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Service Manual for Marine MK IV liferafts

- Throwover
 - Davit Launch
-
- Beaufort Seafarer
 - Crewsaver
 - DSB LR07
 - Elliot
 - EV Silver Series
 - New Wave Guardian
 - Oceanmaster
 - RFD - Surviva
 - Survitec Zodiac
 - Survitec Safety Solutions (SURVITEC)

Version 8



MARINE MKIV
SERVICE MANUAL

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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:



Tommy Scott
Design Manager Marine
RFD Beaufort Limited

Date:

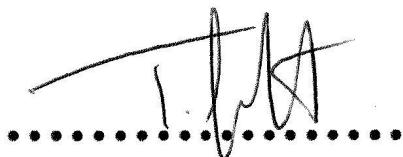
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STATEMENT OF CERTIFICATION
(for 4 Persons Liferaft)

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: 18-2-09

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 Survitec Group Ltd ('entitlement'). It is not a stand-alone text embodying the basic techniques or skills appropriate to liferaft servicing.

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MARINE MKIV
SERVICE MANUAL

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Telephone: +44 (028) 9030 1531 Fax: +44 (028) 9062 1765

Letter of Transmittal

To: Holders of Part No. 08431009 (M269)

Title: SURVIVA MKIV

VERSION No. 3 Dated Jun/12

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

Signed

Date

19 / 6 / 12

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights
This revision introduces the WHITE operating head and Appendix for Canadian option, along with other sundry updates.	
TITLE PAGE Pg 1	Version number updated
EFFECTIVE PAGES Pgs 1-4	Pages updated
CHAPTER 1 Pgs 111	Torque table updated
CHAPTER 4 Pg 403-407	Cylinder testing/repair
CHAPTER 5 Pg 503,512-522	Test schedule updated, New weight test, Cylinder testing
CHAPTER 6 Pg 613-615 & 622	Righting strap repair, cylinder repair
CHAPTER 7 Pgs 719-723	Foam protection update
CHAPTER 8 Pgs 809-812, 823-826, 828-829, 833, 838-840 845-848, 852-853, 863-864	Painter update, White op heads, Painter attach Bowing line knot, Raft folds, Crimps heat sealing.
CHAPTER 10 Pg 1003-1005	Additional equipment added
CHAPTER 11 Pg 1107-1109 Pg 1113, 1122-1126, Pgs 1133-1136	Raft items added, MK16 Container, Crimp tools, Additional/new inflation items
Appendix A3	Canada option added
Appendix A4	Cylinder chemical leak test - form
Appendix A5	Additional protection 36-46 metres drop height

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Letter of Transmittal

To: Holders of Part No. 08431009 (M269)

Title: SURVIVAMKIV

REVISION No. 2 Dated FEB/09

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

Signed

Date 18-2-09

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights
This revision introduces the 4 Person liferaft to be included in this manual.	
TITLE PAGE Pg 1	SOLAS ref removed
CERTIFICATION Pg 2-4	4 Person included & Page num amended.
REVISION RECORD Pg 1	Revision updated
EFFECTIVE PAGES Pgs 1-4	Pages updated
CHAPTER 1 Pgs 102-112	4 Person & Fig added. Torque table updated
CHAPTER 3 Pg 303	TABLE 301 updated
CHAPTER 4 Pg 403	Inspect seam slippage
CHAPTER 5 Pg 502 & 506	FIGURES 501 & 502 updated
CHAPTER 6 Pg 603-607	Adhesive text updated
Pg 611 & 623-624	FIGURE 603, Container text added
CHAPTER 7 Pgs 703-706, 714-721	4 Person added to E-packs
CHAPTER 8 Pgs 813-819,838,844-853	4 Person added (general)
CHAPTER 10 Pg 1004-1005	Digital pressure gauge only & Fabric alternative
CHAPTER 11 Pg 1106	Boarding ramp P/N added
Pg 1108-1112, 1116-1124, 1132	4 Person added, TABLES updated
Appendix A1 Pg 1	4 Person included
Appendix A2 Pg 2-4, 7	4 Person included, FIGURES updated

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Letter of Transmittal

To: Holders of Part No. 08431009 (M269)

Title: SURVIVAMKIV

REVISION No. 1 Dated AUG/08

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

Signed

Date 28-8-08

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights
This revision introduces data table updates, Splice knot, Painter sachet positioning, US Appendix and other sundry changes.	
REVISION RECORD Pg 1	Revision updated
EFFECTIVE PAGES Pgs 1,2,3 & 4	Pages updated
CONTENTS Pg 1	Appendix 2 added
INTRODUCTION Pgs 6-8	Abbreviation added
CHAPTER 1 Pgs 106-116	Data tables updated
CHAPTER 2 Pg 204	FIGURE 203 amended
CHAPTER 4 Pg 407	Gas inflation (US) updated
CHAPTER 5 Pgs 505 & 507	Conversion added & Text amended
CHAPTER 6 Pg 611	FIGURE 603 amended
CHAPTER 7 Pgs 701-722	E-packs & Extra foam protection updated
CHAPTER 8 Pgs 801-809, 813-814	General amendments, Hauling-in ladder corrected
Pgs 827-828, 845-846	New painter splice knot introduced
Pgs 831-832, 853-854	New painter position
CHAPTER 10 Pg 1004	Fid tool added
CHAPTER 11 Pg 1109,10, 14-24	Container/ Strap & crimp tables updated
Pg 1126	Mk18 Container labelling introduced
Appendix A2 Pg 1-8	US Appendix Epack information introduced

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MARINE MKIV
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Letter of Transmittal

To: Holders of Part No. 08431009 (M269)

Title: MARINE MKIV

VERSION No. 4 Dated Apr/16

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

Signed _____

Date 22-4-16

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights
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This version of Manual 269 combines several service manuals. Use this service manual instead of the service manuals that follow:

Elliot Crewsaver	Service Manual 273
Eurovinil Silver Series	Service Manual 282
DSB LR07	Service Manual 270
New Wave Guardian	Service Manual
SSPI Oceanmaster	Service Manual 9103

Please note that these service manuals will be rescinded at a later date.

The reference number of this service manual will now be given as "M269-00".

The two digits at the end denotes the language of the manual.

For example, the "-00" represents the English variant.

This version includes sundry corrections and standardisation of technical nouns.

Please see the pages that follow for the changes introduced into this service manual.

Section	Page	Changes
Title Page	1	Manual header updated throughout. Company name and address updated.
Certification Page	3	Company name updated.
Revision Record	1	Revision record updated.
Service Bulletin List	1	Service bulletins that have been included in this manual have been listed here.
Effective Pages	1-7	Effectivity updated.
Associated Publications	1-2	Updated to reflect changes in manual. Manufactures guidance notes added.
Contents Page	1	Updated to include new appendices.
Introduction	1	Brands that have been included are listed here.
	6	Millibar added to abbreviations.
	7	Service provision updated.
Chapter 1	103	Alternative adhesive added.
	108	4N nominal dimensions added.
	114	Silver series flatpack added.
	115	Millibar added.
	116	RL6 power unit activation cord lengths added
Chapter 2	206	FIGURE 205 updated.
Chapter 4	407	Gas cylinder manual withdrawn. Cylinder tolerances updated.
	411	Inspection of RL 6 light steps added.
	413 - 419	Zip pullers inspection steps added.
Chapter 5	520 - 523	Blast testing steps added.
Chapter 6	604	Alternative adhesive added.
	607	Alternative to MEK added.
	606 - 612	Introduction of alternative structural fabric.
Chapter 7	701 - 706	SB03/01 referenced.

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Chapter 8	804	Floating knife steps added.
	808 - 815	RL 6 installation steps added and correctly fitted RL 6 steps added
	831 - 833, 835 & 837	Desiccant drainage holes steps added.
	841	Dispose of all black operating heads added.
	850	Floating knife steps and drogue placement steps added
	859	Replace DL container seal strip.
	860	Containers dropped from a height greater than 18 metres steps added.
	863	Dispose of all black operating heads added.
	864	FIGURE 843 updated.
	873	Drogue placement steps added.
	883	Containers dropped from a height greater than 18 metres steps added.
Chapter 10	1004	Tools added from EV manual
Chapter 11	1105	Brands added to light equipment.
	1106	Zip pullers added.
	1116	Standardise straps (throughout).
	117	4N container added.
	1120	GRP containers approved for a maximum stowage height of 36 metres can be used as an alternative to GRP containers approved for a maximum stowage height of 18 metres added.
	1135 - 1171	Each type of container added. Positioning of each label added. all brands included
Appendix A-1	1	Alternative first aid kit added
	4	Anti-seasickness tablets added.
Appendix A-2	1-2	Alternative labels added.
	3-4	Alternative torch added.
	5	Torch testing steps added.
Appendix A-5	2 - 3	Conatiner information added.
Appendix A-6		25 Person liferaft - overcapacity variant

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MARINE MKIV SERVICE MANUAL

Appendix A-7

Silver Series liferaft added.

Appendix A-8

Servicing a 13 person liferaft steps
added.

Appendix A-9

Standard packing of a DSB LR07
DL liferaft added.

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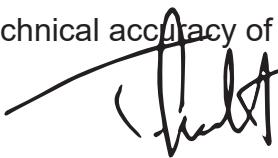
To: Holders of Part No. 08431009 (M269-00)

Title: Marine MKIV Service Manual

VERSION No. 5 Dated Sep/16

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

Signed



Date 9/9/16

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights	
Section	Page	Changes
Chapter 1	103	Constructional material clarified
Chapter 4	407	Cylinder testing steps amended
Chapter 5	507 510	Step 3.2.1 corrected mb value inserted
Chapter 6	603	TABLE 601 removed Liferaft condemnation procedure amended
Chapter 8	806 846 848 849 858 870 879	Paragraph title amended Figure number corrected in text Figure number corrected in text Figure number corrected in caption Figure 828 amended Figure number corrected in text Step 6.26 inserted

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Pages Affected		Revision Highlights
Section	Page	Changes
Section 11	1117	Sales Code added
	1124	Table 1113 broken out
		Table 1113 (i) & (ii) inserted
Section 11	1128	Table 1117 broken out
		Table 1117 (i) & (ii) inserted
	1129	Note inserted
		Table 1118 broken out
		Table 1118 (i) & (ii) inserted
	1130	Note inserted
		Table 1119 broken out
		Table 1119 (i) & (ii) inserted
	1131	Note inserted
		Table 1120 broken out
		Table 1120 (i) & (ii) inserted
	1131	Note inserted
	1138—1149	Call-outs amended
	1158	Sales Code added
		Quantities amended
	1159—1164	Call-outs amended
	1175	Sales Code added
		Quantities amended
Appendix 1	1	Quantities amended
	3—5	Sales Codes added, NOTE removed

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Letter of Transmittal

To: Holders of Part No. 08431009 (M269-00)

Title: Marine MKIV Service Manual

VERSION No. 6 Dated Oct/16

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

Signed



Date

3-10 - 16

Tommy Scott
Marine Design Manager

Pages Affected	Revision Highlights	
Section	Page	Changes
Title Page	1	Version updated
Revision Record	1	Revision Record updated
Service Bulletin List	1	Service Bulletin List updated
Chapter 5	510	Pressure conversion corrected

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Letter of Transmittal

To: Holders of Part No. 08431009 (M269-00)

Title: Marine MKIV Service Manual

VERSION No. 7 Dated Jan/17

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

Signed  Date 16 - 1 - 17
Tommy Scott
Marine Design Manager

Pages Affected		Revision Highlights
Section	Page	Changes
Title Page	1	Version updated
Revision Record	1	Revision Record updated
Contents	1	Appendix 10 inserted
Introduction	1	Contents page updated
Chapter 1	101	Contents page updated
	115	N-Series Low Profile container nominal dimensions inserted
	116	N-Series Xtrem container nominal dimensions inserted

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Pages Affected		Revision Highlights
	117	Torque setting added for H-Pack and vacuum plugs
	118	Battery activation cord lengths updated.
Chapter 2	201	Contents page updated
	207-212	Unpacking procedure for Xtrem containers inserted
Chapter 4	404	Step 1.5.3 - MED wheelmark updated
	405	Figure 401 updated
Chapter 5	501	Contents page updated
	524-527	Testing the H-Pack steps inserted
Chapter 7	701	Contents page updated
	702	Figure 701 caption inserted
	703-706	Figure captions amended
	707-709	Emergency equipment tables inserted for N-Series containers
	722-734	Emergency packs for N-Series Low Profile containers inserted
	735-745	Emergency packs for N-Series Xtrem containers inserted
	746-751	Figure references updated

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Pages Affected		Revision Highlights
Chapter 8	801	Contents page updated
	845-846	N-Series Low Profile container preparation inserted
	847-849	N-Series Xtrem container preparation inserted
	866	Figure 834A caption amended.
	867	Figure 834B caption amended.
	867	Figure 834B amended.
	872	Table 801 updated. 25 DL container size corrected.
	896	Table 802 updated. 20 DL container size corrected.
	897	Heat-shrink sleeve section changed to sub-section 7, moved to page 897
	898.1-898.41	Pack a throwover liferaft into a N-Series Low Profile Container steps inserted
	898.42-898.86	Pack a throwover liferaft into a N-Series Xtrem Container steps inserted
	898.87	Container labelling changed to sub-section 10
	898.88	Blank page inserted
Chapter 11	1101	Contents page updated
	1102	Text moved to page 1103
	1103	Text moved from page 1102 to 1103
	1107	Boarding ramp part numbers updated.

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Pages Affected		Revision Highlights
Chapter 11	1112	Two-piece paddles inserted
	1115	N-Series containers inserted
	1133	N-Series Low Profile container information inserted
	1134	N-Series Xtrem container information inserted
	1136	N-Series container spares inserted
	1137	N-Series H-Pack bag sizes inserted
	1137	N-Series heat-shrink sleeve P/Ns inserted
	1137	N-Series Xtrem H-Pack sizes inserted
	1138	Note amended
	1185	Blank page inserted
	1186-96	N-Series Low Profile container labels inserted
	1197-1198.8	N-Series Xtrem container labels inserted
	1198.13-15	Foam protection pads broken out
	1198.14	N-Series foam protection pads inserted
Appendix 10	A10 1-2	Appendix 10 for Post operational packing vacuum test record inserted

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Letter of Transmittal

To: Holders of Part No. 08431009 (M269-00)

Title: Marine MKIV Service Manual

VERSION No. 8 Dated Aug/21

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

Signed



Date 06/09/2021

Richard Kerrigan
Marine Technical Manager

Pages Affected	Revision Highlights	
Section	Page	Changes
Title Page	1	Version updated
Revision Record	1	Revision Record updated
Contents	2	Contents updated
Section 1	117	Para. 3. Table updated Table 101 updated
Chapter 2	211	New step inserted at Step 4.2.15 All subsequent steps renumbered
Chapter 6	605—606	Liferaft condemnation procedure updated

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Pages Affected		Revision Highlights
Section 7	703 705 706 707 708 709 710 711 712 737—750	Part number change Table 701 Part number change Table 702B Part number change Table 703 Part numbers changed on Table 703B Table 703BB added Part number change Table 703d Part number change Table 703E Table 703EE added Table updated Xtrem sub heading major update.
Chapter 8	845 846 848 853 875 877 880 898.3 898.4 898.44 898.44 898.47 898.50 898.42— 898.91	Step 4.5.1 updated Figure 820A updated Step 4.6.1 updated Reference to Appendix 12 added Reference to Appendix 14 added Reference to Appendix 12 added Reference to Appendix 14 added Reference to Appendix 12 added Step 8.5 removed Reference to Appendix 14 added Steps 9.3 and 9.4 removed Step 9.6 appendix 12 reference added Step 9.4 removed Step 9.12.1 removed Reference to Appendix 14 added Figure 899A updated Xtrem packing major update
Chapter 10	1004	Table updated
Chapter 11	1105 1117 1134 1139 1182	Table updated Table updated Table updated Reference to Appendix 15 added Table updated

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Pages Affected		Revision Highlights
Appendix 1	1 4 5	Table A1-1 updated Table A1-4 updated Table A1-5 updated Table A1-6 updated
Appendix 6	6 6—7	Table A6-1 updated Figure A6-2 updated
Appendix 7	6 7 8 9	Reference to Appendix 12 added Figure A7-6 removed Reference to Appendix 14 added Figure A7-11 updated
Appendix 9	6 7 8	Reference to Appendix 12 added Figure A9-1E removed Reference to Appendix 14 added
Appendix 11	1—4	Appendix added
Appendix 12	1—6	Appendix added
Appendix 13	1—6	Appendix added
Appendix 14	1—6	Appendix added
Appendix 15	1—10	Appendix added
Appendix 16	1—10	Appendix added

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RECORD OF VERSIONS

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SERVICE BULLETIN LIST

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LIST OF ASSOCIATED PUBLICATIONS

NOTE: Please make sure that you are using the latest issue.

INFLATION EQUIPMENT

- M-07-IS-GIVT Gas Inflation System (GIS) (Torsional) inlet valve installation instructions
- M-07-UM-GIST General user manual for gas inflation system (Torsional)
- M-07-IS-1HOSE Inspection of all inflation hoses.

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

Leaffield Marine Limited
Leaffield Way, Corsham, Wiltshire, SN13 9SS
Tel: +44 (0)12 2581 0771 Fax: ++44 (0)12 2581 0771
E-mail: lml@leaffield.co.uk

APPROVED SPARE PARTS, NON-OPERATIONAL LIFERAFTS AND THE MED

- Service bulletin 03/01
- Service bulletin DSB_5_2009
- Service bulletin 62/10 (EV)
- Service bulletin 60/11 (SSPI)
- Service bulletin 42/13 (Elliot Crewsaver)

The above service bulletins are published by :-

Survitec Group Limited
Kingsway, Dunmurry
Belfast, BT17 9AF
Tel: +44 (0)28 9030 1531, Fax: +44 (0)28 9062 1765
Email: publications@survitecgroup.com

Search And Rescue Transponder (SART)

- User Guide (latest revision) 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

RL6 Liferaft Light

- 49-117 RL6 Liferaft Light - Installation and Maintenance Instructions (Daniamant)
- PSDS 017 RL6 Liferaft Light - Product Safety Data Sheet (Daniamant)
- 49-129 RL6 Liferaft Light - Plug Fitting Instructions Supplement (Daniamant)

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

Daniamant Limited
Unit 3, The Admiral Park, Airport Service Road, Portsmouth, PO3 5RQ
Tel: +44 (0)23 9267 5100 Fax: ++44 (0)23 9267 5101
www.daniamant.com

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- A5 Additional protection 36-46 metres drop height
- A6 25 person liferaft - overcapacity variant
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- A10 Records of post operational packing vacuum test
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- A12 Install and check Leafield GIST operating head
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1. General

- 1.1 This service 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.
- 1.2 Survitec Group 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 Survitec Group Limited. Unauthorised changes may cause the equipment to malfunction. They may also void the approval of the equipment.
- 1.3 This manual covers the Marine MK IV family including:
 - Elliot
 - EV Silver Series
 - Crewsaver
 - DSB LR07
 - Beaufort Seafarer
 - New Wave Guardian
 - Oceanmaster
 - RFD - Surviva
 - Survitec Zodiac
- 1.4 Wheelmark 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, thermal protection aid (TPA's), position indicating lamps, retro-reflective tape and HRU). Items not wheel-marked may be subject to approval by the National authority.

2. Manual breakdown

2.1 Chapters and Page Numbers

2.1.1 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
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8	801 - 899	Assembly and Repacking
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10	1001 - 1099	Tools, Equipment and Materials
11	1101 - 1199	Illustrated Parts List
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2.2 List of Effective page

2.2.1 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 currency.
This list is included in the introductory pages of the manual.

2.3 Record of revisions

- 2.3.1 Modifications to the equipment will be embodied under the approval of the United Kingdom Department of Transport. When required, the pages of this manual will be amended, approved and reissued as a revision.
- 2.3.2 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.

- 2.3.3 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.
- 2.3.4 The transmittal letters are to be filed behind the Record of Versions page at the front of the manual.

2.4 Associated publications

- 2.4.1 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 NOTE

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

- 4.1 Survitec Group 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 1974 or any such enactment.

5. List of abbreviations

The following list of abbreviations are used throughout the manual:

AR	As required	m	metre(s)
assy.	Assembly	max.	Maximum
B	Bridle test	mb	millibar
C	Celsius	min.	Minimum
cc, cm ³	Cubic centimetre(s)	ml	Millilitre(s)
cu.in	Cubic inch	mm	Millimetre(s)
cm	centimetre(s)	mm WG	millimetres of Water Gauge
CO ₂	Carbon dioxide	MED	Marine Equipment Directive
c/w	Complete With	Mod.	Modification
DL	Davit Launch	N	Newton
dia.	Diameter	NAP	Necessary Additional Pressure test
DoM	Date of Manufacture	N ₂	Nitrogen
F	Fahrenheit	Nm	Newton Metre(s)
FS	Floor seam test	No.	Number
ft	Foot or feet	o/d	Outside Diameter
ft lb	foot-pound	OP	Operationally Packed
g	Gram	S/A	Self-Adhesive
g/cm ²	Gram per square centimetre	Spec.	Specification
GI	Gas Inflation test	P/N	Part Number
GIS	Gas inflation test	PRV	Pressure Relief Valve
GRP	Glassfibre Reinforced Plastics	psi	Pounds per square inch
iaw	In accordance with	PU	Polyurethane
i/d	Inside Diameter	PVC	Polyvinylchloride
in.	Inch	RF	Reference
inch WG	Inch of Water Gauge	RHS	Right Hand Side
in ³	Cubic inch	S/A	Self Adhesive
instl.	Installation	S/C	Sales Code
kg	Kilogram	sq.in	Square inch
kgf	Kilogram force	TO	Throwover
kN	kilonewton	WP	Working Pressure test
L	Litre		
lb	Pound		
lbf	Pound force		
LHS	Left Hand Side		

6. Service provision

- 6.1 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.
- 6.2 Servicing work must not be done to Survitec Group products except by Survitec Group certificated service technicians employed by and working in the approved premises of Survitec Group accredited service agents.

WARNING THE SERVICE TECHNICIAN MUST NOT SERVICE THE LIFERAFT WITHOUT A VALID SURVITEC GROUP TRAINING CERTIFICATE FOR THE LIFERAFT TYPE AND BRAND.

- 6.3 In brief, the following tasks shall be carried out:

- 6.3.1 The servicing record chart on reverse of the Liferaft Identification Label is to be completed at each servicing including;
 - (a) The stamp of the Certified Operator who serviced the liferaft in the place designated.
 - (b) The number of the Annual Certificate is to be written in the space provided.
 - (c) The Service Station Manager or Chief Inspector is to sign this card in the space provided.
 - 6.3.2 Liferafts shall be unpacked in accordance with Chapter 2.
 - 6.3.3 Liferafts and constituent items shall be cleaned and inspected in accordance with Chapters 3 and 4.
 - 6.3.4 Testing appropriate to the age of the liferaft (refer to Chapter 5, Paragraph C.1. onward) shall be carried out according to Chapter 5.
 - 6.3.5 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 Survitec Group Ltd. Technical Services.
 - 6.3.6 Sub-assembly processes and repacking of the liferaft shall be in accordance with Chapters 7 and 8.

6.4 Installation and Removal (See also Chapter 1).

- 6.4.1 Satisfactory installation of liferafts on board is the responsibility of the vessel's master and operator. In relation to servicing, however, Survitec Group servicing agents must make sure that the responsibility for reinstallation following servicing is identified within their contractual agreement and that, when the Survitec Group agent reinstalls liferafts, the resulting installation is according to Survitec Group recommendations and is in all respects satisfactory.

6.5 Special Tools, Equipment, Replacement Parts and the 'MED'.

- 6.5.1 The special tools and equipment listed in Chapter 10 or in associated publications may not be substituted except by the explicit permission of Survitec Group.
- 6.5.2 No replacement parts or materials other than those of Survitec Group supply or approval may be used in the servicing of Survitec Group products. Replacement parts are listed in Chapter 11, materials in Chapter 10 or in current service bulletins.
- 6.5.3 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 lamps
 - (b) Retro-reflective material
 - (c) Thermal Protective Aids
 - (d) Pyrotechnics (hand flares, rocket parachutes flares and buoyant smoke signals).

NOTE: MED compliant items must be accompanied by an MED 'declaration of conformity'.

Locally obtained substitutes may be used only upon approval by Survitec Group Limited, and only if they are MED compliant. Application to Survitec Group Limited, 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.



MARINE MKIV
SERVICE MANUAL

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CHAPTER 1

DESCRIPTION AND DATA

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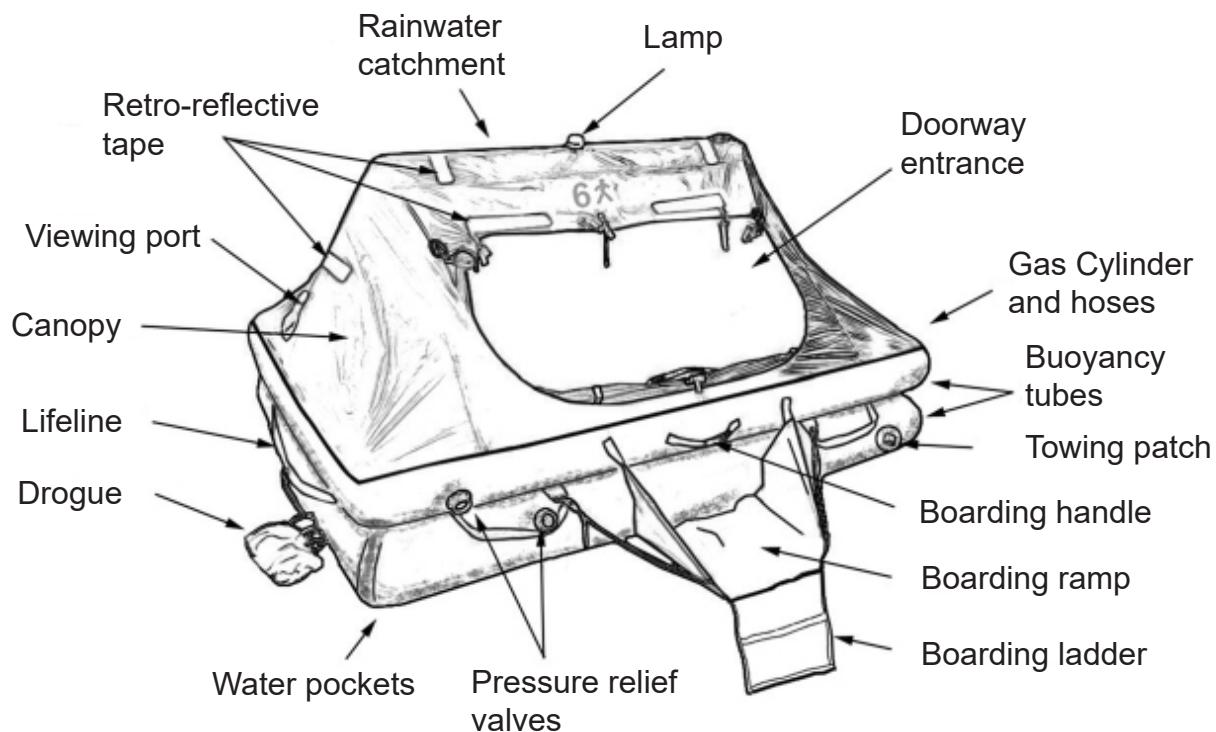


FIGURE 101A
SOLAS style Throwover Liferaft (4 - 8 person liferaft)

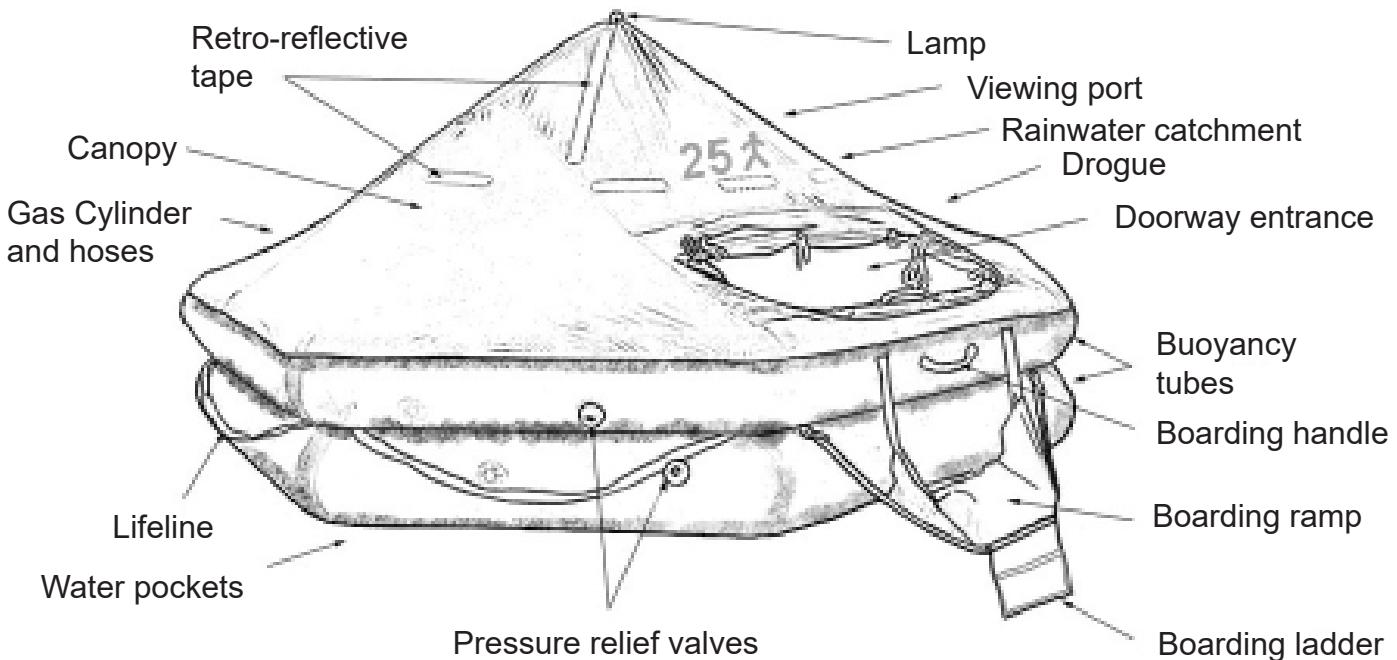


FIGURE 101B
SOLAS style Throwover Liferaft (25 person liferaft)

1. Description and Data

- 1.1 The Marine MK IV range of Throwover board (TO) liferafts are high capacity liferafts rated for 4, 6, 8, 10, 12, 16, 20 or 25 persons. Refer to FIGURE 101A and B. The range is complemented by Davit-launch (DL) versions sized 12, 16, 20 or 25 persons. Refer to FIGURE 102.
- 1.2 The design consists of two buoyancy tubes 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 tube.
- 1.3 Polychloroprene adhesive (BOSTIK 486) must be used for service repairs.

NOTE:

An alternative adhesive, for repair on marine liferafts is available. This adhesive is called Alpha S5001. The Alpha S5001 repair adhesive is to be mixed and used in exactly the same way as the current Bostik 486 adhesive as detailed in the service manuals. This adhesive can only be purchased from Survitec Group under the existing P/N 04929009.

- 1.4 The liferaft is made from the following parts.
Refer to FIGURE 101A and B or FIGURE 102:
 - 1.4.1 Two buoyancy tubes: one installed on top of the other with a floor suspended below them. This gives a high freeboard.
 - 1.4.2 A canopy, which is erected automatically by an inflated arch tube.
 - 1.4.3 Water pockets, which are installed on the base, make the liferaft stable and control the drift subsequent to the launch.
 - 1.4.4 The liferaft is made either from rubber-proofed nylon fabric or polyurethane (PU)-proofed nylon fabric. The buoyancy tubes of the liferaft are black and the canopy is a high visibility colour.

- 1.5 The liferaft has the internal and external equipment as follows.
Refer to FIGURE 101A and B or FIGURE 102:

- 1.5.1 Lifelines which are attached around the interior and exterior of the buoyancy tubes.
- 1.5.2 A rescue line and quoit which are located inside the liferaft.
- 1.5.3 Automatically deployed internal and external lamps.
- 1.5.4 Drogue (sea anchor). (Automatically deployed on Throwover liferafts).
(Manually deployed on Davit-launch liferafts).
- 1.5.5 Survival equipment, which is contained in the E-pack valise(s), are stowed inside the liferaft.
- 1.5.6 A righting ladder on the base used to right an upturned Liferaft.
- 1.5.7 Boarding means by ladder or ramp.
- 1.5.8 Rainwater catchment device on canopy exterior.
- 1.5.9 Illustrations are given, (where possible), on the liferaft to show operation of the equipment.
- 1.5.10 Immediate action leaflets are provided in English and appropriate foreign language.
- 1.5.11 Lifting bridle. (Only on Davit-launch liferafts).

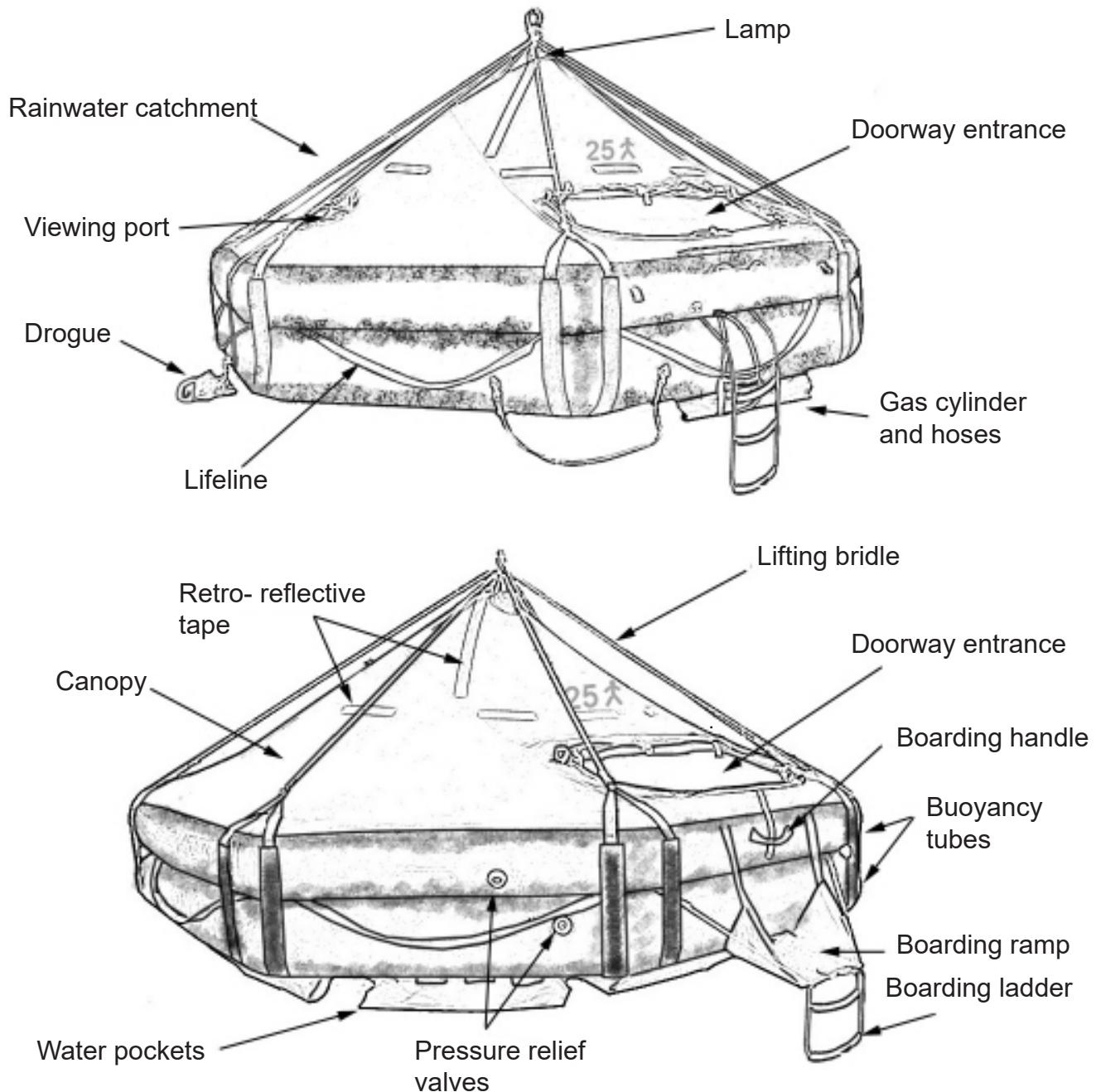
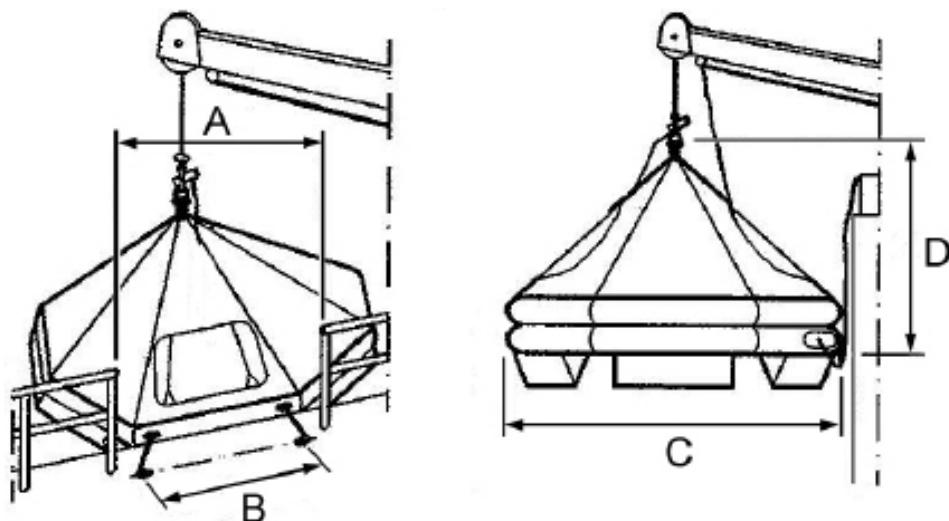


FIGURE 102
SOLAS style Davit-launch Liferaft

2. Liferaft nominal dimensions:

2.1 The following nominal measurements are the overall dimensions for each liferaft type.

Liferaft Dimensions						
	4 person	6 person	8 person	10 person	12 TO/DL person	16 TO/DL person
L	m (in)	1.64 (64.5)	2.29 (90)	2.72 (107)	—	—
B	m (in)	1.7 (67)	1.7 (67)	1.85 (73)	—	—
S	m (in)	—	—	2.66 (105)	2.86 (113)	3.27 (129)
H	m (in)	1.12 (44)	1.14 (45)	1.16 (46)	1.52 (60)	1.56 (61)
Diameter buoyancy tubes	(cm) (in)	19.7 (7.8)	22.8 (9)	24.7 (9.7)	27.5 (10.8)	28.8 (11)
Vol. buoyancy tubes without arch	(dm ³) (ft ³)	400 (14.1)	576 (20.3)	777 (27.4)	977 (34.5)	1156 (40.8)
Floor	(m ²) (ft ²)	1.5 (16.1)	2.27 (24.4)	2.98 (32.0)	3.82 (41.1)	4.48 (48.2)
Dimensions						
Liferaft shape						

Davit-launch dimensions:

DAVIT-LAUNCH HEIGHTS
(all minimum values in millimetres)

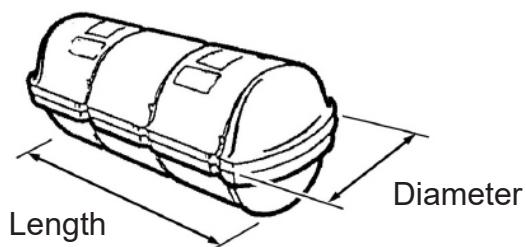
Rated capacity	A	B	C	D
12	1600	1000	2860	1891
16	1700	1000	3270	2065
20	1800	1000	4070	2065
25	1800	1000	4070	2270

Nominal dimensions for Throwover cylindrical containers:

Container Dimensions Throwover Liferafts						
Rated Capacity	MK 10 SOLAS A-PACK			MK 10 SOLAS B-Pack		
	mm (in)		Approx. Operational	mm (in)		Approx. Operational
	Length	Diameter	Weight kg (lb)	Length	Diameter	Weight kg (lb)
4	1160 (45)	435 (17)	56 (123)	1160 (46)	435 (17)	48 (106)
6	1260 (50)	485 (19)	76 (167)	1160 (46)	435 (17)	57 (126)
8	1260 (50)	485 (19)	80 (176)	1160 (46)	435 (17)	57 (126)
10	1390 (55)	535 (21)	100 (220)	1260 (50)	485 (19)	80 (176)
12	1390 (55)	535 (21)	109 (240)	1260 (50)	485 (19)	85 (187)
16	1540 (61)	535 (21)	137 (302)	1390 (55)	535 (21)	103 (227)
	—			—		
20	1635 (64)	585 (23)	158 (348)	1540 (61)	535 (21)	109 (240)
25	1635 (64)	585 (23)	178 (392)	1540 (61)	535 (21)	128 (282)

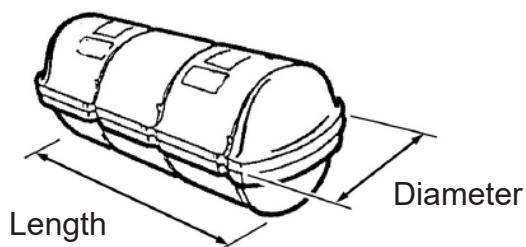
Container Dimensions Throwover Liferafts				
Rated Capacity	4N SOLAS B-PACK			
	mm (in)		Approx. Operational	
	Length	Diameter	Weight kg (lb)	
6	1050 (41)	610 (24)	63 (139)	
8	1050 (41)	610 (24)	63 (139)	

Container Dimensions Throwover Liferafts								
Rated Capacity	MK 14 SOLAS A-PACK			MK 14 SOLAS B-PACK				
	mm (in)		Approx. Operational	mm (in)		Approx. Operational		
	Length	Diameter	Weight kg (lb)	Length	Diameter	Weight kg (lb)		
4	—			—				
6	1066 (42)	556 (22)	76 (167)	—	57 (126)			
8	—			—				
10	1066 (42)	556 (22)	99 (218)	—				
12	1156 (46)	584 (23)	108 (238)	—	79 (174)			
16	1156 (45)	584 (23)	144 (317)	1156 (45)	584 (23)	101 (223)		
	1308 (51)	685 (27)	139 (306)	—				
20	1308 (51)	685 (27)	160 (353)	1156 (45)	584 (23)	106 (234)		
25	1308 (51)	685 (27)	180 (397)	—	130 (287)			

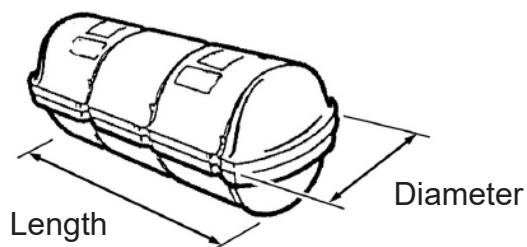


Nominal dimensions for Davit-launch cylindrical containers:

Container Dimensions Davit-launch Liferafts						
Rated Capacity	MK 10 SOLAS A-PACK			MK 10 SOLAS B-PACK		
	mm (in)		Approx. Operational	mm (in)		Approx. Operational
	Length	Diameter	Weight kg (lb)	Length	Diameter	Weight kg (lb)
12	1390 (55)	535 (21)	114 (251)	1260 (50)	485 (19)	90 (198)
16	1540 (61)	535 (21)	139 (306)	1390 (55)	535 (21)	107 (236)
20	1635 (64)	585 (23)	160 (353)	1540 (61)	535 (21)	120 (293)
25	1635 (64)	585 (23)	183 (403)	1540 (61)	535 (21)	133 (293)



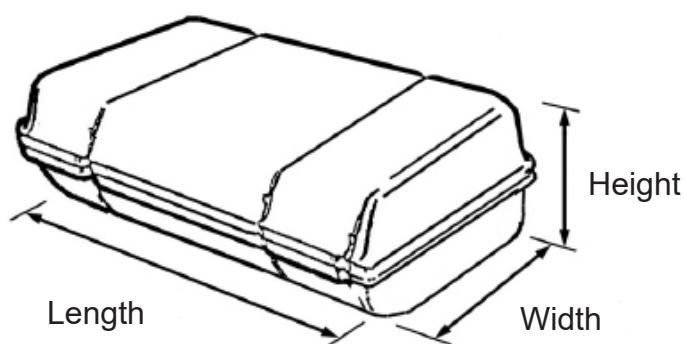
Container Dimensions Davit-launch Liferafts						
Rated Capacity	MK 14 SOLAS A-PACK			MK 14 SOLAS B-PACK		
	mm (in)		Approx. Operational	mm (in)		Approx. Operational
	Length	Diameter	Weight kg (lb)	Length	Diameter	Weight kg (lb)
12	—		113 (249)	—		92 (203)
16	1156 (45)	584 (23)	152 (335)	1156 (45)	584 (23)	106 (234)
	1308 (51)	685 (27)	141 (310)	—		
20	—		163 (359)	—		123 (271)
25	1308 (51)	685 (27)	185 (408)	—		135 (298)



Nominal dimensions for Flat-Pack containers:

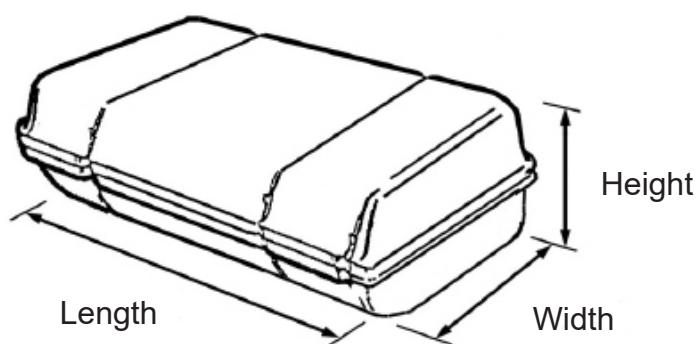
Flat-Pack Containers								
Rated Capacity	MK 16 (Size 2) SOLAS A-PACK				MK 16 (Size 2) SOLAS B-PACK			
	Length	Width	Height	Weight	Length	Width	Height	Weight
	mm (in)			kg (lb)	mm (in)			kg (lb)
10	1190 (46.8)	650 (25.6)	315 (12.4)	101 (223)	1190 (46.8)	650 (25.6)	315 (12.4)	85 (187)
12	1190 (46.8)	650 (25.6)	315 (12.4)	111 (245)				91 (201)

Flat-Pack Containers								
Rated Capacity	MK 18 (Size 1) SOLAS A-PACK				MK 18 (Size 3) SOLAS B-PACK			
	Length	Width	Height	Weight	Length	Width	Height	Weight
	mm (in)			kg (lb)	mm (in)			kg (lb)
4	900 (35)	646 (25)	310 (12)	53 (117)	900 (35)	646 (25)	310 (12)	45 (99)
6	985 (39)	670 (26)	435 (17)	76 (167)	900 (35)	670 (26)	435 (17)	57 (125)
8	985 (39)	670 (26)	435 (17)	86 (190)	985 (39)	670 (26)	435 (17)	62 (137)



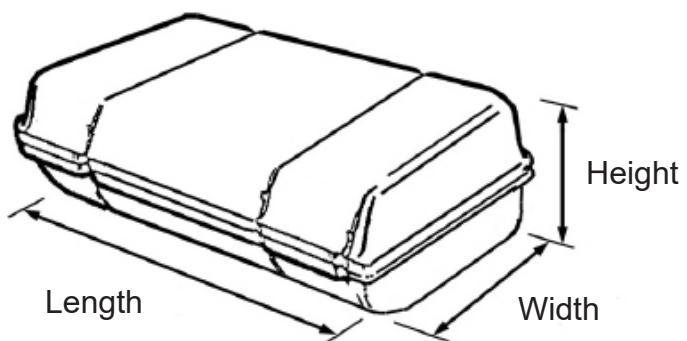
Flat-Pack Containers								
Rated Capacity	MK 20 container SOLAS A-PACK				MK 20 container SOLAS B-PACK			
	Length	Width	Height	Weight	Length	Width	Height	Weight
	mm (in)			kg (lb)	mm (in)			kg (lb)
25 DL	1525 (60)	820 (32)	505 (20)	183 (403)	1525 (60)	820 (32)	505 (20)	153 (337)
20 DL	1525 (60)	820 (32)	505 (20)	160 (353)	—			

Flat-Pack Containers				
Rated Capacity	G21 container SOLAS B-PACK			
	Length	Width	Height	Weight
	mm (in)		kg (lb)	
12 TO	925 (36.5)	600 (24)	340 (13.5)	—



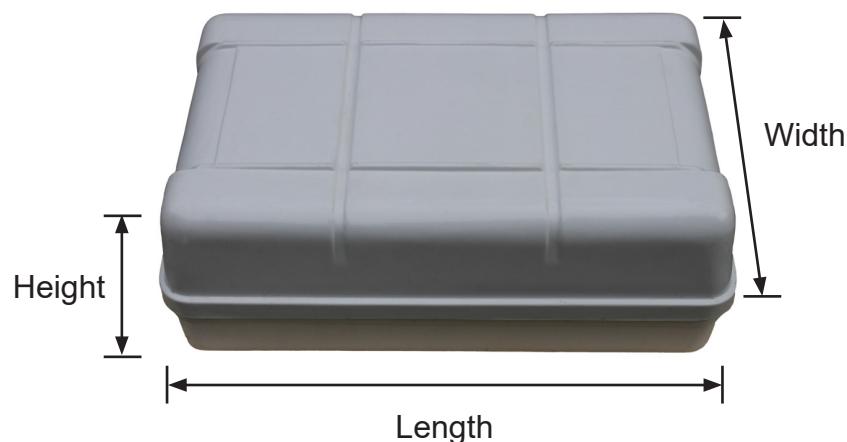
Nominal dimensions for Silver Series Flat-Pack containers:

Silver Series Flat-Pack Containers								
Rated Capacity	SOLAS A-PACK				SOLAS B-PACK			
	Length	Width	Height	Weight	Length	Width	Height	Weight
	mm ("')			kg (lb)	mm ("')			kg (lb)
6	820 (32)	640 (25)	310 (12)	65.5 (144)	820 (32)	540 (21)	310 (12)	52.5 (116)
8	820 (32)	640 (25)	360 (14)	74.5 (164)	820 (32)	540 (21)	310 (12)	52.5 (116)
10	975 (38)	640 (25)	360 (14)	94 (207)	975 (38)	640 (25)	310 (12)	75.5 (166)
12	975 (38)	640 (25)	360 (14)	103 (227)	975 (38)	640 (25)	310 (12)	80.5 (177)



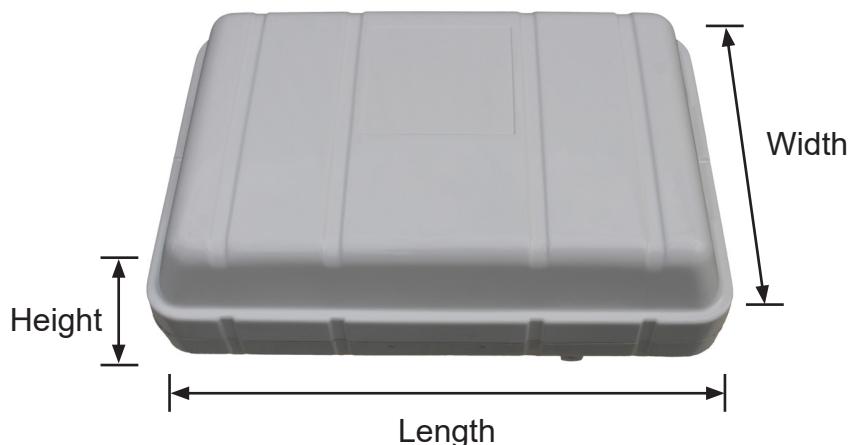
Nominal dimensions for N-Series Low Profile containers:

Low Profile Containers									
Rated Capacity	Container Size	SOLAS A-PACK				SOLAS B-PACK			
		Length	Width	Height	Weight	Length	Width	Height	Weight
		mm ("")		kg (lb)		mm ("")		kg (lb)	
4	N133	900 (35)	550 (22)	350 (14)	53 (117)	900 (35)	550 (22)	350 (14)	45 (99)
6	N133	—	—	—	—	900 (35)	550 (22)	350 (14)	54 (119)
	N134	940 (37)	570 (22)	370 (14)	74 (163)	—	—	—	—
8	N134	—	—	—	—	940 (37)	570 (22)	370 (14)	57 (126)
	N135	1088 (43)	666 (26)	390 (15)	82 (181)	—	—	—	—
10	N135	1088 (43)	666 (26)	390 (15)	101 (223)	1088 (43)	666 (26)	390 (15)	85 (187)
12	N134	—	—	—	—	940 (37)	570 (22)	370 (14)	86 (243)
	N135	1088 (43)	666 (26)	390 (15)	110 (190)	—	—	—	—
16	N136	—	—	—	—	1160 (46)	752 (30)	400 (16)	101 (223)
	N136H	1160 (46)	752 (30)	505 (20)	137 (302)	—	—	—	—
20	N136H	1160 (46)	752 (30)	505 (20)	155 (342)	1160 (46)	752 (30)	505 (20)	108 (238)



Nominal dimensions for N-Series Xtrem containers:

Xtrem Containers									
Rated Capacity	Container Size	SOLAS A-PACK				SOLAS B-PACK			
		Length	Width	Height	Weight	Length	Width	Height	Weight
		mm ("")		kg (lb)		mm ("")		kg (lb)	
6	N137	—	—	—	—	790 (31)	555 (22)	270 (11)	53 (117)
	N137H	790 (31)	555 (22)	340 (13)	72 (159)	—	—	—	—
8	N138	—	—	—	—	840 (33)	570 (22)	294 (12)	55 (121)
	N138H	840 (33)	570 (22)	340 (13)	75 (165)	—	—	—	—
10	N139	—	—	—	—	940 (37)	640 (25)	314 (12)	80 (176)
	N139H	940 (37)	640 (25)	364 (14)	95 (209)	—	—	—	—
12	N139	—	—	—	—	940 (37)	640 (25)	314 (12)	85 (187)
	N139H	940 (37)	640 (25)	364 (14)	104 (229)	—	—	—	—
16	N140	—	—	—	—	1100 (43)	650 (26)	340 (13)	99 (218)
	N140H	1100 (43)	650 (26)	370 (15)	131 (289)	—	—	—	—



3. Inflation system and Gas charges:

(for TPED approved cylinders (Transportable Pressure Equipment Directive))

Liferaft Working Pressure (Throwover)..... 2.8 psi / 77.5 in WG / 1970 mm WG / 193 mb

Liferaft Working Pressure (Davit-launch)..... 3.5 psi / 97.0 in WG / 460 mm WG / 241 mb

Inflation system and gas charges				
Rated Capacity	kg Charging CO ₂	kg Cylinder N ₂	kg Charging CO ₂	kg Cylinder N ₂
	Throwover		Davit-launch	
4	1.98	0.06	—	—
6/8	3.38	0.14	—	—
10	5.38	0.27	—	—
12	5.38	0.27	5.38	0.27
16	6.85 7.18	0.212 0.36	8.80	0.44
20	8.80	0.44	10.77	0.54
25	10.77	0.54	12.57	0.63

4. Period to overhaul

Liferaft — 12 months

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

5. Torque wrench settings:

LEAFIELD INFLATION SYSTEM	Nm	(Ft lb f)	Special tool required
M24 nut (inlet check valve)	30	22	Yes
M16 connector (inlet check valve)	10.5±1.5	7.744±1.106	No
Cylinder valve/gas cylinder:	160	118	No
Union nut/cylinder valve	20	14.75	No
Cylinder valve/hose	12.2	9.0	No
Break stem seal assy./valve body	40	29.5	Yes
Torque drive assy./valve body	4	2.95	Yes
Operating head/cylinder valve (3 mm Hex)	1.12	0.8	No
A10 pressure relief valve (inner)	27	19.9	Yes
B10 pressure relief valve (inner) (alternative)	27	19.9	Yes
Valve, Topping-up	15	11	Yes
H-Pack nylon nut	9.5	7.0	Yes
Vacuum valve plug	6.5	4.8	Yes
Vacuum valve retaining nut	6.5	4.8	Yes

TABLE 101
Torque settings

6. Battery activation cord lengths:

- 6.1 The following cord lengths are used to attach the battery activation pins to the liferaft floor.

RL5 Lighting system		
Rated Capacity	Throw Over	Davit-launch
	Cut length (mm)	
4		
6		
8	700	—
10		
12		700
16		
20	1000	1000
25		

TABLE 102
Battery activation cord lengths

RL6 Lighting system		
Rated Capacity	Throw Over	Davit-launch
	Cut length (mm)	
4		
6		
8	400	—
10		
12		1200
16	1300	1300
20	1500	1500
25		

TABLE 103
Battery activation cord lengths

7. Installation notes:

ONLY USE GENUINE SURVITEC GROUP PARTS FOR INSTALLATIONS.

- 7.1 When more detailed instructions are necessary, refer to Survitec Group Customer Service Department.

7.1.1 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 9 m (29.5 ft) forward of the ships propellers.

7.1.2 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.

7.1.3 Magnetic deviation

- (a) 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.

7.1.4 Secure the painters

- (a) 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.

7.1.5 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.

7.1.6 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.

7.1.7 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.

7.1.8 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 7.1.10.
- (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.

7.1.9 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 7.1.10.

7.1.10 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

Section	Title	Page
1	Safety procedures.....	203
2	Removal/Date of Manufacture	204
3	Unpacking procedure.....	204
4	Unpacking procedure for H-Pack.....	207

Wear eye, face and hand protection

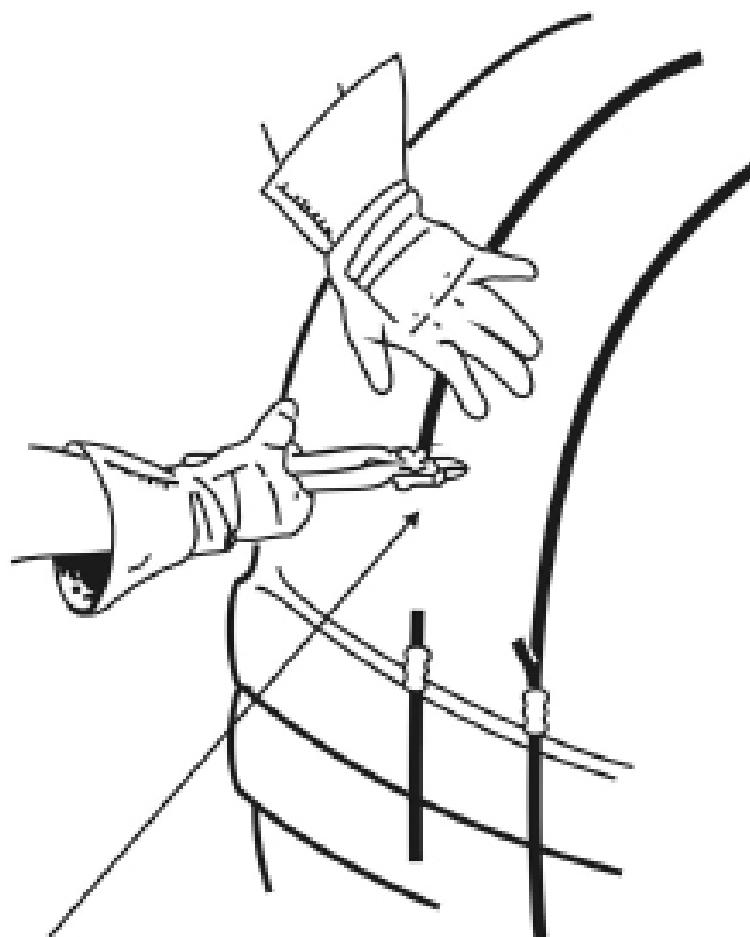
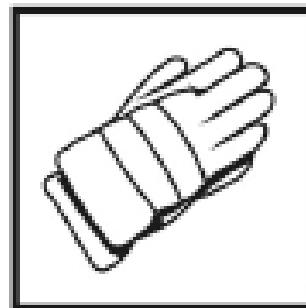
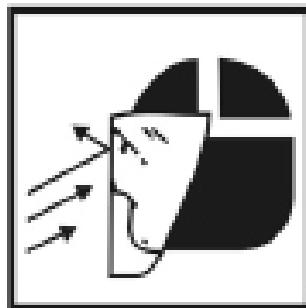
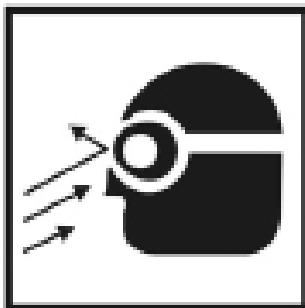


FIGURE 201
Safety procedure

1. Safety procedures

1.1 Make sure the work area is clean and the lighting is sufficient.

1.2 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.

1.2.1 Make sure that personnel are at a safe distance from the container when cutting the strap.

1.2.2 Stand to one side of each strap when cutting it.

1.2.3 Hold the strap against the container before cutting it.

1.2.4 Cut each strap between the seal and the position where the strap is held. Refer to FIGURE 202.

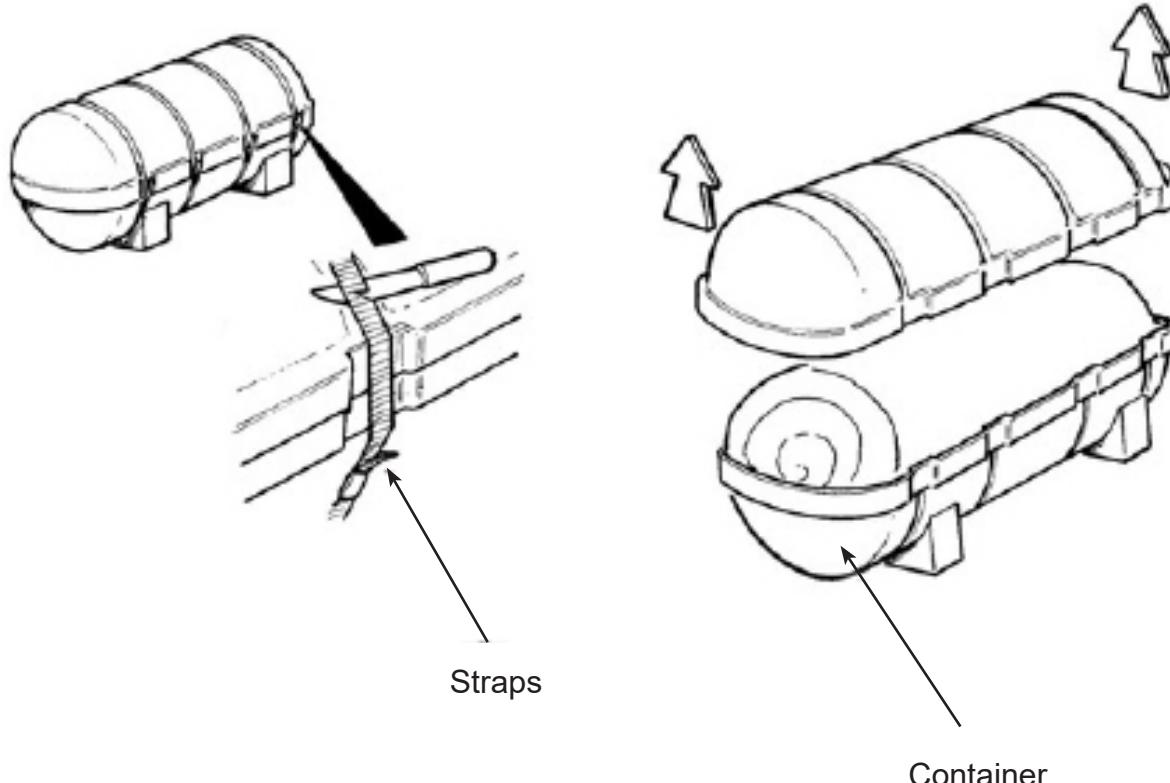


FIGURE 202
Container and liferaft

2. Removal/Date of Manufacture

- 2.1 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).
- 2.2 Check the date of manufacture and servicing period of the gas inflation system. Refer to Chapter 5, TESTING AND TROUBLESHOOTING for the test procedure. If a test is not necessary, continue this procedure at Step 3.

3. Unpacking procedure

3.1 Container and liferaft (FIGURE 202)

- 3.1.1 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.

CAUTION: HAVE A LARGE DARK COVER AVAILABLE, 10 M × 10 M. THE LIFERAFT WHEN REMOVED FROM THE CONTAINER MUST BE IMMEDIATELY COVERED AND KEPT OUT OF SUNLIGHT.

WARNING: OBEY THE SAFETY PROCEDURES IN STEP 1.

- 3.1.2 Cut the straps which hold each half of the container together as given in the safety procedure. Refer Step 1 and FIGURE 202.
- 3.1.3 Cut the straps of the container at the end grooves first and then the centre grooves. Refer to FIGURE 202.
- 3.1.4 Carefully lift the top part of the container. Refer to FIGURE 202.

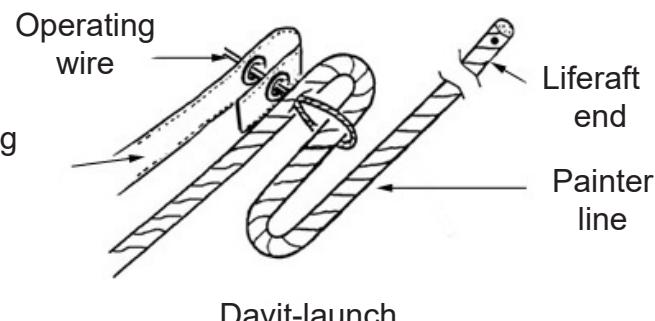
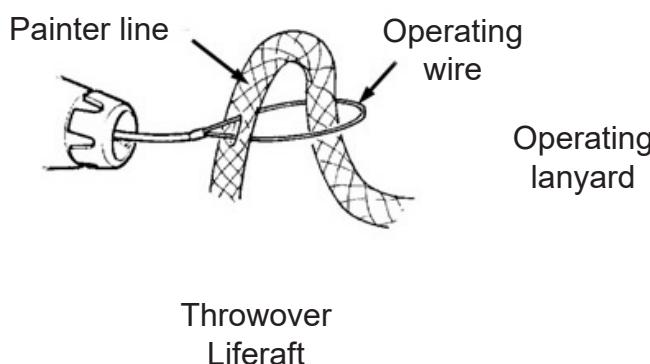


FIGURE 203
Gas inflation system

3.2 Gas inflation system (FIGURE 203)

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

- 3.2.1 CAREFULLY remove the polythene sheet covering the packed liferaft. Locate the painter patch. Untie the painter line from the painter patch.
- 3.2.2 CAREFULLY remove the liferaft until the operating head is exposed.

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

- 3.2.3 Throwover: 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. Refer to FIGURE 203.
This prevents accidental deployment.
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. Refer to FIGURE 203.
This prevents accidental deployment.
- 3.2.4 Lift the bulk of the raft out of the container and onto a packing table. Refer to FIGURE 204.
- 3.2.5 Unroll the liferaft completely. Fold the liferaft buoyancy tubes and canopy out of the way. Refer to FIGURE 204.
- 3.2.6 Remove the equipment pack(s) and set them aside. Refer to FIGURE 204.

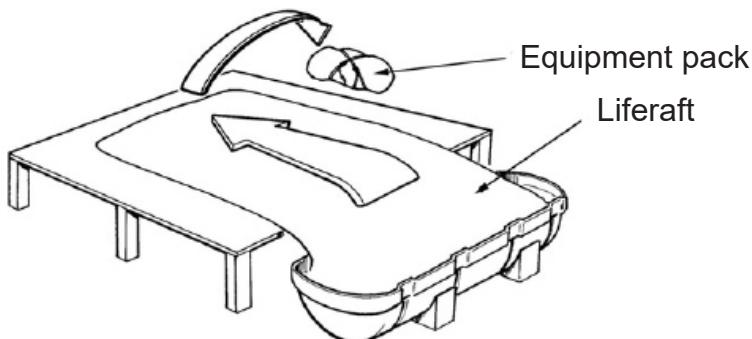


FIGURE 204
Liferaft and Equipment pack

- 3.2.7 Detach the hoses from the operating head/cylinder assembly. Fit two protection caps on the operating head immediately.
Refer to FIGURE 205.
- 3.2.8 Fit dust caps onto the ends of the inflation hoses. Refer to FIGURE 206.
- 3.2.9 Carefully remove the cylinder assembly from the liferaft.
Refer to FIGURE 205.
- 3.2.10 Secure the gas cylinder in a clamp device. Carefully unscrew the two 3 mm Hex bolts and remove the operating head, from the cylinder.
Refer to FIGURE 205.
- 3.2.11 Untie the holding cord and remove the paddles from the liferaft.
- 3.2.12 Disconnect the battery “activation cords” from the attachment location point.

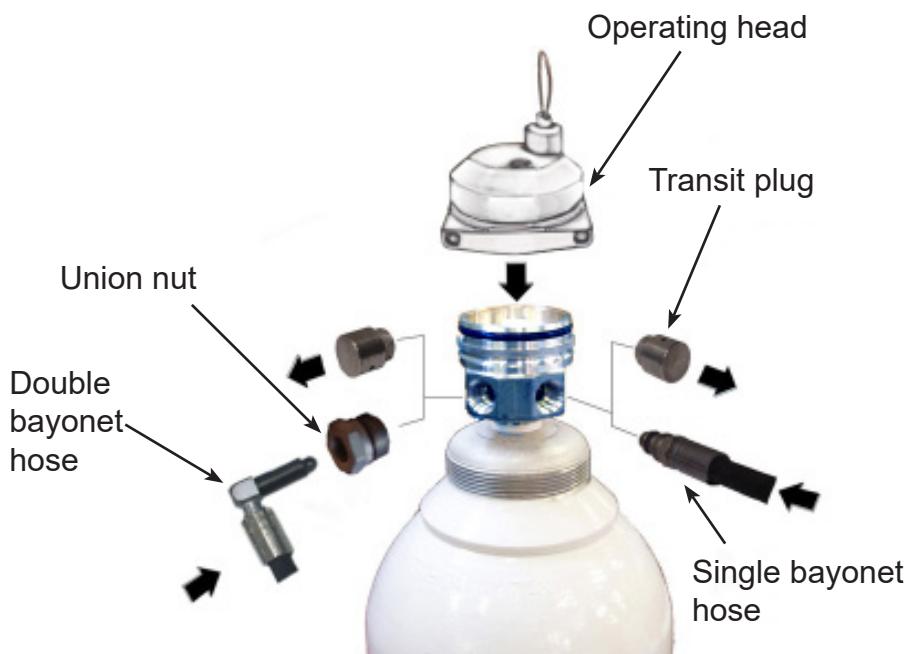


FIGURE 205
Operating head removal



FIGURE 206
Fitting dust caps

4. Unpacking procedure for Xtrem containers

4.1 Container and liferaft (FIGURE 202)

CAUTION: HAVE A LARGE DARK COVER AVAILABLE, 10 M × 10 M. THE LIFERAFT WHEN REMOVED FROM THE CONTAINER MUST BE IMMEDIATELY COVERED AND KEPT OUT OF SUNLIGHT.

- 4.1.1 Put the container onto a suitable trolley or cradle. Make sure it is held securely with the top uppermost.
- 4.1.2 Put the trolley next to the packing table.

WARNING: OBEY THE SAFETY PROCEDURES IN STEP 1.

- 4.1.3 Cut the straps which hold each half of the container together as given in the safety procedure. Refer to **Step 1** and **Figure 202**.
- 4.1.4 Cut the straps of the container at the end grooves first and then the centre grooves. Refer to **Figure 202**.
- 4.1.5 Carefully lift the top part of the container. Refer to **Figure 202**.

4.2 Do the steps that follow for the gas inflation system:

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.

WARNING: HOLD THE CYLINDER IN A VICE OR SAFE CLAMPING DEVICE WHEN YOU ATTACH OR REMOVE AN OPERATING HEAD.

- 4.2.1 Take care to remove the polythene sheet covering the packed liferaft.
- 4.2.2 Disconnect the painter line from the painter attachment hole. Refer to **Figure 207**.

