

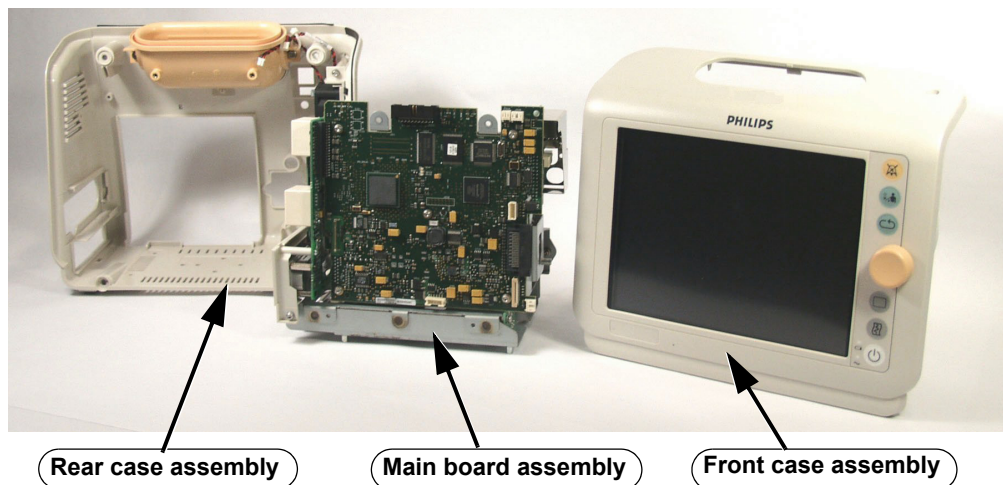
Repairing the Monitor

Disassembling the Monitor

This chapter contains the procedures for disassembling the monitor to replace defective assemblies or components.

The monitor has three main assemblies:

- Rear case
- Main board
- Front case



The monitor can be further disassembled into all major components, including:

- Printed circuit boards (boards)
- Battery
- Cables
- LCD
- Measurement modules

For more information about replaceable parts, see Chapter 6, “Replacement Parts and Assembly Drawings.”

Warning

Before you open or disassemble the monitor, disconnect the AC power from the monitor and remove the battery.

After any monitor repair, you must perform the recommended Performance and Safety tests before you put the monitor into operation. Failure to perform these tests can result in erroneous monitor readings. For more information about performing safety and performance tests, see Chapter 3, “Performance Verification Testing.”

Caution

Observe ESD (electrostatic discharge) precautions when working inside the monitor.

Do not dispose of this product (or any parts of it) in industrial or domestic waste. The system may contain hazardous substances that can cause serious environmental pollution. The system also contains privacy sensitive information. Philips recommends that you contact your Philips Service Organization before disposing of this product.

To avoid contaminating or infecting personnel, the environment or other equipment, disinfect and decontaminate the monitor before disposing of it in accordance with your country's laws. For more information, see the resources listed below.

Philips Healthcare gives support for:

- **Recovery of reusable parts.**
- **The recycling of useful materials by competent disposal companies.**
- **Safe and effective disposal of equipment**

For advice and information, contact your Philips Service Organization and see <http://www.healthcare.philips.com/main/about/sustainability/recycling/index.wpd> for more information.

Before disposing of a SureSigns monitor, delete all patient information. For instructions on deleting patient data, see “Clearing Patient Data” on page 4-37.

If the device label on your monitor indicates that it may contain mercury, recycle or dispose of the monitor in accordance with local, state, or federal laws for mercury.

If this product is to be passed on to another user who is to use it for its intended purpose, then it should be passed on in its complete state. In particular, the existing user should make sure that all the product support documentation — including all Instructions for Use — are passed on to the new user. A new user should be made aware of the support services that Philips Healthcare provides for installing, commissioning, and maintaining the equipment or system, and for the comprehensive training of operators. Existing users must bear in mind that passing on medical electrical equipment to new users may present serious technical, medical, privacy, and legal risks. The original user may remain liable even if the equipment is given away.

Existing users are strongly advised to seek advice from their local Philips Healthcare representative before agreeing to pass on any equipment.

After the equipment has been passed on to a new user, the previous user may still receive important safety-related information, such as bulletins and field change orders. In many jurisdictions there is a clear duty on the previous user to communicate such safety-related information to new users.

Previous users who are not able or prepared to do this should inform Philips Healthcare about the new user, so that Philips Healthcare can provide the new user with safety-related information.

Note — *If your monitor is equipped with a wireless assembly, remove all of the wireless components before performing any of the following procedures. For more information, see the SureSigns VS3 Wireless Installation and Setup Guide.*

Tools Required for Service

The following tools and additional test equipment are required to disassemble, repair, and re-assemble the monitor.

- #1, #2 Phillips screwdrivers
- Torx T10, T20 screwdrivers
- Small and medium flathead screwdrivers
- 10 mm, 12 mm wrenches
- Needle nose pliers

- Plastic cable zip ties
- Wire-cutters
- ESD mat and wrist strap

Shutting Down the Monitor

Perform a hard shutdown whenever you need to power down the monitor for repair. Performing a hard shutdown ensures that all patient and system data is saved in memory.

To perform a hard shutdown:

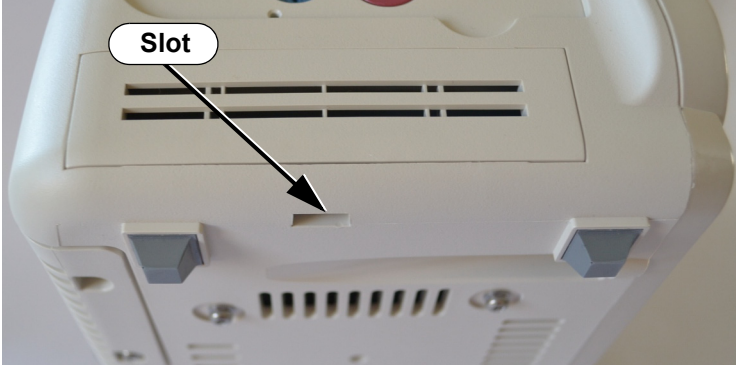
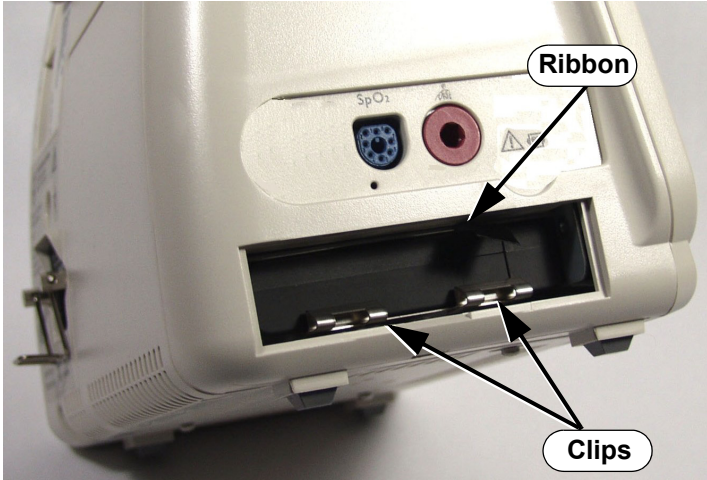
Step	
1	Open the System Menu . See “Accessing the System Menu” on page 3-4.
2	Select the Shutdown button.
3	In the confirmation window that appears, select the Yes button. The monitor shuts down.

Removing the Battery

Caution **Before you remove the battery, perform a monitor hard shutdown.**



To remove the battery:

Step	
1	Shut down the monitor. See “Shutting Down the Monitor” on page 5-3.
2	Disconnect the AC power cord from the rear of the monitor.

<p>3</p>	<p>Tip the monitor and insert a flathead screwdriver into the slot in the bottom of the case under the battery cover.</p>  <p>Slot</p> <hr/> <p>Caution</p> <p>Do not try to remove the battery cover by inserting the screwdriver into the vents in the cover. This can damage the battery case cover.</p> <hr/>
<p>4</p>	<p>Slightly twist the screwdriver to pop the battery cover off of the case.</p>
<p>5</p>	<p>Press down on the battery retaining clips, and pull the battery out of the monitor by the ribbon.</p>  <p>Ribbon</p> <p>Clips</p>

Reinstalling the Battery

To reinstall the battery:

Step	
1	Orient the battery so that the contacts and ribbon are on the right.
2	<p>Insert the battery into the empty battery compartment and push it in until the battery snaps into place behind the metal retaining clips.</p> 
3	<p>Replace the battery cover by inserting it into the battery opening with the two tabs facing up.</p> 
4	Snap the battery cover into place by pressing it firmly against the monitor case.

Removing a Fuse

To remove a fuse in the AC power connector:

Step	
1	Disconnect the AC power cord from the rear of the monitor.
2	Remove the battery from the monitor (see “Removing the Battery” on page 5-3).
3	Use needle nose pliers to lift the fuse holder away from AC power connector. <div data-bbox="483 594 1268 1039" data-label="Image"> </div>
4	Replace the fuse(s), and then push the fuse holder back into the power connector until it snaps into place.

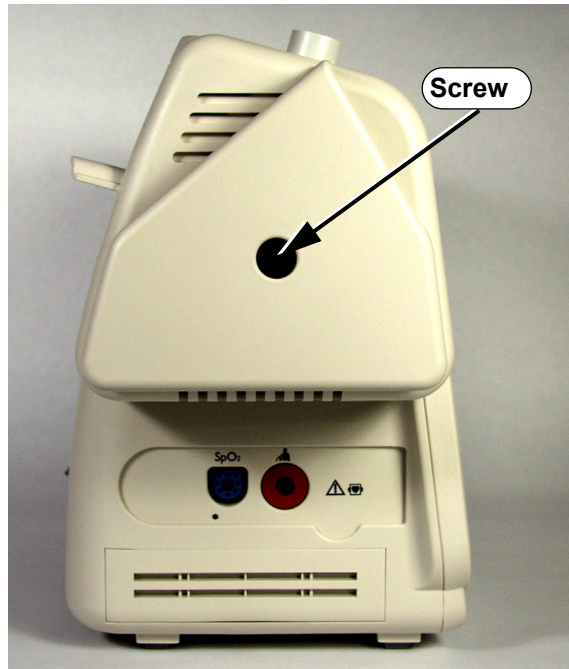
Removing the Predictive Temperature Module and Probe Cover Holder

To remove the predictive temperature module and probe cover holder:

Step	
1	Disconnect the AC power cord from the rear of the monitor.
2	Disconnect the temperature probe.
3	Remove the battery from the monitor (see “Removing the Battery” on page 5-3).

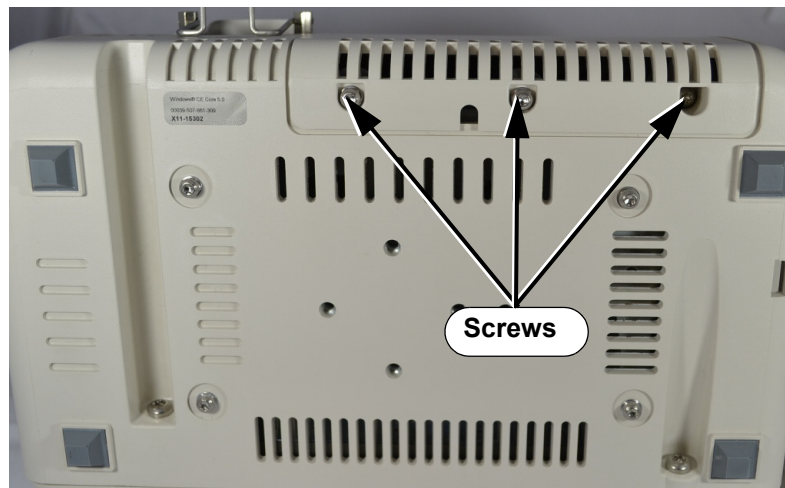
4

Remove the Torx T10 screw and washer from the probe cover holder and remove the holder from the case.

