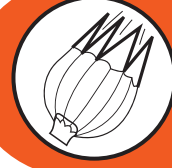
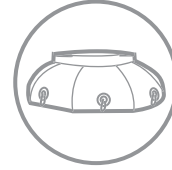


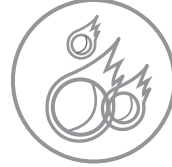
POWERFILL SNORKEL MANUAL



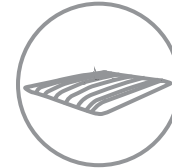
Bambi Bucket



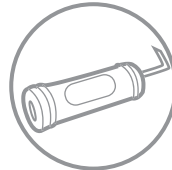
Fireflex



Dragon



Remote Site



Environmental



Emergency Response



POWERFILL SNORKEL MANUAL - Version A

Issue Date: December 2008

PLEASE READ BEFORE USING.

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Section 1: PowerFill Snorkel Overview

Introduction to PowerFill Snorkel

Important Note

The PowerFill Snorkel system is for use on the original Bambi bucket equipped with the standard flexible dump valve or the Aqualanche valve. This system is specifically designed to be installed on 2024 to 4453 models only.

The PowerFill Snorkel pump system allows operators to get quick, partial or complete fills from a range of previously inaccessible shallow water sources including streams, canals, ponds and low profile dip tanks. Once the flange has been installed, the pump unit can be quickly attached and removed, as the situation requires. The system can also be transported separately from the bucket, if required. The Bambi bucket, equipped with the PowerFill Snorkel, has the same handling, ease of transport and collapsibility as other Bambi buckets in this size range.

The Snorkel system consists of a single, high-flow electrically-driven pump mounted to a flange on the side of the bucket. This flange can be purchased separately, allowing the pump unit to be moved between buckets.

New Bambi buckets have the flange installed. For older model Bambi buckets, the flanges can be purchased and retrofitted onto the unit. There is another PowerFill system available, called the PowerFill Torrentula, where the pumps are mounted integral to the valve. This system offers many features that the standard Bambi bucket cannot.



Bambi bucket with PowerFill installed.

No prior experience is required to quickly master using the PowerFill Snorkel. The operator simply has to press a push button for the duration of the fill. Alternatively, the operator may wish to install their own switch or use existing utility circuits in the cockpit for ease of operation by pilots. To assist operators with installing the PowerFill in the aircraft, this manual contains a suggested wiring diagram.

For your own protection and for longer system life, always read the instructions and warnings. Ignoring them could result in personal injury and damage to the bucket or aircraft. These notices are divided by severity of the outcome into warnings, cautions and important notes.

SEI offers complete parts and repair services for the Bambi bucket and PowerFill systems. For maintenance and repair purposes, parts lists and wiring diagrams are also included in this manual. When ordering, please provide the model and serial number of your Bambi bucket.

Additional hard copies of this manual are available from SEI Industries Ltd. or visit our website for electronic copies at www.bambibucket.com.

System Overview

The PowerFill Snorkel system is comprised of one electrically-driven high-efficiency pump mounted onto a flange that is installed into the side of the bucket. The pump can fill the bucket rapidly and completely in water sources as shallow as 15” deep.

System Description

The pump is 28 volt DC powered, compact, light weight and efficient. The pump requires up to 45 amps of current and can pump 425 US gallons of debris-free water per minute (26 litres per second). Power is supplied by 28 volt DC power from the aircraft non-essential or utility bus. Power is transmitted through a waterproof and oil-resistant cable to the pump motor. At the top end of the cable, a quick disconnect plug will separate with minimal force in the event of a load jettison.

The pump motor, impeller and housings are contained within a circular steel filter basket. The filter basket serves to protect the components from impact damage while also acting as a debris screen. The pump can run “dry” without damage. The pump is fully waterproof in operation to a depth of 10 ft. (3.0 m) and has a standard hydraulic grease nipple provision to extend the life of the motor output shaft seal.

The mating flange consists of two plates that clamp together over the bucket shell to form a hard point for quick mounting of the pump unit. The flange can be installed on a number of buckets to accept the same pump unit. Mounted to the inside of the flange, a one-way flapper valve prevents water from flowing back through the pump when the pump is not running. If the pump is not in use for a period of time, a blanking plate should be installed to replace the pump.

The PowerFill Snorkel system comes complete with wiring harness. An optional control box can also be ordered.

Important Note

If you are switching pumps from one size of bucket to another, it is recommended that the discharge hose and restrainer chain also be changed to the lengths required for that bucket size.

PowerFill Snorkel System Requirements

- 28 volts DC power supply
- 45 amps continuous output for at least one minute
- Recommended circuit protection is 50 amps

Use of a longline lifting cable will lower the actual current draw of the PowerFill system (see details below for wire gauges required).

Longline Wire Gauge Requirements

LENGTH		BAMBI		POWERFILL SNORKEL	
Feet	Meters	Wire	Recommended Plugs	Wire	Recommended Plugs
0 – 75	0 – 23	14/2 SOW	NEMA 5-15P / NEMA 5-15R	#6 TEW	APP 6326G6
76 – 100	23 – 30	14/2 SOW	NEMA 5-15P / NEMA 5-15R	# 6 TEW	APP 6326G6
101 – 150	30 – 45	12/2 SOW	NEMA 5-15P / NEMA 5-15R	# 4 Welding	APP 6326G6
151 – 200	46 – 61	12/2 SOW	NEMA 5-15P / NEMA 5-15R	# 4 Welding	APP 6326G6

PowerFill Snorkel Specifications

Bucket Model	Current Draw Amps at 24.5 VDC	Optimal Fill Time (Sec.)	PowerFill System Additional Weight Lbs. (Kg)	Bucket Weight Empty w/ Pump Lbs. (Kg)	Bucket Gross Weight Lbs. (Kg)
2024	45	34	46 (21)	180 (82)	2200 (1000)
2226	45	38	46 (21)	190 (87)	2400 (1100)
2732	45	45	46 (21)	200 (90)	2900 (1300)
320C	45	45	46 (21)	190 (86)	2900 (1300)
3542	45	59	46 (21)	200 (90)	3700 (1700)
420B	45	59	46 (21)	190 (86)	3700 (1700)
4453	45	75	46 (21)	220 (100)	4600 (2100)

Important Note

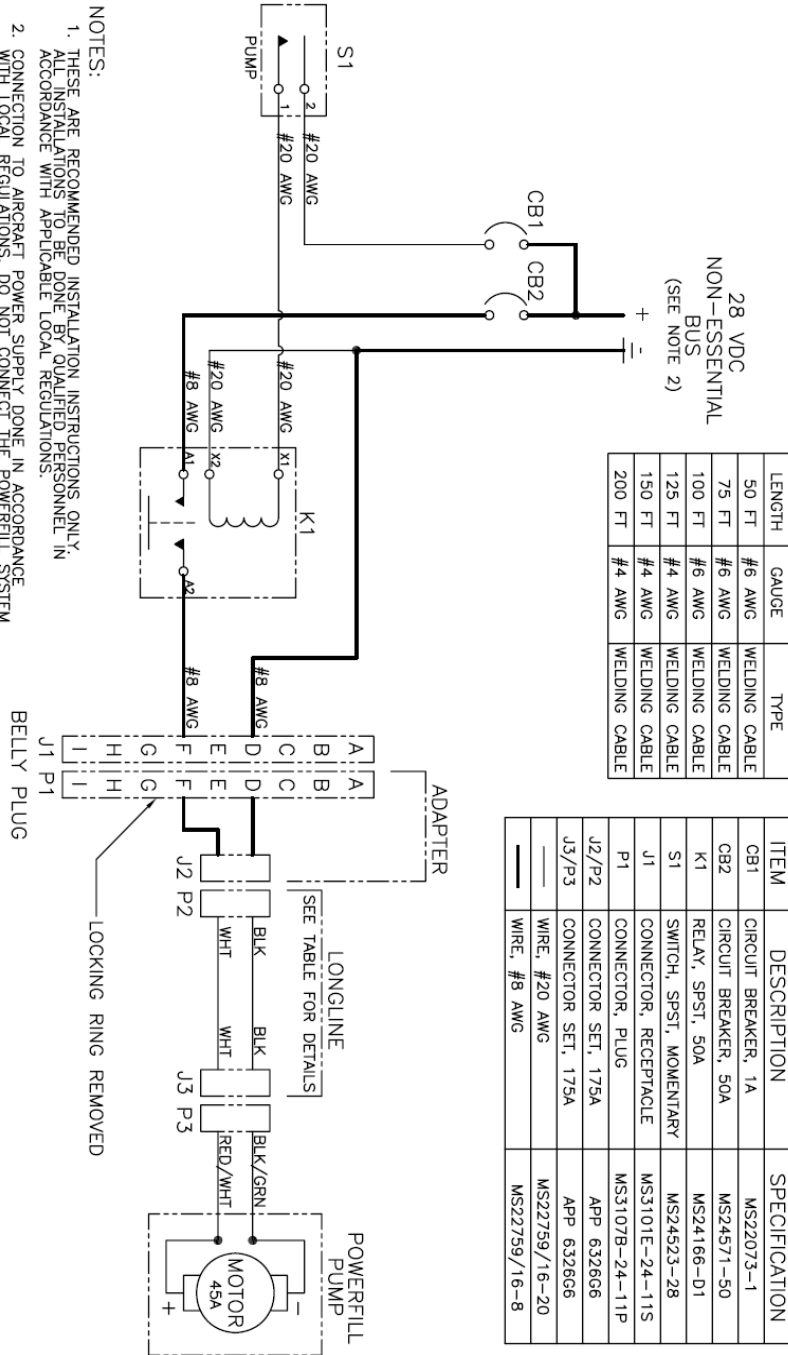
Specifications subject to change. Check control head serial number plate for capacity and add listed PowerFill additional system weight to empty weight and gross weights.

- Listed model weights are with the PowerFill and ballast installed on the bucket. It is not necessary to have the ballast mounted on the bucket. If it is removed, subtract 26 lbs. from the weight of the bucket.
- Fill time and current draw are listed based on pumping clean water at standard atmospheric conditions.
- Maximum depth with pumps running is 10 feet (3 m).
- Maximum immersion depth with pumps off is 20 feet (6 m).

Listed weights do not include longline conductors. See the previous page for recommended longline conductor configurations. For the wiring diagram, please see next page.

Powerfill Snorkel Wiring Diagram

- NOTES:
1. THESE ARE RECOMMENDED INSTALLATION INSTRUCTIONS ONLY. ALL INSTALLATIONS TO BE DONE BY QUALIFIED PERSONNEL IN ACCORDANCE WITH APPLICABLE LOCAL REGULATIONS.
 2. CONNECTION TO AIRCRAFT POWER SUPPLY DONE IN ACCORDANCE WITH LOCAL REGULATIONS. DO NOT CONNECT THE POWERFILL SYSTEM TO ANY AIRCRAFT BUS BAR THAT IS USED FOR EMERGENCY OR ESSENTIAL LOADS. AMMEND THE AIRCRAFT ELECTRICAL LOAD ANALYSIS TO ENSURE THAT THE GENERATOR CAPACITY IS ADEQUATE TO OPERATE THE SYSTEM.
 3. ALL GROUNDS, SOLDERED TERMINALS, AND CRIMPED TERMINALS DONE IN ACCORDANCE WITH AIRCRAFT MANUFACTURERS INSTRUCTIONS.



