Maintenance & Service Guide
Presario 1660 Model

assistenza compaq

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For content comments or questions, contact the Editor. To report a technical problem, contact your Regional Support Center or IM Help Center.
This MSG will be periodically updated online as needed.

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Presario 1660 Model

Notice

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Maintenance and Service Guide

Compaq Presario 1660 Model Portable Computers

First Edition (December 1999)
Compaq Computer Corporation

Maintenance & Service Guide
Presario 1660 Model

Preface

This *Maintenance and Service Guide* is a troubleshooting guide that can be used for reference when servicing the Compaq Presario 1660 Model Portable Computers. Compaq Computer Corporation reserves the right to make changes to the Compaq Presario 1660 Model Portable Computers without notice.

Symbols

The following words and symbols mark special messages throughout this guide.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technician Notes

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, the user should not attempt to make repairs at the component level or to make modifications to any printed circuit board. Improper repairs can create a safety hazard. Any indications of component replacement or printed circuit board modifications may void any warranty

Serial Number

When requesting information or ordering spare parts, the computer serial number should be provided to Compaq. The serial number is located on the bottom of the computer.

Locating Additional Information

The following documentation is available to support this product:

- Compaq Presario 1660 Model Portable Computer documentation set
- *Introducing Windows 95 Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- *Compaq QuickFind*
- *Compaq Service Quick Reference Guide*

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Product Description

Compaq Presario 1600 Portable Computer is a continuation of the new generation of multimedia portable computers with an innovative integrated design, outstanding audio and video, advanced core features, and attractive styling. This full-function portable computer allows full desktop functionality.

Troubleshooting

This section covers troubleshooting information for the Compaq Presario 1660 Model Portable Computer. The basic steps in troubleshooting include:

1. Follow the Preliminary Steps.

2. Run the Power-On Self-Test (POST).

3. Follow the recommended actions described in the diagnostic tables, if you are unable to run POST or if POST displays an error message.

When following the recommended actions in the Sections on POST and Diagnostic Error Codes perform them in the order listed. Rerun POST after each recommended action until the problem is solved and no error message occurs. Once the problem is solved, do not complete the remaining recommended actions.

NOTE: If the problem is intermittent, check the computer several times to verify that the problem is solved.

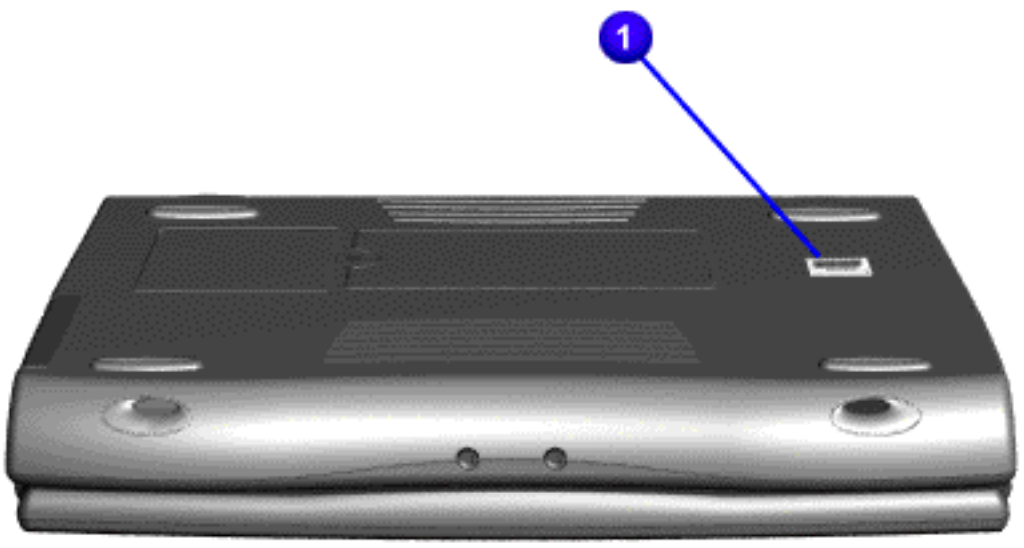
Illustrated Parts Catalog

This section provides a breakdown and identifies the spare parts ordering number associated with items for the Compaq Presario 1660 Model Portable Computers.

Removal and Replacement Procedures

This section explains the removal and replacement procedures for the computer.

Serial Number Location



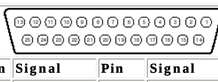
Report the computer serial number to Compaq when requesting information or ordering spare parts.

Connector Pin Assignments

This appendix provides connector pin assignment tables for Compaq Presario 1660 Model Portable Computers. For more information on connectors, refer to the section on Rear Connectors.

NOTE: The signals in all tables of this appendix are considered active high unless otherwise indicated by an asterisk (*).

Parallel Connector



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 Linefeed*
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

* = Active low

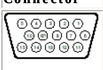
Serial Connector

Connector	Pin	Signal
	1	Carrier Detect
	2	Receive Data
	3	Transmit Data
	4	Data Terminal Ready
	5	Signal Ground
	6	Data Set Ready
	7	Ready to Send
	8	Clear to Send
	9	Ring Indicator

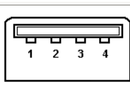
Keyboard/Mouse

Connector	Pin	Signal
	1	Data 1
	2	Clock 2
	3	Ground
	4	+5 V
	5	Clock 1
	6	Data 2

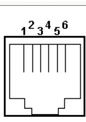
External VGA Monitor

Connector	Pin	Signal
	1	Red Analog
	2	Green Analog
	3	Blue Analog
	4	Not connected
	5	Ground
	6	Ground
	7	Analog
	8	Ground
	9	Analog
	10	Ground
	11	Analog
	12	Not connected
	13	Ground
	14	Monitor Detect
	15	DDC2B Data Horizontal Sync Vertical Sync DDC2B Clock

Universal Serial Bus

Connector	Pin	Signal
	1	+5V
	2	Data -
	3	Data +
	4	Ground

Modem

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

Port Replicator

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	N.C.	21	Printer Data 0	41	N.C.	61	CTS
2	N.C.	22	Printer Data 1	42	N.C.	62	DCD
3	Kb Clk 1	23	Printer Data 2	43	Switch A	63	DSR
4	Joystick Data A	24	Printer Data 3	44	Switch B	64	TXD
5	Kb Data 1	25	Printer Data 4	45	Switch C	65	RTS
6	Joystick Data B	26	Printer Data 5	46	Switch D	66	N.C.
7	Kb Clk 2	27	Printer Data 6	47	N.C.	67	Detect
8	Joystick Data C	28	Printer Data 7	48	MIDI In	68	N.C.
9	Kb Data 2	29	USB 0 -	49	MIDI Out	69	V. Sync
10	Joystick Data D	30	USB 0 +	50	+5V	70	Ground
11	Lp Select In	31	USB 1 -	51	+5V	71	H. Sync
12	Lp Paper End	32	USB 1+	52	N.C.	72	Ground
13	Lp Initialize	33	Adapter In	53	N.C.	73	Blue
14	Lp Busy	34	Adapter In	54	N.C.	74	Ground
15	Lp Error	35	Adapter In	55	N.C.	75	Green
16	Lp Ack	36	Adapter In	56	Dock ID -	76	Ground
17	Lp Auto Feed	37	Adapter In	57	RXD	77	Red
18	Lp Strobe	38	Adapter In	58	Lp Select	78	Ground
19	DDC2BC	39	N.C.	59	RI	79	N.C.
20	DDC2BD	40	N.C.	60	DTR	80	N.C

Battery Pack Operating Time

This appendix covers the following information concerning battery pack operating time:

- Increase battery pack operating time
- Conditioning a battery pack
- Disposal of a used battery pack

Increasing Battery Pack Operating Time

Battery pack operating time differs depending on several variables. To avoid unnecessary replacement, consider the following variables when determining how long a charged battery pack should last:

- Power management settings
- Hardware configuration
- Software applications
- Installed options
- Display brightness
- Hard drive usage
- Changes in operating temperature
- Type and number of installed PC Cards

NOTE: The power consumption requirements for PC Cards vary widely. Some cards drain the battery pack very rapidly.

Battery pack operating time can be increased by as much as 50 percent by controlling the energy required by the computer and the energy stored in the battery pack.

Minimizing the Energy Required

To minimize the energy required by the computer, follow these steps:

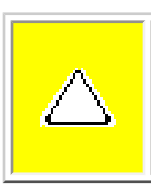
- Set the power conservation levels in the Power Management utility to **Maximum**.
- Customize the timeout value to work more efficiently with the applications. The amount of battery life depends on the values selected.

Maximizing the Energy Stored

To maximize the energy stored in the battery pack, follow these guidelines:

- Condition the battery pack at least every 30 days to improve overall battery performance.
- Keep a battery pack in the computer when using it with AC power to supply the battery pack with a constant trickle charge.
- Store the battery pack in a cool, dry place when not in use.

Conditioning a Battery Pack



CAUTION: To avoid a loss of data, ensure that all data is saved before discharging a battery pack.

To condition a battery pack, complete the following steps:

1. Allow the battery to drain until the computer reaches hibernation and turns itself off. **Do not plug in the AC adapter during this process.** Also, the system should not be allowed to sleep. To prevent sleep, you may either use the computer while the battery is draining, or you may disable power management.

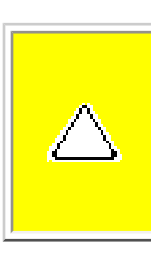
2. Plug in the AC adapter and allow the battery to charge until the LED light on the display stops blinking. Your battery gauge may read 100 percent for a period of time before LED light on the display stops blinking. Do not unplug the AC adapter until the arrow disappears.

   Your battery is now re-conditioned, and you may begin using the computer normally.

The battery pack charge time may vary greatly from 2 hours to 5 hours or more, depending on many factors (including whether it is charged on-line or off-line).

Disposal of a Used Battery Pack

In the interest of safeguarding our environment. Compaq Computer Corporation recommends that nickel metal hydride (NiMH) and lithium ion (Li ion) battery packs be recycled. Battery packs should be handled in accordance with country, state, province, or local regulations.



CAUTION: Never attempt to open or service a battery pack. Opening a battery pack not only damages the pack and makes it unusable, but also expose potentially harmful battery components.

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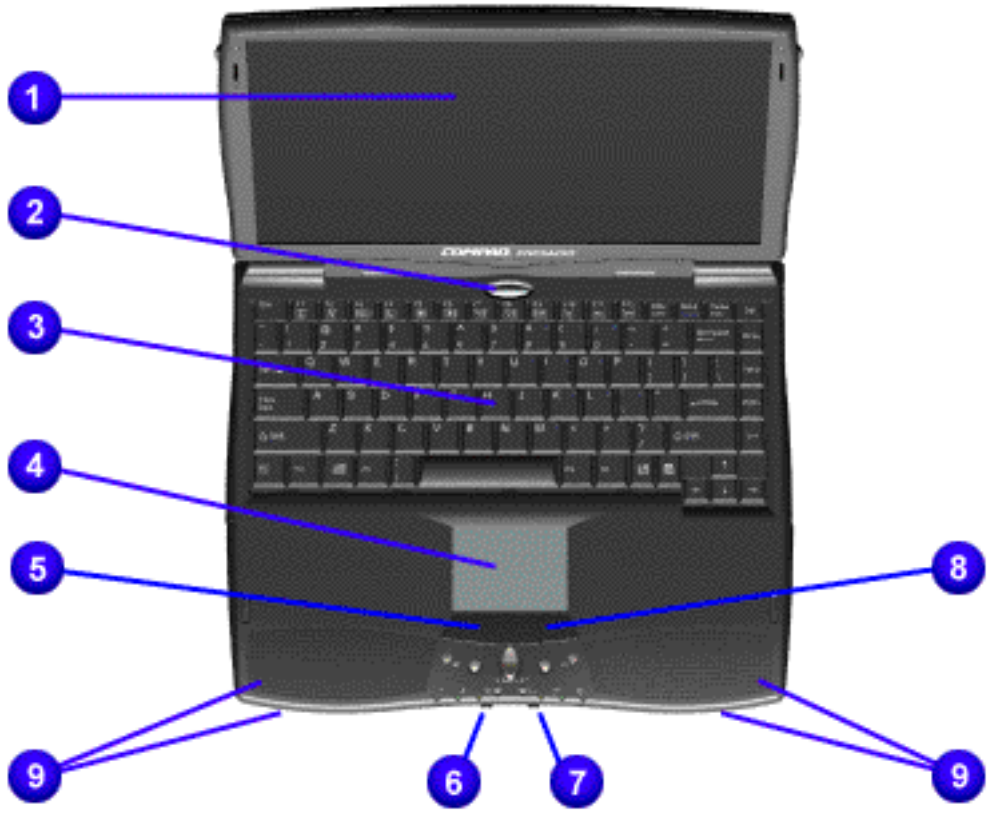
Models and Features

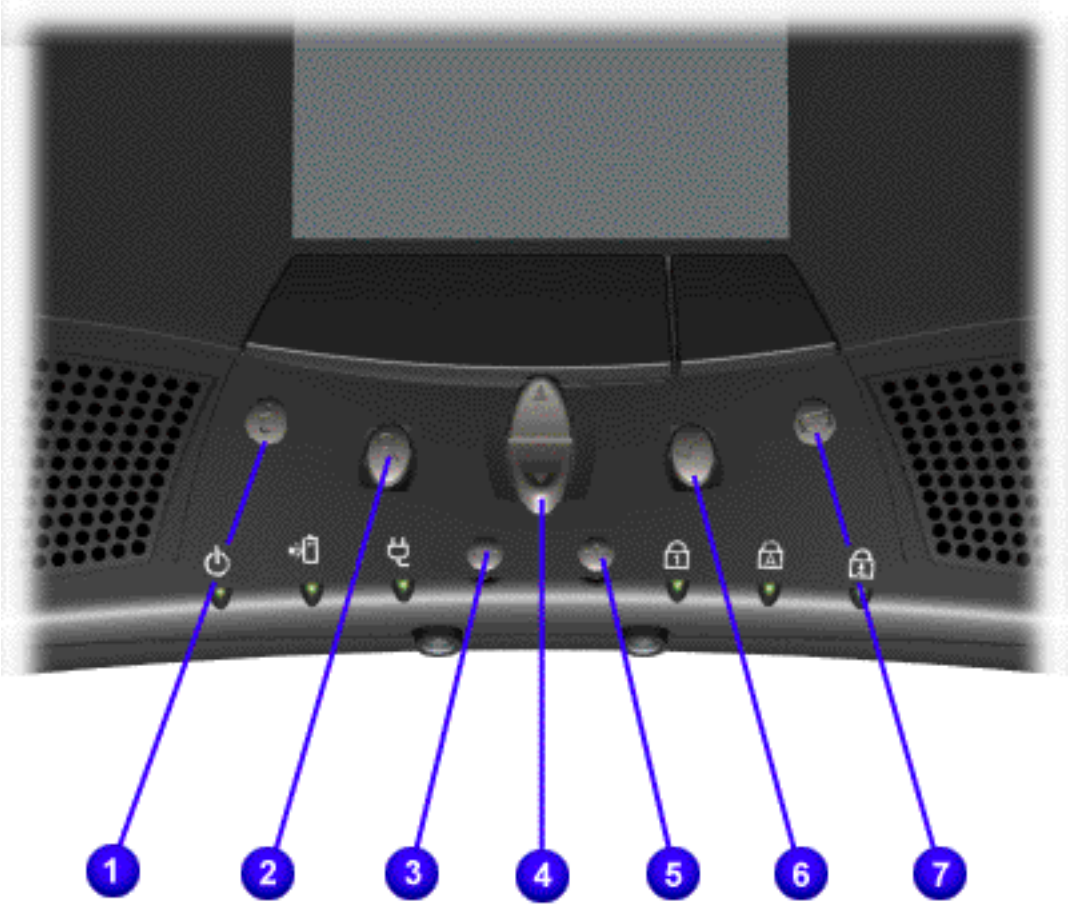
Compaq Presario 1660 Model Portable Computer	
Display	13.3" TFT
Processor	300 MHz Pentium II
Hard Drive	4 GB
Memory	64 MB or 128 MB SDRAM
CD Drive	DVD
Modem	56 Kbps Data/Fax with ITU V.90
Battery	High Capacity Li Ion

Controls and Lights



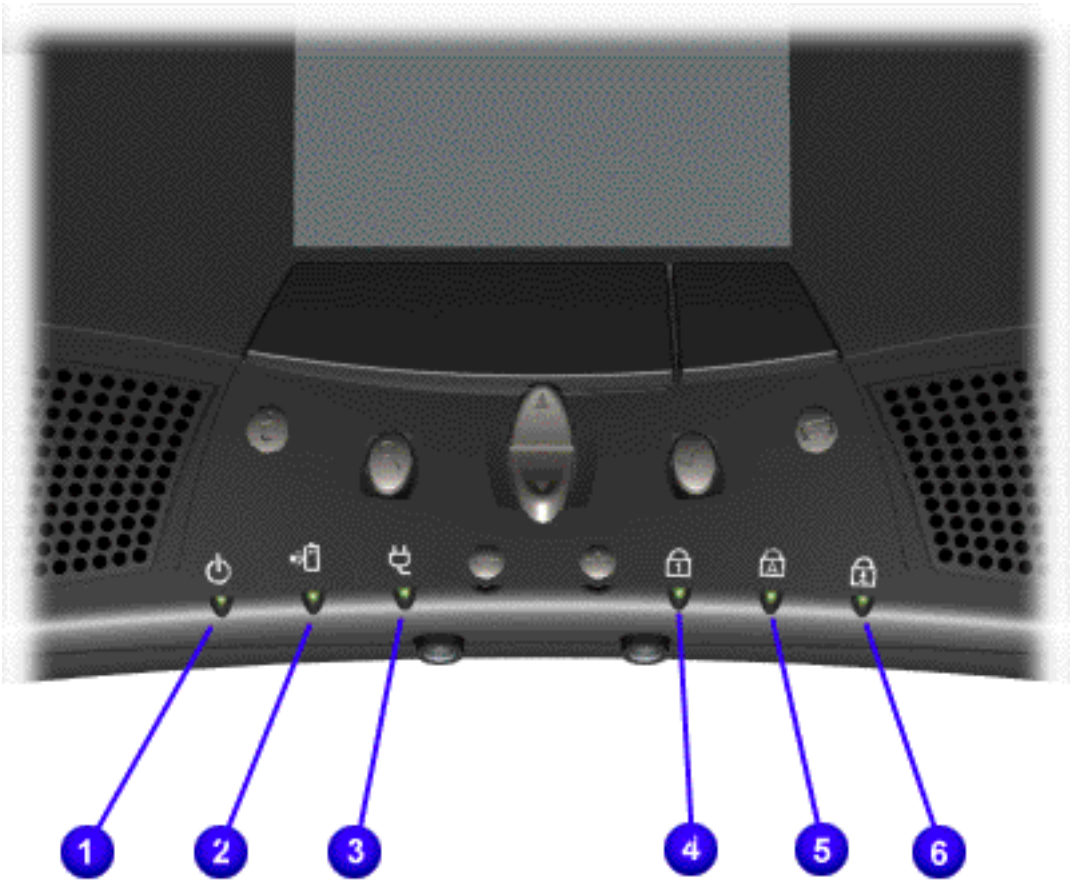
1	Display
2	Power (On/Off) Button
3	Keyboard
4	Touch Pad
5	Left Touch Pad Button
6	Headphone Jack
7	Microphone Jack
8	Right Touch Pad Button
9	Speakers and Ports

Front Bezel Buttons



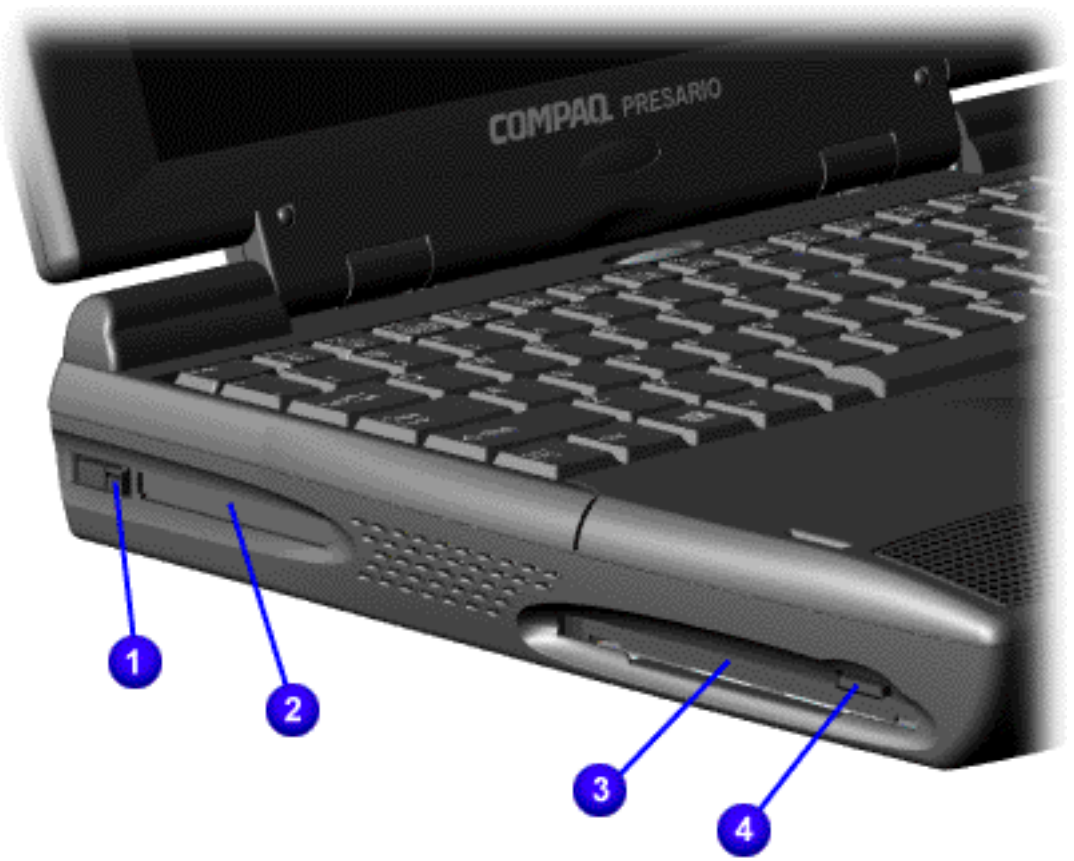
1	Instant Internet Access Button
2	Instant Search Button
3	Volume Down
4	Scroll Up/down Button
5	Volume Up
6	Secure E-Commerce Button (or Favorite Web site)
7	Instant E-Mail Button

Front Bezel Lights



1	Power
2	Battery Charge
3	AC Adapter
4	Num Lock
5	Cap Lock
6	Scroll Lock

Left Side Components



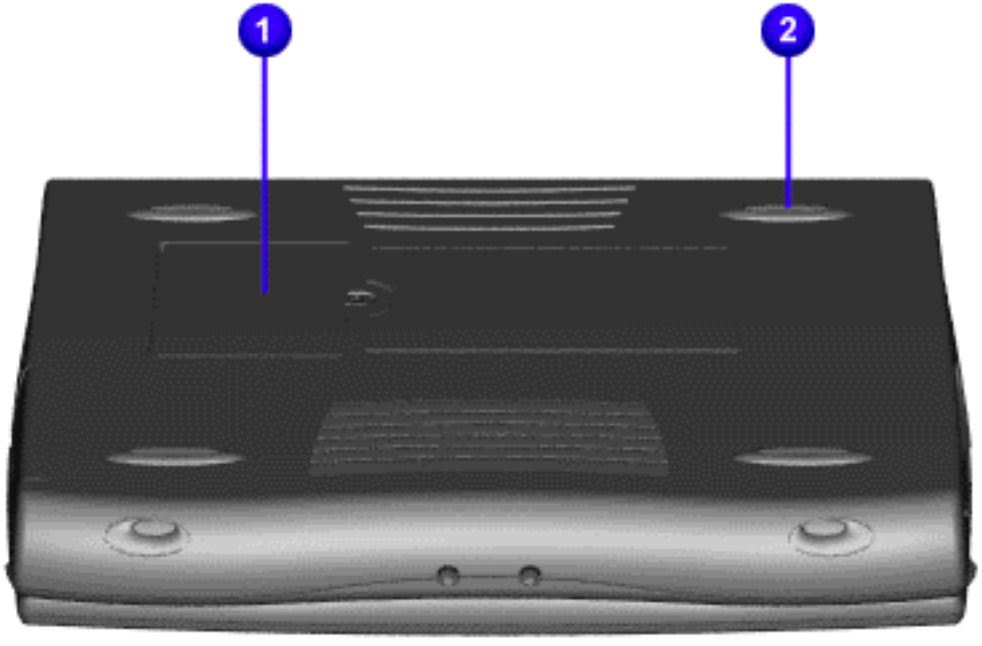
1.	PC Card Eject Lever	3.	Diskette Drive Slot
2.	PC Card Slot	4.	Diskette Eject Button

Right Side Components

1	Battery Compartment
2	DVD Drive
3	DVD Drive Eject Button
4	Manual DVD Eject Hole

Bottom of Unit

- Models and Features
- Upper Unit Components
- Front Bezel Buttons
- Front Bezel Lights
- Left Side Components
- Right Side Components
- **Bottom of Unit**
- Rear Connectors
- Power Management for Windows 98



1.	Memory Compartment
2.	Feet

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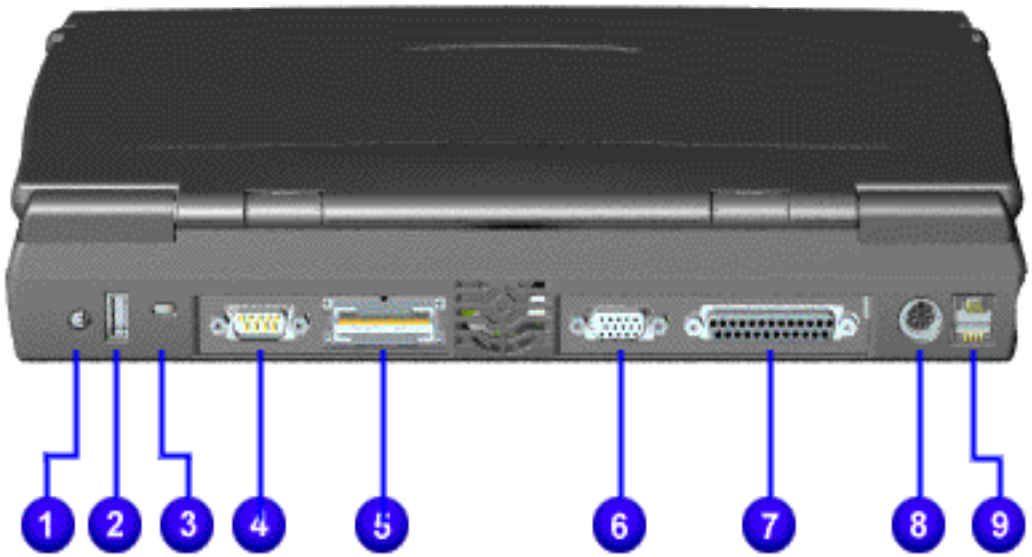
Rear Connectors



1.	AC Adapter
2.	USB
3.	Security Slot
4.	Serial Port
5.	Port Replicator Port
6.	External Monitor Port
7.	Parallel Printer Port
8.	Keyboard/Mouse Port
9.	Modem Jack

Power Management for Windows 98

The following power management features are available for conserving AC power and extending battery operating time:

Power Management Settings

Depending on your patterns of computer use, you can set different levels of power management. These different power management levels can be activated based on the amount of time passed since the last system activity. System activity examples include keyboard or mouse movement, CD or DVD playback (while under program control that monitors Sleep), and modem use.

