
Sof•Matt® Low Air Loss Mattress System

(see inside cover for applicable serial numbers)



**OPERATOR'S MANUAL
SERVICE MANUAL**

IMPORTANT

Please read all precautions and instructions before using the Sof•Matt® Low Air Loss Mattress System.

Maximum benefit to the patient at the greatest margin of safety requires a thorough knowledge and understanding of the correct operation and application of the Sof•Matt Low Air Loss Mattress System.

Users must follow the instructions and precautions included with each mattress system prior to use. Operate the equipment with the same care you would use when operating precision medical equipment.

WARRANTY

Sof•Matt Low Air Loss Mattress Systems are warranted against defects in material and workmanship under normal use and operation from the date of shipment for a period of one year.

During the warranty period, Gaymar will repair or replace at its sole option, free of charge, any defective parts or products returned with prior authorization prepaid to Gaymar Industries, Inc. See *Incoming Inspection and Return Policy*.

Warranty does not cover products abused, misused, or altered outside factory. There are no obligations on the part of Gaymar for consequential damages arising out of or in connection with the use or performance of the product. Gaymar disclaims all implied warranties including, but not limited to, the implied warranties of merchantability and of fitness for a particular purpose.

APPLICABLE SERIAL NUMBERS

This service manual applies only to models RSM176S (no configuration) and RSM180S configuration 'A' Sof•Matt Mattress Systems. The 8th character of the serial number identifies the configuration.

For example, S/N RSM180S A BI0042 identifies a configuration 'A' system.

INCOMING INSPECTION AND RETURN POLICY

Check the shipping carton for damage immediately after receipt. If damage is discovered, the product should be unpacked with the carrier's agent present. Make a claim immediately to the carrier for the damage.

Do not return damaged goods without notifying the carrier. If products damaged during shipment are returned to Gaymar without notifying the carrier, Gaymar will assume that repairs will be made at the customer's expense. Products returned to Gaymar must be accompanied by Returned Goods (RG) numbers. Returned Goods authorization and numbers may be obtained by calling Gaymar Industries' Customer Service Department:

Toll free: 1 800 828-7341
Direct: (716) 662-2551

When inquiring, please supply model and serial number, purchase order number, whether merchandise was bought on contract, and reason for return.

In general, deleted and outdated merchandise will not be accepted for credit. A restocking charge of 15% will be assessed on returns of current merchandise.

Ship returns prepaid to Gaymar Industries, Inc., 10 Centre Drive, Orchard Park, NY 14127-2295.

Sof•Matt Low Air Loss Mattress Systems purchased by individuals for home use must be returned to the dealer from which they were purchased for repair.

SYMBOLS USED



Attention: consult accompanying documents



Dangerous voltage



Double insulated. When servicing, use only identical replacement parts.



Type BF applied equipment



Pull red strap to rapidly deflate mattress for performing CPR

CONTENTS

<u>Description</u>	<u>Page</u>
Contraindications/Indications/Precautions	2
Introduction	3
Operating Instructions	4
Cleaning and Care	7
Specifications	8
Functional Check	9
Troubleshooting	12
Checking Cells for Leaks	15
Maximum Pressure Test	17
Mattress Replacement Parts	20
Control Panel Calibration [advanced]	28
Replacing the Controllers	32

ILLUSTRATIONS

<u>Figure</u>	<u>Description</u>	<u>Page</u>
1	Sof•Matt Mattress System	3
2	Support Boards	3
3	Firmness Control	4
4	Securing Linens with 'D' Rings	4
5	Visual Firmness Check	5
6	CPR Plug	6
7	Test Pin	10
8	Functional Check/Inspection Form	11
9	Troubleshooting Matrix	12
10	Mattress Air Flow/Pressure Diagram	17
11	Mattress Replacement Parts	20
12	RSM Sof•Matt Mattress	21
13	Upper Cell	21
14	Control Panel-to-Cell Connections	22
15	Folding Lower Replacement Cells	23
16	Panel Assembly	25
17	CPR Dump Pin Assembly, Parts	27
18	Upper Cell Controller Parts	27
19	Calibration Test Bladder Setup	28
20	Adjustment Points for Calibration	29
21	Pinch Points	30
22	Adjustment Points, Upper Cell Calibration	31
23	Control Panel Parts	35
24	Functional Test Kit	36

CONTRAINDICATIONS

Air support therapy is not recommended when spinal stability is a concern.

INDICATIONS

This device is intended to help treat and prevent decubitus ulcers (bed sores).

**SOF•MATT MATTRESS
PRECAUTIONS**

⚠ WARNING



Electric shock hazard. Do not remove pump cover. Refer servicing to qualified service personnel.



Double insulated. When servicing, use only identical replacement parts.

- There are no operator serviceable parts within the equipment. Refer servicing, maintenance and **FUNCTIONAL CHECK AND SAFETY INSPECTION** to qualified technical personnel familiar with good practice for medical device repair.
- Always perform the *FUNCTIONAL CHECK* after making repairs and before returning the Sof•Matt Mattress System to patient use.

Otherwise, personal injury, damage to the Sof•Matt Mattress System or improper therapy may result.

**PATIENT
PRECAUTIONS**

⚠ CAUTION

- Some medical conditions may not respond to this type of therapy. Patient's skin condition should be inspected regularly.

If any redness or breaks in skin occur, consult a physician.

- Disinfect the mattress between patient installations, utilizing standard hospital protocol and FDA approved disinfectants (such as a 10% chlorinated bleach solution).

Failure to disinfect may risk cross-contamination and infection.

- Keep bedding dry. Use incontinence pads if necessary.

Failure to keep the patient's skin clean and dry may lead to maceration.

INTRODUCTION

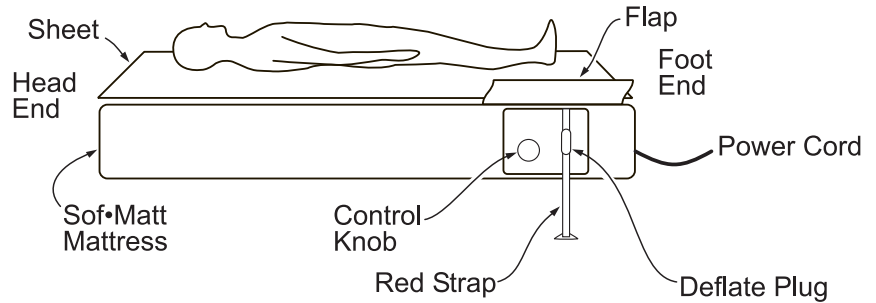


Figure 1—Sof•Matt Mattress System

Gaymar Sof•Matt Low Air Loss Mattress Systems are designed to aid in the prevention and treatment of pressure ulcers. The Sof•Matt Low Air Loss Mattress System (fig. 1) has an internal air pump which maintains adequate pressure in its upper and lower cells.

Please read and understand the precautions and instructions within this manual before attempting to use the mattress system. Carefully follow the instructions included with each mattress. In addition, we recommend that you request in-service training from your Gaymar representative.

PREPARING THE BED

The mattress is designed for use on bed frames which provide firm, solid support. Use otherwise may cause the mattress to be ineffective.

- NOTE:
- When the mattress is used on a link-spring bed frame, it may cause the RSM mattress to sag. Additional support can be provided by using three appropriately sized support boards. The RSM mattress contains straps inside the bottom of its cover to accommodate these boards and hold them in place. See figure 2.
 - Support boards (Gaymar P/N 10623-000) are available from your dealer. Boards may also be made as follows: Use 1/2" thick interior grade plywood board, good both sides. Cut each board to 33-1/2 inches (85 cm) long by 9 inches (23 cm) wide. Radius all corners. Sand all surfaces and edges smooth. Make sure all edges are rounded and smoothed to prevent wood splinters from causing punctures, which are not covered by warranty.

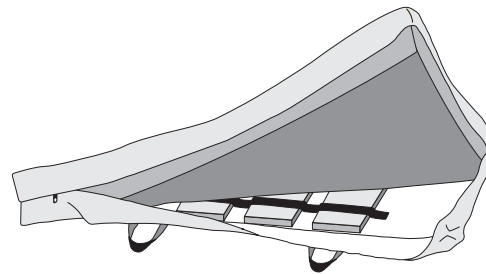


Figure 2—Support Boards

**OPERATING
INSTRUCTIONS**

NOTE: This product is not known to be susceptible to interference from outside sources in its normal environment, nor does it produce radiated or line conducted emission that will interfere with other equipment in its vicinity.

1. Place the Sof•Matt Mattress on the bed frame with the *FOOT END* markings at the proper end of the bed, facing up (fig. 1, p. 3).
2. Plug the power cord into a polarized electrical outlet. The mattress will immediately begin to inflate. The power cord is the only means to disconnect this product from the supply (MAINS).
3. Position the *Firmness Control* (located behind the control panel flap) initially as shown in figure 3.

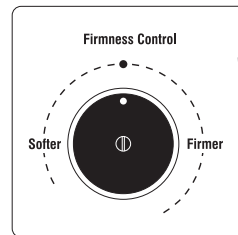


Figure 3—Firmness Control

4. The patient may be placed on the mattress after 45 minutes. The heel section will completely inflate within 90 minutes. For rapid inflation, insert a portable inflator (e.g., Gaymar model SC505) into the CPR valve and inflate for one minute. Replace the CPR plug quickly to prevent air from escaping.
5. Apply linens, leaving the red CPR strap exposed.

SECURING LINENS (OPTIONAL)

To secure linens to the Sof•Matt Mattress, thread the four corners through the D rings attached to the mattress (fig. 4). To ensure proper therapy, do not pull linens taut. The linens should remain loose and wrinkly on surface of mattress.

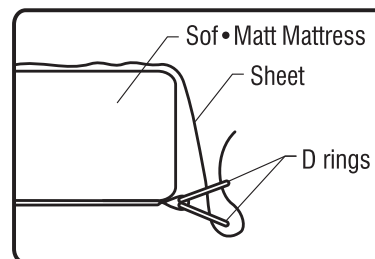


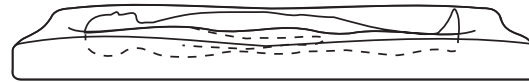
Figure 4—Securing Linens with D Rings

**MAINTAINING
PATIENT COMFORT
AND PROTECTION**

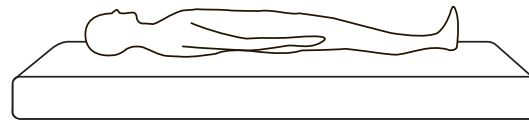
6. Place the patient on the mattress. If necessary, the *Firmness Control* setting may now be adjusted for patient comfort.

