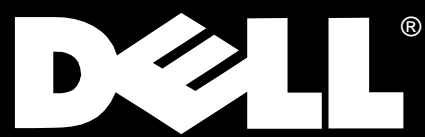Thank you for purchasing this Factory Service Manual CD/DVD from servicemanuals4u.com.

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DELL ®

Dell® Inspiron™ 3000 Series

SERVICE MANUAL

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Read This First

A prerequisite for using this manual to service Dell portable computers is a basic knowledge of IBM-compatible PCs and prior training in IBM-compatible PC troubleshooting techniques. In addition to information provided in this manual and the online *System User's Guide* that came with the system, Dell provides the *Diagnostics and Troubleshooting Guide* for troubleshooting procedures and instructions on using the Dell Diagnostics to test the computer system.

Warnings, Cautions, and Notes

Throughout this manual, there may be blocks of text printed in bold type or in italic type. These blocks are warnings, cautions, and notes, and they are used as follows:

WARNING: A WARNING indicates the potential for bodily harm and provides instructions for how to avoid the problem.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and provides instructions for how to avoid the problem.

NOTE: A NOTE provides helpful information about using the computer system.

Chapter 1
System Overview

*T*he Dell® Inspiron™ 3000 series is a family of expandable multimedia porta-
ble computers that use the Intel® Pentium® and Pentium II microprocessors
with MMX™ technology. This chapter provides an overview of the components
and subsystems of these computers.

The individual model names within the Inspiron 3000 series indicate the type
and operating frequency of the microprocessor and the display used in the com-
puter. For example:

- The Inspiron 3000 M166ST contains a 166-MHz Pentium microprocessor
  with MMX technology and an SVGA (S) active-matrix (T) TFT LCD.

- The Inspiron 3000 M200ST contains a 200-MHz Pentium microprocessor
  with MMX technology and an SVGA (S) active-matrix (T) TFT LCD.

- The Inspiron 3000 M233ST contains a 233-MHz Pentium microprocessor
  with MMX technology and an SVGA (S) active-matrix (T) TFT LCD.

- The Inspiron 3000 M233XT contains a 233-MHz Pentium microprocessor
  with MMX technology and an XGA (X) active-matrix (T) TFT LCD.

- The Inspiron 3000 M266XT contains a 266-MHz Pentium microprocessor
  with MMX technology and an XGA (X) active-matrix (T) TFT LCD.

- The Inspiron 3200 D233ST contains a 233-MHz Pentium II microprocessor
  with MMX technology and an SVGA (S) active-matrix (T) TFT LCD.

- The Inspiron 3200 D233XT contains a 233-MHz Pentium II microprocessor
  with MMX technology and an XGA (X) active-matrix (T) TFT LCD.

- The Inspiron 3200 D266XT contains a 266-MHz Pentium II microprocessor
  with MMX technology and an XGA (X) active-matrix (T) TFT LCD.

System Features

In addition to the standard features found in IBM®-compatible portable com-
puters, the Dell Inspiron 3000 series computers include the following new and/
or advanced features:

- 32 MB of SDRAM consisting of 16 MB of nonremovable main memory on
  the main board and a 16-MB memory module in one of the two memory
  module sockets. The memory capacity can be increased up to 144 MB by
  installing 16-, 32-, or 64-MB 3.3-V memory modules in the memory mod-
  ule sockets on the main board.

- A 12.1-inch active-matrix SVGA display on Inspiron 3200 D233ST and on the Inspiron 3000 M166ST, M200ST, and M233ST; a 13.3-inch active-matrix XGA display on the Inspiron 3000 M233XT and M266XT, and the Inspiron 3200 D233XT and D266XT.

- 40-WH lithium ion battery (eight cells).

- 512-KB SRAM level-2 external cache and 32-KB internal cache. (The Inspiron 3000 M166ST has a 256-KB SRAM level-2 external cache.)

- NeoMagic 2160 video controller supporting all video features with a PCI local bus on Inspiron 3000 M166ST, M200ST, M233ST, M233XT, and M266XT. NeoMagic 2160B video controller supporting all video features with a PCI local bus on the Inspiron 3200 D233ST, D233XT and D266XT.

- Intel 430TX PCIset for system and PCI controller on the Inspiron 3000 M166ST, M200ST, M233ST, M233XT, and M266XT; Intel 440BX PCIset for system and PCI controller on the Inspiron 3200 D233ST, D233XT and D266XT.

- Built-in microphone and jacks for connecting external speakers, microphones, and headphones.

- Two new diagnostics tests (infrared and audio).

- An options bay that lets users replace the diskette drive with a secondary lithium ion battery, CD-ROM drive, or DVD-ROM drive. If the computer is booted with a diskette drive or battery in the options bay, you must reboot after installing the CD-ROM or DVD-ROM drive in the options bay.

- Built-in serial IrDA 1.1-compliant infrared transmitter/receiver, effective to 1 m (3.3 ft).

- Support for connecting an external diskette drive to the parallel connector on the I/O panel.

- Universal Serial Bus (USB), which provides a single connection point for multiple USB-compliant devices such as mice, printers, keyboards, and computer speakers. These devices can be connected and disconnected while the system is running.

Physical Description

display

status display panel

display
close/suspend button

speakers (2)

keyboard

touch pad

touch pad
buttons (2)

display latch

microphone

power/suspend
indicator

power button

options bay

main battery
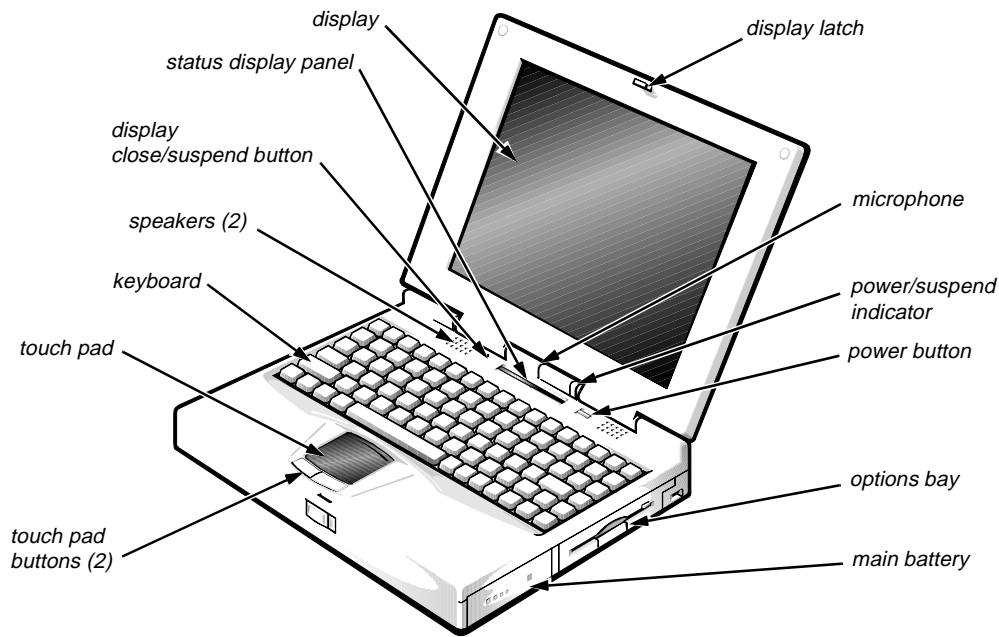
Figure 1-1. Front View of the Portable Computer

infrared port

USB connector

serial connector

parallel connector

monitor connector

expansion connector

PS/2 connector

PC Card slots (2)

audio jacks (3)

AC adapter
connector

security cable slot

hard-disk drive
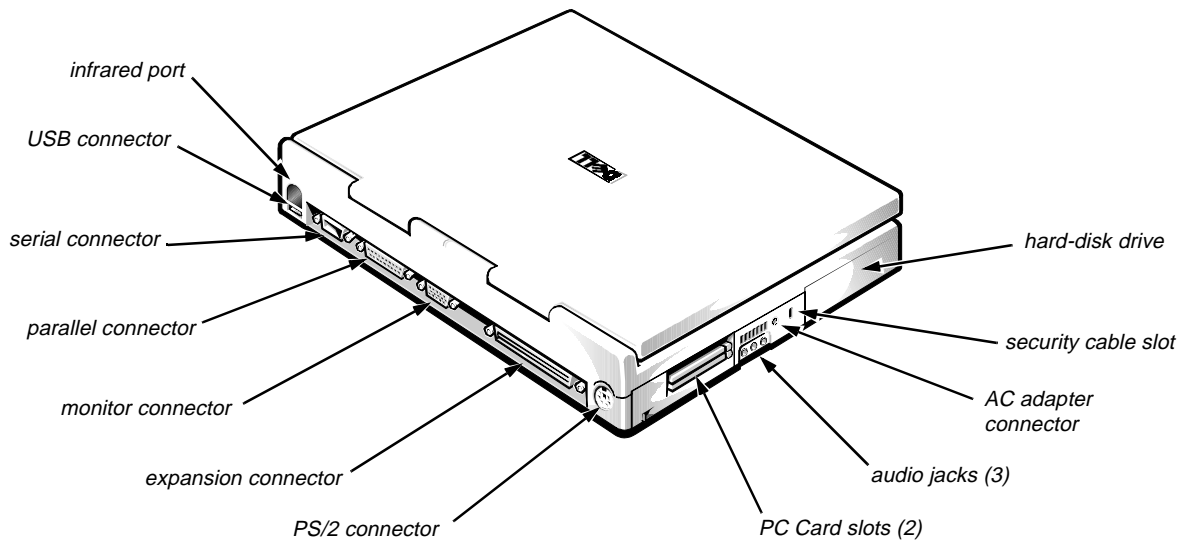
Figure 1-2. Back View of the Portable Computer

Status Display

Figure 1-3. Status Display Panel

The status display panel is located directly above the keyboard. This panel shows icons that indicate aspects of keyboard operation or save-to-RAM suspend mode; CD-ROM or DVD-ROM drive, hard-disk drive, diskette drive, and PC Card activity; and status of the power source (AC power or batteries).

Keyboard Indicators

The following icons indicate the status of the keyboard and whether the computer is in suspend mode.

Caps Lock Indicator
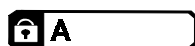
 Press <Caps Lock> to activate this feature. Press <Caps Lock> again to deactivate the feature.

Num Lock Indicator
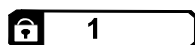
 Press <Num Lock> to activate this feature. Press <Num Lock> again to deactivate this feature.

Pad Lock Indicator
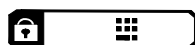
 Appears when the embedded numeric keypad is active. Press <Num Lock> to activate the embedded numeric keypad. Then press and hold <Fn> and press <Num Lock> to lock the keypad. Press and hold <Fn> to toggle between the letter and the number keys. To deactivate the keypad, press <Num Lock>. Then press and hold <Fn> and press <Num Lock> to unlock the keypad.

Scroll Lock Indicator
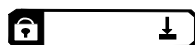
 Press <Scroll Lock> to activate this feature. Press <Scroll Lock> again to deactivate this feature.

Suspend Mode
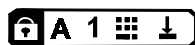
 When all indicators are present and appear in sequence, the computer is in save-to-RAM suspend mode.

CD-ROM/DVD-ROM/Hard-Disk Drive Indicator

 This indicator blinks when data is being transferred to or from the CD-ROM, DVD-ROM, or hard-disk drive.

Diskette-Drive Access Indicator

This indicator blinks when data is being transferred to or from the diskette drive in the options bay.

PC Card Indicator

This indicator blinks when the computer is accessing data from an installed PC Card or Cards.

AC Power Indicator

This indicator appears when the computer is receiving power through an AC power adapter.

- If the icon is present but not blinking, the computer is on but the battery is not charging.

- If the icon is blinking, the computer is on and the battery is charging.

Battery Activity Indicator

This indicator appears when there are batteries in the computer. If a battery is installed in the main battery compartment, the upper triangle appears. If a secondary battery is installed in the options bay, the lower triangle appears. If either triangle is blinking, the battery is in use or charging. If one of the triangles is not blinking, the battery it represents is installed but not in use.

Battery Status Indicator

The battery status indicator reflects the state of the main or secondary battery in the computer when the computer is off.

No indicator means there is no battery (main or secondary) in the computer, or if present, the battery has been discharged.

- The AC power indicator with the battery status indicator means the battery is defective.

- An indicator with one bar on the left means a battery is too hot. Allow the battery to cool to room temperature.

- The AC power indicator with the battery status indicator and one bar means that the battery is too hot (60° C [140° F] or more) to start charging. Charging starts automatically when the battery cools to below 45° C.

- An indicator with no bars means that battery power is low (about 90 percent depleted). This is the first low-battery indication and the computer warns the user with three short, audible beeps. There are about 10 minutes of battery life remaining.

- A blinking indicator with no bars means that battery power is critically low (about 95 percent depleted) and needs recharging. There are about 5 minutes of battery life remaining.

- An indicator with bars on the right side of the icon indicates the percentage of battery life remaining. Each bar equals 10 percent of battery life.

Battery Charge Gauge

CAUTION: If only one or none of the charge-level indicator lights are lit, the battery is almost completely discharged. Do not use the battery unless the computer is connected to AC power or unless you install a second charged battery.

There is a battery charge gauge on the main and secondary battery. The charge gauge has four charge-level indicator lights that indicate how much battery charge remains. Each light indicates approximately 25 percent battery charge. Press the status button to the right of the lights to check the total battery charge. If none of the lights are on, the battery has no charge left.

status button

indicator lights
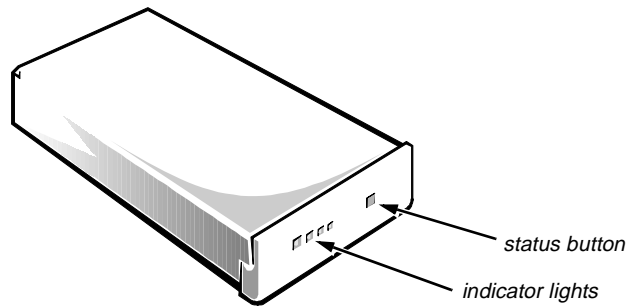
Figure 1-4. Battery Charge Gauge

NOTE: Figure 1-4 shows a main battery. For the secondary battery, the same button and lights are present, but are located on top of the battery and can be seen only when the secondary battery is out of the computer.

System Power

The power button controls power to the system. The computer receives power from either the AC adapter connected to an AC power source or from up to two batteries. If you use the AC adapter, constant power is available to the computer. If you use one or two batteries, the system has built-in power management features that extend battery life by removing power from parts of the computer that are not being used.

Power Conservation

Attach the AC power adapter to the computer, whenever possible, to conserve battery power. When the AC adapter is attached, the battery is charged while the computer uses AC power.

The Power Menu of the Setup program has power conservation features. To open the Main Menu of the Setup program, Press <F2> during the boot process. When activated, each power conservation feature turns off or slows down one or more functions while the computer is idle. The power conservation features are as follows:

- Standby mode — To activate this feature, select the Standby Time-Out option in the Power Menu of the Setup program. To deactivate the feature, move the cursor or press any key on the built-in or external keyboard.

- Save-to-RAM suspend mode — To activate this feature, press <Fn><Esc> or set the Suspend Time-Out option in the Power Menu of the Setup program. When save-to-RAM suspend mode is activated, the icons cycle through the keyboard indicators area of the status display panel. To deactivate this feature, press the power button. The computer may take several seconds to return to normal operation. Use the Resume On Modem Ring option in the Power Menu of the Setup program to enable the computer to automatically answer calls to external modems attached to the computer's serial port or to determine how long the computer remains in save-to-RAM suspend mode before resuming normal operation.

- Save-to-disk suspend mode — To activate this feature, press <Fn><a> (or <Fn><q> on the French keyboard) or set the Suspend Time-Out option in the Power Menu of the Setup program. To resume using the computer, press the power button. The computer may take several seconds to return to normal operation. If you connect or remove devices while the computer is in save-to-disk suspend mode, the computer automatically recognizes the newly connected devices when it resumes normal operation. If you encounter problems with a PC Card after resuming from save-to-disk suspend mode, remove and reinsert the PC Card. When the battery is nearly depleted, the computer enters save-to-disk suspend mode to preserve system data.

*I*nterrupt Assignments

Table 1-1. Interrupt Assignments

IRQ Line	Used/Available
IRQ0	Generated by the system timer
IRQ1	Generated by the keyboard controller to signal that the keyboard output buffer is full
IRQ2	Cascade to second interrupt controller
IRQ3	Reserved
IRQ4	Reserved
IRQ5	Used by the audio controller
IRQ6	Generated by the diskette drive controller to indicate that the diskette drive requires the attention of the microprocessor
IRQ7	Used by the parallel port
IRQ8	Generated by the system RTC
IRQ9	Software redirect to INT0A
IRQ10	Reserved
IRQ11	Reserved
IRQ12	Generated by the keyboard controller to indicate that the output buffer of the integrated touch pad or external PS/2 mouse is full
IRQ13	Used by the math coprocessor on the microprocessor
IRQ14	Generated by the hard-disk drive to indicate that the drive requires the attention of the microprocessor
IRQ15	Reserved

Technical Specifications

Table 1-2. Technical Specifications

Microprocessor	
Microprocessor type	Inspiron 3000 M166ST, M200ST, M233ST, M233XT, and M266XT: Intel Pentium micro-processor with MMX technology
	Inspiron 3200 D233XT and D266XT: Intel Pentium II microprocessor with MMX technology
Microprocessor speed	Inspiron 3000 M166ST, M200ST, M233ST, M233XT, and M266XT: 166, 200, 233, or 266 MHz
	Inspiron 3200 D233ST, D233XT, and D266XT: 233 or 266 MHz
Internal cache memory	32 KB
External cache	512-KB write-back SRAM (256-KB write-back SRAM for the M166ST)
Math coprocessor	internal to the microprocessor

Chip Set and Bus	
System chip set	Inspiron 3000 M166ST, M200ST, M233ST, M233XT, and M266XT: Intel 430TX PCIset
	Inspiron 3200 D233ST, D233XT, and D266XT: Intel 440BX PCIset
Data bus width	64 bits
DRAM bus width	64 bits
Address bus width	32 bits
Flash EPROM	2 Mbits

PC Card	
PCI controller	Texas Instruments PCI 1131 cardbus controller
PC Card connectors	two (supports two type I or type II cards or one type III card)
Cards supported	3.3- and 5-V

Table 1-2. Technical Specifications (continued)

PC Card *(continued)*	
PC Card connector size	68 pins
Data width (maximum)	32 bits

Memory	
Architecture	SDRAM
Memory module capacities	16-, 32-, and 64-MB SODIMMs
Standard RAM	32 MB (16 MB of nonremovable memory on the main board and a 16-MB 3.3-V memory module in one of the two memory module sockets on the main board).
Maximum RAM	144 MB
Memory access time/ clock frequency	83 MHz
BIOS address	F000:0000

Connectors	
Serial (DTE)	one 9-pin connector; 16,550-compatible UART, 16-byte buffer
Parallel	one 25-hole connector; normal (unidirectional), bidirectional, EPP 1.9, or ECP
Monitor	one 15-hole connector
PS/2 keyboard/mouse	one 6-pin mini-DIN
Infrared	one IrDA 1.1-compliant port
Expansion connector	240 pins
Audio	microphone; headphones/speaker; line-in
USB	one 4-pin connector

Table 1-2. Technical Specifications (continued)

Audio	
Audio type	Sound Blaster Pro-compatible voice and music functions
Audio controller	Crystal 4237B
Conversion	16 bit (stereo analog-to-digital and digital-to-analog)
FM music synthesizer	20-voice, 72-operator
Interfaces:	
Internal	ISA bus
External	microphone (minijack, mono); headphones/speaker (minijack); line-in
Internal speaker amplifier	1.5 W
Controls	volume can be controlled through key combinations and software application menus
Video	
Video type	64-bit (128-bit hardware accelerated) PCI
Video controller (M166ST, M200ST, M233ST, M233XT, M266XT)	NeoMagic 2160
Video controller (D233ST, D233XT, D266XT)	NeoMagic 2160B
Video memory	2 MB equivalent
12.1-Inch Display	
Type (M166ST, M200ST, M233ST, D233ST)	active-matrix color (TFT)
Dimensions:	
Height	184.5 mm (7.3 inches)
Width	246.0 mm (9.7 inches)
Diagonal	307.5 mm (12.1 inches)
Maximum resolution	800 x 600 pixels; 16 million colors
Response time (typical)	30 ms

Table 1-2. Technical Specifications (continued)

12.1-Inch Display *(continued)*	
Operating angle	0° (closed) to 180°
Dot pitch	0.264 mm
Power consumption	2.35 W
Controls	brightness can be controlled through key combinations
13.3-Inch Display	
Type (M233XT, M266XT, D233XT, D266XT)	active-matrix color (TFT)
Dimensions:	
Height	203 mm (8.0 inches)
Width	271 mm (10.7 inches)
Diagonal	338 mm (13.3 inches)
Maximum resolution	1024 x 768 pixels; 64,000 colors
Response time (typical)	30 ms
Operating angle	0° (closed) to 170°
Dot pitch	0.264 mm
Power consumption	3.9 W
Controls	brightness can be controlled through key combinations
Keyboard	
Number of keys	87 (U.S. and Canada); 88 (Europe); 88 (Japan)
Key travel	3.0 ± 0.5 mm (0.12 ± 0.02 inch)
Key spacing	19.1 mm (0.75 inch)
Layout	QWERTY/AZERTY/Kanji
Touch Pad	
Interface	PS/2-compatible
X/Y position resolutions (graphics table mode)	20 points/mm (500 points/inch)

Table 1-2. Technical Specifications (continued)

Touch Pad *(continued)*

Size:

Thickness	4.65 mm (0.18 inch) at highest component
Width	64-mm (2.52-inch) sensor-active area
Height	47.0-mm (1.85-inch) rectangle with 0.5-mm (0.02-inch) tabs
Weight	15 g (0.52 ounce) ± 0.5 g (0.001 ounce)

Power:

Supply voltage	5 V ± 10%
Supply current	4 mA (maximum operating)

Main Battery

Type	lithium ion
Dimensions:	
Height	23.0 mm (0.9 inch)
Depth	161.5 mm (6.4 inches)
Width	73.4 mm (2.9 inches)
Weight	0.41 kg (0.9 lb)
Voltage	14.4 VDC
Capacity	39 WH
Charge time (approximate):[1]	
Computer on	2.5 hours
Computer off	1.5 hours
Operating time (approximate, with no power management features enabled)[1]	2.5 to 3.5 hours with one battery; 5 to 7 hours with two batteries
Life span (approximate)[1]	500 discharge/charge cycles
Temperature range:	
Charge	0° to 40°C (32° to 104°F)
Discharge	0° to 60°C (32° to 140°F)
Storage	–20° to 50°C (–4° to 122°F)

[1] *Battery performance features such as charge time, operating time, and life span can vary according to the conditions under which the computer and battery are used.*

Table 1-2. Technical Specifications (continued)

AC Adapter	
Input voltage	90 to 264 VAC
Input current (maximum)	1.5 A at 90 VAC, full load
Input frequency	47 to 63 Hz
Output current	2.4 A (continuous)
Output power	45 W
Rated output voltage	19 VDC
Physical:	
Height	29.6 mm (1.17 inches)
Width	60.0 mm (2.36 inches)
Depth	105 mm (4.13 inches)
Weight (with cables)	0.3 kg (0.66 lb)
Temperature range:	
Operating	5° to 35°C (41° to 95°F)
Storage	–20° to 50°C (–4° to 122°F)
Physical (Computer)	
M166ST, M200ST, M233ST, D233ST:	
Height	42 mm (1.65 inches)
Width	299 mm (11.77 inches)
Depth	234 mm (9.21 inches)
Weight[2]	2.8 kg (6.2 lb)
M233XT, M266XT, D233XT, D266XT:	
Height	51.5 mm (2.03 inches)
Width	303 mm (11.93 inches)
Depth	234 mm (9.21 inches)
Weight[2]	3.1 kg (6.8 lb)

[2] *Includes hard-disk drive, diskette drive, battery, and two PC Card blanks.*

Table 1-2. Technical Specifications (continued)

Environmental (Computer)	
Temperature:	
Operating	5° to 35°C (41° to 95°F)
Storage	–20° to 50°C (–4° to 122°F)
Relative humidity	10% to 90% (noncondensing)
Maximum vibration:	
Operating	0.5 GRMS using a random-vibration spectrum that simulates air/truck shipment
Storage	1.1 GRMS using a random-vibration spectrum that simulates air/truck shipment
Maximum shock:[3]	
Operating	1.52 m/sec (60 inches/sec) (less than or equal to a pulse width of 2 ms)
Storage	2.03 m/sec (80 inches/sec) (less than or equal to a pulse width of 2 ms)
Altitude:	
Operating	0 to 3048 m (0 to 10,000 ft)
Storage	0 to 12,192 m (0 to 40,000 ft)

[3] *Measured with the hard-disk drive in head-parked position.*

Chapter 2
Initial Procedures

*T*his chapter describes initial procedures that can help you diagnose a computer problem. These procedures can often reveal the source of a problem or indicate the correct starting point for troubleshooting the computer. Dell recommends that you perform these initial procedures in the order they are presented.

