



Maintenance and Service Guide

HP Compaq nc6220 and nc6230
Notebook PC

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

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Maintenance and Service Guide
HP Compaq nc6220 and nc6230 Notebook PC
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Product Description

The HP Compaq nc6220 and nc6230 Notebook PCs offer advanced modularity, Intel® Pentium® M and Celeron® M processors, and extensive multimedia support.



HP Compaq nc6220 and nc6230 Notebook PCs

1.1 Features

- The following processors are available, varying by computer model:
 - ❑ Intel Pentium M 770 (2.13-GHz)
 - ❑ Intel Pentium M 760 (2.00-GHz)
 - ❑ Intel Pentium M 750 (1.86-GHz)
 - ❑ Intel Pentium M 740 (1.73-GHz)
 - ❑ Intel Pentium M 730 (1.60-GHz)
 - ❑ Intel Celeron M 1.50-GHz
- The following displays are available, varying by computer model:
 - ❑ 14.1-inch, SXGA, TFT (1400 × 1050) with over 16.8 million colors
 - ❑ 14.1-inch, XGA, TFT (1280 × 800) with over 16.8 million colors
- The following high-capacity hard drives are available, varying by computer model:
 - ❑ 60-GB (7200-rpm)
 - ❑ 80-GB, 60-GB, 40-GB (5400-rpm)
- 256-MB DDR2 synchronous DRAM (SDRAM) at 400 and 533 MHz, expandable to 2.0 GB
- Microsoft® Windows® XP Home Edition or Windows XP Professional, varying by computer model
- Full-size Windows keyboard with embedded numeric keypad
- TouchPad pointing device, including a dedicated vertical scroll region
- Integrated 10Base-T/100Base-TX Ethernet local area network (LAN) network interface card (NIC) with RJ-45 jack
- Integrated high-speed 56K modem with RJ-11 jack
- Integrated wireless support for Mini PCI IEEE 802.11a/b/g or 802.11b/g WLAN device

- Support for one Type I or Type II PC Card slot, with support for both 32-bit (CardBus) and 16-bit PC Cards, varying by computer model
- External 65-watt AC adapter with 3-wire power cord, varying by computer model
- 6-cell Li-Ion battery pack
- Stereo speakers
- Volume up, volume mute, and volume down buttons
- Support for the following optical drives:
 - DVD-ROM Drive
 - DVD+RW/R and CD-RW Combo Drive
 - DVD/CD-RW Combo Drive
- Connectors:
 - Audio-out (headphone)
 - Audio-in (microphone)
 - Universal Serial Bus (USB) v. 2.0 (3 ports)
 - Power
 - External monitor
 - RJ-11 (modem)
 - RJ-45 (network)
 - IEEE 1394
 - Travel battery
 - SD Memory Card slot
 - Smart card reader
 - Infrared
 - Parallel port
 - S-Video-out
 - Docking connector

1.2 Resetting the Computer

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

1. Prepare the computer for disassembly (refer to [Section 6.3, “Preparing the Computer for Disassembly,”](#) for more information).
2. Remove the real-time clock (RTC) battery (refer to [Section 6.24, “System Board,”](#) for more information on removing and replacing the RTC battery).
3. Wait approximately 5 minutes.
4. Replace the RTC battery and reassemble the computer.
5. Connect AC power to the computer. Do not reinsert any battery packs at this time.
6. Turn on the computer.

All passwords and all CMOS settings have been cleared.

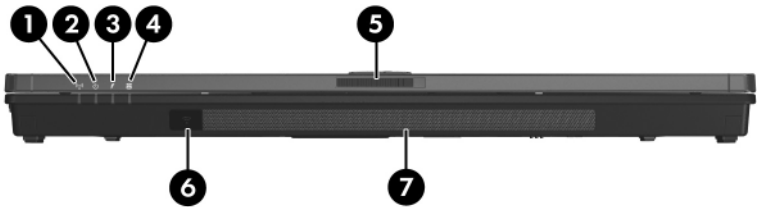
1.3 Power Management

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

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

1.4 External Components

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



Front Components

Table 1-1

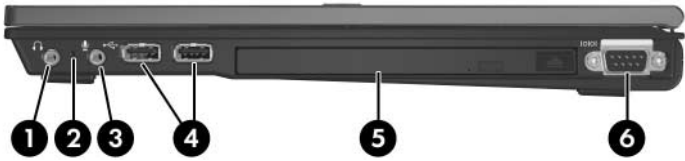
Front Components

Item	Component	Function
1	Wireless light	On: an integrated wireless device has been turned on.
2	Power light	■ On: Computer is turned on. ■ Blinking: Computer is in standby. ■ Off: Computer is off.

Table 1-1
Front Components (Continued)

Item	Component	Function
3	Battery light	<p>Amber: A battery pack is charging.</p> <p>Green: A battery pack is close to full charge capacity.</p> <p>Blinking amber: 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.</p> <p>Off: If the computer is connected to an external power source, the light is turned off when all batteries in the computer are fully charged. If the computer is not connected to an external power source, the light is turned off until the battery reaches a low-battery condition.</p>
4	Integrated Drive Electronics (IDE) drive light	On: A drive in the hard drive bay or MultiBay II is being accessed.
5	Display release latch	Opens the computer.
6	Infrared port	Provides wireless communication between the computer and an optional IrDA-compliant device.
7	Speakers (2)	Produce stereo sound.

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

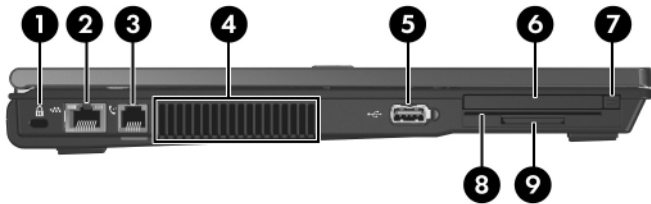


Right-Side Components

Table 1-2
Right-Side Components

Item	Component	Function
1	Audio-out (headphone) jack	Produces system sound when connected to optional powered stereo speakers, headphones, headset, or television audio.
2	Internal microphone	Records sound.
3	Audio-in (microphone) jack	Connects an optional microphone.
4	USB ports (2)	Connects USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable.
5	MultiBay II	Holds a MultiBay II device.
6	Serial port	Connects an optional serial device.

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




Left-Side Components

Table 1-3

Left-Side Components

Item	Component	Function
1	Security cable slot	Attaches an optional security cable to the computer. △ The purpose of security solutions is to act as a deterrent. These solutions do not prevent the product from being mishandled or stolen.
2	RJ-45 (network) jack	Connects a network cable.
3	RJ-11 (modem) jack	Connects the modem cable.

Table 1-3
Left-Side Components (Continued)

Item	Component	Function
4	Vent	<p>Enables airflow to cool internal components.</p> <p> To prevent overheating, do not obstruct vents. Using the computer on a soft surface, such as a pillow, blanket, rug, or thick clothing, may block airflow.</p>
5	USB port	Connects USB 1.1- and 2.0-compliant devices to the computer using a standard USB cable.
6	PC Card slot	Supports optional Type I or Type II PC Cards.
7	PC Card eject button	Ejects an optional PC Card from the PC Card slot.
8	Smart card reader	Accepts smart cards.
9	SD Memory Card slot	Accepts Secure Digital (SD) Memory Cards.

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



Rear Panel Components

Table 1-4
Rear Panel Components

Item	Component	Function
1	External monitor port	Connects an optional external monitor or overhead projector.
2	Power connector	Connects an AC adapter or an optional automobile or aircraft adapter.
3	S-Video-out jack	<p>Is a 7-pin, dual-purpose jack.</p> <p>It connects an optional S-Video device such as a television, VCR, camcorder, overhead projector, or video capture card by means of an optional, standard (4-pin) S-Video cable.</p> <p>The extra 3 pins also enable an optional S-Video-to-composite adapter to be used with the computer.</p>

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

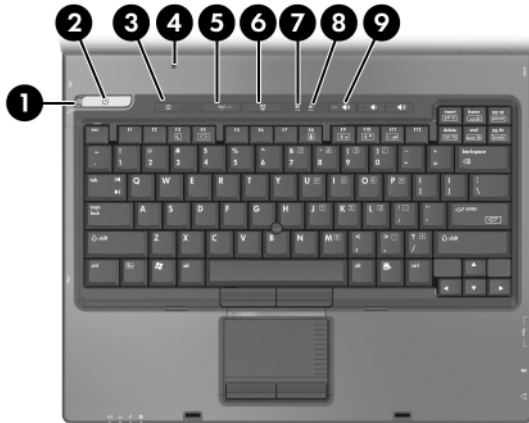


Standard Keyboard Components

Table 1-5
Standard Keyboard Components

Item	Component	Function
1	f1 to f12 keys (12)	Execute frequently used system functions when pressed in combination with the fn key.
2	caps lock key	Enables caps lock and turns on the caps lock light.
3	fn key	Executes frequently used system functions when pressed in combination with a function key or the esc key.
4	Windows logo key	Displays the Windows Start menu.
5	Windows applications key	Displays a shortcut menu for items beneath the pointer.
6	Arrow keys	Moves the cursor around the screen.
7	Embedded numeric keypad	Can be used like the keys on an external numeric keypad.
8	num lock key	Enables numeric lock, turns on the embedded numeric keypad, and turns on the num lock light.

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



Top Components, Part 1

Table 1-6
Top Components, Part 1

Item	Component	Function
1	Power light	On: The computer is on.
2	Power button	<p>When the computer is:</p> <ul style="list-style-type: none"> ■ Off, press and release to turn on the computer. ■ In standby, press and release to exit standby. ■ In hibernation, press and release to restore from hibernation. <p>If the system has stopped responding and Windows shutdown procedures cannot be used, press to the left and hold for 5 seconds to turn off the computer.</p>
3	Info Center button	Enables you to view a list of commonly used software solutions.
4	Display switch	Initiates standby if the display is closed while the computer is turned on.
5	Wireless button Wireless light	<p>Enables/disables the WLAN and Bluetooth® devices.</p> <p>On: An integrated wireless device is hardware enabled.</p>
6	Presentation mode button	Turns on Presentation mode.
7	Caps lock light	On: caps lock is on.
8	Num lock light	On: num lock is on or the embedded numeric keypad is enabled.
9	Volume mute button	Turns off the computer sound.

The computer top components are continued below and described in Table 1-7.

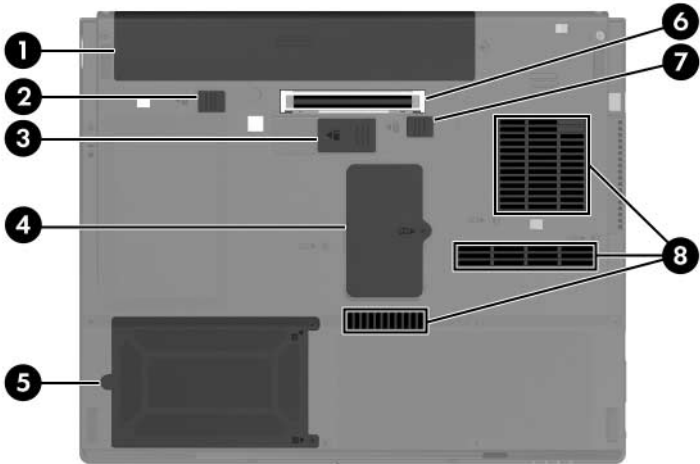


Top Components, Part 2

Table 1-7
Top Components, Part 2

Item	Component	Function
1	Volume down button	Decreases computer sound.
2	Volume up button	Increases computer sound.
3	Pointing stick	Moves the pointer and selects or activates items on the screen.
4	Left/right pointing stick buttons	Function like the left and right buttons on an external mouse.
5	TouchPad scroll zone	Scrolls up or down.
6	Left/right TouchPad buttons	Function like the left and right buttons on an external mouse.
7	TouchPad	Moves the pointer and selects or activates items on the screen. Can be set to perform other mouse functions, such as scrolling, selecting, and double-clicking.

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



Bottom Components

Table 1-8
Bottom Components

Item	Component	Function
1	Primary battery bay	Holds the primary battery pack.
2	Primary battery locking latch	Secures the primary battery pack into the battery bay.
3	Travel battery connector	Connects an optional travel battery.
4	Expansion memory module compartment	Accepts one optional memory module.
5	Hard drive bay	Holds the primary hard drive.
6	Docking connector	Connects the computer to an optional docking device.
7	Primary battery release latch	Releases the primary battery pack from the battery bay.
8	Vents (3)	Enable airflow to cool internal components.

△ To prevent overheating, do not obstruct vents. Using the computer on a soft surface, such as a pillow, blanket, rug, or thick clothing, may block airflow.

1.5 Design Overview

This section presents a design overview of key parts and features of the computer. Refer to [Chapter 4, “Illustrated Parts Catalog,”](#) to identify replacement parts, and [Chapter 6, “Removal and Replacement Procedures,”](#) for disassembly steps.

The system board provides the following device connections:

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



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

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

Troubleshooting



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

2.1 Computer Setup

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

Using Computer Setup

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

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

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





Selecting from the Main Menu

Table 2-1
Main Menu

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

Selecting from the Security Menu

Table 2-2
Security Menu

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

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Advanced Menu

Table 2-3
Advanced Menu

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

Selecting from the Tools Menu

Table 2-4
Tools Menu

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

2.2 Troubleshooting Flowcharts

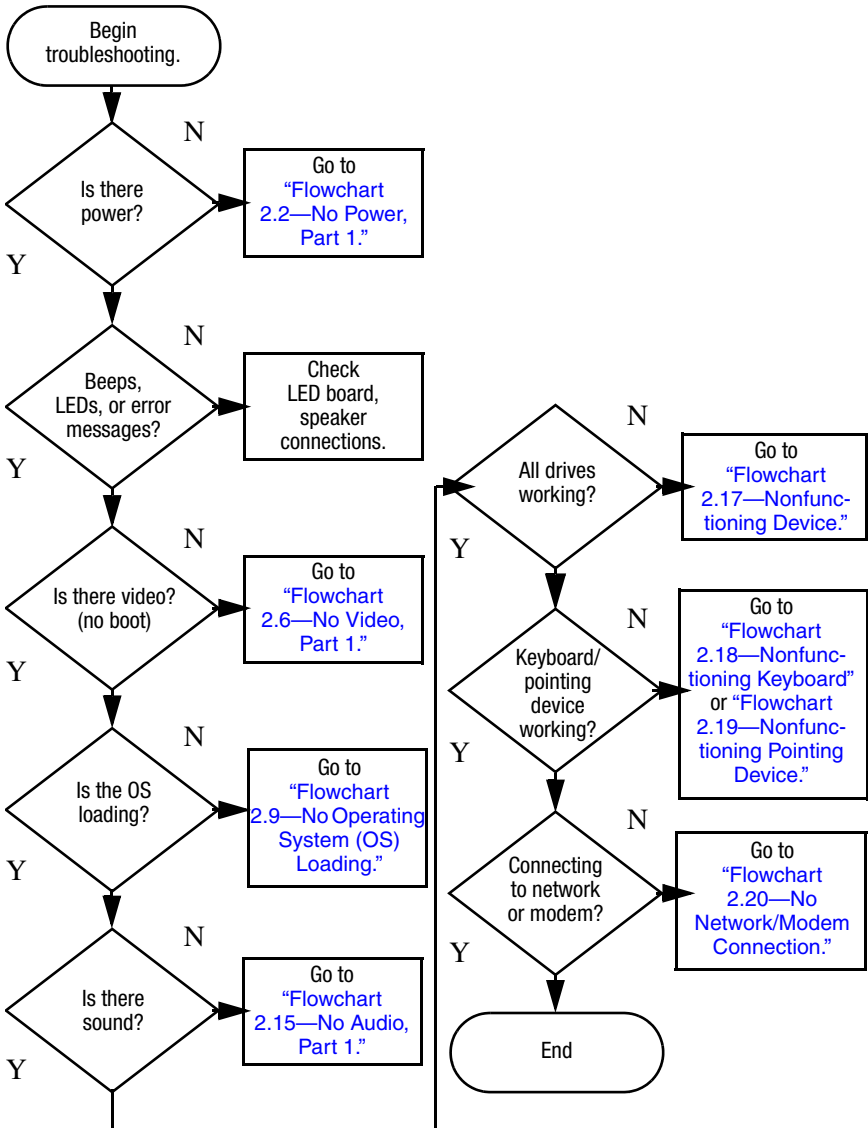
Table 2-5
Troubleshooting Flowcharts Overview

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

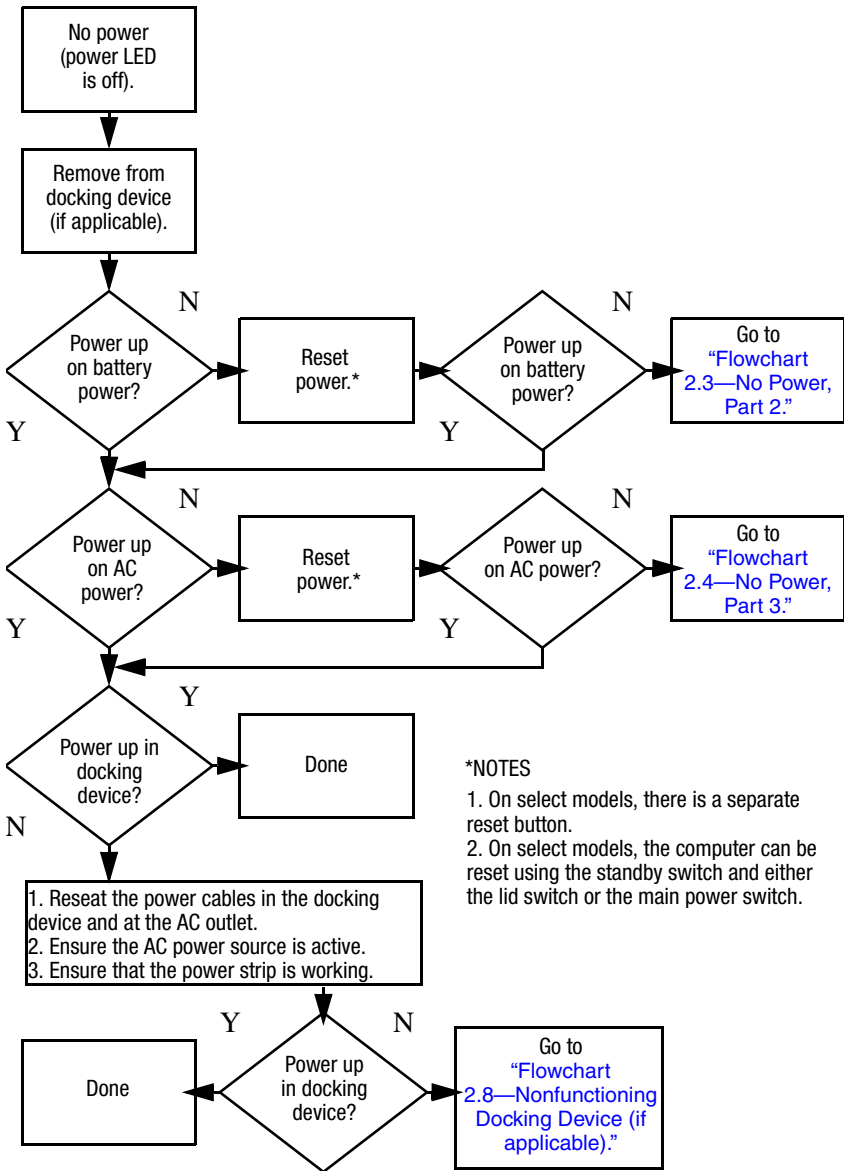
Table 2-5
Troubleshooting Flowcharts Overview (*Continued*)

