

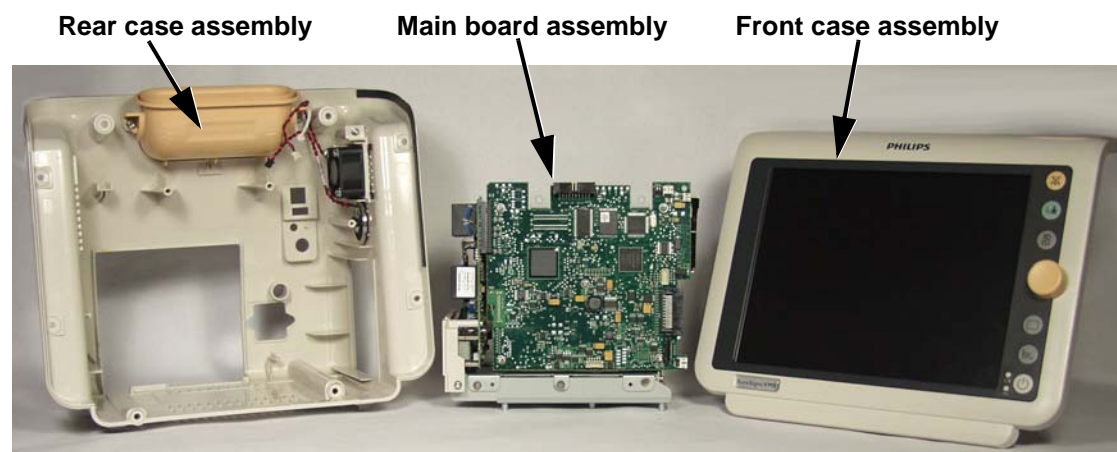
Repairing the Monitor

Overview

This chapter describes the procedures for disassembling and assembling the monitor to replace or repair defective assemblies or components.

The monitor has three main assemblies:

- Rear case
- Main board
- Front case



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

- Printed Circuit Boards
- Battery
- Cables
- LCD

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

Warning

Before attempting to 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 putting 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 VM4, VM6, or VM8 SE patient monitor, delete all patient information. For instructions on deleting patient data, see “Clearing Patient Data” on page 4-39.

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 the monitor you are repairing is connected to a SureSigns Central and you are removing the monitor from service and replacing it, you must remove the monitor from the Central Bed/Monitor list and add the replacement monitor. For more information see the *SureSigns Central Installation and Configuration Guide*.

Tools Required for Service

The tools and equipment required to disassemble, repair, and re-assemble the monitor include the following:

- #1, #2 Phillips head screwdrivers
- Torx T10, T20 screwdrivers
- Small and medium slotted screwdrivers
- Needle-nose pliers
- 10 mm wrench
- Plastic cable zip ties
- Wire cutters
- ESD mat and wrist strap

Shutting Down the Monitor

Perform a hard shutdown when you power down the monitor for repair to ensure that all patient and system data is saved in memory.

To perform a hard shutdown:



Step	
1	Access the System Admin Menu . See “Accessing the System Admin Menu” on page 3-7.
2	Rotate the wheel to highlight the Shutdown button, and then press the wheel.
3	In the window that appears, rotate the wheel to highlight Yes and then press the wheel. The system shuts down.

Removing the Battery

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



To remove the battery:

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

3	<p>Tip the monitor and insert a slotted screwdriver into the slot in the bottom under the battery cover.</p> <hr/> <p>Caution</p> <p>Do not try to remove the battery case cover by inserting the screwdriver into the slots on the cover. This can damage the battery case cover.</p> <hr/> 
4	<p>Holding one hand over the battery cover, while you twist the screwdriver slightly to release the battery cover from the case.</p> <hr/> <p>Warning</p> <p>Twist the screwdriver slowly and gently to avoid expelling the battery cover with enough force to cause personal injury.</p> <hr/>
5	<p>Press down on the metal battery retaining clips, and remove the battery from the monitor by pulling the black ribbon.</p>  <p>Ribbon</p> <p>Retaining Clips</p>


Installing the Battery

To install 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 case opening with the two small case cover clips up.</p> 
4	Snap the battery cover into place by pressing it firmly against the monitor case.

Removing the Fuses

To remove a fuse in the AC power connector:

Step	
1	Remove 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 pull the fuse holder out of the AC power connector. 
4	Replace the fuse(s), and then push the fuse holder back into the power connector until it snaps into place.

Removing the SureSigns VM4 Temperature Module and Probe Cover Holder

To remove the temperature module and probe cover holder:

Step	
1	Remove 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).

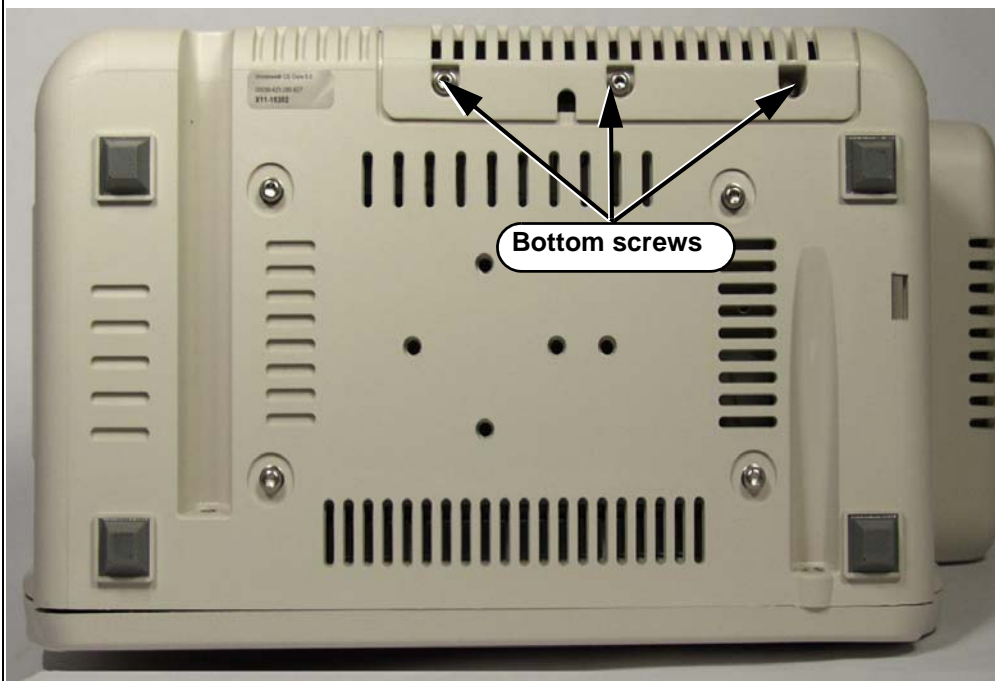
3

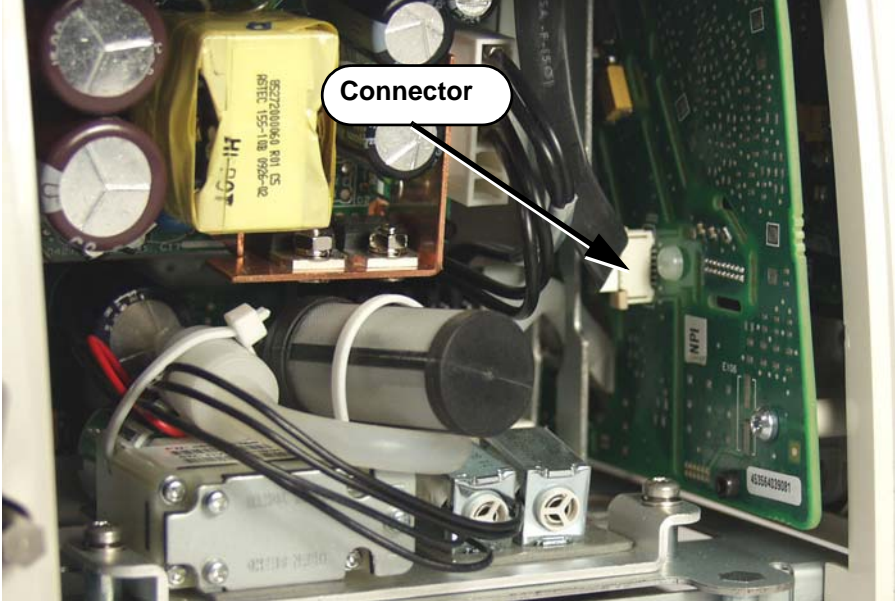

Remove the Torx T10 screw and washer from the probe cover holder and remove the holder from the case.



4



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



5	<p>Disconnect the temperature module cable from the front end assembly board.</p> 
6	<p>Remove the two Torx T10 screws and washers from the temperature module.</p> 
7	<p>Gently pull the temperature module and temperature module cable away from the monitor.</p>

Reinstalling the Temperature Module

To reinstall the temperature module:

Step	
1	<p data-bbox="435 384 1404 447">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="430 478 1414 1024"> <p data-bbox="735 485 1031 527">Clean here</p>  </div>
2	<p data-bbox="435 1056 1015 1083">Place a new adhesive strip on the temperature module.</p>
3	<p data-bbox="435 1108 1404 1171">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 data-bbox="435 1188 1404 1283">Note — You may need to open the front and rear case assemblies in order to reattach the connector ribbon. For more information, see “Separating the Front and Rear Case Assemblies” on page 5-12.</p> <div data-bbox="430 1325 1414 1850"> <p data-bbox="735 1352 992 1394">Adhesive strip</p>  </div>
4	<p data-bbox="435 1875 1404 1938">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>

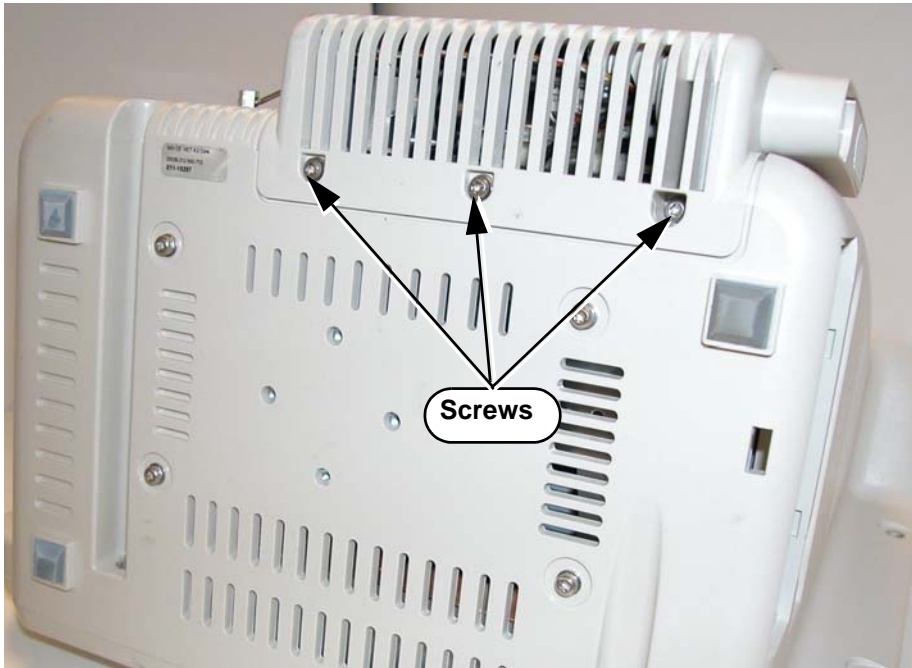
5	Remove the paper backing from the adhesive strip on the temperature module.
6	Align the screw holes of the temperature with the screw holes on the monitor.
7	Secure the temperature module to the monitor with two Torx T10 screws.
8	<p>Place the monitor on its side and then place a 10 to 15 lb. weight 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/>
9	<p>Reattach the rear cover and temperature probe cover holder to the monitor.</p> <hr/> <p>Caution</p> <p>After you replace the temperature module, complete all necessary tests. For more information, see the “SureSigns VM4 Temperature Test” on page 3-28.</p> <hr/>

Removing the SureSigns VM8 SE CO₂ Module

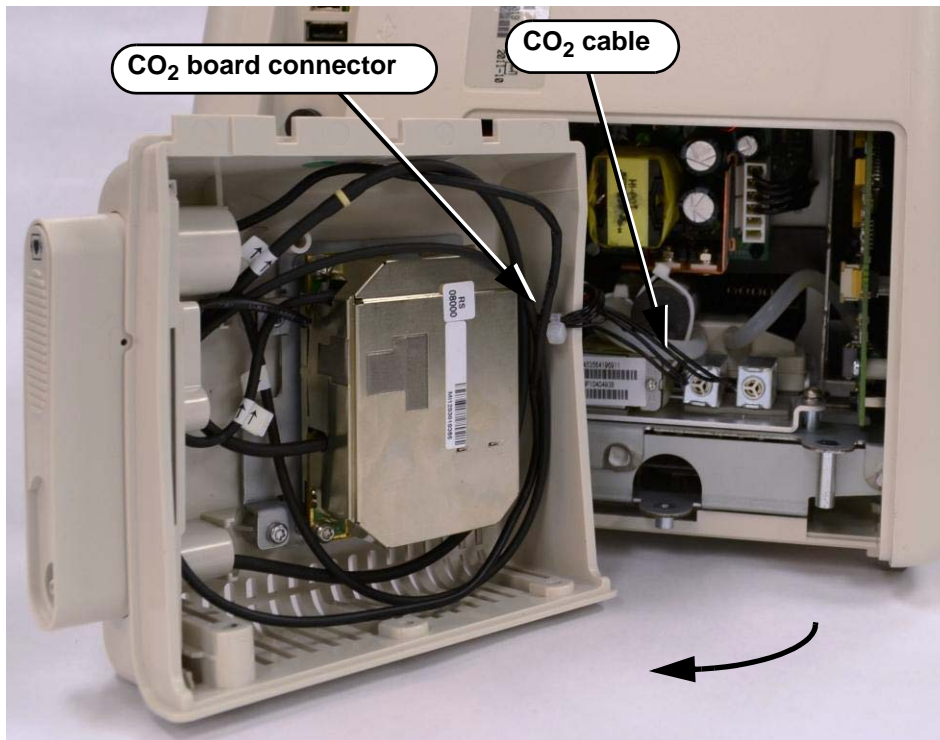
To remove the CO₂ module:

Step	
1	Remove the AC cord from the rear of the monitor.
2	Remove the battery from the monitor (see “Shutting Down the Monitor” on page 5-3).