NOTE: When elevating the head of the bed above 30°, the *Firmness Control* setting may need to be increased.

1. If the patient appears to be bottomed when the head of the bed has been raised to a sitting position (30° or more above horizontal), adjust the firmness as described in step 6, page 4. When the bed is returned to a flat sleeping position (0°), adjust as necessary for patient comfort.



Too Soft



Too Firm

Figure 5—Visual Firmness Check

2. To determine if the Sof•Matt Mattress is functioning properly, visually check twice each day that the mattress is correctly inflated (fig. 5). Turn the pressure control knob clockwise to increase firmness.

If the inflation is still incorrect at the maximum setting, remove from service and contact your dealer.

3. To provide greater comfort, follow the procedure in step 6, page 4. Check patient after changing setting to confirm that the mattress surface is correctly inflated.

⚠ CAUTION

Some medical conditions may not respond to therapy of this type. **Check patient's skin frequently.** Consult physician if any redness or skin break occurs.

Serious injury could result if the patient's skin condition is left unchecked.

**POWER OUTAGE/
PATIENT TRANSPORT
FEATURE**

When power is removed from the mattress, therapy will be continued; however, the height of the mattress will gradually begin to decrease. To maintain therapy, power should be restored within 4 hours.

When transporting, unplug the power cord and bundle it on top of the mattress to keep it from underfoot.

The lower cell will maintain internal cell pressure for approximately four hours. The upper cell will partially deflate and the foot end will completely deflate.

**DEFLATING THE
MATTRESS**

The Sof•Matt Mattress can be deflated for storage by pulling firmly on the red CPR strap.



**REINFLATING THE
MATTRESS**

To reinflate, make certain to reinstall the CPR pin below the flap and to resecure the retaining snap. Plug the system into a polarized electrical outlet. The mattress will automatically inflate in approximately 90 minutes.

For rapid inflation, a portable inflator can be used by inserting it into the CPR valve.

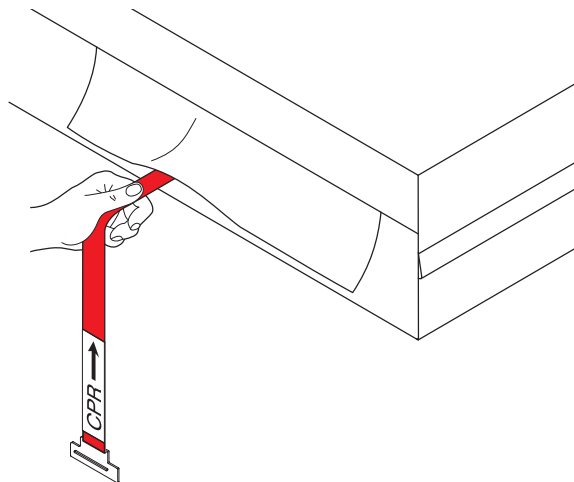


Figure 6—CPR Plug (pull strap to deflate)

CLEANING AND CARE

1. Unplug the power cord from the electrical outlet.
2. To clean, use soap and water and a clean cloth to wipe down the power cord and mattress. Do not use abrasive cleaners. Wipe dry with a clean cloth. Do not autoclave.

NOTE: Blood and other body fluids must be thoroughly cleaned from all surfaces before applying the disinfectant.

3. Apply an FDA approved disinfectant or 10% chlorinated bleach solution (chlorinated bleach with 5.25% sodium hypochlorite) to the external surfaces of the mattress.

Allow to completely dry. The solution contact time is what makes disinfection effective.

4. Wipe down the mattress with a clean, dry cloth to remove any excess disinfectant.

NOTE:

- Mattress cover must be dry prior to storage or application of linens.
- Failing to remove excess disinfectant could eventually degrade the polyurethane coating of the mattress cover.

STORAGE AND CARE,
SOF•MATT MATTRESS
AND COVER

Individual states have established rules and regulations pertaining to the cleaning and sterilization of mattresses that are intended to be resold, rented, or otherwise transferred from one user to another. Some states prohibit reselling mattresses and require them to be disposed of properly. Gaymar recommends contacting your state bedding department to obtain information on your state's rules and regulations if reusing, renting, or transferring mattresses.

Clean in accordance with the *Cleaning and Care* instructions above.

Plastic material should not be exposed to high temperature. Do not allow heat lamps or heating pads to come close to the mattress cover. **Do not autoclave.**

Do not place sharp objects in contact with the mattress. Holes in the mattress will degrade system performance.

SPECIFICATIONS

PHYSICAL

Dimensions 89 cm x 193 cm x 20 cm
(35" x 76" x 8")
or
89 cm x 203 cm x 20 cm
(35" x 80" x 8")

Weight 12.2 kg
(27 lb)

Operating Ambient Temperature Range 15.6°C to 32.2°C
(60°F to 90°F)

Storage and Transport Temperature Range -6.7°C to 48.9°C
(20°F to 120°F)

ELECTRICAL

Classification Type BF with no applied patient parts, Class II, double insulated, transportable equipment suitable for continuous operation. Not classified for protection against harmful ingress of liquid. Not classified for use in the presence of flammable anesthetics.

Input ~120 V, 60 Hz, 9 VA

Power Cord 4.6 m (15 ft), 18 AWG cord with polarized plug

Fuses (located inside pump, not accessible to the operator) Subminiature, 250 V, very fast acting, 1/4 ampere

Current Leakage 100 microamperes max.

CODE APPROVALS UL2601-I
CAN/CSA 22.2 No. 601.1

FUNCTIONAL CHECK

⚠ CAUTION

- The *FUNCTIONAL CHECK* must be performed by qualified technical personnel familiar with good practice for medical device repair.

Otherwise, damage to the Sof•Matt System and improper therapy may result.

- Testing will verify proper operation of the Sof•Matt System. Always perform the *FUNCTIONAL CHECK* after making repairs. Record each maintenance check on the *INSPECTION FORM* (fig. 8, p. 11).

Operation of the Sof•Matt System at other than specified operating pressures can result in poor or reduced patient support. Improper repair can result in patient injury.

TOOLS REQUIRED

- Functional Test Kit (P/N 78281-000—see fig. 24, p. 35)
- Manometer, 0-50 mm Hg (± 1 mm Hg accuracy)

**I. OPERATING
PRESSURE TEST**

Operate the Sof•Matt Mattress for at least two hours at nominal 120VAC line voltage prior to performing the *Operating Pressure Test*.

NOTE: Perform steps 1-3 prior to the two-hour warm-up.

1. See figure 7 (p. 10). Use the Functional Test Kit (fig. 24, p. 35). Replace the CPR plug with the test pin. Connect the female CPC connector and hose to the manometer.
2.
 - **To measure lower cell pressure**—Connect the shortest tube (*L*) from the test pin to the connector on the manometer.
 - **To measure foot cell pressure**—Connect the medium length tube (*F*) from the test pin to the connector on the manometer.
 - **To measure upper cell pressure**—Connect the longest tube (*U*) from the test pin to the connector on the manometer.
3. Turn the *Firmness Control* knob to the lowest position (*Softer*), at approximately 8 o'clock. After a two-hour warm-up, the cell pressures should be:
 - lower cell pressure: 25.0 \pm 2.0 mm Hg;
 - foot cell pressure: 5.5 \pm 2.0 mm Hg;
 - upper cell pressure: 12.0 \pm 2.0 mm Hg.

**I. OPERATING PRESSURE TEST
(continued)**

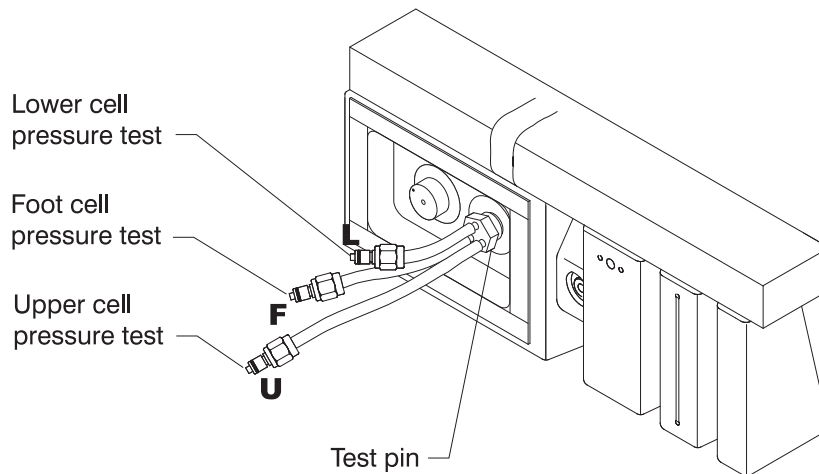


Figure 7—Test pin

4. Turn the *Firmness Control* knob to the highest position (*Firmer*), at approximately 5 o'clock. After the system stabilizes, the cell pressures should be:
 - lower cell pressure: 25.0 ± 2.0 mm Hg;
 - foot cell pressure: 5.5 ± 2.0 mm Hg;
 - upper cell pressure: 32.0 ± 3.0 mm Hg.
5. If the pressure(s) in steps 3 or 4 are not met, see *Troubleshooting*, page 12.

NOTE: When testing has been completed, remove the manometer and test pin. Replace the original CPR dump plug.

2. CURRENT LEAKAGE

The internal pump contained within the mattress system has double insulated construction. It is not necessary to measure current leakage. However, if you choose to do so, refer to *UL 2601-1, Clause 19*.

3. GROUND RESISTANCE

Measuring ground resistance is not applicable to the internal pump. Double insulated appliances are permitted to have two-conductor cords (refer to *NFPA 99--Standard for Health Care Facilities*, paragraph 9-2.1.2.2).

Sof•Matt Low Air Loss Mattress Functional Check and Safety Inspection Form					
Initials _____		Date _____	Serial Number _____		
Item(s)	Action	Observation	Results (circle selection)		
Warmup	Operate for two hours prior to performing steps 1-3.	Was pump operated for two hours?	YES	NO	
1. 3.*	Operating Pressure Test	Connect the manometer to the CPR valve using test pin. Use shortest tube to measure lower cell, medium length for foot cell, and longest for upper cell. Set pressure control knob to the <i>SOFTER</i> (lowest) position.	Is lower cell pressure 25.0 ± 2.0 mm Hg?	YES	NO _____*
			Is foot cell pressure 5.5 ± 2.0 mm Hg?	YES	NO _____*
			Is upper cell pressure 12.0 ± 2.0 mm Hg?	YES	NO _____*
1. 4.*	Operating Pressure Test	Connect manometer as in 1. 3. above, but set the pressure control knob to the <i>FIRMER</i> (highest) position.	Is lower cell pressure 25.0 ± 2.0 mm Hg?	YES	NO _____*
			Is foot cell pressure 5.5 ± 2.0 mm Hg?	YES	NO _____*
			Is upper cell pressure 32.0 ± 3.0 mm Hg?	YES	NO _____*

* NOTE: If the pressure measured in 1. 3. or 1. 4. exceeds the allowable range ("NO"), record the value for use with the *Troubleshooting Matrix* (figure 9).