Initial User Contact

When you first contact a user who has a problem, ask the user to describe the problem and the conditions under which it occurs. A verbal description can often indicate the cause of a problem or indicate the appropriate troubleshooting procedure to use. After the user describes the problem, follow these steps:

1. Ask the user to back up any data on the hard-disk drive if the computer's condition permits.

   See the "Maintaining Your Computer" section of the online *System's User's Guide*.

2. Ask the user to try to duplicate the problem by repeating the operations he or she was performing at the time the problem occurred.

   Can the user duplicate the problem?

   Yes. Proceed to step 3.

   No. Proceed to the next section, "Visual Inspection."

3. Observe the user to determine whether he or she is making an error, such as typing an incorrect key combination or entering a command incorrectly.

   Is the problem a result of user error?

   Yes. Instruct the user in the proper procedure or direct him or her to the appropriate user documentation for a description of the correct procedure.

   No. Proceed to the next section, "Visual Inspection."

Visual Inspection

The visual inspection consists of a quick inspection of the exterior of the computer and any attached peripherals, including making any necessary corrections. For information about the proper removal and installation of computer

components, as instructed in the following procedure, see Chapter 4, "Removing and Replacing Parts."

CAUTION: Before you proceed with the visual inspection, ensure that the user has saved all open files and exited all open application programs if possible.

To perform a visual inspection, follow these steps:

1. Determine the power state of the computer.

   If the display is on, go to step 2.

   Check the status display window to determine the status of the computer. If the display is off, press the power key to verify that the computer is not in suspend or standby mode. Then go to step 2.

2. Turn off any attached peripherals, and then shut down the computer.

3. Verify that the exterior of the computer is free of any obvious physical damage.

4. If the computer is operating from an AC adapter, verify the following:

   a. The AC adapter's AC power cable is connected to both the AC adapter and the wall outlet. The AC adapter's LED should be on.

   b. The AC adapter's DC power cable is properly connected to the computer's AC adapter connector.

   c. The AC adapter and cables are free of any obvious physical damage.

5. If the computer is operating from battery power, remove any installed batteries, verify that they are free of any obvious physical damage, and then reinsert the batteries into their respective compartments. Press the test button located on each battery to see if there is a charge.

6. Remove the diskette drive (if installed), verify that it is free of any obvious physical damage, and then reinsert the drive into its compartment.

7. Remove any installed PC Cards from the PC card slot, verify that they are free of any obvious physical damage, and then reinsert the card(s) into the PC card slot.

8. If there is a memory area problem and the computer has memory modules, remove the memory modules from the main board, verify that they are free of any obvious physical damage, and then reinstall the modules.

9. Raise the LCD display, and verify that the computer is free of any obvious physical damage.

10. Verify that the keyboard is free of any obvious physical damage and that its keys operate freely.

11. Verify that the touch pad and its associated buttons operate freely.

12. If an external monitor is connected, verify the following:

    a. The monitor's interface cable is properly attached to the external-monitor connector on the computer's I/O panel.

b. The monitor's power cable is attached to a power source and is free of any obvious physical damage.

   c. The monitor and its interface cable are free of any obvious physical damage.

   d. The monitor's controls are set according to the instructions in the documentation for the monitor.

13. If an external mouse is connected, verify the following:

   a. The mouse is properly connected to the keyboard/keypad/mouse connector on the computer's I/O panel.

   b. The mouse and its cable are free of any obvious physical damage.

   c. The mouse's ball and pushbuttons operate freely.

14. For any attached serial or parallel devices, verify the following:

   a. The device's interface cable connector is correctly attached to the appropriate port connector on the computer's I/O panel.

   b. The captive screws that secure the connectors at each end of the interface cable are secure enough to ensure a firm connection.

   c. The attached device and its interface cable are free of any obvious physical damage.

15. Turn on any attached peripherals and then the computer.

   Does the problem recur?

   Yes. Go to the next section, "Observing the Boot Routine."

   No. No further steps are necessary.

Observing the Boot Routine

After you perform a visual inspection as described in the previous section, boot the computer from a diagnostics diskette and, while the boot routine is running, observe the computer for any indications of problems.

NOTE: To prevent possible damage to the original diagnostics diskette, always use a backup copy of the diagnostics diskette when servicing a user's computer. Dell recommends that users make copies of the Dell Diagnostics Diskette. *For instructions, see "Before You Start Testing" in Chapter 4 of the* Dell Inspiron 3000 Reference and Troubleshooting Guide.

To observe the boot routine, follow these steps:

1. Turn off the computer and any attached peripherals.

2. Insert a diagnostics diskette into the diskette drive. Turn on all peripherals and then the computer.

3. Watch the indicators at the top of the keyboard. Depending on how your computer is configured, after various indicators flash momentarily in the status display panel, some indicators should light up and remain on.

Do these indicators light up within seconds after the boot routine starts?

Yes. Go to step 4.

No. Troubleshoot the power subsystem.

4. While the boot routine is running, observe the computer for any of the following:

- Diskette-drive and hard-disk drive access indicator activity

  These indicators light in response to data being transferred to or from the drives. If either of these indicators fails to light during the boot routine, troubleshoot the diskette drive or hard-disk drive subsystem, as appropriate.

- System error messages

  These messages can indicate problems or provide status information. If a system error message is displayed, refer to Table 3-2.

- Beep codes

  A beep code is a series of beeps that indicates an error condition. If the computer emits a beep code, refer to Table 3-1.

  NOTE: The computer beeps once shortly after the system boots. This beep is normal and not part of a beep code.

- Any unusual sounds

5. Observe the display for the Diagnostics Menu of the Dell Diagnostics.

   Does the Diagnostics Menu appear on the display?

   Yes. See "Running the Dell Diagnostics" in Chapter 3.

   No. Go to step 6.

6. Insert another copy of the diagnostics diskette into the diskette drive, and reboot the computer.

   Does the Diagnostics Menu appear on the display?

   Yes. See "Running the Dell Diagnostics" in Chapter 3.

   No. Go to the next section, "Eliminating Resource Conflicts."

*E*liminating Resource Conflicts

Devices within or connected to the computer may require dedicated memory spaces, interrupt levels, and/or DMA channels. Because different devices can be configured at different times, it is possible that the same resource is assigned to two or more devices.

Disconnect all peripherals and remove all PC Cards to make sure that the computer failure is not caused by faulty devices.

If you suspect that resource conflicts might exist, check the computer and reassign the resources as necessary. For more information about resolving conflicts, see Chapter 3, "Troubleshooting Your Computer," in the *Reference and Troubleshooting Guide*.

Getting Help

If none of the procedures in this chapter reveal the source of the problem or lead to the proper troubleshooting steps for determining the source of the problem, contact Dell for technical assistance. For instructions, see Chapter 5, "Getting Help," in the *Reference and Troubleshooting Guide* or the "Contacting Dell" section of the online *System User's Guide*.

Chapter 3
Beep Codes and Error Messages

*T*his chapter describes beep codes and system error messages that can occur during system start-up or, in the case of some failures, during normal computer operation. The tables in this chapter list faults that can cause a beep code or system error message to occur and the probable causes of the fault in each case.

If a faulty computer does not emit beep codes or display system error messages to indicate a failure, you should load the diagnostics and run the appropriate tests to help isolate the source of the problem. See "Running the Dell Diagnostics" found later in this chapter.

*P*OST *Beep Codes*

If the display cannot display error messages during POST, the computer may emit a series of beeps that identify the problem or that can help you identify a faulty component or assembly. The following table lists the beep codes that may be generated during POST. Most beep codes indicate a fatal error that requires replacement of the main board or other corrective actions before the computer can operate.

Table 3-1. POST Beep Codes

Beep Code	Error	Probable Causes
1-2	Memory module not being properly identified or used	Faulty memory module or faulty main board
1-2-2-3	ROM BIOS checksum failure	Faulty main board
1-3-1-1	DRAM refresh failure	Faulty main board
1-3-1-3	Keyboard controller test failure	Faulty keyboard or faulty main board
1-3-4-1	RAM failure on address line *nnnn*	Faulty memory module or faulty main board
1-3-4-3	RAM failure on data bits *nnnn* of high byte on memory bus	Faulty memory module or faulty main board
1-4-1-1	RAM failure on data bits *nnnn* of low byte on memory bus	Faulty memory module or faulty main board
2-1-2-3	Check ROM copyright notice failure	Faulty main board
2-2-3-1	Interrupt mask register failure	Faulty main board

System Error Messages

The following table lists (in alphabetical order) system error messages that may appear on the display during the boot routine or during normal computer operation.

Table 3-2. System Error Messages

Message	Definition	Probable Causes
Diskette drive A error	Connector loose or diskette faulty. Cannot access diskette drive.	Faulty or incorrectly inserted diskette in drive. Faulty diskette drive. Faulty main board. Faulty or loose external cable.
Extended RAM failed at off-set: *nnnn*	Extended memory not configured properly or failed at memory address *nnnn*.	Faulty or improperly seated memory module. Faulty main board.

Table 3-2. System Error Messages *(continued)*

Message	Definition	Probable Causes
`Failing bits: nnnn`	Memory failed at RAM address *nnnn*.	Faulty or improperly seated memory module. Faulty main board.
`Fixed disk 0 failure`	Hard-disk drive not responding to commands from computer.	Corrupted hard-disk drive boot sector or configuration file. Faulty hard-disk drive. Faulty main board.
`Fixed disk controller failure`	Hard-disk drive or controller not responding to commands from computer.	Faulty hard-disk drive. Faulty main board.
`Incorrect drive A type—run Setup`	Diskette drive not identified properly in the Setup program.	Incorrect drive configuration. Faulty connections. Faulty diskette drive. Faulty main board.
`Keyboard controller error`	Keyboard controller faulty.	Faulty keyboard connection. Faulty keyboard. Faulty main board.
`Keyboard error`	Keyboard not responding correctly.	Built-in keyboard: faulty keyboard or key pressed while computer booting. External keyboard: cable or connector loose. Faulty keyboard or key pressed while computer booting.
`Operating system not found`	Operating system cannot be found on hard-disk drive or on diskette in diskette drive.	Incorrect drive configuration. Operating system not installed on hard-disk drive or diskette drive not bootable. Faulty connections. Faulty drive. Faulty main board.
`Parity check 1 nnnn`	Parity error in system bus at address *nnnn*.	Faulty main board.
`Parity check 2 nnnn`	Parity error in I/O bus at address *nnnn*.	Faulty main board.

Table 3-2. System Error Messages (continued)

Message	Definition	Probable Causes
`Real time clock error`	CMOS battery that supports data stored in NVRAM may be dead.	Faulty battery. Faulty main board.
`Shadow RAM failed at offset: nnnn`	Shadow RAM failed at address *nnnn*.	Faulty or improperly seated memory module. Faulty main board.
`System battery is dead—Replace and run Setup`	CMOS battery dead.	Faulty CMOS battery or main board.
`System cache error—cache disabled`	Primary cache failed.	Faulty microprocessor.
`System CMOS checksum bad—run Setup`	CMOS has been corrupted or modified, possibly by an application program that changes data stored in CMOS.	BIOS has been updated. Verify correct CMOS settings, save, and exit.
`System RAM failed at offset: nnnn`	Memory not operating correctly. System RAM failed at address *nnnn* in the 64-KB block at which error was detected.	Faulty or improperly seated memory module. Faulty main board.
`System timer error`	Timer circuit on main board malfunctioning.	Faulty main board.

*R*unning the Dell Diagnostics

> **CAUTION: To prevent damage to the original diagnostics diskette, always use a backup copy of the diagnostics diskette when servicing a user's computer. Dell recommends that users make several copies of this diskette to ensure that one is always available.**

The Dell Diagnostics contains tests that aid in troubleshooting the computer. The diagnostics diskette contains the following test groups:

- RAM — Tests the main memory
- System Set — Tests the primary functions of the main board
- Video — Tests the video subsystem
- Keyboard — Tests the keyboard subsystem

- Mouse — Tests the mouse/touch pad subsystem

- Diskette Drives — Tests the diskette drive subsystem

- Hard-Disk Drives (Non-SCSI) — Tests the IDE hard-disk drive subsystem

- IDE CD ROM Drives — Tests a CD-ROM drive subsystem

- Serial/Infrared Ports — Tests the serial communications port

- Parallel Ports — Tests the parallel communications port

- Audio — Tests the operation of the audio chip set

- SCSI Devices — Tests a SCSI hard-disk drive subsystem

  NOTE: This test does not apply to Dell Inspiron 3000 computers.

- Network Interface — Tests a network controller and its associated interface

  NOTE: This test does not apply to Dell Inspiron 3000 computers.

Before starting the Dell Diagnostics, you must configure the computer correctly. For more information, see "Before You Start Testing" in Chapter 4 of the *Reference and Troubleshooting Guide*.

To run the Dell Diagnostics completely, you must have an external diskette drive with a diskette drive cable attached.

Follow these steps to start the diagnostics:

1. Install a CD-ROM drive in the options bay.

2. Attach the external diskette drive cable to the parallel port connector on the back of the computer.

3. Turn off the computer.

4. Place a copy of the *Dell Diagnostics Diskette* in the diskette drive, and boot the computer.

Starting the diagnostics causes the Dell logo screen to appear, followed by a message indicating that the diagnostics is loading. Before the diagnostics loads, a program tests the portion of main memory (RAM) required for loading the diagnostics. If a main memory error is detected, a message appears on the screen telling you a memory module has failed.

If no errors are found in main memory, the diagnostics loads, and the Diagnostics Menu appears. This menu lets you choose the following options or exit to the MS-DOS® prompt:

- Run Quick Tests — Runs preselected tests to quickly locate a computer failure or to indicate where further testing is needed to isolate a failure

- Run All Tests — Runs all tests for a thorough test of the computer

- Run Specific Tests — Tests a particular area or subsystem of the computer

Chapter 4
Removing and Replacing Parts

*T*his chapter provides procedures for removing and replacing components, assemblies, and subassemblies.

Unless otherwise noted, each of the procedures in this chapter assumes the following:

- The computer and any attached peripherals are turned off and the peripherals are disconnected from the computer's I/O panel.

- A part can be replaced or installed by performing the removal procedure in reverse order.

When performing the procedures in this chapter that require the display assembly to be open, use a book or something similar to support the display assembly. The angle of the display assembly with respect to the base assembly should not exceed 180 degrees for a 12.1-inch LCD and 170 degrees for a 13.3-inch LCD. Also, assume that locations or directions relative to the computer are as shown in Figure 4-1 unless otherwise specified in a procedure.

back of computer

left side   **DELL**   right side

front of computer
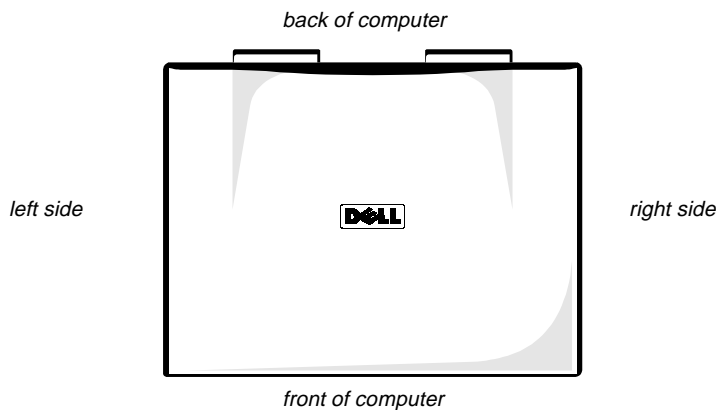
Figure 4-1. Computer Orientation

*R*ecommended Tools

Most of the procedures require the use of one or more of the following tools:

- Small flat-blade screwdriver

- Number 1 magnetized Phillips-head screwdriver

- Antistatic grounding strap

- Dental pick

- Small scribe (or Delrin [plastic] screwdriver)
- Nut drivers (4 mm and 5 mm)

Screw Identification and Tightening
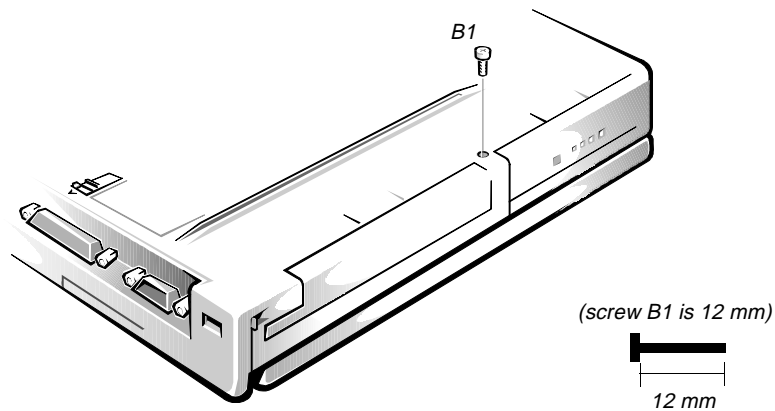
Figure 4-2. Screw Identification (Example)

> **CAUTION: It is essential that the correct length screw be used when reinstalling a screw. Otherwise, hardware damage could result. Make sure that the screw is properly aligned with its corresponding hole, and avoid overtightening.**

Where applicable, information about screw lengths is provided in illustrations. Before installing a screw, match the screw to the screw length graphics provided to check for correct length.

Precautionary Measures

Before performing any of the procedures in this chapter, read the following warning.

> **WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT: Before you start to work on the computer, perform the following steps in the sequence indicated.**
>
> 1. **Turn off the computer and any attached peripherals.**
>
> 2. **Disconnect the computer and any attached peripherals from AC power sources to reduce the potential for personal injury or shock.**
>
> 3. **Ground yourself by attaching an antistatic grounding strap to your wrist and to an unpainted metal surface on the computer's I/O panel. If an antistatic grounding strap is not available, periodically discharge static electricity from your body by touching one of the connectors on the I/O panel.**

Follow these precautionary measures before removing or replacing any parts that are described in this chapter:

1. Determine the power state of the computer.

   If the display is on, go to step 2.

   Check the status display window to determine the status of the computer. If the display is off, press the power key to verify that the computer is not in suspend or standby mode. Then proceed to step 2.

2. Turn off any attached peripherals, and then shut down the computer.

3. Disconnect the computer and any attached peripherals from AC power sources to reduce the potential for personal injury or shock.

   If the computer has an AC adapter, disconnect the adapter from the AC power source, and then disconnect the AC adapter from the computer or from the port replicator (see Figures 4-3 and 4-4).

AC power cable
(to AC power source)

AC adapter

AC adapter cable
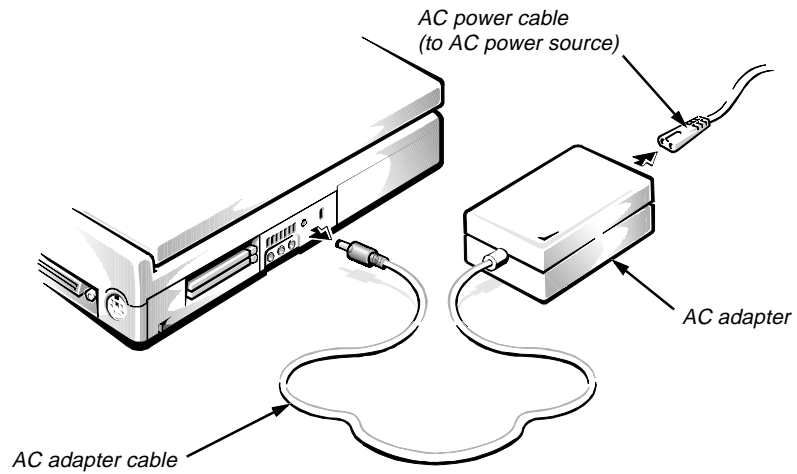
Figure 4-3. AC Adapter Removal

4. If the computer is connected to a port replicator, remove the computer from the replicator.

release handle
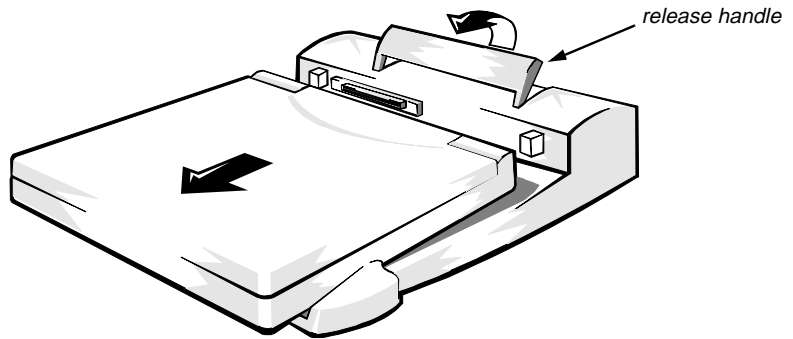
Figure 4-4. Computer Removal From Replicator

5. Remove the main battery from the battery compartment.

    Unlock the latch lock (see Figure 4-5). Slide the latch toward the back of the computer (the latch does not move all the way to the lock groove). Keep holding the latch with one hand while pulling the battery straight out to release the battery. Then slide the battery out of the compartment.

latch lock (unlocked position)

bottom of computer

battery latch

back of computer
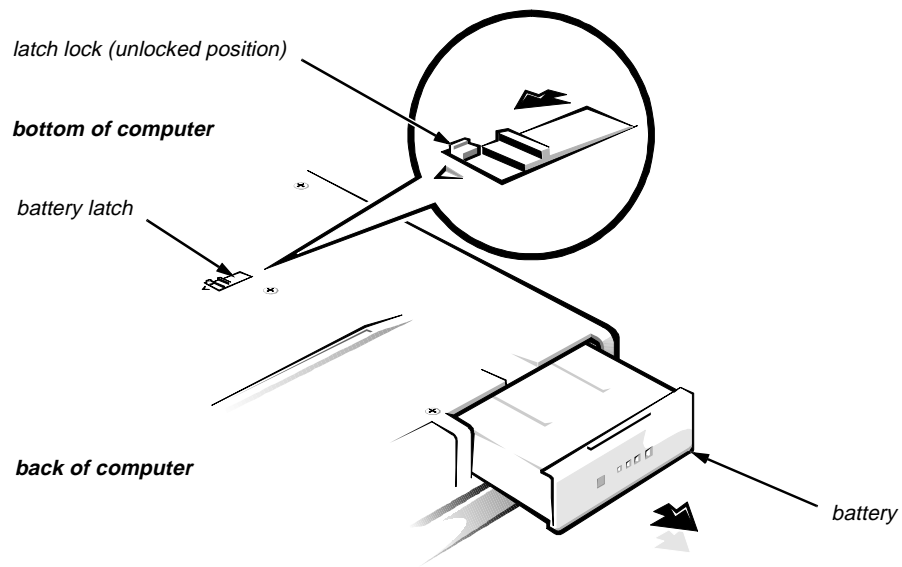
battery

Figure 4-5. Main Battery Removal

6. Remove any PC Cards.

To remove a PC Card from the top connector (see Figure 4-6), press the top eject button (identified by an arrow pointing up) twice. To remove a PC Card from the bottom connector, press the bottom eject button (identified by an arrow pointing down) twice. If you are removing a type III card, press the bottom eject button twice.

NOTES: The first time you press an eject button, the eject button itself pops out. The second time you press the eject button, the PC Card is released and extends slightly from the slot.

Grasp the end of the card, and pull it completely from the slot. Then install one or both of the blanks provided with the computer to protect the PC Card connectors.
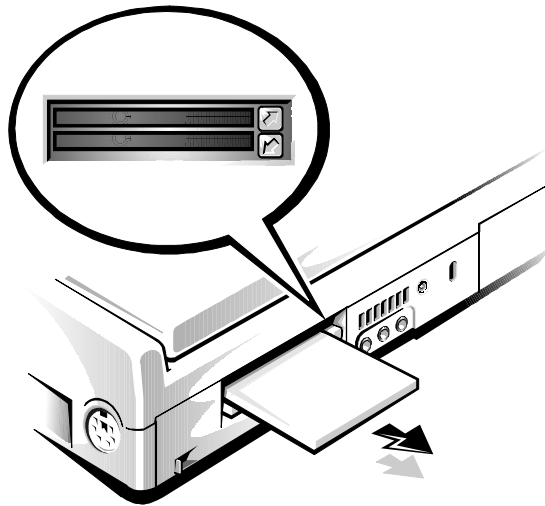
Figure 4-6. PC Card Removal

> **CAUTION: When handling the hard-disk drive, handle it gently and don't bump or drop the drive. Rough handling of the drive could induce failure or loss of data.**

7. Remove the hard-disk drive assembly.

Turn the computer over and remove the small rubber covers over screws HD1 and HD2, then remove the screws. Pull the hard-disk drive straight out of the computer (see Figure 4-7).

