SEI INDUSTRIES

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BAMBI BUCKET
(2024–4453 MODELS)
SERVICE MANUAL

2015 VERSION F

BAMBI BUCKET SERVICE MANUAL - Version F
(Models 2024-4453 only)

Issue Date: July 2015

PLEASE READ BEFORE USING.

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Section 1: Introduction

Bambi Bucket (Models 2024–4453)

This manual provides helicopter operators with information on the service and maintenance of the Bambi bucket and PowerFill Snorkel. This service manual also includes all parts lists and installation drawings. A separate Bambi bucket operations manual is also supplied which should be carried on-board the helicopter.

For your own protection, and for longer bucket life, always read the instructions and warnings. Ignoring these warnings could result in personal injury, bucket damage or aircraft damage.

SEI Industries Ltd. offers complete parts supply and repair services for the Bambi bucket. For a repair facility in your area, please contact SEI.

For maintenance and repair purposes, parts diagrams and descriptions are provided in this manual. When ordering parts, please provide the model and serial number of your Bambi bucket.

There are several other models of buckets available from SEI Industries. These include Bambi bucket model series 6072-1821 and 5566-9800 as well as the Signature series of Bambi buckets.

Cut away view of standard Bambi bucket.

In addition, a number of accessories and enhancements are also available including the Bambi MAX, the Torrentula valve, the Powerfill Torrentula system and the Powerfill Snorkel system.

For more copies of this manual, please contact SEI or visit our website at www.bambibucket.com for more information on these products.

Section 2: Deploying the Bambi Bucket

Deployment Instructions

Attaching to the Cargo Hook

Caution

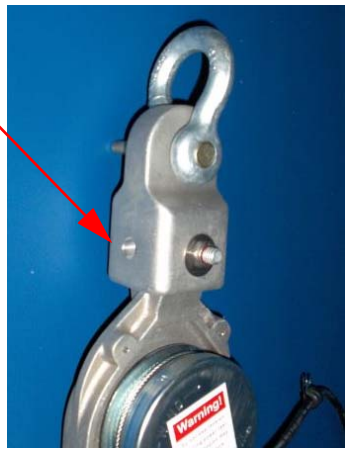
The Bambi bucket may not be suitable for a direct hook-up to the cargo hook. The actual hook-up will be different for various aircraft and operators must comply with all instructions and bulletins supplied by the aircraft manufacturer. It is the operator's responsibility to ensure that the Bambi bucket is correctly fitted to the helicopter.

The Bambi bucket is rigged for a lateral cargo hook. Correct attachment is indicated when the name plate on the control head faces forward in flight. This ensures that the ballast on the Bambi will also face forward in flight.

Caution

It is important that the ballast faces forward in flight. This will avoid twisting of the suspension lines and possible jamming of the trip line.

The control head used on models 2024-4453 has a moveable yoke which can be rotated by 90 degrees. The yoke is machined to orient in either direction.



If your helicopter has a longitudinal hook, rotate the shackle yoke unit at the top of the head by 90-degrees. This will place the name plate on the control head forward in flight.

For this style of head, if using a swivel hook, we recommend that you always operate in the locked position to assure that the ballast is always facing forward in flight.

Important Note

If you are using a swivel with an electrical connection, then it is acceptable for the bucket to be flown without the ballast facing forward. The Bambi bucket has been tested with some aerospace swivel arms and performs very well despite rotating in flight. The swivel also prevents the suspension lines from twisting up after dipping the bucket.

In some cases, where the cargo hook is too large for the standard shackle, a second larger shackle can be used.

Warning

When a second shackle is used to turn the bucket 90 degrees, choose a shackle that is the same size as the shackle on the head. If a very large shackle is used, as shown in the photo below, it may cause the power cable to tangle in the shackle, pulling apart the break-away plug.

If the shackle is too large, it may cause the power cable to tangle, pulling apart the break-away plug.

Control Head Operation

Warning

Do not remove the cover on the control head while operating the Bambi bucket. Part of the tripline safety keeper is cast into the control head cover. With the cover removed, this safety feature is no longer functional. Without the safety keeper functioning, a separated tripline could cause a tail rotor strike which could result in severe injury or death and/or helicopter damage.

For proper operation of the control head, avoid the following modifications:

- Do not use another type of bearing as a replacement for the ball bearing.
- Do not use lockwire as a substitute for the swage blocks on the tripline.
- Do not shorten or change the portion of the tripline which attaches to the reel.
- Do not use threaded bolts as a substitute for clevis pins.
- Do not modify the size or angles of the catch, other than as recommended.
- Do not tighten control head suspension bolts over 5 ft.-lbs. (6.5 Nm).

Connecting Power

Important Note

To operate the solenoid and release the water, use a **momentary contact** switch rated for 5 amps at 24 VDC. A suitable switch is available from SEI Industries. Alternatively, a lower rated switch may be used with a relay (see suggested wiring diagram). The solenoid has a 10% duty cycle (designed to not be operated more than 10% of the time). Operating the solenoid continuously will result in solenoid failure.

The control head of the Bambi bucket comes equipped with a short length of electrical cable. A common electrical plug, male and female, is supplied with each bucket. The operator can change the plugs to make them compatible with plugs on their aircraft, if desired.

To complete the wiring hookup:

1. Connect a plug to the wire supplied on the control head.

2. Make a 12 AWG or heavier two-wire interconnecting electrical cable long enough to run from the bucket cable to the accessory plug on the belly of the helicopter (leave enough length for the control head to swing freely).
3. Attach the mating plug to one end of the interconnecting cable.
4. To check for continuity in the connections, push the momentary contact switch. A clicking sound should be heard from the control head.
5. With the engine running, test for a minimum of 24 VDC at the breakaway plug. If the voltage is lower than 24 volts, use a heavier gauge wire for the interconnecting cable. Re-test to confirm a minimum of 24 VDC at the breakaway plug.

The purpose of the plug is to offer a clean "breakaway" if the Bambi bucket has to be jettisoned from the aircraft in an emergency. It is suggested that the plug be lightly taped together with vinyl tape, while in use, to ensure that wind action does not separate the plug. Current draw is 5 amps (24/28 VDC).

There are four types of suggested wiring installations (see *Section 12: Diagrams*):

1. **Pilot control:** In this configuration, the control is wired into the pilot's control column through a relay.
2. **Pilot control (US InterAgency):** In this configuration, the control is wired into the pilot's control column through a 50 amp relay as per US interagency regulations. This system can also be used to control a heli-torch, etc.
3. **Crew control:** This configuration allows a crew member or the pilot to control the dumping of the bucket using power from the helicopter and a remote switch box.
4. **Crew control (remote power supply):** This configuration allows a crew member or the pilot to control the dumping of the bucket using a battery pack to supply the power to the remote switch box.

Using Longlines

Important Note

It is recommended that operators, who choose to use the Bambi bucket with a longline, ensure that the longline is at least 50' long.

Longlines should be at least 50 ft. long to keep the Bambi bucket well clear of the helicopter's tail rotor. When using a longline, care must be taken in selecting the correct gauge of control cable. See the chart below for recommendations.

When purchasing a synthetic rope longline, we recommend that the customer also purchase a protective cover and have the conduit inserted at the time of manufacture. However, if this is not feasible due to different conduits for different applications, we recommend taping the conduit using duct tape (grey) at 3-4 ft. intervals along the longline and cover.

We do not recommend using zip ties to attach wiring/conduit as this tends to damage the cover and longline. When attaching conduit, allowances must be made for any stretch in the load bearing line and this must be taken into account when attaching to ensure that the terminations are not released from the belly, bucket or hook, etc.

It is also imperative to take extreme care when removing the conduit from the longline, especially if a knife is used to remove the tape as one could inadvertently cut through the cover and the damage the synthetic rope. It is important to remember that when conduit is duct taped to the outside of a longline, the flight characteristics can change. In our experience, it may take some time and a few trial flights to determine the length between attachment points of the conduit to the longline.

Longline Wire Details

LENGTH	GAUGE	TYPE
50 FT.	# 14 GAUGE	14/2 SOW
75 FT.	# 14 GAUGE	14/2 SOW
100 FT.	# 14 GAUGE	14/2 SOW
125 FT.	#12 GAUGE	12/2 SOW
150 FT.	# 12 GAUGE	12/2 SOW
200 FT.	# 12 GAUGE	12/2 SOW

Checking Suspension Cable Length

Warning

Using a Bambi bucket with a greater overall length than the distance from the cargo hook to the front tip of the tail rotor on your helicopter could result in a tail rotor strike and possible loss of control of the helicopter which could result in injury or death.

Measuring the bucket. If the Firesock is to be used, attach first and then measure to the bottom of the sock. See Section 4: Flight Operations for information on how to use the Firesock.

Overall lengths of Bambi buckets with standard rigging are provided in this manual. Before using the Bambi bucket, check for the maximum total length.

To determine this length, measure the distance from the cargo hook to the front tip of the tail rotor on the helicopter you will be using and subtract 6" (152 mm).

To determine overall bucket length:

1. Stretch out the bucket on the ground; secure the control head.
2. Pull out the dump valve fully; pulling taut to ensure the suspension cables are straight

Bambi Model	Overall Length	
	Feet	Meters
2024	20' 1"	6.12
2024S	15' 10"	4.83
2226	15' 10"	4.83
2732	23' 0"	7.01
2732S	15' 2"	4.63
3542	23' 8"	7.21
4453	23' 9"	7.25

Lengths are accurate to within 1%. Note: Specifications subject to change.

3. If the Firesock or other item is used, attach first and then measure to the bottom of the sock.

4. Measure the distance from the shackle on the control head to the bottom of the dump valve. This measurement should be less than the maximum total length of the dimension taken from the helicopter.

Important Note

To avoid potential rotor strikes when using the Bambi bucket, the operator must measure the extended length of the Bambi bucket and the distance from the belly hook to the closest possible point of the tail rotor.

A) Always measure the overall extended length of your Bambi bucket.

and

B) Measure the distance from the belly hook to the closest possible point on the tail rotor.

"B" must always exceed "A" by at least six (6) inches.

Instant Deployment System (IDS)

The instant deployment system uses a hub and spoke mechanism to automatically expand the mouth of the bucket as soon as the weight of the Bambi bucket is taken up by the suspension cables. When the bucket is full, the IDS deployment cable and hub restrainer cables should be slack as they should not bear any load. Their function is to position the hub and spoke mechanism to hold the bucket open.

The main parts of the IDS are illustrated in this manual for maintenance purposes. To deploy the IDS on the ground, reach into the bucket, grasp the hub of the IDS and pull outward fully until the two restraining cables from the hub to the lower bucket shell are tight.

The IDS restraining cables are set at the factory and normally should not require any adjustment.

Grasp the hub of the IDS and pull outward fully to tighten cables.

Correct IDS position.

Section 3: Using Accessories

Using the PowerFill System

Important Note

PowerFill Snorkel is only available on 2024-3542 models.

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.

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.

Bambi bucket with PowerFill installed.

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. See the specifications section of this manual for wire sizes, etc.

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.

Flying with the PowerFill Snorkel System

No prior experience is required to quickly master using the PowerFill Snorkel since flying a Bambi bucket with the PowerFill Snorkel will not adversely affect the flight characteristics of the bucket. To assist operators with installation of the PowerFill Snorkel in an aircraft, this manual contains a suggested wiring diagram.

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.

MODEL	Optimal Fill Time (Sec.)
BBX2024	30
BBX2226	33
BBX2732	41
BBX3542	53

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
- Opening the valve while immersing the bucket allows the water to enter the bucket, keeping the bucket more stable and decreasing the filling time.
- 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.
- 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.
- 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.

Using Foam

The Bambi bucket is designed to be effective with foam. All materials used in the manufacture of the Bambi bucket are resistant to the chemical action of foam.

Caution

After using foam or retardants, cycle through several dumps with water only or hose down with fresh water. This will prolong the bucket life.

Sacksafoam Foam Injection System

The Sacksafoam is SEI Industries' advanced foam dispensing system for use with the Bambi bucket. This system, exclusive to the Bambi, allows foam to be dispensed into the bucket in route from the filling source to the fire site.

There are three models of Sacksafoam to fit this range of Bambi buckets. The operation of the Sacksafoam is controlled by the pilot through a control unit, which is mounted in the cockpit. Sacksafoam I contains the foam reservoir directly installed inside the bucket.

Sacksafoam I

The Sacksafoam II is a self-contained unit that can be stowed onboard the helicopter. This system is completely housed in a foam-resistant case. With the Sacksafoam II, the pilot still controls the foam dispensing through the control unit.

Sacksafoam II, Model 5598

Sacksafoam Plus

If additional foam storage is required, the Sacksafoam Plus can be purchased to add an additional 40 gallons of foam on board.

Compatible Bambi Bucket/Sacksafoam Models

Model	For Bambi Bucket	Reservoir USG	Capacity Liters
	Sacksafoam I		
004339	BB2024-BB4453	30	114
	Sacksafoam II		
004344	BB1518-BB4453	25	95
	Sacksafoam Plus		
004350	Sacksafoam II & III	40	151

Bambi Mobility Cart

The rugged, lightweight two-piece Bambi Mobility Cart allows one person to move a bucket from one location to another. Easy to steer and brake, the three-wheeled cart comes equipped with tow-bar and foam-filled all-terrain 16" tires. Roll on, winch and go!

PART NUMBER	DESCRIPTION
009387	SKID, HL4000-HL9800

Section 4: Making Adjustments

Adjusting Various Components

Adjusting the Dump Valve Udder

Udder refers to the amount that the dump valve bulges out below the bucket shell, when the bucket is full. Dump valve udder adjustment has a significant effect on the valve seal between the fabric dump valve itself and the bucket shell. This adjustment is carried out by lengthening or shortening the tripline adjustment chain.

Ninety percent of the dump valve seal is produced by the stainless steel bolts passing through the neoprene foam and the bucket. The balance of the sealing action is a result of the valve "uddering" out the bottom of the bucket and compressing the foam between the valve and the bucket.

Exposed Udder

A properly adjusted dump valve will have a maximum of 2" (50 mm) of udder. Too much udder will add to the volume and thus the weight of the bucket. Too little udder will prevent the secondary sealing action and will result in the valve leaking.

Adjusting the Udder via the Tripline

Each new Bambi bucket is adjusted and checked at the factory under full fill for proper dump valve adjustment. To adjust the udder, change the length of the tripline by adjusting it at the tripline adjustment chain.

The method of securing the ring and riser is to secure the adjustment chain to a shackle that is attached to the tripline.

If a new tripline is installed, first install it at the same point on the adjustment chain and then test the dump valve in use. Remember to secure the adjustment shackle with a lockwire or tie wrap first. It is impossible to judge udder with an empty bucket on the ground.

Adjusting Purse Strings in the Dump Valve

Adjustment of the purse string in the dump valve is important to effect a good seal at the neoprene lips of the valve mouth. The purse line adjustment is set and tested at the factory. The purse string may shrink or stretch after use and require adjustment.

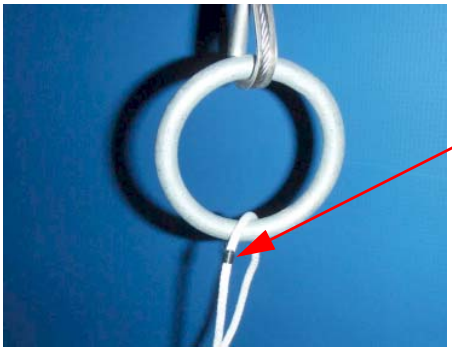
Whenever new purse strings are installed, adjustments must be made. Braided nylon is specified for purse string use since it is self-lubricating under water.

When installing a new set of purse strings, orientate the valve correctly and always make sure to stagger the strings from side to side. Check *Section 9: Purse String Replacement* for how to replace purse strings and how colored purse strings are used.

Note the staggered purse strings.

Important Note

When initially tying up the purse strings, note that more tension should be on the outside string with progressively less tension towards the middle. If the tension is too great on the middle string, the valve action will be sluggish when the valve is retracting. All strings have a black mark; this mark should be tied at the inside of the ring.



Red and black colored tie mark

To adjust a single line:

1. Simply adjust the tension of the line to equal that of corresponding lines. Repeat the knot shown three times for each purse string.

To adjust all the lines:

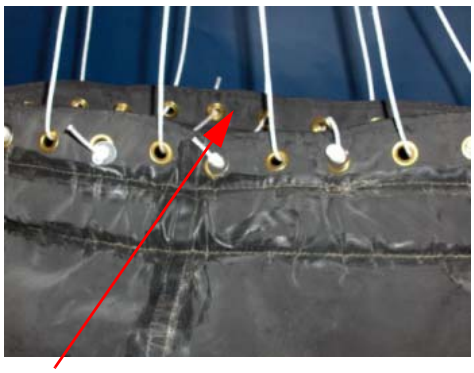
1. Stand the bucket vertically.
2. With the valve bottom flat on the floor, pull the bucket shell into a round shape by deploying the IDS.
3. Run a rope from an overhead support to the ring on the top of the valve.
4. Proceed to adjust the string.

Checking Purse Line Adjustment

Once the lines are adjusted, fill the Bambi bucket half full, with the water, just below the top of the valve. Check to see if both lips of the valve are matched right across the top. Sometimes, one lip will 'track' slightly above or below the other.

Usually, one or two specific purse lines will cause this improper tracking. To correct:

1. Grasp the purse lines at the centre of the lower side.
2. Pull the strings several times to bring the lip into alignment.
3. Re-tie the purse lines so that the line is just snug. Do not over-tension the line. Over-tensioning will result in misalignment at another position on the valve.



One side lip is raised due to incorrect purse line adjustment.

Section 5: Packing and Storage

Packing and Storing

Packing the Bucket

1. Collapse the IDS by pushing the hub into the bucket.

2. Grab the control head and pull the suspension lines taut. Tape the lines together in two bunches.

3. Insert the operations manual and control head into the storage bag.

4. Gather the suspension lines into a coil and stow inside the bucket. Place the control head outside of the bucket to prevent the possibility of the lines tangling.

5. Avoid any sharp folds along the base of the shell as this protects the shell from delamination which can occur if the Bambi bucket is stored for a long period of time.

6. Place the control head bag on top of the collapsed bucket.

7. Roll the bucket into a bundle and wrap with straps supplied.

8. Take the carrying bag and drape it over the bucket.

9. Roll the bucket over and insert the bucket and Firesock into the bag.

The Bambi bucket carrying bag makes a suitable shipping container when shipping via airfreight. Because of the compactness of the Bambi, many operators carry it aboard the helicopter, at all times, during the fire season. This allows for rapid deployment when required.

Storing the Bambi Bucket

The following guidelines will help to ensure the longevity of your Bambi bucket:

1. Do not pile heavy objects on the Bambi bucket in storage. This may result in creases in the neoprene seal in the dump valve, which may cause leakage.
2. Wash the bucket and allow it to dry prior to storing it.
3. Do not store a wet bucket. This will result in the growth of mildew and the corrosion of aluminium and steel parts.
4. Store the bucket indoors in an unfolded position, preferably by suspending the main shackle from an overhead hook. An alternative is to suspend the bucket upside down from its bottom chain.
5. Before storing the bucket for an extended period, perform the seasonal maintenance procedures as outlined in *Section 9: Maintenance*.

Section 6: Troubleshooting Guide

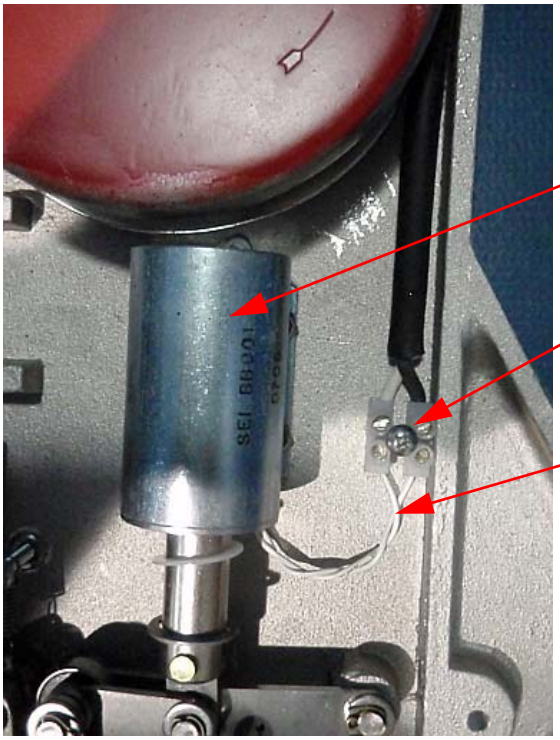
General Troubleshooting Guide

Valve Troubleshooting

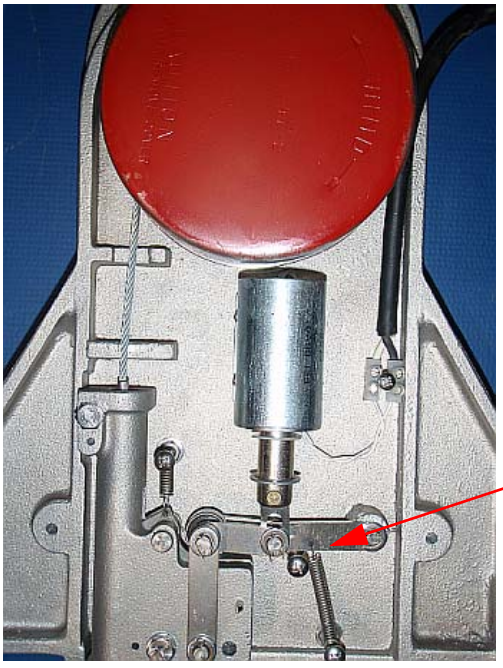
Problem	Possible Cause	Solution
Leaking dump valve	Over tightening of cinch strap affecting seal.	Re-adjust cinch strap.
	Lack of seal between valve and bucket shell.	Apply butyl rubber sealant.
	Creases or deterioration in the foam lips of the dump valve.	Work out creases or replace valve.
	Misaligned purse lines.	Adjust purse lines.