LONGLINE DETAILS

LENGTH	GAUGE	TYPE
50 FT	#6 AWG	WELDING CABLE
75 FT	#6 AWG	WELDING CABLE
100 FT	#6 AWG	WELDING CABLE
125 FT	#4 AWG	WELDING CABLE
150 FT	#4 AWG	WELDING CABLE
200 FT	#4 AWG	WELDING CABLE

RECOMMENDED COMPONENTS

ITEM	DESCRIPTION	SPECIFICATION
CB1	CIRCUIT BREAKER, 1A	MS22073-1
CB2	CIRCUIT BREAKER, 50A	MS24571-50
K1	RELAY, SPST, 50A	MS24166-D1
S1	SWITCH, SPST, MOMENTARY	MS24523-28
J1	CONNECTOR, RECEPTACLE	MS3101E-24-11S
P1	CONNECTOR, PLUG	MS3107B-24-11P
J2/P2	CONNECTOR SET, 175A	APP 632866
J3/P3	CONNECTOR SET, 175A	APP 632866
---	WIRE, #20 AWG	MS22759/16-20
---	WIRE, #8 AWG	MS22759/16-8

Section 2: Installation on New Buckets

Snorkel Installation Procedures

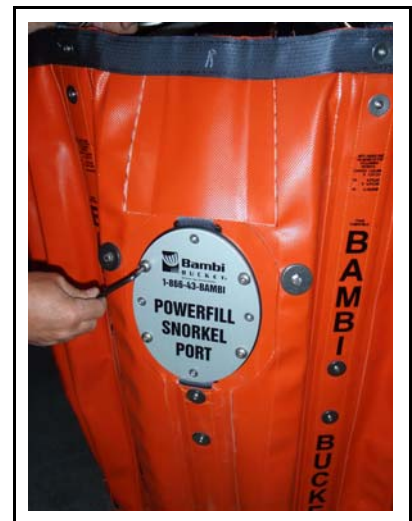
Important Note

New Bambi buckets have the Powerfill Snorkel flange already installed. This section's instructions apply to new buckets only. For older model Bambi buckets, the flanges can be purchased and retrofitted onto the unit. For installation instructions for pre-existing buckets, please see section 3 of this manual.

1. Unpack the bucket and pull the IDS hub out into its deployed position. Stand the bucket in an upright position. If necessary, the bucket can be held in this position by attaching a rope to the M-strap on the opposite side to the PowerFill port. Secure the other end of the rope to a heavy object that is at least three feet off the floor.



2. Remove the blanking plate.



3. Make sure the flange gasket is on the flange. The pump should be mounted to the flange, hanging straight down.



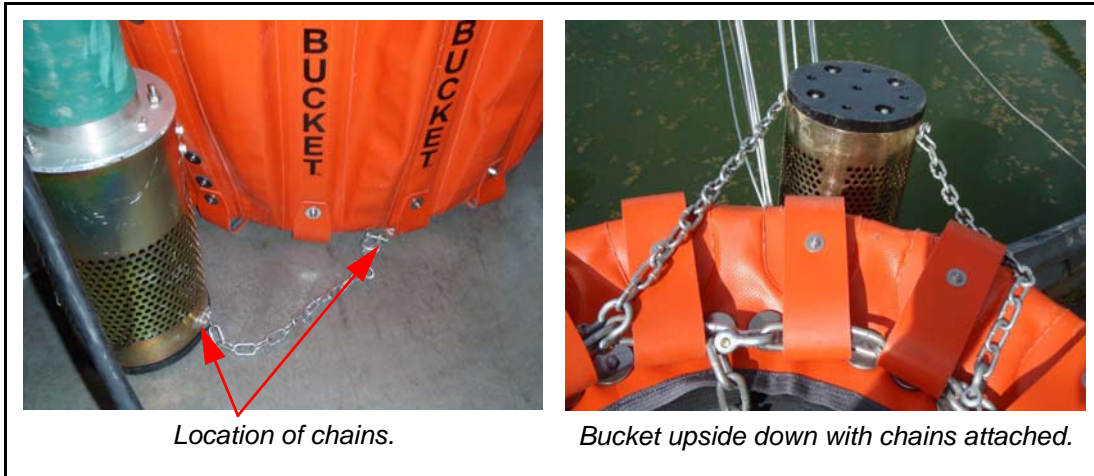
4. Hold the pump against the flange. It will be supported slightly by the four flange bolts. Insert the four 3/8" NC socket head bolts by hand.



5. Tighten the bolts with a 5/16" allen key. Apply as much torque as you can by hand. Never use a pipe to tighten the bolts as you can strip the threads in the flange.

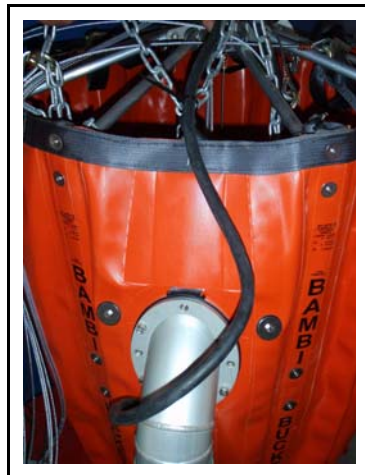
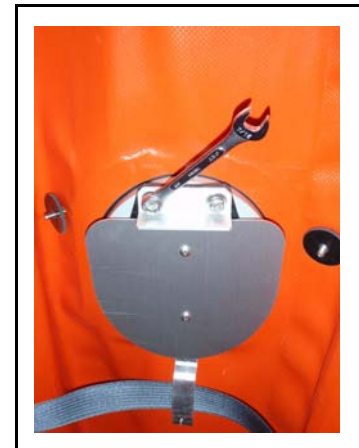


6. Attach the restrainer chains on the pump filter basket to the bottom chain on the bucket in the positions shown in the pictures below.



7. Install the flapper valve.

8. Leave about 8” (20 cm) of slack to allow for movement in the bucket when filled. Using Zap straps, tie the electrical cord from the pump to the lower shackle on the suspension line above the pump.



Section 3: Installation on Pre-Existing Buckets

Snorkel Flange Kit Installation

Important Note

This section's instructions apply only to pre-existing Bambi bucket models 2024 to 4453, equipped with standard or Aqualanche valves. New Bambi buckets have the Powerfill Snorkel flange already installed. For installation instructions for new buckets, please see section 2 of this manual.

Introduction

For existing Bambi buckets that don't have the PowerFill Snorkel flange mounted, a flange must be permanently attached to the shell of the bucket. Once the flange has been installed, the pump may be attached or removed in mere minutes, as required. A blank plate is included with the flange installation kit to cover the flange hole when the pump is not attached.

The pump mating flange is located approximately midway up the bucket on the center, or front most panel, below the ballast. By mounting the flange in the center of the panel, tensile forces from the load bearing webbing straps are transferred through the flange via anchor plates secured by the flange bolt. A pattern is supplied to make the locating of the flange assembly simple.

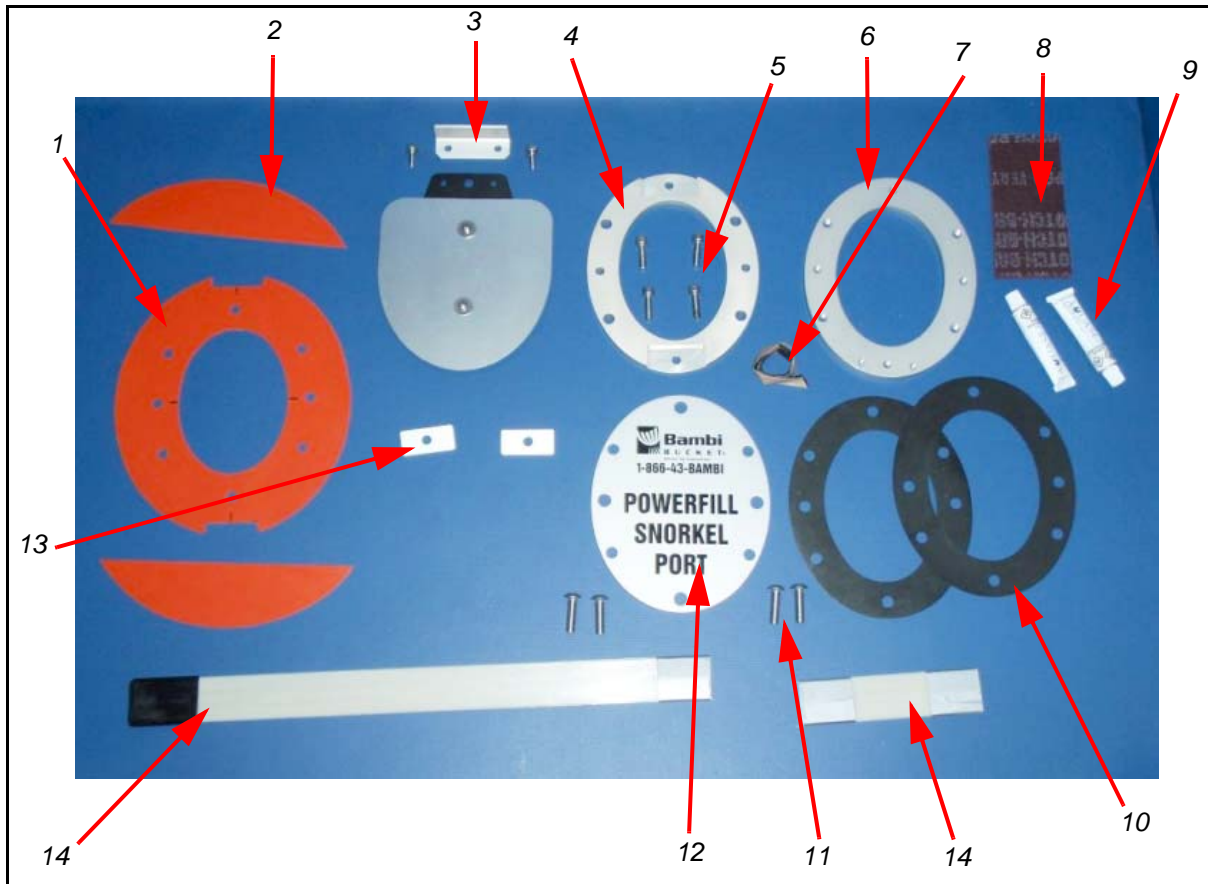
The following detailed instructions are supplied to guide the operator through all the steps required for the installation of the flange. Please read the instructions and study the corresponding pictures to determine what tools and consumables you require, from the list supplied, before commencing work.

Important Note

Operators who choose to deviate from the instructions supplied, must do so only with the approval of SEI Industries or risk voiding any warranties extended by SEI Industries.

Flange Kit Parts

The picture below shows all parts that you receive in the kit.



ITEM #	PART #	DESCRIPTION	QTY.
1	PP407	BUCKET SHELL DOUBLER	1
2	PP408	BUCKET SHELL SPACER	2
3	BBPPF2	FLAPPER VALVE ASSEMBLY (Refer to picture for assembly)	1
4	BAB404	FLANGE OUTER BBPF SNORKEL 2024-4453	1
5	FBSC020510	BOLT SOCKET HEAD CAPSCREW 5/16-18 X 1	4
6	BAB403	FLANGE INNER BBPF SNORKEL 2024-4453	1
7	PP020	BUTYL TAPE 3/8" X 6"	.5ft.
8	PP504	PAD ABRASIVE	1
9	PP525	ADHESIVE DURA SEAL	2
10	BAB406	GASKET FLANGE BBPT SNORKEL 2024-4453	2
11	FBSC080612	BOLT BUTTON HEAD ALLAN S/S 3/8-16 X 1 1/4"	4
12	BAB422	BLANK PLATE BBPF SNORKEL 2024-4453	1
13	BAB402	ANCHOR PLATE BBPF SNORKEL 2024-4453	2
14	BAB460	BATTEN SET PF II2024-2226 LONG 20 3/4" SHORT 6 1/2'	SET
14	BAB462	BATTEN SET PF II 2732 LONG 20 3/4" SHORT 9'	SET
14	BAB464	BATTEN SET PF II 320C LONG 16 1/4" SHORT 9"	SET
14	BAB466	BATTEN SET PF II 3542 LONG 27 1/2" SHORT 12 1/2"	SET
14	BAB468	BATTEN SET PF II 420B LONG 20" SHORT 12 1/2"	SET
14	BAB470	BATTEN SET PF II 4453 LONG 24" SHORT 14 1/2"	SET

Tools Required

- Small hammer
- Soldering gun (to seal the edges of the holes) or 3/8" (9.5mm) diameter fabric punch
- Drill motor
- 3/16" drill
- 3/8" combination wrench
- 7/16" combination wrench
- Philips screwdriver #2
- Adjustable blade utility knife
- 1/4" Allan key
- 5/16" Allan key
- Scissors (sharp)
- Awl

If a hot air gun is available, capable of 1100 deg. F (600 deg C) and equipped with a wide nozzle, it can be used in place of glue.

