



SEI
INDUSTRIES



Bambi
BUCKET®
Driven by Innovation

BAMBI BUCKET
(6072-1821 MODELS)
SERVICE
MANUAL

2015 VERSION E

**BAMBI BUCKET SERVICE MANUAL - Version E
(Models 6072-1821 only)**

Issue Date: July 2015

PLEASE READ BEFORE USING.

SEI INDUSTRIES LTD.

7400 Wilson Avenue
Delta, B.C. Canada
V4G 1H3

Phone: (604) 946-3131

Fax: (604) 940-9566

E-Mail: seisales@sei-ind.com

Website: www.sei-ind.com

COPYRIGHT © 2015 SEI INDUSTRIES LTD. ALL RIGHTS RESERVED
PRINTED IN CANADA



Table of Contents

Section 1: Introduction to the Bambi Bucket	1
Overview (Models 6072-1821)	1
Section 2: Deploying the Bambi Bucket	2
Deployment Information	2
<i>Control Head Orientation (Models 6072-1821 only)</i>	2
<i>Control Head Operation</i>	4
<i>Connecting Power</i>	4
<i>Using Longlines</i>	6
<i>Checking Suspension Cable Length</i>	7
<i>Shortening Suspension Cables</i>	9
Instant Deployment System (IDS)	12
Section 3: Using Accessories	13
Using Foam	13
<i>Sacksafoam Foam Injection System</i>	13
<i>Compatible Bambi Bucket/Sacksafoam Models</i>	14
Section 4: Making Adjustments	15
Adjusting Various Components	15
<i>Adjusting the Dump Valve Udder</i>	15
<i>Adjusting the Udder via the Tripline</i>	15
<i>Adjusting Udder After Shortening Cables</i>	16
<i>Adjusting Purse Strings in the Dump Valve</i>	16
<i>Checking Purse Line Adjustment</i>	17
Section 5: Packing and Storage	18
Packing and Storing	18
<i>Packing the Bucket</i>	18
<i>Storing the Bambi Bucket</i>	21
Section 6: Troubleshooting guide	22
General Troubleshooting Guide	22
<i>Control Head Troubleshooting</i>	23
Section 7: Control Head Maintenance	27
Operation and Maintenance	27
<i>Control Head Operation</i>	27
Tripline Replacement	27
<i>Removing the Old Tripline</i>	28

<i>Winding the Spring Reel</i>	30
<i>Installing a New Tripline</i>	31
Spring Power Reel Replacement	34
<i>Removing Old Spring Reel</i>	34
<i>Catch Replacement</i>	37
Section 8: Repair Quick Guide	39
Overview of Repair Categories	39
<i>Category 1: Safety</i>	39
<i>Category 2: Operational</i>	39
<i>Category 3: Monitor</i>	39
<i>Category 4: OKAY</i>	39
<i>Bambi System Drawing</i>	40
Bucket Shell Repair Criteria	41
Cinch Strap Repair Criteria	42
Cables Repair Criteria	43
Valve Repair Criteria	44
IDS Hub Repair Criteria	45
M-Straps and Top Chains Repair Criteria	46
Control Head Repair Criteria	47
Section 9: General Maintenance and Repairs	48
Maintenance and Repairs	48
<i>Purse Line Replacement</i>	48
<i>Purse Line Specifications</i>	48
<i>Suspension Line Replacement</i>	50
<i>M-Strap Replacement</i>	51
<i>Removing Old M-Straps</i>	52
<i>Installing New M-Straps (Short)</i>	53
<i>Installing New M-Straps (Long)</i>	55
<i>Dump Valve Replacement</i>	57
<i>Bottom Loop Repairs</i>	58
<i>IDS Hub/Spokes Replacement</i>	59
<i>Load Test on the Hook</i>	60
Shell Repairs	61
<i>Repair Failures</i>	61
<i>Repairing in High Humidity</i>	62
<i>Making Temporary Repairs with Sealing Clamps</i>	63
Temporary Repairs Using Glue	65
<i>Applying the Glue</i>	65
<i>Gluing with Patches</i>	66
<i>Cutting the Patch</i>	67
<i>Applying the Patch</i>	67
Hot Air Gun Patching	69
<i>Hot Air Gun Procedure</i>	70
Repair Kits	71

<i>Repair Kit Parts Table</i>	71
<i>Optional Supplies</i>	71
Section 10: Specifications and Parts	72
Capacity and Weight Specifications	72
<i>Control Head Parts List, Models 6072-1821, Major Components 7</i>	3
<i>Control Head Parts List, Models 6072-1821, Bolts, Nuts and Washers</i>	74
<i>Control Head Parts List, Models 6072-1821, Catch, Linkage/Terminal Block</i>	75
<i>Control Head Parts List, Models 6072-1821, Clevis, Cotter and Split Pins</i> ..	76
<i>Valve Models 6072-1821</i>	77
<i>Valve Kits</i>	78
<i>Bucket Shell, Models 6072-1821</i>	79
<i>Cinch Strap</i>	80
<i>Rigging, Models 6072-1821</i>	81
<i>IDS Parts List, Models 6072-1821</i>	82
<i>IDS Parts List (continued)</i>	83
<i>Ballast System, Models 6072-1518</i>	84
<i>Ballast System, Model 1821</i>	85
<i>Troubleshooting Kits</i>	86
<i>Carry Bags</i>	87
Section 11: Warranty	88
Appendix: Drawings	89
<i>Pilot Controls</i>	89
<i>Pilot Controls, US InterAgency</i>	90
<i>Bambi Crew Controls</i>	91
<i>Bambi Crew Controls (using remote power supply)</i>	92

Section 1: Introduction to the Bambi Bucket

Overview (Models 6072-1821)

This manual provides helicopter operators with information on the service and maintenance of the Bambi bucket. 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 2024-4453 and 5566-9800 as well as the Signature series of Bambi buckets.

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.



Cut away view of standard Bambi bucket.

Section 2: Deploying the Bambi Bucket

Deployment Information

Control Head Orientation (Models 6072-1821 only)

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 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 tripline.

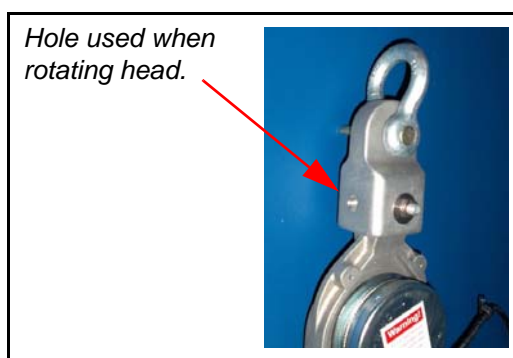
If your helicopter has a longitudinal hook, rotate the shackle yoke unit at the top of the head by 90 degrees. This will place the name plate on the control head forward in flight.

For this style of head, if using a swivel hook, we recommend that you always operate it 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, it is acceptable for the bucket to be flown without the ballast facing forward. The Bambi bucket has been tested with some swivels and performs very well despite rotating in flight. The swivel also prevents the suspension lines from twisting up after dipping the bucket.

The control head, used on models 6072-1821, has a moveable yoke which can be rotated by 90 degrees. The yoke is machined to orient in either direction.



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 an extremely 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 popular wiring hookup involves fitting a common electrical plug to the end of the cable or whatever matches the plug installed on your aircraft.

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 11: 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 a Firesock is to be used, attach first and then measure to the bottom of the sock. See the separate Bambi bucket operations manual for information on how to use the Firesock.

Important Note

If a firesock is being used, add 8" (200 mm) to the overall length shown the chart on next page.

Overall lengths of Bambi buckets with standard rigging are provided in the chart to the right. 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
6072	12' 11"	3.94
8096	14' 6"	4.42
8096S	12' 11"	3.94
9011	14' 6"	4.42
9011S	12' 11"	3.94
1012	14' 6"	4.42
1012S	12' 11"	3.94
1214	14' 10"	4.52
1214S	13' 3"	4.04
1518	15' 2"	4.62
1518S	13' 7"	4.14
1821	15' 11"	4.84
1821S	14' 3"	4.34

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

3. If the Firesock is to be 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

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.

Shortening Suspension Cables

If the overall length of the Bambi bucket exceeds the distance from the cargo hook to the front tip of the tail rotor of the helicopter, the suspension lines, triplines and deployment lines must be shortened. Shorter suspension lines, triplines and deployment cables can be ordered from SEI. Please specify model and serial number when ordering parts.

Important Note

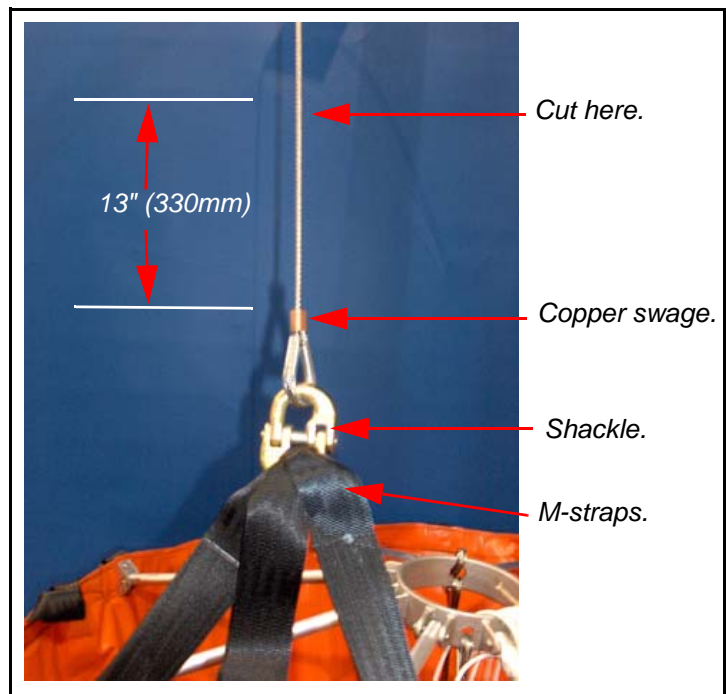
It is important to keep the tripline adjusted properly or the bucket may not dump. See *Section 4: Making Adjustments* for more information.

Shortening Procedure

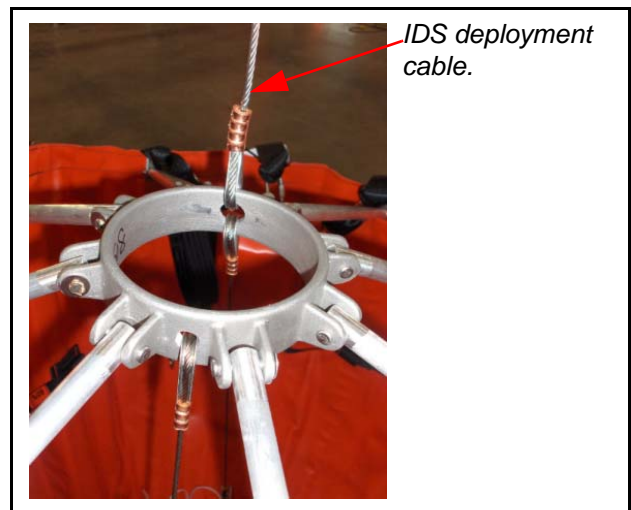
The following procedure reduces the overall length by 19" (483 mm). This 19" (483 mm) reduction in overall length is standard when converting a bucket with regular length suspension cables for operation with a McDonnell Douglas, Hughes or Schweizer helicopter. The overall length reduced should be adjusted for your specific overall length requirement.

1. In determining the new length, allow for the cable that passes around the thimble and into the new sleeve for swaging. Example: To shorten the suspension cable by 19" (483 mm) in effective length, cut the original cable by 13" (330 mm) i.e. 19" (483 mm) minus 6" (152 mm).

2. Cut the suspension cables one at a time (to avoid mixing them up) just above the swage where the thimble attaches to the M-straps. Cut off 13" (330 mm).

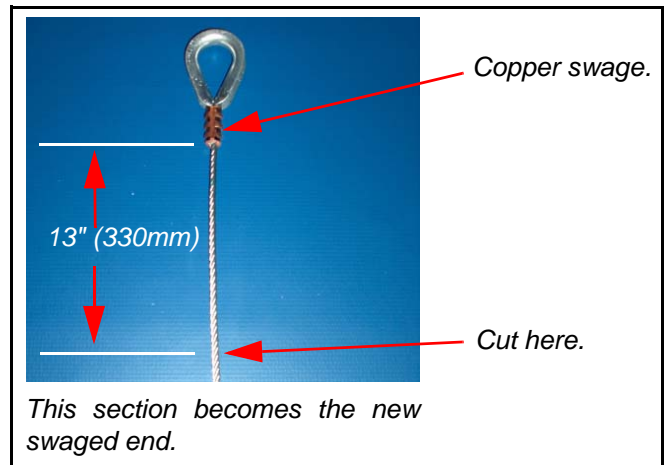


3. Install a new thimble and sleeve onto the cable. Swage the sleeve securely using the correct size swaging tool.
4. Locate the IDS deployment line on the HUB and follow it up to the head.

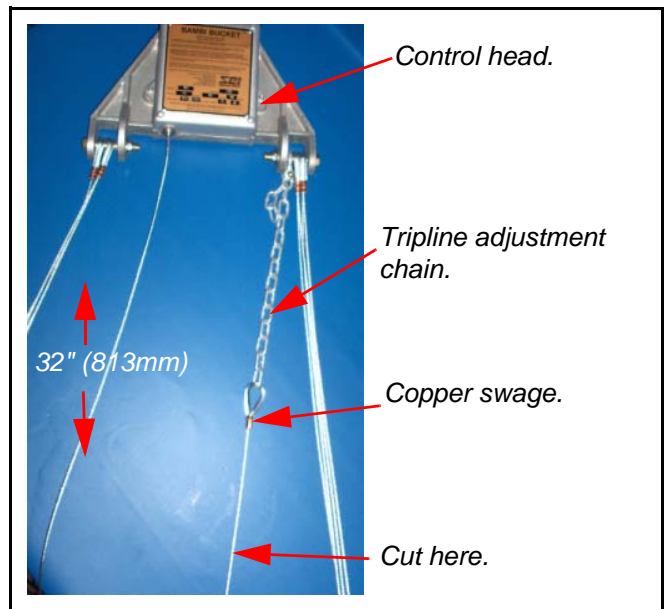


- Unhook the cable from the 1/2" head bolt and cut 13" (330 mm) off the IDS deployment cable.

- Install a new thimble. Sleeve and swage the IDS deployment cable securely.



- Cut 32" (813 mm) off the tripline.



- Install a new thimble. Sleeve and swage the tripline securely.
- Grasp the top shackle and extend the control head to stretch out the suspension lines. Check for correct cable sequence and/or twisted cables.

