



 survitecgroup

Part of the SURVITEC group of companies

# SERVICE MANUAL

for SOLAS 74/88 – Liferafts and their equipment

Throw-over-board liferafts type LR 97 for 6 to 25 persons  
Davit launchable liferafts type LR 97 L for 12 to 25 persons

Issue: 10/97  
Art.-No.: 8.09.57.11.0

Designed and compiled by ..... *Hermann Daenzer*

Approved by ..... *H. D. Glens*

Date approved ..... *06.01.1998*

DSB DEUTSCHE SCHLAUCHBOOT  
GMBH & CO. KG  
Angerweg 5, 37632 Eschershausen

Telefon : ++5534/3010  
Telefax : ++5534/301200  
e-mail: info@deutsche-schlauchboot.de

Copyright for this Manual by DSB. The Manual has be treated confidential and may only be used for its intended purpose. It s not allowed to copy this Manual without written permission by DSB.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page I issue : 10/97
--	---	--

## **Limitation of use**

A precondition for use of this Manual is:

1. Service Station is approved by the national administration in accordance with S.O.L.A.S., IMO and existing national regulations.

The service station must hold a DSB service station number and be in possession of a valid DSB authorisation certificate.

2. Service personnel have participated in a DSB service course on this liferaft type and are in posession of a valid DSB LR-service diploma.
3. DSB-Certificate of reinspection to be issued for each service on DSB-liferafts.  
Raft and container to be marked with DSB-inspection labels with punched station number.

DSB will not be responsible if the conditions shown above are not followed.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page II issue : 10/97
--	---	---

## **Arrangement of the Service Manual**

This Manual is made up in loose-leaf form. This form allows modifications and supplements to be added to the Manual by replacing or adding pages and consequently keeping the Manual always up-to-date.

#### **Modifications, Supplements, Delivery**

As occasion demands we shall send you a „modification notice“ with a list of the pages to be exchanged or added together with the new pages.

The cancelled pages have to be returned to DSB together with the acknowledgement of receipt of the new pages. It is absolutely necessary to file modifications at once and to inform all servicing personnel without delay.

The number of the modification notice, chapter/page no., issue old/new, the date of filling and the name of the person who exchanged or added the page(s) have to be recorded in the schedule below.



## **Table of contents**

### **Chapter 1**

#### **1. Description**

##### **1.1 General**

##### **1.2 Constructional features**

1.2.1 Raft and canopy material

1.2.2 Shape of liferafts

1.2.3 Buoyancy tubes

1.2.4 Arch tube

1.2.5 Canopy

1.2.6 Floor

1.2.7 Inflation system

1.2.8 Boarding systems

1.2.9 Other equipment

1.2.10 Container

1.2.11 Break-down torques

### **Chapter 2**

#### **2. Technical Data**

### **Chapter 3**

#### **3. Major inspection**

##### **3.1 Preparations**

##### **3.2 Unpacking of raft**

3.2.1 Container

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page V issue : 10/97
--	---	--

### **3.3. *Visual examination of the whole raft***

- 3.3.1 Liferaft material
- 3.3.2 Belts and cords
- 3.3.3 Connection canopy fabric with upper buoyancy-tube
- 3.3.4 Patches
- 3.3.5 Seams
- 3.3.6 Bonded joints buoyancy tube / buoyancy tube / floor
- 3.3.7 Davit launchable liferafts
- 3.3.8 Valves and high pressure hoses
- 3.3.9 All loose liferaft accessories
- 3.3.10 Lighting

### **3.4 *Checking of inflation system***

- 3.4.1 Checking of C0<sub>2</sub>-cylinder
- 3.4.2 Disconnection of the C0<sub>2</sub>-cylinder with operating head
- 3.4.3 Operating head: type Thanner DK 94 - checking and mounting
- 3.4.4 Mounting operating head type Thanner DK 94 on cylinder valve  
Thanner type Compact
- 3.4.5 Check C0<sub>2</sub>-cylinder weight
- 3.4.6 Test and inspection of the cylinder valve
- 3.4.7 Leakage testing of C0<sub>2</sub>-cylinder
- 3.4.8 Exchange of cylinder valve and filling of cylinder

### **3.5 *Checking of the inflation valves and high pressure hoses***

### **3.6 *Checking of raft buoyancy tubes for air-tightness***

### **3.7 *Checking of raft floor for air-tightness***

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page VI issue : 10/97
--	---	---

**3.8        *Checking of lighting system***

- 3.8.1      Structure of the lighting system
- 3.8.2      Revision and maintenance
- 3.8.3      Light system at raft packing

**3.9        *Testing of the pressure relief valves***

**3.10      *Load test - davit launchable liferafts***

**3.11      *Testing of detachable raft accessories***

- 3.11.1     Checking of the emergency pack
- 3.11.2     Checking of bellows bag, repair bag and paddles
- 3.11.3     Checking of painter line
- 3.11.4     Checking of radar reflector  
(only for rafts approved by German Shipping Authority)

**3.12      *Documentation***

**3.13      *Hydrostatic release unit***

- 3.13.1     type „Hammar H 20“
- 3.13.2     type „Thanner DK 84“

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page VII issue : 10/97
--	---	--

## **Chapter 4**

### **4.       Folding and packing of the liferaft**

#### **4.1       *Completing the raft***

- 4.1.1       General
- 4.1.2       Raft equipment of raft and preparation for packing
- 4.1.3       Final check before deflation
- 4.1.4       Preparation of exterior of raft

#### **4.2       *Rolling up of raft***

- 4.2.1       with emergency pack type A (SOLAS-A-Pack)
  - 4.2.1.1      LR 97 for 6 and 8 persons
  - 4.2.1.2      LR 97 for 10, 12, 15, 16, 20 and 25 persons
  - 4.2.1.3      LR 97 L for 12, 16, 20, and 25 persons
- 4.2.2       with emergency pack type B (SOLAS-B-Pack)
  - 4.2.2.1      LR 97 for 6 and 8 persons
  - 4.2.2.2      LR 97 for 10, 12, 15 16, 20 and 25 persons
  - 4.2.2.3      LR 97 L for 12, 16, 20, and 25 persons

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page VIII issue : 10/97
--	---	---

#### **4.3 *Packing of raft in container***

- 4.3.1 Container - coordination and measurement
- 4.3.2 Container equipment
- 4.3.3 Packing of liferaft into the container / Attaching painter line to the operating head
- 4.3.4 Closing of container

### **Chapter 5**

#### **5. Cradle and hydrostatic release unit**

##### **5.1 *Coordination: container - cradle - lashing***

##### **5.2 *Mounting of container***

- 5.2.1 with lashing and line strop
- 5.2.2 with lashing and hydrostatic release unit

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page IX issue : 10/97
--	---	---

## **ANNEXES**

- Annex 1 - Placing of painter line
- Annex 2 - Identification label on raft
- Annex 3 - Contents of emergency pack
- Annex 4.1 - Certificate of re-inspection (Art.-No. 0.09.05.65.0)  
Annex 4.2 - Label: Inspection Approval (Art.-No. 0.09.05.65.0)
- Annex 5 - Log book / Log card
- Annex 6 - Container labels „Service“
- Annex 7 - Directions for the Repair of Rubber Dinghies  
Art.-No.: 0.09.05.32.0
- Annex 8 - Service hydrostatic release unit type „Thanner DK 84“
- Annex 9 - Tests according to IMO A 761/18
- Annex 10 - Break-down torques
- Annex 11 - Comparison of old topping up and deflation valve  
with new topping up and deflation valve,  
with went plug and deflation adapter
- Annex 12 - Safety instructions - mounting of straps
- Annex 13 - Liferaft marking with the name and the port of registry of the ship  
(IMO Res. A 759 (18))

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Introduction - page X issue : 10/97
--	---	--

# **1 Description**

## **1.1 General**

The LR 97-liferafts are made for 6, 8, 10, 12, 15, 16, 20 and 25 persons and meet the following requirements referring for construction and equipment:

1. 1983 Amendments to the International Convention for the Safety of Life at Sea 1974, Chapter III, with amendments and are tested according to:
2. Testing and Evaluation of LIVE-SAVING APPLIANCES 1992 Edition, IMO Resolution A.689(17) and amendments
3. Scheme for the Reciprocal Recognition of Tests and Inspections carried out on Ships Equipment -  
- Common Requirements for Inflatable Liferafts

## **1.2 Constructional features**

### **1.2.1 Raft and canopy material**

All liferafts are made of one layer of polyamide fabric coated with rubber proofing on both sides.

### **1.2.2 Shape of Liferafts**

for 6 and 8 persons	rectangular
for 10, 12 and 16 persons	hexagonal
for 20 and 25 persons	octagonal

### **1.2.3 Buoyancy tubes**

Two adjacent buoyancy tubes are each provided with a CO<sub>2</sub> non-return valve, an outboard mounted pressure relief valve and an inboard mounted inflate / deflate valve. The buoyancy tubes have a carrying capacity of 96 litres of air per person.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen/Germany	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 1 page : 1 Issue: 10/97
---	---	--------------------------------------

#### **1.2.4 Arch tube**

All liferafts are equipped with inflatable arch tube(s). The arch tube(s) is/are inflated from the upper buoyancy tube via non-return valve(s). These non-return valves prevent the arch(es) from deflating should the upper tube be damaged. The arch(es) is/are also equipped with a topping up and deflation valve.

#### **1.2.5 Canopy**

The canopy consists of a blue fabric inside and a luminous-orange fabric on the outside.

The rectangular liferafts have one boarding entrance each while the hexagonal and octagonal liferafts are provided with two boarding entrances.

A catchment gutter on the canopy collects rain water and conducts the water through a hose into the raft.

#### **1.2.6 Floor**

The two-layer floor is attached to the lower side of the lower buoyancy tube. The floor is inflated by means of an inflate/deflate valve and bellows.

After inflation the floor shows a stitched structure and provides insulation against the water underneath. The floor area measures 0.372 square metre for each person the liferaft can accommodate.

The underside of the floor is fitted with water pockets to provide stability and reduce drift. They fill automatically when the raft is deployed.

The underside of the floor is also provided with an arrangement for righting the liferaft in case of inflation in an inverted position.

#### **1.2.7 Inflation arrangement**

All liferafts have a pressure gas cylinder with a screw in type valve and operating head.

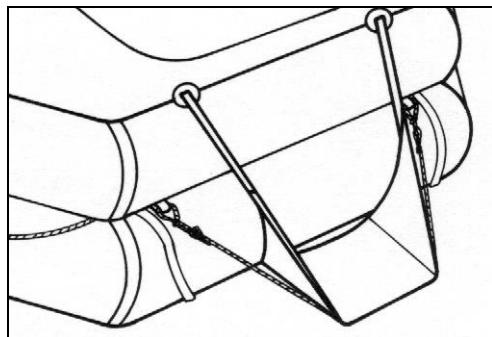
The filling gas is C02/ N2 . When activated the gas passes through a high-pressure hose with a Y-distributor and then through two other high-pressure hoses separately into the upper and lower buoyancy tubes.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen/Germany	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 1 page : 2 Issue: 10/97
---	---	--------------------------------------

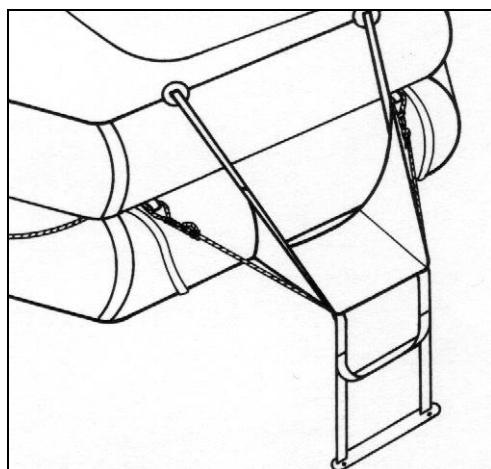
## **1.2.8 Boarding systems**

At least one entrance is equipped with a semi-rigid boarding system.  
The different non-inflatable boarding-systems are shown below:

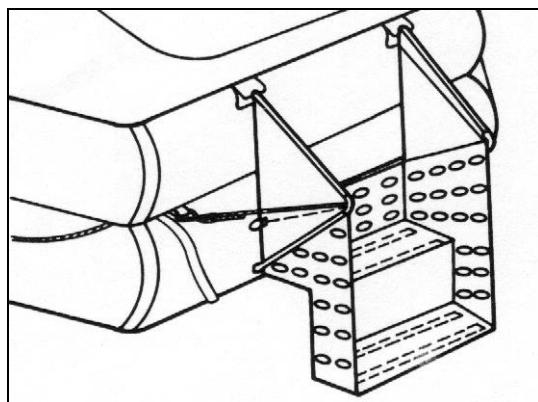
### **1.2.8.1 SOLAS - inflatable liferafts**



### **1.2.8.2 EFTA - inflatable liferafts**



### **1.2.8.3 SBG - inflatable liferafts**



### 1.2.9 Other equipment

- a) A grab line is mounted around the inner and outer circumference of the liferaft.
- b) A safety knife is located on the upper buoyancy tube, on the right hand side of the entrance adjacent to the painter line.
- c) Two independent lamps, one located on the outside of the canopy, the other attached to the arch inside the raft, are powered by dry lithium cells which are also located on the arch inside the raft. The cells are automatically activated during inflation.
- d) A rescue quoit with line is located in a bag attached to the inner canopy. On Danish approved liferafts the rescue quoit is attached to the upper buoyancy tube.
- e) A sea anchor is attached to a patch on the lower buoyancy tube, at right angles to the boarding entrances.
- f) Liferafts manufactured in accordance with German and Norwegian approvals are equipped with a self draining system.
- g) The emergency equipment is stowed in a valise, which is fastened to the inner floor of the liferaft.
- h) Bellows, bailer, repair bag and rainwater collecting bags are stowed in a bag attached to the internal lifeline.
- i) Liferafts approved by the German Shipping Authority are provided with two textile radar reflectors mounted on the outer canopy. In all other liferafts one radar reflector is stowed in the emergency pack, provided this is required by the relevant national authority.

*Additional equipment for davit-launched liferafts:*

- j) A bowsing line is fitted to the upper buoyancy tube each side of the boarding entrance above the gas cylinder, for securing the raft to the liferaft embarkation point.
- k) An outer suspension arrangement comprising rope spliced onto lifting patches which are in turn attached to the outer sides of the upper and lower buoyancy tubes and to the outer floor of the liferaft.
- l) An inner suspension arrangement comprises rope spliced onto lifting patches which are attached to the inner floor of the liferaft.
- m) Lowering shackles for

LR 97 L - 12, 16, 20 and 25 persons - Safe Working Load 7500 kp

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen/Germany	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 1 page : 4 Issue: 10/97
---	---	--------------------------------------

### **1.2.10 Container**

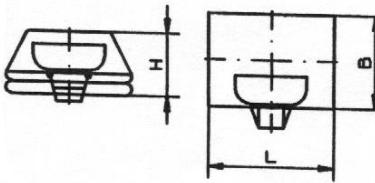
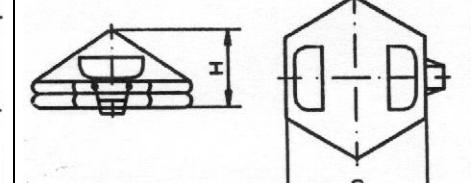
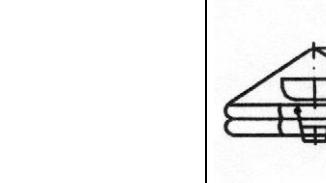
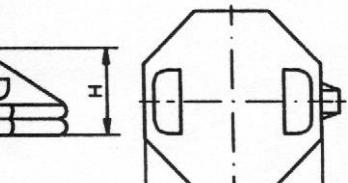
The liferaft is packed in a glassfibre reinforced plastic container.

### **1.2.11 Break-down torques**

The break-down torques for the different screwed connections are listed in Annex 10.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen/Germany	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 1 page : 5 Issue: 10/97
---	---	--------------------------------------

## 2. Technical Data

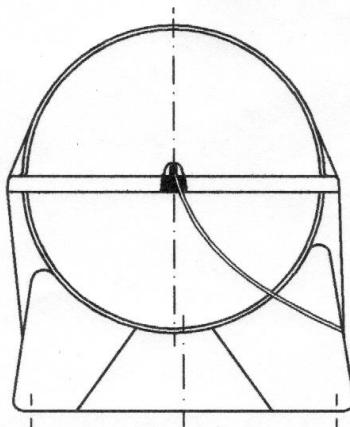
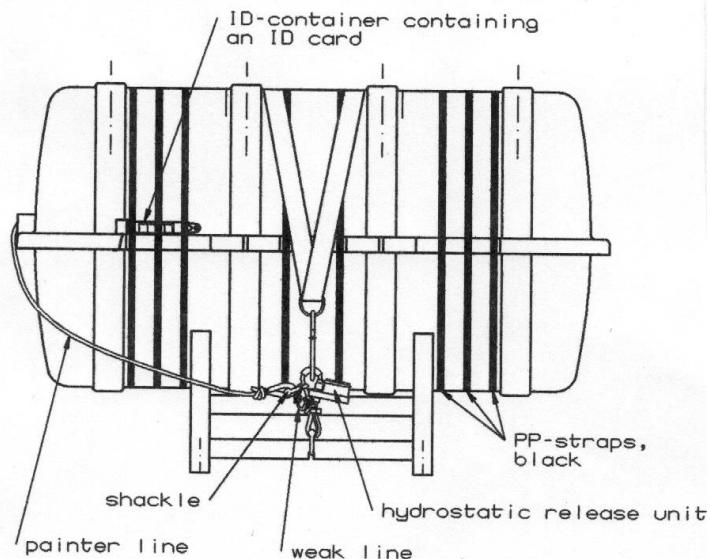
	LR 97 - 6 persons	LR 97 - 8 persons	LR 97 - 10 pers.	LR 97 - 10/12 p.	LR 97 L- 12 pers.	LR 97 - 16 pers.	LR 97 L- 16 pers.	LR 97 - 20 pers.	LR 97 L- 20 pers.	LR 97 - 25 pers.	LR 97 L- 25 pers.
Liferaft shape											
Dimensions:	L (m)	2,29	2,72	-	-	-	-	-	-	-	-
	B (m)	1,70	1,85	-	-	-	-	-	-	-	-
	S (m)	-	-	2,66	2,86	2,86	3,27	3,27	3,67	3,67	4,07
	H (m)	1,14	1,16	1,515	1,565	1,565	1,74	1,74	1,755	1,755	1,96
Diameter buoyancy tubes	(cm)	22,80	24,70	27,50	28,80	28,80	31,10	31,10	33,50	33,50	35,40
Vol. buoyancy tubes without arch	(dm <sup>3</sup> )	576	777	977	1156	1156	1544	1544	1946	1946	2418
Floor	(m <sup>2</sup> )	2,27	2,98	3,82	4,48	4,48	5,97	5,97	7,45	7,45	9,32
C0 <sub>2</sub> -cylinder charging: C0 <sub>2</sub>	type	4 kg	4 kg	6 kg	6 kg	6 kg	8 kg	10 kg	10 kg	12 kg	14 kg
	(kg)	3,59 kg	3,59 kg	5,38 kg	5,38 kg	5,38 kg	7,18 kg	8,80 kg	8,80 kg	10,77 kg	10,77 kg
5 % N <sub>2</sub>	(kg)	0,18 kg	0,18 kg	0,27 kg	0,27 kg	0,27 kg	0,36 kg	0,44 kg	0,44 kg	0,54 kg	0,63 kg

### 3 Major Inspection

These instructions are valid for all DSB LR 97 and LR 97 L liferafts complying with SOLAS 74/88, packed in containers.

Attention! If not already carried out by manufacturer or a service station, each DSB liferaft (types:DSL; LR 86(L) and LR 97(L)) must be equipped with an ID-container containing an ID card according to ANNEX 13.

Container with cradle and hydrostatic release unit



The major inspection should only be made by authorized maintenance personnel. Unauthorized persons are not allowed to do this kind of work.  
Violation will be prosecuted!

### **3.1 *Preparations***

The liferaft must be serviced in a facility meeting the requirements of IMO Resolution A.761(18) and approved by DSB and the relevant national authority.

#### **3.1.1 Take the container from the cradle.**

Loosen the bottle screw of the lashing strap and slip the hook. The rope strop may be knotted if a hydrostatic release unit is not mounted. If an HRU is fitted loosen the screw of the shackle securing the weak link, painter and HRU. Safeguard the shackle and screw until the end of the servicing.

### **3.2 *Unpacking of raft***

#### **3.2.1 Container**

3.2.1.1 First inspect the container of the raft. Examine any damage, whether splinters or the like protrude into the container, which, when unpacking, could cause more damage to the raft. Remove these foreign bodies, if possible, before unpacking.

#### **3.2.1.2 Cut the black plastic closing strap**

**Attention ! Davit launchable liferafts: Do not damage the black tear strip which will be re-used when packing the raft.**

3.2.1.3 On container it is necessary to remove the moulded rubber painter seal from the top half of the container, in order to prevent the painter line being pulled as the top is lifted off.

3.2.1.4 Lift off the top half of container.

3.2.1.5 Carefully open the packing foil.

3.2.1.6 Carefully untie the firing line from the operating head release wire.  
(Take care to avoid pulling the wire to avoid firing)

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	2
--	--	---	---

- 3.2.1.7 Detach painter line from the thimble of the towing bridle.
- 3.2.1.8 Remove the raft from the lower half of the container.
- 3.2.1.9 Throw-over board liferafts: Cut through the flax webbing.  
Davit-launchable liferafts : Unbuckle the 40 mm wide fabric tape.  
The tape will be re-used for packing.
- 3.2.1.10 Unfold and spread out the raft (with canopy on top).  
A check should be made to ensure that liferaft and container are dry.
- 3.2.1.11 **Carry out tests according to IMO-Resolution A.761 (18). (See Annex 9)**
- 3.2.1.12 Position and method of attaching equipment bags should be precisely marked (make notes and mark position with coloured chinagraphs).  
The equipment bags are fastened at different places according to the type of raft and method of packing.

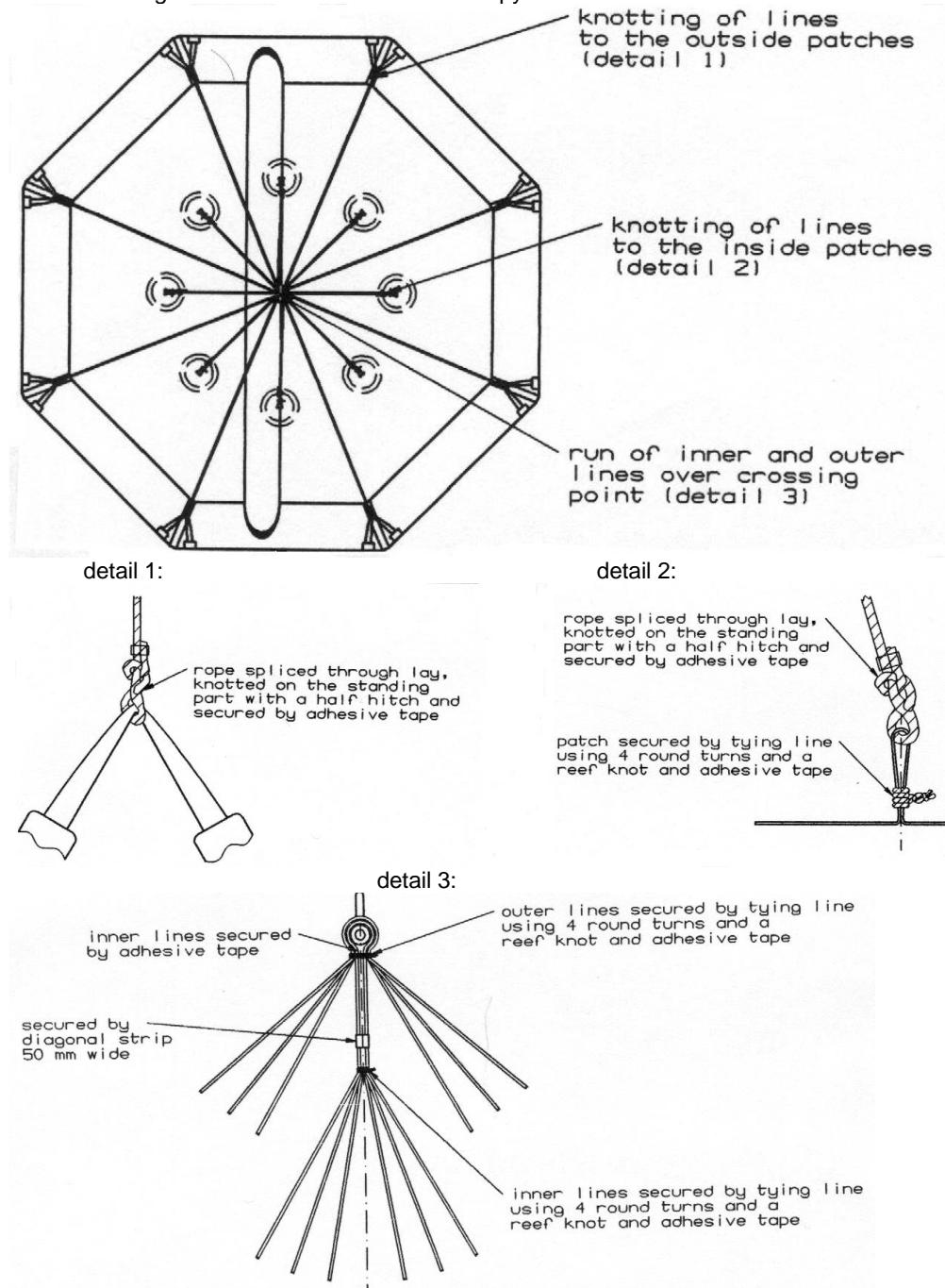
### **3.3 Visual examination of the whole raft**

(Obvious damage to be marked with chinagraph and noted down)

- 3.3.1 Examine raft material for wear by ageing and abrasion. The raft material has to be smooth and must not show any fractures.
- 3.3.2 Examine webbings and cords for mildew.
- 3.3.3 Check the connection of the canopy fabric to the upper buoyancy tube and the liferaft floor to the lower buoyancy tube.
- The floor seam strength test should be carried out in accordance with IMO-Resolution A.761 (see Annex 9).**
- 3.3.4 Examine all vulcanized patches.
- 3.3.5 Seams of both buoyancy tubes
- 3.3.6 Connection op upper buoyancy tube to lower buoyancy tube.

### 3.3.7 Suspension arrangement for davit-launchable liferafts

*Drawing:* liferaft shown without canopy



DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3 page : Issue : 10/97	4
--	---	------------------------------------	---

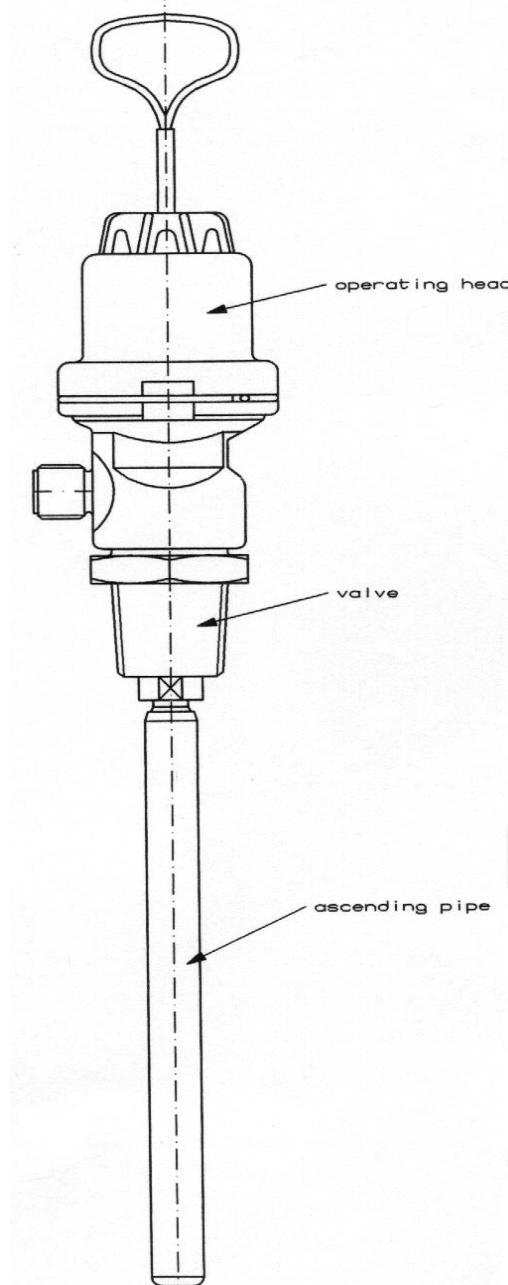
to

- 3.3.7 Carefully examine the following details of the suspension arrangement to ensure it is in faultless condition.
  - 3.3.7.1 Knotting of lines to the lifting patches (inclusive securing of lines)
  - 3.3.7.2 Condition of lines, especially in the crossing point at the lowering shackle.
  - 3.3.7.3 Condition and connection of patches at the buoyancy tubes and at the floor.
  - 3.3.7.4 Lowering shackle screw must be secured either by a split pin or by use of Loctite, type 243.
- 3.3.8 Examine all valves, high pressure hoses and „Y“ distributor, particularly for external damage.
- 3.3.9 Remove all loose accessories from the raft, such as the emergency pack, bellows bag, repair bag, knife, rescue quoit, sea anchor.
- 3.3.10 Inspect exterior and interior lighting systems, including batteries and connecting plugs.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	5
--	--	---	---

### **3.4 Inspection of inflation system**

These instructions apply to the inflation system incorporating the Thanner-valve and Thanner operating head, type DK 94 (Compact system).



### **3.4.1 Checking of C02-cylinder**

All work has to be done with utmost care to avoid injuries by unexpected escape of carbon dioxide.

#### **Be sure to wear goggles !**

##### **3.4.1.1 Required test instruments**

- a) A standard, commercial weighing device with an accuracy of +/- 25 g
- b) Testing and closing plug (aluminium)  
for Thanner cylinder valve „Compact system“  
DSB-Art.-No.: 0.09.13.82.0
- c) Three-square pin spanner (figure stamp 14)  
for penetration membrane.  
DSB-Art.-No.: 0.11.06.77.0
- d) Special filling head, compl. (figure stamp 22)  
for Thanner cylinder valve „Compact system“  
DSB-Art.-No.: 0.07.24.17.0
- e) Resetting tool for DK 94 operating head  
DSB-Art.-No.: 0.07.24.15.0

### 3.4.2 Disconnecting the CO<sub>2</sub>-cylinder with operating head

**Ensure that all personnel are made aware of the following safeguards when handling compressed gas cylinders !**

- a) Observe official rules concerning compressed gas!
- b) Do not use any compressed gas cylinders the contents of which are not well known and/or which:
  - are not provided with an official inspection mark
  - show signs of corrosion or traces of burning and / or any other severe damage (such as deformation, incision or unauthorised modifications);
  - are furnished with distorted or otherwise damaged valves
  - give rise to objections in any other way.

Such cylinders must be discharged\*, withdrawn from use and the empty cylinders sent to DSB for further examination.

**(\*) Note:** Cylinders, the contents of which are unknown, should be discharged only by an acknowledged expert with due consideration for the necessary precautions !

- c) Compressed gas cylinders with incomplete and not clearly readable marking must not be used.
- d) Do not store more cylinders in the working room than will be required as a maximum for one shift. Cylinders not required should be securely stored in suitable racking to guard against shock or movement, in a separate room.
- e) Full or empty cylinders kept in the working room should be securely stored in suitable racking to guard against shock or movement.
- f) Cylinders kept in the working room and not destined for immediate use should be stored in such a way that in the event of a valve rupture, the risk to persons by flying components and / or he recoil of the cylinder is reduced to a minimum.
- g) Cylinders charged with compressed gas should never be left uncontrolled and/or be placed in the vicinity of doors, gangways and emergency escapes.
- h) Filled cylinders should be protected from heat.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	8
--	--	---	---

i) The following recommendations should be observed when examining cylinders charged with compressed gas and when assembling or adjusting their valves:

- wear full protection goggles,
- never direct assembly axis (i.e. possible „line of fire“ in case of valve rupture) and/or valve discharge opening towards oneself or other persons. (This applies also to transport and mounting of cylinders in the raft).

j) In case of distorted valves diverging from the cylinder axis:

Do not operate, do not perform any assembly work. Unscrew operating head cautiously without strong effort and discharge cylinder - see item 3.4.8. Send cylinder to DSB for examination and repair.

k) When mounting or dismounting cylinders charges with compressed gas, or during testing or assembly procedures, no persons should be allowed to stay in front of the valve or behind the cylinder bottom.

l) Leakages around the valve fittings of CO<sub>2</sub>-cylinders:

Don't tighten valve connection !  
Further handling see point 3.4.7.1.

m) Cylinders that have been rejected, or those with valves that have been rejected, should only be shipped in discharged condition.

n) For test inflation of liferafts:

Safety range for observers = at least twice the maximum diameter of the raft, standing behind the operating line.  
On smooth floor the raft should, if necessary, be secured by ropes to prevent it dragging.

o) Always keep in mind:

Compressed gas cylinders are completely harmless if correctly handled, but are highly dangerous and uncontrollable if wrongly handled!

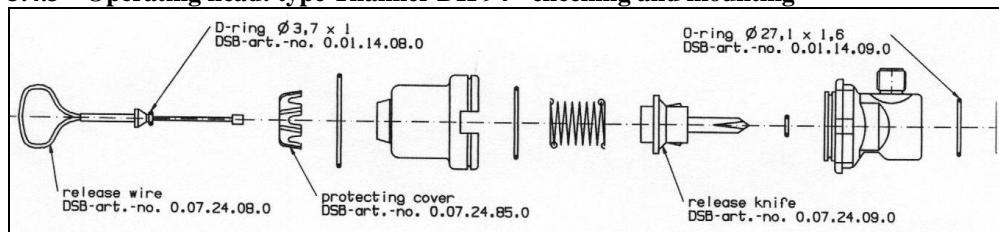
3.4.2.1 Lift one side of the raft and put it on two stools so that the gas cylinder is easily to hand.

3.4.2.2 Untie and put aside the valve-protective cap.

3.4.2.3 Unscrew the high pressure hose from the cylinder valve using an open spanner (size 19 or 22)

- 3.4.2.4 Untie the line on the cylinder pocket.
- 3.4.2.5 Pull the CO<sub>2</sub>-cylinder out of the pocket (if the cylinder is firmly seated reduce the pressure of the lower buoyancy tube) and place it in a vice for inspection.
- 3.4.2.6 Remove the operating head type „DK 94“, using a 27-wrench (right hand thread), holding the valve with a 36-wrench against torsion.
- 3.4.2.7 After removing the operating head protect the thread of the cylinder valve by fitting an aluminium test cap (DSB-Art.-No.: 0.09.13.82.0).

### 3.4.3 Operating head: type Thanner DK 94 - checking and mounting



#### 3.4.3.1 General

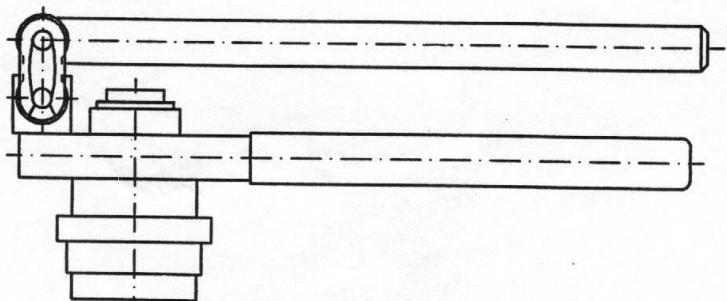
The function of the DK 94 - and also the DK 88 - is based on a pre-loaded spring which is activated by pulling out the release wire.

When the operating head is activated the two latches are broken on the red protecting cap.

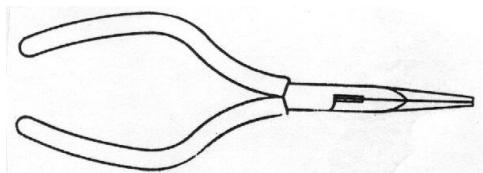
**Important ! After activation the red protection cap must be replaced by an original protection cap (DSB-Art.-No.: 0.07.24.85.0)  
To exchange the protection cap see the following instructions.**

For checking and re-assembly the following special tools are required:

Resetting tool, DSB-Art.-No.: 0.07.24.87.0



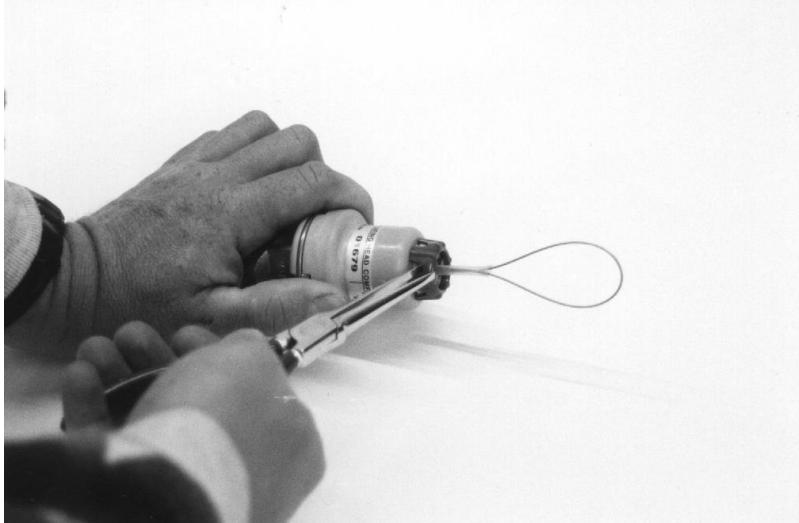
Flat pliers (commercial)



### 3.4.3.2 Visual inspection of the operating head

- a) general condition of the operating head
- b) check the identification label for damage and legibility
- c) check knife edge and replace if blunt or damaged
- d) Exchange the red protection cap at each service in accordance with point 3.4.3.3

### 3.4.3.3 Exchange of the red protection cap



Hold the operating head in your hand and and remove the protection cap with the flat pliers.

Check the new protection cap for damage (cracks and existence of both lashes)

Pass the release wire through the new protection cap and then press down the protection cap until it rests in the groove of the casing.

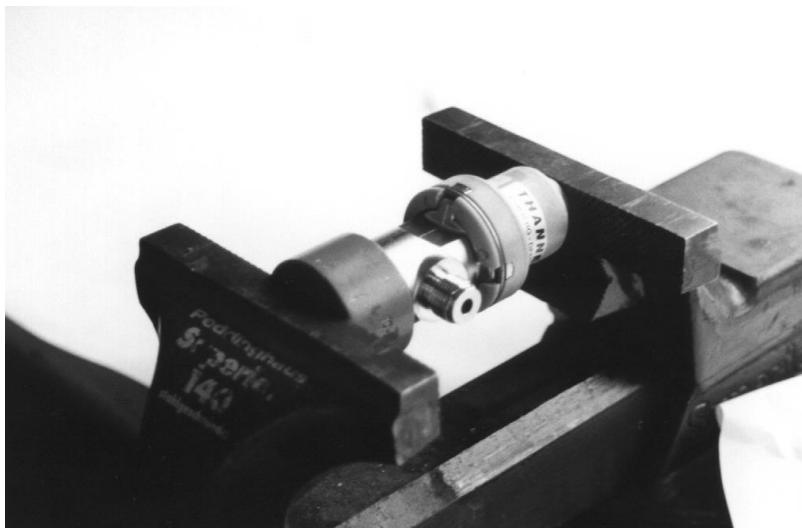
### 3.4.3.4 Disassembly, inspection and re-assembly of operating head

**Important ! If the operating head was released in water or a wet environment, then it must be serviced as follows:**

#### 3.4.3.4.1 *Disassembly*

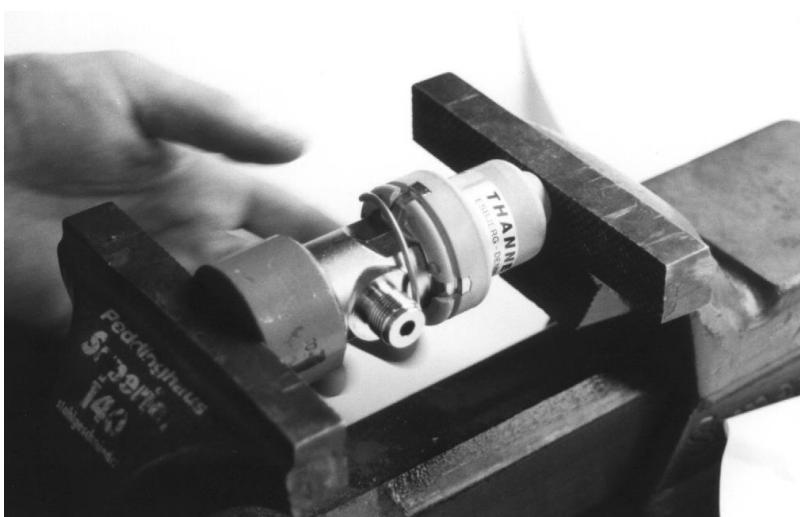
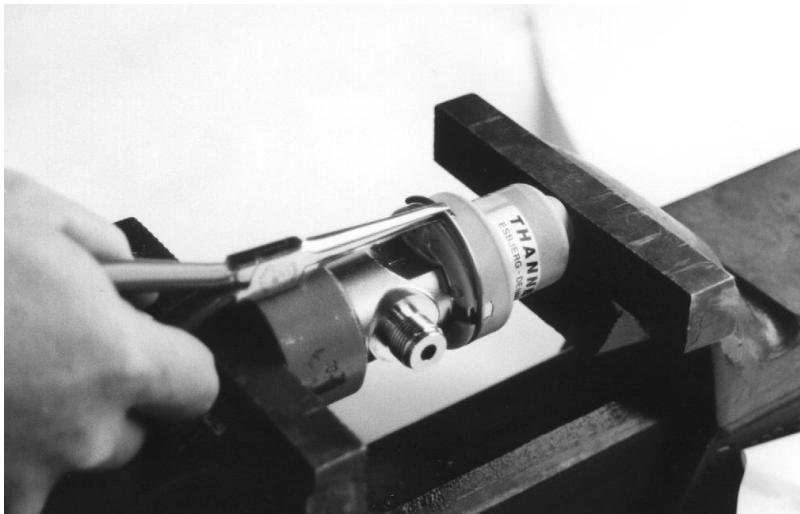
- 3.4.3.4.1.1 Remove the red protection cap with flat pliers and activate the operating head.

### 3.4.3.4.1.2



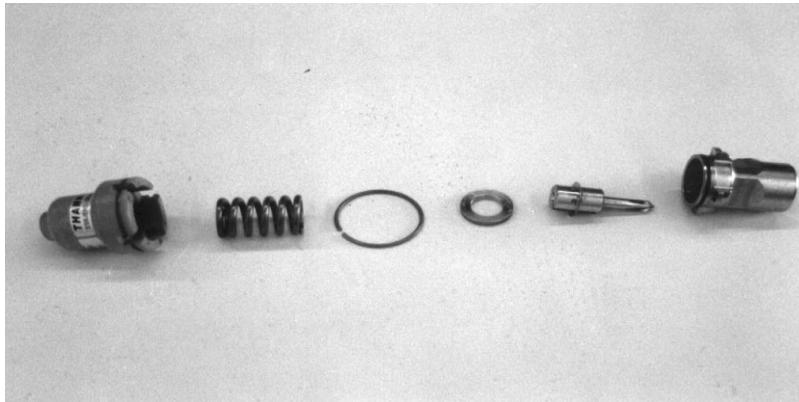
Place the operating head in a vice and protect the release knife with a wooden block or a bored metal block.

### 3.4.3.4.1.3



Remove the bursting ring using flat pliers.

#### 3.4.3.4.1.4



Open the vice slowly and disassemble the operating head.

#### 3.4.3.4.2 *Inspection*

All parts must be undamaged and free of water or other contamination. If necessary clean with compressed air and then grease the „O“-rings, the rubbing surfaces of the knife and casing with commercial grease (Aeroshell 14).

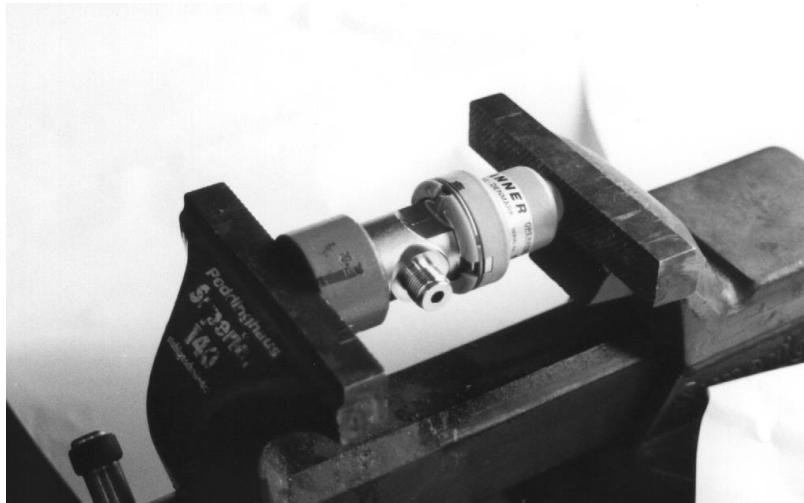
#### 3.4.3.4.3 *Assembly*

##### 3.4.3.4.3.1



Assemble all parts and vice together with the the wood block.  
Compress until the lock ring can be located into its recess, all the  
way round.

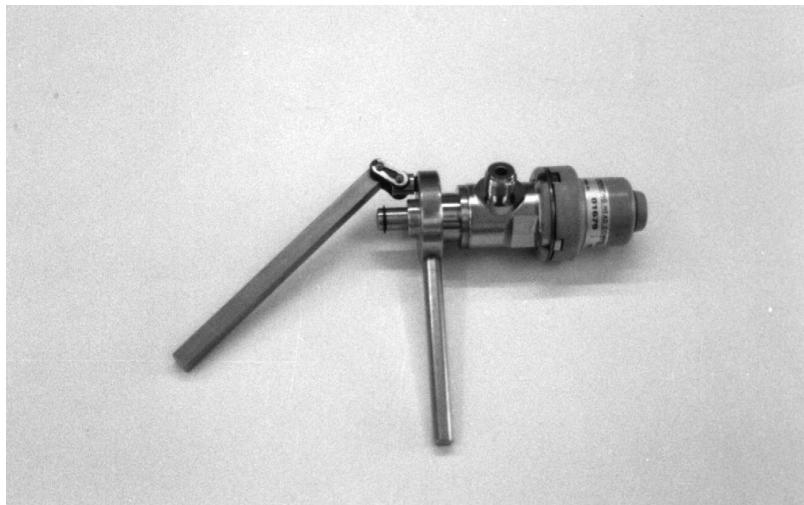
3.4.3.4.3.2



Mounting spring ring with flat pliers.

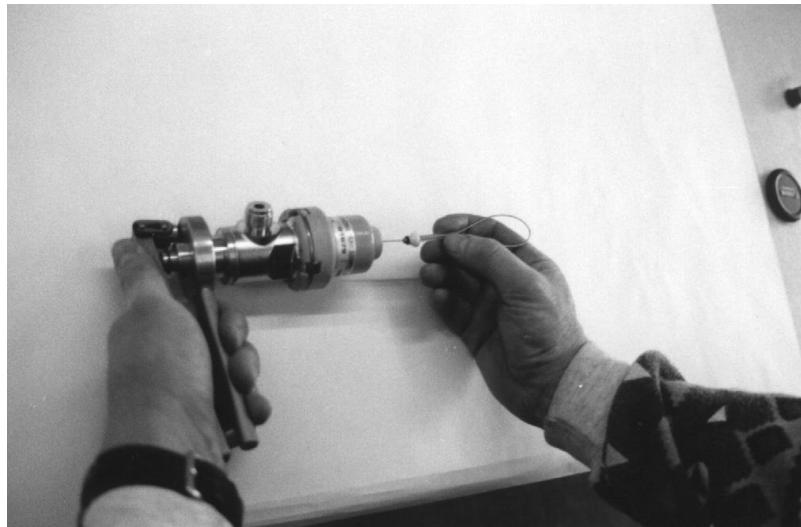
3.4.3.5      Tighten the operating head

3.4.3.5.1



Vice the clamping tool, DSB-Art.-No. 0.07.24.15.0, into the operating head up to the stop.