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

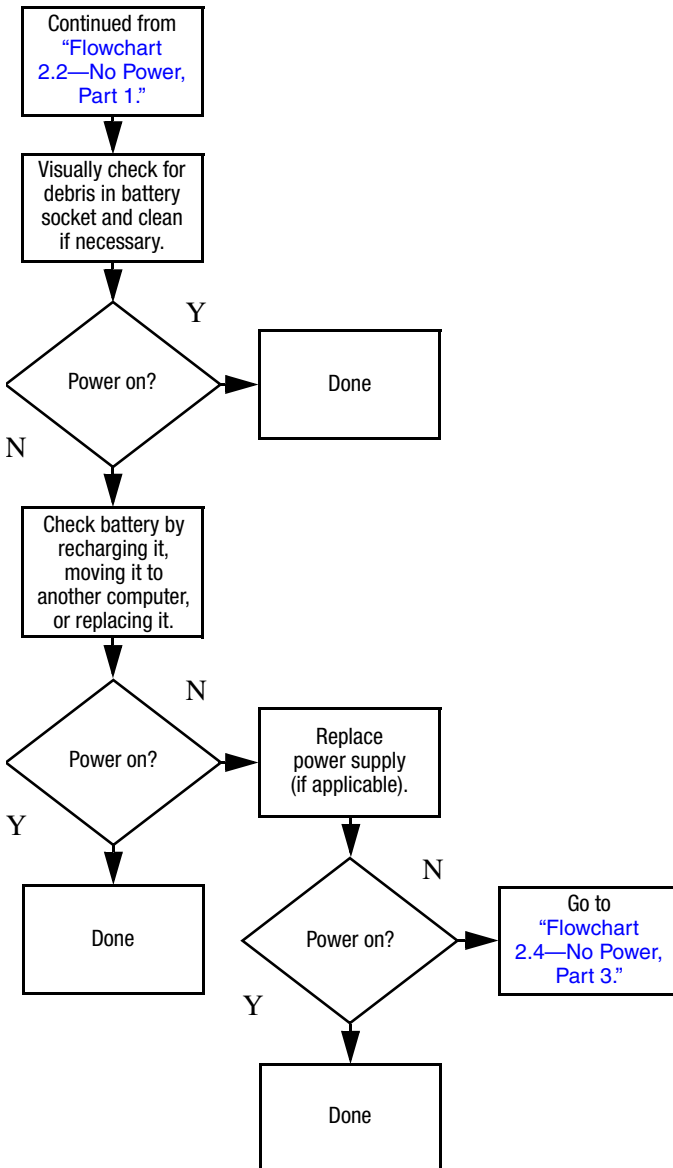
Flowchart 2.1 – Initial Troubleshooting



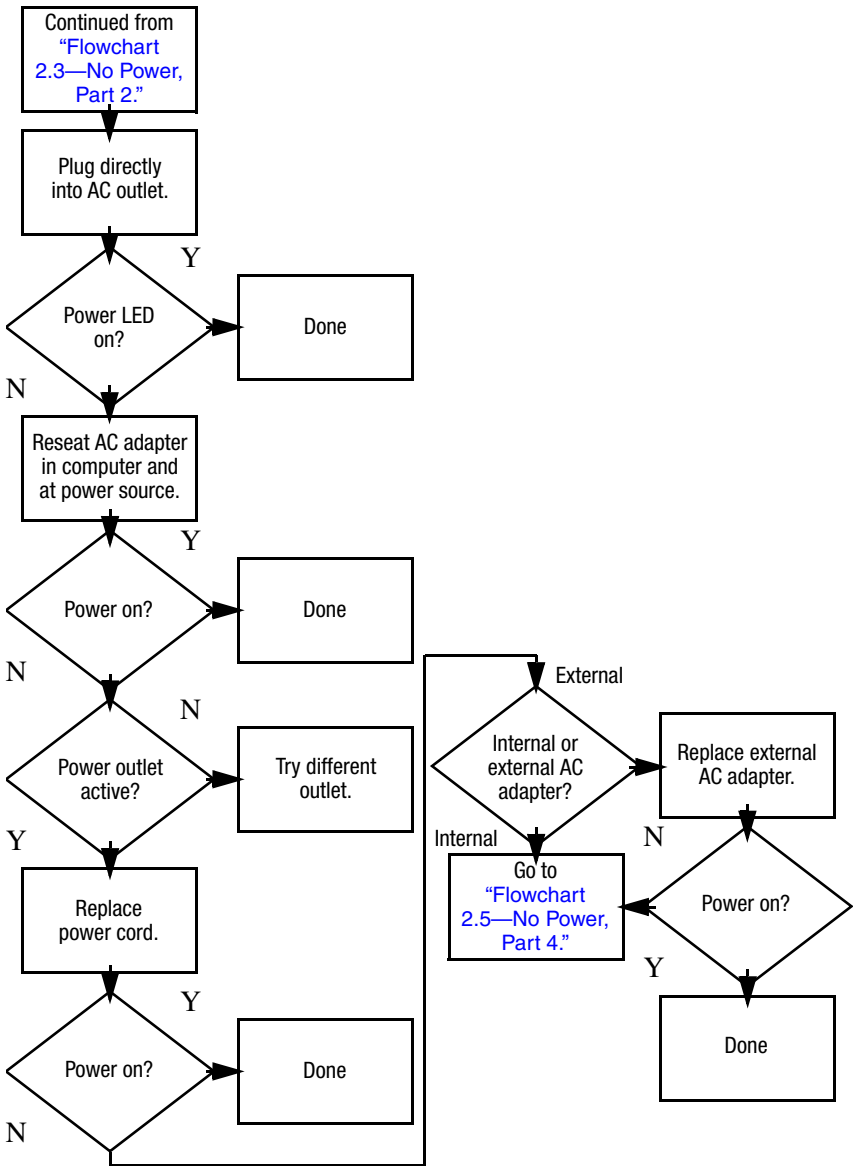
Flowchart 2.2—No Power, Part 1



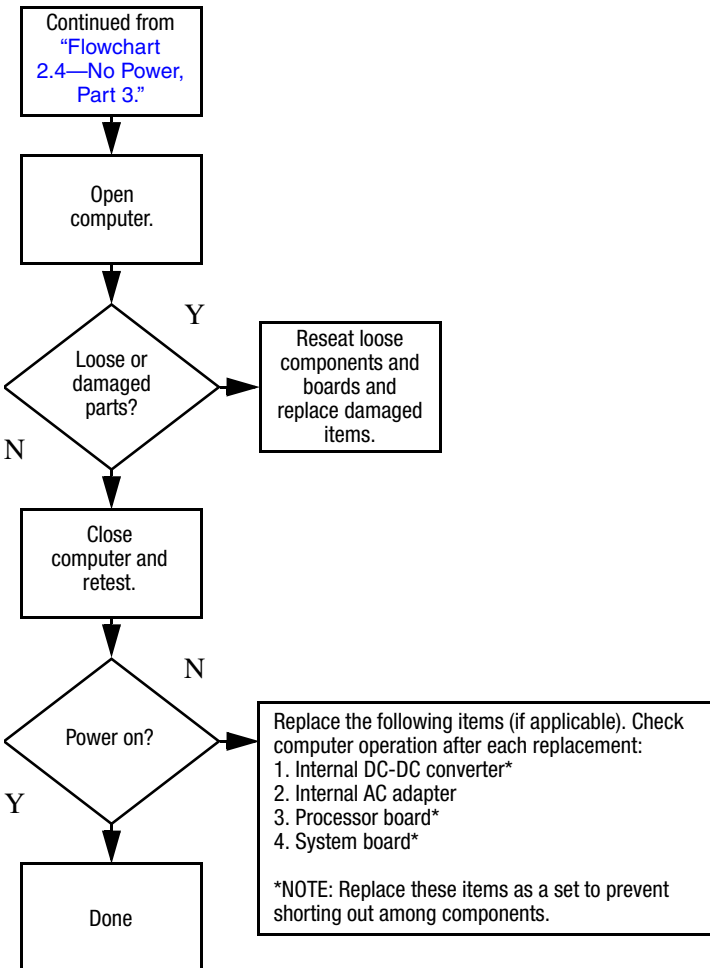
Flowchart 2.3—No Power, Part 2



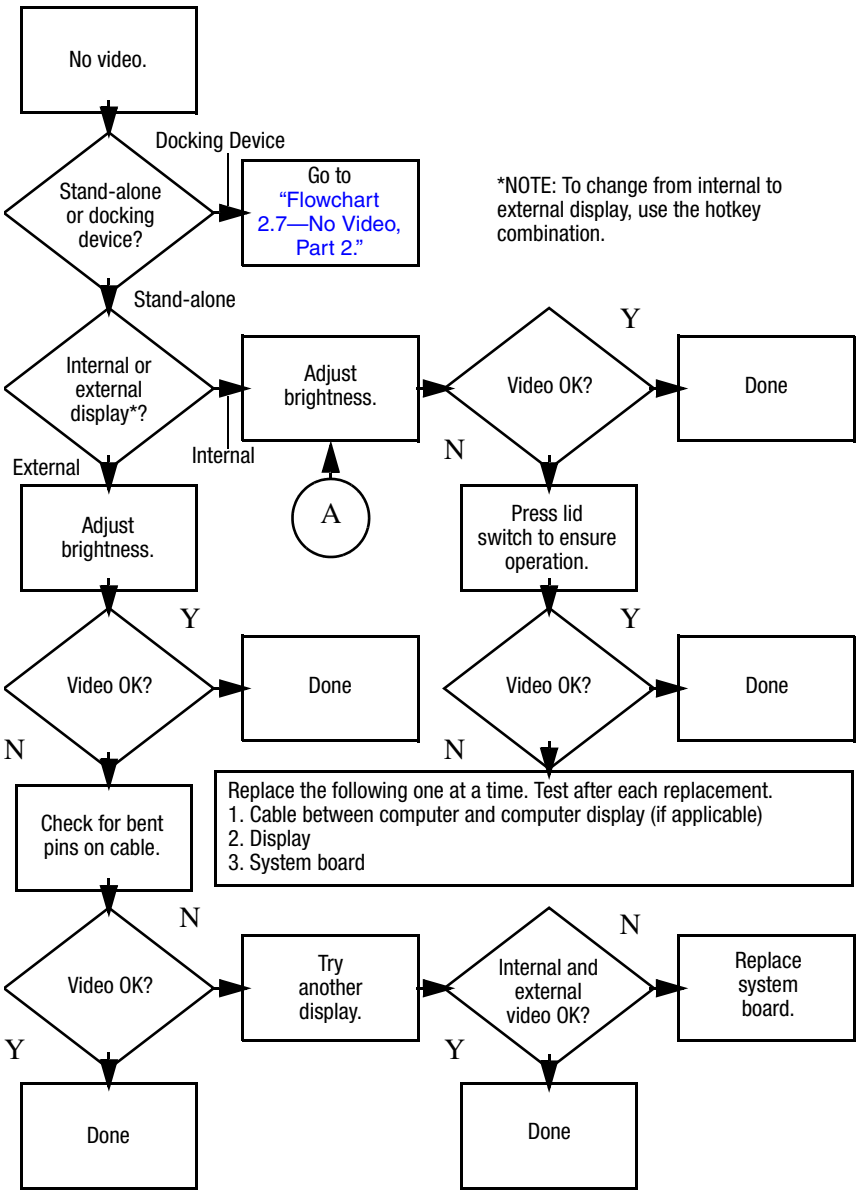
Flowchart 2.4—No Power, Part 3



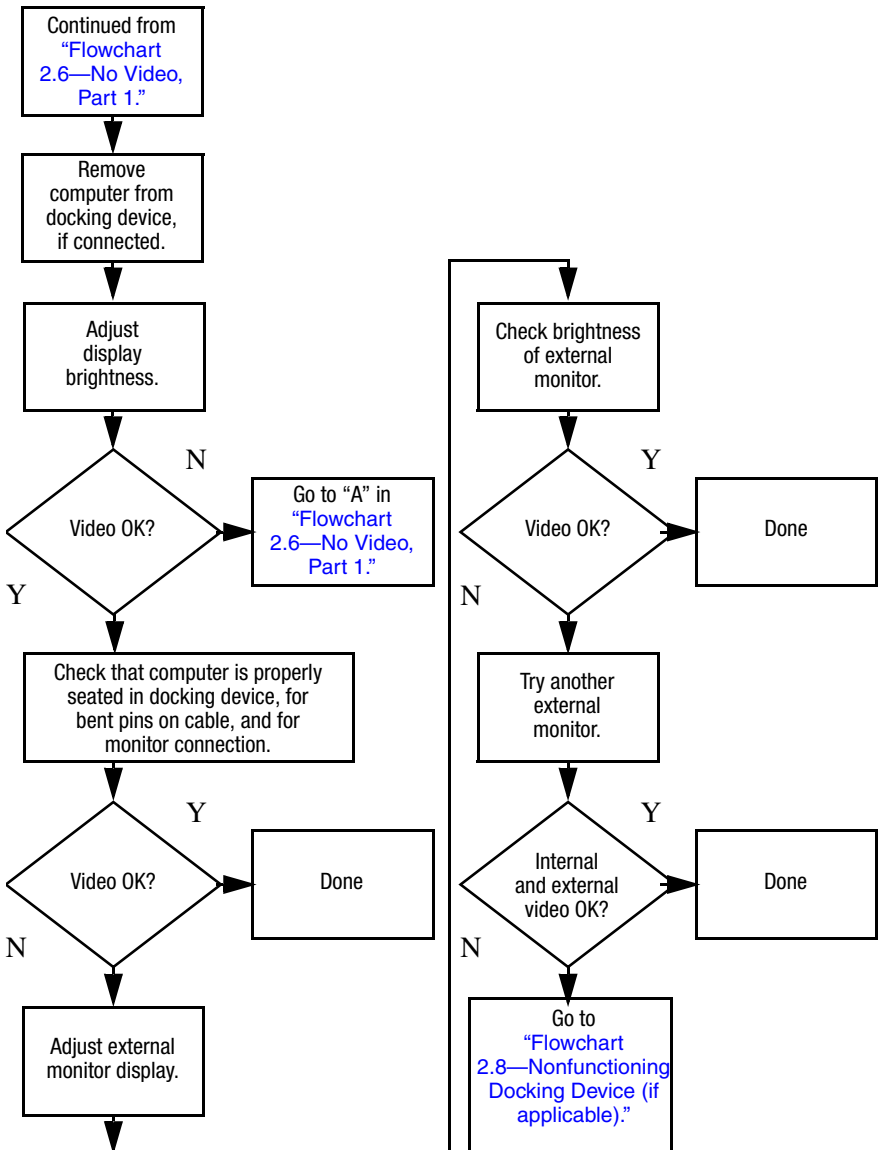
Flowchart 2.5—No Power, Part 4



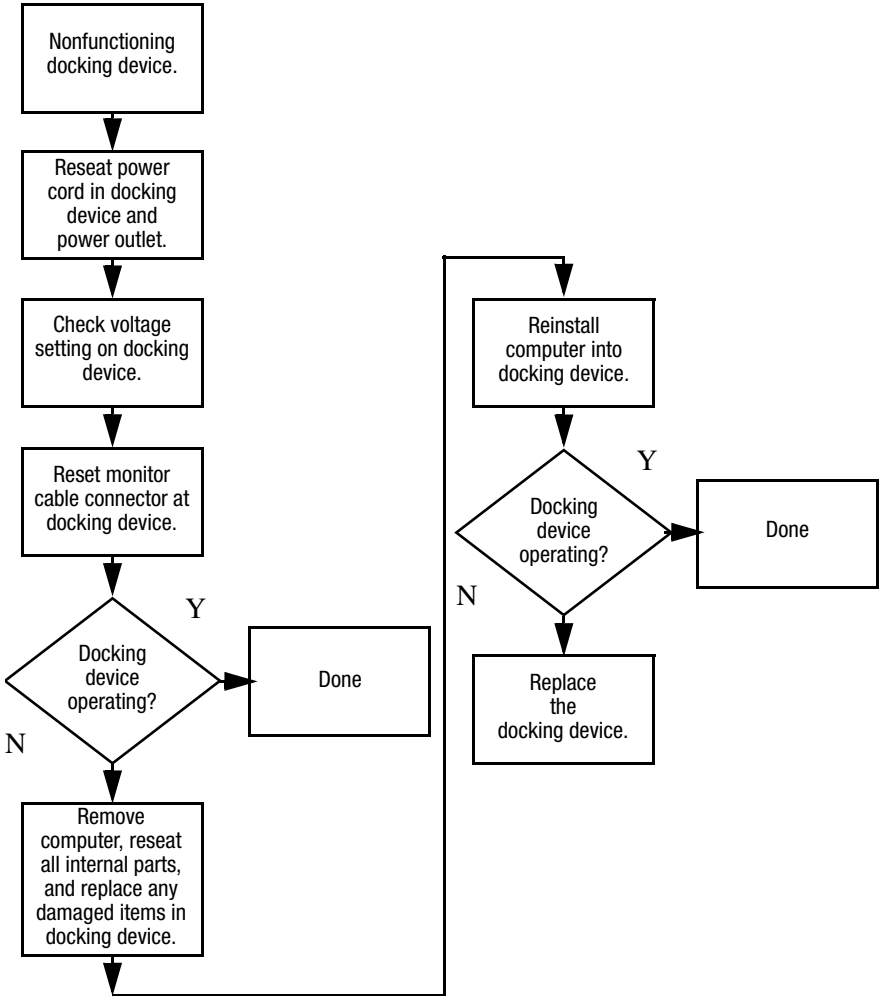
Flowchart 2.6—No Video, Part 1



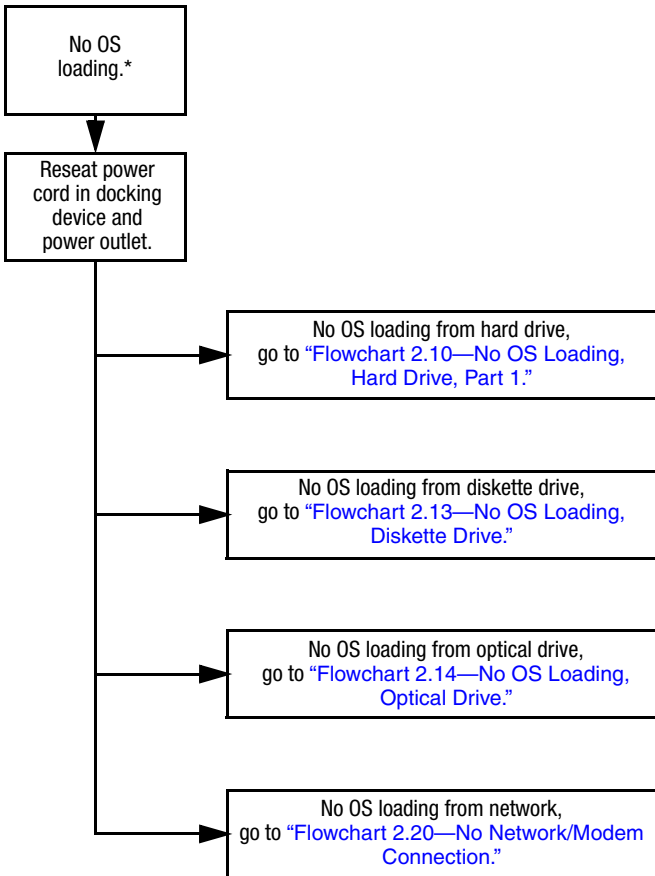
Flowchart 2.7—No Video, Part 2



Flowchart 2.8—Nonfunctioning Docking Device (if applicable)

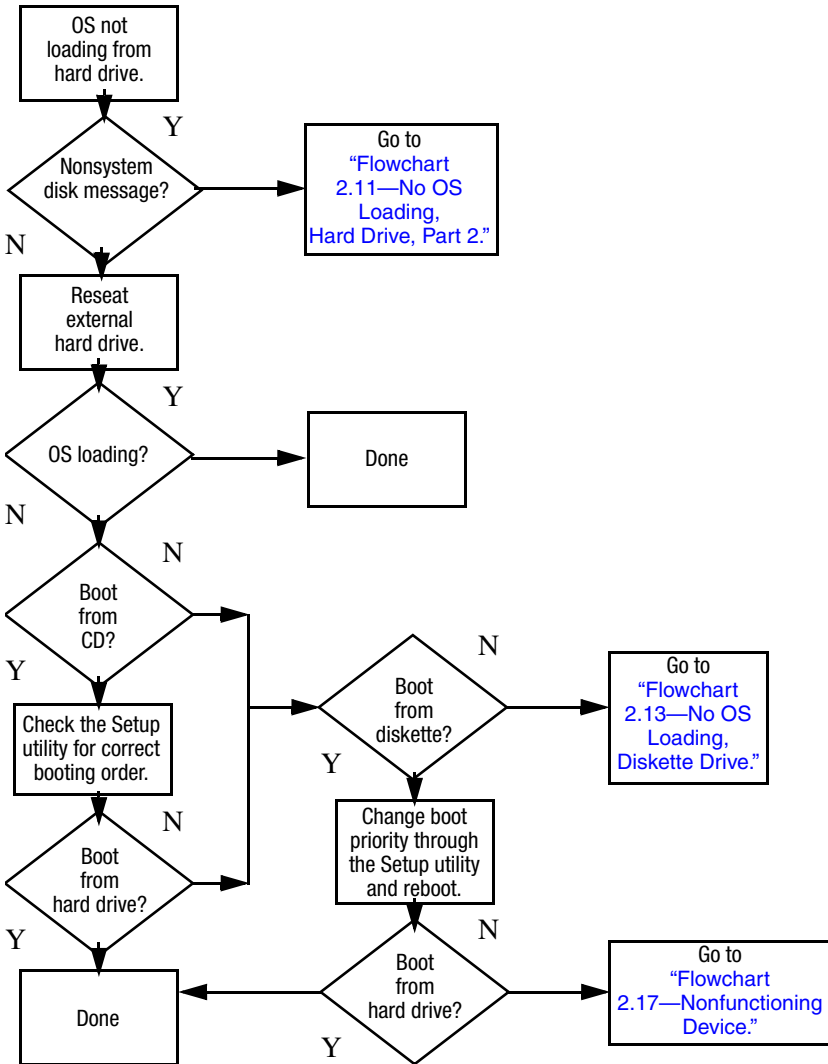


Flowchart 2.9—No Operating System (OS) Loading

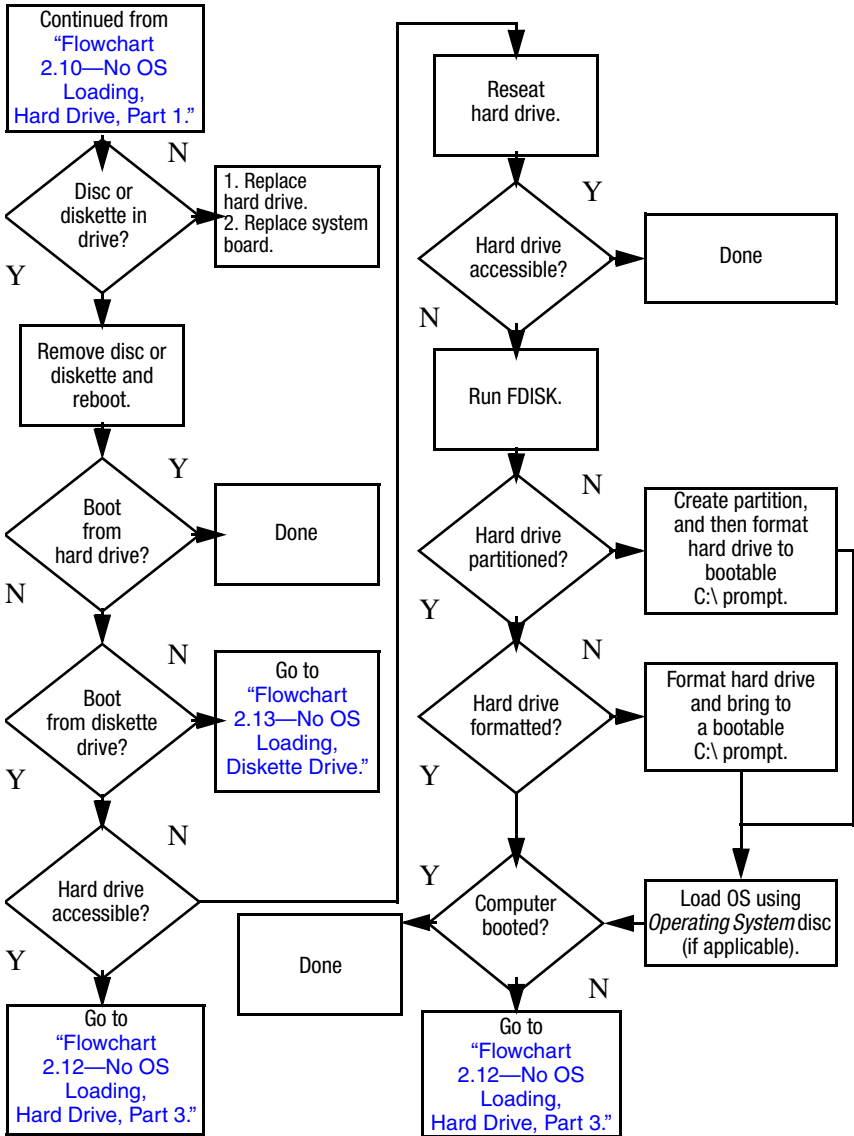


*NOTE: Before beginning troubleshooting, always check cable connections, cable ends, and drives for bent or damaged pins.

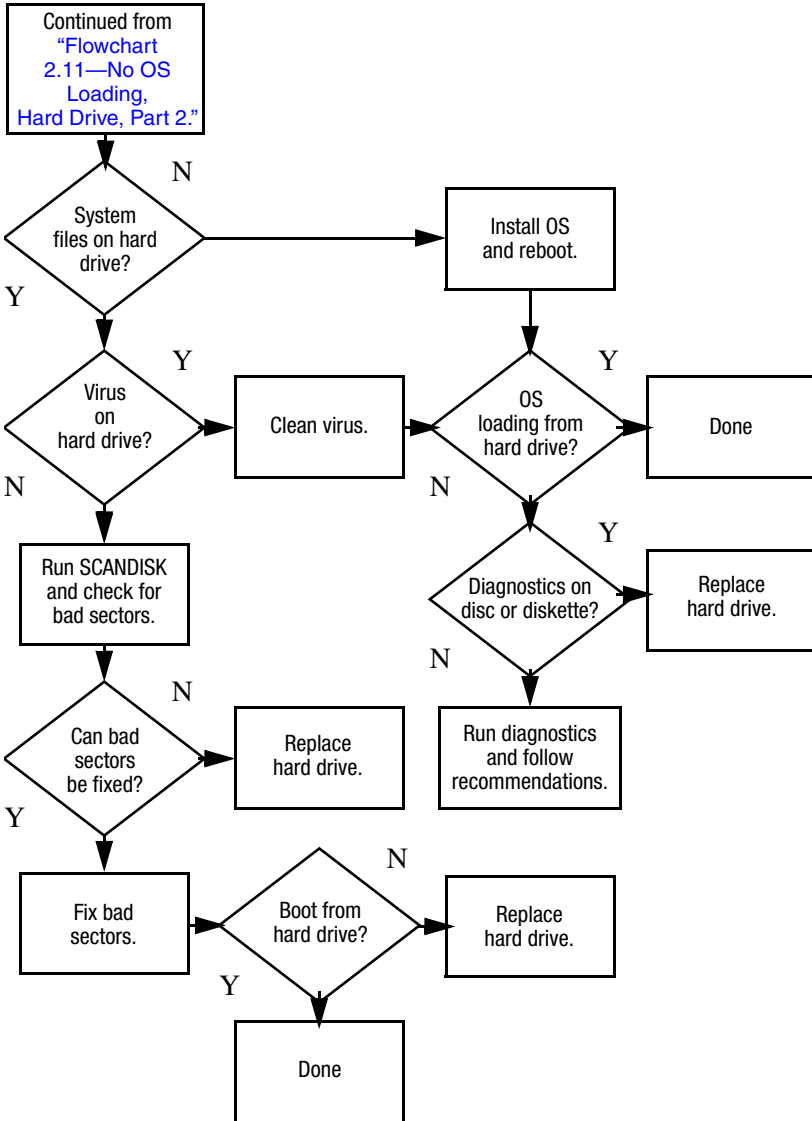
Flowchart 2.10—No OS Loading, Hard Drive, Part 1



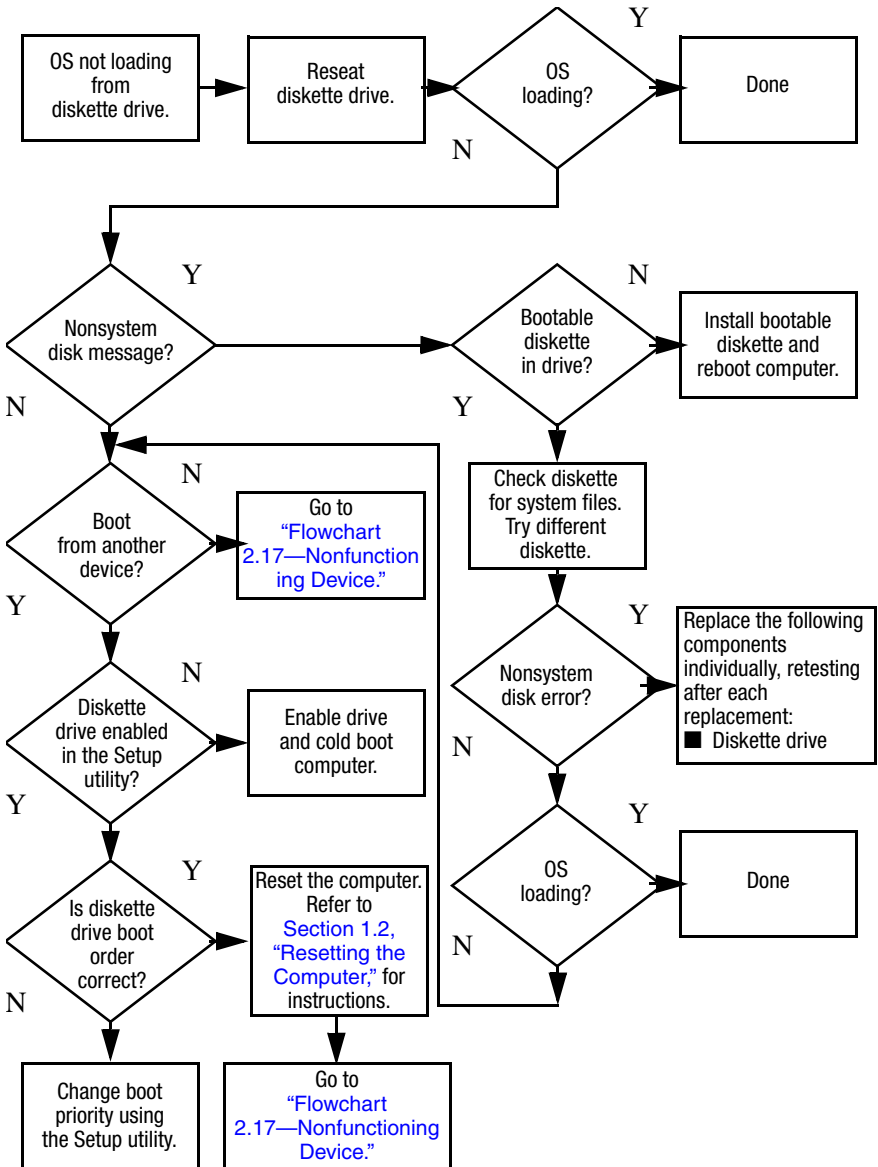
Flowchart 2.11 – No OS Loading, Hard Drive, Part 2



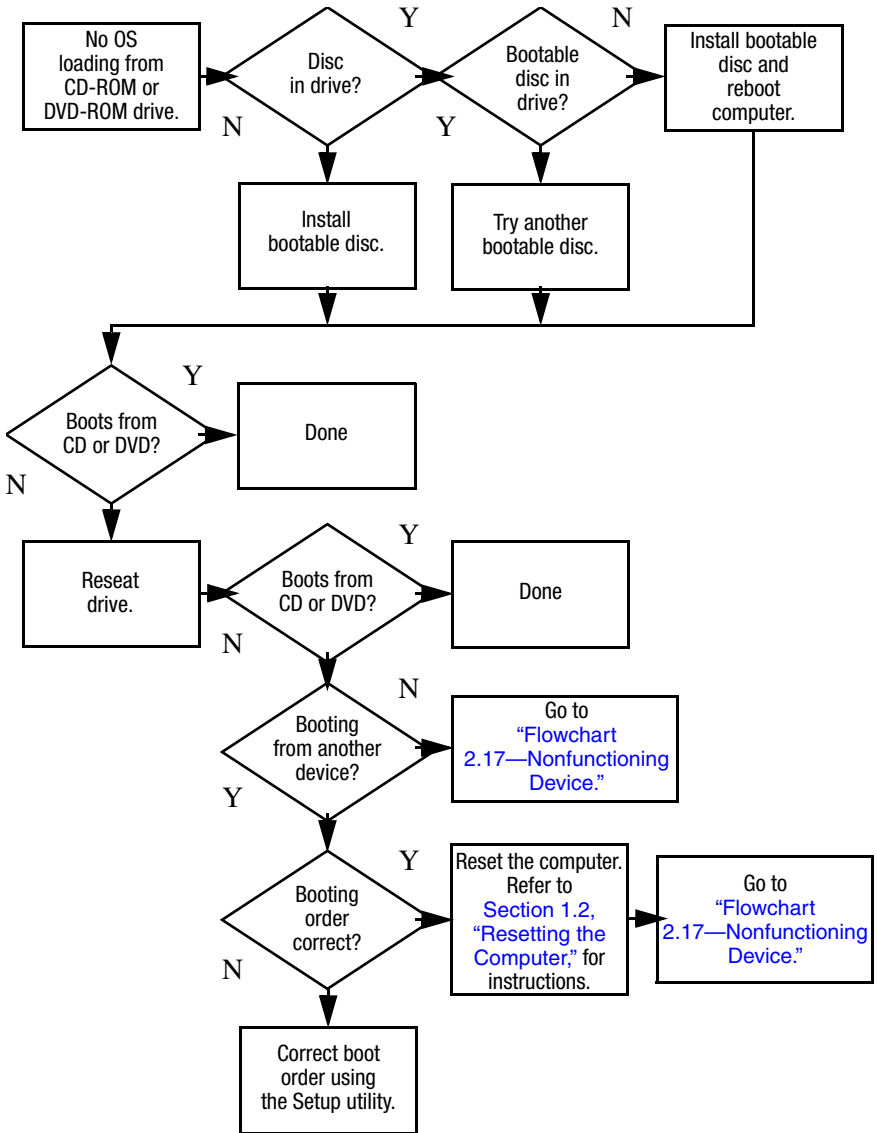
Flowchart 2.12—No OS Loading, Hard Drive, Part 3



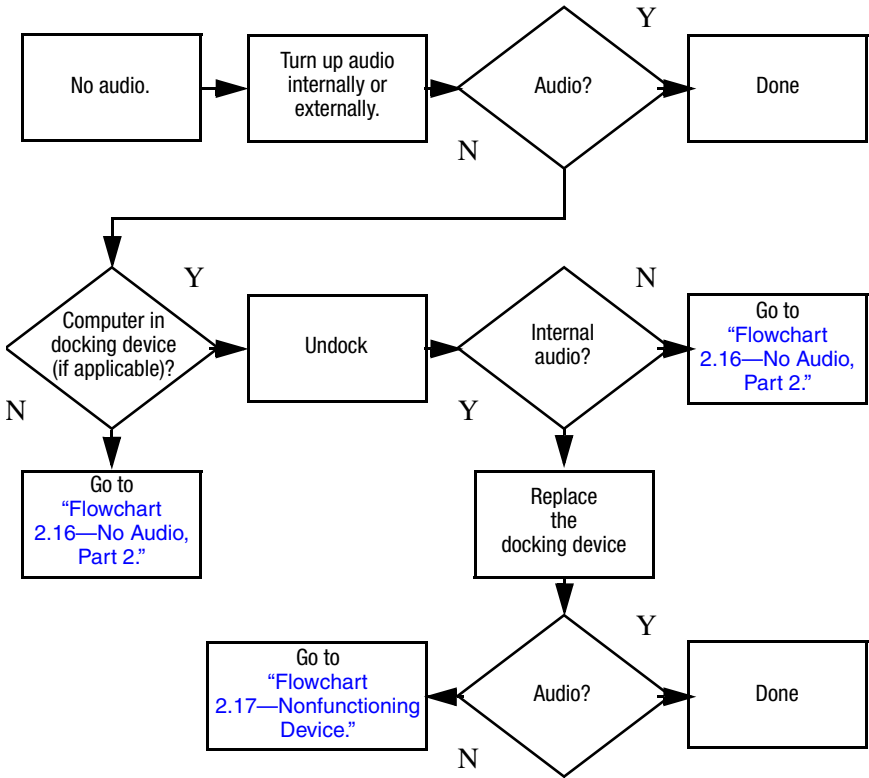
Flowchart 2.13—No OS Loading, Diskette Drive