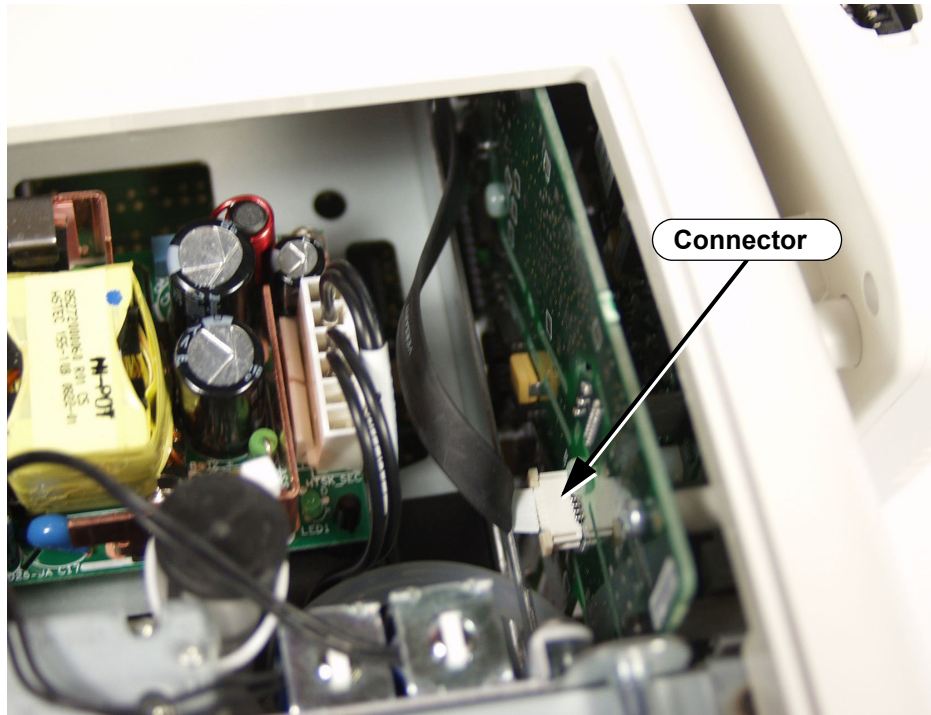


5

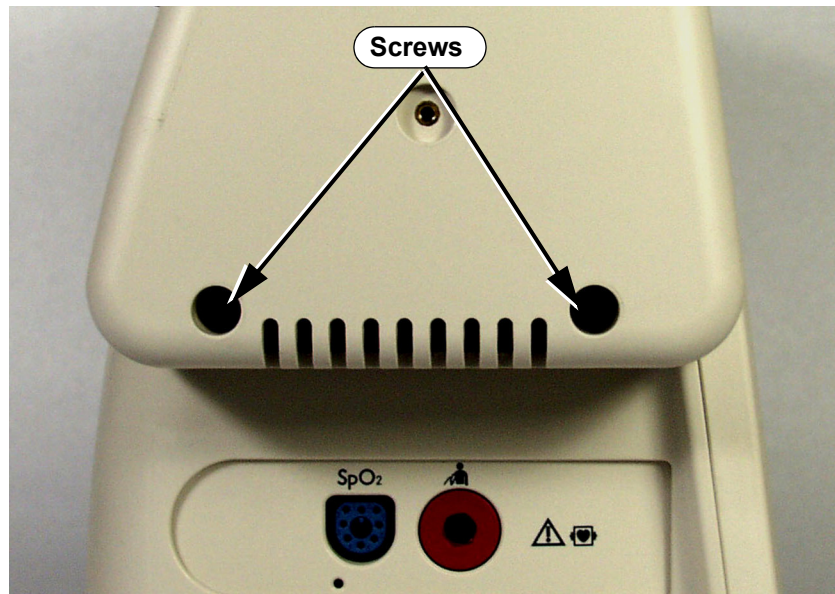
Remove three Torx T10 screws and washers from the bottom of the rear cover and remove the cover from the monitor case.



- 6 Disconnect the temperature module cable from the connector on the front end assembly board.



- 7 Remove the two Torx T10 screws and washers from the temperature module.



- 8 Gently pull the temperature module and temperature module cable away from the monitor.

Reinstalling the Predictive Temperature Module

To reinstall the temperature module:

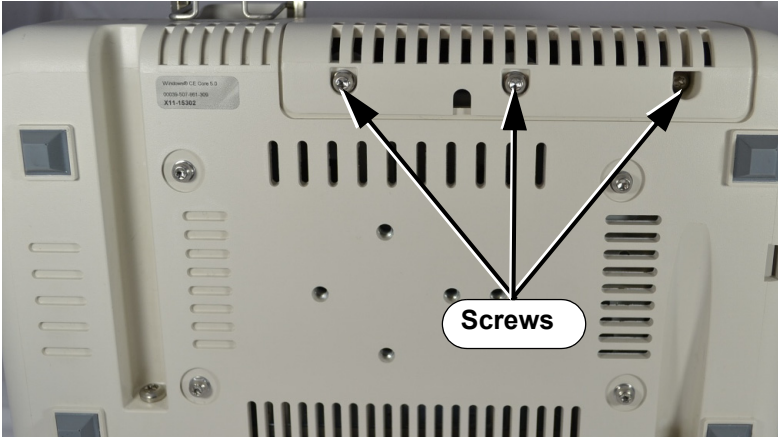
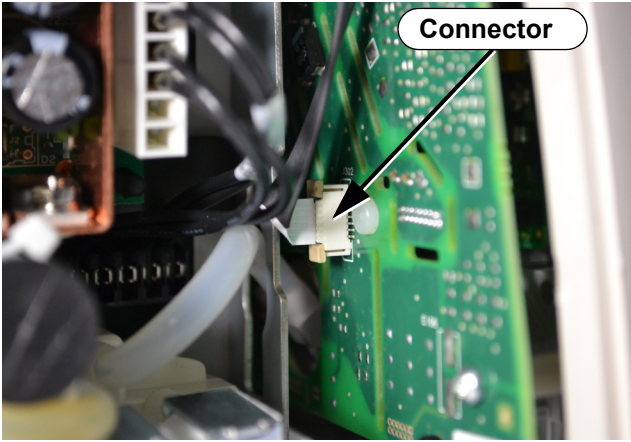
Step	
1	<p>Use isopropyl alcohol to clean the surface where the adhesive strip will be applied. Ensure that the surfaces are clean and free of any adhesive residue. Dry the surface thoroughly.</p> <div data-bbox="532 493 1393 976" style="text-align: center;"> <p>Clean here</p> </div>
2	Place a new adhesive strip on the temperature module.

<p>3</p>	<p>Feed the temperature module cable through the top vent slot on the side of the monitor and over the top of the front end board.</p> <p>Note — You may need to open the front and rear case assemblies to reattach the temperature module cable. See “Separating the Front and Rear Case Assemblies” on page 5-13.</p> <div data-bbox="607 396 1127 1047" data-label="Image"> </div>
<p>4</p>	<p>Reattach the temperature module cable to the front end board. Be sure the gold leads of the temperature module cable are facing toward the back of the monitor.</p>
<p>5</p>	<p>Remove the paper backing from the adhesive tape on the temperature module.</p>
<p>6</p>	<p>Align the screw holes of the temperature module with the screw holes on the monitor.</p>
<p>7</p>	<p>Secure the temperature module to the monitor with two Torx T10 screws.</p>
<p>8</p>	<p>Place the monitor on its side and then place a 10 lb to 15 lb weight on the module and leave it in place for 15 minutes to ensure a strong bond.</p> <hr/> <p>Caution</p> <p>This step is crucial to ensure a secure bond. It takes 24 hours to attain full bonding.</p> <hr/>
<p>9</p>	<p>Reattach the rear cover and temperature probe cover holder to the monitor.</p>

Caution After you replace the temperature module, complete all necessary performance tests. For more information, see “Testing and Inspection Guidelines” on page 3-1.

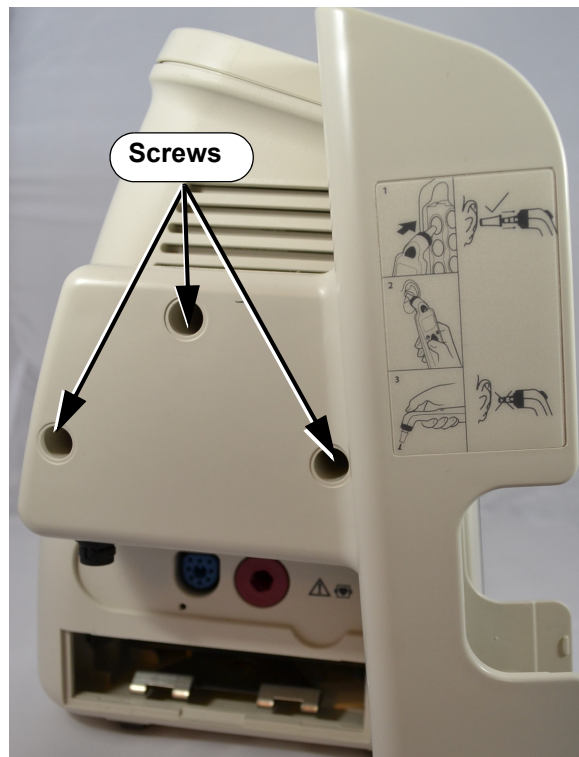
Removing the Tympanic Temperature Module

To remove the tympanic temperature module:

Step	
1	Disconnect the AC power cord from the rear of the monitor.
2	Disconnect the temperature probe.
3	Remove the battery from the monitor (see “Removing the Battery” on page 5-3).
4	Separate the front and rear cases. See “Separating the Front and Rear Case Assemblies” on page 5-13.
5	<p>Remove three Torx T10 screws and washers from the bottom of the rear cover and remove the cover from the monitor case.</p> 
6	<p>Disconnect the temperature module cable from the connector on the front end assembly board.</p> 
7	Remove the plastic labels covering the three screw holes.

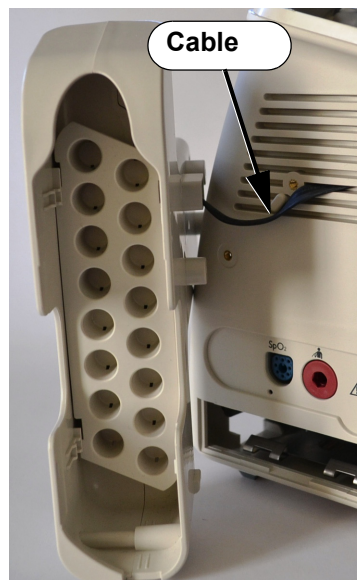
8

Remove the three Torx T10 screws and washers from the temperature module.



9

Gently pull the temperature module cable out of the monitor and remove the temperature module from the monitor.

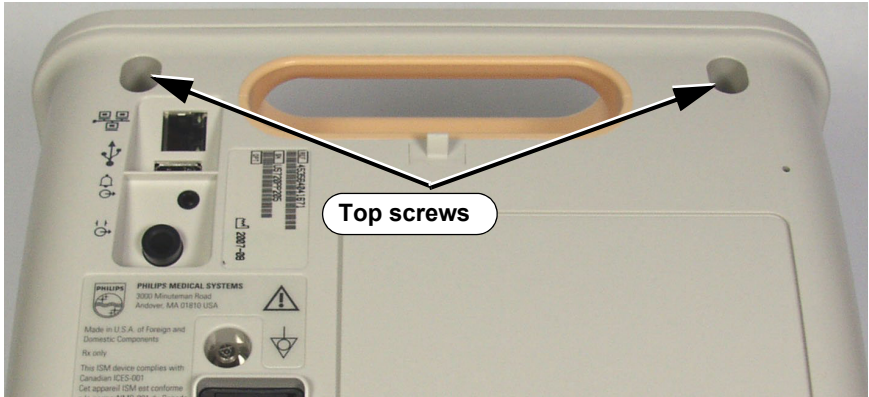


Separating the Front and Rear Case Assemblies

To install internal replacement parts, you must first separate the front and rear case assemblies.

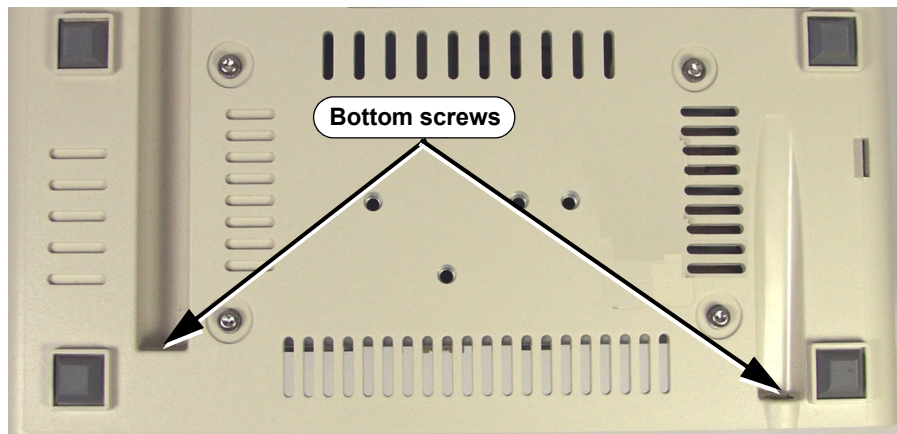
To separate the front and rear case assemblies:

Warning The metal edges on the inside of the front case assembly are sharp. Use extreme caution when handling the separated monitor assemblies.

Step	
1	Disconnect the AC power cable from the back of the monitor.
2	Disconnect all external cables from the monitor.
3	Remove the battery from the monitor (see “Removing the Battery” on page 5-3).
4	Remove the USB hub (if attached) from the rear cover.
5	<p>Remove the two Torx T20 screws from the top of the rear case.</p>  <p>Caution</p> <p>Cables run between the front and rear case assemblies.</p>

6

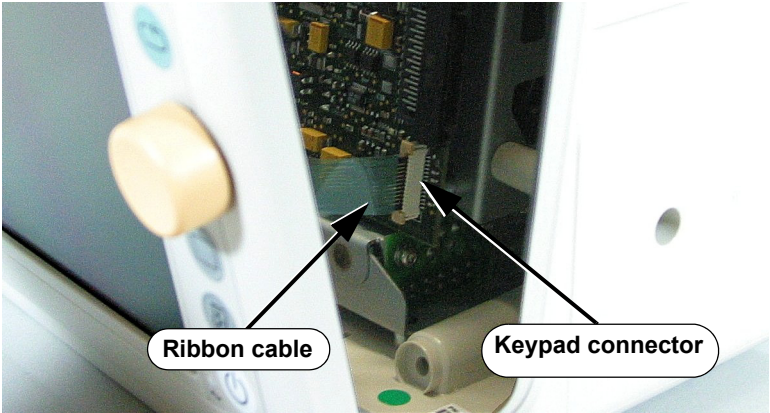
Remove the two Torx T20 screws from the bottom of the rear case.



