal or external display*?

Internal → Adjust brightness.

Video OK? — Y → Done

N

Press lid switch to ensure operation.

Video OK? — Y → Done

N

External

Adjust brightness.

A

Video OK? — Y → Done

N

Check for bent pins on cable.

Replace the following one at a time. Test after each replacement.
1. Cable between notebook and notebook display (if applicable)
2. Inverter board (if applicable)
3. Display
4. System board

Video OK? — N → Try another display.

Internal and external video OK? — N → Replace system board.

Y

Done

Y

Done

Flowchart 2.7—No Video, Part 2

```
Continued from
"Flowchart 2.6—No
Video, Part 1"
```
↓
```
Remove
notebook from Port
Replicator,
if connected.
```
↓
```
Adjust
display
brightness.
```
↓

N

```
Video OK?
```
→
```
Go to "A" in
"Flowchart 2.6—No
Video, Part 1"
```

Y
↓
```
Verify that notebook is properly
seated in Port Replicator, and check for
bent pins on cable and for secure
monitor connection.
```
↓

Y

```
Video OK?
```
→
```
Done
```

N
↓
```
Adjust external
monitor display.
```

```
Check brightness
of external
monitor.
```
↓

Y

```
Video OK?
```
→
```
Done
```

N
↓
```
Try another
external
monitor.
```
↓

Y

```
Internal
and external
video OK?
```
→
```
Done
```

N
↓
```
Go to
"Flowchart
2.8—Nonfunctioning
Port Replicator (if
applicable)"
```

Flowchart 2.8—Nonfunctioning Port Replicator (if applicable)

```
┌──────────────┐
│ Nonfunctioning│
│ Port Replicator.│
└──────┬───────┘
       │
       ▼
┌──────────────┐
│ Reseat power │
│ cord in Port │
│ Replicator and│
│ power outlet.│
└──────┬───────┘
```

Nonfunctioning Port Replicator.

Reseat power cord in Port Replicator and power outlet.

Check voltage setting on Port Replicator.

Reseat monitor cable connector at Port Replicator.

Port Replicator operating?

Y — Done

N

Remove notebook, reseat all internal parts, and replace any damaged items in Port Replicator.

Reinstall notebook into Port Replicator.

Port Replicator operating?

Y — Done

N

Replace the following Port Replicator components one at a time. Check notebook operation after each replacement.

1. Power supply
2. I/O board
3. Backplane board
4. Switch box
5. Port Replicator motor mechanism

Flowchart 2.9—No Operating System (OS) Loading

```
┌─────────────┐
│   No OS     │
│  loading.*  │
└─────────────┘
       │
       ▼
┌─────────────┐
│Reseat power │
│cord in Port │
│Replicator and│
│power outlet.│
└─────────────┘
       │
       │      ┌──────────────────────────────────────────┐
       ├─────▶│ No OS loading from hard drive,           │
       │      │ go to "Flowchart 2.10—No OS Loading, Hard│
       │      │ Drive, Part 1"                           │
       │      └──────────────────────────────────────────┘
       │
       │      ┌──────────────────────────────────────────┐
       ├─────▶│ No OS loading from diskette drive,       │
       │      │ go to "Flowchart 2.13—No OS Loading,     │
       │      │ Diskette Drive"                          │
       │      └──────────────────────────────────────────┘
       │
       │      ┌──────────────────────────────────────────┐
       ├─────▶│ No OS loading from CD- or DVD-ROM drive, │
       │      │ go to "Flowchart 2.14—No OS Loading, CD- │
       │      │ or DVD-ROM Drive"                        │
       │      └──────────────────────────────────────────┘
       │
       │      ┌──────────────────────────────────────────┐
       └─────▶│ No OS loading from network,              │
              │ go to "Flowchart 2.20—No Network/Modem   │
              │ Connection"                              │
              └──────────────────────────────────────────┘
```

*__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

OS not loading from hard drive.

Nonsystem disk message?

Y → Go to "Flowchart 2.11—No OS Loading, Hard Drive, Part 2"

N

Reseat external hard drive.

OS loading?

Y → Done

N

Boot from CD?

N

Y

Check the Setup utility for correct booting order.

Boot from hard drive?

N

Y → Done

Boot from diskette?

N → Go to "Flowchart 2.13—No OS Loading, Diskette Drive"

Y

Change boot priority through the Setup utility and reboot.

Boot from hard drive?

N → Go to "Flowchart 2.17—Nonfunctioning Device"

Y

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

Continued from "Flowchart 2.10—No OS Loading, Hard Drive, Part 1"

CD or diskette in drive?

N →
1. Replace hard drive.
2. Replace system board.

Y ↓

Remove diskette and reboot.

Boot from hard drive?
Y → Done

N ↓

Boot from diskette drive?
N → Go to "Flowchart 2.13—No OS Loading, Diskette Drive"

Y ↓

Hard drive accessible?

Y ↓

Go to "Flowchart 2.12—No OS Loading, Hard Drive, Part 3"

Reseat hard drive.

Hard drive accessible?
Y → Done

N ↓

Run FDISK.

Hard drive partitioned?
N → Create partition, then format hard drive to bootable C:\ prompt.

Y ↓

Hard drive formatted?
N →

Y ↓

Format hard drive and bring to a bootable C:\ prompt.

Load OS using *System Restore* CD (if applicable).

Notebook booted?
Y → Done

N ↓

Go to "Flowchart 2.12—No OS Loading, Hard Drive, Part 3"

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

Continued from "Flowchart 2.11—No OS Loading, Hard Drive, Part 2"

N

System files on hard drive?

Install OS and reboot.

Y

Y

Virus on hard drive?

Clean virus.

OS loading from hard drive?

Y

Done

N

N

Run SCANDISK and check for bad sectors.

Diagnostics on diskette?

Y

Replace hard drive.

N

N

Can bad sectors be fixed?

Replace hard drive.

Run diagnostics and follow recommendations.

Y

Fix bad sectors.

Boot from hard drive?

N

Replace hard drive.

Y

Done

Flowchart 2.13—No OS Loading, Diskette Drive

```
OS not loading        Reseat              OS          Y      Done
from           →      diskette drive  →   loading?   →
diskette drive.                                       N
```

```
Nonsystem          Y      Bootable           N      Install bootable
disk message?     →       diskette          →       diskette and
                   N      in drive?          Y      reboot notebook.
```

```
Boot              N      Go to                    Check diskette
from another     →       "Flowchart               for system files.
device?          Y       2.17—Nonfunc-            Try different
                         tioning Device"          diskette.
```

```
Diskette          N      Enable drive             Nonsystem     Y     1. Replace diskette
drive enabled    →       and cold boot            disk error?  →         drive.
in the Setup             notebook.               N                    2. Replace system
utility?         Y                                                      board.
```

```
Is diskette       Y      Clear CMOS.              OS          Y     Done
drive boot       →       Refer to                 loading?   →
order                    Section "Clearing a     N
correct?         N       Password" for
                         instructions.
```

```
Change boot              Go to
priority using           "Flowchart
the Setup utility.       2.17—Nonfunc-
                         tioning Device"
```

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

Flowchart 2.15—No Audio, Part 1

```
┌──────────────┐     ┌──────────────┐            Y      ┌──────────────┐
│              │     │ Turn up audio│         ╱─────────▶│              │
│  No audio.   │────▶│ internally or│───▶◇ Audio? ◇      │    Done      │
│              │     │  externally. │      ╲            │              │
└──────────────┘     └──────────────┘       ╲N          └──────────────┘
```

```
        Y                                N
◇ Notebook in ◇──▶┌────────┐──▶◇ Internal ◇──────────▶┌──────────────────┐
│ Port Replicator│ │ Undock │   │  audio?  │           │    Go to         │
│ (if applicable)?│└────────┘    ◇        ◇            │ "Flowchart 2.16—No│
 ◇            ◇                      │Y                │  Audio, Part 2"   │
     │N                              ▼                 └──────────────────┘
     ▼
┌──────────────┐          ┌─────────────────────────────────────────────┐
│   Go to      │          │ Replace the following Port Replicator        │
│ "Flowchart   │          │ components one at a time, as applicable.     │
│ 2.16—No Audio,│          │ Check audio status after each change.        │
│   Part 2"    │          │                                              │
└──────────────┘          │ 1. Port Replicator audio cable               │
                          │ 2. Audio cable                               │
                          │ 3. Speaker                                   │
                          │ 4. Port Replicator audio board               │
                          │ 5. Backplane board                           │
                          │ 6. I/O board                                 │
                          └─────────────────────────────────────────────┘
```

```
┌──────────────┐                              Y      ┌──────────────┐
│   Go to      │◀──────────────◇ Audio? ◇─────────────▶│    Done      │
│ "Flowchart   │                ◇       ◇             │              │
│ 2.17—Nonfunc-│                    │N                └──────────────┘
│tioning Device"│
└──────────────┘
```

Flowchart 2.16—No Audio, Part 2

```
┌─────────────────────┐
│   Continued from    │
│ "Flowchart 2.15—No  │
│    Audio, Part 1"   │
└─────────────────────┘
           │
           ▼
                      N
    ╱ Audio    ╲ ────────►  ┌──────────────┐
   ╱ driver in OS ╲         │   Reload     │
   ╲ configured?  ╱         │ audio drivers.│
    ╲          ╱            └──────────────┘
       │ Y
       ▼
                      N
    ╱ Correct   ╲ ────────► ┌──────────────────┐
   ╱ drivers for ╲          │ Load drivers and │
   ╲ application? ╱         │ set configuration│
    ╲          ╱            │     in OS.       │
       │ Y                  └──────────────────┘
       ▼
┌──────────────┐
│ Connect to   │
│  external    │
│  speaker.    │
└──────────────┘
       │
       ▼
            N            ┌──────────────┐              Y
    ╱ Audio? ╲ ────────► │ Replace audio│       ╱ Audio? ╲ ──────► ┌──────┐
    ╲       ╱            │  board and   │ ────► ╲        ╱         │ Done │
       │ Y               │   speaker    │          │ N             └──────┘
       │                 │ connections  │          │
       │                 │  in notebook │          │
       │                 │(if applicable)│         │
       │                 └──────────────┘          │
       │                                           ▼
       │              ┌────────────────────────────────────────┐
       └────────────► │ 1. Replace internal speakers.           │
                      │ 2. Replace audio board (if applicable). │
                      │ 3. Replace system board.                │
                      └────────────────────────────────────────┘
```

Flowchart 2.17—Nonfunctioning Device

```
                    ┌─────────────────┐
                    │  Nonfunctioning │
                    │     device.     │
                    └─────────────────┘
                             │
                             ▼
                    ┌─────────────────┐
                    │     Reseat      │
                    │     device.     │
                    └─────────────────┘
                             │
                             ▼
        ┌──────────────────────────────────────────┐
        │ Unplug the nonfunctioning device from the │
        │ notebook, and inspect cables and plugs    │
        │ for bent or broken pins or other damage.  │
        └──────────────────────────────────────────┘
```

Any physical device detected? — Y → Fix or replace broken item.

N

Clear CMOS.

Reattach device. Close notebook, plug in power, and reboot.

Device boots properly? — N → Replace hard drive.

Y → Done

Replace NIC. If integrated NIC, replace system board.

Replace diskette drive.

Go to "Flowchart 2.9—No Operating System (OS) Loading"

Device boots properly? — N → Go to "Flowchart 2.9—No Operating System (OS) Loading"

Y → Done

Flowchart 2.18—Nonfunctioning Keyboard

Flowchart 2.19—Nonfunctioning Pointing Device

```
┌─────────────────┐
│ Pointing device │
│ not operating   │
│ properly.       │
└─────────────────┘
         │
         ▼
┌─────────────────┐
│ Connect notebook│
│ to good external│
│ pointing device.│
└─────────────────┘
         │
         ▼
        ╱╲            N
       ╱  ╲      ┌──────────┐
      ╱External╲ │ Replace  │
     ╱ device   ╲──►│ system   │
      ╲ works?  ╱   │ board.   │
       ╲      ╱     └──────────┘
        ╲    ╱
         ╲  ╱
       Y  ╲╱
         │
         ▼
┌─────────────────┐
│ Reseat internal │
│ pointing device │
│ connector       │
│ (if applicable).│
└─────────────────┘
         │
         ▼
        ╱╲            N
       ╱  ╲      ┌──────────────────┐
      ╱    ╲     │ Replace internal │
     ╱ OK?  ╲───►│ pointing device  │
      ╲    ╱     │ or cable.        │
       ╲  ╱      └──────────────────┘
      Y ╲╱              │
        │               ▼
        ▼              ╱╲            Y
┌──────────┐         ╱  ╲      ┌──────────┐
│ Done     │        ╱    ╲     │ Done     │
└──────────┘       ╱ OK?  ╲───►│          │
                    ╲    ╱     └──────────┘
                   N ╲  ╱
                     ╲╱
                     │
                     ▼
              ┌──────────┐
              │ Replace  │
              │ system   │
              │ board.   │
              └──────────┘
```

Flowchart 2.20—No Network/Modem Connection

```
┌──────────────┐
│  No network  │
│  or modem    │
│  connection. │
└──────┬───────┘
       │
       ▼                    N
     ╱Network╲        ┌──────────────────┐
    ╱ or modem ╲──────│ Replace jack or  │
    ╲  jack    ╱      │ have jack        │
     ╲ active?╱       │ activated.       │
       ╲  ╱           └──────────────────┘
      Y │
        ▼                  Y
     ╱Digital╲        ┌──────────────┐
    ╱  line? ╲────────│  Connect     │
    ╲        ╱        │ to nondigital│
     ╲      ╱         │  line.       │
       ╲  ╱           └──────────────┘
      N │
        ▼        N                              Y
   ╱NIC/modem╲  ┌──────────┐    ╱OK?╲    ┌──────┐
  ╱configured ╲─│  Reload  │───╱     ╲───│ Done │
  ╲  in OS?   ╱ │ drivers  │  ╲      ╱   └──────┘
   ╲        ╱   │   and    │   ╲    ╱
    ╲     ╱     │reconfigure│     ╲╱
      Y │       └──────────┘    N │
        ▼                          ▼
 ┌──────────────┐         ┌────────────────┐
 │Disconnect all│         │Replace NIC/modem│
 │power from    │         │(if applicable). │
 │the notebook  │         └────────┬───────┘
 │and open.     │                  │   Y
 └──────┬───────┘                  ▼
        │                        ╱OK?╲    ┌──────┐
        ▼                       ╱     ╲───│ Done │
 ┌──────────────┐               ╲      ╱  └──────┘
 │Reseat NIC/   │                ╲    ╱
 │modem         │                  ╲╱
 │(if applicable)│               N │
 └──────┬───────┘                  ▼
        │                   ┌──────────┐
        └───────────────────│ Replace  │
                            │ system   │
                            │ board.   │
                            └──────────┘
```