- 3 Remove the three Torx T10 screws and washers from the CO₂ module cover.



- 4 Push the module down to disengage it from the monitor case and then pull the module away.




- 5 Disconnect the CO₂ cable from the CO₂ board connector.

Separating the Front and Rear Case Assemblies

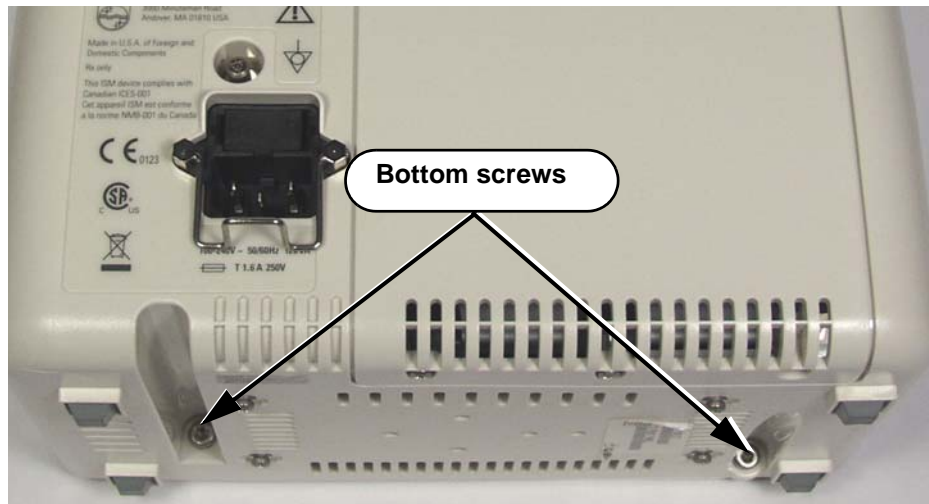
To open the monitor to install internal replacement parts, you must first separate the front and rear case assemblies.

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

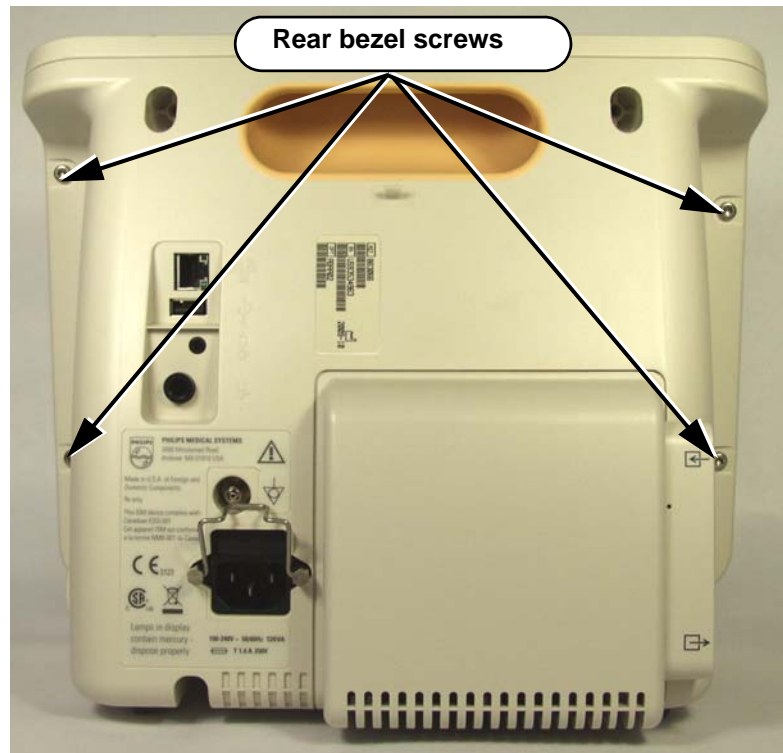
To separate the front and rear case assemblies:

Step	
1	Disconnect the AC power cable from the back of the monitor.
2	Remove the battery from the monitor (see “Shutting Down the Monitor” on page 5-3).
3	Disconnect all external cables from the monitor.
4	Remove the USB hub (if attached) from the rear cover.
5	Remove the two Torx T20 screws from the top of the monitor. <div></div>

- 6 Tip the monitor and remove the two bottom screws holding together the front and rear case assemblies.



For the SureSigns VM8 SE monitor, remove four additional screws from the rear bezel.



Caution

Cables run between the front and rear case assemblies.

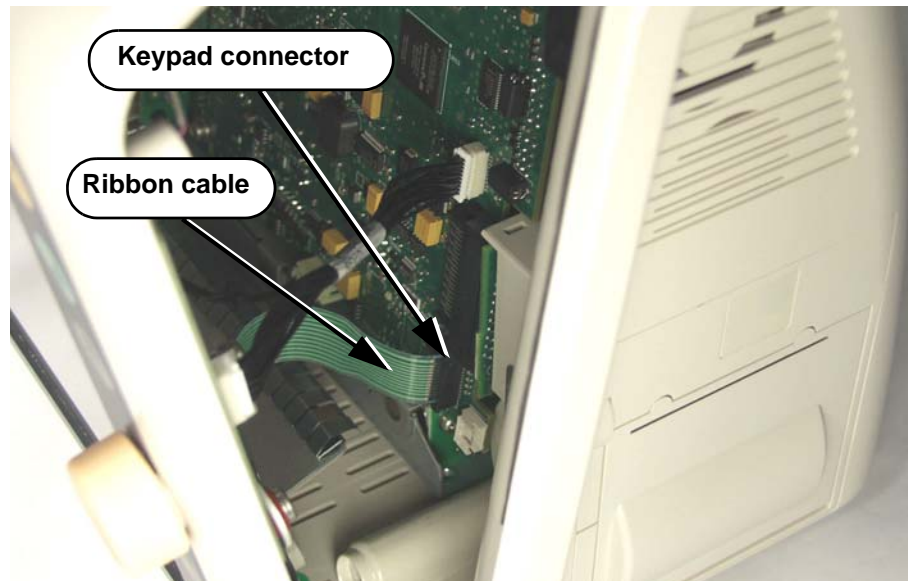
7

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

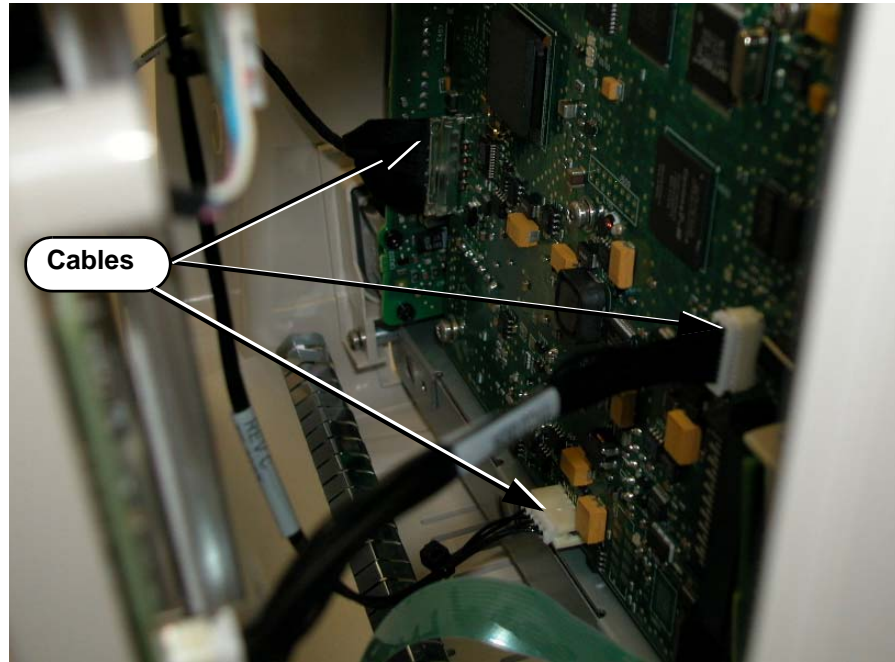


8

Disconnect the keypad ribbon cable from the board by pulling up the keypad connector to release it, and then gently pulling the ribbon cable out of the connector.



- 9 Disconnect the remaining cables from the main board.



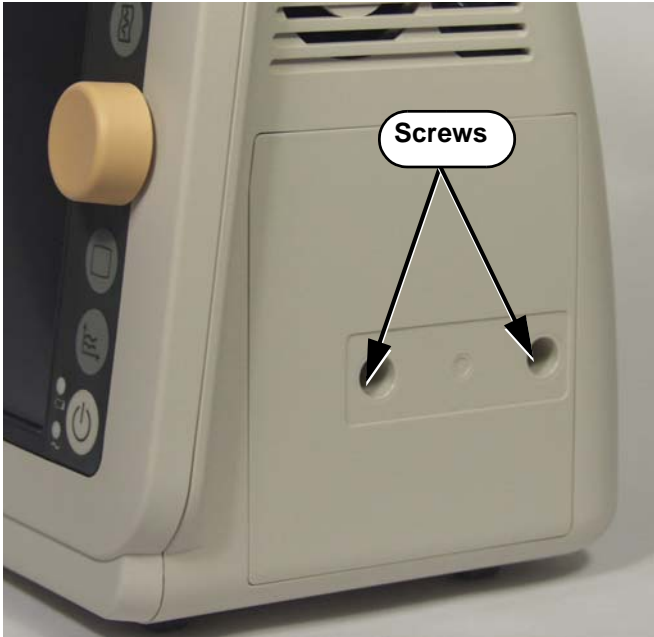
Reassembling the Front and Rear Cases

To reassemble the front and rear cases:

Step	
1	Connect all of the cables.
2	Line up the tab on the front assembly case with the handle on the rear case and slip the front assembly case over the handle.
3	Snap the two assembly cases together.
4	Install the four Torx T20 screws (eight screws on VM8 SE) and power up the monitor.
5	If the monitor starts up properly, perform the required performance tests (see “Testing and Inspection Guidelines” on page 3-1).

Removing the Faceplate or Optional Recorder

To remove the faceplate or recorder:

Step	
1	Go to the step appropriate for your monitor: <ul style="list-style-type: none">For monitors without the optional recorder, go to step 2.For monitors with the optional recorder, go to step 4.
2	Remove the plastic label covering the two Torx T10 screws holding the faceplate to the monitor case.
3	Remove the two screws and lift the faceplate off. <div></div>
4	Open the recorder door on the rear case assembly and remove the paper roll.
<div>Caution When you reassemble the recorder or faceplate, do not overtighten the screws.</div>	

5

Loosen (do not try to remove) the two Torx T10 screws holding the recorder to the monitor case.



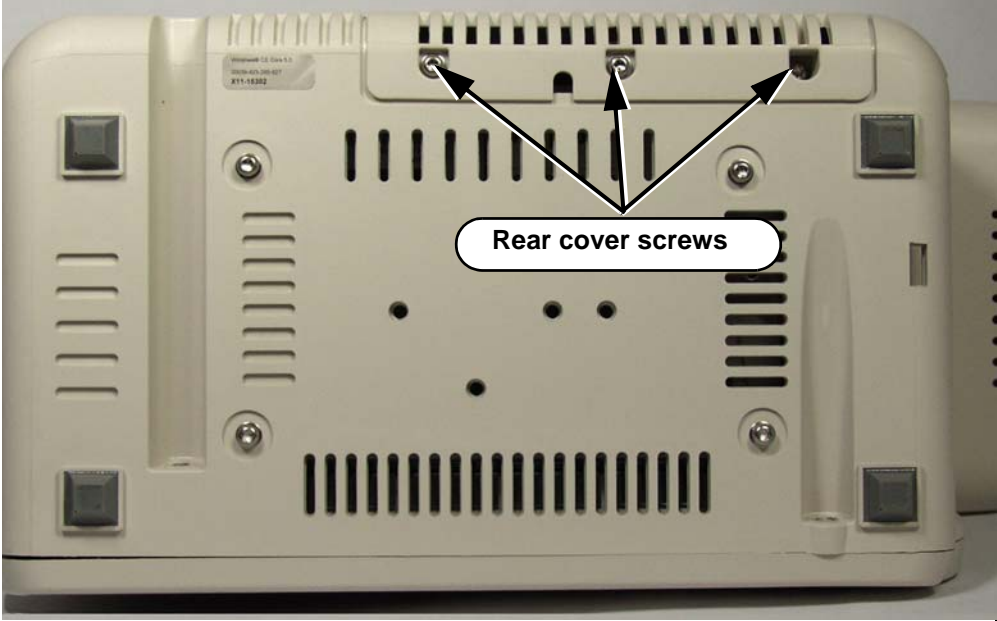
6

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.



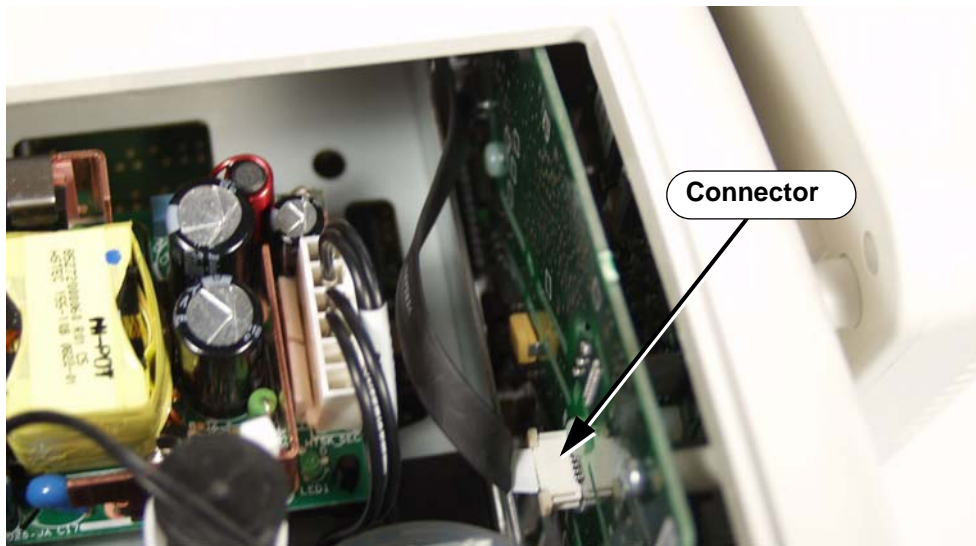
Removing the Main Board Assembly

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 5-12.
2	Remove the faceplate or optional recorder. See “Removing the Faceplate or Optional Recorder” on page 5-16.
3	<p>Do one of the following:</p> <ul style="list-style-type: none">• SureSigns VM4, VM6, or VM8 SE monitor without optional CO₂ module — Turn the monitor over and remove the three Torx T10 screws and washers from the rear cover. Remove the module cover.  <ul style="list-style-type: none">• SureSigns VM8 SE monitor with optional CO₂ module — Remove the CO₂ module. See “Removing the SureSigns VM8 SE CO₂ Module” on page 5-10.