Figure 8—Functional Check and Safety Inspection Form

TROUBLESHOOTING

OK=within specification
 LOW=less than spec.
 HIGH=greater than spec.

Field calibration of the panel assembly is not normally feasible. See Ordering Parts, page 20.

<i>Use Observations from 1.3, Operating Pressure Test</i>			
<i>IF</i>			<i>GO TO</i>
<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>	
OK	LOW	OK	1
LOW	LOW	OK	2
HIGH	LOW	OK	3
HIGH	HIGH	OK	4
OK	OK	LOW	5
LOW	LOW	LOW	6
OK	OK	HIGH	7

Figure 9—Troubleshooting Matrix

1.

<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>
OK	LOW	OK

Possible Causes:

1. Leak in connection to foot cell or to outlet of foot check valve.
2. Leak in foot cell (see p. 16)
3. Foot check valve malfunctioning.

Remedies:

1. Use O ring lubricant on elbow to foot cell if the leak is here—use wire tie or cut tube shorter by 1/4" to foot check valve.
2. Replace upper cell.
3. Replace panel assembly.

2.

<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>
LOW	LOW	OK

Possible Causes:

1. Lower cell controller out of calibration
2. CPR plug not inserted all the way.
3. Larger O ring or middle O ring leaks—may be cracked or dried out.
4. Loose or disconnected tubing.
5. Leak in lower cell and/or foot cell.

TROUBLESHOOTING
(continued)

Remedies:

1. Replace panel assembly.
2. Reinsert plug and snap.
3. Replace O ring if cracked—lubricate with O ring lubricant if dry.
4. Reconnect, wire tie, or cut 1/4" off loose tube and reconnect.
5. Replace leaking cell(s).

3.

<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>
HIGH	LOW	OK

Possible Causes:

1. Lower cell controller out of calibration.
2. Ball is stuck in foot check valve.
3. Orifice in the power outage check valve is plugged or valve is stuck closed.

Remedies:

1. Replace panel assembly.
2. Replace panel assembly.
3. Replace panel assembly.

4.

<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>
HIGH	HIGH	OK

Possible Causes:

1. Lower cell controller and/or check valve are/is out of calibration.
2. Low air loss line from the lower cell controller is restricted.
3. Orifice in the power outage check valve is plugged or valve is stuck closed.
4. Restriction in the 0.013" dia. orifice machined in the check valve.

Remedies:

1. Replace panel assembly.
2. Remove the restriction from the low air loss line connected to the lower cell controller (brass).
- 3, 4. Remove restriction from orifice.

NOTE: Never insert a drill into the orifice.

**TROUBLESHOOTING
(continued)**

5.

<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>
OK	OK	LOW

Possible Causes:

1. Larger or middle size O ring on CPR dump pin assembly is leaking.
2. Leak in a tube connection between the upper cell controller and entrance to the upper cell.
3. Leak in upper cell.
4. Damper bag has a leak.
5. Upper cell controller out of calibration.

Remedies:

1. Replace O rings. Lubricate with O ring lube (silicone grease).
2. Repair leak at connection. Use wire tie or cut tube shorter by 1/4".
3. Replace upper cell.
4. Replace damper bag.
5. Replace panel.

6.

<i>Lower Cell</i>	<i>Foot Cell</i>	<i>Upper Cell</i>
LOW	LOW	LOW

Possible Causes:

1. Pump is not running or runs intermittently—damaged cord or plug.
2. CPR plug almost or actually disengaged.
3. Leaks in upper cell and/or damper bag and lower cell (repeated punctures with hypodermic needle).

Remedies:

1. Plug in pump. If the power cord is damaged, replace panel assembly.
2. Insert CPR plug and snap the fastener. Lubricate O rings with O ring lubricant if they are dry.
3. Check for leaks (see pp. 15-16) and replace cells.

TROUBLESHOOTING
(continued)

7.

Lower Cell	Foot Cell	Upper Cell
OK	OK	HIGH

Possible Causes:

1. Patient pressure setting knob is set too high.
2. Upper cell controller out of calibration.
3. Low air loss line to upper cell controller is restricted.

Remedies:

1. Lower the patient pressure setting.
2. Replace the panel.
3. Remove restriction in the low air loss line connected to the upper cell controller.

EXCESSIVE NOISE

The Sof•Matt Mattress System is designed to produce noise levels less than 40 dB(A) per ASTM E1574-95 except at a distance of 36", when the patient weight setting controller is set to the maximum setting position. If the internal pump produces excessive noise, replace the panel assembly.

CHECKING LOWER CELL FOR LEAKS

To check the lower cell for leaks:

1. Prepare the test setup described in *Operating Pressure Test*, step 2, page 9. See also figure 7, page 10.
2. Connect the manometer assembly to the lower cell (shortest tube on test pin). The pressure should be 25.0 ± 2.0 mm Hg. Then, connect the manometer assembly to the foot cell (medium length tube). The pressure should be 5.5 ± 2.0 mm Hg. If both pressures are met, the lower and foot cells are OK. If not, proceed to step 3.
3. Pinch the tubing between the outlet port from the foot check valve and the in-line tee (pinch point #3, fig. 10, p.17).
4. Connect the manometer assembly to the lower cell. It should read 25.0 ± 2.0 mm Hg. If it meets pressure, the lower cell and the circuitry to it are OK. If it doesn't reach at least 23.0 mm Hg, proceed to step 5.
5. Take one finger and press against the valve body outlet of the CPR body to stop the flow into the lower cell. This will have to be done by pressing on the upper layer of the cell. Use care not to damage the urethane. With flow to the lower cell being stopped and the tubing still being pinched at pinch point #3, take another reading at the test pin (fig. 7). If the pressure now reads at least 23.0 mm Hg, the lower cell or the connection to it has a leak. If the leak is not at the connection, replace the cell. Use soap to check connections. If the pressure is less than 23 mm Hg, replace the panel. Release pinch point #3.

At this point, we have a non-leaking lower cell.

**CHECKING FOOT
CELL FOR LEAKS**

To check the foot cell for leaks:

1. Connect the manometer assembly to the foot cell (medium length tube on test pin) as described in *Operating Pressure Test*, step 2, page 9. The manometer will display the pressure of the foot cell.
2. Pinch the tubing at pinch point #4 (fig. 10).
3. Read the manometer pressure. If the pressure at this point is approximately 5.5 mm Hg with pinch point #4 closed, but less when the pinch point is released, the foot cell has a leak. The entire upper cell will have to be replaced since the foot cell is part of the entire upper cell.
4. Having already established that the lower cell is within spec, we should see a pressure of 5.5 ± 2.0 mm Hg just ahead of the foot cell when pinch point #4 is pinched. If this pressure is not within spec, the foot check valve is defective. Replace the panel.

**CHECKING
UPPER CELL AND
DAMPER BAG
FOR LEAKS**

To check the upper cell and damper bag for leaks:

1. Connect the manometer assembly to the upper cell (longest tube on the test pin) as described in *Operating Pressure Test*, step 2, page 9. The manometer will display the pressure of the upper cell.
2. Set the patient pressure setting valve to the lowest setting (full counterclockwise) position.
3. Read the manometer pressure. It should read 12.0 ± 2.0 mm Hg. If it does, turn the patient pressure setting valve to the highest setting (full clockwise) position. It should read 32.0 ± 3.0 mm Hg.
4. Return the patient pressure setting valve to the lowest setting, full counterclockwise position.
5. Pinch the tubing at pinch point #2 (fig. 10) and the manometer should indicate above the spec. If the pressure in the upper cell is within spec, the connection to the cell or the cell itself is leaking. If a soap test of the connection to the cell does not show a leak, replace the upper cell. If the pressure does not fall within spec when pinch point #1 is closed, proceed to step 6.
6. Pinch the tube at pinch point #2. If the pressure in the upper cell falls within spec, but it didn't when pinch point #1 was closed, there is a leak between these two points. Leak test all joints (with soap solution) between the two pinch points. Also, leak test around the plug of the CPR dump valve. There may be a leak by the larger O ring. If this is the case, replace or lubricate the O ring. If the pressure in the damper bag is less than 10 mm Hg and remains the same whether pinch point #1 or pinch point #2 is pinched, there is either a leak in the damper bag or the upper cell controller is out of calibration. See *Calibrating the Upper Cell*, page 31.

MAXIMUM
PRESSURE TEST

To test the lower cell pressure controller

Operate the Sof•Matt pump for at least two hours at nominal 120VAC line voltage prior to performing the *Maximum Pressure Test*.

To test the lower cell pressure controller for maximum pressure during a fault condition:

1. Connect the manometer assembly to the lower cell (shortest tube on the test pin) as described in *Operating Pressure Test*, step 2, page 9. See figure 7, page 10.
2. Clamp the low air loss line at point #4 (fig. 10).
3. Take one finger and press against the CPR valve hose outlet to stop the air flow into the lower cell. This will have to be done by pressing on the upper layer of the cell (near point C, figure 14, page 22). Use care not to damage the urethane.

