
SACKSAFOAM®
OPERATOR'S MANUAL

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PLEASE READ BEFORE USING THE SACKSAFOAM

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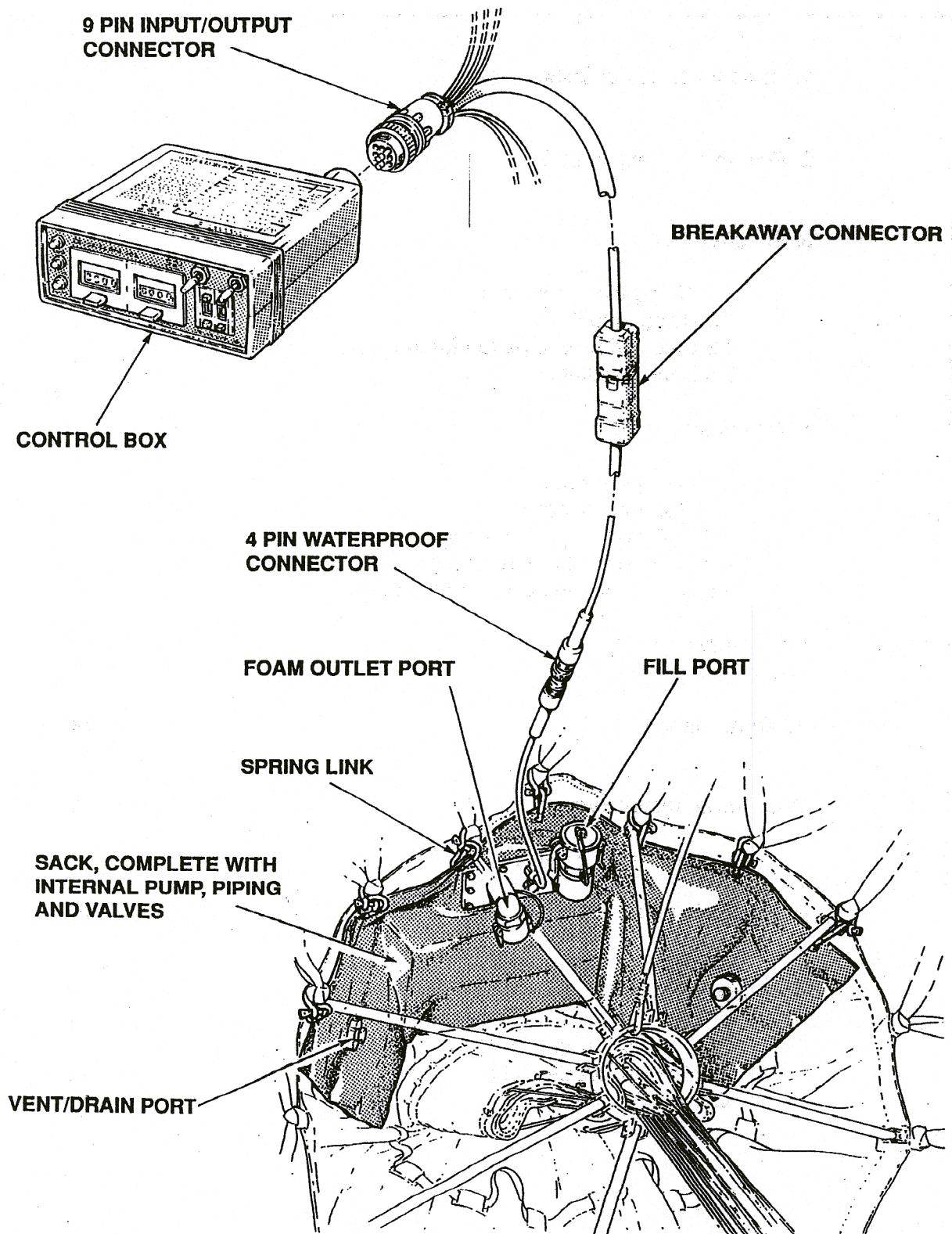


Fig. 1. General Installation of Sacksafoam; models 8018, 2044 and 5550.

1. INTRODUCTION TO THE SACKSAFOAM

This manual provides helicopter operators with information on the operation and maintenance of the Sacksafoam foam dispensing system for use with the Bambi Bucket.

The Sacksafoam has advanced features to enhance the efficiency of helicopter firefighting.

The control box has a quartz digital timer to control delivery of accurate percentages of foam concentrate. The timer circuit has crowbar over-voltage protection and its own circuit breaker. The system supports a mixer if required.

The sack containing foam concentrate mounts in the Bambi Bucket. This eliminates spillage and possible corrosion damage associated with carrying foam concentrate inside the helicopter. An internal check valve stops water from flowing into the sack, and insures that foam is dispensed only while the injection pump is operating.

Because the foam in the sack displaces the water in the Bambi Bucket, the total payload is always constant.

The operation of the Sacksafoam can be quickly mastered by operators with no prior experience. Several dumps with foam will provide familiarity with the use of the system.

Please read this manual prior to flying the bucket, particularly the sections on installation, filling and dispensing. If problems are experienced, please refer to the manual. Section 5 on "Troubleshooting" may be especially helpful.

For your own protection and for longer system life, always heed the instructions and warnings. Ignoring them could result in damage to the Sacksafoam, Bambi Bucket or aircraft, or personal injury.

Safety notices, given either as a **WARNING** or **CAUTION**, are categorized in order of severity. The description of each type of notice is as follows:

WARNING: Hazards or unsafe practices which could result in personal injury or death.

CAUTION: Hazards or unsafe practices which could result in minor personal injury or property damage.

SEI offers complete parts supply and repair facilities for the Sacksafoam. For maintenance and repair purposes, parts diagrams and descriptions are provided in Section 9. When ordering parts, please provide the model and serial number of the sack. The model and serial number are stamped into one of the fender washers at the bottom of the sack.

Additional copies of this manual are available from SEI Industries Ltd.

2. PREFLIGHT SAFETY CHECK

Just as the pilot preflights his aircraft he should preflight his Bambi Bucket and Sacksafoam system. Start at the bottom and work up.

1. Are all the attachments connecting the sack to the Bambi Bucket firmly secured?
2. Is the wiring connector close to the sack tightly secured? Does it have the white waterproofing washer installed inside the receptacle?
3. Is the power cable leading to the sack secured to one of the Bambi Bucket suspension lines?
4. Is there a breakaway plug installed in the power cable near the cargo hook? Is it taped together to prevent premature release?
5. Is the control box operating properly (Cap the outlet port on the sack to avoid dispensing foam when testing the control box)?
6. Are the wires in the helicopter secured to avoid tripping and tangling?
7. Prior to takeoff, ensure that the Kamlock cap on the foam outlet port is removed.