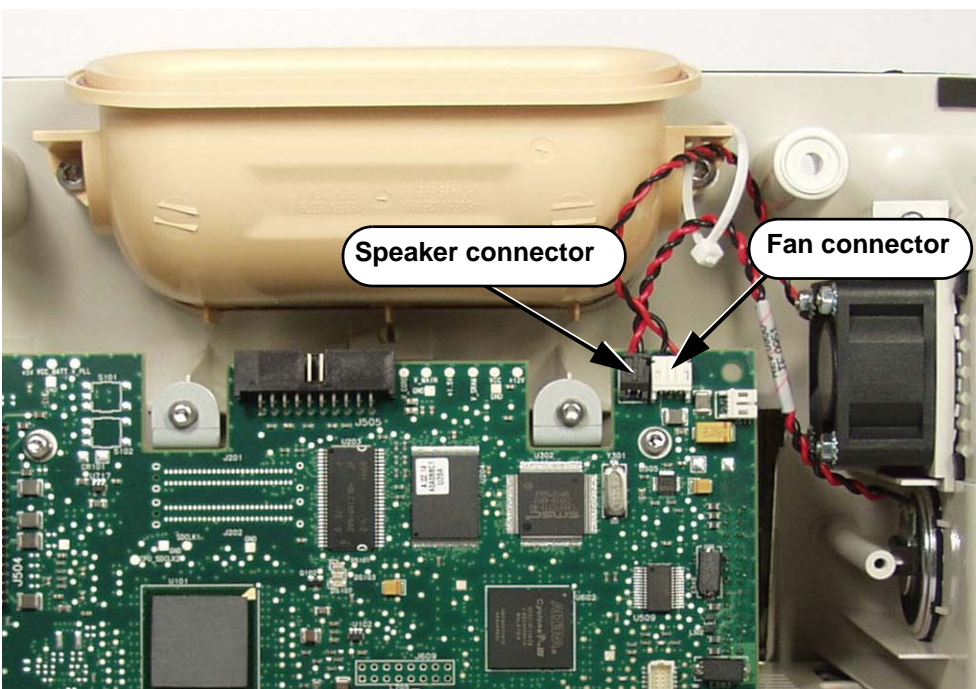
4

For SureSigns VM4 monitors with the optional temperature module, disconnect the temperature cable connector from the front end assembly board.



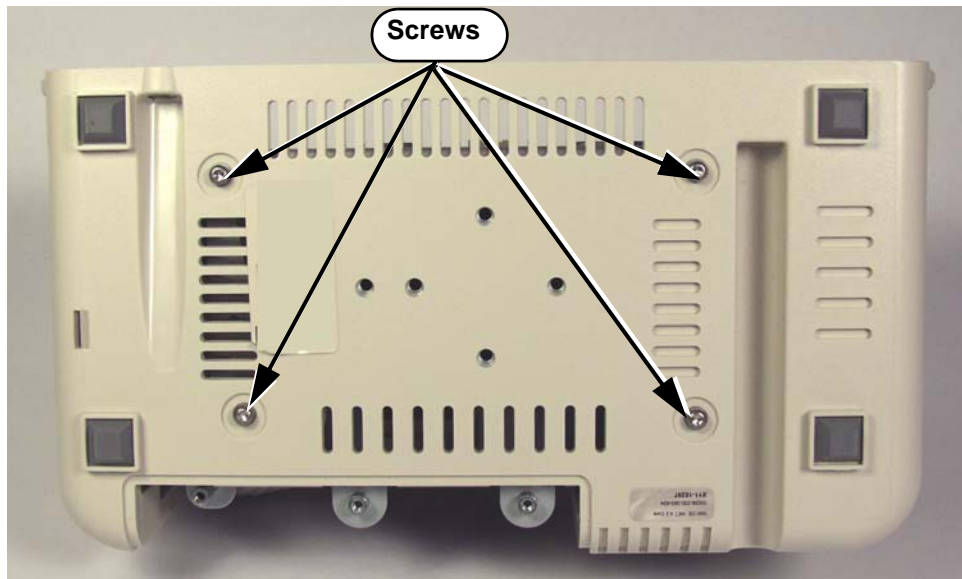
5

Disconnect the fan and speaker connectors from the main board.



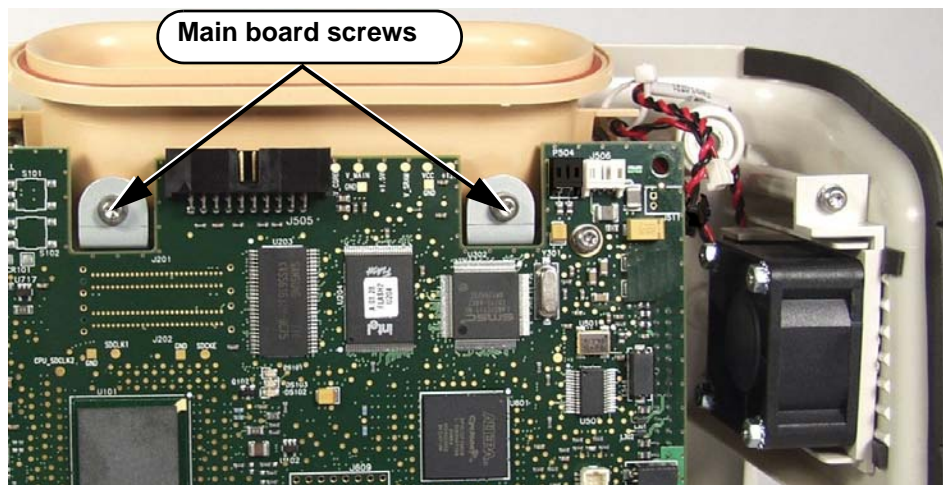
6

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



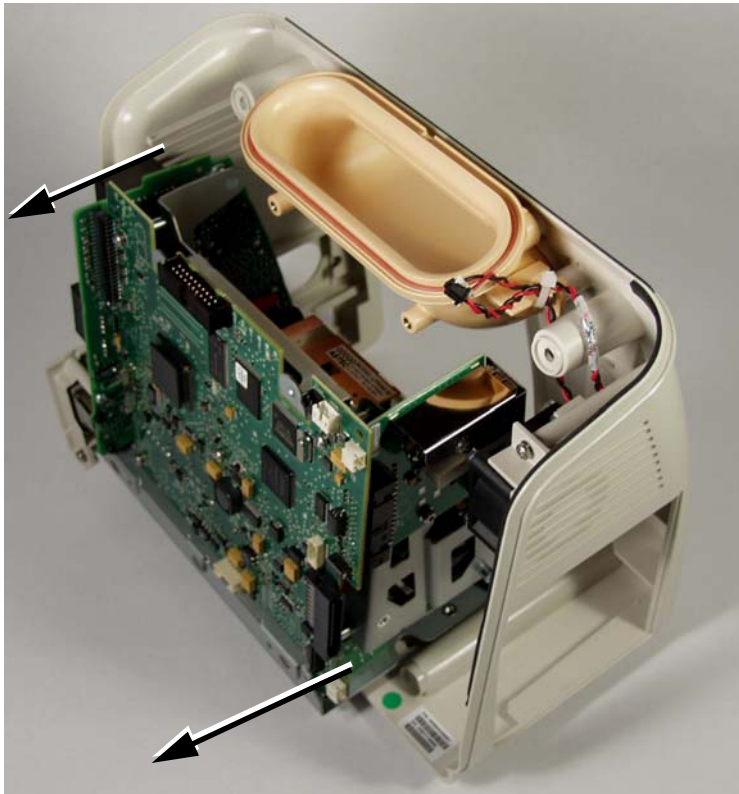
7

Remove the two Torx T10 screws and washers holding the main board assembly in place in the rear case assembly.



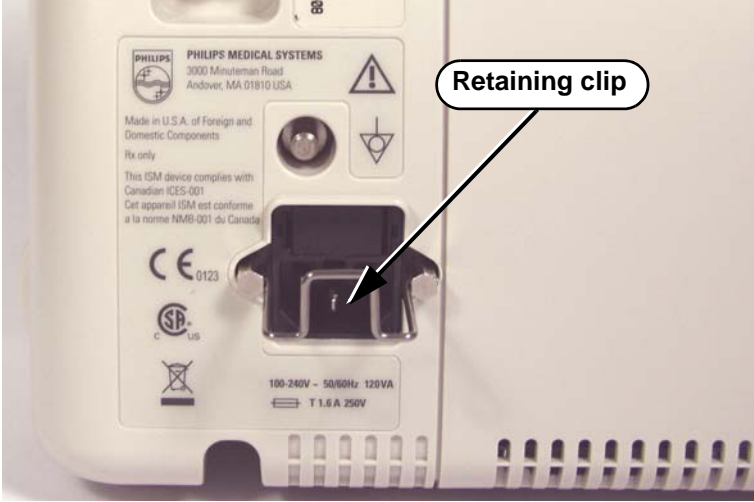
8

Pull the main board assembly forward and slide it out of the rear case.



Reinstalling the Main Board Assembly

To reinstall the Main board assembly:

Step	
1	<p>Slide the board assembly into the rear case (guiding the power cord retaining clip through the rear cover) and ensuring enough clearance for the speaker and fan cables.</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 is aligned correctly in the case.

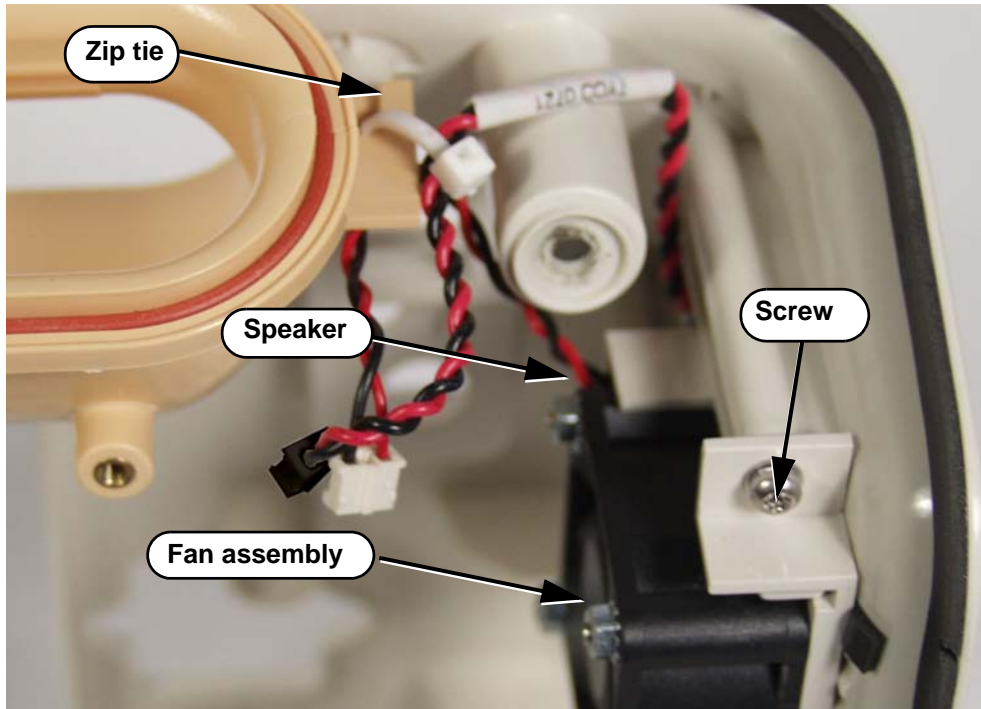
Removing the Fan and/or Speaker Assembly

To remove the fan and/or speaker assembly:

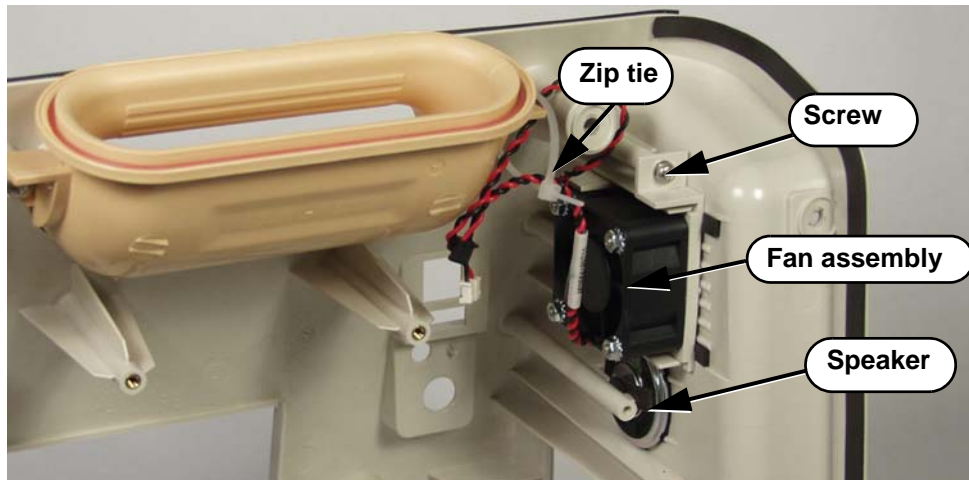
Step	
1	Separate the front and rear case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.

- 3 Use wire cutters to cut the plastic zip tie securing the speaker and fan wires to the handle.

Note — When you reassemble the fan and speaker assemblies, secure the cables to the handle with a new plastic zip tie.



The SureSigns VM8 SE monitor speaker and fan assembly are shown below.