Consumables

- Isopropyl rubbing alcohol
- Rags

Stripping Down the Bucket

1. Pull the IDS up into its deployed position.
2. Find the strip with the Bambi bucket label that is the center of the ballast pouch and chains.



3. Remove the ballast pouch or bars.



4. Remove clevis pins from the shell brackets on each side of ballast.



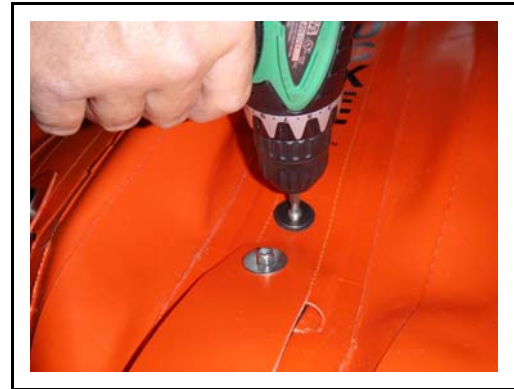
5. Remove the cinch strap bracket from the panel.



6. Remove the lower IDS restrainer bracket.



7. Remove the bolts holding the wear strip.



8. Remove the fiberglass batten from the panel.

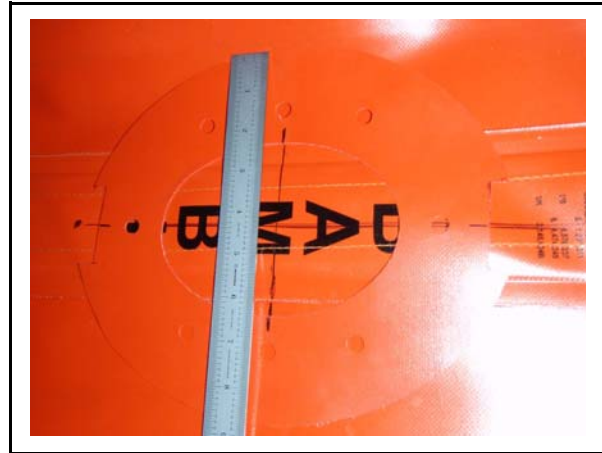


Measuring the Bucket

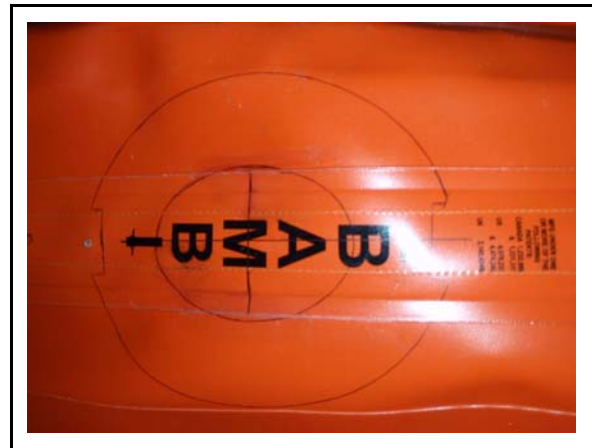
1. Support the inside of the shell with a thick piece of wood about 6" (150 mm) wide and up to 3' (1 m) long. Use stands or boxes to support the wood. This will push the panel out and give you a supported surface to work on.
2. Locate the upper cinch strap hole. Measure up 1 ½" and draw a line at this location.
3. Draw a center line from the cinch strap hole, about 11" long.



4. Place the pattern and, using the center line on the pattern, draw a line across the Bambi strip.

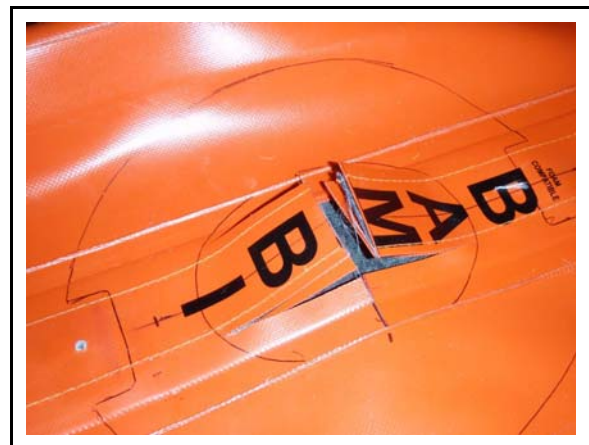


5. Using the pattern supplied, draw lines on the bucket. The panel should now look like this.



Cutting the Bucket

1. Using a utility knife, cut across the webbing strip, staying inside the inner circle.



2. Insert batten and cut straight down. From the bottom of the notch down to the center cut, move the batten from side to side to make sure you are cutting on top of the batten, not on top of the shell fabric. Repeat this cutting for the flange bottom.



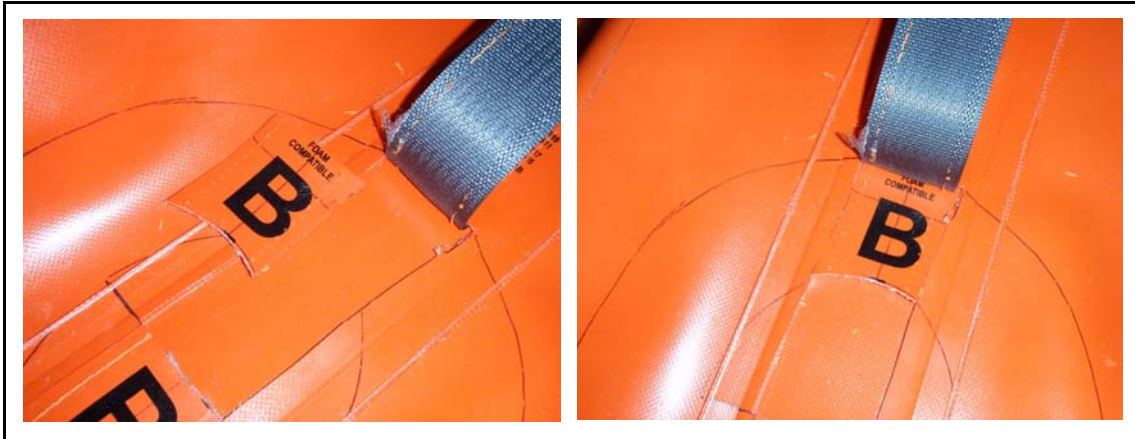
3. Remove the webbing from the fabric strip, up to the bottom of the notches.



4. Cut the orange fabric bottom of the notches.



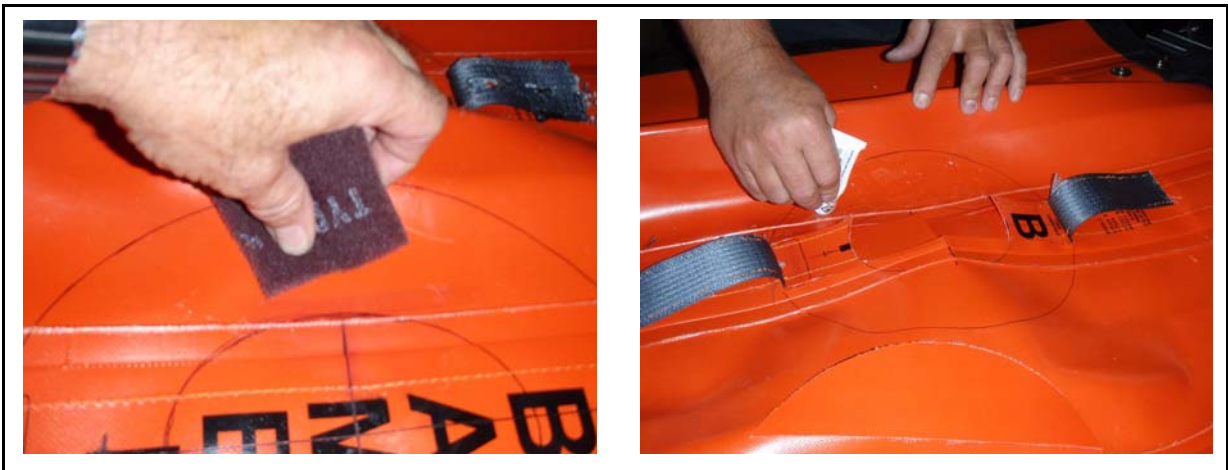
5. Using the orange fabric strips, cut along the inner flange line. With glue on the back of the strip, place this strip under the webbing in the void created.



6. Repeat for the bottom of the flange.

Gluing the Bucket

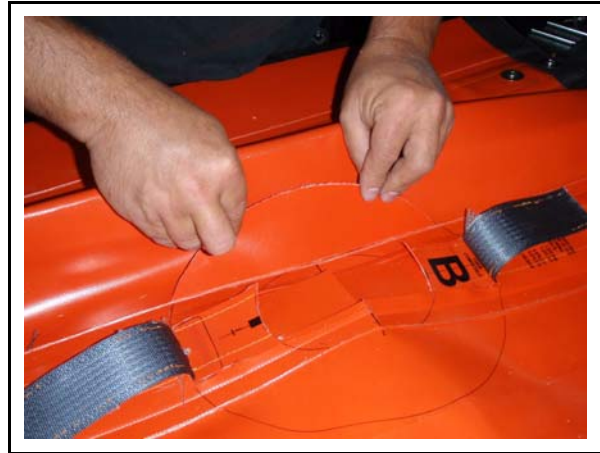
1. Using the Scotch Brite pad supplied, scuff the surface inside the flange area and then clean the surface with the alcohol.



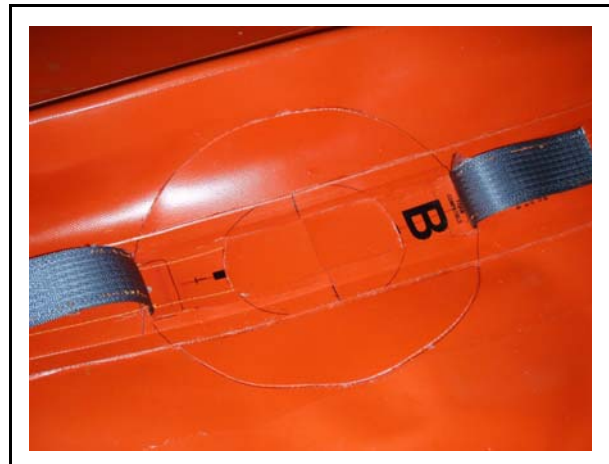
2. Placing the bucket shell spacer on a flat clean surface, coat one side of each spacer evenly with Dura Seal glue.



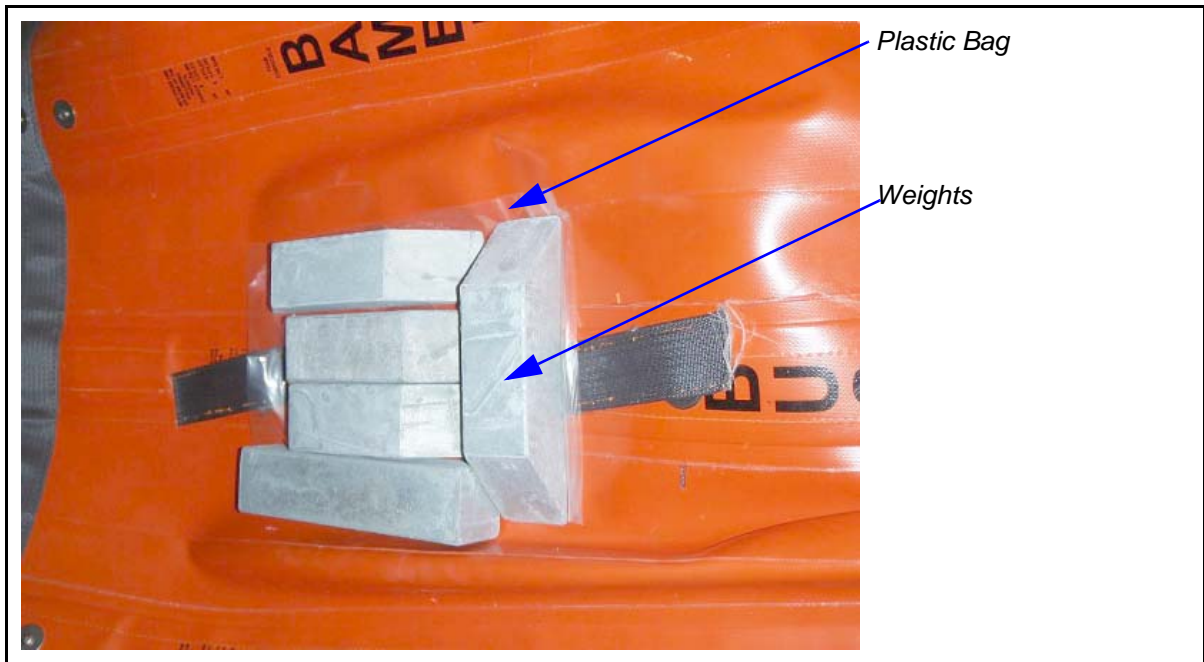
3. Place the bucket shell spacers on each side of the strip, inside the flange lines.



