



MANUFACTURER INSTRUCTION & MAINTENANCE MANUAL

406-TS-200016 Modified Stretcher

Parts Installation & Maintenance Procedures

MIM 200016

Issue 4

May 2024

Prepared By: John Berman
Safety Equipment Technical Services

Checked By: Greg Hanlon
Five Rings Aerospace

Approved By:

Greg Hanlon (ARN: 553501)
Five Rings Aerospace

Safety Equipment Technical Services Pty Ltd (SETS) is the owner of the copyright of this document & no part is to be copied, reproduce or passed on to any person or organisation without the express written permission of Safety Equipment Technical Services Pty Ltd. This document was originated in Australia & is covered under existing laws, regulations & agreements for the possession & release of any data contained herein or associated with this document & its approvals.

Safety Equipment Technical Services Pty Ltd
60 Emerald Creek Rd, Monbulk.
Vic. Australia. 3793

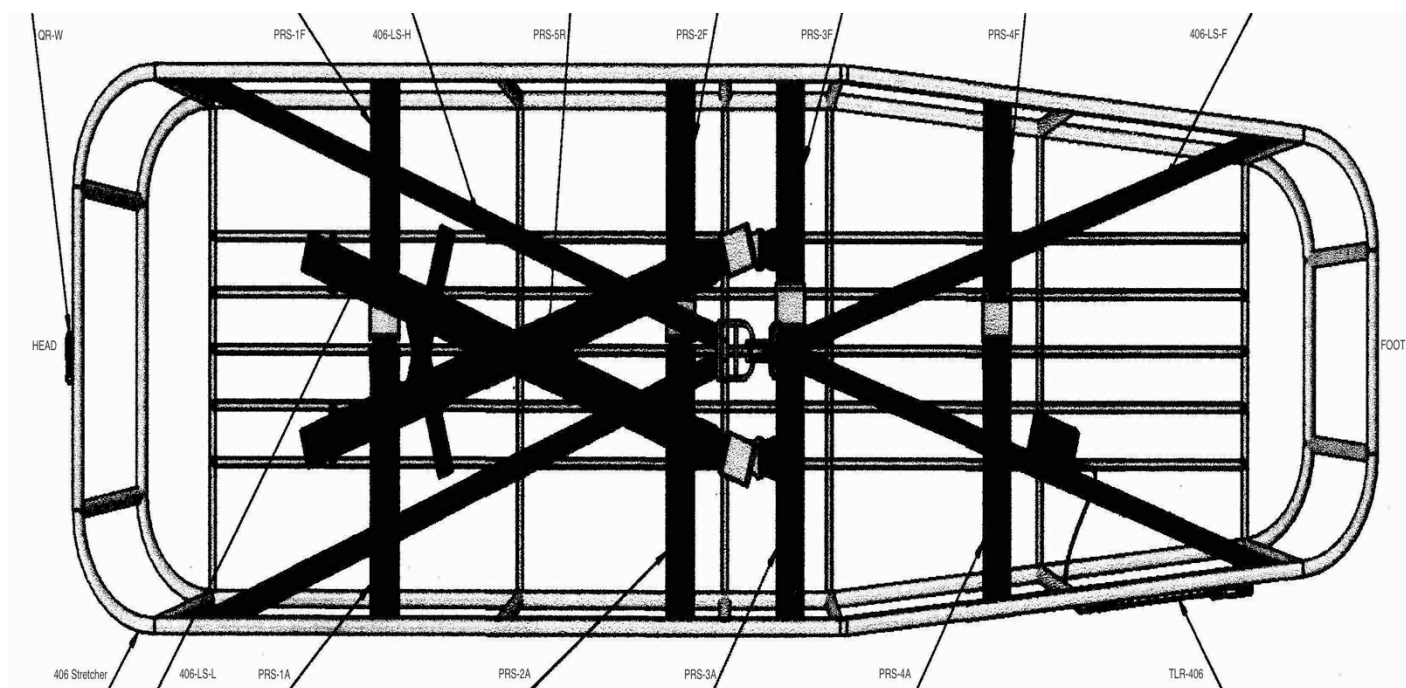
General

This manual is provided for use with the SETS Modified 406 Stretcher Assembly Pt. No. 406-TS-200016 and provides installation of component instruction to be used by the operator/user in installation of the various components supplied for the modification of the supplied components of the 406 Stretcher.