See the Bambi Bucket manual for the preflight check on the Bambi Bucket.

3. INSTALLATION

3.1 Wiring the control box

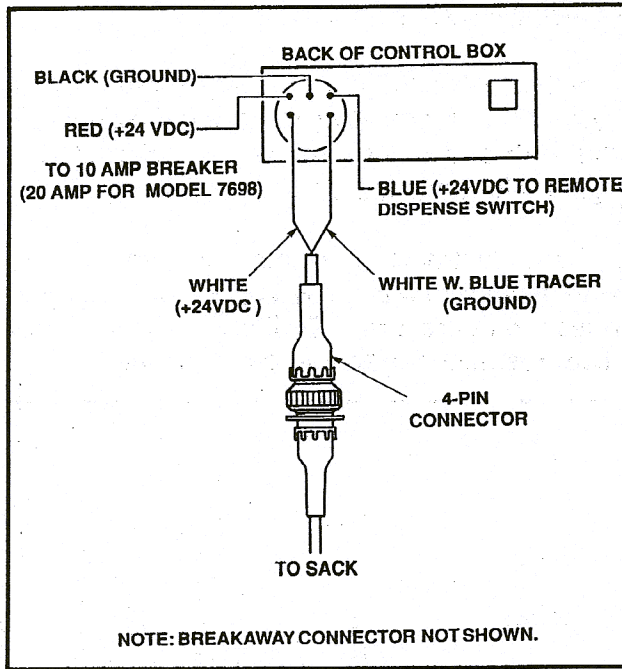


Figure 2: Control box wiring diagram.

The control box has a 3 amp breaker that protects its electronic components. The injection pump is protected by the helicopter circuit breaker. Observe correct polarity. The control box will not operate if hooked up with reverse polarity. The injection pump will work but at greatly reduced volume if hooked up with reverse polarity.

1. Connect power input wires (red is positive, black is negative) to a 28 volt direct current power supply, protected by a 10 amp breaker (20 amp breaker for HL series Sacksafoam only). 28 volts is the nominal charging voltage on a 24 volt system.
2. Connect the 9 pin plug to the socket on the back of the control box (pin 1 is positive, pin 2 is negative). See Figure 2.

CAUTION: Excessive force or twisting on the wiring connector can damage the contacts.

3. Check that the control box and injection pump operate. Install the Kamlock cap on the foam outlet port to prevent dispensing foam. Set the dispense time switch to 5 seconds. Turn the on/off switch on. Momentarily lift the dispense switch. The orange dispensing light should come on, and the injection pump should run for 5 seconds. Refer to Figure 9.

3.2 Using long lines

The control cable supplied (connecting the control box and sack), fits Bambi Buckets with standard length suspension lines. The cable is sized to provide 24 volts to the injection pump when 28 volts is supplied to the control box. If the Bambi Bucket is suspended from the helicopter with an additional long line, the standard control cable may not be long enough. If a longer control cable is required, the correct gauge can be determined by the following method. The objective is to provide 24 volts to the injection pump after accounting for voltage drop along the cable.

3.3 Calculating wire gauge for long lines

The Sacksafoam pump draws the following current:

Small and medium series	4.5 Amps.
HL Series	9.0 Amps.

Control cables supplied with the Sacksafoam unit meet Mil-C-27500 specifications. Individual hook-up wires meet Mil-W-22759/16 specifications. It is recommended that any replacement wire or cable meet these specifications. Extra cable and wire is available from SEI Industries Ltd.

3. INSTALLATION

Table 1: Wire Specifications

Wire Size: (AWG #)	Resistance:	
	Ohms/1000 ft.	Ohms/1000/m
18	5.74	18.83
16	4.51	14.80
14	2.88	9.45
12	1.82	5.97
10	1.18	3.87

With a supply voltage of 28 volts, and a requirement of 24 volts at the pump, the voltage can drop 4 volts. The current has to flow in both directions, so the wire length used in the calculation will be the distance from the control box to the sack, multiplied by two.

Use this formula, based on Ohms law ($V=IR$).

$$\text{Voltage drop, } V_D = \text{Amps draw} \times \frac{\text{resistance}/1000 \times \text{wirelength} \times 2}{1000}$$

NOTE: Wire length can be in feet or meters, just use the appropriate resistance value from Table 1.

EXAMPLE: A 100 ft. long line with a HL-7600 Bambi Bucket, and a 12 gauge wire, with a length of 160 ft. from the control box to the sack.

$$V_D = 9 \times \frac{1.82}{1000} \times 160 \text{ ft.} \times 2 = 5.24 \text{ volts}$$

Therefore, a 12 gauge wire would be satisfactory. It would produce a slightly low voltage at the pump ($28 - 5.24 = 22.76$ volts), which could be compensated for by adjusted run times shown in Table 5, section 4.4.

3.4 Sack installation

NOTE: If the Bambi Bucket cinch strap clip is on the ballast side of the Bucket, it must be rotated 180 degrees to the opposite side, to allow cinch adjustment once the sack is installed.

SACK MODELS 8018, 2044 & 5550:

To install the sack:

1. Release the bottom end of the ballast side I.D.S. restrainer cable by removing the clevis pin from the restrainer bracket inside the bucket. See Figure 3 for parts location.
2. Tie the restrainer cable out of the way where it will not interfere with bucket operation. It may be reused to restrain the I.D.S. hub if the sack and I.D.S. restrainer strap are later removed.

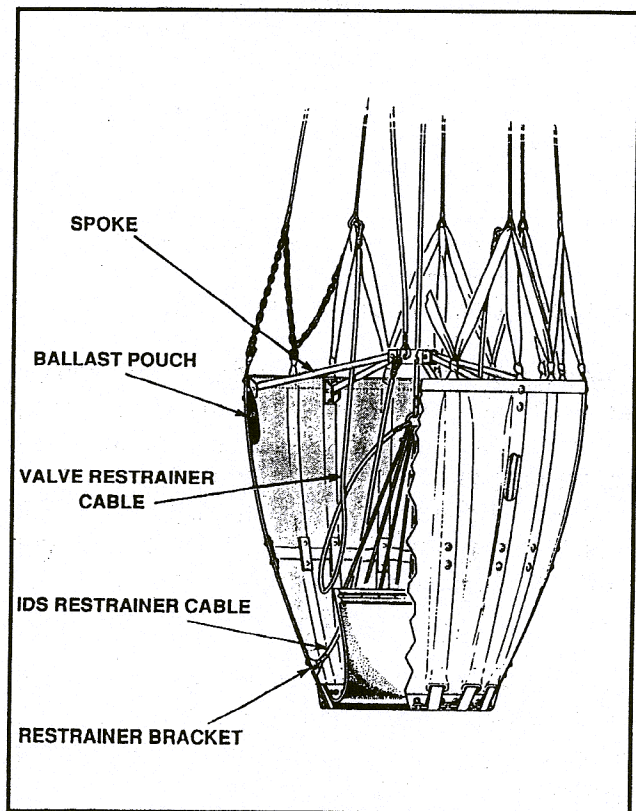


Figure 3: Bambi parts location.