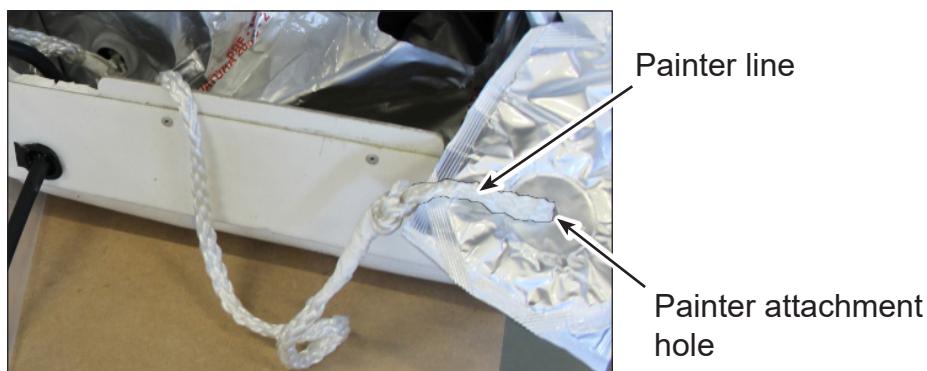


FIGURE 207
Disconnect the painter line from the painter attachment hole

4.2.3 Take care to put the painter line back through the actuator cable.
Refer to **Figure 208 (i)**.

4.2.4 Gently remove the painter line from the wire loop.
Refer to **Figure 208 (ii)**.

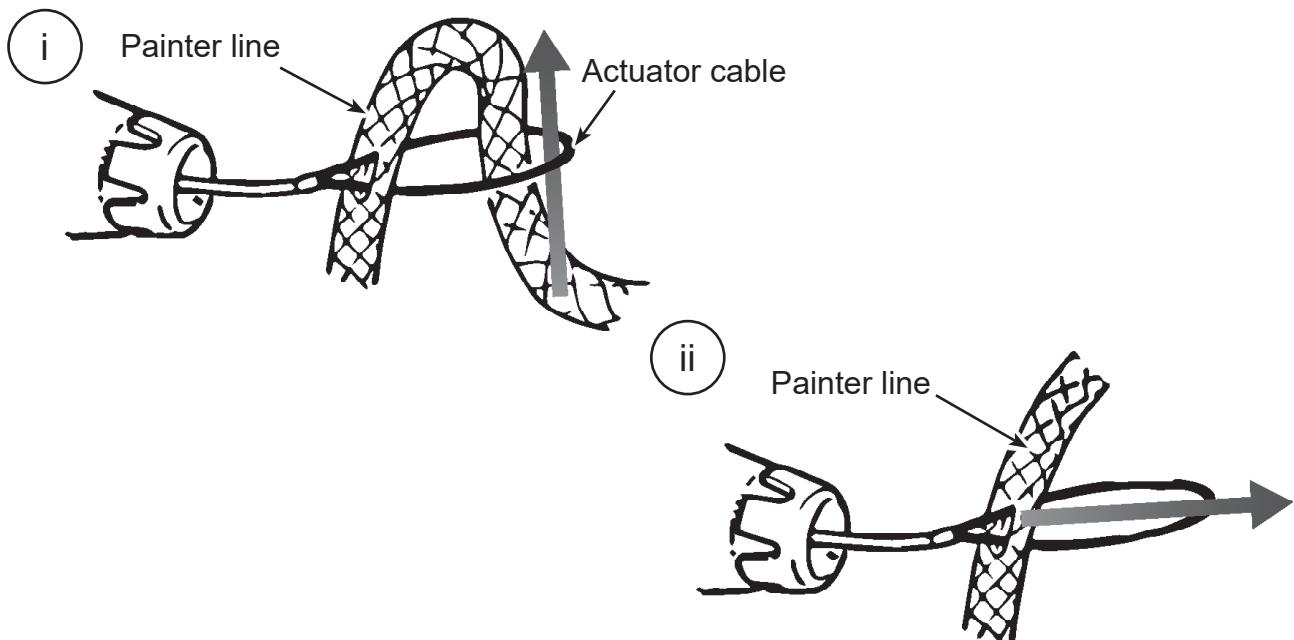


FIGURE 208
Disconnect the painter from the operating head (H-Pack not shown for clarity)

4.2.5 Take care to remove the painter sachet from the H-Pack.
Refer to **Figure 209**.

4.2.6 Remove the painter and painter sachet from the container.

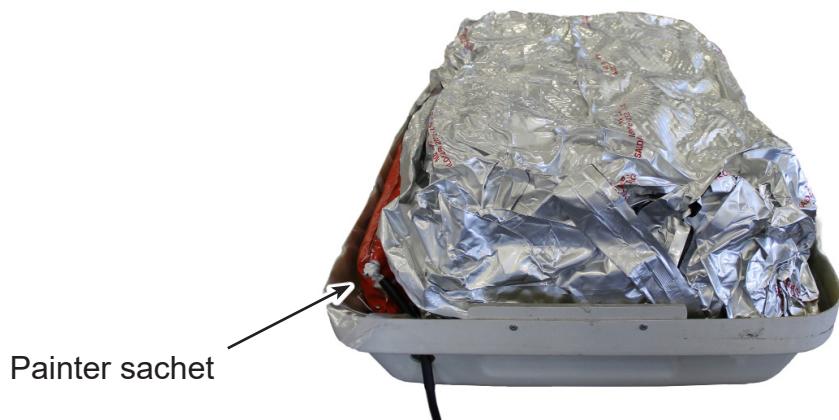


FIGURE 209
Remove the painter sachet

- 4.2.7 Remove the identification tube from the painter attachment hole on the H-Pack. Refer to **Figure 210**.
- 4.2.8 Remove the vacuum valve nuts at the front of the container. Refer to **Figure 210**.
- 4.2.9 Remove all washers and discard.

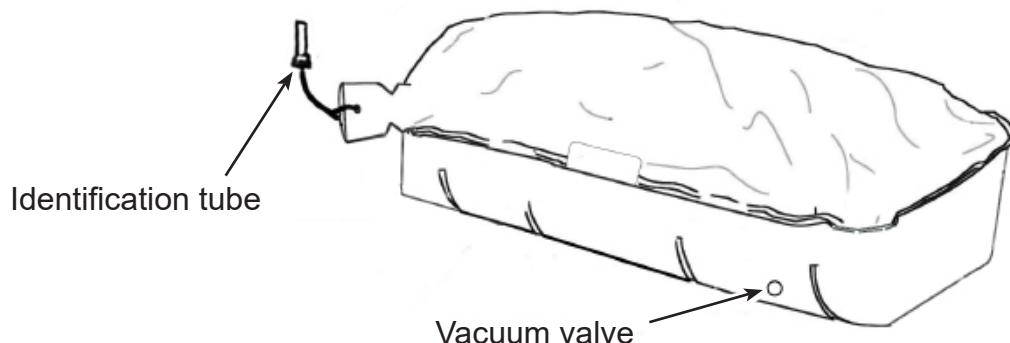


FIGURE 210
Remove the identification tube and vacuum valve

CAUTION: MAKE SURE THE SEALED H-PACK IS PULLED AWAY FROM THE FABRIC OF THE LIFERAFT BEFORE YOU CUT THE H-PACK.

- 4.2.10 Use scissors to cut around three sides of the sealed H-Pack. Refer to **Figure 211**.

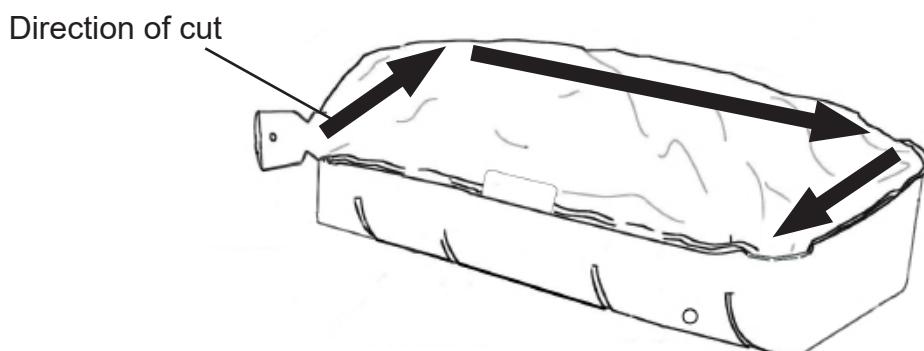


FIGURE 211
Cut the H-Pack

4.2.11 Remove the clamp nut from the operating head. Refer to **Figure 212**.

NOTE: This will allow the cylinder to be removed.

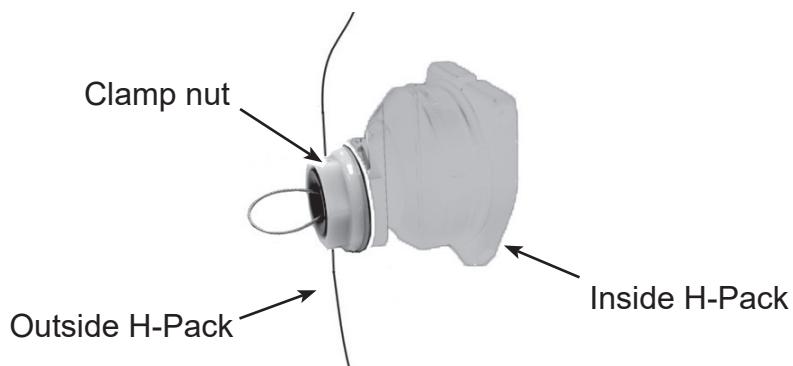


FIGURE 212
Remove the clamp nut

4.2.12 Unroll the liferaft out of the container onto the packing table.
Refer to **Figure 213**.

4.2.13 Untie and remove the paddles.

4.2.14 Untie and remove the emergency packs. Refer to **Figure 213**.

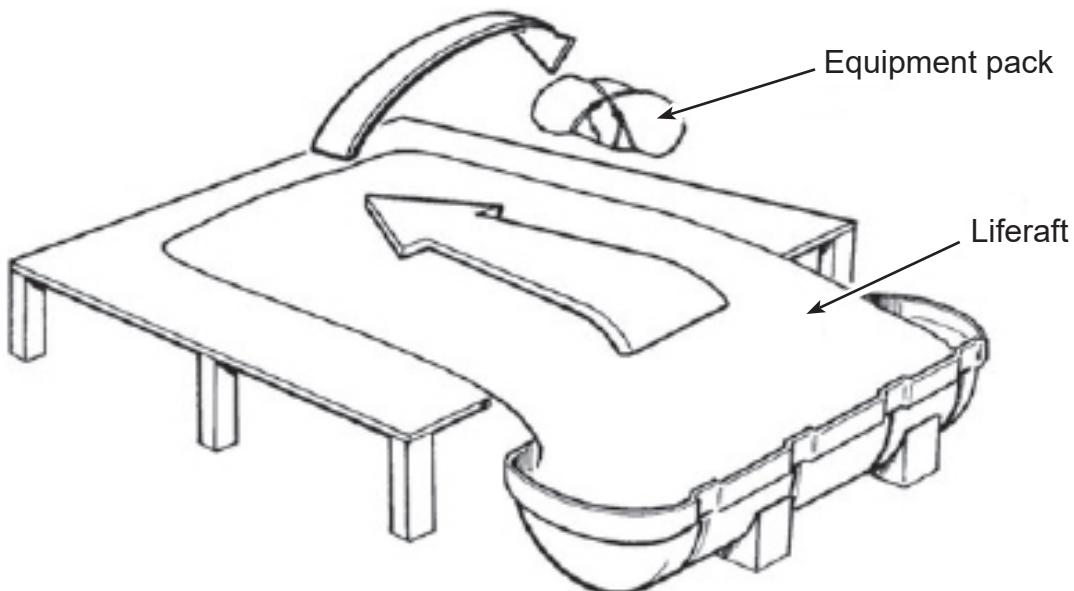


FIGURE 213
Unroll the liferaft and remove the emergency packs

- 4.2.15 Untie the painter line from the liferaft painter line loop patch.
- 4.2.16 Take care to lift the liferaft out of the H-Pack and container.
- 4.2.17 Put the remainder of the liferaft onto the packing table.
- 4.2.18 Disconnect the inflation hoses.
- 4.2.19 Install the cylinder protection cap and recoil caps.
- 4.2.20 Remove the cylinder from the liferaft.
- 4.2.21 Take care to remove the operating head. Refer to **Figure 214**.

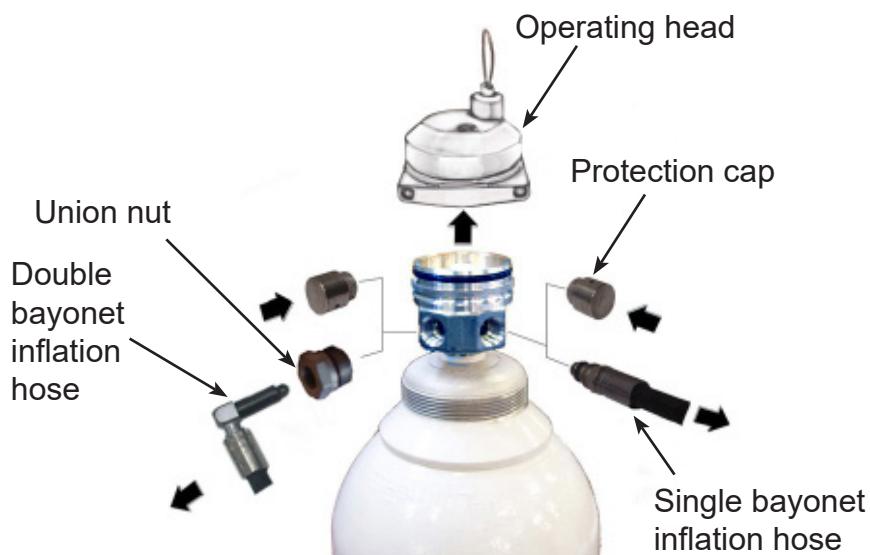


FIGURE 214
Remove the operating head

- 4.2.22 Keep the nut, O-ring and plastic washer to the side for packing.
- 4.2.23 Discard the rubber washer. A new washer is required for packing.
- 4.2.24 Remove and discard the H-Pack.
- 4.2.25 Unfold the liferaft.
- 4.2.26 Disconnect all the power unit activation cords from the attachment patch on the floor. Keep the pins in their switch blocks.

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CHAPTER 3

CLEANING

Section	Title	Page
1	General	303
2	Procedure	303
	Liferaft.....	304
	Rigid container	304

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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	Rubber coated fabrics must only be cleaned using toluene or Petroleum. The solvent shall be applied by a lint free fabric pad, wet but not dripping with 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 4% solution)	Anti-mould treatment

TABLE 301
Cleaning solvents and materials

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.

2.1 Liferaft

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

- 2.1.1 Wash the liferaft with a solution of hard soap and water.
- 2.1.2 Dry the liferaft with a clean, lint-free cloth.
- 2.1.3 Use recommended solvent in TABLE 301, to remove any oil or similar substance. Wash and dry the area as given in the previous steps.

2.2 Rigid container (anti-mould treatment)

- 2.2.1 Wash the container outer surfaces with a solution of hard soap and water.
- 2.2.2 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 4% 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

Section	Title	Page
1	General	403
	Fabric components	403
	Metal and plastic components	403
	Webbing, ropes, cordage and velcro strips.....	404
	MED (Marine Equipment Directive) Marking	404
2	Detail.....	406
	Gas inflation system.....	406
	Lamp unit and battery assembly	409
	E-pack.....	412
	Zip puller	413
	Rigid glass-reinforced plastic container	418

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1. General

- 1.1 Using the intervals specified in Chapter 5, TESTING AND TROUBLESHOOTING inspect the liferaft as follows to make sure:
 - 1.1.1 The buoyancy tube maintain the specified pressure.
 - 1.1.2 The inflation system functions efficiently. Refer to Chapter 5, TESTING AND TROUBLESHOOTING Section 3 for test procedures.
 - 1.1.3 All the components and equipment are maintained in a serviceable condition.
- 1.2 Fabric components
 - 1.2.1 Inspect all fabric components for:
 - (a) Slits, tears, apertures or abrasion.
 - (b) Proofing removal.
 - (c) Deterioration.
 - (d) Adhesion of seams and components.
 - (e) For seam slippage and edge lifting.
 - (f) Broken or worn stitching.
 - (g) Instructions and labels
(make sure that all of the pictograms are legible).
 - (h) Unwanted bonds between fabrics.
- 1.3 Metal and plastic components
 - 1.3.1 Examine for:
 - (a) Cleanliness.
 - (b) Cracks.
 - (c) Distortion.
 - (d) Scoring and burrs.
 - (e) Damaged threads.
 - (f) Frayed cables.
 - (g) Corrosion.

1.4 Webbing, ropes, cordage and 'Velcro' strips

1.4.1 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.

1.5 MED (Marine Equipment Directive) Marking

- 1.5.1 Service Station personnel must check that the 'Wheelmark', 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.
- 1.5.2 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.
- 1.5.3 The 'Wheelmark' must be completed as shown in FIGURE 401. The four 'X' digits, denote the product's Notified Body for Quality conformance. This number is recorded on the raft's declaration of Conformity (amid the Module D quality conformance data).
The 'Y' digits represent the date of original manufacture of that particular assembly/date the label was attached to the product. For instance, for a liferaft originally assembled in 2005, the four 'Y' digits are represented by 2005.

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

- 1.5.4 The MED labels are located in the following positions on Marine MK IV products:
 - (a) ID label at doorway entrance
 - (b) Outside surface of container
- 1.5.5 If a label has become damaged or illegible, replace it with a new label containing the original information or request a replacement from Survitec Group Ltd.
- 1.5.6 If a label is to be updated, use an indelible marker pen.

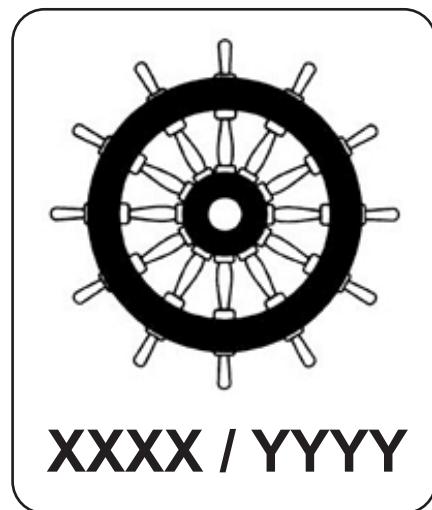


FIGURE 401
Wheelmark



FIGURE 402
Operating heads-activation

2. Detail

2.1 Gas inflation system:

NOTE:

Refer to the latest copy of the manufacturer's manual for gas cylinder instruction listed at the front of this manual, in Associated Publications section.

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.

- 2.1.1 Operating heads must be tested. It is essential that they are removed from the cylinders before testing.
- 2.1.2 If the loaded indicator is not aligned with the arrow or the actuator cable is removed, this indicates that the head may have been activated. Refer to FIGURE 402.
- 2.1.3 When the operating head is removed from its cylinder, pull the operating wire. The mechanism of the operating head must activate immediately.
On a Leafield operating head. Refer to FIGURE 402:
 - (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.
- 2.1.4 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.
- 2.1.5 Compare the weight of the cleaned cylinders against the weight printed on the cylinder label. Cylinders are to be weighed without the transit cap.

- 2.1.6 The tolerance on the weight of the CO₂ charge is +0, -46 g.
The tolerance on the N₂ charge is +0, -10 g.
If the cylinder is charged with N2 only, the overall tolerance on the cylinder weight is +0, -10 g.
Cylinders are to be charged and the weight checked to a tolerance of +0/-56 g.
- (a) You must use scales with an accuracy of ±1 g to weigh cylinders.
 - (b) A cylinder found to be outside the acceptable tolerance must be inspected and recharged. Refer to Associated Publications for the correct manual.
 - (c) If the cylinder is to be charged by an outside contractor the service station must make sure that the outside contractor is provided with all necessary tools and documentation. The service station must do a leak test on the cylinder when it has been returned from the outside contractor.
 - (d) Do a leak test on all cylinders which are recharged.
- 2.1.7 Make sure the syphon tube inside the cylinder is still serviceable.
Shake the cylinder. If the syphon 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 syphon tube has stiffened and is no longer serviceable. You must therefore reject the cylinder.
- CAUTION:** WHEN YOU CHARGE A CYLINDER, USE EITHER:
CO₂ TO SPECIFICATION BS4105, TYPE 1, AND
N₂ TO SPECIFICATION BS4366, TYPE 1, OR
CO₂ TO FEDERAL SPECIFICATION BB-C-101 AND
N₂ TO FEDERAL SPECIFICATION BB-N-411
- 2.1.8 Refer to the associated publications (at the start of this manual) for recharging instructions. If a cylinder needs to be recharged, you must charge the correct quantities of gases.
Refer to Chapter 1, DESCRIPTION AND DATA, Section 3.
- 2.1.9 Check the date of the last hydraulic pressure test. The hydraulic test should be conducted within 5 years of the previous hydraulic test.
- 2.1.10 Inspect the cylinder surface for any paint finish which is damaged and/or surface corrosion which has occurred. Please refer to Chapter 6, REPAIR if any rework is necessary.
- NOTE:** For (USA) DOT cylinders please refer to Appendix A-2, Section 2 Detail.

2.1.11 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 /gouge which is deeper than 5% of the cylinder 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.

- 2.1.12 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.
- 2.1.13 Examine hoses, inlet valves and top-up valves for visual defects. Make sure all components are correctly attached.

2.2 Lamp unit and battery assembly - RL5 lighting system

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

- 2.2.1 Illuminate the internal lamp using the switch marked 'internal' on the side of the internal lamp unit. Refer to FIGURE 403A. If the LED lamp on the internal lamp unit fails to illuminate, replace the unit.
- 2.2.2 Check the expiry date on the internal lamp unit. If the expiry date will be reached before the next scheduled service, replace the unit.
- 2.2.3 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.
- 2.2.4 Make sure the internal lamp unit is stored at a temperature below 50°C (122°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 BATTERY 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.

- 2.2.5 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 that 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 battery 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.
- 2.2.6 Check the external lamp unit. Make sure that the cables and connections have no signs of damage or deterioration.
- 2.2.7 Illuminate the external lamp using the switch marked 'external' on the side of the internal lamp unit. Refer to FIGURE 403A. If the LED lamp in the external lamp unit fails to illuminate, replace the unit.

External lamp unit switch



FIGURE 403A
RL5 internal lamp unit

2.3 Lamp unit and battery assembly - RL6 lighting system

NOTE: Refer to the manufacturer's instructions listed in the associated publications.

RL6 units are maintenance free. However, the following checks must be made at each service of the liferaft:

- 2.3.1 Check the date on the battery pack and external lamp. Both must be replaced when the expiry date is reached. If the battery or external lamp expiry date is earlier than the next scheduled service, then the units must be replaced.
- 2.3.2 Inspect the lamp and the batteries for signs of damage or corrosion.
- 2.3.3 Pull the toggle from the RL6 battery unit, both lamps must illuminate and the external lamp must flash immediately.
 - (a) If lamps fail to operate, replace the entire unit.
 - (b) If lamps operate, replace the toggle in the battery pack and switch off the lamps.

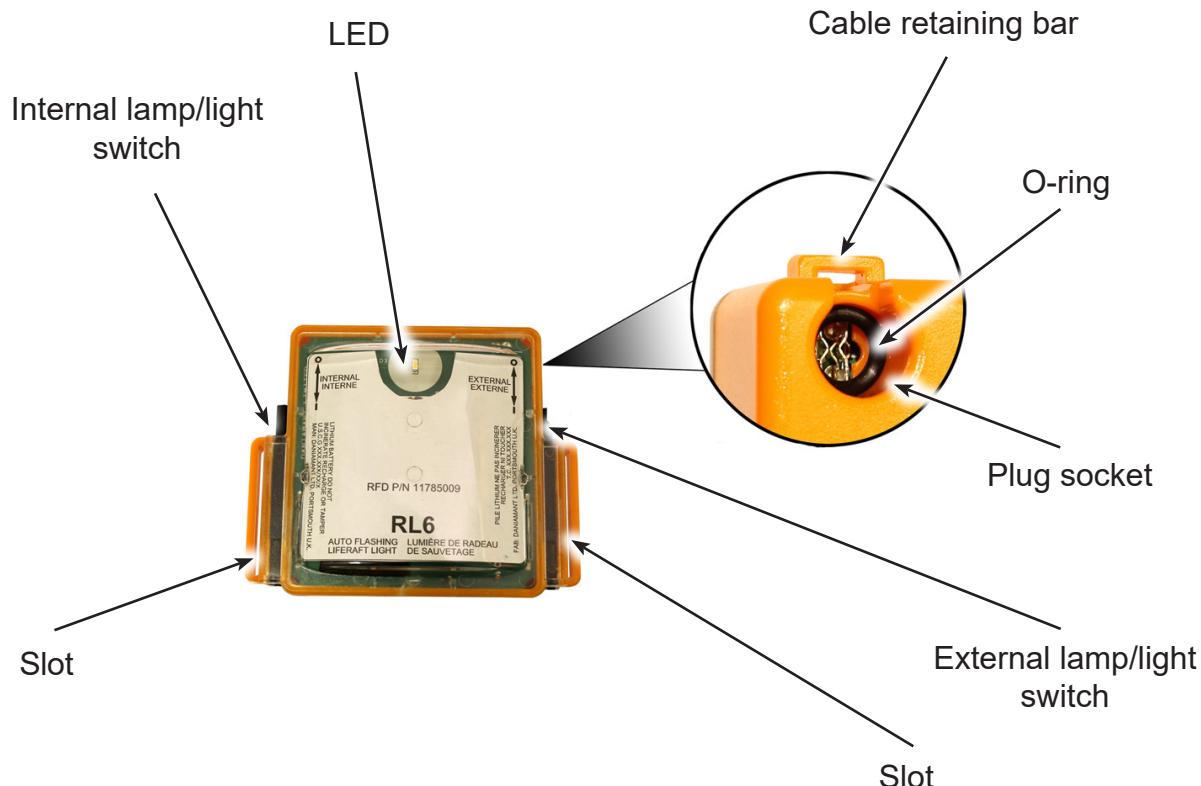


FIGURE 403B
RL6 internal lamp unit

3. E-pack (lifed items)

NOTE:

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

- 3.1 All 'lifed' items that will expire before the date of the next scheduled service, MUST be replaced in the E-pack.
- 3.2 Discard any stock which is out-of-date, as given in the applicable regulations of the country.
- 3.3 Check the pyrotechnics for general condition. Any pyrotechnics with dents, corrosion or other visible damage must be replaced.
- 3.4 Check the handbooks and leaflets. Make sure that they are in good condition and legible.
- 3.5 Test the Whistle and Bellows. Make sure they function correctly and are not damaged. Make sure that any adaptor required is fitted to the bellows and is suitable for the top up valve fitted.
- 3.6 Test the torch/flashlight, spare bulb and batteries. Make sure that 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.

NOTE:

Please refer to Appendix 2 - USA if you are using torch / flashlight P/N 06276009.

- 3.7 Radar reflectors test - (if installed)
 - 3.7.1 Examine the radar reflector for damage.
 - 3.7.2 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. Let the pressure stay for a period of one hour. Make sure that the pressure does not decrease to below 0.5 psi.
- 3.8 Check the first aid kit, bailers and paddles. Make sure that they are not corroded or damaged. If necessary, replace any defective parts.

- 3.9 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.

- 3.10 Visually check water sachets for any signs of damage, squeeze sachets and check for leaks.
- 3.11 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.
- 3.12 Check can openers, heliographs, fishing kits and leak stoppers for condition, corrosion and damage. Renew as necessary.
- 3.13 Check the drogues. If damaged, replace. If not, re-pack.
Please refer to Chapter 8, ASSEMBLY.
- 3.14 Examine the capsules of anti-seasickness tablets for condition and damage. Renew as necessary.

4. Zip pullers

If the zip pullers show signs of corrosion or they are difficult to close, they must be cleaned and then replaced.

CAUTION: THE LIFERAFT AND WORK AREA MUST BE COMPLETELY DRY BEFORE REPACKING.

CAUTION: IF USING SHARP IMPLEMENTS TAKE CARE NOT TO DAMAGE THE BUOYANCY TUBES OR CANOPY.

4.1 Replace the outside zip pullers (2 sets at each doorway)

- 4.1.1 Deflate the arch tube only.
- 4.1.2 Check for corrosion around all zips.

CAUTION: DO NOT ATTEMPT TO PULL OR FORCE THE CORRODED ZIP PULLERS.

- 4.1.3 Clean the corrosion using fresh water and/or vinegar. Make sure that you remove all corrosion.

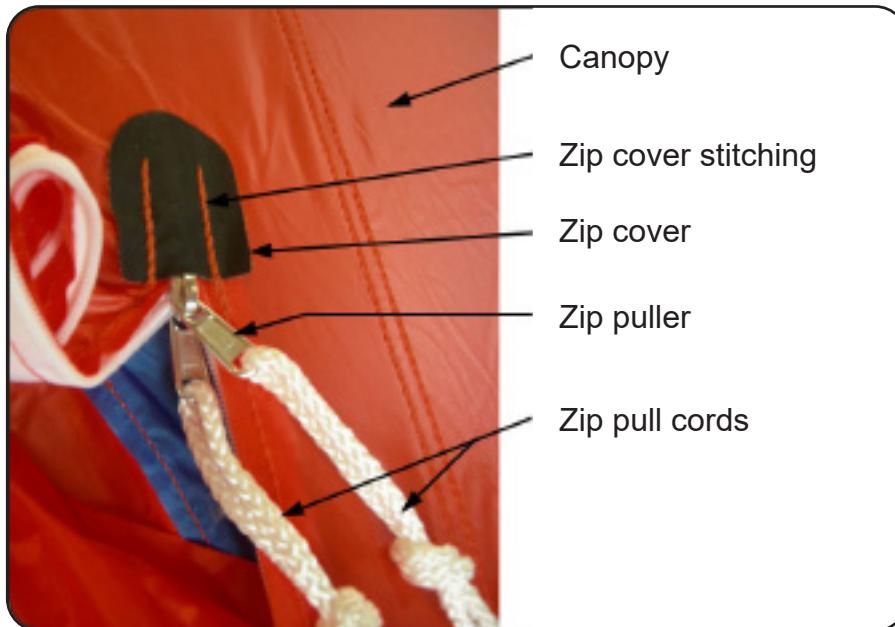


FIGURE 404
Outer doorway zip

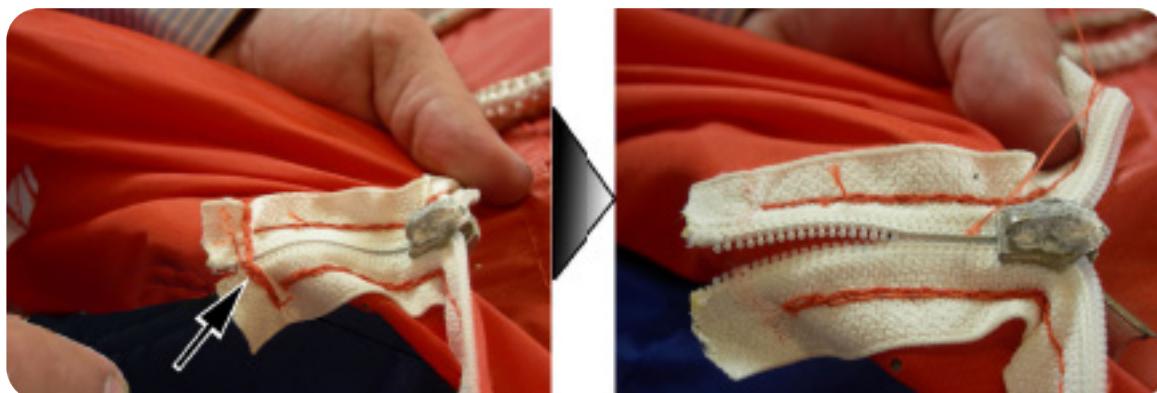


FIGURE 405
Remove zip securing stitches

- 4.1.4 Remove the zip pull cords from the ends of the zip pullers.
Refer to FIGURE 404.
- 4.1.5 Carefully remove the zip securing stitches from the back of the zips.
Refer to FIGURE 405.
- 4.1.6 Remove the zip by pushing it towards the end of the zip track.

CAUTION: DO NOT USE EXCESS FORCE TO MOVE THE CORRODED ZIP PULLER. THIS WILL DAMAGE THE ZIP TEETH. IF THE ZIP PULLER DOES NOT MOVE USE CUTTING PLIERS TO CUT THE ZIP SPINE. REFER TO FIGURE 406.

- 4.1.7 When cut, the zip will break into two halves. Remove the cut pieces of the zip without damaging the zip slider.
- 4.1.8 Insert the zip puller into the zip cover, then push it fully through.
Refer to FIGURE 407.

NOTE: The zip puller may be difficult to remove through the zip cover. If necessary remove the stitching from one side of the cover.

- 4.1.9 Retrieve the new zip puller. The zip puller must be the same type as the one being removed. Refer to FIGURE 408.

NOTE: The orientation of the zip puller. The flat side must remain on the inside of the liferaft when the zip is closed.
Refer to FIGURE 409.

- 4.1.10 Retrieve two pieces of 525 lb cord, length 500 mm. Insert one end through the zip puller eye and pull through half way. Use an overhand knot to secure the cord to each zip puller.
Refer to FIGURE 404.
- 4.1.11 Align the new zip puller evenly onto both zips and pull the zip closed for a distance of 75 mm (3"). Refer to FIGURE 409.
- 4.1.12 Stitch the zip ends securely, using thread (p/n 02426001). This will make sure that the zip puller will remain on the zip.
- 4.1.13 If the stitch cover was partially removed, re-stitch it back again to the liferaft canopy.
- 4.1.14 Route the outside zip puller cord through the zip pullers so that it is not trapped inside. Refer to FIGURE 410.



FIGURE 406
Cutting the zip spine

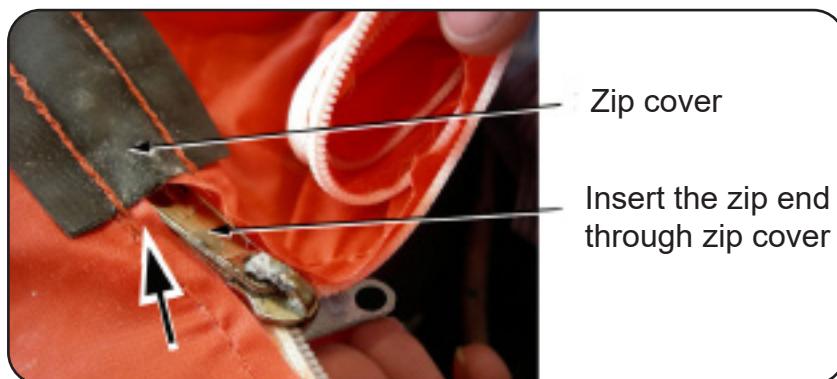


FIGURE 407
Removing the outer zip puller



FIGURE 408
OPTI Doorway zip puller YKK Doorway zip puller

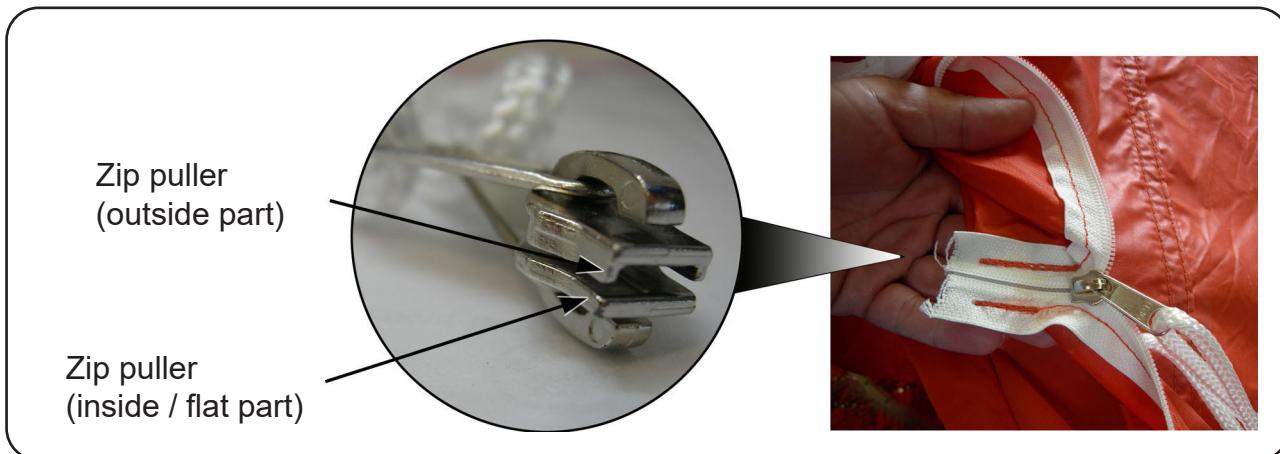


FIGURE 409
Orientate and insert the outer zip puller

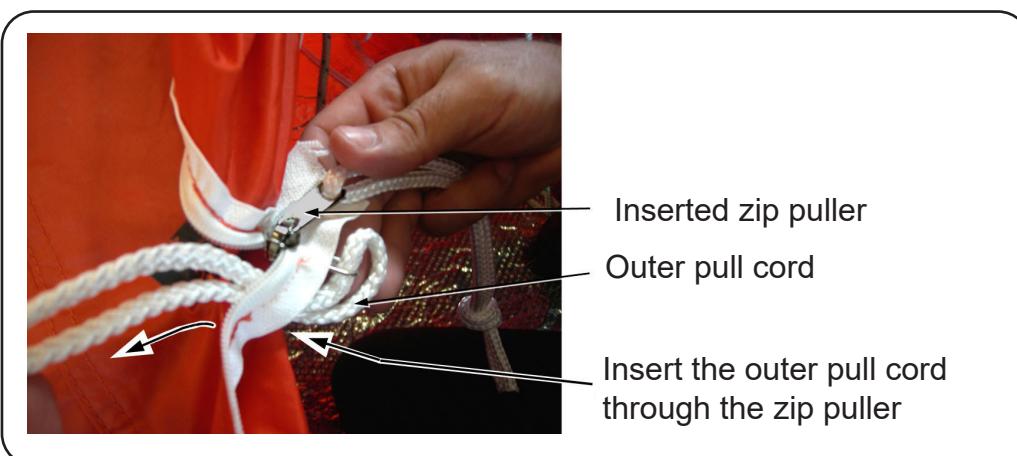


FIGURE 410
Route outer pull cord

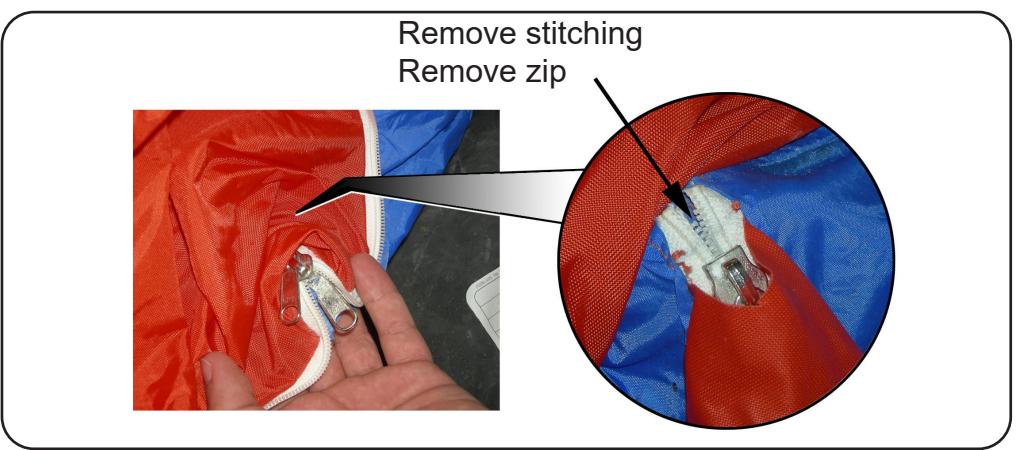


FIGURE 411
Removing the inner zip puller

- 4.2 Replace the inside zip pullers (2 sets at each doorway)
 - 4.2.1 Deflate the liferaft fully and locate the end of the inside zips.
 - 4.2.2 Remove the zip pull cords from the ends of the zip pullers.
Refer to FIGURE 411.
 - 4.2.3 Carefully remove the zip securing stitches from the back of the zips.
Refer to FIGURE 411. Remove the zip.
 - 4.2.4 Retrieve the new zip puller. The zip puller MUST be same type as the one being removed.
- NOTE:** The orientation of the zip puller. The flat side should remain on the inside of the liferaft when the zip is closed.
Refer to 412
- 4.2.5 Align the new zip puller evenly onto both zips and pull the zip closed.
Refer to FIGURE 412.
- 4.2.6 Carefully stitch the zip ends securely, using thread (p/n 02426001). This will make sure the zip puller will remain on the zip.
- 4.2.7 Insert the zip puller into the canopy zip channel and push it fully through. Refer to FIGURE 412.
- 4.2.8 Retrieve two pieces of 525 lb cord, length 500 mm. Insert one end through the zip puller eye and pull through half way. Use an overhand knot to secure the cord to each zip puller.
Refer to FIGURE 413.

5. Rigid glass-reinforced plastic container

- 5.1 Examine the container as follows:
 - 5.1.1 Make sure that the container is clean.
 - 5.1.2 Make sure that there are no cracks. Minor gelcoat craze cracking is permitted.
 - 5.1.3 Examine the container for superficial and other damage.
 - 5.1.4 Check all the markings and the labels. Make sure that they are legible.

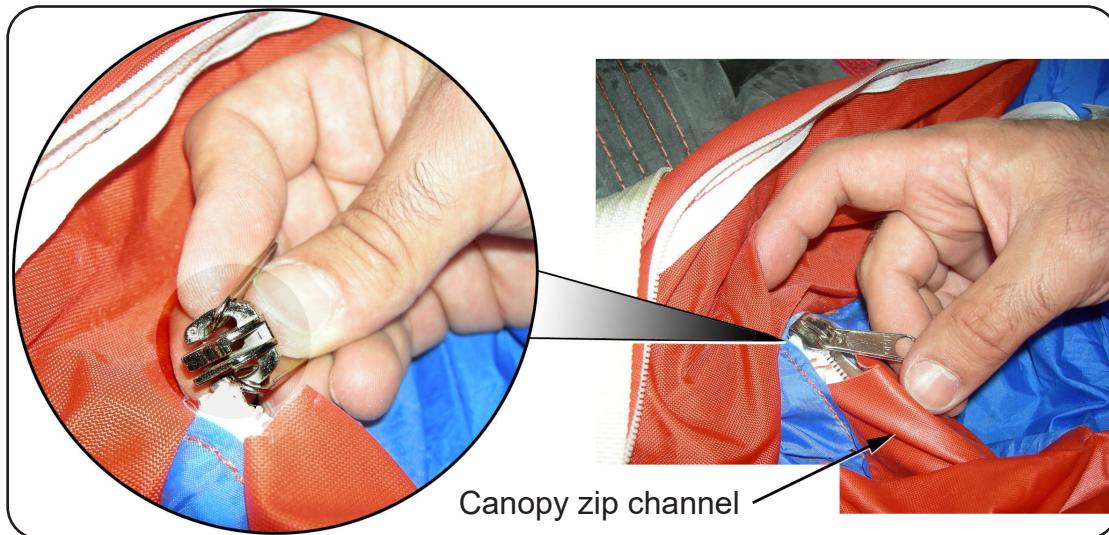


FIGURE 412
Orientate and fit the zip puller



FIGURE 413
Replace the zip pull cords

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CHAPTER 5

TESTING AND TROUBLESHOOTING

Section	Title	Page
1	General	503
2	Preparation	505
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	General	507
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	Gas inflation test	507
	NAP test.....	508
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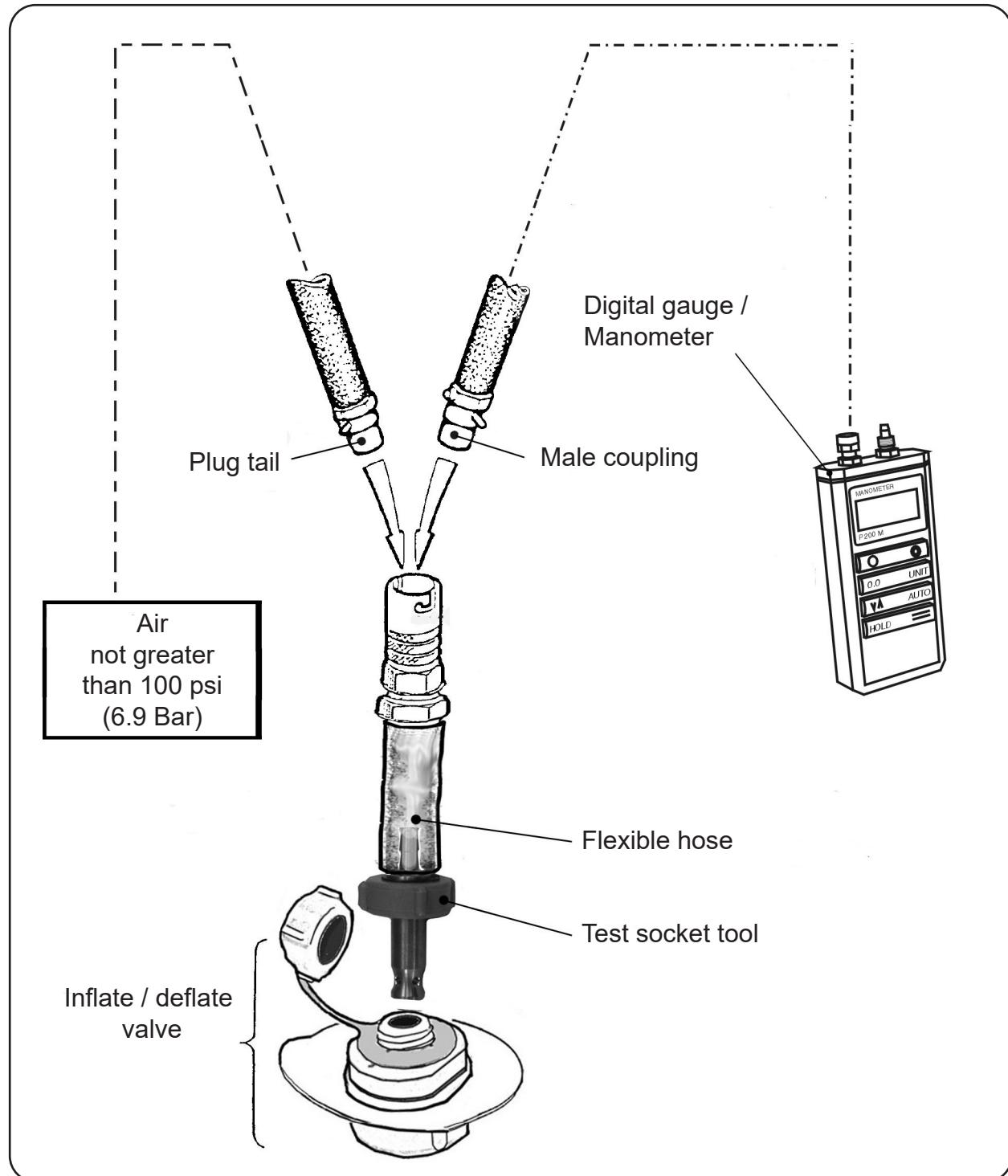


FIGURE 501
Test layout

1. General

- 1.1 The items described in Chapter 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS 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.

GI = Gas Inflation test.

FS = Floor seam test.

NAP = Necessary Additional Pressure test.

OP = Operationally packed

DoM = Date of Manufacture

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

TABLE 501
Liferaft test schedule

NOTE: Where, in years 5,10, 15 and 20, both the GI and WP test are required, time may be saved by conducting the GI first. If the test is satisfactory, continue with the pressure 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 that is critical to safety of life, such as the lifting bridle, its attachment points on the liferaft or to the lifting ring, must be replaced if any doubt exists as to its operating capability.

Noncritical parts such as some minor pockets must be repaired so as to make them fit for purpose. If doubt exists as to the repair required, contact Survitec Group Ltd.

Inflation Test Record					
Liferaft Type:		Serial 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/Pressure variation	Corrected Pressure

Survey Record			
Liferaft Type:		Serial No.:	
Repairs Required			
Part	Damage	Form of repair	Inspected by:
Upper Buoyancy tube			
Lower Buoyancy tube			
Floor			
Inflation Equipment			
Components			

TABLE 502
Example of test record cards

2. Preparation

- 2.1 Keep the records of all the inflation tests. A recommended format for the test cards is shown in TABLE 502.
- 2.2 Keep the liferaft away from draughts and direct sunlight, as change in temperature affects pressure.
- 2.3 Keep a solution of hard soap (not detergent), water, and a quantity of clean, dry, lint free cloths in the area.
- 2.4 If a buoyancy chamber needs to be tested separately because of a repair, carry out a WP test, refer to Section 3 of this chapter.
- 2.5 Calculate the change in the buoyancy tube pressure, caused by any change in temperature as follows:
 - 2.5.1 Subtract 38 mm WG (0.054 psi / 1.49 inch WG / 4 mb) from the manometer indication for each degree Celsius increase in temperature.
 - 2.5.2 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.

- 2.6 Calculate the change in pressure caused by barometric pressure as follows:
 - 2.6.1 Subtract 10.2 mm WG (0.0145 psi / 0.40 inchWG / 1 mb) from the manometer indication for each millibar decrease in pressure.
 - 2.6.2 Add 10.2 mm WG to the manometer indication for each millibar increase in pressure.

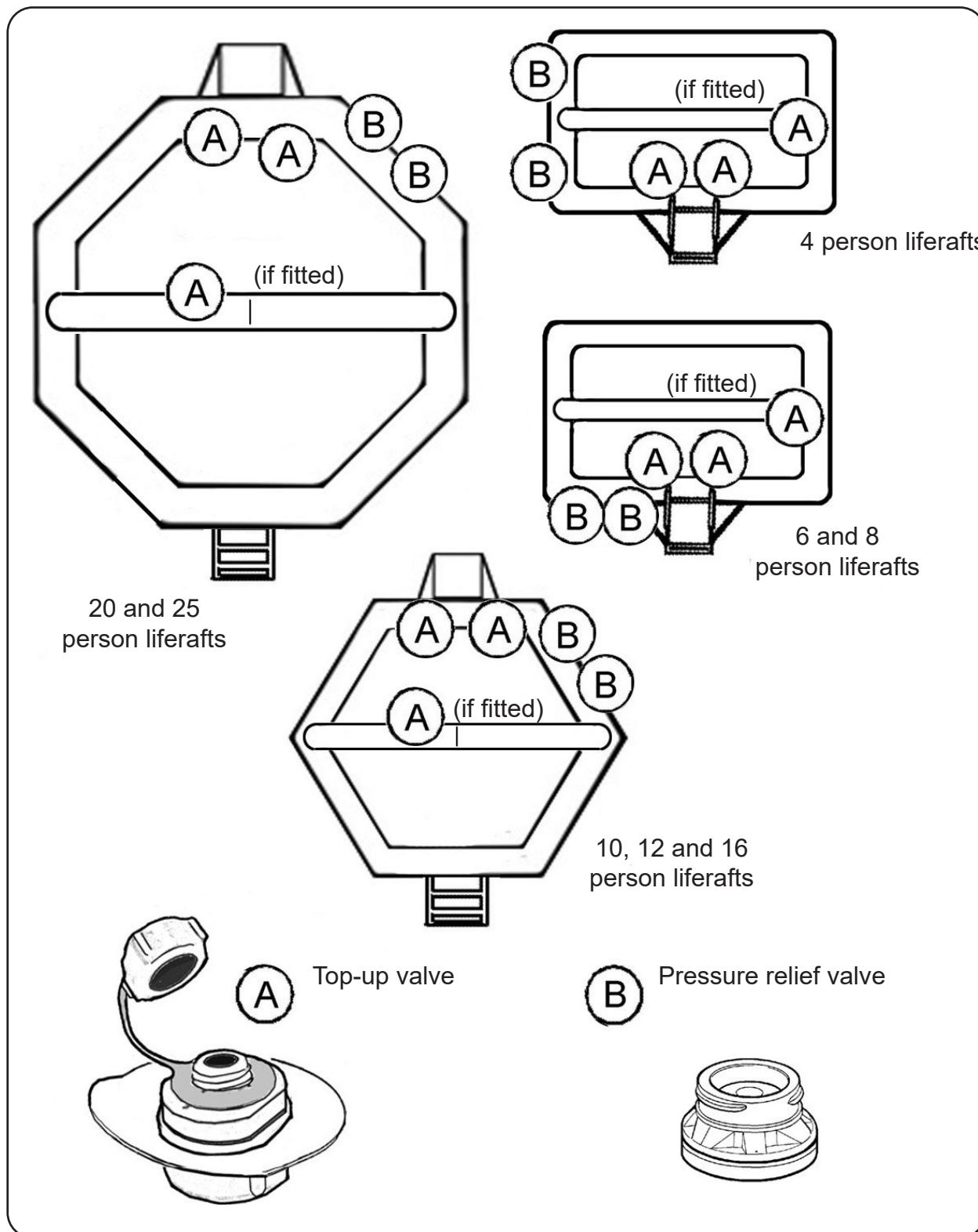


FIGURE 502
Location of valves

3. Test procedures

3.1 General

- 3.1.1 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 chamber and the arch tube, (if no transfer valve is fitted).
 - (c) The arch tube, (if transfer valve is fitted).

3.2 Additional test time intervals

- 3.2.1 Do a GI test on liferafts every 5 years. Refer to step 3.3.
- 3.2.2 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 3.4.

3.3 GI test

- 3.3.1 Unpack the liferaft, see Chapter 2, REMOVAL AND UNPACKING and put it on the packing table.
- 3.3.2 Reconnect the gas cylinder and operating head.
- 3.3.3 Pull the operating head actuator cable to inflate the liferaft.
- 3.3.4 Make sure the relief valves operate satisfactorily.
- 3.3.5 Let the liferaft settle for a minimum of 2 hours.
- 3.3.6 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.
- 3.3.7 Leave the pressure in the 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.
- 3.3.8 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, REPAIR. Carry out a re-test of the buoyancy tubes again.

3.4 NAP test

3.4.1 Carry out a NAP test as follows: Install the caps on both *relief valves*. Refer to FIGURE 505/1.

3.4.2 Inflate the liferaft slowly to twice the working pressure.

WARNING: DO NOT INFLATE THE BUOYANCIES THROUGH THE HOSES.

3.4.3 Let it stand for a minimum of 5 minutes after which there should be no seam slippage or cracking or other defects.

3.4.4 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, REPAIR. Carry out a re-test of the buoyancy tubes again.

3.4.5 If the pressure decreases abruptly during the NAP test and there is audible 'cracking' from the liferaft, condemn the liferaft.

3.4.6 Sounds from the liferaft with no drop in pressure may be ignored.

3.4.7 After testing remove both PRV caps together.

3.5 WP test

NOTE: If the liferaft is subjected to the gas inflation test Step 3.3, it is still necessary to carry out the WP test, provided no repair work is carried out.

NOTE: The arch tube is mounted on the upper buoyancy chamber. These will be fully inflated when the upper buoyancy chamber is tested. Therefore they will be checked with the upper buoyancy chamber. Each compartment will be tested over a period of 60 minutes.

3.5.1 For each inflatable compartment defined in this chapter section 3.1, carry out a WP test as follows. Refer to FIGURE 503:

(a) Install caps on both relief valves.

(b) Inflate the compartments to between values through the inflate / deflate valve shown below. Record the temperature and barometric pressure.

WARNING: DO NOT INFLATE THE BUOYANCIES THROUGH THE HOSES.

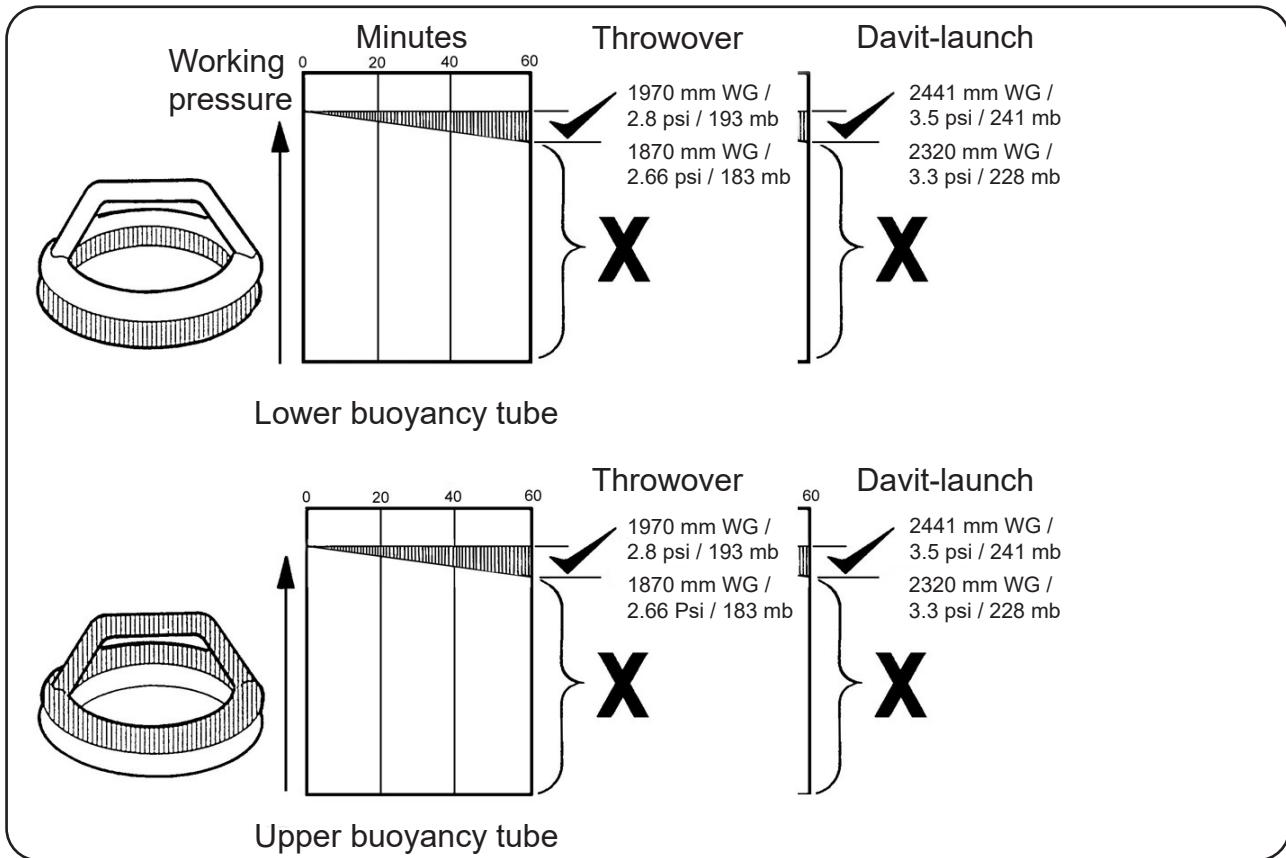


FIGURE 503

Working Pressure test

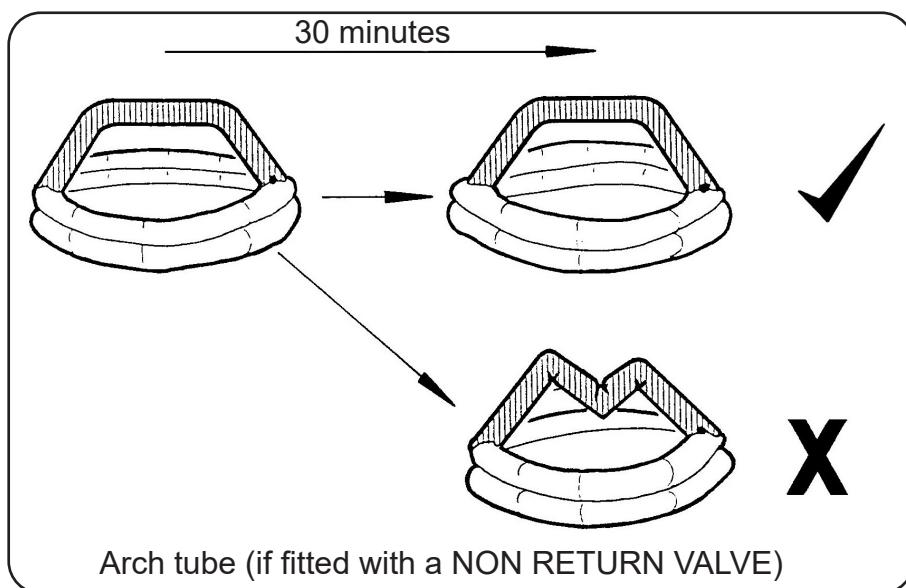


FIGURE 504

Transfer valve test (if fitted)

- (i) Throwover; Inflate the compartments to between 2.8 psi / 1970 mm WG / 193 mb and 3.2 psi / 2250 mm WG / 221 mb.
- (ii) Davit-launch; Inflate the compartments to between 3.5 psi / 2441 mm WG / 239 mb and 4 psi / 2814 mm WG / 276 mb.
- (c) Disconnect the air supply and connect the manometer. Refer to 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. Note the pressure, provided the pressure is not less than;
 - (i) Throwover; 2.8 psi / 1970 mm WG / 193 mb.
 - (ii) Davit-launch; 3.5 psi / 2441 mm WG / 239 mb.
- (f) Leave the pressure in the compartments for an additional 60 minutes. Refer to 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, REPAIR.

3.6 Arch tube Transfer valve test (if fitted)

- 3.6.1 After the upper buoyancy chamber has been deflated completely, the arch tube transfer valve can be tested.
 - (a) After 30 minutes the arch tube must maintain its full shape. Transfer valve which do not hold air must be replaced. Refer to 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, REPAIR.

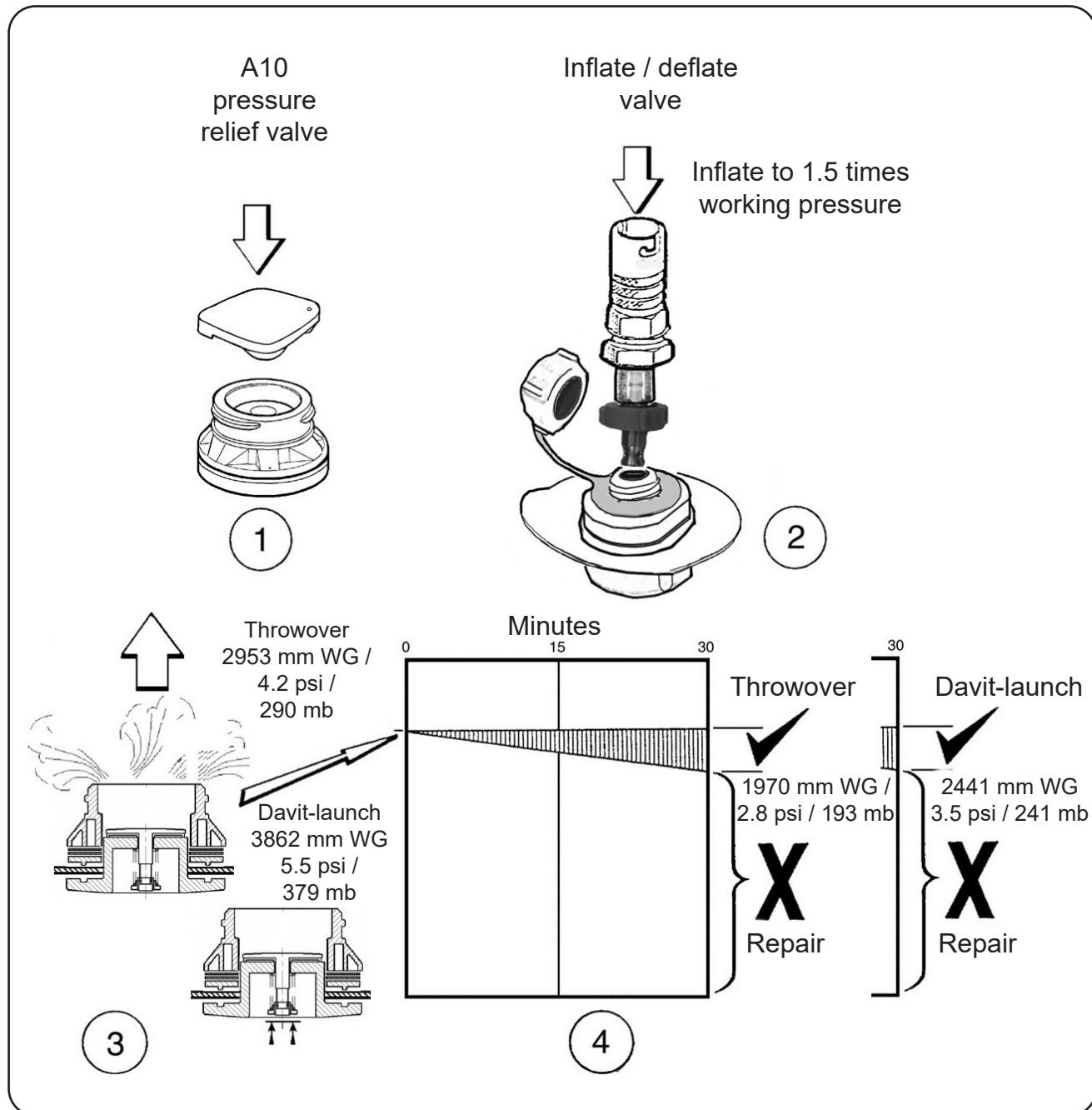


FIGURE 505
Pressure Relief Valves

3.7 Pressure Relief Valves test

3.7.1 Test the relief valves as follows:

- (a) Install the caps on the pressure relief valves (PRV). Refer to 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. Refer to FIGURE 505. After 30 minutes recheck the PRV's. The indicated pressure on the manometer when the valves are closed must not be:
 - (i) Throwover; less than 1970 mm WG / 2.8 psi / 193 mb.
 - (ii) Davit-launch; less than 2441 mm WG / 3.5 psi / 241 mb.

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

3.8 Floor seam test

- 3.8.1 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.
- 3.8.2 To facilitate the test, a proper test frame as shown is recommended,. Refer to FIGURE 506.
- 3.8.3 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 82.5 kg (182 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, REPAIR.

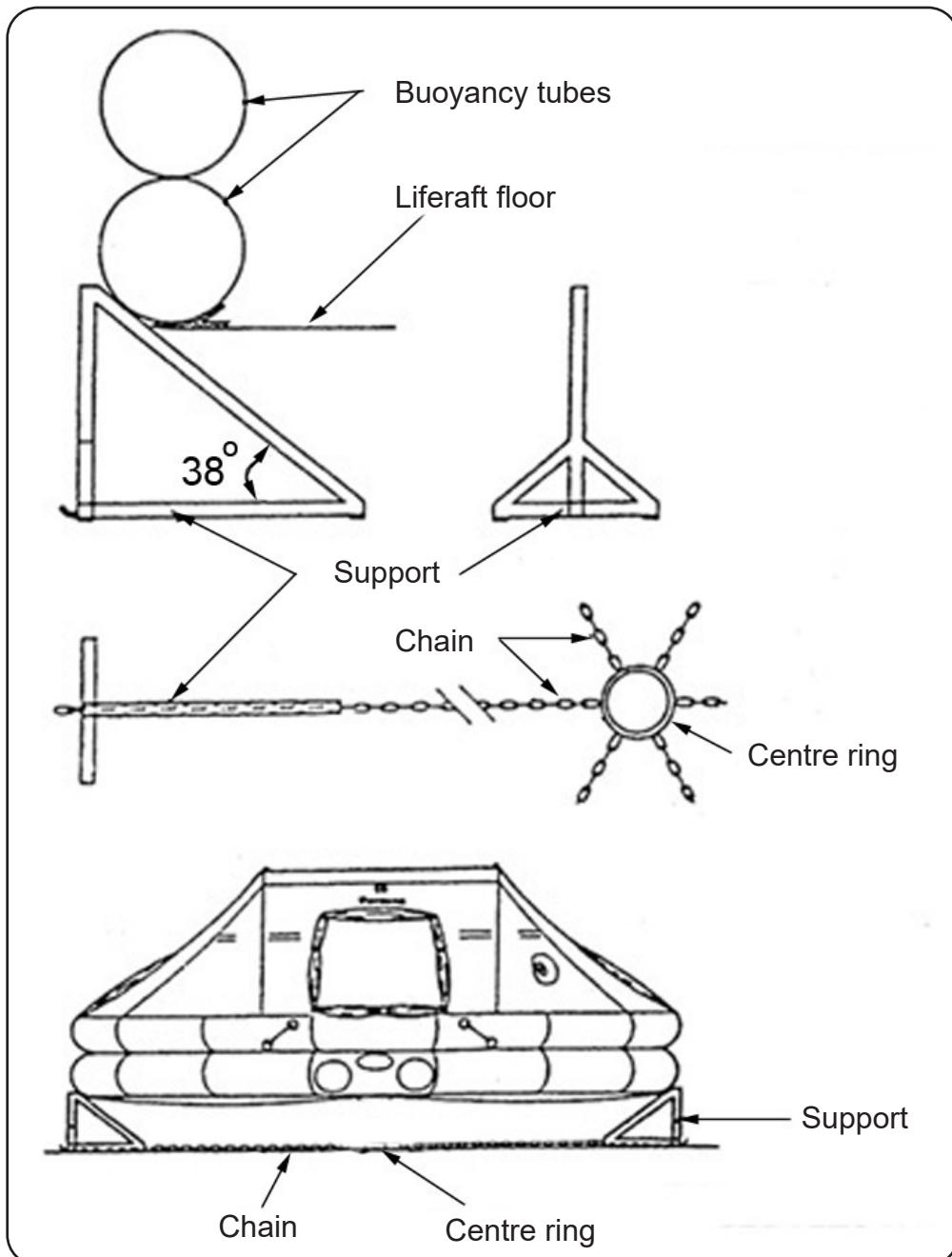


FIGURE 506
Floor seam test supports

3.9 Function test

- 3.9.1 A full function test may be demanded by the local Inspecting Authority. This test may be done either with a packed or unpacked liferaft.
- 3.9.2 The load required to initiate inflation of the liferaft shall not exceed 15.3 kgf (33.73 lbf) when measured on a spring balance.
- 3.9.3 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).
- 3.9.4 The working pressure should be determined by the reseat of the relief valves. The pressure relief valves should be fully operational.

3.10 Suspension Overload test (Davit-launch liferafts only)

- 3.10.1 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).
- 3.10.2 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 502) are measured at the lifting ring and imposed for a minimum of 5 minutes.

		Liferaft size (number of persons)			
		12DL	16DL	20DL	25DL
$W_{1\min}$	Kg (lb)	1293 (2851)	1656 (3651)	2019 (4451)	2472 (5450)
$W_{1\max}$	Kg (lb)	1343 (2961)	1706 (3761)	2069 (4561)	2522 (5560)

$W_{1\min}$ = 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.

TABLE 502
Davit-launch suspension overload test loads

3.10.3 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.

3.10.4 The liferaft shall be thoroughly checked and cleaned after testing to make sure that there is no residual debris or dirt which could result in damage.

3.11 Gas cylinders test

3.11.1 Cylinder valve installation

If a cylinder is required to be hydrostatically tested or 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 503. The tape must be applied to the threads of the cylinder adaptor. Refer to FIGURE 507.
- (b) The charge weight is specified in the IPL section of this service manual.
- (c) 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.

3.11.2 Leak testing

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

Method A. 30-day quarantine period

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

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

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

Method B. Do a leak test with a chemical detector

- (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 must be taken to determine the cause of the leak.

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

TABLE 503
PTFE tape wrapping

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

CAUTION: FOR THESE TESTS ONLY USE THE LEAK DETECTION TEST KIT AS LISTED IN CHAPTER 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS.

- (b) Lay the cylinder to be tested on its side, in a rack, so that the valve end is protruding. Refer to FIGURE 508. Make sure that 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 25 ml of the test solution into a polythene bag. The initial colour of the test solution will be a pink colour.
- (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 that there are no air gaps in the seal. Refer to 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 below.
Alternatively the bag can be shaken while still hanging from the cylinder.
- (g) A control sample is necessary, this is made by introducing 25 ml 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.

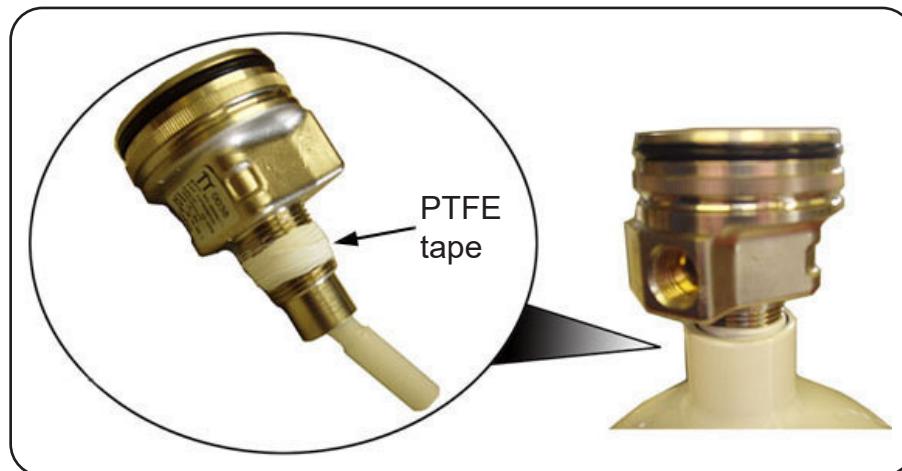


FIGURE 507
Typical operating head with PTFE tape applied

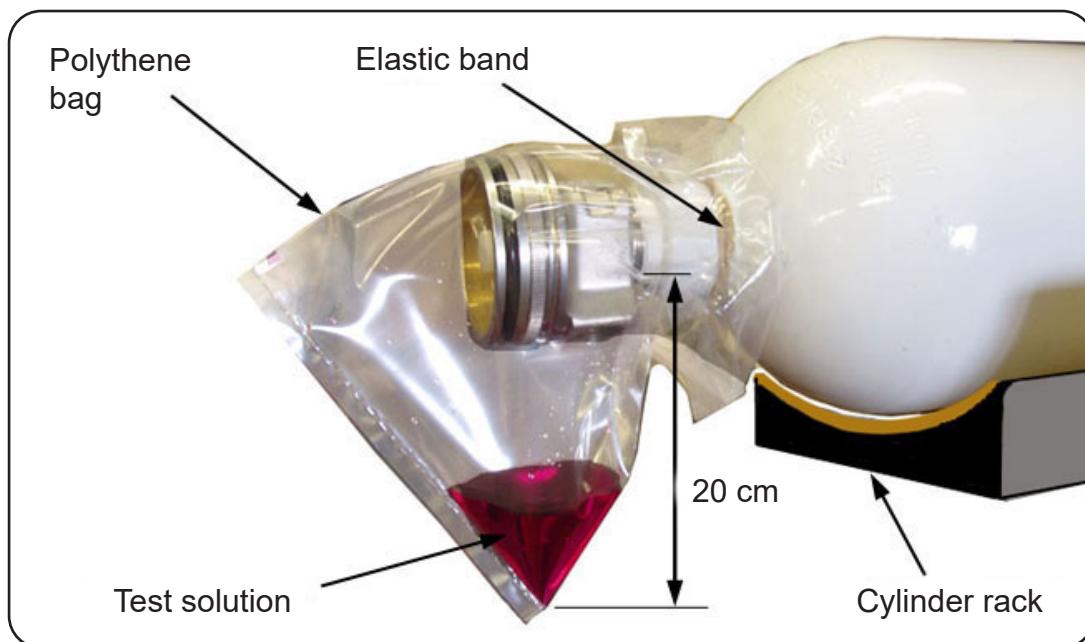


FIGURE 508
Chemical leak test applied

Observations

- (a) All tests are to be recorded on a sheet similar to sample provided in Appendix 4.
- (b) Carbon dioxide leaking from the cylinder will cause the pink colour 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 must 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. Make sure that the welded seam is inside the bag. The test is then carried out as per the above method.