4. Coat the surface of the bucket shell spacers and the webbing void spacers with glue and place the shell doubler patch. Press the patch down and clean any excess glue from the edges.



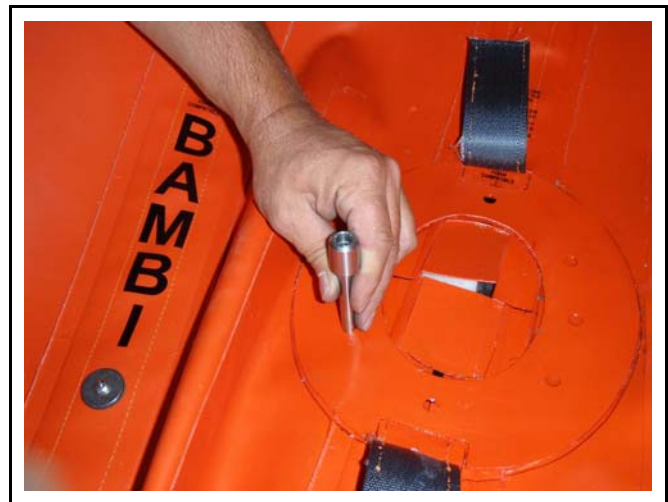
5. Place a piece of plastic bag over the glued area and then place weights over top of the bag. Allow the glue to cure for 4-6 hours.



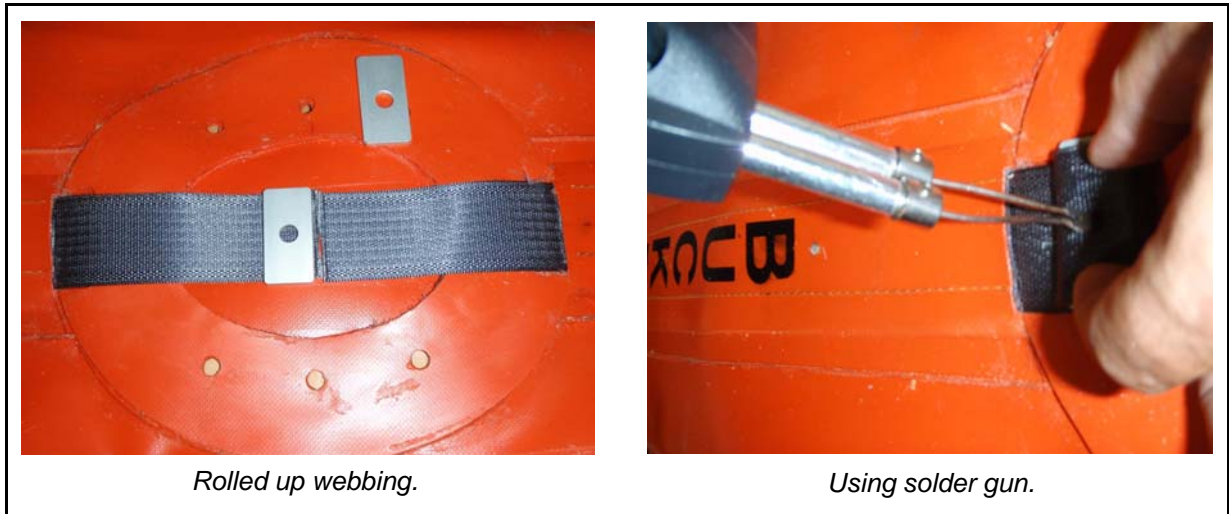
6. After the glue has dried, remove the weights and plastic. You are now ready to install the flange.

Inserting the Flange

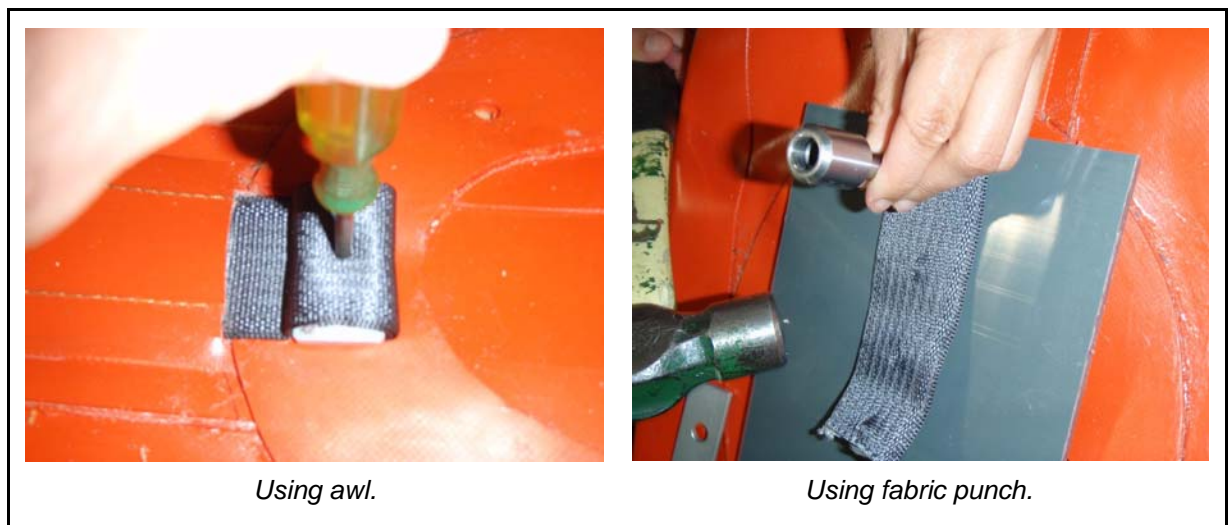
1. Using the fabric punch, punch the eight holes found in the shell doubler (a 3/8" drill can be used if no punch is available).



2. Wrap the webbing around the anchor plates. With tension on the webbing, the anchor plate lip holes line up with the holes in the Powerfill flange. Use a soldering gun to burn a hole, pushing it through the webbing, anchor plate and flange hole.



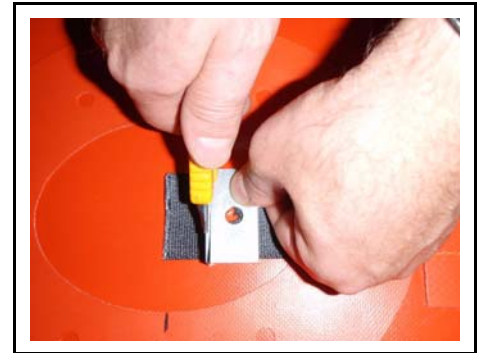
3. If an awl is to be used, push the awl through webbing and anchor plate. Unwrap the webbing, locate the awl punched hole, then, using the fabric punch, punch three holes in the webbing. Make sure to place a piece of plastic under the webbing before punching.



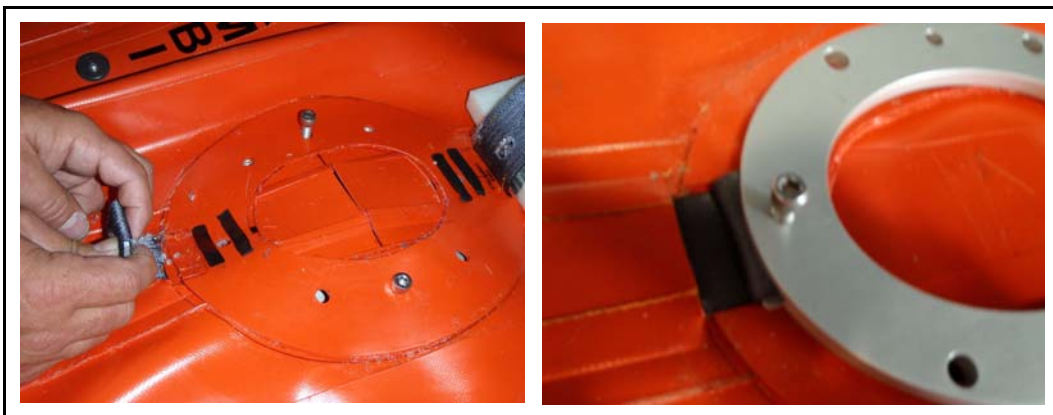
4. After burning or punching the webbing should look like this.



5. Now, place the anchor plate over the first hole and trim the webbing, if it goes beyond the anchor plate.



6. Roll up the anchor plate in the webbing. Line up the three holes, then, position the outer flange with the cutout down and push the bolt through flange, webbing and anchor plate. Repeat for the second hole.



7. Position the inner flange and gasket. Insert and tighten the four flange bolts.



8. With the utility knife, cut out the fabric inside the flange.

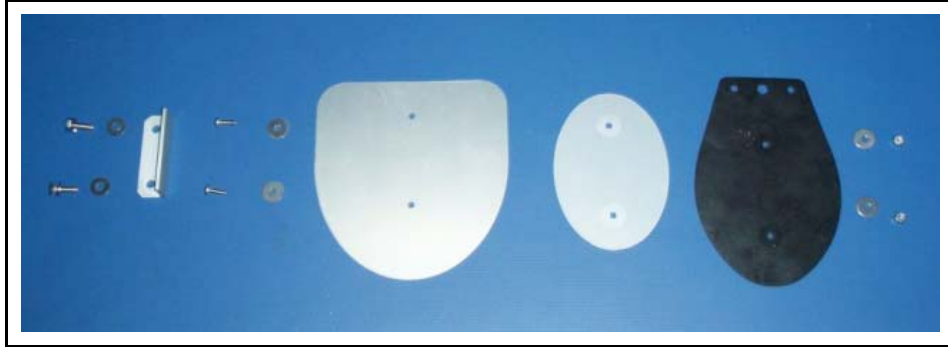


9. If the PowerFill Snorkel is not to be mounted at this time, install the gasket and blank plate, then mount the ballast and attach the two disconnected IDS spokes.



Section 3: Installation on Pre-Existing Buckets

10. If the PowerFill Snorkel unit is to be mounted now, the flapper valve should be installed at this time (see picture below for assembly sequence).



11. Attach the ballast and the two IDS spokes (refer to this manual for attaching PowerFill pump and flapper valve).

Section 4: Safety

Pre-Flight Safety Check

In addition to performing the pre-flight check on the Bambi bucket (please refer to the Bambi bucket Operations Manual for your model), perform the following checks on the PowerFill Snorkel system:

1. Check that the electrical junction box is secure in the aircraft.
2. Inspect the conductor wires for damage, chafing or wear. Confirm that the conductor cables are firmly secured to the Bambi bucket actuator cable, to the long line cable (if used) and to the suspension line that attaches to the chains near the PowerFill. Repair any damage before operating the system.

Warning

Do not operate with damaged cables. Damage to an electrical cable, that leaves the conductor exposed, can result in a fire if it comes in contact with another conductor or metal object.

3. Inspect the cable connectors for damage and ensure proper connections.

Warning

Do not put your fingers or other objects into the pump impeller while the pump is running. Personal injury or damage to the pump can occur.