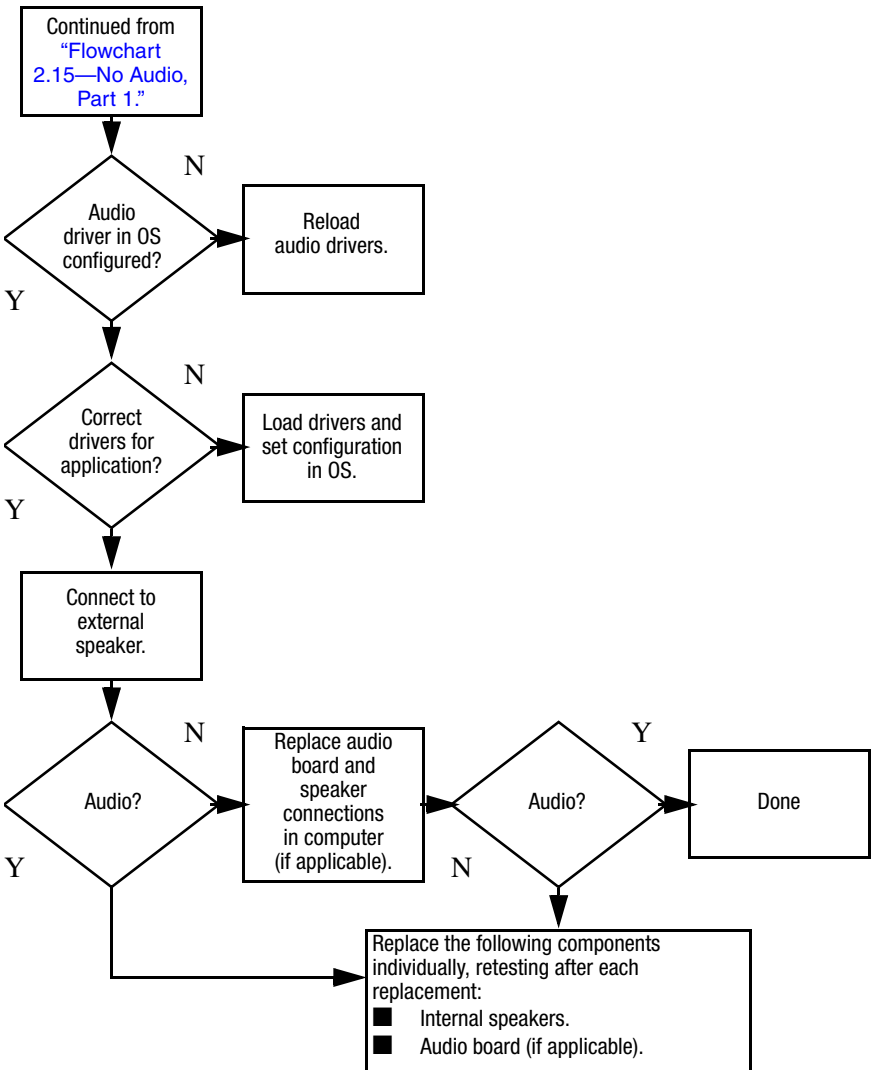
Flowchart 2.14—No OS Loading, Optical Drive



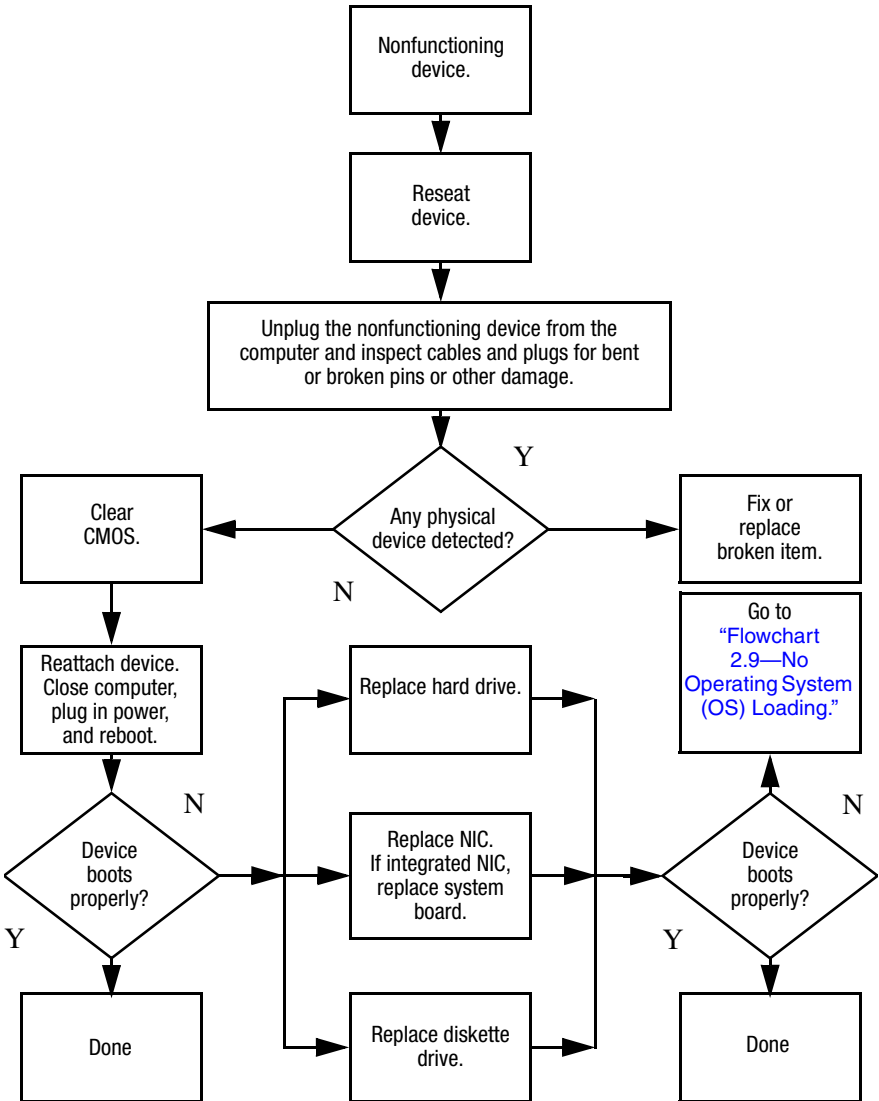
Flowchart 2.15—No Audio, Part 1



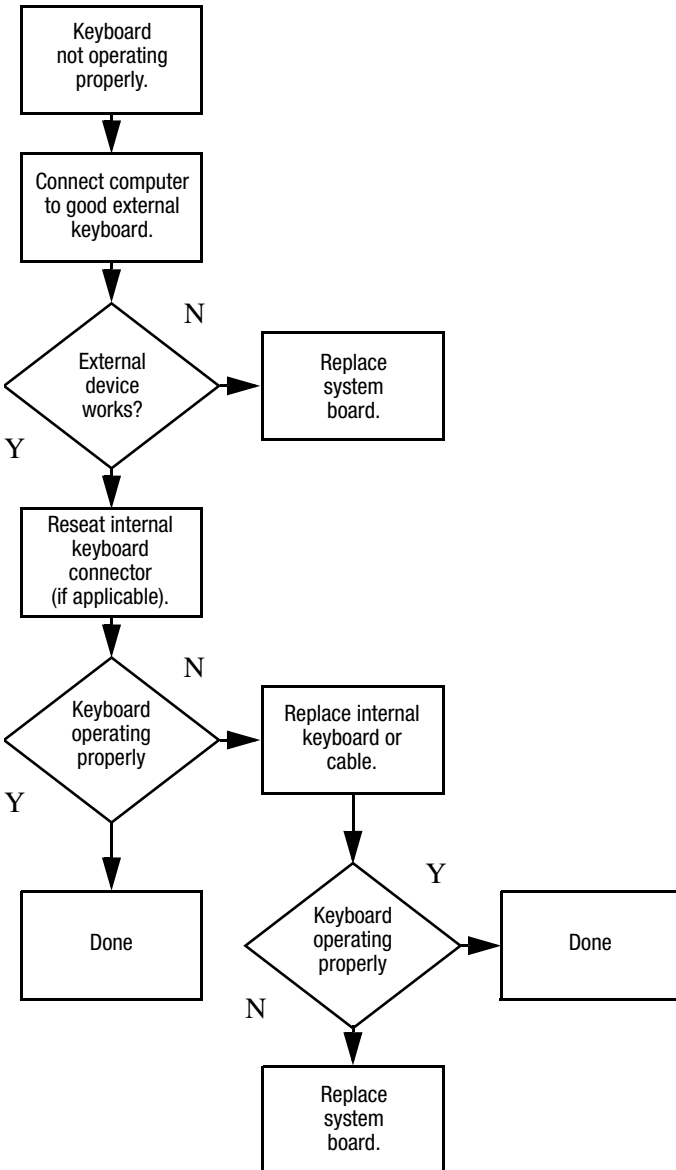
Flowchart 2.16—No Audio, Part 2



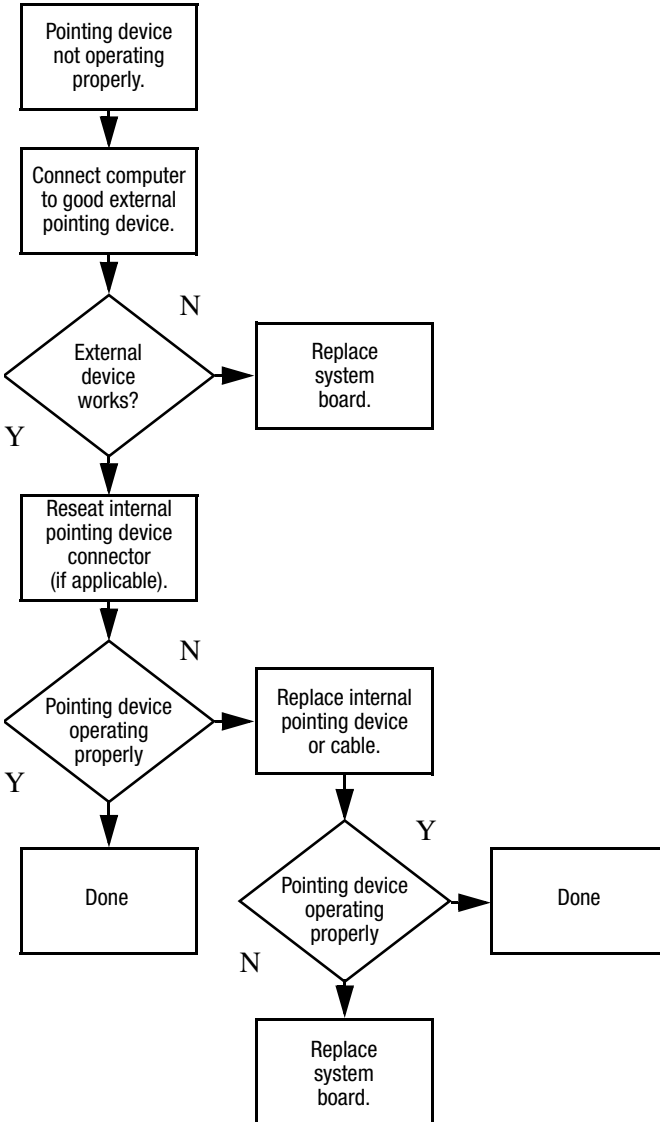
Flowchart 2.17—Nonfunctioning Device



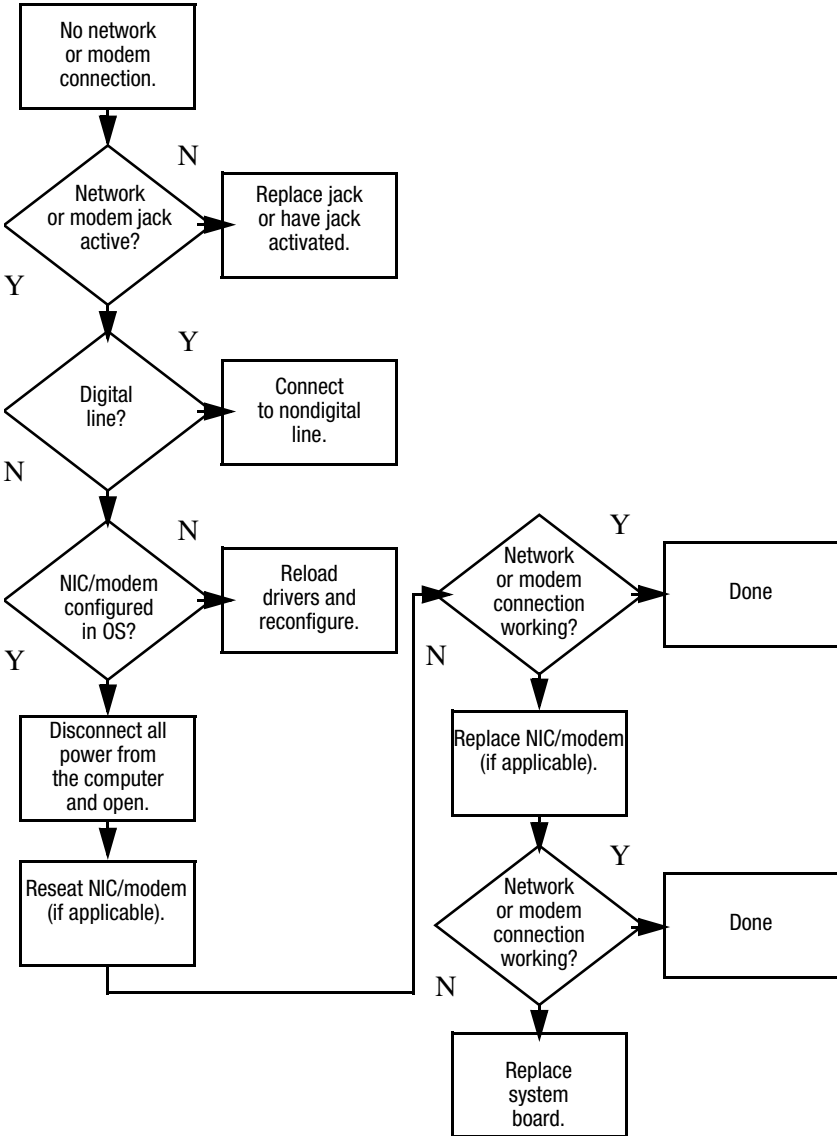
Flowchart 2.18—Nonfunctioning Keyboard



Flowchart 2.19—Nonfunctioning Pointing Device



Flowchart 2.20—No Network/Modem Connection



Software Update and Recovery

3.1 Software Updates

To stay current with the newest technology and maintain optimal performance, install the latest versions of HP software on your computer as they become available.

To update HP software:

1. Identify your computer model, product category, and series or family. Prepare for a system ROM update by identifying the ROM version currently installed on the computer. For more information, refer to “[Accessing Computer Information](#).”



CAUTION: If your computer is connected to a network, it is recommended that you consult with your network administrator before installing any software updates, especially system ROM updates.



The computer system ROM stores the BIOS software. The BIOS initializes the operating system, determines how the computer will interact with the hardware devices, and provides for data transfer among hardware devices, including the time and date.

2. Access the updates through the HP Web site by visiting <http://www.hp.com> or by obtaining the *Support Recovery* disc (purchased separately). For information about obtaining the *Support Recover* disc, refer to “[Obtaining the Support Recovery Disc](#).”
3. Install the updates.

Accessing Computer Information

Before you access the updates for your computer, collect the following information:

- The product *category* is Notebook.
- The product *family* name and *series* number are printed on the display bezel.
- *Model* information is provided on the serial number label on the bottom of the computer.

To determine whether available ROM updates contain later ROM versions than those currently installed on the computer, you need to know the version of the system ROM currently installed.

ROM version information (also known as ROM date and System BIOS) can be displayed by pressing **fn+esc** (if you are already in Microsoft Windows) or by opening Computer Setup.

To use Computer Setup for displaying ROM information:

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the “F10 = ROM Based Setup” message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > System Information**, and then press **enter**.
ROM date information is displayed.
3. To exit Computer Setup, use the arrow keys to select **File > Ignore changes and exit**. Then follow the instructions on the screen.

Obtaining the Support Recovery Disc

The *Support Software* CD provides HP software updates and installation instructions. The CD includes device drivers, ROM updates, and utilities.

To purchase the current *Support Software* CD or a subscription that provides both the current version and future versions of the CD, visit the HP Web site at <http://www.hp.com>.

Software Updates and the HP Web Site

Most software on the HP Web site is packaged in compressed files called *SoftPaqs*. Some ROM updates may be packaged in compressed files called *ROMPaqs*.

Most download packages contain a file named *Readme.txt*. A *Readme.txt* file contains information regarding installing and troubleshooting the file. The *Readme.txt* files included with *ROMPaqs* are provided in English only.


Downloading a ROM Update



CAUTION: To prevent damage to the computer or an unsuccessful installation, download and install a ROM update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a ROM update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation:

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
 - Do not shut down the computer or initiate standby or hibernation.
 - Do not insert, remove, connect, or disconnect any device, cable, or cord.
-

To download a ROM update:

1. Access the page on the HP Web site that provides software for your computer:
 - ❑ Select **Start > Help and Support**, and then click a software update link.
 - or –
 - ❑ Visit the HP Web site at <http://www.hp.com/support>.
2. Follow the instructions on the screen to identify your computer and access the ROM update you want to download.
3. At the download area:
 - a. Identify the ROM update that is later than the ROM version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the instructions on the screen to download your selection to the hard drive.
 -  Make a note of the path to the location on your hard drive to which the ROM package will be downloaded. You may need to access the ROM package after it has been downloaded.

Installing a ROM Update



If your computer is connected to a network, it is recommended that you consult with your network administrator before installing any software updates, especially system ROM updates.

ROM installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed:

1. Open Windows Explorer by selecting **Start > All Programs > Accessories > Windows Explorer**.
2. In the left pane of the Windows Explorer window:
 - a. Click **My Computer** and then your hard drive designation. (The hard drive designation is typically Local Disk C.)
 - b. Open the folder on your hard drive that contains the update.



Follow the path you made a note of before you downloaded the update.

3. Double-click the file with an .exe extension (for example, filename.exe).

The ROM installation begins.

4. Complete the installation by following the instructions on the screen.



After a message on the screen reports a successful installation, you may delete the downloaded file from your hard drive.

Downloading Other Software

To download and install software other than a ROM update:


1. Access the page on the HP Web site that provides software for your computer:

Select **Start > Help and Support**, and then click a software update link.


– or –

Visit the HP Web site at <http://www.hp.com/support> and click **Download drivers and software** to download the software for your computer model.

2. Follow the instructions on the screen to find the software you want to update.
3. At the download area, select the software you want and follow the download instructions on the Web page.

 Make a note of the path to the location on your hard drive to which the ROM package will be downloaded. You may need to access the ROM package after it has been downloaded.

4. When the download is complete, open Windows Explorer by selecting **Start > All Programs > Accessories > Windows Explorer**.
5. In the left pane of the **Windows Explorer** window, click **My Computer** and then your hard drive designation. (The hard drive designation is typically Local Disk C.)

 Follow the path you made a note of earlier to the folder on your hard drive that contains the update.

6. Open the folder and double-click the file with an .exe extension (for example, filename.exe).
The installation begins.
7. Complete the installation by following the instructions on the screen.



After a message on the screen reports a successful installation, you may delete the download package from your hard drive.

3.2 System Recovery

The computer system recovery process provides several ways to recover optimal system functionality. For best results, attempt to recover optimal computer functionality by using the following procedures *in the order described here*.

Safeguarding Your Data

Software or devices added to the computer can cause your system to become unstable. To safeguard your documents, store personal files in the My Documents folder and periodically create a backup copy of the My Documents folder.

Using Altiris Local Recovery

Altiris Local Recovery is a preloaded application that protects the files on your computer by storing copies of files, called *snapshots*. If files on your computer are accidentally deleted or corrupted, you can easily restore the files yourself. You can also restore your complete file system to a previous state.

Altiris Local Recovery provides protection of files by backing up files to a hidden Altiris recovery partition. When you install the software, the Recovery Agent Partition Wizard guides you through the process of creating the recovery partition. After the partition is created, the computer restarts and creates the first snapshot. After the snapshot is created, the computer restarts, making the snapshot available for recovery through Windows.

By default, Local Recovery automatically takes snapshots of your files on a regular basis. You can change the snapshot schedule. For more information, refer to the Altiris Local Recovery Help.

To access your snapshots in the Altiris Recovery Agent folder:

1. Right-click the Altiris Recovery Agent icon on your desktop.
2. Click **Open**.

To restore one of the listed snapshots, drag the snapshot file to the appropriate location on your hard drive.

For more information on configuring and using Altiris Local Recovery, visit the HP Web site at <http://www.hp.com/go/easydeploy>, or open the software and click **Help** on the menu bar.

Using System Restore Points

System Restore is a Windows operating system feature that allows you to reverse undesirable changes to your computer by restoring the computer to an earlier state, called a *restore point*. A restore point is a “snapshot” of your software, drivers, and operating system files at a particular time. The computer automatically creates restore points at regular intervals and may create additional restore points when you change your personal settings or add software or hardware.

You can manually create additional restore points to provide increased protection for your system files and settings. It is recommended that you manually create restore points

- Before you add or extensively modify software or hardware.
- Periodically, whenever the system is performing optimally.

Restoring to any restore point does not affect your data files. For example, restoring your system software to an earlier state will not affect documents or e-mails that you saved after that time.



If you do not like the results of your restoration, you can reverse the restoration.

Creating a System Restore Point

To create a system restore point:

1. Select **Start > Help and Support**.
2. Click **System Restore**.

The System Restore window opens.

3. Click **Create a restore point**, and then click **Next**.
4. Follow the on-screen instructions.

Restoring to a Restore Point

To restore the computer to a previous date and time when it was functioning optimally:

1. Select **Start > Help and Support**.
2. Click **System Restore**.
The System Restore window opens.
3. Click **Restore my computer to an earlier time**, and then click **Next**.
4. Follow the on-screen instructions.

Reinstalling Applications

Applications preinstalled or preloaded on your computer can be reinstalled by using the *Recovery* disc or a third-party software disc.



In most cases, the applications preloaded on your computer, such as those available in the Software Setup utility, can be reinstalled from your hard drive. To access the Software Setup utility, select **Start > All Programs > Software Setup**.

The application reinstallation process replaces corrupted system files within the application and reinstalls deleted system files within the application.

- In most cases: If the application you are reinstalling is still installed on your computer, the reinstallation process does not affect your settings within the application.
- In all cases: If an application has been deleted from your computer, the reinstallation process reinstalls the application or utility to the factory image but cannot restore your personal settings.

Reinstalling Applications from the Hard Drive

To reinstall a preloaded application or utility from your hard drive:

1. Select **Start > All Programs > Software Setup**, and then follow the instructions on the screen.
2. When you are prompted to select the software you want to reinstall, select or clear the appropriate check boxes.

Reinstalling Applications from Discs

To reinstall applications from discs:

1. Insert the disc into the optical drive.
 - If autorun is enabled, an installation wizard opens.
 - If autorun is disabled, select **Start > Run**. Enter
x:\setup.exe
where *x* is your optical drive designation
and then select **OK**.
2. When the installation wizard opens, follow the installation instructions on the screen.
3. Restart the computer if prompted.

Repairing the Operating System

To attempt an operating system repair without deleting your personal data, use the *Operating System* disc that was shipped with the computer:



If your computer does not have an internal optical drive, connect an optional external optical drive.

1. Connect the computer to external power through the AC adapter and turn on the computer.
2. Immediately insert the *Operating System* disc into the computer.
3. Press and hold the power button for at least 5 seconds to turn off the computer.
4. Press the power button again to turn on the computer.
5. When prompted, press any key to start from the disc.

After a few minutes, you may need to select your language, and then the Setup Wizard opens.



On the “Welcome to Setup” page, do not press **R** (step 8 in this procedure) until you have completed steps 6 and 7.

6. Press **enter** to continue.

A licensing agreement page is displayed.

7. Press **f8** to accept the agreement and continue.

The “Setup” page is displayed.

8. Press **R** to repair the selected Windows installation.

The repair process begins. This process takes 1 to 2 hours to complete.

The computer restarts in Windows after the process is complete.

Reinstalling the Operating System



CAUTION: To protect your personal data and the software installed on the computer, back up your data before reinstalling the operating system. See the Windows online Help utility to learn more about backing up your files. Select **Start > Help and Support**. Then type "backup" in the Search box.

If other recovery efforts do not successfully repair the operating system, you can reinstall it.

To reinstall the operating system:




During the reinstallation, you may be prompted for your Product Key. Your Product Key is provided on the Microsoft Certificate of Authenticity label on the bottom of the computer.



If your computer does not have an internal optical drive, connect an optional external optical drive.

1. Connect the computer to external power through the AC adapter and turn on the computer.
2. Immediately insert the *Operating System* disc into the computer.
3. Press and hold the power button for at least 5 seconds to turn off the computer.

4. Press the power button again to turn on the computer.
5. When prompted, press any key to start from the disc.
After a few minutes, you may need to select your language, and then the Setup Wizard opens.
6. Press **enter** to continue.
A licensing agreement page is displayed.
7. Press **f8** to accept the agreement and continue.
The “Setup” page is displayed.
8. Press **esc** to continue installing a new copy of the operating system instead of repairing it.
9. Press **enter** to set up the operating system.
10. Press **C** to continue setup using this partition.
11. Select **Format the partition using the NTFS file system (Quick)**, and then press **enter**.

 Formatting this drive deletes all current files.

12. Press **F** to format the drive.
The reinstallation process begins. This process takes 1 to 2 hours to complete.
The computer restarts in Windows when the process is complete.

Reinstalling Device Drivers and Other Software

After the operating system installation process is complete, you must reinstall drivers.

To reinstall drivers, use the *Recovery* disc included with the computer:

1. While running Windows, insert the *Recovery* disc into the optical drive.
2. If you do not have autorun enabled:
 - a. Select **Start > Run**.
 - b. Then type `D:\SWSETUP\APPINSTL\SETUP.EXE`
where *D* indicates the optical drive.
3. Follow the on-screen instructions for installing the drivers.

After the drivers are reinstalled, you must reinstall any software you added to the computer. Follow the installation instructions provided with the software.