Warning

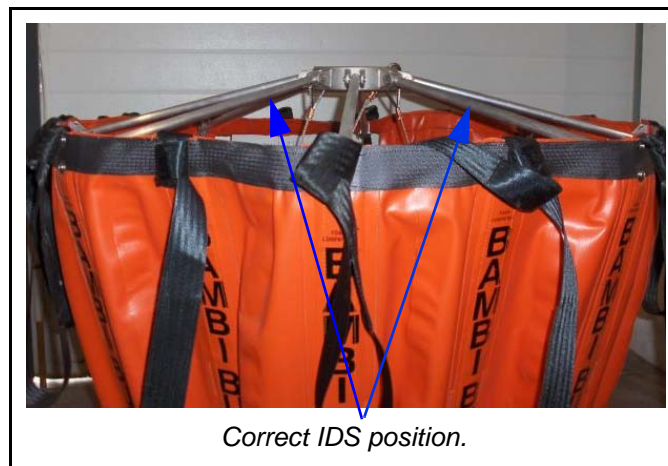
For models 6072-1821, do not tighten the control head suspension bolts over 5 ft.-lbs. (6.5 Nm) torque. Overtightening suspension bolts may cause failure of the control head casting.

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.



Section 3: Using Accessories

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.

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 I



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 Capacity	
		USG	Liters
Sacksafoam I			
SFF01-8018	8096-1821	12	45
Sacksafoam II			
SFF02-8044	6072-1821	10	38
SFF02-5598	1821-4453	25	94
Sacksafoam Plus (for additional foam storage for SFII and SFIII)			
SFF-Plus		40	151

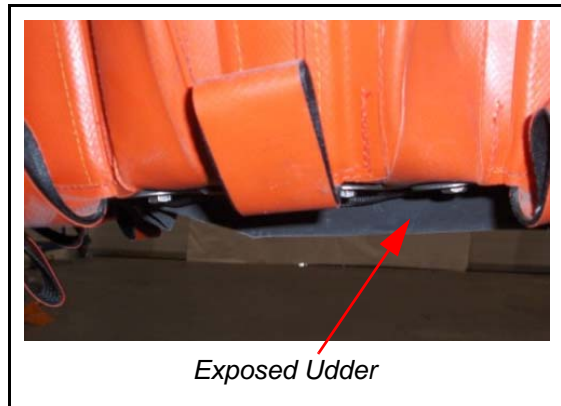
Section 4: Making Adjustments

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.



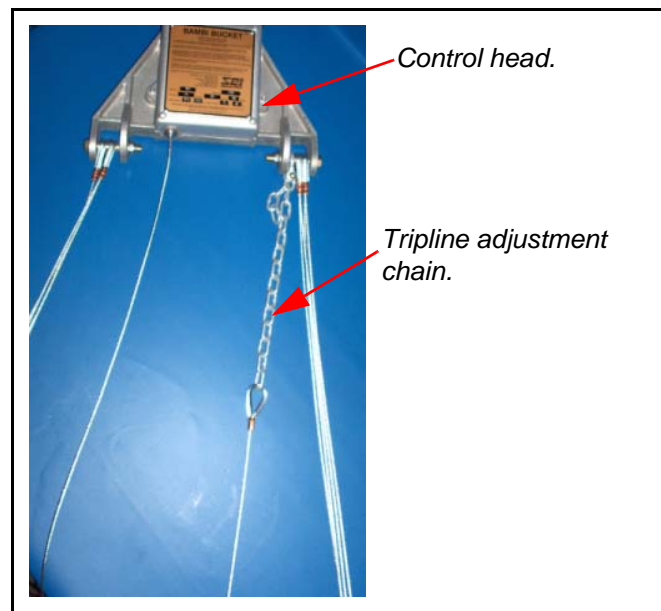
A properly adjusted dump valve will have a maximum of 2" (50 mm) of udder. Too much udder will add to the volume and thus the weight of the bucket. Too little udder will prevent the sealing action and will result in the valve leaking. It is also hard on the purse strings.

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 tripline is to secure the adjustment chain to a shackle that is attached to the suspension bolt on the control head.

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 Udder After Shortening Cables

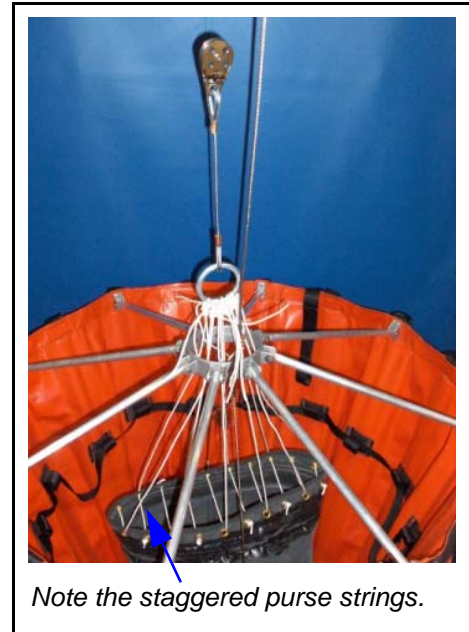
Whenever the length of the main suspension cables are modified, the tripline should also be modified. For models 8096-1821, which have a pulley on the tripline, modify the tripline by double the amount. The riser should then be attached with the adjustment chain in the original position. A final check for udder should then be made when the bucket is full.

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.

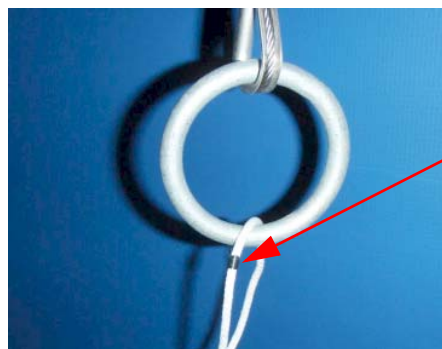
When installing a new set of purse strings, orientate the valve correctly and always make sure to stagger the strings from side to side. See *Section 8: General Maintenance and Repairs* for complete instructions on how to replace purse strings and how the color-marked purse strings are used (see *Section 8: Purse String Replacement*).



Note the staggered purse strings.

Important Note

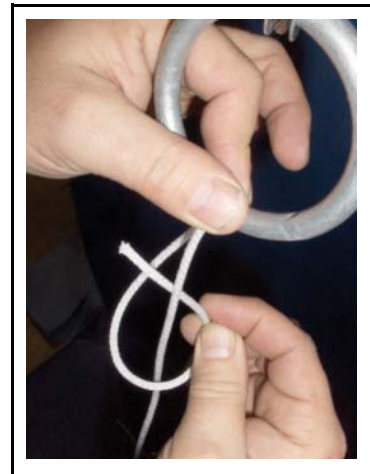
When initially tying up the purse strings, note that more tension should be on the outside string with progressively less tension towards the middle. If the tension is too great on the middle string, the valve action will be sluggish when the valve is retracting. All strings have a black mark; this mark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



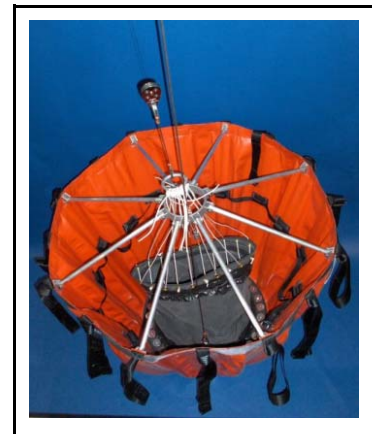
Green and black colored tie marks

To adjust a single line:

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

***To adjust all the lines:***

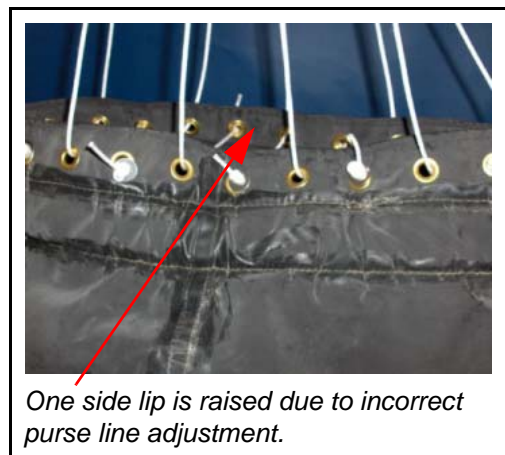
1. Stand the bucket vertically.
2. With the valve bottom flat on the floor, pull the bucket shell into a round shape by deploying the IDS.
3. Run a rope from an overhead support to the ring on the top of the valve.
4. Proceed to adjust the string.

***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 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 aluminum 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 8: General Maintenance and Repairs*.

Section 6: Troubleshooting guide

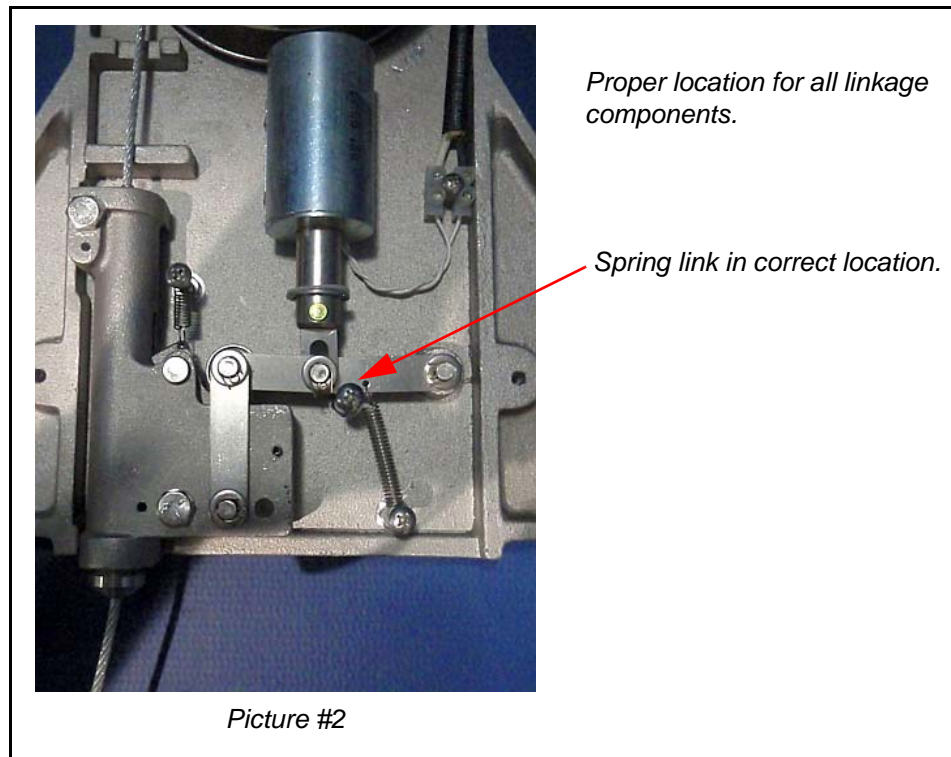
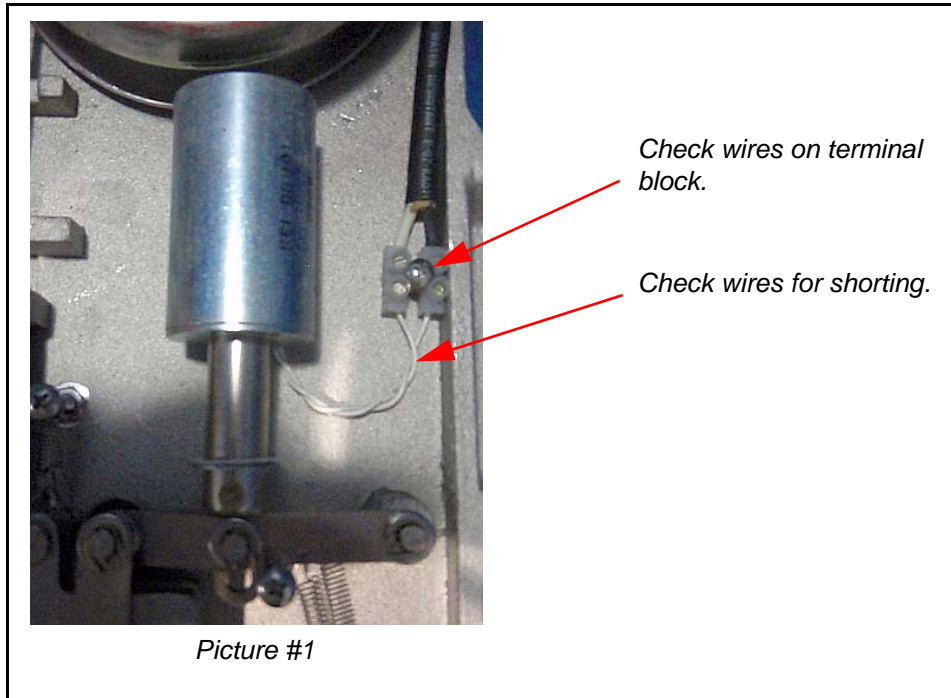
General Troubleshooting Guide

