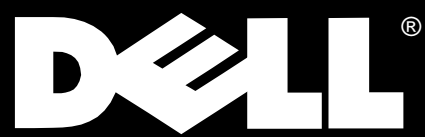


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Dell® Inspiron™ 7000

SERVICE MANUAL

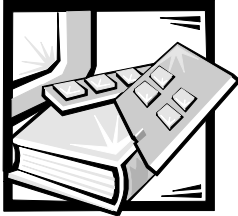
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August 1998 P/N 6086C



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Read This First

A prerequisite for using this manual to service Dell computer systems 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 *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

The Dell[®] Inspiron[™] 7000 is an expandable, multimedia portable computer that uses the Intel[®] Pentium[®] II microprocessors with MMX[™] technology. This chapter provides an overview of the components and subsystems of this computer.

Model names for the Inspiron 7000 indicate the operating frequency of the microprocessor (266 for 266 MHz or 300 for 300 MHz), the size (X for 13.3-inch LCD or G for 14.1-inch LCD) of the display, and the type (T for TFT) of display.

- The Inspiron 7000 D266XT contains a Pentium II microprocessor with MMX technology 266 MHz and a 13.3-inch XGA active-matrix TFT LCD.
- The Inspiron 7000 D266GT contains a Pentium II microprocessor with MMX technology 266 MHz and a 14.1-in. XGA active-matrix TFT LCD.
- The Inspiron 7000 D300GT contains a Pentium II microprocessor with MMX technology 300 MHz and a 14.1-in. XGA active-matrix TFT LCD.

System Features

In addition to the standard features found in IBM-compatible portable computers, the Dell Inspiron 7000 computers include the following new and/or advanced features:

- A minimum of 32 MB of SDRAM on the system board. The memory capacity can be increased up to 192 MB by increasing the SDRAM on the system board to 64 MB and/or by installing 32- or 64-MB 3.3-V memory modules in the two user-accessible memory module sockets.
- A 13.3-inch active-matrix XGA display on the Inspiron 7000 D266XT; a 14.1-inch active-matrix XGA display on the Inspiron 7000 D266GT and D300GT.
- 65-WH smart lithium ion battery (12 cells).
- 512-KB SRAM level-2 external cache and 32-KB internal cache.
- ATI Rage LT Pro 64-bit video controller incorporating an accelerated graphics port (AGP2X) that bypasses the PCI bus and transmits graphics data about four times more quickly. Standard memory is 4 MB, with an optional upgrade to 8 MB.
- Intel Mobile 440BX AGP system chip set.
- Built-in microphone; built-in speakers; jacks for headphones, line-in, and line-out.

- A media bay that accepts a combination CD-ROM/diskette drive, combination DVD-ROM and diskette drive, or secondary lithium ion battery.
- Built-in serial IrDA 1.1-compliant infrared communications port, effective to 1 m (3.3 ft).
- Universal Serial Bus (USB), which provides a single connection point for multiple USB-compliant devices such as mice, printers, keyboards, joysticks, and computer speakers. USB devices are hot-pluggable, meaning that they can be connected and disconnected while the system is running.
- PCI docking connector for full port replication.
- Kensington Lock, which secures the notebook.

Physical Description

Figures 1-1 and 1-2 illustrate front and back views of the Inspiron 7000.

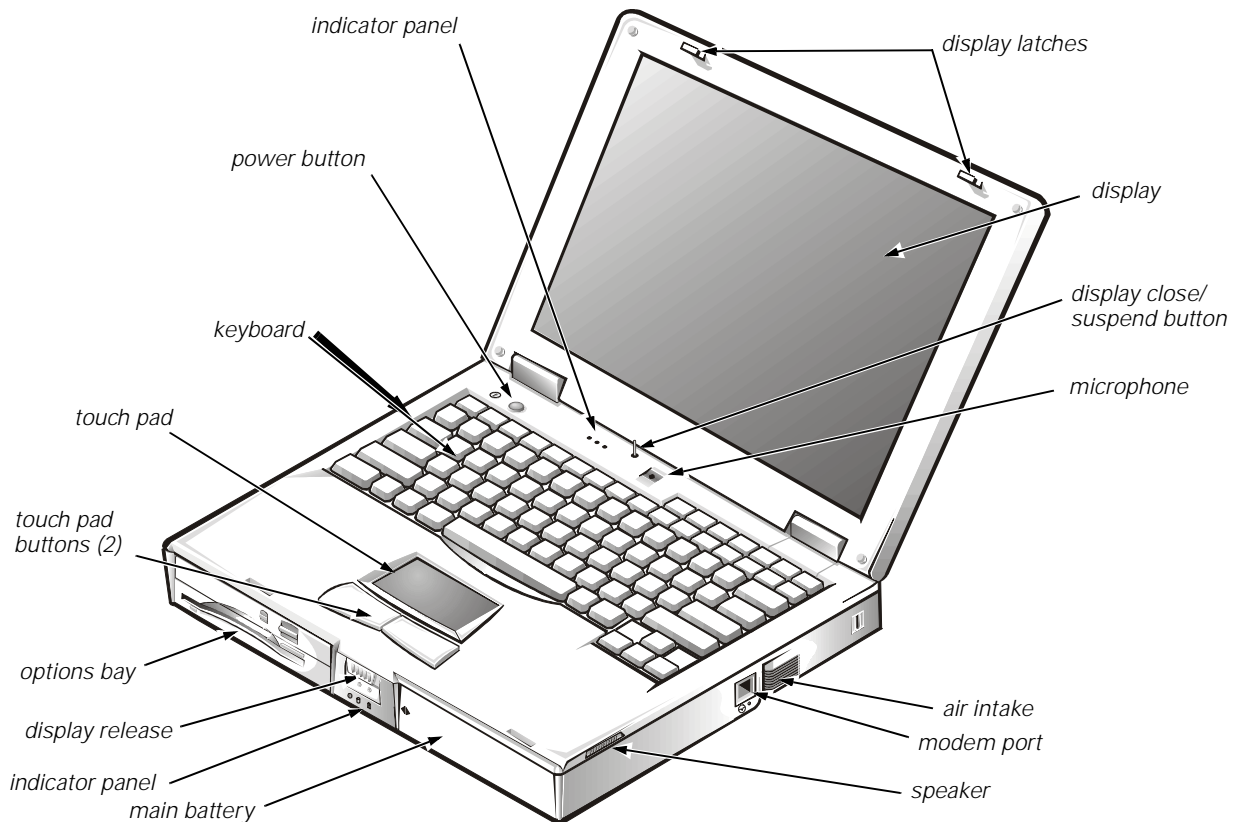


Figure 1-1. Front View

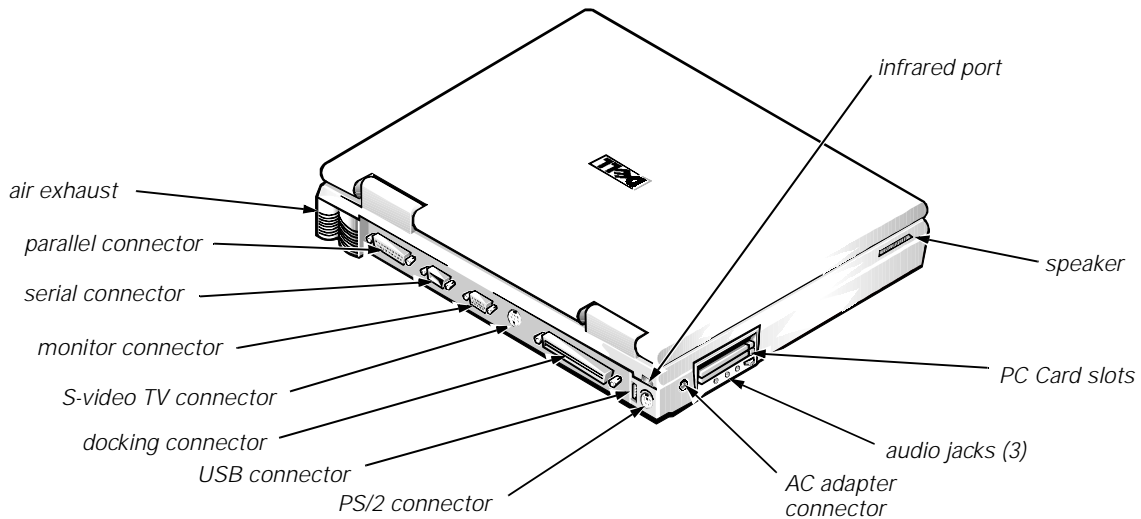


Figure 1-2. Back View

Status Display

Three status lights are located in the indicator panel directly above the keyboard (see Figure 1-3):

- Num Lock: Solid green light when Num Lock is on. Press <Num Lock> to turn this feature on or off.
- Caps Lock: Solid green light when Caps Lock is on. Press <Caps Lock> to turn this feature on or off.
- Scroll Lock: Solid green light when Scroll Lock is on. Press <Scroll Lock> to turn this feature on or off.

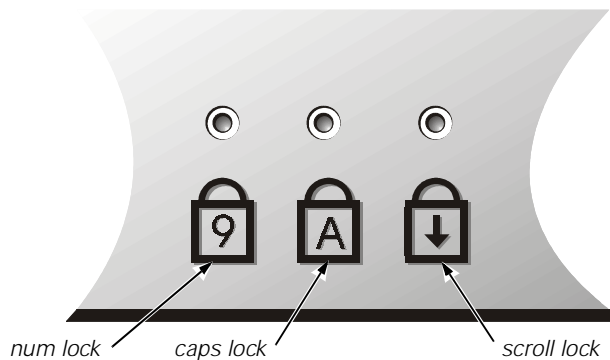


Figure 1-3. Indicator Panel above Keyboard

Five additional status lights are located on the front of the unit, three in the indicator panel below the display latch and two on the left side (see Figure 1-4):

- System power: Solid green light when the system is on; blinking green light when system is in suspend state.

- Hard-disk drive activity: Blinking green light as the drive is being accessed.
- Battery status:
 - Solid green light when the battery is fully charged.
 - Blinking green light when the battery is charging.
 - No light when the battery is discharging.
 - Solid amber light when the battery charge is low (7 percent life remaining).
 - Blinking amber light when the battery charge is critically low (1.5 percent life remaining). The system beeps when this level is first reached.
- Floppy disk drive activity: Blinking green light as the drive is being accessed.
- CD-ROM or DVD-ROM drive activity: Blinking green light as the drive is being accessed.

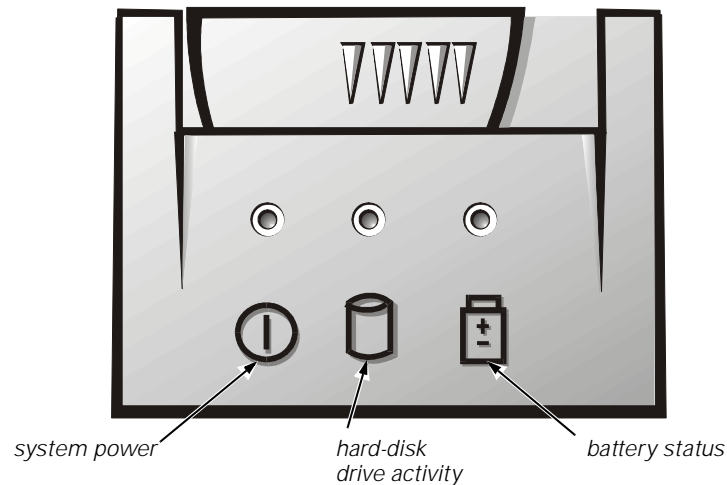


Figure 1-4. Indicator Panel on Front of Computer

Battery Charge Gauge

The battery charge gauge (see Figure 1-5) on the rear of the main and secondary batteries has five 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.

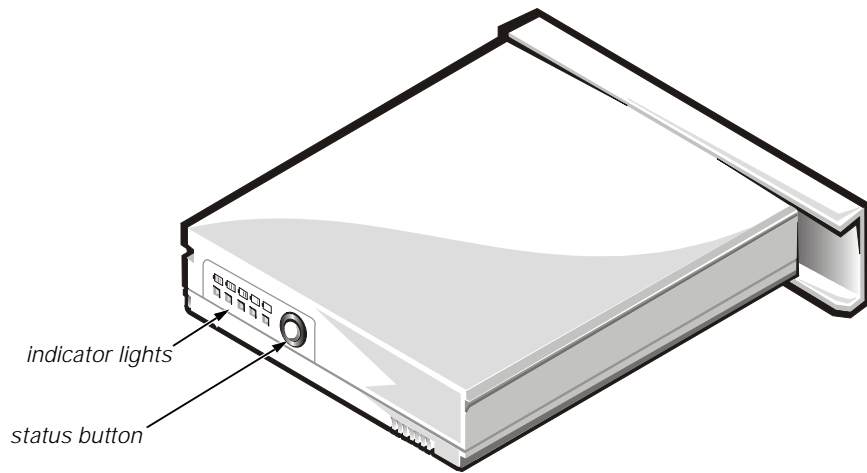


Figure 1-5. Battery Charge Gauge



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.

System Power

The power button controls power to the system. The computer receives power from either the AC adapter connected to an electrical outlet or from up to two batteries. The system has built-in power management features that remove power from parts of the computer that are not being used.

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.

Power Management Mode

The power management mode has four settings:

- Select **Customized** (the default) to control the power-saving time-outs individually.
- Select **Disabled** to turn off power management.

- Select **Maximum Performance** to conserve power but allow greatest system performance. When this setting is selected, the **Standby Time-Out** option is set automatically to 4 minutes, and the **Suspend Time-Out** option is disabled. The **Smart CPU Mode** option is set automatically to **Off**.
- Select **Maximum Power Savings** to conserve the greatest amount of system power. When this setting is selected, the **Standby Time-Out** option is set automatically to 1 minute, and the **Suspend Time-Out** option is set automatically to 5 minutes. The **Smart CPU Mode** option is set automatically to **On**.

Smart CPU Mode

Smart CPU Mode allows the computer to slow down the microprocessor automatically if it is not being used. Settings for this option are:

- **On** — Allows the computer to slow down the microprocessor when it is inactive
- **Off** (the default) — Keeps the microprocessor running at its normal operating speed regardless of microprocessor inactivity

To increase battery operating time, set the **Smart CPU Mode** option to **On**.

Standby Time-Out

Standby Time-Out conserves battery power by turning off various devices in the system, including the display, but leaves the computer ready to resume operations immediately. Use **Standby Time-Out** when you leave the computer unattended for less than a few minutes.

Standby Time-Out lets you determine how long the computer remains idle (no I/O activity) before activating standby mode to conserve battery power. Settings for this option are **Disabled**, **1 min.**, **2 min.**, **4 min.**, **6 min.**, **8 min.**, **12 min.**, and **16 min.**

To increase battery operating time, set this option to a lower number of minutes. Press any key on the built-in keyboard to resume normal computer operation.

Suspend Time-Out

Suspend Time-Out lets you determine how long the computer remains idle (no I/O activity) before activating suspend mode. Settings for this option are **Disabled**, **5 min.**, **10 min.**, **15 min.**, **20 min.**, **30 min.**, **40 min.**, and **60 min.**

To increase battery operating time, set this option to a lower number of minutes.

Suspend Mode

The **Save-to-disk** option under **Suspend Mode** copies all system data to a reserved area on the hard-disk drive and then turns off all power to the computer. When you resume normal operation, the same programs will be running and the same files will be open that were loaded before you activated this mode. Use **Save-to-disk** suspend mode to conserve battery power or to preserve system data by quickly saving it to the hard-disk drive if you are about to run out of battery power.

Interrupt Assignments

Table 1-1 lists the interrupt 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	Used by the communications port (COM1)
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 real-time clock
IRQ9	Free
IRQ10	Generated by the USB
IRQ11	Generated by the cardbus controller
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	Generated by the secondary IDE controller (CD-ROM drive or DVD-ROM drive) to indicate that the drive requires attention of the microprocessor

Technical Specifications

Table 1-2 lists the technical specifications for the Inspiron 7000.

Table 1-2. Technical Specifications

Microprocessor	
Microprocessor type	Intel Mobile Pentium II microprocessor with MMX technology
Microprocessor speed	Inspiron 7000 D266XT or D266GT: 266 MHz Inspiron 7000 D300GT: 300 MHz
Internal cache	32 KB
External cache	512-KB pipelined-burst SRAM
Math coprocessor	internal to the microprocessor
Chip Set and Bus	
System chip set	Intel Mobile 440BX AGP
Data bus width	64 bits
DRAM bus width	64 bits
Address bus width	32 bits
Flash EPROM	4 Mbits
PC Card	
PCI controller	Texas Instruments PCI 1220 cardbus controller
PC Card connectors	two type I, two type II, or one type III
Cards supported	3.3-V and 5-V
PC Card connector size	68 pins
Data width (maximum)	32 bits
Memory	
Architecture	SDRAM
Memory module capacities	32- and 64-MB
Standard RAM	32-MB SODIMM (13.3-inch display) 64-MB SODIMM (14.1-inch display)
Maximum RAM	192 MB
Memory access time/ clock frequency	66 MHz
BIOS address	F000:0000

Table 1-2. Technical Specifications (continued)

Connectors	
Serial (DTE)	one 9-pin connector; 16550-compatible, 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 connector
Infrared	one IrDA 1.1 port
Expansion connector	240 pins
TV-out.	one 7-pin S-video
Audio	microphone, headphones/speakers, and line-out jacks
USB	one 4-pin connector
Integrated Audio	
Audio type	Sound Blaster Pro-compatible voice and music functions, HRTF 3D positional audio, hardware wavetable
Audio controller	ESS Technology Maestro-2
Conversion.	20 bit (stereo analog-to-digital and digital-to-analog)
Hardware wavetable synthesizer.	64-voice
Interfaces:	
Internal.	PCI bus, microphone, dual stereo speakers
External	microphone (minijack), headphones, line-in
Internal speaker amplifier.	1.0 W stereo (0.5 W per speaker)
External microphone input voltage range	280 mV peak-to-peak
Line/audio input voltage range	2.8 V peak-to-peak
Controls	volume can be controlled through thumb wheel, software application menus, and keyboard

Table 1-2. Technical Specifications (continued)

Video	
Video type	AGP 2X with sideband signals, hardware 3D accelerator, DVD motion compensation, ImpacTV-2 quality TV output
Video controller	ATI 3D Rage LT Pro AGP 2X
Video memory	4 or 8 MB 100 MHz SGRAM
LCD interface	65 MHz LVDS
TV support	NTSC or PAL in S-video and composite modes
13.3-Inch Display	
Type	active-matrix color (TFT)
Dimensions (active area):	
Height	214 mm (8.4 inches)
Width	296.5 mm (11.7 inches)
Diagonal	337.8 mm (13.3 inches)
Maximum resolution	1024 x 768 pixels; 4 billion colors as supported by application software
Response time (typical)	50 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
14.1-Inch Display	
Type	active-matrix color (TFT)
Dimensions (active area):	
Height	228.5 mm (8.9 inches)
Width	299.5 mm (11.8 inches)
Diagonal	358.1 mm (14.1 inches)
Maximum resolution	1024 x 768 pixels; 4 billion colors as supported by application software
Response time (typical)	40 ms
Operating angle	0° (closed) to 170°
Dot pitch	0.279 mm
Power consumption	4.6 W
Controls	brightness can be controlled through key combinations

Table 1-2. Technical Specifications (continued)

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)
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 current)
Main and Secondary Battery	
Type	lithium ion
Maximum dimensions:	
Height	23.8 mm (0.94 inch)
Depth	148.2 mm (5.83 inches)
Width	116.2 mm (4.58 inches)
Weight	0.60 kg (1.32 lb)
Voltage	14.4 VDC
Capacity	65 WH

Table 1-2. Technical Specifications (continued)

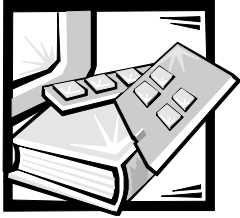
Main and Secondary Battery (continued)	
Charge time (approximate): ¹	
Computer on	3.5 hours
Computer off	3 hours
Operating time (approximate) ¹	
	2.5 to 3.5 hours with one battery; 5 to 7 hours with two batteries
Life span (approximate) ¹	500 discharge/charge cycles
Ambient temperature range:	
Charge	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)
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	3.5 A (continuous)
Output power	70 W
Rated output voltage	20 VDC
Dimensions:	
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)

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 and according to the configuration of the computer system.

Table 1-2. Technical Specifications *(continued)*

Physical (Computer)	
Height	54 mm (2.1 inches)
Width	318 mm (12.52 inches)
Depth	254 mm (10 inches)
Weight (includes hard-disk drive, diskette drive, and CD-ROM drive).	3.74 kg (8.25 lb) with 13.3-inch display 3.8 kg (8.37 lb) with 14.1-inch display
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	0.8 GRMS using a random-vibration spectrum that simulates air shipment
Storage	1.3 GRMS using a random-vibration spectrum that simulates truck shipment
Maximum shock: ²	
Operating	1.52 m/sec (4.98 ft/sec) (less than or equal to a pulse width of 2 ms)
Storage	2.03 m/sec (6.66 ft/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)

² Measured with the hard-disk drive in head-parked position.



CHAPTER 2

Initial Procedures

This 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 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



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.

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."

To perform a visual inspection, follow these steps:

1. Determine the power state of the computer.

If the system is on, go to step 2.

If you are unsure whether the system is on, shut down and restart the system, and 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 electrical outlet. The AC adapter's indicator light 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, verify that the connectors on the battery and inside the battery bay are not damaged, and then reinsert the batteries into their respective compartments. Press the test button located on the back of each battery to make certain that there is a charge.
6. Remove the combo module (CD-ROM/diskette drive or DVD-ROM/diskette drive) if installed, verify that it is free of any obvious physical damage, verify that the connectors on the combo module and inside the options bay are not damaged, and then reinsert the drive into the options bay.
7. Remove any installed PC Cards from the PC Card slot, verify that they are free of any obvious physical damage, verify that the connectors on the PC Cards and inside the PC Card cage are not damaged, 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, verify that the connectors on the modules and in the memory module sockets are not damaged, 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 operates 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, its interface cable, and connectors are free of any obvious physical damage.
 - d. The monitor is on.
 - e. 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, its cable, and connectors 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, its interface cable, and connectors 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, "Running the Dell Diagnostics," of the Dell Inspiron 7000 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 front 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."

Eliminating Resource Conflicts

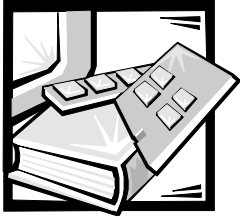
Devices within or connected to the computer may require dedicated memory spaces, interrupt levels, and/or DMA channels. Because different devices can be configured at different times, it is possible that the same resource is assigned to two or more devices.

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

This 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.