3.11.3 Weight testing

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.

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.

3.11.4 Blast testing

CAUTION: PLEASE MAKE SURE THAT YOU ARE USING THE CORRECT VALVE FOR BLAST TEST CYLINDER.

Install the new blast test cylinder valve assembly handle.

- (a) All service stations must place an order for a new blast test cylinder valve assembly handle.
- (b) Remove the current blast test handle and discard.
- (c) Install the new blast test cylinder valve assembly handle, complete with a counter gauge. Refer to FIGURE 509.
Please refer to step (e) for correct instructions.
- (d) When the counter gauge reaches 1500 compressions, the handle must be replaced.
- (e) The liferaft must be packed in accordance with Chapter 8, ASSEMBLY.
- (f) 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. Refer to 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 L cylinder – bare cylinder (P/N 41947001), description CYLINDER M BARE 16.9 L 250 bar)). This cylinder for blast testing should be charged with 11.26 kg CO₂ + 0.36kg N₂.
The cylinder valve must be installed into the cylinder with 2 turns of PTFE tape and torqued to 240 Nm (177 ft lb) +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, must be charged with 8.80 kg CO₂ + 0.44 kg N₂.
The cylinder valve must be installed into the cylinder with 2 turns of PTFE tape & torqued to 220 Nm +10% / -0 Nm. A cylinder adaptor (see TABLE 505) is required to install the valve (see TABLE 505) onto the cylinder.

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

Blast test kit			
Liferaft inflation system	Part number	Item description	Quantity per service station
Leafield	11813009	Valve for blast test cylinder, with counter gauge	1

TABLE 505
Blast test required kit

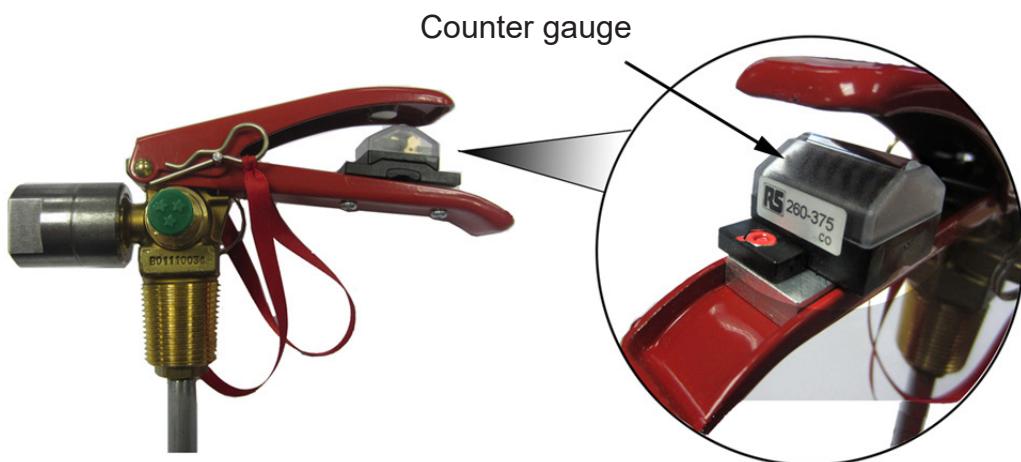


FIGURE 509
Blast test counter complete with counter gauge

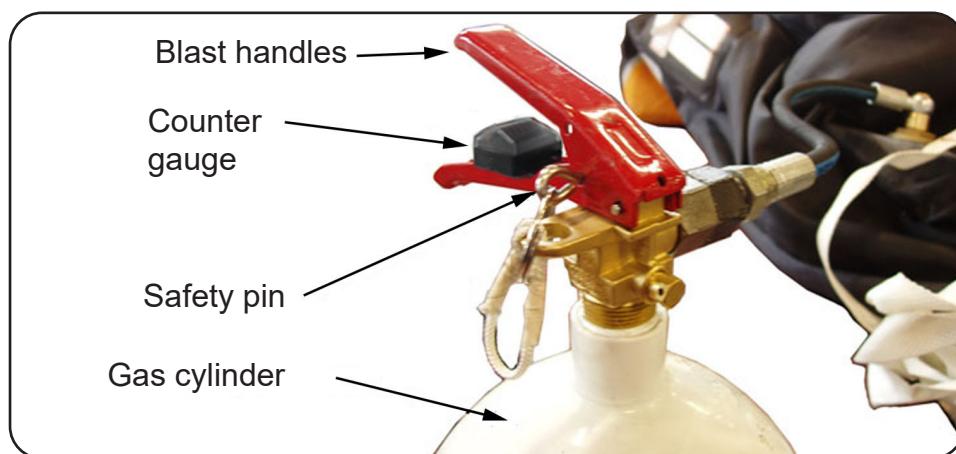


FIGURE 510
Blast test set-up

CAUTION: MAKE SURE THAT THE SAFETY PIN IS IN PLACE AT ALL TIMES. IT MUST ONLY BE REMOVED FOR THE PERIOD OF THE BLAST TEST.

- (ii) Disconnect the high pressure (HP) inflation hoses, which are currently installed to the liferaft, from the operating head.
- (iii) Visually examine the metal end fittings. Obey the manufacturer's Guidance Note (refer to M-07-IS-1Hose).

NOTE: Make sure that you refer to the latest copy of the manufacturer's Guidance Note - M-07-IS-1Hose.

- (iv) Before you do a blast test, examine the outer surface of the hose. Obey the manufacturer's Guidance Note.
Refer to M-07-IS-1Hose.
- (v) Connect one HP hose at a time, to the fitting on the blast test cylinder valve. Refer to FIGURE 510 / 511. The correct torque value for this hose attachment can be found in Chapter 1, DESCRIPTION AND DATA, TABLE 101, Torque Settings.

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

- (vi) It is necessary to blast test each CO₂ inlet valve three times.
Refer to FIGURE 511.
- (vii) For each blast, the red handles of the blast test cylinder must be closed together. Refer to FIGURE 511. The blast should last for 1 second.
- (viii) If no gas leakage is observed on the first blast, do the second and third blasts with the one hand near the inlet valve to detect leakage, BUT NOT IN CONTACT with it.
- (ix) The hose should now be disconnected from the blast cylinder.
- (x) After you do a blast test, examine the outer surface of the hose. Obey the manufacturer's Guidance Note.
Refer to M-07-IS-1Hose.
- (xi) Examine the O-rings. Obey the manufacturer's Guidance.
Refer to M-07-IS-1Hose.

3.12 Search And Rescue Transponder (SART) - (if installed)

3.12.1 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.



FIGURE 511
Blast test operational

3.13 Do the steps that follow for a Throwover liferaft in an Xtrem container only:

3.13.1 Post operational packing vacuum test

You must do this test after every service. This makes sure that the liferaft's hermetic seal has not been compromised during service.

This test is to be completed after the container upper half has been installed and the straps/crimps are installed. If desired the technician is permitted to perform this test prior to the installing of the container upper half. This will be an extra additional test. This additional test does not need to be recorded. It does not negate the requirement to perform the official test.

You must make record of this test in **Appendix 10**.

Records must be kept by the service station for a minimum of 10 years after the service date. These records must be available on demand for inspection by staff of Survitec Group Ltd. A similar record must be made when a service station operationally packs a new liferaft.

3.13.2 Persons permitted to perform this test

The post operational packing vacuum test must only be completed (including recording – see subsequent Section) by two technicians who are trained, qualified and competent in packing the MkIV liferafts in question.

3.13.3 Post operational packing vacuum test procedure

- (a) Make sure that the nut has been torqued correctly. Refer to **Chapter 1, TABLE 101** for correct torque values. Refer to **Figure 512**.
- (b) Use the correct tool and a suitable 3/8 " square drive wrench to remove the plug. Refer to **Figure 512**.
- (c) Insert a standard airline A8 adaptor into the vacuum plug hole.
- (d) Connect the airline to a vacuum capable of sustaining 5 psi / 3515 mm WG / 345 mb.

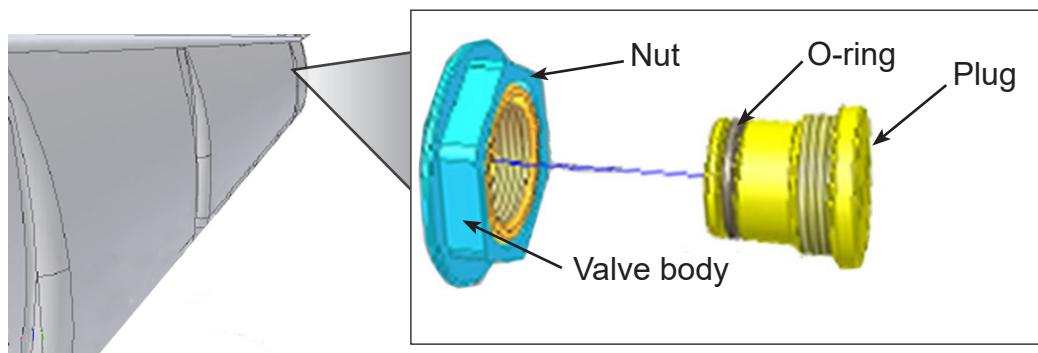


FIGURE 512
Exploded diagram of vacuum plug

- (e) Attach the vacuum to the point from which the plug was removed.

CAUTION: A VACUUM OF 6 psi / 4218 mm WG / 414 mb. MUST NOT BE EXCEEDED FOR TESTING. WORK QUICKLY THROUGH THE STEPS THAT FOLLOW ONCE VACUUM IS APPLIED. THE VACUUM MUST NOT BE LEFT ON FOR EXTENDED PERIODS OF TIME, OTHERWISE DAMAGE WILL RESULT. IT IS RECOMMENDED THAT THE H-PACK SHOULD NOT BE SUBJECT TO VACUUM FOR PERIODS IN EXCESS OF 20 MINUTES.

- (f) Use the vacuum to bring the H-Pack down to between 5 — 6 psi / 3515 — 4218 mm WG / 345 — 414 mb.
- (g) Record the exact "Start Pressure".
- (h) Allow liferaft to remain undisturbed stand for minimum 5 minutes
- (i) Record the exact "End Pressure".

NOTE: "End Pressure" must not be corrected for atmospheric/temperature fluctuations.

NOTE:

You may use the plug provided with the H-Pack or a clean rubber bung from a standard Leafield A8 top-up valve adaptor to temporarily bung the valve body. This will form a reliable temporary seal when hand tightened.

- (j) Insert a deflator pin into the vacuum valve body.
- (k) Leave the liferaft to settle to atmospheric pressure.

NOTE:

This takes approximately 5 — 10 minutes.

NOTE:

When atmospheric pressure has been reached a pressure reading will return 0 psi / 0 mm WG / 0 mb.

- (l) Calculate the percentage gain of pressure (equal to the percentage loss of vacuum).

This is calculated as follows:

$$\% \text{ gain} = 100 \left\{ \frac{(\text{Start Pressure} - \text{End Pressure})}{\text{Start Pressure}} \right\}$$

- (m) Attach the plug provided with the H-Pack. Refer to **Figure 512**.
- (n) Use the correct tool and a calibrated 3/8 " square drive torque wrench to torque the plug into vacuum valve body. Make sure that silicone grease doesn't come into contact with any thread forms on the plug or vacuum valve body.

NOTE:

The plug supplied with H-Pack has an integral O-ring. Silicone grease is already provided on the O-ring. This is sufficient for installing the plug directly, provided the plug has been kept free of contaminants and grease provided hasn't been wiped off.

- (o) If there is no silicone grease on the O-ring then do the steps that follow:
 - (i) Use a suitable non-sharp implement to remove the O-ring and discard.
 - (ii) Use a clean lint-free cloth to clean the plug
 - (iii) Apply a layer of silicone grease to the O-ring.
 - (iv) Install the new O-ring.

(p) Pass fail criteria:

Liferaft capacity	Pass criteria (% Gain must not be more than)
6	30
8	35
10	50
12	50
16	55
20	60
25	60

- (q) You must record the data of the Operational packing vacuum test on the testing card. Refer to **Appendix 10**.
- (i) Record the “Start Pressure”, “End Pressure” and % gain.
 - (ii) Pass/Fail must be deleted as appropriate.
 - (iii) The operational technician or inspector’s stamp must be put on the form.

3.13.4 Repair the H-Pack (after the container has been strapped)

- (a) Do the steps that follow if the container has failed the vacuum pressure tests:
 - (i) Remove the container straps.
 - (ii) Do the vacuum test and check/listen for leaks around the H-pack.
 - (iii) Check all welded seams, operating head seals, indicator valve and vacuum valve.
 - (iv) If a leak is detected repair it with the heat sealing tool.
 - (v) Finish the packing process.
 - (vi) Do the Post Operational Packing Vacuum test again.

4. Troubleshooting

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 must 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 the limits given in Chapter 6, REPAIR
	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

TABLE 506
Function test troubleshooting

CHAPTER 6

REPAIR

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1. General

1.1 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. rubber coated material must be replaced with rubber coated material). Please refer to the Chapter 11, ILLUSTRATED PARTS LIST for part number.

1.2 When marking fabrics, use wax crayon (e.g. Chinagraph). If a 'major' repair is carried out record the repairs on the liferaft log card.

1.3 LIFERAFT CONDEMNATION PROCEDURE:

1.3.1 Inspect the liferaft

- (a) You must condemn a liferaft if:
- (i) You can see wear or chafing on material
 - (ii) You can see damage caused by mould
 - (iii) You can see damage caused by water
 - (iv) You can see copperisation on rubber material
 - (v) Its adhesive has degraded and seams have separated
 - (vi) It failed a test (NAP, Floor Seam, Overload)
 - (vii) It has damage beyond economic repair
 - (viii) It has damage caused by heat or fire
 - (ix) It has damage caused by vandalism
 - (x) It was deployed accidentally
 - (xi) It was deployed during an emergency
 - (xii) It was removed from a vessel after an incident or accident

1.3.2 Tell the owner why the liferaft has been condemned

1.3.3 Put the liferaft beyond use

You must damage a condemned liferaft so that it cannot be used again. This will prevent a condemned liferaft from being accidentally installed on a vessel or submitted to an unapproved service station for overhaul.

- (a) Cut the liferaft identification label from the floor or the buoyancy.
Do not discard it.
- (b) Remove the drogue.
- (c) Remove the painter.
- (d) Cut the painter and drogue loop patches from the buoyancies.

WARNING: IN THE STEPS THAT FOLLOW OBEY STANDARD WORKSHOP PROCEDURE TO SECURE THE INFLATION CYLINDER. USE PERSONAL PROTECTIVE EQUIPMENT.

- (e) Fully empty the inflation cylinder.
- (f) Remove the operating head and valve from the inflation cylinder.
- (g) Drill a hole in one side of the inflation cylinder.
- (h) Write CONDEMNED on the:
 - (i) Buoyancies
 - (ii) Canopy
 - (iii) Container

NOTE: Spray paint is the best way to do this.

- 1.3.4 The condemned liferaft and equipment belong to the owner. You must give them to the owner if requested.
- 1.3.5 If the owner does not want the condemned liferaft and equipment, obey your local regulations and guidance to dispose of the batteries, food, pyrotechnics and material.

1.3.6 Recording

- (a) Obey your standard protocol to record the liferaft's condemnation.
- (b) Keep the liferaft identification label with the record of the liferaft's condemnation.

NOTE: Do not send the liferaft identification label to Survitec Group.

1.3.7 Reporting

- (a) Record the condemnation on the technical publications portal (Cumulus).

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.

- 2.1 The adhesive used for repairs to air-holding components and load-bearing components, is a two part polychloroprene mix to Specification Bostik 486 or Alpha S 5001.
- 2.2 Only the adhesive specified in Step 2.1 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.
- 2.3 Mixing Instructions for Bostik 486 Adhesive or Alpha S 5001.

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.

- 2.3.1 Bostik 486 or Alpha S 5001. 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.

- 2.3.2 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.
- 2.3.3 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.
- 2.3.4 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. The measuring vessels must be kept clean and dry.
- 2.3.5 Keep the adhesive, curing agent and mixed adhesive in completely sealed airtight containers.
- 2.3.6 Adhesive must not be used outside the temperature range +5° to +30° C (41-86° F) or when the relative humidity exceeds 70%.
- 2.3.7 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.
- 2.3.8 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.

- 2.3.9 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 usable.

3. Preparation of coated surfaces.

3.1 Rubber-proofed surfaces

WARNING: ONLY COATED SURFACES MAY BE INCLUDED IN REPAIRS.

CAUTION: THOROUGHLY CLEAN RUBBER PROOFED SURFACES WITH RECOMMENDED SOLVENT (REFER TO CHAPTER 3, CLEANING, TABLE 301 CLEANING SOLVENTS AND MATERIALS) AND/OR SOAP AND WATER TO REMOVE SURFACE CONTAMINATION COMPLETELY.

TOLUENE MUST BE USED TO PRIME THE RUBBER SURFACES, BY AGGRESSIVELY WIPING WITH A CLEAN SOAKED RAG.

- 3.1.1 The Nylon fabric used for air-holding chambers has a heavy-duty rubber coating which has been compounded to give a high resistance to abrasion.
- 3.1.2 These rubber coated fabrics must be prepared for bonding by priming the coated surfaces with the solvent Toluene and allow the solvent to dry off.
- 3.1.3 Apply the solvent with a clean lint-free fabric pad, wet but not dripping with the solvent.
- 3.1.4 Apply the first coat of adhesive immediately after the Toluene has dried off.
- 3.1.5 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.

3.2 Polyurethane (PU)-proofed surfaces

WARNING: ONLY COATED SURFACES MAY BE INCLUDED IN REPAIRS.

CAUTION: THOROUGHLY CLEAN PU PROOFED SURFACES WITH TOLUENE SOLVENT (REFER TO CHAPTER 3, CLEANING, TABLE 301 CLEANING SOLVENTS AND MATERIALS) AND/OR SOAP AND WATER TO REMOVE SURFACE CONTAMINATION COMPLETELY.

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

- 3.2.1 PU 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.

- 3.2.2 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.
- 3.2.3 Attempts to prime PU 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.
- 3.2.4 Repeated applications of MEK solvent on a clean PU surface tend to become less effective. Apply the first coat of adhesive immediately after the first MEK wipe.
- 3.2.5 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.

3.3 Alternative surface preparation of coated surfaces to MEK

- 3.3.1 The prepared area must be lightly abraded, using a 80-180 grit sand paper, until a matt (dull) surface finish is achieved.

CAUTION: DO NOT OVER ABRADE THE PU AREA. THIS WILL RESULT IN DAMAGE TO THE PU MATERIAL.

- 3.3.2 As a result of the abrasion, surface debris will be created from the PU. This must be dry wiped off, using lint free cloth.
- 3.3.3 RFD 549 structural adhesive, is then applied onto the debris-free PU surface. This must be done in accordance with the service manual

4. Application of adhesive. Bostik 486 or Alpha S 5001 adhesive:

- 4.1 For the purposes of repair, the words 'tacky' and aggressive tack' are defined thus:
 - 4.1.1 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.
 - 4.1.2 When the expression 'aggressive tack' is used, this means that when applying light finger 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.

- 4.2 Apply three coats of adhesive to each mating surface. Allow each coat to become tacky before applying subsequent coats.
- 4.3 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.
- 4.4 Take care when rolling down seams and patches, particularly on curved edges. Avoid making rucks and creases. All seams MUST be rolled twice.
- 4.5 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.
- 4.6 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.

NOTE: Adhesive must not be used outside the temperature range +5° to +30° Celsius or when the relative humidity exceeds 70%.

After the adhesive has been used to join surfaces, it will cure in two to four days at 20° Celsius. At higher temperatures the curing time will be reduced and at lower temperatures the curing time will increase.

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.

5. Repair damaged areas

- 5.1 All of the seams in Marine MK IV liferafts, particularly the air holding seams, are formed using adhesive. The liferaft buoyancy tubes, floor and canopy (non air holding joints) are also held together with adhesive.
- 5.2 Note that a correct adhesive-jointed seam or assembly of rubber or PU 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 MUST BE KEPT AWAY FROM THE HOT AIR GUN.

NOTE: to RELEASE ADHESIVE JOINTED SEAMS or assemblies formed using rubber or 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.

5.3 Repair to product brand labels.

The logo will be screen printed onto a velcro-backed label sub-assembly that can be attached to the canopy at a predefined position.

Product brand labels are attached to the liferaft canopy using velcro.

5.3.1 "Survitec Group" logo

- (b) If a repair to the canopy fabric will detract from the logo's appearance it is acceptable to completely remove the screen printed ink. Use toluene to remove the ink. Make sure that the completed repair work leaves the liferaft serviceable, clean condition.

5.3.2 "Product brand" logo

- (a) Repairs to the label or velcro are not permitted. Damaged or illegible labels must be replaced.

5.3.3 Canopy velcro

- (a) If the female velcro on the canopy is damaged or must be moved to allow canopy fabric repair, it can be replaced as required.

5.4 Patches

Damage to pressure holding chambers requires the application of a single patch for the repair, please refer to FIGURE 601.

Rubber coated patch:

- Marking out patches should be done using a wax or chinagraph pencil.
- Never use a ballpoint pen for this task.

PU coated patch:

- 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 repaired using RFD 1015)
- When marking PU coated fabrics, use a silver ballpoint pen (Schmidt 700) or BIC Crystal red Pen or wax crayon (e.g. Chinagraph).
- If a 'major' repair is carried out record the repairs on the liferaft log card.

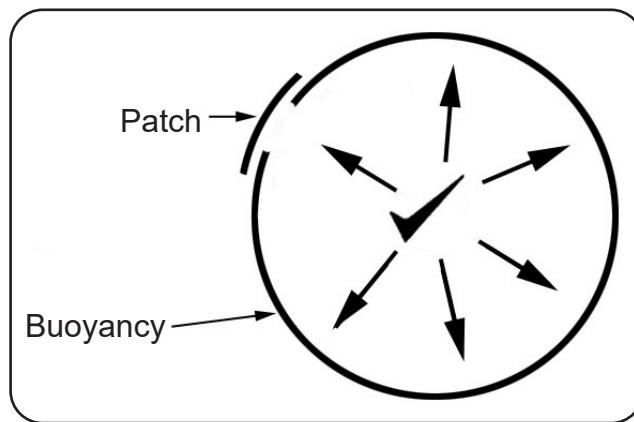


FIGURE 601
Application of patch

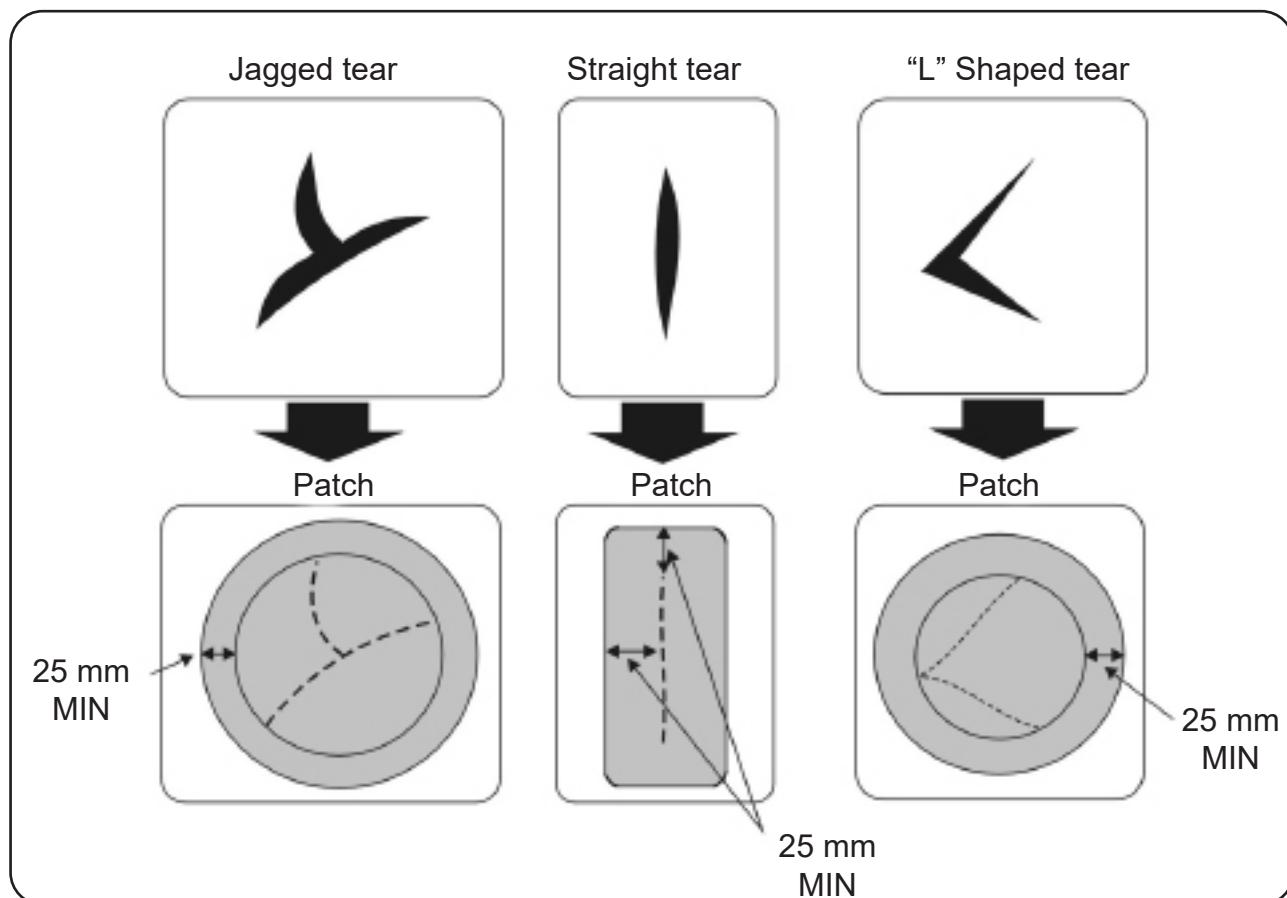


FIGURE 602
Patching

Do the following steps for rubber or PU patches:

- 5.4.1 Thoroughly clear the damaged area, trimming any frayed edges as necessary.
- 5.4.2 Repair patches on air-holding components may be made from either fabric RFD1015, Type 1, P/N 10772009 (single-sided PU ‘proofing’) or RFD1015, Type 2, P/N 10773009 (Double-sided PU ‘proofing’), or Rubber P/N 08449009 or DSB 00220020.
- 5.4.3 Where other components are to be bonded on top of the patch use only RFD1015 Type 2 Fabric, P/N 10773009 (Double-sided PU ‘proofing’), or Rubber P/N 08449009 or DSB 00220020.

NOTE: MEK must not be used before adhesive is applied on rubber surfaces

- 5.4.4 Cut the patch so that it overlaps the area of damage by at least 25 mm all round. Prepare the patch for gluing as per the requirements in this Chapter.
- 5.4.5 Allow the adhesive to dry. Test it by touching the adhesive with the back of a finger. If the adhesive is dry to the touch it is ready to be applied.
- 5.4.6 Apply adhesive to the outer repair patch as per the requirements in this Chapter and allow to dry.
- 5.4.7 When the adhesive is touch dry, apply the patch to the repair area ensuring it is centrally aligned.
- 5.4.8 Use a spatula or roller to expel the air from under the patch, ensuring that there are no creases. Once again, press from the centre to the edge. Allow sufficient time for the repair to cure (recommended 24 hours), before making a pressure test on the repaired chamber prior folding and packing the liferaft.

5.5 Types of patches

- 5.5.1 Repair patches must overlap at least 25 mm (1") beyond the edge of the damage. Refer to FIGURE 602 e.g:
 - (b) If the diameter of a jagged aperture is 25 mm (1"), the patch must be at least 75 mm (3 in) diameter.
 - (c) If a straight tear is 25 mm (1") long, the patch must be at least 75 mm (3") × 50 (2") mm.
 - (d) Treat ‘L’ shaped tears as apertures; calculate the “diameter” as the distance between the ends of the tear.

- 5.5.2 Patches must be circular or rectangular with rounded corners. Refer to FIGURE 602.
- 5.5.3 Repair patches on air-holding components may be made from the same material as that of the air-holding chamber.

5.6 Applying patches and tapes

- 5.6.1 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. Make sure that 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 25 mm (1"). Refer to FIGURE 603.
- 5.6.2 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").

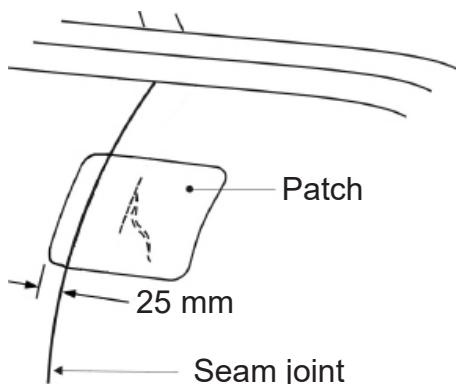


FIGURE 603
Patch application over seams

5.7 Repair to the retaining straps for the insulated floor

NOTE:

Where an insulated floor assembly is not installed in a liferaft and the retaining straps become damaged, there is no requirement for repair.

Only do the steps that follow if an insulated floor has been installed in a liferaft and the retaining straps have become damaged:

- 5.7.1 Remove the damaged retaining strap using the method described in 5.2, in this Chapter,
- 5.7.2 Fit the repair strap in the same position and orientation.

5.8 Testing repairs (Refer to Chapter 5, TESTING AND TROUBLESHOOTING)

- 5.8.1 Make sure that the adhesive cures completely before testing.
- 5.8.2 When carrying out repairs to air holding compartments, carry out a working pressure test for each compartment.

5.9 Repair limits

- 5.9.1 Patches (External). Use a patch to repair if:
 - (a) The damage does not enter a seam.
 - (b) 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.
 - (c) The maximum area of the patch is not more than one eighth of the total panel area.

5.10 Righting strap repair

The liferaft has a righting strap attached to the underside of the liferaft. Refer to FIGURE 604. To prevent the righting strap from becoming tangled during deployment, it is held securely against the liferaft floor by two fixing strips. These fixing strips can be pulled free of the floor when required. The fixing strips have two pre-cut notches that provide a weak point at which the strips will break when pulled. To replace the fixing strips when necessary the following procedure must be used:

To replace fixing strips:

- 5.10.1 Remove the used fixing strip by carefully peeling away from the liferaft surface. Make sure that no other liferaft components are damaged or affected.
- 5.10.2 Prepare the outer surface of the liferaft floor and the textile side of the fixing strip, as instructed in Section 3 of this chapter.
- 5.10.3 Apply adhesive to the textile surface of the fixing strip.
Refer to FIGURE 605. Apply adhesive only to the ends of the fixing strip, stopping 5 mm from the pre-cut notch.
- 5.10.4 Apply adhesive to the areas of the liferaft floor where the original fixing strip was attached.

NOTE: Preparation of this surface is unnecessary, assuming it is clean, dry and free from debris.

- 5.10.5 Position the righting strap between the two areas of adhesive on the liferaft floor.
- 5.10.6 Apply the textile surface of the fixing strip to the two areas of adhesive on the liferaft floor. Refer to FIGURE 605. Make sure that the righting strap webbing is secured between the fixing strip and the liferaft floor.
- 5.10.7 Make sure that the righting strap webbing is free to slide through the 'channel' created by the fixing strip.
- 5.10.8 Check to make sure that the fixing strip is affixed to the liferaft floor at the intended areas of attachment.

5.11 More extensive damage

- 5.11.1 Repairs not described in this manual are not permitted except by permission from the Design Authority, Survitec Group Ltd. Separate application must be made for each occasion when repair is proposed.

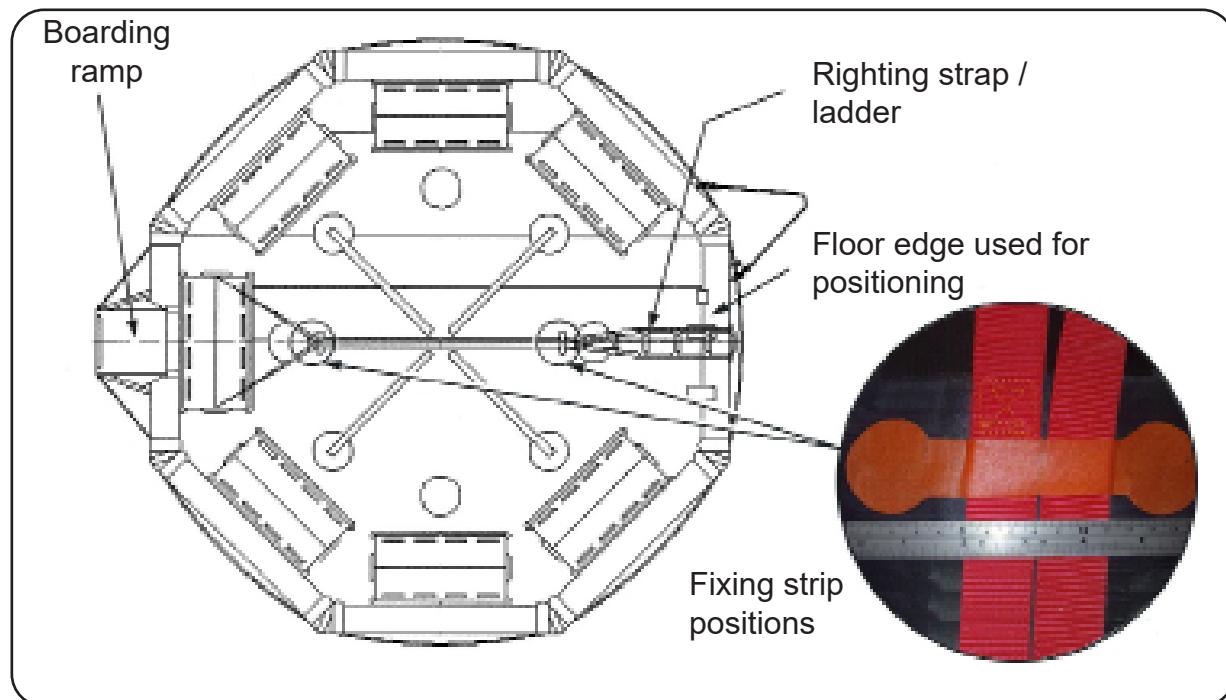


FIGURE 604
Liferaft viewed from underside

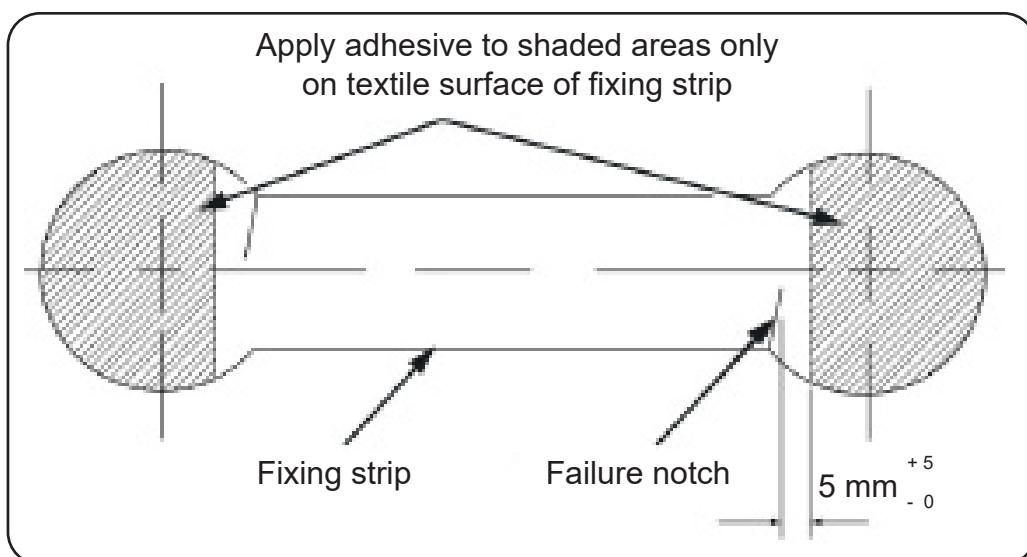


FIGURE 605
Fixing strip viewed on textile surface

6. Component repair

6.1 Pressure relief valve (Leafield PRV Type A10 or B10)

CAUTION: MAKE SURE THAT 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 or B10 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

- 6.1.1 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 tube. The end of the slit should be no closer than 100 mm (4") to the edge of the PRV doubler.
- 6.1.2 The slit should be made as small as possible and repaired subsequently by patching according to standard practice.
- 6.1.3 Loosen both parts of the valve using the appropriate tools.
- 6.1.4 Remove the valve.
- 6.1.5 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: Make sure that all surfaces are clean and dry before fitting the new PRV.

6.1.1 Push the valve body into the hole from which the faulty one was removed.

6.1.2 Assemble the valve body as shown in FIGURE 606.

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

6.1.3 Holding the valve body in place, through the buoyancy fabric, hand-tighten the components of the PRV using the nut.

6.1.4 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, DESCRIPTION AND DATA, 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 RE-TIGHTENING IS NECESSARY A COMPLETE NEW PRV MUST BE FITTED.

6.1.5 The slit must then be repaired as detailed in this Chapter.

CAUTION: MAKE SURE THAT THE PRV CAP(S) HAVE BEEN REMOVED BEFORE INFLATION.

6.1.6 After waiting the required time for the repair to cure please complete and record an air-holding test as described in Chapter 5, TESTING AND TROUBLESHOOTING. Record the relief and reseat pressures of the new PRV.

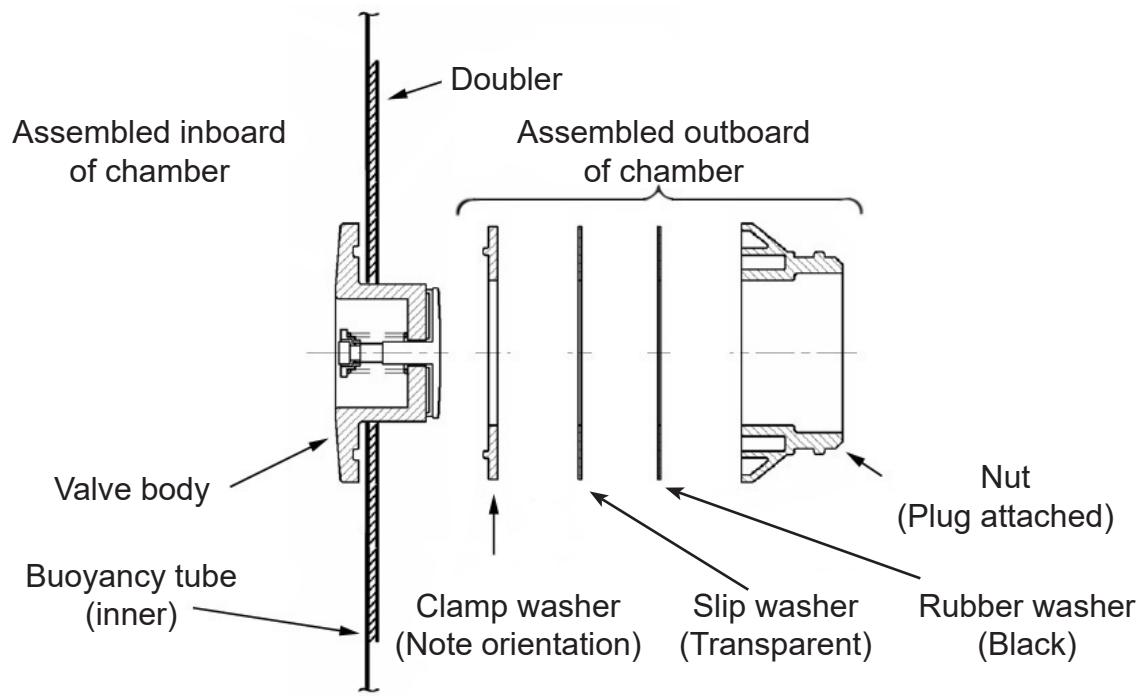


FIGURE 606A
Leaffield PRV A10

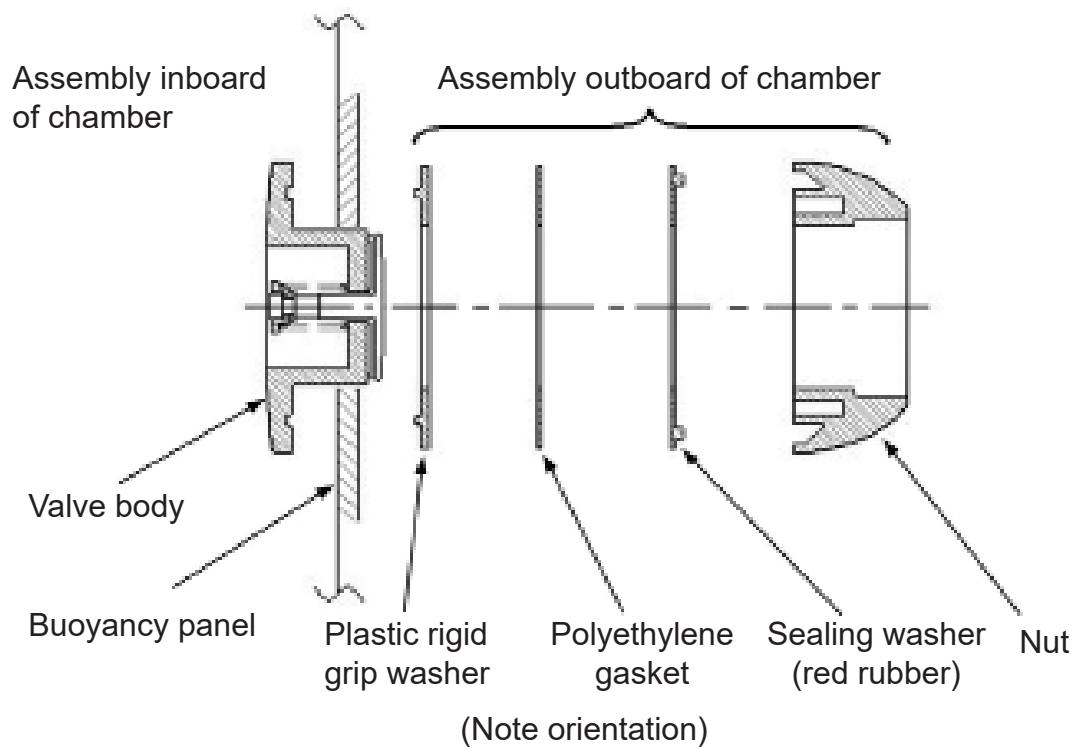


FIGURE 606B
Leaffield PRV B10

6.2 Inflate / Deflate valve

CAUTION: MAKE SURE THAT WHEN CONDUCTING THE REPAIR TO THE SLIT, NO MEK COMES IN CONTACT WITH THE VALVE. THE VALVE 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 valve is not permitted. The Inflate/ Deflate valve has no serviceable components — a faulty valve must be replaced with a new unit. Replace the complete assembly:

Removal method

- 6.2.1 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 must be made along the length of the buoyancy tube. The end of the slit must be no closer than 100 mm (4") to the edge of the PRV doubler.
- 6.2.2 The slit must be made as small as possible and repaired subsequently by patching according to standard practice.
- 6.2.3 Loosen both parts of the valve using the appropriate tools.
- 6.2.4 Remove the valve.

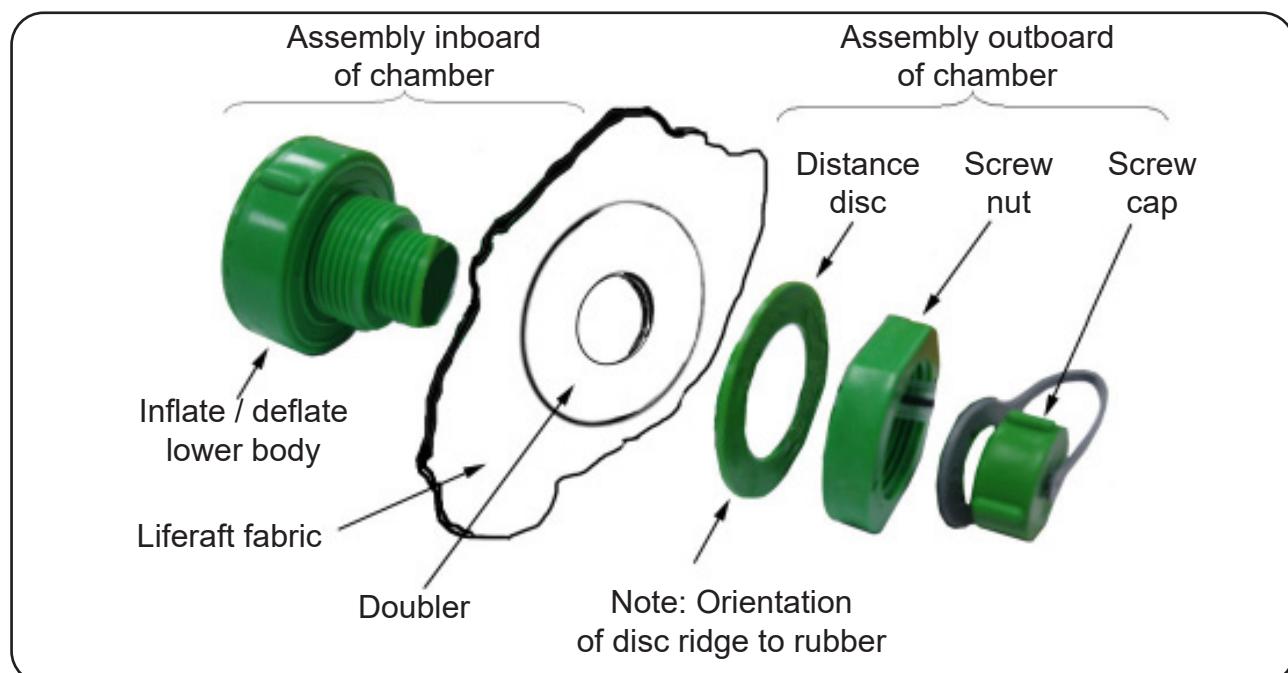


FIGURE 607
Inflate / Deflate valve

6.2.5 Discard all parts of the faulty valve. Do not reuse any of them.

Fitting a new valve

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

NOTE: Make sure that all surfaces are clean and dry before installing the new Inflate/ Deflate valve.

6.2.1 Push the valve body into the slit, from which the faulty one was removed.

6.2.2 Assemble the valve body as shown in FIGURE 607.

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

6.2.3 Holding the valve body in place, through the buoyancy fabric, hand-tighten the components of the valve using the nut.

6.2.4 While holding the valve on the inside, use a calibrated torque wrench and the correct adaptor tools, to tighten the valve from the outside. Please refer to Chapter 1, DESCRIPTION AND DATA, TABLE 101 for torque settings value.

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

6.2.5 The slit must then be repaired as detailed in this Chapter.

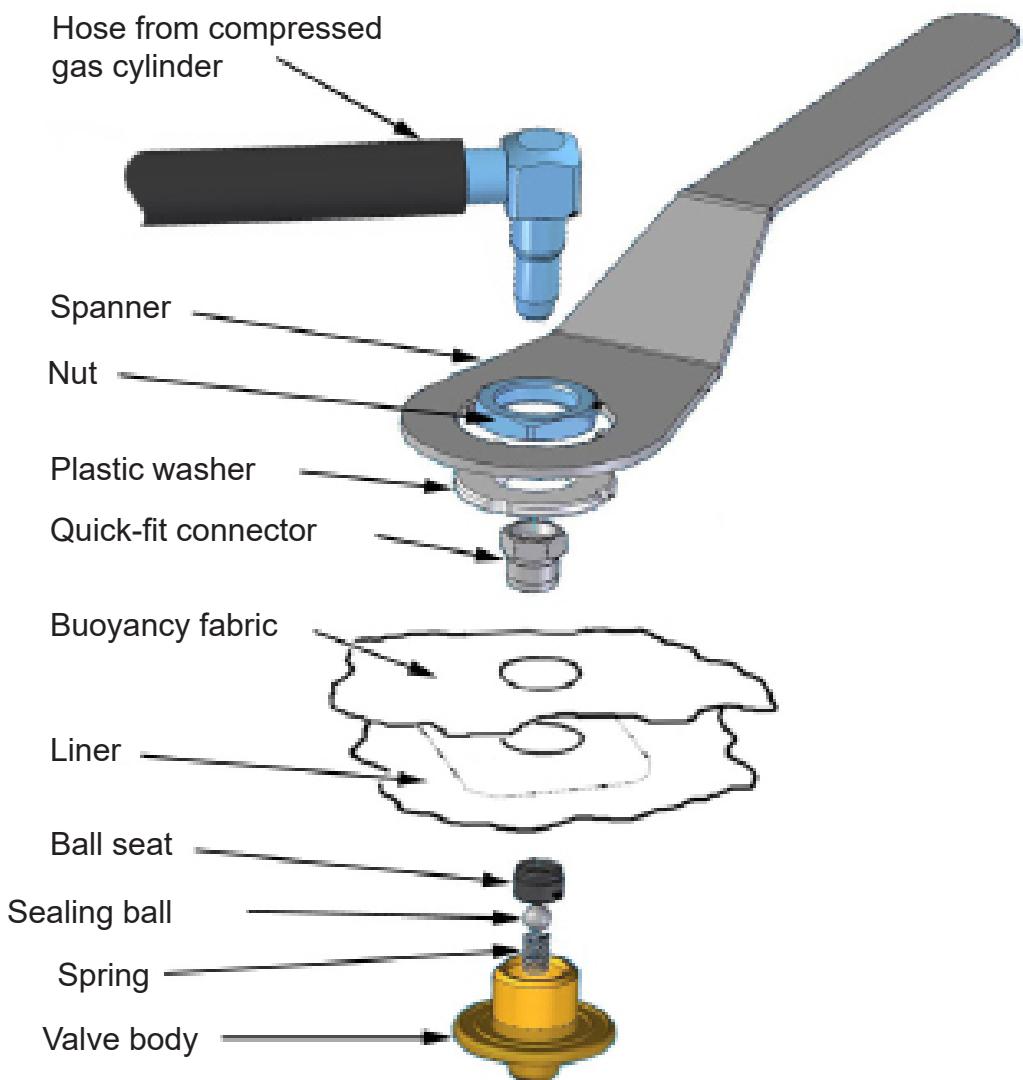
CAUTION: MAKE SURE THAT THE VALVE CAP(S) HAVE BEEN REMOVED BEFORE INFLATION.

6.2.6 After waiting the required time for the repair to cure please complete and record an air-holding test as described in Chapter 5, TESTING AND TROUBLESHOOTING.

6.3 Inflation valve

Leaflet type (FIGURE 608)

- 6.3.1 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 jet holes.
- (a) The bore size for the lower buoyancy is 2.2 mm.
 - (b) The bore size for the upper buoyancy is 2.8 mm.
- 6.3.2 There is only one size of hose for this valve.
- 6.3.3 The assembly requires an aperture of 24 mm diameter in the buoyancy tube. The aperture is reinforced at this point.
- (a) Deflate the liferaft for this repair.
 - (b) To install an inflation valve access to the inside of the buoyancy tube is required. This is achieved by making a slit in the buoyancy tube, approximately 150 mm (6") long. The slit is required close to the inlet valve position.
 - (c) To disassemble the inflation valve, remove the fixing nut and the plastic washer from the valve.
 - (d) Reach inside the liner, via this slit, and pull the body of the valve to the inside of the liner, then remove it from the buoyancy tube.
 - (e) To install a new inflation valve, first disassemble the nut and the plastic washer from the valve.
 - (f) Using all new components assemble the inflation valve unit. Pass the valve body through the liner and the 24 mm hole in the buoyancy tube.
 - (g) Fit the plastic washer and nut to the inflation valve body and tightening it by hand.
 - (h) 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.



NOTE: Exploded view is for illustration only- actual valve unit may vary

FIGURE 608
Leafield inflation valve

- (i) A special tool, (refer to Chapter 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS), is shaped to match the body of the valve. Using a 33 mm socket and torque wrench, tighten the nut to the stated torque value in, Chapter 1, DESCRIPTION AND DATA, TABLE 101.
- (j) 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.
- (k) 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.
- (l) Use the patching procedure to repair the access slits.

6.4 Minor cylinder repair

If cylinder surface finish has been damaged repair as follows;

- 6.4.1 Clean the surface to the bare metal.
- 6.4.2 Apply the paint primer to the damaged area, as per the manufacturer's instructions.
- 6.4.3 When dry, as per the manufacturers instructions, apply the required number of top coats in the correct colour. Please refer to Chapter 1, SPECIAL TOOLS, EQUIPMENT AND MATERIALS for paint repair kit.

6.5 Miscellaneous

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

7. Rigid containers

7.1 Classification of structural repairs

- 7.1.1 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.

7.2 Repair limits.

- 7.2.1 The limits of minor repairs are:

- (a) Damage to the gelcoat only, which does not penetrate the glass fibre mat.
- (b) Damage to the painted surface.

- 7.2.2 The limits of major repairs are:

- (a) 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.
- (b) Apertures or penetrating damage over an area of less than 58 square centimetres (9 sq.in) on the inner surface of the container.
- (c) 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.

7.3 Other repairs

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

- 7.3.1 Replace damaged or illegible labels. Re-stencil illegible markings.

7.4 Gelcoat

7.4.1 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:

- (a) Clean the damaged area with acetone to remove all contamination.
- (b) Spread the GRP filler until it is higher than the adjacent surface of the container.
- (c) Cover the GRP filler with plastic sheeting and then adhesive tape and allow it to cure.
- (d) Remove the tape and abrade the repaired area. Rub down the surface with abrasive papers until it is level with the container surface.

7.4.2 To paint the container:

- (a) Remove all loose labels.
- (b) Remove grease, tar etc. with a suitable solvent, e.g. toluene.
- (c) Wash the container with a solution of detergent and water and rinse with clean water.
- (d) Fill any cracks or voids in the gelcoat with GRP filler as per step 7.4.1.
- (e) Spray paint one coat of white Epimide paint or Polyurethane paint.

7.5 Major structural repairs

7.5.1 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 as follows. 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.

7.5.2 Repair limits. The limits of repair are:

- (a) 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.
- (b) Holes or penetrating damage over an area of more than 58 square centimetres on the inner surface of the container.
- (c) 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

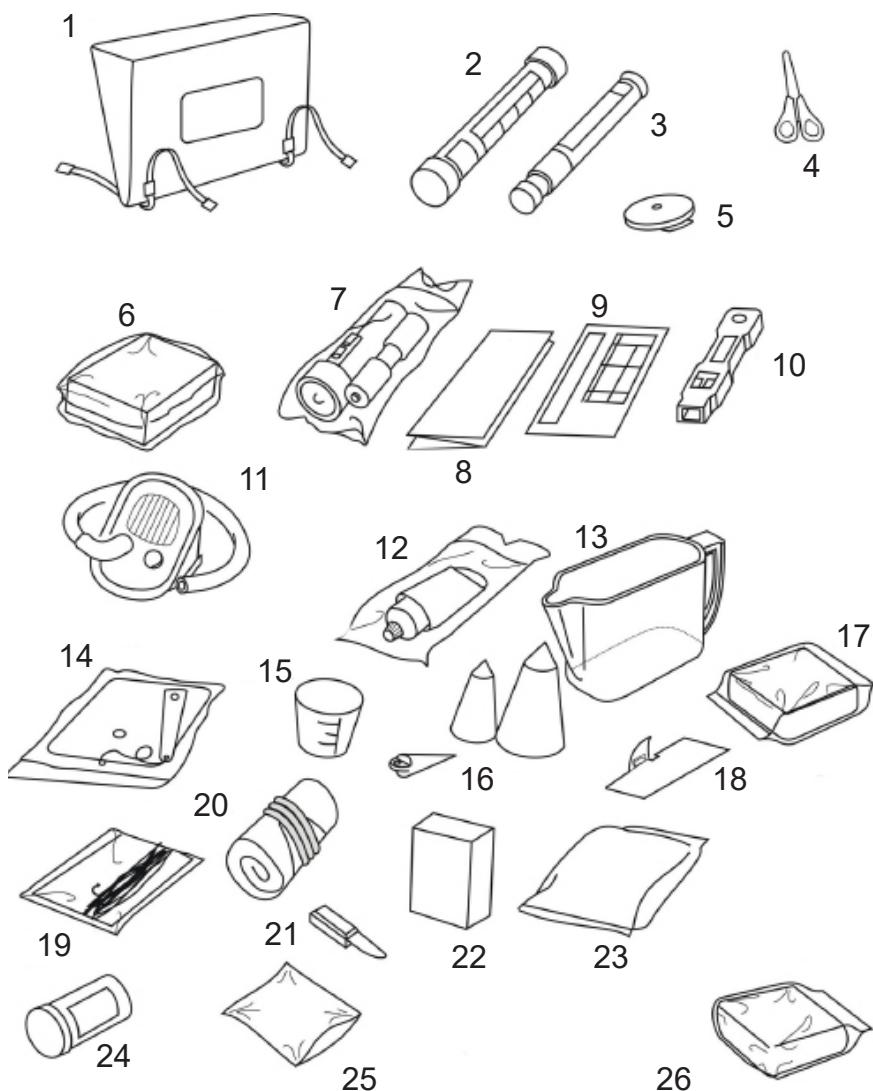
E-PACKS AND EQUIPMENT

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1. E-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.

- 1.1 For liferafts packed into different containers pack the contents of each E-pack into its valise in accordance with TABLES 701-703E.
- 1.2 All 'lived' items that have less than 12 months life remaining, MUST be replaced in the E-pack.



Item	Description
1	Valise
2	Parachute flare
3	Handheld flare
4	Scissors
5	PRV blanking cap
6	First Aid Kit
7	Torch c/w spares
8	Immediate action leaflet
9	Rescue signal table
10	Whistle
11	Top-up bellows
12	Repair kit
13	Bailer, (jug) PVC (1 pint)
14	Heliograph
15	Drinking vessel
16	Leak stoppers
17	Thermal protection aid
18	Tin opener
19	Fishing kit
20	Drogue (spare sea anchor)
21	Buoyant knife
22	Food rations
23	Water sachets
24	Lifesmoke
25	Bag, seasickness, poly
26	Radar reflector mast

FIGURE 701
Emergency pack items

Liferaft size (persons)	Part number	4TO	6TO	8TO	10TO	12 TO & DL	16 TO & DL	20TO & DL	25TO & DL
Anti-seasickness tablets	*1*2	1	1	1	1	2	2	2	3
Bag, seasickness, poly (229 x 366 mm)	11105001	4	6	8	10	12	16	20	25
Bailer, (jug) PVC (1 pint)	05720107	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	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	1	1	1	1	1	1	1	1
Fishing Kit	05720099	1	1	1	1	1	1	1	1
Handheld flare	*3	6	6	6	6	6	6	6	6
Parachute flare	*3	4	4	4	4	4	4	4	4
Lifesmoke	*3	2	2	2	2	2	2	2	2
Heliograph	12499009	1	1	1	1	1	1	1	1
A10 PRV Caps	06400009	2	2	2	2	2	2	2	2
B10 PRV Caps	08557009	2	2	2	2	2	2	2	2
Immediate action leaflet	*1*2	1	1	1	1	1	1	1	1
Immediate action leaflet (language)	*1*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
Radar reflector	*2	1	1	1	1	1	1	1	1
Radar reflector mast	*1*2	1	1	1	1	1	1	1	1
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 (TPA)	06317009	2	2	2	2	2	2	2	3
Tin opener	07889009	3	3	3	3	3	3	3	3
Torch (Long life) c/w spares	06973009	1	1	1	1	1	1	1	1
Torch c/w spares	07966009	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, MK 14 (1050 mm)	20993051	—	—	—	1	1	—	—	—

*1 These items are attached to the liferaft interior and are not packed in an emergency 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 as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

TABLE 701
Emergency equipment for SOLAS A-pack 1
(Mk 10, Mk 14 and all Flat-Pack containers)

Liferaft size (Persons)	Pack number	4TO	6TO	8TO	10TO	12TO & DL	16TO & DL	20TO & DL	25 TO & DL
MK 10 Container		2	2	2	2	2	2	3	2
Water sachet (500 ml)	* ¹	12	18	24	30	36	48	30	30
Food rations (500 g)	* ¹	4	6	8	10	12	16	10	12
Valise (530 mm)	20993011	—	—	—	—	—	—	—	—
Valise (700 mm)	20993021	1	1	1	—	—	—	2	2
Valise (800 mm)	20993031	—	—	—	1	1	—	—	—
Valise (1050 mm)	20993051	—	—	—	—	1	—	—	—

MK 14 Container	Pack number	2	2	2	2	2	2	3	4	2	3	4
Water sachet (500 ml)	* ¹	12	18	24	30	36	48	—	30	30	—	37
Food rations (500 g)	* ¹	4	6	8	10	12	16	20	—	—	25	—
Valise (700 mm)	20993021	1	1	1	—	—	3	3	3	3	3	3
Valise (1050 mm)	20993051	—	—	—	1	1	—	—	—	—	—	—

*¹ Denotes this item as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED.
(see associated publications for details).

TABLE 702A
Emergency equipment for SOLAS A-pack 2,3 & 4
(Mk 10 and Mk 14 containers)

Liferaft size (Persons)	Part number	10TO	12TO
MK 16 Container	Pack number	2	2
Water sachet (500 ml)	*1	30	36
Food rations (500 g)	*1	10	12
Valise (700 mm)	20993051	1	1

Liferaft size (Persons)	Part number	4TO	6TO	8TO
MK 18 Container	Pack number	2	2	2
Water sachet (500 ml)	*1	12	18	24
Food rations (500 g)	*1	4	6	8
Valise (700 mm)	20993021	1	1	1

Liferaft size (Persons)	Part number	25 DL	
MK 18 Container	Pack number	2	3
Water sachet (500 ml)	*1	—	75
Food rations (500 g)	*1	25	—
Valise (700 mm)	20993021	—	2

*1 Denotes this item as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED.
(see associated publications for details).

TABLE 702B
Emergency Equipment for SOLAS A Pack 2,3 & 4
(Mk 16 and Mk 18 Flat-Pack containers)

Liferaft size (persons)	Part number	4TO	6TO	8TO	10TO	12 TO & DL	16 TO & DL	20TO & DL	25TO & DL
Anti-seasickness tablets	*1*2	1	1	1	1	2	2	2	3
Bag, seasickness, poly (229 x 366 mm)	11105001	4	6	8	10	12	16	20	25
Bailer, jug PVC (1 pint)	05720107	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
Drogue (spare sea anchor)	45510101	1	1	1	1	1	1	1	1
First Aid Kit	*2	1	1	1	1	1	1	1	1
Handheld flare	*3	3	3	3	3	3	3	3	3
Parachute flare	*3	2	2	2	2	2	2	2	2
Lifesmoke	*3	1	1	1	1	1	1	1	1
Heliograph	12499009	1	1	1	1	1	1	1	1
A10 - PRV Caps	06400009	2	2	2	2	2	2	2	2
B10 - PRV Caps	08557009	2	2	2	2	2	2	2	2
Immediate action leaflet	*1*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
Radar reflector	*2	1	1	1	1	1	1	1	1
Radar reflector mast	*1*2	1	1	1	1	1	1	1	1
Repair kit	10085003	1	1	1	1	1	1	1	1
Rescue signal table	02176011	1	1	1	1	1	1	1	1
Thermal protection aid (TPA)	06317009	2	2	2	2	2	2	2	3
Torch (Long life) c/w spares	06973009	1	1	1	1	1	1	1	1
*4Torch c/w spares	07966009								
Whistle	05090005	1	1	1	1	1	1	1	1
Valise (800 mm)	20993031	1	1	1	1	1	1	1	1

*1 These items are attached to the liferaft interior and are not packed in an emergency 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 as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

TABLE 703
Emergency equipment for SOLAS B-pack 1
(Mk 10, Mk 14, and all Flat-Pack containers)

Item	Part number	Liferaft size (persons)						
		4 TO	6 TO	8 TO	10 TO	12 TO	16 TO	20 TO
Anti-seasickness tablets	*1*2	1	1	1	1	2	2	2
Bag, seasickness, poly (229 x 366 mm)	11105001	4	6	8	10	12	16	20
Bailer, (jug) PVC (1 pint)	05720107	1	1	1	1	1	2	2
Bellows	51784001	1	1	1	1	1	1	1
Buoyant knife	04503009	0	0	0	0	0	1	1
Drinking vessel	05720098	1	1	1	1	1	1	1
Drogue (spare sea anchor)	45510101	1	1	1	1	1	1	1
First Aid Kit	*2	1	1	1	1	1	1	1
Fishing Kit	05720099	1	1	1	1	1	1	1
Handheld flare	*3	6	6	6	6	6	6	6
Parachute flare	*3	4	4	4	4	4	4	4
Lifesmoke	*3	2	2	2	2	2	2	2
Heliograph	12499009	1	1	1	1	1	1	1
A10 PRV Caps	06400009	2	2	2	2	2	2	2
B10 PRV Caps	08557009	2	2	2	2	2	2	2
Immediate action leaflet	*1*2	1	1	1	1	1	1	1
Immediate action leaflet (language)	*1*2	1	1	1	1	1	1	1
Label E-pack	45036001	1	1	1	1	1	1	1
Leak stopper No.1	40318001	1	1	1	1	1	1	1
Leak stopper No. 3	05720019	1	1	1	1	1	1	1
Leak stopper No. 5	05720023	1	1	1	1	1	1	1
Radar reflector	*2	1	1	1	1	1	1	1
Radar reflector mast	*1*2	1	1	1	1	1	1	1
Repair kit	10085003	1	1	1	1	1	1	1
Rescue signal table	02176011	1	1	1	1	1	1	1
Scissors	05290018	1	1	1	1	1	1	1
Thermal protection aid (TPA)	06317009	2	2	2	2	2	2	2
Tin opener	07889009	3	3	3	3	3	3	3
Torch (Long life) c/w spares	06973009	1	1	1	1	1	1	1
Torch c/w spares	07966009	1	1	1	1	1	1	1
Two-piece paddles	11944009	2	2	2	2	2	2	2
Whistle	05090005	1	1	1	1	1	1	1
Valise (800 mm)	20993031	1	1	1*4	—	—	—	—
Valise (1050 mm)	20993051	—	—	1	1	1	1	1

*1 These items are attached to the liferaft interior and are not packed in an emergency 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 as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

*4 Xtrem container only.

TABLE 703B
Emergency equipment for SOLAS A-Pack, Pack 1
(N-Series Low Profile containers)

Item	Part number	Liferaft size (persons)							
		4 TO	6 TO	8 TO	10 TO	12 TO	16 TO	20 TO	
Anti-seasickness tablets	*1*2	1	1	1	1	2	2	2	
Bag, seasickness, poly (229 x 366 mm)	11105001	4	6	8	10	12	16	20	
Bailer, (jug) PVC (1 pint)	05720107	1	1	1	1	1	2	2	
Bellows	51784001	1	1	1	1	1	1	1	
Buoyant knife	04503009	0	0	0	0	0	1	1	
Drinking vessel	05720098	1	1	1	1	1	1	1	
Drogue (spare sea anchor)	45510101	1	1	1	1	1	1	1	
First Aid Kit	*2	1	1	1	1	1	1	1	
Fishing Kit	05720099	1	1	1	1	1	1	1	
Handheld flare	*3	6	6	6	6	6	6	6	
Parachute flare	*3	4	4	4	4	4	4	4	
Lifesmoke	*3	2	2	2	2	2	2	2	
Heliograph	12499009	1	1	1	1	1	1	1	
A10 PRV Caps	06400009	2	2	2	2	2	2	2	
B10 PRV Caps	08557009	2	2	2	2	2	2	2	
Immediate action leaflet	*1*2	1	1	1	1	1	1	1	
Immediate action leaflet (language)	*1*2	1	1	1	1	1	1	1	
Label E-pack	45036001	1	1	1	1	1	1	1	
Leak stopper No.1	40318001	1	1	1	1	1	1	1	
Leak stopper No. 3	05720019	1	1	1	1	1	1	1	
Leak stopper No. 5	05720023	1	1	1	1	1	1	1	
Radar reflector	*2	1	1	1	1	1	1	1	
Radar reflector mast	*1*2	1	1	1	1	1	1	1	
Repair kit	10085003	1	1	1	1	1	1	1	
Rescue signal table	02176011	1	1	1	1	1	1	1	
Scissors	05290018	1	1	1	1	1	1	1	
Thermal protection aid (TPA)	06317009	2	2	2	2	2	2	2	
Tin opener	07889009	3	3	3	3	3	3	3	
Torch (Long life) c/w spares	06973009	1	1	1	1	1	1	1	
Torch c/w spares	07966009	1	1	1	1	1	1	1	
Two-piece paddles	11944009	2	2	2	2	2	2	2	
Whistle	05090005	1	1	1	1	1	1	1	
Valise (1247 mm)	53641001	2	2	2	2	2	2	2	

*1 These items are attached to the liferaft interior and are not packed in an emergency 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 as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

*4 Xtrem container only.

TABLE 703BB
Emergency equipment for SOLAS A-Pack, Pack 1
(N-Series Xtrem containers)

Liferaft capacity	Part number	4TO	6TO	8TO	10TO	12TO	16TO	20TO
N-Series Low Profile		N133	N134	N135	N135	N135	N136H	N136H
Water sachet (500 ml)	*1	12	18	24	30	36	48	60
Food rations (500 g)	*1	4	6	8	10	12	16	20
Valise (700 mm)	20993021	—	—	—	—	—	—	2
Valise (800 mm)	20993031	1	1	—	—	—	—	—
Valise (1050 mm)	20993051	—	—	1	1	1	1	—

*1 Denotes this item as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

TABLE 703C
Contents of Pack 2: food and water
(N-Series Low Profile containers)

Liferaft capacity	Part number	6TO	8TO	10TO	12TO	16TO
N-Series Xtrem		N137H	N138H	N139H	N139H	N140H
Water sachet (500 ml)	*1	18	24	30	36	48
Food rations (500 g)	*1	6	8	10	12	16
Valise (1247 mm)	53641001	2	2	2	2	2

*1 Denotes this item as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

TABLE 703D
Contents of Pack 2: food and water A-Pack
(N-Series Xtrem containers)

Item	Part number	Liferaft size (persons)						
		4TO	6TO	8TO	10TO	12 TO	16 TO	20TO
Bag, seasickness, poly (229 x 366 mm)	11105001	4	6	8	10	12	16	20
Bailer, jug PVC (1 pint)	05720107	1	1	1	1	1	2	2
Bellows	51784001	1	1	1	1	1	1	1
Buoyant knife	04503009	0	0	0	0	0	1	1
Drogue (spare sea anchor)	45510101	1	1	1	1	1	1	1
First Aid Kit	* ²	1	1	1	1	1	1	1
Handheld flare	* ³	3	3	3	3	3	3	3
Parachute flare	* ³	2	2	2	2	2	2	2
Lifesmoke	* ³	1	1	1	1	1	1	1
Heliograph	12499009	1	1	1	1	1	1	1
A10 - PRV Caps	06400009	2	2	2	2	2	2	2
B10 - PRV Caps	08557009	2	2	2	2	2	2	2
Immediate action leaflet	* ^{1*2}	1	1	1	1	1	1	1
Label E-pack	45036001	1	1	1	1	1	1	1
Leak stopper No.1	40318001	1	1	1	1	1	1	1
Leak stopper No. 3	05720019	1	1	1	1	1	1	1
Leak stopper No. 5	05720023	1	1	1	1	1	1	1
Radar reflector	* ²	1	1	1	1	1	1	1
Radar reflector mast	* ^{1*2}	1	1	1	1	1	1	1
Repair kit	10085003	1	1	1	1	1	1	1
Rescue signal table	02176011	1	1	1	1	1	1	1
Thermal protection aid (TPA)	06317009	2	2	2	2	2	2	2
Torch (Long life) c/w spares	06973009	1	1	1	1	1	1	1
* ⁴ Torch c/w spares	07966009	1	1	1	1	1	1	1
Two-piece paddles	11944009	2	2	2	2	2	2	2
Whistle	05090005	1	1	1	1	1	1	1
Valise (800 mm)	20993031	1	1	1	1	1	1	1

*¹ These items are attached to the liferaft interior and are not packed in an emergency 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 as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

TABLE 703E
Emergency equipment for SOLAS B-Pack, Pack 1
(N-Series Low Profile containers)

Item	Part number	Liferaft size (persons)						
		4TO	6TO	8TO	10TO	12 TO	16 TO	20TO
Bag, seasickness, poly (229 x 366 mm)	11105001	4	6	8	10	12	16	20
Bailer, jug PVC (1 pint)	05720107	1	1	1	1	1	2	2
Bellows	51784001	1	1	1	1	1	1	1
Buoyant knife	04503009	0	0	0	0	0	1	1
Drogue (spare sea anchor)	45510101	1	1	1	1	1	1	1
First Aid Kit	* ²	1	1	1	1	1	1	1
Handheld flare	* ³	3	3	3	3	3	3	3
Parachute flare	* ³	2	2	2	2	2	2	2
Lifesmoke	* ³	1	1	1	1	1	1	1
Heliograph	12499009	1	1	1	1	1	1	1
A10 - PRV Caps	06400009	2	2	2	2	2	2	2
B10 - PRV Caps	08557009	2	2	2	2	2	2	2
Immediate action leaflet	* ^{1*2}	1	1	1	1	1	1	1
Label E-pack	45036001	1	1	1	1	1	1	1
Leak stopper No.1	40318001	1	1	1	1	1	1	1
Leak stopper No. 3	05720019	1	1	1	1	1	1	1
Leak stopper No. 5	05720023	1	1	1	1	1	1	1
Radar reflector	* ²	1	1	1	1	1	1	1
Radar reflector mast	* ^{1*2}	1	1	1	1	1	1	1
Repair kit	10085003	1	1	1	1	1	1	1
Rescue signal table	02176011	1	1	1	1	1	1	1
Thermal protection aid (TPA)	06317009	2	2	2	2	2	2	2
Torch (Long life) c/w spares	06973009	1	1	1	1	1	1	1
* ⁴ Torch c/w spares	07966009	1	1	1	1	1	1	1
Two-piece paddles	11944009	2	2	2	2	2	2	2
Whistle	05090005	1	1	1	1	1	1	1
Valise (1247 mm)	53641001	1	1	1	1	1	1	1

*¹ These items are attached to the liferaft interior and are not packed in an emergency 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 as listed in Service bulletin - Approved spare parts, Non-operational liferafts and the MED. (see associated publications for details).

