

Disassembly

This chapter provides step-by-step procedures that are used to access replaceable parts of the monitor. The sections in this chapter describe and photographically illustrate procedures for disassembling the monitor in order to remove or replace suspected defective assemblies or components.

Introduction

The monitor consists of two main assemblies, the front case assembly, and the rear case assembly.

All part numbers and exploded views of some assemblies are located in *Chapter 8, "Spare Parts" on page 8-1*. The monitor can be disassembled down to all major component parts, including

- PCBs
- Battery
- Cables
- Function buttons
- Chassis enclosures

Tools Required

You will need the following tools to disassemble the monitor:

- small/medium, Philips-head screwdriver
- flathead screwdriver
- needle-nose pliers
- 10 mm socket wrench (for navigation wheel)
- 5/16 nut driver

Note—If you want to disassemble the RS-232 connector located on the rear panel, you will need a 3/16 inch socket wrench.

Disassembly Safety Information

Warning

Performance Verification: Do not place the monitor into operation after repair or maintenance has been performed, until all recommended Performance and Safety Tests listed in *Chapter 4, "Testing the Monitor"* of this Service Guide have been performed. Failure to perform all tests could result in erroneous monitor readings.

Before attempting to open or disassemble the monitor, disconnect the power supply from the monitor.

Before you begin any disassembly procedure, you must remove the battery.

High voltage is generated by the LCD backlight driver. Exercise caution when operating the monitor with the covers open.

Caution

Observe ESD (electrostatic discharge) precautions when working within the unit.

Before you remove any module, make sure you are wearing ESD protection and you are working in a grounded environment.

If the internal battery cable has been disconnected, pay particular attention to the polarity of the cable before reattaching. If the battery cable polarity is reversed, it is likely that circuit damage will occur.

Note—If you want to disassemble the RS-232 connector located on the rear panel, you will need a 3/16 inch socket wrench.

Disassembly Procedures

This section provides instructions for closed case, front case and rear case disassembly procedures.


Closed Case Disassembly Procedures

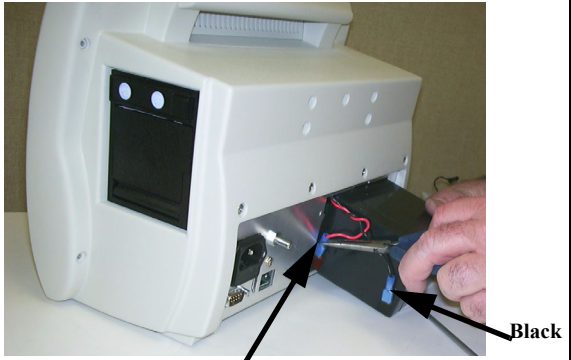
This section describes the items that can be removed without disassembling the main case of the monitor.

Removing the Battery

Warning

Before you begin any disassembly procedure, you must remove the battery.

Step	Action
1	With the rear of the monitor facing you, disconnect the battery cover from the rear panel using a Philips no. 1 screwdriver to loosen the 4 captive screws fastening the battery cover. 
2	Slide the battery out by tilting the monitor towards you.

Step	Action
3	Disconnect both battery lug terminals to release the battery.
4	When you re-insert the battery, verify that the battery is inserted the correct way and the polarity is correct (see figure below). <div style="text-align: center; margin-top: 20px;">  <p style="text-align: center;">Red Black</p> </div>

**Removing the
Navigation
Wheel**

Step	Action
1	Firmly grasp both sides of the wheel and pull straight back from the monitor. The wheel should slip off the encoder shaft. If the wheel does not slip off the encoder shaft, use the needle-nose pliers and pull the wheel.
2	For further disassembly, use the 10 mm socket wrench to unscrew the brass hex nut.

Removing the Keypad on the Front Panel


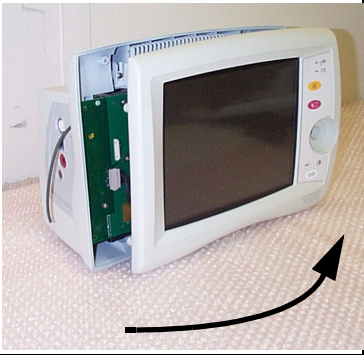
Step	Action
1	The keypad is attached with an adhesive to the front panel. To remove it, carefully lift up one corner of the keypad with a flathead screwdriver.
2	Peel the adhesive away from the front panel.

Removing the Optional, External Recorder

Step	Action
1	Press the external Paper Eject button on the right hand side of the recorder. The door drops forward.
2	Remove the paper roll. Two secure screws are visible on the back panel of the recorder.
3	Use a Philips screwdriver to loosen the two captive screws.

