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SERVICE MANUAL

for

RFD SURVIVA MK III BEAUFORT SEAFARER

SOLAS STYLE LIFERAFTS
THROW OVERBOARD & DAVIT LAUNCH TYPES

|
Ver. 3

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This manual: Part number 08133009

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STATEMENT OF CERTIFICATION

(for 6 Persons and larger Liferafts)

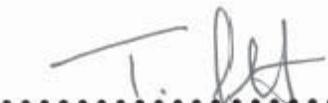
The equipment described in this manual has been accepted by the United Kingdom Department of Transport, and refers to inflatable liferafts which comply with the following international conventions and regulations:

1. SOLAS 74 as amended by Regulation III/4, 34, 35, 36 and MSC/Circ 809 as amended.
2. LSA Code, regulations I/1.2, IV/4.1 and 4.2.
3. IMO resolution MSC 81(70) Part 1.

and has been type approved in compliance with the Marine Equipment Directive, (Council Directive 96/98/EC and amendments up to and including CD 2002/84/ EC).

The technical accuracy of this manual has been verified and is certified as correct.

Signed:



Date: 17/12/2004

Tommy Scott
Design Manager Marine
RFD Beaufort Limited

STATEMENT OF CERTIFICATION

(for 4 Persons Liferaft)

The equipment described in this manual has been accepted by the United Kingdom Department of Transport,

The technical accuracy of this manual has been verified and is certified as correct.

Signed:



Date: 17/12/2004

Tommy Scott
Design Manager Marine
RFD Beaufort Limited

Important Notice

This publication is for reference purposes and its use restricted to trained service technicians in lawful possession of a current marine liferaft servicing certificate granted by RFD Beaufort Ltd ('entitlement'). It is not a stand-alone text embodying the basic techniques or skills appropriate to liferaft servicing.

RFD Beaufort Ltd accepts no responsibility for loss, injury or death resulting from the partial, improper or unlawful application of the instructions herein.

If the requirements within this publication are believed to be contrary to legislated national or international requirements RFD Beaufort Ltd must be consulted prior to release into service of affected product.

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Communications regarding this publication should be addressed to the Technical Services Department or the Technical Publications Department at RFD Beaufort Ltd.

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**RFD SURVIVA MK III
BEAUFORT SEAFARER**

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RFD Beaufort Limited, Kingsway, Dunmurry, Belfast BT17 9AF, Northern Ireland.
Telephone: +44 (028) 9030 1531 Fax: +44 (028) 9062 1765

Letter of Transmittal

To: Holders of Part No. 08133009 (M251)

Title: SURVIVA MK 111

REVISION No. 3 Dated Feb/12

The technical accuracy of this revision has been verified and is certified as correct.

Signed

Date 23/2/12

Tommy Scott
Marine Design Manager

Pages Affected

Revision Highlights

This revision introduces the Appendix 07 - 25P USCG liferaft in USN container

Appendix 07 Packing procedure introduced

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Letter of Transmittal

To: Holders of Part No. 08133009

Title: SURVIVAMKIII

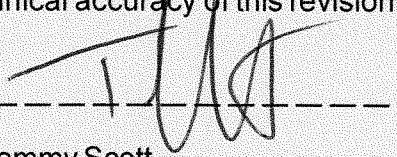
M251

REVISION No. 2 Dated DEC/09

The technical accuracy of this revision has been verified and is certified as correct.

Signed _____

Date 23/12/09


Tommy Scott
Marine Design Manager

Pages Affected

Revision Highlights

This revision introduces Cylinder chemical leak testing & blast testing. Also App.6 leak test form & App.2 US options updated. Crimp seal options and use of correct crimping tools.

TITLE PAGE

Revision number added

REVISION RECORD PAGE Pgs 1

Revision added

EFFECTIVE PAGES Pgs 1,2,3&4

Pages updated

CONTENTS PAGE

Appendix 6 added

INTRODUCTION P3-8

Text updated

CHAPTER 1 P108 & 110

Dimension amended & Torque table updated

CHAPTER 4 P403, 406-408

Text amended

CHAPTER 5 P516-524

PTFE tape, Chem leak, Blast testing added

CHAPTER 6 P604-626

Text and pages reformatted.

CHAPTER 7 P703-706 & 718-722

US options. Extra foam protect updated.

CHAPTER 8 P813,818,829,837

Painter sachet tie, Puncture holes, Tape operation cable, Crimp tools, Heat sealing option.

P843,846,854,855

CHAPTER 10 P1004 & 1006

Torque adaptor & heat seal tools added.

CHAPTER 11 P1110,1118,1122,
P1125,1132 & 1138

Table amended, Straps updated,
Heat sleeve & crimp tools added, P/nos corrected

Appendix A2 Pgs 1-10

USA options updated.

Appendix A3 Pgs 1

First Aid Kit P/n updated.

Appendix A5 Pgs 3,4,6

Painter line changed to read firing line.

Appendix A6 Pgs 1-2

Cylinder chemical leak test form added.

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Letter of Transmittal

To: Holders of Part No. 08133009

Title: SURVIVAMKIII

M251

REVISION No. 1 Dated AUG/08

The technical accuracy of this revision has been verified and is certified as correct.

Signed

Date

29-8-08

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights
REVISION RECORD PAGE Pgs 1	Revision added
EFFECTIVE PAGES Pgs 1,2,3&4	Pages updated
ASSOCIATED PUBLICATIONS Pg 1&2	List of manufacturers updated
INTRODUCTION Pgs 3-8	Wheelmark info added.
CHAPTER 1 P103, 106-114	Punit cords, Adhesive, Dimensions & Leaffield Torque added.
CHAPTER 2 P204-206	FIGURE 203 & Inflation system updated.
CHAPTER 3 P303	Pages formatted.
CHAPTER 4 P403-414	MED added, Inflation & Lighting system updated.
CHAPTER 5 P502-518	FIGS 501,502 & 506 updated. Test schedule, DL Overload tests added & text formatted.
CHAPTER 6 P601-624	Text formatted, Leaffield & Liner repair added.
CHAPTER 7 P701-722	Tables & text updated. Extra foam protect added
CHAPTER 8 P801-854	Container Mk20, RL5 lighting & Leaffield added. Container preparation updated.
CHAPTER 10 P1003-1006	Items updated & Leaffield tools added.
CHAPTER 11 P1102-1142	Lighting, ramp parts & container info added. Leaffield cylinder info added.
Appendix A5 Pgs 1-8	25P Overcapacity variant inserted.

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RECORD OF REVISIONS

REVISION NUMBER	ISSUE DATE	DATE INSERTED	INSERTED BY:
INITIAL ISSUE	Dec/04		RFD Beaufort
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SERVICE BULLETIN LIST



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BEAUFORT SEAFARER**

SERVICE BULLETIN LIST

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LIST OF ASSOCIATED PUBLICATIONS

INFLATION EQUIPMENT

QA Doc. 2017	Instruction Manual for Thanner Operating Head DK94 and cylinder adaptor CV DK94 and CV DK 99 system.
QA Doc. 0050	Installation Manual - Thanner Mk III Inflation Valve.
QA Doc. 2045	Instruction Manual for Thanner Operating Head DK99.

The above manuals are published by the manufacturer:-

Thanner & Co. A/S, Randersvej 8-10,
DK-6700, Esbjerg, Denmark.

Tel.: (45) 7513 0066
Fax: (45) 7545 2993
E-mail: admin@thanner.dk
Web site: www.thanner.dk

M-07-IS-GIVT	Gas Inflation System (Torsional) inlet valve installation instructions
M-07-UM-GIST	General user manual for gas inflation system (Torsional)

The above manuals (latest versions) are published by the manufacturer:-

Leafield Marine Limited
Leafield Way, Corsham, Wiltshire, SN13 9SS

Tel: +44 (0)12 2581 0771, Fax: +44 (0)12 2581 2057
E-mail: lml@leafield.co.uk

Service bulletin 03/01

Approved spare parts, Non-operational liferafts and the Marine Equipment Directive.

The above service bulletin is published by :-

RFD Beaufort Limited
Kingsway,
Dunmurry
Belfast
Tel: +44 (0)28 9030 1531, Fax: +44 (0)28 9062 1765
E-mail: marine@rfdbeaufort.com

MISCELLANEOUS

User Guide (Issue 5) SART S4 Search And Rescue Transponder

The above manual is published by the manufacturer:-

Daniamant Ltd
Unit 3, The Admiral Park
Airport Service Road
Portsmouth
Hampshire
PO3 5RQ
United Kingdom

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BEAUFORT SEAFARER**

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INTRODUCTION TO THE MANUAL

1 General

- A This manual is intended for use by the people who will do the regular servicing work on the equipment. They will normally be employees of the Manufacturer or of Service Stations appointed by the Manufacturer. The manual describes the procedures used to disassemble, inspect, repair and reassemble the equipment. These procedures must be strictly obeyed.
- B RFD Beaufort Limited is the Design Authority for the equipment. The company has invested much effort to create the equipment and its servicing procedures, so that the equipment will be capable of reliable use, regardless of climate, weather conditions or circumstances.
While comments intended to improve the efficiency of servicing procedures are always welcome, you must not make any changes to the servicing procedures without the permission of RFD Beaufort Ltd. Unauthorised changes may cause the equipment to malfunction. They may also void the approval of the equipment.
- C This manual covers the RFD SURVIVA MK III family including BEAUFORT SEAFARER liferafts.
- D Wheel-mark instruction - European Council Directive 96/98/EC (Marine Equipment) mark of conformity, is known as the 'Wheelmark'.
An inflatable liferaft which bears the Wheelmark, embodies wheel-marked components (pyrotechnics, TPA's, position indicating lights, retro reflective tape and HRU). Items not wheel-marked may be subject to approval by the administration of the flag State.

2 Manual Breakdown

A Chapters and Page Numbers

- (1) The Chapter and Page Number blocks are as follows:

Chapter	Page Nos.	Title	
-	1	99	Introduction
1	101	199	Description and Data
2	201	299	Removal and Unpacking
3	301	399	Cleaning
4	401	499	Inspection and Checking
5	501	599	Testing and Trouble Shooting
6	601	699	Repair

continued: PTO

7	701	-	799	Emergency Packs and Equipment
8	801	-	899	Assembly and Repacking
9	901	-	999	Storage Conditions and Instructions
10	1001	-	1099	Tools, Equipment and Materials
11	1101	-	1199	Illustrated Parts List
Appendices	-			List of Appendices covering variations to basic (UK) provisions for various national Authorities.

B List of Effective pages

- (1) The List of Effective Pages details all the pages that are contained in the manual and indicates the issue dates of those pages allowing the manual content to be checked for completeness and latest update. This list is included in the introductory pages of the manual.

C Record of revisions

- (1) Modifications to the equipment will be embodied in compliance with the MED. When required, the pages of this manual will be amended, approved and reissued as a revision.
- (2) A revision to the manual consists of a transmittal letter, a revised List of Effective Pages, and new or revised text and illustrations. Revised contents lists are issued when necessary.
- (3) The transmittal letter carries at its head the certification statement which authorises the revision. It describes, in general terms, the contents of the revision in the manual. All pages that are required to be removed without replacements are listed. All other out of date pages are to be removed when superseding pages of the same number are inserted. All additional pages to be inserted are also listed where applicable.
- (4) The transmittal letters are to be filed behind the Record of Revisions page at the front of the manual.

D Associated publications

- (1) The list of Associated Publications containing details of the manuals published by the manufacturer of a component fitted to, or used in conjunction with, the equipment described in this manual. This list, where applicable, is located at the front of the manual.

3 WARNINGS, CAUTIONS and NOTES

Certain areas of the manual require particular attention. These are classified as follows;

WARNING: A WARNING CALLS ATTENTION TO A PROCEDURE WHICH IF INCORRECTLY PERFORMED IS LIABLE TO CAUSE INJURY OR DEATH TO PERSONNEL.

CAUTION: A CAUTION CALLS ATTENTION TO A PROCEDURE WHICH IF INCORRECTLY PERFORMED IS LIABLE TO CAUSE DAMAGE TO THE EQUIPMENT OR ITS COMPONENTS.

NOTE: A NOTE calls attention to methods which make the job easier.

4 Health and safety

- A RFD Beaufort Limited shall not be deemed by virtue of any of these instructions to have assumed any of the responsibilities of the service agent or operator under the HEALTH AND SAFETY AT WORK ACT or any such enactment.

5 List of abbreviations

The following list of abbreviations are used throughout the manual;

AR	-	As required
assy.	-	Assembly
C	-	Celsius
cc	-	Cubic Centimetre(s)
cm	-	centimetre(s)
c/w	-	Complete With
dia.	-	Diameter

g	-	Gramme
g/cm ²	-	Grammes per square centimetre
iaw	-	In accordance with
i/d	-	Inside Diameter
instl.	-	Installation
in.	-	Inch
kg	-	Kilogramme
kgf	-	Kilogramme force
Lbs	-	Pounds
L.H.	-	Left Hand
R.H.	-	Right Hand
m	-	metre(s)
mm	-	millimetre(s)
mm WG	-	millimetres of Water Gauge
max.	-	Maximum
min.	-	Minimum
Mod.	-	Modification
Nm	-	Newton Metre(s)
o/d	-	Outside Diameter
Spec.	-	Specification
P/N	-	Part Number
PU	-	Polyurethane
PVC	-	Polyvinylchloride
RF	-	Reference
S/A	-	Self Adhesive

6 Service provision

- A** The provision of service on liferafts, at the intervals required by governing legislation or by the Design Authority, is detailed in Chapters 2 to 8 of this manual.
- B** Servicing work must not be done to RFD Beaufort Ltd products except by or under the direct supervision of RFD Beaufort certificated service technicians employed by and working in the approved premises of RFD Beaufort accredited service agents.
- C** In brief, the following tasks shall be carried out:
 - (1) The servicing record chart on reverse of the liferaft Identification label is to be completed at each servicing including;
 - The stamp of the Certified operator who serviced the liferaft in the place designated.
 - The number of the annual Certificate is to be written in the space provided.
 - The Service station Manager or Chief Inspector is to sign this card in the space provided.

- (2) Liferafts shall be unpacked in accordance with Chapter 2.
- (3) Liferafts and constituent items shall be cleaned and inspected in accordance with Chapters 3 and 4.
- (4) Testing appropriate to the age of the liferaft (refer to Chapter 5, Paragraph C.1. onward) shall be carried out according to Chapter 5.
- (5) Required repairs shall be carried out according to Chapter 6 provided the appropriate techniques are described there. In all other cases procedural advice shall be obtained from RFD Beaufort . Technical Services.
- (6) Sub-assembly processes and repacking of the liferaft shall be in accordance with Chapters 7 and 8.

D Installation and Removal (See also Chapter 1).

- (1) Satisfactory installation of liferafts on board is the responsibility of the vessel's master and operator. In relation to servicing however, RFD Beaufort servicing agents must ensure that the responsibility for reinstallation, following servicing, is identified within their contractual agreement with the operator . Also when the RFD Beaufort agent reinstalls liferafts, the resulting installation is according to RFD Beaufort recommendations and is in all respects satisfactory.

E Special tools, Equipment, Replacement parts and the 'MED'.

- (1) The special tools and equipment listed in Chapter 10 or in associated publications may not be substituted except by the explicit permission of RFD Beaufort.
- (2) No replacement parts or materials other than those of RFD Beaufort supply or approval may be used in the servicing of RFD Beaufort products. Replacement parts are listed in Chapter 11, materials in Chapter 10 or in current service bulletins.

- (3) Liferafts that are labelled – ‘wheel-marked’ – indicating compliance with the Marine Equipment Directive of the European Union ('the MED') shall contain items which are themselves wheel-marked; these are:
- (a) Position indicating lights
 - (b) Retro-reflective material
 - (c) Thermal Protective Aids
 - (d) Pyrotechnics (hand flares, rocket parachutes flares and buoyant smoke signals)

Note that MED compliant items must be accompanied by an MED ‘declaration of conformity’.

Locally obtained substitutes may be used only upon approval by RFD Beaufort and only if they are MED compliant. Application to RFD Beaufort, must make it perfectly clear that they are wheel-marked and quote the complete technical specification.

At present the MED governs the following countries:

Nations of the European Union
Norway

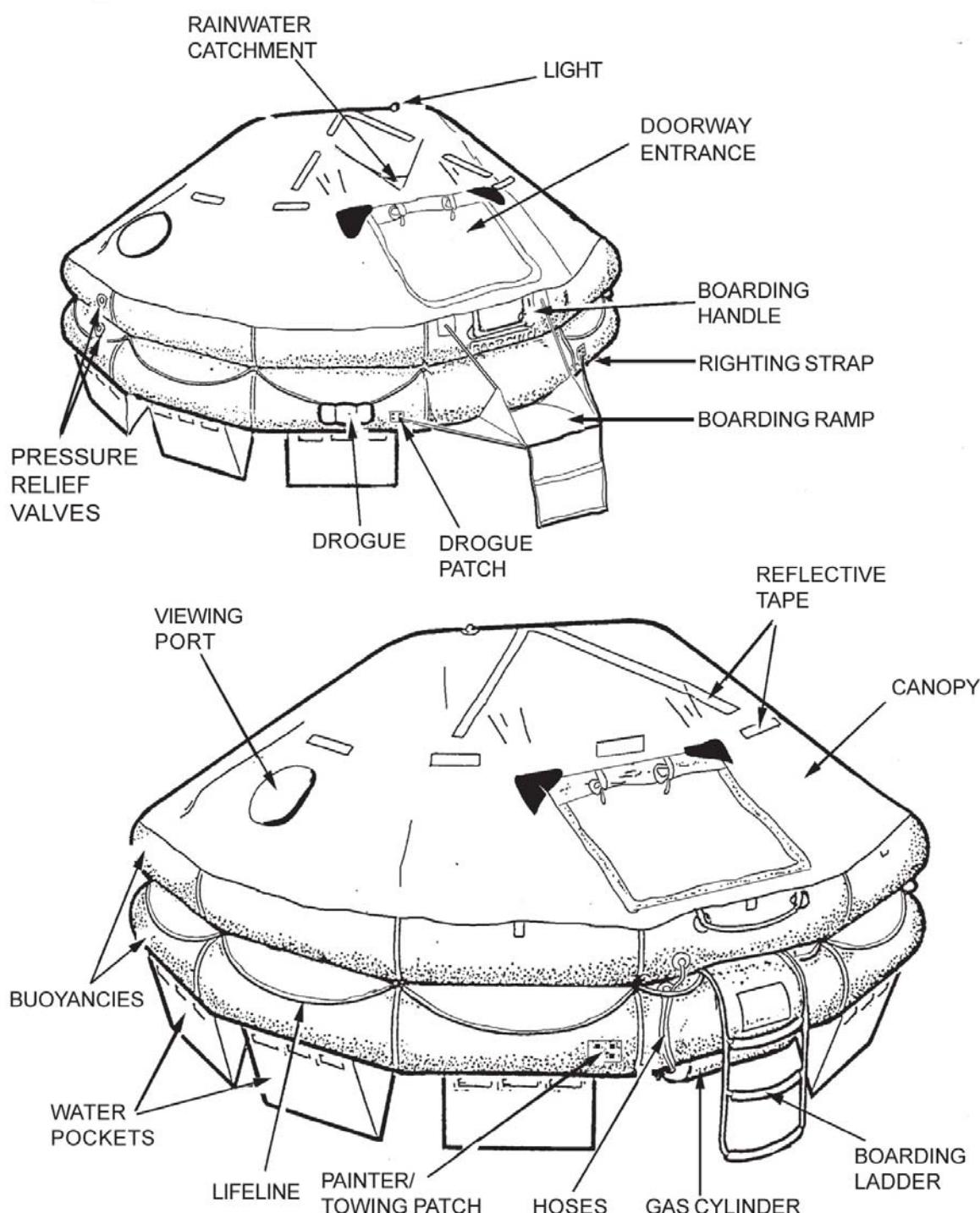
Some emergency equipment items (for example, first aid kits) may be subject to explicit approval by the relevant administration of the flag state.

NOTE: Australia are not governed by the MED, but do recognise it.

CHAPTER 1

DESCRIPTION AND DATA

<u>Section</u>	<u>Page</u>
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**SOLAS style Throw Over liferaft
FIGURE 101**

CHAPTER 1

DESCRIPTION AND DATA

1 Description

A The Surviva MK III SoLaS style range of Throw Overboard liferafts are high capacity liferafts rated for 4, 6, 8, 10, 12, 16, 20 or 25 persons (FIGURE 101).

The range is complemented by Davit Launch versions sized 12, 16, 20 or 25 persons, (FIGURE 102).

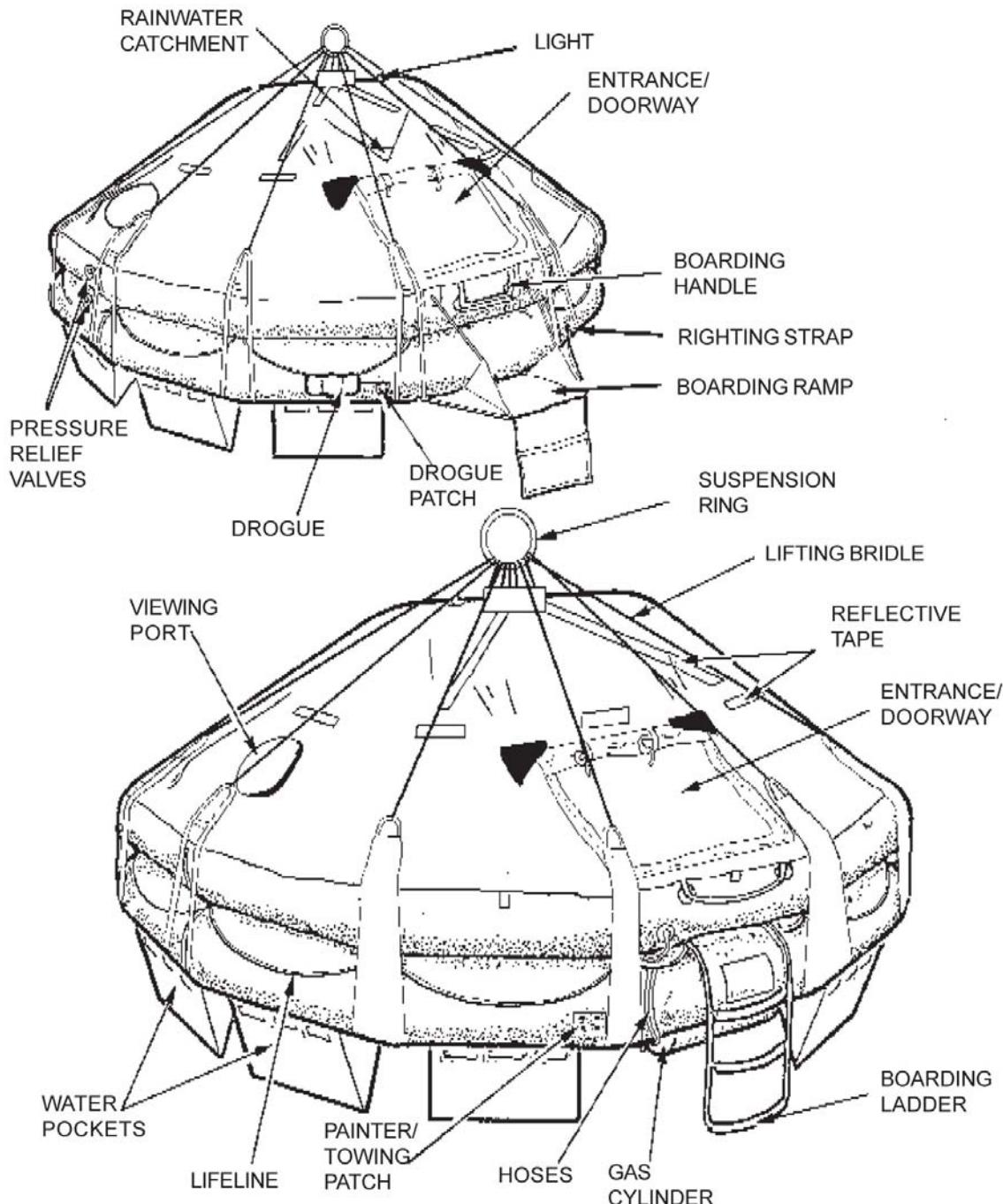
B The design consists of two buoyancy chambers forming a high freeboard, an insulated floor and an automatically erected canopy for all-weather protection that incorporates doors, vents and rainwater catchment systems. The canopy is double skinned for insulation purposes and is supported by an arch tube which is inflated via the upper buoyancy chamber.

C Polyurethane adhesive (BOSTIK 1520), is used during manufacture. Polychloroprene adhesive (BOSTIK 486) must be used for service repairs.

D The liferaft is made from the following parts, (FIGURE 101 or FIGURE 102):

- (1) Two buoyancy tubes: one installed on top of the other with a floor suspended below them. This gives a high freeboard.
- (2) A canopy, which is erected automatically by an inflated arch tube.
- (3) Water pockets, which are installed on the base, make the liferaft stable and control the drift subsequent to the launch.
- (4) The liferaft is made from polyurethane-proofed Nylon fabric. The buoyancy chambers of the liferaft are black and the canopy is a high visibility colour.

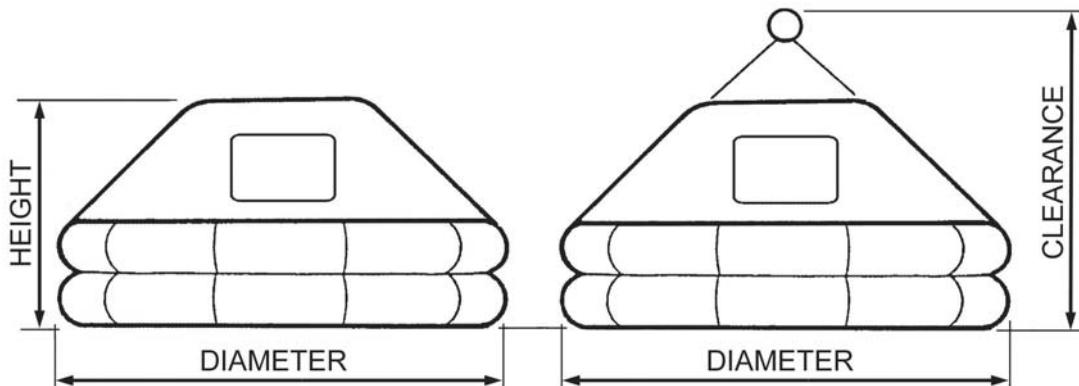
- E The liferaft has the internal and external equipment as follows, (FIGURE 101 or FIGURE 102).
- (1) Lifelines which are attached around the interior and exterior of the buoyancy tubes.
 - (2) A rescue line and quoit which are located inside the liferaft.
 - (3) Automatically deployed internal and external lights.
 - (4) Drogue (sea anchor).
(Automatically deployed on Throw Over liferafts).
(Manually deployed on Davit Launch liferafts).
 - (5) Survival equipment, which is contained in emergency pack valise(s), are stowed inside the liferaft.
 - (6) A righting ladder on the base used to right an upturned Liferaft.
 - (7) Boarding means by ladder or ramp.
 - (8) Rainwater catchment device on canopy exterior.
 - (9) Illustrations are given, (where possible), on the liferaft to show operation of the equipment.
 - (10) Immediate action leaflets are provided in English and appropriate foreign language.
 - (11) Lifting bridle. (Only on Davit Launch liferafts).



**SOLAS Style Davit Launch liferaft
FIGURE 102**

2. Liferaft Nominal Dimensions :

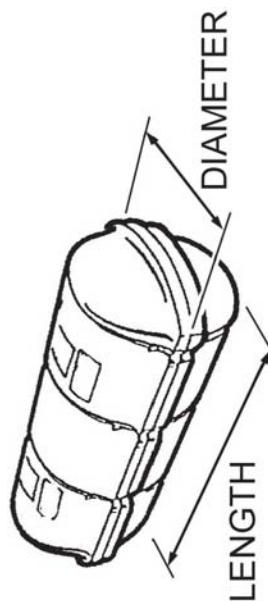
RATED CAPACITY	LIFERAFT DIMENSIONS					
	THROW OVER Nominal Dimensions mm (in)			DAVIT LAUNCH Nominal Dimensions mm (in)		
	Diameter	Height		Diameter	Height	Clearance
4	2010 (79.1)	1080 (42.5)				
6	2400 (94.5)	1120 (44.0)				
8	2740 (108.0)	1230 (48.0)				
10	2900 (114.0)	1460 (57.5)				
12	2900 (114.0)	1460 (57.5)		2900 (114.0)	1460 (57.5)	1900 (75.0)
16	3310 (130.0)	1600 (63.0)		3310 (130.0)	1600 (63.0)	1950 (77.0)
20	3710 (146.0)	1680 (66.0)		4110 (162.0)	1900 (75.0)	2470 (97.0)
25	4110 (162.0)	1900 (75.0)		4110 (162.0)	1900 (75.0)	2470 (97.0)



Nominal Dimensions for TO and DL in CYLINDRICAL CONTAINERS

RAFTED CAPACITY	CONTAINER DIMENSIONS - THROW OVER RAFTS									
	MK 10 CONTAINER SOLAS A pack					MK 14 CONTAINER SOLAS A pack				
	Length	Diameter	Approx. Operational Weight Kg (lb)	mm (in)	Diameter	Length	Diameter	Approx. Operational Weight Kg (lb)	mm (in)	Diameter
4	1160 (45.7)	435 (17)	56 (123.5)	1160 (45.7)	435 (17)	48 (105.8)	-	-	-	-
6	1260 (49.6)	485 (19)	74 (163.2)	1160 (45.7)	435 (17)	55 (121.1)	1066 (42.0)	556 (22)	74 (163.1)	-
8	1260 (49.6)	485 (19)	81 (178.6)	1160 (45.7)	435 (17)	58 (127.9)	1066 (42.0)	556 (22)	79 (174.2)	-
10	1390 (54.7)	535 (21)	104 (229.3)	1260 (49.6)	485 (19)	84 (185.2)	1066 (42.0)	556 (22)	104 (229.3)	-
12	1390 (54.7)	535 (21)	104 (229.3)	1260 (49.6)	485 (19)	84 (185.2)	1156 (45.5)	584 (23)	108 (238.1)	-
16	1540 (60.6)	535 (21)	133 (293.2)	1390 (54.7)	535 (21)	103 (227.1)	1156 (45.5)	584 (23)	133 (293.2)	-
20	1635 (64.4)	585 (23)	159 (350.5)	1540 (60.6)	535 (21)	110 (242.5)	1273 (50.2)	685 (27)	159 (350.5)	1156 (45.5)
25	1635 (64.4)	585 (23)	178 (392.4)	1540 (60.6)	535 (21)	128 (282.2)	1273 (50.2)	685 (27)	175 (385.8)	-

CONTAINER DIMENSIONS - DAVIT LAUNCH RAFTS									
MK 14 CONTAINER SOLAS B pack									
Length	Diameter	Approx. Operational Weight Kg (lb)	mm (in)	Diameter	Length	Diameter	Approx. Operational Weight Kg (lb)	mm (in)	Diameter
12	1390 (54.7)	535 (21)	113 (249.0)	1260 (49.6)	485 (19)	89 (196.2)	-	113 (249.1)	-
16	1540 (60.6)	535 (21)	139 (306.4)	1390 (54.7)	535 (21)	107 (235.9)	-	139 (306.4)	-
20	1635 (64.4)	585 (23)	185 (407.9)	1540 (60.6)	535 (21)	135 (297.6)	-	172 (379.2)	-
25	1635 (64.4)	585 (23)	185 (407.9)	1540 (60.6)	535 (21)	135 (297.6)	1273 (50.2)	685 (27)	182 (401.2)

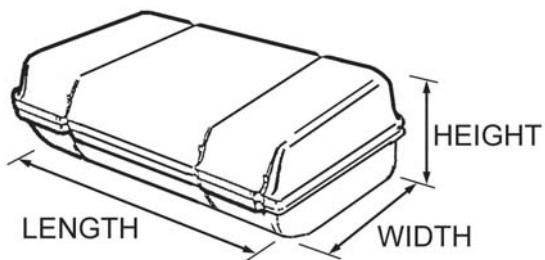


Nominal Dimensions for Flat Pack CONTAINERS

FLATPACK CONTAINERS								
RATED CAPACITY	MK 16 CONTAINER (Sz2)				MK 16 CONTAINER (Sz2)			
	SOLAS A pack				SOLAS B pack			
	mm (in)	Length	Width	Height	mm (in)	Length	Width	Kg (lb)
10	-				1190 (46.8)	650	315	TBA
12	1190 (46.8)	650 (25.6)	315 (12.4)	TBA	(46.8)	(25.6)	(12.4)	TBA

RATED CAPACITY	MK 18 CONTAINER				MK 18 CONTAINER			
	SOLAS A pack				SOLAS B pack			
	mm (in)	Length	Width	Height	mm (in)	Length	Width	Kg (lb)
4	900 (35.4)	646 (25.3)	310 (12.2)	53 (116.8)	900 (35.4)	646 (25.4)	310 (12.2)	45 (99.2)
6	985 (38.8)	670 (26.4)	435 (12.2)	71 (156.5)	985 (38.8)	670 (26.4)	435 (12.1)	57 (125.7)
8	985 (38.8)	670 (26.4)	435 (12.2)	79 (174.2)	985 (38.8)	670 (26.4)	435 (12.1)	63 (138.9)

RATED CAPACITY	MK 20 CONTAINER				MK 20 CONTAINER			
	SOLAS A pack				SOLAS B pack			
	mm (in)	Length	Width	Height	mm (in)	Length	Width	Kg (lb)
25	1525 (60.1)	820 (32.3)	505 (19.9)	180 (396.8)	1525 (60.1)	820 (32.3)	505 (19.9)	130 (286.6)



3. Period to overhaul

Liferafts 12 months

Inflation System..... See Associated Publications
at the front of this manual

4. Inflation system and Gas charges

Liferaft Working Pressure	2.8 Psi
.....	77.5 in WG
.....	1970mm WG

EUROPEAN Cylinders							
THROW OVER RAFTS				DAVIT LAUNCH RAFTS			
RATED CAPACITY	INFLATION SYSTEM and GAS CHARGES			RATED CAPACITY	INFLATION SYSTEM and GAS CHARGES		
	Cylinder CO ₂ Kg	Cylinder CO ₂ Lb	Cylinder N ₂ Kg	Cylinder N ₂ Lb	Cylinder CO ₂ Kg	Cylinder CO ₂ Lb	Cylinder N ₂ Kg
4	1.98	4.37	0.06	0.13			
6	2.50	5.51	0.16	0.35			
8	3.51	7.74	0.23	0.51			
10	5.94	13.10	0.18	0.40			
12	5.94	13.10	0.18	0.40	12	5.94	13.10
16	8.44	18.61	0.37	0.82	16	8.44	18.61
20	8.44	18.61	0.37	0.82	20	11.26	24.82
25	11.26	24.82	0.36	0.79	25	11.26	24.82

USA & CANADA Cylinders							
THROW OVER RAFTS				DAVIT LAUNCH RAFTS			
RATED CAPACITY	INFLATION SYSTEM and GAS CHARGES			RATED CAPACITY	INFLATION SYSTEM and GAS CHARGES		
	Cylinder CO ₂ Kg	Cylinder CO ₂ Lb	Cylinder N ₂ Kg	Cylinder N ₂ Lb	Cylinder CO ₂ Kg	Cylinder CO ₂ Lb	Cylinder N ₂ Kg
4	1.454	3.20	0.177	0.39			
6	3.171	6.99	0.386	0.85			
8	3.171	6.99	0.386	0.85			
10	4.362	9.62	0.532	1.39			
12	4.362	9.62	0.532	1.39	12	4.362	9.62
16	6.343	13.98	0.773	1.70	16	6.343	13.98
20	6.343	13.98	0.773	1.70	20	8.722	19.23
25	9.410	20.75	0.750	1.65	25	8.722	19.23

5. Torque wrench settings:

THANNER INFLATION SYSTEM	VALUE		Special tool required
	Nm	(Ft/Lbs)	
Valve, Topping-up, A8	16	11.8	No
Hose, Inflation (cylinders to raft)	20.3	14.97	No
Banjo bolt, inflation	23	16.96	No
Valve nut, inflation valve MKIII	30	22.13	No
Vave pressure relief, Thanner OTS65	27	19.91	Yes
Cylinder valve (to gas cylinder)	160 (+/-10 N/m)	118 (+/-8 f/lbs)	Yes
Head, operating, DK99 (to cylinder valve)	50	36.88	No

LEAFIELD INFLATION SYSTEM	Nm	(Ft/Lbs)	Special tool required
M24 nut (inlet check valve)	30	22.17	Yes
M16 connector (inlet check valve)	9	6.6	No
Cylinder valve/gas cylinder:	200	147.51	No
Cylinder valve/hose	12.2	9	No
Break stem seal assy./valve body	40	29.5	Yes
Torque drive assy./valve body	4	2.95	Yes
Operating head/cylinder valve (3mm Hex)	1.12	0.83	No
A10 pressure relief valve (inner)	27	19.91	Yes

Torque settings
TABLE 101

6. Powerunit activation cord lengths:

RATED CAPACITY	RL1/RL4/RB2 Lighting system		RL5 Lighting system	
	Cut length		Cut length	
	mm	inch	mm	inch
4 TO	450	18	600	23.5
6 TO	450	18	650	25.5
8 TO	450	18	750	29.5
10 TO	900	35.5	1100	43
12 TO	900	35.5	1100	43
12 DL	900	35.5	1100	43
16 TO	900	35.5	1350	53
16 DL	900	35.5	1350	53
20 TO	1000	39.5	1400	55
20 DL	1000	39.5	1500	59
25 TO	1300	51	1500	59
25 DL	1300	51	1500	59

Power unit activation cord lengths
TABLE 102

7. Installation notes:

USE ONLY GENUINE RFD-BEAUFORT PARTS FOR INSTALLATIONS.

- A When more detailed instructions are necessary, refer to RFD Beaufort Customer Service Department.

(1) Stowage positions

- (a) Stow the liferafts in a position which will make sure they will be serviceable when necessary. Make sure they can be easily launched (manually) or can float-free from a sinking ship .

NOTE: The liferafts must be stowed away from the propellers, side thrust apertures and stabilisers. The stow position must not prevent the operation of a survival craft or rescue boat at any other launching station.

In cases where Davit Launch liferafts are to be fitted they should be positioned at least 9m forward of the ships propellers.

(2) Protection of stowed liferafts

- (a) Stow the liferafts in a position which will give the maximum possible protection from fire, smoke, vibration, funnel deposits, sparks, oil, heat, explosion, flooding and weather.
- (b) In conditions when ice is present, stow the liferafts in protected positions (adjacent to casings) so that they will not be frozen over.
- (c) Do not stow the liferafts in positions where they can be in a pool of water.
- (d) Do not let the liferafts touch any material that has copper or copper compounds.
- (e) When using a power hose to wash the ship's deck and liferaft installation, do not point the hose directly at the liferaft container.

(3) Magnetic deviation

In deciding on the stowage position of the liferafts, particularly in small vessels, consideration should be given to the possible effect on the ship's compass of any ferrous metal in the liferaft or its stowage arrangements. Under these conditions, liferafts and their stowage should, if necessary, be regarded as fixed magnetic material.

(4) Secure the painters

The end of the painter on every liferaft should be secured to a suitable strong point, so that on being launched the liferaft is held to the vessel. The securing arrangement for the *painter* will normally include a float free arrangement, such as a hydrostatic release unit, (HRU). Where a HRU is fitted the painter line should be attached only to the HRU weak link.

WARNING: IT SHOULD BE IMPRESSED UPON ALL MEMBERS OF THE CREW THAT, IF FOR ANY REASON A LIFERAFT PAINTER HAS TO BE UNFASTENED BEFORE A LIFERAFT IS LAUNCHED, THEN IT SHOULD BE MADE FAST AGAIN TO SOME OTHER SUITABLE STRONG POINT BEFORE LAUNCHING TAKES PLACE.

(5) Height of stowage above the waterline

- (a) The liferafts should be stowed as close to the waterline as is safe and practical.

NOTE: The painter line of the liferaft is at minimum 10 metres more than the installation height as listed on the exterior of the container.

- (b) Make sure the liferaft is approved to be dropped from the height of its stowage point.

(6) Installation and removal of liferafts

- (a) Be very careful when installing or removing the liferafts at their stowage positions. The glass-reinforced plastic (the container) can be damaged and subsequently, the liferaft. They must not be rolled or dropped during removal/installation.

(7) Stowage of liferafts in rigid containers

NOTE: Liferafts are usually packed in rigid *containers* with no other protection.

- (a) Install the *container* the correct way up with the drainage apertures at the bottom. Keep the drainage apertures clear of obstructions such as the launching cradle support structure.

NOTE: Each cradle must be of the correct dimensions for the type of container installed. The rack must be attached to the ship's structure.

(8) Attachment of stowed liferafts

- (a) Make sure the liferaft can be released easily when a manual launch is necessary or for float-free operation (refer to Step 10).
- (b) Make sure the mechanism which holds the liferaft on the rack can be removed easily in an emergency:
A slip-link (Senhouse slip) or other release mechanism which can be operated by a single swift action should be provided.

(9) Ramp Stowage

- (a) On passenger ships which have a large number of inflatable liferafts installed, the liferafts must be stowed away from the lifeboat positions along the ship's side.
- (b) The liferafts should be installed on vertical racks or racks that slope outboard to the sea. If the liferafts are installed in this way, make sure each liferaft can be released independently and that the float-free attachment is satisfactory (refer to Step 10).

(10) Float-free attachment (hydrostatic release)

- (a) A float-free launch is operated by a mechanism which inflates and releases the liferaft automatically from a ship that is sinking.

NOTE: The hydrostatic release must be installed as per manufacturer's instructions.

NOTE: If the hydrostatic release is a type which requires servicing, it must be serviced by an approved servicing station. The service station must record the date of servicing on the data plate attached to the unit.

NOTE: If the hydrostatic release is a type that must be discarded (lifed item) it must be identified with the date of expiry and must be replaced by that date. They usually have an operational life which does not include a servicing period.

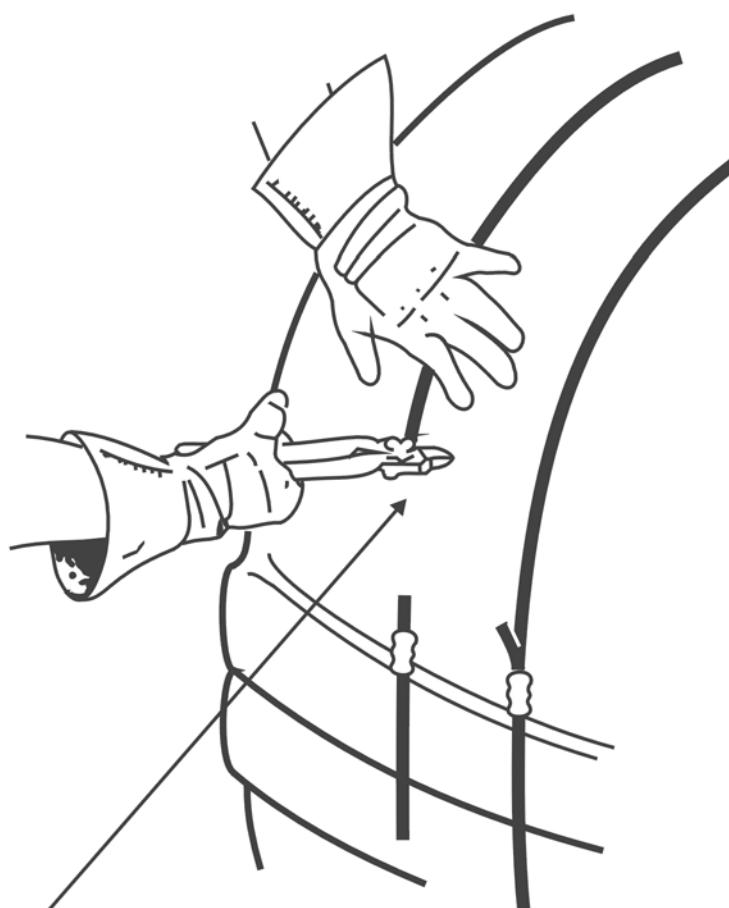
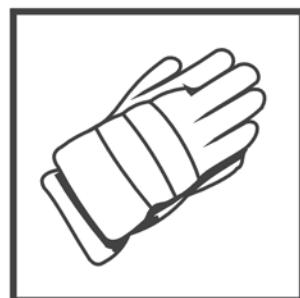
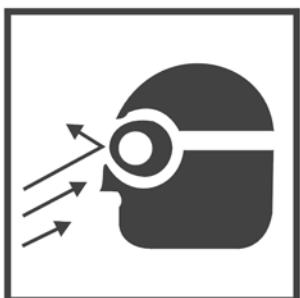
- (b) A weak-link must be installed in the hydrostatic system to make sure a liferaft is not pulled under the water by a sinking ship.
The weak-link in the system must have a breaking strength of 1.8 - 2.6 kN (404.66-584.5 lbf) to pull the painter from the liferaft container and activate its inflation system.
- (c) If it is necessary to launch the liferaft manually, make sure the painter line is attached to a strong point on the ship. The strong point must be sufficient to support the pull of the painter line to operate the inflation system.
- (d) A slip link, lashed to the holding down straps, should be provided between the hydrostatic release and the straps. This will enable manual quick release for the liferaft.

CHAPTER 2

REMOVAL AND UNPACKING

<u>Section</u>	<u>Page</u>
1 Safety procedures	203
2 Removal/Date of Manufacture	204
3 Unpacking procedure	204

WEAR EYE, FACE AND HAND PROTECTION



CUT CAREFULLY

Safety procedure
FIGURE 201

CHAPTER 2

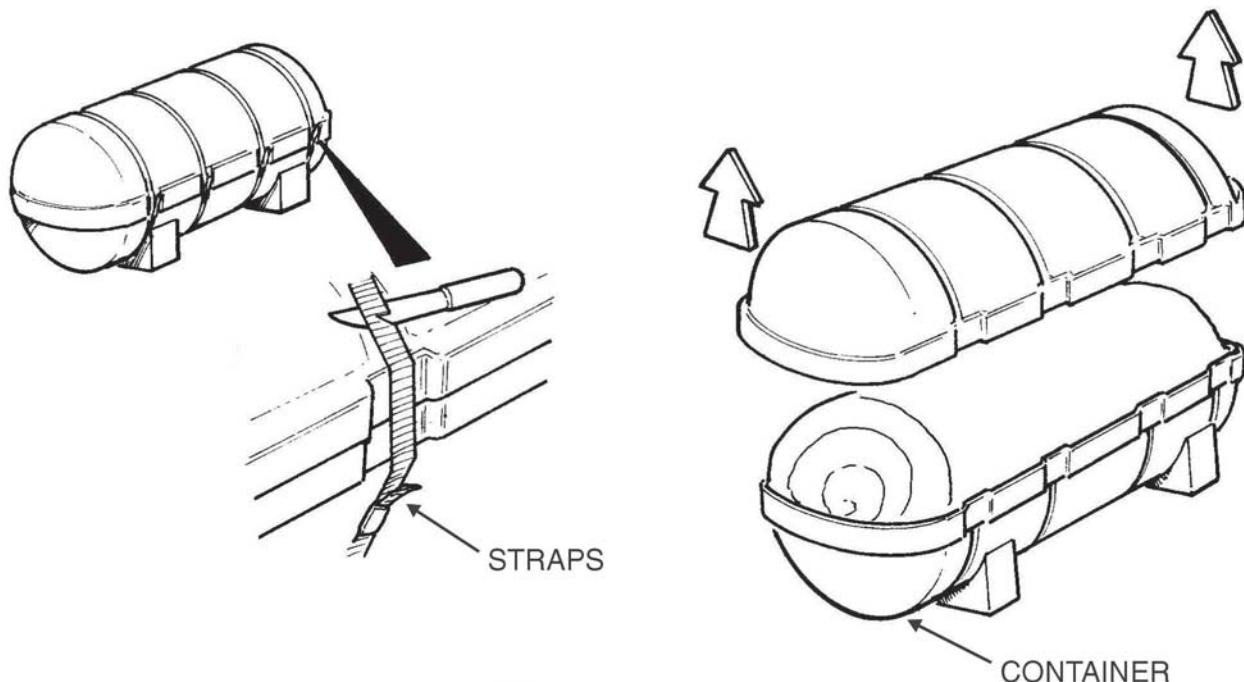
REMOVAL AND UNPACKING

1 Safety procedures

- A Make sure the work area is clean and the lighting is sufficient.
- B Use the following procedure if cutting container straps:

WARNING: PUT ON FACE PROTECTION EQUIPMENT SUCH AS GOGGLES OR A FACE SHIELD AND GLOVES WHEN CUTTING THE STRAP AROUND THE CONTAINER. THE STRAP CAN CAUSE INJURY TO FACE AND HANDS WHEN CUTTING IT.

- (1) Make sure personnel are at a safe distance from the container when cutting the strap.
- (2) Stand to one side of each strap when cutting it.
- (3) Hold the strap against the container before cutting it.
- (4) Cut each strap between the seal and the position where the strap is held, (FIGURE 202).



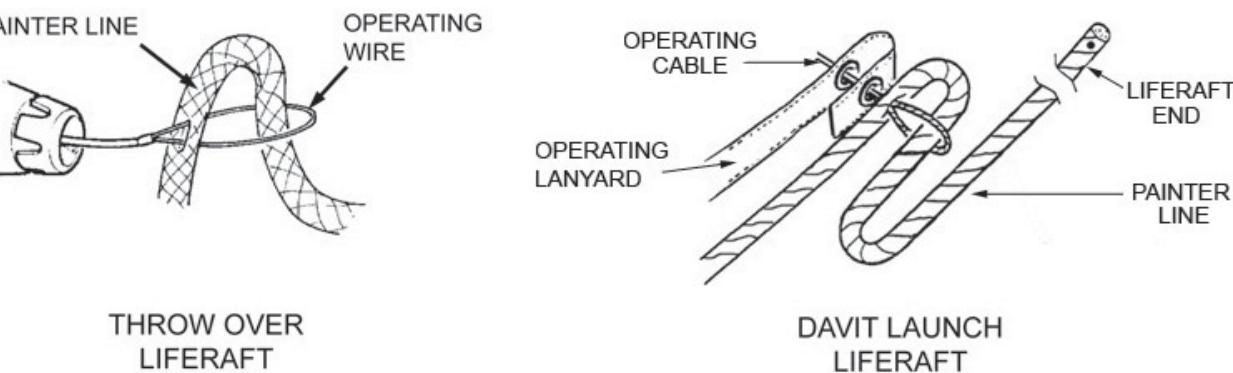
**Container and liferaft
FIGURE 202**

2 Removal/Date of Manufacture

- A Remove the liferaft containers from the ship, 12 months from the date of manufacture and subsequently at 12 month periods. Send them to an approved service station for inspection, testing and repair (if necessary).
- B Check the date of manufacture and servicing period of the gas inflation system. Refer to Chapter 5 for the test procedure. If a test is not necessary, continue this procedure at Step 3.

3 Unpacking procedure

- A Container and liferaft (FIGURE 202).
 - (1) Put the container onto a suitable trolley or cradle. Make sure it is held securely with the top uppermost. Position the trolley so that the container is next to the packing table.
 - (2) Cut the straps which hold each half of the container together as given in the safety procedure (Refer Step 1 & FIGURE 202).
 - (3) Cut the straps of the container at the end grooves first and then the centre grooves, (FIGURE 202).
 - (4) Carefully lift the top part of the container, (FIGURE 202).



**Gas inflation system
FIGURE 203**

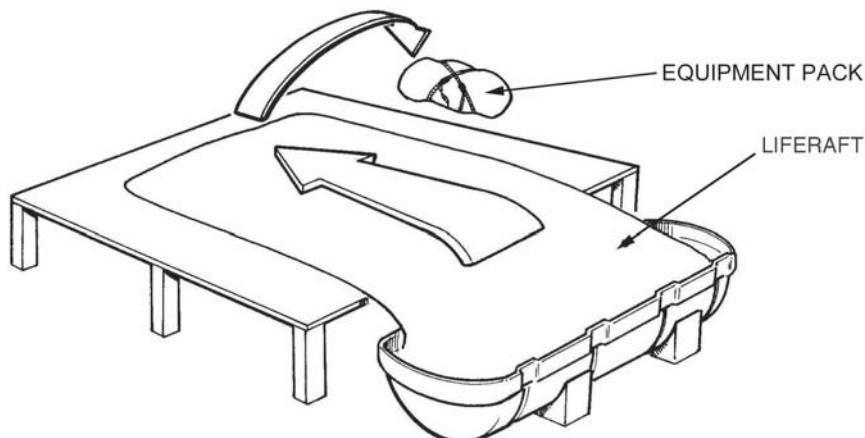
B Gas inflation system (FIGURE 203).

NOTE: Hold the gas cylinder in a vice or safety clamping mechanism when installing or removing an operating head.

- (1) CAREFULLY remove the polythene sheet covering the packed liferaft. Locate the painter patch. Untie the painter line from the painter patch.
- (2) CAREFULLY remove the liferaft until the operating head is exposed.

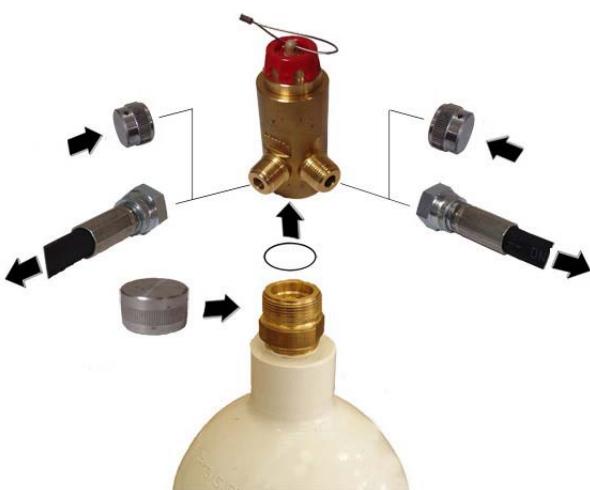
WARNING: TAKE CARE WITH THE NEXT STEP OR LIFERAFT COULD INFLATE UNINTENTIONALLY.

- (3a) THROW OVER: Exercising due caution, CAREFULLY pass the painter line back through the operating head wire loop, then gently remove painter line from wire loop. Bend the wire loop back against the operating head and tape, (FIGURE 203). This prevents accidental deployment.
- (3b) DAVIT LAUNCH: Exercising due caution, CAREFULLY pass the painter line back through the operating head wire loop, then gently remove painter line from wire loop. Carefully remove the operating lanyard from the wire loop also. Bend the wire loop back against the operating head and tape, (FIGURE 203). This prevents accidental deployment.
- (4) Lift the bulk of the raft out of the container and onto a packing table, (FIGURE 204).
- (5) Unroll the liferaft completely. Fold the raft buoyancies and canopy out of the way, (FIGURE 204).
- (6) Remove the equipment pack(s) and set them aside, (FIGURE 204).



**Liferaft and Equipment pack
FIGURE 204**

- (7) Detach the hoses from the operating head/cylinder assembly. Fit two protection caps on the operating head immediately, (FIGURE 205).
- (8) Fit dust caps onto the ends of the inflation hoses, (FIGURE 206).
- (9) Carefully remove the operating head/cylinder assembly from the liferaft. For a Leaffield operating head, two 3mm Hex bolts must be removed.
- (10) Carefully remove the operating head from the cylinder, (FIGURE 205).
- (11) On a Thanner operating head, install the cylinder recoil cap, (FIGURE 205a).
- (12) Untie the holding cord and remove the paddles from the liferaft.
- (13) Disconnect the power unit “activation cords” from the attachment location point.

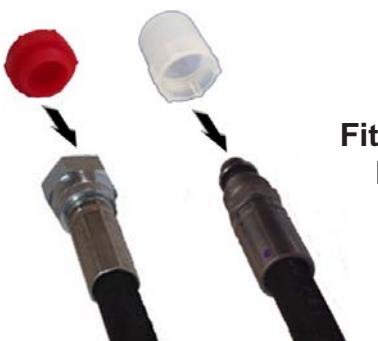


(a) Thanner inflation system



(b) Leaffield inflation system

**Operating head removal
FIGURE 205**



**Fitting dust caps
FIGURE 206**

CHAPTER 3

CLEANING

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Rigid container		304

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CHAPTER 3

CLEANING

1 General

CAUTION: DO NOT USE ANY SOLVENTS, OTHER THAN THOSE GIVEN IN TABLE 301. DAMAGE CAN BE CAUSED TO THE FABRIC.

ITEM	DESCRIPTION	APPLICATION
1	Toluene or Petroleum rubber solvent	To clean proofed fabrics
2	Hard soap (NOT detergent)	To wash the liferaft
3	Lint-free cloth (clean and dry)	To dry the liferaft
4	Sodium Hypochlorite (25 parts water, 1 part 14%-15% solution)	Anti mould treatment

**Cleaning solvents and materials
TABLE 301**

2 Procedure

WARNING: DO NOT USE THE SOLVENTS NEAR A FLAME OR OTHER SOURCE OF IGNITION. THE SOLVENT IS FLAMMABLE.

WARNING: USE A BARRIER CREAM ON HANDS AND WASH THEM AFTER USING SOLVENTS. THE SOLVENT IS DANGEROUS AND CAN CAUSE DAMAGE TO SKIN. REFER TO THE MANUFACTURER'S SAFETY DATA SHEET.

WARNING: USE THE SOLVENT IN AN AREA THAT HAS GOOD AIR FLOW. AVOID BREATHING VAPOUR FROM THE SOLVENT AND AVOID CONTACT WITH THE EYES. THE SOLVENT IS DANGEROUS AND CAN CAUSE DAMAGE TO PERSONNEL. REFER TO THE MANUFACTURER'S DATA SHEET.

A Liferaft

CAUTION: DO NOT LET PUDDLES OF CLEANING SOLUTION STAY ON THE LIFERAFT. TOO MUCH SOLVENT CAN CAUSE DAMAGE.

- (1) Wash the liferaft with a solution of hard soap and water.
- (2) Dry the liferaft with a clean, lint-free cloth.
- (3) Use toluene or petroleum rubber solvent to remove any oil or similar substance. Wash and dry the area as given in steps A1 and A2 above.

B Rigid container (anti-mould treatment)

- (1) Wash the container outer surfaces with a solution of hard soap and water.
- (2) Perform the following anti-mould treatment on all rigid containers, at the normal overhaul period of the liferaft and on all containers that have been in damp storage conditions:
 - (a) Use a solution of hard soap and water to clean the inside of the container.
 - (b) Mix a solution of Sodium Hypochlorite, (25 parts water to 1 part of 14% to 15% solution).
 - (c) Use a sponge to apply the solution evenly over the inner surface of the container.
 - (d) Let all surfaces dry before packing the liferafts into the container.

CHAPTER 4

INSPECTION AND CHECKING

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RFD

BEAUFORT

**RFD SURVIVA MK III
BEAUFORT SEAFARER**

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CHAPTER 4

INSPECTION AND CHECKING

1 **General**

- A** Using the intervals specified in Chapter 5, inspect the liferaft as follows to make sure:
- (1) The inflatable chambers maintain the specified pressure.
 - (2) The inflation system functions efficiently. Refer to Chapter 5, Section 3 for test procedures.
 - (3) All the components and equipment are maintained in a serviceable condition.

B Fabric components

- (1) Inspect all fabric components for:
 - (a) Slits, tears, apertures or abrasion.
 - (b) Proofing removal.
 - (c) Deterioration.
 - (d) Adhesion of seams and components.
 - (e) Seam slippage and edge lifting.
 - (f) Broken or worn stitching.
 - (g) Instructions and labels (make sure all of the pictograms are legible).
 - (h) Unwanted bonds between fabrics.

C Metal and plastic components

- (1) Examine for:
 - (a) Cleanliness.
 - (b) Cracks.
 - (c) Distortion.
 - (d) Scoring and burrs.
 - (e) Damaged threads.
 - (f) Frayed cables.
 - (g) Corrosion.

D Webbing, ropes, cordage and 'Velcro' strips

(1) Check for:

- (a) Damage and fraying.
- (b) Discolouration and deterioration (including any material in contact with them).
- (c) Incomplete bonds to fabric.
- (d) Broken or worn stitching.

E MED (Marine Equipment Directive) Marking

(1) Introduction

Service Station personnel must check that the Ship's wheel label, as required when a product is approved in accordance with the Marine Equipment Directive, is fitted to the product, is marked correctly and is legible.

- (2) Whenever the equipment is being serviced, the Marine Equipment Directive labelling and data labels are to be checked for legibility, for correct information and for secure attachment.
- (3) The Ship's Wheel mark label must be completed as shown (FIGURE 401). The first four digits, denote the product's Notified Body for quality conformance. This number is recorded on the liferaft's declaration of conformity, (within the Module D quality conformance data).

The second set of digits are the reference to the date of original manufacture of that particular assembly/date the label was attached to the product, e.g. for an liferaft originally assembled in 2005, the last two digits would be 05.