3. Adjust the chain connected to the I.D.S. restrainer strap, to the length which corresponds to your bucket size (see Table 2) then connect a 1/4" quick link. Attach the quick link to the I.D.S. hub as shown in Fig. 4.

3. INSTALLATION

4. Connect the lower end of the restrainer strap to the restrainer bracket, reinstalling the clevis pin (removed in step 1). Use a new cotter pin to secure the clevis pin to the restrainer bracket.

5. Disconnect the bottom end of the I.D.S. restrainer cable, opposite the ballast, by removing the clevis pin from the restrainer bracket. Attach the supplied shackle and length of chain to the I.D.S. restrainer cable and re-connect it to the bracket. If the I.D.S. cable already has a chain fitted, extend it to its longest length.

Table 2: Chain length specifications

Bucket size.	Length (in.) of chain (quick link to strap)
8096	3
9011	3
1012	3
1214	3
1518	12
2024	15
2732	21
3542	22
4453	CONTACT SEI
5566	35
7590	32
HL5000	CONTACT SEI
HL7600	CONTACT SEI
HL9800	CONTACT SEI

6. Fold up the sack and slide it in between the spokes and into the bucket. The sack should be centred on the ballast pouch. The I.D.S restrainer strap attached in steps 3 and 4 should pass around the bottom of the sack.

CAUTION: Do not remove the Bambi Bucket's ballast pouch when fitting the sack. This could cause unpredictable flight characteristics.

7. Install the shackles onto the webbing suspension straps at the bucket rim to line up with the spring links on the sack. See Fig. 5.

8. Connect the spring links on the sack to the shackles on the bucket.

9. Straighten out the sack so that it sits straight inside the bucket.

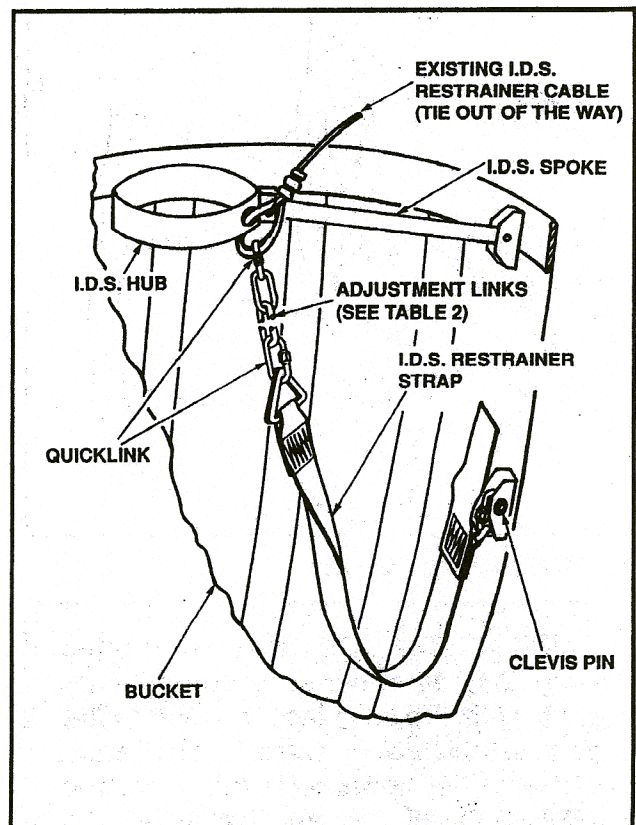


Fig. 4: I.D.S. restrainer strap installation.

10. Connect the control cable to the waterproof connector on the sack. Ensure that the white waterproofing washer is installed inside the receptacle.

3. INSTALLATION

11. Install the breakaway connector in the control cable, near the Bambi control head. Secure the control cable to one of the Bambi suspension cables using the tie wraps provided. The connector may be taped together to prevent premature release.

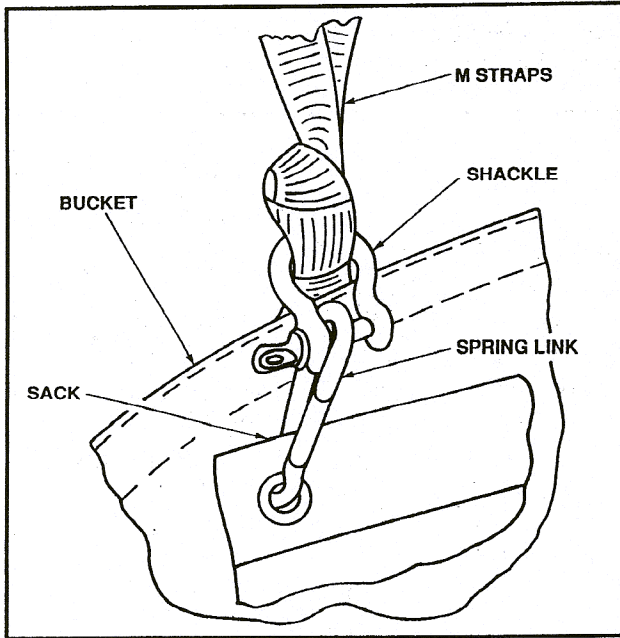


Fig. 5: Attaching the sack.

CAUTION: The I.D.S. restrainer cable and I.D.S. restrainer strap adjustments are required to keep the I.D.S. hub as flat as possible throughout its vertical range of travel. If improperly adjusted, the I.D.S. hub will not sit level when the bucket is empty; this is due to the deformation of the Bambi Bucket shell, caused by the weight of the Sacksafoam. Improper adjustment may result in fouling of the trip line pulley on the I.D.S. hub (small series), and/or severe damage to the entire I.D.S. (all models).

SACK MODEL 7698:

To install the sack:

1. Release the bottom end of the ballast side I.D.S. restrainer cable by removing the clevis pin from the restrainer bracket inside the bucket. See Fig. 3 for parts location.

2. Tie the restrainer cable out of the way where it will not interfere with bucket operation. It may be reused to restrain the I.D.S. hub if the sack and I.D.S. restrainer strap are later removed.

