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**Bambi**  
**BUCKET**  
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# ***BAMBI BUCKET DAMAGE ASSESSMENT MANUAL***

***REVISION E***

# Bambi Bucket®

## Repair Assessment Manual

Revision **E**

Issue Date: **June 2 2009**

Manufactured under one or more of the  
following patents:

U.S. Patents 4,576,237 and 4,474,245  
Canada Patents 232,889 and 1,231,311  
U.K. Patent 2,145,624B

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## INTRODUCTION

### Introduction to the Bambi Bucket®

Since its introduction to the marketplace in 1983, the Bambi Bucket has become the preferred means of helicopter fire fighting by over 600 companies and agencies worldwide. The industrial fabrics used in the construction of the Bambi Bucket are designed specifically for the Bambi Bucket and meet substantial safety factors to provide the operator with a quality product that is designed to last.

This manual is intended to provide the user with information that will allow for the proper repair assessment evaluation of the Bambi Bucket. The repair assessment process is mostly identical for all sizes of the Bambi Buckets, with exceptions noted for minor bucket design variations between the models. In these cases subsections describing the different types of damage will be presented. Diagrams, photos and part descriptions are provided as an aid for quick identification and evaluation of parts and components on the Bambi Bucket.

This manual contains specific guidelines for the assessment of the operational condition of Bambi Buckets. At the end of each section of the Repair Assessment Manual is a guide that sorts the component defects into one of four categories, **Safety, Operational, Monitor, and OKAY**. Use the guideline definitions below to determine how urgently a repair should be carried out:

Attached as a supplement is the repair assessment process and guidelines for the Bambi Bucket fitted with the PowerFill II shallow water pumping system. The following guidelines are also to be used to sort the component defects into categories and determine the urgency of repairs.

#### **Category 1: Safety**

All defects in this category must be repaired immediately before further operation of the Bambi Bucket. 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:

1. Structural integrity
2. Flight stability
3. Water release
4. Flight Safety

#### **Category 2: Operational**

All defects in this category should be repaired before the next operational day, or approximately 8 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**

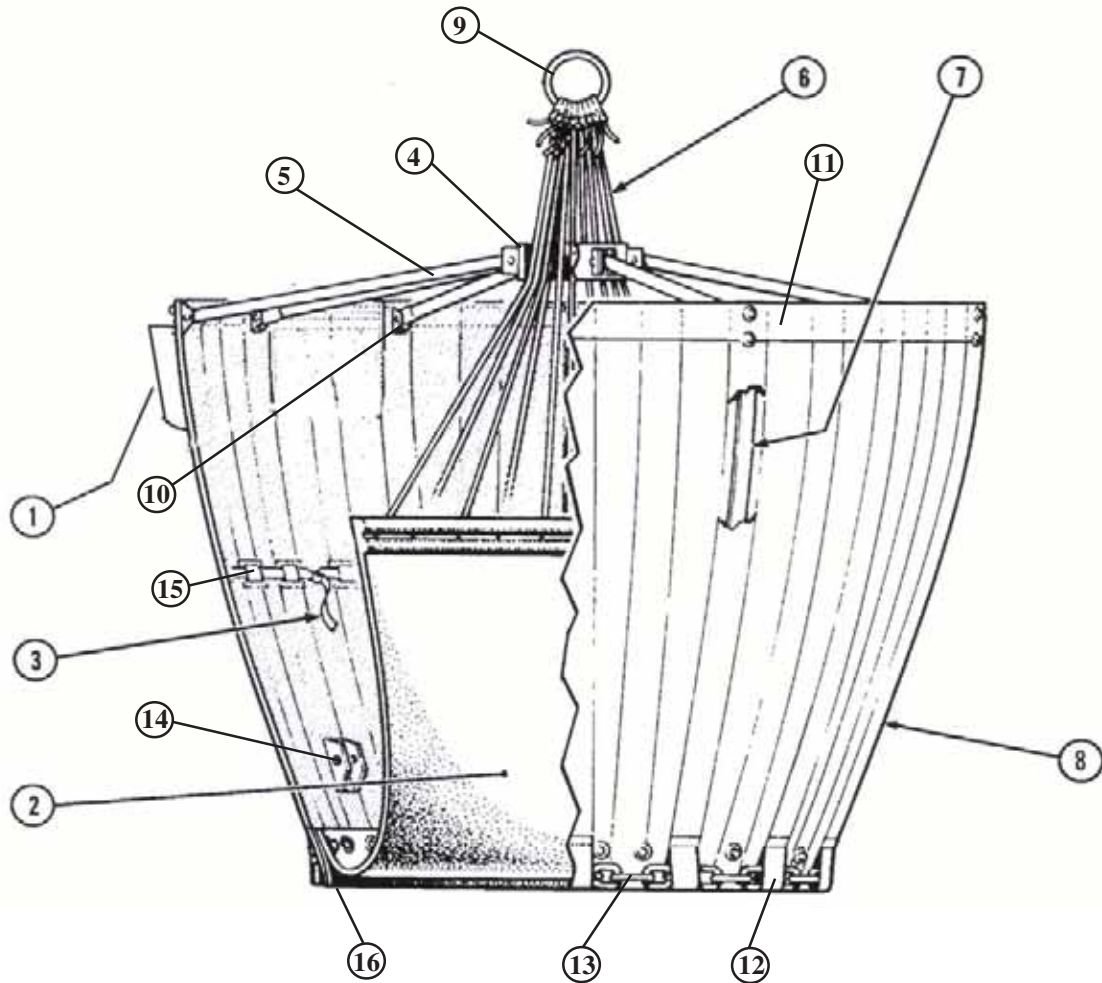
Many defects such as wear, abrasion and minor impact damage do not need urgent attention. Defects of this nature should be monitored daily and repaired before the progress to Category 2 defect.

#### **Category 4: OKAY**

The Bambi Bucket does not need repairs.

**SECTION A.: PARTS - SHELL AND VALVE MODELS 6072-1821**

**Parts Diagram**



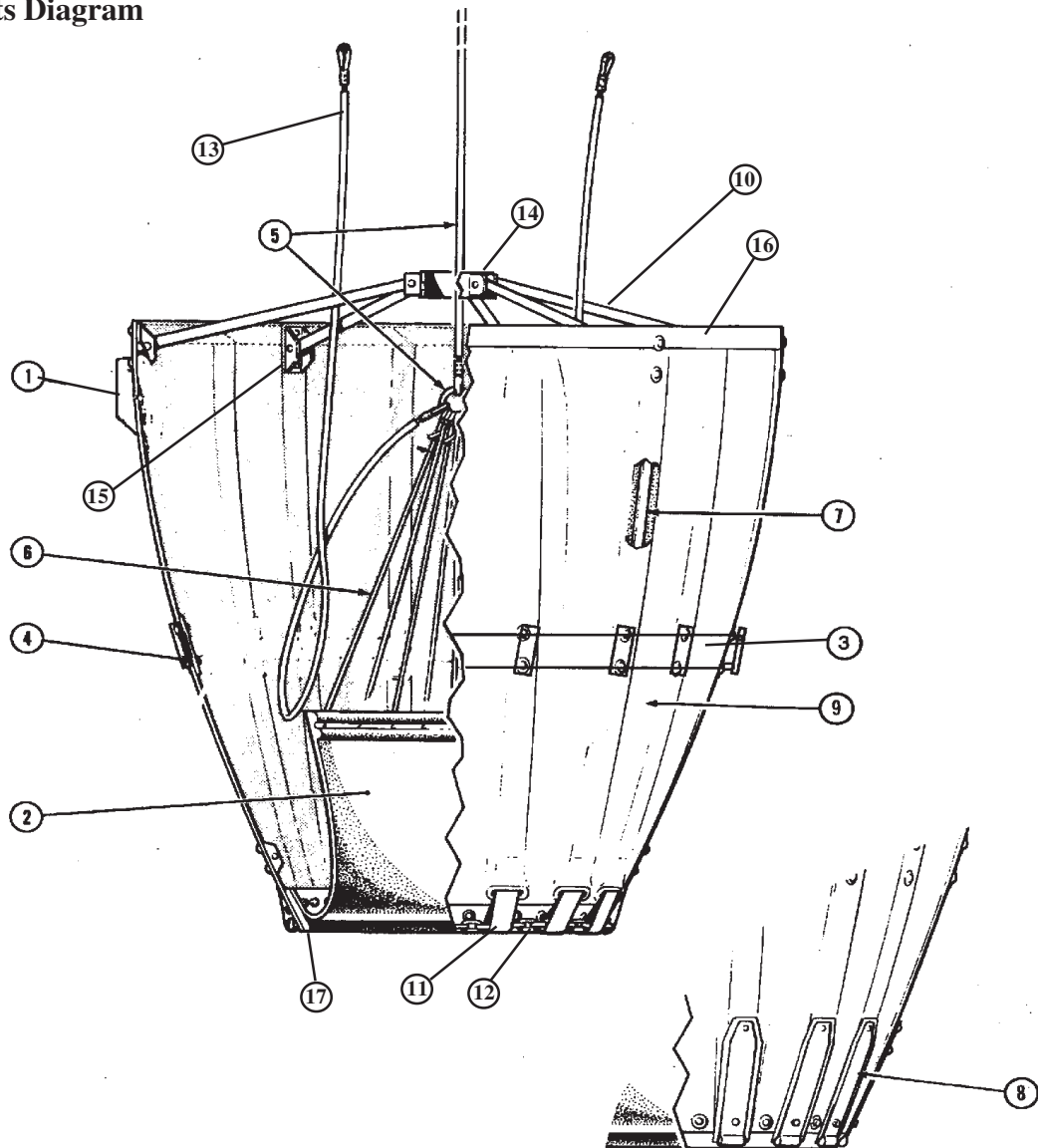
<u>Diagram #</u>	<u>Description</u>	<u>Diagram #</u>	<u>Description</u>
1	Ballast Plates	9	Riser Ring
2	Dump Valve	10	IDS Brackets
3	Cinch Strap	11	Top Webbing
4	IDS Hub	12	Bottom Webbing Loops
5	IDS Spokes	13	Bottom Chain
6	Purse Line Set	14	Hub Restrainer Bracket
7	Side Battens	15	Cinch Strap Loop
8	Bambi Bucket Shell	16	Bottom Webbing

**Figure 1**



**SECTION A: PARTS - SHELL AND VALVE MODELS 2024-HL9800**

**Parts Diagram**

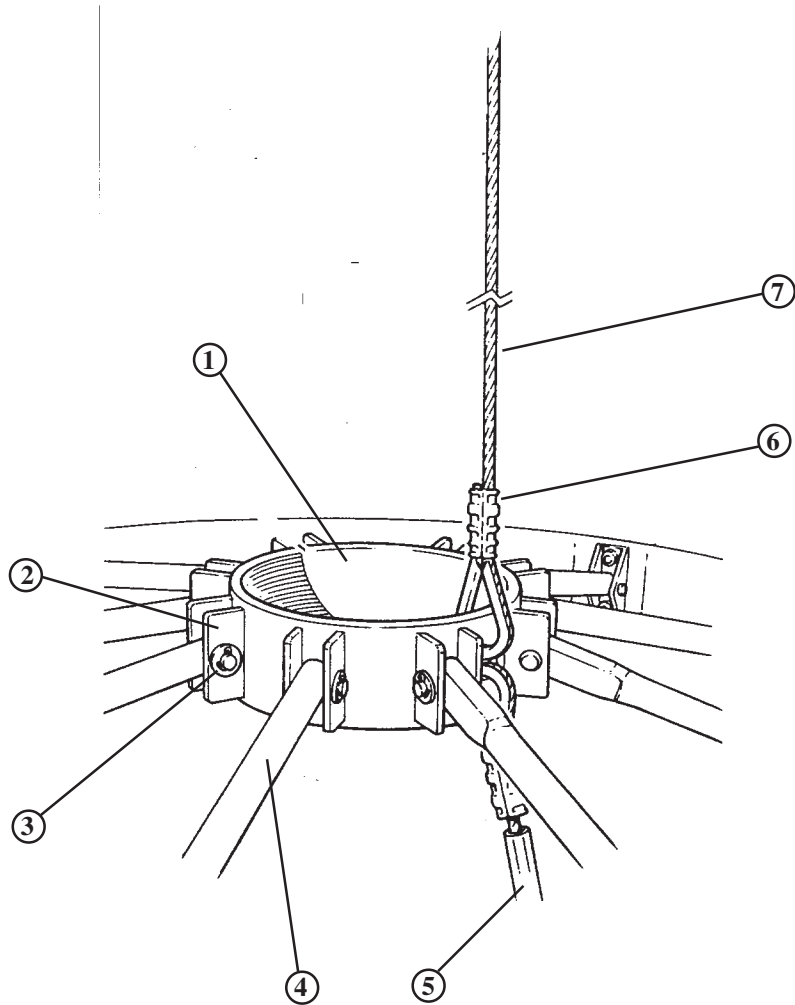


<u>Diagram #</u>	<u>Description</u>	<u>Diagram #</u>	<u>Description</u>
1	Ballast Plates	9	Bambi Bucket Shell
2	Dump Valve	10	IDS Hub Spokes
3	Cinch Strap	12	Bottom Chain
4	Cinch Strap Bar	11	Bottom Webbing Loops
5	Riser Cable and Riser Ring	13	Valve Restrainer Cable
6	Purse String Set	14	IDS Hub
7	Side Battens	15	IDS Brackets
8	Bottom Webbing Loop Wear Strip	16	Top Webbing
		17	Bottom Webbing

**Figure 2**

# SECTION A: PARTS - IDS HUB

## Parts Diagram



<u>Diagram #</u>	<u>Description</u>	<u>Diagram #</u>	<u>Description</u>
1	IDS Hub	5	IDS Hub Restrainer
2	IDS Hub Bracket	6	Swage Block
3	Clevis Pin	7	Deployment cable
4	IDS Spokes		