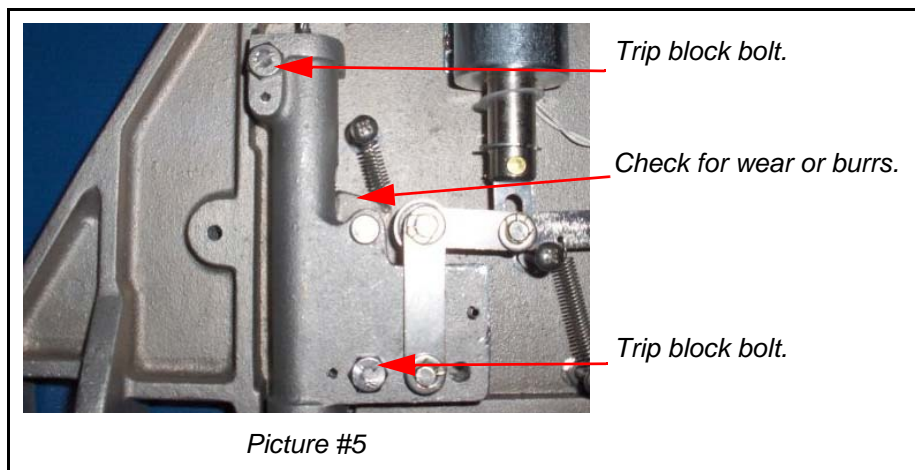
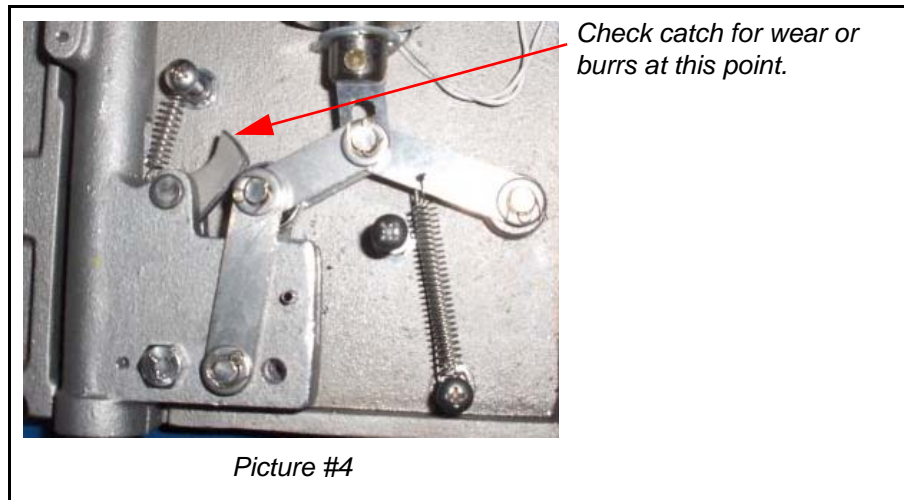
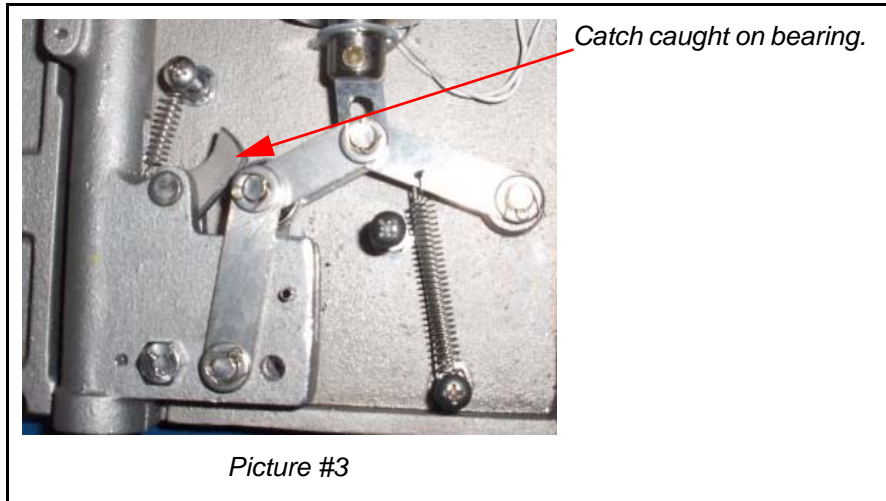
Valve Troubleshooting

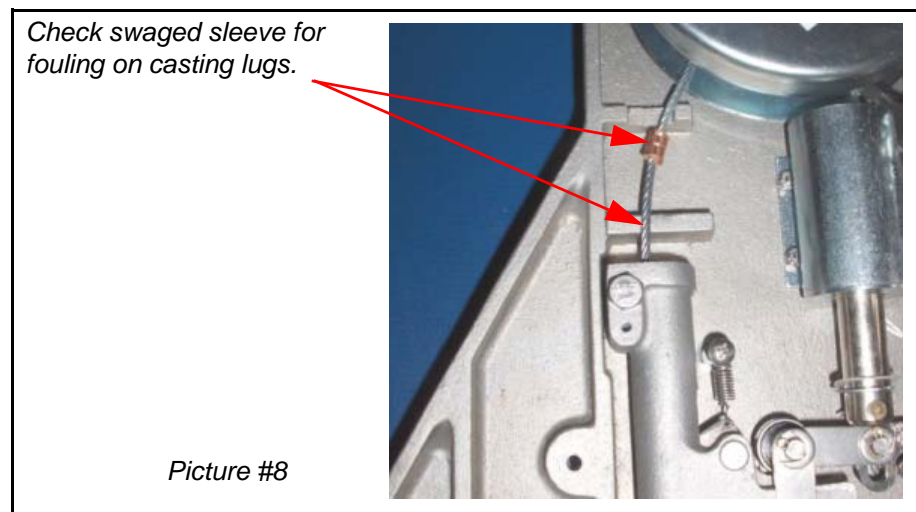
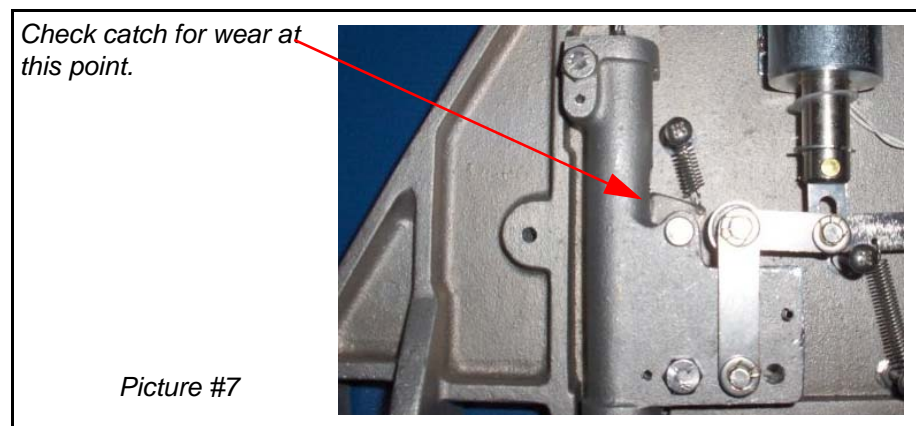
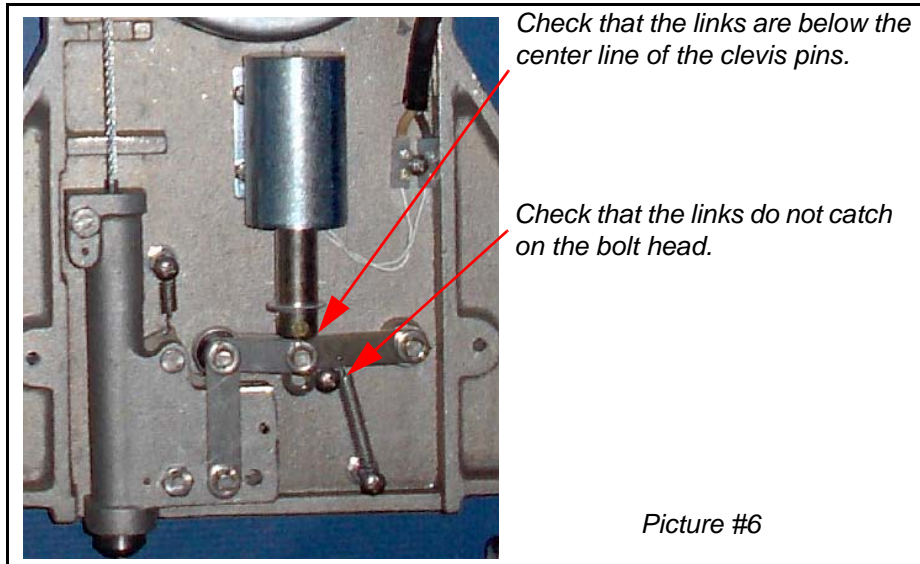
Problem	Possible Cause	Solution
Leaking dump valve	Over tightening of cinch strap affecting seal.	Re-adjust cinch strap.
	Lack of seal between valve and bucket shell.	Apply butyl rubber sealant.
	Creases or deterioration in the foam lips of the dump valve.	Work out creases or replace valve.
	Misaligned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







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 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 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.



- 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.



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



- 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.



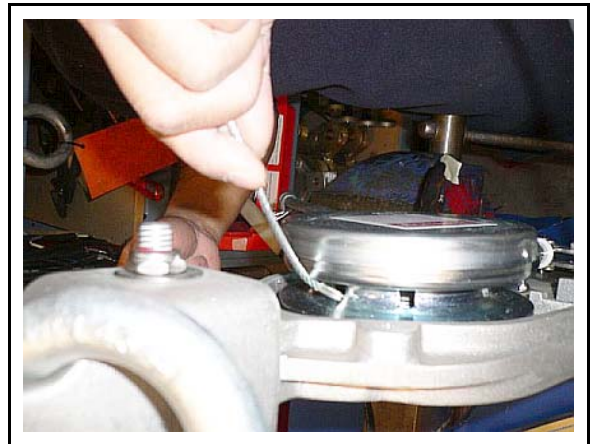
6. The photo shows the tripline end being pulled from the reel.



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.

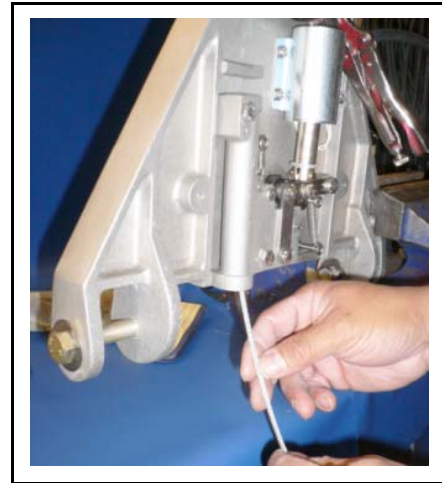
1. Wind the spring reel in the direction indicated by the arrow stamped on the cover to its maximum, then back off until the three holes in the reel are positioned at the top (approximately one full turn).
2. Secure with vice grips to prevent the reel from unwinding.



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.

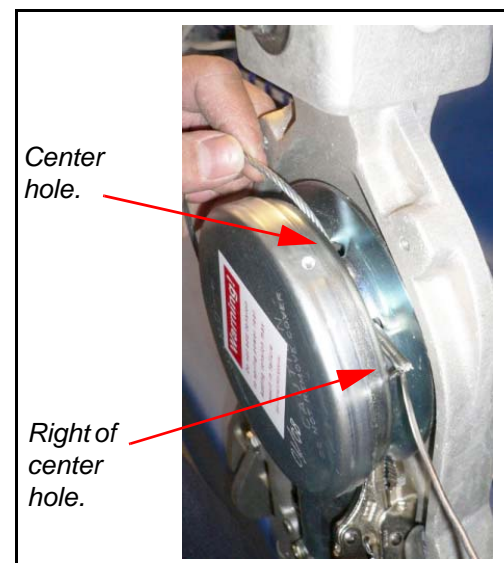
1. Pass the tripline through the trip block's bottom hole upwards to the top.



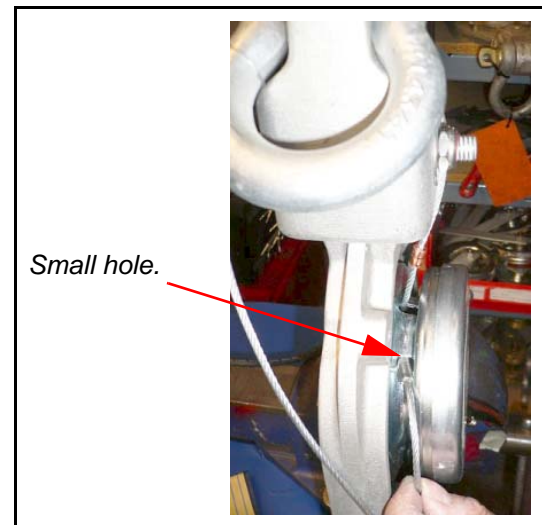
2. Once the tripline has passed through the trip block, bend the end of the tripline into a tight spiral using a pair of pliers.



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.

Swage Block



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.

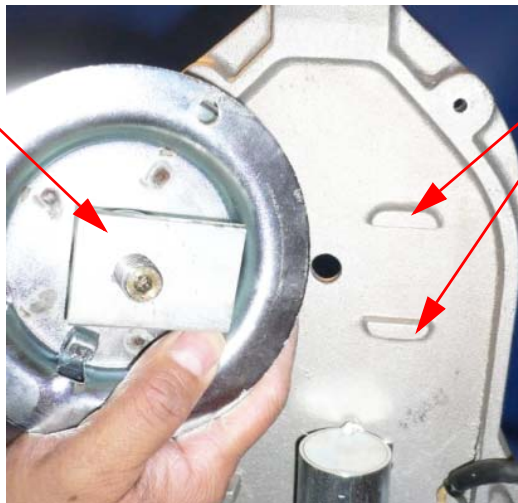


Holding the threaded bolt with an Allen key.

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.

Anti-torque plate.



Locking lugs.

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.



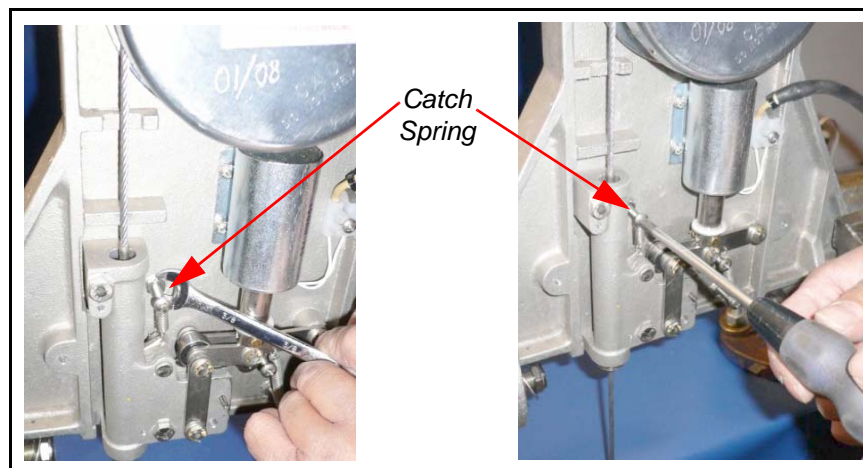
10. Wrap the vinyl covered cable back around the spring reel. Remove the temporary lock and, again, pull the cable out until the reel stops.
11. Back the spring reel off until the three holes are positioned at the top (approx. one full turn) and secure the reel.
12. Remove the vinyl covered cable and 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 Quick Guide

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.