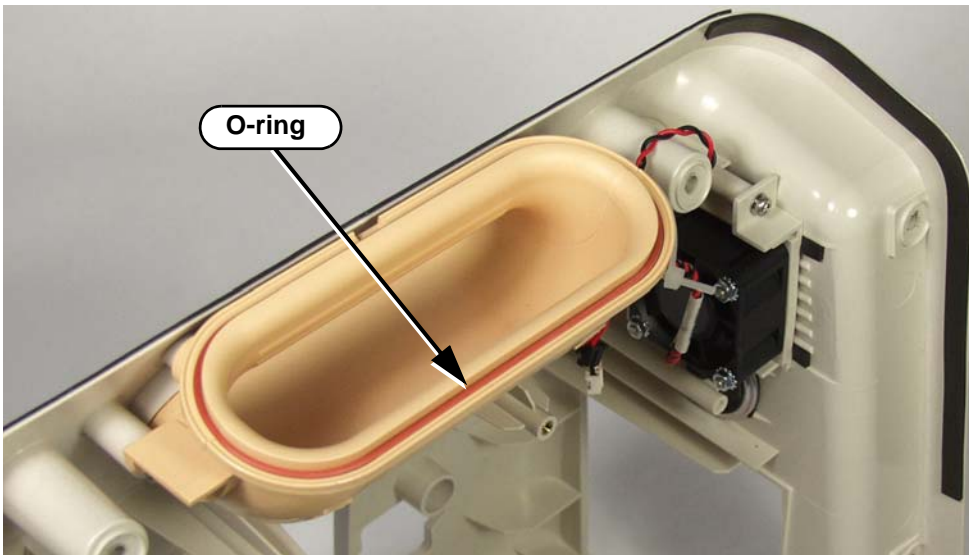


- 4 Remove the speaker by sliding it out of the rear case. The speaker is held in place by foam pads and friction.
- 5 Remove the one Torx T10 screw and washer holding the fan assembly and slide it out of the rear case.

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.

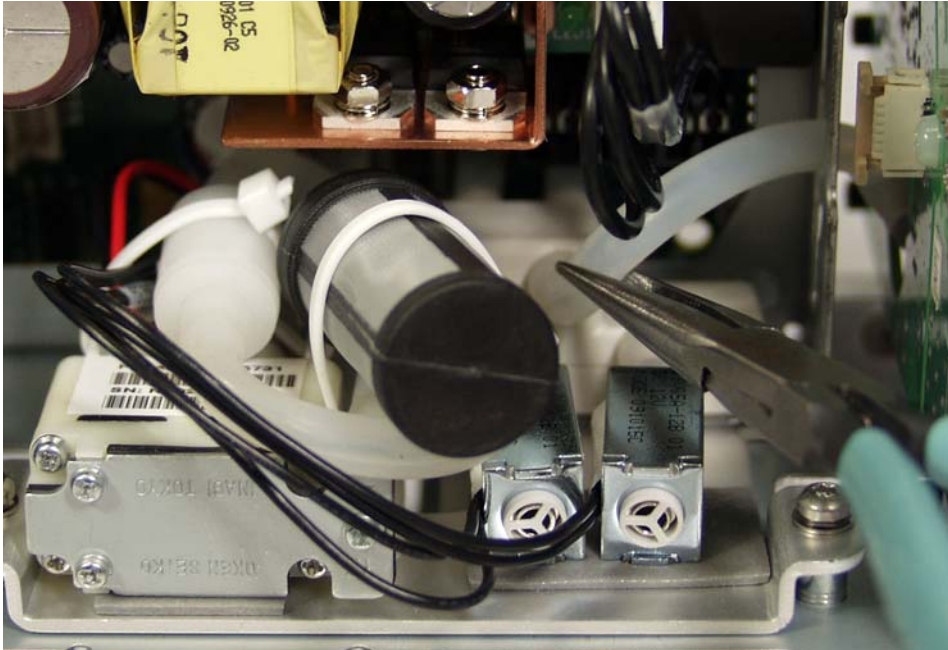
To replace the handle O-ring:

Step	
1	Separate the front and rear case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	<p>Gently pull the O-ring from its position in the handle. If the O-ring has been damaged or torn, be sure to remove all of the pieces from the channel in the handle.</p> 
3	Place a new O-ring in the handle and tap it into place all along the channel.

Removing the Front End Assembly

Caution After replacing the front end assembly, you must recalibrate the monitor by programming the IBP and temperature gain/offset values into the main board. For more information, see “Calibrating IBP (SureSigns VM6 and VM8 SE)” on page 3-27 and “Calibrating the SureSigns VM6 and VM8 SE Temperature” on page 3-29.

To remove the plastic patient connector panel from the front end assembly or SpO₂ board, you must remove the front end assembly from the main board assembly.

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Turn the main board assembly around and disconnect the tubing from the NBP manifold. 

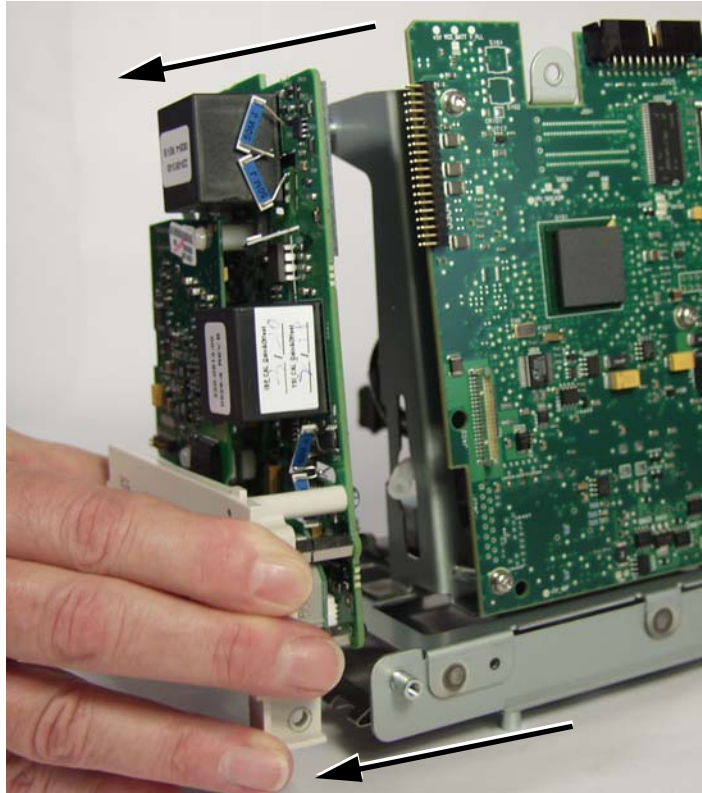
4

Remove the two Torx T10 screws and washers holding the front end assembly to the main board assembly metal case.



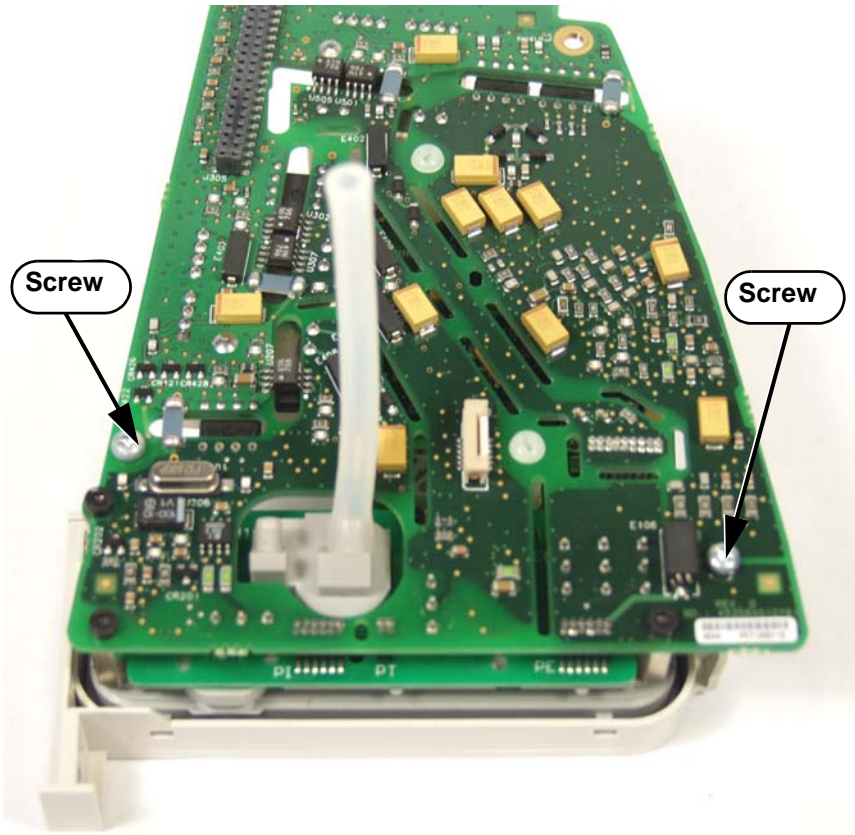
- 5 Pull the front end assembly away from the 40-pin connector on the side of the main board.

Note — Before you reassemble the monitor, note the calibration values. These values are needed to reset the serial number and calibrate the monitor. For more information, see “Calibrating the SureSigns VM6 and VM8 SE Temperature” on page 3-29 and “Calibrating IBP (SureSigns VM6 and VM8 SE)” on page 3-27.

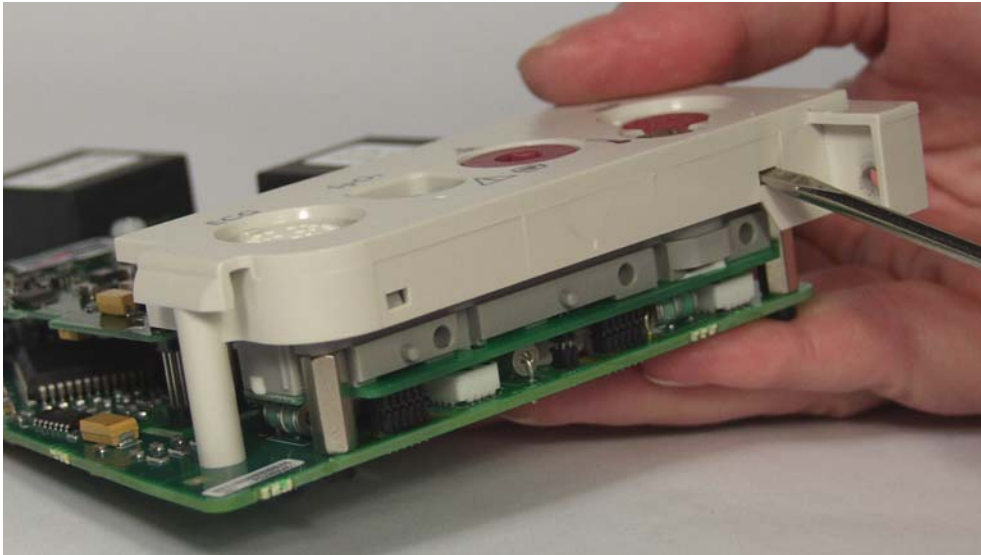


Removing the Front End Assembly Cover

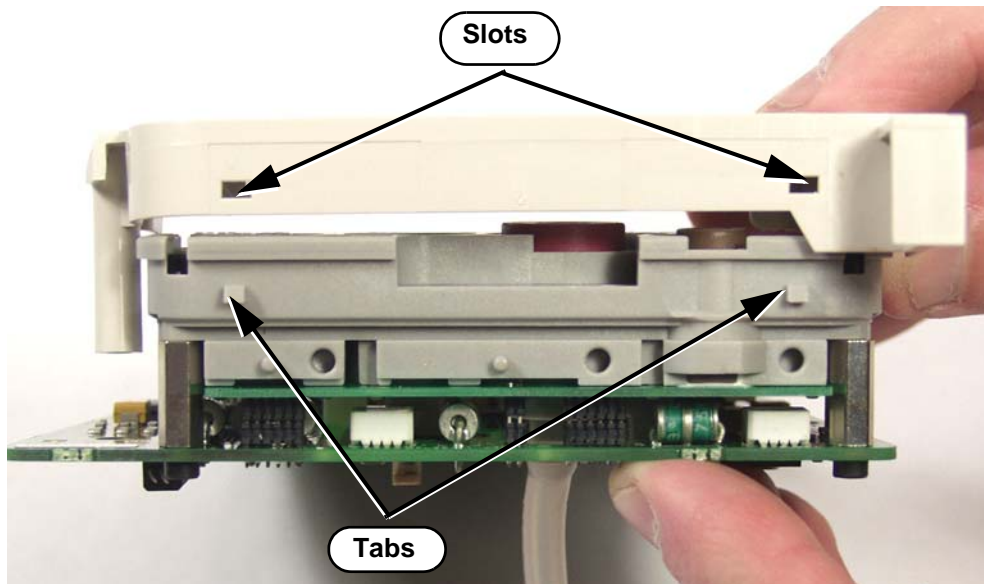
To remove the front end assembly cover:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-25.
4	<div>Remove the two Torx T10 screws holding the plastic cover to the front end assembly board. </div>

- 5 Snap the cover off of the front end assembly by inserting a small slotted screwdriver into the two slots at the bottom of the cover and pushing the tabs.