TABLE 703EE
Emergency equipment for SOLAS B-Pack, Pack 1
(N-Series Xtrem containers)

Default equipment	
Item	Part number
Anti-seasickness tablets (60×)	12864009
First aid kit	12873009
Immediate action leaflet	50165011
Radar reflector	41955011
Radar reflector mast	41955021

TABLE 704
Default equipment

Optional equipment			
Item	Part number	Quantity	Additional information
Search and Rescue Transponder	08111009	1	SART (S4)

TABLE 705
Optional equipment

2. Additional wrapping / preparation

2.1 Pyrotechnics

It is important to wrap pyrotechnics correctly with pillowflex and/or protective foam. The types of pyrotechnics used in E-packs are lifesmoke, parachute flares and handheld flares.

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

2.1.1 For liferaft drop heights of 18 metres and below, use the wrapping method as illustrated in FIGURE 702.

Use rubber bands or tape to retain the wrap.

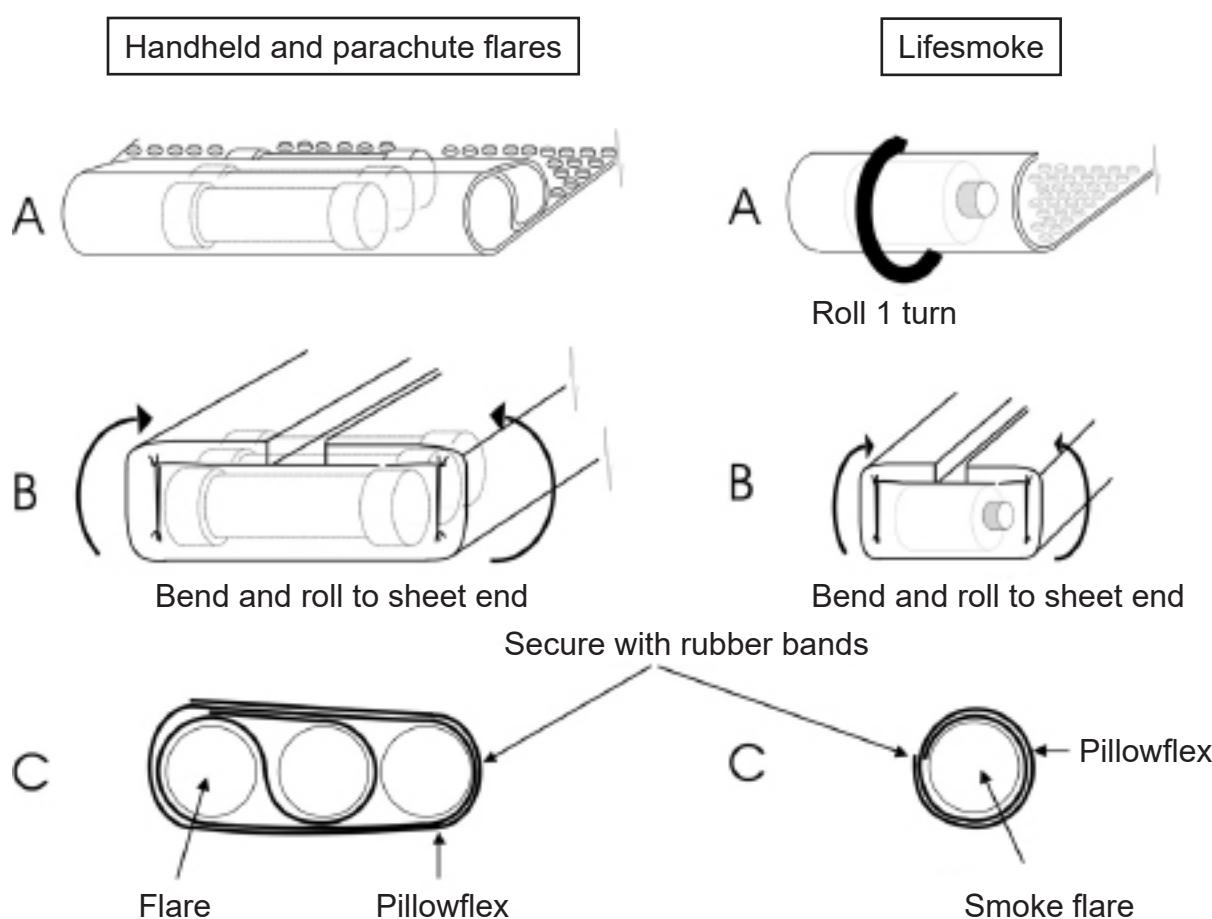


FIGURE 702
Pyrotechnics wrapping method for liferafts with drop heights up to and including 18 metres

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

NOTE: Use 5 layers of pillowflex bubble wrap.

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

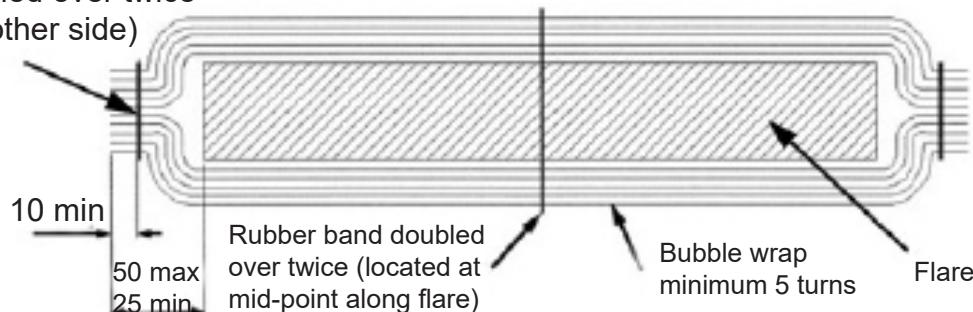
Handheld and parachute flares are to be individually wrapped with minimum 5 turns of Pillowflex bubble wrap. Refer to FIGURE 703A. Use rubber bands or tape to retain the bubble wrap.

Lifesmoke is to be wrapped in one turn of protective foam and 2 turns

Pillowflex bubble wrap. Refer to FIGURE 703B.

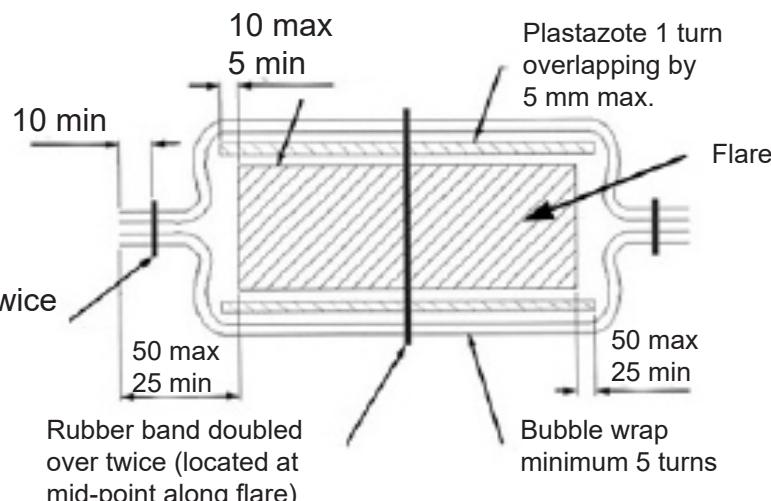
Use rubber bands or tape to retain the bubble wrap.

Rubber band doubled over twice
 (The same at the other side)



Handheld and parachute flares

Rubber band doubled over twice
 (The same at the other side)



Lifesmoke

FIGURE 703

Pyrotechnics wrapping for liferafts with drop heights greater than 18 metre but less than or equal to 36 metres: Handheld flare and parachute flares (top); lifesmoke

2.2 Bellows

It is important to wrap the bellows with sufficient Pillowflex. The method for wrapping the bellows is as follows;

- 2.2.1 Wrap the bellows hosing around the bellows and secure the wrap with rubber bands. Refer to FIGURE 704.
- 2.2.2 Insert protective foam into the socket as shown in FIGURE 704.
- 2.2.3 Place the bellows top down, as shown, on a large length of pillowflex. Refer to FIGURE 704.
- 2.2.4 Wrap the bellows seven times, with the pillowflex. Refer to FIGURE 704.
- 2.2.5 Fold in both ends of the wrap and tape securely. Refer to FIGURE 704. Use two lengths of tape.

Wrap hose and secure
with rubber band

Insert protective foam
here



Turn bellows face down
onto pillowflex



Wrap bellows with
7 turns of pillowflex
Secure with black tape



FIGURE 704

Bellows wrapping for liferafts with drop heights greater than 18 metre but less than or equal to 36 metre

2.3 Radar reflector

- 2.3.1 Deflate the radar reflector allowing the seams of the outer balloon panels to line up with each other as far as possible.
Refer to FIGURE 705.
- 2.3.2 Fold the sides in to equal the width of the plastic stowage bag. Roll the reflector, excluding any residual air through the valve.
Refer to FIGURE 705.
- 2.3.3 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.
Refer to FIGURE 705.
- 2.3.4 Put the radar mast (if fitted) alongside the paddles, so that the protective foam at paddle end covers and protects the mast ends.
Refer to Chapter 8, ASSEMBLY, FIGURE 802.

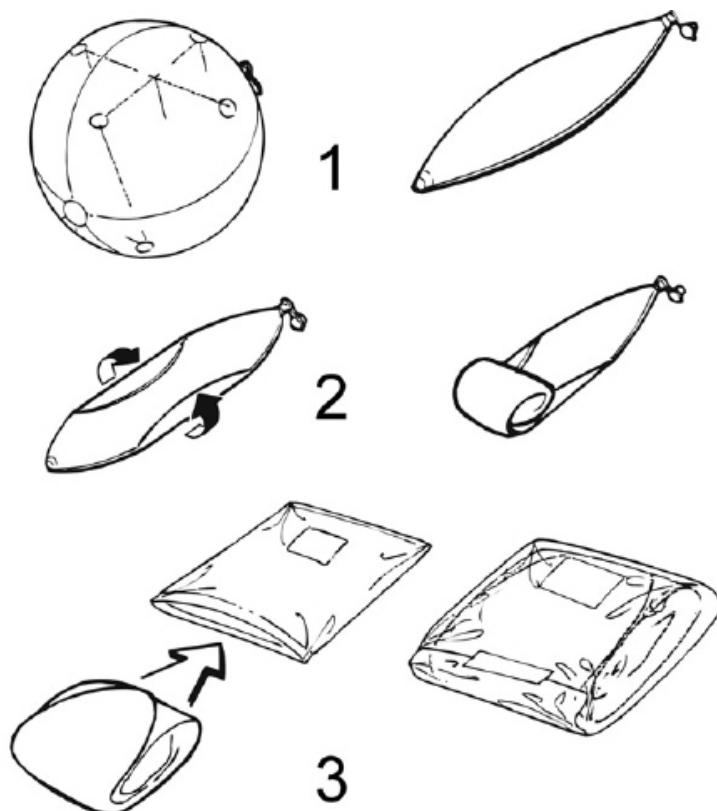


FIGURE 705
Pack the radar reflector

2.4 Search And Rescue Transponder (SART) - if included

Pack the SART into the E-pack:

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

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

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

2.4.5 Documentation

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

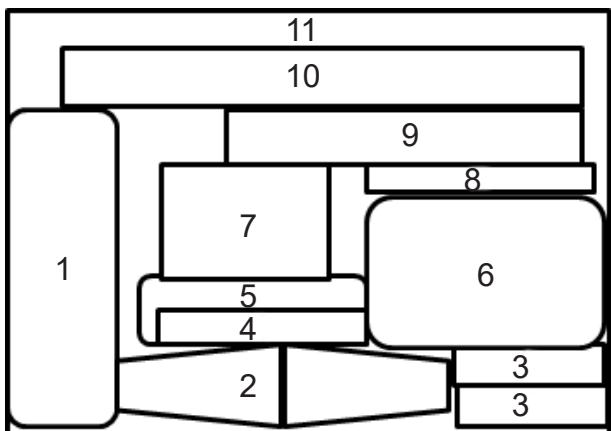
3. Packing the valise

3.1 Using a MK 10 container

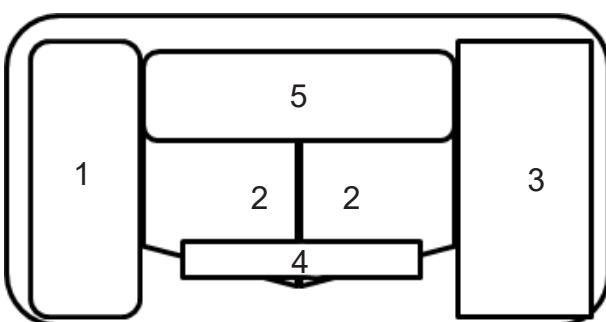
Arrange items into the valise as required, making sure the finished packs are long and thin. As a guide, a layout is shown but this can vary slightly from liferaft to liferaft. Refer to FIGURE 706A and 706B.

- 3.1.1 Pack 1, FIGURE 706A shows the position and layout of the equipment.
- 3.1.2 Pack 2 and/or 3 contains the water and food packs. View CC shows the position and layout of both. Refer to FIGURE 706B and 707.

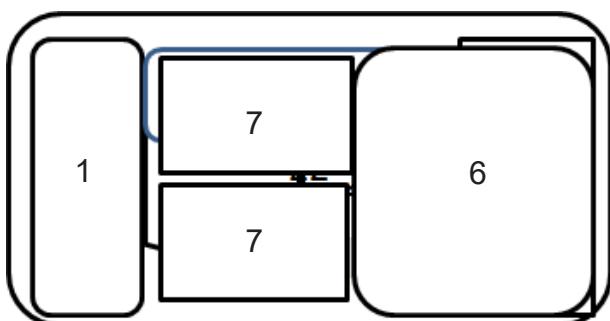
800 mm valise (31)



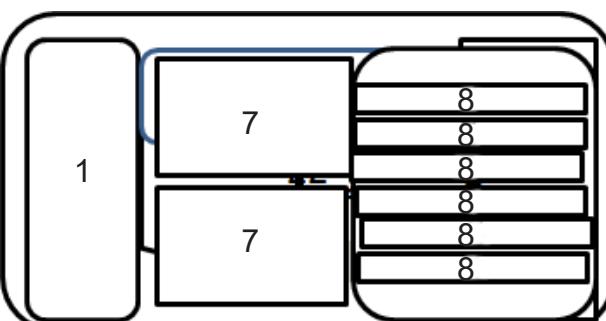
Pan view first layer



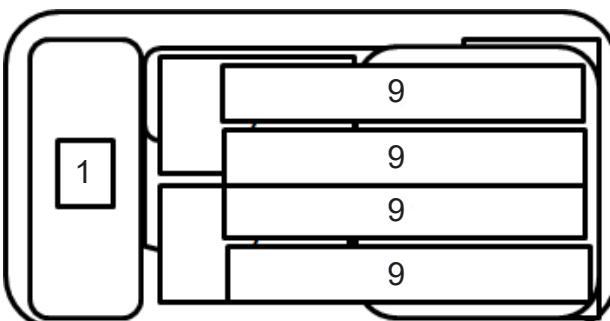
Pan view second layer



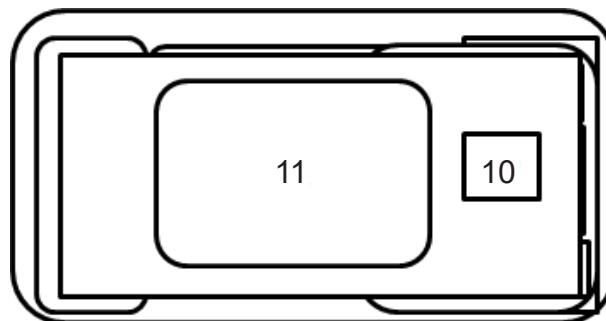
Pan view third layer



Pan view fourth layer



Pan view fifth layer



Key:

1	Bellows / Pump	4	Bag, seasickness, poly	7	lifesmoke (2)	10	Radar reflector (2 bubble wrap)
2	Bailer (1 or 2)	5	Drogue	8	Handheld flare (6)	11	Rescue signal table
3	TPA's (2 or 3)	6	First Aid Kit	9	Parachute flare (4)		

FIGURE 706A
 Pack 1 valise packing for MK 10 container (all sizes)

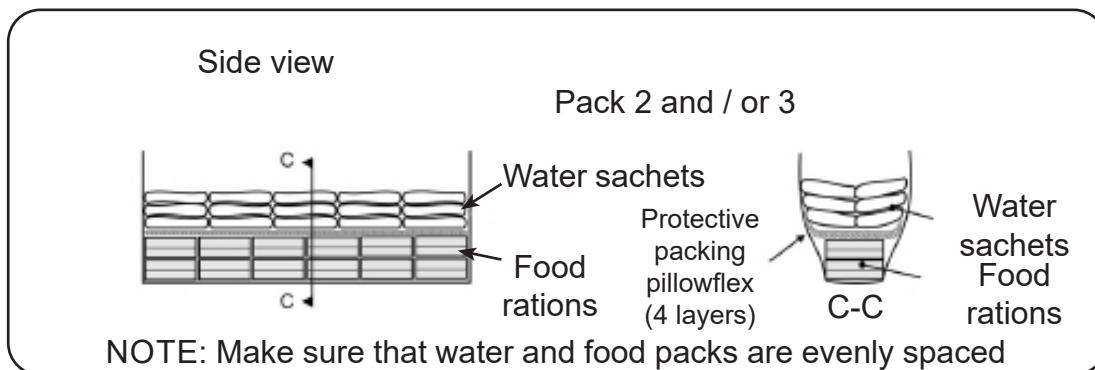
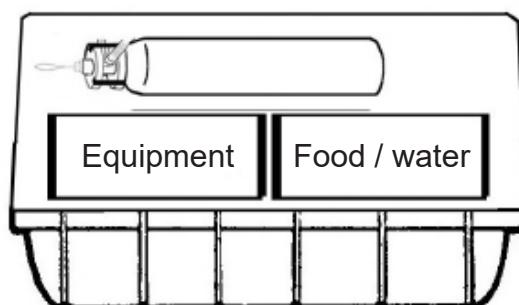


FIGURE 706B
Pack 2 and / or Pack 3 valise packing for MK 10 container (all sizes)



NOTE: 20 and 25 persons TO and DL have two food and water packs

FIGURE 707
Positioning the packs in MK 10 container

3.2 Using a Flat-Pack container - Flat-Pack (SOLAS A-pack)

3.2.1 Work the liferaft into the container and into the corners to use all the space of the Flat-Pack.

3.2.2 Place the items into the valises as shown in FIGURES 708 or 709.

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.

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

NOTE: Make sure that water sachets and food rations are evenly spaced.

3.2.4 Tie the valise straps together.

3.2.5 Using a bowline knot, tie the pack 2 to the inner lifeline using the flying ends of the valise straps. 525 lb / 263 kgf cord can be used as an alternative to the valise straps.

3.2.6 Pack 1, the plan view and section view AA, shows the position and layout of the equipment. Refer to FIGURES 708 or 709.

(a) If packing for a 4, 6 or 8 Person refer to FIGURE 708.

(b) If packing for a 10 or 12 Person refer to FIGURE 709.

3.2.7 Tie the valise straps together.

3.2.8 Using a bowline knot, tie the pack 1 to the inner lifeline using the flying ends of the valise straps. 525 lb / 263 kgf cord can be used as an alternative to the valise straps.

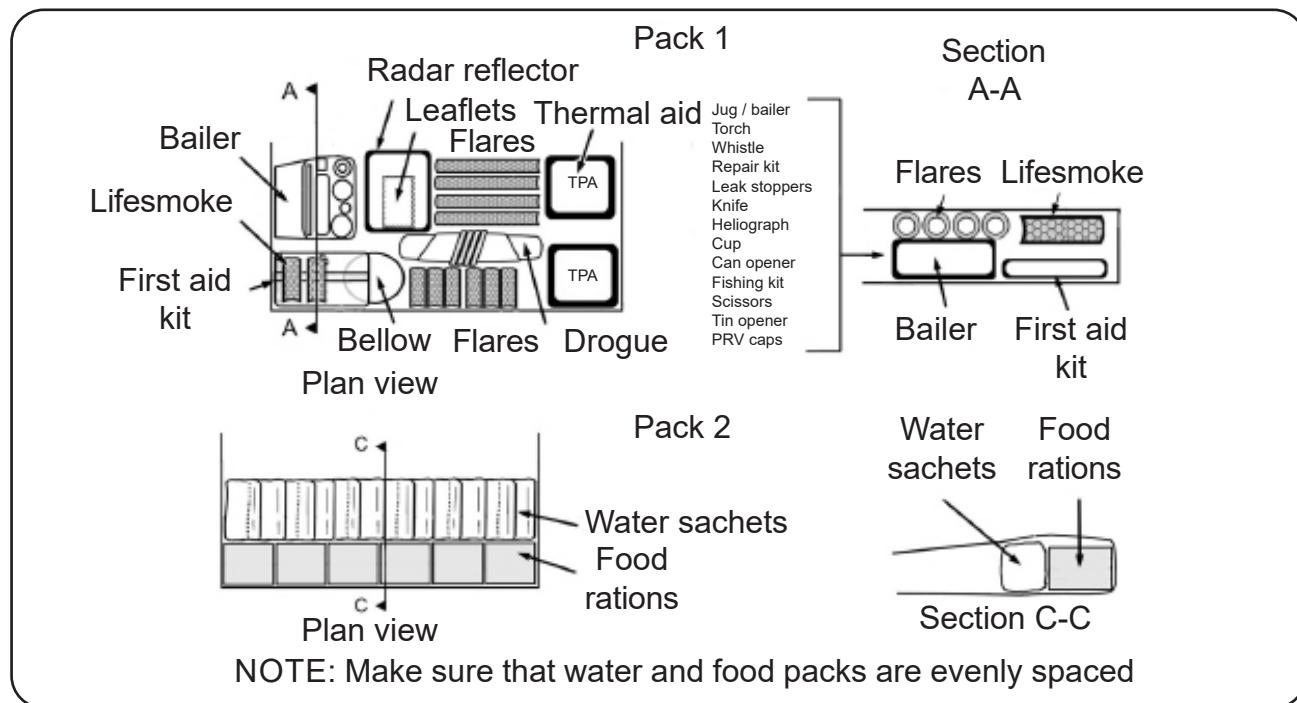


FIGURE 708
Valise packing for 4, 6 and 8 Person into Flat-Pack container

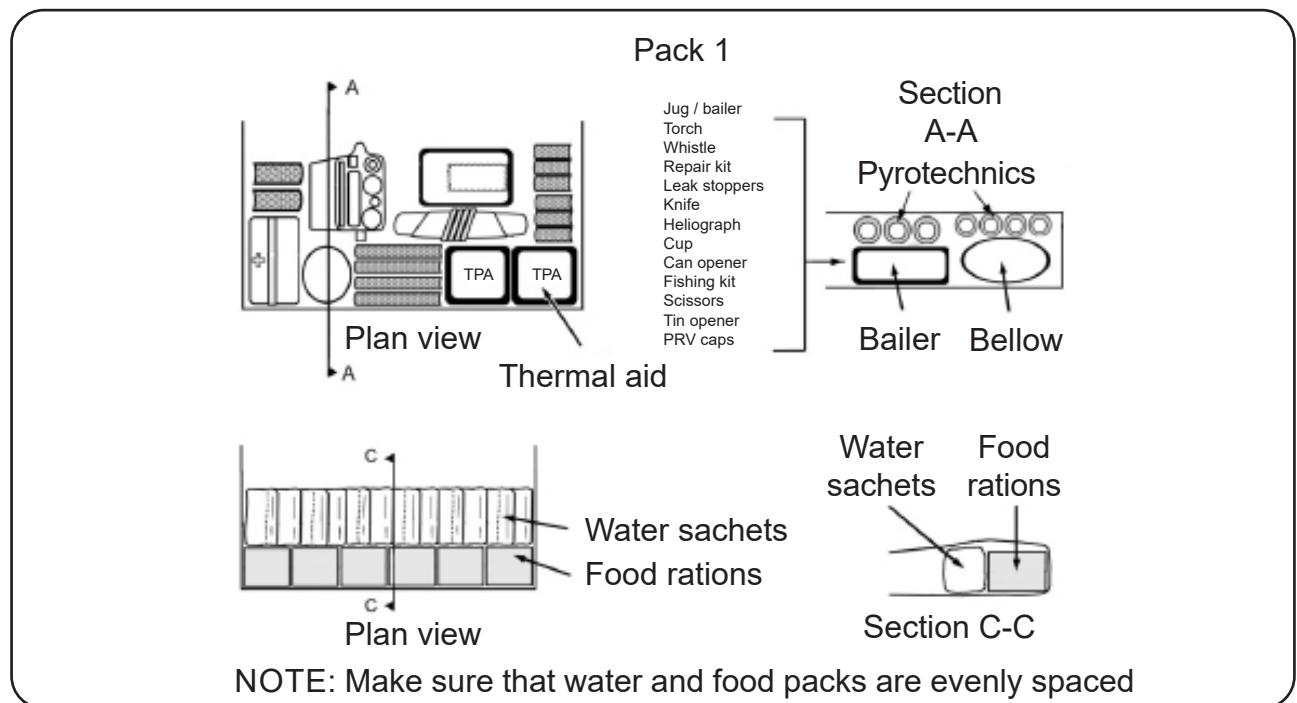


FIGURE 709
Valise packing for 10 and 12 Person into Flat-Pack container

3.3 Using a MK 20 Flat-Pack container SOLAS B-pack

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

3.3.1 Work the liferaft into the container and into the corners to use all space of the Flat-Pack.

3.3.2 Place the items into the valise as shown in FIGURE 709.

3.3.3 Pack 1, the plan view and section view AA, shows the position and layout of the equipment. Refer to FIGURE 709.

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.

3.3.4 Tie the valise straps together.

3.3.5 Using a bowline knot, tie the E-pack to the inner lifeline using the flying ends of the valise straps. 525 lb / 263 kgf cord can be used as an alternative to the valise straps.

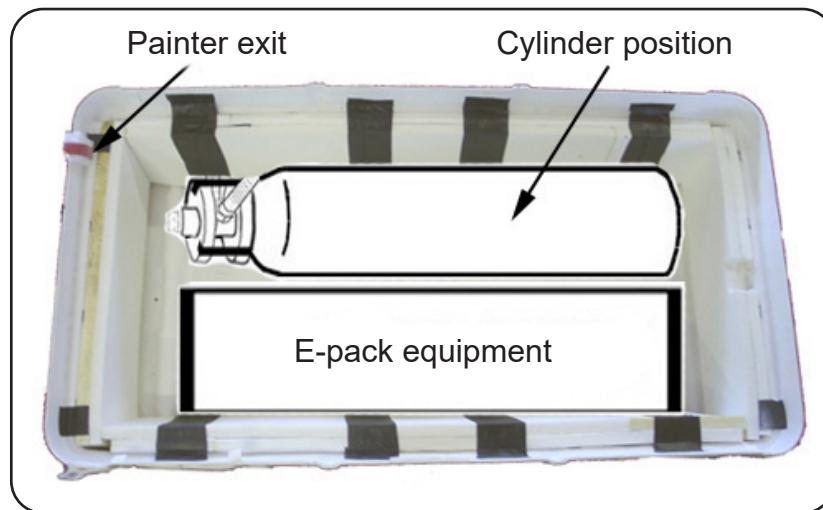


FIGURE 710
Positioning the B-pack in MK 20 container

3.4 Using a MK 14 container

- 3.4.1 Put the equipment items into Pack 1 valise as required, refer to FIGURE 706, views AA and BB, making sure the finished packs are long and thin:
- 3.4.2 Pack 1, FIGURE 706 (view AA and view BB), show the position and layout of the equipment within the valise.
- 3.4.3 For 10 and 12 Person. Refer to FIGURE 711A.
Pack 2 contains food rations and water sachets.
For 16, 20 and 25 Person. Refer to FIGURE 711B.
Pack 2 contains food rations only.
Pack 3 and 4 contain the water sachets only, (evenly split)

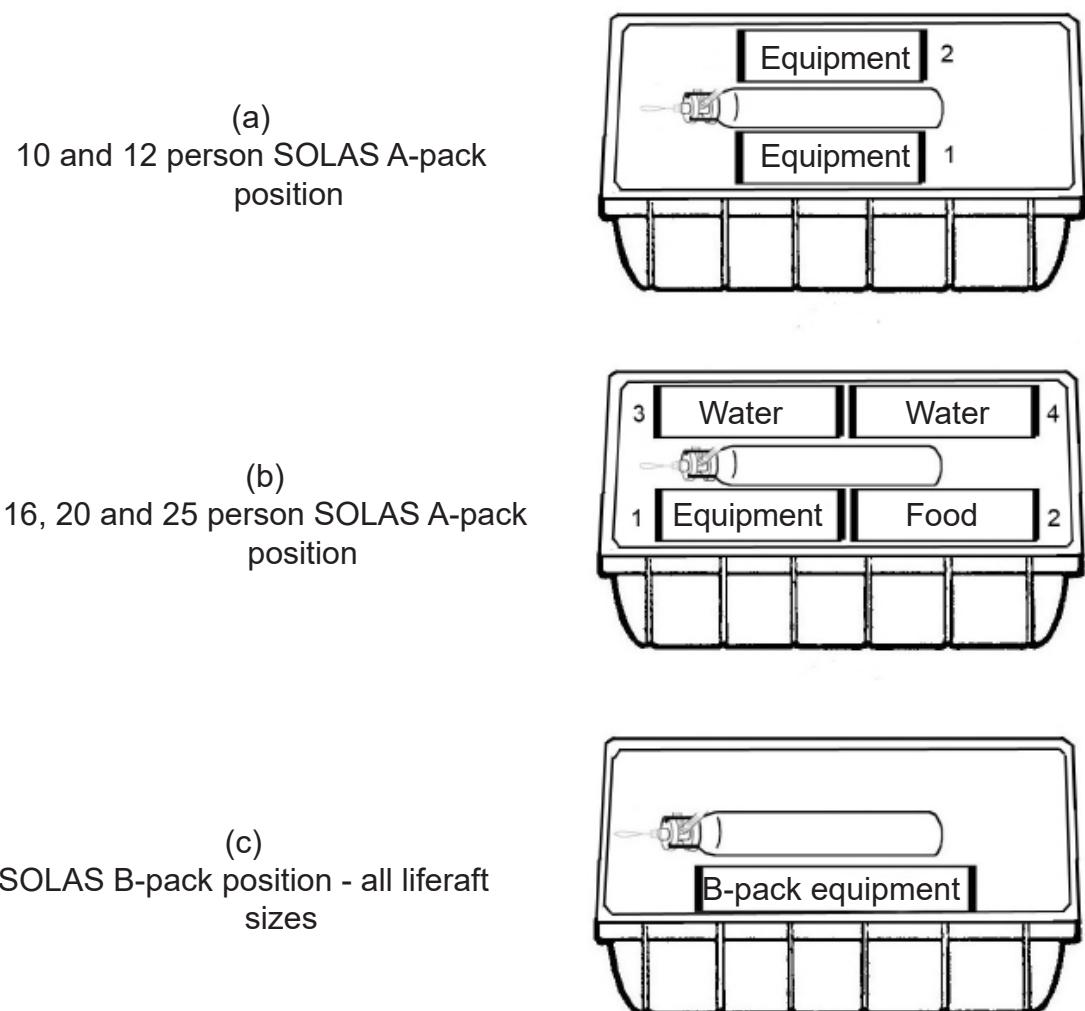
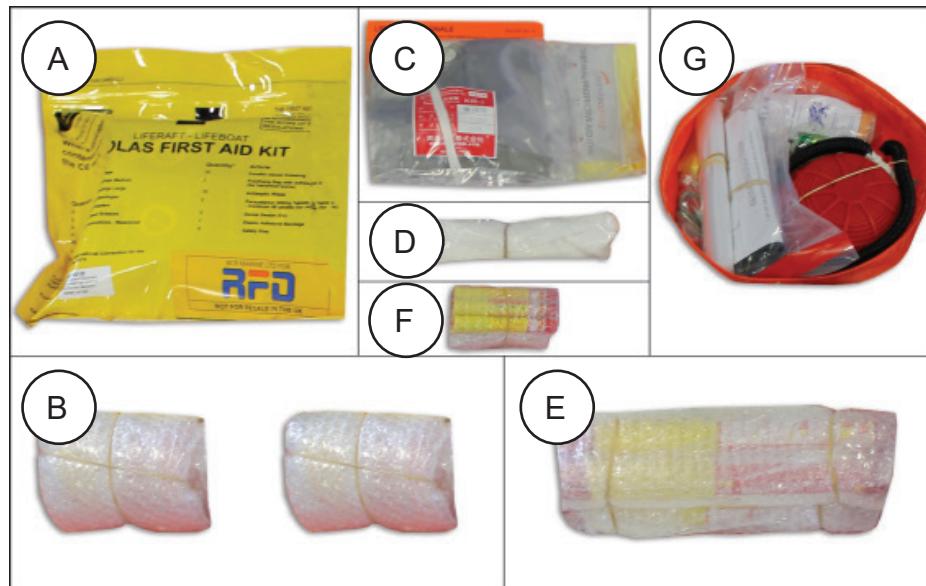


FIGURE 711
Positioning the packs in MK 14 container

3.5 Do the steps that follow for a N-Series Low Profile container:

- 3.5.1 Put the liferaft into the corners of the container. Make sure that you use all of the space in the container.
- 3.5.2 Put the items into the E-Pack valise:
 - (a) Do the steps that follow for SOLAS A-Pack:
 - (i) Refer to **TABLE 703B** for Pack 1: emergency equipment quantities.
 - (ii) Refer to **Figure 712** to assemble Pack 1 for a 800 mm valise.
 - (iii) Refer to **Figure 713** to assemble Pack 1 for a 1050 mm valise.
 - (iv) Refer to **TABLE 703C** for SOLAS A-Pack, Pack 2: food and water quantities.
 - (v) Refer to **Figure 714** to assemble Pack 2 for a 700 mm valise.
 - (vi) Refer to **Figure 715** and **Figure 716** to assemble Pack 2 for a 800 mm valise.
 - (vii) Refer to **Figure 717**, **Figure 718**, **Figure 719**, **Figure 720A** and **Figure 720B** to assemble Pack 2 for a 1050 mm valise.
 - (b) Do the steps that follow for SOLAS B-Pack:
 - (i) Refer to **TABLE 703E** for SOLAS B-Pack, Pack 1 emergency equipment quantities.
 - (ii) Refer to **Figure 721** to assemble Pack 1 for a 800 mm valise.
- 3.5.3 Refer to **Step 4 Sealing the valise** to seal the valise.
- 3.5.4 Refer to **Figure 722A** and **Figure 722B** to put the valise into the container.
- 3.5.5 Tie the valise straps together.
- 3.5.6 Get the flying ends of the valise straps.
- 3.5.7 Use a half hitch to tie the valise straps of the E-Pack to the inner lifeline. You may use 525 lb / 263 kgf cord as an alternative to the valise straps.

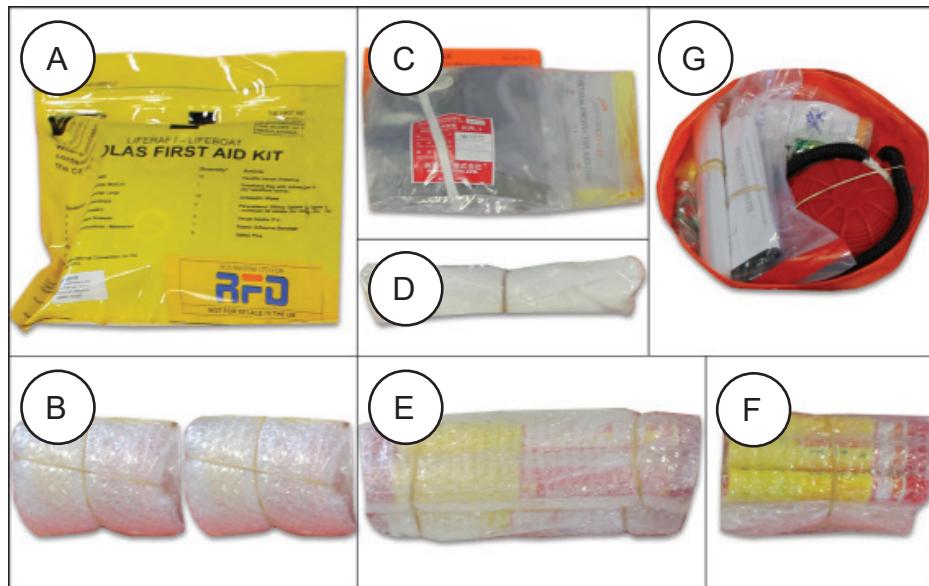
NOTE: Two-piece paddles are attached to the inner lifeline at the rear end of the liferaft.
Refer to **Figure 841** and **842** in **Chapter 8, Assembly**.



Item	Description
A	First Aid Kit
B	Lifesmoke
C	Radar reflector
	TPA
	Rescue signal table
D	Drogue
E	Parachute flares
F	Hand flares

Item	Description
G	Bailer, containing:
	Torch
	Whistle
	Repair kit
	Leak stoppers
	Knife
	Drinking vessel
	Tin opener
	Fishing kit
	Scissors
	PRV caps
	Heliograph
	Seasickness bags

FIGURE 712
Contents of SOLAS A-Pack, Pack 1: emergency equipment
800 mm valise (N-Series Low Profile container)



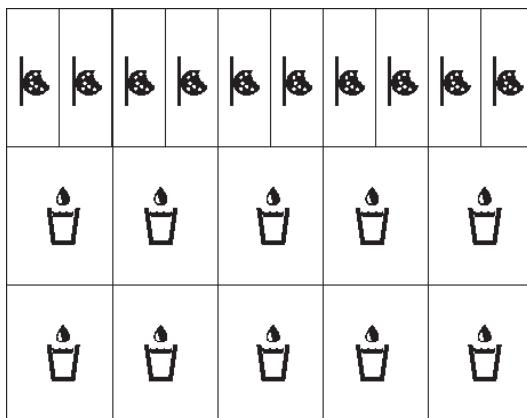
Item	Description
A	First Aid Kit
B	Lifesmoke
C	Radar reflector
	TPA
	Rescue signal table
D	Drogue
E	Parachute flares
F	Hand flares

Item	Description
G	Bailer, containing:
	Torch
	Whistle
	Repair kit
	Leak stoppers
	Knife
	Drinking vessel
	Tin opener
	Fishing kit
	Scissors
	PRV caps
	Heliograph
	Seasickness bags

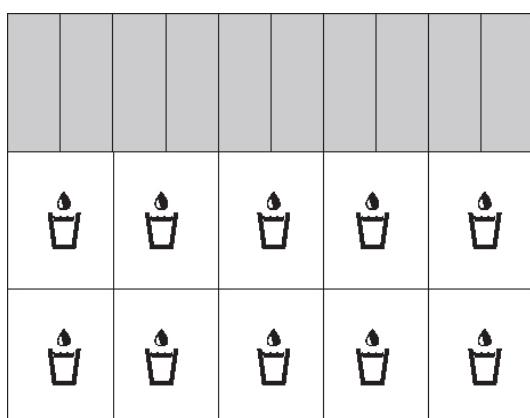
FIGURE 713
Contents of SOLAS A-Pack, Pack 1: emergency equipment
1050 mm valise (N-Series Low Profile container)

20 Person

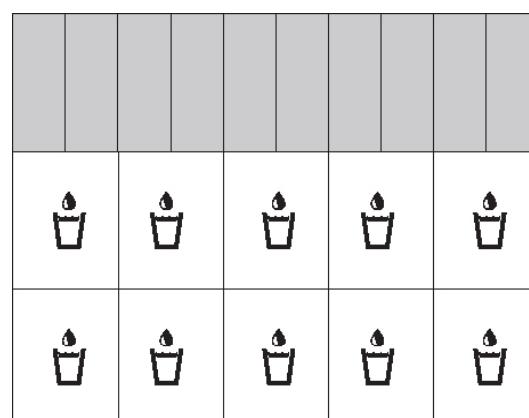
Layer 1



Layer 2



Layer 3

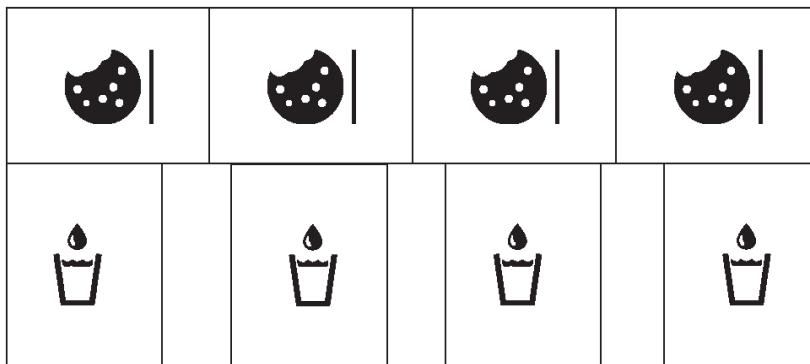


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

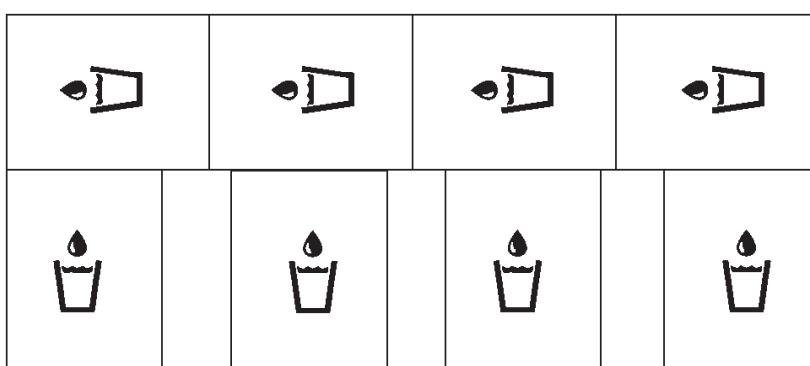
FIGURE 714
**Contents of SOLAS A-Pack, Pack 2: food and water for 20 Person in a
 700 mm valise (N-Series Low Profile container)**

4 Person

Layer 1



Layer 2

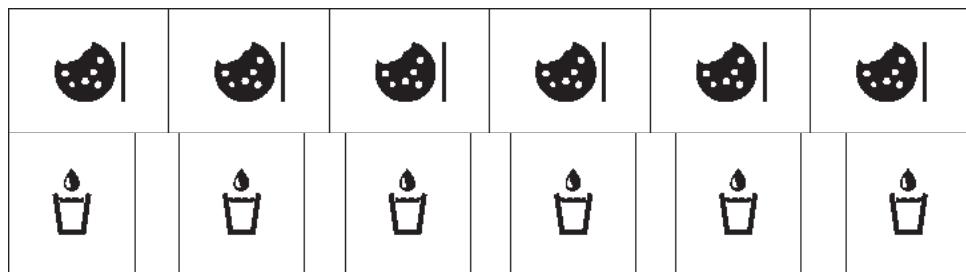


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

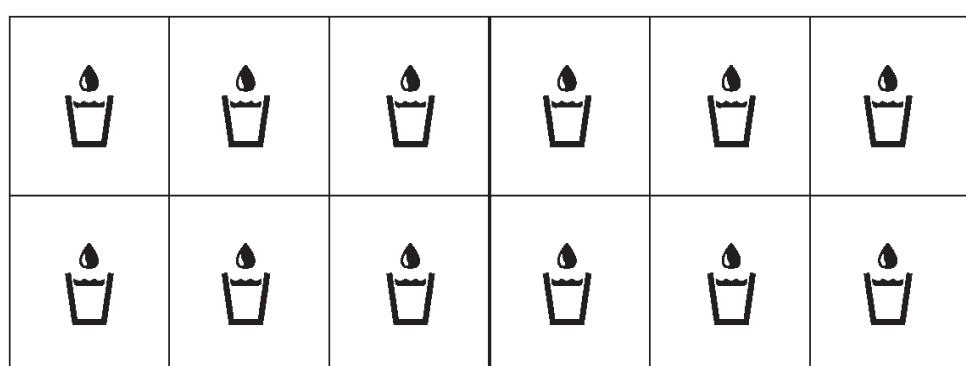
FIGURE 715
**Contents of SOLAS A-Pack, Pack 2: food and water for 4 Person in an
 800 mm valise (N-Series Low Profile container)**

6 Person

Layer 1



Layer 2

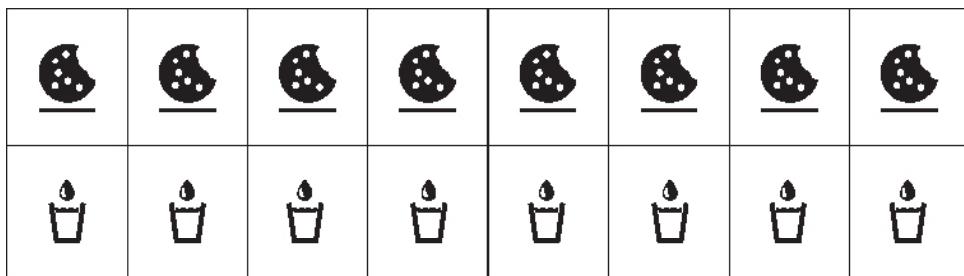


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

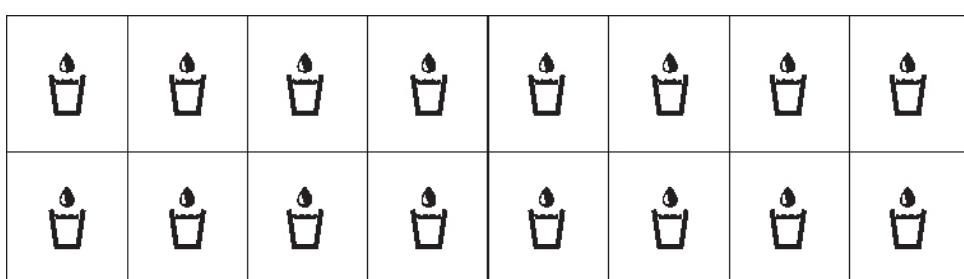
FIGURE 716
**Contents of SOLAS A-Pack, Pack 2: food and water for 6 Person in an
 800 mm valise (N-Series Low Profile container)**

8 Person

Layer 1



Layer 2

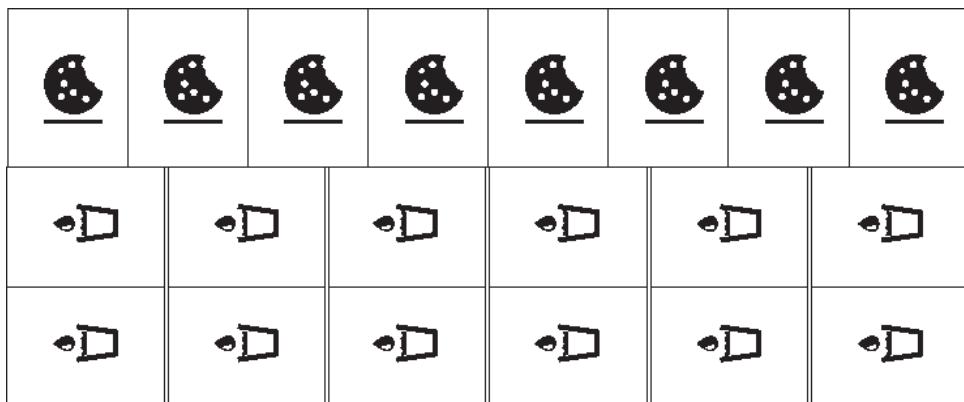


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

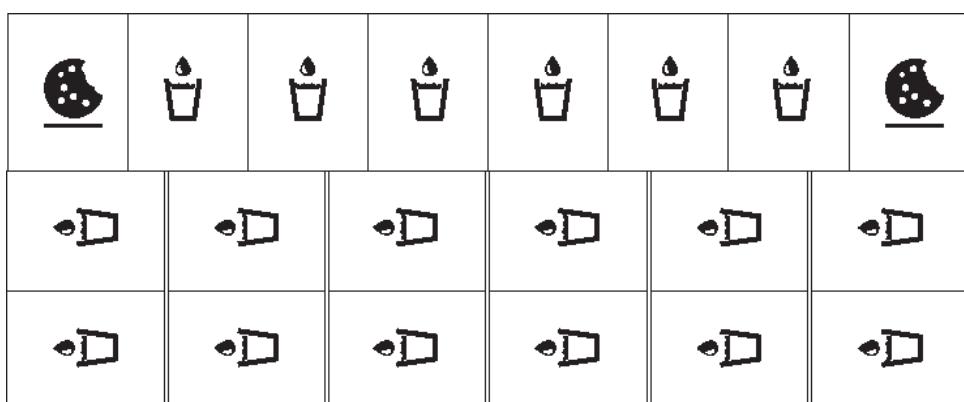
FIGURE 717
**Contents of SOLAS A-Pack, Pack 2: food and water for 8 Person in a
 1050 mm valise (N-Series Low Profile container)**

10 Person

Layer 1



Layer 2

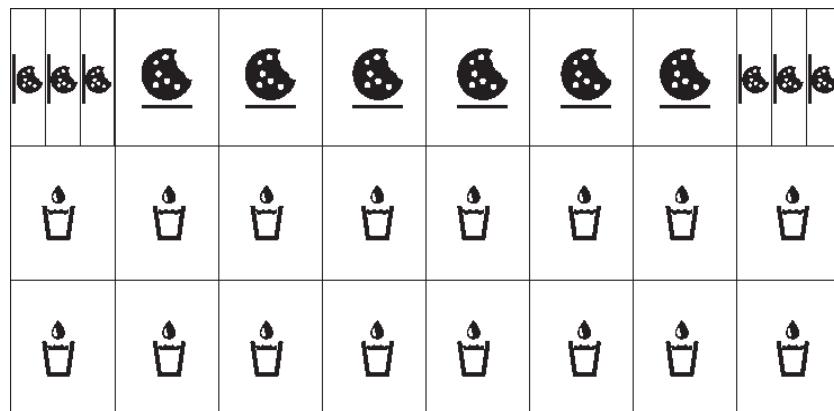


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

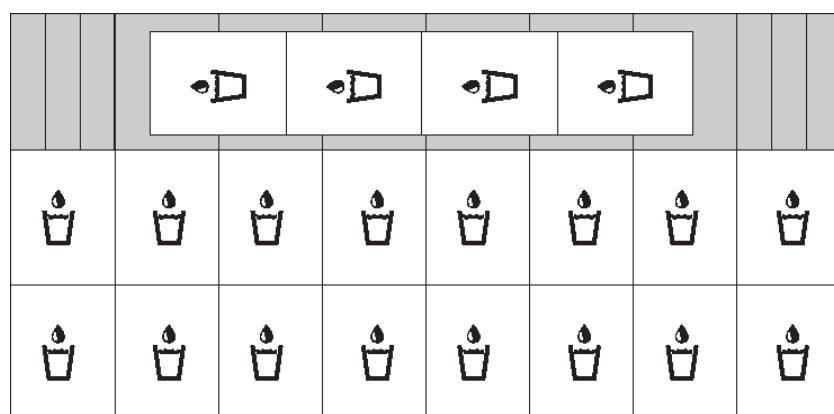
FIGURE 718
**Contents of SOLAS A-Pack, Pack 2: food and water for 10 Person in a
 1050 mm valise (N-Series Low Profile container)**

12 Person

Layer 1



Layer 2

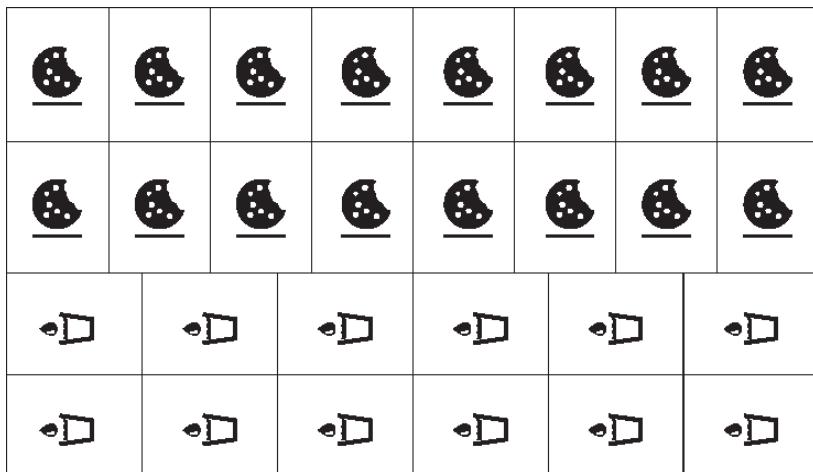


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

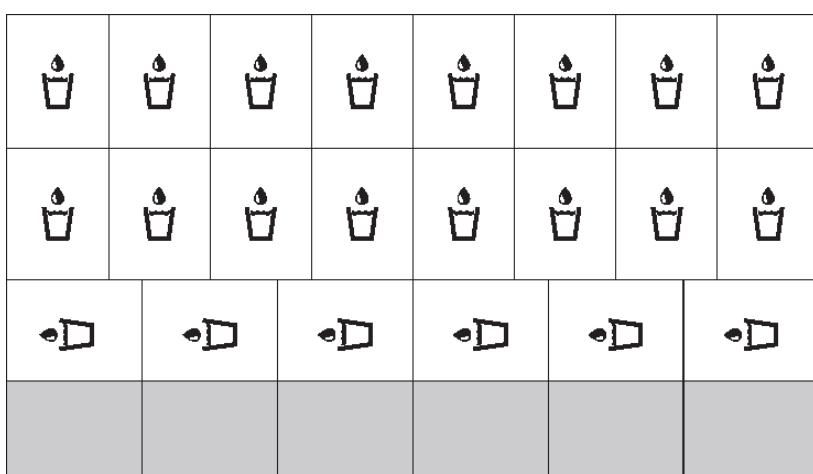
FIGURE 719
**Contents of SOLAS A-Pack, Pack 2: food and water for 12 Person in a
 1050 mm valise (N-Series Low Profile container)**

16 Person

Layer 1



Layer 2

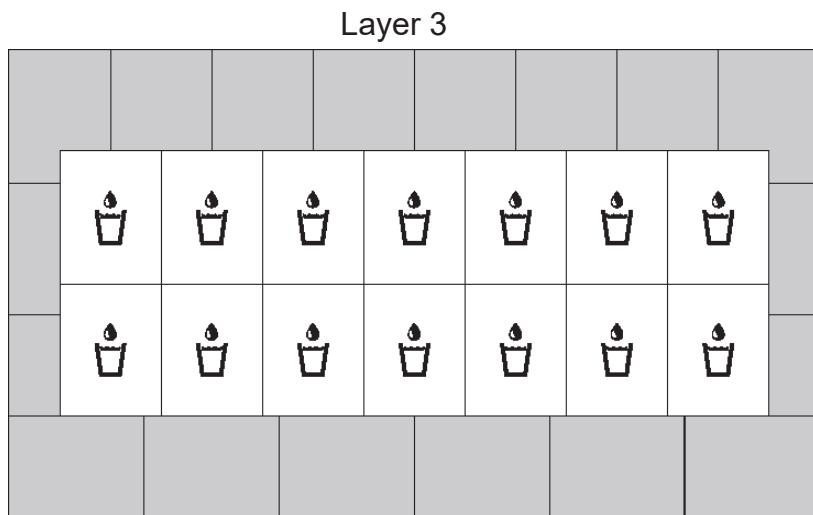


Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

FIGURE 720A

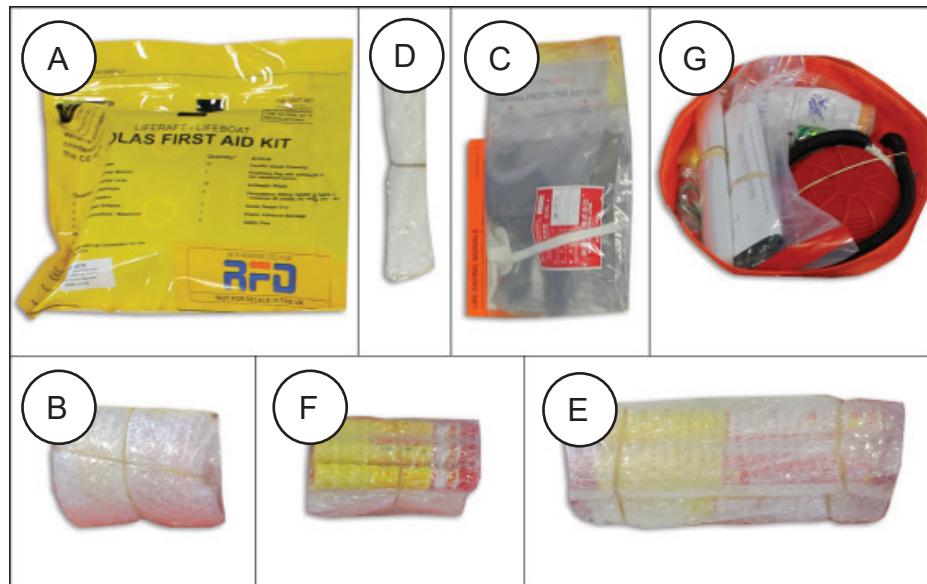
Contents of SOLAS A-Pack, Pack 2: food and water for 16 Person in a 1050 mm valise (N-Series Low Profile container)

16 Person



Item	Description
	Food ration (upright)
	Food ration (flat)
	Water sachet

FIGURE 720B
**Contents of SOLAS A-Pack, Pack 2: food and water for 16 Person in a
 1050 mm valise (N-Series Low Profile container)**



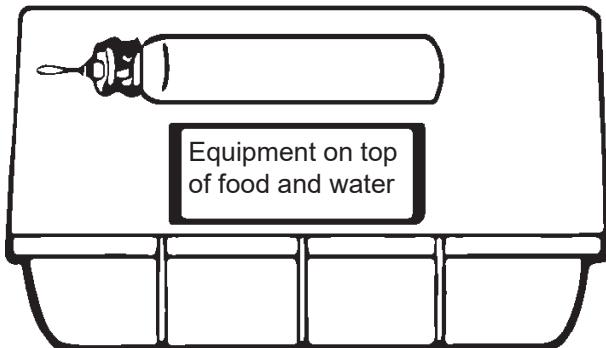
Item	Description
A	First Aid Kit
B	Lifesmoke
C	Radar reflector
	TPA
	Rescue signal table
D	Drogue
E	Parachute flares
F	Hand flares

Item	Description
G	Bailer
	Torch
	Whistle
	Repair kit
	Leak stoppers
	Knife
	PRV caps
	Heliograph
	Seasickness bags

FIGURE 721
Contents of SOLAS B-Pack, Pack 1: emergency equipment
800 mm valise (N-Series Low Profile container)

4-16 Person

SOLAS A-Pack position



SOLAS B-Pack position

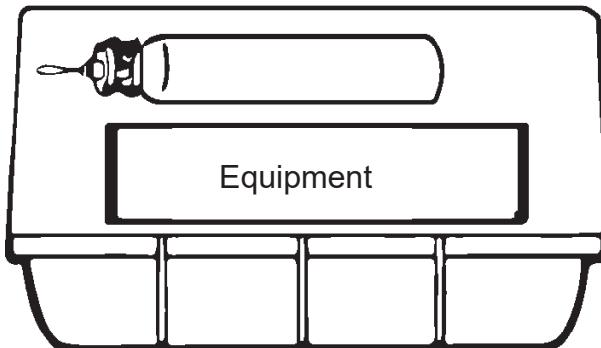
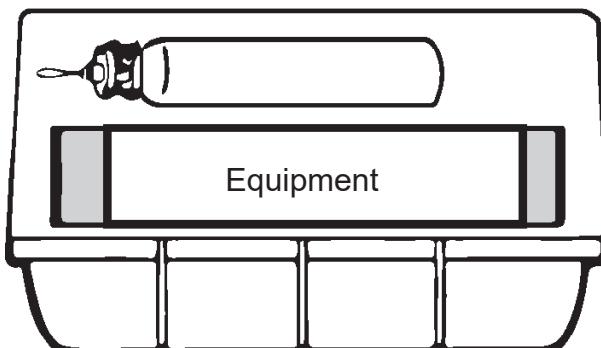
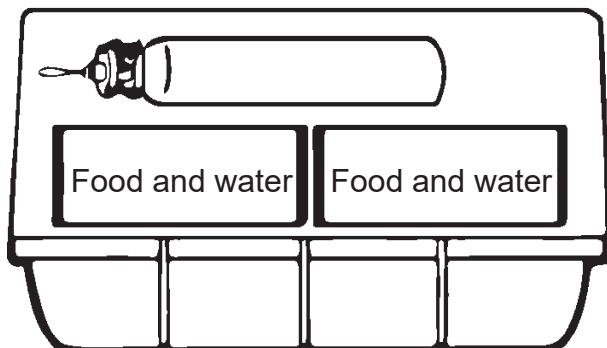


FIGURE 722A

Put the E-Pack valises into the N-Series Low Profile container (4-16 Person)

20 Person

SOLAS A-Pack position



SOLAS B-Pack position

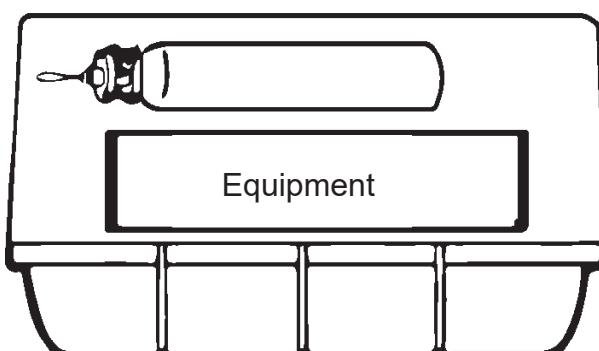


FIGURE 722B

Put the E-Pack valises into the N-Series Low Profile container (20 Person)

3.6 Do the steps that follow for a N-Series Xtrem container:

- 3.6.1 Put the liferaft into the corners of the container. Make sure that you use all of the space in the container.
- 3.6.2 Assemble the emergency pack:
 - (a) Put the survival aids in the emergency pack bag:
 - (i) Refer to **TABLE 703D** for the SOLAS A-Pack food and water quantities.
 - (ii) Refer to the images that follow for the specific configuration of the survival aids in the emergency pack bag.
 - (iii) Stow the items to form a flat pack of even thickness.
 - (b) Fold over the open end of the pack and seal it along its entire length with 100 mm self-adhesive tape.

6 Person

Layer 1



Layer 2



FIGURE 723
Contents of SOLAS A-Pack, Pack 2: food and water for 6 Person in an
1247 mm valise (N-Series Xtrem container)

8 Person

Layer 1



Layer 2



FIGURE 724
Contents of SOLAS A-Pack, Pack 2: food and water for 8 Person in an
1247 mm valise (N-Series Xtrem container)

10 Person

Layer 1



Layer 2



FIGURE 725A

Contents of SOLAS A-Pack, Pack 2: food and water for 10 Person in a
1247 mm valise (N-Series Xtrem container)

10 Person

Layer 3

**FIGURE 725B**

Contents of SOLAS A-Pack, Pack 2: food and water for 10 Person in a 1247 mm valise (N-Series Xtrem container)

12 Person

Layer 1



Layer 2


FIGURE 726A

Contents of SOLAS A-Pack, Pack 2: food and water for 12 Person in a 1247 mm valise (N-Series Xtrem container)

12 Person

Layer 3

**FIGURE 726B**

Contents of SOLAS A-Pack, Pack 2: food and water for 12 Person in a 1247 mm valise (N-Series Xtrem container)

16 Person

Layer 1



Layer 2



FIGURE 727A
Contents of SOLAS A-Pack, Pack 2: food and water for 16 Person in a
1247 mm valise (N-Series Xtrem container)

16 Person

Layer 3

**FIGURE 727B**

Contents of SOLAS A-Pack, Pack 2: food and water for 16 Person in a 1247 mm valise (N-Series Xtrem container)

3.6.3 Insert the emergency pack. Refer to **Figure 728**:

(a) Make space inside the liferaft that is in the container base.

(b) Put the emergency pack inside the liferaft.

NOTE: Make sure to push the emergency pack flat against the container bottom

(c) Use a vacuum to remove any excess air from the emergency pack.



FIGURE 728
Insert the emergency pack

3.6.4 Assemble the equipment bag pack:

- (a) Put the survival aids in the equipment bag:
 - (i) Refer to TABLE 703BB for SOLAS A-Pack emergency equipment quantities.
 - (ii) Refer to Figure 729 or the specific configuration of the survival aids in the equipment bag.
 - (iii) Stow the items to form a flat pack of even thickness.
- (b) Fold over the open end of the pack and seal it along its entire length with 100 mm self-adhesive tape.

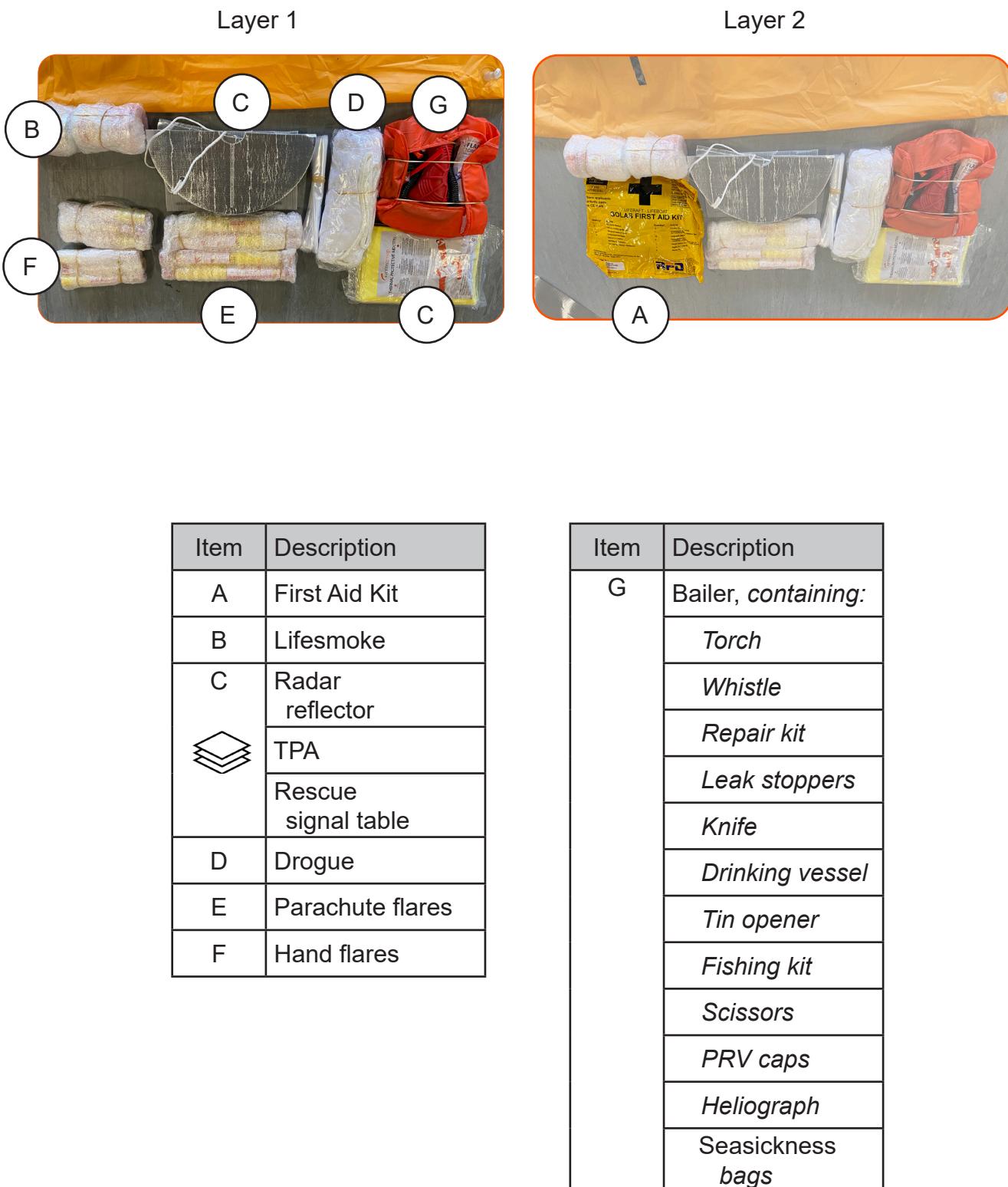


FIGURE 729
Contents of SOLAS A-Pack, Pack 1: emergency equipment
1150 mm valise (N-Series Xtrem container)

3.6.5 Insert the equipment bag and paddles. Refer to **Figure 730**:

- (a) Put the equipment bag inside the liferaft on top of the emergency pack.

NOTE: Make sure the equipment bag is below the lower container boundary

- (b) Use a vacuum to remove any excess air from the equipment bag.
- (c) Put the paddles inside the liferaft alongside the equipment bag.