4. With power on, check the function of the pumps by pressing the pump's ON button for four or five seconds. The pump should turn on and run for the period the button is held. The pump will be audible within a few feet of the bucket. Listen for abnormal noises that are not consistent with smooth operation. If you are operating in a noisy environment, you can confirm that the pump is running by holding your hand on the top of the filter screen. You may also see the shell move each time you activate the switch.
5. Check the filter screen for debris accumulation and clear as necessary.
6. Check the filter screen for signs of damage that may affect water flow.

Section 5: Operations

Operating the Powerfill Snorkel

Flying with the PowerFill Snorkel System

Flying a Bambi bucket with the PowerFill Snorkel will not adversely affect the flight characteristics of the bucket. Refer to the Bambi bucket operations manual for information on flying the Bambi bucket.

Filling the Bambi Bucket with the PowerFill Snorkel System

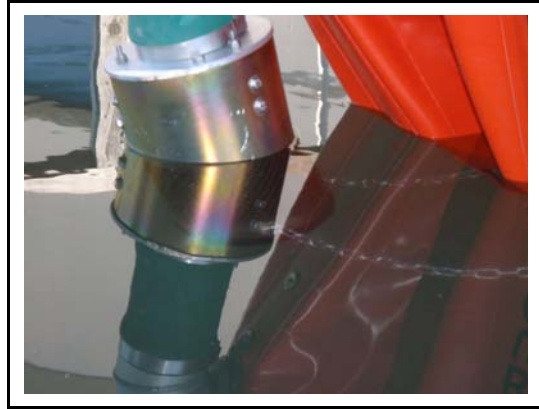
Initiating a fill with the PowerFill Snorkel is simple and can be quickly mastered. Operation of the pump is accomplished by simply pressing the fill button for as long as it takes to fill the bucket. There are a few key points to keep in mind:

- To initiate a fill, the pump impeller must be immersed. It may not be possible to fill from water sources less than 15" (40cm) deep.



- Once a fill has been started, the bucket will need to be supported by maintaining some tension on the suspension lines, particularly when the bucket is nearly full. If the bucket is not supported, the flexible nature of the bucket shell may allow it to collapse to one side as the water load increases.

- Once a fill has been started, the bucket can be raised or lowered, relative to the water line, without losing the prime, as long as the top row of filter screen holes does not rise above the water line.



- Frothing of the water or slow fill rate indicates the pump is not submerged for enough to maintain prime.
- The further the bottom of the bucket can be lowered into the water source, the faster the bucket will fill.
- Where possible, employ a partial dip fill, augmented by the pump, to reduce the total fill time.
- It is recommended that the pump not be run when a conventional dip fill is possible.
- Do not run the pump if it is submerged to a depth of 10 feet (3 m) or more.
- Do not submerge the bucket to a depth of more than 20 feet (6.1 m) when performing conventional dip fills (pump off) in deep water sources.
- The filter screen is designed to filter out objects large enough to damage the pump impeller and to prevent weeds and debris from clogging the pump intake. If operating the pump in extremely dirty or swampy water sources, more frequent inspections of the pump impeller and filter screen may be required to maintain optimal function.
- The pump can be run dry without damage. However, maximum life can be obtained from the pump motor if the run time is limited only to filling the bucket. Excessive run time will require more frequent lubrication of the pump output shaft. See this manual's section 6 on *Maintenance and Troubleshooting* for the shaft seal lubrication procedure.

Section 6: Maintenance and Troubleshooting

Maintenance Procedures

In addition to the daily pre-flight inspections as outlined in *Section 4: Safety*, follow the weekly inspection procedure for times when the bucket is in continuous use.

Caution

The lubrication of the pumps output shaft seals is critical to the longevity of the pump. Failure to follow the recommended lubrication intervals may result in premature pump failure. See this section's instructions on pump output shaft lubrication intervals.

Weekly Inspection

1. Check all parts of the system for visible damage or defects.
2. Clean all debris from the pump motor impellers and debris screen.
3. Inspect the entire length of all electrical cables for damage.
4. Assess the function of the pumps by running each one in turn. Isolate each pump by turning the other pump circuit breakers off during the test.

Warning

Disconnect power to the pump motor before performing visual inspection of pump impeller.

5. Inspect each pump impeller for signs of damage, particularly on the leading (lower) edge of the impeller blades.
6. Inspect the one-way flapper valves on the pump exit ducts (inside the bucket) for cuts or tears.
7. Inspect the motor conductors for cuts or signs of chafing or wear. Immediately repair any damage to the conductor cable installation.
8. Ensure each cable connector is securely attached to its cable and free from cracks or damage.

Pump Output Shaft Lubrication

The pump output shaft must be lubricated periodically to preserve the life of the seals. Good seal condition will prolong the life of the motor by preventing moisture and other contaminants from entering the motor case. Lubrication will require a hand pump grease gun with a standard hydraulic coupler.

Grease Procedure

Interval: All models, every 300 fill cycles.

Important Note

Regular air fills do not count as fill cycles if pumps are not operated.

1. Remove the three nuts securing the filter basket to the top mount ring and pull the filter basket free from the pump assembly.
2. Gently apply one to two pumps of grease to the grease nipple using enough to purge grease through the seal.
3. Check for dirt or gravel accumulation between the seal cup and the bottom shank of the impeller. Also, clean out any dirt and debris that may have accumulated inside the filter basket.
4. Re-install the filter basket.

Troubleshooting Chart

Problem	Possible Cause	Check/Repair
Pump will not run when first connected.	<ol style="list-style-type: none"> 1. Incorrect connection to power supply. 2. Incompatible power supply. 3. Circuit breaker in the off position. 	<ol style="list-style-type: none"> 1. Re-check connections, check control circuit fuse. 2. Compare power supply output with requirements. 3. Reset breaker to on position.
Pump fails to operate or suddenly stops in use.	<ol style="list-style-type: none"> 1. Disconnected conductor cable. 2. Over-load current to motor. 3. Debris jamming or clogging pump. 	<ol style="list-style-type: none"> 1. Check all cable connections. 2. Check motor. 3. Remove debris.
Average bucket fill times increase over time.	<ol style="list-style-type: none"> 1. Debris filter clogged. 2. Pump impeller worn or damaged. 3. Wear/damage to cable connections or cable 	<ol style="list-style-type: none"> 1. Clean debris filter. 2. Assess pump function. 3. Inspect and repair/replace pump impeller. 4. Inspect, repair connectors, cable as reqd.
Pump noisy in operation.	<ol style="list-style-type: none"> 1. Damaged pump assembly or impeller. 2. Debris in impeller housing. 	<ol style="list-style-type: none"> 1. Inspect and repair/replace pump components as required. 2. Remove debris.
Fill times longer than expected when used on longline.	<ol style="list-style-type: none"> 1. Excessive voltage drop in long line cables 	<ol style="list-style-type: none"> 1. Measure cable resistance, compare cable sizes with recommended sizes.

Unscheduled Maintenance

Unscheduled Maintenance Procedures

Please follow the procedures described in this section for maintenance on the PowerFill Snorkel pump unit. The construction of the external pump unit is very similar to the Torrentula Valve, with only minor variations to note:

1. **Removal and installation of the discharge hose:** The discharge hose has to be stretched slightly to fit over the discharge elbow and the pump housing. When removing or replacing the hose, undo the hose clamps completely and work the hose from side to side while restraining the pump unit and/or discharge elbow. When installing the hose, apply soapy water or a small amount of petroleum jelly to the inside lip of the hose to assist in getting the hose over the nipple. Use a round rod or screwdriver to help pry the hose onto the nipple – in a manner similar to changing a bicycle tire. If you have a new piece of hose, cut a 1/8" (3 mm) chamfer on the inside edge of the hose before installation.
2. **Two O-ring seals reside in the filter mount ring:** One seals the pump housing and one seals the interface between the filter basket. Whenever the filter basket is removed, always check the condition of the mating seal. If cut or broken, it should be replaced with a new seal. If disassembly of the pump proceeds to the point where the pump housing is separated from the filter mount ring, replace the mating seal.
3. **Conductor cable seal:** If removing the pump motor, impeller or impeller housing, you will need to break the silicone RTV seal at the conductor cable through the point on the filter mount ring. Upon reassembly, apply a small amount of silicone RTV sealant to re-seal the cable.

Important Note

A good seal at the filter mount ring will prevent pump cavitation in water less than 16" deep.

Section 7: Storage and Shipping

Storage Procedures

No additional preparations for storage are required after performing the yearly maintenance procedures, as outline in *Section 6: Maintenance*. However, these points should be noted:

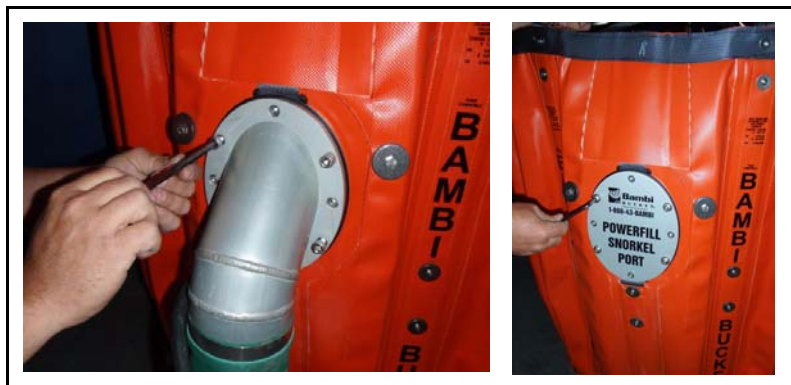
- If you are going to store the PowerFill unit for a period of time, it is recommended that the pump unit be cleaned, dried and greased with one pump of the grease gun.
- It is highly recommended that the Bambi bucket and PowerFill Snorkel system components are stored indoors when not in use. This will minimize deterioration due to temperature change, UV light and atmospheric moisture.
- If the Powerfill Snorkel pump is to be put into storage for a long period of time, it is advisable to store it in a moderate temperature storage area and off the floor, on a shelf, to prevent moisture build up inside the motor from repeated changes in temperature.
- To ensure operational readiness, carry out any required repairs before putting the system in storage. SEI Industries offer comprehensive repair services for all Bambi bucket operators.

Shipping Instructions

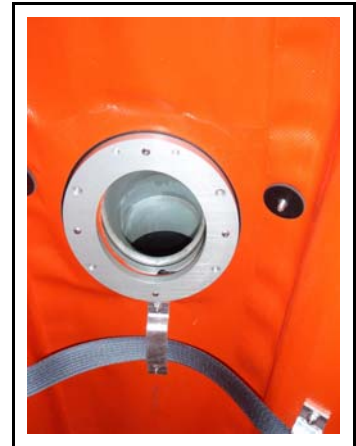
If the Bambi bucket is to be moved to a different site, the pump unit should be removed from the shell before shipping. Also, dry the pump and clean any debris from the filter screen before shipping.

Pump Removal

1. Unbolt the four flange bolts, remove the pump and replace it with the gasket and blanking plate.



2. Remove the flapper valve.

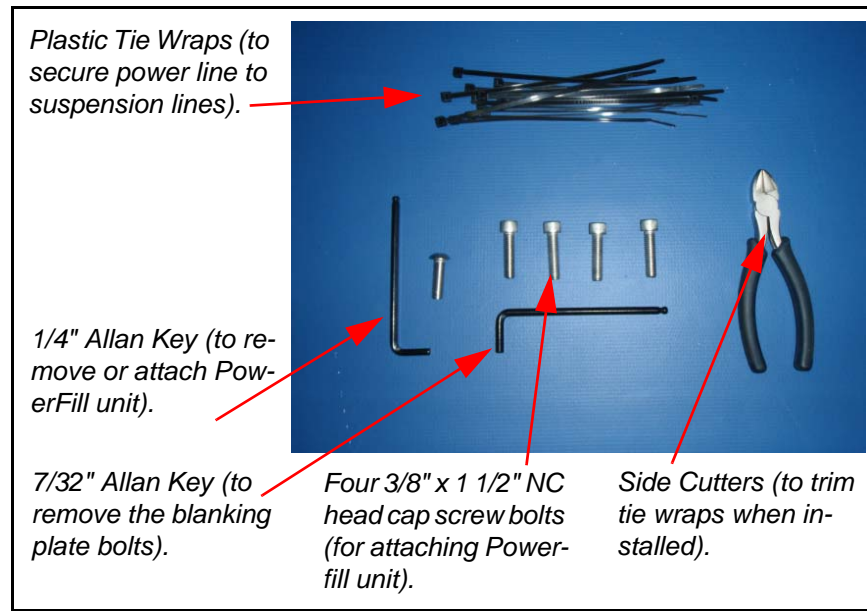


Important Note

If you encounter any problems removing the pump, please refer to the installation instructions for clarification.