For instruction & procedures associated with the original unmodified stretcher assembly the operator should refer to the LSC documentation.

The procedures associated with this equipment prescribe the minimum performance standards, which have been met by this assembly for the purpose of a person using this equipment for helicopter external lift. It is the responsibility of those wishing to install the Modified Stretcher Assembly on or within an aircraft to determine that the aircraft's installation conditions are within the approval requirements. The Modified Stretcher Assembly may only be installed if further evaluation, by the user/installer, substantiates an acceptable installation and is approved by the Civil Aviation Safety Authority or approved representative.

NOTE: Orientation of the stretcher is described by Head end, Foot end, Left & Right sides as a patient would be positioned within the stretcher.



AMENDMENT RECORD

1. All amendments to content are to be recorded below;
2. All new content inserted during an amendment will be shown with a vertical line in the margin indicating the extent of the amended portion.

Amendment		Summary	Incorporated	
No.	Date	Sections/Pages Affected	Date	Name
1	12-4-16	2.i. / 2.a Pg 6, 7.iii. Pg 21, 8.ii. Pg 22-23, 11 Pg 25	12-4-16	JB
2	11-6-20	8.iii	11-6-20	DC
3	24-11-22	Pg 8. Part 3. a) & b), Pg 17 Part 5 iii., Pg 21 7. i. b) & add 7-1, Pg 22 Part 8 ii & iii. f), Pg 26 Part 12 1., 1.b), c), d)	24-11-22	JB
4	03-05-24	Pg 10 Part 3. c)	03-05-24	JB
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

CONTENTS

PAGE

1.	COVER PAGE
2.	GENERAL – INFORMATION
3.	AMENDMENT RECORD
4.	CONTENTS
5.	1. LIMITATIONS OF USE
6.	2. DESIGN & CONSTRUCTION
7.	3. DESCRIPTION - Parts
8.	4. LIFTING
12.	5. INSTALLATION OF MODIFIED PARTS & ASSEMBLIES
21.	6. STORAGE
	7. MAINTENANCE - GENERAL
22.	8. INSPECTION
24.	9. SALT WATER IMMERSION
	10. FRESH WATER IMMERSION
25.	11. DECONTAMINATION PROCEDURES
26.	11. REPAIRS - LIMITATIONS

1. Limitations of Use

The Modified Stretcher Assembly is to be used in accordance with the instructions in this manual and the Approved Flight Manual Supplement issued to the aircraft.

The Modified Stretcher Assembly is not a 'seat belt', it is provided for use outside the aircraft cabin when attached to the winch hook as a means of winching (lifting on a winch hook), a patient into the helicopter. The Modified Stretcher Assembly attaches to the winch hook & would normally, but not necessarily, be used in conjunction with a winchman in a helicopter rescue harness & personnel on the ground controlling the 'tag-line' which is attached to the right side of the foot end (the right side of the winch crewman).

The Modified Stretcher Assembly is only to be used by personnel trained in the correct fitting, assembly, disassembly and emergency release of the Stretcher assembly, and who are familiar with the assembly's limitations and guidelines for installation and use as set out in this manual and the Approved Flight Manual Supplement.

NOTE

The contents of this manual are specific only to the modifications made to the Lifesaving Systems Inc #406 Medevac II Basket Style Rescue Stretcher. The modifications include replacement of all webbing with aviation grade webbing and hardware as well as installation of tag line release kit and custom lifting bridle.

The basic frame of the LSC #406 Medevac II litter is unmodified. For maintenance of the litter frame, refer to the LSC #406 Medevac II Litter Owner's Manual.

CAUTION

Any modifications, additions or alterations to any part of the stretcher assembly must be approved prior to use.

If any part of the webbing, covering material or hardware becomes exposed to corrosive or hazardous chemicals, the stretcher should be retired from service.

Any repairs must be completed & certified by an approved repairer prior to placing the stretcher back into service.

If any part of the assembly is worn or damaged, consult this manual or the manufacturer direct to establish the serviceability of the assembly prior to next use.