Each of the following system components can be made to go to sleep after periods of inactivity:

- system (goes into Sleep (Standby) mode)
- screen (times out and goes blank)
- hard drive (spins down)

You can select different conditions or power schemes through Power Management.The optional settings are **Home/Office Desk**, **Portable/ Laptop**, and **Always On**. From the default settings, you can change the delay time settings. Note: the setting for hard drive must be less than or equal to the setting for System.

IMPORTANT: If you're on a network, it's recommended that you set **System Standby** to **Never**.

There are five categories of power management settings under the Control Panel. The default setting for each feature is listed below in the tables.

Power Management Properties

Tab: **Power Schemes**:	Plugged in	Running on Batteries
Always on System Standby:	Never	15 minutes
Turn OFF Monitor	After 15 minutes	After 10 minutes
Always on System Standby:	After 15 minutes	After 10 minutes

Power Management Properties

Tab: **ALARMS**::		
Low Battery Alarm:	10%	
Critical Battery Alarm	0%	
Alarm Actions:	X Display Message Notification	
	Text Action	**No Action**

Power Management Properties

Tab: **POWER METER**:	Default
Tab: ADVANCED	Default

Display Properties

Tab: **Monitor**: Laptop Display (Maximum resolution according to unit display size)

Sleep

You can select Sleep mode instead of turning off the computer when you have finished using it. This allows the computer to wake up faster than turning it completely off and saves power over the active (On) mode. Compaq Presario Notebook computers have two levels of sleep, Hibernation and Sleep.

Hibernation - by pushing the power button once your computer will perform a save to disk followed by a shut down of the computer into Off mode.

Sleep - is a low power mode, also referred to as Standby mode. While in Sleep mode, your computer will maintain system information and open files. Unsaved information will be lost if you turn off your system prior to system wake-up, or if you lose power while using the AC adapter.

CAUTION: While in Sleep mode, your computer will maintain system information and open files. Unsaved information will be lost if you turn off your system prior to system wake-up, or if you lose power while using the AC adapter.

Hibernation Mode

Hibernation helps conserve battery life and protects your data. Hibernation can be a routine power saving event, or can be the result of a low battery condition. As it enters Hibernation your computer will display a progress screen, as it automatically saves the machine state before it shuts down and turns itself off. Your computer will automatically go into Hibernation, when the battery has little power left, or when the system (operating on battery power) has been in Sleep mode for more than an hour. You can also manually initiate Hibernation by pressing the power button once while the system is active. To restore the computer's previous state, simply press the power button once again. While waking up, the computer will display a progress screen.

The following table shows the conditions and indicators for getting in and out of the various power management modes, Sleep, Hibernation, and Off.

Mode	To Initiate	To End	Indicators
Sleep	Manual keys combination - **Fn+F4**	Press any key	Flashing green Power LED
	Time Out Default 15 minutes. If on Battery power (system will not go to Sleep if on AC power)		
Hibernate	Manual - Press Power Button once	Press Power Button once	No Power LED, blank screen
	Time Out Default If low battery or after 1 hour of sleep (system will not Hibernate if on AC power)		
Off	Perform normal Windows shutdown via the start button, or press and hold down the power button for 4 seconds	Press Power Button once	No Power LED, blank screen

Servicing Your Computer - Full Off Mode

If you need to install or replace components in your system, you must turn the computer off *completely*. Follow the instructions above for properly putting the computer into Off mode, unplug from the outlet, and remove the battery (see battery section for instruction on removing battery).

Rebooting After a Lockup

Occasionally you may encounter a frozen keyboard or a locked screen. To reboot your computer (as if from a cold start) press and hold down the Power Button for at least four seconds, which will cause a manual shutdown. Then, restart it with a single press of the Power Button. If it still doesn't recover, press the Power Button and hold it for four seconds to shut it down, then, remove the battery or unplug the AC power for at least 30 seconds. Reinsert the battery or reconnect AC power and press the Power Button once to reboot.

Battery Operating Time

Battery operating time is affected by variables, such as the following:

- Power conservation settings
- Hardware configuration
- Software applications
- Installed options
- Display brightness
- Hard drive usage
- Power button
- Changes in operating temperature
- Type and number of installed PC Cards

For more information on increasing battery pack operating time, conditioning the battery pack, and disposing of a used battery pack, refer to the Battery Pack Operations.

Preliminary Steps

Before running POST, complete the following preliminary steps:

1. If a power-on password has been established, type the password and press the **Enter** key. If the password is not known, clear the password.

2. Run Computer Checkup.

3. Turn off the computer and its external devices.

4. Disconnect any external devices that you do not want to test. Do not disconnect the printer if you want to test it or use it to log error messages.

IMPORTANT: If the problem only occurs when an external device is connected to the computer, the problem may be related to the external device or its cable. Verify this by running POST with and without the external device connected.

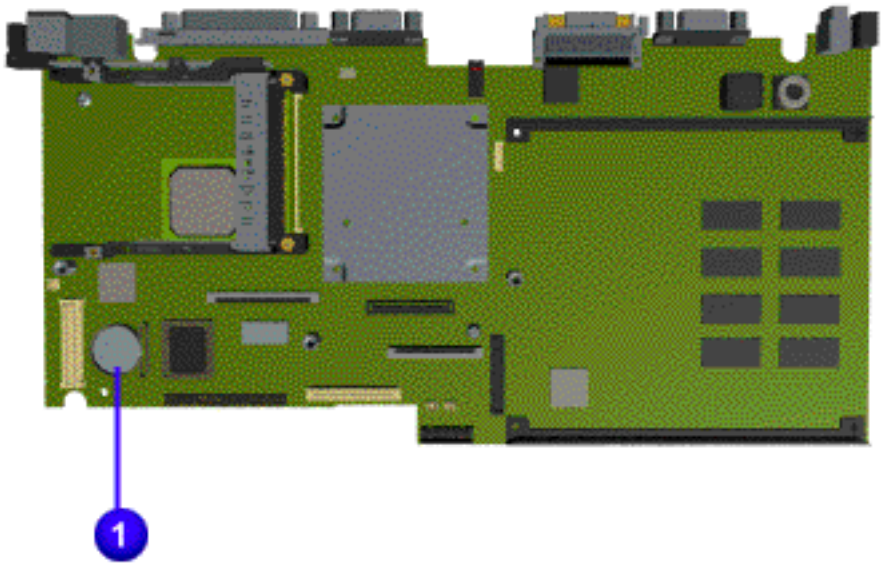
5. Install loopback plugs in the serial and parallel connectors if you would like to test these ports.

6. Ensure the hard drive is installed in the computer.

7. Ensure that the battery pack is inserted in the computer and the computer is connected to an external AC power source.

When the preliminary steps are completed, you are ready to run POST.

Clearing the Power-on Password



Clearing the power-on password requires removing all Setup attributes that are programmed in the CMOS.

If the password is not known, clear it by removing the RTC battery (located on the system board) as follows:

1. Turn off the computer.

2. Disconnect the power cord.

3. Remove the battery pack.

4. Remove the palmrest assembly.

5. Remove the keyboard and heatspreader.

6. Remove the modem

7. Remove RTC battery 1 for 10 seconds, then replace it .

8. Reassemble the computer.

9. Turn on the computer to verify that the power-on password has been cleared. If it has not been cleared, repeat all steps above.

Power-On Self Test (POST)

Running POST

To run POST, turn off the computer, then turn it back on.

If POST does not detect any errors, the computer will not beep. This indicates successful completion of POST test. POST has run successfully and boots from the hard drive (or from a bootable diskette if one is installed in the diskette drive).

If POST detects errors, the errors are indicated by screen and/or audible messages. Refer to the following tables for a list of POST codes and their relevant descriptions. If there is more than one recommended action, only try the later actions in the list if the first action recommended does not solve the problem.

NOTE: If the system is not functioning well enough to run POST, or if the display is not functioning well enough to show POST error messages, refer to the Troubleshooting tables.

102	System board failure
162	System options not set
XX000YZZ 201	Memory Error
301	Keyboard Error
304	Keyboard or System Unit Error
601	Diskette Controller Error
605	Diskette Drive Error
1780	Primary Hard Drive 0 Failure
1782	Hard Drive Controller

Power-On Self-Test Messages

102-System Board Failure	
Probable Cause	**Recommended Action**
DMA, timers, etc.	Replace the system board.

162-System Options Not Set	
Probable Cause	**Recommended Action**
Configuration incorrect	Run Computer Setup.
CMOS reflects that an invalid configuration has been set.	Run Computer Setup.

XX000YZZ 201-Memory Error	
Probable cause	**Recommended action**
RAM failure	1. Replace the memory modules. 2. Replace the system board.
Memory test data error	1. Replace the memory modules. 2. Replace the system board.
XX000YZZ RAM failure	Replace the system board.

301-Keyboard Error	
Probable Cause	**Recommended Action**
Keyboard failure	1. Ensure the keys are not depressed during POST. 2. Reconnect the keyboard with the computer off. 3. Replace the keyboard.

304-Keyboard or System Unit Error	
Probable Cause	**Recommended Action**
Keyboard or system board error	1. Replace the keyboard. 2. Replace the TouchPad or mouse. 3. Replace the system board.

601-Diskette Controller Error	
Probable Cause	**Recommended Action**
Mismatch in drive type or failure in the diskette controller	1. Run Computer Checkup (TEST). 2. Check and/or replace cables. 3. Replace the system board.

605-Diskette Drive Error	
Probable Cause	**Recommended Action**
Mismatch in drive type	Run Computer Setup.

1780-Primary Hard Drive 0 Failure	
Probable Cause	**Recommended Action**
Disk 0 failed to respond	1. Run Computer Checkup (TEST). 2. Replace the hard drive.
Hard drive format error	1. Run Computer Checkup (TEST). 2. Replace the hard drive.

1782-Hard Drive Controller	
Probable Cause	**Recommended Action**
Hard drive controller failure	1. Run Computer Setup. 2. Replace the hard drive.

Compaq Diagnostics

Compaq Diagnostics is installed on the hard drive of the computer. Run the Diagnostics utilities when you want to view or test system information and if you have installed or connected devices. If you run Compaq Diagnostics from a diskette, ensure that it is version 10.11 or later.

The Diagnostics menu includes the following utilities:

- Computer Setup
- Computer Checkup (TEST)
- View System Information (INSPECT)
- Prepare Computer for a Compaq Service Call (RemotePaq)

If you have a problem you cannot solve, run the Diagnostics utilities before you call for support. Run Computer Checkup and select to save the device list to a file and to print or to save the log of errors. Run the View System Information (INSPECT) utility and select to print or to save that information. Have the files or the printed information available when you call for support.

Computer Setup

The Computer Setup utility resides in a hidden partition on the hard drive. It gives you a snapshot of the computer's hardware andconfiguration, aids in troubleshooting, and allows you to set custom features.

Access Computer Setup when you want to:

- Modify settings for audio, storage, communications, and input devices
- Get an overall picture of the computer's hardware configuration
- Verify configuration parameters in determining problems
- Configure options
- Update time, date, or password information

To run Computer Setup:

Go to the Compaq Utilities menu and select the Computer Setup option. Follow the on-screen instructions to complete your chosen task.

Computer Checkup (TEST)

Computer Checkup (TEST) determines whether the various computer components and devices are recognized by the system and are functioning properly. You can display, print, or save the information generated by Computer Checkup.

Follow these steps to run Computer Checkup:

1. Plug the computer into an external power source. (A low battery condition could interrupt the program.)

2. Turn on the external devices that you want to test. Connect the printer if you want to print a log of error messages.

3. Insert the Compaq Diagnostics diskette in drive A.

4. Turn on or restart the computer. The computer starts from drive A, and the **Diagnostics Welcome** screen appears.

5. Press **Enter** to continue. The **Diagnostics** menu appears.

6. Select Computer Checkup from the **Diagnostics** menu. A **Test Option** menu appears.

7. Select **View the Device List** from the **Test Option** menu. A list of the installed Compaq devices appears.

8. If the list of installed devices is correct, select **OK**. The **Test Option** menu appears.

NOTE:	If the list is incorrect, ensure that any new devices are installed properly.

9. Select one of the following from the **Test Option** menu:

- Quick Check Diagnostics. Runs a quick, general test on each device with a minimal number of prompts. If errors occur, they display when the testing is complete. You cannot print or save the error messages.
- Automatic Diagnostics. Runs unattended, maximum testing of each device with minimal prompts. You can choose how many times to run the tests, to stop on errors, or to print or save a log of errors.
- Prompted Diagnostics. Allows maximum control over testing the devices. You can choose attended or unattended testing, decide to stop on errors, or choose to print or save a log of errors.

10. Follow the instructions on the screen as the devices are tested. When testing is complete, the **Test Option** menu appears.

11. Exit the **Test Option** menu.

12. Exit the **Diagnostics** menu.

View System Information (INSPECT)

The View System Information (INSPECT) utility provides information about the computer and installed or connected devices. You can display, print, or save the information.

Follow these steps to run View System Information (INSPECT) from the Compaq Diagnostics diskette:

1. Turn on the external devices that you want to test. Connect the printer if you want to print the information.

2. Insert the Compaq Diagnostics diskette in drive A.

3. Turn on or restart the computer. The computer starts from drive A, and the **Diagnostics Welcome** screen appears.

4. Press **Enter** to continue. The Diagnostics menu appears.

5. Select **View System Information (INSPECT)** from the **Diagnostics** menu.

6. Select the item you want to view from the following list:

System	Memory
ROM	Audio
Keyboard	Operating system
System ports	System files
System storage	Windows files
Graphics	

7. Follow the instructions on the screen to cycle through the screens, to return to the list and choose another item, or to print the information.

Contacting Compaq Support

Obtain the following information before contacting Compaq Reseller Support:

- Product name
- Product serial number
- Purchase date
- Conditions under which the problem occurred
- Any error messages that have occurred
- Hardware configuration
- Type of printer connected
- Hardware/software being used
- Printed result of Computer Checkup (TEST)
- Printed copies of *CONFIG.SYS* and *AUTOEXEC.BAT* files, if possible

Shipping Preparation

To ship the computer, complete the following steps:

1. Back up the critical hard drive files. Ensure that backup tapes/diskette are not exposed to electrical or magnetic fields while stored in transit.

2. Turn off the computer and external devices.

3. Disconnect the external devices from their power sources, then from the computer.

IMPORTANT:	Ensure that there is no diskette in the diskette drive and that there are no PC Cards in the PC slots.

4. Close the display and all exterior doors of the computer.

5. Pack the computer with sufficient packing material to protect it. Use the original packing box or similar packaging.

Diagnostic Error Codes

Diagnostic error codes occur if the system recognizes a problem while running the Compaq Diagnostic program. These error codes help identify possibly defective subassemblies.

The following tables list error codes, a description of the error condition, and the action required to resolve the error condition.

IMPORTANT: Retest the system after completing each step. If the problem has been resolved, do not proceed with the remaining steps.

For the removal and replacement of a particular subassembly, see **Removal and Replacement Procedures**.

Select error codes by number or type:

Error Code	Description	Recommended Action
Processor Test Error Codes		
101-xx	CPU test failed	Replace the processor and retest.
102-xx	Coprocessor or Weitek Error	1. Run the Configuration and Diagnostics Utilities. 2. Replace the processor board and retest.
103-xx	DMA page registers test failed	Replace the system board and retest.
104-xx	Interrupt controller master test failed	
105-xx	Port 61 error	
106-xx	Keyboard controller self-test failed	
107-xx	CMOS RAM test failed	
108-xx	CMOS interrupt test failed	
109-xx	CMOS clock test failed	
110-xx	Programmable timer load data test failed	
113-xx	Protected mode test failed	
114-01	Speaker test failed	1. Check system configuration. 2. Verify cable connections to speaker. 3. Replace the system board and retest.
Memory Test Error Codes		
200-xx	Memory machine ID test failed	1. Flash the system ROM and retest. 2. Replace the system board and retest.
202-xx	Memory system ROM checksum failed	
203-xx	Write/Read test failed	1. Remove the memory module and retest. 2. Install a new memory module and retest.
204-xx	Address test failed	
211-xx	Random pattern test failed	
214-xx	Noise test failed	
215-xx	Random address test failed	
Keyboard Test Error Codes		
300-xx	Failed ID Test	1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard. 2. Replace the keyboard and retest. 3. Replace the system board and retest.
301-xx	Failed Selftest/Interface Test	
302-xx	Failed Individual Key Test	
304-xx	Failed Keyboard Repeat Test	
Parallel Printer Test Error Codes		
401-xx	Printer failed or not connected	1. Connect the printer. 2. Check power to the printer. 3. Install the loop-back connector and retest. 4. Check port and IRQ configuration. 5. Replace the system board and retest.
402-xx	Failed Port Test	
403-xx	Printer pattern test failed	
Diskette Drive Test		
600-xx	Diskette ID drive types test failed	1. Replace the diskette media and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed	
602-xx	Diskette read test failed	
603-xx	Diskette write, read, compare test failed	
604-xx	Diskette random read test failed	
605-xx	Diskette ID media failed	
606-xx	Diskette speed test failed	
609-xx	Diskette reset controller test failed	
610-xx	Diskette change line test failed	
697-xx	Diskette type error	
698-xx	Diskette drive speed not within limits	
699-xx	Diskette drive/media ID error	1. Replace media. 2. Run the Configuration and Diagnostics Utilities.

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Diagnostic Error Codes (continued)

Serial Test Error Codes		
1101-xx	Serial port test failed	1. Check port configuration 2. Replace the system board and retest.
Hard Drive Test Error Codes		
1701-xx	Hard drive format test failed	1. Run the Configuration and Diagnostics Utilities and verify drive type. 2. Verify that all secondary drives have secondary drive capability. 3. Replace the hard drive and retest. 4. Replace the system board and retest.
1702-xx	Hard drive read test failed	
1703-xx	Hard drive write/read/compare test failed	
1704-xx	Hard drive random seek test failed	
1705-xx	Hard drive controller test failed	
1706-xx	Hard drive ready test failed	
1707-xx	Hard drive recalibration test failed	
1708-xx	Hard drive format bad track test failed	
1709-xx	Hard drive reset controller test failed	
1710-xx	Hard drive park head test failed	
1715-xx	Hard drive head select test failed	
1716-xx	Hard drive conditional format test failed	
1717-xx	Hard drive ECC* test failed	
1719-xx	Hard drive power mode test failed	
1724-xx	Network preparation test failed	
1736-xx	Drive monitoring test failed	
* ECC = Error Correction Code		
Video Test Error Codes		
501-xx	Video controller test failed	The following apply to error codes 501-xx through 516-xx: 1. Disconnect external monitor and test with internal LCD display. 2. Replace the display assembly and retest. 3. Replace the system board and retest.
502-xx	Video memory test failed	
503-xx	Video attribute test failed	
504-xx	Video character set test failed	
505-xx	Video 80 × 25 mode 9 × 14 character cell test failed	
506-xx	Video 80 × 25 mode 8 × 8 character cell test failed	
507-xx	Video 40 × 25 mode test failed	
508-xx	Video 320 × 200 mode color set 0 test failed	
509-xx	Video 320 × 200 mode color set 1 test failed	
510-xx	Video 640 × 200 mode test failed	
511-xx	Video screen memory page test failed	
512-xx	Video gray scale test failed	
514-xx	Video white screen test failed	
516-xx	Video noise pattern test failed	
2402-xx	Video memory test failed	The following steps apply to error codes 2402-xx through 2456-xx: 1. Run the Configuration and Diagnostics Utilities. 2. Replace the display assembly and retest. 3. Replace the system board and retest.
2403-xx	Video attribute test failed	
2404-xx	Video character set test failed	
2405-xx	Video 80 × 25 mode 9 × 14 character cell test failed	
2406-xx	Video 80 × 25 mode 8 × 8 character cell test failed	
2408-xx	Video 320 × 200 mode color set 0 test failed	
2409-xx	Video 320 × 200 mode color set 1 test failed	
2410-xx	Video 640 × 200 mode test failed	
2411-xx	Video screen memory page test failed	
2412-xx	Video gray scale test failed	
2414-xx	Video white screen test failed	
2416-xx	Video noise pattern test failed	
2418-xx	ECG/VGC memory test failed	
2419-xx	ECG/VGC ROM checksum test failed	1. Run the Configuration and Diagnostics Utilities. 2. Disconnect external monitor and test with internal LCD display. 3. Replace the display assembly and retest. 4. Replace the system board and retest.
2421-xx	ECG/VGC 640 × 200 graphics mode test failed	
2422-xx	ECG/VGC 640 × 350 16 color set test failed	
2423-xx	ECG/VGC 640 × 350 64 color set test failed	
2424-xx	ECG/VGC monochrome text mode test failed	
2425-xx	ECG/VGC monochrome graphics mode test failed	
2431-xx	640 × 480 graphics test failure	
2432-xx	320 × 200 graphics (256 color mode) test failure	
2448-xx	Advanced VGA Controller test failed	
2451-xx	132-column Advanced VGA test failed	
2456-xx	Advanced VGA 256 Color test failed	
2458-xx	Advanced VGA BitBLT test	The following step applies to error codes 2458-xx through 2480-xx: Replace the system board and retest.
2468-xx	Advanced VGA DAC test	
2477-xx	Advanced VGA data path test	
2478-xx	Advanced VGA BitBLT test	
2480-xx	Advanced VGA LineDraw test	
Audio Test Error Codes		
3206-xx	Audio System Internal Error	Replace the system board and retest.
TouchPad/Pointing Device Interface Test Error Codes		
8601-xx	Mouse test failed	1. Replace the TouchPad and retest. 2. Replace the system board and retest.
8602-xx	Interface test failed	
CD or DVD Drive Test Error Codes		
3301-xx	CD / DVD drive read test failed	1. Replace the CD / DVD and retest. 2. Verify that the speakers are connected. 3. Verify that drivers are loaded and properly installed. 4. Replace the CD / DVD drive and retest. 5. Replace the system board and retest.
3305-xx	CD / DVD drive seek test failed	
6600-xx	ID test failed	
6605-xx	Read test failed	
6608-xx	Controller test failed	
6623-xx	Random read test failed	

Troubleshooting Without Diagnostics

This section provides information about how to identify and correct some common hardware, memory, and software problems. It also explains several types of common messages that may be displayed on the screen. The following pages contain troubleshooting information on these topics:

Audio	Power	Hard drive
Memory	Diskette/Diskette drive	Keyboard/Numeric keypad
Battery/Battery gauge	Printer	Hardware Installation
PC Card	Display	
CD or DVD drive	Touch Pad	

Since symptoms can appear to be similar, carefully match the symptoms of the computer malfunction against the problem description in the Troubleshooting tables to avoid a misdiagnosis.