Figure 3

## SECTION A: SUSPENSION CABLES AND M-STRAPS

### Parts Diagram

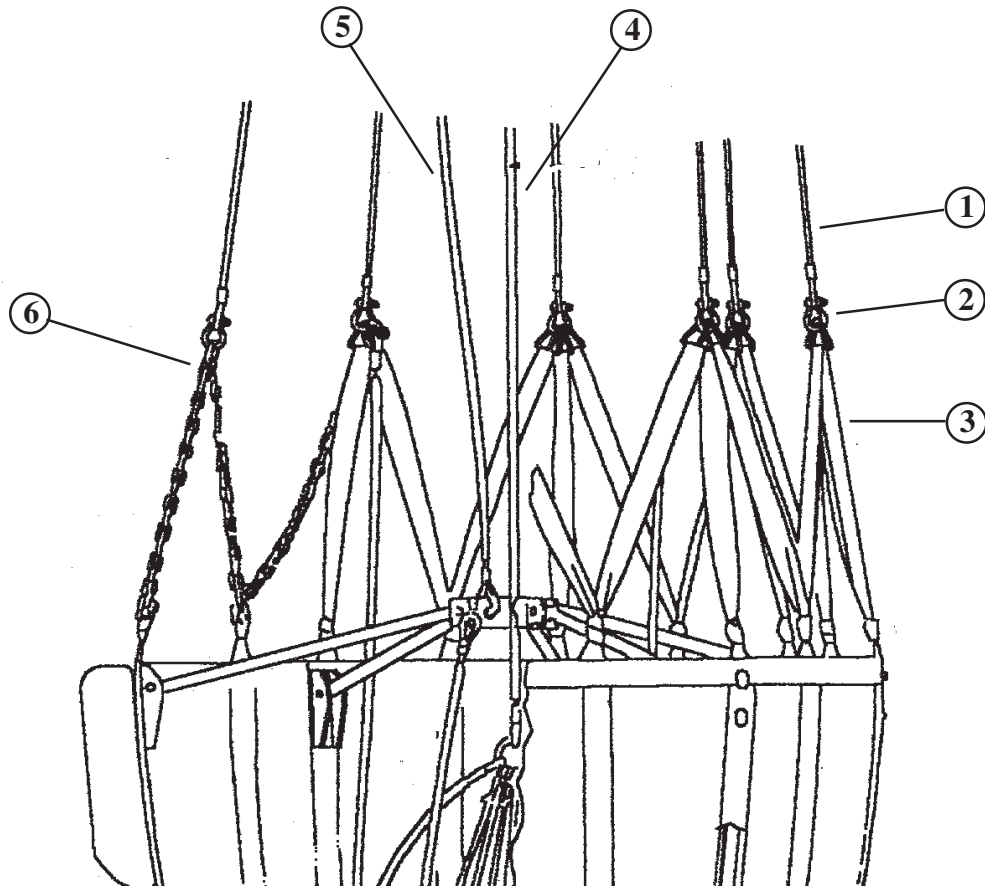


Diagram #	Description
1	Suspension Cables
2	Shackles
3	M-Straps
4	Valve Trip Line
5	IDS Deployment Cable
6	Top Chains

Figure 4



## SECTION B: CARRY BAG

Inspect the carry bag carefully. Look for any holes, broken zippers or torn handles. Torn handles and holes in bags can be fixed, but broken zippers cannot. The carry bag acts as a protective cover for the Bambi Bucket when not in use. In the event that the zipper is broken, you may want to replace the bag. Holes can be fixed by hand sewing fabric over the holes. Torn handles can be fixed by overlapping a portion of the handle webbing, and sewing it together.



## **SECTION B: CARRYBAG**

### **Category 1: Safety Cease Operations and Repair Immediately**

- Not Applicable

### **Category 2: Operational Repair before next days operation, or 8 hours flight time**

- Not Applicable

### **Category 3: Monitor Monitor and or repair if condition deteriorates**

- Holes in the bag
- Broken zipper
- Torn handles

### **Category 4: OKAY Does not need repair**

## SECTION C: SHELL

### Bambi Bucket Shell

The shell forms the basis for the Bambi Bucket. In your repair assessment, examine the shell for any weld separations along the panels, punctures, leaks or tears on the fabric, broken Top or Bottom Webbing Loops, broken Battens or for Bambi Strips that are beginning to peel away from the panel.

- Small punctures, tears or leaks can be repaired by the operator, by welding a patch over the affected area with a heat gun (refer to Operator's Manual for proper procedure). Large holes may require replacement of the panel.
- Look for peeling along the welded seam. Examine the seams carefully by folding each panel along the weld's edge, and look for any areas that have begun to peel. Sections that are peeling will appear to pull away from the mating panel when folded. If peeling is severe, the panel may need to be replaced

In this picture, the operator applied a patch to cover a puncture



## SECTION C: SHELL - TOP WEBBING

### Top Webbing

The Top Webbing is sewn around the upper perimeter of the Bambi Bucket Shell. Its function is to reinforce the top of the Shell and to help prevent tears during operation. Examine the Top Webbing for broken stitching or tears. Pay close attention to the sewing directly below each Top Loop. Due to high tensile loading, broken stitching in this area may result in the Strip being pulled away from the Panel. Larger model buckets have bolts as additional reinforcement to the stitching.

Protective covers: used to protect the Top Loops from wear - on larger models only

Top Webbing

Top Chains



Strip

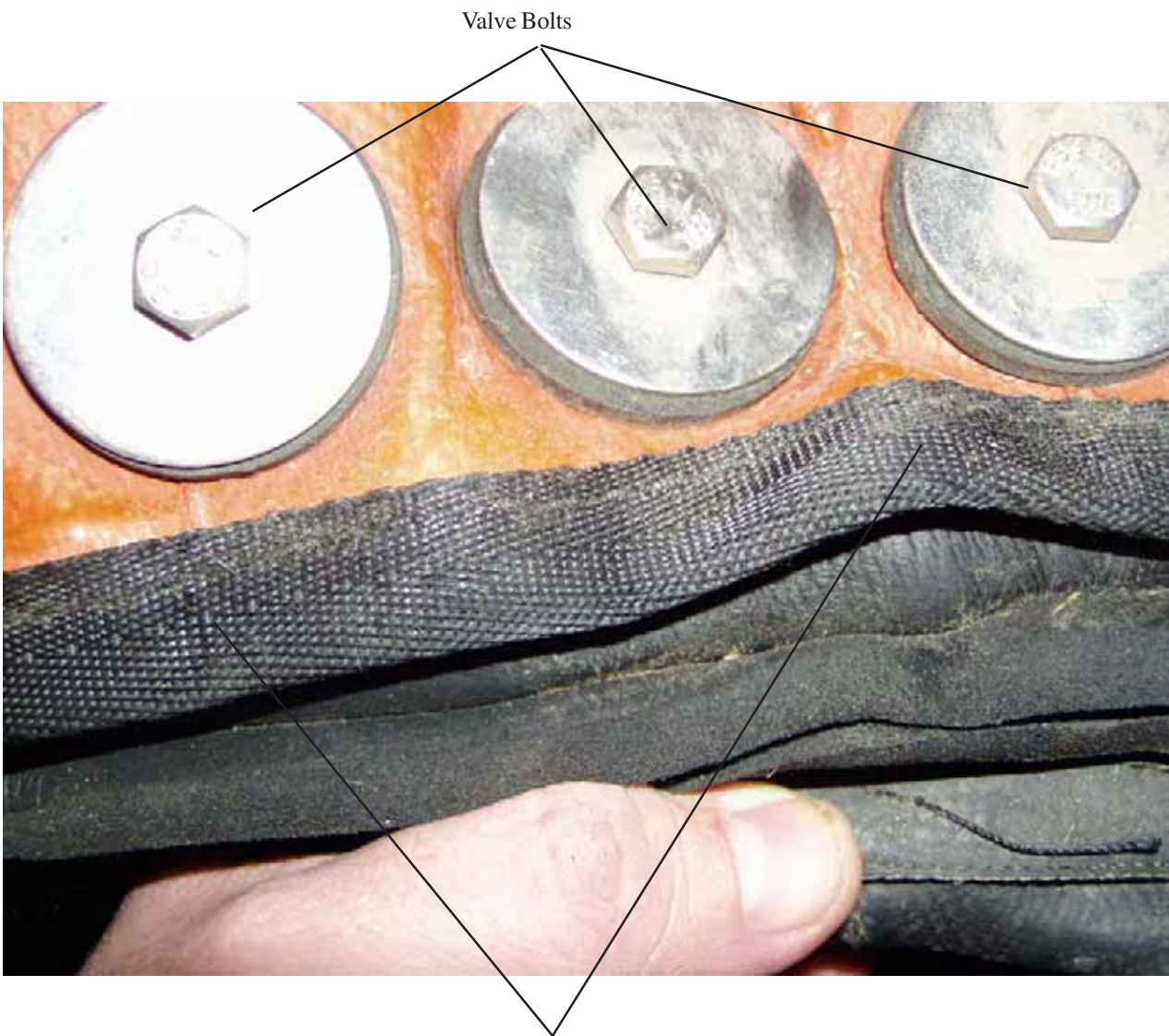
Examine the Top Webbing at the intersection of each Top Loop for broken stitching



## SECTION C: SHELL - BOTTOM WEBBING

### Bottom Webbing

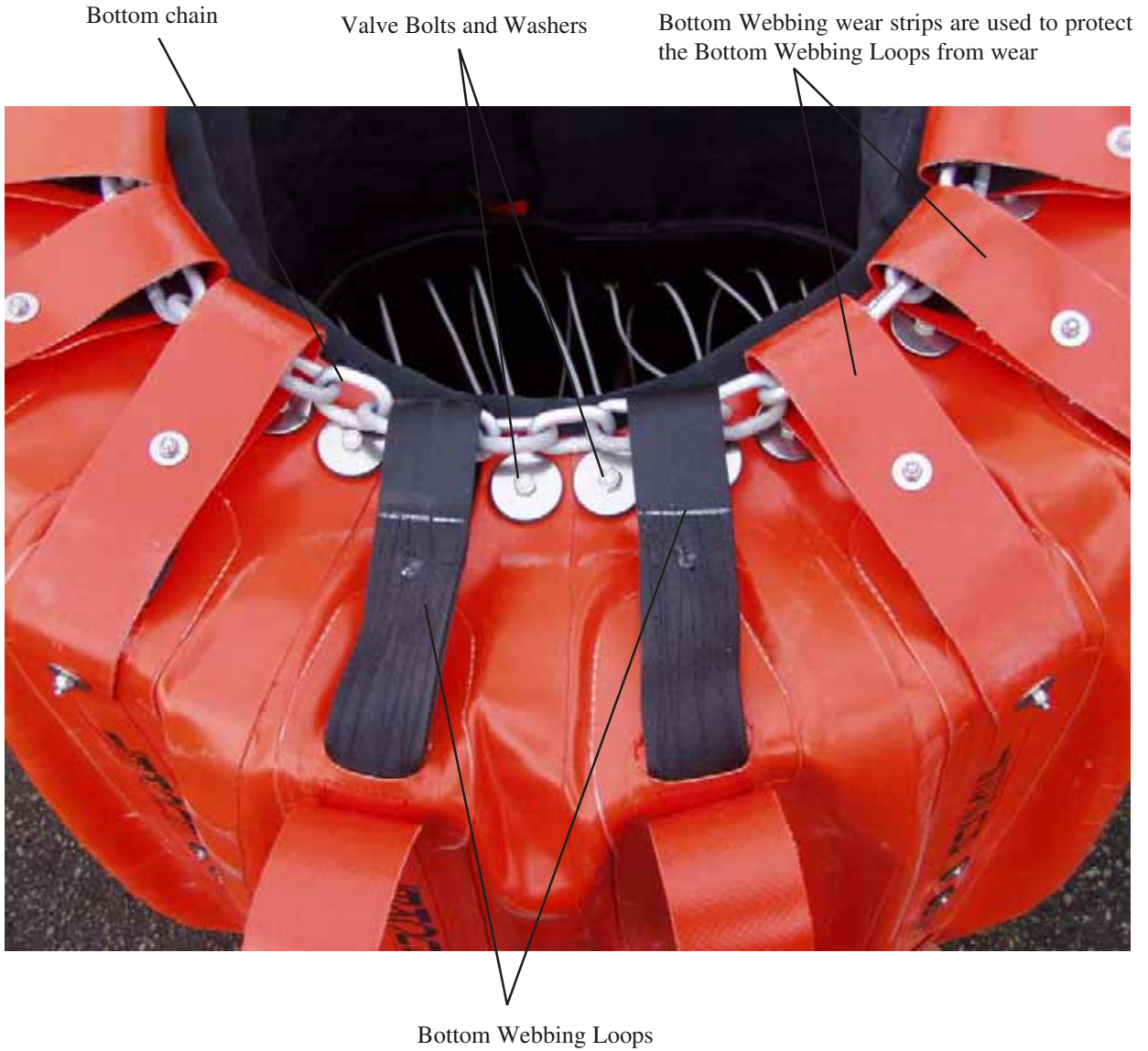
The webbing that is sewn to the bottom of the Bambi Bucket plays only a minor role in the structural integrity of the shell. The webbing's primary purpose is to protect the ends of the panels from tearing or peeling apart. If the webbing is torn, or if some of the stitching has come loose it is recommended that repairs be carried out to prevent future damage to the bucket Shell.



Bottom Webbing - sewn to the bottom edge of the Bambi Bucket Shell

## SECTION C: SHELL - BOTTOM LOOPS

Bottom Webbing Loops support the chain on the bottom of the bucket, which in turn helps to distribute the water load evenly among all the Panels of the bucket.