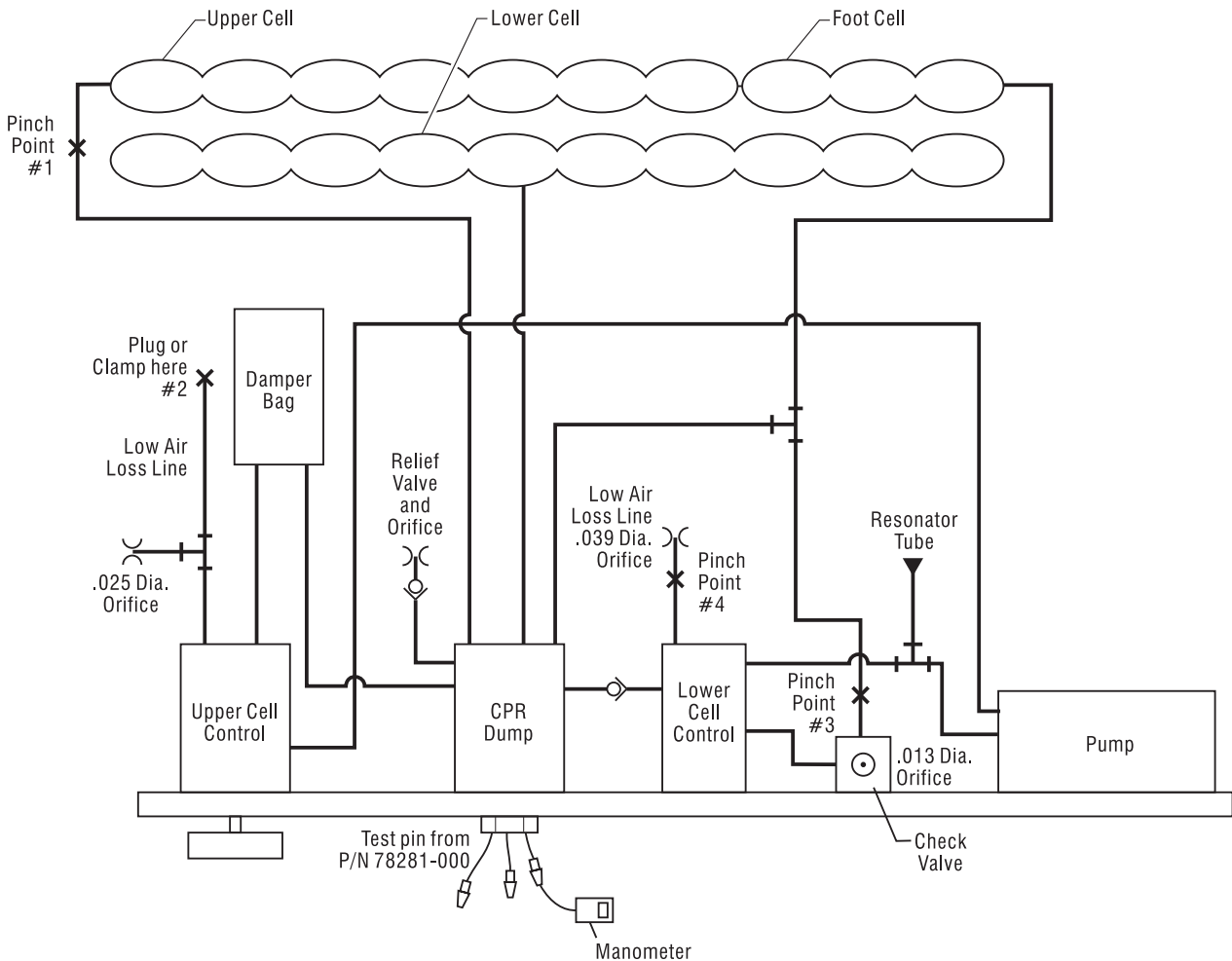


Figure 10—Mattress Air Flow/Pressure Diagram

**MAXIMUM
PRESSURE TEST
(continued)**

**To test the upper cell
pressure controller**

4. Allow the pressure reading to stabilize.
5. If the pressure is less than or equal to 45 mm Hg, the lower cell pressure controller passes the test. If the pressure is greater than 45 mm Hg, it has failed the test; check that the 0.025" diameter orifice mounted on the CPR dump valve relief valve is not restricted. Also, make sure that the 0.013" diameter orifice machined into the check valve is not restricted. If the reading is still greater than 45 mm Hg, replace the panel assembly.

- NOTE:
- Never insert a drill into the orifice.
 - After completing the test, remove the clamp from point #4 (fig. 10) on the low air loss line.
 - The results of this test are valid only if the mattress panel assembly has operating pressures within specification (see *Operating Pressure Test*, pp. 9-10).

To test the upper cell pressure controller for maximum pressure during a fault condition:

1. Connect the manometer assembly to the upper cell (longest tube on test pin) as described in *Operating Pressure Test*, step 2, page 9. See figure 7, page 10.
2. Turn the *Firmness Control* knob to the 8 o'clock position.
3. Plug or clamp the low air loss line at point #2 (fig. 10, p. 17).
4. Pinch the 1/2" ID tubing at point #1 (fig. 10) using 8" needle nose pliers.
5. Allow the pressure reading to stabilize.
6. If the pressure is less than or equal to 45 mm Hg, the upper cell pressure controller passes the test. If the pressure is greater than 45 mm Hg, it has failed the test. Check that the 0.025" diameter orifice connected to the low air loss line is not restricted.

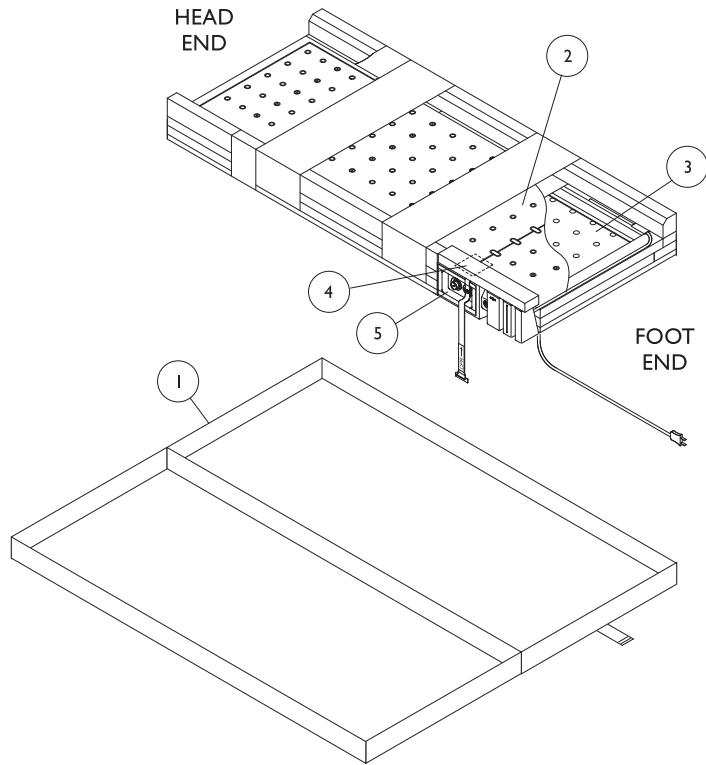
- NOTE:
- Never insert a drill into the orifice.
 - If the pressure is still greater than 45 mm Hg, replace the panel assembly.
 - After completing the test, remove the plug or clamp from point #2 (fig. 10) on the low air loss line.

NOTE: When testing has been completed, remove the test pin and replace the CPR plug removed in step 1.

PATIENT TRANSFER
TEST

1. The Sof•Matt Mattress must be operating to start this test.
2. Verify that the lower cell pressure is within specification (see *Operating Pressure Test*, step 4, p. 10).
3. After the lower cell pressure has been verified, remove the power cord. Observe the manometer. If the pressure drops below 15 mm Hg within four (4) hours, the two check valves need to be checked for leaks. While a drop in pressure indicates that the patient transfer function is not working, the Sof•Matt Mattress will still function with power applied. Contact your dealer for service.

**MATTRESS
REPLACEMENT PARTS**



Item	Description	P/N
1	Mattress cover, RSM176S	11323-000
	Mattress cover, RSM180S	10928-000
2	Upper cell, RSM176S	11329-000
	Upper cell, RSM180S	11025-000

Item	Description	P/N
3	Lower cell	11026-000
4	Damper bag assembly	10964-000
5	Panel assembly	11070-000

Figure 11—Mattress replacement parts

ORDERING PARTS

See figures 17-18 (p. 27) for replacement control panel parts. See figure 24 (p. 35) for the functional test kit. If any other panel parts are required, we recommend replacing the panel assembly. **Field calibration of the panel assembly is not normally feasible.** If you do have the proper equipment and skills, you can calibrate the panel assembly by following the instructions on pages 28-31, *Control Panel Calibration*. Otherwise, contact Gaymar Industries' Technical Service Department to order a replacement assembly.

To order parts, please contact Gaymar Industries' Customer Service Department. See back cover for telephone numbers. Identify the serial number (located under the flap), part descriptions and part numbers.

If technical assistance is required, please contact Gaymar Industries' Technical Service Department.

REPLACING THE
UPPER CELL

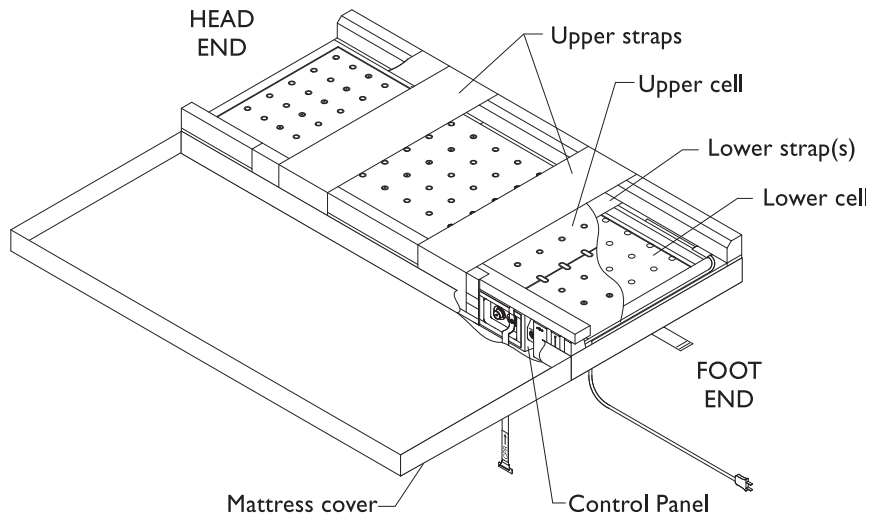


Figure 12—RSM Sof•Matt Mattress

1. Unplug mattress before servicing.
 2. Unzip the mattress cover (fig. 12) to expose cells.
 3. Disconnect valves A and B from items 1 and 2 (fig. 14) on the panel assembly, using a twist-and-pull motion.
 4. Remove the upper cell (fig. 12) by sliding it between the straps within the foam crib toward the head end of the mattress.
- NOTE: Use care not to rip the straps made of nonwoven material.
5. Unroll the replacement cell.
 6. Slip the new upper cell over the head end of the foam crib.
 7. Insert the new cell between the straps within the foam crib. Position it flat within the foam crib.