POST Beep Codes

If the display cannot display error messages during POST, the computer may emit a series of beeps that identifies the problem or that can help you identify a faulty component or assembly. For example, one beep, a burst of three short beeps, and two more single beeps (beep code 1-3-1-1) means that the system has encountered a DRAM refresh error condition, probably caused by a faulty system board.

Table 3-1 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 <i>nnnn</i>	Faulty memory module or faulty main board
1-3-4-3	RAM failure on data bits <i>nnnn</i> of high byte on memory bus	Faulty memory module or faulty main board
1-4-1-1	RAM failure on data bits <i>nnnn</i> 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

Table 3-2 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
CMOS battery is dead-Replace and run Setup	The CMOS battery does not have enough charge to power the computer.	CMOS battery completely discharged. Faulty CMOS battery or main board.
Diskette drive A error	Connector loose or diskette faulty.	Faulty or incorrectly inserted diskette in drive. Faulty diskette drive. Faulty main board. Faulty or loose external cable.
Extended RAM failed at off-set: <i>nnnn</i>	Extended memory not configured properly or failed at memory address <i>nnnn</i> .	Faulty or improperly seated memory module. Faulty main board.

Table 3-2. System Error Messages (continued)

Message	Definition	Probable Causes
Failing bits: <i>nnnn</i>	Memory failed at RAM address <i>nnnn</i> .	Faulty or improperly seated memory module. Faulty main board.
Fixed disk 0 failure	The hard-disk drive failed to initialize.	Corrupted hard-disk drive boot sector or configuration file. Faulty hard-disk drive. Faulty main board.
Fixed disk controller failure	The hard-disk drive controller may be faulty.	Faulty hard-disk drive. Faulty main board.
Incorrect drive A type—run Setup	The diskette drive is not identified properly in the Setup program.	Incorrect drive configuration. Faulty connections. Faulty diskette drive. Faulty main board.
Keyboard controller error	The keyboard controller is faulty.	Faulty keyboard connection. Faulty keyboard. Faulty main board.
Keyboard error	If an external keyboard is being used, a cable or connector may be loose or the keyboard may be faulty. If the built-in keyboard is being used, it may be faulty. A key on the built-in keyboard may have been pressed while the computer was booting.	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	The operating system may be corrupted. Or, the operating system cannot be found on the hard-disk drive or on the diskette in the 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 <i>nnnn</i>	A parity error was found in the system bus at address <i>nnnn</i> .	Faulty main board.
Parity check 2 <i>nnnn</i>	A parity error was found in the I/O bus at address <i>nnnn</i> .	Faulty main board.

Table 3-2. System Error Messages (continued)

Message	Definition	Probable Causes
Real time clock error	The CMOS battery that supports data stored in NVRAM may be dead.	Faulty battery. Faulty main board.
Shadow RAM failed at offset: <i>nnnn</i>	Shadow RAM failed at address <i>nnnn</i> .	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	The primary cache internal to the microprocessor has failed.	Faulty microprocessor.
System CMOS checksum bad—run Setup	The BIOS has been updated. 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: <i>nnnn</i>	System RAM failed at address <i>nnnn</i> in the 64-KB block at which the error was detected.	Faulty or improperly seated memory module. Faulty main board.
System timer error	A chip on the system board may be malfunctioning.	Faulty main board.

Running 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

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

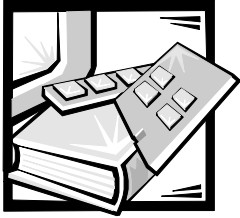
Follow these steps to start the diagnostics:

1. Install a CD-ROM drive in the options bay.
2. Turn off the computer.
3. 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 **Diag-nostics Menu** appears. This menu lets you choose the following options or exit to the MS-DOS[®] prompt:

- **Run All Tests** — Runs all tests for a thorough test of the computer
- **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 Specific Tests** — Tests a particular area or subsystem of the computer



CHAPTER 4

Removing and Replacing Parts

This chapter provides procedures for removing and replacing components and assemblies. 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 computer 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 170 degrees.

Locations or directions relative to the computer are shown in Figure 4-1 unless otherwise specified.

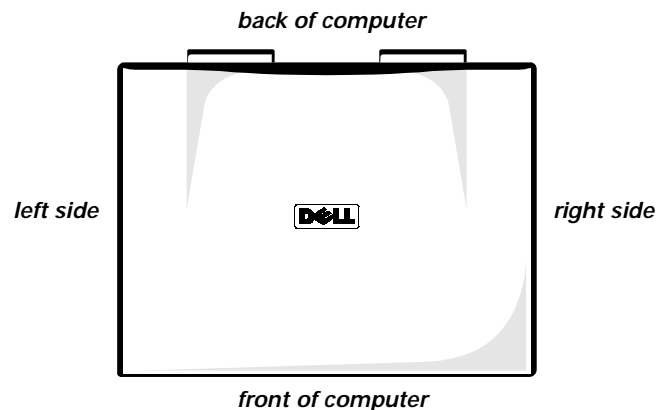


Figure 4-1. Computer Orientation

Recommended Tools

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

- Small flat-blade screwdriver
- Number 1 Phillips-head screwdriver
- Antistatic grounding strap
- Dental pick

- Small scribe or nylon flat blade
- Nut driver (5 mm and 5.5 mm)

Screw Identification and Tightening



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 in Figure 4-2 to check for correct length.

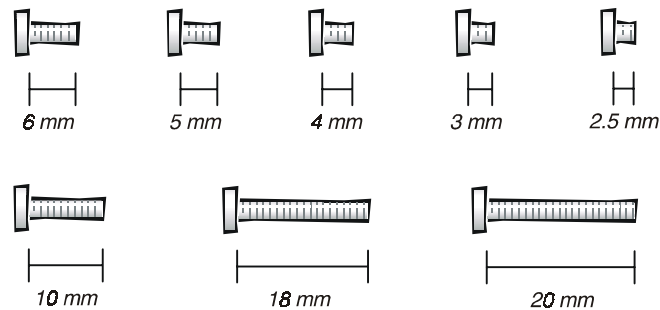


Figure 4-2. Screw Identification

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 electrical outlets 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.

Precautionary measures include disconnecting the computer from the AC adapter and port replicator and removing the main battery, PC Cards, hard-disk drive, memory module cover, video card cover, memory modules, and devices in the options bay.

To take these precautionary measures, follow these steps:

1. Determine the power state of the computer.

If the system is on, go to step 2.

If you are unsure whether the system is on, shut down and restart the system, and then go to step 2.

2. Turn off any attached peripherals, and then shut down the computer.
3. Disconnect the computer and any attached peripherals from electrical outlets to reduce the potential for personal injury or shock.

If the computer has an AC adapter, disconnect the AC power cable from the electrical outlet and then from the AC adapter; then disconnect the AC adapter from the computer (see Figure 4-3) or from the Inspiron Port Replicator II.

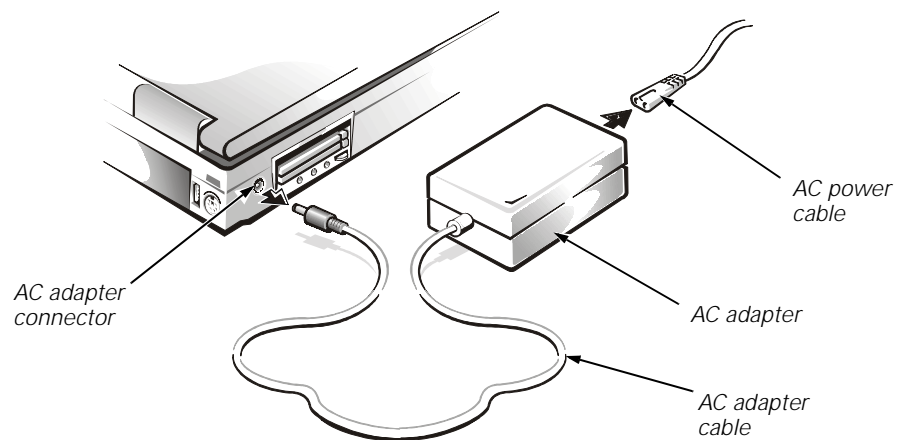


Figure 4-3. AC Adapter Removal

4. If the computer is connected to a port replicator, pull both release handles on the sides of the replicator to undock the computer (see Figure 4-4).

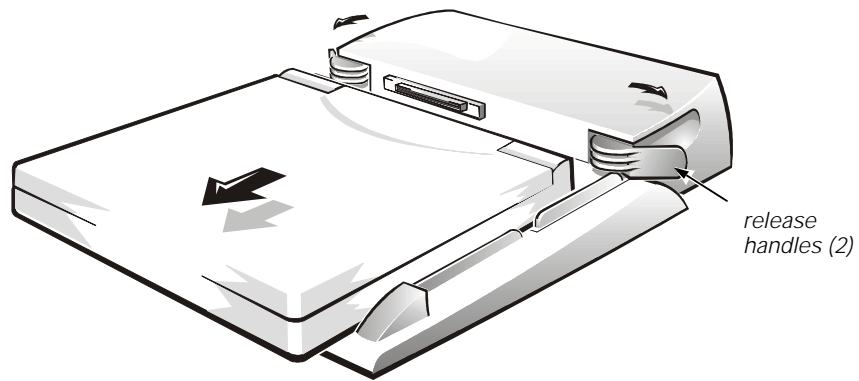


Figure 4-4. Computer Removal From Inspiron Port Replicator II

5. Remove the main battery from the battery compartment.

Unlock the latch lock on the bottom of the computer by flipping it toward the back of the computer (see Figure 4-5). Slide the latch release in the direction of the arrow. Keep holding the latch release with one hand while pulling the battery out of the compartment with the other.

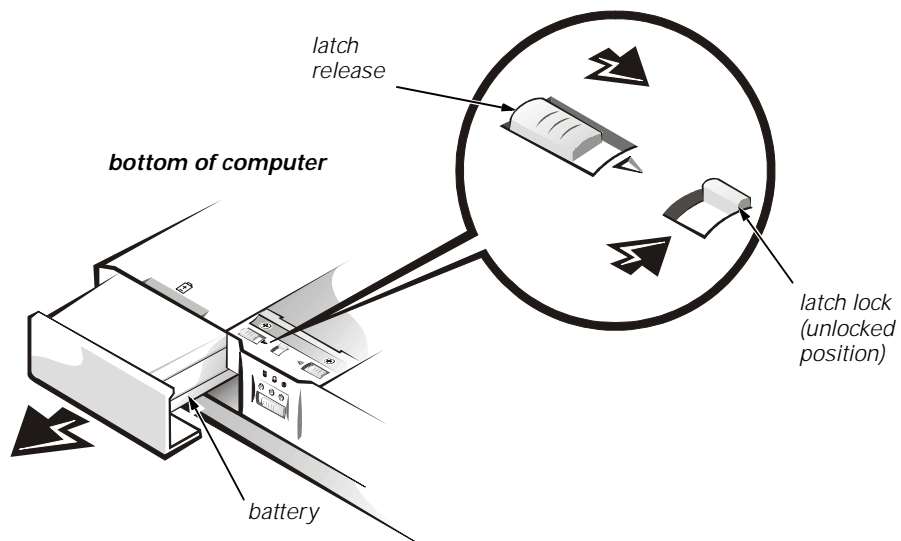


Figure 4-5. Main Battery Removal

The plastic front bezel on the battery slides back and forth, which allows it to be used in the options bay as a secondary battery, and can be removed.

On the back of the battery is a battery charge gauge. The five charge-level lights indicate the total battery charge, ranging from fully charged to completely discharged. Press the status button to the right of the lights to check the level of the total battery charge. See "Battery Charge Gauge" in Chapter 1 for more information.

6. Remove any PC Cards.

To remove a type I or type II PC Card from the top connector (see Figure 4-6), press the top eject button twice. To remove a type I or type II PC Card from the bottom connector, press the bottom eject button twice. To remove a type III card, press the bottom eject button twice.



NOTE: 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.

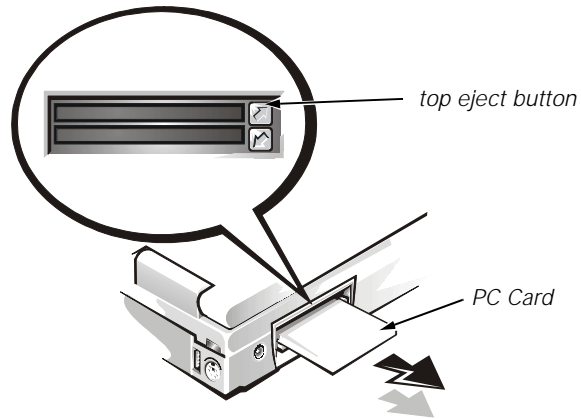


Figure 4-6. PC Card Removal

7. Remove the hard-disk drive assembly.



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



CAUTION: Handle the hard-disk drive gently and don't bump or drop the drive. Rough handling could induce failure or loss of data.

Loosen the two captive screws that secure the hard-disk drive into the bottom of the computer. The front edge of the cover pops up slightly. Slide the hard-disk drive toward the front of the computer and then lift the drive out of the computer (see Figure 4-7).

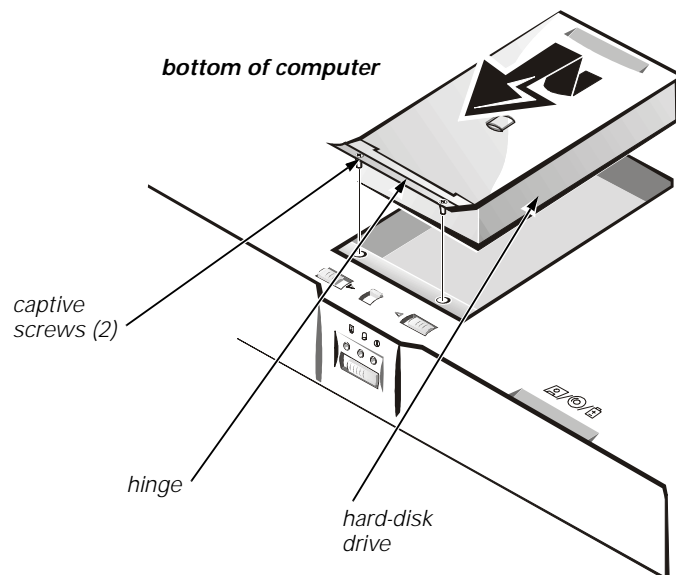


Figure 4-7. Hard-Disk Drive Removal

8. Remove the video card and memory module covers.

Slide the video card cover as far as it will go in the direction of the arrow, and then remove the cover (see Figure 4-8). Remove the memory module cover in the same way.

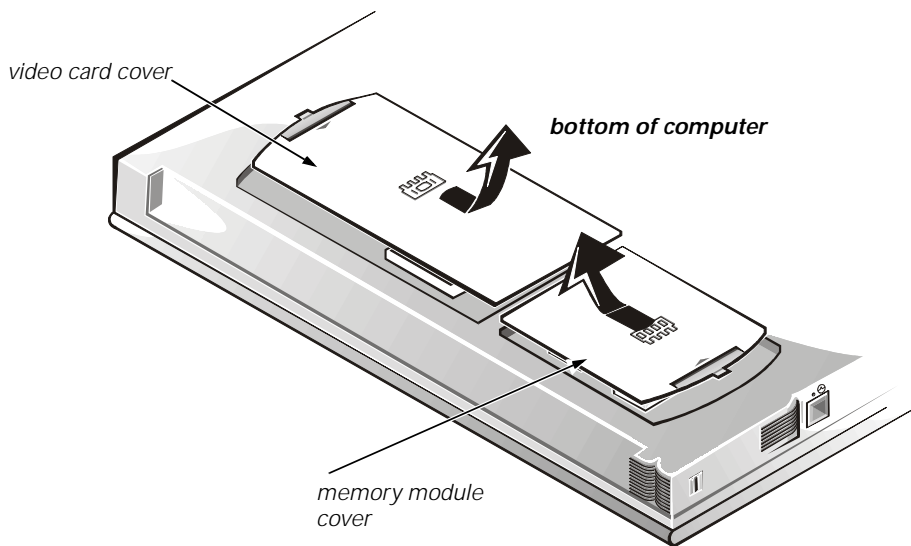


Figure 4-8. Memory Module and Video Card Cover Removal

To replace a cover, place it over the opening, leaving a small gap along the rounded edge, and then slide the cover toward the outside of the computer until it snaps into place.

9. Remove the memory modules.

Carefully spread the inner metal tabs of the memory module socket to disengage the module from the socket. The module should pop up slightly. Then pull the memory module out of the socket (see Figure 4-9).

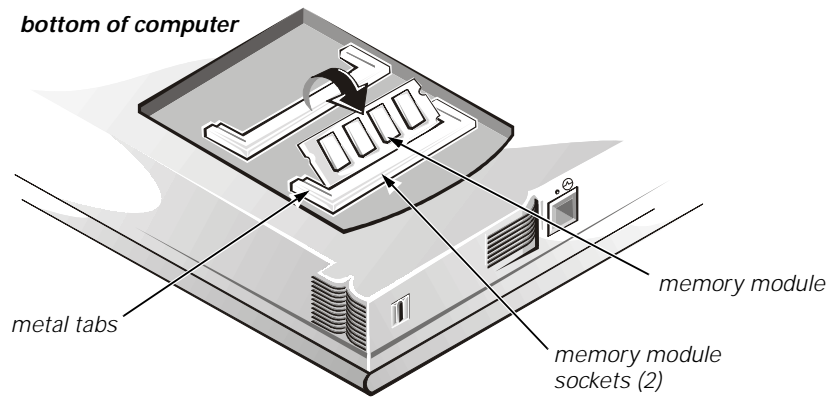


Figure 4-9. Memory Module Removal

10. Remove the video card.

Remove the two 3-mm screws securing the video card (see Figure 4-10). Gently pull the video card off of the connectors on the bottom of the system board by lifting it at the notches located between the screws. Do not rock the card to remove it because this may damage the connectors.

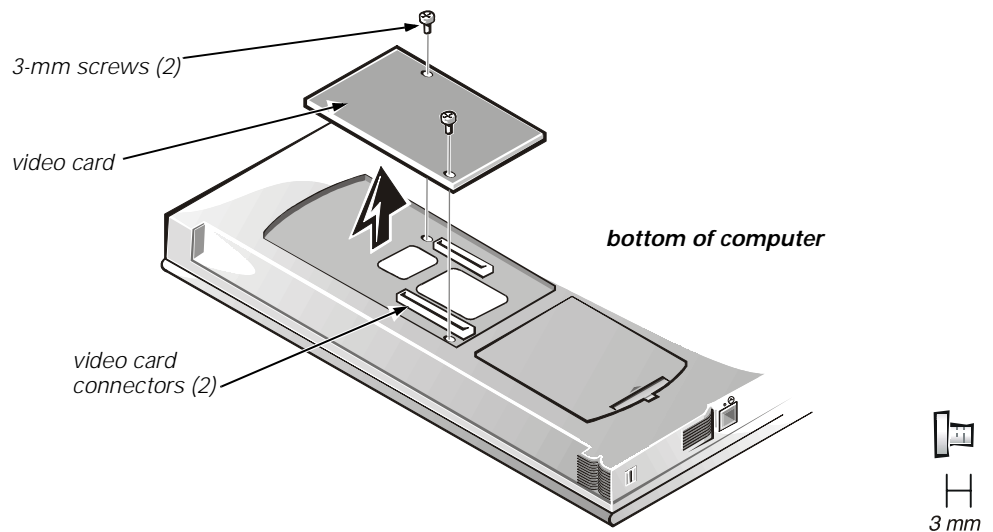


Figure 4-10. Video Card Removal

Inspect the two thermal pads on the bottom of the system board and replace them if necessary.

11. If present, remove the combo module or secondary battery from the options bay.

Unlock the latch lock by flipping it toward the back of the computer (see Figure 4-11). Slide the latch release in the direction of the arrow. Keep holding the latch release with one hand while pulling the combo module or secondary battery straight out of the options bay with the other.

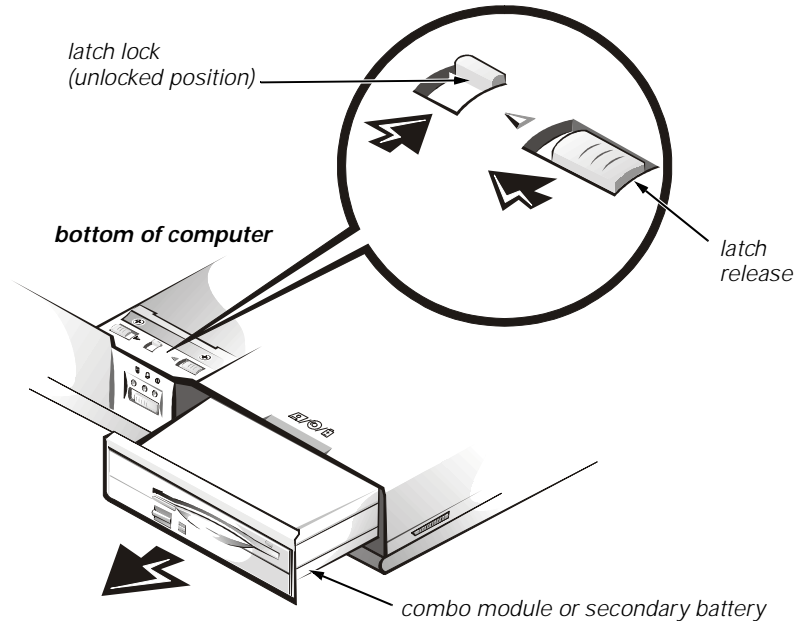


Figure 4-11. Combo Module or Secondary Battery Removal



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

ZIF Connectors



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.

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.

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 4-12).

For most ZIFs, carefully pry up first one end of the movable part of the connector and then the other end. Some ZIFs may need to be lifted in the center.

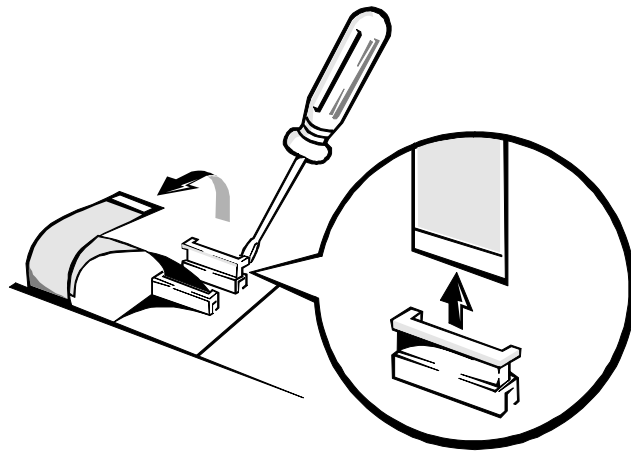


Figure 4-12. Releasing a ZIF Connector

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 or dental pick 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 that the ZIF connector is completely closed.