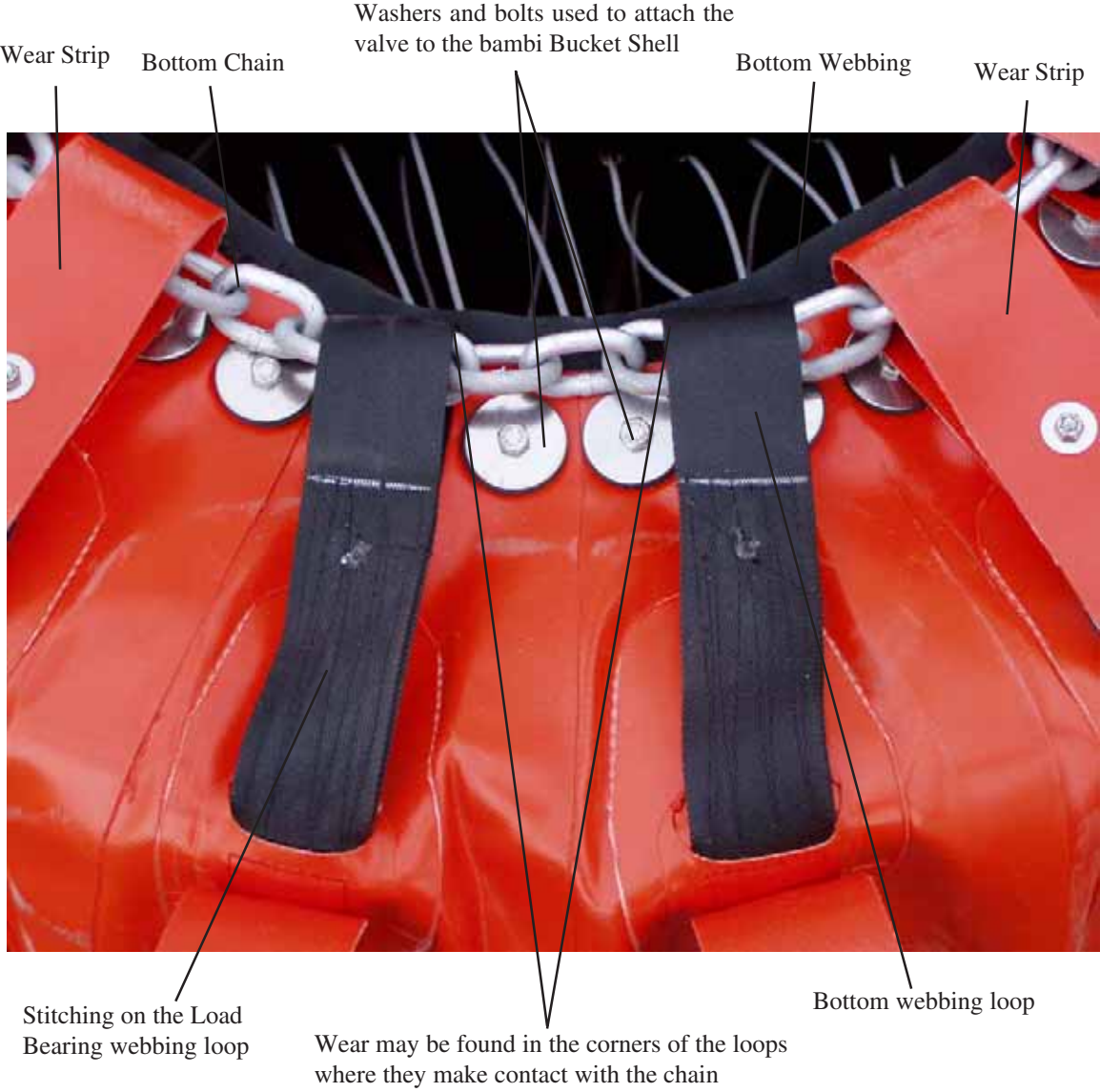


## SECTION C: SHELL - BOTTOM LOOPS

Examine the Bottom Webbing Loops for any wear, tears and broken loops. The majority of the wear will occur where the loops make contact with the chain. Broken Bottom Loops may adversely affect the operation of the Valve.

The protective Wear Strips are designed to protect the Bottom Webbing Loops from abrasive wear, and are not load bearing components. Worn or damaged wear strips can easily be replaced. Small amounts of broken stitching will not affect the function of a loop. Significant damage may require that the Loop be re-sewn.

**Note: Some older models of Bambi Buckets do not have the Wear Strips.**



## SECTION C: SHELL - SIDE BATTENS

### Side Battens

The Side Battens give the Bambi Bucket some shape when the bucket is empty. They assist in the process of deploying and filling the bucket. A minimum number of broken Battens will not affect the safe operation of the Bambi Bucket, but the sharp edges of broken Battens may cause small punctures through the shell with prolonged operation. Replacement of broken Battens is recommended.

Operators who cinch their buckets beyond the maximum cinch rating run the risk of breaking the Battens.



#### To Check for broken battens:

##### Step 1

Open up the bucket and turn it upside down. For a large heavy bucket, lay the bucket onto its side.

##### Step 2

Place your hand along the centerline of the strip that you want to inspect, and grab the bottom of the bucket as shown in the picture.



##### Step 3

Using your other hand, apply pressure along the length of the strip, checking for breaks

- Broken Battens will make a cracking noise
- Broken Battens will bend at the break point

## SECTION C: SHELL - TOP LOOPS

Examine the Top Loops for tears and wear under the knot.





## SECTION C: SHELL - BAMBI STRIPS

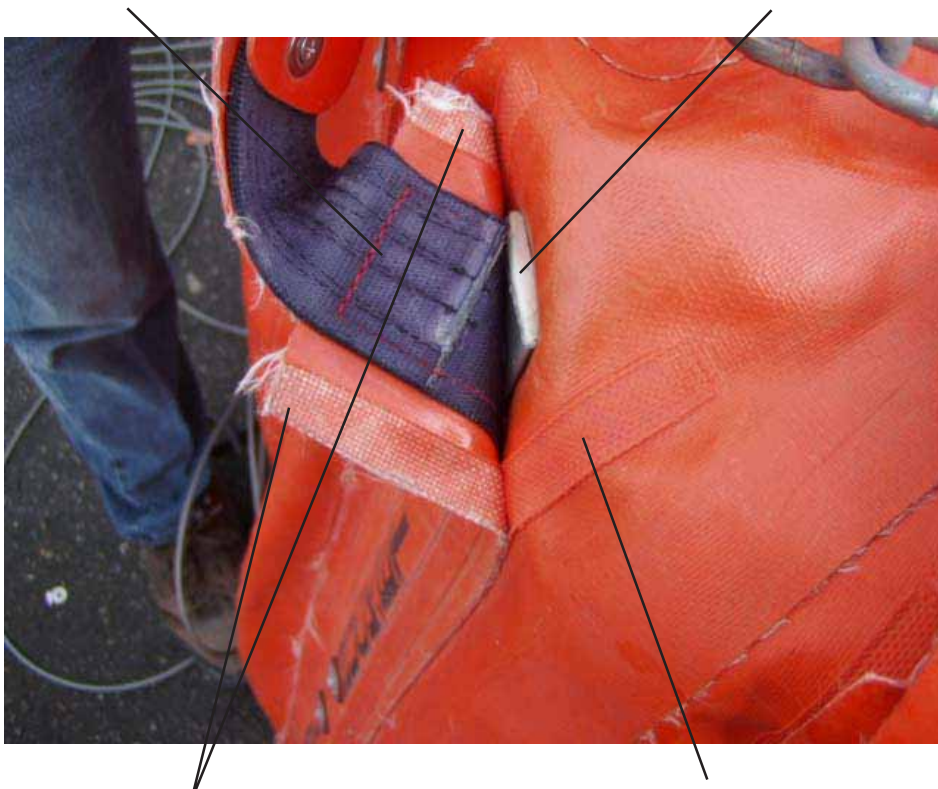
### Bambi Strips

Look for cuts that run across the Strip. Cuts can be on the surface of the strip only, or they can penetrate through the Strip into the webbing. Cuts may also break through the stitching that holds the webbing to the Strip, and may result in the stitching in that area working loose over time. Small cuts can usually be repaired by applying a patch with a heat gun or with glue (see Operator's Manual). If the cut is deep enough such that it severs the webbing, the panel may need replacement.

The Strip may peel away from the Shell at the weld. Peeling can expose the scrim on the Panel, which could result in leaks or punctures.

Webbing, which is sewn to the Bambi Strip is used to transfer the vertical loads to the Shell and the Bottom Chain. Look for torn loops, or broken or loose stitching.

Battens are inserted between the Bambi Strip and the panel and help give the bucket its shape.



Here, the Bambi Strip, which is welded to the Panel, has begun to peel away.

As long as the topcoat on the Panel is intact, up to 4 inches of peeled weld is acceptable.

## SECTION C: SHELL - BALLAST

### Ballast

All Bambi Buckets use ballast to assist in sinking the bucket when dipping and to help stabilize the bucket in flight. The Ballast comes in the form of steel Ballast Bars, or Ballast Bags filled with lead shot. The Ballast Bags are no longer offered with new buckets, but can still be found on older models. Conversion kits are available for those who wish to convert from Ballast Bags to Ballast Bars.

**Ballast Bars:** Examine the Shell for missing Bars, or missing retaining hardware. Check the Ballast backing plates, which are mounted behind the Ballast bars on the other side of the shell, for rough or bent edges. Rough edges may result in cutting on the Shell.

**Ballast Bags:** Look for tears, and for broken tabs or missing grommets. If the Ballast bag needs repairs, Conversion to Ballast Bars is recommended.



Steel Ballast Bars mounted to the outside of a Bambi Bucket.



Ballast Bags (used on older models of the Bambi Bucket) are located on the inside of the shell.

## SECTION C: SHELL - REPAIR CRITERIA GUIDELINES

### Category 1: Safety

#### Cease Operations and Repair Immediately

- 1 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)
- 2 or more broken Bottom Webbing Loops

### Category 2: Operational

#### Repair before next days operation, or 8 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
- 5 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 4 broken Battens

### Category 4: OKAY

#### Does not need repair



## SECTION D: CINCH STRAPS

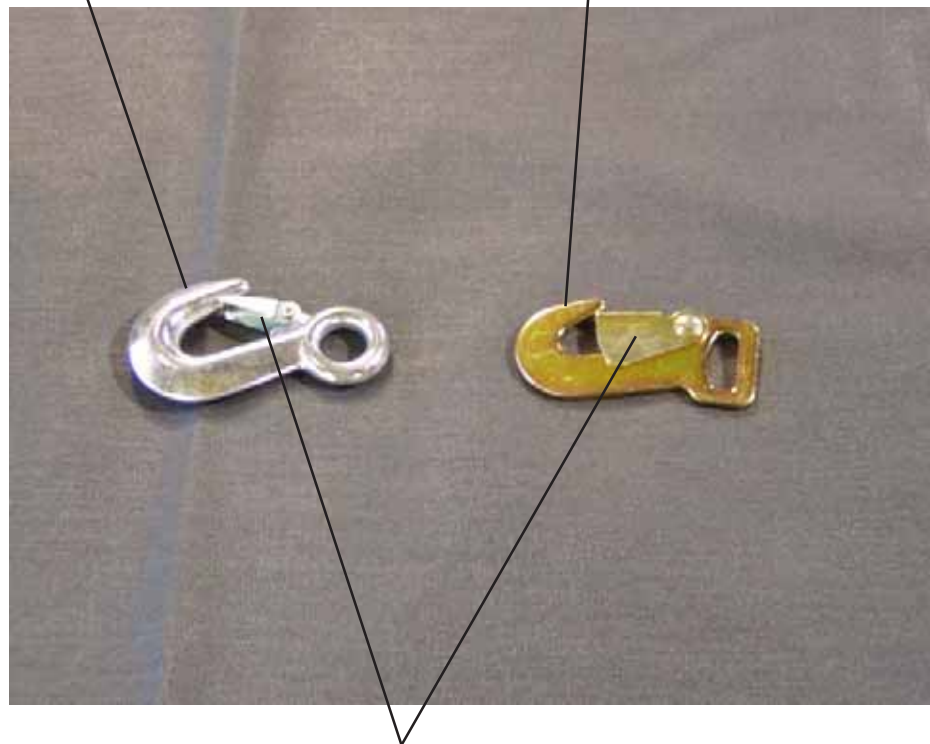
### Cinch Strap

The Cinch Strap is located on the inside of the Bambi Bucket for models 8096 - 4453, and on the outside of the Bambi Bucket for models 5566 - HL9800. The Cinch Strap is made up of a strap, hook, and load-setting rings. Each ring location has a tag that indicates the percentage of maximum fill. Examine each strap for damage to the hook, torn or broken cinch straps and missing or broken rings at each load tag. A damaged cinch strap may impair the operator's ability to reduce the maximum volume of the Bambi Bucket. Cinching beyond the marked load ratings may result in damage to the bucket. Tying knots in the Cinch Strap is not an acceptable practice as it will give a false indication of the actual maximum volume of water in the bucket. Buckets that are operated in the cinched mode should have their Hub Restrainer Cables adjusted (see Operators Manual).

The Cinch Strap hook may not work properly if the jaw is broken or if the latch has been damaged. Examine the hook carefully, and manually test the latch for correct operation. If it does not close or lock properly, the cinch strap needs to be replaced.