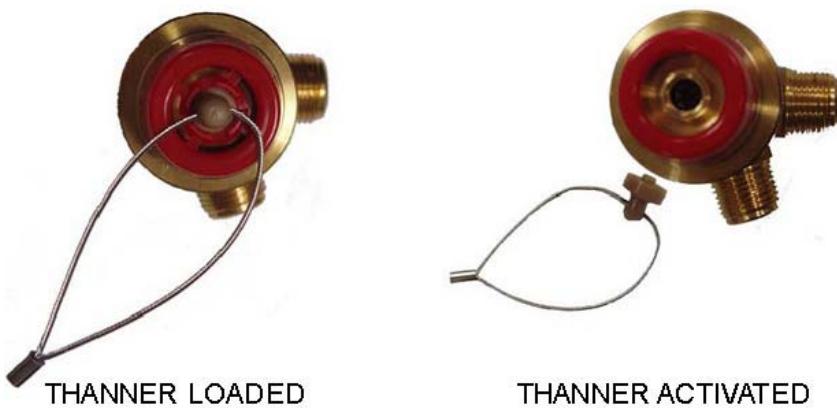
NOTE: These digits are not to be updated at subsequent services.

- (4) The MED labels are located in the following positions on the Surviva product:
 - ID label at doorway entrance
 - outside surface of container
- (5) If a label has become damaged or illegible, replace it with a new label containing the original information or request a replacement from RFD Beaufort.
- (6) If a label is to be updated, use an indelible marker pen.



MED marking label
FIGURE 401

A



B



Operating heads-activation
FIGURE 402

2 Detail**A Gas inflation system:**

NOTE: Refer to the manufacturer's manual listed at the front of this manual, in Associated Publications section. Please ensure the most up-to-date Revisions are being used.

WARNING: A GAS CYLINDER CAN BE A LETHAL PROJECTILE IF IT DISCHARGES TO ATMOSPHERE. ALWAYS ATTACH A RECOIL CAP TO THE GAS OUTLET WHEN HANDLING A FULLY CHARGED CYLINDER. HOLD THE CYLINDER IN A VICE OR SAFETY CLAMPING DEVICE WHEN ATTACHING OR REMOVING AN OPERATING HEAD.

WARNING: OPERATING HEADS MUST NOT BE CHECKED UNTIL THEY HAVE BEEN REMOVED FROM THEIR CYLINDERS.

(1) Operating heads must be tested. It is essential that they are removed from the cylinders before testing.

(2) Thanner operating head

If the tab, on the red safety cap (FIGURE 402A), is broken or missing this indicates that the head may have been actuated.

If the tab is not broken, the head has not been actuated.

Leafield operating head

If the loaded indicator is not aligned with the arrow or the actuator cable is removed this indicates that the head may have been actuated (FIGURE 402B).

(3) When the operating head is removed from its cylinder, pull the operating wire. The mechanism of the operating head must act immediately.

On a Thanner operating head:

- (a) The wire loop will separate completely from the operating head.
- (b) The central shaft inside the operating head will move rapidly downwards.
- (c) The plastic tab on the safety cap will break.

On a Leafield operating head:

WARNING: THE OPERATING HEAD IS INTENDED AS A SEALED FOR LIFE UNIT AND MUST NOT BE DISASSEMBLED. IT MUST NOT BE CLEANED WITH SOLVENTS, SOAPS OR CHEMICAL CLEANING AGENTS. THESE MAY DEGRADE SYSTEM COMPONENTS AND CAUSE A MALFUNCTION.

- (a) The wire loop will separate completely from the operating head.
 - (b) The gear mechanism on the bottom of the head will rotate.
 - (c) The indicator arrow will rotate to display that the device is no longer loaded.
- (4) It is now necessary to service and reset the operating heads. The procedure used to service operating heads is given in the manufacturer's manual listed in the Associated Publications Section of this manual.
- (5) Compare the weight of the cleaned cylinders against the weight printed on the cylinder label. Cylinders are to be weighed without the transit cap *¹.
- (6) The tolerance for the full weight is +0 g to -56 g. Record the actual weight on the log card and packing certificate *².

Record the actual weight on the log card and packing certificate. A cylinder found to be outside the acceptable tolerance must be inspected and recharged in accordance with the Assembly and Charging of Transportable Gas Cylinders manual.

- (7) Make sure the siphon tube inside the cylinder is still serviceable. Shake the cylinder. If the tube is still flexible, it will strike the wall of the cylinder with a ringing sound. If there is a noticeable delay before the sound is heard, the tube has stiffened and is no longer serviceable. You must therefore reject the cylinder.

CAUTION: ALWAYS USE CO₂ TO SPECIFICATION BS4105, TYPE 1, AND N₂ TO SPECIFICATION BS4366, TYPE 1, WHEN RECHARGING A GAS CYLINDER.

*Please refer to US Appendix A-2

- (9) Check the date of the last hydraulic pressure test. The hydraulic test should be conducted within 5 years of the previous hydraulic test. Proceed in accordance with the regulations of the Department of Transportation Subsection N (Dangerous Cargoes).
- (10) The external condition of the cylinder must be checked in accordance with British Standard 5430 Pt.2. This standard gives the limits for surface damage.
If the damage is more than the limits, reject the cylinder. The standard gives the following conditions for rejection and destruction of a cylinder:
- (a) Visible swelling of a cylinder.
 - (b) A dent which is deeper than 2 mm.
 - (c) A dent which has a diameter of less than 30 times its depth.
 - (d) A cut or gouge which is more than 2% of the cylinder's length.
 - (e) A cut or gouge which is deeper than 5% of the cylinder's wall thickness.
 - (f) A crack in the metal.
 - (g) Any delamination of the metal.
 - (h) The wear of the base end of the cylinder has reduced the thickness to less than 75% of the original.
 - (i) Heat damage has caused burning of the metal or distortion of the cylinder.
 - (j) Stamp marks have been made by a metal punch on the parallel section of the cylinder.
 - (k) Stamp marks are illegible.
- (11) Cylinders that have been submerged in water, i.e. those attached to liferafts that have been used in an actual emergency, must be returned to the cylinder manufacturer (or an approved agent) for reconditioning and re-test before reuse.
- (12) Examine hoses, inlet valves and top-up valves for visual defects. Make sure all components are correctly attached.

B Light unit and Power unit assembly**RL1/RL4/RB2 lighting system**

- (1) Check the outer light / flasher unit. Make sure the leads and connections have no signs of damage or deterioration.

NOTE: The flasher unit is not a serviceable item.

- (2) Use a circuit with a 3 volt supply, to test the light for operation.

- (3) If the inner light unit is unserviceable, replace the light as necessary:

(a) Replace the filament.

(b) If a sealed light unit is installed, replace the light assembly.

- (4) Examine the power unit for damage. If the power unit is emitting an odour, it is possible that the unit is damaged, (refer to Step 8).

- (5) Check the expiry date on the power unit. If the expiry date will be reached before the next scheduled service, replace the power unit.

- (6) Make sure the power units are stored at a temperature below 65°C (149°F).

- (7) Check the power unit for satisfactory operation as follows:

(a) Make sure the operating pin is pushed fully into its socket.

(b) Use a 0-10V Voltmeter (connected in parallel with a 15 ohm resistor) to measure the output of the battery. Remove the operating pin. The Voltmeter indication of the battery output must be between 2.7 and 3.0 volts.

NOTE: Lithium/sulphur dioxide cells have very high discharge rates. It is necessary to install a fuse to put a limit on the current output from the cell and the circuit wiring.

(c) Install the operating pin again and check that the voltmeter reading is 0 (zero) volts. Make sure the operating pin retainer holds the pin in its socket.

(d) Disconnect the voltmeter.

WARNING: KEEP THE POWER UNIT AWAY FROM ANY SOURCE OF IGNITION. DO NOT HEAT THE POWER UNIT ABOVE 50 °C OR BURN IT. THE CONTENTS OF THE POWER UNIT ARE FLAMMABLE. REFER TO THE MANUFACTURER'S DATA SHEET.

WARNING: DO NOT OPEN, CRUSH OR PUNCTURE THE POWER UNIT. THE CONTENTS OF THE POWER UNIT ARE TOXIC AND CORROSIVE. REFER TO THE MANUFACTURER'S DATA SHEET.

WARNING: IF THE CHEMICALS FROM THE POWER UNIT BATTERIES TOUCH SKIN, CLOTHING OR EQUIPMENT, WASH THEM WITH LARGE QUANTITIES OF COLD WATER. REFER TO THE MANUFACTURER'S DATA SHEET.

NOTE: The power unit cannot be recharged. When the life of the power unit is expired, reject it and fit a replacement.

(8) If the power unit is damaged, or is emitting an odour, remove it as follows:

WARNING: PUT ON PROTECTIVE CLOTHING AND EQUIPMENT TO COVER EYES, HANDS AND BODY. THE CONTENTS OF THE POWER UNIT CAN CAUSE INJURY. REFER TO THE MANUFACTURER'S DATA SHEET.

NOTE: Make sure there is good air flow in the work area.

- (a) Put the defective unit in a cool area. Let it stand for approximately 24 hours. After this time the power unit should be odourless.
- (b) Insulate the electrical connections. Put the unit in a strong plastic bag or container to seal it from the atmosphere.
- (c) Discard the unit as given in the applicable regulations of the country.

RL5 lighting system

NOTE: The Internal and External lamp unit are not serviceable items. If either unit displays a fault, replace the unit.

- (1) Illuminate the Internal lamp using the switch marked 'internal' on the side of the internal lamp unit, (FIGURE 403). If the LED lamp on the internal lamp unit fails to illuminate, replace the unit.
- (2) Check the expiry date on the Internal lamp unit. If the expiry date will be reached before the next scheduled service, replace the unit.
- (3) Examine the battery compartment on the Internal lamp unit for damage. If it is emitting an odour, it is possible that the unit is damaged, (refer to Step 5).
- (4) Make sure the Internal lamp unit is stored at a temperature below 65°C (149°F).

WARNING: KEEP THE INTERNAL LAMP UNIT AWAY FROM ANY SOURCE OF IGNITION. DO NOT HEAT THE INTERNAL LAMP UNIT ABOVE 50 °C OR BURN IT. THE CONTENTS OF THE POWER UNIT ARE FLAMMABLE. REFER TO THE MANUFACTURER'S DATA SHEET.

WARNING: DO NOT OPEN, CRUSH OR PUNCTURE THE INTERNAL LAMP UNIT. THE CONTENTS OF THE BATTERY ARE TOXIC AND CORROSIVE. REFER TO THE MANUFACTURER'S DATA SHEET.

WARNING: IF THE CHEMICALS FROM THE INTERNAL LAMP UNIT BATTERY TOUCH SKIN, CLOTHING OR EQUIPMENT, WASH THEM WITH LARGE QUANTITIES OF COLD WATER. REFER TO THE MANUFACTURER'S DATA SHEET.

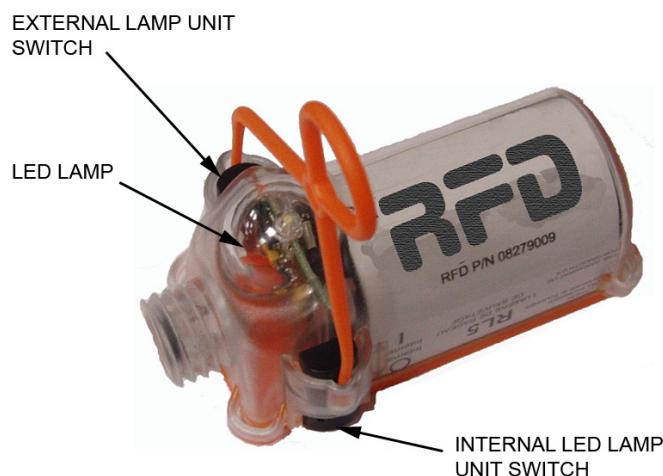
NOTE: The Internal lamp unit cannot be recharged. When the life of the battery is expired, reject the unit and fit a replacement.

- (5) If the Internal lamp unit is damaged, or is emitting an odour, remove it as follows:

WARNING: PUT ON PROTECTIVE CLOTHING AND EQUIPMENT TO COVER EYES, HANDS AND BODY. THE CONTENTS OF THE BATTERY CAN CAUSE INJURY. REFER TO THE MANUFACTURER'S DATA SHEET.

NOTE: Make sure there is good air flow in the work area.

- (a) Put the defective unit in a cool area. Let it stand for approximately 24 hours. After this time the power unit should be odourless.
 - (b) Insulate the electrical connections. Put the unit in a strong plastic bag or container to seal it from the atmosphere.
 - (c) Discard the unit as given in the applicable regulations of the country.
- (6) Check the External lamp unit. Make sure the leads and connections have no signs of damage or deterioration.
- (7) Illuminate the External lamp using the switch marked 'external' on the side of the Internal lamp unit. (FIGURE 403). If the LED lamp in the External lamp unit fails to illuminate, replace the unit.



**RL5 Internal lamp unit
FIGURE 403**

C Emergency pack (lifed items)

NOTE: Each of the items given below may not be supplied in some emergency packs. Refer to the contents label for the contents of the pack.

- (1) RFD Beaufort recommend that any 'lifed' item that has less than 12 months life remaining, it MUST be replaced in the emergency pack.
- (2) Discard any stock which is out-of-date, as given in the applicable regulations of the country.
- (3) Check the pyrotechnics for general condition. Any pyrotechnics with dents, corrosion or other visible damage should be replaced.
- (4) Check the handbooks and leaflets. Make sure they are in good condition and legible.
- (5) Test the Whistle and Bellows. Make sure they function correctly and are not damaged.
Ensure any adaptor required is fitted to the bellows and is suitable for the top up valve fitted.
- (6) Test the torch/flashlight and batteries. Make sure they function correctly and are not damaged.

NOTE: Check the expiry date on the torch batteries. If the expiry date will be reached before the next scheduled service, replace the batteries.

- (7) Check the first aid kit, bailers and paddles. Make sure they are not corroded or damaged. If necessary, replace any defective parts.
- (8) Examine the repair kit, for damage to the contents. If necessary, replace any damaged items.

NOTE: The repair kit items have a life of 3 years, but not the adhesive solution. The tube of solution has a storage life of 2 years (maximum) and must have a servicing life of more than 12 months when part of the repair kit.

- (9) Visually check water sachets for any signs of damage, squeeze sachets and check for leaks.
- (10) Ration packs are to be discarded if there is evidence of damage, defect or loss of vacuum which may affect the contents. Open a pack and check that the contents are fresh and fit for use.

- (11) Check can openers, heliographs, fishing kits and leak stoppers for condition, corrosion and damage. Renew as necessary.
- (12) Check the drogues. If damaged, replace. If not, re-pack (Please refer to Chapter 8).
- (13) Examine the capsules of anti-seasickness tablets for condition and damage. Renew as necessary.

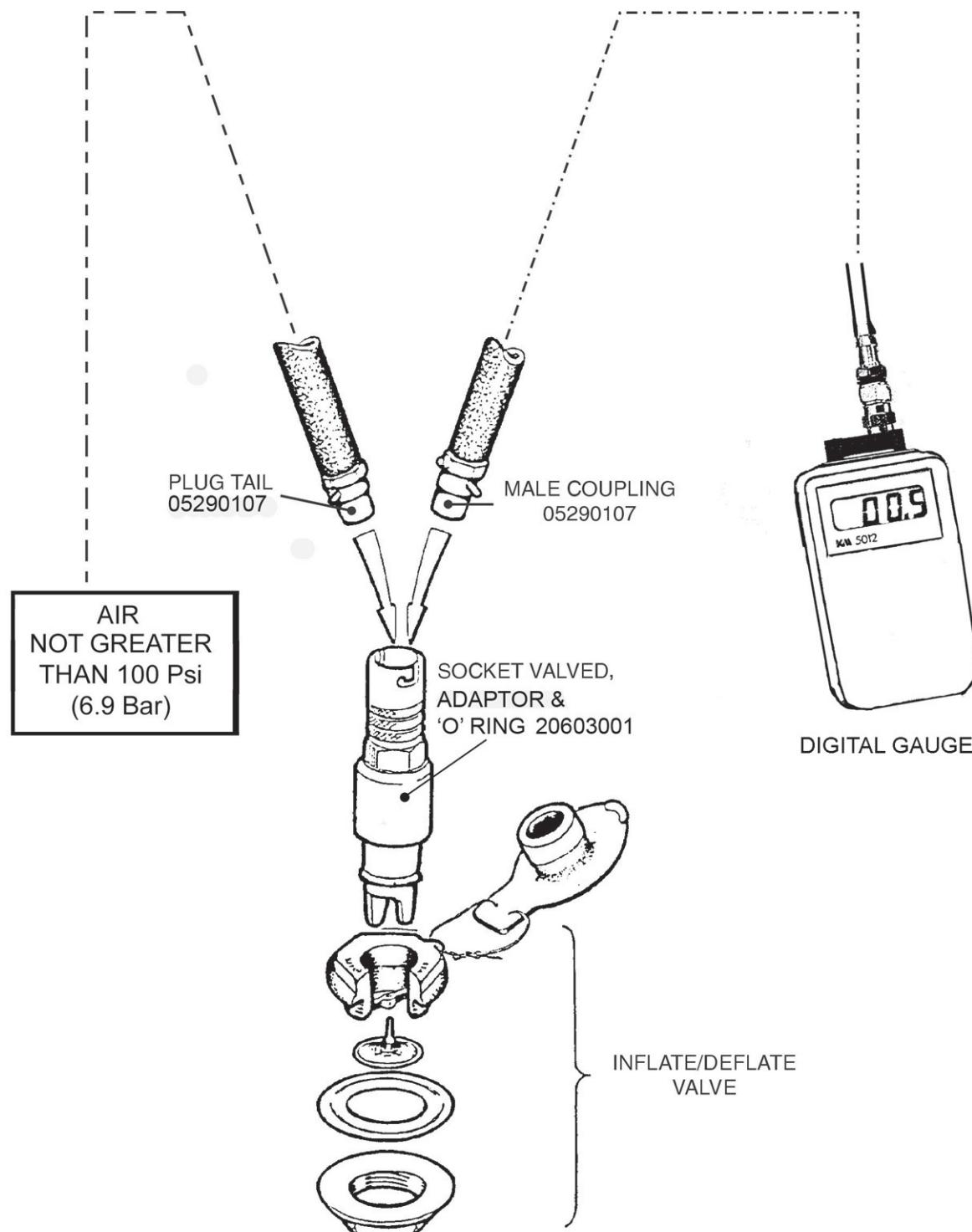
D Rigid glass-reinforced plastic container

- (1) Examine the container as follows:
 - (a) Make sure the container is clean.
 - (b) Make sure there are no cracks. Minor gelcoat craze cracking is permitted.
 - (c) Examine the container for superficial and other damage.
 - (d) Check all the markings and the labels. Make sure they are legible.

CHAPTER 5

TESTING AND TROUBLESHOOTING

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Search & Rescue Transponder (SART) (if installed)	523
4 Troubleshooting	524



**Test layout
FIGURE 501**

CHAPTER 5

TESTING AND TROUBLE SHOOTING

1 General

The items described in CHAPTER 10 are necessary to test the liferaft. When not in use, keep the test equipment and all special tools in conditions that protect them from damage:

The liferaft shall be submitted to pressure and other physical tests according to its age as defined in TABLE 501 and as described in this chapter.

WP = Working Pressure test.
 B = Bridle Overload test. (DL's ONLY)
 GI = Gas Inflation test.
 FS = Floor seam test.
 NAP = Necessary Additional Pressure test.

Age in years from DoM	Test(s) required	Age in years from DoM	Test(s) required
1 and 3	WP	12 and 14	NAP, FS, B, WP
2 and 4	B, WP	15	GI, NAP, FS, WP
5	GI, WP	16 and 18	NAP, FS, B, WP
6 and 8	B, WP	17 and 19	NAP, FS, WP
7 and 9	WP	20	GI, NAP, FS, B, WP
10	GI, NAP, FS, B, WP	21 and 23	NAP, FS, WP
11 and 13	NAP, FS, WP	22 and 24	NAP, FS, B, WP

Liferaft test schedule

TABLE 501

NOTE: Where, in years 5,10, 15 and 20, both the Gas inflation and Working pressure test are required *¹, time may be saved by conducting the Gas inflation test first. If the test is satisfactory, continue with the Relief valve and Air holding tests required to complete the WP test. It is vital however that all CO₂ must be given time to evaporate.

Any part whose operation which is critical to safety of life, such as the lifting bridle, its attachment points on the liferaft or to the lifting ring, shall be replaced if any doubt exists as to its operating capability. Non critical parts such as some minor pockets shall be repaired so as to make them fit for purpose. If doubt exists as to the repair required, contact RFD Beaufort.

*Please refer to US Appendix A-2

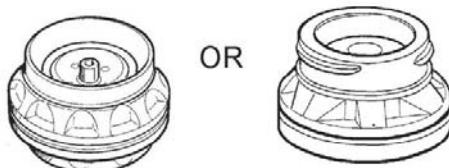
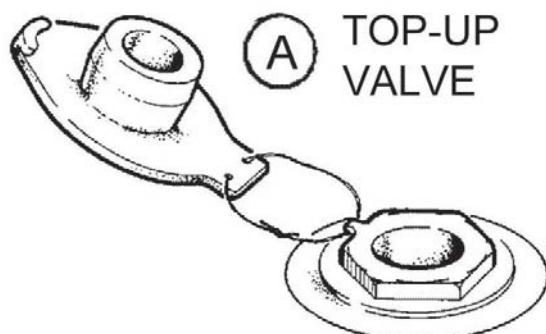
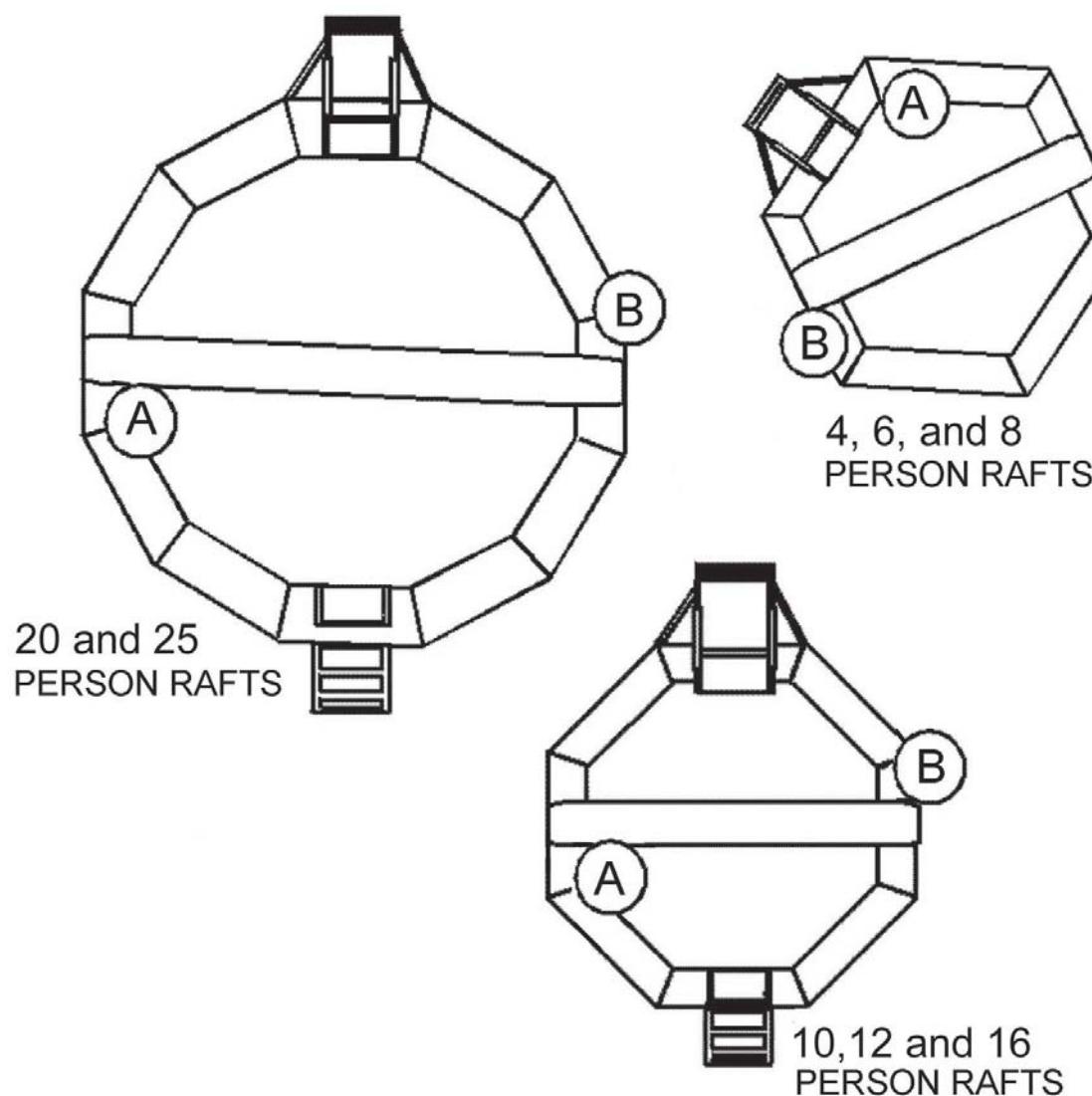
SURVEY RECORD			
LIFERAFT TYPE:	SILVER No.:		
REPAIRS REQUIRED			
PART	DAMAGE	FORM of REPAIR	INSPECTED BY
UPPER BUOYANCY TUBE			
LOWER BUOYANCY TUBE			
FLOOR			
CANOPY SUPPORT TUBE			
INFLATION EQUIP.			
COMPONENTS			

INFLATION TEST RECORD					
LIFERAFT TYPE:	SILVER No.:				
PACK LIFERAFTS WITHIN 48 HOURS OF TEST, UNLESS STORED UNDER APPROVED CONDITIONS. RE-TEST if not operationally packed within 30 days of test.					
Time/Date of Test	Manometer Reading	Thermometer Reading	Barometer Reading	Temp/Pres Variation	Corrected Pressure

**Examples of Test record cards
TABLE 502**

2 Preparation

- A Keep the records of all the inflation tests. A recommended format for the test cards is shown in TABLE 502.
 - B Keep the liferaft away from draughts and direct sunlight, as change in temperature affects pressure.
 - C Keep a solution of hard soap (not detergent), water, and a quantity of clean, dry, lint free cloths in the area.
 - D If a buoyancy tube needs to be tested separately because of a repair, carry out a working pressure test, refer to Step 3E.
 - E Calculate the change in the buoyancy tube pressure, caused by any change in temperature as follows:
 - (1) Subtract 38 mm WG from the manometer indication for each degree Celsius increase in temperature.
 - (2) Add 38 mm WG to the manometer indication for each degree Celsius decrease in temperature.
- NOTE:** The test result is not accepted if the temperature changes by more than 3.5°C, (38.3°F).
- F Calculate the change in pressure caused by barometric pressure as follows:
 - (1) Subtract 10.2 mm WG from the manometer indication for each millibar decrease in pressure.
 - (2) Add 10.2 mm WG to the manometer indication for each millibar increase in pressure.



Location of valves
FIGURE 502

3 Test procedures

A General

- (1) Test each compartment of the liferaft that inflates. Inflate the liferaft to the working pressure. The separate compartments of the liferaft that are inflated by the gas inflation system are:
 - (a) The lower buoyancy tube.
 - (b) The upper buoyancy tube and the arch tube, (if no transfer valve is fitted).
 - (c) The arch tube, (if transfer valve is fitted).

B Additional test time intervals

- (1) Carry out a gas inflation (GI) test on liferafts that are over 5 years old and then at 5 year intervals after that date.
- (2) Carry out a NAP test and test the floor seams on any liferaft that is over ten years old and subsequently at each 12 month service.

NOTE: It may be necessary to carry out the NAP test if the liferaft has been repaired, see Step D.

C Gas inflation test

- (1) Unpack the liferaft, see Chapter 2, and put it on the packing table.
- (2) Reconnect the gas cylinder and operating head.
- (3) Pull the operating head actuator cable to inflate the liferaft.
- (4) Make sure the relief valves operate satisfactorily.
- (5) Let the liferaft settle for a minimum of 2 hours.

NOTE: This is regarded as working pressure.

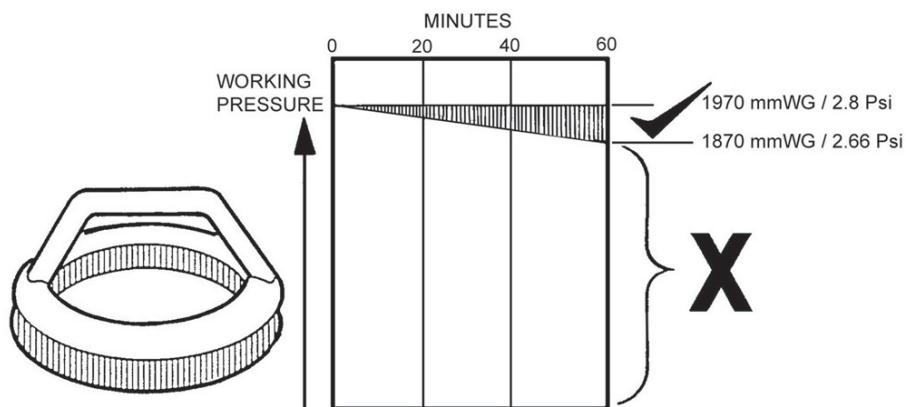
- (6) Use a manometer to make sure the gas pressure in each compartment of the liferaft is at or above working pressure. Record the gas pressure in each compartment. Record the temperature and barometric pressure.

- (7) Leave the pressure in each compartment for an additional 60 minutes. If the inflation pressure, corrected for temperature and barometric changes, decreases by more than 5% of the noted pressure, the liferaft fails this test. *1
- (8) If the pressure decrease is more than 5%, look for leaks and porous fabric. If possible, repair the liferaft within the limits given, refer to Chapter 6. Carry out a re-test of the buoyancy tubes again.

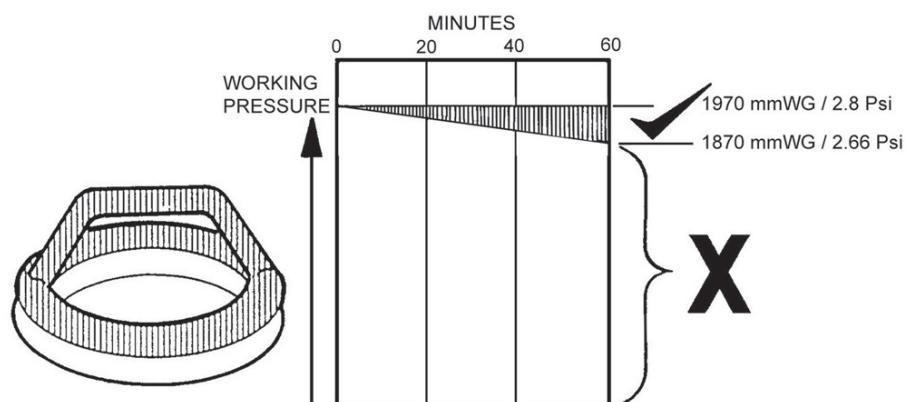
D Necessary Additional Pressure (NAP) test

- (1) Carry out a NAP test as follows:
 - (a) Install the caps on both relief valves, (FIGURE 505/1).
- (2) Inflate the liferaft slowly to twice the working pressure.
- (3) Let it stand for a minimum of 5 minutes after which there should be no seam slippage or cracking or other defects.
- (4) If the pressure decreases, allowing for temperature or barometric changes, by more than 5% the liferaft has failed the NAP test. Look for leaks and porous fabric. If possible, repair the liferaft within the limits given, refer to Chapter 6. Carry out a re-test of the buoyancy tubes again.
- (5) If the pressure decreases abruptly during the NAP test and there is audible 'cracking' from the liferaft, condemn the liferaft.
- (6) Sounds from the liferaft with no drop in pressure may be ignored.
- (7) After testing remove both PRV caps together.

*1 Please refer to US Appendix A-2

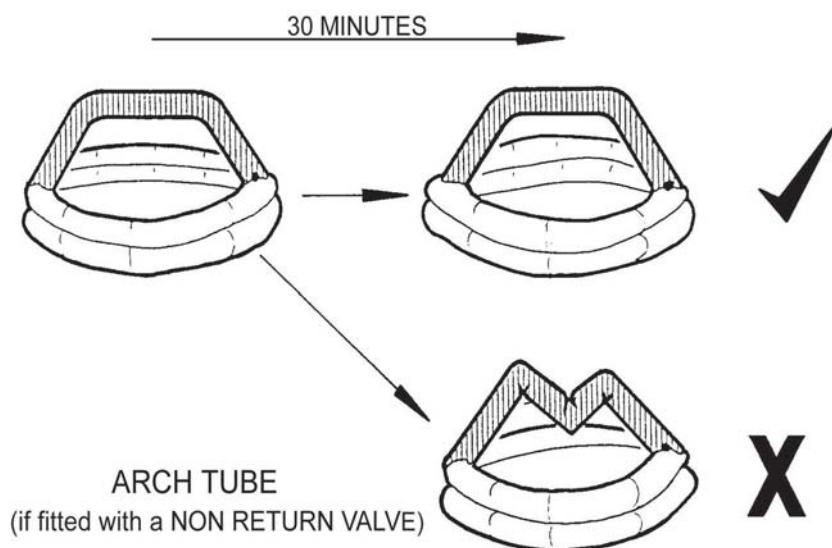


LOWER BUOYANCY TUBE



UPPER BUOYANCY TUBE

Working Pressure test
FIGURE 503



Transfer valve test (if fitted)
FIGURE 504

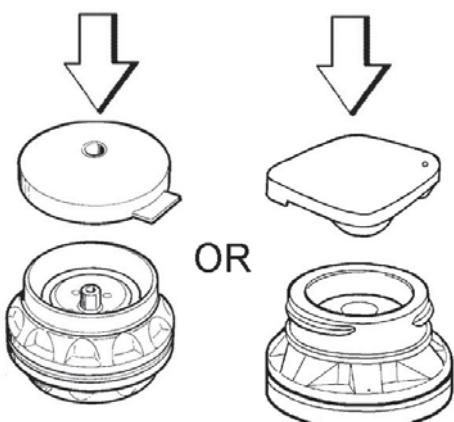
E Working Pressure test

NOTE: The arch tube and central strut (if fitted), are mounted on the upper buoyancy tube. These will be fully inflated when the upper buoyancy tube is tested. Therefore they will be checked with the upper buoyancy tube. Each compartment will be tested over a period of 60 minutes.

- (1) For each inflatable compartment defined in this chapter section 3A, carry out a working pressure test as follows, (FIGURE 503):
 - (a) Install caps on both relief valves. *²
 - (b) Inflate the compartments to between 1970 and 2100 mm water gauge. Record the temperature and barometric pressure.
 - (c) Disconnect the air supply and connect the manometer (FIGURE 501).
 - (d) Make sure there are no leaks at the test equipment connections. Use a brush to apply a solution of soapy water, if necessary, to carry out a test at each joint.
 - (e) Leave pressurised compartments to settle, undisturbed for 30 minutes. Provided the pressure is not less than 2.8 Psi / 1970mm WG, note the pressure.
 - (f) Leave the pressure in the compartments for an additional 60 minutes, (FIGURE 503). If the inflation pressure, corrected for temperature and barometric changes, decreases by more than 5% of the noted pressure, the liferaft fails this test.
 - (g) If the pressure decrease is more than 5%, look for leaks and porous fabric. If possible, repair the liferaft within the limits given, refer to Chapter 6.

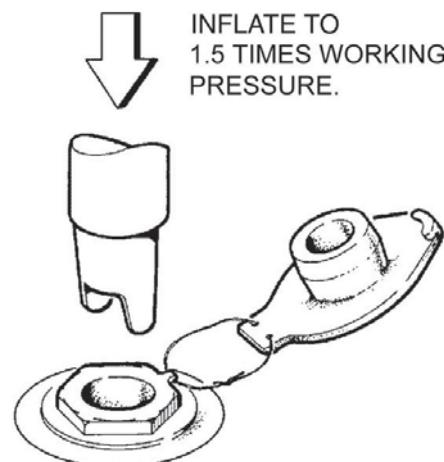
*² Please refer to US Appendix A-2

OTS-65
PRESSURE
RELIEF VALVE A10
PRESSURE
RELIEF VALVE

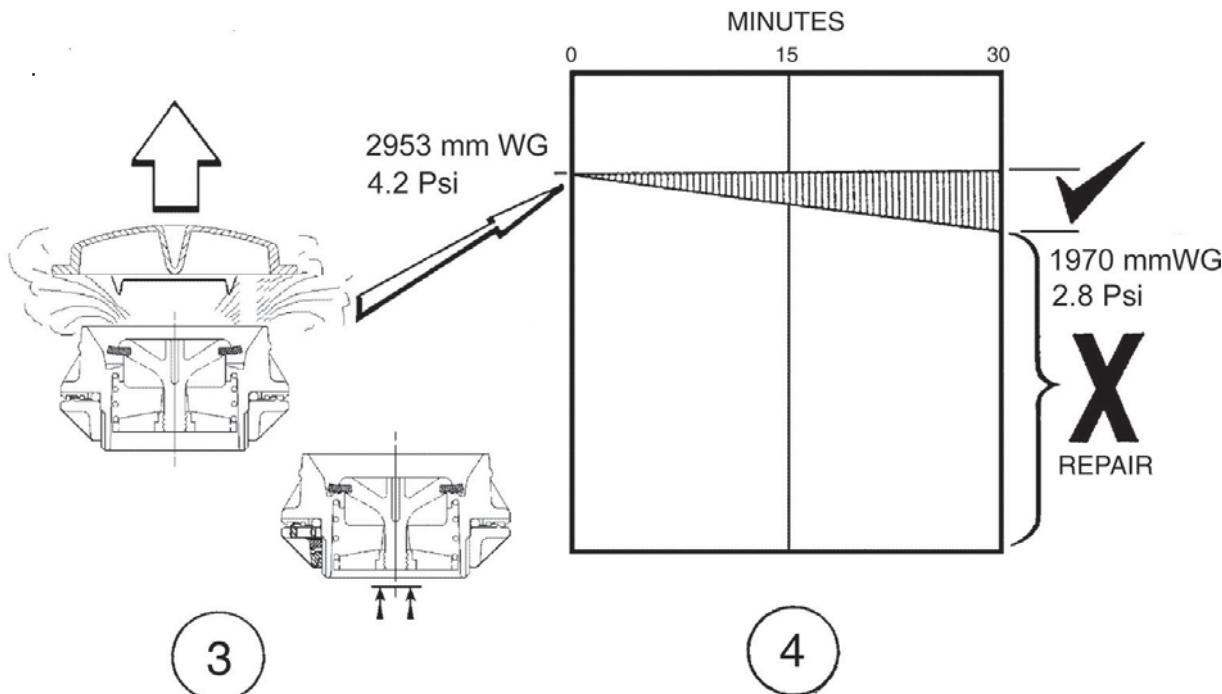


1

A8
INFLATE/DEFLATE
VALVE



2



Pressure Relief Valves
FIGURE 505

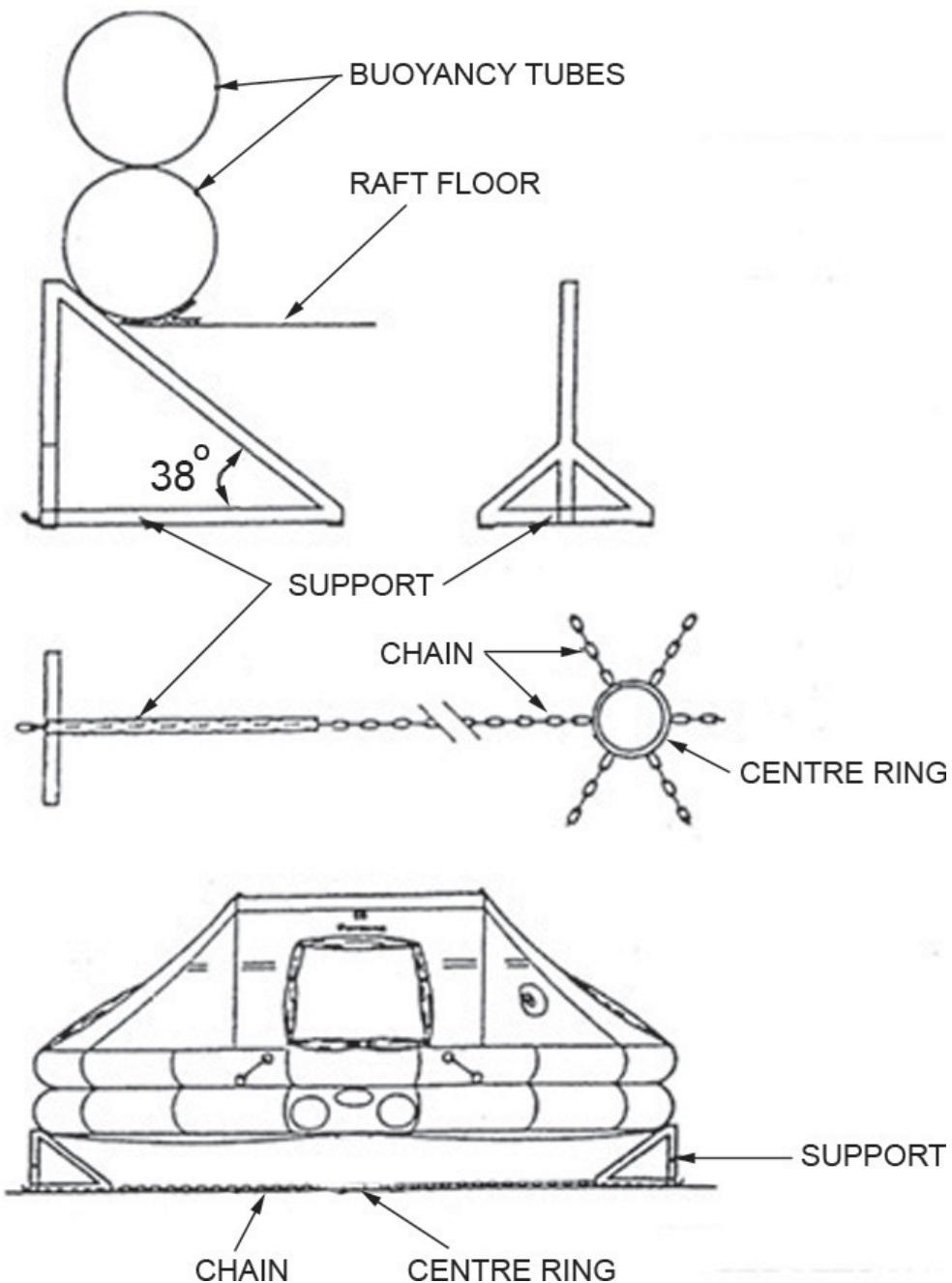
F Arch tube Transfer valve test (if fitted)

- (1) After the upper buoyancy tube has been deflated completely, the arch tube transfer valve can be tested.
 - (a) After 30 minutes the arch tube should maintain its full shape. Transfer valve which do not hold air must be replaced, (FIGURE 504).
 - (b) If the arch tube does not maintain its full shape, look for leaks and porous fabric. If possible, repair the liferaft within the limits given, refer to Chapter 6.

G Pressure Relief Valves test

- (1) Test the relief valves as follows:
 - (a) Install the caps on the pressure relief valves, (PRV) (FIGURE 505).
 - (b) Connect the manometer to the liferaft (refer to FIGURE 501).
 - (c) Inflate the liferaft to $1\frac{1}{2}$ times normal working pressure.
 - (d) Remove the caps from the relief valves.
 - (e) Make sure the valves open and release the excess pressure immediately. After 30 minutes recheck the PRV's. The indicated pressure on the manometer when the valves are closed must not be less than 1970 mmWG / 2.8 Psi, (FIGURE 505).

NOTE: Any valves which do not close correctly, must be replaced
(Refer to Chapter 6)



Floor seam test supports
FIGURE 506

H Floor seam test

- (1) A floor seam test is to be carried out on each liferaft at yearly intervals from the tenth year of the liferafts life, unless earlier servicing is deemed necessary as a result of visual inspection.
- (2) To facilitate the test, a proper test frame as shown is recommended, (FIGURE 506).
- (3) Perform the floor seam test as follows:
 - (a) Make sure the liferaft is inflated to working pressure.
 - (b) Put the inflated liferaft on top of the floor seam test frame.
 - (c) A person of at least 75 Kg (165 lb) weight must walk around the perimeter of the floor for the entire circumference, close as possible to the buoyancy.
 - (d) Examine the floor seam around the underside of the lower buoyancy. If the floor has detached from the buoyancy at any point, repair within the limits of Chapter 6.

I Function test

- (1) A full function test may be demanded by the local Inspecting Authority. This test may be done either with a packed or unpacked liferaft.
- (2) The load required to initiate inflation of the liferaft shall not exceed 15.3 kgf (33.73 lbf), when measured on a spring balance.
- (3) All buoyancy chambers must fully inflate and pressure relief valves function. Working pressure must be obtained after no more than 60 seconds at an ambient temperature of 18°C to 20°C (64.4°F to 68°F).
- (4) The working pressure should be determined by the reseat of the relief valves. The pressure relief valves should be fully operational.

J Suspension overload test (Davit Launched Liferafts only)

- (1) This test shall be undertaken as required at the appointed age interval or after renewing any component or sub-assembly of the liferaft suspension arrangement, including the floor. It must be carried out before any pressure test(s).
- (2) The liferaft shall be inflated to working pressure and suspended normally by the lifting ring. The liferaft is loaded evenly using water or clean ballast bags. The test loads (TABLE 503), are measured at the lifting ring and imposed for a minimum of 5 minutes.
- (3) The test is failed if:
 - (a) any suspension member, attachment or structural component breaks or is damaged, or
 - (b) the nominal working pressure or the basic shape of the buoyancy chambers is not maintained.
- (4) The liferaft shall be thoroughly checked and cleaned after testing to ensure there is no residual debris or dirt which could result in damage.

RAFT SIZE (Number of Persons)								
	12DL		16DL		20DL		25DL	
	Kg	Lbs	Kg	Lbs	Kg	Lbs	Kg	Lbs
$W_{1\min}$	1115	2458	1473	3247	1840	4057	2266	4996
$W_{1\max}$	1165	2568	1523	3358	1890	4167	2316	5106
W_{hull}	35.2	77.5	40	88	56.4	124	56.4	124
$W_{2\min}$	1080	2381	1433	3159	1784	3933	2210	4872
$W_{2\text{nom}}$	1105	2436	1458	3214	1809	3988	2235	4927
$W_{2\max}$	1130	2491	1483	3270	1834	4043	2260	4983

**Davit launch test loads
TABLE 503**

$W_{1\min}$ = Minimum combined weight of the liferaft hull and the ballast required

$W_{1\max}$ = Maximum combined weight of the liferaft hull and the ballast required

W_{hull} = Maximum weight of bare liferaft hull (less all Equipment Schedule items)

$W_{2\min}$ = Minimum weight of the ballast required

$W_{2\text{nom}}$ = Nominal weight of the ballast required

$W_{2\max}$ = Maximum weight of the ballast required

K Gas cylinders test
(1) Cylinder valve installation

If a cylinder adaptor has been removed then it must be refitted as follows;

- (a) Prior to the cylinder adaptor being fitted to the bare cylinder, apply the correct number of turns of PTFE tape, TABLE 504. The tape must be applied to the threads of the cylinder adaptor, (FIGURE 507).
- (b) Apply Molytote III lubricant to the first 3 threads of the cylinder adaptor. This will assist with fitting the adaptor to the cylinder.
- (c) The charge weight is specified in the IPL section of this service manual.
- (d) The cylinder is to be charged following the procedures recommended by the inflation system manufacturer. Reference to these can be found in the Associated Publication section in the relevant liferaft service manual.

PTFE tape wrapping					
		Cylinder Adaptor			
		Thanner		Leafield	
Part No.	PTFE tape	Plated	Unplated	Plated	Unplated
Description	06168009	12 wraps	12 wraps	12 wraps	12 wraps
	12 mm wide x 0.076 mm thick				
Description	5X3117	6-8 wraps	8-10 wraps	6-8 wraps	8-10 wraps
	3/4" wide x 0.002" - 0.0025" thick				

**PTFE Tape wrapping
TABLE 504**

(2) Chemical leak testing

Testing for leaks must be carried out as follows, as per Method A or Method B;

Method A. 30-day quarantine period

- (i) Check the weight of the cylinder at regular intervals during the 30-day quarantine period.
- (ii) After thirty (30) days the weight must be the same as when it was first filled.
- (iii) If the weight has decreased, corrective action must be taken and the above process repeated.

WARNING: A CHARGED CYLINDER SHOWING LOSS OF WEIGHT, CANNOT BE USED IN SERVICE.

- (iv) If weight is the same, the cylinder can be used in service.

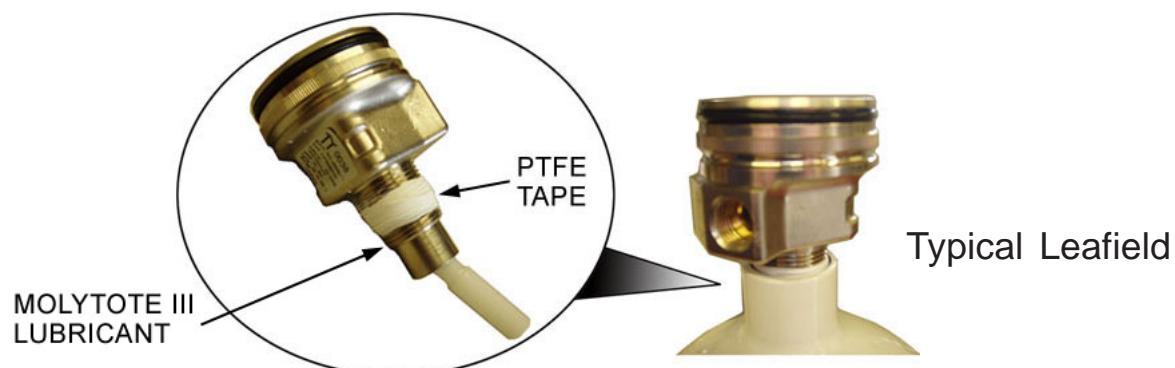
Method B. Chemical leak test

- (a) Before the gas cylinder is chemically leak tested, the mass of the gas in the cylinder is to be recorded, ensuring that it is within the limits specified in the service manual.
If there is insufficient gas in the cylinder, and/or a leak is detected, corrective action should be taken to determine the cause of the leak.

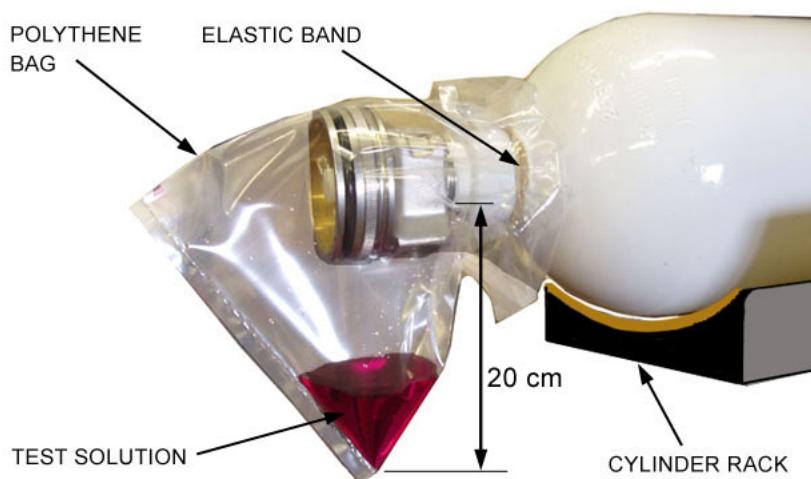
WARNING: A CHARGED CYLINDER SHOWING LOSS OF WEIGHT, CANNOT BE USED IN SERVICE.

CAUTION: FOR THESE TESTS ONLY USE THE LEAK DETECTION TEST KIT AS LISTED.

- (b) Lay the cylinder to be tested on its side, in a rack, so that the valve end is protruding, (FIGURE 508). Ensure the valve and shoulder of the cylinder are free from dust and other contaminates by carefully wiping using a clean, dry cloth. Remove the dust cap to clean the valve then replace the cap loosely.
- (c) Using the measuring cylinder provided in the test kit, transfer 25ml of the test solution into a polythene bag. The initial colour of the test solution will be a pink color.



Typical operating heads with PTFE tape applied
FIGURE 507



Chemical leak test applied
FIGURE 508

- (d) Attach the open end of the bag over valve head and attach it to the cylinder body using one or more elastic bands. Make sure there are no air gaps in the seal, (FIGURE 508).
- (e) The polythene bag shall then hang 20 cm off the valve end of the cylinder with the test solution in one corner.
- (f) Maintain the test for a period of not less than one hour. Remove the bag, (ends closed), and gently shake the solution. Make the observation as detailed in Step 3 below.

Alternatively the bag can be shaken while still hanging from the cylinder.

- (g) A control sample is necessary, this is made by introducing 25ml of test solution into a bag which is not fitted to a cylinder, but must be sealed at the open end, to exclude contamination from the atmosphere. This bag must be placed on the rack in the vicinity of the cylinders under test, and the above test method applied.

(v) Observations

- (a) All tests are to be recorded on a sheet similar to sample provided in Appendix 6.
- (b) Carbon dioxide leaking from the cylinder will cause the pink color of the test solution to be lost and the test solution will become clear.
- (c) If no colour change is observed there is no leak of gas from the cylinder.
- (d) The control sample shall not change colour during the test.
If a colour change takes place, this indicates that the atmosphere in the test area is contaminated with carbon dioxide and tests carried out under this control sample are therefore invalidated.
- (e) Tests shall be repeated after corrective action has been taken on the atmosphere, i.e. area ventilated.

NOTE:

This method may also be adapted to check CO₂ leakage from the base of cylinders, by taping a suitable sized plastic bag over the cylinder. Ensure the welded seam is inside the bag. The test is then carried out as per the above method.

(3) Weight testing

- (1) Check the cylinder weight. The weight must be the same as that given on the cylinder data label. The weight recorded on the cylinder data label does not include the cylinder recoil caps. *³

WARNING: INSTALL A RECOIL CAP ON THE OUTLET OF A FULLY CHARGED GAS CYLINDER BEFORE MOVING IT. THE GAS CYLINDER CAN BECOME A PROJECTILE IF IT IS DISCHARGED ACCIDENTALLY AND CAN CAUSE INJURY AND DEATH.

WARNING: HOLD THE GAS CYLINDER IN A VICE OR SAFE CLAMPING MECHANISM WHEN INSTALLING OR REMOVING AN OPERATING HEAD.

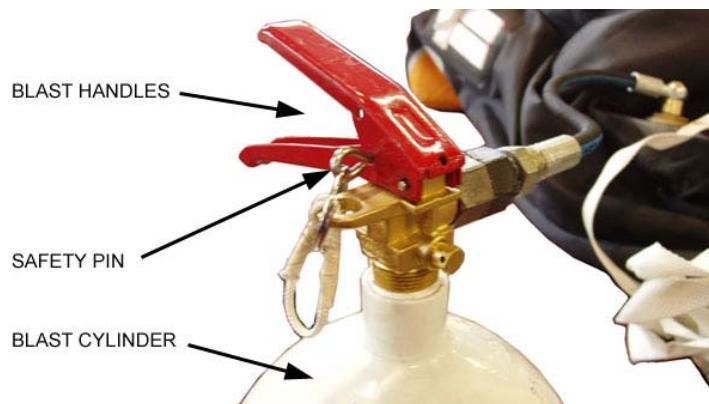
(4) Blast testing

- (a) The high pressure inflation hose, attached to the inlet valve connection, must be pressure tested as follows;

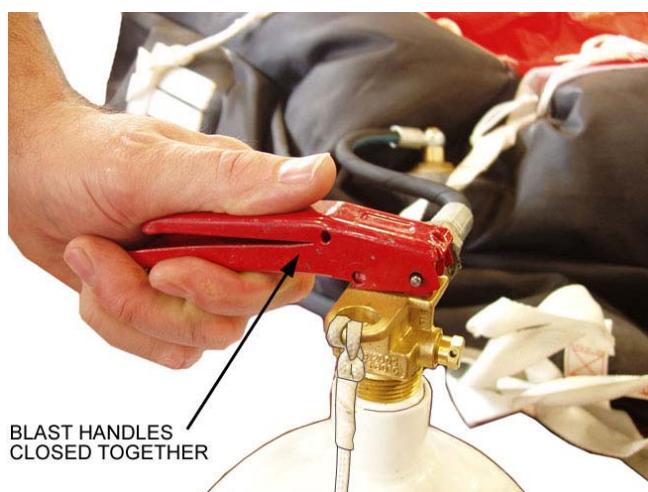
NOTE: This Blast test must be performed using the purpose-made Blast test valve / Syphon tube (see TABLE 505). If a TPED compliant cylinder is to be used, then it is recommended that this is done so in conjunction with a 16.9 litre cylinder – bare cylinder (P/N 41947001), description CYLINDER M BARE 16.9lt 250bar). This cylinder for blast testing should be charged with 11.26kg CO₂ + 0.36kg N₂. The cylinder valve should be installed into the cylinder with 2 turns of PTFE tape & torqued to 240Nm (177ftLb) +10% -0% This blast test cylinder assembly is not suitable for transportation in USA/Canada.

NOTE: If a USDOT compliant cylinder is to be used, then it is recommended that this is done in conjunction with a 960 cu.in. cylinder – bare cylinder (P/N 42117001). This cylinder for blast testing, should be charged with 8.80 kg CO₂ + 0.44 kg N₂. The cylinder valve should be installed into the cylinder with 2 turns of PTFE tape & torqued to 220 Nm +10% / -0 Nm. A cylinder adaptor is required to fit the valve, onto the cylinder, (see TABLE 505).

*³ Please refer to US Appendix A-2



Blast test set-up
FIGURE 509



Blast test operational
FIGURE 510

BLAST TEST KIT				
Liferaft Inflation system		Part number	Item description	Qty per Service station
a	Leafield	*08251009	Cylinder valve (blast test)	1
b	Thanner	*08576009	Cylinder valve (blast test)	1
c	#	08351009	Cylinder valve (adaptor)	1

* This item to be purchased as required for ongoing service activity.

This item is only required when Part a or Part b, is to be used in conjunction with a USDoT compliant cylinder.

This item is not required when Parts a or b, are fitted to a TPED compliant cylinder.

Blast test required kit
TABLE 505

- (i) The Blast kit required is listed in TABLE 505.

CAUTION: ENSURE THE SAFETY PIN IS IN PLACE AT ALL TIMES. IT SHOULD ONLY BE REMOVED FOR THE PERIOD OF THE BLAST TEST.

- (ii) Disconnect the high pressure (HP) inflation hoses, which are currently fitted to the liferaft, from the operating head.
- (iii) Connect one HP hose at a time, to the fitting on the blast test cylinder valve, (FIGURE 509/510). The correct torque value for this hose attachment can be found in Chapter1, TABLE 101, Torque settings.

CAUTION: FOR THE FIRST BLAST, KEEP HANDS AWAY FROM THE INLET VALVE IN CASE OF CO₂ BURN.

- (iv) It is necessary to blast test each CO₂ inlet valve three times, (FIGURE 510).
- (v) For each blast, the red handles of the Blast test cylinder should be closed together, (FIGURE 510). The blast should last for 1 second.
- (vi) If no gas leakage is observed on the first blast, then the second and third blasts should be conducted with the one hand near the inlet valve to detect leakage, BUT NOT IN CONTACT with it.
- (vii) The hose should now be disconnected from the blast cylinder.

L Radar reflectors test - (if installed)

- (1) Examine the radar reflector.
 - (a) Examine the radar reflector for damage.
- (2) Carry out the radar reflector test as follows:
 - (a) Remove the radar reflector from its plastic bag.
 - (b) Inflate the radar reflector to a pressure of 0.7 Psi / (492 mm/WG). Let the pressure stay for a period of one hour. Make sure the pressure does not decrease to below 0.5 Psi / (351.5 mm/WG).

M Search & Rescue Transponder (SART) - (if installed)

- (1) The SART must be tested in accordance with the manufacturers instructions (refer to List of Associated Publications).

NOTE: If a SART is included in a liferaft, a radar reflector is not required.

4 Trouble shooting

TABLE 506 is given to help you to find a fault if there is a malfunction during the function test. The table shows the possible causes and the corrective action. If there is a failure or malfunction you should also look for signs of damage which could have caused the failure.

FAILURE	POSSIBLE CAUSE	CORRECTIVE ACTION
Failure to inflate.	The cylinder is not fully charged.	Install a fully charged cylinder.
	The cylinder is empty.	
	The hose is not installed.	Install the hose.
	The connections are loose.	Tighten the hose connections.
Pressure leaks.	Damaged or porous fabric.	Repair the fabric or seam, within limits given in Chapter 6.
	Damaged or porous seam.	
	Foreign body on a valve seat.	Clean or replace the relief/top up valves.
	Loose connections in the hose system.	Tighten all hose connections.
Relief valve does not relieve or reseat at the correct valve pressure.	Sealing cap is installed.	Remove sealing plug.
	A relief valve defect.	Replace the relief valve.
	Unwanted material.	Clean the relief valve on the valve seat.
Operating head is not operating correctly.	Various reasons.	Replace the operating head.