3. Adjust the chain connected to the I.D.S. restrainer strap, to the length which corresponds to your bucket size (see Table 2) then connect a 1/4" quick link. Attach the quick link to the I.D.S. hub as shown in Fig. 4.

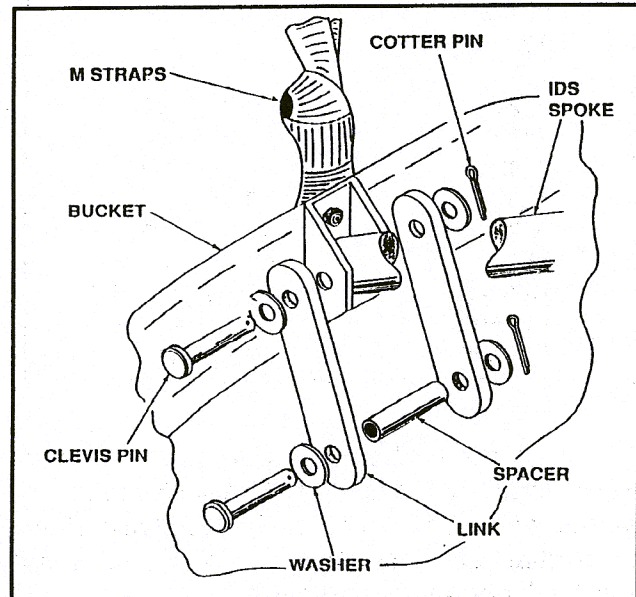


Fig. 6: Suspension hanger assembly.

4. Connect the lower end of the restrainer strap and sack harness (joined together with a spring link) to the restrainer bracket, reinstalling the clevis pin (removed in step 1). Use a new cotter pin to secure the clevis pin to the restrainer bracket. See Fig. 7.

3. INSTALLATION

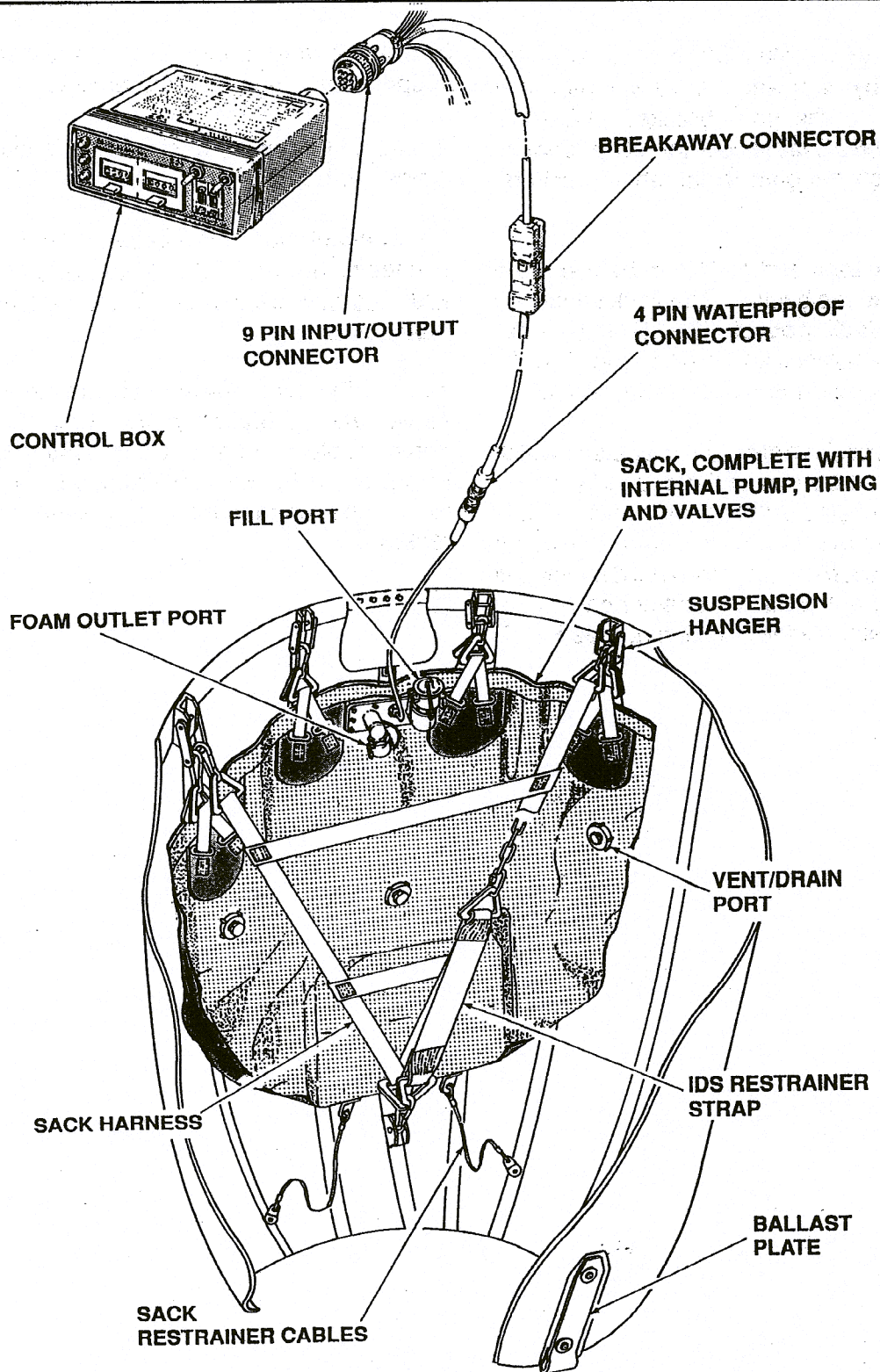


Fig. 7: General installation of Sacksafoam; model 7698.

3. INSTALLATION

5. Disconnect two spokes on either side of the ballast pouch by removing the clevis pins which connect them to the shell bracket. With the hardware provided, reconnect the I.D.S. spokes and suspension hangers to the shell brackets. See Fig. 6.

6. Fold up the sack and slide it in between the spokes and into the bucket. The sack should be centred on the ballast pouch. The I.D.S. restrainer strap and sack harness attached in steps 3 and 4 should pass around the bottom of the sack.

7. Locate the stainless steel ballast plates, which are bolted to the bottom of the second stiffener batten, on either side of the ballast pouch. Inside the bucket, remove the nylock nut and washer which retain the top of each ballast plate. Slide the tab on the end of the sack restrainer cable over the bolt, and reinstall the nylock nut. See Fig. 7.

8. Connect the spring links on the sack to the suspension hangers on the bucket.

9. Straighten out the sack so that it sits straight inside the bucket.

10. Connect the control cable to the waterproof connector on the sack. Ensure that the white waterproofing washer is installed inside the receptacle.