2. Design & Construction

Modified 406 Stretcher Assembly: 406-TS-200016

- i. The modified 406 Stretcher Assembly is a LSC Corp manufactured Rescue Stretcher with modified patient restraint straps, modified lifting slings, tag line release assembly installed & a '**non-human load**' lift point with quick release mechanism on the head end. These modifications have been designed to safely lift patients weighing up to 200kg.
- ii. The Patient Restraint Straps are manufactured using Australian Standards Polyester webbing, tested & proven stitch patterns & AMSAFE seat belt hardware latch & connectors.
- iii. The other components are manufactured using Mil-Spec nylon webbing & tape & have all been stitch pattern &/or proof tested for load strengths.
- iv. All the hardware used for connection of the lift slings, stretcher to a floor mounted connector (not a part of this assembly), & for the release assemblies is stainless steel & of the highest & most reputable quality available.

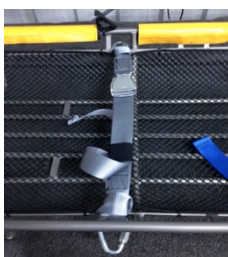
a) Maximum patient weight.....200 kg (440 lb)

3. Description

- i. The Modified Stretcher includes a Life Saving Systems Corp. 406 Rescue Litter with the original patient restraint straps & Lifting Slings removed & replacement parts installed by Safety Equipment Technical Services Pty Ltd.

The replacement parts include the following:

a) Patient Restraint Straps.



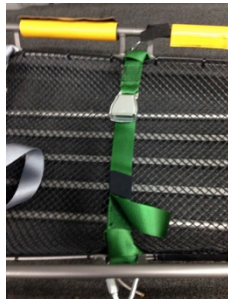
- PRS-1A (Grey) - adjustable right side upper torso strap – head end. Includes Maillon Delta connector for floor attachment.
- PRS-1F (Grey) - non-adjustable left side upper torso strap – head end. Includes Maillon Delta connector for floor attachment.



- PRS-2A (Blue) – adjustable right side lower torso strap – head end.
- PRS-2F (Blue) - non-adjustable left side lower torso strap – head end.



- PRS-3A (Grey) - adjustable right side lower torso strap – foot end. Includes red shoulder strap connector buckle.
- PRS-3F (Grey) - non-adjustable left side lower torso strap – foot end. Includes black shoulder strap connector buckle.



- PRS-4A (Green) - adjustable right side lower leg strap – foot end. Includes Maillon Delta connector for floor attachment.
- PRS-4F (Green) - non-adjustable left side lower leg strap – foot end. Includes Maillon Delta connector for floor attachment.



- PRS-5L (Red) - adjustable left side shoulder strap.
- PRS-5R (Black) - adjustable right side shoulder strap

- CFS-A (Orange) - adjustable left side chest flotation strap.
 - CFS-F (Orange) - adjustable right side chest flotation strap.
- b) Lifting Slings – Two Part
- PRS-LS-H - head end lifting sling. Upper D Ring winch hook attachment. Bent D Ring for Foot sling attachment. Two lower attachment loops with 8mm maillon oval rapide.
 - PRS-LS-F - foot end lifting sling. Upper snap hardware for attachment to head end lifting sling. Two lower attachment loops with maillon oval rapide.



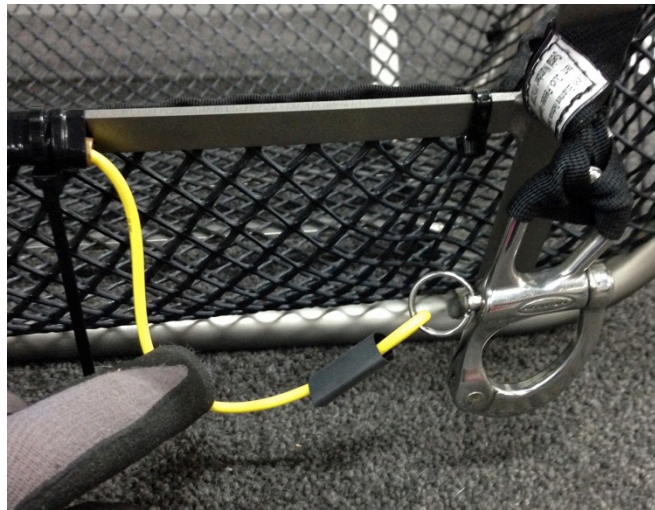
DD302 Stainless Steel Delta Ring winch attachment hardware also available