Cinch Strap Hook for Bambi  
Models 2024 - HL9800

Cinch Strap Hook for Bambi  
Models 8096 - 1821

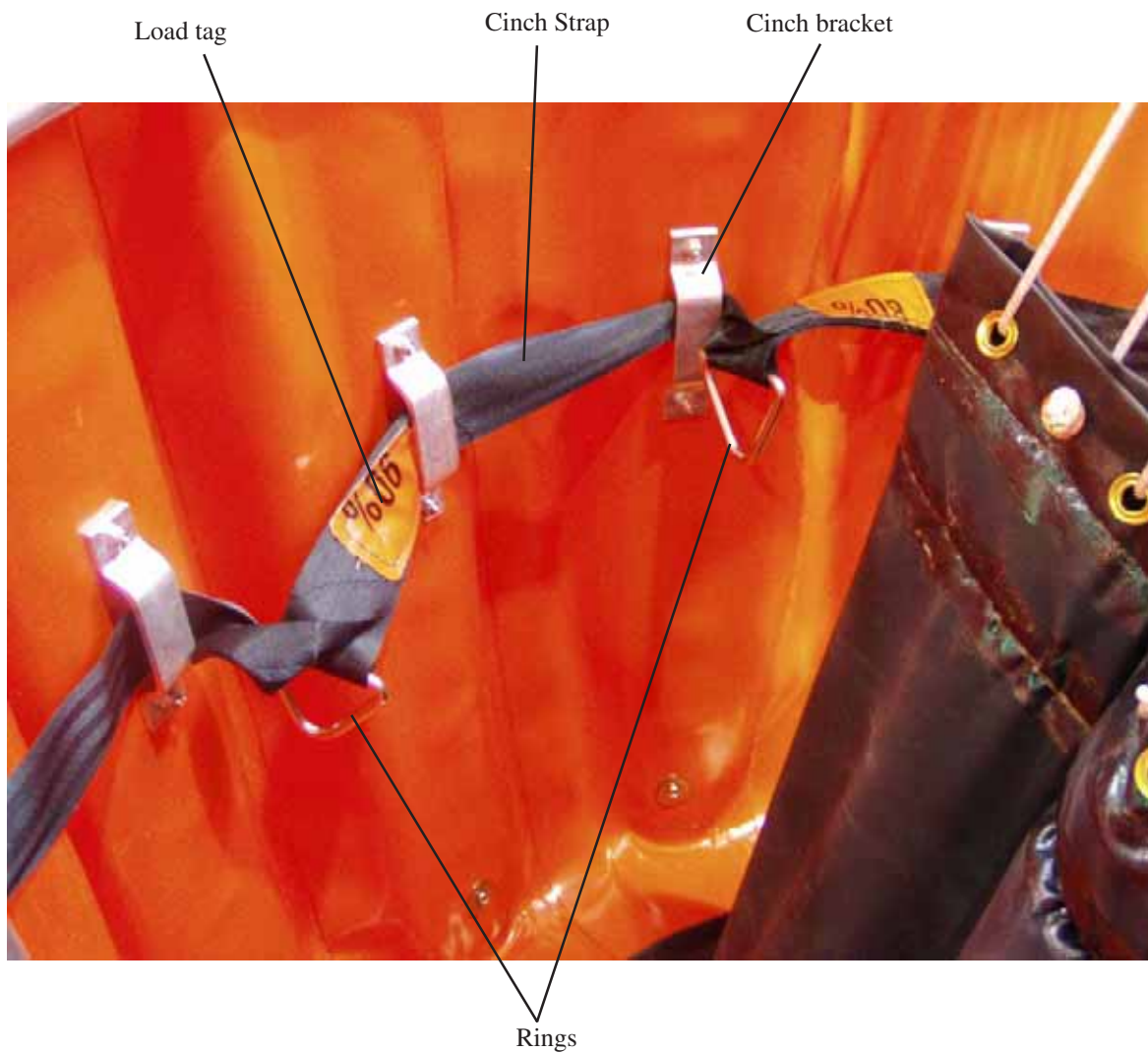


Manually test the latch for correct operation

## SECTION D: CINCH STRAPS

When cinched, the strap is under tension. Any tears or cuts in the strap may eventually result in breakage.

Beside the load rings on are tags indicating the percentage of maximum fill. Examine each ring and the stitching that holds the ring in place. Straps that show signs of loose or broken stitching at the load ring should be repaired or replaced.



## SECTION D: CINCH BRACKETS

### Cinch Brackets

The Cinch Brackets retain the Cinch Strap to the bucket Shell.

There are two versions of the Cinch Brackets:

- Fabric Cinch Brackets are found on the small Bambi Bucket (Models 8096 - 1821)
- Aluminum Cinch Brackets are found on the medium and large Bambi Buckets (Models 2024 - HL9800)

**Bucket models 8096 - 1821:** The Cinch Bracket is made from fabric, and is sewn to the inside of the Bambi Bucket Shell. Look for tears and loose or broken stitching. Torn or broken Cinch Brackets must be replaced. The ability of the Cinch Strap to reduce the volume of water in the bucket will be compromised if any Brackets are non-functional.

**Bucket models 2024 - 4453:** The medium size Bambi Buckets use aluminum Cinch Brackets, which are located on the inside of the bucket's shell. Examine the Brackets for any bending and look for broken or missing hardware. Broken bolts, bent Cinch Brackets or bent washers should be replaced. Loose bolts can be tightened.

**Bucket models 5566 - HL9800:** The large buckets have their Cinch Brackets located on the outside of the Bambi Bucket Shell. Examine the Brackets for any bending, dents and rough edges. Look for broken or missing hardware. Broken bolts, bent Cinch Brackets or bent washers should be replaced. Loose bolts can be tightened. You may be able to file or sand the edges of the Cinch Brackets that have experienced some gouging.

## SECTIONS D: CINCH STRAP - REPAIR CRITERIA GUIDELINES

The following guidelines apply to Bambi Buckets where the Cinch Strap is in use and is the only method of limiting the maximum gross capacity of the bucket.

### 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 operations, or 8 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**

## SECTION E: CABLES

The various cables on the Bambi Bucket use common components and examination of all cables is similar. Look for breaks, frayed wires, twisting and kinks. Pay close attention to the wires directly under the swage blocks as these areas may display more fatigue wear than on other parts of the cable.

### **Suspension Lines**

The Suspension Lines interface the control head with the M-Straps and carry the load in the Bambi Bucket.

### **Riser Cable**

The Riser Cable connects the trip Line to the Riser Ring.

### **Hub Restrainer Cables**

The Hub Restrainer cables are connected from the Hub restrainer brackets, located on the inside bottom of the shell, to the IDS hub. They prevent the IDS hub from deploying beyond its designed position when the Bambi Bucket is empty.

### **Deployment Cable.**

The Deployment Cable pulls vertically on the IDS hub when the bucket is lifted, and deploys the IDS hub system.

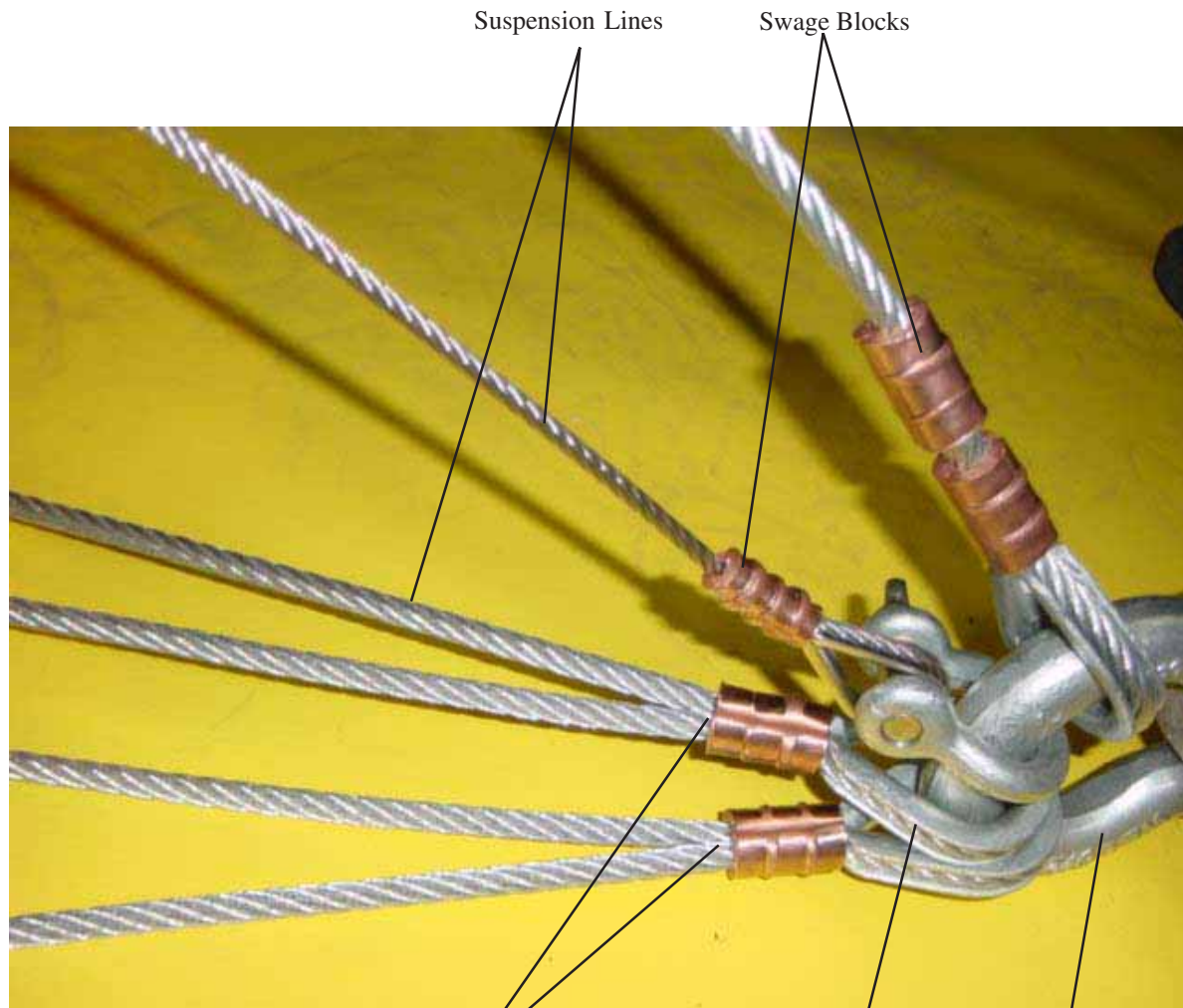
### **Valve Restrainer Cable**

The valve Restrainer Cable prevents the valve from being pulled out of the Bambi Bucket when in operation.

### **Tripline**

The Tripline connects to the Riser Cable on Bambi Bucket Models 6072 - 1821 (small buckets). The Tripline is routed through a small pulley that attaches to the Riser Ring. The purpose of the Tripline is to retract and release the dump valve.

## SECTION E: CABLES



Examine the cables directly under the Swage Blocks and look for any frayed or broken wires.