Exploded View of Components and Assemblies

Exploded views of the computer, the 13.3-inch and 14.1-inch display assemblies, the palmrest assembly, and the base assembly are shown in Figures 4-13, 4-14, 4-15, 4-16, and 4-17, respectively.

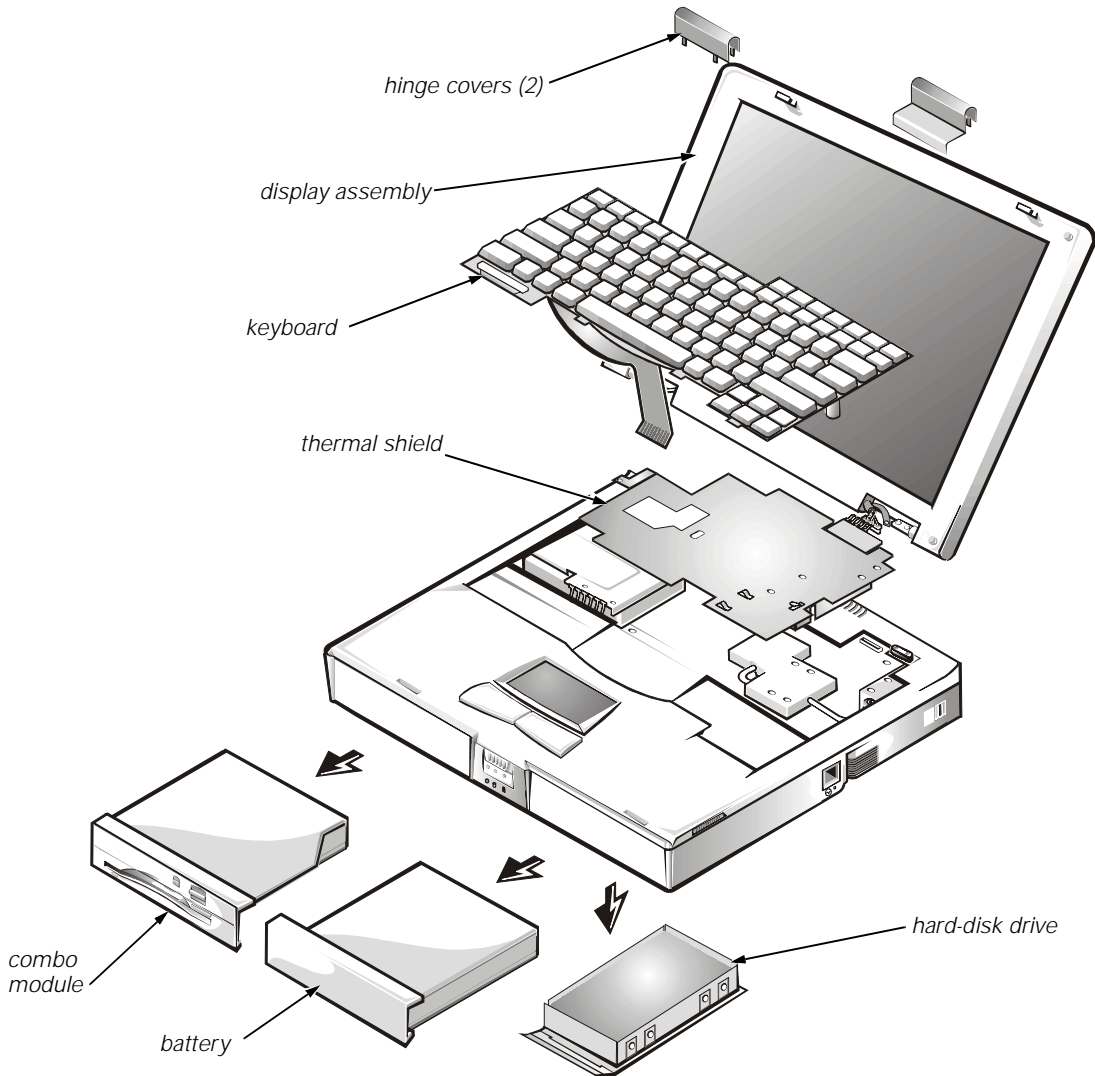


Figure 4-13. Exploded View—Computer

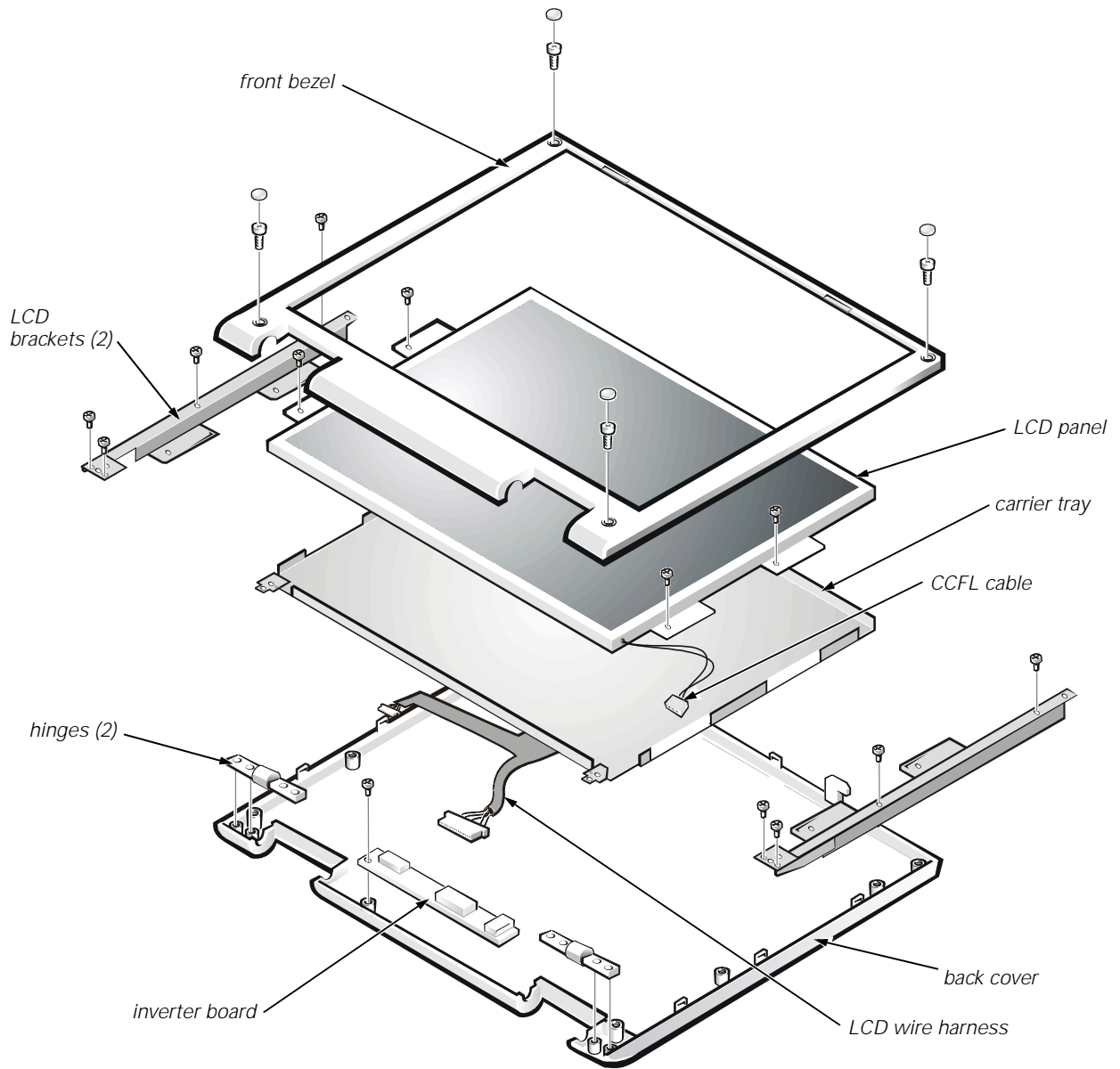


Figure 4-14. Exploded View—13.3-Inch Display Assembly

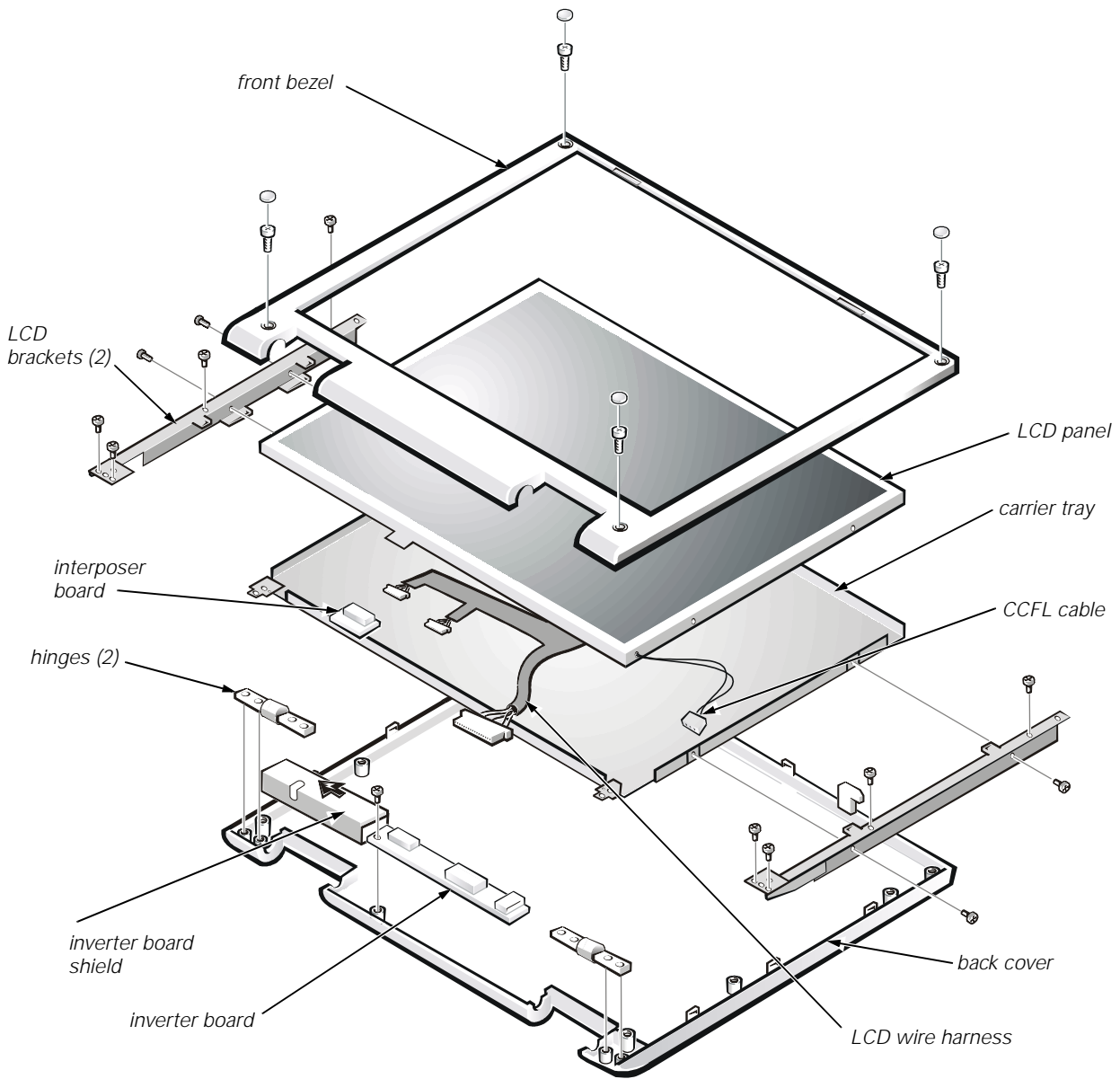


Figure 4-15. Exploded View—14.1-Inch Display Assembly

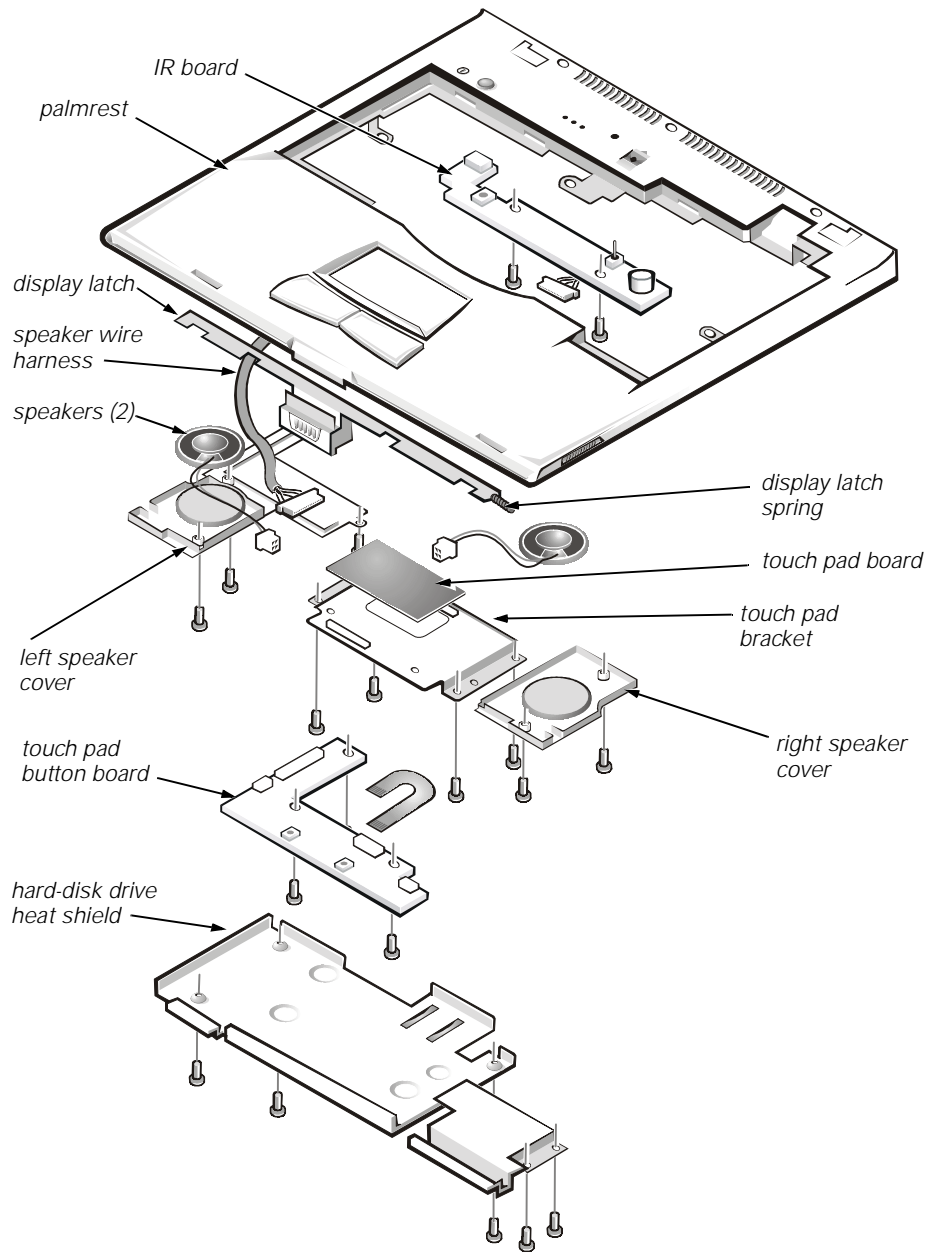


Figure 4-16. Exploded View—Palmrest Assembly

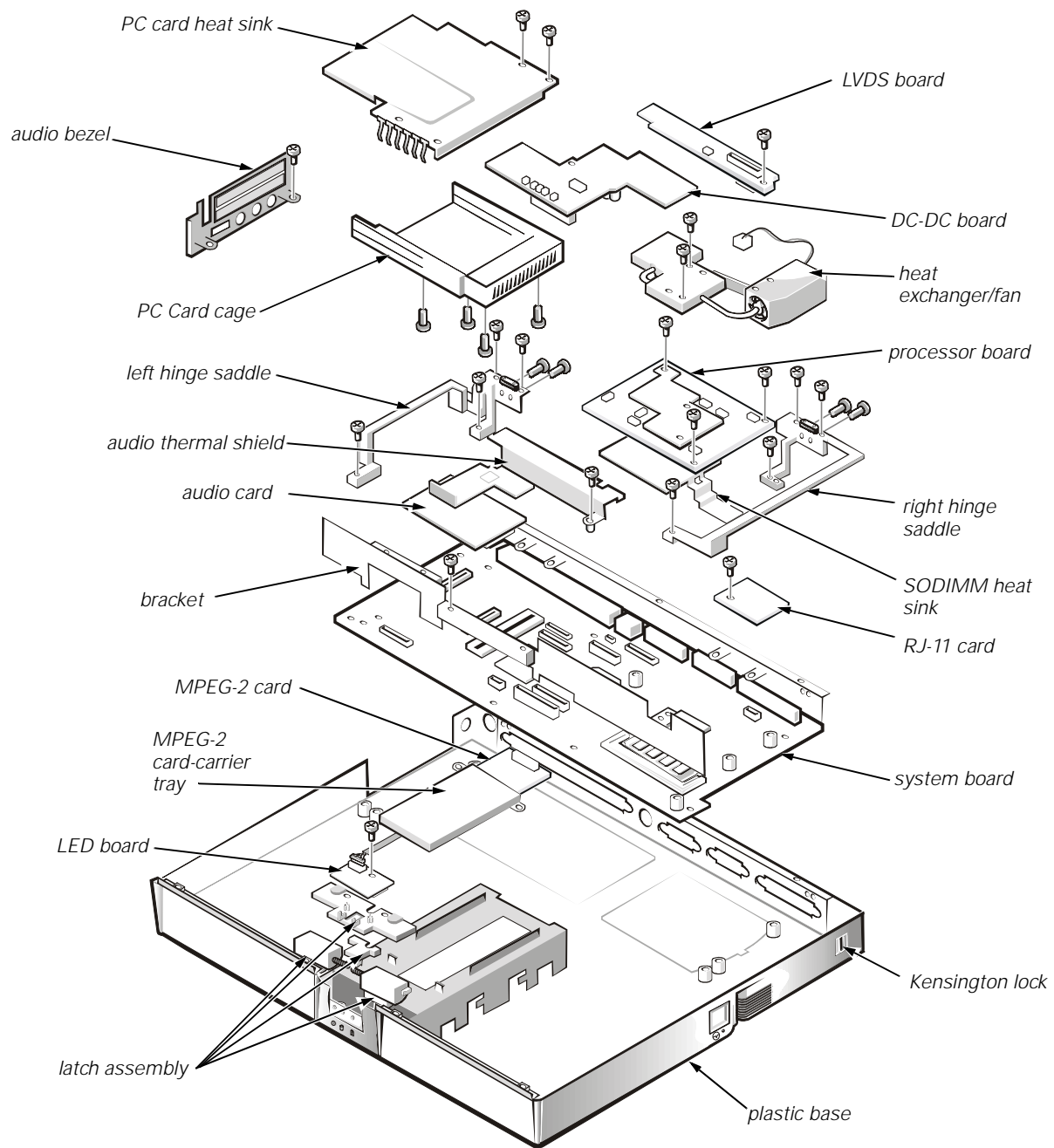


Figure 4-17. Exploded View—Base Assembly

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. Customer kits are those parts or assemblies that are replaceable by a customer.