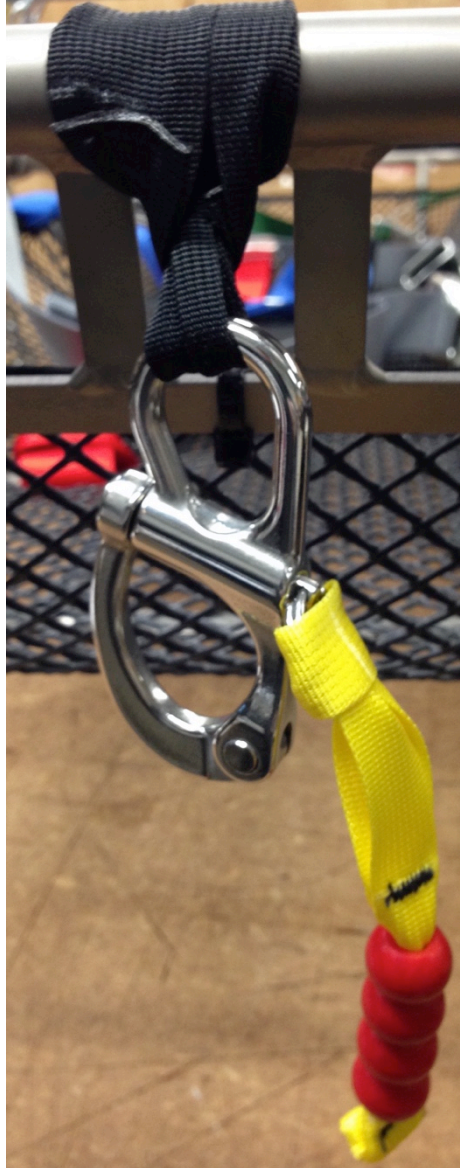
c) Tag Line Release Assembly with Quick Release Assembly.

- TLR-406 and QR-W-TLR

includes one release pad which is inserted into pocket located on the right leg of the foot end lifting sling & yellow cable swaged to the release pin of a Ronstan quick release snap shackle which is attached to the stretcher rail with a webbing loop. The yellow cable is routed from the pad through a bendix channel held in place on the right leg of the foot end lifting sling & along the stretcher side rail using cable ties & electrical tape.



- d) Quick Release Assembly – Webbing
- QR-W - Ronstan quick release shackle attached to centre of head rail with webbing loop.



4. **Lifting**

- i. The modified stretcher has a two part lifting sling:
 - a) PRS-LS-H. The head end lift sling is attached to the winch hook using the large upper D Ring.
 - b) PRS-LS-F. The foot end lift sling is attached to the head end lift sling with the snap on the upper foot end to the bent D Ring of the head end sling.



5. Installation of Modified Parts & Assemblies

- i. Remove all original patient restraint straps from stretcher.
- ii. Patient Restraint Straps:
 - The restraint straps are numbered from the head end down to the feet end. PRS-1, PRS-2, PRS-3, PRS-4.
 - The shoulder restraint straps are numbered PRS-5 & are given an L & R for left & right (as the patient lays in the stretcher).
 - Lay the loop end of the strap over the lower edge bar of the stretcher from the inside & bring it back inside routing it in between the bar & mesh.



- Route the hardware end through the loop towards the middle of the stretcher.



- Tighten the strap by moving it side to side until it sits neatly across the centre of the stretcher base.