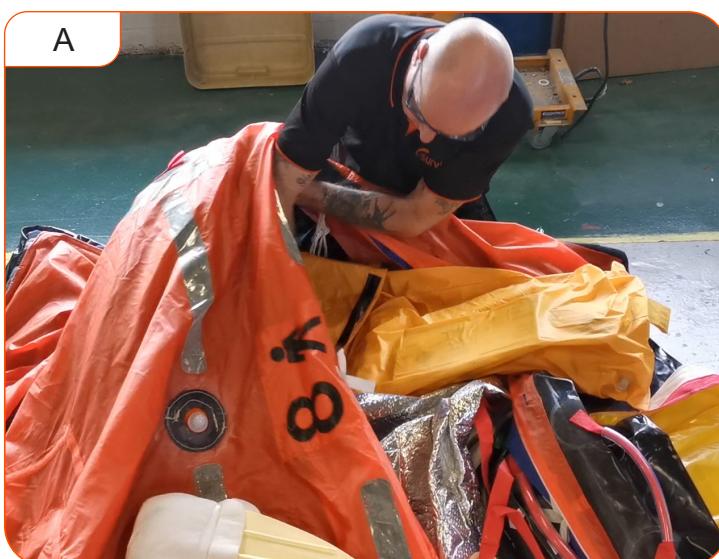


FIGURE 730
Insert the equipment bag and paddles

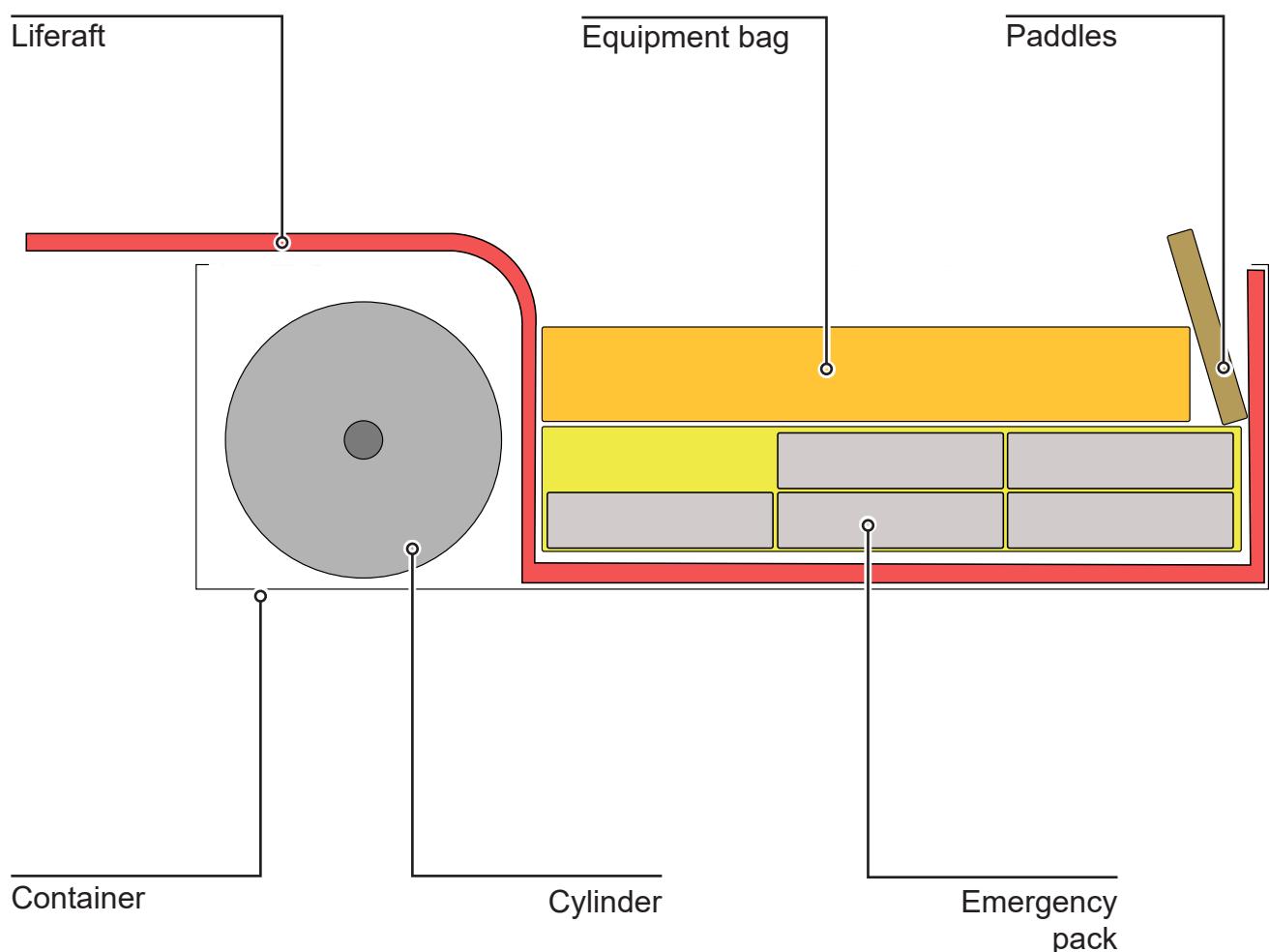
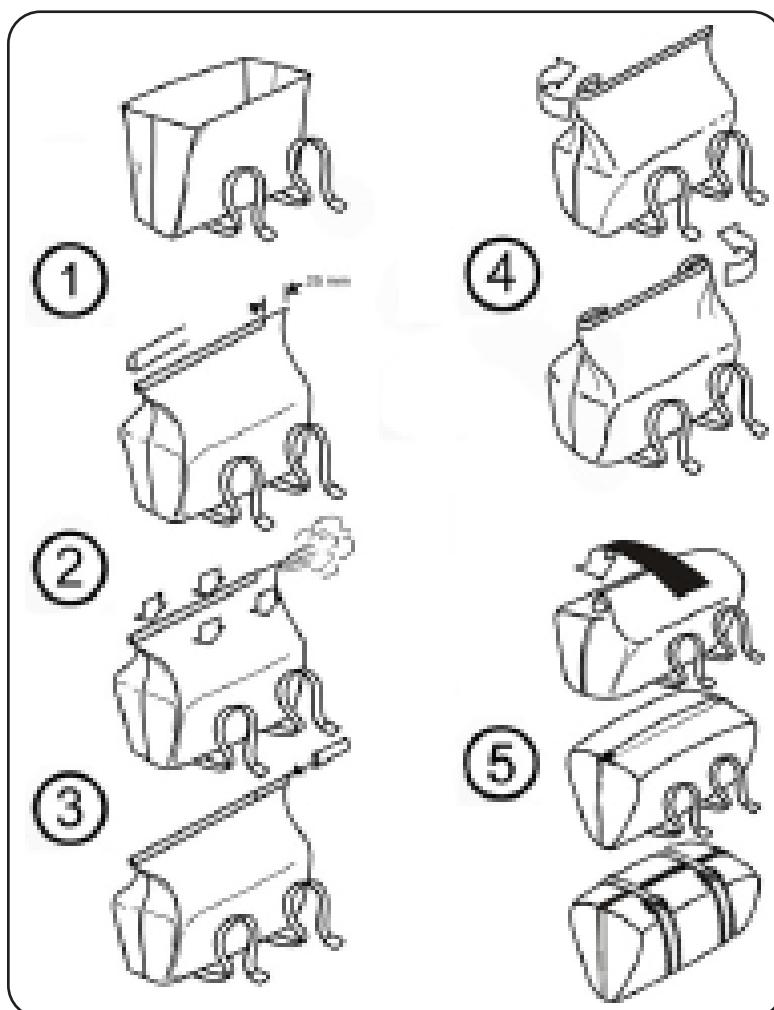


FIGURE 732
Layout of cylinder, emergency pack, equipment bag and paddles
(Xtrem containers SOLAS A-Pack)

| 4. Sealing the valise (FIGURE 733)

- 4.1 Fold a length of 50 mm wide adhesive tape over the top opening of the valise leaving a 25 mm gap at one end.
- 4.2 Insert a vacuum line and remove the air from the valise.
- 4.3 Withdraw the line and quickly seal the open part with tape.
- 4.4 Fold the 'flaps' at the top of the valise inwards and down. Secure these with 50 mm wide adhesive tape.
- 4.5 Roll down the excess valise tightly.
- 4.6 Attach the buckle straps together. Tie the flying ends together using a reef knot.

**| FIGURE 733
Sealing the valise**

5. Extra protective foam - Drop height 18 metres - 36 metres

- 5.1 For liferafts with drop heights above 18 metres and below 36 metres, extra protective foam is added as follows;

Protective foam is used to protect E-packs that are in direct contact with the cylinder. Refer to **Figure 734-737**.

Please refer to TABLE 706 for part numbers and quantities.

5.1.1 Protective foam around No.1 E-pack valise

NOTE: Use protective foam 1 for 10-25 person throwover and 12-25 person Davit-launch where a SOLAS "A-pack" E-pack is used.

Protective foam 1, is to be fitted as per **Figure 734**. The purpose of protective foam 1, is to protect the No.1 E-pack contents from both the liferaft inflation valves and the gas cylinder.

Protective foam 1 is to be fitted after the cylinder is positioned in the container and just prior to fitting the No.1 E-pack.

5.1.2 Protective foam around No.1 E-pack valise

NOTE: Use protective foam 2 and 3 for 4-8 person liferafts where a SOLAS "A-pack" E-pack is used

Protective foam 2 and protective foam 3 are to be fitted as per **Figure 735**. The purpose of protective foam 2 and protective foam 3 is to protect the No.1 E-pack contents from both the liferaft gas cylinder and the inflation valves respectively.

Protective foam 2, is to be fitted after the cylinder is positioned in the container and just prior to fitting the No.1 E-pack.

Protective foam 3, is to be fitted just after fitting the No.1 E-pack.

5.1.3 Protective foam between the cylinder end and E-pack rations

NOTE: Use protective foam 4 for all liferafts where a SOLAS "A-pack" E-pack is used.

Protective foam 4 is to be fitted as per **Figure 737**.

The purpose of protective foam 4 is to protect the E-pack rations from the end of the liferaft gas cylinder.

Protective foam 4, is to be fitted after the cylinder is positioned in the container, just prior to fitting the E-pack.

MK 10 Container E-pack protective foam specific to SOLAS A-pack											
Part number	Description	Dimensions (mm)	Liferaft size	4	6	8	10	12	16	20	25
50152002	Protection foam 1	750 × 500 × 25	Quantity	—			1	1	1	1	1
		30" × 20" × 1"		—			—	—	—	—	—
50152003	Protection foam 2	500 × 250 × 25	Quantity	1	1	1	—				
		20" × 10" × 1"		—			—				
50152004	Protection foam 3	175 × 175 × 25	Quantity	1	1	1	—				
		7" × 7" × 1"		—			—				
50152001	Protection foam 4	150 × 150 × 25	Quantity	1	1	1	1	1	1	1	1
		6" × 6" × 1"		—			—	—	—	—	—

MK 14 Container E-pack protective foam specific to SOLAS A-pack											
Part number	Description	Dimensions (mm)	Liferaft size	4	6	8	10	12	16	20	25
50152002	Protection foam 1	750 × 500 × 25	Quantity	—			1	1	1	1	1
		30" × 20" × 1"		—			—	—	—	—	—
50152003	Protection foam 2	500 × 250 × 25	Quantity	1	1	1	—				
		20" × 10" × 1"		—			—				
50152004	Protection foam 3	175 × 175 × 25	Quantity	1	1	1	—				
		7" × 7" × 1"		—			—				
50152006	Protection foam 6	350 × 150 × 25	Quantity	1	1	1	1	1	2	2	2
		14" × 6" × 1"		—			—	—	—	—	—

MK 10 and MK 14 Container E-pack protective foam specific to SOLAS B-pack											
Part number	Description	Dimensions (mm)	Liferaft size	4	6	8	10	12	16	20	25
50152002	Protection foam 1	750 x 500 x 25	Quantity	1	1	1	1	1	1	1	1
		30" x 20" x 1"		—			—	—	—	—	—

TABLE 706
Protective foam for E-packs

Make sure that the inboard side of the liferaft inflation valves (through the buoyancy fabric) do not contact the number 1 valise. Inlet valves must rest against protective foam 1.

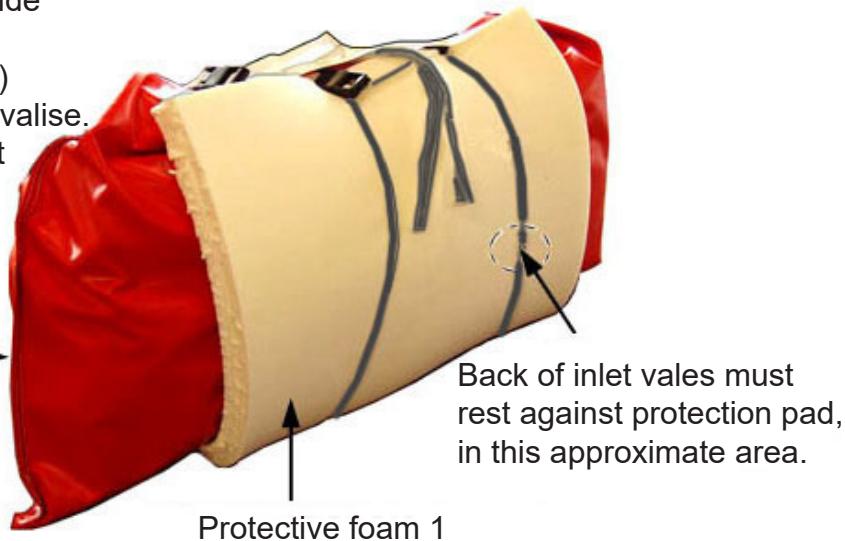


FIGURE 734
Assembled view of protective foam for SOLAS A-pack only.
(Liferaft sizes 10-25 Person Throwover, and 12-25 Person Davit-Launch)

Make sure that the inboard side of the liferaft inflation valves (through the buoyancy fabric) do not contact the number 1 valise. Inlet valves must rest against protective foam 3.

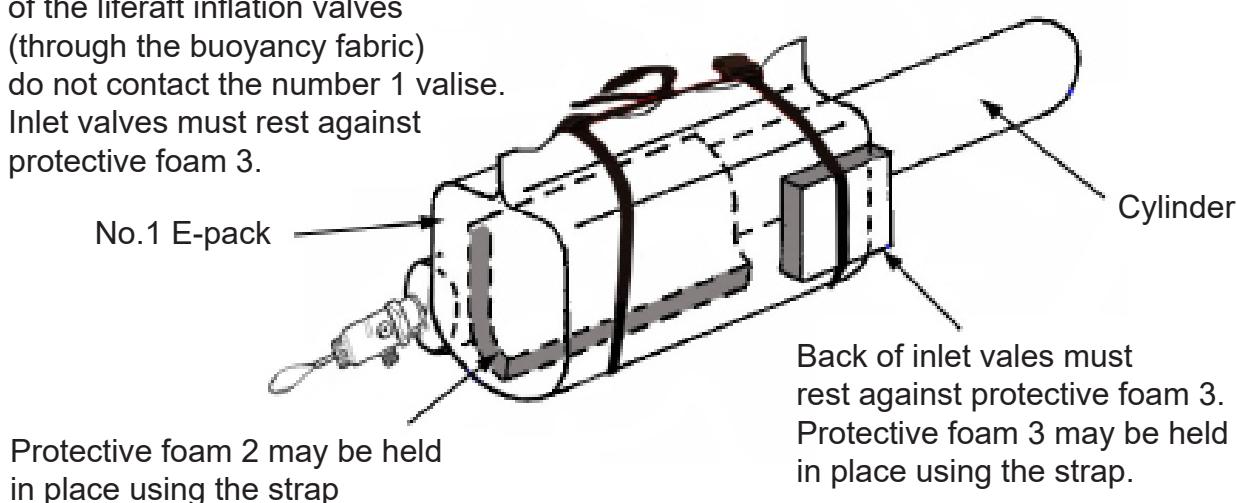


FIGURE 735
Assembled view of protective foam for SOLAS A-pack only.
(Liferaft sizes 4-8 Person Throwover)



FIGURE 736
Assembled view of protective foam for MK 14, SOLAS A-pack only.
(All liferaft sizes)

Protective foam 4 is held in place using the E-pack strap.
Position overhanging cylinder end so that emergency valise is protected from end of cylinder

Note: Protective foam 4 is not attached to cylinder.
E-pack has been omitted for clarity

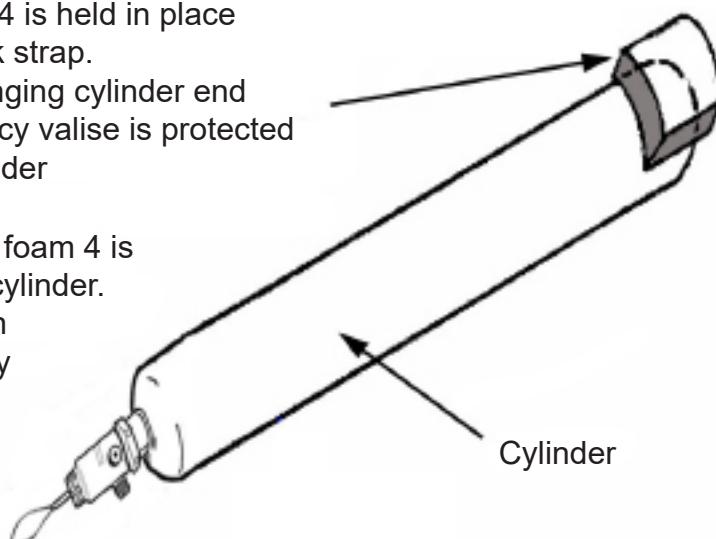


FIGURE 737
Assembled view of protective foam for MK 10, SOLAS A-pack only.
(All liferaft sizes)

5.1.4 Protective foam around water E-pack valise

NOTE: Use protective foam 6 for all MK 14 container person liferafts where a SOLAS "A-pack" E-pack is used.

Protective foam 6 is to be fitted as per **Figure 736**.

The purpose of protective foam 6 is to protect the No.1 E-pack contents from both the liferaft gas cylinder and the inflation valves respectively.

Protective foam 6, is to be fitted just after fitting the E-pack.

5.1.5 Protection around No.1 E-pack valise

NOTE: Use protective foam 1 for all liferafts where a SOLAS "B-pack" E-pack is used.

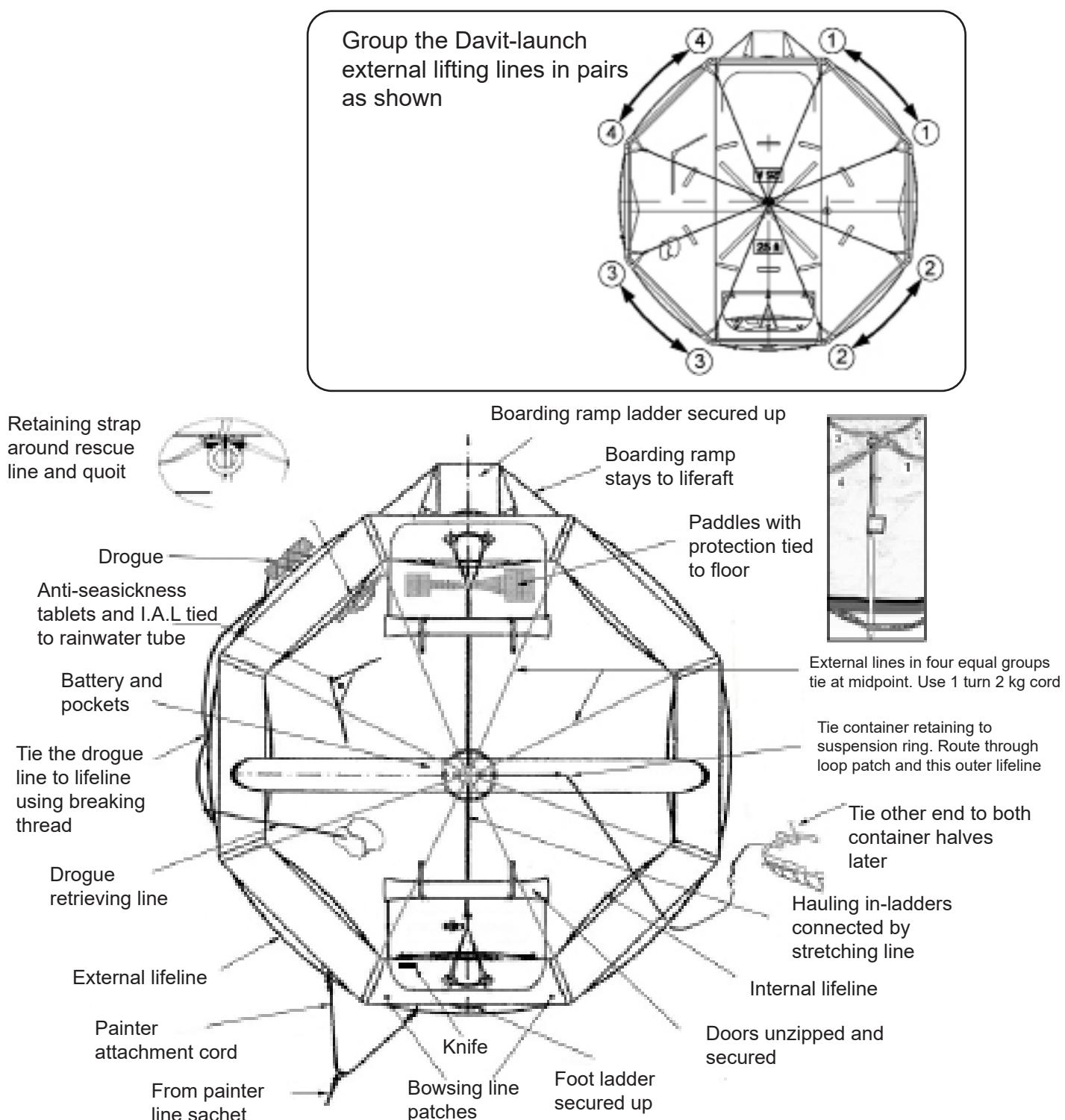
Protective foam 1 is to be fitted as per **Figure 734**.

The purpose of protective foam 1 is to protect the No.1 E-pack contents from both the liferaft gas cylinder and the inflation valves respectively.

CHAPTER 8

ASSEMBLY

Section	Title	Page
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7	Heat-shrink sleeve	897
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10	Container labelling	898.87



NOTE: The picture illustrated is 25 Person DL liferaft. Layout will be similar for all other (12-25) DL rafts.

FIGURE 801A
Preparation for packing assembly of Davit-launch

1. General

- 1.1 The paragraphs of this chapter 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 Refer to Chapter 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS 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 Chapter 11, ILLUSTRATED PARTS LIST and Chapter 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS, 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 25 mm wide PVC self adhesive (SA) tape, unless stated otherwise. The ends of cords are to be heat sealed and taped to prevent fraying.
- 1.6 Make sure that during unpacking, preparation and repacking of the liferaft no moisture is introduced to the liferaft.
- 1.7 The liferaft must be completely dry before packing.

2. Preparation of the liferaft

For each liferaft, carry out the following operations; Refer to FIGURE 801A for Davit-launch or refer to FIGURE 841 and FIGURE 842 for Throwover:

- 2.1 Fit adaptors and valved sockets (female couplings) to the inflate/deflate valves.
- 2.2 Fit a plug tail (male coupling) to a low pressure air line and to the manometer supply 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 make sure that the correct fitting and rigging of the equipment and to make sure that the liferaft is the right shape for packing after deflation.

- 2.3 Install the knife. Refer to FIGURE 801B.
 - 2.3.1 Make sure that the knife is attached to the knife pocket by its lanyard.
 - 2.3.2 Wind the lanyard around the handle of the knife.
 - 2.3.3 Put the knife into the pocket.
 - 2.3.4 Fold the studded flap over the handle of the knife.
 - 2.3.5 Fold the opposite flap over the handle of the knife and push the stud through its hole.
 - 2.3.6 Fold the top flap over the handle of the knife and push the stud through its hole.
 - 2.3.7 Make sure that the three flaps are closed correctly.
- 2.4 Using 23 kgf (50lbf) cord, tie the paddles together at each end, with protective foam (FIGURE 802 Detail A) and tie them to the internal lifeline (FIGURE 801A).

If there is a radar reflector fitted, secure any mast along with the paddles. Tie the paddles and radar reflector mast independently to the internal lifeline. Refer to FIGURE 802 Detail A.

If using a Flat-Pack container, tie the paddles opposite to each other. Refer to FIGURE 802 Detail B.

- 2.5 Put the anti-seasickness tablets in their labelled bag. Tie them to the rain-water tube, using 23 kgf (50 lbf) cord. Refer to FIGURE 801A.
- 2.6 Tie the immediate action leaflet to the rain-water tube using 23 kgf (50 lbf) cord. Refer to FIGURE 801A.

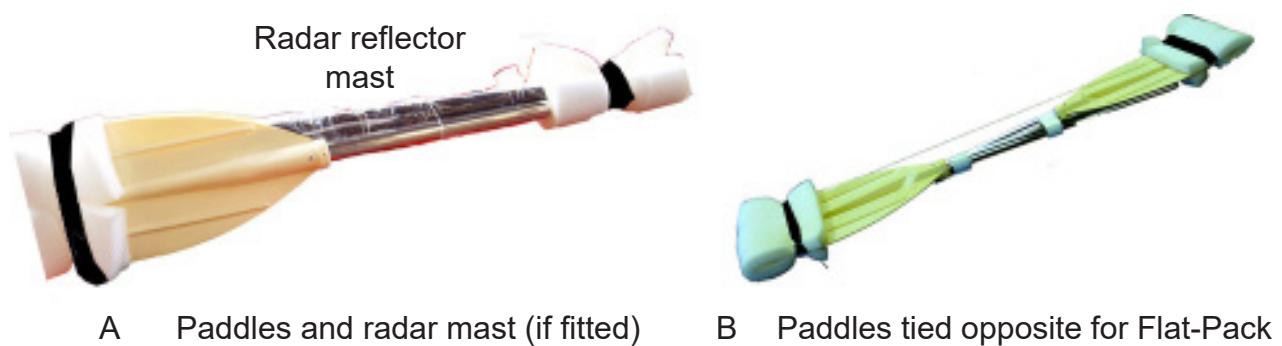
NOTE:

Make sure that the immediate action leaflet is the latest issue, refer to Chapter 7, E-PACKS AND EQUIPMENT, Chapter 11, ILLUSTRATED PARTS LIST, and Appendix 1, MARINE EQUIPMENT DIRECTIVE for details.

- 2.7 Fit the rubber plug to the rain-water catchment tube. Refer to FIGURE 801A.



FIGURE 801B
Fold and close the flaps of the pocket knife



A Paddles and radar mast (if fitted) B Paddles tied opposite for Flat-Pack

FIGURE 802
Paddles tied and padded

2.8 Install the RL5 lighting system (if applicable)

2.8.1 External lamp unit

- (a) This operation is best performed with the arch tube deflated.
- (b) Open the velcro fastener on the top patch. Refer to FIGURE 803.
- (c) From outside the liferaft, pass the connector and all of the cable from the external lamp unit through the open velcro fastener into the hole on the patch on the top of the liferaft. Refer to FIGURE 803.
- (d) Slide the external lamp unit into the patch. Refer to FIGURE 804A.
- (e) Close the velcro fastener to secure the external lamp unit in position. Refer to FIGURE 804B.



FIGURE 803
Top patch assembly



(a) External lamp unit partially installed

(b) External lamp unit fully installed

FIGURE 804
External lamp installation

2.8.2 Installing the internal RL5 lamp unit

The RL5 internal lamp is inserted into the existing retaining patch on the bottom centreline of the arch tube, inside the liferaft.

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 BATTERY ARE FLAMMABLE. REFER TO THE MANUFACTURER'S DATASHEET.

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 DATASHEET.

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.

- (a) Remove the protective cup and disc from the external lamp connector.
- (b) Attach the switch activator as shown in FIGURE 805. Make sure that the 'O' ring is seated correctly.
- (c) Locate the internal lamp retaining patch located on the bottom centreline of the arch tube, inside the liferaft.
Refer to FIGURE 806.

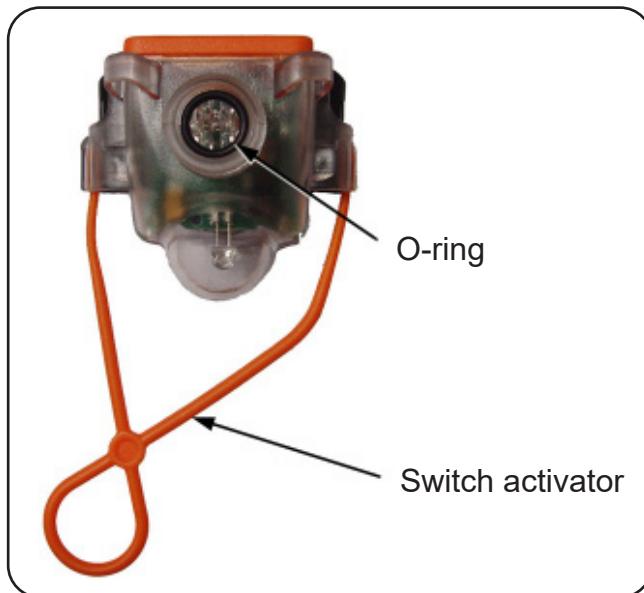


FIGURE 805
Internal lamp installation

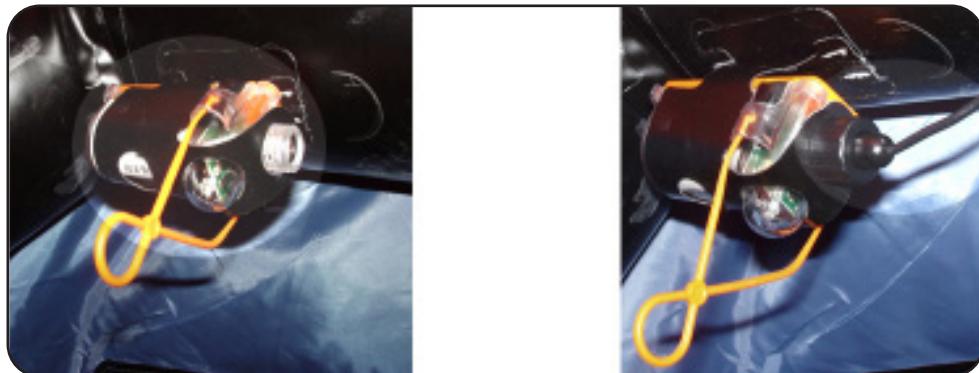
- (d) Put the internal lamp unit into the patch and secure. Refer to FIGURE 807A detail A.
- (e) Attach the connector for the external lamp unit. Refer to FIGURE 807A detail B.
- (f) Hold the internal lamp unit in place against the arch tube.
- (g) Use one length of tape to attach the internal lamp unit to the arch tube. The tape must be positioned lengthwise around the arch tube with the lamp unit at its midpoint and 25 mm from the orange switch activator. Refer to FIGURE 807B.
- (h) Apply the second length of tape to overlap the first tape by 50 mm. Carefully attach it to fully cover the end of the lamp unit and the gap.

CAUTION: MAKE SURE THAT THE TAPE DOES NOT COVER THE INTERNAL LAMP UNIT.

- (i) Locate the appropriate length of battery activation line Please refer to Chapter 1, TABLE 102.
- (j) Tie one end to the switch activator. Use a bowline knot, and tape the flying end.
- (k) Tie the remaining end to the floor patch, directly below. Use a bowline knot, and tape the flying end.



FIGURE 806
Internal lamp unit retaining patch



(a) Secure the internal lamp unit (b) Connecting the cable from the external lamp unit.

FIGURE 807A
Internal lamp unit assembly

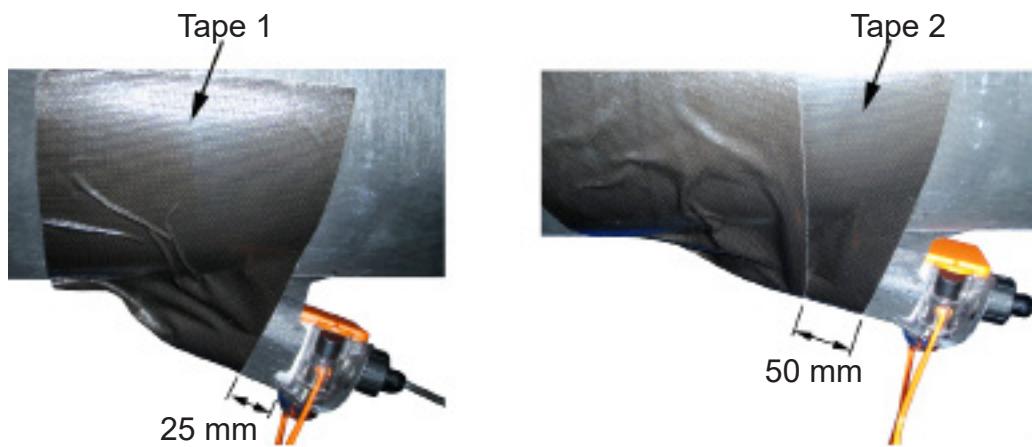


FIGURE 807B
Apply tapes

2.9 Install the RL6 lighting system

Do the step that follows for 4, 6 and 8 person liferafts with internal lamp mounting patch attached to the inside of the canopy:
For all other liferafts see step 2.13.

2.10 Install the RL6 external lamp.

CAUTION: YOU MUST REPLACE THE RL6 EXTERNAL LAMP IF THE CABLE PLUG CONNECTION PINS ARE DAMAGED.

- 2.10.1 Examine the cable plug connection pins for damage.
Refer to **FIGURE 807B-1 (i)**

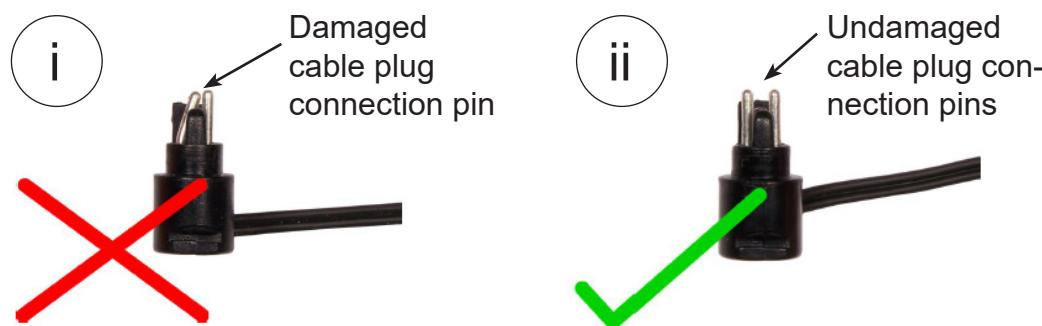


FIGURE 807B-1
Check the cable plug connection pins on the RL6 external lamp

2.10.2 Installing the RL6 internal Lamp unit

2.10.3 Deflate the arch tube.

2.10.4 Find the lamp mounting patch for the RL6 external lamp. Refer to **FIGURE 807B-2**

2.10.5 Pull the top fabric to open the RL6 external lamp mounting patch. Refer to **FIGURE 807B-3**.

2.10.6 Put the plug and cable of the RL6 external lamp through the top and bottom fabric and then through the hole of the RL6 external lamp mounting patch. Refer to **FIGURE 807B-3**.

2.10.7 Install the RL6 external lamp into the RL6 external lamp mounting patch. Make sure that the RL6 external lamp points away from the liferaft. Refer to **FIGURE 807B-4**.

2.10.8 Carefully attach the top fabric to the bottom fabric to seal the RL6 external lamp mounting patch. Refer to **FIGURE 807B-4**.

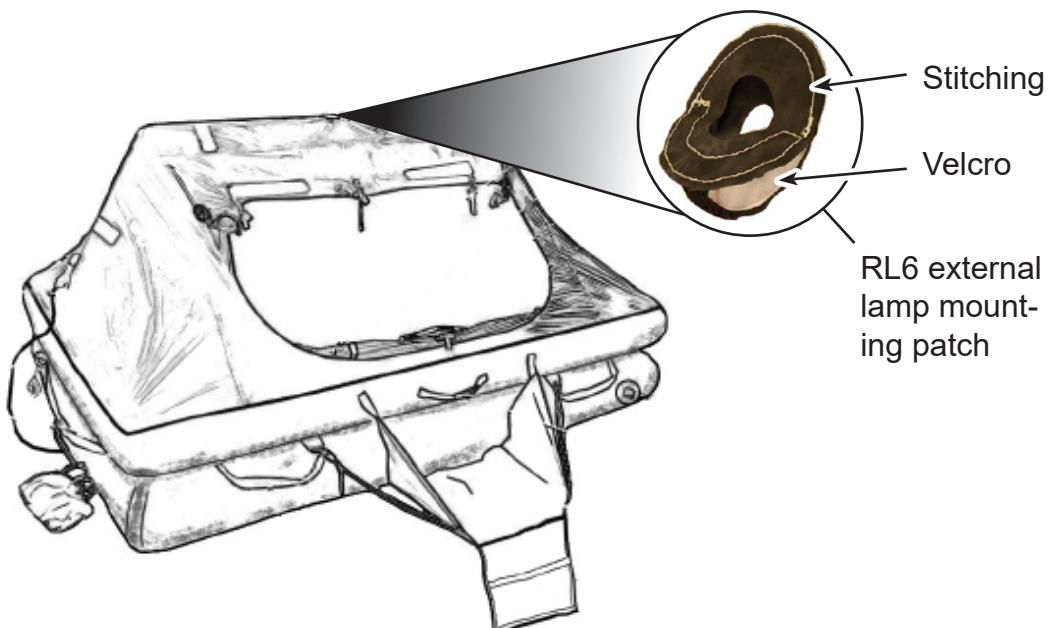


FIGURE 807B-2
Location of RL6 external lamp mounting patch

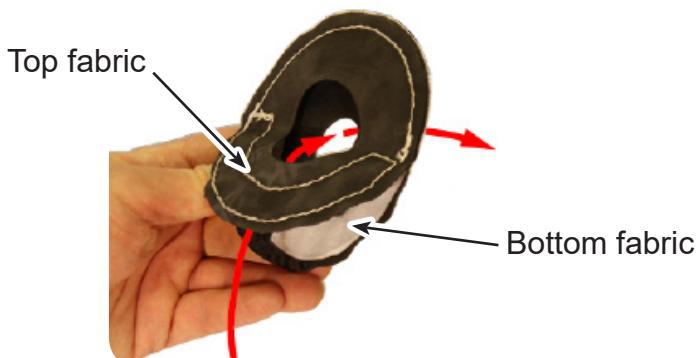


FIGURE 807B-3
Put the plug and cable through the hole



FIGURE 807B-4
Install the RL6 external lamp

2.11 Install the RL6 internal lamp and battery unit. Refer to **Figure 807B-1 (ii).**

2.11.1 Find the RL6 internal lamp mounting patch on the inside of the canopy opposite the entrance of the liferaft. Refer to **FIGURE 807B-5.**

NOTE: The RL6 internal lamp mounting patch has four velcro straps to hold the RL6 internal lamp and battery unit in position

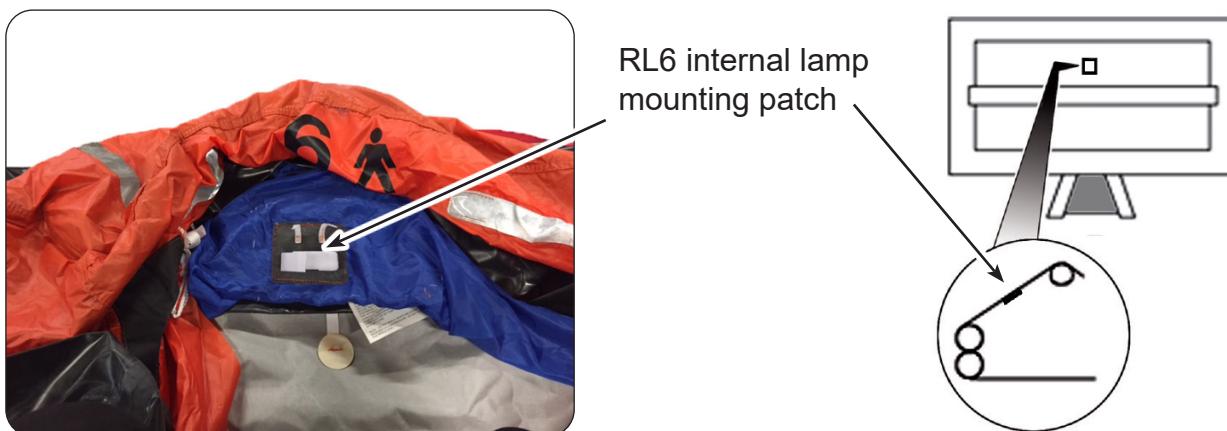


FIGURE 807B-5
Location of RL6 internal lamp mounting patch

2.11.2 Open the velcro straps and put the RL6 internal lamp and battery unit on the mounting patch. Make sure the RL6 internal lamp and battery unit points up. Refer to **FIGURE 807B-6.**

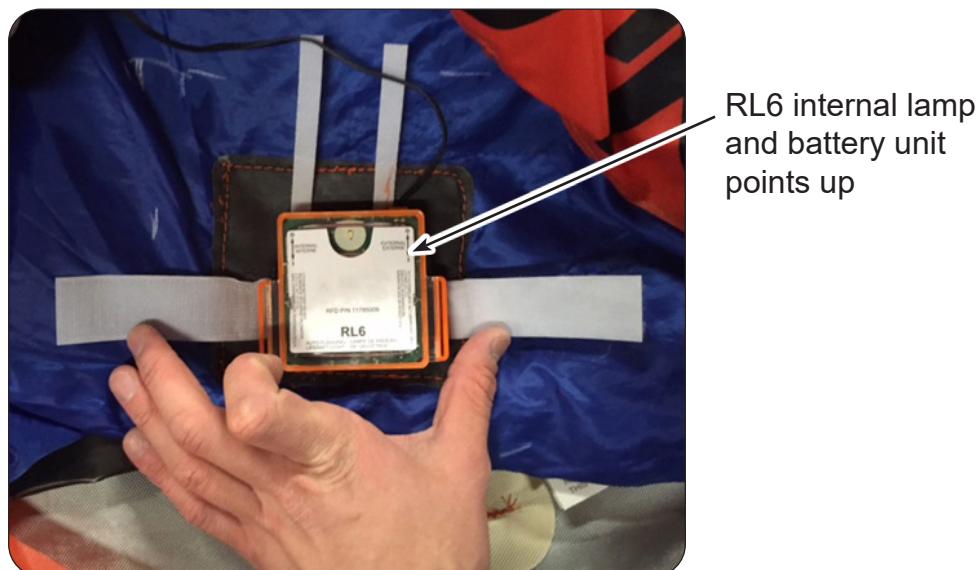


FIGURE 807B-6
Put the RL6 internal lamp on the mounting patch

- 2.11.3 Attach the RL6 internal lamp and battery unit to the mounting patch. Refer to **FIGURE 807B-7**.
- 2.11.3.12 Put the left horizontal velcro strap through slot 1. Refer to **FIGURE 807B-7 (i)**.
- 2.11.3.13 Put the right horizontal velcro strap through slot 2. Refer to **FIGURE 807B-7 (ii)**.
- 2.11.3.14 Fold the right horizontal velcro strap over and hold in place. Refer to **FIGURE 807B-7 (iii)**.
- 2.11.3.15 Fold the two narrow vertical velcro straps down to attach to the right horizontal velcro strap. Refer to **FIGURE 807B-7 (iv)**.
- 2.11.3.16 Fold the left horizontal velcro strap to attach to the right horizontal velcro strap. Refer to **FIGURE 807B-7 (v)**.

CAUTION: AFTER YOU CONNECT THE CABLE PLUG TO THE RL6 INTERNAL LAMP AND BATTERY UNIT, YOU CANNOT DISCONNECT THE PLUG. MAKE SURE THAT THE RL6 INTERNAL LAMP AND BATTERY UNIT IS CORRECTLY INSTALLED BEFORE YOU CONNECT THE PLUG.

- 2.11.4 Connect the cable plug of the RL6 external lamp to the plug socket of the RL6 internal lamp and battery unit. Refer to **FIGURE 807B-8**.
- 2.11.4.17 Make sure there is an O-ring around the plug socket. Refer to **FIGURE 807B-8(i)**.
- 2.11.4.18 Make sure that there is a cable plug hook on the cable plug connection. Refer to **FIGURE 807B-8 (ii)**.
- 2.11.4.19 Connect the cable plug to the plug socket. Make sure that the cable plug hook is under the cable retaining bar. Refer to **FIGURE 807B-8 (iii)**.

2.12 Make an activation line:

- 2.12.1 Use a measuring tape to measure 400 mm of 50 lbf cord.
- 2.12.2 Use scissors to cut the 50 lbf cord at 400 mm.
- 2.12.3 Use a bowline knot to tie one end of the 50 lbf cord to the tie-off patch on the bottom buoyancy. Refer to **FIGURE 807B-9 (i)**.
- 2.12.4 Use self-adhesive tape to tape the flying end of the cord.
- 2.12.5 Use a bowline knot to tie the other end of the 50 lbf cord to the loop on the activation toggle. Refer to **FIGURE 807B-9 (ii)**.

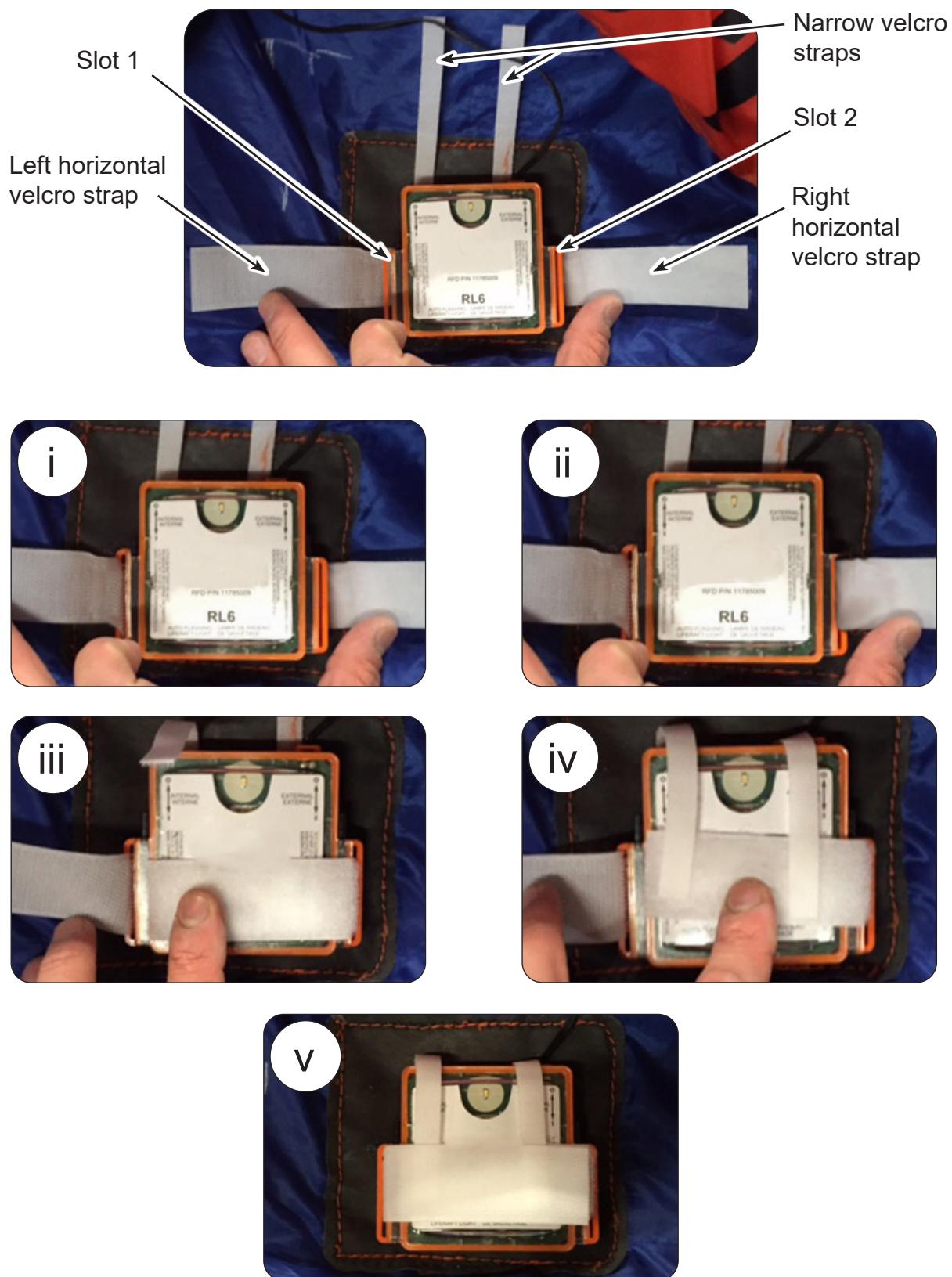


FIGURE 807B-7
Attach the RL6 internal lamp and battery unit to the mounting patch

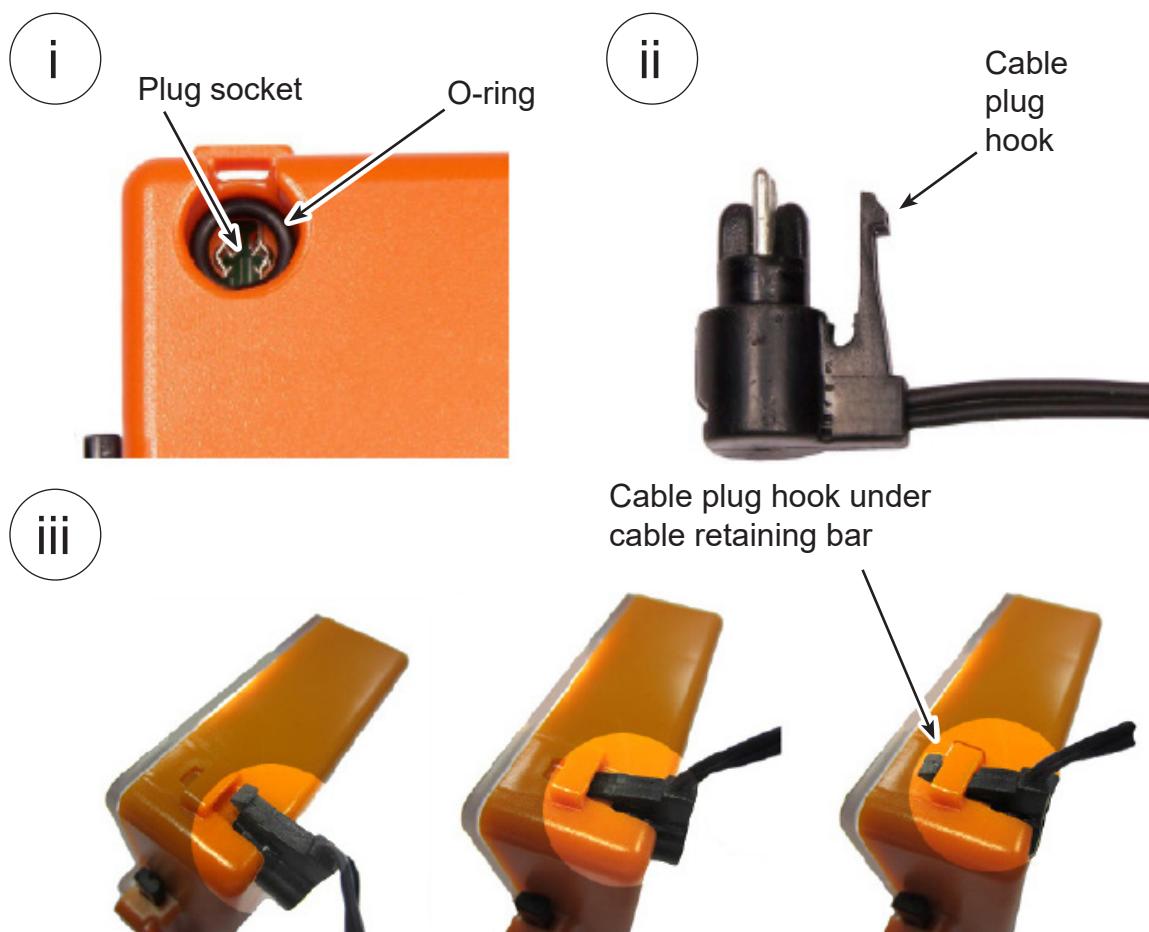


FIGURE 807B-8
Connect the cable plug to the plug socket

- 2.12.6 Use self-adhesive tape to tape the flying end of the cord.
- 2.12.7 Remove the activation toggle and make sure that the RL6 internal lamp and external lamp comes on.
- 2.12.8 Put the activation toggle into the RL6 internal lamp and battery unit. Make sure that both lamps goes off.

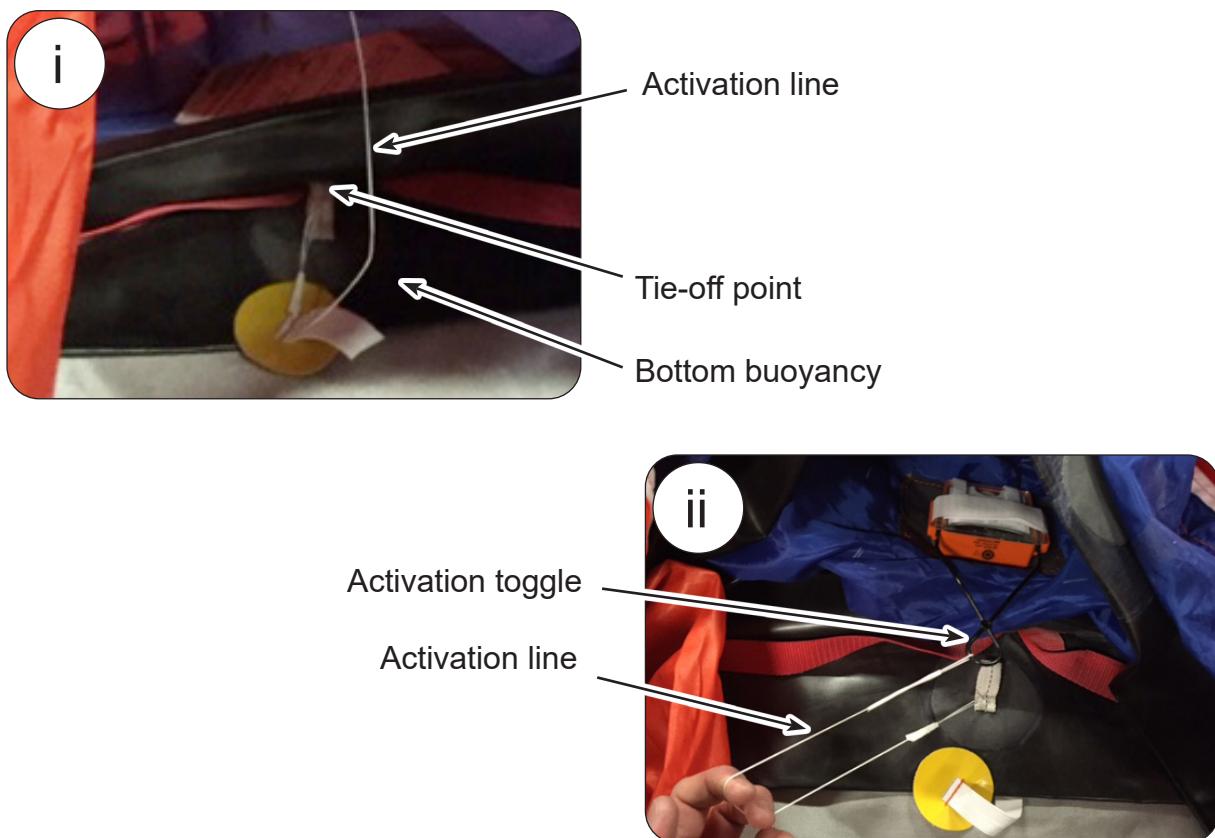


FIGURE 807B-9
Make an activation line

2.13 For all other liferafts do the steps that follow:

Install the RL6 external lamp.

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 BATTERY ARE FLAMMABLE. REFER TO THE MANUFACTURER'S DATA SHEET LISTED IN THE IPL (PSDS 017).

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 LISTED IN THE IPL (PSDS 017).

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 DATASHEET LISTED IN THE IPL (PSDS 017).

2.13.1 Install the external lamp unit:

NOTE: The step that follows is easier to do when the arch tube is deflated.

- (a) Locate the lamp mounting patch for the external lamp unit. Refer to FIGURE 808A. It is on the outside of the canopy, at the middle of the arch tube.

NOTE: The lamp mounting patch for the external lamp has a top and bottom fabric. These are connected by stitching on one half and by velcro on the other half. Refer to FIGURE 808B.

- (b) Pull the top/bottom fabric, to open the lamp mounting patch.
- (c) Get the internal lamp unit.
- (d) Insert the plug and cable between the top and bottom fabric. Refer to FIGURE 808B. Pull the plug through the hole in the bottom ring.
- (e) Fit the external lamp unit fully into the lamp mounting patch. Refer to FIGURE 808C.

NOTE: Make sure that the external lamp unit points away from the liferaft.



FIGURE 808A
External lamp mounting patch

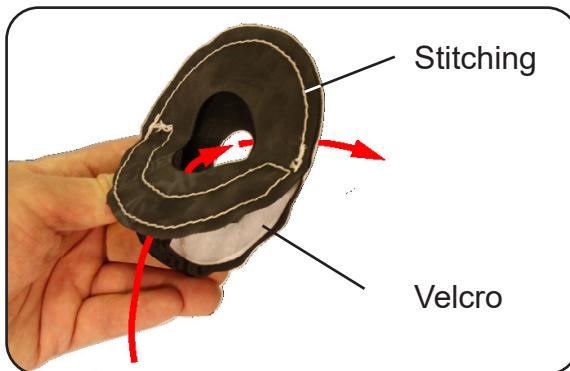


FIGURE 808B
Insert the plug and cable of the external lamp unit



FIGURE 808C
External lamp unit is fitted into the lamp mounting patch

- (f) Carefully push the top fabric down and around the external lamp to close the lamp mounting patch. Refer to FIGURE 808C.

2.13.2 Install the internal lamp unit

- (a) Locate the lamp mounting patch for the internal lamp unit.
 - (i) It is on the arch tube and inside the liferaft.
 - (ii) The lamp mounting patch for the external lamp has two wide velcro straps and two narrow velcro straps.
Refer to FIGURE 808D.
- (b) Hold the internal lamp unit so that the activation toggle points up and the label points towards you.
Refer to FIGURE 808D.
- (c) Put the internal lamp unit against the lamp mounting patch.
Refer to FIGURE 808E.
 - (i) Put the left wide velcro strap through the slot on the left side of the internal lamp unit.
 - (ii) Put the right wide strap through the slot on the right side of the internal lamp unit.
 - (iii) Fold the left wide velcro strap across the label.
 - (iv) Fold both of the narrow velcro straps over the left wide strap.
 - (v) Fold the right wide velcro strap across and over all straps.
This will hold the straps and internal lamp unit in place.

CAUTION: AFTER YOU CONNECT THE PLUG TO THE INTERNAL LAMP UNIT, YOU CANNOT DISCONNECT THE PLUG. MAKE SURE THAT THE INTERNAL LAMP UNIT IS CORRECTLY INSTALLED BEFORE YOU CONNECT THE PLUG.

CAUTION: MAKE SURE THE O-RING IS IN PLACE BEFORE INSERTING THE PLUG. REFER TO FIGURE 808F.

CAUTION: MAKE SURE THE PLUG CONNECTION PINS ARE NOT DAMAGED BEFORE INSERTING THE PLUG. REFER TO THE MANUFACTURER'S INSTRUCTIONS LISTED IN THE IPL (49-129).

- (d) Connect the cable plug to the internal lamp unit.

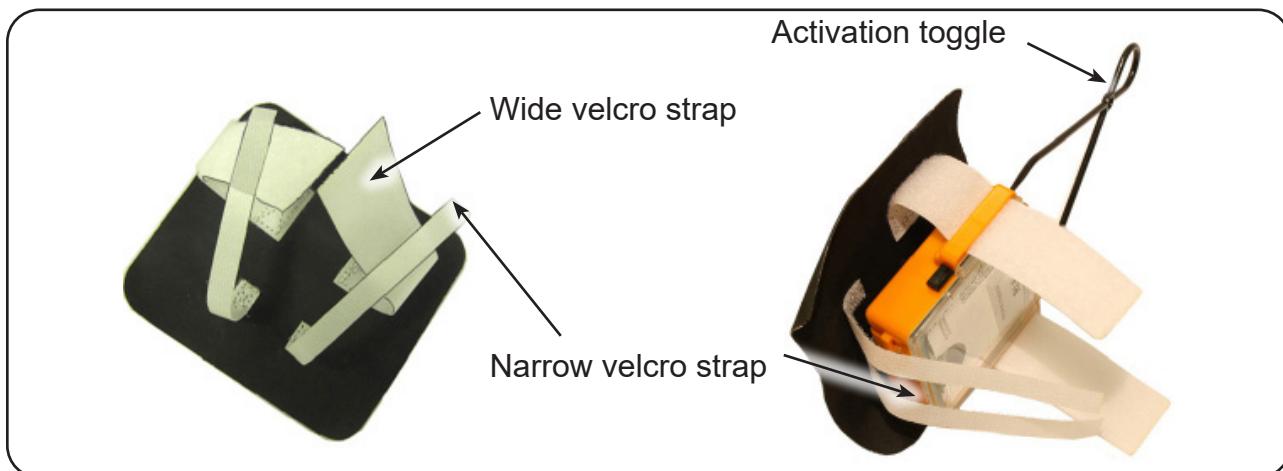


FIGURE 808D
Internal lamp mounting patch

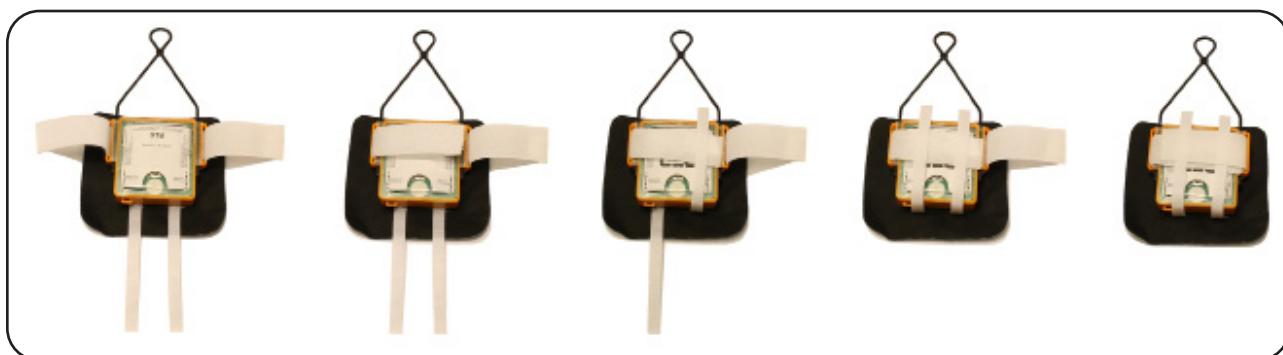


FIGURE 808E
Put the velcro straps across the internal lamp unit

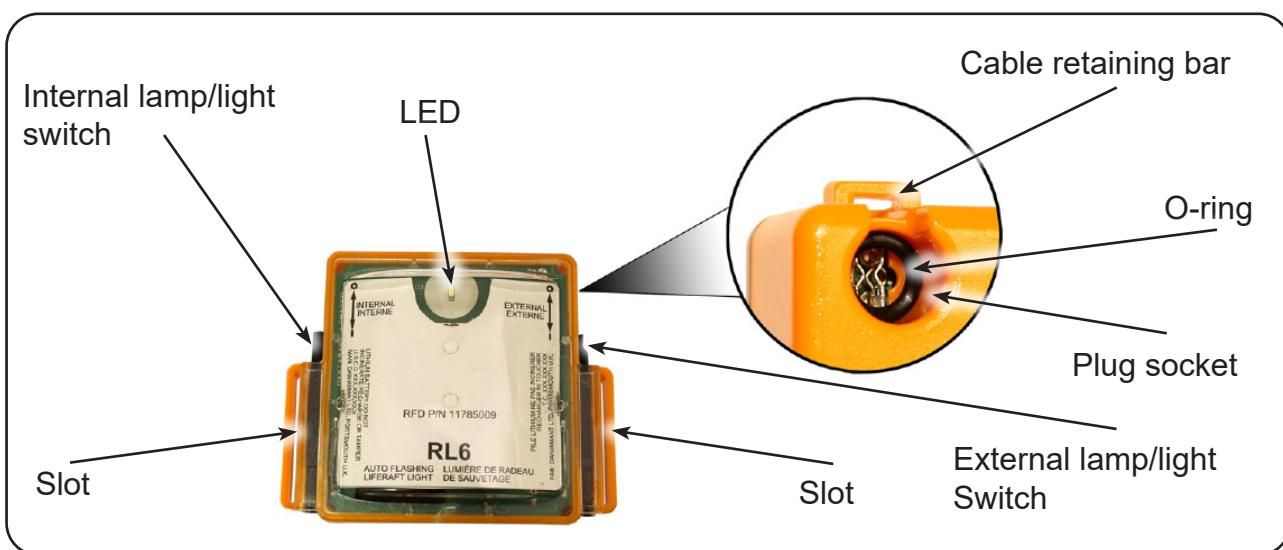


FIGURE 808F
RL6 internal lamp unit

WARNING: THE CABLE PLUG MUST BE INSERTED FULLY.
REFER TO FIGURE 808G. MAKE SURE THE PLUG CLIP HAS
ENGAGED.

2.13.3 Make an activation line:

- (a) Get the 23 kg cord.
- (b) Cut the required length of cord.

NOTE: The location of the lamp activation patch will vary depending on liferaft size. Refer to FIGURE 808H to confirm correct location.

NOTE: Please refer to Chapter 1, TABLE 103 for the correct cut lengths.

- (c) Tie one end of the activation line to the tie-off patch on the bottom buoyancy tube:
 - (i) Use a bowline knot.
 - (ii) Wind self-adhesive tape around the flying end.
- (d) Tie the other end of the activation line to the loop on the activation toggle:
 - (i) Use a bowline knot.
 - (ii) Wind self-adhesive tape around the flying end.



FIGURE 808G
Fit the cable plug correctly

- (e) Pull out the activation toggle. Make sure that the internal lamp unit and external lamp unit operate.

NOTE: Do step 2.13.4 for 4-8 person liferafts before you connect the activation toggle. For all other liferafts see step 2.13.5.

2.13.4 4-8 person liferafts:

- (f) Disconnect the RL6 activation toggle.
- (g) Use a measuring tape and mark out 600×300 mm on the polyethylene sheet.
- (h) Use scissors to cut 600×300 mm of polyethylene sheet.
- (i) Move the polyethylene sheet so that the RL6 internal lamp is in the middle of the polyethylene sheet. Refer to FIGURE 808G-1.

RL6 internal lamp
in the middle
of polyethylene
sheet

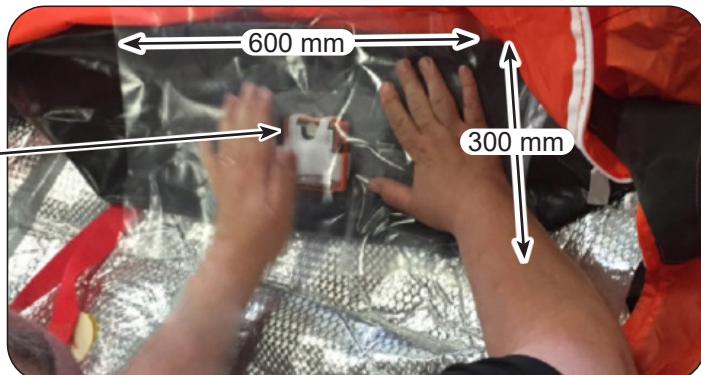


FIGURE 808G-1
Position of polyethylene sheet over the RL6 internal lamp

- (j) Make two strips of black tape:
- (i) Use a measuring tape to measure one 350 mm length of black tape.
- (ii) Tear two 30×350 mm strips of black tape.
Refer to FIGURE 808G-2.
- (iii) Discard the black tape that remains.

CAUTION: MAKE SURE THE TAPE IS ATTACHED TO THE ARCH TUBE AND POLYETHYLENE SHEET.

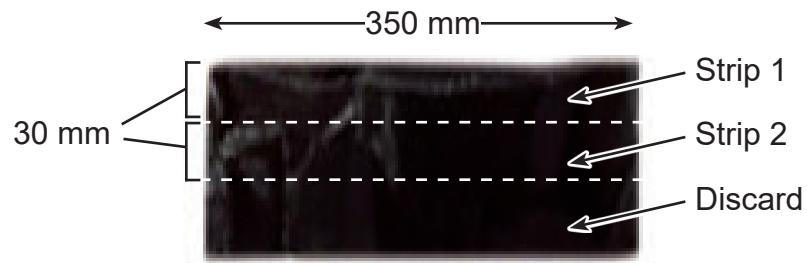


FIGURE 808G-2
Tear two strips of black tape

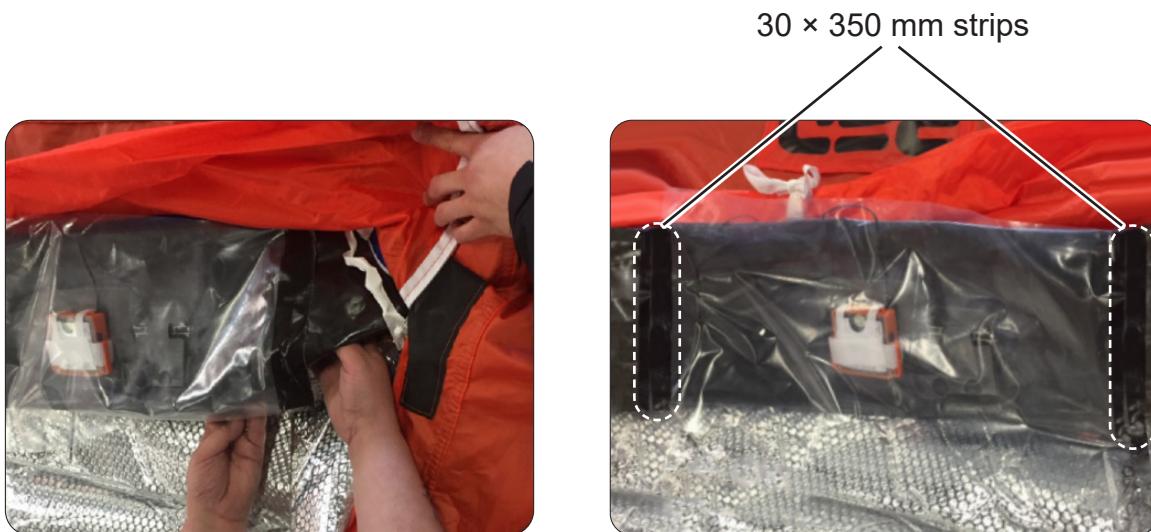


FIGURE 808G-3
Attach both short sides of the polyethylene sheet to the arch tube

- (k) Use the two 30×350 mm strips of black tape to attach both short sides of the polyethylene sheet to the arch tube.
Refer to FIGURE 808G-3.
- (l) Create four strips of black tape.
- Use a measuring tape to measure two 200 mm lengths of black tape.
 - On the first length of black tape tear two strips of 30×200 mm of black tape. Refer to FIGURE 808G-4 (i).
 - Discard the black tape that remains.
 - On the second length of black tape tear two strips of 30×200 mm of black tape. Refer to FIGURE 808G-4 (ii).
 - Discard the black tape that remains.

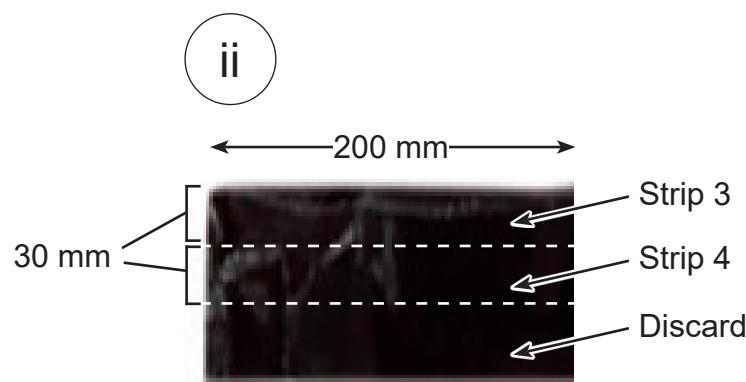
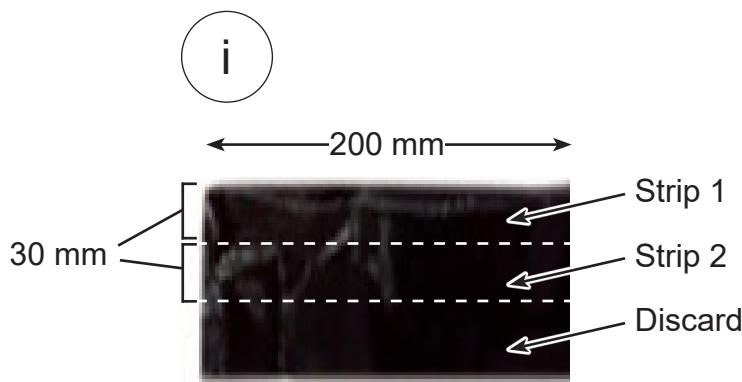


FIGURE 808G-4
Tear four strips of black tape

- (m) Use four strips of 30 × 200 mm black tape to attach both long sides of the polyethylene sheet to the arch tube. Refer to FIGURE 808G-5.
- (n) Use scissors to make a 100 mm slit in the bottom of the polyethylene sheet. Refer to FIGURE 808G-6 (i).

2.13.5 Attach the RL6 activator toggle FIGURE 808G-6 (ii).

2.13.6 Make sure that both lamps operate.

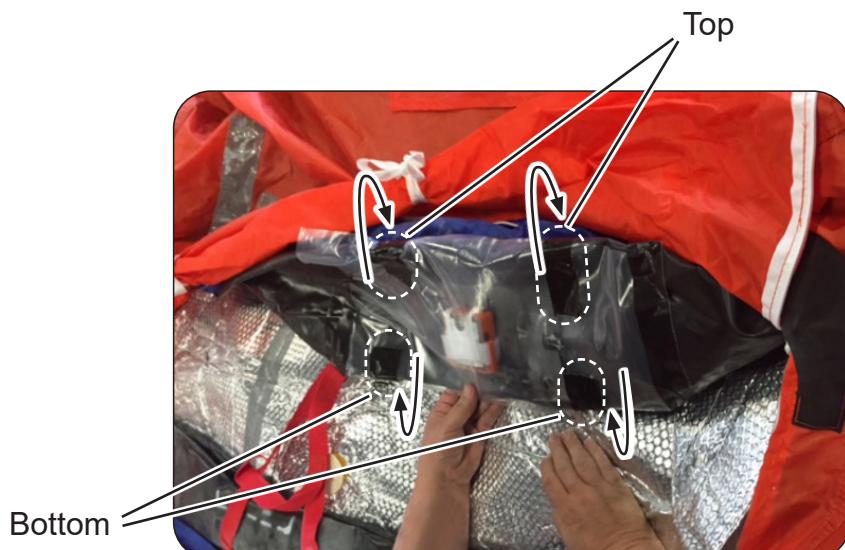


FIGURE 808G-5
Attach both long sides of the polyethylene sheet to the arch tube

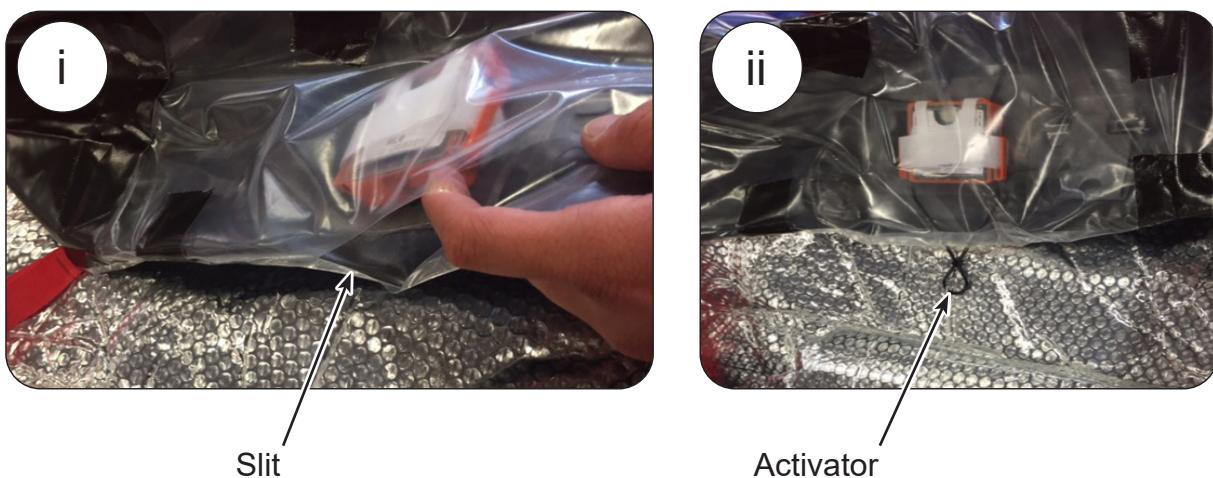


FIGURE 808G-6
Make a slit in the polyethylene sheet and attach the activator toggle

2.13.7 Correctly fitted RL6 lighting patch on 4-25 persons liferafts:

- (a) If the RL6 internal lighting patch has been correctly fitted on the arch tube it will be located as shown in FIGURE 808H.