Table 4-1. Factory Repair Parts and Assemblies

Part or Assembly Name	Order Name
System Board	
System Board Assembly	ASSY,SYS,PLN,NBK,I7000
System Board	SYS,PLN,NBK,I7000
Plastic Frame	SPCR,PLSTC,MTHBD,NBK,I7000
System/Keyboard BIOS	IC,BIOS,SYS,NBK,I7000
I/O Bracket	BRKT,MET,I/O,NBK,I7000
PC Card Cage Assembly	ASSY,CAGE,MET,PCMCIA,I7000
PC Card Cage Top Half	
PC Card Cage Bottom Half	
Saddle Hinge, Bracket Right	PLT,BRACE,HNG,LCD,RT,NBK,I7000
Saddle Hinge, Bracket Left	PLT,BRACE,HNG,LCD,LF,NBK,I7000
Standoffs, Processor Board	STDF,6-32X1/4,HEX,CS,PRM,I7000
Standoff, DC/DC Board	STDF,4-40X.3,HEX,CS,DCDC,I7000
Standoff, Port Connector	STDF,M2.5X4.14,5.5HEX,BRS
Standoff, I/O Connector	STDF,4-40X6,4.8HEX,BRS
PC Card Heat Sink	HTSNK,PCMCIA,NBK,I7000
Audio Thermal Shield	PLT,MET,PCMCIA,NBK,I7000
Audio Card	CRD,INTFC,AUD,NBK,I7000
DC/DC Board	CRD,INTFC,DC/DC,NBK,I7000
Audio Bezel	CVR,PLSTC,AUD JK,NBK,I7000
Processor Board (PRM/MMO)	
266MHz Processor Board	PRM,5PP266,266M,512K,AGP
300MHz Processor Board (PRM)	PRM,5PP300,300M,512K,AGP

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

Part or Assembly Name	Order Name
Heat Sink Assembly	
Heat Exchanger Assembly	ASSY,CAGE,MET,THRM SOLN,I7000
Heat Exchanger, Metal Plate	PLT,MET,CPU,NBK,I7000
SODIMM Heat Sink	HTSNK,DIMM,PRM,NBK,I7000
PMThermal Solution, Metal Blocks w/ Fan	CAGE,MET,THRM SOLN,CPU,I7000
Fan	FAN,25MMX25MM,5V,03W,I7000
Spacer	SPCR,PLSTC,FAN,NBK,I7000
Thermal Kit	ASSY,PAD,THRM,INTFC,NBK,I7000
Thermal Pad (Northbridge)	PAD,THRM,INTFC,BX-CHIP,I7000
Thermal Pad (over processor)	PAD,THRM,INTFC,CPU,I7000
Bottom Case	
Bottom Plastic	CVR,BTM,PLSTC,NBK,I7000
Latch Assembly	ASSY,LTCH,LKG,BTM,PLSTC,I7000
Latch Cover (Outer)	n/a
Latch Separator/Lock	n/a
Right Latch	n/a
Spring	n/a
Left Latch	n/a
Spring	n/a
Cover Latch Spring	n/a
Rubber Feet, Front	FOOT,RBR,BTM,NBK,I7000
LED Board	CRD,INTFC,LED,NBK,I7000
LED Board Cable	CBL,INTFC,LED,NBK,I7000
RJ-11 Cover	CVR,SIDE,PLSTC,MDM,I7000
Memory Door	DOOR,PLSTC,BTM,RAM,NBK,I7000
VGA Door	DOOR,PLSTC,BTM,VGA,NBK,I7000

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

Part or Assembly Name	Order Name
Upper Logic	
Palmrest Plastics	CVR,BTM,PLSTC,NBK,I7000
Left Touch Pad Button	n/a
Right Touch Pad Button	n/a
Left Touch Pad Button Hinge	n/a
Right Touch Pad Button Hinge	n/a
Right Speaker Cover	CVR,PLSTC,SPKR,RT,NBK,I7000
Left Speaker Cover	CVR,PLSTC,SPKR,LF,NBK,I7000
Right Speaker w/ wire	SPKR,0.6W,23M,RT,NBK,I7000
Left Speaker w/ wire	SPKR,0.6W,23M,LF,NBK,I7000
Hard-Disk Drive Heat Sink, under Palmrest	HTSNK,HD,NBK,I7000
Touch Pad Button Board	CRD,INTFC,BTN,TPAD,NBK,I7000
Touch Pad Bracket	BRKT,MET,TPAD,NBK,I7000
Touch Pad	CRD,INTFC,TPAD,NBK,I7000
Touch Pad Flex Cable	CBL,FLEX,CRD,TPAD,NBK,I7000
Touch Pad Button, Audio Cable	CBL,INTFC,TPAD,NBK,I7K
Display Latch Assembly	ASSY,LTCH,PLMRST,NBK,I7000
Latch Button	n/a
Slide Mechanism	n/a
Spring	SPR,LTCH,NBK,I7000
IR, Microphone Board	CRD,IR,NBK,I7000
IR Cable	CBL,FLEX,CRD,IR,NBK
IR Lens 13.3" and 14.1"	LENS,IR,NBK,I7K
LCD Parts for 13.3-Inch	
13.3" LCD Panel	LCD,TFT,XGA,13.3,I7000,LG
Front Bezel	BZL,PLSTC,LCD,13.3,NBK,I7000
Display Hinge	HNG,MET,LCD,I7000
Display Back Cover	CVR,BK,LCD,13.3,I7000
Display Upper Rubber Bumper	BMPR,RBR,UPR,LCD,I7000
Display Lower Rubber Bumper	BMPR,RBR,LWR,LCD,I7000
LCD Flex Cable Assembly	CBL,FLEX,LCD,13.3,I7000,LG
LCD Shielding, behind panel	SHLD,EMI,LCD,13.3,NBK,I7000

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

Part or Assembly Name	Order Name
LCD Parts for 13.3-Inch (continued)	
Inverter Board	CRD,INTFC,INVRTR,LG,13.1,I7000
Right Bracket	BRKT,MET,RT,LCD,13.3,I7000
Left Bracket	BRKT,MET,LF,LCD,13.3,I7000
LVDS Board	CRD,INTFC,LVD,13.3,NBK,LG
Right Hinge Cover	CVR,HNG,PLSTC,RT,I7000
Left Hinge Cover	CVR,HNG,PLSTC,LF,I7000
LCD Parts for 14.1-Inch	
14.1" LCD Panel	LCD,TFT,XGA,14.1,I7000,LG
Front Bezel	BZL,PLSTC,LCD,14.1,I7000,LG
LCD Flex Cable Assembly	CBL,FLEX,LCD,14.1,I7000,LG
Right Display Hinge	HNG,MET,LCD,I7000
Display Back Cover	CVR,BK,LCD,13.3,I7000
Display Upper Rubber Bumper	BMPR,RBR,UPR,LCD,I7000
Display Lower Rubber Bumper	BMPR,RBR,LWR,LCD,I7000
EMI Plate, Behind Panel	SHLD,EMI,LCD,14.1,I7K,LG
Inverter Board	CRD,INTFC,INVRTR,LG,14.1,I7000
Right Bracket	BRKT,MET,RT,LCD,14.1,I7K,LG
Left Bracket	BRKT,MET,LF,LCD,14.1,I7K,LG
Right Hinge Cover	CVR,HNG,PLSTC,RT,I7000
Left Hinge Cover	CVR,HNG,PLSTC,LF,I7000
LVDS Board	CRD,INTFC,LVD,14.1,NBK,LG
Keyboards	
Keyboard, US	KYBD,87,US,NBK,I7000
Keyboard, UK	KYBD,88,UK,NBK,I7000
Keyboard, Japan	KYBD,88,JPN,NBK,I7000
Keyboard, German	KYBD,88,GER,NBK,I7000
Keyboard, French	KYBD,88,FR,NBK,I7000
Keyboard, Norwegian	KYBD,88,NOR,NBK,I7000,EMEA
Keyboard, Denmark	KYBD,88,DEN,NBK,I7000,EMEA
Keyboard, Swedish	KYBD,88,SWE,NBK,I7000,EMEA
Keyboard, Italian	KYBD,88,ITL,NBK,I7000,EMEA

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

Part or Assembly Name	Order Name
Screws	
Screw, 2.5 x 4	SCR,2.5X4,KSH,MS,CPS
Screw, 2.5 x 6	SCR,2.5X6,BSH,MS,CPS
Screw, 2.5 x 18	SCR,2.5X18,KSH,MS,CPS
Screw, 2.5 x 20	SCR,2.5X20,PNH,MS,CPS
Screw, 2.5 x 10	SCR,2.5X10,BSH,MS,CPS
Screw, 2 x 4	SCR,2X4,FLH,MS,CPS
Screw, 2 x 5	SCR,2X5,BSH,MS,CPS
Screw, 2 x 3	SCR,2X3,KSH,MS,CPS
Screw, 2 x 18	SCR,2X18,PNH,MS,CPS
Screw, 3 x .5	SCR,3X.5,KSH,MS,CPS
Screw, 2.5 x .45	SCR,2.5X.45,KSH,MS,CPS
Screw, CD-ROM bezel	SCR,1.7x.35,KSH,MS,CPS
Hard-Disk Drive Holder	
Hard-Disk Drive Cover Assembly	ASSY,CARRIER,MTG,HD,NBK,I7000
Plastic Cover	CVR,PLSTC,HD,I7000
Top Shield	PLT,MET,BTM,HD,I7000
Connector Board	CON,2X22,INTFC,IDE,HDD,I7000
Internal Options—Modem, PCI, VGA	
Modem Kit	
56K Modem	MDM,56K,INT,RJ11,I7000
Modem Carrier Box	CVR,MET,MDM,I7000
RJ-11 Card	CRD,MDM,RJ11,INTFC,NBK,I7000
Modem Flex Cable	CBL,FLEX,MDM,RJ11,NBK,I7000
Twisted Pair Cable	CBL,INTFC,MDM,MTHBD,NBK,I7000
Miscellaneous Parts	
Modem Kit	KIT,CBL,ADPT,MDM,INT,I7000,US
Phone Cable	CBL,PHONE,MDM,PCMCIA,MHZ
Adaptor Coupler	ADPT,COUPLER,MDM,PCMCIA,RJ-11
Assembly, Internal MPEG-2 Card	ASSY,CRD,DCDR,MPEGII,INT,I7000
MPEG-2 Card	CRD,DCDR,MPEG-II,INT,I7000
Metal Cover	CVR,MET,MPEG-II,I7000

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

Part or Assembly Name	Order Name
Video Card 4MB	CRD,VID,VGA,4M,ATI,I7000
Video Card 8MB	CRD,VID,VGA,8M,ATI,I7000
LCD Rubber Bumper Kit	KIT,BMPR,RBR,LCD,I7000
Upper	BMPR,RBR,UPR,LCD,I7000
Lower	BMPR,RBR,LWR,LCD,I7000
Foot	FOOT,RBR,CVR,BTM,13.3,I7000
Customer Replaceable Units (CRU) (All CRUs are sent as customer kits)	
Customer Kit, Memory Module Cover	CUS,DOOR,PLSTC,BTM,RAM,I7000
Plastic Door	DOOR,PLSTC,BTM,RAM,NBK,I7000
Customer Kit, Video Card Cover	CUS,DOOR,PLSTC,BTM,VGA,I7000
Plastic Door	DOOR,PLSTC,BTM,VGA,NBK,I7000
Customer Kit, Rubber Bumpers, 13.3"	CUS,FOOT,PAD,BMPR,13.3,I7000
Foot	FOOT,RBR,CVR,BTM,13.3,I7000
Upper	BMPR,RBR,UPR,LCD,I7000
Lower	BMPR,RBR,LWR,LCD,I7000
Customer Kit, Rubber Bumpers, 14.1"	CUS,FOOT,PAD,BMPR,14.1,I7000
Foot	FOOT,RBR,CVR,BTM,14.1,I7000
Lower	BMPR,RBR,LWR,LCD,I7000
Upper	BMPR,RBR,UPR,LCD,I7000
Customer Kit, 4.0GB Hard-Disk Drive, IBM	CUS,HD,4GB,I,IBM,I7K
4.0GB Subassembly	
Boot Information	INFO,1ST BOOT,HARD DRIVE
Screw, 3 x .5	SCR,3X.5,KSH,MS,CPS
Hard-Disk Drive Carrier Assembly	ASSY,CARRIER,MTG,HD,NBK,I7000
Top Shield	PLT,MET,BTM,HD,I7000
Plastic Cover	CVR,PLSTC,HD,I7000
Connector Board	CON,2X22,INTFC,IDE,HDD,I7000
Customer Kit, 4.0GB Hard-Disk Drive, Fujitsu	CUS,HD,4GB,I,12.5MM,FJTSU,I7K
4.0GB Subassembly	
Boot Information	INFO,1ST BOOT,HARD DRIVE
Screw, 3 x .5	SCR,M3.0x0.5x4,PHH,NPL

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

Part or Assembly Name	Order Name
Customer Replaceable Units (CRU) (continued)	
Hard-Disk Drive, 4.0GB	HD,4.0GB,I,F2,12.5MM,FJTSU
Hard-Disk Drive Carrier Assembly	ASSY,CARRIER,MTG,HD,NBK,I7000
Top Shield	PLT,MET,BTM,HD,I7000
Plastic Cover	CVR,PLSTC,HD,I7000
Connector Board	CON,2X22,INTFC,IDE,HDD,I7000
Customer Kit, 6.4GB Hard-Disk Drive, Fujitsu	CUS,HD,6.4G,I,12.5MM,FJTSU,I7K
6.4GB Subassembly	
Boot Information	INFO,1ST BOOT,HARD DRIVE
Screw, 3 x 0.5	SCR,M3.0x0.5x4,PHH,NPL
Hard-Disk Drive, 6.4GB	HD,6.4GB,I,F2,12.5MM,FJTSU H10
Hard-Disk Drive Carrier Assembly	ASSY,CARRIER,MTG,HD,NBK,I7000
Top Shield	PLT,MET,BTM,HD,I7000
Plastic Cover	CVR,PLSTC,HD,I7000
Connector Board	CON,2X22,INTFC,IDE,HDD,I7000
Customer Kit, 6.4GB Hard-Disk Drive, IBM	CUS,HD,6.4GB,I,12.5MM,IBM,I7K
6.4GB Subassembly	
Boot Information	INFO,1ST BOOT,HARD DRIVE
Screw, 3 x 0.5	SCR,M3.0x0.5x4,PHH,NPL
Hard-Disk Drive, 6.4GB	HD,6.4GB,I,F2,12.5MM,IBM ACDIA
Hard-Disk Drive Carrier Assembly	ASSY,CARRIER,MTG,HD,NBK,I7000
Top Shield	PLT,MET,BTM,HD,I7000
Plastic Cover	CVR,PLSTC,HD,I7000
Connector Board	CON,2X22,INTFC,IDE,HDD,I7000
Customer Kit, 8.1GB Hard-Disk Drive, IBM	CUS,HD,8.1GB,I,F2,17MM,IBM,NBK
8.1GB Subassembly	
Boot Information	INFO,1ST BOOT,HARD DRIVE
Screw, 3 x 0.5	SCR,M3.0x0.5x4,PHH,NPL
Hard-Disk Drive, 8.0GB	HD,8.1GB,I,F2,17MM,IBM,NBK
Hard-Disk Drive Carrier Assembly	ASSY,CARRIER,MTG,HD,NBK,I7000
Top Shield	PLT,MET,BTM,HD,I7000
Plastic Cover	CVR,PLSTC,HD,I7000
Connector Board	CON,2X22,INTFC,IDE,HDD,I7000

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

Part or Assembly Name	Order Name
Customer Replaceable Units (CRU) (continued)	
Customer Kit, MPEG-2 Card	CUS,CRD,VID,MPEGII,PCMCIA,INSP
MPEG-2 Card	CRD,VID,DECODER,PCMCIA,MPEGII
Kit,MPEG-2 Card	KIT,CBL\CDISK,VID,MPEGII,PCMCIA
Customer Kit, CD-ROM/FDD	CUS,CD/FD,680M,24X/1.44M,I7000
CD-ROM/FDD Assembly	ASSY,CD/FD,24X/1.44M,I7000
Combo Plastics Kit	ASSY,BRKT,PLSTC,DVD/CD,I7K
CD-ROM	CD,680M,24X,I,INT,INSP
Front Plastic Bezel	BZL,FRT,PLSTC,CD,SANYO,I7000
Customer Kit, DVD-ROM/FDD	CUS,DVD/FD,17G/1.44M,I7000
DVD-ROM/FDD Assembly	ASSY,DVD/FD,17G/1.44M,I7000
Combo Plastics Kit	ASSY,BRKT,PLSTC,DVD/CD,I7K
CD-ROM	CD,680M,24X,I,INT,INSP
Front Plastic Bezel	BZL,FRT,PLSTC,CD,SANYO,I7000
Combo Plastics Kit	
Plastic Cover	CVR,PLSTC,FD,NBK,I7000
CD-ROM/DVD-ROM Metal Bracket	BRKT,CD/DVD,MET,I7000
EMI Shield	SHLD,EMI,FD,F3,COMBO,NBK,I7000
Back Metal Plate	PLT,BK,MET,COMBO,I7000
Flex Cable	CBL,FLEX,FD,CITIZEN,NBK,I7000
Customer Kit, TV Out Cable	CUS,CBL,COAX,TV OUT,I7K
Coax Cable Kit	CBL,COAX,TV OUT,I7K
Customer Kit, 32MB Memory	CUS,DIMM,32M,66M,2K,144,I7000
DIMM, 32MB	DIMM,32,66M,4X64,4K,144
Customer Kit, 64MB Memory	CUS,DIMM,64M,66M,2K,144,I7000
DIMM, 64MB	DIMM,64,66M,8X64,4K,144
Customer Kit, Main Battery	CUS,BTRY,MAIN,60W,LIION,I7000
Battery Assembly	ASSY,BTRY,60W,LIION,NBK,I7000
60W Lithium Ion Battery	BTRY,MAIN,60W,LIION,NBK,I7000
Bezel	BZL,FRT,PLSTC,BTRY,NBK,I7000

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

Part or Assembly Name	Order Name
Customer Replaceable Units (CRU) (continued)	
Assembly, Secondary Battery	ASSY,BTRY,#2,60W,LIION,I7000
60W Lithium Ion Battery	BTRY,60W,12,LIION,NBK,I70
Bezel	BZL,FRT,PLSTC,BTRY,NBK,I7
US Power Cord	CORD,PWR,110V,6F,AC ADPT,US
Customer Kit, Flash BIOS	CUS,DSK,FLASH,BIOS,UPG,I7000
Kit, BIOS Flash	KIT,DSK,FLASH,BIOS,UPG,I7000
Diskette Envelope	ENV,DSK,F3,PLSTC
Card Lag	CARD,LAG
BIOS Diskette	DSK,BIOS,FLASH,F3,I7000
Customer Kit, AC Adapter	CUS,ADPT,AC,EXT,19V,70W,I7000
AC Adapter Only	ADPT,AC,EXT,19V,70W,NBK,I7000
US Power Cord	CORD,PWR,110V,6F,AC ADPT,US
Customer Kit, Adaptor, US, APCC	CUS,ADPT,AC,EXT,19V,US,APCC
Customer Kit, Adaptor, UK, APCC	CUS,ADPT,AC,EXT,19V,UK,APCC
Customer Kit, Adaptor, AUS, APCC	CUS,ADPT,AC,EXT,19V,AUS,APCC
Customer Kit, Adaptor, EUR, APCC	CUS,ADPT,AC,EXT,19V,EUR,APCC
Customer Kit, Adaptor, 70W, EUR	CUS,ADPT,AC,EXT,19V,70W,EUR
Customer Kit, Adaptor, 70W	CUS,ADPT,AC,EXT,19V,70W,I7000
Customer Kit, Adaptor, 70W, UK	CUS,ADPT,AC,EXT,19V,70W,UK
Customer Kit, Plastic Hinge Cover	CUS,CRV,PLSTC,HNG,I7000
Left Plastic Hinge Cover	CVR,HNG,PLSTC,LF,I7000
Right Plastic Hinge Cover	CVR,HNG,PLSTC,RT,I7000
Dell Inspiron Port Replicator (Sierra)	
Customer Kit, Port Replicator	CUS,PPR,I/O,NBK,I7000,US
Port Replicator Assembly	ASSY,PPR,I/O,NBK,I7000
AC Adaptor	ADPT,AC,EXT,19V,70W,NBK,I7000
US Power Cord	CORD,PWR,110V,6F,AC ADPT,US
Sierra Kit (AMF Only)	KIT,PPR,I/O,NBK,I7000
AC Adaptor	ADPT,AC,EXT,19V,70W,NBK,I7000
US Power Cord	CORD,PWR,110V,6F,AC ADPT,US
Port Replicator Assembly	ASSY,PPR,I/O,NBK,I7000

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

Part or Assembly Name	Order Name
Dell Inspiron Port Replicator (Sierra) (continued)	
Left Release Lever	LEVER,REL,LF,I/O PPR,NBK
Right Release Lever	LEVER,REL,RT,I/O PPR,NBK
Lower Tray	TRAY,LWR,PPR,I/O,NBK,I7K
Upper Tray	TRAY,UPR,PPR,I/O,NBK,I7K
CRD,PLN	CRD,PLN,I/O,PPR,NBK,I7K
Customer Kit, Port Replicator, AUS, APCC	CUS,PPR,I/O,I7000,NBK,AUS,APCC
Customer Kit, Port Replicator, EUR	CUS,PPR,I/O,I7000,NBK,EUR
Customer Kit, Port Replicator, EUR, APCC	CUS,PPR,I/O,I7000,NBK,EUR,APCC
Customer Kit, Port Replicator, NBK, UK	CUS,PPR,I/O,I7000,NBK,UK
Customer Kit, Port Replicator, UK, APCC	CUS,PPR,I/O,I7000,NBK,UK,APCC
Customer Kit, Port Replicator, US, APCC	CUS,PPR,I/O,I7000,NBK,US,APCC
Customer Kit, Port Replicator, JPN,APCC	CUS,PPR,I/O,NBK,I7000,JPN,APCC
Diagnostics	
Diagnostics Kit, US	KIT,DSK,DIAG,DELL,3.94,F3,I7K
Diskette Envelope	ENV,DSK,F3,PLSTC
License Agreement Card	CARD,LAG
Diagnostics Diskette	DSK,DIAG,DELL,3.94,F3,WW,I7K
Customer Kit, System Software Diskette	CUS,SSD,F3,NBK,I7000
System Software Diskette Kit	KIT,DSK,SSD,NBK,I7000
Diskette Envelope	ENV,DSK,F3,PLSTC
Card Lag	CARD,LAG
Service Manual	
Service Manual	MNL,SERV,I7000,ENG
Removal and Replacement Guide	DOC,SERV,GDE,I7000,ENG
Reference/Troubleshooting Guide	GDE,REF/TRBLSHT,I7000,ENG
Setup Guide	GDE,SETUP,I7000,ENG

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

Part or Assembly Name	Order Name
Drivers	
DVD-ROM Driver	SRV,IMG,SW,DVD,NBK,I7000
Utilities Driver	SRV,SW,UTIL,NBK,I7000
DVD-ROM Driver	SRV,SW,DVD,NBK,I7000
Audio Driver, W98	SRV,SW,AUD,W98,NBK,I7000
Hypertext Driver	SRV,SW,HYPTXT,I7000,WW
Modem Driver	SRV,SW,MDM,INT,NBK,I7000
MPEG-2 Driver	SRV,SW,MPEGII,INT,NBK,I7000
Touch Pad Driver, W98	SRV,SW,TPAD,W98,NBK,I7000
Video Driver, W98	SRV,SW,VID,W98,NBK,I7000
Modems and LAN Cards	
Network Board 10/100	KIT,CRD,ADPT,NTWK,10/100,TX,3C
Network Board 10BT	KIT,ADPT,NTWK,10BT,NBK,3COM
56K WW Winmodem	MDM,56K,PCMCIA,FF,PSION,WW
56K Value Modem	MDM,56K,PCMCIA,CBL/XJACK,USROB
Carrying Case	
Customer Kit, Carrying Case, Nylon	CUS,CASE,CRYG,NYL,UNIV,INSP,US
Carrying Case, Nylon, Universal	CASE,CRYG,NYL,NBK,UNIVERSAL
Customer Kit, Carrying Case, Leather	CUS,CASE,CRYG,LTHR,UNIV,INSP
Carrying Case, Leather, Universal	CASE,CRYG,LTHR,NBK,UNIVERSAL
Labels	
Regulatory Label	LBL,REG,NBK,GNRC,I7000
Label, Intel Inside	LBL,INTEL INSIDE,PII,MMX,NBK
Regulatory Label, Modem, CAN	LBL,REG,MDM,INT,NBK,I7000,CAN
Regulatory Label, Battery	LBL,REG,BTRY,NBK,I7000
Identification Label, Main Battery	LBL,IDENT,BTRY,NBK,I7000
Identification Label, PPR	LBL,IDENT,PPR,NBK,I7K
Label, Win98/NT	LBL,NBK,POLY,COMBO WIN98/NT
Identification Label, I/O, PPR	LBL,IDENT,I/O,PPR,I7K

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

Part or Assembly Name	Order Name
Labels (continued)	
Identification Label, Video Card	LBL,IDENT,CRD,VID,VGA,I7000
Regulatory Label, Modem	LBL,REG,MDM,INT,NBK,I7000
Regulatory Label, Replicator	LBL,REG,RPLCTR,I7K
Field Svc Bases (AMF only)	
266MHz Field Service Base, no battery, 13.3"	BASE,NBK,I7K,D266XT,NO BTRY
Assembly w/o battery, 266MHz	ASSY,NBK,BASE,I7000,13.3,NOBATT
266MHz Field Service Base, no battery, 14.1"	BASE,NBK,I7K,D266GT,NO BTRY
Assembly w/o battery, 300MHz	ASSY,NBK,BASE,I7000,14.1,NOBATT
300MHz Field Service Base, no battery, 14.1"	BASE,NBK,I7K,D300GT,NO BTRY
Assembly w/o battery, 300MHz	ASSY,NBK,BASE,I7000,14.1,NOBATT
Manufacturing Bases	
D266XT (13.3") Base, AGP, AMF	BASE,I7000,D266XT,13.3,AGP,AMF
13.3" Base Assembly	ASSY,NBK,BASE,I7000,13.3,OEM
D266GT (14.1") Base, AGP, AMF	BASE,I7000,D266GT,14.1,AGP,AMF
14.1" Base Assembly	ASSY,NBK,BASE,I7000,14.1,OEM
D300GT (14.1") Base, AGP, AMF	BASE,I7000,D300GT,14.1,AGP,AMF
14.1" Base Assembly	ASSY,NBK,BASE,I7000,14.1,OEM
D266GT (14.1") Base, DAO, FR	BASE,I7000,D266GT,14.1,DAO,FR
14.1" Base Assembly	ASSY,NBK,BASE,I7000,14.1,OEM
D266XT (13.3") Base, DAO, FR	BASE,I7000,D266XT,13.3,DAO,FR
13.3" Base Assembly	ASSY,NBK,BASE,I7000,13.3,OEM
D300GT (14.1") Base, DAO, FR	BASE,I7000,D300GT,14.1,DAO,FR
14.1" Base Assembly	ASSY,NBK,BASE,I7000,14.1,OEM

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

Part or Assembly Name	Order Name
	Assemblies
Base Assembly, 13.3"	ASSY,NBK,BASE,I7000,13.3,OEM
Base Assembly, 14.1"	ASSY,NBK,BASE,I7000,14.1,OEM
Floppy Disk-Drive Assembly	ASSY,FD,1.44M,11MM,COMBO,I7000
DVD-ROM Assembly	ASSY,DVD,17G,2X,INT,MKE,I7000
Display Assembly, 13.3"	ASSY,LCD,XGA,13.3,I7000,LG
Display Assembly, 14.1"	ASSY,LCD,XGA,14.1,I7000,LG
System Board Assembly	ASSY,SYS,PLN,I7000
Bottom Plastic Assembly	ASSY,CVR,BTM,PLSTC,I7000
Palmrest Assembly	ASSY,PLMRST,PLSTC,BLK,I7000
Touchpad Assembly	ASSY,TPAD,NBK,I7000
Speaker Assembly	ASSY,SPKR,INT,NBK,I7000
Palmrest Latch Assembly	ASSY,LTCH,PLMRST,NBK,I7000
Bottom Plastic Assembly w/ Reg Label	ASSY,BTM CASE,W/LBL,I7K

Hard-Disk Drive

The hard-disk drive resides in a carrier that mounts in the hard-disk drive compartment in the bottom of the computer (see Figure 4-18). Four screws secure the drive inside the carrier.