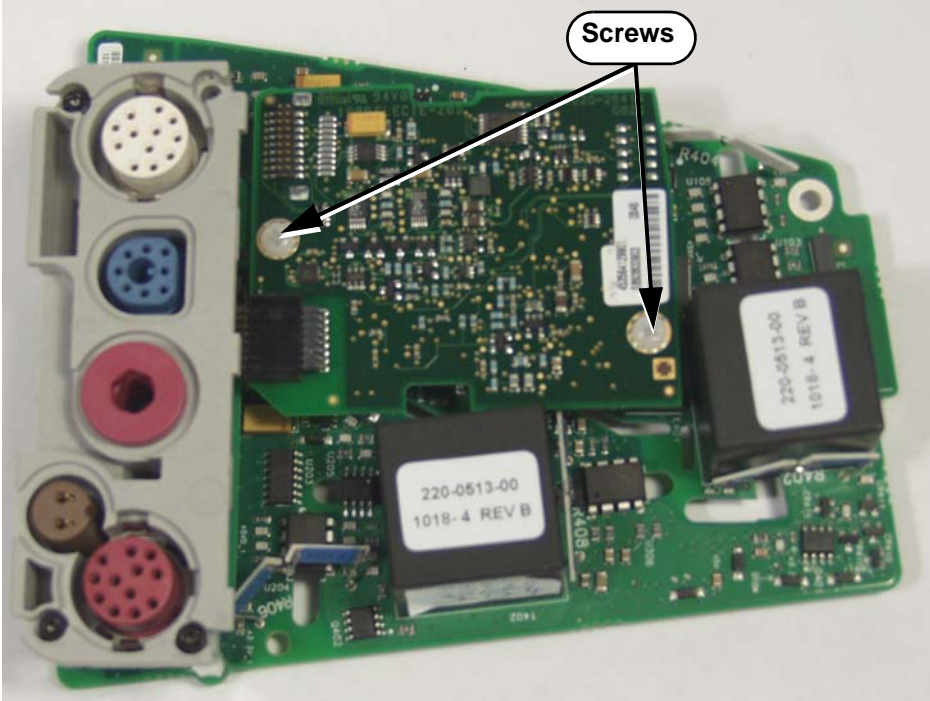


- 6 To reattach the cover, line up the slots in the plastic cover with the connector tabs and snap the cover into place by pressing it onto the assembly.



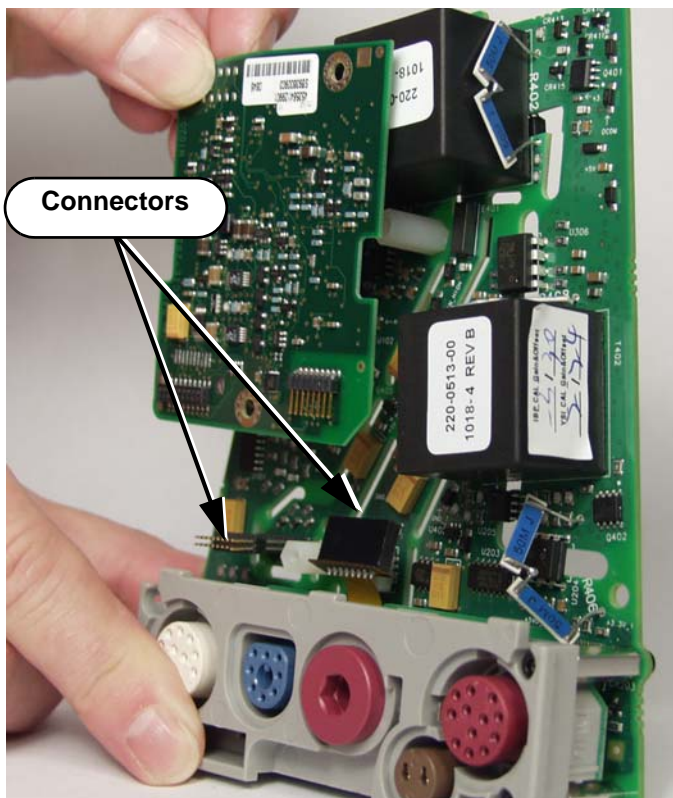
Removing the SpO₂ Board

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 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-25.
4	Remove the front end assembly cover. See “Removing the Front End Assembly Cover” on page 5-28.
5	Remove the two white plastic #1 Phillips-head screws on the front end assembly. 

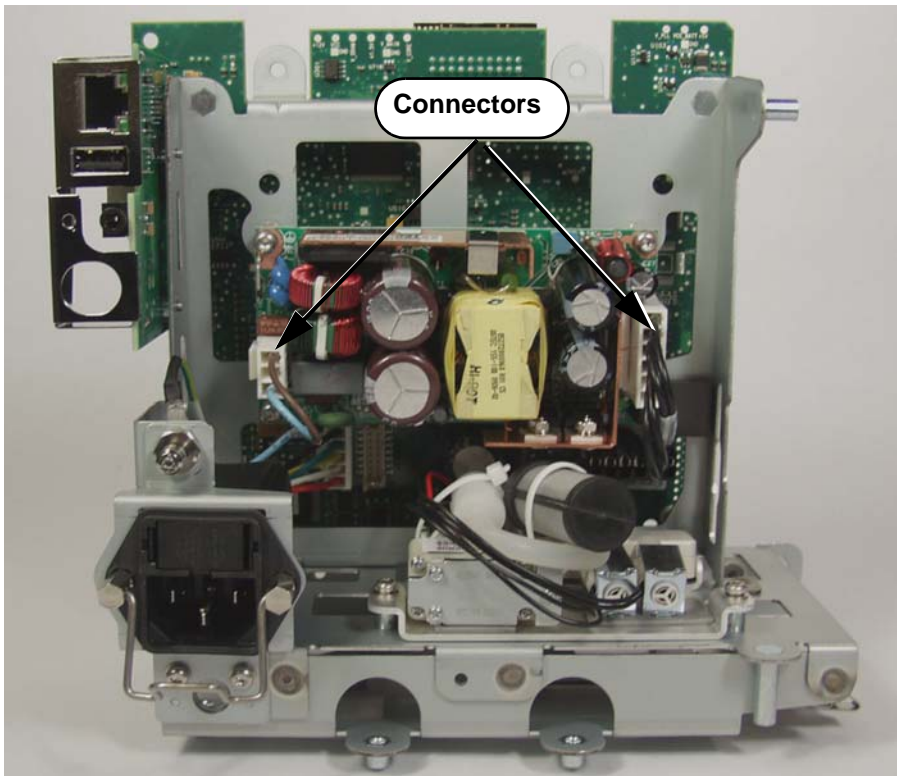
6

Disconnect the two connectors and separate the SpO₂ board from the front end assembly board.

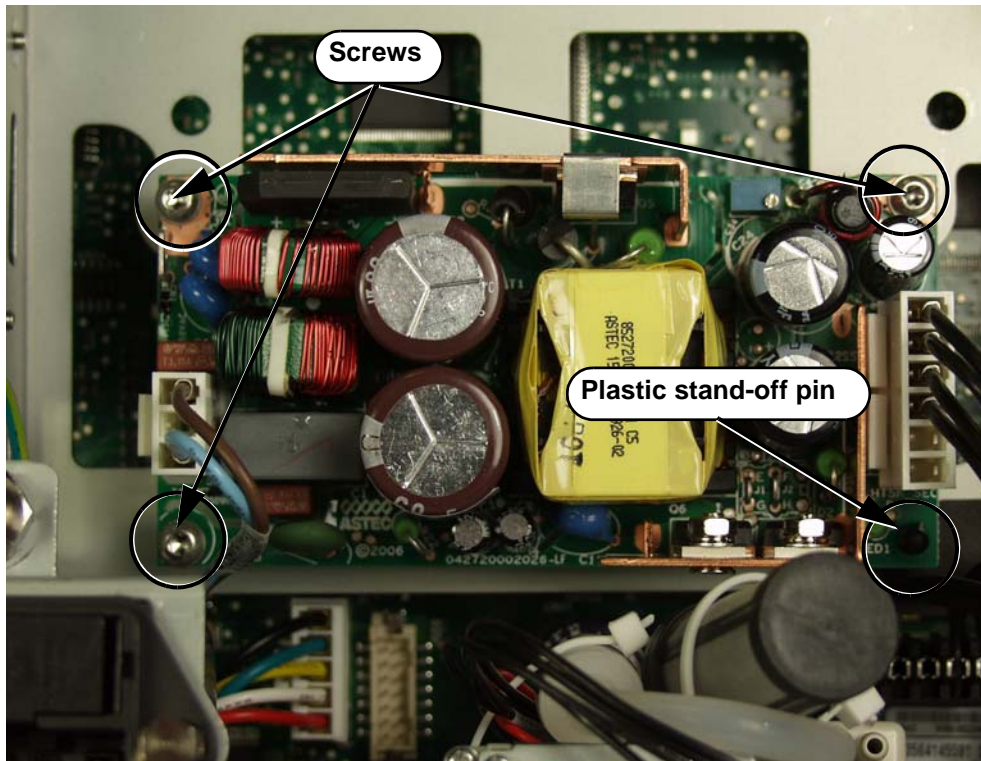


Removing the Power Supply

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 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	<p data-bbox="272 613 1247 680">Remove the 2-pin and 6-pin power supply connectors from the back of the main board assembly.</p> <hr/> <p data-bbox="272 737 386 768">Caution</p> <p data-bbox="272 785 1219 869">When reconnect the cables, be sure the white 6-pin connector is connected to the power supply and the black connector is attached to the main board. If you reverse the connectors, the monitor will not power up.</p> <hr/> 

- 4 Remove the three Torx T10 screws and washers.



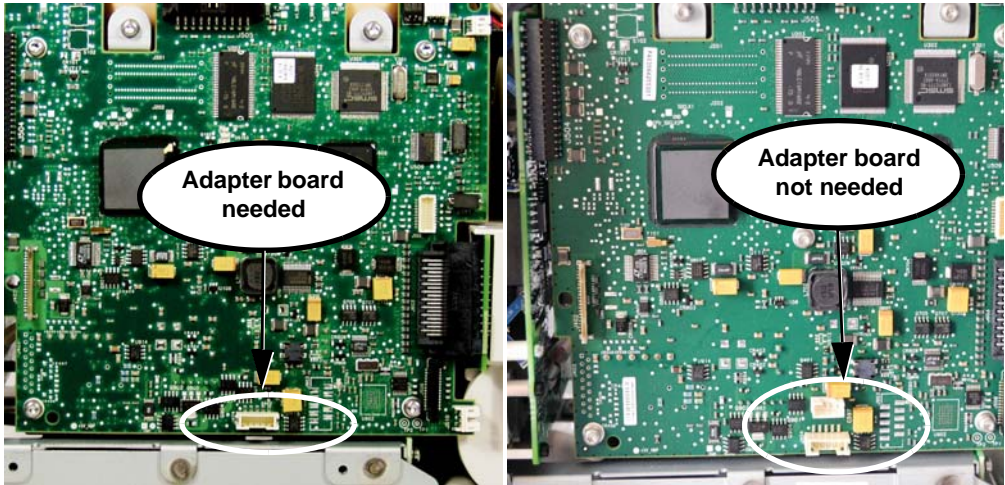
- 5 Use pliers to release the plastic stand-off pin and remove the power supply from the assembly.

Removing the Main Board

Caution After you replace the main board, you must reset the monitor serial number, reconfigure the system, and recalibrate the monitor.
For information on resetting the serial number, see “Resetting the Serial Number” on page 5-36.
For information on configuring the system, see “Setting the System Configuration” on page 5-38.
For information on calibrating the monitor, see Chapter 3, “Performance Verification Testing.”

Main Board Versions

Depending on the version of main board in your monitor, the LCD may require an adapter board. Use the following illustration to determine the main board version. If the board has one connector in the area shown below, you must install an adapter board. If the area has two connectors, the adapter board is not needed and you can connect the LCD cable directly to the main board.

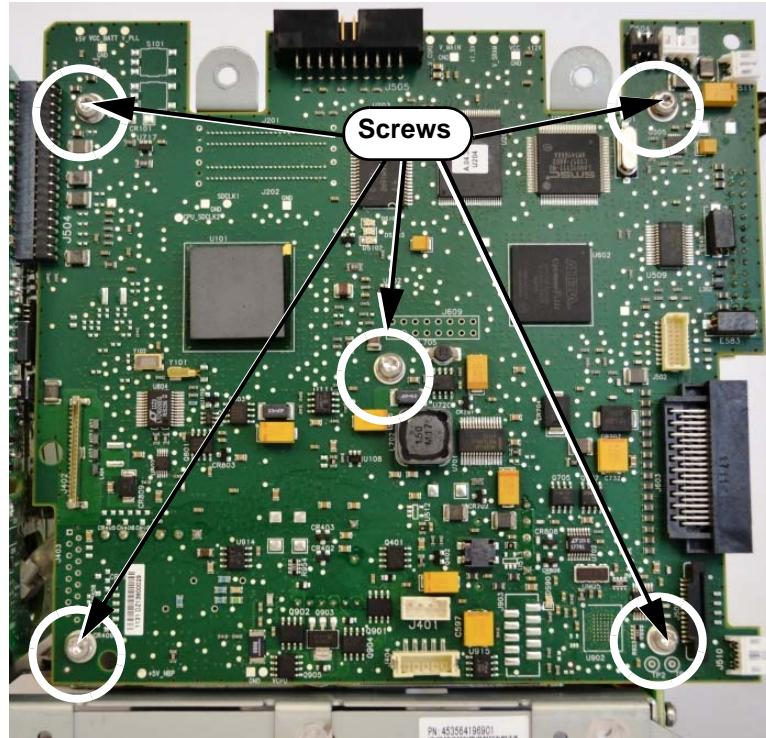


To remove the main board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-25. Note — Before you reassemble the monitor, note the calibration values. These values are needed to reset the serial number and calibrate the monitor. For more information, see “Calibrating IBP (SureSigns VM6 and VM8 SE)” on page 3-27 and “Calibrating the SureSigns VM6 and VM8 SE Temperature” on page 3-29.

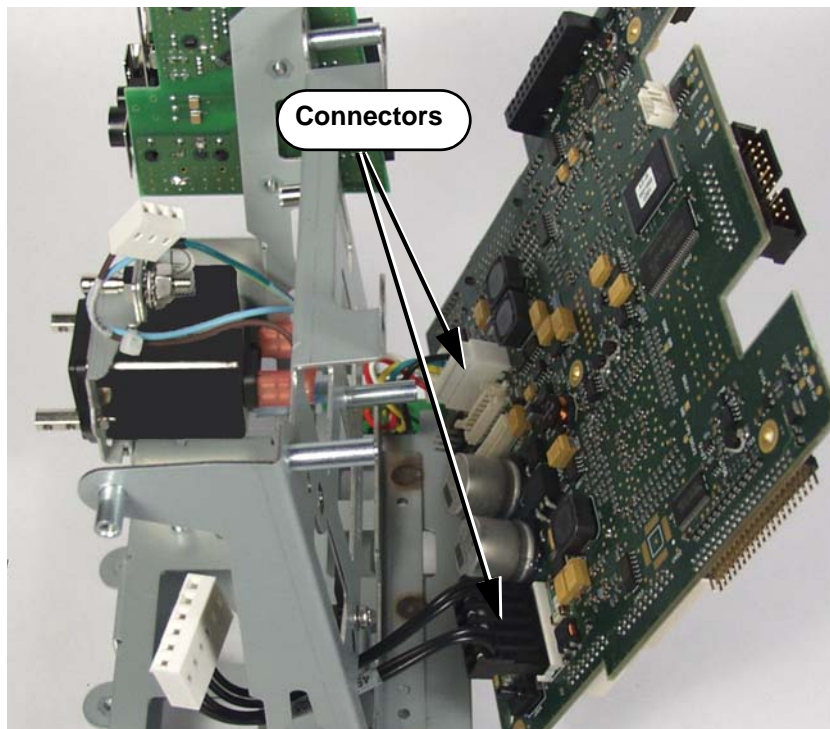
4

Remove the five Torx T10 screws from the main board.