WARNING: To avoid a potential shock hazard during troubleshooting procedures, disconnect all power sources before removing the keyboard cover or the display bezel.

Before Replacing Parts

Verify that cables are connected properly to the suspected defective parts.

- Run Computer Setup after connecting external devices.
- Verify that all required device drivers are installed.
- Verify that all required changes have been made to the *CONFIG.SYS* file.
- Verify that all required changes have been made to the *AUTOEXEC.BAT* file.
- Verify that all printer drivers have been installed for each application.

Solving Minor Problems

Some minor problems and possible solutions are outlined in the following tables. If the problem appears related to a software application, check the documentation provided with the software.

Audio Battery pack Battery gauge CD/DVD drive Diskette/diskette drive Display
Hard drive

Hardware installation Keyboard Memory PC card Power Printer
Touchpad/pointing device

Audio Problems

Problem	Probable Cause	Solution(s)
Computer does not beep after the Power-On Self-Test (POST).	This is typical; it indicates successful completion of the Power-On Self-Test (POST).	No action is required.

Battery Pack and Battery Gauge Problems (see also Power Problems)

Problem	Probable Cause	Solution(s)
Computer won't turn on when battery pack is inserted and power cord is unplugged.	Battery pack is discharged.	1. Connect the computer to an external power source and charge the battery pack. 2. Replace the battery pack with a fully charged battery pack.
	Battery connectors may be bent or broken.	Check the battery connectors on the system board to verify they are evenly spaced and that they are not bent or broken.
Computer is beeping and battery LED icon is blinking.	Battery charge is low.	Immediately save any open file(s). Then either: • Connect the computer to an external power source to charge the battery pack, or • Turn off the computer or initiate Hibernation until you can find another power source or charge the battery pack.
Computer battery LED icon (front on the unit) blinks to indicate low battery condition, but computer does not beep.	Volume is turned down too low.	Adjust the volume.
Battery LED icon doesn't light and battery pack won't fast charge.	Battery pack is already charged.	No action is necessary.
	Battery pack was exposed to temperature extremes.	Allow time for the battery pack to return to room temperature.
	Battery pack is at end of its life.	Replace battery pack.
You have to set the date and time every time you turn on the computer.	RTC battery is dead.	Replace the RTC battery.
Battery pack is warm to the touch after charging.	Normal warming has occurred due to charging.	No action is required.
Battery pack operating time is far less than the documented average operating time.	Power management is turned off or disabled.	Enable power management in Computer Setup and in Windows Power Properties.
	An external device or PC Card is draining the battery.	Turn off or disconnect external devices when not using them.
	Battery pack has partially self-discharged.	Condition the battery pack by fully charging, fully discharging, then fully recharging it. To maintain the charge, leave battery packs in the computer when it is connected to external power. If the computer is disconnected from external power for more than two weeks, remove battery packs from the computer to reduce the discharge rate.
	Battery pack is being exposed to high temperatures or extremely cold temperatures.	Keep the battery pack within the recommended temperature ranges: Operating: 50° F to 104° F (10° C to 40° C) Storage: -4° F to 86° F (-20° C to 30° C) Recharge the battery pack.

CD/DVD Drive Problems

Problem	Probable Cause	Solution(s)
CD / DVD drive cannot read a compact disc.	Compact disc is upside down or is improperly inserted in the CD / DVD drive.	Open the CD / DVD loading tray, lay the compact disc in it (label side up), then close the tray.
	Trying to read a CD Plus or Pregap/Track 0 type disc with a 24x CD-ROM drive.	None - these types of CD are unreadable with this drive.

Diskette and Diskette Drive Problems

Problem	Probable Cause	Solution(s)
Diskette drive cannot write to a diskette.	Diskette is write-protected.	Disable the diskette's write-protect feature or use a diskette that is not write-protected.
	Computer is writing to the wrong drive.	Check the drive letter in the path statement.
	Not enough space is left on the diskette.	Use another diskette.
	Drive error has occurred.	Run Computer Checkup from the Compaq Diagnostics diskette.
	Diskette is not formatted.	Format the diskette. At the system prompt, enter FORMAT A:
Diskette drive cannot read a diskette.	The wrong type of diskette is being used.	Use the type of diskette required by the drive.
	Diskette has a bad sector.	Copy files to hard drive or another diskette. Reformat bad floppy.
	Drive error has occurred.	Run Computer Checkup from the Compaq Diagnostics diskette.
	Diskette is not formatted.	Format the diskette. At the system prompt, enter FORMAT A:
Cannot boot from diskette.	Bootable diskette is not in drive A.	Put the bootable diskette in drive A.
	Diskette Boot has incorrect setting in Computer Setup.	Run Computer Setup and set diskette as first to boot.

Solving Minor Problems (continued)

Audio Battery pack Battery gauge CD/DVD drive Diskette/diskette drive Display Hard drive
Hardware installation Keyboard Memory PC card Power Printer Touchpad/pointing device

Display Problems

You can perform a self-test on an external VGA color or monochrome monitor as follows:

1. *Turn off the monitor.*
2. *Turn off the computer.*
3. *Disconnect the monitor signal cable from the computer.*
4. *Turn on the monitor and allow it to warm up for one minute.*

The display should be white. A narrow black border may also appear on the left and right sides of the display. Either of these displays indicates that the monitor is working properly.

Problem	Probable Cause	Solution(s)
Screen is dim.	Control for brightness or contrast (if applicable) is not set properly.	Adjust the Brightness of the display by using **Fn** + **F7** (¯) or **Fn** + **F8** (-). Adjust the Contrast of the display by using **Fn** + **F5** (¯) or **Fn** + **F6** (-). See other entries in this table if these adjustments do not work.
	Computer screen is in direct light.	Tilt display or move computer.
Screen is blank.	Screen save was initiated by Power Management due to lack of user activity.	Press any key or touch the Touch Pad.
	Display has overheated.	If computer is in direct sunlight, move it and allow it to cool off.
Display is blank and the Suspend icon is flashing.	System is in Suspend mode.	Press any key or touch the Touch Pad.
Internal display is blank and the screen on an external monitor displays information.	Display function was switched to the external monitor.	Use **Fn** + **F2** to switch between **LCD** or **CRT.**
Internal display flashes or has garbled characters when computer is connected to external monitor.	Using 1024 × 768 or higher resolution on external monitor and have toggled back to internal display, which supports up to 800 × 600.	Restart the computer.
This display panel has a continuous pattern across it (e.g., a "jailbars" pattern), has a single color on it, or has garbled graphics across the entire panel. This failure is for patterns across the entire panel (not just on one section).	Improper display cable connections.	Reseat the display cable to the following until the problem is solved: 1. System board 2. Display assembly
	Defective display cable.	Replace the display assembly.
	Defective inverter board.	Replace the display assembly.
	Defective system board.	Replace the system board.
Ghost bars extending from graphics on the display.	Common characteristic of STN displays.	1. Change the background colors. 2. Adjust the Contrast of the display by using **Fn** + **F5** (¯) or **Fn** + **F6** (-).
A single line, small group of lines, or block appears on the display panel. This failure occurs in only a section of the display panel.	Defective display panel.	Replace the display assembly.
The light tubes on the edge of the display panel do not light up at all and Power-On Self-Test (POST) completes when the unit is powered up.*	Improper backlight or display cable connections	Replace the display assembly.
	Defective inverter board.	Replace the display assembly.
	Defective display cable.	Replace the display assembly.
	Defective display panel.	Replace the display assembly.
	Defective system board.	Replace the system board.
The light tubes on the edge of the display panel do not light up at all and Power-On Self-Test (POST) does ***not*** complete when the unit is powered up.*	Defective system board.	Replace the system board.
Backlight (brightness) cannot be adjusted with **Fn** + **F7** (¯) or **Fn** + **F8** (-).*	Improper display cable connections.	1. Reseat the display cable to the system board. 2. Replace the display assembly.
	Defective inverter board.	Replace the display assembly.
	Defective display cable.	Replace the display assembly.
	Defective system board.	Replace the system board.
Contrast cannot be adjusted with **Fn** + **F5** (¯) or **Fn** + **F6** (-).	Improper display cable connections.	1. Reseat the display cable to the system board. 2. Replace the display assembly.
	Defective inverter board.	Replace the display assembly.
	Defective display cable.	Replace the display assembly.
	Defective system board.	Replace the system board.

***** This problem indicates that the backlight or its power circuitry has failed. Since you cannot observe the POST result on the display panel when the backlight is not functioning, connect the unit to an external monitor before powering the unit up. If an external monitor is not available, verify that POST completes by opening and closing the display, listening for the single or double beep, and watching for the LEDs turn on at the front of the computer.

Hard Drive Problems

CAUTION: To prevent loss of information, always maintain an up-to-date backup of your hard drive at all times, in case of errors or failures.

Problem	Probable Cause	Solution(s)
Reading hard drive takes an unusually long time after restarting the computer.	System entered Hibernation due to low battery condition and is now exiting from it.	Give the system time to restore the previously saved data to its exact state before Hibernation.
Hard drive error occurs.	Hard drive has bad sectors or has failed.	Run Computer Checkup.
Hard drive does not work.	Hard drive is not seated properly.	Turn off and unplug the computer, remove the battery pack, and remove and then reinstall the hard drive.

Hardware Installation Problems

Problem	Probable Cause	Solutions(s)
A new device is not recognized as part of the computer system.	Cable(s) of new external device are loose or power cables are unplugged.	Ensure that all cables are properly and securely connected.
	Power switch of new external device is not turned on.	Turn off the computer, turn on the external device, then turn on the computer to integrate the device with the computer system.
	Device is not seated properly.	Turn off the computer and reinsert the device.

Keyboard/Numeric Keypad Problems

Problem	Probable Cause	Solution(s)
Embedded numeric keypad on computer keyboard is disabled.	Num Lock function is not enabled.	Press the **Shift**+**NumLk** keys to enable the Num Lock function and embedded numeric keypad. The Num Lock icon on the status panel turns on.
Embedded numeric keypad is disabled and Num Lock function is on.	External numeric keypad is connected to the computer.	Disconnect the external numeric keypad from the computer.

Memory Problems

Problem	Probable Cause	Solution(s)
Memory count during Power-On Self-Test (POST) is incorrect.	Optional memory expansion card is installed incorrectly, is incompatible with the computer, or is defective.	Ensure that the optional memory expansion card is installed correctly.
"Out of Memory" message is displayed on the screen or insufficient memory error occurs during operation.	System ran out of memory for the application.	1. Check the application documentation for memory requirements. 2. Install additional memory.
	Too many TSR (terminate-and stay-resident) applications are running.	Remove from memory any TSR applications that you do not need.

Solving Minor Problems (continued)

Audio Battery pack Battery gauge CD/DVD drive Diskette/diskette drive
Display Hard drive

Hardware installation Keyboard Memory PC card Power Printer
Touchpad/pointing device

PC Card Problems

Problem	Probable Cause	Solution(s)
When turned on, the computer does not beep when a PC Card is inserted.	Card is not inserted properly. PC Card beeps are disabled.	Ensure the card is inserted in the correct orientation. Double-click the PC Card icon in the Control Panel, click the **Global Settings** tab, the enable PC Card sound effects.
	Speaker is turned off or volume is turned down.	Press **volume buttons** to turn the speaker on, then increase the volume.
	PC Card drivers are not installed.	Double click the **Add New Hardware** icon in the Control Panel for installation instructions. If PC Card or drivers are not compatible with Windows, install drivers and use the PC Card in MS-DOS mode.
	Card or card driver is not supported.	Contact your Compaq authorized service provider for a list of PC Cards tested successfully in Compaq PC Card platforms.
PC Card modem, fax, or network card does not work.	Card is not fully inserted into the slot or is not inserted properly.	Ensure the card is inserted in the correct orientation.
	Telephone cord is not plugged in all the way.	Check and secure telephone connection.
	Necessary drivers are not installed (turned on).	Install drivers.
PC Card modem or fax card does not work.	You are trying to access the card using the wrong COM port.	See Specifications to verify COM port.
	The card conflicts with a serial device.	See Specifications to verify address.
	The card is not supported.	Use supported cards only.
Modem network PC Card does not work.	Network driver is not installed or is not set up properly.	Install driver.
	Telephone cord is not properly connected.	Verify telephone connection.
Memory or storage card does not work.	SRAM and flash memory cards require the memory card driver to be loaded (turned on). Flash memory cards require the Microsoft FlashFile System to be loaded. Hard drives on flash mass storage cards require the PC Card ATA driver to be loaded.	Install driver.
	You are trying to access the hard drive card using the wrong drive letter.	Double-click **My Computer** to verify the drive letter assigned to the card.
	The card is not supported.	Contact your Compaq authorized service provider for a list of PC Cards tested successfully in Compaq PC Card platforms.

Power Problems (see also Battery and Battery Gauge Problems)

Problem	Probable Cause	Solution(s)
Computer won't turn on and battery pack is not inserted.	Computer is not connected to a power source.	Insert battery or connect an external power source.
	Power cords to the external power source are unplugged.	Ensure that power cords connecting the computer and the external power source are plugged in properly.
	Power adapter is defective.	Replace AC Adapter and restart.
Computer turned off while it was left unattended and the power icon is off.	System board is defective.	Replace the system board.
	System initiated Hibernation due to a critical low-battery condition.	Replace the battery pack with a fully charged battery pack or connect the computer to an external power source. Then turn on the computer.
	System initiated Hibernation after a preset timeout.	Turn on the computer.

Printer Problems

If you experience problems printing, run a printer self-test (refer to the documentation provided with your printer for instructions). If the self-test fails, it is a printer-specific problem. Also refer to the printing section of your application documentation.

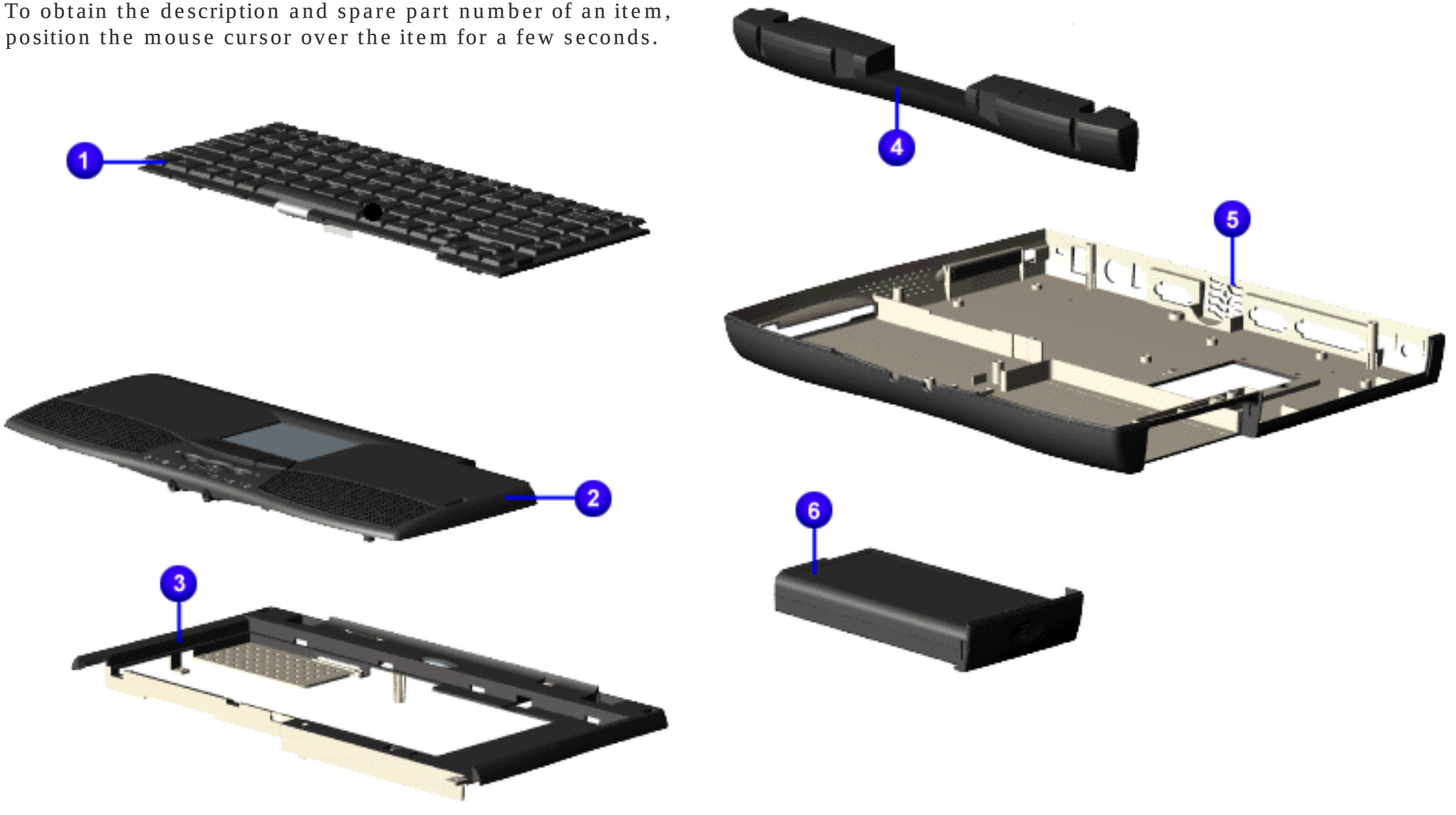
Problem	Probable Cause	Solution(s)
Printer will not turn on.	The signal cable may not be connected properly, or the printer is unplugged.	Ensure that the signal cable is properly connected and that the power cord is connected to the electrical outlet.
Printer will not print.	Printer is not turned on or is off line.	Turn the printer on and set it to on line.
	The device drivers for your application are not installed.	Refer to the printer documentation to install the correct printer driver.
	Printer that is set up for a network is not connected to the network.	Connect the printer to the network.
	Printer cable is too long, unshielded, or defective.	Replace the cable.
	Paper tray is empty.	Fill the paper tray with paper and set the printer to online.
Printer prints garbled information.	Correct printer drivers are not installed.	Refer to the printer documentation to install the correct printer driver.
	Cable is not connected properly.	Ensure that the printer signal cable is properly connected to the computer.
	Cable is defective.	Replace the printer cable and retest.

Touch Pad/Pointing Device Problems

Problem	Cause	Solution(s)
Touch Pad or mouse does not work.	Incorrect or no device driver is installed.	Install the device driver and add to the AUTOEXEC.BAT file or CONFIG.SYS file.
	The device driver is not installed in Windows.	Install the Touch Pad/mouse driver in Windows.
External mouse does not work.	Mouse is not securely connected or is connected to an incorrect external connector.	Ensure that the mouse is securely connected to the appropriate external connector.
Touch Pad or mouse does not work even though the device is enabled in Windows.	Mouse is not enabled.	1. Enter MOUSE at the system prompt to activate the mouse device driver. 2. Add a line in the AUTOEXEC.BAT file to automatically activate the mouse device driver each time computer is turned on or restarted.
	Cable not properly seated in Touch Pad board.	Reseat cable.
	Defective Touch Pad board.	Replace Touch Pad board.
	Defective system board.	Replace system board.
	Device driver is not correctly installed in Windows.	Install the appropriate device driver in Windows.
Cursor skips or moves abnormally when using the Touch Pad.	The Touch Pad needs to be cleaned.	Clean the Touch Pad with a cloth dampened with alcohol or an ammonia-based glass cleaner. Wipe up liquid with a dry cloth.

Illustrated Parts Catalog

To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.

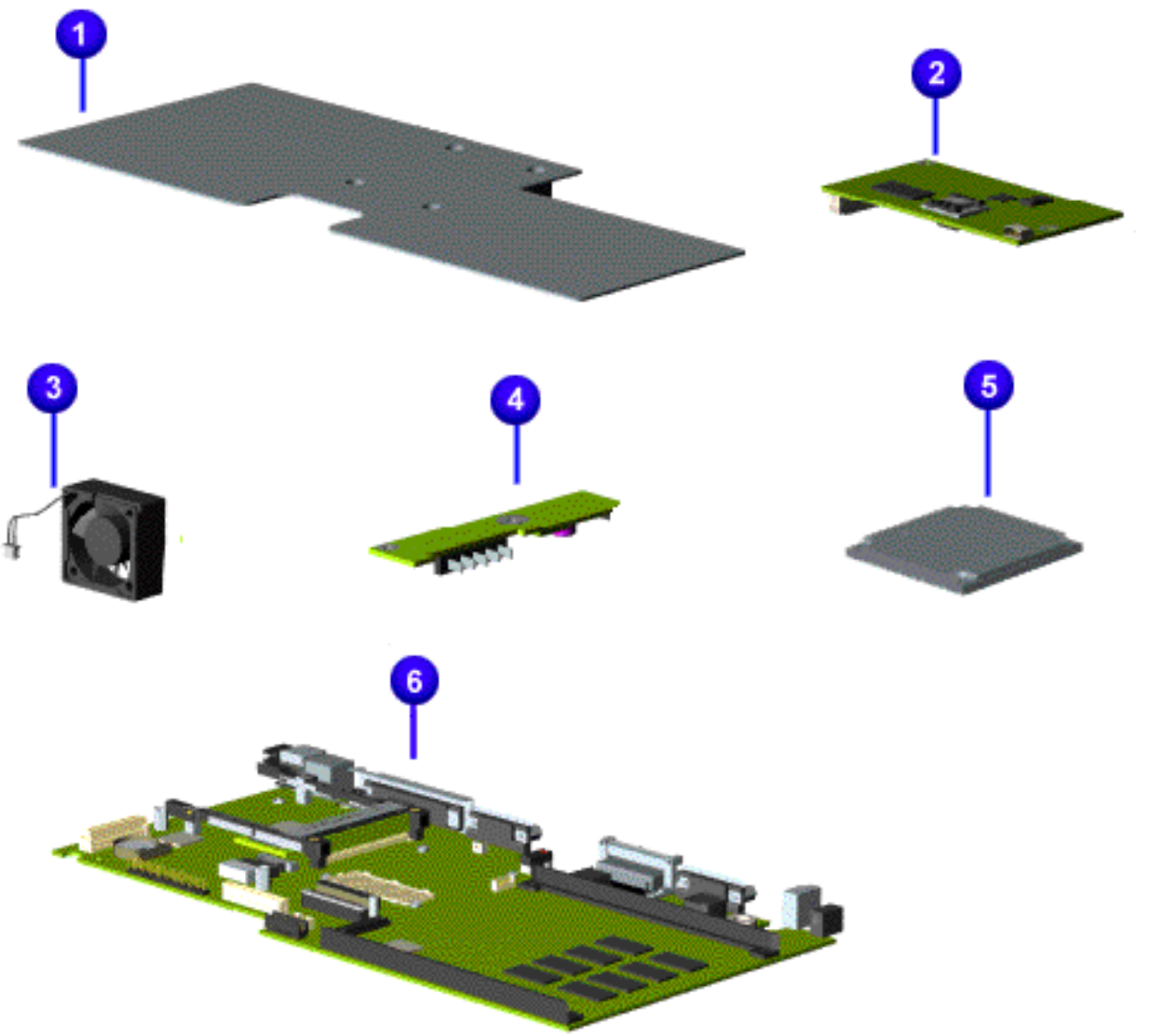


Illustrated Parts Catalog

- System Unit
- Boards
- Display Assembly
- Mass Storage Devices
- Miscellaneous Cable Kit
- External Cables
- Miscellaneous Hardware and Plastics Kit
- Miscellaneous Parts
- Documentation and Software

To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.

Not shown: 128-MB SODIMM Memory 388646-001



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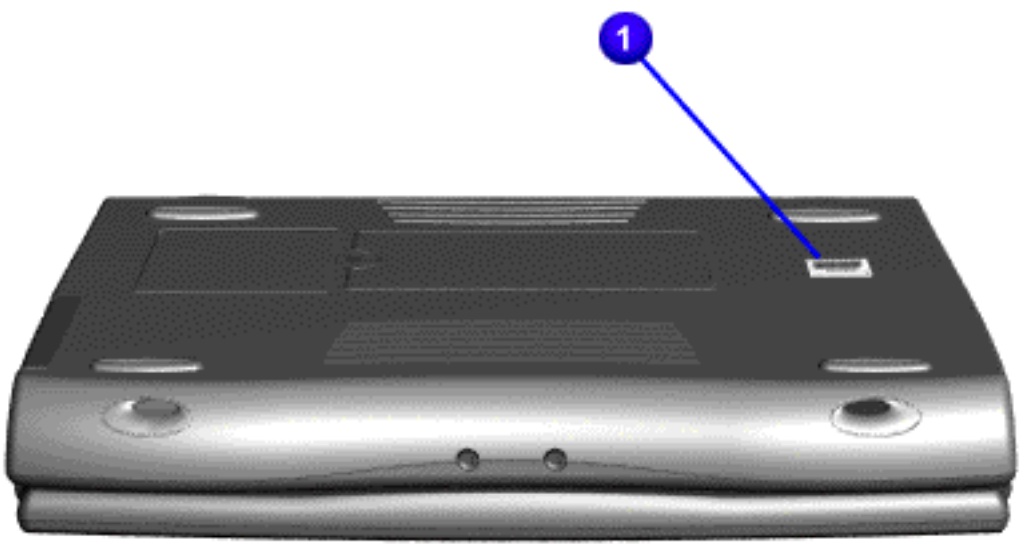
Illustrated Parts Catalog

To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.