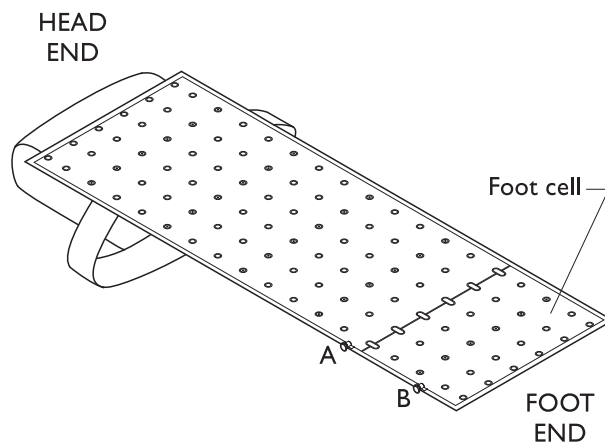


Figure 13—Upper cell

**REPLACING THE
UPPER CELL
(continued)**

8. See figure 14. Push the two valve stems (items A and B) of the cell onto the two 90° connectors (items 1 and 2) on the panel assembly, until the face of each valve touches the shoulder of the 90° connector.

NOTE: Water or soap solution may be used as a lubricant to ensure correct penetration.

9. Position the damper bag (fig. 14) between the upper and lower cells.
10. Zip the mattress cover closed.

NOTE: For rapid inflation, remove the CPR plug located on the panel assembly. Insert an inflator into the valve body and fill the mattress. After the lower and upper torso cells and foot cells have inflated, replace the CPR plug. The mattress is now ready to use.

**REPLACING THE
LOWER CELL**

1. Unplug mattress before servicing.
2. Unzip the mattress cover (fig. 12) to expose cells.
3. Disconnect valves A and B (fig. 13) from the panel assembly (fig. 14, items 1 and 2) using a twist-and-pull motion.

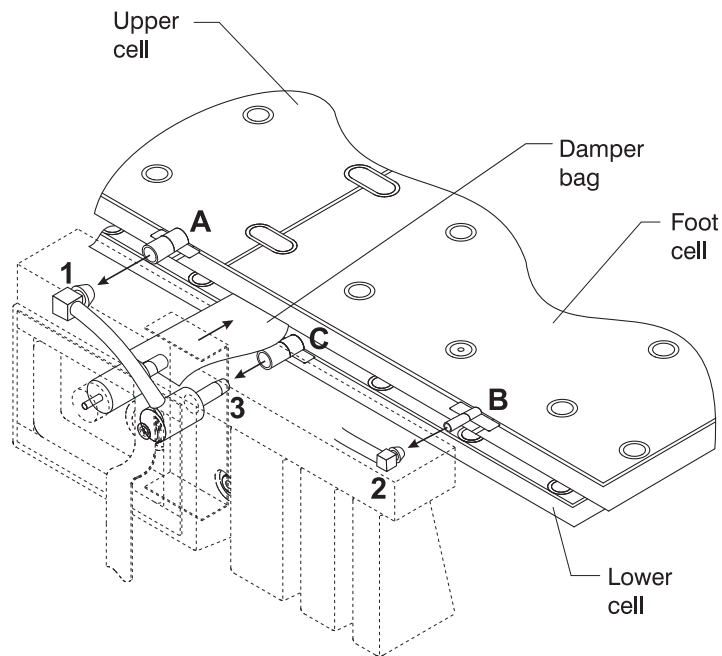


Figure 14—Control panel-to-cell connections

REPLACING THE
LOWER CELL
(continued)

- Slide the upper cell (fig. 12) between the straps within the foam crib toward the middle of the mattress and then fold back the upper cell toward the head end.

NOTE: Use care not to rip the straps made of nonwoven material.

- Disconnect valve C (fig. 14) from the panel assembly using a twist-and-pull motion.
- Remove the lower cell from the foam crib.
- Unroll the replacement lower cell and fold it as shown (fig. 15).

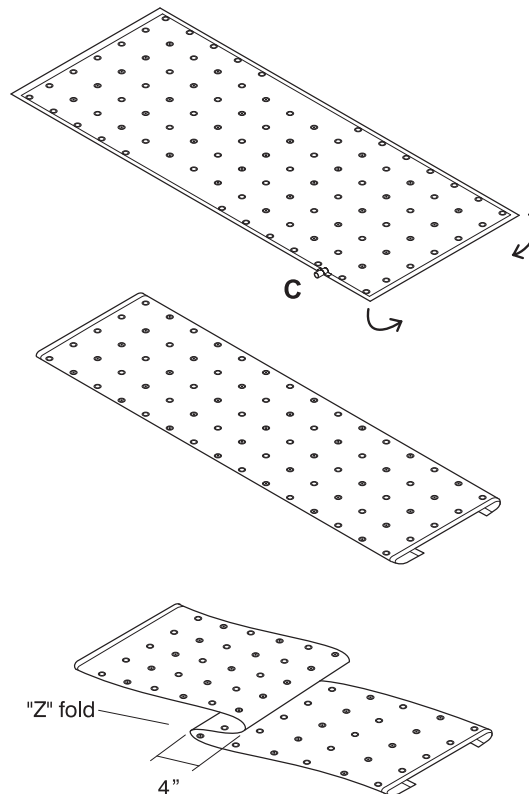


Figure 15—Fold lower cell before inserting

- Insert the new lower cell underneath the lower nonwoven material. Position it flat within the foam crib. **Do not unfold the cell.** It will unfold when it inflates.
- Push valve C onto the black connector (item 3, fig. 14) until the end of the tube touches the shoulder of the connector.
- Unfold the upper cell and slide it between the straps within the foam crib.

**REPLACING THE
LOWER CELL
(continued)**

11. Push the two tubes (items A and B, fig. 14) of the upper cell onto the two 90° connectors (items 1 and 2) on the panel assembly, until the end of each tube touches the shoulder of the 90° connector.

NOTE: Water or soap solution may be used as a lubricant to ensure correct penetration.

12. Position the damper bag (fig. 14) between the upper and lower cells.
13. While the cells are inflating, check that both cells are properly positioned within the foam crib.
14. Zip the mattress cover closed.

NOTE: For rapid inflation, remove the CPR plug located on the panel assembly. Insert an inflator into the valve body and fill the mattress. After the lower and upper torso cells and foot cells have inflated, replace the CPR plug. The mattress is now ready to use.

**REPLACING THE
PANEL ASSEMBLY**

1. Unplug power cord from the electrical outlet.
2. Unzip the mattress cover (fig. 12, p. 21) to expose cells and panel assembly.
3. Disconnect valves A, B, and C from panel assembly items 1, 2, and 3, using a twist and pull motion (fig. 14).
4. Carefully cut the wire ties from the low air loss tubes (fig. 16).
5. Remove the low air loss tube from nonwoven loop (fig. 16).
6. Carefully pull the power cord through the mattress cover and bundle it together.
7. Remove the panel assembly from the foam crib.
8. Insert replacement panel assembly into the foam crib as shown in figure 16.
9. Unhank the power cord. Thread it through the mattress cover.
10. Take the low air loss line that is connected to the lower cell controller (brass) and run it along the panel assembly side of the foam crib.
11. To hold the tubing in place, insert a wire tie through the hole in the nonwoven material. Tighten the wire tie until the tubing is snug but not restricted.
12. Cut off any excess wire ties with cutting pliers. Turn the heads so the cut portion does not contact the air cells. Make sure there are no sharp points.

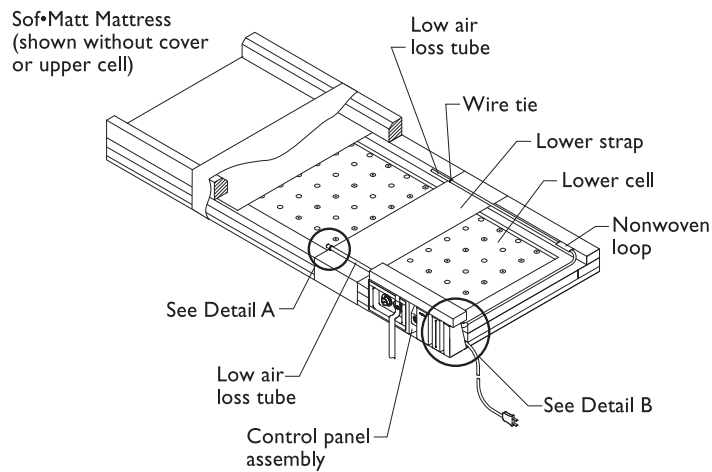
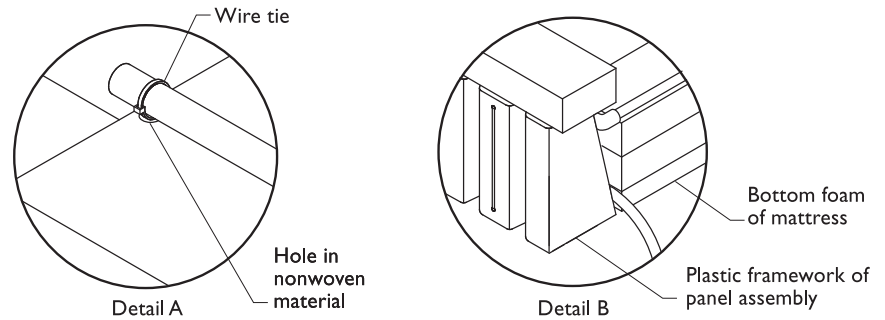
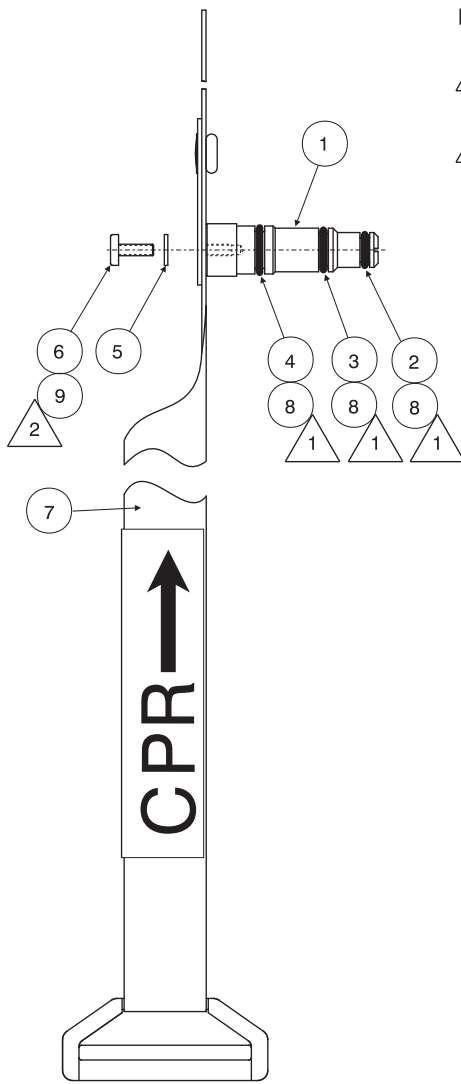


Figure 16—Panel assembly

13. Take the low air loss line that is connected to the upper cell controller and run it along the foot end of the foam crib, through the nonwoven loop opposite the panel assembly, and along the side of the foam crib.
14. Repeat steps 12 and 13.
15. Push valve C onto the black connector (location 3, fig. 14, p. 22) until the face of the valve touches the shoulder of the connector.