> **CAUTION: When the hard-disk drive is not in the computer, protect the drive from exposure to static electricity by storing it in a hard-disk drive case.**

> **CAUTION: When the hard-disk drive is removed, the memory module cover is not secured. Use caution to avoid damage to the memory modules or the cover.**
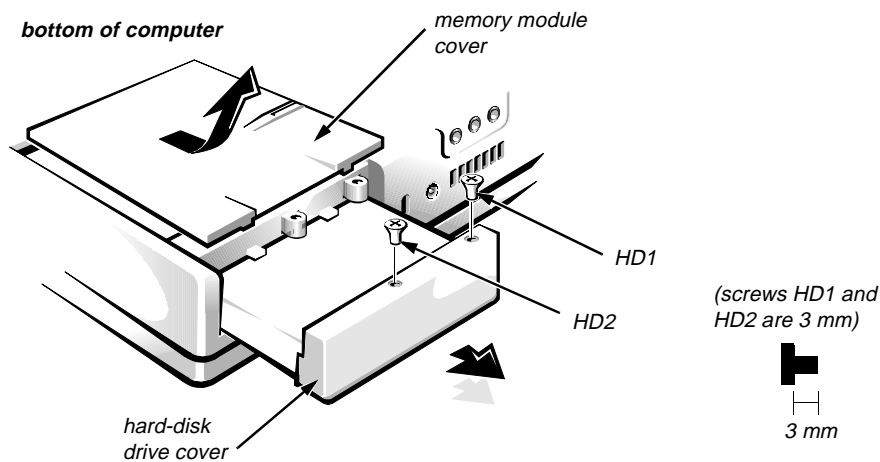
Figure 4-7. Hard-Disk Drive Removal

8. Remove the memory module cover.

   After the hard-disk drive is removed, lift the memory module cover off the computer. Slide the cover out slightly and lift it up and away from the computer (see Figure 4-7).

   When reinstalling the cover, place it over the memory module opening, leaving about 1/4-inch gap, then slide the cover into place.

9. Remove the memory modules.

   Carefully spread apart the inner metal tabs of the memory module socket to disengage the module from the socket (the module should pop up slightly). Then lift the memory module away from the socket (see Figure 4-8).
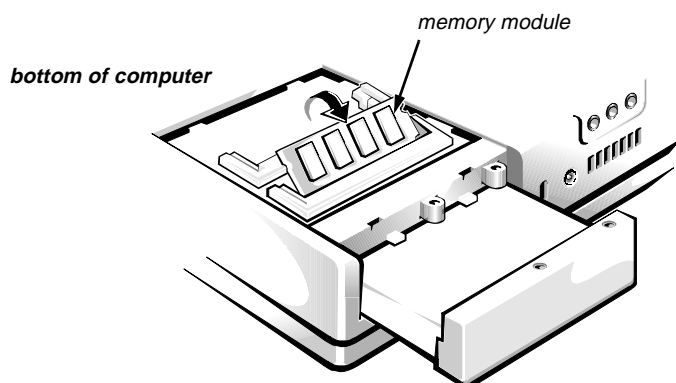
Figure 4-8. Removing a Memory Module

10. Remove the diskette drive, secondary battery, CD-ROM drive, or DVD-ROM drive from the options drive bay.

Unlock the latch lock (see Figure 4-9). Slide the latch toward the back of the computer; the latch does not move all the way to the lock groove. Keep holding the latch with one hand while pulling the device (diskette drive, secondary battery, CD-ROM drive, or DVD-ROM drive) straight out of the options bay with the other.
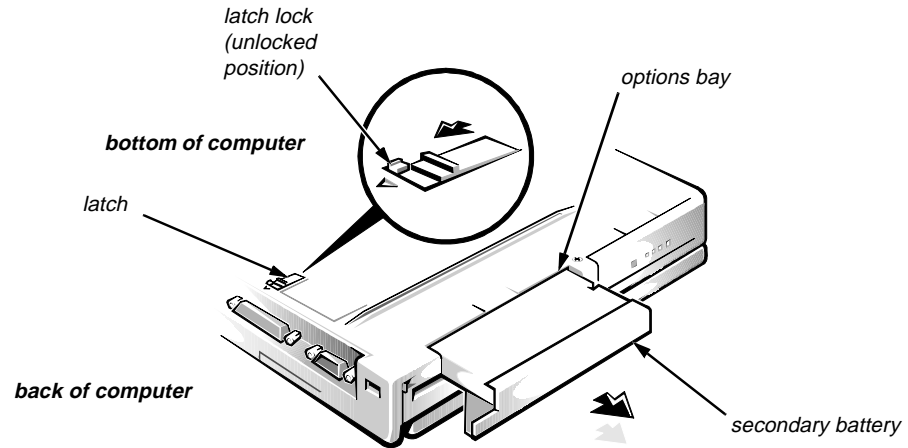
Figure 4-9. Diskette Drive, Secondary Battery, CD-ROM Drive, or DVD-ROM Drive Removal

NOTE: If the computer is booted with a diskette drive or secondary battery in the options bay, you must reboot after installing the CD-ROM or DVD-ROM drive in the options bay.

ZIF Connectors

Some of the computer's interface connectors are zero insertion force (ZIF) connectors. These connectors are not removable; they must be released to disconnect a cable from them.

CAUTION: ZIF connectors are fragile. To avoid breaking the connectors, touch them carefully. Do not apply too much pressure to the movable part of the connector when opening or closing it.

To disconnect a cable from a ZIF connector, follow these steps:

1. Insert a small flat-blade screwdriver or dental pick under the movable part of the connector (see Figure 4-10).

   For most ZIFs, carefully pry up first one end of the movable part of the connector and then the other end. Some ZIFs (keyboard connector on the main board) may need to be lifted in the center.
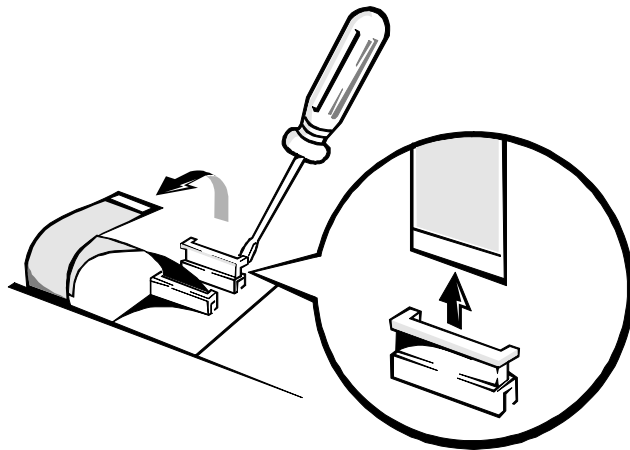
Figure 4-10. Releasing a ZIF Connector

2. Pull up gently on the movable part of the connector until the cable is released.

3. Grasp the cable and pull it out of the connector.

To reconnect an interface cable to a ZIF connector, follow these steps:

1. Use the flat-blade screwdriver to open the movable part of the ZIF connector.

2. Orient the end of the cable with the ZIF connector, and insert the end of the cable into the connector.

3. While holding the cable in place, close the ZIF connector.

   To ensure a firm connection, make sure the ZIF connector is completely closed.

Exploded Views of Components and Assemblies

LCD panel
assembly

latch

keyboard

heat sink

connector cover

hinge covers (2)

hard-disk drive

diskette drive,
secondary battery,
CD-ROM drive, or
DVD-ROM drive

base
assembly

main battery
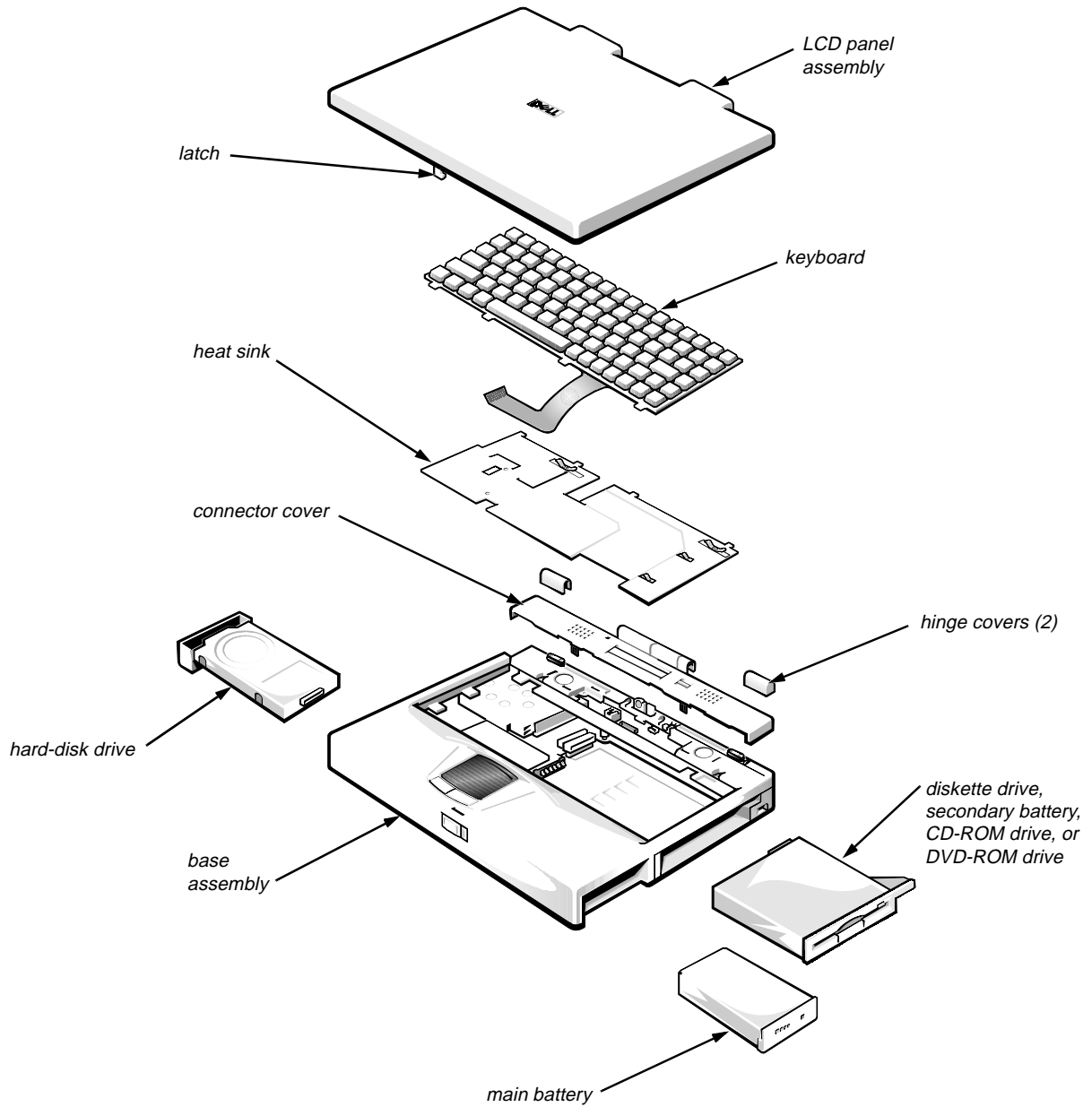
Figure 4-11. Exploded View—Computer

Labels in figure:
- front bezel
- LCD panel
- LCD panel flex cable
- bobbin (adhered to LCD flex cable)
- hinges (2)
- back cover
- latch
- inverter board
- inverter board connector
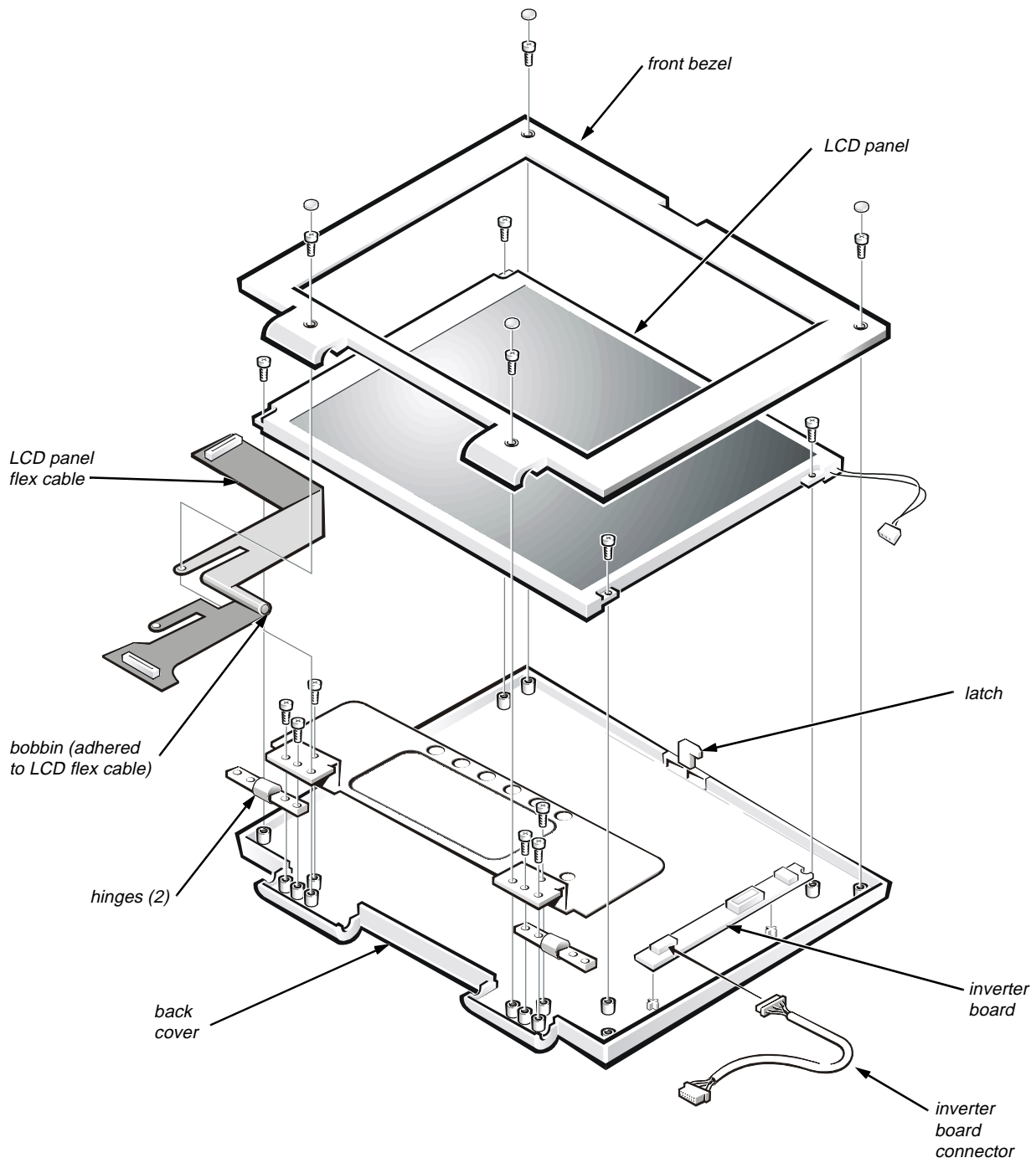
Figure 4-12. Exploded View—12.1-Inch LCD Assembly
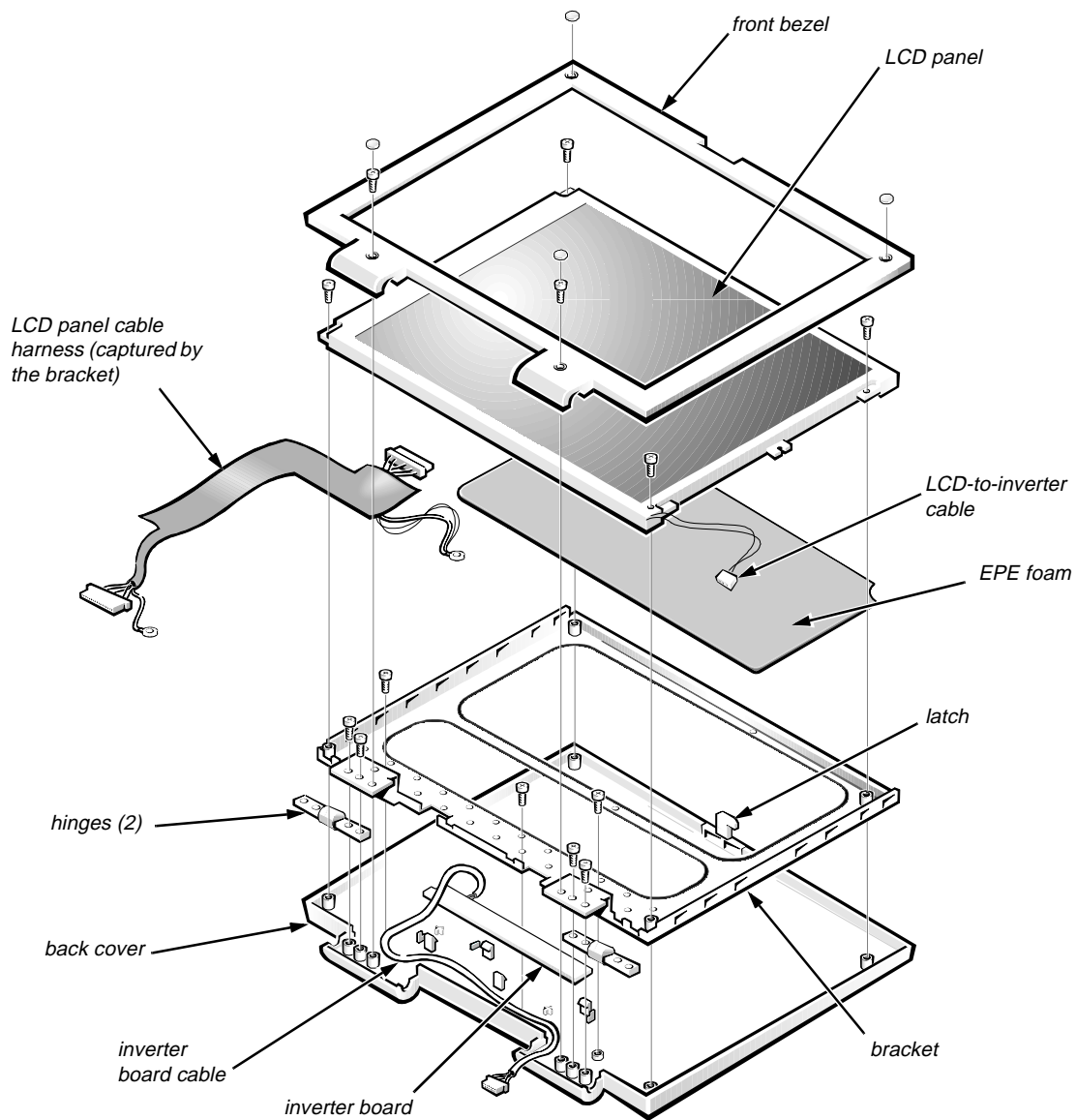
front bezel

LCD panel

LCD panel cable
harness (captured by
the bracket)

LCD-to-inverter
cable

EPE foam

latch

hinges (2)

back cover

inverter
board cable

inverter board

bracket

*NOTE: The inverter board is installed with the component side down, next to the
back cover.*

Figure 4-13. Exploded View—13.3-Inch LCD Assembly

status display panel screws (3)

connector cover

palmrest
assembly

cover screws (6)

touch pad button
board cable

I/R board cable

touch pad button
board

I/R board

I/R board screw

touch pad button
board screw

speakers (2)

touch pad

plastic housings (2)

speaker screws (2)

hard-disk drive
heat sink screws (6)

hard-disk drive
heat sink
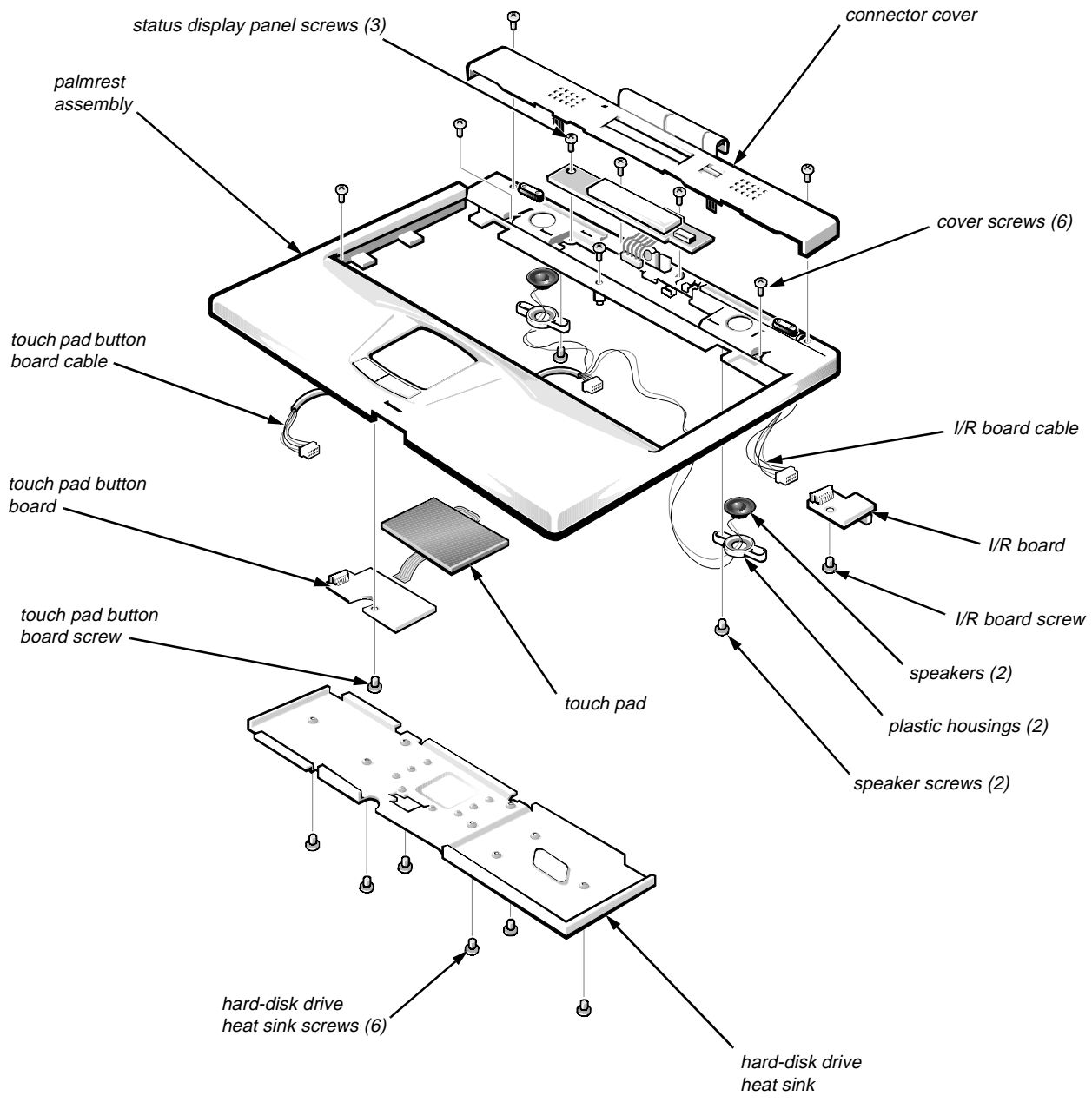
Figure 4-14. Exploded View—Palmrest Assembly
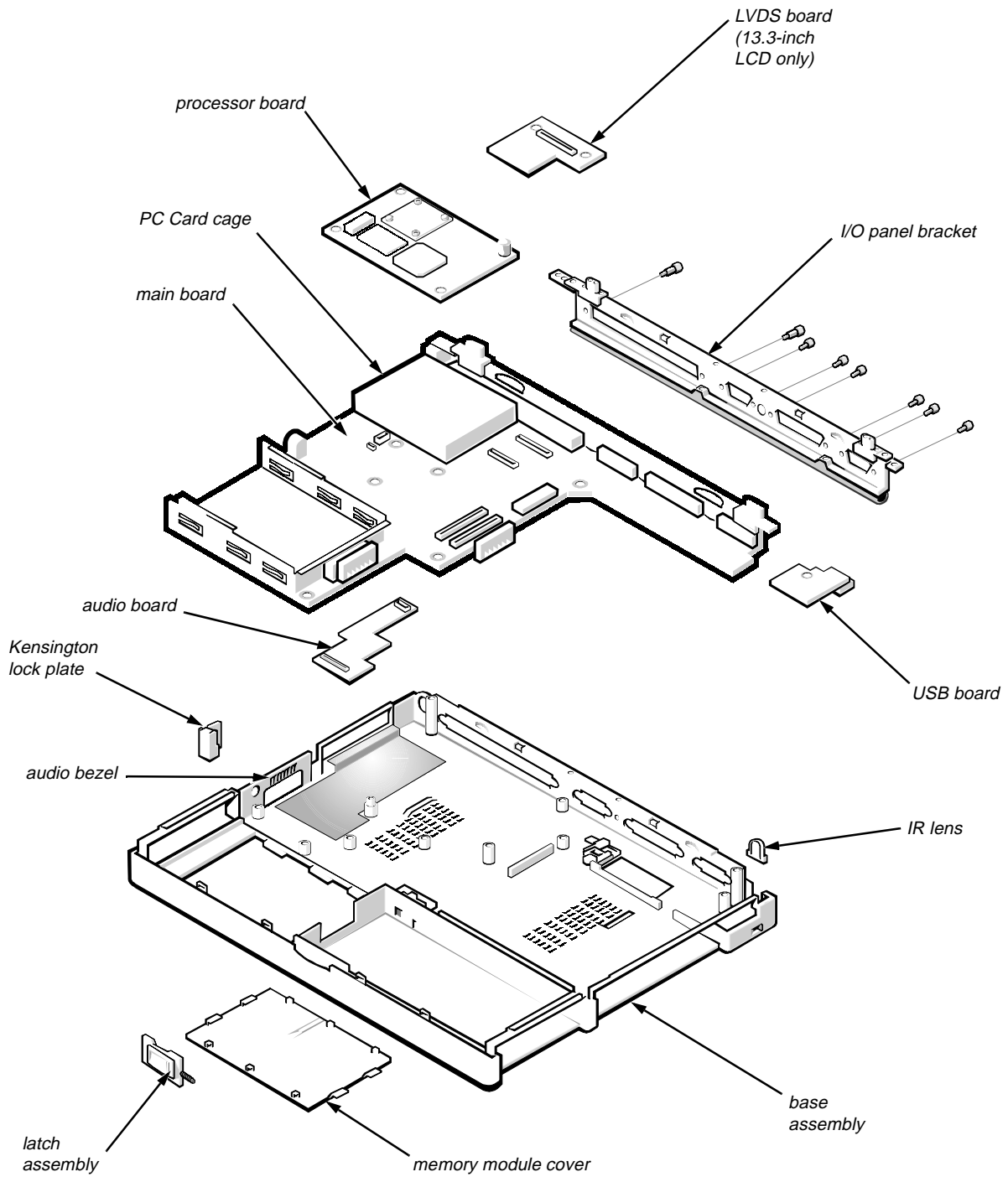
Figure 4-15. Exploded View—Base Assembly

Factory Repair Parts and Assemblies

This section contains a parts list and procedures for removing and replacing factory components and subassemblies. This information is provided for reference only. Dell does not recommend removal and replacement of these parts in the field.