Control Head Troubleshooting

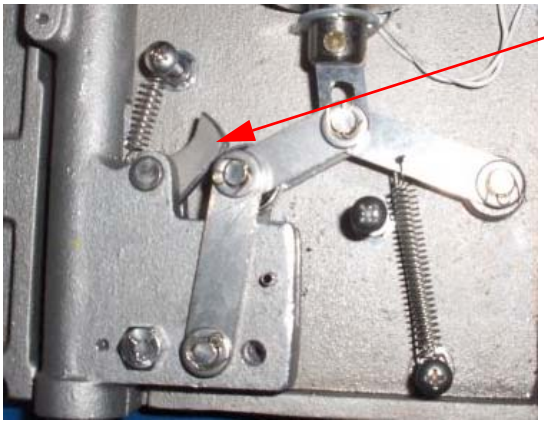
Problem	Possible Cause	Solution
Head doesn't release dump valve	Solenoid malfunction	Check the electrical connections for proper operation of the solenoid. A click should be heard when the circuit is closed. See picture 1 on the following pages.
		Check the white wires on the solenoid for shorting. Check terminal block for loose wires.
		Check for a burned-out solenoid, measured with an ohmmeter, the solenoid should have about 5.7 ohms resistance. A higher resistance may indicate a poor connection or a burned out solenoid. A lower resistance may indicate a shorted-out solenoid coil.
	Jammed linkage	With the cover plate removed, activate the solenoid and check for jamming of linkage. Check terminal block for loose wires. See picture 1 on the following pages.
		The tail of the catch may ride up on the bearing. Activate solenoid to release. See picture 3 on following pages.
		Check that the spring link is resting on the body of the stop bolt and not on the head of the bolt, with the control head sitting vertically. See picture 2 on the following pages.
		Check the catch for burrs at the bearing or the point. The point can be worn by the passage of the trip line bullet. Remove burrs with a fine file. See pictures 4 and 7 on the following pages. Check for rifling in the trip block and deformation on the top of the bullet.
Head releases dump valve prematurely	Loose trip block bolts	Tighten trip block bolts. See picture 5 on the following pages.
	Links are above center	Check that links are below center line of clevis pins. Adjust links. See picture 6 on the following pages.
	Worn catch at point	Check the catch point for wear at the bullet. Replace catch. See picture 7 on the following pages.
Tripline jams on returning	Tripline sleeves are fouling cast lugs on head.	Pull the tripline completely out. Check that the swaged sleeves at the end of the tripline are not fouling the cast guide lugs on the head and cover. Round the end of the swage sleeves with a file. If necessary the lower set of cast lugs (closest to the trip block) on the head act as a safety keeper to prevent a tripline broken at the top end from causing a tail rotor strike. The swage blocks should not pass between them. See picture 8 on the following pages.
Tripline doesn't return	Broken spring in reel	Check for a broken spring in the reel. A broken spring is indicated if the tension on the reel doesn't increase as the reel is wound, or if the tension increases in jerks or the spring seems to "slip" inside the reel. See Spring Power Reel Replacement for reel replacement procedure.



Picture #1



Picture #2



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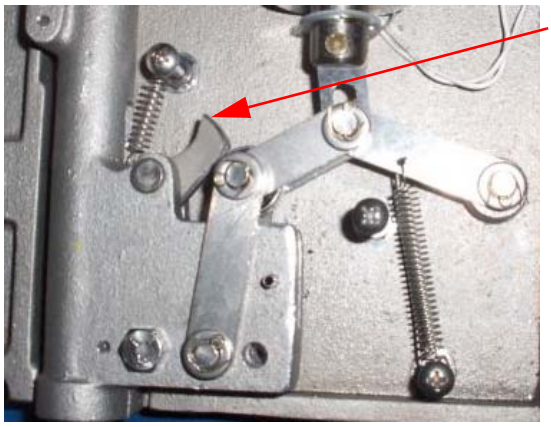
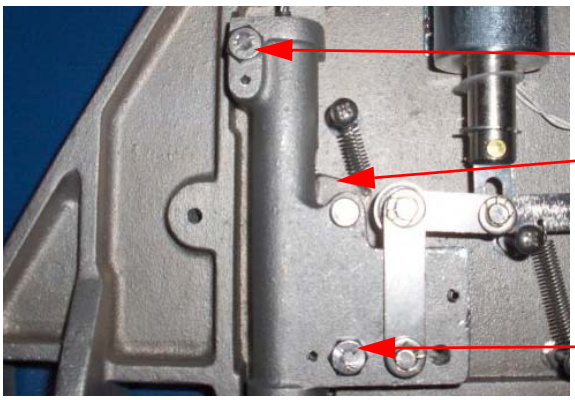
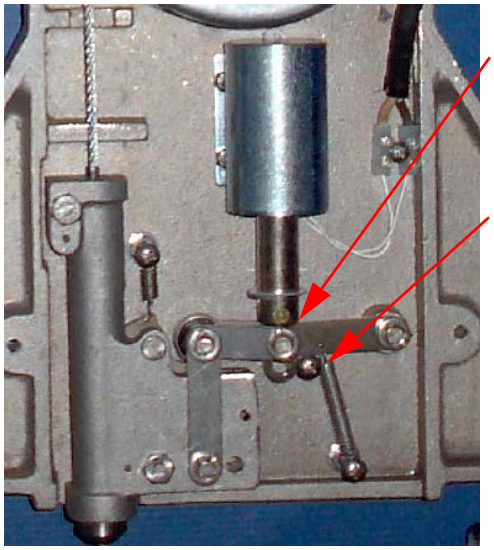


Picture #4



Picture #5

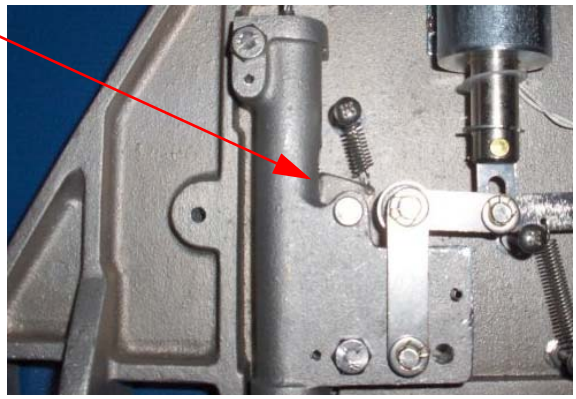


Check that the links are below the center line of the clevis pins.

Check that the links do not catch on the bolt head.

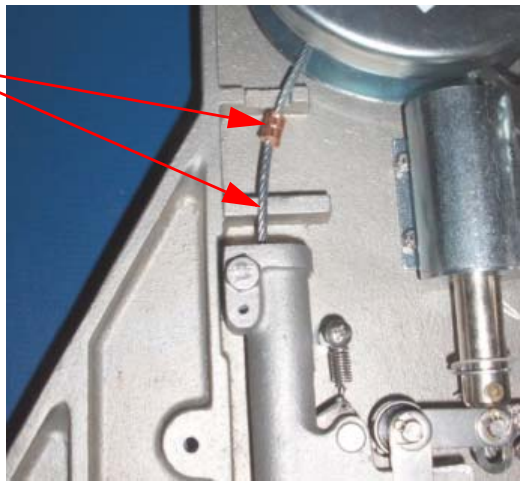
Picture #6

Check catch for wear at this point.



Picture #7

Check swaged sleeve for fouling on casting lugs.



Picture #8

Section 7: Control Head Maintenance

Operation and Maintenance

Control Head Operation

Warning

Do not remove the cover on the control head while operating the Bambi bucket. Part of the trip line safety keeper is cast into the control head cover. With the cover removed, this safety feature is no longer functional. Without the safety keeper functioning, a separated trip line could cause a tail rotor strike which could result in severe injury or death and/or helicopter damage.

For proper operation, nuts and bolts should be tightened until a sharp rise in torque is felt. Avoid the following modifications:

- Do not use another type of bearing as a replacement for the ball bearing.
- Do not use lockwire as a substitute for the swage blocks on the trip line.
- Do not shorten or change the portion of the trip line which attaches to the reel.
- Do not use threaded bolts as a substitute for clevis pins.
- Do not modify the size or angles of the catch, other than as recommended.
- Do not tighten control head suspension bolts over 5 ft-lbs. (6.5 Nm).

Tripline Replacement

The tripline should be examined daily for kinks, frays or loose swages. Replace the tripline as soon as any deterioration is observed.

Caution

Accidental release of a wound spring reel can result in injury to your hands. Wear gloves and use caution when winding the spring reel or pulling the tripline.

Removing the Old Tripline

Important Note

It is recommended that you study how the tripline is installed before removing it. This will make it easier to understand the following directions.

1. If possible, secure the head in a clamp, as shown.

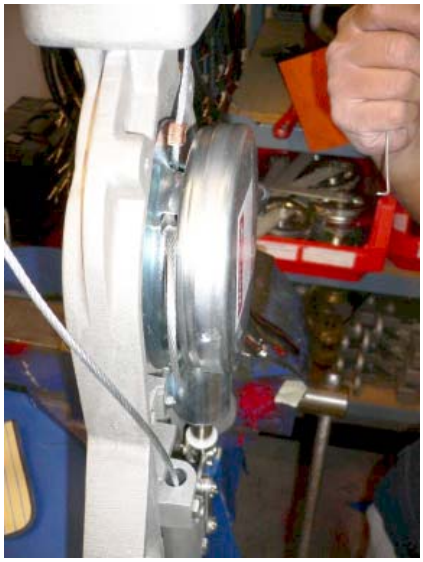
2. If the tripline is not broken above the trip block and the spring reel is functional, push the solenoid up releasing the catch and pull the tripline out to its full extent.

3. Secure the spring reel to prevent the reel from unwinding. This can be done by clamping a small pair of vice-grips onto the bottom flange of the reel, locking the reel against the solenoid.

4. Using needle nose pliers, create slack in the cable by pulling the copper swage close to the drum.

5. Use a small screwdriver and a stiff wire through the hole in the spring reel drum to remove the end of the tripline from the locking finger.

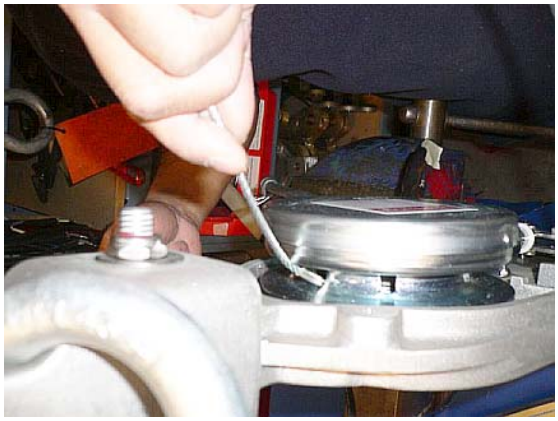
6. The photo shows the tripline end being pulled from the reel.



Winding the Spring Reel

If the spring reel tension has been released, the spring reel must be re-wound before the new tripline is installed.

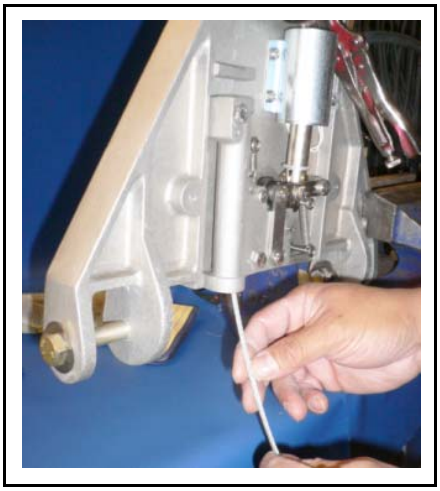
1. Wind the spring reel in the direction indicated by the arrow stamped on the cover to its maximum, then back off until the three holes in the reel are positioned at the top (approximately one full turn).
2. Secure with vice grips to prevent the reel from unwinding.



Installing a New Tripline

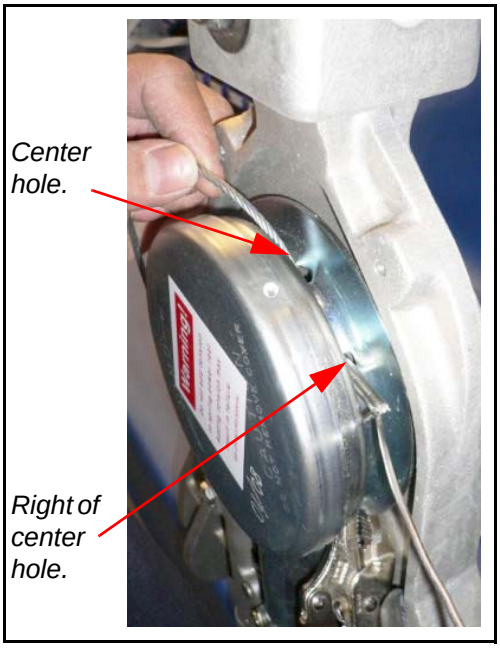
Before installing, check the trip block for grooves or rifling. Also, check that the bullet moves freely. If it does not, ream out the trip block.

1. Pass the tripline through the trip block's bottom hole upwards to the top.

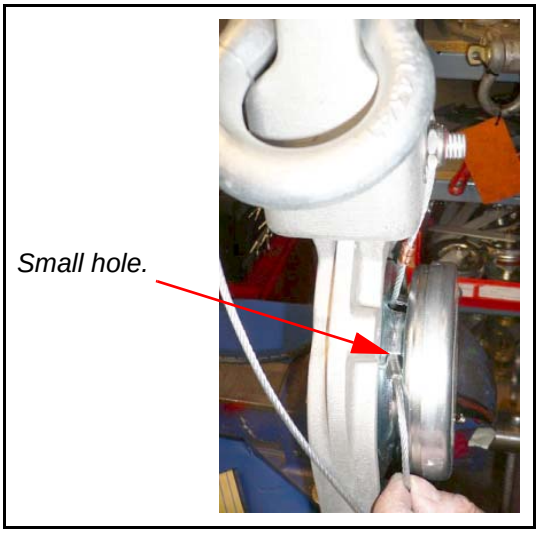


2. Once the tripline has passed through the trip block, bend the end of the tripline into a tight spiral using a pair of pliers.

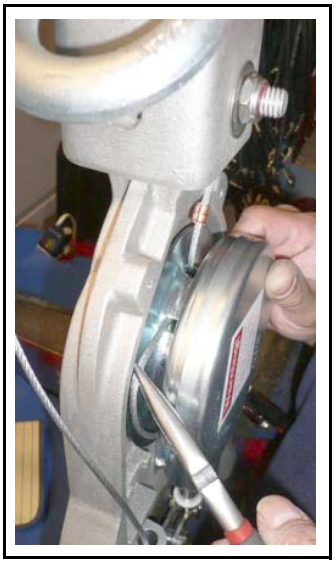
3. Insert the end of the tripline through the large center hole of the drum. Fish the tripline out through the small hole to the right of the center hole using a flat screw driver. Guide the end of the swage block out through the hole.



4. Pull 12-14" (30-35 cm) of line from the hole and pull it around the drum in a clockwise motion. Insert the tripline into the small hole to the left of the larger hole, when facing the head.



5. Locate the locking finger in the large center hole of the reel. Push the swage on the end of the tripline past this locking finger.



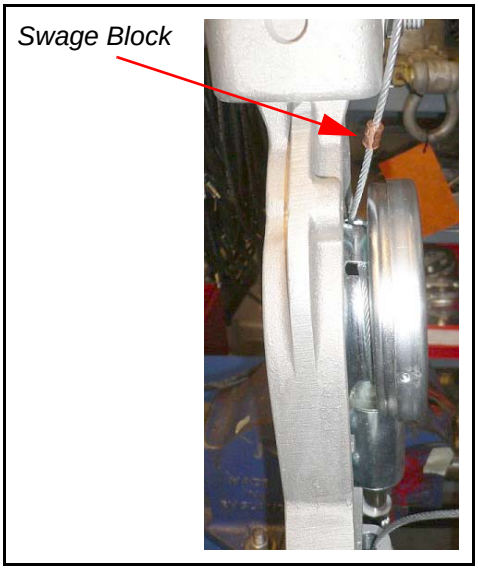
6. Pull the line up and over the finger and into the slot between the finger and the drum. To assist in this step:
    - Bend a piece of lockwire into a U shape.
    - Insert the bent end of the U into the large center hole of the reel.
    - Push the tripline through the U and past the finger on the reel.
    - Pull on the lockwire to lift the tripline outward past the finger.
    - Push the tripline into the slot.
    - Remove the lockwire.

7. Pull the free end of the tripline to remove any slack around the drum. Loop the cable behind the yoke to assist in this operation. Once completed, return the cable to the front of the head.

Important Note

Ensure that the swage blocks, at the end of the tripline, lie behind the section of tripline that passes through the centre hole to one outside hole. If the swage blocks lie outside the section of wire, they may foul the two cast lugs on the head which orientate the reel anti-torque plate. This will stop the tripline from winding up onto the reel.

8. With the tripline fully connected to the drum, note that there is a swage block about 1-2" (2-5 cm) from the drum. This block will be stopped by the safety keeper cast into the head. If the tripline should break where it enters the reel drum, the swage block will ensure that the tripline cannot come free of the control head.



9. While holding the reel securely, release the temporary lock. Allow the cable to wind in gradually. Do not let the reel free-wheel. **Use gloves to protect your hands from injury.**

Spring Power Reel Replacement

Removing Old Spring Reel

Caution

The spring reel must be unwound before its securing nut is loosened. Loosening the nut on a wound spring reel could result in damage to the reel and/or injury to your hands.

1. Remove the tripline as per *Tripline Replacement* instructions in this manual.
2. Wear gloves to protect your hands. Hold the spring reel firmly and remove the clamp or other locking device. Release the tension gradually until the reel is completely unwound.

Removing the locking device.

Slowly release the tension on the spring.

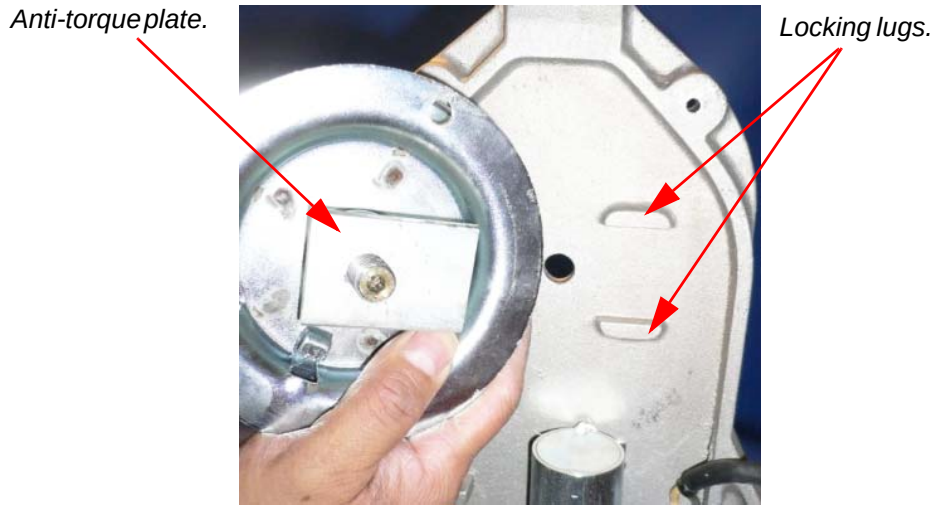
3. Locate the spring reel locking nut on the back of the control head.

4. Remove the locking nut and then the spring reel. Make sure to hold the threaded bolt with an Allen key when removing the nut.

Holding the threaded bolt with an Allen key.

Important Note

Note the position of the anti-torque plate on the back of the spring reel. The spring reel must be installed with the anti-torque plate positioned between the two lugs, cast in the control head.



5. When fitting the new spring reel, check the clearance between the reel and the control head. There must be a gap of approximately 1/8" (3 mm) to prevent rubbing. Older fabricated heads may require spacer washers, under the spring reel, to achieve the required clearance.

6. Install the spring reel locking nut. Use an Allen key to prevent the reel shaft from turning. Tighten the reel locking nut to 40 ft-lbs (55 nm).
7. Use Loctite to prevent the locking nut from loosening.

Important Note

The new spring reel is supplied with a vinyl coated cable attached. This vinyl coated cable must NOT be used as a tripline.

8. Disconnect the elastic band on the vinyl coated cable and slowly pull the cable off the reel.

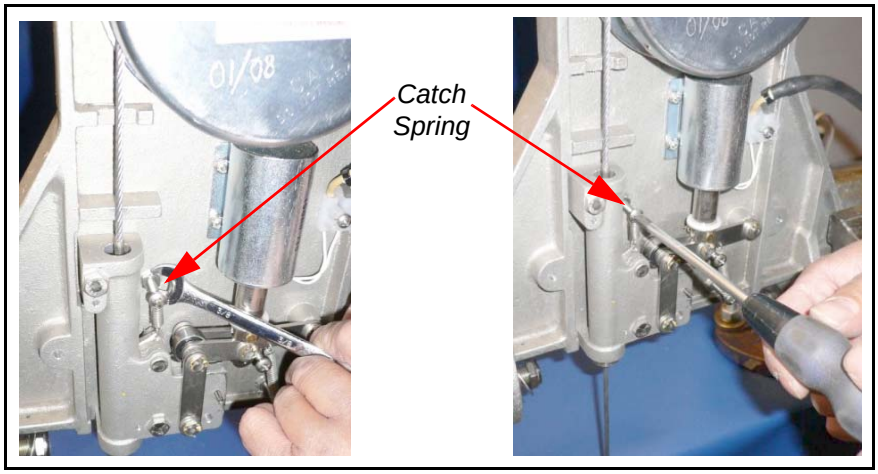
9. Lock the reel with vise grips.

10. Wrap the vinyl covered cable back around the spring reel. Remove the temporary lock and, again, pull the cable out until the reel stops.
11. Back the spring reel off until the three holes are positioned at the top (approx. one full turn) and secure the reel.
12. Remove the vinyl covered cable and discard. Re-install the tripline (see instructions on replacing triplines).