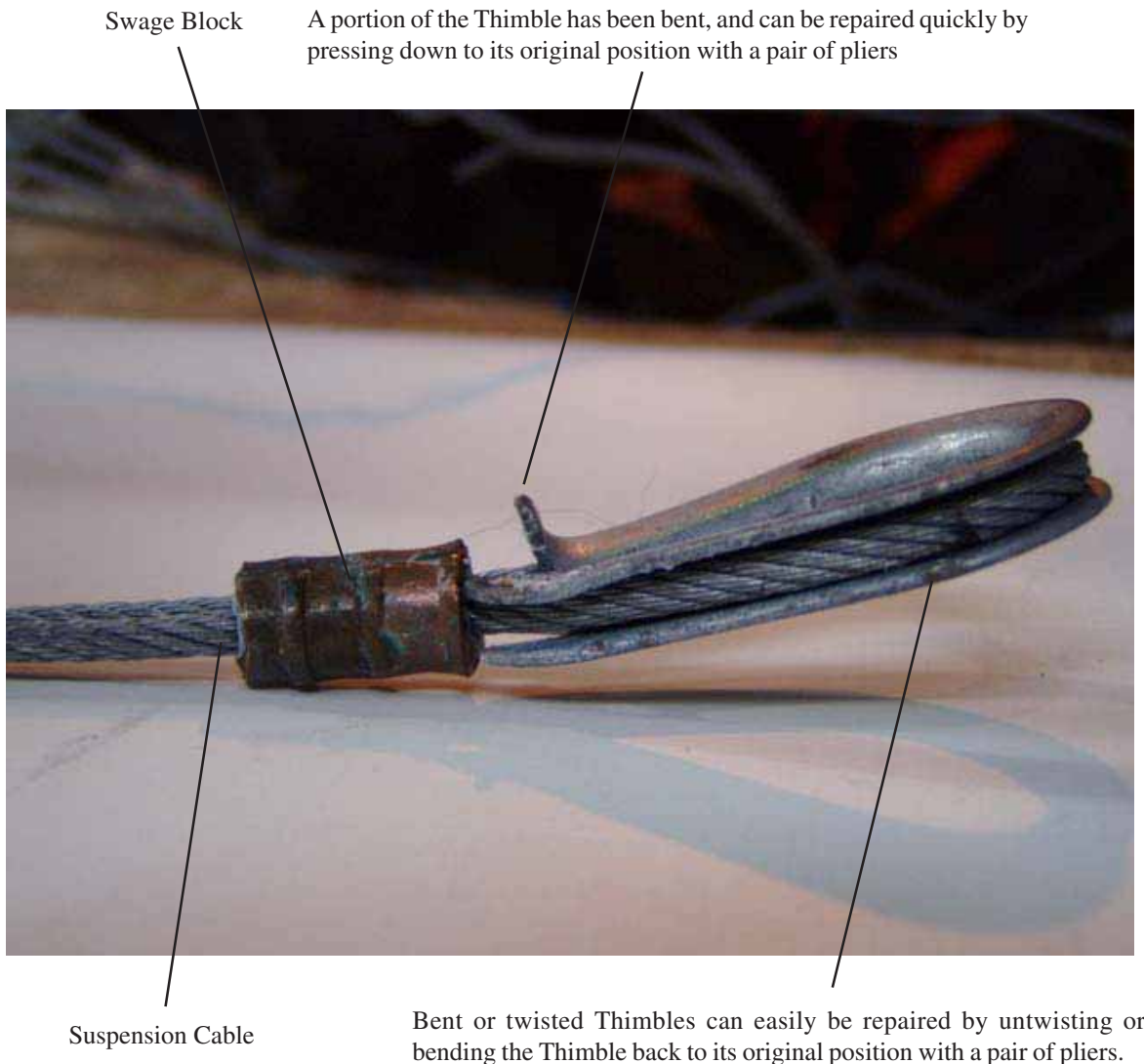
Thimble

Shackle

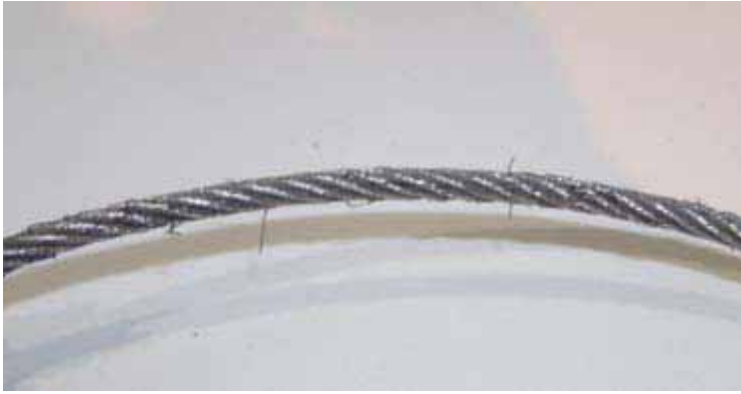


## SECTION E: CABLES

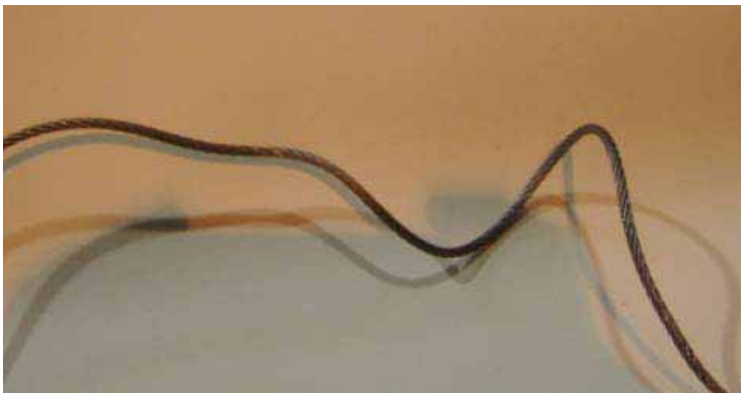
In your repair assessment, you may encounter thimbles that are bent, twisted or have begun to stretch as shown in picture below. Some elongation of the Thimbles may occur in use. Elongation is acceptable as long as the cable is not damaged, and the Thimble is not cracked or broken.



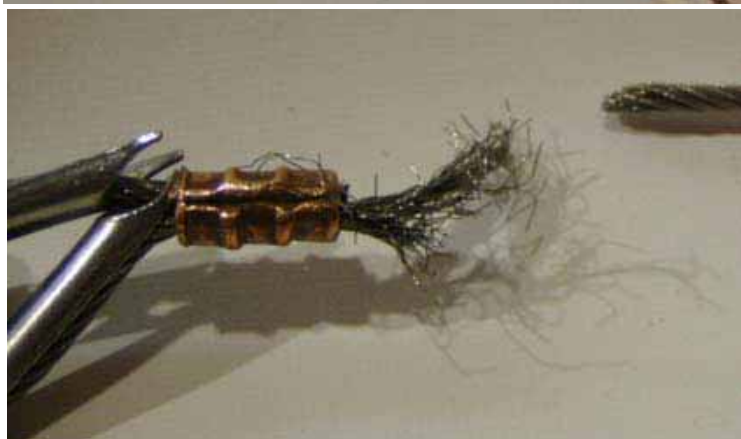
## SECTION E: CABLES



Frayed wires on the Riser cable or the IDS Restrainer cable can cause tears in the valve fabric.



Twisted cables that show no signs of fraying, kinks, or broken strands can usually have their twist worked out. If the twisted cable cannot be reasonably straightened then the cable may need replacement.



Cables that have broken must be replaced



Cables that have severe kinks or broken wire bundles should to be replaced.

## SECTION E: CABLES



Kinks that cause the wire bundles to spread apart are known as “Bird Caging”. If you can see through the strands, as shown in the picture, then the cable should be replaced.



Bent cables that do not show signs of Bird Caging can usually have the kink worked out by hand.



Protective covers are intended to protect the cable from wear. When protective covers have more than 25% wear on in a single wear area, or if they have broken in two or more pieces, they should be replaced.

## SECTION E: CABLES - REPAIR CRITERIA GUIDELINES

### Category 1: Safety

Cease operations and repair immediately

- 1 or more broken Suspension Cables or end fittings
- Broken Riser cable
- Broken Deployment Cable
- Broken Tripline

### Category 2: Operational

Repair before next days operations, or 8 hours flight time

If 3 or more individual Suspension Cables, Riser Cables, or the Deployment cable have the following defects:

- 10 or more randomly distributed broken strands, or 4 adjacent broken strands
- Visible kink or kinks
- 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

## SECTION F: VALVE





## SECTION F: VALVE - VALVE BOLTS

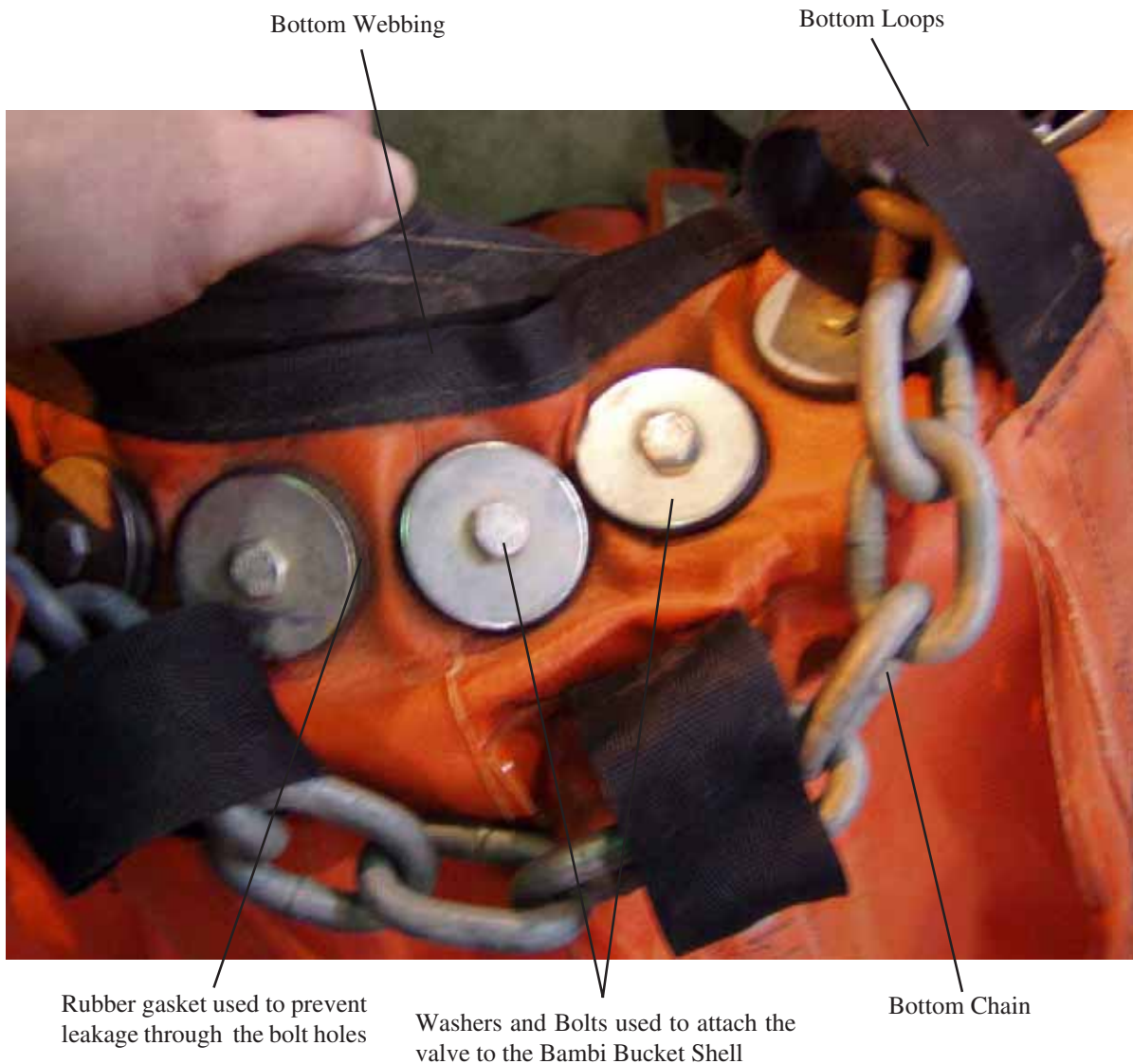
### Inspection of the Valve

There are three areas on the valve that are of primary interest when inspecting the valve:

- 1) the Valve Bolts
- 2) the Valve Body
- 3) the Valve Rubber

#### Valve Bolts

The Valve bolts attach the Valve to the Shell and are located on the bottom of the bucket. Examine the Valve Bolts and look for any damage. Bent washers, broken or loose Valve Bolts may allow leakage. Replace all bent washers and broken bolts. Loose Valve Bolts can be tightened.

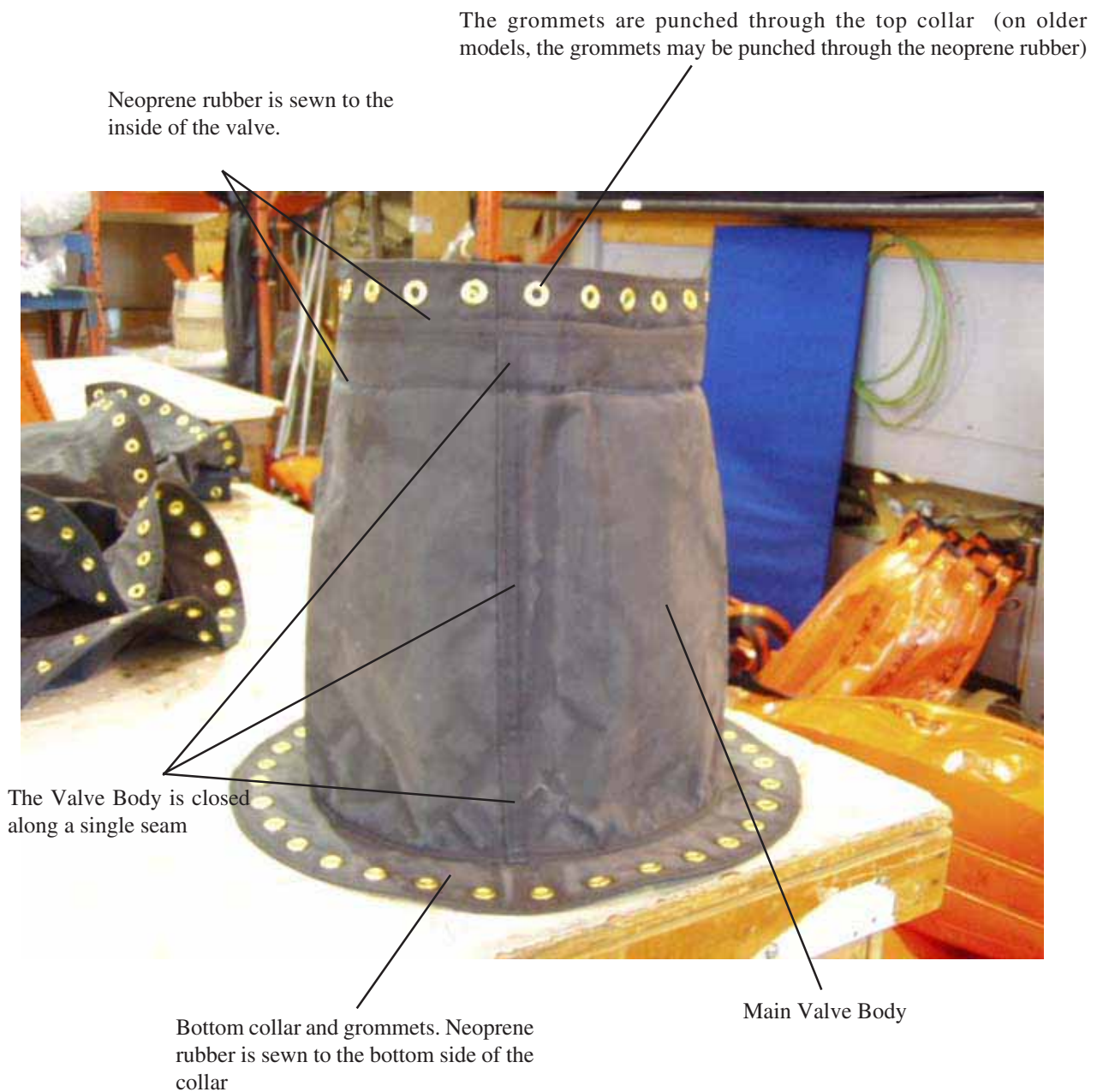




## SECTION F: VALVE - VALVE BODY

### Valve Body

The Valve Body must be examined for damage. Look for any chafing, tearing of the valve fabric, missing grommets, fold marks, punctures in the fabric or erosion of the glue along the stitching.