7

Separate the front and rear case assemblies by pulling the lower edge of the front case assembly and slowly lifting it up over the handle.



8	<p>Disconnect the keypad ribbon cable from the main board by pulling the keypad connector to release it, and then gently pulling the ribbon cable out of the connector.</p> 
9	<p>Disconnect the other three cables from the main board.</p>

Reassembling the Front and Rear Cases

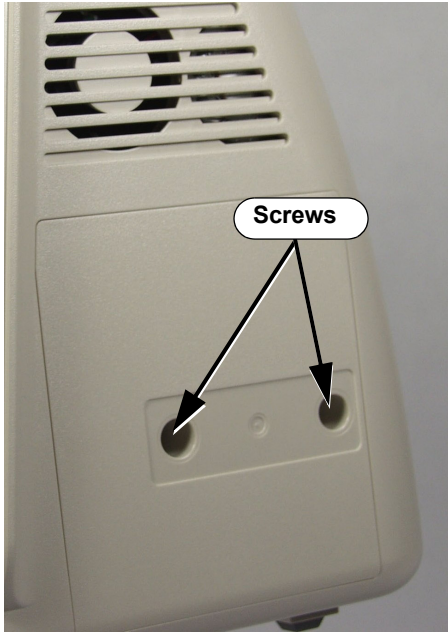
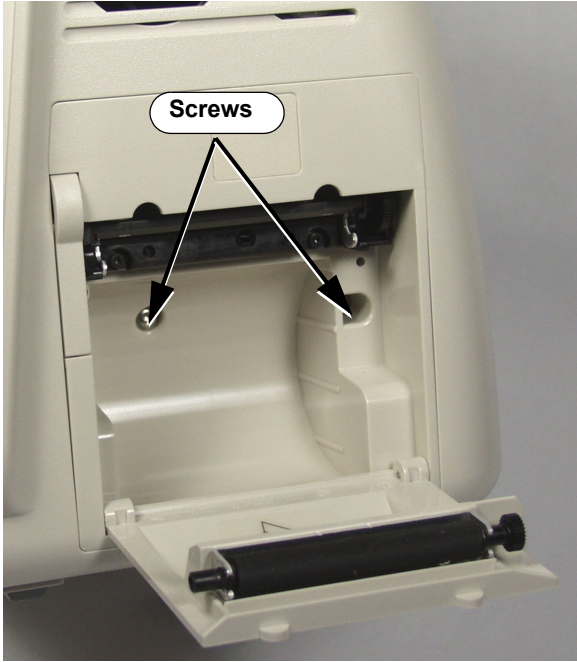
To reassemble the front and rear cases:

Step	
1	Connect all cables.
2	Line up the tab on the front assembly case with the handle on the rear case, and then slip the front assembly case over the handle.
3	Snap the two assembly cases together and install the four screws.
4	<p>Power up the monitor.</p> <p>If the monitor starts properly, perform the required performance tests (see “Testing and Inspection Guidelines” on page 3-1).</p>

Removing the Faceplate or Recorder

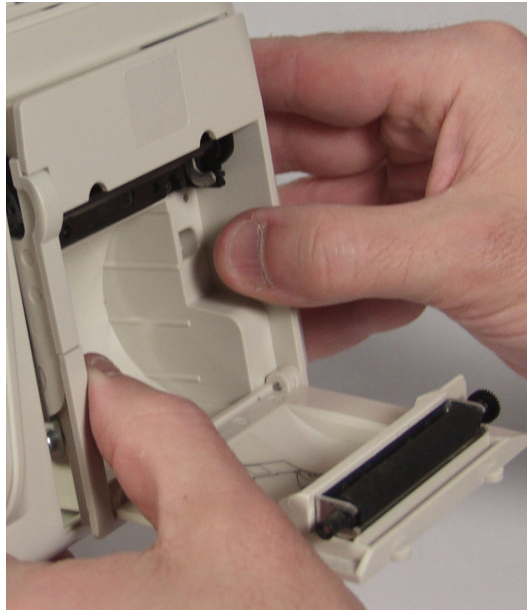
To remove the faceplate or optional recorder:

Step	
1	Shut down the monitor. See “Shutting Down the Monitor” on page 5-3.
2	<p>Go to the step appropriate for your monitor:</p> <p>For monitors without the optional recorder, go to step 3.</p> <p>For monitors with an optional recorder, go to step 5.</p>
3	Remove the plastic labels covering the two Torx T10 screws holding the faceplate to the monitor case.

4	<p>Remove the two screws, and lift the faceplate off.</p> 
5	<p>Open the recorder door on the rear case assembly and remove the paper roll.</p>
6	<p>Loosen (do not remove) the two Torx T10 screws holding the recorder to the monitor case.</p> 

7

Place your thumbs on either side of the recorder case and pull it straight out of the assembly and away from the recorder connector on the main board.



Caution

When you reassemble the recorder or faceplate, do not overtighten the screws.

Removing the Main Board Assembly

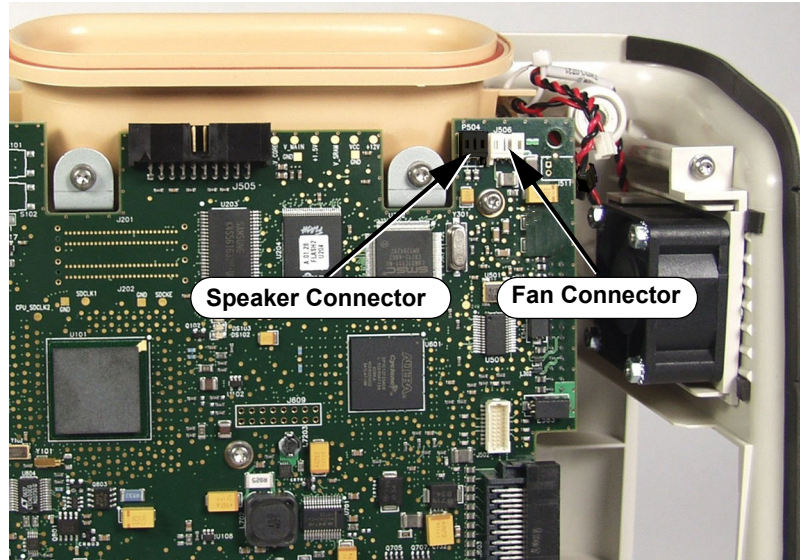
This section describes how to remove the main board assembly from the rear case and how to reinstall it.

Removing the Main Board Assembly

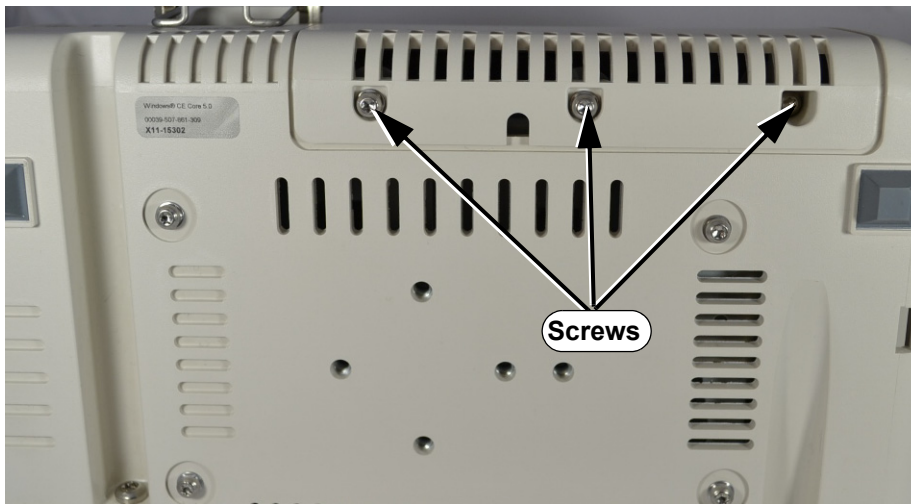
To remove the main board assembly from the rear case:

Step	
1	Separate the front and rear case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the faceplate or recorder. See “Removing the Faceplate or Recorder” on page 5-15.

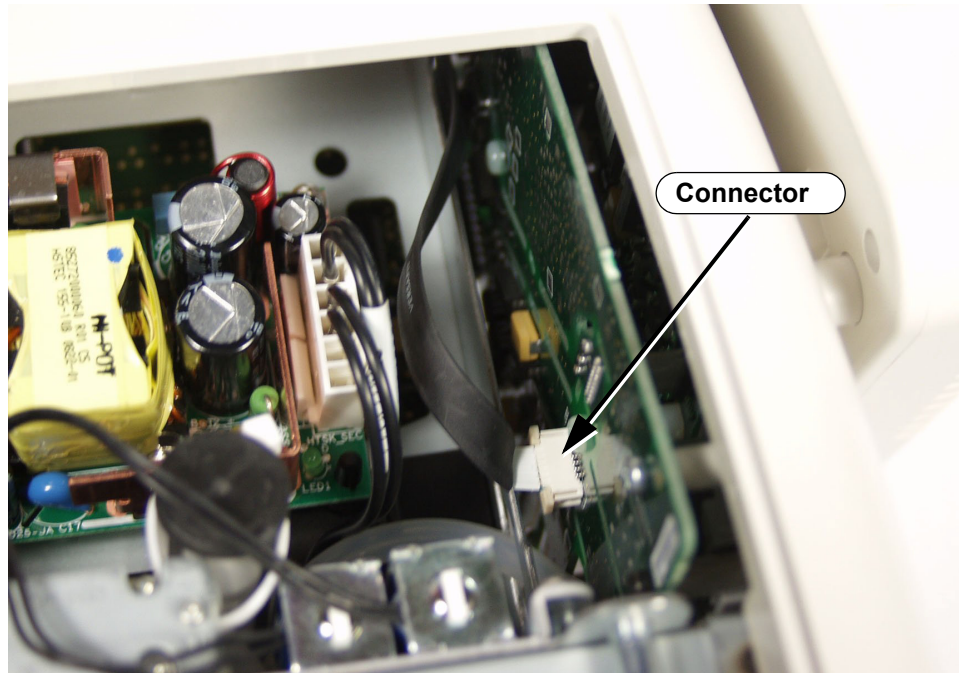
- 3 Disconnect the fan and speaker cables from the connectors on the main board.



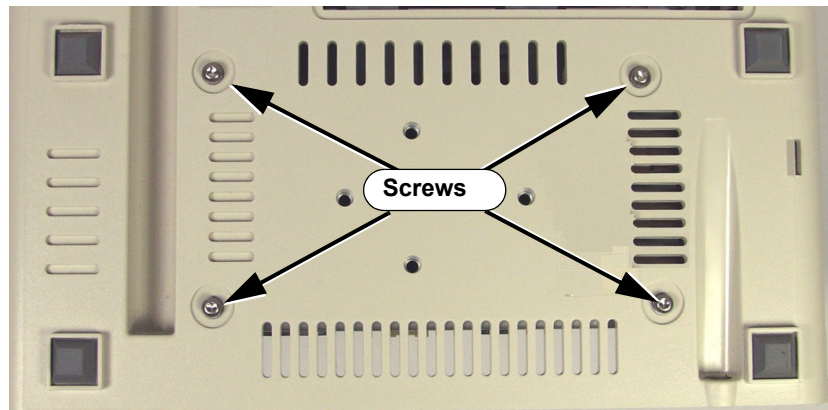
- 4 Remove three Torx T10 screws and washers from the bottom of the rear cover and remove the cover from the monitor case.



- 5 For monitors with the optional temperature module, disconnect the temperature cable connector from the front end assembly board.

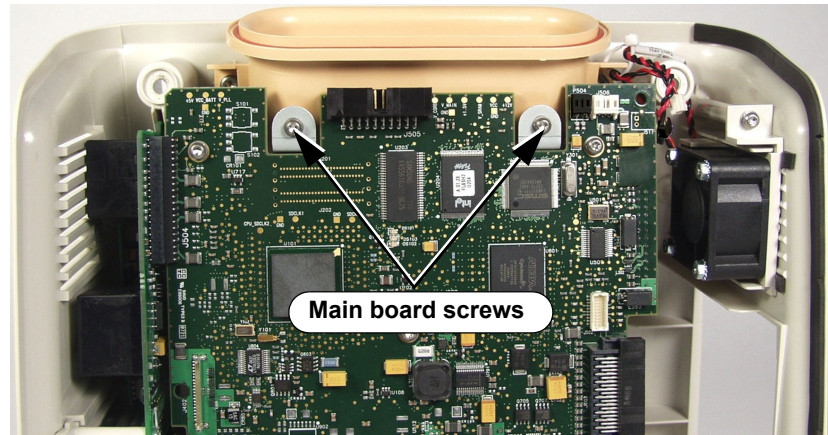


- 6 Remove the four Torx T10 screws and washers on the bottom of the rear case assembly.