Catch Replacement

Newer buckets use a standardized catch and trip block which should not require the following procedure when replacing the catch. However, when replacing the catch in older buckets (manufactured before June 1993), use the following procedure.

1. Check the tripline for play in the tube and snug up swage sleeves with a swaging tool, if necessary, to ensure the tube is snug between the bullets.
2. Remove the catch spring.



3. Remove the bottom cotter pin on the catch clevis pin. Then, remove the catch clevis pin and the damaged catch by inserting an awl into the cotter pin eye and prying it out. Remove the catch clevis pin. Remove the catch and spring assembly.

4. Attach the spring to the new catch as shown.

5. With the tripline installed, place the new blank catch in its slot and slide the point in against the tube on the tripline. Keep the tail of the catch in place under the ball bearing and insert the clevis pin.
6. When installing the catch with the catch clevis pin, check that the point just touches the tube on the tripline.
7. Install the bolt, holding the spring in tension, and tighten the jam nut.
8. If your head was built prior to 1993, you may have to perform the following procedures to make the catch work.
    - If the pin will not insert into the catch hole, note the amount that must be filed off the point of the catch to allow the hole in the catch to fit through the hole in the trip block. File or grind off the point of the catch in a radius centered on the hole in the catch. Keep the ground point square to the faces of the catch. Round the corners of the filed point smoothly to remove burrs.
    - When the solenoid retracts, the tail of the catch must clear the bearing in order for the tripline to be released. Operate the solenoid by hand to check that the tail of the catch will clear the bearing. If it does not, remove the catch and grind the tail of the catch so that it will clear the bearing. File edges just enough to remove any burrs.

Section 8: Repair Categories and Criteria

Overview of Repair Categories

This section is intended to provide the user with information that will allow for the quick repair assessment evaluation of the Bambi Bucket. The repair assessment process is almost identical for all sizes of the Bambi Buckets, with some exceptions for minor bucket design variations between the models. This section also offers specific guidelines that sort the component defects into one of four categories: Safety, Operational, Monitor and OKAY. Use the guideline definitions to determine how urgently a repair should be carried out.

Category 1: Safety

All defects in this category must be repaired immediately before further operation of the Bambi Bucket occurs. Ignoring defects in this category could result in personal injury or damage to equipment. These defects can compromise the following functions of the Bambi Bucket: structural integrity, flight stability, water release and flight safety.

Category 2: Operational

All defects in this category should be repaired before the next operational day or approximately eight hours of flight time. The defects do not compromise the safety of the bucket but may lead to Category 1 defects, if not addressed within a short time frame.

Category 3: Monitor

Many defects such as wear, abrasion and minor impact damage do not need urgent attention. Defects of this nature should be monitored daily and repaired before they progress to a Category 2 defect.

Category 4: OKAY

The Bambi Bucket does not need repairs.

Important Note

Unfortunately, it is impossible to provide a recommended service time frame as some buckets are used often while others are used only rarely. In addition, buckets are shifted between operators, making it difficult to track usage. If you are unsure of your bucket's status, check with any Bambi Bucket Service Center, in your area, for more information and assistance.

Important Note

If more information is required, refer to the Bambi Bucket Operations manual, the Bambi Bucket Service manual (for the model being used) or the Bambi Bucket Repair Assessment manual.

Bucket Shell Repair Criteria

Category 1: Safety
Cease operations and repair immediately.

- One or more broken top loop knots (M-strap attachment point to the shell).
- Gross punctures through shell that cut or severely damage one or more panel strips.
- Separation of fabric welds longer than 3” (76 mm).
- Punctures or cuts through shell longer than 3” (76 mm).
- Two or more broken bottom webbing loops.

Category 2: Operational
Repair before next days operation or eight hours flight time.

- Top loop knots that are worn or have damage to more than 25% of the fabric.
- Cuts, punctures or weld separations less than 3” and/or cut through more than 25% of a panel strip.
- Bottom webbing loops with more than 25% damage to fabric strands.
- Broken or missing bottom webbing protective wear strips.
- Five or more broken battens.

Category 3: Monitor
Monitor and/or repair if condition deteriorates.

- Wear, abrasions, and cuts to the bucket shell fabric isolated to one side of the material that do not cut through.
- Wear, abrasions and cuts to the webbing loops, strips and top loop knots that involve less than 25% of the fabric strands on any portion of the affected webbing.
- Wear and abrasions to webbing protective strips.
- Up to 4” (102 mm) of peeled weld on panel strip.
- Up to four broken battens.

Category 4: Okay
Does not need repair.

Cables Repair Criteria

Category 1: Safety
Cease operations and repair immediately.

- One or more broken suspension cables or end fittings.
- Broken deployment cable.

Category 2: Operational
Repair before next days operation or eight hours flight time.

If three or more individual suspension cables or the deployment cable have the following defects:

- 10 or more randomly distributed broken strands or four adjacent broken strands
- Visible kink(s).
- Separation of the strands due to twisting (known as “bird-caging”).
- Evidence of heat damage.
- Abrasion wear comprising of more than 1/3 of the original diameter of the outside individual strands.
- Any visible reduction in outside diameter due to overload.
- Cracked or broken end fittings (some elongation of cable eyes is acceptable).

Category 3: Monitor
Monitor and/or repair if condition deteriorates.

- Wear, broken strands, kinks and twisting in cable that do not exceed the limits defined in Category 2 defects.

Category 4: Okay
Does not need repair.

IDS Hub Repair Criteria

Category 1: Safety
Cease operations and repair immediately.

- Cracks or breaks across the major section of the IDS hub.
- Two or more broken or cracked spoke brackets.
- Two or more broken or missing spokes, clevis pins, shell brackets.
- Three or more bent spokes (bends in excess of 20 degrees = broken).

Category 2: Operational
Repair before next days operation or eight hours flight time.

- One broken or cracked spoke bracket on IDS hub.
- One broken or missing spoke.
- One broken or missing clevis pin or shell bracket.
- Up to two bent spokes.

Category 3: Monitor
Monitor and/or repair if condition deteriorates.

- Wear on IDS hub.
- Dents, abrasions and wear on spokes.
- Clevis pin and shell bracket wear.

Category 4: Okay
Does not need repair.

M-Straps/Top Chains Repair Criteria

Category 1: Safety
Cease operations and repair immediately.

- Broken top chains.
- Broken or missing shackles.
- Two or more broken M-straps.

Category 2: Operational
Repair before next days operation or eight hours flight time.

- M-straps with more than 25% of the fabric strands broken.
- Visibly worn top chains.
- Bent, gouged, worn or cracked shackles and shackle pins.

Category 3: Monitor
Monitor and/or repair if condition deteriorates.

- Damage to an M-strap that does not exceed 25% of the fabric.
- Minor wear, impact marks or corrosion on chains.
- Minor wear, impact marks or corrosion on shackles.

Category 4: Okay
Does not need repair.

Control Head Repair Criteria

Category 1: Safety
Cease operations and repair immediately.

- Any visible crack or break on the head.
- Visibly bent shackles.
- Broken or missing safety wire on shackle pins.
- Broken or exposed electrical conductors.
- Broken or missing break-away plug.

Section 9: General Maintenance and Repairs

Maintenance and Repairs

Important Note

After using the bucket in salt water, wash the bucket with fresh water. Make sure to pay special attention to the purse strings.

Purse Line Replacement

There are several different purse string sets used. Make sure the replacement set you are using is the correct one for the Bambi model you are servicing. Current valves have the ends sewn, eliminating two of the purse strings used in older valves.

When a new set is ordered, you will receive 12 purse strings and two bolts and nuts along with four washers which can be used to lock the two end grommets together.

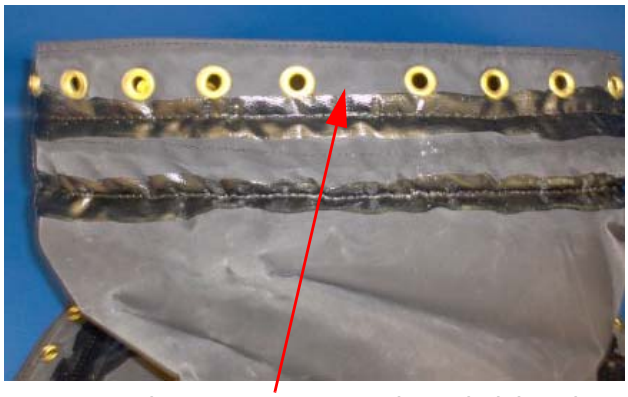
These grommets are spaced further apart than the others. The new purse string set of 12 strings will have two green, two red and eight black-marked strings. Model 4453 purse line set will have all black-marked lines.

The purse lines alternate from one side of the valve to the other. When threading the valve, insert the first purse line from one side. The next purse line is inserted from the opposite side. Any or all lines replaced should follow the same sequence. Refer to *Adjusting Purse Lines* in this manual.

Braided nylon for new purse lines can usually be purchased locally. Make sure to use nylon since it is self-lubricating in water. After cutting the new line, melt the ends with a lighter to prevent fraying. Tie a knot on the end of a new line large enough to prevent passage of the line through the fender washer.

To replace all purse lines:

1. For older models, ensure the valve grommets are aligned properly. The two pairs of grommets, with a larger space between them, serve to indicate where the valve is folded and where you will install the bolts, nuts and washers. When folded correctly, all the grommets will line up. When the valve is correctly installed in the bucket, the folded seal will be parallel to the ballast.



Large gap between grommets shows bolt location.

2. If you are using new SEI-supplied purse strings, note the green, red and black markers for models 2024-3542 and just black markers for 4453 model. This mark is centred on the ring when tying.

3. Thread the purse lines, alternating from one side of the valve to the other. Leave the first two grommet sets and start installing the black marked lines in the center. Once all the black lines are installed, there should be two blank spaces on each end. Next, install the red-marked lines followed by the green-marked lines at the very end.

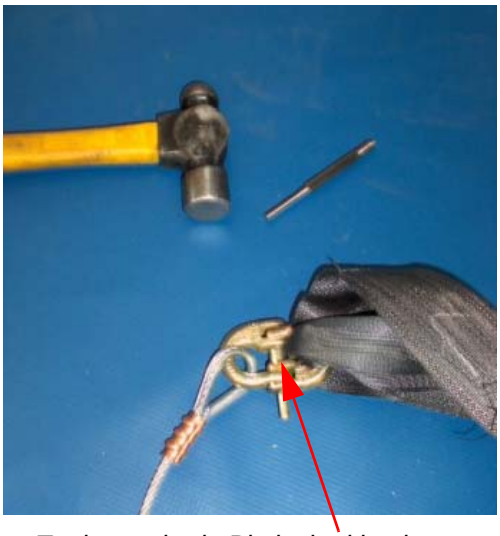
4. Starting from one end of the valve, tie the green-marked line with the mark centered on the ring. Next, do the red-marked line, followed by the eight black-marked lines. Then finish with the final red and green-marked lines.

5. Work towards the other end, tying the lines with equal tension from alternate sides of the ring.

Further details on purse line adjustments are given in *Adjusting Purse Lines* in this manual.

Suspension Line Replacement

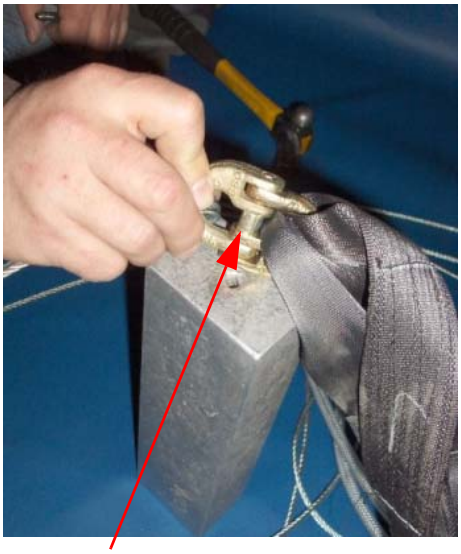
A suspension line should be replaced whenever it displays noticeable kinking or fraying. Factory replacement lines come pre-swaged with connection links to make replacing quick and easy.



Tools required. Pin locked in place.

To remove the connecting link (connecting the suspension line to the M-strap) follow the procedures outlined on the next page.

1. Locate a metal bar with a 5/16" hole (or drill a 5/16" hole into any metal bar). If you are unable to locate a metal bar, a wooden block will work, however, make sure to drill the hole into the end grain.



Center holding sleeve.

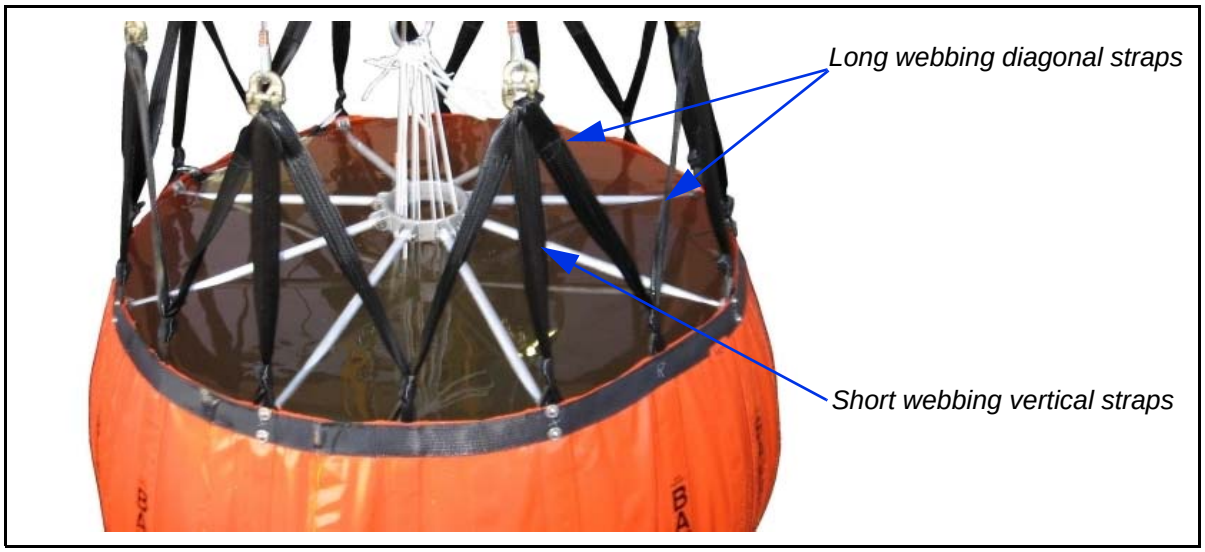
2. Place the connecting link with the pin located over the hole and using a 3/16" punch, drive pin through the center holding sleeve.

3. After the pin is free, remove the old suspension line. Place the new line in the connecting link by inserting the pin into one side of the connecting link. Using a hammer, drive the pin in until it is flush with both sides of the connecting link.

M-Strap Replacement

Replace M-straps if they become noticeably worn. M-straps may be repaired, if frayed, by melting the fray with a lighter to stop the fray from spreading. The length of the M-strap is critical to the proper functioning of the Bambi bucket and we recommend that you replace worn straps with factory-supplied equipment.

There are two types of straps; long webbing and short webbing. Long webbing are used for the diagonal straps while short webbing are used for the vertical straps.



When replacing straps, do one set at a time to avoid confusion. Cut off the old straps from the shackle and un-tie them from the top of the bucket shell. Attach replacement straps as per the originals.

Removing Old M-Straps

1. Using needle nose pliers, insert the tip under the top webbing layer.

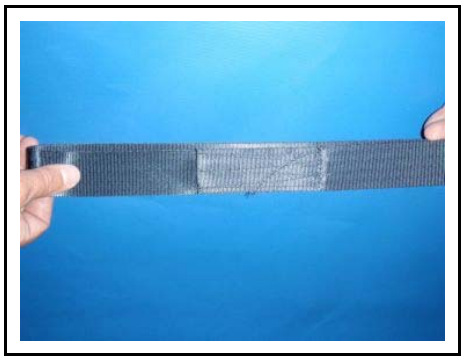
2. Fully insert the pliers at the far left hand side of the top layer.

3. Holding the pliers tight, turn your hand clockwise. Repeat the operation until the knot is loose enough to remove the strap.

Installing New M-Straps (Short)

Once the old straps have been removed, the new strap installation can begin.

1. Rotate the strap until the joint is centered.



2. Pass the strap through the loop.

3. Twist the loop eye 180 degrees.

4. Rotate the eye to the opposite side.

5. Pull strap end through the eye.

6. Pull strap tight.

Installing New M-Straps (Long)

Once the old straps have been removed, the new strap installation can begin.

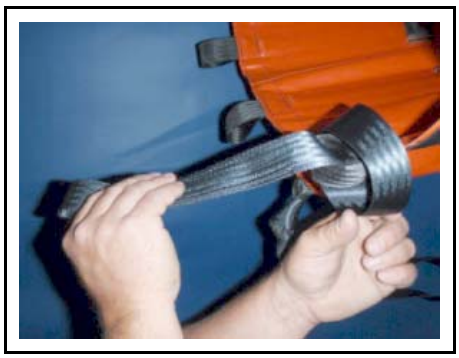
1. Locate the center of the strap.

2. Pass the strap through the loop.

3. Twist the loop eye 180 degrees.

4. Rotate the eye to the opposite side.

5. Pull strap end through the eye.



6. Pull the strap tight.

7. The M strap set should now look like this. The suspension line attaches to the top of each M-strap set.

Dump Valve Replacement

SEI Industries replacement dump valves come complete with new purse lines, bolts, nuts, washers and butyl rubber sealant.

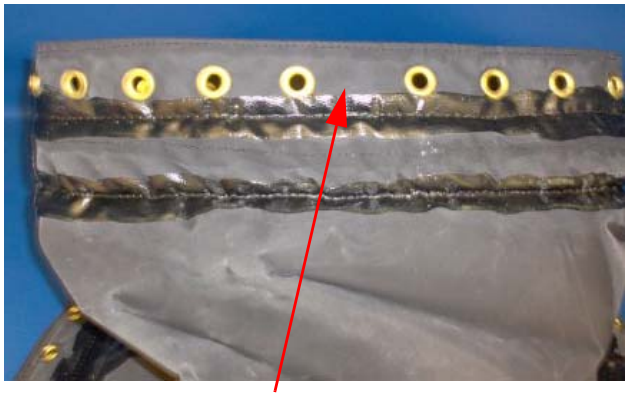
To replace a valve:

1. Remove the old valve as well as all butyl tape and ballast
2. Stand the bucket up with the valve hole on the bottom.
3. Apply a 1/2" x 1/8" (13 mm x 3 mm) bead of butyl rubber sealant in a circle around the inside of the bucket shell, just below the valve grommets, to make a seal between the shell fabric and the dump valve fabric.
4. Place the large stainless washer and then the rubber washer onto the bolt. Insert the bolt up from outside of shell.

Washers and Bolts

5. Close the mouth of the new valve.

6. There are two grommets at the top of the valve at opposite sides that are spaced further apart. This is where the valve folds flat. When the valve is folded flat, the seam will be in the middle of the top or bottom surface and the grommets at the top will line up.



Large gap between grommets shows bolt location.

7. Place the new valve into the bucket with the valve mouth (when closed) parallel to the ballast pouch location (see picture). If the valve is not aligned correctly, leakage will occur.
8. Install the fastenings and snug up the nuts until two threads on the bolts show. Do not overtighten.
9. If the purse lines require tying or adjustment, refer to the instructions *Adjusting Purse Lines* and/or *Purse Line Replacement.*

Ballast Pouch Location

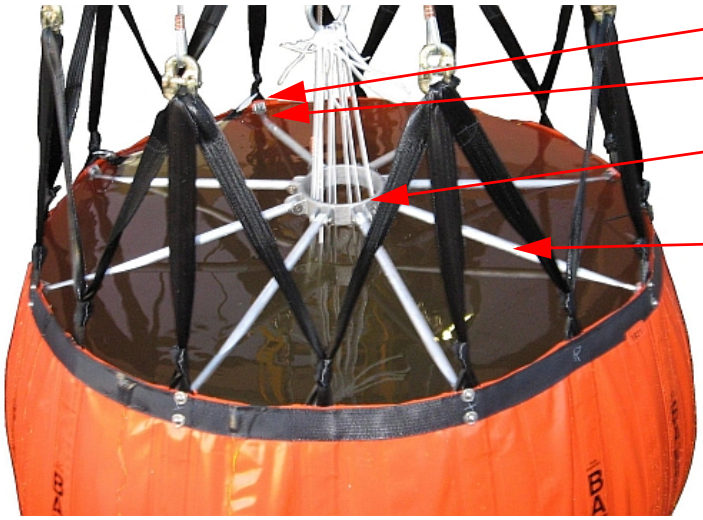
Bottom Loop Repairs

If the bottom loops, which hold the chain, become worn, the frays can be melted with a lighter to prevent them from spreading. If the bottom loops require replacement, they should receive an overlay of heavy duty wear-resistant webbing.

Bucket Patching

Please see *Bucket Repairs* in this section.

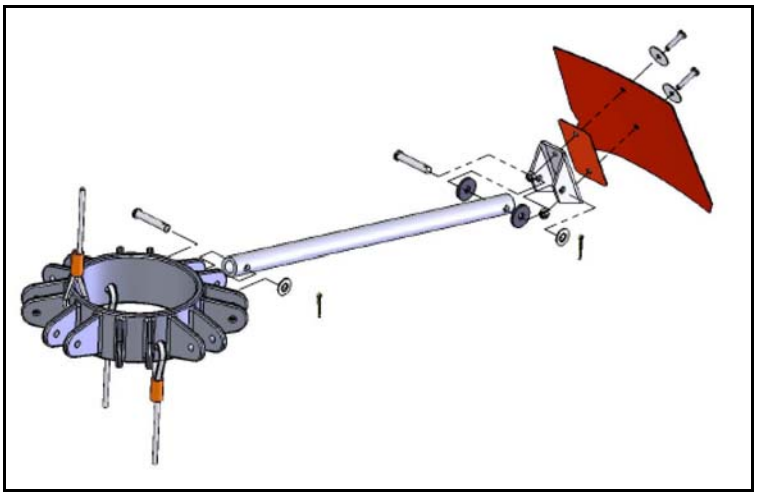
IDS Hub/Spokes Replacement



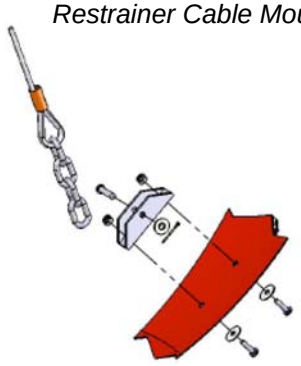
For part ordering information, please see Section 10 of this manual.