Removal and Replacement Procedures

This section explains the removal and replacement procedures for the computer.

Serial Number Location



Report the computer serial number to Compaq when requesting information or ordering spare parts.

Electrostatic Discharge

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 (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Although, it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

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.

Generating Static

The table shows how different activities generate static electricity and at different electrostatic voltage levels.

Typical Electrostatic Voltages			
	Relative Humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tubes	2,000 V	700 V	400 V
Removing DIPS from vinyl trays	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 PCBs	26,000 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V
NOTE: 700 volts can degrade a product.			

Return to Removal & Replacement Procedures

Service Considerations

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

Tool and Software Requirements

To service the computer, you need the following:

- Compaq screwdriver kit (Spare Part No. 161946-001)
- Torx T-9 screwdriver
- 3/16-inch and 5mm nut drivers (for screwlocks and standoffs)
- Small, standard screwdriver
- Small, Phillips screwdriver
- Diagnostics software

Screws

The screws used in the computer are not interchangeable. If an incorrect screw is used during the reassembly process, it can damage the unit. Compaq strongly recommends that all screws removed during disassembly be kept with the part that was removed, then returned to their proper locations.

IMPORTANT: As each subassembly is removed from the computer, it should be placed away from the work area to prevent damage.

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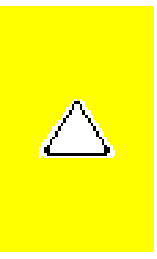
Cables and Connectors

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

Cables

Use the following precautions when handling cables to avoid damage to the cable or computer:

- Always handle cables by their connectors.
- Avoid bending, twisting, or pulling on the cables.
- Apply minimum required force when seating or unseating the cables from their connectors.
- Place the cables in such a manner that they cannot be caught or snagged by parts being removed or replaced.
- Handle flex cables with extreme care; they can tear easily.



CAUTION: When servicing these computers, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can cause severe damage to the unit.

Select the desired illustration.

Removing a cable from a **ZIF Connector**.

The ribbon cable position for the **hard drive**.

The ribbon cable position for the **DVD drive.**

The ribbon cable position for the **diskette drive**.

The cable position for the **speaker assembly.**

Plastic Parts

Plastic parts can be damaged by the use of excessive force during disassembly and reassembly. When handling the plastic parts, use care. Apply pressure only at the points designated in the maintenance instructions.

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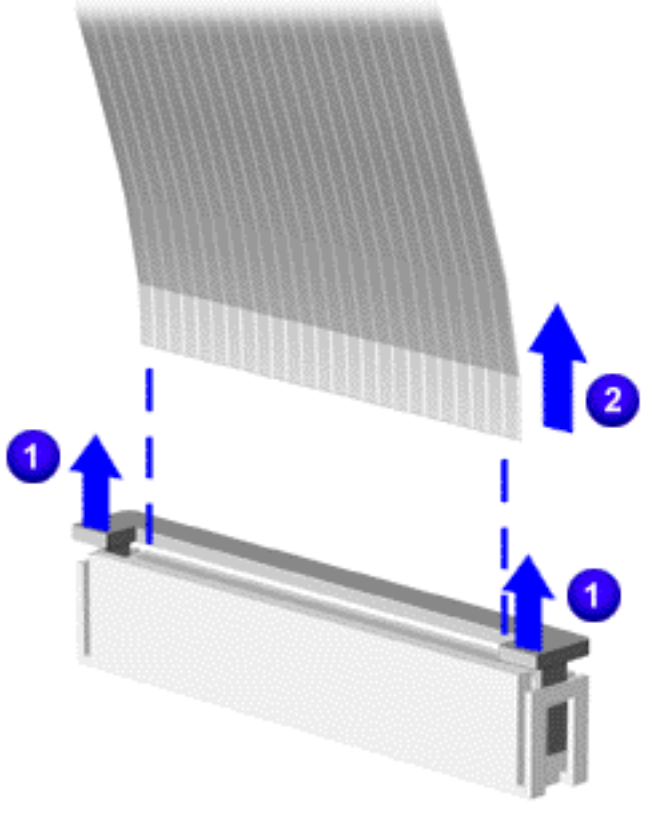


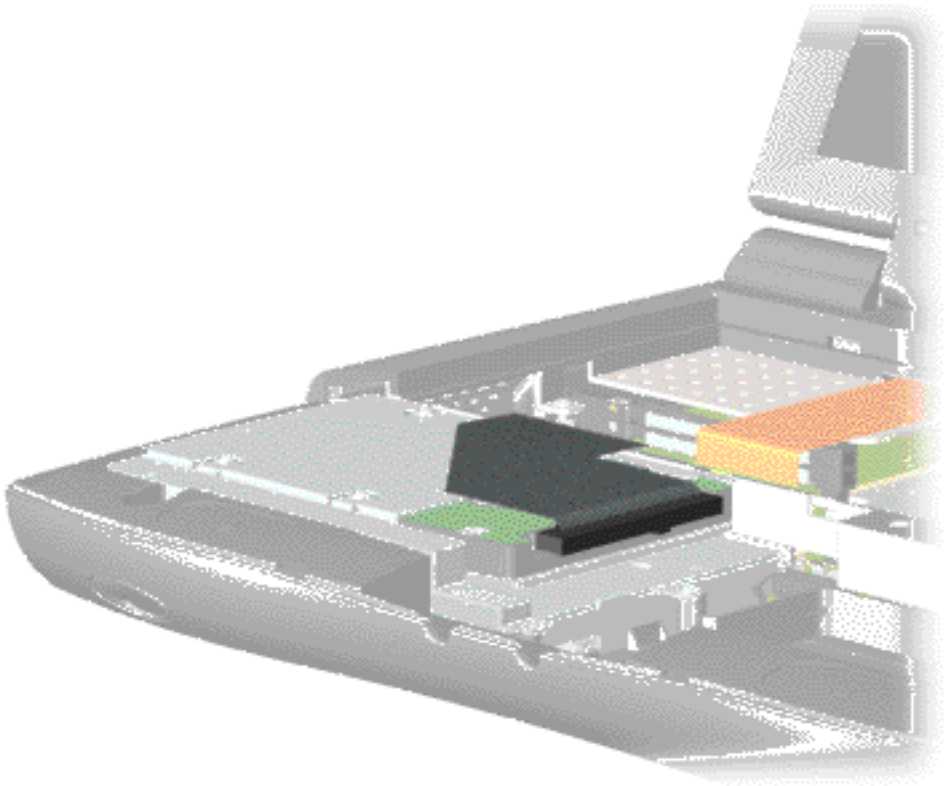
ZIF Connectors

The computer uses a zero insertion force (ZIF) connector for several cable connections on the system board. To remove a ZIF cable from its connector, pull both ends of the ZIF cable guide clasp out of the sleeve about 0.05 - 0.1" (1 - 2 mm) 1, then gently slide the cable out 2.

CAUTION: A ZIF connector and its attached cable can be easily damaged. Never pull or twist on the cable while it is connected.

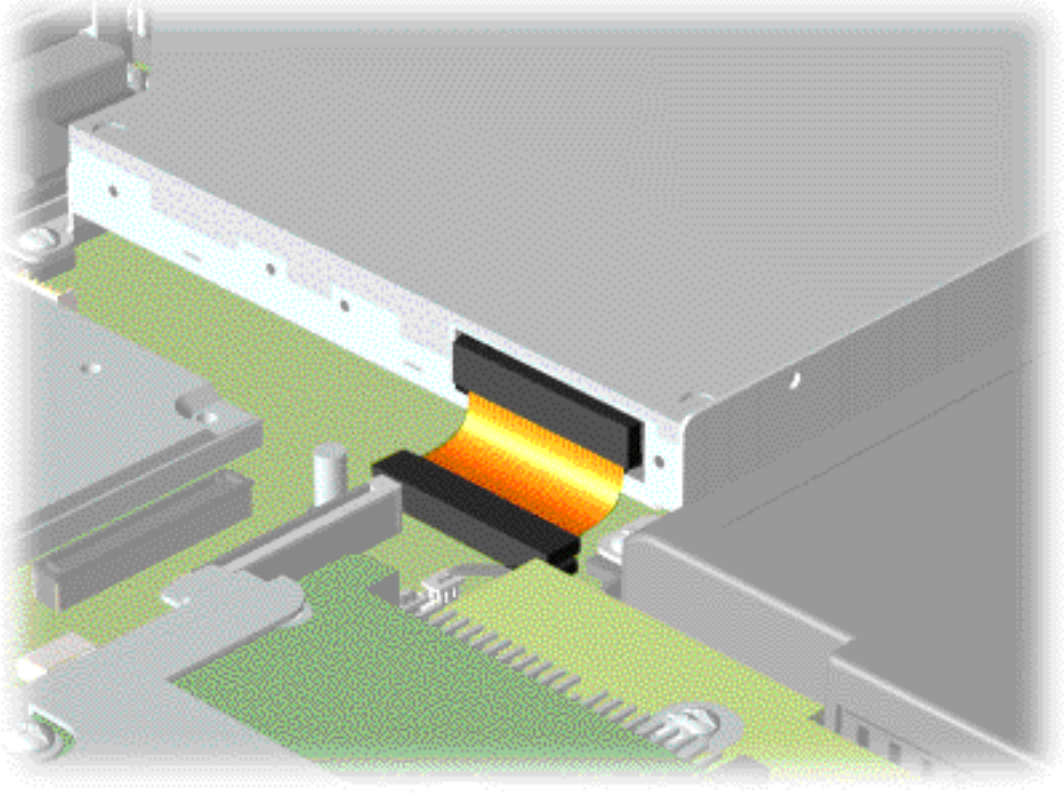
CAUTION: Ensure that cables are replaced in their proper location. Improper cable placement can damage the computer.

Back to **Cables and Connectors**.



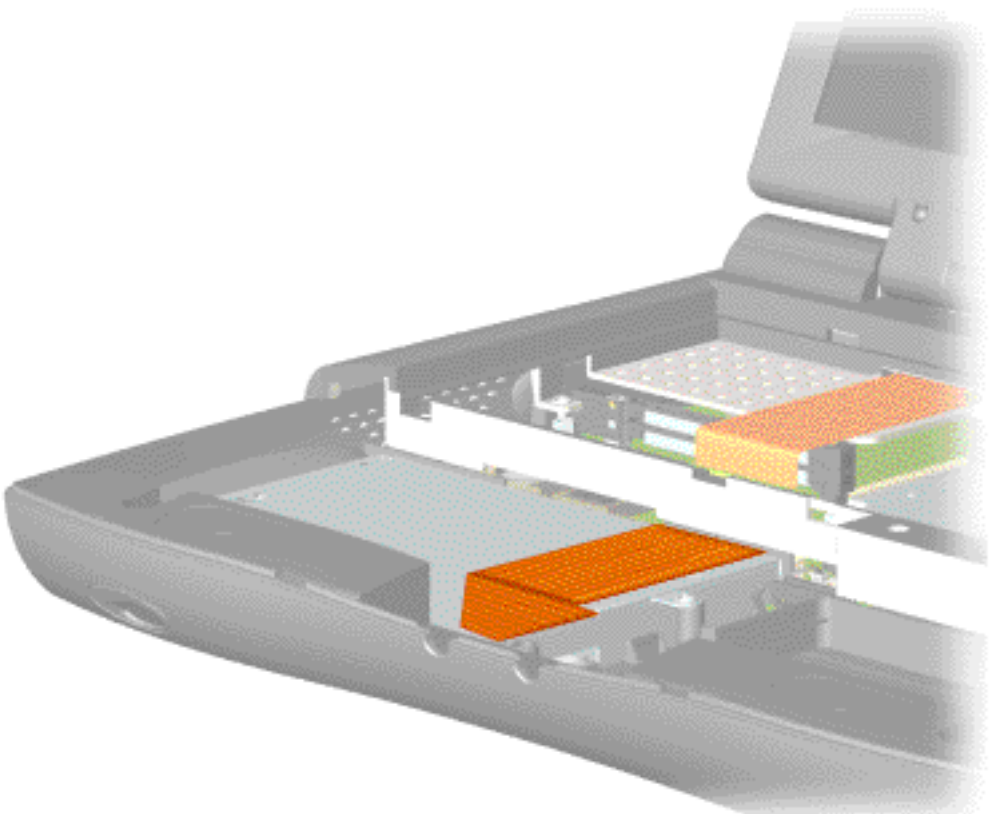
The ribbon cable position for the hard drive.

Back to Cables and Connectors.



The ribbon cable position for the DVD drive.

Back to Cables and Connectors.



The ribbon cable position for the diskette drive.

Back to **Cables and Connectors**.

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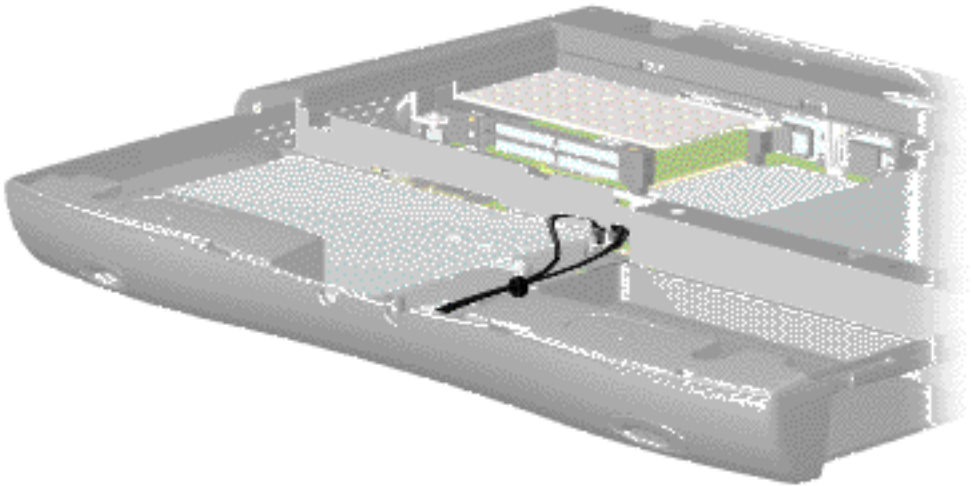


The cable position for the speaker assembly.

Back to Cables and Connectors.

Preparing the Computer for Disassembly

Before removing or replacing any components, the following procedures ***must*** be completed:

1. Disconnect AC power and any external devices.

2. Remove the battery pack.

3. Remove any PC Cards.

WARNING: Metal objects can damage the battery pack as well as the battery contacts in the battery compartment. To prevent damage, do not allow metal objects to touch the battery contacts. Place only the battery pack for the Compaq Presario 1660 Model Portable Computers into the battery compartment. Do not force the battery pack into the bay if insertion does not occur easily.

CAUTION: Do not crush, puncture, or incinerate the battery pack. Do not open a battery pack, as this damages the pack, makes it unusable, and exposes potentially harmful battery components. There are no field-serviceable parts located inside the battery pack.

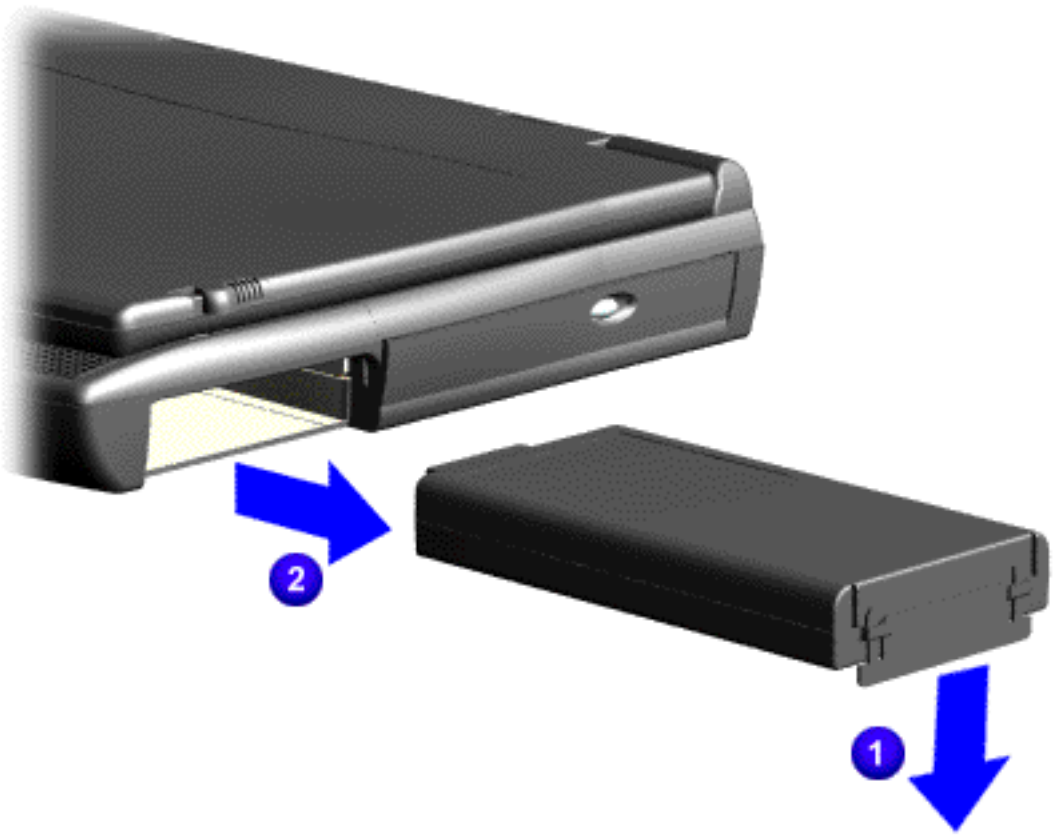
NOTE: The Compaq Presario 1660 Model Portable Computers have several screws of various sizes which are **not** interchangeable. Care must be taken during reassembly to ensure that the correct screws are used in their correct location. During removal please keep respective screws with their associated sub-assembly.

Removing the Battery Pack

To remove the battery pack, complete the following steps:

1. Slide the battery pack compartment door down and remove it from the battery pack.

Next Step

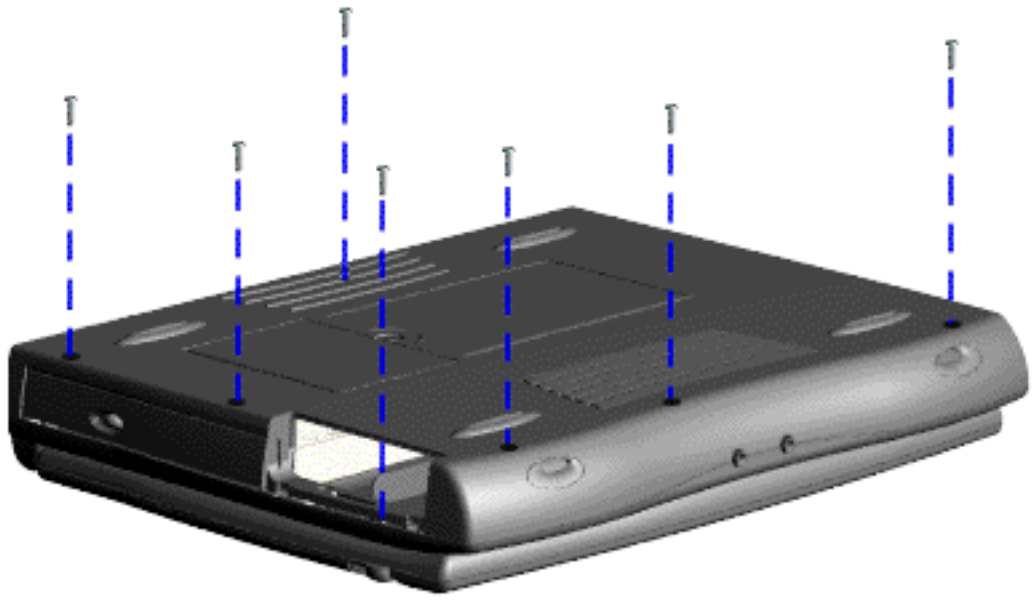


2. Pull down the battery pack tab 1 and slide the battery pack out 2 from the chassis.

To replace the battery pack, reverse the previous steps.

Return to Removal & Replacement Procedures

Removing the Palmrest Assembly



The Palmrest Assembly must be removed to gain access to any of the interior components of the computer, and it is the first component that has to be removed to gain access to the interior components.

To remove the Palmrest Assembly, complete the following steps:

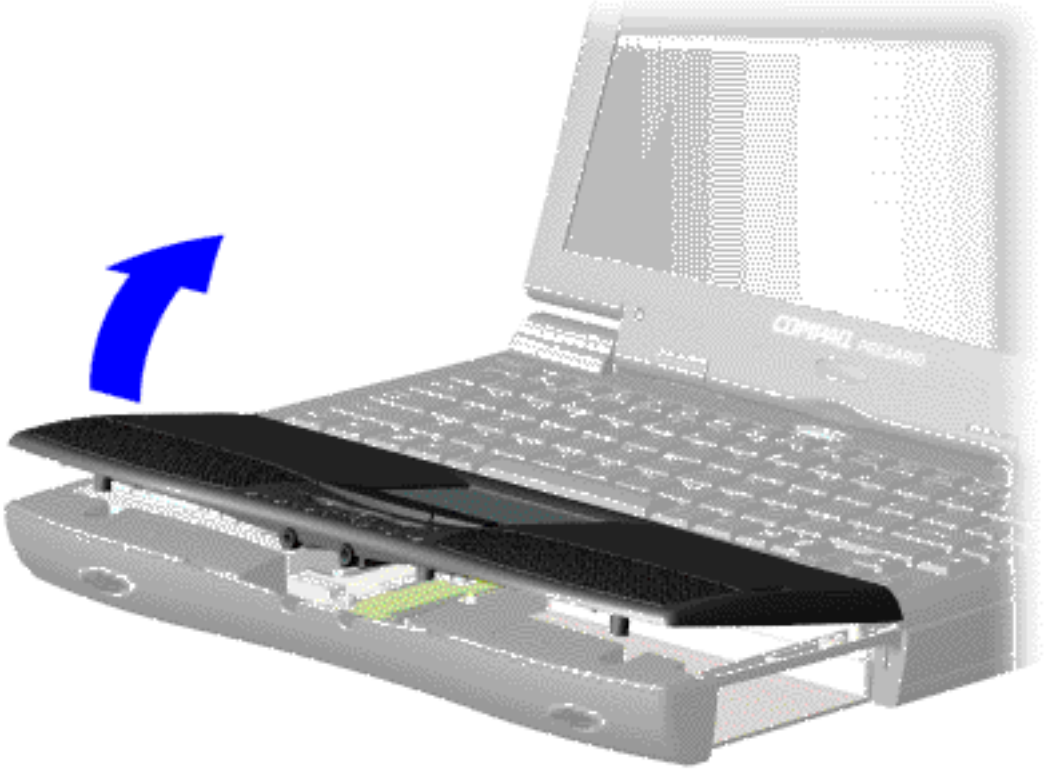
1. Prepare the computer for disassembly.

2. Close the computer and turn it upside down.

3. Remove seven screws from the bottom of the computer.

Next Step

Removing the Palmrest Assembly (continued)

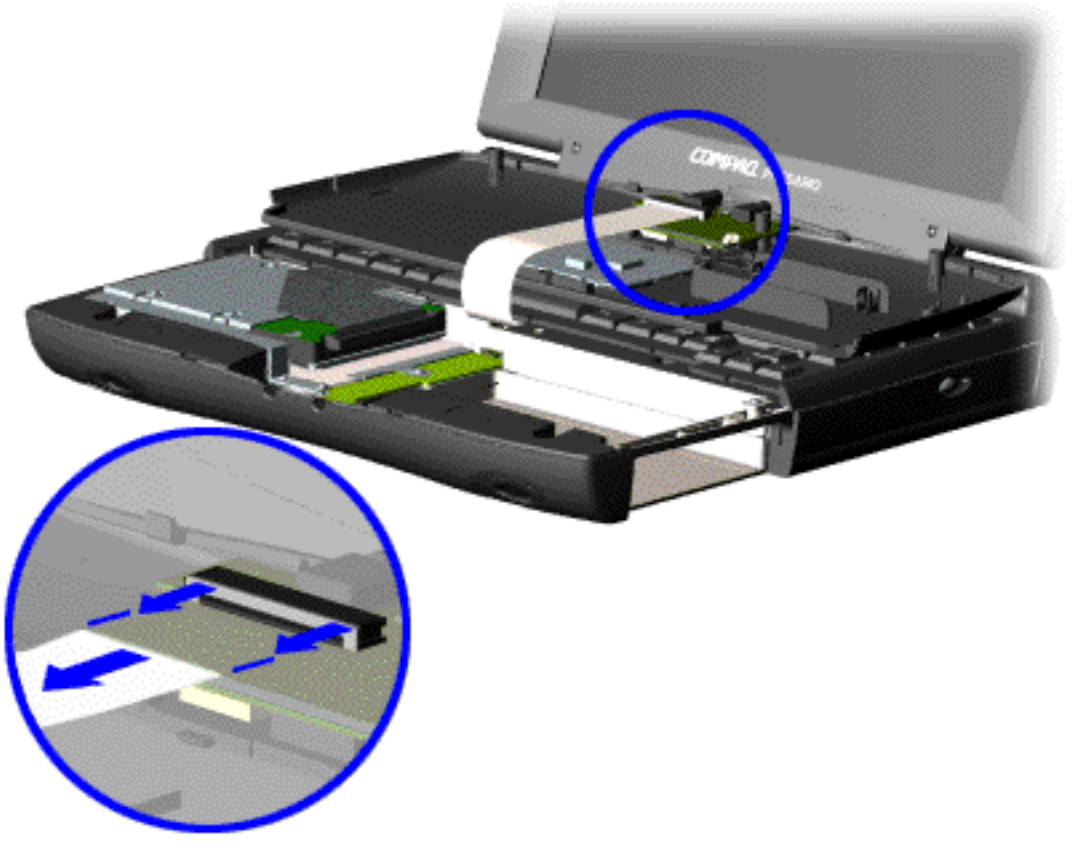


4. Turn the computer over (right side up) and open the unit.

5. Lift up front end of the Palmrest Assembly and place it upside down on the keyboard.

Next step

Removing the Palmrest Assembly (continued)



6. Disconnect the flex cable from the LIF connector on the palmrest cover.

End of procedure.