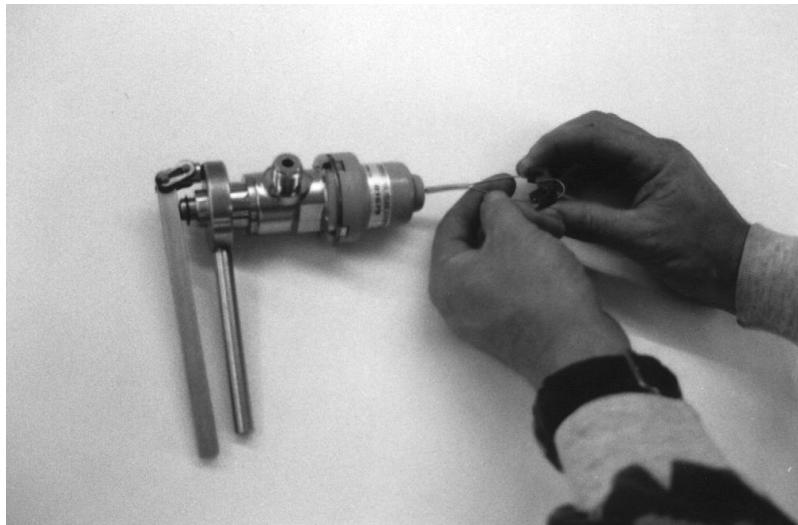
### 3.4.3.5.2



Compress both the levers of the clamping tool.  
Check the release wire visually and if necessary replace  
it as follows:

Insert the release wire until it is in position, i.e. the plastic  
cone is in level with the top surface and the small „O“ring  
is compressed.

### 3.4.3.5.3



Mount the red protection cap as described in point 3.4.3.3 and unscrew the clamping tool.  
The end of the knife must lie level with the edge of the casing.  
Visually check the operating head once more.

**Note:** The release wire must be mounted correctly and must hold the knife in its starting position.  
Don't assemble the release wire, before the clamping procedure is finished.

The „O“ring ( $\varnothing$  27,1 x 1,6) must be greased and checked for damages.

### 3.4.3.6 Storing the operating head

Provide the thread connections with plastic caps

outer thread 3/8“ = protecting cap no. 30, red,  
DSB-Art.-No.: 0.08.01.76.0

inner thread        = protecting cap no. 27-M, yellow,  
M 30 x 1,5           DSB-Art.-No.: 0.08.01.75.0

and store on a place with normal atmospheric humidity.

### 3.4.4 Mounting operating head type DK 94 on the cylinder valve

- screw the head on to the valve manually
- screw the head tightly (60 N) using the fork spanner and torque spanner

### 3.4.5 Check C0<sub>2</sub>-cylinder weight

The unit for weighing consists of:

- a) C0<sub>2</sub>-cylinder, filled, with bottle adhesive label (filling and total weight)
- b) Cylinder valve with penetration membrane, but without testing- and protection caps and without release head

#### 3.4.5.1 The cylinder must be free of dirt of any kind.

Small damages to the painting must principally be eradicated before weighing.

#### 3.4.5.2 In case of a weight loss of more than 60 g, the cylinder has to be refilled or replaced

C0 <sub>2</sub> + 5 <sup>Gew.</sup> <sub>WT.</sub> - % N <sub>2</sub>		
Gewicht, leer WEIGHT, EMPTY	:	kg
Füllung FILLING	C0 <sub>2</sub>	kg
Füllung FILLING	N <sub>2</sub>	kg
Gewicht, voll WEIGHT, TOTAL	:	kg
Art.-Nr. 0.09.50.03.0		

- Differences in weight of +/- 14 g are to be ignored since that is the accuracy required of the weighing device.

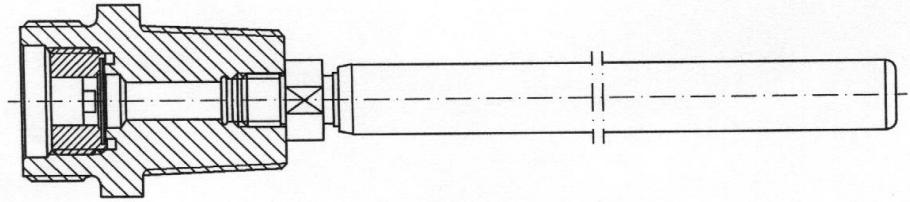
- record losses of weights from 15 to 59 g on logcard
- in case of weight losses of more than 60 g cylinder has to be refilled or replaced
- in case of any doubt replace the gas cylinder.

### 3.4.5.3 Tabular review of CO<sub>2</sub> / 5 % N<sub>2</sub> mixed filling

liferaft type and - size	cylinder type used kg	number	mixed filling		
			kg CO <sub>2</sub>	5 % kg N <sub>2</sub>	kg total
LR 97 - 6 persons	4	5,36	3,59	0,18	3,77
LR 97 - 8 persons	4	5,36	3,59	0,18	3,77
LR 97 - 10 persons	6	8,04	5,38	0,27	5,65
LR 97 - 10/12 persons	6	8,04	5,38	0,27	5,65
LR 97 - 16 persons	8	10,72	7,18	0,36	7,54
LR 97 - 20 persons	10	13,40	8,80	0,44	9,24
LR 97 - 25 persons	12	16,08	10,77	0,54	11,31
LR 97 L - 12 persons	6	8,04	5,38	0,27	5,65
LR 97 L - 16 persons	10	13,40	8,80	0,44	9,24
LR 97 L - 20 persons	12	16,08	10,77	0,54	11,31
LR 97 L - 25 persons	14	18,76	12,57	0,63	13,20

Kommentar [HD1]:

### **3.4.6 Test and inspection of the cylinder valve type THANNER COMPACT**



Clean the inside of the valve by blowing out with compressed air.  
Check for corrosion and dirt and clean it if necessary.

**Attention !    Don't damage the membrane**

Check the penetration membrane for damage. It must not have any kind of corrosion or damage (indentation from the blade tip).

Any cylinder with a damaged valve and / or membrane has to be replaced in accordance with point 3.4.8 and must be refilled.

### **3.4.7 Leakage testing of CO<sub>2</sub>-cylinder**

Screw off the aluminium testing- and protection cap.

The screwed connections have to be checked as following:

cylinder valve / cylinder: spray leak finder spray onto the screw connection  
cylinder valve / membrane: fill in some alcohol or cleaning gasoline inside the valve.

Any leakages of the valve system will be indicated by air bubbles.

#### **3.4.7.1 Leakages of the screw connection cylinder valve / cylinder**

The cylinder must be replaced by a seasoned and tested new one

**The defective cylinder has to be handled according to 3.4.8.**

#### **3.4.7.2 Leakages of the screw connection cylinder valve / membrane**

Screw off the filling head and tighten the membrane with 40 Nm **only once**.

Check the screw connection once more for tightness with alcohol or cleaning gasoline.

If there are further air bubbles, the membrane must be replaced by a new one, handling according to 3.4.8.

#### **3.4.7.3 The exterior of the cylinder and valve has to be dried thorough.**

Screw on the protection cap and until the purpose of reinsertion deposit the cylinder in a safe place.

Conditions for depository:

- a) maximum ambient temperature 25 ° C
- b) maximum atmospheric humidity 60 %
- c) no acrid fumes

- filled CO<sub>2</sub>-cylinders are only be handled and stored with metal (aluminium) protection caps - not with plastic protection caps !

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	22
--	--	---	----

### 3.4.8 Exchange of cylinder valve and filling of cylinder

All work must be carried out by trained personnel of an authorized service station.

**Attention!** Execute all work with particular care in order to avoid injuries by escaping carbonic acid.

**Wear safety goggles !!!**

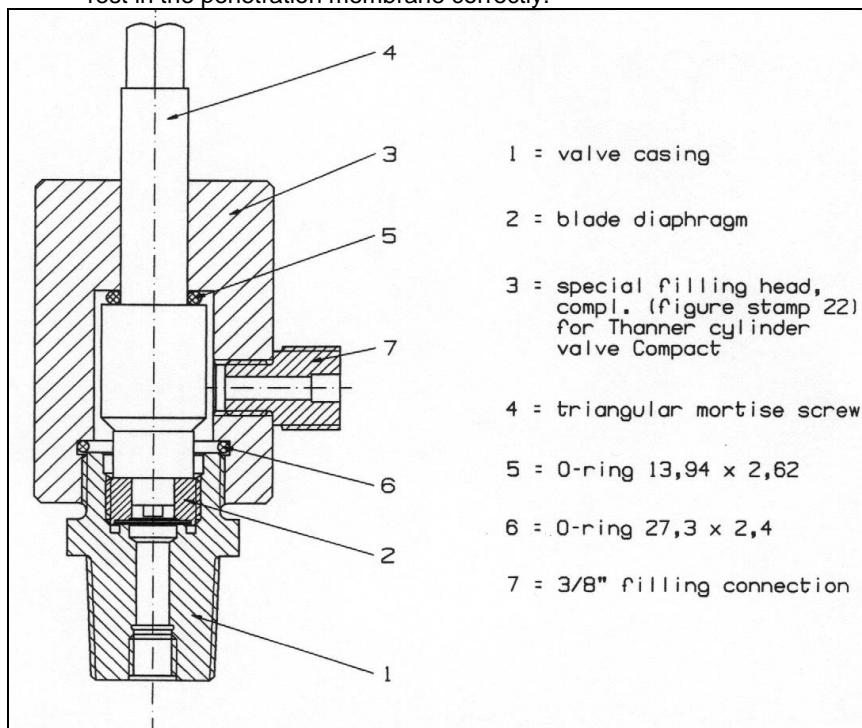
Exhausted C<sub>2</sub>-cylinders have to be „TÜV-approved“ after ten years before refilling (see date at the cylinder neck - e.g. „5/97 - 07“)

Explanation: 5/97 = month and year of last approval  
07 = date of required (next) approval  
TÜV = Technischer Überwachungsverein

3.4.8.1 Vice the cylinder in tension clamp or bench so that the valve opening (discharge nipple) points to a direction without danger.

3.4.8.2 Exhausting of C<sub>2</sub>-cylinders

- Check special filling head for all o-rings are existing.  
Subsequently screw on manual the filling head on the valve housing. The triangular mortise screw must rest in the penetration membrane correctly.



to

3.4.8.2

- b) The filling head is to be further screwed onto the valve housing with a fixed spanner (SW 50) and tightened.
- c) By turning the pin spanner to the left (anticlockwise) with the fixed spanner (SW 12) the penetration membrane is to be loosened and turned to such an extent that an elastic resistance is detectable. (The o-ring closes in a sealing manner onto the filling head)
  - cylinder empties itself -

The special filling head with the three-square pin spanner to be left in this position.

3.4.8.3 After exhausting unscrew the the filling head from the valve.

3.4.8.4 Clean the threads in the cylinder neck completely and remove leak proofing material if existing.

**Pay attention that no dust or other foreign objects penetrate into the interior of the cylinder as they are able to block valves and supply lines.**

3.4.8.5 Turn the C0<sub>2</sub>-cylinder upside down and remove remains of leak proofing material or other foreign substances if existing at all by beating out.  
Blow out the cylinder with compressed air.

3.4.8.6 Replace the ascending pipe if there are visible damages or if the ball bearing is not moveable. The ascending pipe screw into the valve without leak proofing tape (starting torque 15 Nm).

3.4.8.7 Control the intact (tested) cylinder valve with ascending pipe and with TEFILON-leak proofing tape by means of a torque spanner (torque 220 Nm)

3.4.8.8 Before every refilling of the cylinder, the penetration membrane must be fundamentally renewed irrespective of whether it is penetrated or not.

New penetration membranes are to be checked for perfect condition and markings (test pressure = 250 and year of make e.g. 97).

Place the penetration membrane onto the three-square spanner, guide it into the valve housing and without force, screw it onto the valve seat.

Fit cylinder valve with aluminium sealing plug and send it for refilling to the C0<sub>2</sub>-filling station. Special filling head and triangular mortise screw must be made available to the filling station.

**CAUTION!** Newly filled cylinders may only be fitted to a liferaft after a storage period of at least 4 weeks and a further careful inspection.

## **3.5 Checking of the filling valves and pressure hoses**

### **3.5.1 Filling valve**

- 3.5.1.1 Connect a separate CO<sub>2</sub>-test cylinder with hand wheel valve to the main hose line.
- 3.5.1.2 Inflate the raft body **for a short time** with CO<sub>2</sub> and pay attention that no gas escapes. If necessary, re-tighten screws on valves. (22 mm spanner for the main hose lines; right hand thread), (19 mm box wrench for the head screw on the filling valves; left hand thread !!!). Both valves must respond, which can firstly be observed acoustically and secondly by an equal slight formation of ice on the valves.
- 3.5.1.3 Remove test cylinder and wait until the outer icing is thawed off. Close hose end of the main hose line with moistened thumb. No remarkable return current of filling gas out of the raft may occur. Otherwise the cap screws (cross hole pieces) of the filling valves have to be removed (left hand thread), the filling valves (mouthpieces) have to be unscrewed (left hand thread) and the interior of the valves (non-return diaphragm and spring) has to be examined for faults.  
**An exchange of a complete filling valve is only to be performed in the factory.**

### **3.5.2 High-pressure hoses**

- 3.5.2.1 High-pressure hoses are to be marked with date (month and year) of installation in the new liferaft or in case of an exchange.
- 3.5.2.2 In case of breaks or cracks an immediate inspection must be performed.
- 3.5.2.3 High-pressure hoses at an age of 3 years have to undergo a pressure test, repeated at least every 2 years even if no breaks or cracks are found.
- 3.5.2.4 Subjected to the test is the hose system from the connection of the pressure gas cylinder up to the connection of the buoyancy tube.
- 3.5.2.5 The test procedure will be executed by means of a liquid high-pressure pump with pressure gauge at a normal temperature of + 20° C. For a time of 60 seconds the hose system is checked at the test pressure as declared by the manufacturer. Leakages are not allowed anywhere in the hose system.

### 3.6 Checking raft buoyancy tubes for airtightness

(It is advisable before first inflation of raft to fill some talc through the valve openings into all raft compartments)

**Important !** Pressure relief valve plugs must have been removed from the valves.

**Attention !** Identify the type of topping up and deflation valve before inflation, testing und deflation of buoyancy tubes and floor. Select the appropriate test socket accordingly (see Annex 11).

- 3.6.1 Inflate the raft using a compressed air line or compressed air cylinder with a handwheel valve, until the pressure relief valves blow off. Should the pressure relief valves not blow off, exercise care as there is a danger the raft will be over-inflated.

Attach the pressure manometer, using the test socket, and ensure the maximum pressure of 360 mbar (270 mm hg) has not been exceeded.

- 3.6.2 **Working pressure test (WP)**

Commence 30 minutes after the pressure relief valves have closed.

Reseat pressures: LR 97 throw-over-board types must be greater than 200 mbar;  
LR 97 L davit launch types must be greater than 250 mbar)

The pressure drop must not exceed more than 5 % after one hour.

- 3.6.2.1 If the raft should fail the working pressure test, the leak may be found by mixing 3 - 5 % soap suds in luke warm water and applying it on the tubes with a cloth, sponge or flat brush. Checks should be made in the following order - all valves, seams, raft body. Any leak will be visible immediately by the formation of small bubbles. It is also possible to so-called „cauliflower“, an agglomeration of tiny bubbles, will form on porous raft material.

- 3.6.2.2 Large leaks must be repaired properly, whereas small leaks are covered with DSB cold vulcanising material or with the post impregnating agent E 3003 after having cleaned the spot to be repaired with toluene. (For repairs please refer to the „Instructions for Repair of Pneumatic Boat Skins“ - Annex 7 -

- 3.6.3 Inspection of arch tube

- a) deflate upper tube
- b) pressure of arch tube must be > 150 mbar
- c) after one hour pressure holding the pressure drop willnot exceed more than 15 % .

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	26
--	--	---	----

### **3.7 Checking of raft floor for airtightness**

(this checking can only be made when raft is inflated)

3.7.1 Inflate raft floor by compressor (between 10 and 15 mbar).  
Close valve firmly.

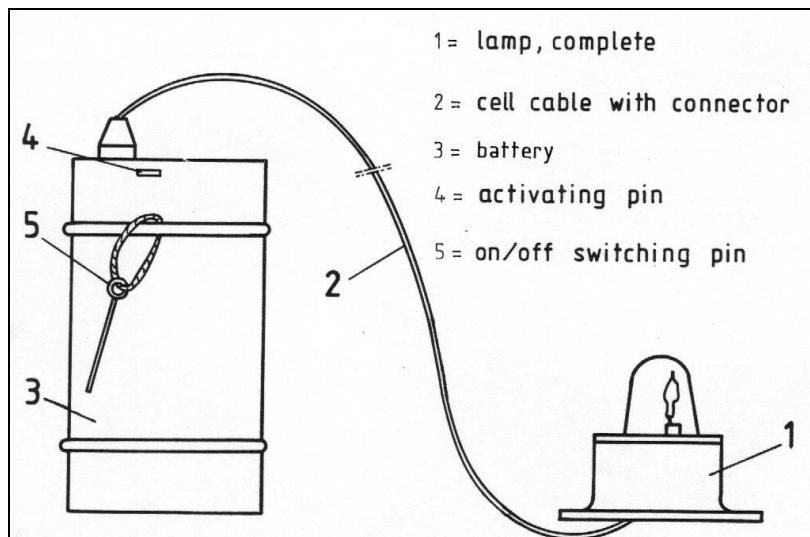
3.7.2 Check after 1-2 hours if there is an acceptable remaining air cushion.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	27
--	--	---	----

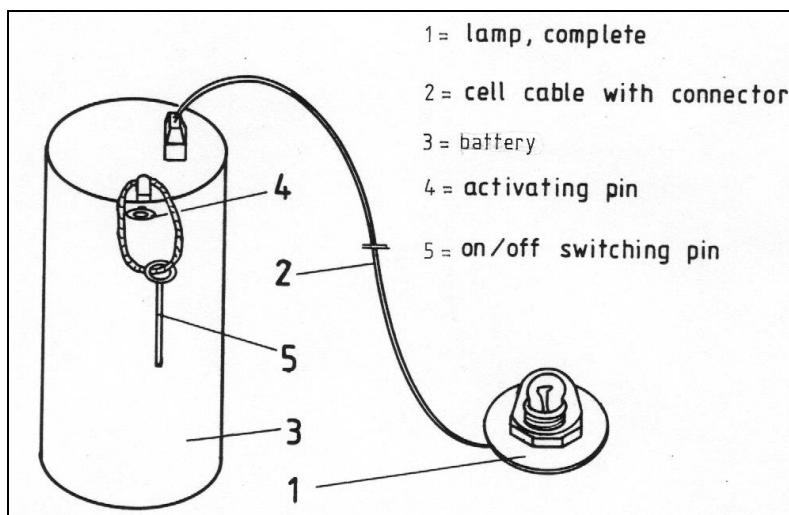
## 3.8 Checking of lighting system

### 3.8.1 Structure of the lighting system

#### 3.8.1.1 Exterior lighting



#### 3.8.1.2 Exterior and interior lighting



### **3.8.2 Revision and maintenance**

- 3.8.2.1 Check carefully when inflating the raft for maintenance that the activating pins are pulled out of the batteries. This is achieved by a line connecting the pins to the floor of the raft. If the pins are not pulled out, the procedure should be repeated after shortening the line.

**The removal of the activating pins from the batteries must be ensured.**

After the pins have been removed the exterior lighting should have a flashing light and the interior a constant light.

After having checked the functioning of the lights the interior and exterior light have to be switched off with the on/off switching pin.  
(See item 3.8.1.1 and 3.8.1.2, pos. 5)

- 3.8.2.2 Make a visual inspection of the battery / cell. Distortion of the housing indicates it is electrolysed and the battery / cell must be replaced.

- 3.8.2.3 Each battery has an expiry dat of five years from the date of manufacture. If this date should occur with in six months of the date of service of the raft, the battery should be replaced. Old batteries must e disposed of in accordance with national requirements.

- 3.8.2.4 All metal parts are to be visually inspected for corrosion and oxidation.  
Affected parts must be cleaned.

- 3.8.2.5 After revision and maintenance join firmly caps and couplings.

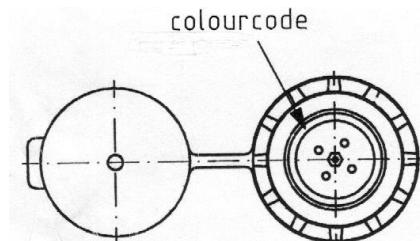
### **3.8.3 Light system at raft packing**

After deflation of the raft and before packing, the switching pins in the batteries must be replaced by the activating pins.

During folding of the raft, care must be taken that the activating pin is not pulled out of the battery.

### **3.9 Testing of the pressure relief valves (safety valves)**

Product pressure relief valve: Thanner DK OTS



(Before starting the test, make sure the caps of the pressure relief valves are removed!)

#### **3.9.1 Connect the manometer / test pressure gauge to the tube being tested**

- pay attention to ANNEX 11 - (first test of lower buoyancy tube)
- Inflate raft by means of a compressor or pressed air test cylinder until the relief valves open. Check the pressure at which the relief valve opened.
- Allow the valve to reseat and check the pressure again. The opening and closing pressures should be within the following scope:

type (colour code)	opening pressure	closing pressure
OTS 65 (yellow)	$\geq 0,230$ bar	minimum 0,200 bar
OTS 65 (red)	$\geq 0,300$ bar	minimum 0,250 bar

If the opening and closing pressures should not meet the requirements as stated above, repeat the inflation test several times. If the valve still does not work properly the valve upper part must be replaced according to item 3.9.3. The complete valve can only be replaced at the works.

#### **Checking the relief valve caps**

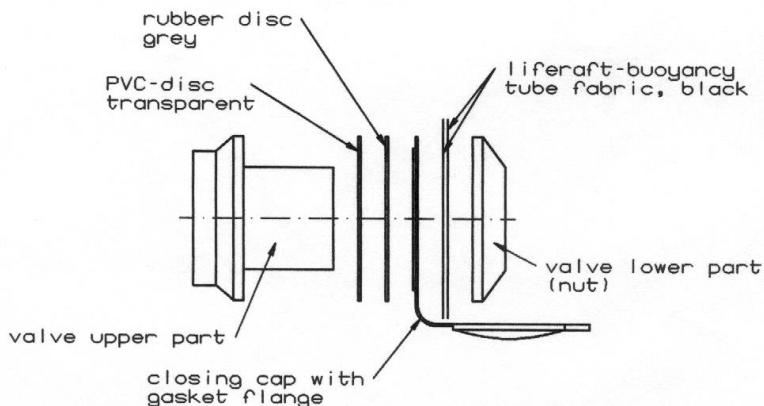
After completing the above test, adjust the pressure in each compartment to the minimum closing pressure. Close the relief valves with the cap and check for airtightness with soap suds.

If the valve screw connection should be leaking, it can be tightened using the special socket wrench (figure stamp 20, DSB-Art.-No.: 0.11.06.62.0, starting torque 35 Nm).

#### **3.9.2. Remove caps after having completed the above check**

### 3.9.3 Exchanging the valve upper part / cap

of the Thanner pressure relief valve OTS 65.



Before exchange first prepare the new parts (**pay attention to the colour code**):

- valve upper part OTS 65, colour code yellow, DSB-Art.-No.: 0.08.11.14.0
- valve upper part OTS 65, colour code red, DSB-Art.-No.: 0.08.11.15.0
- cap with sealing flange, DSB-Art.-No.: 0.08.10.08.0

The buoyancy tube is inflated. Loosen the upper part of the valve using the special socket wrench (figure stamp 20). Then deflate the buoyancy tube. When deflated unscrew the upper part from the lower part. Now undertake the exchange.

(pay attention to the succession shown in the sketch above)

**The grooves of the sealing flange must press the buoyancy tube material**

Inflate the buoyancy tube when valve upper part is manual screwed. Then tighten it with special socket wrench (figure stamp 20) with 35 Nm. A leakage and function test must be carried out after completion of the above.

### 3.10 Loading test - davit launchable liferafts

Each davit launchable raft must be loaded with 1,1x G every two years.  
Use the following cases (to fill with water) for ballast:

a) ballast case for inside:

- LR 86 L and LR 97 L - 12 and 16 persons, DSB-Art.-No.: 8.11.06.83.0
- LR 86 L and LR 97 L - 20 and 25 persons, DSB-Art.-No.: 8.11.06.80.0

b) ballast case for outside:

LR 86 L and LR 97 L - 12 persons,	DSB-Art.-No.: 8.11.06.85.0
LR 86 L and LR 97 L - 16 persons,	DSB-Art.-No.: 8.11.06.84.0
LR 86 L and LR 97 L - 20 persons,	DSB-Art.-No.: 8.11.06.81.0
LR 86 L and LR 97 L - 25 persons,	DSB-Art.-No.: 8.11.06.82.0

Fixed coupling on the case (water supply): DN 50 mm (2"), d = 66 mm

Size: G 2"

Type: Storz C-2" Al

The load test must be recorded on the raft log card and on the raft label

„Loading test carried out on....“

If the raft label is not available it can be obtained from DSB,  
DSB-Art.-No.: 0.09.53.51.0. It should be glued on the canopy on the raft being  
tested.

Loading: 75 kg/pers.

LR 97 L 12 pers. x 75 kg/pers. x 1,1 = 1000 kg

LR 97 L 16 pers. x 75 kg/pers. x 1,1 = 1325 kg

LR 97 L 20 pers. x 75 kg/pers. x 1,1 = 1650 kg

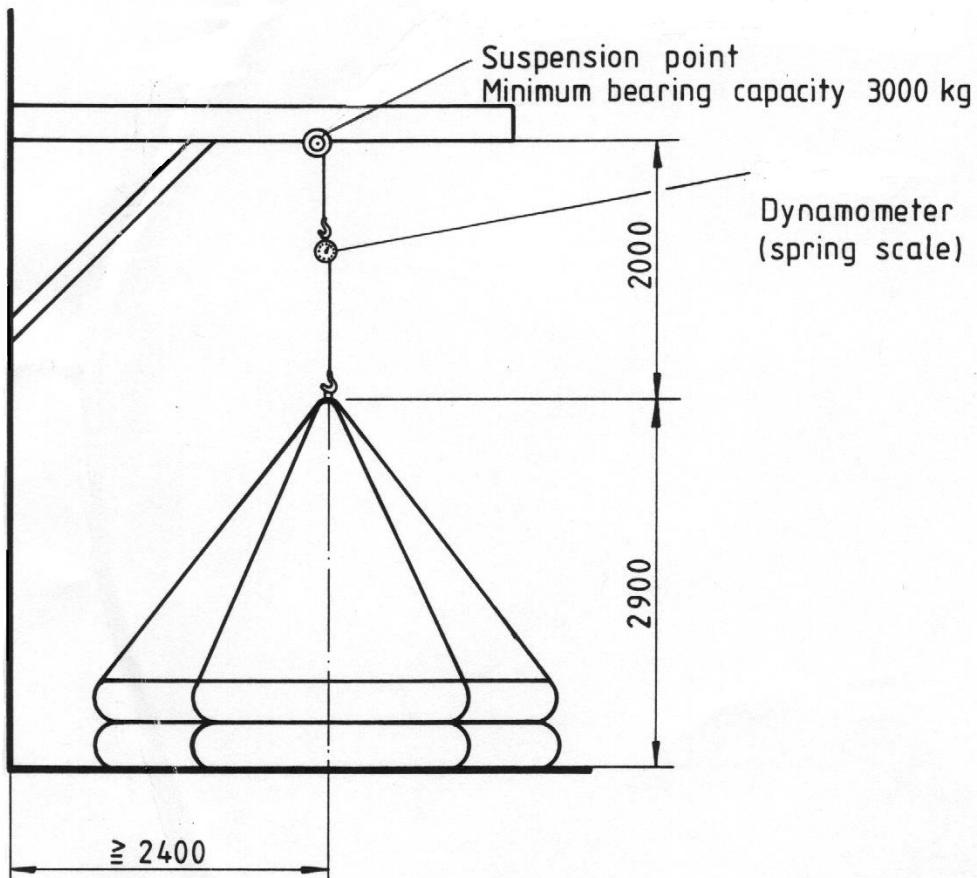
LR 97 L 25 pers. x 75 kg/pers. x 1,1 = 2075 kg

**Test after loading:**

1. Connection of canopy fabric to the upper buoyancy tube
2. Knotting of lines to the lifting patches (securing of lines inclusive)
3. Condition of lines, especially in the crossing point (lifting shackle)
4. Condition and connection of lifting patches to the buoyancy tubes and to the floor
5. Seams on both buoyancy tubes
6. Connection of the upper and lower tube
7. Connection of lower tube to raft floor.
8. Each valve and the high-pressure hoses with distributor for outer damages
9. Outer and inner lighting, their batteries and connection plugs
10. All prescribed pressure tests have to be carried out according to Annex 9, page 1

## Test arrangement for load test

### Inspection of davit launchable liferafts



**Make sure that the load ballast is equally distributed inside the raft**

### **3.11 Checking of detachable raft accessories**

All raft accessories detachable by hand, e.g. emergency pack, bellows bag with repair kit included, paddles, safety knife, rescue quoit with ring, sea anchor and painter line with bag, must be removed from the raft and inspected.

#### **3.11.1 Checking of the emergency pack**

When performing the inspection of a LR 97 (L)-liferaft, the emergency pack is to be controlled as follows:

##### **3.11.1.1 *Opening of packing case***

###### **3.11.1.1.1 *Sewn packing case***

Open the packing case at zip fastener.  
Take out the polyethylene bag with contents.

###### **3.11.1.1.2 *Welded packing case***

Open packing case by removing adhesive closing strip.  
In case of welded packing cases contents are not packed in polyethylene bags. Take contents out of case.

##### **3.11.1.2 *Visually inspect the pack valise for damage or mildew***

###### **3.11.1.2.1 *Damages - sewn packing case***

Fissures or smaller tears may be repaired by sewing but larger damages must be patched with the same or similar fabric.

###### **3.11.1.2.2 *Damages - welded packing case***

Small damages may be repaired by gluing an adhesive strip over the damage. In case of larger damages the packing case should be replaced.

###### **3.11.1.2.3 *Mildew***

A small amount of mildew is acceptable and can be removed after drying. Very mouldy packing cases are to be replaced.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual      SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3      page : Issue : 10/97	34
--	--	---	----

3.11.1.3     *Opening and control of polyethylene bag*  
(only in case of sewn acking cases)

The welded polyethylene bag must be opened by cutting close to the welded seam and visually inspected for damages.  
Damaged bags are to be exchanged. Undamaged bags having been cut are large enough to render possible a new seal by welding.

3.11.1.4     *Checking of contents of the emergency pack*

Unpack all the contents of the polyethylen bags and compare with the table of contents inside the packing case to ensure that all are present.

Generally six different groups are contained:

- |          |  |
|----------|--|
| group 1: | drinking water   |
| group 2: | emergency ration   |
| group 3: | pyrotechnics<br>(handflares, parachute distress signals, smoke signals)  |
| group 4: | signal lamps, spare batteries and bulb   |
| group 5: | First aid kit  |
| group 6: | Sundries:<br>sea anchor with line<br>bailer<br>sponge<br>buoyant knife<br>tin opener<br>signalling mirror<br>whistles<br>fishing set, complete<br>drinking vessel<br>seasickness bag<br>anti seasickness tablets<br>table of life saving signals<br>instructions on how to survive<br>instructions for immediate actions<br>thermal protective aids<br>drinking straw<br>radar reflector (if required by relevant national authority)<br>scissors (only in case of Danish rafts) |

For inspection of the 6 above mentioned groups pay attention as a matter of principle to the following:

- a) Check quantity of the contents, following the table of contents
- b) check the date in case any of the contents is life expired and must be exchanged.
- c) check that nothing is damaged, corroded, gone mouldy or rotted.

#### 3.11.1.4.1 Control of the groups

##### 3.11.1.4.1.1 Group 1: drinking water - Art.-No. 0.09.04.35.0

raft size persons	number of bags à 0,1 litre	water kg	bags +	total kg	=	total kg
6	90	9	+ 0,27	9,27	=	9,27
8	120	12	+ 0,36	12,36	=	12,36
10	150	15	+ 0,45	15,45	=	15,45
12	180	18	+ 0,54	18,54	=	18,54
15	225	22,5	+ 0,675	23,175	=	23,175
16	240	24	+ 0,72	24,72	=	24,72
20	300	30	+ 0,90	30,90	=	30,90
25	375	37,5	+ 1,125	38,625	=	38,625

##### Period of consumption - drinking water

The drinking water bags should be replaced 4 years from the date of manufacture printed on them. The expiry date should not be exceeded by more than six months.

drinking water rations - this only applies to liferafts with Danish approval

raft size persons	number of bags à 0,1 litre	water kg	bags + total kg	total = weight kg
4	61	6	+ 0,18	= 6,18
6	92	9,2	+ 0,27	= 9,47
8	123	12,3	+ 0,36	= 12,66
10	153	15,3	+ 0,45	= 15,75
12	184	18,4	+ 0,54	= 18,94
15	230	23,0	+ 0,675	= 23,675
16	245	24,50	+ 0,72	= 25,22
20	306	30,60	+ 0,90	= 31,50
25	383	38,30	+ 1,1,25	= 39,425

3.11.1.4.1.2 Group 2 - emergency ration

1/2 kg packing  
1 kg packing

Basically:

Open every cardboard box when inspecting and check the vacuum packing of the emergency ration. Packs with have lost vaccum **must** be replaced.

Time limit for consumption:

All emergency rations must be replaced after four or five years (depending on the manufacturer). The expiry date must not be exceeded by more than six months.

3.11.1.4.1.3	Group 3	- Pyrotechnics	
		handflares	order no. 0.09.04.07.0
		parachute distress	
		signals	order no. 0.09.04.06.0
		smoke signals	order no. 0.09.04.25.0

Basically:

Generally the handflares, the parachute distress signals and smoke signals must be visually checked for damage every 12 months, especially for corrosion in the watertight package or for other defects. Substandard pyrotechnics have to be replaced.

Time limit use:

Generally the pyrotechnics have to be replaced after expiration of the date printed on them. The old exchanged parachute distress signals, handflares and smoke signals must be disposed of in accordance to the national requirements.

The time limit is not allowed to be exceeded by more than 6 months.

3.11.1.4.1.4 Group 4: - signal lamp with spare battery and bulb

a) Signal lamps

Check the signal lamps every 12 months for safe working and for corrosion on the metal parts.

At the same time control the spare bulbs together with the signal lamps. Watch particularly that the thread of the spare bulbs fits into the signal lamps

b) Batteries

Generally exchange the batteries of the signal lamps (torches) and the spare batteries every 12 months. The exchanged old batteries must be disposed of in accordance to the national requirements.

3.11.1.4.1.5 Group 5: - first-aid kit

a) damaged first-aid kits must be replaced without regard to its expiry date.

b) first-aid kit for liferafts approved by SBG:  
Check or replacement of the first-aid kit must be carried out every 12 months.

c) first-aid kit for liferafts approved by all the other authorities:  
Check or replacement must be carried out according to the printed expiry date. The expiry date must not be exceeded by more than 6 months.

3.11.1.4.1.6 Group 6: - Sundries

Inspect the remaining contents of the emergency pack for quantity and quality. Exchange substandard parts.

Sundries:

sea anchor with line  
bailer (rafts more than 15 persons)  
sponge  
buoyant knife (on top of the emergency pack)  
seasickness bag  
signalling mirror  
whistle (fitted on outside of bag)  
fishing set  
drinking vessel  
tin opener  
anti-seasickness tablets - if existing -  
(check date of expiry - must not exceeded by more than six months)  
table of life saving signals, instructions on how to survive  
and instructions for immediate actions  
emergency bag / thermal protective aids  
drinking straw  
scissors (only Danish rafts)  
radar reflector (if required by relevant national authority)

3.11.1.5 Packing of the emergency pack

3.11.1.5.1 Emergency pack bag, sewn

Step 1:

every part of the contents has to be checked so that no sharp edge of tins or other cornered or pointed object protrude through the package, to avoid damage to the covering polyethylene bag.

Step 2:

after inspection the fundamental packings have to be completed - as described in table on the following page - and to be packed again. Take care of a proper closure and the presence of the opening notch on the polybags.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3 page : Issue : 10/97	40
--	---	------------------------------------	----

to 3.11.1.5.1

### Additional fundamental and/or collective packing

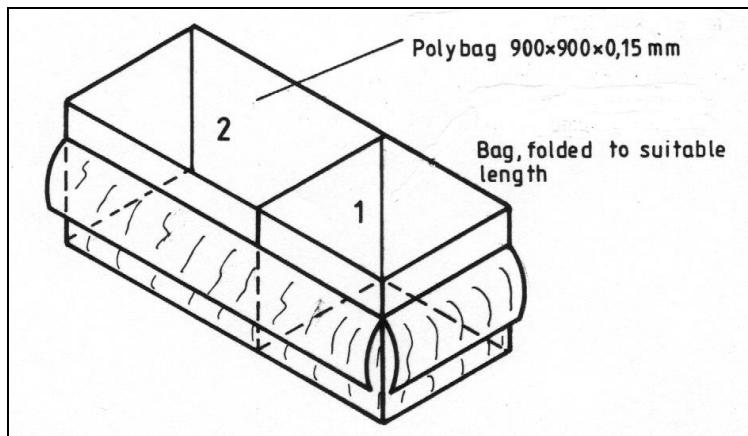
serial no.	Article	additionally packed in: (dimensions in mm)	remarks
1	parachute distress signal handflare	PB 85 x 350 x 0,1	
2		PB 70 x 250 x 0,1	
3	smoke signal	PB 310 x 200 x 0,1	
4	signal lamp / torch	PB 130 x 300 x 0,05	) together in )
5	torch bulb (spare)	Sch 50 x 300 x 3	) polybag
6	torch batteries(spare) (2 pcs together)	PB 100 x 180 x 0,1	) 110 x 400 x 0,1 )
7	signalling mirror	PB 110 x 140 x 0,1	
8	fishing set	PB 100 x 200 x 0,1	
9	emergency ration	-	in original cardboard box
10	seasickness bag (6 to 25 pcs )	PB 150 x 220 x 0,5	2 pieces
11	first-aid kit	PB 305 x 450 x 0,15	
12	drinking water bag à 0,1 litre (15 pcs together)	PB 200 x 500 x 0,1	
13	tin opener (3 pcs. together)	Sch 130 x 180 x 0,3	wrapped up
14	anti-seasickness-tabl.(36 to 150 pcs ) in holder with screw on lid	PB 110 x 150 x 0,1	depending on type of raft
15	Table of life saving signals and instructions	PB 200 x 300 x 0,1	) together ) ) ) in original PE-bag )
16	thermal protect.aids	-	
17	radar reflector	-	in original PE-bag

explanation of symbols:      PB = Flat-floored polyethylene bag  
                                   SCH = Smooth foam

to

3.11.1.5.1 Step 3:

Lay in the polyethylene bag (dimensions 900 x 900 x 0,15 mm)



Pack up drinking water, emergency rations, first aid kit, pyrotechnics and all the other items (except signal whistle) according to the packing scheme on next pages.

Step 4:

Bring together the edges of the polybag, shut them with the fingers and suck off the air content of the bag by means of a vacuum cleaner. Then weld the bag together approx. 25 mm from the edges.

Step 5:

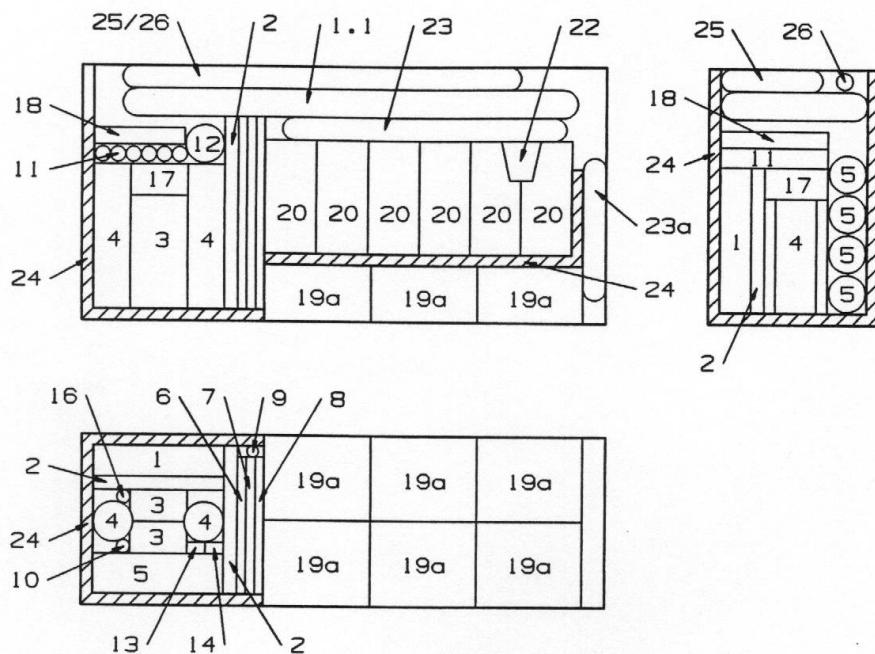
Cut in a ripping slot of about 20 mm in form of a „V“ in the middle of the bag.

Step 6:

Fold in free parts and fix them with self-sealing tape.