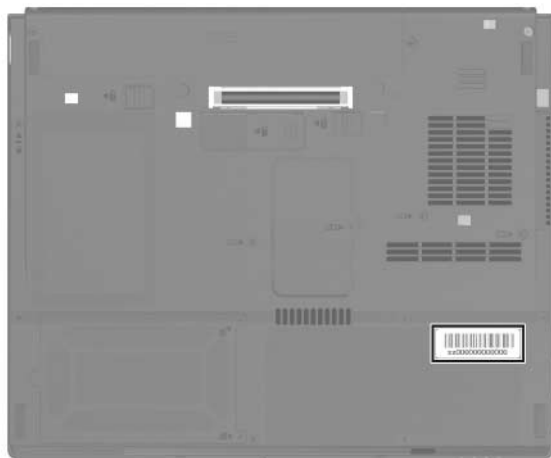
4

Illustrated Parts Catalog

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

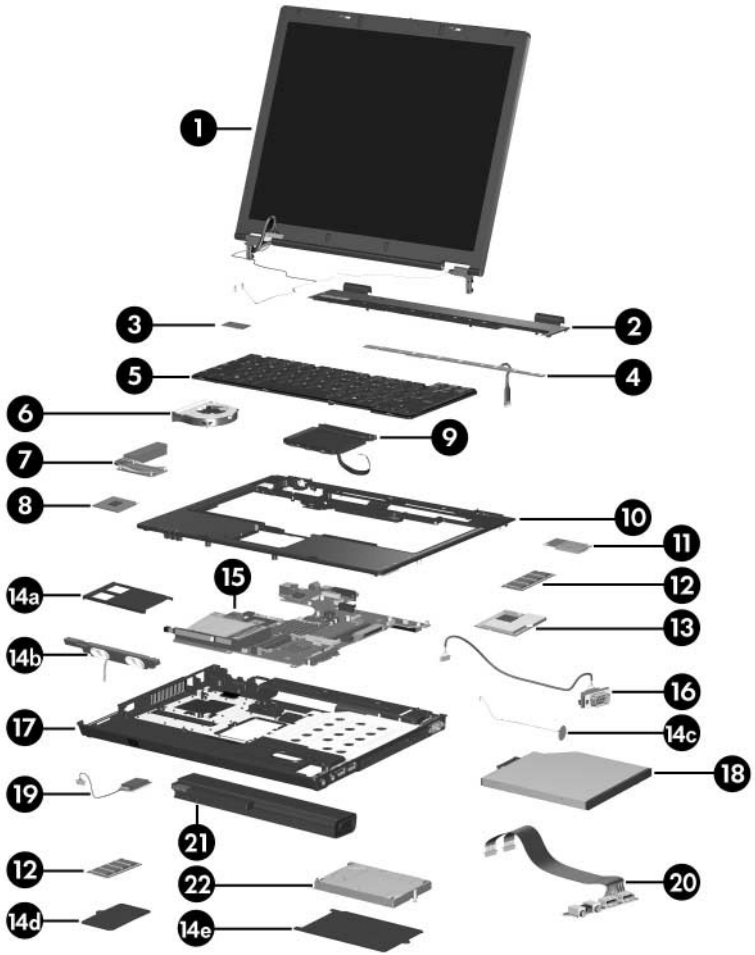
4.1 Serial Number Location

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



Serial Number Location

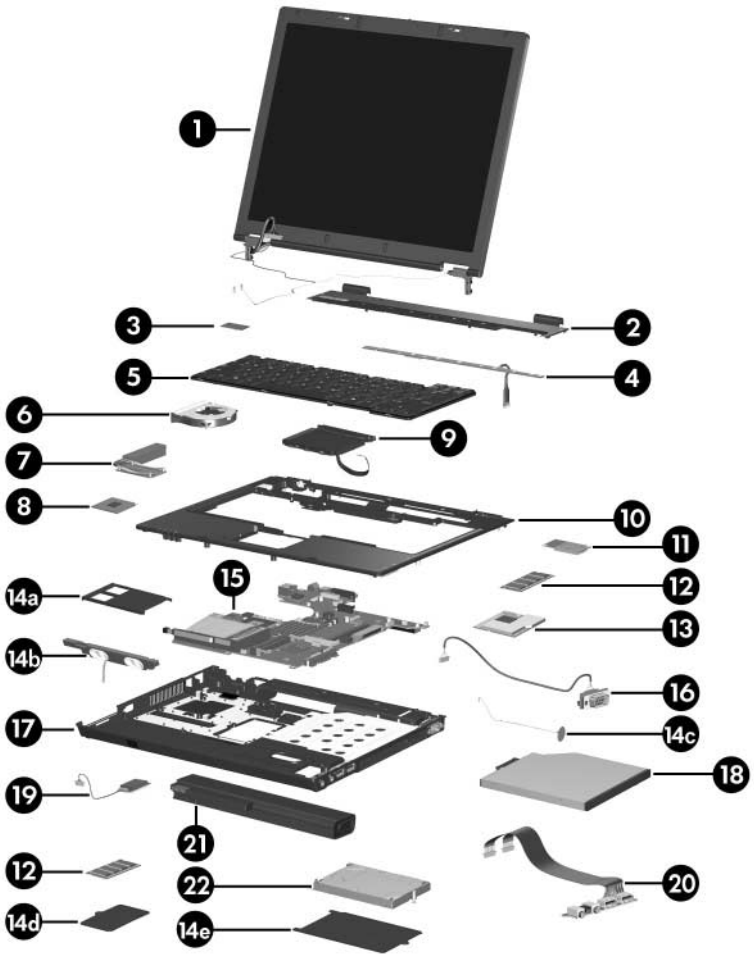
4.2 Computer Major Components



Computer Major Components

Table 4-1
Spare Parts: Computer Major Components

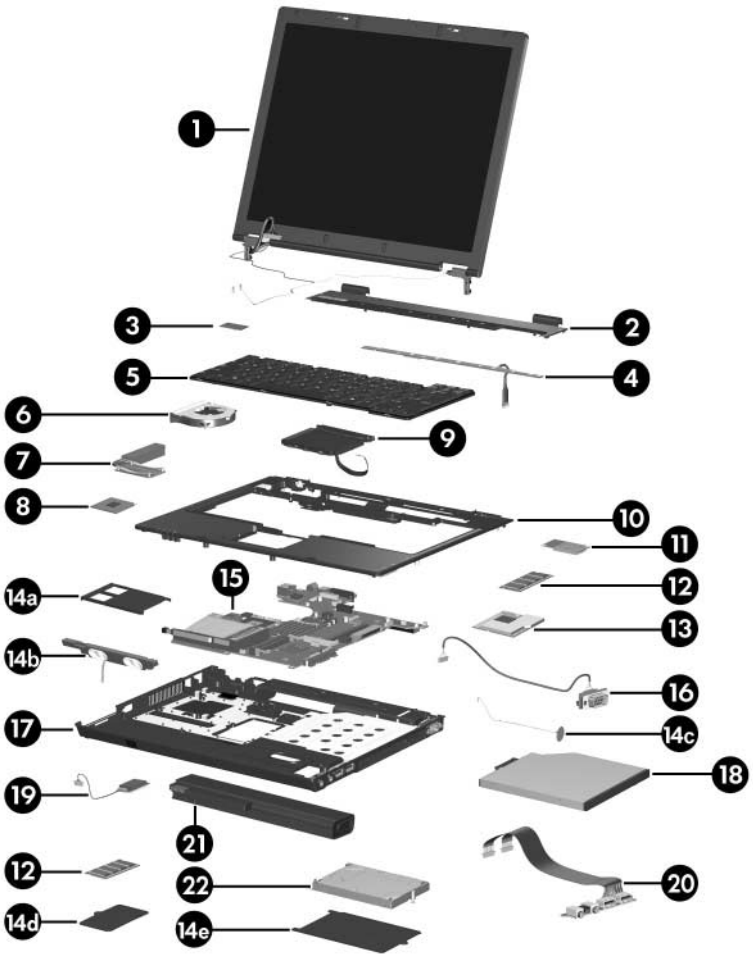
Item	Description	Spare Part Number
1	Display assemblies (include wireless antenna transceivers and cables)	
	14.1-inch, SXGA, TFT	379793-001
	14.1-inch, XGA, TFT	379792-001
2	Switch cover	379794-001
3	TPM security module	379807-001
4	LED board (includes LED board cable)	379795-001
5	Keyboards	
	Belgium	378188-A41
	Brazil	378188-201
	Czech Republic	378188-221
	Denmark	378188-081
	France	378188-051
	French Canada	378188-121
	Germany	378188-041
	Greece	378188-151
	Hungary	378188-211
	Iceland	378188-DD1
	International	378188-021
	Israel	378188-BB1
	Italy	378188-061
	Japan	378188-291
	Korea	378188-AD1
	Latin America	378188-161
	Norway	378188-091
	Portugal	378188-131
	Russia	378188-251
	Saudi Arabia	378188-171
	Slovakia	378188-231
	Slovenia	378188-BA1
	Spain	378188-071
	Sweden	378188-101
	Switzerland	378188-111
	Taiwan	378188-AB1
	Thailand	378188-281
	Turkey	378188-141
	United Kingdom	378188-031
	United States	378188-001



Computer Major Components

Table 4-1**Spare Parts: Computer Major Components (Continued)**

Item	Description	Spare Part Number
6	Fan	378233-001
7	Heat sink (includes thermal paste)	379799-001
8	Processors (include thermal paste)	
	Intel Pentium M 770 (2.13-GHz)	379806-001
	Intel Pentium M 760 (2.00-GHz)	379805-001
	Intel Pentium M 750 (1.86-GHz)	379804-001
	Intel Pentium M 740 (1.73-GHz)	379803-001
	Intel Pentium M 730 (1.60-GHz)	379802-001
	Intel Celeron M 730 (1.5-GHz)	379801-001
9	TouchPad (includes TouchPad cable)	379798-001
10	Top cover	379796-001
11	Modem board	380774-001 and 379814-001
12	Memory modules (PC2-3200, CL3)	
	1024 MB	373121-001
	512 MB	373120-001
	256 MB	373119-001

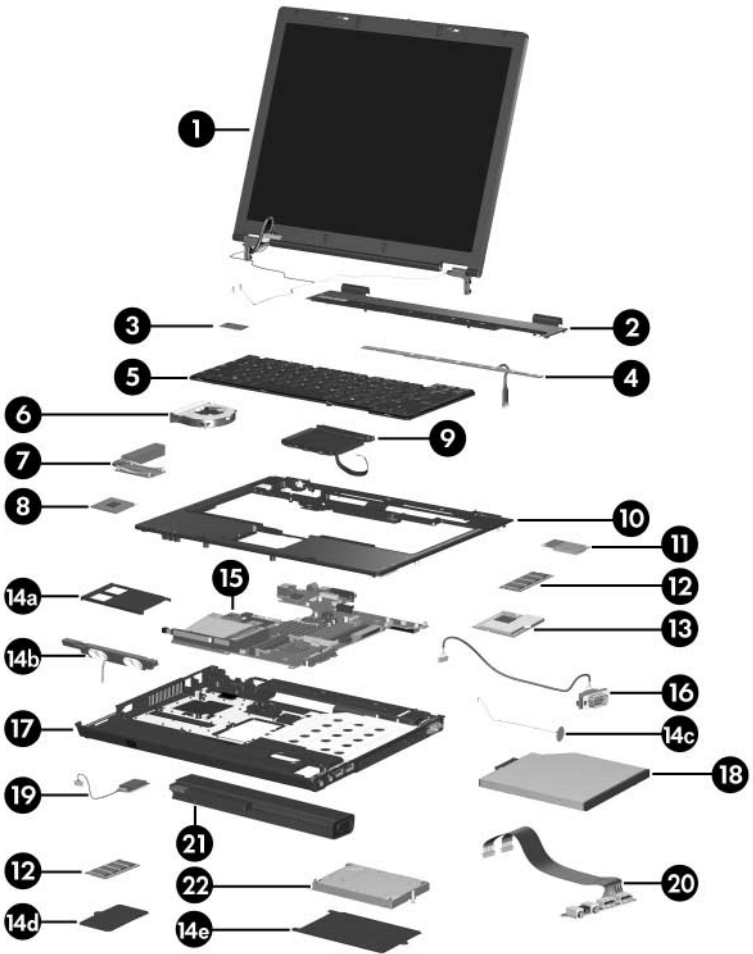


Computer Major Components

Table 4-1

Spare Parts: Computer Major Components (*Continued*)

Item	Description	Spare Part Number
13	Mini PCI communications modules	
	802.11b/g combination WLAN module, for use internationally	373032-002
	802.11b/g combination WLAN module, for use Japan	373032-291
	802.11b/g combination WLAN module, for use in the United States	373032-001
	802.11a/b/g combination WLAN module, for use in Europe, Middle East, Africa	373900-021
	802.11a/b/g combination WLAN Mini PCI communications module for use Japan	373900-291
	802.11a/b/g combination WLAN module, for use internationally	373033-002
	802.11a/b/g combination WLAN module, for use Japan	373033-291
	802.11a/b/g combination WLAN module, for use in MOW	373033-001
	802.11a/b/g combination WLAN module, for use in the United States	373901-001
	802.11a/b/g High Band combination WLAN module	

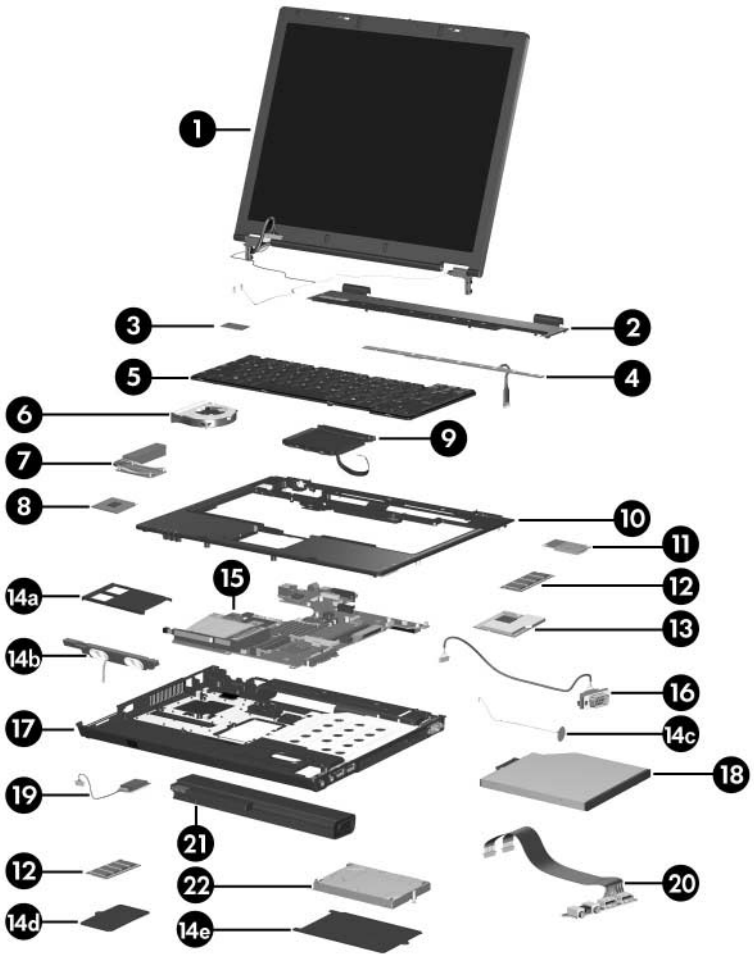


Computer Major Components

Table 4-1

Spare Parts: Computer Major Components (*Continued*)

Item	Description	Spare Part Number
	Miscellaneous Plastics Kit	379812-001
	Includes:	
14a	PC Card slot space saver	
14b	Speaker	
14c	RTC battery	
14d	Memory module compartment cover (includes 1 captive screw)	
14e	Hard drive cover (includes 2 captive screws)	
	Not illustrated:	
	Computer feet	
	Base enclosure screw caps	
	Display bezel rubber caps	
	MultiBay II space saver	
15	System boards (include RJ-11 connector and cable)	
	Includes 64 MB of discrete video memory	382909-001
	Includes 32 MB of discrete video memory	379790-001
	Includes UMA video memory	379791-001
16	Serial connector module (includes serial connector module cable)	378227-001
17	Base enclosure	379797-001
	MultiBay II eject device (not illustrated)	382693-001
18	MultiBay II devices	
	8X Max DVD-ROM drive	373314-001
	DVD+RW/R and CD-RW Combo Drive	375557-001
	DVD/CD-RW Combo Drive	373315-001



Computer Major Components

Table 4-1

Spare Parts: Computer Major Components (Continued)

Item	Description	Spare Part Number
19	Bluetooth wireless module (includes Bluetooth module cable)	367871-001
20	Audio boards (include audio board cables)	
	For use with system boards with discrete video memory	385498-001
	For use with system boards with UMA video memory	379811-001
21	Battery packs	
	6-cell, 4.8-AHr	372772-001
	6-cell, 4.8-AHr	367457-001
	8-cell, travel battery	367456-001
22	Hard drives (include frame and connector)	
	7200-rpm	5400-rpm
	60-GB	380950-001
		80-GB
		60-GB
		40-GB
		379810-001
		379809-001
		379808-001

4.3 Miscellaneous Plastics Kit

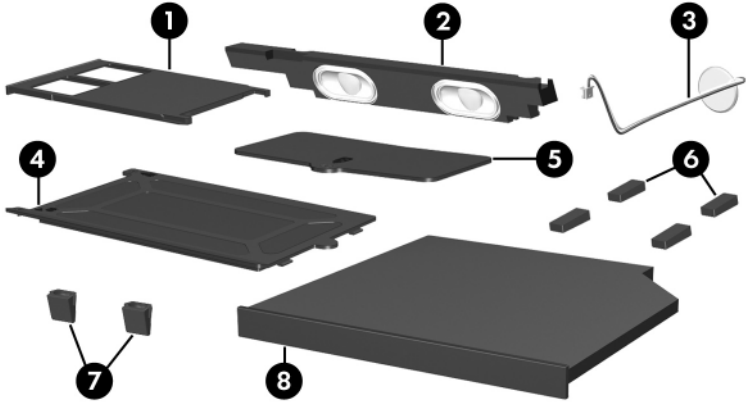


Table 4-2
Miscellaneous Plastics Kit
Spare Part Information

Item	Description	Spare Part Number
	Miscellaneous Plastics Kit , includes:	379812-001
1	PC Card slot space saver	
2	Speakers	
3	RTC battery	
4	Hard drive cover (includes 2 captive screws)	
5	Memory module compartment cover (includes 1 captive screw)	
6	Notebook feet (4)	
7	Base enclosure rubber screw caps (2)	
8	MultiBay II space saver	
	Not illustrated: Display bezel rubber caps	

4.4 Miscellaneous Cable Kit

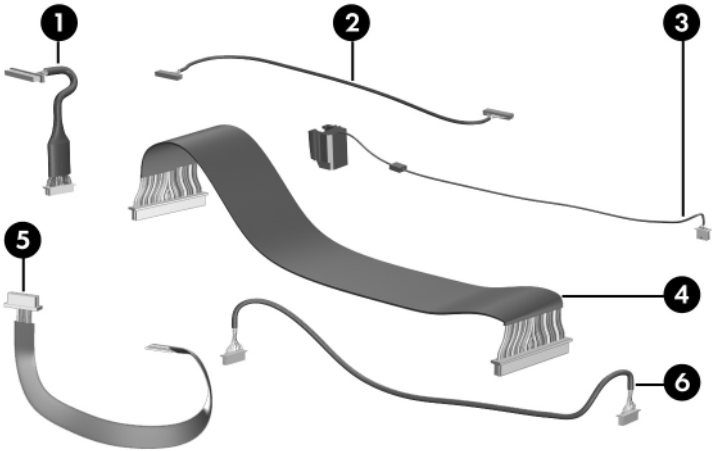


Table 4-3
Miscellaneous Cable Kit
Spare Part Information

Item	Description	Spare Part Number
	Miscellaneous Cable Kit , includes:	389013-001
1	LED board cable	
2	Bluetooth module cable	
3	RJ-11 connector module with cable	
4	Audio board cables (two, one for use on models with system boards with discrete video memory, one for use on models with system boards with UMA video memory)	
5	TouchPad cable	
6	Serial connector module cable	
	Not illustrated: Speaker cable (for use on models with system boards with discrete video memory)	

4.5 Mass Storage Devices



Table 4-4
Mass Storage Devices
Spare Part Information

Item	Description	Spare Part Number
1	Hard drives (include frame and connector)	
	7200-rpm	5400-rpm
	60-GB	380950-001
		80-GB
		60-GB
		40-GB
		379810-001
		379809-001
		379808-001
2	Optical drives (include bezel)	
	8X Max DVD-ROM drive	373314-001
	DVD+RW/R and CD-RW Combo Drive	375557-001
	DVD/CD-RW Combo Drive	373315-001

4.6 Miscellaneous (Not Illustrated)

Table 4-5
Miscellaneous (Not Illustrated)
Spare Part Information

Description	Spare Part Number
Adjustable Notebook Stand	372420-001
HP Advanced Docking Stand	374804-001
HP Docking Stand	374803-001
Docking Stand Miscellaneous Plastics Kit	380045-001
Carrying cases	
Nylon top load	325815-001 and 325815-002
Nylon entry level	325814-001
External MultiBay II	367621-001
External MultiBay II USB cable and stand	367622-001
External MultiBay II power cable	367870-001
USB 1.1 diskette drive	359118-001

Table 4-5
Miscellaneous (Not Illustrated)
Spare Part Information (*Continued*)

Description	Spare Part Number
Power supplies	
65 watt AC adapter	239704-001
65 watt, slim profile AC adapter	381090-001
Power cords	
For use in:	
Australia and New Zealand	246959-011
Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden	246959-021
Brazil	246959-201
Canada, French Canada, Latin America, Taiwan, Thailand, and the United States	246959-001
Denmark	246959-081
Hong Kong and the United Kingdom	246959-031
Israel	246959-BB1
Italy	246959-061
Japan	246959-291
Korea	246959-AD1
Sweden	246959-AG1

Table 4-5
Miscellaneous (Not Illustrated)
Spare Part Information (*Continued*)

Description	Spare Part Number
Screw Kit (includes the following screws; refer to Appendix C, "Screw Listing," for more information on specifications and usage)	379813-001
<ul style="list-style-type: none"> ■ Hex socket HM5.0×11.0 screw lock ■ Phillips PM2.5×13.0 spring-loaded screw ■ Phillips PM2.5×4.0 screw ■ Phillips PM2.0×8.0 shoulder screw ■ Phillips PM2.0×8.0 screw 	<ul style="list-style-type: none"> ■ Phillips PM2.0×7.0 screw ■ Phillips PM2.0×4.0 screw ■ Phillips PM2.0×3.0 screw ■ Phillips PM1.5×8.0 screw ■ Phillips PM1.5×3.0 screw ■ Torx8 T8M2.0×8.0 screw

4.7 Sequential Part Number Listing

Table 4-6
Sequential Part Number Listing

Spare Part Number	Description
239704-001	65-watt AC adapter
246959-001	Power cord for use in Canada, French Canada, Latin America, Taiwan, Thailand, and the United States
246959-011	Power cord for use in Australia and New Zealand
246959-021	Power cord for use in Belgium, Europe, Finland, France, Germany, Greece, the Netherlands, Norway, Portugal, Spain, and Sweden
246959-031	Power cord for use in Hong Kong and the United Kingdom
246959-061	Power cord for use in Italy
246959-081	Power cord for use in Denmark
246959-201	Power cord for use in Brazil
246959-291	Power cord for use in Japan
246959-AD1	Power cord for use in Korea
246959-AG1	Power cord for use in Sweden
246959-BB1	Power cord for use in Israel
325814-001	Nylon, entry-level top load carrying case
325815-001	Nylon top load carrying case

Table 4-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
325815-002	Nylon top load carrying case
359118-001	USB 1.1 diskette drive
367456-001	8-cell, travel battery pack
367457-001	6-cell, 4.8-AHr battery pack
367871-001	Bluetooth wireless module (includes Bluetooth board cable)
372420-001	Adjustable Notebook Stand
372772-001	6-cell, 4.8-AHr battery pack
373032-001	802.11b/g combination WLAN module, for use in the United States
373032-002	802.11b/g combination WLAN module, for use internationally
373032-291	802.11b/g combination WLAN module, for use Japan
373033-001	802.11a/b/g combination WLAN module, for use in the United States
373033-002	802.11a/b/g combination WLAN module, for use internationally
373033-291	802.11a/b/g combination WLAN module, for use Japan
373119-001	256-MB memory module (PC2-3200, CL3)
373120-001	512-MB memory module (PC2-3200, CL3)
373121-001	1024-MB memory module (PC2-3200, CL3)

Table 4-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
373314-001	8X Max DVD-ROM drive MultiBay II device
373315-001	DVD/CD-RW Combo Drive MultiBay II device
373900-001	802.11a/b/g combination WLAN module, for use in MOW
373900-021	802.11a/b/g combination WLAN module, for use in Europe, Middle East, and Africa
373900-291	802.11a/b/g combination WLAN Mini PCI communications module for use Japan
373901-001	802.11a/b/g High Band combination WLAN module
374803-001	HP Docking Station
374804-001	HP Advanced Docking Station
375557-001	DVD+RW/R and CD-RW Combo Drive MultiBay II device
378188-001	Keyboard for use in the United States
378188-021	Keyboard for use internationally
378188-031	Keyboard for use in the United Kingdom
378188-041	Keyboard for use in Germany
378188-051	Keyboard for use in France
378188-061	Keyboard for use in Italy
378188-071	Keyboard for use in Spain

Table 4-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
378188-081	Keyboard for use in Denmark
378188-091	Keyboard for use in Norway
378188-101	Keyboard for use in Sweden
378188-111	Keyboard for use in Switzerland
378188-121	Keyboard for use in French Canada
378188-131	Keyboard for use in Portugal
378188-141	Keyboard for use in Turkey
378188-151	Keyboard for use in Greece
378188-161	Keyboard for use in Latin America
378188-171	Keyboard for use in Saudi Arabia
378188-201	Keyboard for use in Brazil
378188-211	Keyboard for use in Hungary
378188-221	Keyboard for use in Czech Republic
378188-231	Keyboard for use in Slovakia
378188-251	Keyboard for use in Russia
378188-281	Keyboard for use in Thailand
378188-291	Keyboard for use in Japan

Table 4-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
378188-A41	Keyboard for use in Belgium
378188-AB1	Keyboard for use in Taiwan
378188-AD1	Keyboard for use in Korea
378188-BA1	Keyboard for use in Slovenia
378188-BB1	Keyboard for use in Israel
378188-DD1	Keyboard for use in Iceland
378227-001	Serial connector module (includes cable)
378233-001	Fan
379790-001	System board (includes 32 MB of discrete video memory and RJ11 connector and cable)
379791-001	System board (includes UMA video memory and RJ11 connector and cable)
379792-001	14.1-inch, XGA, TFT display assembly (includes wireless antenna boards and cables)
379793-001	14.1-inch, SXGA, TFT display assembly (includes wireless antenna boards and cables)
379794-001	Switch cover
379795-001	LED board (includes LED board cable)
379796-001	Top cover

Table 4-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
379797-001	Base enclosure
379798-001	TouchPad (includes TouchPad cable)
379799-001	Heat sink (includes thermal paste)
379801-001	Intel Celeron M 730 (1.5-GHz) processor (includes thermal paste)
379802-001	Intel Pentium M 730 (1.60-GHz) processor (includes thermal paste)
379803-001	Intel Pentium M 740 (1.73-GHz) processor (includes thermal paste)
379804-001	Intel Pentium M 750 (1.86-GHz) processor (includes thermal paste)
379805-001	Intel Pentium M 760 (2.00-GHz) processor (includes thermal paste)
379806-001	Intel Pentium M 770 (2.13-GHz) processor (includes thermal paste)
379807-001	TPM security module
379808-001	5400-rpm 40-GB hard drive (includes frame and connector)
379809-001	5400-rpm 60-GB hard drive (includes frame and connector)
379810-001	5400-rpm 80-GB hard drive (includes frame and connector)

Table 4-6
Sequential Part Number Listing (*Continued*)

Spare Part Number	Description
379811-001	Audio for use with system boards with UMA video memory board (includes audio board cable)
379812-001	Miscellaneous Plastics Kit
379813-001	Screw Kit
379814-001	Modem board
380045-001	Docking Stand Miscellaneous Plastics Kit
380774-001	Modem board
380950-001	7200-rpm 60-GB hard drive (includes frame and connector)
381090-001	65 watt, slim profile AC adapter
382909-001	System board (includes 64 MB of discrete video memory and RJ11 connector and cable)
382693-001	MultiBay II eject assembly
385498-001	Audio board for use with system boards with discrete video memory (includes audio board cable)
389013-001	Miscellaneous Cable Kit

Removal and Replacement Preliminaries

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

5.1 Tools Required

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

- Magnetic screwdriver
- Phillips P0 screwdriver
- Torx T8 screwdriver
- 5.0-mm socket for system board locks
- Flat-bladed screwdriver
- Tool kit—includes connector removal tool, loopback plugs, and case utility tool

5.2 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 computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

Plastic Parts

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

Cables and Connectors



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

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.