The IDS can be purchased either as a complete kit or as individual pieces, as required. Follow the procedure below to replace the entire assembly.

1. Start by removing the old IDS including the shell brackets. Replace the restrainer cable brackets, if worn. You will have to disconnect the tripline from the valve or control head since the tripline passes through the hub.
2. For re-assembly, first install the new shell brackets. This can be accomplished by installing the bolts through the bucket shell, fitting the fabric wear strips onto the bolts and, then, fitting the brackets to the bolts. Install and tighten the Nylock nuts.
3. With the ballast oriented at the 6 o'clock position, rotate the IDS assembly so that the deployment cable faces upward and it's at the 3 o'clock position.
4. Attach the two spokes at either side of the 12 o'clock position using the stainless steel clevis pins. Complete by fitting the fender washer and cotter pin. Working around the bucket perimeter, attach the rest of the spokes.
5. Once the IDS is fully installed, test for fit. You should be able to pull the hub past the midpoint position with a slight effort. If the IDS is either too loose or too tight, it will require adjustment.
6. Remember to re-attach the tripline to the dump valve, passing the line through the hub. Also, attach the IDS deployment cable to the control head small adjustment chain.
7. Attach the two restrainer cables. One is found below the ballast and the other is directly opposite (6 o'clock position). No wear strips are required for the restrainer cable brackets.



Restrainer Cable Mount



If the IDS is too tight, adjust two of the spokes as follows:

1. Cut off the spoke just above the existing hole on one end only. Then, redrill a new hole centred the same distance from the new end of the spoke as the other spokes. This will likely produce a good fit.
2. If the IDS is still too tight remove another spoke and repeat the above steps.
3. These two spokes are across from each other.

Bambi Bucket Shell Repairs

Please read these instructions carefully and follow them exactly to obtain a good repair. Failure to follow these instructions or poor repair workmanship can lead to failed repairs and/or more damage to the bucket.

Before commencing repairs using glue, the weather should be warm (above 60 deg. F or 15 deg. C) and dry.

Important Note

Try a test repair before attempting to repair the bucket. This will verify your technique without risking damage to the bucket. It is much harder to fix a repair once a failed attempt has been made as the hardened glue is difficult to remove.

Repair Failures

Repairs will likely fail if:

- The area to be repaired is not perfectly clean and scrubbed to a matte finish before applying the patch.
- Repairs are attempted during wet or cold weather.
- The glue and patch are not properly placed, creating air bubbles between the glue and the patch.
- The patch is not weighed down for 24 hours.
- The bucket is used before the glue has set.

Important Note

Dura-Seal glue has been designed specifically for the SEI family of fabrics. The shelf life of this adhesive is about one year. Fresh adhesive can be obtained directly from SEI Industries Ltd.

Repairing in High Humidity

In conditions of high humidity, a proper technique is essential for securing the bond strength desired. The presence of surface moisture can destroy the effectiveness of the cemented bond.

The evaporation of solvent from the adhesive may reduce surface temperature below the dew point resulting in condensation of water vapour on the surface of the adhesive. This is often visible as fogging or a milky white appearance on the surface.

The use of a solvent to clean the surface prior to cementing can also reduce temperatures below the dew point.

To overcome the high humidity problem, raise the temperature of the patch area. This can be accomplished with a warm air fan.

Warning

- Glue vapours are highly explosive! Explosive vapours may occur causing fire and/or injury. Keep away from all sparks, flame, lighters or cigarettes.
- Solvent and glue are both extremely hazardous. Use solvent and glue under well ventilated conditions only.
- Use an approved respirator mask to avoid breathing fumes.
- When using a warm air fan, either use one which is rated EXPLOSION PROOF or make sure that there is a steady flow of air past the work area to remove fumes as they are generated.

Making Temporary Repairs with Sealing Clamps

Repair clamps are used for an immediate repair to prevent the loss of liquid through large rips or holes. For example, if a vehicle accidentally backed into a bucket and caused a 3" (76 mm) long rip in the bucket, a repair clamp could be inserted to stop the loss of liquid. Repair clamps are only used for temporary repairs. The damage should be permanently repaired with a patch when the bucket can be set aside for 24 hours.

Important Note

Leaving the clamp's string on makes it easier to remove the repair clamp when placing a permanent patch on the bucket.

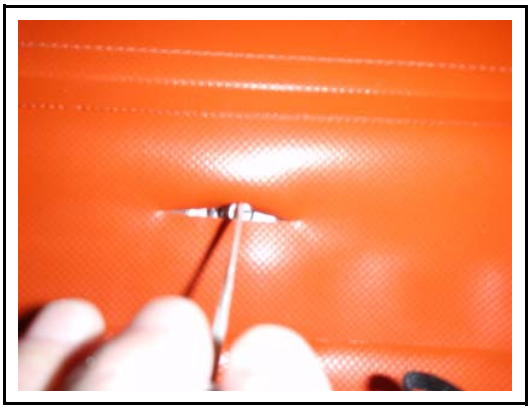
1. Select the largest clamp that will just slip through the hole in the item. The size of cut or hole will determine the size of the sealing clamp to use.
   - For a cut or hole up to 2" (5 cm), use a 3" (7.6 cm) clamp (supplied).
   - For a cut or hole up to 4" (10 cm), use a 5" (12.7 cm) clamp (supplied).
   - For a cut or hole up to 6" (15 cm), use a 7.5" (19 cm) clamp (special order).

Caution

Use caution if deciding to enlarge the slit to insert a clamp. It is very easy to make the slit too large.

2. Keeping hold of the string, slip one half of the repair clamp through the hole as indicated.

3. Pull the bolt up through the hole. Turn it until the clamp lines up with the hole.



4. Place the top of the clamp over the bolt.

Caution

Tightening the nut with tools may break the bolt away from the lower clamp. Overtightening can also deform the clamp and cause leaks.

Temporary Repairs Using Glue

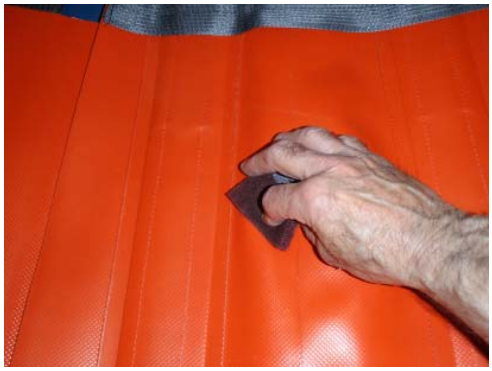
Important Note

Allow repair to harden for 24 hours at room temperature before using the item.

Applying the Glue

Small scrapes, damaged fabric coating or pinholes, which are not leaking, can be repaired with glue only. They do not require a patch. (A small scrape is defined as damage to the outer fabric coating only. A pinhole is defined as a small puncture that is not leaking.) However, damage to the base fabric must be repaired with a patch.

1. Fill the weight bag with water prior to beginning repairs.
2. Clean the area to be repaired with an abrasive pad dampened with solvent. Remove all traces of masking tape, if previously used. If possible, place a piece of masking tape on the back side of the item being repaired.
3. Paint the damaged area with glue. Use a thick coat of glue, overlapping the edges of the repair by 1" (25 mm). Be sure that the edges are well coated. A damaged coating should be given two coats of glue. Apply the second coat within four hours of the first coat.



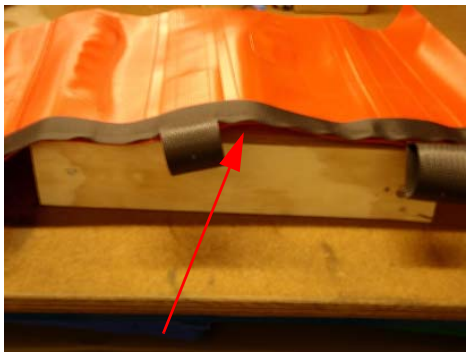
Clean and apply masking tape on the backside of the tear.

Squeeze glue around the tear and spread with fingers.

Gluing with Patches

If there is dampness around the area to be patched, then dry the area with a hot air fan or heat gun. Any loose coating should be cut back with scissors.

1. Support the damaged area on a flat, solid platform. This platform should be strong enough to support the fabric (flat) and allow the patch to be rolled once it is in place.



The damaged area should be supported on a flat, solid platform.

2. Scrub the damaged area with an abrasive pad dampened with solvent (isopropyl rubbing alcohol is recommended). Scrub vigorously to remove the cured surface. The area should be clean and dry with a dull matte finish.

Caution

Solvent will damage the fabric if too much is used or if the fabric is left exposed to solvent residue.

3. Wipe with a rag, dampened with solvent, to remove any residue from cleaning. Check to see if the area is totally clean and all coated surfaces and edges are dull. If not, repeat the cleaning. This is critical for a good glue bond.

Cutting the Patch

1. Cut a patch. The patch should be at least 2" (50 mm) larger in every direction from the damaged area. A round patch is recommended but, if a rectangular patch covers the damage better, then round all corners. Clean the patch by scrubbing with a pad dampened with solvent. Rub vigorously to remove the gloss from the fabric. Clean **both sides of the patch,** as it is easy to get the patch turned over during installation. Another reason the patch should cleaned on both sides is that it will be painted with glue, on the outside, later.

The color of patch will vary, depending on the product repair kit.

Applying the Patch

1. Apply the Dura-Seal glue to the patch and damaged area. Wait 30 minutes (at 75F or 22C) for some of the solvent to evaporate from the glue. The glue should become thicker but still be quite wet. If it has been allowed to dry too long, give both sides another thin coat. If the glue has dried too long, it will be difficult to avoid entrapping air bubbles in the bonded joint.

2. Place the patch and roll it down with the roller. Place the centre of the patch down first, then roll it out towards the edges with the roller. This expels trapped air. Once the patch is rolled down, do not let it lift up. This will prevent air from getting under the patch which causes a weak bond.

3. Weigh down the patch. Place a plastic cover sheet over the patch followed by a weight bag for 12 hours at room temperature. Remove the weight bag and leave to dry for 24 hours.

4. If the patch will be subjected to abrasion after 24 hours, paint over the patch with glue. Painting the patch also provides protection from ultra violet light and weather. Allow the bond to harden for 24 hours at room temperature before using the item.

Hot Air Gun Patching

On most items, hot air gun patching is the preferred method because it provides the most durable, permanent repair possible.

Tools and materials required:

- Patches
- One plastic hand-held roller
- One hot air gun, Steinel HL 1800 E or equivalent:
  120 V-1500 W (800 to 1100 deg. F, 450 litres per min.)
- One wide surface nozzle
- Isopropyl alcohol
- Scissors

Warning

It is extremely dangerous to use a hot air gun in the presence of flammable fumes such as gasoline or paint thinner. There is a high risk of explosion and/or burns.

Warning

Injury, especially to hands and fingers, can occur when using a hot air gun. Most welding will occur at temperatures of 800-1000 degrees F. Wear gloves to protect skin from overheating, burning and blistering.

Hot Air Gun Procedure

1. In a well-ventilated location, clean the area to be repaired as well as one side of the patch with an abrasive pad. Wipe down the repair area and patch with isopropyl alcohol.

2. Mount a wide surface air nozzle on the hot air gun so as to direct the heat flow in a large pattern. Turn the power on, adjust the temperature in the low range first and let the hot air gun warm up. Increase the temperature as required during the operation. **DO NOT OVERHEAT OR BLACKEN THE FABRIC.**

Caution

Overheating can occur quickly and can damage the product. It's recommended that you test, using the supplied fabric samples, to determine the correct temperature to be used and the duration of heat to be applied.

3. Starting from the centre of the patch (held down by the roller), concentrate the heat flow equally to patch and fabric. Apply a light pressure with the roller when the fabric starts melting. This can be seen as small bubbles. **DO NOT OVERHEAT.**

4. Roll the patch down to fuse it to the fabric, moving roller and gun simultaneously. Repeat on the unfused portion of the patch. Let the repaired area cool down. Attempt to peel off at the edges with your fingers. If there is even a slight peel, repeat the operation locally. Otherwise, the repair is finished.

Repair Kits

Bambi Repair Kit 003613 (no glue)

Used for Bambi Buckets or other product lines where **no glue is required or allowed.**

Important Note

It is the responsibility of the dealer and end user to ensure that the importation of glue is allowed in the country of use.

Repair Kit Parts Table

PART NUMBER	DESCRIPTION	QTY.
011161	BAG, TOOL	1
003661	FABRIC REPAIR MANUAL	1
003608	BAG, WEIGHT	1
003064	PAD,ABBRASIVE	2
003071	ROLLER, SEAM, 1 ¼	1
003074	SCISSORS	1
004502	CLAMP, REPAIR, SMALL, (2” HOLE)	1
003856	PATCH, FABRIC, 32OZ. BAMBI	3

Optional Supplies

PART NUMBER	DESCRIPTION	QTY.
003090	ADHESIVE, DURA-SEAL ¾ OZ.	1
003091	ADHESIVE, DURA-SEAL 8 OZ.	1
004503	CLAMP, REPAIR, MEDIUM, (4” HOLE)	1
004504	CLAMP, REPAIR, LARGE, (6” HOLE)	1

Section 10: Specifications and Parts

Capacity and Weight Specifications

Model	Capacity			Gross Weight		Empty Weight	
	IMP Gal	USG Gal	Liters	lb	kg	lb	kg
BB2024	200	240	910	2130	960	127	58
BB2024S	200	240	910	2120	960	125	57
BB2226	220	260	1000	2330	1050	125	57
BB2732	270	320	1200	2830	1290	134	61
BB2732S	270	320	1200	2830	1280	130	59
BB3542	350	420	1600	3640	1650	142	64
BB420B	350	420	1600	3640	1650	139	63
BB4453	440	530	2000	4580	2080	180	80

Note: Capacities and weights are accurate to within 5%. Specifications subject to change. Check original control head nameplate.

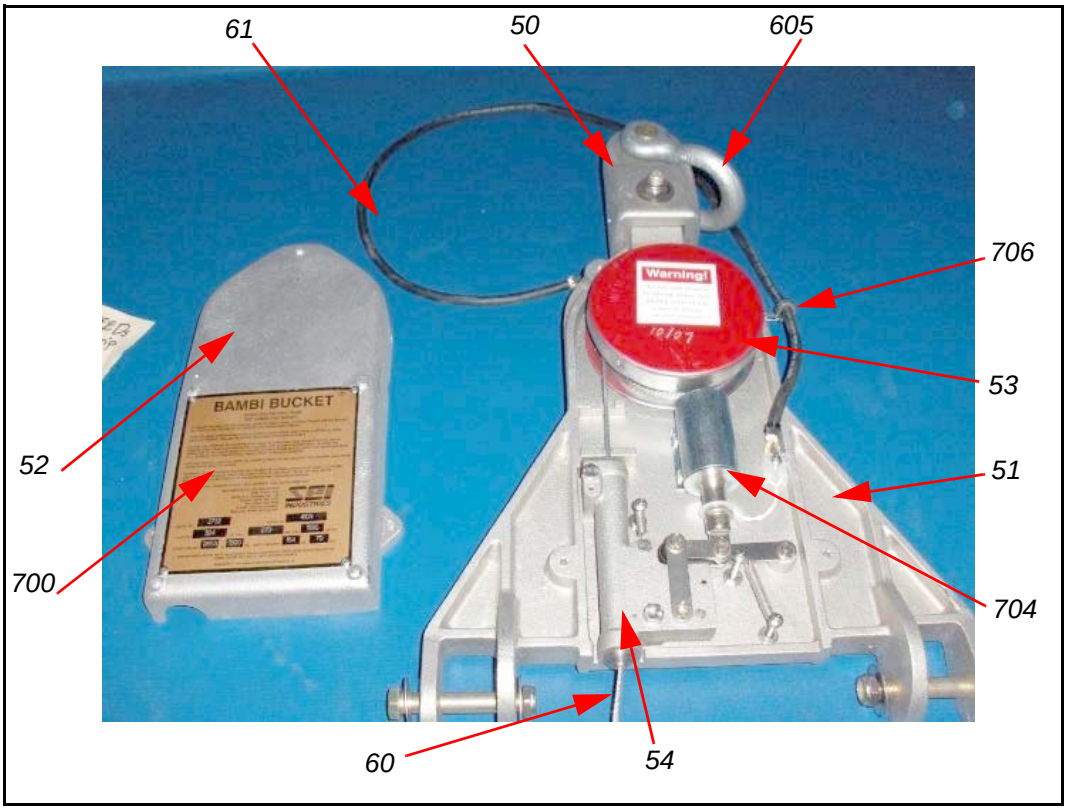
Bambi with PowerFill Snorkel Capacity and Weight Specifications

Model	Capacity			Gross Weight		Empty Weight	
	IMP Gal	USG Gal	Liters	lb	kg	lb	kg
BB2024	200	240	910	2180	989	177	80
BB2024S	200	240	910	2170	984	175	79
BB2226	220	260	1000	2380	1080	175	79
BB2732	270	320	1200	2880	1314	184	83
BB2732S	270	320	1200	2880	1304	180	82
BB3542	350	420	1600	3690	1674	192	87
BB420B	350	420	1600	3690	1624	189	86
BB4453	440	530	2000	4630	2104	230	104

Caution

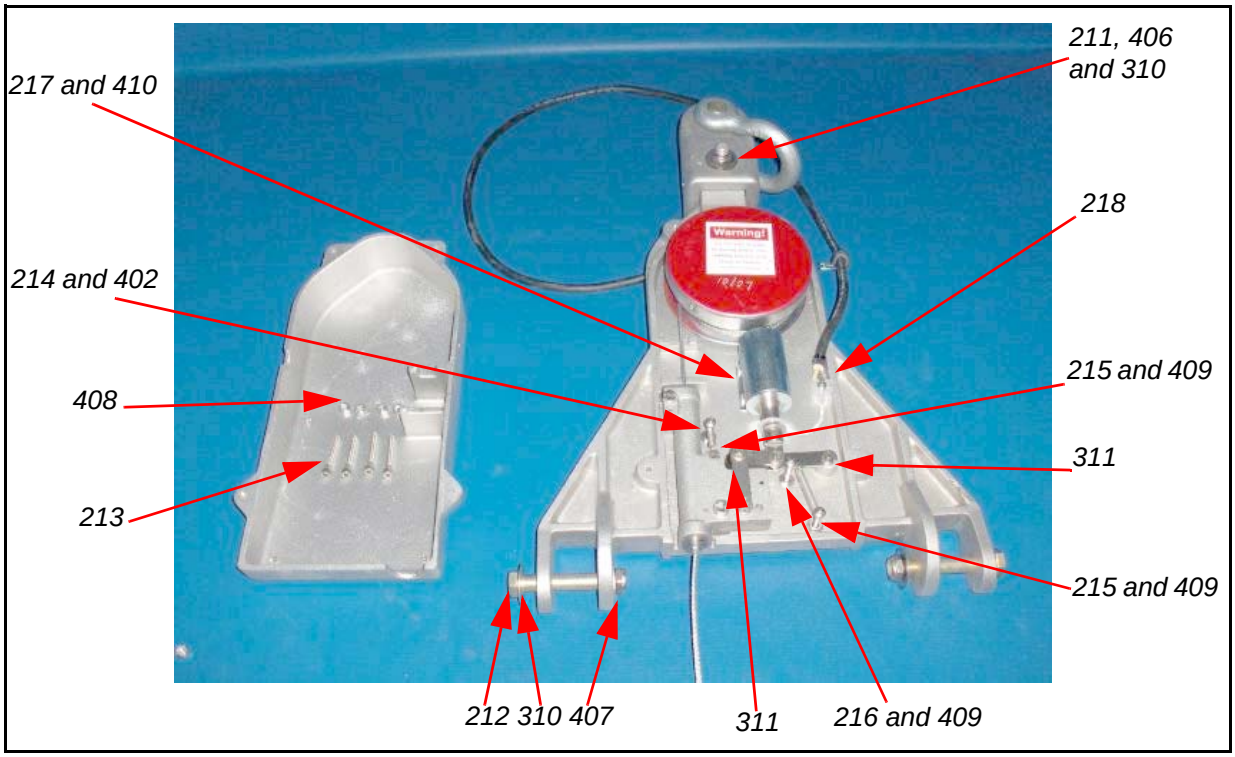
The selection of a Bambi bucket model for a specific aircraft is dependent on many factors including aircraft weight, fuel weight, operation elevation and atmospheric conditions. The helicopter operator must select a bucket model which is appropriate for their specific situation. The operator must also ensure that the bucket selected does not pose a tail rotor strike hazard.