## SECTION F: VALVE - VALVE BODY

Chafing on the Valve Body may lead to wear spots that can weaken the material. Wear spots may tear or puncture easily and lead to leakage. If wear is substantial, replacement of the Valve may be required. Tears in the Valve can not be repaired.

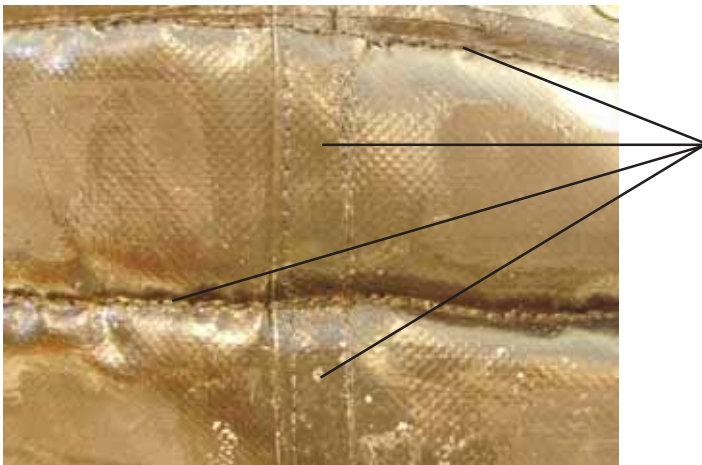
Examine the top part of the Valve, and look for displaced or missing grommets. The Purse Strings can cut through the Valve's fabric if the Grommets are displaced, resulting in a leaking valve. Older style valves have grommets that are punched through the Valve Rubber. If the strings damage the rubber, the Valve should be replaced.

Fold marks can cause the Valve's topcoat to break away from the scrim, and may cause the Valve to tear. Fold marks can appear as the result of improper preparation for storage (See Operator's Manual).

Class A foam residue may cause some stiffness of the valve's fabric if not thoroughly washed off before storage.

Punctures in the valve's fabric will result in leakage.

Small punctures created during the stitching process are sealed to prevent leaks along the seams. Check all sewing on the Valve body, and look for broken stitching, and areas along the seams where the sealant may be peeling away. Broken stitching or peeling sealant may result in leaks.



Examine all of the stitching on both the inside and outside of the valve. Look for any loose or broken stitching. Also examine the sealant on the stitching for peeling.

Broken stitching may indicate that the seam has separated. Failure along the seam will result in leaks.

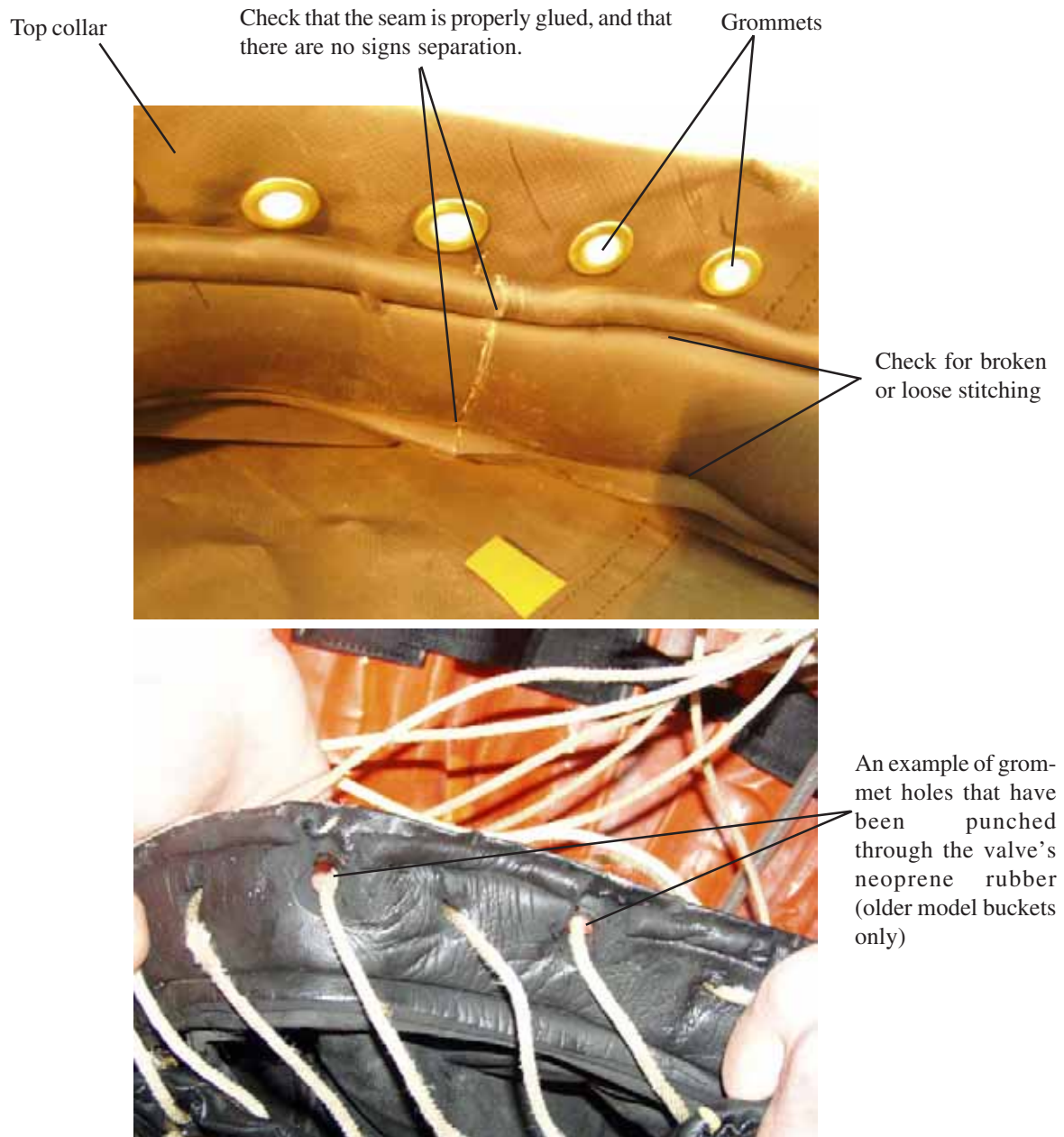
New sealant that has been applied over the stitching will appear clear in color. With use and age, it can become opaque (whiten). This can be an indication that the sealant has lost its adhesive properties.

## SECTION F: VALVE - TOP AND BOTTOM RUBBER

### Top Rubber

The Top Rubber (made from neoprene rubber) is sewn to the inside top collar on the Valve. When the Bambi Bucket is filled with water, the pressure acting on the Valve forces the purse strings to tighten and pull the Top Rubber together, sealing the Valve.

Examine the neoprene rubber for any tears, broken stitching, and check that the main seam is still glued together. If the seam or stitching comes apart, the valve will not seal properly.



## SECTION F: VALVE - BOTTOM RUBBER

### Bottom Rubber

The Bottom Rubber is used to seal the bottom of the valve to the shell. After prolonged use, the rubber can become compressed, causing some of the bolts to loosen. This can be corrected by simply tightening the bolts.



Bolt holes are punched into the neoprene rubber



## SECTION F: VALVE - PURSE STRINGS

### Purse Strings

The Purse Strings are ropes that pull the Valve into the closed position. Look for frayed or broken ropes, bent or broken washers or loose knots.

Examine the Purse Strings for loose knots at both ends. Loose knots can be re-tied. Broken strings may result in leaks and should be replaced.

Grommet with missing Purse String. The Valve will not seal properly in this area.

The knot and washer at the end of the Purse String prevent it from pulling through the grommet hole.



Broken purse string



## SECTION F: VALVE - PURSE STRINGS

Look for fraying along the length of each Purse String. On the medium and large bucket models (2024 - HL9800), fraying will occur where the Purse String goes through the grommet hole on the Valve. On the small bucket models (8096 - 1821), Purse Strings also pass through the IDS hub, and some fraying may occur there as well.

Wear on the Purse Strings occurs through normal operation of the Valve and should be monitored. Frayed strings may eventually break resulting in Valve leakage.



Top collar

Check the grommets for any rough edges or raised lips that may be accelerating the wearing process. These may have to be replaced if they are a problem.

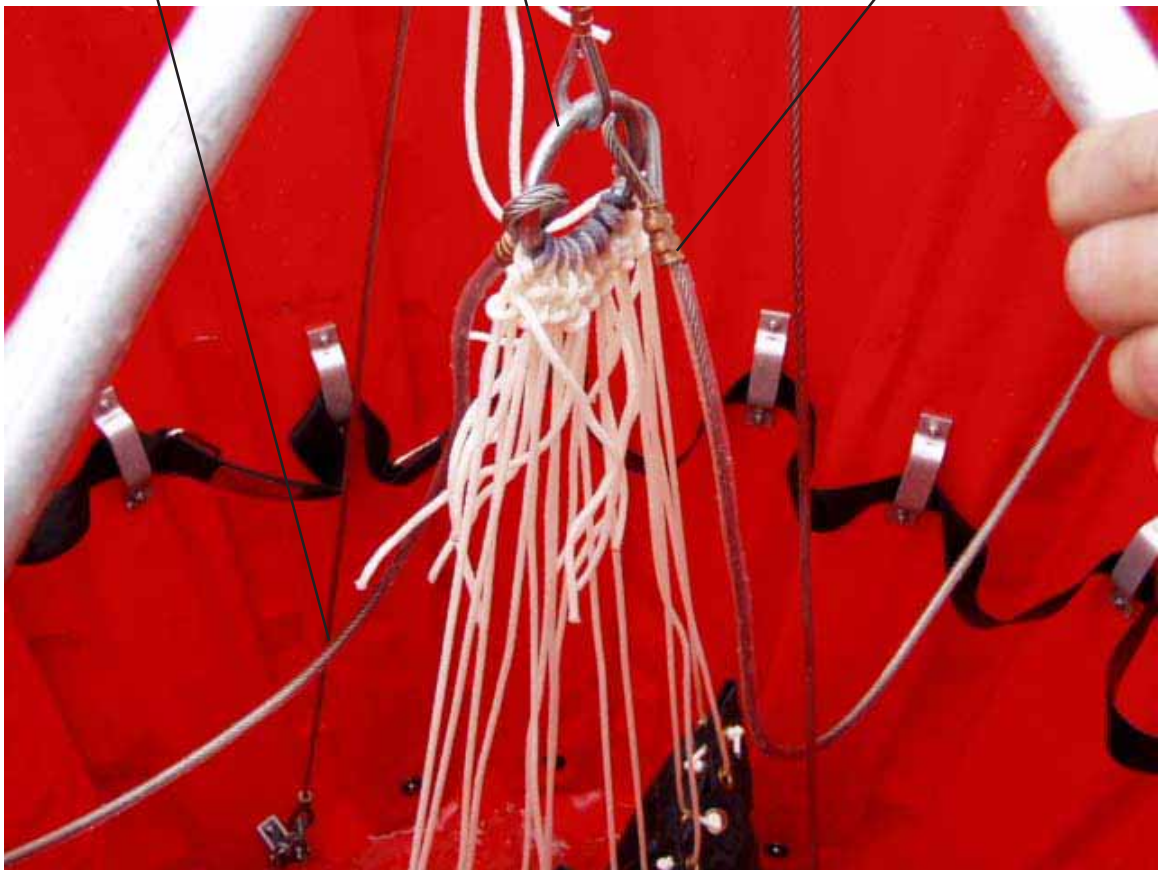
## SECTION F: VALVE - VALVE RESTRAINER CABLES

The Valve Restrainer Cables prevent excessive stress on the Valve when the water is released from the bucket. They are connected from the M-Straps to the Riser Ring. Wear may occur where the Restrainer Cables rub against the inside edge of the IDS Hub. Check the cable for frayed wires directly under the swage block, and for worn protective covers. Damage to the Restrainer Cable could cause damage to the valve through prolonged use.

Valve Restrainer cables. Check the cable for any worn or frayed wires.

Riser Ring

Valve Restrainer cables. Check for any frayed wires under the swage blocks.