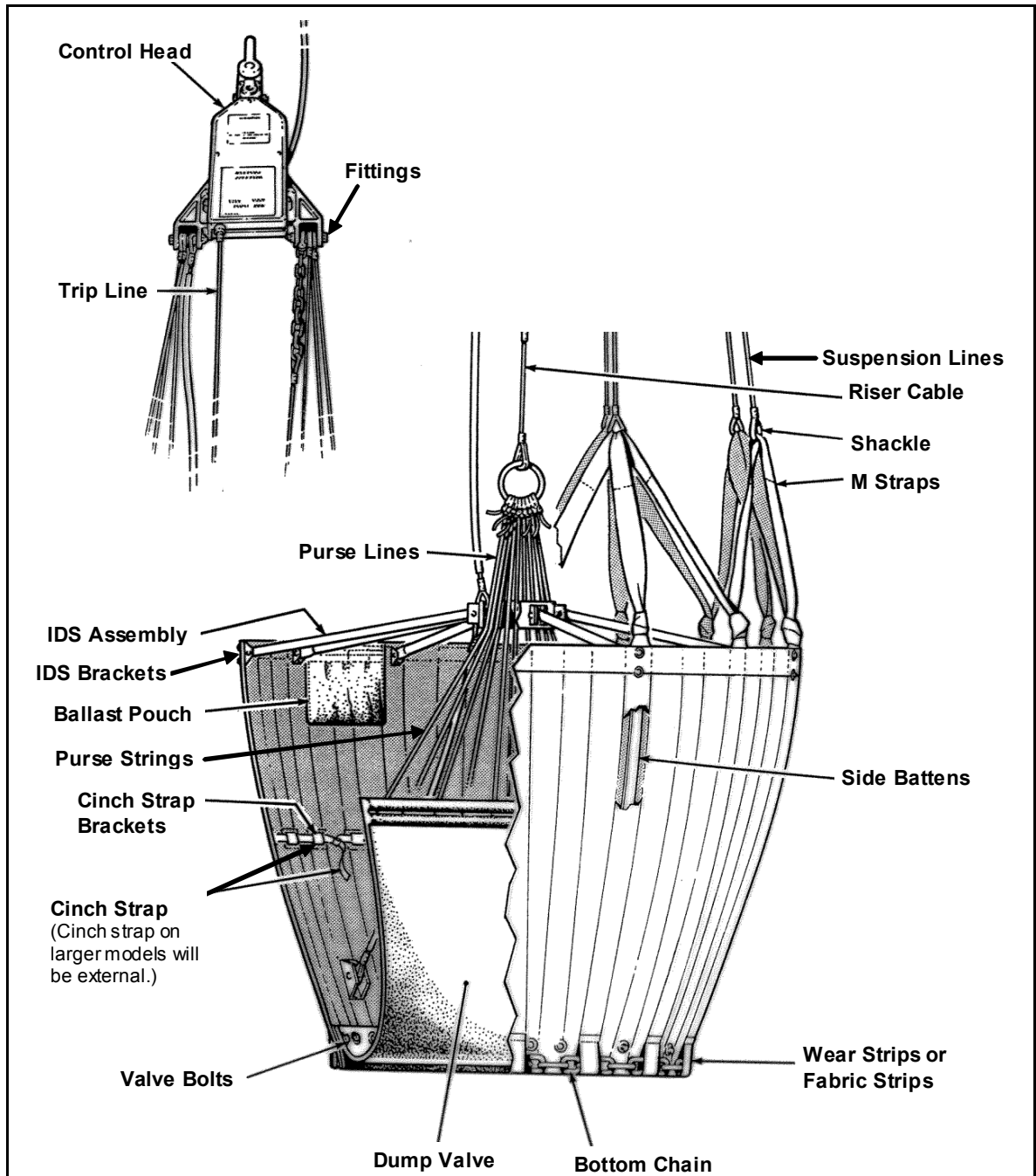
Category 4: OKAY

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.

Bambi System Drawing



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.

Cinch Strap Repair Criteria

Category 1: Safety

Cease operations and repair immediately.

- Broken or missing cinch strap.
- Field-modified cinch strap.
- Broken or missing cinch strap retaining brackets.
- Broken or missing cinch strap hook or mating ring.

Category 2: Operational

Repair before next days operation or eight hours flight time.

- Wear or damage to cinch strap involving more than 25% of the fabric strands.
- Missing cinch strap bracket hardware.

Category 3: Monitor

Monitor and/or repair if condition deteriorates.

- Wear or damage to cinch strap, less than 25%.
- Worn or bent brackets.

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 riser cable.
- Broken deployment cable.
- Broken tripline.

Category 2: Operational

Repair before next days operation or eight hours flight time.

If three or more individual suspension cables, riser 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.

Valve Repair Criteria

Category 1: Safety

Cease operations and repair immediately.

- Broken valve restrainer cable.
- Two or more broken purse strings.

Category 2: Operational

Repair before next days operation or eight hours flight time.

- Up to one broken purse string.
- Wear or damage to the purse strings comprising more than 50% of fibers.
- Cuts or tears on valve material.
- Broken stitching that allows separation of seam(s).
- Wear, abrasion and creases that allow leakage.
- Broken or missing valve bolts.
- Missing or broken purse strings grommets.
- Frayed wires on riser cable.

Category 3: Monitor

Monitor and/or repair if condition deteriorates.

- Wear and abrasion on valve material.
- Wear on purse strings.
- Valve bolt security.

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 and 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 base plate.
- Visibly bent shackles or suspension line bolts.
- Broken or missing safety wire on shackle pins.
- Missing, broken or loose valve release mechanism parts.
- Broken or exposed electrical conductors.
- Broken or missing break-away plug.
- Broken or cracked shackle yoke.

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

- Missing control head cover hardware.
- Cracked or damaged control head cover.

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

- General wear and visual condition of components including electrical connections and wire.
- Optimal function of valve release mechanism (check daily).

Category 4: Okay**Does not need repair.**

Section 9: General Maintenance and Repairs

Maintenance and Repairs

Important Note

After using the bucket in salt water, make sure to wash the bucket with fresh water, paying special attention to 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 bolted, eliminating two of the purse strings used in older valves.

When a new set is ordered, you will receive eight 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 purse strings sets have eight strings, two of which have green markings and six that have black markings. The green marked strings are placed at each end of the valve opening.

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.



Important Note

The purse strings sets have eight strings, two of which have green markings and six that have black markings. The green marked strings are placed at each end of the valve opening.

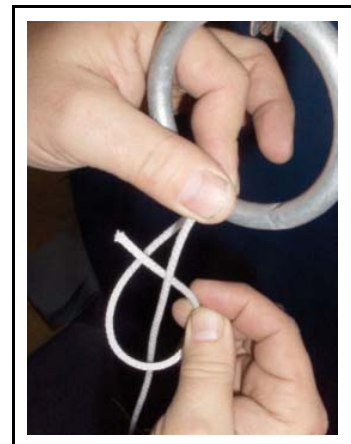
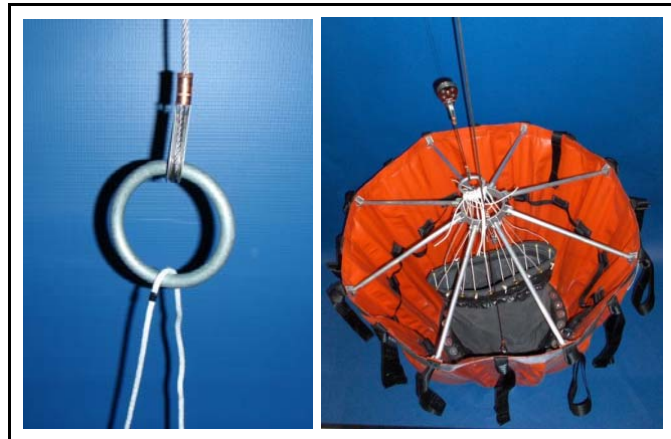
To replace all purse lines:

1. 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 and bolt location.

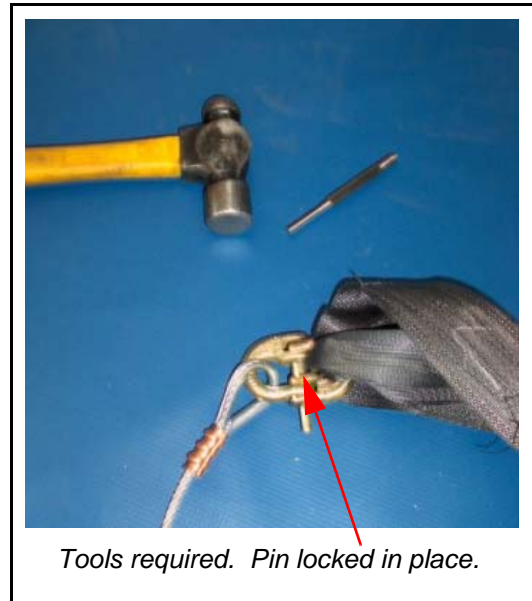
2. Ensure the new purse lines are melted at the loose end and have a large enough knot to be secured at the fender washer.
3. If you are using new SEI-supplied purse strings, note the green and black marks. This mark is centred on the ring when tying.
4. The green marked strings are installed at each end of the valve.
5. Thread the purse lines, alternating from one side of the valve to the other.
6. Starting from one end-fold of the valve, tie the purse line to the metal ring at the mark with a round turn and three half hitches.
7. 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.

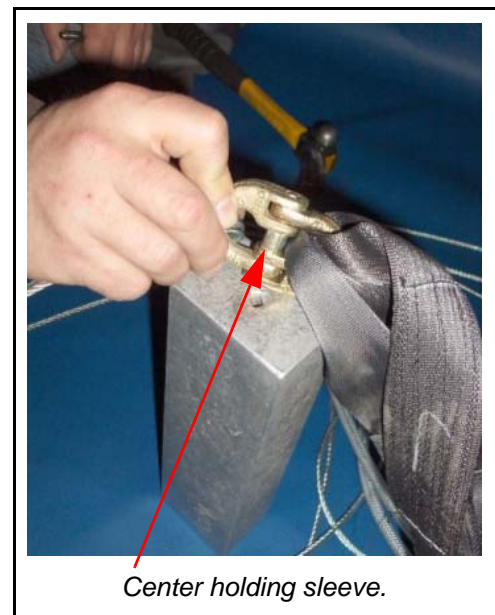
Suspension Line Replacement

A suspension line should be replaced whenever it displays noticeable kinking or fraying. Factory replacement lines come pre-swaged without connection links to make replacing quick and easy.



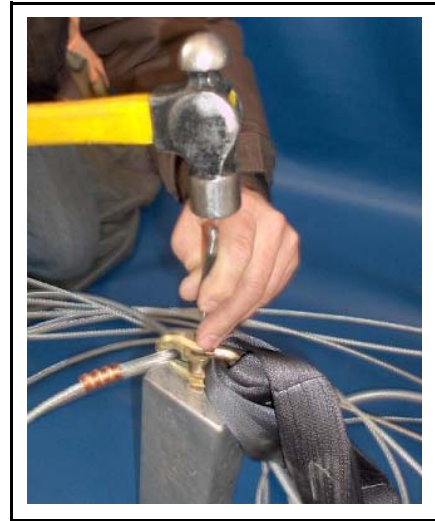
To remove the connecting link (connecting the suspension line to the M-strap) follow the procedures outlined below.

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.



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.

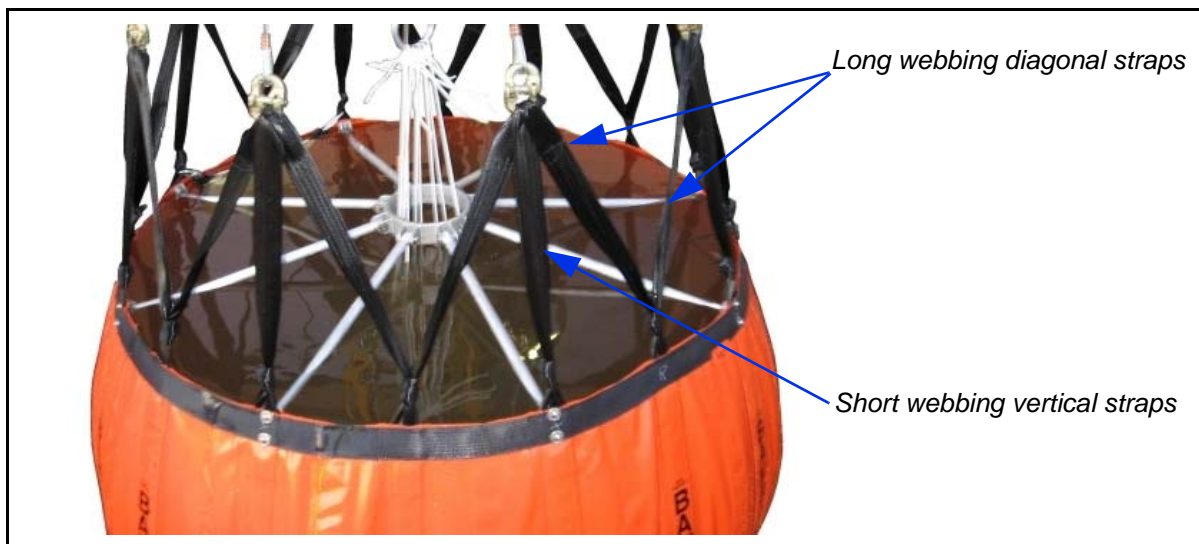
3. After the pin is free, remove the old suspension line. Place the new line in the connecting link by inserting the pin into one side of the connecting link. Insert holding sleeve. Using a hammer, drive the pin in until it is flush with both sides of the connecting link.



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 straps.

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

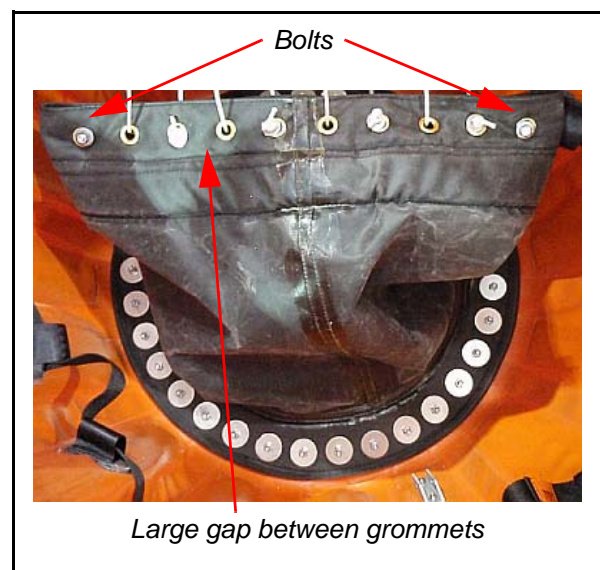
SEI Industries replacement dump valves come complete with new purse lines, bolts, nuts, washers and butyl rubber sealant.

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 above 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.



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 and where the bolts, nuts and washers are installed through the grommets. 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.



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*.



