COMPAQ

Maintenance and Service Guide

Compaq Evo Notebook N400c Series

Document Part Number: 225760-002

September 2001

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

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1

Product Description

1.1 Models and Features

The Compaq Evo Notebook N400c Series offer advanced modularity, 850- or 700-MHz Intel Pentium III processors with 64-bit architecture, industry-leading Accelerated Graphics Port (AGP) implementation, and extensive multimedia support. The computer provides desktop functionality and connectivity through the optional Mobile Expansion Unit (MEU).

Figure 1-1. Compaq Evo Notebook N400c

Models

Model naming conventions are shown in Table 1-1.

Table 1-1
Compaq Evo Notebook N400c
Models and Model Naming Conventions

Key										
N4c	P	850	X2	10	V	C	128	98	9L	XXXXXX-XXX
1	2	3	4	5	6	7	8	9	10	11

Key	Description	Options	
1	Brand / family designator	N=Notebook	4=Ultra portable c=Common
2	Processor type	P=Intel Pentium III	
3	Processor speed	850=850 MHz	700=700 MHz
4	Display type and size	X=XGA (1024 × 768)	2=12.x inches
5	Hard drive size	20=20.0 GB	
6	Optical drive designator	V=8X Max DVD-ROM drive	D=24X Max CD-ROM drive 0=None
7	Integrated communication	M=Modem 0 = None	C=Modem/NIC combination card
8	RAM	12=128 MB	
9	Operating system	8=Windows 98	6=Windows 2000/ Window NT 4.0 dual install
10	Battery cells / type	L=4 cells, Lithium ion	
11	SKU#		

Table 1-1
Compaq Evo Notebook N400c
Models and Model Naming Conventions *(Continued)*

1	2	3	4	5	6	7	8	9	10	11
N4c	P	850	X2	20	0	C	12	6	L	470022-xxx

Australian	470022-713	Middle Eastern	470022-695
Belgian	470022-685	Norwegian	470022-697
Brazilian	470022-711	People's Republic of China	470022-714
Czech	470022-686	Portuguese	470022-698
Danish	470022-687	Russian	470022-699
Dutch	470022-696	Slovak/Slovenian	470022-700
French	470022-689	Spanish	470022-701
French Canadian	470022-684	Swedish/Finnish	470022-702
German	470022-690	Swiss 1 (French/German/ U.S. English)	470022-703
Greek/Polish	470022-691	Swiss 2 (French/German/ Italian)	470022-704
Hebrew	470022-693	Taiwanese	470022-715
Hong Kong	470022-716	Thai	470022-712
Hungarian	470022-692	Turkish	470022-705
Italian	470022-694	U.K. English	470022-706
Japanese	470022-707	U.S. English	470022-683
Japanese English	470022-708		
Korean	470022-717		
Latin American Spanish	470022-710		

Table 1-1
Compaq Evo Notebook N400c
Models and Model Naming Conventions *(Continued)*

1	2	3	4	5	6	7	8	9	10	11
N4c	P	850	X2	20	0	C	12	8	L	470022-xxx
Australian			470022-677			Korean				470022-681
Belgian			470022-650			Latin American Spanish				470022-674
Brazilian			470022-675			Middle Eastern				470022-660
Czech			470022-651			Norwegian				470022-662
Danish			470022-652			People's Republic of China				470022-678
Dutch			470022-661			Portuguese				470022-663
French			470022-654			Russian				470022-664
French Canadian			470022-649			Slovak/Slovenian				470022-665
German			470022-655			Spanish				470022-667
Greek/Polish			470022-656			Swedish/Finnish				470022-668
Hebrew			470022-658			Taiwanese				470022-679
Hong Kong			470022-680			Thai				470022-676
Hungarian			470022-657			Turkish				470022-669
Italian			470022-659			U.K. English				470022-670
Japanese			470022-671			U.S. English				470022-682
Japanese English			470022-672							
N4c	P	850	X2	20	0	C	12	6	L	470022-xxx
Latin American Spanish (NAFTA)			470022-709			U.S. English (NAFTA)				470022-718
N4c	P	850	X2	20	0	C	12	8	L	470022-xxx
Latin American Spanish (NAFTA)			470022-673			U.S. English (NAFTA)				470022-648

Table 1-1
Compaq Evo Notebook N400c
Models and Model Naming Conventions *(Continued)*

N4c	P	850	X2	20	0	0	12	6	L	470022-688
European			470022-688							

Table 1-1
Compaq Evo Notebook N400c
Models and Model Naming Conventions *(Continued)*

1	2	3	4	5	6	7	8	9	10	11
N4c	P	850	X2	20	0	0	12	8	L	470022-653
European			470022-653							
N4c	P	700	X2	20	0	C	12	6	L	470013-xxx
N4c	P	700	X2	20	0	C	12	8	L	470013-xxx
N4c	P	700	X2	20	0	C	12	6	L	470013-xxx
N4c	P	700	X2	20	0	C	12	8	L	470013-xxx
N4c	P	700	X2	20	0	0	12	6	L	470013-xxx
N4c	P	700	X2	20	0	0	12	8	L	470013-xxx

All models use configuration code **JMWZ.**

Features

The computer has the following features:

- Intel Pentium III 850- or 700-MHz processor, with 256-KB integrated cache, varying by computer model
- ATI Mobility M1, 8-MB SDRAM
- 128 MB standard memory, expandable to 384 MB
- Microsoft Windows 98, or Windows 2000 or Windows NT preinstalled
- 12.1-inch, XGA, TFT (1024 × 768) display, with over 16.8 million colors
- TouchPad or pointing stick pointing device
- Mini PCI 56K V.90 modem, or optional Mini PCI V.90 modem plus 10/100 NIC combination card

- Support for one Type II PC Card slot with support for both 32-bit CardBus and 16-bit PC Cards
- External AC adapter with power cord
- Supports a 4-cell Lithium ion (Li ion) primary battery pack in the battery bay and an external 4-cell Li ion or 9-cell high-capacity battery pack
- 20- or 10-GB high-capacity hard drive
- Connectors for Mobile Expansion Unit (MEU), MultiPort wireless communication devices, stereo speaker/headphone, microphone, universal serial bus (USB), RJ-45 network, RJ-11 modem, parallel, serial, video out, external monitor, and AC power
- Speaker

1.2 Clearing a Password

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

1. Prepare the computer for disassembly. Refer to Section 5.3, "Preparing the Computer for Disassembly," for more information.
2. Remove the RTC battery (refer to Section 5.9, "Real Time Clock (RTC) Battery").
3. Wait approximately five 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 are clear.

1.3 Power Management

The computer comes with a collection of power management features that extends battery operating time and conserves power. The computer supports the following power management features:

- Standby
- Hibernation
- Setting customized by the user
- Hotkeys for setting level of performance
- Smart battery that provides an accurate battery power gauge
- Battery calibration
- Lid switch suspend/resume
- Power switch
- Standby button
- Advanced Configuration and Power Management (ACP) compliant

1.3 Computer External Components

The external components on the display and left side of the computer are shown in Figure 1-2 and described in Table 1-2.

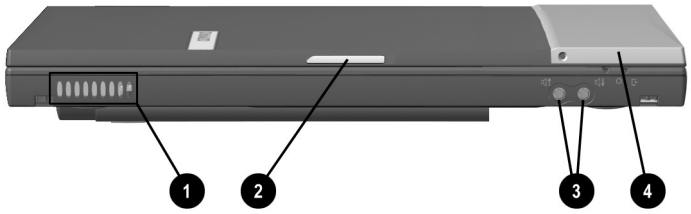


Figure 1-2. Front Panel Components

Table 1-2
Front Panel Components

Item	Component	Function
1	Vent	Allows airflow to cool internal components.
2	Display release latch	Releases the display to open the computer.
3	Volume buttons (2)	Adjust or mute the system volume.
4	MultiPort	Connects wireless communication devices, such as a Bluetooth or 802.11b MultiPort Module, and other options.

The computer rear panel components are shown in Figure 1-3 and described in Table 1-3.

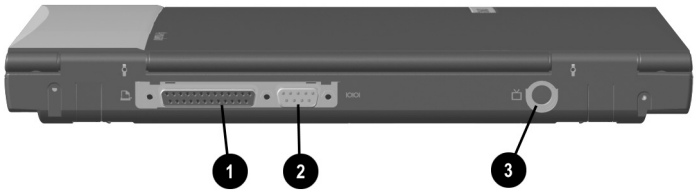


Figure 1-3. Rear Panel Components

Table 1-3
Rear Panel Components

Item	Component	Function
1	Parallel connector	Connects a parallel device.
2	Serial connector	Connects a serial device.
3	Video-out connector	Connects a television, VCR, camcorder, overhead projector, or video capture card. The connection requires the use of the video-out adapter included with the computer and an optional video cable.

The external components on the right side of the computer are shown in Figure 1-4 and described in Table 1-4.

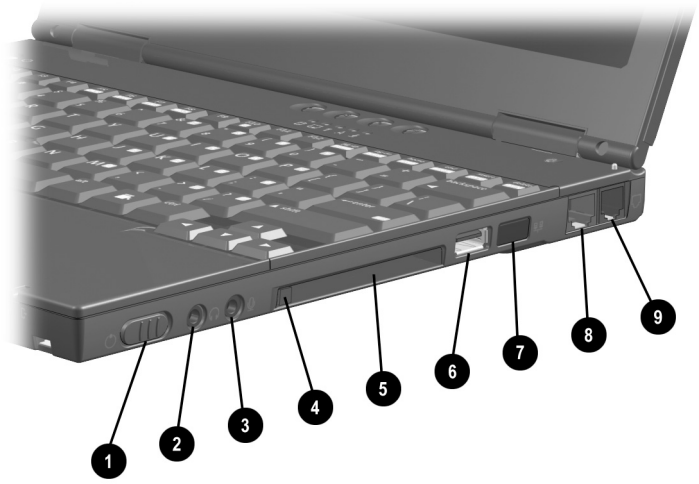


Figure 1-4. Right Side Components

Table 1-4
Right Side Components

Item	Component	Function
1	Power switch	Turns the computer on or off or exits Standby.
2	Stereo speaker/ headphone jack	Connects stereo speakers, headphones, headset, or television audio.

Table 1-4
Right Side Components *(Continued)*

Item	Component	Function
3	Microphone jack	Connects a single sound channel microphone.
4	PC Card eject button	Ejects a PC Card from the PC Card slot.
5	PC Card slot	Supports 32-bit (CardBus) and 16-bit PC Cards.
6	USB connector	Connects USB devices.
7	Infrared port	Links another IrDA-compliant device for wireless communication.
8	RJ-45 jack (network models only)	Connects the network cable. ✎ A network cable is included with network models.
9	RJ-11 jack (internal modem models only)	Connects the modem cable to an internal modem. ✎ A modem cable is included with internal modem models.

The external components on the left side of the computer are shown in Figure 1-5 and described in Table 1-5.

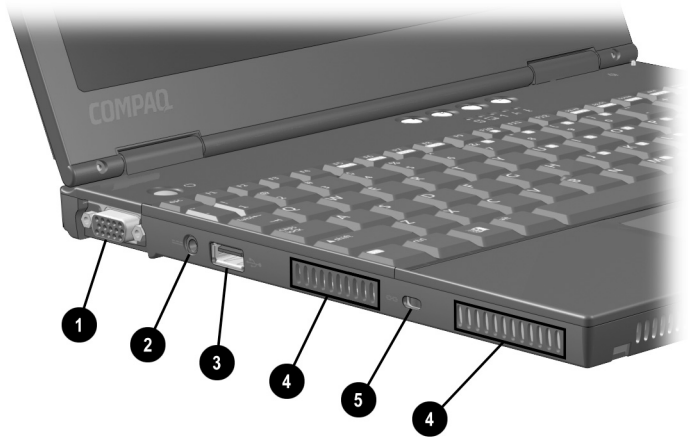


Figure 1-5. Left Side Components

Table 1-5
Left Side Components

Item	Component	Function
1	External monitor connector	Connects an external monitor or overhead projector.
2	Power jack	Connects any one of the following: ■ AC adapter ■ Optional automobile power adapter/charger ■ Optional aircraft power adapter
3	USB connector	Connects USB devices.
4	Vents	Allow airflow to cool internal components.
5	Security cable slot	Attaches an optional security cable to the computer.

Computer keyboard components are shown in Figure 1-6 and described in Table 1-6.

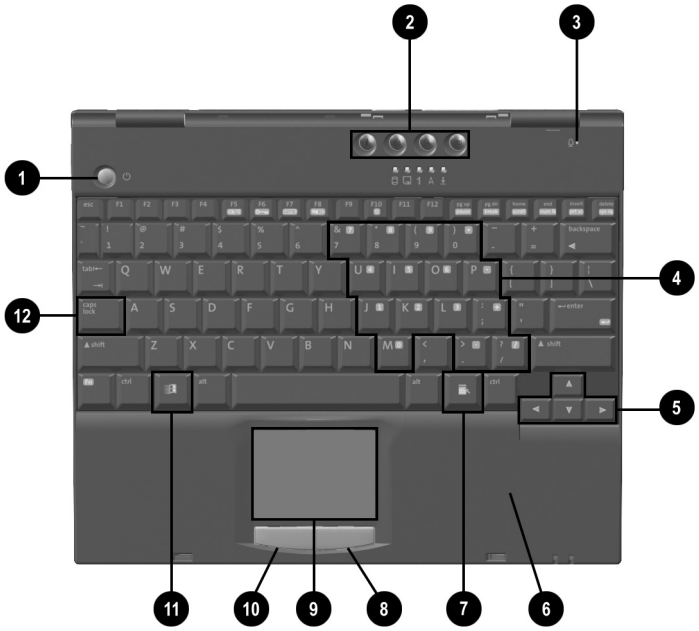


Figure 1-6. Keyboard Components (TouchPad Model)

Table 1-6
Keyboard Components

Item	Component	Function
1	Standby button	■ Turns on the computer if it is off. ■ Initiates and exits Standby. ■ When pressed with the **Fn** key, initiates Hibernation.
2	Easy Access buttons (4)	Provide quick access to the Internet.

Table 1-6
Keyboard Components *(Continued)*

Item	Component	Function
3	Microphone	Inputs single-channel sound to the computer; can be used whether the computer is open or closed.
4	Embedded numeric keypad	Converts keys to numeric keypad.
5	Cursor control keys	Move the cursor around the screen.
6	Palm rest	Provides TouchPad and TouchPad buttons or the pointing stick buttons. Also protects the internal hard drive, internal memory expansion slot, and modem/NIC mini PCI slot connector.
7	Windows application key	Displays a menu when using a Microsoft application. The menu is the same one that is displayed by pressing the right mouse button.
8	Right TouchPad button (TouchPad models only)	Functions like the right mouse button on an external mouse.
9	TouchPad (TouchPad models only)	Moves the mouse cursor, selects, and activates.
10	Left TouchPad button (TouchPad models only)	Functions like the left mouse button on an external mouse.
11	Windows logo key	Displays Windows Start menu.
12	Caps lock key	Turns on the caps lock function.

Computer top components are shown in Figure 1-7 and described in Table 1-7.

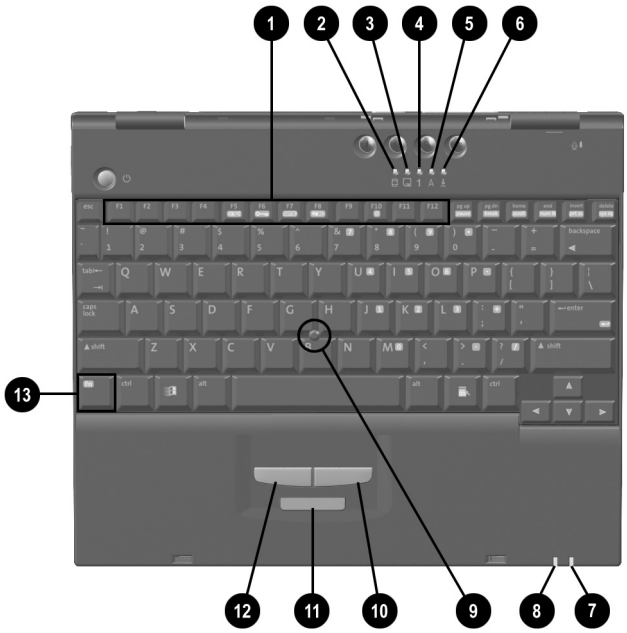


Figure 1-7. Keyboard Components (Pointing Stick Model)

Table 1-7
Keyboard Components

Item	Component	Function
1	**F1** through **F12** function keys	Perform preset functions.
2	Hard drive light	On: The primary hard drive is being accessed.
3	MultiBay light	On: A MultiBay drive in the optional MEU or an external diskette drive connected to the computer is being accessed.

Table 1-7
Keyboard Components *(Continued)*

Item	Component	Function
4	Caps lock light	On: Caps lock is on.
5	Num lock light	On: Num lock is on and the embedded numeric keypad is enabled.
6	Scroll lock light	On: Scroll lock is on.
7	Battery light	On: A battery pack is charging. Blinking: A battery pack that is the only available power source has reached a low-battery condition.
8	Power light	On: Power is turned on. Blinking: Computer is in Standby. The power light also blinks if a battery pack that is the only available power source reaches a critical low-battery condition while Hibernation is disabled.
9	Pointing stick	Moves the mouse cursor.
10	Right mouse button	Functions like the right mouse button on an external mouse.
11	Scroll button	Can be set to scroll, magnify, or function like the third button on an external mouse.
12	Left mouse button	Functions like the left mouse button on an external mouse.
13	**Fn** key	Used with hotkeys to perform preset hotkey functions.

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

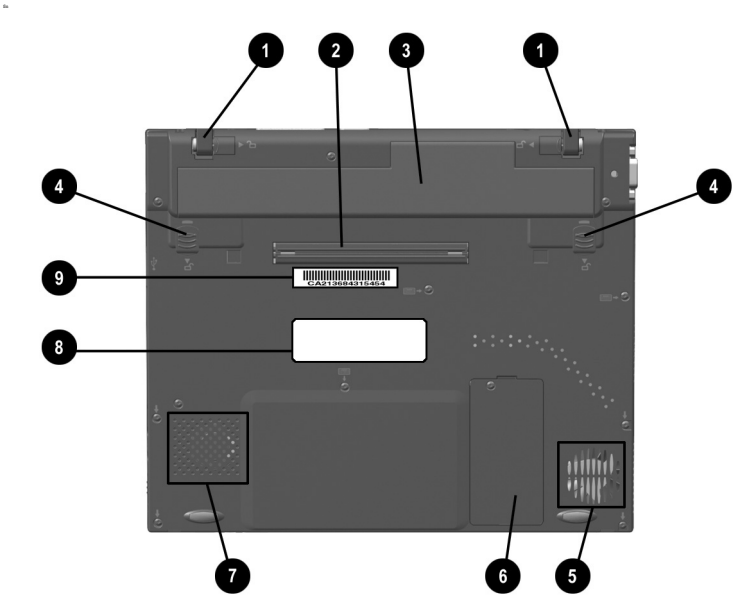


Figure 1-8. Bottom Components

Table 1-8
Bottom Components

Item	Component	Function
1	External battery release latches (2)	Release the external battery pack.
2	Docking connector	Connects the computer to an optional Mobile Expansion Unit.
3	Battery bay	Holds the primary battery pack.
4	Primary battery release latches (2)	Release the primary battery pack from the battery bay.
5	Fan	Provides airflow to cool internal components.
6	Memory expansion compartment cover	Covers the memory expansion compartment that contains one memory expansion slot for a memory expansion board.
7	Speaker	Produces sound.
8	Certificate of Authenticity label	Contains the Product Key, which may need to be entered before using some Windows operating systems.
9	Serial number	Identifies the computer; needed when you call Compaq customer support.