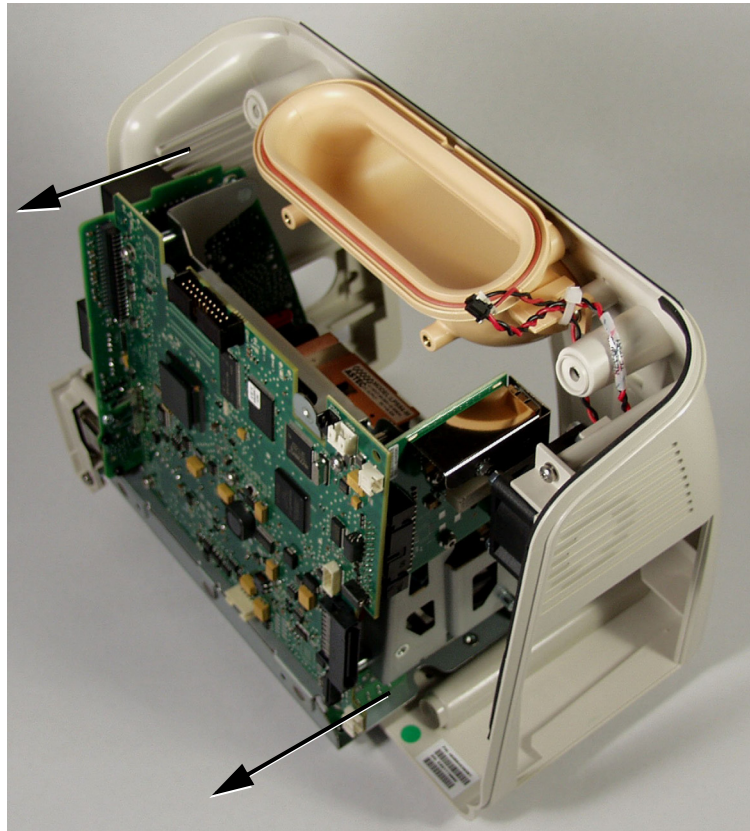


Removing the Main Board Assembly

- 7 Remove the two Torx T10 screws and washers from the main board assembly.

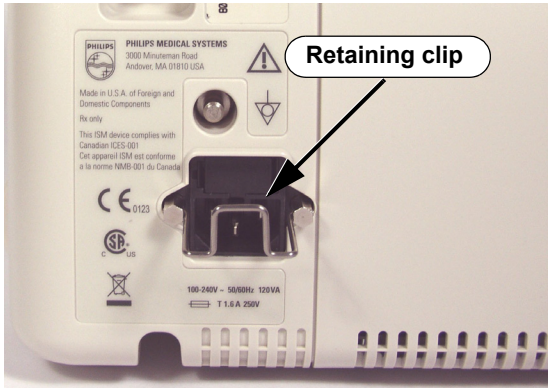


- 8 Pull the main board assembly out of the rear case.



Reinstalling the Main Board Assembly

To reinstall the main board assembly:

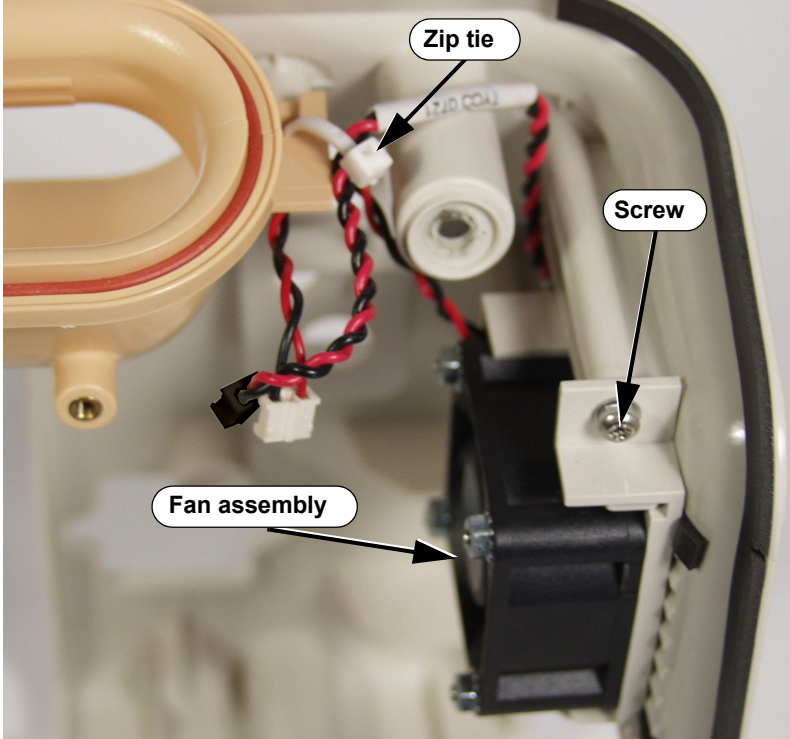
Step	
1	<p>Slide the main board assembly into the rear case (guiding the power cord retaining clip through the rear cover).</p> 
2	Push the assembly until it snaps into place in the case.
3	Replace the four Torx T10 screws and washers on the bottom of the rear case to ensure that the main board assembly fits correctly in the case.

Removing the Fan and Speaker

To remove the fan and speaker:

Step	
1	Separate the front and rear case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.

Replacing the Handle O-Ring

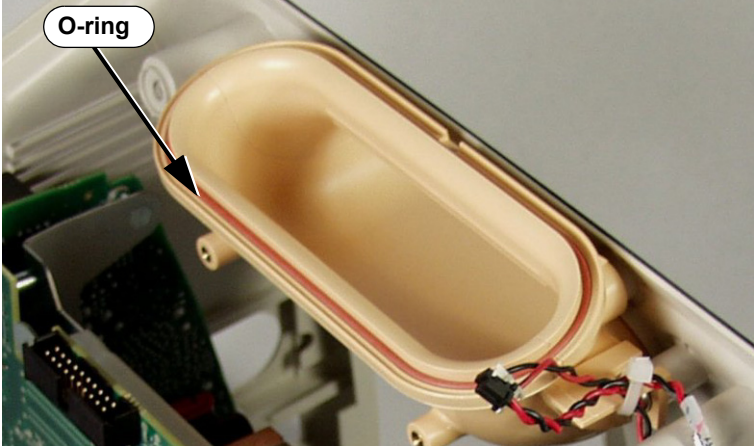
3	<p>Use wire cutters to cut the plastic zip tie securing the speaker and fan wires to the handle.</p>  <p>Note — When you reassemble the fan and speaker, secure the cables to the handle with a new plastic zip tie.</p>
4	Remove the Torx T10 screw and washer holding the fan assembly in place.
5	Slide the fan assembly and then the speaker out of the rear case.

Replacing the Handle O-Ring

Caution Do not try to remove the handle from the rear case. It is part of the rear case and not a replacement part.

To replace the handle O-ring:

Step	
1	Separate the front and rear case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.

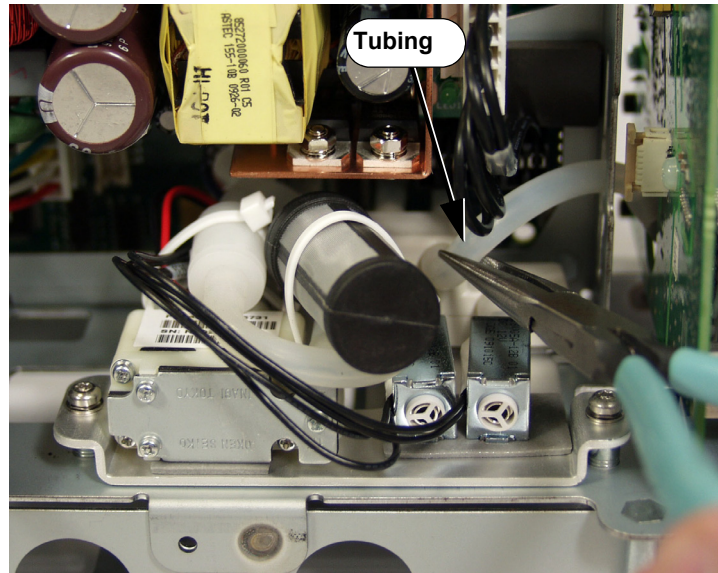
<p>2</p>	<p>Gently pull the O-ring from the inside of the handle. If the O-ring is damaged or torn, remove all pieces from the channel in the handle.</p> 
<p>3</p>	<p>Insert a new O-ring in the handle and press it into place along the channel in the handle.</p>

Removing the Front End Assembly

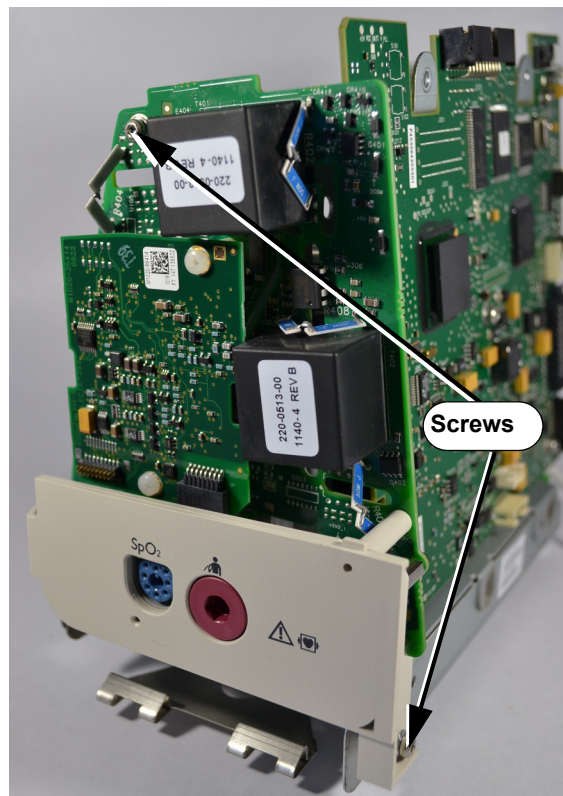
To remove the front end assembly:

Step	
<p>1</p>	<p>Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.</p>
<p>2</p>	<p>Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.</p>

- 3 Disconnect the tubing from the NBP manifold.

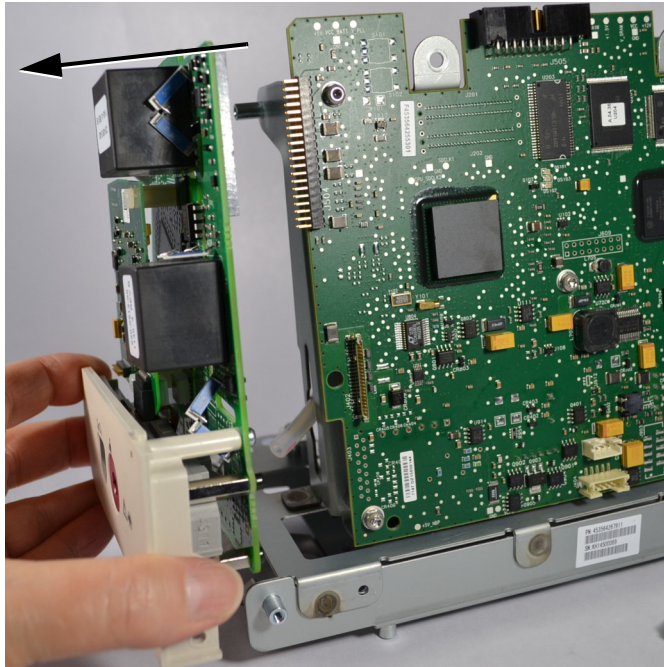


- 4 Remove the two Torx T10 screws and washers holding the front end assembly to the frame.



5

Pull the front end assembly away from the 40-pin connector on the side of the main board.



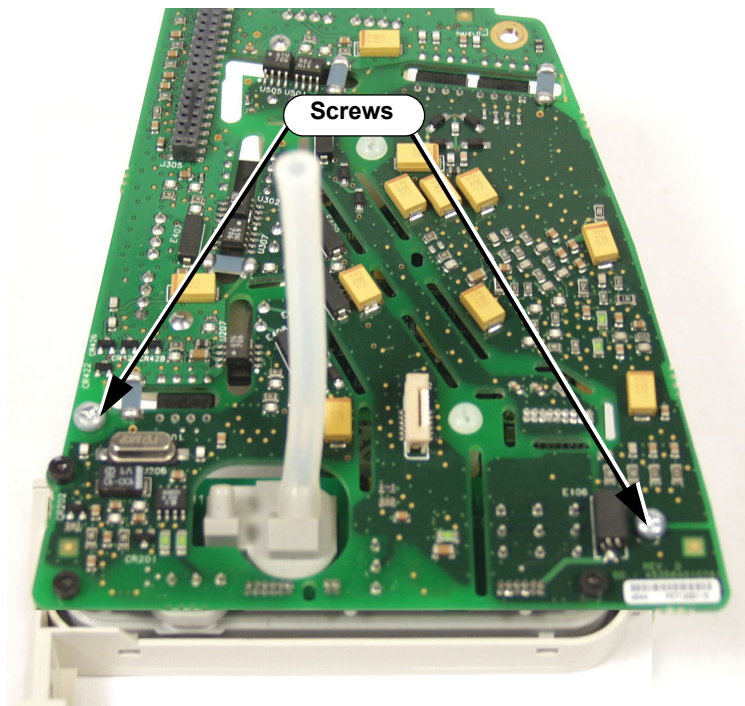
Replacing the SpO₂ Board

To remove the SpO₂ board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-23.