4	Pull the recorder straight out of the side of the monitor by placing your index and middle fingers in the inside center of the recorder and firmly pulling the recorder towards you.
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**Separating
the Front
from the
Rear Case**

Step	Action
1	Verify that the battery has been removed. If not see, <i>“Removing the Battery on page 7-4.</i>
2	Verify that the navigation wheel and brass hex nut have been removed. If not see, <i>“Removing the Navigation Wheel on page 7-5.</i>
3	Use a Philips no. 2 screwdriver to remove the 6 screws fastening the Rear Case Assembly to the Front Case Assembly. 
4	Facing the front of the monitor, shift the front case slightly to the right, making sure that you do not break off the navigation wheel shaft. 

Step	Action
5	<p>Disconnect the display cable located on your left-hand side by pulling the connector towards you. Disconnect the backlight tube, front panel and speaker cables located on your right-hand side.</p>
6	Separate the front from the rear case.

Front Case Disassembly

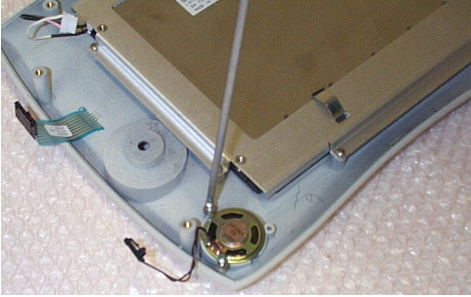
After you have separated the front from the rear case you can replace the following from the front case assembly:

- Speaker
- Backlight Tube

Caution

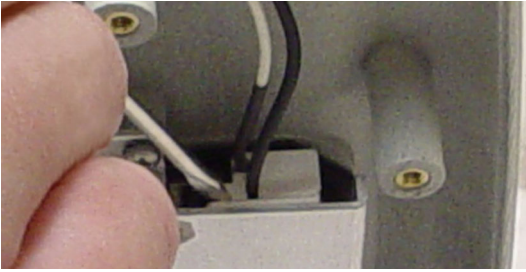

Before you remove any module, make sure you are wearing ESD protection and you are working in a grounded environment.

Replacing the Speaker

Step	Action
1	Use a Philips no. 2 screwdriver to remove the 3 screws fastening the speaker. 
2	Pull the speaker up.

Replacing the Backlight Tube

The backlight tube is located within the LCD screen. However, you do not need to disassemble the LCD screen display to replace the backlight tube.

Step	Action
1	Insert a small, thin, flathead screwdriver into the crevice between the LCD screen and where the backlight tube slides in. 
2	Using the screwdriver, grab the corner of the backlight tube and gently pull the tube out. Re-insert a new backlight tube. 

Rear Case Disassembly


You must disassemble the rear case to remove the following modules:

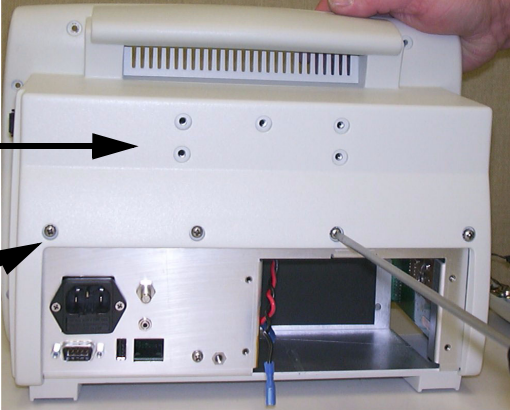
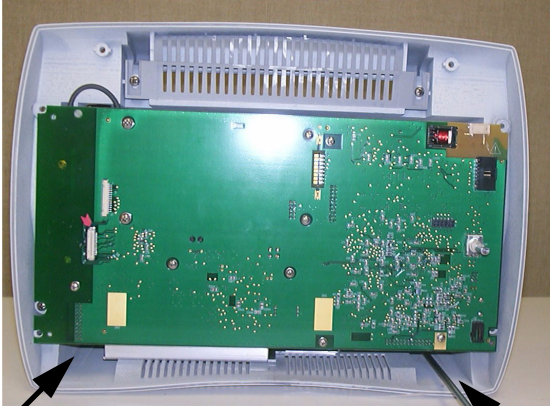
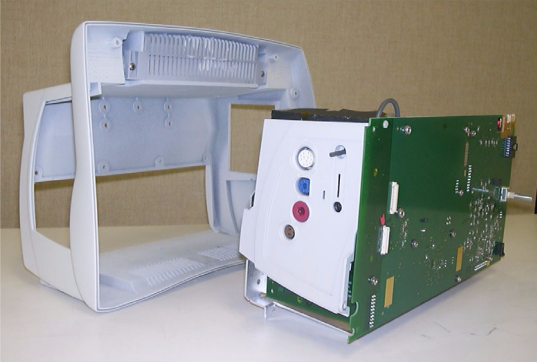
- Main PCB
- Patient Monitoring I/O
- SpO₂
- CO₂
- NBP
- Communications
- Power Supply

