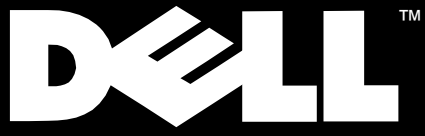


Dell™ Latitude™ CS Portable Computers

## SERVICE MANUAL







Dell™ Latitude™ CS Portable Computers

**SERVICE MANUAL**

---

**Information in this document is subject to change without notice.  
© 1999 Dell Computer Corporation. All rights reserved.**

Reproduction in any manner whatsoever without the written permission of Dell Computer Corporation is strictly forbidden.

Trademarks used in this text: *Dell*, the *DELL* logo, and *Latitude* are trademarks of Dell Computer Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Computer Corporation disclaims any proprietary interest in trademarks and trade names other than its own.

November 1999 P/N 0708R Rev. A01



# Contents

|  |    |
|--|----|
| Recommended Tools . . . . .  | 2  |
| Preparing to Work Inside Your Computer . . . . .   | 2  |
| Screw Identification and Tightening . . . . .  | 3  |
| ZIF Connectors . . . . .   | 5  |
| Removing Field-Replaceable Parts and Assemblies . . . . .  | 6  |
| Hard-Disk Drive Assembly . . . . .   | 7  |
| Memory Module Cover . . . . .  | 7  |
| Bottom Memory Module . . . . .   | 8  |
| Top Memory Module . . . . .  | 9  |
| Display Assembly . . . . .   | 11 |
| Display-Assembly Bezel . . . . .   | 13 |
| Display-Assembly Latch . . . . .   | 15 |
| LCD Panel . . . . .  | 15 |
| Replacing a Sharp LCD panel with a Sharp LCD panel or Replacing a Samsung LCD panel with a Samsung LCD panel . . . . . | 15 |
| Replacing a Sharp LCD Panel with a Samsung LCD Panel or Replacing a Samsung LCD Panel with a Sharp LCD Panel . . . . . | 16 |
| Removing the Packing Bezel on a New Sharp LCD Panel . . . . .  | 17 |
| Packing a Defective Sharp LCD Panel for Return Shipping . . . . .  | 17 |
| Keyboard Assembly . . . . .  | 18 |
| Palmrest Assembly . . . . .  | 19 |
| Bottom Assembly . . . . .  | 22 |
| Reserve Battery . . . . .  | 22 |
| Main Battery . . . . .   | 23 |
| Main Battery Release Latch . . . . .   | 23 |
| Thermal Cooling Solution . . . . .   | 24 |
| System Board Assembly . . . . .  | 26 |
| Touch Pad . . . . .  | 29 |
| Fan Assembly . . . . .   | 29 |

## Index

## Figures

|   |   |
|---|---|
| Figure 1. Computer Orientation . . . . .          | 1 |
| Figure 2. Main Battery Assembly Removal . . . . . | 3 |

|   |    |
|---|----|
| Figure 3. Screw Identification . . . . .                    | 3  |
| Figure 4. Disconnecting an Interface Cable. . . . .         | 5  |
| Figure 5. Exploded View—Computer . . . . .                  | 6  |
| Figure 6. Hard-Disk Drive Assembly Removal. . . . .         | 7  |
| Figure 7. Bottom Memory Module Removal. . . . .             | 8  |
| Figure 8. Top Memory Module Removal . . . . .               | 9  |
| Figure 9. Status Indicator Panel Removal. . . . .           | 10 |
| Figure 10. Display Assembly Removal . . . . .               | 11 |
| Figure 11. Sharp Display-Assembly Bezel Removal . . . . .   | 13 |
| Figure 12. Samsung Display-Assembly Bezel Removal . . . . . | 14 |
| Figure 13. Removing the Keyboard-Assembly Screws. . . . .   | 18 |
| Figure 14. Removing the Palmrest-Assembly Screws . . . . .  | 19 |
| Figure 15. Palmrest Assembly Removal. . . . .               | 21 |
| Figure 16. Bottom Assembly. . . . .                         | 22 |
| Figure 17. Main Battery Release Latch. . . . .              | 23 |
| Figure 18. Thermal Cooling Solution Removal . . . . .       | 24 |
| Figure 19. System Board Assembly Removal. . . . .           | 26 |
| Figure 20. Microprocessor Removal. . . . .                  | 29 |

**Tables**

|   |
|---|
| Table 1. Screw Placement Mat with Component Screw Counts and Sizes. . 4 |
|---|



## ***Read This First***

A prerequisite for using this manual to service Dell computer systems is a basic knowledge of PCs and prior training in PC troubleshooting techniques. In addition to information provided in this manual, Dell provides the *User's Guide* for troubleshooting procedures and instructions on using the Dell Diagnostics to test the computer system.

## ***Notes, Notices, and Cautions***

Throughout this guide, blocks of text may be accompanied by an icon and printed in bold type or in italic type. These blocks are notes, notices, and cautions, and they are used as follows:



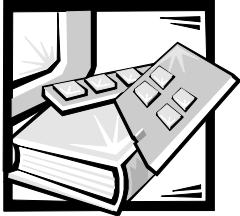
*NOTE: A NOTE indicates important information that helps you make better use of your computer system.*

**NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells how to avoid the problem.**



**CAUTION: A CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.**



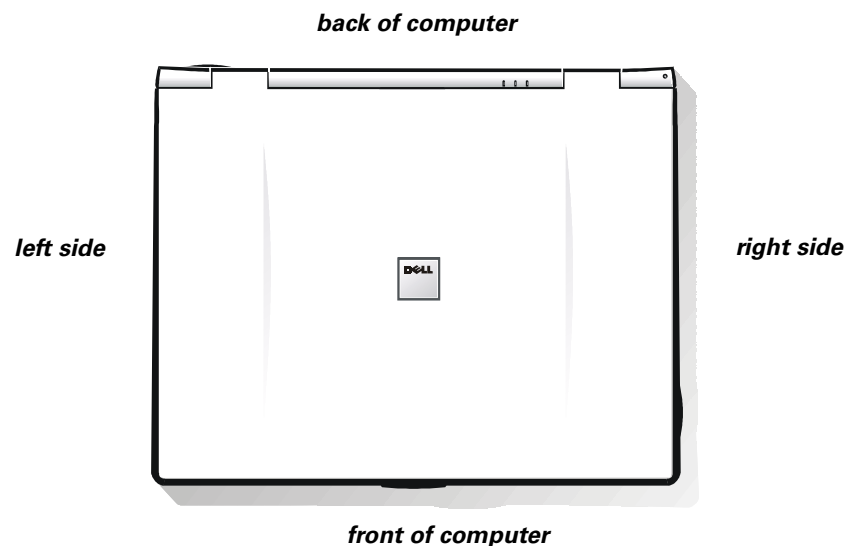


# **Dell™ Latitude™ CS Portable Computers Service Manual**

This manual provides instructions for removing and replacing field-replaceable components, assemblies, and subassemblies in your Dell Latitude portable computer. Unless otherwise noted, each procedure in this manual assumes the following conditions:

- The computer and any attached peripherals are turned off, and the peripherals are disconnected from the I/O panel on the back and right side of the computer.
- A part can be replaced by performing the removal procedure in reverse order.

When the display assembly is open nearly 180 degrees, use a book or something similar to support it. The angle of the display assembly with respect to the bottom case should never exceed 180 degrees. Also, when performing the procedures in this manual, the locations or directions relative to the computer are as shown in Figure 1 unless otherwise specified.



**Figure 1. Computer Orientation**

## Recommended Tools

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

- #0 and #1 magnetized Phillips-head screwdrivers
- Small flat-blade screwdriver
- 5-mm socket wrench
- 7-mm socket wrench
- Small plastic scribe

## Preparing to Work Inside Your Computer

Before you start to work on the computer, perform the following steps:

1. Save any work in progress and close all open application programs.
2. Turn off the computer and any attached peripherals.



*NOTE: Make sure that the computer is turned off and not in suspend-to-disk mode (S2D). If you cannot shut down the computer using its operating system, press the power button for 4 seconds.*

3. If the computer is docked in a C/Dock Expansion Station or C/Port Advanced Port Replicator (APR), undock the computer.
4. Disconnect the computer and any attached peripherals from their electrical outlets to reduce the potential for personal injury or shock. Also disconnect any telephone or telecommunications lines from the computer.
5. Remove the power cable.
6. Disconnect all other external cables from the computer.
7. Remove any installed PC Cards.

**NOTICE: Make sure that the work surface is clean to prevent scratching the computer cover.**

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

8. Turn the computer over so the battery is on the lower right corner of the computer, and remove the main battery assembly from the battery bay.

Slide the battery bay latch toward the right side of the computer to push the back side of the battery up out of the battery bay (see Figure 2).



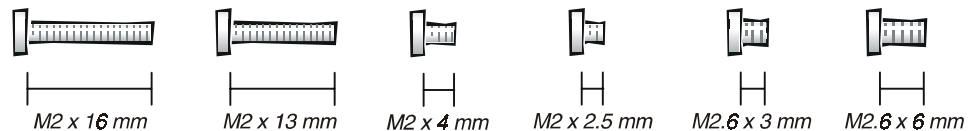
**Figure 2. Main Battery Assembly Removal**

9. Ground yourself by touching the unpainted metal surface of the I/O panel on the back of the computer.

While you work, periodically touch the I/O panel to dissipate any static electricity that might harm components.

## Screw Identification and Tightening

The illustrations in the following removal procedures provide lengths of the correct screws for each procedure. Figure 3 shows examples. Match the actual screw to the illustration to check for correct length.



**Figure 3. Screw Identification**

**NOTICE:** When reinstalling a screw, you must use a screw of the correct length. Otherwise, you could damage the hardware. Make sure that the screw is properly aligned with its corresponding hole, and avoid overtightening.