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
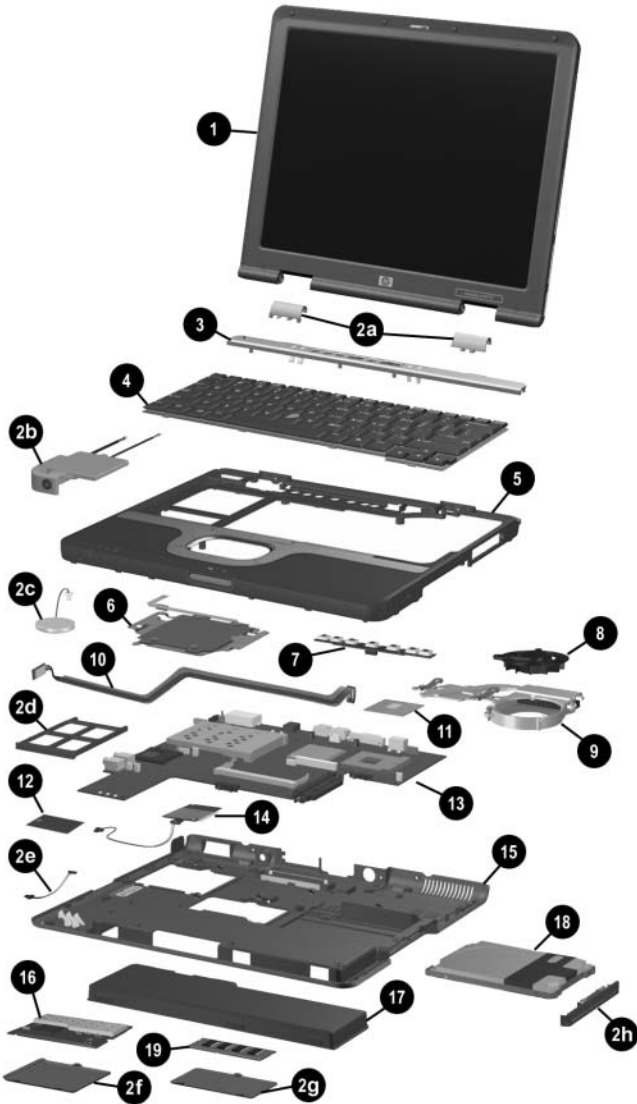
Notebook Major Components

Table 3-1

Spare Parts: Notebook Major Components

Item	Description	Spare Part Number
1	Display assembly, 12.1-inch TFT XGA with wireless device antennae	360383-001
	Miscellaneous Plastics Kit, includes:	325528-001
2a	Left and right display hinge covers	
2b	Speaker/microphone	
2c	RTC battery	
2d	PC Card slot space saver	
2e	Modem cable	
2f	Mini PCI compartment cover	
2g	Memory expansion compartment cover	
2h	Hard drive bezel	
	Not illustrated: Notebook feet (4) Display rubber screw covers (6: 4 round, 2 oblong) Smart Card Reader bezel	
3	LED switch cover	360384-001

Notebook System Major Components

Table 3-1

Spare Parts: Notebook Major Components (*Continued*)

Item	Description		Spare Part Number
4	**Keyboards, include pointing stick**		
	Asia Pacific	325530-371	Latin America	325530-161
	Australia	325530-011	The Netherlands	325530-331
	Brazil	325530-201	Norway	325530-091
	Czech Republic	325530-221	People's Republic of China	325530-AA1
	Denmark	325530-081		
	Europe	325530-021	Poland	325530-241
	France	325530-051	Portugal	325530-131
	French Canada	325530-121	Russia	325530-251
	Germany	325530-041	Saudi Arabia	325530-171
	Greece	325530-151	Slovakia	325530-231
	Hong Kong	325530-AC1	Spain	325530-071
	Hungary	325530-211	Sweden	325530-101
	Iceland	325530-DD1	Switzerland	325530-111
	India	325530-D61	Taiwan	325530-AB1
	International	325530-002	Thailand	325530-281
	Israel	325530-BB1	Turkey	325530-141
	Italy	325530-061	United Kingdom	325530-031
	Japan	325530-291	United States	325530-001
	Korea	325530-AD1		
5	**Top cover** (includes TouchPad, speaker/microphone, and RTC battery)		360386-001
6	**TouchPad with cable**		325513-001
7	**Switch board**		325515-001

Table 3-1

Spare Parts: Notebook Major Components (*Continued*)

Item	Description	Spare Part Number
8	**Fan**	291266-001
9	**Heat sink with fan**	325520-001
10	**Bluetooth wireless device** (not available on all models)	333605-001
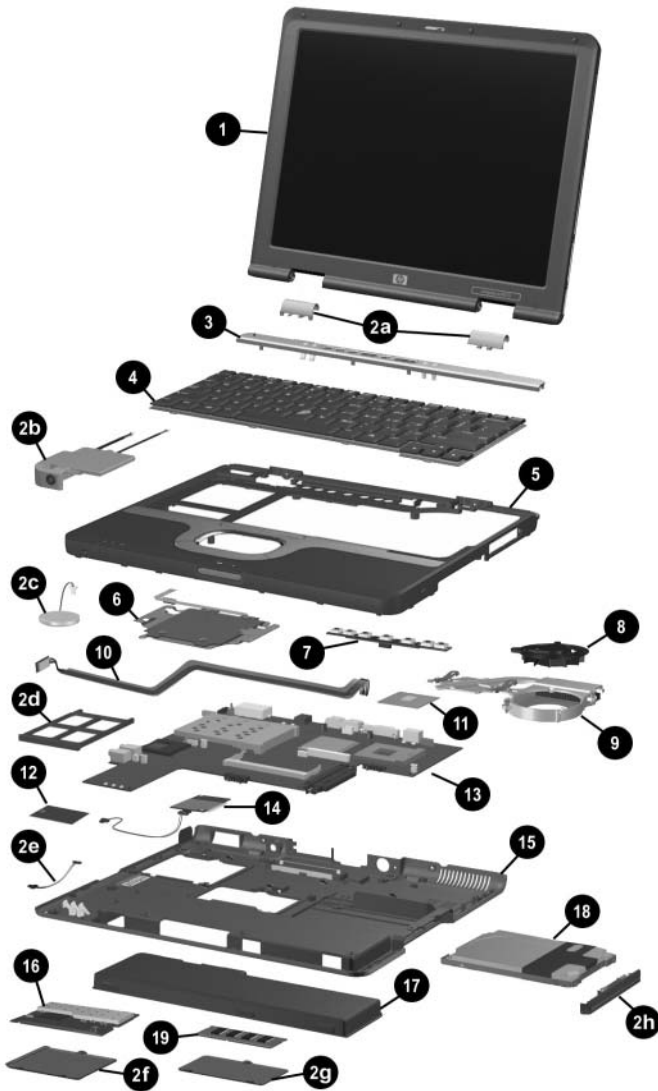
Notebook System Major Components

Table 3-1 *(Continued)*

Spare Parts: Notebook Major Components

Item	Description	Spare Part Number
11	**Processors**	
	Intel Pentium-M 1.7-GHz	340165-001
	Intel Pentium-M 1.6-GHz	319777-001
	Intel Pentium-M 1.5-GHz	319776-001
	Intel Pentium-M 1.4-GHz	319775-001
	Intel Pentium-M 1.3-GHz	319774-001
12	**TPM security module**	345856-001
13	**System board**	325514-001
14	**Modem board**	325521-001
15	**Base enclosure** (includes left and right display supports)	360385-001
16	**Mini PCI communications boards**	
	802.11a/b/g wireless LAN board	333782-001
	802.11b/g wireless LAN board	333781-001
	802.11 b wireless LAN board	345640-001
17	**Battery pack, 6-cell, 40-wH**	315338-001
18	**Hard drives** (include hard drive bezel and frame)	
	80-GB	345632-001
	60-GB	325524-001
	40-GB	325523-001
	30-GB	325522-001
19	**Memory modules**	
	512-MB DDR	280875-001
	256-MB DDR	280874-001

3.3 Miscellaneous Plastics Kit Components
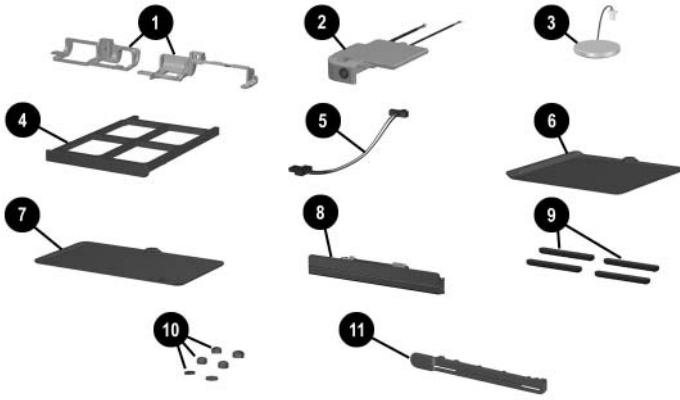
Miscellaneous Plastics Kit Components

Table 3-2

**Miscellaneous Plastics Kit Components
Spare Part Number 325528-001**

Item	Description
1	Left and right display hinge covers
2	Speaker/microphone
3	RTC battery
4	PC Card slot space saver
5	Modem cable
6	Mini PCI compartment cover
7	Memory expansion compartment cover
8	Hard drive bezel
9	Notebook feet (4)
10	Display rubber screw covers (6:4 round, 2 oblong)
11	Smart Card Reader bezel

3.4 Port Replicators and Mass Storage Devices
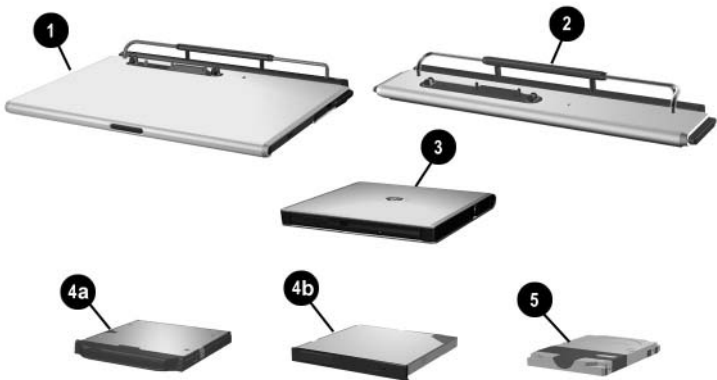
Port Replicators and Mass Storage Devices

Table 3-3

Port Replicators and Mass Storage Devices

Item	Description	Spare Part Number
1	**Advanced Port Replicator**	316194-001
2	**Simple Port Replicator**	316193-001
3	**USB MultiBay cradle**	322814-001
	Optical drives (for use only with the Advanced and Common port replicators and USB MultiBay cradle)	
4a	8X Max DVD-ROM drive	202837-001
	24X Max CD-RW drive	323226-001
	24X Max CD-ROM drive	228746-001
	24X Max Slim CD-ROM/CD-RW combination drive	306800-001
4b	1.44-MB diskette drive	241995-001
5	**Hard drives** (include hard drive bezel)	
	80-GB	345632-001
	60-GB	325524-001
	40-GB	325523-001
	30-GB	325522-001

3.5 Miscellaneous

Table 3-4

Spare Parts: Miscellaneous (not illustrated)

Description	Spare Part Number
65-watt AC adapter	239704-001
Adapter cables	
Aircraft Power Adapter	293204-001
Automobile Power Adapter/Charger	293203-001
Carrying cases	
Top load leather cases	325817-001 and 325817-002
Top load nylon cases	325815-001 and 325815-002
Nylon case	325814-001

Table 3-4

Spare Parts: Miscellaneous (not illustrated) *(Continued)*

Description			Spare Part Number
Power cord set, three-wire			
Australia	246959-011	Japan	246959-291
Denmark	246959-081	Korea	246959-AD1
Europe/Middle East/Africa	246959-021	Switzerland	246959-AG1
		United Kingdom	246959-031
Italy	246959-061	United States	246959-001
Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing" for more information on screw specifications and usage.)			325529-001

- Phillips M2.5×3.5 screw
- Phillips M2.5×3.0 screw
- Phillips M2.0×5.0 screw
- Phillips M2.0×4.0 screw
- Phillips M2.0×3.0 screw (silver)
- Phillips M2.0×3.0 screw (black)
- Spring-loaded Torx T8 M2.0×10.0 screw

- Torx T8 M2.0×8.0 screw
- Torx T8 M2.0×6.0 screw
- Torx T8 M2.0×4.0 screw
- Torx T5 M2.5×4.5 screw
- 4.0-mm socket M2.0×10.0 alignment pin
- M2.0×4.0 security screw
- Phillips M1.5x3.0 screw

Description	Spare Part Number
Travel battery carrier	325527-001

4

Removal and Replacement Preliminaries

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

4.1 Tools Required

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

- Magnetic screwdriver
- Torx T8 screwdriver
- Torx T5 screwdriver
- Phillips P0 screwdriver
- Flat-bladed tool
- 5.0-mm socket
- 4.0-mm socket

4.2 Service Considerations

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

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

Plastic Parts

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

Cables and Connectors

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

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

4.3 Preventing Damage to Removable Drives

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

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

■ Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive. Ensure that the optical drive tray is closed.

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

■ Handle drives on surfaces that have at least one inch of shock-proof foam.

■ Avoid dropping drives from any height onto any surface.

■ After removing a hard drive, 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 to 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. However, the device might function normally for a while, and then degrade in the internal layers, reducing its life expectancy.

4.5 **Packaging and Transporting Precautions**

Use the following grounding precautions when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe containers, such as tubes, bags, or boxes.

- Protect all electrostatic-sensitive parts and assemblies with conductive or approved containers or packaging.

- Keep electrostatic-sensitive parts in their containers until the parts arrive at static-free workstations.

- Place items on a grounded surface before removing items from their containers.

- Always be properly grounded when touching a sensitive component or assembly.

■ Store reusable electrostatic-sensitive parts from assemblies in protective packaging or nonconductive foam.

■ Use transporters and conveyors made of antistatic belts and roller bushings. Ensure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

4.6 **Workstation Precautions**

Use the following grounding precautions at workstations:

■ Cover the workstation with approved static-shielding material (refer to Table 4-2 "Static-Shielding Materials").

■ Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

■ Use conductive field service tools such as cutters, screwdrivers, and vacuums.

■ When using fixtures that must directly contact dissipative surfaces, only use fixtures made of static-safe materials.

■ Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.

■ Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

■ Avoid contact with pins, leads, or circuitry.

■ Turn off power and input signals before inserting or removing connectors or test equipment.

4.7 Grounding Equipment and Methods

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

■ When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±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.

Torx and Phillips screws are removed during disassembly. There are 57 screws, alignment pins, and standoffs, in 14 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.

Table 5-1

Disassembly Sequence Chart

Section	Description	# of Screws Removed
5.3	**Preparing the notebook for disassembly**	
	Battery pack	0
	Hard drive	1
	Hard drive bezel	6 screws, 2 alignment pins
5.4	**Notebook feet**	0
5.5	**Memory module**	1 loosened
5.6	**Mini PCI communications board**	1 loosened
5.7	**LED switch cover**	2
5.8	**Keyboard**	1
5.9	**TPM security module**	1
5.10	**Smart Card reader**	0
5.11	**Fan**	3
5.12	**Heat sink**	2 loosened, 4 removed
5.13	**Processor**	0
5.14	**Display assembly**	4
5.15	**Top cover**	13
5.16	**Bluetooth wireless device**	0
5.17	**TouchPad**	2
5.18	**RTC battery**	0

Table 5-1

Disassembly Sequence Chart *(Continued)*

5.19	**Speaker/microphone**	2
5.20	**Switch board**	2
5.21	**System board**	5 screws, 2 standoffs
5.22	**Modem board**	2

5.3 Preparing the Notebook for Disassembly

Before you begin any removal or installation procedures:

1. Shut down the notebook. If you are unsure whether the notebook is off or in Hibernation, turn the computer on and then shut it down through the operating system.

2. Disconnect all external devices connected to the notebook.

3. Disconnect the power cord.

4. Remove the battery pack.

Battery Pack

Spare Part Number Information

Battery pack, 6-cell, 40-wH	315338-001

5. Remove the battery pack by following these steps:

   a. Turn the notebook upside down with the rear facing you.

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

c. Lift the front edge of the battery pack up and swing it away from you ❷.

d. Remove the battery pack.
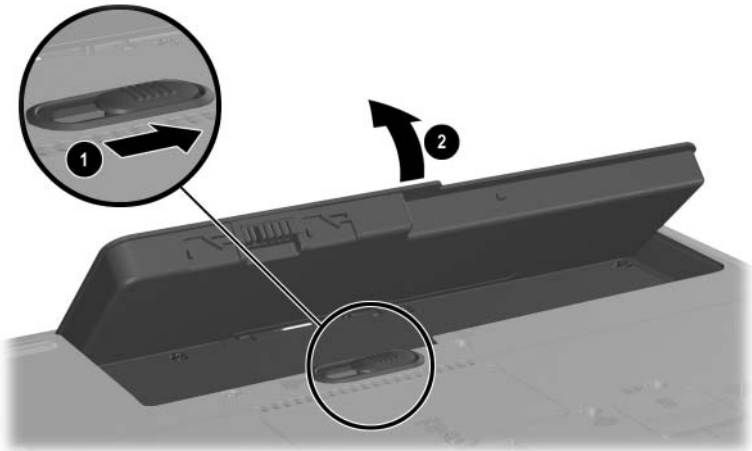
Removing the Battery Pack

Reverse the above procedure to install the battery pack.

Hard Drive

Spare Part Number Information

80-GB	345632-001
60-GB	325524-001
40-GB	325523-001
30-GB	325522-001

6. Remove the hard drive by following these steps:

   a. Turn the notebook upside down with the front facing toward you.

   b. Remove the PM2.5×3.0 screw ❶ that secures the hard drive to the notebook.

   c. Separate the hard drive bezel ❷.

   d. Use the bezel to slide the hard drive away from the notebook ❸ to unseat the hard drive connector from the system board.

   e. Remove the hard drive.
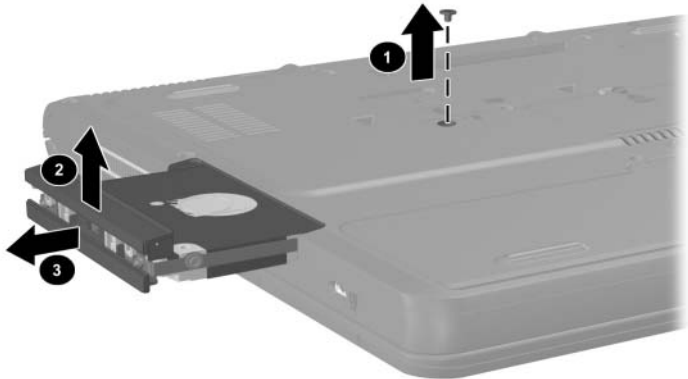
Removing the Hard Drive

Reverse the above procedure to install the hard drive.

7. Remove the hard drive bezel by following these steps:

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

✎ The hard drive bezel is included with the hard drive and also in the Miscellaneous Plastics Kit, spare part number 325528-001.

a. Use a flat-bladed tool to press down on the tabs ❶ on the hard drive lower bezel.

b. Remove the lower bezel ❷ from the hard drive upper bezel.
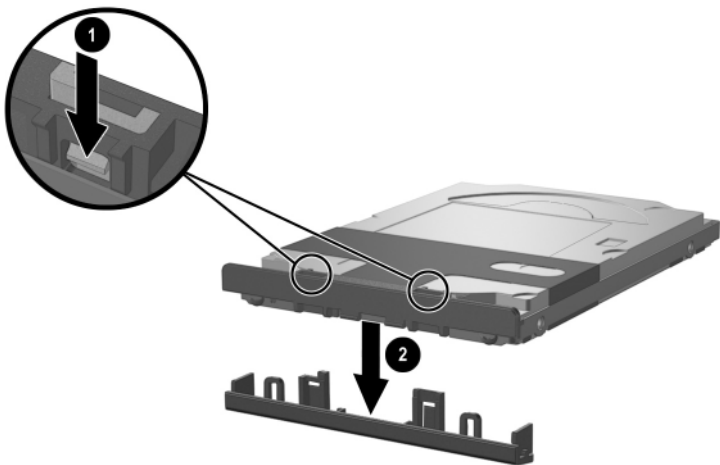
Removing the Hard Drive Lower Bezel

c. Remove the two Torx T5 M2.5×4.5 screws ❶ and the two PM2.5×3.5 screws ❷ that secure the hard drive to the hard drive frame.

d. Use a 4.0-mm socket to remove the two M2.0×10.0 alignment pins ❸ from the back of the hard drive.
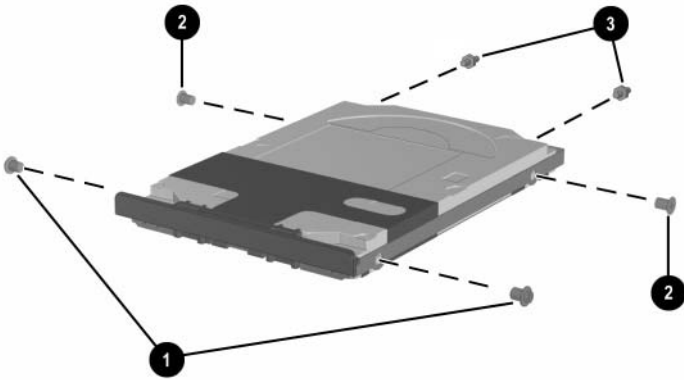
Removing the Hard Drive from the Hard Drive Frame

e. Remove the hard drive from the frame.
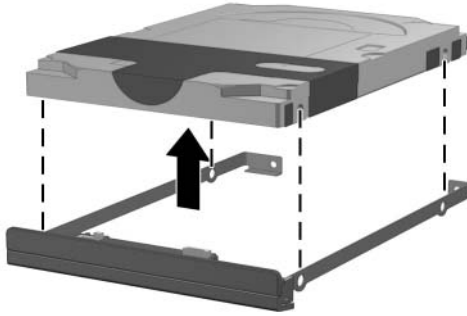
f. Remove the two PM2.0×3.0 screws ❶ that secure the hard drive upper bezel to the hard drive frame.

g. Remove the upper bezel from the frame ❷.
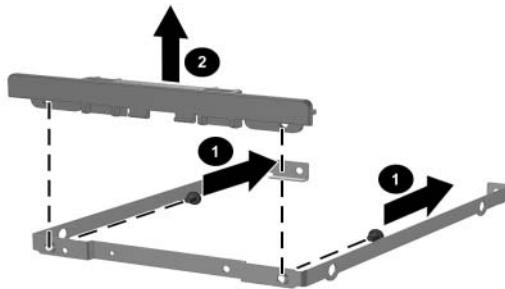
Removing the Hard Drive Upper Bezel

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 325528-001. The notebook feet attach to the base enclosure as illustrated below.
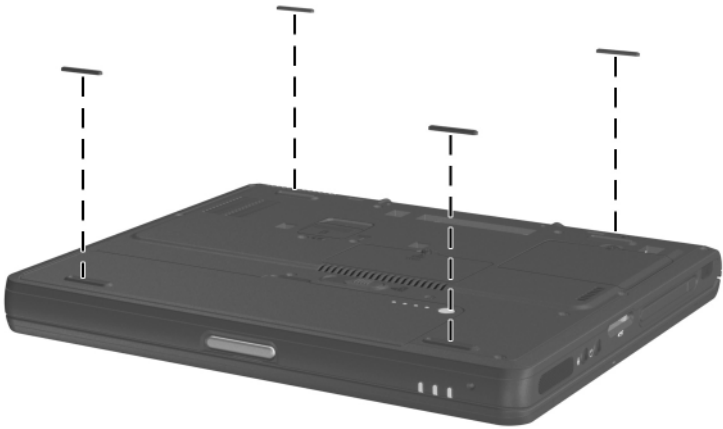
Replacing the Notebook Feet

5.5 Memory Module

Memory Modules

Spare Part Number Information

512-MB DDR	280875-001
256-MB DDR	280874-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Turn the notebook upside down with the front facing toward you.

3. Loosen the PM2.0×4.0 screw ❶ that secures the memory expansion compartment cover to the notebook.

4. Lift the rear edge of the cover up and swing it toward you ❷.

5. Remove the cover.

✎ The memory expansion compartment cover is included in the Miscellaneous Plastics Kit, spare part number 325528-001.
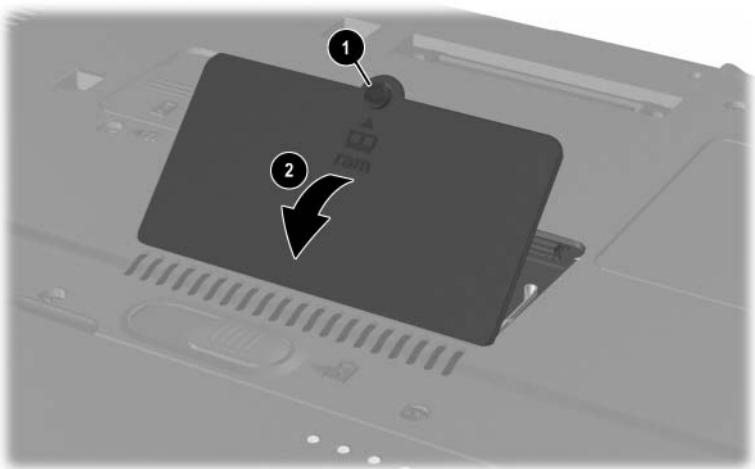
Removing the Memory Expansion Compartment Cover

6. Spread the retaining tabs ❶ that secure the memory module to the socket. The board rises up at a 45-degree angle.

7. Pull the board away from the socket at a 45-degree angle ❷.
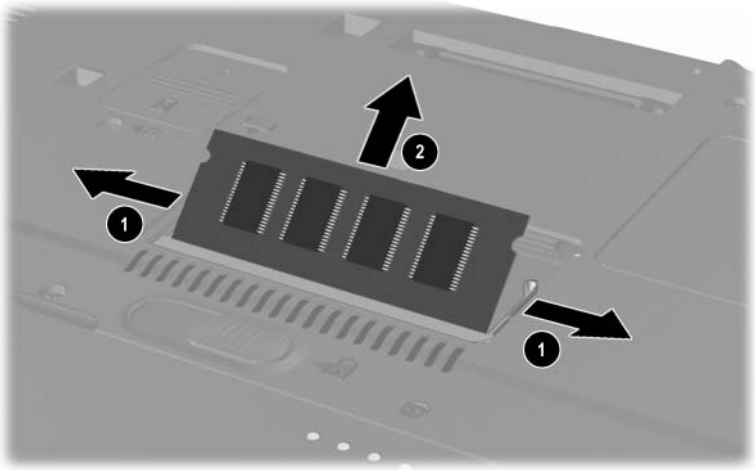
Removing a Memory Module

Reverse the above procedure to install a memory module.

5.6 Mini PCI Communications Board

Mini PCI Communications Boards

Spare Part Number Information

802.11a/b/g wireless LAN board	333782-001
802.11b/g wireless LAN board	333781-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Turn the notebook upside down with the front facing toward you.

3. Loosen the PM2.0×4.0 screw ❶ that secures the Mini PCI compartment cover to the notebook.

   ✎ The Mini PCI compartment cover on notebook models equipped with a 5-GHz wireless communications device is secured by an M2.0×4.0 security screw. This screw can be removed only by using a special security driver.