Control Head Parts List, Models 2024-4453, Major Components



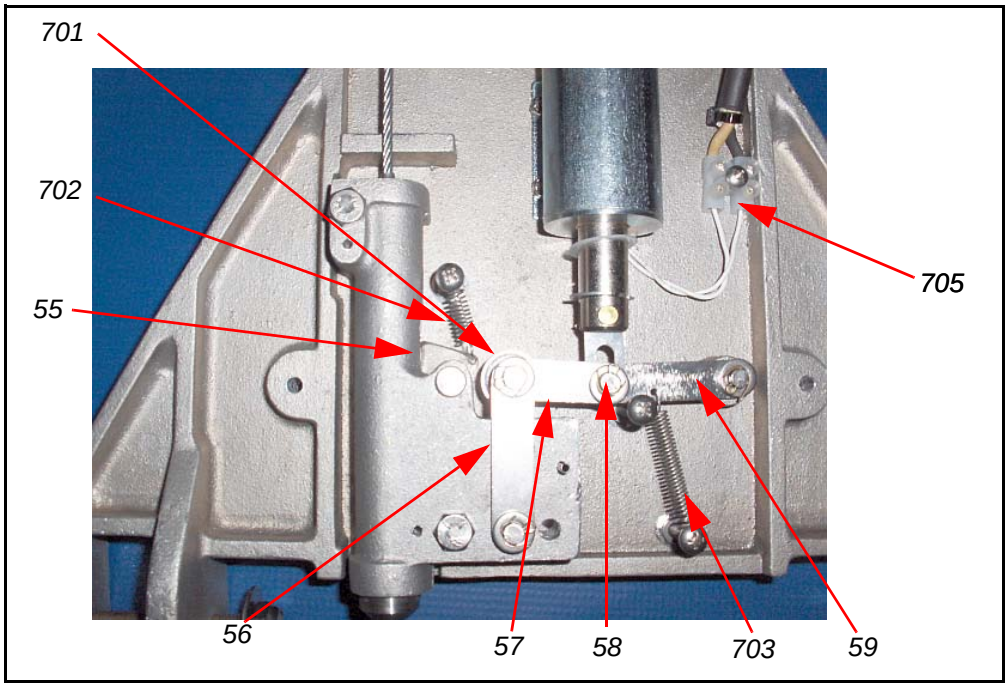
ITEM	MODEL	PART #	DESCRIPTION	QTY
50	BB2024 – BB4453	005261	YOKE, CASTING	1
51		005248	HEAD, BASE, ALMAG535, CASTING	1
52		005257	COVER, HEAD, FRONT, ALMAG535, CASTING	1
53		005234	REEL, SPRING, ASSY 2024 UP	1
54		005258	BLOCK, TRIP, ALMAG535, CASTING	1
60		005334	TRIPLINE, 2024-4453	1
61		005260	WIRE, LEAD, BAMBI	1
605		001790	SHACKLE, ANCHOR, SCREW ¾", GAL	1
700		004772	LABEL, SPECPLATE, ENGRAVED	1
704		005220	SOLENOID, w/HARDWARE	1
706		002956	CLAMP, CABLE, 3/8"	1

Control Head Parts List, Models 2024-4453, Bolts, Nuts and Washers



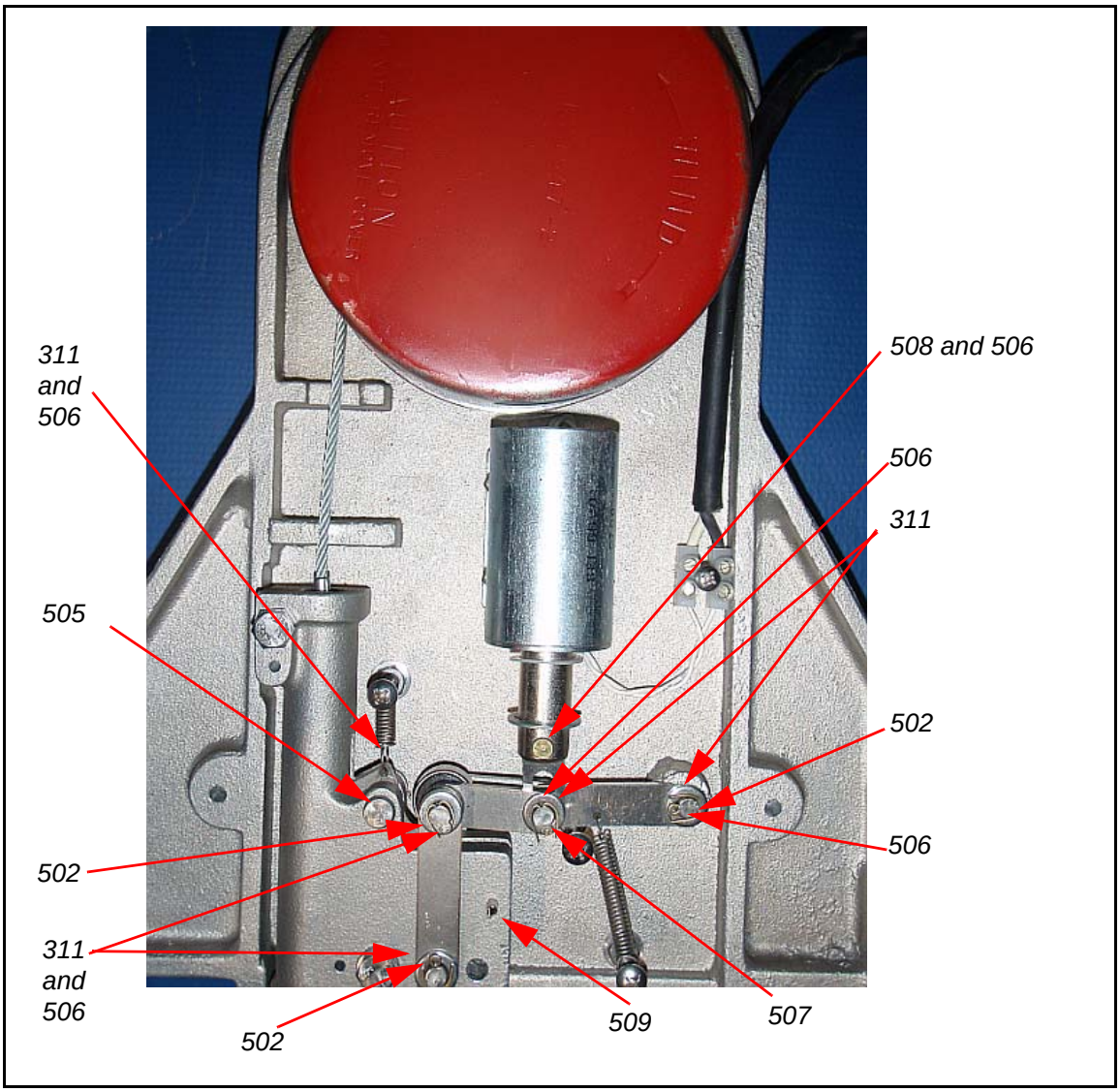
ITEM	MODEL	PART #	DESCRIPTION	QTY
211	BB2024 – BB4453	000276	BOLT, SHL, 5/8 X 2-3/4 X 1/2-13 SC, PLT	1
212		000322	BOLT, HX, 1/2-20 X 3-3/32, CAD	2
213		000551	SCREW, 10-32 X 1-1/2 SC,SS	4
214		006266	SCREW, 1/4-20 X 2, SC, SS	2
215		000498	SCREW, 10-24 X 1-1/4 PNPH, SS	2
216		000501	SCREW, 10-24 X 1-1/2 PNPH, SS	1
217		000508	SCREW, 6-32 X 5/8, SC, SS	4
218		001784	SCREW, SELF, #8 X 3/4, PNPH, SS	1
310		001841	WASHER, FLAT, 1/2 X1-1/4,SS	5
311		001838	WASHER, FLAT, 1/4 X 1/2 , AN,SS	15
406		001668	NUT, HEX, JAM, NYLOCK, 1/2 -13, SS	1
407		001694	NUT, HEX, JAM, NYLOCK, 1/2-20, SS	2
408		001685	NUT, HEX,10-32,SS	4
402		001662	NUT, HEX, NYLOCK, 1/4-20,SS	2
409		001654	NUT, HEX, 10-24, SS	3
410		001658	NUT, HEX, NYLOCK, 6-32, SS	4

Control Head Parts List, Models 2024-4453, Catch, Linkage and Terminal Block



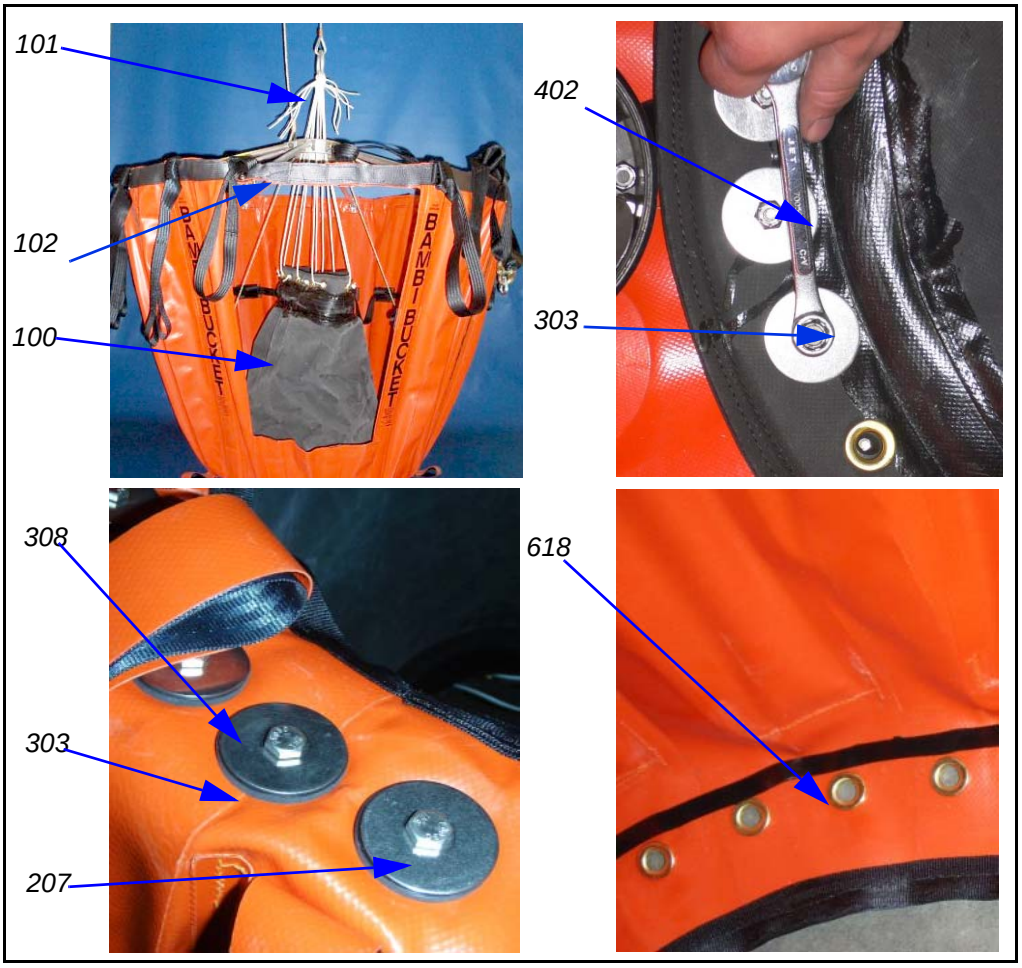
ITEM	MODEL	PART #	DESCRIPTION	QTY
55	BB2024 – BB4453	005230	CATCH, SMALL	1
56		005224	LINK, LONG	2
57		005225	LINK, SHORT	2
58		005226	LINK, SLOTTED	1
59		005227	LINK, SPRING, LONG	1
701		003148	BEARING, RADIAL	1
702		005242	SPRING, CATCH	1
703		005243	SPRING, RETURN	1
705		002953	TERMINAL, BLOCK	1

Control Head Parts List, Models 2024-4453, Clevis, Cotter and Split Pins



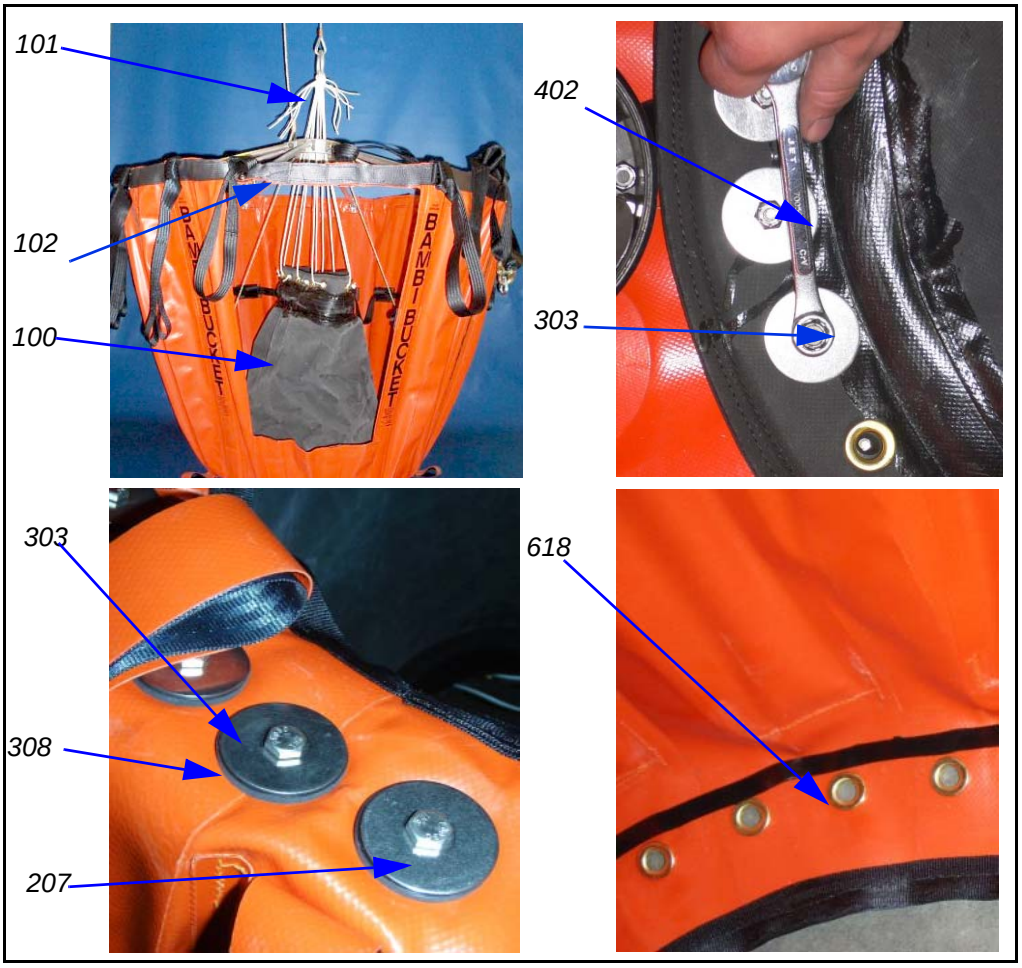
ITEM	MODEL	PART #	DESCRIPTION	QTY
311	BB2024 – BB4453	001844	WASHER, 1/4 X 1/2, SS	15
502		001705	PIN, CLEVIS, 1/4 X 1-1/4, SS	3
505		001704	PIN, CLEVIS, 1/4 X 1, SS	1
506		001712	PIN, COTTER, 1/16 X 1, PLT	6
507		001702	PIN, CLEVIS, 1/4 X 3/4, SS	1
508		001701	PIN, CLEVIS, 1/8 X 3/4, SS	1
509		001733	PIN, SPLIT, 1/8 X 1-1/4, SS	1

Valve Models 2024-3542



ITEM	MODEL	PART #	DESCRIPTION	QTY
100	ALL	005330	VALVE, DUMP, 2024-3542	1
101		005616	STRING, PURSE, SET, 2024-3542	1
102	BB2024	006110	RING, RISER & RESTRAINER CABLES	1
	BB2024S	006114		
	BB2226	005283		
	BB2732	006117		
	BB2732S	006121		
	BB3542	006123		
207	ALL	000370	BOLT, HEX, 1/4-20 X 1, SS	35
303		001857	WASHER, 1/4 X 1-1/2, FND, SS	70
308		001828	WASHER, 7/32 X 1-1/2 X 1/8" NEO	35
42		001662	NUT, HEX, NYLOCK, 1/4-20, SS	35
618		002963	TAPE, BUTYL, 440, 3/16 X 3/8"	10'

Valve Model 4453



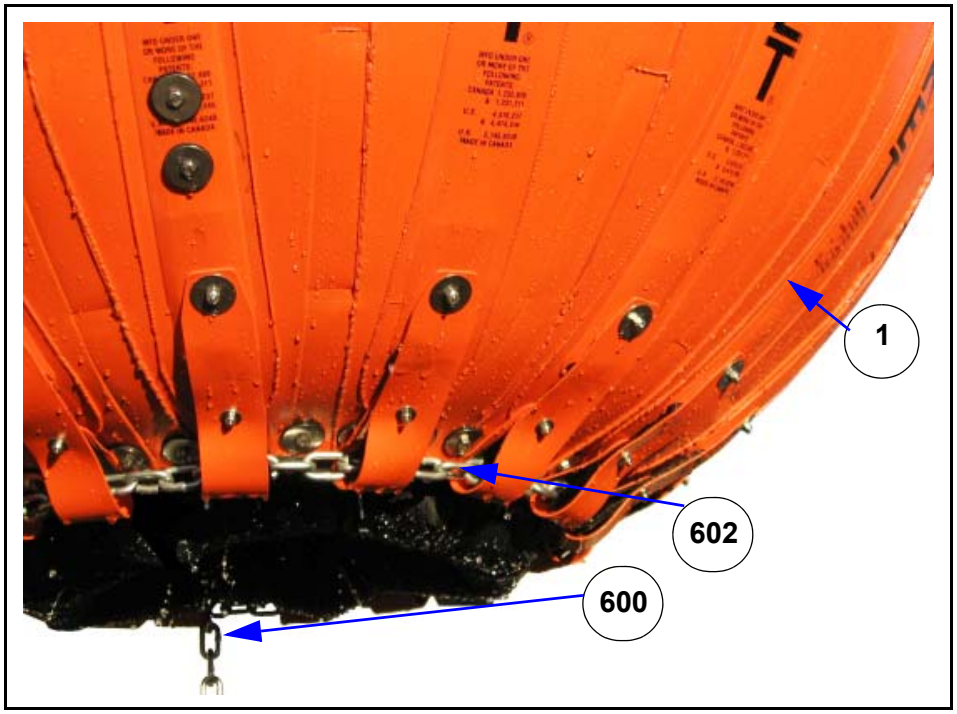
ITEM	MODEL	PART #	DESCRIPTION	QTY
100	BB4453	005280	VALVE, DUMP, 4453-HL9800	1
101		005617	STRING, PURSE, SET, 4453-HL9800	1
102		006630	RING, RISER & RESTRAINER CABLES	1
207		000370	BOLT, HEX, 1/4-20 X 1, SS	40
303		001857	WASHER, 1/4 X 1-1/2, FND, SS	80
308		001828	WASHER, 7/32 X 1-1/2 X 1/8" NEO	40
42		001662	NUT, HEX, NYLOCK, 1/4-20, SS	40
618		008229	TAPE, BUTYL, 440, 3/16 X 3/8"	10'

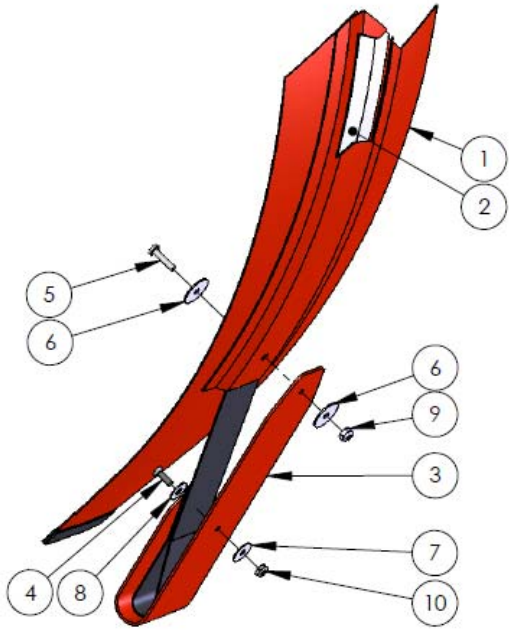
Valve Kits

Valve kits include valve, purse strings, bolts, nuts, washers and butyl tape.