11. Install the breakaway connector in the control cable near the Bambi control head. Secure the control cable to one of the Bambi suspension cables using the tie wraps provided. The connector may be taped together to prevent premature release.

4. OPERATION

4.1 Filling the sack

1. If any adjustment of the Bambi Bucket cinch strap is required, it should be made prior to installation and filling of the sack. Adjusting the cinch strap is difficult when the sack is full of foam.

NOTE: The volume of the sack should be reduced 20% for every 10% reduction in Bambi Bucket volume.

2. Remove the Kamlock plug from the fill port.
3. Pour, or pump in foam concentrate.

4. All air trapped in the sack must be removed, otherwise the Bambi Bucket may not sink when dipped in the water. If the sack is lying on the ground, excess air can be removed by opening the vents on each side and pressing down in the centre of the sack. Close the vents tightly after exhausting all of the air.

5. Replace the Kamlock filler plug.

6. Remove the Kamlock cap from the foam outlet port. An internal check valve ensures foam is dispensed only while the injection pump is operating.

CAUTION: Overfilling the sack with the Bambi Bucket cinched down may cause the dump valve to jam.

1 SELECT BAMBI SIZE
EG. 1012

3 SELECT DESIRED CONCENTRATION
EG. 0.7%

BAMBI MODEL		FOAM CONCENTRATION (%)											SACK SIZE
		.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	
8096	1	3	5	8	11	13	16	19	21	24	27	27	10 GAL 12 USG 45 L
	3	6	9	12	15	18	21	24	27	30	33	33	
9011	1	3	5	8	11	13	16	19	21	24	27	27	25 GAL 30 USG 114 L
	3	6	9	12	15	18	21	24	27	30	33	33	
1012	1	3	5	8	11	13	16	19	21	24	27	27	60 GAL 72 USG 272 L
	3	6	9	12	15	18	21	24	27	30	33	33	
1214	1	3	5	8	11	13	16	19	21	24	27	27	110 GAL 132 USG 500 L
	3	6	9	12	15	18	21	24	27	30	33	33	
1518	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
1821	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
2024	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
2732	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
3542	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
4453	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
5566	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
7590	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
HL3800	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
HL5000	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
HL7600	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	
HL9800	1	3	5	8	11	13	16	19	21	24	27	27	
	3	6	9	12	15	18	21	24	27	30	33	33	

2 CONFIRM CORRECT SACK SIZE

4 READ OFF DISPENSE TIME AND DUMPS AVAILABLE WITH FULL SACK
EG. 23 SECONDS, 14 DUMPS

Fig. 8: Foam concentration chart.

4. OPERATION

4.2 Dispensing foam

1. Select the desired concentration and run time from the chart on top of the control box. See Fig. 8 for explanation.
2. Set desired run times by pressing the small buttons on the digital dispense time switch. See Table 3 for switch functions.
3. Turn the control box on/off switch on.
4. When the bucket is full and lifted clear of the water, momentarily lift the dispense switch to dispense foam.
5. The timer can be reset at any time, and the inject cycle stopped by turning the on/off switch off, then back on.

NOTE: The chart on the control box shows the minimum foam concentration available at the indicated run time. See Fig. 8.

If the Bambi Bucket is cinched down, the foam concentration in the bucket will be higher than indicated on the mixing chart on the top of the box.

In both of these cases the increased concentration is due to a smaller volume of water in the Bambi due to the displacement of the full sack of foam. The change in concentration is relatively small. For the smallest Bambi Bucket used, with its appropriate sack, the concentration will increase about 19% over the indicated concentration; i.e. from .5% to .6%. For the largest Bambi Bucket used, with its appropriate sack, the increase will be about 14% over the indicated concentration; i.e. from .5% to .57%.

The first pump run will result in a lower concentration of foam as the pump has to fill the discharge pipe. Supplied voltage and brand of foam will also effect run time required to achieve the desired concentration. See sections 3.4, 4.3 and 4.4.

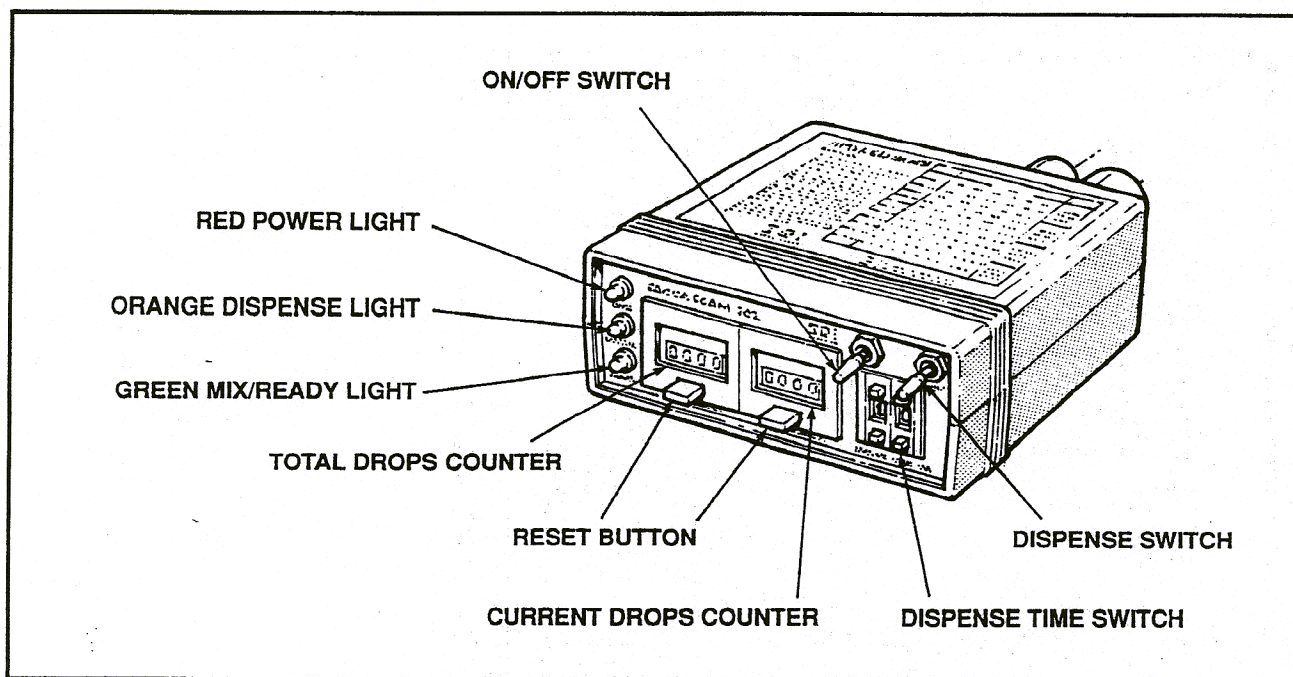


Fig. 9: Control box switch location.