4. Lift the rear edge of the cover up and swing it toward you❷.

5. Remove the cover.

✎ The Mini PCI compartment cover is included in the Miscellaneous Plastics Kit, spare part number 325528-001.
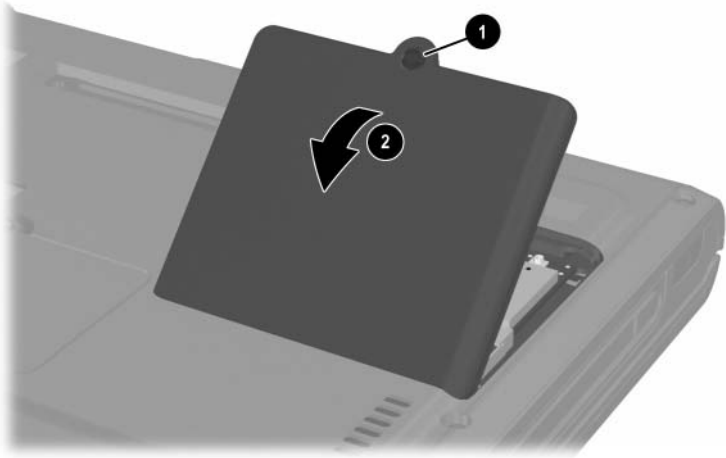
Removing the Mini PCI Compartment Cover

6. Disconnect the 2 antenna cables from the Mini PCI communications board. Note that the longer cable ❶ connects to the left socket and the shorter cable ❷ connects to the right socket.
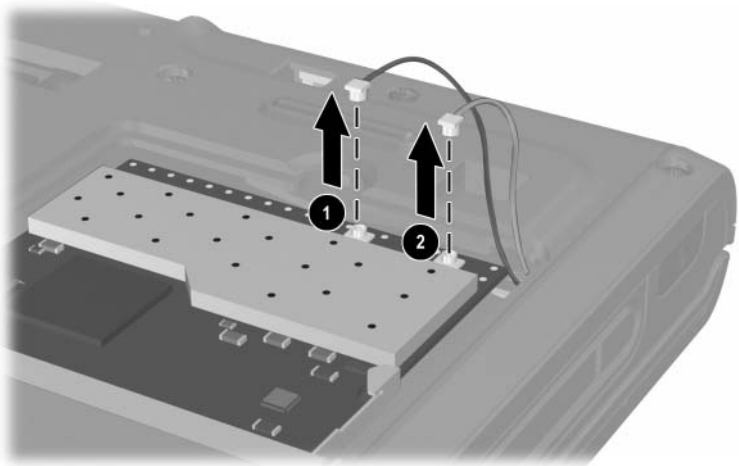
Disconnecting a Mini PCI Communications Board

7. Spread the retaining tabs ❶ that secure the Mini PCI communications board to the socket. The board rises up at a 45-degree angle.

8. Pull the board away from the socket at a 45-degree angle ❷.
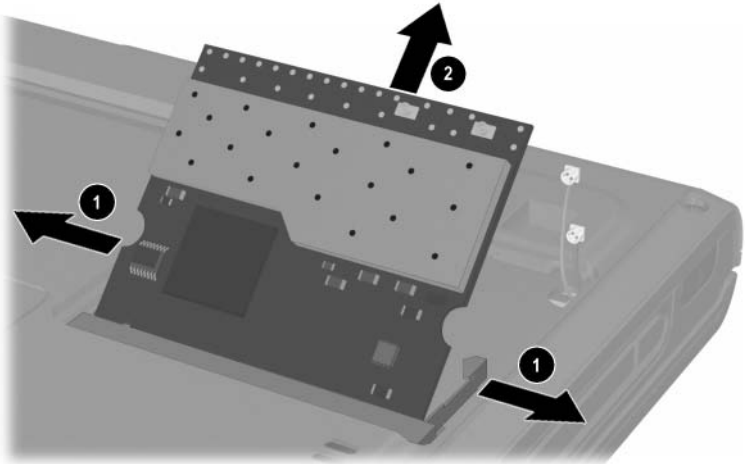
Removing a Mini PCI Communications Board

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

5.7 **LED Switch Cover**

LED Switch Cover

Spare Part Number Information

LED switch cover	325512-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Turn the notebook upside down with the rear panel facing you.

3. Remove the two T8M2.0×8.0 screws that secure the LED switch cover to the notebook.

Removing the LED Switch Cover Screws

4. Turn the notebook right-side up with the front facing toward you.

5. Open the notebook as far as it will open.

6. Press down on the **esc** key ❶ to reveal the notch ❷ in the left side of the LED switch cover.

7. Insert a flat-bladed tool into the notch and lift the left side of the LED switch cover.

8. After the left side of the LED switch cover has disengaged from the notebook, swing the LED switch cover up and to the right.

9. Remove the LED switch cover.
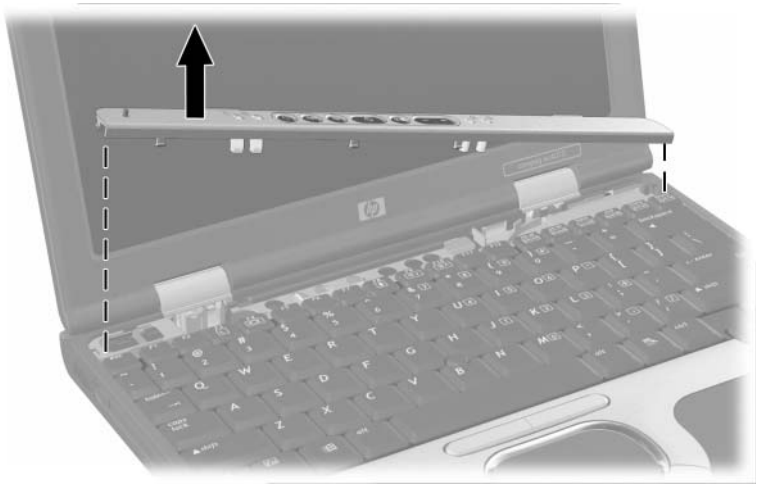
Removing the LED Switch Cover

Reverse the above procedure to install the LED switch cover.

5.8 Keyboard

Keyboards

Spare Part Number Information

Asia Pacific	325530-371	Latin America	325530-161
Australia	325530-011	The Netherlands	325530-331
Brazil	325530-201	Norway	325530-091
Czech Republic	325530-221	People's Republic	325530-AA1
Denmark	325530-081	of China	
Europe	325530-021	Poland	325530-241
France	325530-051	Portugal	325530-131
French Canada	325530-121	Russia	325530-251
Germany	325530-041	Saudi Arabia	325530-171
Greece	325530-151	Slovakia	325530-231
Hong Kong	325530AC1	Spain	325530-071
Hungary	325530-211	Sweden	325530-101
Iceland	325530DDd1	Switzerland	325530-111
India	325530Dd61	Taiwan	325530-AB1
International	325530-002	Thailand	325530-281
Israel	325530-BB1	Turkey	325530-141
Italy	325530-061	United Kingdom	325530-031
Japan	325530-291	United States	325530-001
Korea	325530-AD1		

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Close the notebook and turn it upside down with the rear panel facing toward you.

4. Remove the T8M2.0×8.0 screw that secures the keyboard to the notebook.

Removing the Keyboard Screw

5. Turn the notebook right-side up with the front facing toward you.

6. Open the notebook as far as it will open.

7. Lift the rear edge of the keyboard ❶.

8. Slide the keyboard toward the display ❷ until the notches on the front edge of the keyboard clear the top cover.

9. Swing the front edge of the keyboard up and back ❸ until it rests on the display.

Releasing the Keyboard

10. Release the zero insertion force (ZIF) connector ❶ to which the pointing stick cable is attached and disconnect the pointing stick cable ❷ from the system board.

11. Release the ZIF connector ❸ to which the keyboard cable is attached and disconnect the keyboard cable ❹ from the system board.
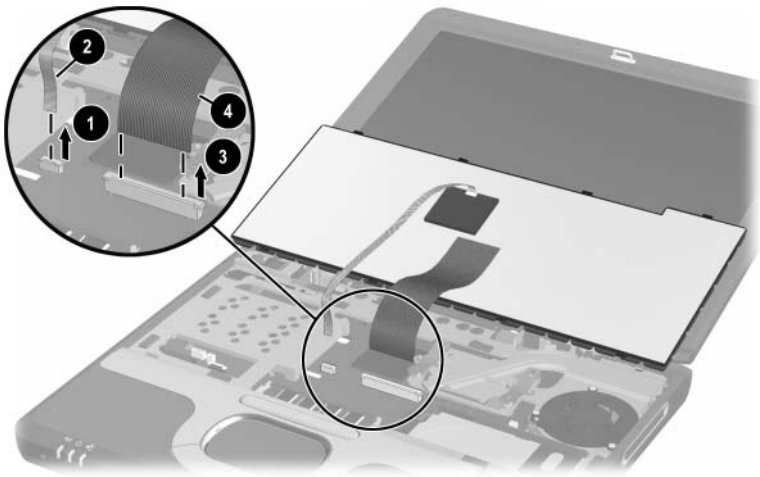
Removing the Keyboard

12. Remove the keyboard.

Reverse the above procedure to install the keyboard.

After the keyboard is removed, the internal memory expansion socket is accessible. Follow these steps to remove a memory module from the internal memory expansion socket:

1. Spread the retaining tabs ❶ that secure the memory module to the socket. The board rises up at a 45-degree angle.

2. Pull the board away from the socket at a 45-degree angle ❷.
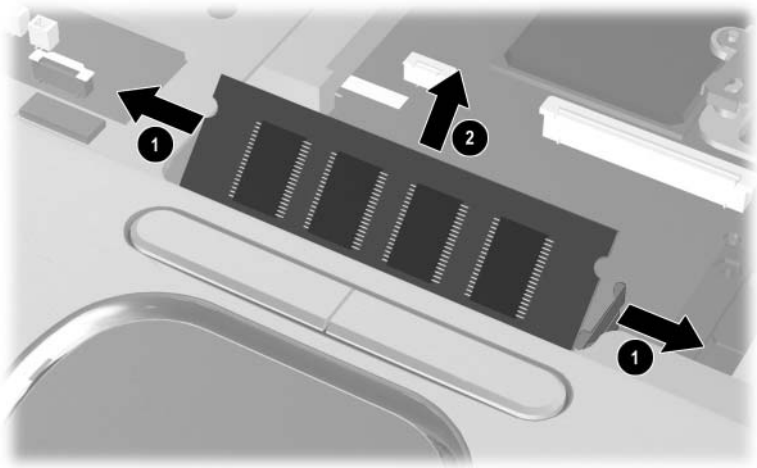
Removing an Internal Memory Module

Reverse the above procedure to install the internal memory module.

5.9 TPM Security Module

TPM Security Module

Spare Part Number Information

TPM security module   345856-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Remove the keyboard (Section 5.8).

4. Remove the PM1.5x3.0 screw ❶ that secures the TPM security module to the system board.

5. Using a flat tool, disconnect and lift the TPM security module ❷ from the system board.
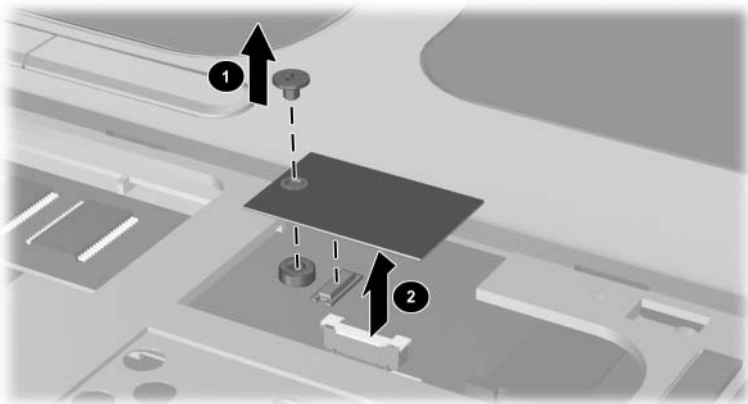
Removing the TPM security module

Reverse the above procedure to install the TPM security module.

5.10 Smart Card Reader

Smart Card Reader

Spare Part Number Information

Smart Card Reader	335942-001
Smart Card	335943-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Remove the keyboard (Section 5.8).

4. Using a flat tool, press the Smart Card Reader release switch to the right to eject the Smart Card Reader and bezel from the PC Card slot.
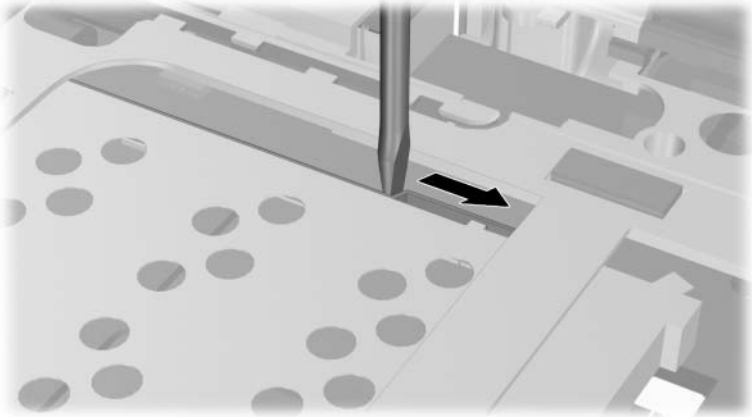
Ejecting the Smart Card Reader

To install the Smart Card Reader, reverse steps 1, 2, and 3, and then insert the Smart Card Reader with bezel in the PC Card slot.

5.11 Fan

Fan

Spare Part Number Information

Fan	291266-001
Fan with heath sink	325520-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Remove the keyboard (Section 5.8).

4. Disconnect the fan cable ❶ from the system board.

5. Remove the three PM2.0×3.0 screws ❷ that secure the fan to the heat sink.

6. Remove the fan, making sure the fan cable clears the screw next to the cable clip ❸.
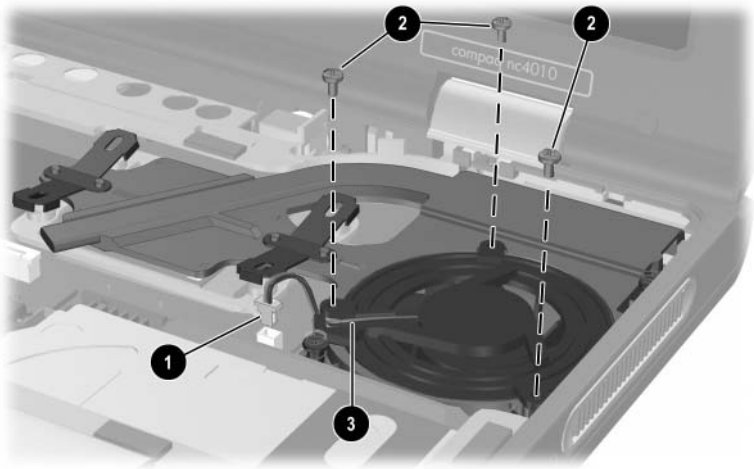
Removing the Fan

Reverse the above procedure to install the fan.

⚠ **CAUTION:** When installing the fan in the heat sink, make sure the fan cable is not crimped by the screw next to the cable clip. If the cable is crimped and damaged, the fan will not cool the notebook internal components, which could result in damage.

5.12 Heat Sink

Heat Sink

Spare Part Number Information

Heat sink (includes fan)	325520-001
Fan	291266-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Remove the keyboard (Section 5.8).