5.3 Preventing Damage to Removable Drives

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

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive and ensure that the optical drive tray is closed.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Handle drives on surfaces covered with at least one inch of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.
- Avoid exposing a hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE: Handle With Care.”

5.4 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 may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

5.5 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.

5.6 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, drivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Handle electrostatic-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

5.7 Grounding Equipment and Methods

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm $\pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.

- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

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

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

Table 5-1 shows how humidity affects the electrostatic voltage levels generated by different activities.

Table 5-1
Typical Electrostatic Voltage Levels

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



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

Table 5-2 lists the shielding protection provided by antistatic bags and floor mats.

Table 5-2
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

6

Removal and Replacement Procedures

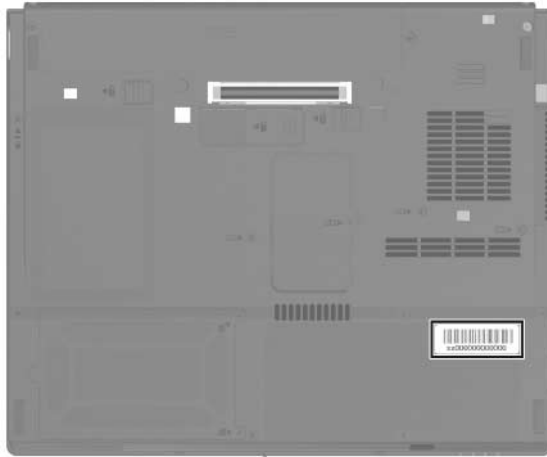
This chapter provides removal and replacement procedures.

There are 56 screws and screw locks, in 12 different sizes, that may need to be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

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

6.1 Serial Number

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




Serial Number Location

6.2 Disassembly Sequence Chart

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

Disassembly Sequence Chart		
Section	Description	# of Screws Removed
5.3	Preparing the Computer for Disassembly Battery pack	0
5.4	Hard Drive	2 loosened to remove the hard drive cover 1 loosened to remove the hard drive 6 to disassemble hard drive
5.5	Computer Feet	0
5.6	Bluetooth Board	0
5.7	MultiBay II Device	1
5.8	External Memory Module	1 loosened to remove the memory module compartment cover
5.9	Keyboard	3
5.10	Switch Cover	3
5.11	LED Board	5
5.12	TPM Security Module	1
5.13	Fan	2 loosened
5.14	Heat Sink	4 loosened

Disassembly Sequence Chart (*Continued*)

Section	Description	# of Screws Removed
5.15	Processor	0
5.16	Modem Board	2
5.17	Internal Memory Module	0
5.18	TouchPad	0
5.19	Mini PCI Communications Module	0
	 To prevent an unresponsive system and the display of a warning message, install only a Mini PCI device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care.	
5.20	Display Assembly	6
5.21	Top Cover	11
5.22	Serial Connector Module	2 screw locks
5.23	Audio Board	0
5.24	System Board	2 screw locks 4 screws

6.3 Preparing the Computer for Disassembly

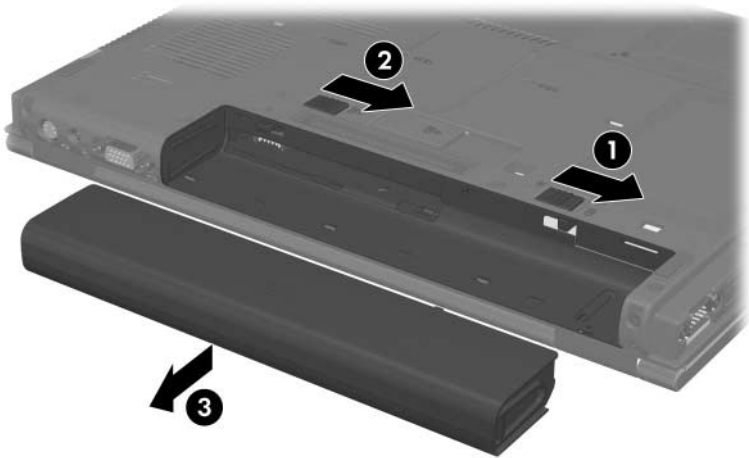
Before you begin any removal or installation procedures:

1. Shut down the computer. If you are unsure whether the computer 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 computer.
3. Disconnect the power cord.

Battery Pack Spare Part Number Information

6-cell, 4.4-AHr	372772-001
6-cell, 4.8-AHr	367457-001
8-cell, travel battery	367456-001

4. Remove the battery pack by following these steps:
 - a. Turn the computer upside down with the rear panel toward you.
 - b. Slide and hold the battery pack lock latch **1** to the right.
 - c. Slide the battery pack release latch **2** to the right. (The battery pack disengages from the computer.)
 - d. Slide the battery pack **3** straight back and remove it.



Removing the Battery Pack

Reverse the above procedure to install the battery pack.

6.4 Hard Drive

Hard Drive Spare Part Number Information

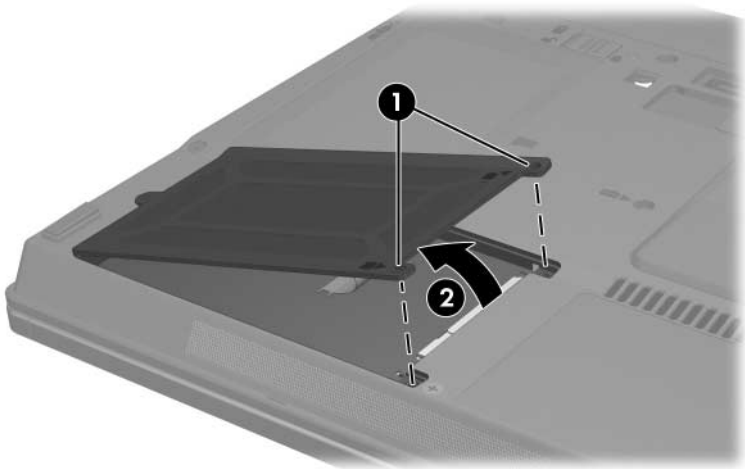
7200-rpm		5400-rpm	
60-GB	380950-001	80-GB	379810-001
		60-GB	379809-001
		40-GB	379808-001

1. Prepare the computer for disassembly (refer to [Section 6.3](#)).
2. Position the computer with the right side toward you.

3. Loosen the two PM1.5×4.0 screws **1** that secure the hard drive cover to the computer.
4. Lift the right side of the hard drive cover **2** and swing it to the left.
5. Remove the hard drive cover.

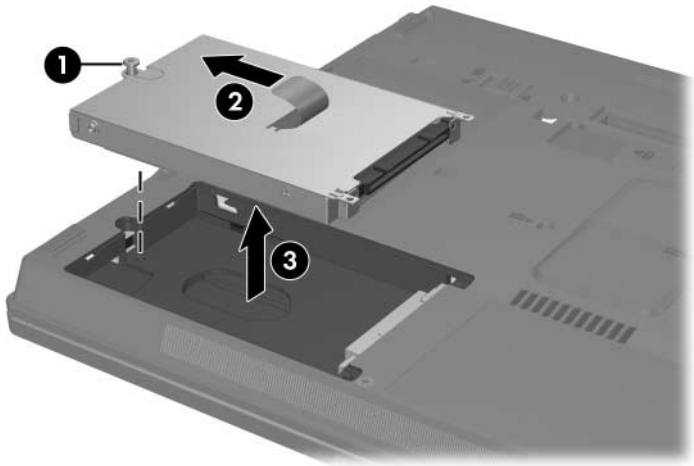


The hard drive cover is included in the Miscellaneous Plastics Kit, spare part number 379812-001.



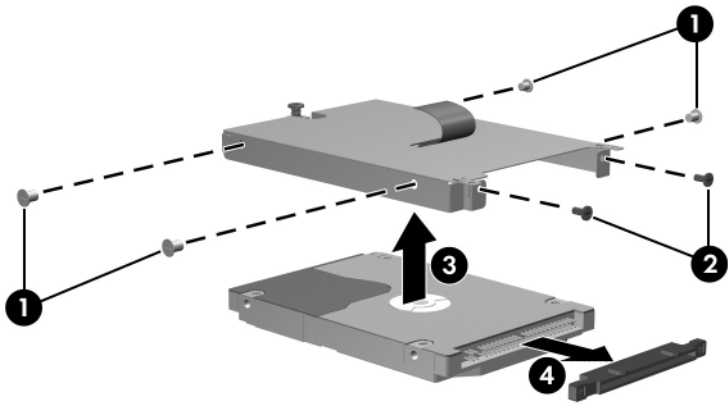
Removing the Hard Drive Cover

- a. Loosen the PM2.5×13.0 spring-loaded hard drive retention screw ❶.
- b. Grasp the mylar tab on the right side of the hard drive and slide the hard drive ❷ to the left to disconnect it from the system board.
- c. Remove the hard drive ❸ from the hard drive bay.



Removing the Hard Drive

- d. Remove the four PM2.5×4.0 screws **1** and the two PM1.5×4.0 screws **2** that secure the hard drive frame to the hard drive.
- e. Lift the frame **3** straight up to remove it from the hard drive.
- f. Remove the hard drive connector **4** from the hard drive.

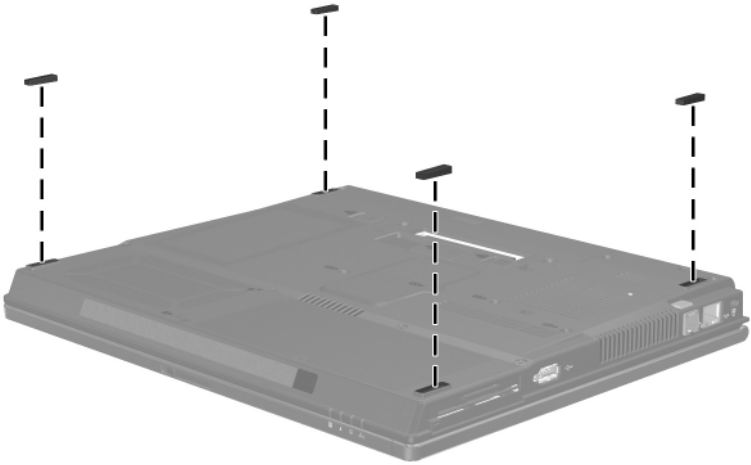


Removing the Hard Drive Frame and Connector

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

6.5 Computer Feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Miscellaneous Plastics Kit, spare part number 379812-001.



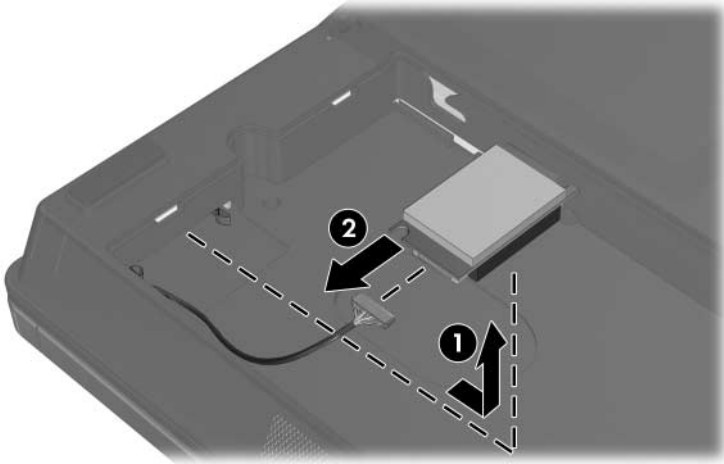
Replacing the Notebook Feet

6.6 Bluetooth Board

Bluetooth Board Spare Part Number Information

Bluetooth wireless board (includes Bluetooth board cable)	367871-001
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1. Prepare the computer for disassembly (refer to [Section 6.3](#)).
2. Position the computer with the front panel toward you.
3. Slide the Bluetooth board **1** out of the clip in the hard drive compartment.
4. Disconnect the Bluetooth board cable **2** from the board.



Removing the Bluetooth Board

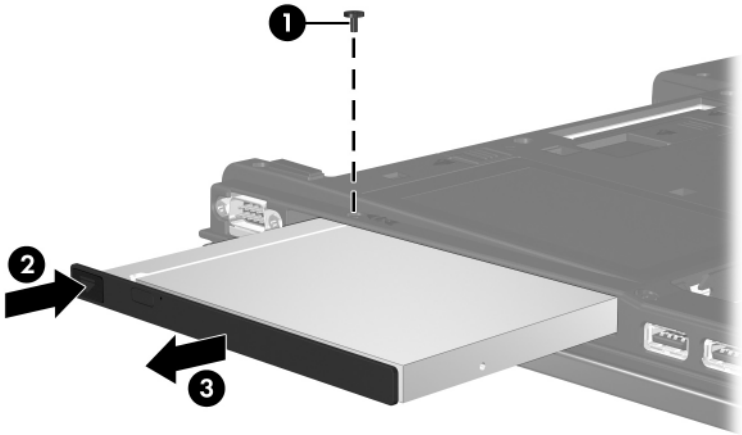
Reverse the above procedure to install a Bluetooth board.

6.7 MultiBay II Device

MultiBay II Device Spare Part Number Information

8X Max DVD-ROM drive	373314-001
DVD+RW/R and CD-RW Combo Drive	375557-001
DVD/CD-RW Combo Drive	373315-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Position the computer with the right side toward you.
3. If it is installed, remove the PM2.0×5.0 security screw **1** that secures the MultiBay II device to the computer.
4. Gently press in on the left side of the device **2** to unlock it.
5. Slide the device **3** from the computer.



Removing the MultiBay II Device

Reverse the above procedure to install a MultiBay II device.

6.8 External Memory Module

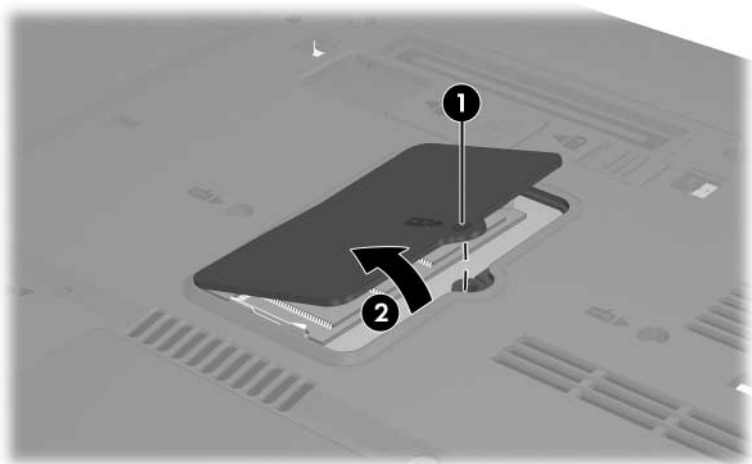
Memory Module Spare Part Number Information

1024 MB	373121-001
512 MB	373120-001
256 MB	373119-001

1. Prepare the computer for disassembly (refer to [Section 6.3](#)).
2. Position the computer with the front panel toward you.
3. Loosen the PM1.5×4.0 screw **1** that secures the memory module compartment cover to the computer.
4. Lift the right side of the cover **2** up and swing it to the left.
5. Remove the memory module compartment cover.



The memory module compartment cover is included in the Miscellaneous Plastics Kit, spare part number 379812-001.

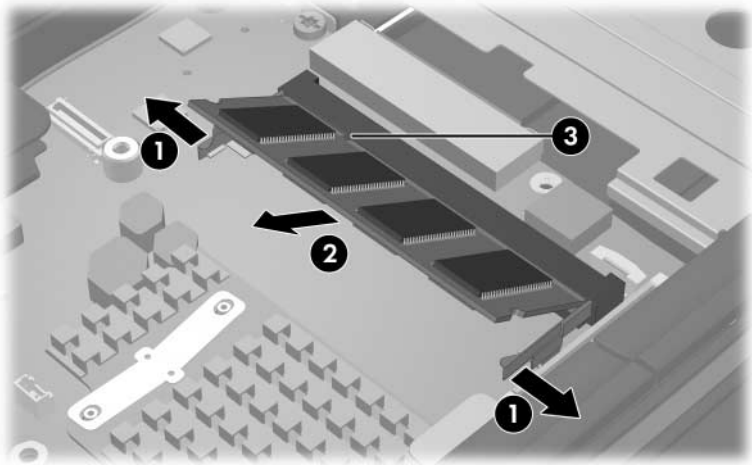


Removing the Memory Module Compartment Cover

6. Spread the retaining tabs ❶ on each side of the memory module socket to release the memory module. (The side of the memory module opposite the socket rises away from the computer.)
7. Slide the memory module ❷ away from the socket at an angle.
8. Remove the memory module.



Memory modules are designed with a notch ❸ to prevent incorrect installation into the memory module socket.



Removing the Memory Module

Reverse the above procedure to install a memory module.

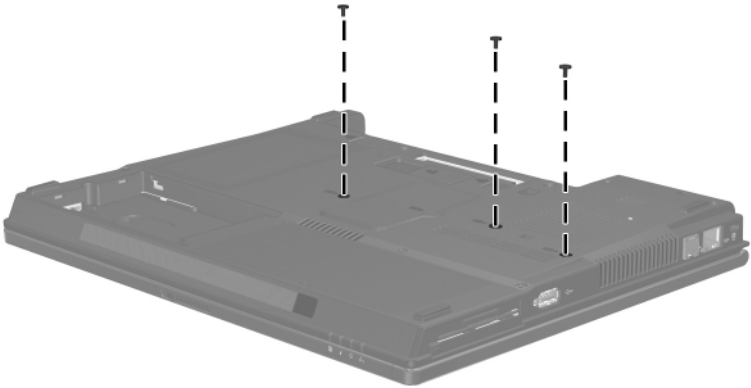
6.9 Keyboard

Keyboard Spare Part Number Information

Belgium	378188-A41	Latin America	378188-161
Brazil	378188-201	Norway	378188-091
Czech Republic	378188-221	Portugal	378188-131
Denmark	378188-081	Russia	378188-251
France	378188-051	Saudi Arabia	378188-171
French Canada	378188-121	Slovakia	378188-231
Germany	378188-041	Slovenia	378188-BA1
Greece	378188-151	Spain	378188-071
Hungary	378188-211	Sweden	378188-101
Iceland	378188-DD1	Switzerland	378188-111
International	378188-021	Taiwan	378188-AB1
Israel	378188-BB1	Thailand	378188-281
Italy	378188-061	Turkey	378188-141
Japan	378188-291	United Kingdom	378188-031
Korea	378188-AD1	United States	378188-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Turn the computer upside down with the front panel toward you.

3. Remove the three T8M2.0×8.0 screws that secure the keyboard to the computer.



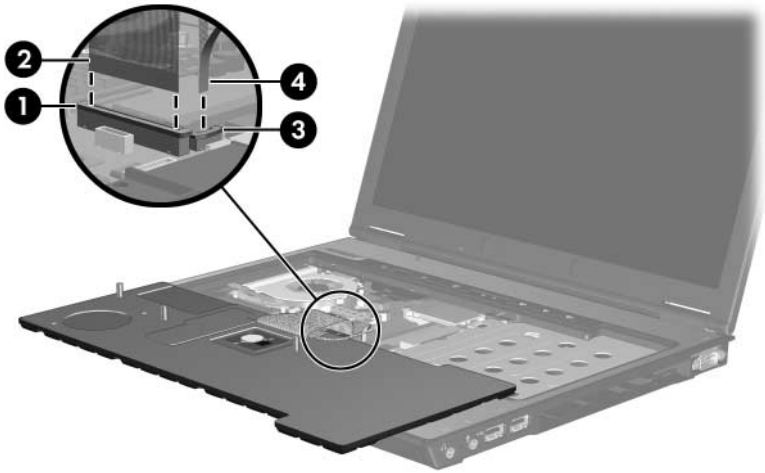
Removing the Keyboard Screws

4. Turn the computer display-side up with the front panel toward you.
5. Open the computer as far as possible.
6. Slide the four keyboard retention tabs ❶ forward. The tabs are located between the **esc** and **f1** keys, between the **f4** and **f5** keys, between the **f8** and **f9** keys, and between the **f12** and **delete** keys.
7. Lift the rear edge of the keyboard ❷ and swing it forward until it rests on the palm rest.



Releasing the Keyboard

8. Release the zero insertion force (ZIF) connector **1** to which the keyboard cable **2** is connected and disconnect the keyboard cable **2** from the system board.
9. Release the ZIF connector **3** to which the pointing stick cable **4** is connected and disconnect the pointing stick cable **4** from the system board.



Disconnecting the Keyboard and Pointing Stick Cables

10. Remove the keyboard.

Reverse the above procedure to install the keyboard.

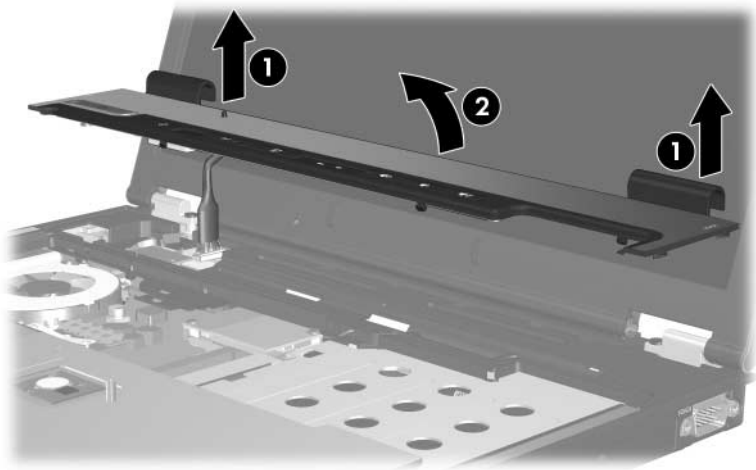
6.10 Switch Cover

Switch Cover Spare Part Number Information

Switch cover

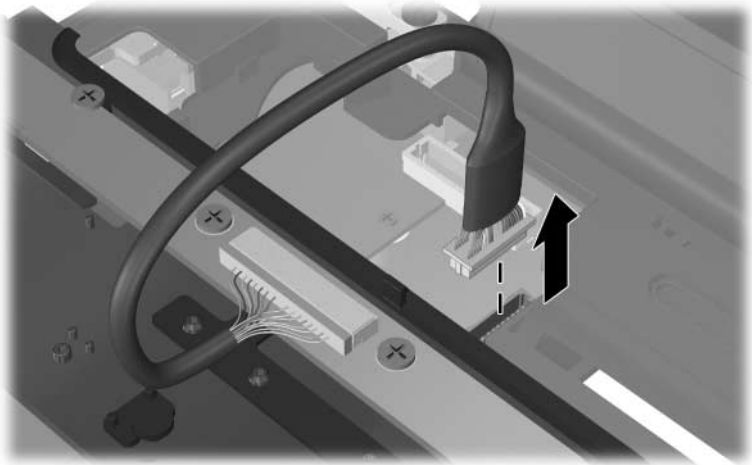
379794-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Release the keyboard ([Section 6.9](#)).
3. Lift up the left and right hinge cover sections **1** of the switch cover to detach the cover from the computer.
4. Swing the rear edge of the hinge cover **2** up and forward until the cover rests on the computer. (The LED board cable is now visible at the upper-left edge of the computer.)



Removing the Switch Cover

5. Disconnect the LED board cable from the system board.



Disconnecting the LED Board Cable

6. Remove the switch cover.
Reverse the above procedure to install the switch cover.

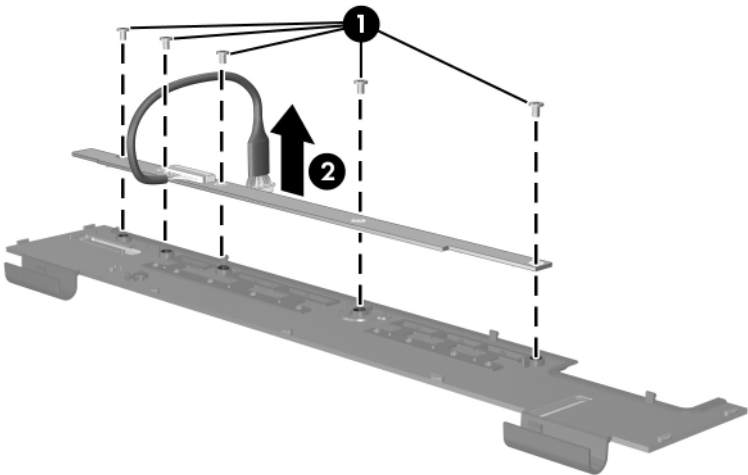
6.11 LED Board

LED Board Spare Part Number Information

LED board (includes LED board cable)

379795-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Remove the keyboard ([Section 6.9](#)).
3. Remove the switch cover ([Section 6.10](#)).
4. Turn the switch cover upside down.
5. Remove five PM2.0×3.0 screws **1** that secure the LED board to the switch cover.
6. Remove the LED board **2**.



Removing the LED Board

Reverse the above procedure to install the LED board.

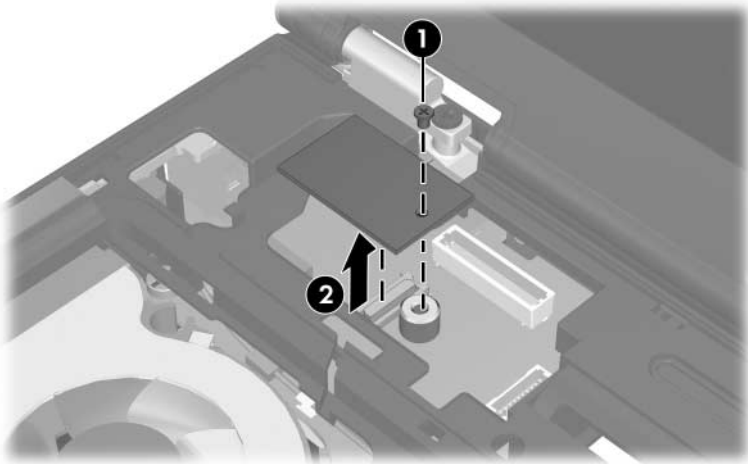
6.12 TPM Security Module

TPM Security Module Spare Part Number Information

TPM security module

379807-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Remove the keyboard ([Section 6.9](#)).
3. Remove the switch cover ([Section 6.10](#)).
4. Remove the PM1.5×3.0 screw **1** that secures the TPM security module to the computer.
5. Lift up on the right side of the module **2** to disconnect it from the system board.



Removing the TPM Security Module

6. Remove the TPM security module.
- Reverse the above procedure to install the TPM security module.

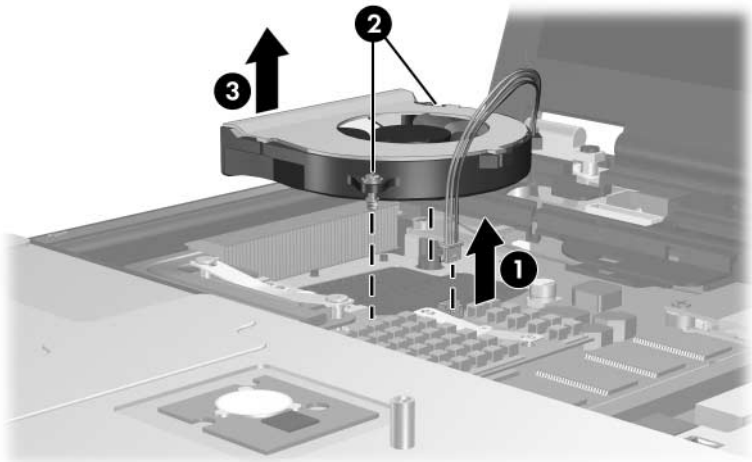
6.13 Fan

Fan Spare Part Number Information

Fan

378233-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Release the keyboard ([Section 6.9](#)).
3. Disconnect the fan cable ❶ from the system board.
4. Loosen the two PM2.0×7.0 screws ❷ that secure the fan to the computer.
5. Remove the fan ❸.



Removing the Fan

Reverse the above procedure to install the fan.