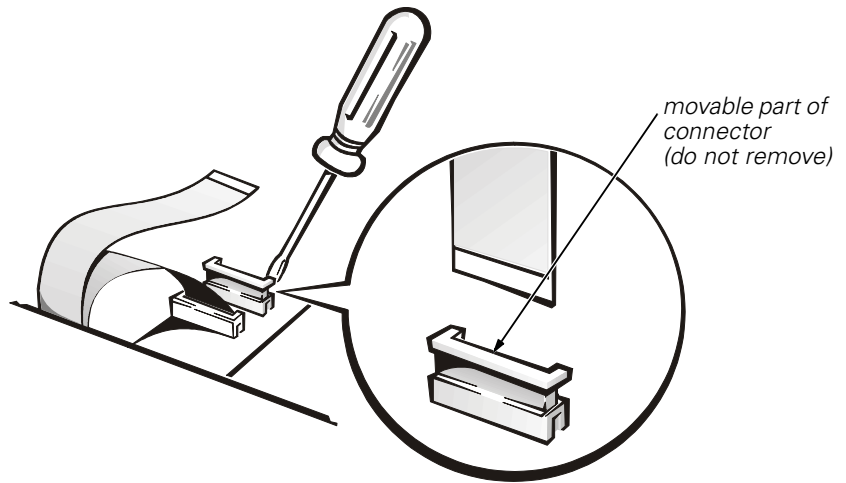
When you are removing and replacing components, photocopy the Table 1 placement mat as a tool to lay out and keep track of the component screws.

**Table 1. Screw Placement Mat with Component Screw Counts and Sizes**

|  |  |  |
|--|--|--|
| <p><b>Hard-Disk Drive Assembly:</b><br/>M2 x 4 mm (2 each)</p>   | <p><b>Memory Module Cover:</b><br/>M2.6 x 3 mm (2 each)</p>                          | <p><b>Display Assembly Hinge to Bottom Case Assembly:</b><br/>M2.6 x 6 mm (4 each)</p>   |
| <p><b>Display Assembly, including Bezel:</b><br/>M2 x 4 mm (6 each [Sharp LCD] and 8 each [Samsung LCD])<br/>Rubber Screw Covers (2 each [large] and 4 each [small])</p> | <p><b>Keyboard Assembly:</b><br/>M2 x 16 mm (2 each)</p>                             | <p><b>Palmrest Assembly:</b><br/>M2 x 2.5 mm (2 each [palmrest top])<br/>M2 x 4 mm (7 each [computer bottom])<br/>M2 x 2.5 mm (5 each [battery bay])</p> |
| <p><b>Thermal Cooling Solution:</b><br/>M2 x 13 mm (4 each)<br/>M2 x 4 mm (3 each)</p>   | <p><b>System Board Assembly:</b><br/>M2 x 4 mm (8 each)<br/>M2.6 x 6 mm (2 each)</p> | <p><b>PC Card Cover:</b><br/>M2 x 4 mm (4 each) (part of system board screws)</p>  |
| <p><b>Media Bay Port:</b><br/>M2 x 2.5 mm (2 each)</p>   | <p><b>Touch Pad:</b><br/>M2 x 2.5 mm (2 each)</p>                                    |  |

## ZIF Connectors

Some of the computer's interface connectors are zero insertion force (ZIF) connectors. These connectors are not removable, but they must be released to disconnect a cable from them (see Figure 4).



**Figure 4. Disconnecting an Interface Cable**

**NOTICE: The ZIF connectors are fragile. To avoid damage, do not apply too much pressure to the movable part of the connector.**

To disconnect an interface cable from a ZIF connector, perform the following steps:

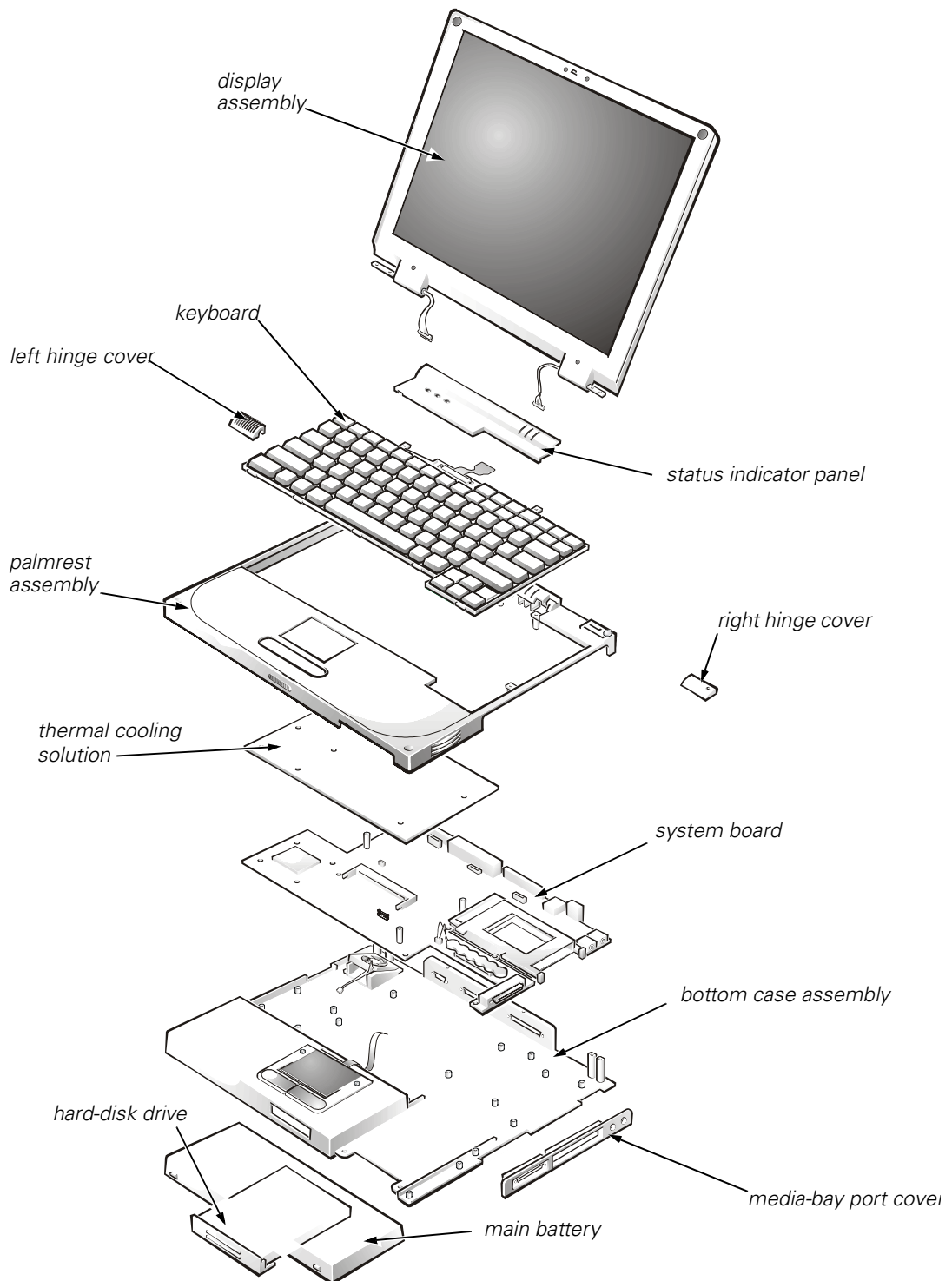
1. Insert a small flat-blade screwdriver under the movable part of the connector.
2. Pull gently upward on the movable part of the connector until it releases the interface cable.
3. Grasp the interface cable and pull it out of the connector.

To reconnect an interface cable to a ZIF connector, perform the following steps:

1. Use a small flat-blade screwdriver to open the movable part of the ZIF connector.
2. Orient the end of the interface cable with the ZIF connector, and insert the end of the cable into the connector.
3. While holding the cable in place, close the ZIF connector.

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

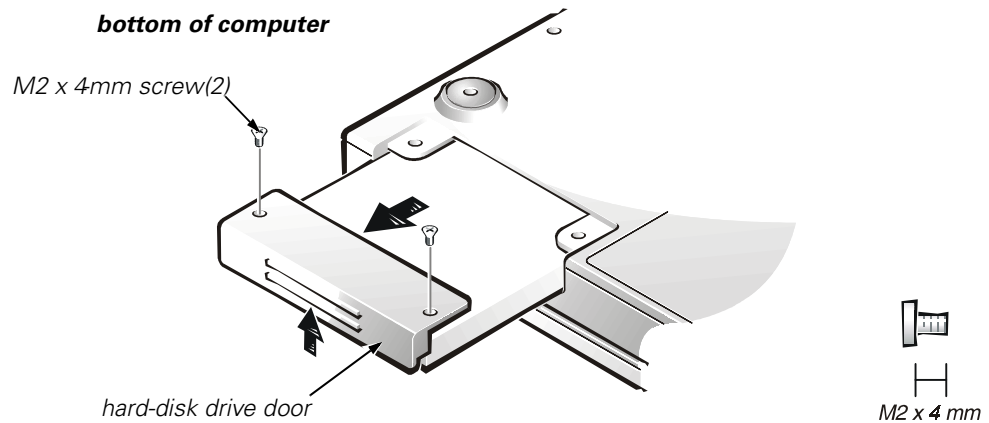
# Removing Field-Replaceable Parts and Assemblies



**Figure 5. Exploded View—Computer**

The following subsections provide instructions for removing and replacing field-replaceable parts and assemblies.

## Hard-Disk Drive Assembly



**Figure 6. Hard-Disk Drive Assembly Removal**

**NOTICE:** To avoid damaging the system board, you must remove the main battery before you service the computer.

**NOTICE:** The hard-disk drive is very sensitive to shock. Handle the assembly by its edges (do not squeeze the top of the hard-disk drive case), and avoid dropping it.

**NOTICE:** Make sure that the work surface is clean to prevent scratching the computer cover.

1. Turn the computer over, and remove the two M2 x 4-mm screws from the bottom of the hard-disk drive door (see Figure 6).