MODEL	PART #	DESCRIPTION	QTY
BB2024-BB3542	006091	VALVE, DUMP, 2024-3542	1
BB4453	006092	VALVE, DUMP, 4453-HL9800	1

Bucket Shell, Models 2024-4453

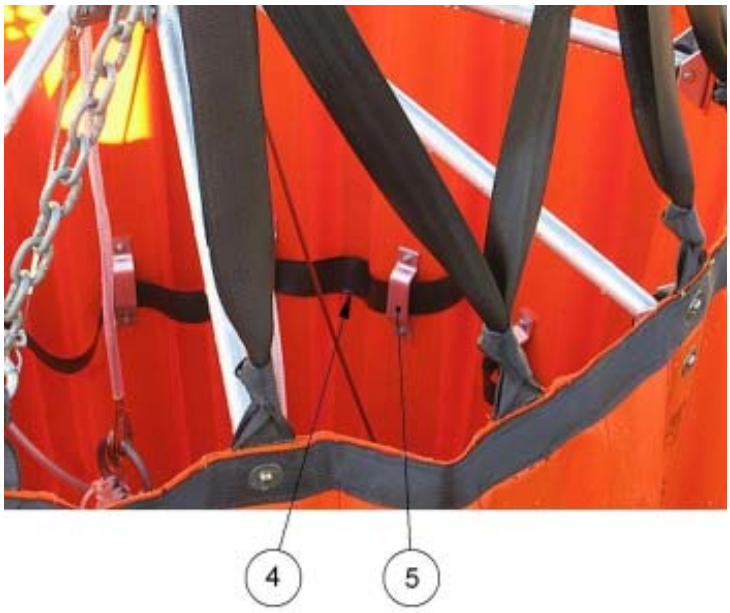


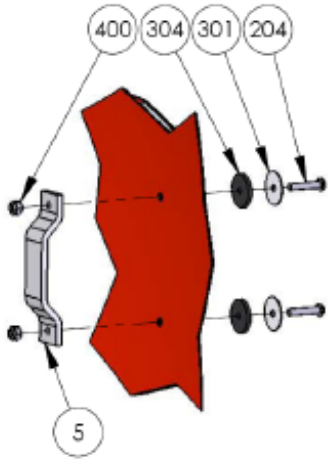


Bucket Shell, Models 2024-4453 (continued)

ITEM	MODEL	PART #	DESCRIPTION	QTY
1	BB2024	005650	SHELL	1
	BB2024S			
	BB2226	005646		
	BB2732	005654		
	BB2732S			
	BB3542	005661		
	BB4453	005664		
2	BB2024	005422	BATTEN, 36-1/2, ASSEMBLY	16
	BB2024S			
	BB2226			
	BB2732	005424	BATTEN, 38-1/2, ASSEMBLY	
	BB2732S			
	BB3542	005425	BATTEN, 48-1/2, ASSEMBLY	
	BB4453	005428	BATTEN, 47-1/2, ASSEMBLY	
3	BB2024-3542	005270	STRIP, WEAR, 16 X 2-3/8”	16
	BB4453			
4	ALL	000450	SCREW, 10-24 X 5/8, FHPH, SS	16
5		000496	SCREW, 10-24 X 7/8, PNPH,SS	14
6		001856	WASHER, FLAT, #10 X 1, FND, SS	28
7		001855	WASHER, FLAT, #10 X 3/4, FND, SS	16
8		001833	WASHER, FLAT, 1/4 X 11/16, THIN, SS	16
9		001660	NUT, HEX, NYLOCK, 10-24, SS	14
10		001661	NUT, HEX, JAM, NYLOCK, 10-24,SS	16
600		001788	SHACLE, ANCHOR, SCREW, 1/4, GLV	1
602	BB2024-3542	007206	CHAIN, BOTTOM, 3/16 X 72”, ASSY	72”
	BB4453	006488	CHAIN, BOTTOM, 5/16 X 72”, ASSY	72”

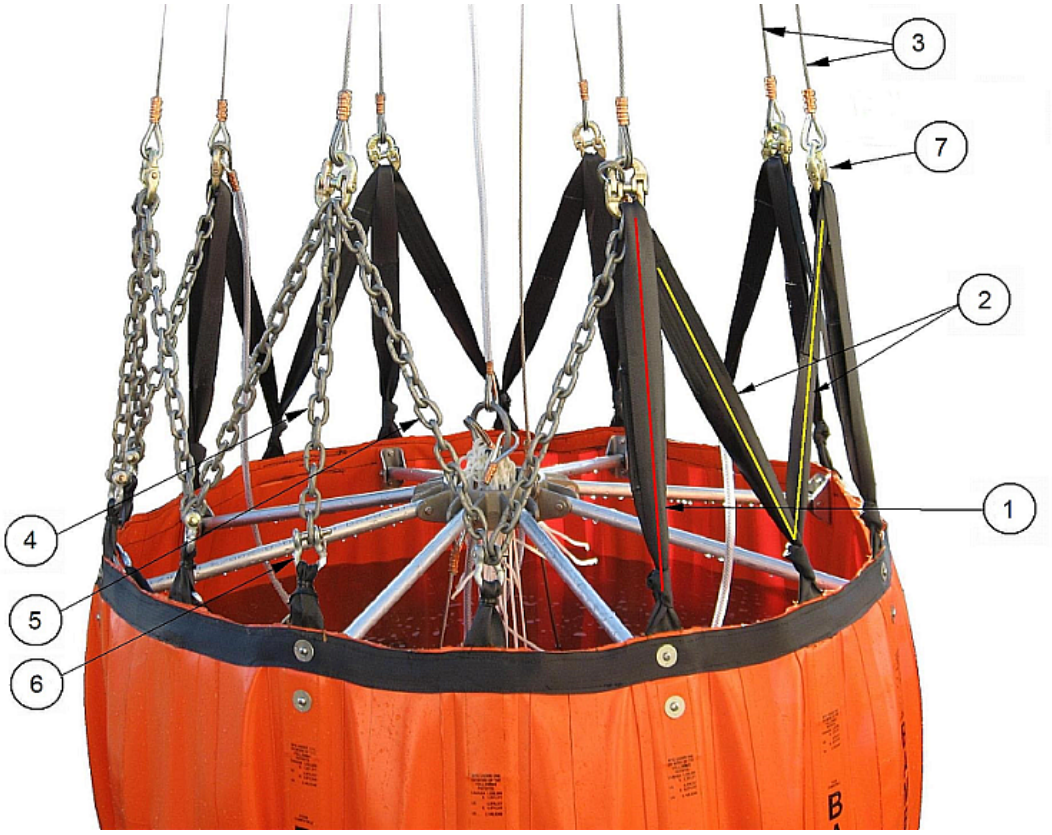
Cinch Strap, Models 2024-4453





ITEM	MODEL	PART #	DESCRIPTION	QTY
4	BB2024	005494	STRAP, CINCH, INTERNAL, 144”	1
	BB2024S			
	BB2226	005495	STRAP, CINCH, INTERNAL, 148”	
	BB2732	005496	STRAP, CINCH, INTERNAL, 168”	
	BB2732S			
	BB3542	005498	STRAP, CINCH, INTERNAL, 188”	
	BB4453	005499	STRAP, CINCH, INTERNAL, 193”	
5	ALL	006197	BRACKET, CINCH, STRAP	16
204		000497	SCREW, 10-24 X 1, PNPH,SS	32
301		001856	WASHER, FLAT, #10 X 1, FND, SS	32
304		001824	WASHER, 3/16 x 1 x 1/8”, NEO	32
400		001660	NUT, HEX, NYLOCK, 10-24, SS	32

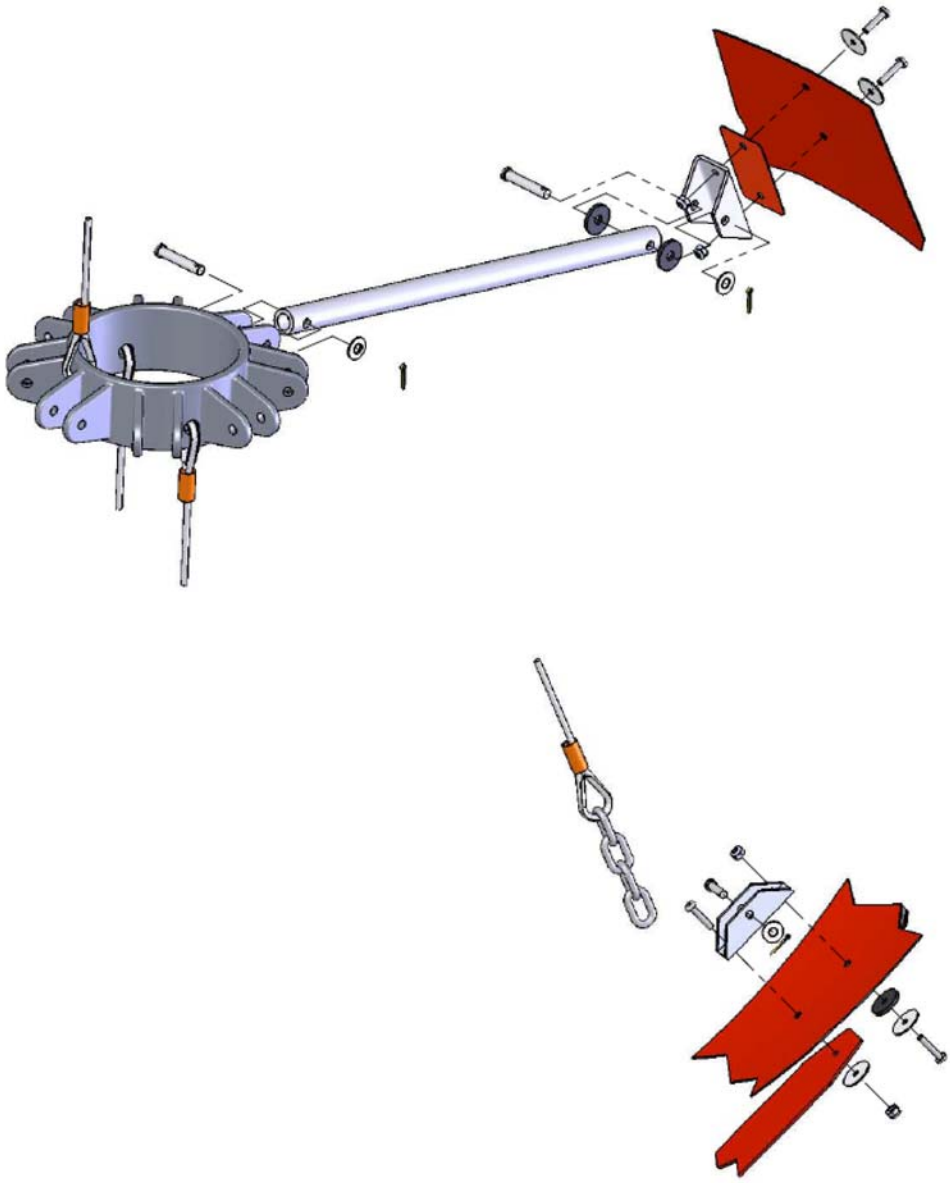
Rigging, Models 2024-4453



Rigging, Models 2024-4453 (continued)

ITEM	MODEL	PART #	DESCRIPTION	QTY
1	BB2024	005469	M-STRAP, LOOP, 18-3/8”	6
	BB2024S			
	BB2226			
	BB2732	005471	M-STRAP, LOOP 22-1/4”	
	BB2732S			
	BB3542			
	BB4453			
2	BB2024	005470	M-STRAP, STRAIGHT 40-3/4”	5
	BB2024S			
	BB2226			
	BB2732	005472	M-STRAP, STRAIGHT, 46-1/2”	
	BB2732S			
	BB3542			
	BB4453			
3	BB2024	005547	CABLE, SUSPENSION, LINE, PAIR	4
	BB2024S	005548		
	BB2226			
	BB2732	005549		
	BB2732S	008854		
	BB3542	005549		
	BB4453			
4	BB2024	005524	CHAIN, TOP, 14.8”	2
	BB2024S			
	BB2226			
	BB2732	005526	CHAIN, TOP, 18.7”	
	BB2732S			
	BB3542			
	BB4453			
5	BB2024	005525	CHAIN, TOP, 16.1”	6
	BB2024S			
	BB2226			
	BB2732	005527	CHAIN, TOP, 21.3”	
	BB2732S			
	BB3542			
	BB4453			
6	ALL	001789	SHACKLE, ANCHOR, 5/16, SCREW,GALV	5
7		004057	LINK, CONNECTING, 9/32, PLT	8

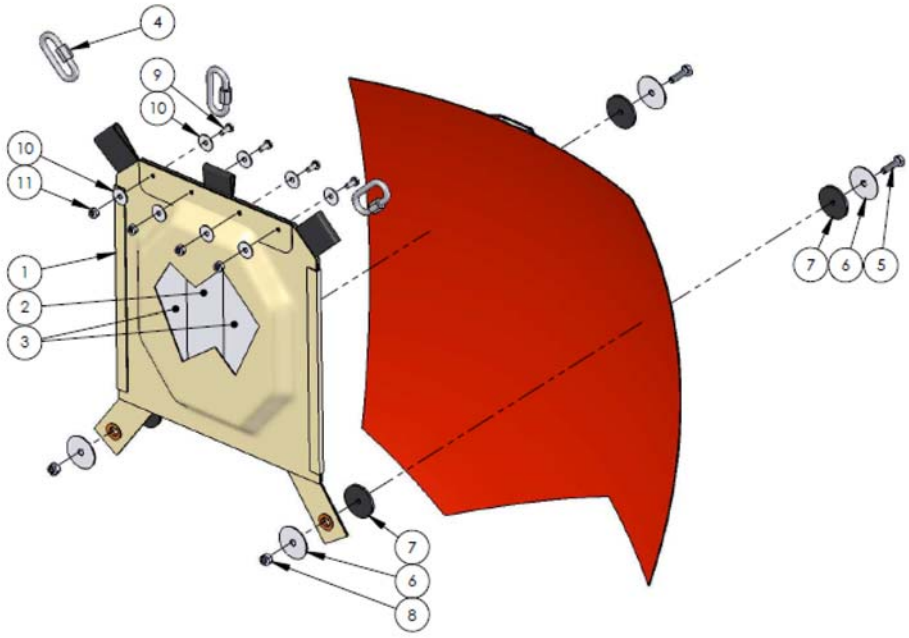
IDS System, Models 2024-4453



IDS System, Models 2024-4453 (continued)

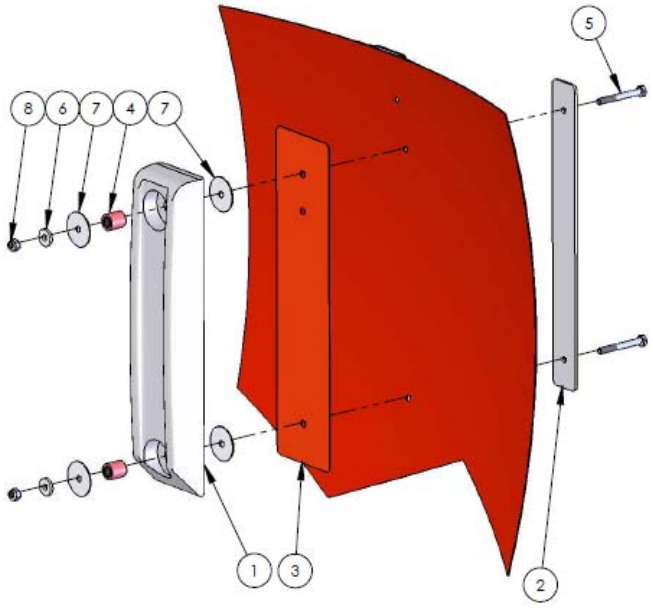
ITEM	MODEL	PART NUMBER	DESCRIPTION	QTY
1	ALL	005373	HUB 8 SPOKE	1
	BB2024	005374	HUB W/ Deployment and Restrainer Cables	1
	BB2024S	008833		
	BB2226	007224		
	BB2732	005376		
	BB2732S	008834		
	BB3542	005377		
	BB4453	005317		
2	BB2024	005343	SPOKE, TUBE, 16-3/4”	8
	BB2226	005344	SPOKE, TUBE, 19-3/8”	
	BB2732	005345	SPOKE, TUBE, 20”	
	BB3542	005346	SPOKE, TUBE, 21-5/8”	
	BB4453	007211	SPOKE, SOLID, 24-5/8	
3	ALL	005385	BRACKET,SHELL	8
4		005389	PATCH,WEAR,BRACKET	8
5		004848	BACKET,RESTRAINER	2
6	BB2024	005297	CABLE, IDS,RESTRAINER	2
	BB2226			
	BB2732	005298		
	BB3542	005299		
	BB4453	005300		
7	BB2024	005316	CABLE,IDS,DEPLOYMENT	1
	BB2024S	006477		
	BB2226			
	BB2732	005317		
	BB2732S	008828		
	BB3542	005317		
	BB4453	005317		
8	ALL	000496	SCREW,10-24 X 7/8,PNPH, SS	8
9		000497	SCREW,10-24 X 1”,PNPH, SS	12
10		001856	WASHER, FLAT,#10 X 1,FND, SS	20
11		001833	WASHER, FLAT,1/4 X 11/16,THIN, SS	2
12		001824	WASHER, 3/16 X 1 X 1/8 NEO	2
13		000068	WASHER, FLAT,5/16 X 3/4, SS	16
14		001826	WASHER, 5/16 X 1 X 1/8, NEO	16
15		001660	NUT, HX, NYLOCK,10-24, SS	20
16		001697	PIN, CLEVIS, 5/16 X 1-3/4, SS	16
17		001703	PIN, CLEVIS, 1/4 1-1/8, SS	2
18		001710	PIN, COTTER, 1/16 X 3/4 PLT	2
19		001713	PIN, COTTER, 3/32 X 3/4 PLT	16

Ballast Systems, Models 2024-3542



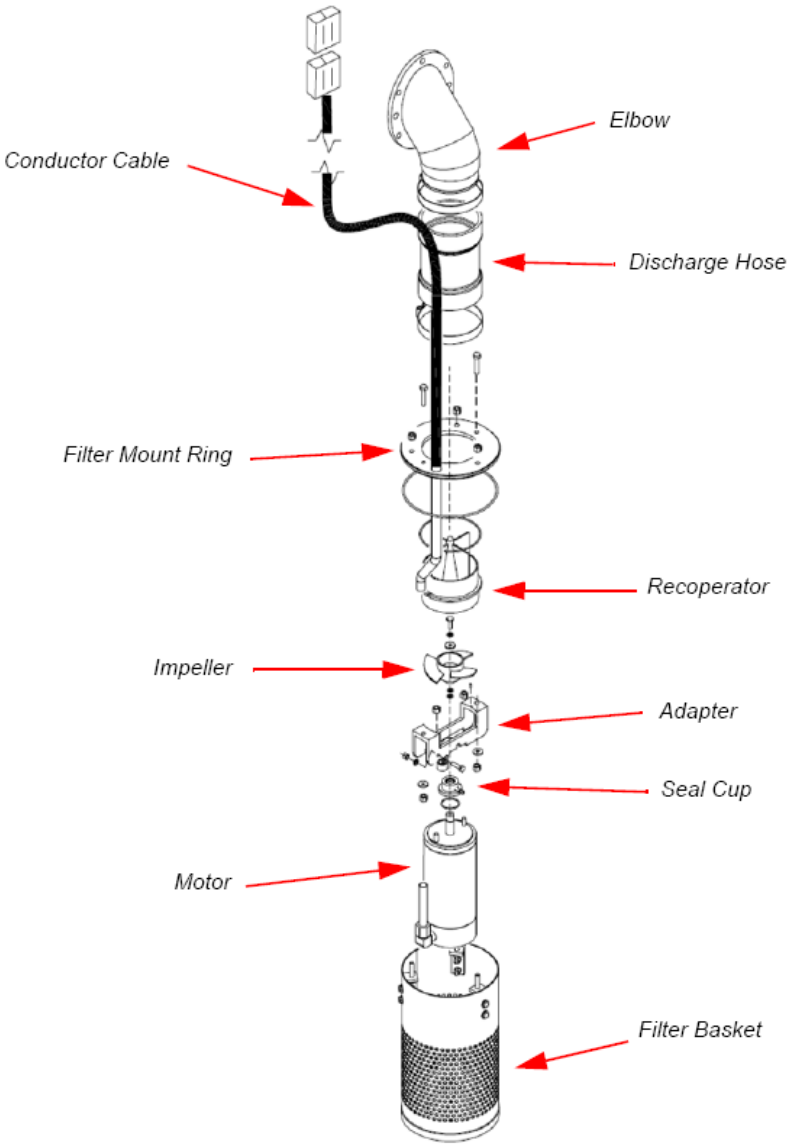
ITEM	MODEL	PART NUMBER	DESCRIPTION	QTY
1	BBX1821	005444	POUCH, BALLAST	1
	BBX2024	005452		
	BBX2024S			
	BBX2024PF			
	BBX2226			
	BBX2226PF			
	BBX2732	005446		
	BBX2732S			
	BBX3542	005447		
2	ALL	005465	BAR, BALLAST, SQUARE,2X2X8.375, GALV	1
3		005466	BAR, BALLAST, TAPER,2X2X8.375 GALV	2
4		003001	QUICKLINK, 1/4,ZC-PLT	3
5		000370	BOLT, HX, 1/4-20 X 1,,SS	2
6		001857	WASHER, FLAT,1/4 X 1-1/2,FND,SS	4
7		001828	WASHER, 7/32 X 1-1/2 X 1/8 NEO	2
8		001662	NUT, HX, NYLOCK,1/4-20,SS	2
9		000493	SCREW,10-24 X 1/2,PNPH,SS	4
10		001855	WASHER, FLAT, #10 X 3/4,FND,SS	8
11		001660	NUT,HX, NYLOCK,10-24,SS	4
KIT	BBX1821	006185	BALLAST, POUCH, ASSEMBLY, COMPLETE	1
	BBX2024	006186		
	BBX2024S			
	BBX2024PF			
	BBX2226			
	BBX2226PF			
	BBX2732	006187		
	BBX2732S			
	BBX3542	006188		

Ballast Systems, Model 4453



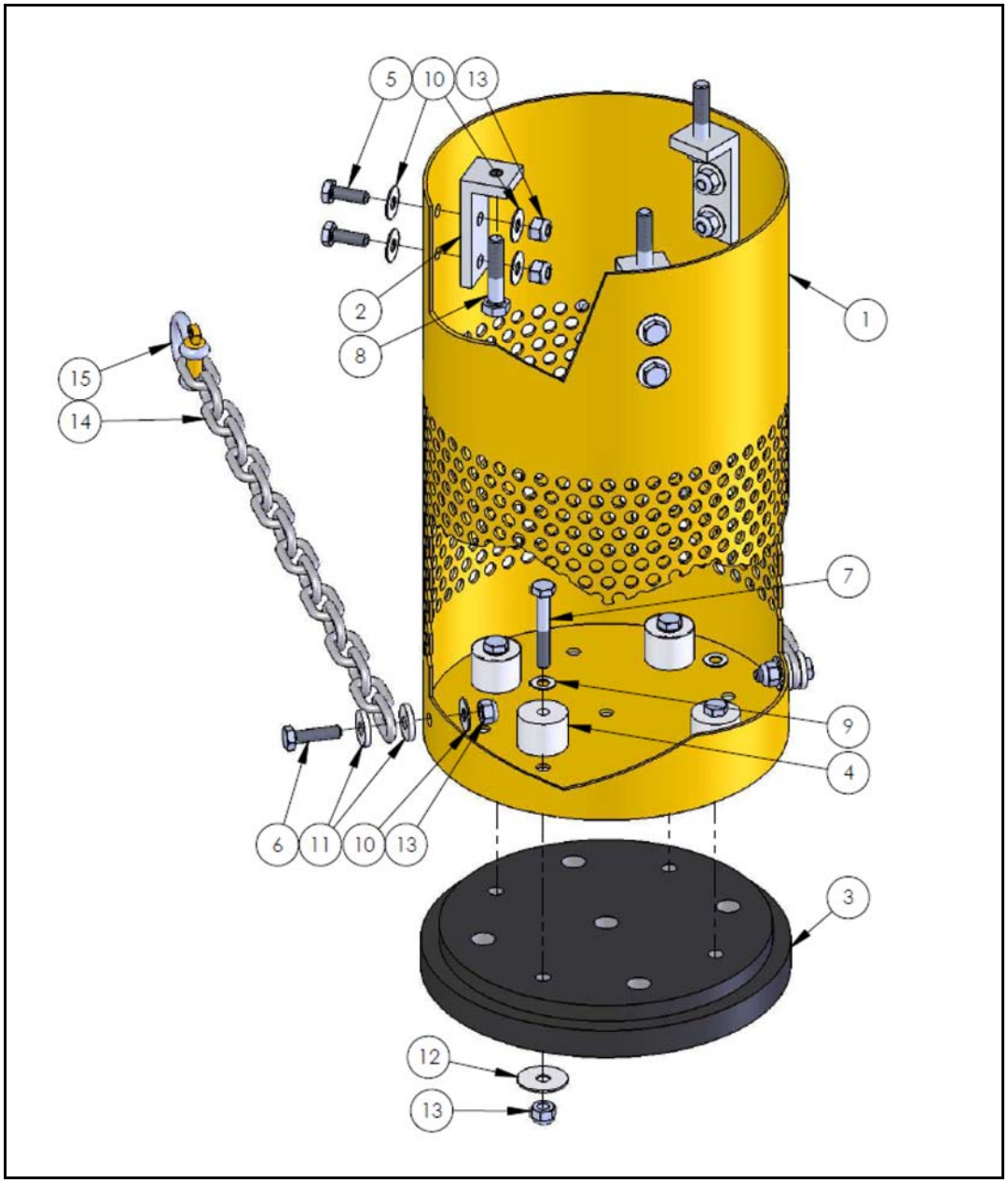
ITEM	MODEL	PART NUMBER	DESCRIPTION	QTY
1	ALL	005455	BALLAST BAR, 16 LB, GALV	3
2		005499	BACKING PLATE, LG, SS	3
3		005494	PATCH, WEAR, BALLAST	3
4		007111	SPACER, BALLAST BAR	6
5		000380	BOLT, HX, 1/4-20 X 2-1/4, SS	6
6		001834	WASHER, FLAT, 1/4 X 3/4 X 1/8, SS	6
7		001857	WASHER, FLAT, 1/4 X 1-1/2, SS	12
8		001662	NUT, HX, NYLOCK , 1/4-20, SS	6

PowerFill Snorkel Drawing



Note: PowerFill Snorkel is available on models 2024, 2732 and 3542 only.