Carry on Tool Kit

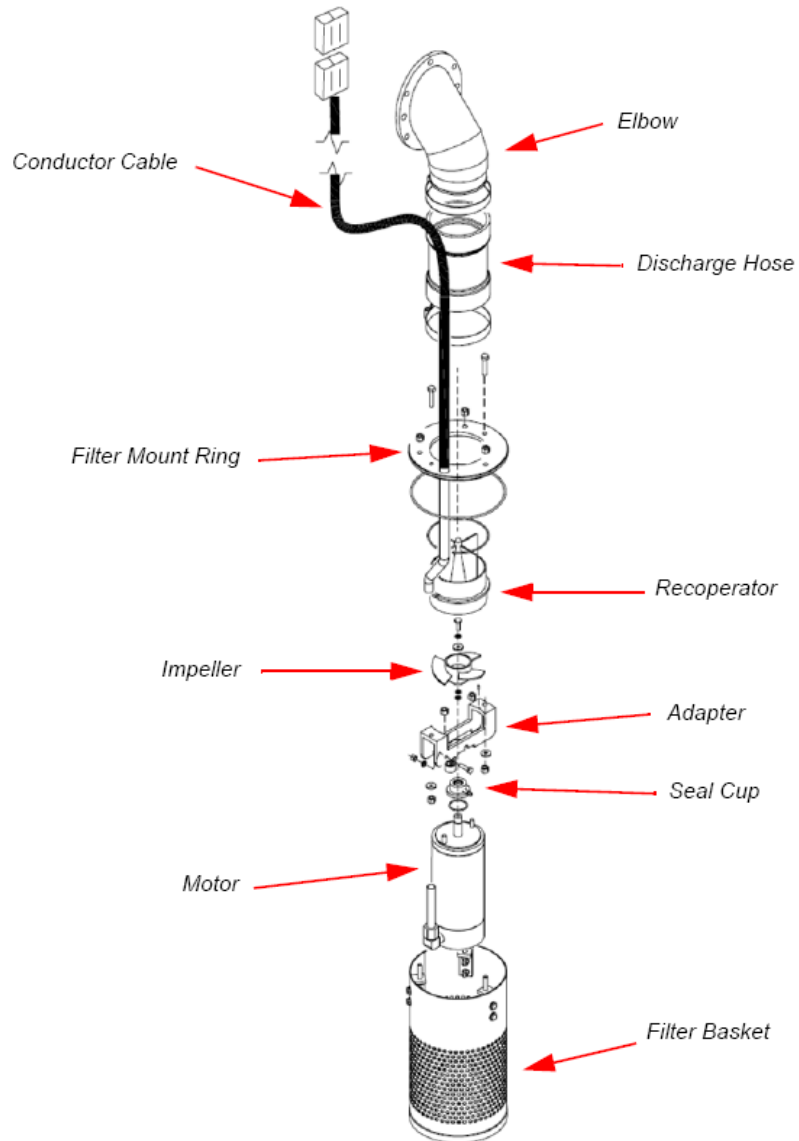
It is recommended that the following tools and supplies be kept with the PowerFill unit at all times. This kit allows you to attach the PowerFill unit as needed.

**Important Note**

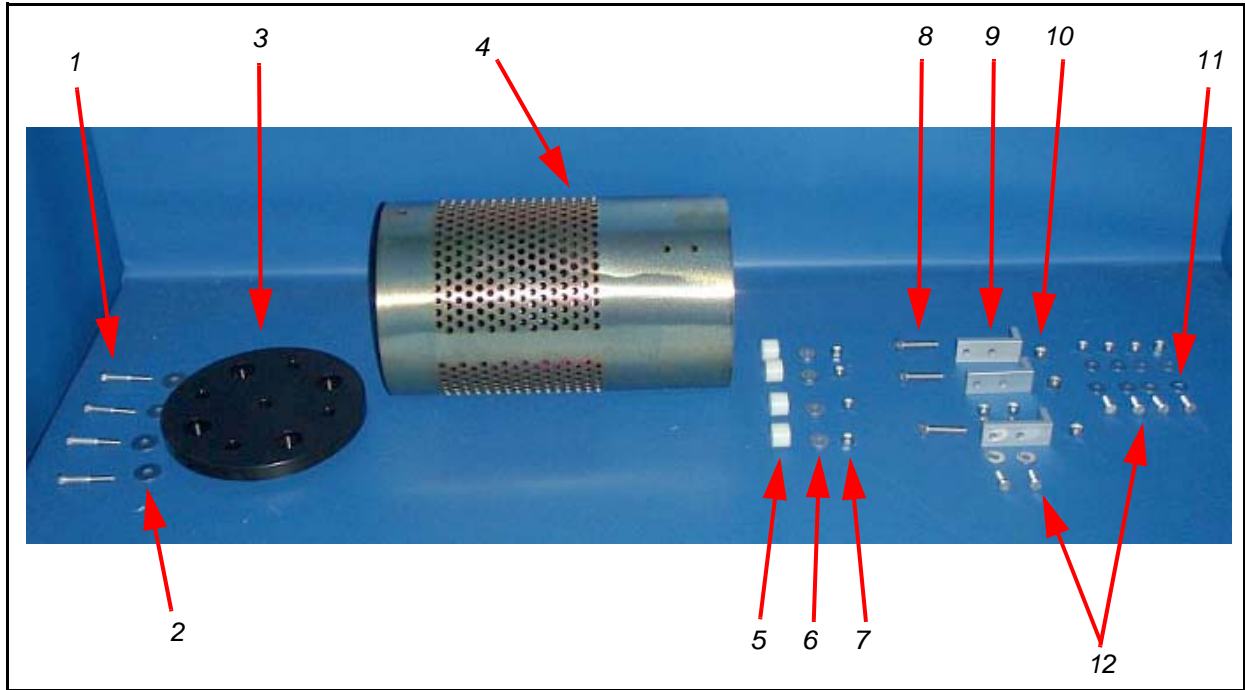
Make sure to conveniently store the blanking plate and the four 3/8" NC x 1 1/4" head bolts as they will be required when the PowerFill unit is removed.

Section 8: Parts

PowerFill Snorkel Assembly

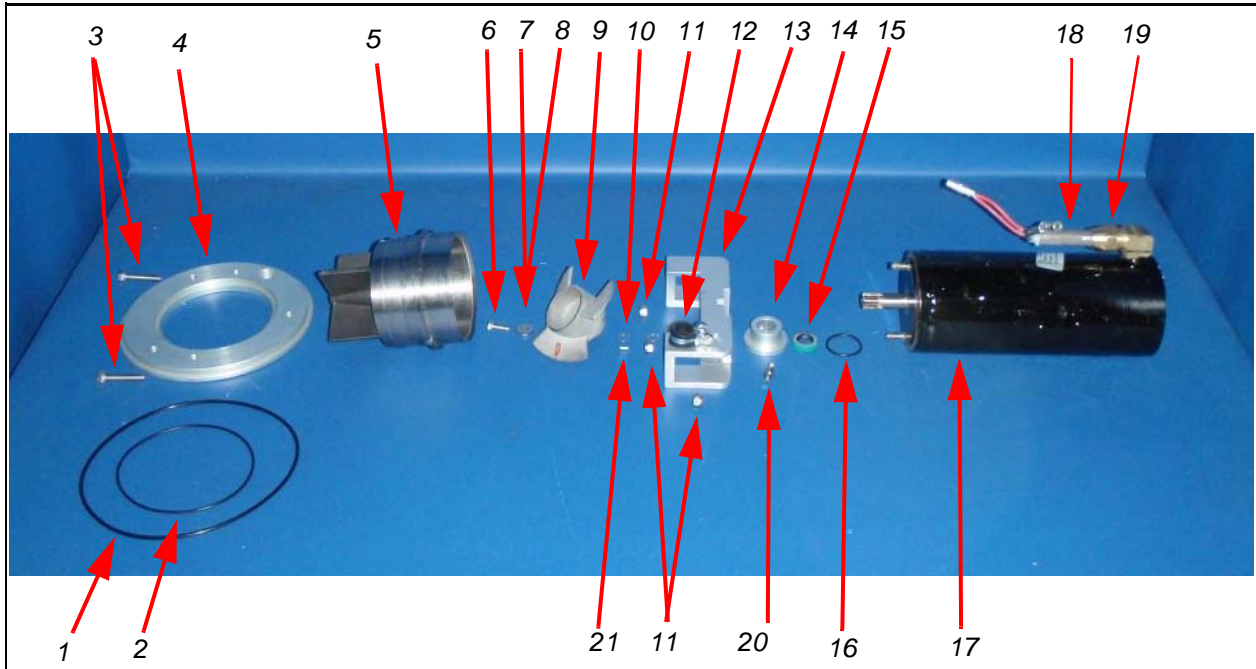


Filter Basket Assembly



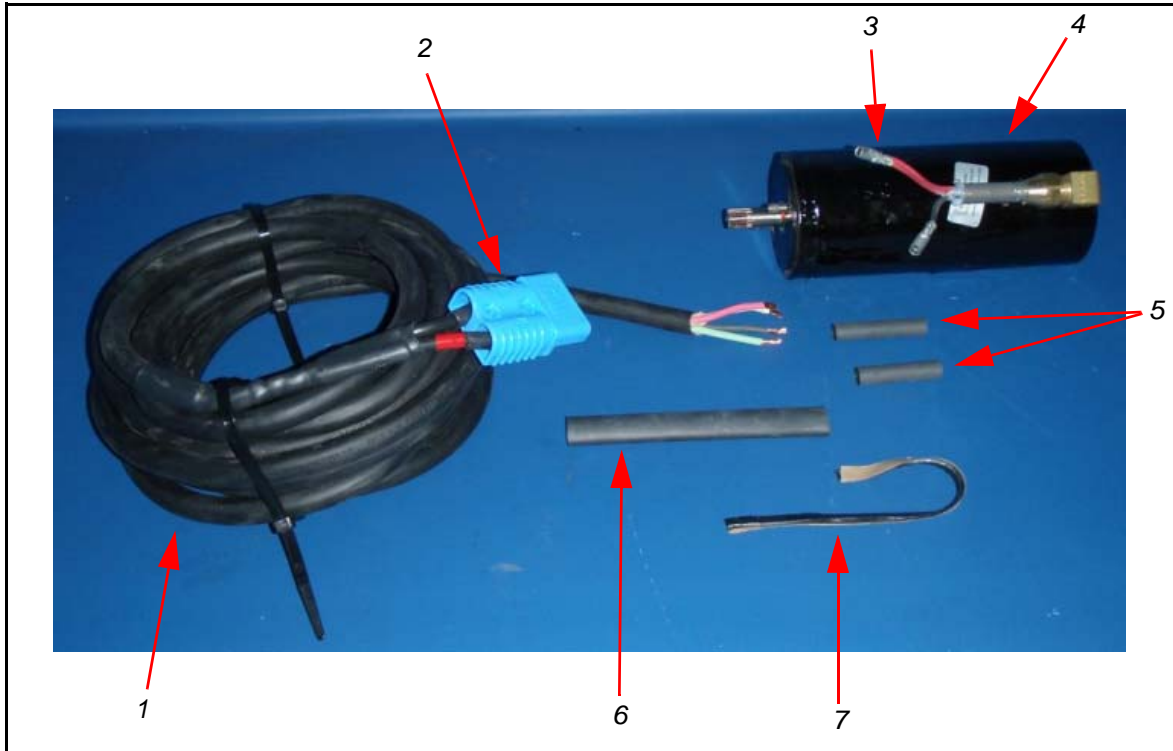
ITEM #	PART #	DESCRIPTION	QTY.
1	FBSC010416	BOLT HEX HEAD S/S 1/4-20 X 1 3/4"	4
2	FWS06041	WASHER S/S 1/4 X 1" OD	4
3	BAB418	BUMPER BLOCK POWERFILL SNORKEL	1
4	BAD417	FILTER BASKET POWERFILL SNORKEL 2024-4453	1
5	FNS255	SPACER NYLON 1/4" ID X 7/8" OD X 5/8" LONG	4
6	FNS0104H	WASHER S/S FLAT 1/4" X 3/4" X 1/8"	4
7	FNSC0204	NUT NYLOCK S/S 1/4-20	4
8	FBSC010514	BOLT HEX HEAD S/S 5/16-18 X 1 1/2"	3
9	BAB416	BRACKET MOUNT FILTER BASKET	3
10	FNSC0205	NUT NYLOCK S/S 5/16-18	3
11	FWS01040	WASHER S/S FLAT 1/4" X 1 1/16"	12
12	FBSC010406	BOLT HEX HEAD S/S 1/4-20 X 3/4"	6