5

Disconnect all of the connectors and NBP tubes from the main board.



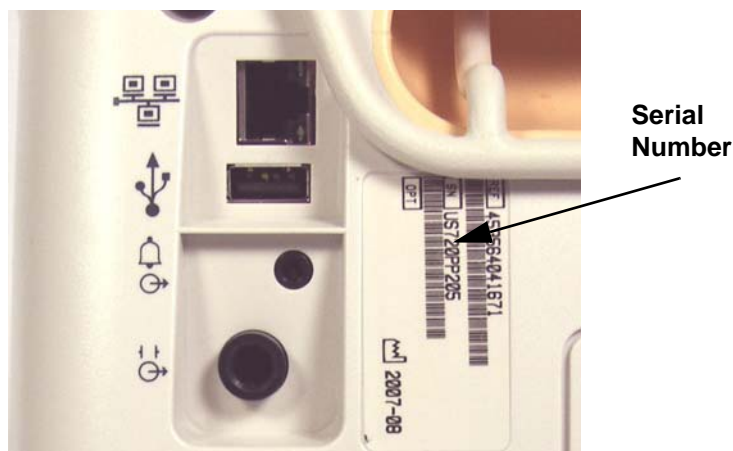
6

Remove the main board from the assembly.

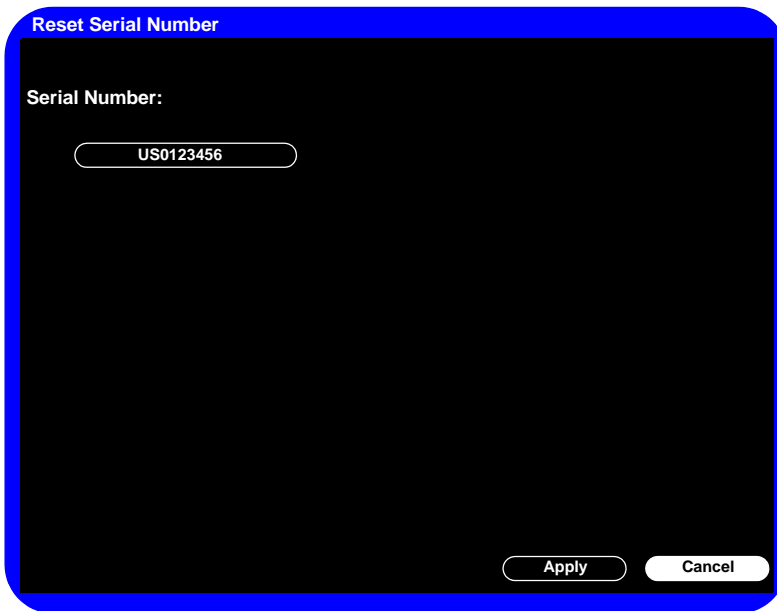
7	If the version of main board you are installing does not require an adapter board for the LCD, remove the adapter board from the LCD frame and connect the LCD directly to the main board. See “Removing the LCD Assembly” on page 5-47.
8	After you replace the main board and reassemble the monitor, you must perform the following procedures before use: <ul style="list-style-type: none">• “Resetting the Serial Number” on page 5-36.• “Setting the System Configuration” on page 5-38.• “Calibrating IBP (SureSigns VM6 and VM8 SE)” on page 3-27.• “Calibrating the SureSigns VM6 and VM8 SE Temperature” on page 3-29.

Resetting the Serial Number

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



To reset a serial number:

Step	
1	Open the Maintenance options of the System Diagnostics menu. See “Accessing the System Diagnostics Menu” on page 3-13.
2	<p>Rotate the wheel to highlight the Reset S/N button and press the wheel. The Reset Serial Number menu appears.</p> 
3	Rotate the wheel to highlight the Serial Number , and then press the wheel. A keyboard appears.
4	Use the wheel to 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	Rotate the wheel to highlight the Apply button, and then press the wheel. A confirmation window displays the message: System will restart now.
6	In the confirmation window, press the wheel to select OK . 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. You can configure the monitor for any of these options:

- IBP
- Temperature module (SureSigns VM4 only)
- Large screen
- CO₂ (SureSigns VM8 SE only)

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. To resolve this problem, correct the system configuration settings.

To reset the system configuration:

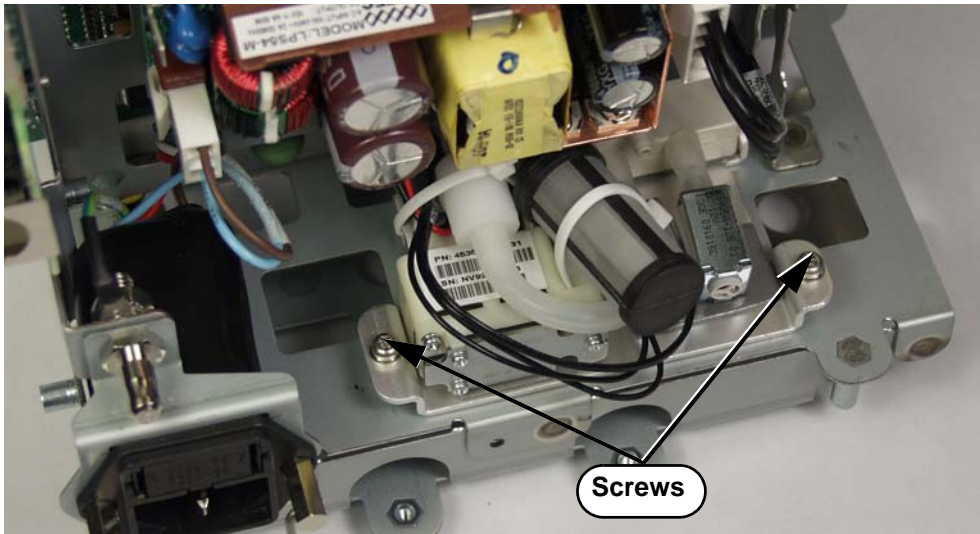
Step	
1	Open the Maintenance options of the System Diagnostics menu. See “Accessing the System Diagnostics Menu” on page 3-13.
2	<p>Rotate the wheel to highlight the Configuration button, and then press the wheel.</p> <p>The Configuration menu appears.</p> <p>An example SureSigns VM8 SE menu is shown below.</p> <div><div>Configuration</div><div><div>Configuration:</div><div><div><input type="checkbox"/> IBP</div><div><input type="checkbox"/> CO2</div><div><input type="checkbox"/> Large Screen</div></div></div><div><div>Apply</div><div>Cancel</div></div></div>

3	Rotate the wheel and press it to place a check mark by each option to be used.
4	To save these settings to the main board, rotate the wheel to highlight the Apply button, and then press the wheel.
5	In the window that appears, press the wheel to select OK . The monitor restarts.

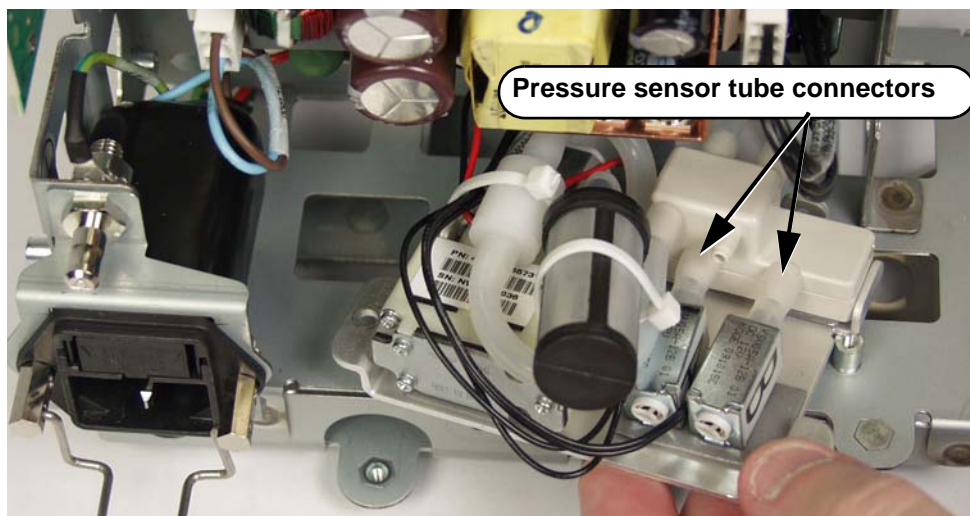
Removing the NBP Module

Caution After you replace the NBP module, you must reset the NBP cycle count and run the NBP test. For information on resetting the NBP cycle count, see “Viewing and Resetting Tracked Parameters” on page 4-37. For information on running the NBP test, see “NBP Test” on page 3-22.

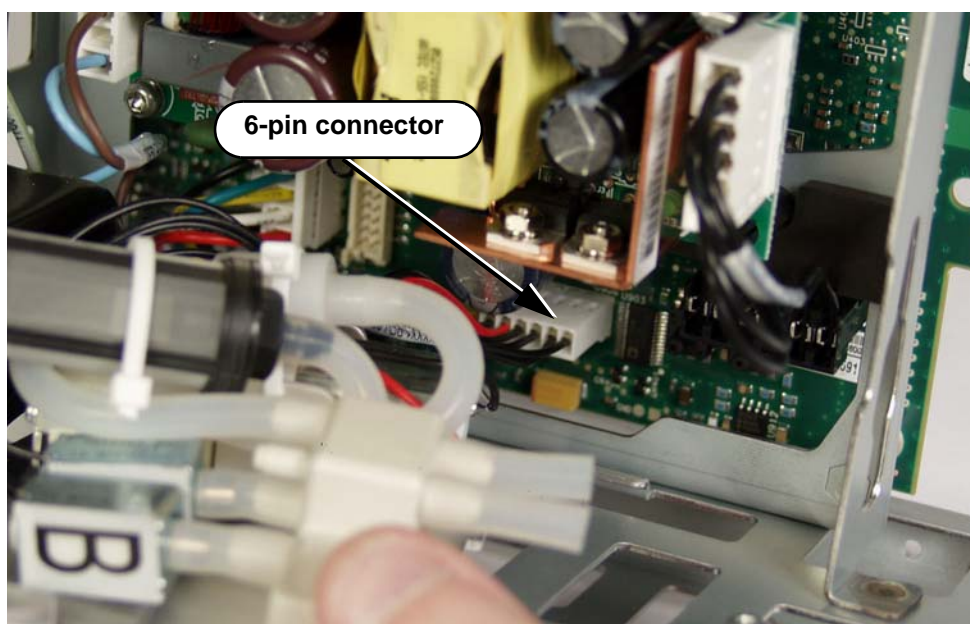
To remove the NBP module:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-25.
4	Remove the two Torx T10 screws and washers from the metal bracket holding the NBP module assembly to the bottom of the main board. 

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

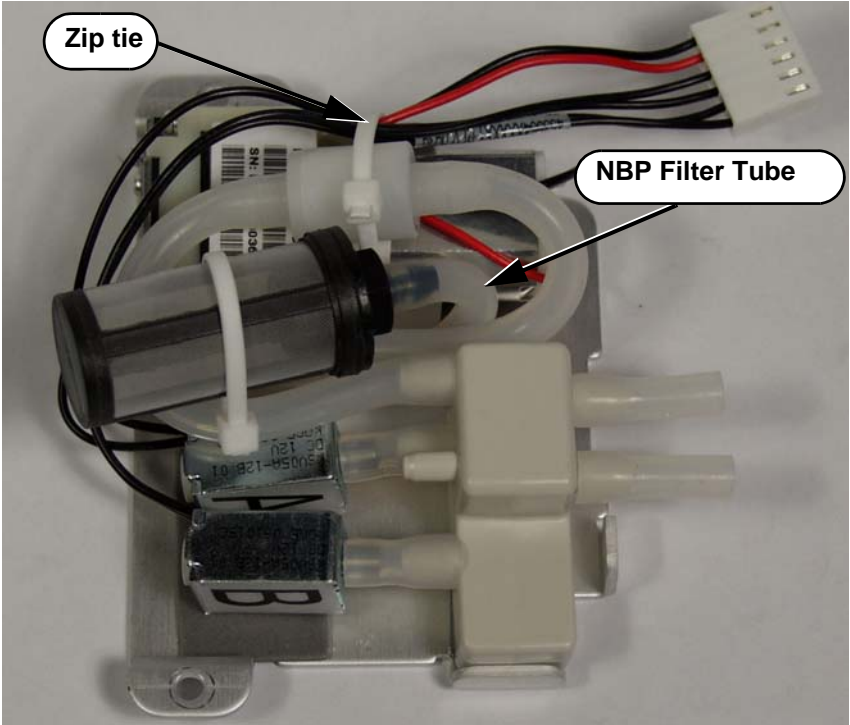


- 6 Disconnect the 6-pin connector from the main board and remove the NBP module.