**REPLACING THE
PANEL ASSEMBLY
(continued)**

16. Push the cell valve stems A and B onto the panel assembly 90° connectors until the face of the valve touches the shoulders of the 90° connectors.
NOTE: Water or soap solution may be used as a lubricant to ensure correct penetration.
17. Position the damper bag so that it lies flat between the upper and lower cells.
18. Plug the power cord into a polarized electrical outlet.
19. Zip the mattress cover closed.
NOTE: For rapid inflation, you may use an inflator to fill the mattress.

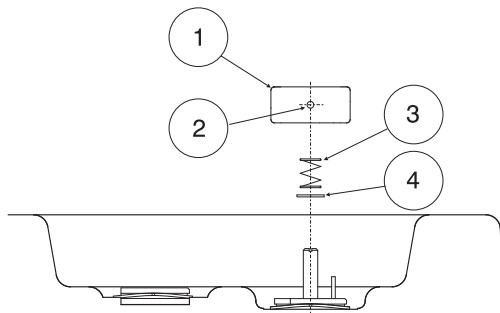


NOTES:

- 1 Apply a light coating of silicone lubricant, item 8, to O rings, items 2, 3, and 4, prior to assembly.
- 2 Apply one drop of green Loctite, item 9, into tapped hole of pin, item 1, prior to assembly.

Item	Description	P/N
1	Pin	10944-000
2	O ring, 1/2 OD x 5/16 ID, Buna-N	90295-018
3	O ring, 5/8 OD x 7/16 ID, Buna-N	90295-015
4	O ring, 1 1/16 OD x 1/2 ID, Buna-N	90295-019
5	Washer, No. 8, SST	90045-002
6	Panhead screw, 8-32 UNC x 1/2, SST	90018-077
7	CPR Strap assembly	10953-000
8	Silicone grease	As required
9	Loctite, green No. 290	As required

Figure 17—CPR Dump Pin Assembly (P/N 78275-000, includes items 1–9)



Item	Description	P/N
1	Control knob	10972-000
2	Setscrew	90176-044
3	Compression spring	91303-004
4	Washer, flat nylon	91037-000

Figure 18—Upper Cell Controller Parts

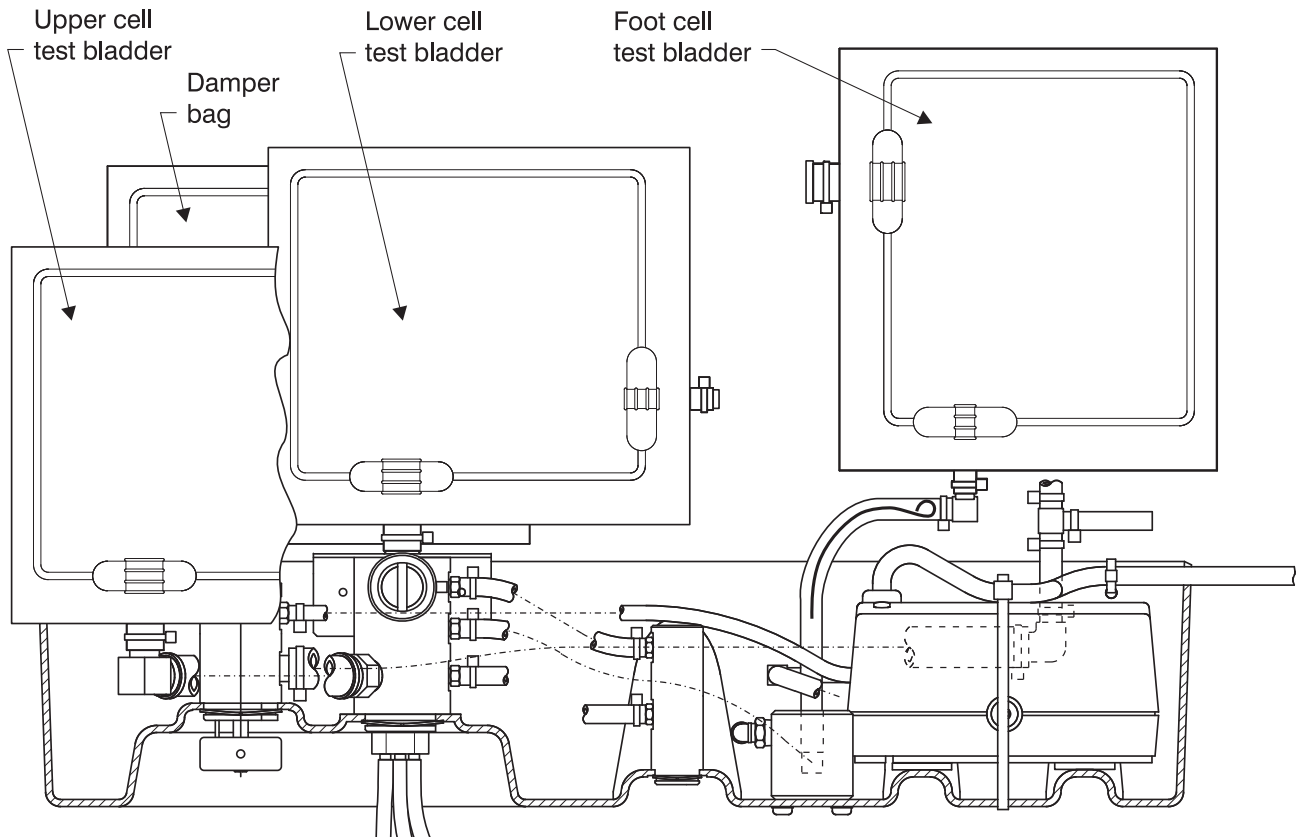


Figure 19—Calibration test bladder setup

**CALIBRATION
TEST SETUP**

Operate the Sof•Matt pump for at least two hours at nominal 120VAC line voltage prior to performing the *Calibration Test Setup*.

1. Remove the CPR dump plug.
2. Install the test pin from the functional test kit.
3. Attach calibration test bladders as shown (fig. 19).
4. Attach female CPC connector and hose to manometer.

**CALIBRATING THE
LOWER CELL
PRESSURE CONTROL**

1. Connect the manometer to the shortest hose connector on the test pin to test the lower cell (fig. 20, p. 28).
2. The pressure for the lower cell should read 25.0 ± 2.0 mm Hg.
3. If the pressure is too high in the lower cell, first check the low air loss line from the controller for restriction (0.039" dia. orifice).

4. If the controller pressure is still too high, then use a thin blade screwdriver to rotate the lower cell adjustment screw counterclockwise to lower the pressure into the allowable range. Let the pump run a few minutes to let the controller stabilize. Recheck pressure and adjust if necessary.
5. If the pressure is too low, the lower cell controller should be readjusted. Before adjusting, check the back of the panel for leaks, broken or disconnected hoses. Use the same procedure as in step 4, but turn the adjustment screw clockwise.

NOTE: Adjustments to the lower cell controller will affect the foot cell calibration and vice versa.

6. Squeeze the lower cell damper bag (see fig. 19). The pressure should rise, then restabilize to 25.0 ± 2.0 mm Hg. If, after checking and adjusting 3 or 4 times, the pressure does not restabilize within tolerances, we recommend replacing the lower cell controller (see p. 32).