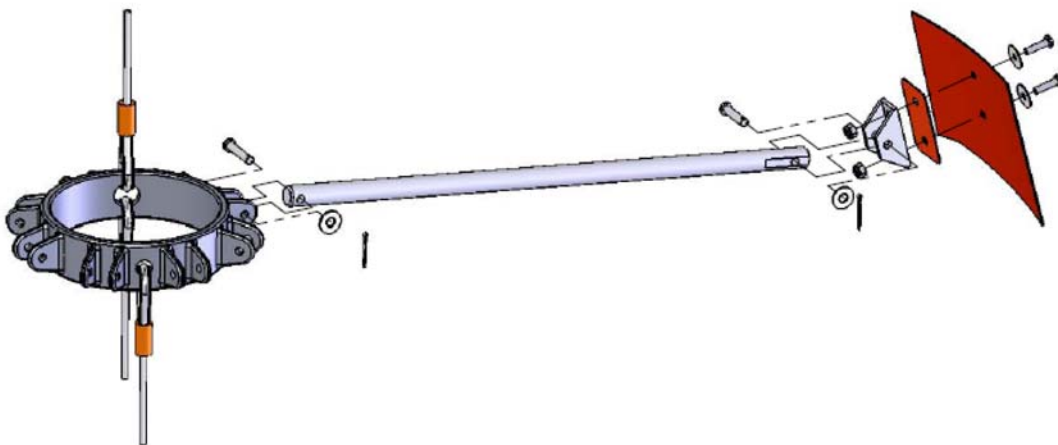
Bottom Loop Repairs

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.

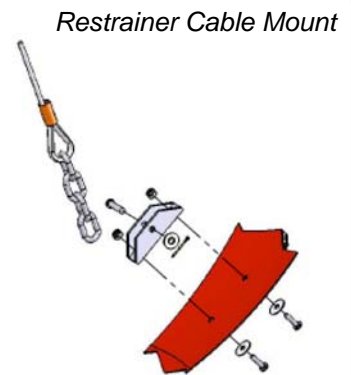
IDS Hub/Spokes Replacement

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 and the old 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 6 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. Attach the two restrainer cables to the brackets. 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.
6. 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.
7. 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.



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. 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 in the opposite position.

Load Test on the Hook

Deployment cable adjustment can only be properly assessed on the hook of the helicopter or otherwise suspended with a full load of water. For this test, with retrofits, the deployment cable is attached to the middle link of the adjustment chain. Check tension in the deployment cable. Under full load, the deployment cable should feel relaxed but not slack. The hub should be free to move up or down about 1/2" (13 mm).

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).

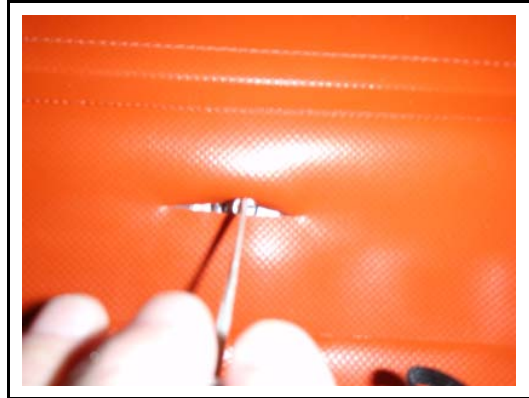
Caution

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.

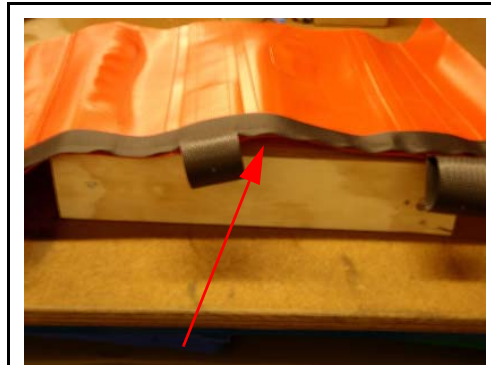


Squeeze glue around the tear and spread with fingers.

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 be 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

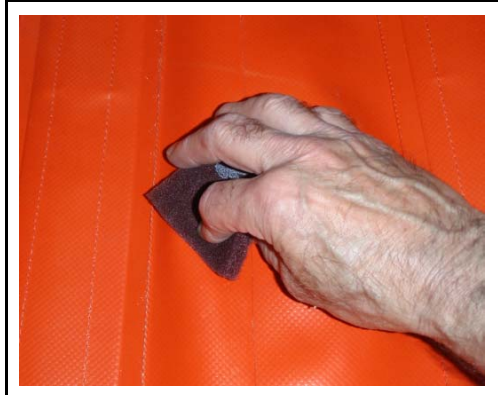
It is extremely dangerous to use a hot air gun in the presence of flammable fumes such as gasoline or paint thinner. There is a high risk of explosion and/or burns.

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.

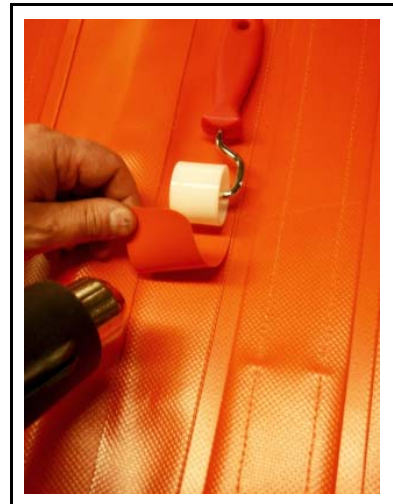
Hot Air Gun Procedure

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, ABRASIVE	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
BB6072	60	72	270	670	300	68	31
BB8096	80	96	360	870	390	71	32
BB8096S	80	96	360	870	390	71	32
BB9011	90	110	410	970	440	72	32
BB9011S	90	110	410	970	440	71	32
BB1012	100	120	460	1070	490	71	32
BB1012S	100	120	460	1070	490	71	32
BB1214	120	140	550	1270	580	73	33
BB1214S	120	140	550	1270	580	72	33
BB1518	150	180	680	1580	710	76	34
BB1518S	150	180	680	1580	710	76	34
BB1821	180	210	820	1890	860	86	39
BB1821S	180	210	820	1890	860	85	39

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

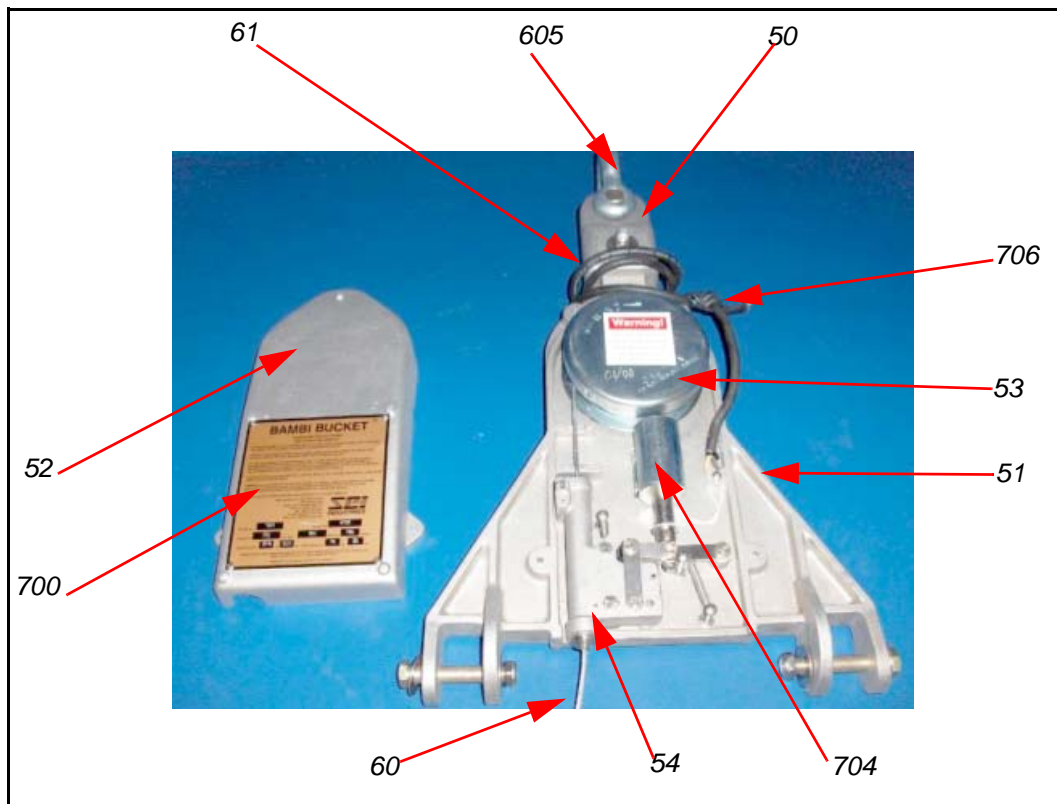
Caution

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.

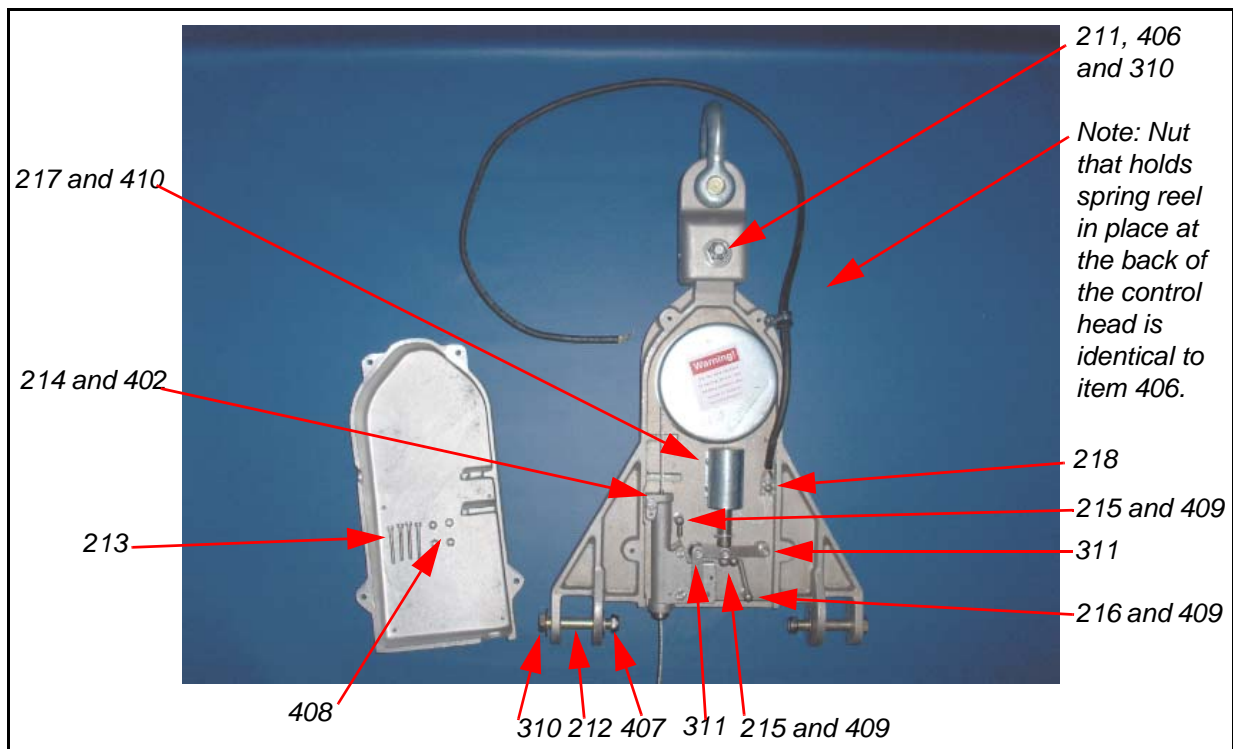
The operator must also ensure that the bucket selected does not pose a tail rotor strike hazard.

Control Head Parts List, Models 6072-1821, Major Components



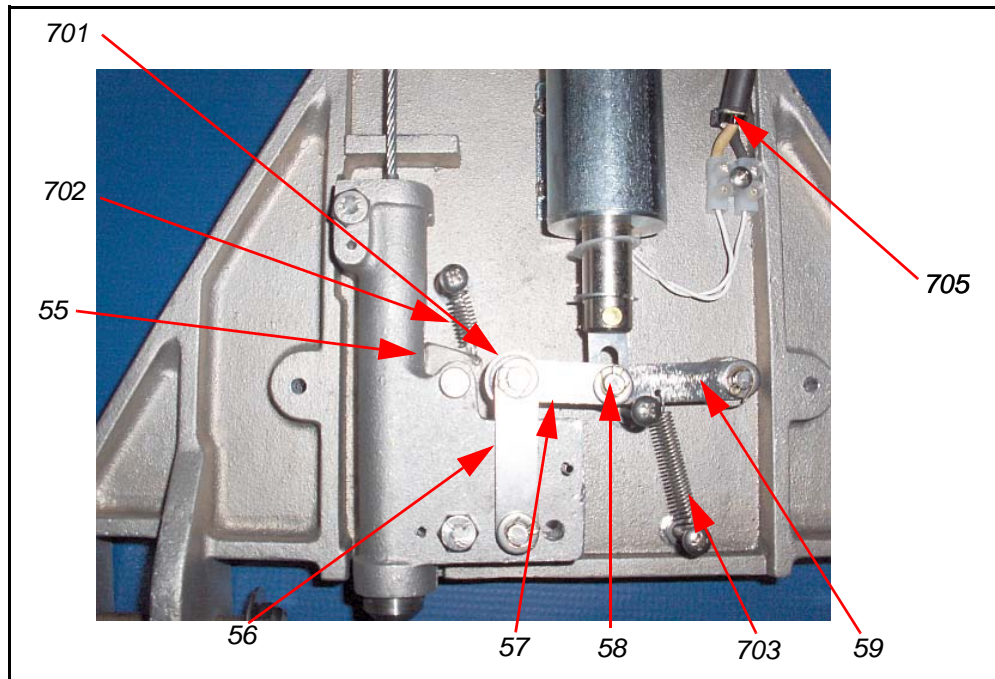
ITEM	MODEL	PART#	DESCRIPTION	QTY
50	ALL	005261	YOKE, CASTING	1
51		005248	HEAD, BASE, ALMAG535, CASTING	1
52		005257	COVER, HEAD, FRONT, ALMAG535, CASTING	1
53		005223	REEL, SPRING, ASSY	1
54		005258	BLOCK, TRIP, ALMAG535, CASTING	1
60		BB8096-BB1821	005332	TRIPLINE, NO PULLEY, 8096-1821
	BB6072, 8096S-1821S	005335	TRIPLINE, NO PULLEY, 6072 8096S-1821S	1
	ALL	002948	PULLEY, BLOCK, SS FOR TRIPLINE	1
61	ALL	005260	WIRE, LEAD, BAMBI	1
605		001790	SHACKLE, ANCHOR, SCREW 3/4", 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 6072-1821, Bolts, Nuts and Washers