CAUTION: When replacing the Palmrest Assembly, ensure that the cable is fully inserted into the LIF connector on the system board. If the metal end should come in contact with the keyboard, damage may occur to the computer.

To replace the Palmrest Assembly, reverse the previous steps.

NOTE: When replacing the palm rest cover, ensure the cable is properly routed through the slot on the Upper CPU cover.

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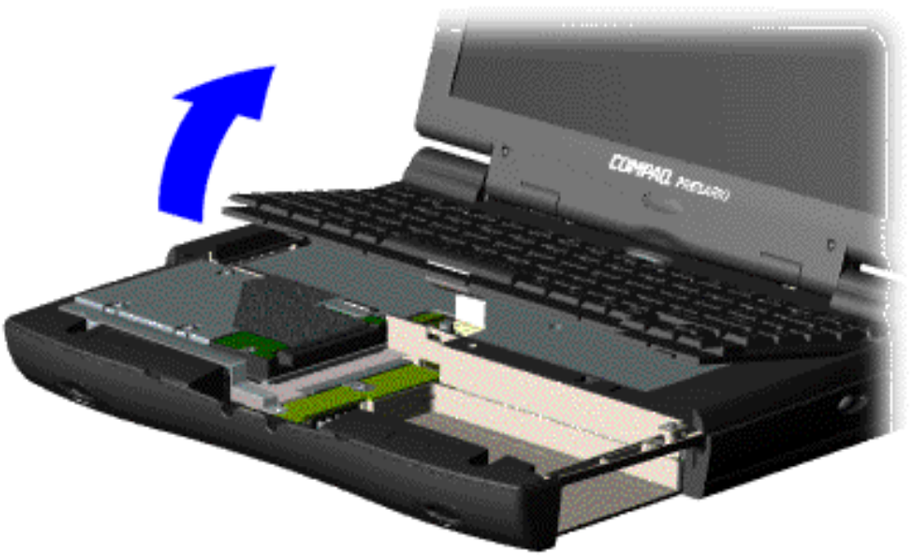
Removing the Keyboard and Heatspreader



The keyboard and heatspreader are best removed together.

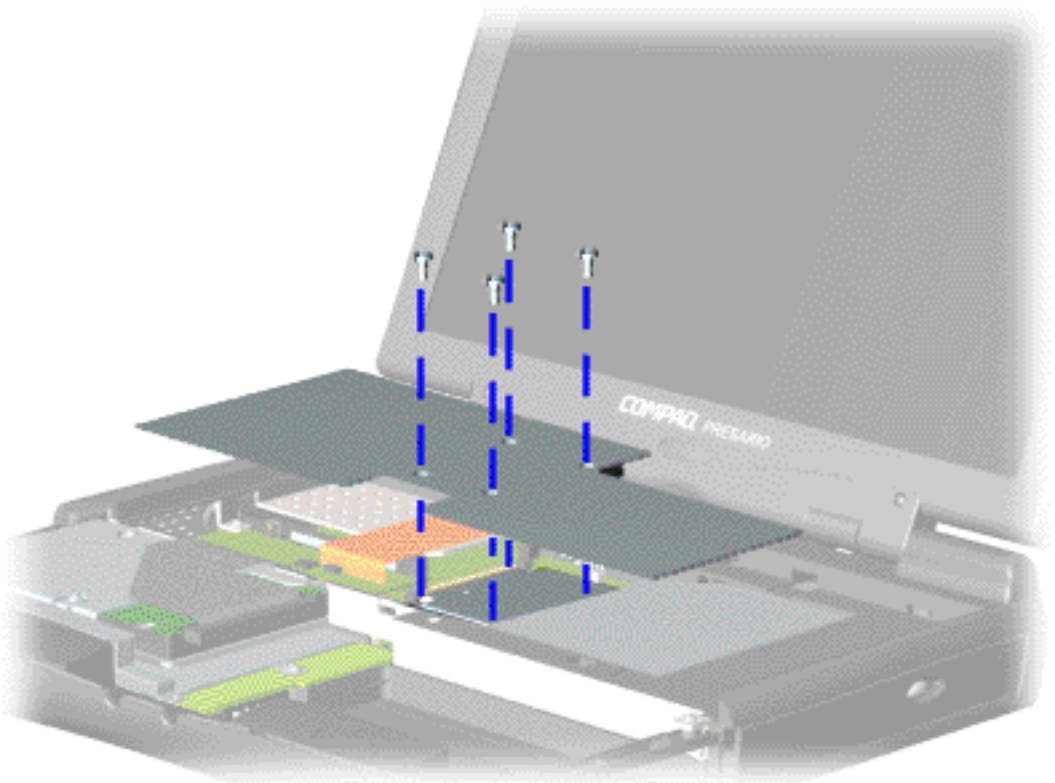
1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Lift up the front of the keyboard and place the keyboard upside-down in the palmrest cavity.

Next Step

Removing the Keyboard and Heatspreader (continued)

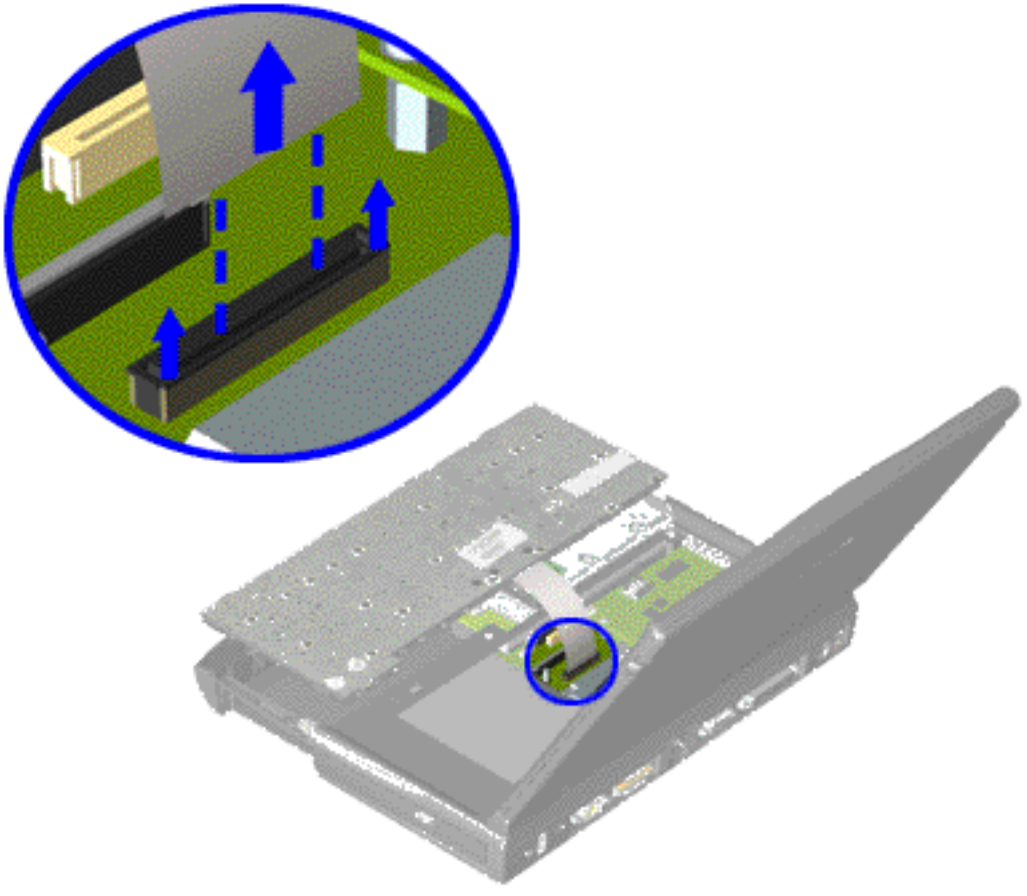


4. Remove the four screws from the heatspreader and lift it out of the chassis.

NOTE The keyboard may be placed upside-down in the palmrest socket while removing the heatspreader. In this picture, the keyboard is left out for clarity.

Next step

Removing the Keyboard and Heatspreader (continued)

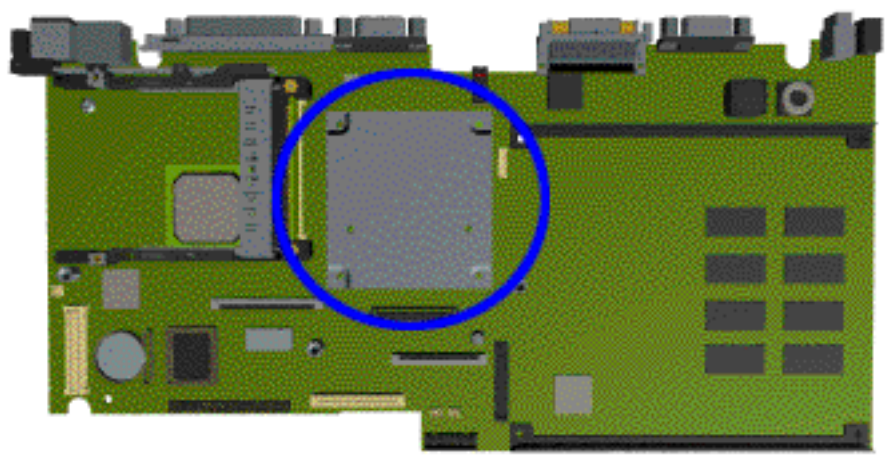


5. Disconnect the flex cable from the ZIF connector on the system board by pulling out the lip of the cable lock about 1 or 2 mm at each end, then removing the cable.

To replace the keyboard and heatspreader, reverse the previous steps.

Return to Removal & Replacement Procedures

Removing the Processor



To remove the processor, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Rock the processor back and forth just a little until it comes out of the processor chassis slot.

To reinsert the processor:

Align the screw holes (on the processor) nearest the speakers with the corresponding screw sockets on the system board, then push the processor in carefully but firmly.

CAUTION: If the processor is not correctly aligned with the socket, the connectors on either the processor or the system board will be bent out of alignment. The processor or board will then be destroyed, and will need to be replaced.

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Removing the Hard Drive

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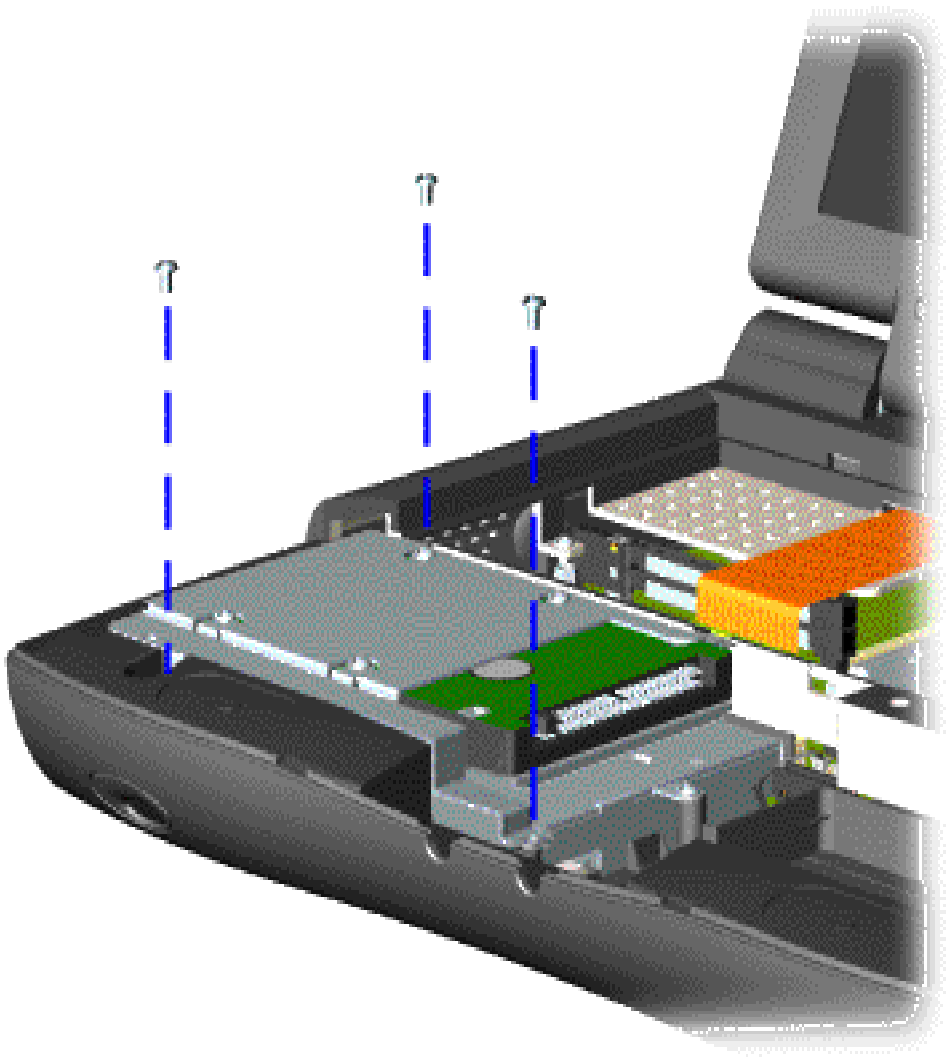
Diskette Drive
Fan Assembly
System Board
Memory Module



To remove the hard drive, complete the following steps:

1. Prepare the computer for disassembly.

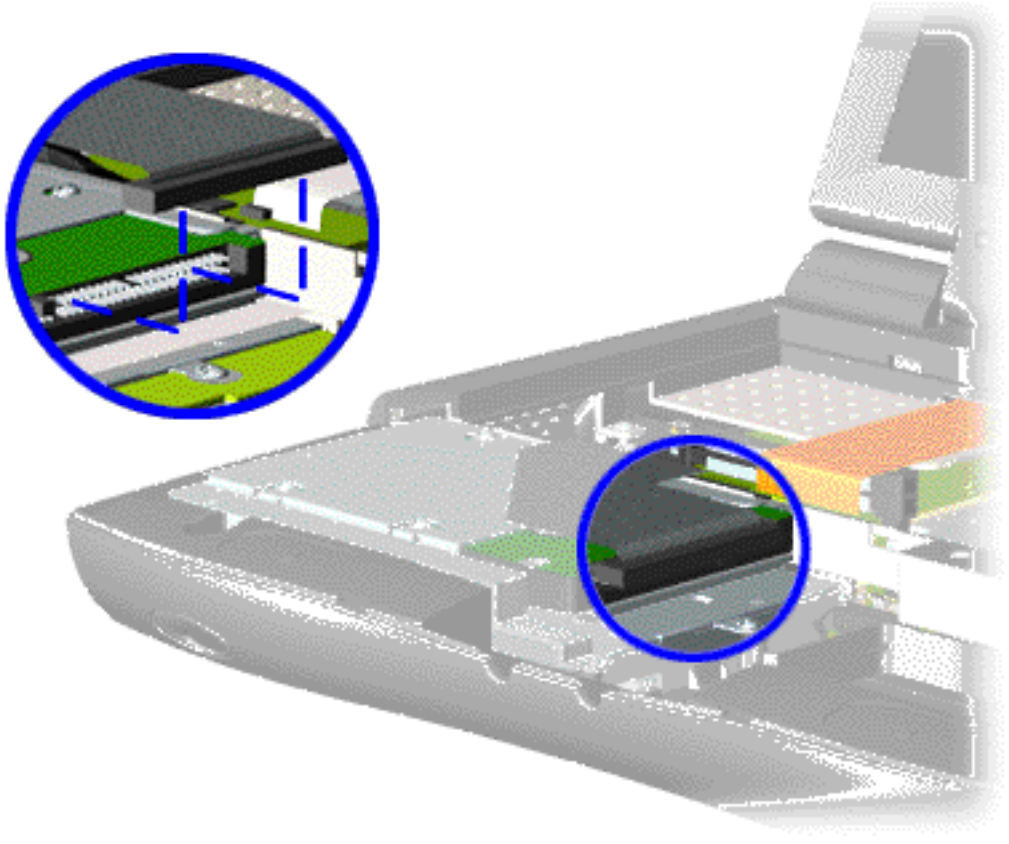
2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

4. Remove two screws from the hard drive mounting bracket and lift up the hard drive.

Next Step

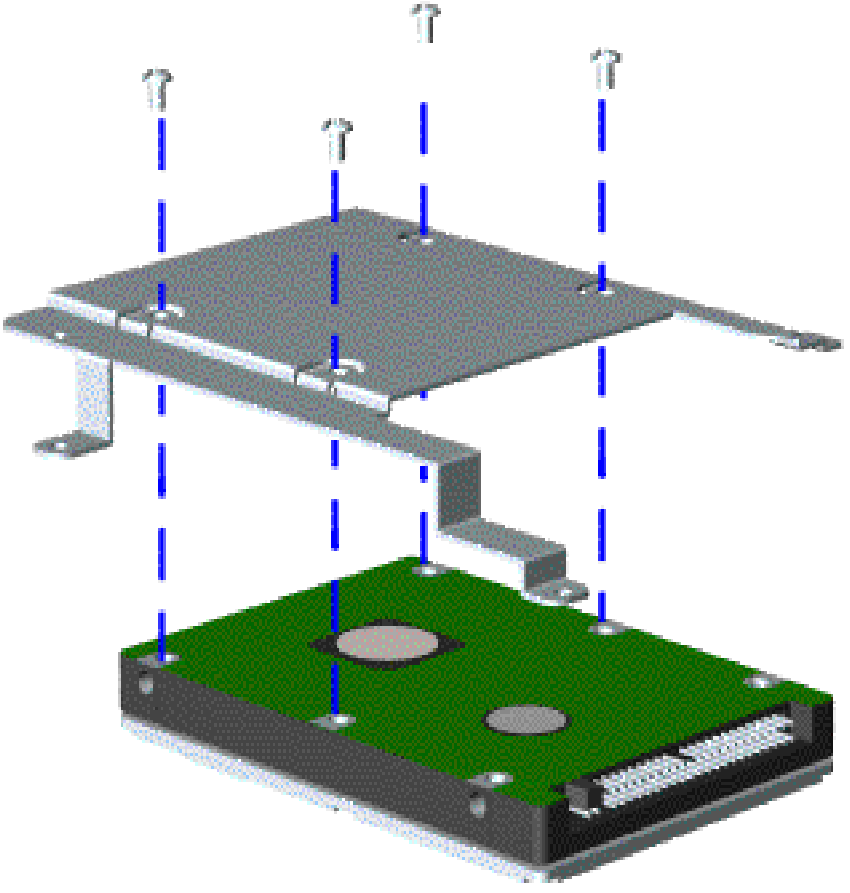
Removing the Hard Drive (continued)



5. Disconnect the hard drive data cable from the hard drive and remove the hard drive from the unit.

Removing the mounting bracket

Removing the Hard Drive (continued)



To remove the hard drive mounting bracket, remove the screw from each corner.

To replace the hard drive and hard drive mounting bracket, reverse the previous steps.

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Removing the Upper CPU Cover

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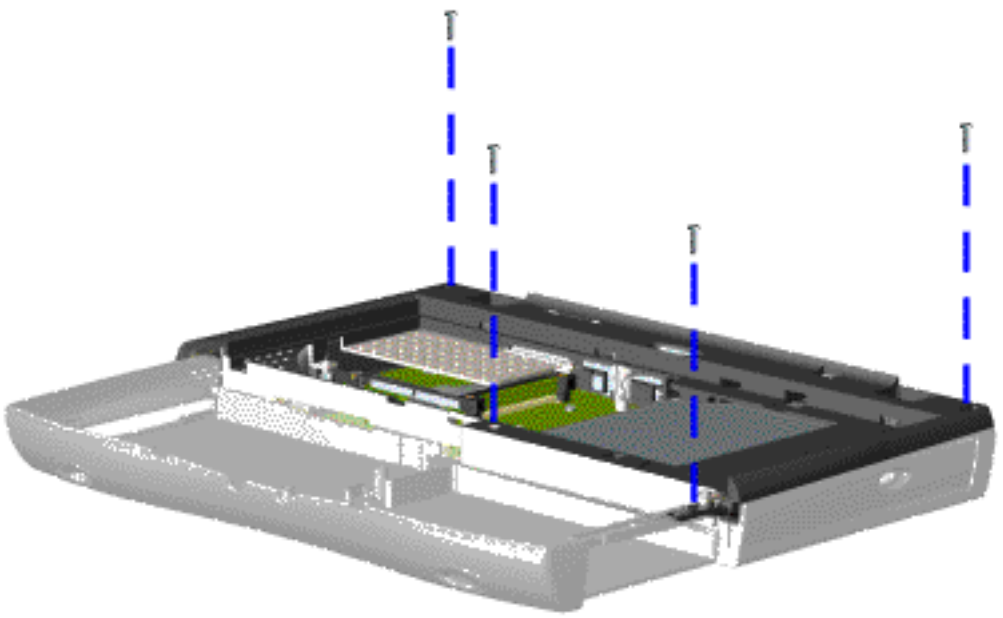
Memory Module



To remove the Upper CPU cover complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

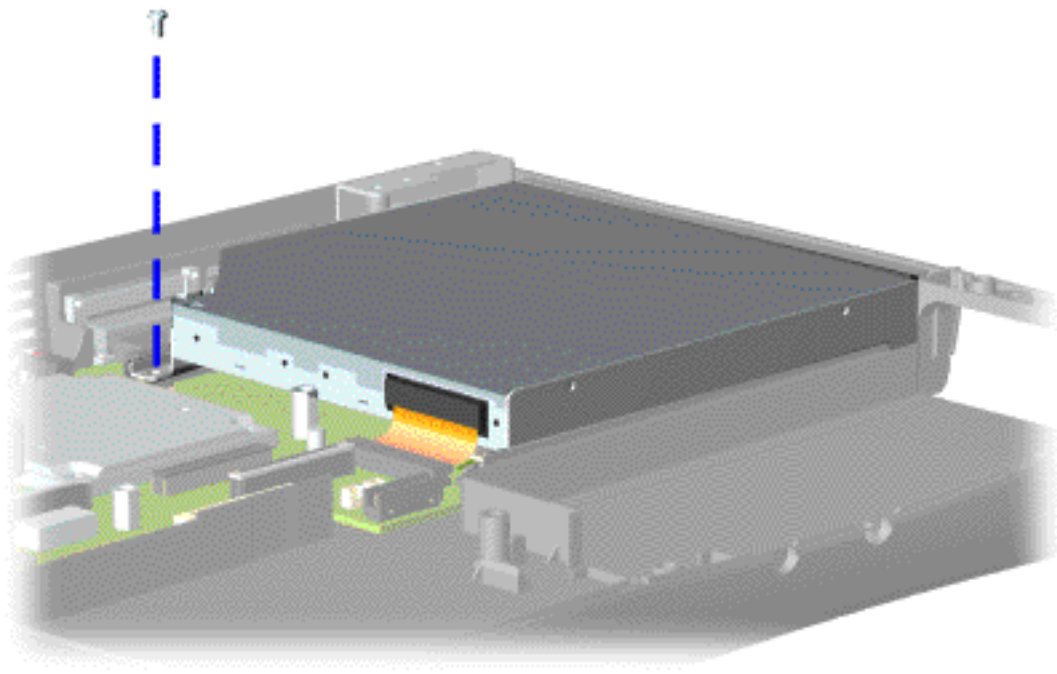
5. Remove the display panel assembly.

6. Remove four screws holding the cover to the chassis.

7. Lift the Upper CPU Cover off the chassis.

To replace the Upper CPU Cover, reverse the previous steps.