**Troubleshooting
TABLE 506**

CHAPTER 6

REPAIR

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CHAPTER 6

REPAIR

1 General

- A Repairs to fabrics normally consist of patching the damage with fabric patches. The patching fabric must be the same type of material as the item under repair (e.g. material RFD 1015 must be replaced with RFD 1015).
- B When marking fabrics, use a silver ballpoint pen (Schmidt 700) or BIC Crystal red Pen or wax (e.g. Chinagraph) crayon. If a 'major' repair is carried out record the repairs on the liferaft log card.
- C RAFT CONDEMNATION PROCEDURE: If a raft has been condemned, it must be damaged further so that it cannot be used.
The raft identification label should be separated from the raft and returned with a completed condemnation form, to the manufacturer.
All remaining material must be disposed off according to the local legislation.

TABLE 601 lists a number of possible reasons, although further reasons may exist. A raft is condemned if;

POSSIBLE CAUSES OF RAFT CONDEMNATION
Leakage -beyond economical repair
Wear/Chafing
Condemned after vessel casualty
Damaged by strong heat (e.g. fire)
Vandalism
Damage by mould
NAP test -NEGATIVE
Floor Seam test -NEGATIVE
Separation of adhesive/welded seams

Raft condemnation
TABLE 601

2 Adhesive

WARNING: ADHESIVES ARE FLAMMABLE. KEEP WELL AWAY FROM NAKED FLAMES. USE ONLY IN A WELL VENTILATED ATMOSPHERE. AVOID CONTACT WITH EYES. AVOID BREATHING FUMES. USE BARRIER CREAM ON HANDS AND WASH AFTER USE.

- A** The adhesive used for repairs to air-holding components and load-bearing components, is a two part polychloroprene mix to Specification Bostik 486.
- B** Only the adhesive specified in Step 2A shall be used for repairs. Although other unspecified adhesives may apparently bond surfaces together, they may also have unexpected negative side effects which will eventually cause premature failure.
- C** Mixing instructions for Bostik 486 adhesive.

CAUTION: THE MIXING PROCEDURE MUST BE FOLLOWED EXACTLY SO THAT THE CURING AGENT WILL NOT SEPARATE FROM THE ADHESIVE.
THE MEASURED VOLUME OF THE CURING AGENT MUST BE POURED INTO THE APPROPRIATE QUANTITY OF THE ADHESIVE, STIRRING CONSTANTLY, AND FOR A MINIMUM OF FIFTEEN MINUTES.
AVOID PARTIAL QUANTITY MIXES IF POSSIBLE. THE ADHESIVE CAN NOT BE STORED READY-MIXED AS IT BECOMES UNUSABLE AFTER A FEW HOURS.

- (1) Bostik 486 is a two-part adhesive.
Part 1 is the adhesive, supplied in a can.
Part 2 is the curing agent (Bostikure), supplied in a bottle.

It is recommended that the constituents must be mixed together in these total quantities. After a bottle of curing agent has been opened, moisture will enter and the curing agent will soon deteriorate if it is not used.

NOTE: The ratio is 1 litre of adhesive to 40 ml of curing agent.

- (2) Partial amounts of the mixture may be made up but, after the curing agent has been opened, the contents start to deteriorate. Any remaining curing agent must be discarded two weeks after it is opened.

- (3) If mixing partial amounts, put the cap back on the curing agent bottle immediately after taking the measured quantity. This prevents evaporation and entry of moisture. If there is any sign of cloudiness in the liquid, this indicates that moisture is present and the complete contents of the bottle must be discarded.
- (4) Graduated measuring vessels must be used to make sure the two parts are mixed together in the ration of 25 measures (by volume) of adhesive to one measure of curing agent. Minimal mixing quantity permitted is 250ml. The measuring vessels must be kept clean and dry.
- (5) Keep the adhesive, curing agent and mixed adhesive in completely sealed airtight containers.
- (6) Adhesive must not be used outside the temperature range +5° to +30° C (41-86° F) or when the relative humidity exceeds 70%.
- (7) After the adhesive has been used to join surfaces, it will cure in two to four days at 20°C (68°F). At higher temperatures the curing time will be reduced, and at lower temperatures the curing time will increase.
- (8) For each batch of mixed adhesive, keep a sample and monitor it for development of cure. Use the sample to join two pieces of fabric. Keep the joined fabric as proof of the quality of the adhesive bond.

CAUTION: THE COMPONENTS AND MIXED ADHESIVE MUST BE KEPT IN COMPLETELY SEALED AIRTIGHT CONTAINERS. MIXED SOLUTION BECOMES UNUSABLE AFTER A FEW HOURS AND CAN NOT BE STORED FOR LONGER PERIODS.

- (9) The mixed adhesive will thicken and become unusable within four to six hours. This time depends on workshop temperature and the quantity of exposure to air. If the adhesive can be easily applied as a normal smooth and even layer, it is still useable.

3 Preparation of coated surfaces

WARNING: ONLY COATED SURFACES MAY BE INCLUDED IN REPAIRS.

A Polyurethane-proofed surfaces.

CAUTION: THOROUGHLY CLEAN POLYURETHANE-PROOFED SURFACES WITH TOLUENE SOLVENT (see TABLE 301 Chapter 3), AND/OR SOAP AND WATER TO REMOVE SURFACE CONTAMINATION COMPLETELY.

MEK (METHYL ETHYL KETONE) SOLVENT MUST BE USED TO CORRECTLY PRIME THE HEAVY DUTY POLYURETHANE COATING ON THE MATERIAL USED FOR THE BUOYANCY CHAMBERS (FLOOR, etc.). TOLUENE OR PETROLEUM TYPE CLEANING SOLVENTS ARE NOT EFFECTIVE FOR THIS PURPOSE.

- (1) The Nylon fabric used for air-holding chambers has a heavy-duty Polyurethane coating which has been compounded to give a high resistance to abrasion.
- (2) These Polyurethane coated fabrics must be prepared for bonding by chemically priming the coated surfaces with the solvent MEK immediately as soon as the solvent has evaporated, but within 10 -20 seconds before application of the coat of adhesive.
You may experiment with identical fabrics to find the optimum time within which the adhesive must be applied, at any given temperature.

NOTE: After 10-20 seconds the prepared surface will become less receptive to the adhesive.

- (3) Apply the solvent with a clean lint-free fabric pad, wet but not dripping with the solvent. Adequate preparation of the surface is shown by the development of a matt appearance and a limited degree of tackiness. The pad should become discoloured.
- (4) Attempts to prime Polyurethane surfaces chemically in a hot humid environment can cause the formation of atmospheric dew. This is because rapid evaporation of the MEK solvent causes the surface temperature to decrease. DO NOT ATTEMPT TO JOIN SURFACES IN THESE CONDITIONS, AS POOR ADHESION WILL RESULT.
- (5) Repeated applications of MEK solvent on a clean Polyurethane surface tend to become less effective. Apply the first coat of adhesive immediately after the first MEK wipe.

- (6) Do not remove residual adhesive from seaming surfaces which have been separated, unless it can be easily peeled off. To make a smooth surface, use toluene to rub off the old adhesive.

4 Application of Adhesive

A **Bostik 486 adhesive:**

- (1) For the purposes of repair, the words 'tacky' and aggressive tack' are defined thus:
 - (a) When the word 'tacky' is used, it means that if the fingers are lightly dragged across the adhesive, it tends to pull off the base material, or off the previous coat.
 - (b) When the expression 'aggressive tack' is used, this means that when applying light finger or knuckle pressure to the adhesive, the adhesive surface tends to retain (stick to) the fingers and does not transfer from the base fabric. When testing a surface with a finger, the adhesive must show aggressive tack, but no adhesive should remain on the finger.

WARNING: NO TEXTILE JOINTS: WHEN JOINING TWO SURFACES TOGETHER, MAKE SURE THE SURFACES ARE PROOF SIDE TO PROOF SIDE. DO NOT USE THE TEXTILE SIDE FOR ANY REPAIRS.

- (2) Apply three coats of adhesive to each mating surface. Allow each coat to become tacky before applying subsequent coats.
- (3) When the third coat develops an aggressive tack, apply the patch or make the seam. Roll well, with a hand roller, to remove any air bubbles, rucks or creases.
- (4) Take care when rolling down seams and patches, particularly on curved edges. Avoid making rucks and creases. All seams MUST be rolled twice.
- (5) If a coat has dried, it may be relivened by a cloth dampened, but not dripping, with toluene solvent. Apply just enough solvent to recreate an aggressive tack on the surface. Relivening may be carried out, up to 3 hours after the application of the first coat of adhesive, but no later.

- (6) Each repair must be completed within 3 hours of commencement.

NOTE: a DRY JOINT will result if:
-The adhesive becomes too dry between coats or at seam make-up.
-Any air bubbles are not completely rolled out.
-The mating surfaces are dry before patches are positioned.

A dry joint may appear good but will be easily pulled apart.

CAUTION: DO NOT USE SOLVENTS TO REMOVE SURPLUS ADHESIVE FROM REPAIR AREAS, UNLESS THE JOINT HAS CURED THOROUGHLY.

5 Repair damaged areas

- A Many of the seams in Surviva MK III liferafts, particularly the air holding seams, are of welded construction. Once welded, these seams can not be opened.

In a correctly welded seam it is not possible to find the interface between the two polyurethane surfaces.

For this type of construction, some of the traditional methods of repair, i.e. those which started with, "separating a structure joined by adhesive", have been replaced as described in this Section. The liferaft buoyancies, floor and canopy (non air holding joints) are held together with adhesive.

- B Note that a correct adhesive-jointed seam or assembly of polyurethane proofed fabric and adhesive, is very strong. It is possible to cause damage to the proofed coat if careless attempts are made to tear apart two surfaces joined by adhesive, particularly if forces are applied in a manner not normally found during service.

WARNING: UNDER NO CIRCUMSTANCES SHOULD THE HOT AIR GUN BE USED IN CONJUNCTION WITH TOLUENE SOLVENT. TOLUENE IS EXTREMELY FLAMMABLE AND SHOULD BE KEPT AWAY FROM THE HOT AIR GUN.

NOTE: to RELEASE ADHESIVE JOINTED SEAMS or assemblies formed using polyurethane adhesive, use the following technique.

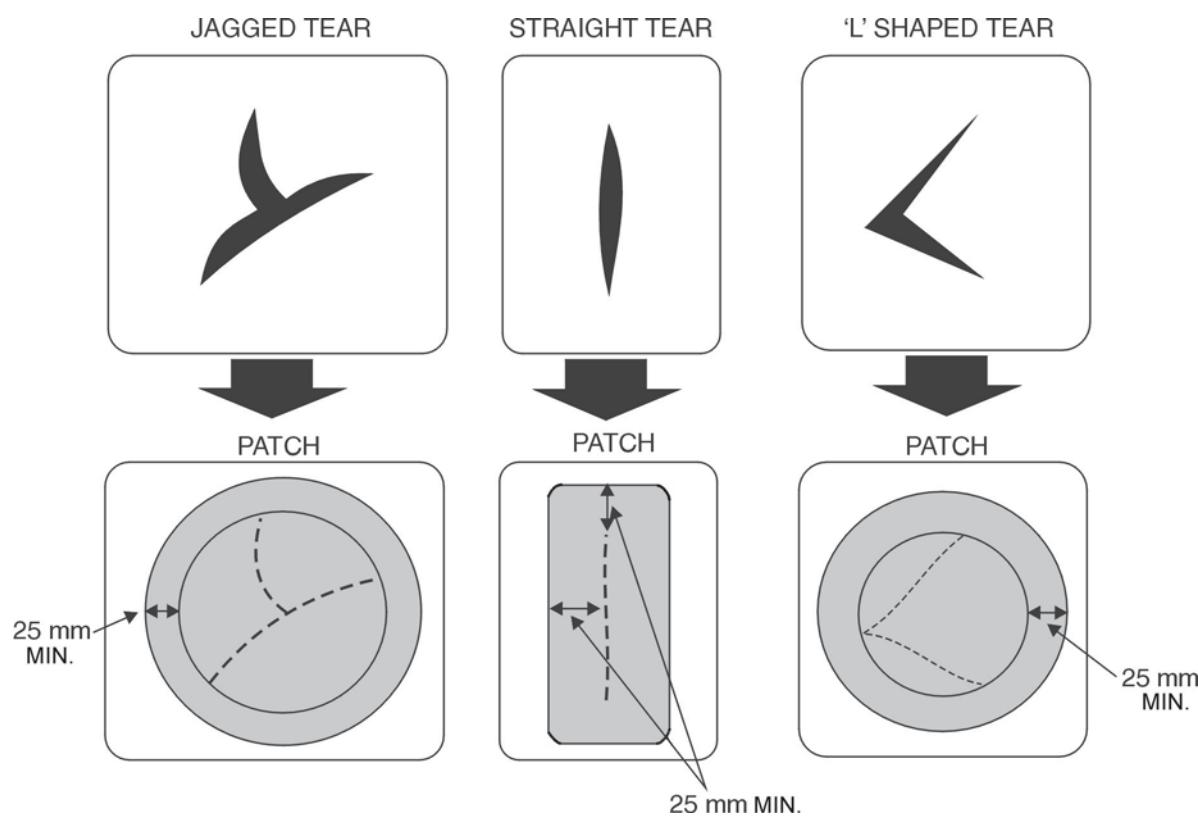
-It is recommended that a hot air gun is used (max.temp. 70°C [158°F]) together with the careful use of a spatula or other suitable tool.

NOTE: to RELEASE ADHESIVE JOINTED SEAMS or assemblies formed using polychloroprene adhesive it is recommended that one of the following techniques is used, together with the careful use of a spatula or other suitable tool.

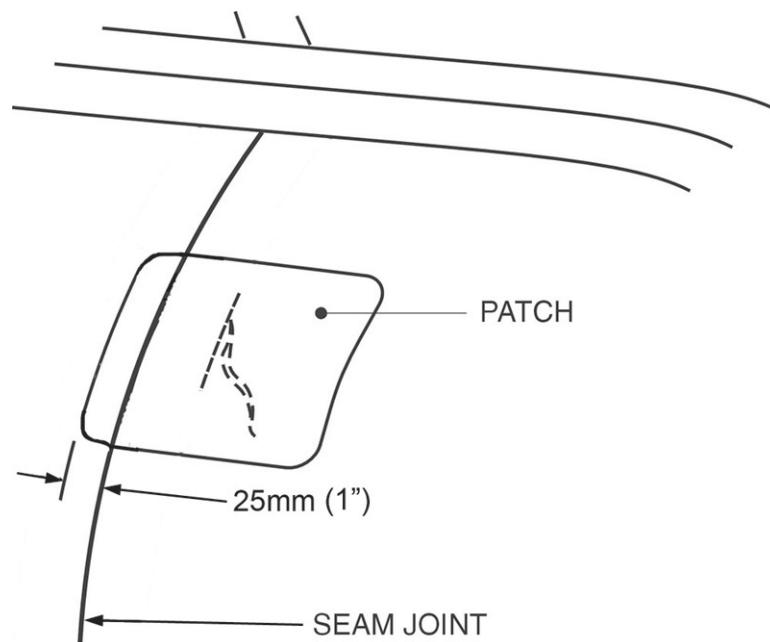
- A hot air gun (max.temperature 70°C [158°F]) or
- Toluene solvent.

C Patches

- (1) Repair patches must overlap at least 25 mm (1") beyond the edge of the damage, (FIGURE 601) e.g:
 - (a) If the diameter of a jagged aperture is 25 mm (1"), the patch must be at least 75 mm (3 ") diameter.
 - (b) If a straight tear is 25 mm (1 in) long, the patch must be at least 75mm (3") x 50 mm (2 ").
 - (c) Treat 'L' shaped tears as apertures; calculate the "diameter" as the distance between the ends of the tear.
- (2) Patches must be circular or rectangular with rounded corners, (FIGURE 601).
- (3) Repair patches on air-holding components may be made from either fabric RFD1015, Type 1, PN 10772009 (single-sided PU 'proofing') or RFD1015, Type 2, PN 10773009 (Double-sided PU 'proofing').
- (4) Where other components are to be bonded on top of the patch use only RFD1015 Type 2 Fabric, PN 10773009 (Double-sided PU 'proofing').



Patching
FIGURE 601



Patch application over seams
FIGURE 602

D Applying Patches and Tapes

- (1) To apply patches or tapes, the following procedure must be followed:
 - (a) Cut the patch to size.
 - (b) Prepare and clean the area as described in Step 3.
 - (c) When the final adhesive coat develops an aggressive tack, put the patch in position and use a hand roller to roll it into firm contact. Ensure the patch is orientated correctly i.e. ‘proof’ surface to ‘proof’ surface. Adhesive joints are not permitted to join one or more textile surfaces.
 - (d) Use a spatula to remove any air bubbles from under the patch.
 - (e) After a repair to an inflatable chamber has cured, the inflatable chamber must be subjected to a pressure holding test.
 - (f) If damage is along the edge of a seam then the patch must extend across the central seam joint by a minimal 25mm (1”), (FIGURE 602).
- (2) To apply tape, use exactly the same manner that is used for patches. Cut a radius on the corners of the tape ends before sticking the surfaces together; overlap tape ends by 50 mm (2”).

E Repair to insulated floor retaining straps

Use the following standard repair method, where insulated floor retaining straps have been fitted to the lower buoyancy ring, to replace them should they become damaged.

- (1) Trim off the damaged retaining strap at the junction with buoyancy short seam.
- (2) Fit the repair strap. Position it a distance of 10mm (0.4 “) from the short seam and butt it within 10mm (0.4 “) of the V-strip,

NOTE: Where an insulated floor assembly is not fitted to a liferaft and the insulated floor retaining straps become damaged, there is no requirement for repair.

F Testing repairs (Refer to Chapter 5)

- (1) Make sure the adhesive cures completely before testing.
- (2) When carrying out repairs to air holding compartments, carry out a working pressure test for each compartment.

G Repair limits

- (1) Patches (External)
 - (a) Use a patch to repair, if:
 1. The damage does not enter a seam.
 2. The damage does not pass under a major anchorage point, such as a towing point or bowsing patch, or within 100 mm (4") of one of these points.
 3. The maximum area of the patch is not more than one eighth of the total panel area.

H More extensive damage

- (1) Repairs not described in this manual are not permitted except by permission from the Design Authority, RFD Beaufort . Separate application must be made for each occasion when repair is proposed.

6 Component repair

A Pressure Relief Valve

A1 (Thanner PRV Type OTS-65)

Disassembly of the pressure relief valve is not permitted. Replace the complete assembly:

Removal Method

NOTE: If the recommended procedure is adhered to, there will be no requirement to cut or patch the liferaft fabric.

1. Inflate the liferaft to working pressure.
2. Using a $\frac{1}{2}$ " square drive ratchet and the appropriate adaptor tool (refer to Chapter 10), loosen both PRV bodies until it is possible to unscrew the PRV assembly by hand.
3. Deflate the upper and lower buoyancies.
4. Holding the PRV nut through the buoyancy fabric, unscrew the valve body. Remove all components of the faulty PRV, including the nut. The nut can be removed through the hole from which the valve body was removed. This is only possible with the liferaft in the deflated state.
5. Discard all parts of the faulty PRV; Do not reuse any of them.

Fitting a new PRV

WARNING: UNDER NO CIRCUMSTANCES SHOULD OLD COMPONENTS BE MIXED WITH NEW COMPONENTS. REPLACE THE ENTIRE PRV ASSEMBLY. DO NOT RE-USE ANY OLD COMPONENTS.

NOTE: Ensure all surfaces are clean and dry before fitting the new PRV.

1. Assemble the valve body as shown in, (FIGURE 603).

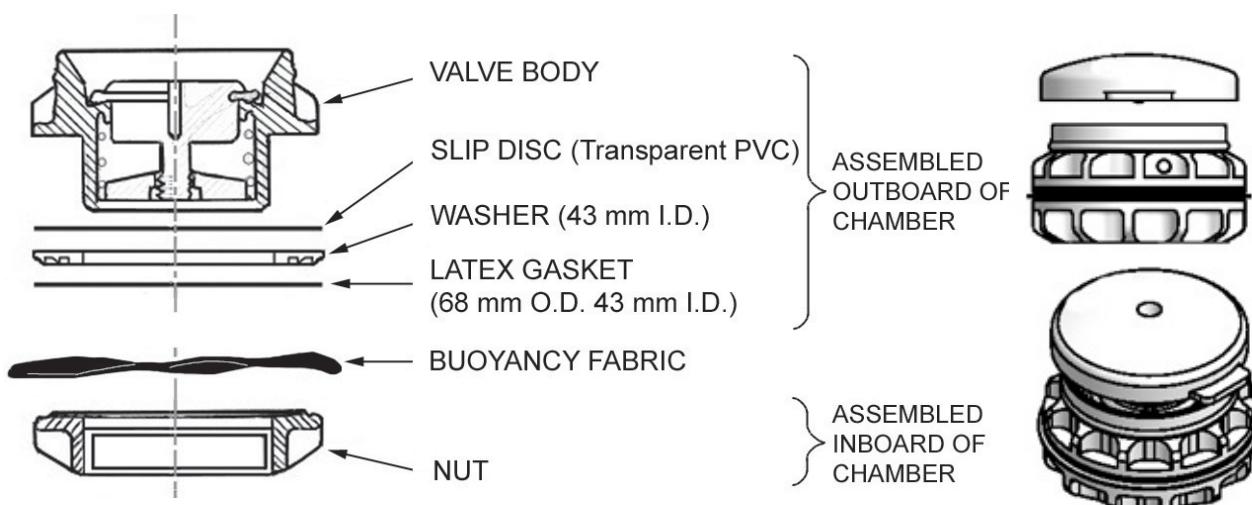
NOTE: The ridged face of the washer should be positioned towards the latex gasket.

2. Push the nut into the hole from which the faulty one was removed.
3. Holding the nut in place, through the buoyancy fabric, hand-tighten the preassembled "outboard" components of the PRV onto the nut. Ensure the latex gasket remains flat when it mates against the PRV doubler.
4. Slowly inflate the liferaft buoyancy. Using a calibrated $\frac{1}{2}$ " square drive torque wrench and the correct adaptor tool, tighten the PRV from the outside. Please refer to Chapter 1, TABLE 101 for torque settings.

NOTE: The pressure inside the buoyancy will prevent the nut from turning during the tightening process.

WARNING: ONLY THE TORQUE VALUE SPECIFIED SHOULD BE APPLIED. WHEN THE CORRECT TORQUE IS ACHIEVED FOR THE FIRST TIME, THE PRV MUST NOT BE TIGHTENED AGAIN. IF RETIGHTENING IS NECESSARY A COMPLETE NEW PRV MUST BE FITTED.

5. Complete and record an air-holding test as described in Chapter 5. Record the relief and reseat pressures of the new PRV.



Pressure Relief Valve
FIGURE 603

A2 (Leafield PRV Type A10)

CAUTION: ENSURE WHEN CONDUCTING THE REPAIR TO THE SLIT, NO MEK COMES IN CONTACT WITH THE PRV. THE PRV IS TO BE FITTED WITH THE SEALING PLUG ATTACHED. NO OTHER CAP OR PLUG IS TO BE USED. PLEASE REMOVE CAP AT THE END OF THE PROCESS.

Disassembly of the pressure relief valve is not permitted. The Leafield A10 valve has no serviceable components — a faulty valve must be replaced with a new unit. Replace the complete assembly:

CAUTION: IT IS NOT PERMITTED TO ATTACH THE LEAFIELD PRV, WHEN PREASSEMBLED INTO A DOUBLER, TO ANOTHER COMPONENT USING ADHESIVE.

Removal Method

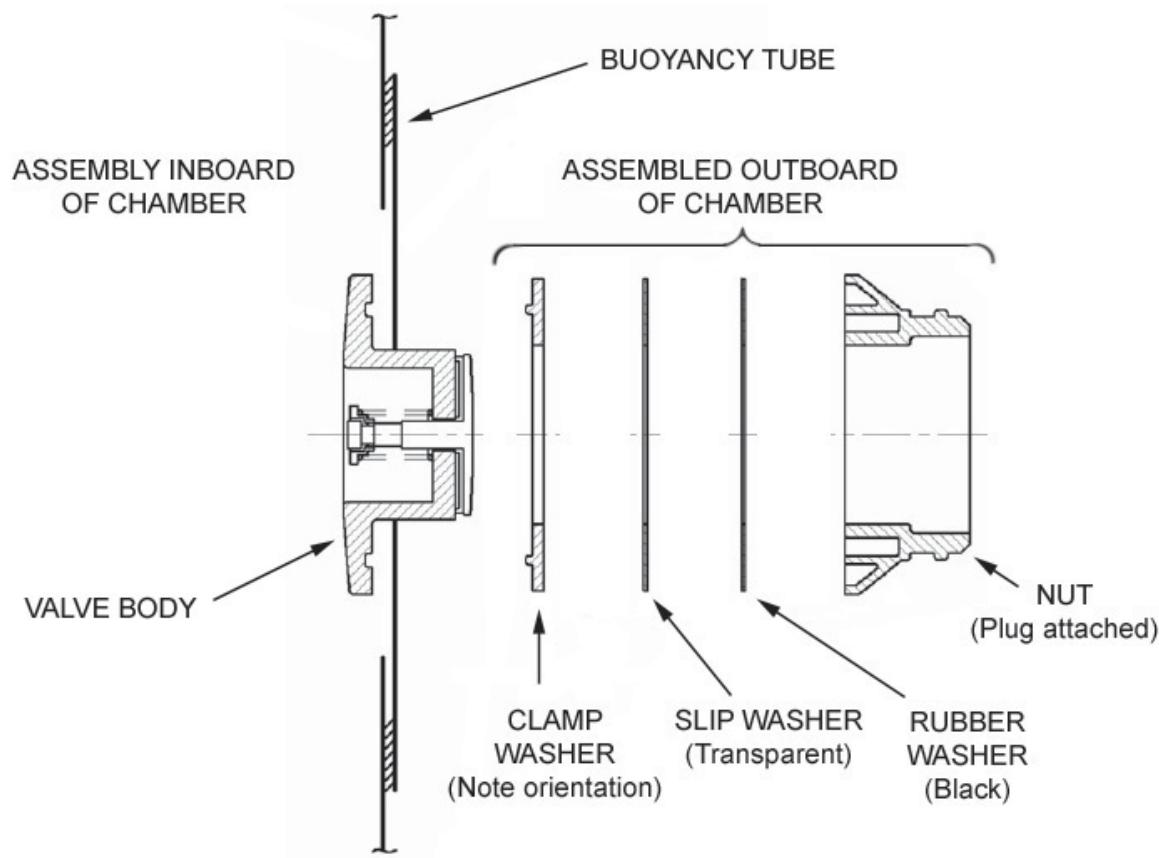
- (1) A slit of approximately 150 mm (6"), must be made in the buoyancy tube in the vicinity of the affected valve to enable access to the inside of the buoyancy tube. The slit should be made along the length of the buoyancy. The end of the slit should be no closer than 100 mm (4") to the edge of the PRV doubler.
- (2) The slit should be made as small as possible and repaired subsequently by patching according to standard practice.
- (3) Loosen both parts of the valve using the appropriate tools.
- (4) Remove the valve.
- (5) Discard all parts of the faulty PRV. Do not reuse any of them.

Fitting a new PRV

WARNING: UNDER NO CIRCUMSTANCES SHOULD OLD COMPONENTS BE MIXED WITH NEW COMPONENTS. REPLACE THE ENTIRE PRV ASSEMBLY. DO NOT RE-USE ANY OLD COMPONENTS.

NOTE: Ensure all surfaces are clean and dry before fitting the new PRV.

- (1) Push the valve body into the hole from which the faulty one was removed.
- (2) Assemble the valve body as shown in, (FIGURE 604).



**PRV-Leafield
FIGURE 604**

NOTE: The ridged face of the clamp washer should be positioned towards the buoyancy tube.

- (3) Holding the valve body in place, through the buoyancy fabric, hand-tighten the components of the PRV using the nut.
- (4) While holding the PRV on the inside, use a calibrated torque wrench and the correct adaptor tools, to tighten the PRV from the outside. Please refer to Chapter 1, TABLE 101 for torque settings.

WARNING: ONLY THE TORQUE VALUE SPECIFIED SHOULD BE APPLIED. WHEN THE CORRECT TORQUE IS ACHIEVED FOR THE FIRST TIME, THE PRV MUST NOT BE TIGHTENED AGAIN. IF RETIGHTENING IS NECESSARY A COMPLETE NEW PRV MUST BE FITTED.

- (5) The slit must then be repaired as detailed in this Chapter.

CAUTION: ENSURE THE PRV CAP(S) HAVE BEEN REMOVED BEFORE INFLATION.

- (6) After waiting the required time for the repair to cure please complete and record an air-holding test as described in Chapter 5. Record the relief and reseat pressures of the new PRV.

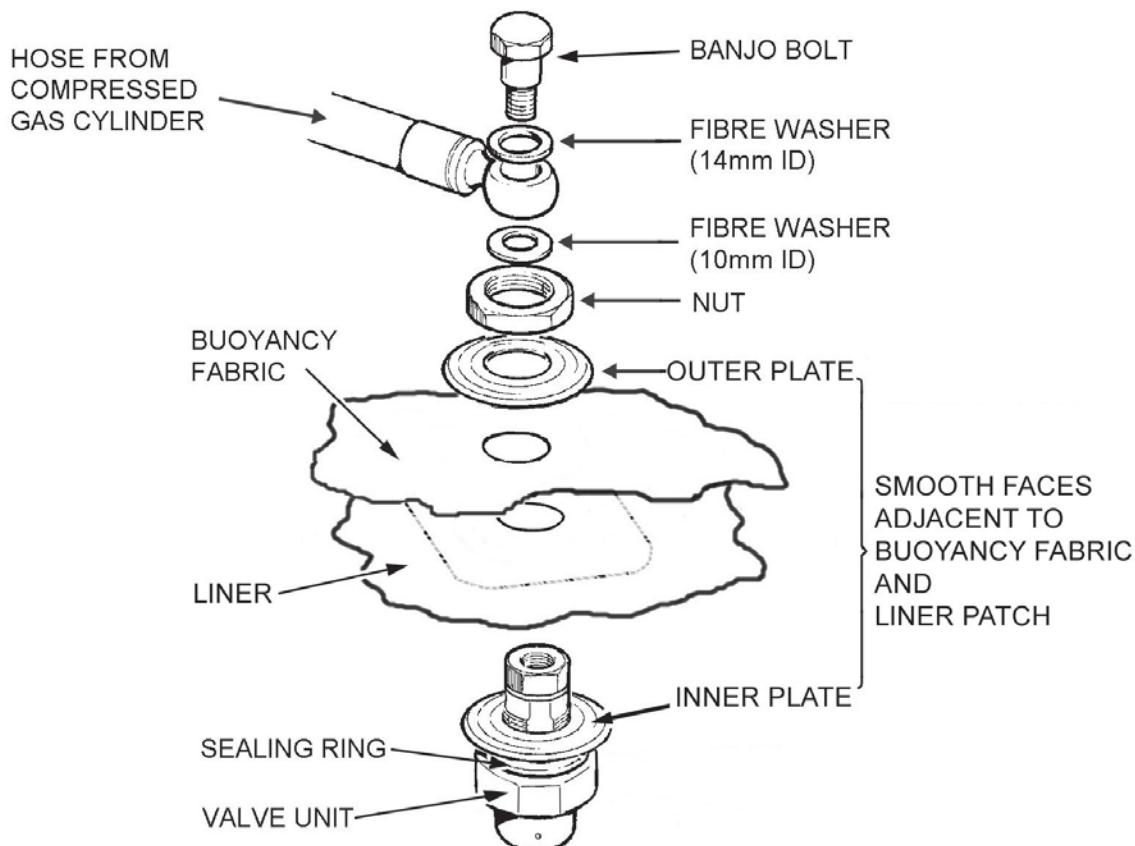
B Topping-up valve

- (1) Cut out the defective valve.
- (2) Make a circular patch of material of the correct size. The patch must have a minimum diameter 50 mm (2") larger than the aperture cut, to remove the defective valve. Punch a star cut in the centre of the new patch. This must be done using tool stated in Chapter 10.
- (3) Attach the valve to the patch and tighten it to the stated torque value in Chapter 1, TABLE 101.
- (4) Use Bostik 486 adhesive to join this assembly to the liferaft so that it has a minimum 25 mm (1") overlap, on the liferaft material.

C Inflation valves**(C1) Thanner type (FIGURE 605)**

- (a) The inflation valves have different jet bores, as stated below. The size of the jet bore is stamped in the flat surface of the valve body. The stamp also shows the direction of the jetholes.
 - (i) The bore size for the lower buoyancy is 2.2 mm.
 - (ii) The bore size for the upper buoyancy is 2.8 mm.
- (b) There is only one size of cross head bolt for this valve.
- (c) The assembly requires an aperture of 22 mm diameter in the buoyancy chamber. The aperture is reinforced at this point.
 - (1) Deflate the liferaft for this repair.
 - (2) To install an inflation valve access to the inside of the buoyancy chamber is required. This is achieved by making two slits in the buoyancy, approximately 150 mm (6 ") long, (FIGURE 606).
 - (i) One slit is required close to the inlet valve position.
 - (ii) One slit is required close to the inner lining retaining patch.
 - (3) Access the slit closest to the inner liner patch, untie one end of the liner and pull it through the slit closest to the inflation valve.
 - (4) To disassemble the inflation valve, remove the fixing nut and the outer plate from the valve.
 - (5) Reach inside the liner and pull the body of the valve to the inside of the liner, then remove it from the buoyancy chamber.
 - (6) To install a new Inflation valve, first disassemble the nut and the outer plate from the valve, (FIGURE 605).
 - (7) The sealing ring and inner plate are attached permanently to the inflation valve body, (FIGURE 605).
 - (8) Using all new components assemble the inflation valve unit, complete with the sealing ring and inner plate, through the liner and the 22 mm hole in the buoyancy panel, (FIGURE 605).

- (9) Fit the outer plate and nut to the inflation valve unit, tightening them by hand, (FIGURE 605).
- (10) Align the jets in the inlet valve by ensuring the arrows on the spanner are orientated, to point along the axis of the buoyancy tube and the liner.
- (11) Use a 30 mm torque spanner and 19 mm socket to tighten the assembly , to the stated torque value in, Chapter 1, TABLE 101.
A special tool, (Chapter 10), is shaped to match the body of the valve. The tool can be used with a 19 mm socket.
- (12) Re-insert the liner through the inflation valve slit and tie the liner to its retaining patch, inside the buoyancy.
- (13) Use the patching procedure to repair both access slits.
- (14) At a later stage of assembly, assemble the hoses using the Banjo bolts.



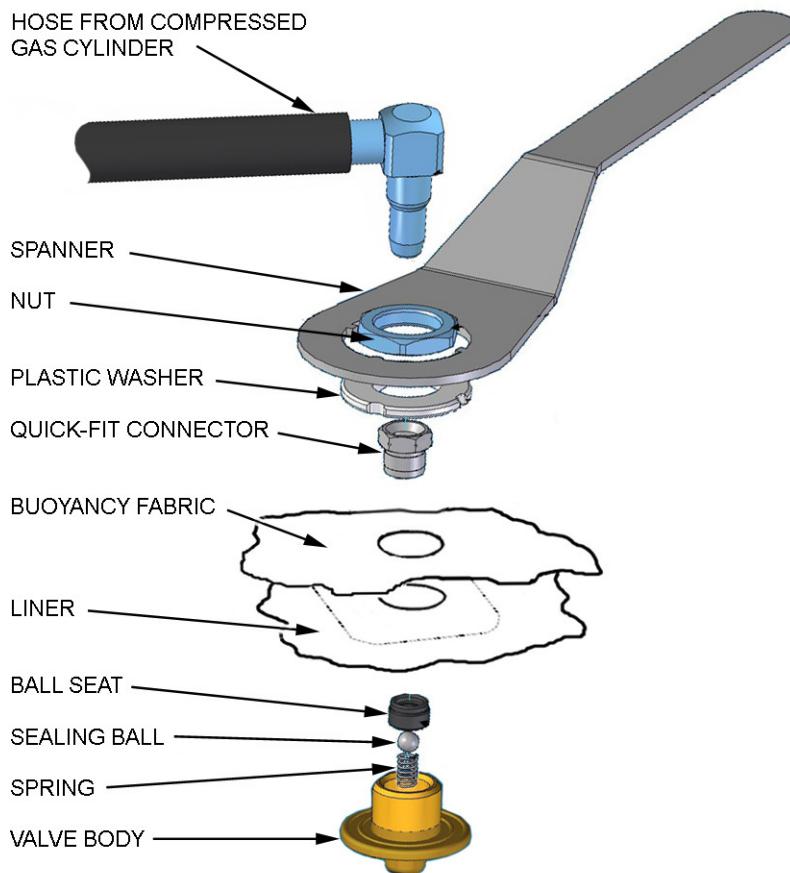
NOTE: EXPLODED VIEW IS FOR ILLUSTRATION ONLY- ACTUAL VALVE UNIT MAY VARY

Thanner inflation valve
FIGURE 605



NOTE: FOR ILLUSTRATION ONLY. LINER POSITION IS SHOWN ON THE OUTSIDE OF THE BUOYANCY

**Position of Liner tie-off patches
FIGURE 606**



NOTE: EXPLODED VIEW IS FOR ILLUSTRATION ONLY- ACTUAL VALVE UNIT MAY VARY

**Leaffield inflation valve
FIGURE 607**

(C2) Leaflet type (FIGURE 606)

- (a) The inflation valves have different jet bores, as stated below. The size of the jet bore is stamped in the flat surface of the valve body. The stamp also shows the direction of the jetholes.
 - (i) The bore size for the lower buoyancy is 2.2 mm.
 - (ii) The bore size for the upper buoyancy is 2.8 mm.
- (b) There is only one size of hose for this valve.
- (c) The assembly requires an aperture of 24 mm diameter in the buoyancy chamber. The aperture is reinforced at this point.
 - (1) Deflate the liferaft for this repair.
 - (2) To install an inflation valve access to the inside of the buoyancy chamber is required. This is achieved by making two slits in the buoyancy, approximately 150 mm (6") long, (FIGURE 606).
 - (i) One slit is required close to the inlet valve position.
 - (ii) One slit is required close to the inner lining retaining patch.
 - (3) Access the slit closest to the inner liner patch, untie one end of the liner and pull it through the slit closest to the inflation valve.
 - (4) To disassemble the inflation valve, remove the fixing nut and the plastic washer from the valve.
 - (5) Reach inside the liner and pull the body of the valve to the inside of the liner, then remove it from the buoyancy chamber.
 - (6) To install a new Inflation valve, first disassemble the nut and the plastic washer from the valve, (FIGURE 607).
 - (7) Using all new components assemble the inflation valve unit. Pass the valve body through the liner and the 24 mm hole in the buoyancy panel, (FIGURE 607).
 - (8) Fit the plastic washer and nut to the inflation valve body and tighten it by hand, (FIGURE 607).
 - (9) Align the jets in the inlet valve by ensuring the arrows on the spanner are orientated, to point along the axis of the buoyancy tube and the liner.



**Liner position
FIGURE 608**

- (10) A special tool, (Chapter 10), is shaped to match the body of the valve. Using a 33mm A/F socket and torque wrench, tighten the nut to the stated torque value in, Chapter 1, TABLE 101.
- (11) Remove the red plastic dust cap from the top thread of the inlet valve. The valve is now ready to accept the quick fit connector on the end of the high-pressure hose. Push the connector firmly into the hole and make sure a click is heard. Check that the connection has been correctly made by tugging firmly on the hose connector.
- (12) If the hose has not been correctly snapped into place, it may blow out during inflation. In this case, check the O-Ring is still in place in the M16 connector before pushing together as described above. If it is not present, replace the M16 connector.
- (13) Re-insert the liner through the inflation valve slit and tie the liner to its retaining patch, inside the buoyancy.
- (14) Use the patching procedure to repair both access slits.

D Replacing the Inner buoyancy liner

Removal Method

- (1) Deflate the liferaft for this repair.
- (2) To replace a liner, access to the inside of the buoyancy chamber is required. This is achieved by making three slits in the buoyancy, approximately 150 mm (6") long, (FIGURE 606).
 - (i) One slit is required close to the inlet valve position.
 - (ii) A slit is required close to each liner retaining patch.
- (3) Access the slit closest to each liner patch, untie both ends of the liner and pull it through the slit closest to the inflation valve, (FIGURE 608).
- (4) To disassemble the inflation valve, please refer to Section C.
- (5) Reach inside the liner and pull the body of the valve to the inside of the liner. Remove the valve and the liner from the buoyancy chamber.

Fitting a new liner

- (1) Insert the new liner through the slit closest to the inflation valve, (FIGURE 606).
- (2) Tie each end of the liner to its respective retaining patch, (FIGURE 606 & 608).
- (3) To fit a new inflation valve, please refer to Section C.
- (4) Use the patching procedure to repair all slits.

E Miscellaneous

- (1) Replace damaged painter, operating lanyard or doorway bowsing lines with new assemblies.
- (2) Should damage be found on any part of the lifting bridle, the entire lifting bridle must be replaced.

7 Rigid Containers

A Classification of structural repairs

- (1) Only minor repairs to glass reinforced plastic (GRP) containers are permitted. These are listed below. When damage is more than these limits, send the container to an approved glass fibre repair depot for major repair.

B Repair limits

- (a) The limits of minor repairs are:
 - (1) Damage to the gelcoat only, which does not penetrate the glass fibre mat.
 - (2) Damage to the painted surface.
- (b) The limits of major repairs are:
 - (1) Apertures or penetrating damage (i.e. through the glass fibre mat) over an area of less than 77 square centimetres (12 sq. in) on the outer surface of the container.
 - (2) Apertures or penetrating damage over an area of less than 58 square centimetres (9 sq. in) on the inner surface of the container.
 - (3) Breakage/cracks of the rims on either half of the container shell.

NOTE: The limits above, apply to the TOTAL area of damage, so that if, for example, repair is required at both ends of the container, then the permissible areas of repair for each end must not TOGETHER total more than the prescribed limits.

C Other repairs

WARNING: WHEN WORKING WITH GLASS FIBRE SURFACES, HANDS, ARMS AND FACES MUST BE PROTECTED. WEAR A FACE MASK.

- (1) Replace damaged or illegible labels. Re-stencil illegible markings.

D Gelcoat

- (a) This is the outer surface of the container. Damage to the gelcoat does not affect the GRP, although it may expose it to view. If only the gelcoat is damaged, repair it with a GRP filler, such as Isopon:
 - (1) Clean the damaged area with acetone to remove all contamination.
 - (2) Spread the GRP filler until it is higher than the adjacent surface of the container.
 - (3) Cover the GRP filler with adhesive tape and allow it to cure.
 - (4) Remove the tape and abrade the repaired area. Rub down the surface with abrasive papers until it is level with the container surface.
- (b) To paint the container:
 - (1) Remove all loose labels.
 - (2) Remove grease, tar etc. with a suitable solvent, e.g. toluene.
 - (3) Wash the container with a solution of detergent and water and rinse with clean water.
 - (4) Fill any cracks or voids in the gelcoat with GRP filler as per Step 1 above.
 - (5) Spray paint one coat of white Epimide paint or Polyurethane paint.

E Major structural repairs

- (1) A major repair is required for any damage to a container that is more serious than damage to the gelcoat only. Major repairs to the glass fibre containers are not permitted except by specially trained and approved personnel.

The limits of repair are given below. If container damage is more than these limits, do not attempt to repair the container. The damaged shell or shells of the container must be replaced.

- (2) Repair limits.

- (a) The limits of repair are:

- (i) Holes or penetrating damage (i.e. through the glass fibre mat) over an area of more than 77 square centimetres on the outer surface of the container.
- (ii) Holes or penetrating damage over an area of more than 58 square centimetres on the inner surface of the container.
- (iii) Breakage of the rims on either half of the container shell.

NOTE: The limits above, apply to the TOTAL area of damage, so that if, for example, repair is required at both ends of the container, then the permissible areas of repair for each end must not TOGETHER total more than the prescribed limits.

CHAPTER 7

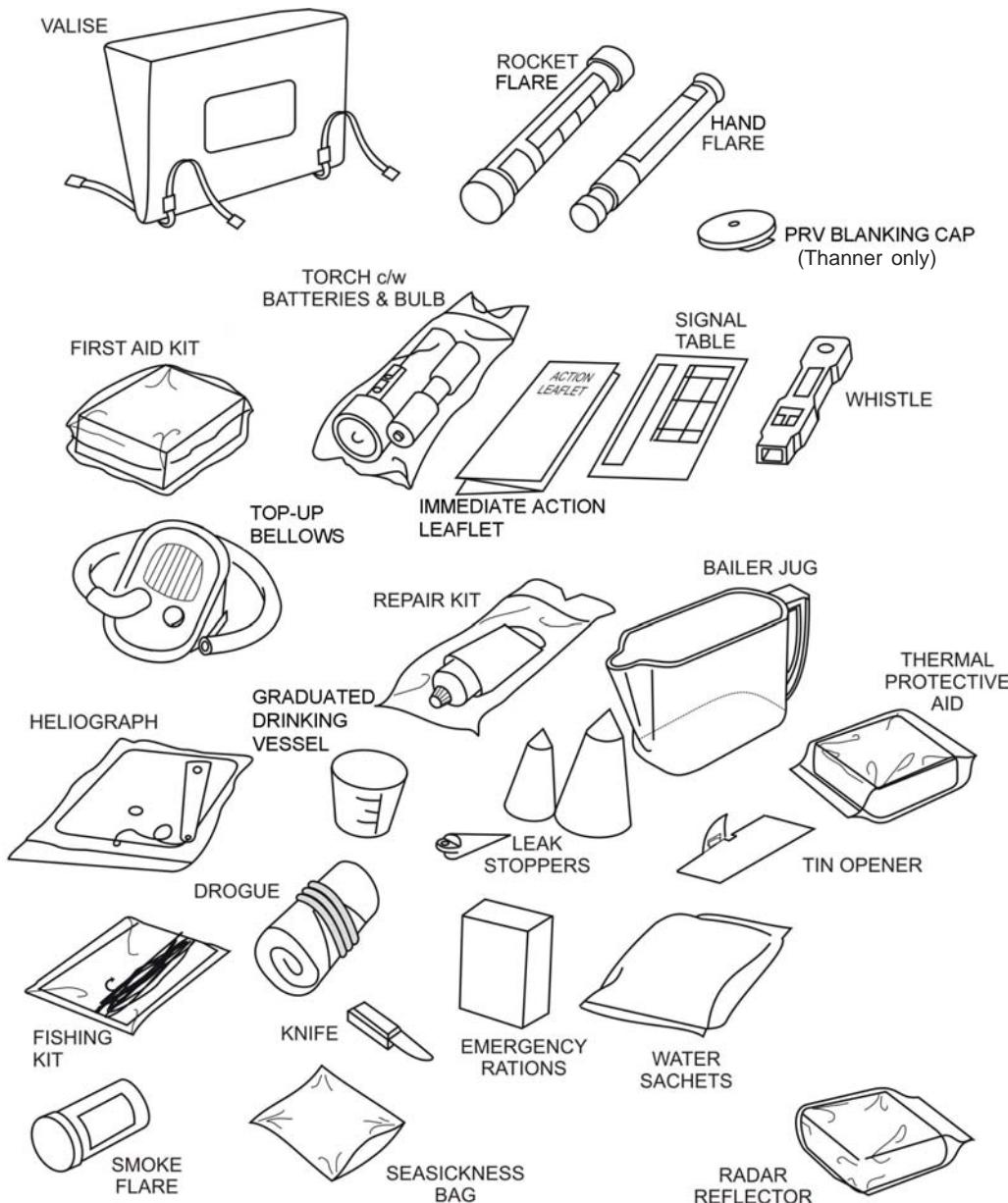
EMERGENCY PACKS AND EQUIPMENT

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1. EMERGENCY PACKS

CAUTION: SURVIVAL AIDS MUST BE PACKED WITH THEIR VALISE(S) POSITIONED EITHER IN THE CONTAINER OR A JIG THAT SIMULATES THE SHAPE OF THE CONTAINER AND CYLINDER.

- A. For liferafts packed into different containers pack the contents, of each emergency pack into it's valise, in accordance with TABLES 701-703.
- B. RFD Beaufort recommend that any 'lived' item that has less than 12 months life remaining, it MUST be replaced in the emergency pack.



**Typical Emergency pack items
FIGURE 701**

Liferaft size (Persons)	Part Number	4 TO	6 TO	8 TO	10 TO	12 TO & DL	16 TO & DL	20 TO & DL	25 TO & DL
Anti seasickness tablets	*1*2	1	1	1	1	2	2	2	3
Bag, seasickness, poly	11105001	4	6	8	10	12	16	20	25
Bailer, (Jug) PVC, 1 pint (*4)	05720107	1	1	1	1	1	2	2	2
Bellows	45201001	1	1	1	1	1	1	1	1
Buoyant knife	04503009	0	0	0	0	0	1	1	1
Drinking vessel	05720098	1	1	1	1	1	1	1	1
Drogue (spare sea anchor)	45510101	1	1	1	1	1	1	1	1
First aid kit	*2 *4	1	1	1	1	1	1	1	1
Fishing kit	05720099	1	1	1	1	1	1	1	1
Flare, hand held	*3 *4	6	6	6	6	6	6	6	6
Flare, parachute	*3 *4	4	4	4	4	4	4	4	4
Signal, Lifesmoke	*3 *4	2	2	2	2	2	2	2	2
Heliograph (*4)	04296009	1	1	1	1	1	1	1	1
Immediate action leaflet	*1*2	1	1	1	1	1	1	1	1
Immediate action leaflet (language)	*2	1	1	1	1	1	1	1	1
Label E-Pack	45036001	1	1	1	1	1	1	1	1
Leak stopper, No 1	40318001	1	1	1	1	1	1	1	1
Leak stopper, No 3	05720019	1	1	1	1	1	1	1	1
Leak stopper, No 5	05720023	1	1	1	1	1	1	1	1
PRV caps (Thanner only)	06742009	2	2	2	2	2	2	2	2
Radar reflector	*2	1	1	1	1	1	1	1	1
Radar reflector mast	*2	1	1	1	1	1	1	1	1
Repair kit	10085001	1	1	1	1	1	1	1	1
Rescue signal table	02176011	1	1	1	1	1	1	1	1
Scissors	05290018	1	1	1	1	1	1	1	1
Thermal protection aid (*4)	06317009	2	2	2	2	2	2	2	3
Tin opener (*4)	07889009	3	3	3	3	3	3	3	3
Torch (Long life) c/w spares (*4)	06973009	1	1	1	1	1	1	1	1
Whistle	05090005	1	1	1	1	1	1	1	1
Valise- 800 mm	20993031	1	1	1	1	1	1	1	1
Valise- 1050mm (16TO only)	20993051					1			

**Emergency Equipment SOLAS A Pack 1 -All container types
TABLE 701**

Please note:

- *1 These items are attached to the liferaft interior and are not packed in an E-pack.
- *2 Denotes this item is country dependant so part numbers will vary.
Please refer to the relevant Appendix. Default equipment is listed in TABLE 704.
- *3 Denotes this item is listed in Service bulletin 03/01, (see associated publications for details).
- *4 Please refer to Appendix 2 for USA options.

Liferaft size(Persons)	Part Number	4 TO	6 TO	8 TO	10 TO	12 TO & DL	16 TO & DL	20 TO & DL	25 TO & DL
MK 10 Container	Pack number	2	2	2	2	2	2	2	2
Water sachet, 500ml	*1 *4	12	18	24	30	36	48	30	30
Food Rations 500g	*1 *4	4	6	8	10	12	16	10	10
Valise- 530 mm	20993011	1	-	-	-	-	-	-	-
Valise- 700 mm	20993021	1	1	1	1	-	-	-	-
Valise- 800 mm	20993031	-	-	-	-	1	-	2	2
Valise- 1050 mm	20993051	-	-	-	-	-	1	1	-

MK 14 Container	Pack number	2	2	2	2	2	2	3	4	2	3	4
Water sachet, 500ml	*1 *4	12	18	24	30	36	48	-	30	30	-	38
Food Rations 500g	*1 *4	4	6	8	10	12	16	20	-	-	25	-
Valise- 530 mm	20993011	1	-	-	-	-	-	-	-	-	-	-
Valise- 700 mm	20993021	1	1	1	1	-	-	3	3	-	-	-
Valise- 800 mm	20993031	-	-	-	-	1	-	-	-	-	-	-
Valise- 1050 mm	20993051	-	-	-	-	-	1	1	1	-	-	-

MK 16 Container	Pack number	2	36	12	1
Water sachet, 500ml	*1 *4				
Food Rations 500g	*1 *4				
Valise- 1050 mm	20993051				

*1 Denotes this item is listed in Service bulletin 03/01, (see associated publications for details).

*4 Please refer to Appendix 2 for USA options.

Emergency Equipment SOLAS A Pack 2,3 & 4
TABLE 702a

Liferaft size(Persons)	Part Number	4 TO	6 TO	8 TO	10 TO	12 TO & DL	16 TO & DL	20 TO & DL	25 TO & DL
MK 18 Container	Pack number	2	2	2					
Water sachet, 500ml	*1 *4	12	18	24					
Food Rations 500g	*1 *4	4	6	8					
Valise- 530 mm	20993011	1	-	-					
Valise- 700 mm	20993021	-	1	1					

MK 20 Container	Pack number	2	3
Water sachet, 500ml	*1 *4		75
Food Rations 500g	*1 *4	25	
Valise- 700 mm	20993021	-	2

*1 Denotes this item is listed in Service bulletin 03/01, (see associated publications for details).

*4 Please refer to Appendix 2 for USA options.

Emergency Equipment SOLAS A Pack 2,3 & 4
TABLE 702b

Liferaft size (Persons)	Part number	4 TO	6 TO	8 TO	10 TO	12 TO & DL	16 TO & DL	20 TO & DL	25 TO & DL
Anti seasickness tablets	*1*2	1	1	1	1	2	2	2	3
Bag, seasickness, poly	11105001	4	6	8	10	12	16	20	25
Bailer, (Jug) PVC, 1 pint (*4)	05720107	1	1	1	1	1	2	2	2
Bellows	45201001	1	1	1	1	1	1	1	1
Buoyant knife	04503009	0	0	0	0	0	1	1	1
Drogue (sea anchor)	45510101	1	1	1	1	1	1	1	1
First aid kit	*2 *4	1	1	1	1	1	1	1	1
Flare, hand held	*3 *4	3	3	3	3	3	3	3	3
Flare, parachute	*3 *4	2	2	2	2	2	2	2	2
Signal, lifesmoke	*3 *4	1	1	1	1	1	1	1	1
Heliograph (*4)	04296009	1	1	1	1	1	1	1	1
Label, valise contents	45036001	1	1	1	1	1	1	1	1
Leak stopper, No 1	40318001	1	1	1	1	1	1	1	1
Leak stopper, No 3	05720019	1	1	1	1	1	1	1	1
Leak stopper, No 5	05720023	1	1	1	1	1	1	1	1
Leaflet, immediate action	*1*2	1	1	1	1	1	1	1	1
PRV caps	06742009	2	2	2	2	2	2	2	2
Radar reflector	*2	1	1	1	1	1	1	1	1
Radar reflector mast	*2	1	1	1	1	1	1	1	1
Repair kit	10085001	1	1	1	1	1	1	1	1
Rescue signal table	02176011	1	1	1	1	1	1	1	1
Thermal protection aid (*4)	06317009	2	2	2	2	2	2	2	3
Torch (long life) c/w spare (*4)	06973009	1	1	1	1	1	1	1	1
Whistle	05090005	1	1	1	1	1	1	1	1
Valise- 800 mm	20993031	1	1	1	1	1	1	1	1

Emergency SOLAS B Pack 1 -All container types
TABLE 703

Please note:

- *1 These items are attached to the liferaft interior and are not packed in an E-pack.
- *2 Denotes this item is country dependant so part numbers will vary.
 Please refer to the relevant Appendix. Default equipment is listed in TABLE 704.
- *3 Denotes this item is listed in Service bulletin 03/01 (see associated publications for details).
- *4 Please refer to Appendix 2 for USA options and Part numbers.

Default Equipment	
ITEM	Part Number
Anti seasickness tablets (60)	01174009
First aid kit	06484009
Immediate action leaflet	50165001
Radar reflector	41955011
Radar reflector mast	41955021

Default Equipment
TABLE 704

Optional Equipment			
ITEM	Part Number	Qty	Additional information
Search And Rescue Transponder	08111009	1	SART (S4)

Optional Equipment
TABLE 705

2. PYROTECHNICS WRAPPING

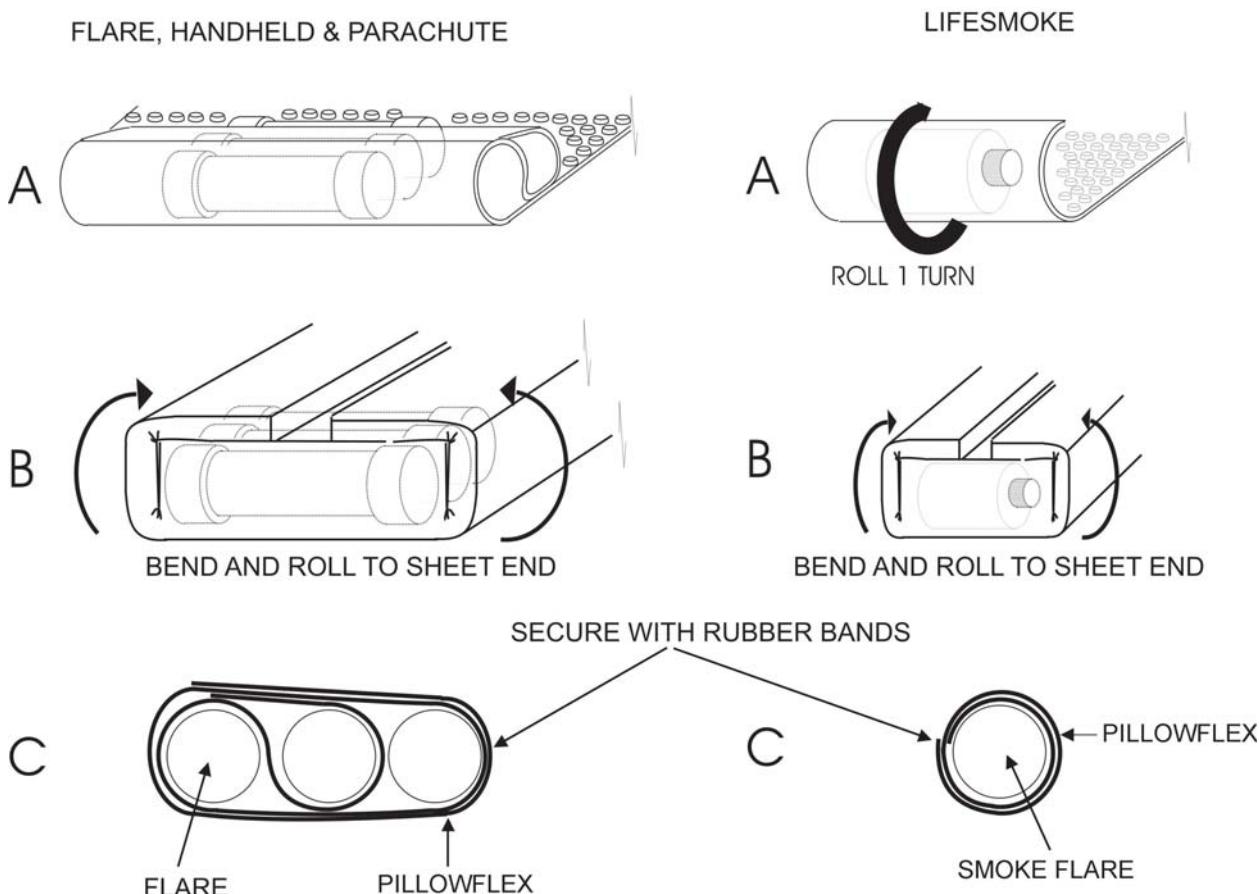
A GENERAL

It is important to wrap pyrotechnics correctly with Pillowflex and/or protective foam. The types of pyrotechnics used in Emergency Packs are Smoke Canisters, Rockets and Hand Flares.

B METHOD DESCRIPTION

The method for wrapping pyrotechnics changes as the liferaft drop height increases.

- (1) For liferaft height drops of 18 metres and below, use the wrapping method as illustrated in (FIGURE 702). Use rubber bands or tape to retain the wrap.



Pyrotechnics wrapping for Liferafts with drop heights up to and including 18m

FIGURE 702

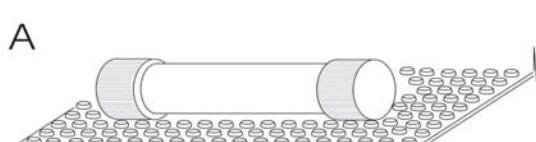
(2) For drop heights greater than 18 metres but not exceeding 36 metres, use the wrapping method as illustrated in (FIGURE 703).

Water sachet protection - Minimum of 4 layers of Pillowflex bubble wrap to be placed between food blocks and water sachets.

Hand flares and Rocket Parachute flares are to be individually wrapped with minimum 5 turns of Pillowflex bubble wrap, see (FIGURE 703a). Use rubber bands or tape to retain the bubble wrap.

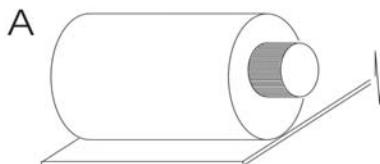
Smoke flares to be wrapped in one turn Plastazote foam and 2 turns Pillowflex bubble wrap, see (FIGURE 703b). Use rubber bands or tape to retain the bubble wrap.