**Packing scheme - SOLAS A Pack** (sketches not according to scale)

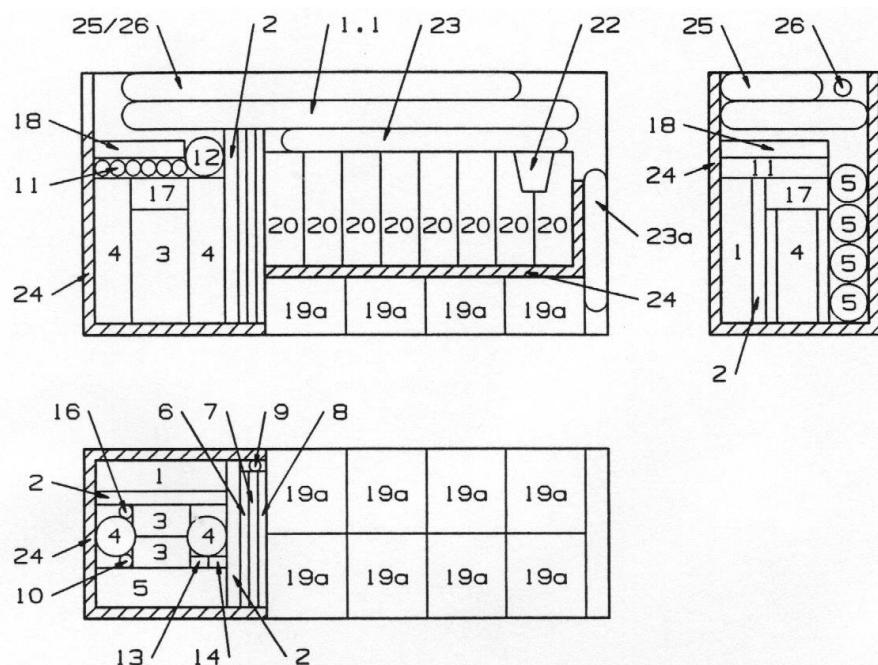
**LR 97 for 6 persons - with 1/2 kg food ration**



- |     |                                |     |                          |
|-----|--------------------------------|-----|--------------------------|
| 1   | First aid kit                  | 15  | not applicable           |
| 1.1 | First aid equipment (only NL)  | 16  | Anti-seasickness tablets |
| 2   | Thermal protective aids        | 17  | Set of fishing tackle    |
| 3   | Sponge                         | 18  | Seasickness bag          |
| 4   | Buoyant smoke signals          | 19  | not applicable           |
| 5   | Rocket parachute flares        | 19a | Food ration (1/2 kg)     |
| 6   | Table of life saving signals   | 20  | Fresh water              |
| 7   | Instructions on how to survive | 21  | not applicable           |
| 8   | Daylight signalling mirror     | 22  | Drinking vessel          |
| 9   | Piercing straw                 | 23  | Sea anchor               |
| 10  | Rain water collecting bag      | 23a | Bag for sea anchor line  |
| 11  | Handflares                     | 24  | Foam rubber padding      |
| 12  | Torch (signalling)             | 25  | Radar reflector          |
| 13  | Battery and bulb (spare)       | 26  | Mast for radar reflector |
| 14  | Tin opener                     |     |                          |

**Packing scheme - SOLAS A Pack** (sketches not according to scale)

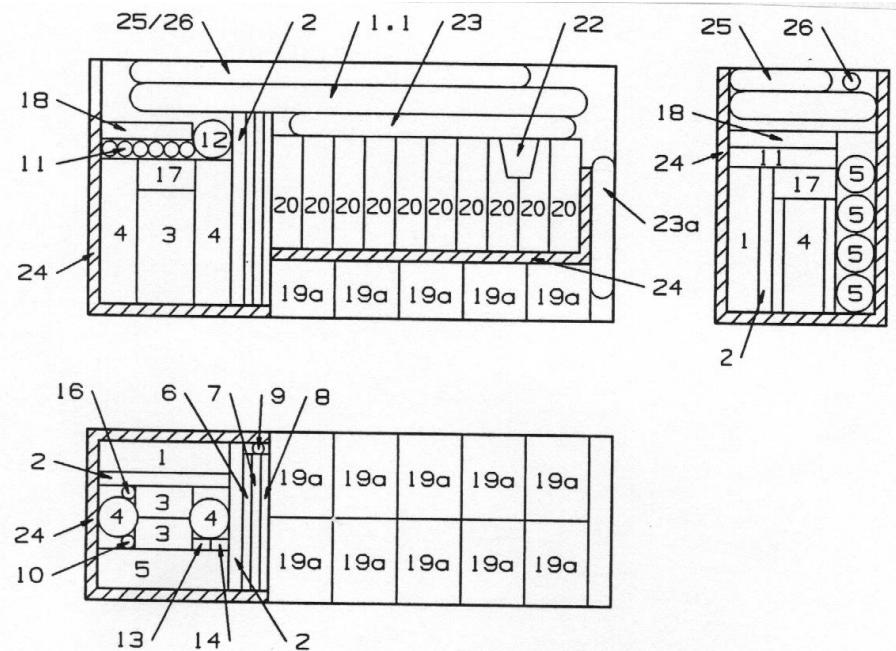
**LR 97 for 8 persons - with 1/2 kg food ration**



- |     |                                |     |                          |
|-----|--------------------------------|-----|--------------------------|
| 1   | First aid kit                  | 15  | not applicable           |
| 1.1 | First aid equipment (only NL)  | 16  | Anti-seasickness tablets |
| 2   | Thermal protective aids        | 17  | Set of fishing tackle    |
| 3   | Sponge                         | 18  | Seasickness bag          |
| 4   | Buoyant smoke signals          | 19  | not applicable           |
| 5   | Rocket parachute flares        | 19a | Food ration (1/2 kg)     |
| 6   | Table of life saving signals   | 20  | Fresh water              |
| 7   | Instructions on how to survive | 21  | not applicable           |
| 8   | Daylight signalling mirror     | 22  | Drinking vessel          |
| 9   | Piercing straw                 | 23  | Sea anchor               |
| 10  | Rain water collecting bag      | 23a | Bag for sea anchor line  |
| 11  | Handflares                     | 24  | Foam rubber padding      |
| 12  | Torch (signalling)             | 25  | Radar reflector          |
| 13  | Battery and bulb(spare)        | 26  | Mast for radar reflector |
| 14  | Tin opener                     |     |                          |

**Packing scheme - SOLAS A Pack** (sketches not according to scale)

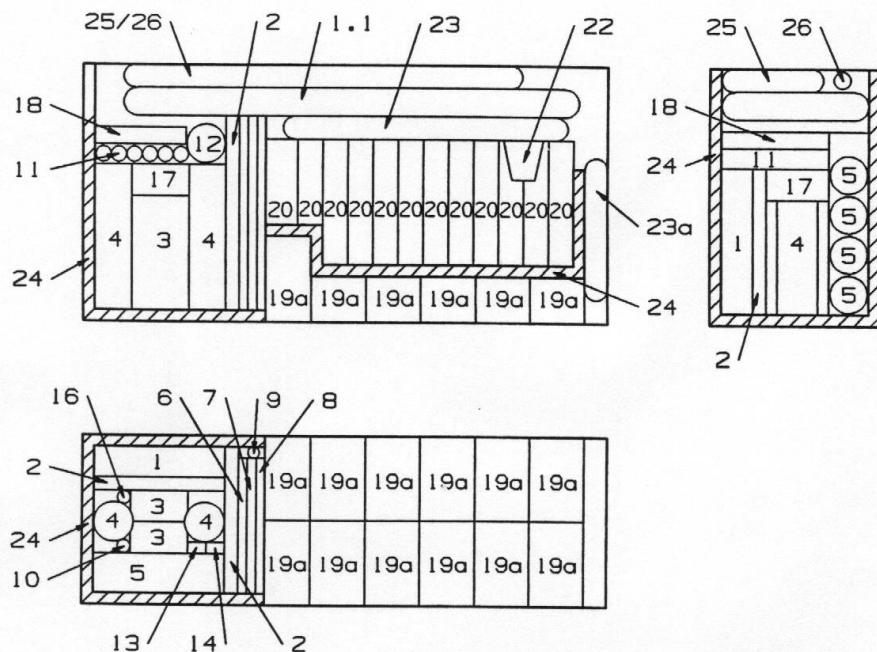
**LR 97 for 10 persons - with 1/2 kg food ration**



1	First aid kit	15	not applicable
1.1	First aid equipment (only NL)	16	Anti-seasickness tablets
2	Thermal protective aids	17	Set of fishing tackle
3	Sponge	18	Seasickness bag
4	Buoyant smoke signals	19	not applicable
5	Rocket parachute flares	19a	Food ration (1/2 kg)
6	Table of life saving signals	20	Fresh water
7	Instructions on how to survive	21	not applicable
8	Daylight signalling mirror	22	Drinking vessel
9	Piercing straw	23	Sea anchor
10	Rain water collecting bag	23a	Bag for sea anchor line
11	Handflares	24	Foam rubber padding
12	Torch (signalling)	25	Radar reflector
13	Battery and bulb (spare)	26	Mast for radar reflector
14	Tin opener		

**Packing scheme - SOLAS A Pack** (sketches not according to scale)

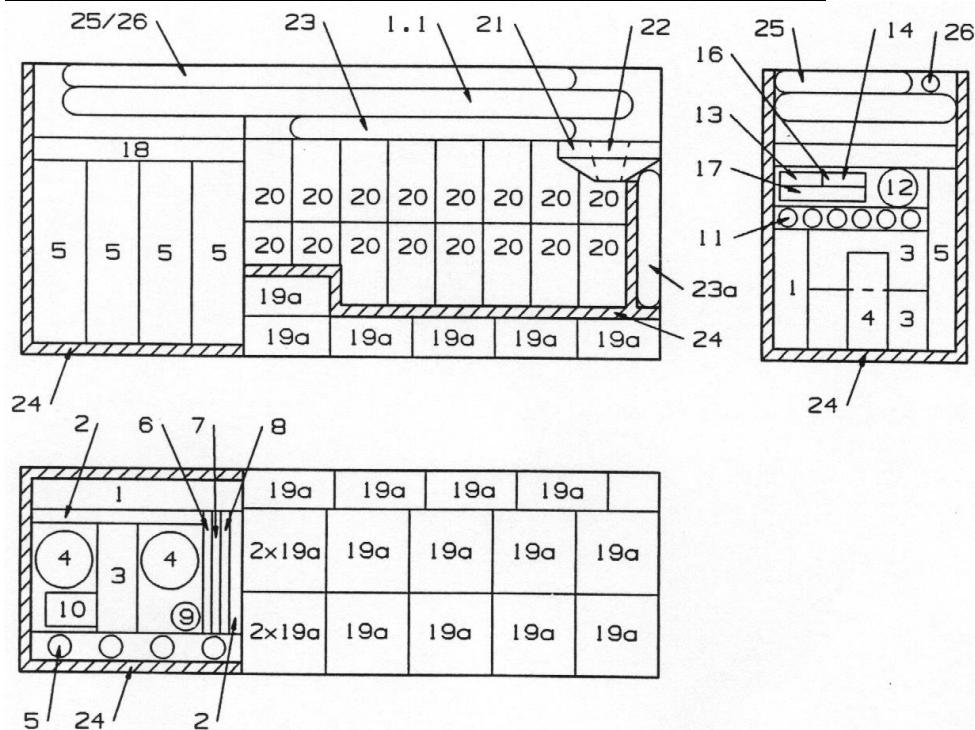
**LR 97 for 12 persons and  
LR 97 L for 12 persons - with 1/2 kg food ration**



1	First aid kit	15	not applicable
1.1	First aid equipment (only NL)	16	Anti-seasickness tablets
2	Thermal protective aids	17	Set of fishing tackle
3	Sponge	18	Seasickness bag
4	Buoyant smoke signals	19	not applicable
5	Rocket parachute flares	19a	Food ration (1/2 kg)
6	Table of life saving signals	20	Fresh water
7	Instructions on how to survive	21	not applicable
8	Daylight signalling mirror	22	Drinking vessel
9	Piercing straw	23	Sea anchor
10	Rain water collecting bag	23a	Bag for sea anchor line
11	Handflares	24	Foam rubber padding
12	Torch (signalling)	25	Radar reflector
13	Battery and bulb (spare)	26	Mast for radar reflector
14	Tin opener		

**Packing scheme - SOLAS A Pack** (sketches not according to scale)

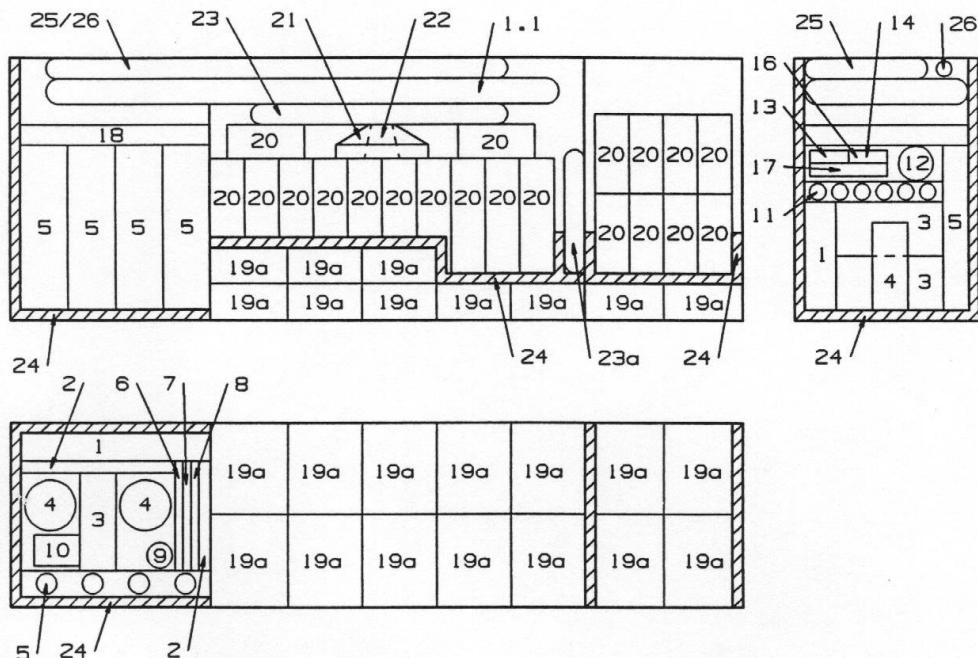
**LR 97 for 15 and 16 persons and  
LR 97 L for 15 and 16 persons - with ½ kg food ration**



- |     |                                |     |                          |
|-----|--------------------------------|-----|--------------------------|
| 1   | First aid kit                  | 15  | not applicable           |
| 1.1 | First aid equipment (only NL)  | 16  | Anti-seasickness tablets |
| 2   | Thermal protective aids        | 17  | Set of fishing tackle    |
| 3   | Sponge                         | 18  | Seasickness bag          |
| 4   | Buoyant smoke signals          | 19  | not applicable           |
| 5   | Rocket parachute flares        | 19a | Food ration (1/2 kg)     |
| 6   | Table of life saving signals   | 20  | Fresh water              |
| 7   | Instructions on how to survive | 21  | Bailer                   |
| 8   | Daylight signalling mirror     | 22  | Drinking vessel          |
| 9   | Piercing straw                 | 23  | Sea anchor               |
| 10  | Rain water collecting bag      | 23a | Bag for sea anchor line  |
| 11  | Handflares                     | 24  | Foam rubber padding      |
| 12  | Torch (signalling)             | 25  | Radar reflector          |
| 13  | Battery and bulb(spare)        | 26  | Mast for radar reflector |
| 14  | Tin opener                     |     |                          |

## **Packing scheme - SOLAS A Pack** (sketches not according to scale)

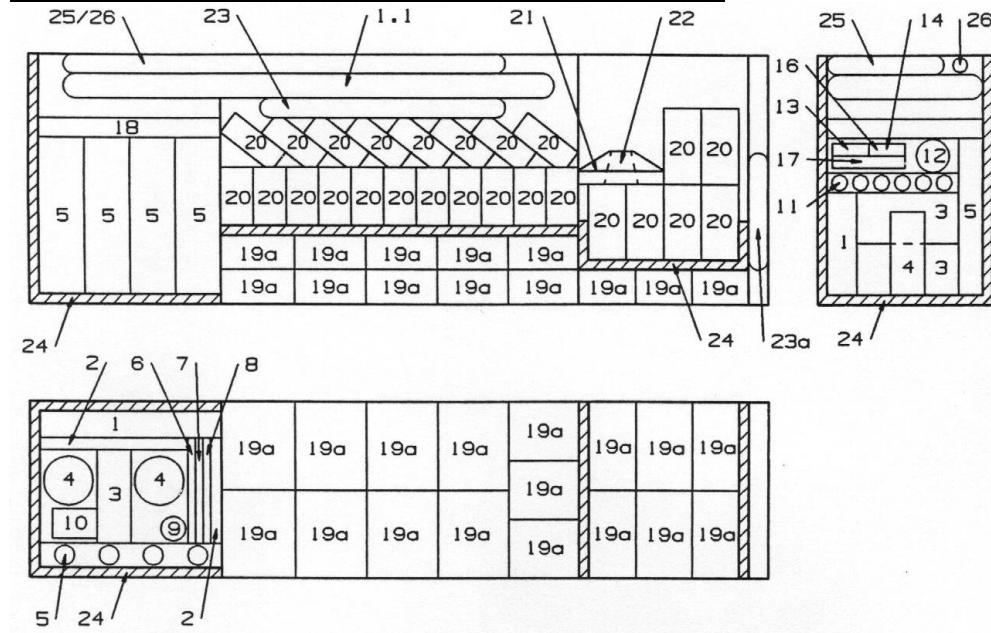
LR 97 for 20 persons and  
LR 97 L for 20 persons - with ½ kg food ration



- |     |                                |     |                          |
|-----|--------------------------------|-----|--------------------------|
| 1   | First aid kit                  |     |                          |
| 1.1 | First aid equipment (only NL)  | 15  | not applicable           |
| 2   | Thermal protective aids        | 16  | Anti-seasickness tablets |
| 3   | Sponge                         | 17  | Set of fishing tackle    |
| 4   | Buoyant smoke signals          | 18  | Seasickness bag          |
| 5   | Rocket parachute flares        | 19  | not applicable           |
| 6   | Table of life saving signals   | 19a | Food ration (1/2 kg)     |
| 7   | Instructions on how to survive | 20  | Fresh water              |
| 8   | Daylight signalling mirror     | 21  | Bailer                   |
| 9   | Piercing straw                 | 22  | Drinking vessel          |
| 10  | Rain water collecting bag      | 23  | Sea anchor               |
| 11  | Handflares                     | 23a | Bag for sea anchor line  |
| 12  | Torch (signalling)             | 24  | Foam rubber padding      |
| 13  | Battery and bulb (spare)       | 25  | Radar reflector          |
| 14  | Tin opener                     | 26  | Mast for radar reflector |

**Packing scheme - SOLAS A Pack** (sketches not according to scale)

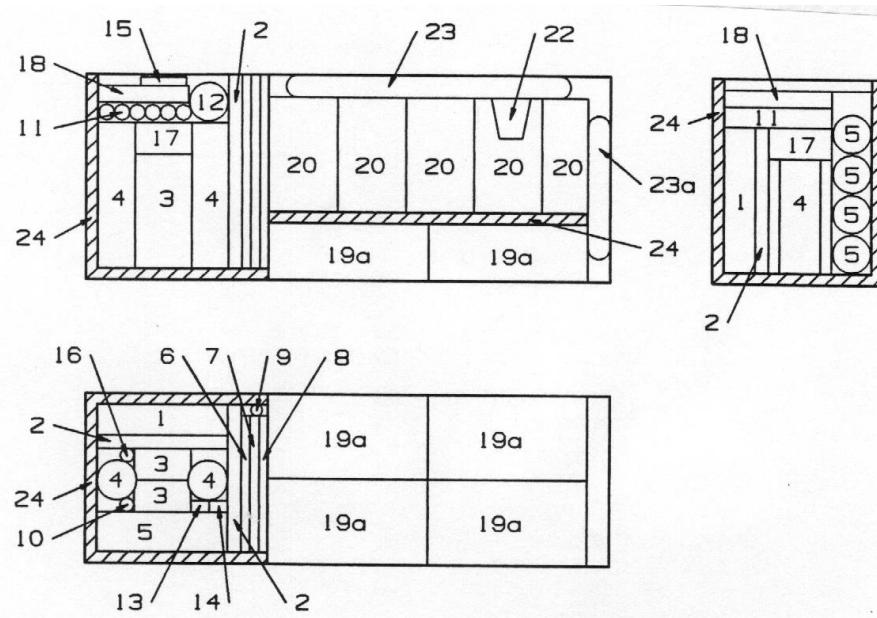
**LR 97 for 25 persons and  
LR 97 L for 25 persons - with 1/2 kg food ration**



- |     |                                |     |                          |
|-----|--------------------------------|-----|--------------------------|
| 1   | First aid kit                  | 15  | not applicable           |
| 1.1 | First aid equipment (only NL)  | 16  | Anti-seasickness tablets |
| 2   | Thermal protective aids        | 17  | Set of fishing tackle    |
| 3   | Sponge                         | 18  | Seasickness bag          |
| 4   | Buoyant smoke signals          | 19  | not applicable           |
| 5   | Rocket parachute flares        | 19a | Food ration (1/2 kg)     |
| 6   | Table of life saving signals   | 19a | Fresh water              |
| 7   | Instructions on how to survive | 20  | Bailer                   |
| 8   | Daylight signalling mirror     | 21  | Drinking vessel          |
| 9   | Piercing straw                 | 22  | Sea anchor               |
| 10  | Rain water collecting bag      | 23  | Bag for sea anchor line  |
| 11  | Handflares                     | 23a | Foam rubber padding      |
| 12  | Torch (signalling)             | 24  | Radar reflector          |
| 13  | Battery and bulb (spare)       | 25  | Mast for radar reflector |
| 14  | Tin opener                     | 26  |                          |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

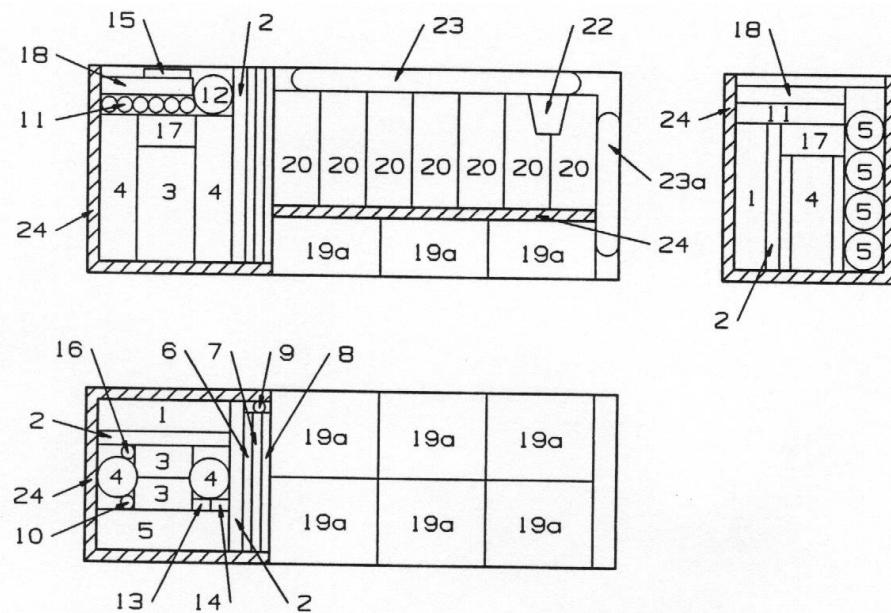
**LR 97 for 4 persons - DK - with 1/2 kg food ration**



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | not applicable           |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

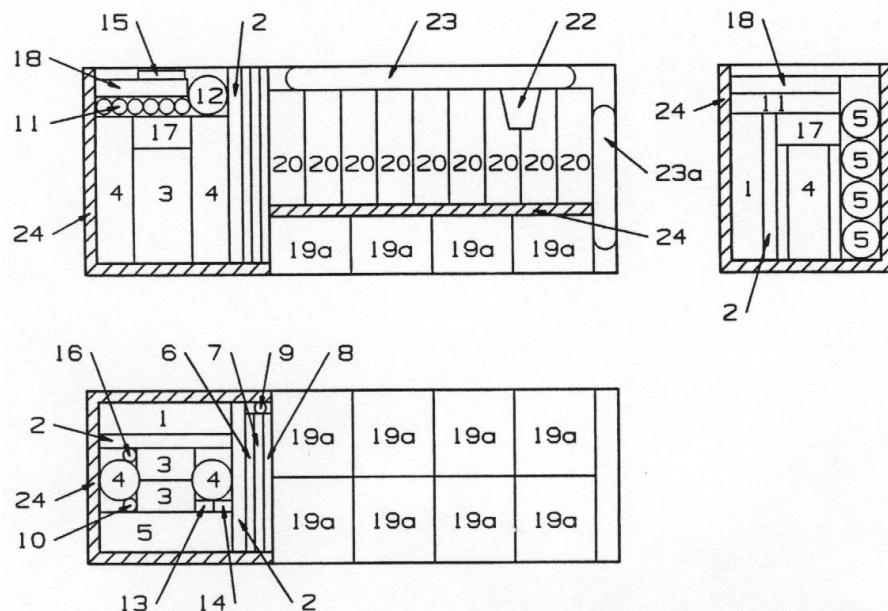
**LR 97 for 6 persons - DK - with 1/2 kg food ration**



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | not applicable           |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

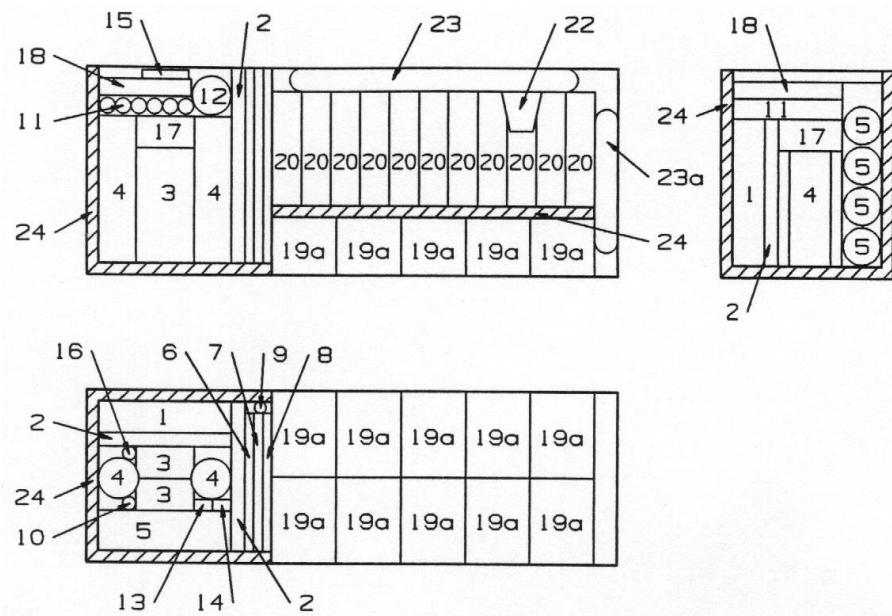
**LR 97 for 8 persons - DK - with 1/2 kg food ration**



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | not applicable           |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

**LR 97 for 10 persons - DK - with 1/2 kg food ration**

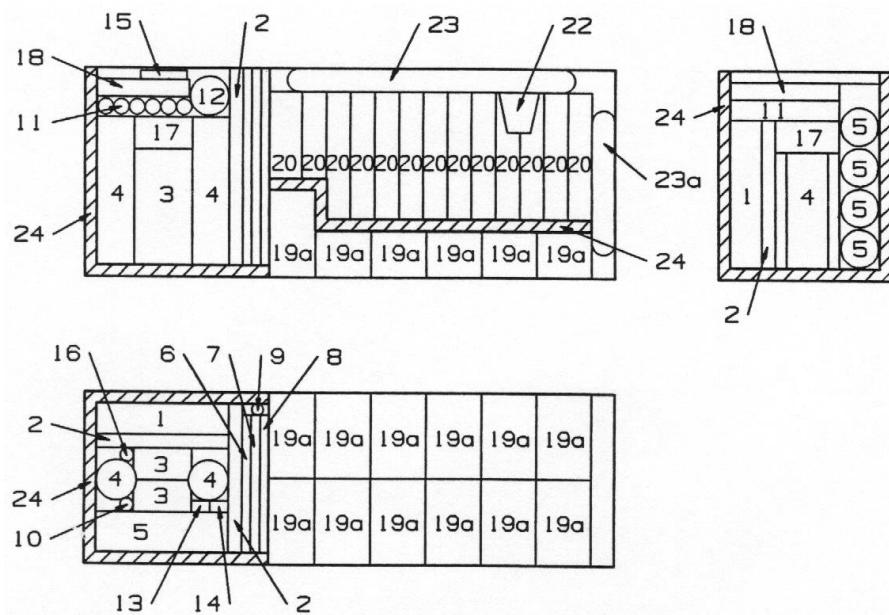


- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | not applicable           |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

**LR 97 for 12 persons - DK**

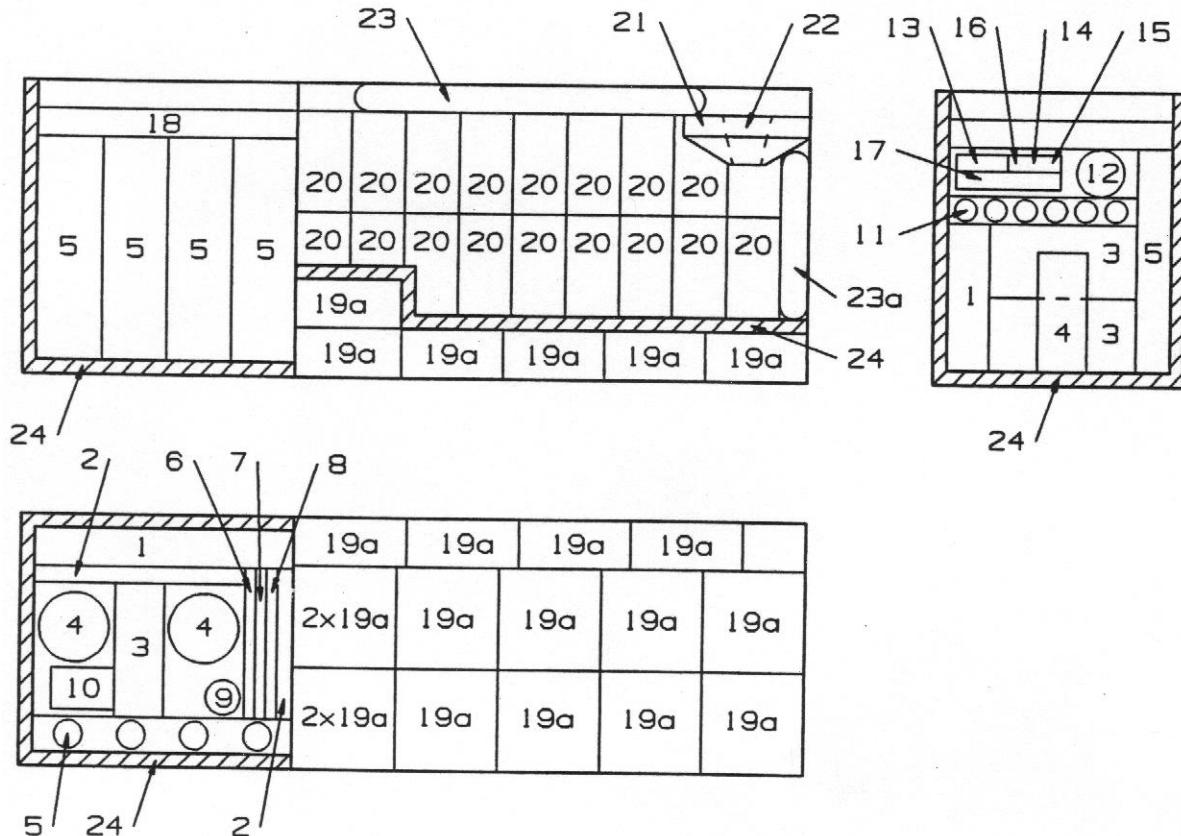
**LR 97 L for 12 persons - DK - with 1/2 kg food ration**



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | not applicable           |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

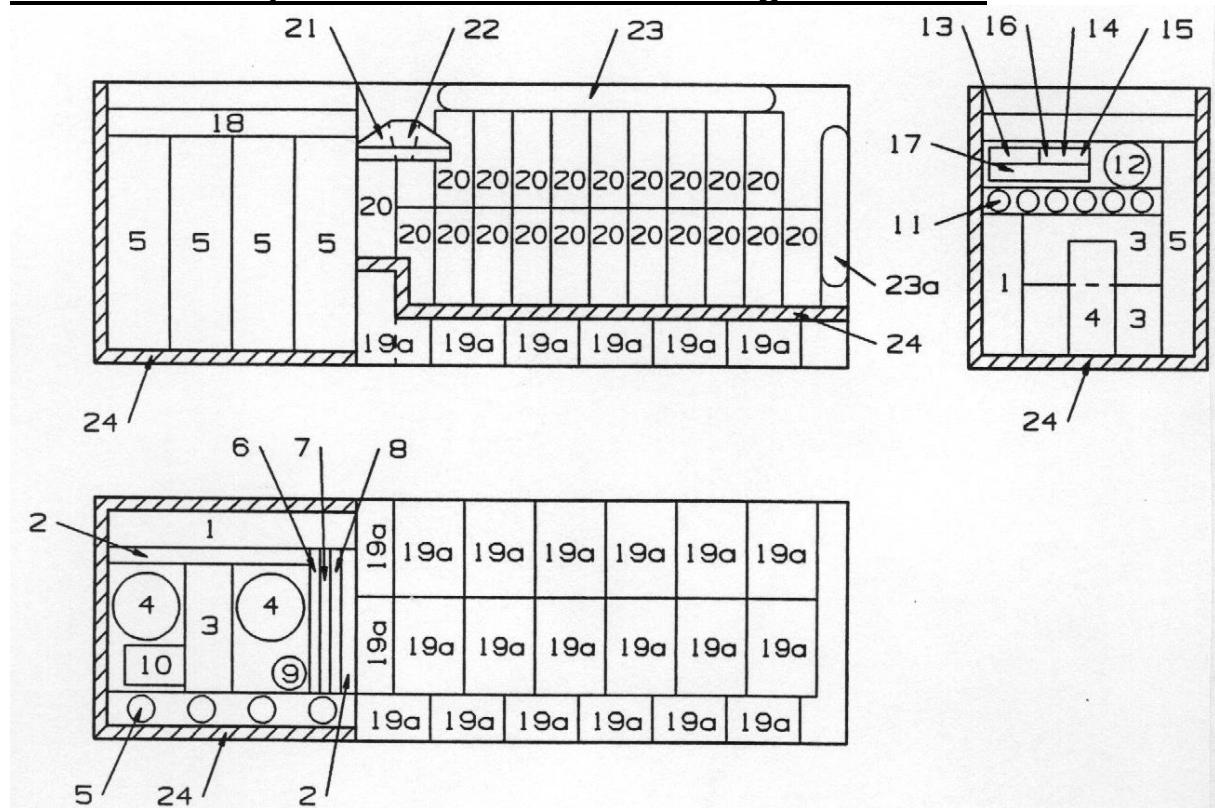
LR 97 for 16 persons - DK and  
LR 97 L for 16 persons - DK - with  $\frac{1}{2}$  kg food ration



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | Bailer                   |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

LR 97 for 20 persons - DK and  
LR 97 L for 20 persons - DK - with  $\frac{1}{2}$  kg food ration

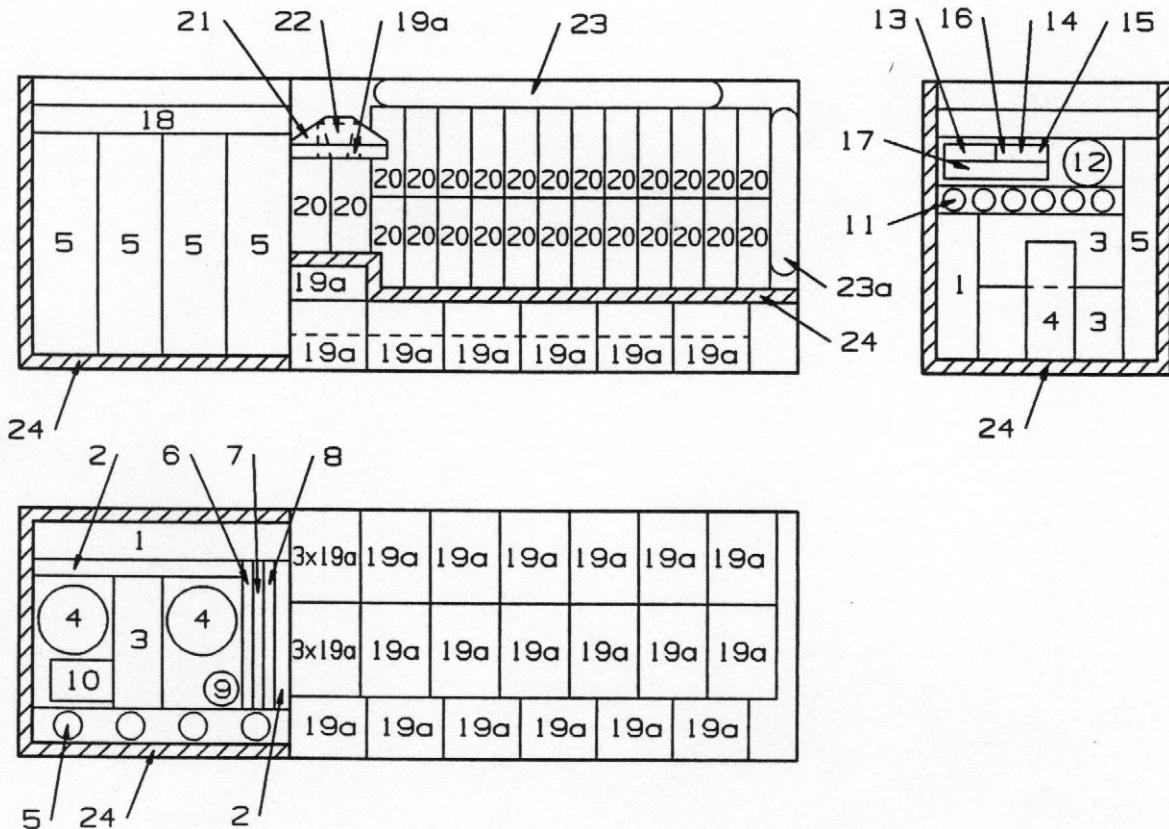


- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | Bailer                   |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

## Packing scheme - SOLAS A Pack - DK

(sketches not according to scale)

**LR 97 for 25 persons - DK and**  
**LR 97 L for 25 persons - DK - with ½ kg food ration**

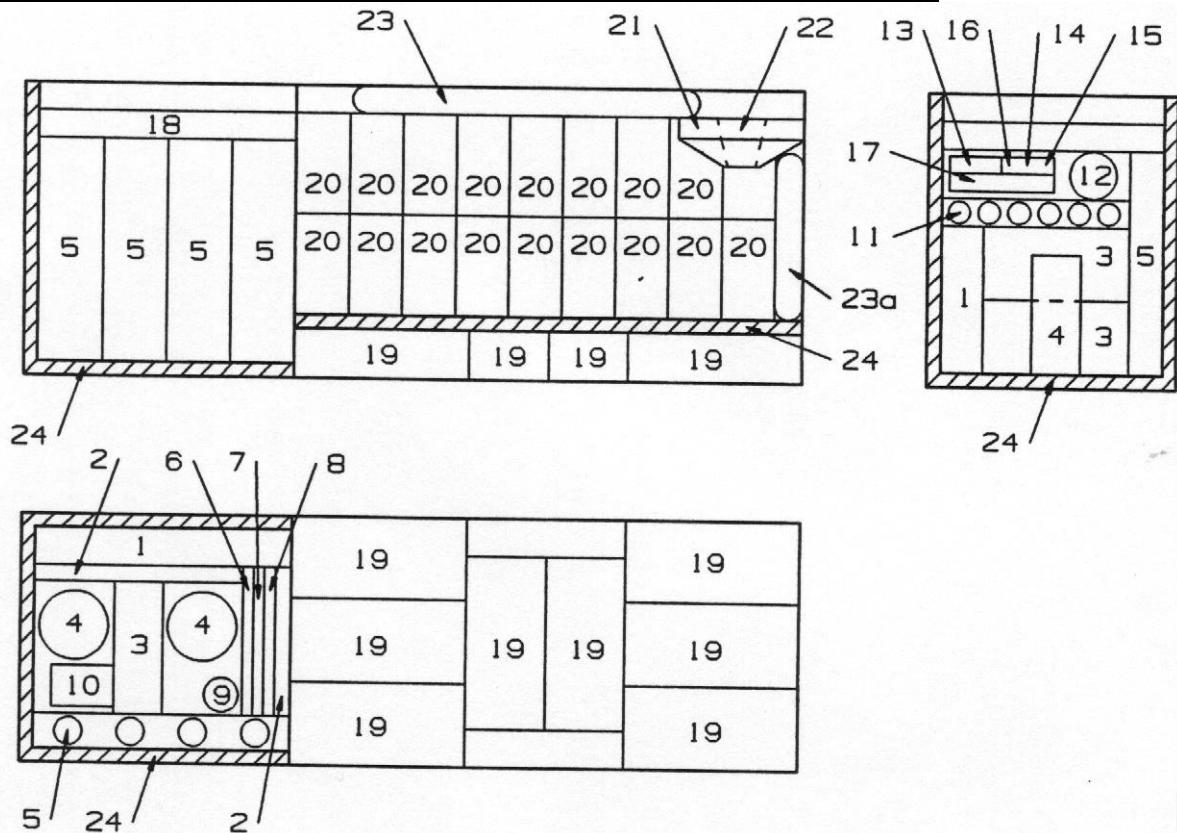


- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | not applicable           |
| 8  | Daylight signalling mirror     | 19a | Food ration (1/2 kg)     |
| 9  | Piercing straw                 | 20  | Fresh water              |
| 10 | Rain water collecting bag      | 21  | Bailer                   |
| 11 | Handflares                     | 22  | Drinking vessel          |
| 12 | Torch (signalling)             | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

## Packing scheme - SOLAS A Pack - DK

(sketches not according to scale)

LR 97 for 16 persons - DK and  
LR 97 L for 16 persons - DK - with 1 kg food ration

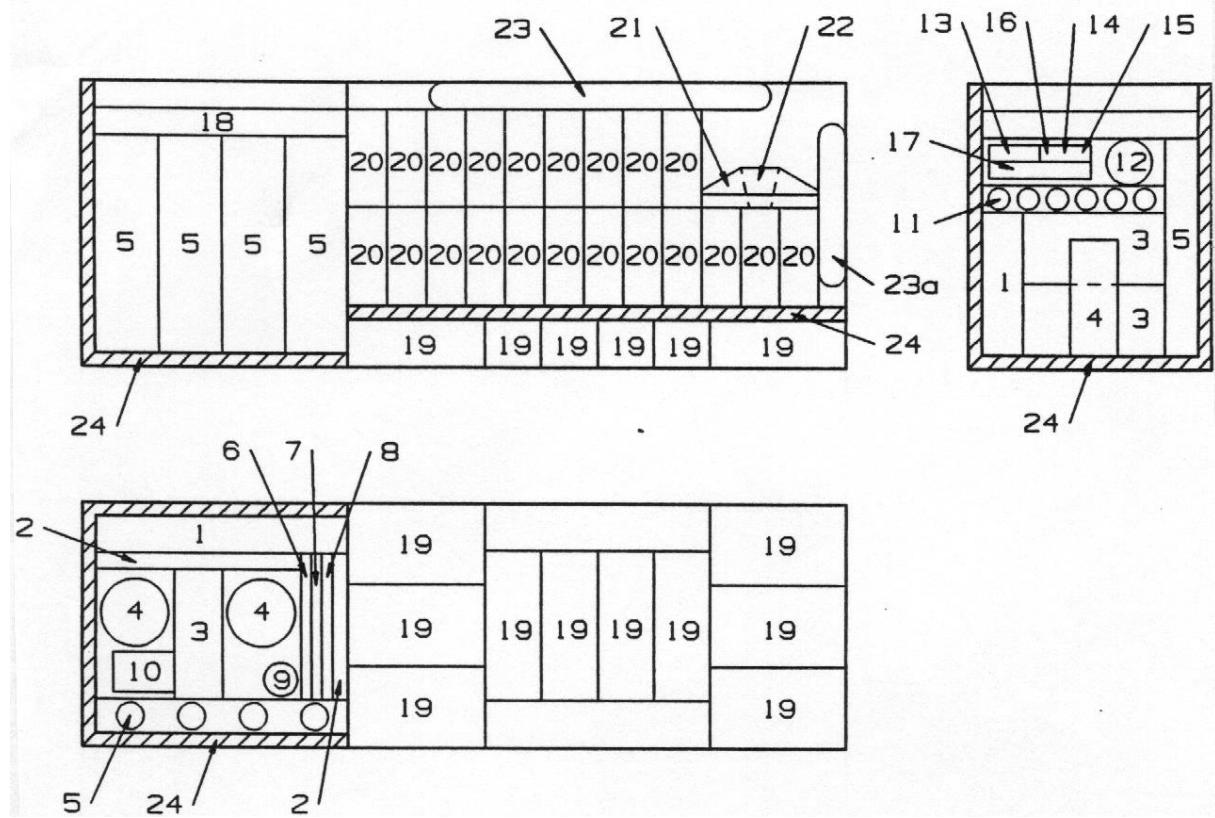


- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | Food ration (1 kg)       |
| 8  | Daylight signalling mirror     | 20  | Fresh water              |
| 9  | Piercing straw                 | 21  | Bailer                   |
| 10 | Rain water collecting bag      | 22  | Drinking vessel          |
| 11 | Handflares                     | 23  | Sea anchor               |
| 12 | Torch (signalling)             | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

## Packing scheme - SOLAS A Pack - DK

(sketches not according to scale)

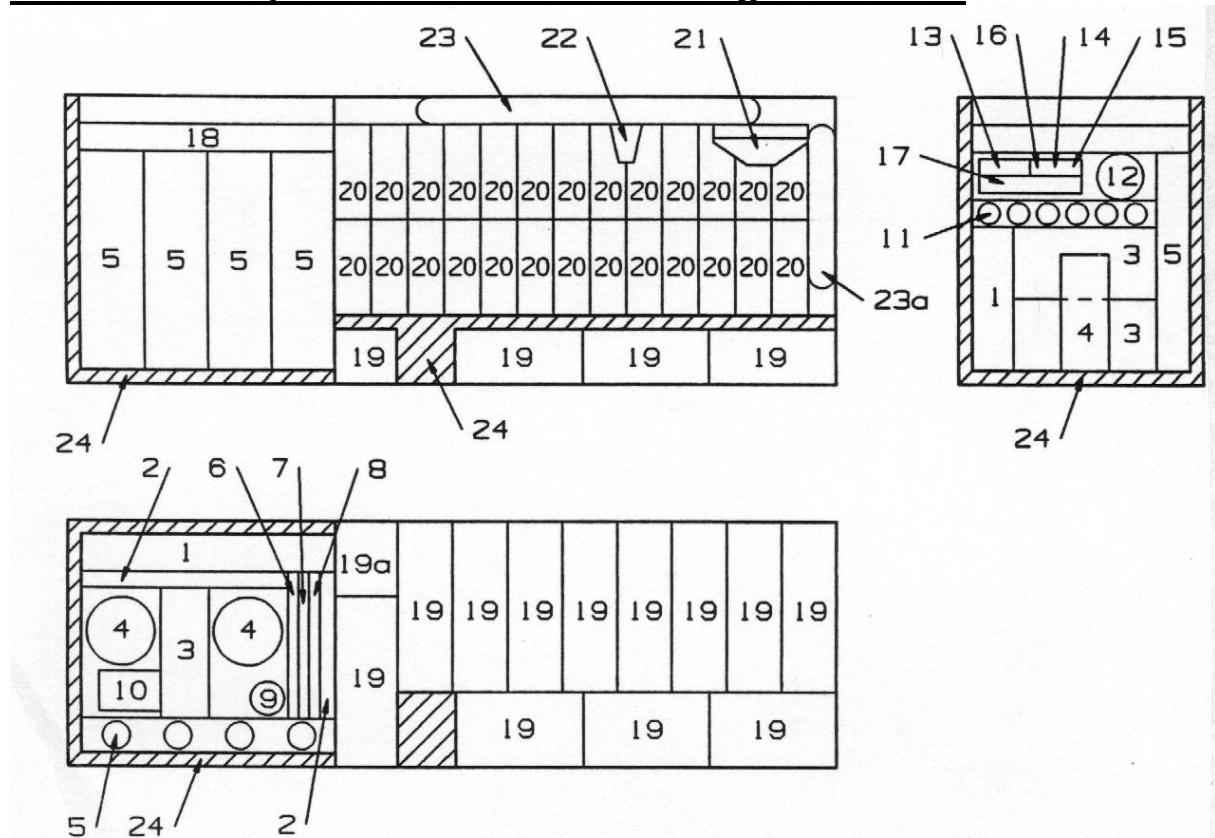
LR 97 for 20 persons - DK and  
LR 97 L for 20 persons - DK - with 1 kg food ration



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | Food ration (1 kg)       |
| 8  | Daylight signalling mirror     | 20  | Fresh water              |
| 9  | Piercing straw                 | 21  | Bailer                   |
| 10 | Rain water collecting bag      | 22  | Drinking vessel          |
| 11 | Handflares                     | 23  | Sea anchor               |
| 12 | Torch (signalling)             | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

**Packing scheme - SOLAS A Pack - DK** (sketches not according to scale)

**LR 97 for 25 persons - DK and**  
**LR 97 L for 25 persons - DK - with 1 kg food ration**



- |    |                                |     |                          |
|----|--------------------------------|-----|--------------------------|
| 1  | First aid kit                  | 13  | Battery and bulb (spare) |
| 2  | Thermal protective aids        | 14  | Tin opener               |
| 3  | Sponge                         | 15  | Scissors                 |
| 4  | Buoyant smoke signals          | 16  | Anti-seasickness tablets |
| 5  | Rocket parachute flares        | 17  | Set of fishing tackle    |
| 6  | Table of life saving signals   | 18  | Seasickness bag          |
| 7  | Instructions on how to survive | 19  | Food ration (1 kg)       |
| 8  | Daylight signalling mirror     | 20  | Fresh water              |
| 9  | Piercing straw                 | 21  | Bailer                   |
| 10 | Rain water collecting bag      | 22  | Drinking vessel          |
| 11 | Handflares                     | 23  | Sea anchor               |
|    |                                | 23a | Bag for sea anchor line  |
|    |                                | 24  | Foam rubber padding      |

3.11.1.5.2 Welded emergency pack bag  
- emergency equipment for Danish rafts -

Prior to packing proceed according to item 3.11.1.5.1  
step 1 and 2.

Step 3:

Drinking water, food rations, first aid kit, pyrotechnic and  
all other parts should be packed according to packing  
scheme illustrated on the preceding pages.

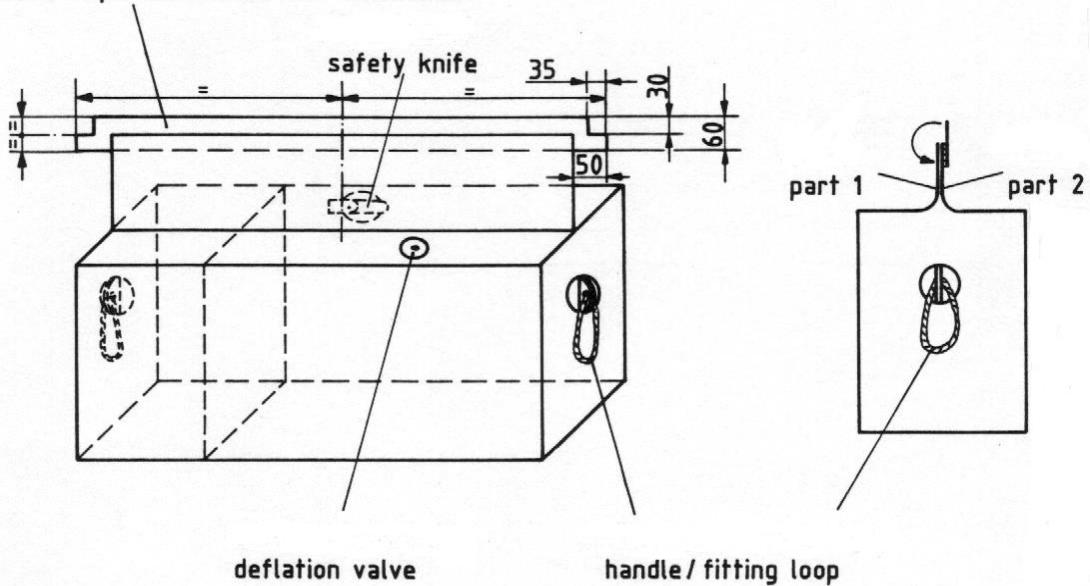
DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3 page : Issue : 10/97	61
--	--	---------------------------------------	----

Step 4:

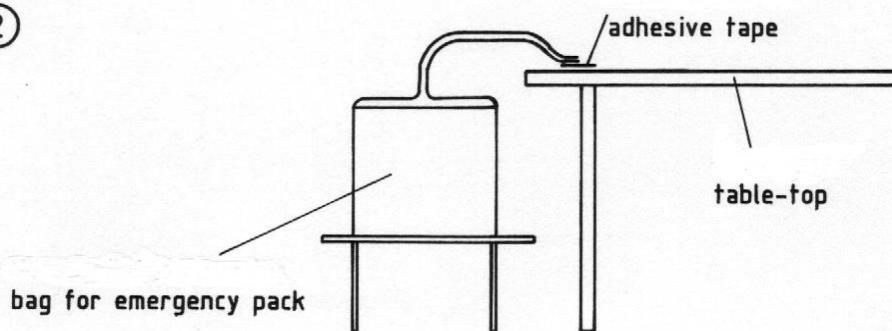
Closing the welded emergency pack bag

①

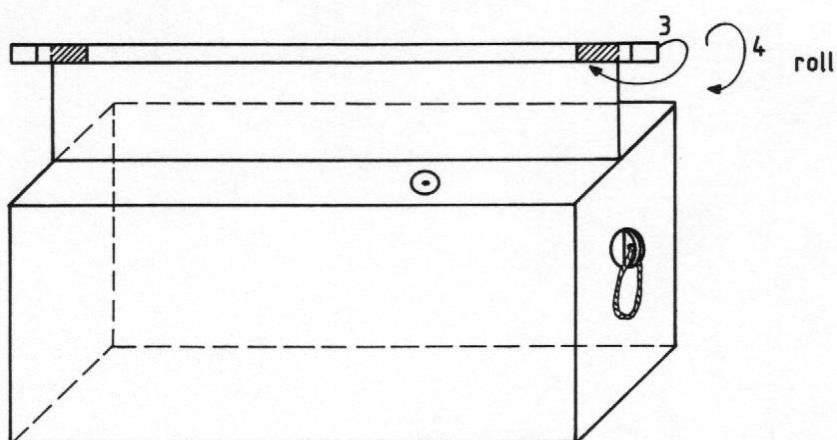
adhesive tape DSB-order-no. 0.09.03.11.0



②



③



1. Unroll new closing strip from the roll  
(total length = length of emergency pack bag + 100 mm)
2. Place adhesive strip - sticky side showing upwards -  
on a table (max. 10 cm away from the edge).  
Fix the strip to the table top in some places with double sided  
adhesive tape. (Sketch 2).
3. Place the packed emergency pack bag in a lower position  
in front of the table according to sketch 2.
4. Lay together the extended cover parts (1 and 2) of the bag  
so that the outer edges are more or less even.
5. Glue part 2 up to half - and midmost - of the strip.
6. Cut closing strip on both ends according to sketch 1  
30 x 35 mm.
7. Bend the 2nd overlapping half of the strip and glue it  
on part 1.
8. Bend the lashes overlapping on the edges and glue them  
according to sketch 3.