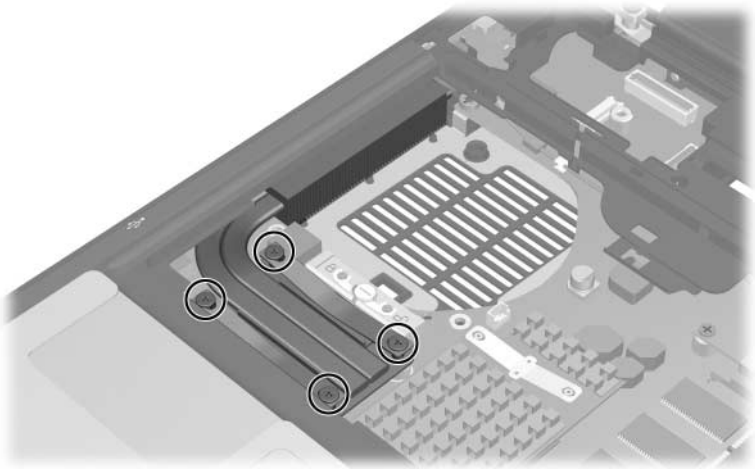
6.14 Heat Sink

Heat Sink Spare Part Number Information

Heat sink (includes thermal paste)

379799-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Release the keyboard ([Section 6.9](#)).
3. Remove the fan ([Section 6.13](#)).
4. Loosen the four PM2.0×8.0 shoulder screws that secure the heat sink to the computer.

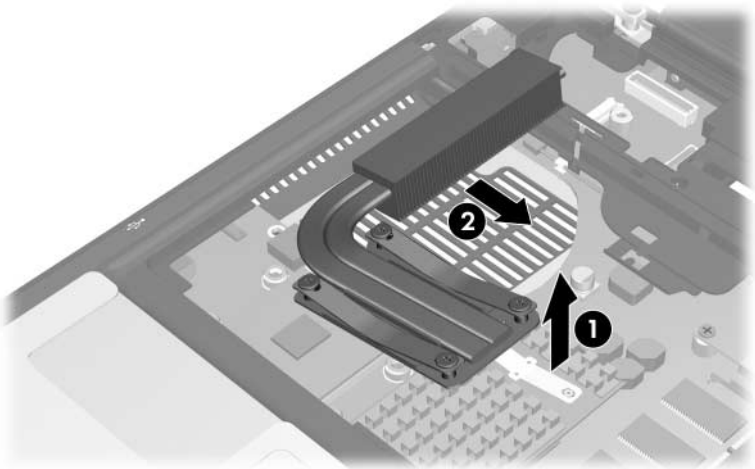


Loosening the Heat Sink Screws

5. Lift the right side of the heat sink ❶ to disengage it from the processor.
6. Slide the heat sink ❷ up and to the right to remove it.



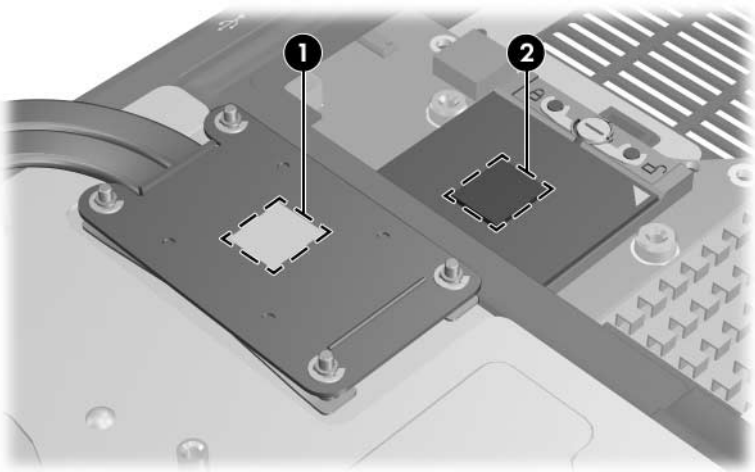
Due to the adhesive quality of the thermal paste located between the heat sink and processor, it may be necessary to move the heat sink from side to side to detach the heat sink from the processor.



Removing the Heat Sink



The thermal paste should be thoroughly cleaned from the surfaces of the heat sink **1** and processor **2** each time the heat sink is removed. Thermal paste is included with all heat sink and processor spare part kits.



Replacing the Thermal Paste

Reverse the above procedure to install the heat sink.

6.15 Processor

Processor Spare Part Number Information

Processors (include thermal paste)

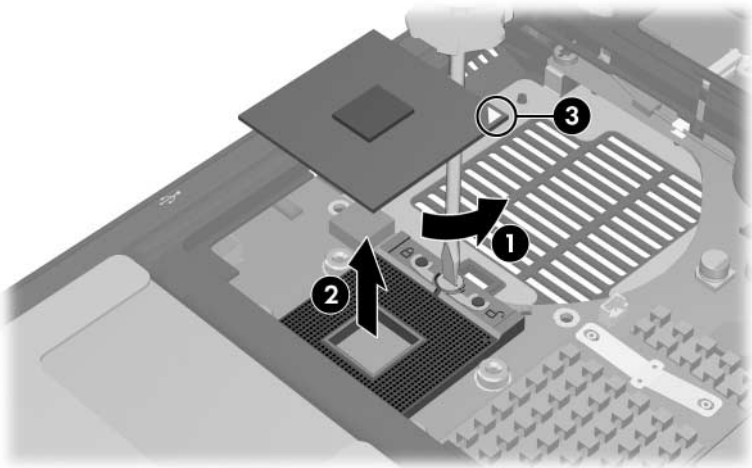
Intel Pentium M 770 (2.13-GHz)	379806-001
Intel Pentium M 760 (2.00-GHz)	379805-001
Intel Pentium M 750 (1.86-GHz)	379804-001
Intel Pentium M 740 (1.73-GHz)	379803-001
Intel Pentium M 730 (1.60-GHz)	379802-001
Intel Celeron-M 730 (1.5-GHz)	379801-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Release the keyboard ([Section 6.9](#)).
3. Remove the fan ([Section 6.13](#)).
4. Remove the heat sink ([Section 6.14](#)).

5. Use a flat-blade screwdriver to turn the processor locking screw **1** one-quarter turn counterclockwise until you hear a click.
6. Lift the processor **2** straight up and remove it.



The gold triangle **3** on the processor should be aligned in the rear right corner when you install the processor.



Removing the Processor

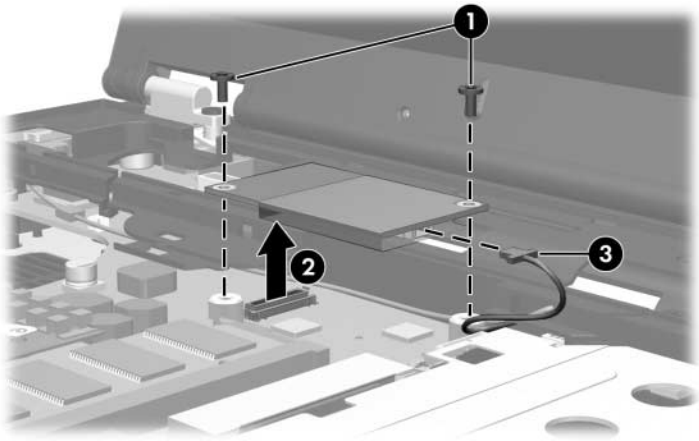
Reverse the above procedure to install the processor.

6.16 Modem Board

Modem Board Spare Part Number Information

Modem board	380774-001 and 379814-001
-------------	---------------------------------

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Release the keyboard ([Section 6.9](#)).
3. Remove the two PM2.0×3.0 screws **1** that secure the modem board to the computer.
4. Lift the left side of the modem board **2** to disconnect it from the system board.
5. Disconnect the modem cable **3** from the modem board.
6. Remove the modem board.



Removing the Modem Board

Reverse the above procedure to install the modem board.

6.17 Internal Memory Module

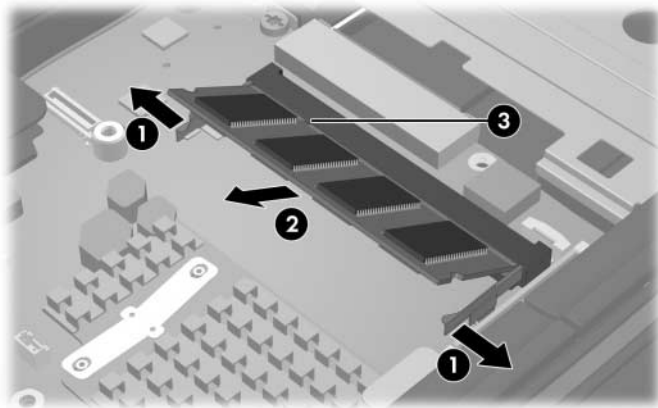
Memory Module Spare Part Number Information

1024 MB	373121-001
512 MB	373120-001
256 MB	373119-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Release the keyboard ([Section 6.9](#)).
3. Spread the retaining tabs **1** on each side of the memory module socket to release the memory module. (The side of the memory module opposite the socket rises away from the computer.)
4. Slide the memory module **2** away from the socket at an angle.
5. Remove the memory module.



Memory modules are designed with a notch **3** to prevent incorrect installation into the memory module socket.



Removing the Internal Memory Module

Reverse the above procedure to install a memory module.

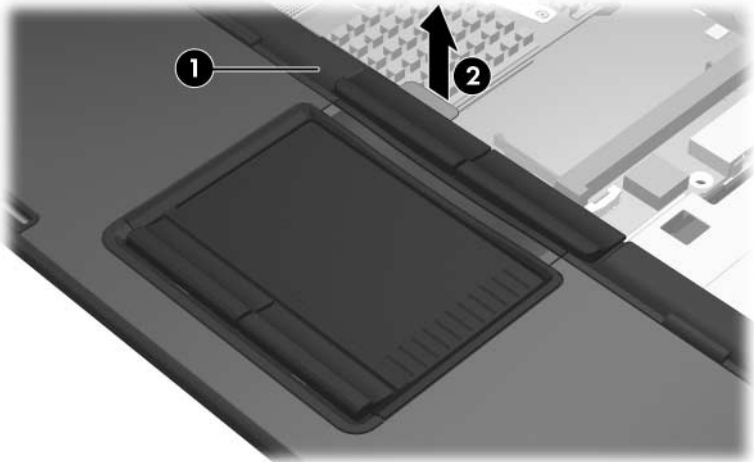
6.18 TouchPad

TouchPad Spare Part Number Information

TouchPad (includes TouchPad cable)

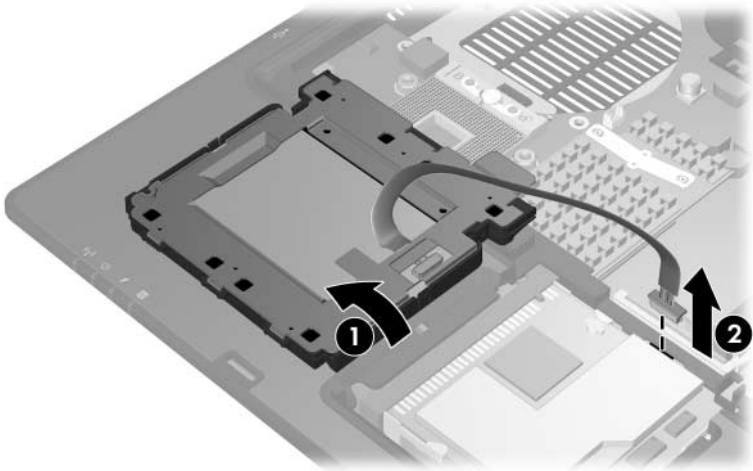
379798-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Remove the keyboard ([Section 6.9](#)).
3. Press down on the section of the top cover **1** to the left of the metal tab next to the TouchPad .
4. Lift up on the metal tab **2** on the TouchPad until the TouchPad disengages from the top cover.



Releasing the TouchPad

5. Swing the TouchPad ❶ up and to the left until it rests on the palm rest.
6. Disconnect the TouchPad cable ❷ from the system board.



Removing the TouchPad

7. Remove the TouchPad.

Reverse the above procedure to install the TouchPad.

6.19 Mini PCI Communications Module

Mini PCI Communications Module Spare Part Number Information

802.11b/g combination WLAN module, for use internationally	373032-002
802.11b/g combination WLAN module, for use Japan	373032-291
802.11b/g combination WLAN module, for use in the United States	373032-001
802.11a/b/g combination WLAN module, for use in Europe, Middle East, and Africa	373900-021
802.11a/b/g combination WLAN Mini PCI communications module for use Japan	373900-291
802.11a/b/g combination WLAN module, for use internationally	373033-002
802.11a/b/g combination WLAN module, for use Japan	373033-291
802.11a/b/g combination WLAN module, for use in MOW	373900-001
802.11a/b/g combination WLAN module, for use in the United States	373033-001
802.11a/b/g High Band combination WLAN module	373901-001

1. Prepare the computer for disassembly ([Section 6.3](#)).
2. Remove the keyboard ([Section 6.9](#)).
3. Remove the TouchPad ([Section 6.18](#)).

4. Disconnect the auxiliary and main antenna cables **1** from the Mini PCI communications module.

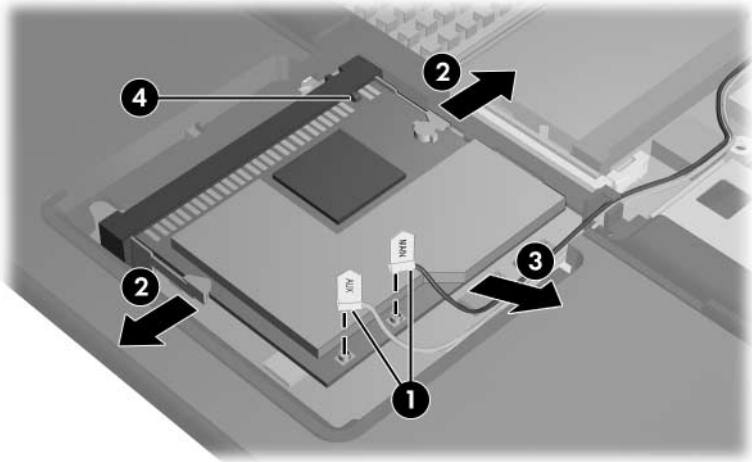


Make note of which antenna cable is attached to which antenna clip on the Mini PCI communications module before disconnecting the cables.

5. Spread the two retaining tabs **2** on each side of the Mini PCI socket to release the Mini PCI communications module. (The side of the Mini PCI communications module opposite the socket rises away from the computer.)
6. Remove the Mini PCI communications module by pulling the module away from the socket at a 45-degree angle **3**.



Mini PCI communications modules are designed with a notch **4** to prevent incorrect installation into the Mini PCI socket.



Removing a Mini PCI Communications Module

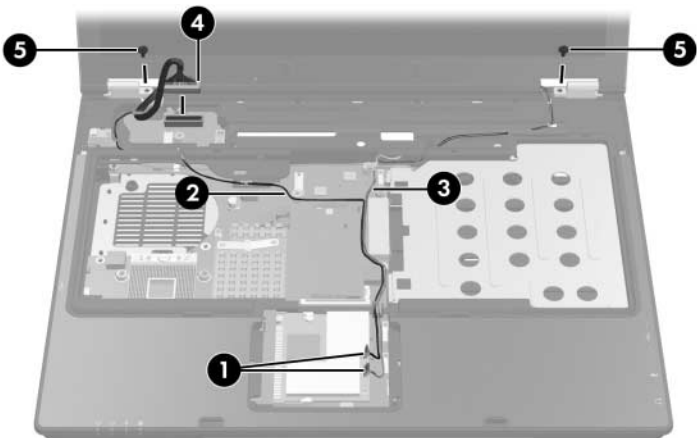
Reverse the above procedure to install a Mini PCI communications module.

6.20 Display Assembly

Display Assembly Spare Part Number Information

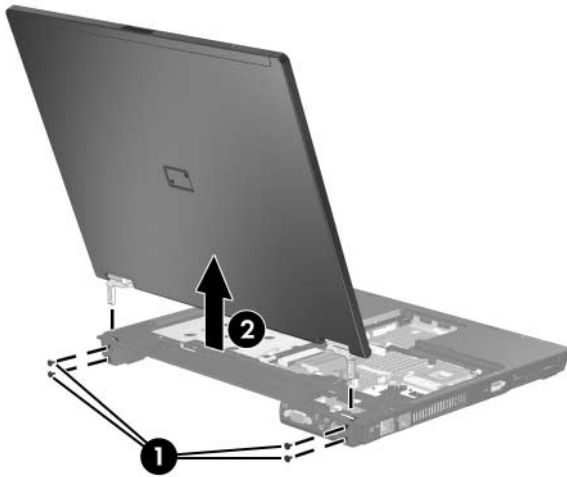
14.1-inch, SXGA, TFT	379793-001
14.1-inch, XGA, TFT	379792-001

1. Prepare the computer for disassembly ([Section 6.3](#)) and remove the following components:
 - a. Keyboard ([Section 6.9](#))
 - b. Switch cover ([Section 6.10](#))
 - c. TouchPad ([Section 6.18](#))
2. Disconnect the wireless antenna cables ❶ from the Mini PCI communications module.
3. Remove the wireless antenna cables from the Mini PCI compartment and the top cover clips ❷ and ❸.
4. Disconnect the display cable ❹ from the system board.
5. Remove the two PM2.0×4.0 screws ❺ that secure the display assembly to the computer.



Disconnecting the Display Cable and Removing the Display Screws

6. Position the computer with the rear panel toward you.
7. Remove the four T8M2.0×8.0 screws **1** that secure the display assembly to the computer.
8. Lift the display assembly straight up and remove it **2**.



Removing the Display Assembly

Reverse the above procedure to install the display assembly.

6.21 Top Cover

Top Cover Spare Part Number Information

Top cover	379796-001
-----------	------------

1. Prepare the computer for disassembly ([Section 6.3](#)) and remove the following components:
 - a. Hard drive ([Section 6.4](#))
 - b. Keyboard ([Section 6.9](#))
 - c. Switch cover ([Section 6.10](#))
 - d. TouchPad ([Section 6.18](#))
 - e. Display assembly ([Section 6.20](#))
2. Turn the computer upside down with the front panel toward you.

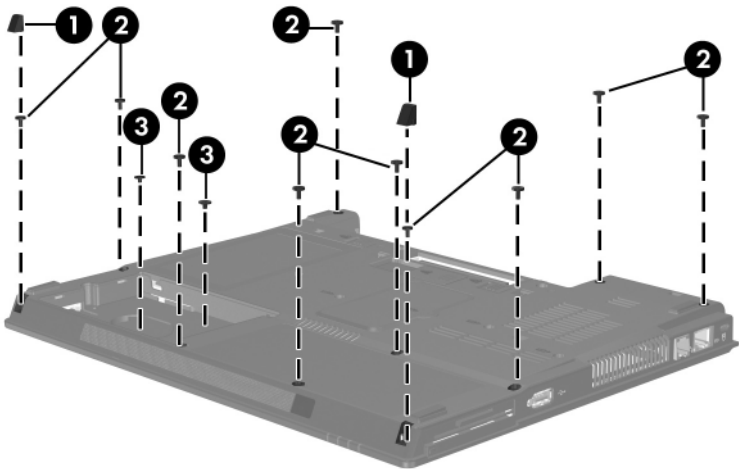
3. Remove the following:

- ① Two rubber screw covers



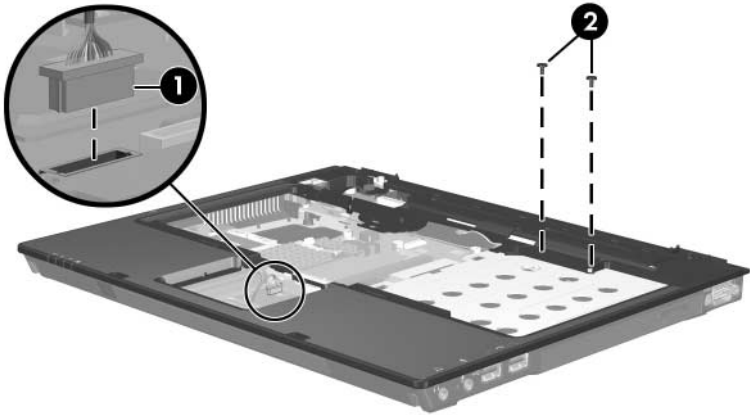
The rubber screw covers are included in the Miscellaneous Plastics Kit, spare part number 379812-001.

- ② Ten T8M2.0×8.0 screws
- ③ Two PM2.0×3.0 screws in the hard drive bay



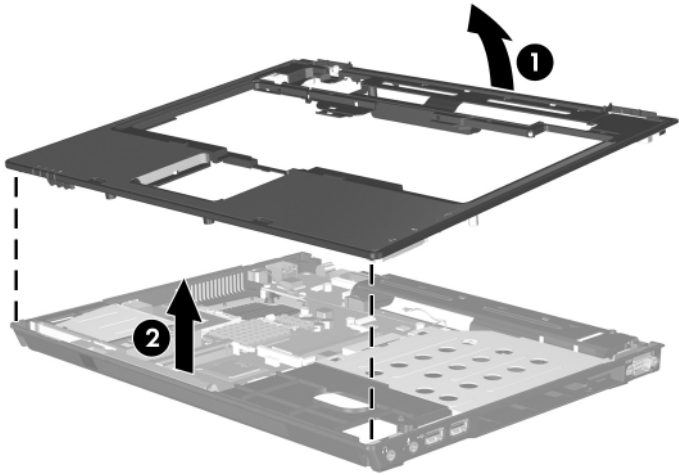
Removing the Top Cover Screws, Part 1

4. Turn the computer right-side up with the front panel toward you.
5. Disconnect the Bluetooth board cable ❶ from the system board.
6. Remove the two PM2.0×4.0 screws ❷ that secure the top cover to the computer.



Removing the Top Cover Screws, Part 2

7. Lift the rear edge of the top cover **1** until it disengages from the left and right sides of the base enclosure.
8. Lift the top cover **2** straight up and remove it.



Releasing the Top Cover

Reverse the above procedure to install the top cover.

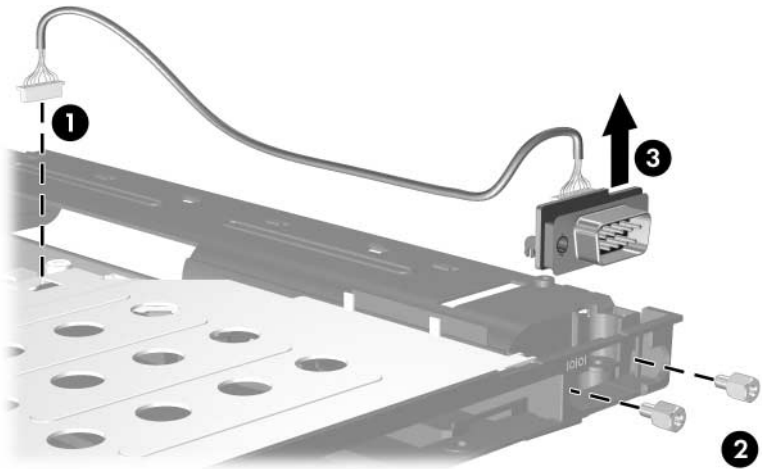
6.22 Serial Connector Module

Serial Connector Module Spare Part Number Information

Serial connector module (includes serial connector module cable)	378227-001
---	------------

1. Prepare the computer for disassembly ([Section 6.3](#)) and remove the following components:
 - a. Hard drive ([Section 6.4](#))
 - b. Keyboard ([Section 6.9](#))
 - c. Switch cover ([Section 6.10](#))
 - d. TouchPad ([Section 6.18](#))
 - e. Display assembly ([Section 6.20](#))
 - f. Top cover ([Section 6.21](#))

2. Position the computer with the right side toward you.
3. Disconnect the serial connector module cable **1** from the system board.
4. Remove the two HM5.0×11.0 screw locks **2** that secure the serial connector module to the base enclosure.
5. Remove the serial connector module **3** from the base enclosure.



Removing the Serial Connector Module and Cable

Reverse the above procedure to install the serial connector module.

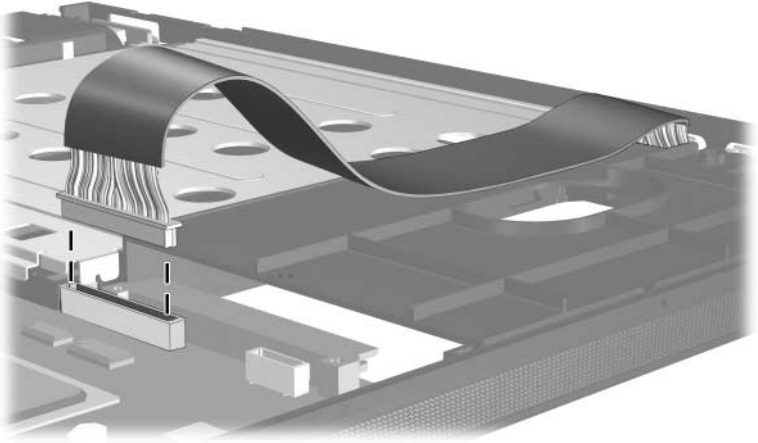
6.23 Audio Board

Audio Board Spare Part Number Information

For use with system boards with discrete video memory	385498-001
For use with system boards with UMA video memory	379811-001

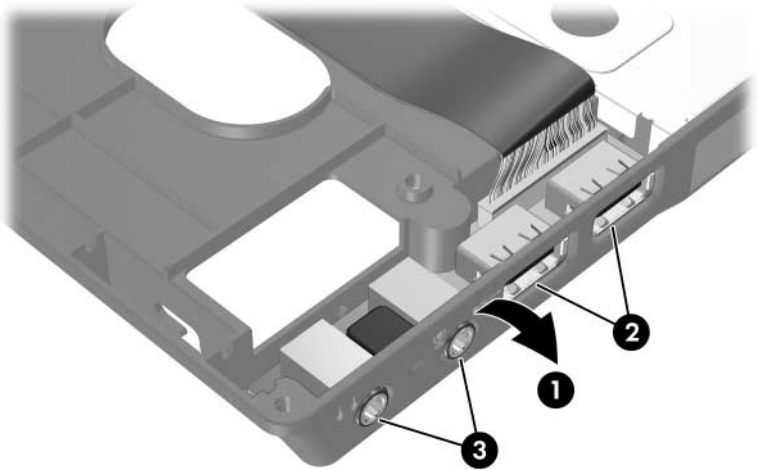
1. Prepare the computer for disassembly ([Section 6.3](#)) and remove the following components:
 - a. Hard drive ([Section 6.4](#))
 - b. Keyboard ([Section 6.9](#))
 - c. Switch cover ([Section 6.10](#))
 - d. TouchPad ([Section 6.18](#))
 - e. Display assembly ([Section 6.20](#))
 - f. Top cover ([Section 6.21](#))

2. Disconnect the audio board cable from the system board.



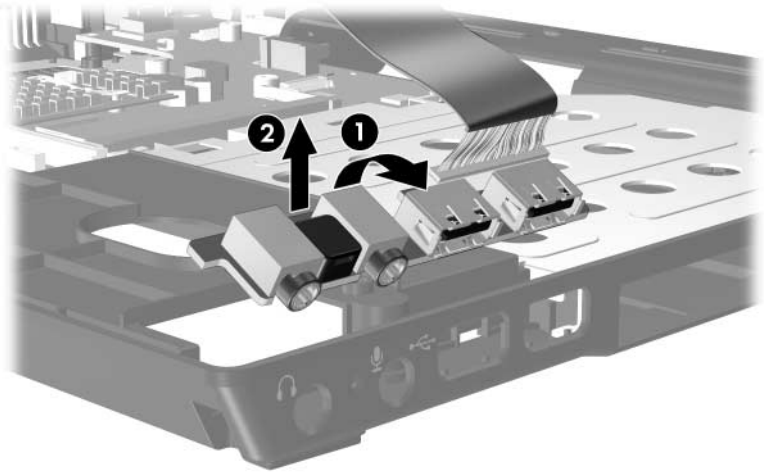
Disconnecting the Audio Board Cable

3. Flex the right side of the base enclosure **1** outward until the USB connectors **2** and audio connectors **3** are clear of the openings in the base enclosure.