FLARE, HANDHELD & PARACHUTE

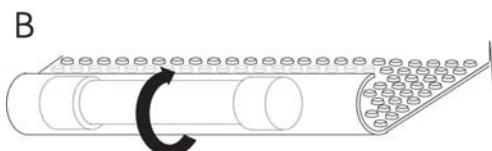


PLACE FLARE ON PILLOWFLEX

LIFESMOKE



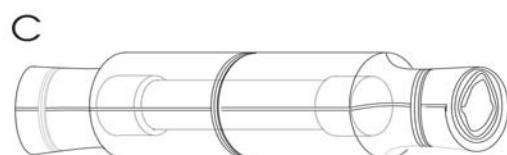
PLACE SMOKE CANNISTER ON PROTECTIVE FOAM



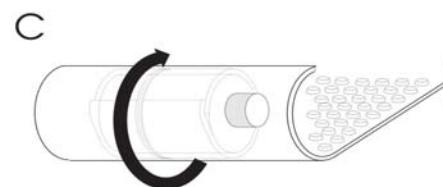
ROLL 5 COMPLETE TURNS



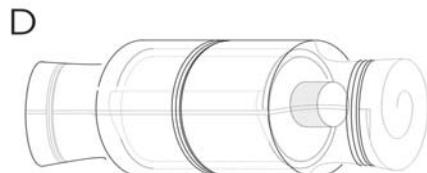
SECURE WITH RUBBER BANDS



SECURE WITH RUBBER BANDS



PLACE ON PILLOWFLEX AND ROLL 2 COMPLETE TURNS



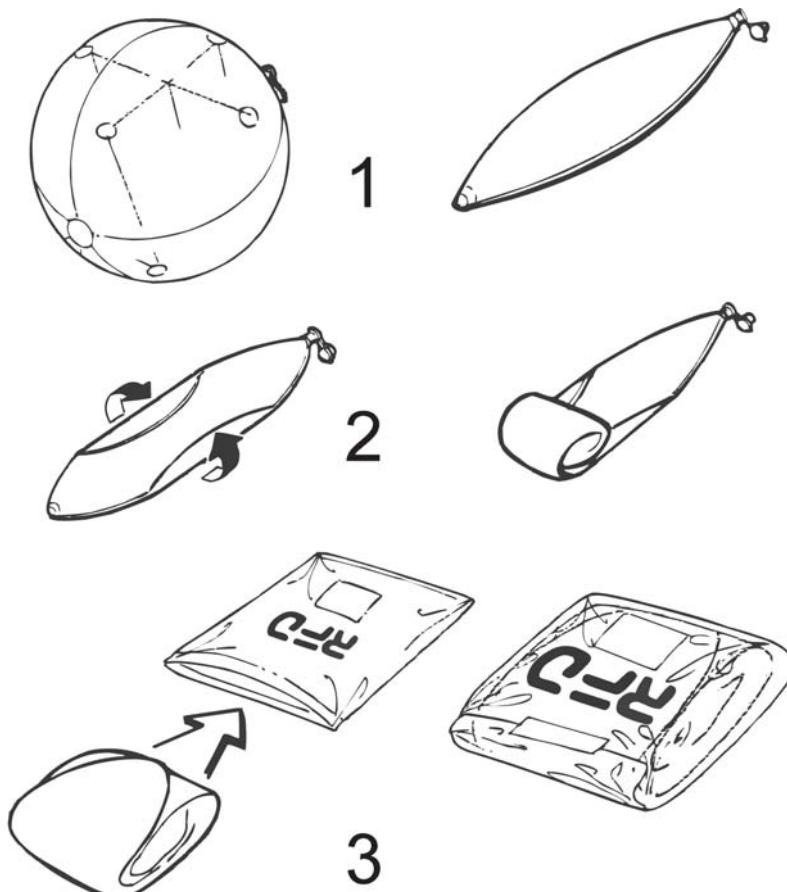
SECURE WITH RUBBER BANDS

**Pyrotechnics wrapping for Liferafts with drop heights
greater than 18 m but less than or equal to 36m**

FIGURE 703

C. Radar reflector

- (1) Deflate the radar reflector allowing the seams of the outer balloon panels to line up with each other as far as possible, (FIGURE 704).
- (2) Fold the sides in to equal the width of the plastic stowage bag. Roll the reflector, excluding any residual air through the valve, (FIGURE 704).
- (3) Replace the valve stopper and put the deflated reflector into its plastic bag with the instruction sheet visible. Fold over one end of the bag and secure it with a short piece of adhesive tape, (FIGURE 704).
- (4) Put the radar mast, (if fitted), alongside the paddles, so that the paddle end protection foam cover and protect the mast ends, (FIGURE 804), Chapter 8.



**Radar Reflector packing
FIGURE 704**

D. Search And Rescue Transponder (SART) - if included

Packing the SART into the emergency equipment pack

NOTE: If a SART is included in a liferaft, a radar reflector is not required.

- (1) Remove the SART from its mounting bracket, if supplied. Discard the mounting bracket.
- (2) Read the instructions on the SART. Pull the pin out and check the SART. Re-insert the pin correctly again.
- (3) Wrap the SART in five turns of pillowflex. Secure the pillowflex using an elastic band.
- (4) Place the SART, wrapped in pillowflex, between two thermal protection aids, for extra protective cushioning.

NOTE: If applicable, ensure that the container label has been marked to state that a SART has been included.

Documentation

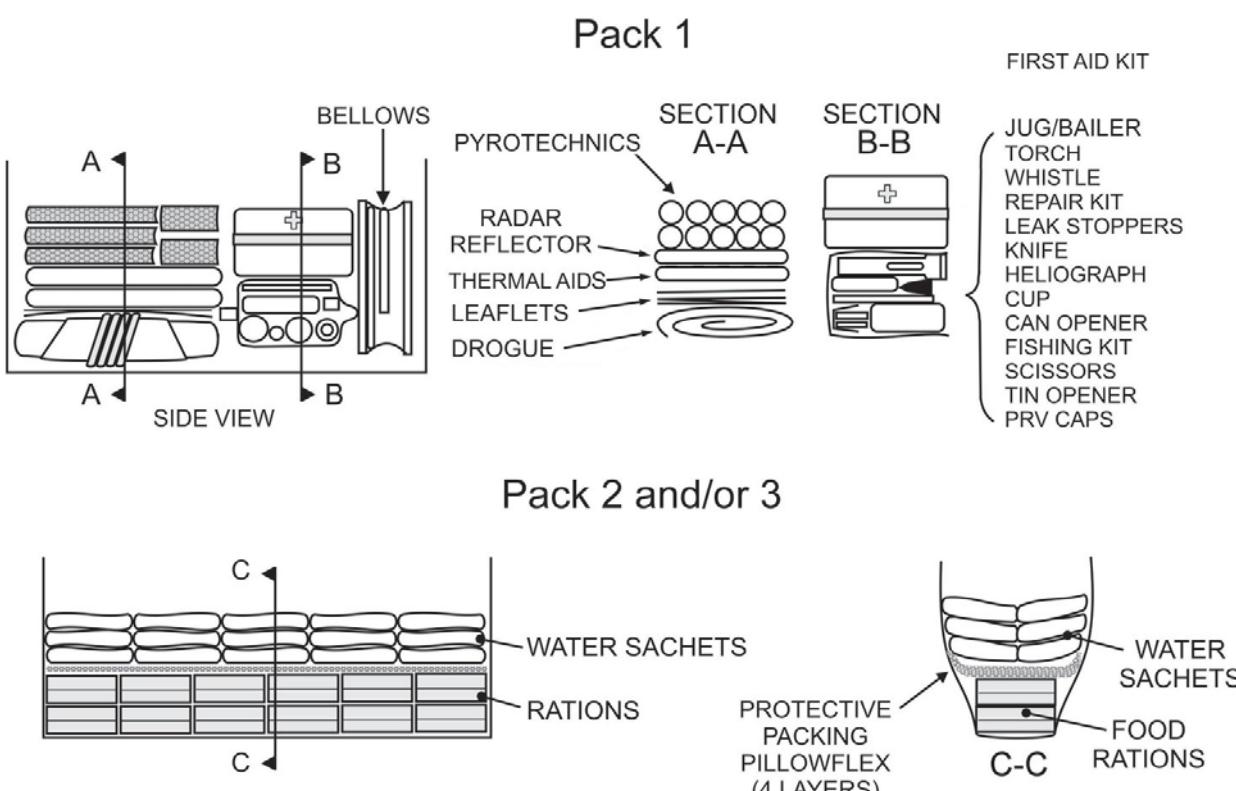
- (1) Please refer to the manufacturer's manual listed at the front of this manual in, List of Associated Publications.
- (2) The outside of the container must be marked to indicate that a SART is present.

3 Packing the valise

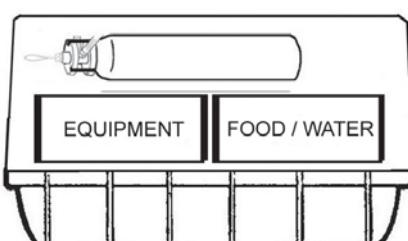
A. Using a MK10 container

Arrange items into the valise as required, making sure the finished packs are long and thin. As a guide, a layout is shown but this can vary slightly from raft to raft, (FIGURE 705).

- (1) Pack 1, view AA and view BB, shows the position and layout of the equipment, (FIGURE 705).
- (2) Pack 2 and/or 3 contains the water and food packs. View CC shows the position and layout of both, (FIGURE 705 and 706).



Valise packing for MK 10 container (all sizes)
FIGURE 705



Positioning the packs in MK 10 container
FIGURE 706

B. (i) Using a Flatpack container (A-Pack)

Work the raft into the container and into the corners to utilise all space of the Flatpack.

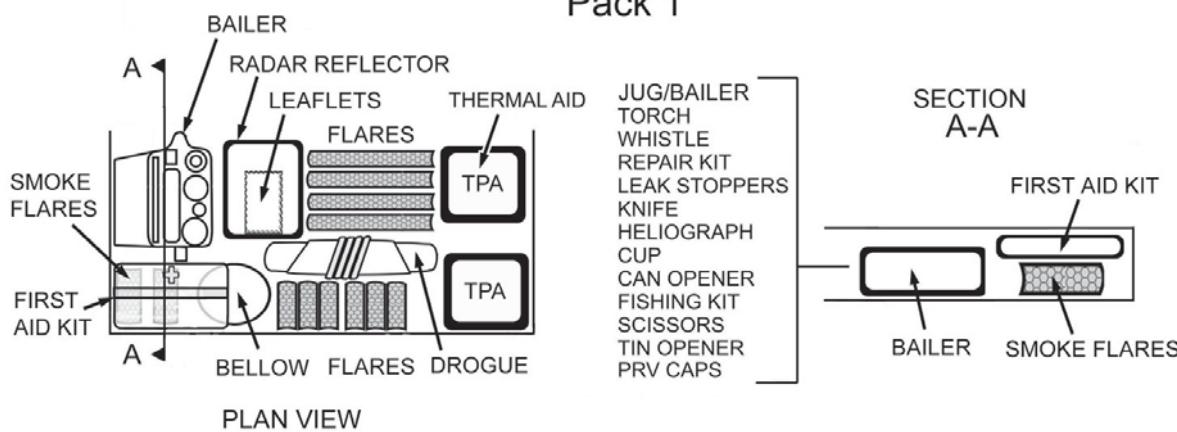
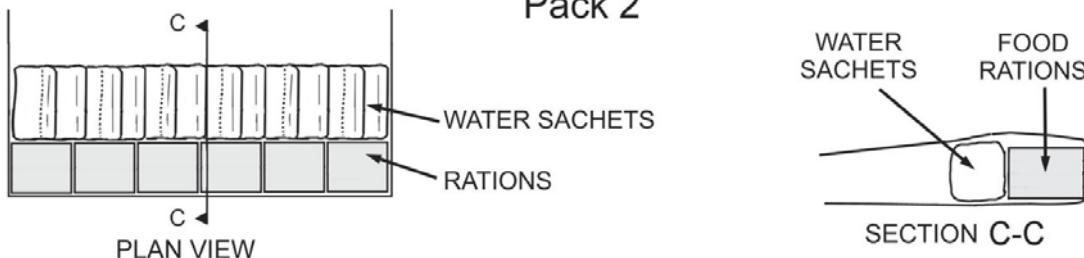
Place the items into the valises as shown in (FIGURES 707 or 708).
Pack 1 shows the plan and one section view. Pack 2 contains the water and food packs. View CC shows the position and layout of both.

NOTE: Keep the packs as thin as possible. Use a measuring tape to get the dimensions of the container area and then pack the valise within these dimensions.

1. Put the pack 2, containing food and water into the container first. The pack must be kept up close to the painter exit side of the container.

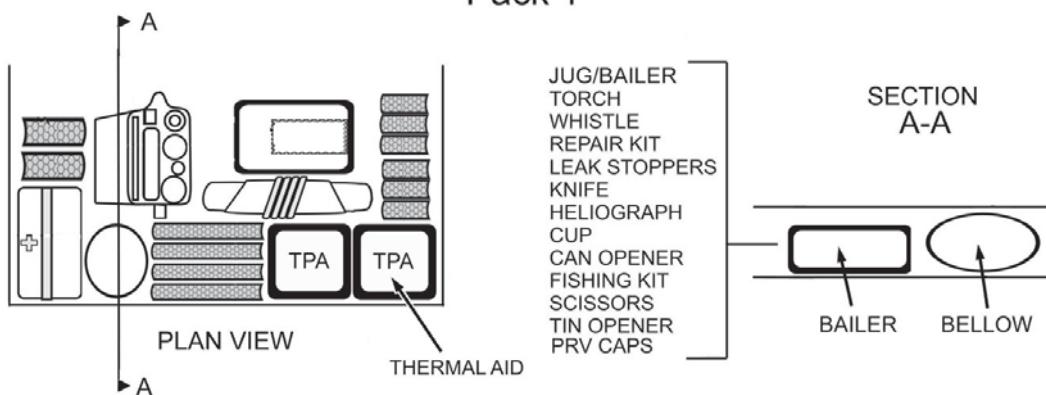
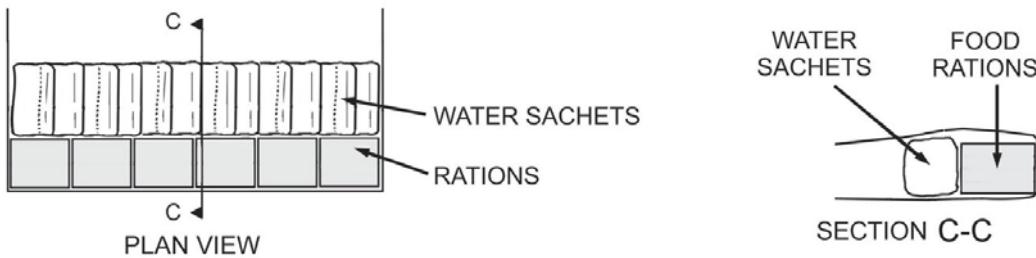
NOTE: Make sure water and food packs are evenly spaced.

2. Tie the valise straps together.
3. Using a bowline knot, tie the pack 2 to the inner lifeline using the flying ends of the valise straps. 525 lbs/ 263 Kgf cord can be used as an alternative to the valise straps.
4. Pack 1, the plan view and section view AA, shows the position and layout of the equipment, (FIGURES 707 or 708).
 - (a) If packing for a 4,6, or 8 Person refer to (FIGURE 707).
 - (b) If packing for a 10 or 12 Person refer to (FIGURE 708).
5. Tie the valise straps together.
6. Using a bowline knot, tie the pack 1 to the inner lifeline using the flying ends of the valise straps. 525 lbs/ 263 Kgf cord can be used as an alternative to the valise straps.

Pack 1**Pack 2**

NOTE: MAKE SURE WATER AND FOOD PACKS ARE EVENLY SPACED

Valise packing for 4,6, 8 Person into Flatpack container
FIGURE 707

Pack 1**Pack 2**

NOTE: MAKE SURE WATER AND FOOD PACKS ARE EVENLY SPACED

Valise packing for 10, 12 Person into Flatpack container
FIGURE 708

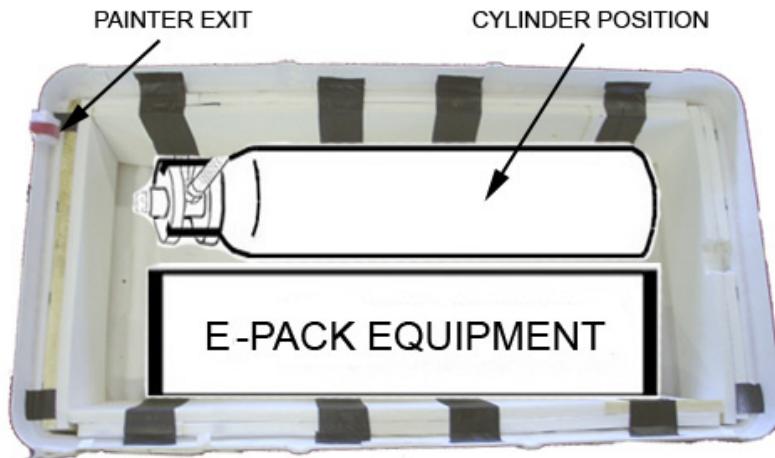
(ii) Using a M20 Flatpack container B-Pack (Transport Canada only)

NOTE: The following details the packing procedure for the 25 Person, B-Pack only.

1. Work the raft into the container and into the corners to utilise all space of the Flatpack.
2. Place the items into the valise as shown in (FIGURE 708).
3. Pack 1, the plan view and section view AA, shows the position and layout of the equipment, (FIGURE 708).

NOTE: Keep the packs as thin as possible. Use a measuring tape to get the dimensions of the container area and then pack the valise within these dimensions.

- 4 Tie the valise straps together.
5. Using a bowline knot, tie the E-pack to the inner lifeline using the flying ends of the valise straps. 525 lbs/ 263 Kgf cord can be used as an alternative to the valise straps.



Positioning the B-pack in MK20 container
FIGURE 709

C. Using a MK14 container

Place the equipment items into the Pack 1 valise as required, see (FIGURE 705), views AA and BB, making sure the finished packs are long and thin:

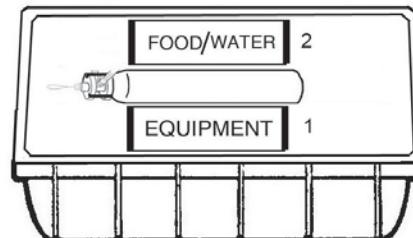
- (1) Pack 1, FIGURE 705 (view AA and view BB), show the position and layout of the equipment within the valise.
- (2) For 10 and 12 Person (FIGURE 710a)
Pack 2 contains food and water rations.

For 16,20 and 25 Person (FIGURE 710b)

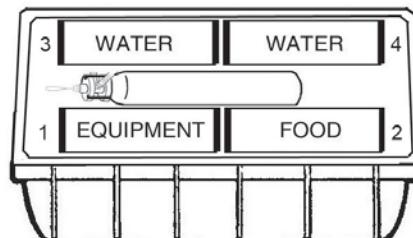
Pack 2 contains food rations only.

Pack 3 and 4 contain the water only, (evenly split)

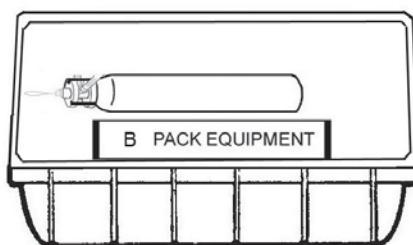
(a) 10/12 person A-Pack position



(b) 16/20/25 person A-Pack position



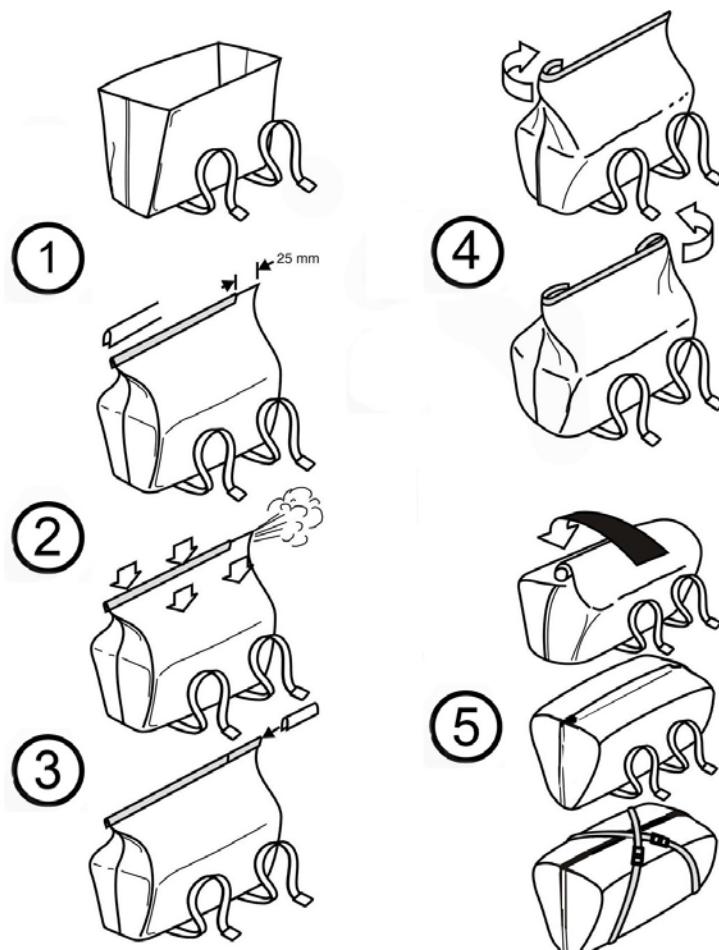
(c) B-Pack position-all raft sizes



**Positioning the packs in MK14 container
FIGURE 710**

4 Sealing the valise

1. Fold a length of 50 mm wide adhesive tape over the top opening of the valise leaving a 25 mm gap at one end, (FIGURE 711).
2. Insert a vacuum line and remove the air from the valise.
3. Withdraw the line and quickly seal the open part with tape.
4. Fold the 'ears' at the top of the valise inwards and down. Secure these with 50 mm wide adhesive tape, (FIGURE 711).
5. Roll down the excess valise tightly.
6. Attach the buckle straps together (FIGURE 710). Tie the flying ends together using a reef knot.



Sealing the Valise
FIGURE 711

5 Extra foam protection

Drop height (18m-36m) / (59-118ft)

- A. For liferafts with drop heights above 18 metres and below 36 metres, extra foam protection is added as follows;
Foam protection is used to protect Emergency packs that are in direct contact with the cylinder.
Please refer to TABLE 706 for part numbers and quantities.

(i) Protection around No. 1 Emergency pack valise

NOTE: Use only where an “A-pack” emergency pack is used on raft sizes 10-25 Person Throw-Over, and 12-25 Person Davit Launch.

Protection Pad 1, is to be fitted as per (FIGURE 712). The purpose of this pad, is to protect the No.1 pack contents from both the liferaft inflation valves and the gas cylinder.

This Protection pad is to be fitted after the cylinder is positioned in the container and just prior to fitting the emergency pack.

(ii) Protection around No. 1 Emergency pack valise

NOTE: Use only where an “A-pack” emergency pack is used on raft sizes 4-8 Person.

Protection Pads 2 and 3 are to be fitted as per (FIGURE 713). The purpose of these pads is to protect the No.1 pack contents from both the liferaft gas cylinder and the inflation valves respectively.

Protection Pad 2, is to be fitted after the cylinder is positioned in the container and just prior to fitting the emergency pack.

Protection Pad 3, is to be fitted just after fitting the emergency pack.

(iii) Protection between Cylinder end & Emergency pack rations

NOTE: Use only where an “A-pack” emergency pack is used on Mk10 container packed liferafts.

Protection Pad 4 is to be fitted as per (FIGURE 714). The purpose of this pad is to protect the emergency pack rations from the end of the liferaft gas cylinder.

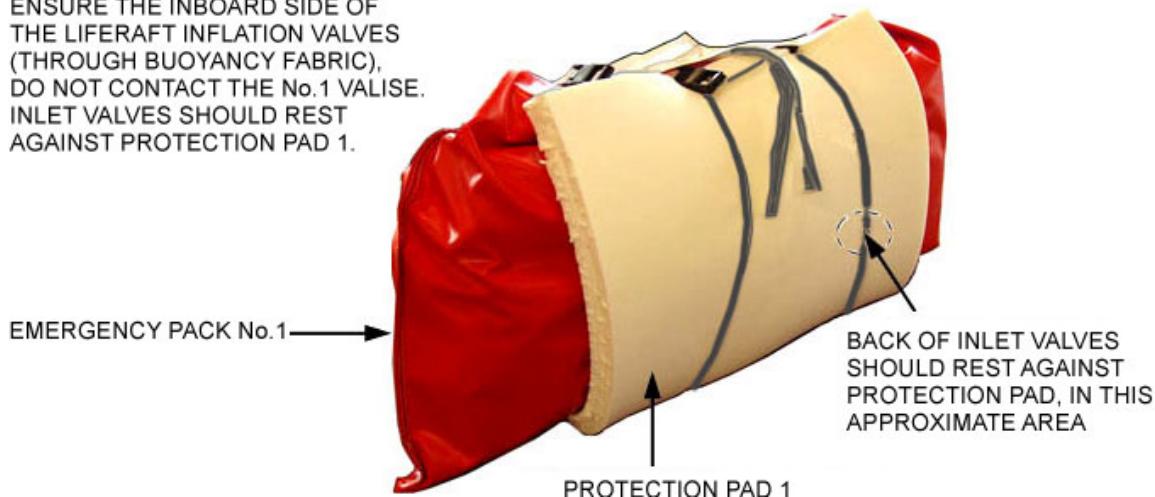
Protection Pad 4, is to be fitted after the cylinder is positioned in the container, just prior to fitting the emergency pack.

(iv) Protection around No. 1 Emergency pack valise

NOTE: Use only where a “B-pack” emergency pack is used on all raft sizes.

Protection Pad1 is to be fitted as per (FIGURE 712). The purpose of this pad is to protect the No. 1 pack contents from both the liferaft gas cylinder and the inflation valves respectively.

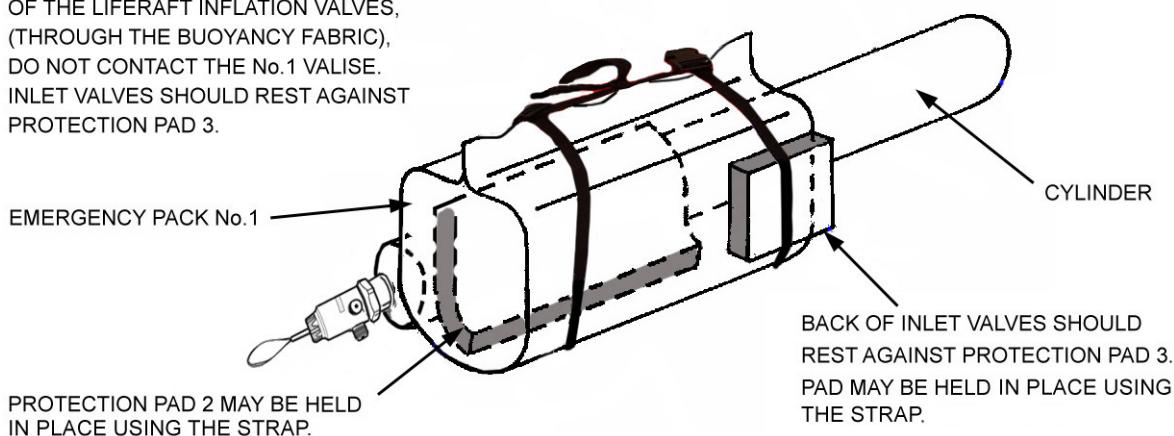
ENSURE THE INBOARD SIDE OF
THE LIFERAFT INFLATION VALVES
(THROUGH BUOYANCY FABRIC),
DO NOT CONTACT THE No.1 VALISE.
INLET VALVES SHOULD REST
AGAINST PROTECTION PAD 1.



**View of protection pad for A-Pack only.
(Raft sizes 10-25 Person Throw-Over & 12-25 Person Davit Launch)**

FIGURE 712

ENSURE THAT THE INBOARD SIDE OF THE LIFERAFT INFLATION VALVES, (THROUGH THE BUOYANCY FABRIC), DO NOT CONTACT THE No.1 VALISE. INLET VALVES SHOULD REST AGAINST PROTECTION PAD 3.

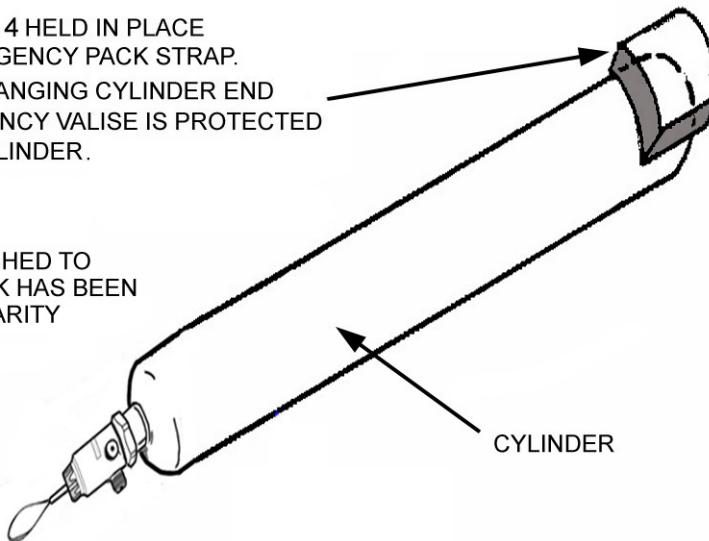


**Assembled view of Protection pads for A-Pack only.
(Raft sizes 4-8 Person Throw-Over)**

FIGURE 713

PROTECTION PAD 4 HELD IN PLACE USING THE EMERGENCY PACK STRAP.
POSITION OVERHANGING CYLINDER END SO THAT EMERGENCY VALISE IS PROTECTED FROM END OF CYLINDER.

NOTE:
PAD IS NOT ATTACHED TO CYLINDER. E-PACK HAS BEEN OMITTED FOR CLARITY



**Assembled view of Protection pad for A-Pack only.
(Mk10 container)**

FIGURE 714

**EMERGENCY PACK FOAM PROTECTION SPECIFIC TO A-PACKS
(Mk10 Container)**

Part Number	Description	Dimensions (mm)	QTY	Raft size							
				4	6	8	10	12	16	20	25
50152002	Protection Pad 1	750 x 500 x 25		-	-	-	1	1	1	1	1
		30" x 20" x 1"									
50152003	Protection Pad 2	500 x 250 x 25		1	1	1	-	-	-	-	-
		20" x 10" x 1"									
50152004	Protection Pad 3	175 x 175 x 25		1	1	1	-	-	-	-	-
		7" x 7" x 1"									
50152001	Protection Pad 4	150 x 150 x 25		1	1	1	1	1	1	1	1
		6" x 6" x 1"									

**EMERGENCY PACK FOAM PROTECTION SPECIFIC TO B-PACKS
(Mk10 Containers)**

Part Number	Description	Dimensions (mm)	QTY	Raft size							
				4	6	8	10	12	16	20	25
50152002	Protection Pad 1	750 x 500 x 25		1	1	1	1	1	1	1	1
		30" x 20" x 1"									

**Foam protection for Emergency packs
TABLE 706**



BEAUFORT

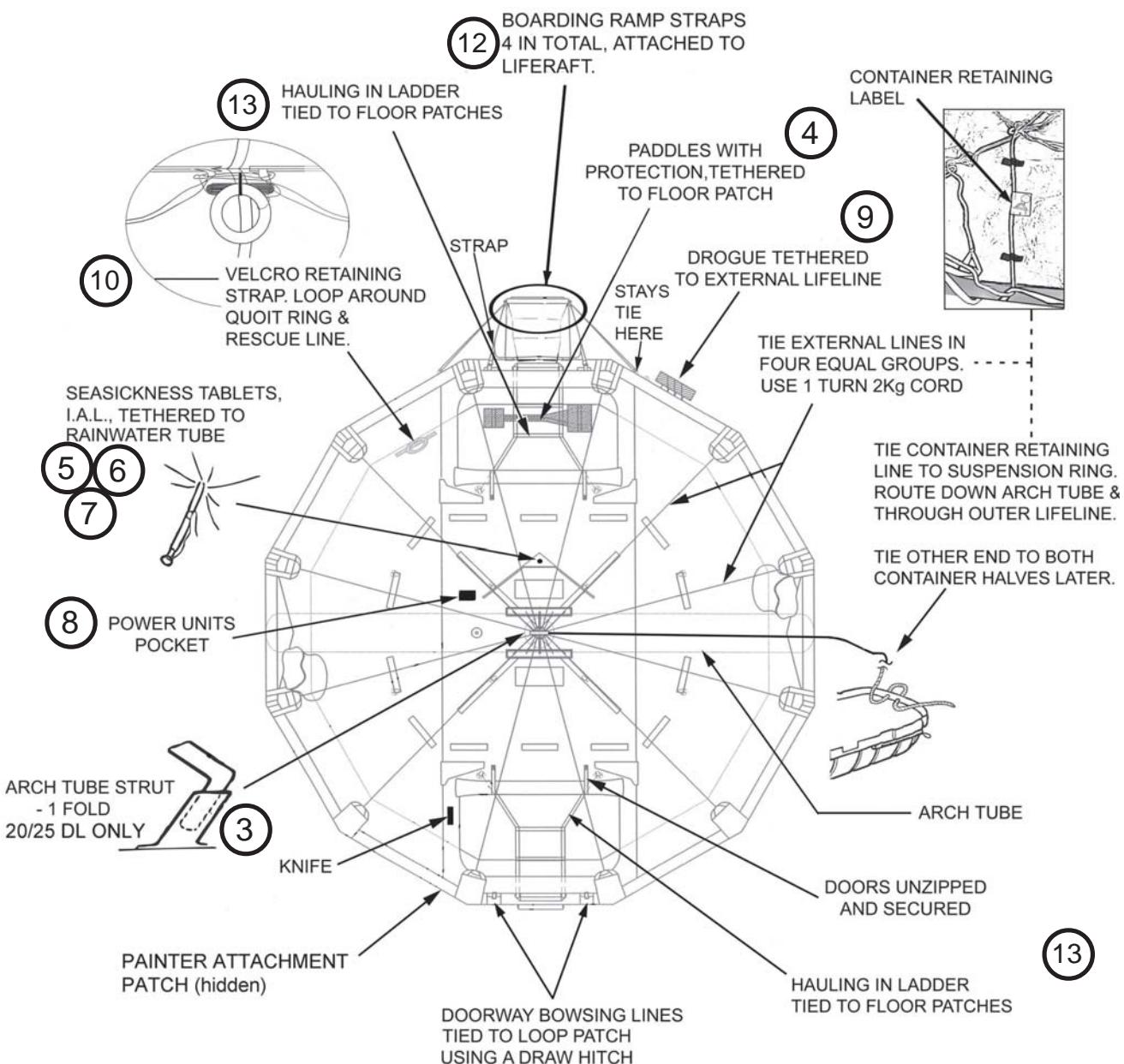
**RFD SURVIVA MK III
BEAUFORT SEAFARER**

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CHAPTER 8

ASSEMBLY

<u>Section</u>	<u>Page</u>
1 General	803
2 Preparation of the Liferaft	803
3 Inflation system preparation	815
4 Container Preparation	818
A. MK10 all sizes	818
B. MK14 all sizes	819
C. MK16 / MK18 container	820
D. MK20 Flatpack	821
5. Packing Davit Launch liferaft into a container	822
6. Packing a Throw Over liferaft into a container	840
7. Container crimps heat seal option	855
8. Container labelling	856



NOTE: The picture illustrated is 20/25 man raft. Layout will be similar for other DL rafts.

**Preparation for packing assembly of Davit Launch
FIGURE 801**

SECTION 8 - ASSEMBLY**1. General**

- A. The paragraphs of this chapter apply generally - unless a suitable qualification (in bold print) is present.
- B. The work area must be clean, dry and free from sharp projections, with a smooth working surface, preferably of vinyl material.
- C. Special Tools, Equipment and Materials:
 - (1) Refer to Chapter 10 for the list of relevant items that are required during the assembly and repacking of a liferaft.
- D. Throughout the description of packing, components which are listed within the Illustrated Parts List (Chapter 11) and Consumables & Equipment (Chapter 10), appear in *italic print*.
- E. Throughout preparation and packing of the liferaft and its associated equipment, all knots are to be bowlines with flying ends taped, using 25mm wide PVC self adhesive (SA) tape, unless stated otherwise. The ends of cords are to be heat sealed to prevent fraying.
- F. Ensure that during unpacking, preparation and repacking of the liferaft no moisture is introduced to the liferaft.
- G. The liferaft must be completely dry before packing.

2. Preparation of the Liferaft

- A. For each liferaft, carry out the following operations
(Refer to FIGURE 801 for Davit Launch or refer to FIGURE 828 for Throw Over):
 - (1) Fit adaptors and valved sockets (female couplings) to the inflate/deflate valves.
 - (2) Fit a plug, tail (male coupling) to a low pressure air line and to the manometer feed line. Connect the low pressure air line to each inflate/deflate valve as necessary. Inflate the liferaft to approximate working pressure.

NOTE:

Inflation of the liferaft is advised, to ensure correct fitting and rigging of the equipment and to ensure the liferaft is the right shape for packing after deflation.

- (3) Tie off the *floating safety knife* to its appropriate patch (FIGURE 801). Wrap the tethering cord around the handle and place the blade through the elasticated loop and into its protective sheath. Ensure that the loop securely holds the handle and traps the tethering cord.
- (4) Using 23 Kgf (50lbf) cord, tie the *paddles* together at each end, with protection foam, (FIGURE 804) and tie them to the internal lifeline (FIGURE 801) *¹.

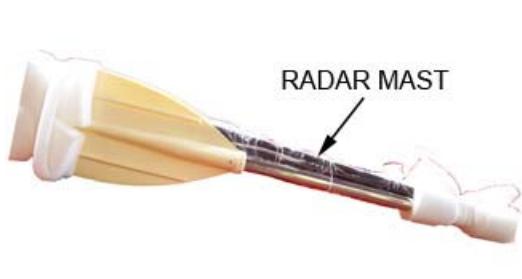
If there is a radar reflector fitted, secure any mast along with the *paddles*. Tie the *paddles* and radar mast independently to the hauling in ladder patch for the rear door, (FIGURE 802A).

If using a *flatpack container*, tie the *paddles* opposite to each other, (FIGURE 802B) *¹.

- (5) Tie off the *anti-seasickness tablets* in their *labelled bag*, (FIGURE 801).
- (6) Tie the *immediate action leaflet* to the rain-water tube using 23 Kgf (50lbf) cord.

NOTE: Ensure *immediate action leaflet* is the latest issue, see IPL CHAPTER 7 and APPENDIX 1 for details.

- (7) Fit the *rubber plug* to the rain-water catchment tube, (FIGURE 801).



Paddles & radar mast (if fitted)
802A



Paddles tied opposite for flatpack
802B

Paddles tied and padded
FIGURE 802

*¹ Please refer to US Appendix A-2

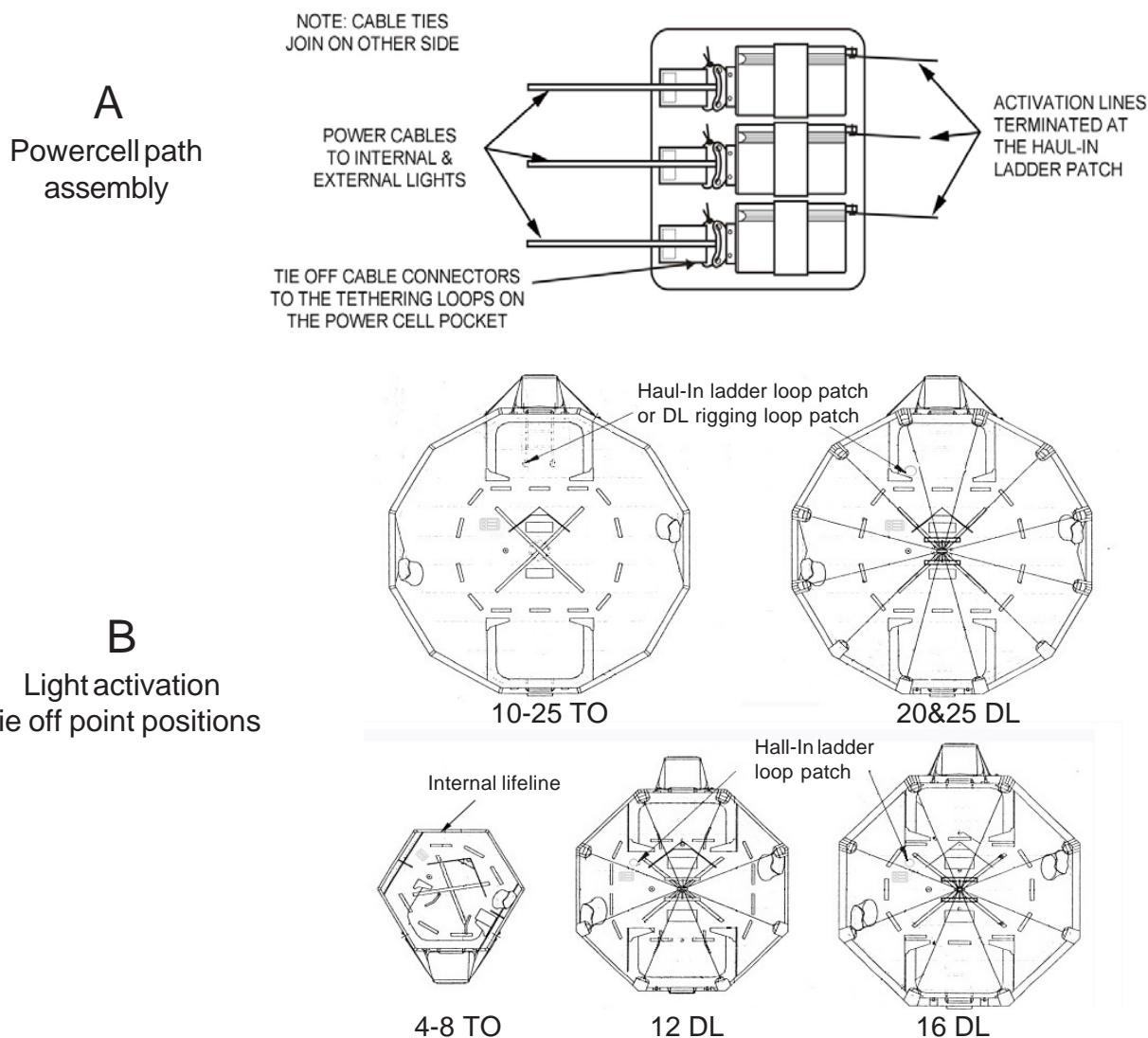
- (8) Install the lighting system.

RL1/RL4/RB2 lighting system

Insert three power units into each of the battery pockets (FIGURE 803A).

Insert the lamp plugs into the power units ensuring the detents have engaged. Secure each plug to the adjoining tethering loop, using light cable ties (05789009). Ensure the cable tie join is into the tethering loop.

Depress the test switches to check that each respective lamp unit illuminates. The external flashing unit shall not operate unless both power units are switched on. For each power unit, take the appropriate length of 23 Kgf thread, (please refer to Chapter 1, Table 102), and tie one end through the switch release pin. Secure them to the nearest Light activation tie off point (FIGURE 803B) with a bowline. Seal flying ends with 25mm PVC tape (02096004).



**Preparation for packing - RL1/RL4/RB2 lighting system
FIGURE 803**

RL5 lighting system

Two types of top mounting patch are available for the RL5 external lamp unit. Both are located in the same position on the top of the liferaft canopy.

A. Top patch with slits

1. This operation is best performed with the arch-tube deflated.
2. From outside the liferaft, pass the connector and all of the cable from the External lamp unit into the hole on the patch on the top of the liferaft (FIGURE 804).
3. Slide the External lamp unit into half the patch (FIGURE 805a).
4. Secure the remaining half of the External lamp unit into the patch (FIGURE 805b).



(a) External lamp unit connector



(b) Top patch on Liferaft

**Top patch assembly
FIGURE 804**



(a) External lamp unit partially fitted.



(b) External lamp unit fully installed

**External lamp installation
FIGURE 805**

B. Top patch with Velcro fasteners

1. This operation is best performed with the arch-tube deflated.
2. Open the velcro fastener on the top patch
3. From outside the liferaft, pass the connector and all of the cable from the External lamp unit through the open fastener into the hole on the patch on the top of the liferaft (FIGURE 806).
4. Slide the External lamp unit into the patch (FIGURE 807a).
5. Close the Velcro fastener to secure the External lamp unit in position (FIGURE 807 b).



Top patch assembly, Velcro variant
FIGURE 806



(a) External lamp unit partially fitted



(b) External lamp unit fully installed

External lamp installation, Velcro variant
FIGURE 807

Installing the Internal RL5 Lamp Unit

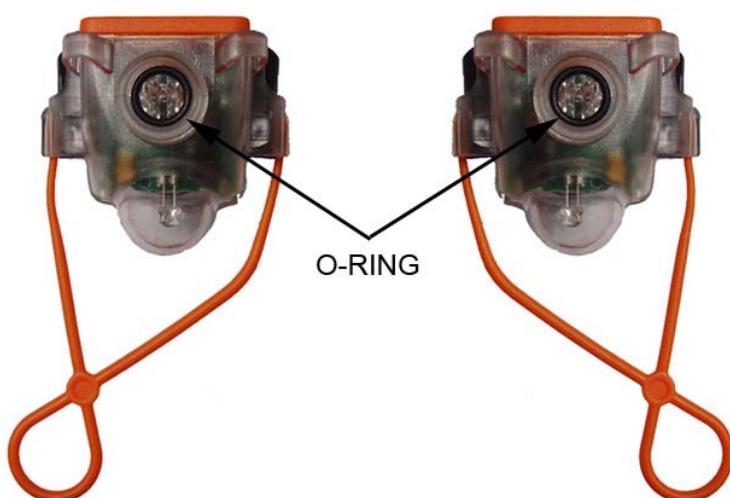
WARNING: KEEP THE INTERNAL LAMP UNIT AWAY FROM ANY SOURCE OF IGNITION. DO NOT HEAT THE INTERNAL LAMP UNIT ABOVE 65 °C OR BURN IT. THE CONTENTS OF THE POWER UNIT ARE FLAMMABLE. REFER TO THE MANUFACTURER'S DATA SHEET.

WARNING: DO NOT OPEN, CRUSH OR PUNCTURE THE INTERNAL LAMP UNIT. THE CONTENTS OF THE BATTERY ARE TOXIC AND CORROSIVE. REFER TO THE MANUFACTURER'S DATA SHEET.

WARNING: IF THE CHEMICALS FROM THE INTERNAL LAMP UNIT BATTERY TOUCH SKIN, CLOTHING OR EQUIPMENT, WASH THEM WITH LARGE QUANTITIES OF COLD WATER. REFER TO THE MANUFACTURER'S DATA SHEET.

The RL5 internal lamp is inserted into the existing retaining patch on the bottom centreline of the arch-tube, inside the raft. The existing patch on the inside of the canopy which held the RB2 batteries for the old lighting system is now obsolete.

1. Remove the protective cup and disc from the external lamp connector .
2. For 4-8 person liferafts attach the switch activator as shown in (FIGURE808a). For 10-25 person liferafts attach the switch activator as shown in (FIGURE 808b). Ensure the 'O' ring is seated correctly.



(a) Switch activator 4-8 person liferaft

(b) Switch activator 10-25 person liferaft

External lamp installation, Velcro variant**FIGURE 808**

3. Locate the Internal lamp retaining patch located on the bottom centreline of the arch-tube, inside the liferaft (FIGURE 809).
4. Place the internal lighting unit in the patch and secure (FIGURE 810a) .
5. Attach the connector for the External lamp unit (FIGURE 810 b)
6. Locate the appropriate Battery activation line (please refer to Chapter 1, TABLE 102).
7. Tie one end to the Switch activator using a Bowline knot, tape flying end.
8. Tie the other end to the tying locations a Bowline knot, tape flying end.
(4-8 person uses the rear lifeline, 10-25 person uses a haul-in ladder patch)



**Internal lamp retaining patch
FIGURE 809**



(a) Securing the Internal lamp unit



(b) Connecting the cable from the external lamp unit.

**Internal lamp unit assembly
FIGURE 810**

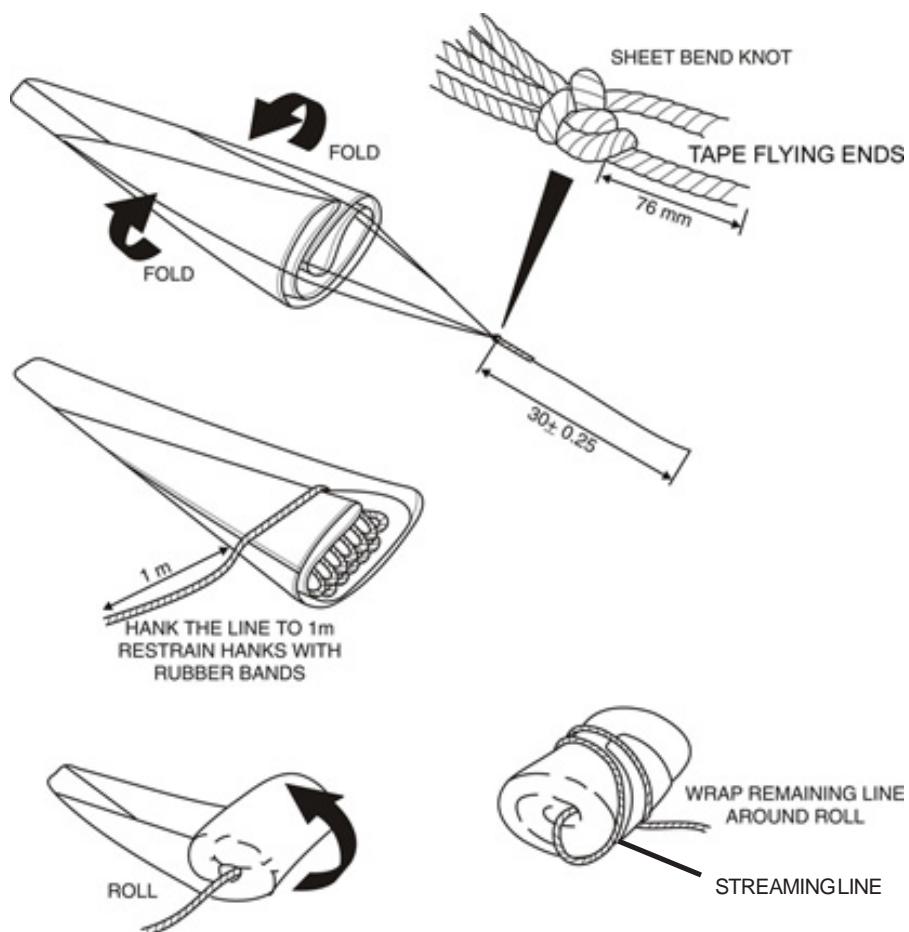
- (9) Fit the streaming line to the *drogue patch* adjacent to the *boarding ramp* using a bowline knot. Secure the flying end with 25 mm (1") wide SA tape.

FOR DAVIT LAUNCH: Tie in the rolled *drogue* to the outer lifeline using 4 turns of 4 lbs nylon breaking thread and a reef knot. Carefully cut and discard the elastic bands.

FOR THROW OVER: Carefully cut and discard the elastic bands. The rolled *drogue* is placed on the raft fold, just before raft rolling.

If the *drogue* assembly has been unrolled for any reason, it must be reassembled as follows (FIGURE 811):

- Flake the six attached cords and the single streaming line into the body of the drogue until approximately 1.8 m (70") of line remains outside.
- Roll up the drogue from the ends. Stop the drogue from unrolling by temporarily securing it with two elastic bands.

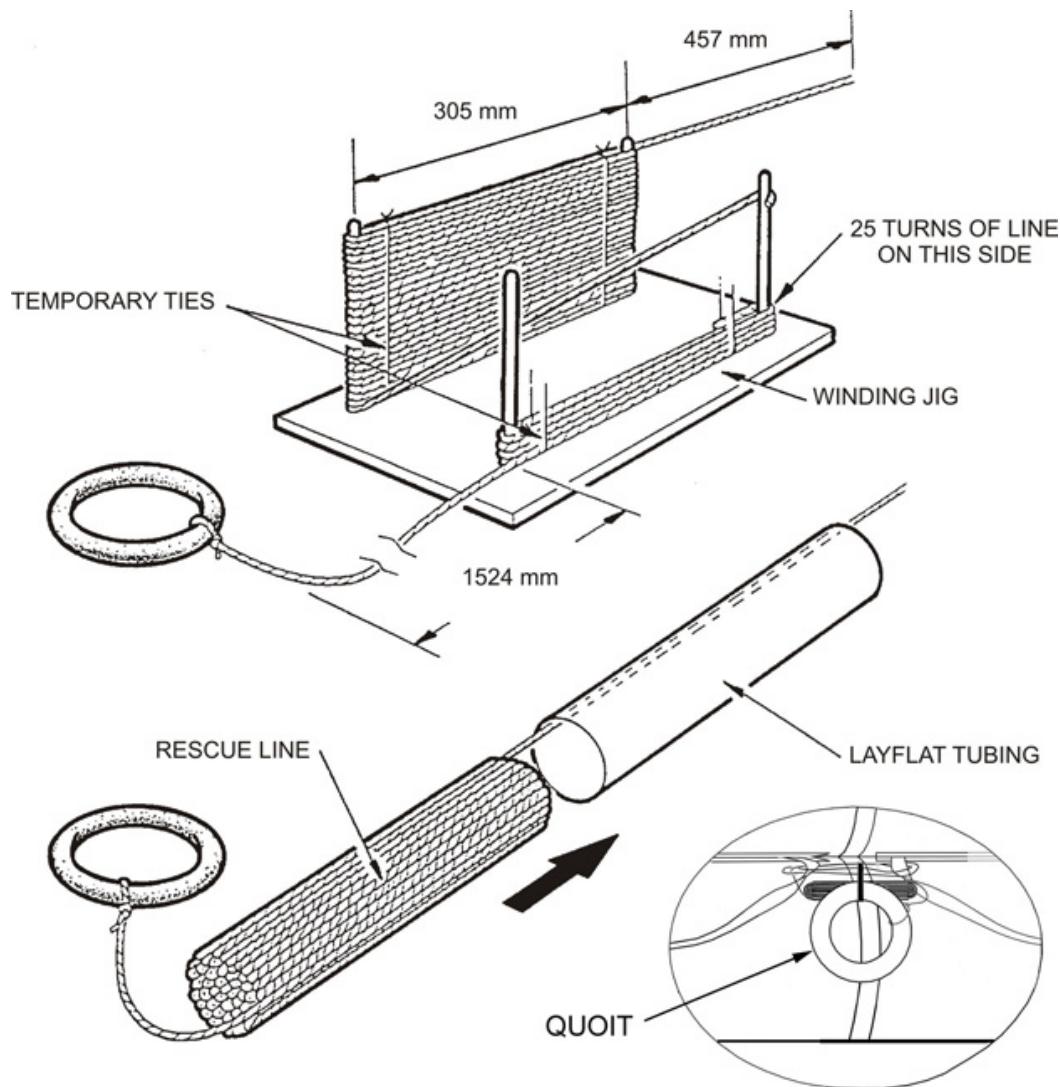


Preparation for packing the Drogue
FIGURE 811

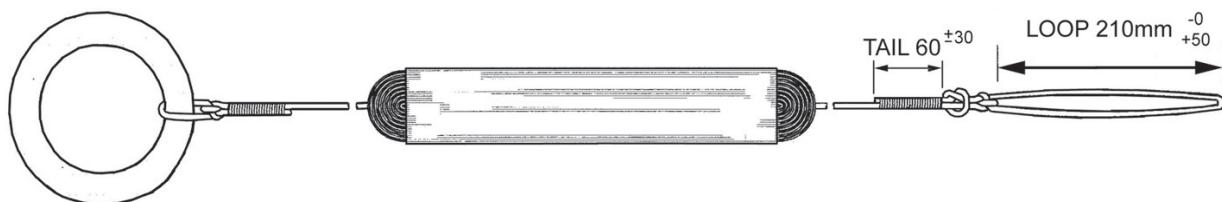
- (10) Attach the end of the *rescue line and quoit* through the lifeline, using lark foot connection. Use the velco retaining strap to retain the quoit and rescue line to the liferaft, (FIGURE 801).

If the *rescue line and quoit* has been dismantled, it must be reassembled as follows, (FIGURE 812):

- (a) Construct a simple winding jig. Leaving 1.2 m (47") free, wind the cord 25 times around the posts, finishing at the post furthest away from the spare cord. Temporarily secure the wound cord with ties or adhesive tape.
- (b) Take the cord diagonally across the jig to the bottom of the remaining front post and wind the cord a further 25 times around the posts finishing with approximately 450 mm (17") of spare cord. Temporarily secure.
- (c) Attach the quoit to the cord at the end where winding started, using a bowline knot. Tape over the bowline and flying end with 25mm (1 in) wide adhesive tape.
- (d) Bring the 450 mm (17") end back to the same end as the quoit. Remove the ties or adhesive tape and push all the cord into the polythene layflat tube.
- (e) Make a loop on the rescue line cord, opposite end to the quoit attachment. This loop must be prepared using a bowline knot, followed by one overhand 'lock' knot. Tape over the tail end using 25 mm (1") wide PVC (SA) tape, (FIGURE 813).



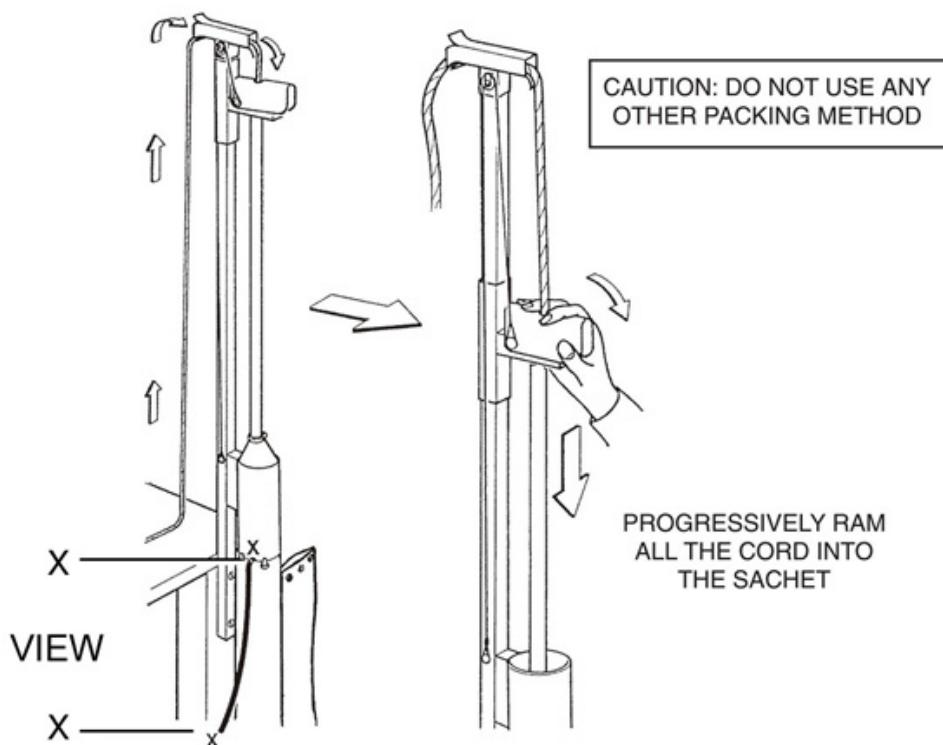
Preparation and fitting the Lifeline and Quoit
FIGURE 812



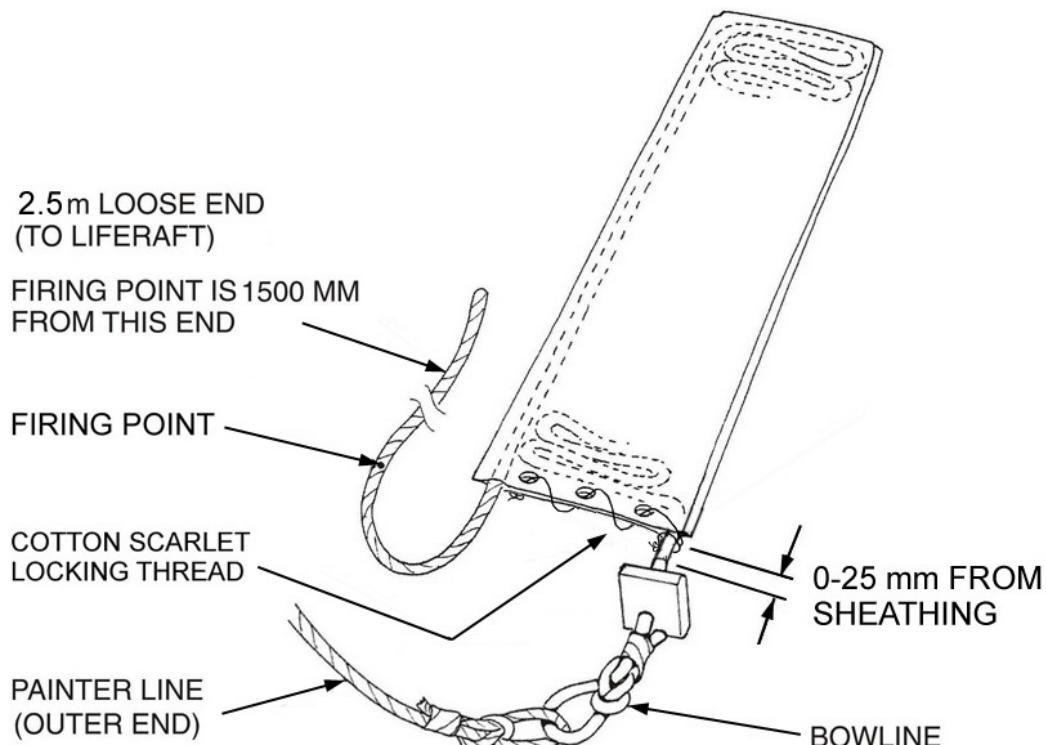
Rescue Line and Quoit assembly
FIGURE 813

- (11) If the *painter* line has been removed from its sachet, it must be repacked as follows, (FIGURES 814 & 815):
 - (a) Take the painter line (FIGURE 814) and disconnect the painter extension. Pass the unsheathed end of the main painter through the top of the painter loading machine and into the sachet. Extract the end so that the firing point, marked in black, plus 600mm (24 ") of cord protrude from the sachet, 2100mm (83") in total (FIGURE 814 view X-X).
 - (b) Holding the line in this position, push the main part of the line to the bottom of the sachet. Progressively ram the remaining length into the compartment, using the plunger of the loading machine, until the cordage protruding measures 300 mm (12 ") to the start of the rubber sheathing, (FIGURE 815).
 - (c) Double compartment sachets:
Proceed as for a single compartment sachet and when the first compartment is filled carefully detach the sachet from the machine and reattach it to the empty compartment.