1.4 Design Overview

This section presents a design overview of key parts and features of the computer. Refer to Chapter 3, "Illustrated Parts Catalog," to identify replacement parts, and Chapter 5, "Removal and Replacement Procedures," for disassembly steps.

The system board provides the following device connections:

- Memory expansion board
- Hard drive
- Display
- Keyboard/TouchPad or pointing stick
- Audio
- Intel Pentium III processor
- Fan
- PC Card
- Modem or modem/NIC

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

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

2

Troubleshooting

WARNING: Only authorized technicians trained by Compaq 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, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

2.1 Computer Setup and Diagnostics Utilities

Selecting Computer Setup or Compaq Diagnostics

The computer features two Compaq system management utilities:

- **Computer Setup**—A system information and customization utility that can be used even when your operating system is not working or will not load. This utility includes settings that are not available in Windows.
- **Compaq Diagnostics**—A system information and diagnostic utility that is used within your Windows operating system. Use this utility whenever possible to:
  - Display system information.

- ❏ Test system components.
- ❏ Troubleshoot a device configuration problem in Windows 98, Windows 2000, or Windows Me.

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

Using Computer Setup

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

1. Turn on or restart the computer. Press **F10** while the F10 = ROM Based Setup message is displayed in the lower-left corner of the screen.
   - ❏ To change the language, press **F2.**
   - ❏ To view navigation information, press **F1.**
   - ❏ To return to the Computer Setup menu, press **esc.**
2. Select the **File, Security, or Advanced** menu.
3. To close Computer Setup and restart the computer:
   - ❏ Select **File > Save Changes and Exit** and press **enter.**

   or

   - ❏ Select **File > Ignore Changes and Exit** and press **enter.**
4. When you are prompted to confirm your action, press **F10.**

Selecting from the File Menu

Table 2-1
File Menu

Select	To Do This
System Information	■ View identification information about the computer, a docking base, and any battery packs in the system. ■ View specification information about the processor, memory and cache size, and system ROM.
Save to Floppy	Save system configuration settings to a diskette.
Restore from Floppy	Restore system configuration settings from a diskette.
Restore Defaults	Replace configuration settings in Computer Setup with factory default settings. (Identification information is retained.)
Ignore Changes and Exit	Cancel changes entered during the current session, then exit and restart the computer.
Save Changes and Exit	Save changes entered during the current session, then exit and restart the computer.

Selecting from the Security Menu

Table 2-2
Security Menu

Select	To Do This
Setup Password	Enter, change, or delete a setup password. (The setup password is called an administrator password in Compaq Computer Security, a program accessed from the Windows Control Panel.)
Power-on Password	Enter, change, or delete a power-on password.
DriveLock Passwords	Enable/disable DriveLock; change a DriveLock User or Master password. ✎ Drive Lock Settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.
Password Options Password options can be selected only when a power-on password has been set.	Enable/disable: ■ QuickLock ■ QuickLock on Standby ■ QuickBlank ✎ To enable QuickLock on Standby or QuickBlank, you must first enable QuickLock.
Device Security	Enable/disable: ■ Ports or diskette drives* ■ Diskette write* ■ CD-ROM or diskette startup ✎ Settings for a DVD-ROM can be entered in the CD-ROM field.
System IDs	Enter identification numbers for the computer, a docking base, and all battery packs in the system.

*Not applicable to SuperDisk LS-120 drives.

Selecting from the Advanced Menu

Table 2-3
Advanced Menu

Select	To Do This
Language (or press **F2**)	Change the Computer Setup language.
Boot Options	Enable/disable: QuickBoot, which starts the computer more quickly by eliminating some startup tests. (If you suspect a memory failure and want to test memory automatically during startup, disable QuickBoot.) MultiBoot, which sets a startup sequence that can include most bootable devices and media in the system.
Device Options	■ Enable/disable the embedded numeric keypad at startup. ■ Enable/disable multiple standard pointing devices at startup. (To set the computer to support only a single, usually nonstandard, pointing device at startup, select **Disable.**) ■ Enable/disable USB legacy support for a USB keyboard. (When USB legacy support is enabled, the keyboard works even when a Windows operating system is not loaded.) ■ Set an optional external monitor or overhead projector connected to a video card in a docking base as the primary device. (When the computer display is set as secondary, the computer must be shut down before undocking from a docking base.)

Table 2-3
Advanced Menu *(Continued)*

Select	To Do This
Device Options *(continued)*	■ Change the parallel port mode from EPP (Enhanced Parallel Port [default]) to standard, bidirectional, EPP or ECP (Enhanced Capabilities Port). ■ Set video-out mode to NTSC (default), PAL, NTSC-J, or PAL-M.* ■ Enable/disable all settings in the SpeedStep window. (When **Disable** is selected, the computer runs in Battery Optimized mode.) ■ Specify how the computer recognizes multiple identical docking bases that are identically equipped. (Select **Disable** to recognize the docking bases as a single docking base; select **Enable** to recognize the docking bases individually, by serial number.) ■ Enable/disable the reporting of the processor serial number by the processor to the software.
HDD Self Test Options	Run a quick comprehensive self test on hard drives in the system that support the test features.

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

2.2 Using Compaq Diagnostics

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

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

Compaq Diagnostics is designed to test Compaq components. If non-Compaq components are tested, the results may be inconclusive.

Obtaining, Saving, or Printing Configuration Information

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

Obtaining, Saving, or Printing Diagnostic Test Information

1. Access Compaq Diagnostics by selecting **Start > Settings > Control Panel > Compaq Diagnostics.**
2. Select the **Test** tab.
3. In the scroll box, select the category or device you want to test.
4. Select a test type:
   - **Quick Test**—Runs a quick, general test on each device in a selected category.
   - **Complete Test**—Performs maximum testing on each device in a selected category.
   - **Custom Test**—Performs maximum testing on a selected device.
     - To run all tests for your selected device, select the **Check All** button.
     - To run only the tests you select, select the **Uncheck All** button, then select the checkbox for each test you want to run.

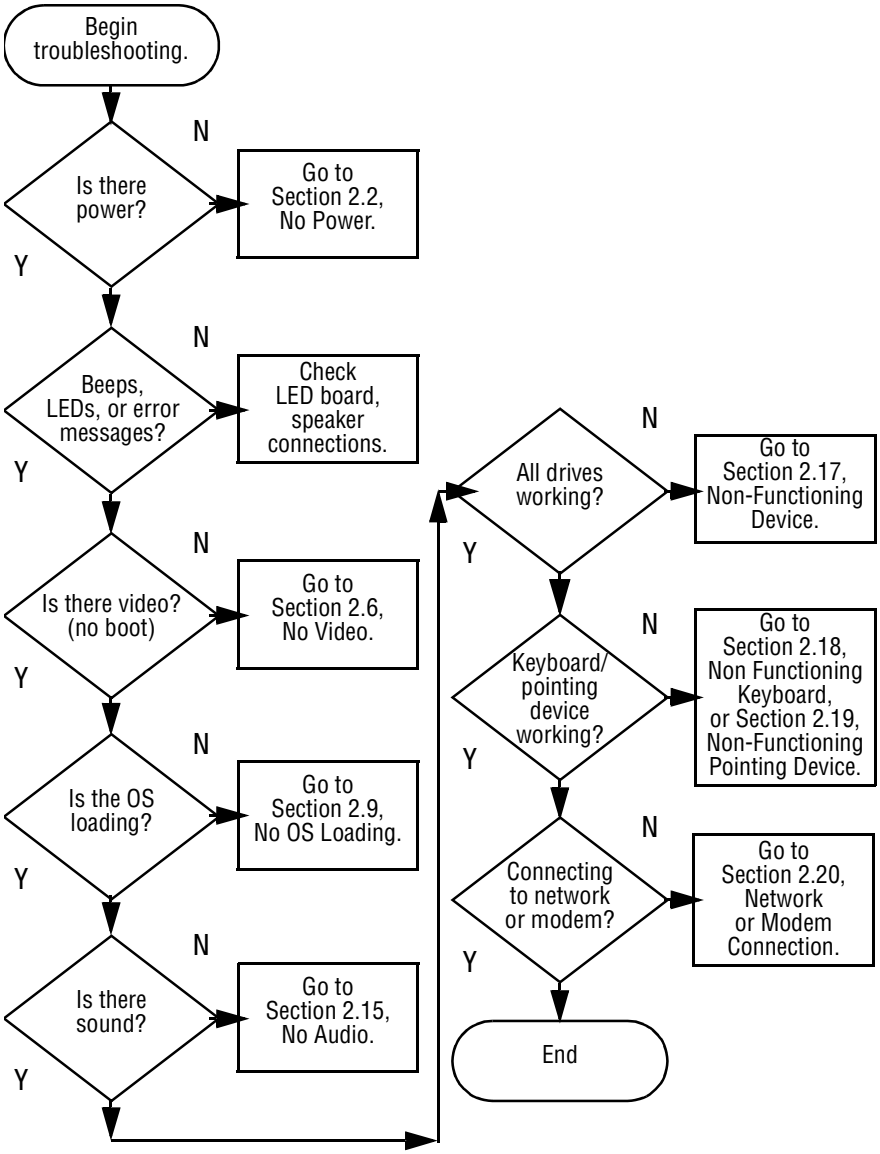
5. Select a test mode:
   - **Interactive Mode**—Provides maximum control over the testing process. You determine whether the test was passed or failed and may be prompted to insert or remove devices.
   - **Unattended Mode**—Does not display prompts. If errors are found, they are displayed when testing is complete.
6. Select the **Begin Testing** button.
7. Select a tab to view a test report:
   - **Status tab**—Summarizes the tests run, passed, and failed during the current testing session.
   - **Log tab**—Lists tests run on the system, the number of times each test has run, the number of errors found on each test, and the total run time of each test.
   - **Error tab**—Lists all errors found in the computer with their error codes.
8. Select a tab to save the report:
   - **Log tab**—Select the **Log tab Save** button.
   - **Error tab**—Select the **Error tab Save** button.
9. Select a tab to print the report:
   - **Log tab**—Select **File > Save As,** then print the file from your folder.

2.3 Troubleshooting Flowcharts

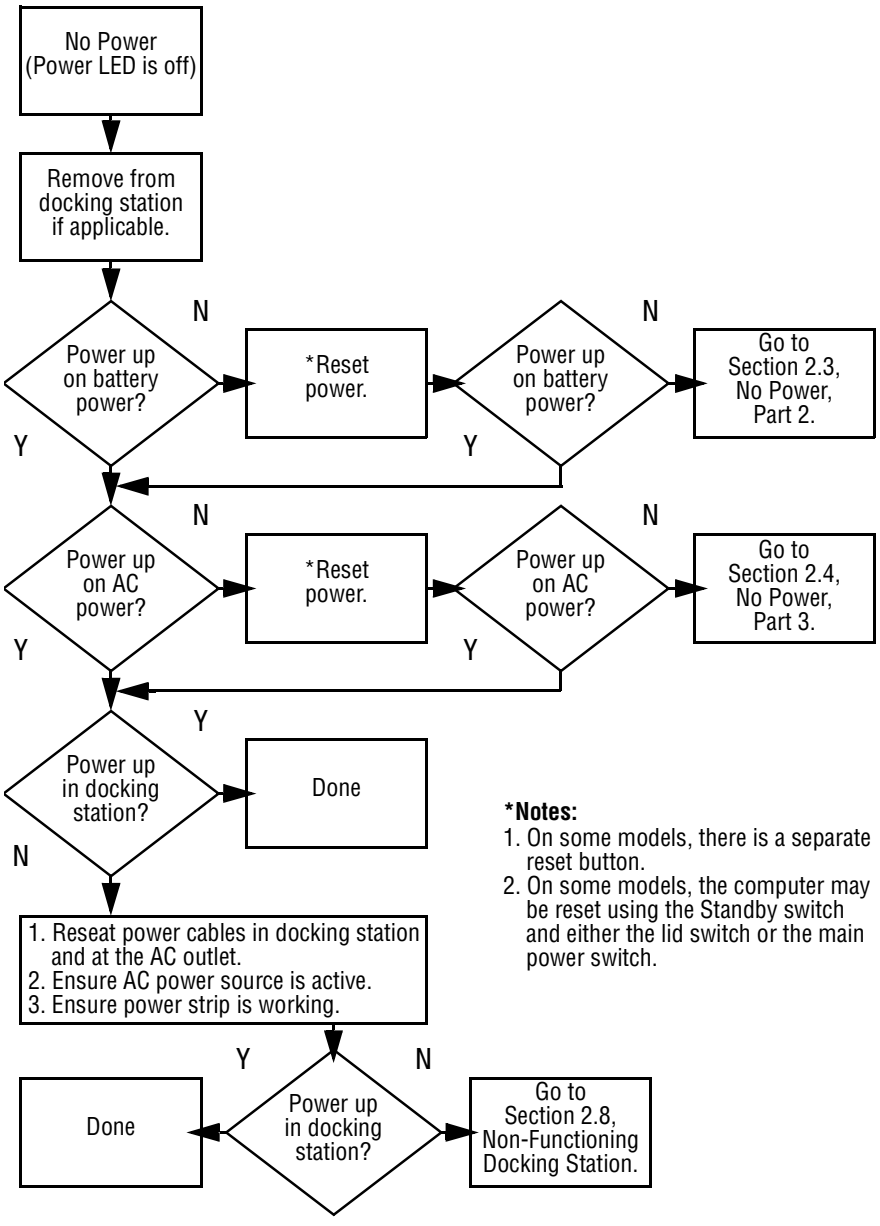
Table 2-4
Troubleshooting Flowcharts Overview