Removing the DVD Drive



To remove the DVD drive, complete the following steps:

1. Prepare the computer for disassembly. If a CD or DVD disc is jammed in the drive, remove it manually.

2. Remove the Palmrest Assembly.

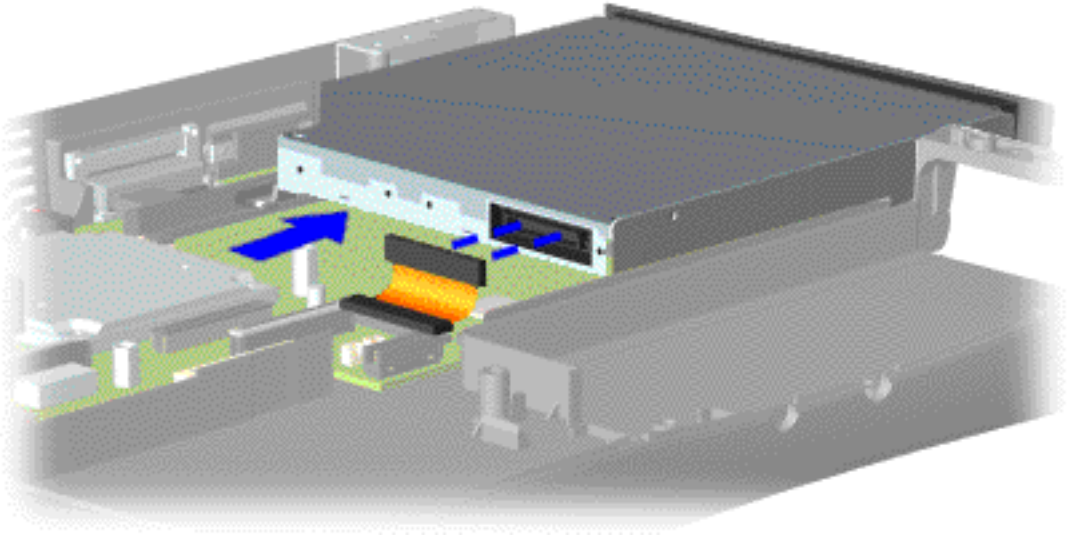
3. Remove the keyboard and heatspreader.

4. Remove the upper CPU cover.

5. Remove the screw at the back end of the DVD drive near the edge of the system board.

Next Step

Removing the DVD Drive (continued)

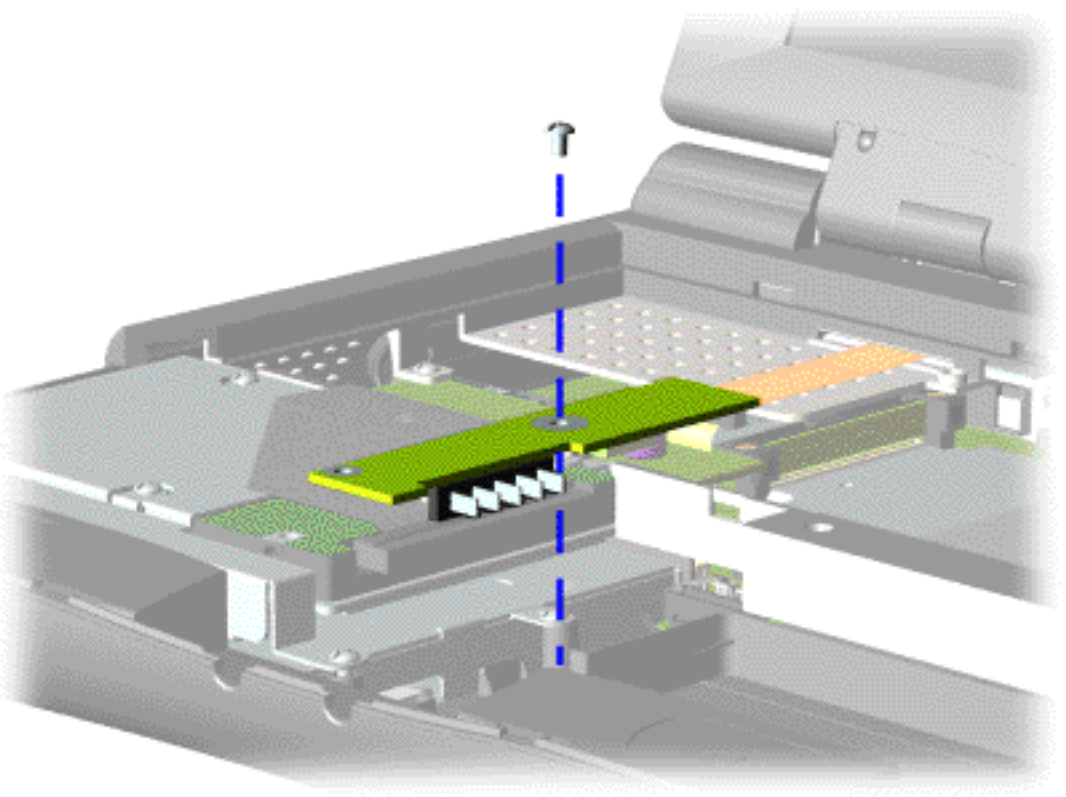


6. Disconnect the cable and push the DVD drive through the gap in the chassis.

To replace the DVD drive, reverse the previous steps.

Return to Removal & Replacement Procedures

Removing the Battery Charger Board



To remove the battery charger board, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

5. Remove the screw from the middle of the battery charger board.

6. Unplug the battery charger board from the connector on the system board, and lift it out of the chassis.

To replace the battery charger board, reverse the previous steps.

NOTE: When replacing the battery charger board, ensure the pins are aligned with the sockets on the system board connector before pressing the board in place.

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Removing the Modem

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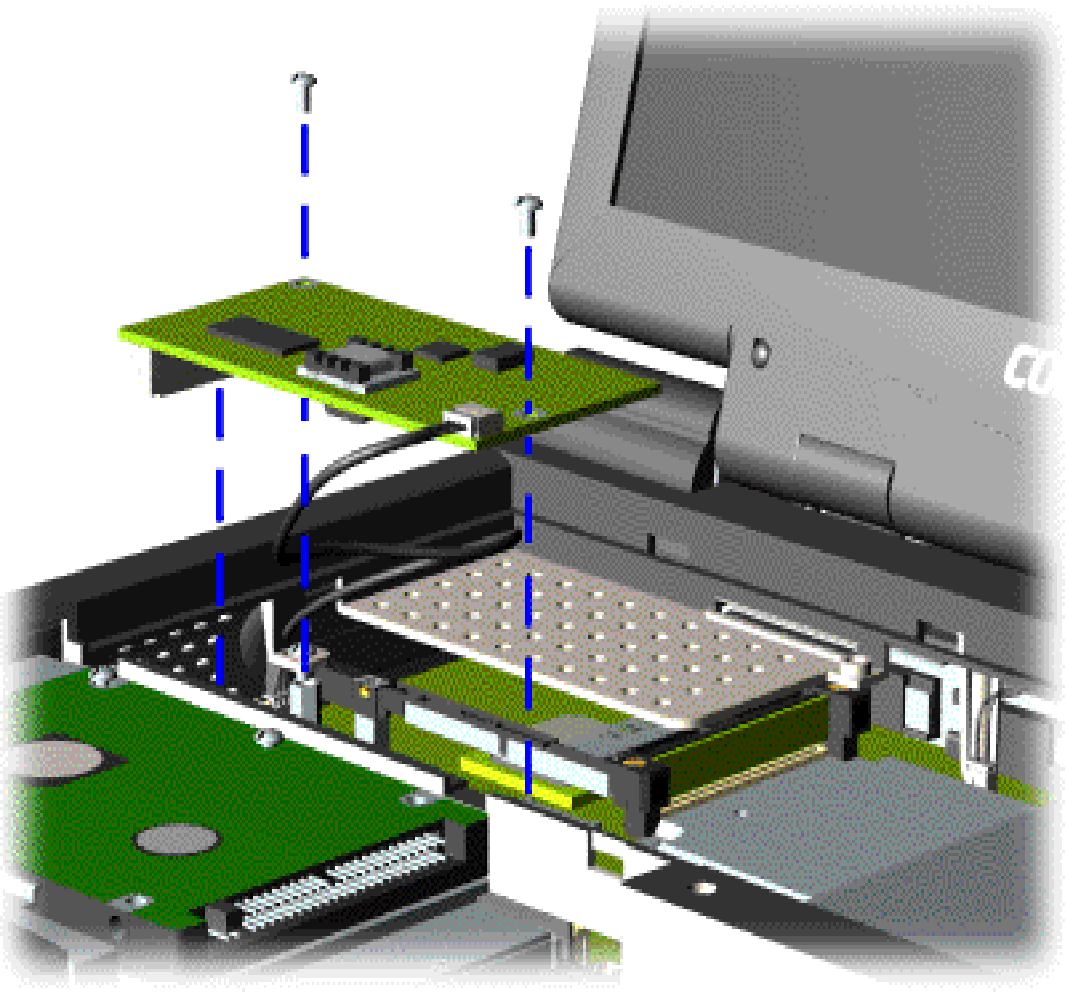
- Display Panel Assembly
- Speaker Assembly
- Diskette Drive
- Fan Assembly
- System Board
- Memory Module



To remove the modem, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

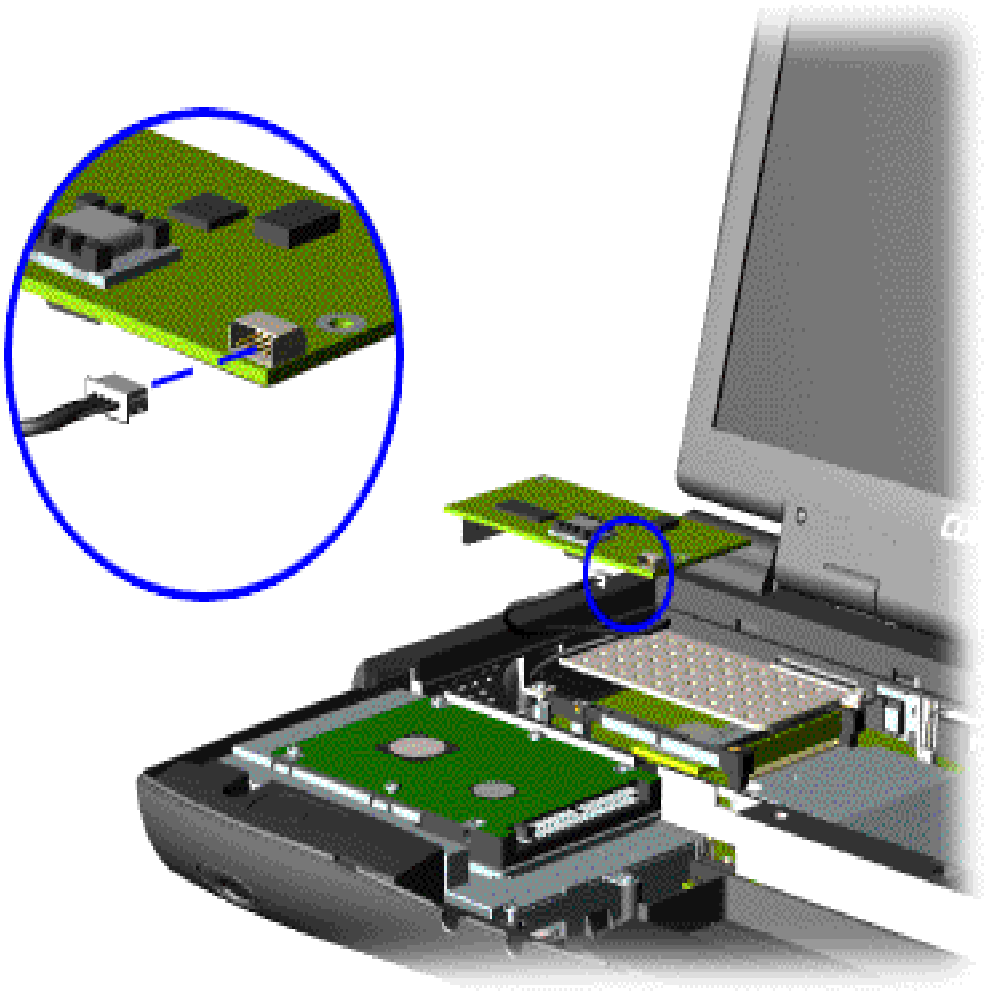
3. Remove the keyboard and heatspreader.

4. Remove the two screws securing the modem to the system board.

5. Pull the modem off the connector on the left-hand side of the system board.

Next Step

Removing the Modem (continued)



6. Disconnect the modem cable from the modem.

To replace the modem, reverse the previous steps.

NOTE The system board connector for the hard drive cable is underneath the modem board. If you remove the hard drive *and* the modem, be sure to replace the hard drive cable before the modem.

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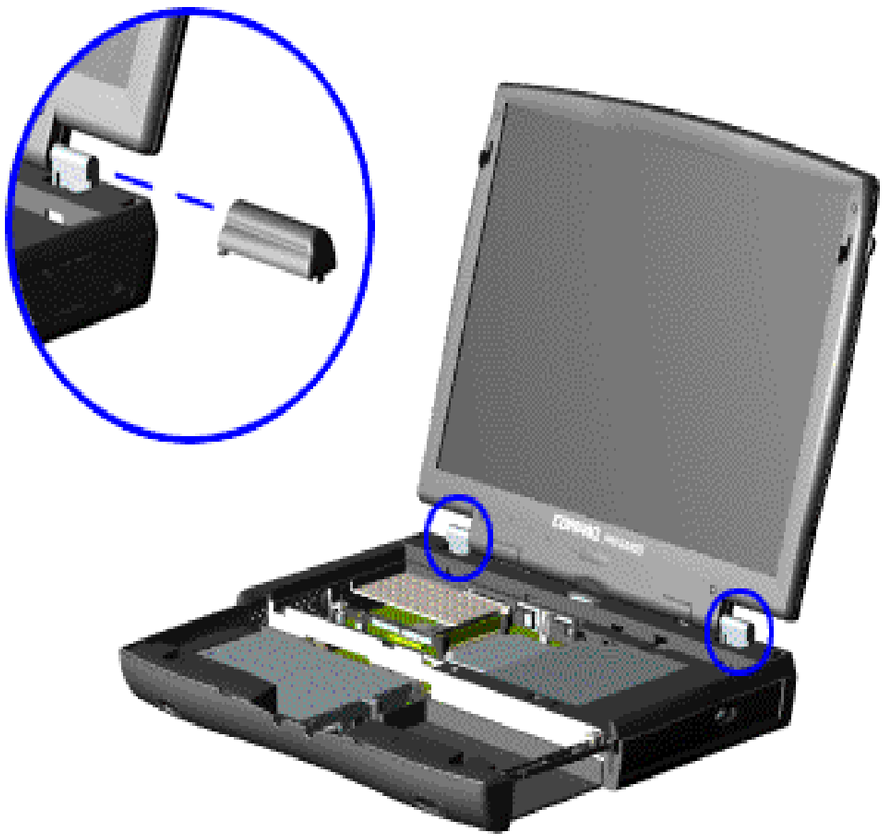
Removing the Display Panel Assembly



To remove the display panel assembly, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the Palmrest Assembly.

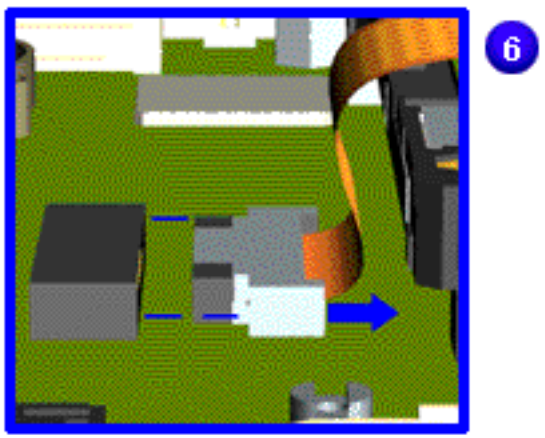
3. Remove the keyboard and heatspreader.

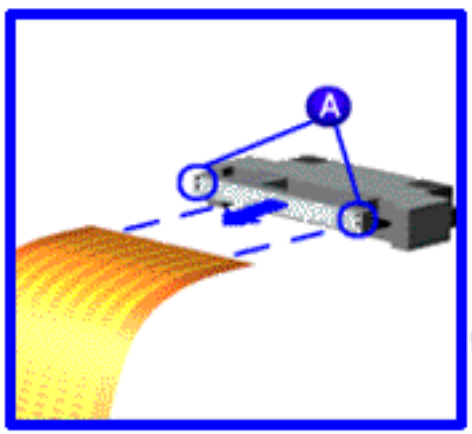
4. Remove the modem.

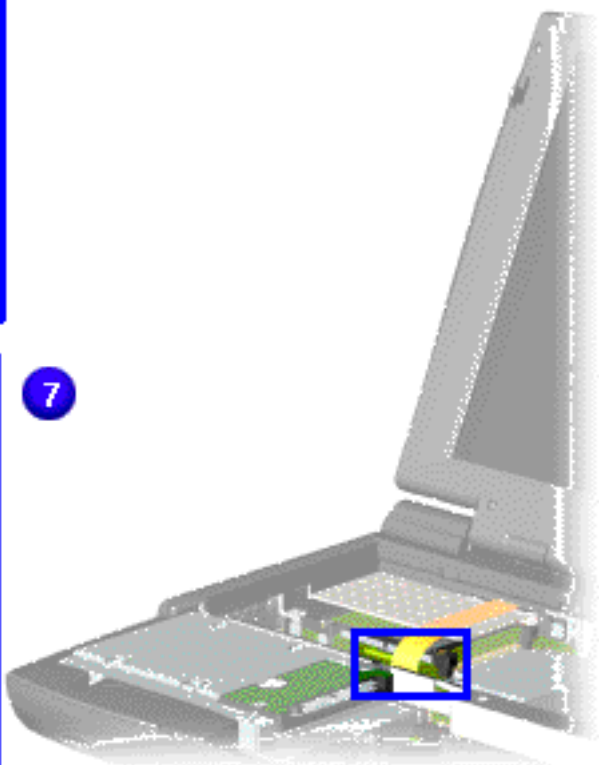
5. Pull up the hinge covers and *carefully* pry the covers off the chassis.

Next Step

Removing the Display Panel Assembly (continued)







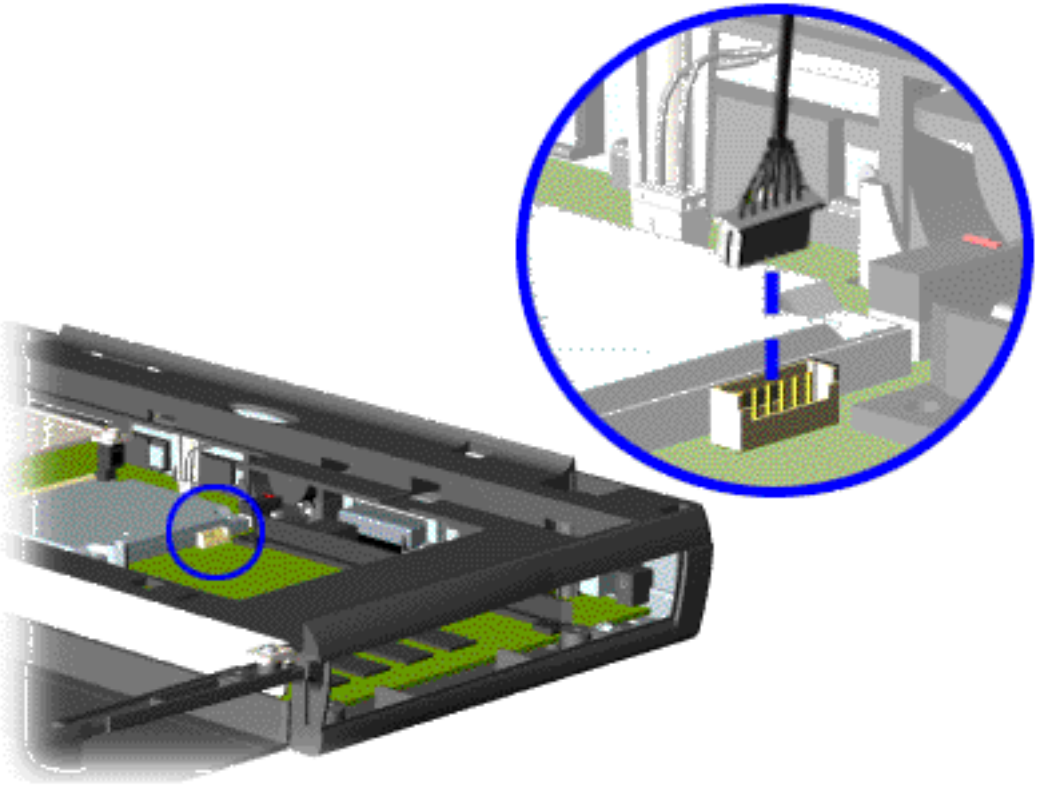
6. Remove the flex cable and end cap from the connector on the system board 6.

7. *Very carefully* pry the LVDS connector cable guide out of the metal sleeve 7, using a needle, toothpick or other sharp object in the small holes (labeled A).

8. Slide the cable out of the connector cable guide.

Next Step

Removing the Display Panel Assembly (continued)



9. Disconnect the backlight cable (attached to the display panel assembly) from the connector on the system board.

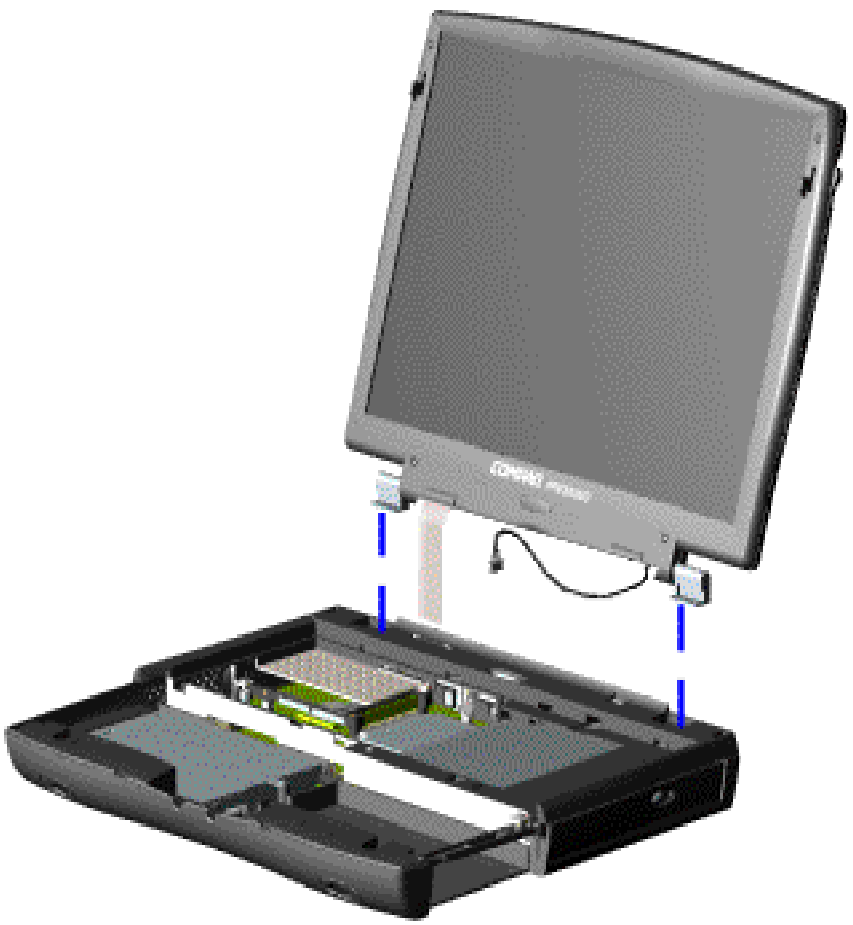
Next Step

Removing the Display Panel Assembly (continued)

10. Support the back of the display panel assembly and remove two screws from each of the display panel hinges.

Next Step

Removing the Display Panel Assembly (continued)



11. Gently pull the flex cable attached to the display panel assembly through the slot on the Upper CPU Cover and remove the display panel assembly with flex and backlight cable attached.

To replace the display panel assembly, reverse the previous steps.

NOTE: When removing the display panel assembly, observe the display panel assembly flex cable routing and position.