When gluing the strip make sure that it is glued smooth  
and without wrinkles and that it is pressed firmly.

9. Suck off the bag on the deflation valve until the fabric  
shows sharp wrinkles.
10. Offer sucking off close the valve and roll up the  
cover parts 1 and 2 (sketch 3).
11. Knot the cord of the signal whistle to the slider of  
the zip-fastener.
12. Place the signal whistle on the rolled up cover parts and  
close the bag with the zip-fastener.

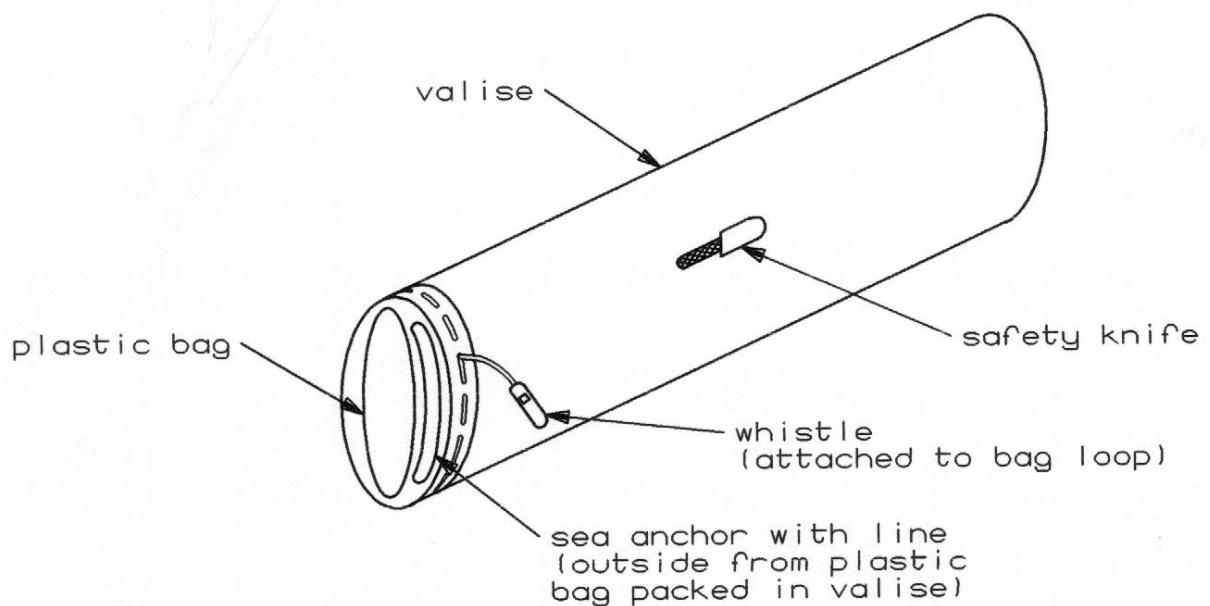
If after some time the bag does not show any sharp wrinkles  
it is no longer watertight.

To determine if a bag is leaking it can be inflated through the  
deflation valve. Use soap suds to establish the location of the leaks.  
Tiny leaks on the surface can be sealed by covering them with  
adhesive strip.

In case of leakages on the closing seam the bag should be  
re-sealed according to above points 1 to 8.

### 3.11.1.5.3 Emergency pack SOLAS B PACK

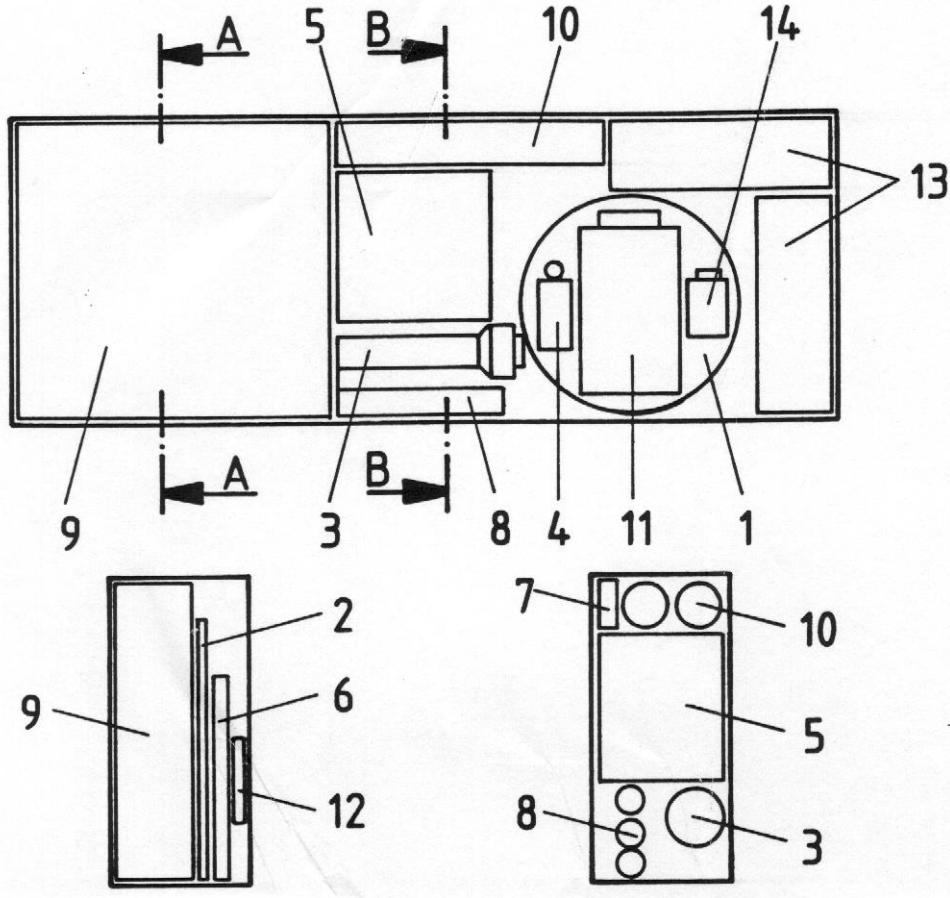
- Valise sewed -



## Packing scheme - SOLAS B PACK -

(sketches not according to scale)

### LR 97 and LR 97 L for 6 to 25 persons



- 1 Bailer \*
- 2 Instructions on how to survive/  
table of life saving signals
- 3 Torch (signalling)
- 4 Battery and bulb (spare)
- 5 First aid kit
- 6 Seasickness bag
- 7 Rain water collecting bag

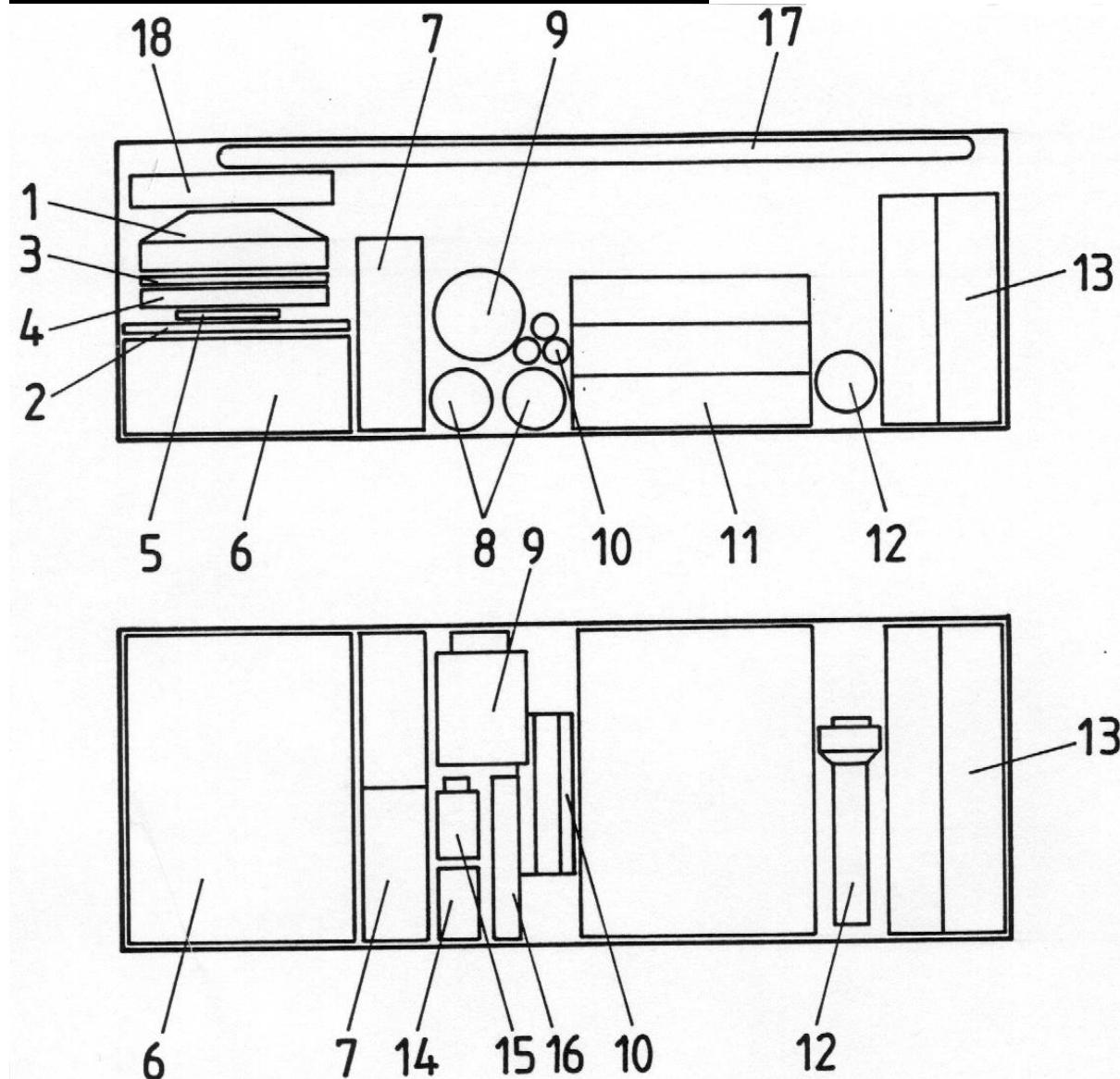
- 8 Handflares
- 9 Thermal protective aids
- 10 Rocket parachute flares
- 11 Buoyant smoke signals
- 12 Daylight signalling mirror
- 13 Sponge
- 14 Anti-seasickness tablets

\* LR 97 and LR 97 L for 6 to 12 persons: no bailer

## Packing scheme - SOLAS B Pack - DK

(sketches not according to scale)

### LR 97 and LR 97 L for 6 to 25 persons DK



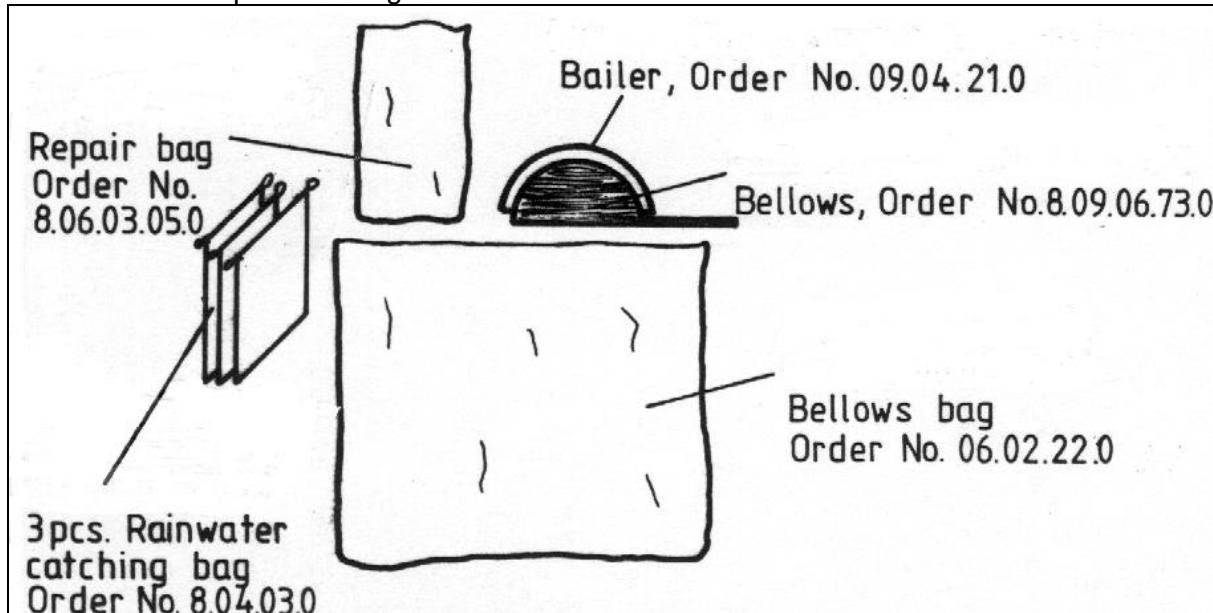
- |   |                                |    |                           |
|---|--------------------------------|----|---------------------------|
| 1 | Bailer *                       | 10 | Handflares                |
| 2 | Table of life saving signals   | 11 | Thermal protective aids   |
| 3 | Instructions on how to survive | 12 | Torch (signalling)        |
| 4 | Seasickness bag                | 13 | Fresh water               |
| 5 | Daylight signalling mirror     | 14 | Battery and bulb (spare)  |
| 6 | First aid kit                  | 15 | Anti-seasickness tablets  |
| 7 | Sponge                         | 16 | Rain water collecting bag |
| 8 | Rocket parachute flares        | 17 | Sea anchor                |
| 9 | Buoyant smoke signals          | 18 | Bag for sea anchor line   |

\* LR 97 and LR 97 L for 6 to 12 persons: no bailer

### 3.11.2 Check bellows bag, repair bag and paddles

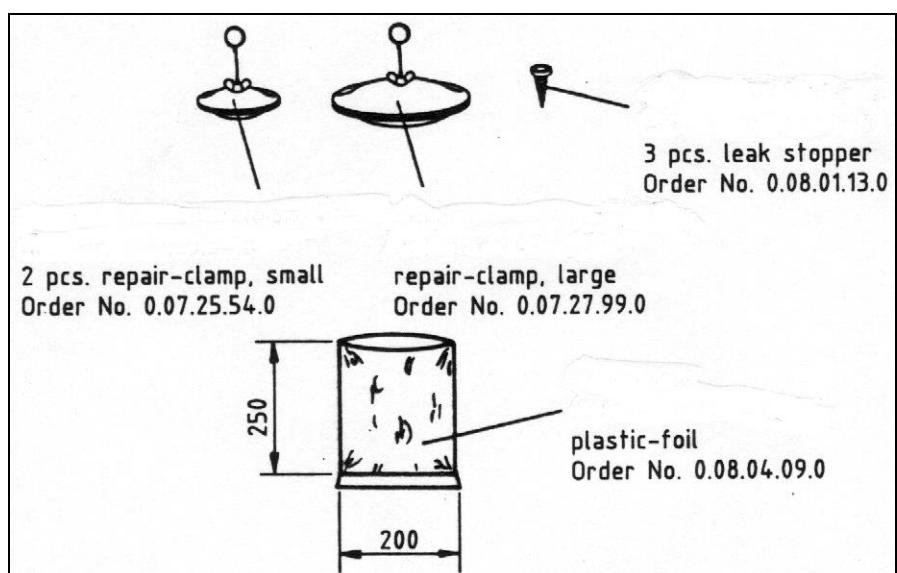
#### 3.11.2.1 Bellows bag

Unpack the bag and check the contents.

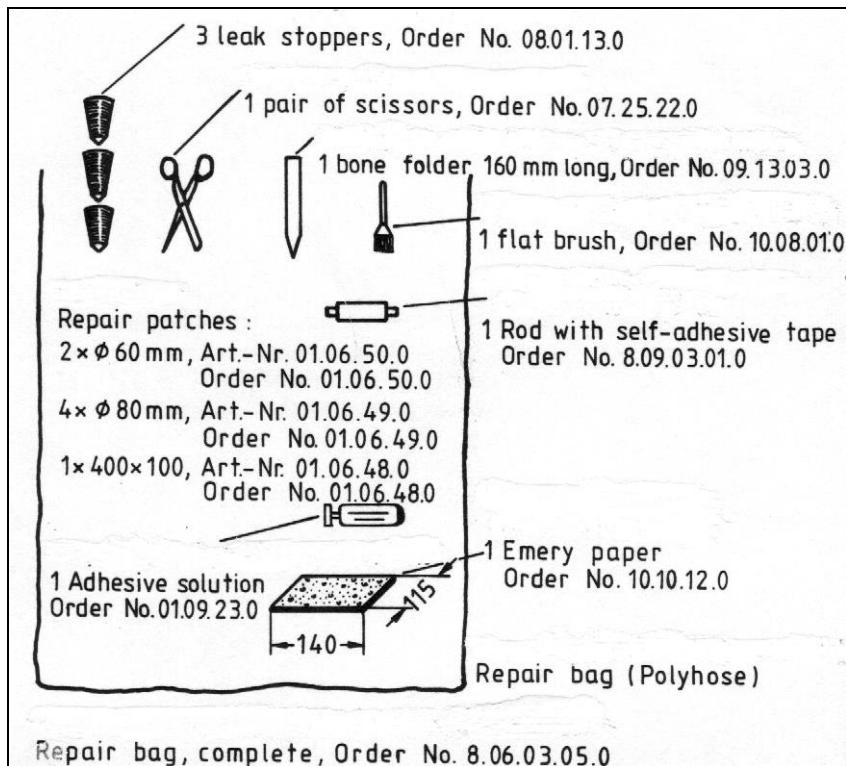


#### 3.11.2.2 Unpack the repair bag and check the contents.

##### 3.11.2.2.1 Only for liferafts approved by German See-Berufsgenossenschaft

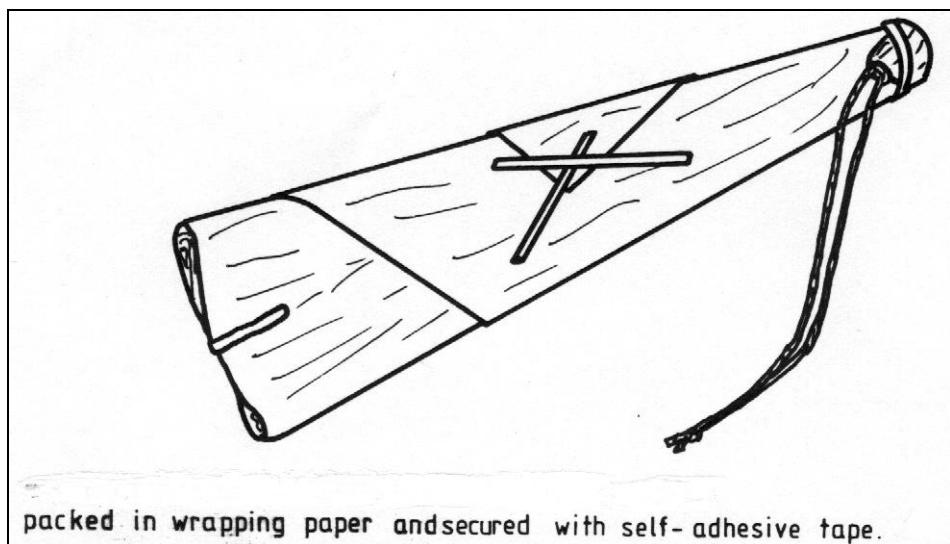


### 3.11.2.2.2 All other liferafts



### 3.11.2.3 Paddles

Paddles are to be checked to ensure they are complete and undamaged. Damaged paddles are to be replaced.



### 3.11.3 Checking of painter line

Check the painter line is properly stowed in its bag and that the thin weak links keeping the bag closed are undamaged. Should the painter line be fully or partially removed from its bag, it must be repacked in accordance with the instructions described in Annex 1.

effective length of line at a drop height of:

max. 25 m = 50 m

max. 18 m = 25 m ) *in accordance with regulations of German*

max. 25 m = 36 m ) *and Dutch Shipping Authorities.*

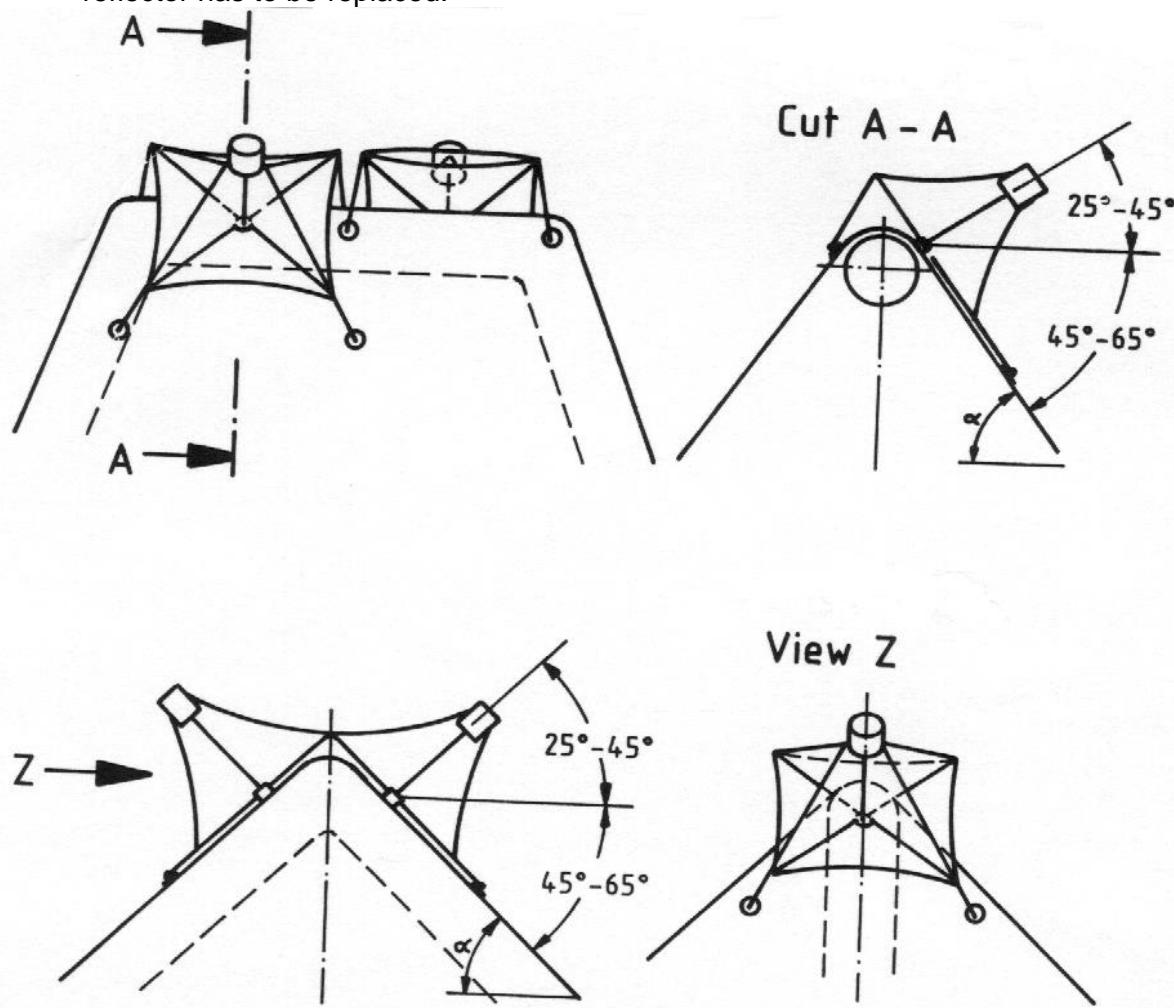
### 3.11.4 Checking of radar-reflector

(only applies to liferafts from year of construction 1988 approved by German Shipping Authority)

Among other things functioning depends on a tight full unfolding and the mounting angle of 45°- 65 ° on the inflated raft.

Both can be adjusted by the fastening straps.

In case of larger damages on the reflective fabric the complete reflector has to be replaced.



### **3.12 Documentation**

The following labels and documents must be filled in after every inspection of raft:

3.12.1 Label on the raft (Annex 2)

The date of servicing and name of service station has to be filled in.

3.12.2 Table of contents of the emergency pack (Annex 3)

The date of servicing and name of service station has to be filled in.

3.12.3 Certificate of service and testing of an inflatable liferaft (Annex 4.1 and 4.2)

(Inspection certificate and label: Inspection approval)

3.12.4 Log book or log card (Annex 5)

3.12.5 Label „Service“ on the container (Annex 6)

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3 Issue : 10/97	page : 70
--	--	-----------------------------	--------------

### **3.13 Hydrostatic release unit**

The hydrostatic release unit replaces the manually operated slip-hook for the automatic release of the lashing belt. It automatically opens the lashing in 1,5 to 4 m depth of water and thus releases the packed liferaft from the sinking vessel.

#### **3.13.1 Type "Hammar H 20"**

This hydrostatic release unit does not have to be serviced.

After a period of 2 years it has to be exchanged by a new one.

The time limit of two years starts counting from the month of mounting the release unit on board. The data tape (in several languages) glued to the hydrostatic release unit consists of 12 spaces for the month entry and 3 spaces for the year entry. This tape must be marked with 2 year time limit prior to mounting hydrostatic release unit on board.

The relevant month and year have to be scratched out.

Should hydrostatic release units be found on board of vessels without any marking or not clearly marked they have to be replaced by new ones immediately.

The serial-number of the newly installed hydrostatic release unit has to be recorded on the log card of the liferaft.

The hydrostatic release unit packed in its original packing can be obtained from DSB. DSB-Art.-No.: 0.07.09.31.

A mounting picture and working instructions are printed on the packing carton. The packing carton also contains instructions for installation intended for display on board.

#### **3.13.2 Type "Thanner DK 84" and „Thanner DK 84.1“**

Service should be carried out according to Annex 8.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 3 Issue : 10/97	page : 71
--	--	-----------------------------	--------------

## **4. Folding and packing of the liferaft**

Only completely dry rafts are allowed to be packed.  
Special attention should be paid to ropes and belt straps.

### **4.1 Completing the liferaft**

#### **4.1.1 General**

Use a suction pump or decompressor to deflate the air compartments after carrying out the „final check before deflation“ - see item 4.1.3. Effective deflation is a prerequisite for proper packing of the raft into container.

The buoyancy tubes, arch tube and the floor are deflated through the inflate/deflate valves provided inside the raft. For deflation, the deflation adaptor - with green cap, Art.-No. 8.07.33.04.0 - should be inserted into the valve.

Deflation can be regarded as complete when the rubberized fabric can be folded sharply and spread out on the top of each other. Then, with the decompressor still running, the deflation adaptor should be **removed quickly from the valve and the valve cap closed immediately.**

**Use of the valve cap will ensure the compartments will not reinflate and further ensure there will be no leakage during gas inflation using the rafts own CO<sub>2</sub> cylinder.**

#### **4.1.2 Equipment of raft and preparation for packing**

4.1.2.1 Plug valve of the rainwater collecting device.

4.1.2.2 Packing of repair bag

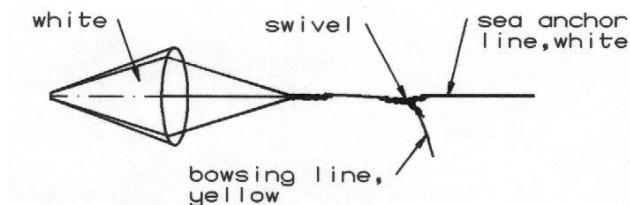
Cut off a length of 230 mm from the polyhose (200mm wide, on roll - order no.: 0.08.04.09.0) and weld one side watertightly. Pack up the component parts according to item 3.11.2.2.1 in the polybag and weld watertightly. Cut in one end of the bag with scissors, short to the welded seam. This will serve as ripping slot.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter : 4 page : 1 Issue : 10/97
--	---	---------------------------------------

4.1.2.3 Pack bellows, bailer, repair bag and rainwater collecting bags into the bellows bag and lace up. Fasten the bag to the same place as found, when unpacking the raft for inspection, with laces by loops or slip knot with additional two half hitches.

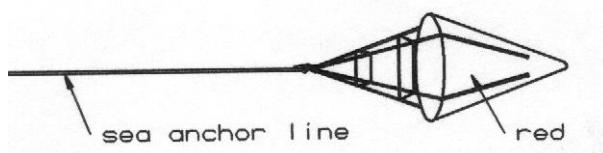
4.1.2.4 Sea anchor

4.1.2.4.1 *SOLAS - construction*



Knot the sea anchor line and bowsing line acc. to the sketch on the next pages.

4.1.2.4.2 *SBG - / EFTA - construction*



Knot the sea anchor line at the sea anchor patch acc. to item 4.3.5.2

In the case of throw-over-board liferafts for automatic launch, the sea anchor must be packed as shown under 4.2.1.1.2.5.

In the case of davit-launchable rafts, the sea anchor must be stowed inside the raft next to the entrance.

In the case of liferafts approved to British regulations (MCA), the sea anchor must be stowed inside the raft next to the entrance of **ALL** liferafts.

4.1.2.5 Loose raft accessories, strap ladders and painter line

Rearrange buoyant knife, emergency pack, rescue quoit etc to the same place as before.

Knot firmly the tension line of strap ladder to the patches on top of the upper buoyancy tube on 6 and 8 person rafts. Attach and stretch the strap ladder with tension line by toggle.

On rafts for 10 to 25 persons tie together firmly the strap ladder with stretched tension line and toggle (see next pages).

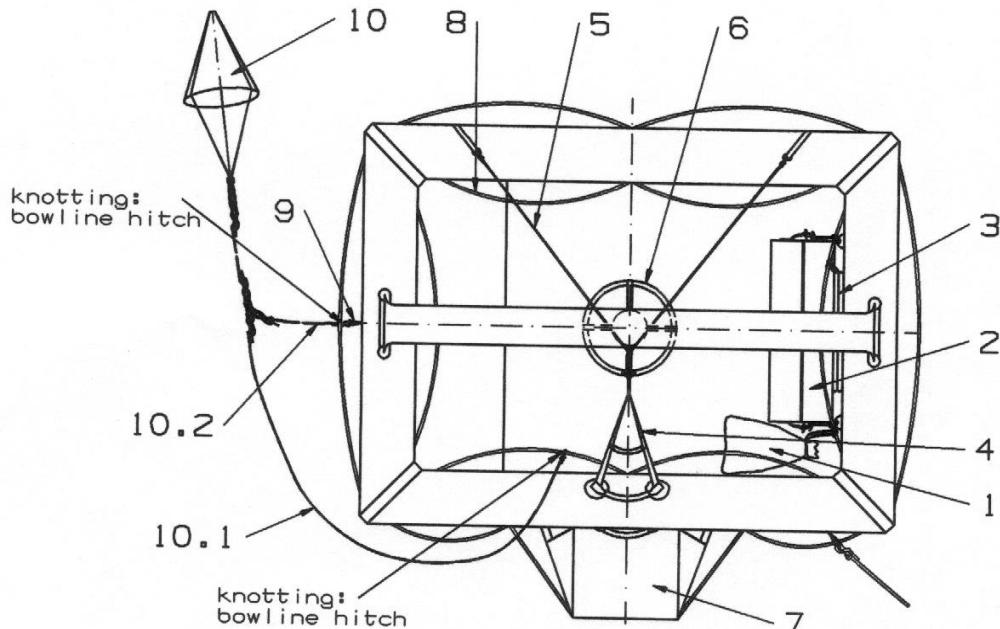
4.1.2.6 Clean thoroughly the inside of raft and sprinkle with talc.

No tools or sharp pointed objects should be left inside the raft.

to  
4.1.2.5

### Stretching of the strap ladder(s) Placing of the Emergency Pack

#### LR 97 for 6 and 8 persons



1 = bag for bellows and repair kit

2 = emergency pack (EP)

3 = paddle

4 = boarding ladder

5 = stretching line with toggle

6 = bailing system (only for rafts according to German and Norwegian regulations)

7 = boarding system

8 = grab line, inside

9 = sea anchor patch

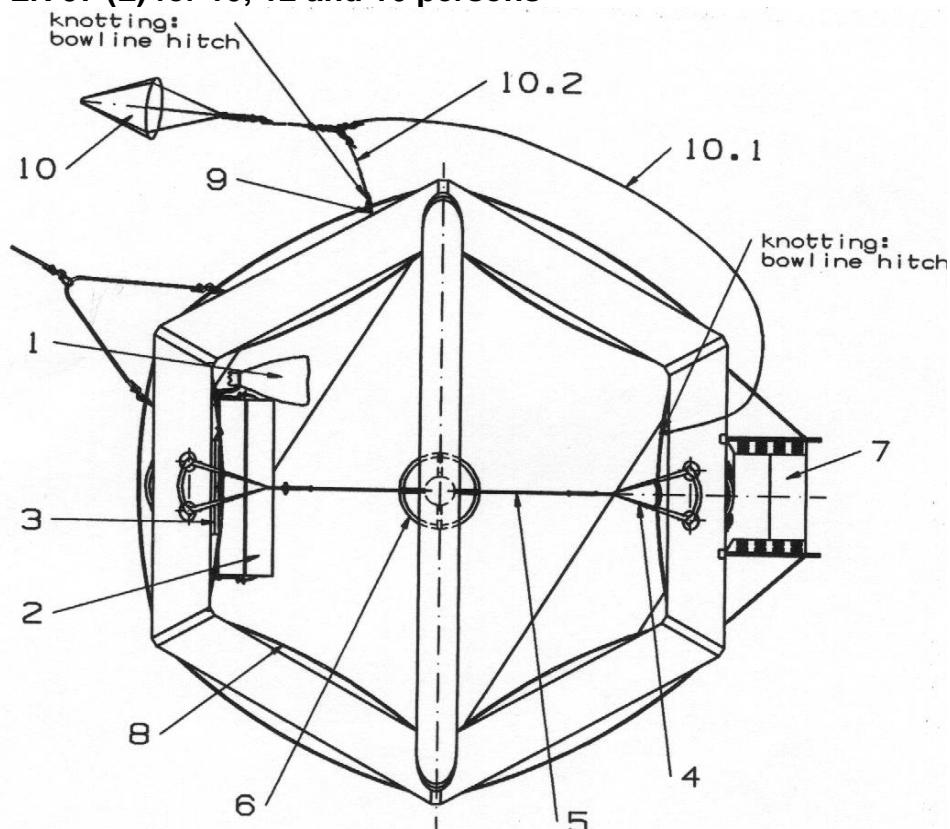
10 = SOLAS - sea anchor

10.1 = bowsing line (yellow)

10.2 = sea anchor line (white)

to  
4.1.2.5

### LR 97 (L) for 10, 12 and 16 persons



1 = bag for bellows and repair kit

2 = emergency pack (EP)

3 = paddle

4 = boarding ladder

5 = stretching line with toggle

6 = bailing system (only for rafts according to German and Norwegian regulations)

7 = boarding system

8 = grab line, inside

9 = sea anchor patch

10 = SOLAS - sea anchor

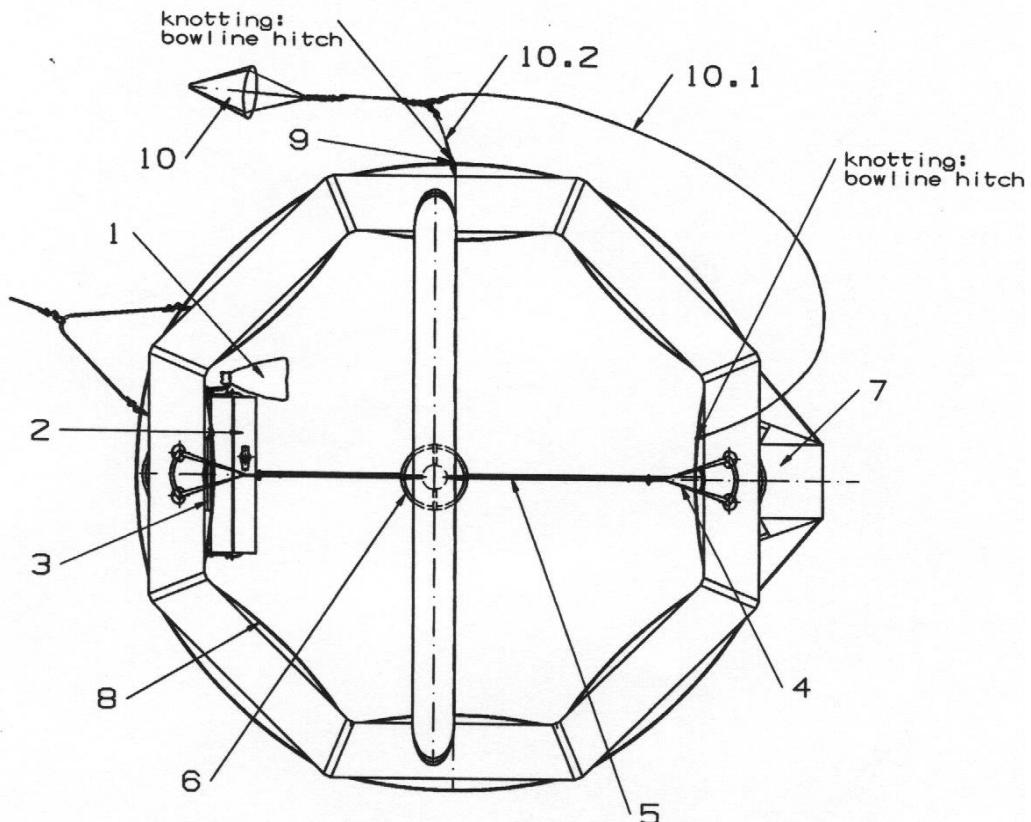
10.1 = bowsing line (yellow)

10.2 = sea anchor line (white)

to

4.1.2.5

### LR 97 (L) for 20 and 25 persons



1 = bag for bellows and repair kit

2 = emergency pack (EP)

3 = paddle

4 = boarding ladder

5 = stretching line with toggle

6 = bailing system      (only for rafts according to German  
and Norwegian regulations)

7 = boarding system

8 = grab line, inside

9 = sea anchor patch

10 = SOLAS - sea anchor

10.1 = bowsing line (yellow)

10.2 = sea anchor line (white)

#### **4.1.3 Final check before deflation**

a) Entrances open, entrance closures rolled and tied together with seizings.

The grabline loops knotted to the push handle of the zipper are located in the rolled up entrance closures.

Lookouts closed with seizings.

Boarding ladder correctly connected and stretched .

b) Sea anchor properly folded, sea anchor line stored inside the pocket. Rope(s) firmly knotted.

c) Bellows bag with repair bag tied up at the proper place  
(see sketch on page before)

d) Loose raft accessories such as rescue quoit, buoyancy knife etc stored neatly on the raft.

e) Emergency pack (EP) placed according to drawing and tied to the patches on the floor and on the lower buoyancy tube.

f) Interior of raft clean and sprinkled with talcum.

g) Are the batteries for interior and exterior lighting in the holder and are they connected ?

h) No pointed and sharp edged objects inside the raft  
(especially don't forget tools such as knives, scissors, screw drivers).

i) C0<sub>2</sub>-cylinders properly slipped into cylinder pocket, pressure hose tightly connected and all other screw connections of C0<sub>2</sub>-fittings and lines tight. Fibre washers fitted and in good condition (note break-down torques).

The raft has to be deflated as described under item 4.1.1

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 6 Issue : 10/97
---	---	---------------------------------------

#### **4.1.4 Preparation of exterior of raft**

4.1.4.1 The switching pins on the exterior and interior lights must be removed and replaced by the activating pins, which must in turn be connected to the floor using the short line provided.

When folding and rolling up the liferaft care must be taken that the activating pin is not pulled out of the battery (see also 3.8.3)

4.1.4.2 Righting strap

Lift up the flat lying raft at the cylinder side and check whether the righting strap is properly running over cylinder bag to the elastic rope.

4.1.4.3 Carefully examine the lacing of the CO<sub>2</sub>-cylinder to the cylinder bag.

4.1.4.4 Check whether protective caps on CO<sub>2</sub>-filling valves are fitted properly.

4.1.4.5 Check whether all protective coverings are in their proper position.

4.1.4.6 Check whether the fastening line for the painter line bag is attached to the cylinder bag.

4.1.4.7 Check on davit launchable rafts that the suspension lines are running over the bolt of the lowering shackle freely and without loops.  
Also check the bolt is securely locked.

#### **4.2 Rolling up of raft**

Raft is spread completely flat on the floor with canopy pointing upwards.

All directions, mentioned in the following, are as seen from a position in front of the pressure gas cylinder.

##### Radar-reflector fitted to the canopy

Prior to packing the rods of the radar reflectors mounted on the canopy have to be bundled by hand and placed down parallel to the CO<sub>2</sub>-cylinder. When packing make sure that the radar reflectors are evenly distributed. By shifting the canopy of the deflated raft the position of the radar reflector can be corrected.

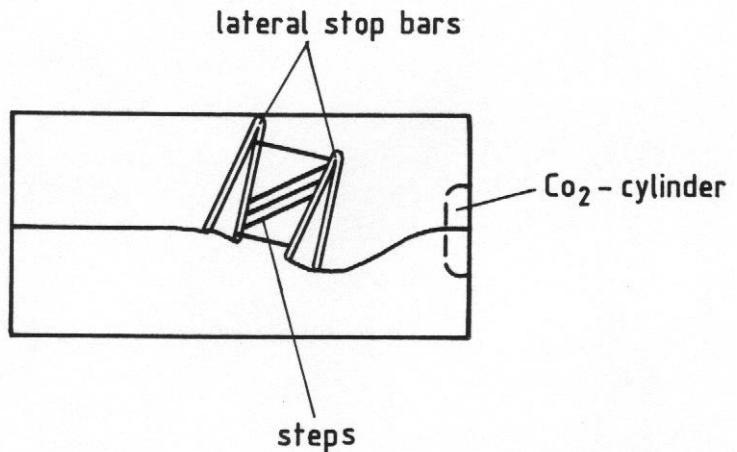
Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 7 Issue : 10/97
---	---	---------------------------------------

#### 4.2.1 With emergency pack type A (SOLAS A Pack)

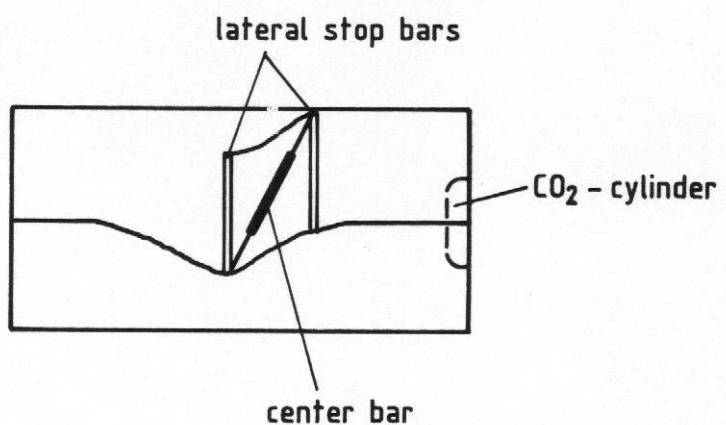
##### 4.2.1.1 LR 97 for 6 and 8 persons

**Note:** The boarding systems have to be arranged as follows after fold 1.

#### SBG - Liferaft

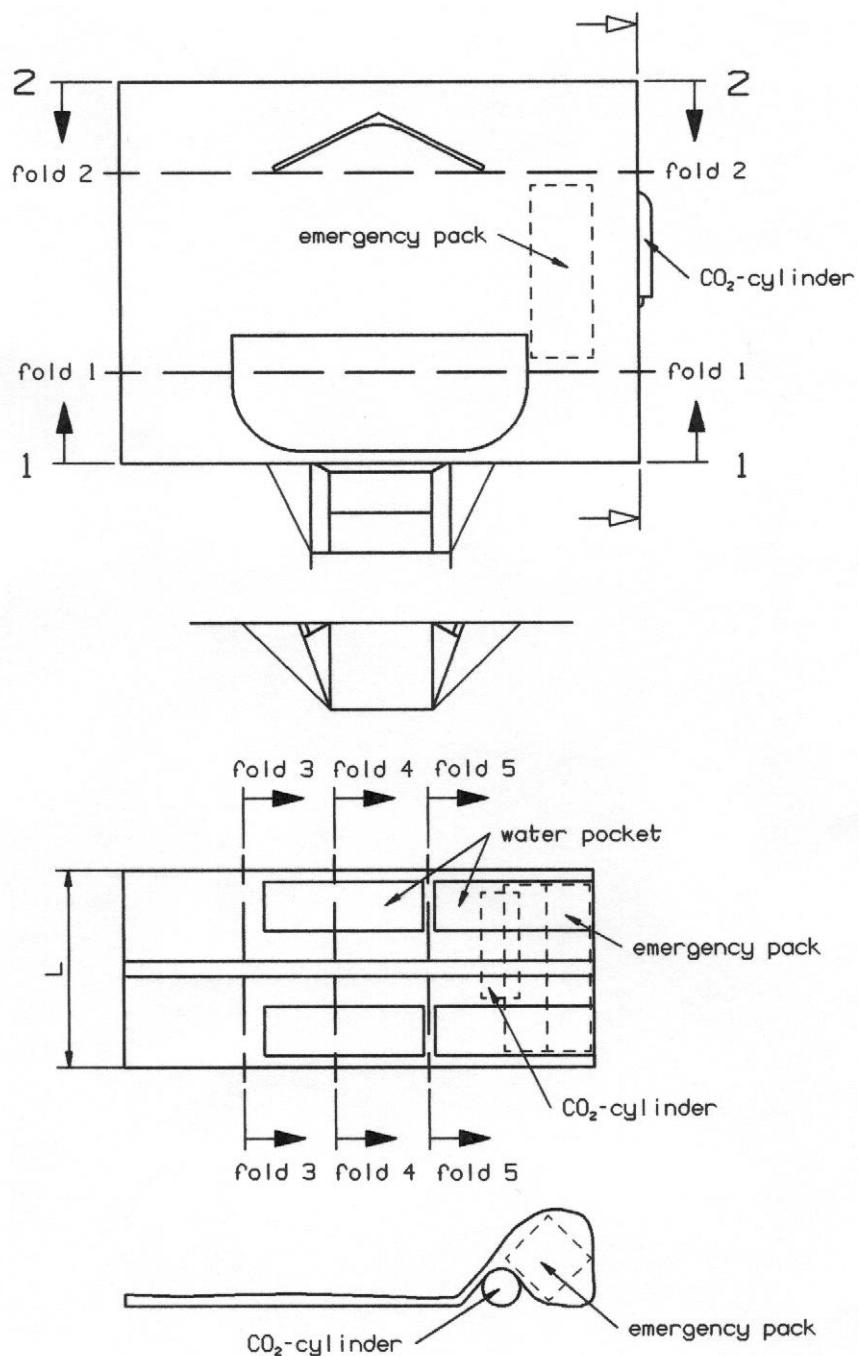


#### SOLAS - Liferaft



#### 4.2.1.1.1 Folding scheme

Before Fold 1, pull the emergency pack inside the raft over the CO<sub>2</sub>-cylinder, as shown in the sketch below



4.2.1.1.2     Folding operation with pictures, here: „LR 97 - 6 persons“

4.2.1.1.2.1   picture 1



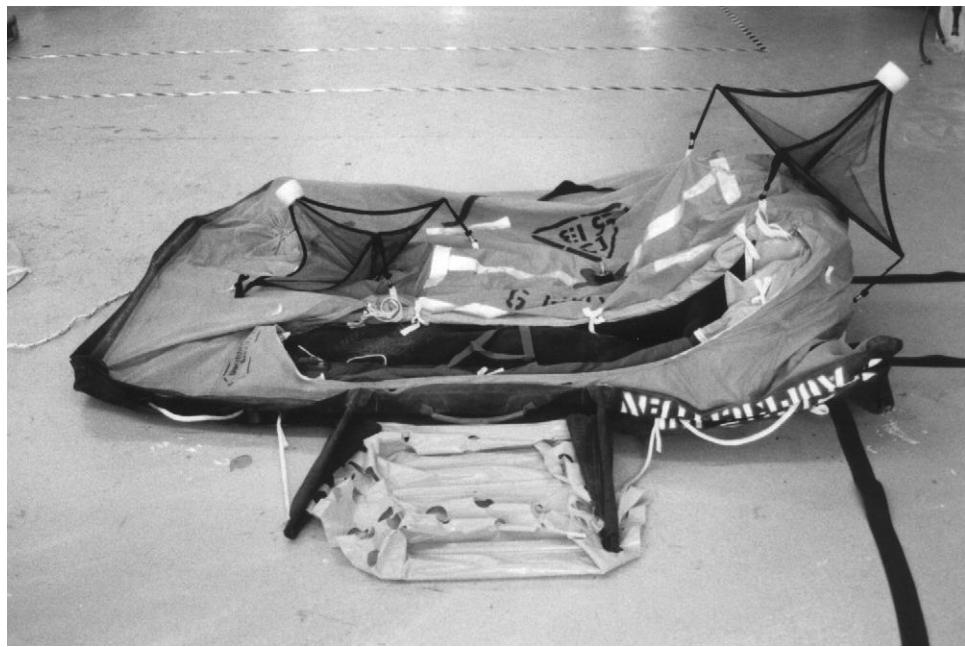
The auxiliary belts must laid down corresponding to picture 1 and 2.