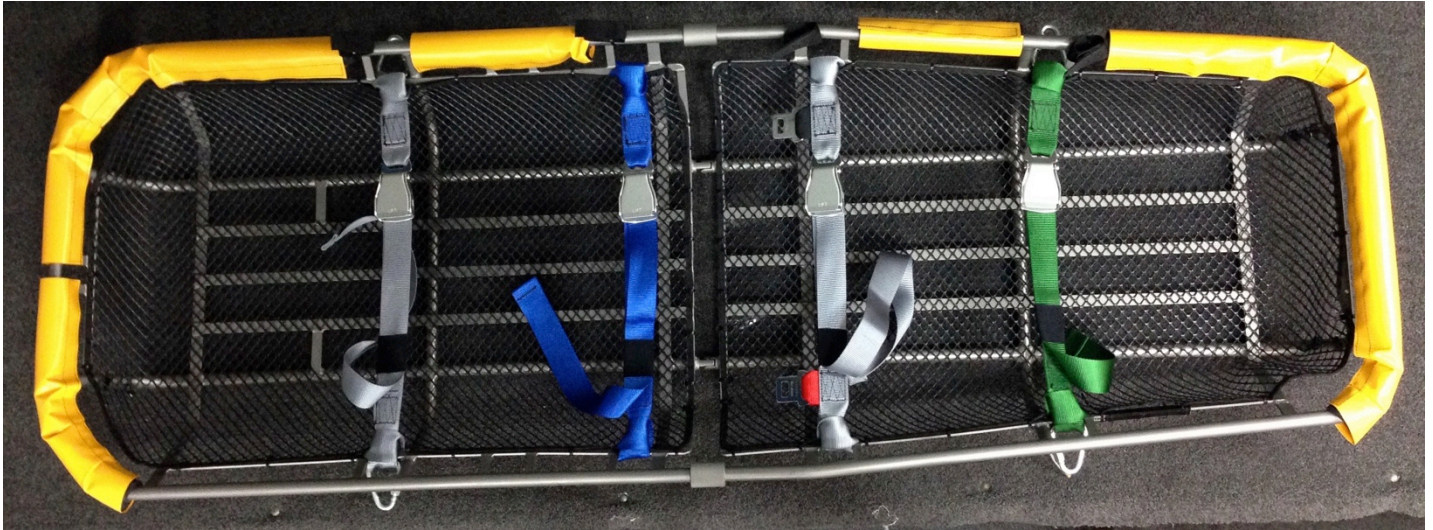


- For PRS-3 straps the installation is the same albeit a little harder to achieve as these have the shoulder strap connector buckles.



- Insert Maillon Delta Ring onto PRS-1A, PRS-1F, PRS-4A & PRS-4F. Ensure ring captures both webbing & barrel closes towards the base of stretcher to avoid loosening from vibrations.





- **Shoulder Patient Restraint Straps:**
Route the strap under the shoulder strap mounting crossbars & back inside stretcher.



- Route the strap through the loop towards the inside centre of the stretcher.



- Pull tight ensuring webbing & fastener tab is through loop. Connect to PRS-3 diagonally across stretcher.



iii. Lifting Sling

- Install sling loop under top bar above PRS-1 & PRS-4 attachment points. Install rapide link cover loosely over webbing & position rapide for installation with barrel facing away from patient & screwing down. This avoids loosening of the barrel due to vibrations.



- Tighten barrel finger tight then $\frac{1}{4}$ to $\frac{1}{2}$ turn with tool.



- If using a heat shrink or other types of cover over the maillon rapide links, ensure the cover allows a visible inspection of the webbing end loops. Locate the cover centrally over rapide link & shrink down with heat gun. The heat shrink cover reduces damage potential & keeps correct orientation of the maillon rapide by preventing side loading caused when the maillons rotate through the webbing loops. It also assists in preventing any loosening of the barrel.

CAUTION:
DO NOT OVERHEAT WEBBING OR HARDWARE



iv. Tag line Release Assembly

- Install quick release snap shackle by wrapping webbing around upright bar at foot end & feeding snap through it.