Motor Assembly



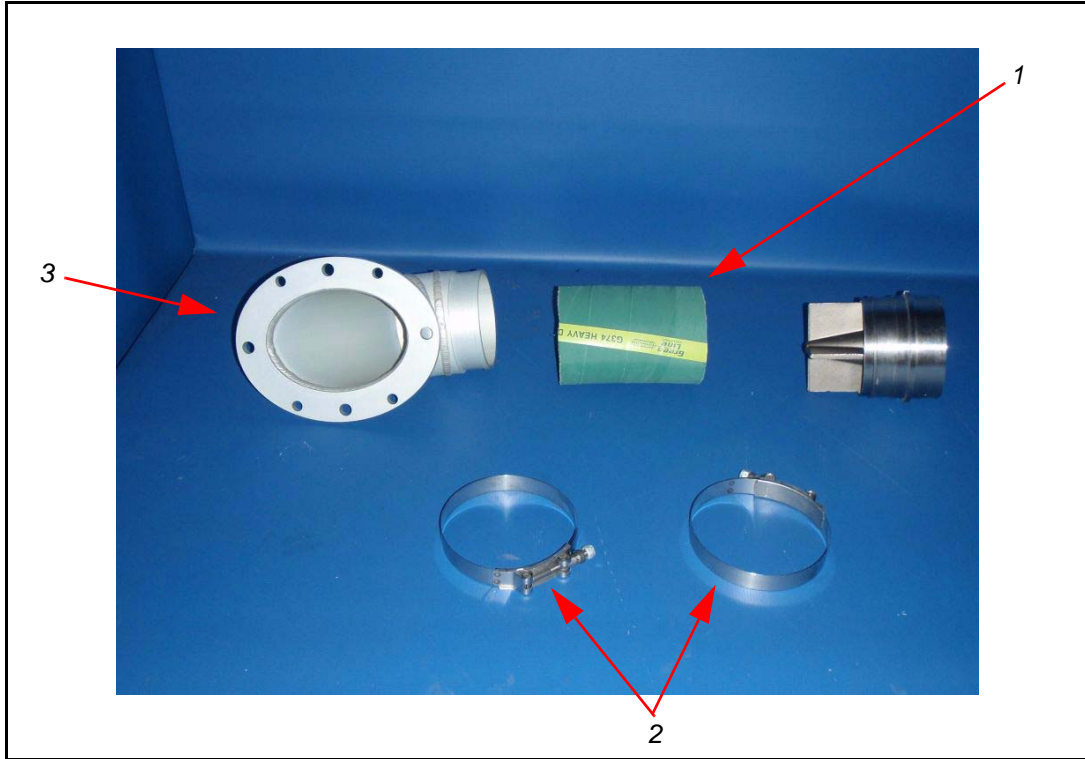
ITEM #	PART #	DESCRIPTION	QTY.
1	GAS262	O-RING BUNA 1/8" X 7" ID	1
2	GAS157	O-RING BUNA 3/32" X 4 1/2" ID	1
3	FBSC010514	BOLT HEX HEAD S/S 5/16 - 18 x 1 1/2"	2
4	BAB412	FILTER MOUNT RING POWERFILL SNORKEL	1
5	BAB413	RECUPERATOR POWERFILL SNORKEL	1
6	FBSF010406	BOLT HEX HEAD 1/4 - 28 X 3/4"	1
7	FWS0504	LOCK WASHER S/S 1/4"	1
8	FWS0104H	WASHER FLAT S/S 1/4" X 3/4" X 1/8"	1
9	BAB359	IMPELLER CAST 4" POWERFILL	1
10	FWS0205-2	WASHER FLAT S/S 5/16" X 3/4"	4
11	FNCS0205	NUT NYLOCK S/S 5/16 - 18	4
12	PP014	CLAMP CABLE LINED 5/8"	1
13	BAB414	ADAPTER MOTORMOUNT POWERFILL SNORKEL	1
14	BAD286202	SEAL CUP POWERFILL ALL MODELS	1
15	BAD286203	SEAL OIL POWERFILL	1
16	GAS124	O-RING BUNA 3/32 X 1 1/4" ID	1
17	BAB358	MOTOR SUBMERSIBLE 24 VOLT DC	1
18	BAB415	CONDUCTOR CONDUIT POWERFILL SNORKEL	1
19	BAD286205	NUT FLARE 45 deg. SAE X 5/8" TUBE	1
20	BAD286202	GREASE NIPPLE 1/4 - 28 X 15/16" PLTD.	1
21	FPSS004	ROLL PIN SPLIT 1/8" X 3/8"	1

Wire Harness Assembly



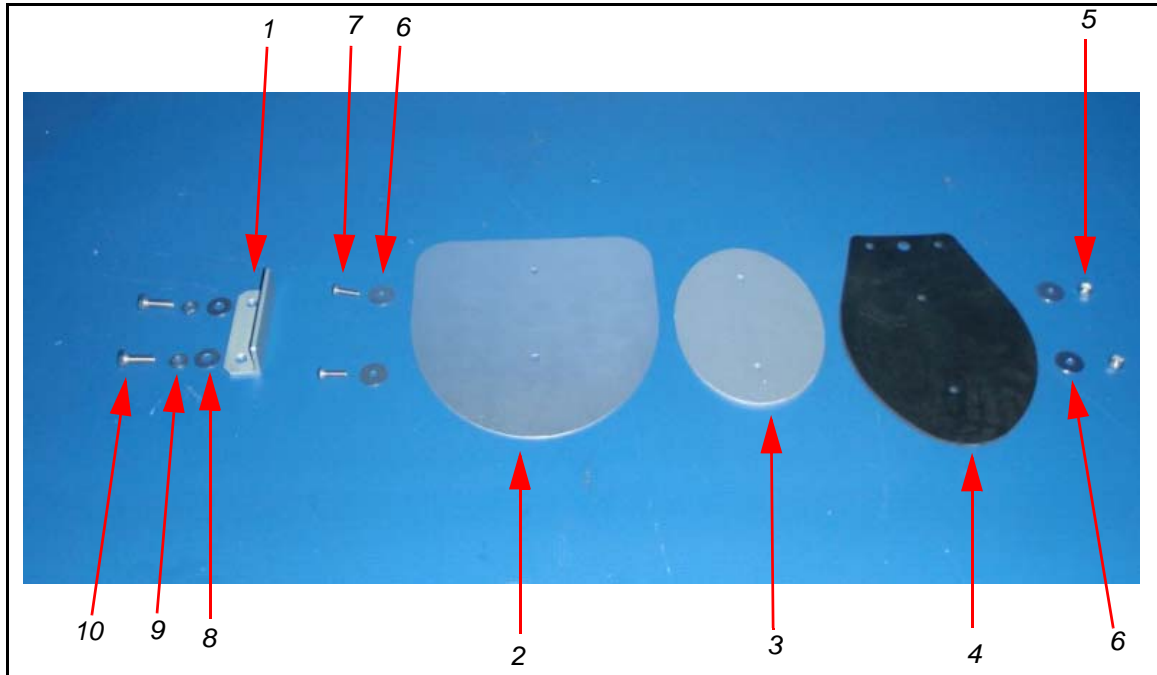
ITEM #	PART #	DESCRIPTION	QTY.
1	EWIR104SOW	WIRE TYPE 10/4SOW	7.6M
2	ECON1754	CONNECTOR PLUG SET 175 AMP BLUE	1
3	EWIRA0034322	BUTT SPLICE #6 WIRE NON INSULATED	2
4	BAB358	MOTOR SUBMERSIBLE 24 VOLT DC	1
5	EWIRA004A	HEAT SHRINK TUBE C/W SEALANT 1/2"	.5 ft.
6	EWIRA006	HEAT SHRINK TUBE C/W SEALANT 3/4"	.6 ft.
7	PP020	BUTYL TAPE 3/8" X 1/8"	.5 ft.

Discharge Hose Assembly



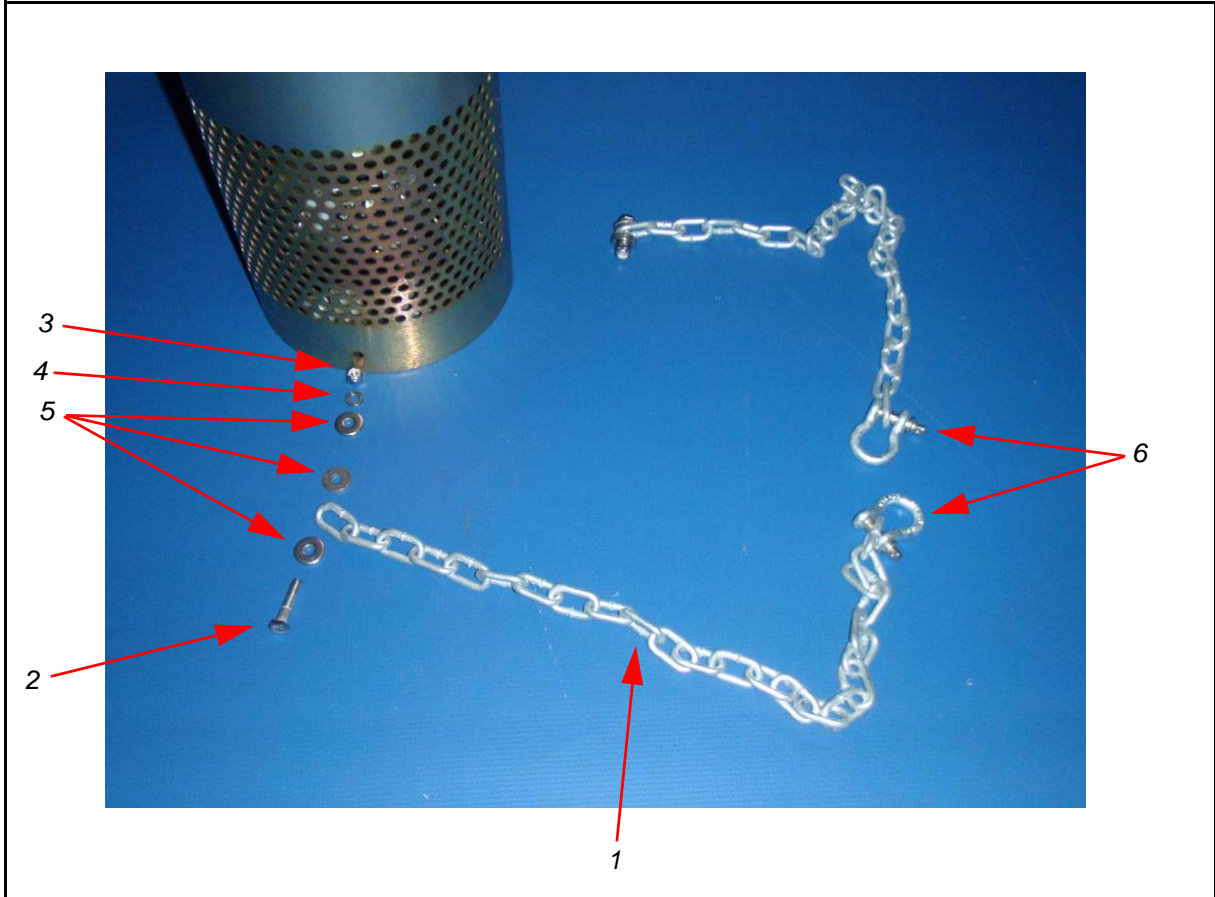
ITEM #	PART #	DESCRIPTION	QTY.
1	BAB4110	HOSE DISCHARGE 4" X 6" BB2226	1
1	BAB4111	HOSE DISCHARGE 4" X 6" BB2024	1
1	BAB4112	HOSE DISCHARGE 4" X 7" BB2732 and 320C	1
1	BAB4113	HOSE DISCHARGE 4" X 11 1/2" BB3542, 420B and 4453	1
2	PP473	CLAMP T-BOLT 4 1/2"	1
3	BAD410	ELBOW POWERFILL SNORKEL 2024 - 4453	1