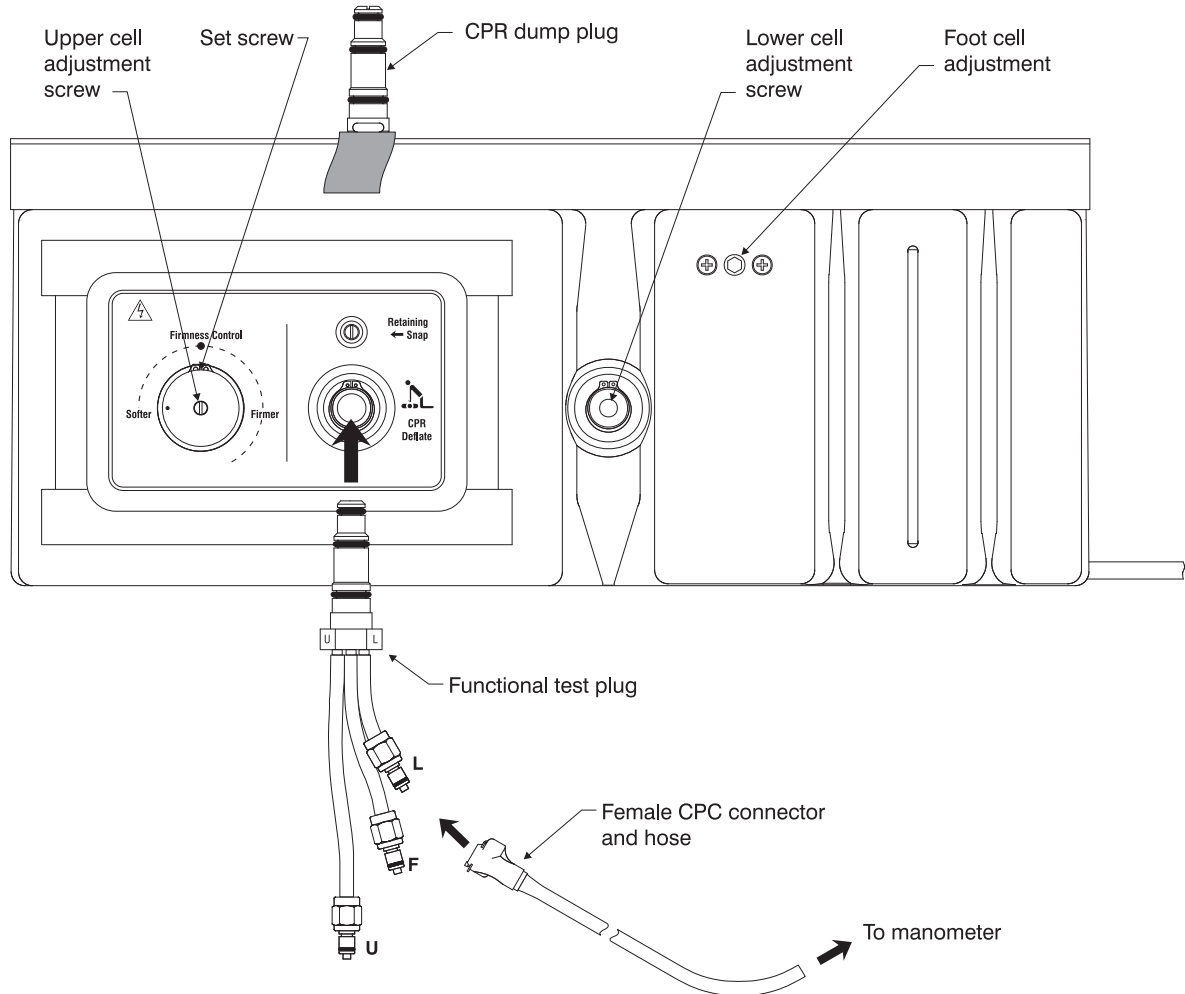


Figure 20—Adjustment points for calibration

**CALIBRATING THE
FOOT CELL
PRESSURE CONTROL**

1. Connect the manometer to the medium length hose on the test pin to test the foot cell.
2. The pressure for the foot cell should read 5.5 ± 2.0 mm Hg.
3. Before any calibration is done on the foot cell, the 0.013" diameter orifice in the valve should be checked to see if it is free of obstructions. Using the 8" needle nose pliers, pinch off the inlet hose to the foot cell valve as shown (fig. 21, p. 32). If the orifice is open, the manometer pressure should drop. If the pressure doesn't drop, the orifice has to be cleaned or the valve replaced.
4. If the pressure for the foot cell is too high, locate the foot cell and adjustment hole located on the front of panel (fig. 20). Using a 1/8" allen wrench, turn the adjustment clockwise to reduce the pressure. This adjustment is sensitive—a small turn is recommended. After making the adjustment, recheck the lower cell to make sure it is still within range.

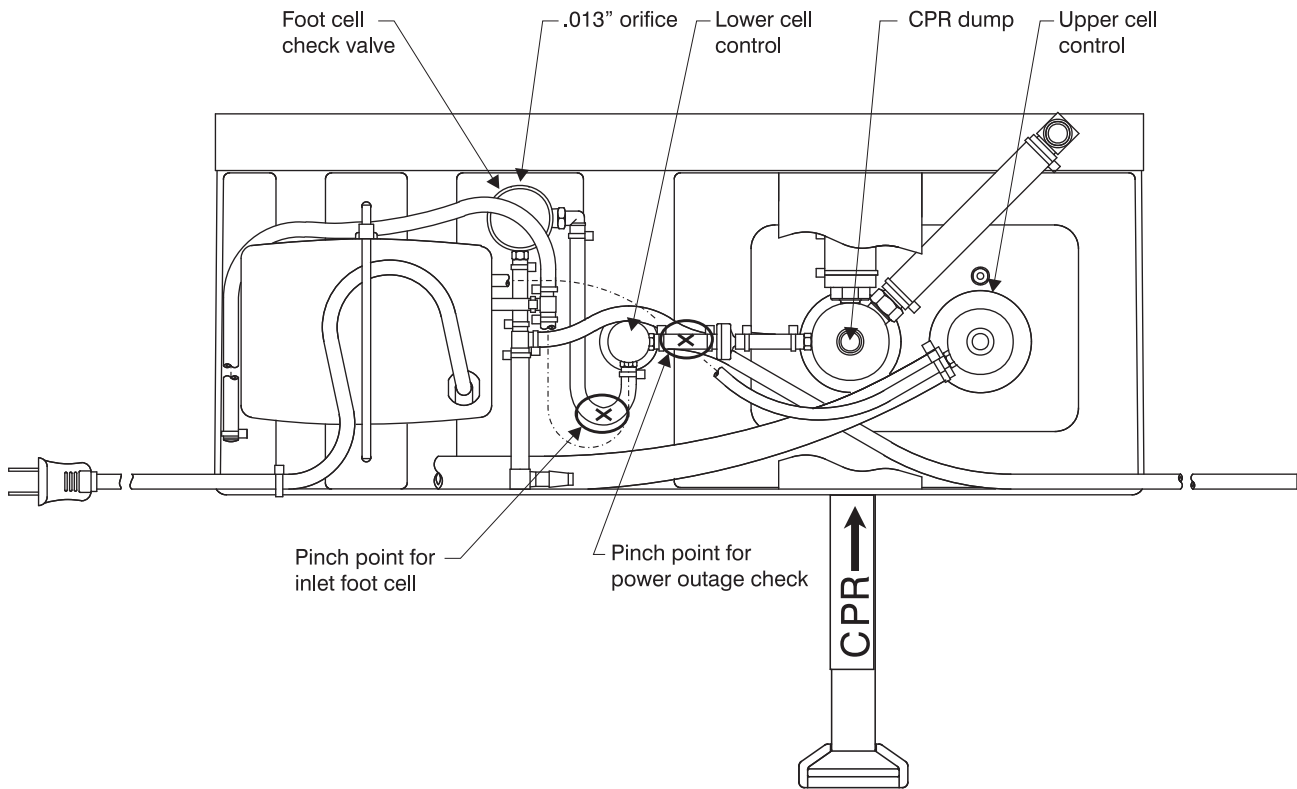


Figure 21—Pinch at "X" with needle nose pliers

**CALIBRATING THE
UPPER CELL
PRESSURE CONTROL**

1. Connect the manometer assembly to the upper cell (longest tube) as described in *Operating Pressure Test*, step 2, page 9. The manometer will display the pressure of the upper cell.
2. Hold the *Firmness Control* knob as shown in figure 22A. Insert allen wrench into set screw. Rotate the knob to 8 o'clock position. Loosen set screw by turning allen wrench counterclockwise. Turn the adjustment screw with screwdriver (fig. 22B) and adjust to 12.0 ± 1.0 mm Hg. Retighten set screw. Allow enough time for the pressure to stabilize and recheck the pressure.
3. Rotate the knob to the 5 o'clock position. The pressure in the upper cell should be 32.0 ± 3.0 mm Hg.

NOTE: When calibration has been completed, remove the test pin. Replace the CPR dump plug.

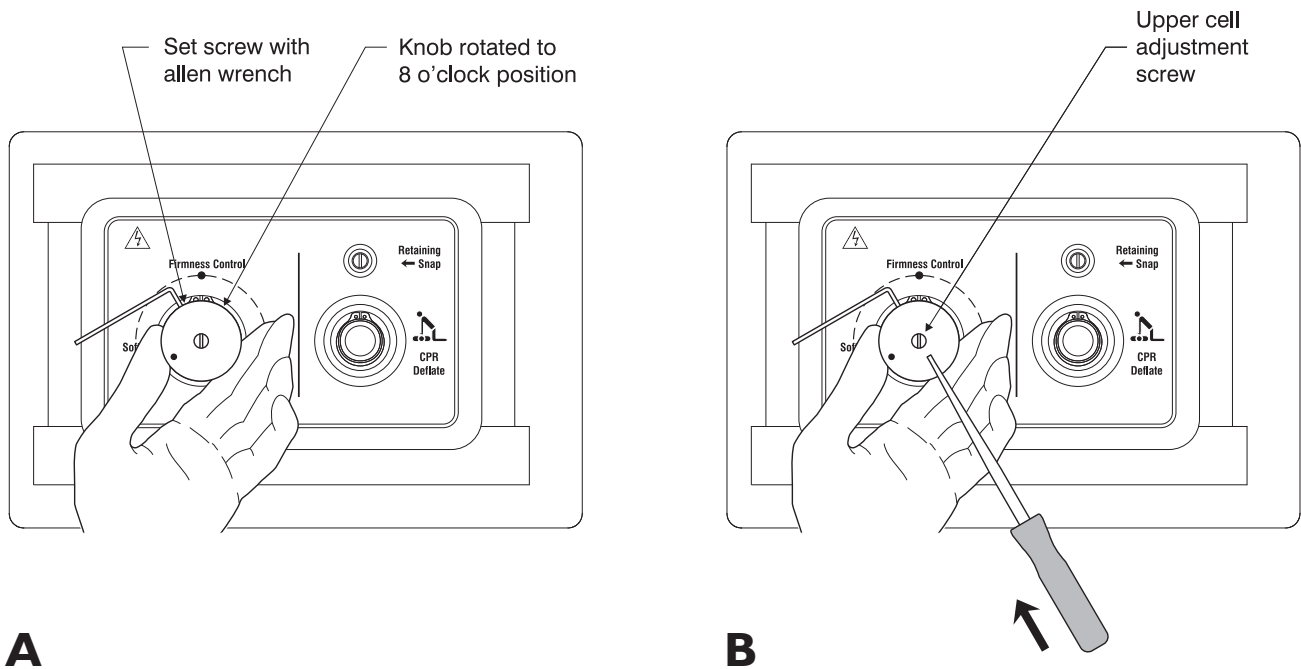


Figure 22—Adjustment points for upper cell calibration

**REPLACING THE
FOOT CELL VALVE**

1. Cut and remove wire ties on hose fitting.
2. Remove hoses.
3. Unscrew the two screws on the front of the panel.
4. Mount new foot cell valve with two screws.
5. Reconnect hoses and wire ties.
6. Cut off any wire tie excess with wire cutters. Turn the heads so the cut portion does not contact the air cell. Make sure there are no sharp points.
7. Plug in pump and run for two hours.
8. Use calibration test kit and recalibrate the foot cell. See page 30.

**CHECK PATIENT
TRANSFER, POWER
OUTAGE FEATURES**

Using the functional test kit, attach the manometer to the short hose for the lower cell. Plug in the pump, check lower cell to see if it meets pressure. Unplug the pump. The manometer should remain above 14 mm Hg for 40 seconds. (The manometer will drop to between 20-21 mm Hg before slowing down.) To determine which check valve is leaking, you will need the 8" needle nose pliers.

Plug in the pump and bring the panel assembly back up to pressure. Pinch off the hose labelled for the power outage check shown in figure 21.

Unplug the pump and observe the manometer. The readings should drop to 20-21 mm Hg and then slow to a stop. If the pressure continues to drop, it means the orifice assembly shutoff valve should be replaced (p. 33).

**REPLACING THE
LOWER CELL
CONTROLLER**

1. Cut and remove wire ties on hose fitting.
2. Remove hoses.
3. Remove snap ring on front of panel.
4. Replace new lower cell controller.
5. Reconnect hoses and wire ties.
6. Cut off any wire tie excess with wire cutters. Turn the heads so the cut portion does not contact the air cell. Make sure there are no sharp points.
7. Plug in pump and run for two hours.
8. Use functional test kit and recalibrate the lower cell. See pages 28-29.