Releasing the Audio Board

4. Lift the right side of the audio board ❶, and then lift the board ❷ out of the base enclosure.



Removing the Audio Board

Reverse the above procedure to install the audio board.

6.24 System Board

System Board Spare Part Number Information

Includes 64 MB of discrete video memory	382909-001
Includes 32 MB of discrete video memory	379790-001
Includes UMA video memory	379791-001



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

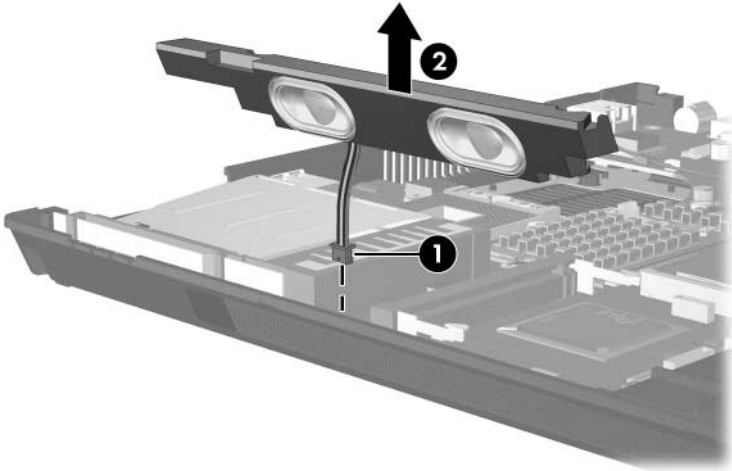
- Memory modules ([Section 6.8](#) and [Section 6.17](#))
 - TPM security module ([Section 6.12](#))
 - Processor ([Section 6.15](#))
 - Modem board ([Section 6.16](#))
 - Mini PCI communications module ([Section 6.19](#))
-

1. Prepare the computer for disassembly ([Section 6.3](#)) and remove the following components:
 - a. Hard drive ([Section 6.4](#))
 - b. Bluetooth board ([Section 6.6](#))
 - c. MultiBay II device ([Section 6.7](#))
 - d. Keyboard ([Section 6.9](#))
 - e. Switch cover ([Section 6.10](#))
 - f. Fan ([Section 6.13](#))
 - g. Heat sink ([Section 6.14](#))
 - h. TouchPad ([Section 6.18](#))
 - i. Display assembly ([Section 6.20](#))
 - j. Top cover ([Section 6.21](#))

2. Disconnect the speaker cable from the system board ❶.
3. Remove the speaker ❷.



The speaker is included in the Miscellaneous Plastics Kit, spare part number 379812-001.

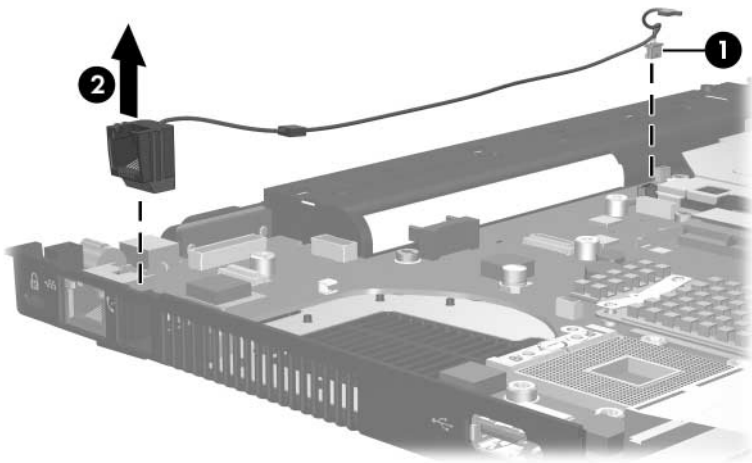


Removing the Speaker

4. Position the computer with the left side toward you.
5. Disconnect the RJ-11 cable ❶ from the system board.
6. Remove the RJ-11 connector ❷ from the clip in the base enclosure.



The RJ-11 connector and cable is included in the Miscellaneous Cables Kit, spare part number 389013-001.

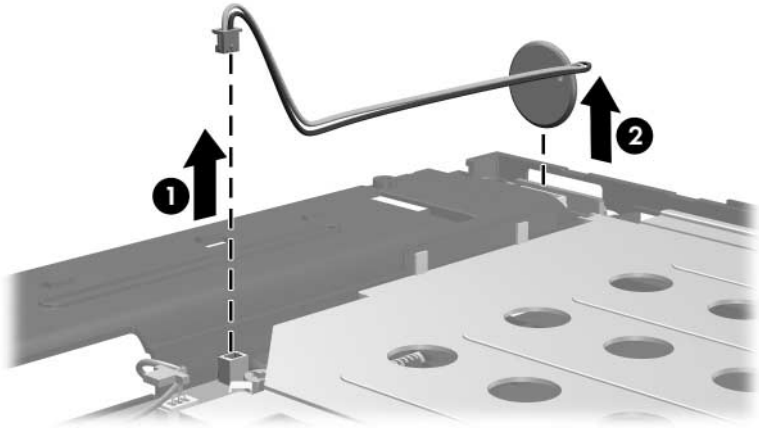


Removing the RJ-11 Connector and Cable

7. Disconnect the RTC battery cable ❶ from the system board.
8. Remove the RTC battery ❷ from the clip in the top cover.



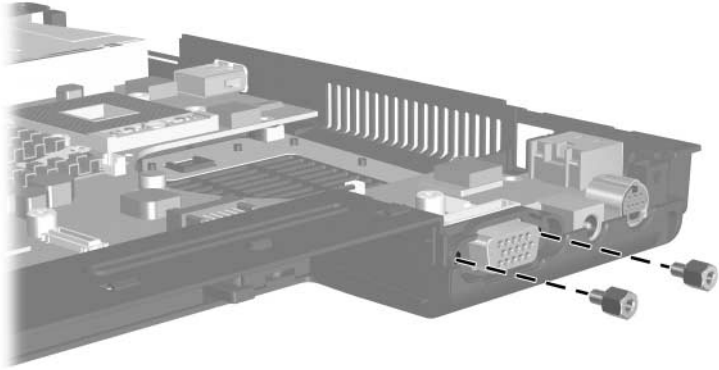
The RTC battery is included in the Miscellaneous Plastics Kit, spare part number 379812-001.



Removing the RTC Battery

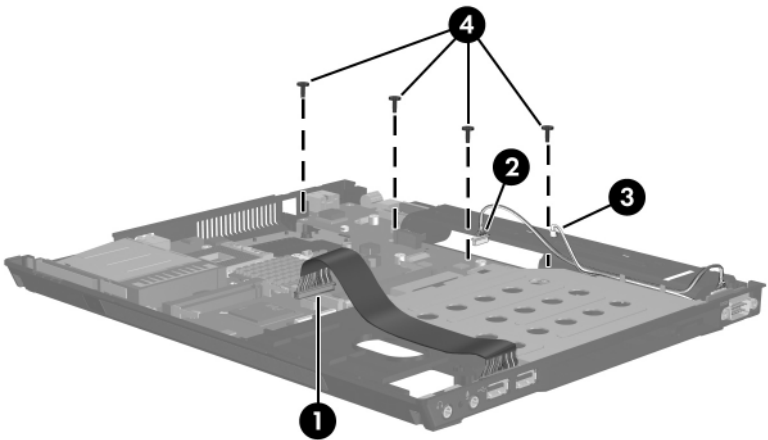
9. Position the computer with the rear panel toward you.

10. Remove the two HM5.0×11.0 screw locks on each side of the external monitor connector.



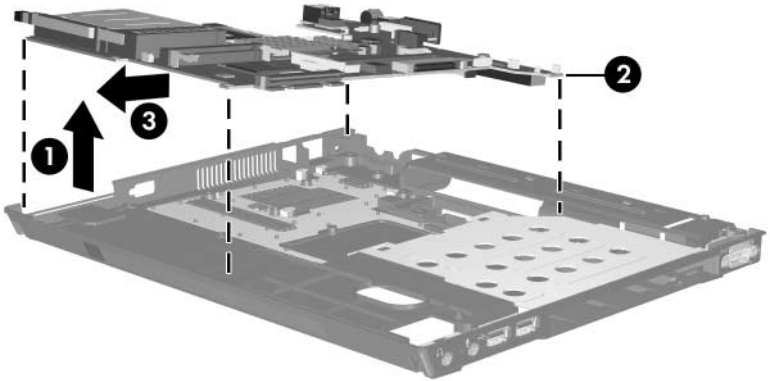
Removing the System Board Screw Locks

11. Position the computer with the front toward you.
12. Disconnect the following cables from the system board:
 - ❶ Audio board cables
 - ❷ Serial connector cable
 - ❸ RTC battery cable
13. Remove the four T8M2.0×8.0 screws ❹ that secure the system board to the base enclosure.



Disconnecting the System Board Cables and Removing the System Board Screws

14. Lift the front edge of the system board **1** until the right/rear corner is clear of the MultiBay II device shield **2**.
15. Slide the system board **3** forward and remove it.



Removing the System Board Screws and Screw Locks

Reverse the above procedures to install the system board.

Specifications

This chapter provides physical and performance specifications.

Table 7-1
Computer

Dimensions	Metric	U.S.
Height (varies from front rear)	2.65 to 3.35 cm	1.04 to 1.32 in
Width	31.5 cm	12.40 in
Depth	25.7 cm	10.12 in
Weight		
Notebook with 14.1-inch display, MultiBay II device, and 6-cell battery pack	2.4 kg	5.29 lb
Input Power		
Operating voltage	18.5 V dc @ 3.5 A- 65 W	
Operating current	3.5 A	
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 7-1
Computer (Continued)

Relative humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random Vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	



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

Table 7-2
14.1-inch, SXGA, TFT Display

Dimensions		
Height	28.5 cm	11.2 in
Width	21.3 cm	8.4 in
Diagonal	35.8 cm	14.1 in
Number of colors		Up to 16.8 million
Contrast ratio		200:1
Brightness		180 nits typical ⁷
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1680 × 1050	
Configuration	RGB vertical stripe	
Backlight		Edge lit
Character display		80 × 25
Total power consumption		5.5 W
Viewing angle		+/-35° horizontal, +15/-35° vertical typical

Table 7-3
14.1-inch, XGA, TFT Display

Dimensions		
Height	28.5 cm	11.2 in
Width	21.3 cm	8.4 in
Diagonal	35.8 cm	14.1 in
Number of colors		Up to 16.8 million
Contrast ratio		250:1
Brightness		180 nits typical
Pixel resolution		
Pitch	0.279 × 0.279 mm	
Format	1024 × 768	
Configuration	RGB vertical stripe	
Backlight		Edge lit
Character display		80 × 25
Total power consumption		4.0 W
Viewing angle		+/-40° horizontal, +20/-40° vertical typical

Table 7-4
Hard Drives


	80-GB*	60-GB*	60-GB*	40-GB*
Dimensions				
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm
Weight	99 g	99 g	99 g	102 g
Interface type	ATA-5	ATA-5	ATA-5	ATA-5
Transfer rate				
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	3 ms	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms	24 ms
Logical blocks [†]	156,301,488	117,210,240	117,210,240	78,140,160
Disk rotational speed	5400 rpm	7200 rpm	5400 rpm	5400 rpm
Operating temperature	5°C to 55°C (41°F to 131°F)			
 Certain restrictions and exclusions apply. Consult Customer Care for details.				
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.				
[†] Actual drive specifications may differ slightly.				

Table 7-5
Primary 6-cell, Li-Ion Battery Pack

Dimensions

Height	2.00 cm	0.79 in
Width	9.40 cm	3.70 in
Depth	13.40 cm	5.28 in
Weight	0.34 kg	0.75 lb

Energy

Voltage	11.1 V
Amp-hour capacity	4.4 Ah
Watt-hour capacity	48 Wh

Temperature

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

Table 7-6
8X DVD-ROM Drive

Applicable disk	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18) CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R CD-RW Photo CD (single and multisession) CD-Bridge	
Center hole diameter	1.5 cm (0.59 in)	
Disk diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
Disk thickness	1.2 mm (0.047 in)	
Track pitch	0.74 μ m	
Access time	CD	DVD
Random	< 100 ms	< 125 ms
Full stroke	< 175 ms	< 225 ms
Audio output level	Line-out, 0.7 Vrms	
Cache buffer	512 KB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 10 seconds	
Stop time	< 3 seconds	

Table 7-7
DVD+RW/R and CD-RW Combo Drive

Applicable disk	Read:	Write:
	DVD-R, DVD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R, CD-RW Photo CD (single and multisession) CD-Bridge	CD-R and CD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disk diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	

Table 7-7
DVD+RW/R and CD-RW Combo Drive (Continued)

Disk thickness	1.2 mm (0.047 in)	
Track pitch	0.74 μ m	
Access time	CD media	DVD media
Random	< 110 ms	< 130 ms
Full stroke	< 210 ms	< 225 ms
Audio output level	Line-out, 0.7 V rms	
Cache buffer	2 MB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 7-8
24X DVD/CD-RW Combo Drive

Applicable disk	Read:	Write:
	DVD-R, DVD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R, CD-RW Photo CD (single and multisession) CD-Bridge	CD-R and CD-RW
Center hole diameter	1.5 cm (0.59 in)	
Disk diameter		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	

Table 7-8
24X DVD/CD-RW Combo Drive (Continued)

Disk thickness	1.2 mm (0.047 in)	
Track pitch	0.74 μ m	
Access time	CD media	DVD media
Random	< 110 ms	< 130 ms
Full stroke	< 210 ms	< 225 ms
Audio output level	Line-out, 0.7 V rms	
Cache buffer	2 MB	
Data transfer rate		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
Startup time	< 15 seconds	
Stop time	< 6 seconds	

Table 7-9
System DMA

Hardware DMA	System Function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned

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

Table 7-10
System Interrupts

Hardware IRQ	System Function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft Natural Keyboard
IRQ2	Cascaded
IRQ3	Intel 82801DB/DBM USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—Link Audio Intel 82801DB/DBM SMBus Controller—24C3 Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	Intel USB UHCI controller—24C2 Intel 82852/82855 GM/GME Graphic Controller Realtek RTL8139 Family PCI fast Ethernet Controller

Table 7-10
System Interrupts (Continued)

IRQ11	Intel USB EHCI controller—24CD Intel USB UHCI controller—24C4 Intel USB UHCI controller—24C7 Intel Pro/Wireless 2200BG TI OHCI 1394 host controller TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel

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



PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

Table 7-11
System I/O Addresses

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

Table 7-11
System I/O Addresses (*Continued*)

I/O Address (hex)	System Function (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	Joystick (decoded in ESS1688)
202 - 21F	Unused
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port

Table 7-11
System I/O Addresses (*Continued*)

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

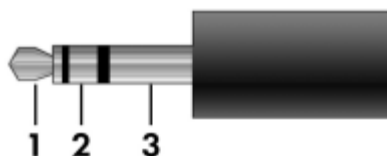
Table 7-12
System Memory Map

Size	Memory Address	System Function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFF	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

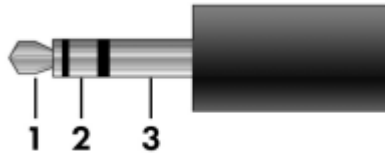
Connector Pin Assignments

Table A-1
Audio-Out (Headphone)



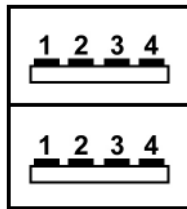
Pin	Signal	Pin	Signal
1	Audio out, left channel	3	Ground
2	Audio out, right channel		

Table A-2
Audio-In (Microphone)



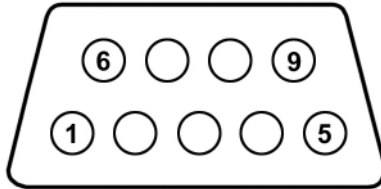
Pin	Signal	Pin	Signal
1	Audio signal in	3	Ground
2	Audio signal in		

Table A-3
Universal Serial Bus



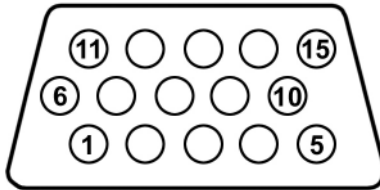
Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data -	4	Ground

Table A-4
Serial



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

Table A-5
External Monitor



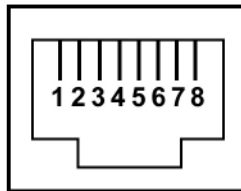
Pin	Signal	Pin	Signal
1	Red analog	9	+5 VDC
2	Green analog	10	Ground
3	Blue analog	11	Monitor detect
4	Not connected	12	DDC 2B data
5	Ground	13	Horizontal sync
6	Ground analog	14	Vertical sync
7	Ground analog	15	DDC 2B clock
8	Ground analog		

Table A-6
S-Video-Out



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

Table A-7
RJ-45 (Network)

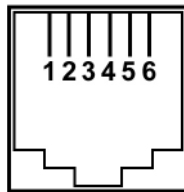


Pin	Signal	Pin	Signal
1	Transmit +	5	Unused

Table A-7
RJ-45 (Network)

2	Transmit –	6	Receive –
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-8
RJ-11 (Modem)



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

Power Cord Set Requirements

3-Conductor Power Cord Set

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

The power cord set included with the computer 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 computer is used.

General Requirements

The requirements listed below are applicable to all countries.

- The length of the power cord set must be at least 1.5 m (5.0 ft) and a maximum of 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by each country's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements

Country/Region	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



NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.

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

Country/Region	Accredited Agency	Applicable Note Number
Korea	EK	4
The Netherlands	KE A	1
Norway	NEMKO	1
People's Republic of China	CCC	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
United Kingdom	BSI	1
United States	UL	2



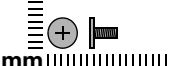
NOTES:

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
 2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
 3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
 4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
 5. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.
-

Screw Listing

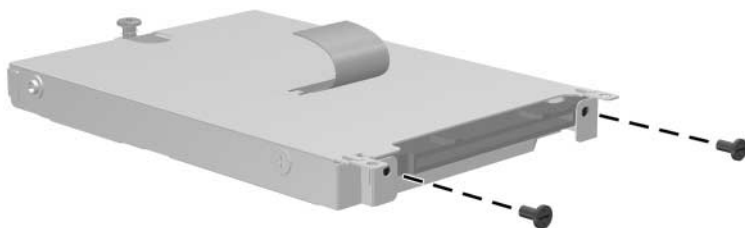
This appendix provides specification and reference information for the screws and screw locks used in the computer. All screws and screw locks listed in this appendix are available in the Screw Kit, spare part number 379813-001.

Table C-1
Phillips 1.5x4.0 Screw (Continued)

 mm	Color	Qty.	Length	Thread	Head Width
	Black	5	4.0 mm	1.5 mm	4.5 mm

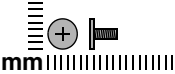
Where used:

2 screws that secure the hard drive frame to the hard drive (documented in [Section 6.4](#))



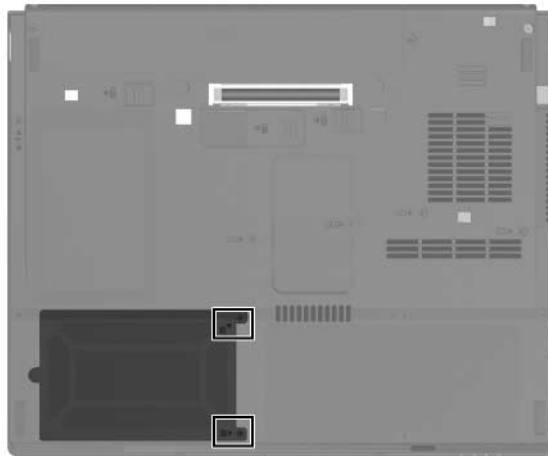
Phillips PM1.5x4.0 Screw Locations

Table C-1
Phillips PM1.5x4.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	5	4.0 mm	1.5 mm	4.5 mm

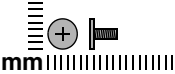
Where used:

2 screws that secure the hard drive cover to the computer (screws are captured on the cover by C clips; documented in [Section 6.4](#))



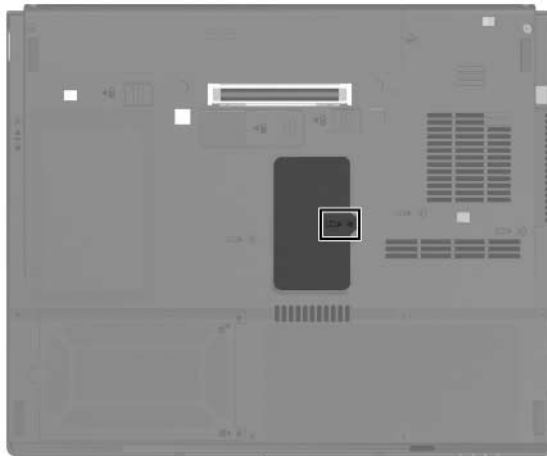
Phillips PM1.5x4.0 Screw Locations

Table C-1
Phillips 1.5×4.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	5	4.0 mm	1.5 mm	4.5 mm

Where used:

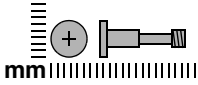
One screw that secures the memory module compartment cover to the computer (screw is secured to the cover by a C clip; documented in [Section 6.8](#))



Phillips PM1.5×4.0 Screw Location

Table C-2

Phillips PM2.5×13.0 Spring-loaded Hard Drive Retention Screw



Color	Qty.	Length	Thread	Head Width
Black	1	13.0 mm	2.5 mm	5.5 mm

Where used:

One screw that secures the hard drive to the computer (screw is captured on the hard drive frame by a C clip; documented in [Section 6.4](#))

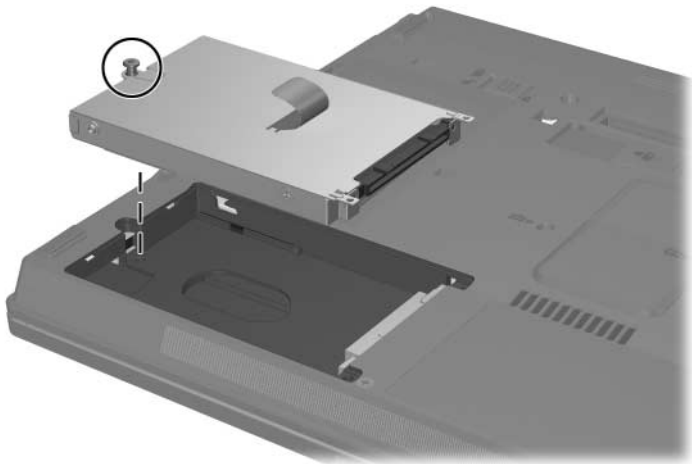
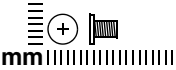

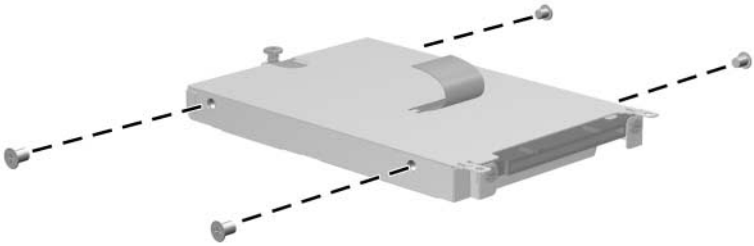
*Phillips PM2.5×13.0 Screw Location*

Table C-3
Phillips PM2.5×4.0 Shoulder Screw

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

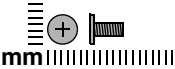
Where used:

4 screws that secure the hard drive frame to the hard drive (documented in [Section 6.4](#))



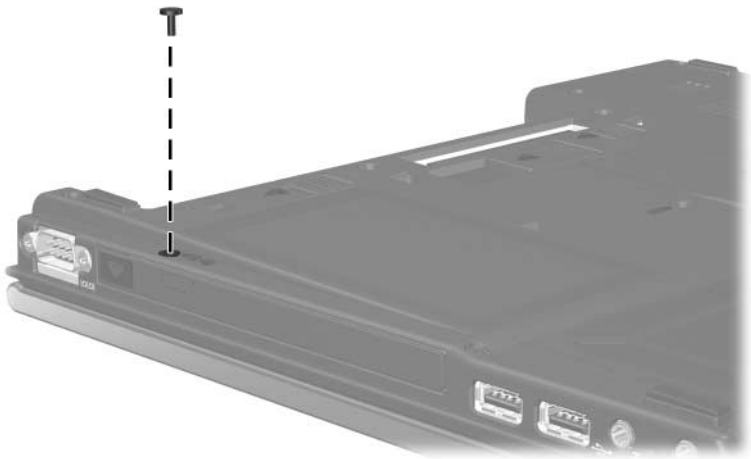
Phillips PM2.5×4.0 Shoulder Screw Locations

Table C-4
Phillips PM2.0x5.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	3	5.0 mm	2.0 mm	4.5 mm

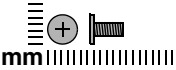
Where used:

One screw that secures the MultiBay II device to the computer (documented in [Section 6.7](#))



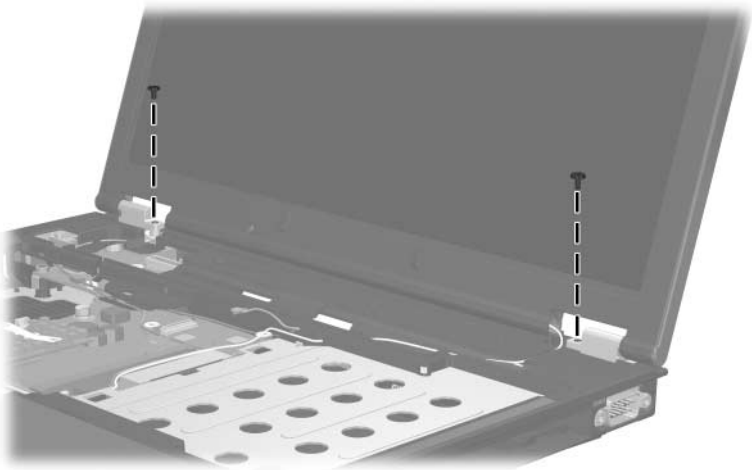
Phillips PM2.0x5.0 Screw Location

Table C-4
Phillips PM2.0x5.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	3	5.0 mm	2.0 mm	4.5 mm

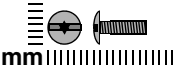
Where used:

2 screws that secure the display assembly to the computer (documented in [Section 6.20](#))



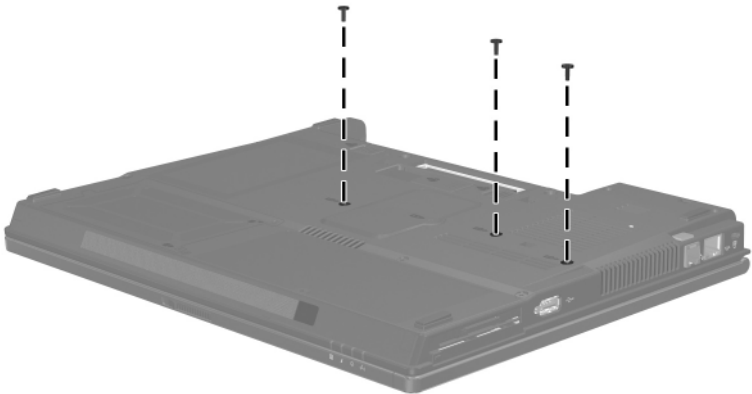
Phillips PM2.0x5.0 Screw Locations

Table C-5
Torx8 T8M2.0×8.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	21	8.0 mm	2.0 mm	4.0 mm

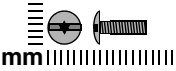
Where used:

3 screws that secure the keyboard to the computer (documented in [Section 6.9](#))