Caution

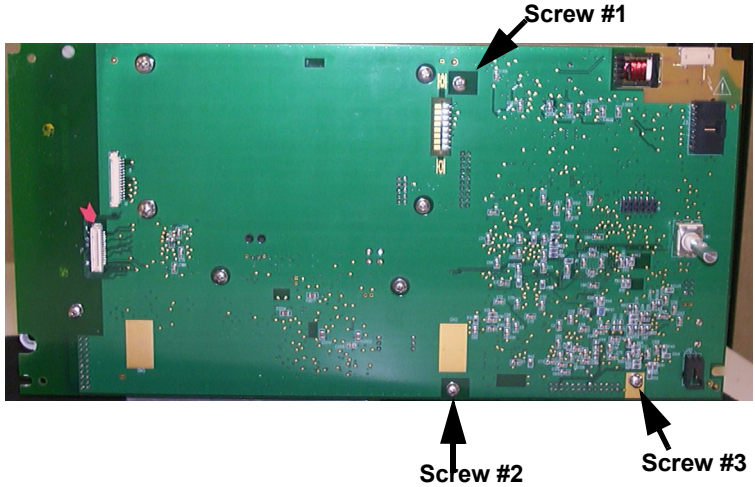
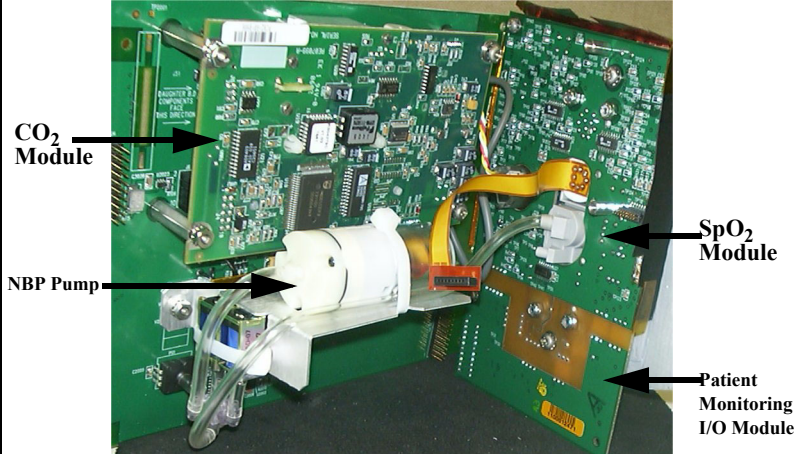
Before you remove any module, make sure you are wearing ESD protection and you are working in a grounded environment.

To disassembly the rear case:

Step	Action
1	Verify that the battery has been removed. If not see, <i>“Removing the Battery on page 7-4.”</i>
2	Verify that the recorder has been removed. If not see, <i>“Removing the Optional, External Recorder on page 7-6.”</i> If there is no recorder, unsnap the recorder door using a flathead screwdriver (see figure below). 

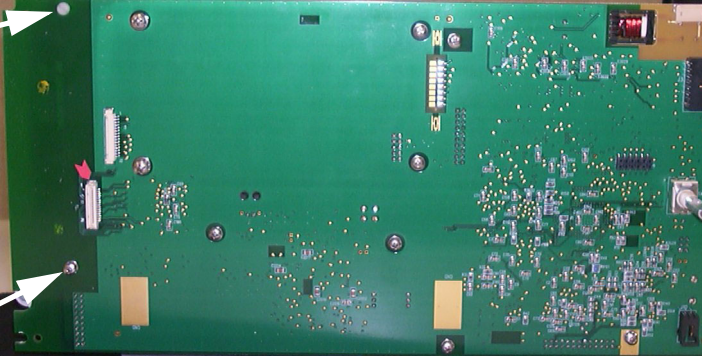
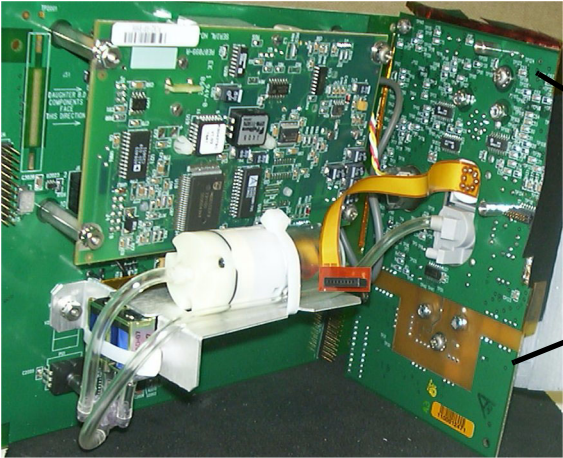
Step	Action
3	<p data-bbox="675 331 1430 359">Use a Philips no. 2 screwdriver to remove the 9 screws fastening the rear case.</p>  <p data-bbox="813 533 922 560">Screws 1-5</p> <p data-bbox="813 701 922 728">Screws 6-9</p>
4	<p data-bbox="675 854 1349 882">Remove the two screws located in the bottom corners of the rear case.</p>  <p data-bbox="862 1360 943 1388">Screw 1</p> <p data-bbox="1360 1360 1442 1388">Screw 2</p>
5	<p data-bbox="675 1411 1143 1438">Gently slide the chassis away from the rear case.</p> 