4.2.1.1.2.2   picture 2



The emergency pack on the cylinder side is to be found by touch through the canopy.

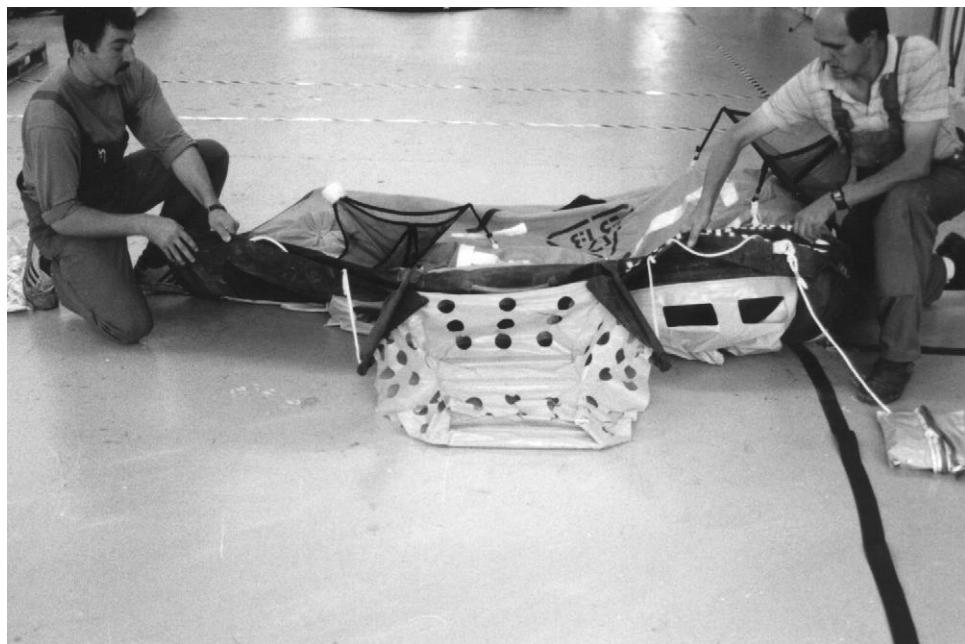
4.2.1.1.2.3 picture 3



Pull the emergency pack - inside the raft - over the C0<sub>2</sub>-cylinder  
and lay down as shown in the sketch.  
Next attach the painter line.

4.2.1.1.2.4 First folding = Fold 1

picture 4



Fold the left side of the raft towards the middle. Ensure the rigid ladder rungs are placed parallel to the cylinder.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 11 Issue : 10/97
---	---	--

4.2.1.1.2.5 Second folding = Fold 2

picture 5



Fold the right side of the raft towards the middle. Check both 1st and 2nd folds are straight. Use an auxiliary belt around the emergency pack to secure the pack length during the following stages.

4.2.1.1.2.6 Third folding = Fold 3

picture 6



Starting from the end opposite the cylinder, make a fold towards the middle of the raft.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 12 Issue : 10/97
---	---	--

4.2.1.1.2.7 Fourth folding = Fold 4

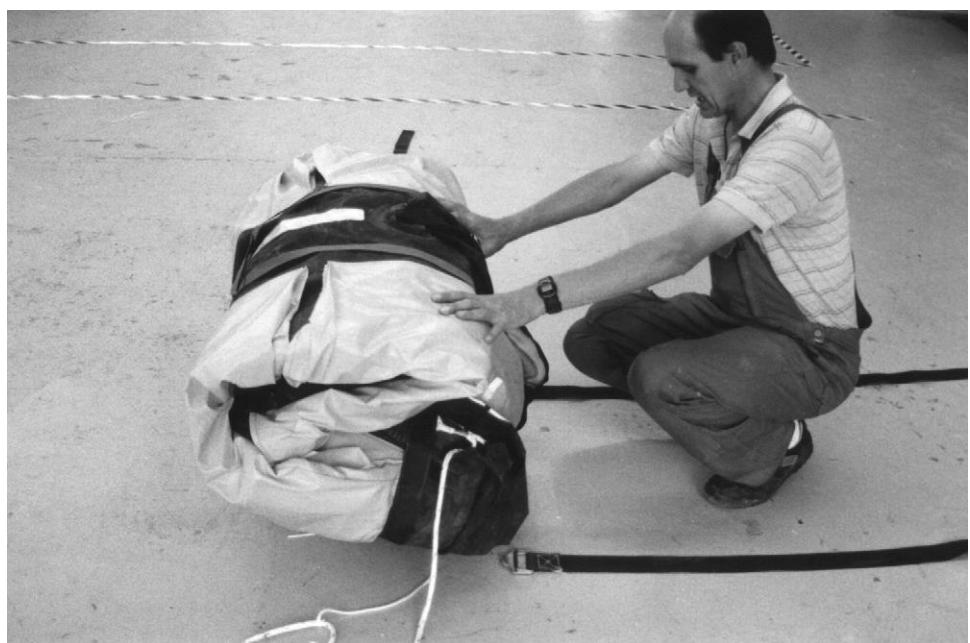
picture 7



Fold the raft pack once more up to the emergency pack.

4.2.1.1.2.8 Fifth folding = Fold 5

picture 8



Roll and lift 4th fold on to the top of the emergency pack.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 13 Issue : 10/97
---	---	--

4.2.1.1.2.9 picture 9



Place two auxiliary belts around the folded raft as shown, to retain the pack shape.

**Remove the belt that was transversely positioned around the emergency pack**

4.2.1.1.2.10 picture 10



Place the 3rd auxiliary belt around the middle of the raft pack and pull together as described under 4.2.1.1.2.9

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 14 Issue : 10/97
---	---	--

4.2.1.1.2.11 picture 11



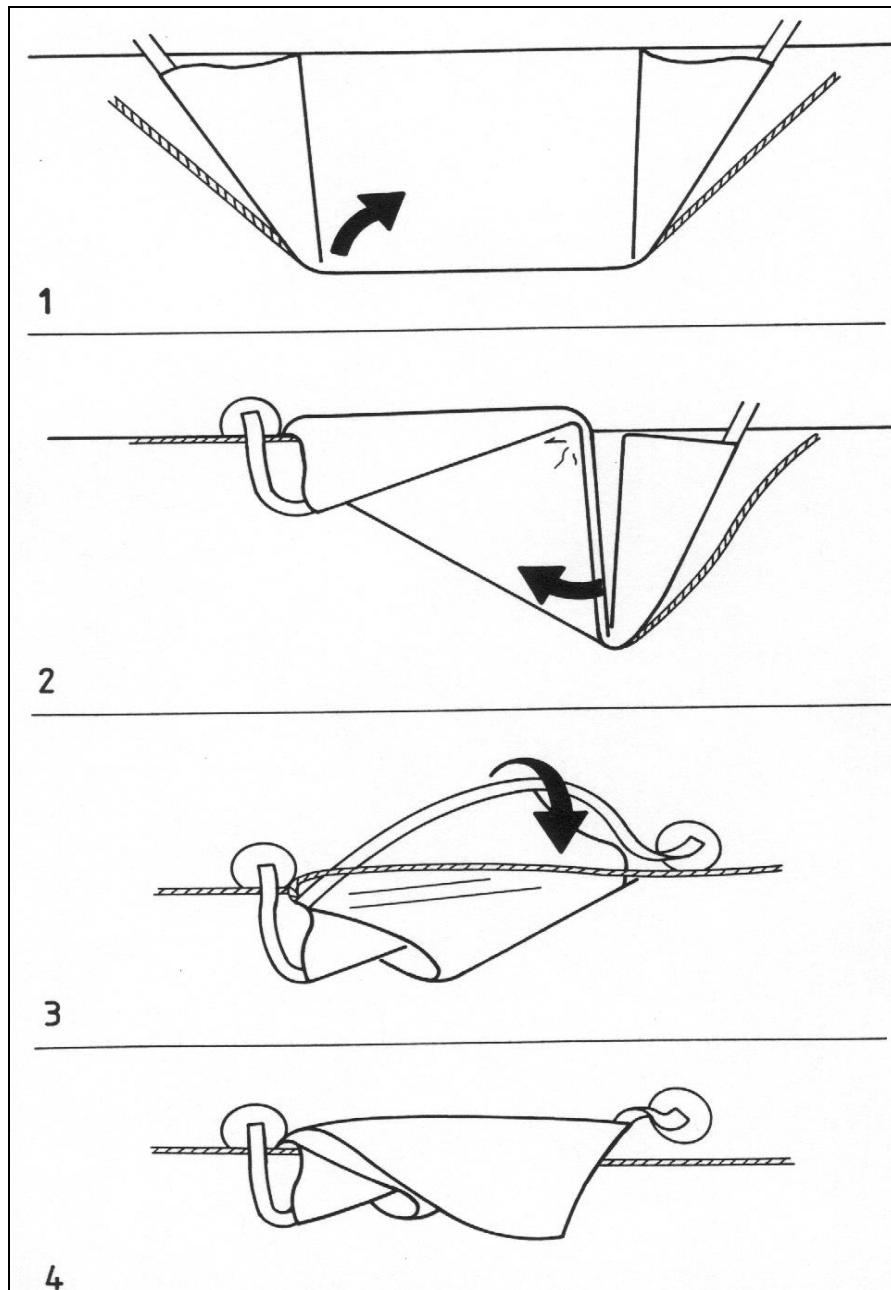
Tighten the 3 auxiliary belts alternately.

Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 15 Issue : 10/97
---	---	--

4.2.1.2      **LR 97 for 10, 12, 15, 16, 20 and 25 persons**

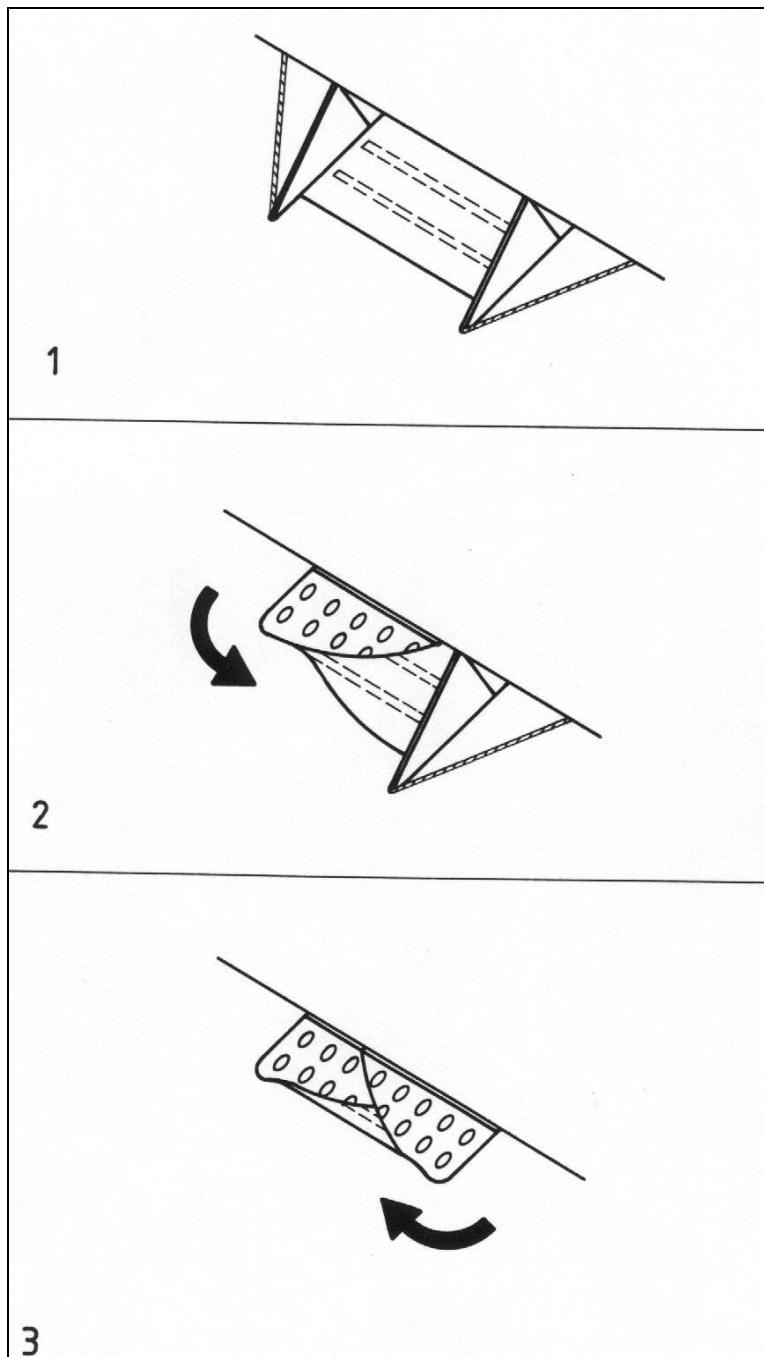
**Note !**      The non-inflatable boarding systems  
have to be folded as follows:

**Non-inflatable boarding ramp for SOLAS liferafts**



to 4.2.1.2

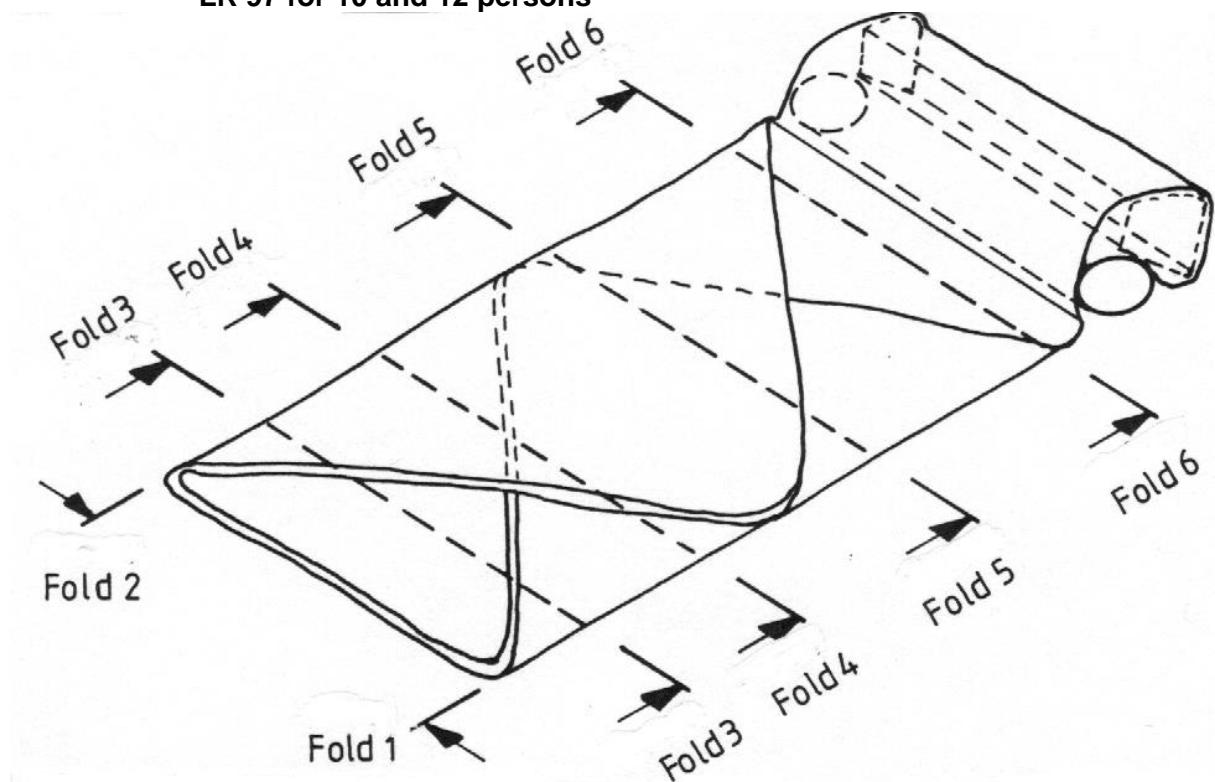
**Non-inflatable boarding ramp for SBG liferafts**



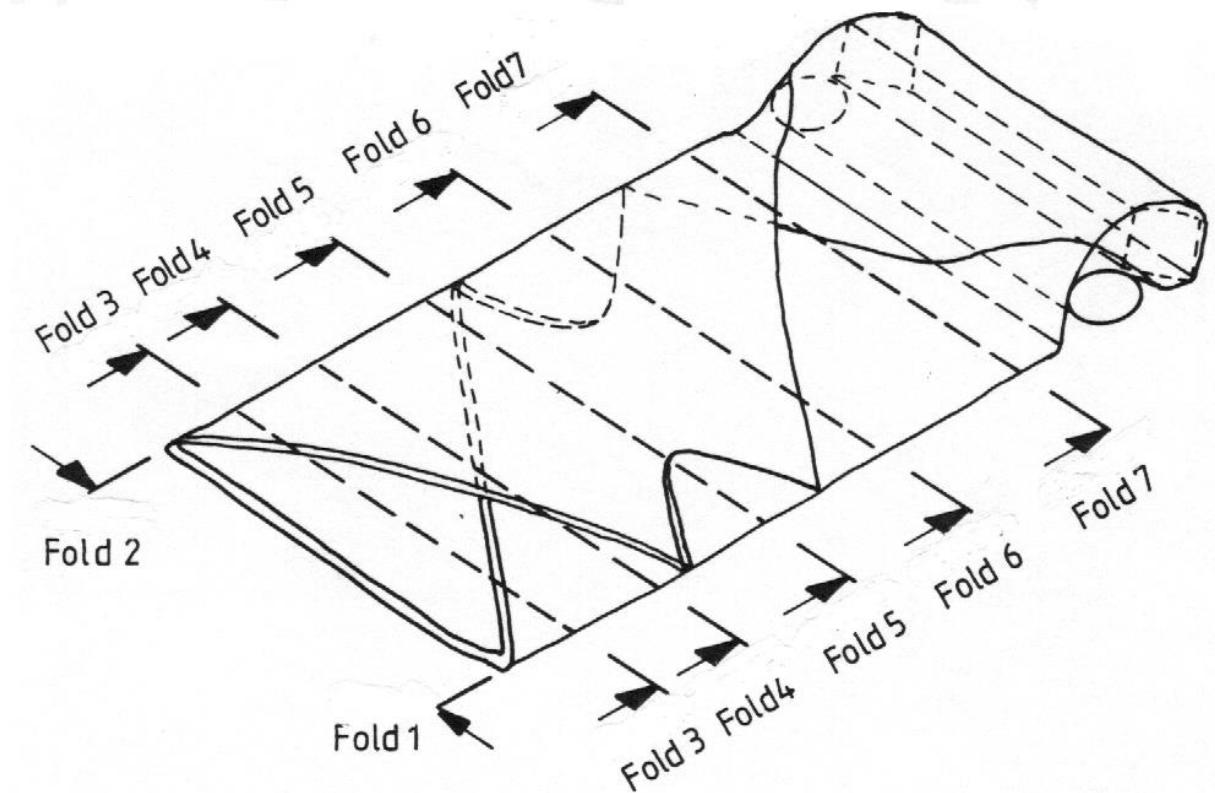
Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 17 Issue : 10/97
---	---	--

#### 4.2.1.2.1 Folding scheme

**LR 97 for 10 and 12 persons**

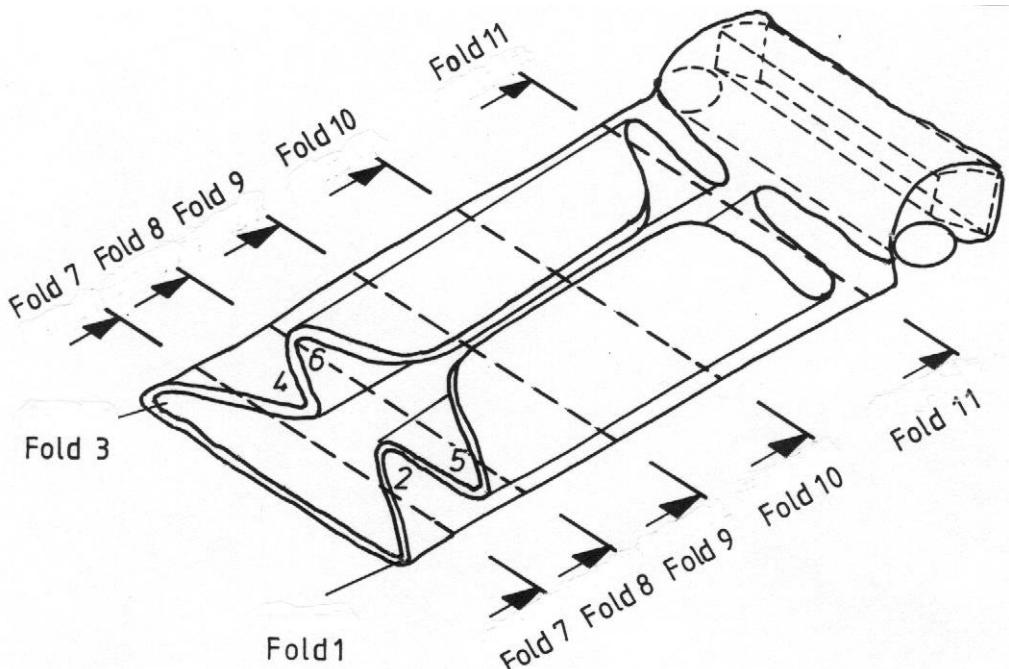


**LR 97 for 15 and 16 persons**



to  
4.2.1.2.1

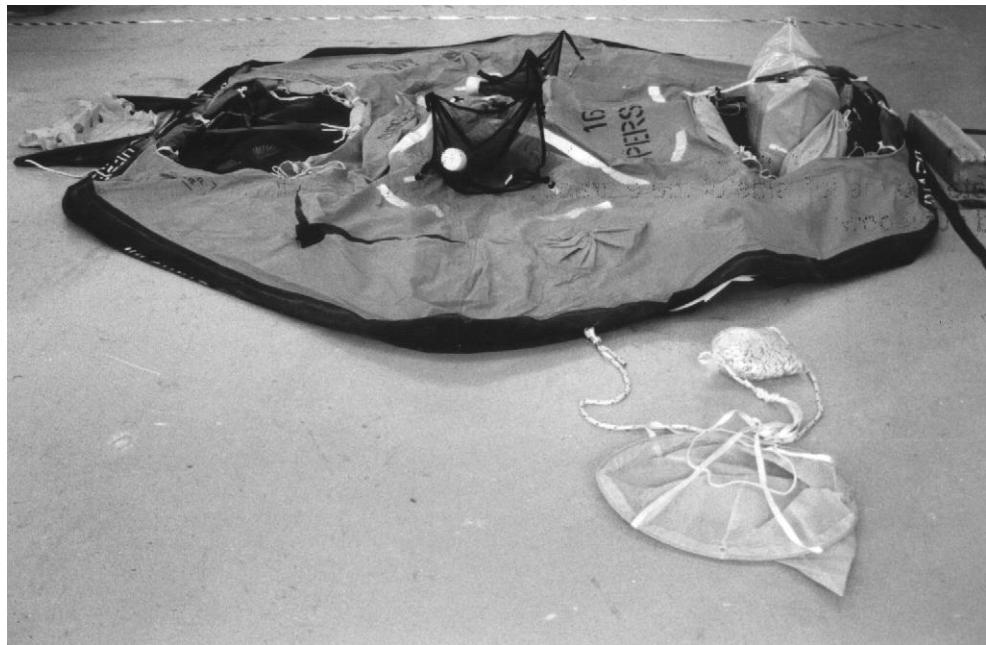
**LR 97 for 20 and 25 persons**



Deutsche Schlauchbootfabrik Hans Scheibert GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : 19 Issue : 10/97
---	---	--

4.2.1.2.2 Folding operation with pictures, here: „LR 97 - 16 persons“

4.2.1.2.2.1 picture 1



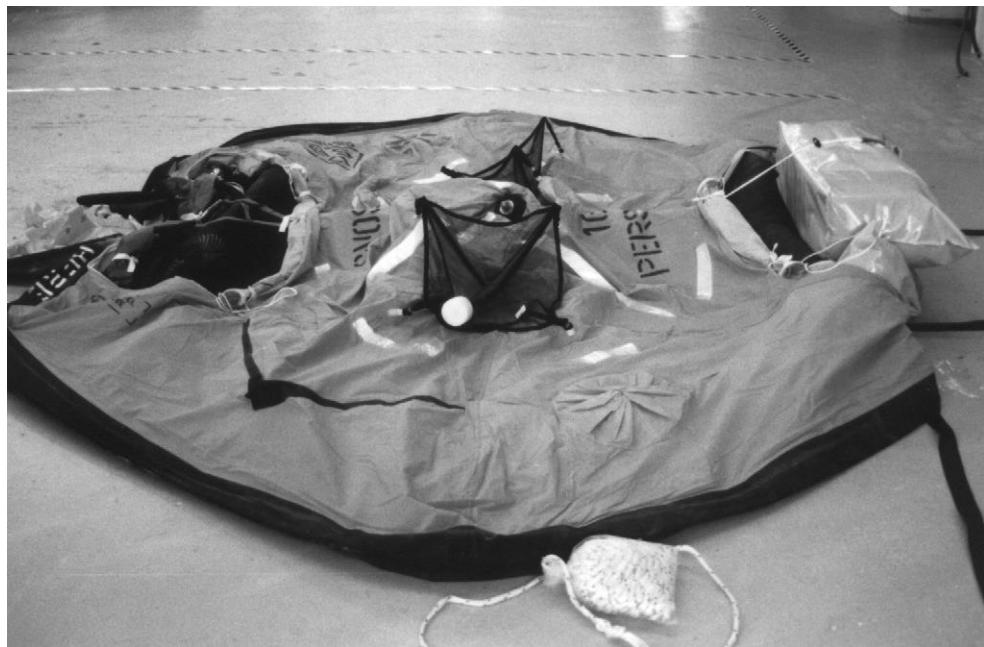
Before folding the raft pull out the towing bridle (Hahnpot), located to the left side of the entrance (seen from the cylinder side) and put it down.

4.2.1.2.2.2 picture 2



Pull the emergency pack - together with the raft - over the CO<sub>2</sub>-cylinder and lay down on the side.

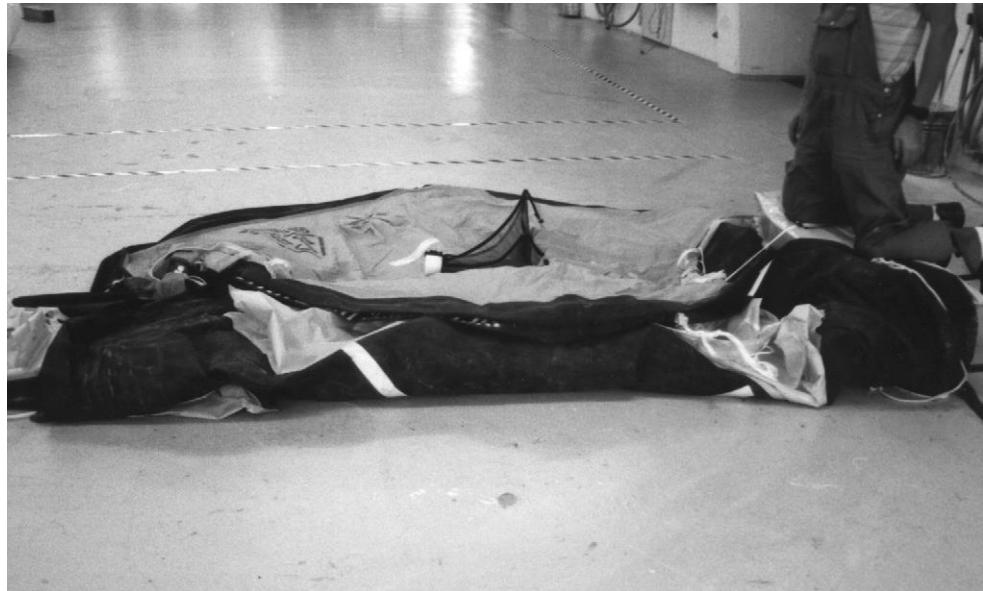
4.2.1.2.2.3 picture 3



Liferaft spread out after pulling the emergency pack over the C0<sub>2</sub>-cylinder.

4.2.1.2.2.4 First folding = Fold 1

picture 4



Fold the left side of the raft towards the middle.  
If necessary make a further fold as described under 4.2.1.2.1  
(LR 97 for 15 and 16 persons)

4.2.1.2.2.5 Second folding = Fold 2

picture 5



Fold the right side of the raft towards the middle. To ensure the pack length, place an auxiliary belt around the emergency pack.

4.2.1.2.2.6 Third folding

picture 6



Starting from the end opposite the cylinder, make a fold towards the cylinder. For folding of the non-inflatable boarding ramp see item 4.2.1.2.

4.2.1.2.2.7 Fourth folding = Fold 4

picture 7



Fold the raft pack once again in the direction of the cylinder.

4.2.1.2.2.8 Fifth folding = Fold 5

picture 8



Fold the raft once more in the direction of the cylinder, so that it is 50 - 60 mm short of the emergency pack.

4.2.1.2.2.9 Sixth folding = Fold 6

picture 9



Roll and lift the 5th fold on to the top of the emergency pack

4.2.1.2.2.10 picture 10



Cast two auxiliary belts around the raft pack and pull together so that the shape of this pack is retained.

**Remove the belt that was positioned transversely around the emergency pack !**

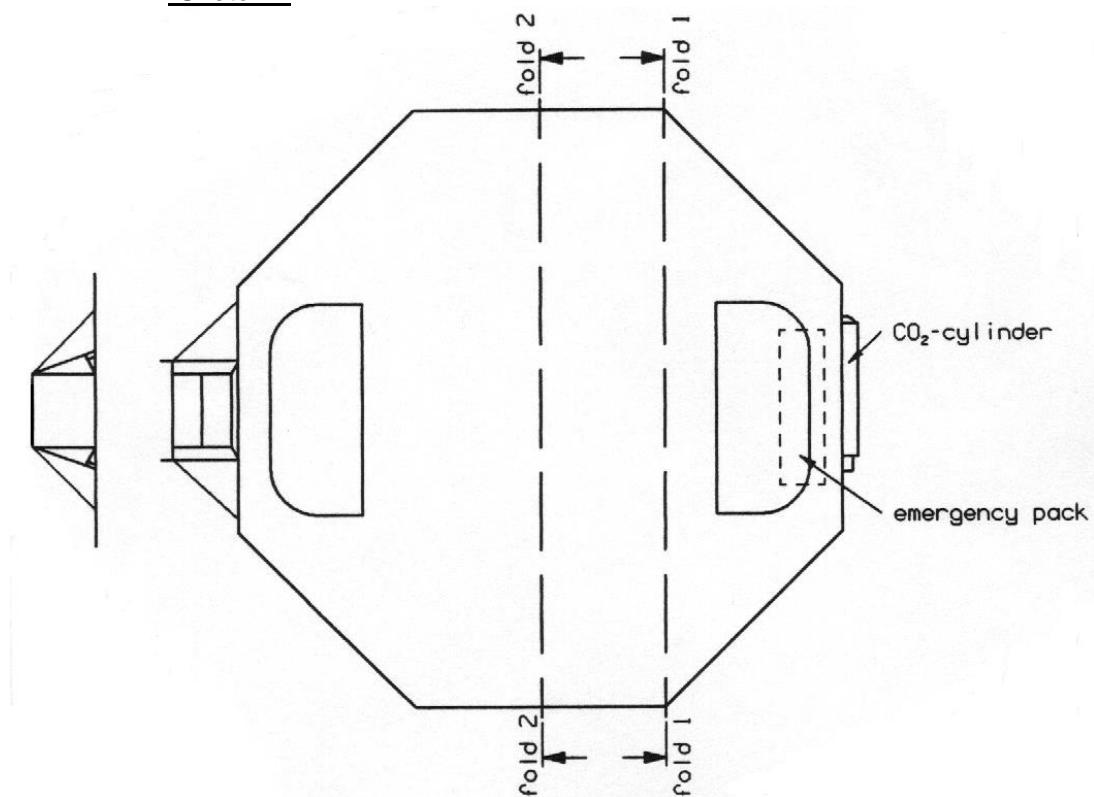
Place this belt around the middle of the raft pack and pull together.

Tighten the 3 auxiliary belts alternately.

4.2.1.3. LR 97 L for 12, 16, 20, and 25

4.2.1.3.1 Folding scheme

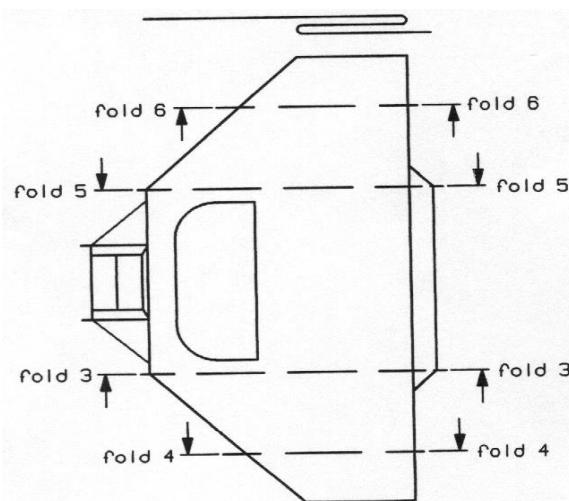
Sketch 1



non-inflatable  
boarding system  
(see also item 1.2.8)

Sketch 2

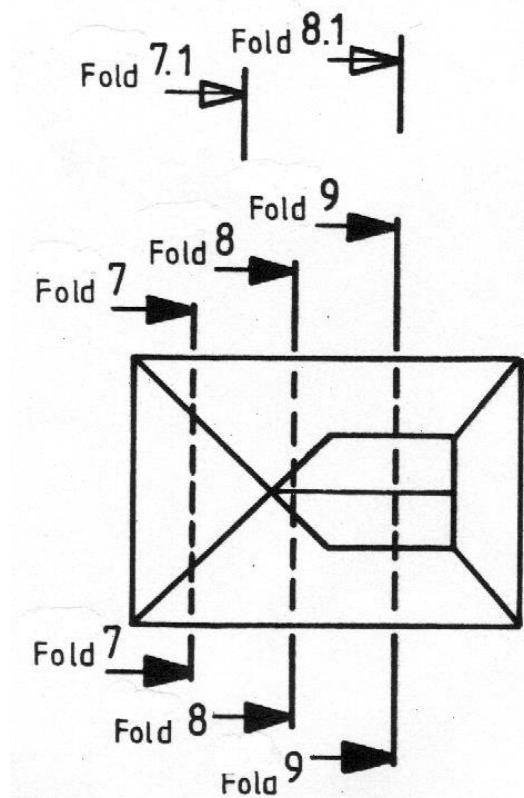
Fold 6 and Fold 4  
do not apply to LR 97 L  
for 12 and 16 persons



to 4.2.1.3.1

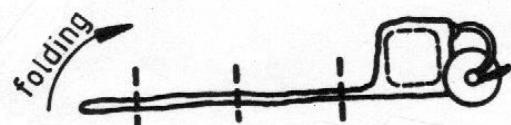
Sketch 3

**Note:** The non-inflatable boarding systems have to be folded according point 4.2.1.2.1 after fold 7 and/or fold 7.1



Fold 7 - 9 applies to LR 97 L for 20 and 25 persons.

Fold 7.1 and 8.1 applies to LR 97 L for 12 and 16 persons.



folding of liferaft

4.2.1.3.2. Folding operation with picture, here „LR 97 I - 25 persons“

4.2.1.3.2.1 picture 1

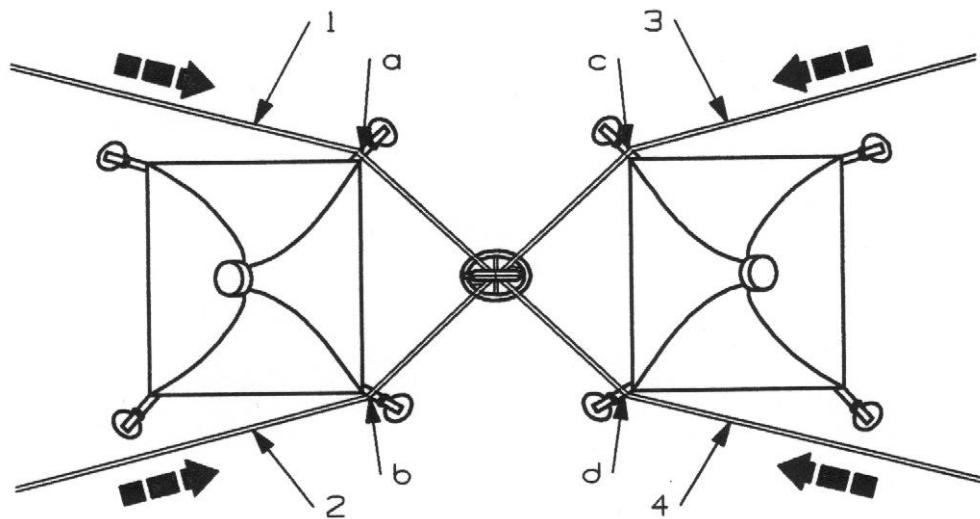


The towing bridle (Hahnpot) and the two bowsing lines are laid outside the raft.

#### 4.2.1.3.2.1.1 (Applicable only for LR 97 L - 20 and 25 persons with SBG-approval)

Tighten the launching lines 1 to 4 in direction to the shackle before first and second folding.

Fixing of the launching lines to point a - d, with 15 mm width adhesive tape (1 winding) outside of the fastening band of the radar reflector.



#### 4.2.1.3.2.2 First and second folding = Fold 1 and 2

picture 2



Pull the auxiliary belt through the lowering shackle.  
With 3 persons take hold of the raft lying on the floor.

4.2.1.3.2.3 picture 3



Pull the shackle over the emergency pack and the C0<sub>2</sub>-cylinder

4.2.1.3.2.4 picture 4



Auxiliary fold (not taken into consideration in the folding scheme). Fold is necessary to straighten raft and remove creases.

4.2.1.3.2.5 picture 5



Finally throw back the auxiliary fold.

4.2.1.3.2.6 Third folding = Fold 3

picture 6



Fold the left side of the raft over, up to the emergency pack.

4.2.1.3.2.7 Fourth folding = Fold 4

picture 7



Fold 4 is made by folding back from the middle. The bowsing line must now be laid out transversely over the folded left side.

4.2.1.3.2.8 Fifth and sixth folding = Fold 5 und 6

picture 8



The right side of the raft is folded in the same way as the left.

The towing bridle (Hahnepot) together with the heart shaped thimble is taken out to the left.

Finally an auxiliary belt is placed longitudinally around the emergency pack above the raft pack and lashed tightly.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : Issue : 10/97	31
--	---	-------------------------------------	----

4.2.1.3.2.9 seventh folding = Fold 7

picture 9



Starting from the end opposite the CO<sub>2</sub>-cylinder, make a fold in the direction of the cylinder. For folding the non-inflatable boarding ladder and boarding ramp see item 4.2.1.2.

4.2.1.3.2.10 Eighth folding = Fold 8

picture 10



The 8th fold is effected once again in the direction of the cylinder up to just short of the emergency pack.

4.2.1.3.2.11 Ninth folding = Fold 9

picture 11



Roll and lift up the 9th fold on to the top of the emergency pack.

4.2.1.3.2.12 picture 12



Place two auxiliary belts around the folded raft as shown, to retain the pack shape.

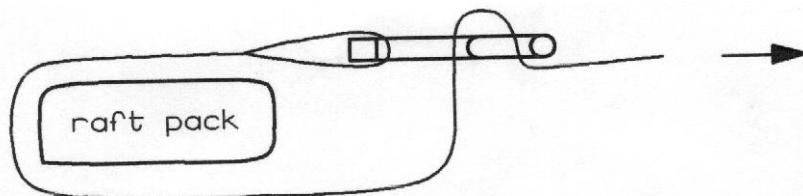
**Remove the belt that was positioned transversely around the emergency pack.**

Place the belt around the middle of the raft pack and pull together.  
Tighten the three auxiliary belts alternately.

4.2.1.3.2.13 picture 13



direction - auxiliary belt:



for securing lead the auxiliary belts around the liferaft and tighten.

Art.-No.	Usage	length over all
8.03.03.10.0	LR 97 L - 12, 16,20 and 25 persons	2730 mm

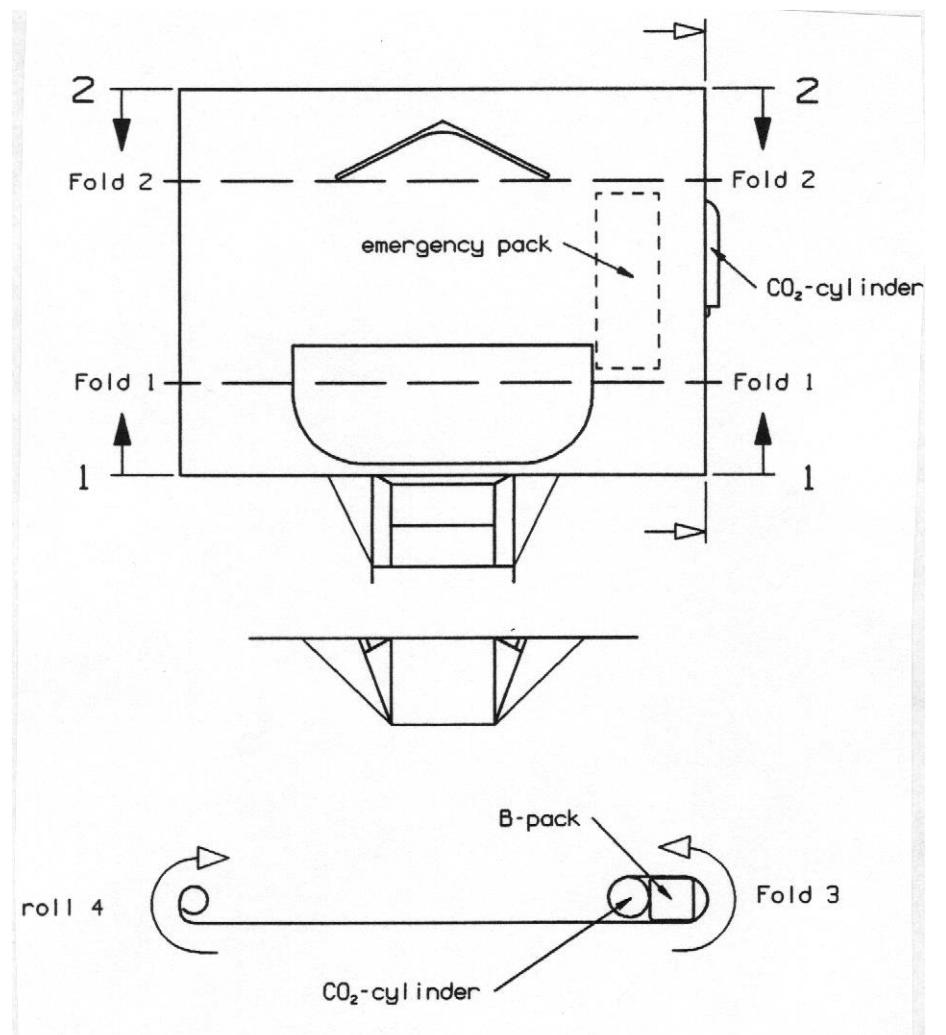
The buckles of the auxiliary belts must be near the C0<sub>2</sub>-cylinder.

**Remove the 3 auxiliary belts !**

## 4.2.2 With emergency pack type B (SOLAS B-Pack)

### 4.2.2.1 LR 97 for 6 and 8 persons

#### 4.2.2.1.1 Folding scheme



4.2.2.1.2     Folding procedure illustrated in pictures, here: LR 97 - 6 persons“

4.2.2.1.2.1   picture 1



Raft equipped and deflated

4.2.2.1.2.2   First folding = Fold 1

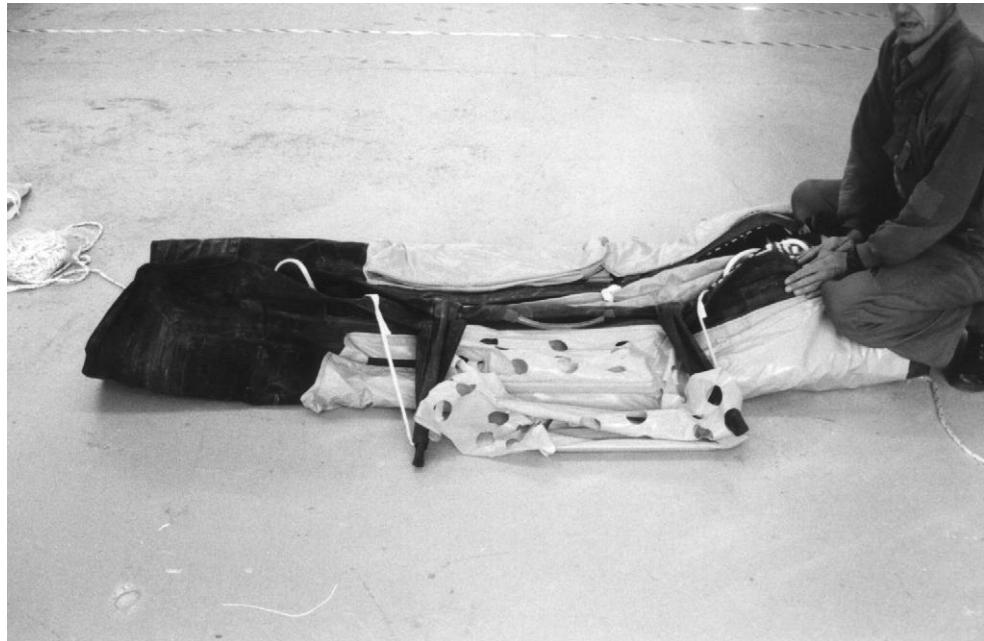
picture 2



Fold left side of the raft towards the middle. Ensure the rigid ladder rungs are placed parallel to the C<sub>0</sub><sub>2</sub>-cylinder.