Table 4-1 lists the factory repair parts and assemblies available for the computer. Some parts may only be available as part of a kit or assembly. The subsections in this chapter provide instructions for removing and replacing these parts and assemblies. An asterisk (*) identifies those parts or assemblies that are replaceable by a customer.

Table 4-1. Factory Repair Parts and Assemblies

Part or Assembly Name	Order Name
AC Adapter/Power Cables	
AC Adapter, service kit*	CUS,ADPT,AC,EXT,19V,I3000,US
AC Adapter*	ADPT,AC,EXT,19V,45W,NBK,I3000
Cable, power, U.S.	CORD,PWR,110V,6F,AC ADPT,US
Batteries	
Battery, main, service kit*	CUS,BTRY,MAIN,40W,LIION,I3000
Battery, main, 40-WH	BTRY,MAIN,40W,LIION,NBK, I1300
Battery, secondary*	CUS,BTRY,2ND,40W,LIION,I3000
Battery, secondary	KIT,BTRY,2ND,40W,LIION,I1300
BIOS	
Door, BIOS, service kit	CUS,DOOR,PLSTC,BIOS,NBK, I3000
Door, BIOS	DOOR,PLSTC,BTM,BIOS,NBK, I3000
BIOS, flash, service kit (M166ST, M200ST, M233ST, M233XT, M266XT)	CUS,FLASH,UPG,I3000
BIOS, flash, service kit (D233ST, D233XT, D266XT)	CUS,DSK,FLASH,BIOS,UPD,I3200

* *Customer-replaceable unit (CRU)*

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
BIOS *(continued)*	
Kit, BIOS flash (M166ST, M200ST, M233ST, M233XT, M266XT)	KIT,FLASH,BIOS,UPG,F3,I3000
Kit, BIOS flash (D233ST, D233XT, D266XT)	KIT,DSK,FLASH,BIOS,UPG,I3200
Base Assembly	
Base (with battery), 166-MHz, 12.1-inch LCD	BASE,I3000,M166ST,FD,BTRY, AMF
Assembly (with battery), 166-MHz	ASSY,NBK,I3000,M166ST,AMF
Base (with battery), 200-MHz, 12.1-inch LCD	BASE,I3000,M200ST,FD,BTRY, AMF
Assembly (with battery), 200-MHz	ASSY,NBK,I3000,M200ST,AMF
Base (with battery), 233-MHz, 12.1-inch LCD	BASE,I3000,M233ST,FD,BTRY, AMF
Assembly (with battery), 233-MHz	ASSY,NBK,I3000,M233ST,AMF
Base (with battery), 233-MHz, 13.3-inch LCD	BASE,I3000,M233XT,FD,BTRY, AMF
Assembly (with battery), 233-MHz	ASSY,NBK,I3000,M233XT,AMF
Base (with battery), 266-MHz, 13.3-inch LCD	BASE,I3000,M266XT,FD,BTRY, AMF
Assembly (with battery), 266-MHz	ASSY,NBK,I3000,M266XT,AMF
Base (without battery), 166-MHz, 12.1-inch LCD	BASE,NBK,I3000,M166ST,NO BTRY
Assembly (without battery), 166-MHz	ASSY,NBK,I3000,M166ST,NO BTRY
Base (without battery), 200-MHz, 12.1-inch LCD	BASE,NBK,I3000,M200ST,NO BTRY
Assembly (without battery), 200-MHz	ASSY,NBK,I3000,M200ST,NO BTRY

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Base Assembly *(continued)*	
Base (without battery), 233-MHz, 13.3-inch LCD	BASE,NBK,I3000,M233XT,NO BTRY
Assembly (without battery), 233-MHz	ASSY,NBK,I3000,M233XT,NO BTRY
Base (without battery), 266-MHz, 13.3-inch LCD	BASE,NBK,I3000,M266XT,NO BTRY
Assembly (without battery), 266-MHz	ASSY,NBK,I3000,M266XT,NO BTRY
Main Board	
Board assembly, main	SYS,PLN,TFT,SDRAM,I3000,WWD
IC, keyboard BIOS (M166ST, M200ST, M233ST, M266ST, M266XT)	IC,BIOS,KYBD,NBK,I3000
IC, keyboard BIOS (D233ST, D233XT, D266XT)	IC,BIOS,KYBD,NBK,I3200
Bracket, I/O	BRKT,MET,I/O,NBK,I3000
Hinge block, right	PLT,BRACE,HNG,LCD,RT,NBK, I3000
Hinge block, left	PLT,BRACE,HNG,LCD,LF,NBK, I3000
Ground springs, PC Card cage	SPR,GND,CAGE,PCMCIA,NBK, I3000
Assembly, PC Card cage	ASSY,CAGE,MTL,PCMCIA,I3000
M166ST board assembly, Pentium 166-MHz	ASSY,CRD,PRCR,NBK,I3000, M166ST
Kit, thermal, M166ST	ASSY,CRD,THRM,PRC,NBK,I3000
M166ST processor board, Pentium 166-MHz	PRM,2PP166AES,166M,MOBIL, PRO
M200ST board assembly, Pentium 200-MHz	ASSY,CRD,PRCR,NBK,I3000, M200ST
Kit, thermal, M200ST	ASSY,CRD,THRM,PRC,NBK,I3000
M200ST processor board, Pentium 200-MHz	PRM,2PP200AES,200M,MOBIL, PRO

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Main Board (continued)	
M233ST board assembly, Pentium 233-MHz	ASSY,CRD,PRCR,NBK,I3000, M233ST
Kit, thermal, M233ST	ASSY,CRD,THRM,PRC,NBK,I3000
M233ST processor board, Pentium 233-MHz	PRM,5PP233,233M,MOBIL,COMPA
M233XT board assembly, Pentium 233-MHz	ASSY,CRD,PRCR,NBK,I3000, M233XT
Kit, thermal, M233XT	ASSY,CRD,THRM,PRC,NBK,I3000
M233XT processor board, Pentium 233-MHz	PRM,5PP233,233M,MOBIL,COMPA
M266XT board assembly, Pentium 266-MHz	ASSY,CRD,PRCR,NBK,I3000, M266XT
Kit, thermal, M266XT	ASSY,CRD,THRM,PRC,NBK,I3000
M266XT processor board, Pentium 266-MHz	PRM,5PP266,266M,MOBIL,COMPA
D233ST board assembly, Pentium II 233-MHz	ASSY,PRM,5PP233,233M,512K,PII
Kit, thermal, D233ST	KIT,THRM,PRC,NBK,I3200,MO-BILE
D233ST processor board, Pentium II 233-MHz	PRM,5PP233,233M,512K,PII
D233XT board assembly, Pentium II 233-MHz	ASSY,PRM,5PP233,233M,512K,PII
Kit, thermal, D233XT	KIT,THRM,PRC,NBK,I3200,MO-BILE
D233XT processor board, Pentium II 233-MHz	PRM,5PP233,233M,512K,PII
D266XT board assembly, Pentium II 266-MHz	ASSY,PRM,5PP266,266M,512K,PII
Kit, thermal, D266XT	KIT,THRM,PRC,NBK,I3200,MO-BILE
D266XT processor board, Pentium II 266-MHz	PRM,5PP266,266M512K,PII

Table 4-1. Factory Repair Parts and Assemblies *(continued)*

Part or Assembly Name	Order Name
CD-ROM Drive	
CD-ROM drive, 20X, service kit∗	CUS,CD,680M,I,INT,20X,I3000
CD-ROM drive, 20X	ASSY,CD,680M,I,INT,20X,I3000
Button, eject	BTN,EJCT,MET,CD,20X,NBK,I3000
Bracket, plastic	BRKT,PLSTC,CD,20X,NBK,I3000
Cover, plastic	CVR,PLSTC,CD,20X,NBK,I3000
Cable, flex	CBL,FLEX,CD,20X,NBK,I3000
Door	DOOR,PLSTC,CD,20X,NBK,I3000
CD-ROM drive, 24X	ASSY,CD,680M,I,INT,24X, TSHBA,I3000
CD-ROM drive	CD,680M,I,INT24X,TOSHIBA
Screw	SCR,M2X0.4+3FP-ZK
Door	DOOR,PLSTC,CD,24X,NBK,I3000
Cover, plastic	CVR,PLSTC,CD,24X,NBK,I3000
Bracket, plastic	BRKT,PLSTC,CD,20X,NBK,I3000
Cable, flex	CBL,FLEX,CD,24X,NBK,I3000
Diskette Drive Assembly	
Diskette drive, internal/external, service kit∗	CUS,FD,INT/EXT,NBK,I3000
Diskette drive assembly	ASSY,FD,F3,INT/EXT,I3000,MITSU
Diskette drive	FD,1.44M,F3,17MM,I3000, MITSUMI
Case, plastic	CVR,PLSTC,FD,NBK,I3000, MITSUMI
Plate, top metal	PLT,MET,TOP,FD,NBK,I3000
Plate, metal	PLT,MET,CONT,FD,NBK,I3000
Plate, external metal	PLT,MET,EXT,FD,NBK,I3000
Cable, flex	CBL,FLEX,FD,NBK,I3000,MIT-SUMI

∗   *Customer-replaceable unit (CRU)*

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Diskette Drive Assembly (continued)	
Cable, service kit∗	CUS,CBL,FD,INT/EXT,I3000,US
Cable, diskette drive	KIT,CBL,FD,INT/EXT,I3000,US
Hard-Disk Drive Assemblies	
Hard-disk drive, 2.1-GB, service kit*	CUS,HD,2.1G,I,12.5MM,IBM,I3000
Assembly, hard-disk drive, 2.1-GB	SUBASSY,HD,2.1G,I,12.5MM,I3000
Hard-disk drive, 2.1-GB	HD,2.1GB,I,F2,12.5MM,IBM,V2
Bracket, hard-disk drive	BRKT,HD,PLSTC,12.5MM,STW
Screws, bracket	SCR,M3.0x0.5x4,PHH,NPL
Insulator, metal	INSUL,MET,BTM,HD,12.5MM, STW
Hard-disk drive, 3.2-GB, service kit*	CUS,HD,3.2G,I,12.5MM,IBM,I3000
Assembly, hard-disk drive, 3.2-GB	SUBASSY,HD,3.2G,I,12.5MM,I3000
Hard-disk drive, 3.2-GB	HD,3.2GB,I,12.5MM,NBK,IBM
Bracket, hard-disk drive	BRKT,HD,PLSTC,12.5MM,STW
Screws, bracket	SCR,M3.0x0.5x4,PHH,NPL
Insulator, metal	INSUL,MET,BTM,HD,12.5MM, STW
Hard-disk drive, 4.0-GB, service kit∗	CUS,HD,4.0G,I,12.5MM,IBM,I3000
Assembly, hard-disk drive, 4.0-GB	SUBASSY,HD,4.0G,I,12.5MM,I3000
Hard-disk drive, 4.0-GB	HD,4.0GB,I,12.5MM,NBK,IBM
Bracket, hard-disk drive	BRKT,HD,PLSTC,12.5MM,STW
Screws, bracket	SCR,M3.0x0.5x4,PHH,NPL
Insulator, metal	INSUL,MET,BTM,HD,12.5MM, STW

∗   *Customer-replaceable unit (CRU)*

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Hard-Disk Drive Assemblies (continued)	
Bracket, plastic	BRKT,HD,PLSTC,12.5MM,NBK, I3000
Plate, insulator, EMI	INSUL,MET,BTM,HD,12.5MM, I3000
Hinge Covers	
Covers, hinge, service kit	CUS,CVR,PLSTC,HNG,NBK,I3000
Covers, hinge	HNG,PLSTC,CVR,LF/RT,NBK, I3000
Keyboards	
Keyboard, U.S.	KYBD,87,US,NBK,I3000,JM
Keyboard, UK	KYBD,88,UK,NBK,I3000,JM
Keyboard, Japan	KYBD,88,JPN,NBK,I3000,JM
Keyboard, Germany	KYBD,88,GER,NBK,I3000,JM
Keyboard, French	KYBD,88,FR,NBK,I3000,JM
LCD Assemblies	
LCD panel, active-matrix color display (TFT), 12.1" IBM	LCD,TFT,SVGA,12.1",I1300,IBM
Bezel, front, 12.1" IBM	BZL,PLSTC,LCD,12.1,NBK,I3000
Cable, flex, 12.1" IBM	CBL,FLEX,LCD,12.1,I3000,IBM
Hinges, display, 12.1"	HNG,MET,LCD,12.1",NBK,I3000
Bezel, back, 12.1" IBM	CVR,BK,12.1,W/LTCH,I3000,IBM
Bumper, upper rubber, 12.1"	BMPR,RBR,UPR,LCD,12.1",I3000
Cable, inverter, 12.1" IBM	CBL,WIRE,INVRTR,LCD,12.1, I3000
Bracket, LCD panel, 12.1" IBM	BRKT,MET,LCD,12.1,I3000,IBM
Screw, LCD panel	SCR,M3.0X0.5+5FP-MC
Screw, bezel	SCR,M2.5X0.45P+5FP-ZK
Washer	WSHR,LLK,7X3X0.5,THIN,SPTE
Cover, lower rubber	PAD,RBR,SCR,LWR,LCD,NBK, I3000
Board, inverter	CRD,INVRTR,12.1,I3000,IBM

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
LCD Assemblies (continued)	
LCD panel, active-matrix color display (TFT), 12.1" Samsung	LCD,TFT,SVGA,12.1",I1300, SMSNG
Bezel, front, 12.1" Samsung	BZL,PLSTC,LCD,12.1,NBK,I3000
Cable, flex, 12.1" Samsung	CBL,FLEX,LCD,12.1,I3000,
Hinges, display, 12.1"	HNG,MET,LCD,12.1",NBK,I3000
Bezel, back, 12.1" Samsung	CVR,BK,12.1",W/LTCH,I3000, SMSNG
Bumper, upper rubber, 12.1"	BMPR,RBR,UPR,LCD,12.1",I3000
Cable, flex cable, Samsung	CBL,WIRE,INVRTR,LCD,12.1, I3000,SMSNG
Bracket, LCD panel, 12.1" Samsung	BRKT,MET,LCD,12.1,I3000, SMSNG
Screw, LCD panel	SCR,M3.0X0.5+5FP-MC
Screw, bezel	SCR,M2.5X0.45P+5FP-ZK
Washer	WSHR,LLK,7X3X0.5,THIN,SPTE
Cover, lower rubber	PAD,RBR,SCR,LWR,LCD,NBK, I3000
Board, inverter	CRD,INVRTR,12.1,I3000,SMSNG
LCD panel, active-matrix color display (TFT), 13.3" IBM	LCD,TFT,SVGA,13.3",I1300,IBM
Bezel, front, 13.3" IBM	BZL,PLSTC,LCD,13.3,NBK,I3000
Hinges, display, 13.3" IBM	HNG,MET,LCD,13.3",NBK,I3000
Bumpers, inverter, 13.3"	BMPR,RBR,INVRTR,13.3,NBK, I3000
	BMPR,RBR,INVRTR,13.3,IBM, I3000
Cable, LCD discreet, 13.3" IBM	CBL,WIRE,LCD,13.3,I3000,IBM
Cable, inverter, 13.3" IBM	CBL,WIRE,INVRTR,LCD,13.3, I3000,IBM
Bezel, back, 13.3" IBM	CVR,BK,13.3,W/LTCH,I3000,IBM
Bracket, EPE, 13.3" IBM	FOAM,SPCR,LCD,13.3",NBK, I3000,IBM

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
LCD Assemblies (continued)	
Bracket, LCD panel, 13.3", IBM	BRKT,MET,LCD,13.3,NBK,I3000, IBM
Screw, flex cable ground	SCR,M2.5X0.45P+3F-NI
Bumper, upper rubber, 13.3"	BMPR,RBR,UPR,LCD,13.3",I3000
Screw, LCD panel	SCR,M3.0X0.5+6FP-MC
Screw, bezel	SCR,M2.5X0.45P+5FP-ZK
Cover, lower rubber	PAD,RBR,SCR,LWR,LCD,NBK, I3000
Board, inverter	CRD,INVRTR,13.3,I3000,IBM
Spacer, 13.3"	SHIM,WSHER,5X3X.3,THIN,NYL
LCD panel, active-matrix color display (TFT), 13.3" Samsung	LCD,TFT,SVGA,13.3",I3000, SMSNG
Bezel, front, 13.3" Samsung	BZL,PLSTC,LCD,13.3,NBK,I3000, SMSNG
Hinges, display, 13.3" Samsung	HNG,MET,LCD,13.3",NBK,I3000
Bumper, inverter, 13.3"	BMPR,RBR,INVRTR,13.3,NBK, I3000
Cable, LCD discreet, 13.3" Samsung	CBL,WIRE,LCD,13.3,I3000,SMSNG
Cable, inverter, 13.3" Samsung	CBL,WIRE,INVRTR,LCD,13.3, I3000,SAM
Bezel, back, 13.3" Samsung	CVR,BK,13.3,W/LTCH,I3000, SMSNG
Bracket, EPE, 13.3" Samsung	FOAM,SPCR,LCD,13.3",NBK, I3000,SMSNG
Bracket, LCD panel, 13.3" Samsung	BRKT,MET,LCD,13.3,NBK,I3000, SMSNG
Screw, flex cable ground	SCR,M2.5X0.45P+3F-NI
Screw, LCD panel	SCR,M3.0X0.5+6FP-MC
Screw, bezel	SCR,M2.5X0.45P+5FP-ZK
Cover, lower rubber	PAD,RBR,SCR,LWR,LCD,NBK, I3000
Board, inverter	CRD,INVRTR,13.3,I3000, SMSNG
Spacer, 13.3"	SHIM,WSHER,5X3X.3,THIN,NYL

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Memory	
Memory module, 16-MB, service kit*	CUS,DIMM,16M,66M,2K,144,NBK
Memory modules, two 16-MB	DIMM,16,66M,2X64,2K,144
Memory module, 32-MB, service kit*	CUS,DIMM,32M,66M,2K,144,NBK
Memory modules, two 32-MB	DIMM,16,66M,4X64,4K,144
Memory module, 64-MB, service kit*	CUS,DIMM,64M,66M,2K,144,NBK
Memory modules, two 64-MB	DIMM,16,66M,8X64,4K,144
Door, memory, service kit*	CUS,DOOR,PLSTC,BTM,RAM, I3000
Door, memory	DOOR,PLSTC,BTM,RAM,NBK, I3000
Foot, rubber	FOOT,RBR,CVR,BTM,NBK,I3000
Modems and LAN	
Board, network, 10/100, service kit	KIT,CRD,ADPT,NTWK,10/100,TX, 3C
Board, network, 10BT, service kit	KIT,ADPT,NTWK,10BT,NBK, 3COM
Modem, 33.6, cable, service kit	KIT,MDM,33.6,CBL,PCMCIA, MTRLA
Modem/LAN, 33.6/10BT, service kit	KIT,MDM/LAN,33.6/10BT, PCMCIA
Modem, 33.6, cable/XJ, service kit	KIT,MDM,33.6,CBL/XJ,PCMCIA, MHZ
Modem, 56KB	MDM,56K,PCMCIA,CBL/XJACK, USROB
Miscellaneous Parts	
Board, LVDS (XGA, 13.3" Samsung)	CRD,INTFC,LVDS,LCD,I3000, SMSNG
Board, LVDS (XGA, 13.3" IBM)	CRD,INTFC,LVDS,LCD,I3000,IBM

* *Customer-replaceable unit (CRU)*

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Miscellaneous Parts *(continued)*	
IC, system BIOS (M166ST, M200ST, M233ST, M233XT, M266XT)	IC,BIOS,SYS,NBK,I3000
IC, system BIOS (D233ST, D233XT, D266XT)	IC,BIOS,SYS,NBK,I3200
Board, audio	CRD,INTFC,AUD,NBK,I3000
Board, USB	CRD,INTFC,USB,NBK,I3000
Board, IR	CRD,IR,NBK,I3000
Lens, IR	LENS,IR,NBK,I3000
Cable, IR	CBL,FLEX,CRD,IR,NBK,I3000
Standoffs, processor board	STDF,M2.5X4.45,M/F,NPLCU
Bezel, audio	HLDR,PLSTC,JK,AUD,MCPHN, I3000
Heat sink (with fan), system (M166ST, M200ST, M233ST, M233XT, M266XT)	ASSY,HTSNK,11X3",CPU,I3000
Heat sink (with fan), system (D233ST, D233XT, D266XT)	SUBASSY,HTSNK,11X3",CPU, I3200
Assembly, base	SUBASSY,CVR,BTM,PLSTC,I3000
Feet, rubber	FOOT,RBR,CVR,BTM,NBK,I3000
Plate, metal locking	PLT,LKG,CVR,BTM,NBK,I3000
Assembly, LCD latch	ASSY,LTCH,LCD,NBK,I3000
Latch	LTCH,PLSTC,DIS,NBK,I3000
Spring	SPR,LTCH,DIS,NBK,I3000
Assembly, speaker wire	ASSY,WIRE,SPKR,NBK,I3000
Speaker	SPRK,O.6W,23M,NBK,I3000
Microphone	MCPHN,SPKR,NBK,STW
Cover, right speaker	CVR,PLSTC,SPKR,RT,NBK,I3000
Cover, left speaker	CVR,PLSTC,SPKR,LF,NBK,I3000

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Miscellaneous Parts (continued)	
Cover, connector (M166ST, M200ST, M233ST, M233XT, M266XT)	CVR,PLSTC,TOP,CON,NBK,I3000
Cover, connector (D233ST, D233XT, D266XT)	CVR,PLSTC,TOP,CON,NBK,I3200
Heat sink, hard-disk drive	HTSNK,11X3",AL,HDD,NBK,I3000
Palmrest Assembly	
Assembly, palmrest, 12.1"	SUBASSY,PLMRST,PLSTC,BLK, I3000
Palmrest, 12.1"	PLMRST,PLSTC,BLK,NBK,I3000
Assembly, palmrest, 13.3"	SUBASSY,PLMRST,PLST,13.3, I3000
Palmrest, 13.3"	SUBASSY,PLMRST,PLST,13.3, I3000
Board, touch-pad	CRD,INTFC,TPAD,NBK,I3000
Board, touch-pad button	CRD,INTFC,BTN,TPAD,NBK, I3000
Cable, touch-pad	CBL,FLEX,CRD,TPAD,NBK,I3000
Board, status display panel	CRD,INTFC,STATUS,DIS,NBK, I3000
Cable, status display panel	CBL,FLEX,CRD,STATUS,DIS,I3000
Replicator	
Replicator, service kit	CUS,PPR,I/O,NBK,I3000,US
Subassembly, replicator	SUBASSY,PPR,I/O,NBK,I3000
Assembly, replicator, with stand	ASSY,PPR,I/O,W/STND,NBK,I3000
Foot, replicator	FOOT,RPLCTR,RBR,LM
Screw	SCR,TPB,3X3X5P,BLO
Stand, replicator	STND,RPLCTR,PLSTC,BK,LM