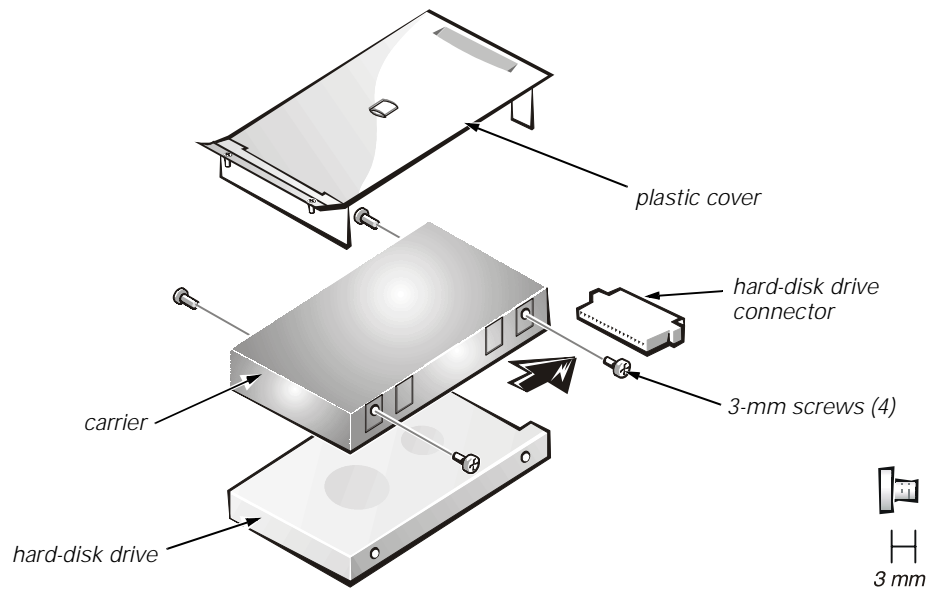


Figure 4-18. Hard-Disk Drive Disassembly

To remove the hard-disk drive from the carrier, follow these steps:

1. Remove the hard-disk drive assembly.
See "Precautionary Measures" found earlier in this chapter.
2. Remove the four 3-mm screws securing the hard-disk drive inside the carrier.
3. Remove the hard-disk drive from the carrier.

Turn the carrier over with one hand and let the drive fall out of the carrier into your other hand.

4. Remove the metal carrier from the plastic cover.

The metal carrier is held in the plastic cover by two tabs on each end. Carefully pry the carrier away from the tabs.

5. Pull the hard-disk drive connector off of the hard-disk drive.

Combo Module

The combo module contains either a CD-ROM drive or a DVD-ROM drive on top of a floppy diskette drive. The combo module (see Figure 4-19) resides in a carrier that slides into the options bay on the left side of the computer.

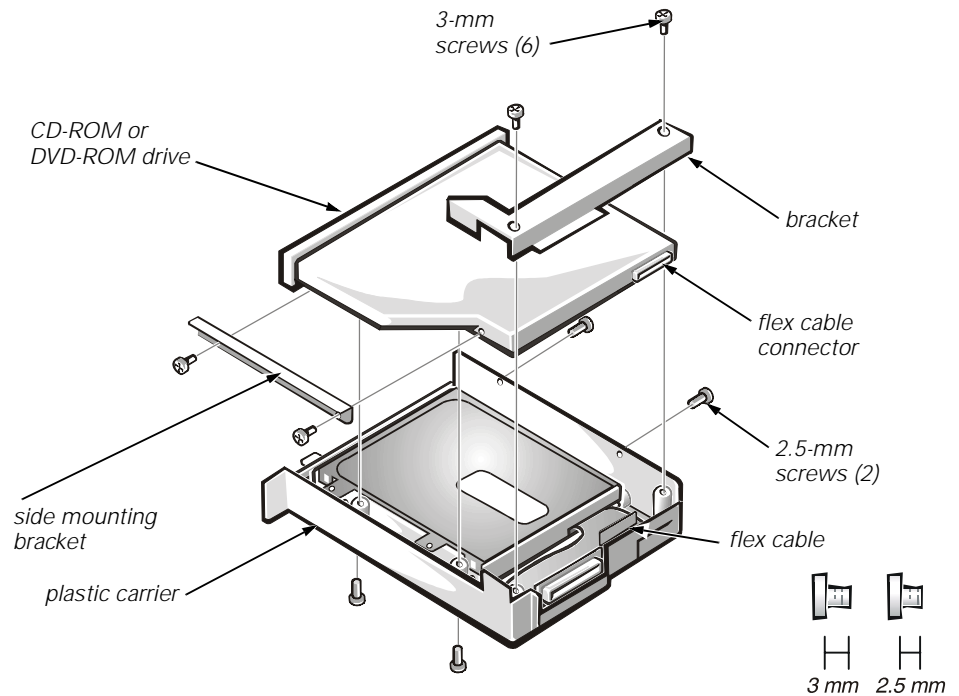


Figure 4-19. CD-ROM/DVD-ROM Disassembly

To remove the CD-ROM drive or DVD-ROM drive from the plastic carrier, follow these steps:

1. Remove the combo module.
See Figure 4-11 found earlier in this chapter.
2. Remove the two 3-mm screws from the L-shaped bracket.
3. Remove the bracket.
4. Remove the two 3-mm screws from the side of the plastic carrier.
5. Remove the two 3-mm screws from the bottom of the plastic carrier.
6. Disconnect the flex cable from the CD-ROM/DVD-ROM drive connector.
7. Remove the CD-ROM/DVD-ROM drive from the plastic carrier.

Turn the carrier over with one hand and let the drive fall out of the carrier into your other hand.

To remove the side mounting bracket from the CD-ROM/DVD-ROM drive, follow these steps (see Figure 4-19):

1. Remove the two 2.5-mm screws from the side of the CD-ROM/DVD-ROM drive.
2. Remove the side mounting bracket.

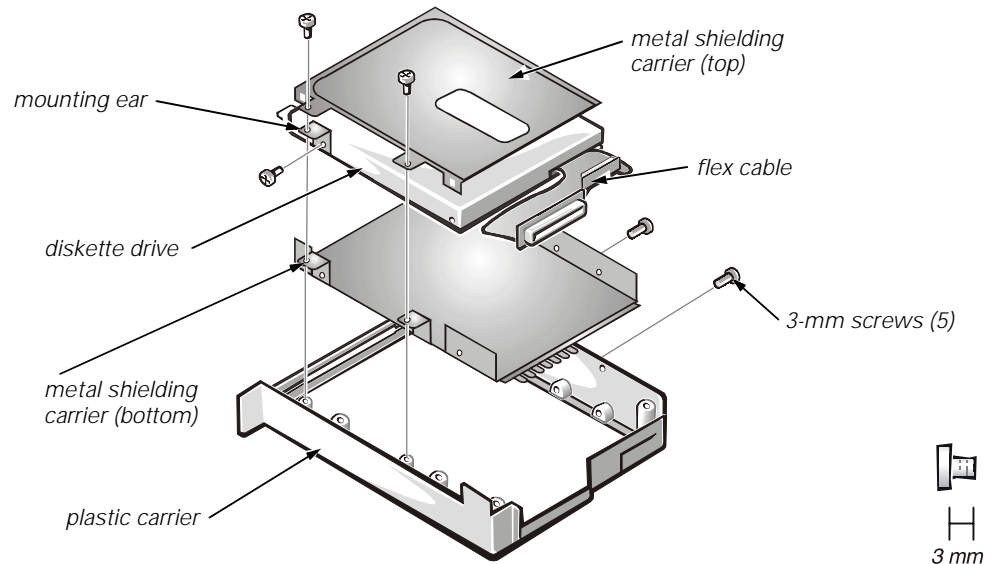


Figure 4-20. Diskette Drive Disassembly

To remove the diskette drive from the plastic carrier (see Figure 4-20), follow these steps:

1. Remove the two 3-mm screws from the top of the metal shielding carrier.
2. Remove the two 3-mm screws from the side of the plastic carrier.



CAUTION: The metal on the shielding carrier is sharp. Be careful not to cut yourself.

3. Lift the metal shielding carrier out of the plastic carrier.

Lift the back of the metal shielding carrier first and then slide it out.

4. Unsnap the metal latches along the top of the metal shielding carrier from the metal tabs on the bottom of the metal shielding carrier, and then remove the top.
5. Remove the diskette drive from the metal shielding carrier.
6. Remove the flex cable from the diskette drive.
7. Remove the 3-mm screw securing the mounting ear from the diskette drive, and remove the mounting ear.

When reassembling the diskette drive, be sure that the bottom of the metal shielding carrier sits inside the groove at the front of the plastic carrier.

General Disassembly



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.

The Inspiron 7000 computer contains many screws of various sizes. To help keep track of the screws, use a tackle or pill box as a storage device. Use the location template in Table 4-2 to store the screws during disassembly.

Table 4-2. Screw Location Template

Video card (Figure 4-10): 2X K-head, M2x3L	Hard-disk drive (Figure 4-18): 4X K-head M3x3L	Combo module (Figure 4-19, 4-20): 2X K-head, M2x2.5L 3X K-head, M2.5x3L 8X K-head M2x3L	Keyboard (Figure 4-21): 4X pan head, M2.5x20L
Thermal shield (Figure 4-22): 1X K-head, M2.5x4L 4X flat head, M2x4L	Display assembly (Figure 4-24): 4X binding head, M2.5x6L	Front bezel (Figure 4-25): 4X binding head, M2.5x6L	LCD panel (13.3") (Figure 4-26): 8X binding head, M2.5x6L
LCD brackets (13.3") (Figure 4-27): 4X binding head, M2.5x6L	Inverter board (Figure 4-26, 4-28): 1X K-head, M2.5x3L	LCD panel (14.1") (Figure 4-28): 4X pan head, M2x4L 8X binding head, M2.5x6L	Palmrest assembly (Figure 4-30): 4X binding head, M2.5x6L 6X K-head, M2.5x4L 1X K-head, M2.5x4L
IR board (Figure 4-31): 2X K-head M2.5x4L	Hard-disk drive heat shield (Figure 4-32): 5X K-head M2.5x4L	Touch pad assembly (Figure 4-33): 4X K-head M2.5x4L 3X K-head M2.5x4L	Speakers (Figure 4-34): 5X K-head M2.5x4L
PC Card heat sink (Figure 4-35): 2X K-head, M2.5x4L	Heat exchanger/fan (Figure 4-36): 2X binding head, M2x5L	LVDS board (Figure 4-38): 1X K-head, M2.5x4L	Processor board (Figure 4-39): 3X binding head, M2x5L
Hinge saddles (Figure 4-40): 1X binding head, M2.5x6L	Left hinge saddle (Figure 4-40): 4X K-head, M2.5x4L 1X binding head M2.5x10L 1X pan head, M2.5x20L	Right hinge saddle (Figure 4-40): 4X K-head, M2.5x4L 1X pan head, M2.5x20L 1X binding head M2.5x10L	RJ-11 card (Figure 4-41): 1X K-head, M2.5x4L
System board (Figure 4-42): 3X K-head, M2.5x4L	PC Card cage (Figure 4-43): 1X K-head, M2.5x4L 4X pan head, M2x18L	Audio thermal shield (Figure 4-44): 1X binding head, M2.5x10L	Latch assembly (Figure 4-45): 1X K-head, M2.5x4L 2X K-head, M2.5x4L

Be careful not to scratch the computer plastic case by allowing the screws to get between the work surface and the plastic case. Dell suggests a soft padded work surface.

Keyboard

This section provides the removal procedure for the keyboard.

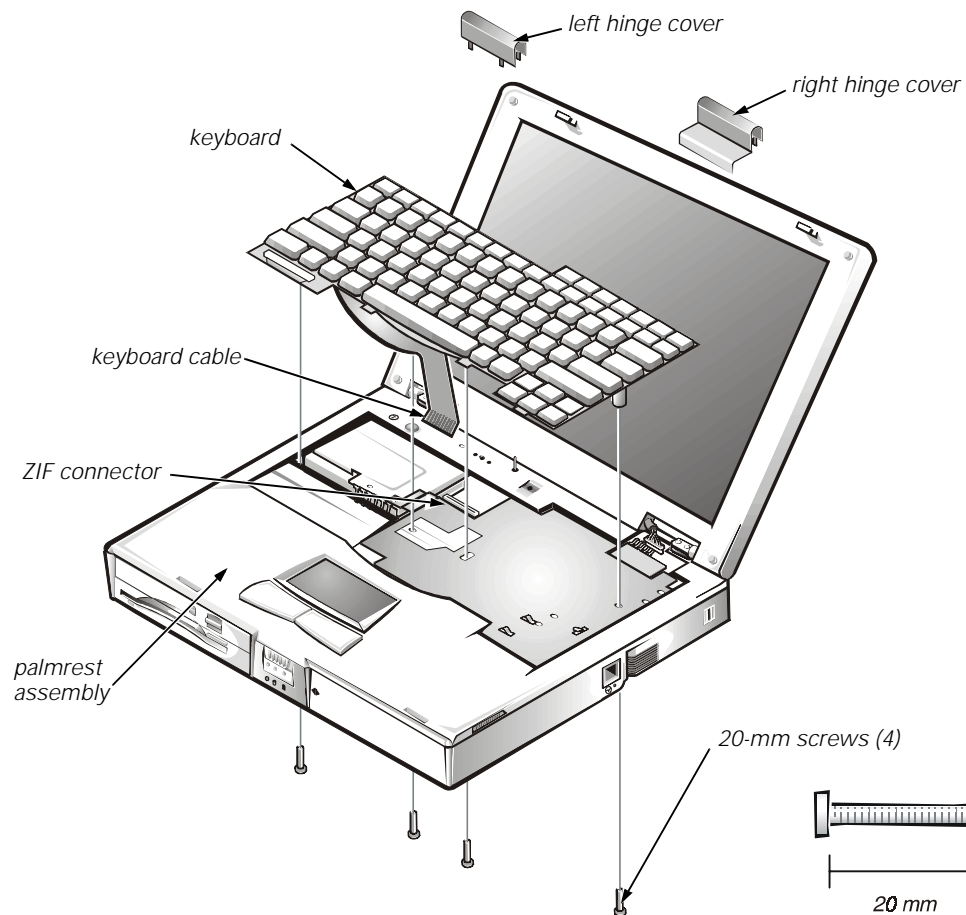


Figure 4-21. Keyboard Removal

To remove the keyboard, follow these steps (see Figure 4-21):

1. Turn the computer over and remove the four 20-mm screws from the bottom of the computer.
2. Turn the computer back over and open the display.
3. Insert a small flat-blade screwdriver or scribe along the right top of the keyboard, just above the row of function keys. Working from right to left, free the keyboard by prying it toward the front of the unit. When free, lift the top of the keyboard slightly to clear the palmrest assembly.
4. Slide the keyboard toward the display assembly to release the front edge of the keyboard from the palmrest assembly.
5. Rotate the bottom of the keyboard up toward the display assembly to expose the keyboard cable.
6. Disconnect the keyboard cable from ZIF connector JP14 on the system board. Use the pick to pry up the latches on each side of the connector.



CAUTION: Lift the cable away 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.

7. Remove the keyboard from the palmrest assembly.

Thermal Shield and Internal Modem

The thermal shield serves as a heat shield for the system board, as well as an EMI fence for the processor board.

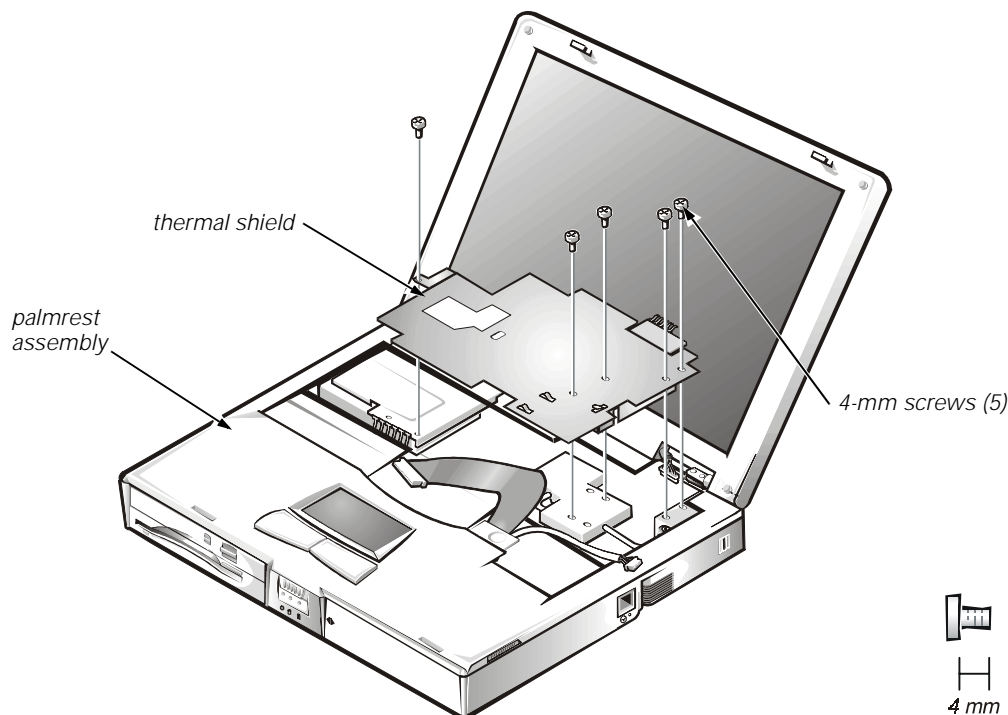


Figure 4-22. Thermal Shield Removal

This procedure assumes that you have removed the keyboard. To remove the thermal shield, follow these steps (see Figure 4-22):

1. Remove the hinge covers.

Open the computer to 170 degrees, supporting the display assembly. From the outside edge of the unit, carefully insert a flat-blade screwdriver or scribe into the space on the inside of the hinge cover. Bring the tool against the front wall of the hinge cover and pull toward the keyboard to loosen the plastic snaps at the back of the hinge cover. Move the tool to the inside top of the hinge cover and lift the hinge cover off. If the hinge covers are tight, use a plastic wedge or scribe to loosen and pop them off.

Be careful not to accidentally turn on the computer when removing the left hinge cover.

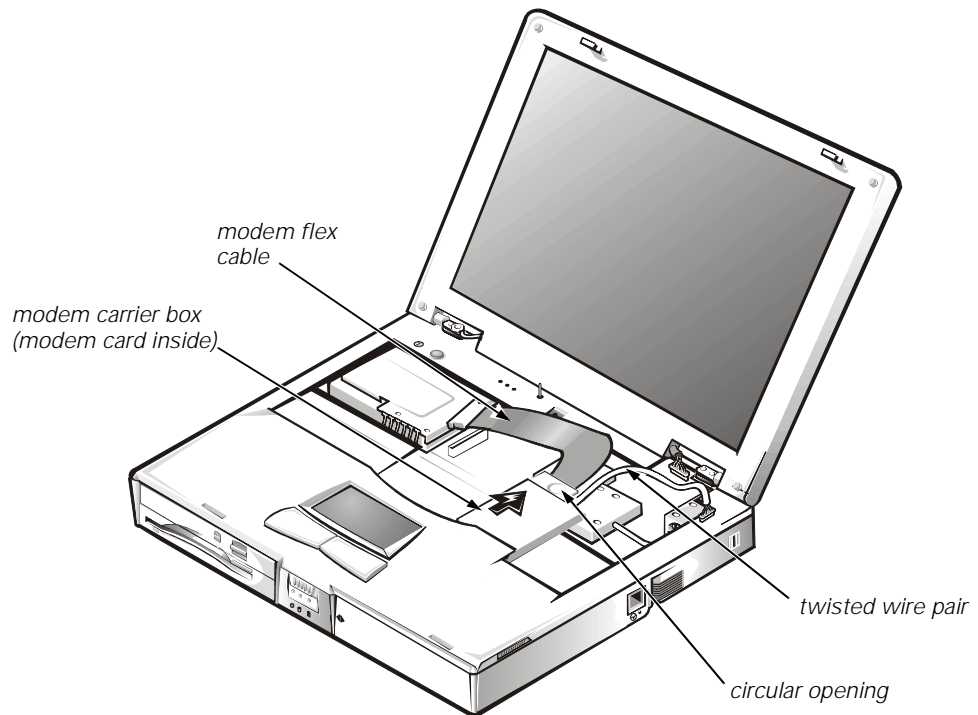


Figure 4-23. Modem Removal

2. If your computer has an internal modem, disconnect the modem flex cable (see Figure 4-23) from connector JP20 on the system board and disconnect the twisted wire pair from connector JP2 on the RJ-11 card. Bend the cables back over the palmrest assembly to move them out of the way of the thermal shield.
3. Remove the four flat-head 4-mm screws and the one K-head 4-mm screw securing the thermal shield. Note that the K-head screw is leftmost and is thicker than the other four.
4. Remove the thermal shield from the palmrest assembly. Note that the bottom of the shield has an EMI fence that surrounds the processor board.
5. If needed, remove the two screws securing the EMI fingers to the thermal shield and remove the fingers.
6. If you have an internal modem, remove it by inserting a screwdriver through the circular opening and pulling the modem carrier box carefully toward the back of the computer (see Figure 4-23). Lift the top off the metal carrier and remove the modem card if needed. Disconnect the flex cable from the modem card if needed.