Push the line down this compartment, keeping it next to the welded seam which separates the two compartments of the sachet. Again, using the loading machine, progressively ram the remaining line in and complete as above.
 - (d) Pass cotton scarlet thread through the first pair of sachet holes. The thread is to be secured to the bottom sachet hole with a reef knot and two half hitches.
Pass the thread through the remaining holes. Tie the remaining end around the sheathed end of the painter cord, with two turns and ending in a reef knot with two half hitches, (FIGURE 815).
- (12) Attach the *boarding ramp* straps and stays, four in total, to the liferaft.
- (13) Tie the hauling in ladders to the ladder floor patches using a draw hitch knot, (FIGURE 801).
- (14) Check that all doorways are unzipped and properly furled (inwards). Tie the doorways using a half bow knot for quick release. Secure open with their tie tapes, (FIGURE 801).



Painter sachet loading machine
FIGURE 814

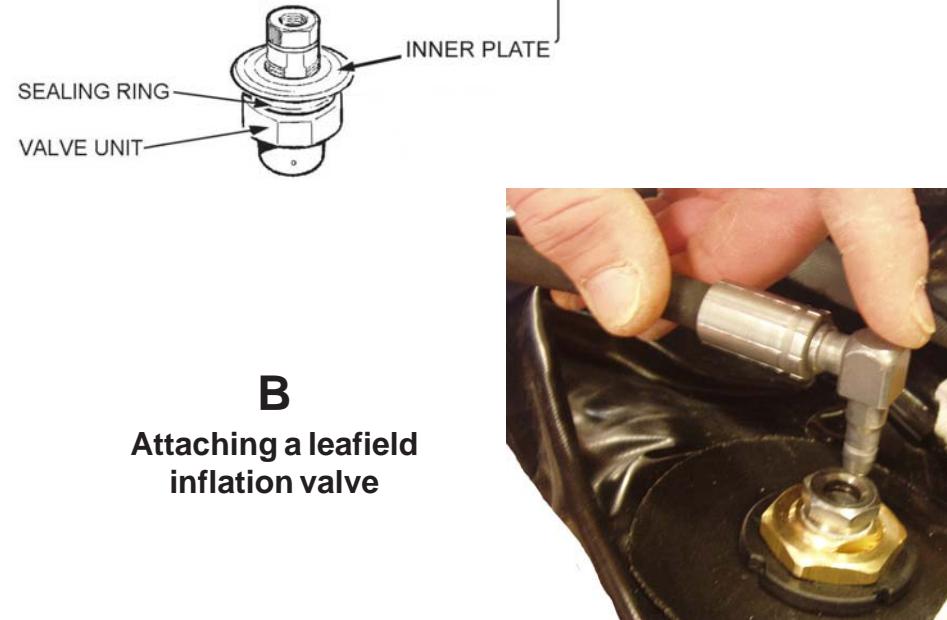
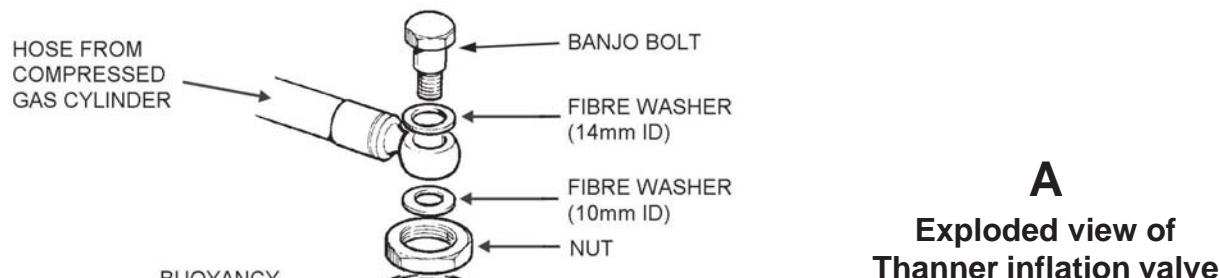


Painter assembly detail
FIGURE 815

3. Inflation system preparation

- (1) Insert deflators into the inflate/deflate valves of buoyancy chambers and deflate fully each compartment.
- (2) For a Thanner inflation system, attach an inner washer, a hose, a outer washer and banjo bolt to the inflation valves, (FIGURE 816A). Hoses should be aligned horizontally. For correct Torque value please refer to Refer to TABLE 101.

For a Leafield inflation system, check the 'O-ring' is located in the valve and attach a hose using the quick-fit connector (FIGURE 816B). Hoses should be aligned horizontally.

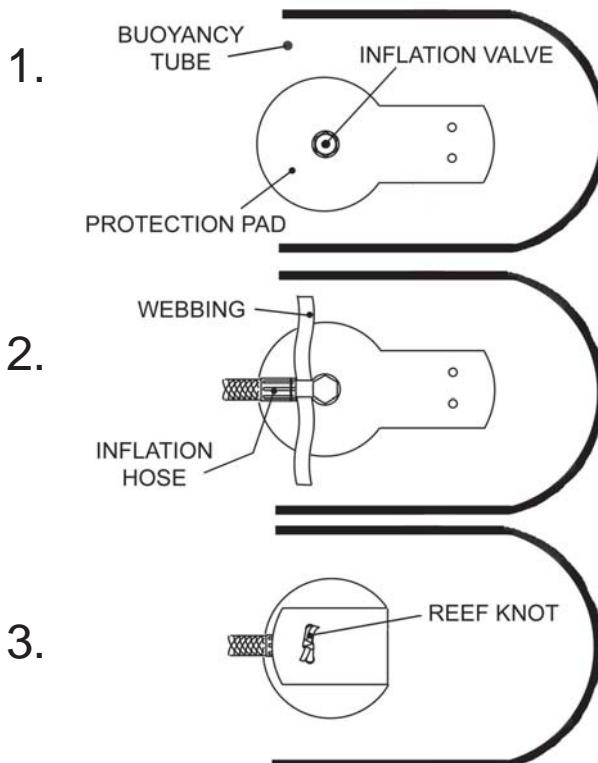


**Inflation valve
FIGURE 816**

- (3) Ensure that the inflation valve has not rotated from its original position. Jets should be aligned axially along the buoyancy chambers. Flats on inlet check valve body line or face the same direction of the jets.

CAUTION: USE ONLY A TEST CYLINDER AND HOSE DESIGNATED FOR THE FOLLOWING STEP.

- (4) While the liferaft is deflating and the tubes have become soft, check the function of each liferaft inflation valve. To do this use bursts of compressed CO₂ air or nitrogen for 5 to 10 seconds to ensure proper function. Check while test blasting that there are no leaks coming from the valves.
- (5) Fit the valve protection pad, (FIGURE 817), 1 for each inflation valve, 2 in total. Secure them with a reef knot.



**Inflation valve pad protection
FIGURE 817**

WARNING

A FULLY CHARGED CYLINDER CAN BECOME A LETHAL PROJECTILE IF DISCHARGED TO ATMOSPHERE WHEN NOT FITTED WITH A RECOIL CAP. ALWAYS FIT A RECOIL CAP TO A CYLINDER VALVE OUTLET WHEN HANDLING A FULLY CHARGED CYLINDER.

CAUTION:

RELIABLE FUNCTIONING OF AN OPERATING HEAD DEPENDS UPON SCRUPULOUSLY OBSERVED RESETTING PROCEDURES. DO NOT TRY TO RESET BY FORCING THE CABLE BACK INTO AN ASSEMBLED HEAD.

- A. Check and if required, reset operating heads according to the manufacturer's documentation (refer to the Associated Publications section).
- B. Refer to the List of Associated Publications for the correct filling data for gas cylinders and to the Illustrated Parts List for correct cylinder application. Check the weight of the gas cylinder against the data printed on the cylinder label. Reject a cylinder if the data on the label is illegible. Disassemble, check, test, assemble and charge cylinders according to the associated manual.

4. Container preparation

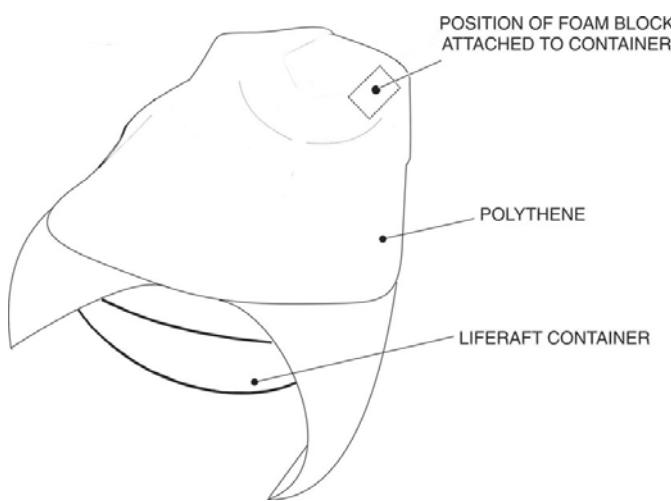
A MK 10 container:

The following preparation is used for all Throw Over and Davit Launch liferafts.

1. The *container seal*, fitted to the upper container half, shall be replaced.
2. Fix *protection foam* to the inside of the container (FIGURE 818A). This foam block prevents the cylinder *operating head* from impacting the container side during handling and deployment.
3. Line the bottom half of the *container* with a polythene sheet, (FIGURE 818A). Make sure this sheet overlaps the front edge of the *container* by 200 mm (8"). Use temporary lengths of tape to secure the polythene in place. Make several puncture holes along the centre of the polythene sheet.
4. For Davit Launch only, use a pair of scissors to cut a flap in the polythene, (FIGURE 818B), at the Davit ring exit.

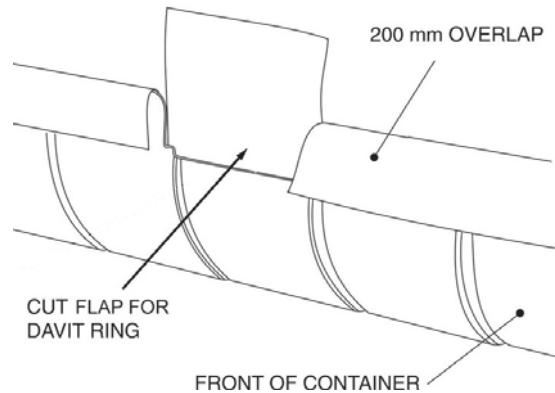
NOTE:

On Davit Launch liferafts, the excess polythene sheet is passed around the circumference of the entire liferaft . The cut -out flap for the Davit ring will be placed under the ring.



Line container with polythene

A



Cut flap in Davit Launch container

B

Preparation of container MK 10
FIGURE 818

B MK 14 container:

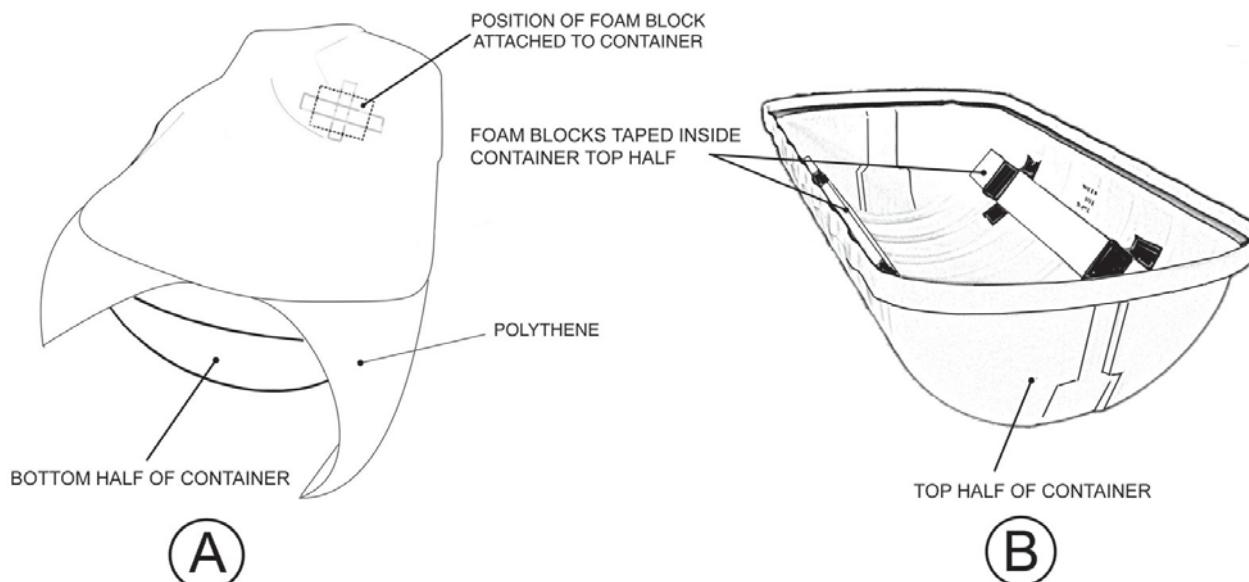
This container not used for USCG market on rafts branded Crewsaver / Elliot. The following preparation is used for all Throw Over and Davit Launch liferafts.

1. The *container seal*, fitted to the top half of the container, shall be replaced.
2. Fix *protection foam* to the inside of the *container* (FIGURE 819a). Position the foam block in the centre. This foam pad prevents the cylinder *operating head* from impacting the container side during handling and deployment.
3. Line the bottom half of the container with a polythene sheet, (FIGURE 819a). Make sure this sheet overlaps the front edge of the container by 200 mm (8"). Use temporary lengths of tape to secure the polythene in place. Make several puncture holes along the centre of the polythene sheet.

NOTE:

On Davit Launch liferafts, the excess polythene sheet is passed around the circumference of the entire liferaft. The cut -out for the davit ring is placed under the ring.

4. Fix two lengths of *polystyrene foam block* to the top half of the container, (FIGURE 819b).



**Preparation of container MK 14
FIGURE 819**

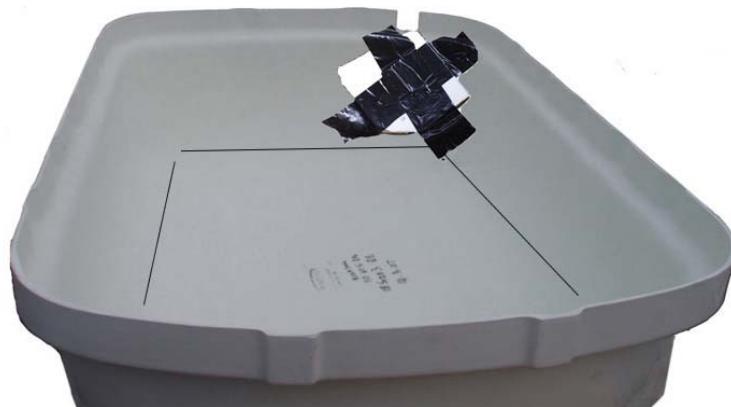
C MK16/ MK18 container:

The following preparation is used for all sizes of MK16 & MK18 containers, Throwover only.

1. The *container seal*, fitted to the upper container half, shall be replaced.

NOTE: Place 2 layers of sealing around the upper half of the container and a third layer at each end.

2. Fix *protection foam* to the inside of the *container*, (FIGURE 820). This foam block prevents the cylinder *operating head* from impacting the container side during handling and deployment.
3. Line the bottom half of the *container* with a polythene sheet. Make sure this sheet overlaps the front edge of the container by 200 mm (8"). Use temporary lengths of tape to secure the polythene in place. Make several puncture holes along the centre of the polythene sheet.

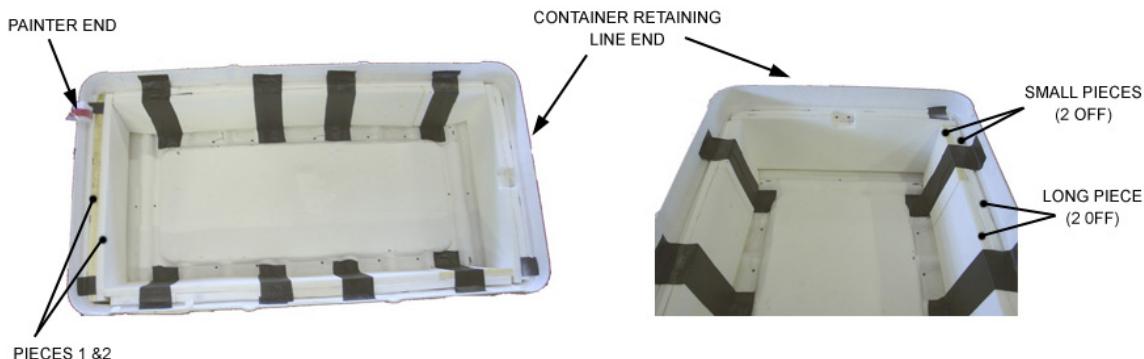


**Preparation of MK16 & MK18 Flatpack containers
FIGURE 820**

E MK20 container:

The following preparation is used for 25 Person DL (B-Pack only).

1. The *container seal*, fitted to the upper container half, shall be replaced.
2. Fix *protection foam* to the inside of the *container*, (FIGURE 821). The lower container is lined around the sides with two layers of plastazote foam.(see IPL, Chapter 11 for details). The layer of foam is attached to the container using black mastic tape (TA175). The second layer of plastazote foam is attached to the first layer using 25mm (1") double sided tape (06675009). Additionally, 100mm (4") black fabric tape (04834009) is used to secure the second layer.
3. Line the bottom half of the *container* with a polythene sheet.
Make sure this sheet overlaps the front edge of the container by 200 mm (8"). Use temporary lengths of tape to secure the polythene in place. Make several puncture holes along the centre of the polythene sheet.
4. After the liferaft is packed in the MK20 container, 3 *Chute valise foam blocks* are placed on top of the raft before the upper container is fitted (FIGURE 822).



Foam protection in Flatpack container (B-pack)
FIGURE 821



Chute valise foam blocks
FIGURE 822

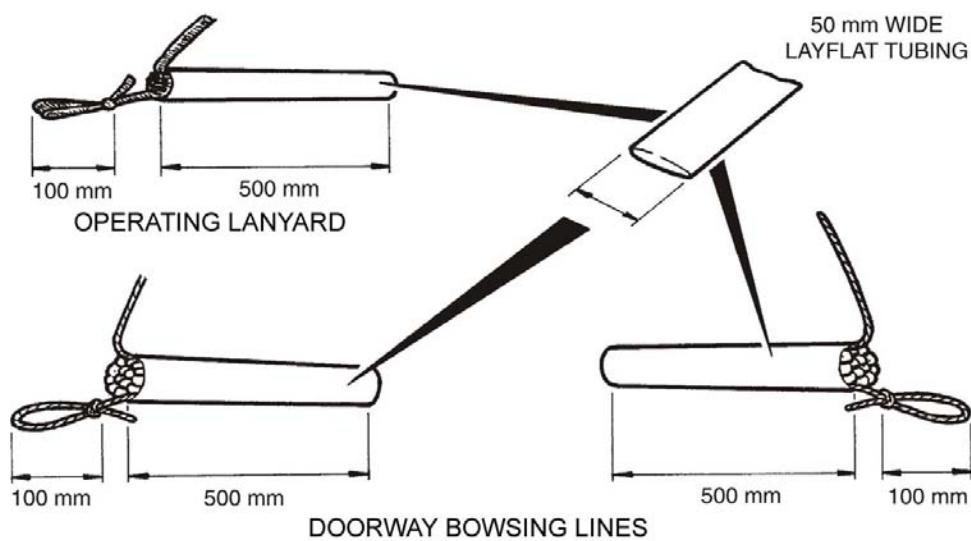
CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

5. Packing a Davit Launch liferaft into a container

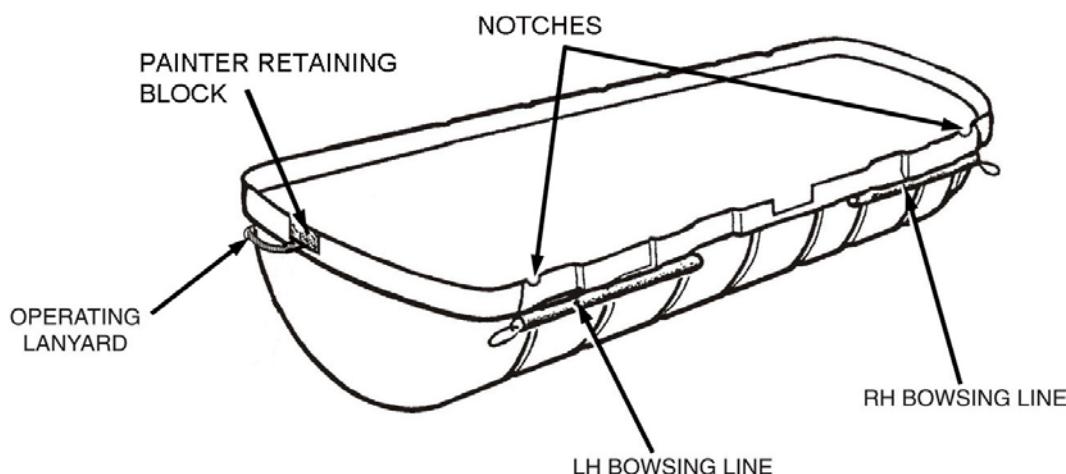
1. Place the liferaft neatly on a packing table in an open area, with enough room to manoeuvre the container during packing. The inflation valves should be positioned adjacent to the edge of the packing table. Ensure all cordage is neat and tidy.

When most of the air has escaped naturally from the liferaft, it must be evacuated as follows:

- (a) Connect a vacuum device to a deflation adapter and evacuate all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
- (b) As each chamber is evacuated, adjust the buoyancies so that they lie flat on each other.
2. Check the red webbing ring pull and *container retaining line* is serviceable.
3. Renew the *container restraint label* if it is torn or illegible, (FIGURE 801).
4. Tie the external lines in four equal groups, at their mid point. Do this for each quadrant of the raft, using 1 turn of 2 kgf (4.41 lbf) *breaking thread*, (FIGURE 801).
This will keep lines away from the door openings and will also prevent entangling.
5. Tie the *container retaining line*, (1818 kgf (4000 lbf) Nylon cord 5.5 m (216") long, to the suspension ring using a bowline knot. (FIGURE 801).
6. Secure the *container retaining line* to the canopy, by taping it at two locations along the arch tube, using 100 mm (4") adhesive tape. Ensure it is routed outside the lifting bridle cords and passed through the lifeline, (FIGURE 801).
7. Thread the free end of the *container retaining line* out through one of the holes in the bottom half of the container and back into the container using the other hole.
The container retaining line is then left until the top half of the container is in place, (FIGURE 801).
8. If the operating lanyard has been removed from its sachet, it must be repacked according to (FIGURE 823).



Preparation of doorway bowsing lines & Operating lanyard
FIGURE 823



Doorway bowsing lines & Operating lanyard location
FIGURE 824

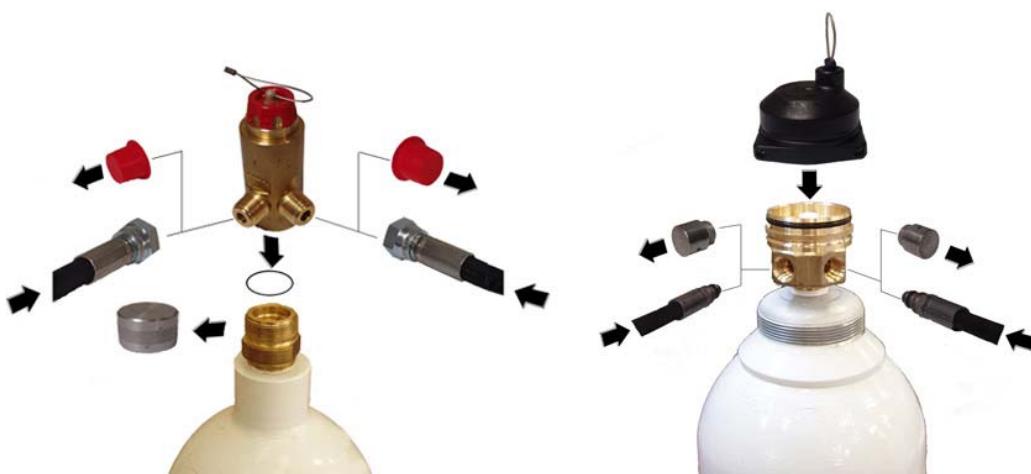
9. If the doorway bowsing lines have been removed from their sachet, they must be repacked according to (FIGURE 823).
10. Attach the operating lanyard and doorway bowsing lines sachets to the outside of the container using adhesive tape (FIGURE 824).
11. Pass the inner end of the operating lanyard through the painter exit slot in the lower container and insert the *painter retaining block* on top, (FIGURE 824).
12. Remove the transit plug from the *operating head* and fit the pre-set *operating head* (FIGURE 825 a & b). Ensure the threads on the body of the *operating head* and cylinder valve are clean. For Leafield equipment operating head, ensure the operating head is pushed firmly on, tighten the two screws in using a 3mm AF hexagon key to the desired torque, see CHAPTER 1, TABLE 101. The operating head must be tight on the cylinder valve (FIGURE 825c).

WARNING: DO NOT REMOVE THE RECOIL CAPS FROM THE OPERATING HEAD YET.

13. Upturn the edge of the liferaft to reveal the cylinder stowage. Place the *cylinder* on the underside of the raft floor, taking care not to trap the *righting strap*. Secure the cylinder with the velcro retaining straps, (FIGURE 826). The *cylinder* must be orientated, so that one of the operating head outlets runs parallel with the base of the liferaft while the other runs perpendicular towards the water (FIGURE 826).
14. Tie the cylinder neck to the adjacent loop patch on the floor. Use a reef knot with 2 turns of 238 kgf (525 lbf) nylon cord, 450 mm (18") long. Tape the flying ends.
15. Remove the recoil caps from the *operating head*.
16. Route both *hoses* through the *painter patch loops* (FIGURE 827) .

CAUTION: THIS ONLY APPLIES TO 10-25 PERSON LIFERAFTS. DO NOT ROUTE HOSES THROUGH PAINTER PATCH LOOPS FOR 4,6 & 8 PERSON LIFERAFTS.

17. Connect up each inflation *hose*, (FIGURE 825). Torque the *hose* connections as stated in Chapter 1, TABLE 101. Wrap a piece of 25mm (1") adhesive *tape* at the end of each hose. This will indicate that they have been torqued. Do not overlap the metal parts.
18. Insert two *protection pads* onto *operating head* and tape together, using 100mm (4") adhesive *tape* (FIGURE 828). Lay liferaft flat on the table again.



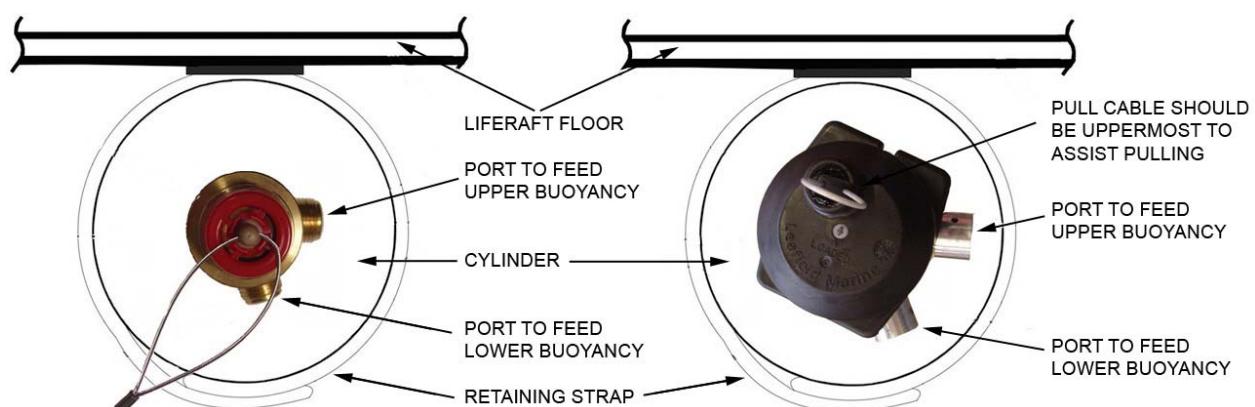
(a) THANNER INFLATION EQUIPMENT

(b) LEAFIELD INFLATION EQUIPMENT

(c) INSERTING RETAINING BOLTS
LEAFIELD OPERATING HEAD



**Assembly of inflation equipment
FIGURE 825**

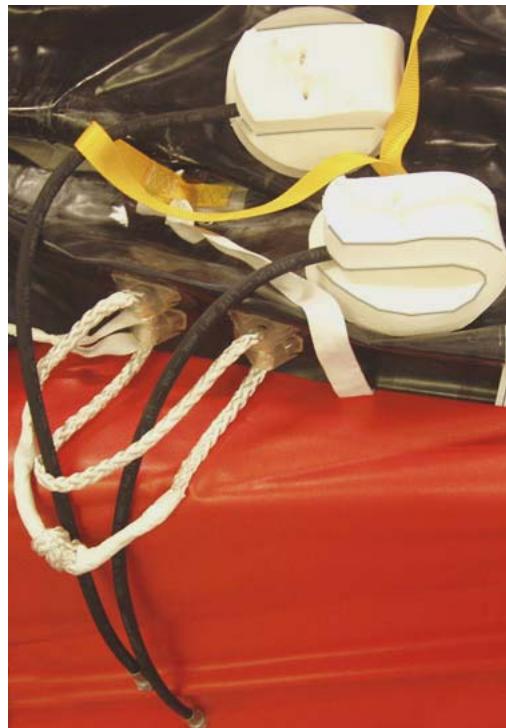


(a) Thanner inflation equipment

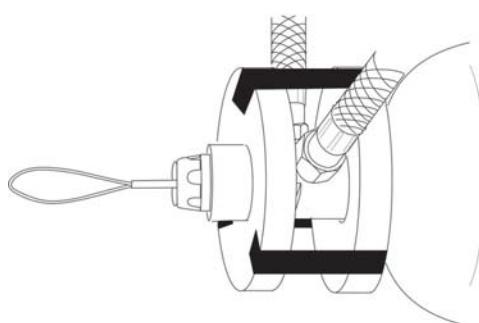
(b) Leaffield inflation equipment

**Cylinder attachment to liferaft
FIGURE 826**

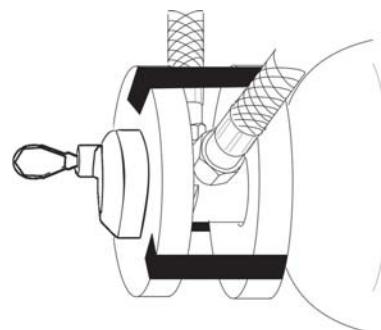
19. Mount the lower half of the *container* on a suitable strong trolley. Position the container next to the table with the Davit launch ring exit hole away from the table. Leave a small gap (about 100 mm (4")) between the table and the side of the container. Tilt the lower half of the container slightly towards the table to facilitate rolling and packing.
20. Grasp the edge of the liferaft and with the *cylinder*, drag the assembly over the *containers* so that the cylinder lies correctly in the container, (FIGURE 829).
 - (a) MK10 CONTAINER: The uppermost edge of the cylinder must be level with the inner container lip, (FIGURE 829A).
 - (b) MK14 CONTAINER: The cylinder must be placed in the centre and with the operating head close to container, (FIGURE 829B).
 - (c) MK20 FLATPACK CONTAINER: The cylinder must be placed at inner edge and with the operating head close to the container corner. Leave space to allow for straight pull of line to reduce pull force values (FIGURE 829C).
21. Work the liferaft floor area down into the recesses towards each end of the *container*.



Inflation hose routing (10-25 Persons only)
FIGURE 827

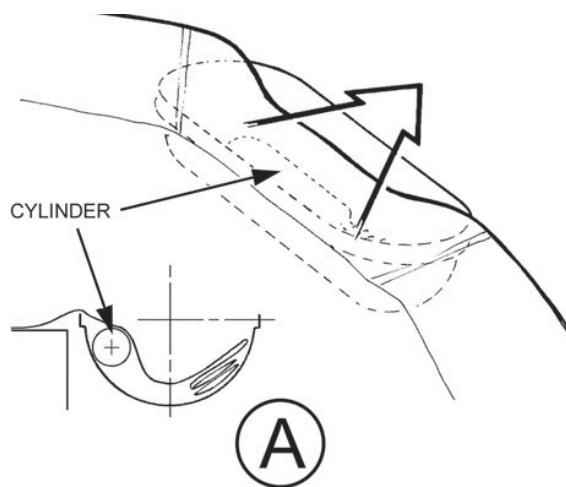


(a) Thanner inflation equipment

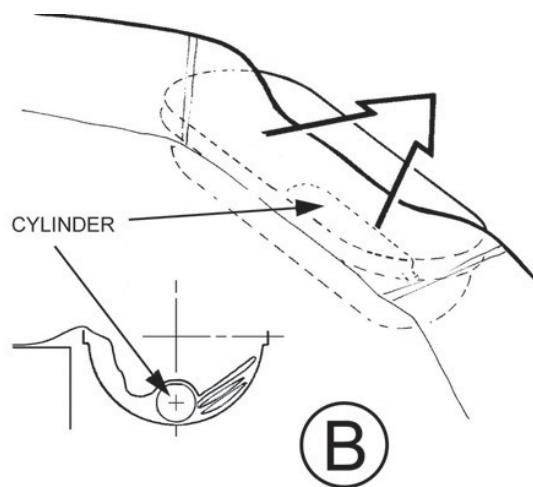


(b) Leafield inflation equipment

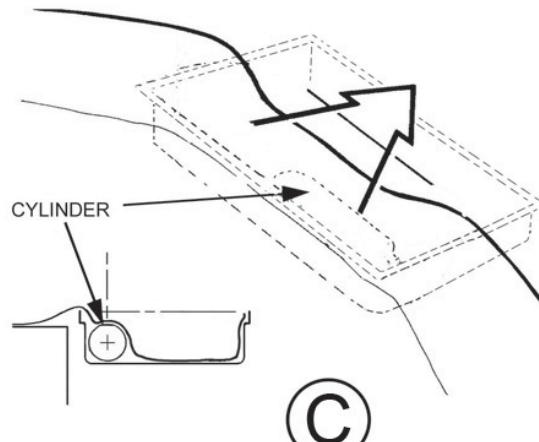
Operating heads protection pads
FIGURE 828



CYLINDER IN A MK 10 CONTAINER



CYLINDER IN A MK 14 CONTAINER



CYLINDER IN A FLATPACK

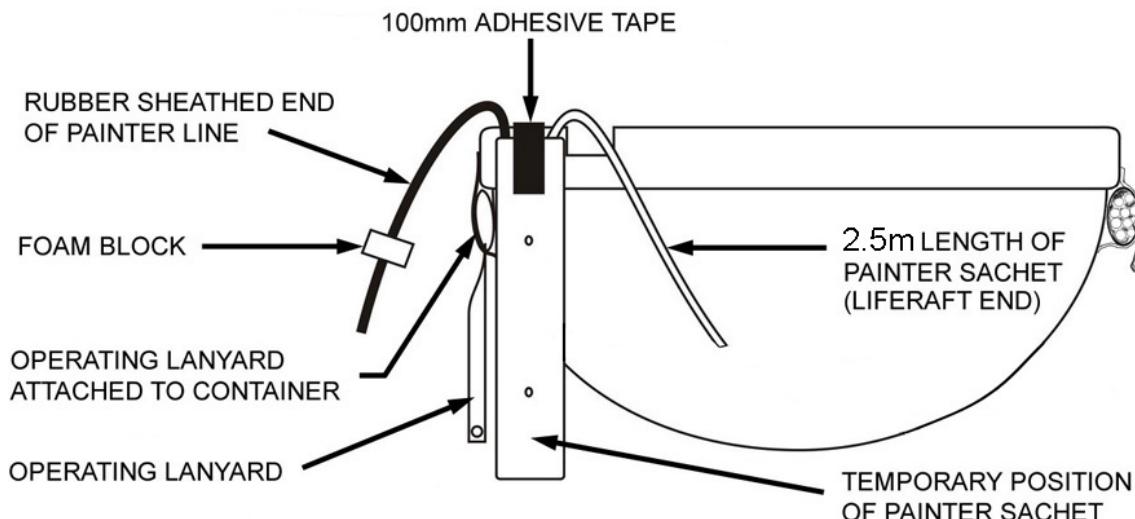
Cylinder position in the container
FIGURE 829

CAUTION: EXERCISE EXTREME CARE DURING THE NEXT OPERATION IN ORDER TO AVOID OPERATING THE INFLATION SYSTEM.

22. Fold back the liferaft so as to reveal the operating mechanism.
23. Obtain the *painter sachet*. Wrap a polyethylene sheet, 915mm x 800mm (36" x 31.5"), around the end of the *painter sachet* and tape it in place. The polyethylene sheet should extend over the open end of the sachet and the painter rope by at least 100mm (4"), but no more than 150mm (6").
24. Temporarily attach the *painter sachet* to the rear of the lower half of the container using *adhesive tape*. Make sure that the open end of the *painter sachet* is at the edge of the container with the painter line cut-out, (FIGURE 830).

CAUTION: EXERCISE EXTREME CARE DURING THE NEXT OPERATION IN ORDER TO AVOID OPERATING THE INFLATION SYSTEM.

25. Place, 300 mm (12") length of layflat tubing over the operating lanyard. Pull the operating lanyard taut and pass it under the *painter sachet* and through the cut-out in the container.
26. Place both the eyelets of the operating lanyard over the operating mechanism actuation cable, (FIGURE 831).



Attach Operating lanyard and Painter sachet to the container
FIGURE 830

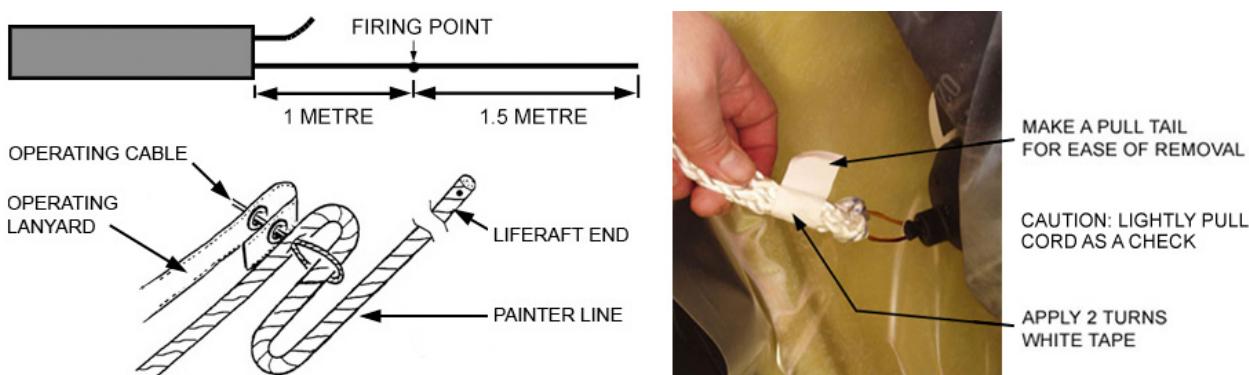
27. Ensure that 2.5 m (100") exits the painter sachet, (FIGURE 831). Pull the 1.5m (60") end of the painter line taut. Place a 300 mm (12"), length of layflat tubing over the painter line.
28. At the firing point, 1.5m (60") from the end of the line, pass the actuation cable of the operating mechanism through the painter line. Thread the remaining painter line back through the actuation cable, (FIGURE 831).

WARNING: THE OPERATING MECHANISM IS NOW ARMED. EXTREME CARE MUST BE TAKEN DURING ALL FOLLOWING ACTIONS.

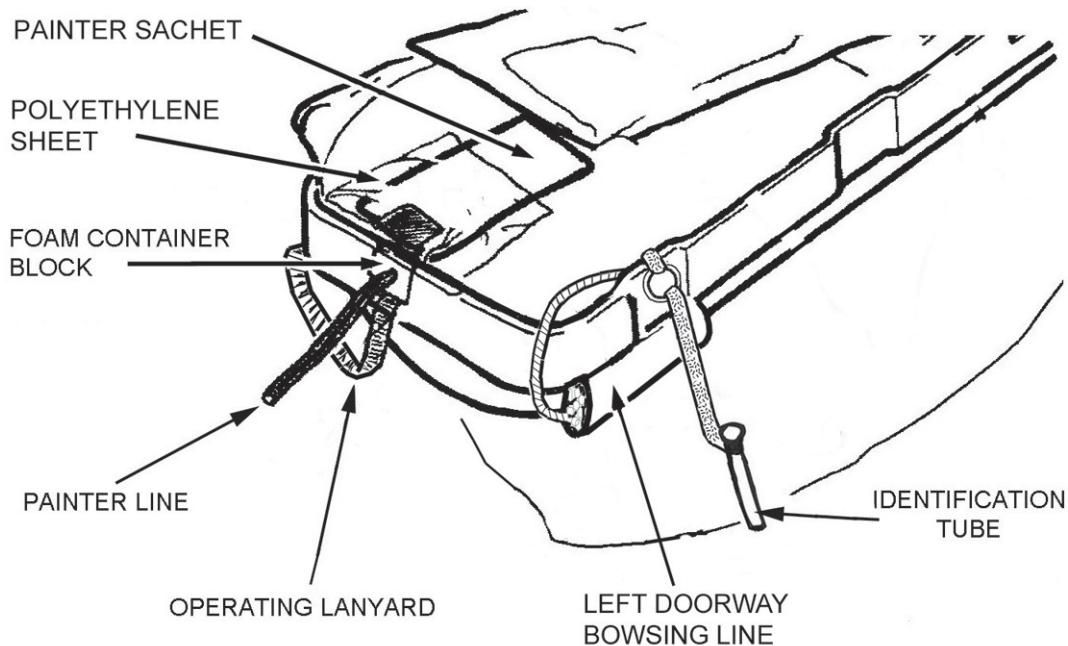
29. Ensure the painter cord is firmly attached to the operating head by lightly tugging on the cord, (FIGURE 831).

CAUTION: ONLY PULL THE CORD SLIGHTLY SO AS NOT TO DISLODGE THE OPERATING HEAD CABLE. THE INFLATION SYSTEM IS ARMED.

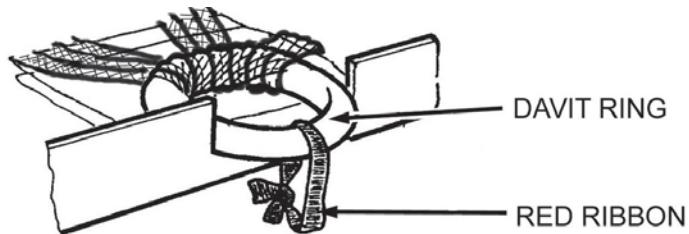
30. Apply two turns of white tape around the painter cord, (FIGURE 826). Fold the end of the tape over on itself to create a pull tail. This will make it easy to remove the tape at the next service.
31. Locate the *painter attachment patch* on the lower buoyancy. Tie the *liferaft identification tube red ribbon* through the *painter patch* attachment, using a bowline knot, (FIGURE 832).



Attachment of Painter line & Operating lanyard to operating mechanism
FIGURE 831



Position of Painter sachet
FIGURE 832



Position of Davit ring
FIGURE 833

32. Tie the liferaft end of the painter line to the liferaft, (FIGURE 844A).

NOTE: The painter should be able to slide freely along the bridle.

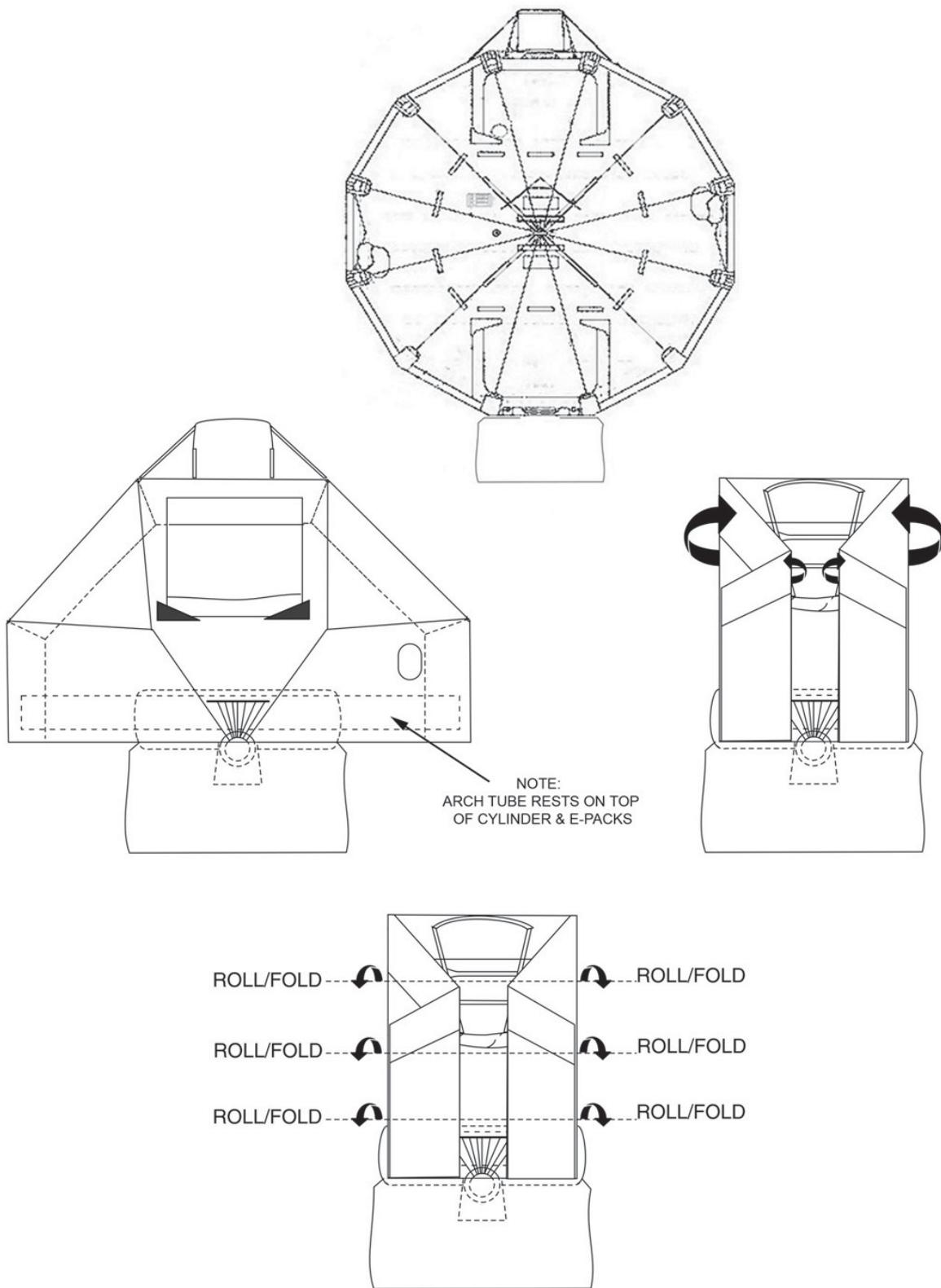
- (a) 10-25 PERSON - Locate the *painter bridle cord* on the lower buoyancy. Tie the liferaft end of the painter to the *painter attachment cord*. Use bowline knot and tape the flying end, (Refer to FIGURE 828).
- (b) 4-8 PERSON - Locate the *painter attachment patch* on the lower buoyancy. Tie the liferaft end of the painter to the *painter attachment patch*. Use a bowline knot and tape the flying end, (FIGURE 828)

33. Place the emergency pack valises for each liferaft (refer to Chapter 7). Position the valises centrally, outboard from the cylinder. If present, place the valise(s) containing rations and water positioned furthest from the operating head end of the cylinder.
Utilise the space available to minimise the vertical excursion of the valises.
Ensure the straps on each emergency pack valise are tight.

34. On each valise, tie the flying ends of the two straps to each other using a reef knot and then around the inner lifeline using an overhand knot, so as to secure the packs to the liferaft.

NOTE: Ensure that when inserting the equipment packs, no parts of the lifting bridle, canopy, door or hauling-in ladder are trapped beneath the packs.

35. Place the hauling in ladder over the valises and tie off to the hauling in ladder floor patches.
36. Place the *painter sachet* on top of the left-hand fold, in line with and facing, close to the painter exit hole of the container. Ensure the free run of painter from the sachet is not impeded, (FIGURE 832).
37. Pull the davit ring forward. Tie a red ribbon through the Davit ring using a reef knot. Position the leading edge of the Davit ring just within the pre-cut notch in the *container*, (FIGURE 833).
38. Using a draw hitch knot, tie the left doorway bowsing line to the left doorway bowsing patch and the right doorway bowsing line to the right doorway bowsing patch, (FIGURE 801).



Folding the liferaft (12-25 DL)
FIGURE 834

- 39 Put the the rubber sheathed end of the *painter line* through the *painter retaining block*. Put the block into the cut-out in the *container*. Make sure the operating lanyard passes into the container under the foam block, (FIGURE 832).
40. Prepare to start the sequence of liferaft folding, (FIGURE 834). Firmly grasp the floor and sides of the liferaft. Haul the assembly forward, so as to cover the emergency pack valises and form a transverse fold level with the front edge of the container. Bring Davit ring towards the cut out, (FIGURE 833).
41. The Davit ring should fit neatly against the cut-out but must have enough slack in the *lifting bridle* to extend at least 150 mm (6") beyond the edge of the container.
Ensure the rigging lines are neat and tidy and the red ring pull is projecting through the cut-out, (FIGURE 833).



(a) COLLECT THE WEBBING LADDER



(b) INITIAL TWIST OF NIBR



(c) FURTHER TWIST OF NIBR



(d) HOLD DOWN AND START ROLLING LIFERAFT FROM THE NIBR

**Folding boarding ramp
FIGURE 835**

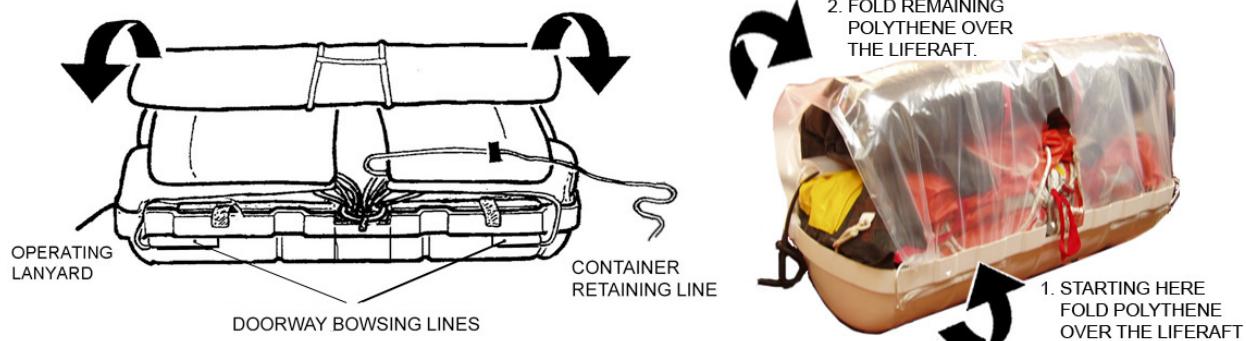


INCORRECT
TOGGLE SHOULD NOT BE BEHIND WEBBING



CORRECT
NIBR SUCCESSFULLY STOWED

**Liferaft with top half rolled
FIGURE 836**

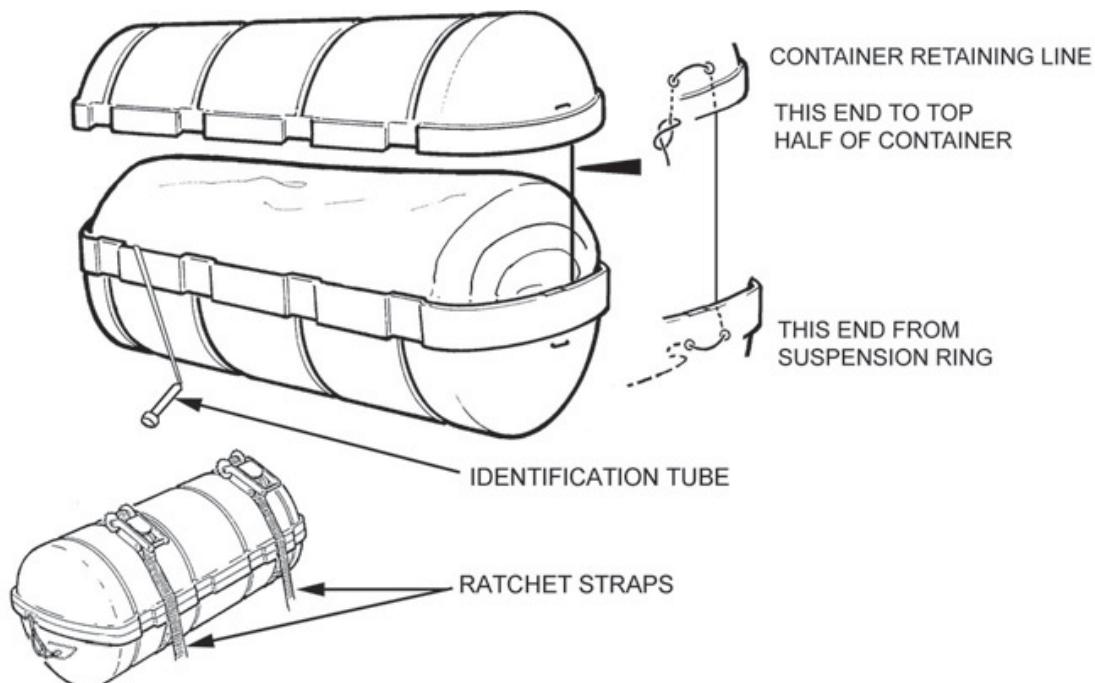


**Liferaft with top half rolled
FIGURE 837**

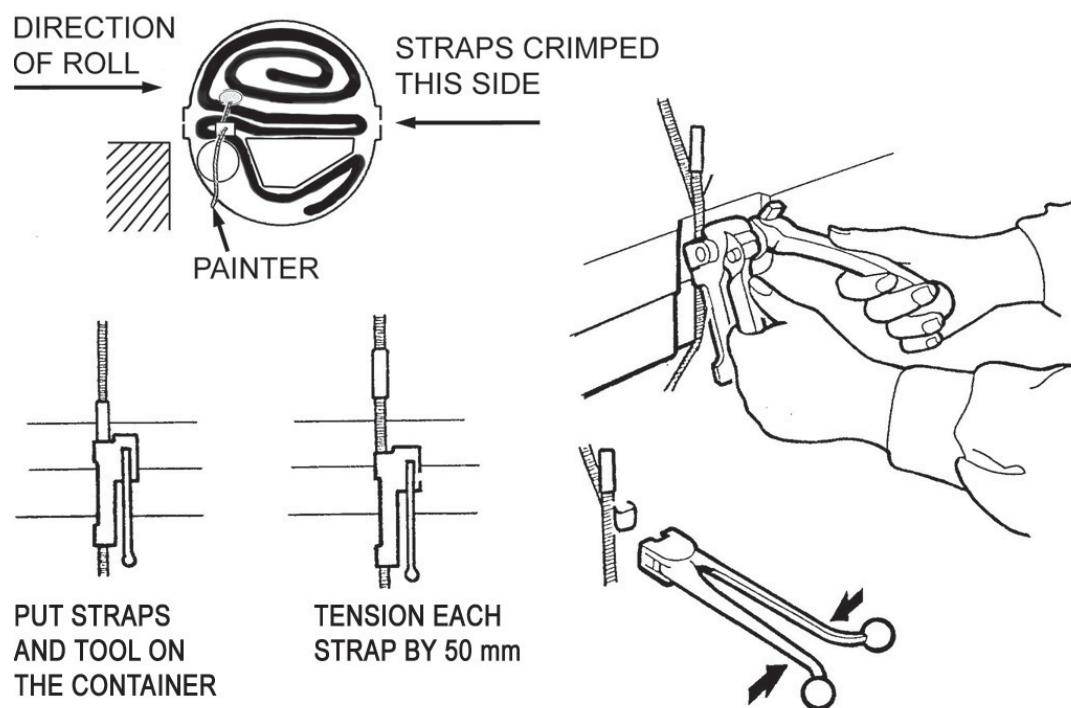
42. The Davit lifting ring is to be positioned no lower than the centre point of the container cutout. From this position, the Davit lifting ring is easily accessible through the cut out provided on the *container* of the operationally packed liferaft, (FIGURE 833).

WARNING: REMEMBER THE OPERATING MECHANISM IS ARMED.
EXTREME CARE MUST BE TAKEN DURING ALL FOLLOWING ACTIONS.

43. Twist the Non Inflateable Boarding Ramp (NIBR) and fold on top of the liferaft. Roll the assembly tightly and onto the top of the container lower half, (FIGURE 835).
44. Ensure the toggle is located in front of webbing, (FIGURE 836).
45. With the liferaft folded and pushed down as far as possible, roll the raft tightly towards and then into the *container*, (FIGURE 837).
46. Wrap the polythene sheeting around the outside of the folded liferaft, tucking the overlap under the liferaft roll. Ensure that the *polythene sheet* does not obstruct the Davit ring or other items, (FIGURE 837).
47. Fold the polythene cut out flap under the Davit ring.
48. Immediately before closing the container make sure that painter line sachet is:
 a) in line with the painter exit,
 b) level with the painter exit of the container,
 c) attached to the liferaft with self adhesive tape.
49. Ensure that the open end of the *painter sachet*, is as close as possible to the painter exit position on the *container*. Adjust the painter sachet extension so that the distance from it to the painter exit is between 100 - 150mm (4" - 6").
50. Ensure that there is sufficient distance between the material of the liferaft and the painter line so that they do not touch when painter line is pulled.
51. Put the top half of the *container* on top of the folded liferaft, (FIGURE 838).
52. Taking the end of the container retaining line from the bottom half container, route the free end out through a hole in the top half container and back in again through the other hole, (FIGURE 838).
 Tie a "figure of eight" knot on the end of the container retaining line and pull the line tight, so that the knot is against the inside of the *container*.
53. Insert the block ring retaining foam into the pre-cut notch. Make sure the Davit ring red ribbon passes between the top of block ring retaining foam and the container.



Container retaining line
FIGURE 838



Crimping container straps
FIGURE 839

54. Put two *ratchet straps* around the *container*, making sure the straps do not cover the grooves in the container, (FIGURE 838).
Tighten the *ratchet straps* uniformly around the *container*. Make sure the upper half of the container mates with the lower half of the *container* correctly.
55. Continue closing the *containers* slowly, while alternating from one strap to the other. Whilst doing so, CAREFULLY position the top half of the container either by striking it with a rubber mallet or by levering it with a hardwood or metal spatula against the bottom half, (FIGURE 839).

The edges of the spatula MUST ALL BE RADIUSED and smooth to avoid damaging the liferaft. Check continuously to ensure that no part of a liferaft becomes trapped between the container lips as they finally close and that the seal is made.

56. Check that the *painter retaining block* on the painter line does not become displaced.

WARNING: WHEN TENSIONING OR CRIMPING STRAPS, THE OPERATOR MUST STAND TO ONE SIDE OF THE STRAP. PROPER CLOTHING AND EYE PROTECTION MUST BE WORN. PROPER FOOTING AND BALANCE MUST BE MAINTAINED WHEN OPERATING THE EQUIPMENT. USE SHORTHAND STROKES ONLY DURING TENSIONING.