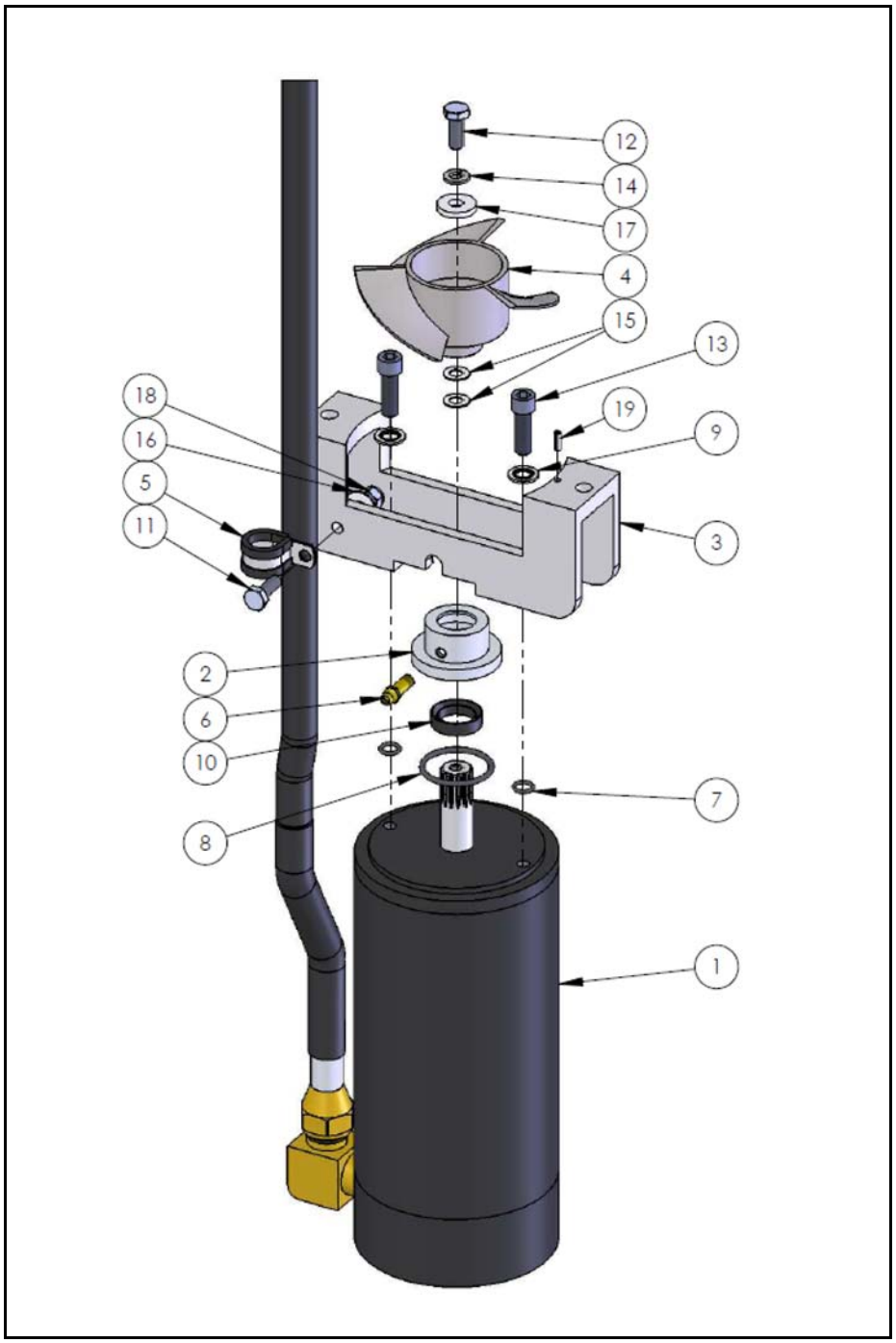
Filter Basket Assembly



Filter Basket Assembly (continued)

ITEM	MODEL	PART #	DESCRIPTION	QTY
1	ALL	005208	BASKET, FILTER, PF2	1
2		001087	BRACKET, MOUNT, FILTERBASKET, PF2	3
3		001088	BLOCK, BUMPER, PUMP, PF2	1
4		001652	SPACER, 1/4" x 5/8" NYLON	4
5		000369	BOLT, HEX, 1/4-20 x 3/4, SS	6
6		000370	BOLT, HEX, 1/4-20 x 1, SS	2
7		000376	BOLT, HEX, 1/4-20 x 1-1/2, SS	4
8		000388	BOLT, HEX, 5/16-18 x 1-1/2, SS	3
9		001838	WASHER, FLAT, 0.27 x 0.50 x 0.032, SS	4
10		001833	WASHER, FLAT, 0.28 x 0.69 x 0.036, SS	14
11		001834	WASHER, FLAT, 0.28 x 0.75 x 0.125, SS	4
12		001858	WASHER, FLAT, 0.28 x 1.00 x 0.047, SS	4
13		001662	NUT, HEX, NYLOCK, 1/4-20, SS	12
14	2024	003844	CHAIN, 3/16", GR30, GLV.	2.6 FT
	2226			2.6 FT
	2732			3.0 FT
	3542			3.7 FT
15	ALL	001788	SHACKLE, ANCHOR, SCREW, 1/4, GLV	2

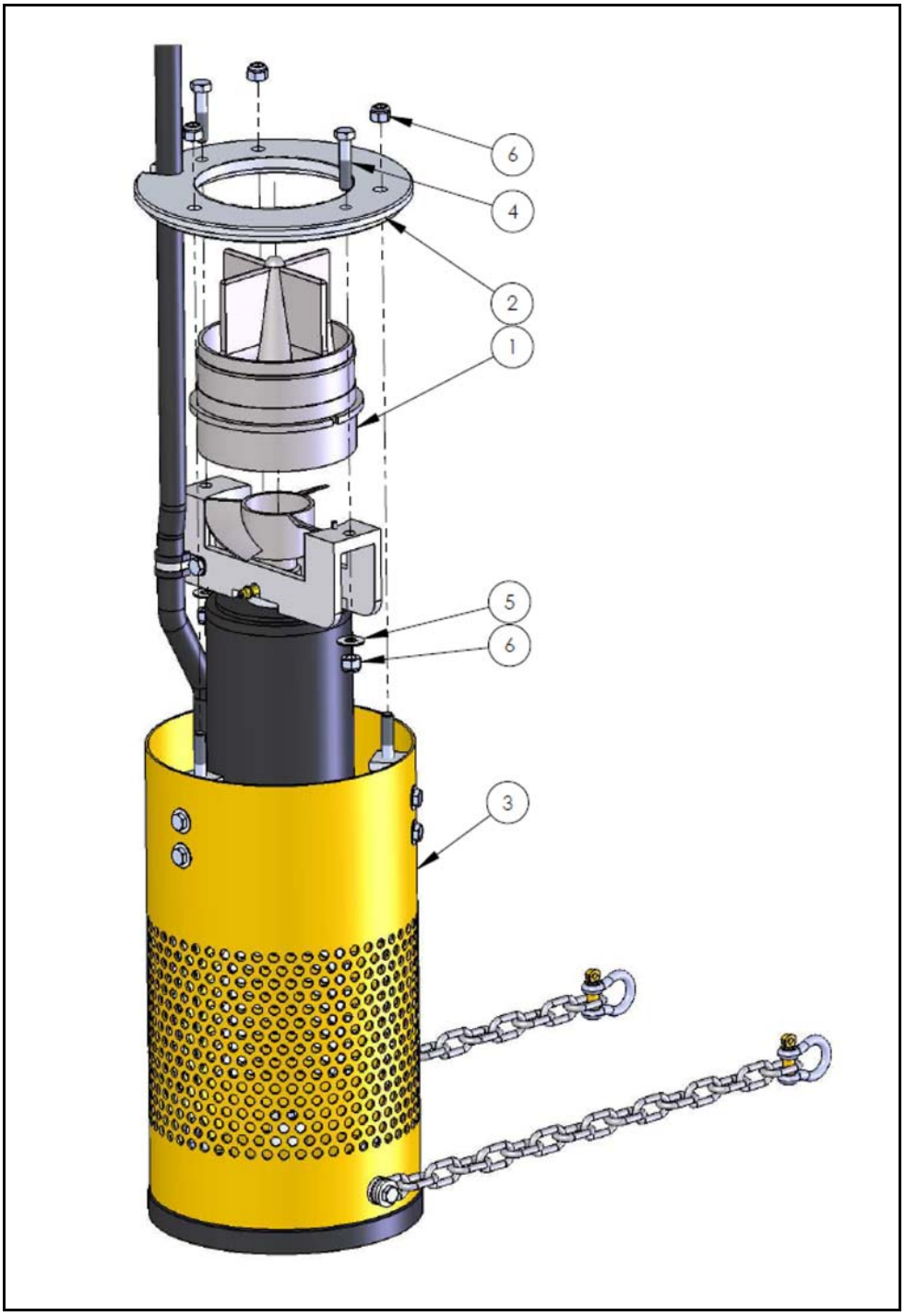
Motor Assembly



Motor Assembly (continued)

ITEM	PART #	DESCRIPTION	QTY
1	006230	MOTOR, PF2, ASSEMBLY	1
2	001059	CUP, SEAL, MOTOR	1
3	005207	ADAPTER, MOTOR, PF2	1
4	005734	IMPELLER, CAST, SS, 4", #3	1
5	002957	CLAMP, CABLE, 5/8"	1
6	005175	FITTING, GREASE, 1/4-28 x 15/16	1
7	007995	O-RING, BUNA N, #011, 50A	2
8	001890	O-RING, BUNA N, #124	1
9	001866	STATOSEAL, 5/16,PLT	2
10	006228	SEAL, LIP, 5/8 x 25 x 1/4	1
11	000369	BOLT, HEX, 1/4-20 x 3/4, SS	1
12	000533	BOLT, HEX, 1/4-28 x 3/4, SS	1
13	000432	SCREW, SC, 5/16-18 x 1, SS	2
14	001852	WASHER, LOCK, SPLIT, 1/4, SS	1
15	001838	WASHER, FLAT, 0.27 x 0.50 x 0.032, SS	2
16	001833	WASHER, FLAT, 0.28 x 0.69 x 0.036, SS	1
17	001834	WASHER, FLAT, 0.28 x 0.75 x 1.125, SS	1
18	001662	NUT, HEX, NYLOCK, 1/4-20, SS	1
19	001734	PIN, SPLIT, 1/8 x 3/8, SS	1

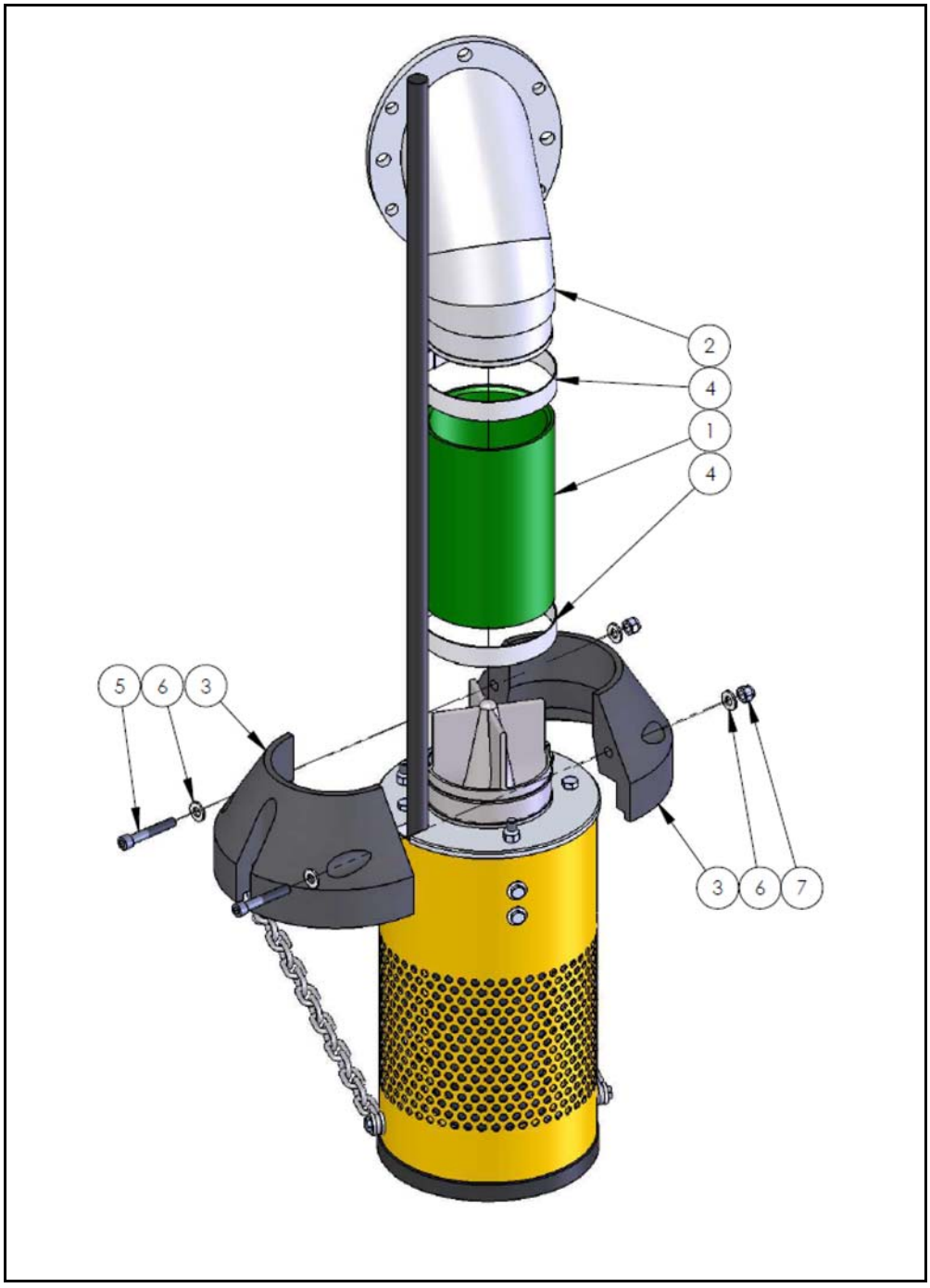
Recuperator



Recuperator (continued)

ITEM	PART #	DESCRIPTION	QTY
1	001085	RECUPERATOR, PF2	1
2	001084	RING, MOUNT, FILTER, PF2	1
3	001089	BASKET, FILTER, PF2, ASSEMBLY, 2024	1
	001090	BASKET, FILTER, PF2, ASSEMBLY, 2226	
	001091	BASKET, FILTER, PF2, ASSEMBLY, 2732	
	001092	BASKET, FILTER, PF2, ASSEMBLY, 3542	
4	000388	BOLT, HEX, 5/16-18 x 1-1/2, SS	2
5	000068	WASHER, FLAT, 0.34 x 0.75 x 0.047, SS	2
6	001664	NUT, HEX, 5/16-18, SS	5

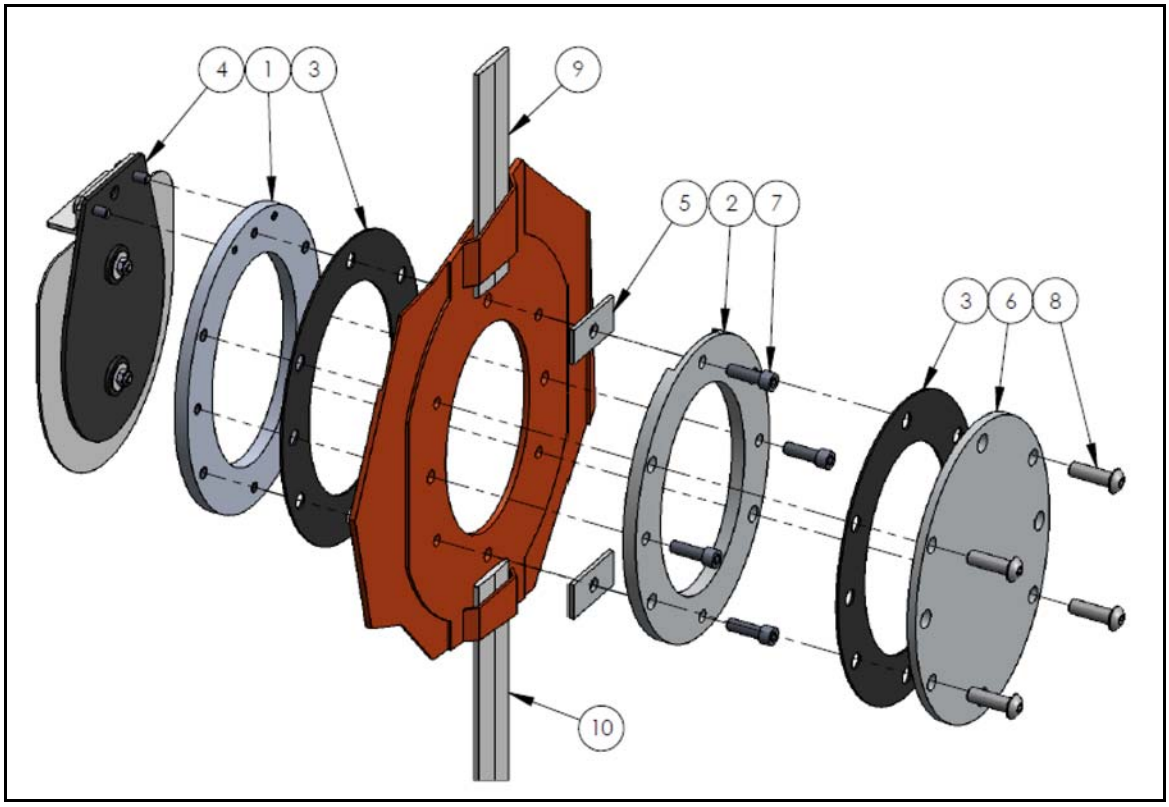
Discharge Hose Assembly



Discharge Hose Assembly (continued)