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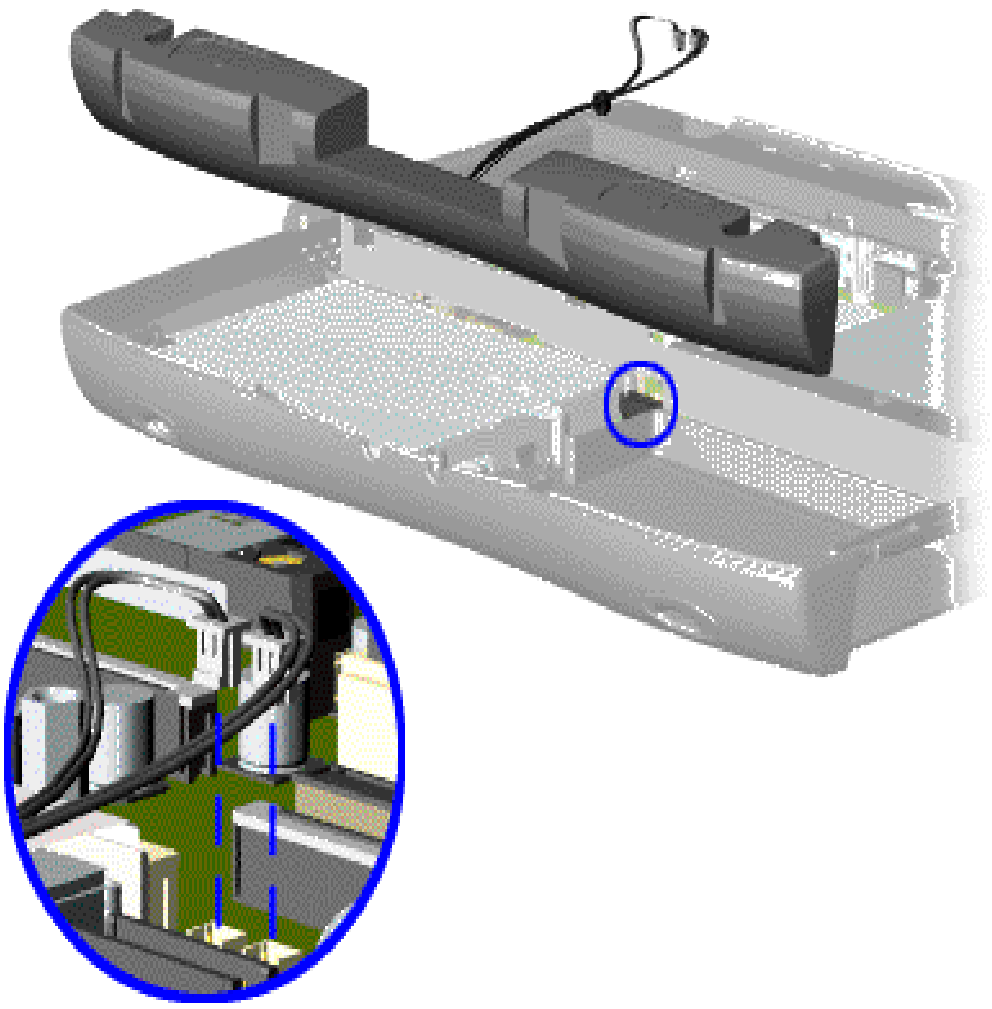
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module



To remove the speaker assembly, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

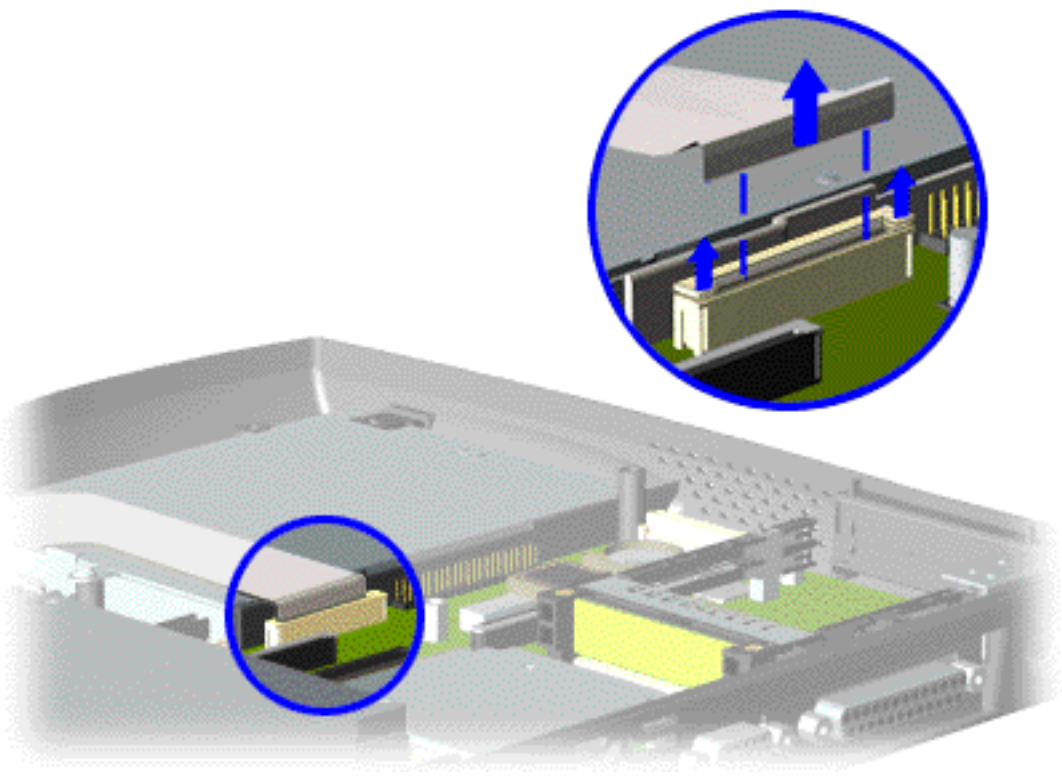
4. Remove the hard drive.

5. Remove the charger board.

6. Disconnect the speaker cables from the system board and remove the speaker assembly from the chassis.

To replace the speaker assembly, reverse the previous procedures.

Removing the Diskette Drive



To remove the diskette drive, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the hard drive.

5. Remove the Upper CPU cover.

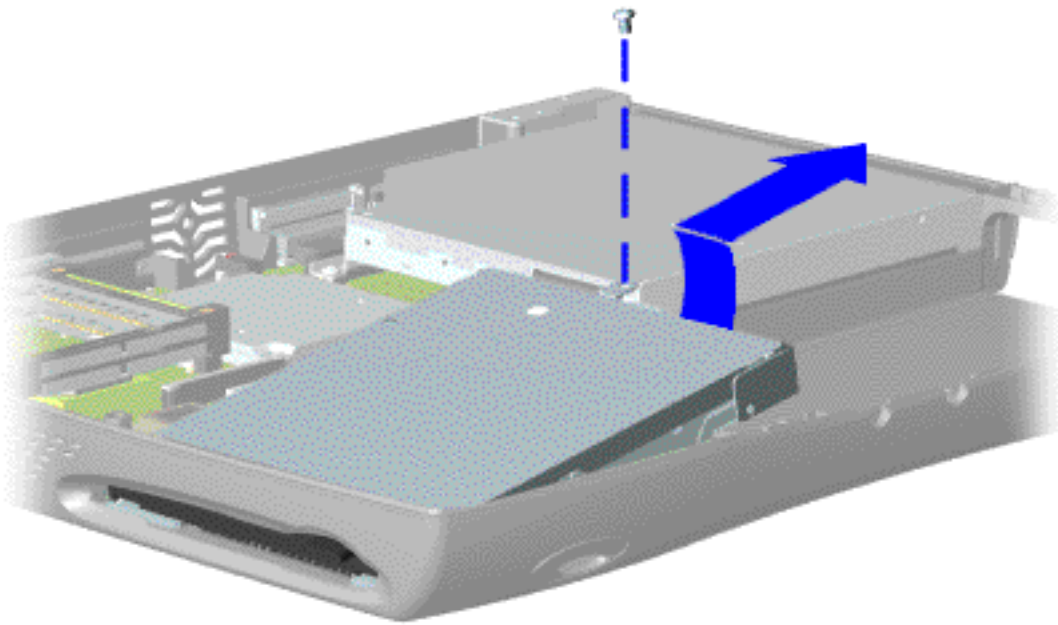
6. Remove the charger board.

7. Remove the speakers.

8. Disconnect the diskette drive data cable from the system board by pulling out the cable lock lip about 1 or 2 mm at each end, then removing the cable .

Next Step

Removing the Diskette Drive (continued)



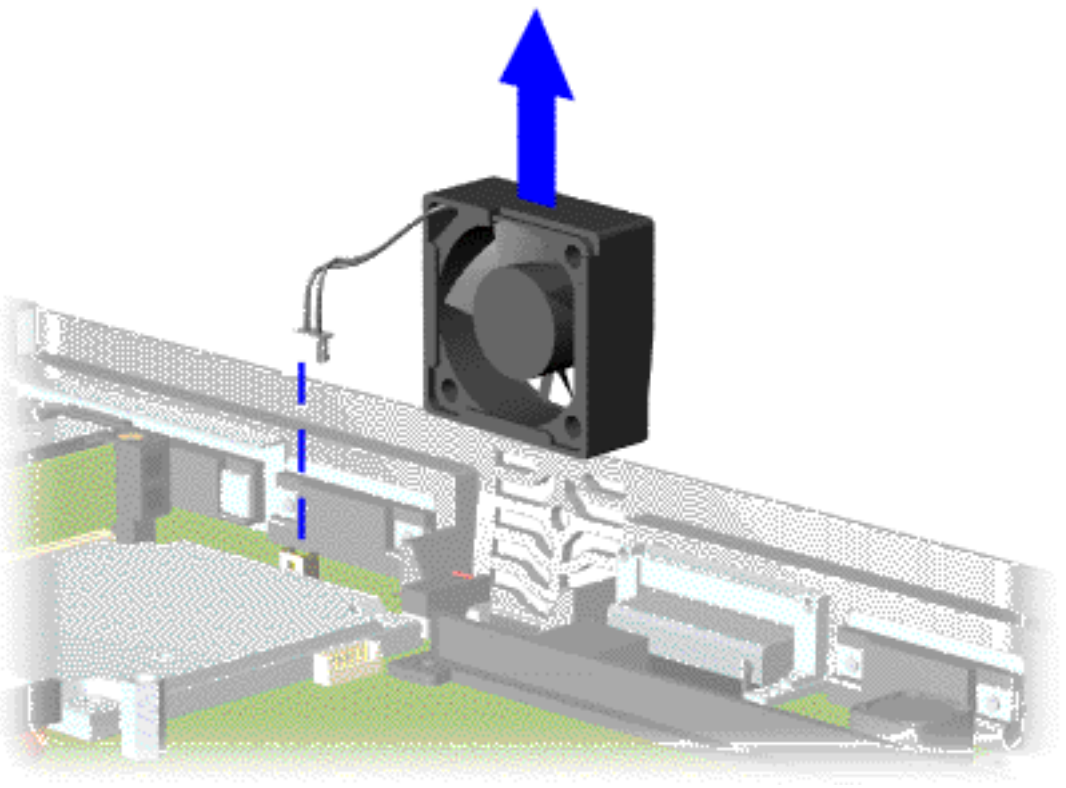
9. Remove the screw and lift the diskette drive up and out of the chassis.

To replace the diskette drive, reverse the previous steps.

NOTE: When replacing the diskette drive, ensure the diskette drive eject lever is properly inserted in the chassis slot.

Return to Removal & Replacement Procedures

Removing the Fan Assembly



To remove the fan assembly, complete the following steps:

1. Prepare the computer for disassembly.

2. Remove the palmrest assembly.

3. Remove the keyboard and heatspreader.

4. Remove the display panel assembly.

5. Remove the hard drive.

6. Remove the Upper CPU cover.

7. Unplug the fan cable and lift the fan assembly from the chassis slot.

To replace the fan assembly, reverse the previous steps.

NOTE Be sure to insert the fan as shown in the figure, to prevent damage to the cable.

Removing the Fan Gasket

Removing the System Board

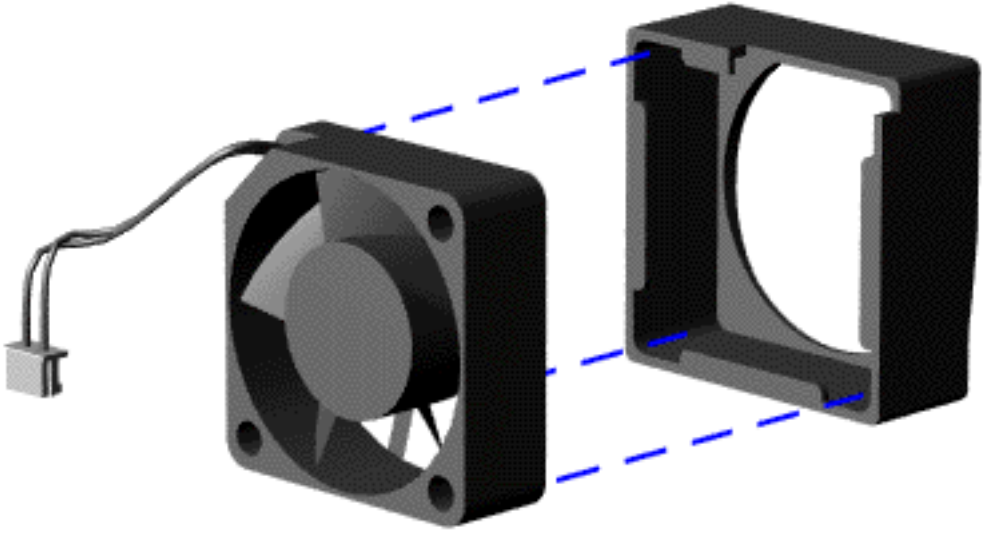
Electrostatic Discharge
Service Considerations
Cables and Connectors
Preparing the Computer for Disassembly
Battery Pack
Palmrest Assembly
Keyboard and Heatspreader
Processor
Hard Drive
Upper CPU Cover
DVD Drive
Battery Charger Board
Modem
Display Panel Assembly
Speaker Assembly
Diskette Drive
Fan Assembly
System Board
Memory Module

To remove the system board, complete the following steps:

1. Prepare the computer for disassembly.
2. Remove the palmrest assembly.
3. Remove the keyboard and heatspreader.
4. Remove the hard drive.
5. Remove the Upper CPU Cover.
6. Remove the DVD drive.
7. Remove the battery charger board.
8. Remove the modem.
9. Remove the display panel assembly.
10. Disconnect the speaker assembly cables.
11. Remove the diskette drive.
12. Remove the fan.
13. Remove the processor.

Next Step

Removing the Fan Assembly (continued)

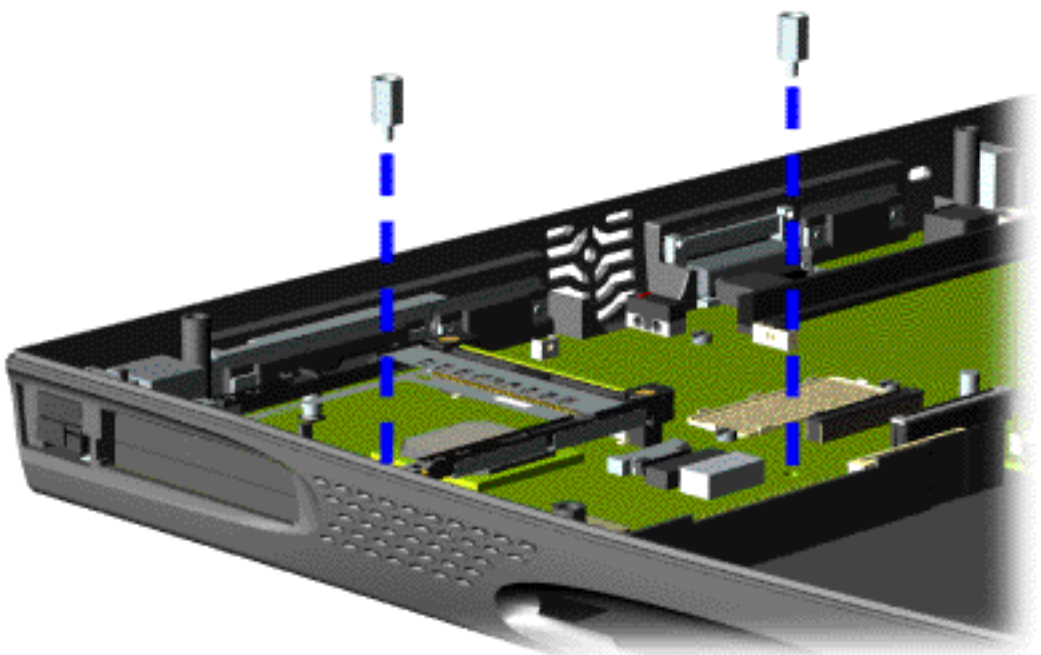


To remove the fan gasket, pull the gasket from the fan.

To replace the fan assembly, reverse the previous steps.

Return to Removal & Replacement Procedures

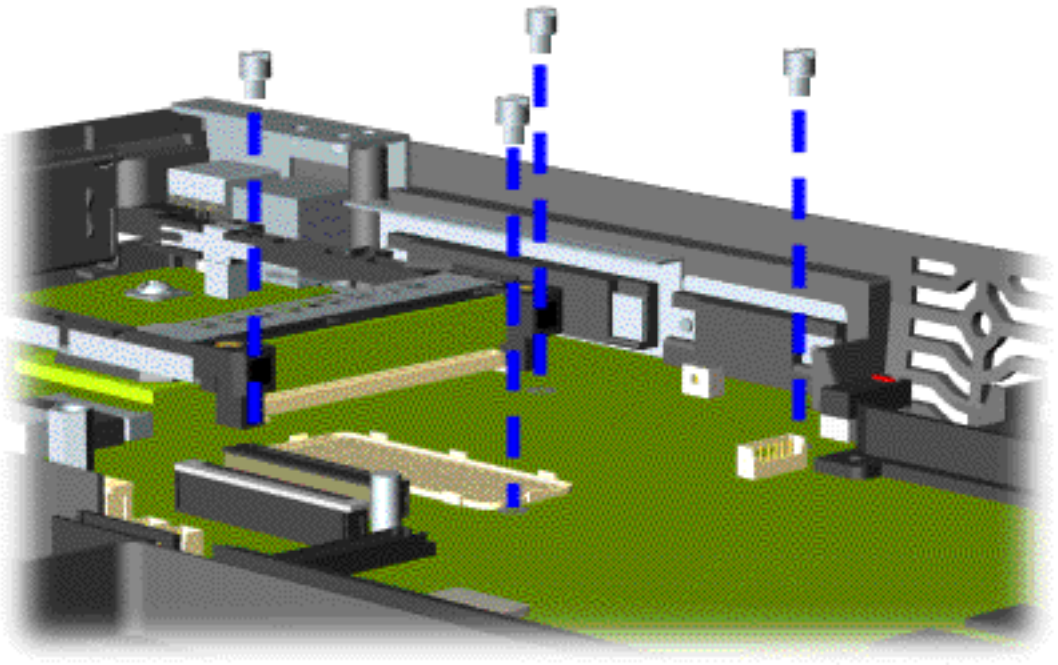
Removing the System Board (continued)



14. Remove the two long standoff nuts from the system board.

Next Step

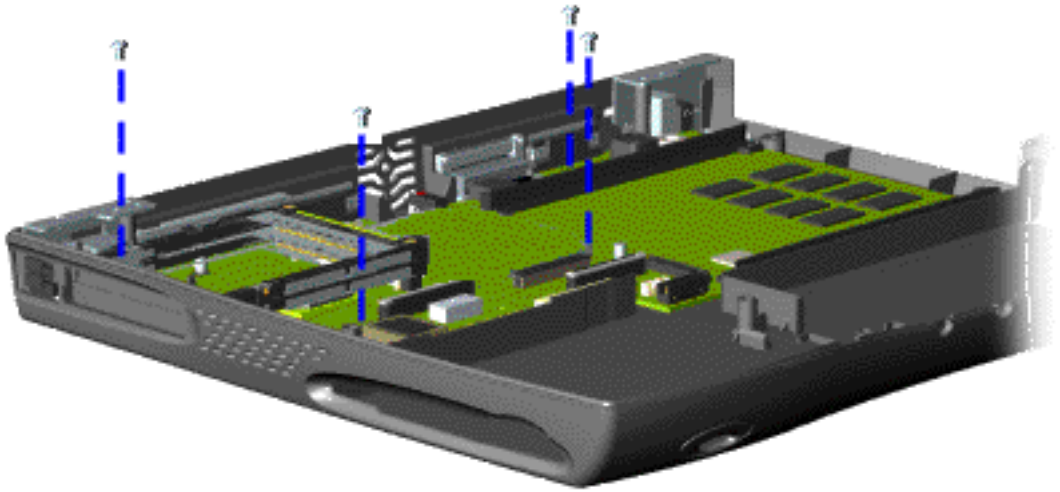
Removing the System Board (continued)



15. Remove the four standoff screws from the processor socket on the system board, using a flat-bladed screwdriver.

Next step

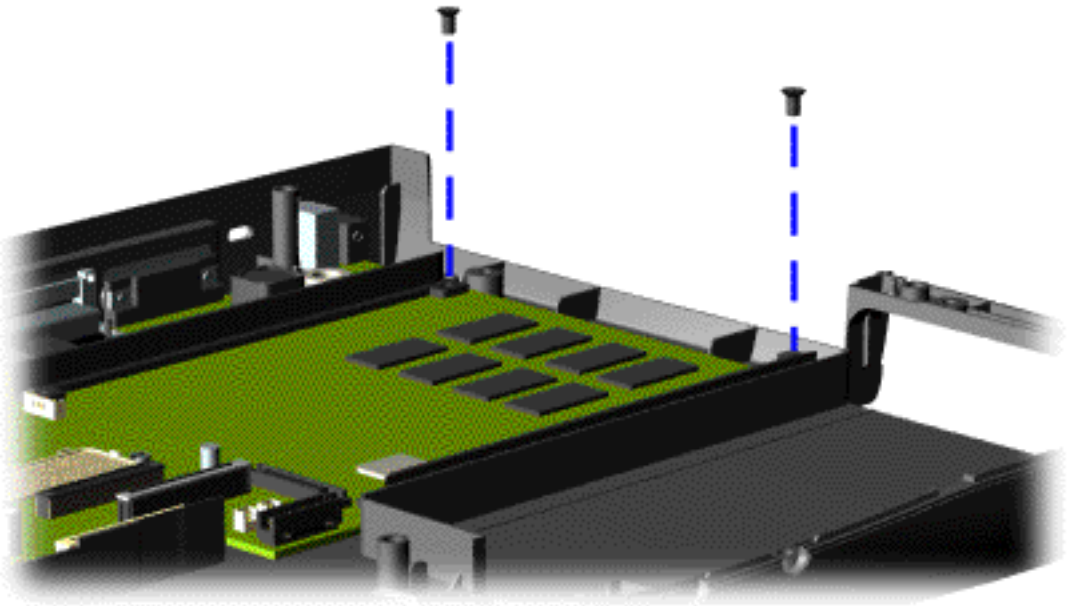
Removing the System Board (continued)



16. Remove four screws from the system board.

Next Step

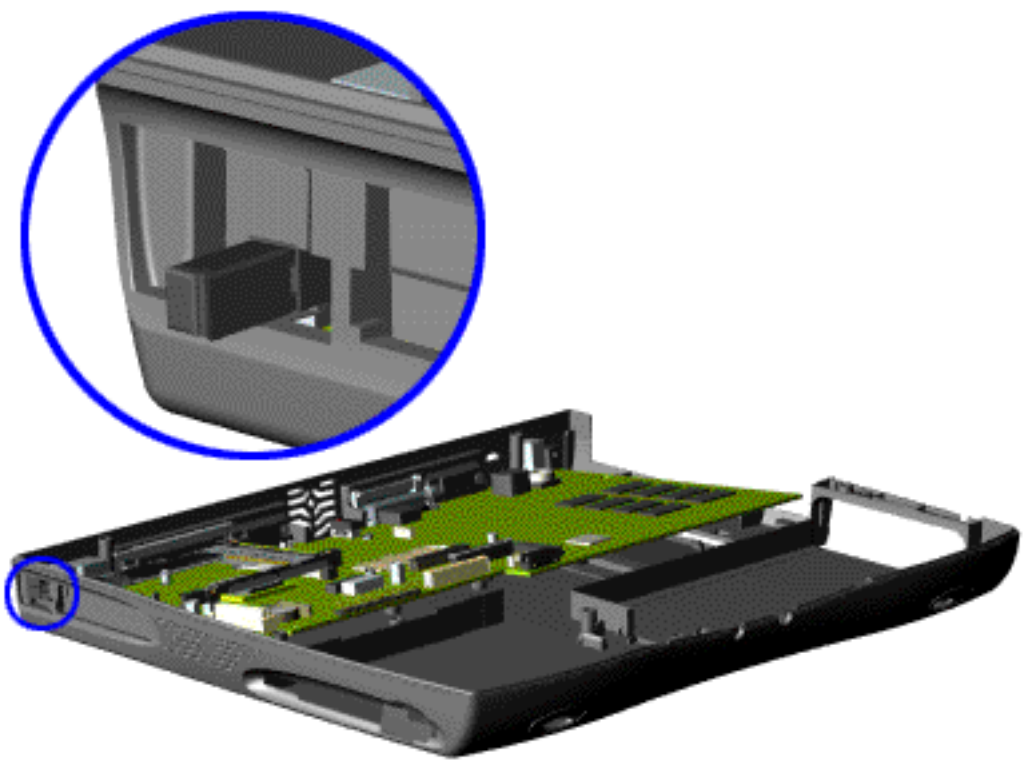
Removing the System Board (continued)



17. Remove two screws from the DVD Drive mounting rails and remove the mounting rails from the system board.

Next Step

Removing the System Board (continued)



IMPORTANT: Check that all cables have been disconnected from the system board before continuing.