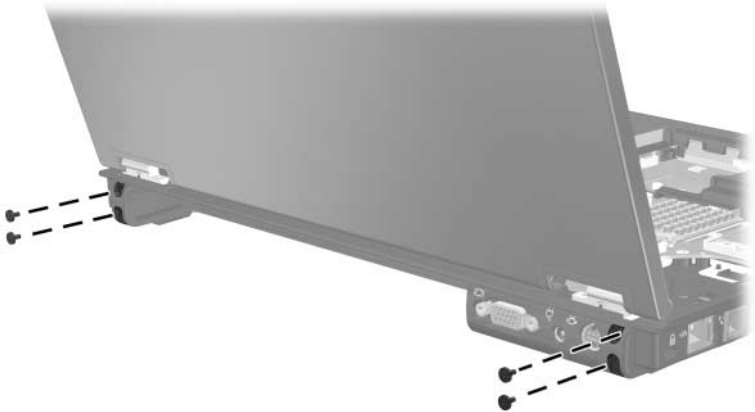
Torx 8 T8M2.0×8.0 Screw Locations

Table C-5
Torx8 T8M2.0×8.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	21	8.0 mm	2.0 mm	4.0 mm

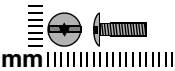
Where used:

4 screws that secure the display assembly to the computer (documented in [Section 6.20](#))



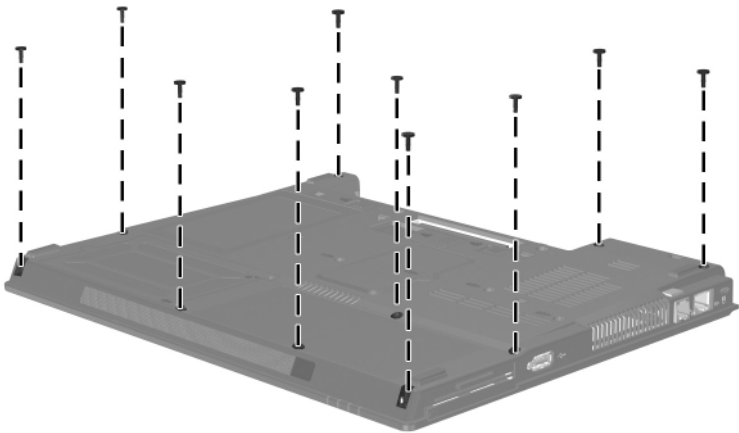
Torx 8 T8M2.0×8.0 Screw Locations

Table C-5
Torx8 T8M2.0×8.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
	Black	21	8.0 mm	2.0 mm	4.0 mm

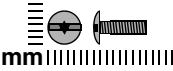
Where used:

10 screws that secure the top cover to the computer (documented in [Section 6.21](#))



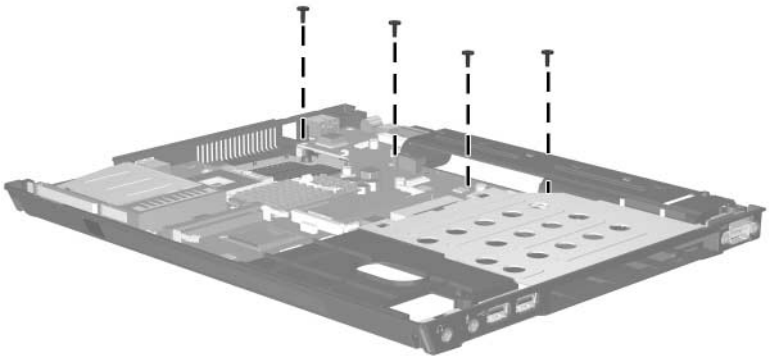
Torx 8 T8M2.0×8.0 Screw Locations

Table C-5
Torx8 T8M2.0×8.0 Screw (Continued)

	Color	Qty.	Length	Thread	Head Width
mm	Black	21	8.0 mm	2.0 mm	4.0 mm

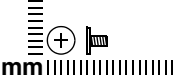
Where used:

4 screws that secure the system board to the computer (documented in [Section 6.24](#))



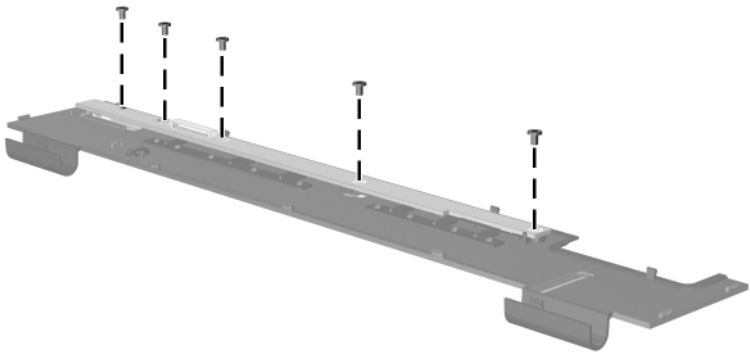
Torx 8 T8M2.0×8.0 Screw Locations

Table C-6
Phillips PM2.0×3.0 Screw

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

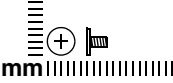
Where used:

5 screws that secure the LED board to the switch cover (documented in [Section 6.11](#))



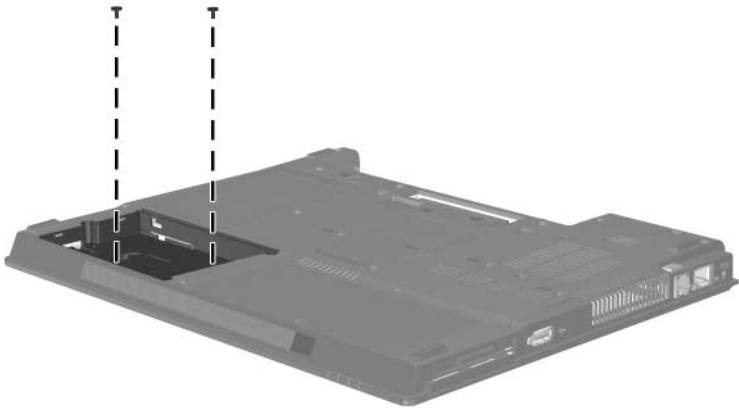
Phillips PM2.0×3.0 Screw Locations

Table C-6
Phillips PM2.0×3.0 Screw (Continued)

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

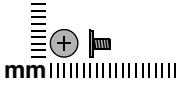
Where used:

2 screws that secure the top cover to the computer in the hard drive bay (documented in [Section 6.21](#))



Phillips PM2.0×3.0 Screw Locations

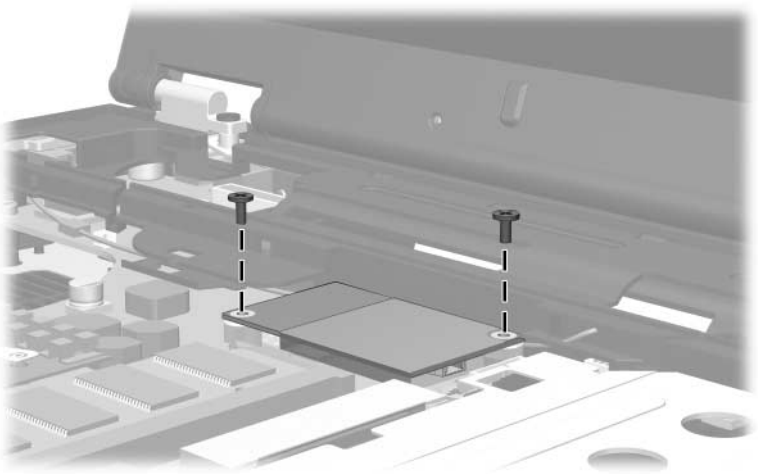
Table C-7
Phillips PM2.0×3.0 Screw



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


Where used:

2 screws that secure the modem board to the computer (documented in [Section 6.16](#))



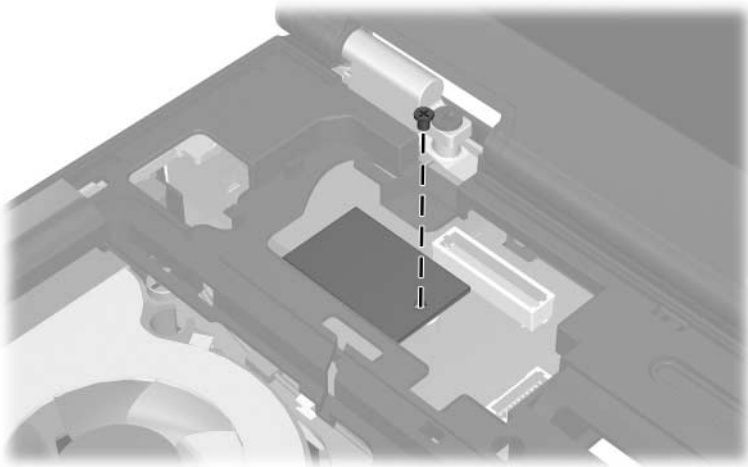
Phillips PM2.0×3.0 Screw Locations

Table C-8
Phillips 1.5×3.0 Screw

 mm	Color	Qty.	Length	Thread	Head Width
	Black	1	3.0 mm	1.5 mm	2.25 mm

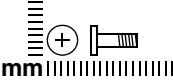
Where used:

One screw that secures the TPM security module to the computer (documented in [Section 6.12](#))



Phillips 1.5×3.0 Screw Location

Table C-9
Phillips PM2.0x7.0 Screw

	Color	Qty.	Length	Thread	Head Width
	Silver	2	7.0 mm	2.0 mm	4.5 mm

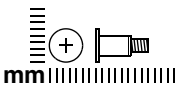
Where used:

2 screws that secure the fan to the computer (screws are captured on the fan assembly by an O clip; documented in [Section 6.13](#))



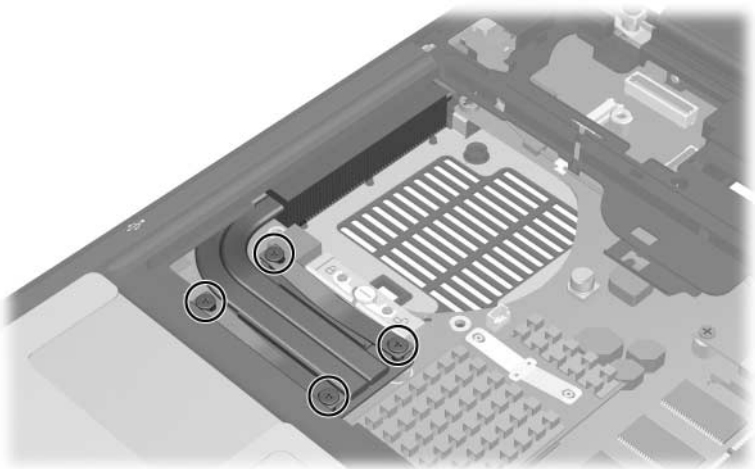
Phillips PM2.0x7.0 Screw Locations

Table C-10
Phillips PM2.0x8.0 Shoulder Screw

	Color	Qty.	Length	Thread	Head Width
Silver	4	8.0 mm	2.0 mm	5.0 mm	

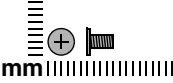
Where used:

4 screws that secure the heat sink to the computer (screws are captured on the heat sink by C clips; documented in [Section 6.14](#))



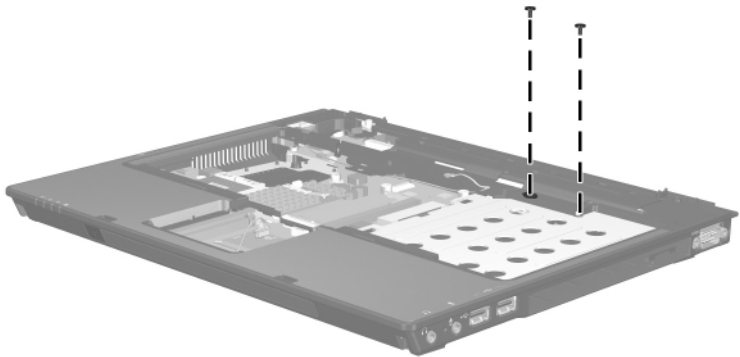
Phillips PM2.0x8.0 Shoulder Screw Locations

Table C-11
Phillips PM2.0x4.0 Screw

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

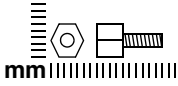
Where used:

2 screws that secure the top cover to the computer (documented in [Section 6.21](#))



Phillips PM2.0x4.0 Screw Locations

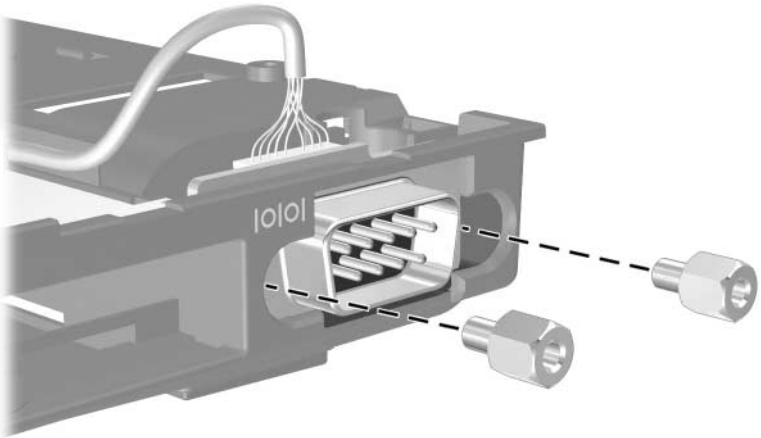
Table C-12
Hex Socket HM5.0×11.0 Screw Lock



	Color	Qty.	Length	Thread	Head Width
	Silver	4	11.0 mm	2.5 mm	5.0 mm

Where used:

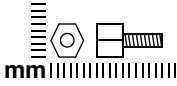
2 screw locks that secure the serial connector module to the computer (documented in [Section 6.22](#))



Hex Socket HM5.0×11.0 Screw Lock Locations

Table C-12

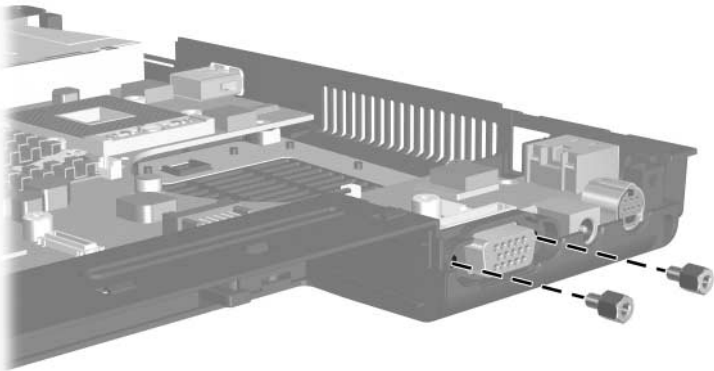
Hex Socket HM5.0×11.0 Screw Lock *(Continued)*



Color	Qty.	Length	Thread	Head Width
Silver	4	11.0 mm	2.5 mm	5.0 mm

Where used:

2 screw locks that secure the system board to the computer (documented in [Section 6.24](#))



Hex Socket HM5.0×11.0 Screw Lock Locations

Display Component Recycling



WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.



CAUTION: The procedures in this appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling should be exercised when removing these components.



Materials Disposal

This HP product contains mercury in the backlight of the display assembly and may require special handling at end of life.

Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities or visit the Electronic Industries Alliance (EIA) at <http://www.eiae.org>.

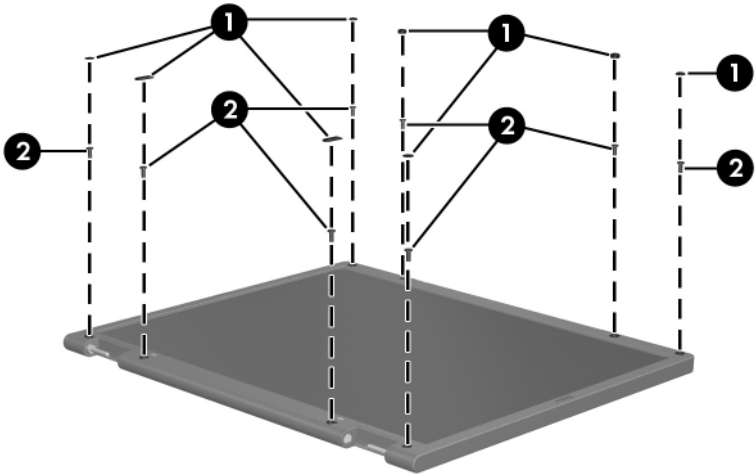
This appendix provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **1** and the liquid crystal display (LCD) panel **2**.



Disassembly procedures differ from one display assembly to another. The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

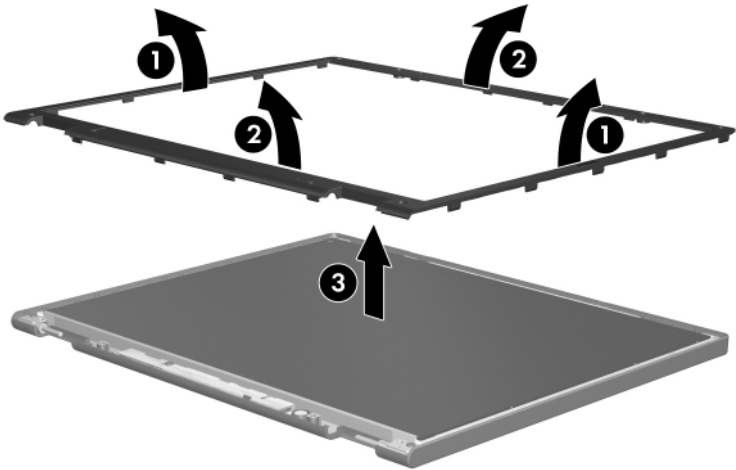
Perform the following steps to disassemble the display assembly:

1. Remove all screw covers **1** and screws **2** that secure the display bezel to the display assembly.



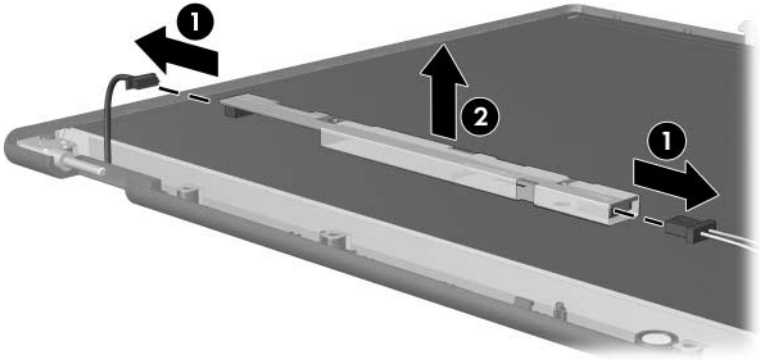
Removing the Display Bezel Screw Covers and Screws

-
2. Lift up and out on the left and right inside edges ① and the top and bottom inside edges ② of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ③.



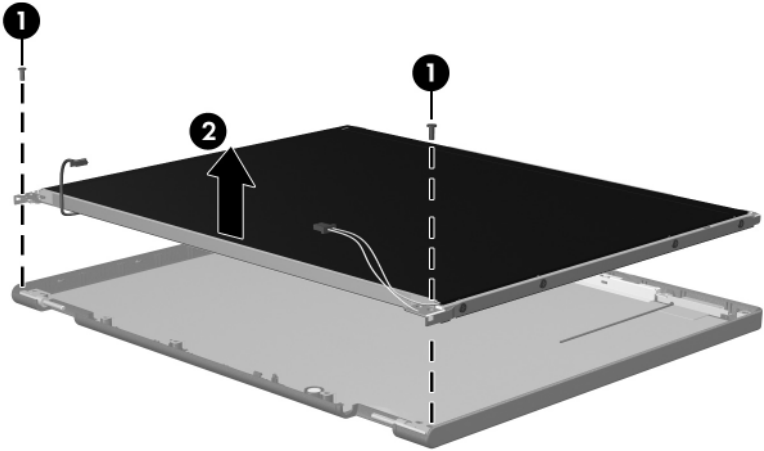
Removing the Display Bezel

4. Disconnect all display panel cables ① from the display inverter and remove the inverter ②.



Removing the Display Inverter

5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly ❷ from the display enclosure.



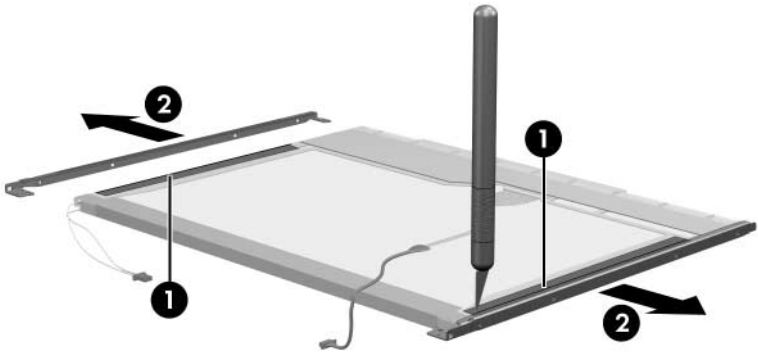
Removing the Display Panel Assembly

7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



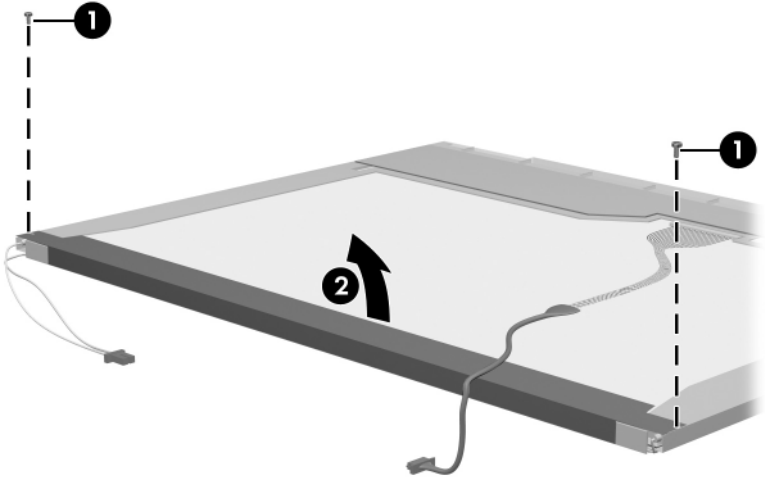
Removing the Display Panel Frame Screws

9. Use a sharp-edged tool to cut the tape ❶ that secures the side of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



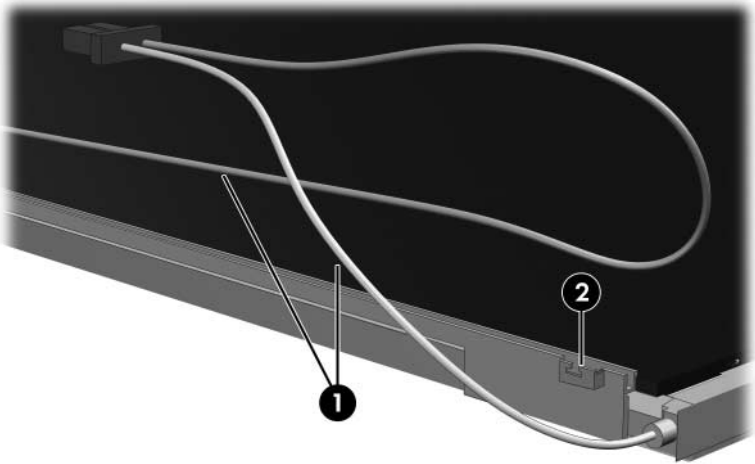
Removing the Display Frame

11. Remove the screws **1** that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover **2** and swing it forward.
13. Remove the backlight cover.



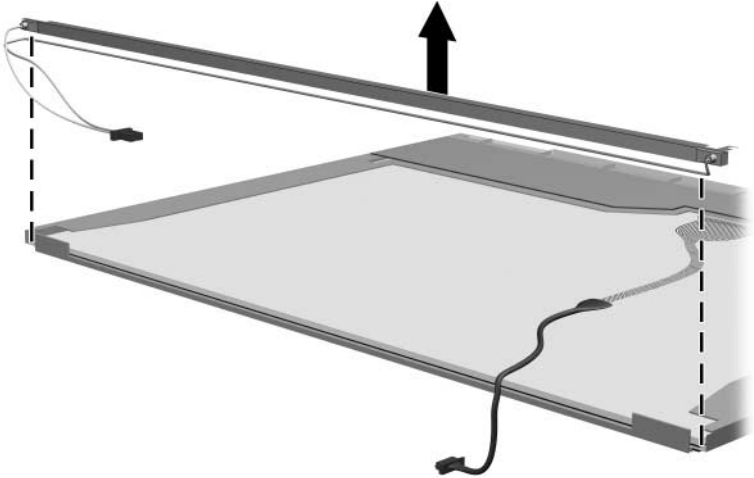
Removing the Backlight Cover

14. Turn the display panel right-side up.
15. Remove the backlight cables **1** from the clip **2** in the display panel.



Releasing the Backlight Cables

16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

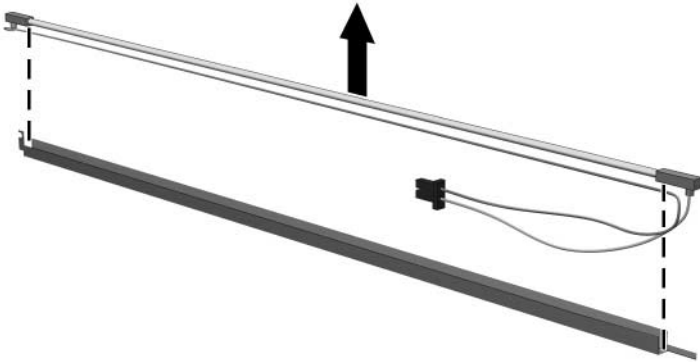


Removing the Backlight Frame



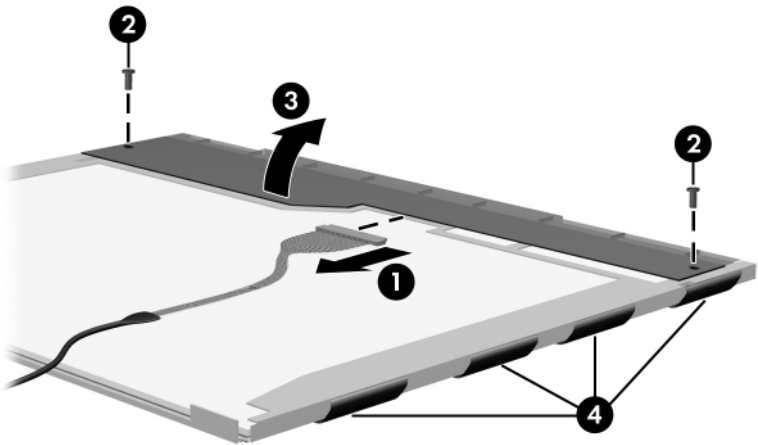
WARNING: The backlight contains mercury. Caution should be exercised when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

18. Slide the backlight out of the backlight frame.



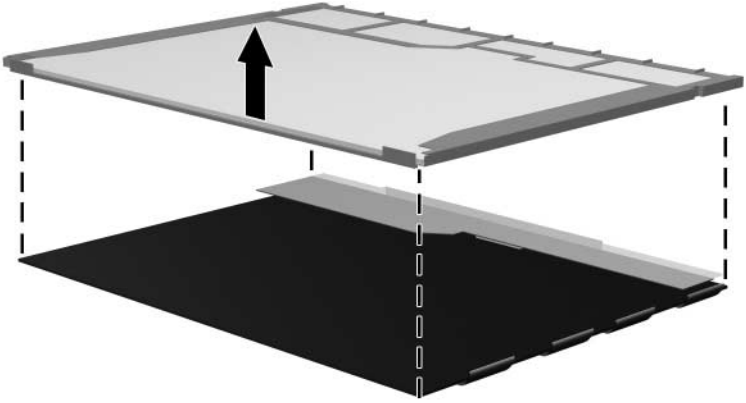
Removing the Backlight

19. Disconnect the display cable **1** from the LCD panel.
20. Remove the screws **2** that secure the LCD panel to the display rear panel.
21. Release the LCD panel **3** from the display rear panel.
22. Remove the tape **4** that secures the LCD panel to the display rear panel.



Releasing the LCD Panel

23. Remove the LCD panel.



Removing the LCD Panel

24. Recycle the display backlight and LCD panel.

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