Part or Assembly Name	Order Name
Rubber Parts	
Parts, rubber, 12.1" LCD, service kit	CUS,KIT,FOOT,REPL,12.1,I3000
Foot, rubber	FOOT,RBR,CVR,BTM,NBK,I3000
Bumper, upper, rubber	BMPR,RBR,UPR,LCD,12.1",I3000
Pad, lower, rubber	PAD,RBR,SCR,LWR,LCD,NBK, I3000
Parts, rubber, 13.3" LCD, service kit	CUS,KIT,FOOT,REPL,13.3,I3000
Foot, rubber	FOOT,RBR,CVR,BTM,NBK,I3000
Bumper, upper, rubber	BMPR,RBR,UPR,LCD,13.3",I3000
Pad, lower, rubber	PAD,RBR,SCR,LWR,LCD,NBK, I3000
Screws	
Screws (6), hard-disk heat sink	SCR,M3.0X0.5+5FP-MC
Screws (4), 12.1 LCD bezel	SCR,M2.5X0.45P+5FP-ZK
Screws (2), keyboard	SCR,M2.5X0.45P+3F-NI
Screws (2), diskette drive	SCR,M2X0.4+3FP-ZK
Screws (3), heat sink	SCR,M2X0.4+5FP-ZK
Screws (4), hinge locks	SCR,M2.5X0.45P+8BH-ZK
Screws (2), I/O expansion connector (docking port) standoff	STDF,M2.5X4.14,5.5HEX,BRS
Screws (6), I/O standoff	STDF,4-40X6,4.8HEX,BRS
Service Documentation	
Service Manual	MNL,SERVICE,I3000
Removal and Replacement Guide	DOC,SERV,GDE,I3000
Reference and Troubleshooting Guide	GDE,REF/TRBLSHT,I3000,ENG
User's Guide	GDE,USER,I3000,ENG
Technical sheet, hard-disk drive	TSH,HD,I3000,EAST
Technical sheet, memory module	TSH,MEM,I3000,EAST
Technical sheet, options bay	TSH,BAY,INSTL,I3000,EAST
Technical sheet, diskette drive	TSH,FD,CBL,I3000,EAST

Table 4-1. Factory Repair Parts and Assemblies (continued)

Part or Assembly Name	Order Name
Service Documentation *(continued)*	
Technical sheet, main battery	TSH,BTRY,MAIN,I3000,EAST
Technical sheet, adapter, AC	TSH,AC ADPT,I3000,EAST
Technical sheet, replicator, English	TSH,RPLCTR,I3000,EAST
Technical sheet, system software diskette, English	TSH,SSD INSTL,I3000,EAST
Technical sheet, replicator, West	TSH,RPLCTR,I3000,WEST
Technical sheet, system software diskette, West	TSH,SSD INSTL,I3000,WEST
Software	
Diagnostics diskette, service kit, U.S. (M166ST, M200ST, M233ST, M233XT, M266XT)	KIT,DSK,DIAG,3.82,F3,US
Diagnostics diskette, service kit, U.S. (D233ST, D233XT, D266XT)	KIT,DSK,DIAG,3.87,F3,WW
System software diskette, service kit (M166ST, M200ST, M233ST, M233XT, M266XT)	CUS,SSD,F3,NBK,I3000
System software diskette, service kit (D233ST, D233XT, D266XT)	CUS,SSD,F3,NBK,I3200
Diskette, system software (M166ST, M200ST, M233ST, M233XT, M266XT)	KIT,DSK,SSD,NBK,I3000
Diskette, system software (D233ST, D233XT, D266XT)	KIT,DSK,SSD,NBK,I3200

Hard-Disk Drive
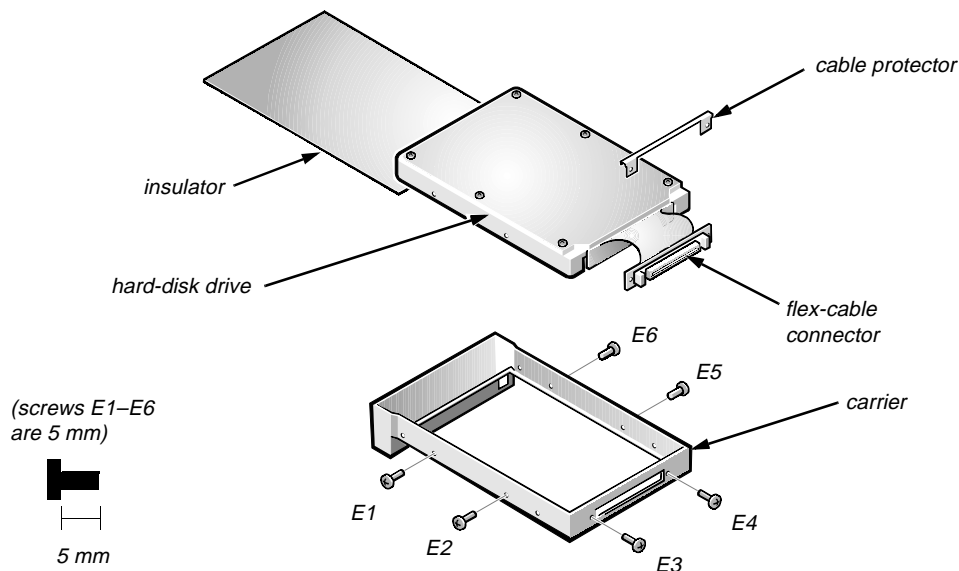
Figure 4-16. Hard-Disk Drive Disassembly

The hard-disk drive resides in an EMI insulator in a carrier that mounts in the computer's hard-disk drive compartment on the left side of the computer. Six screws secure the drive inside the carrier. To disassemble the hard-disk drive from the carrier and the insulator, follow these steps:

1. Remove the hard-disk drive assembly from the computer.

    See step 7 of "Precautionary Measures" found earlier in this chapter.

2. Place the hard-disk drive assembly in a hard-disk drive fixture, and remove hard-disk drive screws E1 through E6.

3. Remove the cable protector.

4. Remove the hard-disk drive from the fixture, and then remove the hard-disk drive and insulator from the carrier.

    Turn the carrier over with one hand and let the drive and insulator fall out of the carrier into your other hand. You may have to thread the cable out of the slot for it in the carrier.

    > **CAUTION: In step 5, use a small flat-blade screwdriver to disconnect the flex-cable connector. Do *not* handle the flex cable too roughly or you could accidently disconnect the cable from the connector card rather than the drive.**

5. Remove the hard-disk drive from the insulator.

    Carefully pry the flex-cable connector away from the hard-disk drive inter-face connector on the back of the drive.

Diskette Drive
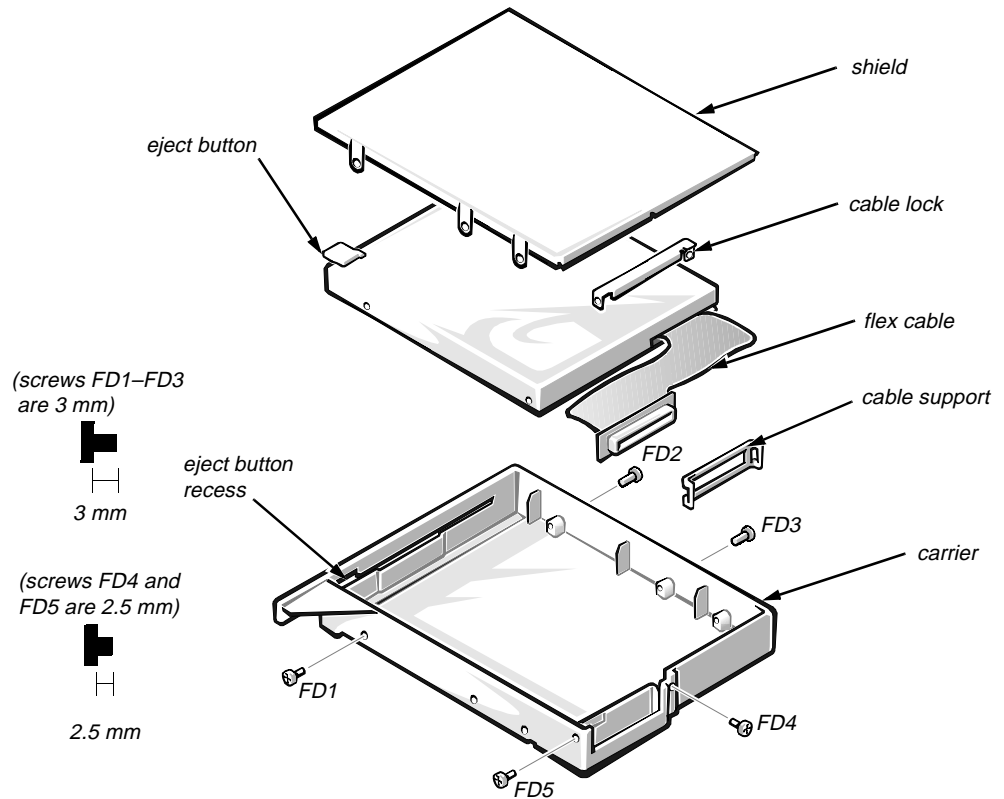
Figure 4-17. Diskette Drive Disassembly

The diskette drive resides in a carrier that slides into the options drive bay on the right side of the computer. To remove the diskette drive from the carrier, follow these steps:

1. Remove diskette drive screws FD1, FD2, and FD3.

2. Remove the protective shield.

3. Remove diskette drive screws FD4 and FD5.

4. Lift the cable lock from the flex cable.

5. Lift the diskette drive from the carrier.

   Lift the back of the drive first, to free the eject button from the eject button access.

6. Remove the cable support from the flex-cable connector.

CD-ROM/DVD-ROM Drive
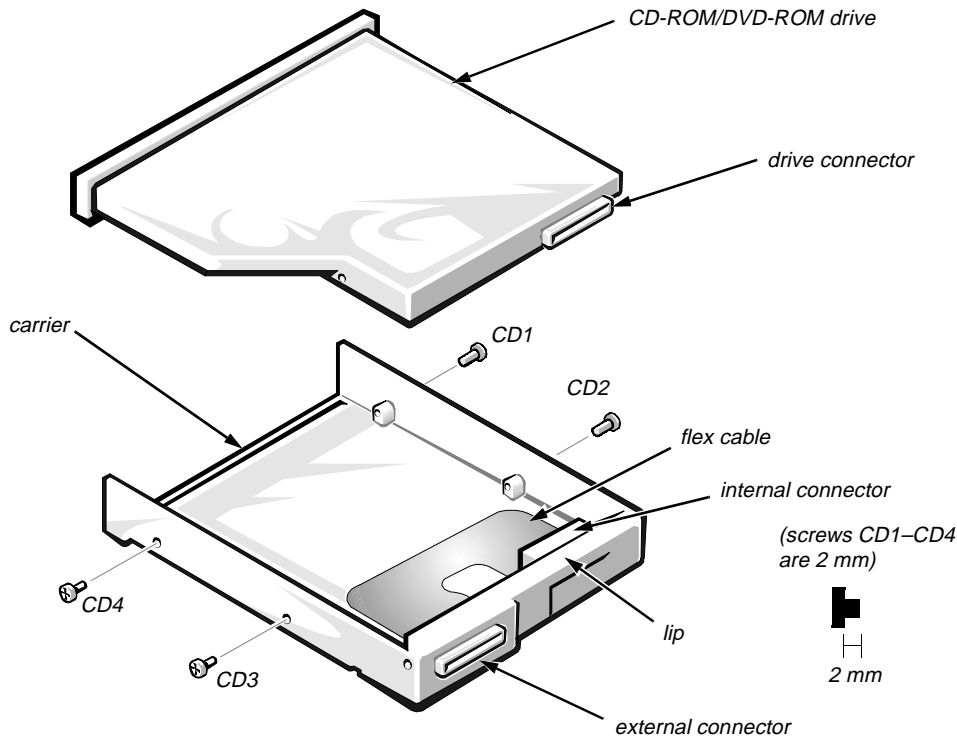
Figure 4-18. CD-ROM/DVD-ROM Drive Disassembly

The CD-ROM drive or DVD-ROM drive resides in a carrier that slides into the options drive bay on the right side of the computer. To disassemble the CD-ROM drive or DVD-ROM drive assembly, follow these steps:

1. Remove screws CD1, CD2, CD3, and CD4 that hold the CD-ROM drive or DVD-ROM drive to the carrier.

2. Disconnect the internal connector on the flex cable from the drive connector.

3. Lift the CD-ROM drive or DVD-ROM drive out of the carrier.

When reinstalling the CD-ROM drive or DVD-ROM drive in the carrier, make sure the rubber cushion behind the internal connector fits under the lip.

General Disassembly

General disassembly procedures assume that the following removal procedures (described at the beginning of this chapter) have been accomplished:

- AC adapter
- Port replicator
- PC Card
- Hard-disk drive
- Memory (module cover and modules)
- Options bay device
- Main battery

Preparation

There are many screws of various sizes. To assist in keeping track of the screws, use a tackle or pill box as a storage device. A location template (see Figure 4-19) is useful as a label for the storage device for the screws. The information in parentheses ( ) denotes the screw name(s) called out in the figures. Be careful not to scratch the computer plastic case by allowing the screws to get between the disassembly surface and the plastic case. Also, to prevent case scratches, a soft padded work surface is suggested.

HDD bay (HD1, HD2, B4); battery bay (B5); HD drive (E1–E6)	diskette drive (FD1–FD5); CD-ROM drive (CD1–CD4)	keyboard (K1, K2); heat sink (HS1–HS3)	status display (SD1); 13.3" LCD ground (G1); 12.1" LCD ground (G1, G2)	LCD hinge (H1–H4); bottom of base assembly (B1–B3)	upper case below LCD (CS1, CS2)
upper case beside microphone (CS3, CS4)	upper case at interior opening (CS5, CS6)	IR PWA (IR1); HDD heat sink (HT1–HT6)	touch pad (H7); speakers (S1, S2)	LVDS (G2); USB (U1)	main board (M1–M3); I/O panel (ST4–ST11)
standoffs (ST1–ST3); PC Card cage (P1–P4)	front bezel (F1–F4 on 12.1", F5 and F6 on 13.3")	LCD panel (LC1–LC4 on 12.1", LC5–LC8 on 13.3")	12.1" LCD hinges (H6, H7, H9, and H10)	12.1" LCD bracket (H5, H8)	13.3" LCD hinges (H12–H15); 13.3" LCD bracket (BR1–BR3)

Figure 4-19. Location Template

> **CAUTION: During the following removal and replacement procedures, you will see Kapton tape in many places on the computer. When reinstalling or replacing parts, be sure to replace the Kapton tape correctly to retain the electrical protection and noise reduction the tape provides.**

Keyboard
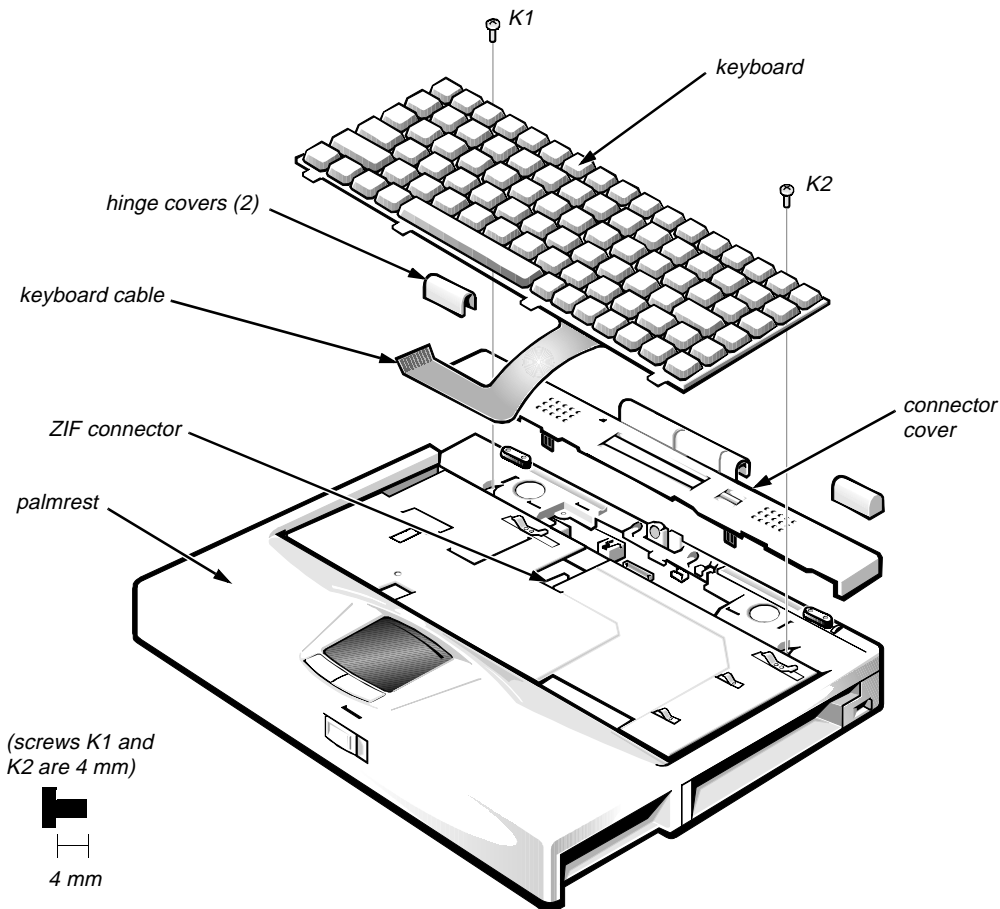
Figure 4-20. Keyboard Removal

To remove the keyboard, follow these steps:

1. Remove the hinge covers.

    If the hinge covers are tight, use a plastic wedge or scribe to loosen them.

2. Remove the connector cover.

    Start from the right side and gently pry the connector cover from the computer.

CAUTION: When reinstalling the connector cover, be sure the routing of the I/R cable (see Figure 4-22) is correct. If the wires of the I/R cable are not replaced correctly, in relation to the tabs of the connector cover, future removal of the cover may not be possible.

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3. Remove the keyboard screws K1 and K2.

4. Lift up the keyboard from the palmrest.

    Pull forward at the back of the keyboard to release the edge of the keyboard from the palmrest assembly.

5. Disconnect the keyboard cable from the ZIF connector.

    Use a small flat-blade screwdriver or scribe to release the ZIF connector securing the keyboard cable.

> **CAUTION: Lift away the cable only after the ZIF connector is opened (see "ZIF Connectors" found earlier in this chapter). Pulling the cable from the connector damages the conductive coating on the end of the cable.**

6. Remove the keyboard from the palmrest.

Heat Sink

HS3

HS1

fan connector

palmrest assembly

HS2

heat sink

(screws HS1–HS3 are 5 mm)

5 mm
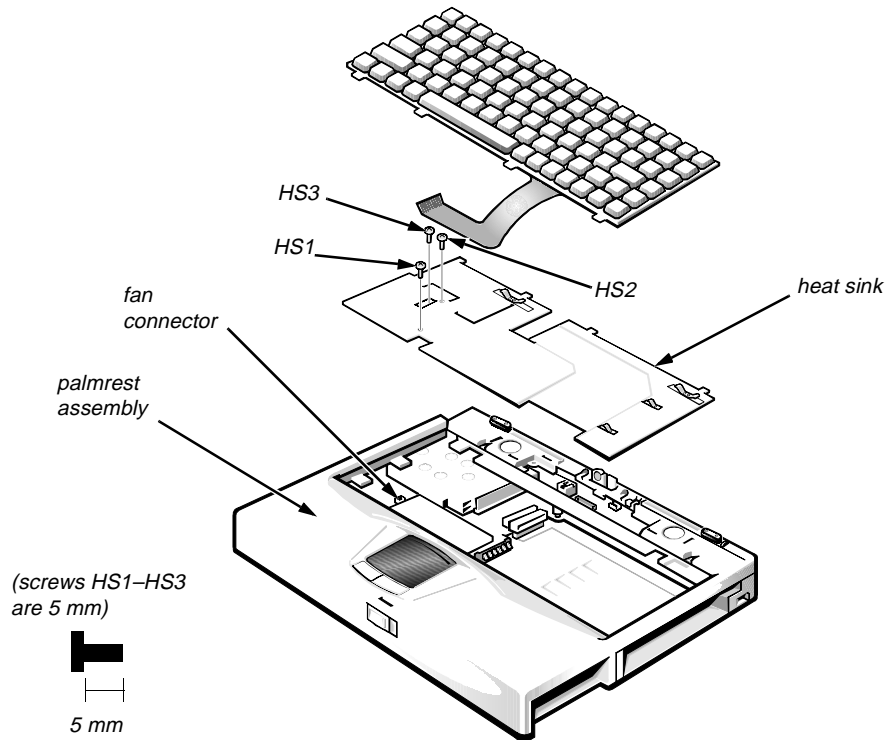
Figure 4-21. Heat Sink Removal

To remove the heat sink, follow these steps:

1. Remove the keyboard.

2. Remove black chromate panhead screws HS1, HS2, and HS3.

    The heat sink will come free except for the fan cable. Push back and lift up on the heat sink to access the fan cable.

3. Remove the fan cable.

    The fan cable is beneath the heat sink on the left side. Use a plastic scribe or flat-blade screwdriver, if necessary.

4. Remove the heat sink from the palmrest assembly.

Status Display Panel

SD1

status display panel

connector JP5

connector P3

palmrest
assembly

status display panel
connector

I/R cable

(screw SD1 is 5 mm)

5 mm
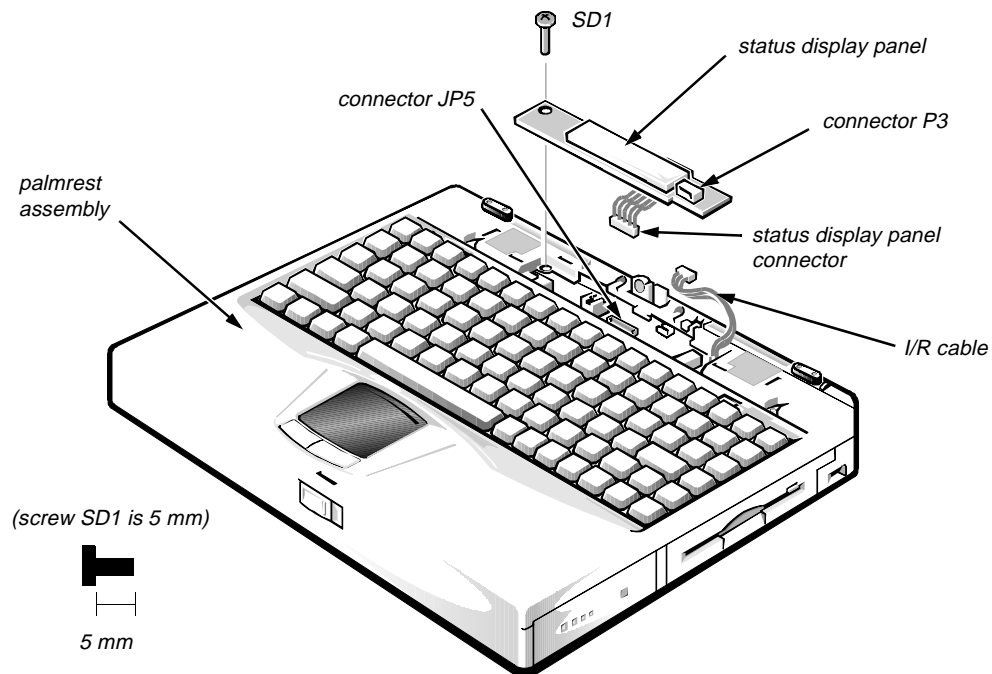
Figure 4-22. Status Display Panel Removal

To remove the status display panel, follow these steps:

1. Remove the hinge covers and connector cover.

    See "Keyboard" found earlier in this chapter.

2. Remove status display panel screw SD1.

3. Remove the status display panel.

    The status display panel has two connectors.

4. Disconnect the status display panel connector from connector JP5 on the main board.

5. Disconnect the I/R cable from connector P3 on the status display panel.

6. Remove the status display panel from the palmrest assembly.

When reinstalling the status display panel, see the first Caution for "Keyboard" found earlier in this chapter.