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

2.1 Initial Troubleshooting



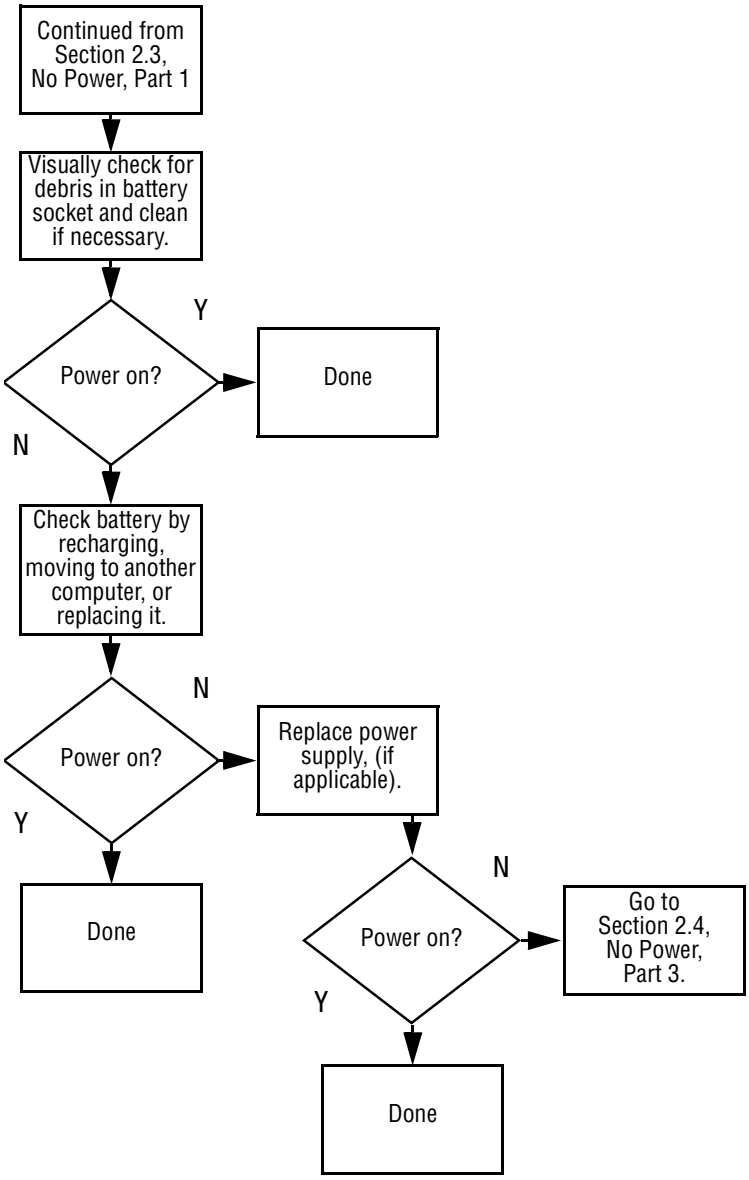
2.2 No Power, Part 1



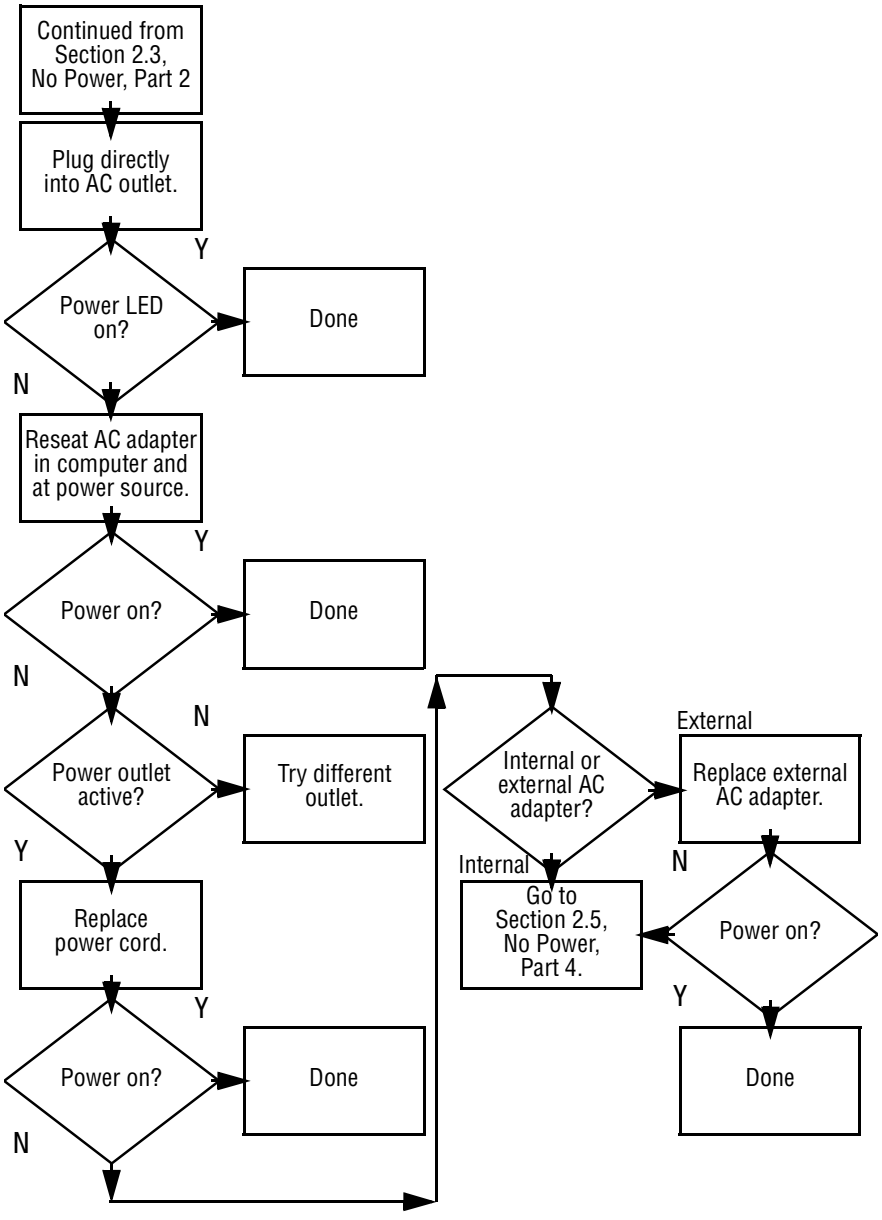
***Notes:**

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

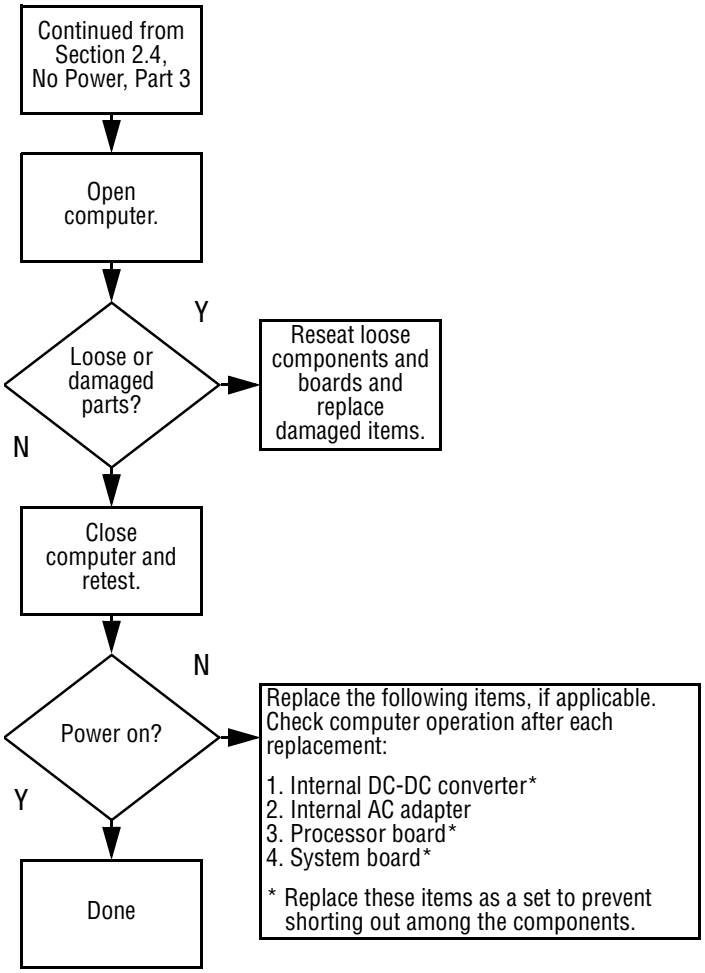
2.3 No Power, Part 2



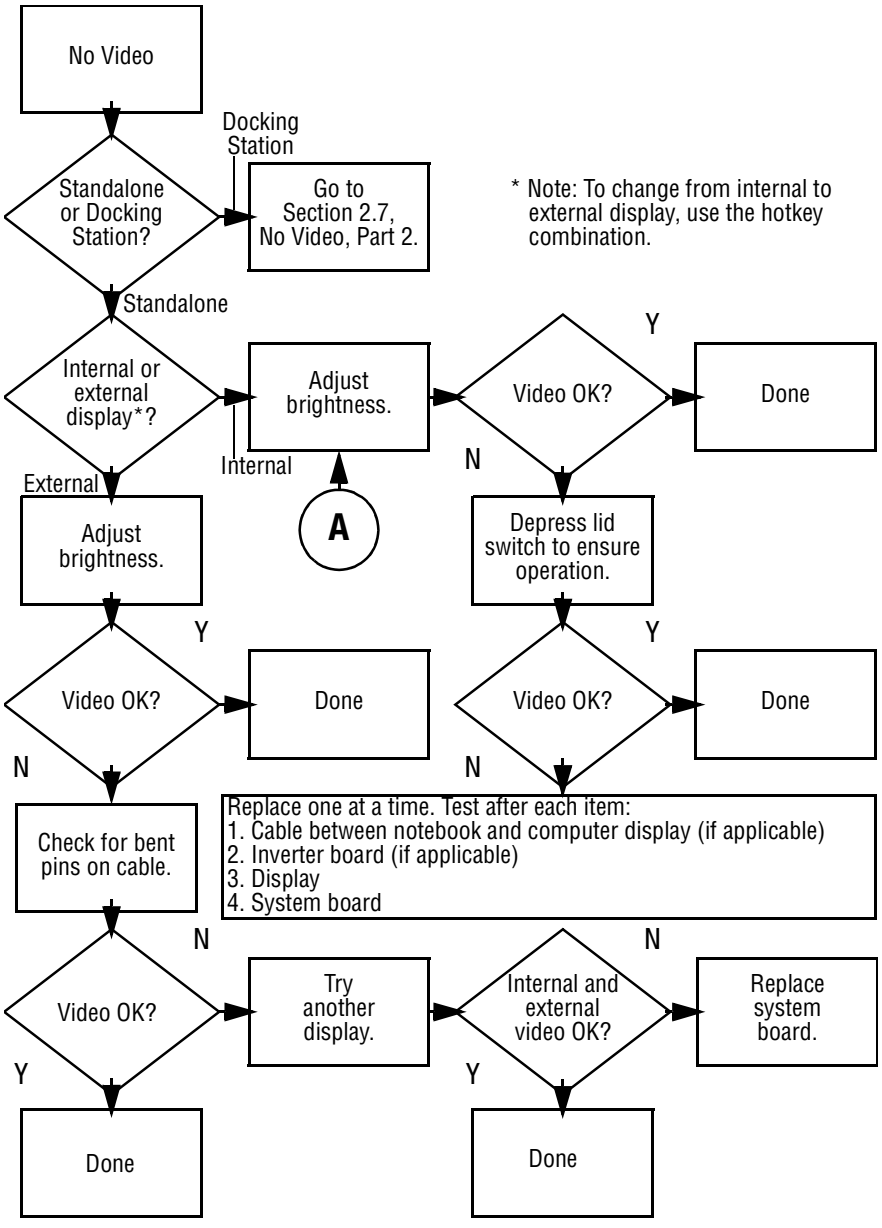
2.4 No Power, Part 3



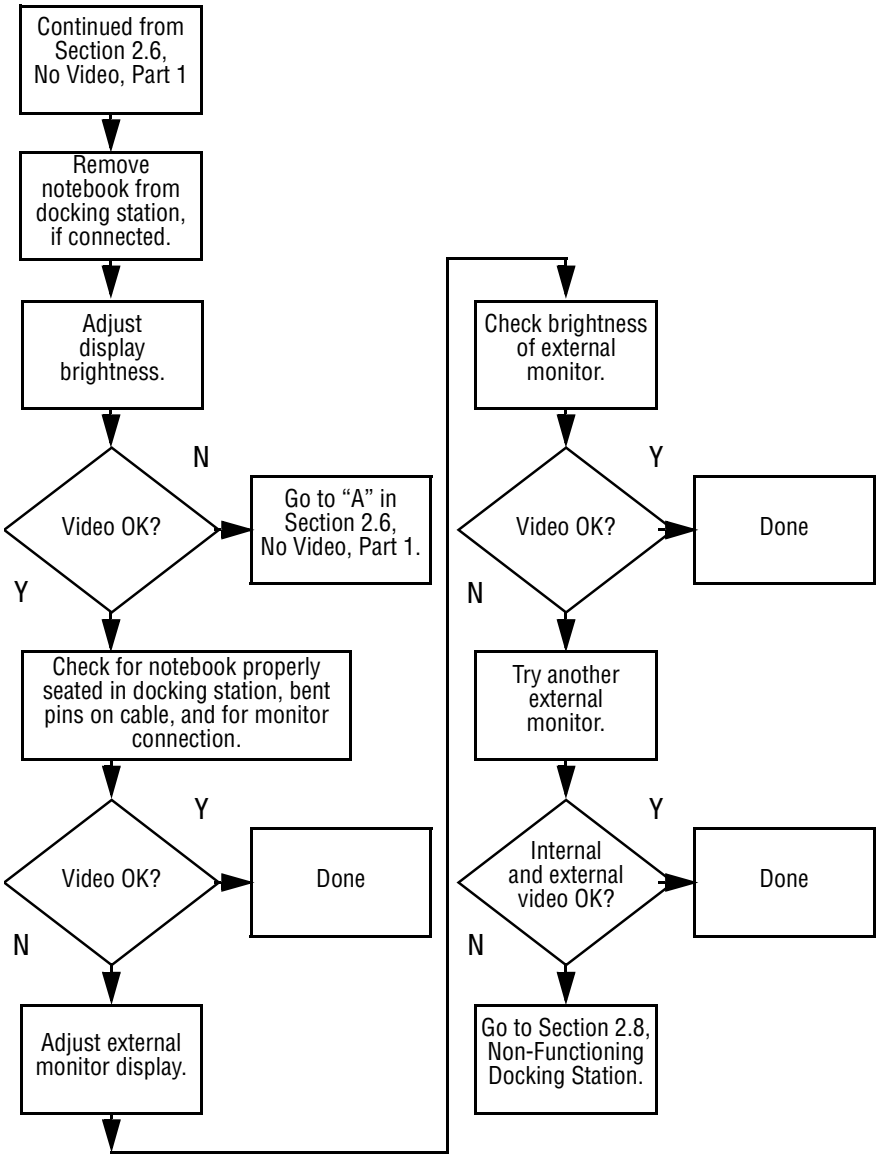
2.5 No Power, Part 4



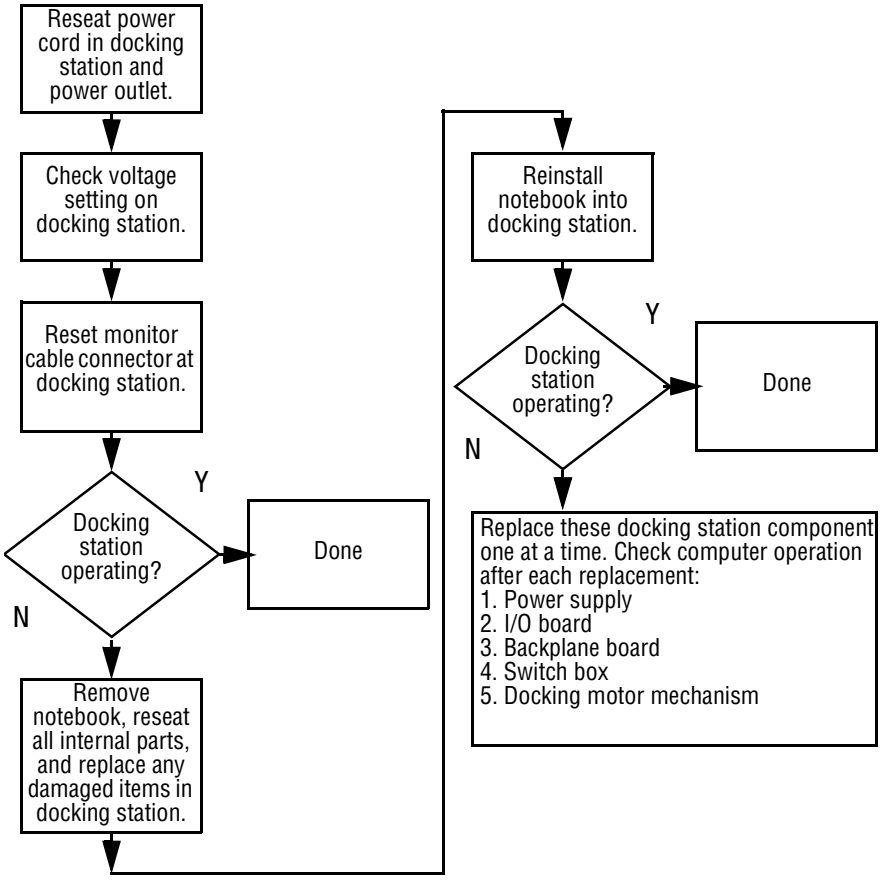
2.6 No Video, Part 1



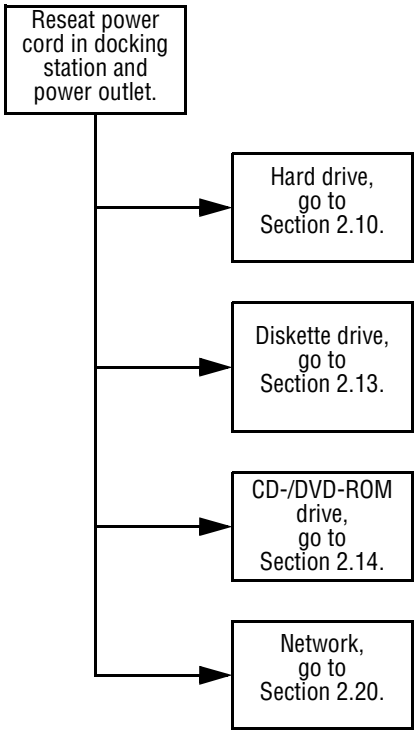
2.7 No Video, Part 2



2.8 Non-Functioning Docking Station (if applicable)

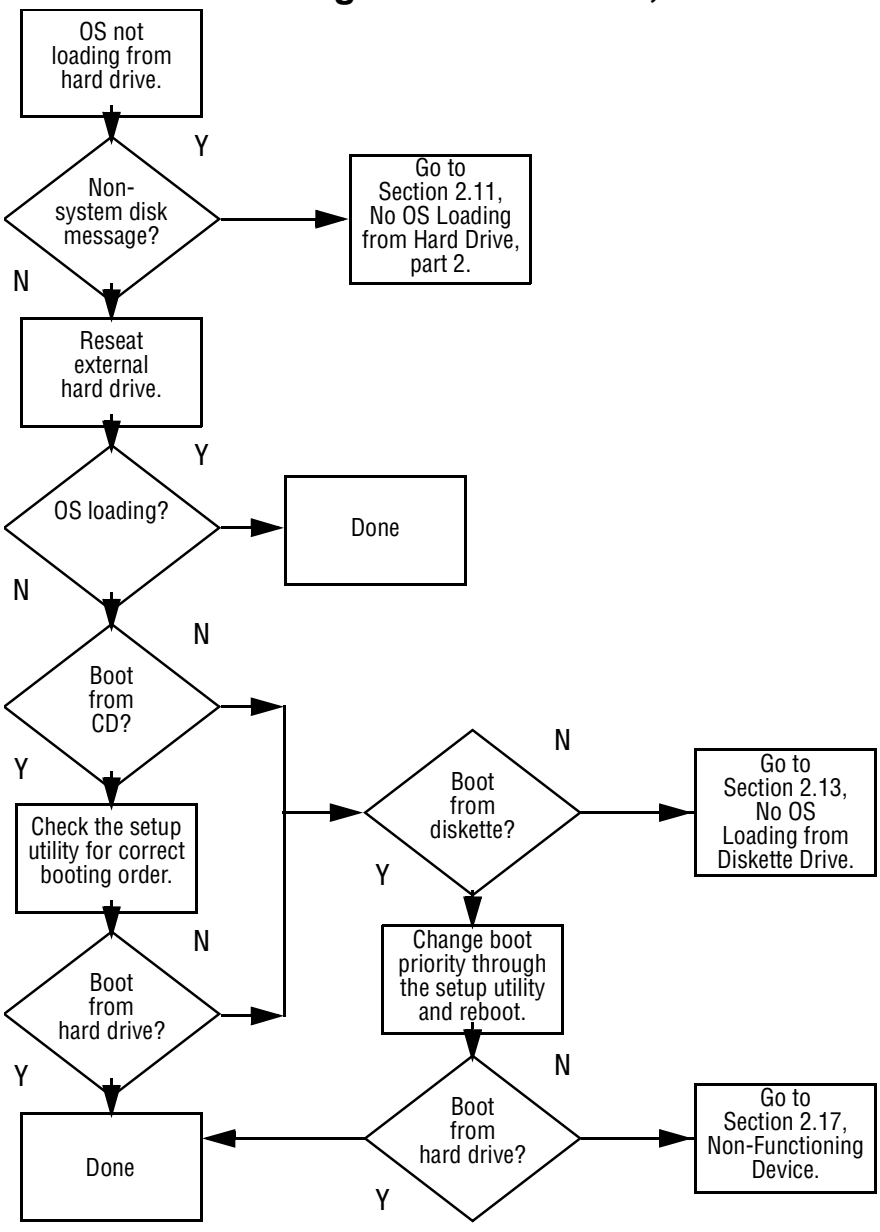


2.9 No Operating System (OS) Loading

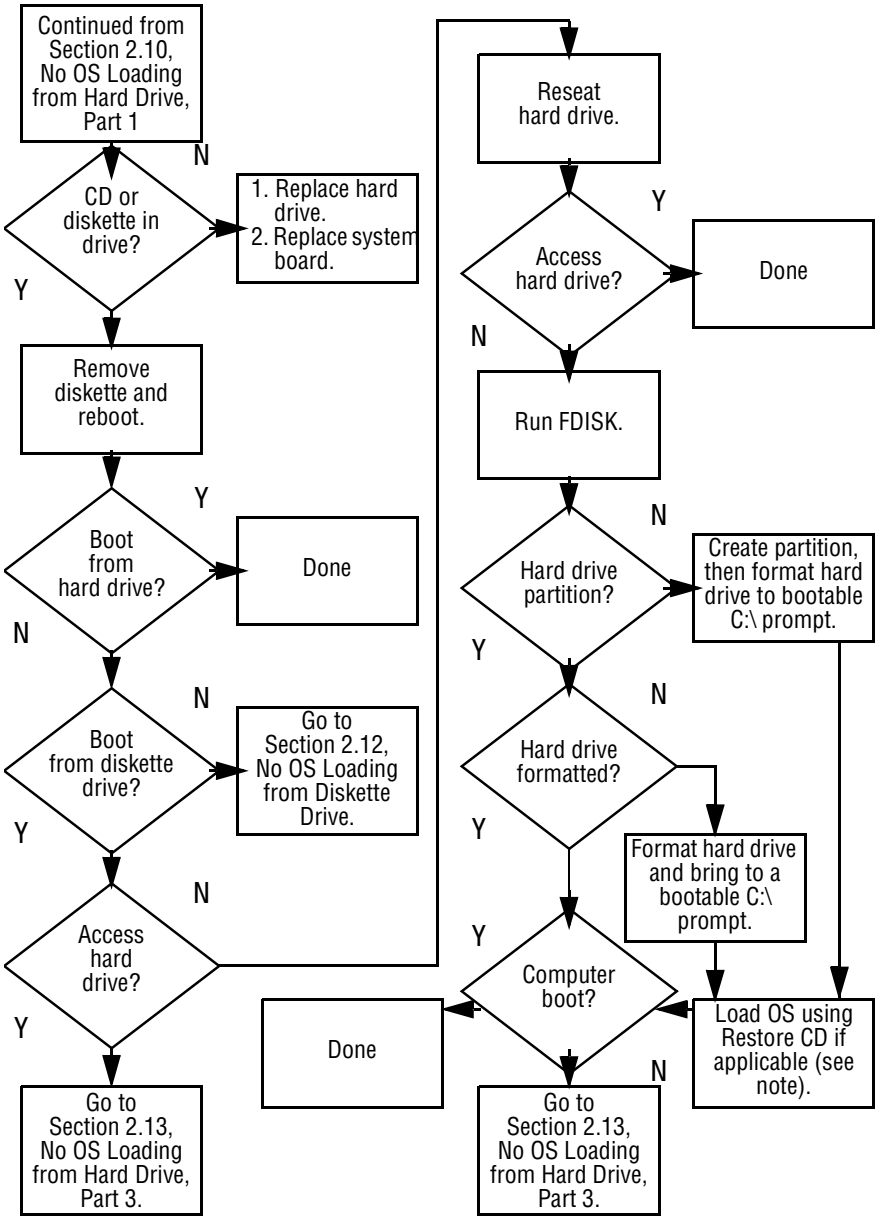


NOTE: Before beginning, always check cable connections, cable ends, and drives for bent or damaged pins.