4. Disconnect the fan cable ❶ from the system board.

5. Loosen the two spring-loaded T8 M2.0×10.0 screws ❷ that secure the heat sink to the base enclosure.

6. Fold back the insulator material ❸ to expose the heat sink screws ❹.
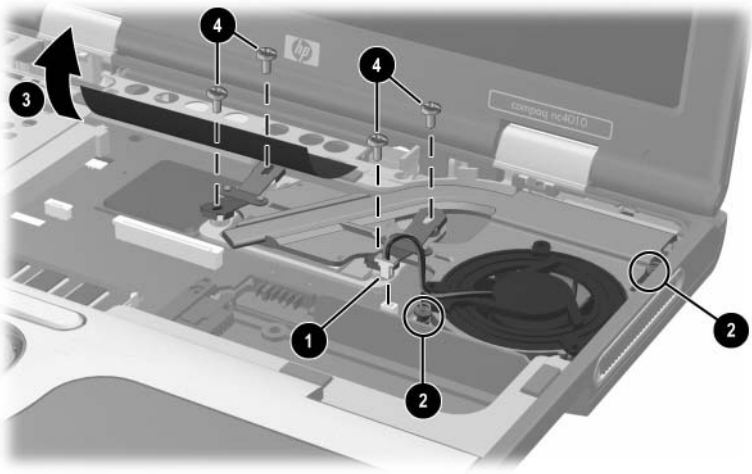
Removing the Heat Sink Screws

7. Remove that the four T8 M2.0×4.0 heat sink screws in the ❶, ❷, ❸, ❹ sequence stamped on the heat sink.
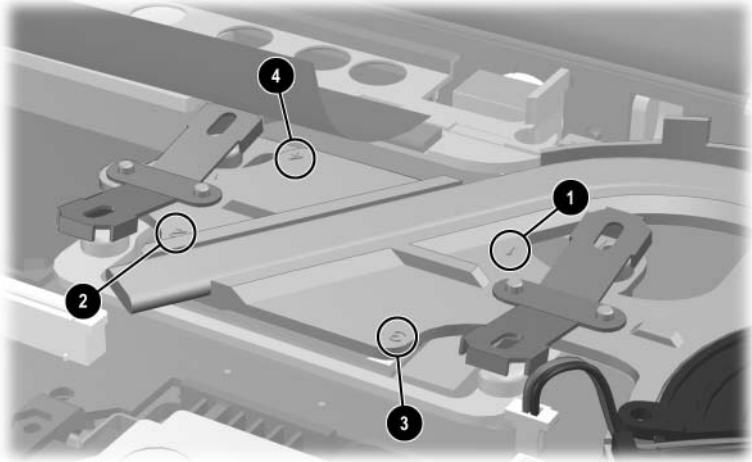
Heat Sink Screw Removal and Installation Sequence

✎ Use the same sequence when installing the heat sink.

8. Lift the front edge of the heat sink ❶ until it clears the base enclosure.

9. Slide the heat sink toward you at an angle ❷ and remove it.
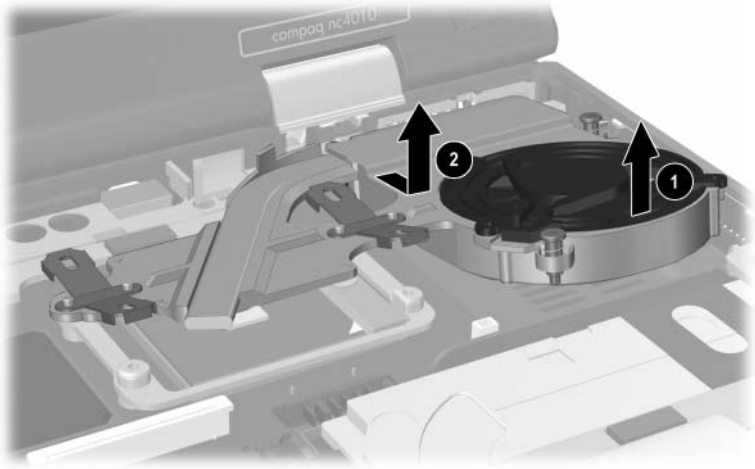
Removing the Heat Sink

✎ Each time the heat sink is removed, any thermal grease residue should be carefully cleaned from the heat sink ❶ and processor surfaces ❷, and new thermal grease should be applied to both surfaces.
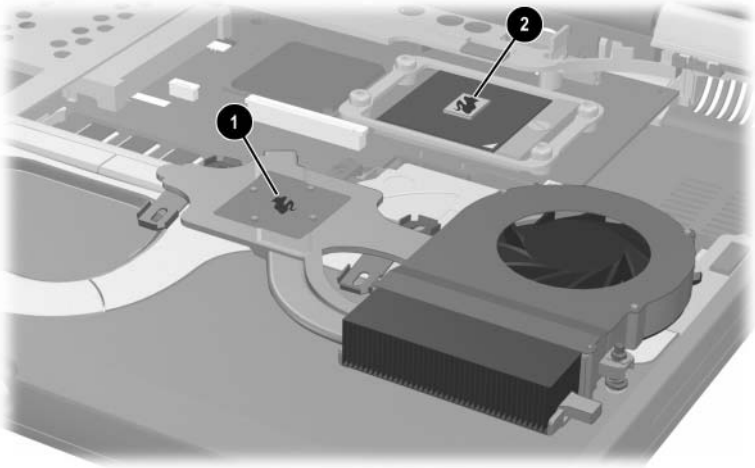
Removing the Thermal Grease From the Heat Sink and Processor

Reverse the above procedure to install the heat sink.

5.13 Processor

Processor	
Spare Part Number Information	
Intel Pentium-M 1.7-GHz	340165-001
Intel Pentium-M 1.6-GHz	319777-001
Intel Pentium-M 1.5-GHz	319776-001
Intel Pentium-M 1.4-GHz	319775-001
Intel Pentium-M 1.3-GHz	319774-001

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Remove the keyboard (Section 5.8).

4. Remove the heat sink and fan (Section 5.12).

5. Use a flat-bladed tool to turn the processor locking screw one-quarter turn counterclockwise ❶.

6. Lift the processor straight up ❷ and remove it.
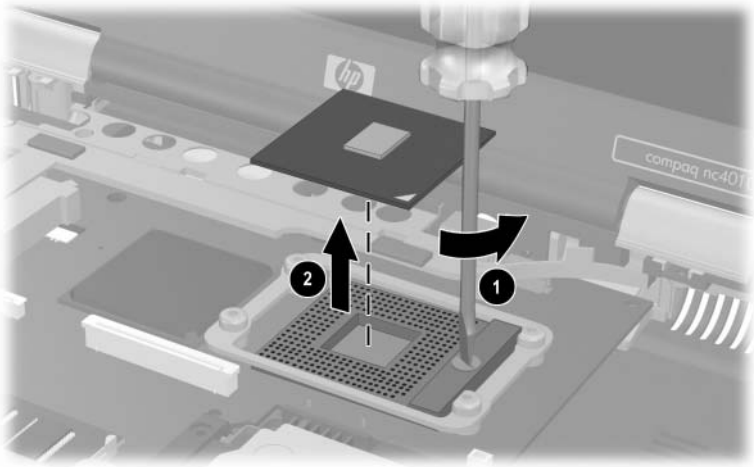
Removing the Processor

✎ Note that the gold triangle should be in the lower right corner when installing the processor.
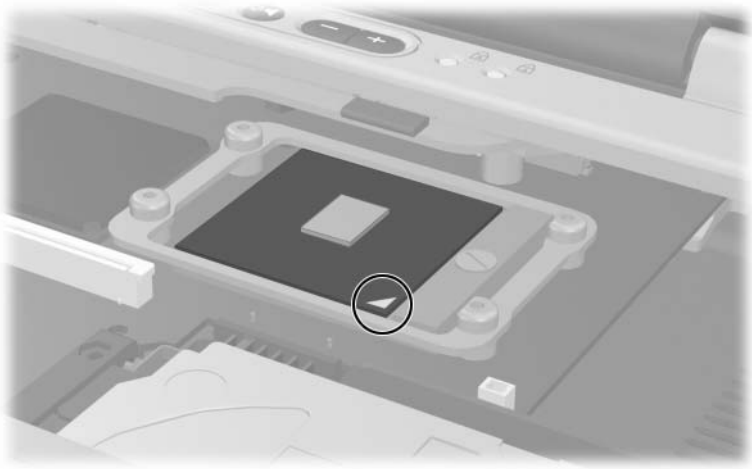
Correctly Installing the Processor

Reverse the above procedure to install the processor.

5.14 Display Assembly

Display Assembly

Spare Part Number Information

12.1-inch TFT XGA with wireless device antennae	325509-001

1. Prepare the notebook for disassembly (Section 5.3).
2. Disconnect the antenna cables from the Mini PCI communications board. Refer to Section 5.6 for instructions.
3. Remove the LED switch cover (Section 5.7).
4. Remove the keyboard (Section 5.8).

5. Close the notebook and position the notebook so the rear panel faces toward you.

6. Remove the two T8M2.0×8.0 screws that secure the hinge covers to the notebook.

Removing the Display Assembly Screws

7. Position the notebook so the front faces toward you and open the notebook as far as it will open.

8. Remove the display hinge covers by inserting a flat-bladed tool under the covers and lifting them up.

✎ The hinge covers are included in the Miscellaneous Plastics Kit, spare part number 325528-001.

Removing the Hinge Covers

9. Remove the wireless antenna cables ❶ and ❷ from the routing channel in the top cover ❸.
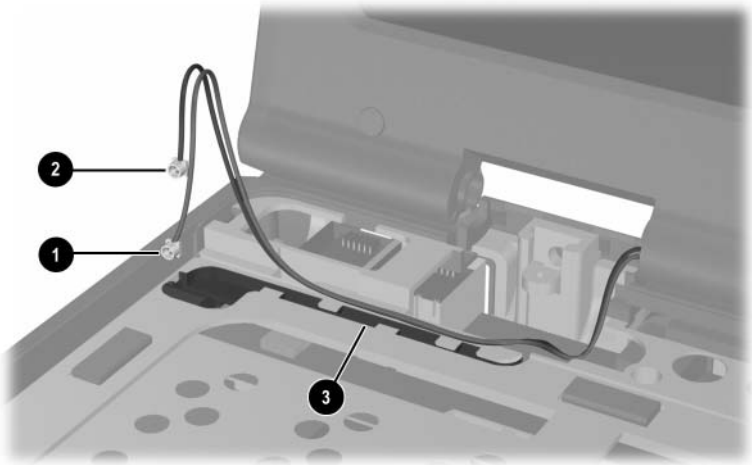
Removing the Antenna Cables

10. Disconnect the display inverter ❶ and video cables ❷ from the system board.

11. Remove the two T8M2.0×8.0 screws ❸ that secure the display assembly to the base enclosure.
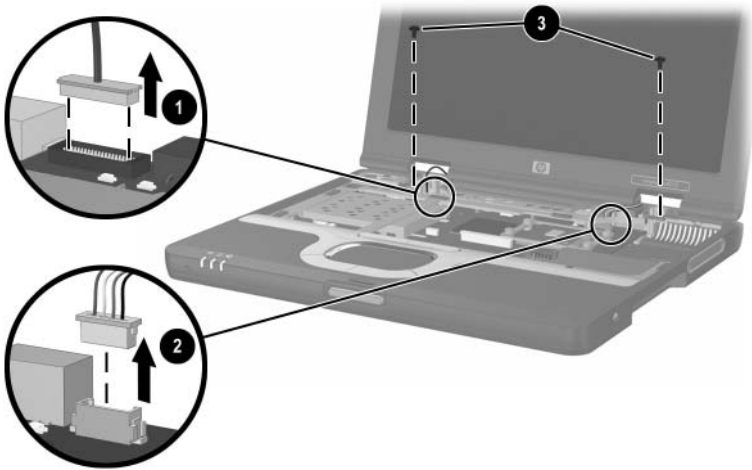
Disconnecting the Display Cables and Removing the Display Assembly Screws

12. Lift the display assembly straight up and remove it.

Reverse the above procedure to install the display assembly.

5.15 Top Cover

Top Cover

Spare Part Number Information

Top cover (includes TouchPad, speaker/microphone, and RTC battery)   325510-001

✎ When replacing the top cover, determine if a Bluetooth wireless device is installed in the defective top cover. If a Bluetooth wireless device is installed, make sure the device is removed from the defective top cover and installed in the replacement top cover. Refer to Section 5.16, " Bluetooth Wireless Device," for instructions on replacing a Bluetooth wireless device.