WARNING: TOO MUCH TENSION WILL BREAK THE STRAP. THIS MAY RESULT IN INJURY TO PERSONNEL.

CAUTION: FOR ALL LIFERAFTS, IT IS ESSENTIAL THAT CRIMPS ARE ATTACHED ON THE OPPOSITE SIDE OF THE CONTAINER TO THE ROLL OF THE LIFERAFT, FIGURE 839. (I.E. ON A DL LIFERAFT THE CRIMPS ARE ATTACHED ON THE SIDE WHICH HAS THE DAVIT RING CUT-OUT).

CAUTION: ENSURE CORRECT CRIMPING TOOLS ARE USED.
PLEASE REFER TO IPL FOR CORRECT LIST).

57. Obtain the *straps* and *crimps*. Tension and *crimp* each *strap* as follows:

NOTE: Please refer to Section 7, of this chapter if applying crimp heat seal option.

- (a) Adjust the ends of each *strap* so that the outer most strap end is facing upwards and is approximately 25mm (1") above the rim of the *container*, (FIGURE 839).
- (b) Apply the *tensioning tool* to each *strap* at a point half way across the two rims. Operate the handle to tension each *strap* until the base of the tensioning tool rests in the lower container rim. Secure the strap with a *crimp*, (FIGURE 839), using a *crimping tool*.

NOTE: It is acceptable to wrap the crimps with several lairs of white (1") PVC tape.

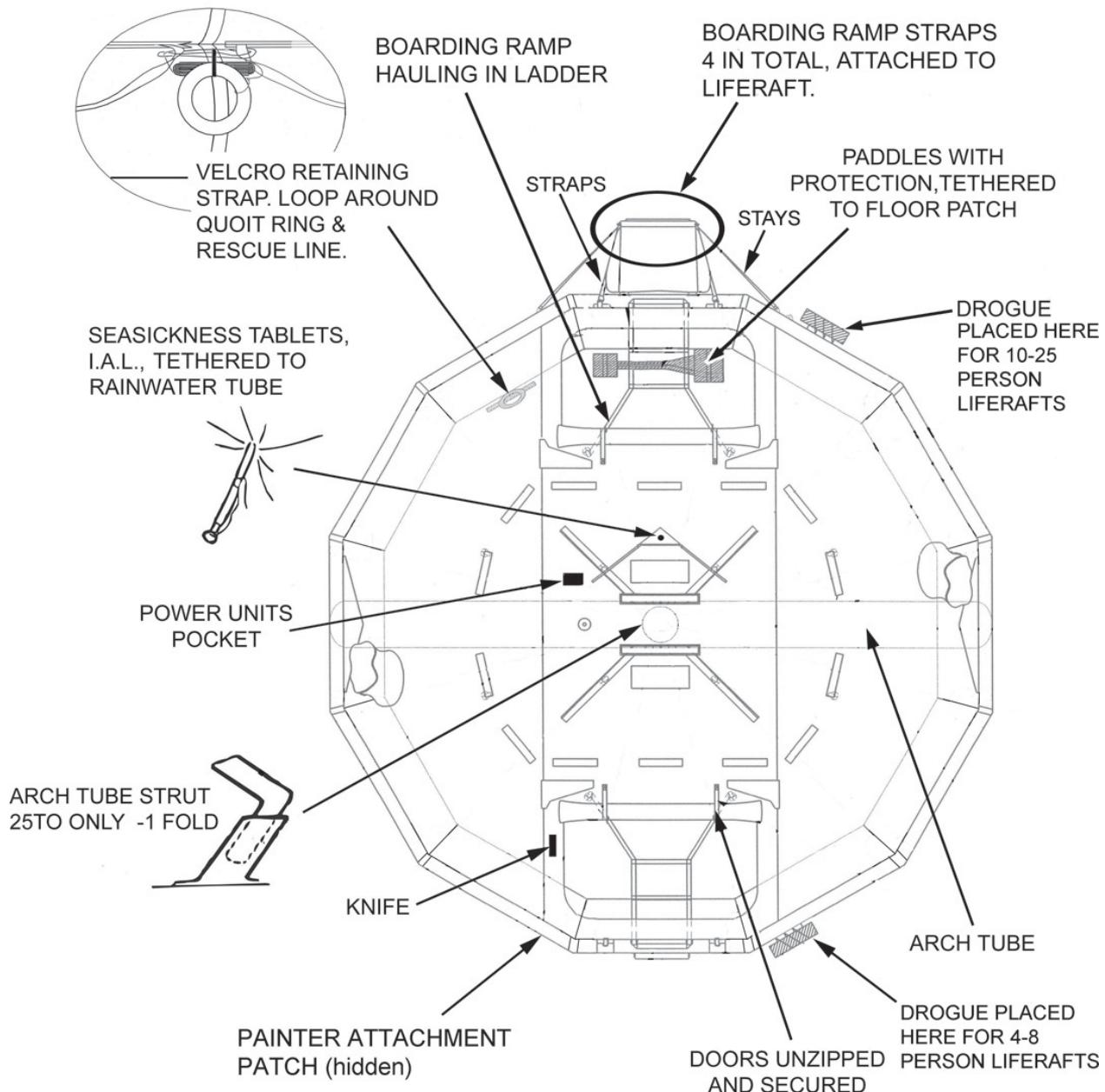
58. Put 'DO NOT CUT' tape over the top of the *straps* in each recess of the *container* (FIGURE 839).

59. Remove the *ratchet straps*.

60. Container labelling

- (a) Check that all *labels* are fitted and positioned correctly and securely. Please refer to Chapter 11, Section 3 *Container label identification and position*.
- (b) Record the liferaft details, onto the liferaft *identification label* and insert it into the *identification tube*. Check for legibility and correct details.
- (c) The *liferaft identification* container and any excess tether webbing shall be tucked between the container strapping and the container.
- (d) Tape the IAL compact disc to the container.

This completes the packing sequence and the liferaft is now ready for installation.



NOTE: The picture illustrated is 25 man raft. Layout will be similar for other TO rafts.

**Preparation for packing assembly of Throw Over
FIGURE 840**

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

6. Packing a Throw Over liferaft into a container

1. Place the liferaft neatly on a packing table in an open area, with enough room to manoeuvre the container during packing. The inflation valves should be positioned adjacent to the edge of the packing table. Ensure all cordage is neat and tidy.

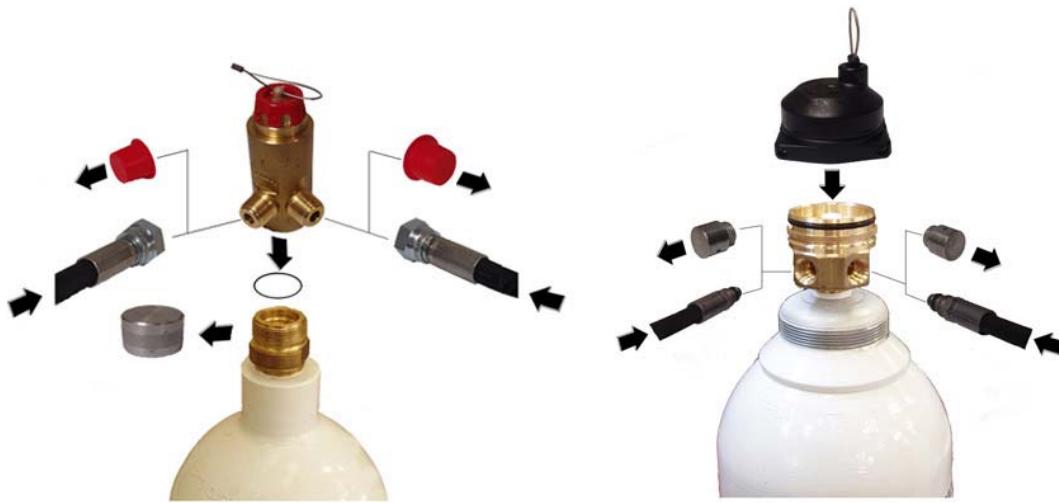
When most of the air has escaped naturally from the liferaft, it must be evacuated as follows:

- (a) Connect a vacuum device to a deflation adapter and evacuate all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
- (b) As each chamber is evacuated, adjust the buoyancies so that they lie flat on each other.
2. Remove the transit plug from the *operating head* and fit each pre-set *operating head* (FIGURE 841 a&b). Ensure the threads on the body of the *operating head* and cylinder valve are clean. For leaflet equipment operating head, ensure the operating head is pushed firmly on, tighten the two screws in using a 3mm AF hexagon key to the desired torque, see CHAPTER 1, TABLE 101. The operating head must be tight on the cylinder valve (FIGURE 839c).

WARNING: DO NOT REMOVE THE RECOIL CAPS FROM THE OPERATING HEAD YET.

3. Upturn the edge of the liferaft to reveal the cylinder stowage. Place the *cylinder* on the underside of the raft floor, taking care not to trap the *righting strap*. Secure the cylinder with the velcro retaining straps, (FIGURE 838). The *cylinder* must be orientated so that one of the operating head outlets runs parallel with the base of the liferaft while the other runs perpendicular towards the water (FIGURE 842).
4. Tie the cylinder neck to the adjacent loop patch on the floor. Use a reef knot with 2 turns of 238 kgf (525 lbf) cord, 450 mm (17") long and tape the flying ends.
5. Remove the recoil caps from the *operating head* and route both *hoses* through the *painter patch assembly* loops. (FIGURE 843).

CAUTION: THIS ONLY APPLIES TO THE 10-25 PERSON LIFERAFTS.
DO NOT ROUTE HOSES THROUGH PAINTER PATCH LOOPS FOR 4,6 & 8 PERSON LIFERAFTS.



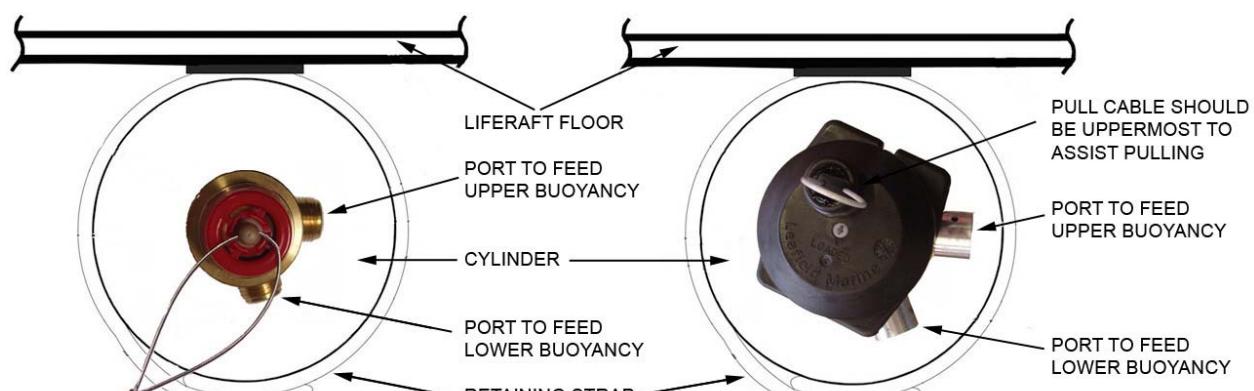
(a) THANNER INFLATION EQUIPMENT

(b) LEAFIELD INFLATION EQUIPMENT

(c) INSERTING RETAINING BOLTS
LEAFIELD OPERATING HEAD



Assembly of inflation equipment
FIGURE 841



(a) Thanner inflation equipment

(b) Leaffield inflation equipment

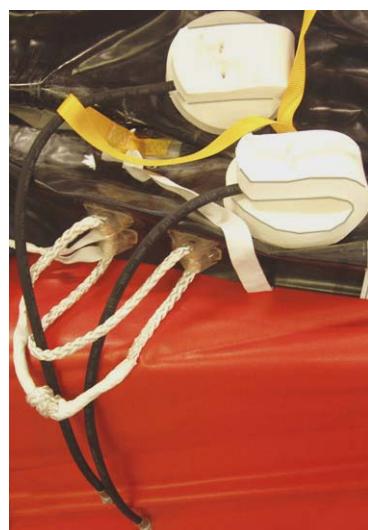
Cylinder attachment to liferaft
FIGURE 842

6. Connect each inflation hose, (FIGURE 841). Torque the *hose* connections as stated in Chapter 1, TABLE 101. Wrap a piece of 25mm (1") adhesive tape at the end of each hose. This will indicate that they have been torqued. Do not overlap the metal parts.

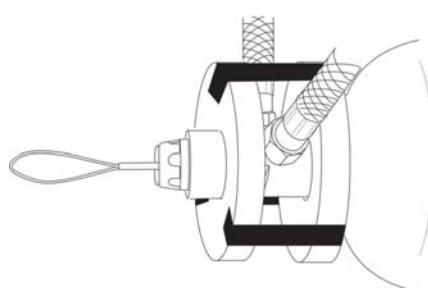
NOTE

For the 4 Person raft; the inflation valve uses original protection valve tube. The cylinder operating head uses reduced size protection, P/n 50067004 and 50067005.

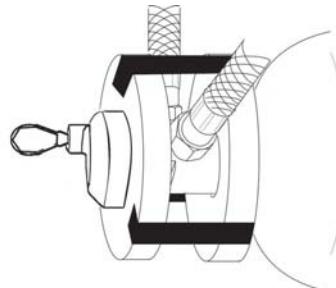
7. Insert two *protection pads* onto *operating head* and tape together, using 100mm (4") adhesive tape (FIGURE 844). Lay the liferaft flat on the table again.
8. Mount the lower half of the *container* on a suitable strong trolley. Position the container next to the table. Leave a small gap (about 100 mm (4")) between the table and the long side of the container. Tilt the lower half of the container slightly toward the table to facilitate rolling and packing.
9. Grasp the liferaft and with the *cylinder*, drag the assembly over the *container* so that the *cylinder* lies correctly in the *container*.



**Inflation hose routing
(10-25 Person only)**
FIGURE 843



(a) Thanner inflation equipment



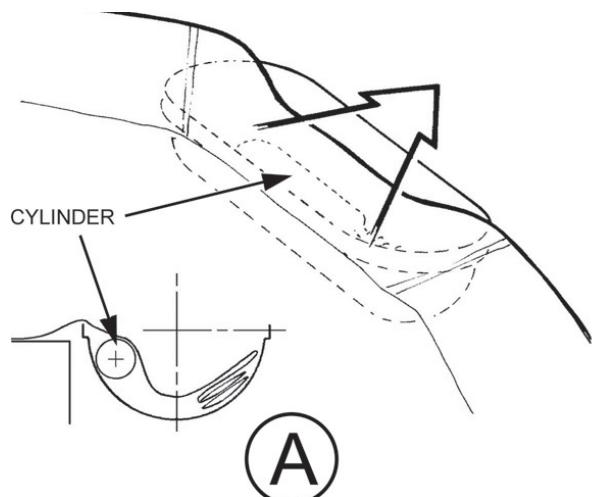
(b) Leafield inflation equipment

Operating heads protection pads
FIGURE 844

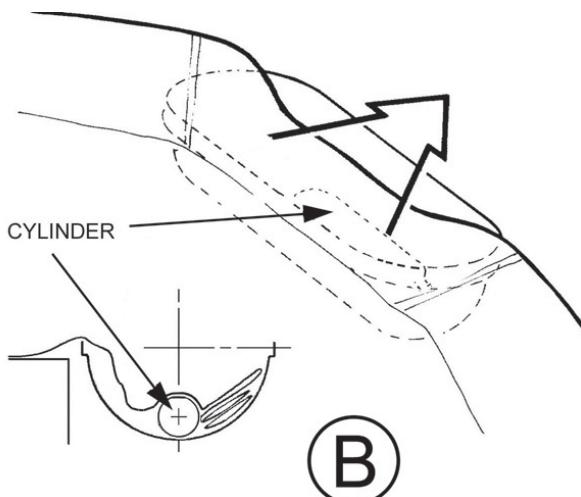
10. Grasp the liferaft and with the *cylinder*, drag the assembly over the *container* so that the *cylinder* lies correctly in the *container*.
 - (a) MK10 CONTAINER: The uppermost edge of the cylinder must be level with the inner container lip, (FIGURE 845A).
 - (b) MK14 CONTAINER: The cylinder must be placed in the centre and with the operating head close to container, (FIGURE 845B).
 - (c) FLATPACK CONTAINER: The cylinder must be placed at the back of the container, with the operating head close to the container corner, (FIGURE 845C). Leave space to allow for straight pull of line to reduce pull force values .
11. Work the liferaft floor area down into the recesses towards each end of the *container*.
12. Fold back the raft so as to reveal the operating mechanism.
13. Obtain the *painter sachet*. Wrap a polyethylene sheet, 915mm x 800mm (36" x 31.5"), around the end of the *painter sachet* and tape it in place. The polyethylene sheet should extend over the open end of the sachet and the painter rope by at least 100 -150 mm (4"- 6").
14. Temporarily attach the *painter sachet* to the rear of the lower half of the container using *adhesive tape*. Make sure that the open end of the *painter sachet* is at the edge of the container with the painter line cut-out, (FIGURE 846).

CAUTION: EXERCISE EXTREME CARE DURING THE NEXT OPERATIONS IN ORDER TO AVOID OPERATING THE INFLATION SYSTEM.

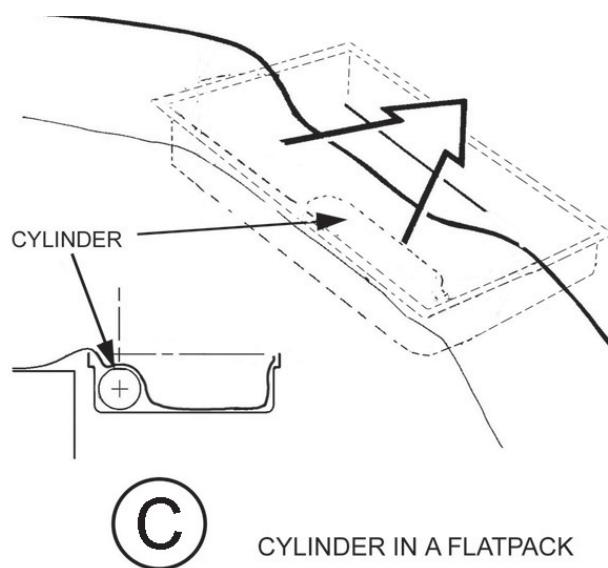
15. Ensure that 2.5 m (100") exits the painter sachet, (FIGURE 847). Pull the 1.5m (60") end of the painter line taut. Place a 300 mm (12"), length of layflat tubing over the painter line.
16. At the firing point, 1.5m (60") from the end of the line, pass the actuation cable of the operating mechanism through the painter line. Thread the remaining painter line back through the actuation cable, (FIGURE 847).



CYLINDER IN A MK 10 CONTAINER

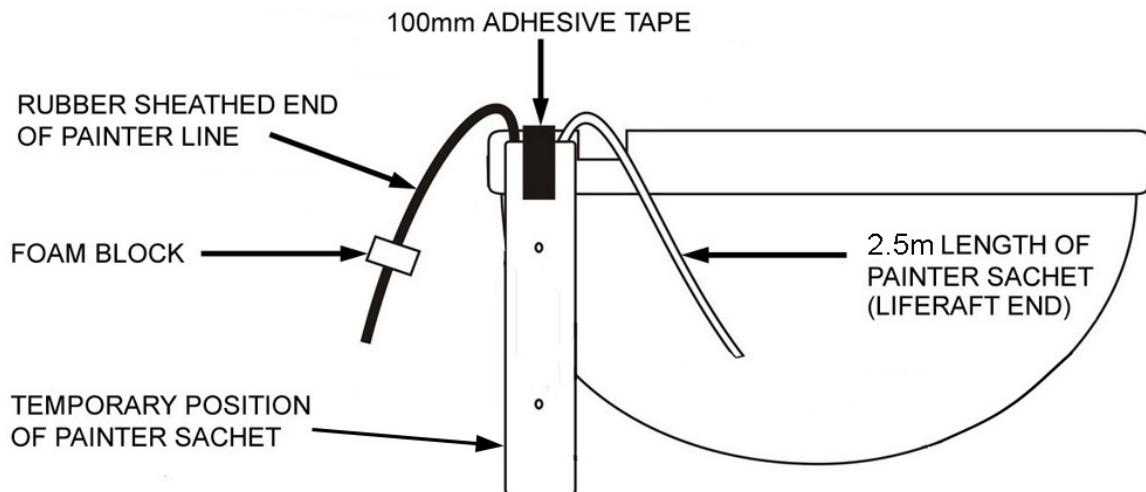


CYLINDER IN A MK 14 CONTAINER



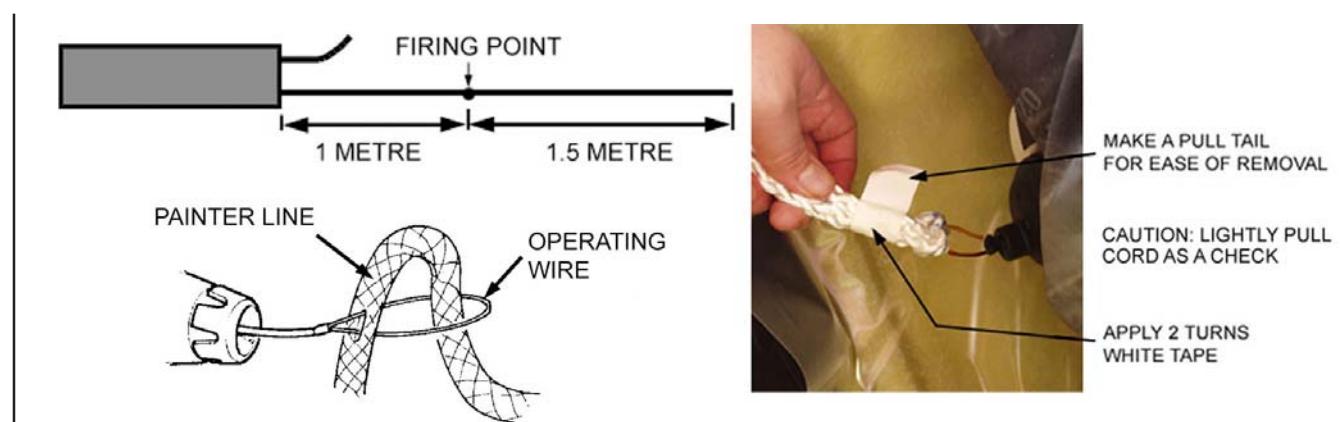
CYLINDER IN A FLATPACK

Cylinder container positions
FIGURE 845



Attach Operating lanyard and Painter sachet to the container

FIGURE 846



Attachment of Painter line to operating mechanism

FIGURE 847

WARNING: THE OPERATING MECHANISM IS NOW ARMED. EXTREME CARE MUST BE TAKEN DURING ALL FOLLOWING ACTIONS.

17. Ensure the painter cord is firmly attached to the operating head by lightly tugging on the cord, (FIGURE 847).

CAUTION: ONLY PULL THE CORD SLIGHTLY SO AS NOT TO DISLodge THE OPERATING HEAD CABLE. THE INFLATION SYSTEM IS ARMED.

18. Apply two turns of white tape around the painter cord, (FIGURE 847). Fold the end of the tape over on itself to create a pull tail. This will make it easy to remove the tape at the next service.

19. Tie the liferaft end of the painter line to the liferaft, (FIGURE 844A).

NOTE: The painter should be able to slide freely along the bridle.

- (a) 10-25 PERSON - Locate the *towing bridle* on the lower buoyancy. Tie the liferaft end of the painter to the *painter attachment cord*. Use bowline knot and tape the flying end, (Refer to FIGURE 828).
- (b) 4-8 PERSON - Locate the *painter attachment patch* on the lower buoyancy. Tie the liferaft end of the painter to the *painter attachment patch*. Use a bowline knot and tape the flying end, (FIGURE 828)



Position of Painter sachet
FIGURE 848

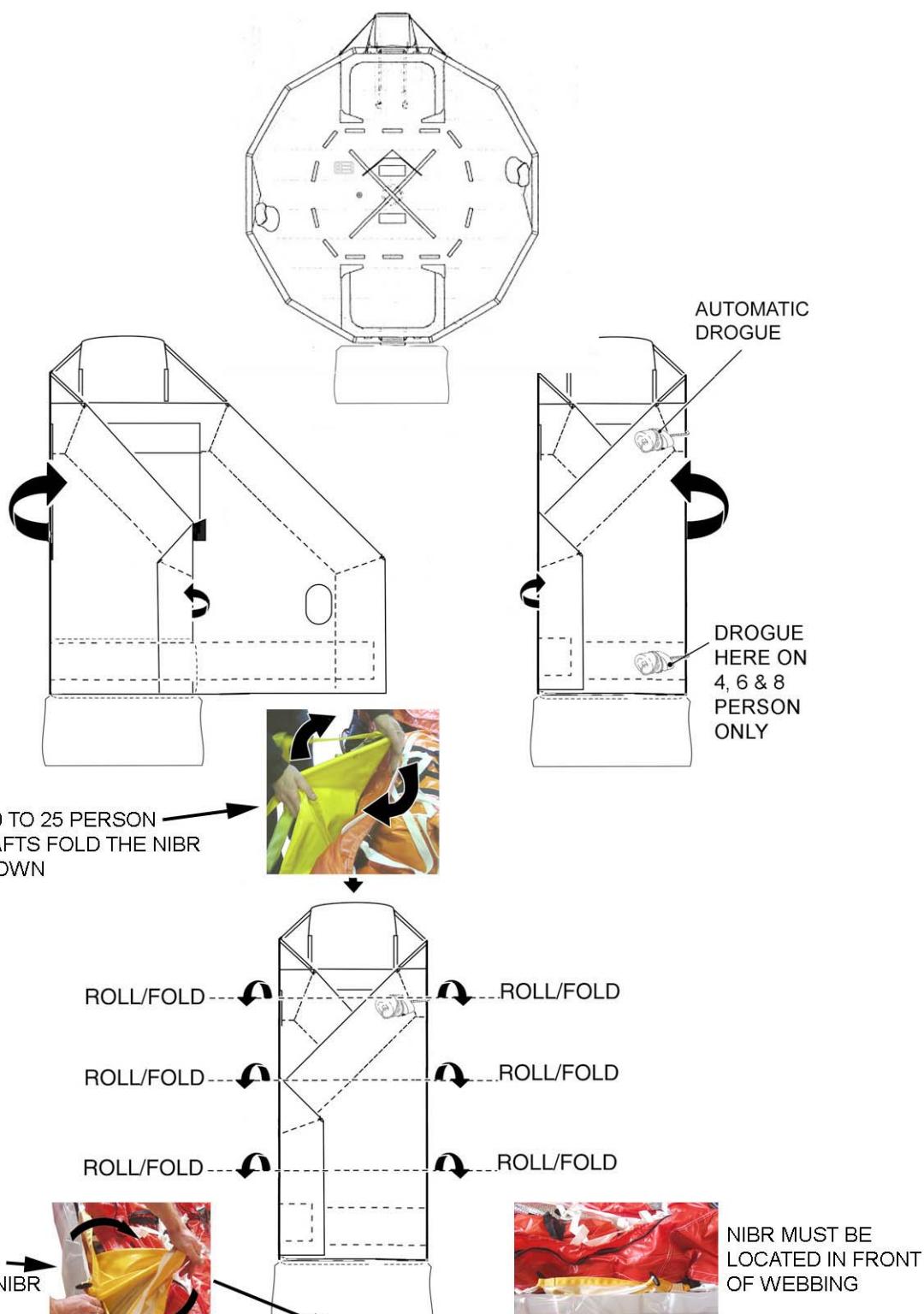
20. Locate the *painter attachment patch* on the lower buoyancy. Tie the *liferaft identification tube* red ribbon through the *painter assembly patch*, using a bowline knot (FIGURE 848).
21. Place the emergency pack valises for each liferaft (refer to Chapter 7). Position the valises centrally, outboard from the cylinder. If present, place the valise(s) containing rations and water positioned furthest from the operating head end of the cylinder.
Utilise the space available to minimise the vertical excursion of the valises.
Ensure the straps on each emergency pack valise are tight.
22. On each valise, tie the flying ends of the two straps to each other using a reef knot. Tie the pack to the inner lifeline, using *525lb / 263 Kgf nylon cord*, with a bowline knot so as to secure the packs to the liferaft.

NOTE: Ensure that when inserting the equipment packs, no parts of the canopy, door or hauling-in line are trapped beneath the packs.

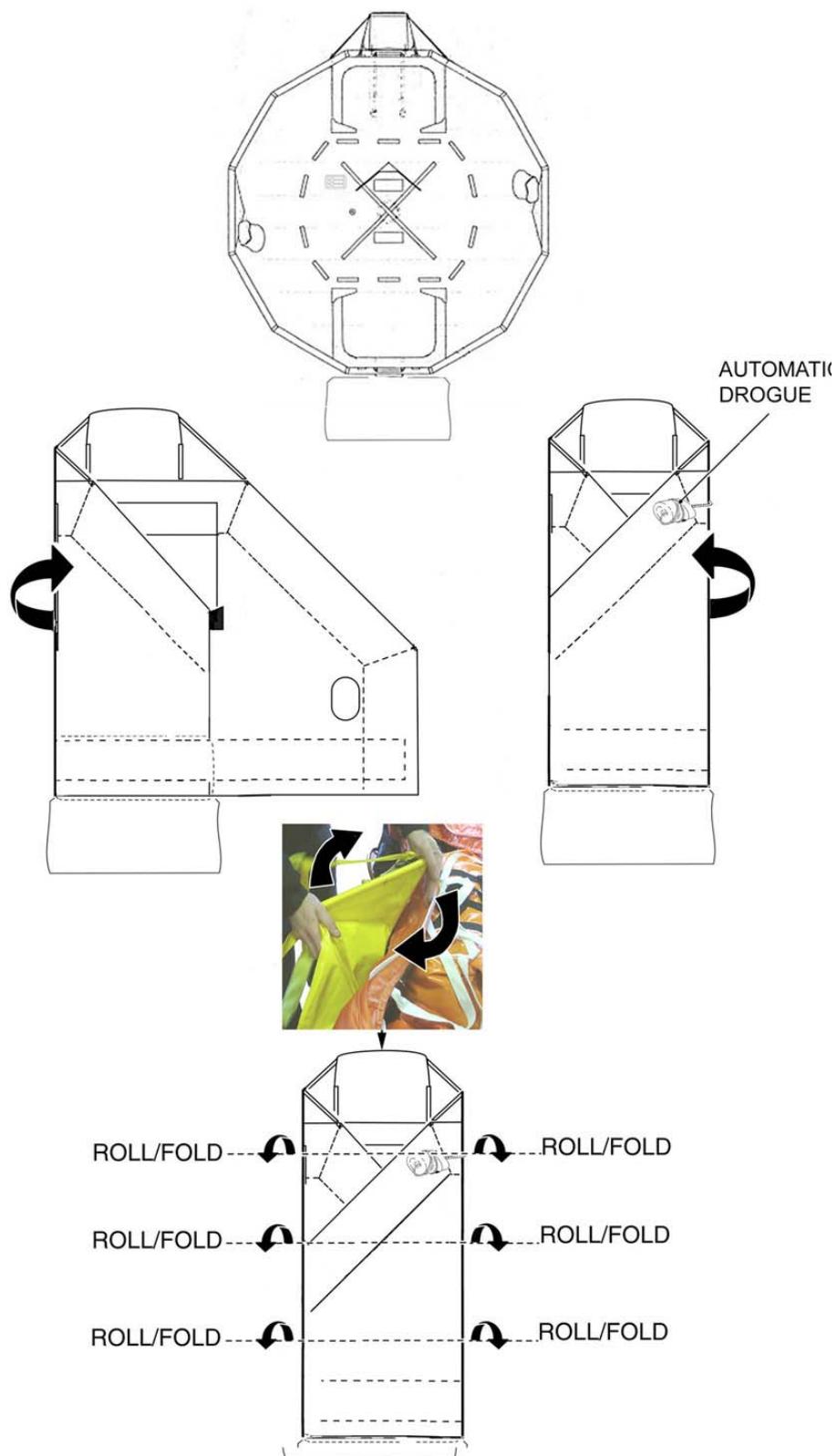
23. Place the hauling in ladder over the valises and tie off to the hauling in ladder floor patches.
24. At the front of the container, fold the polythene sheet over the liferaft, (FIGURE 848).
25. Remove the *painter sachet* from its temporary position on the side of the container. Place the *painter sachet* on top of the left-hand fold, in line with and facing, close to the painter exit hole of the container. Ensure the free run of painter from the sachet is not impeded (FIGURE 848).
26. Using 100 mm (4") wide *self adhesive tape*, secure the rear of the sachet to the polythene sheet, as shown in, (FIGURE 848).
27. Tie the free end of the painter line to the looped painter patch rope.
28. Put the the rubber sheathed end of the *painter line* through the *painter retaining block*. Put the block into the cut-out in the container. (FIGURE 848).

NOTE: If packing a SURVIVA (4 Person) please refer to Page 851.

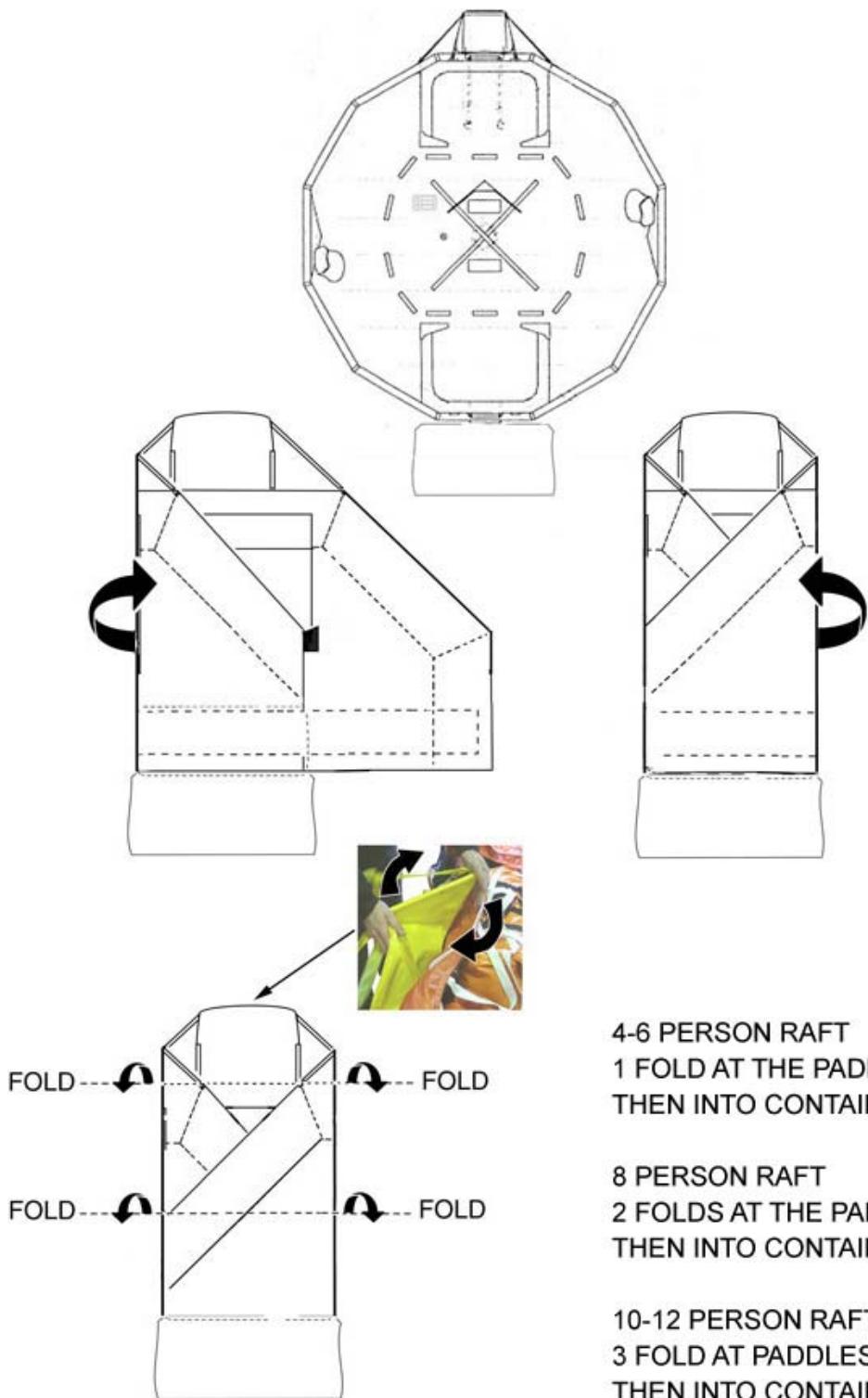
29. Prepare to start the sequence of liferaft folding;
 - (a) Refer to FIGURE 849 to fold into a MK10 container.
 - (b) Refer to FIGURE 850 to fold into a MK14 container.
 - (c) Refer to FIGURE 851 to fold into a MK16 or MK18 container.



Folding the liferaft into MK10 container
FIGURE 849



**Folding the liferaft into MK14 container
FIGURE 850**



4-6 PERSON RAFT
**1 FOLD AT THE PADDLES,
THEN INTO CONTAINER.**

8 PERSON RAFT
**2 FOLDS AT THE PADDLES,
THEN INTO CONTAINER.**

10-12 PERSON RAFT
**3 FOLD AT PADDLES,
THEN INTO CONTAINER**

Folding the liferaft into a Flatpack container
FIGURE 851

NOTE:

The following information on this page applies only to the Surviva MKIII, 4 Person liferaft, being packed into a MK10 container Size 3.

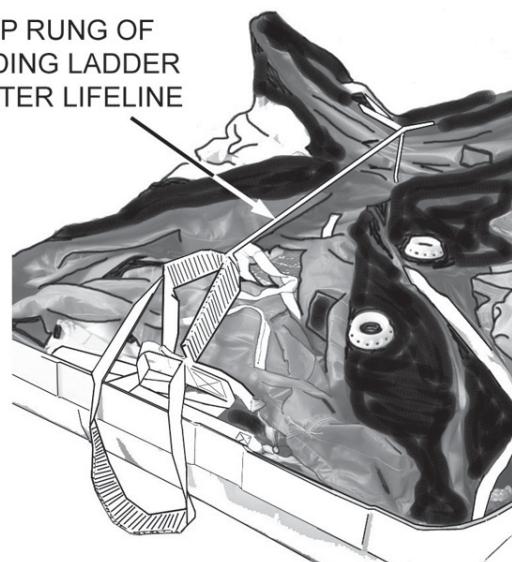
It details the procedure of how the boarding ladder is to be crossed and tied off to the outer lifeline.

1. Open out the *boarding ramp ladder*, then twist it before tucking it into the *container*, (FIGURE 852).
2. Tie a cord (900mm (35")) to the outer lifeline at the rear of the liferaft. Use 50lbs/23Kg *terylene cord* and a round turn 2 half hitch knot.
3. Tie the top rung of the *boarding ramp ladder* to the free end of the cord. Ensure there is 600mm (24") between knots, (FIGURE 853).



Twist and insert boarding ladder
FIGURE 852

TIE TOP RUNG OF
BOARDING LADDER
TO OUTER LIFELINE



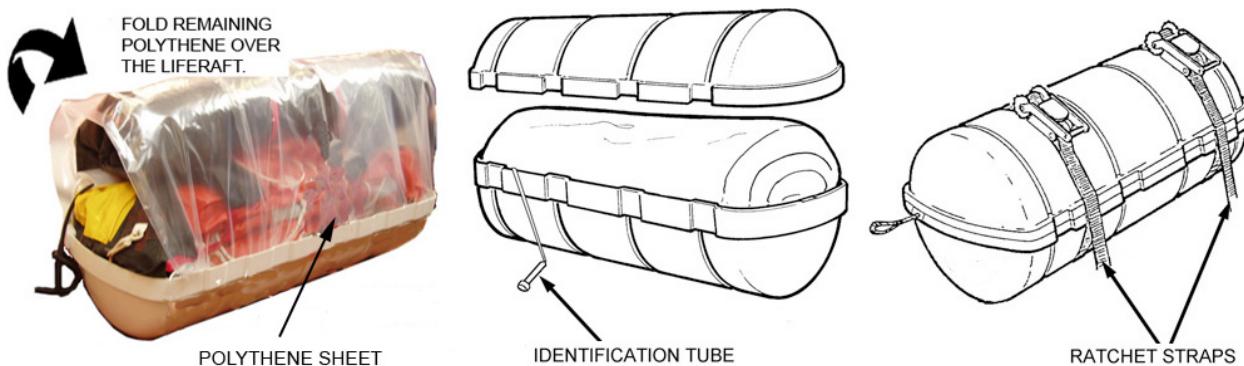
Boarding ladder to outer lifeline
FIGURE 853

30. Remember to insert the automatic *drogue* on top of the folds, just before the actual rolling of the liferaft takes place, (FIGURES 849 and 850 only).

NOTE: One entrance for the 4, 6 and 8 person rafts. Place drogue in along side edge of the raft, (FIGURE 840)

WARNING: REMEMBER THE OPERATING MECHANISM IS ARMED.
EXTREME CARE MUST BE TAKEN DURING ALL FOLLOWING ACTIONS.

31. Cross the *boarding ramp* over and fold it on top of the liferaft.
32. With the liferaft folded and pushed down as far as possible, roll the raft tightly towards and then into the *container*.
33. Wrap the polythene sheeting around the outside of the folded liferaft, tucking the overlap under the liferaft roll, (FIGURE 854).
34. Immediately before closing the *container* make sure that the painter line sachet is:
 - (a) in line with the painter exit,
 - (b) level with the painter exit of the container,
 - (c) attached to the liferaft with self adhesive tape.
35. Ensure that the open end of the *painter sachet*, is as close as possible to the painter exit position on the container. Adjust the painter sachet extension so that the distance from it to the painter exit is between 100- 150mm (4"- 6").

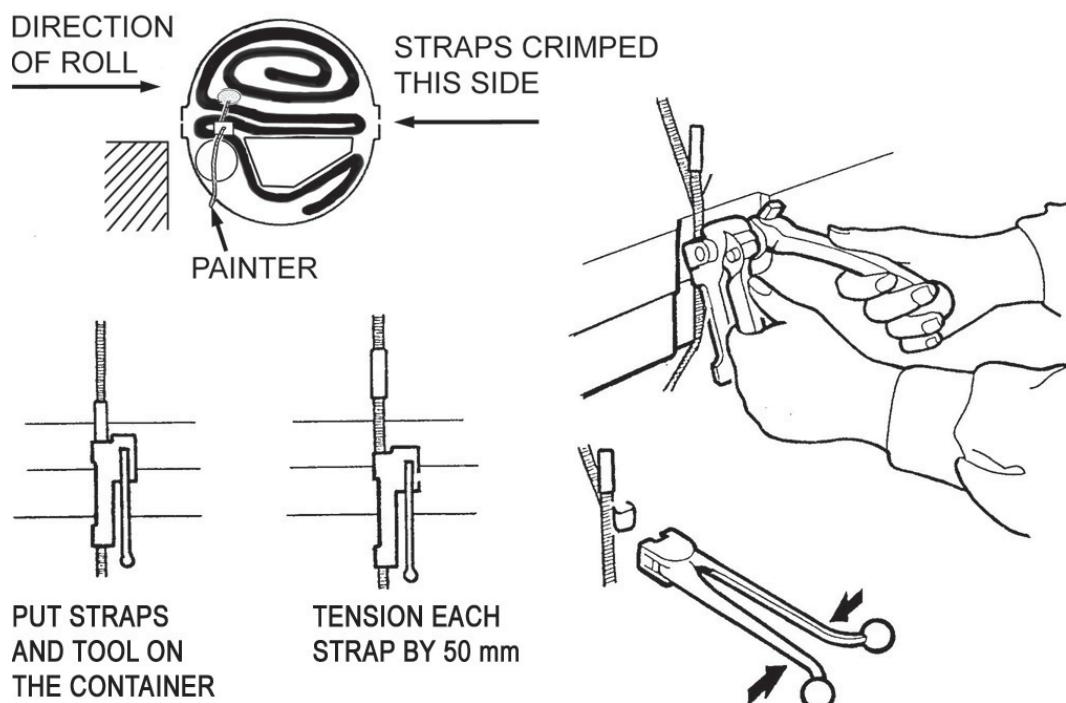


Container closing
FIGURE 854

36. Ensure that there is sufficient distance between the material of the liferaft and the painter line so that they do not touch when painter line is pulled.
37. Put the top half of the *container* on top of the folded liferaft, (FIGURE 854).
38. Put two *ratchet straps* around the *container*, making sure the straps do not cover the grooves in the *container*, (FIGURE 854). Tighten the *ratchet straps* uniformly around the container. Make sure the upper half of the container mates with the lower half of the container correctly.
39. Continue closing the *containers* slowly, while alternating from one strap to the other. Whilst doing so, CAREFULLY position the top half of the container either by striking it with a rubber mallet or by levering it with a hardwood or metal spatula against the bottom half, (FIGURE 854).

The edges of the spatula MUST ALL BE RADIUSED and smooth to avoid damaging the liferaft. Check continuously to ensure that no part of a liferaft becomes trapped between the container lips as they finally close and that the seal is made.

40. Check that the *painter retaining block* on the painter line does not become displaced.



Crimping container strap opposite side to roll
FIGURE 855

WARNING: WHEN TENSIONING OR CRIMPING STRAPS, THE OPERATOR MUST STAND TO ONE SIDE OF THE STRAP. PROPER CLOTHING AND EYE PROTECTION MUST BE WORN. PROPER FOOTING AND BALANCE MUST BE MAINTAINED WHEN OPERATING THE EQUIPMENT. USE SHORT HAND STROKES ONLY DURING TENSIONING.

WARNING: TOO MUCH TENSION WILL BREAK THE STRAP. THIS MAY RESULT IN INJURY TO PERSONNEL.

CAUTION: FOR ALL LIFERAFTS, IT IS ESSENTIAL THAT CRIMPS ARE ATTACHED ON THE OPPOSITE SIDE OF THE CONTAINER TO THE ROLL OF THE LIFERAFT, (FIGURE 855).

CAUTION: ENSURE CORRECT CRIMPING TOOLS ARE USED. PLEASE REFER TO IPL FOR CORRECT LIST).

41. Obtain the *straps* and *crimps*. Tension and *crimp* each *strap* as follows:

NOTE: Please refer to Section 7, of this chapter if applying crimp heat seal option.

- (a) Adjust the ends of each *strap* so that the outer most *strap* end is facing upwards and is approximately 25mm (1") above the rim of the *container*, (FIGURE 855).
- (b) Apply the *tensioning tool* to the *strap* at a point half way across the two rims. Operate the handle to tension the strap until the base of the tensioning tool rests in the lower container rim. Secure the strap with a *crimp*, (FIGURE 855), using the *crimping tool*.

NOTE: It is acceptable to wrap the crimps with several layers of white (1") PVC tape.

42. Put 'DO NOT CUT' tape over the top of the straps in each recess of the *container* (FIGURE 855).

43. Remove the *ratchet straps*.

This completes the packing sequence for the Throw Over liferaft. The *container* is now ready for labelling. Please refer to Chapter 11, Section 3 Container assembly.

7. Container crimps heat sealing option

To encapsulate crimps with a heat shrink sleeve, (see IPL for part numbers), the following procedures should be observed:

1. Slide the strap through the heat-shrink sleeve. Keep the strap ID tag as close as possible to the crimp - the maximum installed separation between these is 10 mm, (FIGURE 856).
2. Apply the tensioning tool to the strap at a point half way across the two rims. Operate the handle to tension the strap until the base of the tensioning tool rests in the lower container rim. Secure the strap with a crimp, (FIGURE 855).

NOTE: The sleeve should be sitting loose in this temporary location. It must not be snagged against the container and strap or between the crimp and strap.

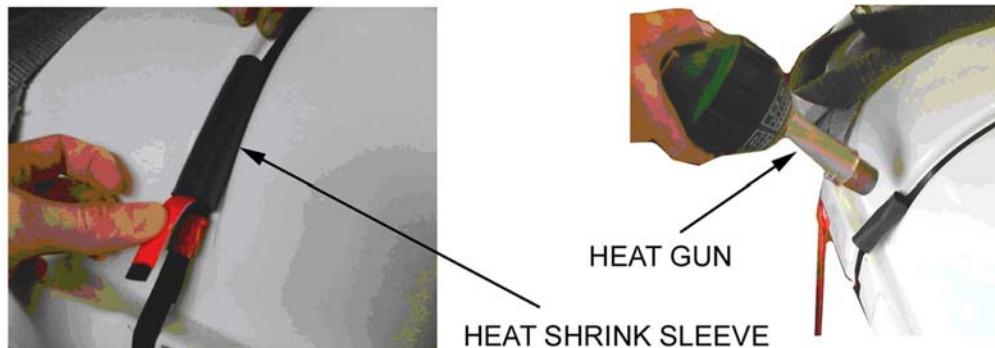
3. Using scissors, carefully trim off the tail of the strap as close as possible to the crimp, but do not trim off the strap ID tag. The maximum distance permitted between the end of the tail and the crimp is 15 mm.
4. Fold the strap ID tag back on itself and slide the heat-shrink sleeve over it. This will hold the folded back tag temporarily in place, (FIGURE 856).

CAUTION: USE THE CORRECT HEAT SHRINK TOOL (see Chapter 10).

CAUTION: A HEAT SETTING GREATER THAN 6 WILL OVERHEAT THE STRAP, WEAKENING IT IN THE PROCESS. DO NOT TO OVERHEAT THE STRAP. DO NOT POINT HEAT GUN DIRECTLY AT THE STRAP. IF ANY DISCOLOURATION IS NOTED IN THE STRAP, IT HAS BEEN OVERHEATED. IN THIS CASE IT MUST BE CUT OFF, DISCARDED AND A REPLACEMENT FITTED.

WARNING: USE EXTREME CARE WITH THE HEAT GUN. ALLOW SUFFICIENT TIME FOR PARTS TO COOL, BEFORE HANDLING DIRECTLY. HEAT GUN NOZZLE WILL REMAIN HOT AFTER USE.

5. With the heat gun at setting at 6, apply heat evenly over the heat-shrink sleeve. The rear of the heat-shrink sleeve should be heated evenly from both left and right hand sides, (FIGURE 856).
6. Ensure that the entire crimp and tail are completely encapsulated and that the heat-shrink sleeve overlaps in both directions by at least 5 mm.
7. Using protective gloves, pinch the ends of the heat-shrink while it is cooling, to ensure that they have sealed tight against the strap.



Fitting a heat shrink sleeve
FIGURE 856

8. Container labelling

- (a) Check that all *labels* are fitted and positioned correctly and securely. Please refer to Chapter 11, Section 3 *Container label identification and position*.
- (b) Record the liferaft details, onto the liferaft *identification label* and insert it into the *identification tube*. Check for legibility and correct details.
- (c) The *liferaft identification* container and any excess tether webbing shall be tucked between the container strapping and the container.
- (d) Tape the IAL compact disc to the container.

This completes the packing sequence and the liferaft is now ready for installation.

CHAPTER 9

STORAGE CONDITIONS AND INSTRUCTIONS

<u>Section</u>	<u>Page</u>
1 General	903
2 Procedure for liferafts not Operationally packed	903
3 Storage limiting period	904
4 Storage of Power units	905

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CHAPTER 9

STORAGE CONDITIONS AND INSTRUCTIONS

1 General

- A Storage conditions for liferafts depend on whether they have been Operationally Packed.

2 Procedure for liferafts that have not been Operationally packed

- A Liferafts that are not operationally packed must be stored in a room that:

- (1) Can be maintained at a temperature of 15 to 21 °C, (59 to 70 °F).
- (2) Is free from direct sunlight.
- (3) Has a dry atmosphere.
- (4) Is free from corrosive fumes or other harmful contamination.

- B Remove components that are easily detachable. Attach transit and recoil caps to the cylinders. Obey the procedure given in the manual 'Assembly and Charging of Transportable Gas Cylinders' to store the gas cylinders.

- C Deflate the liferaft until the fabric creases are sharp and well defined (Refer Chapter 8).

CAUTION: DO NOT STORE MORE THAN THREE LIFERAFTS ON TOP OF ONE ANOTHER.

- D Fold the liferaft to a manageable size, enclose it in stiff waterproof paper and store it above floor level, preferably on slatted shelving to permit air circulation.

- E Tie a label to the liferaft recording the following:

- (1) Liferaft Type, Mark and Serial Number.
- (2) Date of last inflation test.
- (3) Date of last service.

- F Store the liferaft accessories, except the gas cylinders, with the liferaft.

- G Attach dust caps to the delivery hoses. If caps for the hoses are temporarily not available, use adhesive tape to keep dirt out of the hoses.

3 Storage limiting period

- A Following a service, the storage limiting period for the liferaft is 12 months, provided that the storage conditions comply with approved standards (Paragraph A above) and meet with the concurrence of the approval authority of the country concerned. At the end of that period the liferaft must be:
 - (1) unfolded and inspected, before further storage.
 - (2) serviced and tested, prior to being operationally packed for installation on vessel stowages.
- B Liferafts not operationally packed and placed in store (for more than 30 days) must be re-tested before being operationally packed and installed on a vessel (Chapter 5).
- C If a liferaft is operationally packed in a container, it can operate in a wide range of temperature and humidity, equivalent to those found in service worldwide. Always make sure the drainage apertures in the bottom of the container point straight down; make sure they are not blocked by dirt. Do not deliberately make containers wet.
 - (1) Do not direct water from hoses at *containers*.
 - (2) Do not leave containers in flooded places.
- D All lines which go through the *container* to the Liferaft must have protective sheaths at their outer ends. These sheaths will prevent water from seeping into the container. If a line has been pulled from the container to expose a part of the line which is not covered by a sheath, call a Service Station to rectify the packing as soon as possible.
- E Do not roll a container when it is necessary to move it.
- F Operationally packed Liferafts are approved for use on board ship for at least twelve months. National Authorities may grant extensions to the original operational period. At the end of a period of operational use, RFD Beaufort recommend that all liferafts should immediately be opened for inspection and service. Any contaminants which may have entered the container will be removed before they cause damage.

4 Storage of Power units

A The built-in power source, is a lithium-sulphur dioxide balanced cell. The component chemicals of the cell become neutralised after the cell is fully discharged. Obey these guidelines:

- (1) Store power units at temperatures less than 65°C, (149 °F).
- (2) For storage, the units must be isolated from materials which are flammable. Subject to satisfactory condition on receipt, they may remain in their original transit containers.
- (3) If a unit is damaged, or suspected to be damaged, refer to Chapter 6 for the necessary actions.

WARNING: THE UNITS ARE NOT A FIRE RISK, BUT THEY COULD CAUSE A HEALTH RISK IF INVOLVED IN A FIRE. DISPOSAL OF DAMAGED UNITS SHALL BE IN ACCORDANCE WITH LOCAL REGULATIONS.

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CHAPTER 10

SPECIAL TOOLS, EQUIPMENT AND MATERIALS

<u>Section</u>	<u>Page</u>
A Special tools	1003
B Equipment and materials.....	1005

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CHAPTER 10

SPECIAL TOOLS, EQUIPMENT AND MATERIALS

A	<u>Special Tools</u>	<u>Part No.</u>
1	Steel hand roller	05290024
2	Spatula (125mm x 25mm x 3mm) (5" x 1" x 1/8")	05290055
3	Solution brushes: 12 mm wide	05290004
	25 mm wide	05290006
	38 mm wide	05290007
4	'Instantair' couplings: Female	20603001
	Male (plug tail)	05290107
5	Adapter (inflate/deflate valve)	20944001
6	DC Voltmeter (0-10V)	—
7	Resistor (15 ohm/5 watt)	—
8	*Torque spanner	06754009
9	Spanner - Open end (3/8" BSP hose connector)	—
10	Packing machine (painter/operating line)	15389001
11	Ratchet strap	05654009
12	*Tensioning tool - Container straps	see IPL
13	*Crimp securing tool - Container straps	see IPL
14	Torque tool - Thanner OTS-65 valves	06744009
		06745009
15	*Torque tool - Leafield A10 valves (Inner)	08320009
	(Outer)	08321009
16	Operating head torque fitting (DK99)	08007009

*Please note this tool must be serviced regularly.

17	Punch star tool	20354001
18	PRV adaptor tool (OTS 65)	06745009
19	Spanner, Inlet valve, Leafield	08200009
20	Resetting tool, Thanner operating heads	06753009
21	Cylinder valve, Thanner adaptor tool	08749009
22	Recoil cap, Thanner	06749009
23	Grease, Aero Shell 14	07968009
24	Silicone grease, 4 Compound	09050003
25	Safety cap, Thanner operating head	06257009
26	Filling bung, Leafield	08252009
27	Cylinder valve filling tool, Leafield	08253009
28	*Torque drive assembly, Leafield	08218009
29	Resetting tool, Leafield operating heads	08254009

*Please note this tool must be serviced regularly.

B Equipment and Materials
Part No.

1	Vacuum Cleaner c/w Hose	—
2	Water Manometer (120" gauge)	11307019
	Digital Pressure Gauge (0-2000 mb) (Alternative)	06295009
3	Thermometer (hang on manometer)	—
4	Rubber Tubing - $1/8$ " x $3/8$ " i/d x $1/2$ in o/d	—
	(manometer connection)	
5	Dry, Oil-free Air Supply of 80 to 100 psig (6.5 -7.9 bar)	—
	(5.6 to 7.0 kg/cm ²) regulated to 2 psig	
	(140 g/cm ²) for inflation purposes.	
6	Solution of non-detergent Soap and Water	—
7	Lint-free Cloth, clean and dry	—
8	Adhesive	Bostik 486
a.	5 litre Container	02868009
b.	1 litre Container	04929009
9	Methyl Ethyl Ketone (MEK)	04528009
10	Self-adhesive Waterproof Tape, 4" / 100 mm wide Cloth Backed, Black	04834009
11	Self-adhesive Waterproof Tape, 1" / 25 mm wide PVC, White	02096004
12	Tape, double sided 25 mm wide	04834009
13	Tape, double sided 25 mm wide	TA175
14	Fabric, Polyurethane/Nylon, RFD1015/1, Black	10772009
	Single PU proofing (main structure and buoyancies)	
	Alternative fabric, Polyurethane/Nylon, RFD1015/2, Black	10773009
	Double PU proofing (main structure and buoyancies)	
15	Fabric - Nylon, Single-ply (canopy outer fabric)	06785009
	(RFD 1044/1)	
	or	
	Fabric - Nylon, Single-ply (canopy outer fabric)	08006009
	(RFD 1044/2)	

16	Fabric - Nylon, Single-ply (canopy inner fabric)	06315009
17	Toluene Solvent (500 ml)	41445001
18	Tubing, Polythene, Layflat, 50 mm	03224012
	(DL Lanyard & Bowsing line)	
19	Tubing, Polythene, Layflat, 100 mm	05815009
	(Painter line)	
20	Cord, Terylene, 22.5 kg/ 50 Lbs	02236006
21	Cord, Nylon, 238 kg/ 525 Lbs	00933009
22	Thread, Nylon, 4 kgf	02426001
23	Thread, Linen, Breaking, 3.2 kgf	02414006
	(Bowsing line & Drogue)	
24	Thread, Scarlet, Cotton	02403001
	(Painter sachet tie-off)	
25	Seal Mk10/Mk14 Container S/A (10 x 19 mm)	05606009
26	Seal Mk16/ Mk18 Container S/A (10 x 38 mm)	06475009
27	Packing M14 Container (50 x 100 x 1000 mm)	04884009
28	Tape S/A (Do Not Cut)	15384001
29	Webbing 13mm Polyester Undyed	WE11
30	Molytote III	07945009
31	Leak detector kit * ¹	45435001
	(This kit is sufficient to test 40 cylinders)	
32	Heat gun 230V (heat shrink sleeve)	08244009
	Heat gun 110V (heat shrink sleeve)	08245009

*¹ Please refer to US Appendix A-2



CHAPTER 11

ILLUSTRATED PART LIST

<u>Section</u>		<u>Page</u>
1	General	1103
2	Sub-Chapters	1103



1. GENERAL

- A. The parts list has been prepared for the sole purpose of identifying and/or ordering replacement parts, it should not be used for any other purpose.

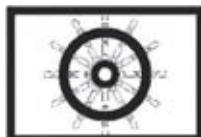
NOTE: Drawings are not to scale; Dimensions where given are in millimetres (mm).