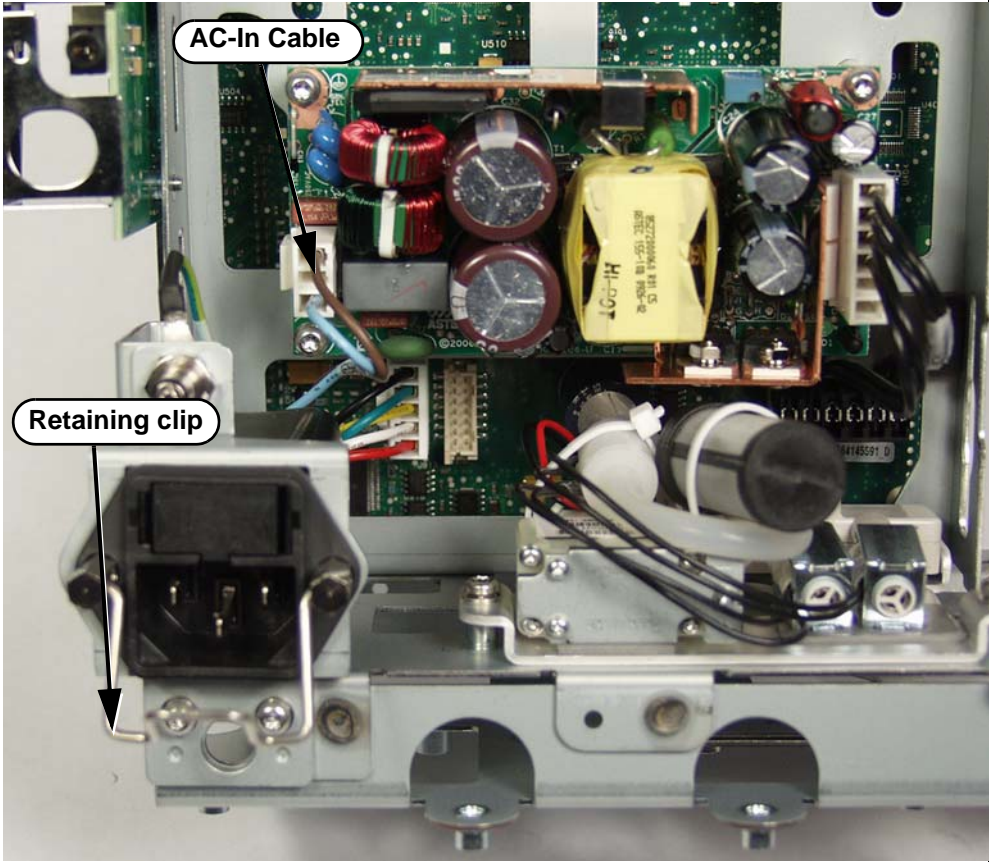
Removing the NBP Filter

To remove the NBP filter:

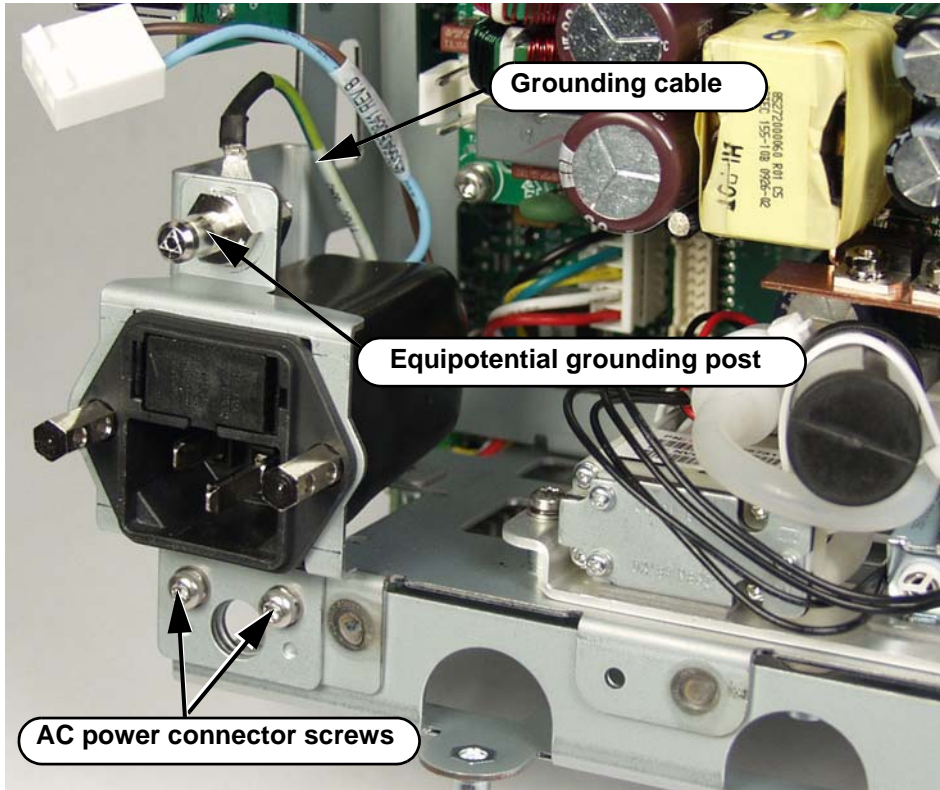
Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Remove the front end assembly. See “Removing the Front End Assembly” on page 5-25.
4	Remove the NBP module. See “Removing the NBP Module” on page 5-39.
5	<p>Use wire cutters to cut the plastic zip tie securing the filter to the module, and disconnect the filter from the NBP filter tube.</p>  <p>Caution</p> <p>When you replace the NBP filter, secure it to the NBP module with a new plastic zip tie.</p>

Removing the AC Power Connector

To remove the AC power connector:

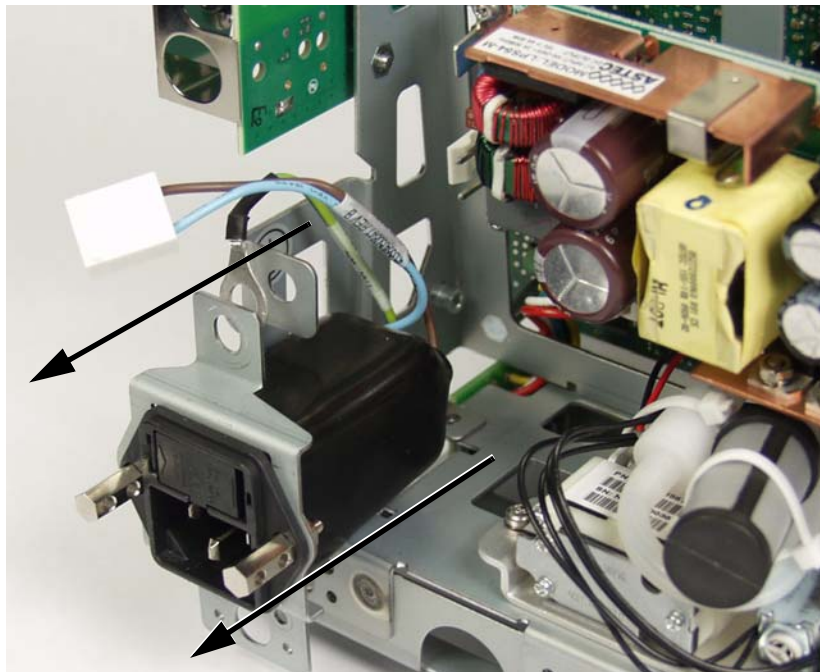
Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	Squeeze the power cord retaining clip and remove it from the bolts. <div data-bbox="264 672 1247 1528"></div>
4	Disconnect the AC-In cable from the main board assembly.

- 5 Remove the two AC power connector screws.



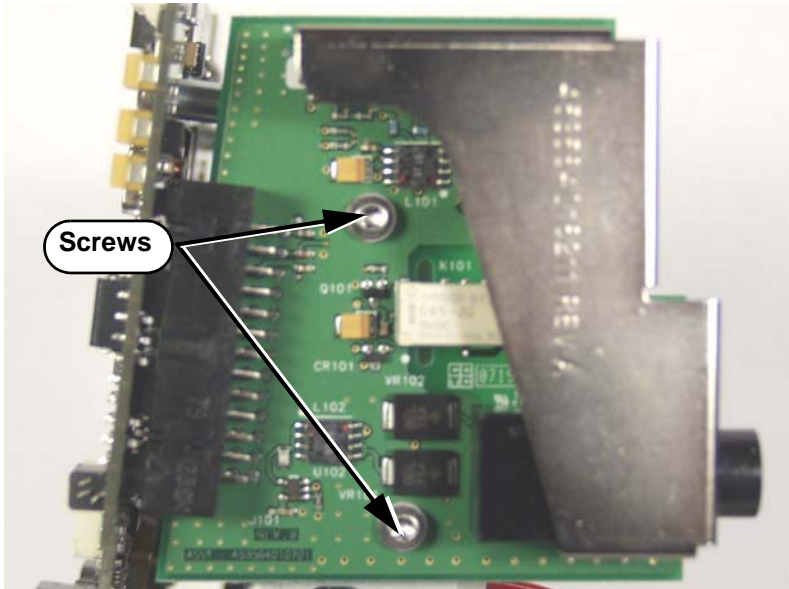
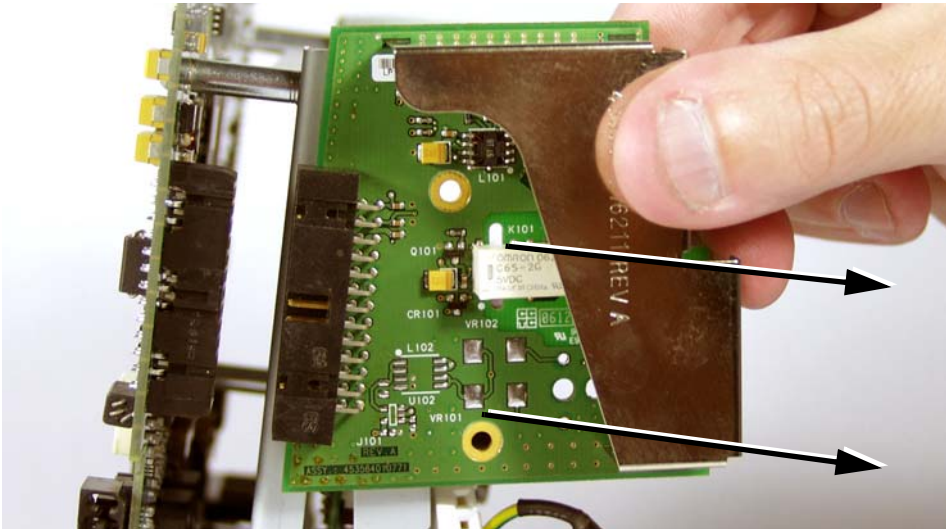
- 6 Remove the grounding washer from the grounding post with a 10 mm wrench and disconnect the grounding cable from the post.

- 7 Slide the AC power connector out of the mounting bracket.



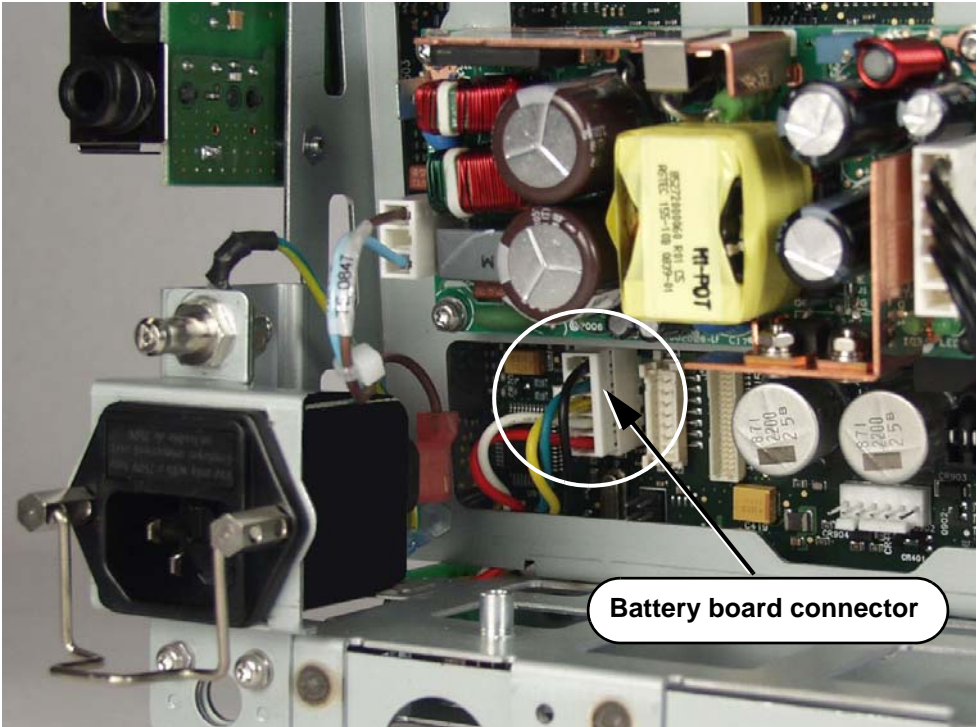
Removing the Communications (LAN) Board

To remove the communications board:

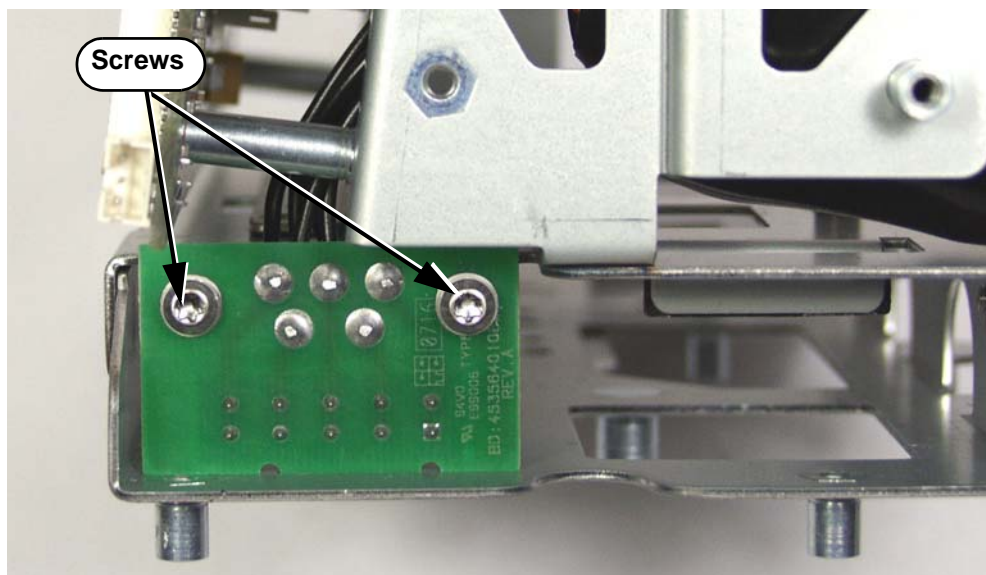
Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	<div>Remove the two Torx T10 screws and washers holding the communications board to the main board assembly. A close-up photograph of the green LAN board being removed from the main board. Two Torx T10 screws are being unscrewed from the board. A callout box labeled 'Screws' with arrows points to the two screws. Various components like capacitors (L101, L102), resistors (Q101, CR101, VR101, VR102), and a heat sink (K101) are visible on the board.</div>
4	<div>Pull the LAN board away from the 26-pin connector on the main board and remove it. A photograph showing a hand pulling the LAN board away from the main board. The board is being lifted away from a 26-pin connector. Two arrows point to the board, indicating the direction of removal. The board has '16211 REV A' printed on it.</div>