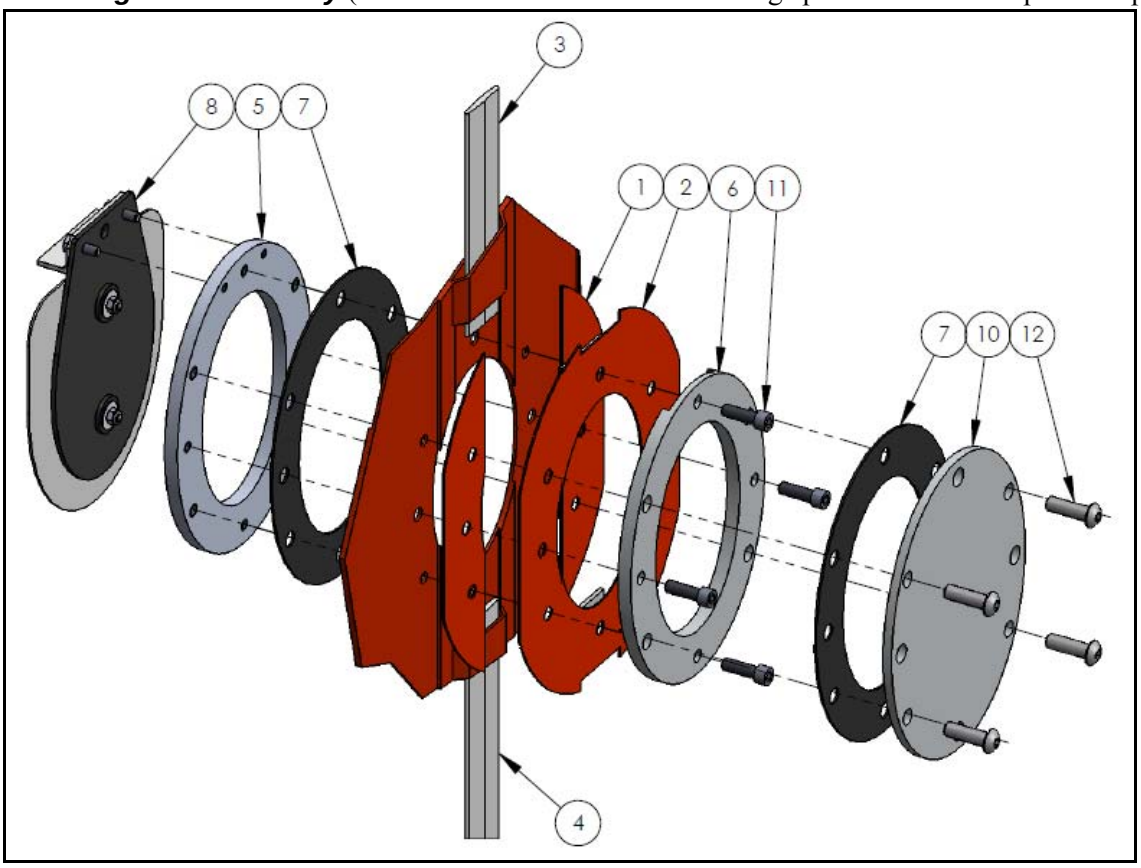
ITEM	MODEL	PART #	DESCRIPTION	QTY
1	2024	001079	HOSE, DISCHARGE, PF2, 2024-2226	1
	2226			
	2732	001081	HOSE, DISCHARGE, PF2, 2732	
	3542	001082	HOSE, DISCHARGE, PF2, 3542	
2	ALL	006231	ELBOW, PF2, FABRICATION	1
3		006413	CONE, SEGMENT, PLASTIC	2
4		003060	CLAMP, T-BOLT, 4.5", SS	2
5		006516	SCREW, SC 5/16-18 x 2, SS	2
6		006702	WASHER, FLAT. 0.34 x 0.69 x 0.08, SS	4
7		001664	NUT, HEX, NYLOCK, 5/16-18, SS	7

Flange Assembly for Shell



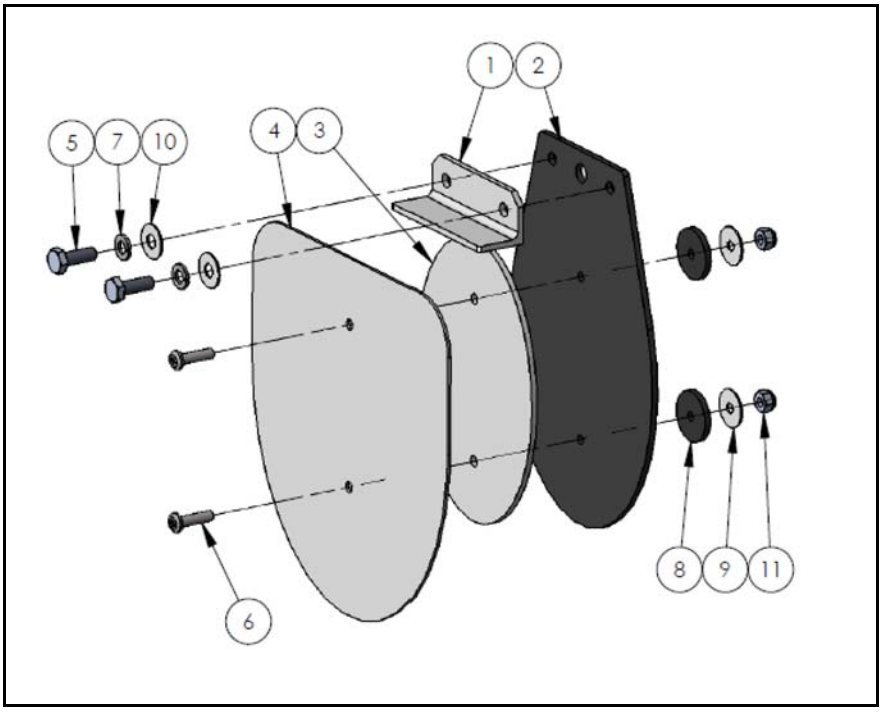
ITEM	Model	PART #	DESCRIPTION	QTY
1	All	001075	FLANGE, INNER, PF2	1
2		001076	FLANGE, OUTER, PF2	1
3		001078	GASKET, FLANGE, PF2	2
4		005737	VALVE, FLAPPER, PF2	1
5		001074	PLATE, ANCHOR, PF2	2
6		001093	PLATE, BLANK, FLANGE, PF2	1
7		000432	SCREW, SC, 5/16-18 x 1, SS	4
8		000519	SCREW, BC, 3/8-16 x 1-1/4, SS	4
9	2024	006492	BATTEN, FIBREGLASS, 1-5/8 X 6-1/2”	1
	2226			
	2732	006615	BATTEN, FIBREGLASS, 1-5/8 X 9”	
	3542	006619	BATTEN, FIBREGLASS, 1-5/8 X 12-1/2”	
10	2024	006491	BATTEN, FIBREGLASS, 1-5/8 X 20-3/4	1
	2226			
	2732	006616	BATTEN, FIBREGLASS, 1-5/8 X 20-1/4	
	3542	006618	BATTEN, FIBREGLASS, 1-5/8 X 27-1/2	

Retrofit Flange Kit Assembly (this kit is used when there's no flange patch as shown on previous page)



ITEM	MODEL	PART #	DESCRIPTION	QTY
1	All	006625	SPACER, SHELL, PF2, 2024-4453	2
2		006626	DOUBLER, SHELL, PF2, 2024-4453	1
3	2024	006492	BATTEN, FIBREGLASS, 1-5/8" X 6-1/2"	1
	2226			
	2732	006615	BATTEN, FIBREGLASS, 1-5/8 X 9"	
	3542	006619	BATTEN, FIBREGLASS, 1-5/8 X 12-1/2"	
	4453	006629	BATTEN, FIBREGLASS, 1-5/8 X 14-1/2"	
4	2024	006491	BATTEN, FIBREGLASS, 1-5/8 X 20-3/4"	1
	2226			
	2732	006616	BATTEN, FIBREGLASS, 1-5/8 X 20-1/4"	
	3542	006618	BATTEN, FIBREGLASS, 1-5/8 X 27-1/2"	
	4453	006628	BATTEN, FIBREGLASS, 1-5/8 X 24"	
5	All	001075	FLANGE, INNER, PF2	1
6		001076	FLANGE, OUTER, PF2	1
7		001078	GASKET, FLANGE, PF2	2
8		005737	VALVE, FLAPPER, ASSEMBLY, PF2	1
9		001074	PLATE, ANCHOR, PF2	2
10		001093	PLATE, BLANK, FLANGE, PF2	1
11		000432	SCREW, SC, 5/16-18 X 1", SS	4
12		00519	SCREW, BC, 3/8-16 X 1"-1/4" SS	4

Flapper Valve Assembly



ITEM	PART NUMBER	DESCRIPTION	QTY
1	001070	BRACKET, VALVE, FLAPPER, PF2	1
2	001071	VALVE, FLAPPER, PF2	1
3	001072	SPACER, VALVE, FLAPPER , PF2	1
4	001073	DEFLECTOR, VALVE, FLAPPER, PF2	1
5	000369	BOLT, HEX, 1/4-20 x 3/4, SS	2
6	000495	SCREW, PNPH, 10-24 x 3/4 , SS	2
7	001852	WASHER, LOCK, SPLIT, 1/4, SS	2
8	001824	WASHER, FLAT, 3/16 x 1 x 1/8, NEO	2
9	001855	WASHER, FLAT, 0.20 x 0.75 x 0.036, SS	2
10	001833	WASHER, FLAT, 0.28 x 0.69 x 0.036, SS	2
11	001660	NUT, HEX, NYLOCK, 10-24, SS	2

Packaging Parts List

PART #	DESCRIPTION	QTY
005599	BAG, CARRY, BAMBI, 2024-4453	1
	OTHER	
003645	PATCH, FABRIC, 8 X 10" ORANGE	1
004502	CLAMP, REPAIR, SMALL	1
004503	CLAMP, REPAIR, MEDIUM	1
004504	CLAMP, REPAIR, LARGE	1
003613	REPAIR, KIT (NO GLUE)	1
003090	ADHESIVE, DURA-SEAL 3/4 OZ	1

Trouble Shooter Kit Model 2024-3542 (006208)

Part No.	Description	Qty.
005220	SOLENOID, w/HARDWARE	1
005234	REEL, SPRING, HEAVY DUTY, ASSY	1
005330	VALVE, DUMP, 2024-3542	1
005616	STRING, PURSE, SET, 2024-3542	1
000370	BOLT, HEX, 1/4-20 X 1, SS	40
001662	NUT, HEX, NYLOCK, 1/4-20	40
001828	WASHER, 7/32 X 1-1/2 X 1/8" NEO	40
001857	WASHER, FLAT,1/4 X 1-1/2, FND, SS	80
002963	TAPE, BUTYL, 1/8 X 3/8	10
005334	TRIPLINE, BB2024-4453	1

Trouble Shooter Kit Model 4453 (006210)

Part No.	Description	Qty.
005221	SOLENOID, w/HARDWARE	1
005234	REEL, SPRING, HEAVY DUTY, ASSY	1
005280	VALVE, DUMP, 4453-HL9800	1
005617	STRING, PURSE, SET	1
000370	BOLT, HEX,, 1/4-20 X 1, SS	40
001662	NUT, HEX, NYLOCK, 1/4-20, SS	40
001828	WASHER, 7/32 X1-1/2 X 1/8" NEO	40
001857	WASHER, FLAT, 1/4 X 1-1/2, FND, SS	80
002963	TAPE, BUTYL, 1/8 X 3/8	10
005334	TRIPLINE, BB2024-4453	1

Section 11: 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.

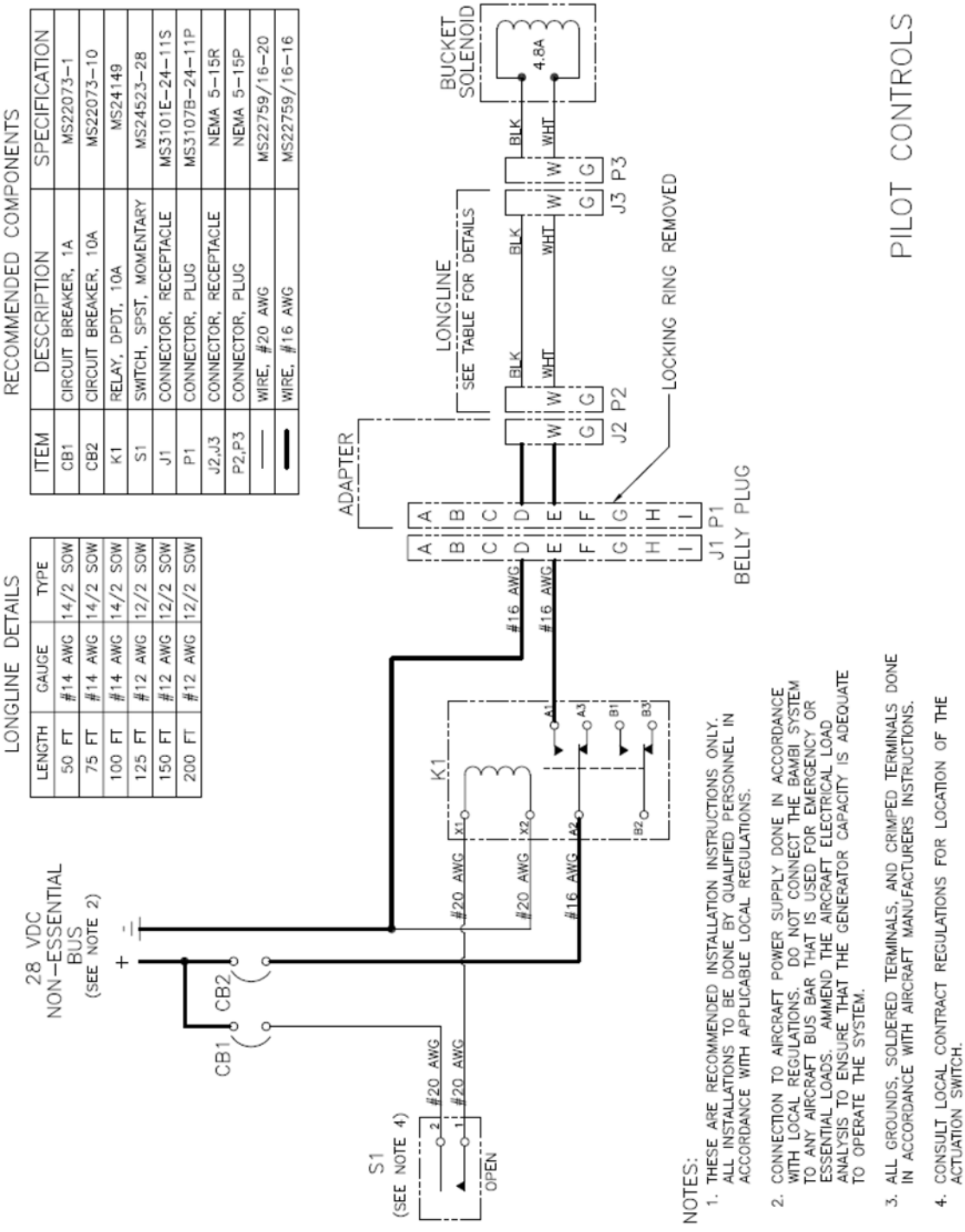
Exclusions

l) This warranty is void if the product is not installed, used and/or maintained in accordance with the operations manual supplied by SEI.

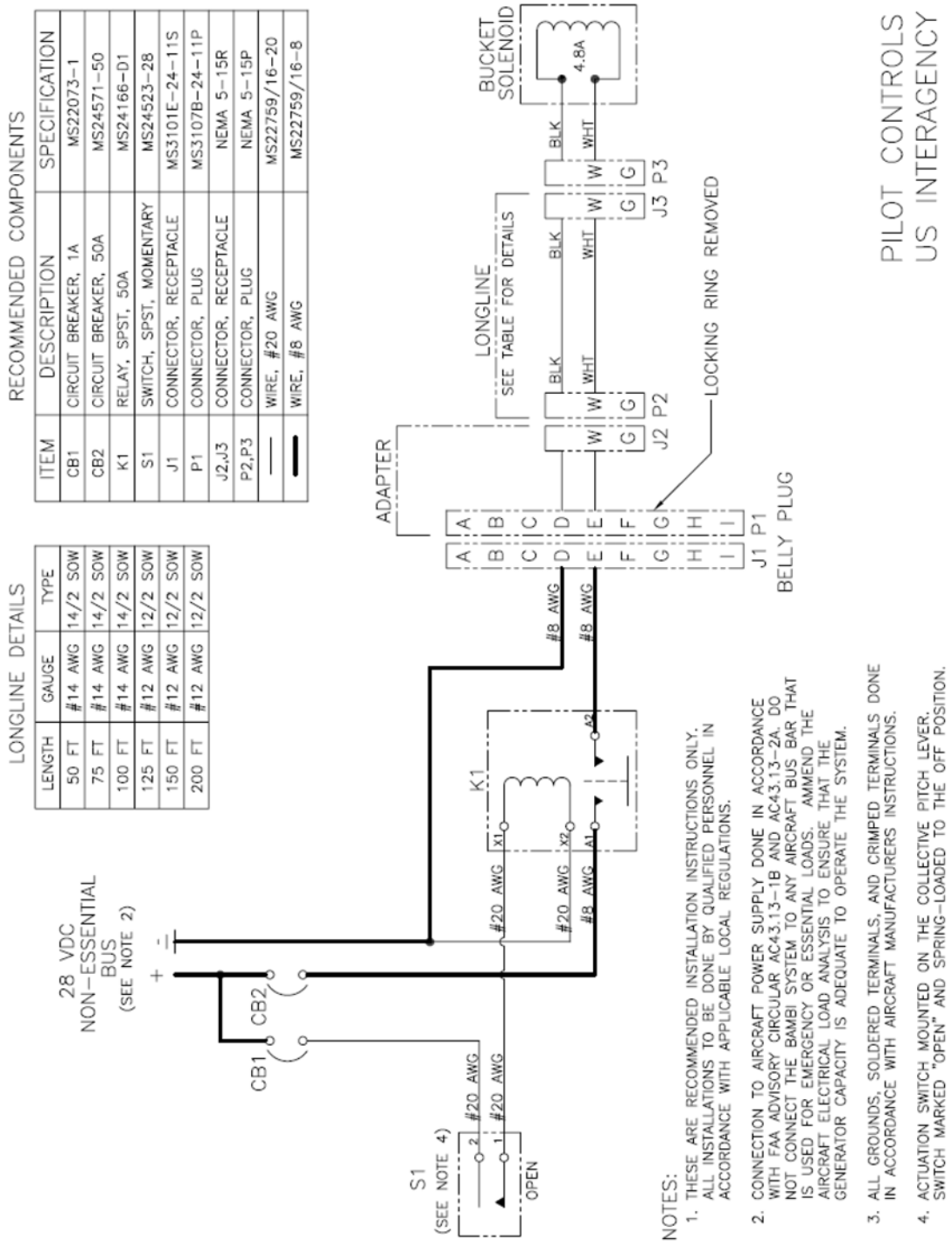
m) All Bambi buckets are designed and manufactured with substantial safety margins. It is the responsibility of the user to ensure that the bucket is maintained to a safe standard.

Section 12: Drawings

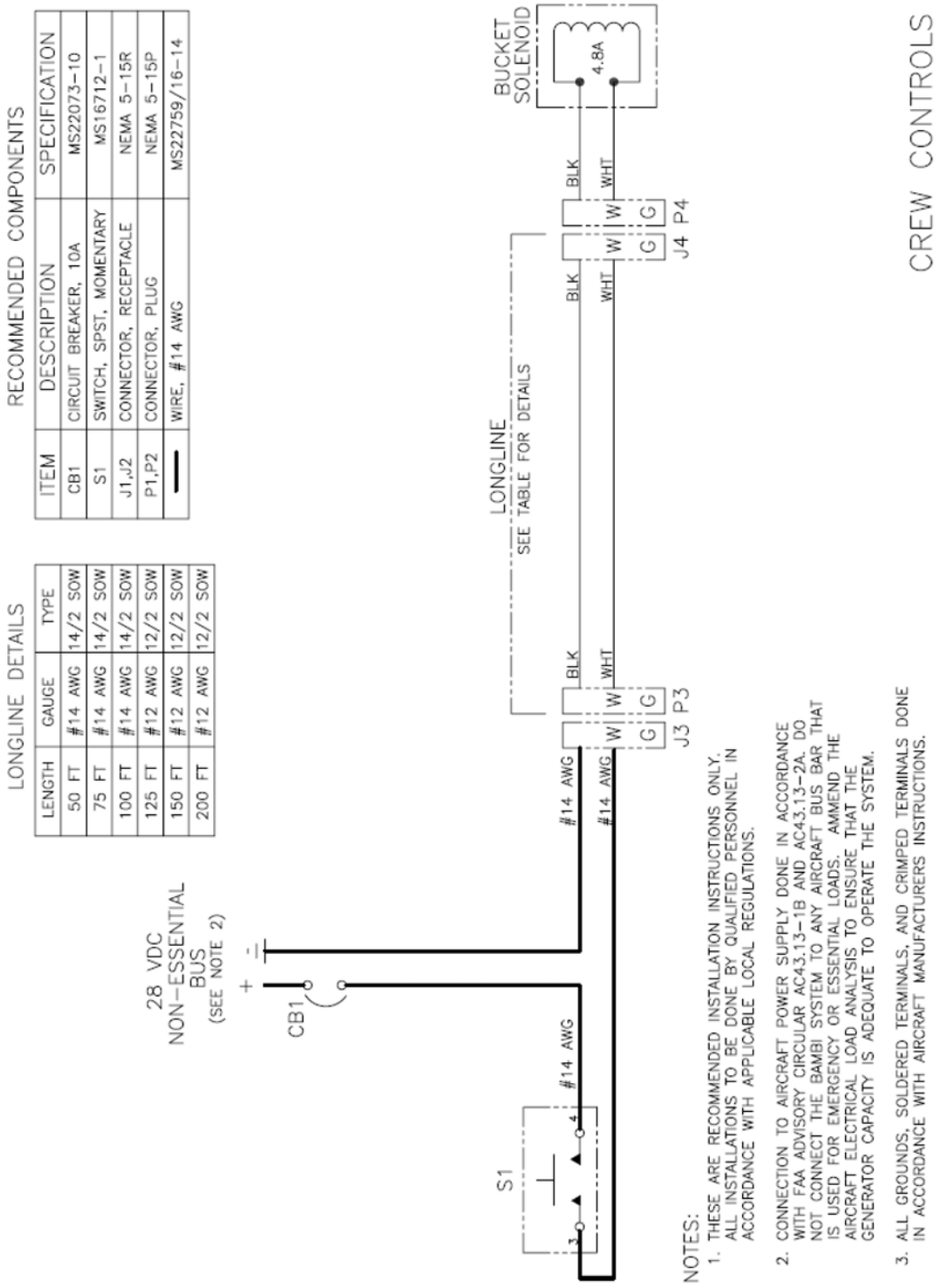
Pilot Controls



Pilot Controls, US InterAgency



Bambi Crew Controls



Bambi Crew Controls (using remote power supply)