The drive is located on the left side of the computer when the computer is turned over.

2. Grasp the drive door, slide it up, and pull the drive out of the computer.

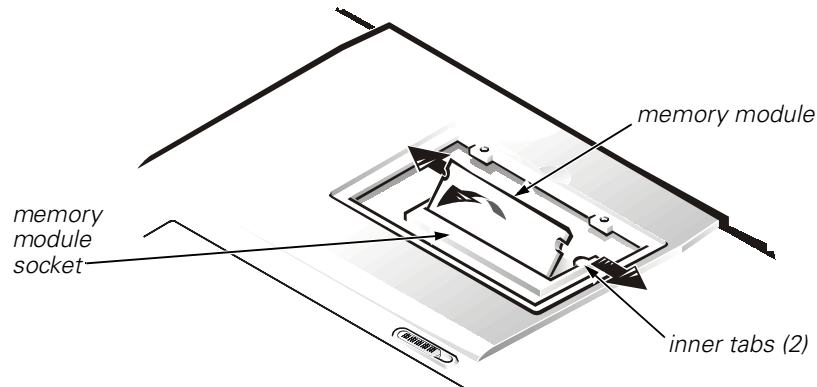
## Memory Module Cover

**NOTICE:** To avoid damaging the system board, you must remove the main battery before you service the computer.

**NOTICE:** Make sure that the work surface is clean to prevent scratching the computer cover.

1. Close the display, and turn the computer upside down on a flat work surface.
2. Remove the two M2.6 x 3-mm screws from the memory module cover, and lift the cover up and out (two tabs are located on the opposite side of the screw holes on the cover).

## Bottom Memory Module



**Figure 7. Bottom Memory Module Removal**

To remove the bottom memory module, perform the following steps.

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

**NOTICE: The 192-MB memory module does not fit in the bottom memory module socket.**

1. Remove the memory module cover.
2. Ground yourself by touching the unpainted metal surface of an I/O connector on the computer's back panel.
3. To release the memory module from its socket, carefully spread apart the inner tabs of the memory module socket just far enough for the memory module to disengage from the socket (it should pop up slightly) (see Figure 7).
4. Lift the memory module out of its socket.

To replace a memory module, perform the following steps:

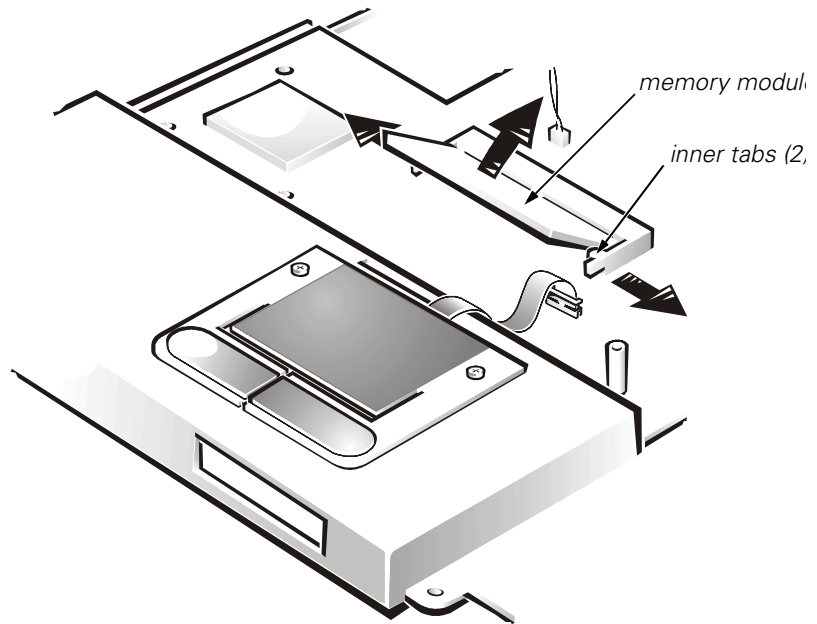
1. Align the memory module's edge connector with the slot in the center of the memory module socket.

Memory modules are keyed, or designed to fit into their sockets in only one direction. The slots on the system board are notched so that the memory module can be firmly seated only one way.

2. With the module at a 45-degree angle, press the memory module's edge connector firmly into the memory module socket.
3. Pivot the memory module down until it clicks into place.
4. If you do not hear a click as each end of the memory module snaps into the tabs, remove the memory module and reinstall it.



## Top Memory Module

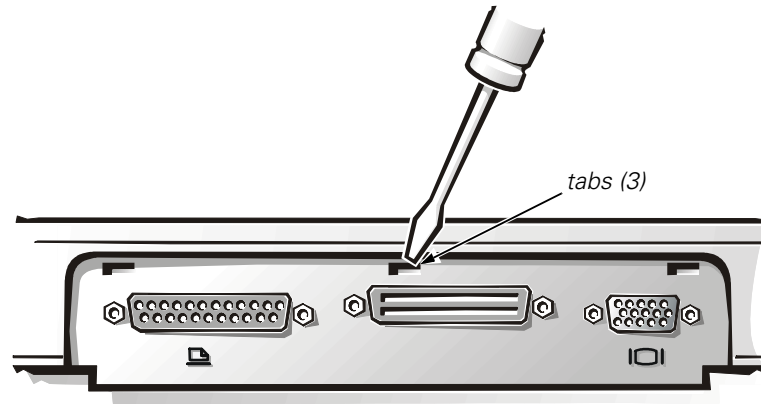


**Figure 8. Top Memory Module Removal**

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

1. Remove the status indicator panel.  
Use a flat-blade screwdriver to press in on the three tabs that secure the status indicator panel to the back panel of the computer (see Figure 9).
2. Remove the keyboard (see Figure 13).
3. Remove the thermal cooling solution (see Figure 18).
4. Ground yourself by touching the unpainted metal surface of an I/O connector on the computer's back panel.
5. To release the memory module from its socket, carefully spread apart the inner tabs of the memory module socket just far enough for the memory module to disengage from the socket (it should pop up slightly) (see Figure 8).

- Lift the memory module out of its socket.



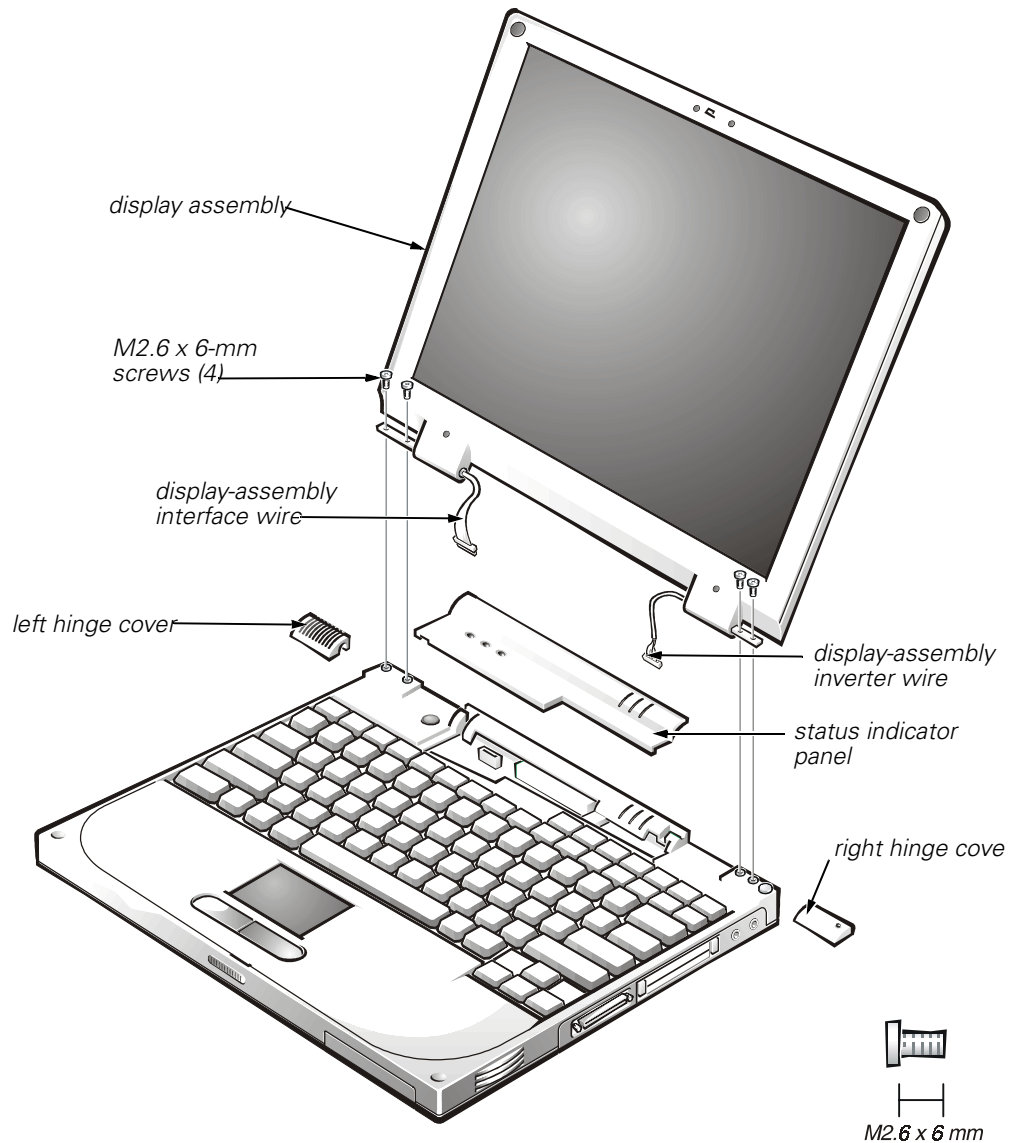
**Figure 9. Status Indicator Panel Removal**

To replace a memory module, perform the following steps.