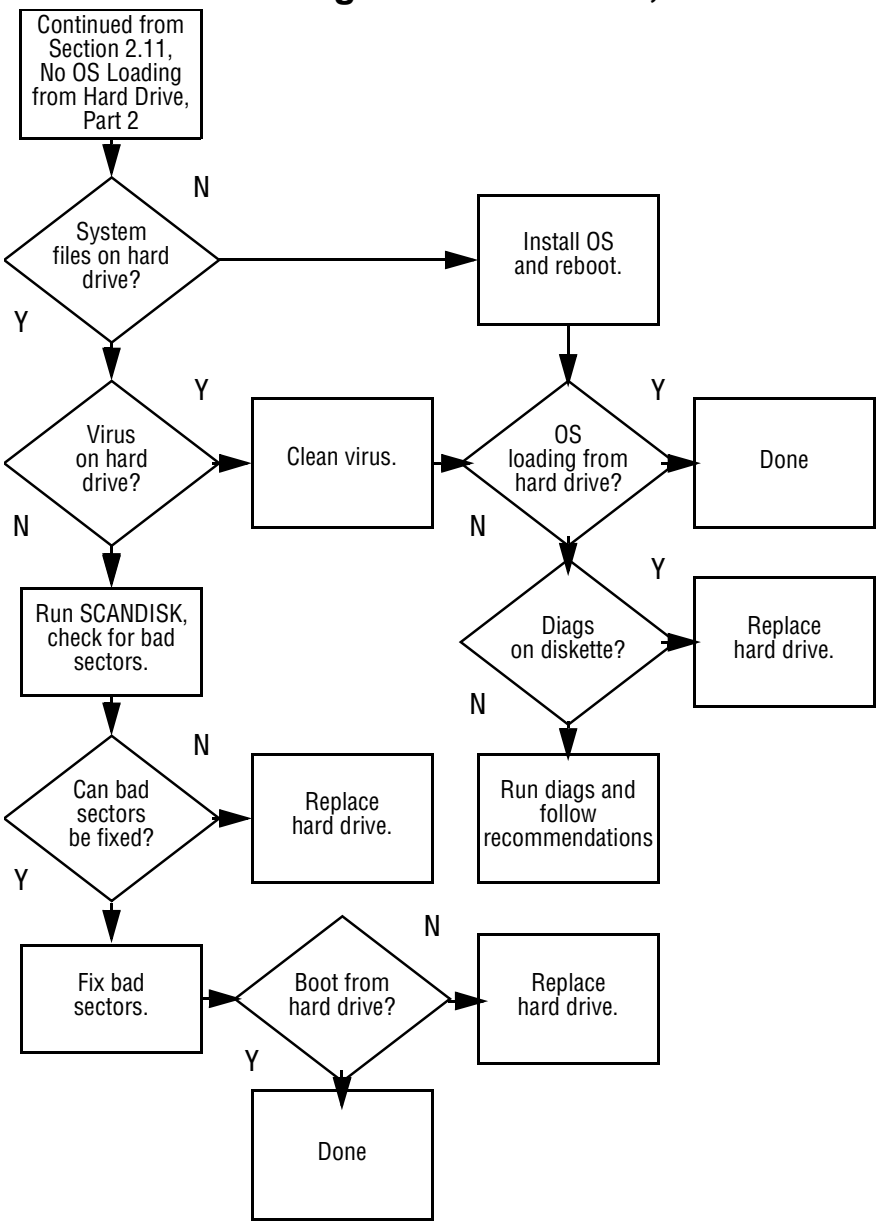
2.10 No OS Loading from Hard Drive, Part 1



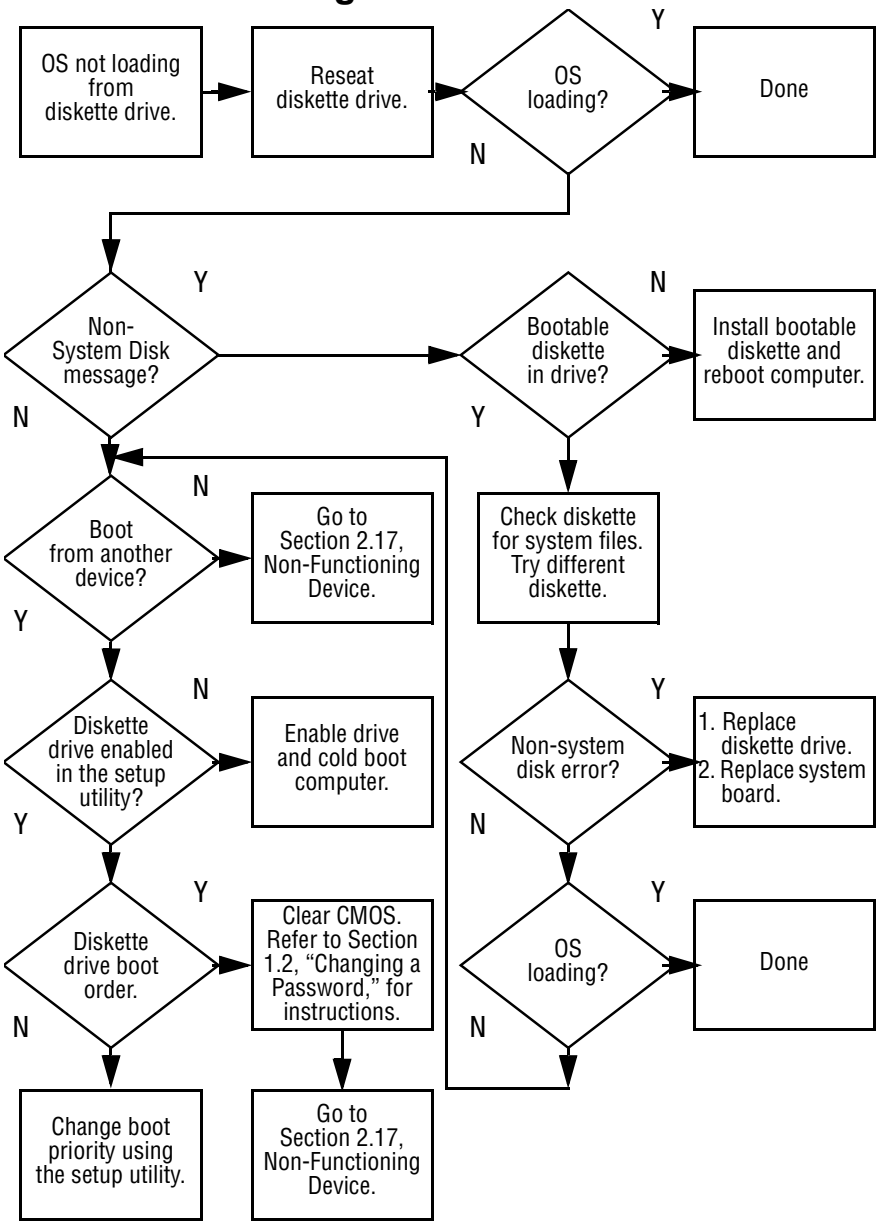
2.11 No OS Loading from Hard Drive, Part 2



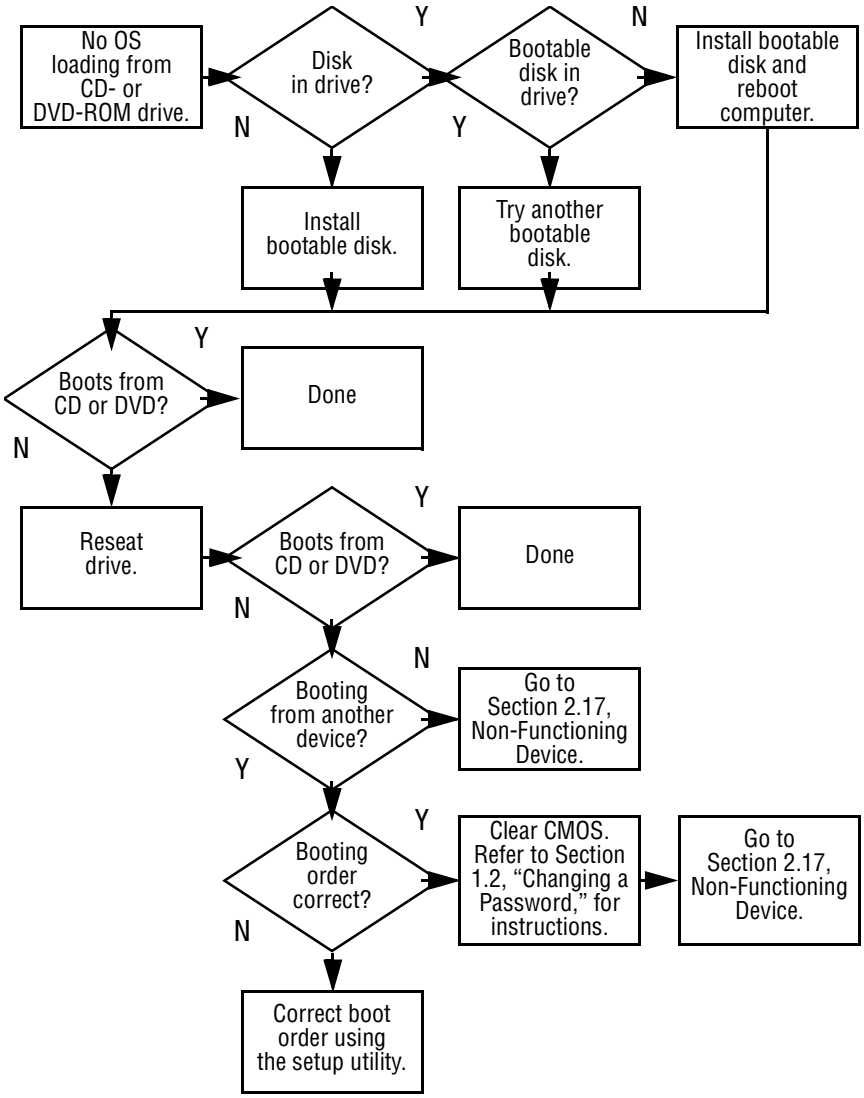
2.12 No OS Loading from Hard Drive, Part 3



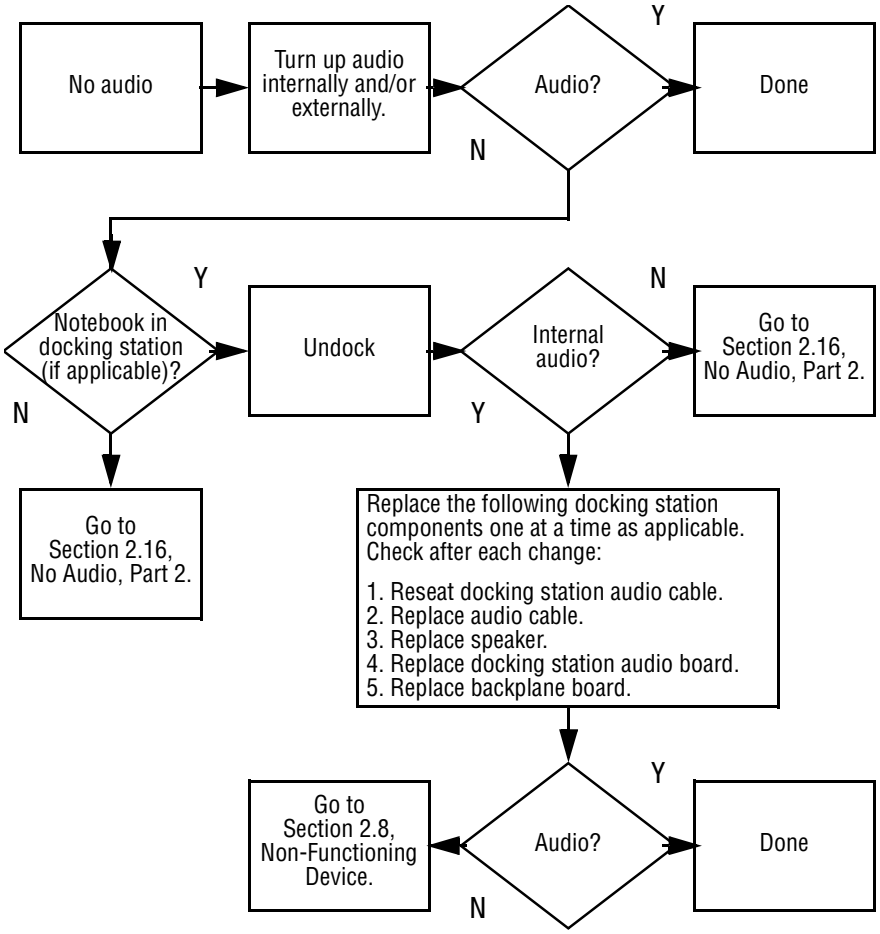
2.13 No OS Loading from Diskette Drive



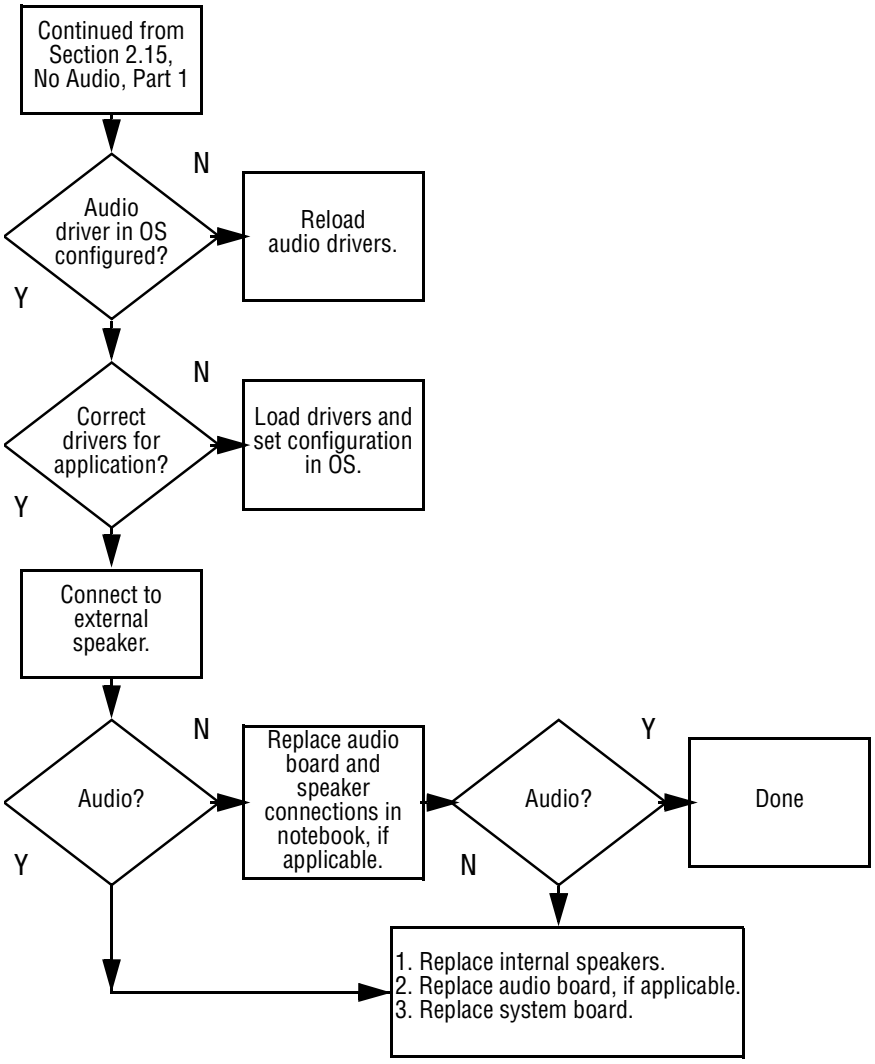
2.14 No OS Loading from CD- or DVD-ROM Drive