NOTE: The activator switch must always point towards the tie-off patch on the lower buoyancy tube.

- (b) Use the narrow and wide velcro straps to hold the internal lighting unit in place.

2.13.8 Incorrectly fitted RL6 lighting patch

- (a) 4 -16 Persons. Refer to FIGURE 808I:

- (i) If the RL6 internal lighting patch has been incorrectly fitted on the arch tube it will be located as shown in FIGURE 808I.
- (ii) In this instance the RL6 internal unit will need to be rotated 180 degrees. You MUST only use the wide velcro straps, to hold the internal unit in place. Refer to FIGURE 808I.

NOTE: The activator switch must always point towards the tie-off patch on the lower buoyancy tube.

- (b) 20 -25 Persons. Refer to FIGURE 808J:

- (i) If the RL6 internal lighting patch has been incorrectly fitted on the arch tube it will be located as shown in FIGURE 808J.
- (ii) Use the narrow and wide velcro straps to hold the internal lighting unit in place. Refer to FIGURE 808J.

NOTE: The activator switch must always point towards the tie-off patch on the lower buoyancy tube.

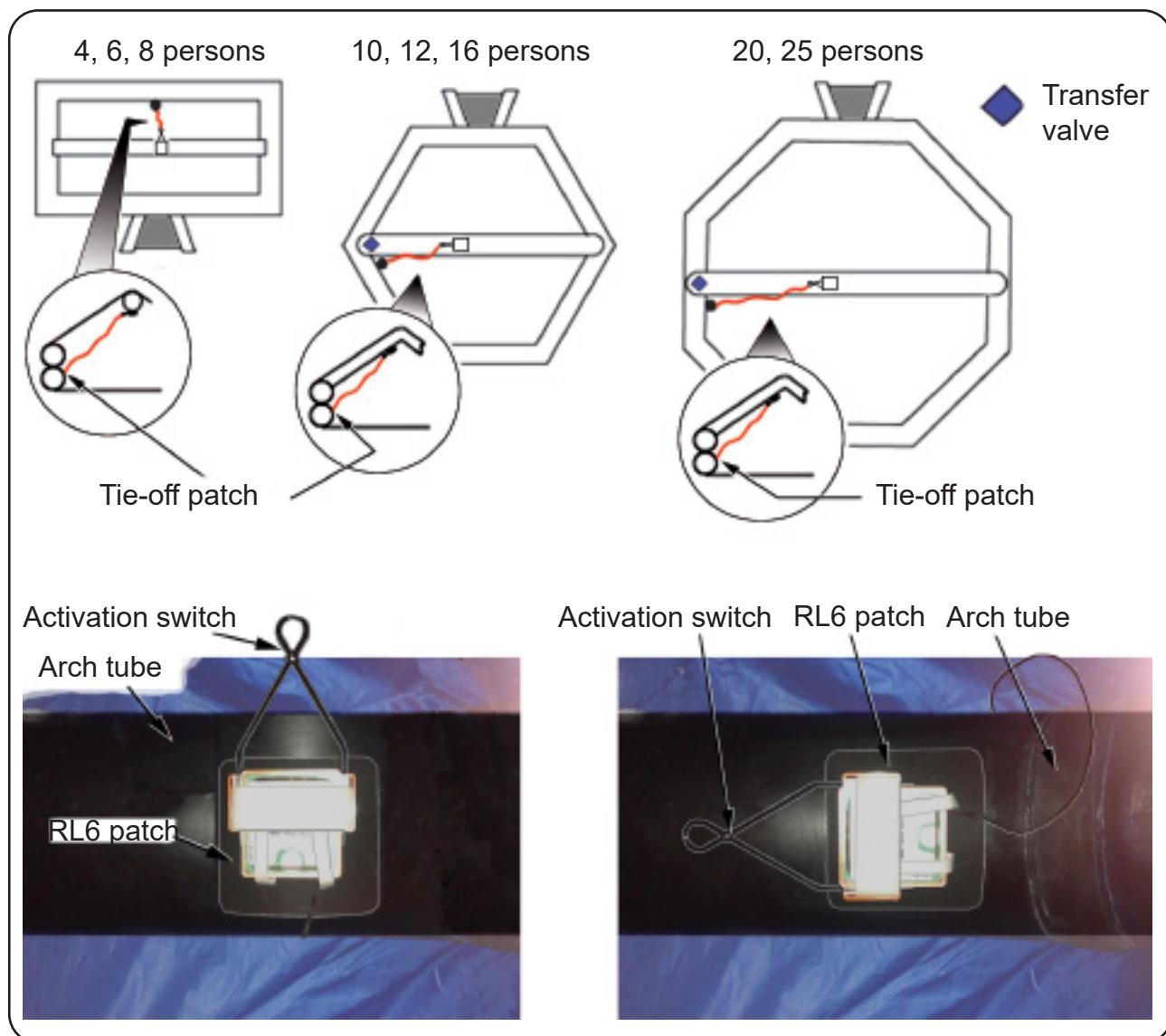


FIGURE 808H
Plan and side views: Lamp activation patch locations

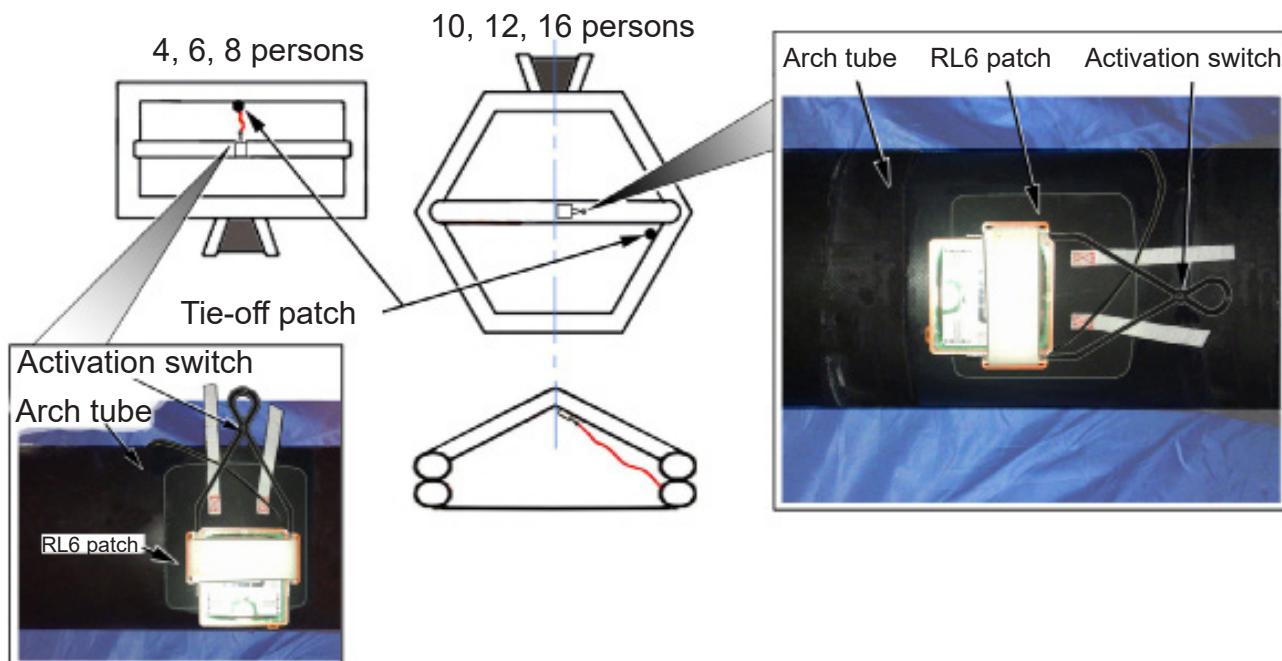


FIGURE 808I
4-16 Persons

Alternative position and direction of incorrectly fitted internal lamp patch

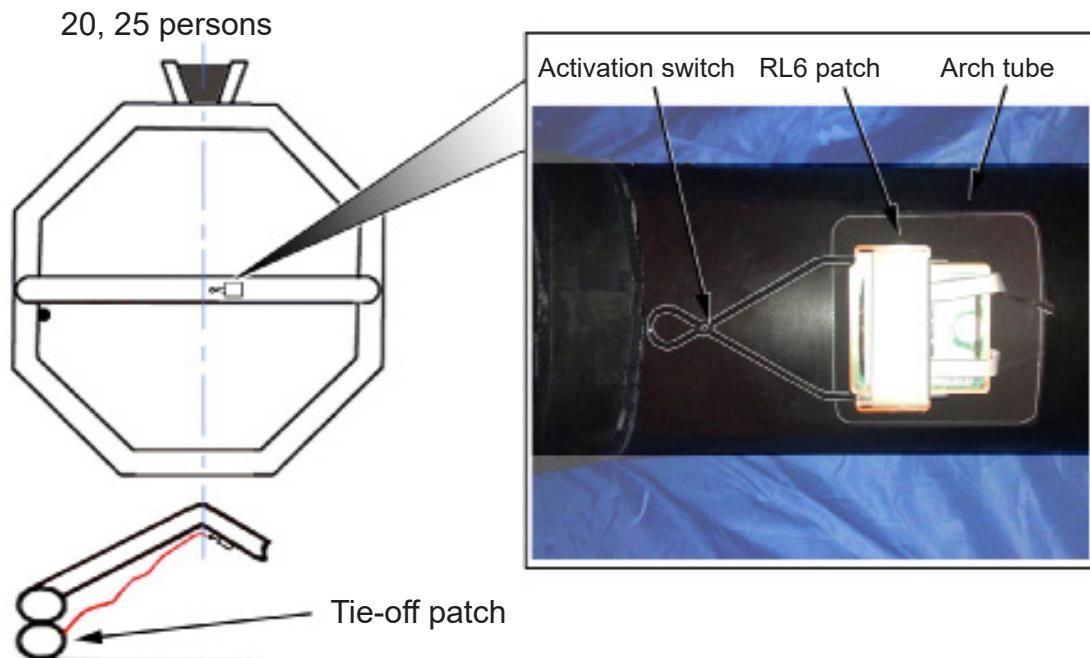


FIGURE 808J
20-25 Persons

Alternative position and direction of incorrectly fitted internal lamp patch

- 2.14 Tie the drogue streaming line of the drogue patch, adjacent to the viewing port. Use a bowline knot and secure the flying end with 25 mm (1") wide tape. Refer to FIGURE 809.

Please note there is no viewing port on the 4 Person liferaft. The drogue retrieving line is passed in through the doorway and is tied to the inner lifeline.

FOR DAVIT-LAUNCH: Tie in the rolled drogue to the outer lifeline close to the rear door. Refer to FIGURE 809. Use 4 turns of 4 kg nylon breaking thread and a reef knot. Carefully cut and discard the elastic bands.

FOR THROWOVER: Carefully cut and discard the elastic bands. The rolled drogue is put on the liferaft fold, just before liferaft rolling.

If the drogue assembly has been unrolled for any reason, it must be reassembled as follows. Refer to FIGURE 808K:

- 2.14.1 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.

- 2.14.2 Roll up the drogue from the ends. Stop the drogue from unrolling by temporarily securing it with two elastic bands.

- 2.15 Tie the drogue retrieving line to the drogue streaming line.
Refer to FIGURE 809.

- 2.15.1 Use 2 metres length of 1200 lb cord. Tie off using a loose bowline knot and tape the flying end.

- 2.15.2 Tie the remaining end of the drogue retrieving line to the inner lifeline. Refer to FIGURE 809. Access the inner lifeline through the viewing port. Use a bowline knot and tape the flying end.

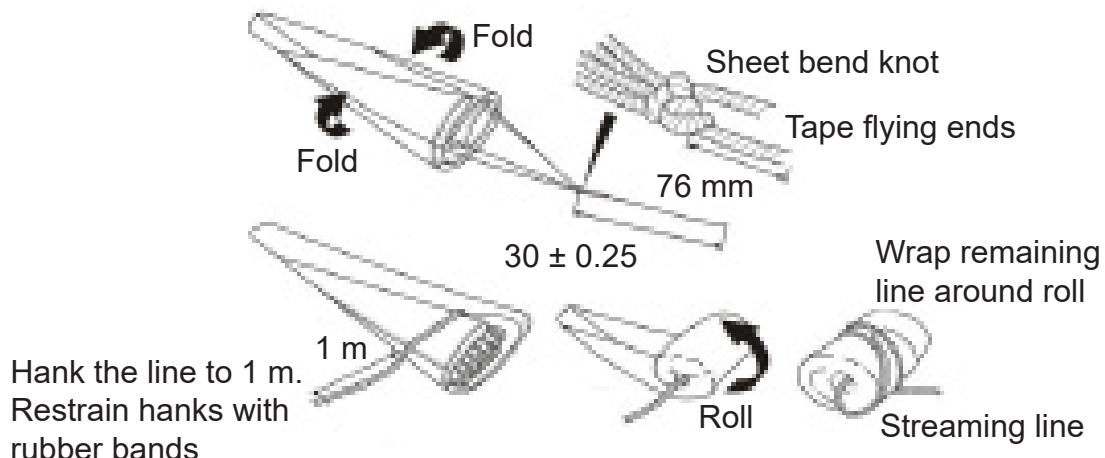


FIGURE 808K
Preparation for packing the Drogue

2.16 Attach the end of the rescue line and quoit through the internal lifeline, using lark foot connection. Use the velcro retaining strap to retain the quoit and rescue line to the liferaft. Refer to FIGURE 801A.

If the rescue line and quoit has been disassembled, it must be reassembled as follows. Refer to FIGURE 810:

- 2.16.1 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.
- 2.16.2 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.
- 2.16.3 Attach the quoit to the cord at the end where winding started, using a bowline knot. Tape over the bowline and flying end with 25 mm (1") wide adhesive tape.
- 2.16.4 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 polyethylene layflat tube.
- 2.16.5 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 tape. Refer to FIGURE 811.

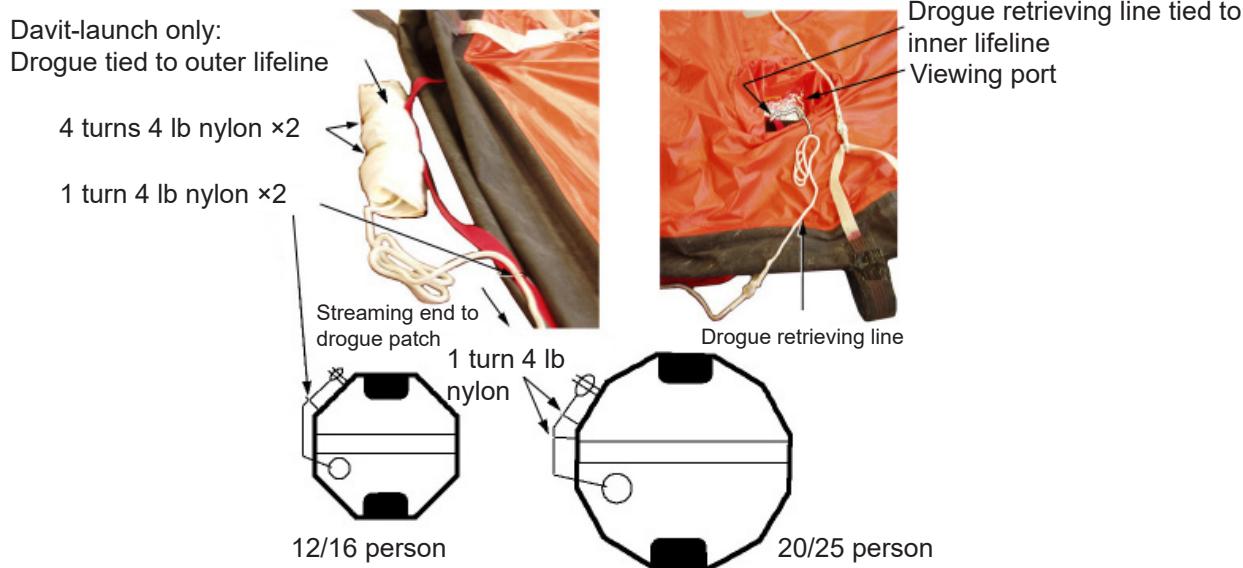


FIGURE 809
Tie the drogue and drogue retrieving line

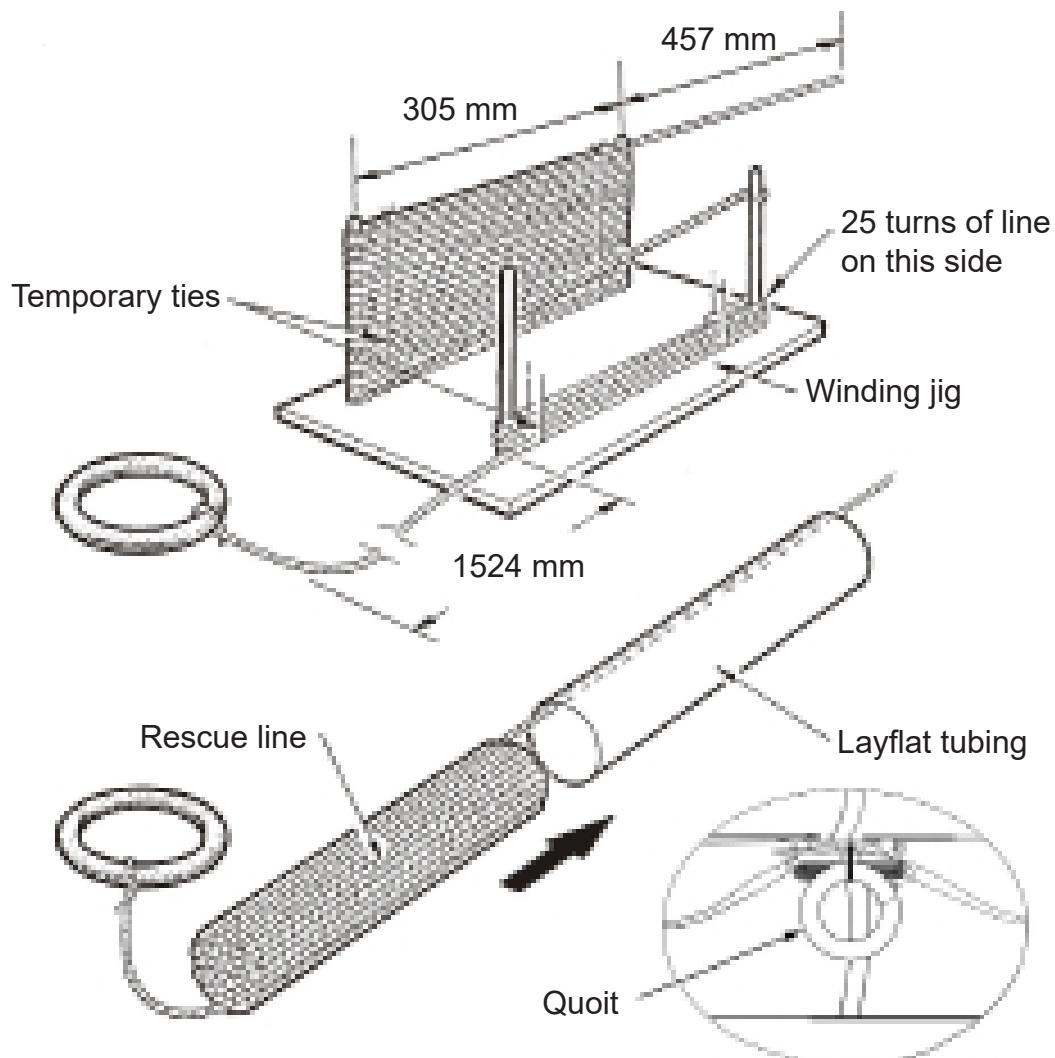


FIGURE 810
Preparation and fitting the lifeline and quoit

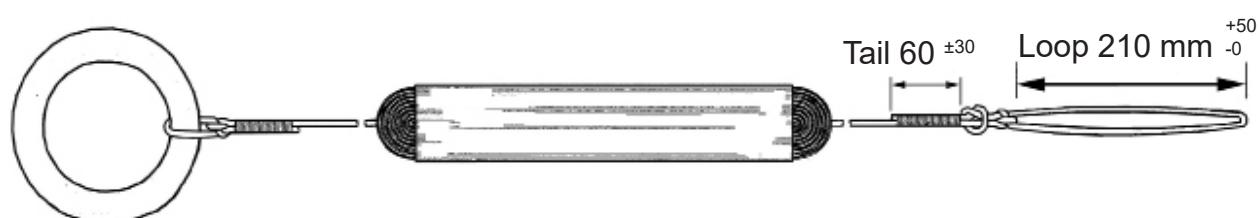


FIGURE 811
Rescue line and quoit assembly

- 2.17 If the painter line has been removed from its sachet, it must be repacked as follows. Refer to FIGURES 812 and 813:
 - 2.17.1 Take the painter line and disconnect the painter extension. Pass the unsheathed end of the main painter line through the top of the painter loading machine and into the sachet.
 - 2.17.2 Extract the end so that the firing point, marked in black, plus 600 mm (24") of cord protrude from the sachet, 2100 mm (83") in total.
Refer to FIGURE 812 view X-X.
 - 2.17.3 Holding the painter line in this position, push the main part of the painter 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 40 mm (2") to the start of the rubber sheathing.
 - 2.17.4 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.
 - 2.17.5 Pass the thread through the remaining holes. This will close the sachet.
 - 2.17.6 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.
- 2.18 Check the boarding ramp stays, (2 in total), are attached to the liferaft.
Refer to FIGURE 801A. Use a round turn and two half hitches and tape the flying ends.
- 2.19 Check that all doorways are unzipped and properly furled (inwards). Using the tie tapes, tie the doorways in open position. Use a half bow knot for quick release. Refer to FIGURE 801A.
- 2.20 Replace the painter retaining block during each service
- 2.21 Make sure that the liferaft serial number is the same as the serial number on the Certificate of Manufacture or Certificate of Reinspection.
 - 2.21.1 If both serial numbers match, continue packing the liferaft.
 - 2.21.2 If a difference in the serial numbers is found, please contact Survitec Group Technical Services.

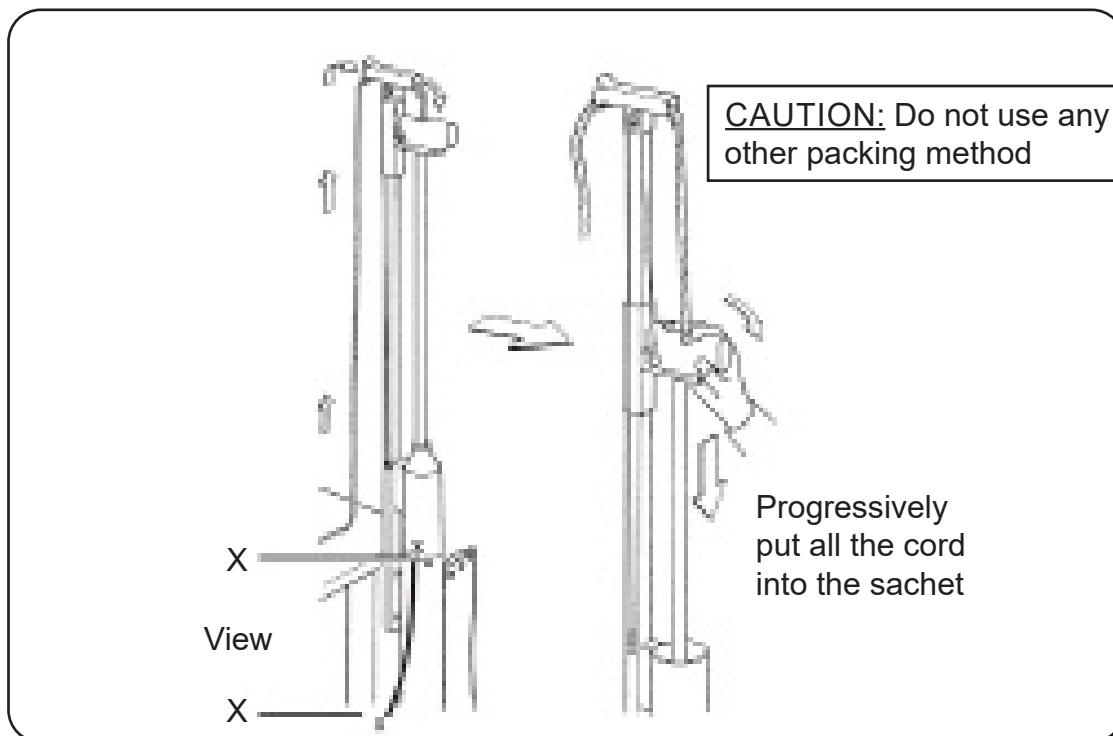


FIGURE 812
Painter sachet loading machine

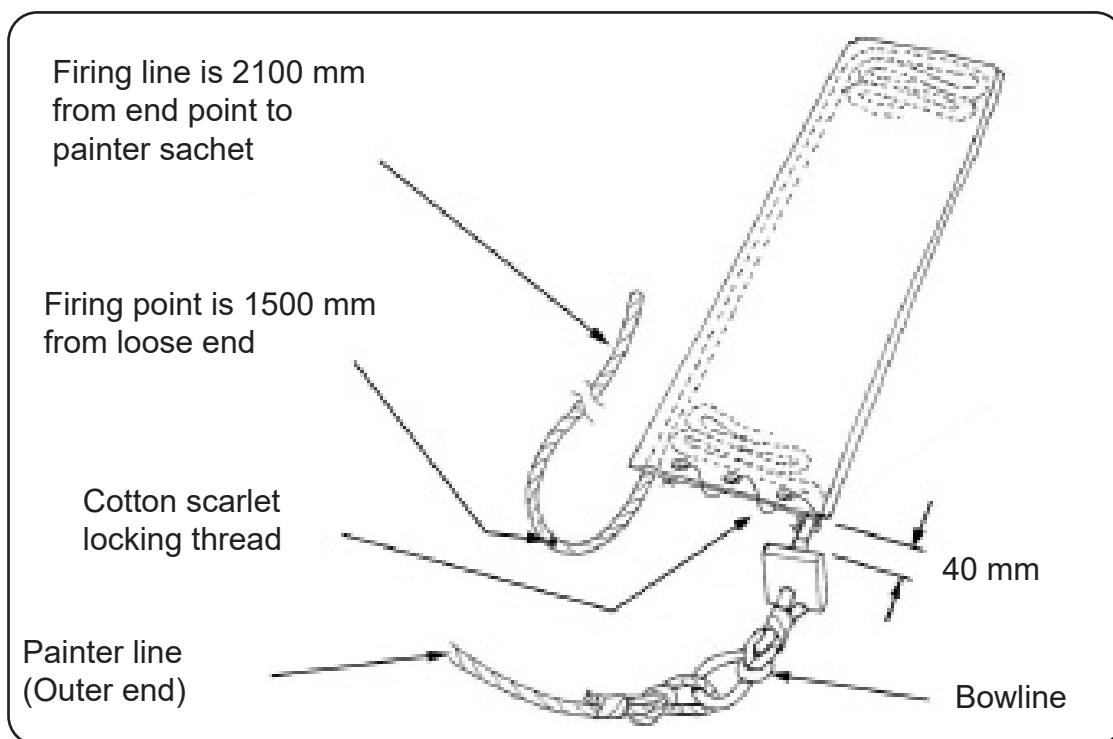


FIGURE 813
Painter assembly detail

2.22 Tie the hauling-in ladders. To carry out this step, the liferaft must be inflated.

2.22.1 10-25 PERSON; Attach the stretching line from one hauling-in ladder to the opposite hauling-in ladder, using the toggle. Refer to FIGURE 801A.

Hauling-in ladder – Boarding ramp side

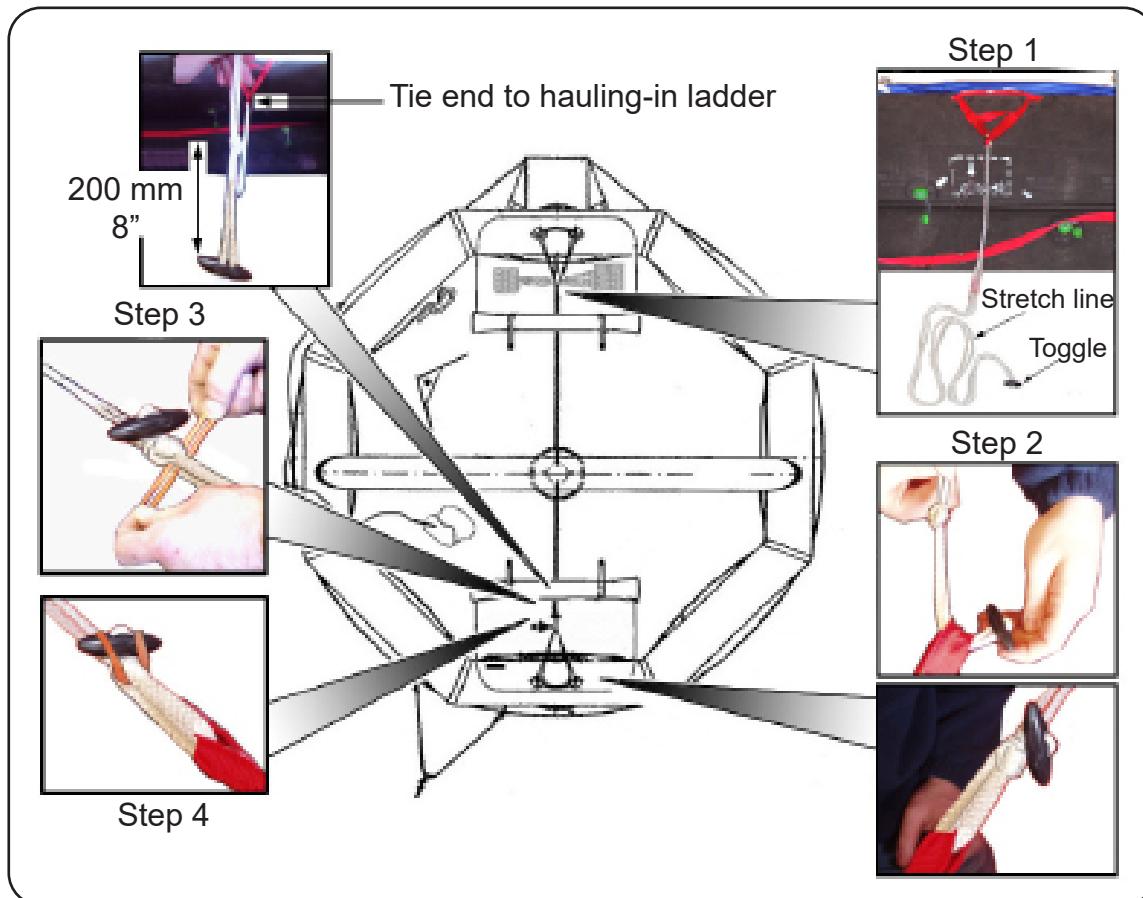
- (a) Retrieve the correct length of stretching line. Refer to the IPL.
- (b) Retrieve the toggle and pull the stretching line, to half way through both holes of the toggle. Refer to FIGURE 814.
- (c) Insert the free ends of the stretching line through the hauling-in ladder at the doorway. Secure the stretching line using an overhand knot and tape the flying ends. Refer to FIGURE 814.
- (d) Tie an overhand knot about (200 mm / 8") above the toggle. Refer to FIGURE 814.

Hauling-in ladder – CO2 cylinder side

- (e) Insert the toggle complete with stretching line through the red webbing loop, of the hauling-in ladder. Refer to FIGURE 814.
- (f) Pull the stretching line tightly and pass toggle above the knot, between the stretching lines. Refer to FIGURE 814.
- (g) Stretching line should be left tight. Modify the position of the knot to adjust the tension.
- (h) Secure toggle in place using a rubber band. (See step 4, below).

2.22.2 4-8 PERSON; Tie the stretching line from hauling-in ladder

- (a) Retrieve the toggle and pull the stretching line, (see IPL), to half way through both holes of the toggle. Refer to FIGURE 814.
- (b) Tie each free ends of the stretching line to the two opposite loops located on the opposite buoyancy tube. Use a round turn and two half hitches and tape the flying end. Refer to FIGURE 814. There is no marking or dimension for the point of knotting necessary.
- (c) Tie an overhand knot about (200 mm / 8") above the toggle.
- (d) Insert the toggle complete with stretching line through the red webbing loop, of the hauling-in ladder. Refer to FIGURE 814.
- (e) Pull the stretching line tightly and pass toggle above the knot, between the stretching lines, Refer to FIGURE 814.
- (f) Attach a rubber band (see IPL) to secure the toggle in place. Put the rubber band behind the knot. Bring the ends of the rubber band up and over the edges of the toggle. Refer to FIGURE 814.



10-25 Person ONLY - Hauling-in ladder assembly

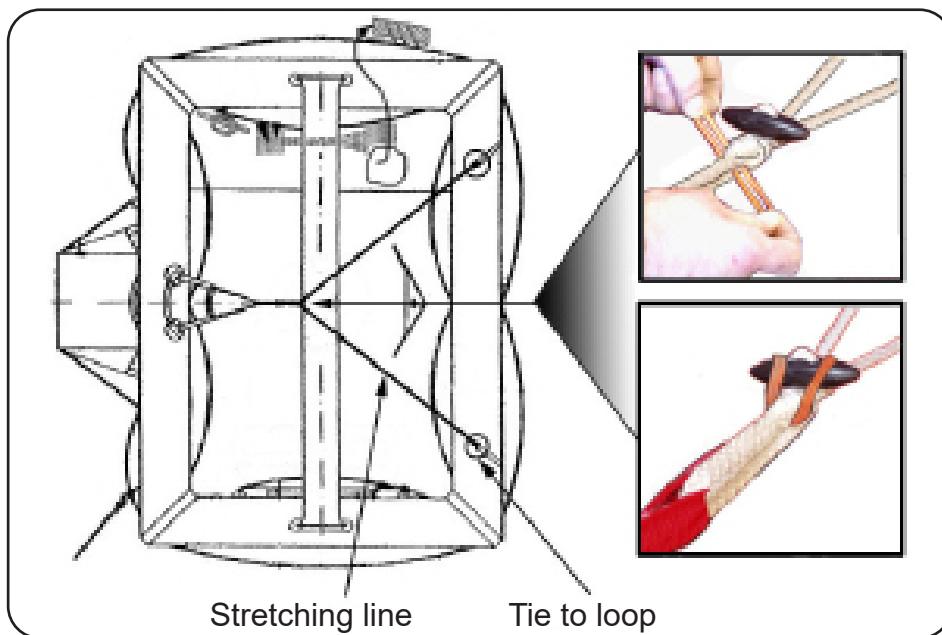


FIGURE 814
4-8 Person ONLY - Hauling-in ladder assembly

3. Inflation system preparation

- 3.1 Insert deflators into the inflate/deflate valves of the buoyancy tubes and arch tube and fully deflate each compartment.
 - 3.2 On the Leafield inflation system, check the 'O-ring' is located in the valve and attach a hose using the quick-fit connector. Refer to FIGURE 815. Hoses must be aligned horizontally.
 - 3.3 Make sure that the inflation valve has not rotated from its original position. Jets must be aligned axially along the buoyancy tube. 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.
- 3.4 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 1 second ×3 for each hose to make sure they function correctly. Check while blast testing that there are no leaks coming from the valves.
 - 3.5 Fit the valve protective foam (FIGURE 816) 1 for each inflation valve, 2 in total. Secure them with a reef knot.

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.

- 3.6 Check and if required, reset operating heads according to the manufacturer's documentation. Refer to the List of Associated Publications.
- 3.7 Refer to the List of Associated Publications for manuals, Chapter 1, DESCRIPTION AND DATA for the correct filling data for gas cylinders and to Chapter 11, 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.



FIGURE 815
Attaching inflation hose to valve

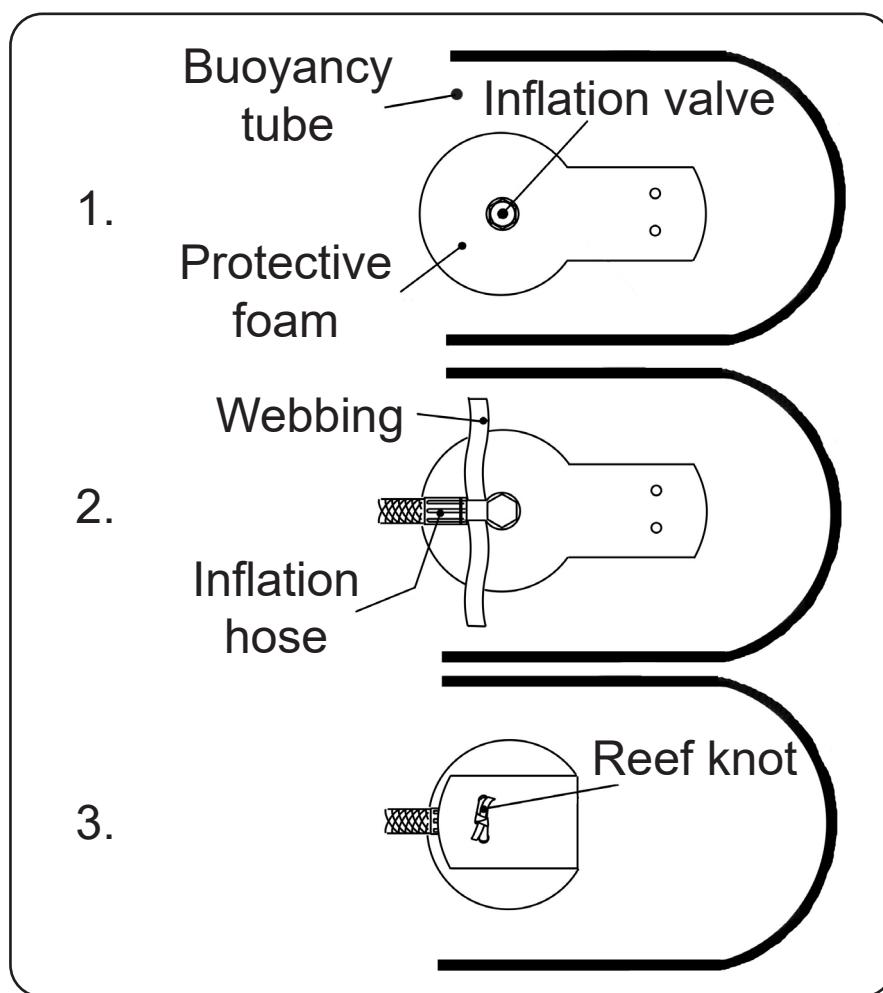


FIGURE 816
Protective foam for inflation valve

4. Container preparation

NOTE: If you are preparing a Silver Series Flat-Pack container then please refer to Appendix 7.

- 4.1 MK 10 container: The following preparation is used for all Throwover and Davit-launch liferafts.
 - 4.1.1 The container seal, fitted to the upper container half, must be replaced at each service.
 - 4.1.2 Attach a protective foam block to the inside of the container. Refer to FIGURE 817 Detail A. This protective foam block prevents the cylinder operating head from impacting the container side during handling and deployment.
 - 4.1.3 Drainage holes/slits:
 - (a) Drainage holes are made in all containers. Refer to FIGURE 817A. These holes allow any build up of water to escape. A polyethylene sheet is then put inside the container before the liferaft is rolled inside.
 - CAUTION:** WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE POLYETHYLENE SHEET.

 - (b) Check that the bottom of the container has drainage holes made.
 - (c) Line the bottom half of the container with a polyethylene sheet. Refer to FIGURE 817A.
 - (d) Make sure that this sheet overlaps the front edge of the container by 200 mm (8").
 - (e) Locate all drainage holes in the bottom of the container.
 - (i) Make a short slit in the polyethylene sheet where it aligns with the container drainage holes. Refer to FIGURE 817B.
 - 4.1.4 For Davit-launch only, use a pair of scissors to cut the two sides in the polyethylene where the davit ring will exit. Refer to FIGURE 817 Detail B.

NOTE: On Davit-launch liferafts, the excess polyethylene sheet is passed around the circumference of the entire liferaft. The cut flap for the davit ring will be put under the davit ring.

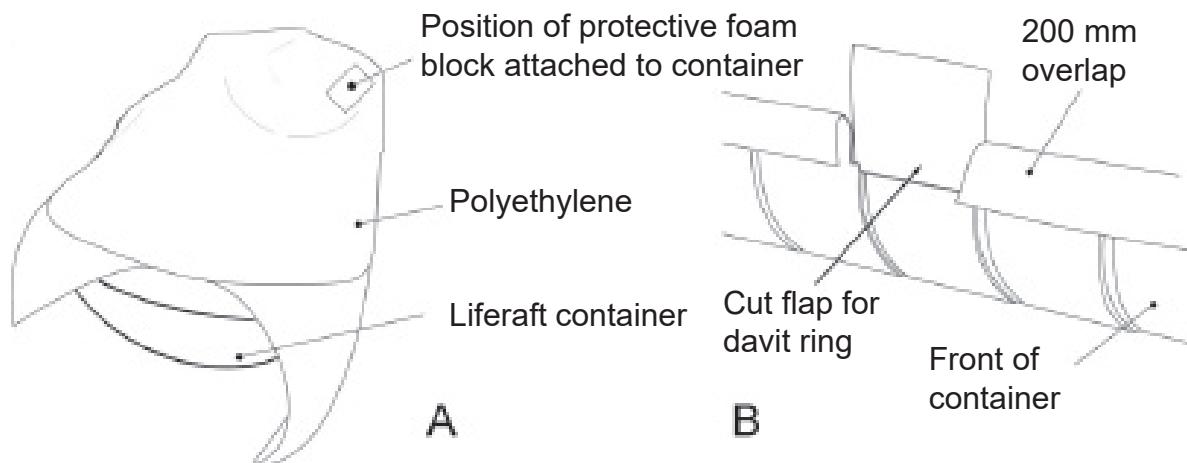


FIGURE 817
Preparation of container MK 10

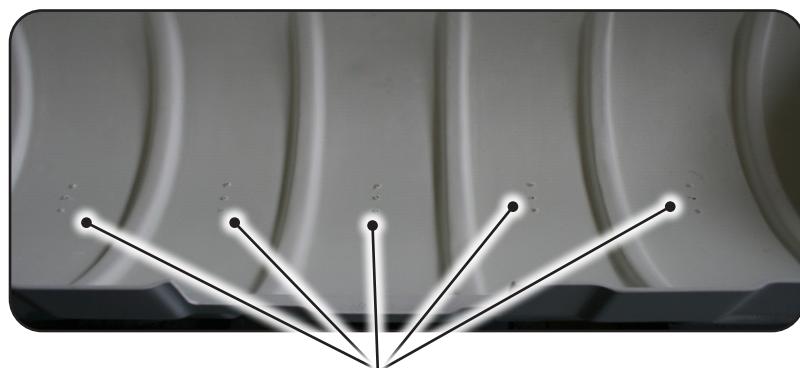


FIGURE 817A
Container drainage holes (Cylindrical shown)

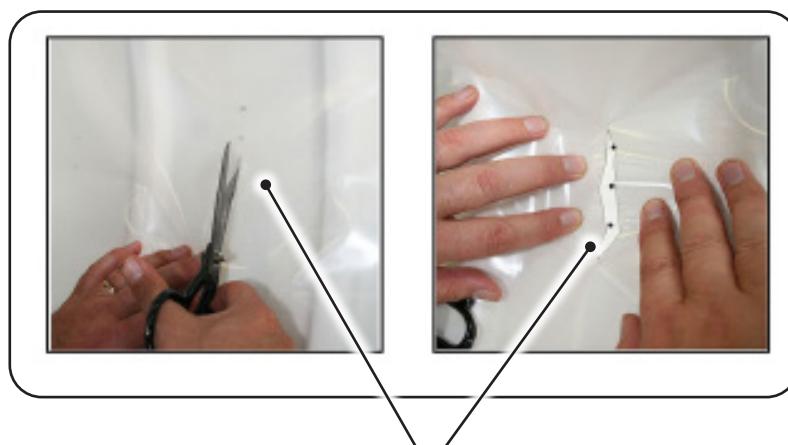


FIGURE 817B
Make a slit in the polyethylene sheet

4.2 MK 14 container: The following preparation is used for all Throwover and Davit-launch liferafts.

4.2.1 The container seal, fitted to the top half of the container, must be replaced.

4.2.2 Attach a protective foam block to the inside of the container. Refer to FIGURE 818 Detail A. Put the protective foam block in the centre. This protective foam block prevents the cylinder operating head from impacting the container side during handling and deployment.

4.2.3 Drainage holes/slits:

(a) Drainage holes are made in all containers. Refer to FIGURE 817A. These holes allow any build up of water to escape. A polyethylene sheet is then put inside the container before the liferaft is rolled inside.

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE POLYETHYLENE SHEET.

(b) Check that the bottom of the container has drainage holes made.

(c) Line the bottom half of the container with a polyethylene sheet. Refer to FIGURE 818 Detail A.

(d) Make sure that this sheet overlaps the front edge of the container by 200 mm (8").

(e) Locate all drainage holes in the bottom of the container.

(i) Make a short slit in the polyethylene sheet where it aligns with the container drainage holes. Refer to FIGURE 817B.

4.2.4 Make sure that this sheet overlaps the front edge of the container by 200 mm (8"). Use temporary lengths of tape to secure the polyethylene in place.

NOTE: On Davit-launch liferafts, the excess polyethylene sheet is passed around the circumference of the entire liferaft. The cut -out for the davit ring is put under the ring.

4.2.5 16 Persons ONLY: (TO and DL): Fix two lengths of protective foam blocks to the top half of the container. Refer to FIGURE 818 Detail B.

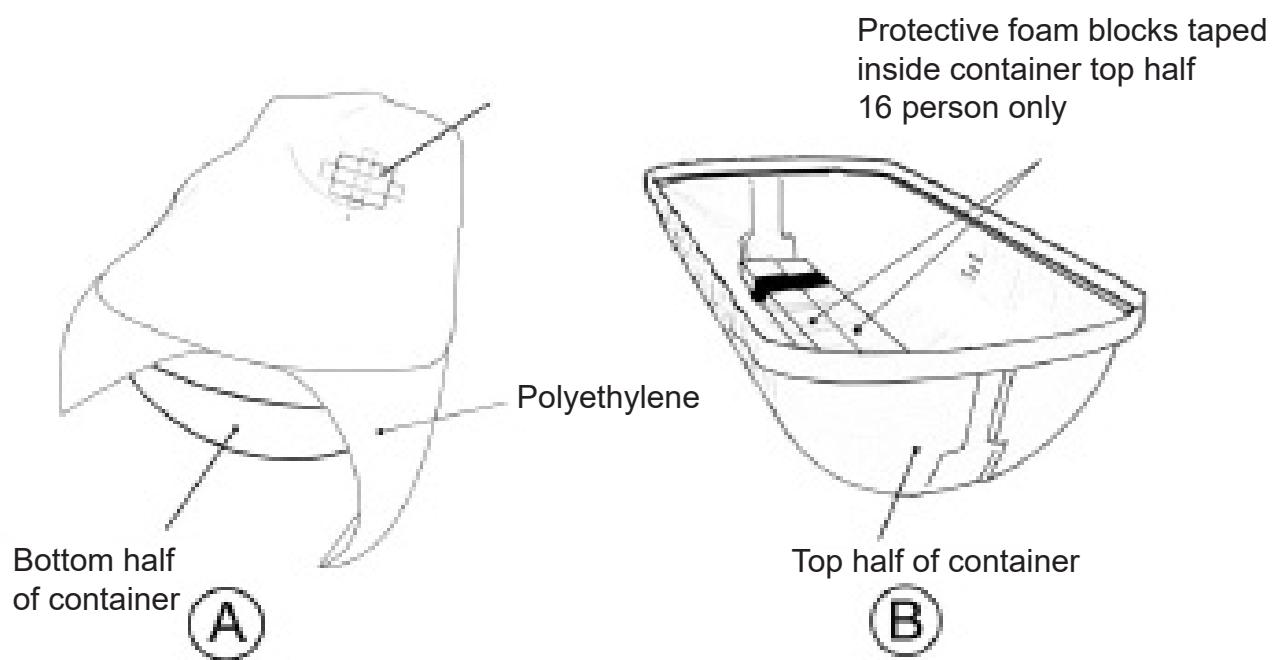


FIGURE 818
Preparation of container MK 14

4.3 MK 16 / MK 18 / G21 container:

The following preparation is used the liferafts stated.

4.3.1 The container seal, fitted to the upper container half, must be replaced.

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

4.3.2 Attach a protective foam block to the inside of the container.

Refer to FIGURE 819 Detail A or Detail B.

This protective foam block prevents the cylinder operating head from impacting the container side during handling and deployment.

(a) For 10,12 Person put protective foam in the MK 16 Flat-Pack container. Refer to FIGURE 819 Detail A.

(b) For 4,6,8 Person put protective foam in the MK 18 Flat-Pack container. Refer to FIGURE 819 Detail B.

4.3.3 Drainage holes/slits:

(a) Drainage holes are made in all Flat-Pack containers. Refer to FIGURE 817A. These holes allow any build up of water to escape. A polyethylene sheet is then put inside the Flat-Pack container before the liferaft is rolled inside.

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE POLYETHYLENE SHEET.

(b) Check that the bottom of the Flat-Pack container has drainage holes made.

(c) Line the bottom half of the Flat-Pack container with a polyethylene sheet. Refer to FIGURE 817 Detail A.

(d) Make sure that this sheet overlaps the front edge of the Flat-Pack container by 200 mm (8").

(e) Locate all drainage holes in the bottom of the Flat-Pack container.

(i) Make a short slit in the polyethylene sheet where it aligns with the Flat-Pack container drainage holes. Refer to FIGURE 817B.

4.3.4 Use temporary lengths of tape to secure the polyethylene in place.

4.4 MK 20 container: The following preparation is used for 25 Person DL liferafts only.

4.4.1 The container seal, fitted to the upper container half, must be replaced.

4.4.2 Attach protective foam to the inside of the container.
Refer to FIGURE 820.

The lower container is lined around the sides with two layers of protective foam. Refer to the Chapter 11, ILLUSTRATED PARTS LIST for details. The layer of protective foam is attached to the container using black mastic tape (P/N TA175). The second layer of protective foam is attached to the first layer using 25 mm (1") double sided tape (P/N 06675009). Additionally, 100 mm (4") black fabric tape (P/N 04834009) is used to secure the second layer of protective foam.

4.4.3 Drainage slits:

(a) Drainage holes are made in all Flat-Pack containers.
Refer to FIGURE 817A. These holes allow any build up of water to escape. A polyethylene sheet is then put inside the Flat-Pack container before the liferaft is rolled inside.

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE POLYETHYLENE SHEET.

- (b) Check that the bottom of the Flat-Pack container has drainage holes made.
- (c) Line the bottom half of the Flat-Pack container with a polyethylene sheet. Refer to FIGURE 817 Detail A.
- (d) Make sure that this sheet overlaps the front edge of the Flat-Pack container by 200 mm (8").
- (e) Locate all drainage holes in the bottom of the Flat-Pack container.
 - (i) Make a short slit in the polyethylene sheet where it aligns with the Flat-Pack container drainage holes.
Refer to FIGURE 817B.

4.4.4 Use temporary lengths of tape to secure the polyethylene in place.

4.4.5 After the liferaft is packed in the MK 20 container, (SOLAS B-Pack), three protective foam blocks are put on top of the liferaft before the upper container is fitted.

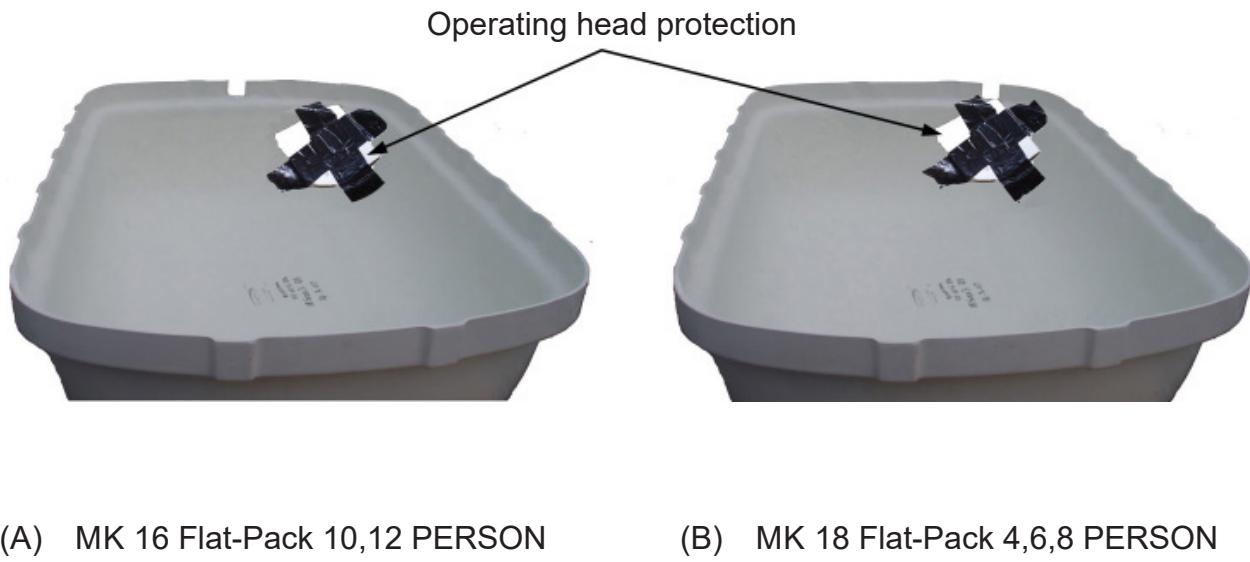


FIGURE 819

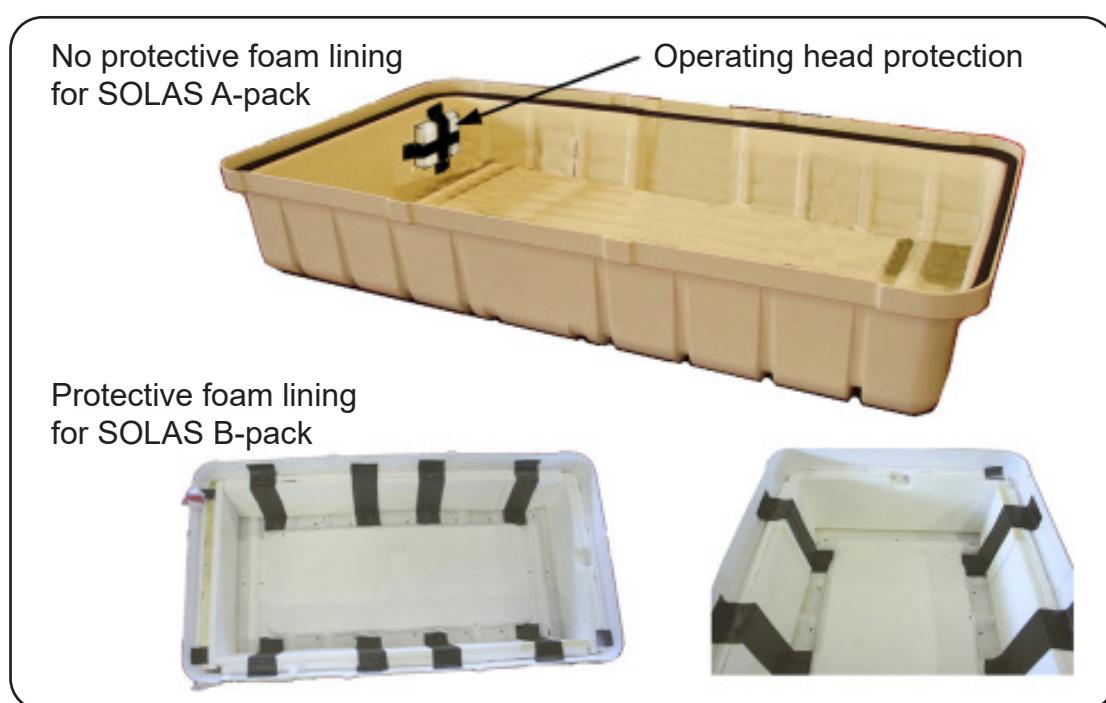


FIGURE 820

4.5 N-Series Low Profile container:

- N133
- N134
- N135
- N136
- N136H

4.5.1 Attach a protective foam block to the inside of the container:
Refer to **Figure 820A**

- (a) Get a protective foam block 4. Refer to Chapter 11, Illustrated Parts List, 2.5.3.
- (b) Use a ruler and pen to mark the midpoint of the protective foam block 4.
- (c) Use a safety knife to cut a Ø40 mm hole around the midpoint of the protective foam block 4.
- (d) Align the protective foam block 4 with the hole in the container.

NOTE: The Ø40 mm must be concentric to the hole in the container.

- (e) Use 100 mm black tape to attach the protective foam block 4 to the container.

NOTE: This protective foam block prevents the cylinder operating head from impacting the container side during handling and deployment.

4.5.2 Drainage holes in the Low Profile container:

- (a) Make sure that there are drainage holes in the Low Profile container. Refer to **Figure 820A**.

NOTE: These holes allow any build up of water to escape. A polyethylene sheet is then put inside the container before the liferaft is rolled inside.

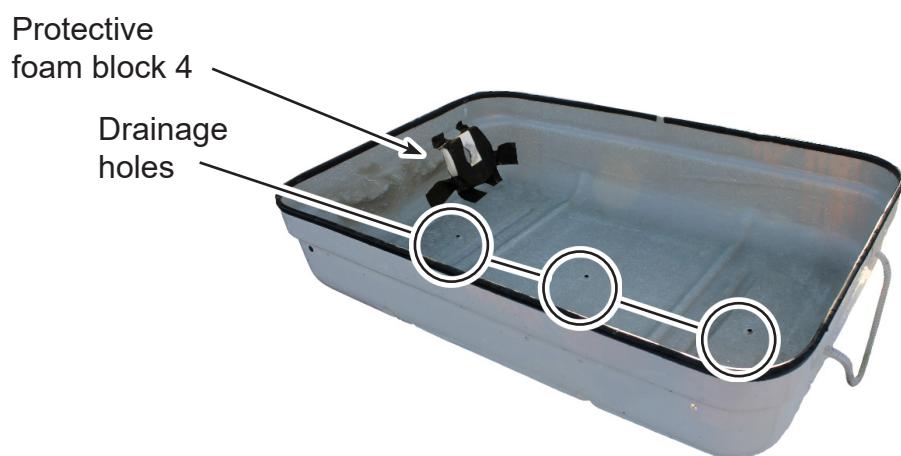


FIGURE 820A
Protective foam block on the inside of the Low Profile container (N133 shown)

4.5.3 Put a polyethylene sheet into the container:

- (a) Line the bottom half of the container with a polyethylene sheet. Refer to **Figure 820B**.
- (b) Make sure that this sheet overlaps the front edge of the container by 200 mm (8").
- (c) Locate all drainage holes in the bottom of the container.

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE POLYETHYLENE SHEET.

4.5.4 Make a short slit in the polyethylene sheet where it aligns with the container drainage holes. Refer to **Figure 820C**.

4.5.5 Use temporary lengths of tape to attach the polyethylene in place.

4.5.6 Proceed to **Section 8, Pack a Throwover liferaft into a N-Series Low Profile container**.

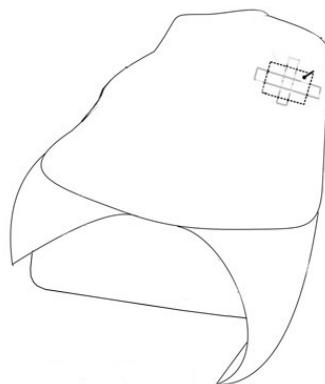


FIGURE 820B
Polyethylene sheet



FIGURE 820C
Make a slit in the polyethylene sheet

4.6 N-Series Xtrem container:

- N137
- N137H
- N138
- N138H
- N139
- N139H
- N140
- N140H

4.6.1 Attach a protective foam block to the inside of the container:

Refer to **Figure 820A**

- (a) Get a protective foam block 4. Refer to Chapter 11, Illustrated Parts List, 2.5.3.
- (b) Use a ruler and pen to mark the midpoint of the protective foam block 4.
- (c) Use a safety knife to cut a Ø40 mm hole around the midpoint of the protective foam block 4.
- (d) Align the protective foam block 4 with the hole in the container.

NOTE: The Ø40 mm must be concentric to the hole in the container.

- (e) Use 100 mm black tape to attach the protective foam block 4 to the container.

NOTE: This protective foam block prevents the cylinder operating head from impacting the container side during handling and deployment.

4.6.2 Drainage holes in the Xtrem container:

- (a) Make sure that there are drainage holes in the Xtrem container.
Refer to **Figure 820D**.

NOTE: These holes allow any build up of water to escape. A polyethylene sheet is then put inside the container before the liferaft is rolled inside.

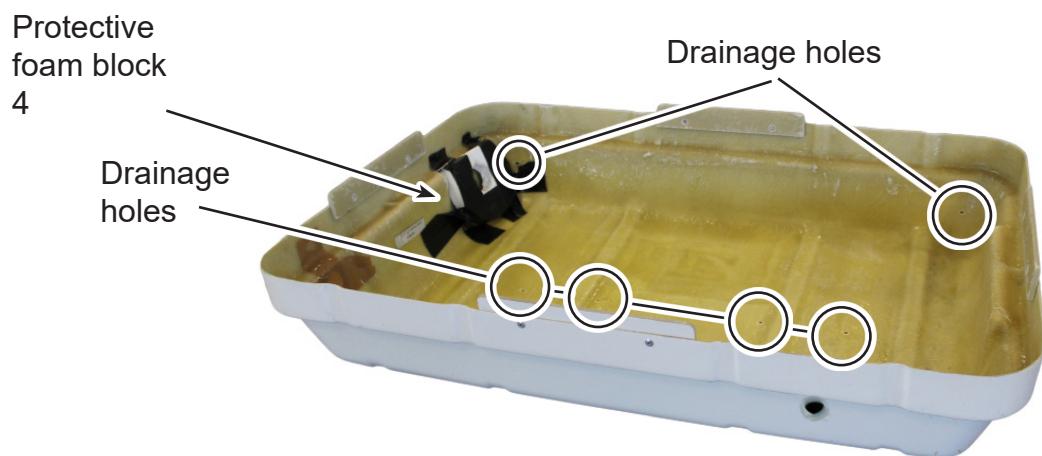


FIGURE 820D
Protective foam block on the inside of the Xtrem container (N139H shown)

4.6.3 Put a polyethylene sheet into the container:

- (a) Line the bottom half of the container with a polyethylene sheet. Refer to **Figure 820E**.
- (b) Make sure that this sheet overlaps the front edge of the container by 200 mm (8").
- (c) Locate all drainage holes in the bottom of the container.

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE POLYETHYLENE SHEET.

4.6.4 Make a short slit in the polyethylene sheet where it aligns with the container drainage holes. Refer to **Figure 820F**.

4.6.5 Use temporary lengths of tape to attach the polyethylene in position.

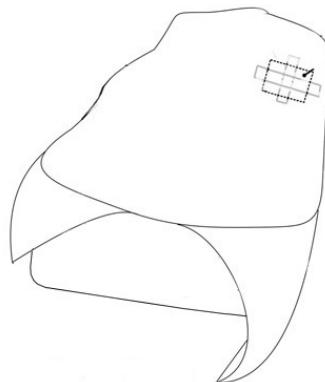


FIGURE 820E
Polyethylene sheet



FIGURE 820F
Make a slit in the polyethylene sheet

- 4.6.6 Put the correct size of hermetic bag (H-Pack) into the bottom half of the container.
- 4.6.7 Remove the 36 mm nut and washer from the vacuum valve.
- 4.6.8 Take care to put the nut and washer on a clean surface.
- 4.6.9 Align the vacuum valve with the cut out in the container.
Refer to **Figure 820G**
- 4.6.10 Put the vacuum valve into the cut out. Refer to **Figure 820G**
- 4.6.11 Hold the back of the vacuum valve.
- 4.6.12 Attach the washer and 36 mm nut on the outside of the container.
- 4.6.13 Hand tighten the vacuum valve.
- 4.6.14 Use a torque wrench to tighten the valve nut to the correct torque. Refer to **Chapter 1** for torque values and **Chapter 10** for special tools.
- 4.6.15 Push the H-Pack down into the container.
- 4.6.16 Proceed to **Section 9, Pack a Throwover liferaft into a N-Series Xtrem container.**

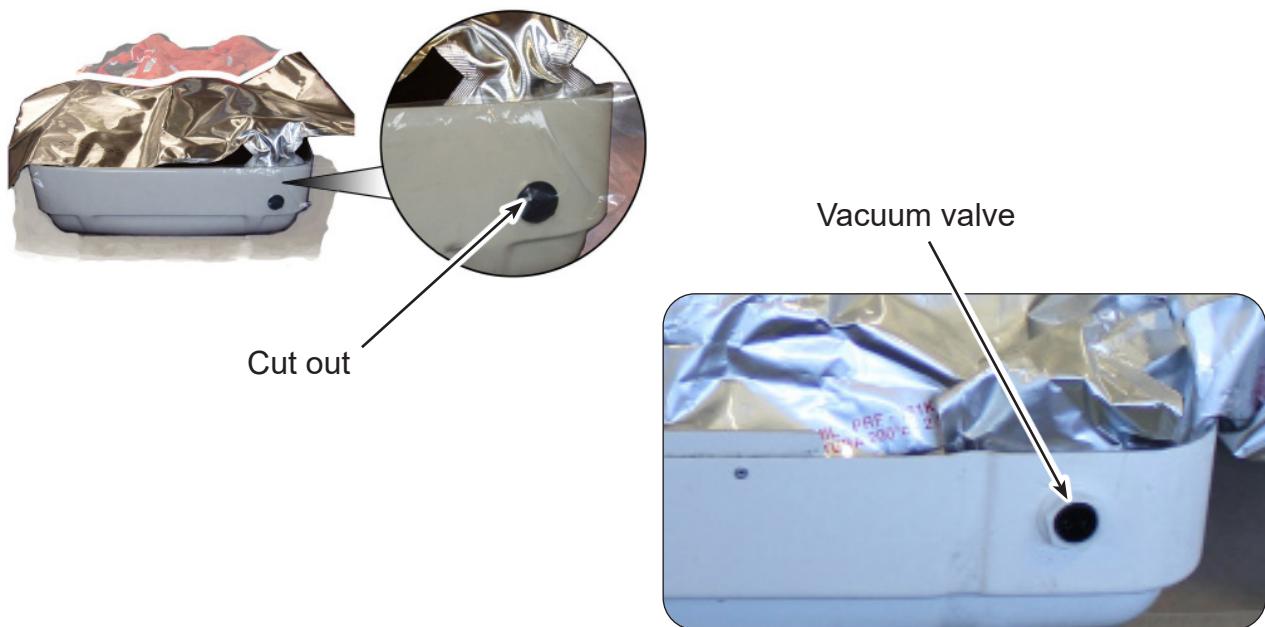


FIGURE 820G
Put the vacuum valve into the cut out

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

5. Packing a Davit-launch (DL) liferaft into a container

NOTE: There are two methods for packing a DSB LR07 Davit-launch liferaft.

Refer to Appendix A-9 for the standard method of packing a DSB LR07 DL liferaft.
Refer to the steps below for the KLAPPE method of packing a DSB LR07 DL Liferaft.

- 5.1 Put the liferaft neatly on a packing table in an open area, with enough room to manoeuvre the container during packing. The inflation valves must be positioned adjacent to the edge of the packing table. Make sure that all cordage is neat and tidy. When most of the air has escaped naturally from the liferaft, it must be evacuated as follows:
 - 5.1.1 Connect a vacuum device to a deflation adapter and evacuate all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
 - 5.1.2 As each chamber is evacuated, adjust the buoyancy tubes so that they lie flat on each other.
- 5.2 Join the lifting bridle cords in four equal groups, at their mid point, using velcro strips. Do this for each quadrant of the liferaft, as shown in FIGURE 801A. This will keep cords away from the door openings and will also prevent entangling.
- 5.3 Check the red webbing ring pull and container retaining line is serviceable.
- 5.4 Replace the container restraint label if it is torn or illegible.
Refer to FIGURE 801A.
- 5.5 Tie the container retaining line (1818 kgf (4000 lbf) Nylon cord 5.5 m (216")) long, to the suspension ring using a bowline knot and tape the flying end.
Refer to FIGURE 801A.
- 5.6 Secure the container retaining line to the canopy, by routing it through the loop patch located on the arch tube. Make sure that it is also routed under the lifting bridle cords and passed through the correct outer lifeline.
Refer to FIGURE 801A.
- 5.7 Put 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. Refer to FIGURE 801A.
- 5.8 If the operating lanyard has been removed from its sachet, it must be repacked according to FIGURE 821.

- 5.9 If the doorway bowsing lines have been removed from their sachet, they must be repacked according to FIGURE 821.
- 5.10 Attach the operating lanyard and doorway bowsing lines sachets to the outside of the container using double sided tape. Refer to FIGURE 821.
- 5.11 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.
Refer to FIGURE 821.
- 5.12 Before installing the cylinder, make sure that the black operating head has been replaced with the correct white model.

CAUTION: DISPOSE OF ALL BLACK OPERATING HEADS.

- 5.13 Refer to **Appendix 12** for steps on installing and checking a Leafield GIST operating head.

WARNING: THE OPERATING HEAD MUST BE TIGHT ON THE CYLINDER VALVE.

- 5.13.1 The actuator cables are colour coded for application.
The white overmould (longer cable) is used with the white operating head.

CAUTION: THE ACTUATOR CABLES ARE NOT INTERCHANGEABLE.

WARNING: DO NOT REMOVE THE RECOIL CAPS FROM THE CYLINDER VALVE YET.