4. OPERATION

Table 3: Control box functions

Item	Function
On/off switch	Toggle up to turn on. Toggle down to turn off and reset.
Dispense switch	Toggle up to begin dispensing foam.
Dispense time switch	Push buttons to set run time of foam injection pump.
Current drops counter	Both counters increment every time dispense switch is toggled up (on). Current drops counter should be reset when Sacksafoam is refilled. Zero counter by pressing reset button.
Total drops counter	Both counters increment every time dispense switch is toggled up (on). Total drops counter can be used to count the total number of drops per day or shift. Zero counter by pressing reset button.
Red power light	Red light is on when power is on.
Orange dispense light	Orange light is on when unit is dispensing foam.
Green mix ready light	Green light is on when unit is ready for next dispense cycle or mixer (if installed) is running. The green light (and mixer; if installed) will go off when the Bambi Bucket is dumped- if green wire (see Fig. 10) is hooked up to Bambi dump circuit.

4 . OPERATION

4.3 Variation in foam viscosity

The run times shown on the control box are calculated using a foam concentrate of average viscosity, such as Firefoam 103. Different brands of foam may require variations in run times to obtain the same percentage dilution.

Most of these changes are relatively small, and for practical purposes can be disregarded; particularly at low concentrations and short run times.

Table 4: Foam variation

Brand of foam	Change in run time.
Firefoam 103	No change
Forexpan	- 17%
Phos Chek	+ 16%
Silvex	- 20%

EXAMPLE: For a concentration of .5% in a Model 9011 Bambi Bucket, the chart on the top of the control box shows a run time of 15 seconds. If you are using Silvex, the run time will be 15 seconds minus 20%. This is $15 - 3 = 12$ seconds.

NOTE: Most of these changes are relatively small and for practical purposes can be disregarded, particularly at low concentrations and short run times.

4.4 Using non-standard voltages

If it is not possible to obtain 28 volts at the control box when using the supplied wire, or 24 volts at the injection pump when using a long line, adjust the run times as shown in Table 5.

Table 5: Voltage variation

Voltage Variation (volts)	Change in run time (%)
+1V	-2%
+2V	-5%
Standard	No change
-1V	+3%
-2V	+7%
-3V	+12%
-4V	+19%

NOTE: Most of these changes are relatively small and for practical purposes can be disregarded, particularly at low concentrations and short run times.

4.5 Removing the sack from the bucket

1. Reverse installation sequence.
2. If there is any appreciable amount of foam left in the sack, it should be pumped out until the pump runs dry. At this point the sack can be easily removed from the bucket. The remaining foam (approximately 4 litres with the 8018 sack) can be removed through the drain port.
3. The sack should be flushed with fresh water and pumped out. This will also clean the pump. Drain any residual water through the drain port.
4. Clean off the outside of the sack to remove any foam residue.

IMPORTANT: Proper cleaning of the sack prior to storage will increase the lifespan of the unit.

5. TROUBLESHOOTING

Problem	Possible Cause	Solution
Pump fails to operate	Blown breaker	Check helicopter breaker, and breaker on back of control box.
	Bad connections	Using a multimeter, check that current is reaching control box and sack. Check contacts in waterproof connector.
Incorrect foam concentration	Pump hooked up backwards	Check pump output by pumping into a bucket. Reverse connections to pump and try again. Select connection that gives highest output.
Bambi Bucket valve not working	Sack fouling valve	Reduce amount of foam in sack until it clears valve.
	I.D.S. hub tipping and fouling trip line	Adjust I.D.S. restrainers so that hub sits level.

6. MAINTENANCE

The Sacksafoam unit requires no maintenance other than cleaning. Daily, after use, and prior to storage, the sack should be flushed out with clean water. Clean off the outside of the sack to remove any residual foam.

7. OPTIONAL MIXER SYSTEM

The Sacksafoam control box will control an optional mixer system. The control box drives a solenoid which switches the mixer motor. The mixer runs during the time the green mix-ready light on the control box is on. When the Bambi Bucket is dumped, the mixer pump stops and the green light goes out.

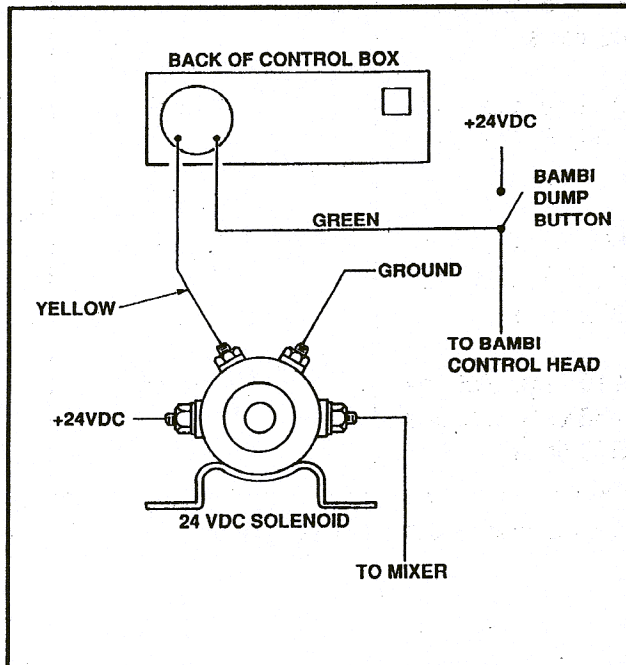


Fig. 10: Wiring diagram; control box with optional mixer.

7.1 Hooking up a mixer

1. Locate the short green and yellow wires on the outlet plug that connects to the control box. See Fig. 10.
2. Connect the green wire to the circuit that supplies a 24 volt positive pulse to dump the Bambi Bucket. This shuts off the mixer when the Bambi Bucket is dumped.
3. Connect the yellow wire to a continuous duty 24 volt solenoid that is capable of switching the mixer motor. The solenoid must not draw more than 1/2 amp at 24 volts. A COLE HERSEE part no. 24063, available from auto or truck electrical suppliers, works well.
4. Provide a separate circuit protected by a breaker and switched by the solenoid to supply power to the mixer.
5. The mixer runs from the end of the injection cycle (orange light) until the Bambi dump button is pressed. If you only require a short mixer run, delay injecting foam until you are close to your dump position.