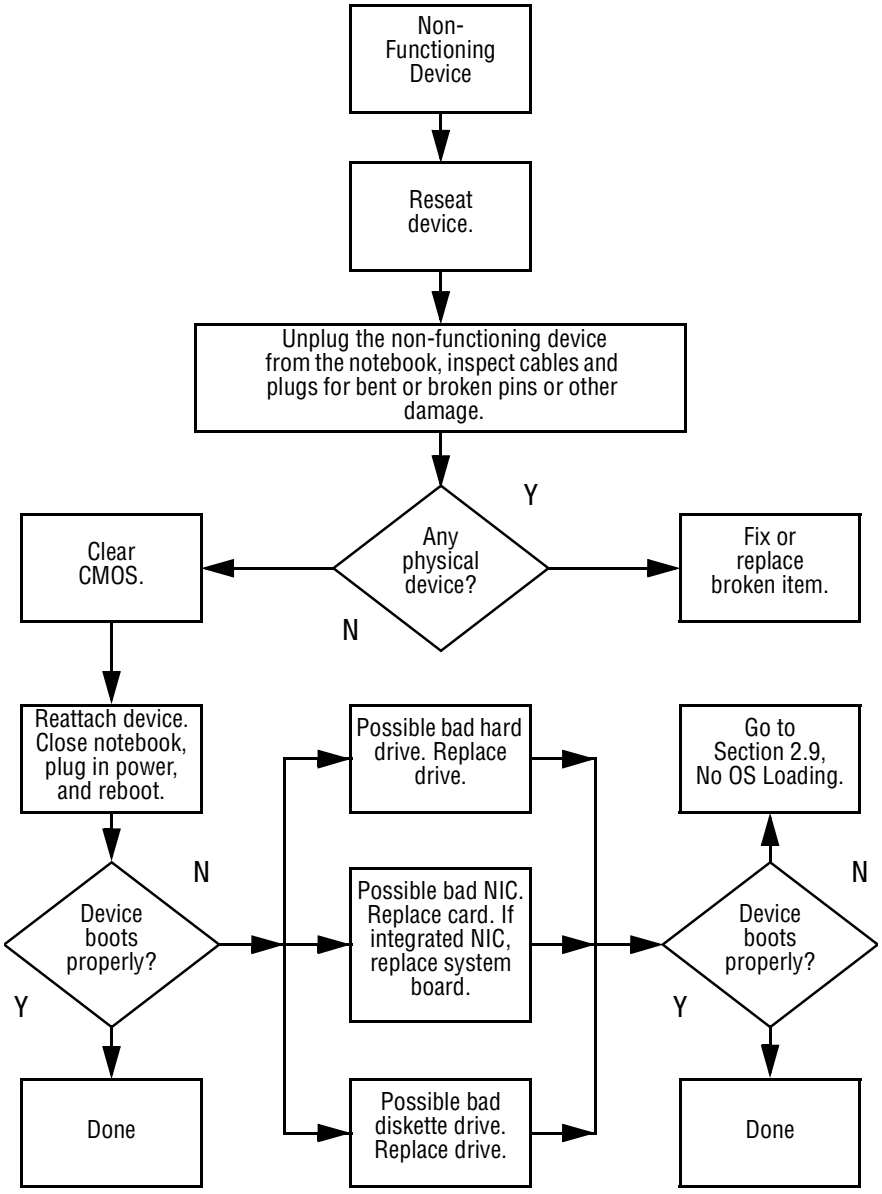
2.15 No Audio, Part 1



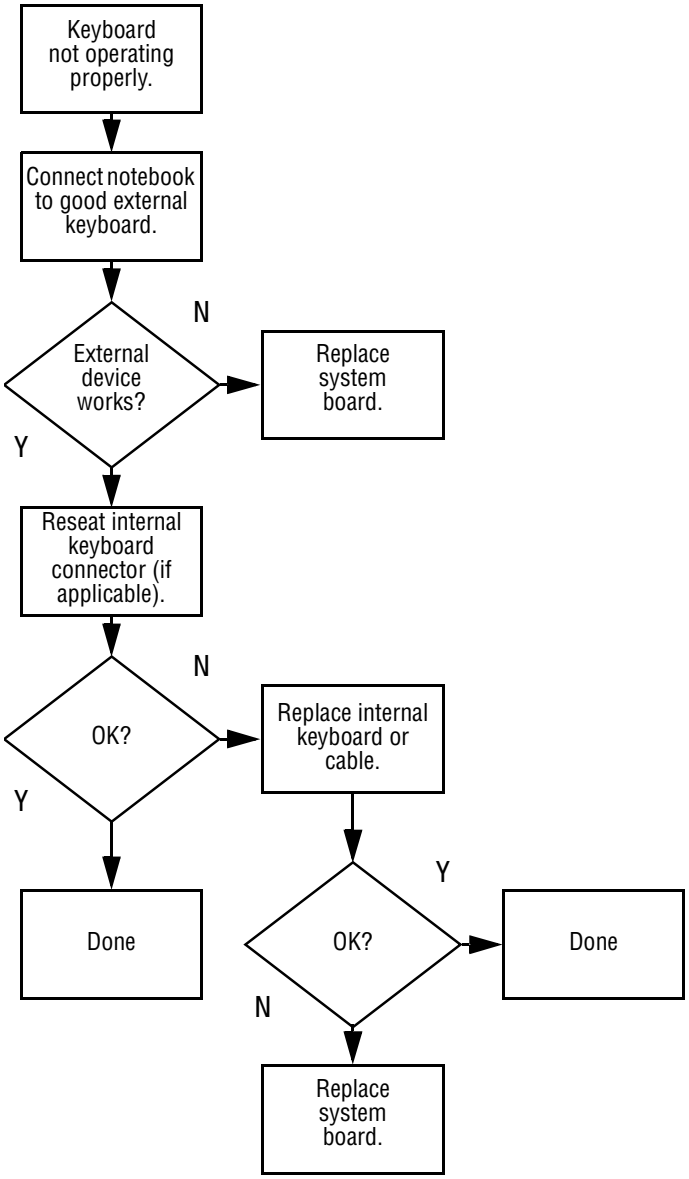
2.16 No Audio, Part 2



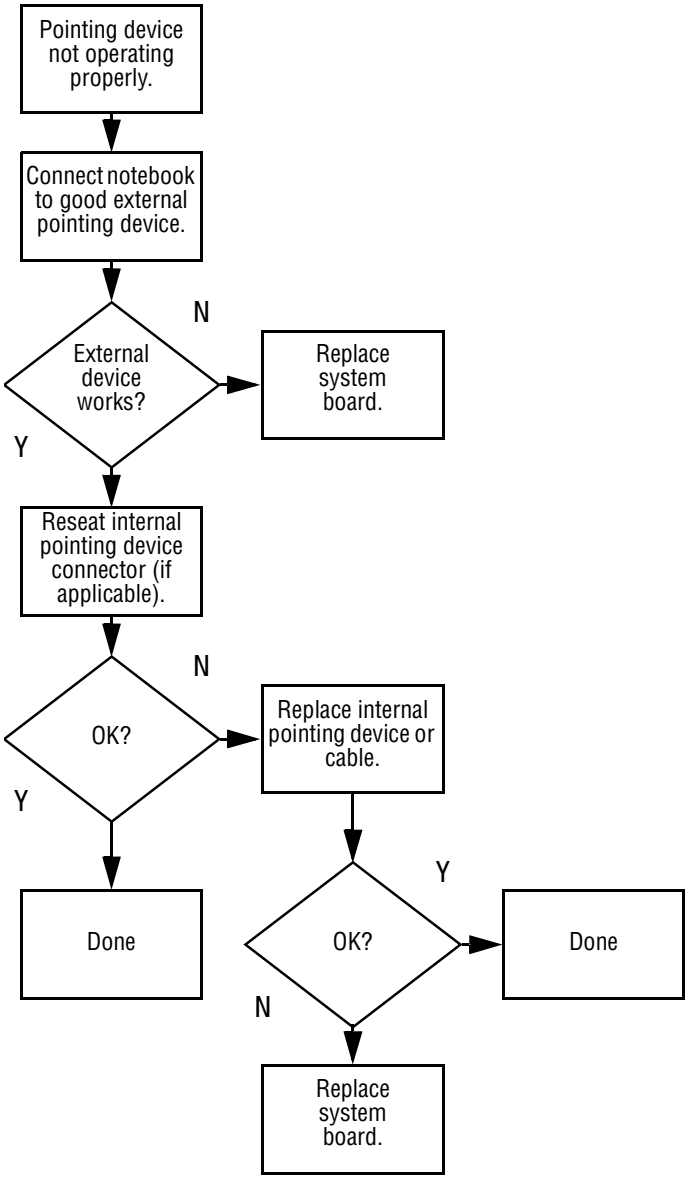
2.17 Non-Functioning Device



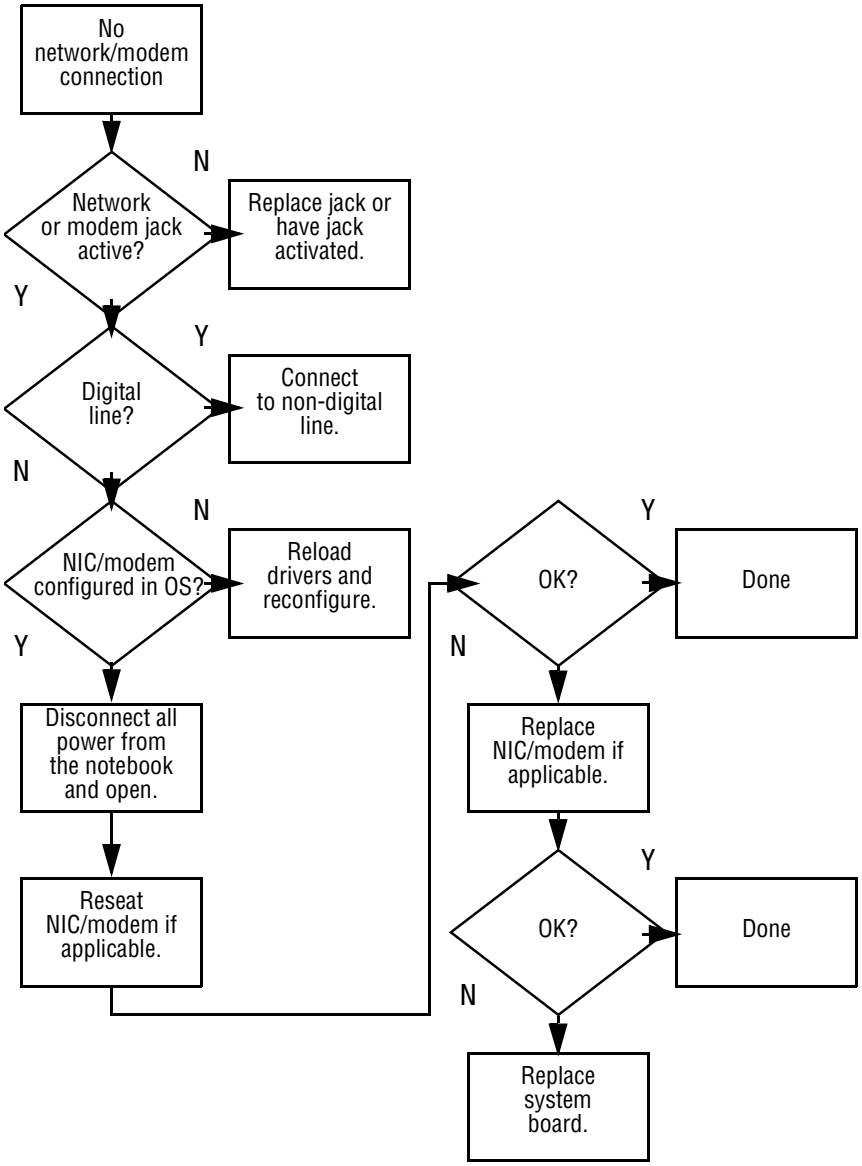
2.18 Non-Functioning Keyboard



2.19 Non-Functioning Pointing Device



2.20 Network or Modem Connection



3

Illustrated Parts Catalog

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

3.1 Serial Number Location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer (Figure 3-1).

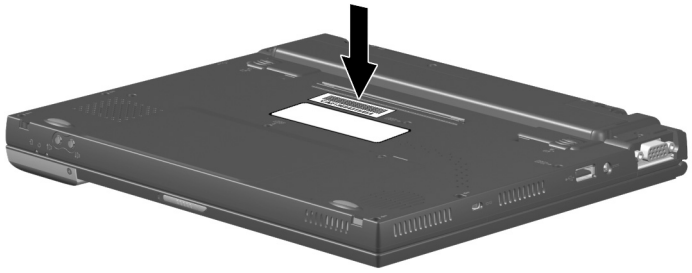


Figure 3-1. Serial Number Location

3.2 Computer System Major Components

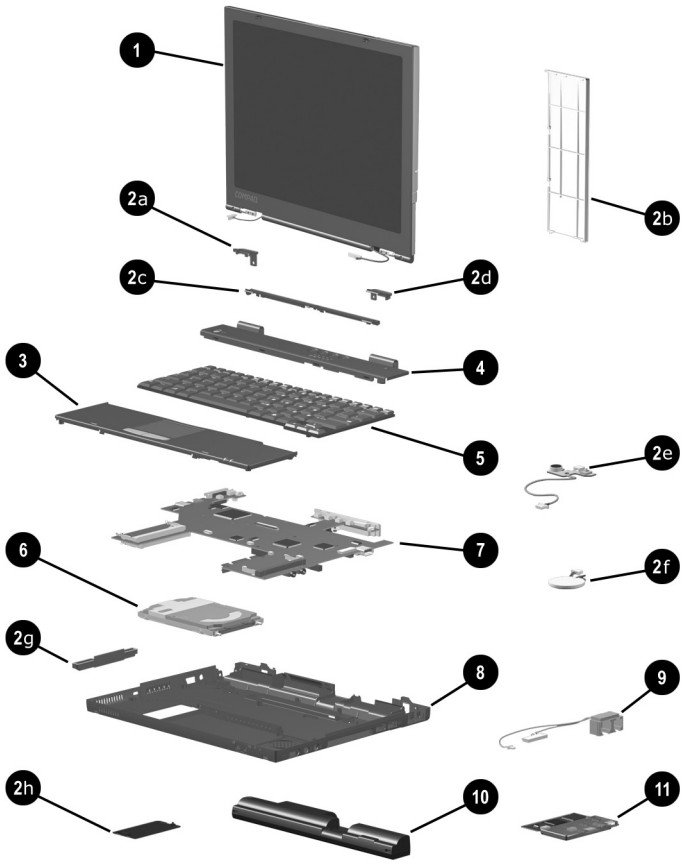
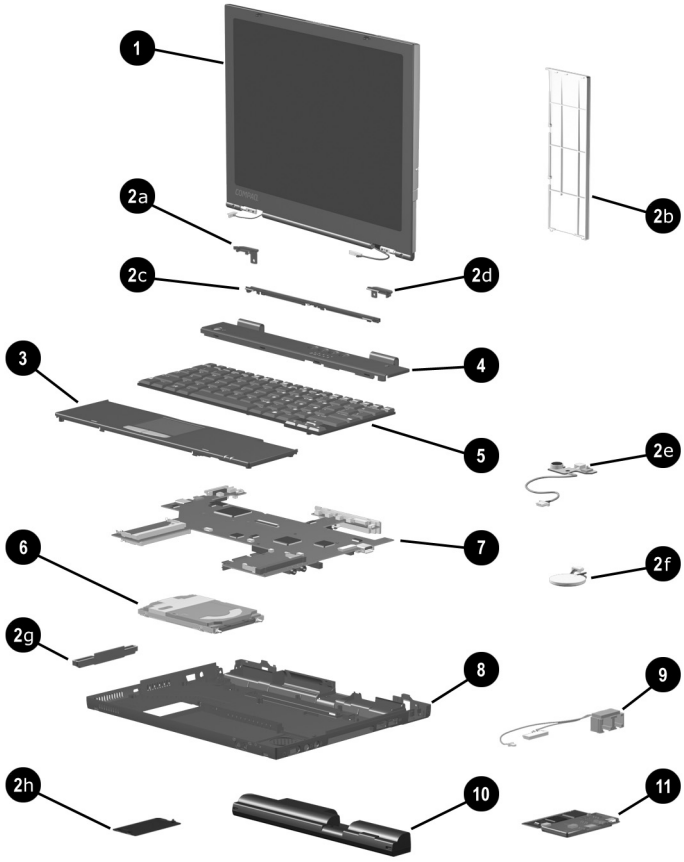


Figure 3-2. Computer System Major Components

Table 3-1
Computer System Major Components

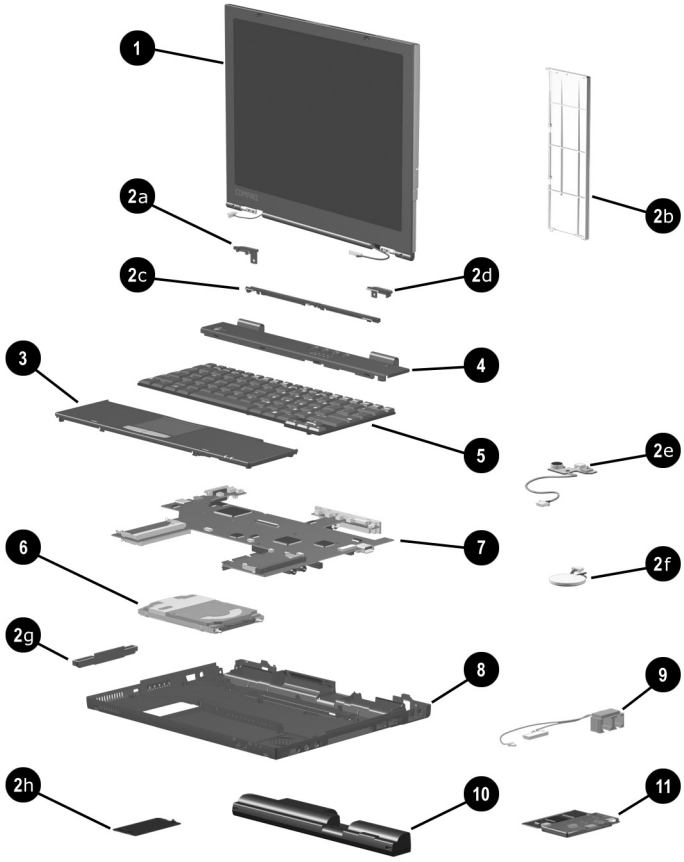
Item	Description	Spare Part Number
1	12.1-inch SVGA CTFT Display	231448-001
	Miscellaneous Plastics Kit	231454-001
2a	Left display support	Not Illustrated
2b	MultiPort cover	■ TouchPad cable
2c	Center display support	■ PC Card slot weight saver
2d	Right display support	■ External battery slot spacers
2e	Display lid switch board	
2f	RTC battery	■ Computer feet
2g	Hard drive spacer	■ External monitor connector cover
2h	Memory expansion compartment cover	
3	Palm rests	
	with TouchPad and two buttons (for use with TouchPad models)	231449-001
	with three buttons (for use with pointing stick models)	231591-001
4	Switch cover	231453-001



Computer System Major Components (continued)

Table 3-1
Computer System Major Components *(Continued)*

Item	Description			Spare Part Number
5	**Keyboard without pointing stick** (for use with TouchPad models)			
	Belgian	230514-181	Latin American Spanish	230514-161
	Brazilian	230514-201	Norwegian	230514-091
	Czech	230514-221	Portuguese	230514-131
	Danish	230514-081	Spanish	230514-071
	French	230514-051	Swedish/ Finnish	230514-101
	French Canadian	230514-121	Swiss	230514-111
	German	230514-041	Taiwanese	230514-AB1
	Hungarian	230514-211	Turkish	230514-141
	International	230514-002	U.K. English	230514-031
	Italian	230514-061	U.S. English	230514-001
	Japanese	230514-291		
	Korean	230514-AD1		
	Keyboard with pointing stick			
	Belgian	230515-181	Latin American Spanish	230515-161
	Brazilian	230515-201	Norwegian	230515-091
	Czech	230515-221	Portuguese	230515-131
	Danish	230515-081	Spanish	230515-071
	French	230515-051	Swedish/ Finnish	230515-101
	French Canadian	230515-121	Swiss	230515-111
	German	230515-041	Taiwanese	230515-AB1
	Hungarian	230515-211	Turkish	230515-141
	International	230515-002	U.K. English	230515-031
	Italian	230515-061	U.S. English	230515-001
	Japanese	230515-291		
	Korean	230515-AD1		



Computer System Major Components (continued)

Table 3-1
Computer System Major Components *(Continued)*

Item	Description	Spare Part Number
6	Hard drives	
	20 GB	218371-001
	10 GB	218370-001
7	**System boards**	
	850-MHz Intel Pentium III processor and 64 MB SDRAM (includes fan and heat sink)	253104-001
	700-MHz Intel Pentium III processor and 64 MB SDRAM (includes fan and heat sink)	231446-001
8	**Base enclosure** (includes NTSC module, modem/NIC connector module, and battery terminals)	231452-001
9	Modem cable	231451-001
10	Battery packs	
	Primary Li ion battery pack, 4 cell	231445-001
	External Li ion battery pack, 4 cell	230609-001
	External high capacity battery pack, 9 cell	155065-001
11	Modem or combination modem/network interface card (NIC) boards	
	Lucent Win Modem + Intel PRO-100 (S)P Mobile Combo Adapter	230339-001
	Type III mini PCI combination 56 Kbps modem/NIC board	230338-001
	Type III mini PCI 56 Kbps modem board	230337-001