LCD Assembly

The LCD assembly consists of the display assembly and its related components. This section describes how to remove either the 12.1-inch or 13.3-inch LCD assembly. Later sections in this chapter provide removal and replacement procedures for the components of the LCD assembly.
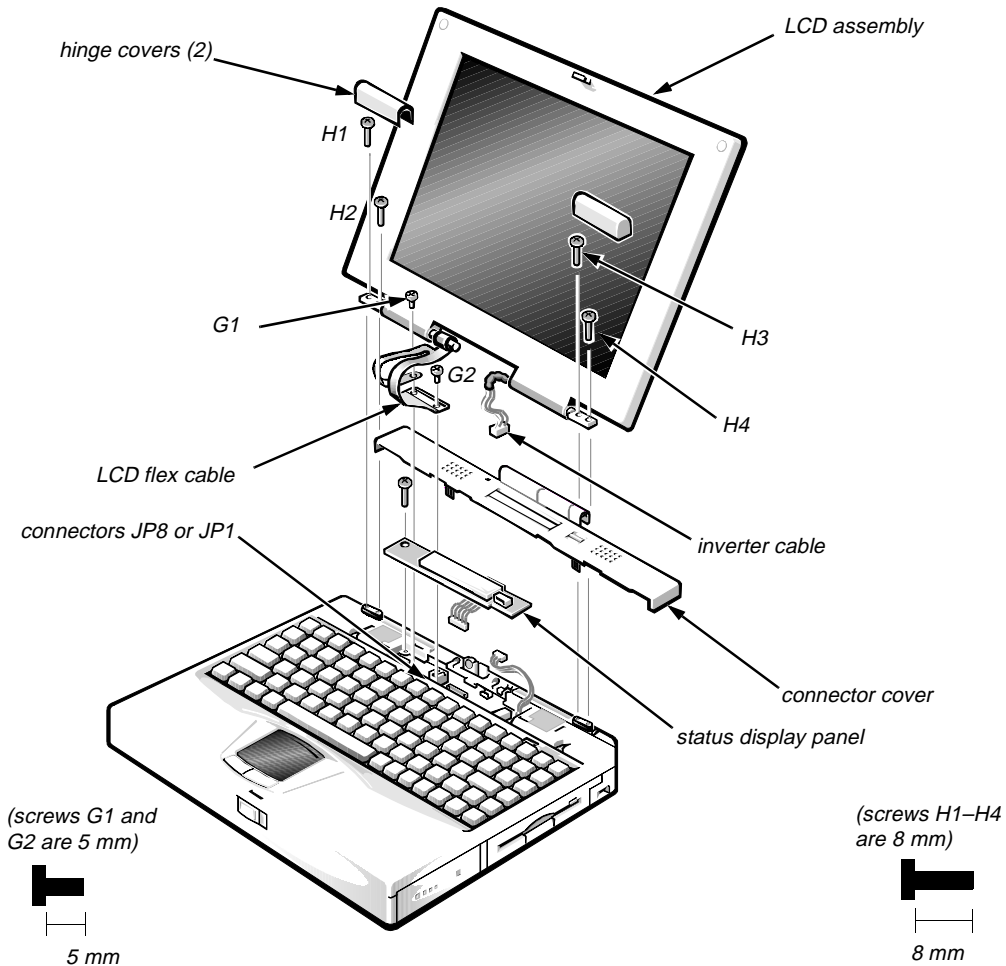
NOTE: This is a figure of a 12.1-inch LCD assembly. The 13.3-inch LCD assembly has an LCD wiring harness instead of an LCD flex cable.

Figure 4-23. LCD Assembly Removal

To remove the LCD assembly, follow these steps:

1. Remove the hinge covers and the connector cover.

    See "Keyboard" found earlier in this chapter.

2. Remove the status display panel.

3. Disconnect the inverter cable.

    The inverter cable is a cable harness on the right side of the LCD assembly.

4. For a 12.1-inch display, remove cable connector screws G1 and G2. For a 13.3-inch display, remove only cable connector screw G1.

   On 12.1-inch displays, screw G1 holds the LCD cable ground in place. G1 has a square washer. On 13.3-inch displays, screw G1 holds the left side of the LVDS board (see Figure 4-32) in place.

5. For a 12.1-inch display, disconnect the LCD flex cable from connector JP8 on the main board. For a 13.3-inch display, disconnect the LCD cable harness from connector JP1 on the LVDS board (see Figure 4-32).

6. Close the display and remove hinge screws H1, H2, H3, and H4.

7. Remove the LCD assembly from the computer.

Palmrest Assembly

The palmrest assembly consists of the following components:

- IR assembly
- Left and right speaker assemblies
- Hard-disk drive heat sink
- Touch-pad assembly

The following subsections provide removal and replacement procedures for the components of the palmrest assembly. These procedures assume that the keyboard assembly, heat sink, status display panel, and the LCD assembly have been removed.
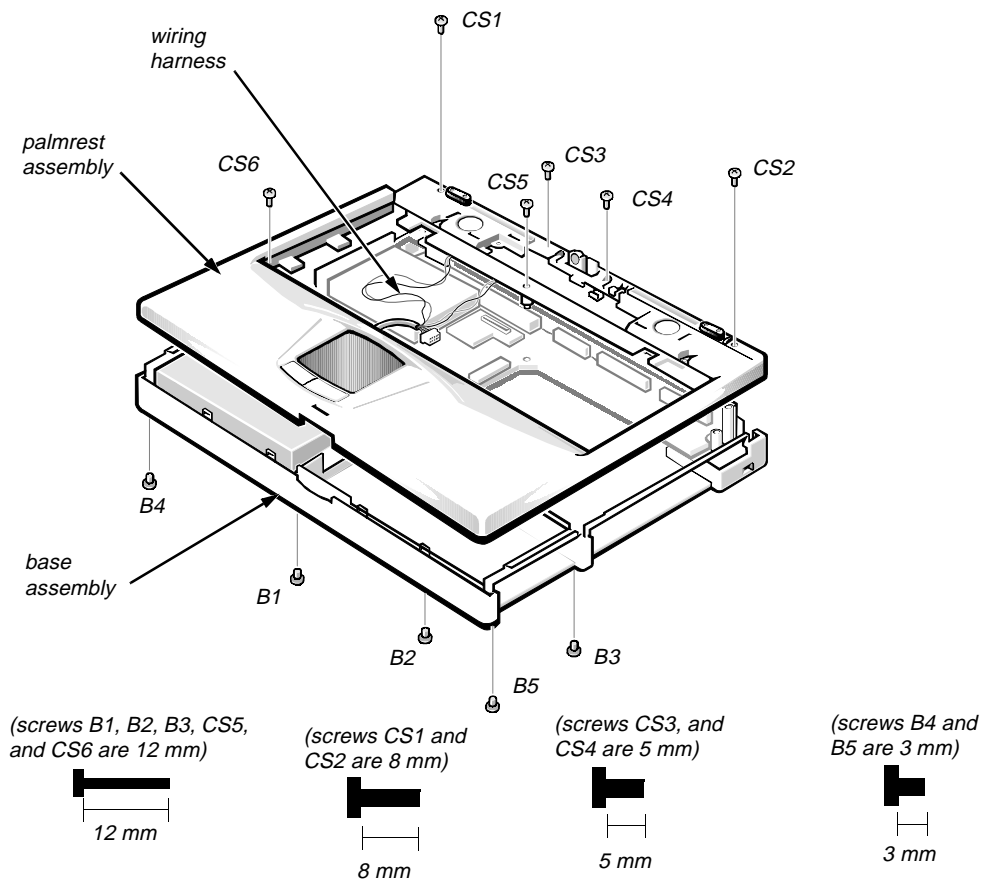
Figure 4-24. Palmrest Assembly Removal

To remove the palmrest assembly, follow these steps:

1. Remove bottom screws B1, B2, B3, B4, and B5.

2. Remove case screws CS1 and CS2.

   These screws are to the side of the hinges.

3. Remove case screws CS3 and CS4.

   These screws are on either side of the microphone.

4. Remove case screws CS5 and CS6.

    These screws are on the edge of the heat sink opening.

5. Disconnect the speaker wiring harness from connector JP16 (see Figure 4-29).

    This wiring harness also contains wiring for the touch pad and the touch pad buttons.

6. Remove the palmrest assembly from the base assembly.

    Start at the right rear of the computer and move forward around the computer. Carefully lift the palmrest assembly up and pull it forward to release the hidden tabs spaced around the sides and front.

When replacing the palmrest assembly, orient the assembly in its original position on the base assembly and press firmly near each tab until the palmrest assembly snaps into place. Start at the front, to align those tabs first. Make sure all the tabs are aligned.

IR Board
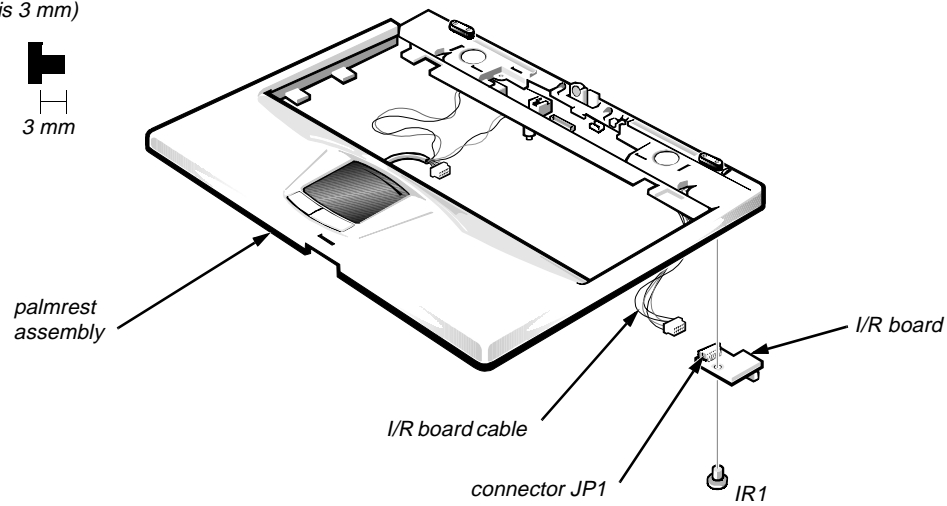
Figure 4-25. IR Board Removal

To remove the IR board, follow these steps:

1. Remove the palmrest assembly.

2. Remove IR board screw IR1.

3. Disconnect the IR board cable from the IR board connector JP1.

4. Remove the IR board from the palmrest assembly.

Hard-Disk Drive Heat Sink

palmrest assembly

hard-disk drive
heat sink

(screws HT1–HT6
are 3 mm)

3 mm

HT1
HT2
HT3
HT4
HT5
HT6
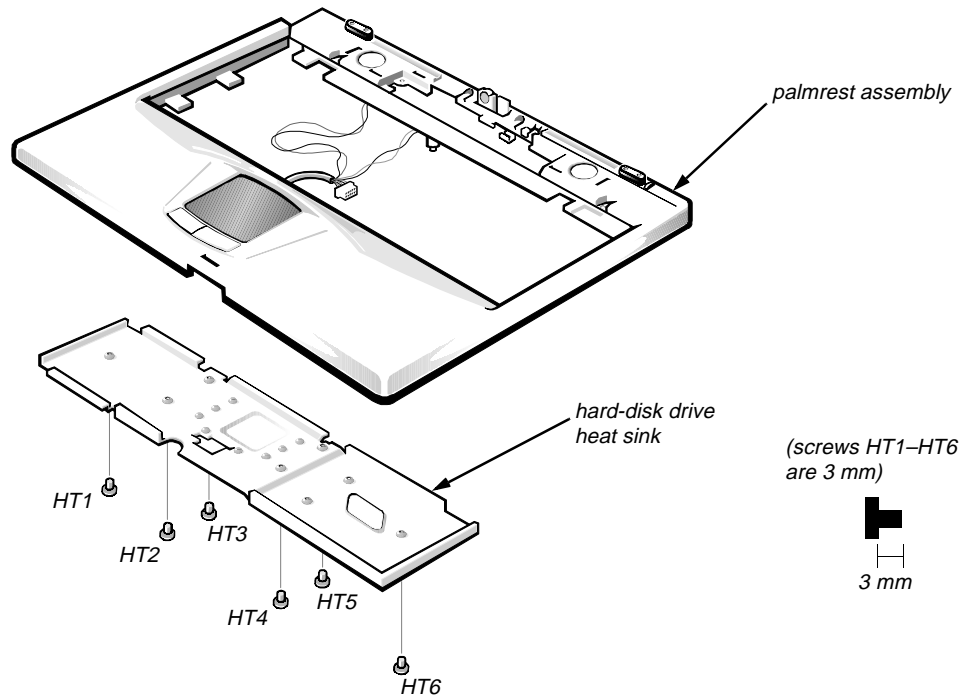
Figure 4-26. Hard-Disk Drive Heat Sink Removal

To remove the hard-disk drive heat sink, follow these steps:

1. Remove the palmrest assembly.

2. Remove hard-disk drive heat sink screws HT1 through HT6.

3. Remove the hard-disk drive heat sink from the palmrest assembly.

Touch-Pad Assembly
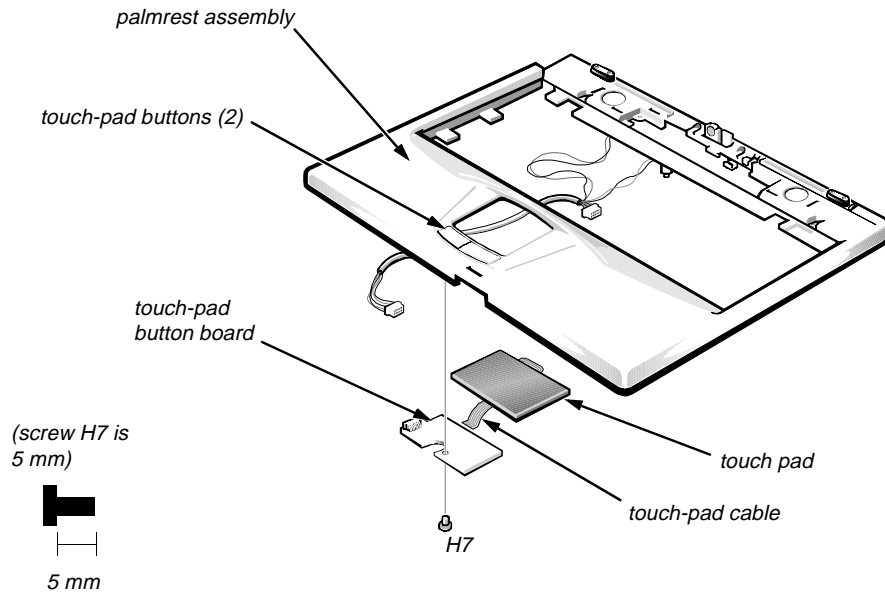
Figure 4-27. Touch-Pad Assembly Removal

To remove the touch-pad assembly, follow these steps:

1. Remove the palmrest assembly.

2. Remove the hard-disk drive heat sink.

3. Remove touch-pad button screw H7.

   This screw holds the touch-pad button board in place.

4. Disconnect the touch-pad cable from touch-pad button connector JP1.

   This is a ZIF connector on the touch-pad board. See "ZIF Connectors" found earlier in this chapter.

5. Remove the touch pad from the computer.

   The touch pad and touch-pad board are held in place by a flange.

6. Remove the touch-pad button board from the touch-pad buttons.

   The board is held in place by two tabs. Rotate the board from under the tabs.

7. Disconnect the touch-pad cable from connector JP2 on the touch-pad button board.

   This is a pressure-fit cable. Reconnect the cable before reinstalling the board.

8. Remove the touch-pad button board from the computer.

   The touch-pad buttons are heat-staked into the palmrest assembly and are not removable.

Speakers

speakers (2)

speaker wires

S1

palmrest assembly

(screws S1 and
S2 are 3 mm)

3 mm

plastic housings (2)

S2
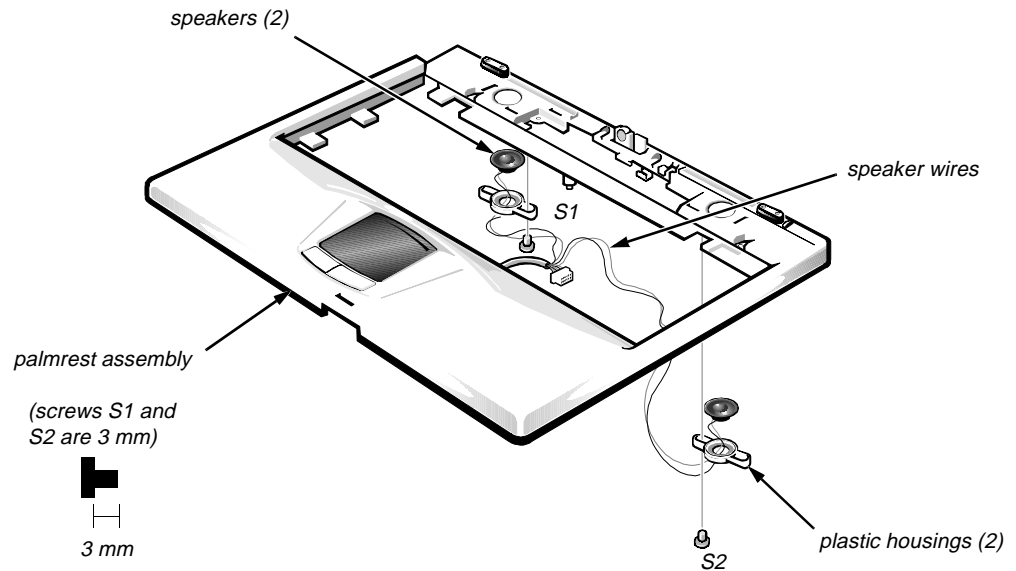
Figure 4-28. Speaker Removal

To remove the speaker, follow these steps:

1. Remove the palmrest assembly.

2. Remove the hard-disk drive heat sink.

3. Remove the touch-pad assembly.

4. Remove left speaker screw S1.

5. Remove the left speaker cover and speaker.

    To replace the speaker, unsolder the wires.

6. Repeat steps 4 and 5 for the right speaker.

    The right speaker screw is S2.

    The touch-pad cable, microphone cable, microphone, speaker cables, and
    speaker housing are joined in one wiring harness that plugs into the main
    board connector JP1. The harness wires are held in place by nine tabs. When
    reinstalling the harness, make sure it routes correctly beneath each of these
    tabs.

Base Assembly

The base assembly consists of the following components:

- IR lens
- Processor board
- LVDS board (13.3-inch LCD only)
- USB board
- Main board
- Audio bezel
- Audio board
- PC Card cage
- Latch assembly
- BIOS door
- Rubber feet

The following subsections provide removal and replacement procedures for most of the components of the base assembly. Procedures for the BIOS door, rubber feet, and 13.3-inch bumpers are not shown because they are obvious. The procedures in this subsection assume that the palmrest assembly and LCD assembly have been removed.

processor board

LVDS board (13.3-inch LCD only)

PC Card cage

USB board

connector JP16

main board

audio board

IR lens

audio bezel
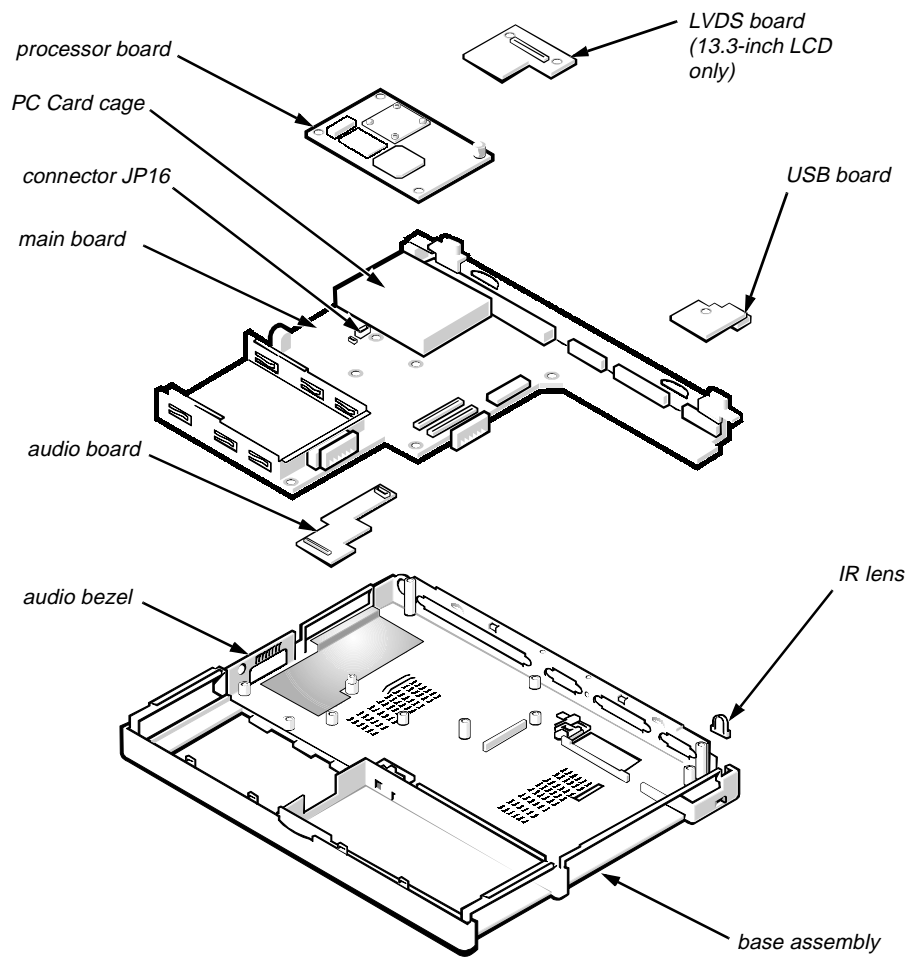
base assembly

Figure 4-29. Base Assembly

IR Lens
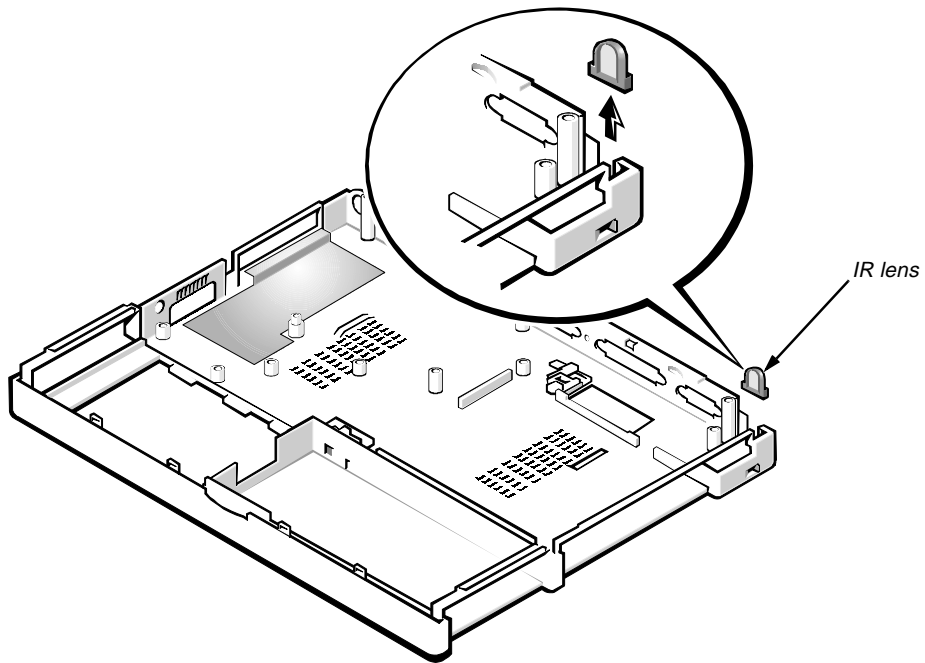
Figure 4-30. IR Lens Removal

Remove the IR lens by gently pulling straight up on the lens with the fingers of
one hand.

Processor Board
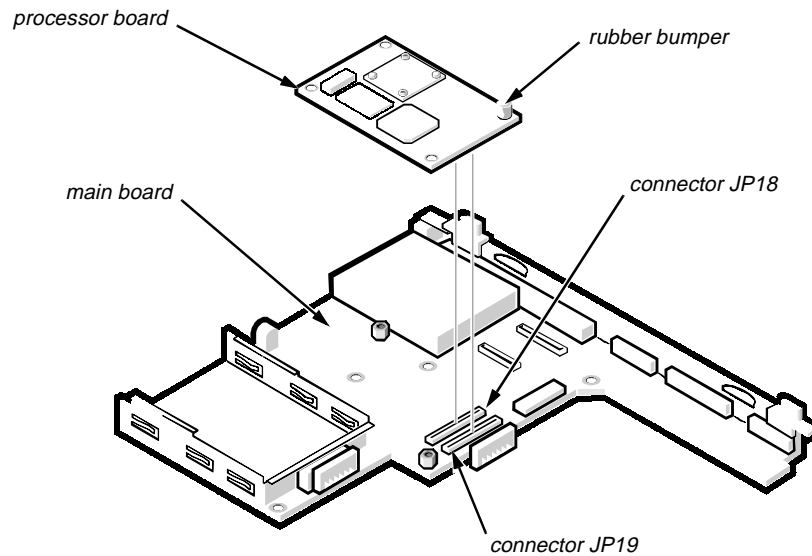
Figure 4-31. Processor Board Removal

Remove the processor board from the main board.

The processor board is held in place on the main board by connectors JP18 and JP19. Using the fingers of one hand, gently remove the processor board from the main board by pulling straight up. Do not rock the processor board to remove it. This may damage the two connectors on the processor board or the main board.

There is a rubber bumper on the upper right corner of the processor board. The bumper assists in keeping the processor board in place. If you install a replacement processor board, be sure to apply a bumper in that corner of the processor board. Also, there is heat-sink thermal pad on top of the microprocessor and this may need to be reinstalled.

When reinstalling the Inspiron M166ST, M200ST, M233ST, or M233XT processor board, press down on the white dot on top of the board. The white dot indicates the best spot to apply pressure to seat the processor correctly on connectors JP18 and JP19. (White dot references on the Inspiron D233ST, D233XT, and D266XT processor boards are not necessary.)