**NOTICE: The 192-MB memory module fits the top memory module socket only.**

- Align the memory module's edge connector with the slot in the center of the memory module socket.  
  
Memory modules are keyed, or designed to fit into their sockets in only one direction. The slots on the system board are notched so that the memory module can be firmly seated only one way.
- With the module at a 45-degree angle, press the memory module's edge connector firmly into the memory module socket.
- Pivot the memory module down until it clicks into place.
- If you do not hear a click as each end of the memory module snaps into the tabs, remove the memory module and reinstall it.

## Display Assembly



**Figure 10. Display Assembly Removal**

**NOTICE: To avoid damaging the system board, you must remove the battery before you service the computer.**

1. Remove the status indicator panel.
2. Remove the right plastic hinge cover by sliding it to the right of the display assembly.
3. Remove the two M2.6 x 6-mm hinge screws that secure the right hinge to the bottom case (see Figure 10).
4. Remove the left plastic hinge cover by sliding it to the left of the display assembly.

5. Remove the two M2.6 x 6-mm hinge screws that secure the left hinge to the bottom case.
6. Carefully disconnect the display-assembly interface wire connector, located on the left side of the display assembly, from the system board.

The female connector attached to the display-assembly interface wire is keyed to fit into the male connector one way only.

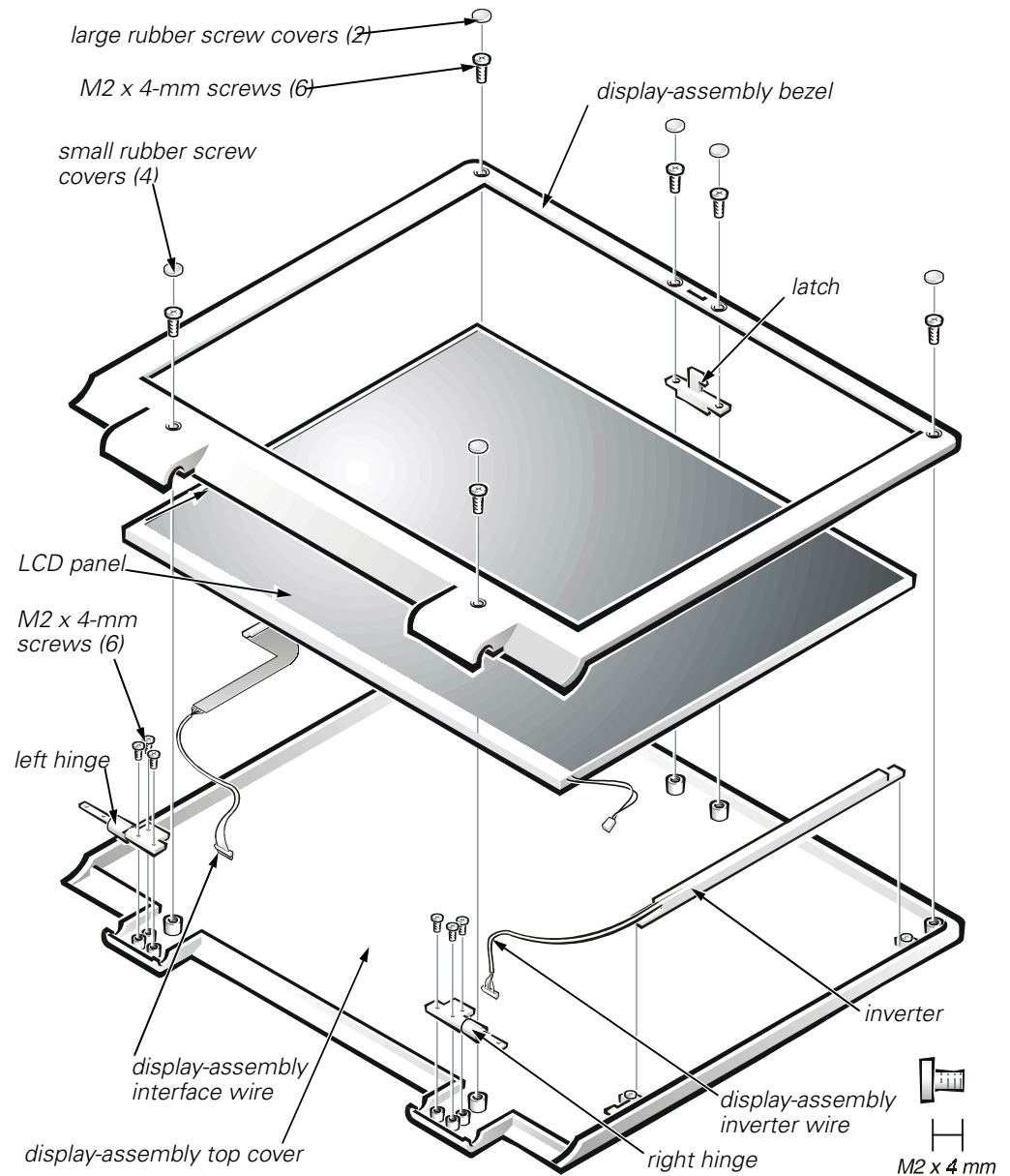
On some models, the interface wire is routed under the left hinge. To remove the wire from under the hinge, remove all three M2 X 4-mm screws attaching the left hinge to the display-assembly top cover (see Figure 11). For models that do not route the interface wire under the left hinge, the wire is removed without removing the left hinge.

7. Carefully disconnect the display-assembly inverter wire connector, located on the right side of the display assembly, from the system board.

The female connector attached to the display-assembly inverter wire is keyed to fit into the male connector one way only.

8. Lift the display assembly from the bottom assembly.

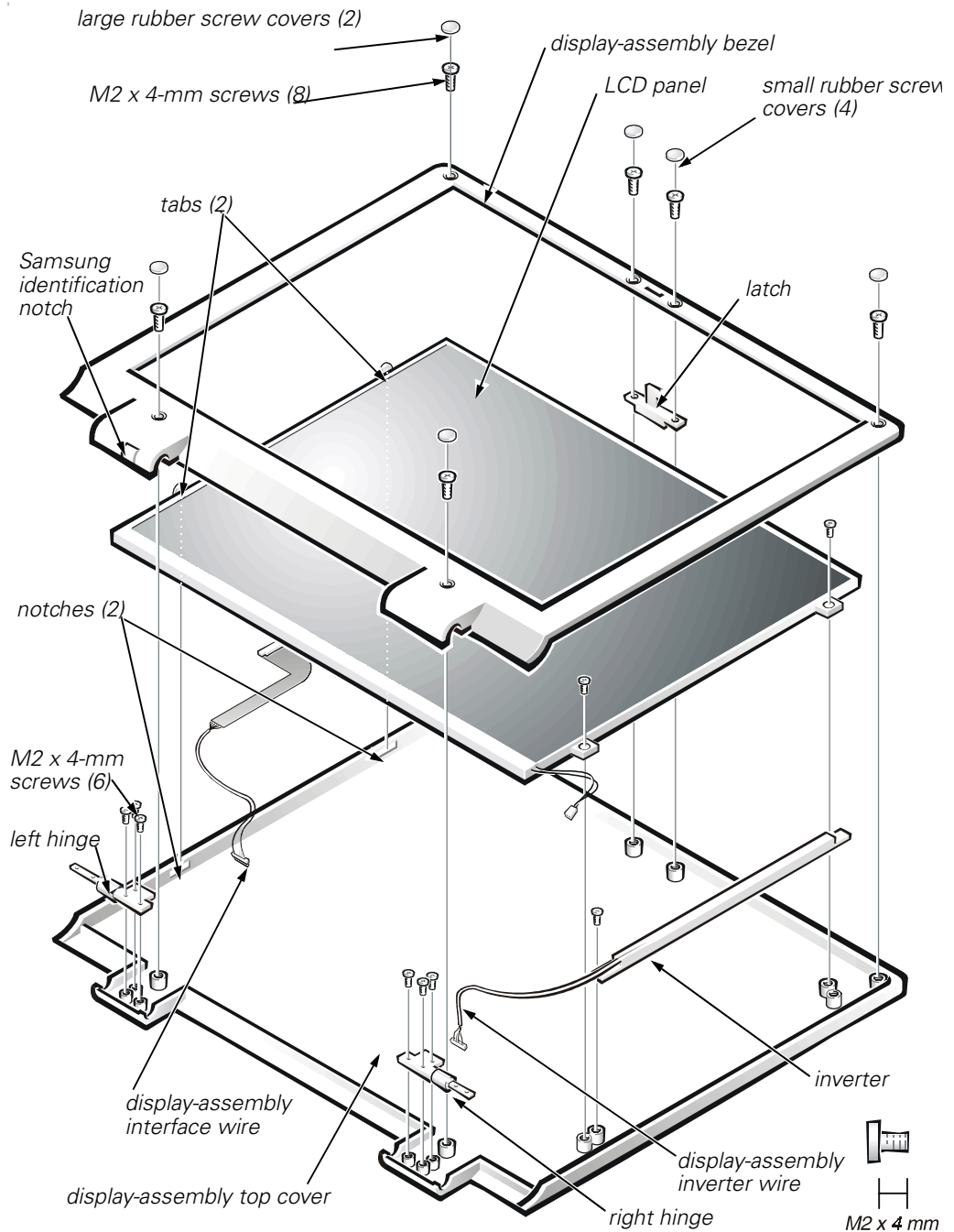
## Display-Assembly Bezel



**Figure 11. Sharp Display-Assembly Bezel Removal**

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

1. Use a scribe to carefully pry the six rubber screw covers out of the six screw holes located along the top and bottom of the bezel on the front of the display assembly.
2. For a Sharp display-assembly bezel, remove the six M2 x 4-mm screws located at the top and bottom of the bezel on the front of the display assembly (see Figure 11). For a Samsung display-assembly bezel, remove



**Figure 12. Samsung Display-Assembly Bezel Removal**

the six M2 x 4-mm screws located at the top and bottom of the bezel on the front of the display assembly (see Figure 12).