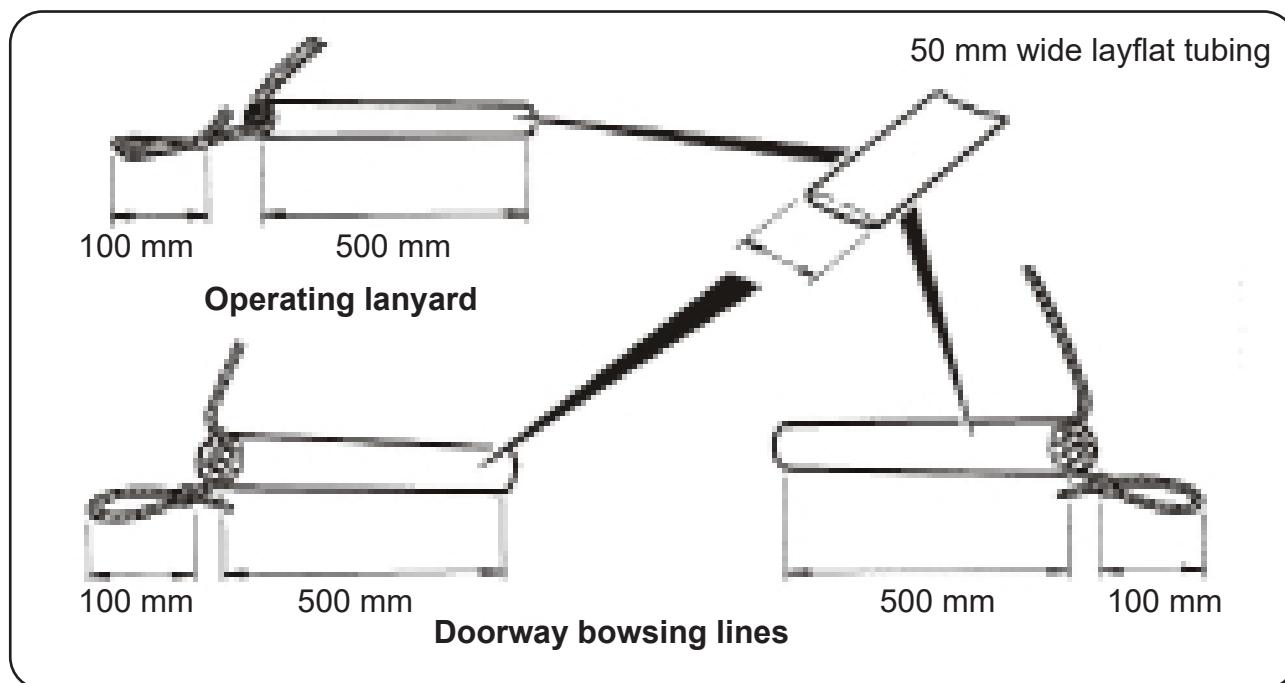


FIGURE 821
Preparation of operating lanyard and doorway bowsing lines

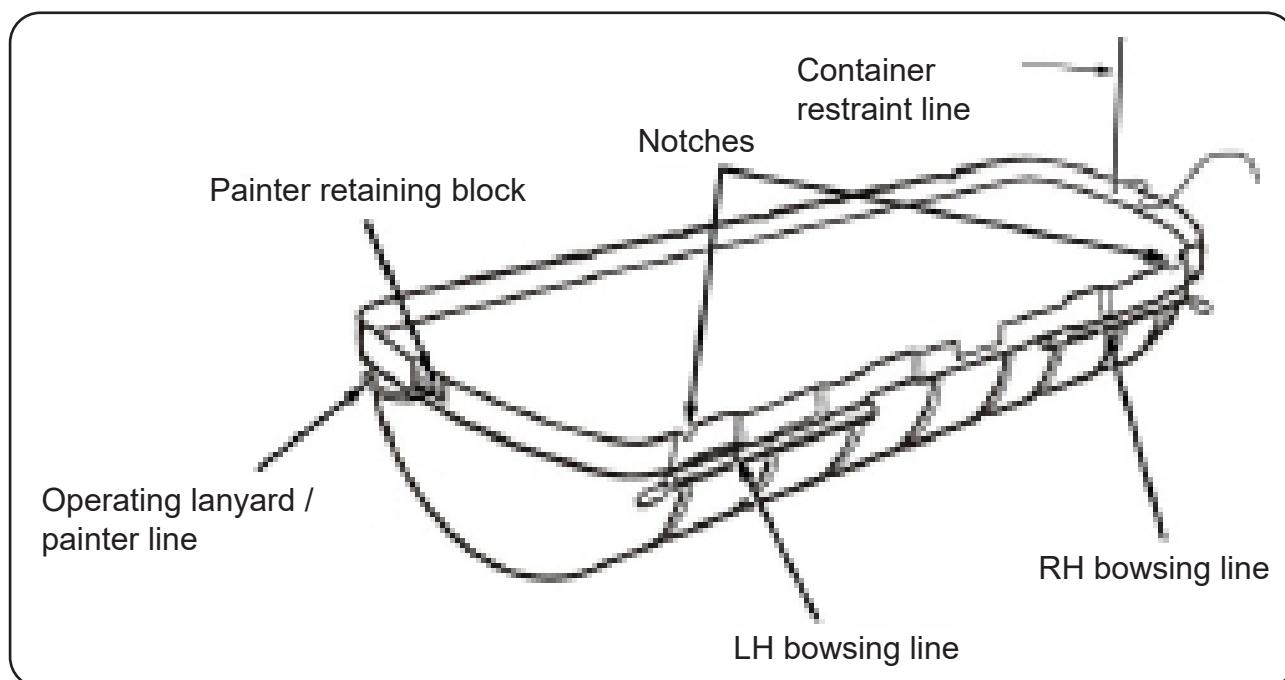


FIGURE 822
Doorway bowsing lines and operating lanyard location

- 5.14 Turn the edge of the liferaft up to reveal the cylinder stowage pocket/straps.
Refer to FIGURE 824.
Slide the cylinder into the cylinder stowage arrangement, taking care not to trap the righting strap.
The cylinder must be orientated so that the top operating head outlet, runs parallel with the base of the liferaft. Refer to FIGURE 824.

- 5.15 Attach the cord to the cylinder neck.

5.15.1 Liferafts with blue cylinder pockets:

- (a) Using the cord attached to the cylinder stowage pocket, tie the cylinder neck securely. Tie with 2 turns around the cylinder neck with a reef knot and 2 half hitches.

5.15.2 Liferaft with velcro straps:

- (b) Tie the cylinder neck securely to the adjacent loop patch on the floor. Use a reef knot and 4 half hitches with 2 turns of 238 kgf / 525 lb nylon cord, 450 mm long and tape the flying ends.

- 5.16 Remove the recoil / transit caps from the cylinder valve.

Refer to FIGURE 823A.

- 5.17 Check inflation hoses for damage and replace if necessary. Refer to **Appendix 14** for guidance on inspection the inflation hose. Connect each inflation hose. Refer to FIGURE 824. Torque the hose connections as stated in Chapter 1, TABLE 101. Use one turn of white tape with a pull tail on each hose connection to show that they have been torqued.

WARNING: FOR 4, 6, 8, 10 AND 12 PERSON LIFERAFTS THE BOTTOM HOSE MUST GO UNDER THE RIGHTING LADDER AND THEN CONNECTED TO THE CYLINDER VALVE.

WARNING: AT ALL STAGES OF PACKING PLEASE CHECK THE ORIENTATION OF THE HOSE THAT RUNS TO THE UPPER BUOYANCY TUBE WITH THE BAYONET FITTING. THE HOSE MUST BE STRAIGHT AND RUN PARALLEL TO THE WALL OF THE CONTAINER. IT MUST NOT POINT TOWARDS THE CONTAINER.

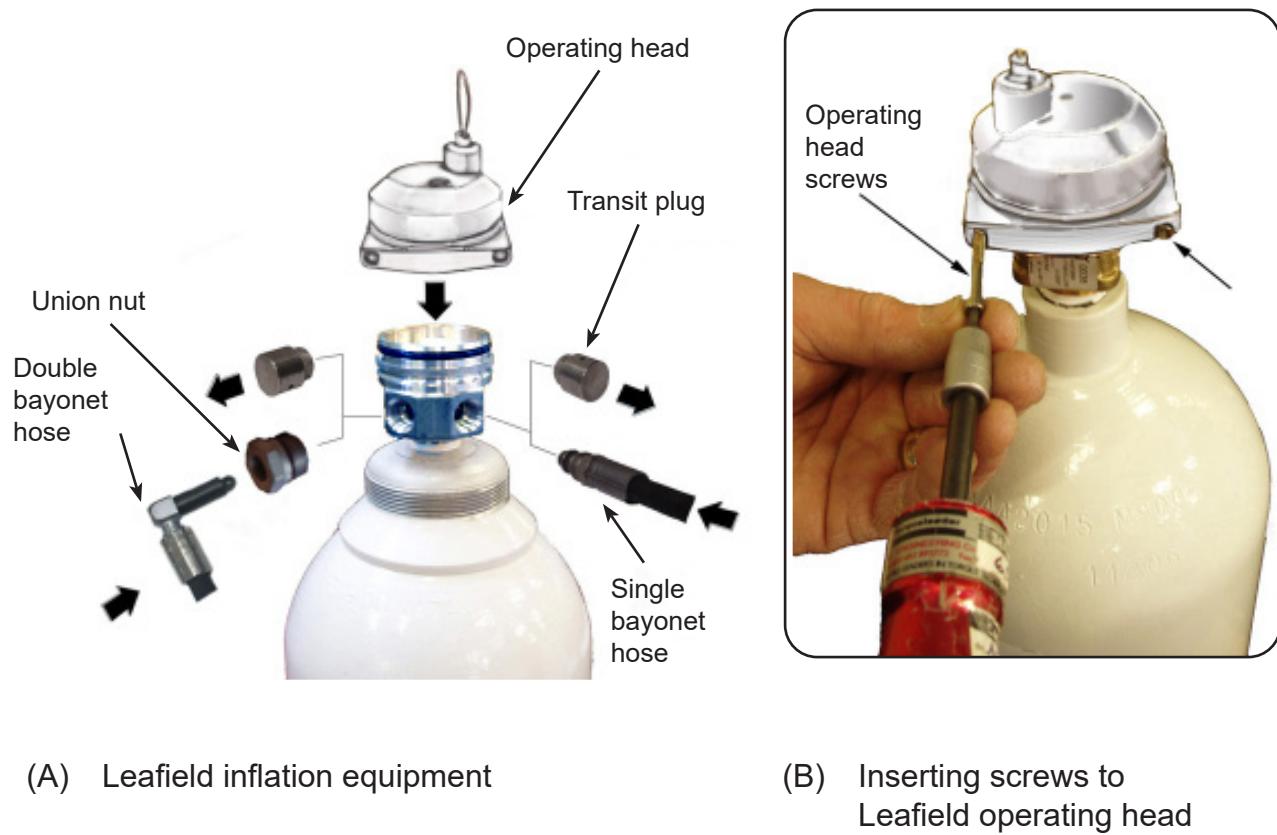
If the bottom buoyancy hose needs to be replaced, a double end bayonet type is used. Please note, two options are available for connecting hose to the operating head.

- 5.17.1 If the cylinder valve has no embossed 'L', connect the hose using a copper washer, union nut and O-ring.

- 5.17.2 If the cylinder valve has an embossed 'L', connect the hose using a union nut and O-ring.



FIGURE 823
White operating head



(A) Leafield inflation equipment

(B) Inserting screws to
Leafield operating head

FIGURE 823A
Assembly of inflation equipment

NOTE: Replace the O-ring if you see damage or distortion.

- 5.18 Insert two pieces of protective foam onto the operating head and tape together, using 100 mm (4") adhesive tape. Refer to FIGURE 825.
Lay the liferaft flat on the table again.
- 5.19 Mount the lower half of the container on a suitable strong trolley. Position the container next to the table with the davit ring pointing 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.
- 5.20 Grasp the edge of the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container.
Refer to FIGURE 826.
 - 5.20.1 MK 10 CONTAINER: - The top edge of the cylinder must be level with the inner container lip. Refer to FIGURE 826 Detail A.
The operating head must be 200 mm from the container end.
 - 5.20.2 MK 14 CONTAINER: - The cylinder must be put in the centre and with the operating head between 150 mm to 200 mm from the end of the container. Refer to FIGURE 826 Detail B.
- 5.21 Work the liferaft floor area down into the recesses towards each end of the container.
- 5.22 Pack the E-pack valises for the liferaft. Refer to Chapter 7.
If present, put the valise(s) containing the food rations and water sachets positioned furthest from the operating head end of the cylinder.
- 5.23 Put the centre E-pack into the container first. This will help to keep the cylinder in its correct position.

CAUTION: MAKE SURE THAT THE E-PACK IS PUT UNDER THE HAULING-IN LADDER.

- 5.24 Fold back the liferaft to reveal the operating mechanism.
- 5.25 Obtain the painter sachet. Wrap a polyethylene sheet, 915 mm × 800 mm (36" × 31.5") around the end of the painter sachet and tape it in place.

The polyethylene sheet must extend over the open end of the sachet and the painter line by at least 100 mm (4") but no more than 150 mm (6").

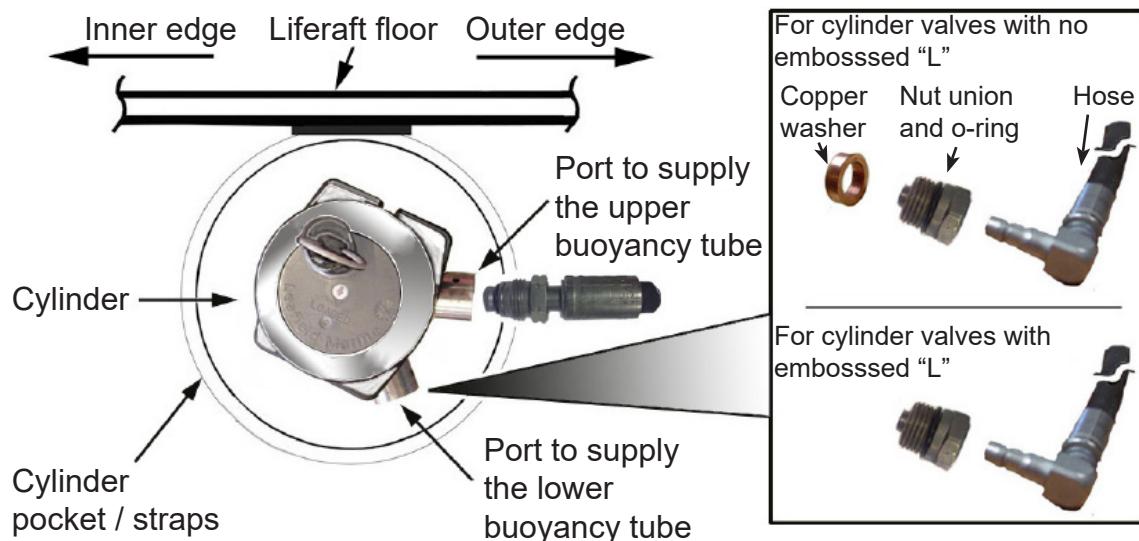


FIGURE 824
Cylinder attachment to liferaft

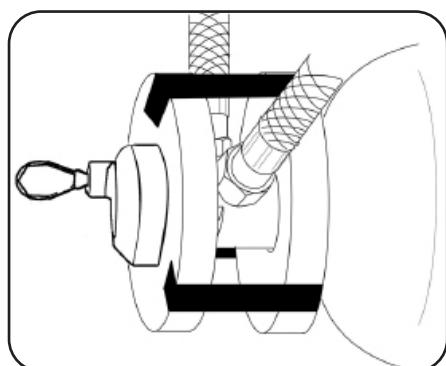


FIGURE 825
Protective foam for operating heads

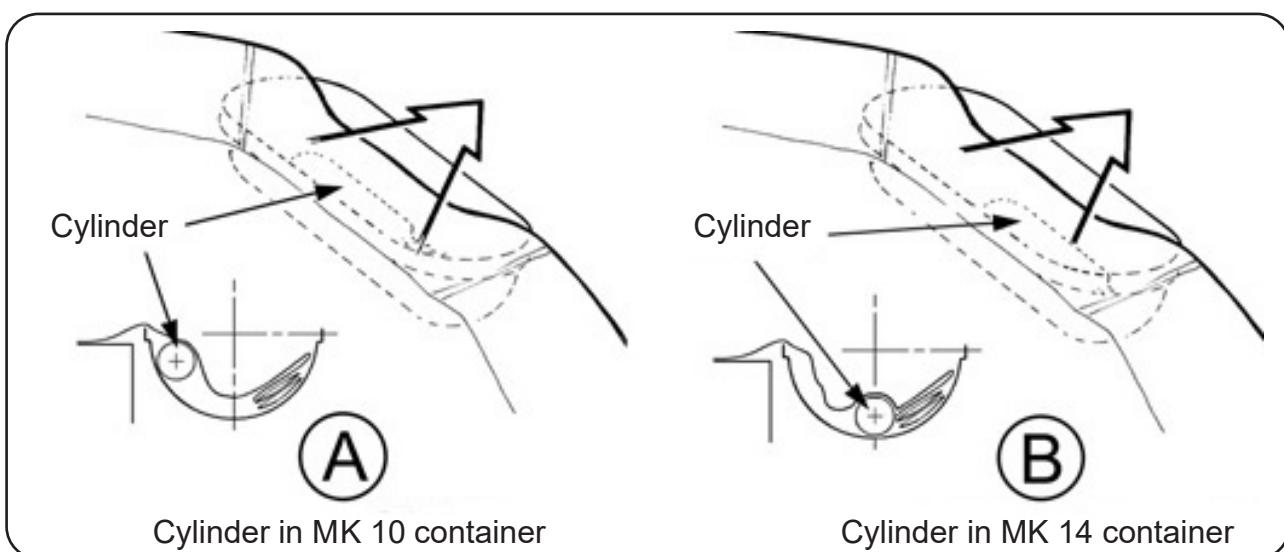


FIGURE 826
Cylinder position in the container

- 5.26 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. Refer to FIGURE 827.

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

- 5.27 Put a 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.
- 5.28 Put both eyelets of the operating lanyard onto the operating actuator cable. Refer to FIGURE 828.
- 5.29 Make sure that 2.1 m (83") exits the painter sachet. Pull the 1.5 m (60") end of the painter line taut. Put a 300 mm (12") length of layflat tubing over the painter line. Refer to FIGURE 828.
- 5.30 At the firing point (1.5 m (59") from the end of the line) pass the actuator cable of the operating mechanism through the painter line. Thread the remaining painter line back through the actuator cable. Refer to FIGURE 828.

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

- 5.31 Make sure that the painter cord is firmly attached to the operating head by lightly pulling on the painter cord. Refer to FIGURE 828.

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

- 5.31.1 Apply two turns of white tape around the painter cord. Refer to FIGURE 828. Fold the end of the tape over on itself to create a pull tail. This will make it easier to remove the tape at the next service.

- 5.32 Locate the painter attachment cord on the lower buoyancy tube. Attach the liferaft end of the painter to the painter cord. Refer to FIGURE 829A. Use a splice tool and half knot, then tape the flying end. Refer to FIGURE 829B.

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

- 5.33 Locate the painter attachment patch on the lower buoyancy tube. Tie the liferaft identification tube, red ribbon to the patch. Refer to FIGURE 830. Use a bowline knot and tape the flying end.

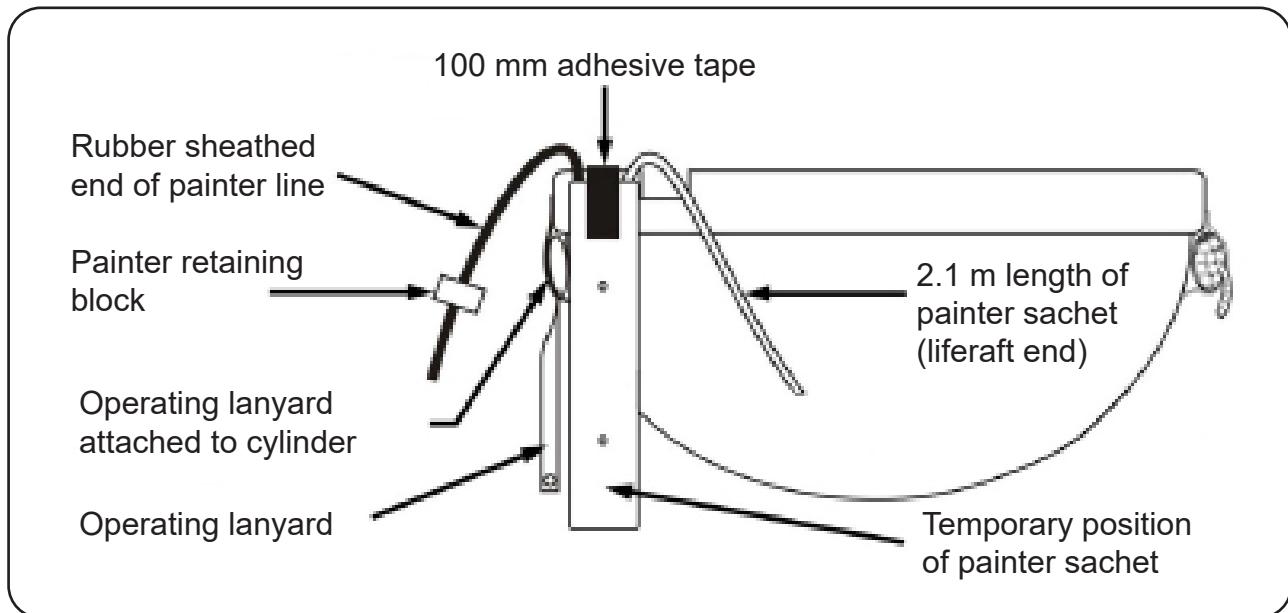


FIGURE 827
Attach operating lanyard and painter sachet to the container

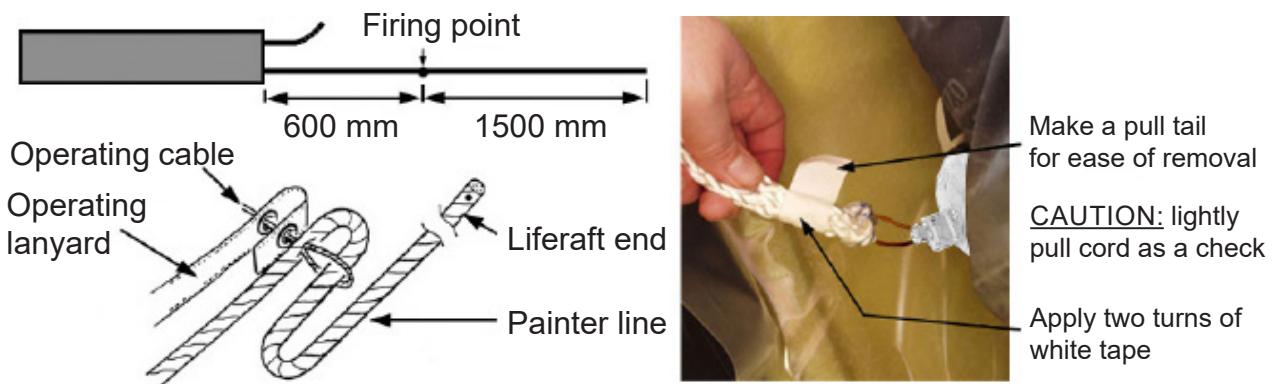


FIGURE 828
Attachment of Painter line and operating lanyard to operating mechanism

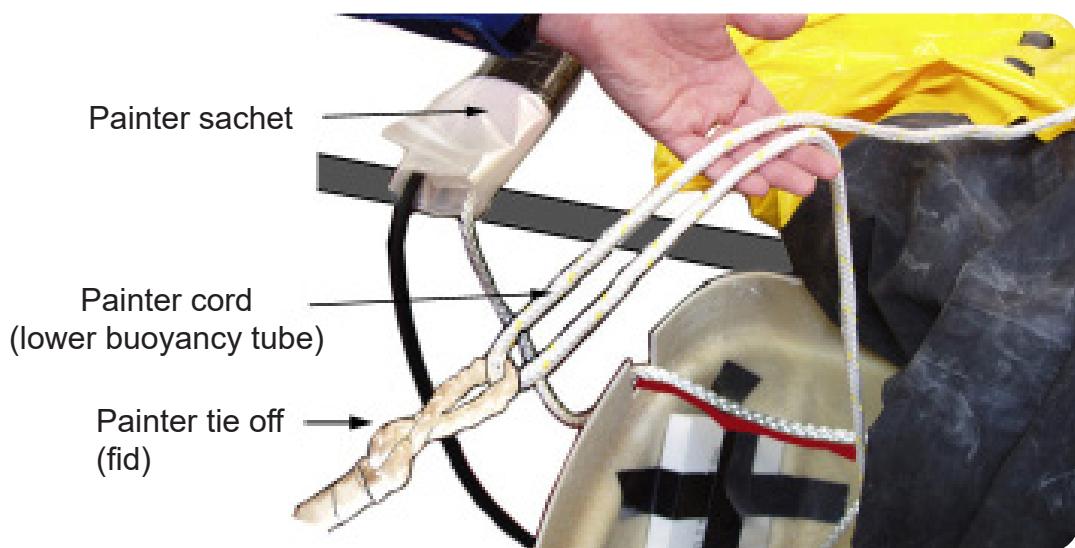


FIGURE 829A
Tie the painter line to the painter patch

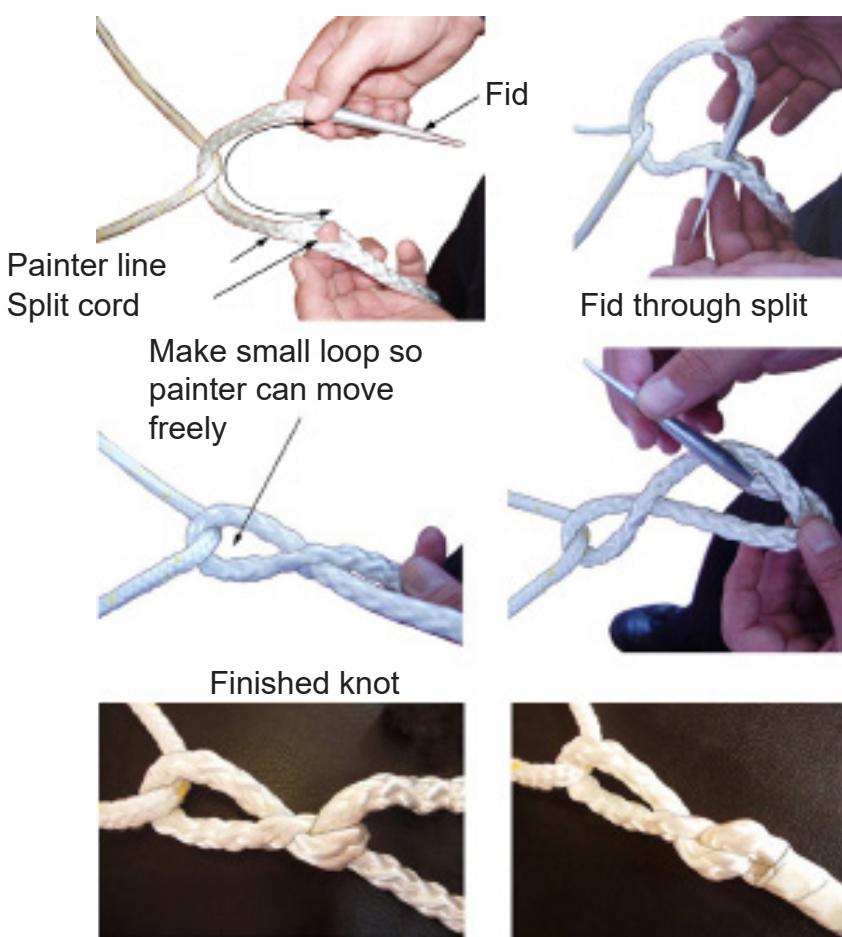


FIGURE 829B
Splice knot procedure using a fid

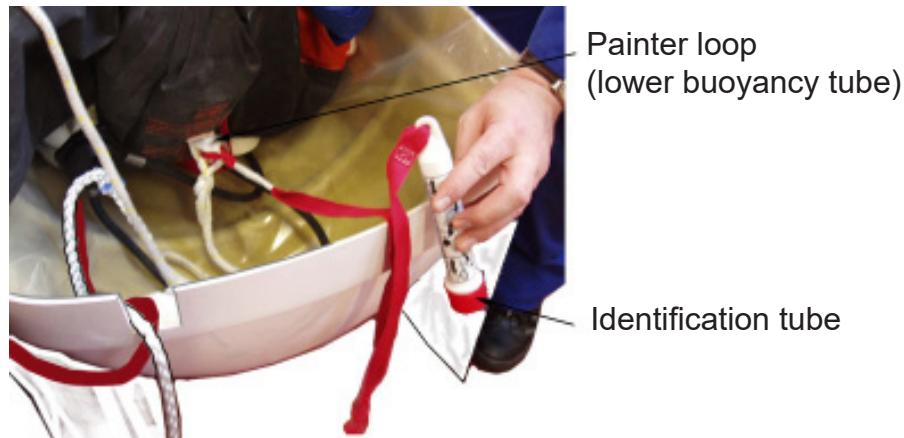


FIGURE 830
Tie identification tube to the painter patch

- 5.34 Position the remaining E-pack valises into the container.

For correct positioning please refer to Chapter 7. Use the space available to minimise the vertical excursion of the valises. Make sure that the straps on each E-pack valise are tight.

CAUTION: MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING-IN LADDER. MAKE SURE THAT NO PARTS OF THE CANOPY OR DOOR ARE TRAPPED BENEATH THE PACKS.

- 5.35 Using the straps on each valise, tie them to the inner lifeline. Use an overhand knot. This will secure the packs to the liferaft.

- 5.36 Locate the bowsing line patches on the bottom buoyancy tube below the doorway. Refer to FIGURE 831A. Tie the left doorway bowsing line to the left doorway bowsing patch and the right doorway bowsing line to the right doorway bowsing patch. Use the procedure that follows and refer to FIGURE 832B:

- 5.36.1 Take the liferaft end of the bowsing line and double it at the premarked black dot.

- 5.36.2 Insert the doubled bowsing line into the bowsing line loop patch.

NOTE: The bowsing line must be inserted upwards into the loop patch.

- 5.36.3 Reach through the double loop and pull the LONG end of the bowsing line through. Pull on the short end of the bowsing line, to tighten the new loop that has just been created.

- 5.36.4 Reach through the newly created loop and pull the SHORT end of the bowsing line through. Pull on the long end of the bowsing line, to tighten the loop.

- 5.36.5 Check that the quick release knot is secure and has been created at the correct end (the liferaft bowsing line patch). To check, pull on the long end of the bowsing line. The knot must remain intact.

- 5.36.6 Tie a "Figure-of-8" knot on the end of the short bowsing line.

- 5.37 Secure the foot ladder to the liferaft using the velcro strap.
Refer to FIGURE 831A.



FIGURE 831A
Secure bowsing lines and foot ladder

5.38 Connect a suction hose to each of the three deflation points and deflate the buoyancy tubes fully.

- (a) 2 at the rear door, 1 on each buoyancy tube
- (b) 1 on the arch tube (if fitted)

5.39 Enter the liferaft by the rear door and connect the switch activator to the internal lamp.

5.40 Locate the drogue and attach it to the drogue patch

5.41 Before folding the liferaft, pull the canopy towards the container.

5.41.1 Check that the internal lamp is not obstructing the hauling-in ladder cord.

5.42 Collect the boarding ramp foot ladder and velcro it securely to the boarding ramp. Refer to FIGURE 832B.

5.43 Knife check

5.43.1 Make sure that the knife was installed and that the flaps of the pocket are correctly closed.

Firmly grasp the floor and sides of the liferaft. Haul the liferaft forward, so as to cover the E-pack valises. Bring the davit ring towards the container cut out. Position the davit ring correctly at the container davit access point (FIGURE 832B).

5.44 Tie a red ribbon through the davit ring using a figure of eight knot.

Refer to FIGURE 832A.

5.45 Fold the polyethylene cut out flap under the davit ring. Refer to FIGURE 832B.

5.46 Prepare to start the sequence of liferaft folding.

For a MK 10 container refer to FIGURE 834A. or for a MK 14 container refer to FIGURE 834B

- (a) Fold the LS of the liferaft over.
- (b) Fold the RS of the liferaft over.
- (c) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.

5.47 Twist the boarding ramp and push down on top of the liferaft.

5.48 Press down as tight as possible, roll the liferaft towards and then into the container. Refer to FIGURE 834.

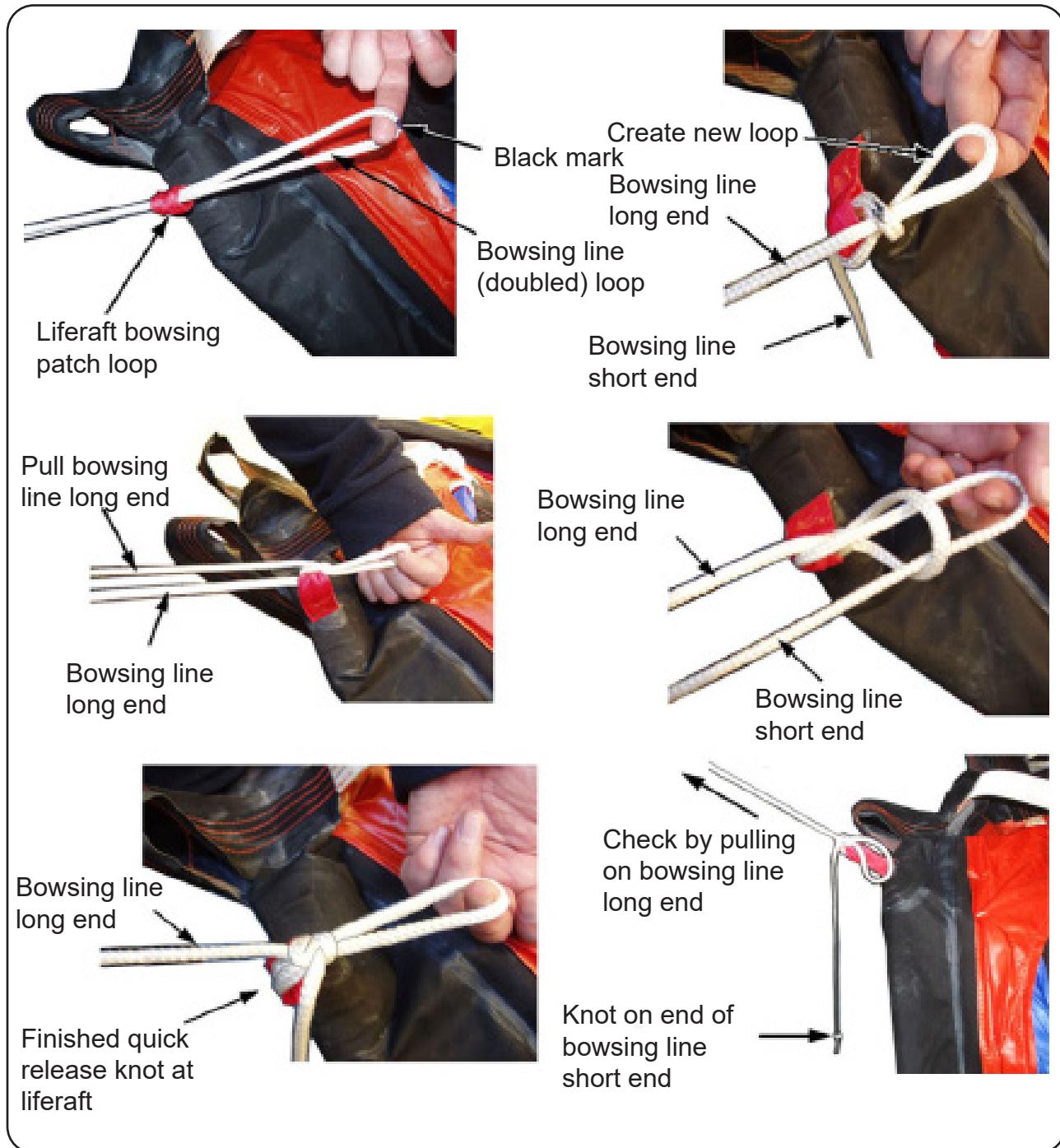


FIGURE 832A
Bowsing line quick release knot

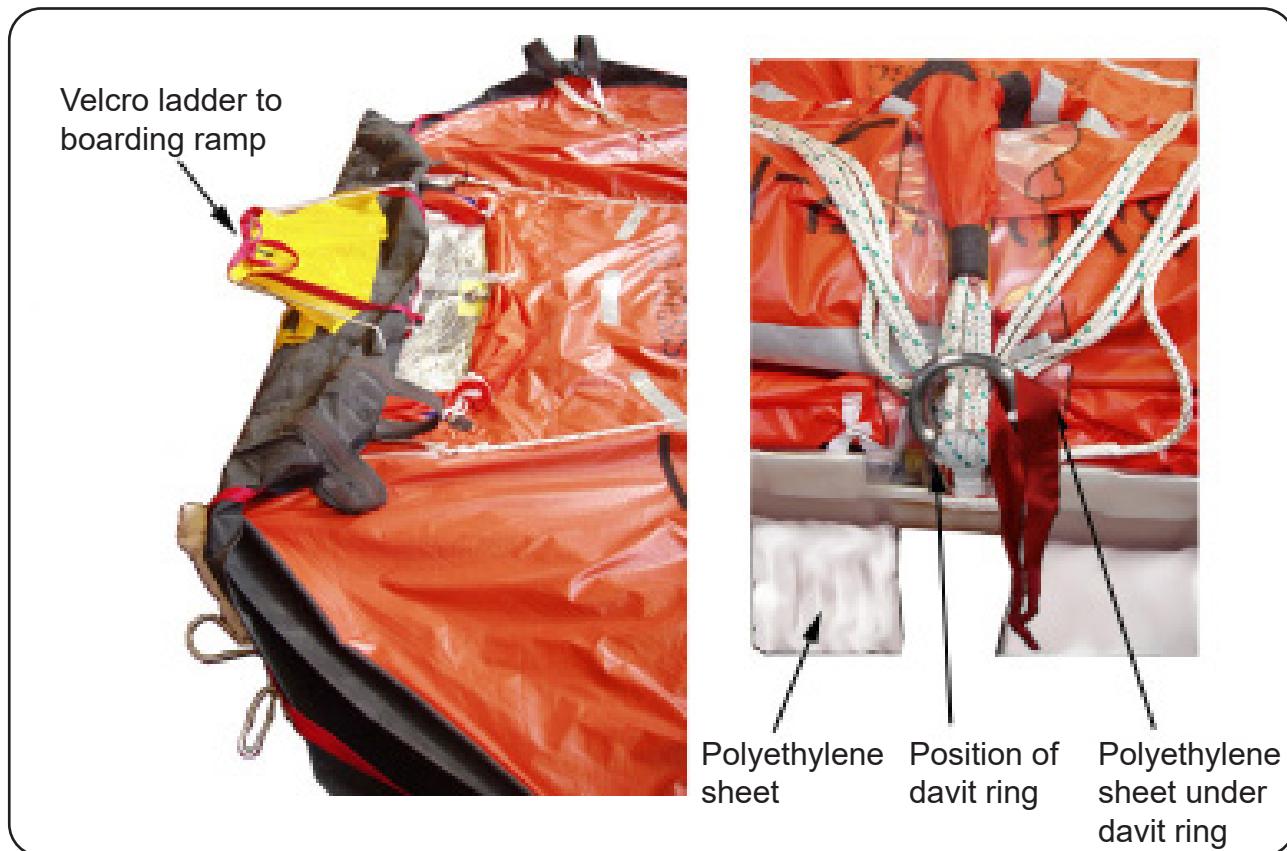


FIGURE 832B
Position of davit ring

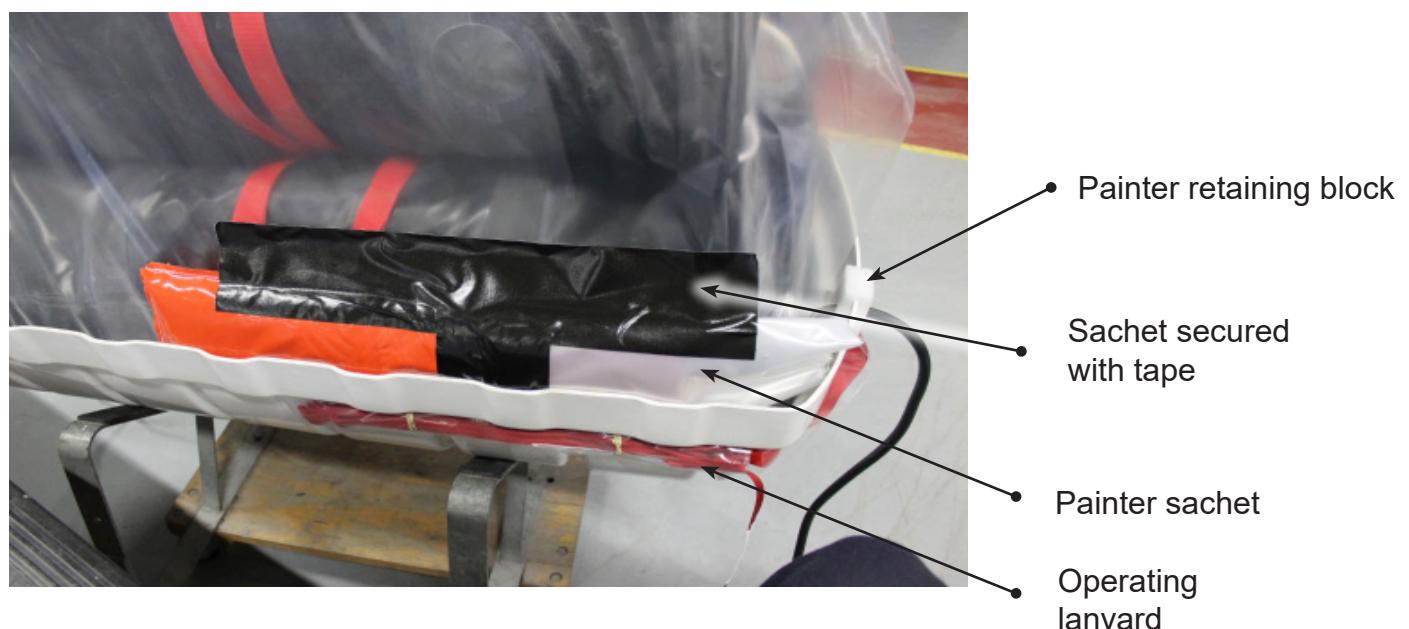


FIGURE 833
Painter sachet positioning

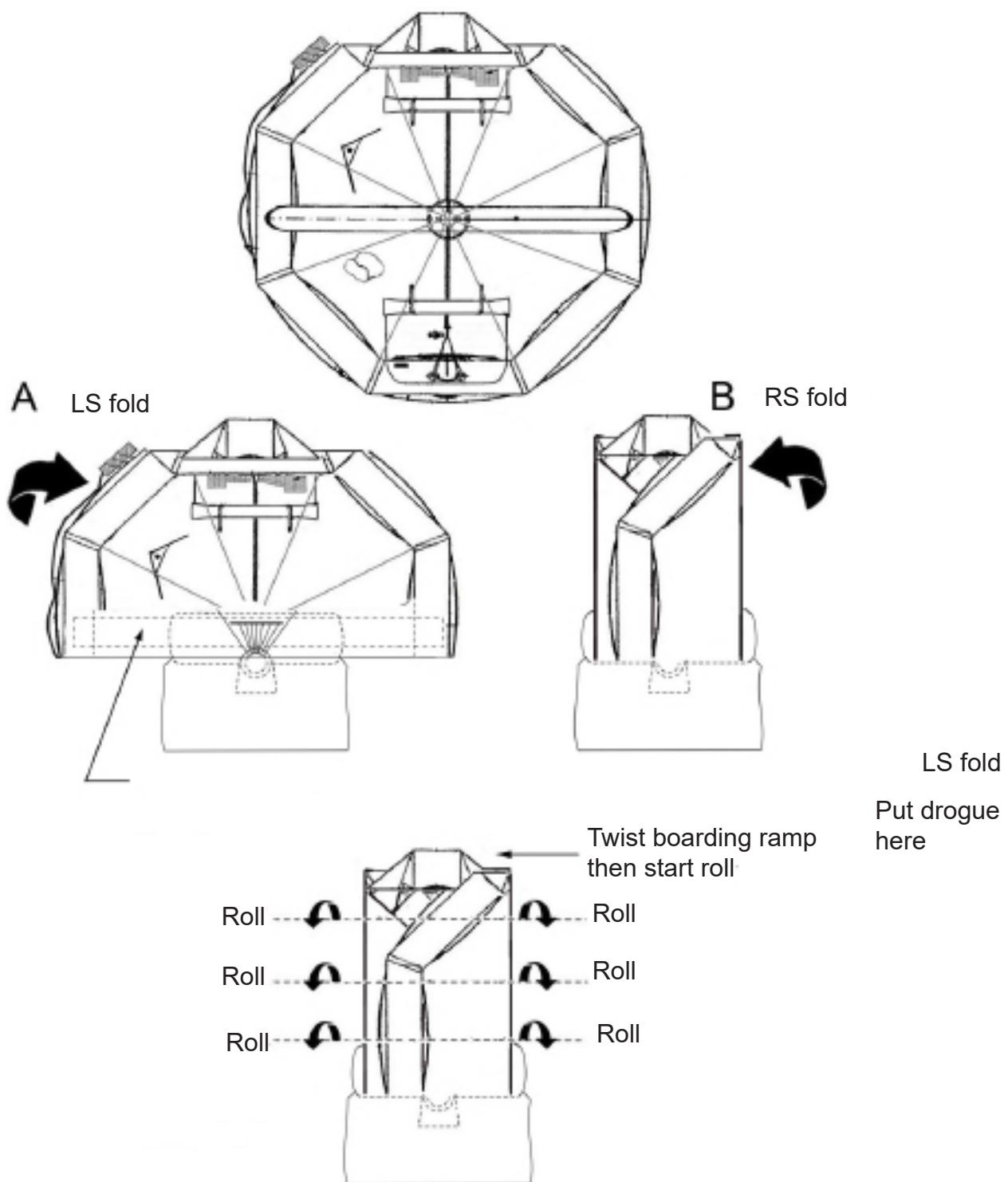


FIGURE 834A
(MK 10 and MK 14 container) Fold the liferaft, 12-25 Person shown

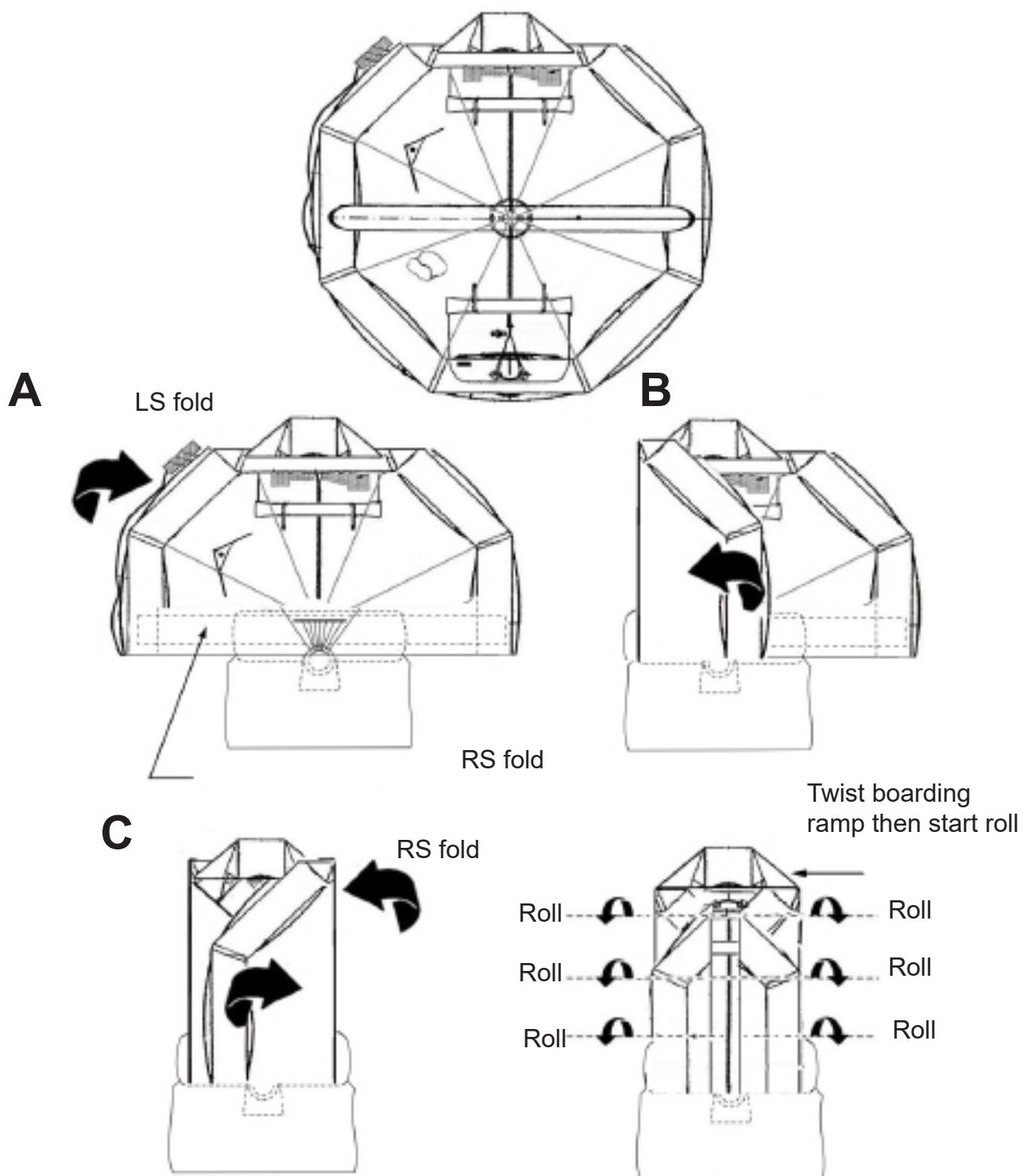


FIGURE 834B
25 DL in MK 14 container - Fold the liferaft

- 5.49 Wrap the polyethylene sheet around the outside of the folded liferaft and tuck the overlap under the roll. Make sure that the polyethylene sheet does not obstruct the davit ring or other items.

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

- 5.50 Put the painter sachet along the back of the container. Refer to FIGURE 833. Make sure that the painter cord is in line with and close to the painter exit hole. Make sure that the painter line can freely exit the sachet.
- 5.51 Make sure 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 - 150 mm (4"- 6"). Refer to FIGURE 833.
- 5.52 Make sure 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.
- 5.53 Secure the painter sachet in place, by taping it to the polyethylene sheet. Refer to FIGURE 833.
- 5.54 Put the rubber sheathed end of the painter line through the painter retaining block. Put the painter retaining block into the cut-out in the container. Make sure that the operating lanyard passes into the container under the painter retaining block. Refer to FIGURE 833.
- 5.55 The davit ring must 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.
Make sure that the rigging lines are neat and tidy and the davit ring ribbon is projecting through the cut-out. Refer to FIGURE 835.
- 5.56 The davit ring is to be positioned no lower than the centre point of the container cutout. From this position, the davit ring is easily accessible through the cut out provided on the container of the operationally packed liferaft.
Refer to FIGURE 835.
- 5.57 Put the top half of the container on top of the folded liferaft.
Refer to FIGURE 835.

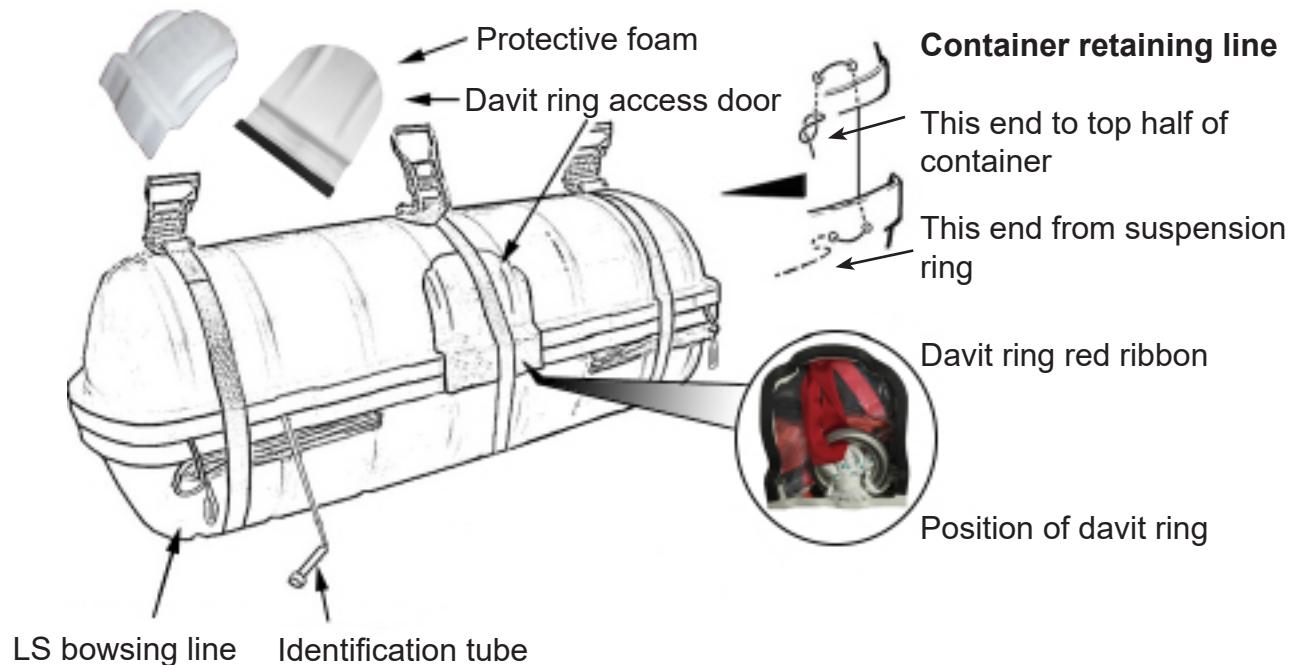


FIGURE 835
Close the container

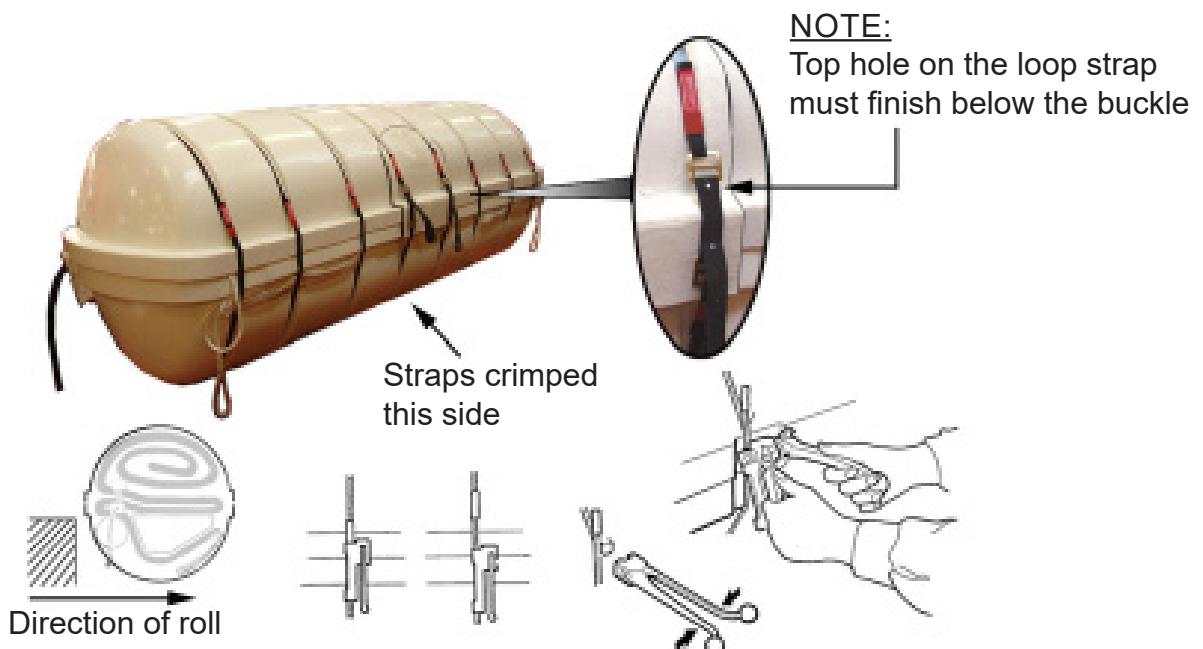


FIGURE 836
Crimping container straps

- 5.58 Take 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. Refer to FIGURE 835.

Tie a 'Figure of 8' knot on the end of the container retaining line and pull the container retaining line tight, so that the knot is against the inside of the container.

- 5.59 Put three ratchet straps around the container, make sure the straps do not cover the grooves in the container. Refer to FIGURE 835.

Tighten the ratchet straps uniformly around the container. Make sure that the upper half of the container mates with the lower half of the container correctly.

- 5.60 Continue closing the container slowly, while alternating from one ratchet strap to the other ratchet strap. 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. Refer to FIGURE 835.

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

- 5.61 Check that the painter retaining block on the painter line does not become displaced.

- 5.62 MK 10 & MK 14 DL ONLY:

Replace the container seal strip (P/N 05606009) around the edge of the DL ring access hole in the container lid at every service. Two strips of protective foam are put along the bottom of the cover / door. Refer to FIGURE 835.

- 5.63 Install the davit ring access door onto the container. Refer to FIGURE 835.

WARNING: WHEN TENSIONING OR CRIMPING STRAPS, YOU 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 835.
(I.E. ON A DL LIFERAFT THE CRIMPS ARE ATTACHED ON THE SIDE WHICH HAS THE DAVIT RING CUT-OUT).

- 5.64 Get two hand loop straps and crimps. These will be used to hold the davit ring access door in place. Refer to FIGURE 836.

WARNING: MAKE SURE THAT THE TOP MARK HOLE ON THE HAND LOOPS FINISHES BELOW THE TOP BUCKLE BEFORE CRIMPING.

- 5.65 Obtain the straps and crimps. Tension and crimp each strap as follows:

- 5.65.1 Adjust the ends of each strap so that the outer most strap end is facing upwards and is approximately 25 mm (1") above the rim of the container. Refer to FIGURE 836.
- 5.65.2 Apply the tensioning tool to each strap at a midpoint 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 using a crimping tool. Refer to FIGURE 836.

- 5.66 Do the step that follows for containers with a drop height of 18 metres or more:

- 5.66.1 Put one extra strap and crimp at each end of the container.
Refer to TABLE 801 and FIGURE 837.

- 5.67 Put 'DO NOT CUT' tape over the top of the straps in each groove of the container. Refer to FIGURE 836.

- 5.68 Remove the ratchet straps.

- 5.69 Refer to Section 7 of this Chapter for container labelling.

Liferaft size	Type	E-Pack type	Container
16	DL	A	MK 10 size 7 MK 14 size 17
20	DL	A	MK 14 size 17
	DL	B	MK 10 size 9
25	DL	A	MK 10 size 9 MK 14 size 17
	DL	B	MK 10 size 7 MK 14 size 17

TABLE 801
Crimping container straps

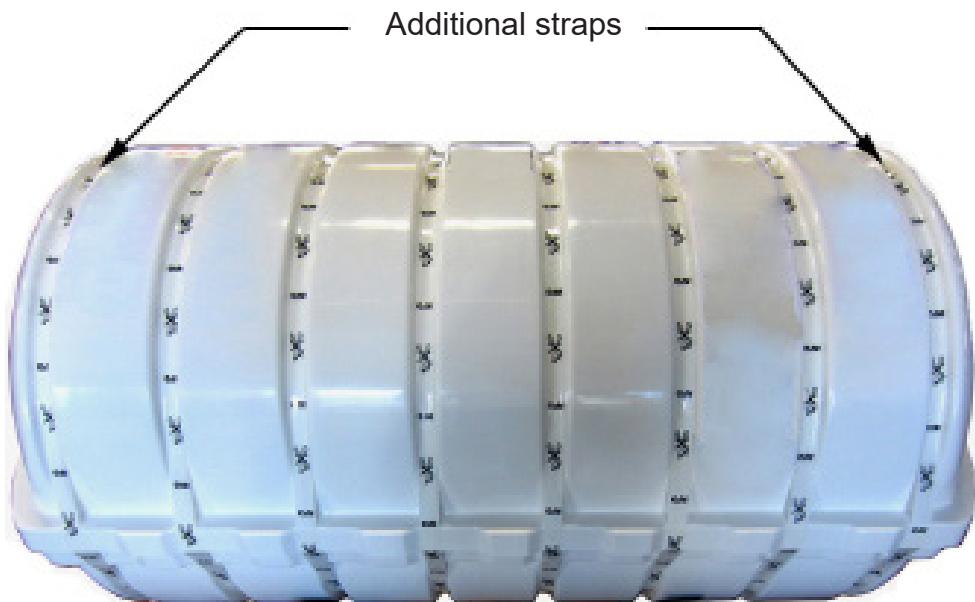


FIGURE 837
Typical container strapping

NOTE: FIGURES 838, 839 and 840 are not used in this Chapter.

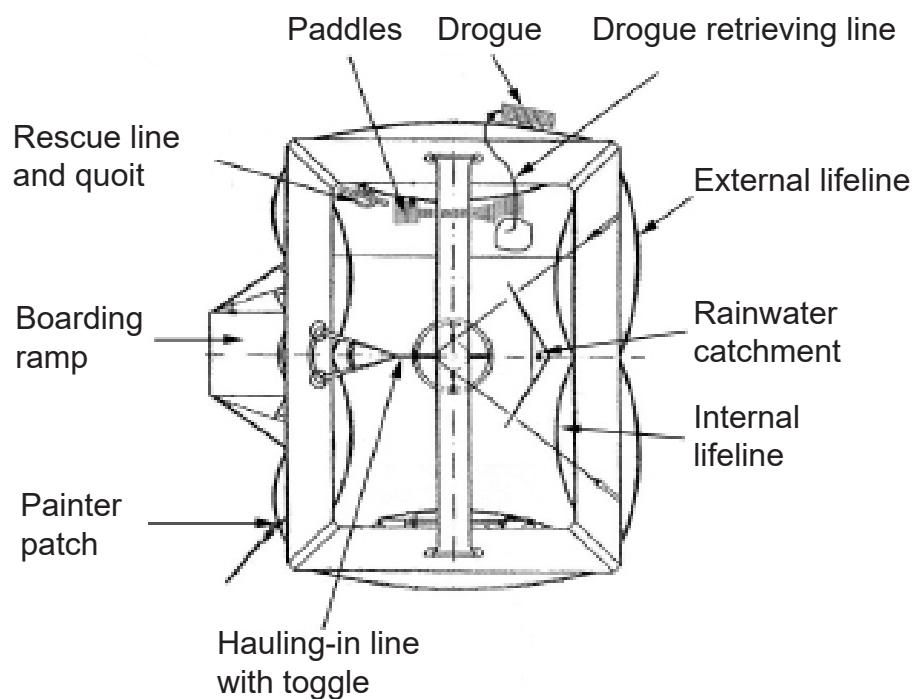
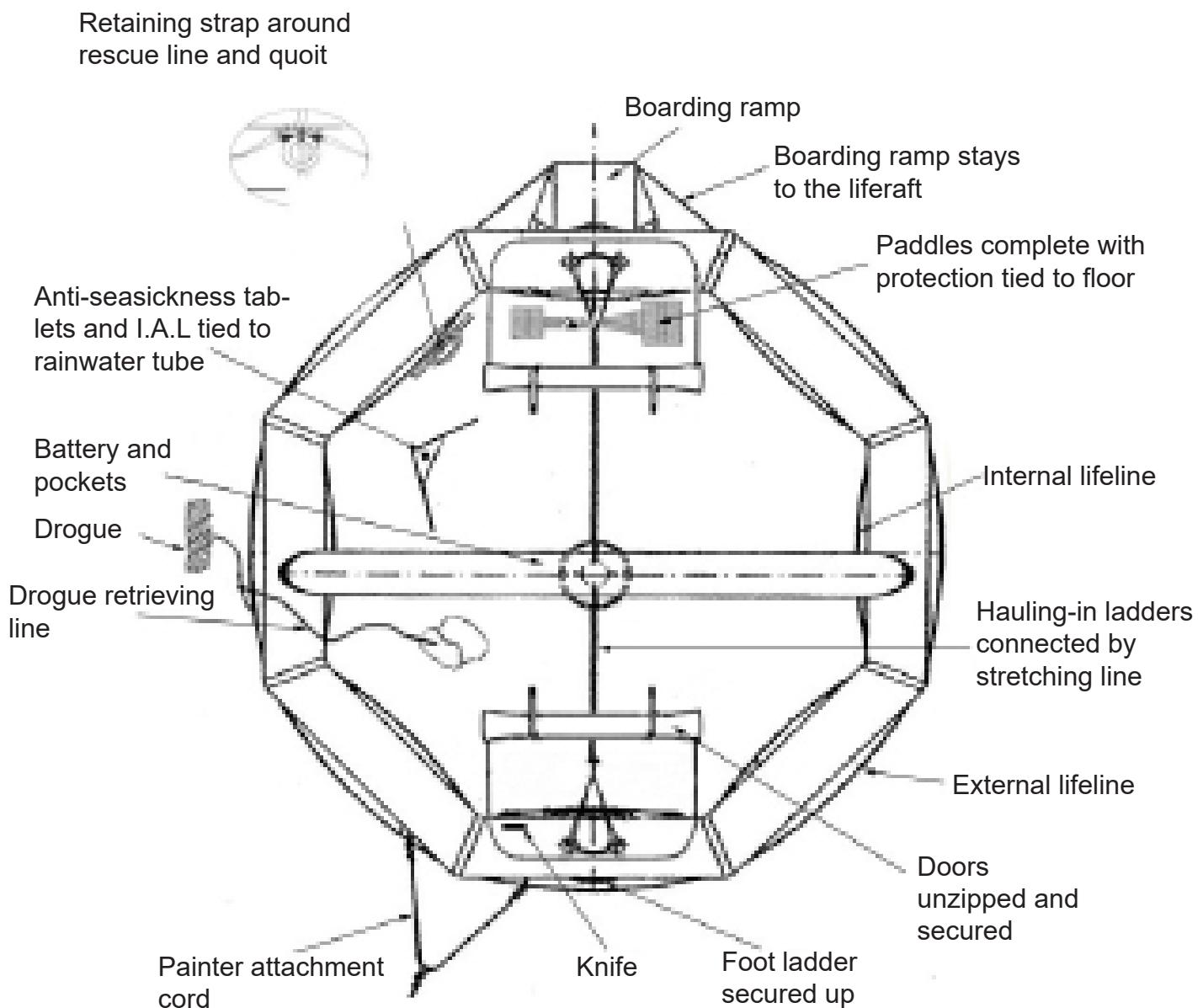


FIGURE 841
Preparation for packing assembly of 4-8 Person Throwover



NOTE: The picture illustrated is 25 Person liferaft. Layout will be similar for other TO liferafts.

FIGURE 842
Preparation for packing assembly for 10-25 Person Throwover

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

6. Packing a Throwover liferaft into a container

NOTE: If you are packing Throwover liferaft into a Silver Series Flat-Pack container then please refer to Appendix 7, SILVER SERIES LIFERAFTS.

- 6.1 Put the liferaft neatly on a packing table in an open area, with enough room to manoeuvre the container during packing. The inflation valves must be positioned adjacent to the edge of the packing table. Make sure that all cordage is neat and tidy.

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

- 6.1.1 Connect a vacuum device to a deflation adapter and evacuate all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
- 6.1.2 As each buoyancy tube is evacuated, adjust the buoyancy tubes so that they lie flat on each other.
- 6.2 Before installing the cylinder, make sure that the black operating head has been replaced with the correct white model.

CAUTION: DISPOSE OF ALL BLACK OPERATING HEADS.

- 6.3 Refer to **Appendix 12** for steps on installing and checking a Leafield GIST operating head.

WARNING: THE OPERATING HEAD MUST BE TIGHT ON THE CYLINDER VALVE.

- 6.3.1 The actuator cables are colour coded for application.
The white overmould (longer cable) is used with the white operating head.

CAUTION: THE ACTUATOR CABLES ARE NOT INTERCHANGEABLE.

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

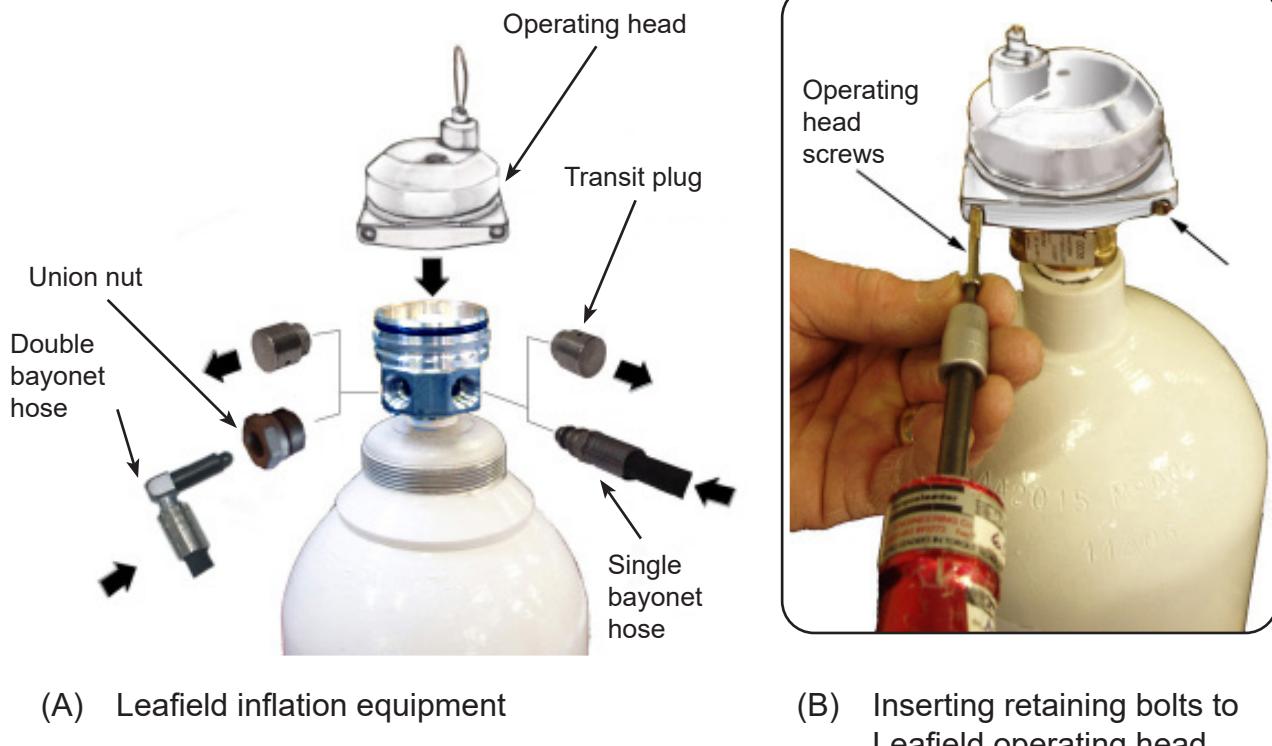


FIGURE 843
Assembly of inflation equipment

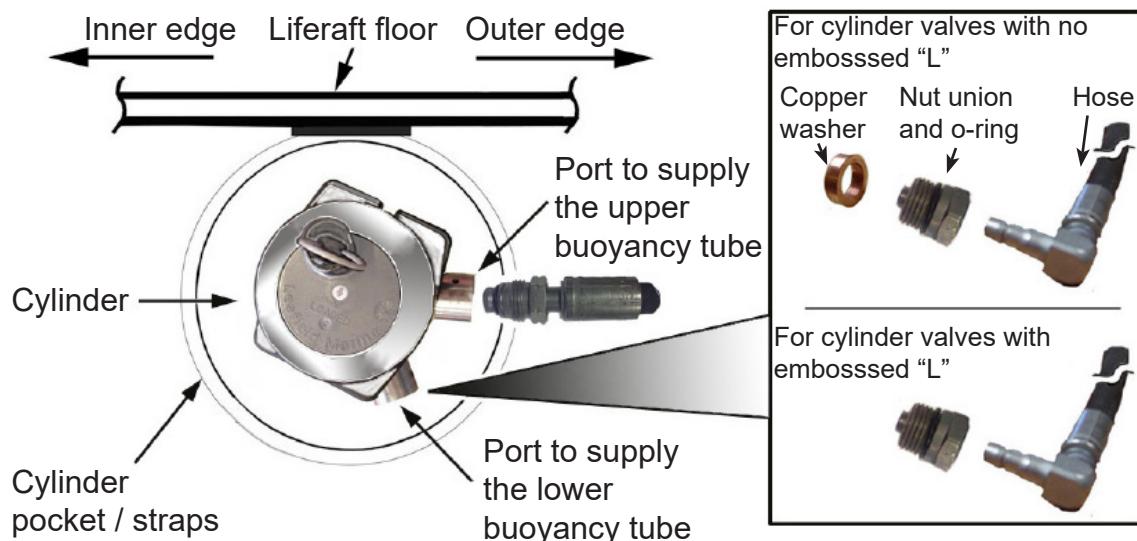


FIGURE 844
Cylinder attachment to liferaft

- 6.4 Upturn the edge of the liferaft to reveal the cylinder stowage pocket/straps. Refer to FIGURE 844. Slide the cylinder into the cylinder stowage arrangement, taking care not to trap the righting strap. The cylinder must be orientated so that the top operating head outlet, runs parallel with the base of the liferaft. Refer to FIGURE 844.
- 6.5 Attach the cord to the cylinder neck.
 - 6.5.1 Liferafts with blue cylinder pockets:
 - (a) Use the cord attached to the cylinder stowage pocket and tie the cylinder neck securely. Tie with 2 turns around the cylinder neck and a reef knot and 2 half hitches.
 - 6.5.2 Liferaft with velcro straps:
 - (b) Tie the cylinder neck securely to the adjacent loop patch on the floor. Use a reef knot and 4 half hitches with 2 turns of 238 kg f / 525 lbf nylon cord, 450 mm long and tape the flying ends.

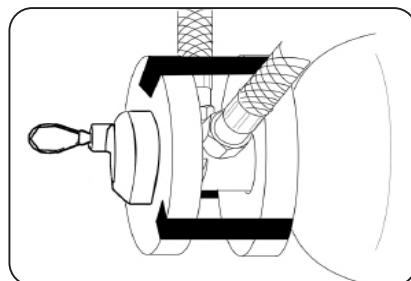


FIGURE 845
Protective foam for operating heads

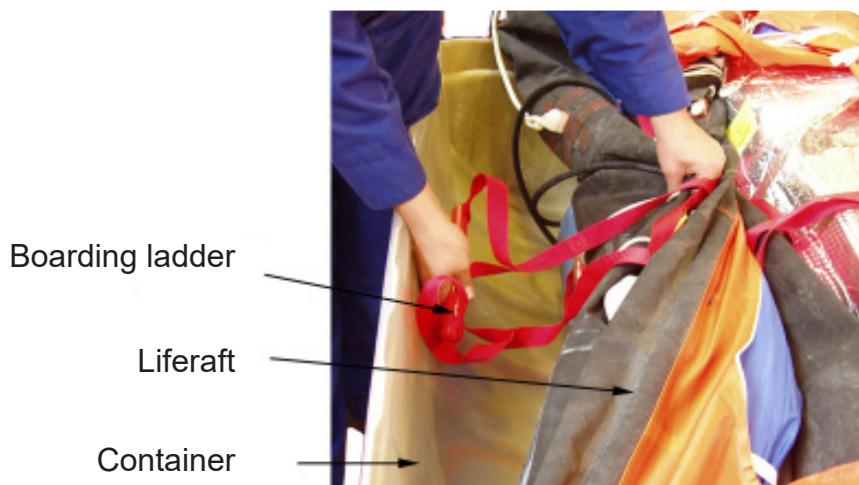


FIGURE 846
Boarding ladder under liferaft

- 6.6 Remove the recoil / transit caps from the cylinder valve.
Refer to FIGURE 843.
- 6.7 Check inflation hoses for damage and replace if necessary. Refer to **Appendix 14** for guidance on inspection the inflation hose. Connect each inflation hose. Refer to FIGURE 843. Torque the hose connections as stated in Chapter 1, TABLE 101.
If the bottom buoyancy hose needs to be replaced, a double end bayonet type is used. Please note, two options are available for connecting hose to the operating head. Use one turn of white tape with a pull tail on each hose connection to show that they have been torqued.
 - 6.7.1 If the cylinder valve has no embossed 'L', connect the hose using a copper washer, nut union and O-Ring.
 - 6.7.2 If the cylinder valve has an embossed 'L', connect the hose using a nut union and O-Ring.
- NOTE: Sealing O-ring is to be replaced at each service.
- 6.8 Insert two pieces of protective foam onto the operating head and tape together, using 100 mm (4") adhesive tape. Refer to FIGURE 845. Lay the liferaft flat on the table again.
- 6.9 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.
- 6.10 Grasp the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container. The operating head must be between 150 mm to 200 mm from the end of the container.
- 6.11 Put the boarding ladder neatly under the liferaft next to the cylinder.
Refer to FIGURE 846.
Applies to 10-25 Person ONLY.
- 6.12 Grasp the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container.
 - 6.12.1 MK 10 CONTAINER:** - The top edge of the cylinder must be level with the inner container lip. Refer to FIGURE 847A. The operating head must be between 150 mm to 200 mm from the end of the container.
 - 6.12.2 MK 14 CONTAINER:** - The cylinder must be put in the centre and with the operating head close to container. Refer to FIGURE 847B.
The operating head must be between 150 mm to 200 mm from the end of the container.