LVDS Board

The LVDS board is present on computers with a 13.3-inch LCD. If you have a 12.1-inch LCD, skip this subsection.
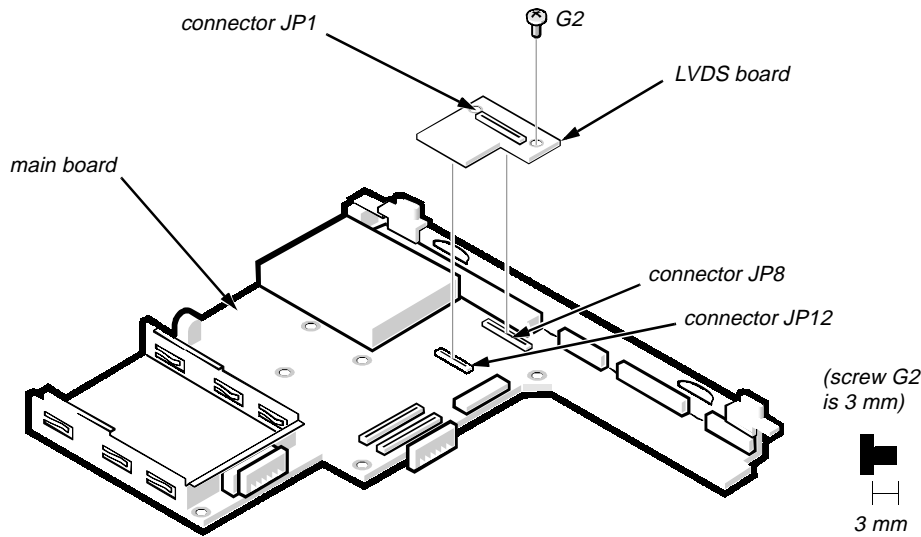
Figure 4-32. LVDS Board Removal

To remove the LVDS board, follow these steps:

1. Remove LVDS board screw G2.

    This is the other screw that you left in place when you removed the 13.3-inch LCD cable harness from connector JP1 on the LVDS board.

2. Remove the LVDS board from the main board.

    The LVDS board is held in place on the main board by connectors JP8 and JP12.

3. Remove the LVDS board from the computer.

USB Board
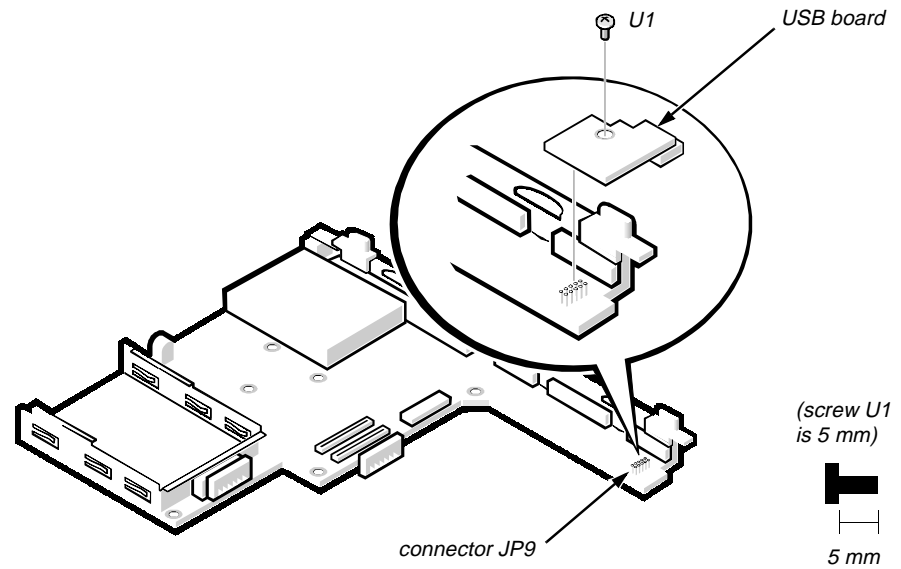
Figure 4-33. USB Board Removal

To remove the USB board, follow these steps:

1. Remove USB board screw U1.

2. Disconnect the USB board from connector JP9 on the main board.

   With the fingers of one hand, gently pull the USB board straight up about 1/4-inch to free it from connector JP9. Then turn the board slightly to the right to remove it from the corner of the main board and the base assembly.

Main Board
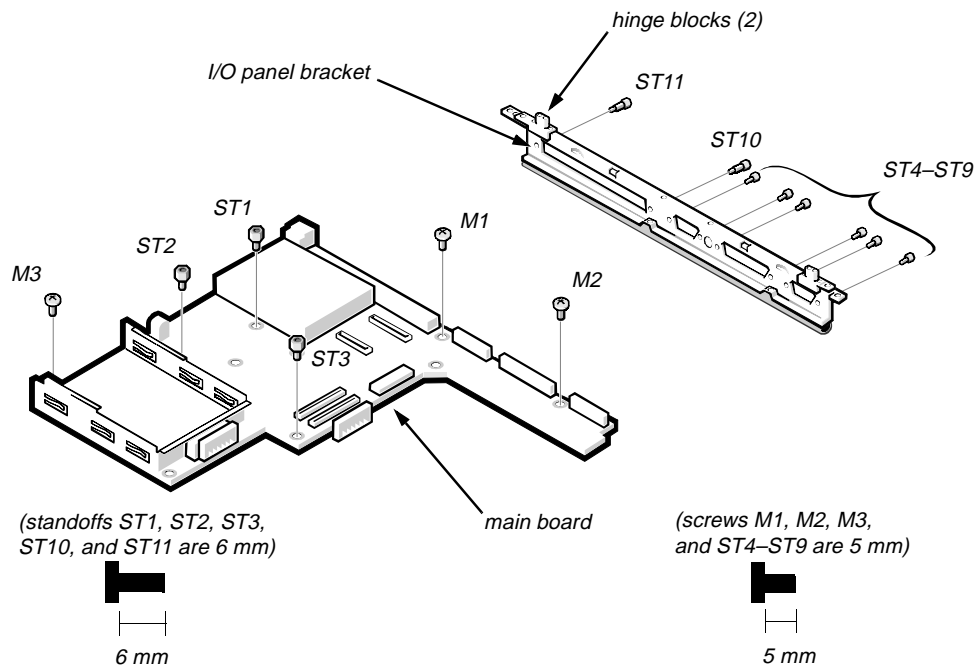
Figure 4-34. Main Board Removal

To remove the main board, follow these steps:

1. Remove the processor board.

2. If one is installed, remove the LVDS board. Otherwise, go to step 3.

3. Remove the USB board.

4. Remove main board screws M1, M2, and M3.

5. Remove standoff nuts ST1, ST2, and ST3.

6. Remove the main board from the base assembly.

    Lift the end of the board nearest the front of the computer, and pull the board up and out of the computer.

    Remove the I/O panel bracket only if you have to replace it. The I/O panel bracket can be removed from the main board by removing standoff nuts ST4 through ST11. Use a 5-mm nut driver to remove standoff nuts ST4-ST9 and a 6-mm nut driver for ST10 and ST11.

    If the threads on the two hinge blocks are damaged, the I/O panel bracket will have to be replaced.

Audio Bezel
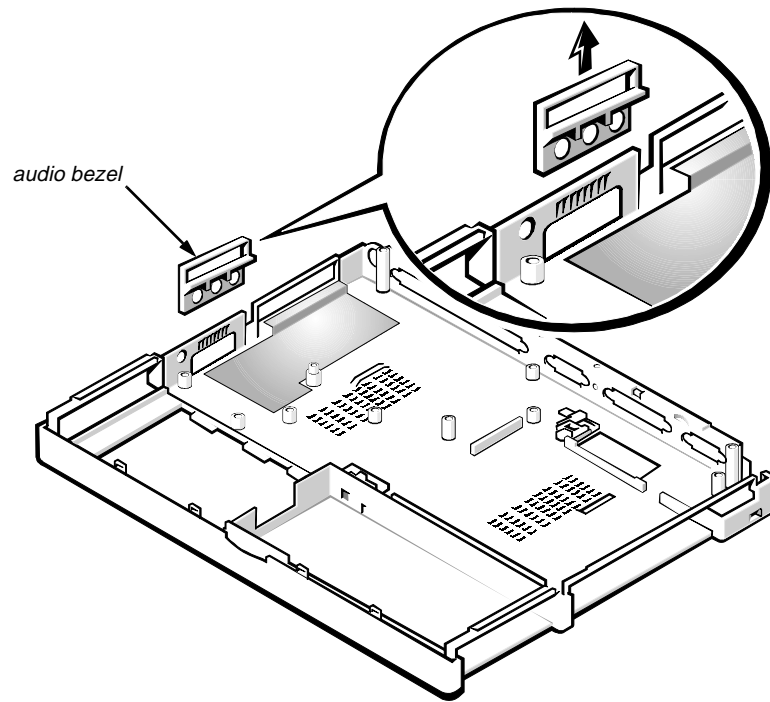
Figure 4-35. Audio Bezel Removal

Remove the audio bezel by gently pulling it from the three audio jacks on the left side of the main board. This bezel usually drops out when the main board is removed from the computer.

Audio Board
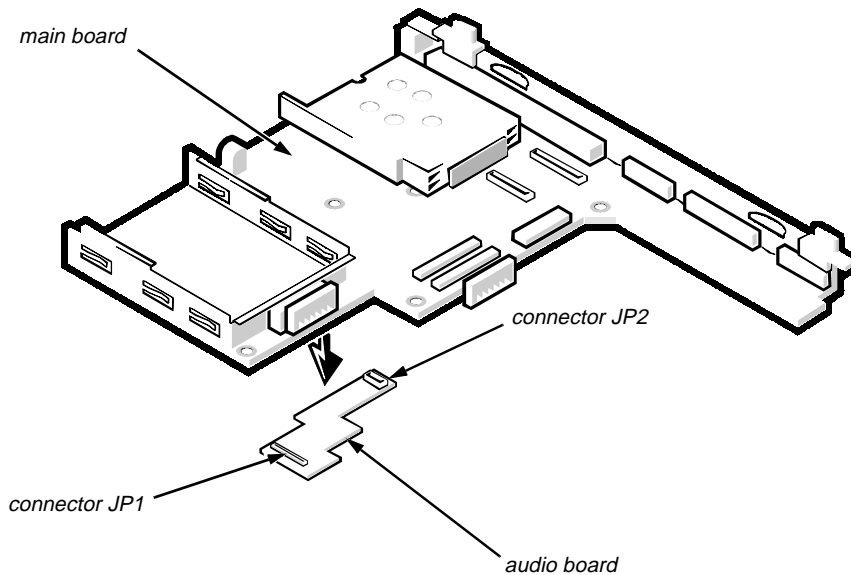
Figure 4-36. Audio Board Removal

To remove the audio board, follow these steps:

1. Remove the main board.

2. Remove the audio board from the bottom of the main board.

   The audio board is held in place by two connectors on the main board (JP26 and JP22) and two connectors on the audio board (JP1 and JP2). The connectors are different sized to ensure correct placement when reinstalling the audio board.

Ensure that you reinstall the audio board when you reinstall the main board. Make sure there are two rubber bumpers installed on the side of the audio board next to the back cover.

PC Card Cage
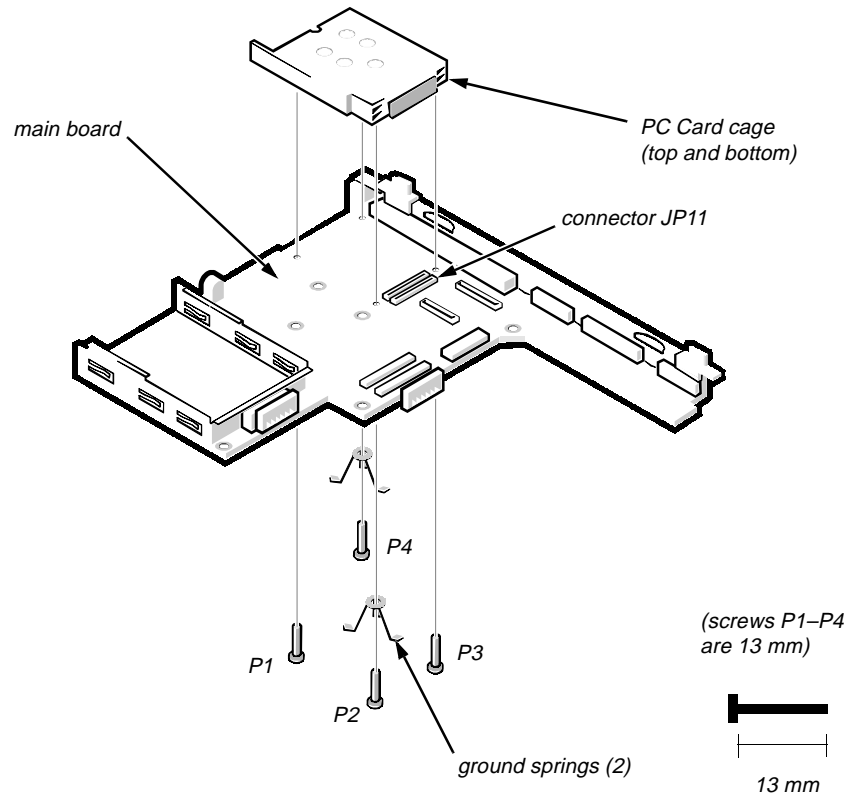
Figure 4-37. PC Card Cage Removal

To remove the PC card cage, follow these steps:

1. Remove the main board.

    Use a support for the main board to prevent the board from flexing when the card cage screws are removed

2. Remove PC Card cage screws P1, P2, P3, and P4.

    Screws P2 and P4 have ground springs attached. There are plastic insulators on the main board, below the ground springs.

3. Remove the top of the card cage.

    Disconnect the top from connector JP11 on the main board.

4. Remove the bottom of the card cage.

    Disconnect the bottom from the connector next to JP11 on the main board. A mylar covering is attached to the main board below the bottom of the card cage.

Replace the PC Card cage if it is damaged.

Latch Assembly
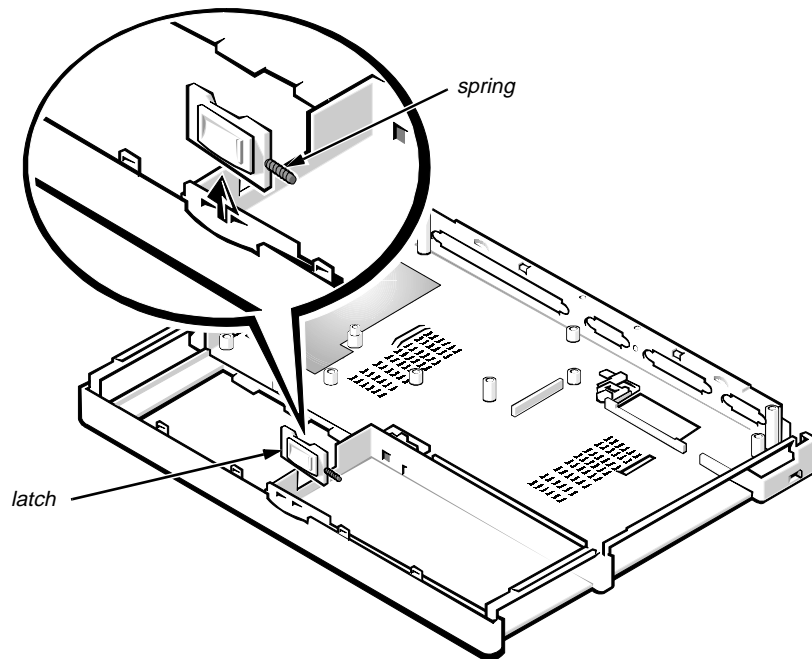
Figure 4-38. Latch Assembly Removal

To remove the latch assembly, follow these steps:

1. Remove the latch assembly from the base assembly.

   Use the fingers of one hand and lift the assembly from its recess in the base assembly. The latch assembly is held in place only by pressure.

2. Remove the spring from the latch.

   Be careful not to lose the small spring that is part of the latch assembly.

Kensington Lock Plate
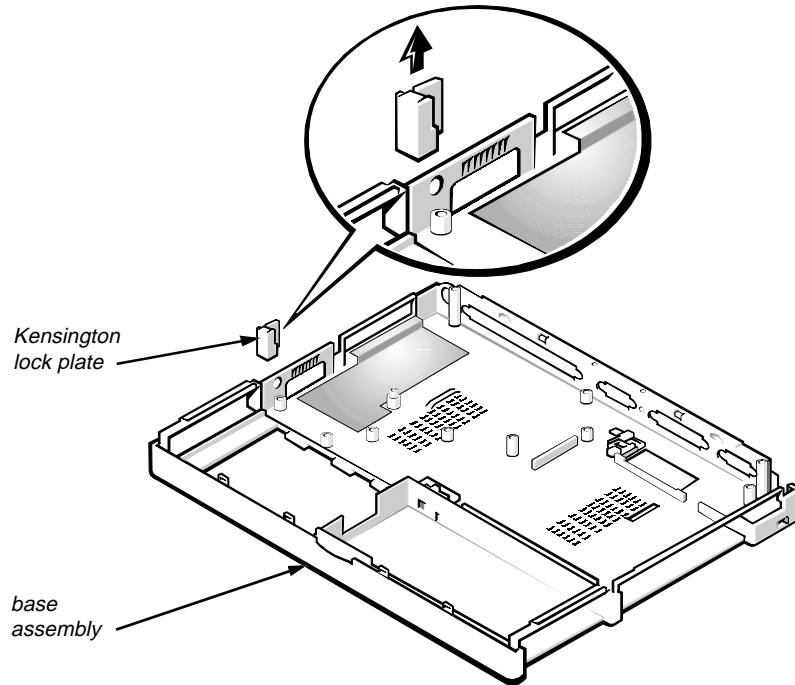
Figure 4-39. Kensington Lock Plate Removal

Use a screwdriver to lift the Kensington lock plate from its recess in the base assembly. The plate is held in place only by pressure.

12.1-Inch LCD Components

The 12.1-inch LCD assembly consists of the following components:

- Front bezel
- LCD panel
- Inverter board and cable
- Hinges
- Bracket
- Back cover
- LCD flex cable

The following subsections provide removal and replacement procedures for these components and assumes that the 12.1-inch LCD assembly has been removed from the computer. See "LCD Assembly" found earlier in this chapter.

12.1-Inch LCD Front Bezel
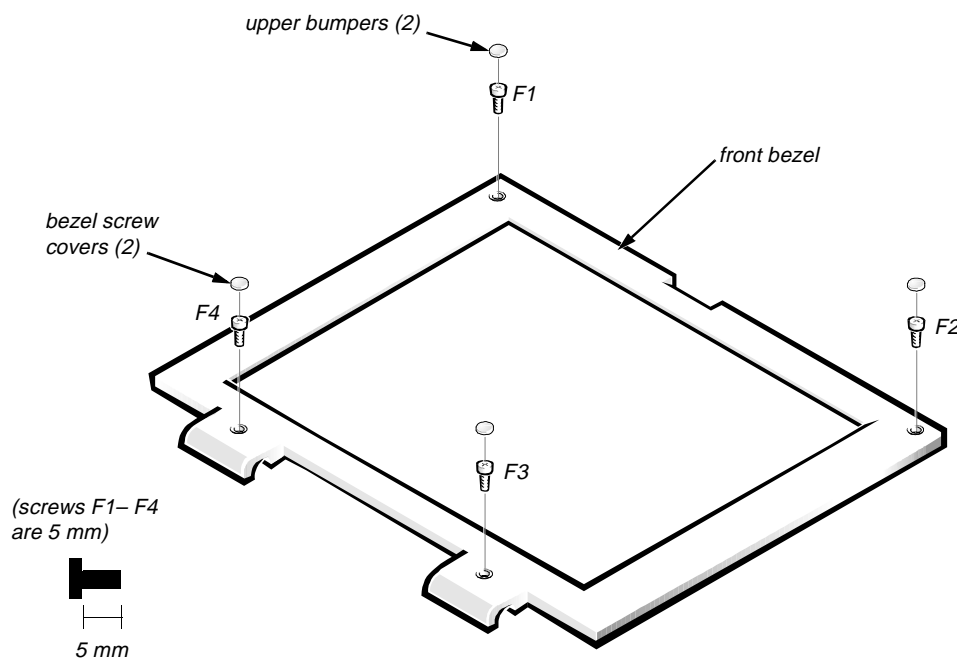
Figure 4-40. 12.1-Inch LCD Front Bezel Removal

To remove the 12.1-inch LCD front bezel, follow these steps:

1. Remove the LCD assembly.

   See "LCD Assembly" found earlier in this chapter.

2. Use a dental pick to pry the front-bezel screw covers and upper bumpers out of the screw holes in the bezel.

3. Remove front bezel screws F1, F2, F3, and F4.

4. Separate the front bezel from the back cover.

   With the bottom of the LCD assembly facing you (cables end), insert your fingertips between the LCD panel and the front bezel. Start in the center of the bezel and work out to the corners. With a peel-back-and-push motion, separate the front bezel from the hidden tabs on the back cover. Do not put pressure on the LCD panel with your knuckles; microscopic fractures in the panel could result. Separate the bottom first and then proceed to each side, leaving the top of the assembly until last. When the bottom and sides have been released from the hidden tabs, proceed to the left corner. Lift the corner of the front bezel out to the side, until the hidden corner tab is freed. Repeat the procedure for the other corner, and lift up on the front bezel to release it from the back cover. Lift the back cover over the latch.

When replacing the bezel, ensure that the LCD flex cable and the inverter cable are routed correctly through the openings in the back cover and are not pinched.

12.1-Inch LCD Panel
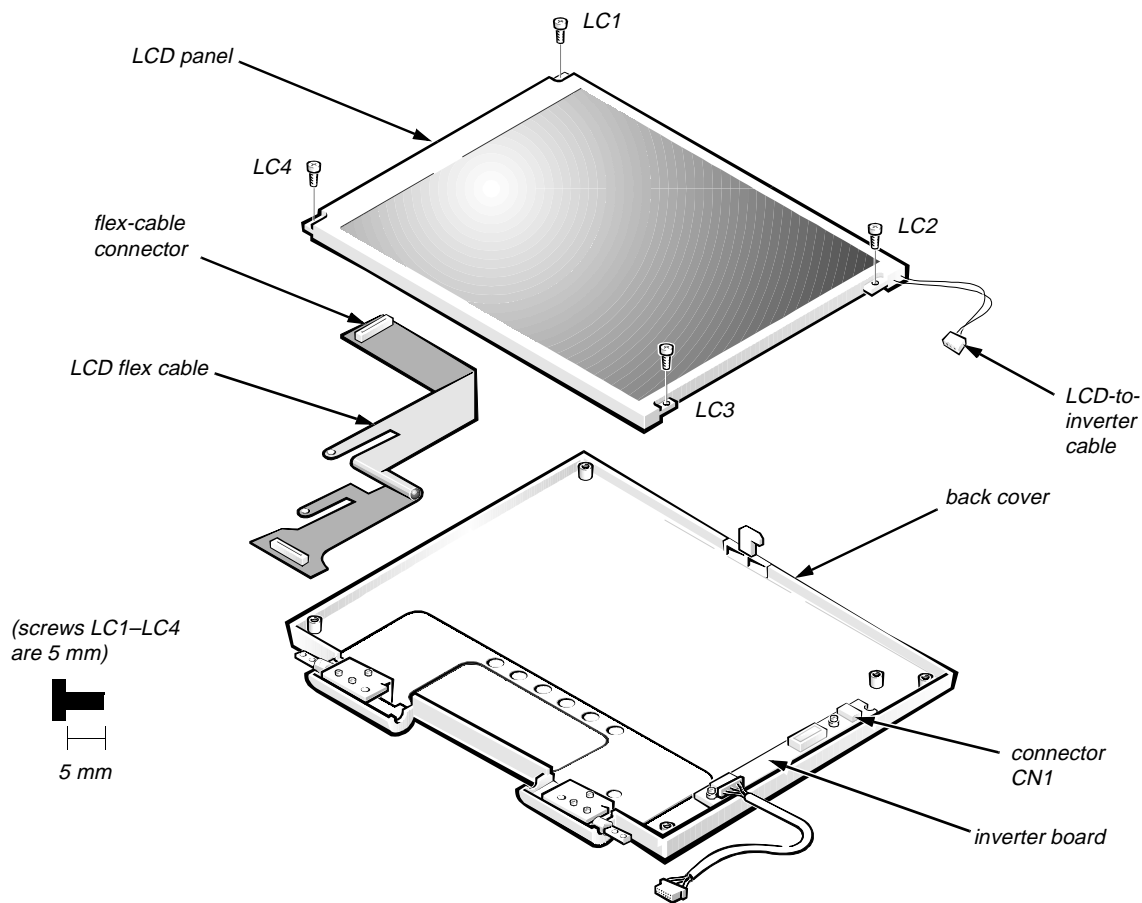
Figure 4-41. 12.1-Inch LCD Panel Removal

To remove the 12.1-inch LCD panel, follow these steps:

1. Remove the front bezel.

   See the previous subsection, "12.1-Inch LCD Front Bezel."

2. Remove LCD panel screws LC1, LC2, LC3, and LC4.

3. Remove the LCD Panel.

   NOTE: Be careful when removing any part of the LCD flex cable.

   Lift up the LCD panel, and disconnect the LCD-to-inverter cable from connector CN1 at the top of the inverter board. Disconnect the LCD flex cable from the flex-cable connector, J1, in the middle left side on the back of the panel.