8. SPECIFICATIONS

8.1 Sack Model (to fit inside corresponding range of Bambi Buckets)

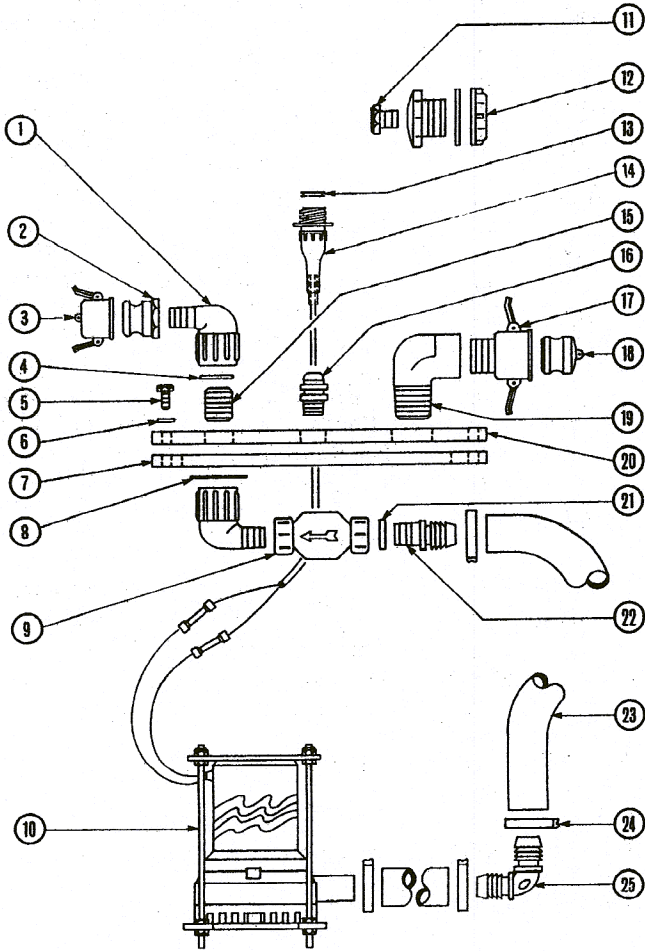
Sack Model Number	Bambi Bucket Model Number	Sack Volume	Current draw @ 28VDC
8018	8096 - 1821	10 Imp. Gallons 12 U.S. Gallons 45 litres	5 AMPS
2044	2024 - 4453	25 Imp. Gallons 30 U.S. Gallons 114 litres	5 AMPS
5550	5566 - HL5000	60 Imp. Gallons 72 U.S. Gallons 272 litres	5 AMPS
7698	HL7600 - HL9800	110 Imp. Gallons 132 U.S. Gallons 500 litres	10 AMPS

NOTE: Maximum current draw of the control box alone is 0.15 amps.

Specifications to change without notice

9. SACK PARTS; MODELS 8018, 2044 & 5550

For use in Bambi Bucket models 8096-HL5000: see specifications, section 8.1.



ITEM	DESCRIPTION	PART No.
1	1in. Street Elbow	PLP-025
2	1in. Kamlock FNPT Adapter	PLN-352
3	1in. Kamlock Dustcap	PLN-202
4	1 1/4in. O-Ring	GAS-003
5	Flange Bolt	FBSC-0507
6	Washer	FWN-0305
7	Inner Flange	SF-100
8	1 1/4 - 1 5/8in. Shim	GAS-005
9	1in. Check Valve	PLV-003
10	Injection Pump	SF-002
11	Vent Plug	PLP-102
12	Vent/Drain Assembly	PLP-101A
13	CPC Waterproof Seal	ECON-023
14	Bladder Wiring Harness	SF-517
15	1in. Nipple	PLP-001
16	Waterproof Fitting	PLP-103
17	1 1/2in. Kamlock MNPT Coupler	PLN-251
18	1 1/2in. Kamlock dustplug	PLN-151
19	1 1/2in. Street Elbow	PLP-206
20	Outer Flange	SF-101

METERING ORIFICES

21	Sack model 8018	SF-110
	Sack model 2044	SF-111
	Sack model 5550	Not Req'd
22	1in. Hose-MNPT Adaptor	PLP-075
23	1in. Hose	PLT-004
24	Hose Clamp	PP-400
25	1in. Hose-Hose Elbow	PLP-050