Flapper Valve Assembly



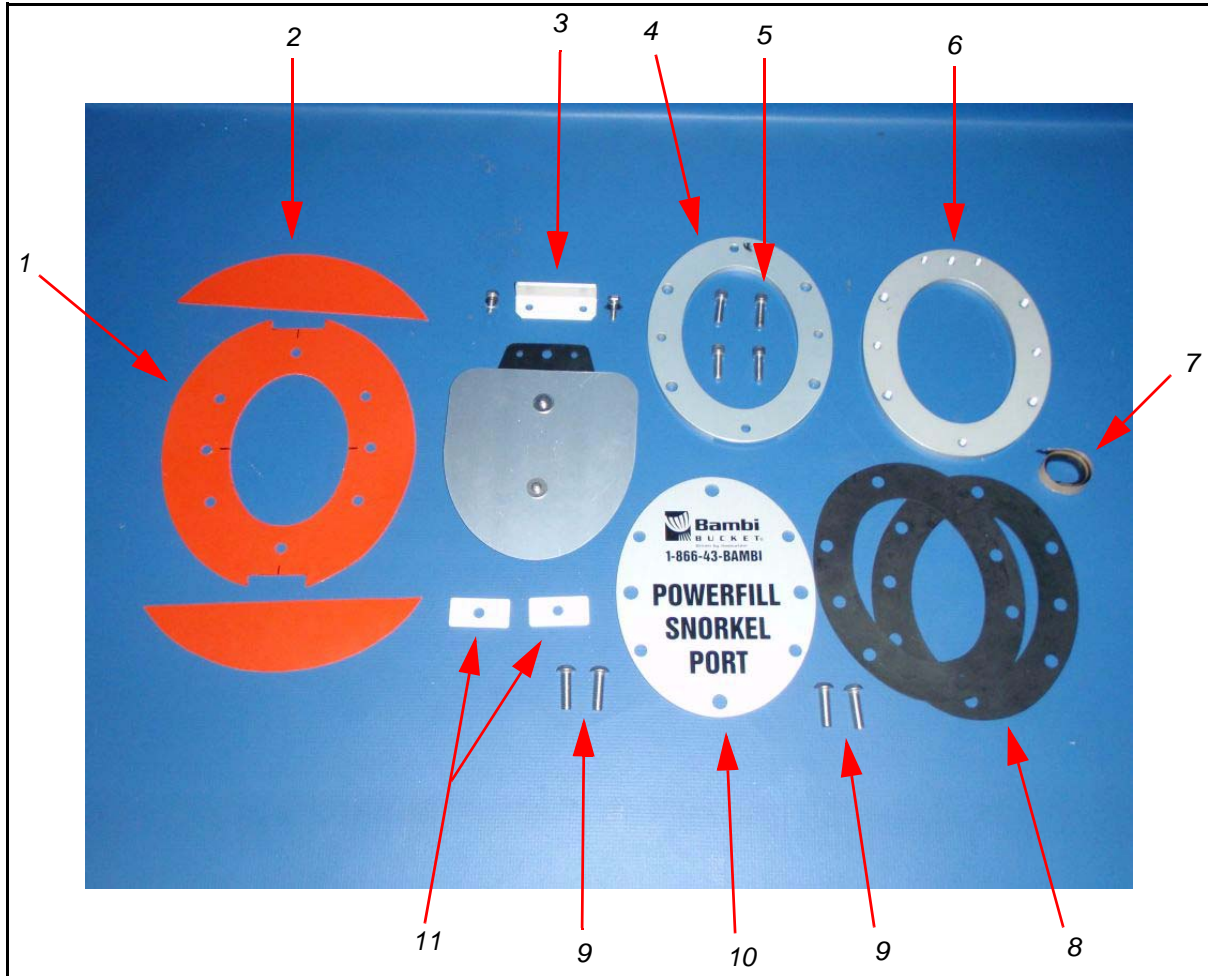
ITEM #	PART #	DESCRIPTION	QTY.
	BBPF005	FLAPPER VALVE ASSEMBLY	1
1	BAB398	BRACKET FLAPPER VALVE	1
2	BAB401	PLATE DEFLECTOR FLAPPER VALVE	1
3	BAB400	SPACER FLAPPER VALVE	1
4	BAB399	FLAPPER VALVE POWERFILL II	1
5	FNFC0203	NUT NYLOCK 1024	2
6	FWS0103	WASHER FLAT S/S 3/16"	4
7	FBSC040306	MACHINE SCREW PANPHILLIPS 1024 X 3/4"	2
8	FWS01040	WASHER FLAT S/S 1/4 X 11/16	2
9	FWS0504	WASHER LOCK 1/4"	2
10	FBSC010406	BOLT HEX HEAD 1/4" UNC X 3/4"	2

Restrainer Chain Assembly and Parts



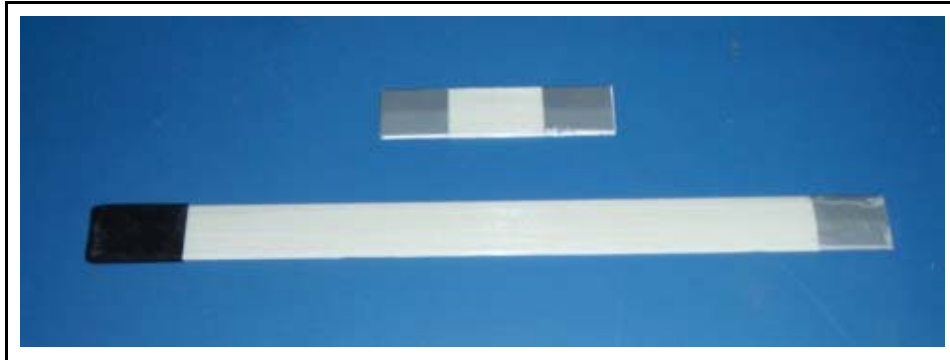
ITEM #	PART #	DESCRIPTION	QTY.
	BAB4190	CHAIN RESTRAINER ASSEMBLY COMPLETE BB2226	1
	BAB4191	CHAIN RESTRAINER ASSEMBLY COMPLETE BB2024	1
	BAB4192	CHAIN RESTRAINER ASSEMBLY COMPLETE BB2732	1
	BAB4193	CHAIN RESTRAINER ASSEMBLY COMPLETE BB3542 & 420B	1
	BAB4194	CHAIN RESTRAINER ASSEMBLY COMPLETE BB4453	1
1	RMCG001	RESTRAINING CHAIN ONLY 2024 1.3 feet or 16 LINKS LONG	2
1	RMCG001	RESTRAINING CHAIN ONLY 2226 & 2732 1.4 feet or 18 LINKS LONG	2
1	RMCG001	RESTRAINING CHAIN ONLY 3542 & 420B 1.75 feet or 22 LINKS LONG	2
1	RMCG001	RESTRAINING CHAIN ONLY 4453 2 feet or 24 LINKS LONG	2
2	FBSC01041	BOLT HEX HEAD S/S 1/4- NC X 1 1/4" LONG	2
3	FNSC0204	NUT NYLOCK S/S 1/4 -20	2
4	FWS0504	WASHER SPLIT LOCK S/S 1/4 "	2
5	FWS0104H	WASHER FLAT 1/4 X 3/4 X 1/8"	6
6	FTAG001	SHACKLE ANCHOR 1/4 " GALVANIZED	2

Flange Assembly for Shell



ITEM #	PART #	DESCRIPTION	QTY.
1	PP407	BUCKET SHELL DOUBLER	1
2	PP408	BUCKET SHELL SPACER	2
3	BBPPF2	FLAPPER VALVE ASSEMBLY (Refer to picture for assembly)	1
4	BAB404	FLANGE OUTER BBPF SNORKEL 2024-4453	1
5	FBSC020510	BOLT SOCKET HEAD CAPSCREW 5/16-18 X 1	4
6	BAB403	FLANGE INNER BBPF SNORKEL 2024-4453	1
7	PP020	BUTYL TAPE 3/8" X 6"	.5ft.
8	BAB406	GASKET FLANGE BBPT SNORKEL 2024-4453	2
9	FBSC080612	BOLT BUTTON HEAD ALLAN S/S 3/8-16 X 1 1/4"	4
10	BAB422	BLANK PLATE BBPF SNORKEL 2024-4453	1
11	BAB402	ANCHOR PLATE BBPF SNORKEL 2024-4453	2

PowerFill Snorkel Battens



PART #	DESCRIPTION	QTY.
BAB460	BATTEN SET PF II2024-2226 LONG 20 3/4" SHORT 6 1/2"	SET
BAB462	BATTEN SET PF II 2732 LONG 20 1/4" SHORT 9"	SET
BAB464	BATTEN SET PF II 320C LONG 16 1/4" SHORT 9"	SET
BAB466	BATTEN SET PF II 3542 LONG 27 1/2" SHORT 12 1/2"	SET
BAB468	BATTEN SET PF II 420B LONG 20" SHORT 12 1/2"	SET
BAB470	BATTEN SET PF II 4453 LONG 24" SHORT 14 1/2"	SET

Section 9: Warranty

SEI Industries Ltd. (the Company) agrees to grant a warranty for a period of one year from the date of purchase of Bambi bucket systems on the following conditions:

- a) The company's sole obligation under this warranty is limited to repairing or replacing, at the company's sole discretion, any product shown to be defective.
- b) The company's products are not guaranteed for any specific length of time or measure of service, but are warranted only to be free from defects in workmanship and material for a period of one year to the original purchaser.
- c) To the extent allowable under applicable law, the company's liability for consequential and incidental damages is expressly disclaimed. **The company's liability in all events is limited to and shall not exceed, the purchase price paid.**
- d) This warranty is granted to the original purchaser of Bambi bucket systems and does not extend to a subsequent purchaser or assignee.
- e) The company must receive notification in writing of any claims of warranty from the original purchaser which must give details of the claimed defect in the product.
- f) Where the original purchaser is claiming under warranty, the product must be returned to the company for inspection with all transportation and duty charges prepaid.
- g) The warranty does not extend to any product that has been accidentally damaged, abraded, altered, punctured, abused, misused or used for a purpose which has not been approved by the company.
- h) This warranty does not apply to any accessories used with the product that are not supplied by the company and any warranty on such accessories must be requested from the manufacturer or dealer of the accessories.
- i) In the event the original purchaser does not give notice of a warranty claim, within one year of the original purchase of the product, it is understood that the purchaser has waived the claim for warranty and the purchaser and/or any subsequent purchaser must accept the condition of the product, without warranty.
- j) Any technical information supplied by the company regarding the product is not a condition of warranty but rather is information provided by the company to the best of its knowledge.
- k) There are no implied warranties nor is there any warranty that can be assumed from any representation of any person, except the company itself.

Exclusions

- l) This warranty is void if the product is not installed, used and/or maintained in accordance with the operations manual supplied by SEI.
- m) All Bambi buckets are designed and manufactured with substantial safety margins. It is the responsibility of the user to ensure that the bucket is maintained to a safe standard.