#### 4.2.2.1.2.3 Second folding = Fold 2

picture 3



Fold the right side of the raft towards the middle.  
Check both 1st and 2nd folds are straight.

#### 4.2.2.1.2.4 Third folding = Fold 3

picture 4



Fold emergency pack with the CO<sub>2</sub>-cylinder

4.2.2.1.2.5 picture 5



Because of the short C0<sub>2</sub>-cylinder, the firing line sewn to the painter should be tied to the release wire of the operating head and the painter line should be tied to the towing bridle (Hahnepot)  
see item 4.4.3.3.

**All work should now be carried out very carefully to avoid activating the C0<sub>2</sub> inflation system**

4.2.2.1.2.6 picture 6



picture 7



Starting from opposite the C<sub>0</sub><sub>2</sub>-cylinder, tightly roll the raft towards the C<sub>0</sub><sub>2</sub>-cylinder.  
Ensure the ladder and rigid rods are parallel with the roll.

4.2.2.1.2.7 picture 8



Slightly lift the rolled up raft pack and place it on the pack with C0<sub>2</sub>-cylinder and emergency pack.  
Put 2 auxiliary belts around the complete pack and pull together.

4.2.2.1.2.8 picture 9



Secure the raft pack with 2 packing bands  
(flax webbing - Art.-No.: 0.03.01.05.0)

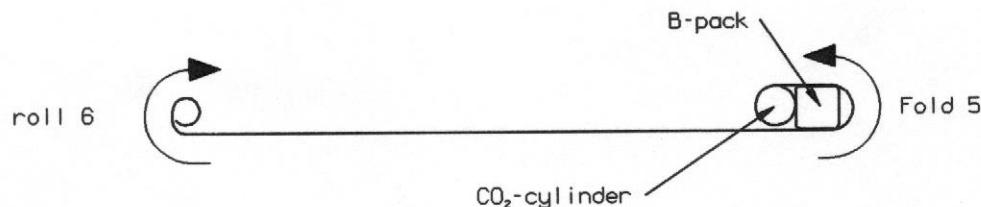
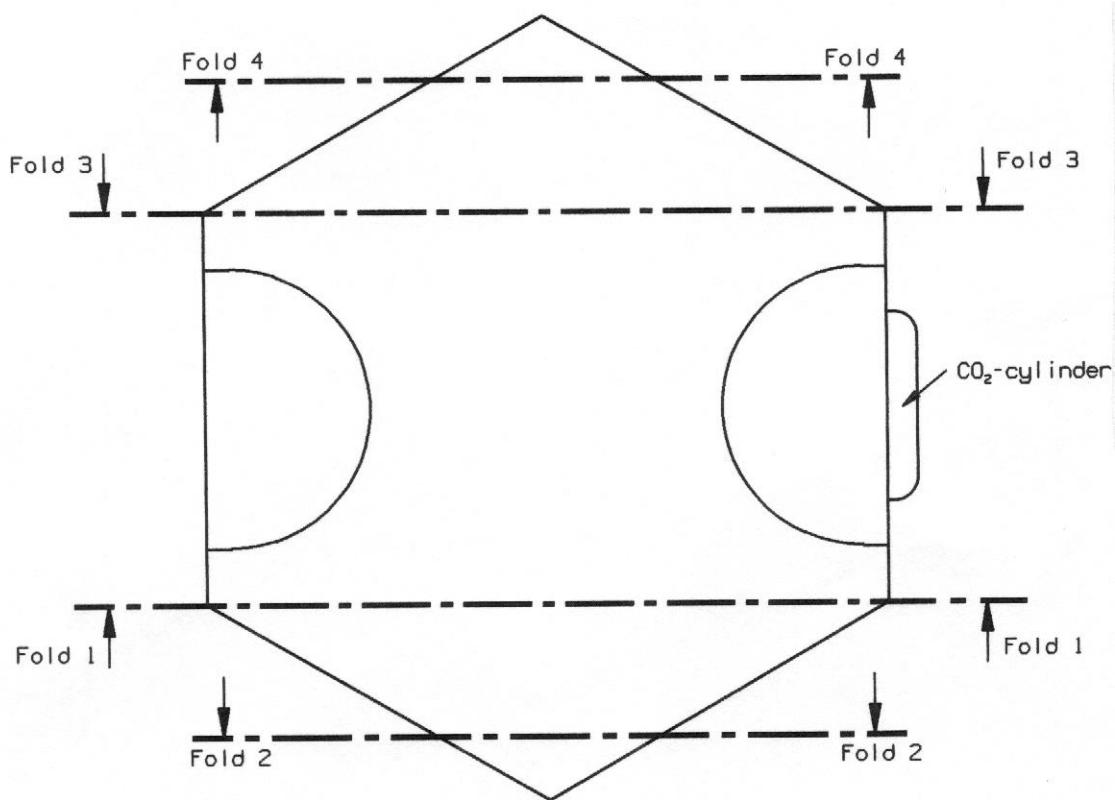
**Remove the 2 auxiliary belts !**

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : Issue : 10/97	40
--	---	-------------------------------------	----

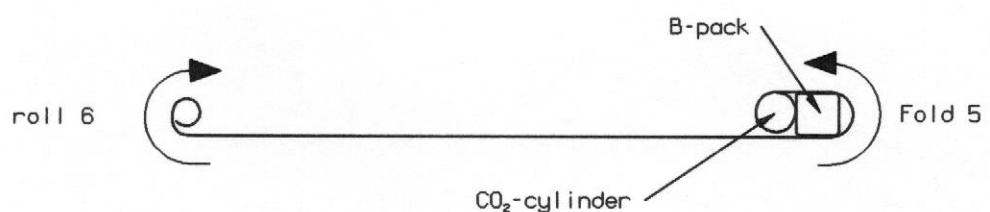
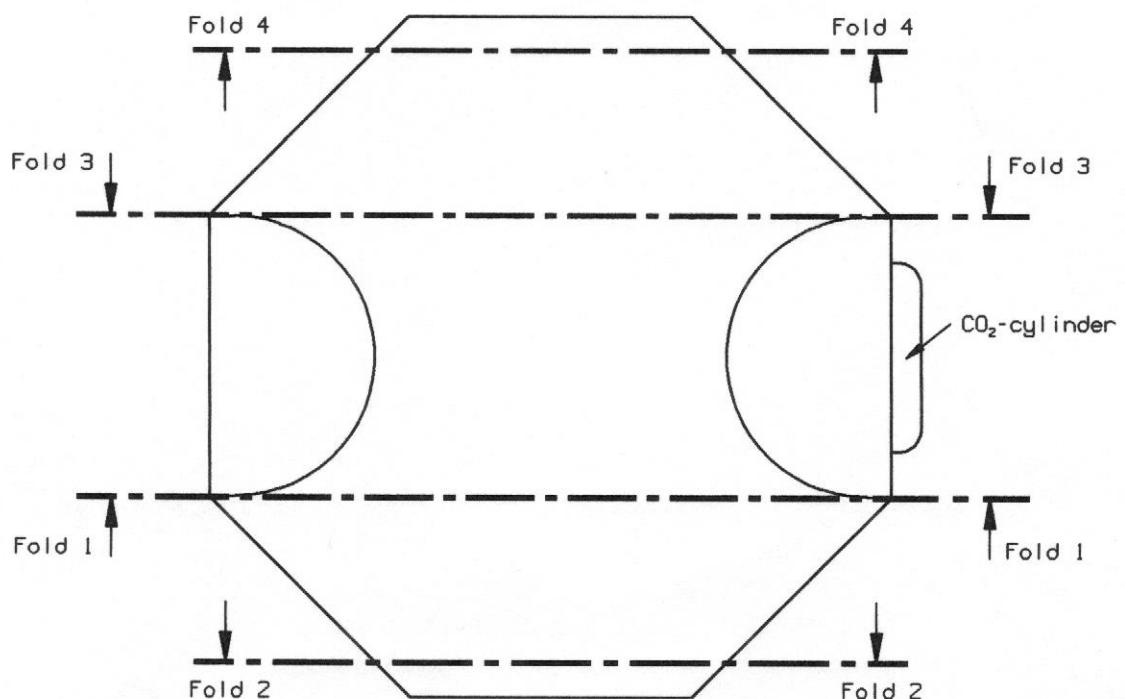
4.2.2.2 LR 97 for 10, 12, 15, 16, 20 and 25 persons

4.2.2.2.1 Folding scheme

LR 97 for 10, 12 and 16 persons

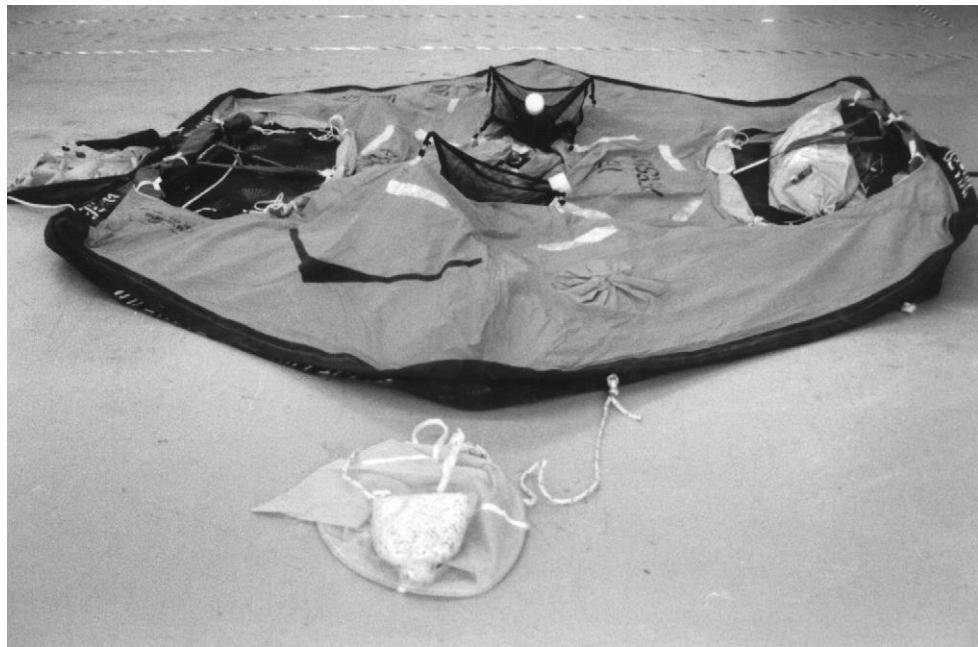


LR 97 for 20 and 25 persons



4.2.2.2.2 Folding procedure illustrated in pictures, here: „LR 97 - 16 persons“

4.2.2.2.1 picture 1



raft equipped and deflated

4.2.2.2.2.1 First and second folding = Fold 1 and 2

picture 2



The raft must be folded so it is the same width as the emergency pack. Fold the left side in to make fold 1. Half of this fold must be turned back to make fold 2. Place the sea anchor in a convenient position.

4.2.2.2.3 Third folding = Fold 3

picture 3



Fold the right side in as shown in the photograph.

4.2.2.2.4 Fourth folding = Fold 4

picture 4



Half of fold 3 must be turned back to make fold 4.  
Lay the radar reflectors parallel to the rolling direction.

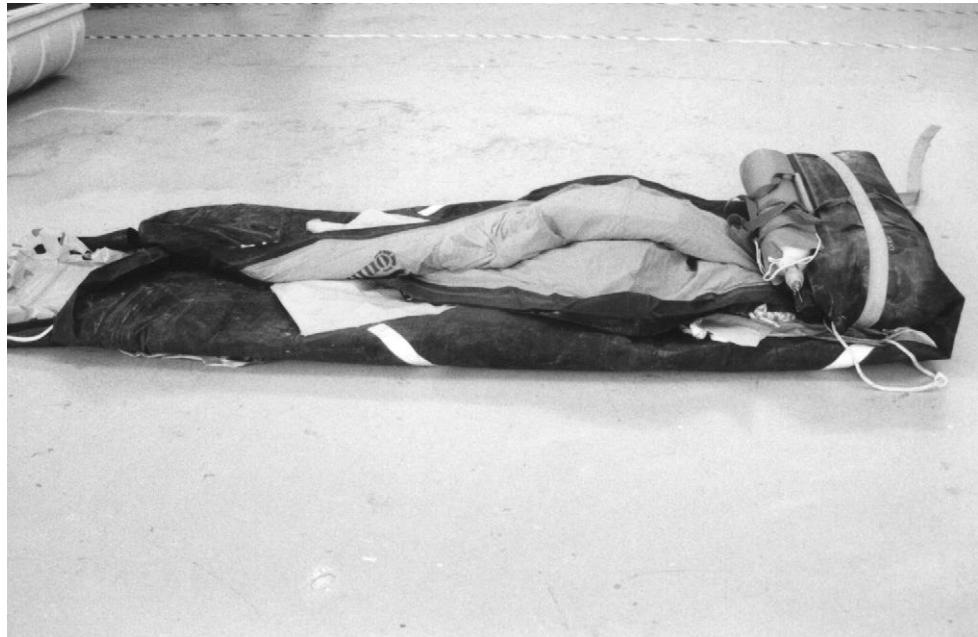
4.2.2.2.5 picture 5



To secure the raft pack place an auxiliary belt around it near the emergency pack.

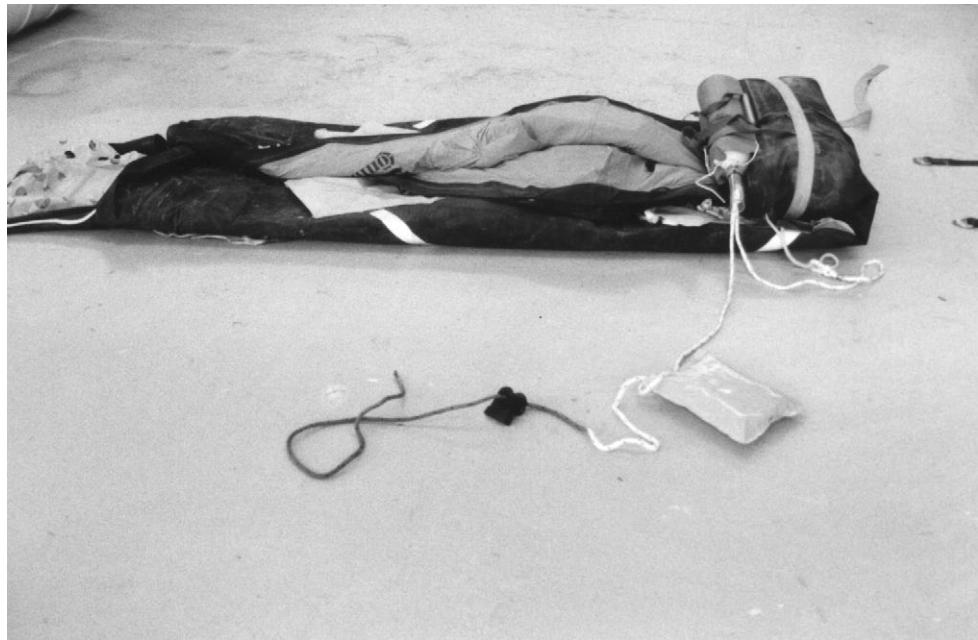
4.2.2.2.6 Fifth folding = Fold 5

picture 6



Fold the emergency pack with the CO<sub>2</sub>-cylinder.

4.2.2.2.7 .picture 7



Because of the short C0<sub>2</sub>-cylinder, the firing line sewn to the painter should be tied to the release wire on the operating head and the painter line tied to the towing bridle (Hahnepot), see item 4.4.3.3.

**All work should now be carried out very carefully to avoid activating the C0<sub>2</sub>- inflation system.**

- 4.2.2.2.8 Make a small fold at the end opposite the C0<sub>2</sub>-cylinder and fold the boarding arrangement outline in the sketches under item 4.2.1.2. Ensure the rigid rods are parallel to the rolling direction.

picture 8

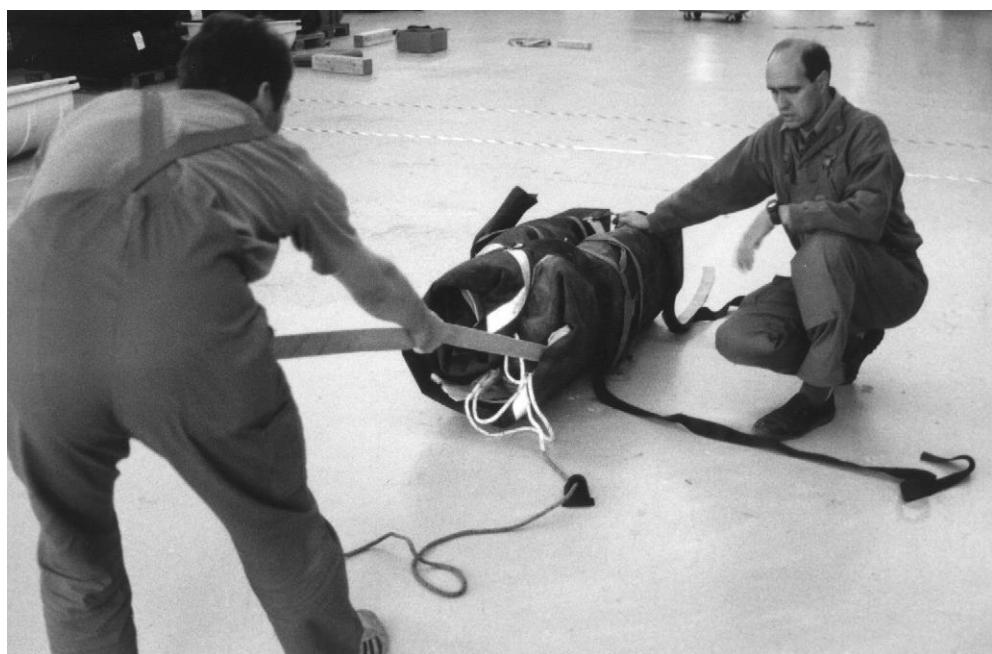


4.2.2.2.8 picture 9



Firmly roll the raft pack towards C0<sub>2</sub>-cylinder.

4.2.2.2.10 picture 10



Slightly lift the rolled raft pack and place it on the pack with C0<sub>2</sub>-cylinder and emergency pack. Lead 2 auxiliary belts around the complete raft pack and pull together

4.2.2.2.11 picture 11



Secure the raft pack with 3 packing bands (flax webbing -  
Art.-No. 0.03.01.05.0)

**Remove the 3 auxiliary belts !**

4.2.2.3 LR 97 L for 12, 16, 20, and 25 persons

4.2.2.3.1 LR 97 L for 12, 16, 20 and 25 persons

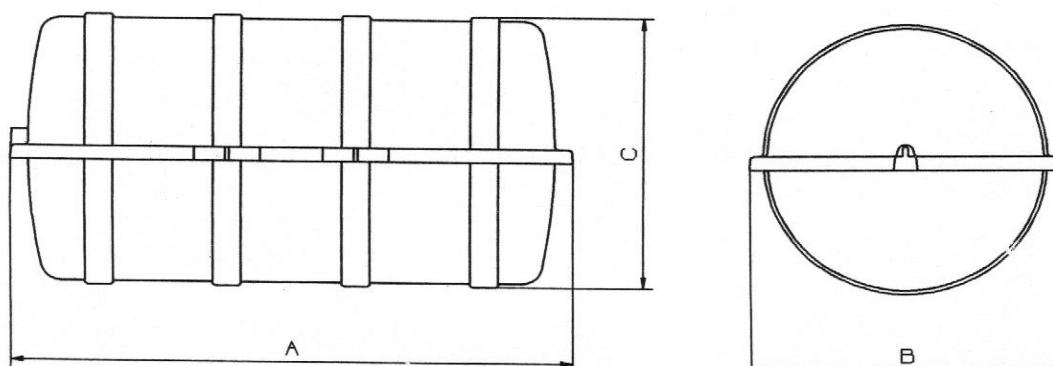
*(will be submitted later)*

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : Issue : 10/97	50
--	---	-------------------------------------	----

## 4.3 Packing of the liferaft in container

### 4.3.1 Container - coordination and measurements - max. height of dropping: 25 m -

The LR 97 liferaft series have no differences in the construction of a container for throw-over board liferaft or davit-launchable liferaft.



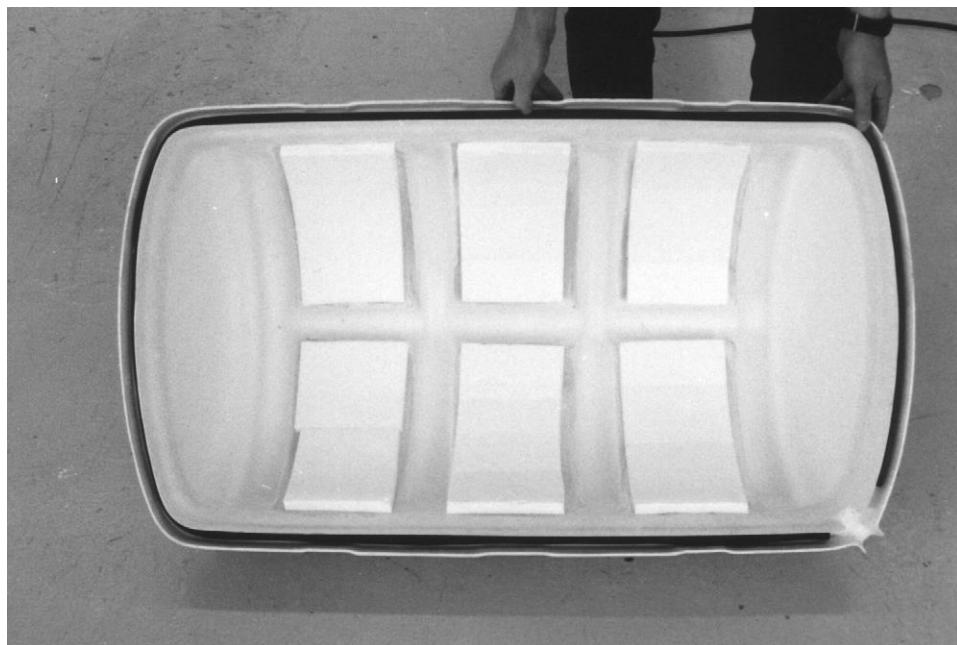
Liferaft	Container-type SOLAS A - Pack	Container-type SOLAS B - Pack
LR 97 for 6 und 8 persons	6 / 8 F	4 N + 20 mm Styropor
LR 97 for 10 und 12 persons	10/12 F	6/8 F
LR 97 for 15 und 16 persons	16/20 F	10/12 F + 20 mm Styropor
LR 97 for 20 persons	25 F	10/12 F
LR 97 for 25 persons	25 F	16/20 F
LR 97 L for 12 persons	10/12 F	10/12 F
LR 97 L for 16 persons	16/20 F	10/12 F
LR 97 L for 20 persons	25 F	16/20 F
LR 97 L for 25 persons	25 F	16/20 F

Container - type	measurement (mm) A	measusrement (mm) B	measurement (mm) C
4 N	1080	610	580
6/8 F	1244	650	580
10/12 F	1304	680	610
16/20 F	1354	710	640
25 F	1400	780	710

## 4.3.2 Container - Coating with Styropor

### 4.3.2.1 The inside of upper and lower case of the container

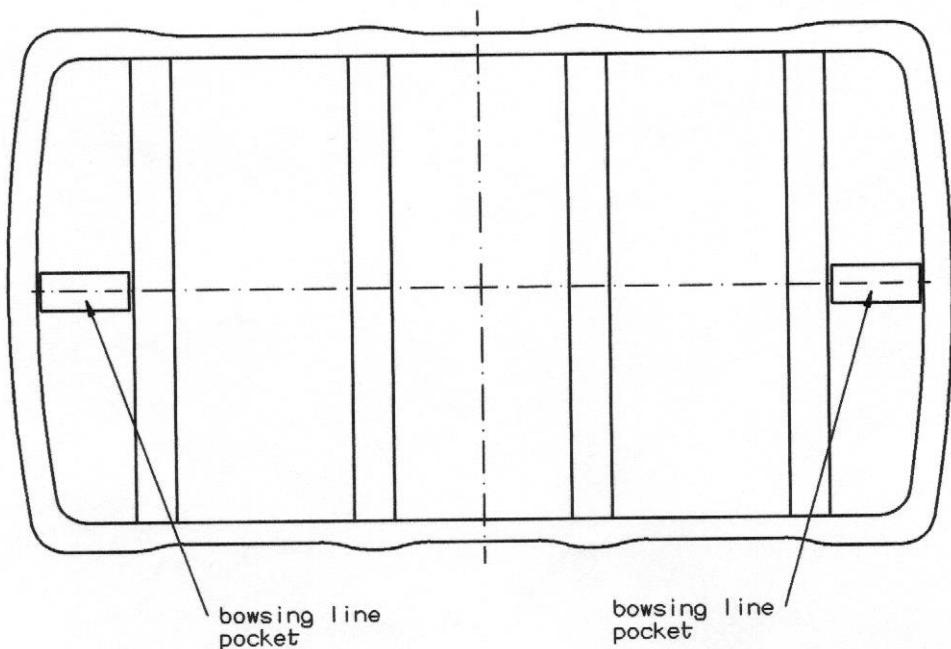
4 N for LR 97 - 6 and 8 persons with SOLAS-B-Pack  
and 10/12 F for LR 97 -15 and 16 persons with SOLAS-B-Pack  
is coated with 20 mm Styropor.



DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : Issue : 10/97	52
--	---	-------------------------------------	----

#### 4.3.2.2 Lower case for davit-launchable liferafts

- view into lower case -



### **4.3.3 Packing of liferaft into the container**

**4.3.3.1 For trial purposes put the liferaft into the proper container lower case**

**- throw-over-board liferaft -**



**- davit-launchable liferaft -**



The shackle must be reached easily.

Put on the upper half of the container and make the following checks:

- 1) The upper half of the container must be resting on the raft body
- 2) The edges of the upper and lower halves of the container must meet at least halfway.

If the edges of the container do not meet properly the raft roll is too loose and the raft will have to be tightened further using the auxiliary belts.

If the upper half does not rest on the raft body even though it has the correct pack length, loosen the auxiliary belts slightly until the container does rest on the raft body.

The centre of gravity of the container can be found in table 4.3.3.4.6

The raft may now be rolled out of the lower half of the container.

If not done previously, place the pack belts, flax webbing, Art. no. 0.03.01.05.0, alongside the auxiliary belts around the raft and securely tie them using double knots.

#### **Remove the auxiliary belts !**

##### **4.3.3.2 Check of container**

Re-examine each container half to make sure that the inside is free of foreign bodies, that they are dry und clean, that the water drain holes in the lower half are open and that the rubber sealing profile is not damaged.

Slightly damaged GFK containers may be repaired in a suitable workshop. In case of serious damage to a container, it must be replaced. Damaged, brittle or cracked rubber sealing profiles must be replaced using adhesive 2444.

Styropor foam linings that are damaged or crushed must be replaced using adhesive 2397.

Replace labels as necessary.

The self adhesive service label has only one line. Existing information must be removed and new information inserted. This information must include the date of service, the date of next service and the name of the station carrying out the service.

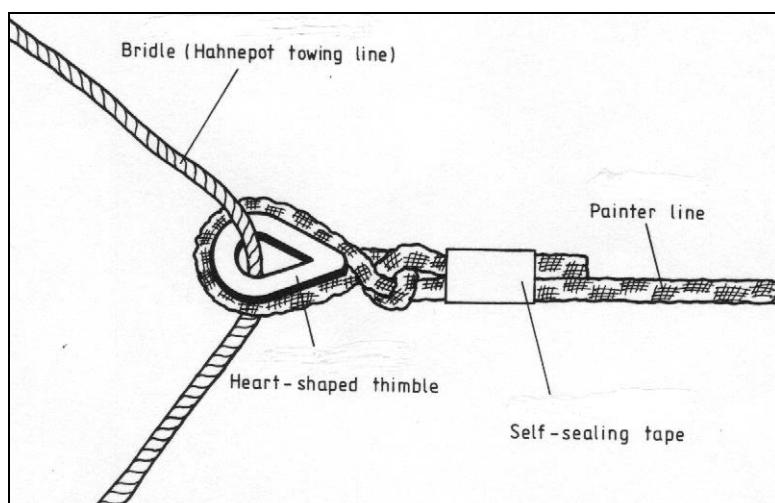
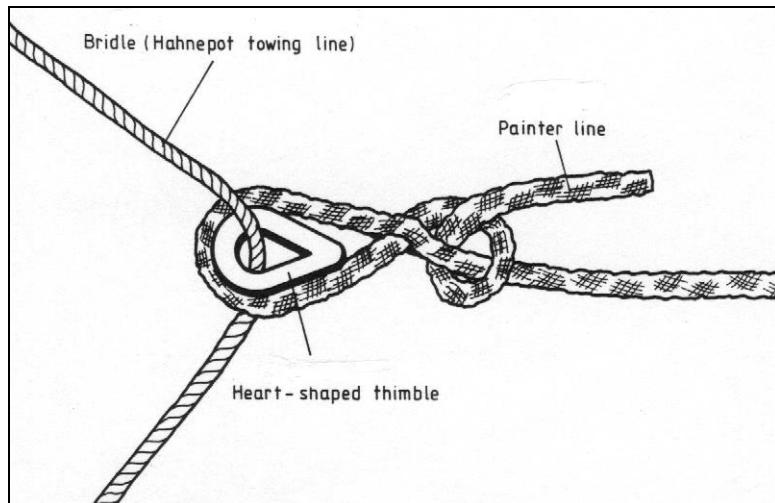
We recommend the use of DYMO Electronic Labelmaker 4500, black printed tape or similar.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : Issue : 10/97	55
--	---	-------------------------------------	----

#### 4.3.3.3 Fastening of the firing line

##### a) painter line

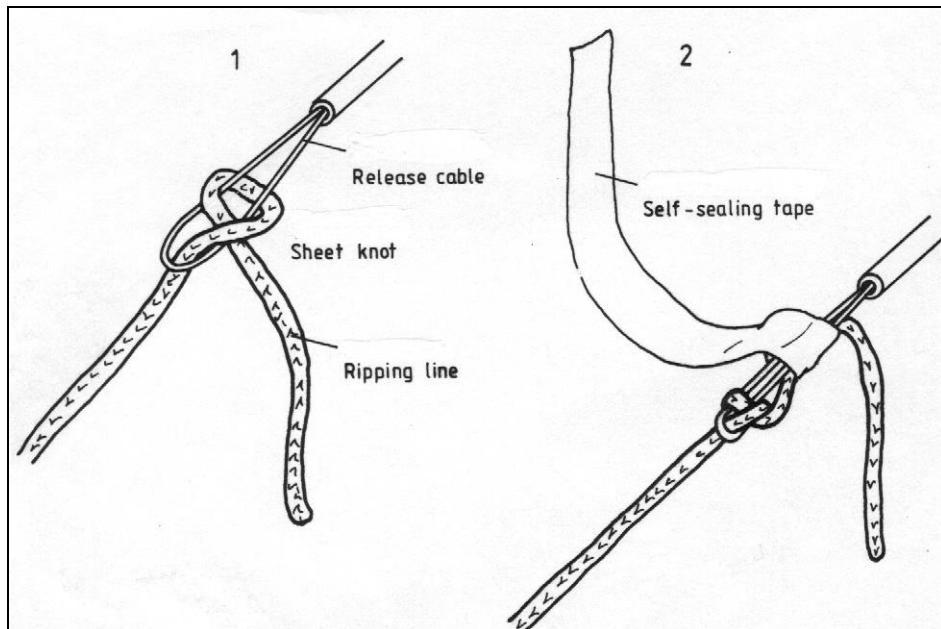
Take the unimpregnated end of the painter line and splice around the thimble of the towing bridle (Hahnepot). Secure the splice with a half hitch knot and fasten the end with self adhesive tape as pictured below.



b) firing line

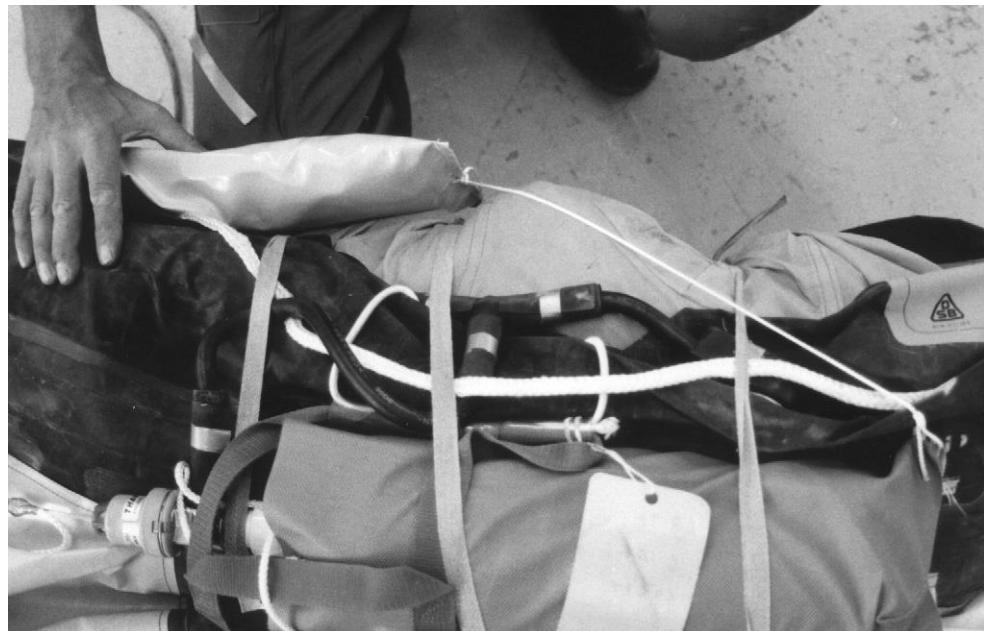
Lead the 50 cm long end of the firing line, which is sewn to the painter, to the release wire on the operating head. Connect it using a sheetbend knot and secure the knot with self adhesive tape.

**Attention !** Handle with care to avoid firing the cylinder.



c) Fastening the painter line bag

Tie the bag to the cylinder pocket using the 3 mm line provided to ensure the bag will not move when the painter line is pulled.



DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Chapter : 4 page : Issue : 10/97	58
--	---	-------------------------------------	----

4.3.3.4      Packing of raft in container

4.3.3.4.1    Lay out the container lower case with undamaged PVC-foil  
- 2 m width - ( Art.-No. 0.10.11.60 ).

Container size	necessary length of PVC-foil
4 N and 6 / 8 F	2,30 m
10 / 12 F and 16 / 20 F	2,50 m
25 F	2,70 m



4.3.3.4.2 Rolling the raft pack into container lower case

- pay attention to centre of gravity -



#### 4.3.3.4.3 Davit launchable liferafts only

If not already done, make a small cut in each flax pack belt above the CO<sub>2</sub>-cylinder (not more than half the width of the flax).



#### 4.3.3.4.4 Closing of packing PVC-foil

Lead the painter line to the end of the container.

Davit launchable liferafts:

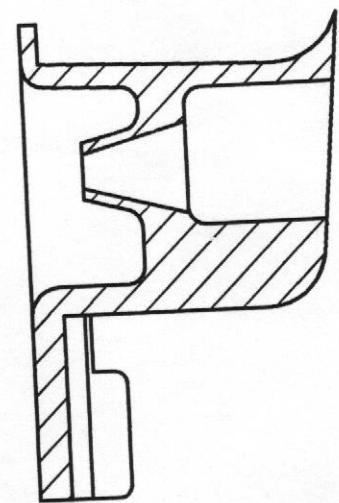
- a) Cut the PVC-foil in the area of the lifting shackle and lay the shackle outside the foil.
- b) Lead the bowsing lines to each end of the raft and stuff into the bags located on the inside of the lower half of the container.  
(See „Stuffing painter line“ in Annex 1).  
The free end of the line must protrude out of the bag.



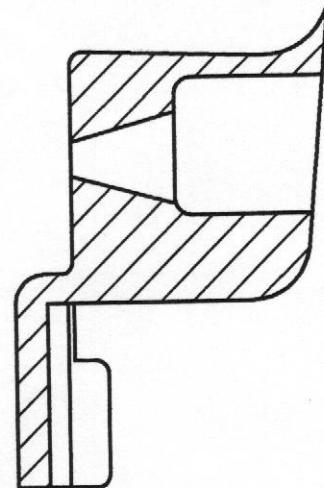
4.3.3.4.5 If necessary, pull the painter seal onto the painter line and secure teh thimble.

**Note:** The painter seal of the old „E“ container and the new „F“ container are of different construction.

**E - Container**

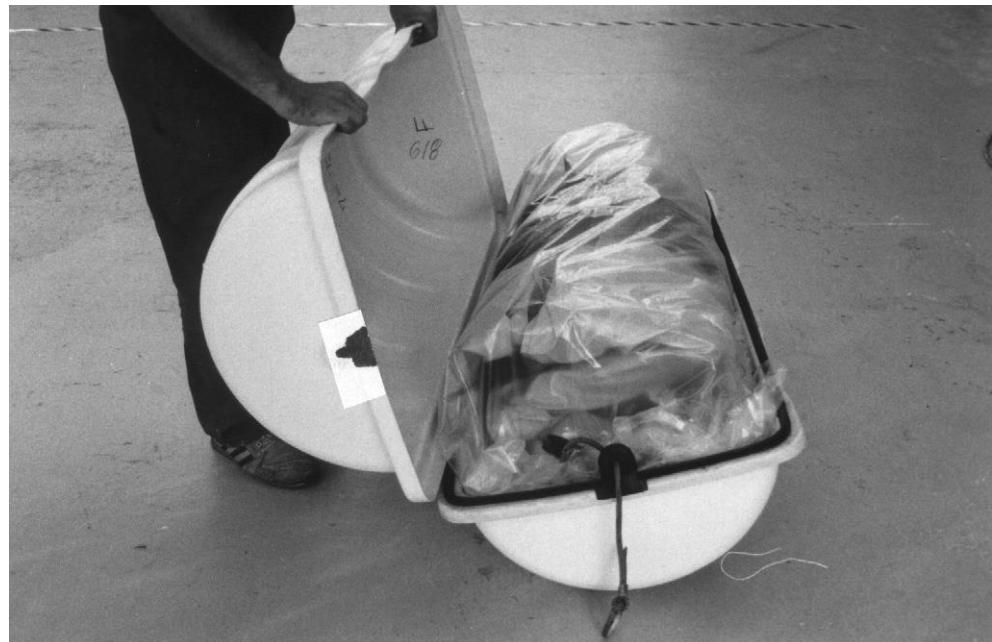


**F - Container**



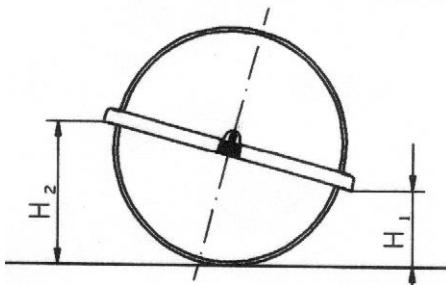


4.3.3.4.6 To check the centre of gravity close the container.

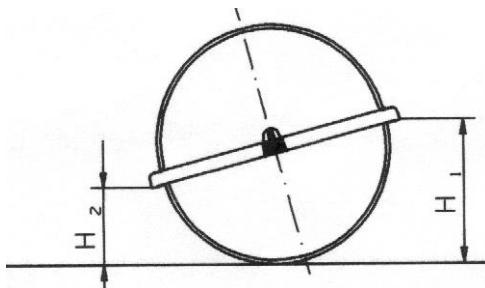


The correct position is found when the measurements  $H_1$  and  $H_2$  are in accordance with the table shown on page 65.

to  
4.3.3.4.6



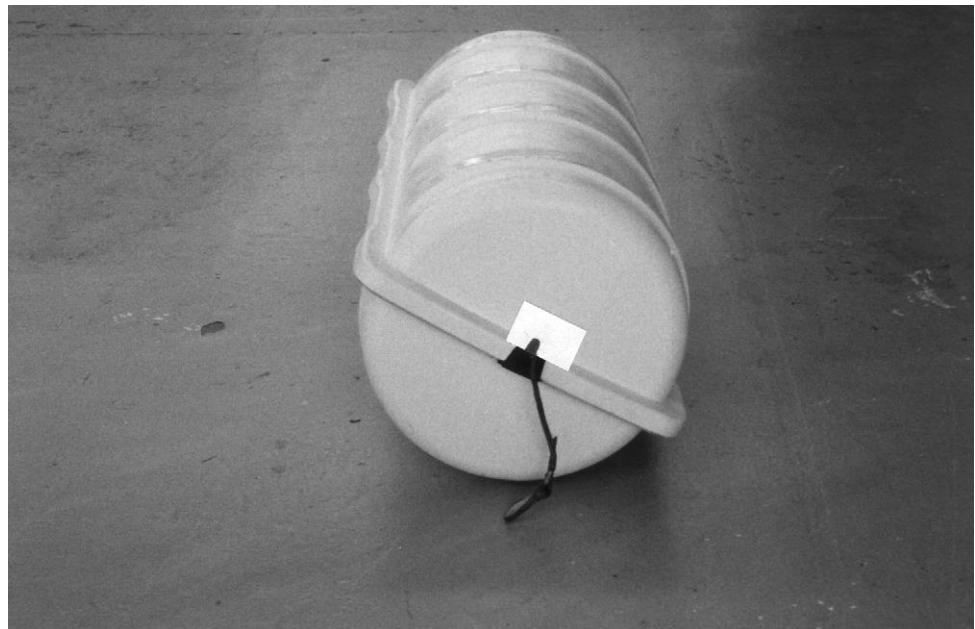
<b>throw-over-board liferafts</b>	<b>A-Pack</b>	<b>Container Size</b>	<b><math>H_1</math></b>	<b><math>H_2</math></b>
6	x	6/8 F	18 cm	39 cm
8	x	6/8 F	18 cm	
10/12	x	10/12 F	18 cm	
16	x	16/20 F	24 cm	37 cm
20	x	25	24 cm	
25	x	25 F	24 cm	



<b>davit-launchable liferafts</b>	<b>A-Pack</b>	<b>Container Size</b>	<b><math>H_1</math></b>	<b><math>H_2</math></b>
12	x	10/12 F	49 cm	
16	x	16/20 F	49 cm	
20	x	25	49 cm	
25	x	25 F	49 cm	19,5 cm

<b>throw-over-board liferafts</b>	<b>B-Pack</b>	<b>Container Size</b>	<b><math>H_1</math></b>	<b><math>H_2</math></b>
6	x	4 N	32 cm	22 cm
8	x	4 N	32 cm	
10/12	x	6/8 F	32 cm	
16	x	10/12 F	32 cm	22 cm
20	x	10/12 F	32 cm	
25	x	16/20 F	32 cm	

It is possible to correct the position of centre of gravity by turning the raft pack in the container.



#### 4.3.4 Closing the container

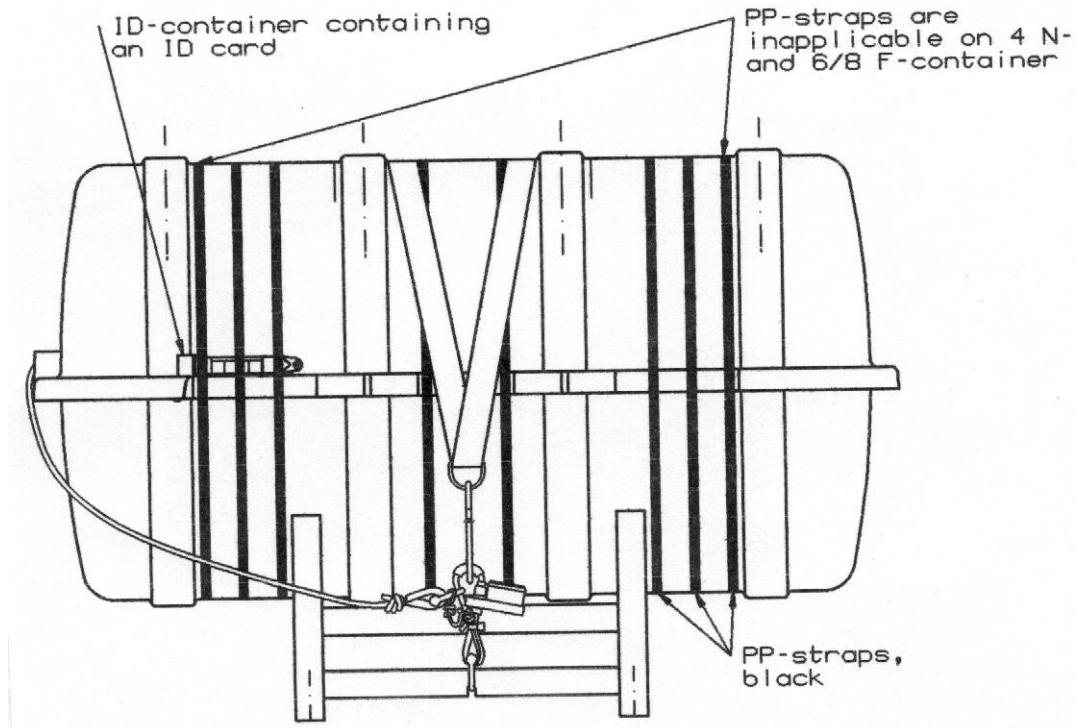
First the painter seal must be glued in place using adhesive „Terokal 2444“, then close the container.

##### 4.3.4.1 Fastening of container closing straps

Use new closing straps (PP-strap) on **each** service.

**Attention !** Only use original DSB closing straps.  
Order **only** by DSB with article-no.  
(see pages 68 and 69)

##### 4.3.4.1.1 number and arrangement of closing straps

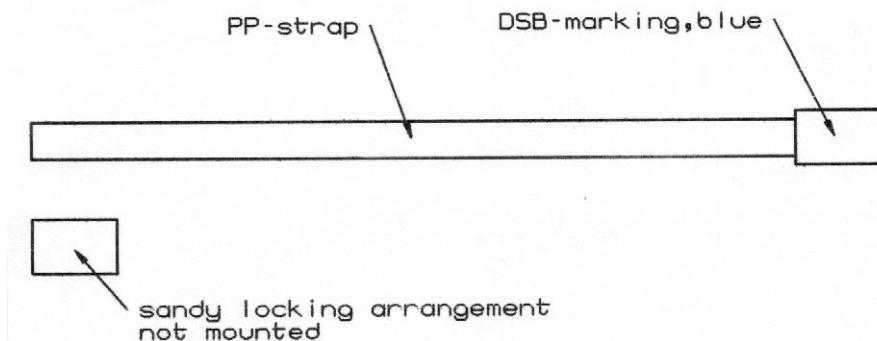


**Note:** Please stock up sufficient pieces of closing straps.

- a) Closing straps (2,50 m length) for throw-over board liferafts in container

proper for container	required number on each container
4 N and 6/8 F	6 pieces
10/12 F, 16/20 F, 25 F	8 pieces

The straps, packed by 50 pieces (part.-no. 0.03.03.17.0), and packed by 100 pieces (part-no. 0.03.03.18.0), to be ordered on DSB.

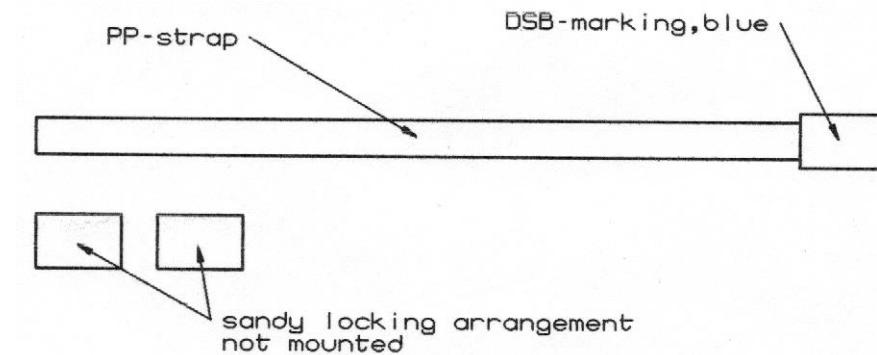


- b) Closing straps for davit-launched liferafts in container

1. closing strap complete, with hand loop

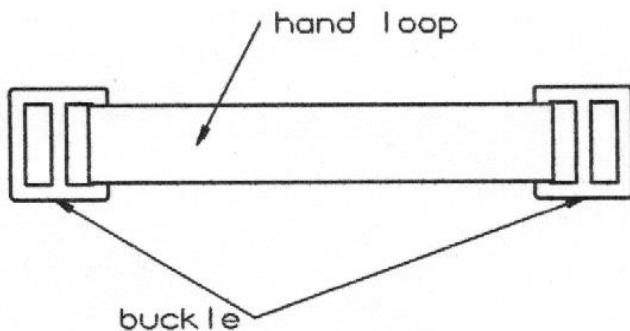
proper for container	required number on each container
10/12 F, 16/20 F, 25 F	8 pieces

The straps, packed by 50 pieces, part.-no. 0.03.03.16.0, to be ordered on DSB.