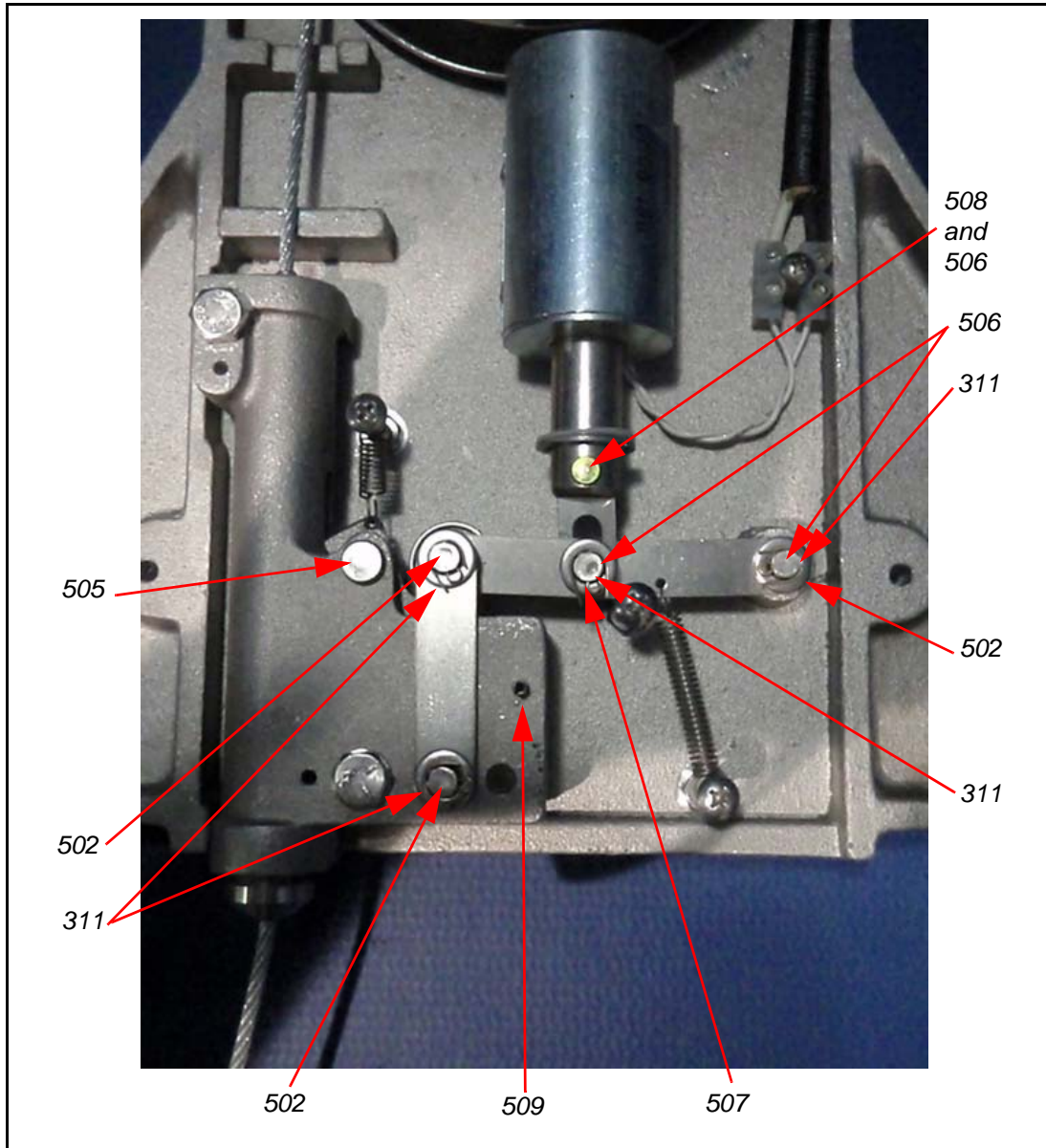
ITEM	MODEL	PART #	DESCRIPTION	QTY
211	ALL	000276	BOLT, SHL, 5/8 X 2-3/4 X 1/2-13 SC, PLT	1
212		000322	BOLT, HX, 1/2-20 X 3-3/32, CAD	2
213		000551	SCREW, 10-32 X 1-1/2 SC,SS	4
214		006266	SCREW, 1/4-20 X 2, SC, SS	2
215		000498	SCREW, 10-24 X 1-1/4 PNP, SS	2
216		000501	SCREW, 10-24 X 1-1/2 PNP, SS	1
217		000508	SCREW, 6-32 X 5/8, SC, SS	4
218		001784	SCREW, SELF, #8 X 3/4, PNP, SS	1
310		001841	WASHER, FLAT, 1/2 X 1-1/4,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 6072-1821, Catch, Linkage and Terminal Block



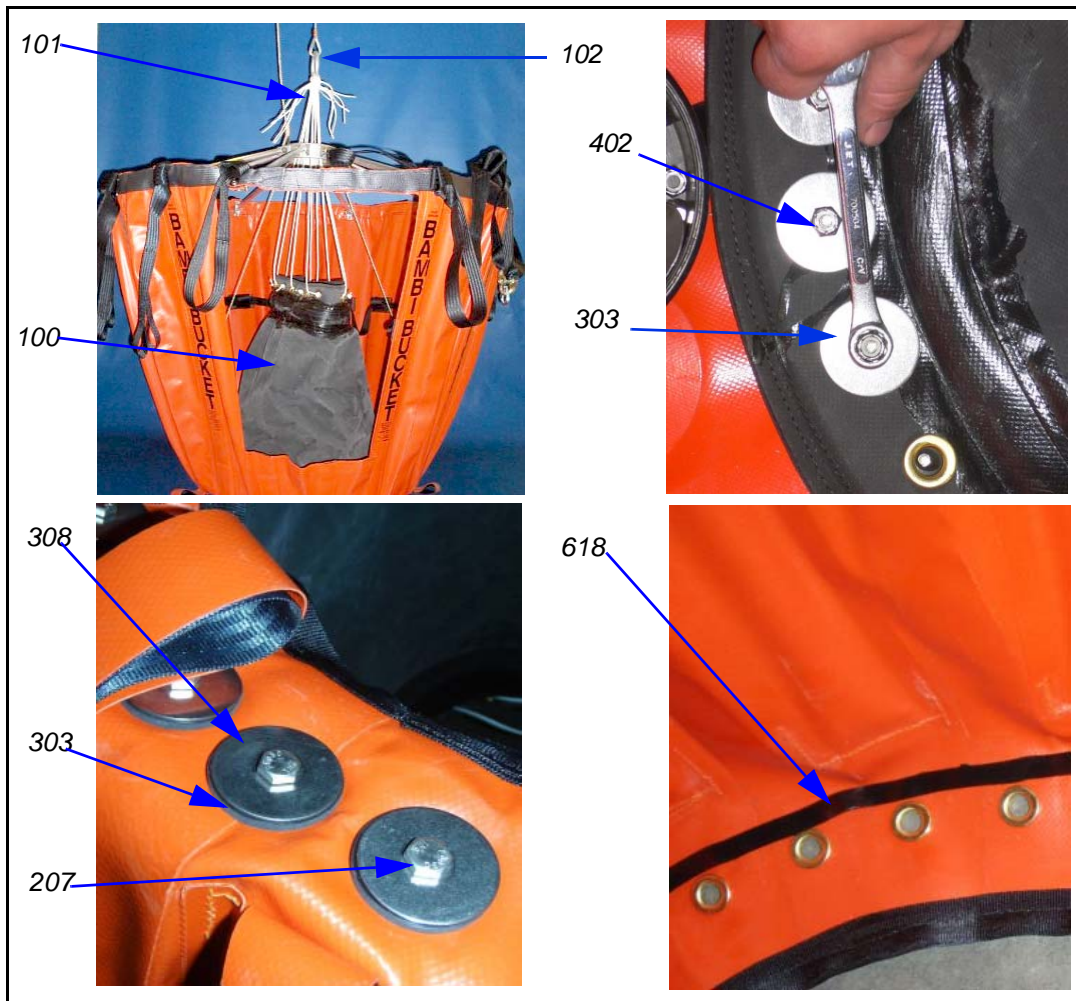
ITEM	MODEL	PART #	DESCRIPTION	QTY
55	ALL	005230	CATCH, SMALL	1
56		005224	LINK, LONG	2
57		005225	LINK, SHORT	2
58		005226	LINK, SLOTTED	1
59		005227	LINK, SPRING, LONG	1
701		003148	BEARING, RADIAL	1
702		005242	SPRING, CATCH	1
703		005243	SPRING, RETURN	1
705		002953	TERMINAL, BLOCK	1

Control Head Parts List, Models 6072-1821, Clevis, Cotter and Split Pins



ITEM	MODEL	PART #	DESCRIPTION	QTY
311	ALL	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 6072-1821



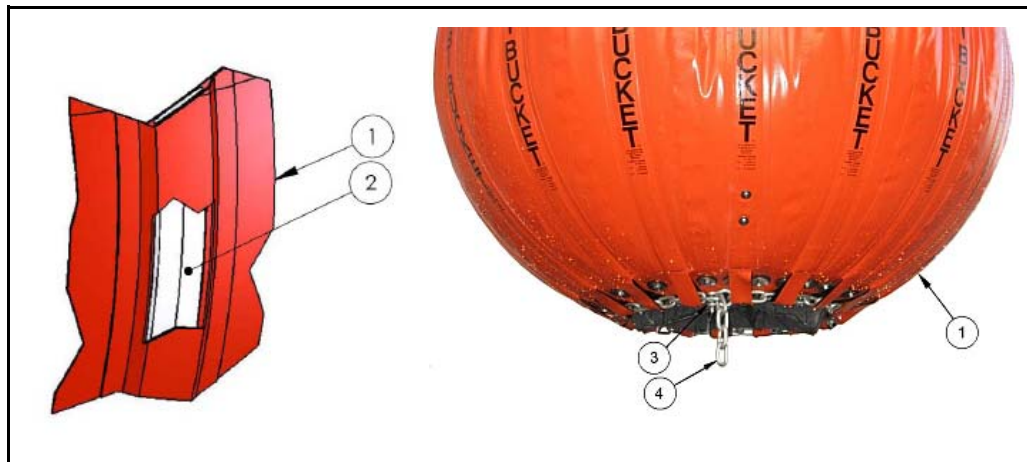
ITEM	MODEL	PART #	DESCRIPTION	QTY
100	ALL	005279	VALVE, DUMP	1
101	BB6072	005520	STRING, PURSE	8
	BB8096			
	BB9011			
	BB1012			
	BB1214			
	BB1518			
	BB1821	005521	STRING, PURSE	
102	ALL	006096	RISER, RING AND PULLEY	1
103		000369	BOLT, HEX, 1/4-20 X 3/4" SS	2
104		001859	WASHER, FLAT, 1/4 X 1-1/4, SS	4
207		000370	BOLT, HEX, 1/4-20 X 1, SS	33
303		001857	WASHER, FLAT, 1/4 X 1-1/2, SS	66
308		001828	WASHER, FLAT, 7/32 X 1-1/2 X 1/8 NEO	33
402		001662	NUT, HEX, NYLOCK, 1/4-20, SS	35
618		002963	TAPE, BUTYL, 1/8 X 3/8	10

Valve Kits

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

PART #	DESCRIPTION	QTY
006089	VALVE, DUMP, ASSEMBLY, 6072-1214	1
006090	VALVE, DUMP, ASSEMBLY, 1518-1821	

Bucket Shell, Models 6072-1821



ITEM	MODEL	PART #	DESCRIPTION	QTY
1	BB6072	005638	SHELL	1
	BB8096	005639		
	BB9011	005640		
	BB1012	005641		
	BB1214	005642		
	BB1518	008643		
	BB1821	008644		
2	BB6072	005416	BATTEN, FIBREGLASS, 21-3/4"	16
	BB8096	005458	BATTEN, FIBREGLASS, 21-1/4"	
	BB9011	005417	BATTEN, FIBREGLASS, 23-3/4"	
	BB1012	005418	BATTEN, FIBREGLASS, 25-1/2"	
	BB1214	005419	BATTEN, FIBREGLASS, 28-1/2"	
	BB1518	005420	BATTEN, FIBREGLASS, 31-5/8"	
	BB1821	005421	BATTEN, FIBREGLASS, 34-3/4"	
3	ALL	001788	SHACKLE, ANCHOR, GALV. 3/16"	1
4		003844	CHAIN, 3/16,GR30,GLV	60"

Note: Add "S" to the part number when a complete shell is required; e.g. BBS-952 consists of shell with

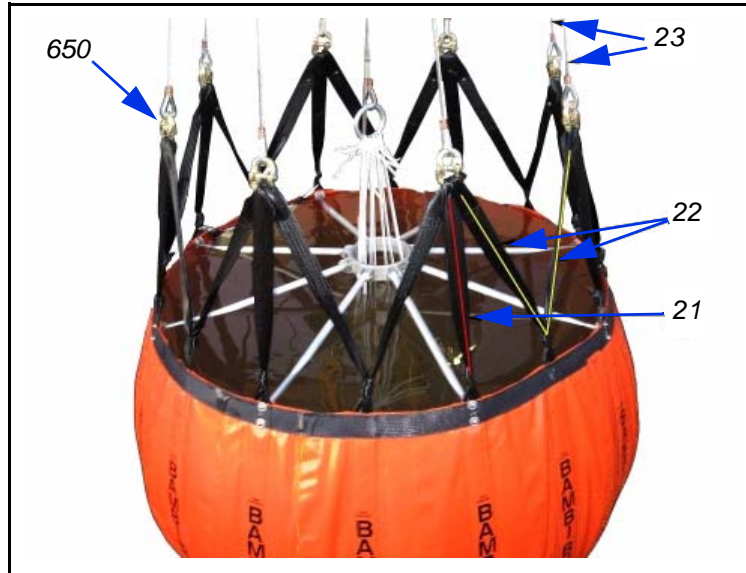
- valve kit
- battens
- ballast plates
- cinch system
- bottom chains/plates

Cinch Strap



ITEM	MODEL	PART #	DESCRIPTION	QTY
4	BB6072	005484	STRAP, CINCH, INTERNAL 102"	1
	BB8096	005487	STRAP, CINCH, INTERNAL 117"	
	BB9011	005488	STRAP, CINCH, INTERNAL 125"	
	BB1012	005490	STRAP, CINCH, INTERNAL 134"	
	BB1214	005491	STRAP, CINCH, INTERNAL 126"	
	BB1518	005492	STRAP, CINCH, INTERNAL 143"	
	BB1821	005493	STRAP, CINCH, INTERNAL 146"	

Rigging, Models 6072-1821

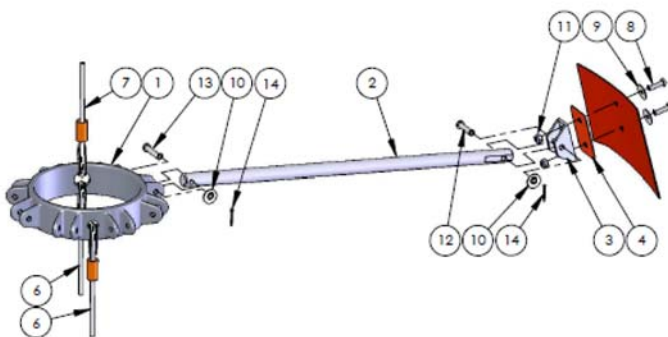


ITEM	MODEL	PART#	DESCRIPTION	QTY
21	ALL	005467	STRAP, M, LOOP 16"	8
22		005468	STRAP, M, STRAIGHT 35"	8
23	BB8096-BB1821	005545	CABLE, SUSPENSION, LINE, PAIR	4
	BB6072-8096S-1821S	005544	CABLE, SUSPENSION, LINE, PAIR, SHORT, SERIES	4
650	ALL	004057	LINK, CONNECTOR, 9/32", PLT	8

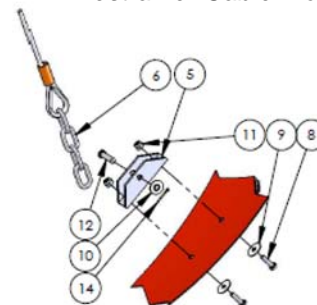
IDS Parts List, Models 6072-1821



IDS deployed inside a Bambi bucket.