3. Separate the bezel from the display-assembly top cover.

The bezel is secured by slot openings that snap into the display-assembly top cover. Lift the inside edge of the bezel, working your way around the inside perimeter, to unsnap and remove it from the display assembly.

**NOTICE: A magnet is mounted on the back side of the bezel behind the left hinge extension cover. Keep diskettes and other magnetic storage media away from this area to avoid the potential for data loss.**

## **Display-Assembly Latch**

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

1. Remove the Sharp display-assembly bezel (see Figure 11), or the Samsung display-assembly bezel (see Figure 12).
2. Remove the display-assembly latch by sliding the latch from the inside of the display-assembly bezel (see Figure 11).

## **LCD Panel**

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**



*NOTE: This computer contains an LCD panel manufactured by Sharp or Samsung. The display-assembly bezel and the display-assembly top cover are unique for each manufacturer's LCD panel. When viewed from the back of the computer, there is a notch on the lower-right corner of the hinged edge of the Samsung display assembly (see Figure 12). Close the LCD display assembly and view the back of the computer to identify the Samsung notch.*

## **Replacing a Sharp LCD panel with a Sharp LCD panel or Replacing a Samsung LCD panel with a Samsung LCD panel**

1. Ground yourself by touching the unpainted metal surface of the I/O panel on the back of the computer.
2. Remove the status indicator panel (see Figure 9).
3. Remove the display assembly (see Figure 10).
4. Remove the display assembly bezel (see Figure 11 for a Sharp LCD panel or Figure 12 for a Samsung LCD panel).
5. Remove the inverter (see Figure 11 for a Sharp LCD panel or Figure 12 for a Samsung LCD panel).

If you have a Sharp or Samsung LCD panel, the inverter is held in place by two plastic clips located at the top and bottom of the inverter. Press down on the top of the inverter, and then rotating the top up and slide the inverter out of the bottom clip.

**NOTICE: Samsung LCD panels have two M2 x 4 mm screws located on the right side of the panel. Remove these screws before rotating the panel.**

6. Rotate the top of the LCD panel away from the display-assembly top cover.
7. From the back side of the LCD panel, carefully disconnect the display-assembly interface cable connector.
8. Disconnect the display-assembly inverter wire connector from the bottom of the inverter (see Figure 11 for a Sharp LCD panel or Figure 12 for a Samsung LCD panel).

The female connector on the interface wire is keyed to fit into the male connector on the system board one way only.

**NOTICE: The LCD panel is fragile. Handle it carefully.**

9. Lift the LCD panel out of the display-assembly top cover.
10. Install the display-assembly interface wire, LCD panel, and inverter wire.

**NOTICE: Before removing the packing bezel from a new Sharp LCD panel, read "Removing the Packing Bezel on a New Sharp LCD Panel," on page 17. Samsung LCD panels do not require a packing bezel.**

11. Install the display-assembly top cover and display-assembly bezel.
12. Turn the computer over.
13. Reinstall the main battery in the main battery compartment.

Installation of the new LCD panel is completed.

### ***Replacing a Sharp LCD Panel with a Samsung LCD Panel or Replacing a Samsung LCD Panel with a Sharp LCD Panel***

1. Ground yourself by touching the unpainted metal surface of the I/O panel on the back of the computer.
2. Remove the status indicator panel (see Figure 9).
3. Remove the display assembly (see Figure 10).
4. Remove the old display-assembly top cover and display-assembly bezel (see Figure 11 for a Sharp LCD panel or Figure 12 for a Samsung LCD panel).
5. Remove the inverter (see Figure 11 for a Sharp LCD panel or Figure 12 for a Samsung LCD panel).



If you have a Sharp or Samsung LCD panel, the inverter is held in place by two plastic clips located at the top and bottom of the inverter. Press down on the top of the inverter, and then rotating the top up and slide the inverter out of the bottom clip.

6. Remove the old display-assembly interface wire, LCD panel, and display-assembly inverter wire.

**NOTICE: The LCD panel is fragile. Handle it carefully.**



*NOTE: A new display-assembly top cover, inverter, inverter wire, and bezel are supplied in the service kit.*

**NOTICE: Before removing the packing bezel from a new Sharp LCD panel, read “Removing the Packing Bezel on a New Sharp LCD Panel.” Samsung LCD panels do not require a packing bezel.**

7. Install the new display-assembly interface wire, LCD panel, and inverter wire into the new top cover provided in the service kit.
8. Attach the new bezel to the display assembly.
9. Turn the computer over.
10. Reinstall the main battery in the main battery compartment.

Installation of the new LCD panel is completed.

### *Removing the Packing Bezel on a New Sharp LCD Panel*

New Sharp LCD panels are shipped with a packing bezel to provide support and prevent damage. Prepare the new Sharp LCD panel for installation in the display assembly by performing the following steps:

1. Carefully peel the protective laminate film off of the LCD panel.
2. Remove the top-half of the packing bezel.

**NOTICE: The LCD panel is fragile. Handle it carefully.**

3. Pull the bezel out from the LCD panel near the hook locations to release the LCD panel from the bottom half of the packing bezel.

The bottom-half of the packing bezel holds the LCD panel in place with six hooks (two located on the top left, two located on the top right, and one located on each side approximately two-thirds up the length of each side).

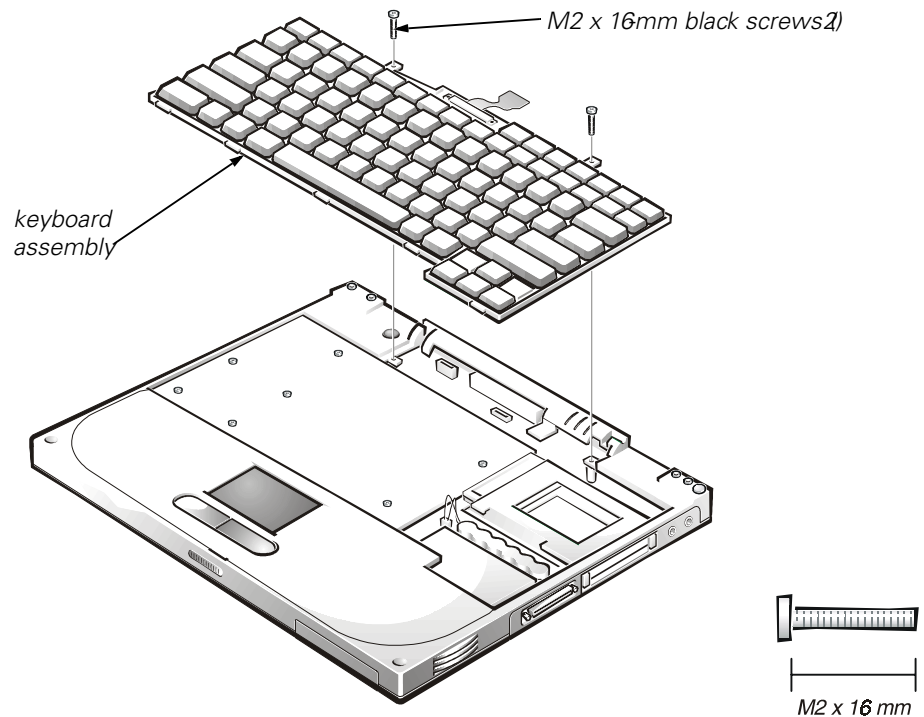
### *Packing a Defective Sharp LCD Panel for Return Shipping*

To assemble the Sharp LCD panel and packing bezel for return shipment, perform the following steps:

1. Place the LCD panel in to the bottom-half of the packing bezel.
2. Place the top-half of the packing bezel on the LCD panel.

3. Make sure that the six hooks on the shipping bezel hold the LCD panel firmly in place behind.

## Keyboard Assembly



**Figure 13. Removing the Keyboard-Assembly Screws**

To remove the keyboard assembly, perform the following steps.

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

**NOTICE: Make sure that the work surface is clean to prevent scratching the computer cover.**

1. Remove the status indicator panel (see Figure 9).
2. Remove the two black M2 x 16-mm screws located at the top of the keyboard (see Figure 13).
3. Carefully disconnect the keyboard cable connector from the system board.

**NOTICE: The keycaps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Be careful when removing and handling the keyboard.**

4. Release the keyboard from the palmrest assembly by lifting the top edge of the keyboard up and sliding it toward the back of the computer.



*NOTE: Five metal tabs retain the bottom of the keyboard in the palmrest assembly.*

5. Remove the keyboard assembly (see Figure 13).

To replace the keyboard assembly, perform the following steps.