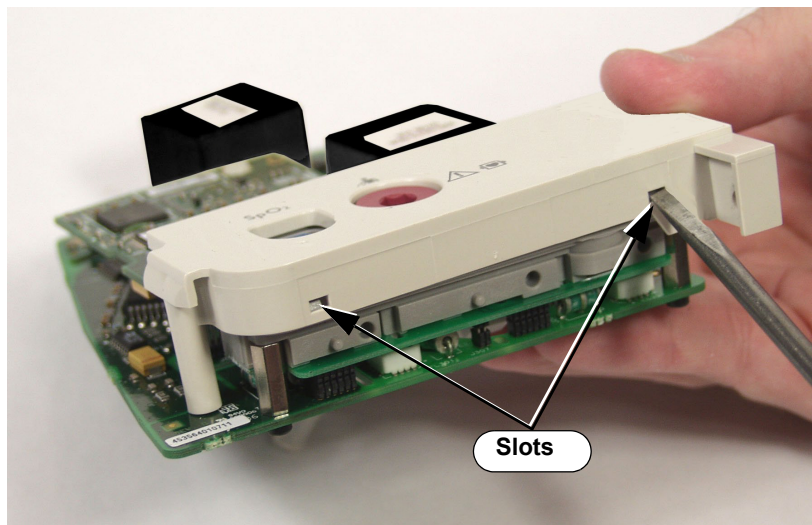
4

Remove the two Torx T10 screws holding the plastic cover to the front end assembly board.

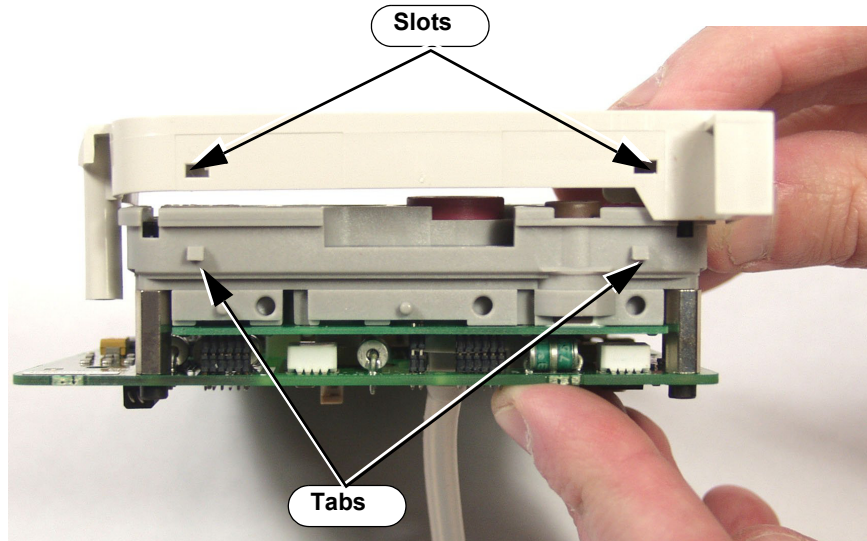


5

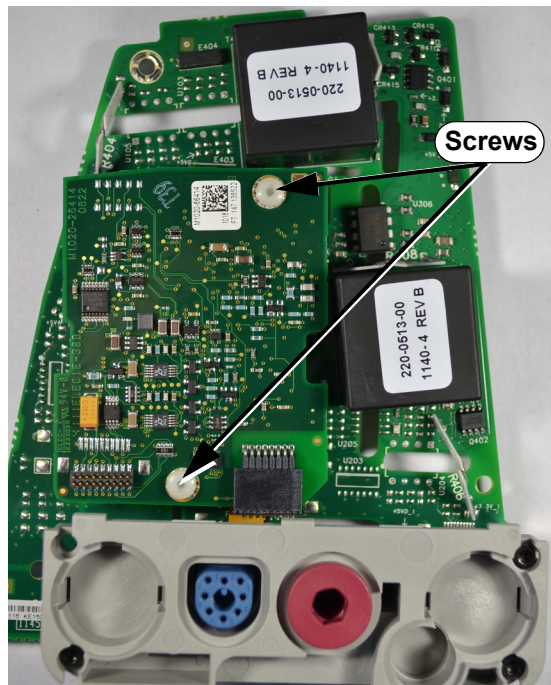
Remove the front end assembly cover by inserting a small flathead screwdriver into the two slots at the bottom of the cover and pushing the tabs.

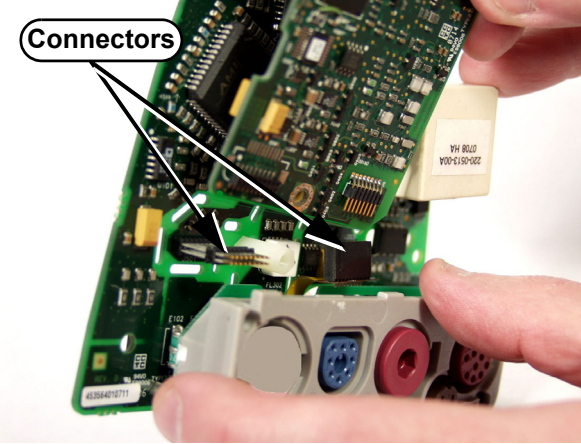


Note — To reattach the cover, line up the slots in the cover with the tabs on the assembly and snap the cover into place by pressing it onto the assembly.



6 Remove the two plastic Phillips screws on the front end assembly.



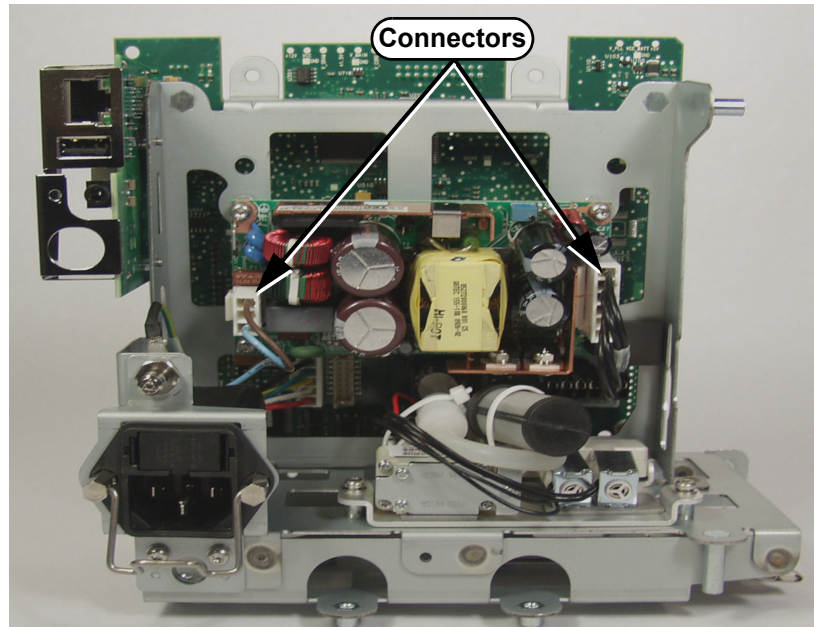
7	<p>Disconnect the SpO₂ board from the two connectors on the front end assembly board and remove the SpO₂ board.</p> 
---	--

Removing the Power Supply

To remove the power supply:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.

- 3 Disconnect the 2-pin and 6-pin power supply connectors from the back of the main board assembly.

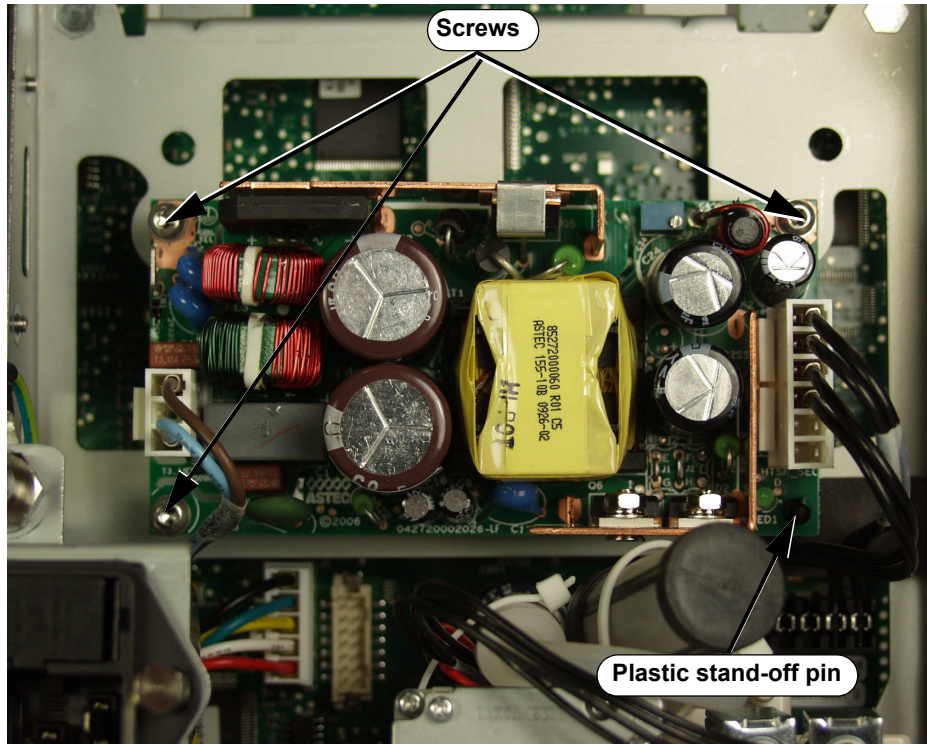


Caution

When you reconnect the power supply, connect the white 6-pin connector cable to the power supply and the black connector on the end of the cable to the main board. If you reverse the connectors, the monitor will not power up.

4

Remove the three Torx T10 screws and washers, use pliers to release the plastic stand-off pin, and then remove the power supply from the assembly.



Removing the Main Board

Caution

Before you replace the main board, export the current configuration settings. For more information, see the “Export Settings” section of the *SureSigns VS3 Installation and Configuration Guide*.

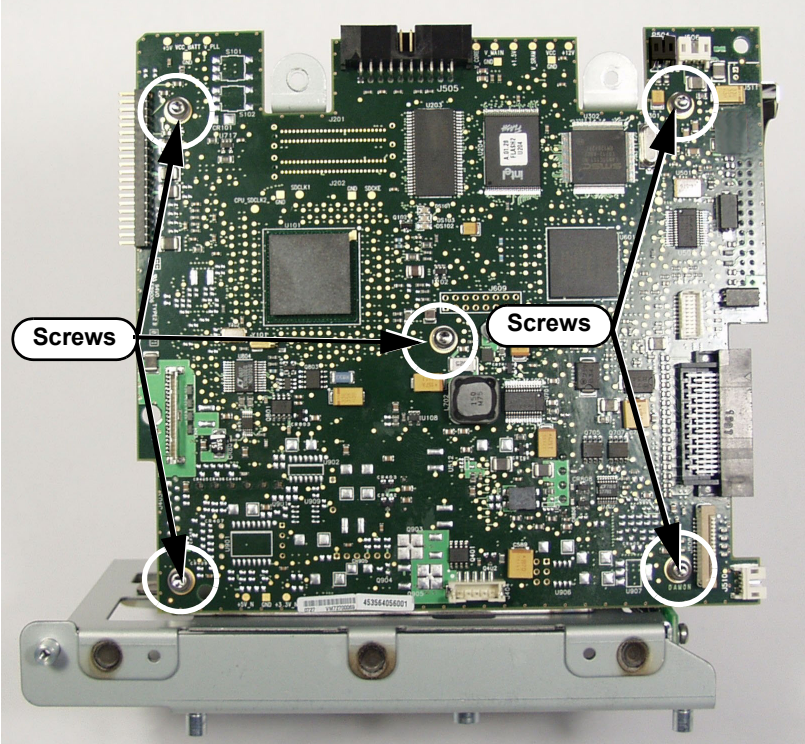
After you replace the main board, you must reset the monitor serial number and reconfigure the system.