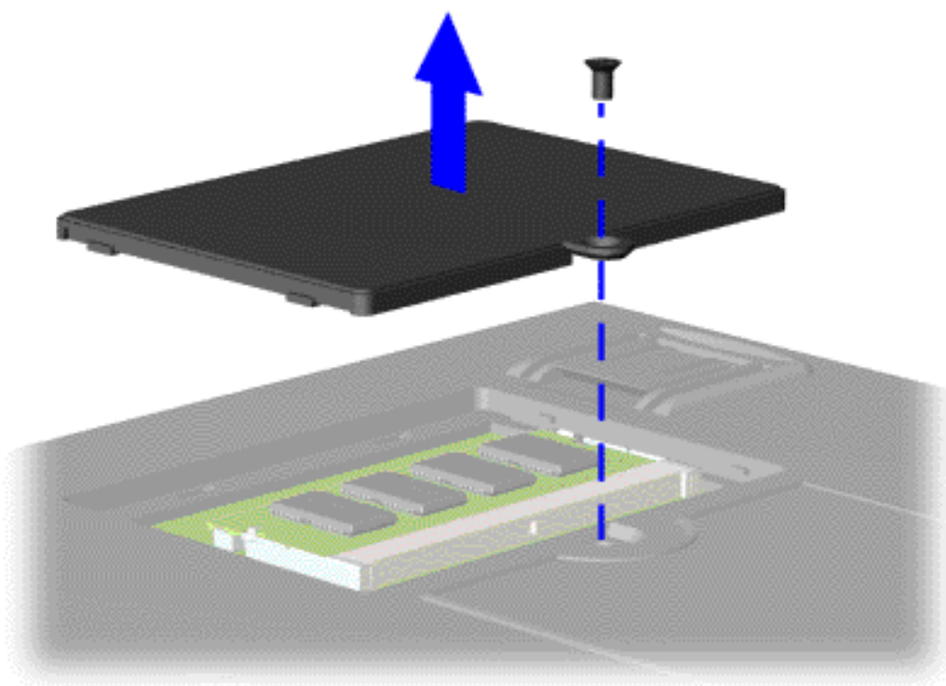
18. Tilt the system board up towards the middle of the unit.

19. Hold in the PCMCIA eject lever while carefully rotating the system board clockwise in a horizontal plane and manipulating it out of the chassis.

To replace the system board, reverse the previous steps.

Return to Removal & Replacement Procedures

Removing the Memory Module



To remove the memory module, complete the following steps:

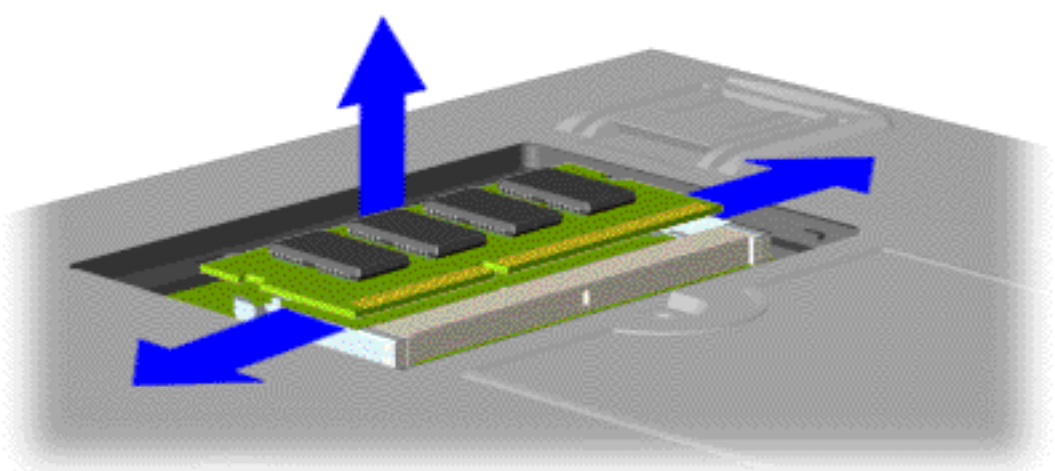
1. Prepare the computer for disassembly.

2. Close the computer and turn it upside down.

3. Remove the screw from the memory module door and pull the door off.

Next Step

Removing the Memory Module (continued)



4. Pull the side levers to release the memory module, then unplug the memory module from the system board.

To replace the memory module, reverse the previous steps.

Return to Removal & Replacement Procedures

Specifications

This section covers the following specifications of Compaq Presario 1660 Model Portable Computers:

Physical and Environmental

Computer Specifications		
	U.S.	**Metric**
Dimensions		
Height Depth Width	1.97 in 12.32 in 10.12 in	4.95 cm 31.00 cm 25.40 cm
Weight	7.37 lb	3.33 kg
AC Power Requirements		
Operating Voltage Operating Current Operating Frequency Maximum Transient	100-240 V 0.8/0.4 A RMS 47-63 Hz (meets IEC 801-4 and IEC801-5) 1kV for 50 ns	
Temperature		
Operating Nonoperating	50° to 95 °F -4° to 140 °F	10° to 35 °C -20° to 60 °C
Relative Humidity (noncondensing)		
Operating Nonoperating (tw = 38.7°C max)	10 to 90% 5 to 95%	10 to 90% 5 to 95%
Altitude		
Operating Nonoperating	0 to 10,000 ft 0 to 30,000 ft	0 to 3.15 km 0 to 9.14 km
Shock		
Operating Non operating	10 G, 11 ms, half sine 240 G, 2 ms, half sine	
Vibration		
Operating Nonoperating	0.5 G 1.5 G	

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. Compaq Presario 1660 Model Portable Computers operate well within this range of temperatures.

System Interrupts

System Interrupts	
Hardware IRQ	**System Function**
IRQ0	System Timer
IRQ1	Standard 101/102-Key or Microsoft Natural Keyboard
IRQ2	Programmable interrupt controller
IRQ3	Compaq Presario 56K-DF
IRQ4	Communications Port (COM1)
IRQ5	NeoMagic MagicWave 3DX Sound System
IRQ6	Standard Floppy Disk Controller
IRQ7	Printer Port (LPT1)
IRQ8	System CMOS/real time clock
IRQ9	Texas Instruments PCI-1211 CardBus Controller
IRQ9	NeoMagic MagicMedia 256AV
IRQ9	IRQ Holder for PCI Steering
IRQ9	IRQ Holder for PCI Steering
IRQ11	Intel 82371AB/EB PCI to USB Universal Host Controller
IRQ11	NeoMagic MagicMedia 256AV Audio
IRQ11	IRQ Holder for PCI Steering
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE controller (dual fifo)
IRQ14	Intel 82371AB/EB PCI Bus Master IDE Controller
IRQ15	Secondary IDE controller (dual fifo)
IRQ15	Intel 82371AB/EB PCI Bus Master IDE Controller

System DMA

System DMA	
Hardware DMA	**System Function**
1	NewMagic MagicWave 3DX Sound System
2	NewMagic MagicWave 3DX Sound System
3	free
4	Standard Floppy Disk Controller
5	Direct Memory Access Controller

Specifications (continued)

System I/O Address

System I/O Address	
I/O Address (Hex)	**System Function (Shipping Configuration)**
0000h-000Fh	Direct memory access controller
0010h-001Fh	In use by unknown device
0020h-0021h	Programmable interrupt Controller
0022h-003Fh	In use by unknown device
0040h-0043h	System timer
0044h-005Fh	In use by unknown device
0060h-0060h	Standard 101/102-Key or Microsoft Natural Keyboard
0061h-0061h	System speaker
0062h-0063h	In use by unknown device
0064h-0064h	Standard 101/102-Key or Microsoft Natural Keyboard
0065h-006Fh	In use by unknown device
0070h-0071h	System CMOS/real time clock
0072h-0073h	Motherboard resources
0074h-007Fh	In use by unknown device
0080h-0080h	Motherboard resources
0081h-008Fh	Direct memory controller
0090h-009Fh	In use by unknown device
00A0h-00A1h	Programmable interrupt controller
00A2h-00BFh	In use by unknown device
00C0h-00DFh	Direct memory access Controller
00E0h-00EBh	In use by unknown device
00ECh-00EFh	Motherboard resources
00F0h-00FFh	Numeric data processor
0120h-0121h	NeoMagic MagicWave 3DX Sound System
0170h-0177h	Intel 82371AB/EB PCI Bus Master IDE controller
0170h-0177h	Secondary IDE controller (dual fifo)
01F0h-01F7h	Intel 82371AB/EB PCI Bus Master IDE controller
0170h-0177h	Primary IDE controller (dual fifo)
0200h-0200h	Gameport Joystick
0220h-02FFh	NeoMagic MagicWave 3DX Sound System
02F8h-02FFh	Compaq Presario 56K-DF
0330h-0331h	NeoMagic MagicWave 3DX Sound System
0376h-0376h	Intel 82371AB/EB PCI Bus Master IDE controller
0376h-0376h	Secondary IDE controller (dual fifo)
0378h-037Fh	Printer Port (LPT1)
0388h-038Fh	NeoMagic MagicWave 3DX Sound System
03B0h-03BBh	NeoMagic MagicMedia 256AV
03C0h-03DFh	NeoMagic MagicMedia 256AV
03F0h-03F5h	Standard Floppy Disk Controller
03F6h-03F6h	Intel 82371AB/EB PCI Bus Master IDE controller
03F6h-03F6h	Primary IDE controller (dual fifo)
03F7h-03F7h	Standard Floppy Disk Controller
03F8h-03FFh	Communications Port (COM1)
04D0h-04D1h	Motherboard resources
0530h-0537h	NeoMagic MagicWave 3DX Sound System
0CF8-0CFFh	PCI bus
2180h-218Fh	Motherboard resources
8000h-803Fh	Motherboard resources
FCD0h-FCD7h	Primary IDE controller (dual fifo)
FCD0h-FCDFh	Intel 82371AB/EB PCI Bus Master IDE Controller
FCD8h-FCDFh	Secondary IDE controller (dual fifo)
FCE0h-FCFFh	Intel 82371AB/EB PCI to USB Universal Host Controller

System Memory Catalog

System Memory Catalog	
Memory Address	**System Function**
00000000h-0009FFFFh	System board extension for PnP BIOS
000A0000h-000AFFFFh	NeoMagic MagicMedia 256AV
000B0000h-000BFFFFh	NeoMagic MagicMedia 256AV
000C0000h-000CBFFFh	NeoMagic MagicMedia 256AV
000E0000h-000E7FFFh	Motherboard resources
000E8000h-000FFFFFh	System board extension for PnP BIOS
00100000h-03FFFFFFh	System board extension for PnP BIOS
06000000h-06000FFFh	Texas Instruments PCI-1211 CardBus Controller
F6000000h-F6FFFFFFh	NeoMagic MagicMedia 256AV
F6000000h-F7BFFFFFh	Intel 82443BX Pentium II Processor to AGP Controller
F7800000h-F7BFFFFFh	NeoMagic MagicMedia 256AV Audio
F8000000h-F83FFFFFh	Intel 82443BX Pentium II Processor to PCI bridge
FE700000h-FE7FFFFFh	NeoMagic MagicMedia 256AV Audio
FE700000h-FECFFFFFh	Intel 82443BX Pentium II Processor to AGP Controller
FE800000h-FEBFFFFFh	NeoMagic MagicMedia 256AV
FEC00000h-FECFFFFFh	NeoMagic MagicMedia 256AV
FFF80000h-FFFFFFFFh	Motherboard resources

Display

13.3" TFT Display						
Model	**Sharp LQ133XILH05**		**Sanyo TM133XG-02L02**		**LG LP133X4-A**	
	U.S.	**Metric**	**U.S.**	**Metric**	**U.S.**	**Metric**
Dimensions Height Width	7.98 in 10.64 in	202.8mm 270.3mm	7.98 in 10.64 in	202.8mm 270.3mm	7.98 in 10.64 in	202.8mm 270.3mm
Display Dimensions Height Width Depth	8.43 in 11.18 in 0.28 in	214.0mm 284.0mm 7.0mm	8.43 in 11.46 in 0.27 in	214.0mm 291.0mm 6.8mm	8.46 in 11.18 in 0.27 in	215.0mm 284.0mm 6.9mm
Weight	19.0 oz	540 grams	18.3 oz	520 grams	18.3 oz	520 grams
Contrast Ratio	150:1		120:1		150:1	
Brightness	120 cd/mm³		100 cd/mm³		120 cd/mm³	
Total Power Consumption, W	3.5		not available		3.08	

Specifications (continued)

Diskette Drive

Diskette Drive			
Model	**Mitsumi D353F3**		
Capacity per Diskette (High/Low)			
Diskette Size	1.0MB	1.6MB	2.0MB
Number of LED Indicators (Read/Write)	None		
Drive Rotation (rpm)	300	360	300
Transfer Rate (Kbps)	250	500	500
KBytes per Sector [Sector]	0.256[16] 0.512[9] 1.024[5]	0.256[26] 0.512[15] 1.024[8]	0.256[32] 0.512[18] 1.024[10]
KBytes per Track [Sector]	4.096[16] 4.608[9] 5.120[5]	6.656[26] 7.680[15] 8.192[8]	8.192[32] 9.216[18] 10.24[10]
KBytes per Disk [Sector]	655.36[16] 737.28[9] 819.20[5]	1064.96[26] 1228.80[15] 1310.72[8]	1310.72[32] 1474.56[18] 1638.40[10]
Number of Read/Write Heads	2		

Hard Drive

Hard Drive						
Model	**Hitachi DK238A-43**	**IBM DKLA-24320**	**Fujitsu MHF2043AT**	**IBM DADA-26480**	**Hitachi DK228A-65**	**Fujitsu MHE2064AT**
Capacity Per Drive	4327MB	4320MB	4340MB	6480MB	6490MB	6490MB
Logical Configuration Cylinders Heads Sectors per track Bytes per sector	 8955 4 N/A 512	 8944 15 63 512	 8647 4 N/A 512	 13424 15 63 512	 8955 6 N/A 512	 8647 6 N/A 512
Typical Seek Times, ms (including settling) Single track Average Full stroke	 N/A 12ms N/A	 4ms 13ms 23ms	 2.5ms 13ms 23ms	 4ms 12ms 23ms	 N/A 12ms N/A	 2.5ms 13ms 23ms
Transfer Rate At interface	16.6MB/sec (max)	16.6MB/sec (max)	33.3MB/sec (U-DMA)	16.6MB/sec (max)	16.6MB/sec (max)	33.3MB/sec (U-DMA)

CD Drive

CD-ROM Drive						
Model	**XM-1802B**		**Mitsumi SR242S1**		**Sanyo CDR-U242-Z**	
Dimensions	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in
Weight	0.230kg	8.11 oz	0.27kg	9.52 oz	< 0.270kg	< 9.52 oz
Maximum Rotational Speed	24x		24x		24x	
Typical Sustained Data Transfer Rate	3600kB/sec (max)		3600kB/sec (max)		3600kB/sec	
Average Random Access Time	110ms		120ms		120ms	
Spin Up Time	2.7sec (max)		n/a		<10sec	
Data Buffer Capacity	128kB		128kB		256kB	

DVD Drive

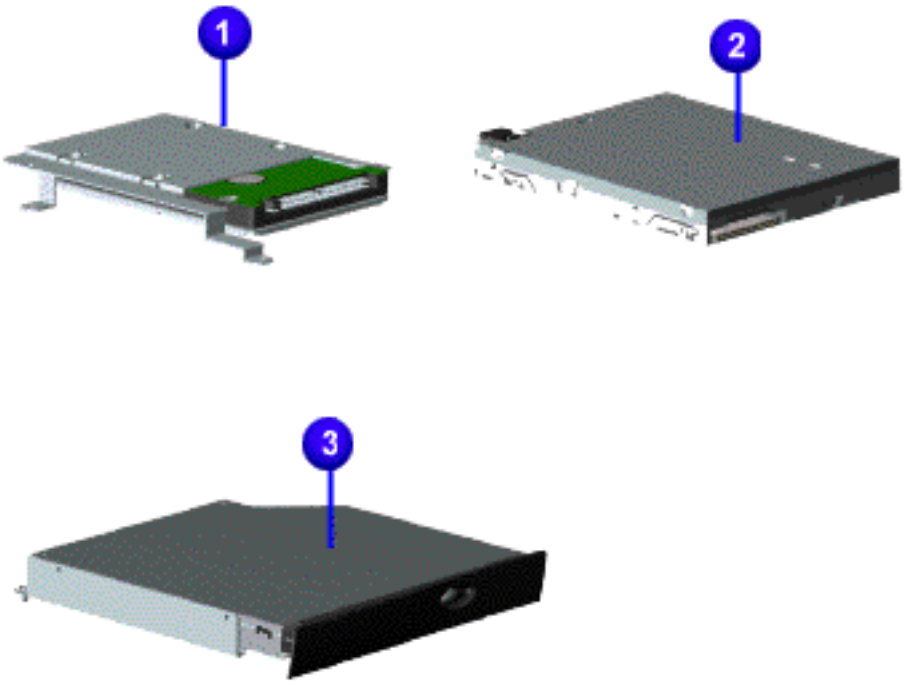
DVD-ROM Drive						
Model	**Sanyo DRD-U220**		**Panasonic SR-8171**		**Toshiba SD-C2102**	
Dimensions	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in	128 x 12.7 x 127 mm	5.04 x 0.5 x 5.00 in	128 x 12.7 x 129 mm	5.04 x 0.5 x 5.08 in
Weight	< 0.280kg	< 9.87 oz	0.290kg	10.2 oz	0.280kg	9.87 oz
Rotational Speed	2.4x		2.0x (max)		2.4x	
Typical Sustained Data Transfer Rate	3240KB/sec (max)		2700KB/sec (max)		1352-3268KB/sec	
Typical Average Random Access Time	180ms		180ms		160ms	
Spin Up Time	< 10sec		4sec		N/A	
Data Buffer Capacity	256kB		512kB		128kB	

Battery Pack

Lithium Ion (Li ion) Battery Pack	
Dimensions Height Length Width	 0.8 in (20.3 mm) 5.7 in (145 mm) 3.1 in (78.7 mm)
Weight	0.90 Ib (408.2 g)
Energy Nominal Open Circuit Voltage Ah rating Capacity	 standard: 14.4 V enhanced: 14.8 V standard: 2600 mAh enhanced: 3000 mAh standard: 37.5 Wh enhanced: 44.5 Wh
Environmental Requirements Operating Temperature Non-operating Temperature Charging Temperature	 50°F to 95° F (10°C - 35°C) 32°F to 140°F (0°C - 60°C) 41°F to 113°F (5°C - 45°C)

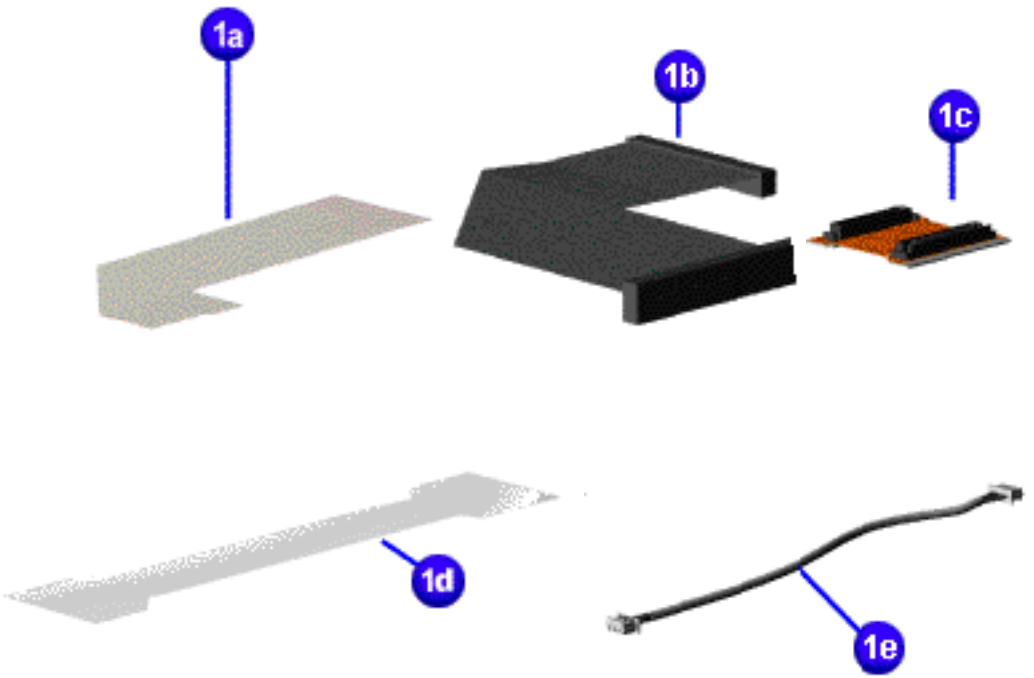
Illustrated Parts Catalog

To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.



Illustrated Parts Catalog

Cable Kit Spare Part Number: 330946-001
Contains each of the cables shown.



Illustrated Parts Catalog

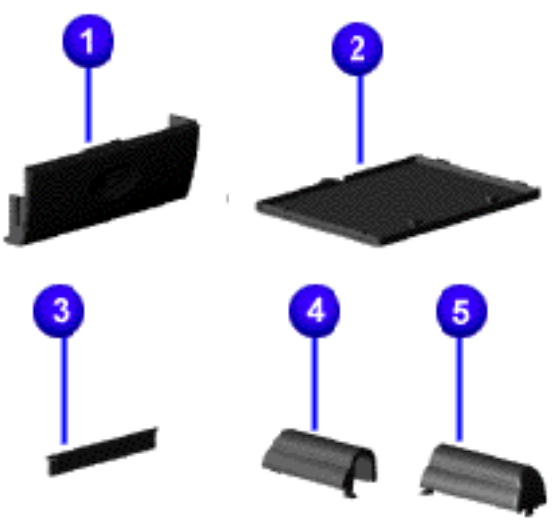
Description	Spare Part Number
AC Power Cord Australia China (PRC)	 293831-011 293831-AA1
Modem cable Australia China (PRC)	 304398-011 304398-AA1

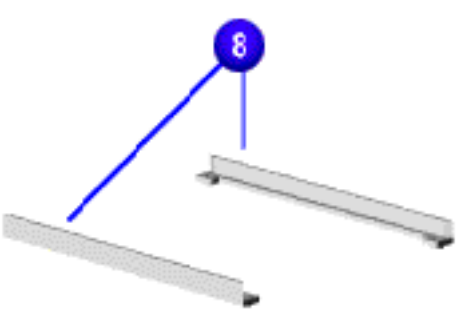
Illustrated Parts Catalog

To obtain the description of an item shown, position the mouse cursor over the item for a few seconds.

Miscellaneous Plastics Kit
Spare Part Number:
330949-001

Contents:





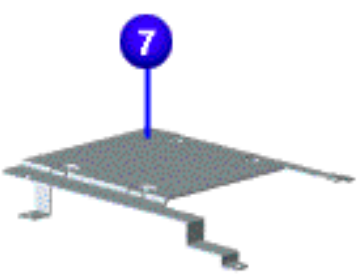
(not shown)
4 Rubber Plugs
Left and Right Latches

8 Rubber Feet

Miscellaneous Screw Kit
Spare Part Number
330959-001

Miscellaneous Hardware Kit Spare Part Number:
346853-001

Contents:



(not shown)
4 PCMCIA Torsion Springs
LCD Cable Guide

Illustrated Parts Catalog

- System Unit
- Boards
- Display Assembly
- Mass Storage Devices
- Miscellaneous Cable Kit
- External Cables
- Miscellaneous Hardware and Plastics Kit
- Miscellaneous Parts
- Documentation and Software

To obtain the description and spare part number of an item, position the mouse cursor over the item for a few seconds.

Other parts not shown:

Logo Kit	352887-001
Return Kit	293799-001

Illustrated Parts Catalog

- System Unit
- Boards
- Display Assembly
- Mass Storage Devices
- Miscellaneous Cable Kit
- External Cables
- Miscellaneous Hardware and Plastics Kit
- Miscellaneous Parts
- Documentation and Software

Description	Spare Part Number
Quick Restore CD Australia China (PRC)	 388205-371 388205-AA1
Quick Reference Guide (single issue) Quick Reference Guide (quarterly subscription)	162212-001 184960-001
QuickFind for Windows*, Asia Pacific Edition	137906-xxx

*QuickFind is updated monthly. To complete the QuickFind part number, add the suffix from the table below for the desired month. If you do not specify the 3-digit suffix, the default is the current month in which the order is placed.

QuickFind Part Number Suffix			
Suffix	**Month**	**Suffix**	**Month**
-001	January	-007	July
-002	February	-008	August
-003	March	-009	September
-004	April	-010	October
-005	May	-011	November
-006	June	-012	December