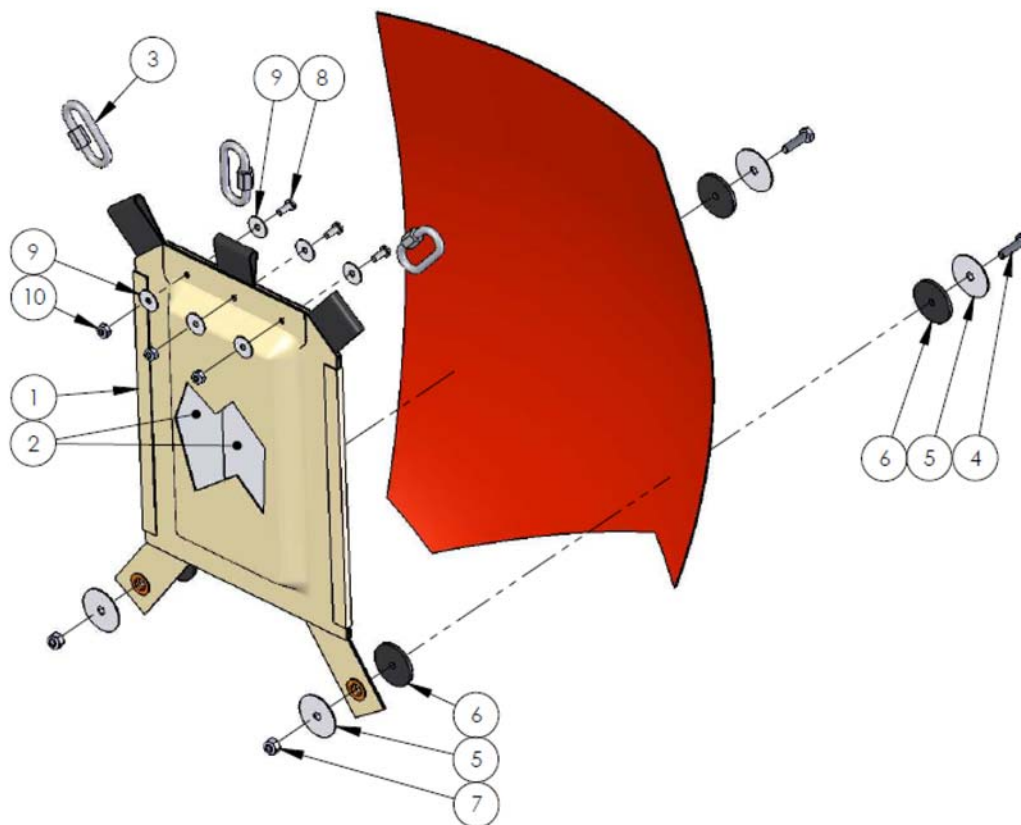
Restrainer Cable Mount



IDS Parts List (continued)

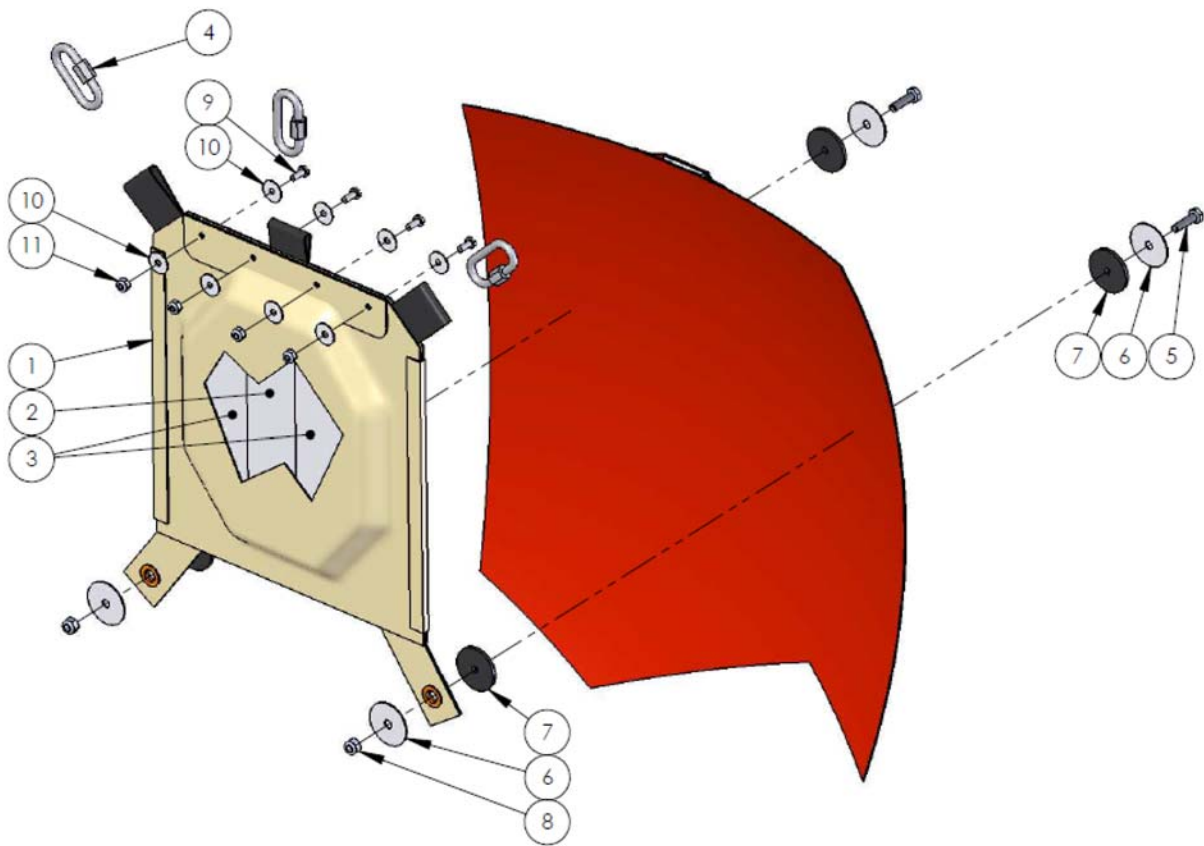
ITEM	MODEL	PART #	DESCRIPTION	QTY
1	ALL	000066	HUB, 8, SPOKE	1
	BB6072	005357	HUB, 8 SOKES, C/W DEPLOYMENT & RESTRAINING CABLES	
	BB8096	005359		
	BB9011	005361		
	BB1012	007225		
	BB1518	005365		
	BB1821	005367		
2	BB6072	005338	SPOKE, SOLID, 10-1/2	8
	BB8096	005340	SPOKE, SOLID, 15-1/8	
	BB9011	005341	SPOKE, SOLID, 16-3/4	
	BB1012			
	BB1214	005342	SPOKE, SOLID, 17-1/2	
	BB1518			
BB1821				
3	ALL	005371	BRACKET, SHELL	8
4		005388	PATCH, WEAR, BRACKET	8
5		004848	BRACKET, RESTRAINER	2
6	BB6072	005293	CABLE, IDS, RESTRAINER	2
	BB8096	005294		
	BB9011	005295		
	BB1012	006373		
	BB1214			
	BB1518	005296		
BB1821				
7	BB6072	005308	CABLE,IDS, DEPLOYMENT	1
	BB8096	005309		
	BB9011	005311		
	BB1012	005313		
	BB1214			
	BB1518	005315		
BB1821				
8	ALL	000495	MACHINE SCREW, 10-24 X 3/4, PNP, SS	20
9		001855	WASHER, FLAT, #10 X 3/4, FND, SS	20
10		001833	WASHER FLAT, 1/4 X 11/16 THIN, SS	18
11		001660	NUT, HEX, NYLOCK, 10-24 HX, SS	20
12		001703	PIN, CLEVIS, 1/4 X 1-1/8 SS	10
13		001705	PIN, CLEVIS, 1/4 X 11/4 SS	8
14		001710	PIN, COTTER, 1/16 X 3/4 PLT	18

Ballast System, Models 6072-1518



ITEM	MODEL	PART #	DESCRIPTION	QTY
1	BB6072 - BB1518	005451	POUCH, BALLAST	1
2		005465	BAR, BALLAST, SQUARE, 2X2X8.375 GLV	2
3		003001	QUICKLINK, 1/4, ZC-PLT	3
4		000370	BOLT, HX, 1/4-20 X 1, SS	2
5		001857	WASHER, FLAT, 1/4 X 1-1/2, SS	4
6		001828	WASHER, 7/32 X 1-1/2 X 1/8" NEO.	2
7		001662	NUT, HX, NYLOCK, 1/4-20, SS	2
8		000493	SCREW, 10-24 X 1/2", PNP, SS	3
9		001855	WASHER, FLAT, #10 X 3/4, SS	6
10		001660	NUT, HX, NYLOCK, SS, 10-24, SS	3
KIT		006184	BALLAST POUCH, ASSEMBLY, COMPLETE	1

Ballast System, Model 1821



ITEM	MODEL	PART #	DESCRIPTION	QTY
1	BB1821	005444	POUCH, BALLAST	1
2		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		006185	BALLAST, POUCH, ASSEMBLY, COMPLETE	1

Troubleshooting Kits

SEI Industries recommends carrying a troubleshooting kit to all fire sites. This will minimize loss of flying time, if problems should develop. The components in these kits are:

Troubleshooting Kit Models 6072 (006205) (Includes All Short Series 8096S-1821S)

Part #	Description	Qty.
005220	SOLENOID, C/W HARDWARE	1
005223	REEL, SPRING, ASSEMBLY	1
005279	VALVE, DUMP, 6072-1821	1
005614	STRING, PURSE, SET	1
000370	BOLT, HEX, 1/4-20 X 1, SS	33
001662	NUT, HEX, 1/4-20, SS	33
001828	WASHER, FLAT, 7/32 X 1-1/2 X 1/8 NEO	33
001857	WASHER, FLAT, 1/4 X 1-1/2, FND, SS	66
002963	TAPE, BUTYL, 1/8 X 3/8	10
005335	TRIPLINE, NO PULLY	1

Troubleshooting Kit Models 8096-1214 (006206)

Part #	Description	Qty.
005220	SOLENOID, C/W HARDWARE	1
005223	REEL, SPRING, ASSEMBLY	1
005279	VALVE, DUMP, 6072-1821	1
005614	STRING, PURSE, SET	1
000370	BOLT, HEX, 1/4-20 X 1, SS	33
001662	NUT, HEX, 1/4-20, SS	33
001828	WASHER, FLAT, 7/32 X 1-1/2 X 1/8 NEO	33
001857	WASHER, FLAT, 1/4 X 1-1/2, FND, SS	66
002963	TAPE, BUTYL, 1/8 X 3/8	10
005332	TRIPLINE, NO PULLY	1

Troubleshooting Kit Models 1518-1821 (006207)

Part #	Description	Qty.
005220	SOLENOID, C/W HARDWARE	1
005223	REEL, SPRING, ASSEMBLY	1
005279	VALVE, DUMP, 6072-1821	1
005615	STRING, PURSE, SET	1
000370	BOLT, HEX, 1/4-20 X 1, SS	33
001662	NUT, HEX, 1/4-20, SS	33
001828	WASHER, FLAT, 7/32 X 1-1/2 X 1/8 NEO	33
001857	WASHER, FLAT, 1/4 X 1-1/2, FND, SS	66
002963	TAPE, BUTYL, 1/8 X 3/8	10
005332	TRIPLINE, NO PULLY	1

Carry Bags

Part Number	Description	Qty.
004901	BAG, CARRY, BAMBI, 6072	1
004902	BAG, CARRY, BAMBI, 8096-1012	1
004903	BAG, CARRY, BAMBI, 1214-1821	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

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.