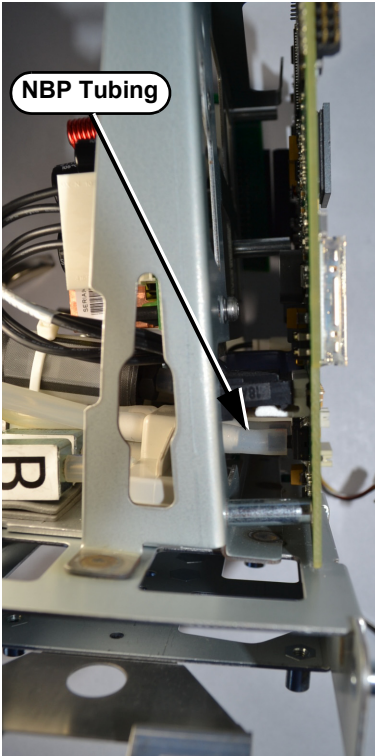
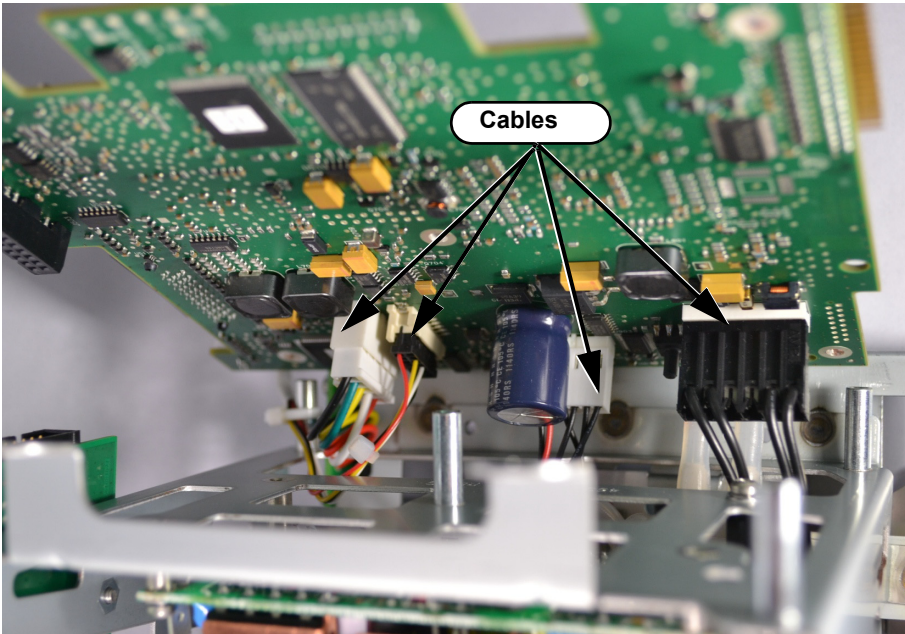
For information about resetting the serial number, see “Resetting the Serial Number” on page 5-33.

For information about configuring the system, see “Setting the System Configuration” on page 5-33.

To remove the main board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.

3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-23.
4	<p>Remove the five T10 screws from the main board.</p> 

<p>5</p>	<p>Disconnect the NBP tubing from the main board.</p>  <p>The image shows a close-up of the main board assembly. A red and black NBP tubing is connected to a component on the board. A callout box labeled "NBP Tubing" has an arrow pointing to the connection point.</p>
<p>6</p>	<p>Disconnect the four cables from the connectors on the main board.</p>  <p>The image shows a close-up of the main board assembly. Four cables are connected to connectors on the board. A callout box labeled "Cables" has arrows pointing to each of the four cable connections.</p>
<p>7</p>	<p>Remove the board from the assembly.</p>

Resetting the Serial Number

When you replace the main board, you must reset the serial number. The serial number appears in a label (marked **SN**) on the back of the monitor.

To reset the serial number:

Step	
1	Open the Maintenance options of the System Diagnostics menu. See “Accessing Maintenance Options” on page 3-11.
2	Select the Reset S/N button. The Reset Serial Number menu appears. <div data-bbox="613 684 1365 1297" style="border: 2px solid blue; border-radius: 15px; padding: 10px; margin: 10px auto; width: fit-content;"> <div style="background-color: black; color: white; padding: 5px;">Reset Serial Number</div> <div style="text-align: center; margin-top: 10px;"> Serial Number: <div style="border: 1px solid white; border-radius: 10px; display: inline-block; padding: 2px 10px; margin: 5px 0;">US93619750</div> </div> <div style="display: flex; justify-content: center; gap: 20px; margin-top: 20px;"> <div style="border: 1px solid white; border-radius: 10px; padding: 5px 15px;">Apply</div> <div style="border: 1px solid white; border-radius: 10px; padding: 5px 15px;">Cancel</div> </div> </div>
3	Select the Serial Number field. A keyboard appears.
4	Enter the serial number. Use the Back button to backspace, the Cancel button to close the keyboard without saving, or the OK button to save the changes.
5	Select the Apply button. A confirmation window displays the message: System will restart now.
6	In the confirmation window, select the OK button. The monitor restarts.

Setting the System Configuration

When the monitor performs a self test, it first checks its system configuration. If you replace the main board, you must reprogram the system configuration.

Caution The system configuration settings must match the hardware installed on the monitor. Incorrect settings may result in system malfunction alarm messages and the monitor may not start. If this happens, correct the system configuration settings.

To reset the system configuration:

Step	
1	In the System Diagnostics menu, select the Configuration button. The Configuration menu appears.
2	Select each option installed in the monitor. Note —
3	Select the Apply button. A confirmation window displays the message: System will restart now.
4	In the confirmation window, select the OK button. The monitor restarts.

Removing the NBP Module

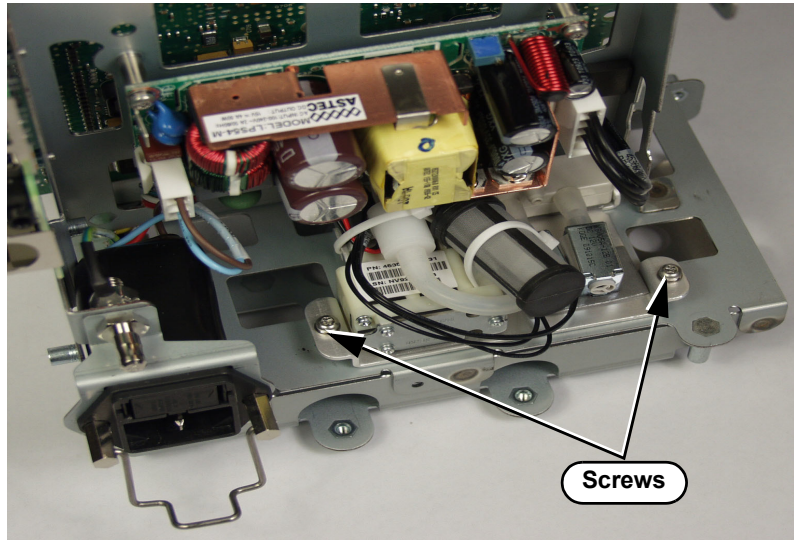
Caution After replacing the NBP module, you must reset the NBP cycle count and run the NBP tests. For more information about resetting the NBP cycle count, see “Viewing and Resetting Tracked Parameters” on page 4-34. For information about running the NBP test, see “NBP Test” on page 3-14.

To remove the NBP module:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-23.

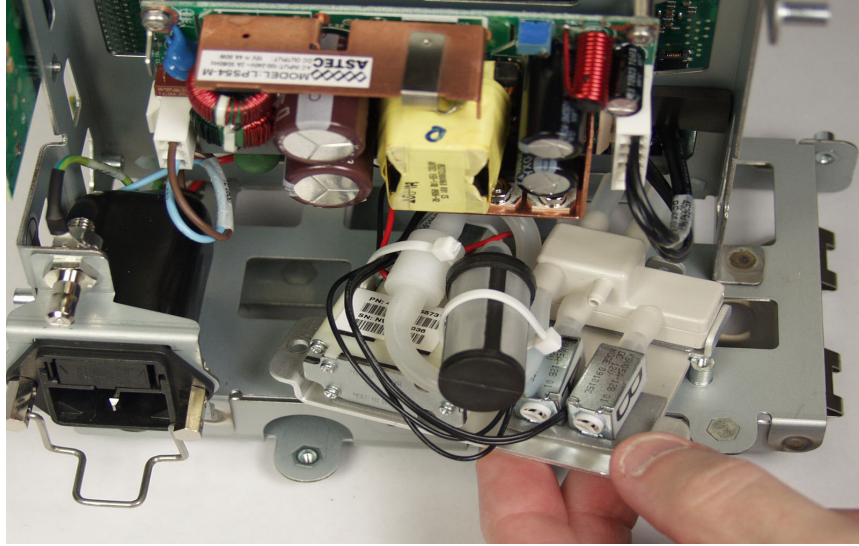
4

Remove two Torx T10 screws and washers from the metal bracket holding the NBP module assembly to the bottom of the main board.

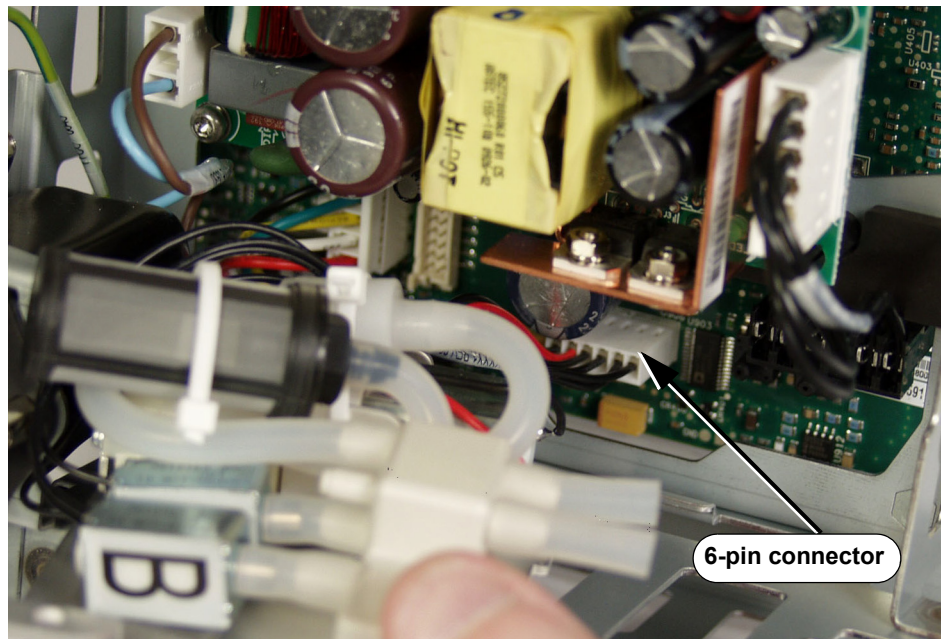


Removing the NBP Module

- 5 Lift the NBP module and *gently* pull it free from the pressure sensor tube connectors on the main board.



- 6 Disconnect the 6-pin connector from the main board and remove the NBP module.



Removing the NBP Filter

To remove the NBP filter:

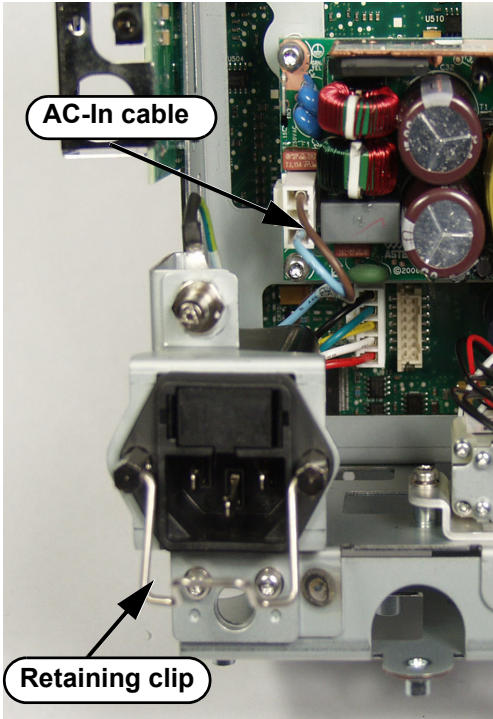
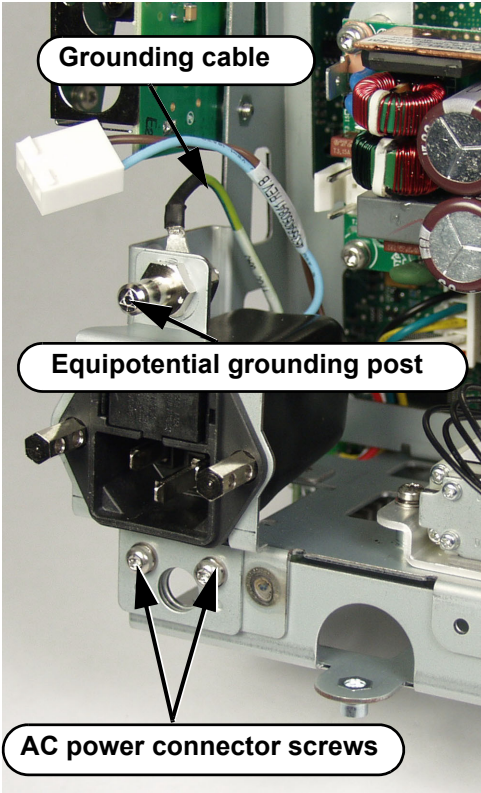
Step	
1	Separate the front and rear monitor case assemblies. See "Separating the Front and Rear Case Assemblies" on page 5-13.