12.1-Inch LCD Inverter Board
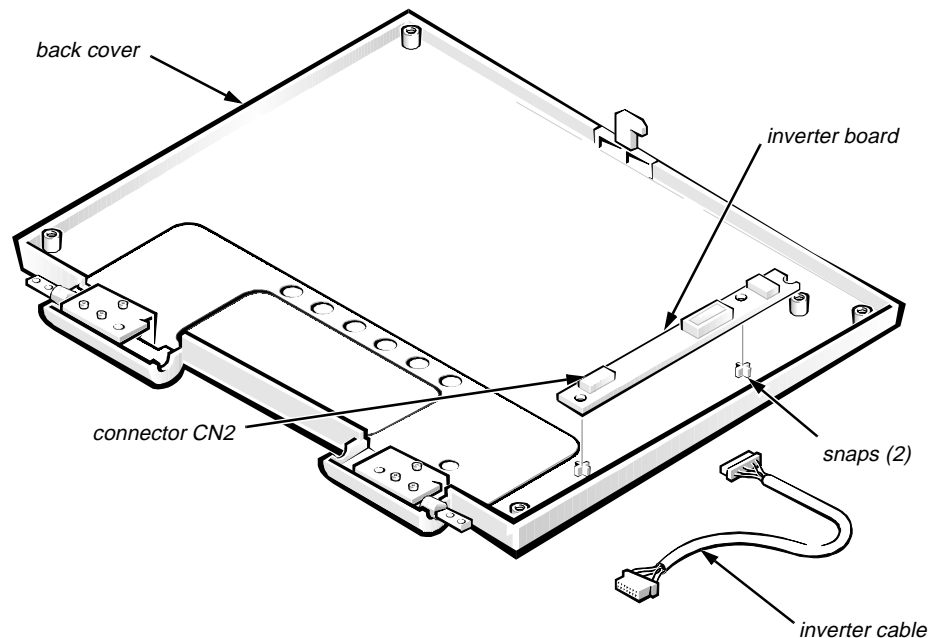
Figure 4-42. 12.1-Inch Inverter Board Removal

To remove the 12.1-inch inverter board, follow these steps:

1. Remove the front bezel.

    See "12.1-Inch LCD Front Bezel" found earlier in this section.

2. Remove the LCD panel.

    See the previous subsection, "12.1-Inch LCD Panel." You may not want to remove this panel if you are replacing only the inverter board.

3. Disconnect the inverter cable from connector CN2 at the bottom of the inverter board, and remove the cable.

4. Remove the inverter board from the back cover.

    The inverter board is mounted on two plastic snaps. It is held in place by these snaps and Kapton tape near the bottom of the board.

When replacing the inverter board, make sure you have the correct board. The inverter board for a 12.1-inch IBM LCD assembly is different from the inverter board for a 12.1-inch Samsung LCD assembly.

12.1-Inch LCD Hinges
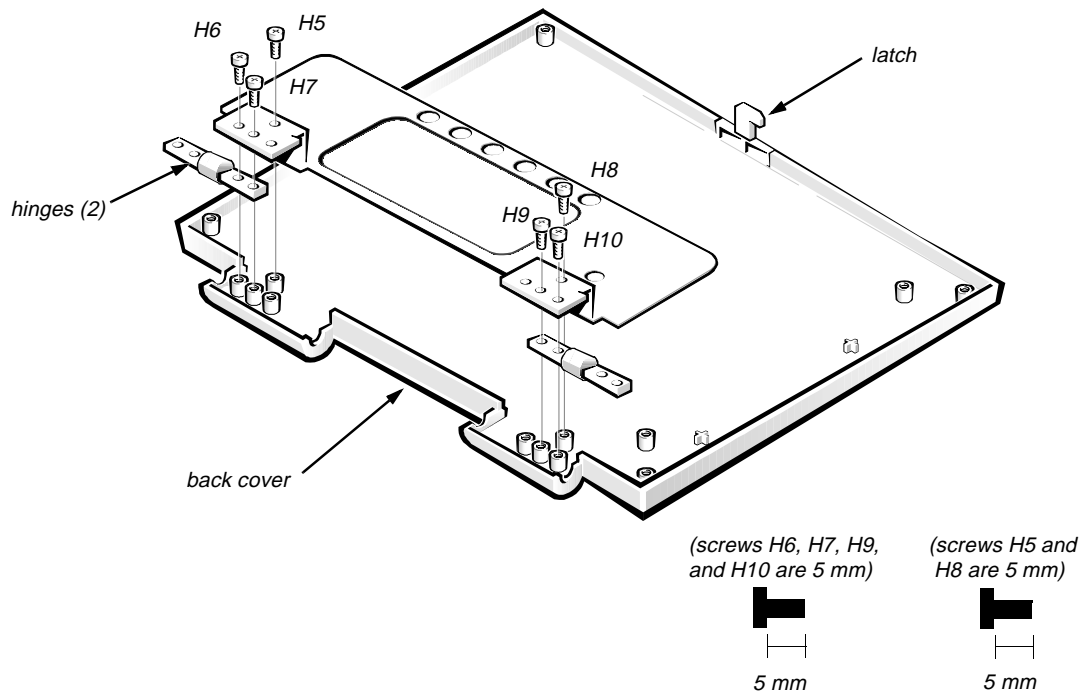
Figure 4-43. 12.1-Inch LCD Hinges Removal

To remove the 12.1-inch LCD hinges, follow these steps:

1. Remove the front bezel.

   See "12.1-Inch LCD Front Bezel" found earlier in this section.

2. Place the back cover down on a work surface.

3. Remove the hinge screws H6, H7, H9, and H10.

   You may need to loosen screws H5 and H8 to free the hinges.

4. Remove the hinges from the back cover.

   The bracket does not have to be taken off to remove the hinges. The bracket in Figure 4-43 is shown removed to assist understanding.

   The hinges for the 12.1-inch LCD assembly are anodized and interchangeable.

12.1-Inch LCD Bracket
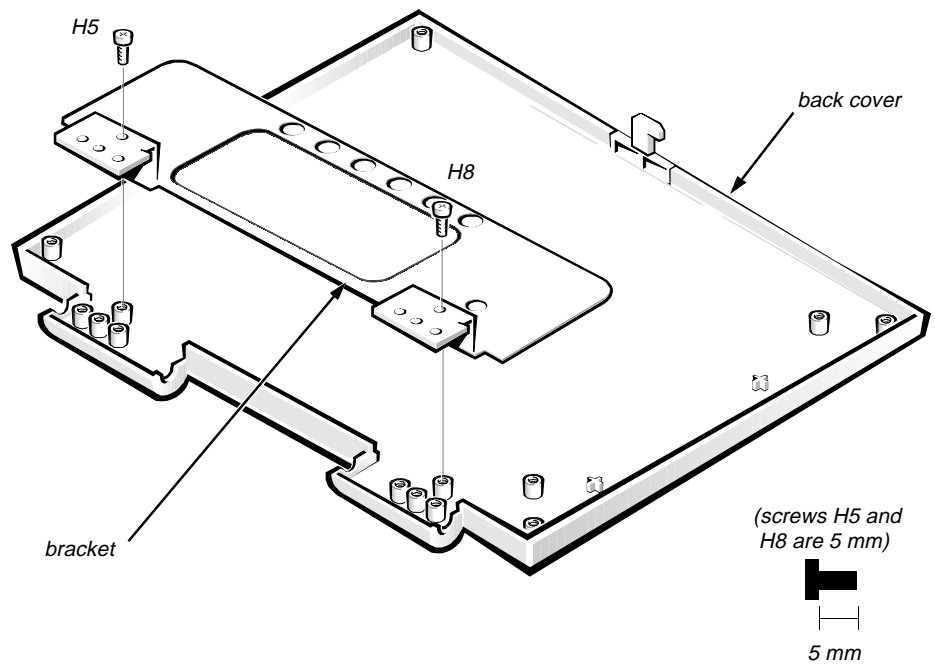
Figure 4-44. 12.1-Inch LCD Bracket Removal

To remove the 12.1-inch LCD bracket, follow these steps:

1. Remove the front bezel.

    See "12.1-Inch LCD Front Bezel" found earlier in this section.

2. Remove the LCD panel.

    See "12.1-Inch LCD Panel" found earlier in this section.

3. Remove the hinges.

    See the previous subsection, "12.1-Inch LCD Hinges."

4. Remove bracket screws H5 and H8.

5. Remove the bracket from the back cover.

    With your fingers, slide the bracket toward the top of the cover and lift the bracket off the back cover. There are two clips, one near each hinge, that hold the bracket in place.

13.3-Inch LCD Components

The 13.3-inch LCD assembly consists of the following components:

- Front bezel
- LCD panel
- Inverter board and cable
- Hinges
- Bracket
- Back cover
- LCD wiring harness

The following procedures provide removal and replacement procedures for these components, and assume that the 13.3-inch LCD assembly has been removed from the computer. See "LCD Assembly" found earlier in this chapter.

13.3-Inch LCD Front Bezel
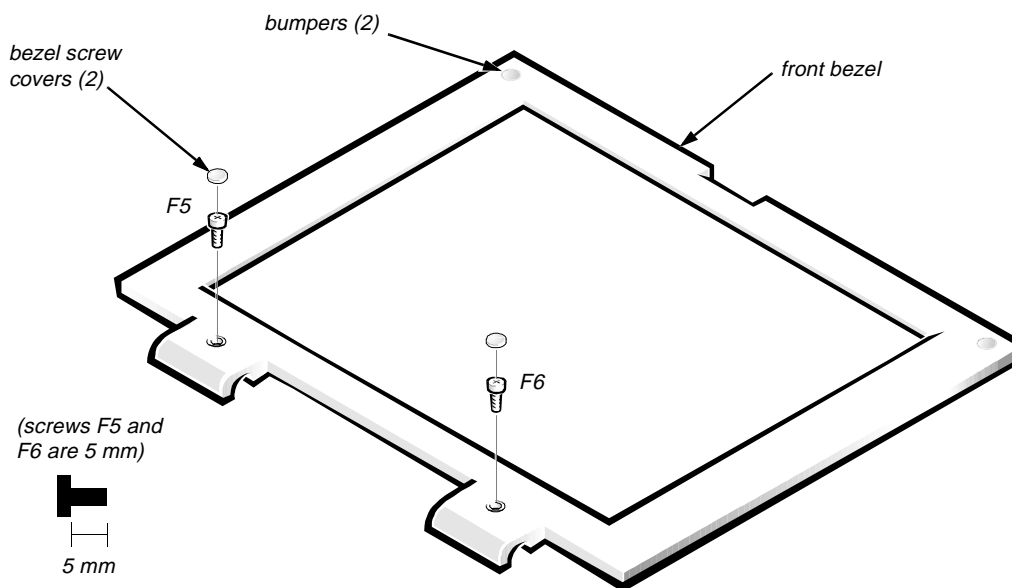
Figure 4-45. 13.3-Inch LCD Front Bezel Removal

To remove the 13.3-inch LCD front bezel, follow these steps:

1. Remove the LCD assembly.

   See "LCD Assembly" found earlier in this chapter.

2. Use a dental pick to pry the front-bezel screw covers out of the screw holes in the bezel.

3. Remove front-bezel screws F5 and F6.

4. Separate the front bezel from the back cover.

   With the bottom of the LCD assembly facing you (cables end), insert your fingertips between the LCD panel and the front bezel. Start in the center of the bezel and work out to the corners. With a peel-back-and-push motion, separate the front bezel from the hidden tabs on the back cover. Do not put pressure on the LCD panel with your knuckles; microscopic fractures in the panel could result. Separate the bottom first and then proceed to each side, leaving the top of the assembly until last. When the bottom and sides have been released from the hidden tabs, proceed to the left corner. Lift the corner of the front bezel out to the side, until the hidden corner tab is freed. Repeat the procedure for the other corner, and lift up on the front bezel to release it from the back cover. Lift the back cover over the latch.

When replacing the front bezel, orient the bezel in its original position on the assembly and press firmly near each tab until the bezel snaps into place. Ensure that the LCD wiring harness and the inverter cable are routed correctly and are not pinched.

13.3-Inch LCD Panel
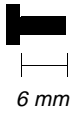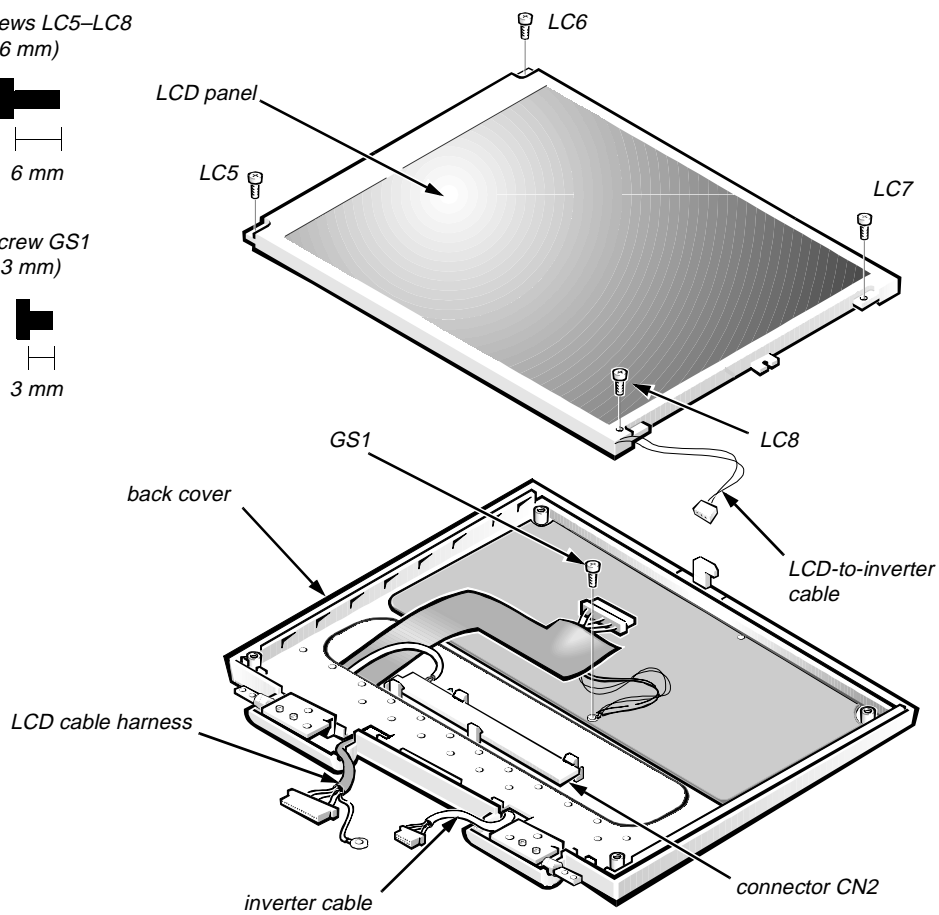
*NOTE: The inverter board is installed with the component side down, next to the back cover.*

Figure 4-46. 13.3-Inch LCD Panel Removal

To remove the 13.3-inch LCD panel, follow these steps:

1. Remove the front bezel.

   See the previous subsection, "13.3-Inch LCD Front Bezel."

2. Remove LCD panel screws LC5, LC6, LC7, and LC8.

3. Remove the LCD panel.

    NOTE: Be careful when removing any part of the LCD cable harness.

    Lift up the LCD panel, and disconnect the LCD cable harness from connector J1 on the back of the LCD panel (for an IBM panel, hold the cable ground strap in place with one hand and peel back the EMI tape covering that holds the ground strap in place on the cable). Disconnect the LCD-to-inverter cable from inverter-board connector CN2 on the side of the inverter board next to the back cover (see Figure 4-47).

    > **CAUTION: When reinstalling an IBM LCD cable, slide the cable underneath the ground strap in place and reapply the EMI tape.**

4. Remove grounding screw GS1 from the bracket.

13.3-Inch LCD Inverter Board
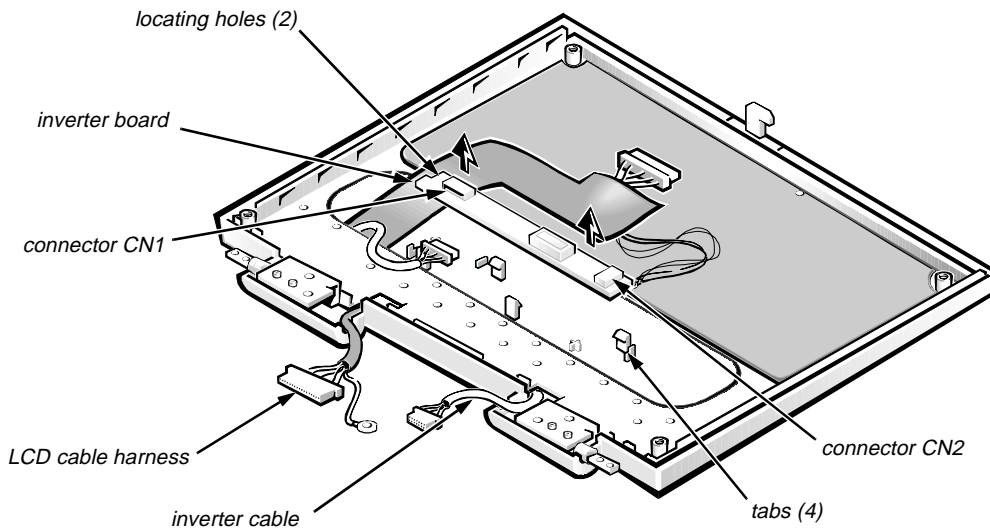
Figure 4-47. 13.3-Inch Inverter Board Removal

To remove the 13.3-inch inverter board, follow these steps:

1. Remove the front bezel.

   See "13.3-Inch LCD Front Bezel" found earlier in this section.

2. Remove the LCD panel.

   See the previous subsection, "13.3-Inch LCD Panel."

3. Remove the inverter board from the four tabs holding it to the back cover.

   Turn the board over so that the board's components are facing up.

4. Disconnect the inverter cable from connector CN1 on the inverter board and remove the cable.

5. Remove the inverter board from the back cover.

   The bracket does not have to be taken off to remove the inverter board.

When reinstalling the inverter board, connect the LCD panel cable to the inverter board connector, CN1, before reinstalling the bracket. Turn the board over with the components side facing the back cover and secure the board with the tabs. There are four tabs that hold the inverter board in place. The inverter board has locating holes in the upper-left corner and lower-right corner. Replace the tape on the back of the board.

When replacing the inverter board, make sure you have the correct board. The inverter board for a 13.3-inch IBM LCD assembly is different from the inverter board for a 13.3-inch Samsung LCD assembly.

13.3-Inch LCD Hinges
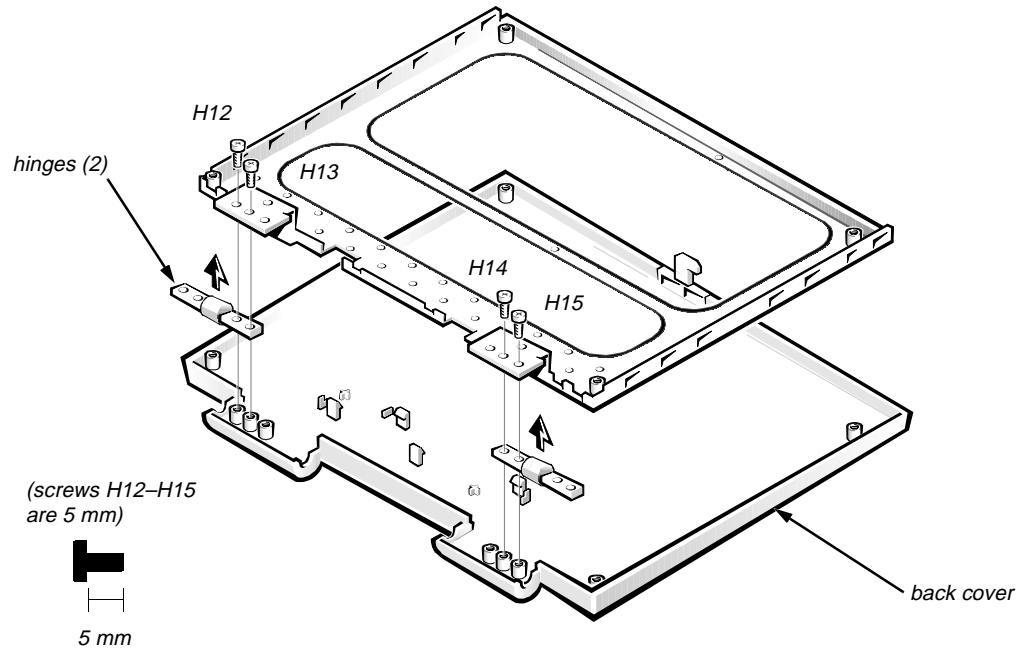
Figure 4-48. 13.3-Inch LCD Hinges Removal

To remove the 13.3-inch LCD hinges, follow these steps:

1. Remove the front bezel.

    See "13.3-Inch LCD Front Bezel" found earlier in this section.

2. Place the back cover on a work surface.

3. Remove hinge screws H12, H13, H14, and H15.

4. Remove the hinges from the back cover.

    The bracket does not have to be taken off to remove the hinges. The bracket in Figure 4-48 is shown removed to assist understanding. The hinges for the 13.3-inch LCD assembly are chromated black and interchangeable.

13.3-Inch LCD Bracket
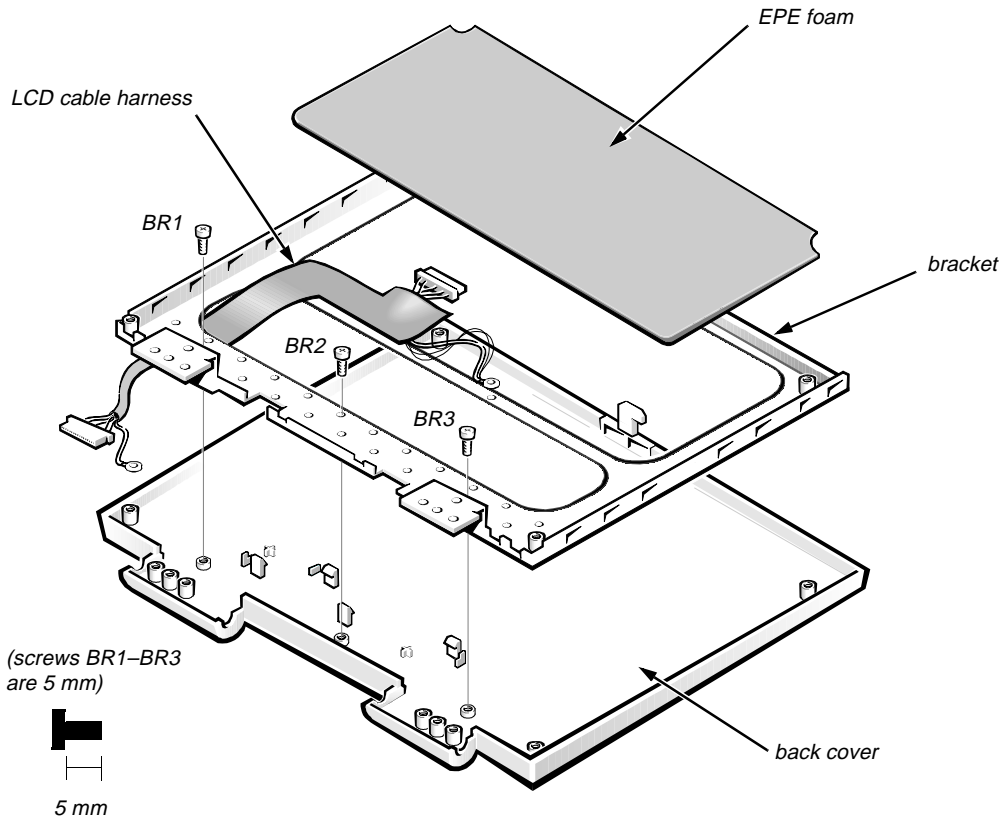
Figure 4-49. 13.3-Inch LCD Bracket Removal

To remove the 13.3-inch LCD bracket, follow these steps:

1. Remove the front bezel.

   See "13.3-Inch LCD Front Bezel" found earlier in this section.

2. Remove the LCD panel.

   See "13.3-Inch LCD Panel" found earlier in this section.

3. Remove the hinges.

   See the previous subsection, "13.3-inch LCD Hinges."

4. Remove the bracket from the back cover.

   Remove EPE foam (taped in place). Remove bracket screws BR1, BR2, and BR3. Remove the bracket using two plastic wedges.

   Be careful not to break the plastic case of the back cover or mar the EMI finish on the inside of the cover.

Start in the lower left corner. Insert a plastic wedge under the bracket and apply pressure upward to free the bracket from the back cover. Insert another plastic wedge one tab at a time along one side of the bezel. Free the bracket from the one corner and this frees the bottom of the bracket. Free the bracket from one side. Repeat the procedure on the other side. Freeing the sides will free the bottom of the bracket. Finally, free the bracket from the top of the bezel. The two top tabs should come free easily.

To reinstall the bracket, the LCD cable harness and the inverter board cable must be under the bracket and through the correct channels in the bracket and the back cover. Be careful not to break the hidden plastic tabs when reinstalling the bracket.

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