## **SECTION F: VALVE - REPAIR CRITERIA GUIDELINES**

### **Category 1: Safety**

**Cease operations and repair immediately**

- Broken Valve Restrainer Cable
- 5 or more broken purse strings

### **Category 2: Operational**

**Repair before the next days operation, or 8 hours flight time**

- Up to 4 broken Purse Strings
- 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

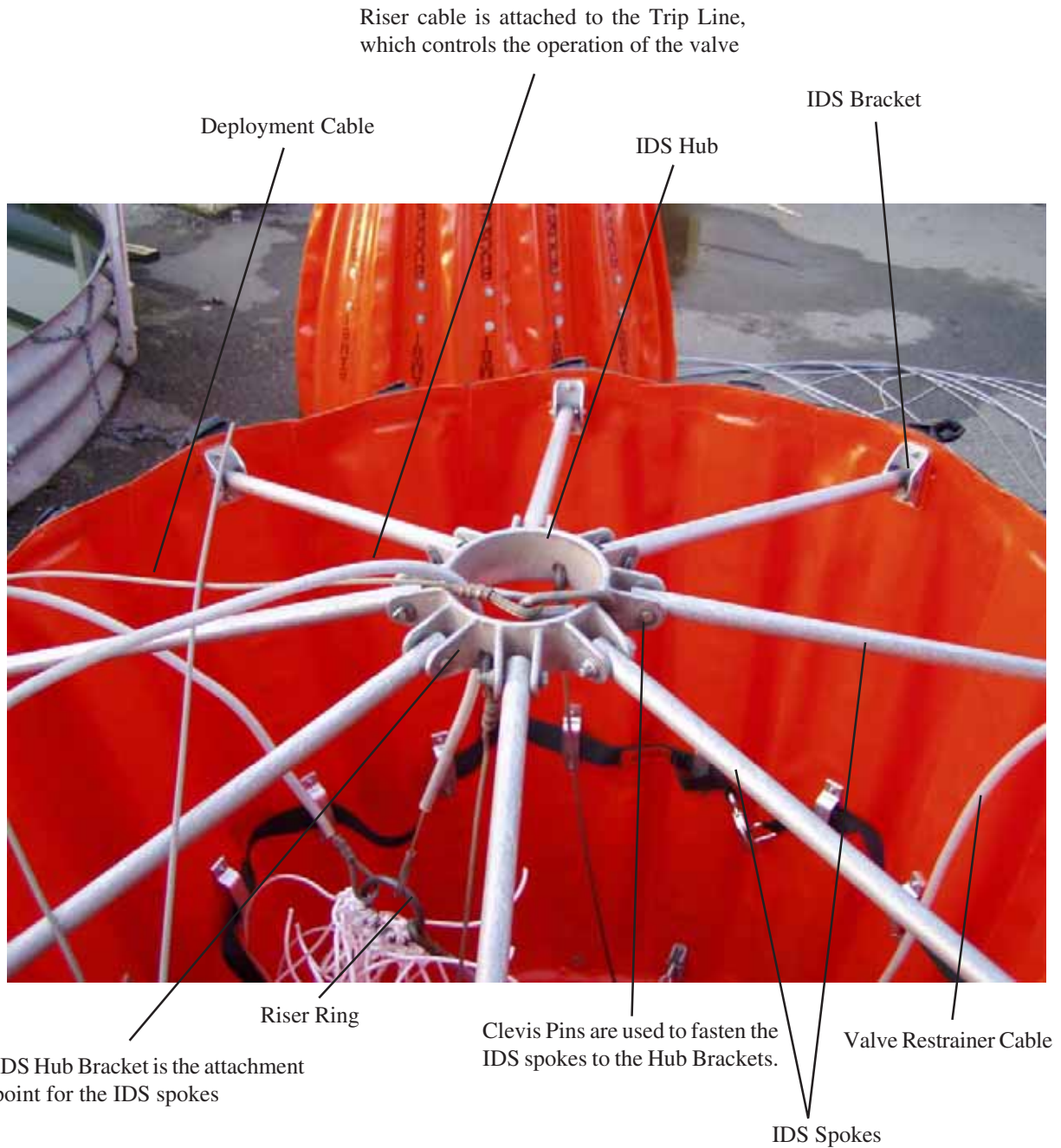
### **Category 4: OKAY**

**Does not need repair**

## SECTION G: IDS SYSTEM

The IDS Hub assembly consists of the IDS Hub, spokes, clevis pins, IDS brackets and cables. The IDS Hub is the attachment point for the Spokes.

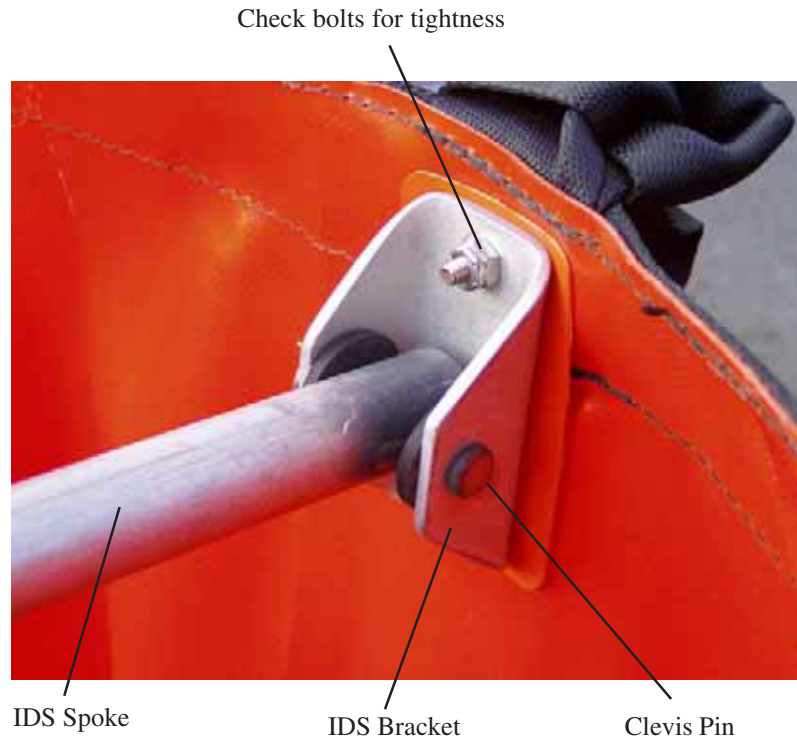
Look for chips, cracks, broken brackets, or enlarged bracket holes. Also look for frayed, twisted or kinked hub restrainer cables.





## SECTION G: IDS BRACKETS

Examine the IDS Brackets for bending and enlargement of the clevis pin holes. Bent Brackets may bind against the Spoke, and prevent the bucket from deploying properly. If the clevis pin holes are too large, the pins can pull out. Check for loose bolts on the IDS Brackets. Loose IDS Brackets may pull through the fabric or damage the Battens.



Bracket that has been bent



Bracket with an enlarged hole



## SECTION G: IDS HUB RESTRAINER CABLES

The IDS Hub Restrainer cables prevent the Hub from opening beyond its proper deployed position.

Check the cables for frayed wires. Also check directly under the swage block for frayed wires.



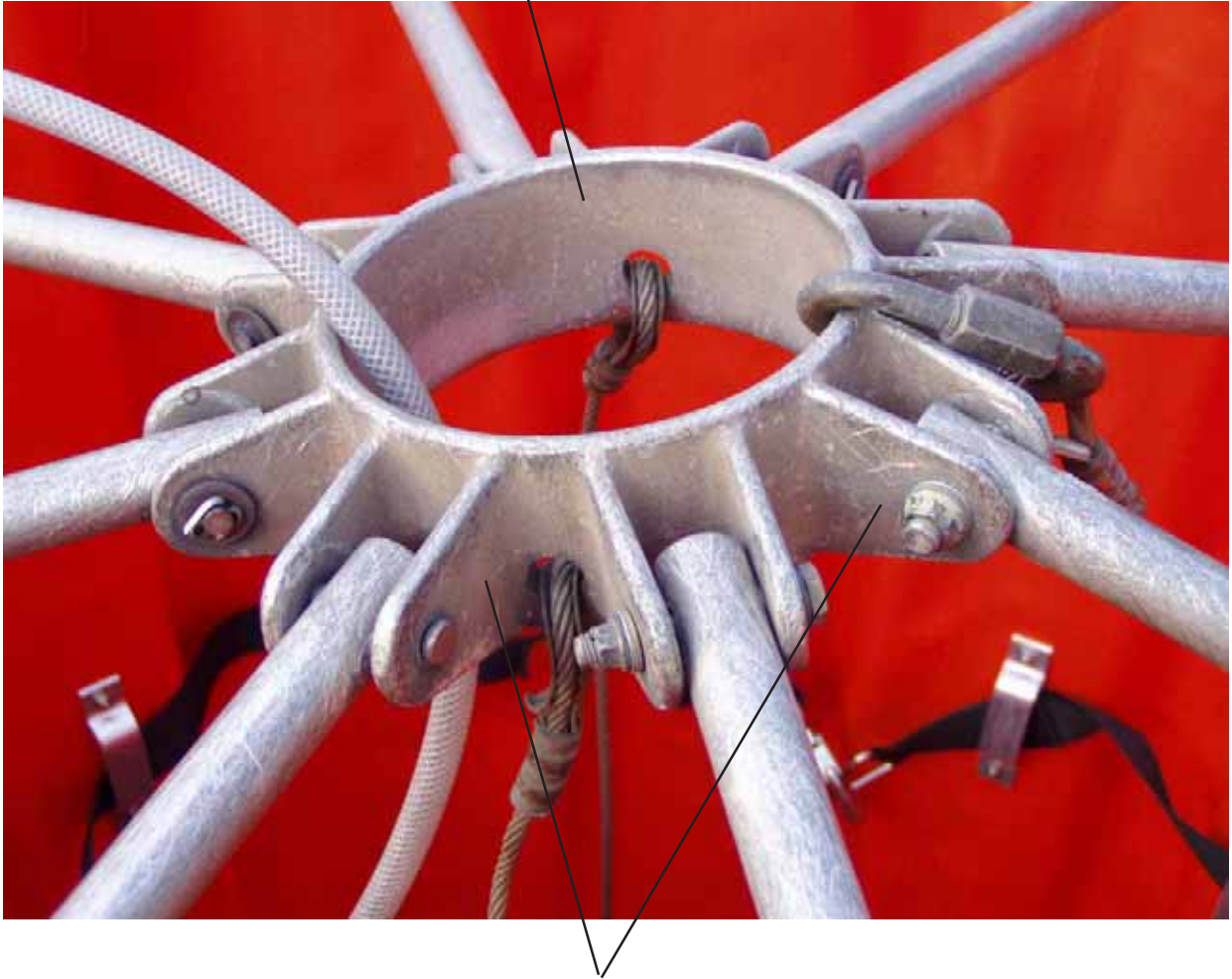
IDS Restrainer Cables

## SECTION G: IDS HUB

The IDS Hub is the mounting point for all IDS spokes.

Check for any cracks or broken parts. If any part of the Hub or Hub Brackets are cracked or broken, the hub needs to be replaced.

Examine the IDS Hub for any cracks



Examine the IDS Hub Brackets for any cracks or breaks.

## SECTION G: IDS SPOKES AND CLEVIS PINS

Examine each Spoke and Clevis pin for bending. The Spoke should be replaced if it is bent or if the holes have enlarged to the point that the head of the Clevis pin can pass through freely. In the event of a heavy impact, the Spokes are designed to bend before the Shell is damaged.

Bent Clevis pins must be replaced. In the event that the operator does not have access to Clevis pins, a correctly sized locknut and bolt can be used instead.



Look for damage in these areas

A lock nut and bolt can be used in place of a clevis pin.

## SECTION G: IDS SPOKES AND CLEVIS PINS



Examine each Spoke for holes that have stretched through wear. If the hole is large enough such that the head of a Clevis pin can pass through, then the Spoke needs to be replaced.



Examine each spoke for any broken holes. In this example, a piece of the spoke has broken away, and the spoke should be replaced.



Bent or broken Spokes will affect the deployment of the bucket. In the event of an overload Spokes are designed to bend and will prevent damage the Shell.



Clevis pins may bend on a hard impact. Bent Clevis pins should be replaced. A correctly sized bolt and a locking nut will act as a suitable replacement.

## **SECTION G: IDS HUB - REPAIR CRITERIA GUIDELINES**

### **Category 1: Safety**

**Cease operations and repair immediately**

- Cracks or breaks across the major section of the IDS hub
- 2 or more broken or cracked Spoke Brackets
- 2 or more broken or missing Spokes, Clevis Pins, Shell Brackets
- 3 or more bent spokes (bends in excess of 20 degrees = broken)

### **Category 2: Operational**

**Repair before next days operation, or 8 hours of flight time**

- 1 broken or cracked Spoke Brackets on IDS Hub
- 1 broken or missing Spoke
- 1 broken or missing Clevis Pin or Shell Bracket
- Up to 2 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**



## SECTION H: M-STRAPS AND TOP CHAINS

### M-Straps

The M-Straps are tied to the Top Loops on the bucket Shell. They transfer the loads between the Suspension Lines and the bucket Shell. Examine the M-Straps for broken webbing and fraying. Minor fraying can be mitigated by melting the frayed area with a flame.

### Top Chains

Chains are used in place of the M-Straps on the weighted side of the bucket because of their greater durability and resistance to abrasion. The weighted side of the bucket is naturally subjected to more wear and tear in operation. Damage to the Chains is rare, but in the event that the Chain is broken, it must to be replaced.