**REPLACING THE
UPPER CELL
CONTROLLER**

1. Cut and remove wire ties on hoses and damper bag.
2. Disconnect damper bag from valve using a twist and pull motion.
3. Remove hoses.
4. With 1.5 mm allen wrench, rotate the control knob to the lowest setting and remove knob. Save knob spring and washer.
5. Remove old valve with snap ring pliers and install new valve.
6. Reconnect hoses and wire ties.
7. Reconnect damper bag to valve body until the end of the tube touches the shoulder of the valve.
8. Cut off any wire tie excess with wire cutters. Turn the heads so the cut portion does not contact the air cell. Make sure there are no sharp points.
9. Plug in pump and run for two hours.
10. Adjust valve to 12.0 ± 1.0 mm Hg. Reinstall the knob spring and washer, leaving enough room between the knob and the front face of the controller to allow for full clockwise rotation without bottoming the stop pin or the spring. The white dot should be at the 8 o'clock position.
11. When the knob is rotated to the full clockwise position, the upper cell pressure should read 32.0 ± 3.0 mm Hg. If this pressure is not attainable, you have bottomed the stop pin and the knob must be readjusted.

**REPLACING THE
CHECK VALVE**

1. Cut wire ties.
2. Remove hoses.
3. Replace check valve with the white side facing the round brass valve.

**REPLACING THE
ORIFICE ASSEMBLY
SHUT OFF VALVE**

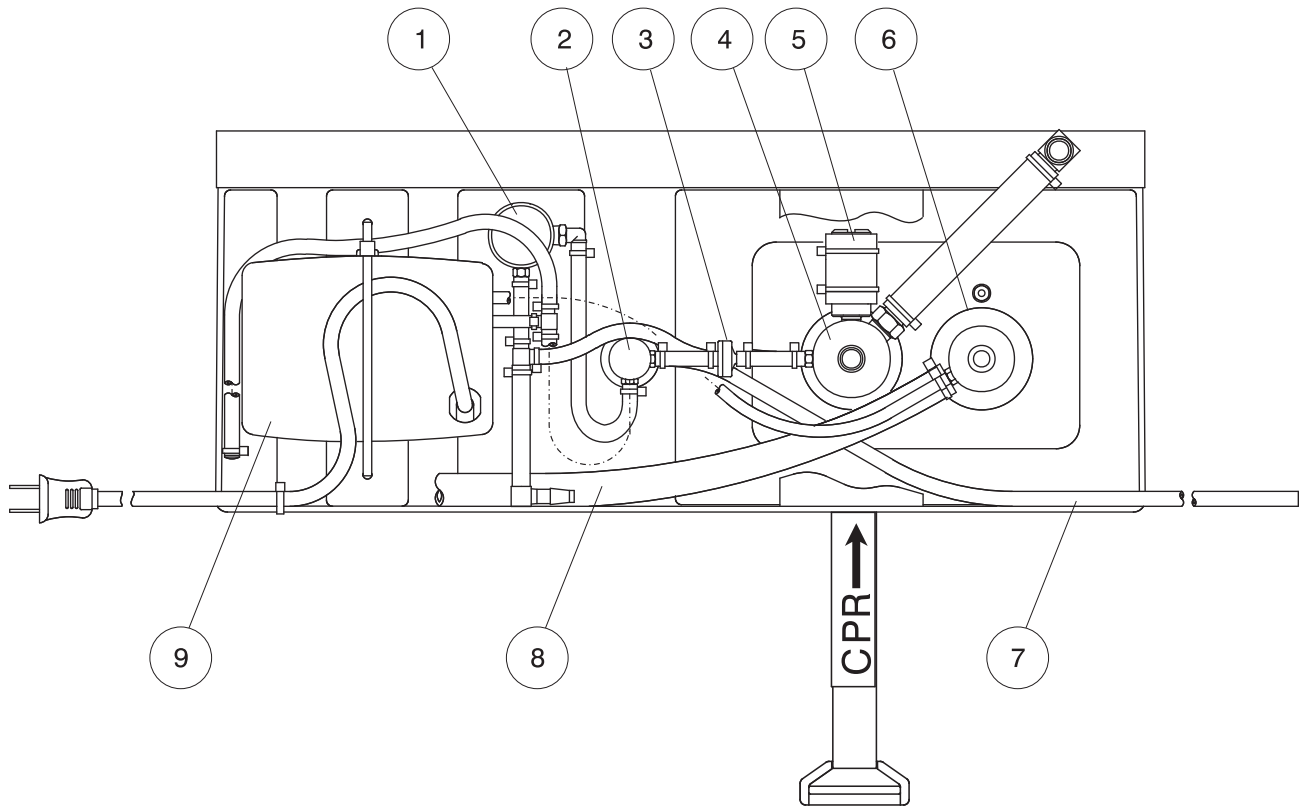
1. Remove screws (5) holding rear bracket in place. Remove bracket.
2. Remove the old check valve. Install new valve, making sure to use thread sealant.
3. Perform a final check by plugging pump in and bringing the system up to pressure. Unplug and time—the manometer should stay above 14 mm Hg for 40 seconds (see page 32).
4. After test has been completed, remove the functional test kit components. Replace CPR dump plug.

**REPLACING
THE PUMP**

When the mattress system is plugged in and you place your hand on the end of the mattress or panel assembly, you should be able to feel the pump running.

If no vibration is felt, the pump will need to be replaced:

1. Remove panel assembly from mattress (see pp. 24–26, steps 1–19).
2. Cut the two wire ties on the outlet hoses and remove tubes.
3. Cut the wire ties holding the power cord to the panel.
4. Cut the wire tie holding the pump to the panel.
5. Pump is held to the panel with Velcro. Remove the pump and replace it with a new one. Reconnect hoses and wire ties and tighten.
6. Tie down the power cord as shown (fig. 16, p. 25).
7. Cut off any wire tie excess with wire cutters. Turn the heads so the cut portion does not contact the air cell. Make sure there are no sharp points.



Item	Description	P/N
1	Foot cell check valve	10960-000
2	Lower cell controller	10963-000
3	Check valve	90382-000
4	CPR dump valve	10961-000
5	Orifice assembly shutoff valve	10733-000
6	Upper cell controller	10966-000
7	Lower cell low air loss line	11119-000
8	Upper cell low air loss line	10971-000

Item	Description	P/N
9	Pump assembly kit	78277-000
--	Tubing, 3/16 ID x 5/16 OD (sold by the foot, not shown)	80232-000
--	Tubing, 1/2 ID x 11/16 OD (sold by the foot, not shown)	81119-000
--	Tubing, 1/4 ID x 3/8 OD (sold by the foot, not shown)	80987-000
--	Wire tie kit (not shown)	78282-000

Figure 23—Control Panel Parts

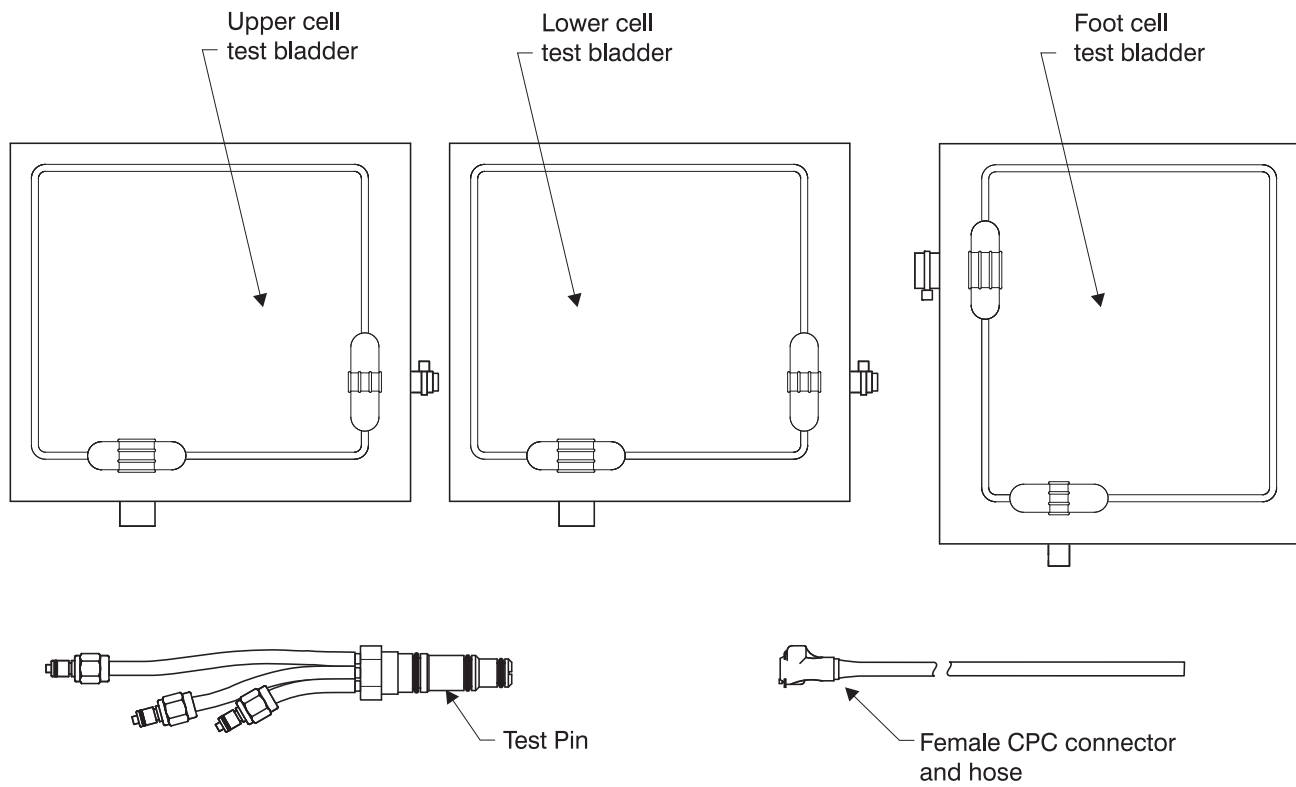


Figure 24—Functional Test Kit (P/N 78281-000)

GAYMAR®

GAYMAR INDUSTRIES, INC.

10 Centre Drive
Orchard Park, NY
14127-2295

Phone:

1 800 828-7341
(716) 662-2551

FAX:

1 800 993-7890
(716) 662-0748

THE SOF•MATT® LOW AIR LOSS
MATTRESS SYSTEM IS MADE IN THE USA