Removing the Main PCB Module

Step	Action
1	Unscrew the PCB module by loosening the following 3 screws: 
2	Gently pull the module towards you.
3	After you have removed the Main PCB module, you should have access to the CO ₂ , SpO ₂ , NBP pump, and the Patient Monitoring I/O modules. 

Removing the Patient Monitoring I/O Module

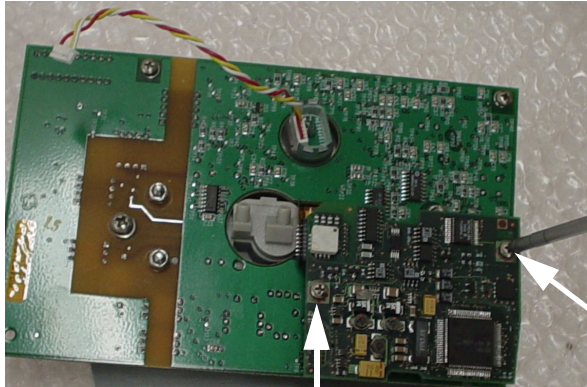
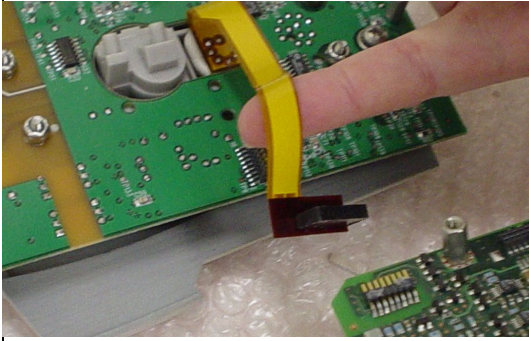
Follow these instructions for removing the I/O module from the Main PCB module.

Step	Action
1	<p>Remove the following 2 screws to remove the connector module.</p> <p>Screw #1 </p> <p>Screw #2</p> <p><i>Note—Use a flathead screwdriver to remove Screw #1.</i></p>
2	Slide the I/O module out.
3	Disconnect the CO ₂ connector and tubing and the NBP tubing. Slide the CO ₂ exhaust tubing out.
4	<p>Pull the I/O module away.</p>  <p>Patient Monitoring I/O Module</p>

Disassembly Procedures

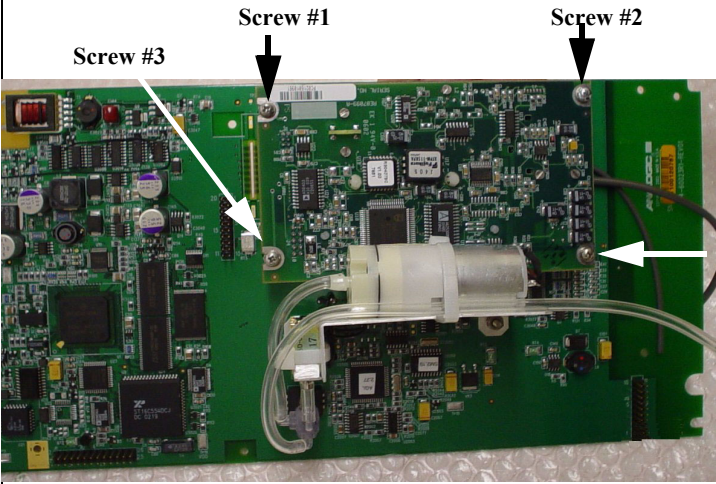
Removing the SpO₂ Module

After you have removed the Patient Monitoring I/O module from the Main PCB module, you can remove the SpO₂ module. To do this:

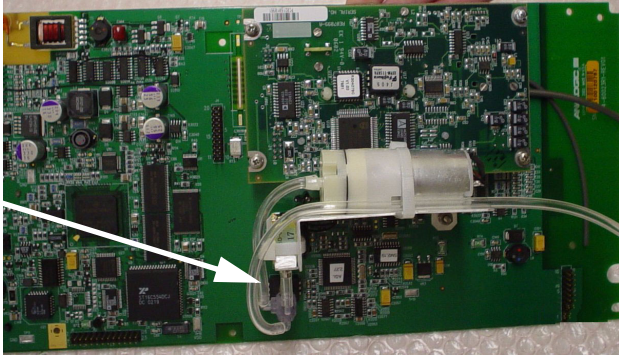
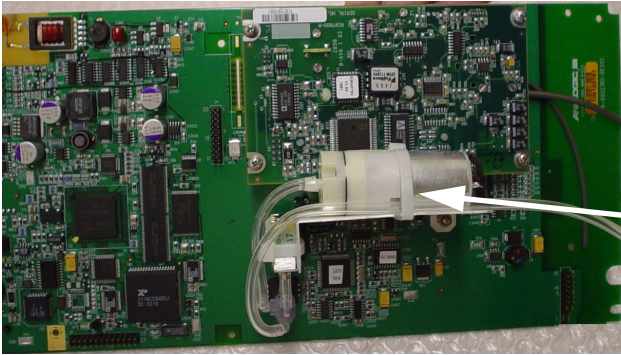
Step	Action
1	Remove the 2 screws fastening the SpO ₂ module to the I/O module. 
2	Remove the connector that attaches the SpO ₂ module to the I/O module. 
3	Gently pull the SpO ₂ module away.

Removing the CO₂ Module

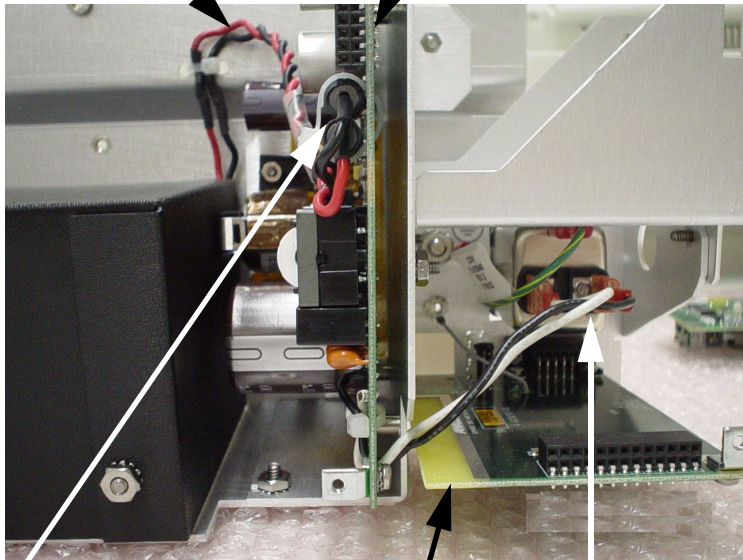
Note—This procedure is only for those that have the C3 Sedation model.

Step	Action
1	Remove the 4 screws on the CO ₂ module. 
2	Tilt the CO ₂ module towards the NBP pump.
3	Gently pull the module away from the Main PCB module. <i>Note—When reassembling the CO₂ module, ensure that the CO₂ header matches up with the mating header.</i>

Removing the NBP Pump

Step	Action
1	Remove the connector from the NBP pump.  <p data-bbox="662 653 773 678">Connector</p>
2	Cut the tie wrap.  <p data-bbox="1208 1129 1308 1155">Tie Wrap</p>

Removing the Power Supply Module

Step	Action
1	<p>Use the needle-nose pliers to unplug the three connectors.</p>  <p>The photograph shows the internal components of a device. A power supply board is visible on the right side. To its left, there are battery cables. Below the power supply board, there is a communications module. Three connectors are labeled: Connector #1, Communications Module, and Connectors #2 & 3. Arrows point to each of these components.</p>
2	Remove the two screws that connect the power supply to the rear panel.
3	Remove the screws on the side and bottom of the rear panel.
4	Cut the tie wrap that holds the battery cables together.
5	Use a 5/16 nut driver to unfasten the power supply from the rear panel.
6	Pull the power supply module away from the rear panel.