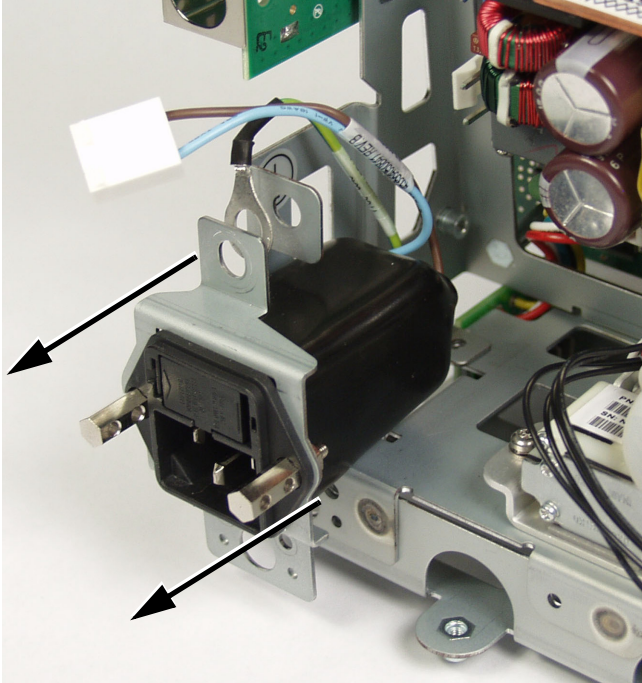
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-23.
4	Remove the NBP module. See “Removing the NBP Module” on page 5-34.
5	<p>Use wire cutters to cut the plastic zip tie securing the filter to the module, and then disconnect the filter from the NBP filter tube.</p> <div data-bbox="548 510 1398 1262" data-label="Image"> </div> <hr/> <p>Caution</p> <p>When you reassemble the NBP filter, secure it to the NBP module with a new plastic zip tie.</p> <hr/>

Removing the AC Power Connector

To remove the AC power connector:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.

<p>3</p>	<p>Squeeze the power cord retaining clip and remove it from the bolts.</p>  <p>AC-In cable</p> <p>Retaining clip</p>
<p>4</p>	<p>Disconnect the AC-In cable from the main board assembly.</p>
<p>5</p>	<p>Remove the two AC power connector screws.</p>  <p>Grounding cable</p> <p>Equipotential grounding post</p> <p>AC power connector screws</p>

6	Use a 10 mm wrench to remove the washer from the equipotential grounding post and disconnect the cable from the lug.
7	<p>Slide the AC power connector out of the mounting bracket.</p> 

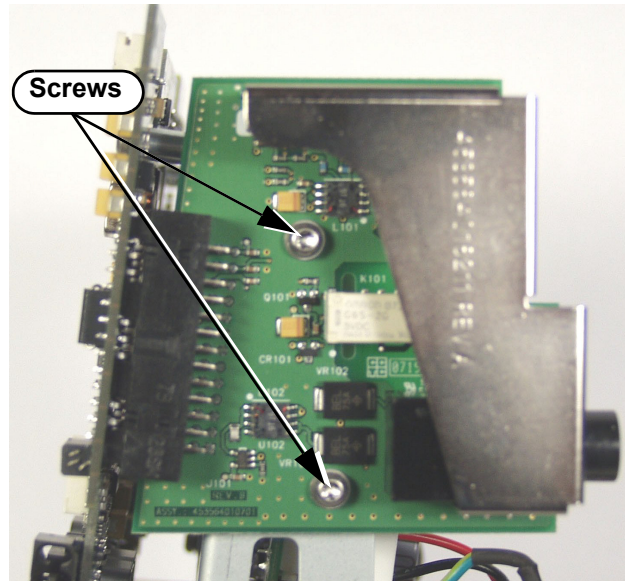
Removing the Communications (LAN) Board

To remove the communications board:

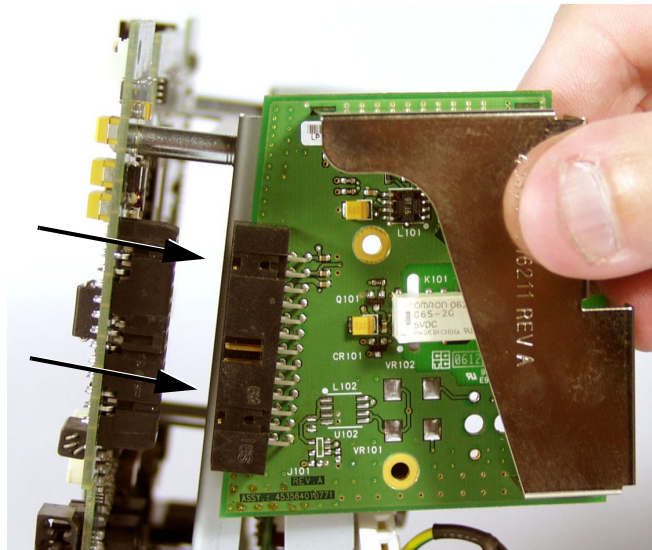
Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.

Removing the Communications (LAN) Board

- 3 Remove the two Torx T10 screws and washers holding the communications board to the main board assembly.

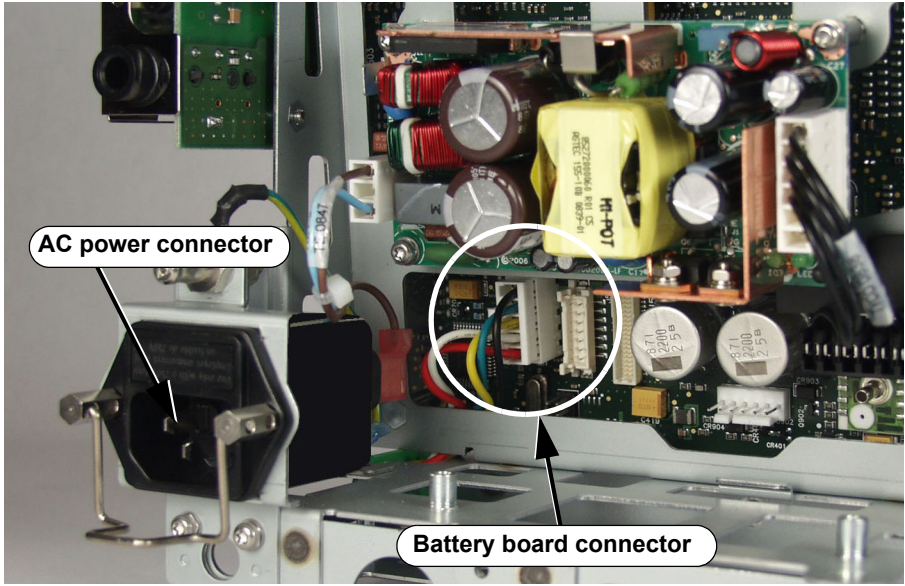
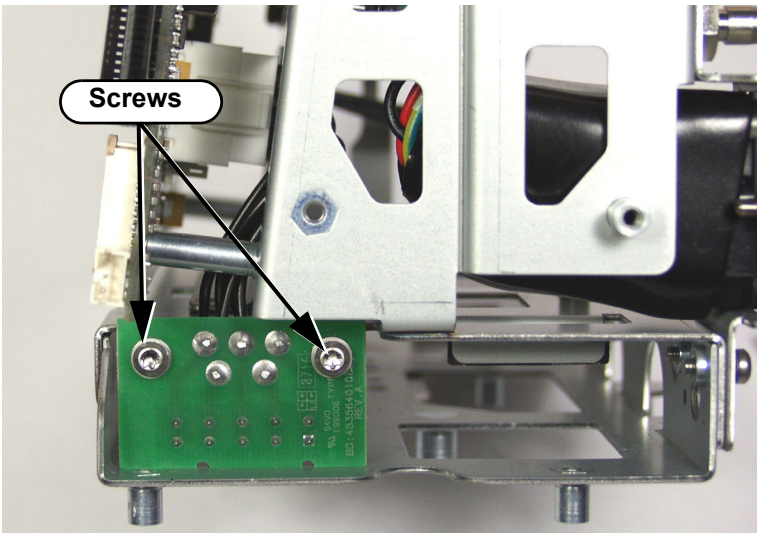


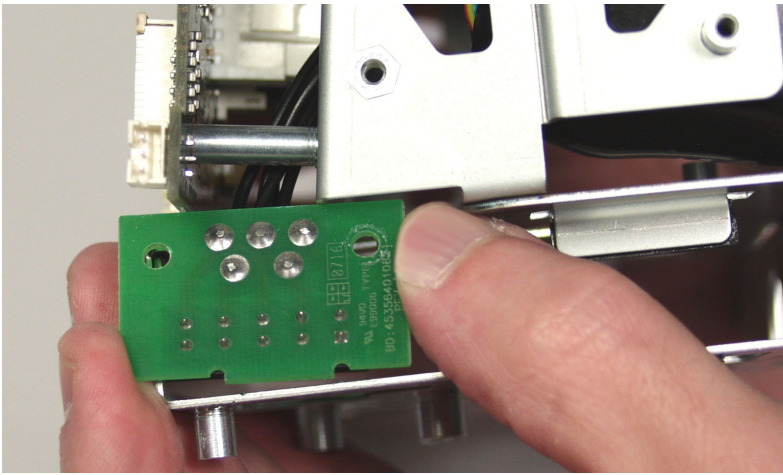
- 4 Pull the LAN board away from the 26-pin connector on the main board and remove it.



Removing the Battery Connector Board

To remove the battery connector board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-17.
3	<p>Disconnect the battery board connector from the main board on the main board assembly.</p> 
4	<p>Remove the two Torx T10 screws and washers holding the battery connector board.</p> 

5	Lift the board out of the slot in the metal frame and remove it. 
---	--

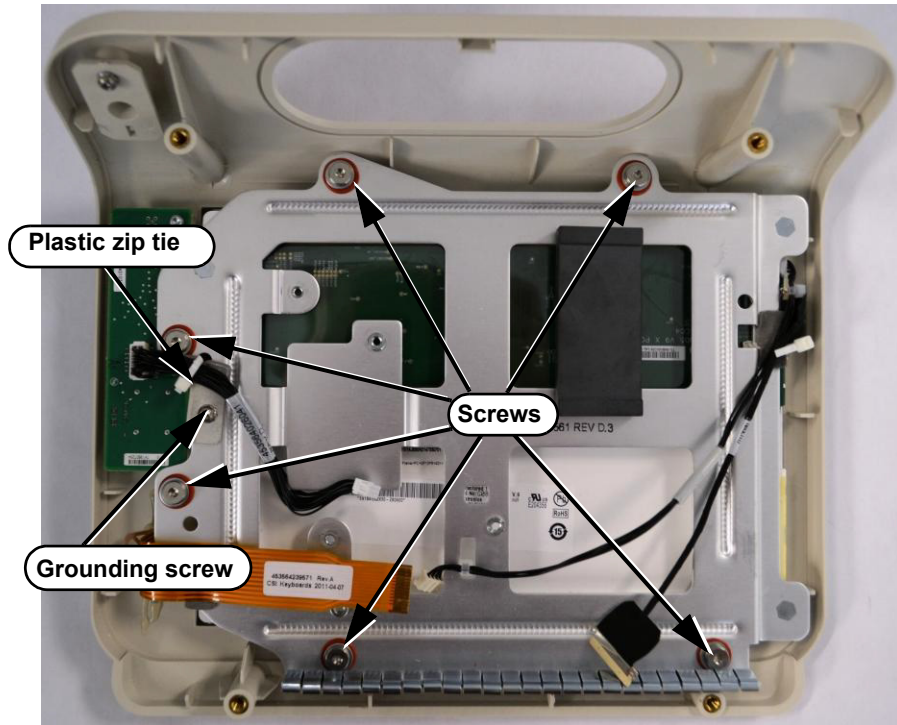
Removing the LCD Assembly

Caution Perform this procedure in a dust-free environment to avoid damage to the LCD display. After replacing the LCD, you must reset the LCD usage hours. For more information about resetting the LCD usage hours, see “Viewing and Resetting Tracked Parameters” on page 4-34.

To remove the LCD assembly:

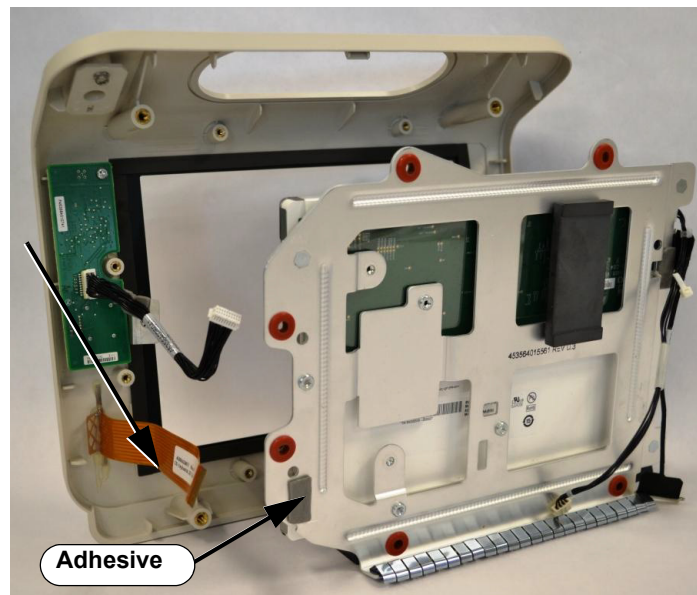
Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.