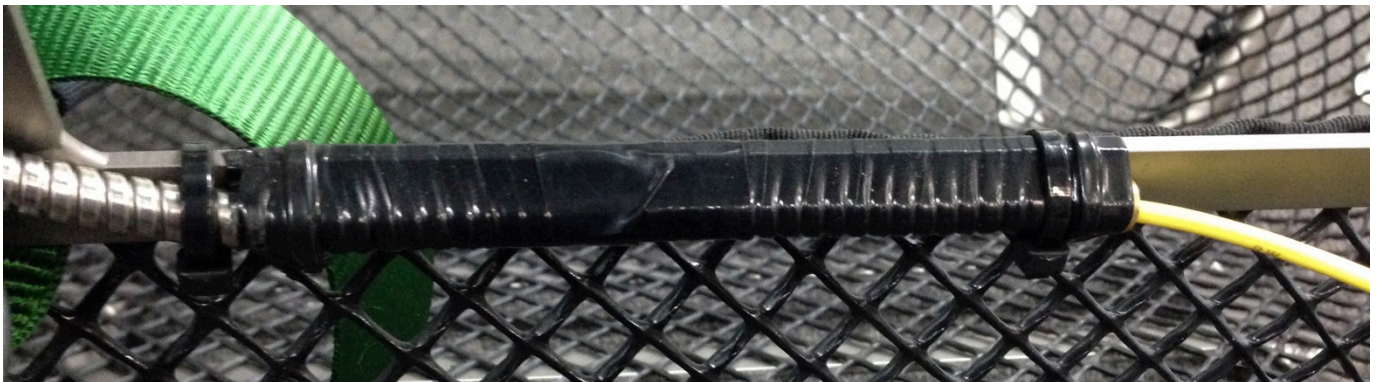
- If repairing snap shackle with the Ronstan Repair Kit, install kit & feed yellow cable through ring.
- If replacing snap shackle with complete unit, attach to stretcher bar & carefully feed yellow cable through snap shackle ring.

CAUTION:
DO NOT ALLOW SNAP SHACKLE PIN TO RELEASE FROM BARREL. IT HAS A SPRING ATTACHED TO IT WHICH NEEDS TO REMAIN IN CORRECT POSITION WITHIN SNAP SHACKLE BARREL.

NOTE:

RONSTAN SNAP SHACKLES ARE SUPPLIED WITH A WELDED RING. ANY REPAIRS MADE TO THE ASSEMBLY WILL REQUIRE THE RONSTAN RING INSTALLED WITHOUT THE WELD. THE UNWELDED RING HAS A LOWER LOAD RATING THAN THE WELDED RING. USE ONLY ORIGINAL RONSTAN RINGS & REPAIR KITS WHEN PERFORMING MAINTENANCE ON THIS ASSEMBLY

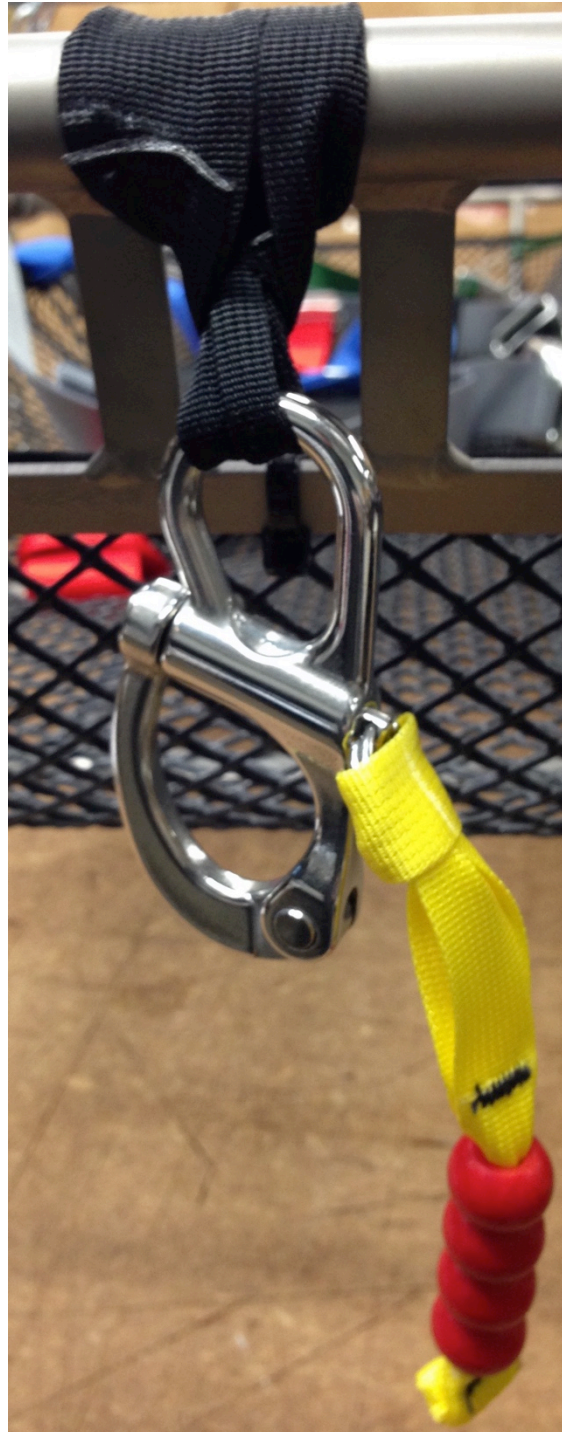
- Install bendix tube on square side bar 120mm from upright bar the snap shackle release is attached. Cut away the 3 cable ties holding the mesh to the frame along this section. Cable tie the bendix using a small cable tie on each end of the tube just past the end ferrules (or caps). Cover the entire section with a continuous run of electrical tape with the ends of the tape finishing at each end of the bendix. Using large cable ties (the same size as the original), cable tie bendix at each end capturing the ends of the electrical tape.