2. SUB-CHAPTERS

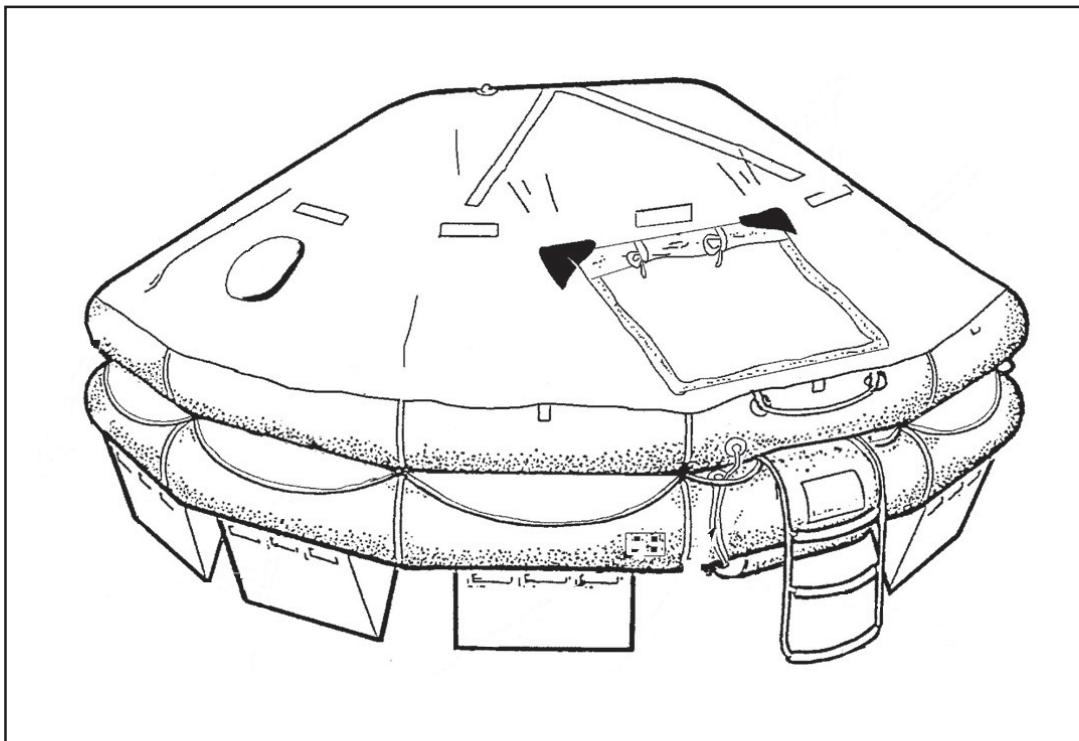
- A. For ease of identification this chapter is broken down into the following sub-chapters.
- (1) Surviva MKIII Liferaft
 - (2) Hull Assembly
 - (3) GRP Container Assembly
 - (4) Inflation equipment
 - (5) Mechanical fixings

NOTE: Information on Emergency Pack types, contents and part numbers is given in Chapter 7 of this document.

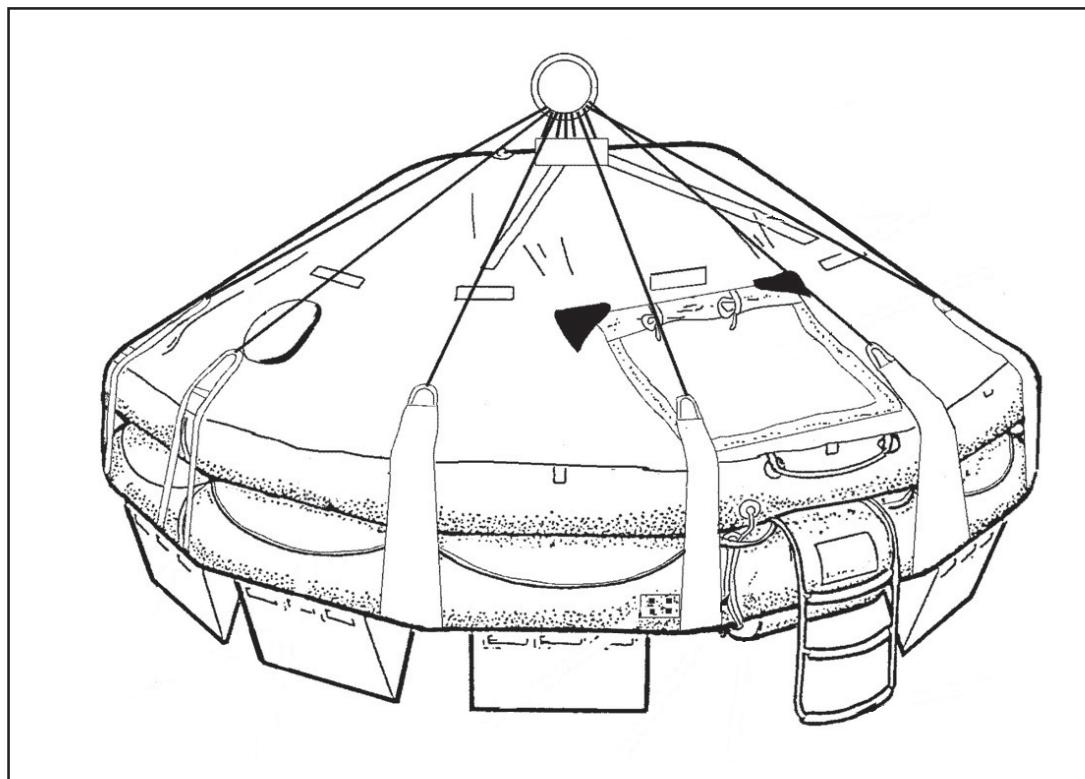
NOTE: The 'Wheelmark' symbol (shown below) indicates an MED compliant item.



(1) Surviva MkIII Liferaft



Typical Surviva MKIII Throwover liferaft
FIGURE 1101



Typical Surviva MKIII Davit Launch liferaft
FIGURE 1102

(2) Hull assembly

The following details the hull level spares in two sub-sections:

- (2a) All-raft spares** - defined as those items (including valves and fabrics) which are **common to all raft sizes**.

These spares form an integral part of, or are attached to, the core raft *before* specific customer and individual authority requirements are applied.

- (2b) Raft specific spares** - defined as those items which **differ depending on raft size**.

These spares form an integral part of, or are attached to, the core raft *before* specific customer and individual authority requirements are applied.

(2a) All-raft spares

The following sub-section details the all-raft spares in terms of nomenclature, part number and the location of the item in relation to the hull assembly.

 	Description:	Lamp unit, inner (RL1)
	Found on:	Archtube assy
	Part Number:	06727009
	Description:	Lamp unit, position indicating (RL4)
	Found on:	Canopy assembly
	Part Number:	06726009
	Description:	Power Unit, Marine
	Found on:	Inner Canopy
	Part Number:	06729009
	Description:	Internal lamp unit (RL5)
	Found on:	Bottom centre line of archtube
	Part Number:	08279009
	Description:	External lamp unit (RL5)
	Found on:	Top of canopy
	Part Number:	08280009

	Description: Line rescue and quoit assembly Found on: Inner lifeline Part Number: 45932001
	Description: Quoit, handle Found on: Line rescue and quoit assembly Part Number: 11501009
	Description: Strap, quoit line and rescue assembly Found on: Quoit line and rescue assembly Part Number: 45932011
	Description: Water pocket Found on: Floor assembly Part Number: 19019002
	Description: Ramp, Boarding, Marine Found on: Upper/lower buoyancy Part Number: 45894001

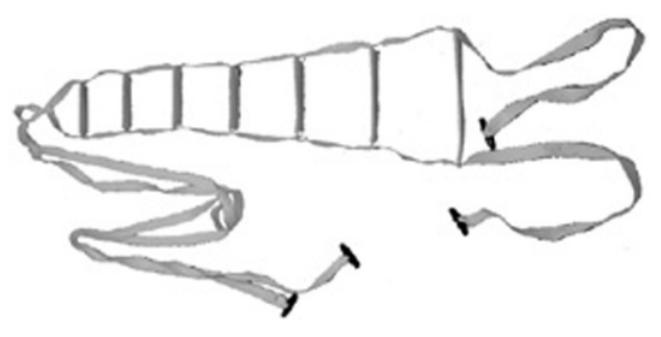
	Description:	Knife, floating, DoT (UK)approved
	Found on:	Upper buoyancy, inside raft
	Part Number:	04503009
	Description:	Plug, rubber, 5/16 in
	Found on:	Rain catchment tube assembly
	Part Number:	05390001
	Description:	Drogue (less swivel)
	Found on:	Drogue patch assembly
	Part Number:	45510101
	Description:	Valve, inflation 2.8mm bore MkIII
	Found on:	Upper buoyancy
	Part Number:	06716009
	Description:	Valve, inflation 2.2 mm bore Mk III
	Found on:	Lower buoyancy
	Part Number:	06715009

	Description:	Valve, A8/1 modified
	Found on:	Upper and lower buoyancy
	Part Number:	20431001
	Description:	Valve, pressure relief 2.90 p.s.i.
	Found on:	Upper and lower buoyancy
	Part Number:	08152009
	Description:	GIST Inlet chk valves 2.2 mm (Yellow)
	Found on:	Lower buoyancy
	Part Number:	08209009
	Description:	GIST Inlet chk valves 2.8 mm (Purple)
	Found on:	Upper buoyancy
	Part Number:	08210009
	Description:	GIST PRV A10 2.8 Psi
	Found on:	Upper buoyancy & Lower buoyancy
	Part Number:	08223009

	Description: Nylon fabric to RFD1015/1 (Black single-ply nylon coated on one face with polyurethane)- minimum usable width 1500mm	Part Number: 10772009
	Description: Nylon fabric to RFD1015/2 (Black single-ply nylon coated on both faces with polyurethane)- minimum usable width 1500mm	Part Number: 10773009
	Description: Floor retaining tab	Found on: Liferaft floor
	Part Number: 50288001	
	Description: Label, service record (attaches to exhausted Service Record Chart found on rear of Liferaft Identification Label)	Part Number: 50207001
 	Description: Tape, reflective (50mm)	Part Number: 07909009 (alternative 04760009)

(2b) Raft specific spares

The following sub-section details the raft specific spares in terms of nomenclature, part number, quantity and the location of the item in relation to the hull assembly.

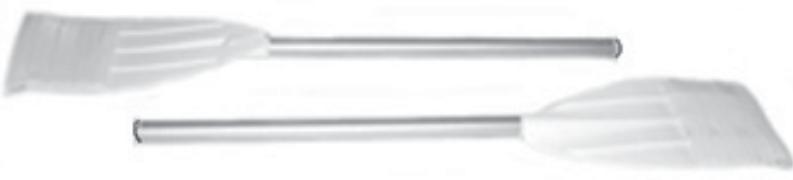


Raft		Part Number
Size (persons)	Launch type	Strap, Righting
4	Throwover	45766011
	Davit	
6	Throwover	45766012
	Davit	
8	Throwover	45766013
	Davit	
10	Throwover	45766015
	Davit	
12	Throwover	45766015
	Davit	
16	Throwover	45766016
	Davit	
20	Throwover	45766017
	Davit	45766018
25	Throwover	45766018
	Davit	

Strap, righting
TABLE 1101

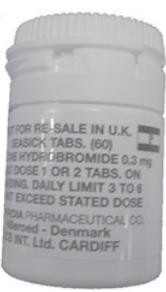
Raft		Part Number		
Size (persons)	Launch type	Strap, attachment (Boarding Ramp)	Stay, (Boarding Ramp)	Strap, Cylinder Retaining
4	Throwover	45894111	50065001	45740001
	Davit			
6	Throwover	45894112	50065002	45740001
	Davit			
8	Throwover	45894113	50065003	45740001
	Davit			
10	Throwover	45894115	50065005	45740002
	Davit			
12	Throwover	45894115	50065005	45740002
	Davit			
16	Throwover	45894116	50065006	
	Davit			
20	Throwover	45894117	50065007	
	Davit	45894118	50065008	
25	Throwover	45894118	50065008	
	Davit			

Raft specific straps and stays
TABLE 1102



Paddles, one piece		
Part Number	Description	Raft/container application
05121009	815 mm long	All Mk10, Mk14 & Mk20 types
05122009	500 mm long	All Mk16 and Mk18 'Flat-pack' types

Paddle, one-piece
TABLE 1103

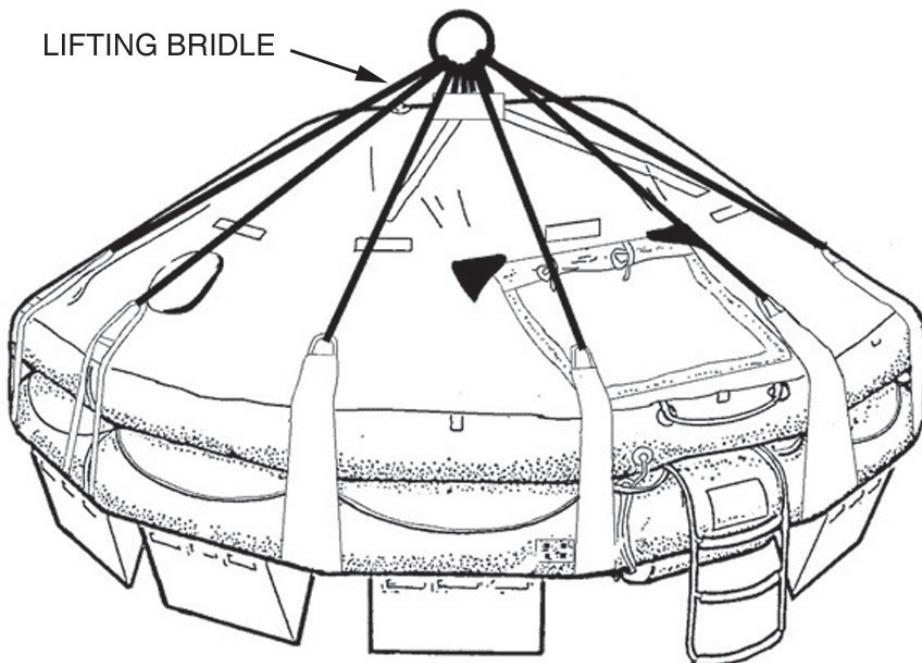


Description: Tablet, Anti-seasickness (Pack of 60)	Attached to:	Inner canopy		
	Part Number:	1174009		
	Allocation by Raft Size			
Raft Size	4-10 TO	12-20 TO and DL	20-25 TO and DL	
Quantity (packs)	1	2	3	

Anti-seasickness tablets - allocation by raft size
TABLE 1104

Typical insulated floor assembly appearance	Raft		Floor, Insulated
	Size (persons)	Launch type	Part No.
	4	Throwover	45772001
		Davit	
	6	Throwover	45773001
		Davit	
	8	Throwover	45774001
		Davit	
	10	Throwover	45776001
		Davit	
	12	Throwover	45776001
		Davit	45776002
	16	Throwover	45777001
		Davit	45777002
	20	Throwover	45778001
		Davit	45779002
	25	Throwover	45779001
		Davit	45779002

Raft specific insulated floor assemblies
TABLE 1105



Typical lifting bridle - Davit launch liferafts only
FIGURE 1103

Raft Size	Bridle, Lifting (DL rafts only)	
	Part Number	
12 DL	20794011	
16 DL	20794021	
20 and 25 DL	20871001	

Davit launch raft specific lifting bridle assemblies
TABLE 1106

(3) GRP Container Assembly spares

NOTE: The part numbers contained in this section are for WHITE GRP containers. Equivalent GREY containers are available on request.

The following sub-sections cover part numbers for the ordering of container assemblies in the form of complete containers or, sub-assemblies, that is, individual container halves (top or bottom) and the specific type and required quantities of Strap and Crimp assembly for each individual container.

The container requirement is determined in this section by one, or all, of the following criteria:

- 1) Launch method, that is, Throwover or Davit launch.
- 2) Drop height, which determines the 'weight' of container. A drop height of up to, but not exceeding 18 metres, (lightweight container) or a drop height of up to, but not exceeding, 36 metres (standard container).
- 3) E-pack option(s) used.
- 4) Raft size.
- 5) Customer preference (container MK number).

The following sub-sections group the relevant part numbers for containers as follows:

Throwovers

- (3a) MK10 containers
- (3b) MK14 containers
- (3c) MK16 containers
- (3d) MK18 containers

Davit launch

- (3e) MK10 containers
- (3f) MK14 containers
- (3g) MK20 containers

3a) MK10 Throwover lightweight and standard weight GRP containers

The following sub-section details the part numbers for Mk10 Throwover container spares:

**Size 3****Size 4****Size 6****Size 7****Size 9****Mk10 Throwover GRP containers
FIGURE 1104**

Mk10 Throwover Containers												
Container size	Raft	Standard weight (up to 18 metres stowed height)			Heavy weight (up to 36 metres stowed height)			Heavy weight (up to 40 metres stowed height)				
		Complete	Upper	Lower	E-pack option	Complete	Upper	Lower	E-pack option	Complete	Upper	Lower
3	4	42271031	42271131	42271231	A & B	17938031	17938131	17938231	A & B	-	-	-
	6				B				B			
	8				B				B			
4	6				A				A			
	8	42271041	42271141	42271241	A	17938041	17938141	17938241	A	-	-	-
	10				B				B			
	12				B				B			
6	10				A				A			
	12	42271061	42271161	42271261	A	17938061	17938161	17938261	A	-	-	-
	16				B				B			
7	16				A				A	43808071	43808171	43808271
	20	42271071	42271171	42271271	B	17938071	17938171	17938271	B	-	-	-
	25				B				B			
9	20	42271091	42271191	42271291	A	17938091	17938191	17938291	A	-	-	-
	25				A				A			

Mk10 Throwover GRP container information
TABLE 1107

(3b) Mk14 Throwover (TO) GRP containers

The following sub-section details the part numbers for the Mk14 Throwover GRP container spares:

Container size	Raft	Standard weight (up to 18 metres stowed height)			Standard weight (up to 36 metres stowed height)			Strap and crimp Qty
		Part Number	E-pack option	Complete	Upper	Lower	Part Number	E-pack option
12	6	21041001	21041011	21041021	A & B	-	-	-
	8				A & B	-	-	-
	10			B				
	10			A				
14	12	50262012	50262021	50262032	-	50262012	50262032	A 21043001
	16			-				A & B
	20			B				A & B
	20			A				-
17	25	50263012	50263021	50263032	A & B	-	-	41295001
								8

Mk14 Throwover GRP container information
TABLE 1109

(3c) Mk16 Throwover GRP containers

The following sub-section details the part numbers for the Mk16 Throwover GRP container spares:



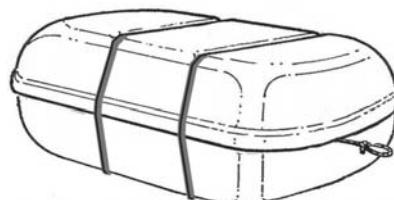
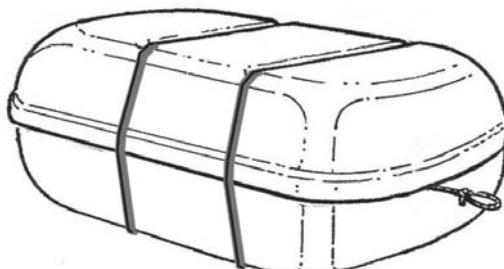
Mk16 Throwover GRP container
FIGURE 1105

Mk16 Throwover container								
Container size	Raft size	up to 36 metres stowed height				Strap and crimp		
		Part Number			E-pack option	Part Number & Description	Qty	
2	12	Complete	Upper	Lower	A	41423001	4	

Mk16 Throwover GRP container information
TABLE 1111

(3d) Mk18 Throwover (TO) GRP containers

The following sub-section details the part numbers for the Mk18 Throwover GRP container spares:

**Size 1****Size 3**

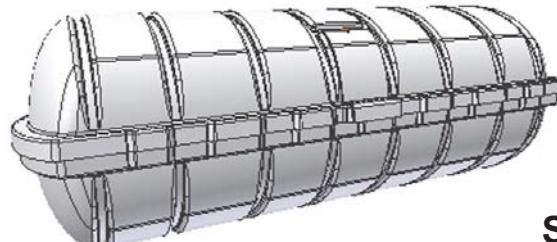
Mk18 Throwover (TO) GRP container
FIGURE 1106

Mk18 Throwover containers							
Container size	Raft size	up to 18 metres stowed height			Strap and crimp		
		Part Number			E-pack option	Part Number & Description	Qty
1	4	43042002	43042101	43042202	A&B	21043001	2
	6				B		
3	6	43043002	43043101	43043202	A	21043001	2
	8				A&B		

Mk18 Throwover (TO) GRP container information
TABLE 1112

(3e) Mk10 Davit-launch (DL) GRP containers

The following sub-section details the part numbers for Mk10 Davit-launch GRP container spares


Size 9
Mk10 Davit-launch (DL) GRP containers c/w cover
FIGURE 1107

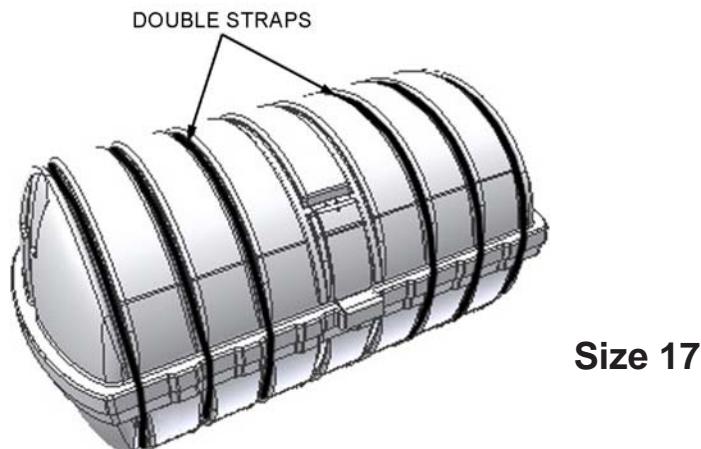
Mk10 Davit Launch containers						
Container size	Raft size	up to 36 metres stowed height				Strap and crimp
		Part Number			E-pack option	Part Number & description
4	12	20843041	20843141	20843241	B	41423001 RED label with WHITE print
6	12	20843061	20843161	20843261	A	
	16				B	
7	16	20843071	20843171	20843271	A	8
	20				B	
	25				B	
9	20	20843091	20843191	20843291	A	8
	25				A	

Mk10 Davit-launch (DL) GRP container information
TABLE 1108

(3f) Mk14 Davit-launch (DL) GRP containers

The following sub-section details the part numbers for the Mk14 Davit-launch GRP container spares:

NOTE: No straps are placed in the centre grooves.



Mk14 Davit-launch (DL) GRP container
FIGURE 1108

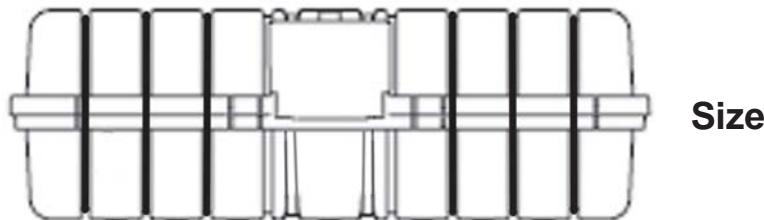
Mk14 Davit launch containers							
Container size	Raft size	up to 36 metres stowed height				Strap and crimp	
		Part Number			E-pack option	Part Number & Description	Qty
		Complete	Upper	Lower			
17	25	50263042	50263021	50263033	A&B	41295001	8

Mk14 Davit-launch (DL) GRP container information
TABLE 1110

(3g) Mk20 GRP containers

The following sub-section details the part numbers for the Mk20 GRP container spares:

NOTE: No straps are placed in the centre grooves.



Mk20 GRP container
FIGURE 1109

Mk20 Davit launch containers								
Container size	Raft size	up to 36 metres stowed height					Strap and crimp	
		Part Number				E-pack option	Part Number	Qty
7	25	50220002	50220021	50220032	50220061	A/B	21061001	6

Mk20 Containers		
Item	Description	Part Number
Strip rubber	50 x 6 x 90 mm	07996009
Adhesive	-	02868009

Mk20 container information
TABLE 1113

(3h) Common container spares

The following sub-section details the container spares common to all raft sizes:

	Description:	Block, Painter Retaining
	Applications:	All rafts
	Part Number:	20883001
	Description:	Sachet Assembly, Painter
	Applications:	For applications and part numbers see TABLE 1114
	Description:	Strap and Crimp
	Applications:	For applications and part numbers see corresponding container tables.
	Description:	Container Assembly, Liferaft Identification
	Applications:	All rafts
	Part Number:	43858001
	Description:	Description: Label, identification
	Applications:	All rafts
	Part Number:	43859011

(3i) Raft specific container spares

The following sub-section details the container spares which are specific to raft sizes.

Liferaft launch type	Maximum installation height (metres)		
	18	25	36
Throwoverboard	15323111	15323121	15323131
Davit	15323111	15323121	21204041

Sachet, painter assembly - applications
TABLE 1114

NOTE: TABLE 1114 quotes maximum installation height. It should be understood that actual painter cord length is 10 metres longer than the maximum installation height. I.E., a container at 36 metres installation height has an actual painter cord length of 46 metres.

Container Application	Container Size	Strap and Crimp Assembly			
		Part number	Description	Length	Qty
Mk10	3	50450001	Sleeve crimp corrosion protection	75mm	4
	4				4
	6				6
	7				8
	9				8
	Mk14				8
Mk20	17				6
	Mk20				
	7				

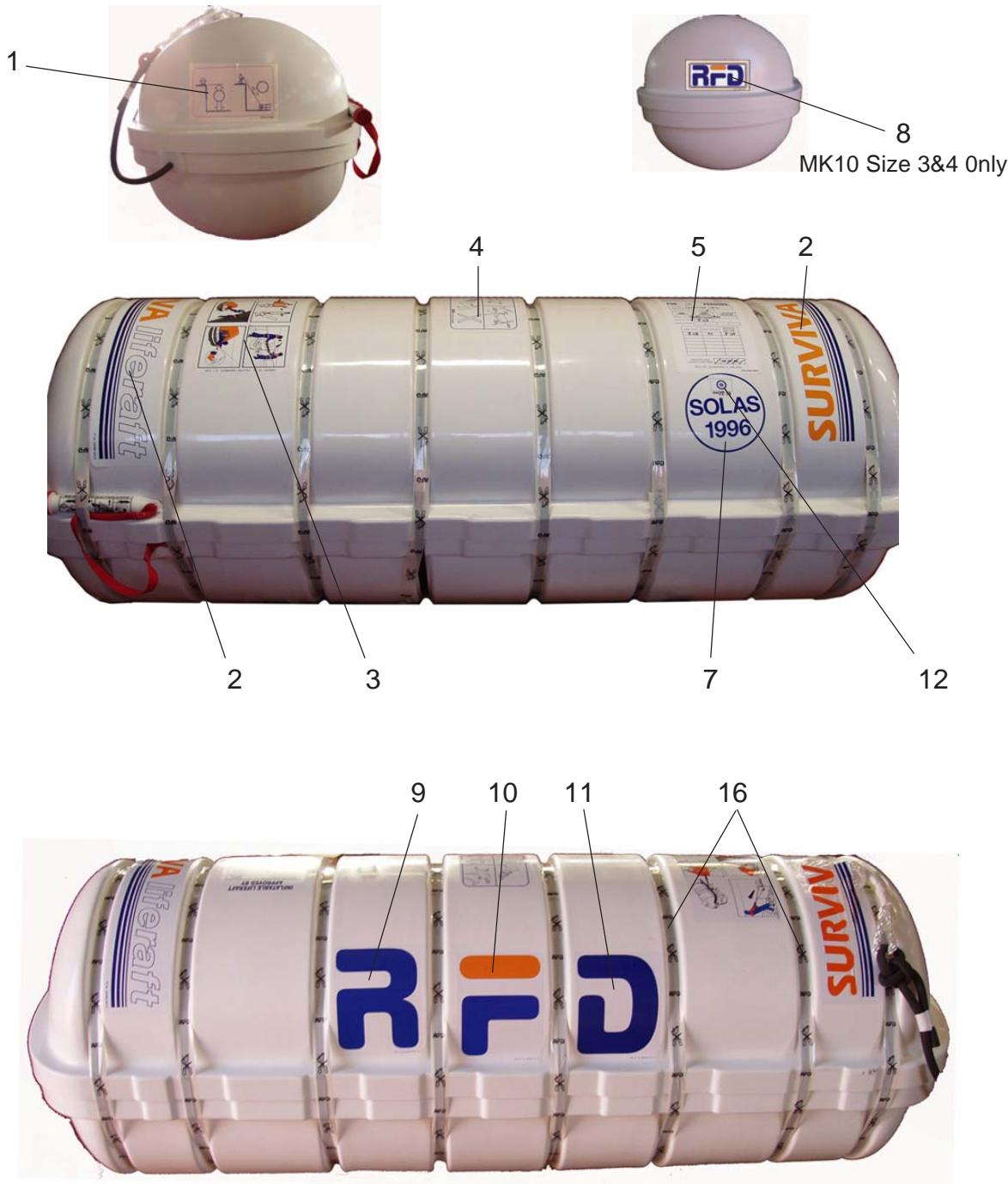
Sleeve protective crimp option
TABLE 1115

Crimp securing tool Part No.	Description	Strapping material SIGNODE Code No.	Strap & Crimp Part Nos.	Strap tensioning tool Part No.
08728009	Tool crimp securing	D504	15372001	04876009
			21043001	
04877009	Tool crimp securing	D506	21061001	04876009
			21030001	
		D508	21362001	
			41295001	
			41423001	

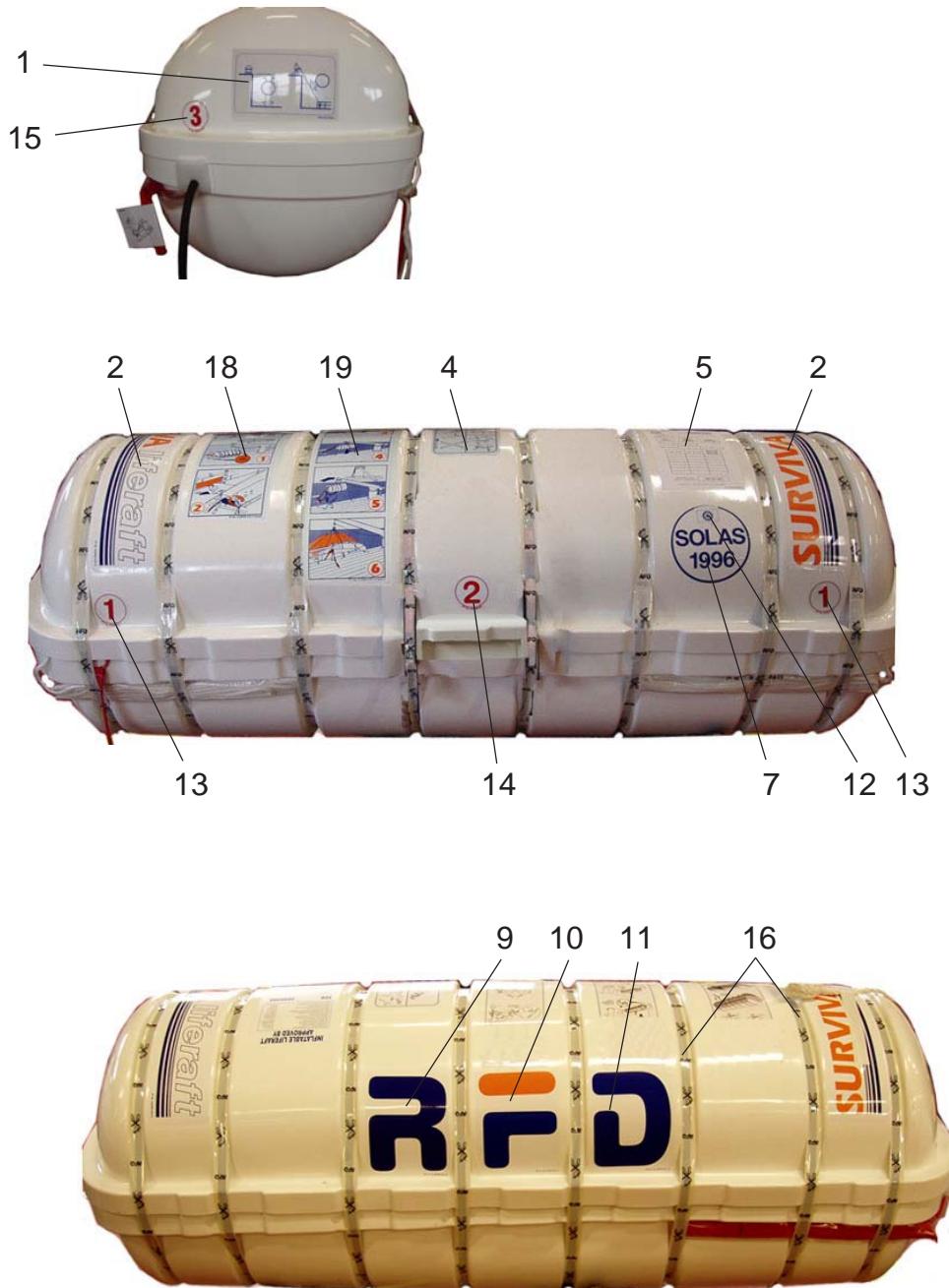
Strapping material and corresponding crimping tools
TABLE 1116

(3j) Container label identification and position

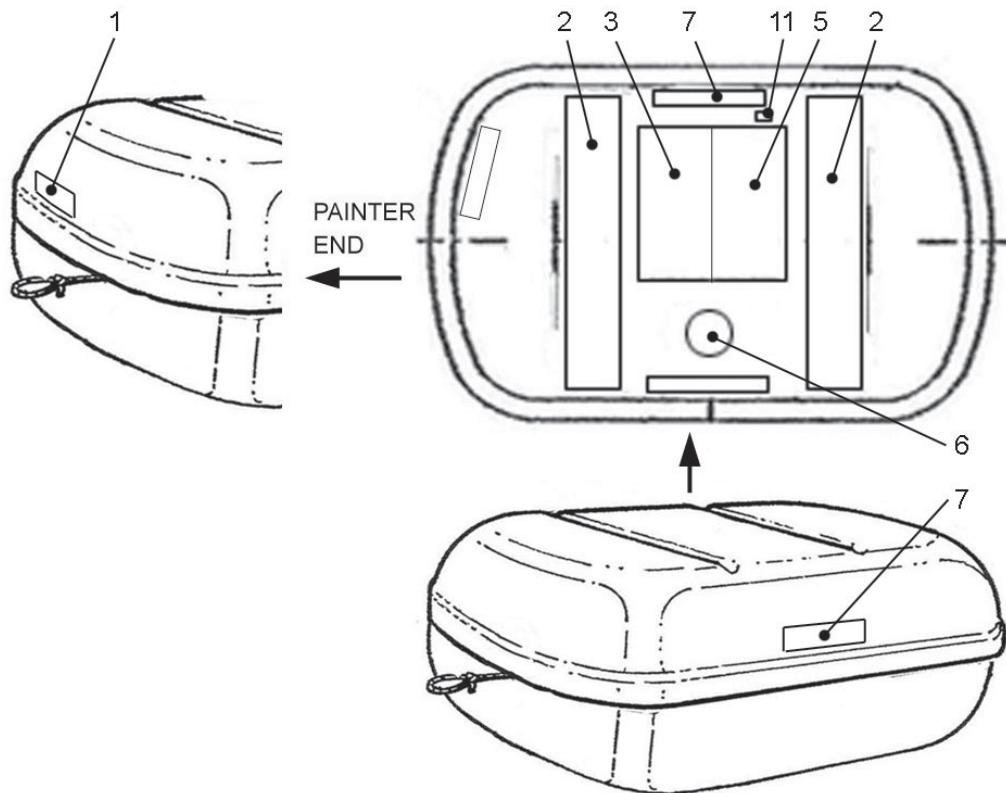
The following sub-section details the container label identification and position for the most commonly used container types:



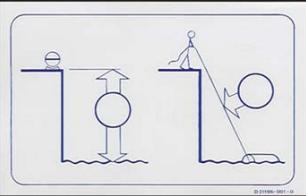
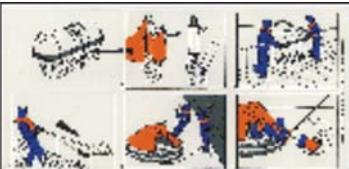
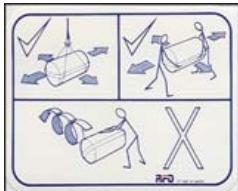
**THROWOVER Container label identification and positioning
FIGURE 1110**

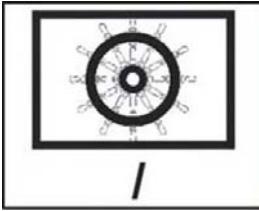


DAVIT LAUNCH Container label identification and positioning
FIGURE 1111



MK18 Container (Sizes 1 & 3)
Label identification and positioning
FIGURE 1112

1		Description:	Label, Max Drop/Painter length
		Application:	All rafts
		Part Number:	21196001
2		Description:	Label, S/A logo, SURVIVA
		Application:	All rafts
		Part Number:	20765001
3		Description:	Label, Visual instruction
		Application:	Throwover ONLY
		Part Number:	05656001
4		Description:	Label, Do Not Roll
		Application:	All rafts
		Part Number:	41144001
5		Description:	Label Data
		Application:	All rafts
		Part Number:	04819001
6		Description:	Poster launch procedure
		Application:	Throwover ONLY
		Part Number:	02174011
7		Description:	Label, 'SoLaS 96'
		Application:	All rafts (except 4 person)
		Part Number:	43869001

8		Description:	Label, Trademark 'RFD'
		Application:	Mk10 size 3 and 4 rafts ONLY
		Part Number:	06231001
9		Description:	Label, Trademark 'R'
		Application:	All rafts EXCEPT Mk10 size 3 and 4
		Part Number:	20958011
10		Description:	Label, Trademark 'F'
		Application:	All rafts EXCEPT Mk10 size 3 and 4
		Part Number:	20958021
11		Description:	Label, Trademark 'D'
		Application:	All rafts EXCEPT Mk10 size 3 and 4
		Part Number:	20958031
12		Description:	Label, Wheelmark
		Application:	All rafts (except 4 person)
		Part Number:	43973001
13		Description:	Label, '1'
		Application:	Davit Launch ONLY
		Part Number:	20085011
14		Description:	Label, '2'
		Application:	Davit Launch ONLY
		Part Number:	20085021

15		Description: Label, '3' Application: Davit Launch ONLY Part Number: 20085031
16		Description: Tape, 'DO NOT CUT' Application: All rafts Part Number: 15384001
17		Description: I.A.L. compact disc Application: All rafts Part Number: 50976001
18		Description: Label, Launch DL Application: Davit Launch ONLY Part Number: 20924011
19		Description: Label, Launch DL Application: Davit Launch containers ONLY Part Number: 20924021
20		Description: Label, Launch Procedure Application: Davit Launch ONLY Part Number: 20879001
21		Description: Leaflet, Installation Application: All rafts Part Number: 43409001

NOTE:

The 'WheelMark' label is applied to all rafts with the exceptions of :

- 4 Person liferafts.
- ALL United States Coast Guard and Transport Canada liferafts

(4a) Inflation equipment - common spares

This sub-section lists the hoses and protection pads, associated with the cylinders, which are common across the entire range of liferafts regardless of size or type.

	Description:	Hose, 800mm, Thanner
	Found on:	Inflation system
	Part Number:	06719009
	Description:	Head, Operating, Thanner, DK99
	Found on:	Cylinder
	Part Number:	08008009
	Description:	Bolt, Banjo, Thanner, MkIII inflation valve
	Found on:	Inflation hose/buoyancy
	Part Number:	06760009
	Description:	Washer, fibre, inner, MkIII inflation valve
	Found on:	Nut, Union
	Part Number:	06761009
	Description:	Washer, fibre, outer, MkIII inflation valve
	Found on:	Nut, Union
	Part Number:	06762009

	Description:	GIST Hose assembly, 800 mm Leafield
	Found on:	Inflation system
	Part Number:	08255009
	Description:	Head, Operating, GIST - outlet Leafield
	Found on:	Cylinder
	Part Number:	08211009

(4b) Cylinders and inflation equipment - associated spares

This sub-section lists the spares associated with the cylinders and inflation equipment:

	Description:	Adaptor, Cylinder, DIN477, Thanner
	Found on:	Used on TPED cylinders
	Part Number:	08387009
 A	Description:	Membrane assembly, 250 bar, Thanner (A)
	Found on:	Used on TPED cylinders adaptor (06772009)
	Part Number:	06457009

(4c) Cylinders (European TPED Compliant)

TABLE 1117 lists the part numbers and applications of charged cylinders (including CO₂ and N₂ charges) and bare cylinders (including volume) with respect to the raft size/ launch method.

CYLINDERS - Thanner Inflation System											
Raft		Description Charged Cylinders			Bare Cylinder						
Size persons	Launch type	Part No.	CO ₂ Charge (Kg)	N ₂ Charge (Kg)	Part No.	Volume (Ltr)	Test Pressure (BAR)	QTY			
4	Throw over	41682002	1.98	0.06	41712001	3.5	250	1			
	Davit										
6	Throw over	41683002	2.50	0.16	*41713001	5.0	250	1			
	Davit										
8	Throw over	41684002	3.51	0.23	41714001	6.7	250	1			
	Davit										
10	Throw over	41686002	5.94	0.18	41716001	10.2	250	1			
	Davit										
12	Throw over	41686002	5.94	0.18	41716001	10.2	250	1			
	Davit										
16	Throw over	41687002	8.44	0.37	41717001	15.5					
		41687004			50511001	13.4					
	Davit	41687002			41717001	15.5					
		41687004			50511001	13.4					
20	Throw over	41687002	8.44	0.37	41717001	15.5					
		41687004			50511001	13.4					
	Davit	41945002	11.26	0.36	41947001	16.9					
25	Throw over	41945002	11.26	0.36	41947001	16.9					

**Cylinder information (European TPED Compliant)
(Thanner inflation)**
TABLE 1117

* Alternative cylinder Pn 50847001 maybe used.

Cylinders - associated equipment (European TPED Compliant)

TABLE 1118 lists the applications of operating heads, adaptors, membranes and labels with respect to the raft size/launch method and charged cylinder type.

CYLINDERS - Thanner Inflation System								
Liferaft		Charged cylinder type	Operating Head		Adaptor	Membrane		Rating (BA)
Size persons	Launch type		DK99	DK94 (Option)				
4	Throw over	41682002	08008009	06721009	08387009	06457009	250	
	Davit							
6	Throw over	41683002	08008009	06721009	08387009	06457009	250	
	Davit							
8	Throw over	41684002	08008009	06721009	08387009	06457009	250	
	Davit							
10	Throw over	41686002	08008009	06721009	08387009	06457009	250	
	Davit							
12	Throw over	41686002						
	Davit							
16	Throw over	41687002 or 41687004						
	Davit							
20	Throw over	41687002 or 41687004						
	Davit	41945002						
25	Throw over	41945002						
	Davit							

Cylinders - associated equipment (European TPED Compliant)

(Thanner inflation)

TABLE 1118

NOTE:

The Part number 41674001 for the cylinder label is common in all applications.

(4d) Cylinders (European TPED Compliant) (Leafield inflation)

TABLE 1119 lists the part numbers and applications of charged cylinders (including CO₂ and N₂ charges) and bare cylinders (including volume) with respect to the raft size/ launch method.

CYLINDERS - Leaffield Inflation System									
Raft		Description Charged Cylinders			Bare Cylinder				
Size persons	Launch type	Part No.	CO ₂ Charge (Kg)	N ₂ Charge (Kg)	Part No.	Volume (Ltr)	Test Pressure (Bar)	QTY	
4	Throw over	50463003	1.98	0.06	41712001	3.5	250	1	
	Davit								
6	Throw over	50463004	2.50	0.16	*41713001	5.0	250	1	
	Davit								
8	Throw over	50463005	3.51	0.23	41714001	6.7	250	1	
	Davit								
10	Throw over	50463007	5.94	0.18	41716001	10.2	250	1	
	Davit								
12	Throw over	50463007	5.94	0.18	41716001	10.2	250	1	
	Davit								
16	Throw over	50463008	8.44	0.37	41717001	15.5			
		50463010			50511001	13.4			
	Davit	50463008			41717001	15.5			
		50463010			50511001	13.4			
20	Throw over	50463008	8.44	0.37	41717001	15.5			
		50463010			50511001	13.4			
	Davit	50463009	11.26	0.36	41947001	16.9			
25	Throw over	50463009	11.26	0.36	41947001	16.9			

**Cylinder information (European TPED Compliant)
(Leafield inflation)**
TABLE 1119

* Alternative cylinder Pn 50847001 maybe used.

**Cylinders - associated equipment (European TPED Compliant)
(Leaffield inflation)**

TABLE 1120 lists the applications of operating heads, adaptors, membranes and labels with respect to the raft size/launch method and charged cylinder type.

CYLINDERS - Leaffield Inflation System						
Raft		Charged cylinder type	Operating Head	Adaptor	Membrane	
Size persons	Launch type	Part Number				Rating (BAR)
4	Throw over	50463003	08211009	08221009	08217009	250
	Davit					
6	Throw over	50463004	08211009	08221009	08217009	250
	Davit					
8	Throw over	50463005	08211009	08221009	08217009	250
	Davit					
10	Throw over	50463007	08211009	08221009	08217009	250
	Davit					
12	Throw over	50463007				
	Davit					
16	Throw over	50463008 or 50463010				
	Davit					
20	Throw over	50463008 or 50463010	08211009	08221009	08217009	250
	Davit					
25	Throw over	50463009				
	Davit					

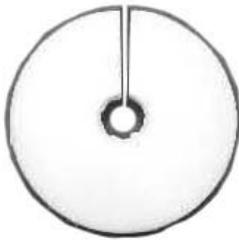
**Cylinders - associated equipment (European TPED Compliant)
(Leaffield inflation)**
TABLE 1120

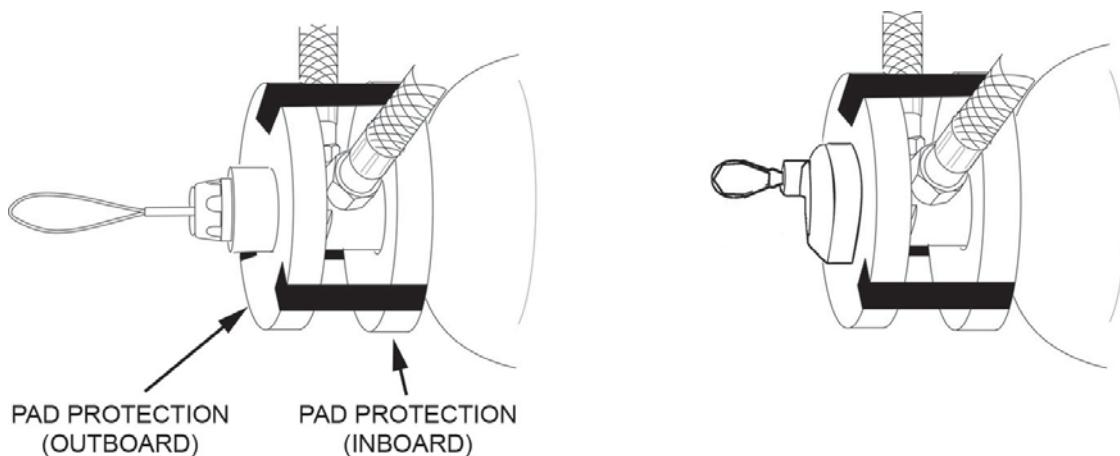
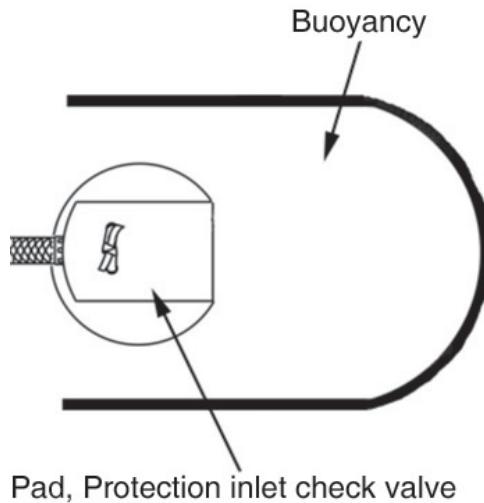
NOTE:

The Part number 41674001 for the cylinder label is common in all applications.

(4e) Foam protection - operating head and inflation system

The following sub-section details the foam protection pads directly associated with the operating head and inflation system.

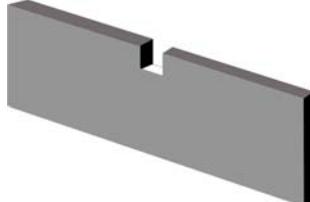
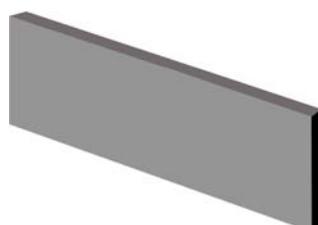
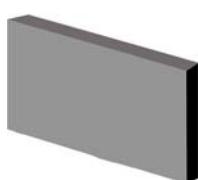
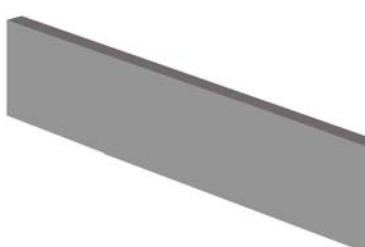
	Description: Pad, protection, operating head (DK99) - inboard
	Found on: Inflation system, (both types)
	Part Number: 50067003
	Description: Pad, protection, operating head (DK99) - outboard
	Found on: Inflation system, Thanner
	Part Number: 50067001
	Description: Pad, protection, inlet check valve
	Found on: Inflation system, (both types)
	Part Number: 50067002
	Description: Pad, protection, inlet check valve
	Found on: GIST Inflation system, Leafield
	Part Number: 50067006



Foam protection for operating head and inflation system
FIGURE 1113

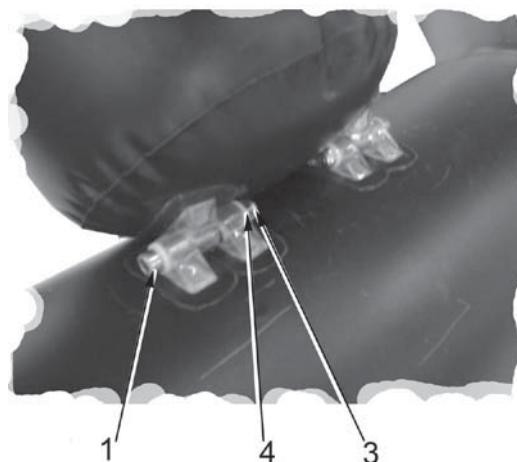
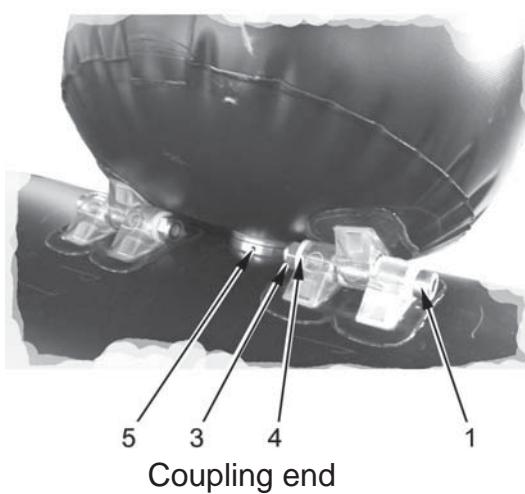
(4f) Foam protection - containers

The following sub-section details the foam protection pads associated with containers.

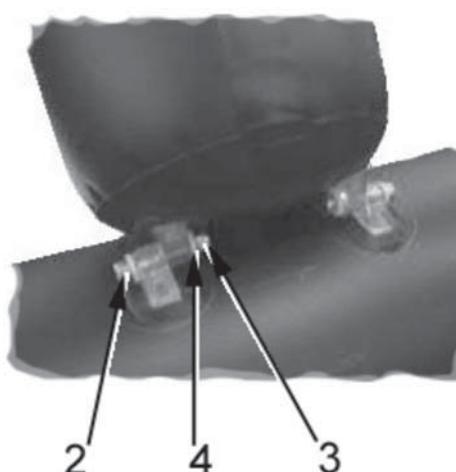
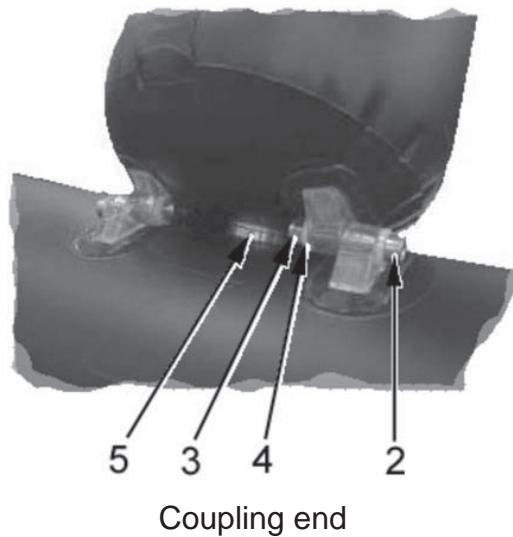
1		Description:	Polystyrene 10mm x 100mm x 1000mm
		Found on:	MK14 upper container
		Part Number:	04884009
2		Description:	Chute block foam
		Found on:	Mk 20 container
		Part Number:	45283031
3		Description:	Lining foam, end
		Found on:	Mk 20 container
		Part Number:	50356004
4		Description:	Lining foam, end
		Found on:	Mk 20 container
		Part Number:	50356003
5		Description:	Lining foam, long side
		Found on:	Mk 20 container
		Part Number:	50356002
6		Description:	Lining foam, long side
		Found on:	Mk 20 container
		Part Number:	50356001

(5) Mechanical fixings

This sub-section lists the mechanical fixings associated with the attachment of the archtube to the upper buoyancy.

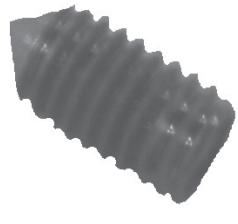


Archtube to buoyancy attachment for 16, 20 and 25 person Throwover and Davit launch liferafts.



Typical archtube to buoyancy attachment for 4, 6, 8 and 10 person Throwover liferafts and 12 person throwover and davit launch liferafts

Archtube to buoyancy attachments
FIGURE 1114

1		Description:	Screw, M10 x 80 socket head, stainless steel
		Found on:	Upper buoyancy/archtube interface
		Part Number:	07961009
2		Description:	Screw, M10 x 60 socket head, stainless steel
		Found on:	Upper buoyancy/archtube interface
		Part Number:	07962009
3		Description:	Nut, M10, Nyloc
		Found on:	Upper buoyancy/archtube interface
		Part Number:	07972009
4		Description:	Washer, Nylon, M10
		Found on:	Upper buoyancy/archtube interface
		Part Number:	07973009
5		Description:	Screw, grub, M4 x 8 stainless steel
		Found on:	Upper buoyancy/archtube interface
		Part Number:	07974009

Appendix A-1
MARINE EQUIPMENT DIRECTIVE VARIATIONS

The following information details the various changes for European Union countries. Items may be included in addition to the standard equipment. Please see below.

Emergency packs (Chapter 7)

First-aid kit	(Substitute)
Radar reflector	(Substitute)
Immediate action leaflet	(Additional)

Country	First Aid Kit								
	Part Number	Quantity per raft application							
		4TO	6TO	8TO	10TO	12TO-/DL	16TO-/DL	20TO-/DL	25TO-/DL
Denmark	06782009	1	1	1	1	1	1	1	1
Finland	15199001	1	1	1	1	1	1	1	1
France	06635009	1	1	1	1	1	2	2	2
Germany	06567009	1	1	1	1	1	1	1	1
Greece	06484009	1	1	1	1	1	1	1	1
Italy	05832009	1	1	1	1	1	1	1	1
Netherlands	06442009	1	1	1	1	1	1	1	1
Norway	15199001	1	1	1	1	1	1	1	1
Poland	05886009	1	1	1	1	1	1	1	1
Portugal	06484009	1	1	1	1	1	1	1	1
Spain	06484009	1	1	1	1	1	1	1	1
Sweden	06556009	1	1	1	1	1	1	1	1
UK	06484009	1	1	1	1	1	1	1	1

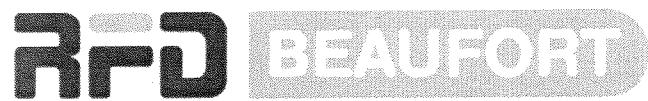
**MED Variations- First-aid kit
TABLE A11**

			Part number for Leaflet, Immediate Action
Country	Authority	Language	Quantity: 1 off for every English item
Denmark	MED	Danish	50165031
Netherlands	MED	Dutch	50165041
Finland	MED	Finnish	50165051
France	MED	French	50165061
Germany	MED	German	50165071
Greece	MED	Greek	50165081
Italy	MED	Italian	50165091
Norway	MED	Norwegian	50165101
Poland	MED	Polish	50165171
Portugal	MED	Portugese	50165111
Spain	MED	Spanish	50165141
Sweden	MED	Swedish	50165151
UK	MED	English	50165011

**MED Variations- Immediate action leaflet
TABLE A12**

Country	Part Numbers		
	Radar Reflector	Alternative Radar Reflector (if applicable)	Radar Reflector Mast
Denmark	41955011		41955021
Finland	06408009	08005009	
France	41955011		41955021
Germany	41955011	06067009	41955021
Greece	06408009	08005009	
Italy	41955011		41955021
Netherlands	details to be confirmed		
Norway	06408009	08005009	
Poland	06408009	08005009	
Portugal	06408009	08005009	
Spain	06408009	08005009	
Sweden	06408009	08005009	
UK	41955011	06067009	41955021

**MED Variations- Radar Reflector
TABLE A13**



**RFD SURVIVA MK III
BEAUFORT SEAFARER**

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Appendix A-2

USA

The following information details variations within United States Coast Guard (USCG) approved liferafts from the basic standard.

General

Please contact sales for brand of liferafts being serviced.

Check the container data label. Make sure all details are clear and legible. It should be marked 'APPROVED US COAST GUARD' together with an approval reference.

Wheelmark label (Chapter 11 - P/n 43973001), is omitted.

Two metal plates need to be attached to the GRP container, see TABLE A2-1 for part numbers and (FIGURE A2-1) for positioning;

Inspection and Checking (Chapter 4)

- *1 Cylinders can be weighed with the transit cap.
- *2 The tolerance for the full weight is +0 g to -56 g / +0% to -1%, (gas charge weight), whichever is greater.

Testing and Troubleshooting (Chapter 5)

- *1 Upon completion of the Gas inflation test the liferaft must be evacuated. CFR requires liferafts to be deflated using vacuum and inflated using workshop air.
- *2 CFR states do not cap PRV's.
- *3 Cylinder weight does include the recoil caps.

		RFD	REVERE	RFDB Inc.
1	Approval Plate	42026001	42152001	3RA1555-1
2	Inspection Plate (USCG)	42027001	42153001	3RA1543-1

**Plate part numbers and Brand ref
TABLE A2-1**

Emergency pack (Chapter 7)

The TABLE A2-2, lists the Emergency pack items with USA part numbers and those items which must be USCG approved.

The following items in each Equipment pack must meet the respective clause of the Code of Federal Regulations;

- | | |
|------------|--|
| Bailer | (must be at least 2 ltr capacity). |
| Sponge | (must have volume when saturated, of at least 750 cm ³ /48 in ³). |
| Can opener | (must have a guard over sharp parts). |
| Paddles | (must be at least 1.2 metres / 4 ft, long). |
| Flashlight | (should have spare bulb and 6 batteries total.
3 in the flash light and in a sealed bag). |

ITEM	Part number	To be USCG approved	Liferaft size (Persons) & Quantities							
			4 TO	6 TO	8 TO	10 TO	12 TO & DL	16 TO & DL	20 TO & DL	25 TO & DL
Anti seasickness tablets	1RA1017-3	-	1	1	1	1	2	2	2	3
Bag, seasickness, poly	11105001	-	4	6	8	10	12	16	20	25
Bailer	06290009	06290009	1	1	1	1	1	2	2	2
Bellows	45201002	-	1	1	1	1	1	1	1	1
Buoyant knife	04503009	-	0	0	0	0	0	1	1	1
Drinking vessel	1RA1017-1	-	1	1	1	1	1	1	1	1
Drogue (spare sea anchor)	45510101	-	1	1	1	1	1	1	1	1
First aid kit	1RA1017-2	see TABLE 2-3	1	1	1	1	1	1	1	1
Flare, hand held	04597009	08374009	6	6	6	6	6	6	6	6
Flare, parachute	04598009	08375009	4	4	4	4	4	4	4	4
Signal, Lifesmoke	05645009	08376009	2	2	2	2	2	2	2	2
Heliograph	06279009	06279009	1	1	1	1	1	1	1	1
Immediate action leaflet	50165011	-	2	2	2	2	2	2	2	2
Label E-Pack	45036001	-	1	1	1	1	1	1	1	1
Fishing kit	1RA1017-6	06274009	1	1	1	1	1	1	1	1
Leak stopper, Kit of 3	1RA1130-1	-	2	2	2	2	2	2	2	2
Repair kit	10085003	-	1	1	1	1	1	1	1	1
Rescue signal table	02176011	-	1	1	1	1	1	1	1	1
Scissors	05290018	-	1	1	1	1	1	1	1	1
Thermal protection aid	06588009	06588009	2	2	2	2	2	2	2	3
Can opener	1RA1017-4	06287009	3	3	3	3	3	3	3	3
Sponge	06286009	06286009	1	1	1	1	1	1	1	1
Flashlight	1RA1014-8	06276009	1	1	1	1	1	1	1	1
Whistle	1RA1017-5	-	1	1	1	1	1	1	1	1
Rubber band	04934001	-	2	2	2	2	2	2	2	2
Valise- 800 mm (31.5")	20993031	-	1	1	1	1	1	1	1	1

Emergency Equipment SOLAS A Pack 1 -All Container Types
TABLE A2-2

USA	Part Number	Quantity per raft application							
		4TO	6TO	8TO	10TO	12TO/ DL	16TO/ DL	20TO/ DL	25TO/ DL
First-aid kit	06273009	1	1	1	1	1	1	1	1
Radar Reflector	-	Not required in USA liferafts.							
Paddles	06289009	1	1	1	1	1	1	1	1
	05121009								
Food rations (to be USCG approved)	08069009								
	04776009								
	06857009								
Water (to be USCG approved)	06277009								
	05163009								

Emergency pack variants
TABLE A2-3

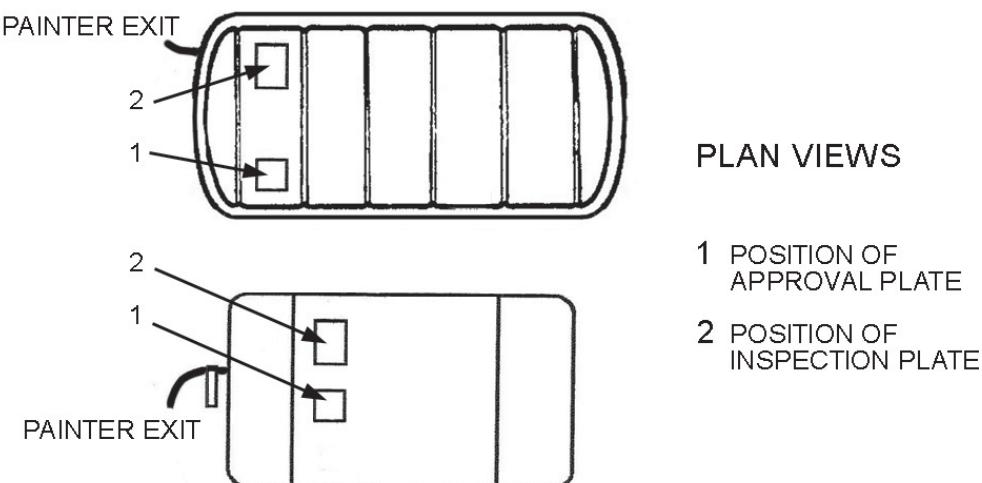


Plate positioning
FIGURE A2-1



Paddles tied and padded
FIGURE A2-2

Assembly (Chapter 8)

Pack paddles, into a plastic bag and seal with brass grommets, (FIGURE802). Use 23 Kgf (50lbf) cord, to tie the paddles to the internal lifeline. This method applies to all types of containers.