Display Assembly and Components

This section describes how to remove the display assemblies shown in Figures 4-14 and 4-15 and gives removal and replacement procedures for the components of the display assembly.

The display assembly consists of the following components:

- Front bezel
- LCD panel and hinges
- LCD brackets
- Carrier tray
- Inverter board
- Back cover

Display Assembly

This section provides the removal procedure for the display assembly.

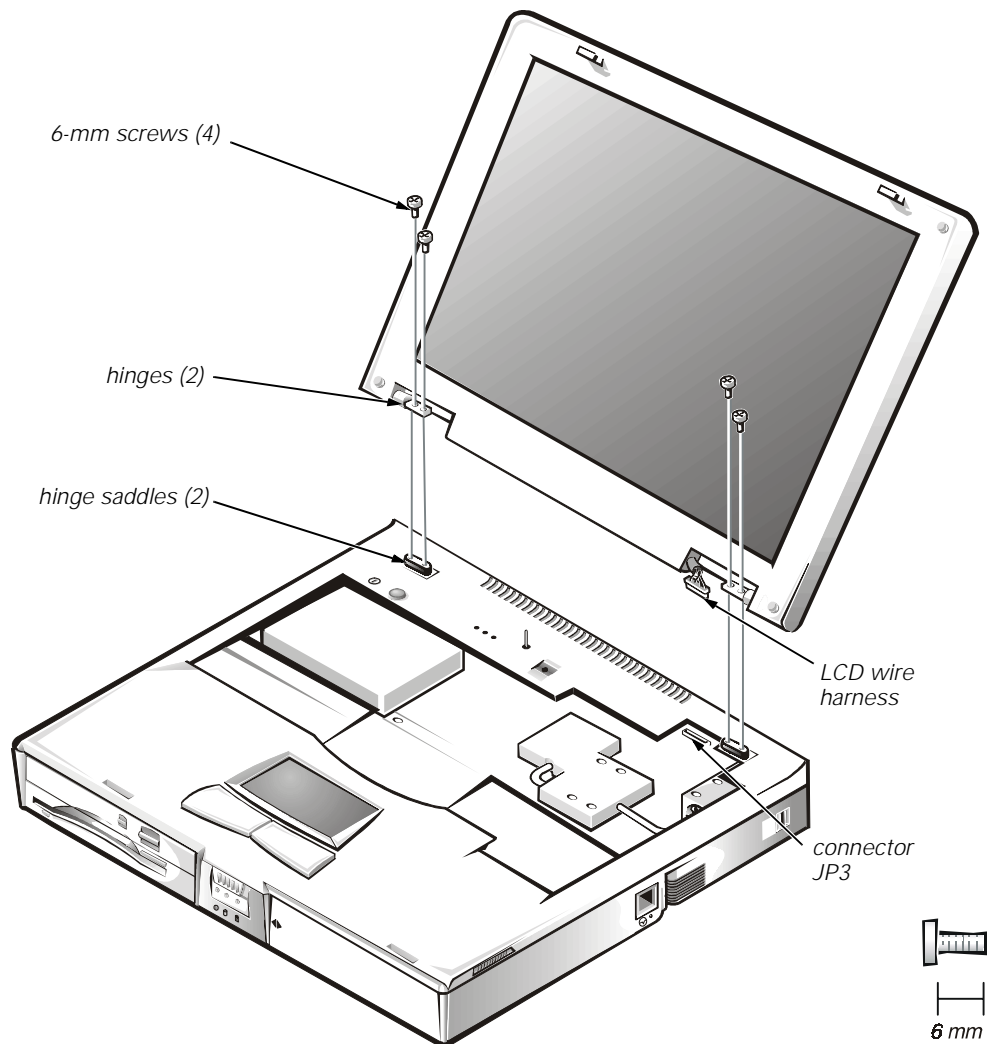


Figure 4-24. Display Assembly Removal

This procedure assumes that you have removed the keyboard and thermal shield. To remove the display assembly from the computer, follow these steps (see Figure 4-24):

1. Disconnect the LCD wire harness from connector JP3.
Use a dental pick or flat-blade screwdriver to pry up each end of the connector to release it.
2. Close the display.
3. Remove the four 6-mm screws that secure the two hinges.
4. Unlatch the display assembly and lift the assembly off the computer base.

Front Bezel

This section provides the removal procedure for the front bezel.

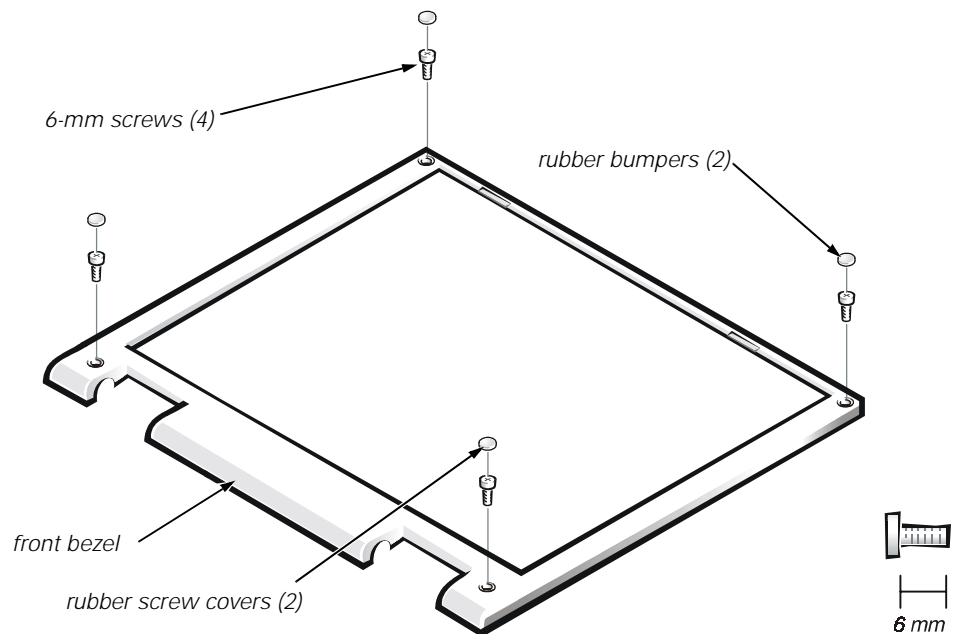


Figure 4-25. Front Bezel Removal

This procedure assumes that you have removed the display assembly from the computer base. To remove the front bezel, follow these steps (see Figure 4-25):

1. Use a dental pick to pry the rubber screw covers off of the bottom two screws and the rubber bumpers off of the top two screws.
2. Remove the four 6-mm screws from the front bezel.
3. Unsnap the front bezel from the back cover and remove it from the assembly.

Carefully insert your fingers between the LCD panel and the bezel. Roll the plastic up slightly to insert your fingers further in, and then lift upward to free the snaps. Start at the middle bottom and then work around.

When replacing the bezel, ensure that the LCD wire harness is routed correctly through the openings in the back cover and is not pinched.

13.3-Inch LCD Panel

This section provides the removal procedure for the 13.3-inch LCD panel.

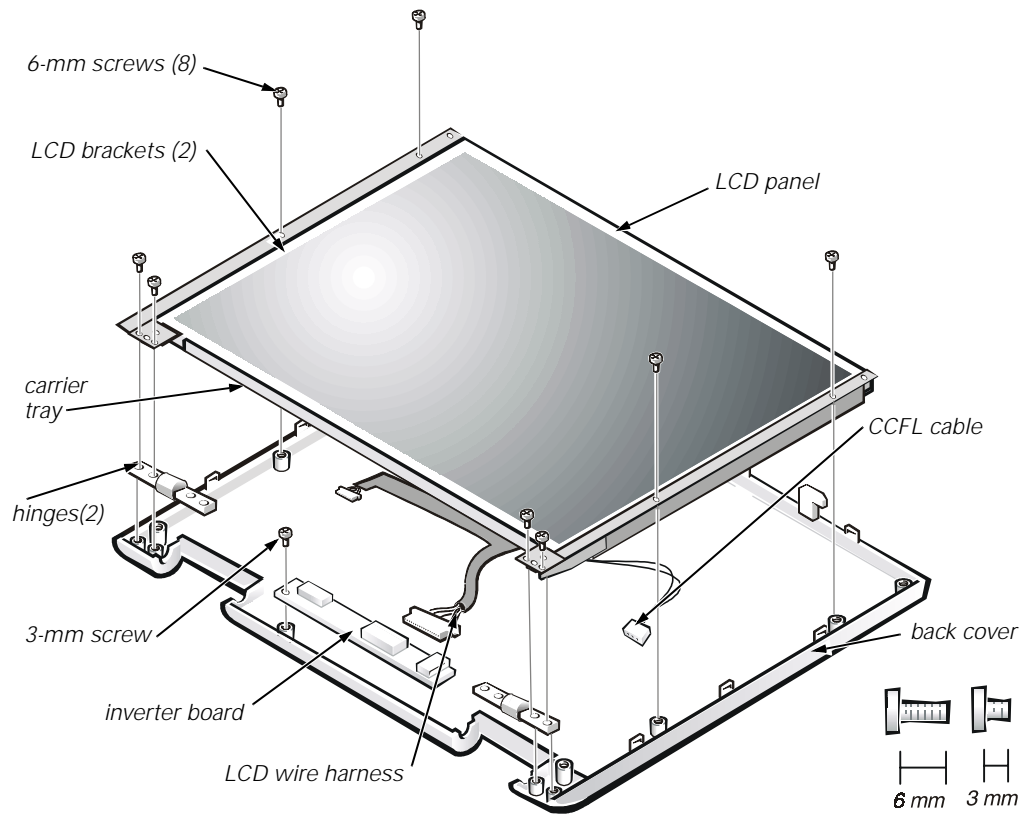


Figure 4-26. 13.3-Inch LCD Panel Removal

This procedure assumes that you have removed the front bezel. Follow these steps to remove the 13.3-inch LCD panel (see Figure 4-26):

1. Remove the eight 6-mm screws that secure the left and right LCD brackets to the front plastic cover.
2. Detach the LCD wire harness from connector CN2 on the right side of inverter board.
3. If present, carefully remove the grounding tape between the inverter board and LCD panel.
4. Loosen the 3-mm screw securing the inverter board.
5. Lift the LCD panel, LCD brackets, and carrier tray, as a unit, out of the back cover.

Rotate upward from the bottom of the panel because the top slides underneath the plastic hooks.

6. Remove the hinges, which were previously held in place by pressure and screws.

To remove the inverter board, follow these steps:

1. Remove the 3-mm screw securing the inverter board to the back cover.
2. If you have not removed the LCD panel, disconnect the LCD wire harness from connectors CN1 and CN2 on the inverter board.
3. Remove the inverter board from the back cover.

13.3-Inch LCD Brackets and Carrier Tray

This section provides the removal procedure for the LCD brackets and carrier tray from the 13.3-inch LCD panel.

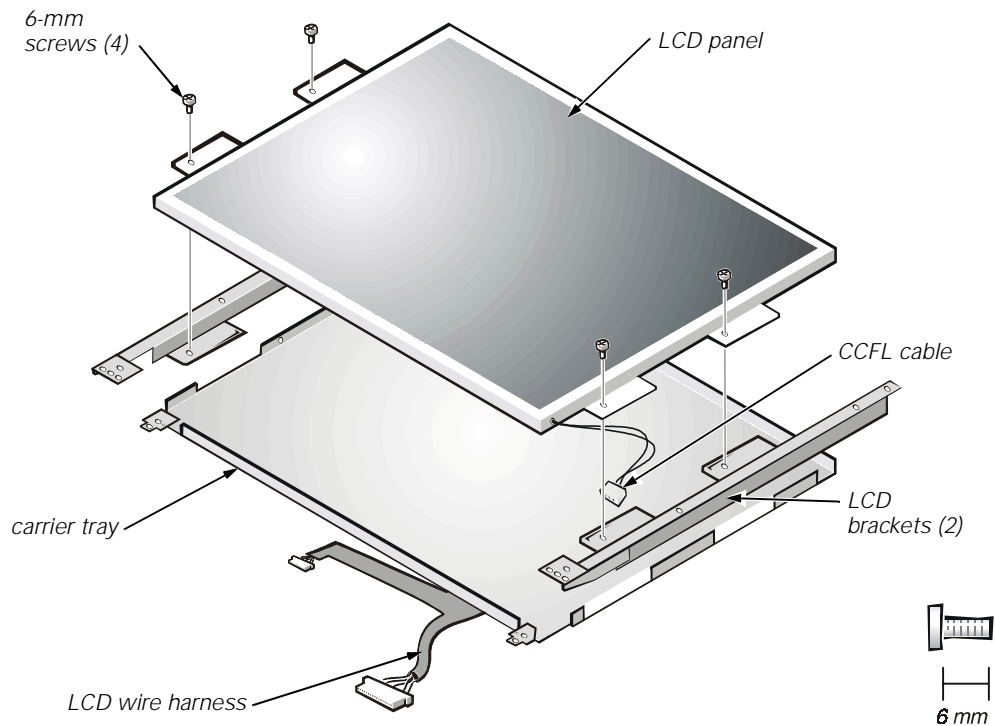


Figure 4-27. 13.3-Inch LCD Brackets and Carrier Tray Removal



CAUTION: The metal on the carrier tray is sharp. Be careful not to cut yourself.

This procedure assumes that you have removed the front bezel and the 13.3-inch LCD panel. To remove the brackets from the LCD panel, follow these steps (see Figure 4-27):

1. Detach the LCD wire harness from connector CN1 on the top left side of the inverter board
2. Remove the four 6-mm screws from the sides of the mounting brackets.
3. Remove the brackets from the LCD panel.

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

1. Remove any Kapton tape covering the CCFL cable.
2. Gently pull the cable out of its connector.
3. Remove any Kapton tape from the LCD wire harness.
4. Disconnect the LCD wire harness from the LCD panel.
5. Lift the LCD panel out of the carrier tray.

14.1-Inch LCD Panel, Brackets, and Carrier Tray

This section provides the removal procedure for the LCD panel, LCD brackets, and carrier tray for the 14.1-inch display assembly.

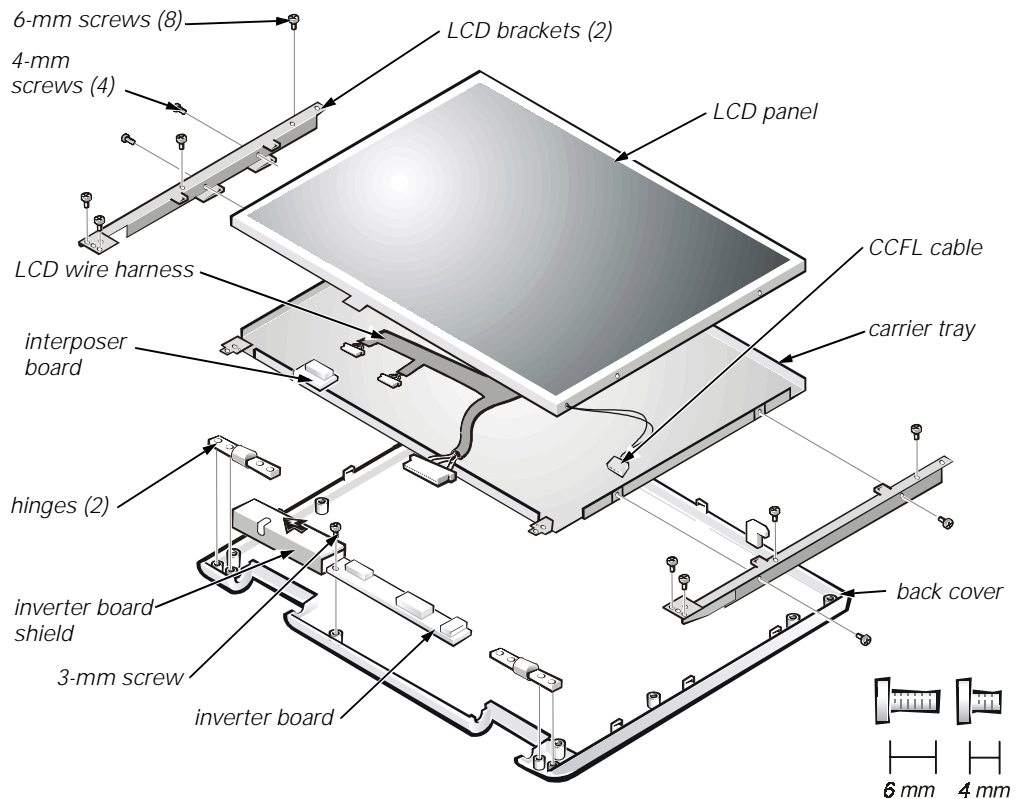


Figure 4-28. 14.1-Inch LCD Panel Removal

This procedure assumes that you have removed the front bezel. Follow these steps to remove the 14.1-inch LCD panel (see Figure 4-28):

1. Remove the eight 6-mm screws that secure the left and right LCD brackets to the front plastic cover.
2. Detach the CCFL cable from connector CN2 on the right side of inverter board.
3. Carefully remove the grounding tape between the inverter board and LCD panel.
4. Remove the 3-mm screw securing the inverter board, and unsnap the inverter board from the back cover.
5. Lift the LCD panel, LCD brackets, and inverter board as one unit out of the back cover.

Rotate upward from the bottom of the panel because the top slides underneath the plastic hooks.

6. Remove the hinges, which were previously held in place by pressure and screws.

To remove the LCD brackets from the LCD panel, follow these steps:

1. Remove the four 4-mm screws from the sides of the LCD brackets.
2. Remove the brackets from the LCD panel.



CAUTION: The metal on the carrier tray is sharp. Be careful not to cut yourself.

To remove the LCD panel from the carrier tray, follow these steps:

1. Lift the inverter board shield, pull it slightly away from the panel to expose the cabling, and detach the LCD wire harness from connector CN1 on the inverter board.
2. Remove any Kapton tape covering the CCFL cable on the back of the LCD.
3. Gently pull the interposer board off the connector to the LCD panel.
4. Lift the LCD panel up and remove any tape between the LCD wire harness and the carrier tray.
5. Disconnect the LCD wire harness from the LCD panel.
6. Lift the LCD panel out of the carrier tray.
7. Disconnect the LCD wire harness from the LCD panel.

Palmrest Assembly and Components

This section describes how to remove the palmrest assembly. The palmrest assembly consists of the following components (see Figure 4-16):

- MPEG-2 card
- IR board
- Hard-disk drive heat shield
- Touch pad assembly
- Speakers

MPEG-2 Card

This section provides the removal procedure for the MPEG-2 card, if present.

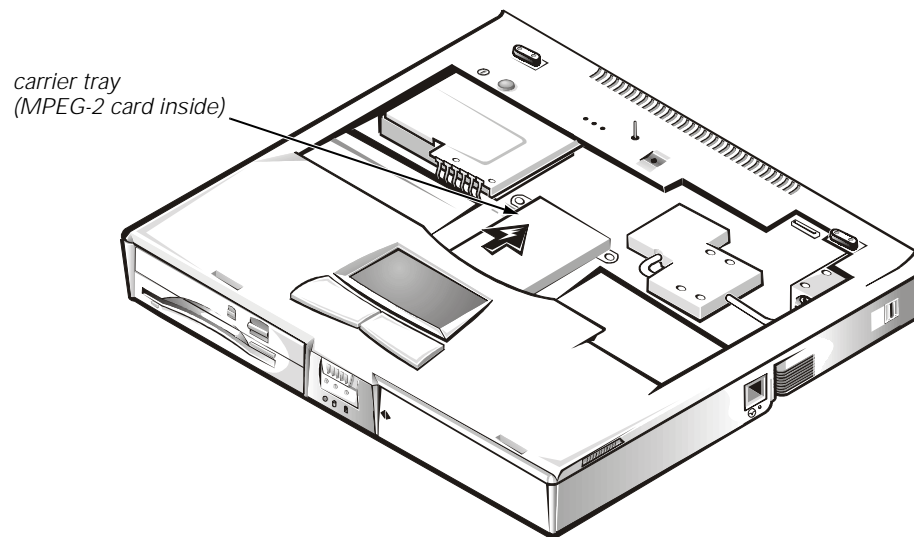


Figure 4-29. MPEG-2 Card Removal

To remove the MPEG-2 card, follow these steps (see Figure 4-29):

1. Gently pull the carrier tray off of connector JP19 on the system board. Do not rock the card to remove it, because this may damage the connectors.
2. Remove the carrier tray by sliding it toward the back of the computer
3. Remove the MPEG-2 card from the carrier tray.

Palmrest Assembly

This section provides the removal procedure for the palmrest assembly.