- Replace the cable tie closest to the release shackle.

v. Quick Release – Webbing Assembly

- Install quick release snap shackle by wrapping webbing around top horizontal bar at centre of head end & feeding snap through it.



6. Storage

- i. The Modified Stretcher should be stored in a secure area which is free from dirt, oil, grease, moisture, direct sunlight, extreme changes in temperature & rodents;
- ii. The Modified Stretcher should be stored away from non-aircraft/industrial products.

CAUTION

Inappropriate storage of the rescue equipment may lead to a deterioration of the materials, webbings & tapes.

7. Maintenance - General

- i. The recommended maintenance schedules for the inspection of the Modified Stretcher are as follows:
 - a) Before & after use by qualified or trained personnel with knowledge of this type equipment;
 - b) Annual Recertification by qualified CASA Approved maintenance workshop.
- ii. The recommended maintenance repair of the Modified Stretcher is 'on condition' due to damage or wear. This maintenance may be carried out by an CASA Approved maintenance workshop using the appropriate tools & materials.

7-1. Continued Airworthiness:

- i. The SETS 406 Rescue Stretcher Modification Kit requires a yearly inspection & recertification for continued airworthiness to the end of life at 10 years from the time first introduced into service.
- ii. Recertification Requirements:
Complete a yearly service inspection & repair/replace any necessary sub parts.

8. Inspection

i. Before & After Use:

The Modified Stretcher should be inspected by the crew member as follows:

- a) Inspect the patient restraint straps with particular attention to the main webbing strap & attachment loops to ensure there is no damage to the webbing & stitching. Inspect the floor attach Delta rings for damage & to ensure the nut & thread operate smoothly & can tighten appropriately. Inspect the male/female seat belt style buckle & connectors for damage, broken springs & corrosion;
- b) Inspect the Modified Stretcher lifting slings for damage to the webbing & stitching. Inspect all hardware for damage & corrosion. Inspect the TLR pocket & bendix cover for torn stitching & adequate retention by the fastener;
- c) Inspect TLR pad & fastener for damage & wear & tear. Inspect the yellow cable for any nicks or major abrasion. Inspect the bendix to ensure the inner channel is free from dirt or other obstructions & the outside for any dints or damage. Inspect the tape & cable ties for damage & security. Inspect the release shackle & key ring for security & ease of action & webbing damage;
- d) Inspect the head end quick release assembly for security & ease of action & webbing damage;
- e) If installed, inspect the aircraft strike pads for security, damage & compression of inner padding.

ii. Monthly:

Text Deleted 11-08-2022

iii. Annual Recertification (\pm 1month):

- a) Inspect stretcher assembly as per directions for Before & After Use Inspection;
- b) Replace all elastic keepers;
- c) Cut off Maillon Heat Shrink Covers to enable inspection of Maillon Rapides & replace heat shrink;
- d) Replace any compressed or torn aircraft strike pad inner foam & damaged outer covers;
- e) Replace any worn or damaged fastener (hook & loop) tapes;
- f) Cut off tag line release bendix securing tapes if necessary, inspect & re-install;

- g) Inspect base net & repair small tears using cable ties. Large tears may require whole mesh replacement;
- h) Inspect the frame for any:
 - a) Broken welds;
 - b) Bends (deformation);
 - c) Corrosion;
 - d) Abrasion.