3.3 Miscellaneous Plastics Kit Components

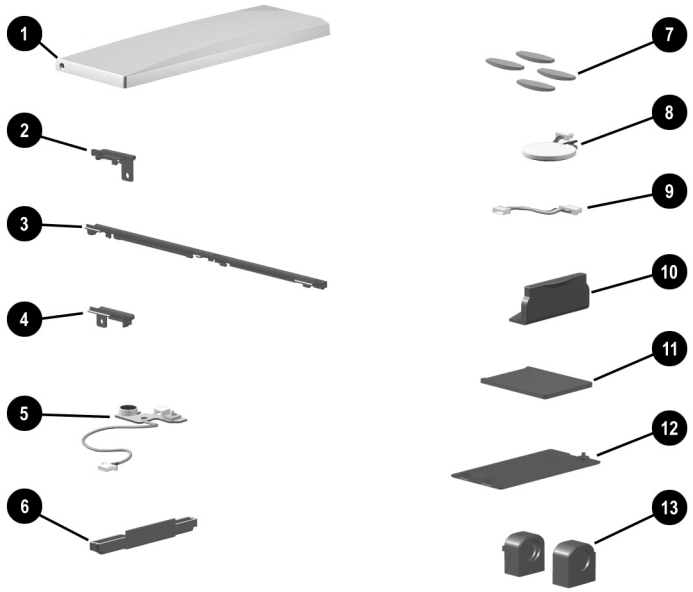


Figure 3-3. Miscellaneous Plastics Kit Components

Table 3-2
Miscellaneous Plastics Kit Components
Spare Part Number 231454-001

Item	Description
1	MultiPort cover
2	Right display support
3	Center display support
4	Left display support
5	Display lid switch board
6	Hard drive spacer
7	Computer feet
8	RTC battery
9	TouchPad cable
10	External monitor connector cover
11	PC Card slot weight saver
12	Memory expansion compartment cover
13	External battery slot spacers

3.4 Mass Storage Devices

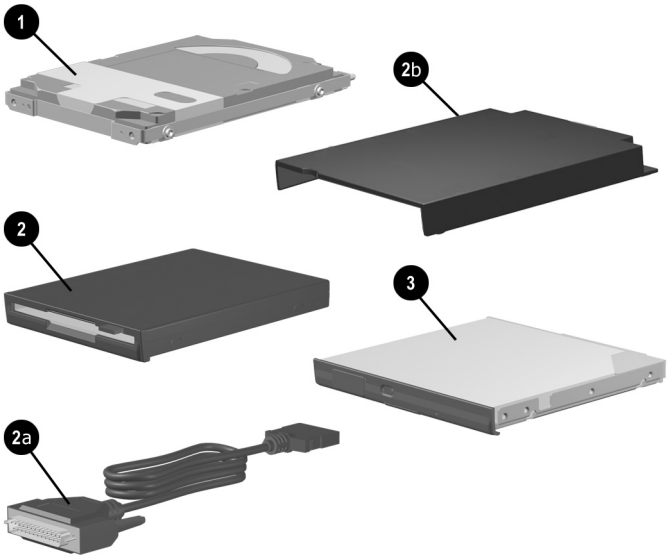


Figure 3-4. Mass Storage Devices

Table 3-3
Mass Storage Devices

Item	Description	Spare Part Number
1	Hard drives	
	20.0 GB	218371-001
	10.0 GB	218370-001
2	External diskette drive	135233-001
2a	External diskette drive cable	135232-001
2b	External diskette drive cradle	175375-001
3	Optical drives	
	8X Max DVD-ROM drive	173949-001
	24X Max CD-ROM drive	315082-002

3.5 Miscellaneous Spare Parts

Table 3-4
Miscellaneous Spare Parts (not illustrated)

Description			Spare Part Number
Power cord, black, 6 feet			
Australian	246959-011	Japanese	246959-291
Danish	246959-081	Korean	246959-AD1
European/Middle Eastern/African	246959-021	Swiss	246959-AG1
Italian	246959-061	U.K. English	246959-031
		U.S. English	246959-001
External AC adapter			163444-001
Battery charger			153991-001
Memory expansion boards			
256 MB			167136-001
128 MB			135244-001
64 MB			135243-001
Screw kit (includes Phillips M2 × 3.0, Torx T8 M2 × 7.0, Phillips M2 × 4.0, Phillips M2 × 7.5 Barrel, Torx T8 M2 × 3.5 screws, and 5.0 mm × 9.5 screwlock; refer to Appendix C, “Screw Listing,” for more information on screw specifications and usage)			231455-001
Mobile Expansion Unit			231450-001
The following options are for use only with the Mobile Expansion Unit:			
Hard drive adapter			155532-001
4X DVD-ROM drive			102266-001
24X CD-ROM drive			315082-002

Table 3-4
Miscellaneous Spare Parts (not illustrated) *(Continued)*

Description			Spare Part Number
Modems			
Type III mini PCI combination 56 Kbps modem/NIC board			233558-001
Type III mini PCI 56 kbps modem board			233557-001
PC Card modem			233564-001
Modem adapters			
Czech	234963-221	Norwegian	234963-091
German	304398-041	Swiss	198294-111
Hungarian	234963-211		
Modem cable			234962-001
Modem cable adapters			
Australian	304398-011		
Belgian	304398-181I		
French	304398-051		
RJ-11 P55 adapters			
Danish	316904-081	Italian	316904-061
Finnish	316904-351	Swedish	316904-101
RJ-11 PTT adapter (used in the United Kingdom)			158593-031

4

Removal and Replacement Preliminaries

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

4.1 Tools Required

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

- Magnetic screwdriver
- Torx T8 screwdriver
- Phillips P0 screwdriver
- 5.0 mm socket
- Tool kit (includes connector removal tool, loopback plugs, and case utility tool)

4.2 Service Considerations

Listed below are some of the considerations that you should keep in mind during disassembly and assembly procedures.

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

Plastic Parts

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

Cables and Connectors

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

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

4.3 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 these 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, then shut it down.
- Before removing a diskette drive or optical drive, ensure that a diskette or disc is not in the drive. Ensure that the optical drive tray is closed.

- Before handling a drive, ensure that you are discharged of

5.6 Hard Drive

Hard Drive Spare Part Number Information	
Hard drives	
20 GB	218371-001
10 GB	218370-001

CAUTION: To prevent damage to the computer and hard drive and loss of information, shut down the computer before removing the hard drive from the hard drive bay. Do not remove the hard drive while the computer is on, in Standby, or in Hibernation. If you are not sure whether the computer is in Hibernation, turn the computer on, then shut it down. If the computer is running a retail version of a Windows operating system, shut down the computer before removing any drive.

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the palm rest (Section 5.5).

3. Remove the hard drive spacer ❶ from the base enclosure (Figure 5-10).

The hard drive spacer is included in the Miscellaneous Plastics Kit (spare part number 231454-001).

4. Grasp the hard drive tab and slide the hard drive to the left ❷.
5. Remove the hard drive ❸.

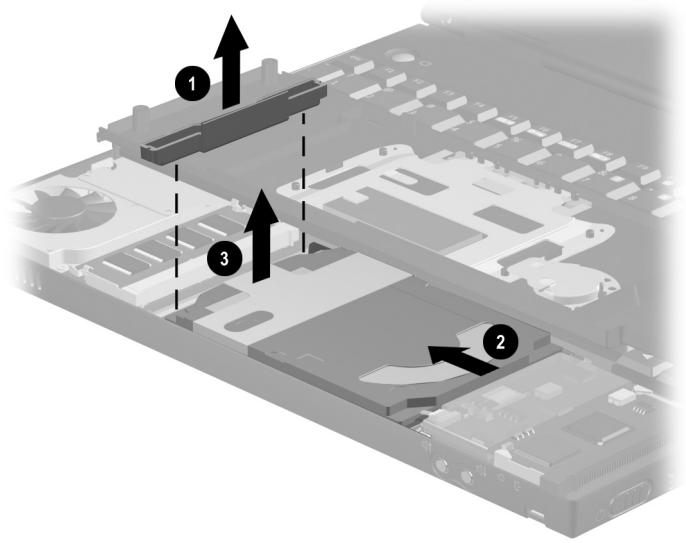


Figure 5-10. *Removing the Hard Drive*

Place the hard drive in an electrostatic-safe container.

Reverse the above procedure to install the hard drive.

CAUTION: When installing the hard drive, make sure the speaker and modem/NIC cables are not crimped between the back edge of the hard drive and the base enclosure.

5.7 Modem or Modem/NIC Board

Modem/NIC Board Spare Part Number Information	
Modem or combination modem/network interface (NIC) boards	
Lucent Win Modem + Intel PRO-100 (S)P Mobile Combo Adapter	230339-001
Type III mini PCI combination 56 Kbps modem/NIC board	230338-001
Type III mini PCI 56 kbps modem board	230337-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the palm rest (Section 5.5).

3. Disconnect the modem/NIC cable from the modem/NIC board ❶ (Figure 5-11).
4. Pull away the plastic retention clips on each side of the modem/NIC board ❷. The modem/NIC board tilts upward.
5. Lift the edge of the modem/NIC board and slide it gently out of the connector at a 45-degree angle ❸.

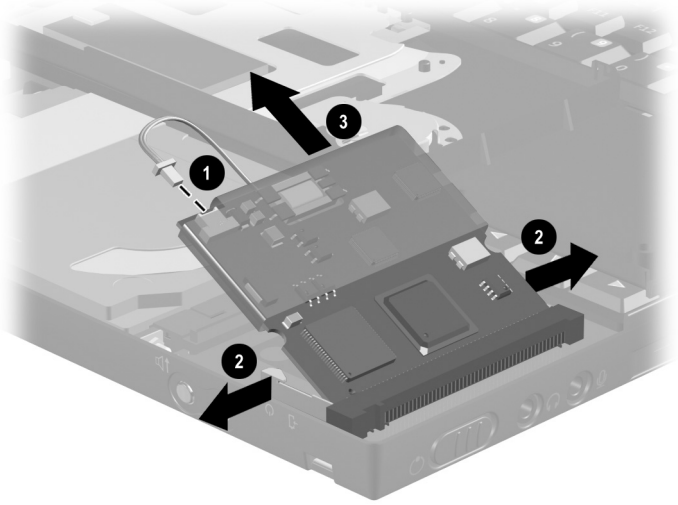


Figure 5-11. *Removing the Modem/NIC Board*

6. Place the modem/NIC board in an electrostatic-safe container.

Reverse the above procedure to install the modem/NIC board.

5.8 Keyboard

Keyboard
Spare Part Number Information

Keyboard without pointing stick (for use with TouchPad models)

Belgian	230514-181	Latin American Spanish	230514-161
Brazilian	230514-201	Norwegian	230514-091
Czech	230514-221	Portuguese	230514-131
Danish	230514-081	Spanish	230514-071
French	230514-051	Swedish/ Finnish	230514-101
French Canadian	230514-121	Swiss	230514-111
German	230514-041	Taiwanese	230514-AB1
Hungarian	230514-211	Turkish	230514-141
International	230514-002	U.K. English	230514-031
Italian	230514-061	U.S. English	230514-001
Japanese	230514-291		
Korean	230514-AD1		

Keyboard with pointing stick

Belgian	230515-181	Latin American Spanish	230515-161
Brazilian	230515-201	Norwegian	230515-091
Czech	230515-221	Portuguese	230515-131
Danish	230515-081	Spanish	230515-071
French	230515-051	Swedish/ Finnish	230515-101
French Canadian	230515-121	Swiss	230515-111
German	230515-041	Taiwanese	230515-AB1
Hungarian	230515-211	Turkish	230515-141
International	230515-002	U.K. English	230515-031
Italian	230515-061	U.S. English	230515-001
Japanese	230515-291		
Korean	230515-AD1		

If you are removing a pointing stick keyboard, you must first remove the palm rest so the pointing stick buttons cable can be disconnected. Refer to Section 5.5 for palm rest removal instructions.

If you are removing a TouchPad keyboard, it is not necessary to remove the palm rest prior to removing the keyboard.

1. Prepare the computer for disassembly (Section 5.3).
2. Turn the computer bottom side up with the front facing forward.
3. Remove the four M2 × 7.0 screws that secure the keyboard to the base enclosure (Figure 5-12).

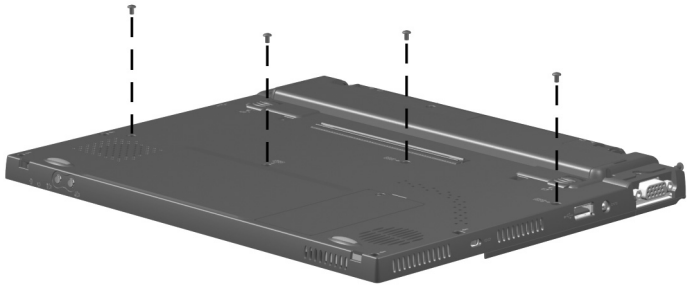


Figure 5-12. *Removing the Keyboard Screws*

4. Turn the computer top side up with the front facing forward.
5. Open the computer.

If you are removing a pointing stick keyboard, make sure the palm rest has been removed and pointing stick buttons cable is disconnected before proceeding with the following steps.

6. Lift up the front edge of the keyboard until it clears the palm rest ❶ (Figure 5-13).
7. Slide the keyboard forward until it disengages from the switch cover ❷.
8. Swing the front edge of the keyboard up and back ❸ and rest it on the display.

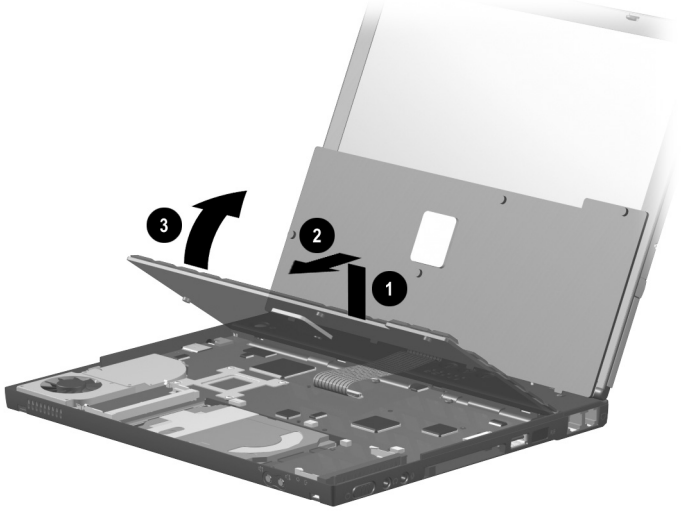


Figure 5-13. *Releasing the Keyboard*

9. Release the ZIF connector ❶ to which the keyboard cable is attached and disconnect the keyboard cable ❷ (Figure 5-14).

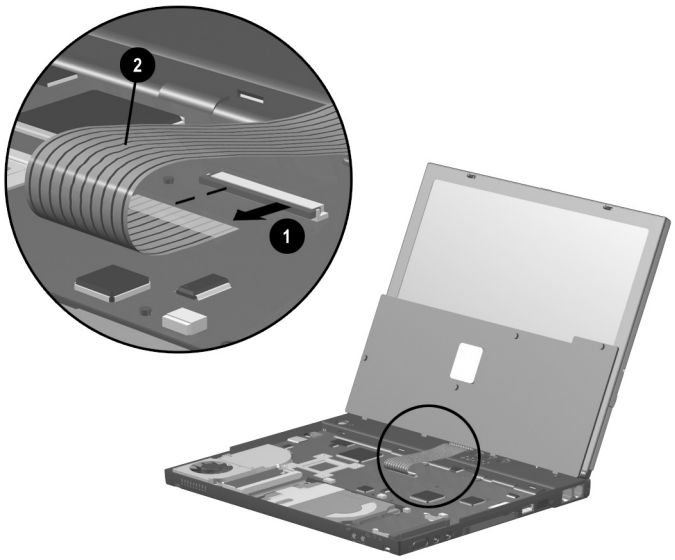


Figure 5-14. *Disconnecting the Keyboard Cable*

10. Remove the keyboard.

Reverse the above procedure to install the keyboard.

5.9 Real Time Clock (RTC) Battery

The RTC battery is included in the Miscellaneous Plastics Kit (spare part number 231454-001).

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the palm rest (Section 5.5).
3. Remove the keyboard (Section 5.8).
4. Disconnect the RTC battery cable from the system board ❶ (Figure 5-15).
5. Remove the RTC battery ❷.

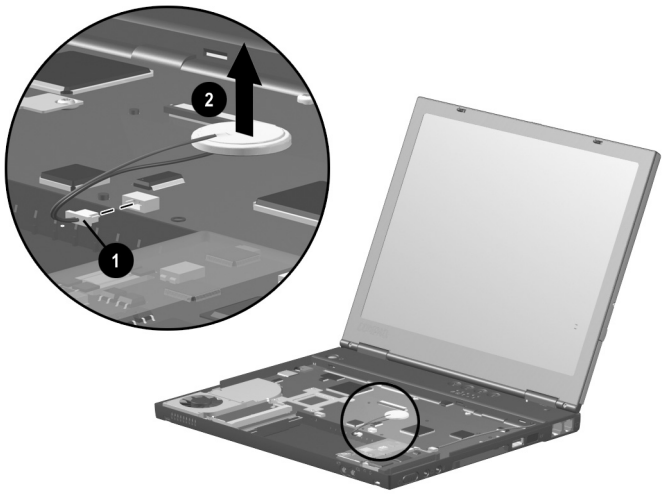


Figure 5-15. *Removing the Real Time Clock Battery*

Reverse the above procedure to install the RTC battery.

5.10 Switch Cover

Switch Cover Spare Part Number Information	
Switch cover	231453-001

1. Prepare the computer for disassembly (Section 5.3).
2. Remove the palm rest (Section 5.5).
3. Remove the keyboard (Section 5.8).
4. Close the computer.
5. Turn the computer bottom side up with the rear panel facing forward.
6. Remove the four M2 × 7.0 screws that secure the switch cover to the base enclosure (Figure 5-16).

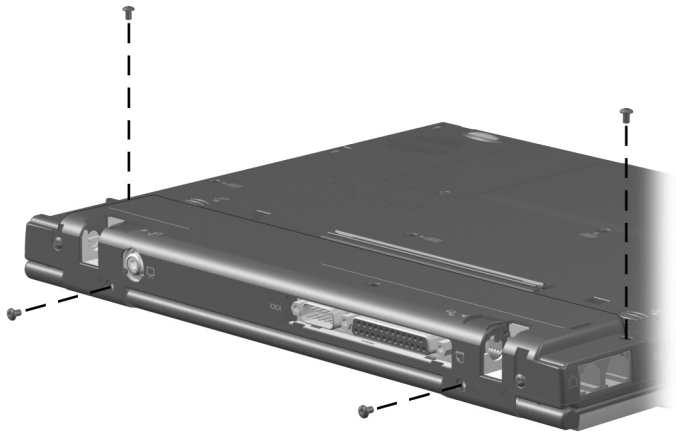


Figure 5-16. *Removing the Switch Cover Screws*

7. Turn the computer top side up with the front facing forward.
8. Open the computer as far as it will open.
9. Lift up on the outside edges of the switch cover to disengage it from the base enclosure ❶ (Figure 5-17).
10. Remove the switch cover ❷.