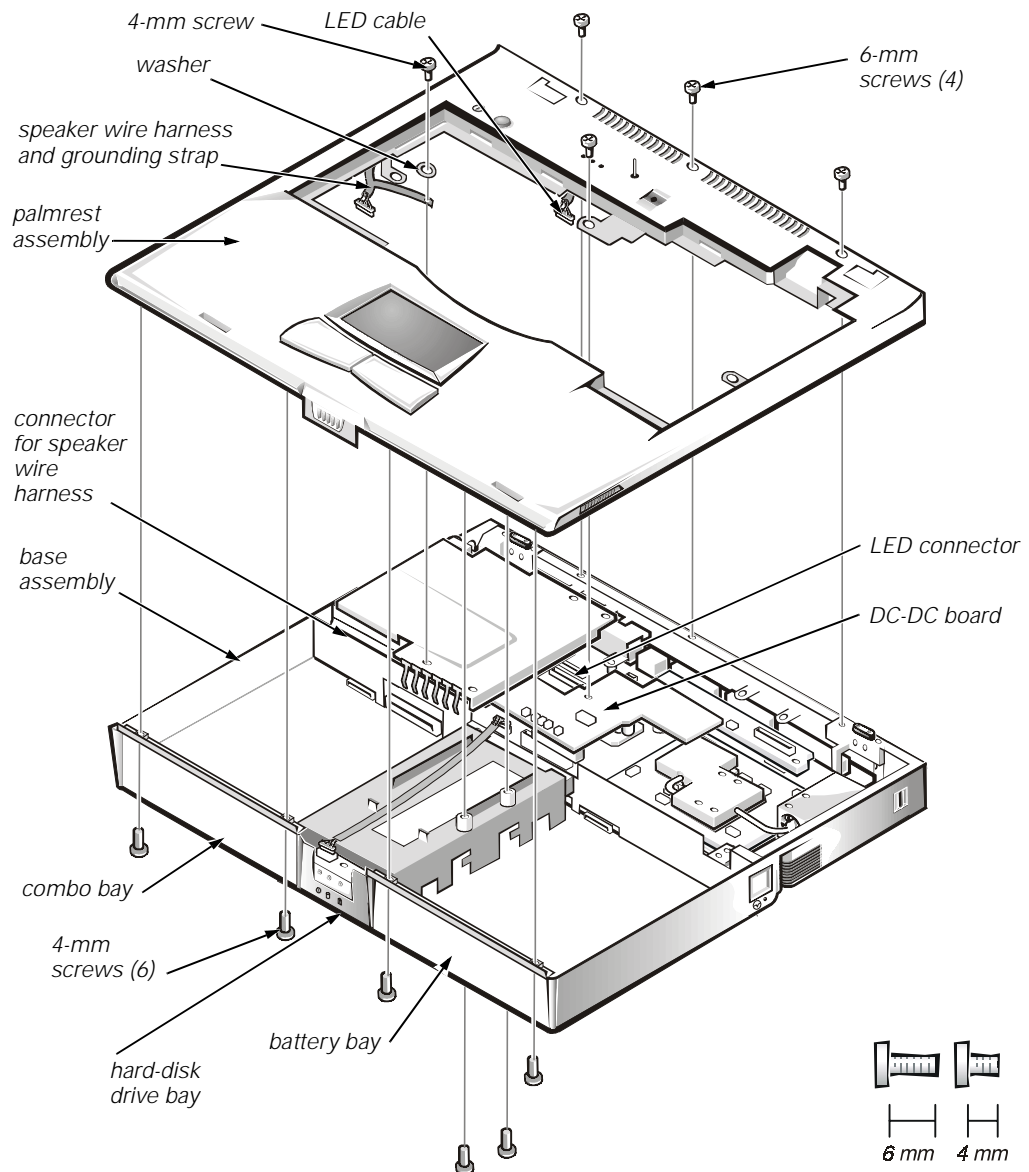


Figure 4-30. Palmrest Assembly Removal

This procedure assumes that you have removed the keyboard, thermal shield, and display assembly. To remove the palmrest assembly, follow these steps (see Figure 4-30):

1. Turn the unit over and place it face down.
2. Remove the two 4-mm screws from the top inside of the combo bay.
3. Remove the two 4-mm screws from the top inside of the battery bay.
4. Remove the two 4-mm screws from the top inside of the hard-disk drive bay.

5. Turn the unit back over.
6. Remove the three 6-mm screws from the top of the base assembly, along the back edge.
7. Remove the 6-mm screw from the DC-DC board.
8. Remove the 4-mm screw and the washer securing the grounding strap to the PC Card heat shield.
9. Disconnect the speaker wire harness from connector JP18 on the left side of the system board.

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

10. Disconnect the LED cable from connector JP10 on the system board.
11. Remove the palmrest assembly from the base assembly.

Start at the back right of the computer and move forward around the computer. Carefully lift the palmrest assembly up and pull it forward to unsnap the hidden tabs spaced around the sides and along the top of the battery bay and options bay.

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 that all the tabs are aligned.

The following subsections provide removal and replacement procedures for the components of the palmrest assembly.

IR Board

The IR board (see Figure 4-31) controls the power button, lid switch, microphone, and lights on the indicator panel above the keyboard.

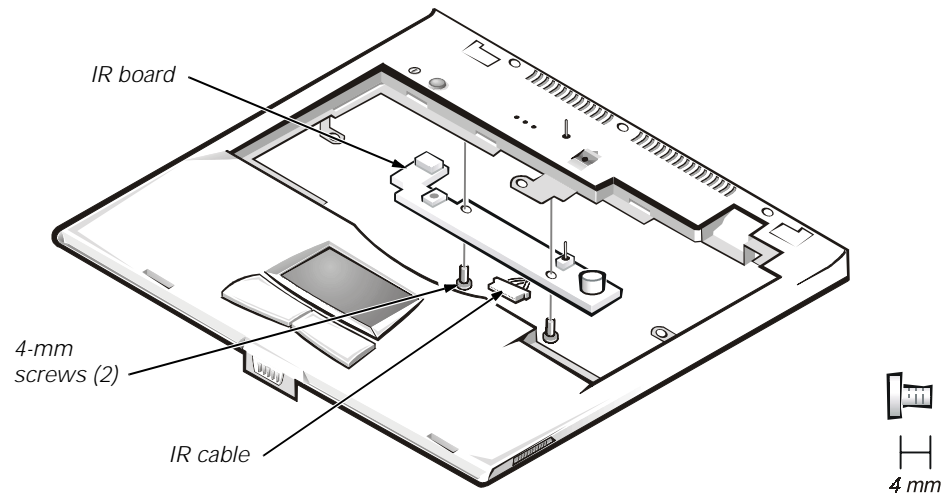


Figure 4-31. IR Board Removal

This procedure assumes that you have removed the palmrest assembly from the base assembly. To remove the IR board, follow these steps:

1. Remove the two 4-mm screws securing the IR board.
2. Disconnect the IR cable from connector JP2 on the IR board.
3. Remove the IR board.

Hard-Disk Drive Heat Shield

This section provides the removal procedure for the hard-disk drive heat shield.

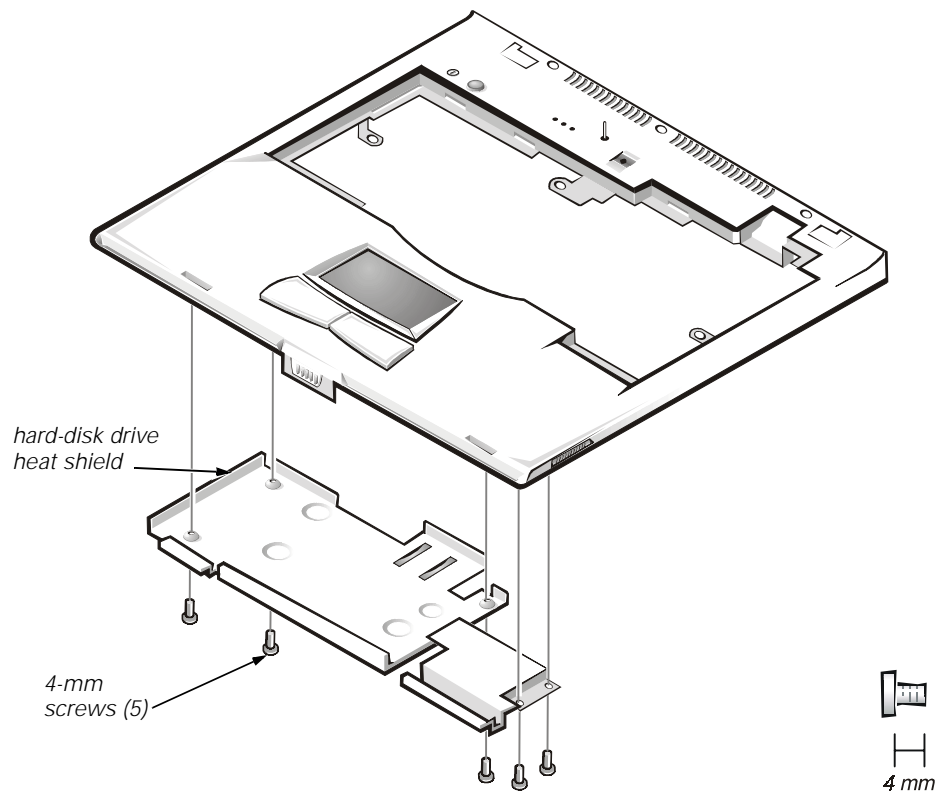


Figure 4-32. Hard-Disk Drive Heat Shield Removal

This procedure assumes that you have removed the palmrest assembly from the base assembly. To remove the hard-disk drive heat shield, follow these steps (see Figure 4-32):

1. Place the palmrest assembly face down.
2. Remove the five 4-mm screws securing the hard-disk drive heat shield.
3. Remove the hard-disk drive heat shield.

Touch Pad Assembly

This section provides the removal procedure for the touch pad assembly.

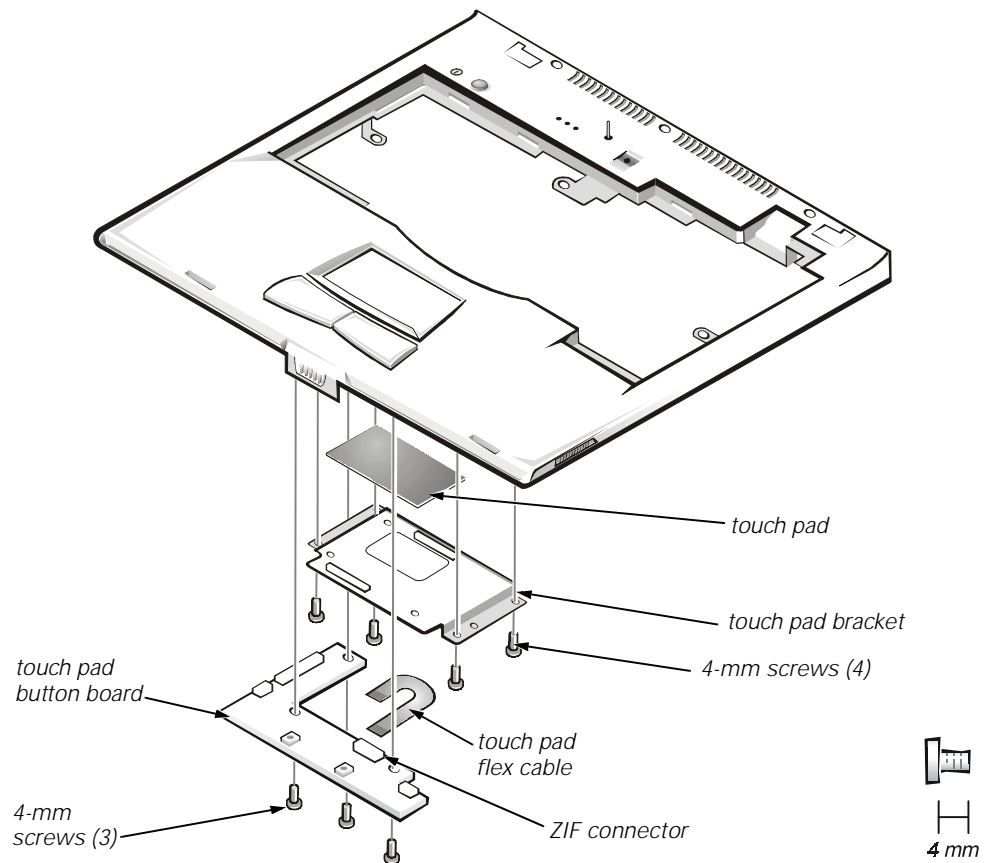


Figure 4-33. Touch Pad Assembly Removal

This procedure assumes that you have removed the palmrest assembly from the base assembly and that you have removed the hard-disk drive heat shield. To remove the touch pad assembly, follow these steps (see Figure 4-33):

1. Remove the three 4-mm screws securing the touch pad button board.
2. Disconnect the two speaker cables from connectors JP5 and JP3 on the touch pad button board.
3. Disconnect the speaker wire harness from connector JP1 on the touch pad button board.
4. Disconnect the touch pad flex cable from ZIF connector JP4 on the touch pad button board. Use the pick to pry up the latches on each side of the connector.



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.

5. Disconnect the touch pad flex cable from ZIF connector J1 on the touch pad. Use the pick to pry up the brown center piece on the connector.



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 touch pad button board.
7. Remove the four 4-mm screws securing the touch pad bracket.
8. Remove the touch pad bracket.
9. Remove the touch pad.

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

Speakers

This section provides the removal procedure for the speakers.

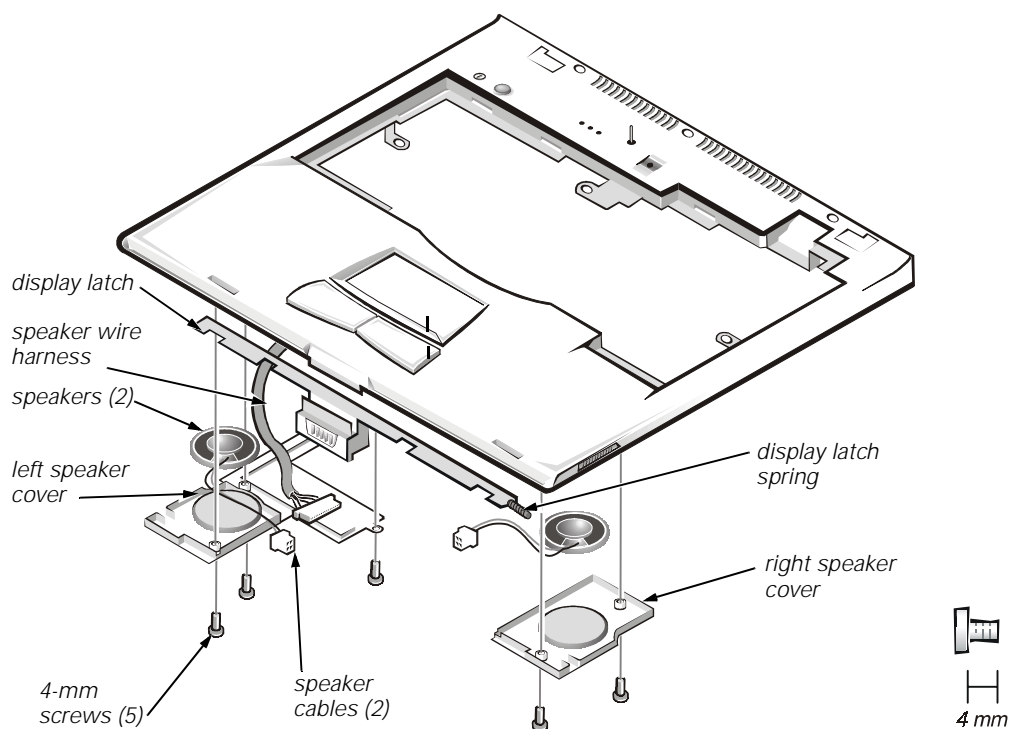


Figure 4-34. Speaker Removal

This procedure assumes that you have removed the palmrest assembly from the base assembly and that you have removed the hard-disk drive heat shield and touch pad assembly. To remove the speakers, follow these steps (see Figure 4-34):

1. Remove any tape securing the speaker cables.
2. Remove the three 4-mm screws securing the left speaker cover.



NOTE: Before removing the speaker cables and wire harness, be sure to note their routing through the slots and pins so you can correctly reinstall the components.

3. Remove the left speaker cover, speaker, and speaker cable.
4. Remove the speaker wire harness.
5. Remove the two 4-mm screws securing the right speaker cover.
6. Remove the right speaker cover, speaker, and speaker cable.

The display latch is no longer secured by the speaker covers. Be careful not to lose the spring.

7. Remove the display latch and spring.

To replace the speaker, resolder the speaker cable to the new speaker.

When reinstalling the speakers, be especially careful to route the speaker cables and speaker wire harness through the appropriate slots and pins.

Base Assembly and Components

The following subsections provide removal and replacement procedures for most components of the base assembly. The procedures in these subsections assume that the keyboard, thermal shield, display assembly, and palmrest assembly have been removed.

The base assembly consists of the following components:

- PC Card heat sink
- Heat exchanger/fan
- DC-DC board
- LVDS board
- RJ-11 card
- Processor board and memory module
- Hinge saddles
- System board
- PC Card cage
- Audio board and audio thermal shield
- Latch assembly
- Kensington lock
- Bottom case

PC Card Heat Sink

This section provides the removal procedure for the PC Card heat sink.

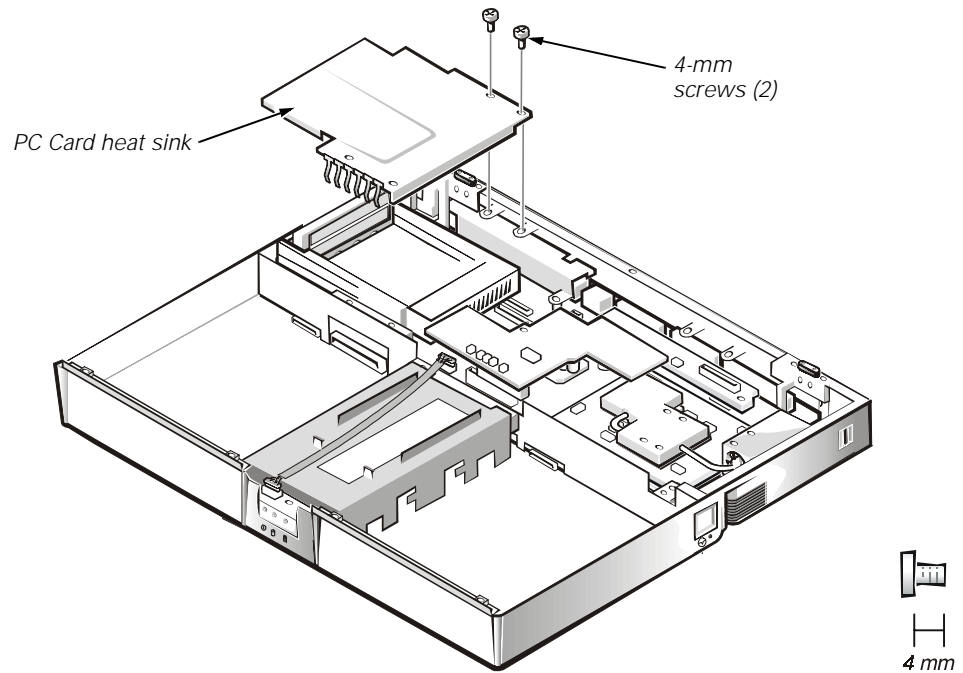


Figure 4-35. PC Card Heat Sink Removal

To remove the PC Card heat sink, follow these steps (see Figure 4-35):

1. Remove the two 4-mm screws securing the PC Card heat sink.
2. Remove the heat sink.

Heat Exchanger/Fan

This section provides the removal procedure for the heat exchanger/fan.

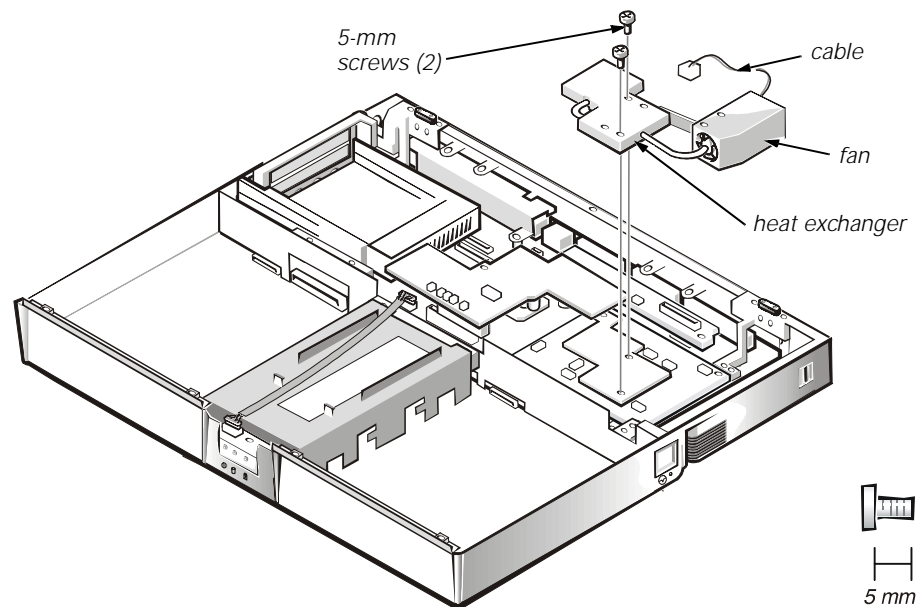


Figure 4-36. Heat Exchanger/Fan Removal

To remove the heat exchanger/fan, follow these steps (see Figure 4-36):

1. Remove the two 5-mm screws securing the heat exchanger.
2. Disconnect the fan cable from connector JP17 on the system board.
3. Remove the heat exchanger/fan.
4. Inspect the two thermal pads on the bottom of the heat exchanger and replace them if necessary.

When reinstalling the heat exchanger/fan, be sure to reconnect the fan cable to JP17; if you have an internal modem, there is an identical connector (JP2) next to JP17.

The heat exchanger/fan can be removed without removing the palmrest assembly.

1. Remove the two 5-mm screws securing the heat exchanger.
2. Disconnect the fan cable from connector JP17 on the system board.
3. Lift the heat exchanger and rotate it upward.
4. Slide the heat exchanger/fan toward the front of the computer until the fan is completely clear of the overhanging palmrest plastic.
5. Lift the heat exchanger/fan out at an angle.
6. Inspect the two thermal pads on the bottom of the heat exchanger and replace them if necessary.

DC-DC Board

This section provides the removal procedure for the DC-DC board.

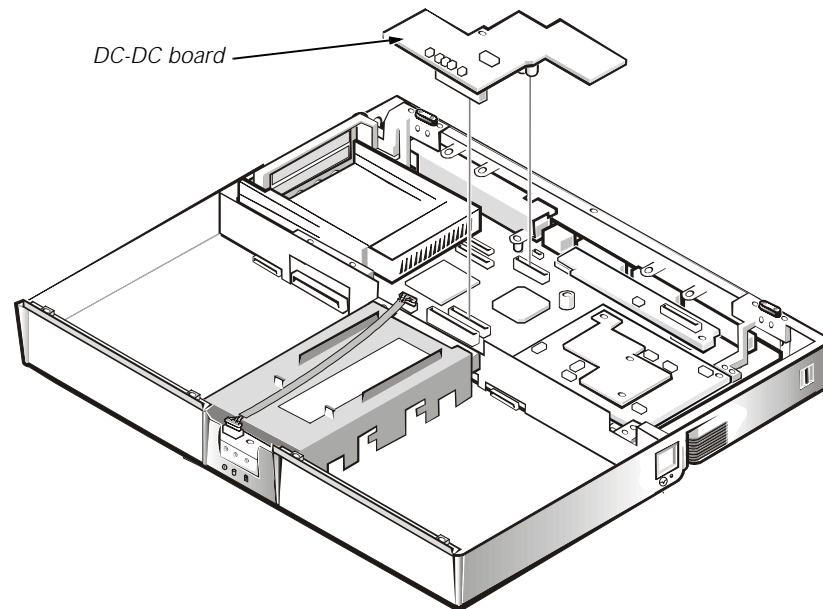


Figure 4-37. DC-DC Board Removal

To remove the DC-DC board, gently pull the DC-DC board off of connectors JP11 and JP16 on the system board (see Figure 4-37). Do not rock the board to remove it, because this may damage the connectors.