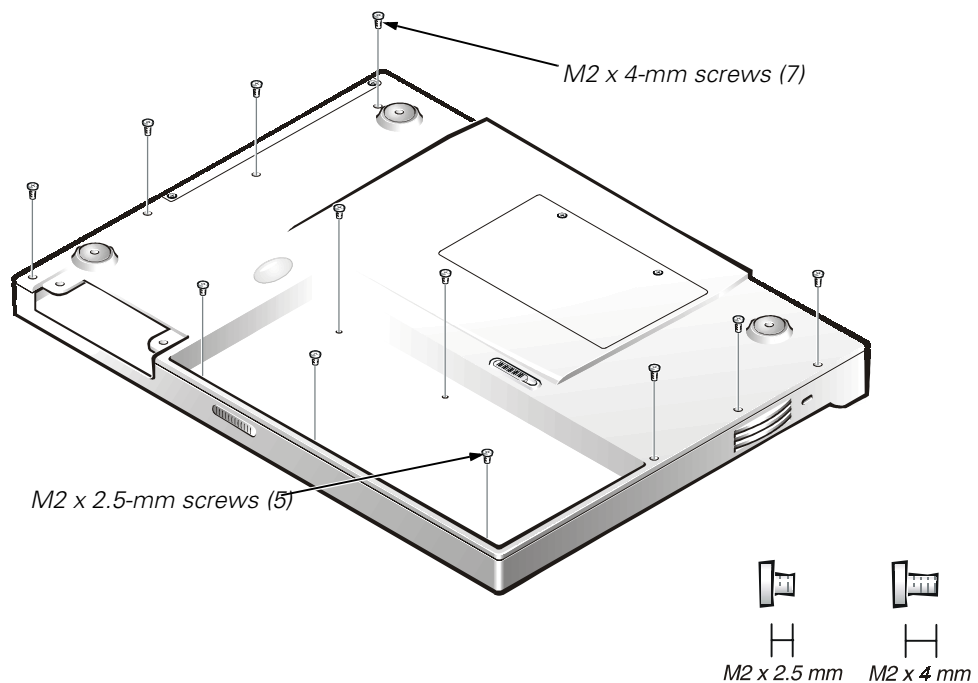
**NOTICE: Position the keyboard cable so it is not twisted when connected to the system board.**

1. Connect the keyboard cable to the connector on the system board.
2. Fit the keyboard into place by sliding the five tabs on the bottom of the keyboard into the palmrest assembly.
3. Press on the upper left and right edges of the keyboard to snap the upper tabs into the palmrest.
4. Verify that the keyboard is correctly installed.

The keys should be flush with the left and right surfaces of the palmrest.

5. Reinstall the two black M2 x 16-mm screws.
6. Snap the status indicator panel in place.

## **Palmrest Assembly**



**Figure 14. Removing the Palmrest-Assembly Screws**

The palmrest assembly consists of the palmrest, speaker, microphone, and power button with spring.

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

1. Remove the display assembly (see Figure 10).
2. Remove the keyboard (see Figure 13).
3. Remove the two M2 x 2.5-mm screws located at the top of the palmrest assembly (see Figure 15).

**NOTICE: Make sure that the work surface is clean to prevent scratching the computer cover.**

4. Turn the computer upside down on a flat work surface.
5. Remove the seven M2 x 4-mm screws that secure the palmrest to the computer.

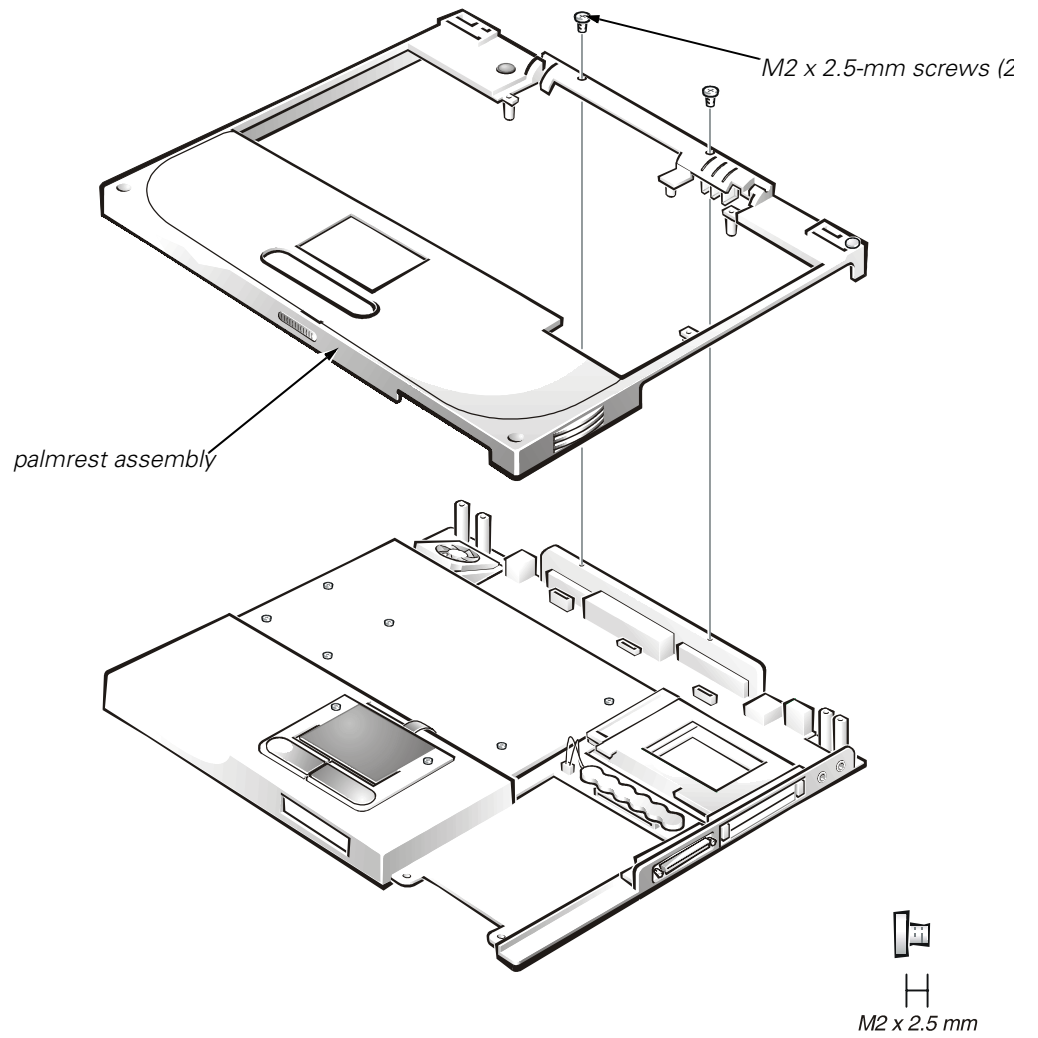
These screws are located along the left and right sides on the bottom of the computer (see Figure 14).

6. Remove the five M2 x 2.5-mm screws located in the main battery compartment (see Figure 14).
7. Turn the computer right-side up on the work surface.
8. Lift the front of the palmrest assembly up and rotate it to a 90-degree angle from the bottom assembly.
9. Carefully disconnect the microphone and speaker connectors from the system board (the microphone and speaker connections are located on the back right-hand corner of the system board).



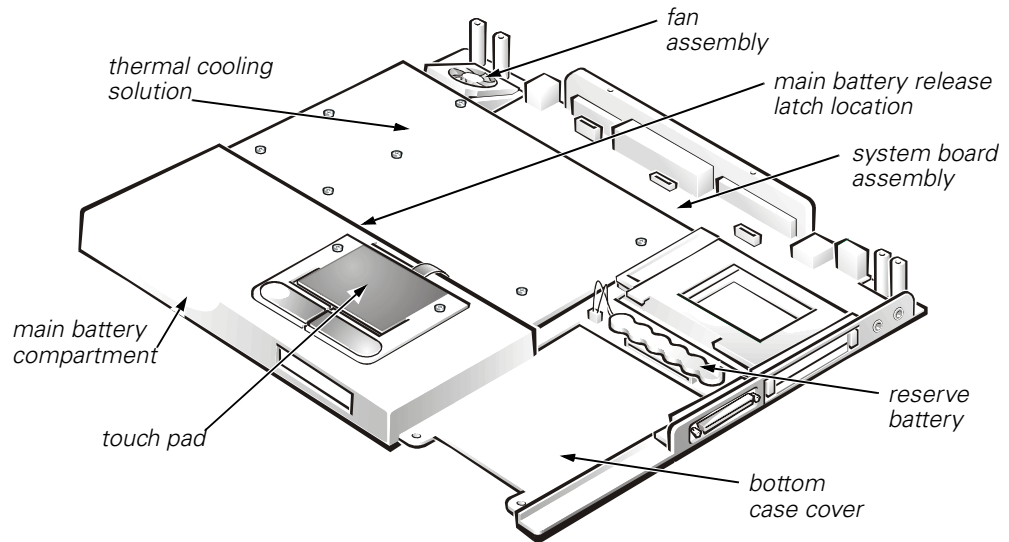
*NOTE: The female connectors are keyed to fit into the male connectors one way only. Also, the microphone and speaker connectors are keyed to fit their specific connectors only.*

10. Carefully remove the palmrest assembly from the bottom assembly (see Figure 15).



**Figure 15. Palmrest Assembly Removal**

## Bottom Assembly



**Figure 16. Bottom Assembly**

The bottom assembly consists of the following field-replaceable components:

- Reserve battery
- Main battery
- Main battery release latch
- Thermal cooling solution
- System board assembly
- Fan assembly
- Touch pad
- Bottom case cover

### Reserve Battery

**NOTICE: The reserve battery provides power to the computer's real-time clock (RTC) and nonvolatile random-access memory (NVRAM) when the computer is turned off. Removing the battery causes the computer to lose its date and time information as well as all user-settable parameters in NVRAM. If possible, make a copy of this information before you remove the reserve battery.**

1. Remove the status indicator panel (see Figure 9).
2. Remove the keyboard (see Figure 13).

3. Disconnect the reserve battery cable from the connector on the system board and lift the reserve battery (see Figure 16).