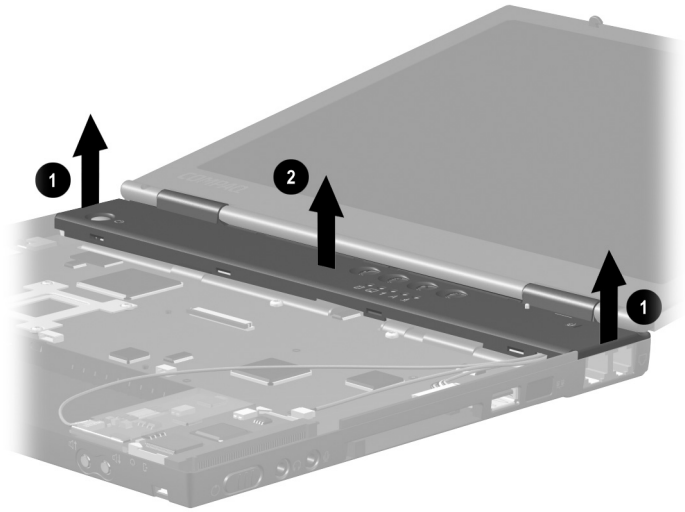


Figure 5-17. *Removing the Switch Cover*

Reverse the above procedure to install the switch cover.

5.11 Display

Display Spare Part Number Information	
12.1-inch SVGA CTFT Display	231448-001

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
   - ❏ Palm rest (Section 5.5)
   - ❏ Keyboard (Section 5.8)
   - ❏ Switch cover (Section 5.10)

2. Disconnect the display signal ❶ and backlight ❷ cables from the system board (Figure 5-18).
3. Remove the four M2 × 7.0 screws ❸ that secure the display to the base enclosure.

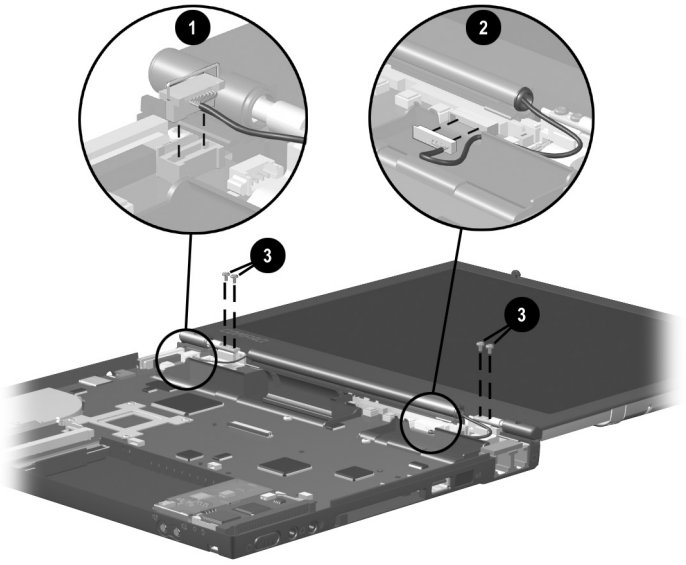


Figure 5-18. *Removing the Display*

When the display screws are removed, the display assembly is unsupported. Make sure to provide support for the display assembly when removing the display screws.

4. Remove the display.

When replacing the display, make sure the display cables are routed as indicated in Figure 5-19. To ensure proper alignment of the display, loosely install the screws in the ❶, ❷, ❸, ❹ sequence indicated. After all four screws have been loosely installed, tighten them.

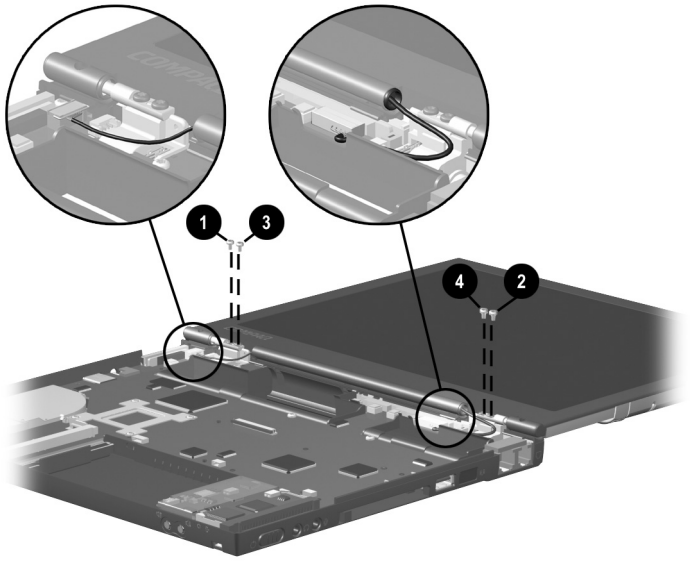


Figure 5-19. *Routing the Display Cables and Installing the Display Screws*

5.12 Display Lid Switch Board

The display lid switch board is included in the Miscellaneous Plastics Kit (spare part number 231454-001).

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
   - ❏ Palm rest (Section 5.5)
   - ❏ Keyboard (Section 5.8)
   - ❏ Switch cover (Section 5.10)
   - ❏ Display (Section 5.11)
2. Position the computer so the rear panel faces you.
3. Remove the M2.0 × 7.0 screw ❶ that secures the right display support to the base enclosure (Figure 5-20).
4. Remove the right display support ❷.

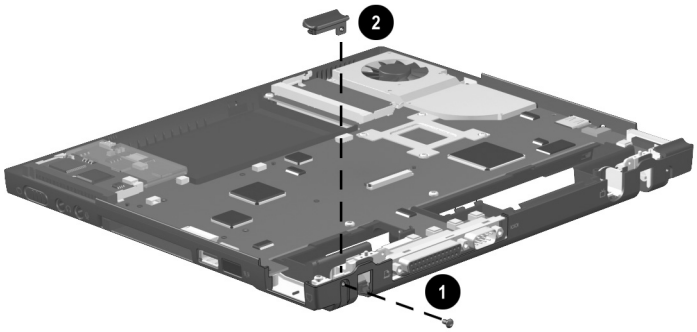


Figure 5-20. *Removing the Right Display Support*

5. Position the computer so the front faces you.
6. Remove the RJ-11/RJ-45 connector module ❶ from the base enclosure (Figure 5-21).
7. Disconnect the display lid switch cable ❷ from the display lid switch board.
8. Disconnect the microphone cable ❸ from the system board.
9. Remove the Phillips M2 × 4.0 screw ❹ that secures the display lid switch board to the base enclosure.

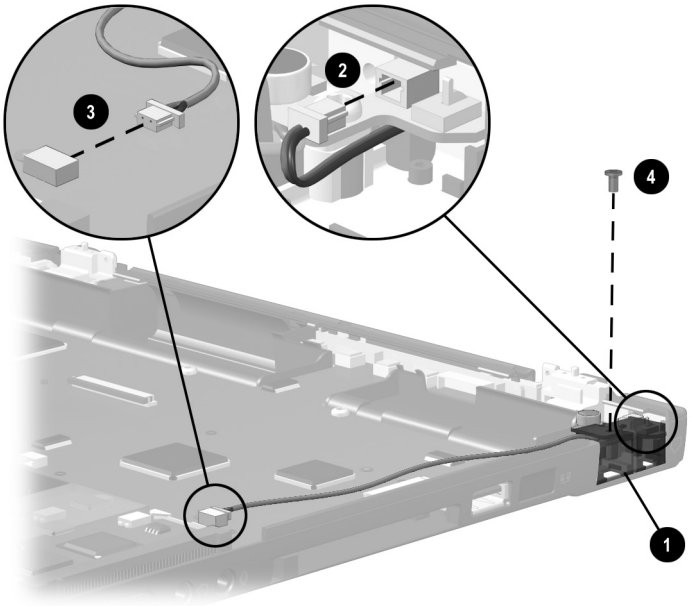


Figure 5-21. *Removing the Display Lid Switch Board*

10. Remove the display lid switch board.

Reverse the above procedure to install the display lid switch board.

5.13 System Board

System Board Spare Part Number Information	
System boards	
850-MHz Intel Pentium III processor and 64 MB SDRAM (includes fan and heat sink)	253104-001
700-MHz Intel Pentium III processor and 64 MB SDRAM (includes fan and heat sink)	231446-001

1. Prepare the computer for disassembly (Section 5.3) and, in the order below, remove the following components:
   - ❏ Palm rest (Section 5.5)
   - ❏ Hard drive (Section 5.6)
   - ❏ Modem/NIC board (Section 5.7)
   - ❏ Keyboard (Section 5.8)
   - ❏ RTC battery (Section 5.9)
   - ❏ Switch cover (Section 5.10)
   - ❏ Display (Section 5.11)
   - ❏ Display lid switch board (Section 5.12)

2. Lift the inside edge of the center display support and swing it toward the back of the computer ❶ (Figure 5-22).
3. Remove the center display support ❷.

The center display support is included in the Miscellaneous Plastics Kit (spare part number 231454-001).

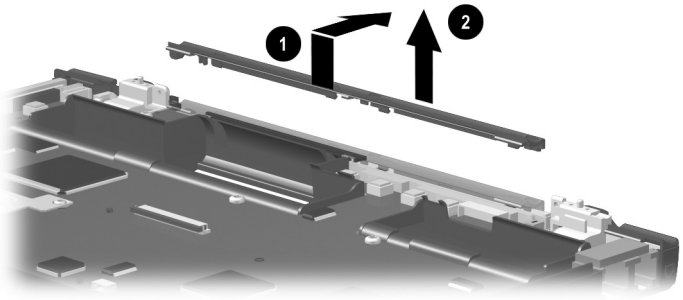


Figure 5-22. *Removing the Center Display Support*

4. Turn the base enclosure bottom side up with the rear panel facing forward.
5. Remove the Phillips M2 × 7.5 barrel screw that secures the system board to the base enclosure (Figure 5-23).

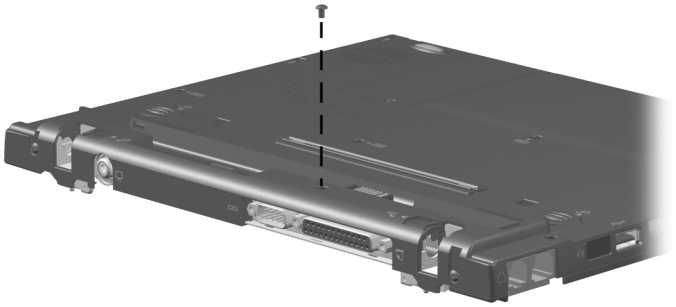


Figure 5-23. *Removing the System Board Screw*

6. Turn the base enclosure top side up with the rear panel facing forward.
7. Remove the M2 × 7.0 screw that secures the left display support to the base enclosure ❶ (Figure 5-24).

The left display support is included in the Miscellaneous Plastics Kit (spare part number 231454-001).

8. Remove the left display support ❷.
9. Remove the two 5.0 mm screwlocks ❸ that secure the external monitor connector to the base enclosure.
10. Remove the six M2 × 3.5 screws that secure the system board to the base enclosure ❹.

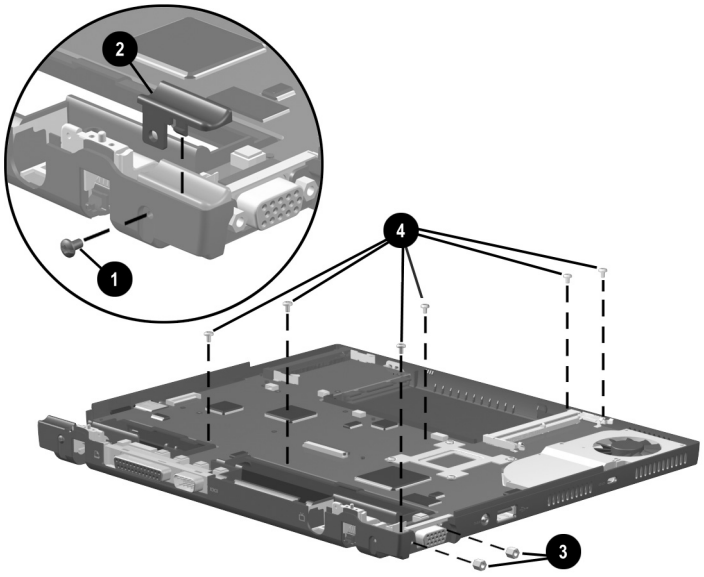


Figure 5-24. *Removing the System Board Screws and Screwlocks*

Do not remove the screw ❶ on the fan assembly or the four screws that secure the processor mounting bracket ❷ when removing the system board (Figure 5-25).

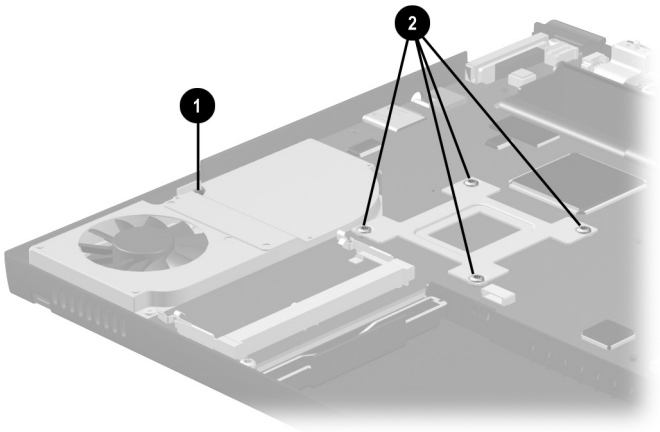


Figure 5-25. *Identifying the Processor Mounting Bracket and Fan Screws*

11. Disconnect the external battery terminal ❶ and speaker cables ❷ from the system board (Figure 5-26).

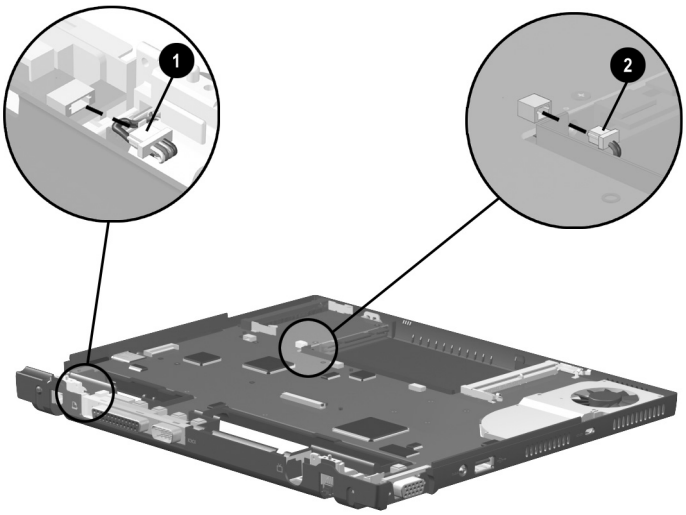


Figure 5-26. *Disconnecting the External Battery Terminal and Speaker Cables from the System Board*

12. Use the fan and heat sink assembly to lift up and hold the right side of the system board ❶ until the external battery terminal ❷ and NTSC module cables ❸ clear the base enclosure (Figure 5-27).

CAUTION: When lifting the system board, do not exert any pressure on the external monitor connector. Lifting the system board using the external display connector can stress and damage the system board.

13. Disconnect the external battery terminal ❷ and NTSC module cables ❸ from the system board.

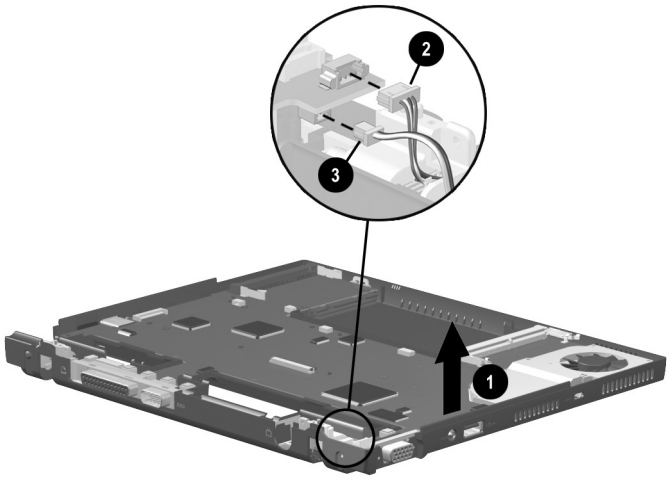


Figure 5-27. *Disconnecting the External Battery Terminal and NTSC Module Cables from the System Board*

14. Slide the system board to the right to remove it from the base enclosure (Figure 5-28).

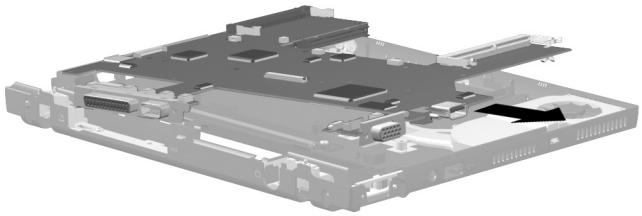


Figure 5-28. *Removing the System Board*

Reverse the above procedure to install the system board.

When installing the system board into the base enclosure, place the left edge of the system board into the base enclosure first to ensure that the PC Card eject button properly fits into the slot in the base enclosure ❶. Make sure the external monitor connector bracket ❷ and security cable slot bracket ❸ are in their proper locations (Figure 5-29).

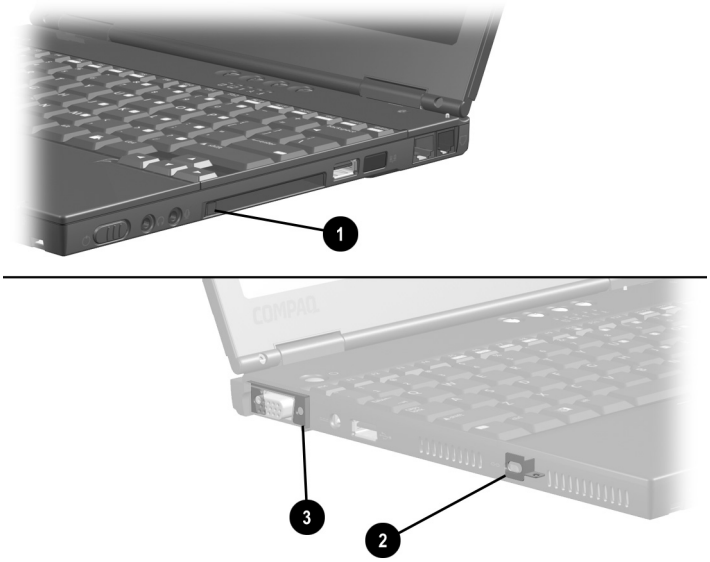


Figure 5-29. *Installing the System Board*

Make sure the speaker ❶, external battery terminal ❷ and ❸, and NTSC module cables ❹ do not get trapped underneath the system board when it is installed into the base enclosure (Figure 5-30).