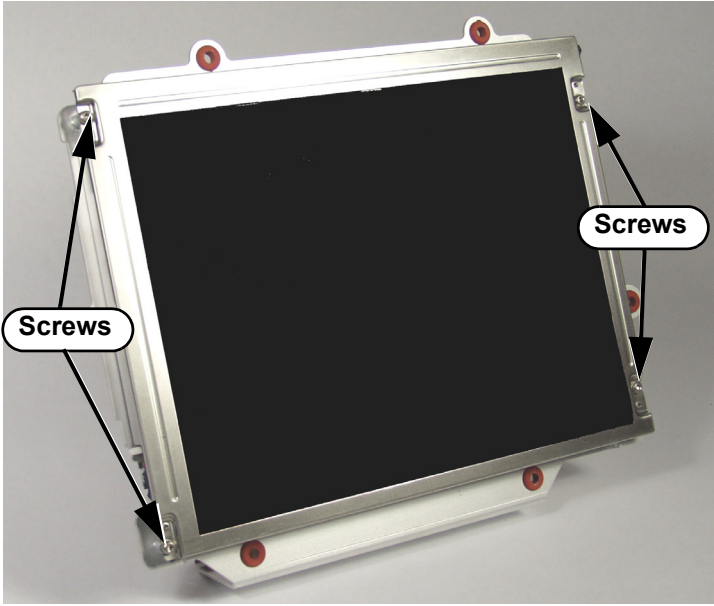
- 2 Remove the six Torx T10 screws that hold the LCD assembly and frame in place.



- 3 Cut the plastic zip tie and remove the Torx T10 grounding screw and washer.

- 4 Gently peel the ribbon cable from the foam adhesive, and lift the LCD assembly out of the front case.





5	<p>Remove the four Phillips screws from the LCD frame.</p> 
6	<p>Remove the LCD from the LCD frame.</p>

Removing the Navigation Wheel Assembly Board

To remove the navigation wheel assembly board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
2	Remove the LCD assembly. See “Removing the LCD Assembly” on page 5-42.

<p>3</p>	<p>Pull the wheel off of the stem.</p>  <p>The image shows a close-up of the right side of a monitor's control panel. A hand is pulling an orange, cylindrical navigation wheel off a metal stem. Above the stem are four circular buttons with icons: a yellow one with a crossed-out 'X', a green one with a person icon, a green one with a circular arrow, and a grey one with a square icon. Below the stem are three more buttons: a grey one with a square icon, a grey one with a document icon, and a grey power button. The monitor screen is visible on the left.</p>
<p>4</p>	<p>Remove the locking nut and washer.</p>  <p>The image shows a close-up of the same control panel area. A hand is using a small metal tool to remove a metal locking nut and washer from the stem. The orange wheel is no longer present. The buttons and their icons are the same as in the previous image. The monitor screen is visible on the left.</p>

5

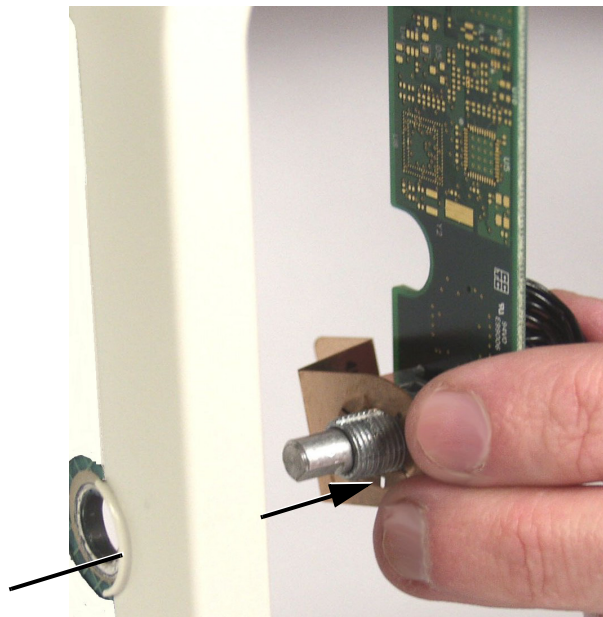
Remove the Torx T10 self-tapping screw.



6

Press the stem while lifting off the wheel assembly.

Note — When you reattach the wheel, line up the flat side of the wheel to the flat side of the wheel stem.




Replacing the Membrane Switch

Caution The replacement membrane switch assembly must be handled carefully. Observe the following precautions:


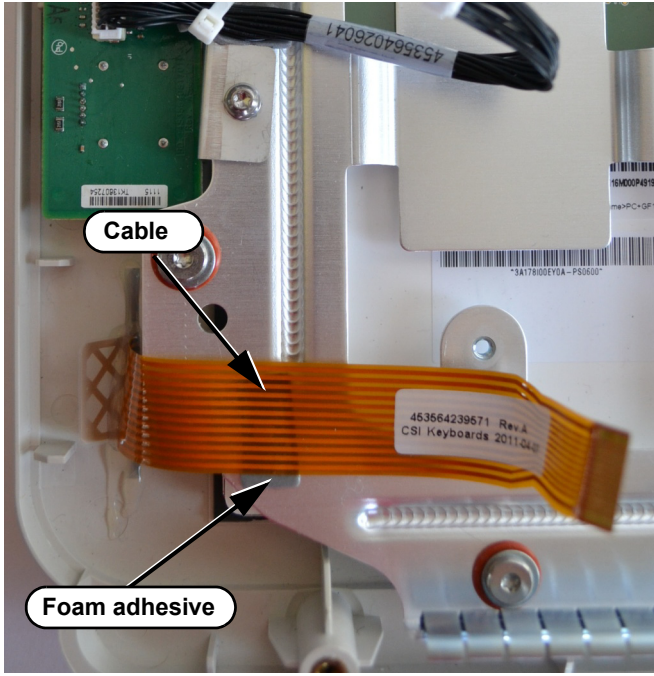
- Keep the assembly perfectly flat and do not flex or bend it.
- Do not press the switches until the assembly is properly applied to the front panel of the monitor.

Failure to follow these guidelines can damage the metal keys inside the assembly and cause the switches to fail.

To replace the membrane switch:

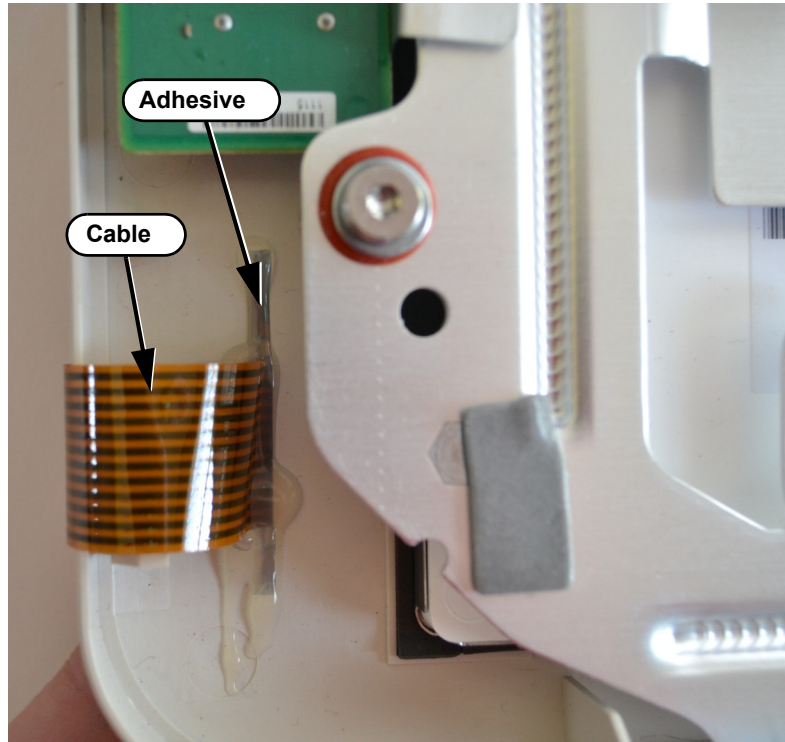
Step	
1	Remove the battery. See “Removing the Battery” on page 5-3.
2	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-13.
3	Remove the LCD assembly. See “Removing the LCD Assembly” on page 5-42.
4	Pull the rotary wheel off of the stem. 

Replacing the Membrane Switch

5	<p>Remove the locking nut and washer with a 10 mm wrench.</p> 
6	<p>Remove the ribbon cable from the foam adhesive. Leave the adhesive attached to the frame for reuse.</p> 

7


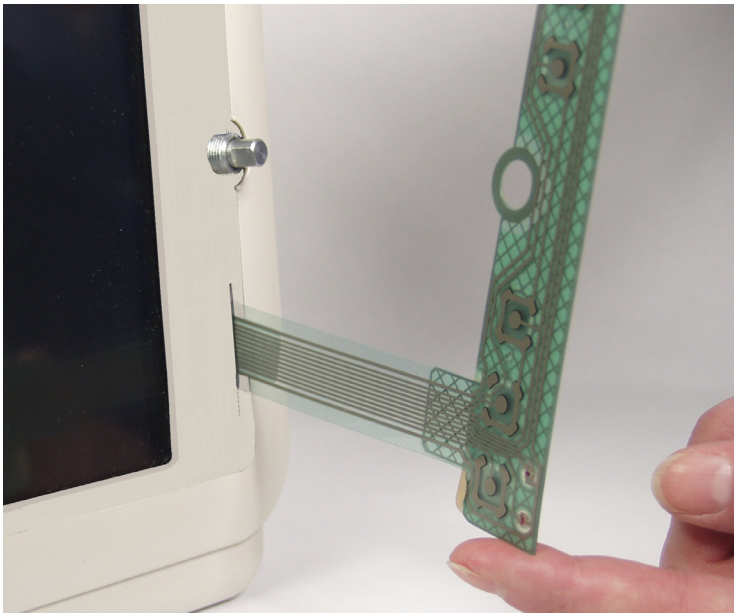
Remove the adhesive from the cable slot in the front panel.

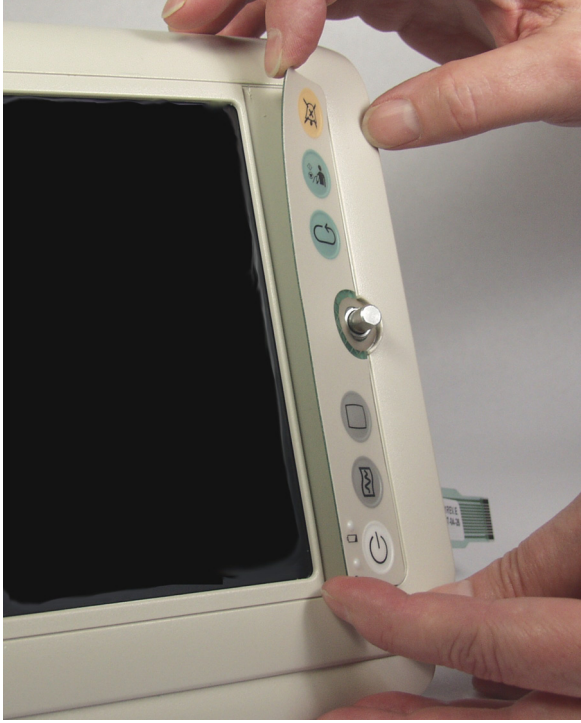



8

Remove the membrane switch assembly by inserting a sharp, pointed tool under the edge and lifting the assembly up. Be careful not to damage the surface of the monitor.



9	<p>Completely peel the membrane switch assembly off the monitor.</p> 
10	<p>Wipe the area under the assembly with isopropyl alcohol (70% solution in water) to remove any adhesive residue. For the assembly to fit properly, the area must be clean and free of debris.</p>
11	<p>Remove the adhesive liner from the back of the assembly and carefully insert the ribbon cable through the slot in the front panel.</p> 

<p>12</p>	<p>Lower the assembly over the wheel stem. Line up the edge of the assembly with the ridge on the monitor frame. To seat the assembly properly, you may need to pivot it back and forth gently.</p> 
<p>13</p>	<p>Carefully lower the assembly until it contacts the front panel, being careful not to flex or bend the assembly.</p>
<p>14</p>	<p>Avoid touching or pressing the keys or LEDs directly, and then press the assembly firmly into place. Ensure good adhesion by pressing in all areas.</p> 

15

Leave as much excess ribbon cable as possible as shown in the photo below, and then press the ribbon cable onto the foam adhesive.