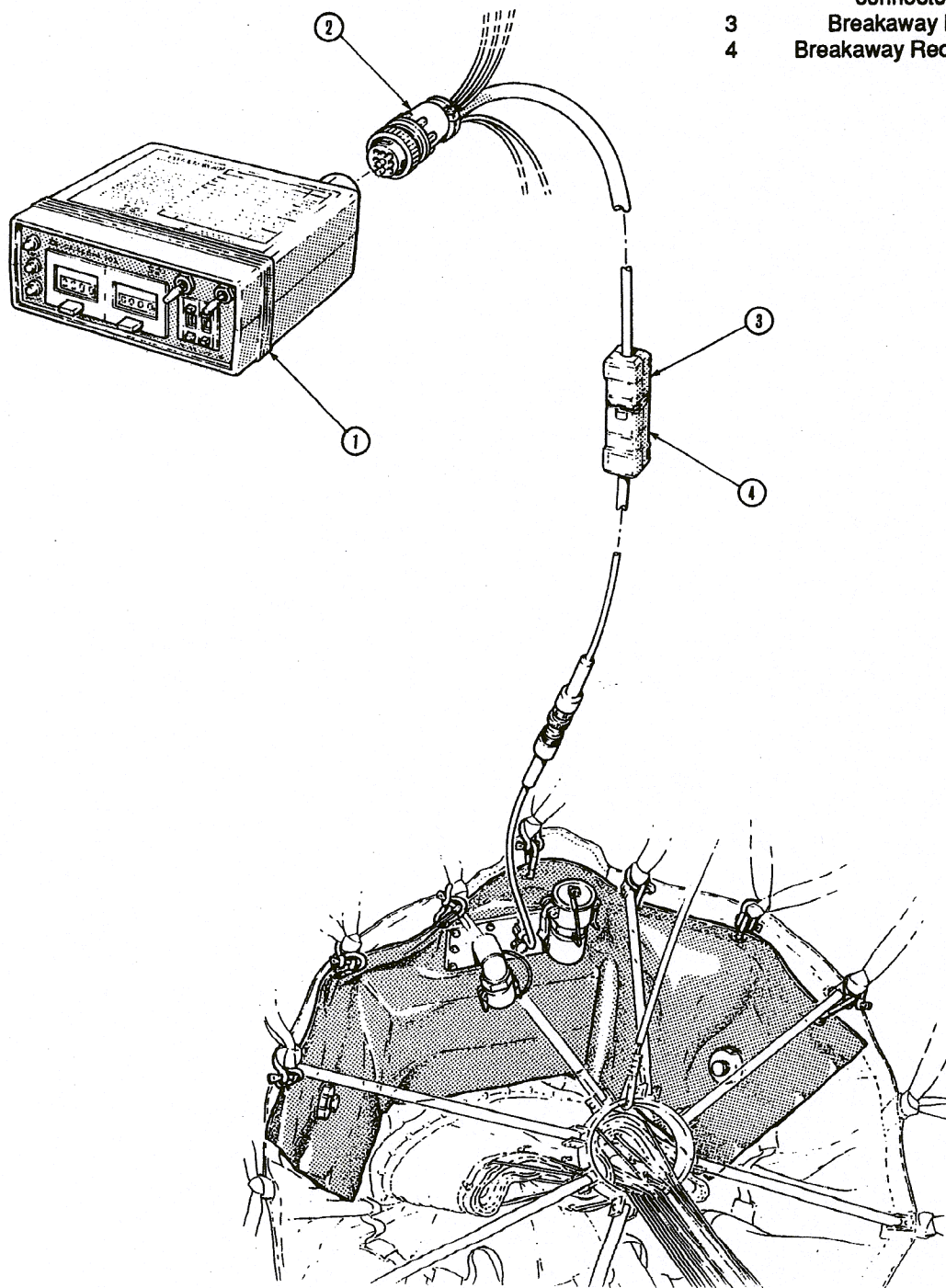
*SACKS

Not Shown	Sack model 8018 (10 IMP. GALLONS)	SFS-010
	Sack model 2044 (25 IMP. GALLONS)	SFS-025
	Sack model 5550 (60 IMP. GALLONS)	SFS-060
Not Shown	Spring Link	PP-211

***NOTE:** Sack only, no internal parts

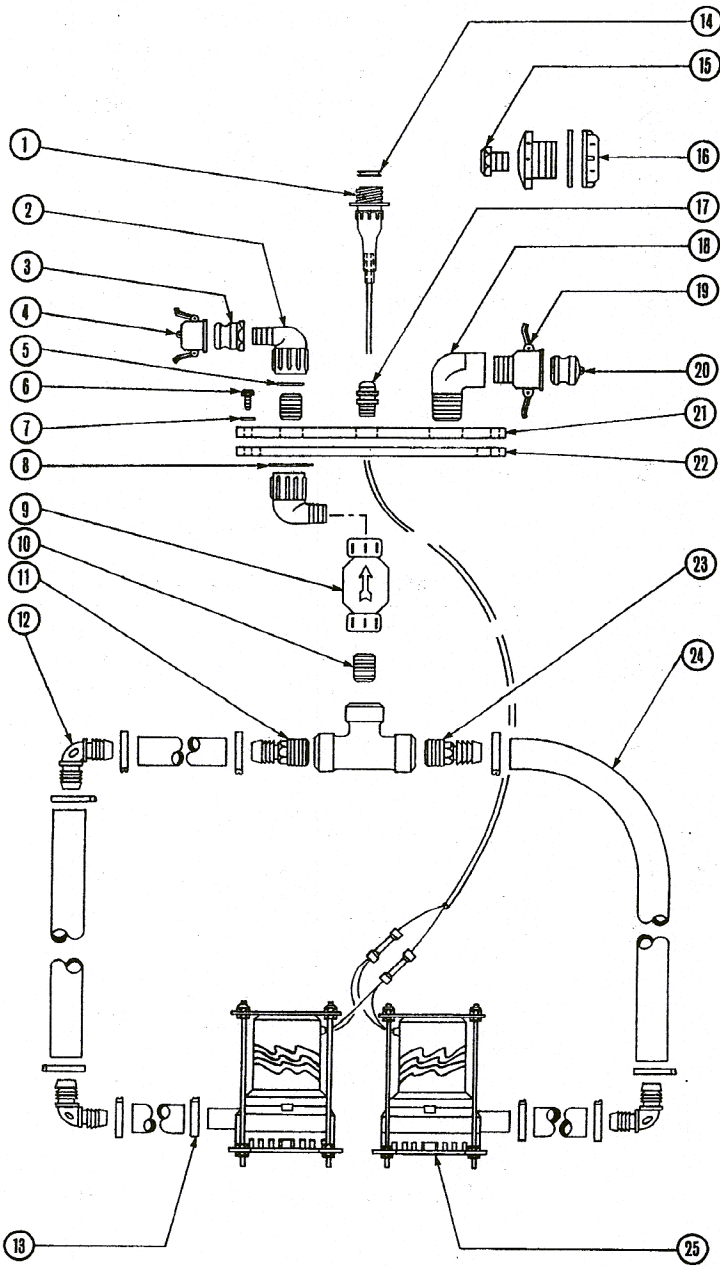
9. CONTROL BOX PARTS

ITEM	DESCRIPTION	PART No.
1	Sacksafoam Control Box	SFF-001
2	Control Box Wiring Harness (includes breakaway connector)	SF-515
3	Breakaway Plug	ECON-025
4	Breakaway Receptacle	ECON-026



9. SACK PARTS; MODEL 7698

For use in Bambi Bucket models HL-7600 and HL-9800.



ITEM	DESCRIPTION	PART No
1	Bladder Wiring Harness	SF-518
2	1 1/2in. Street Elbow	PLP-206
3	1 1/2in. Kamlock FNPT Adapter	PLN-351
4	1 1/2in. Kamlock Dustcap	PLN-201
5	1 7/8in O-Ring	GAS-004
6	Flange Bolt	FBSC-0507
7	Washer	FWN-0305
8	1 7/8in - 2 1/8 Shim	GAS-006
9	1 1/2in. Check Valve	PLV-004
10	1 1/2in. Nipple	PLP-002
11	1 1/2in. Tee	PLP-100
12	1in. Hose-Hose Elbow	PLO-050
13	Hose Clamp	PP-400
14	CPC Waterproof Seal	ECON-023
15	Vent Plug	PLP-102
16	Vent/Drain Assembly	PLP-101A
17	Waterproof Fitting	PLO-103
18	2in. Street Elbow	PLO-027
19	2in. Kamlock MNPT Coupler	PLP-252
20	2in. Kamlock Dustplug	PLN-150
21	Outer Flange	SF-102
22	Inner Flange	SF-100
23	1in. Hose-Hose MNPT Adapter	PLP-076
24	1in. Hose	PLT-004
25	Injection Pump	SF-002
Not Shown	*Sack model 7698 (110 IMP. GALLONS)	SFS-110
Not Shown	Spring Link	PP-211
Not Shown	Suspension Hanger	

*NOTE: Sack only, no internal parts.