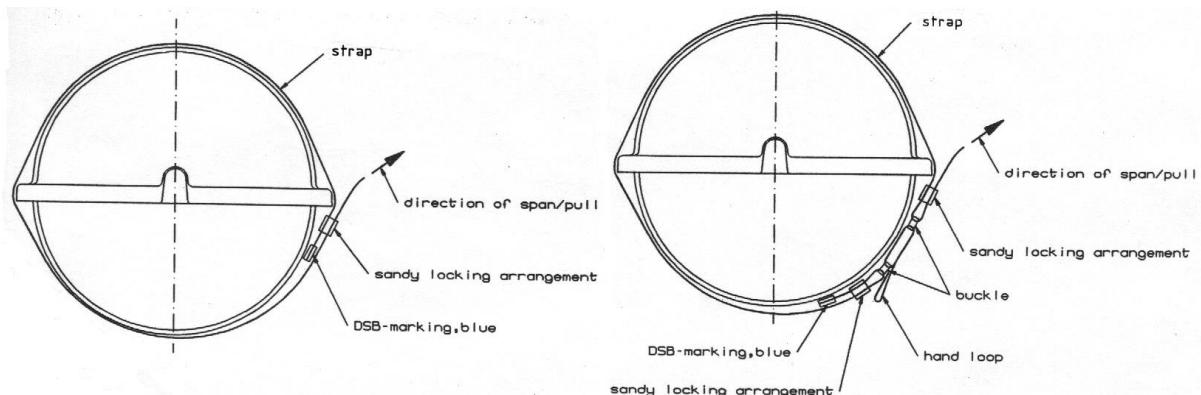
## 2. Ripping up loop, complete

The complete ripping up loop, packed by 10 pieces  
(part-no: 8.03.03.36.0) to be ordered on DSB.



### 4.3.4.1.2 Mounting of closing straps

The closing straps must be mounted as demonstrated in the sketch below.



The following tools are needed for mounting:

- |                  |                            |
|------------------|----------------------------|
| 1 ST-D Tensioner | DSB-art.-no.: 0.11.06.00.0 |
| 1 sealing tool   | DSB-art.-no.: 0.11.06.01.0 |

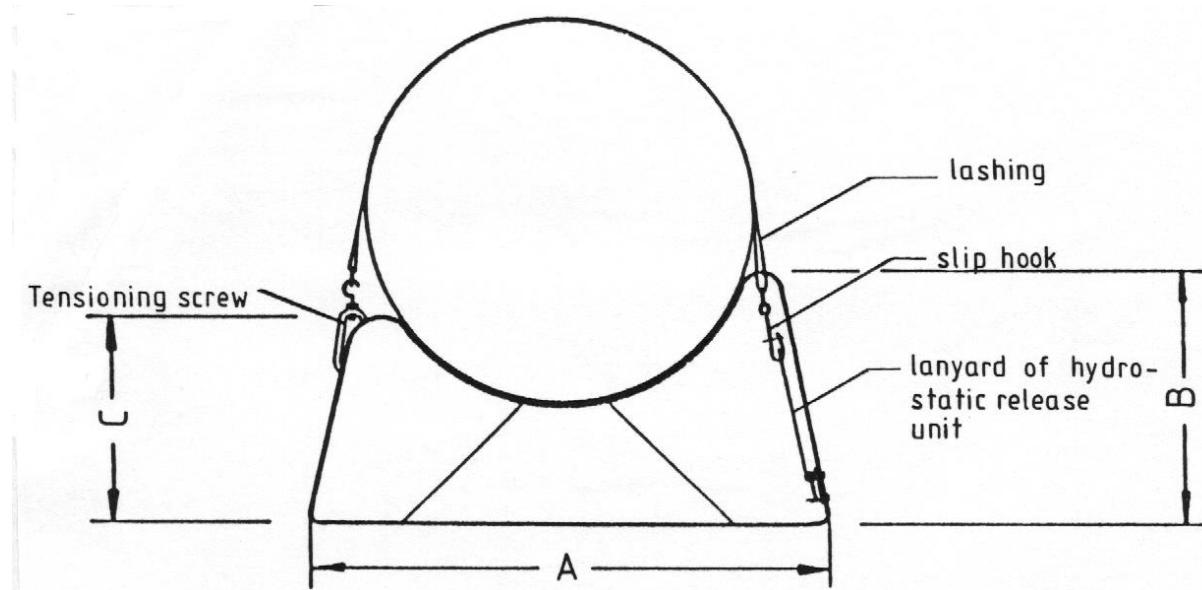
For spare, each ST-D Tensioner:

- |              |                            |
|--------------|----------------------------|
| 2 feedwheels | DSB-art.-no.: 0.11.06.02.0 |
|--------------|----------------------------|

**Fastening of straps according to Annex 12.**

## 5. Cradle and hydrostatic release unit

### 5.1 Coordination: Container - Cradle - Lashing

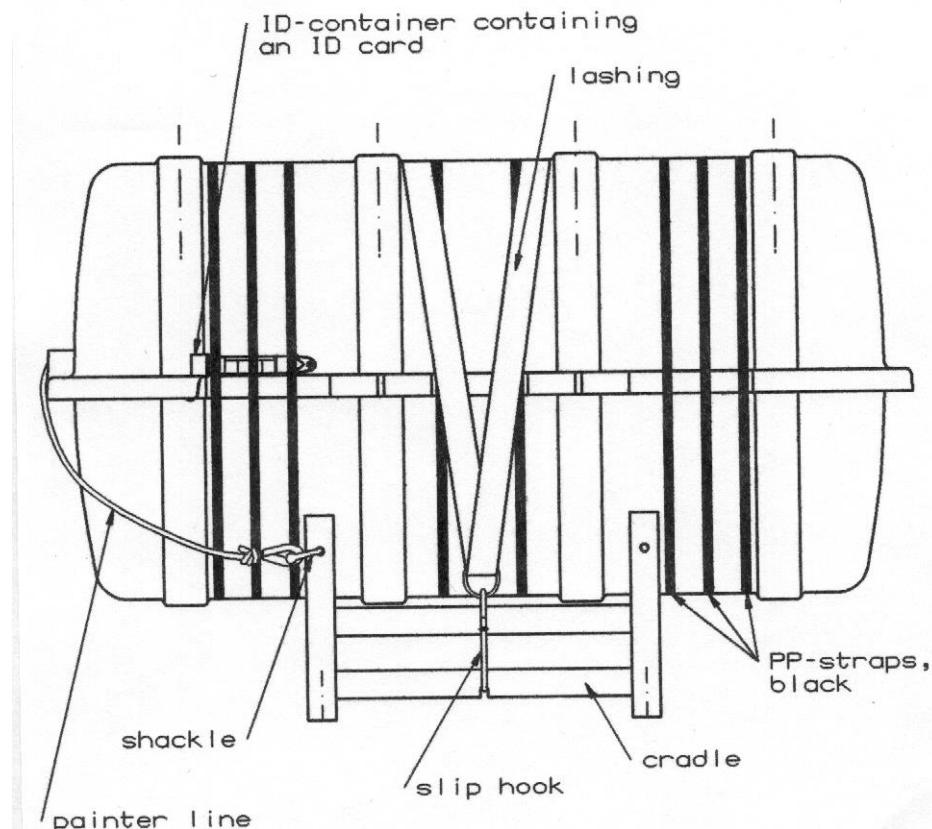


Container	Cradle Type	Cradle Art.-No.	Dimensions			Lashing Art.-No.
			A	B	C	
4 N	6/8	8.07.25.29.0	660	340	285	8.03.03.84.0
6/8 F	6/8	8.07.25.29.0	660	340	285	8.03.03.85.0
10/12 F	10/12	8.07.25.30.0	690	345	290	8.03.03.85.0
16/20 F	16/20	8.07.25.31.0	720	362	305	8.03.03.85.0
25 F	25	8.07.25.32.0	798	395	335	8.03.03.85.0

## **5.2. Mounting of container**

### **5.2.1 With lashing and line strop**

5.2.1.1 Put the container into the proper cradle, place the lashing strap over the container and open the hook of the tensioning screw as far as possible. Place the hook of the tensioning screw into the hole on the cradle, than fasten the slip hook on the cradle.



Thighten the tensioning screw to ensure a firm lashing on the container.

5.2.1.2 Attach the eye (thimble) of the painter line to the shackle of the cradle.

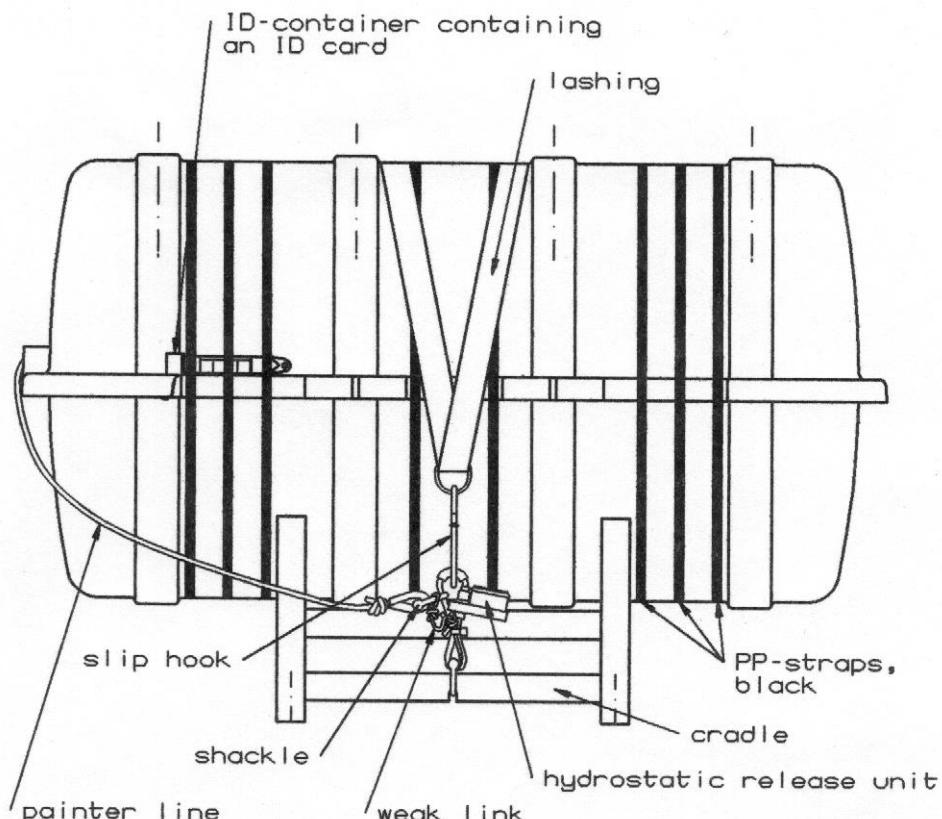
DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-Nr.: 8.09.57.11.0	Chapter: 5 page 2 Issue : 10/97
--	---	------------------------------------

## 5.2.2 With lashing and hydrostatic release unit

Put the container with lashing and hydrostatic release unit into the proper cradle. Place the lashing strap over the container and open the hooks of tensioning screw as far as possible. Place one hook of the tensioning screw into the holee on the cradle and the other hook into the D-ring of the lashing strap. Lead the slip hook through the eye of the hydrostatic release unit and fasten, then tighten tensioning screw until the container is firmly lashed.

Connect the thimble of the painter line and the red weak link with a shackle. Then attach the shackle to the rope eye on the hydrostatic release unit.

(See also installation instructions for hydrostatic release unit „Hammar H 20“)

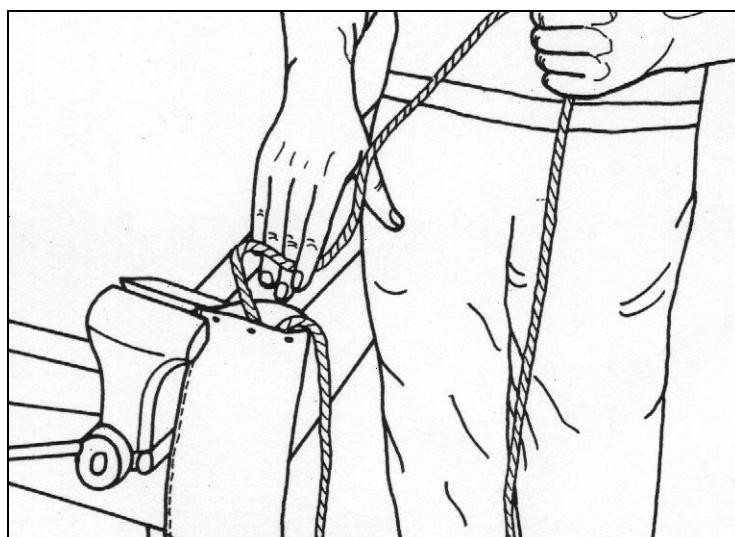
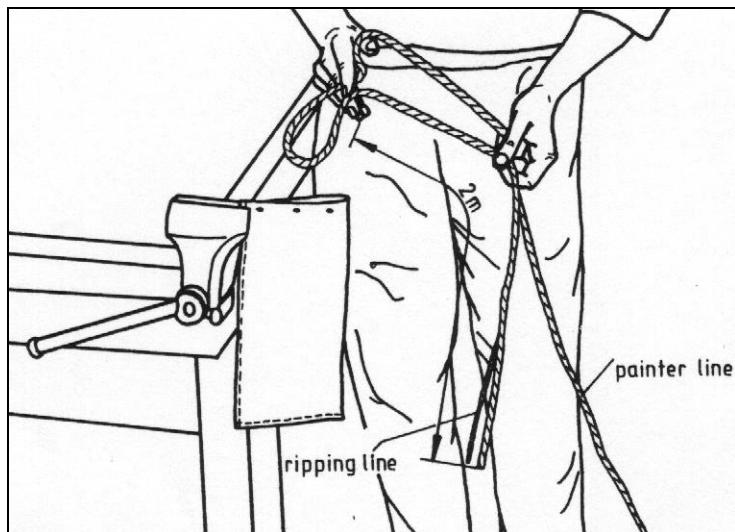


## Annex 1

### Stuffing painter line into the bag

Stuffing of the painter line must be carried out with **utmost care**. If entanglements and/or knots should occur when pulling the line, the firing of the inflating device is endangered.

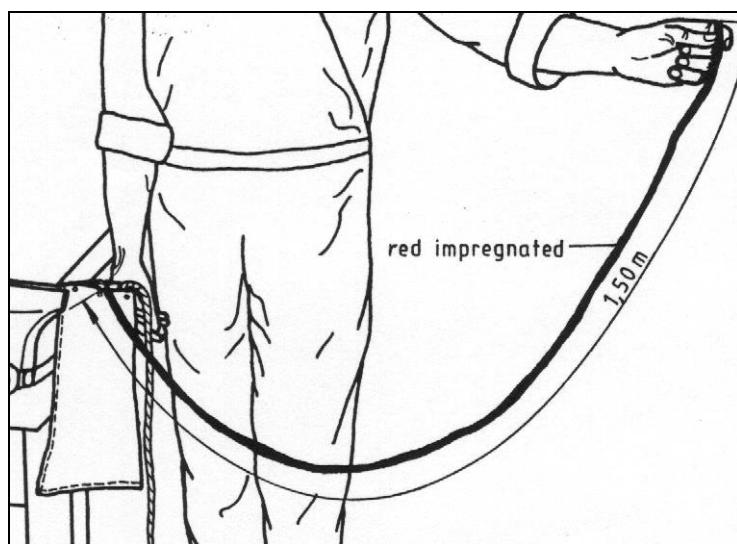
Clamp the bag into a vice. Get hold of the painter line to be stuffed as shown on picture about 2 m from the line end where the ripping line is sewn to and stuff the long end of line into the bag forming loops.



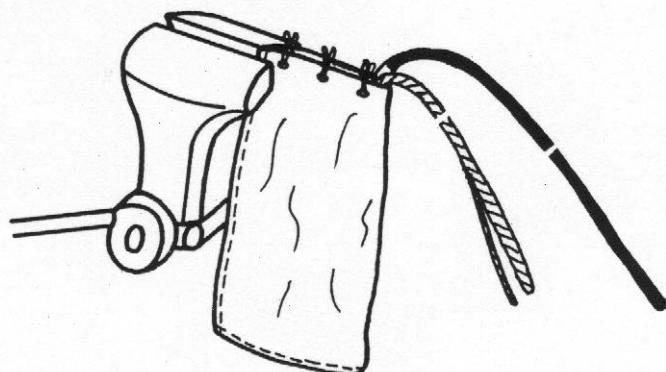
DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 1, page 1 Issue: 10/97
--	---	---------------------------------

## ANNEX 1 continued

This stuffing procedure has to be continued until about 1.50 m of the red impregnated end of line remain.



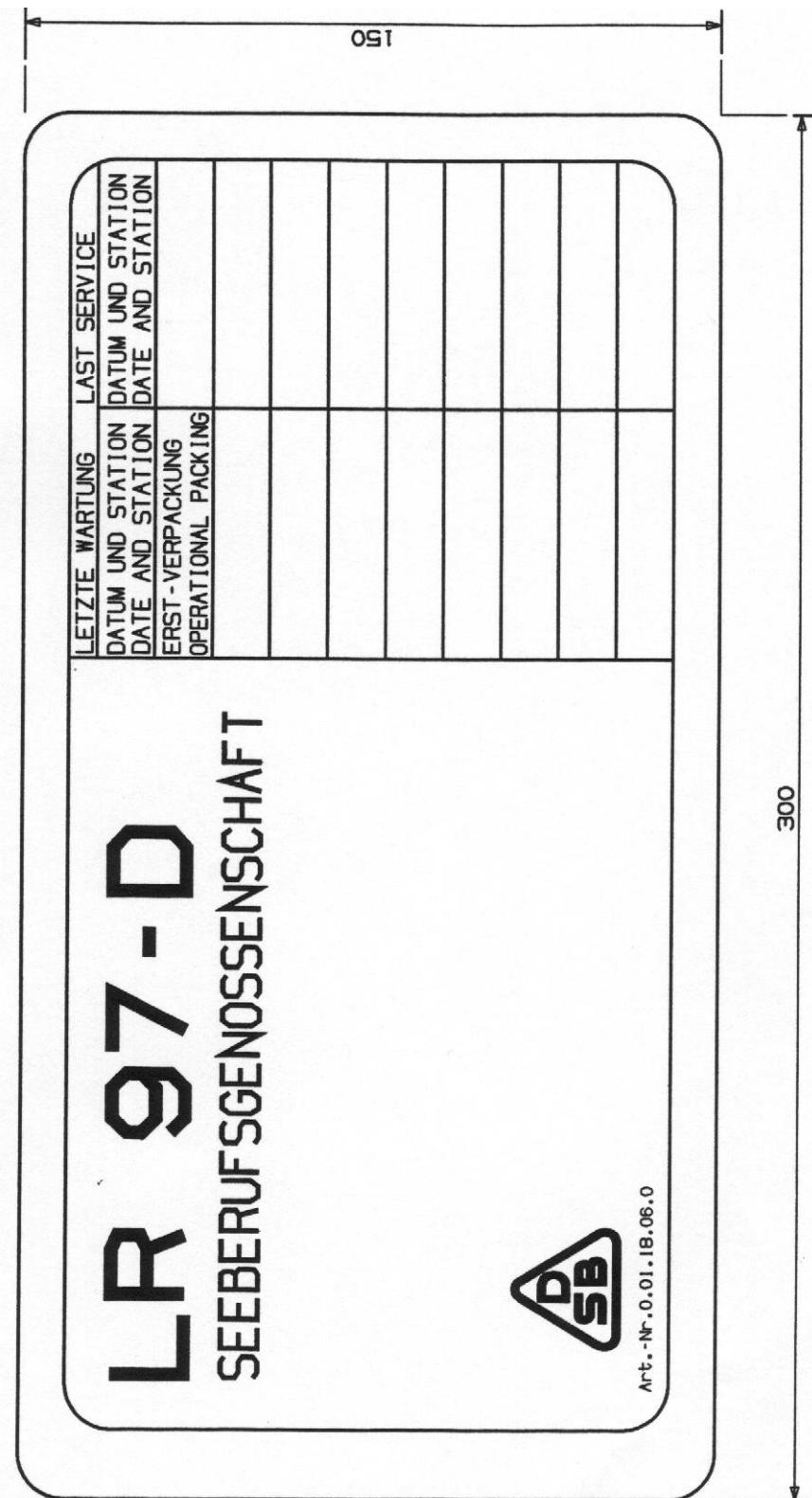
Thread (cotton, mercerised, 20 N tensile strength)  
knotted with 2x 1/2 turn.



After that the bag has to be closed on the 3 holes with thread which has been knotted 2 x 1/2 turns.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 1, page 2 Issue: 10/97
--	---	---------------------------------

## ANNEX 2



## ANNEX 3

DSB LIFERAFT EMERGENCY EQUIPMENT S.O.L.A.S. 74/88														
DSB Rettungsflöß - Notausrüstung S.O.L.A.S. 74/88														
LR 97 .... / .... Pers. No. .... SOLAS ... PACK														
SBG PACK SOLAS B+	SOLAS PACK A	SOLAS PACK B	CONTENTS OF THE EMERGENCY PACK			6 Pers.	8 Pers.	10 Pers.	12 Pers.	15 Pers.	16 Pers.	20 Pers.	25 Pers.	
x	x	x	SEA ANCHOR with line			1	1	1	1	1	1	1	1	
x	x	x	TABLE OF LIFE SAVING SIGNALS			1	1	1	1	1	1	1	1	
x	x	x	INSTRUCTIONS ON HOW TO SURVIVE			1	1	1	1	1	1	1	1	
x	x	x	TORCH(Signalling)			1	1	1	1	1	1	1	1	
x	x	x	TORCH BATTERY (Spare)			2	2	2	2	2	2	2	2	
x	x	x	TORCH BULB (Spare)			1	1	1	1	1	1	1	1	
x	x	x	ANTI SEASICKNESS TABLETS			36	48	60	72	90	96	120	150	
x	x	x	FIRST AID OUTFIT			1	1	1	1	1	1	1	1	
x	x	x	SEASICKNESS BAG			6	8	10	12	15	16	20	25	
x	x	½x	HANDFLARES			6	6	6	6	6	6	6	6	
x	x	½x	ROCKET PARACHUTE FLARES			4	4	4	4	4	4	4	4	
x	x	½x	BUOYANT SMOKE SIGNALS			2	2	2	2	2	2	2	2	
x	x	x	DAYLIGHT SIGNALLING MIRROR			1	1	1	1	1	1	1	1	
x	x	x	SPONGE			2	2	2	2	2	2	2	2	
x	x	x	SET OF FISHING TACKLE			1	1	1	1	1	1	1	1	
x	x	x	FOOD RATION (kg)			3	4	5	6	7,5	8	10	12,5	
x	x	x	FRESH' WATER (bags)			90	120	150	180	225	240	300	375	
x	x	x	DRINKING VESSEL			1	1	1	1	1	1	1	1	
x	x	x	SAFETY KNIFE			-	-	-	-	1	1	1	1	
x	x	x	WHISTLE, non metallic			1	1	1	1	1	1	1	1	
x	x	x	BAILER			-	-	-	-	1	1	1	1	
x	x	x	THERMAL PROTECTIVE AID			2	2	2	2	2	2	2	3	
x	x	x	TIN OPENER			3	3	3	3	3	3	3	3	
x	x	x	RAIN WATER COLLECTING BAG			3	3	3	3	3	3	3	3	
x	x	x	PIERCING STRAWS			3	3	3	3	3	3	3	3	
x	x	x	RADAR REFLECTOR			1	1	1	1	1	1	1	1	
INSIDE THE RAFT:													Im Flöß:	
x	x	x	PADDLE, buoyant			2	2	2	2	2	2	2	2	
x	x	x	INSTRUCTIONS F IMMEDIATE ACTION			1	1	1	1	1	1	1	1	
x	x	x	INSTRUCTIONS F SUBSEQUENT ACTION			1	1	1	1	1	1	1	1	
x	x	x	BELLOWS WITH HOSE			1	1	1	1	1	1	1	1	
x	x	x	REPAIR OUTFIT			1	1	1	1	1	1	1	1	
x	x	x	BAILER			1	1	1	1	1	1	1	1	
x	x	x	BUOYANT RESCUE QUOIT			1	1	1	1	1	1	1	1	
x	x	x	SAFETY KNIFE			1	1	1	1	1	1	1	1	
x	x	x	SEA ANCHOR, with line			1	1	1	1	1	1	1	1	
x	x	x	RADAR REFLECTOR			2	2	2	2	2	2	2	2	
RAFTS APPROVED BY SBG. RADARREFLECTORS ARE MOUNTED ON THE CANOPY. Rettungsflöße zugelassen von SBG. Radarreflektoren sind montiert auf dem Dach.														
PACK CONTENTS TO BE EXAMINED AT EACH SERVICING AND DEFECTIVE ITEMS REPLACED Vollzähligkeit und Gebrauchsfähigkeit der Notausrüstung muß bei jedem Service überprüft werden														
LAST INSPECTION DATE: Letzte Inspektion am:														
SERVICE STATION: Service - Station:														

## ANNEX 4.1



DEUTSCHE SCHLAUCHBOOT



### CERTIFICATE OF RE-INSPECTION

No:

This is to certify that the liferaft detailed below has been surveyed, controlled and tested in compliance with requirements from:

and the manufacturer and in accordance with IMO Resolution:

#### Inflatable Liferaft

Identification:	Type:	Capacity:	Serial No:	Date of manufacture:
DSB TVB AFG	Fabric type:	Length of painter: m/inside	m/outside	Max stowage height: m

Cylinders:	Serial No:	Contents CO <sub>2</sub> :	Contents N <sub>2</sub> :	Latest hyd. test:

Equipment:	Unit:	Type:	Serial No:	Expiry date:
Emergency pack:				
EPIRB:				
HRU test:				
Radar reflector:				
First aid kit:				

Tests:	NAP test:	Gas inflation test:	Floor seam test:	Load test davit-launched:
Yes/no:	Yes/no:	Yes/no:	Yes/no:	Yes/no:
Latest test*:	Latest test*:	Latest test*:	Latest test*:	Latest test*:

\* Latest test date (month/year)

Verification:	Date of inspection:	Servicing station name and No:	Date issued to ship:

National Marine authority ID No.	Remarks / modification:

AUTHORIZED AND APPROVED SERVICING STATIONS TO BE USED ONLY. ONLY THIS ORIGINAL DOCUMENT FORM TO BE ACCEPTED.

This inflatable liferaft requires servicing 12 months from the latest inspection date in accordance with the SOLAS regulation.

Flagstate of ship:

IMO No:

International call signal:

For authorized servicing station (printed name)

Name of ship / owner:

Signature

To be kept on board	Shipowner	DSB - Servicing station	Shipping inspection	DSB
---------------------	-----------	-------------------------	---------------------	-----

DSB: Art.-Nr.: 00905650, TVB: Art.-Nr.: 00905680, AFG: Art.-Nr.: 00905710

1 / 98

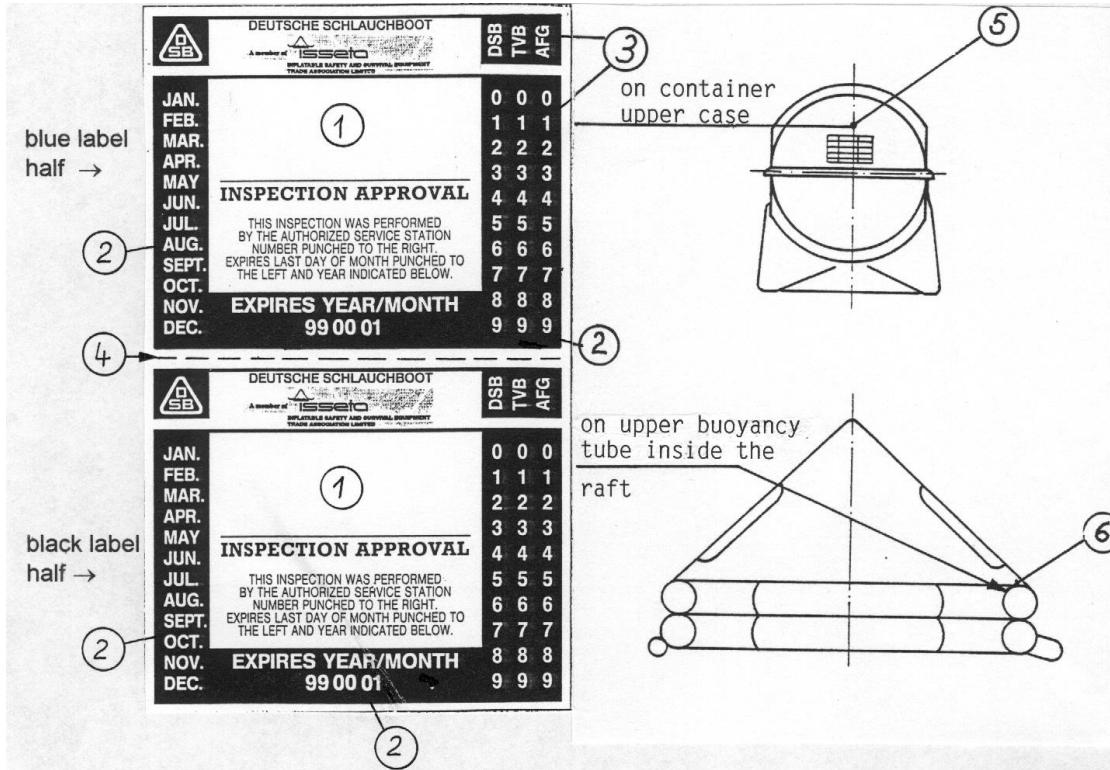
DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 4 Issue: 10/97	page 1
---	---	-------------------------	--------

## ANNEX 4.2

New label: **INSPECTION APPROVAL**

**for DSB - / TVB- and AFG-Inflatable Liferafts**

### - DIRECTIONS FOR USE -



1. Put in STATION ADDRESS 1 by rubber stamp.
2. Punch MONTH and YEAR for next service 2
3. Maker and makers station number (already punched) 3
4. Cut the label into two halves 4
5. Blue label half stick on position 5
6. Black label half stick on position 6

**Note 5. and 6.:** Before sticking on label:  
Position on container and liferaft must be cleaned.  
Press on self-sealing label firmly

ANNEX 5.1

<b>Please note:</b>	<ol style="list-style-type: none"> <li>1. This log card is to be stowed in a plastic bag and deposited with the documents on board the ship.</li> <li>2. This log card is to be completed at each servicing.</li> <li>3. If the CO<sub>2</sub>-cylinder is replaced or retested the relevant data must be recorded on the front of this log card.</li> <li>4. At each servicing this log card is to be signed by an operator certified by DSB.</li> <li>5. The information on the front of this card shall be suitably amended if the type of emergency is changed.</li> <li>6. Where this card replaces the log card of an existing raft the latter should be attached to the present log card by stapling. The first entry in this card should state the number of the service being undertaken e.g. 6 and the printed numbers e.g. 1<sup>st</sup> service, 2<sup>nd</sup> service etc. should be deleted.</li> <li>7. All entries must be made in ink or typed.</li> </ol>
<p>Inspection of this inflatable liferaft has been made in accordance with IMO Resolution A.761(18).</p>	<p>The prototype has been tested in accordance with IMO Resolution MSC.81(70).</p>
	<p><b><u>ATTENTION:</u></b></p> <p>THIS LIFERAFT AND ACCESSORIES MUST BE INSPECTED AND CERTIFIED BY AN AUTHORISED SERVICE STATION AT 12 MONTHS INTERVALS !</p> <p><b>DSB DEUTSCHE SCHLAUCHBOOT GMBH &amp; CO KG</b>  <b>Angerweg 5, D-37632 ESCHERSHAUSEN, GERMANY</b>  <b>Tel.: ++49 5534 301-0      Fax: ++49 5534 301-200</b>  <b>e-mail: info@deutsche-schlauchboot.de</b>  <b>www.deutsche-schlauchboot.de</b></p>

## ANNEX 5.2

**Dates of Inspection**

Control-No. Date First packing	Service Station	Repairs, Replacements, Renewals, Remarks	Modifications,			No. of Annual Certificate	Stamp and Name of Surveyor
			OL	FS	GI		
1	DSB, Eschershausen						
2							
3							
4							
5							
6							
7							
8							
9							
10							

## ANNEX 6

LAST SERVICE LETZTE WARTUNG LAATSTE INSPECTIE INSPECTION DERNIER ПОСЛЕДНЕЕ ОБСЛУЖИВАНИЕ	SERVICE-STATION, WARTUNGS-STATION, INSPECTIE-STATION, STATION DE SERVICE, СТАНЦИЯ ОБСЛУЖИВАНИЯ	NAME NAME NAAM NOM ФАМИЛИЯ, ИМЯ, ФАМИЛИЯ NAME NAME NAAM NOM СЛЕДУЮЩЕЕ ОБСЛУЖИВАНИЕ	NEXT SERVICE NAECHSTE WARTUNG VOLGENDE INSPECTIE INSPECTION PROCHAINE СЛЕДУЮЩЕЕ ОБСЛУЖИВАНИЕ
---	--	---	--

Art. - Nr. 0.09.53.44.0

GB/D/NL/F/RUS



## **Hinweise für die Reparatur von Schlauchboothäuten**

## **Directions for the Repair of Rubber Dinghies**

## **Conseils pour la réparation des tissus caoutchoutés de canots pneumatiques**

**DSB Deutsche Schlauchboot  
GmbH & Co. KG**

D-37628 Eschershausen • Angerweg 5  
Telefon: 0 55 34 / 30 10 • Telefax: 0 55 34 / 30 12 00

Deutsch - Englisch - Französisch

**Attention! Directions for the solution!**

**Caution! Attend to the protective instructions (specifications)!**

The solution includes hydro-carbons. It is inflammable and belongs to the danger class A 1. The producer declares 360 as a Max. Value of the Working Place Concentration. It is **unhealthy** at a longer influence.

The bonding agent has a Max. Value of the Working Place Concentration of 500 (Methylene-Chloride). It is **Injurious to health** at a non-observance of the protective instructions.

**Important directions for the repair of DSL-Liferafts!**

DSL-Liferafts consist of natural-caoutchouc coated tissue in order to obtain a sufficient freezing resistance. This tissue must be repaired with SF-solution. The following directions for using NE-solution are also applicable for SF-solution. Therefore separate directions for using the SF-solution are not necessary.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7      page 2 Issue:        10/97
--	---	--

## **Directions for the Repair of Rubber Dinghies**

---

### **General Remarks**

Any skins of the rubber dinghies manufactured in our factory can easily and satisfactorily be repaired. A prerequisite for a perfect repair, however, is to follow strictly the hints and details described below.

To begin with, it must be mentioned that rubber dinghies are patched or repaired.

Patching is always to be considered as a makeshift and should be applied only while the dinghy is in service. Immediately after conclusion of the service, when the dinghy is ready for storing, any patches must be removed and the damaged areas repaired according to instructions.

For patching it is expedient to use the gluing solution contained in the repair kits. Orderly repairs should only be made with the adhesive consisting of two components (cold curing agent) designed as NE-solution, which has specially been developed for this purpose.

### **Patching the Skin of a Dinghy**

The damaged skin is only patched on the outside. If possible the patch should be similar in material to the damaged skin. The repairing material in the repair kit supplied with the boat contains the patches matching the material of the dinghy.

### **Brief Instruction for Patching Skins of Rubber Dinghies**

- 1). Deflate dinghy. (In case of emergency while being in service the dinghy can also be patched in inflated condition.)
- 2) Expose, dry and clean damaged area.
- 3) Cut patch to a fitting size and round off corners. Patch must overlap the damage on all sides at least by 30 mms.
- 3a) At ready-made patches: Pick out the suitable patch.
- 4) Roughen patch and damage with emery paper, remove the rubber dust produced thereby completely.
- 4a) At ready-made patches: Only roughen the damaged area.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7 Issue:	page 3 10/97
--	---	-------------------	-----------------

- 5) Spread patch and damage with solution (NE-adhesive"). Allow to dry (appr. 4 minutes), then apply another coat of solution and allow to dry again. Impregnate the exposed fabric edges of the damage several times with solution.
- 5a) At ready-made patches: Only spread damaged area with solution. Remove the protective foil from the prepared gluing side of the patch.
- 6) Apply the patch unrolling it on the damage, pressing it on by hand and finally rubbing it tight with a smoother.
- 7) After a few minutes of waiting the boat can be inflated again.  
\*) without second component.

### **Repairing the Dinghy's Skin**

**Attention:** For repairing use "NE-solution" only!  
(Excepting DSL-Liferafts)

### **General Remarks on the NE-solution**

The NE-solution represents a selfvulcanizing rubber solution consisting of 2 components. To avoid a prevulcanization they are stored in separated receptacles. The mixing of the 2 components is to realize just immediately before working up. The actual solution (1. component) is a thick **rubber solution**. Its receptacle must always be kept securely closed. The polymerization or **bonding agent** is a violet fluid boiling already at **42 degrees Celsius**. Delivery is therefore carried out in an Aluminium-Monobloc tin of 50 g tight against expansion. Having opened the tin the bonding agent must be worked up at once. For solution and bonding agent a storage as cool as possible is necessary as well as protection from heat.

**The bonding agent is extremely reactive to any impurity and to water.** Even the water vapor contained in the normal atmosphere is liable to affect the solution. Therefore it is recommended to perform a repair at a low relative hygroscopic moisture in dry heated rooms.

### **Preparation of the Solution**

The basic solution is mixed with the bonding agent in the weight ration of 10 : 1 (10 units of solution to 1 unit of bonding agent). Stirring and/or mixing the solution requires a certain exercise. It is expedient not to add the whole quantity of bonding agent at once, but first only part of it, to mix this in and then to add the rest.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7      page 4 Issue:        10/97
--	---	--

As immediately after adding the curing agent the storage property of the finished adhesive solution is limited, the quantities prepared should be confined to such as are actually used within the next one to two hours. The thickened solution cannot be made brushable again by adding solvents.

The storage property of the adhesive in tightly closed and completely filled containers last for approx. 8–10 months. On the contrary the bonding agent – filled out into Monobloc-pressure tins – can be stored for 12 months. Thus it is recommended to store only such quantities of basic solution and bonding agent as empirically will be used within the above-mentioned periods.

### Procedure of Gluing

The areas to be glued are roughened, (cover tapes need no roughening but can be glued with the NE-solution immediately) cleaned and coated twice, each, with the ready-made solution. Two thin coats subsequently applied will dry more quickly than a single thick one. After a drying time of the coated areas of approx. 5–20 minutes, the surfaces to be glued on to each other are pressed together. The coated surfaces are ready to stick at the moment when the solution applied is still felt to be tacky when touching it with a dry finger, but no solution remains on the finger tip. Watch that between mixing the solution and pressing the adherends together not more time than 1,5 or at most 2 hours elapses. If this time is surpassed the gluing efficiency will be impaired as the vulcanization has meantime set in. Joining the adherends too early will equally result in a bad gluing effect. The best binding power is reached after approx. 48 hours when the solution is thoroughly vulcanized. The vessels used for stirring the finished solution are cleaned successfully by leaving the rest of the vulcanized mixture to dry (appr. 6–8 hours after gluing) and then stripping it off. Paint brushes are washed in toluene or benzine directly after use. The vulcanized solution can be forced out of the bristles with a small stick.

### Repairs on the Air Tubes

Old joining points are easier to separate after heating up to 100–120 °C by an air heater.

It is necessary to deflate the whole dinghy. Unscrew the inflation valves – resp. bring them in a deflating position. While repairing, the valves remain unscrewed, resp. opened. The damage must be cleared to such extent that the patch can overlap it by at least 60 mms. on all sides. Damages which directly join glued on strengthening patches, cover tapes or trimmings etc. are exposed by removing any items obstructing the repair so far that the repairing patch can be applied in the required size. But joints or gluing seams, respectively, of the air tubes are excluded from this measure. In case the damage of the skin borders

..

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7 Issue:	page 5 10/97
--	---	-------------------	-----------------

on them immediately, they must be glued over by the repairing patch. Minor damages are increased expediently in a triangular form to a size which allows the cut out repairing patch, spread with solution, to be pushed by two fingers into the inside of the dinghy.

Any air tube repairs are to be carried through in such a way that the damage is covered from inside and from outside with the repairing material. The inner material serves to secure airtightness. It prevents the pressure air in the air tubes from penetrating the exposed fabric edges of the damage from where it permeates as vagary air the fabric under the outer rubber coat and then escapes to the open air at possible chafing points on the outside.

The outer material renders the repairing area additional mechanical strength covering the otherwise exposed fabric edges of the damage. Repairing areas with natural fabric on the outside are finally secured on their edges with the cover tapes specially developed for this purpose. The cover tapes prevent the repairing patches from peeling off and protect their fabric edges from moisture.

Treat the finished repairs of skins painted before with rubber soluble paints after 12–14 hours with the special preserving paints provided for the respective skins.

### **Brief Instruction for Repairing Air Tubes**

- 1) Deflate dinghy completely.**
- 2) Clear damage, increase it, if necessary, to get through with two fingers, dry and clean it inside and outside.**
- 3) Cut out inner and outer repairing patches to a fitting size and round off the corners. The repairing material is to overlap the damage on all sides by at least 60 mms. Roughen gluing side. Be careful not to abrade the rubber coat down to the fabric!**
- 4) Roughen edges of damage from inside as described under paragraph 3. Roughened surface must be larger in size than inner repairing patch.**
- 5) Roughen edges of damage from outside as described under paragraph 3. Roughened surface to be slightly larger than outer repairing patch.**
- 6) Carefully clean roughened areas from emery dust and wash them with toluene.**
- 7) Apply two thin coats of NE-solution to inner repairing patch and also a dot of solution to its back side.**
- 8) Apply two thin coats of adhesive to the damage from inside:**

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7 Issue:	page 6 10/97
--	---	-------------------	-----------------

- 9) Press air tube on its damaged spot towards the inside until seeing and reaching precisely the opposite of the air tube.
- 10) Apply a dot of solution to the opposite inside.
- 11) Allow the applied solution to dry as described above.
- 12) Cover the gluing surface of the inner repairing patch with a piece of oil-paper and push it through the damage into the inside of the air tube.
- 13) Attach inner repairing patch with its rear solution dot to the dot on the opposite inside of the air tube so as to fit the damage.
- 14) Draw off the oilpaper which has served to pressing the patch down.
- 15) Locate the damage slowly and carefully on the repairing patch and press it tight. Make sure that the patch is applied in a precisely centric position to the damage.

(Alternative to sections 9 to 15)

Leave the applied solution to dry as described above. Push two sides of the triangular damage slightly down towards the inside and, simultaneously, bring the repairing patch carefully, without touching the jointing edges of the damage, with one side through the hole. Glue this to the remaining side of the triangle observing the required overlapping margin. Pass the patch entirely through the damage and press the damage slowly against the opposite side of the air tube so that the patch sticks to remaining sides of the triangle without wrinkling.

- 16) Press damage on all round as far as covered by the inner repairing patch, using a smoother.
- 17) Wait for 30 minutes approximately.
- 18) After this time, inflate dinghy slightly until the air tubes are fully rounded but the repair does not burst open yet.
- 19) Test the repaired damage for airtightness by using soapy-water. Open leaks, if any, at once with smoother, dry them, apply a new coat of solution and close tightly again.
- 20) Apply two thin coats of NE-solution each to the outer repairing patch and the outside of the damage, allow to dry as detailed above.
- 21) Unroll outer repairing patch on the damage and rub it fast with a smoother.

### **Bringing up the cover-tape**

(concerning natural fabrics of canvas or cotton fabrics for instance)

- 1) To apply cover-tape, abrade the edges of the repairing patch as well as the neighbouring skin of the dinghy with emery paper so that both, repairing patch and boat's skin are equally roughened by a total width of 25–30 mms.
- 2) Remove emery dust and spread two thin coats of NE-solution on the roughened area around the patch (cover-tape is not to be spread with solution).
- 3) Allow solution to dry.
- 4) Taper or round off the beginning of the cover-tape roll and locate it equally on the strip of solution. Guide the tape roll with your left hand, slowly uncoiling it, along the round strip while your right hand pushes the tape in the desired direction pressing it softly to the gluing seam. In case of wrinkling, tear the cover-tape off again by a quick jerk and start fitting it anew. Minor folds can be equalized with the smoother.

Overlaps of the cover-tape as they come from the roll must be loosened again and separately glued on with solution. Taper or round off the end of the cover-tape. The end must overlap the beginning of the tape by a few centimeters. Secure it carefully with solution. Then rub the cover-tape fast. First use the ridge of the smoother to press the cover-tape tightly to the edge of the repairing patch in order to eliminate any channels.

Before applying the cover-tape, make sure that its end comes to lie towards the bow end of the dinghy.

### **Repairing the Fabric Floor**

As much as the damage reaches to the inside of the dinghy and is accessible there, it is to be patched on both sides with the fabric for repairs.

The repairing procedure is the same as described under the brief instructions for the repair of air tubes.

The finished repairs of natural fabrics are also secured with cover-tape and painted boats get treated with the special preservative paint.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7 Issue:	page 8 10/97
--	---	-------------------	-----------------

## **Repairing the trimmings**

**It is necessary to tear the damaged trimming from the dinghy's skin. (Use an air heater!) This is expediently done while the dinghy is in inflated condition. The outer rubber coat of the skin injured hereby must be restored by applying of pure bonding agent (accelerator) and following mixed NE-solution after having before ground the edges of the damage with emery (be careful not to damage the exposed fabric). Let it dry after appliance sufficiently.**

The new trimming which is to be ordered from the manufacturing firm before starting the repair must be treated and applied like a piece of repairing material. Inflate the dinghy slightly so that the buoyancy tubes are just rounded, any folds in the dinghy's skin evade and the air tubes can still be deformed by finger tip. The newly attached trimming, however, should not be fully used during the next 48 hours. The best guarantee for a lasting and resistant cold vulcanization is conditioned by strong and uniform rubbing whereby any air between the glued surfaces must be avoided.

The trimmings are to get rubbed on from their center towards their periphery.

**DSB-Eschershausen**

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 7      page 9 Issue:        10/97
--	---	--

## ANNEX 8

### Service instructions for hydrostatic release unit (HRU) „Thanner DK 84“ and „Thanner DK 84.1“

1. The HRU and the weak link must be serviced in intervals of at least 12 months by an authorized service station.

#### Visual inspection

When a HRU is received for service a visual inspection must be carried out:

- a) Possible coats of paint must be removed and it is important to ensure that the water entering holes on the reverse side of the membrane flange are clean.  
4 entering holes (production-no. 110111-127798)  
3 entering holes (" " 127799-)
  - b) After this the correct release pressure must be tested in the test tank (see item 7 for instructions for test tank).
  - c) For the test the HRU is pre-tensioned with a force of 100 N by operating the load lever.
  - d) The release pressure must not reach 4000 mm water column (approx. 157 inches / 0,4 bar).
2. If the HRU does not release at the described pressure it must be detached from the test tank and activated manually as follows:
    - a) Press down the release mechanism (PUSH TO RELEASE) with a pin and open the locking catch.
    - b) Close the locking catch again and turn the index-bolt to position "I". A clear „click“ indicates that the locking catch has rested and that the HRU is functioning again.
    - c) Carry out another test in the test tank.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 8 Issue:	page 1 10/97
--	---	-------------------	-----------------

## **ANNEX 8 continued**

3. If the test is still not satisfying the membrane must be checked for any damages.  
If necessary it must be replaced as follows:
  - a) Remove screws (10 pcs.) from membrane casing and take out spring as well as membrane.
  - b) Fix the new membrane to pos. 1 with index-screw-bolt to ensure correct compression in the membrane casing.
  - c) Then mount the spring and membrane casing.
  - d) Insert the screws of the membrane casing again and tighten diagonally (starting torque: 3 Nm).
4. Carry out a final test in the test tank.
5. a) „**Thanner DK 84**“

Visually check the weak link and the clamp for damages and corrosion.  
If there are any doubts as far as the strength of the weak link is concerned it should be replaced.