Removing the Battery Connector Board

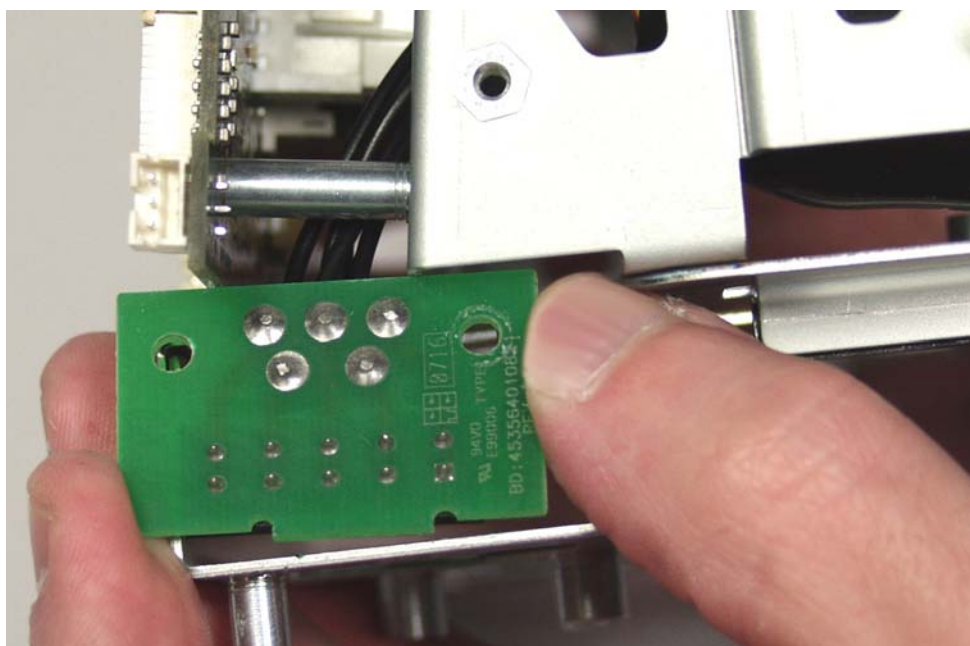
To remove the battery connector board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the main board assembly. See “Removing the Main Board Assembly” on page 5-18.
3	<div>Disconnect the battery board connector from the main board assembly. </div>

- 4 Remove the two Torx T10 screws and washers holding the battery connector board.



- 5 Lift the board out of the slot in the metal front end assembly case and remove it.

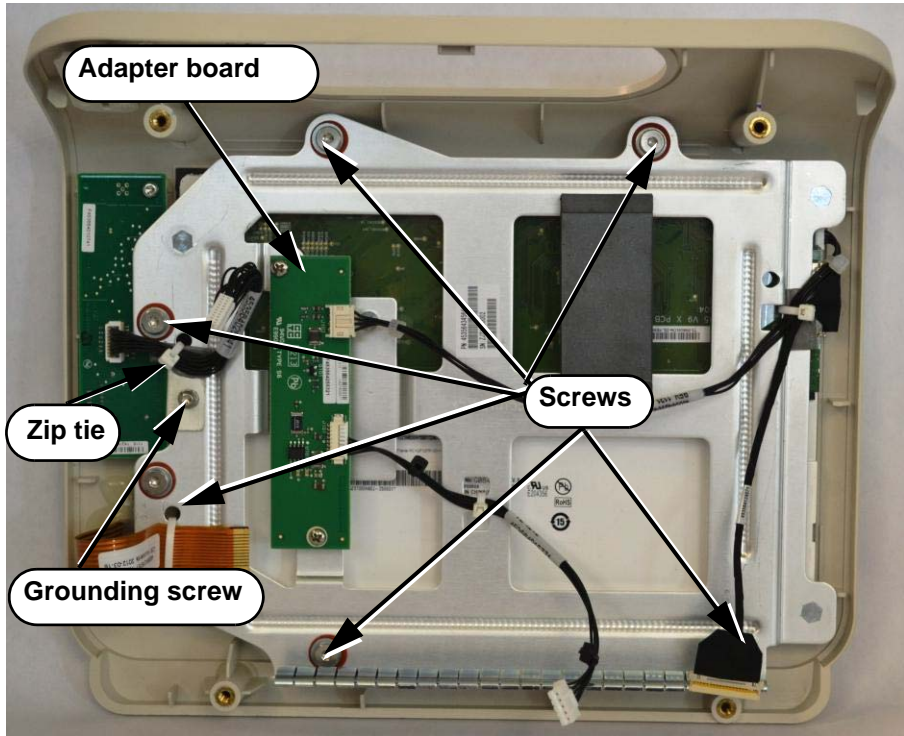


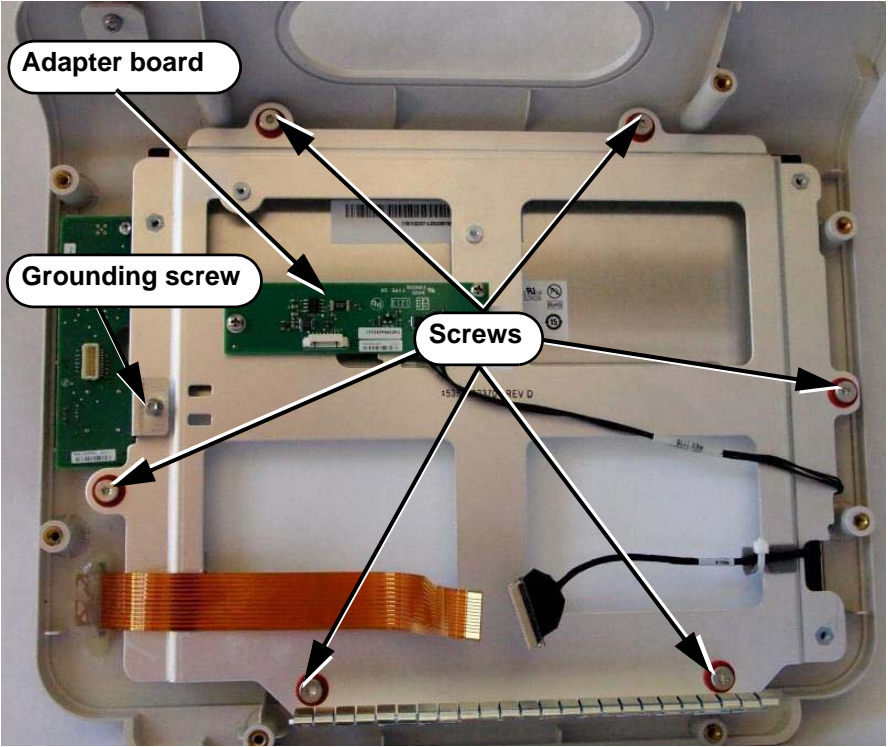
Removing the LCD Assembly

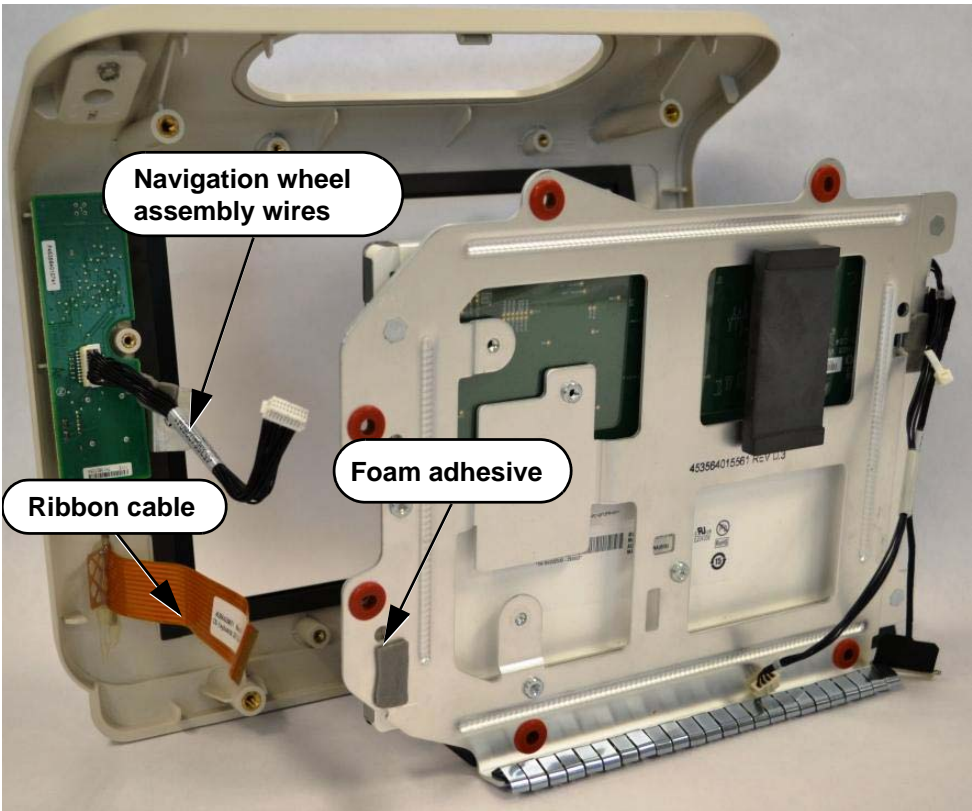
Depending on the version of main board in your monitor, you may require an adapter board for the LCD. If your monitor has an adapter board, replace it with the new one included in the replacement kit.

Caution After you replace the LCD, you must reset the LCD Usage Hours. For more information on resetting the LCD Usage Hours, see “Viewing and Resetting Tracked Parameters” on page 4-37. Perform this procedure in a dust-free environment to avoid damage to the LCD display.

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 5-12.
2	<p>Remove the six Torx T10 screws that attach the display to the front panel. The SureSigns VM4 monitor with an adapter board is shown below.</p>  <p>The diagram shows the internal components of the SureSigns VM4 monitor. It includes an adapter board, a main board, and a display panel. Six Torx T10 screws are shown being removed from the front panel. Labels with arrows point to the 'Adapter board', 'Screws', 'Zip tie', and 'Grounding screw'.</p>

	<p>The SureSigns VM8 SE monitor with an adapter board is shown below. Your monitor may be slightly different.</p>  <p>The diagram shows the internal components of a SureSigns VM8 SE monitor. A green adapter board is mounted on the back of the monitor. A grounding screw is located on the left side of the adapter board. Several screws are used to secure the adapter board to the monitor's frame. Labels with arrows point to the 'Adapter board', 'Grounding screw', and 'Screws'.</p>
3	<p>Remove the grounding screw and washer.</p> <p>Note — <i>The ferrite position on your monitor may vary.</i></p>
4	<p>For SureSigns VM4 monitors, use wire cutters to cut the plastic zip tie that secures the navigation wheel assembly wires to the display.</p> <p>Note — <i>When you reassemble the LCD display and navigation wheel assemblies, secure the cables to the display with a new plastic zip tie.</i></p>

5	<p>Gently peel the ribbon cable from the foam adhesive on the LCD frame and lift the assembly out of the front case.</p> 
6	<p>Replace the entire LCD assembly.</p>
7	<p>If your monitor does not require an adapter board, remove the board from the LCD replacement assembly frame.</p>
8	<p>After you reassemble the monitor and perform the following procedures before you put the monitor back in service. For detailed information, see Chapter 3, “Performance Verification Testing.”</p> <ul style="list-style-type: none"> • Power-on test • Pneumatic leakage test • Display test • All safety tests • Reset the LCD usage hours

Removing the Navigation Wheel Assembly Board

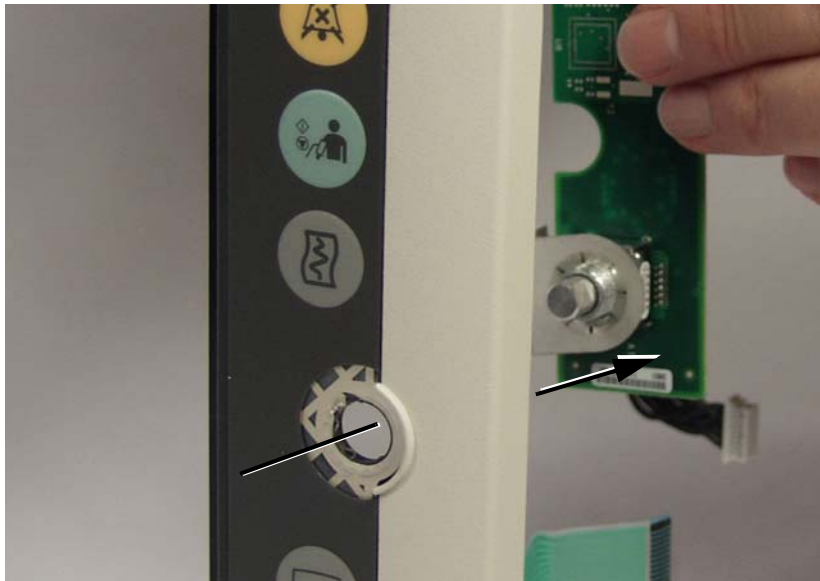
To remove the navigation wheel assembly board:

Step	
1	Separate the front and rear monitor case assemblies. See “Separating the Front and Rear Case Assemblies” on page 5-12.
2	Remove the LCD display. See “Removing the LCD Assembly” on page 5-47.
3	<p>Pull the wheel off of the stem.</p> 
4	<p>Remove the locking nut and washer with a 10 mm wrench.</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 metal wheel stem.