Special tools equipment and materials (Chapter 10)

Leak detector kit *1 1RA1148-5
(This kit is sufficient to test 40 cylinders)

Construction (Chapter 11)

Canopy outer fabric (Chapter 10) is P/n 06785009, RFD 1044 Type 1, only.

Gas cylinder assemblies

Raft		Charged cylinders			Bare cylinder	
Size (persons)	Launch type	Part No.	CO ₂ Charge (kg)	N ₂ Charge (kg)	Part No.	Volume (Cu In)
4	Throwover	42092002	1.45	0.18	42112001	214
	Davit					
6	Throwover	42094002	3.17	0.39	42114001	475
	Davit					
8	Throwover	42094002	3.17	0.39	42114001	475
	Davit					
10	Throwover	42096002	4.36	0.53	42116001	650
	Davit					
12	Throwover	42096002	4.36	0.53	42116001	650
	Davit					
16	Throwover	42097002	6.34	0.77	42117001	942
	Davit					
20	Throwover	42097002	6.34	0.77	42117001	942
	Davit	42100002	8.72	1.06	42120001	1320
25	Throwover	42100002	8.72	1.06	42120001	1320
	Davit					

Cylinders and charge weights for the USA
TABLE A2-4

Raft	Charged cylinders		THANNER			LEAFIELD				
	Size (persons)	Launch type	Part No.	Operating head DK99	Adaptor	Membrane	Rating (bar)	Cylinder valve	Break stem	Part number
4	Throwover	42092002	08008009	07038009	06456009	230	08318009	08324009	08324009	230
6	Throwover	42094002	08008009	07038009	06456009	230	08318009	08324009	08324009	230
8	Throwover	42094002	08008009	07038009	06456009	230	08318009	08324009	08324009	230
10	Throwover	42096002	08008009	07038009	06456009	230	08318009	08324009	08324009	230
12	Throwover	42096002								
16	Throwover	42097002	08008009	07038009	06456009	230	08318009	08324009	08324009	230
20	Throwover	42097002	08008009	07038009	06456009	230	08318009	08324009	08324009	230
25	Throwover	42100002								

Cylinder associated equipment for USA
TABLE A2-5

Increased height and foam protection

for Drop height 36m-46m (20DL, 25TO & 25DL liferafts only)

1. For liferafts with drop heights between 36 metres and 46 metres the following additions are required; Please refer to (TABLE A2-6) for part numbers and quantities.

NOTE: Add foam protection to E-packs as per 18m-36m liferafts, Chapter 7.

- (a) Strengthened container, to absorb a higher impact is used.
- (b) 56m painter.
- (c) 10% more drinking water in an additional valise.
- (d) Four additional straps, (2 at each end), are used to close the container.
- (e) Foam protection on:
 - i. External light
 - ii. Cylinder
 - iii. PRV's
 - iv. Inflate/deflate valves
 - v. Graduated drinking vessel

Part Number	Description	Quantity
43808091	Container, 25 TO	1
00018651	Container, 25 DL	1
	Container, 20 DL	1
21204051	Sachet Assy. Painter (56 m)	1
06277009 or 1RA1101-1	Drinking water	Not less than 10% of e-pack allowance
20993021	Valise, 700mm	1
41423001	Packing straps and crimps	2
01999069	Cover protection	2
05339009	Plastazote foam	1
50152004	Pad protection	8
50152006	Pad protection	2
50067003	Pad protection (for RL4 External lamp)	1
50067006	Pad protection (for RL5 External lamp)	1

Additional equipment for liferafts with 46m drop height
TABLE A2-6

2. Positioning the foam protection

- (a) Roll a cover protection (RFD P/n 01999069) and place it inside the graduated drinking vessel. Trim the cover protection to within 25mm of the graduated drinking vessel.
- (b) Roll a second cover protection around the outside of the graduated drinking vessel.
- (c) Secure on both axis with 25mm S/A tape. For ease of removal, create a tab on both axis by folding the tape back on itself.
- (d) Place the graduated drinking vessel into Emergency pack 1.



Packing graduated drinking vessel
FIGURE A2-2

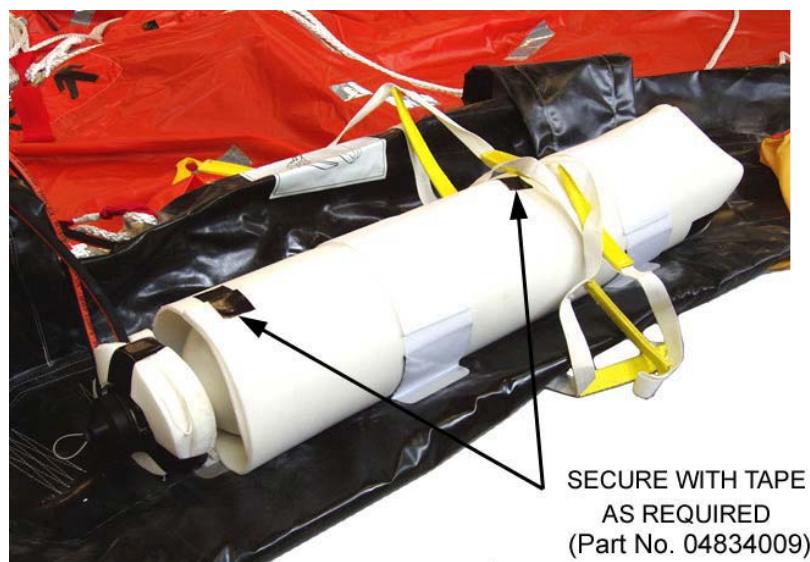


Foam protection for external lamp
FIGURE A2-3



NOTE: The additional E-pack is placed under the hauling-in ladder and tied to the internal lifeline.

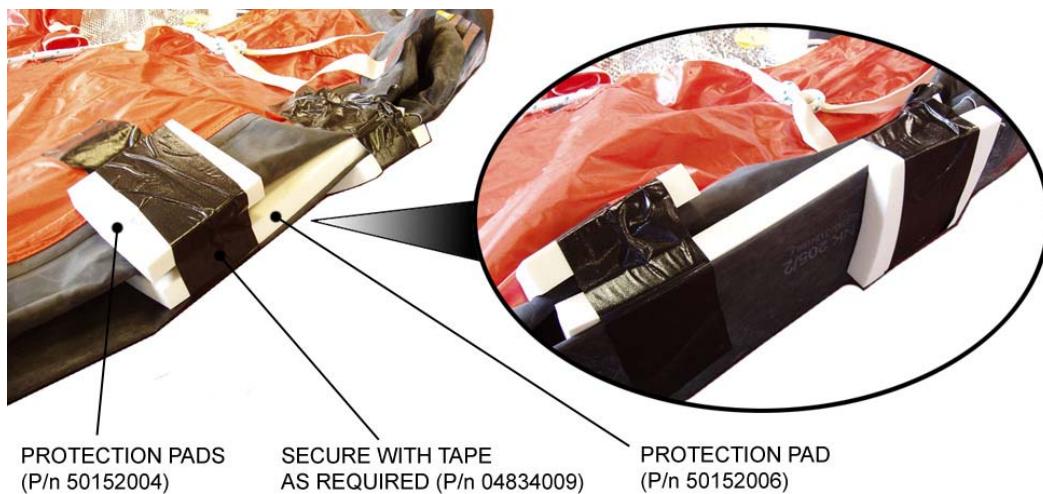
Packing position of additional water E-pack
FIGURE A2-4



Cylinder foam protection
FIGURE A2-5



**Inflate/deflate valve protection
FIGURE A2-5**



**Pressure release valve protection
FIGURE A2-6**



**Pressure release valve protection (Archtube)
FIGURE A2-7**

Appendix A-3

CANADA

The following information details variations within Transport Canada approved liferafts, from the basic standard.

General

Check the container data label. Make sure all details are clear and legible. It should be marked 'APPROVED TRANSPORT CANADA' together with an approval reference.

Wheelmark label (Chapter 11 - P/n 43973001), is omitted.

All labels, instructions and immediate action leaflets are in English and French.

Emergency Pack (Chapter 7)

The following provisions in each equipment pack must be compliant as indicated;

First-aid kit (must be Canadian approved)

Immediate action leaflet (French translation must be provided)

CANADA	Part Number	Quantity per raft application							
		4TO	6TO	8TO	10TO	12TO/ DL	16TO/ DL	20TO/ DL	25TO/ DL
First-aid kit	08231009	1	1	1	1	1	1	1	1
Immediate action leaflet	50165061	1 off French, in addition to each English version.							

Emergency pack variants
TABLE A31

C. Gas cylinders

Raft		Charged cylinders			Bare cylinder	
Size (persons)	Launch type	Part No.	CO2 Charge (kg)	N2 Charge (kg)	Part No.	Volume (Cu In)
4	Throwover	42092002	1.45	0.18	42112001	214
	Davit					
6	Throwover	42094002	3.17	0.39	42114001	475
	Davit					
8	Throwover	42094002	3.17	0.39	42114001	475
	Davit					
10	Throwover	42096002	4.36	0.53	42116001	650
	Davit					
12	Throwover	42096002	4.36	0.53	42116001	650
	Davit	42096002	4.36	0.53	42116001	650
16	Throwover	42097002	6.34	0.77	42117001	942
	Davit	42097002	6.34	0.77	42117001	942
20	Throwover	42097002	6.34	0.77	42117001	942
	Davit	42100002	8.72	1.06	42120001	1320
25	Throwover	42100002	8.72	1.06	42120001	1320
	Davit	42100002	8.72	1.06	42120001	1320

Cylinder charge and charge weights for Canada
TABLE A32

Raft		Charged Cylinder type	Operating Head	Adaptor	Membrane	
Size (persons)	Launch type		DK99		Part Number	
4	Throwover	42092002	08008009	07038009	06456009	230
	Davit					
6	Throwover	42094002	08008009	07038009	06456009	230
	Davit					
8	Throwover	42094002	08008009	07038009	06456009	230
	Davit					
10	Throwover	42096002	08008009	07038009	06456009	230
	Davit					
12	Throwover	42096002	08008009	07038009	06456009	230
	Davit	42096002	08008009	07038009	06456009	230
16	Throwover	42097002	08008009	07038009	06456009	230
	Davit	42097002	08008009	07038009	06456009	230
20	Throwover	42097002	08008009	07038009	06456009	230
	Davit	42100002	08008009	07038009	06456009	230
25	Throwover	42100002	08008009	07038009	06456009	230
	Davit	42100002	08008009	07038009	06456009	230

**Cylinder associated equipment for Canada
TABLE A33**



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Appendix A-4

RUSSIA

The following information details variations to Russia approved liferafts, from the basic standard.

General

Check the container data label. Make sure all details are clear and legible. It should be marked ‘APPROVED RUSSIAN MARITIME REGISTER OF SHIPPING’ together with an approval reference.

Equipment Pack (Chapter 7)

The following items in each equipment pack must be compliant as indicated;

First-aid kit

RUSSIA	Part Number	Quantity per raft application							
		4TO	6TO	8TO	10TO	12TO/ DL	16TO/ DL	20TO/ DL	25TO/ DL
First-aid kit	06154009	1	1	1	1	1	1	1	1
Immediate action leaflet	50165121	1 off Russian, in addition to each English version.							

Emergency pack variants
TABLE A41

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APPENDIX 5**25 PERSON REVERSIBLE LIFERAFT -**
OVERCAPACITY VARIANT

<u>Section</u>	<u>Page</u>
1 Description and data	A5-3
2 Removal and unpacking	A5-3
3 Cleaning	A5-3
4 Inspection and checking	A5-3
5 Testing and trouble shooting	A5-4
6 Repair	A5-4
7 Emergency packs	A5-4
8 Assembly and repacking	A5-4
9 Storage conditions and instructions	A5-7

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1 Data and description

- A The data and description for the Overcapacity 25 person liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 1 of this publication, except for the addition of the following part numbers:

Part Number	Description	Millimetres	Feet	Qty
05768009	Snap hook, safety	-	-	3
06823009	Throwing line	25000	82	1
43978001	Patch, velcro	-	-	1
05002009	Cord, superbraid (firing line)	5000	16.4	1
44021001	Label, overcapacity	-	-	3
20883001	Foam, painter block retaining	-	-	2
05002009	Cord, superbraid, natural, bowsing	2800	9.2	1
05502009	Cord, superbraid, red, bowsing	2800	9.2	1
42088011	Label, painter	-	-	1
42089011	Label, bowsing	-	-	1
20739002	Patch, attachment (throwing line)	-	-	1
02236006	Break thread	-	-	A/R
20815001	Handle	457	1.5	2

Additional items required for 25 person overcapacity liferaft

TABLE 5-1

2 Removal and unpacking

- A The removal and unpacking procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 2 of this publication.

3 Cleaning

- A The cleaning procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 3 of this publication.

4 Inspection and checking

- A The Inspection and Checking procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 4 of this publication.

5 Testing and trouble shooting

- A The Testing and trouble shooting procedures for the 25 Overcapacity person liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 5 of this publication.

6 Repair

- A The repair procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 6 of this publication.

7 Emergency packs

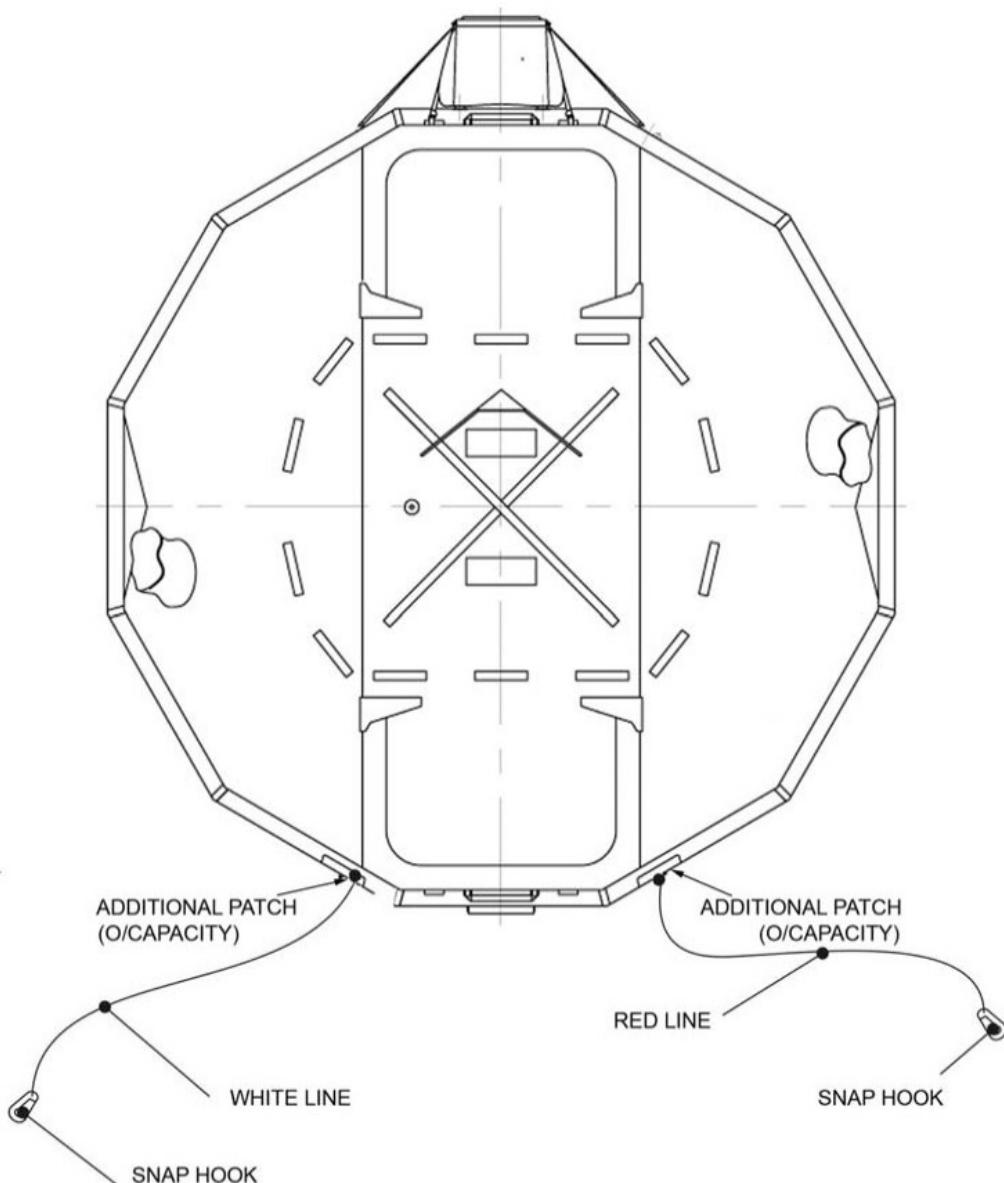
- A There is no difference between the emergency packs for a Standard SoLAS Liferaft and Overcapacity SoLAS Liferaft. The emergency packs should be packed in accordance with the details in Chapter 7 of this publication.

8 Assembly and repacking

- A The assembly and repacking of the Overcapacity liferaft are identical to those of the SoLAS style liferaft, as detailed in Chapter 8 of this publication, with the following exceptions:

B Liferaft

- (1) The Overcapacity Liferaft is fitted with two additional loop patches in the locations shown in FIGURE 5-1. With the liferaft laid out flat, the red line (05502009) is secured to the patch on the right, when viewing from the doorway closest to the inflation cylinders and the white/natural coloured line (05002009) is secured to the left. The lines are secured using a taped bowline knot. The snap hooks (05768009) are fitted to the end of each line using a taped bowline knot.
- (2) For configuration Type A and Type B, the red line remains on the right, and the white on the left.
- (3) The firing line is replaced with a short firing line (05002009), 5000mm (16.4 ft) long. It is not secured to the strong point on the liferaft. The firing line is connected to the firing pins on the operating head of the gas cylinder in the same fashion and same position.



Location of additional patches
FIGURE 5-1

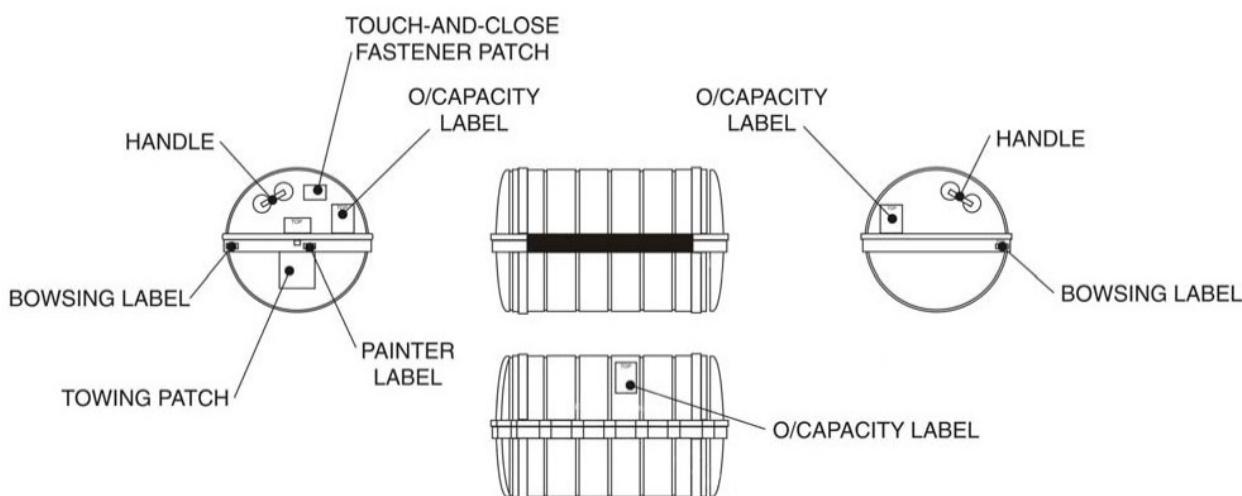
C Container

- (1) On the firing line end of the container the following items are positioned as shown in FIGURE A2.
- (2) The Throwing line is secured to the ring patch by passing the loop on the end of the line over itself or using a taped bowline and stopper knot.
- (3) Prepare the lower half of the container by creating two small cutouts to allow the bowsing lines to pass through. These are located at the end of the container on the side away from the hinge strip.

Part Number	Description	Millimetres	Feet	Qty
06823009	Throwing line	25000	82	1
43978001	Touch-and-close fastener patch	-	-	-
44021001	Label, overcapacity (*)	-	-	3
20883001	Foam, painter block retaining	-	-	2
42088011	Label, painter	-	-	1
42089011	Label, bowsing (*)	-	-	1
20739002	Patch attachment (throwing line)	-	-	1
20815001	Handle	457	1.5	2

(*) Also located on opposite end from firing line

Container attachments
TABLE 5-2



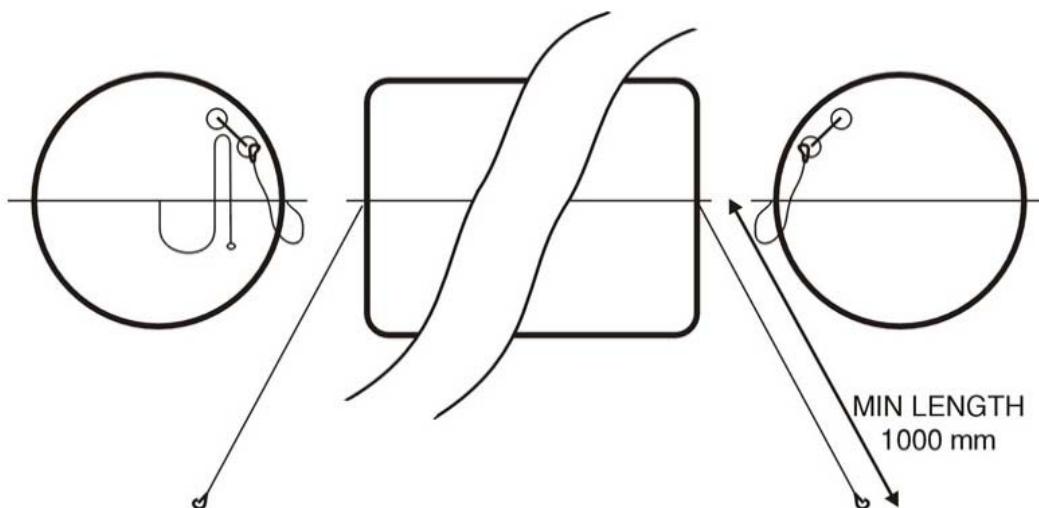
Position of additional patches labels and handles
FIGURE 5-2

D Packing

- (1) Prepare the liferaft for packing as described in Chapter 8, ensuring the extra bowsing lines are on the side of the container opposite to the hinge side.
- (2) Fold and flake as described in Chapter 8, ensuring the red and white bowsing lines do not become crossed or entangled on any equipment. The **red** line must still be on the **right** hand side, and the **white** on the **left**.
- (3) Prior to closing the container, ensure again that both lines are not trapped by any equipment, and then fit the sealing blocks to the lines. Ensure that there is at least 1000mm of each line outside the container.
- (4) Once the container has been closed, use single turns of break thread to flake the extra bowsing line and snap hook to the handles on the container (FIGURE A3 refers).

9 Storage conditions and instructions

- A The storage conditions and instructions for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style reversible inflatable liferafts, detailed in Chapter 9 of this publication.



Overcapacity liferaft - attach the operating line and the snap hooks to the handles of the container

FIGURE 5-3

RFD

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RECORDS OF CYLINDER CHEMICAL LEAK TEST

Service Station Name _____

Service Station ID No. _____

Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
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Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)
Cylinder Serial Number	PASS / FAIL	Tested by (Name & Stamp)

This form must be kept by the service station for a minimum of 10 years after the earliest test date on this sheet. These records must be available on demand, for inspection by staff of RFD Beaufort Ltd.



BEAUFORT

ENDURA liferafts
SERVICE MANUAL

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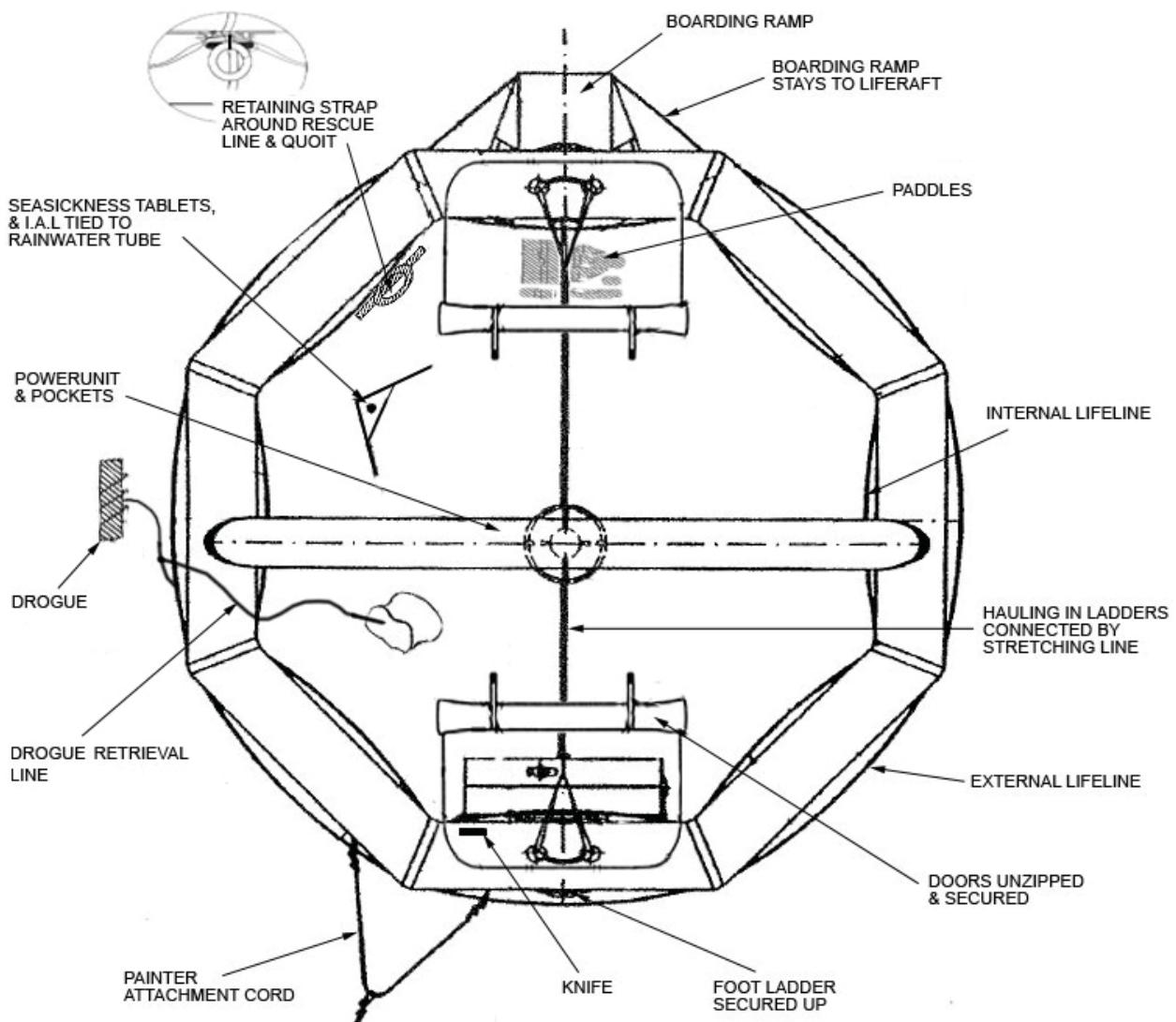
Appendix 7

Appendix for USCG Mk3 liferaft in USN container

25P MK3 USCG / SOLAS raft Packed in White USN container.

Approval number 160.151/168/0

Section	Title	Page
1.	General	3
2.	Preparation of the liferaft.....	4
3.	Inflation system preparation.....	4
4.	Container preparation	5
5.	Packing a Throw Over liferaft into container	5
6.	Container labelling	8

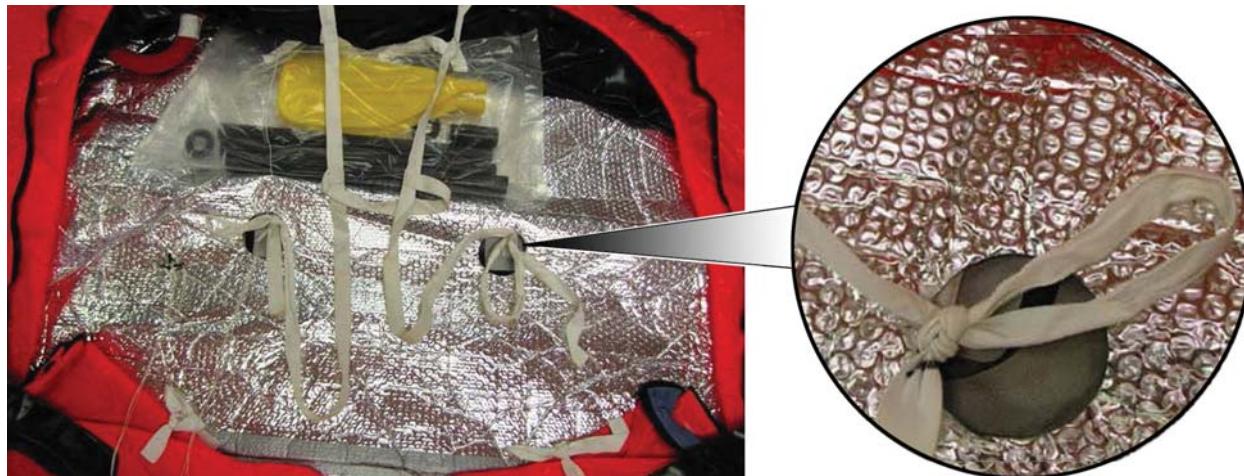
**NOTE:**

The picture illustrated is 25 Person raft. Layout will be similar for other TO rafts.

**Preparation for packing assembly for 10-25 Person Throw Over
FIGURE A7-01**

1. General

- 1.1 The paragraphs of this Appendix apply generally - unless a suitable qualification (in bold print) is present.
- 1.2 The work area must be clean, dry and free from sharp projections, with a smooth working surface, preferably of vinyl material.
- 1.3 Special Tools, Equipment and Materials:
 - 1.3.1 Refer to Chapter 10 for the list of relevant items that are required during the assembly and repacking of a liferaft.
- 1.4 Throughout the description of packing, components which are listed within the Illustrated Parts List (Chapter 11) and Consumables & Equipment (Chapter 10), appear in italic print.
- 1.5 Throughout preparation and packing of the liferaft and its associated equipment, all knots are to be bowlines with flying ends taped, using 25mm wide PVC self adhesive (SA) tape, unless stated otherwise. The ends of cords are to be heat sealed to prevent fraying.
- 1.6 Ensure that during unpacking, preparation and repacking of the liferaft no moisture is introduced to the liferaft. The liferaft must be completely dry before packing.



Securing paddles and Hauling-in ladder

FIGURE A7-02

2. Preparation of the liferaft, (FIGURE A7-01)

- 2.1 Place the liferaft neatly on a packing table and in an open area, with enough room to manoeuvre the container during packing. The inflation valves should be positioned adjacent to the edge of the packing table. Ensure all cordage is neat and tidy. Start with the raft inflated on the table or floor.

NOTE: Inflation of the liferaft is advised, to ensure correct fitting and rigging of the equipment and to ensure the liferaft is the correct shape for packing after deflation.

- 2.2 For each liferaft carry out the following, (FIGURE A7-01).

- 2.2.1 Fit adaptors and valved sockets (female couplings) to the inflate/deflate valves.
- 2.2.2 Fit a plug, tail (male coupling) to a low pressure air line and to the manometer feed line. Connect the low pressure air line to each inflate/deflate valve as necessary. Inflate the liferaft to approximate working pressure.

- 2.3 Tie off the floating safety knife to its appropriate patch. Wrap the tethering cord around the handle and place the blade through the elasticated loop and into its protective sheath. Ensure that the loop securely holds the handle and traps the tethering cord.

- 2.4 Tie off the anti-seasickness tablets in their labelled bag.

- 2.5 Tie the immediate action leaflet to the rain-water tube using 23 Kgf (50 Lbf) cord.

NOTE: Ensure immediate action leaflet is the latest issue, see IPL CHAPTER 7 and APPENDIX 1 for details.

- 2.6 Fit the rubber plug to the rain-water catchment tube.

- 2.7 Pack the paddles into a plastic bag and seal with brass grommets, (FIGURE A7-02). Attach the paddle retaining line to Boarding ladder loop patch using a Bowline knot. Tape the flying end with 1" (25 mm) white PVC tape.

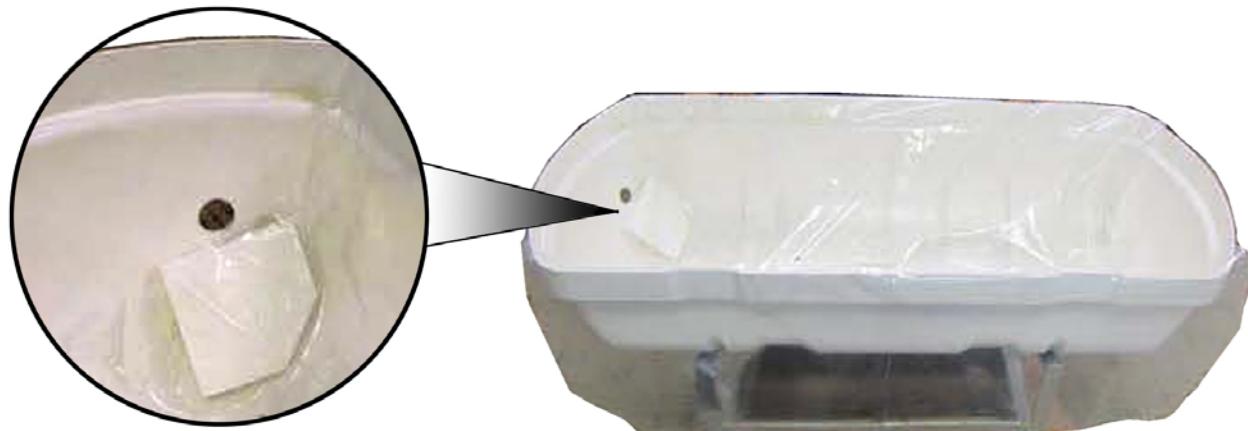
- 2.8 Ensure both Hauling-in ladder webbings are tensioned properly to the reference marks. Tie them to each floor loop patch using a Draw hitch knot. The lines should be tight, but not lifting the raft floor off the ground.

- 2.9 Attach the boarding ramp straps and stays, to the liferaft. There are four in total,



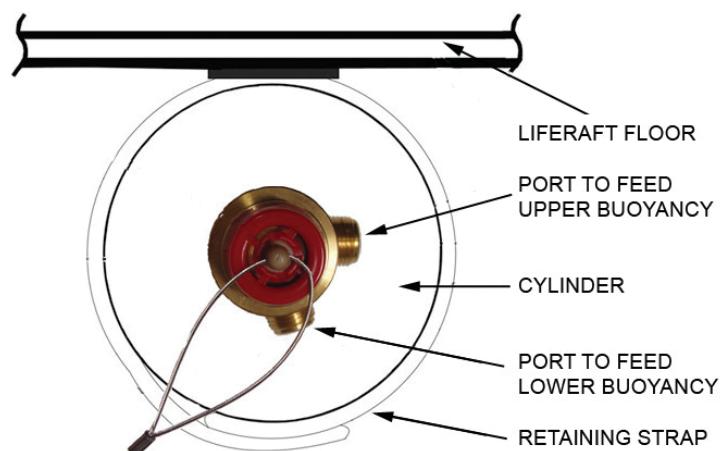
Attach battery activation cords

FIGURE A7-03



Prepare the container

FIGURE A7-04



Orientation of cylinder

FIGURE A7-05

- 2.10 Ensure all doorways are unzipped and properly furled (inwards). Tie the doorways using a half bow knot for quick release. Secure open with their tie tapes.
- 2.11 Ensure that ID tube lanyard is attached to the Towing bridle assembly. Use a bowline knot and tape the flying end with 25 mm (1") white PVC tape.
- 2.12 Attach new battery activation cords to each battery assembly if cord shows signs of water or deterioration, (FIGURE A7-03).

NOTE: If battery pack(s) were replaced, all old pin(s) must be discarded. Use the new pin(s) supplied with the new unit(s).

- 2.13 Remove most, but not all, of the air from the upper and lower buoyancies.
- 2.14 Connect the battery activation pins to the batteries so that they are armed for service.

3. Inflation system preparation

- 3.1 Prepare the inflation system as detailed in CHAPTER 8, Section 3. Please note the WARNINGS and CAUTIONS when working with compressed gas cylinders.

4. Container preparation

Prepare the container as follows, (FIGURE A7-04).

- 4.1 The container seal, fitted to the upper container half, shall be replaced.
- 4.2 Fix protection foam block to the inside of the container. This will prevent the cylinder operating head from impacting the container side during handling and deployment.
- 4.3 Line the bottom half of the container with a polythene sheet, 60" x 96" (1525 x 2440 mm). Ensure this sheet overlaps the front edge of the container by 18" (460 mm). Use temporary lengths of tape to secure the polythene in place.
- 4.4 Make several puncture holes along the centre of the polythene sheet.

5. Packing a 25P MK3 SOLAS Throw Over liferaft into a White USN container

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

WARNING: DO NOT REMOVE THE RECOIL CAPS FROM THE OPERATING HEAD YET.

- 5.1 Upturn the edge of the liferaft to reveal the cylinder stowage. Place the cylinder on the underside of the raft floor, taking care not to trap the righting strap. Secure the cylinder with the velcro retaining straps.
The cylinder must be orientated so that one of the operating head outlets runs parallel with the base of the liferaft while the other runs perpendicular towards the water.
- 5.2 Tie the cylinder neck to the adjacent loop patch on the floor. Use a reef knot with 2 turns of 238 kgf (525 Lbf) cord, 450 mm (17") long and tape the flying ends.
- 5.3 Remove the recoil caps from the operating head and route both hoses through the Towing bridle assembly loops.
- 5.4 Connect each inflation hose, (FIGURE A7-05). Torque the hose connections as stated in Chapter 1, TABLE 101. Wrap a piece of (1") (25 mm) adhesive tape at the end of each hose. This will indicate that they have been torqued. Do not overlap the metal parts.
- 5.5 Insert two protection pads onto operating head and tape together, using (4") (100 mm) adhesive tape.
- 5.6 Carefully lay the liferaft flat on the table again.
- 5.7 Mount the lower half of the container on a suitable strong trolley. Position the container next to the table. Leave a small gap (about 100 mm (4")) between the table and the long side of the container. Tilt the lower half of the container slightly towards the table to facilitate rolling and packing.
- 5.8 Grasp the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container.
The cylinder operating head must be inline with the painter exit with the tip of the firing cable approximately 1"- 2" (25-50mm) away from the container end wall.

- 5.9 Work the liferaft floor area down into the recesses towards each end of the container.
- 5.10 Wrap the equipment E-Pack with protective foam. This will protect the equipment from the inlet check valves and the cylinder.
- 5.11 Insert the number 2, E-Pack (food and water), inside the liferaft, so that it is resting in the centre and against the cylinder, (FIGURE A07-06).
- 5.12 Insert the number 1, E-Pack to the left and remaining E-Pack to the right. Secure all E-Pack straps to the inner lifeline with a reef knot and a maximum of 2"- 4" loop.
- 5.13 Fold back the raft so as to reveal the operating mechanism.

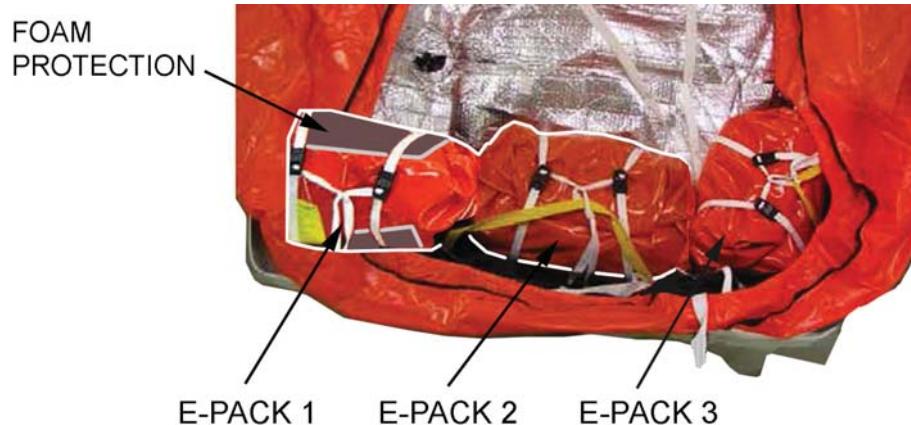
CAUTION: EXERCISE EXTREME CARE DURING THE NEXT OPERATIONS IN ORDER TO AVOID OPERATING THE INFLATION SYSTEM.

- 5.14 Locate and attach the Painter line to the firing cable and then tie off to the Tow bridle, (FIGURE A07-07).
 - 5.14.1 Identify the firing end of the painter. Ensure that 2.1 m (100") exits the painter sachet. Pull the (59" /1.5m) end of the painter line taut. Place a 300 mm (12"), length of layflat tubing over the painter line.
 - 5.14.2 At the firing point, (59" /1.5m) from the end of the line, pass the actuation cable of the operating mechanism through the painter line. Thread the remaining painter line back through the actuation cable.

WARNING: THE OPERATING MECHANISM IS NOW ARMED. EXTREME CARE MUST BE TAKEN DURING ALL FOLLOWING ACTIONS.

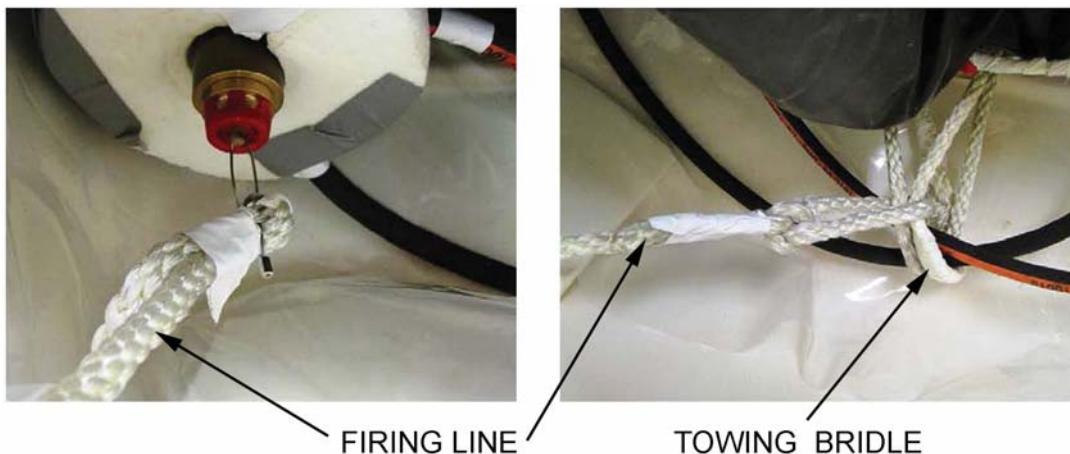
- 5.14.3 Ensure the painter cord is firmly attached to the operating head by lightly tugging on the cord.

CAUTION: ONLY PULL THE CORD SLIGHTLY SO AS NOT TO DISLodge THE OPERATING HEAD CABLE. THE INFLATION SYSTEM IS ARMED.
- 5.14.4 Apply two turns of white tape around the painter cord. Fold the end of the tape over on itself to create a pull tail. This will make it easy to remove the tape at the next service.
- 5.14.5 Locate the Tow bridle and tie the free end of painter to it using a Bowline knot and tape the flying end.



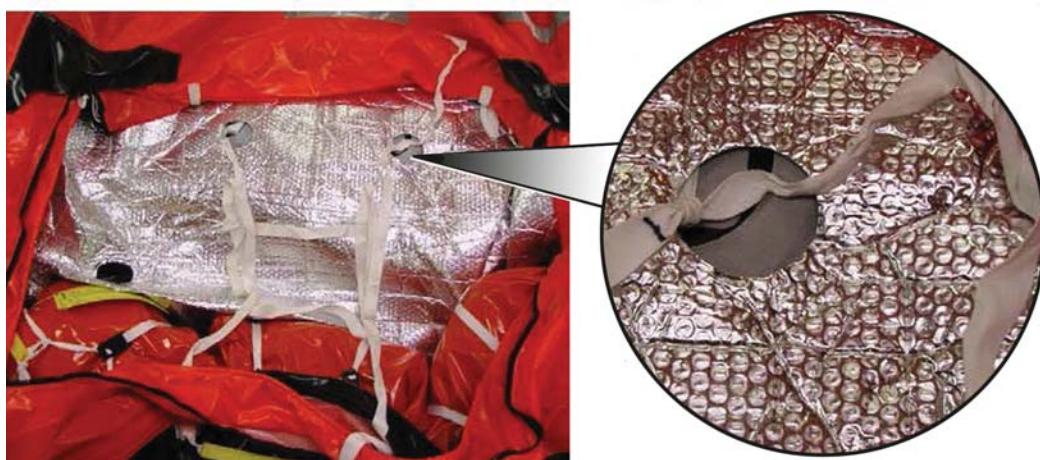
Emergency pack positioning

FIGURE A7-06



Firing line attachment

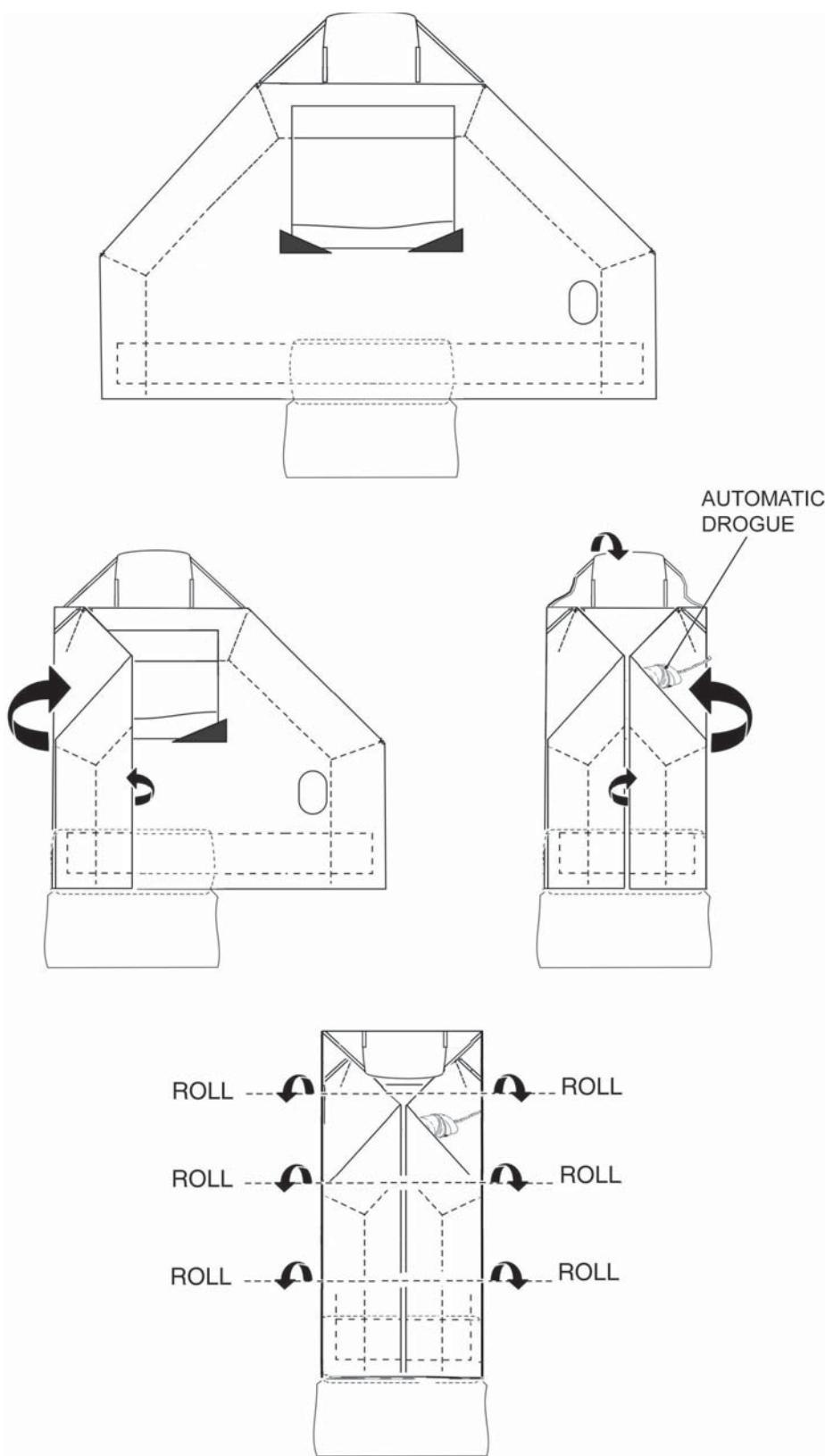
FIGURE A7-07



Haul-in ladder attachment

FIGURE A7-08

- 5.15 Place a foam block 6" x 6" x 1" thick between the bottom end of the cylinder and E-Pack contents.
- 5.16 Locate the last, number 3, E-Pack (Food and Water) and place it into the space at the bottom end of the cylinder. This pack is placed at a 90° angle to ensure the previous two E-Packs maintain a straight upright orientation along the cylinder.
- 5.17 Secure the E-Pack straps to the inner lifeline using a reef knot. Secure all E-Pack straps to the inner lifeline with a reef knot and a maximum of 2"- 4" loop.
- 5.18 Carefully pull the buoyancy fabric up and around the E-Packs.
- 5.19 Ensure the Hauling-in ladder is not trapped under the E-Packs. Re-attach the ladder webbings using draw hitch knots. Use the black reference marks as a guide, (FIGURE A07-08).
- 5.20 Place the external boarding ramp / ladder on top of the inlet check valves and buoyancy material so it does not get trapped under the raft during the inflation process.
- 5.21 Remove all remaining air from the upper and lower buoyancy chambers. Ensure the topping off valve plugs are inserted fully into the valve port.
- 5.22 Prepare to start the sequence of liferaft folding; (FIGURE A7-09).
 - 5.22.1 Fold the left hand side over, then back.
 - 5.22.2 Fold the right hand side over, then back.
- 5.23 Fold the overhanging polythene on top of the Emergency Packs and buoyancy material.
- 5.24 Position the Painter line assembly on top of the polythene, with the opening and rubber sleeve facing the painter exit. The opening should be within 2"- 4" of the container side wall and rest on top of the plastic sheet, (FIGURE A7-10).
- 5.25 Tape the Painter line sachet to the plastic sheet using 4" cloth tape, (FIGURE A7-10).



Folding the liferaft

FIGURE A7-09



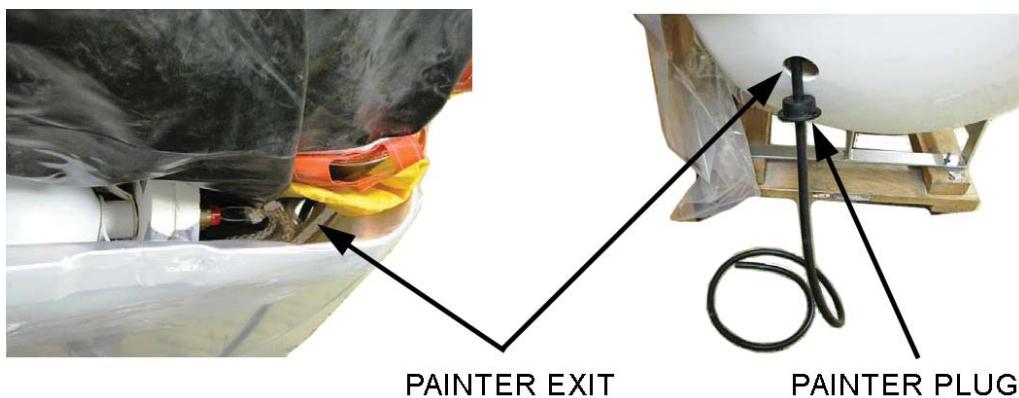
Painter sachet attachment

FIGURE A7-10



Drogue & Boarding ramp

FIGURE A7-11



Painter exit

FIGURE A7-12

- 5.26 Locate the Sea anchor/ Drogue and place it under the raft fold. It is located between the raft floor and outer ballast pocket surface, (FIGURE A7-11).
- 5.27 Locate the non-inflatable boarding ramp, (NIBR) and carefully twist clockwise to prepare ramp for folding process, (FIGURE A7-11).
- 5.28 Starting at the boarding ramp side, begin to roll the liferaft into the container. Begin with a tight fold and then roll the material towards the lower container half. Ensure the sides of the original folds remain inline with the container ends.

NOTE: If necessary, adjust the painter sachet back into position if it has moved. Insert the rubber sleeve through the painter exit, (FIGURE A7-12).

NOTE: Ensure the rear hose closest to container wall runs parallel and follows the container contour.

NOTE: Ensure the firing cable tip is within 1"- 2" of the foam pad installed in container bottom. The top of the cylinder must be level and parallel with the lower container rim, (FIGURE A7-12).

CAUTION: DO NOT PLACE THE EXCESS POLYTHENE SHEET DOWN THE FRONT OF THE CONTAINER. THIS CAN BECOME TRAPPED AND AFFECT HOW THE RAFT DEPLOYS IN AN EMERGENCY SITUATION.

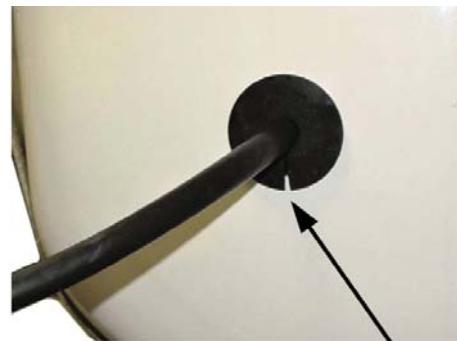
- 5.29 Place any excess polythene sheet into the middle section under the rolled raft. Alternatively trim the sheet so that it is level with the lower container rim on the front side.
- 5.30 Locate the rubber painter plug and attach it to painter line. Insert the plug into the lower container half and ensure the split is positioned downwards. This will prevent water from entering the container, (FIGURE A7-13).
- 5.31 Adjust painter line to ensure it has a clear path to the painter exit
- 5.32 Also adjust webbing for I.D. tube so that red anti-wicking ring is level with exterior of front container rim.
- 5.33 Carefully place container top on rolled raft and begin to close with ratchet straps. Before applying pressure to the top with the straps, adjust the top so that it is clam shelled towards the rear of the container. This should be the first side to close. This will help prevent the cylinder from being shifted from its position.

CAUTION: PLEASE REFER TO CHAPTER 8 OF THIS MANUAL FOR STRAP AND CRIMPING INSTRUCTION.

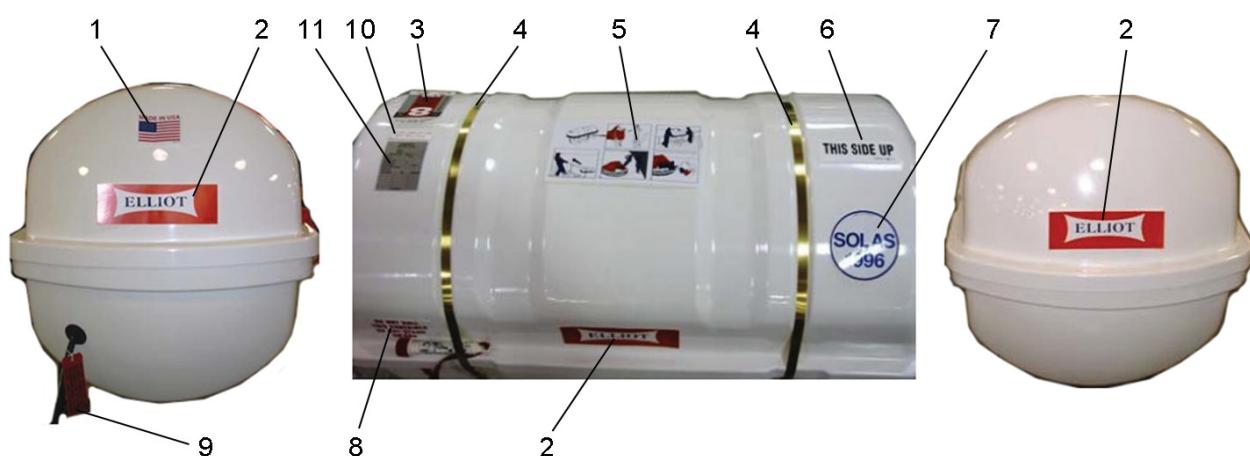
- 5.34 Install two brass bands on the closed assembly. Each strap requires two stainless steel crimps, (FIGURE A7-14).
- 5.35 This completes the packing sequence for the Throw Over liferaft. The container is now ready for labelling. Please refer to this Appendix, Section 6 Container labelling.

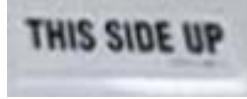
6. Container labelling

- 6.1 Check that all labels are fitted and positioned correctly and securely, (FIGURE A7-14).
- 6.2 If required attach new stickers to the cleaned container assembly. All labels must be legible at the time of service and throughout the service cycle.
- 6.3 Record the liferaft details onto the liferaft identification label and insert it into the identification tube. Check for legibility and correct details.
- 6.4 The liferaft identification container and any excess tether webbing shall be placed between the container strapping and the container.
- 6.5 Tape the IAL compact disc to the container.
- 6.6 This completes the packing sequence and the liferaft is now ready for installation.



PAINTER PLUG, SPLITT TO BOTTOM

Painter plug positioning**FIGURE A7-13****Label positioning****FIGURE A7-14**

1		Description:	Label, Flag
		Application:	All rafts
		Part number:	
2		Description	Label, S/A logo, Elliot
		Application:	All Rafts
		Part number:	
3		Description	Label, data
		Application:	
		Part number:	
4		Description	Straps
		Application:	All Rafts
		Part number:	
5		Description	Label, launch procedure
		Application:	Throw Over ONLY
		Part number:	
6		Description	Label, This side up
		Application:	All rafts
		Part number:	
7		Description	Label, SoLaS 96
		Application:	All Rafts (Except 4 Person)
		Part number:	
8		Description	Label,
		Application:	All rafts
		Part number:	

9		Description	Label, Painter tag
		Application:	
		Part number:	
10		Description	Label, data
		Application:	
		Part number:	
11		Description	Label, Data
		Application:	
		Part number:	



BEAUFORT

**RFD SURVIVA MK III
BEAUFORT SEAFARER**

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