1. Prepare the notebook for disassembly (Section 5.3).

2. Remove the LED switch cover (Section 5.7).

3. Remove the keyboard (Section 5.8).

4. Remove the display assembly (Section 5.14).

5. Turn the notebook upside down with the rear panel facing toward you.

6. Remove the following screws:

   ❏ Four T8M2.0×4.0 screws ❶ in the battery bay

   ❏ One T8M2.0×4.0 screw ❷ in the hard drive bay

   ❏ Eight T8M2.0×8.0 screws ❸
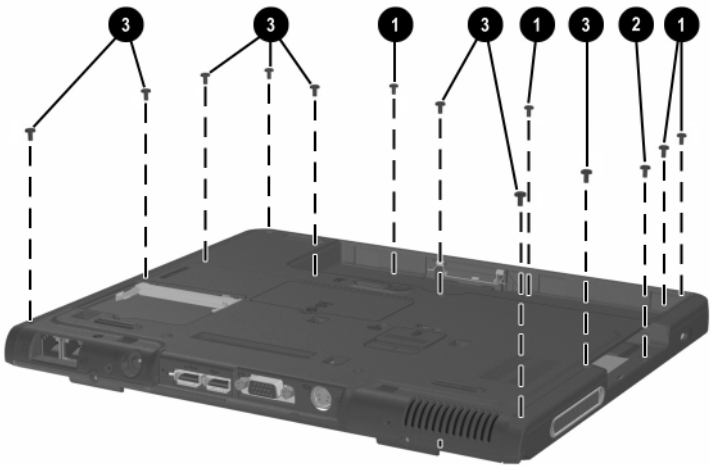
Removing the Top Cover Screws

7. Turn the notebook right side up with the front facing toward you.

8. If present, disconnect the Bluetooth wireless device cable ❶ from the system board.

9. Disconnect the RTC battery cable ❷ from the system board.

10. Release the ZIF connector ❸ to which the TouchPad cable is connected and disconnect the TouchPad cable ❹ from the system board.
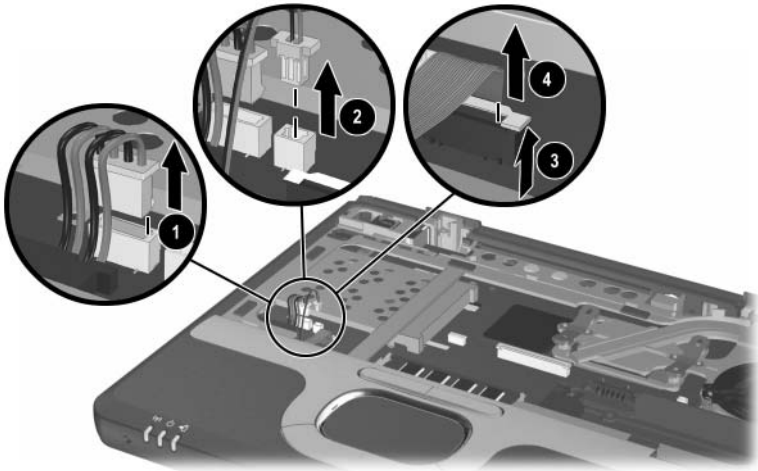
Disconnecting the Top Cover Cables

11. Lift the rear edge ❶ of the top cover until it disengages from the base enclosure.

12. Slide the top cover to the right ❷ until the speaker and microphone cables are exposed.

13. Disconnect the speaker ❸ and microphone ❹ cables from the system board.

14. Remove the top cover.
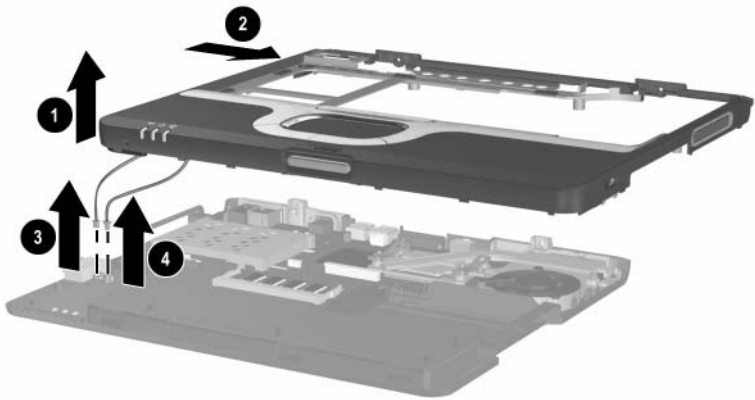
Removing the Top Cover

Reverse the above procedure to install the top cover.

5.16 Bluetooth Wireless Device

Bluetooth Wireless Device

Spare Part Number Information

Bluetooth wireless device	333605-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:

   ❏ LED switch cover (Section 5.7)

   ❏ Keyboard (Section 5.8)

   ❏ Display assembly (Section 5.14)

   ❏ Top cover (Section 5.15)

2. Turn the top cover upside down with the TouchPad facing toward you.

3. Remove the Bluetooth wireless device ❶ from the slot in the top cover and device cable from the routing channels ❷ in the top cover.
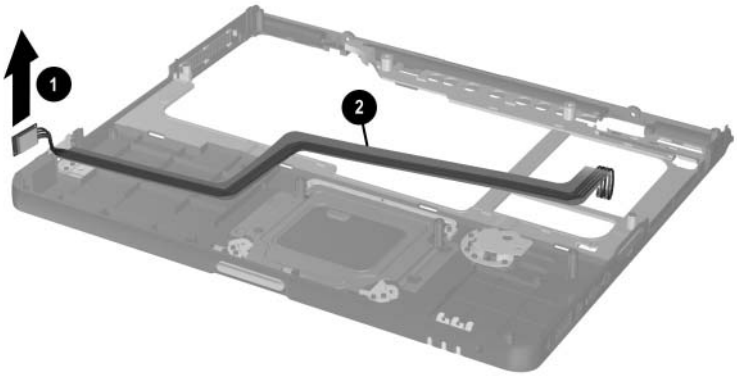
Removing the Bluetooth Wireless Device

Reverse the above procedure to install the Bluetooth wireless device.

5.17 TouchPad

TouchPad

Spare Part Number Information

TouchPad with cable and bracket	325513-001
TouchPad included in the Miscellaneous Plastics Kit	325528-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:

   ❏ LED switch cover (Section 5.7)

   ❏ Keyboard (Section 5.8)

   ❏ Display assembly (Section 5.14)

   ❏ Top cover (Section 5.15)

2. Turn the top cover upside down with the TouchPad facing toward you.

3. Remove the two PM2.0×4.0 screws that secure the TouchPad bracket to the top cover.
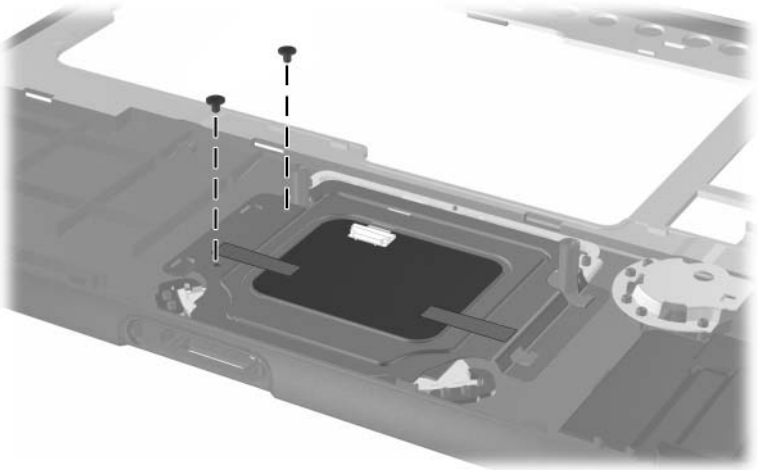
Removing the TouchPad Screws

4. Lift the left side of the bracket ❶ until it rests at an angle.

5. Slide the bracket to the right ❷ and remove it.
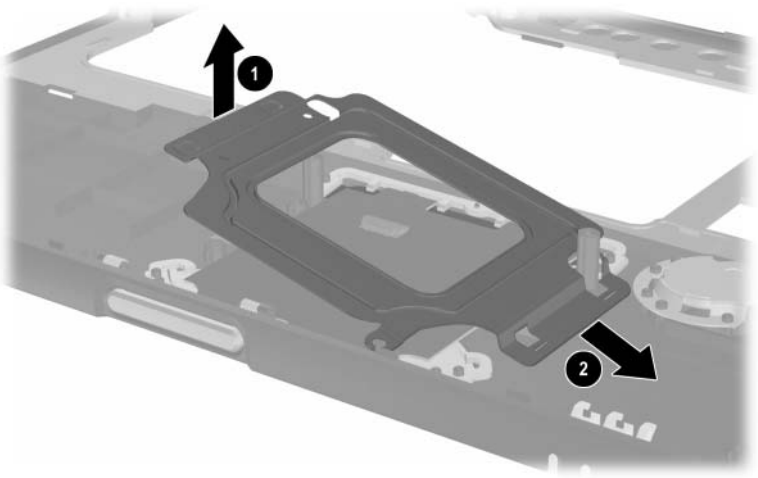
Removing the TouchPad Bracket

6. Release the ZIF connector ❶ to which the TouchPad cable is attached and disconnect the cable ❶ from the TouchPad board.

7. Lift the TouchPad straight up and remove it ❸.
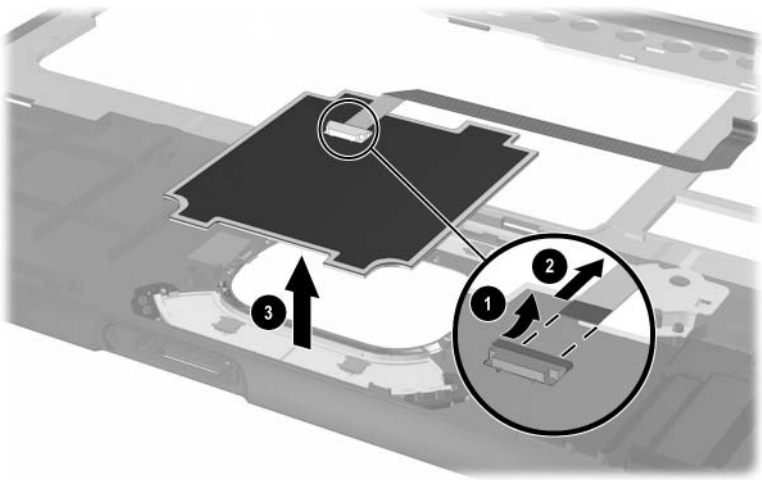
Removing the TouchPad

Reverse the above procedure to install the TouchPad.

5.18 RTC Battery

✎ The RTC battery is included in the Miscellaneous Plastics Kit, spare part number 325528-001, and is also included with the top cover, spare part number 325510-001.

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:
   - ❏ LED switch cover (Section 5.7)
   - ❏ Keyboard (Section 5.8)
   - ❏ Display assembly (Section 5.14)
   - ❏ Top cover (Section 5.15)
2. Turn the top cover upside down with the TouchPad facing toward you.
3. Slide the RTC battery out of the bracket in the top cover.
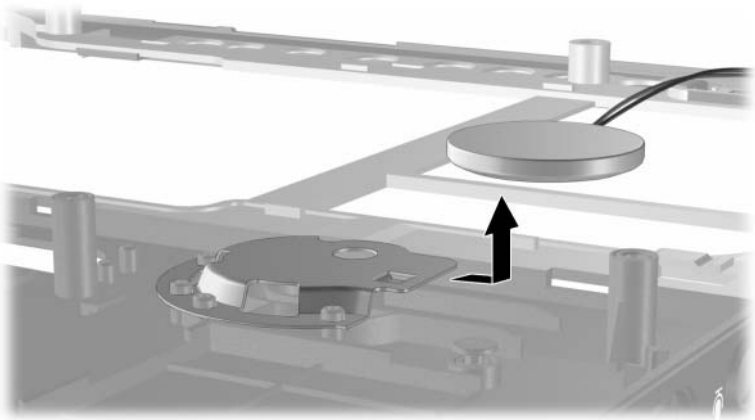
Removing the RTC Battery

Reverse the above procedure to install the RTC battery.

5.19 Speaker/Microphone

✎ The speaker/microphone is included in the Miscellaneous Plastics Kit, spare part number 325528-001, and is also included with the top cover, spare part number 325510-001.

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:

   ❏ LED switch cover (Section 5.7)

   ❏ Keyboard (Section 5.8)

   ❏ Display assembly (Section 5.14)

   ❏ Top cover (Section 5.15)

2. Turn the top cover upside down with the TouchPad facing toward you.

3. Remove the two PM2.0×4.0 screws ❶ that secure the speaker/microphone to the top cover.

4. Remove the speaker/microphone ❷ from the top cover.
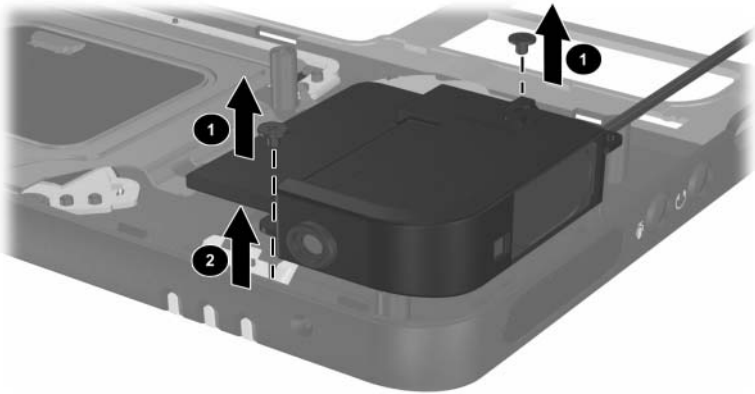
Removing the Speaker/Microphone

Reverse the above procedure to install the speaker/microphone.

5.20 Switch Board

Switch Board

Spare Part Number Information

Switch board	325515-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:

   ❏ LED switch cover (Section 5.7)

   ❏ Keyboard (Section 5.8)

   ❏ Display assembly (Section 5.14)

   ❏ Top cover (Section 5.15)

2. Remove the two PM2.0×3.0 screws ❶ that secure the switch board to the system board.

3. Lift up on the middle of the switch board ❷ to disconnect it from the system board.

4. Remove the switch board.
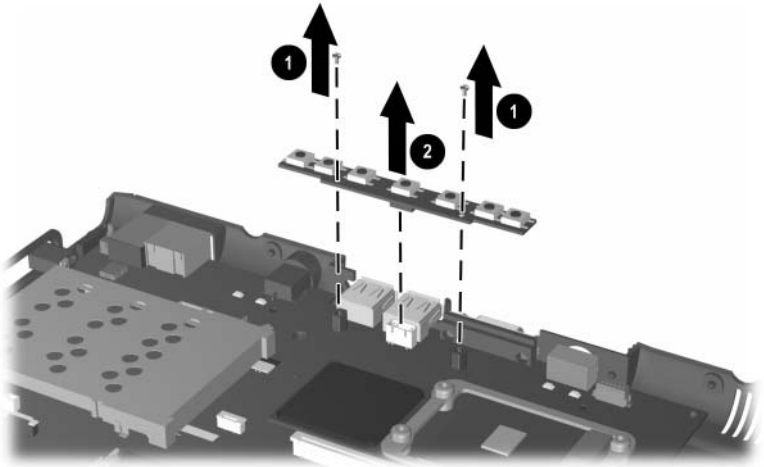
Removing the Switch Board

Reverse the above procedure to install the switch board.