LVDS Board

This section provides the removal procedure for the LVDS board.

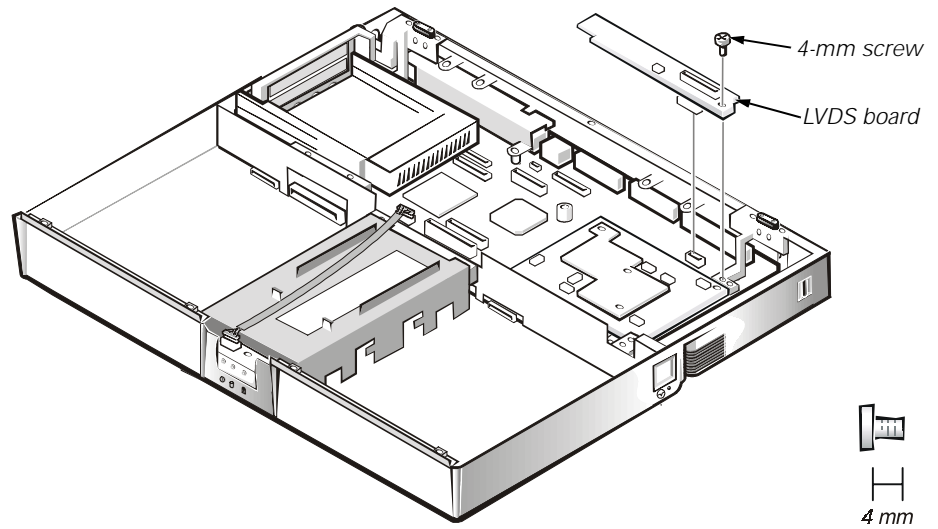


Figure 4-38. LVDS Board Removal

To remove the LVDS board, follow these steps (see Figure 4-38):

1. Remove the 4-mm screw securing the LVDS board.
2. Gently pull the LVDS board off of connectors JP9 and JP8 on the system board. Do not rock the board to remove it, because this may damage the connectors.

Processor Board and Memory Module

This section provides the removal procedure for the processor board and memory module. The processor board and memory module can be removed without removing the palmrest assembly.

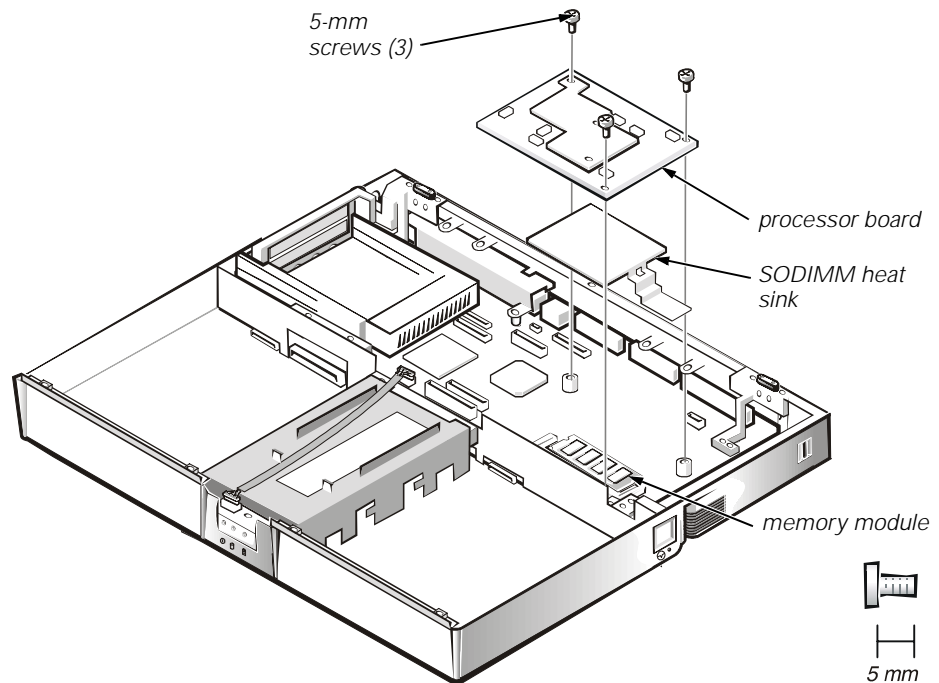


Figure 4-39. Processor Board and Memory Module Removal

This procedure assumes that you have removed the heat exchanger/fan. To remove the processor board and memory module, follow these steps (see Figure 4-39):

1. Remove the three 5-mm screws securing the processor board to the system board.
2. Gently pull the processor board off of connector JP15 on the system board. Do not rock the board to remove it, because this may damage the connectors.
3. Lift the SODIMM heat sink off of the memory module.
4. Remove the memory module.

Carefully spread the inner metal tabs of the memory module socket to disengage the module from the socket. The module should pop up slightly. Then pull the memory module out of the socket.

5. Inspect the thermal pad beneath the memory module to see if it needs replacement.

When reinstalling the SODIMM heat sink, be careful to align the hole in the SODIMM heat sink over the metal clip soldered to the system board.

When reinstalling the processor board, align the board with the notch on the system board connector. Press down on the left side of the board over the system board connector. This is the best spot to apply pressure to seat the processor correctly on connector JP15.

Hinge Saddles

This section provides the removal procedure for the hinge saddles.

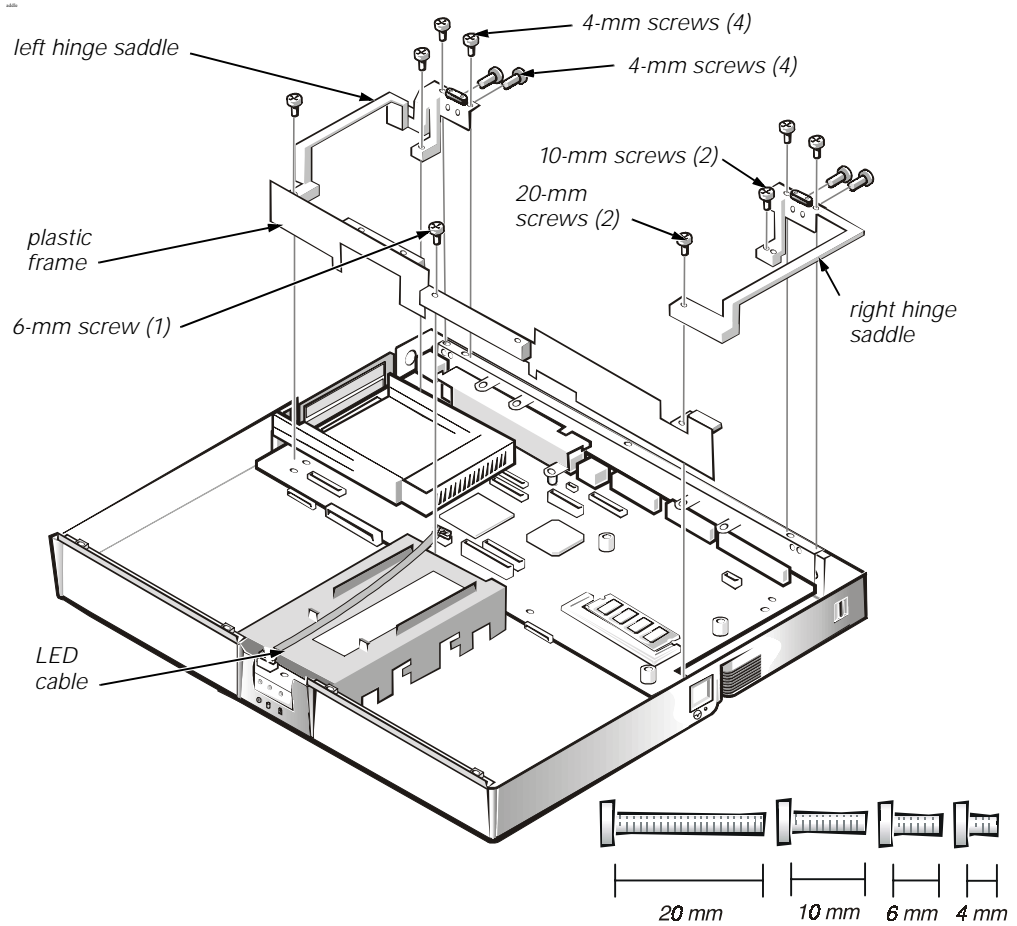


Figure 4-40. Hinge Saddle Removal

This procedure assumes that you have removed the PC Card heat sink and LVDS board. To remove the hinge saddles, follow these steps (see Figure 4-40):

1. Remove the four 4-mm screws from the top of the left and right hinge saddles.
2. Remove the four 4-mm screws from the back of the computer above the ports.
3. Remove the 10-mm screw and 20-mm screw from the right hinge saddle and remove the saddle.
4. Remove the 10-mm screw and 20-mm screw from the left hinge saddle and remove the saddle.
5. Disconnect the LED cable from connector J6 on the system board.
6. Remove the 6-mm screw from the plastic frame, remove any tape, and remove the plastic frame.

RJ-11 Card

This section provides the removal procedure for the RJ-11 card.

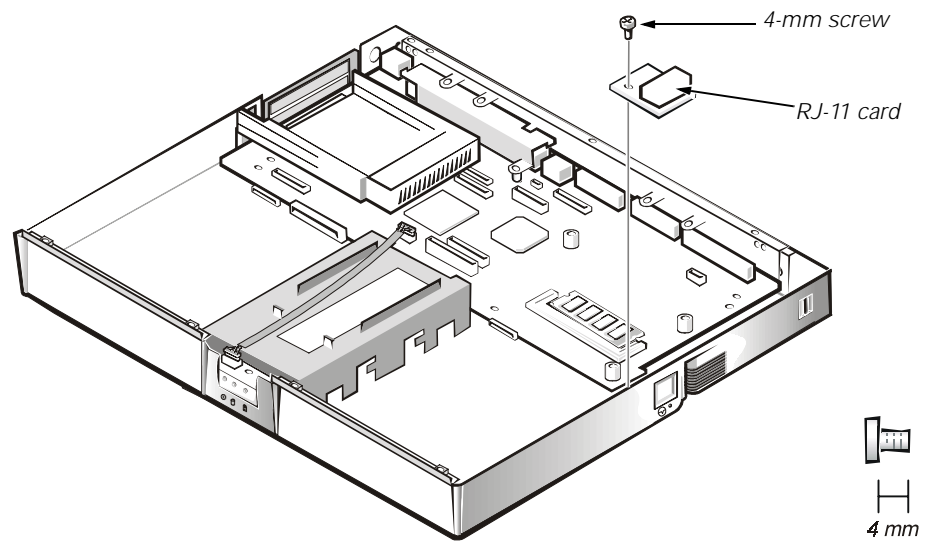


Figure 4-41. RJ-11 Card Removal

To remove the RJ-11 card, follow these steps (see Figure 4-41):

1. Remove the 4-mm screw securing the RJ-11 card to the system board.
2. Lift the card off the system board.

System Board

This section provides the removal procedure for the system board.

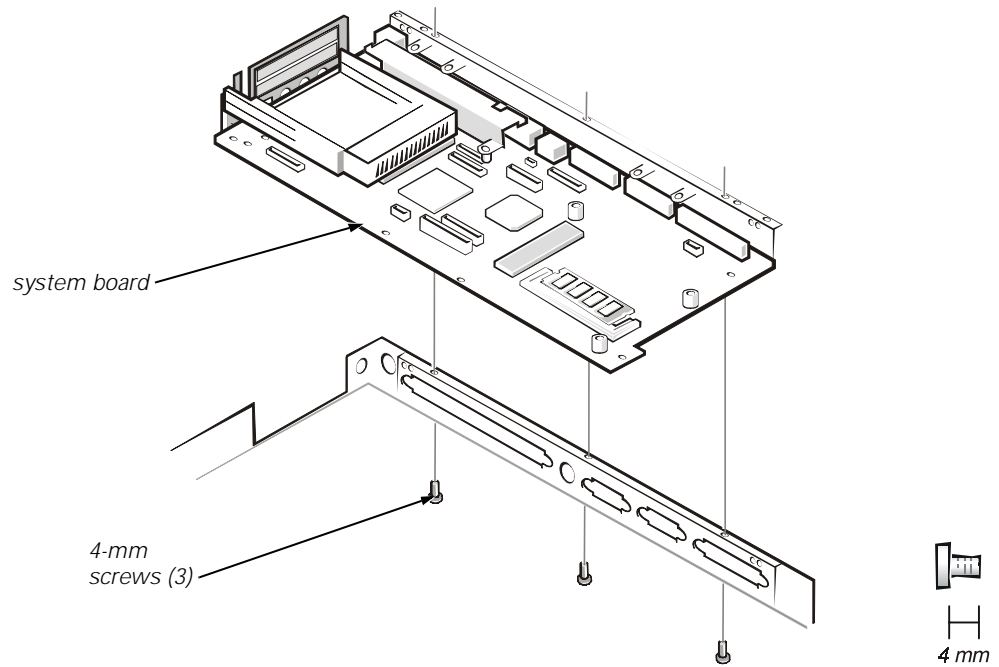


Figure 4-42. System Board Removal

This procedure assumes that you have removed the PC Card heat sink, LVDS board, and hinge saddles. To remove the system board, follow these steps (see Figure 4-42):

1. Remove the three 4-mm screws from the bottom of the computer.
2. Remove the system board from the bottom case.

PC Card Cage

This section provides the removal procedure for the PC Card cage.

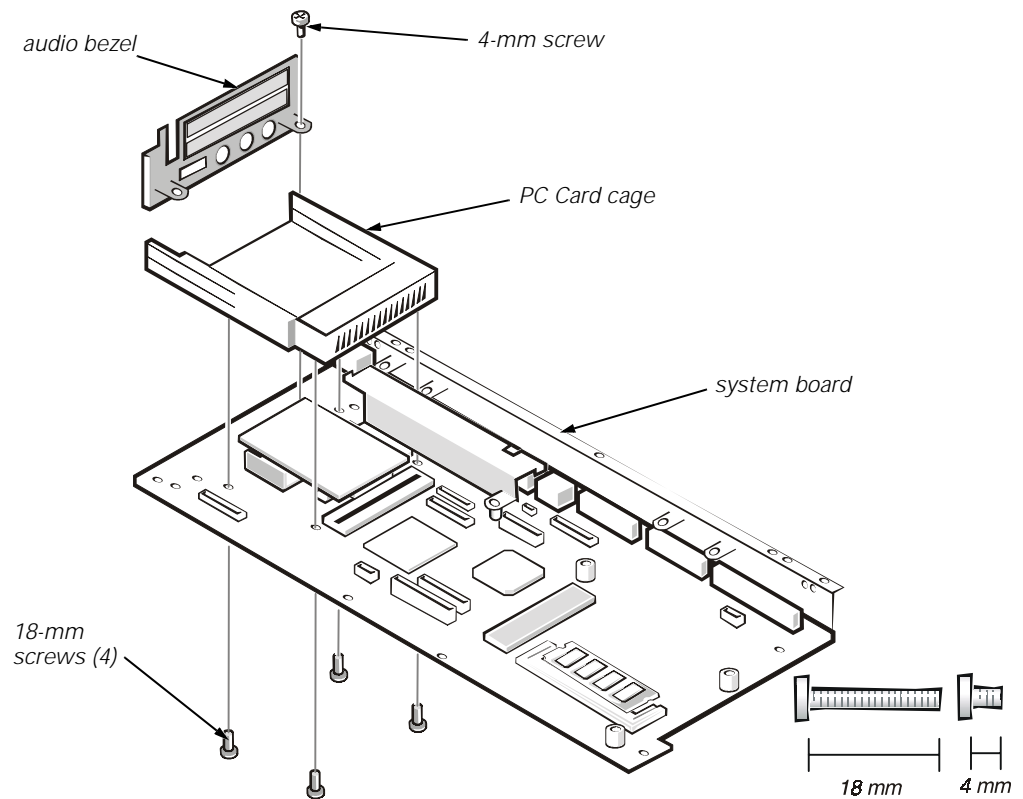


Figure 4-43. PC Card Cage Removal

This procedure assumes that you have removed the system board from the plastic case. To remove the PC Card cage, follow these steps (see Figure 4-43):

1. Remove the 4-mm screw securing the audio bezel.
2. Remove the audio bezel.
3. Remove the four 18-mm screws securing the PC Card cage to the system board.

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

4. Gently pull the card cage off of connector UP9 on the system board. Do not rock the cage to remove it, because this may damage the connectors.

Replace the PC Card cage if it is damaged.

Audio Card and Audio Thermal Shield

This section provides the removal procedure for the audio card and audio thermal shield.

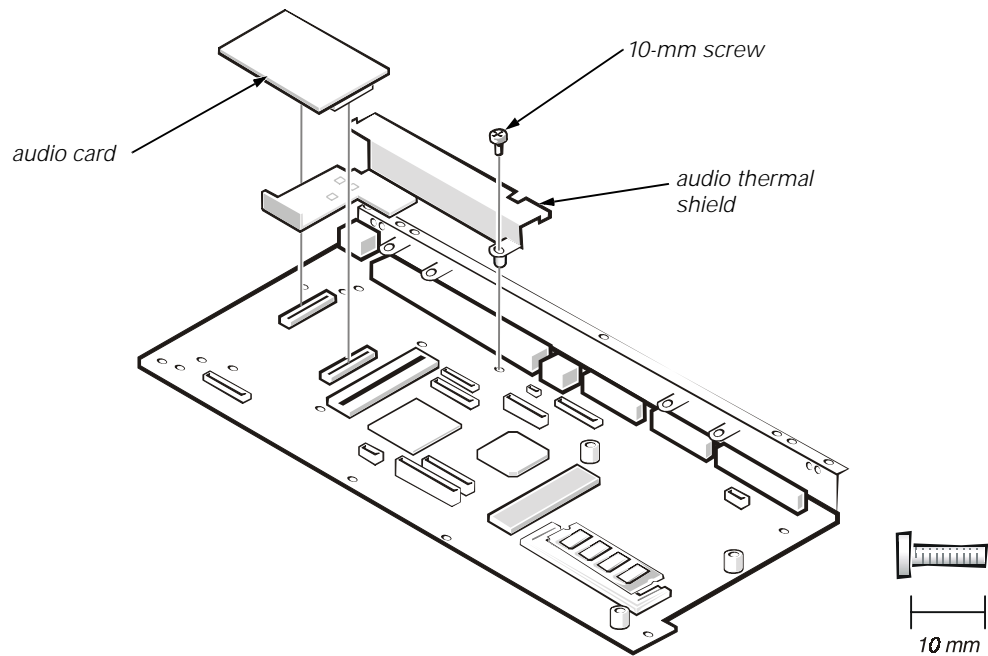


Figure 4-44. Audio Card and Audio Thermal Shield Removal

This procedure assumes that you have removed the system board from the plastic case and have removed the PC Card cage from the system board. To remove the audio card and audio thermal shield, follow these steps (see Figure 4-44):

1. Gently pull the audio card off of connectors JP12 and JP13 on the system board. Do not rock the card to remove it, because this may damage the connectors.
2. Remove the 10-mm screw securing the audio thermal shield, and then remove the shield.

Latch Assembly

This section provides the removal procedure for the latch assembly.

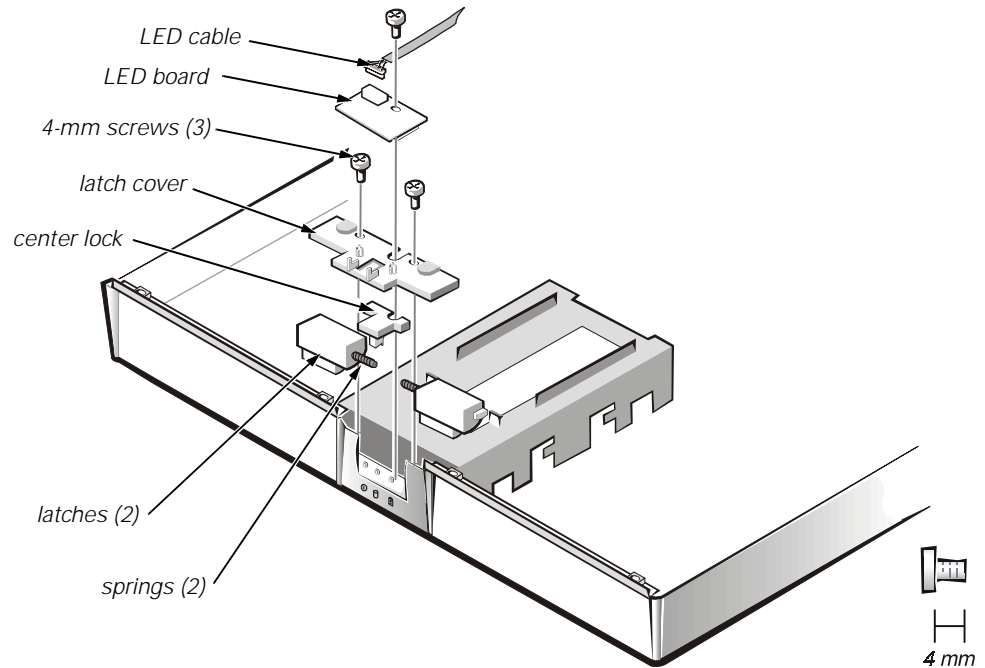
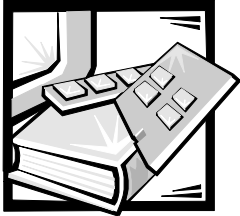


Figure 4-45. Latch Assembly Removal

To remove the latch assembly, follow these steps (see Figure 4-45):

1. Disconnect the LED cable from connector JP2 on the LED board.
2. Remove the 4-mm screw securing the LED board to the plastic base.
3. Remove the LED board.
4. Remove the two 4-mm screws holding the latch cover for the battery bay and options bay.
5. Remove the latch cover.
6. Remove the center lock over the two latches with springs.
7. Remove each spring and latch.

Be careful not to lose the small springs.



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