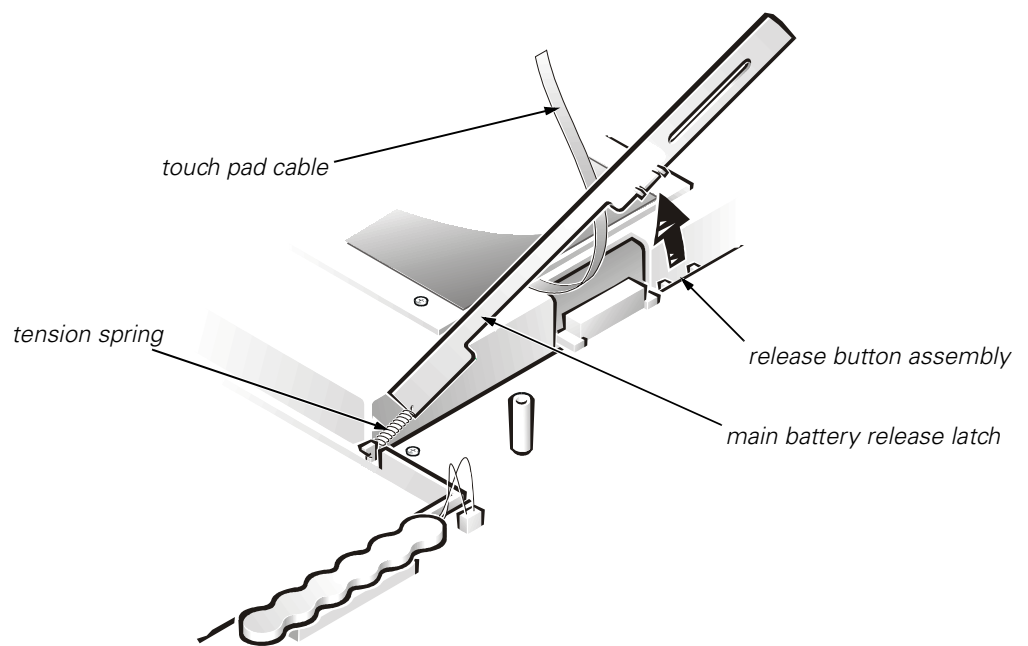
The reserve battery is located behind the hard-disk drive, and is attached to the system board with an adhesive foam pad.

4. Tear the reserve battery free from the foam pad.
5. Remove the remnants of the foam pad from the system board.

### **Main Battery**

See the “Preparing to Work Inside Your Computer” section found earlier in this manual for detailed instructions for removing the battery.

### **Main Battery Release Latch**



**Figure 17. Main Battery Release Latch**

1. Remove the status indicator panel (see Figure 9).
2. Remove the display assembly (see Figure 10).
3. Remove the keyboard assembly (see Figure 13).
4. Remove the palmrest assembly (see Figure 14).
5. Remove the thermal cooling solution (see Figure 18).
6. Carefully disconnect the touch pad cable from the ZIF connector on the system board (see Figure 4 and Figure 17).

7. Grasp the top of the battery release latch and gently pull up to free it from the release button assembly, which is located underneath the system board (see Figure 17).

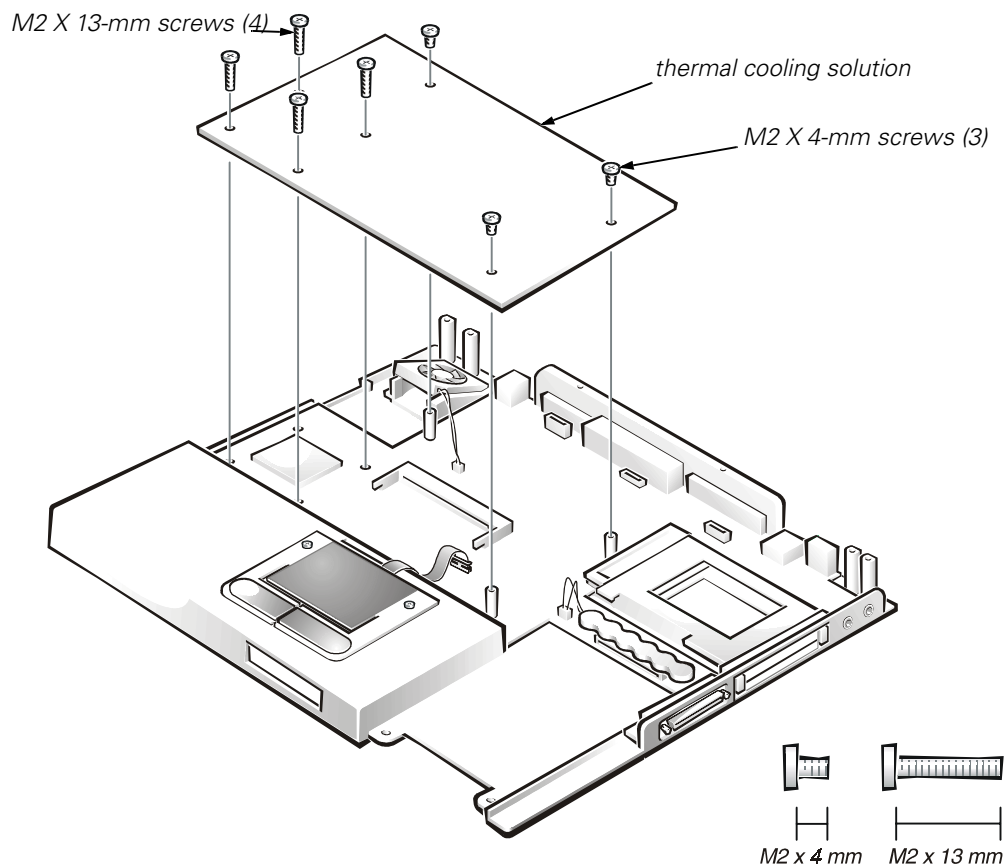
The battery release latch is mounted on the back side of the battery compartment next to the system board assembly.

**NOTICE: When reinstalling the battery release latch, connect the touch pad cable to the ZIF connector on the system board after installing the battery release latch.**

8. Unhook the small tension spring from the metal post to remove the battery release latch.

The spring attaches the right end of the battery release latch to a small metal post located next to the hard-disk drive.

### Thermal Cooling Solution



**Figure 18. Thermal Cooling Solution Removal**



**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**



*NOTE: The thermal cooling solution screw holes are labeled with screw sizes and numbered for the order that the screws should be removed or installed.*

1. Remove the keyboard assembly (see Figure 13).
2. Remove the four M2 x 13-mm screws grouped around the section of the thermal cooling solution that covers the microprocessor (see Figure 18).

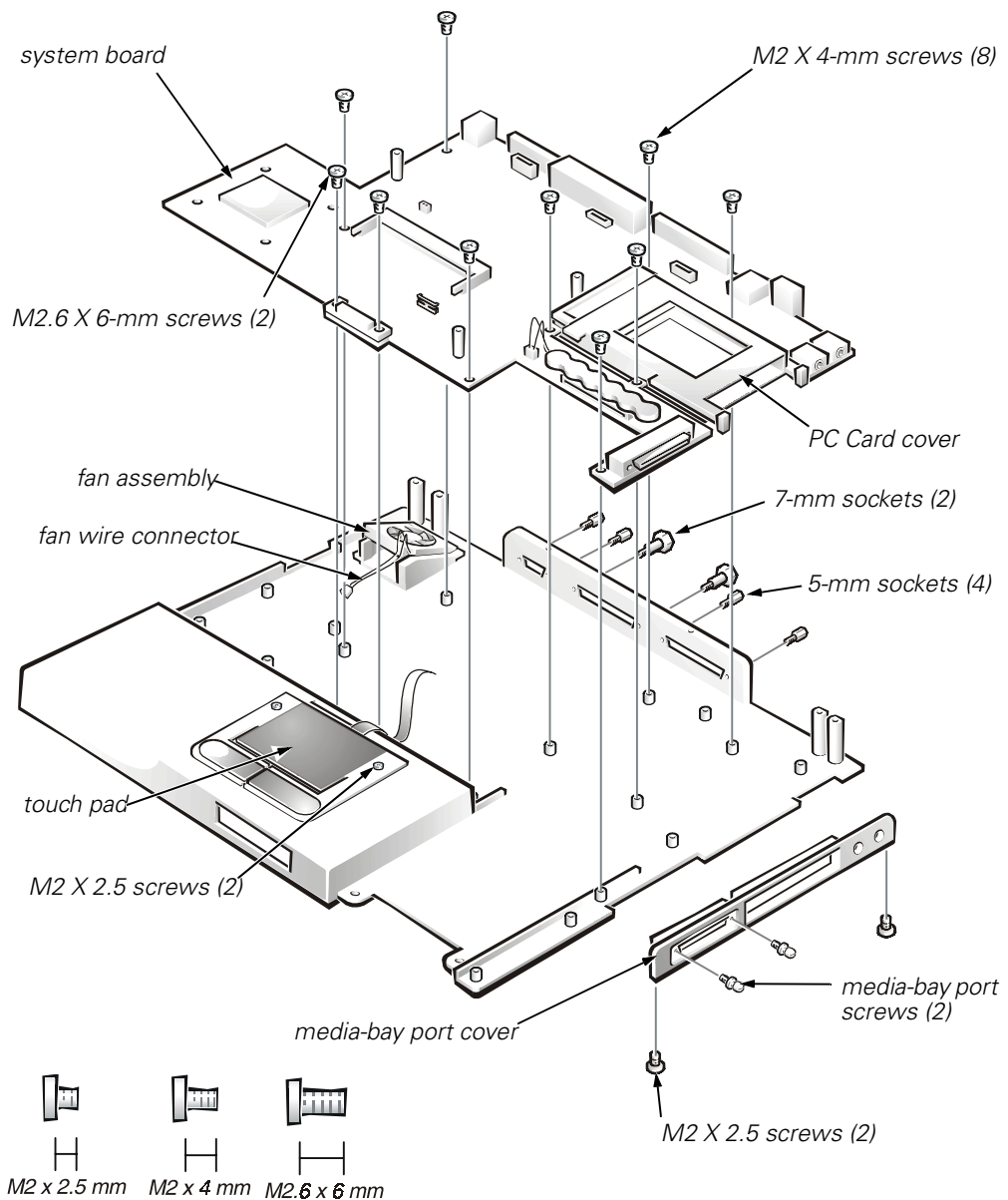
The screw holes are labeled on the thermal cooling solution in the order that the screws should be removed ("1" through "4").

3. Remove the three M2 x 4-mm screws in the corners of the thermal cooling solution.

The screw holes are labeled on the thermal cooling solution in the order that the screws should be removed ("5" through "7").