Chains are used because they can withstand abrasive wear on the weighted side of the bucket

M-Straps are used to transfer the vertical loads from the Suspension Lines to the Shell



## SECTION H: M-STRAPS AND TOP CHAINS REPAIR CRITERIA GUIDELINES

### **Category 1: Safety**

**Cease Operations and repair immediately**

- Broken Top Chains
- Broken or missing Shackles
- 2 or more broken M-Straps

### **Category 2: Operational**

**Repair before the next days operation, or 8 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**

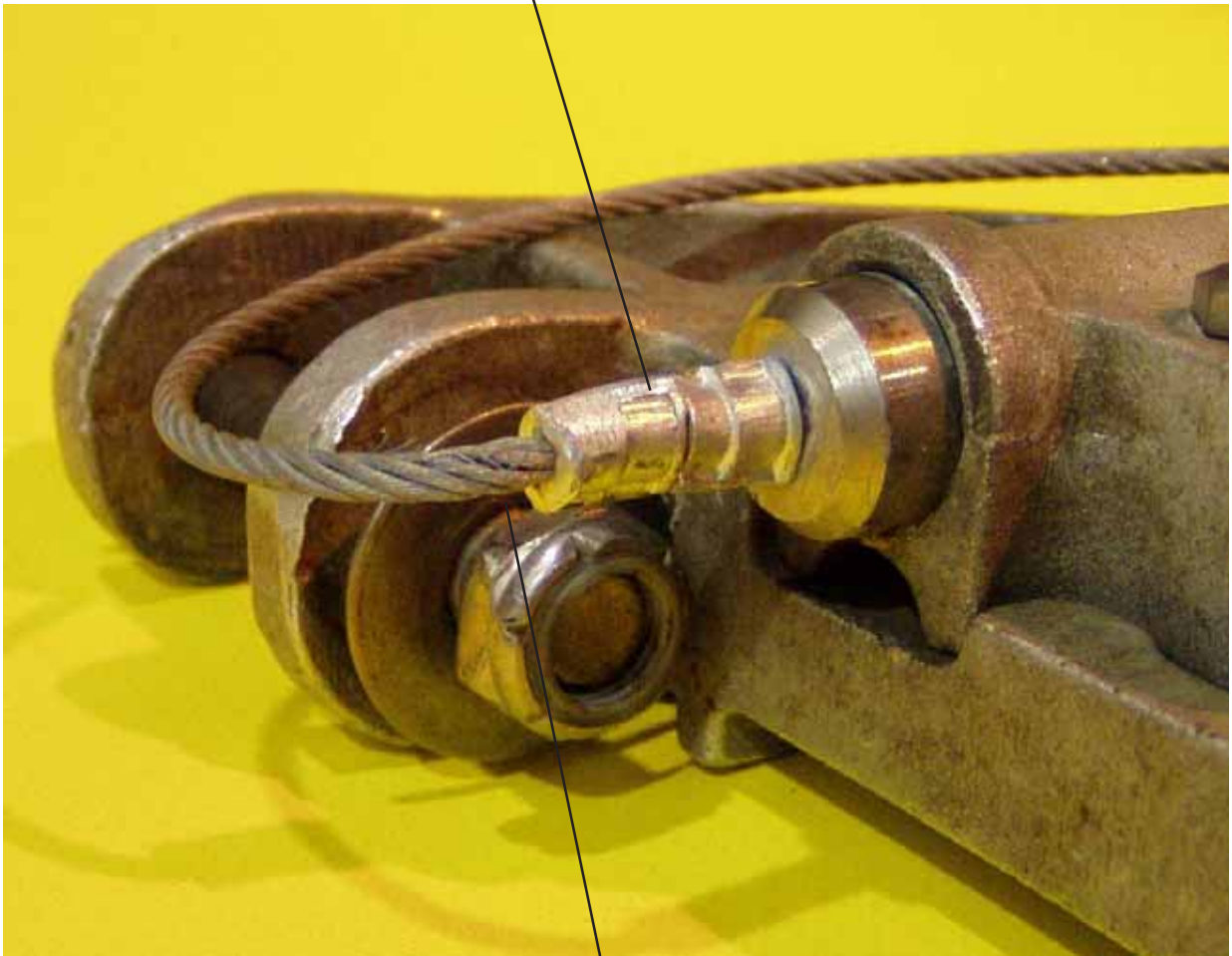
**Does not need repair**

## SECTION I: CONTROL HEAD - TRIP LINE

The Trip Line is connected from the Control head to the Riser Cable. The Trip Line controls the operation of the Valve.

Examine the Trip Line for frays, kinks or loose swages.

Examine the swage block for displacement from original position

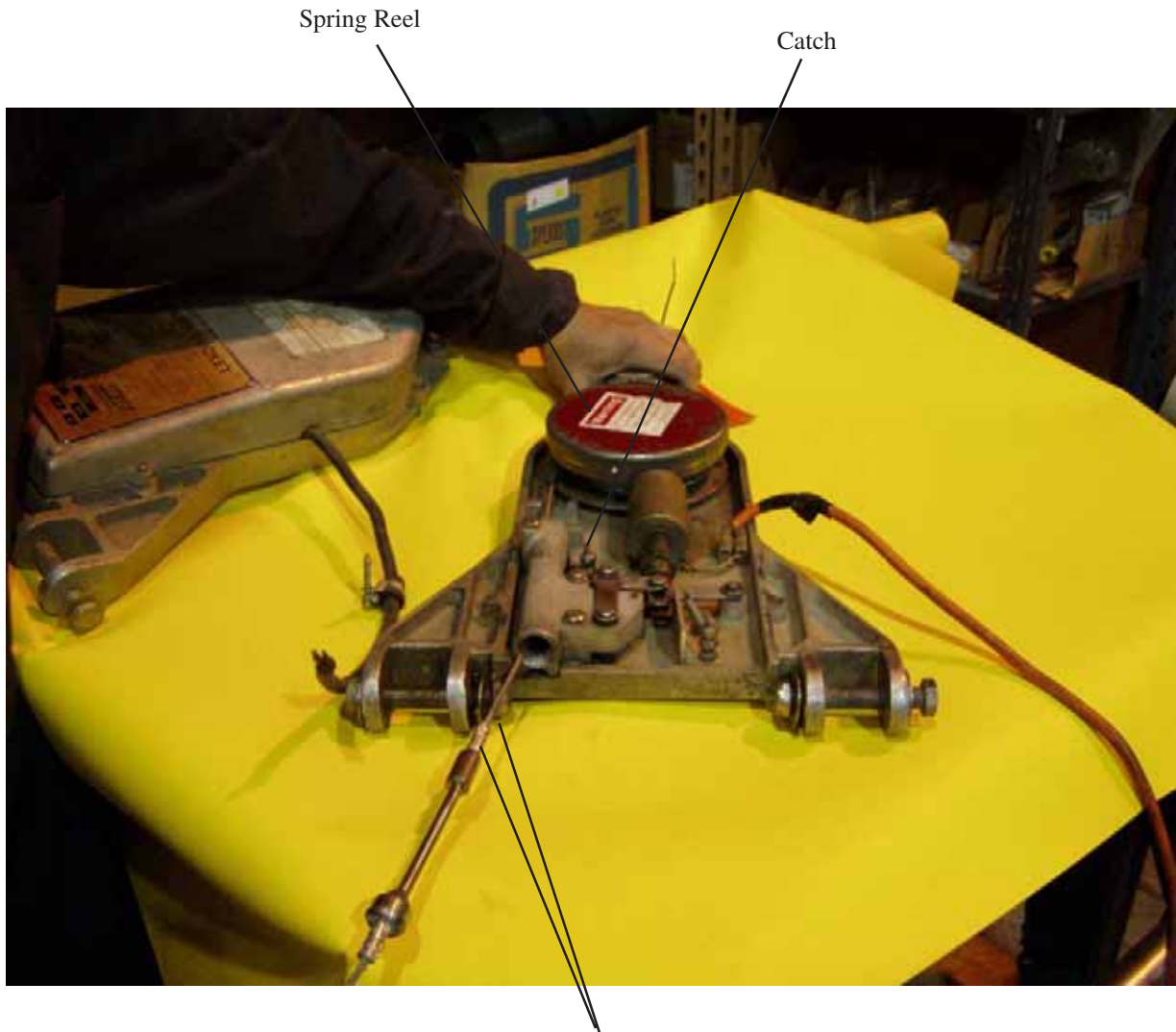


Examine the Trip Line directly under the swage block for any frayed wire.

## SECTION I: CONTROL HEAD - TRIP LINE

Examine the section of the Trip Line line that enters that control head. Cycle the Trip Line in and out of the head several times to confirm that the Spring Reel and Trip mechanism are functioning correctly.

**Note: If the Cover is installed, use electrical power to operate the release solenoid.**



Release the Catch on the Trip Block and pull down on the Trip Line. Inspect the top swage block and cable. Cycle the Trip Line a few times, checking that the spring reel and trip mechanism work correctly (refer to Operator's Manual).

## SECTION I: CONTROL HEAD - BASE PLATE

As well as being the main lifting member on the Bambi Bucket, the Control Head base plate serves as the mounting point for the Valve release mechanism.

**There can be no cracks, broken parts, or bends on the base plate. Some operators may attempt to repair heads by welding. This practice is not acceptable as it may weaken the casting material and lead to sudden failure.**



Examine the base plate for any broken parts such as broken Yokes, or broken Suspension Cable Mounts



Welded repairs are unacceptable. The control head shown here must be removed from service and scrapped.



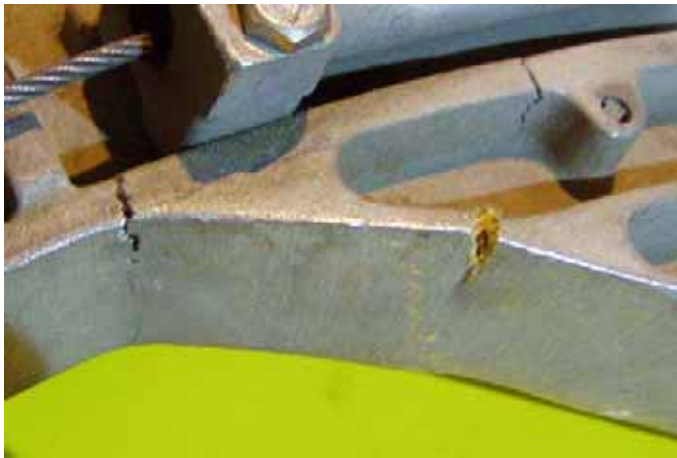
Look for base plates that have been bent. Bending like this requires a lot of force, and can occur if the operator lands directly on the Head



## SECTION I: CONTROL HEAD - BASE PLATE



Examine the Base plate for damaged Suspension Line mounts. If bent or twisted the control head must be replaced.



Examine the base plate for any cracks. Remove the cover of the Control Head if a full inspection is required.



Base plates that show signs of stretching or overloads at the shackle pin bosses must be replaced

## SECTION I: CONTROL HEAD - WIRES

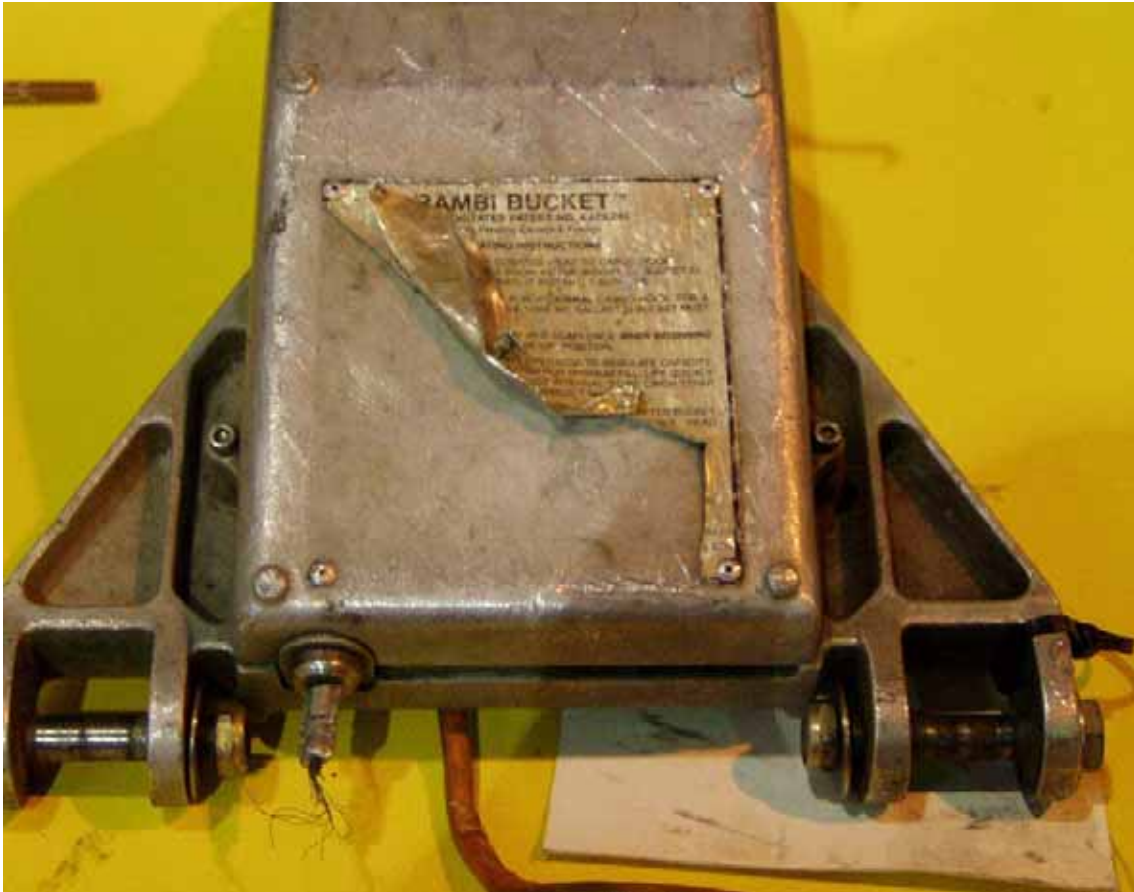
Examine the wire cover for wear, and for exposed conductors. Damage to the wiring may lead to a short that prevents the operator from being able to release the water load.



Frayed covers or exposed wire must be replaced

## SECTION I: CONTROL HEAD - SERIAL NUMBER PLATE

The serial number plate identifies the bucket model, serial number and gross capacity of the bucket. In the event the the plate is missing, or if it's been damaged such that the information is no longer legible, a new plate is required.



## **SECTION I: CONTROL HEAD - REPAIR CRITERIA GUIDELINES**

### **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 operations, or 8 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 J: GENERAL INSPECTION CRITERIA

### Category 1 Defects

- **Excessive gross Bucket weight for specific helicopter and/or operating conditions**  
(Ref. Section 16.1, Bambi Bucket Operator's Manual)
- **Maximum total length of Bucket in excess of hook to tail rotor distance, minus 6 inches**  
(Ref. Section 3.3, Bambi Bucket Operator's Manual)