5.21 System Board

System Board

Spare Part Number Information

System board	325514-001

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

■ Memory modules (Section 5.5)

■ Mini PCI communications board (Section 5.6)

■ Processor (Section 5.13)

■ Modem and modem cable (Section 5.22)

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:

   ❏ LED switch cover (Section 5.7)

   ❏ Keyboard (Section 5.8)

   ❏ Heat sink and fan (Section 5.12)

   ❏ Display assembly (Section 5.14)

   ❏ Top cover (Section 5.15)

   ❏ Switch board (Section 5.20)

2. Position the base enclosure so the rear panel is facing toward you.

3. Remove the following screws:

   ❏ Two T8M2.0×6.0 screws ❶ from the rear panel

   ❏ One T8M2.0×4.0 screw ❷ in the upper right corner of the system board

   ❏ One T8M2.0×4.0 screw ❸ in front of the hard drive bay

   ❏ One T8M2.0×4.0 screw ❹ in the lower left corner of the system board

4. Use a 5.0-mm socket to remove the two M2.0×9.0 standoffs ❺ that secure the system board to the base enclosure.
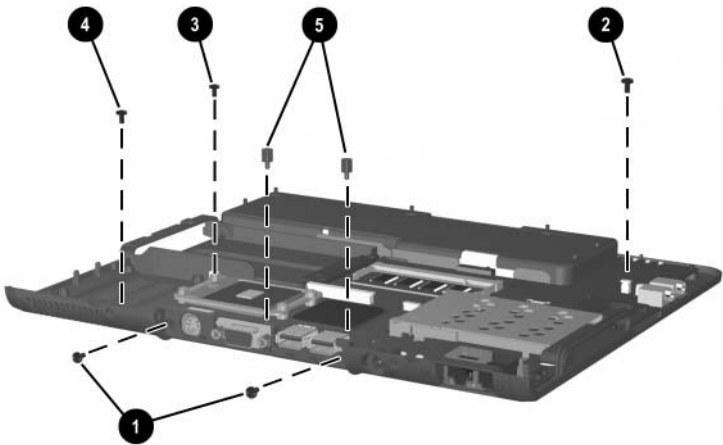
Removing the System Board Screws

5. Remove the grounding tape ❶ that grounds the RJ-11 and RJ-45 connectors to the base enclosure.

6. Lift the left side of the system board ❷ until the battery connector ❸ clears the base enclosure.

7. Slide the system board away from the base enclosure at an angle ❹.
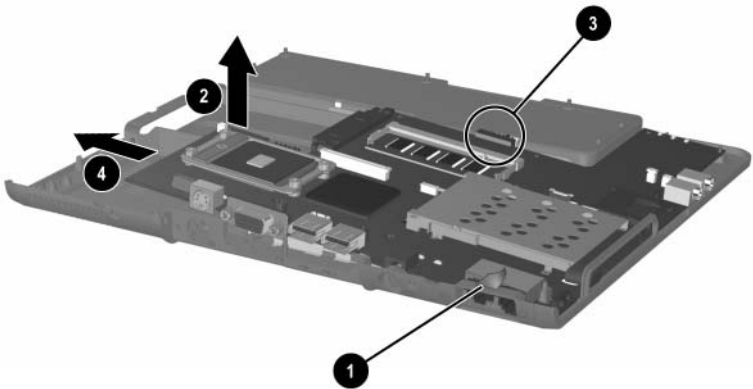
Removing the System Board

Reverse the above procedure to install the system board.

5.22 Modem Board

Modem Board

Spare Part Number Information

Modem board	325521-001

1. Prepare the notebook for disassembly (Section 5.3) and remove the following components:

   ❏ LED switch cover (Section 5.7)

   ❏ Keyboard (Section 5.8)

   ❏ Heat sink and fan (Section 5.12)

   ❏ Display assembly (Section 5.14)

   ❏ Top cover (Section 5.15)

   ❏ Switch board (Section 5.20)

   ❏ System board (Section 5.21)

2. Turn the system board upside down with the rear panel facing toward you.

3. Disconnect the modem board cable ❶ from the modem board.

4. Remove the two PM2.0×3.0 screws ❷ that secure the modem board to the system board.

5. Lift the rear edge of the modem board ❸ to disconnect it from the system board.

6. Remove the modem board.

7. If the modem board cable must be replaced, remove the tape ❹ that secures the cable to the system board and disconnect the cable ❺ from the system board.

✎ The modem cable is included with the modem board and is also included in the Miscellaneous Plastics Kit, spare part number 325528-001.
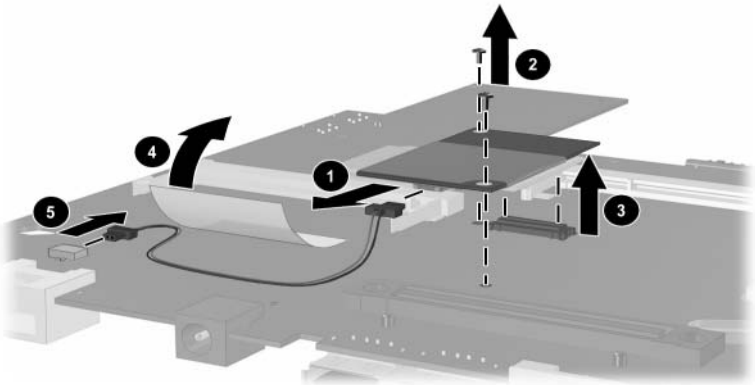
Removing the Modem Board

Reverse the above procedure to install the modem board.

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1

Notebook

Dimensions		
Height	2.79 cm	1.1 in.
Width	27.94 cm	11.0 in.
Depth	23.37 cm	9.2 in.
Weight (varies by configuration)		
	1.58 kg	3.5 lbs
Stand-alone power requirements		
Nominal operating voltage	14.8 V dc	
Maximum operating power		
Peak operating power	40.0 W	
Power in Standby mode		
Power in Hibernation mode	50.0 W	
	< 800 mW	
	< 100 mW	
Temperature		
Operating		
(not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating		
(writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F

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	

Vibration		
Operating	0.75 g zero-to-peak, 10 to 500 Hz, 0.5 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 to 500 Hz, 0.5 oct/min sweep rate	

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

Table 6-2

12.1.0-inch XGA, TFT Display

Dimensions		
Height	26.1 cm	10.3 in
Width	19.9 cm	7.8 in
Diagonal	30.7 cm	12.1 in
Number of colors	up to 16.8 million	
Contrast ratio	125:1	
Refresh rate	60 Hz	
Brightness	130 nit typical AC only (115 nit minimum); 70 nit on battery	
Pixel resolution		
Pitch	0.264 × 0.264 mm	
Format	1024 × 768	
Configuration	RGB vertical stripe	
Backlight	CCFT	
Character display	80 × 25	
Total power consumption	4.00 W	
Viewing angle	±35° horizontal, +15°/-35° vertical typical	

Table 6-3

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 gm	99 gm	99 gm
Interface type	ATA-5	ATA-5	ATA-5
Transfer rate			
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA	ATA	ATA
Seek times (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
Logical blocks[2]	117,210,240	78,140,160	58,605,120
Disk rotational speed	5400 rpm	5400 rpm	4200 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)	5°C to 55°C (41°F to 131°F)

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

[2]Actual drive specifications may differ slightly.

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

Table 6-4

External AC Adapter

Weight	0.29 kg	0.65 lb
Power supply		
Operating voltage	90 to 264 V ac (auto-switching)	
Operating current	1.6 A RMS	
Operating frequency range	47 to 63 Hx AC	
Maximum transient	4/50 kV	

Table 6-5

6-Cell, Primary Li-ion Battery Pack

Dimensions		
Height	2.3 cm	0.90 in
Width	6.3 cm	2.48 in
Depth	20.7 cm	8.15 in
Weight	281 g	0.62 lb
Energy		
Voltage	11.1 V	
Amp-hour capacity	3.96 aH	
Watt-hour capacity	40 wH	
Temperature		
Operating	5°C to 45°C	41°F to 113°F
Nonoperating	-20°C to 60°C	-4°F to 104°F

Table 6-6

6-Cell, Travel Li-ion Battery Pack

Dimensions		
Height	2.3 cm	0.90 in
Width	6.3 cm	2.48 in
Depth	20.7 cm	8.15 in
Weight	306 g	0.67 lb
Energy		
Voltage	11.1 V	
Amp-hour capacity	3.96 aH	
Watt-hour capacity	40 wH	
Temperature		
Operating	5°C to 45°C	41°F to 113°F
Nonoperating	-20°C to 60°C	-4°F to 104°F

Table 6-7

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 6-8

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	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 6-9

System I/O Addresses

I/O Address (hex)	System Function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 "Super I/O" configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/RTC
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2

Table 6-9

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 6-9

System I/O Addresses *(Continued)*

I/O Address (hex)	System Function (shipping configuration)
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	PC Card controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	"A" diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

Table 6-10

System Memory Map

Size	Memory Address	System Function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	01000000-047FFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFF	Video memory (direct access)
4 GB	08200000-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

A

Connector Pin Assignments

Table A-1

RJ-45 Network Interface
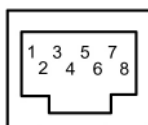
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-2

RJ-11 Modem
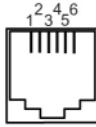
Pin	Signal	Pin	Signal
1	Unused	4	Unused
2	Tip	5	Unused
3	Ring	6	Unused

Table A-3

Universal Serial Bus
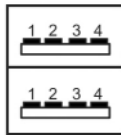
Pin	Signal	Pin	Signal
1	+5 V dc	3	Data +
2	Data –	4	Ground

Table A-4

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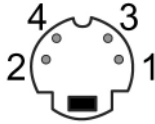
Pin	Signal	Pin	Signal
1	Ground (Y)	3	Y-Luminance (Intensity)
2	Ground (C)	4	C-Chrominance (Color)

Table A-5

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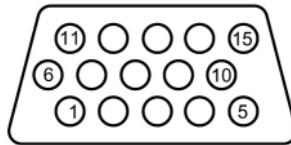
Pin	Signal	Pin	Signal
1	Red analog	9	+5 V dc
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table A-6

Stereo Speaker/Headphone

Pin	Signal	Pin	Signal
1	Audio out	2	Ground

Table A-7

Microphone

Pin	Signal	Pin	Signal
1	Audio in	2	Ground

B

Power Cord Set Requirements

3-Conductor Power Cord Set

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

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

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

General Requirements

The requirements listed below are applicable to all countries:

■ The length of the power cord set must be at least 1.5 m (5.00 feet) and a maximum of 2.0 m (6.50 feet).

■ All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.

■ The power cord set must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.

■ The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the notebook.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

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

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

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

Notes

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

2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.

3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² 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 325529-001.

Table C-1

Phillips PM2.5×3.0 Screw
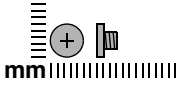
	Color	Qty.	Length	Thread	Head Width
	Black	1	3.0 mm	2.5 mm	5.0 mm
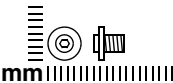
Where used:

1 screw that secures the hard drive to the notebook
(documented in Section 5.3)

Phillips M2.5×3.0 Screw Location

Table C-2

Torx T5 M2.5×4.5 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	4.5 mm	2.5 mm	5.0 mm

Where used:

2 screws that secure the hard drive to the hard drive frame
(documented in Section 5.3)
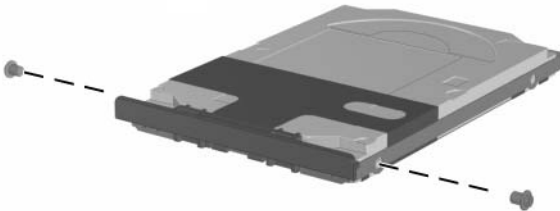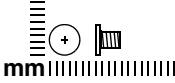
Table C-3

Phillips PM2.5×3.5 Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	2	3.5 mm	2.5 mm	4.5 mm
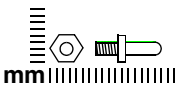
Where used:

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

Torx T5 M2.5×4.5 and Phillips M2.5×3.5 Screw Locations

Table C-4

4.0-mm Socket M2.0×10.0 Alignment Pin

mm	Color	Qty.	Length	Thread	Head Width
	Silver	2	10.0 mm	2.0 mm	4.0 mm
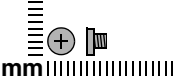
Where used:
2 alignment pins that secure the hard drive to the hard drive frame (documented in Section 5.3)
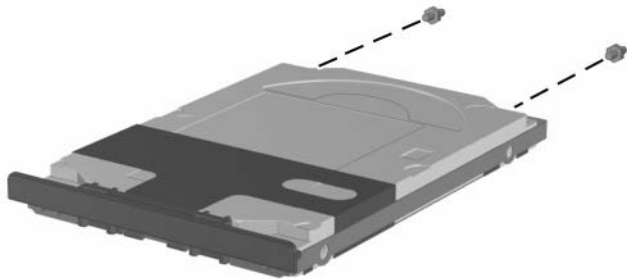
4.0-mm Socket M2.0×10.0 Alignment Pin Locations

Table C-5

Black Phillips PM2.0×3.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	2	3.0 mm	2.0 mm	4.5 mm
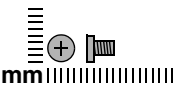
Where used:
2 screws that secure the hard drive upper bezel to the hard drive frame (documented in Section 5.3)
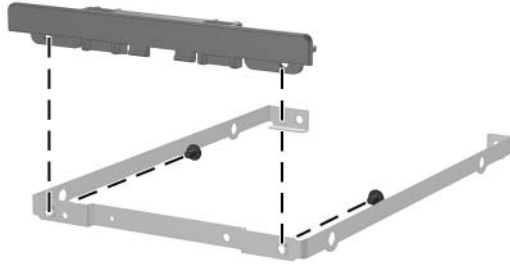
Phillips PM2.0×3.0 Screw Locations

Table C-6

Phillips PM2.0×4.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Black	6	4.0 mm	2.0 mm	5.0 mm
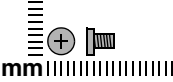
Where used:

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

❷ One screw that secures the Mini PCI compartment cover to the notebook (documented in Section 5.6)
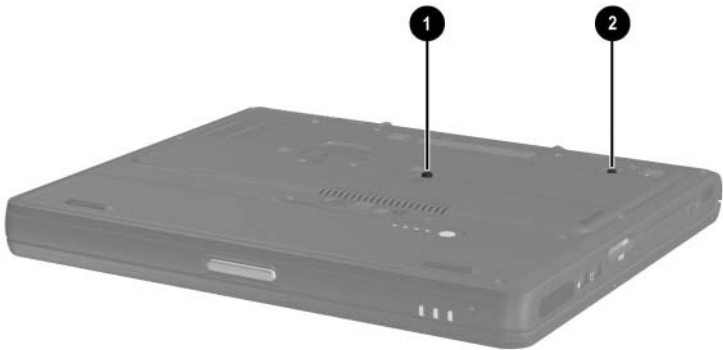
Phillips M2.0×4.0 Screw Locations

Table C-6

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	6	4.0 mm	2.0 mm	4.5 mm
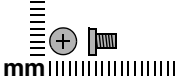
Where used:

2 screws that secure the TouchPad to the top cover
(documented in Section 5.17)
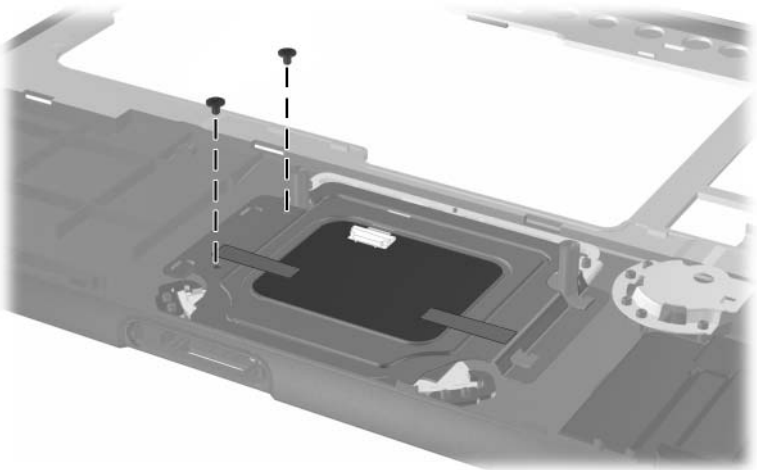
Phillips PM2.0×4.0 Screw Locations

Table C-6

Phillips PM2.0×4.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	6	4.0 mm	2.0 mm	4.5 mm

Where used:
2 screws that secure the speaker/microphone to the top cover
(documented in Section 5.19)
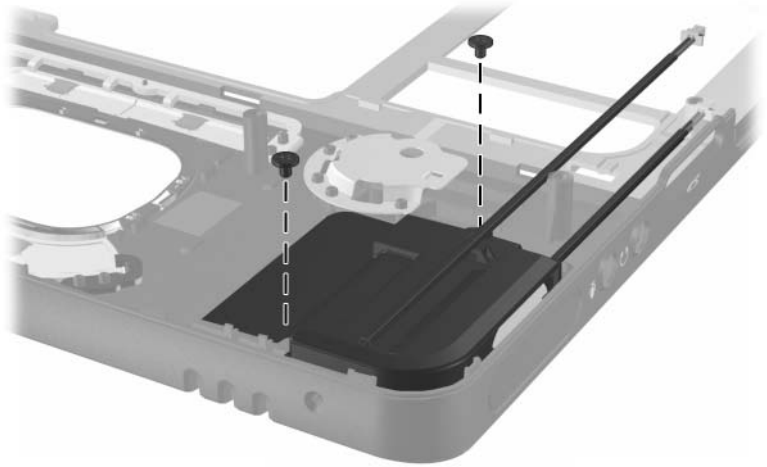
Phillips PM2.0×4.0 Screw Locations

Table C-7

Silver Phillips PM2.0×3.0 Screw
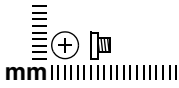
	Color	Qty.	Length	Thread	Head Width
	Silver	7	3.0 mm	2.0 mm	4.0 mm
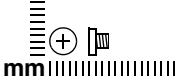
Where used:

3 screws that secure the fan to the heat sink
(documented in Section 5.12)

Phillips PM2.0×3.0 Screw Locations

Table C-7

Silver Phillips PM2.0×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	7	3.0 mm	2.0 mm	4.0 mm

Where used:

2 screws that secure the switch board to the system board
(documented in Section 5.20)

Phillips PM2.0×3.0 Screw Locations

Table C-7

Silver Phillips PM2.0×3.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Silver	7	3.0 mm	2.0 mm	4.0 mm

Where used:

2 screws that secure the switch board to the system board
(documented in Section 5.20)

Phillips PM2.0×3.0 Screw Locations

Table C-8

Torx T8 M2.0×8.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	8.0 mm	2.0 mm	4.5 mm

Where used:

❶ Two screws that secure the LED switch cover to the notebook (documented in Section 5.7)

❷ One screw that secures the keyboard to the notebook (documented in Section 5.8)
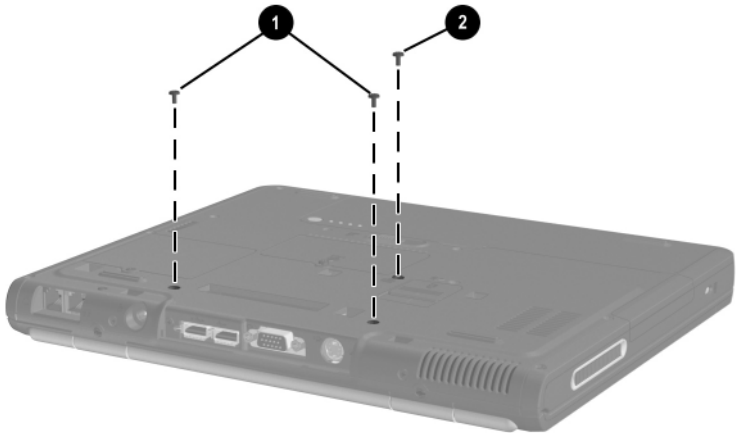
Torx T8 M2.0×8.0 Screw Locations
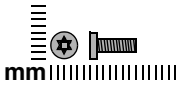
Table C-8

Torx T8 M2.0×8.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	8.0 mm	2.0 mm	4.5 mm
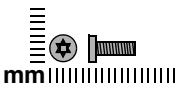
Where used:

2 screws that secure the display hinge covers to the notebook (documented in)

Torx T8 M2.0×8.0 Screw Locations

Table C-8

Torx T8 M2.0×8.0 Screw *(Continued)*

	Color	Qty.	Length	Thread	Head Width
	Black	15	8.0 mm	2.0 mm	4.5 mm

Where used:

2 screws that secure the display assembly to the notebook
(documented in Section 5.14)

Torx T8 M2.0×8.0 Screw Locations

Table C-8

Torx T8 M2.0×8.0 Screw *(Continued)*

mm	Color	Qty.	Length	Thread	Head Width
	Black	15	8.0 mm	2.0 mm	4.5 mm
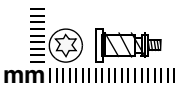
Where used:

8 screws that secure the top cover to the notebook
(documented in Section 5.15)
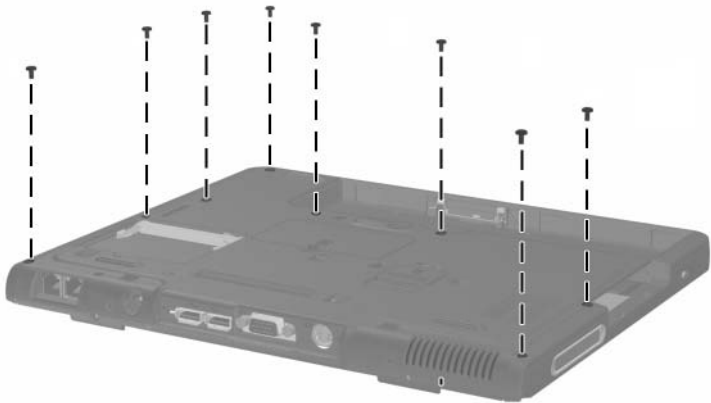
Torx T8 M2.0×8.0 Screw Locations

Table C-9

Spring-Loaded Torx T8 M2.0×10.0 Screw

	Color	Qty.	Length	Thread	Head Width
mm	Silver	2	10.0 mm	2.0 mm	5.0 mm

Where used:

2 screws that secure the heat sink to the notebook
(documented in Section 5.12; screws and springs secured to heat sink
by c-clip)
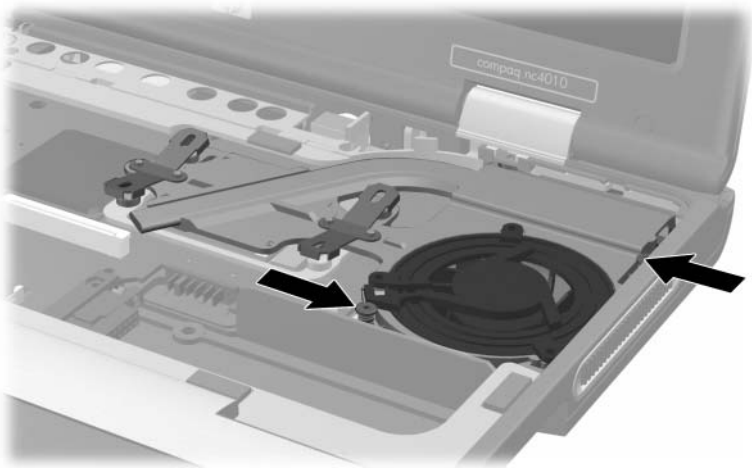
Spring-Loaded Torx T8 M2.0×10.0 Screw Locations

**Table C-10
Torx T8 M2.0×4.0 Screw**

	Color	Qty.	Length	Thread	Head Width
mm|||||||||||||||||	Black	12	4.0 mm	2.0 mm	4.5 mm
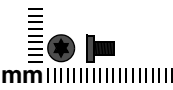
Where used:

4 screws that secure the heat sink to the notebook
(documented in Section 5.12)
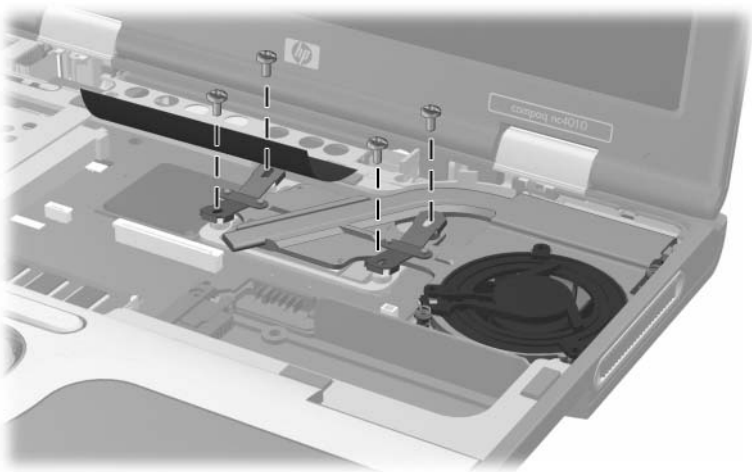
Torx T8 M2.0×4.0 Screw Locations

Table C-10

Torx T8 M2.0×4.0 Screw *(Continued)*

	Color	Qty.	Length	Thread	Head Width
	Black	12	4.0 mm	2.0 mm	4.5 mm

Where used:

5 screws that secure the top cover to the notebook
(documented in Section 5.15)
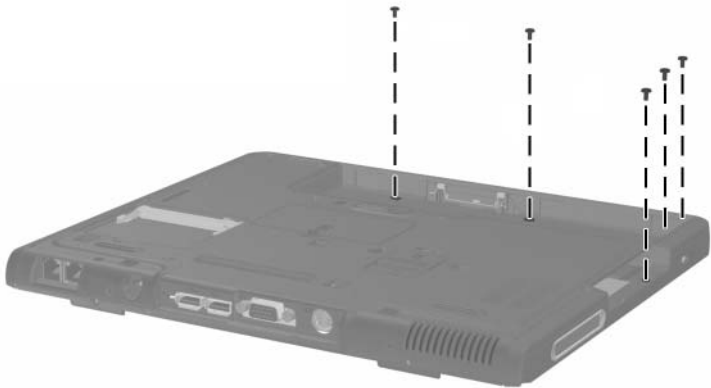
Torx T8 M2.0×4.0 Screw Locations

Table C-10

Torx T8 M2.0×4.0 Screw *(Continued)*
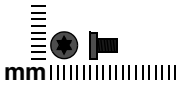
mm ||||||||||||||||||||||	Color	Qty.	Length	Thread	Head Width
	Black	12	4.0 mm	2.0 mm	4.5 mm
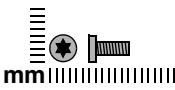
Where used:

3 screws that secure the system board to the notebook
(documented in Section 5.21)

Torx T8 M2.0×4.0 Screw Locations

Table C-11

Torx T8 M2.0×6.0 Screw

mm	Color	Qty.	Length	Thread	Head Width
	Black	2	6.0 mm	2.0 mm	4.5 mm

Where used:

2 screws that secure the system board to the notebook (documented in Section 5.21)
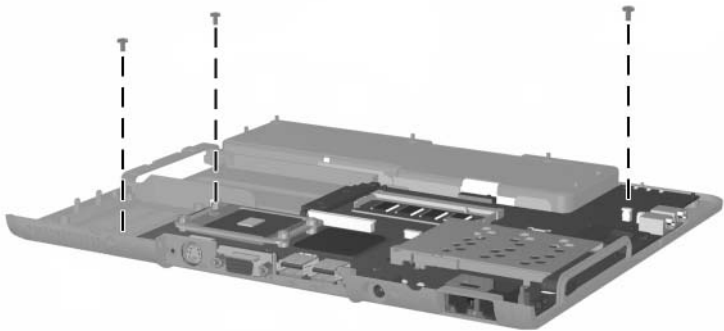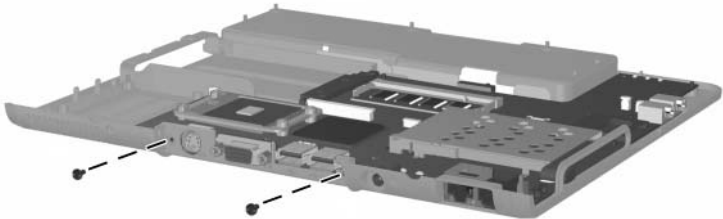
Torx T8 M2.0×6.0 Screw Locations

Table C-11

Torx T8 M2.0×6.0 Screw
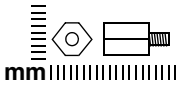
	Color	Qty.	Length	Thread	Head Width
mm	Silver	2	9.0 mm	2.0 mm	5.0 mm

Where used:

2 standoffs that secure the system board to the base enclosure (documented in Section 5.21)
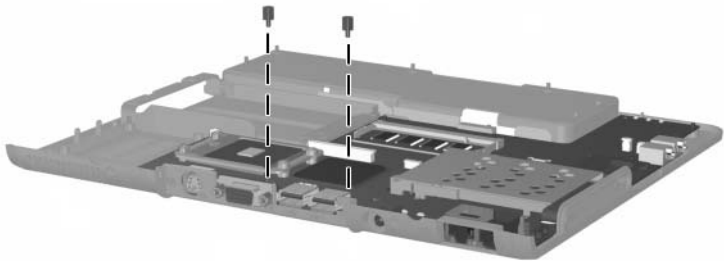
5.0-mm Socket M2.0×9.0 Standoff Locations

Table C-13
Phillips PM1.5×3.0 Screw

	Color	Qty.	Length	Thread	Head Width
mm	Silver	1	3.0 mm	1.5 mm	3.0 mm

Where used:

1 screw that secures the security card to the system board
(documented in Section 5.9)

Phillips PM1.5×3.0 Screw Location

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