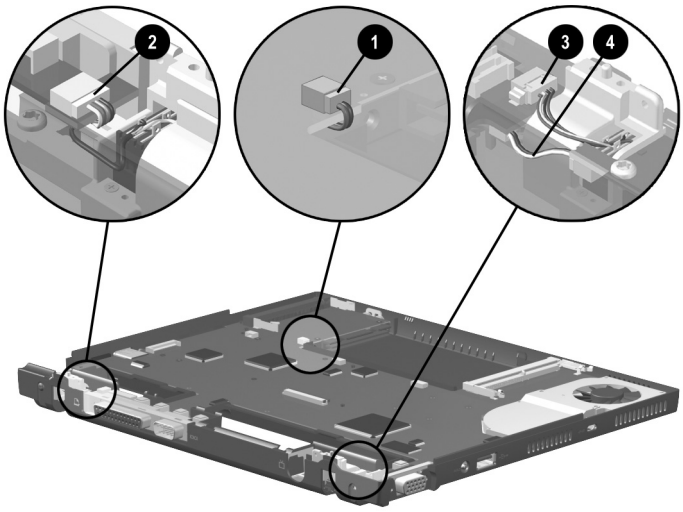


Figure 5-30. *Routing the Speaker, External Battery Terminal and NTSC Module Cables*

6

Specifications

This chapter provides physical and performance specifications.

Table 6-1
Computer

Dimensions		
Height	.89 in	22 mm
Width	10.5 in	266 mm
Depth	9.5 in	242 mm
Weight	3.5 lb	1.59 kg
Standalone (battery) power requirements		
Nominal operating voltage (Li ion)	14.8 VDC	
Maximum operating power	40 W	
Peak operating power	50 W	
AC adapter power requirements		
Rated input power	90 to 264 VAC RMS (auto switching)	
Rated input current	< 60 W	
Rated frequency	47 to 63 Hz	
Temperature		
Operating	50 to 95°F	10 to 35°C
Nonoperating	-4 to 140°F	-20 to 60°C

Table 6-1
Computer *(Continued)*

Relative humidity		
Operating	10 to 90% relative humidity, non-condensing	
Nonoperating	5 to 90% relative humidity, 101.6°F/38.7°C maximum wet bulb temperature	
Altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	0 to 10,000 ft	0 to 3,048 m
Nonoperating (14.7 to14.4 psia)	0 to 30,000 ft	0 to 9,144 m
Shock		
Operating	10 G, 11 ms, half sine	
Nonoperating	60 G, 11 ms, half sine	
Vibration		
Operating	0.5 G, 10 to 500 Hz, 0.5 oct/min sweep rate	
Nonoperating	1.0 G, 10 to 500 Hz, 0.50 oct/min sweep rate	

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

Table 6-2
12.1-inch XGA, TFT Display

Dimensions		
Height	10.3 in	261 mm
Width	7.8 in	199 mm
Diagonal	12.1 in	307 mm
Number of colors	Up to 16.8 million	
Contrast ratio	125:1	
Brightness	130 nits typical on AC power, 70 nits typical on battery power, 115 nits minimum	
Pixel resolution		
Pitch	0.264 × 0.264 mm	
Format	1024 × 768	
Configuration	RGB vertical stripe	
Backlight	Cold cathode fluorescent, 1 tube	
Character display	80 × 25	
Refresh rate	60 Hz	
Total power consumption	4 W	

Table 6-3
Hard Drives

	20.0 GB	**10.0 GB**
User capacity per drive[1]	20.0 GB	10.0 GB
Drive height (with drive frame)	0.38 in, 9.5 mm	0.38 in, 9.5 mm
Drive width (with drive frame)	2.50 in, 70 mm	2.50 in, 70 mm
Interface type	ATA-5	ATA-4
Seek times (typical read, including setting)		
Single track	2.5 ms	2.5 ms
Average	12.0 ms	12.0 ms
Full stroke	23.0 ms	23.0 ms
User addressable sectors[3]	39,070,080	19,640,880
Logical configuration		
Cylinders	16,383	16,383
Heads	16	16
Sectors per track	63	63

Table 6-3
Hard Drives *(Continued)*

	20.0 GB	**10.0 GB**
Physical configuration		
Cylinders[3]	22,784	22,784
Heads	4	2
Sectors per track[3]	293–560	293–560
Bytes per sector	512	512
Buffer size[3]	2 MB	KB
Disk rotational speed	4200 rpm	4200 rpm
Transfer rate		
Interface max (MB/s)[2]	66.6	66.6
Media (Mb/s)[3]	109–203	109–203

[1] 1 GB = 1,000,000,000 bytes.

[2] System capability may differ.

[3] Actual drive specifications may differ slightly.

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

Table 6-4
Diskette Drive

Diskette size	3.5 inch	
Light	On system	
Height	0.5 in	12.7 mm
Bytes per sector	512	
Sectors per track		
High density	18 (1.44 MB)	15 (1.2 MB)
Low density	9	
Tracks per side		
High density	80	
Low density	80	
Read/write heads	2	
Average seek times		
Track-to-track (high/low)	3 ms	6 ms
Average (high/low)	95 ms	174 ms
Settling time	15 ms	
Latency average	100 ms	

Table 6-5
CD-ROM Drive

Applicable disk	CD-ROM (Mode 1, 2, and 3) CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD-Extra Video CD CD-WO (fixed packets only) CD-Bridge
Center hole diameter	.59 in 15 mm
Disk diameter	12 cm, 8 cm
Disk thickness	1.2 mm
Track pitch	1.6 µ
Access time	
Random	< 150 ms
Full Stroke	< 300 ms
Cache buffer	128 KB
Data transfer rate	
Sustained, 24X	2400 KB/sec (150 KB/sec at 1X)
Variable	1500 to 3600 KB/sec (10X to 24X)
Normal PIO Mode 4 (single burst)	16.66 KB/sec
Startup time	< 8 seconds
Stop time	< 4 seconds

Table 6-6
DVD-ROM Drive

Applicable disk	DVD-5, DVD-9, DVD-10 CD-ROM (Mode 1 and 2) CD Digital Audio CD-XA ready (Mode 2, Form 1 and 2) CD-I ready (Mode 2, Form 1 and 2) CD-R (read only) CD Plus Photo CD (single/multisession) CD-Bridge
Center hole diameter	.59 in 15 mm
Disk diameter	12 cm, 8 cm
Disk thickness	1.2 mm
Track pitch	.74 µ
Access time	
Random	< 150 ms
Full Stroke	< 225 ms
Audio output level	
Lineout	0.7 V rms
Headphone	None
Cache buffer	128 KB
Data transfer rate	
Sustained, 1X DVD rate	150 KB/sec
Sustained, 16X DVD rate	2400 KB/sec
Sustained, 1X DVD rate	1380 KB/sec
Sustained, 4X DVD rate	5520 KB/sec
Normal IO Mode 4 (single burst)	16.6 MB/sec
Startup time	< 15 seconds
Stop time	< 6 seconds

Table 6-7
Battery Packs

Dimensions		
Primary Lithium ion (Li ion)		
Height	.78 in	20 mm
Width	9.06 in	231 mm
Depth	1.84	47 mm
Weight	.49 lb	.22 kg
Cells	4	
External Li ion		
Height	.9 in	23 mm
Width	10.47 in	266 mm
Depth	.9 in	23 mm
Weight	.48 lb	.22 kg
Cells	4	
External Li ion High Capacity		
Height	1.8 in	46 mm
Width	10.6 in	269 mm
Depth	1.2 in	30 mm
Weight	.93 lb	.42 kg
Cells	4	
Energy		
Primary and External Li ion		
Voltage	14.4 V	
Amp-hour capacity	1.96 Ah	
Watt-hour capacity	28 Wh	
External Li ion High Capacity		
Voltage	14.4 V	
Amp-hour capacity	2.87 Ah	
Watt-hour capacity	349 Wh	
Environmental requirements		
Temperature		
Operating	41°F to 95°F	5°C to 35°C
Nonoperating	-4°F to 140°F	-20°C to 60°C

Table 6-8
AC Adapter

Weight	0.39 lb	.18 kg
Power supply (input)		
Operating voltage	90 to 260 VAC RMS Nominal	
Operating current	1.3 A RMS	
Operating frequency range	47 to 63 Hz Nominal	
Maximum transient	4/50 kV	

Table 6-9
System DMA

Hardware DMA	System Function
DMA0	Available for audio
DMA1	Entertainment audio (default; alternate = DMA0, DMA3, none)
DMA2	Diskette drive
DMA3	ECP parallel port LPT1 (default; alternate = DMA0, none)
DMA4	DMA controller cascading (not available)
DMA5	Available for PC Card
DMA6	Not assigned
DMA7	Not assigned
PC Card controller can use DMA 1, 2, or 5.	

Table 6-10
System Interrupts

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

PC Cards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ 4.

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

Table 6-11
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 IO” configuration for CPU
040 - 05F	Counter/timer registers
044 - 05f	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/real time clock
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2

Table 6-11
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 6-11
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)

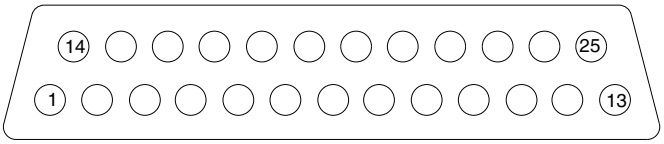
Table 6-12
System Memory Map

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

A

Connector Pin Assignments

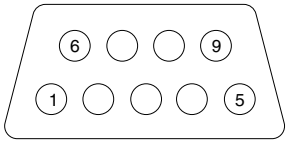
Table A-1
Parallel



Pin	Signal	Pin	Signal
1	Strobe*	10	Acknowledge*
2	Data bit 0	11	Busy
3	Data bit 1	12	Paper out
4	Data bit 2	13	Select
5	Data bit 3	14	Auto line feed*
6	Data bit 4	15	Error*
7	Data bit 5	16	Initialize printer*
8	Data bit 6	17	Select in*
9	Data bit 7	18-25	Signal ground

*Signal is active low.

Table A-2
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	Signal ground		

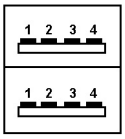
Table A-3
Stereo Speaker/Headphone

Pin	Signal	Pin	Signal
1	Audio out	2	Ground

Table A-4
Microphone

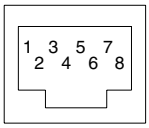
Pin	Signal	Pin	Signal
1	Audio in	2	Ground

Table A-5
Universal Serial Bus



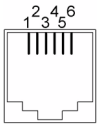
Pin	Signal	Pin	Signal
1	+5 VDC	3	Data +
2	Data -	4	Ground

Table A-6
RJ-45 Network Interface



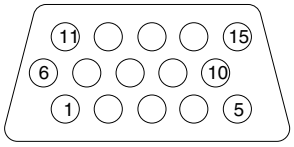
Pin	Signal	Pin	Signal
1	Transmit +	5	Unused
2	Transmit -	6	Receive -
3	Receive +	7	Unused
4	Unused	8	Unused

Table A-7
RJ-11 Modem



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

Table A-8
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	DDC2B clock
8	Ground analog		

B

Power Cord Set Requirements

3-Conductor Power Cord Set

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

The power cord set received with the 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. For more information on power cord set requirements, contact a Compaq authorized reseller or service provider.

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord set must be at least 5.00 feet (1.5 m) and a maximum of 6.50 feet (2.0 m).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
- The power cord set must have a minimum current capacity of 10A and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector, for mating with appliance inlet on the back of the computer.

Country-Specific Requirements

3-Conductor Power Cord Set Requirements—By Country

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

Notes

1. The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0mm2 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 (15A, 125V) or NEMA 6-15P (15A, 250V) 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, 1.0 mm^2 conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

C

Screw Listing

This appendix provides specification information for the screws used in the computer. All screws listed in this appendix are available in the Miscellaneous Screw Kit, spare part number 231455-001.

Table C-1
Phillips M2 × 3.0 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	1	3.0 mm	M2	3.0 mm

Where used:

One screw securing the MultiPort cover to the display assembly (refer to the documentation included with the MultiPort device for information on removing the MultiPort cover)

Table C-2
Torx T8 M2 × 7.0 Screw

	Color	Qty	Length	Thread	Head Width
	Black	18	7.0 mm	M2	4.0 mm

Where used:

❶ Four screws securing the palm rest to the base enclosure (documented in Section 5.5)

❷ Four screws securing the keyboard to the base enclosure (documented in Section 5.11)

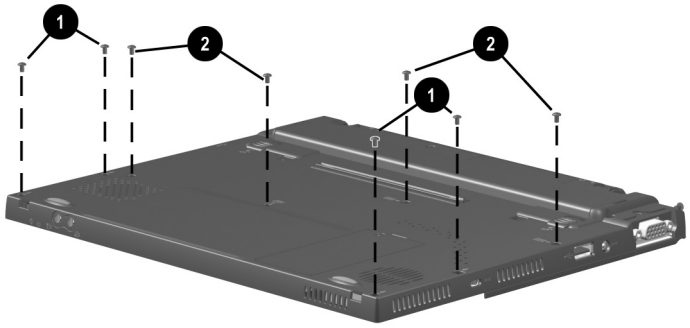


Table C-2
Torx T8 M2 × 7.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Black	18	7.0 mm	M2	4.0 mm

Where used:

❶ Four screws securing the switch cover to the base enclosure (documented in Section 5.10)

❷ One screw securing the right display support to the base enclosure (documented in Section 5.12)

❸ One screw securing the left display support to the base enclosure (documented in Section 5.13)

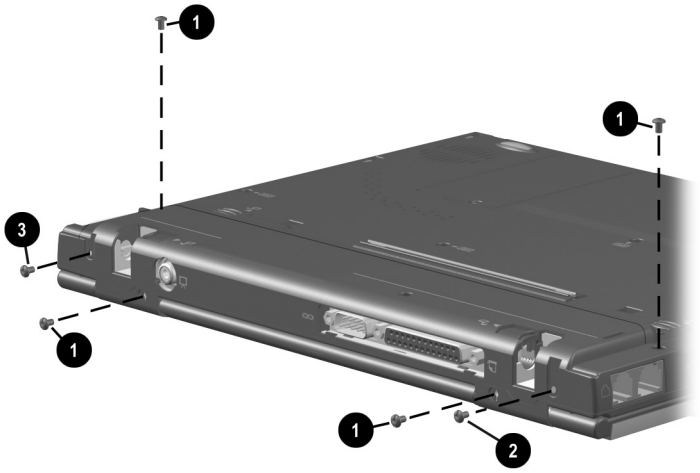


Table C-2
Torx T8 M2 × 7.0 Screw *(Continued)*

	Color	Qty	Length	Thread	Head Width
	Black	18	7.0 mm	M2	4.0 mm

Where used:

Four screws securing the display to the base enclosure (documented in Section 5.12)

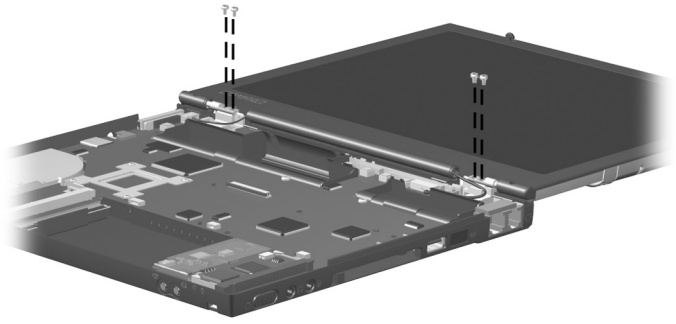


Table C-3
Phillips M2 × 4.0 Screw

	Color	Qty	Length	Thread	Head Width
	Black	1	4.0 mm	M2	3.0 mm

Where used:

One screw securing the display lid switch board to the system board (documented in Section 5.13)

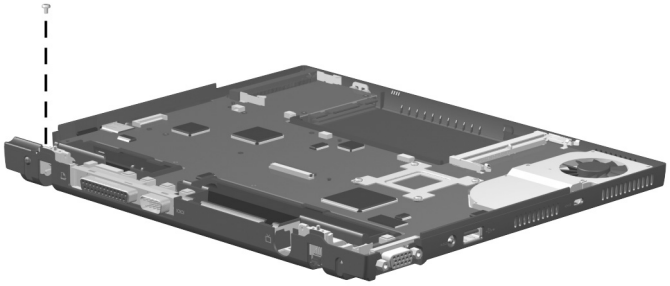


Table C-4
Phillips M2 × 7.5 Barrel Screw

	Color	Qty	Length	Thread	Head Width
	Silver	1	7.5 mm	M2	5.0 mm

Where used:
One screw securing the system board to the base enclosure (documented in Section 5.13)

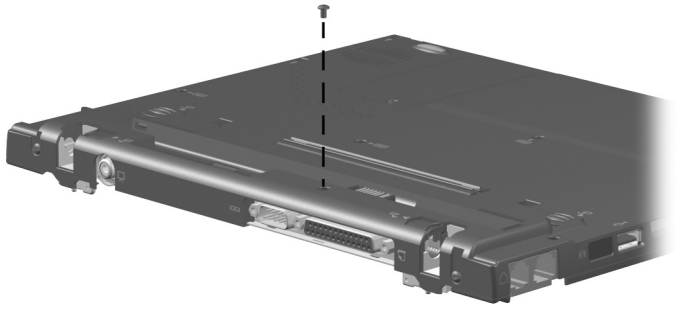


Table C-5
Torx T8 M2 × 3.5 Screw

	Color	Qty	Length	Thread	Head Width
	Silver	6	3.5 mm	M2	4.0 mm

Where used:

Six screws securing the system board to the base (documented in Section 5.13)

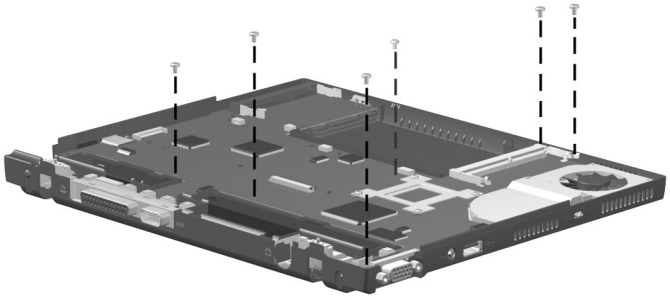
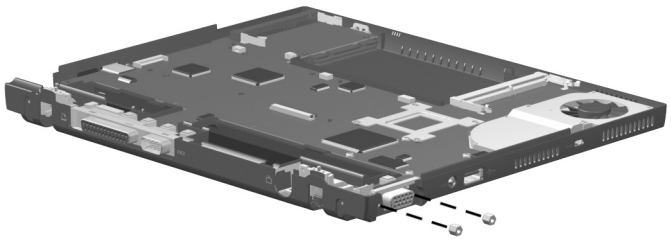


Table C-6
5.0 mm × 9.5 Screwlock

	Color	Qty	Length	Thread	Head Width
	Silver	2	9.5 mm	n/a	5.0 mm

Where used:

Two screwlocks securing the system board to the base enclosure on each side of the external monitor connector (documented in Section 5.13)



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