Repair or replace as required any damage or worn items.

NOTE

Annual re-certification is only to be performed by Safety Equipment Technical Services, or an authorised representative thereof.

NOTE

The Manufacturer of the stretcher base does not recommend any field repairs to the titanium stretchers. Titanium welding requires specialised equipment & training.

For maintenance of the litter frame, refer to the LSC #406 Medevac II Litter Owner's Manual.

9. Salt Water Immersion

To clean the stretcher & components:

- i. Remove all items from stretcher possible;
- ii. Thoroughly wash the components in warm water;

CAUTION

If using soaps & detergents in the cleaning of the stretcher, the product should be checked to ensure there will be no detrimental effect on the webbings & materials in the stretcher.

- iii. Thoroughly rinse the entire assemblies in clean water – it may require several rinses;
- iv. Air-dry the assemblies out of sunlight & away from any heating elements;
- v. When dry, re-assemble & complete the 'Before & After Use' inspection.

10. Fresh Water Immersion

To clean the stretcher:

- i. Remove all items from the stretcher possible;
- ii. Thoroughly rinse the entire assembly in clean water – it may require several rinses;
- iii. Air-dry the assembly out of sunlight & away from any heating elements;
- iv. When dry, re-assemble & complete the 'Before & After Use' inspection.

11. Decontamination of Stretcher & Assembly

- a) Remove all items from the stretcher that is possible & place in a biohazard container or bag;
- b) Pre-clean contaminated areas with detergent to remove all signs of contamination & allow to dry;
- c) Apply a decontamination spray or wash to all hard & non-porous surfaces & allow to dry;
- d) Clean all covers, straps & webbing, foam inserts in a bleach solution such as Virkon solution at 1%, Milton Anti Bacterial & DC20 Bleach.

NOTE:

The Following Consumables have been listed by the Manufacturer of the Stretcher Base as the only Authorised decontamination/disinfectant materials to be used on the folding litter:

- Bleach, A-A-1427C (for machine washing)
- Detergent, General Purpose (for machine washing)
- Detergent, General Purpose, MIL-D-16791 (Series) Public Places (Microgen Inc.)

12. Repairs - Limitations

i. Repairs are limited to the following schedule:

All parts are available in kit form where the end user can install on-site or if required, the stretcher may be shipped to SETS facility for repairs to be completed.

- a) Patient Restraint Straps – repairs by replacement. Contact SETS for available parts:
 - Replacement of single strap.
 - Option for Maillon Delta ring for PRS-1 & PRS-4. 2 part - adjustable & fixed sides.
 - including connector buckle for shoulder straps on PRS-3.
 - Replacement of entire set of 6 straps. 2 part – adjustable & fixed sides.
 - Replacement of Chest Flotation Straps. 2 part – adjustable & fixed sides.
 - Replacement of Maillon Delta rings x 1 set (4 rings).
- b) Lifting Slings – repairs by replacement. Contact SETS for available parts:
 - Head end sling - complete including maillon rapides.
 - Foot end sling – complete including maillon rapides & TLR pocket & tapes.
- c) Tag Line Release – Contact SETS for available parts:
 - Release Pad repaired by replacement of pad & yellow cable with swage end – includes repair kit for Ronstan or replacement Ronstan quick release shackle assembly fitted & replacement bendix channel already installed over yellow cable.
 - Repair kit for Ronstan quick release shackle – pin & ring kit.
 - Complete shackle with split ring to enable fitment through swaged end of yellow release cable - including attachment webbing.
 - Bendix replacement – complete length. Requires replacement Release Pad routed through bendix channel & swaged to ring.
- d) Quick Release Assembly - Contact SETS for available parts:
 - Repair kit for Ronstan quick release shackle including pin & ring kit.
 - Complete shackle with release handle & attachment webbing
- e) Patient Restraint Strap Elastic Keepers – repair by replacement only.

- f) Fastener Hook & Loop – repair by over stitching or replacement of tapes complete.