**NOTICE: To ensure maximum cooling for the microprocessor, do not touch the heat transfer areas on the thermal cooling solution. The oils in your skin reduce the heat transfer capability of the thermal pads.**

## System Board Assembly



**Figure 19. System Board Assembly Removal**

The system board's BIOS chip contains the system service tag number, which is also visible on a bar-code label on the bottom of the computer. The replacement kit for the system board assembly includes a diskette that provides a utility for transferring the service tag number to the replacement system board assembly.

To remove the system board assembly, perform the following steps.

**NOTICE: To avoid damaging the system board, you must remove the main battery before you service the computer.**

1. Remove the palmrest assembly (see Figure 15).
2. Remove the thermal cooling solution (see Figure 18).

**NOTICE: To ensure maximum cooling for the microprocessor, do not touch the heat transfer areas on the thermal cooling assembly. The oils in your skin reduce the heat transfer capability of the thermal pads.**

3. Remove the media-bay port cover from the bottom assembly by removing the two M2 x 2.5 screws from the bottom of the media-bay port cover and removing the two media-bay port screws (see Figure 19).
4. Remove the main battery release latch (see Figure 17).
5. Use a 5-mm socket wrench to remove the four 5-mm sockets for the VGA and parallel ports located on the back of the bottom assembly.
6. Use a 7-mm socket wrench to remove the two 7-mm sockets for the docking connector located on the back of the bottom assembly (or use a flat-blade screwdriver to remove these 7-mm sockets).
7. Remove the eight M2 x 4-mm screws connecting the system board to the bottom assembly.

These eight M2 x 4-mm screws are marked with white circles around the screw head on the system board.

8. Remove the two M2.6 x 6-mm screws connecting the system board to the bottom assembly.

These two M2.6 x 6-mm screws are marked with white circles around the screw head on the system board.

9. Remove any PC Cards or plastic blanks from the PC Card slot.
10. Verify that the PC Card ejectors do not extend from the PC Card slot.
11. Carefully disconnect the fan wire connector from the system board (see Figure 19).

The female connector on the fan wire is keyed to fit into the male connector one way only.

12. Lift the system board assembly out of the bottom assembly.
13. Transfer the memory module(s) to the replacement system board assembly.
14. Remove the microprocessor. The microprocessor socket is either type A or type B (see Figure 20).

If the socket is type A, use a flat-blade screwdriver to turn the cam 180 degrees counterclockwise. When the cam is in the open position, the triangular-shaped pointer on the cam points toward the "O" (open position), and a view window, on the lower right-hand side of the cam, displays a full circle (see Figure 20, type-A socket). Grasp the edges of the microprocessor to lift it out of the socket.

If the socket is type B, use a Phillips-head or a flat-blade screwdriver to turn the cam 180 degrees counterclockwise. When the cam is in the open position, a tab on the cam points toward the "O" (open position) (see Figure 20, type-B socket). Grasp the edges of the microprocessor to lift it out of the socket.

**NOTICE: The microprocessor die (the purple rectangular area) must remain free of any scratches, dust, residue, and fingerprints.**

**NOTICE: Do not touch the microprocessor die or the microprocessor pins. Pick up the microprocessor by the edges touching only the brown perimeter area surrounding the die.**

**NOTICE: Do not drop the microprocessor from a distance of more than 6 inches, and do not bend the microprocessor pins. Replace the microprocessor if it is dropped from a distance of more than 6 inches or if the pins are bent more than 45 degrees.**

15. Remove the two M2 x 4-mm screws located on the back corners of the hard-disk drive bay that attach the hard-disk drive electromagnetic interference (EMI) clips to the system board.
16. Install a new microprocessor.

*To install a microprocessor in a type-A socket, place the microprocessor in the socket and use a flat-blade screwdriver to turn the triangular-shaped pointer on the cam clockwise 180 degrees toward the "L" (locked position). The view window displays a half circle when the cam is in the locked position (see Figure 20, type-A socket).*

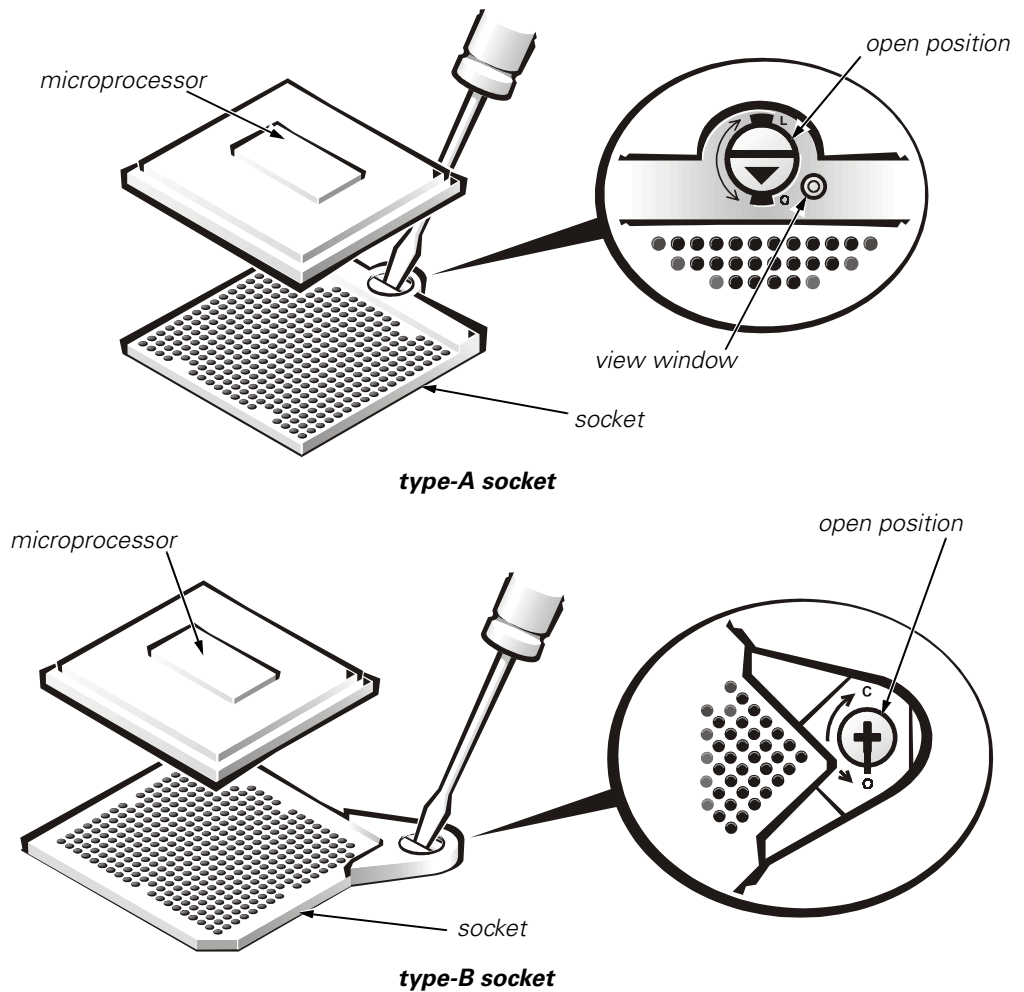
*To install a microprocessor in a type-B socket, place the microprocessor in the socket and use a Phillips-head or flat-blade screwdriver to turn the cam clockwise 180 degrees so that the tab on the cam points toward the "C" (closed position) (see Figure 20, type-B socket).*



*NOTE: When replacing the microprocessor, save the package material from the new microprocessor to repackage the old microprocessor for transport.*

17. Attach the hard-disk drive EMI clips and the PC Card cover to the new system board assembly.

After replacing the system board assembly, be sure to enter the system's service tag number into the BIOS of the replacement system board assembly. Insert the diskette that accompanied the replacement system board assembly into the diskette drive, and turn on the computer. Follow the instructions on the display screen.



**Figure 20. Microprocessor Removal**

### *Touch Pad*

1. Remove the palmrest assembly (see Figure 15).
2. Remove the two M2 x 2.5-mm screws from the top of the touch pad (see Figure 19).
3. Carefully disconnect the ZIF connector to release the touch pad cable from the system board (refer to Figure 4).
4. Remove the touch pad.

### *Fan Assembly*

1. Remove the palmrest assembly (see Figure 15).
2. Remove the thermal cooling solution (see Figure 18).
3. Carefully disconnect the fan wire connector from the system board (see Figure 19).

The female connector on the fan wire is keyed to fit into the male connector one way only.

4. Remove the two M2 x 4-mm screws that secure the fan assembly to the bottom assembly.



# Index

## **B**

bottom assembly  
  components, 22  
  illustrated, 22

## **D**

display assembly  
  bezel removal, 13, 14  
  removal, 11

## **F**

fan removal, 29  
field-replaceable parts and  
  assemblies illustrated, 6

## **G**

grounding to dissipate static  
  electricity, 3

## **H**

hard-disk drive assembly removal, 7

## **K**

keyboard assembly removal, 18

## **L**

LCD panel removal, 15

## **M**

main battery  
  release latch removal, 23  
  removal, 3, 23  
memory module  
  cover removal, 8  
  removal, 8  
microprocessor removal, 29

## **P**

palmrest assembly  
  removal, 21  
  screws removal, 19

## **R**

reserve battery removal, 22

## **S**

screw identification and tightening, 3  
sockets  
  memory module, 8  
status indicator panel removal, 10  
system board assembly

illustration, 26  
removal, 26

## **Z**

ZIF connectors, 5

## **T**

thermal cooling solution removal, 24  
tools, 2  
top memory module removal, 9  
touch pad removal, 29





Printed in Ireland.



\* 0 7 0 8 R \*

P/N 0708R Rev. A01





Printed in the U.S.A.

**DELL**™



\* 0 7 0 8 R \*

P/N 0708R Rev. A01

[www.dell.com](http://www.dell.com)