Appendix: Drawings

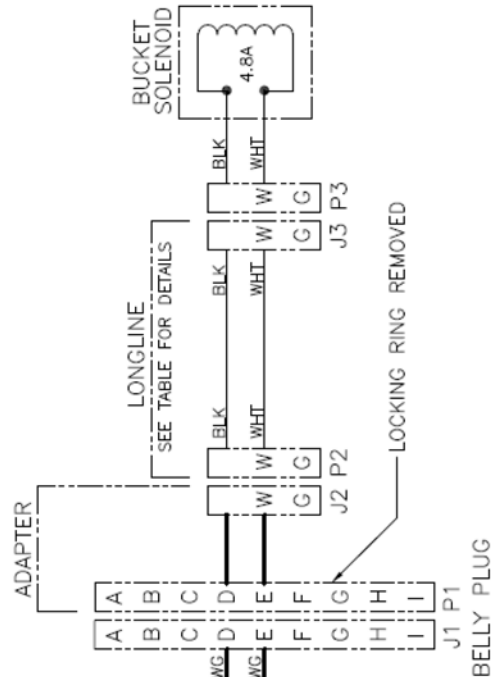
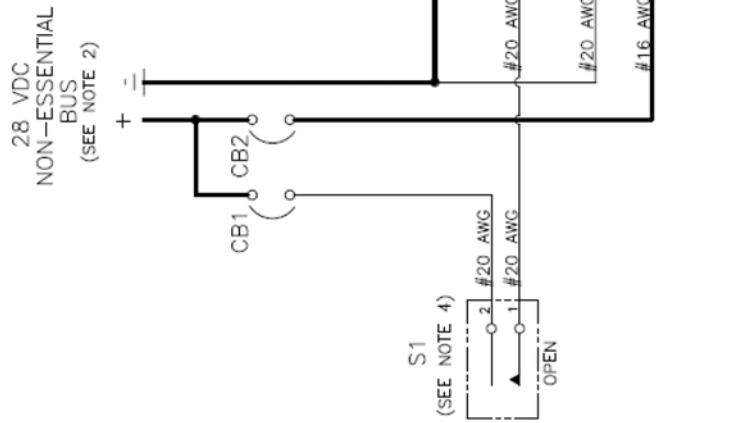
Pilot Controls

RECOMMENDED COMPONENTS

ITEM	DESCRIPTION	SPECIFICATION
CB1	CIRCUIT BREAKER, 1A	MS22073-1
CB2	CIRCUIT BREAKER, 10A	MS22073-10
K1	RELAY, DPDT, 10A	MS24149
S1	SWITCH, SPST, MOMENTARY	MS24523-28
J1	CONNECTOR, RECEPTACLE	MS3101E-24-11S
P1	CONNECTOR, PLUG	MS3107B-24-11P
J2,J3	CONNECTOR, RECEPTACLE	NEMA 5-15R
P2,P3	CONNECTOR, PLUG	NEMA 5-15P
—	WIRE, #20 AWG	MS22759/16-20
—	WIRE, #16 AWG	MS22759/16-16

LONGLINE DETAILS

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



NOTES:

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

PILOT CONTROLS

Pilot Controls, US InterAgency

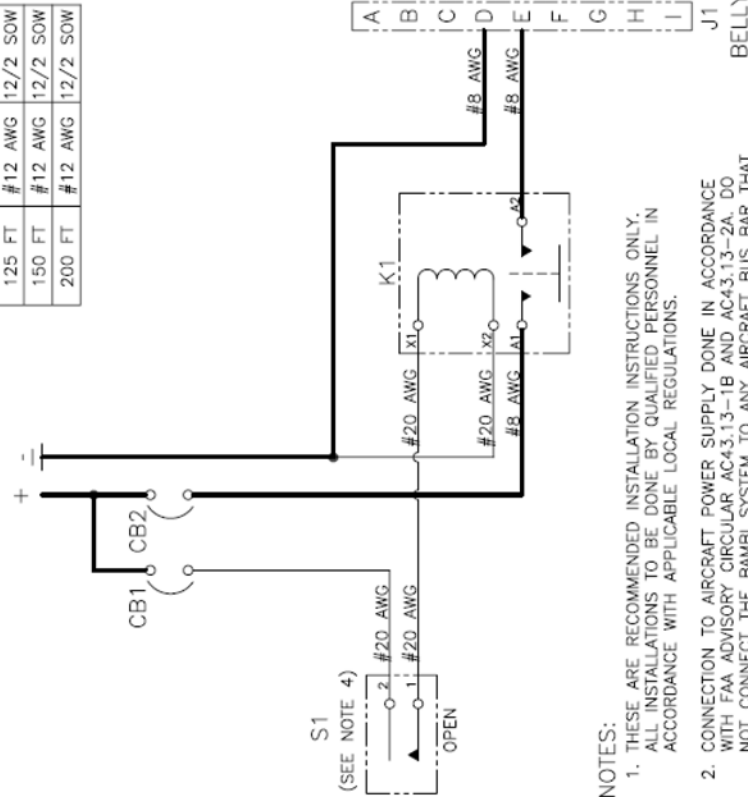
RECOMMENDED COMPONENTS

ITEM	DESCRIPTION	SPECIFICATION
CB1	CIRCUIT BREAKER, 1A	MS22073-1
CB2	CIRCUIT BREAKER, 50A	MS24571-50
K1	RELAY, SPST, 50A	MS24166-D1
S1	SWITCH, SPST, MOMENTARY	MS24523-28
J1	CONNECTOR, RECEPTACLE	MS3101E-24-11S
P1	CONNECTOR, PLUG	MS3107B-24-11P
J2,J3	CONNECTOR, RECEPTACLE	NEMA 5-15R
P2,P3	CONNECTOR, PLUG	NEMA 5-15P
—	WIRE, #20 AWG	MS22759/16-20
—	WIRE, #8 AWG	MS22759/16-8

LONGLINE DETAILS

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

28 VDC
NON-ESSENTIAL
BUS
(SEE NOTE 2)



NOTES:

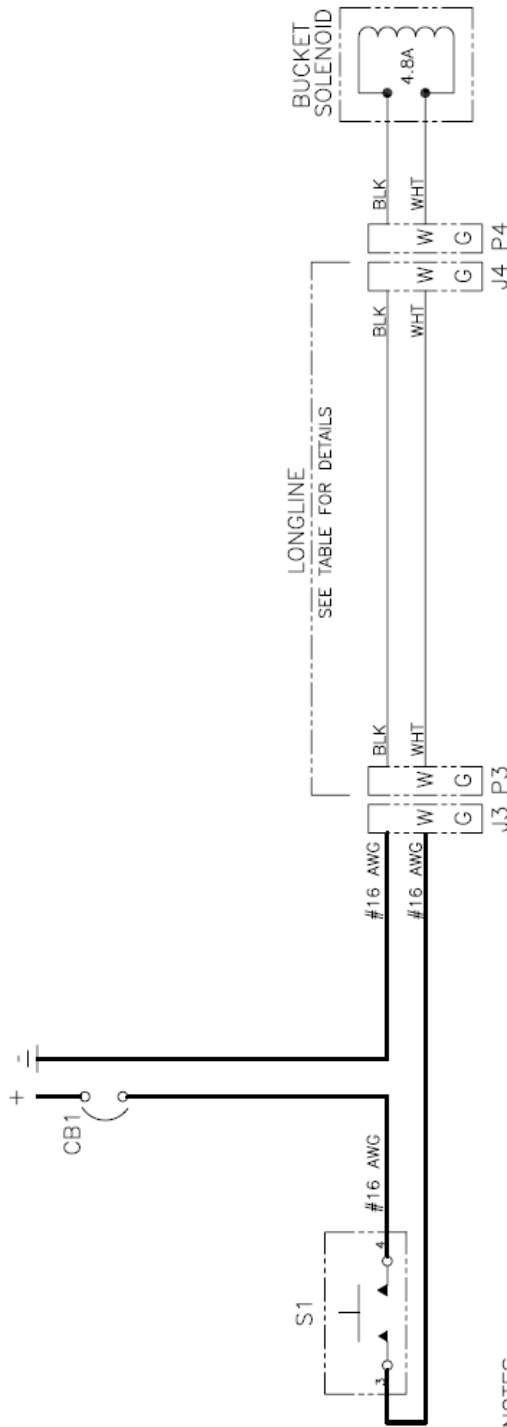
1. THESE ARE RECOMMENDED INSTALLATION INSTRUCTIONS ONLY. ALL INSTALLATIONS TO BE DONE BY QUALIFIED PERSONNEL IN ACCORDANCE WITH APPLICABLE LOCAL REGULATIONS.
2. CONNECTION TO AIRCRAFT POWER SUPPLY DONE IN ACCORDANCE WITH FAA ADVISORY CIRCULAR AC43.13-1B AND AC43.13-2A. DO NOT CONNECT THE BAMBİ SYSTEM TO ANY AIRCRAFT BUS BAR THAT IS USED FOR EMERGENCY OR ESSENTIAL LOADS. AMMEND THE AIRCRAFT ELECTRICAL LOAD ANALYSIS TO ENSURE THAT THE GENERATOR CAPACITY IS ADEQUATE TO OPERATE THE SYSTEM.
3. ALL GROUNDS, SOLDERED TERMINALS, AND CRIMPED TERMINALS DONE IN ACCORDANCE WITH AIRCRAFT MANUFACTURERS INSTRUCTIONS.
4. ACTUATION SWITCH MOUNTED ON THE COLLECTIVE PITCH LEVER. SWITCH MARKED "OPEN" AND SPRING-LOADED TO THE OFF POSITION.

PILOT CONTROLS
US INTERAGENCY

Bambi Crew Controls

LONGLINE DETAILS		RECOMMENDED COMPONENTS	
LENGTH	GAUGE	DESCRIPTION	SPECIFICATION
50 FT	#14 AWG	CIRCUIT BREAKER, 10A	MS22073-10
75 FT	#14 AWG	SWITCH, SPST, MOMENTARY	MS16712-1
100 FT	#14 AWG	CONNECTOR, RECEPTACLE	NEMA 5-15R
125 FT	#12 AWG	CONNECTOR, PLUG	NEMA 5-15P
150 FT	#12 AWG	WIRE, #16 AWG	MS22759/16-16
200 FT	#12 AWG		

28 VDC
NON-ESSENTIAL
BUS
(SEE NOTE 2)



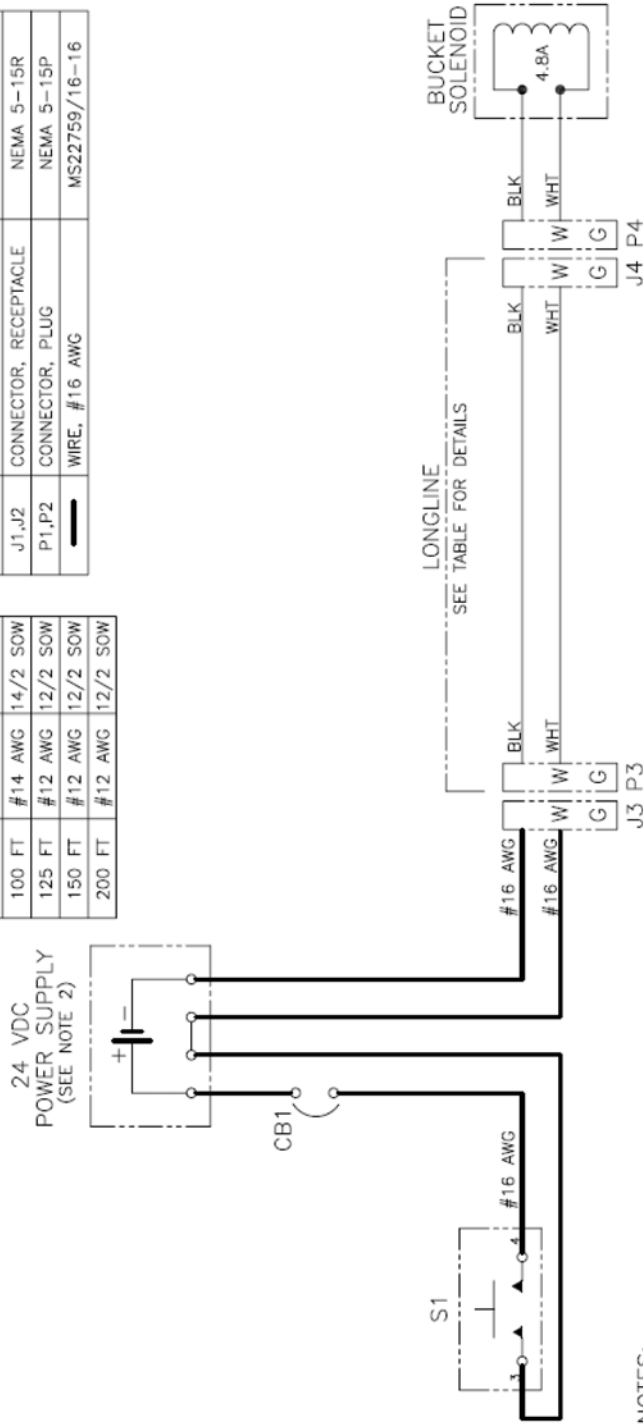
NOTES:

1. THESE ARE RECOMMENDED INSTALLATION INSTRUCTIONS ONLY. ALL INSTALLATIONS TO BE DONE BY QUALIFIED PERSONNEL IN ACCORDANCE WITH APPLICABLE LOCAL REGULATIONS.
2. CONNECTION TO AIRCRAFT POWER SUPPLY DONE IN ACCORDANCE WITH FAA ADVISORY CIRCULAR AC43.13-1B AND AC43.13-2A. DO NOT CONNECT THE BAMBİ SYSTEM TO ANY AIRCRAFT BUS BAR THAT IS USED FOR EMERGENCY OR ESSENTIAL LOADS. AMMEND THE AIRCRAFT ELECTRICAL LOAD ANALYSIS TO ENSURE THAT THE GENERATOR CAPACITY IS ADEQUATE TO OPERATE THE SYSTEM.
3. ALL GROUNDS, SOLDERED TERMINALS, AND CRIMPED TERMINALS DONE IN ACCORDANCE WITH AIRCRAFT MANUFACTURERS INSTRUCTIONS.

CREW CONTROLS

Bambi Crew Controls (using remote power supply)

LONGLINE DETAILS			RECOMMENDED COMPONENTS		
LENGTH	GAUGE	TYPE	ITEM	DESCRIPTION	SPECIFICATION
50 FT	#14 AWG	14/2 SOW	CB1	CIRCUIT BREAKER, 10A	MS22073-10
75 FT	#14 AWG	14/2 SOW	S1	SWITCH, SPST, MOMENTARY	MS16712-1
100 FT	#14 AWG	14/2 SOW	J1,J2	CONNECTOR, RECEPTACLE	NEMA 5-15R
125 FT	#12 AWG	12/2 SOW	P1,P2	CONNECTOR, PLUG	NEMA 5-15P
150 FT	#12 AWG	12/2 SOW	—	WIRE, #16 AWG	MS22759/16-16
200 FT	#12 AWG	12/2 SOW			



- NOTES:
1. THESE ARE RECOMMENDED INSTALLATION INSTRUCTIONS ONLY. ALL INSTALLATIONS TO BE DONE BY QUALIFIED PERSONNEL IN ACCORDANCE WITH APPLICABLE LOCAL REGULATIONS.
 2. POWER SUPPLY CAPABLE OF DELIVERING 4.8A FOR FIVE SECONDS ON A 5% DUTY CYCLE.
 3. ALL GROUNDS, SOLDERED TERMINALS, AND CRIMPED TERMINALS DONE IN ACCORDANCE WITH AIRCRAFT MANUFACTURERS INSTRUCTIONS.

CREW CONTROLS
REMOTE POWER SUPPLY