### **Only use original Thanner Weak links !!**

Thanner DK 84 weak link - Art.-No. 300-696 (DSB-Art.-No. 0.07.10.29.0)

### **b) „**Thanner DK 84.1**“**

### **The line must be replaced on each service !**

Thanner DK 84.1 weak link - Art.-No. 10-057 (DSB-Art.-No. 0.07.10.31.0)

6. After inspection of the HRU the date of inspection and the number of the authorized service station must be recorded on the enclosed log card (inspection card)

**Note:** The release mechanism cannot be replaced.  
In this case the HRU must be exchanged.

### **Cleaning**

It can happen that the surface of the HRU made of stainless steel shows a dull cover.

This cover should be removed with a brass brush.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 8 Issue:	page 2 10/97
--	---	-------------------	-----------------

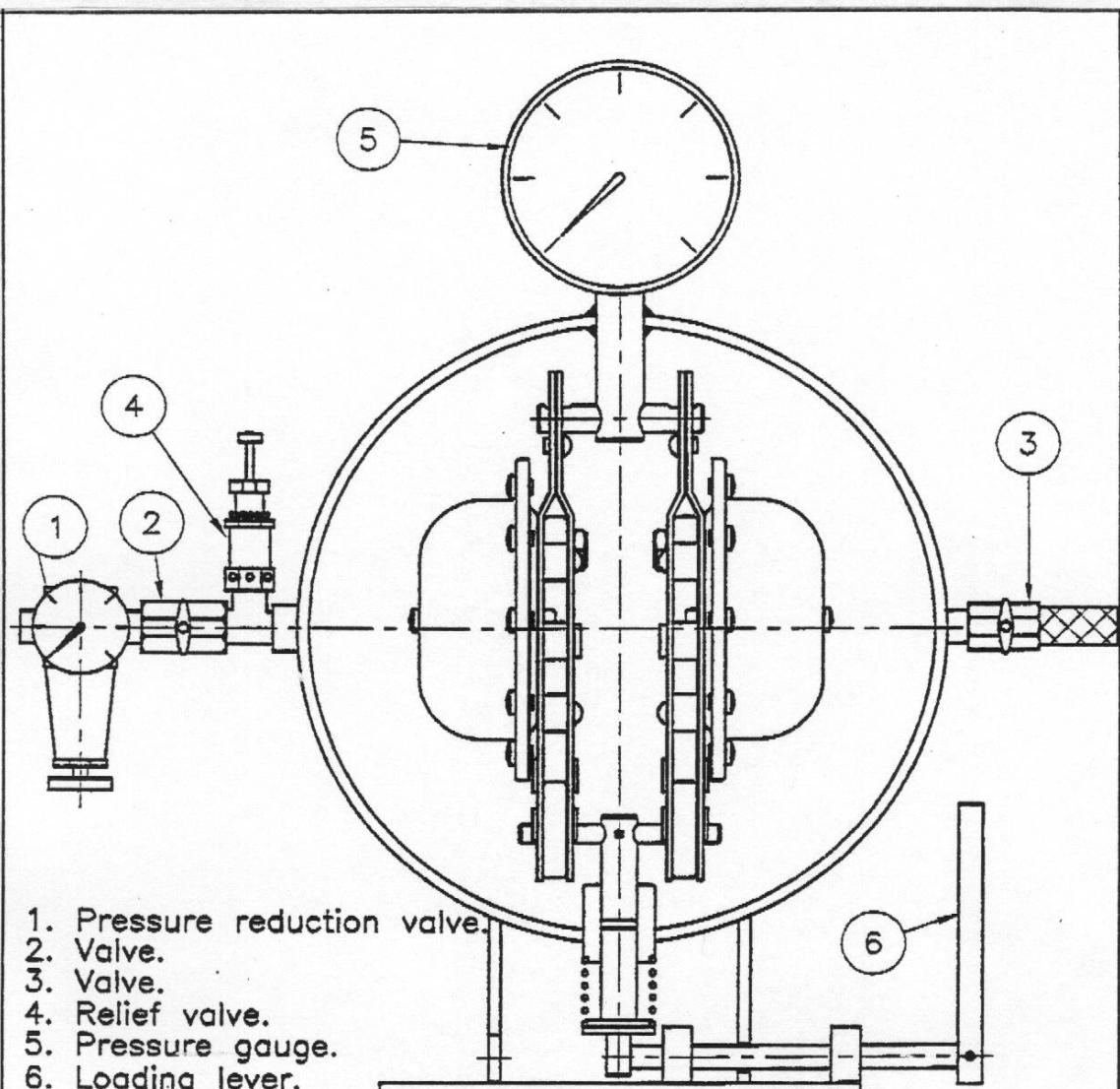
## **ANNEX 8 continued**

### **7. Operating instructions for test tank of HRU type „Thanner DK 84“ and „Thanner DK 84.1“**

- a) The test tank is connected to a compressed air filling device. Remove the lid from the tank and insert the HRU into the relevant slots.
- b) Adjust the distance between the split pins until the HRU with the locking catch fits.
- c) Close the test tank and tightly close the lid.
- d) Being pressure on the test tank while the valves are slightly opened. With one eye watch the pressure gauge. The HRU must release before the needle has reached the 0,4 bar mark (approx. 157 inches/4000 mm water column) Then loosen the compressed air device.
- e) Carefully open the test tank and dismantle the HRU.

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 8 Issue:	page 3 10/97
--	---	-------------------	-----------------

**ANNEX 8 continued**



Begrens-tojer	.00 (2.dec)	.0 (1.dec)	ingen dec.	S3	<input type="checkbox"/>
m.m.	Fin ca.11 12	Middel ca.11 14	Grov ca.11 16	S3	<input type="checkbox"/>
(3)- 6	$\pm 0.05$	$\pm 0.1$	$\pm 0.2$	S3	<input type="checkbox"/>
(6)- 30	$\pm 0.1$	$\pm 0.2$	$\pm 0.5$	S3	<input type="checkbox"/>
(30)-120	$\pm 0.15$	$\pm 0.3$	$\pm 0.8$	Inspection	AQI- Code.
(120)-315	$\pm 0.2$	$\pm 0.5$	$\pm 1.2$	DIN 40.080	AQI- Value.
D				Final inspection.	
C			Art. Thanner HRU DK-84.	Name. D.C.	Date 17/9-93.
B			Detail Test tank.	App.	Date
A				Scale.	1:2.5
	Modification.	Date	Matr.	Dwg.No.	10-050.
			Surface-processing		

## ANNEX 9

### TEST METHODS ON INFLATABLE LIFERAFTS -according to IMO A.761(18) and frequency of tests-

for DSB-; TVB- and AFG-Inflatable Liferafts follow table below

Service	GI*	NAP	WP	FS	FS	OL	davit launched only
(manufacturer)		x	x	x		x	
1.service			x				
2.service			x			x	
3.service			x				
4.service			x			x	
5.service	x**						
6.service			x			x	
7.service			x				
8.service			x			x	
9.service			x				
10.service	x	x		x		x	
11.service		x		x	x		
12.service		x		x		x	
13.service		x		x	x		
14.service		x		x		x	
15.service	x	x		x	x		
16.service		x		x		x	
17.service		x		x	x		
18.service		x		x		x	
19.service		x		x	x		
20.service	x	x		x		x	
21.service		x		x	x		
22.service		x		x		x	
23.service		x		x	x		
24.service		x		x		x	
25.service	x	x		x	x		

GI = gas inflation test (fitted gas - removed containers)

NAP = necessary additional pressure test, compressed air 2,0 times the working pressure (=0,5 bar) for 5 minutes without defects.

WP = working pressure test over one hour, not exceed 5 % drop (= reset pressure of relief valves).

FS = floor seam strength test - 75 kg around the perimeter/circumference.

OL = overload test (on davit launched liferafts) hanging with 1.1 times load for 5 minutes.

\* = See-BG allow CO<sub>2</sub> from workshop  
DOT (UK) allow use of cylinder other than that from liferaft

\*\* = NSI, Icelandic Register of Shipping & Russian Register of Shipping do not require until Year 10

## ANNEX 9 continued

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 9 page 1 Issue: 10/97
--	---	--------------------------------

## **1. GAS INFLATION TEST (GI)**

A gas inflation (GI) test should be carried out at 5-year intervals, and when undertaking a gas inflation test, special attention should be paid to the effectiveness of the relief valves. The folded liferaft should be removed from its container before activating the fitted gas inflation system. After gas inflation has been initiated, sufficient time should be allowed to enable the pressure in the buoyancy tubes to become stabilized and the solid particles of CO<sub>2</sub> to evaporate. After this period the buoyancy tubes should, if necessary, be topped up with air, and the liferaft subjected to a pressure holding test over a period of not less than one hour during which the pressure drop will not exceed 5 % of the working pressure (reseat pressure relief valve).

## **2. NAP - TEST**

Each liferaft should be subjected to the necessary additional pressure (NAP) test at yearly intervals after the tenth year of the liferaft's life unless earlier servicing is deemed necessary as a result of visual inspection. After allowing sufficient time for the liferaft to regain fabric tension at working pressure, the liferaft should be subjected to a pressure holding test over a period of not less than one hour during which the pressure drop will not exceed 5 % of the working pressure.

### **2.1 Procedure**

2.1.1 Plug the relief valves.

2.1.2 Gradually raise the pressure of 2.0 times the working pressure = 0,500 bar. The test pressure should be 0,500 bar because the maximum pressures calculated in the below table are higher.

Size of Liferaft (persons)	Diameter (cm)	Tensile strength buoyancy fabric NK 200 250 dN/5 cm	Tensile strength buoyancy fabric NK 205/2 275 dN/5 cm
6	23	0,869*	0,956*
8	24,7	0,810*	0,890*
10	27,5	0,727*	0,800*
12	28,9	0,692*	0,761*
16	32	0,625*	0,688*
20	33,4	0,599*	0,659*
25	35,4	0,565*	0,621*

\* maximum permissible pressure with factor of safety of 5

2.1.3 After 5 minutes, there should be no seam slippage, cracking, or other defects, or significant pressure drop. If cracking in the buoyancy tubes is audible, the liferaft should be condemned. If no cracking is heard, the pressure in all buoyancy chambers should be reduced simultaneously by removing the plugs from the relief valves.

## ANNEX 9 continued

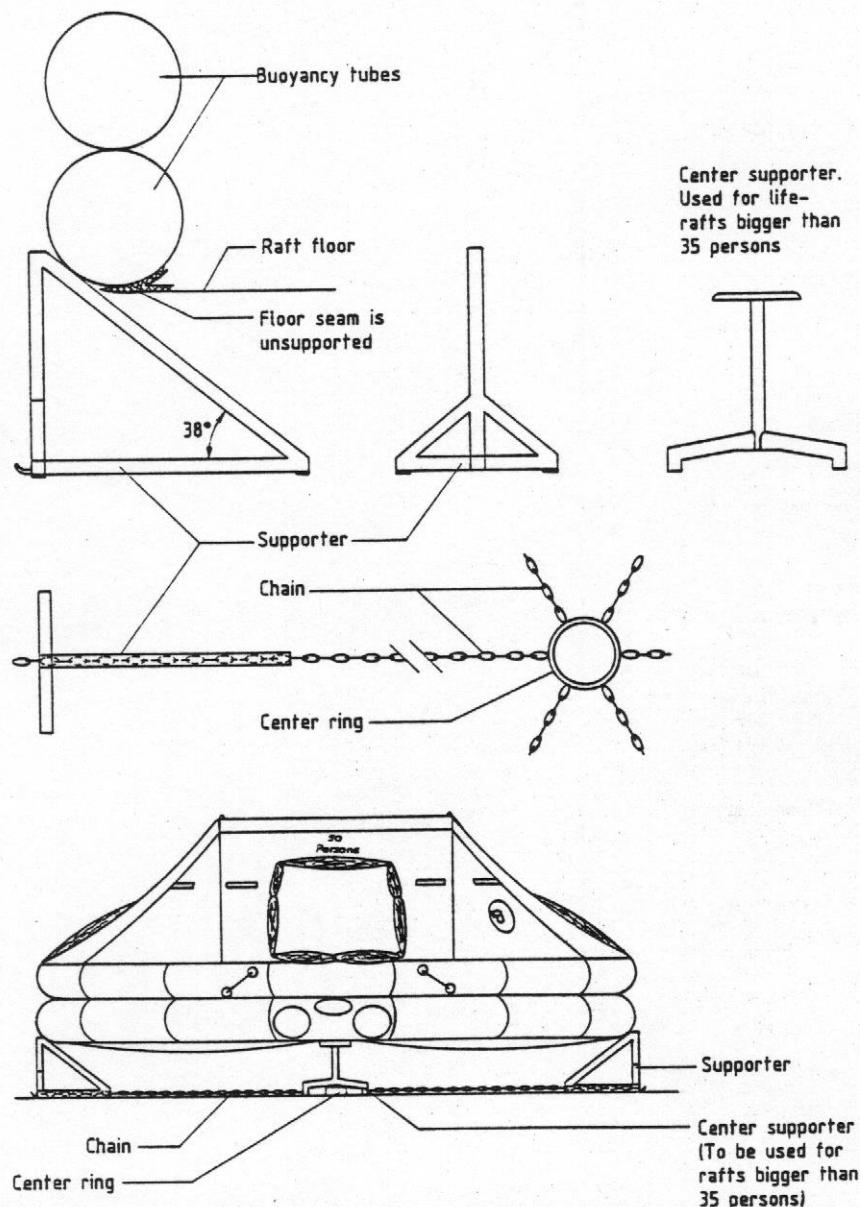
### 3. WORKING PRESSURE TEST (WP)

see instructions under item 3.6.2, chapter 3

### 4. FLOOR SEAM STRENGTH TEST (FS)

With the buoyancy tube supported at a suitable height above the service floor a person weighing not less than 75 kg should walk/crawl around the perimeter of the floor for the entire circumference and the floor seams should be checked again.

#### Guidelines for floor seam test supporters



DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 9 page 3 Issue: 10/97
--	---	--------------------------------

## **ANNEX 9 continued**

### **5. OVERLOAD TEST (OL)**

The overload test has to be carried out as described under item 3.10.

### **6. RECORDS**

- 6.1 A record of servicing should be maintained for at least 5 years after the date of service.
- 6.2 Statistical records should be prepared on all liferafts serviced, indicating, in particular, defects found, repairs carried out and units condemned and withdrawn from service. Such statistics should be available to the administration.
- 6.3 All tests (NAP/WP/GI/FS) carried out have to be recorded into the log card and into the certificate of re-inspection.

DSB Deutsche Schlauchboot GmbH & CO KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 9 page 4 Issue: 10/97
--	---	--------------------------------

## ANNEX 10

### BREAK-DOWN TORQUES

	N m
topping up and deflation valve, green	15
relief valve - OTS (Thanner)	35
C0 <sub>2</sub> -valve	22,5
cross-hole connection	25
high-pressure hose / y-distributor	25
high-pressure hose / cylinder valve	40
operating head DK 94 / cylinder valve	50
cylinder / cylinder valve	220
ascending pipe / cylinder valve Compact	15
membrane / cylinder valve Compact triangular mortise screw	40

## ANNEX 11

### TOPPING UP AND DEFLATION VALVE

Gegenüberstellung altes und neues Nachblas- u. Entlüftungsventil mit den dazugehörenden Entlüftungsstöpsel, Prüf- und Absaugstutzen topping up and deflation valve, old, in comparison with topping up and deflation valve, new, with vent plug and deflation adapter		neu (ab Flöß Nr. 47861) from now on (from raft no. 47861)
	bisher up to now	
Nachblas- und Entlüftungsventil topping up and deflation valve	Artikel-Nr. / part no. Farbe colour	0.08.01.15.0 gelb yellow
Kappe für Nachblas- und Entlüftungsventil cap for topping up and deflation valve	Artikel-Nr. / part no. Farbe colour	0.08.10.07.0 gelb yellow
Entlüftungsstöpsel vent plug	Zeichng.-Nr. drawing no. Artikel-Nr. / part no. Farbe / colour	21 - 04.11 0.08.01.79.0 rot / red
Prüfstutzen test socket	Zeichng.-Nr. drawing no. Artikel-Nr. / part no.	21 - 04.129 0.07.09.00.0 Kappe: Farbe grün cap: colour green
Absaugstutzen deflation adapter	Zeichng.-Nr. drawing no. Artikel-Nr. / part no.	21 - 04.128 0.07.33.18.0 Kappe: Farbe grün cap: colour green

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 11 page 1 Issue: 10/97
--	---	---------------------------------

## ANNEX 12

**READ THESE INSTRUCTIONS CAREFULLY.**

**FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN SEVERE PERSONAL INJURY.**

### GENERAL SAFETY CONSIDERATIONS

#### 1. EYE INJURY HAZARD.

Failure to wear safety glasses with side shields can result in severe eye injury or blindness. Always wear safety glasses with side shields which conform to ANSI Standard Z87.1.



#### 2. STRAP BREAKAGE HAZARD.

Improper operation of the tool or sharp corners on the load can result in strap breakage during tensioning, which could result in the following:

- A sudden loss of balance causing you to fall.
- Both tool and strap flying violently towards your face.

Failure to place the strap properly around the load or an unstable or shifted load could result in a sudden loss of strap tension during tensioning. This could result in a sudden loss of balance causing you to fall!

Read the tool's operating instructions. If the load corners are sharp use edge protectors. Place the strap correctly around a properly positioned load.

- Positioning yourself in-line with the strap, during tensioning and sealing, can result in severe personal injury from flying strap or tool. When tensioning or sealing, position yourself to one side of the strap and keep all bystanders away.
- Using strap not recommended for this tensioner can result in strap breakage during tensioning. Use the correct Signode products for your application.

#### 3. FALL HAZARD.

Maintaining improper footing and/or balance when operating the tool can cause you to fall. Do not use the tool when you are in an awkward position.

#### 4. CUT HAZARD.

Handling strap or sharp parts could result in cut hands or fingers. Wear protective gloves.



#### 5. TRAINING.

This tool must not be used by persons not properly trained in its use. Be certain that you receive proper training from your employer. If you have any questions contact your Signode Representative.

### Annex 12, continued

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 12, page 1 Issue: 10/97
--	---	----------------------------------

**6. TOOL CARE.**

Take good care of the tool. Inspect and clean it daily, lubricate it weekly and adjust when necessary. Replace any worn or broken parts.

**7. WORK AREA.**

Keep work areas uncluttered and well lighted.

Several combinations of strap, seals and tools can be used with this tensioner. Use the correct Signode products for your application. If you need help contact your Signode Representative.

## SAFETY PROCEDURES FOR TOOL OPERATION

**1. OPERATION SEQUENCE.**

Before using this tool, read the Operation and Safety instructions, contained in this manual.

**NEVER HANDLE OR SHIP ANY LOAD WITH IMPROPERLY FORMED SEALS.**

Misformed seals may not secure the load and could cause serious injury. Inspect the tool for worn and/or damaged parts. Replace tool parts as needed.

If seals are not being properly formed:

A. Ensure that the tool's operating instructions are being followed before applying another strap.

B. Cut the strap off and apply another.

Tuck strap end back into the dispenser when not in use.

## CUTTING TENSIONED STRAP

**FLYING STRAP HAZARD.**

Using claw hammers, crowbars, chisels, axes or similar tools will cause tensioned strap to fly apart with hazardous force. Use only cutters designed for cutting strap. Read the instructions in the cutters manual for proper procedure in cutting strap. Before using any Signode product read its Operation and Safety manual.

---

Safety instructions in Spanish are available from  
your Signode Sales Representative.

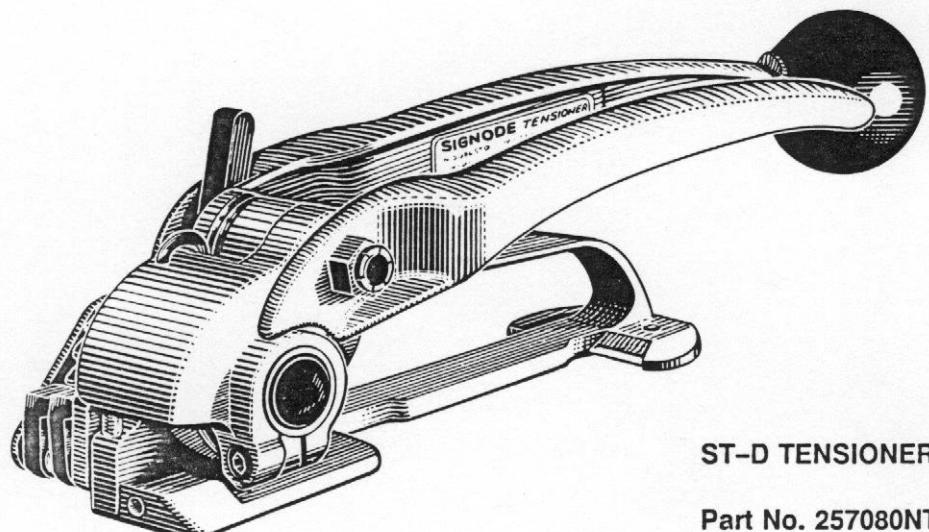
Su vendedor Signode le puede proporcionar los  
instructivos de seguridad en español.

## Annex 12, continued

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 12, page 2 Issue: 10/97
--	---	----------------------------------

## TABLE OF CONTENTS

General Safety Instructions	2
Specifications	4
Operating Instructions	5
Parts Removal and Replacement	7
Maintenance	8
Adjustments	9
Parts List	10



ST-D TENSIONER

Part No. 257080NT

## SPECIFICATIONS

MODEL	STRAP		
	TYPE	WIDTH	THICKNESS
ST-D	Dymax Contrax Tenax	1/2"	.015 – .030

## Annex 12, continued

DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 12, page 3 Issue: 10/97
--	---	----------------------------------

## OPERATING INSTRUCTIONS

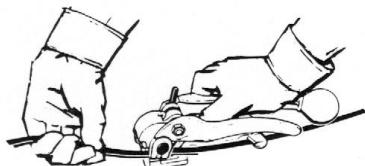


### **WARNING**

Wear safety glasses.

Stand to one side of the strap while tensioning. Make sure all bystanders are clear before proceeding.

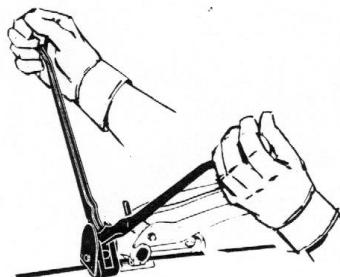
1. Drape strap around package with the bottom strap tail facing away from operator. Take-up slack, keeping straps squarely in line. Hold hand tensioned strap in position with left hand, grasp the tool in right hand, squeeze handle to base, thus lifting feedwheel. Fully insert both straps between feedwheel and gripper plug, allowing lower strap to extend approximately 2" beyond gripper plug, as shown. Position rear foot of tool on top of straps.



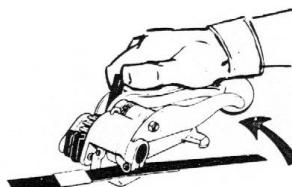
2. Stand to one side of the strap line. Tension is obtained through a continuous up and down motion with the tensioning handle. At the same time, maintain a constant upward pressure on the reaction handle, lifting the back of the base slightly off the package. On initial downward strokes, do not allow handle to press against base as this will raise feedwheel and release tensioned strap. Snap seal on strap directly in front of tool.



3. Hold sealing tool at right angles to strap, resting it squarely over seal. Seal the tensioned strap by bringing sealer handles together as far as they will go.



4. Return tensioning handle to rest on the tool by pressing the handle pawl with thumb. Squeeze handle to base and remove tool from strap by swinging rear foot out, as illustrated.



DSB Deutsche Schlauchboot GmbH & Co KG D-37632 Eschershausen	Service Manual SOLAS 74/88 LR 97 (L) 6 to 25 persons Art.-No.: 8.09.57.11.0	Annex 12, page 4 Issue: 10/97
--	---	----------------------------------

## OPERATING INSTRUCTIONS, Continued

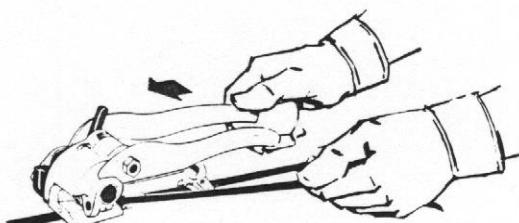
5. With left hand, pull top strap back and at an angle to the left, holding taut. Place base of tool just ahead of seal, cutter blade on the strap.

### **! WARNING**

Cutter blade is very sharp.  
Use extreme care in handling tool.



Grasp the knob of the tensioning handle and slide tool forward to cut the strap. The strap joint is now complete. Inspect the joint to make sure it had been properly formed.



### SEALING OPERATION

**NEVER HANDLE OR SHIP ANY LOAD WITH IMPROPERLY FORMED SEALS.** Misformed seals may not secure the load and could cause serious injury. Inspect the tool for worn and/or damaged parts. Replace tool parts as needed.

Refer to the sealing tool manual for details regarding the joint.

If seals are not being properly formed:

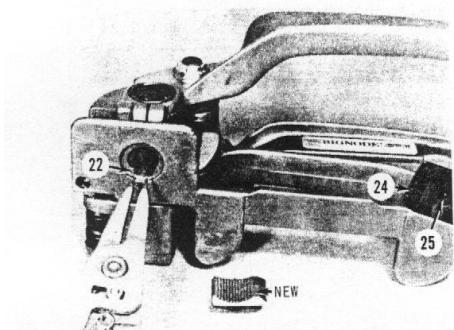
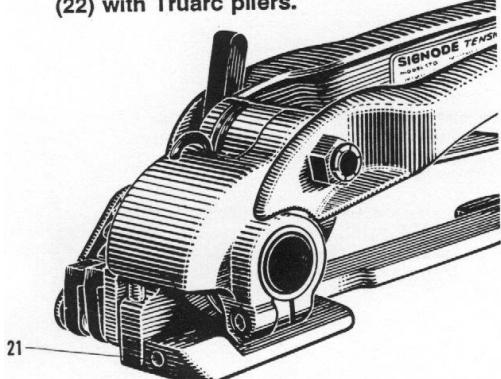
1. Ensure that the tool's operating instructions are being followed before applying another strap.
2. Cut the strap off and apply another.

## Annex 12, continued

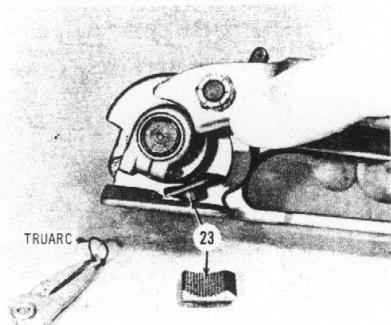
### PARTS REMOVAL AND REPLACEMENT

#### CLUTCH PLUG

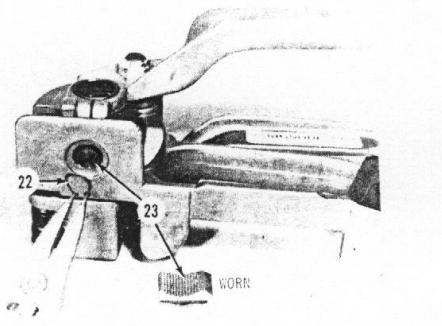
1. Loosen the set screw (21). Turn the tensioner over and remove the Truarc (22) with Truarc pliers.



2. Remove the clutch plug (23) by pressing down on the handle to lift the feedwheel out of the way. Replace the new clutch plug in the same manner.



3. Replace the Truarc on the clutch plug with the Truarc pliers. Readjust gripper plug per instructions on page 8.

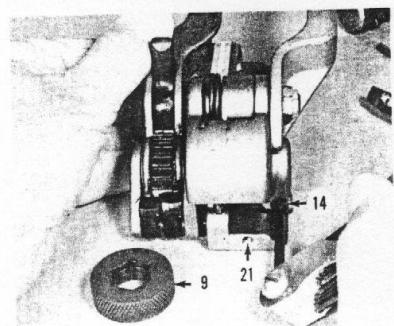


#### CUTTER BLADE

1. Refer to photo in step 1, Clutch Plug Removal, to loosen and remove the flat head socket screw (25).
2. Remove and replace the cutter blade (24). Secure with the mounting screw (25).

#### FEEDWHEEL

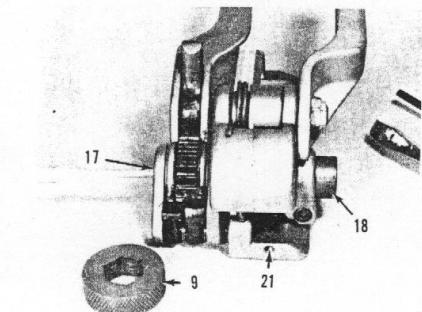
1. Loosen the socket head cap screw (14) with a hex wrench.



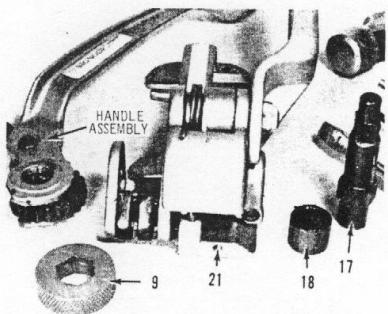
NOTE: Gloves have been omitted for clarity.

## Annex 12, continued

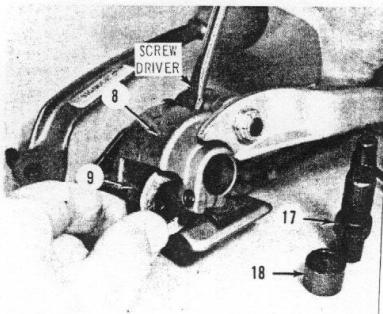
### PARTS REMOVAL AND REPLACEMENT, Continued



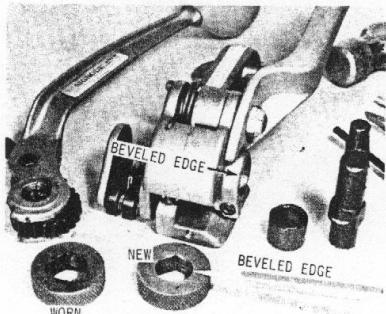
3. Lift out and lay aside the handle assembly.



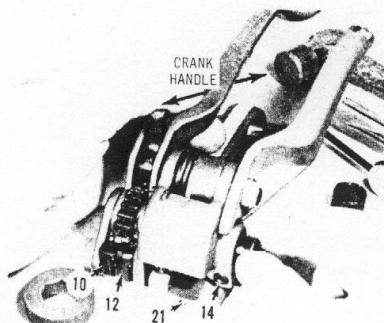
4. Using a screwdriver, lift the feedwheel support (8) and remove the worn feedwheel (9).



5. When installing a new feedwheel, it is easier to replace the feedwheel shaft and bearing if the inner beveled portion of the feedwheel, pointed to here, is facing the shaft opening or away from the tool.



6. When replacing the handle assembly, the holding pawls (10-12) must be lifted up to allow a clear way for the ratchet gear. Grease the feedwheel shaft, bushing and insert. When pushing the parts back in place, crank the handle several times until these two parts slide into place in the feedwheel support, handle and ratchet gear. Tighten the socket head cap screw (14).



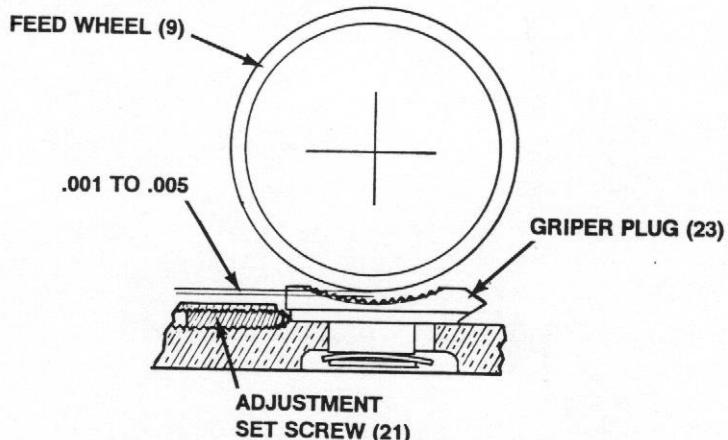
## MAINTENANCE

### CLEANLINESS/LUBRICATION

Clean the feedwheel and gripper plug periodically, or when strap slippage is indicated, with a wire brush. Apply light machine oil to all moving parts.

## ADJUSTMENTS

### FEEDWHEEL TO GRIPPER PLUG



1. Maintain a clearance of .001 to .005 between the feed wheel (9) and the gripper plug (23) by adjusting the set screw (20) as needed. See page 11 for the set screw location on the tool.
2. Depress the handle (3) to raise the feed wheel support assembly (8).
3. While the support assembly is raised, turn in the set screw (21) clockwise, until it bottoms out.
4. Back out the set screw (21) 1 3/4 turns for a general factory setting. If needed, continue to back out or turn in the set screw according to the following chart of strap variations.

<u>STRAP</u>	<u>NO. OF TURNS</u>
502, 504	1 1/2
506	1 3/4
508	2 1/2
1816	1 3/4
1822	2 1/2
814	1 1/2
816, 818	1 3/4

<u>STRAP</u>	<u>NO. OF TURNS</u>
502, 504	1 1/2
506	1 3/4
508	2 1/2
1816	1 3/4
1822	2 1/2
814	1 1/2
816, 818	1 3/4

General factory setting is 1 3/4 turns.

NOTE: As the tool wears, it may be necessary to turn the set screw (21) in 1/4 to 1/2 turn. This will become apparent if strap begins to slip in the tool while under tension.

## Annex 12, continued

### PARTS LIST

<u>KEY</u>	<u>QTY.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
1	1	<u>003489</u>	<u>Handle pawl spring</u>
2	1	<u>003492</u>	Handle pawl
3	1	<u>003493</u>	Handle
5	1	<u>003488</u>	Ratchet gear
6	1	<u>003494</u>	Handle pawl pin
7	1	<u>023964</u>	Feedwheel support pin
8	1	<u>003490</u>	<u>Feedwheel support</u>
9	1	<u>023954</u>	<u>Feedwheel</u>
10	1	<u>003485</u>	Short retaining pawl
11	2	<u>003483</u>	<u>Retaining pawl spring</u>
12	1	<u>003484</u>	Long retaining pawl
13	1	<u>003486</u>	Retaining pawl pin
14	1	<u>004502</u>	Soc. hd. cap screw, #10-32 x 3/4
15	1	<u>023953</u>	Reaction handle
16	1	<u>003868</u>	Flexloc thin nut, 3/8-24
17	1	<u>003487</u>	Feedwheel shaft
18	1	<u>003478</u>	<u>Bearing</u>
19	1	<u>003479</u>	<u>Feedwheel support spring</u>
20	1	<u>023957</u>	Flt. pt. set screw, #10-32 x 5/8
21	1	<u>023965</u>	Set screw, #10-32 x 5/8
22	1	<u>020711</u>	Truarc, #5101-37
23	1	<u>023912</u>	<u>Gripper plug</u>
24	1	<u>023966</u>	<u>Cutter blade</u>
25*	1	<u>023967</u>	Flt. hd. soc. screw, #10-32 x 5/16
26	1	<u>023952</u>	Base
27	1	<u>183024</u>	Nameplate
28	1	<u>182997</u>	Caution plate
29	1	<u>098228</u>	Protective cover
—	1	<u>023963</u>	Brush

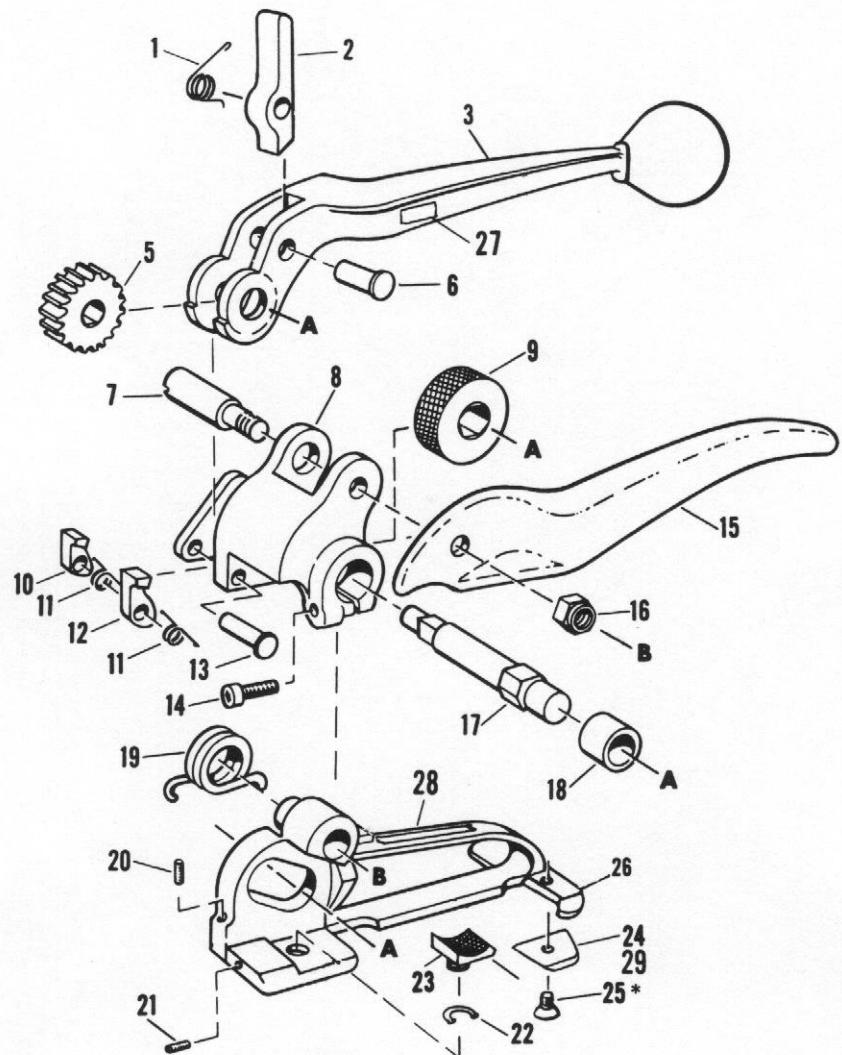
\* Apply one drop of Loctite #242 Sealant to cleaned parts. Allow 12 hours to set if possible. NOTE: Do not apply to small screws or close to moving parts as liquid spreads easily.

When ordering parts, please show tool model, part number, and name.

All recommended spare parts are underlined and should be stocked.

Standard hardware parts may be obtained at any local hardware supply.

## Annex 12, continued



### ! WARNING

All parts must be periodically inspected and replaced if worn or broken. Failure to do this can affect a tool's operation and present a safety hazard.

## ANNEX 13



### TO THE MASTER OF THE SHIP

September 1998

page 1 of 5 pages

#### New International regulation concerning liferaft marking as of 1 July 1998

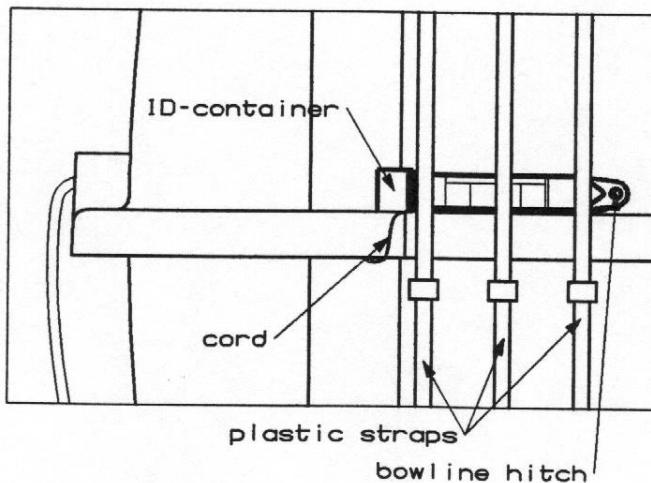
The International Life-Saving Appliance Code (LSA Code), which entered into force on 1 July 1998 prescribes the following on inflatable liferaft marking:

*„4.2.7.2 Provision shall be made for marking each liferaft with the name and port of registry of the ship to which it is to be fitted, in such form that the ship identification can be changed at any time without opening the container.“*

The background of this new requirement may be best explained by reproducing a sentence from IMO Resolution A.759(18), MARKING OF INFLATABLE LIFERAFTS:

*„RECOGNIZING that properly marked inflatable liferafts may considerably facilitate the initiation or effective conduct of a search and rescue operation, or the determination as to whether such an operation is necessary“.*

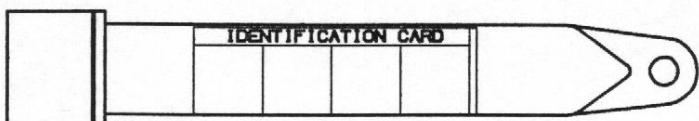
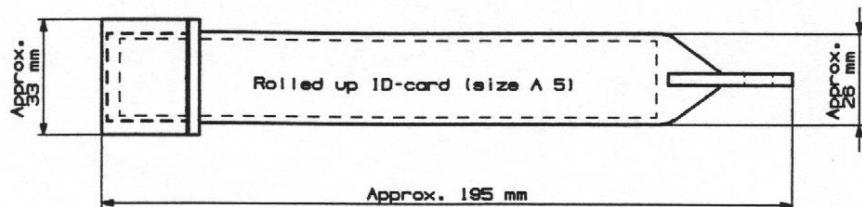
A watertight ID container is fitted to the exterior of the DSB liferaft container. The ID container is connected to the liferaft via a white cord leading through the liferaft container.



ID container placed below the black plastic straps of the liferaft container

## Annex 13, continued

	<b>TO THE MASTER OF THE SHIP</b>	September 1998 page 2 of 5 pages
---	----------------------------------	-------------------------------------



Inside the ID container you will find the ID card. The ship's master is obliged to fill in the ship data on the card and to keep them updated if the liferaft has been transferred from another ship. Please see the example below. For fishing vessels, don't forget to fill in the registration number in the column „FISHERY SIGN“.

IDENTIFICATION CARD <small>Inflatable Liferafts</small>				
NAME OF SHIP	INTERNATIONAL CALL SIGNAL	FISHERY SIGN	SHIPS IMO No.	FLAG STATE

An ordinary ball-point pen will be suitable to use when filling in the ID information's.  
Please use block letters.

When replacing the ID card in the ID container don't forget to screw the container cap back on tight.

## Annex 13, continued

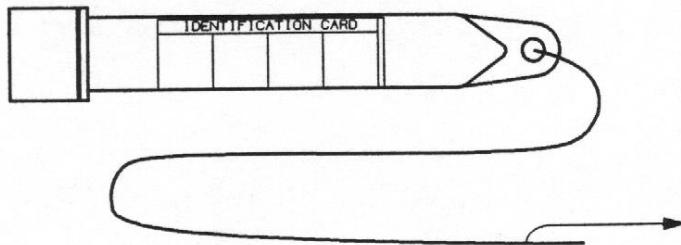
	<b>TO THE MASTER OF THE SHIP</b>	September 1998 page 3 of 5 pages
---	----------------------------------	-------------------------------------

**Acc. to chap. 4- 4.2.7.2 of the LSA Code/Resolution MSC.48(66), the following applies as of 1 July 1998:**

All SOLAS liferafts manufactured as from 1 July 1998 are to be provided with an ID container containing an ID card stating the ship's identification.

DSB recommend that all existing SOLAS liferafts are provided with the ID container at the first service inspection taking place after 1 July 1998.

For mounting instructions, please see the next page.



**Spare part no: 0.08.05.18.0**

**Covers the following:**

Cord (1 m)

spare part no: 0.03.02.04.0

IDENTIFICATION CARD Inflatable Liferafts				
NAME OF SHIP	INTERNATIONAL CALL SIGNAL	FISHERY SIGN	SHIPS IMO No.	FLAG STATE

**ID card - front and back:  
spare part no: 0.09.05.72.0**

The card is to be rolled up and put into the container.

The front is to be filled in by the master of the ship.

## **Annex 13, continued**



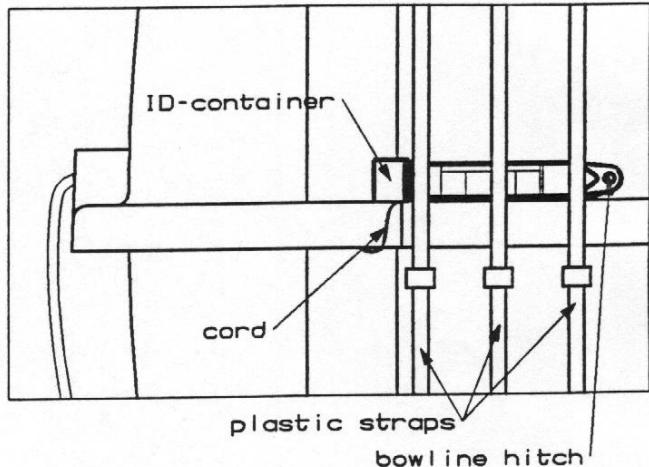
# TO THE MASTER OF THE SHIP

September 1998  
page 4 of 5 pages

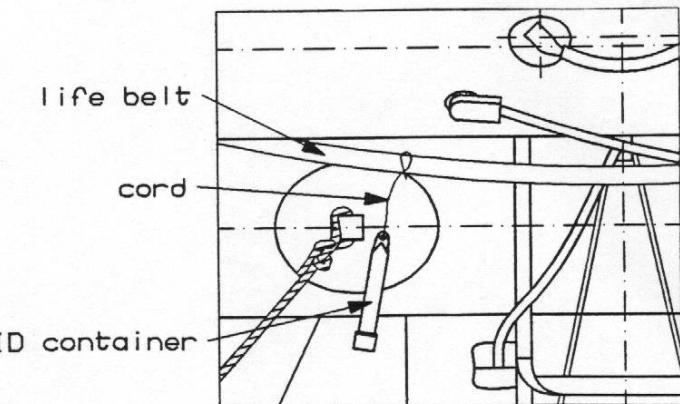
The back is to be filled in during final assembly and at each service inspection.

## 1.0 Mounting

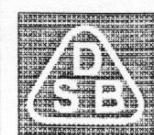
- 1.1 Tie the ID container to the life belt with the cord by means of a bowline hitch.
  - 1.2 If necessary fasten the ID container to the cord by means of a bowline hitch.



- 1.3 Let the cord and the ID container out between the upper und lower parts of the liferaft container.  
Fasten the ID container below the black plastic straps.



## Annex 13, continued

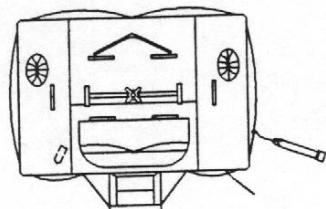


### TO THE MASTER OF THE SHIP

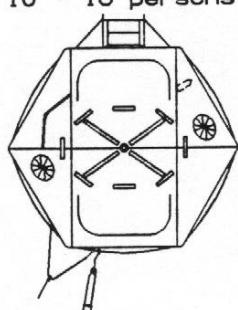
September 1998  
page 5 of 5 pages

- 1.4 For position on liferafts  
- see drawing below.

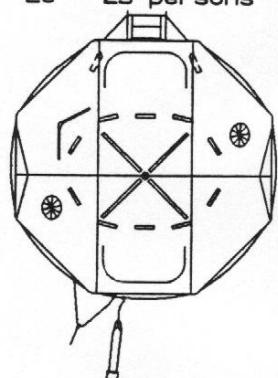
4 - 8 persons



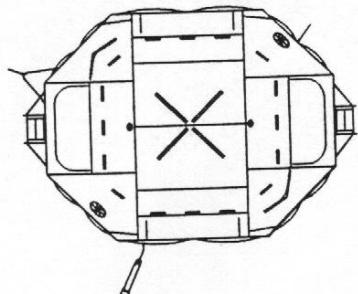
10 - 16 persons



20 - 25 persons



35 and 50 persons



65 persons