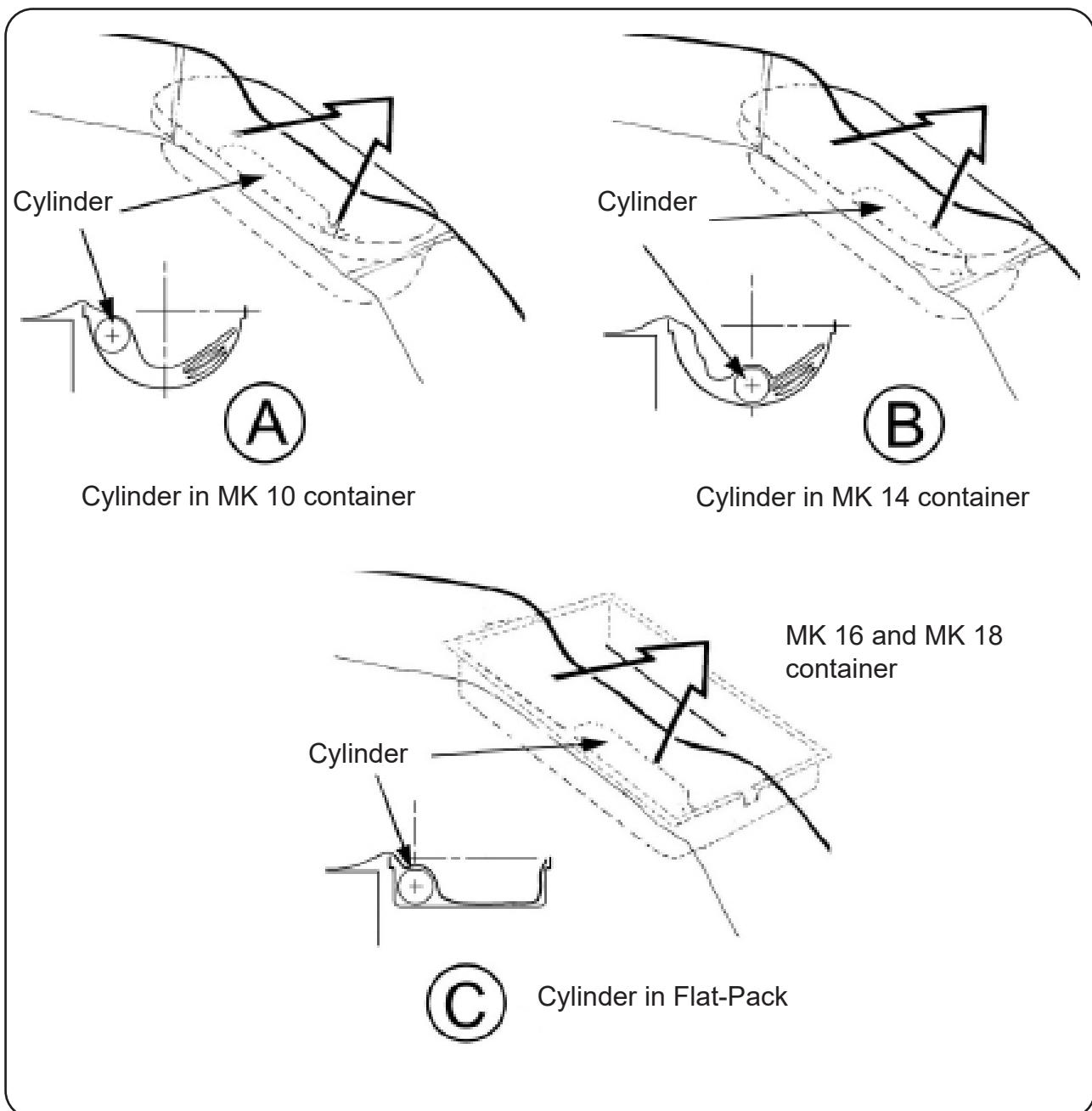


FIGURE 847
Cylinder position in the cylindrical / Flat-Pack container

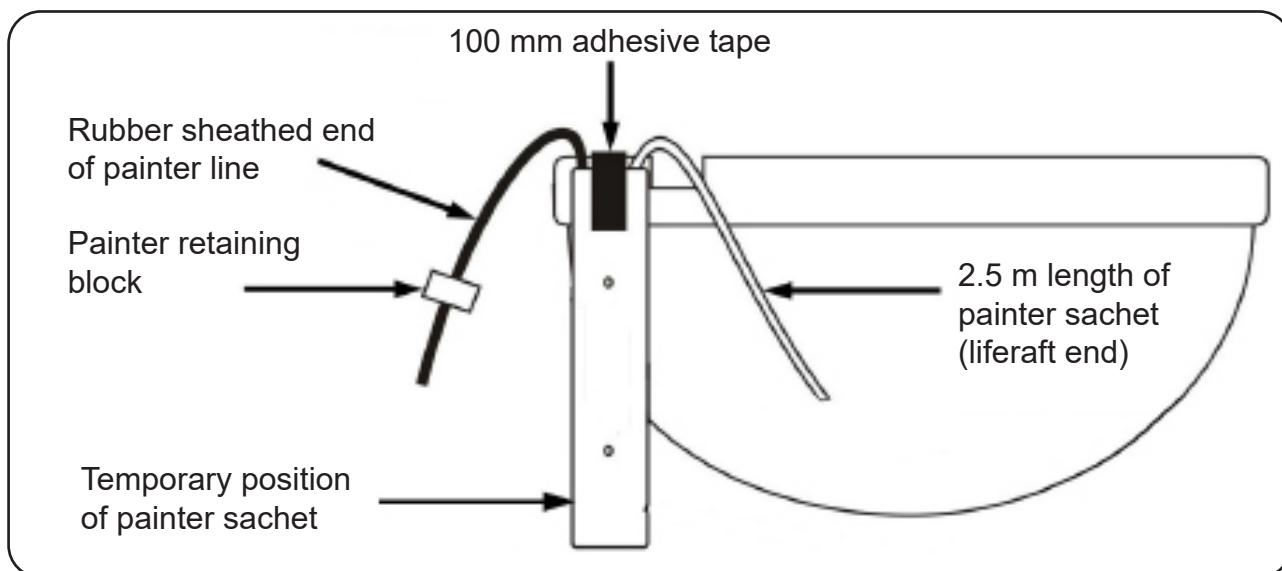


FIGURE 848
Attach operating lanyard and painter sachet to the container

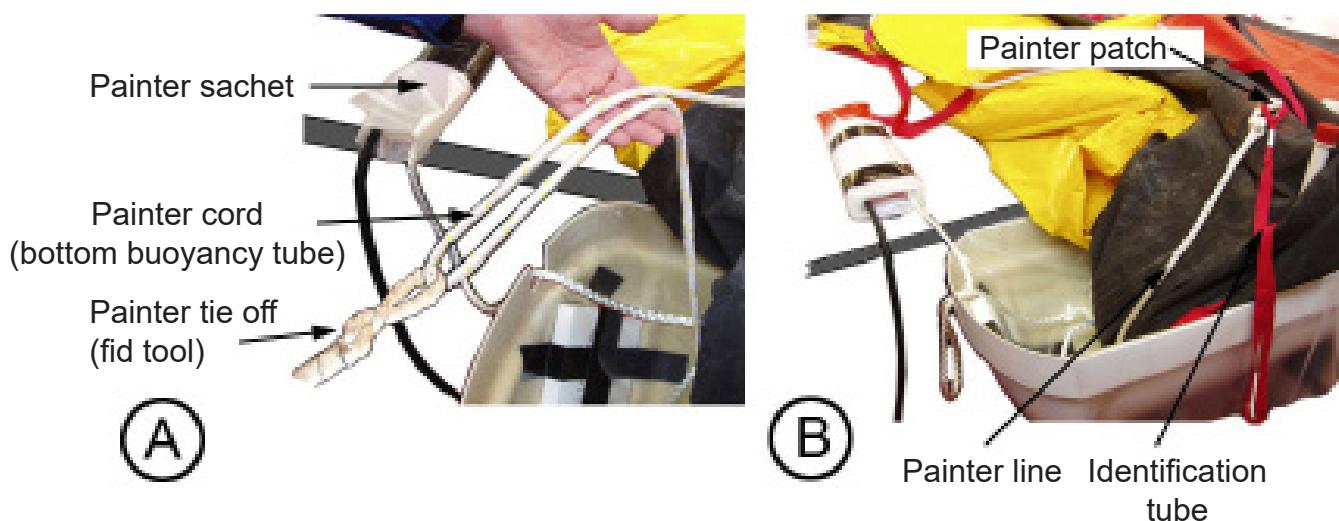


FIGURE 849
Tie painter line to painter cord

- 6.12.3 MK16 / MK 18 FLAT-PACK CONTAINER:** The cylinder must be put at back of container and with the operating head close to the container corner. Refer to FIGURE 847C. Leave space to allow for straight pull of line to reduce pull force values.
- 6.13 Push the liferaft floor area down into the recesses towards each end of the container.
- 6.14 Pack the E-pack valises for the liferaft. Refer to chapter 7, E-PACKS AND EQUIPMENT. If present, put the valise(s) containing food rations and water sachets positioned furthest from the operating head end of the cylinder.
- 6.15 Put the E-pack into the container first. This will help to keep the cylinder in its correct position.
- CAUTION:** FOR 10-25 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING IN LADDER.
- CAUTION:** FOR 4-8 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE ARCH TUBE.
- 6.16 Fold back the liferaft so that you can see the operating mechanism.
- 6.17 Get the painter sachet. Wrap a polyethylene sheet, 915 mm × 800 mm (36" × 31.5") around the end of the painter sachet and use tape to hold it in position.
The polyethylene sheet should extend over the open end of the sachet and the painter rope by at least 100 mm (4") but no more than 150 mm (6").
- 6.18 Make sure that 2.5 m (100") exits the painter sachet. Refer to FIGURE 851.
- 6.19 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. Refer to FIGURE 848.
- 6.20 Tie painter line to the liferaft: Refer to FIGURE 849A.

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

- 6.20.1 At the firing point, (1.5 m (59") from the end of the line), put the actuator cable of the operating mechanism through the painter line. Thread the remaining painter line back through the actuation cable. Refer to FIGURE 851.

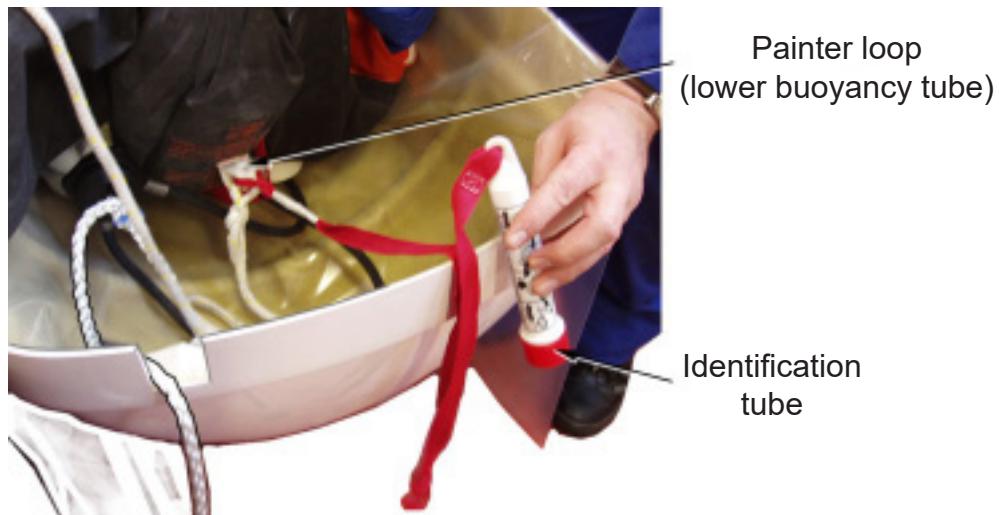


FIGURE 850
10-25 PERSON ONLY - Tie Identification tube to painter patch

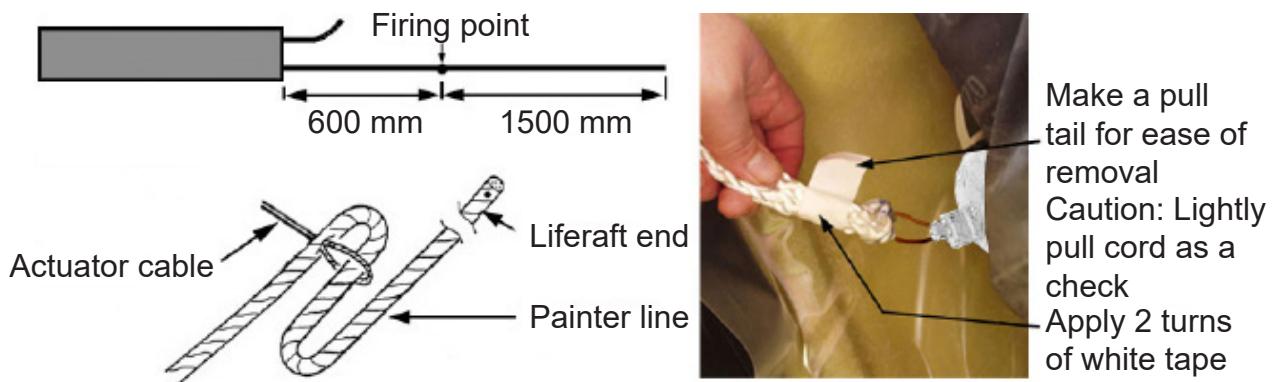


FIGURE 851
Attachment of painter line to operating mechanism

WARNING: THE OPERATING MECHANISM IS NOW ARMED. BE VERY CAREFUL DURING ALL FOLLOWING ACTIONS.

6.20.2 Make sure that the painter cord is firmly attached to the operating head by lightly pulling on the cord. Refer to FIGURE 851.

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

6.20.3 Wind two turns of white tape around the painter cord.

Refer to FIGURE 828. Fold the end of the tape over on itself to create a pull tail. This will make it easier to remove the tape at the next service.

6.20.4 10-25 PERSON - Locate the painter attachment cord on the lower buoyancy tube. Tie the liferaft end of the painter to the painter attachment cord. Use a fid and half knot, then tape the flying end. Refer to FIGURE 829B.

6.20.5 4-8 PERSON - Locate the painter attachment patch on the lower buoyancy tube. Tie the liferaft end of the painter to the painter attachment patch. Use a splice tool and half knot, then tape the flying end. Refer to FIGURE 829B.

6.21 Locate the painter attachment patch on the lower buoyancy tube. Tie the liferaft identification tube red ribbon to the patch. Refer to FIGURE 849B or 850. Use a bowline knot and tape the flying end.

WARNING: BE VERY CAREFUL DURING THE NEXT OPERATION IN ORDER TO AVOID OPERATING THE INFLATION SYSTEM.

6.22 Position the remaining E-pack valises into the container. For correct positioning please refer to Chapter 7.

Use available space to minimise the height of the valises. Make sure that the straps on each E-pack valise are tight.

CAUTION: FOR 10-25 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING-IN LADDER. MAKE SURE THAT NO PARTS OF THE CANOPY OR DOOR ARE TRAPPED BENEATH THE PACKS.

CAUTION: FOR 4-8 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE ARCH TUBE.

6.23 Use the straps on each valise to tie them to the inner lifeline. Use an overhand knot. This will secure the packs to the liferaft.

6.24 Connect a suction hose to each of the three deflation points, and deflate the buoyancy tubes fully.

- (a) 2 at the rear door, 1 on each buoyancy tube
- (b) 1 on the arch tube (if fitted)

6.25 Enter the liferaft by the rear door and connect the switch activator to the internal lamp.

6.26 The step that follows is for the RL5 internal lamp only:

CAUTION: 4-8 PERSON ONLY: FOLD THE ARCH TUBE AROUND THE INTERNAL LAMP.

6.26.1 Fold the arch tube around the internal lamp and secure with 1 turn of 25 mm (1") tape, (FIGURE 852). This will prevent the tension line from interfering with the lighting switch. Make sure that the knife was installed and that the flaps of the pocket are correctly closed.

6.27 Before folding the liferaft, pull the canopy towards the container.

6.27.1 Make sure that the internal lamp is not in the way off the hauling-in ladder.

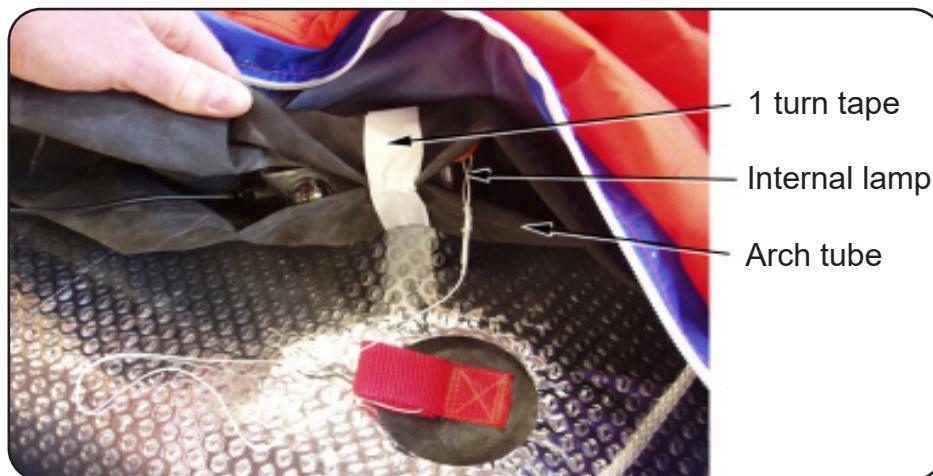


FIGURE 852
4-8 PERSON ONLY - Wrap arch tube around internal lamp

6.28 Prepare to start the sequence of liferaft folding;

- (a) MK 10 container: Refer to FIGURE 853.
 - (i) 25 PERSON - 1 fold LS, 1 fold RS
 - (ii) 10-20 PERSON - 1 fold LS, 1 fold RS
- (b) MK 14 container: Refer to FIGURE 854.
 - (i) 20-25 PERSON - 2 folds LS, 2 folds RS
 - (ii) 10-16 PERSON - 1 fold LS, 1 fold RS
- (c) Flat-Pack container: Refer to FIGURE 855.
 - (i) 20-25 PERSON - 2 folds LS, 2 folds RS
 - (ii) 10-16 PERSON - 1 fold LS, 1 fold RS
- (d) 4N and MK 10 container: Refer to FIGURE 856A.
 - (i) 4-8 PERSON - 1 fold LS, 1 fold RS

NOTE: The boarding ramp must be twisted and folded down before rolling of liferaft can begin. For the 4-8 liferaft the boarding ramp must be laid parallel with the roll.

6.29 Wrap the polyethylene sheet over the front of the liferaft.
Refer to FIGURE 857.

6.30 Locate the drogue and attach it to the drogue patch.

- (a) 4, 6, or 8 person liferafts.
 - (i) Put the rolled up drogue on top of the left side fold.
Refer to FIGURE 856B.
- (b) 10, 12, 16, or 25 person liferafts.
 - (i) Put the rolled up drogue below the water pocket.
Refer to FIGURE 856C.

6.31 Reach into the liferaft and make sure that the knife is flat along the buoyancy tube. Twist the boarding ramp and push it down on top of the liferaft.

6.32 Pressing down as tight as possible, roll the liferaft towards and then into the container.

6.33 Wrap the remainder of polyethylene sheet around the outside of the rolled liferaft, tucking the overlap under the roll.

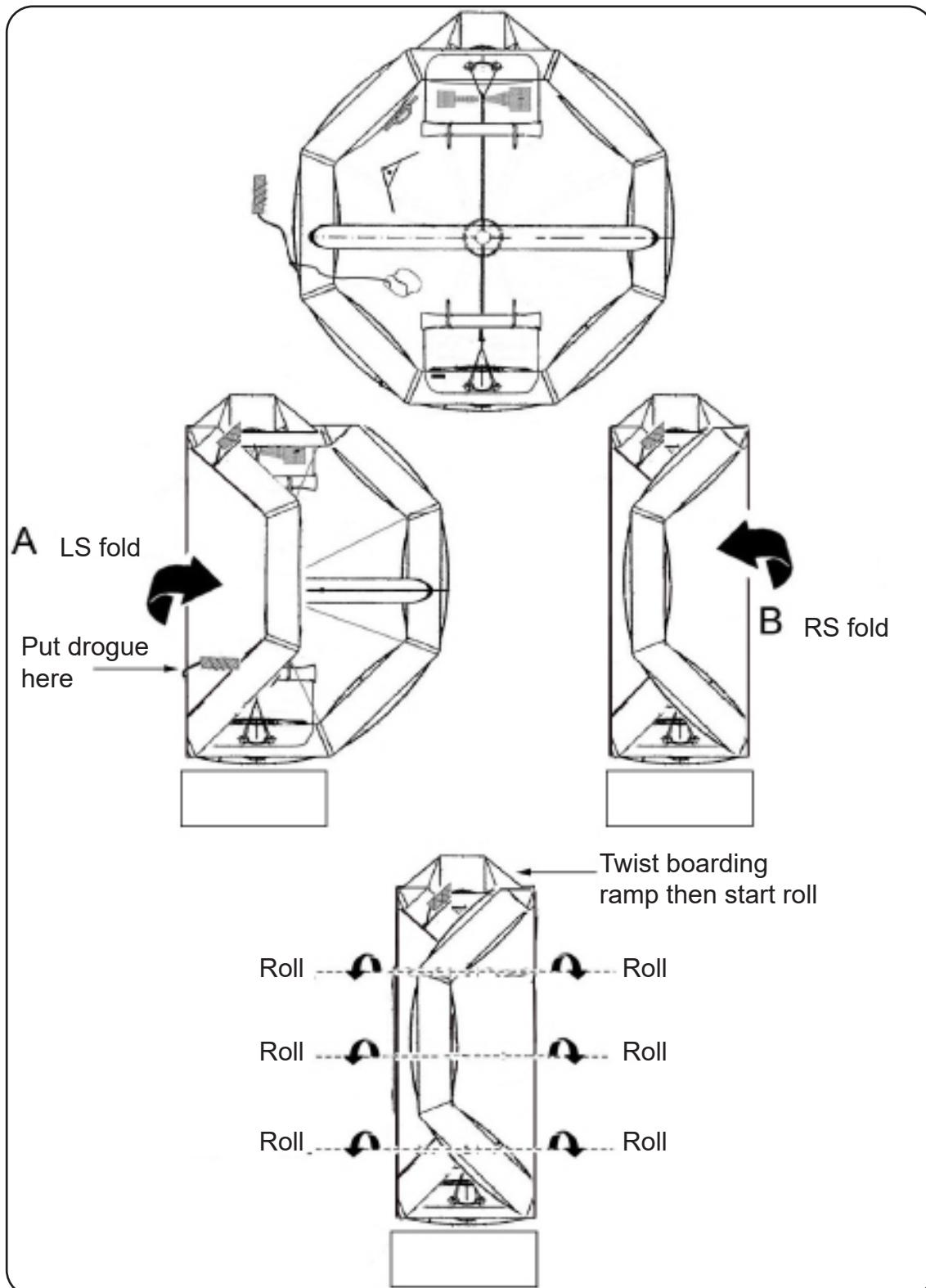


FIGURE 853
Fold the liferaft into MK 10 container
25 PERSON SHOWN - 1 Fold

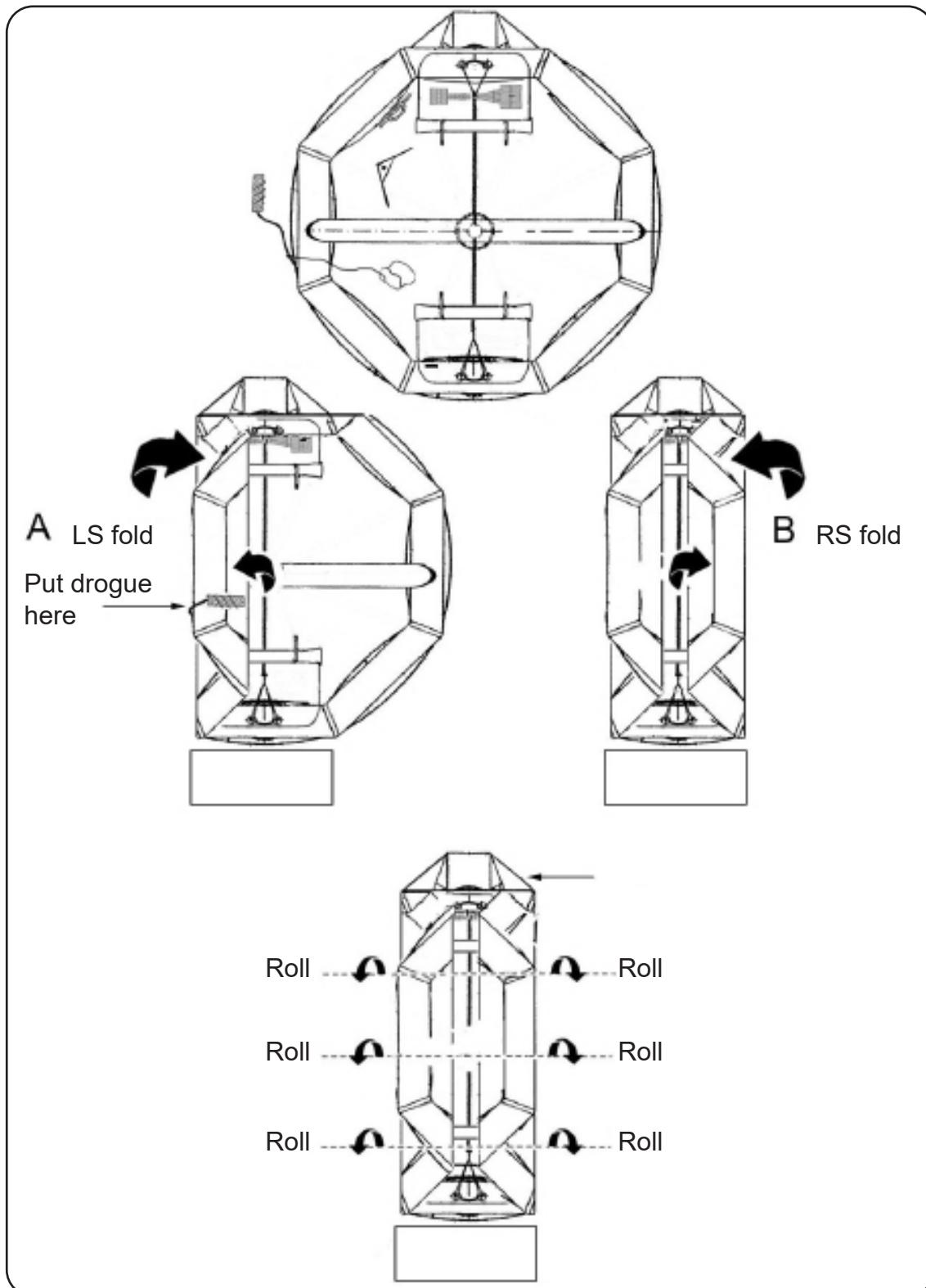


FIGURE 854
Fold the liferaft into MK 14 container
20-25 PERSON SHOWN - 2 Folds

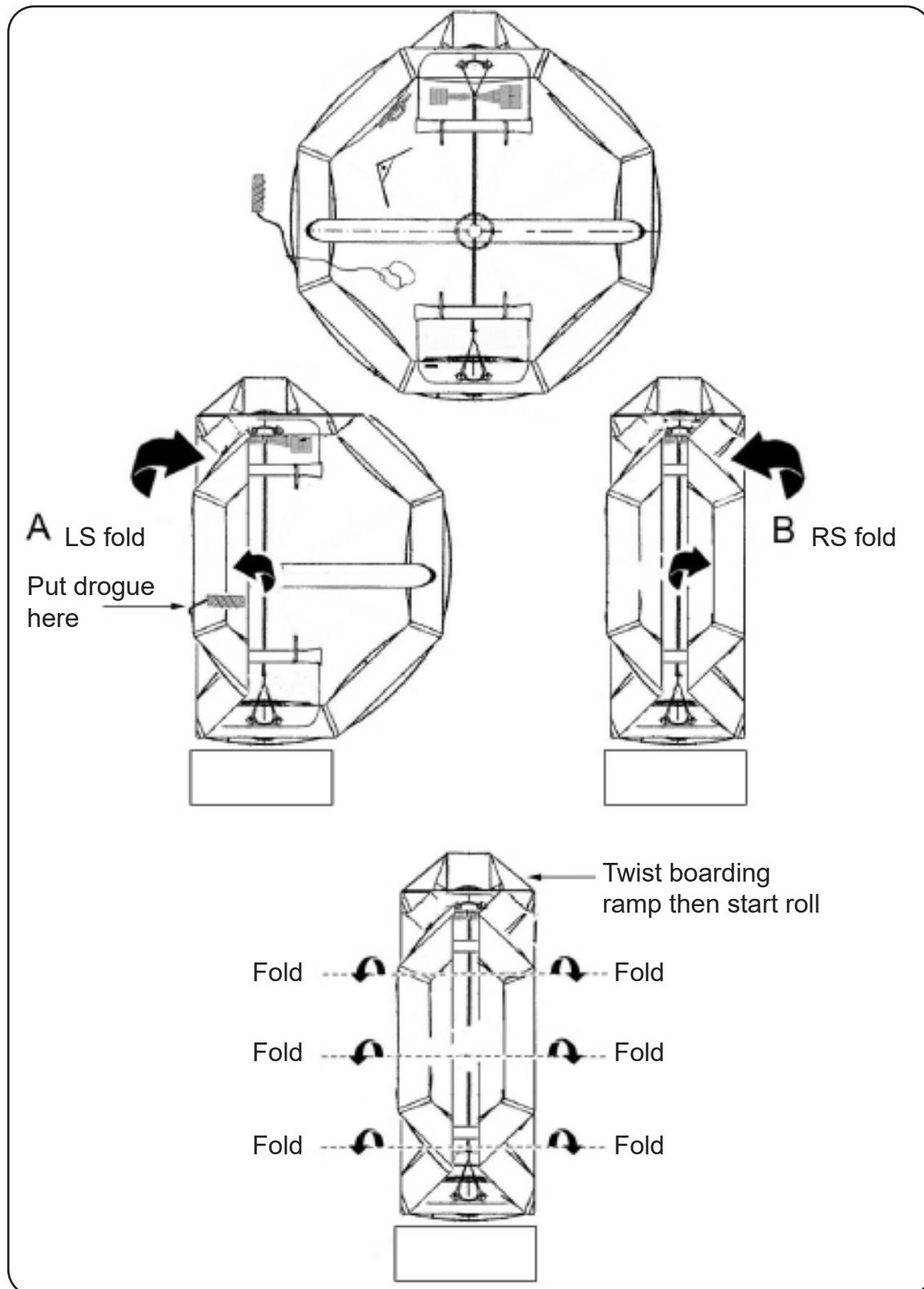


FIGURE 855
Fold the liferaft into Flat-Pack container
20-25 PERSON SHOWN - 2 Folds

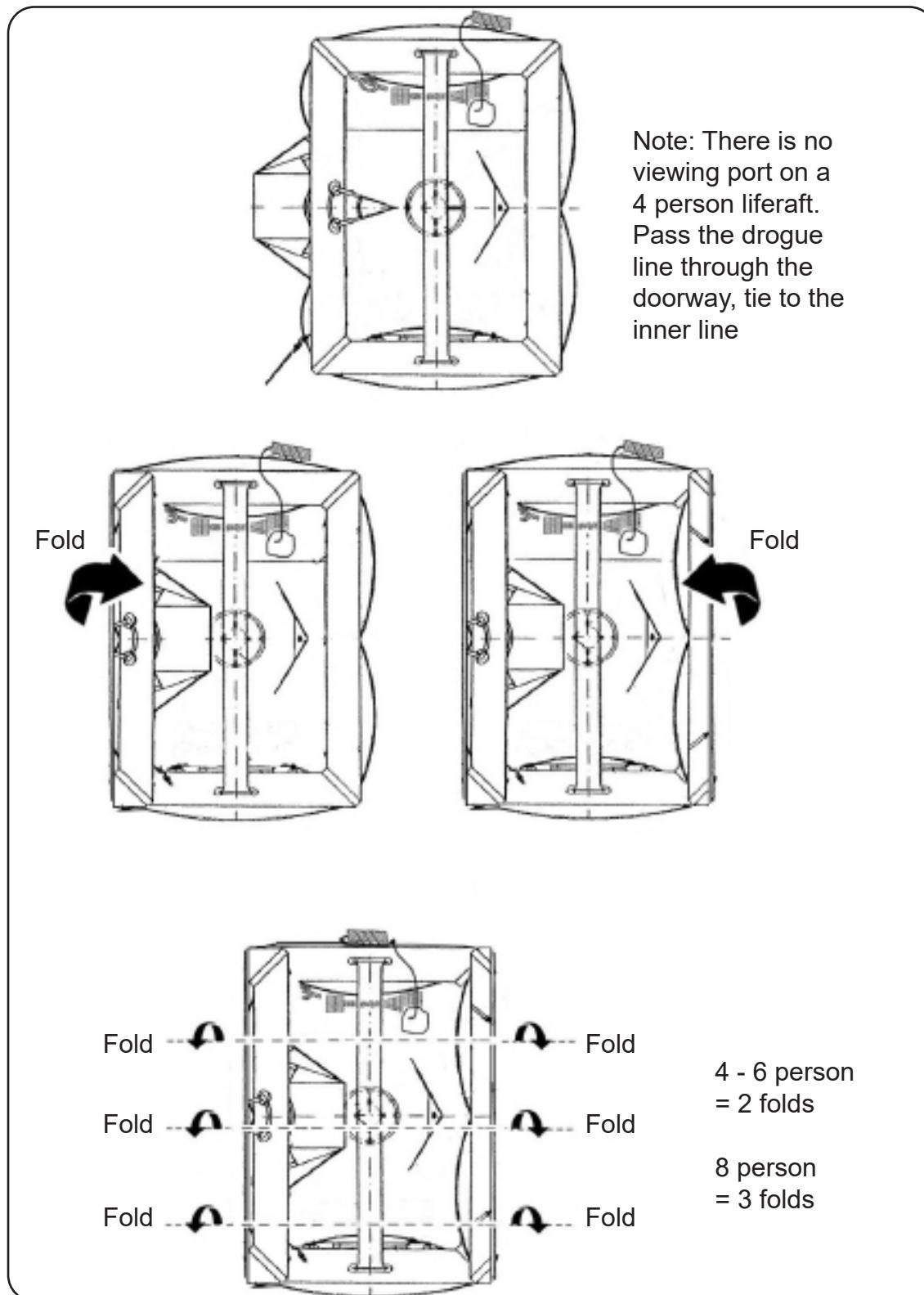


FIGURE 856A

4-8 PERSON - Folding the liferaft into MK 10 container SOLAS A-pack

6-8 PERSON - Folding the liferaft into 4N SOLAS B-pack

- 6.34 Position the identification tube ring at the edge of the container and use black 400 mm tape it securely into place. Refer to FIGURE 858A.

WARNING: THE OPERATING MECHANISM IS ARMED. BE VERY CAREFUL DURING ALL FOLLOWING ACTIONS.

- 6.35 Remove the painter sachet from its temporary position on the side of the container.

- 6.36 Put the painter sachet along the back of the container. Refer to FIGURE 858A. Make sure that the painter cord is in line with and near to the painter exit hole. Make sure that the painter can freely exit the painter sachet.

NOTE: For 6-8 Person liferaft in a 4N container with SOLAS B-Pack option ONLY, the painter sachet is positioned at an angle near to the painter exit. Refer to FIGURE 858B.

- 6.37 Make sure that the open end of the painter sachet, is as near as possible to the painter exit hole on the container. Adjust the painter sachet extension so that the distance from it to the painter exit is between 100 - 150 mm (4" - 6").

- 6.38 Make sure 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.

- 6.39 Use tape to attach the painter sachet to the polyethylene sheet. Refer to FIGURE 858A.

- 6.40 Put the rubber sheathed end of the painter line through the painter retaining block. Put the painter retaining block into the cut-out in the container. Refer to FIGURE 858A.

NOTE: When packing into a G21 Flat-Pack container the painter retaining block must first be cut in half. Refer to FIGURE 858A. Discard one half. Put the rubber sheathed end of the painter line through the painter retaining block. Put the painter retaining block into the cut-out in the container.

- 6.41 After the liferaft is packed in the Flat-Pack MK 20 container, (SOLAS B-Pack), three chute valise foam blocks are put on top of the liferaft before the upper container is fitted.

- 6.42 Put the top half of the container on top of the folded liferaft. Refer to FIGURE 859.



FIGURE 856B
Put the drogue on the top of the left side fold



FIGURE 856C
Put the drogue below the water pocket



FIGURE 857
Fold the polyethylene sheet over the liferaft



FIGURE 858A
Painter sachet positioning

- 6.43 Put two ratchet straps around the container and make sure that the ratchet straps do not cover the grooves in the container. Refer to FIGURE 859.
- Tighten the ratchet straps uniformly around the container. Make sure that the upper half of the container mates with the lower half of the container correctly.
- 6.44 Continue closing the container 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. Refer to FIGURE 859.
- 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.

NOTE: When packing into a G21 Flat-Pack container take care not to compress the painter line exiting the painter retaining block. Refer to FIGURE 860.
Make sure that the painter can freely exit the painter sachet.

- 6.45 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 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. REFER TO FIGURE 861.

- 6.46 Get the straps and crimps. Tension and crimp each strap as follows:

- 6.46.1 Adjust the ends of each strap so that the outer most strap end is facing upwards and is approximately 25 mm (1") above the rim of the container. Refer to FIGURE 861.



FIGURE 858B
Painter sachet positioning (6-8 Person in 4N container, SOLAS B-Pack ONLY)

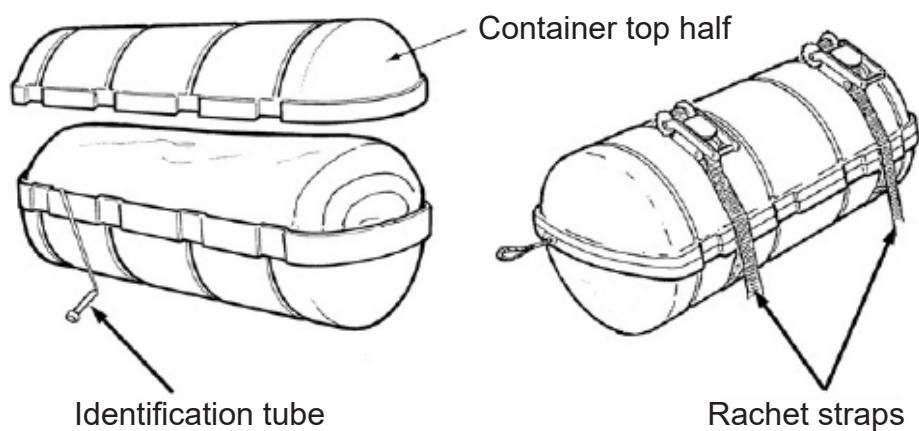


FIGURE 859
Container retaining line



FIGURE 860
Close the G21 container closing

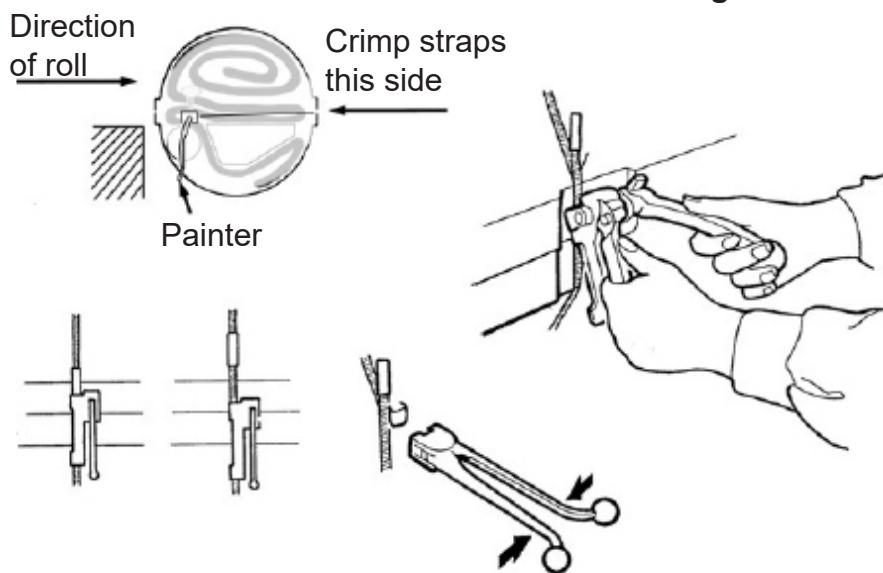


FIGURE 861
Crimp each container strap on opposite side to roll

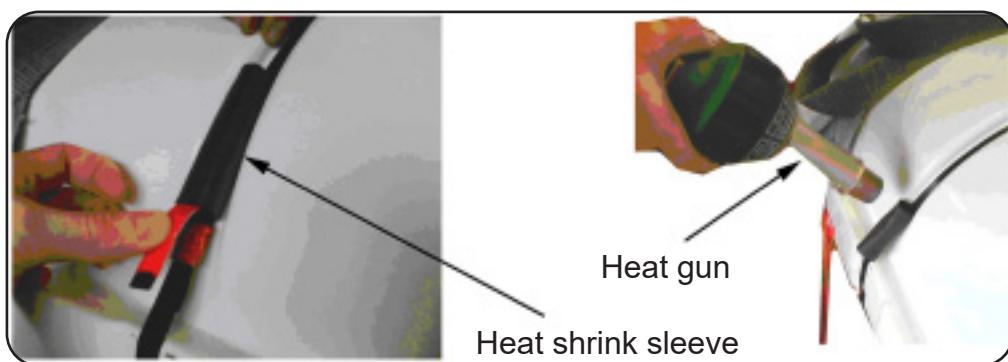


FIGURE 862
Crimp sealing option

- 6.46.2 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. Refer to FIGURE 861, using the crimping tool.
- 6.47 Do the step that follows for containers dropped from a height greater than 18 metres or more:
- 6.47.1 Put one extra strap and crimp at each end of the container.
 Refer to TABLE 802 and FIGURE 837.

Liferaft size	Type	E-Pack type	Container
16	TO	A	MK 14 size 17
20	TO	A	MK 10 size 9 MK 14 size 17
	TO	B	MK 10 size 7
25	TO	A	MK 10 size 9 MK 14 size 17
	TO	B	MK 10 size 7 MK 14 size 17

TABLE 802
Throwover containers with a drop height of 18 metres or more

- 6.48 Put 'DO NOT CUT' tape over the top of the straps in each recess of the container. Refer to FIGURE 861.
- 6.49 Remove the ratchet straps.
- 6.50 This completes the packing sequence for the Throwover liferaft. The container is now ready for labelling. Refer to Chapter 11, ILLUSTRATED PARTS LIST Section 3 Container assembly.

7. Heat shrink sleeve. Refer to FIGURE 862.

To encapsulate crimps with a heat shrink sleeve the following procedures must be observed. Refer to **Chapter 11, ILLUSTRATED PARTS LIST** for part numbers.

- 7.1 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.
- 7.2 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.

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

- 7.3 Using scissors, carefully cut 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.

CAUTION: USE THE CORRECT HEAT SHRINK TOOL.
REFER TO CHAPTER 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS.

CAUTION: A HEAT SETTING GREATER THAN 6 WILL OVERHEAT THE STRAP. DO NOT OVERHEAT THE STRAP. DO NOT POINT THE HEAT GUN DIRECTLY AT THE STRAP. IF YOU SEE DISCOLOURATION IN THE STRAP, IT HAS BEEN OVERHEATED. IN THIS CASE IT MUST BE DISCARDED, REMOVED AND A REPLACED.

WARNING: BE VARY CAREFUL WITH THE HEAT GUN. ALLOW SUFFICIENT TIME FOR PARTS TO COOL BEFORE HANDLING DIRECTLY. THE HEAT GUN NOZZLE WILL REMAIN HOT AFTER USE.

- 7.4 With the heat gun at setting at 6, apply heat evenly over the heat shrink sleeve. The rear of the heat shrink sleeve must be heated evenly from both left and right hand sides.
- 7.5 Make sure that the entire crimp and tail are completely encapsulated and that the heat shrink sleeve overlaps in both directions by at least 5 mm.
- 7.6 Using protective gloves, pinch the ends of the heat shrink while it is cooling, to make sure that they have sealed tight against the strap.

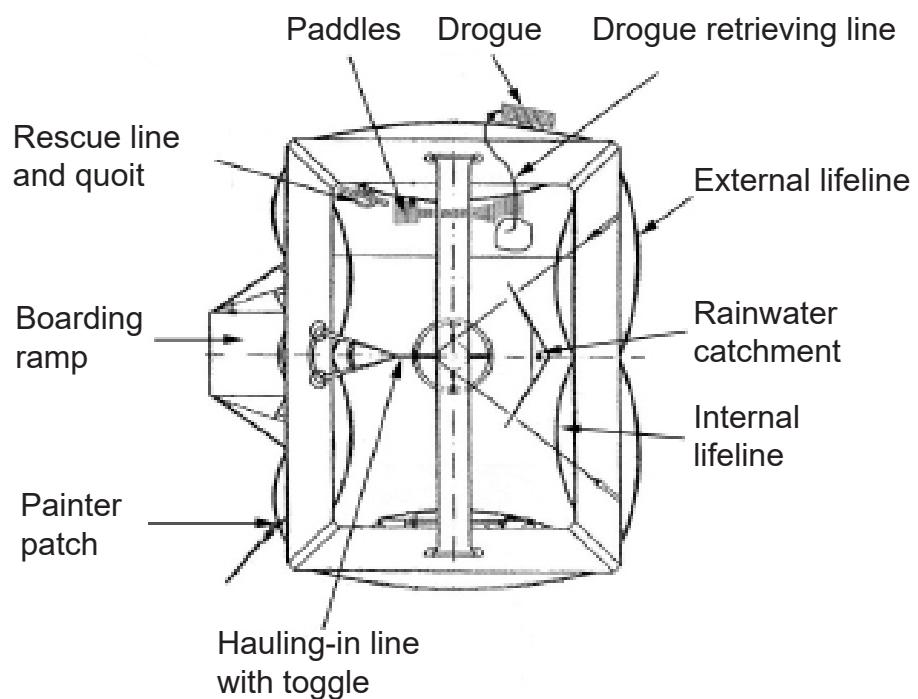
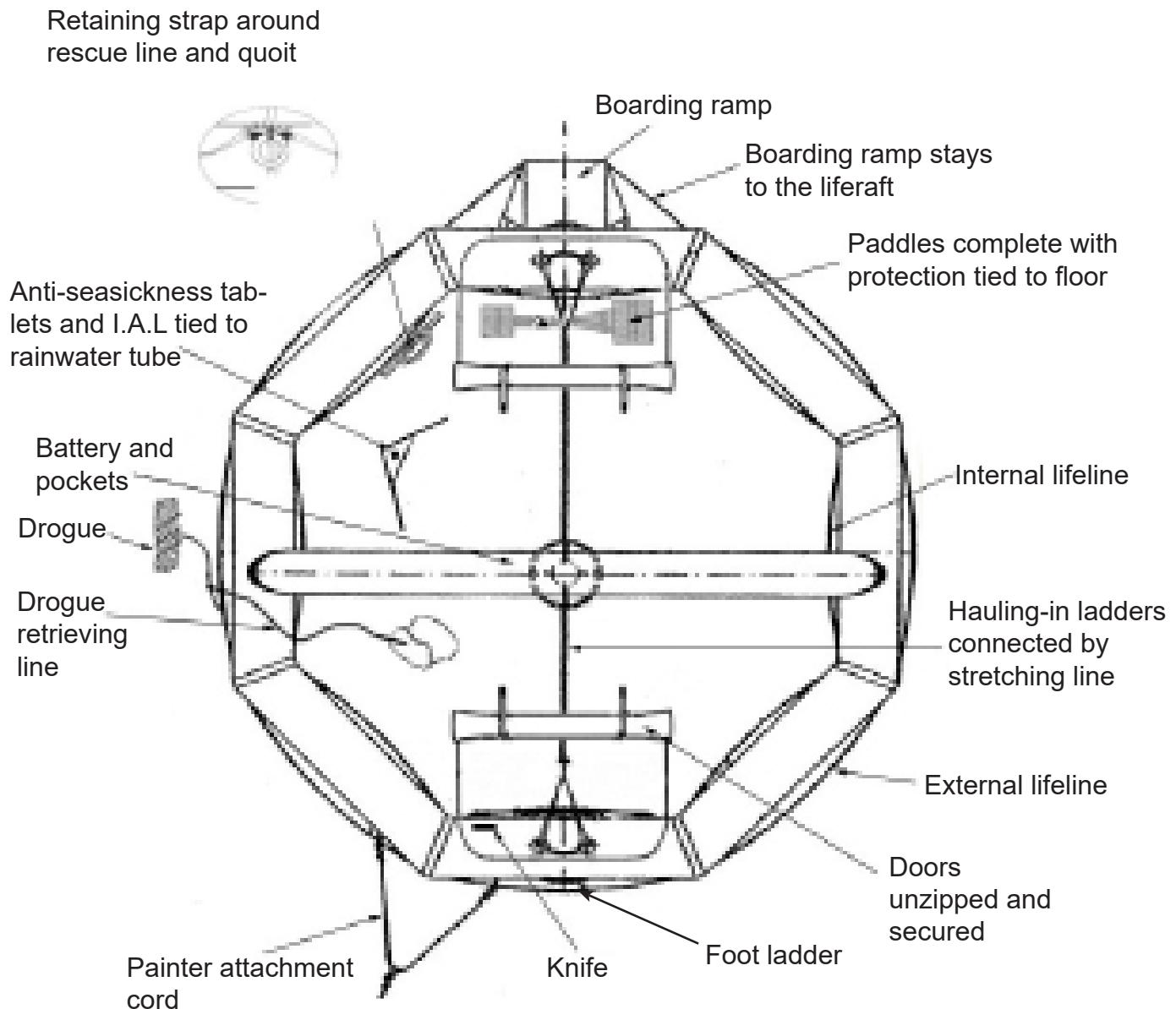
8. Pack a Throwover liferaft into a N-Series Low Profile container:

FIGURE 863
Preparation for packing assembly of 4-8 Person Throwover for
N-Series Low Profile container



NOTE: The picture illustrated is 25 Person liferaft. Layout will be similar for other TO liferafts.

FIGURE 864
Preparation for packing assembly for 10-20 Person Throwover for
N-Series Low Profile container

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

- 8.1 Put the liferaft neatly on a packing table in an open area with enough room to manoeuvre the container during packing.
- 8.2 Put the inflation valves adjacent to the edge of the packing table. Make sure that all cordage is neat and tidy.

Do the steps that follow when most of the air has naturally escaped from the liferaft:

- 8.2.1 Connect a vacuum device to a deflation adapter and remove all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
- 8.2.2 As the air in each buoyancy tube is removed adjust the buoyancy tubes so that they lie flat on each other.
- 8.3 Before you install the cylinder make sure that the black operating head has been replaced with the correct white model.

CAUTION: DISPOSE OF ALL BLACK OPERATING HEADS.

- 8.4 Refer to **Appendix 12** for guidance on installing and checking a Leafield GIST operating head.
- 8.5 <NOT USED>

WARNING: THE OPERATING HEAD MUST BE TIGHT ON THE CYLINDER VALVE.

- 8.5.1 The actuator cables are colour coded for application.
The white overmould (longer cable) is used with the white operating head.

CAUTION: THE ACTUATOR CABLES ARE NOT INTERCHANGEABLE.

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

- 8.6 Upturn the edge of the liferaft to reveal the cylinder stowage pocket/straps. Refer to **Figure 9**.
- 8.7 Put the cylinder into the cylinder stowage arrangement. Take care not to trap the righting strap. The cylinder must be orientated so that the top operating head outlet runs parallel with the base of the liferaft. Refer to **Figure 865**.
- 8.8 Attach the cord to the cylinder neck.
 - 8.8.1 Liferafts with blue cylinder pockets:
 - (a) Find the cord attached to the cylinder stowage pocket.
 - (b) Use two turns around the cylinder neck and a reef knot and two half hitches to tie to the cylinder neck.
 - 8.8.2 Liferaft with velcro straps:
 - (a) Use a reef knot and four half hitches with two turns of 238 kg f / 525 lbf nylon cord (450 mm long) to tie the cylinder neck securely to the adjacent loop patch on the floor.
 - (b) Tape the flying ends.
- 8.9 Remove the recoil / transit caps from the cylinder valve. Refer to FIGURE 843.
- 8.10 Check the inflation hoses for damage and replace if necessary. Refer to **Appendix 14** for guidance on inspection the inflation hose.
- 8.11 Connect each inflation hose. Refer to FIGURE 843.

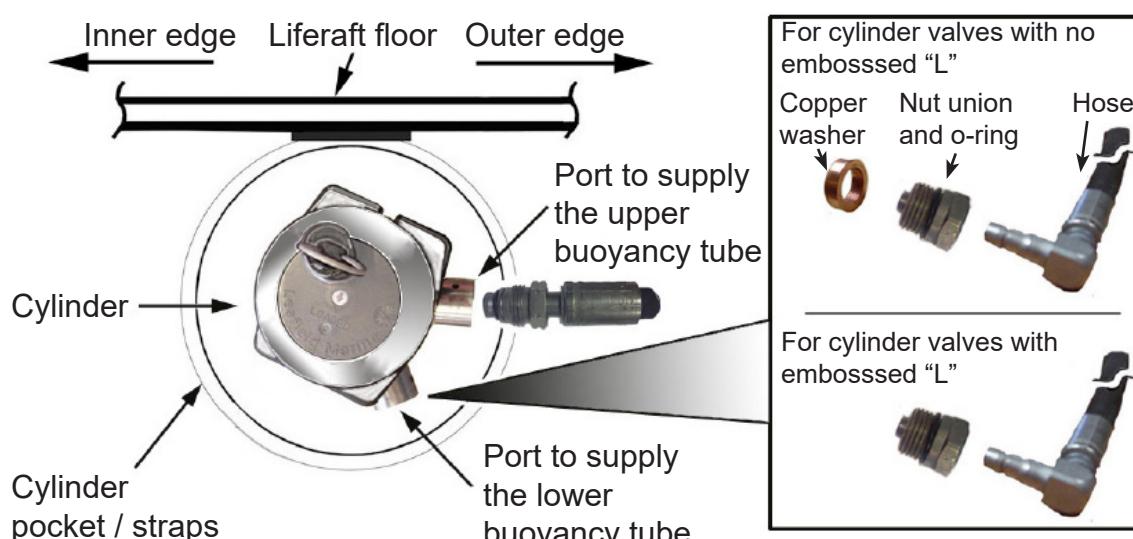


FIGURE 865
Cylinder attachment to liferaft

8.12 Torque the hose connections. Refer to **Chapter 1, TABLE 101.**

NOTE: If the bottom buoyancy hose needs to be replaced, a double end bayonet type is used.

8.13 There are two options available to connect the inflation hose to the operating head:

- 8.13.1 Use a copper washer, nut union and O-ring to connect the hose if the cylinder valve has no embossed 'L'.
- 8.13.2 Use one turn of white tape with a pull tail on each hose connection to show that they have been torqued.
- 8.13.3 Use a nut union and O-ring to connect the hose if the cylinder valve has an embossed 'L'
- 8.13.4 Use one turn of white tape with a pull tail on each hose connection to show that they have been torqued.
- 8.13.5 Replace the sealing O-ring at each service.

8.14 Put two lengths of 13 mm webbing through each pair of holes in the lower protective foam. Refer to **Figure 866 (i).**

8.15 Insert the upper and lower pieces of N-Series protective foam onto the operating head.

8.16 Put the two lengths of 13 mm webbing through each pair of holes in the upper protective foam.

8.17 Tie the 13 mm webbing to attach the upper and lower pieces of N-Series protective foam together. Refer to **Figure 866 (ii).**

8.18 Put the liferaft flat on the table.

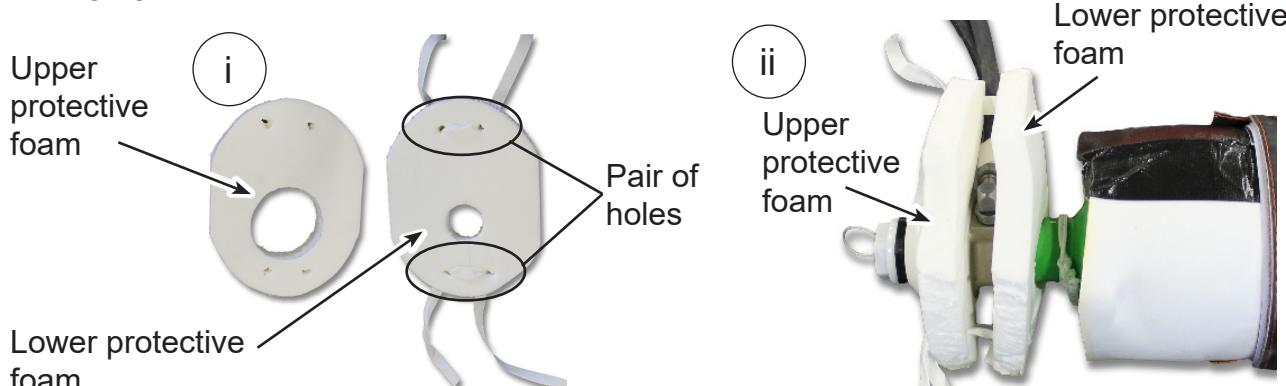


FIGURE 866
N-Series protective foam for the operating head

- 8.19 Put the lower half of the container on a suitable strong trolley.
- 8.20 Put the container next to the table. Leave a small gap (about 100 mm (4") between the table and the long side of the container.
- 8.21 Grasp the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container.
 - 8.21.1 Put the cylinder at the back of the container and with the operating head close to the container corner. Refer to **Figure 867**.
 - 8.21.2 Leave space to allow for straight pull of line to reduce pull force values.

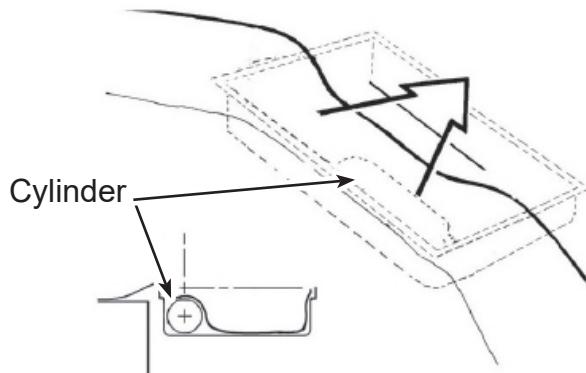


FIGURE 867
Cylinder position

- 8.22 Put the boarding ladder neatly under the liferaft next to the cylinder. Refer to **Figure 868**. Applies to 10-20 Person ONLY.

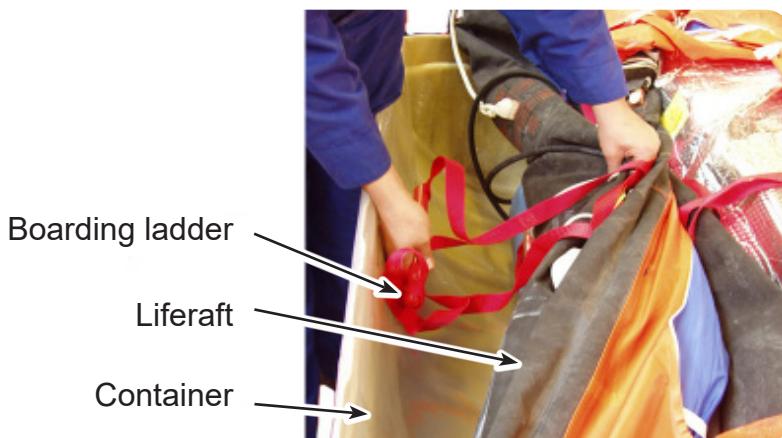


FIGURE 868
Cylinder position

8.23 Push the liferaft floor area down into the recesses towards each end of the container.

8.24 Pack the E-pack valises for the liferaft. Refer to **Chapter 7, E-Packs and Equipment**. If present, put the valise(s) containing food rations and water sachets positioned furthest from the operating head end of the cylinder.

CAUTION: FOR 10-20 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING IN LADDER.

CAUTION: FOR 4-8 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE ARCH TUBE.

8.25 Put the E-pack into the container.

NOTE: This will help to keep the cylinder in its correct position.

8.26 Fold back the liferaft so that you can see the operating mechanism.

8.27 Get the painter sachet.

8.28 Wrap a polyethylene sheet, 915 mm × 800 mm (36" × 31.5") around the end of the painter sachet and use tape to hold it in position.

8.29 Extend the polyethylene sheet over the open end of the sachet and the painter rope by at least 100 mm (4") but no more than 150 mm (6").

8.30 Make sure that 2.5 m (100") exits the painter sachet. Refer to **Figure 869**.

8.31 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. Refer to **Figure 869**.

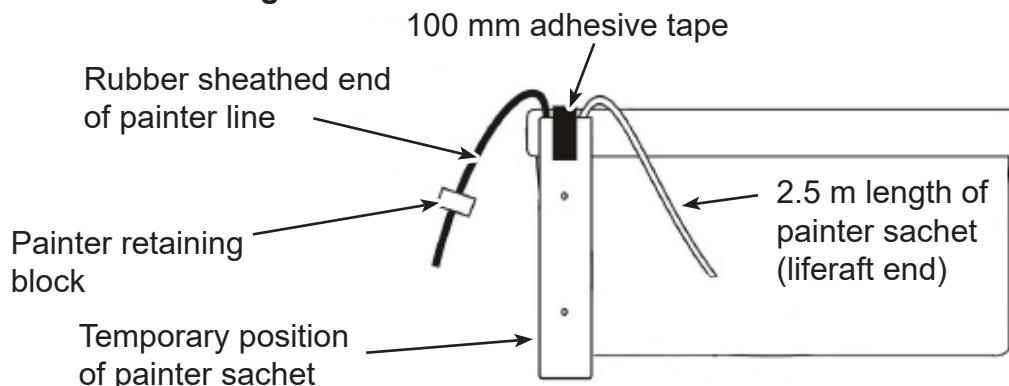


FIGURE 869
Attach painter sachet to the container

8.32 Tie the painter line to the liferaft:
Refer to **Figure 870**.

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

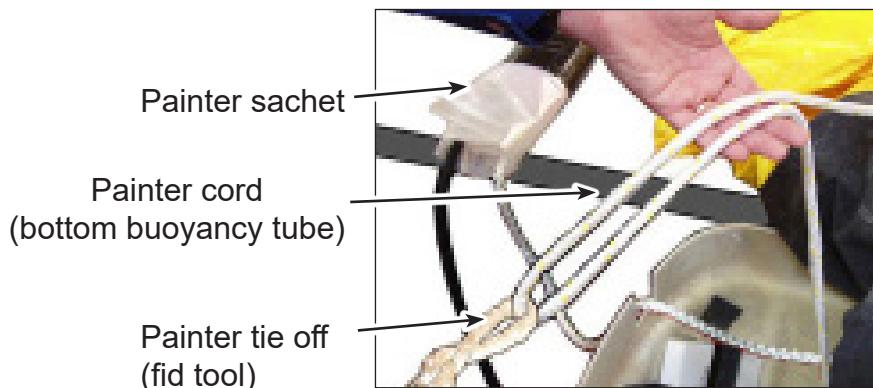


FIGURE 870
Tie painter line to painter cord

8.32.1 At the firing point (1.5 m (59") from the end of the line), put the actuator cable of the operating mechanism through the painter line. Put the painter line that remains back through the actuation cable.

Refer to **Figure 871**.

WARNING: THE OPERATING MECHANISM IS NOW ARMED. BE VERY CAREFUL DURING ALL FOLLOWING ACTIONS.

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

8.32.2 Lightly pull on the cord to make sure that the painter cord is firmly attached to the operating head. Refer to **Figure 871**.

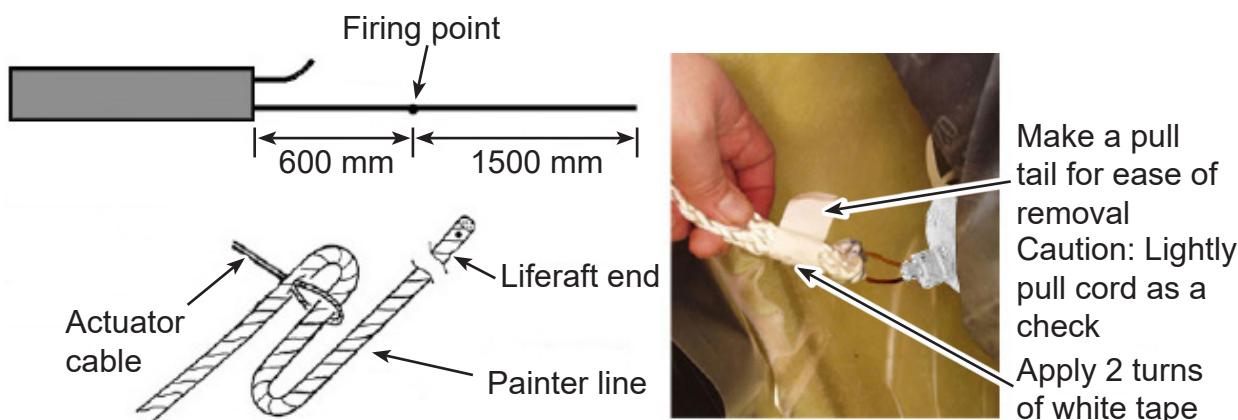


FIGURE 871
Attach the painter line to operating mechanism

8.32.3 Wind two turns of white tape around the painter cord.

Refer to **Figure 15**. Fold the end of the tape over on itself to create a pull tail. This will make it easier to remove the tape at the next service.

8.32.4 10-20 PERSON - Find the painter attachment cord on the lower buoyancy tube.

- (a) Tie the liferaft end of the painter to the painter attachment cord.
Use a fid and half knot, then tape the flying end.
Refer to **Figure 878**.

8.32.5 4-8 PERSON - Find the painter attachment patch on the lower buoyancy tube.

- (a) Tie the liferaft end of the painter to the painter attachment patch.
Refer to **Figure 879**.
- (b) Use a splice tool and half knot, then tape the flying end.
Refer to **Figure 878**.

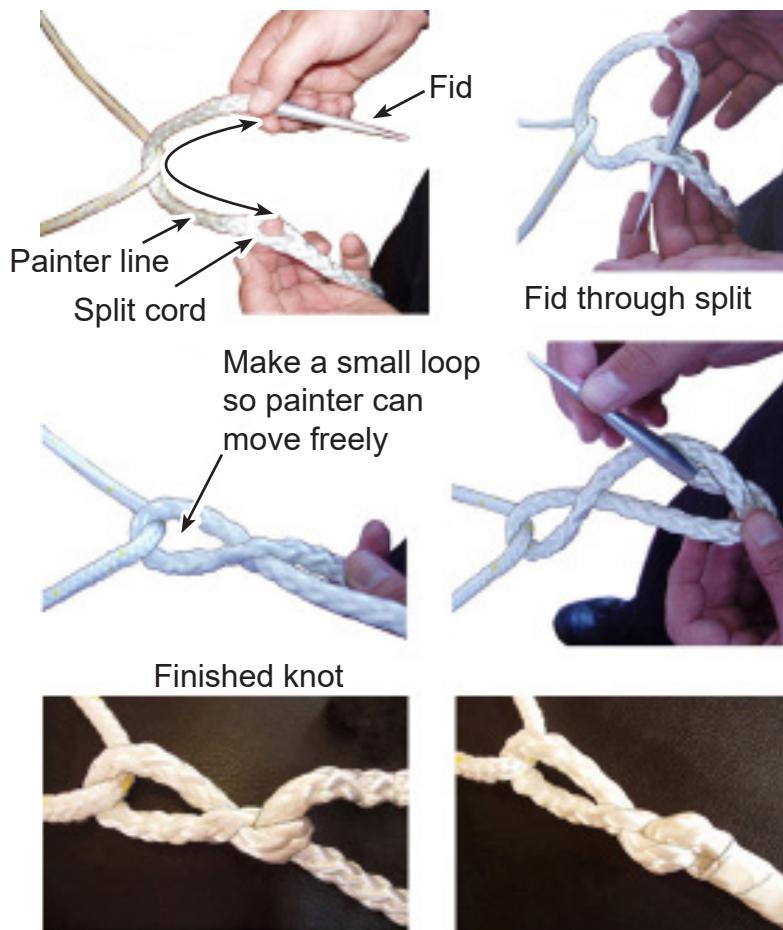


FIGURE 878
Splice knot procedure using a fid

- 8.33 Find the painter attachment patch on the lower buoyancy tube.
- 8.34 Use a bowline knot to tie the liferaft identification tube red ribbon to the patch.
Refer to **Figure 879**.
- 8.35 Tape the flying end.



FIGURE 879
Attach the liferaft identification tube

WARNING: TAKE EXTREME CARE DURING THE NEXT OPERATION TO MAKE SURE THAT YOU DO NOT OPERATE THE INFLATION SYSTEM.

CAUTION: FOR 10-20 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING-IN LADDER. MAKE SURE THAT NO PARTS OF THE CANOPY OR DOOR ARE TRAPPED BENEATH THE PACKS.

CAUTION: FOR 4-8 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE ARCH TUBE.

- 8.36 Put the E-pack valises into the container. Use available space to minimise the height of the valises. Make sure that the straps on each E-pack valise are tight.
Refer to **Chapter 7**.
- 8.37 Use a half hitch to tie the valise straps of the E-Pack to the inner lifeline. You may use 525 lb / 263 kgf cord as an alternative to the valise straps.
- 8.38 Connect a suction hose to each of the two deflation points and deflate the buoyancy tubes fully.
 - (a) One on each buoyancy tube.

8.39 The step that follows is for the RL5 internal lamp only:

Enter the liferaft by the rear door and connect the switch activator to the internal lamp.

CAUTION: 4-8 PERSON ONLY: FOLD THE ARCH TUBE AROUND THE INTERNAL LAMP.

8.39.1 Fold the arch tube around the internal lamp and secure with 1 turn of 25 mm (1") tape. Refer to **Figure 880**.

NOTE: This will make sure that the tension line does not interfere with the lighting switch. Make sure that the knife is installed and that the flaps of the pocket are correctly closed.

8.40 Pull the canopy towards the container.

8.40.1 Make sure that the internal lamp is not in the way off the hauling-in ladder.

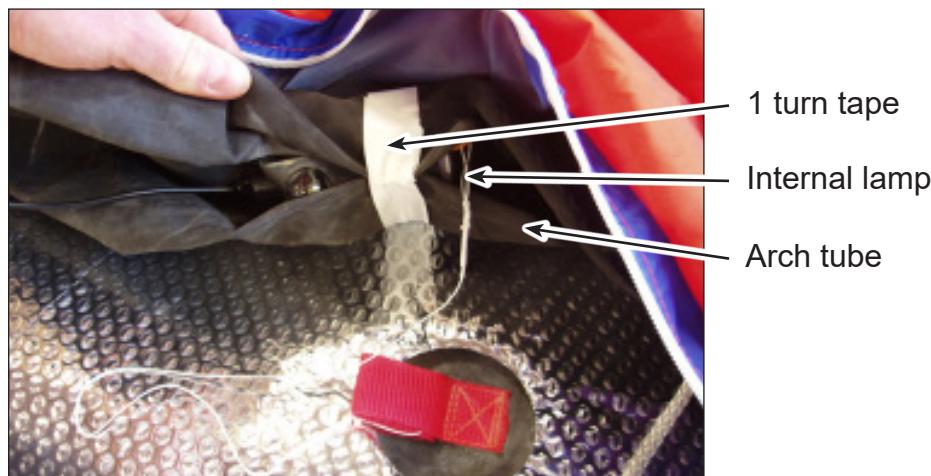


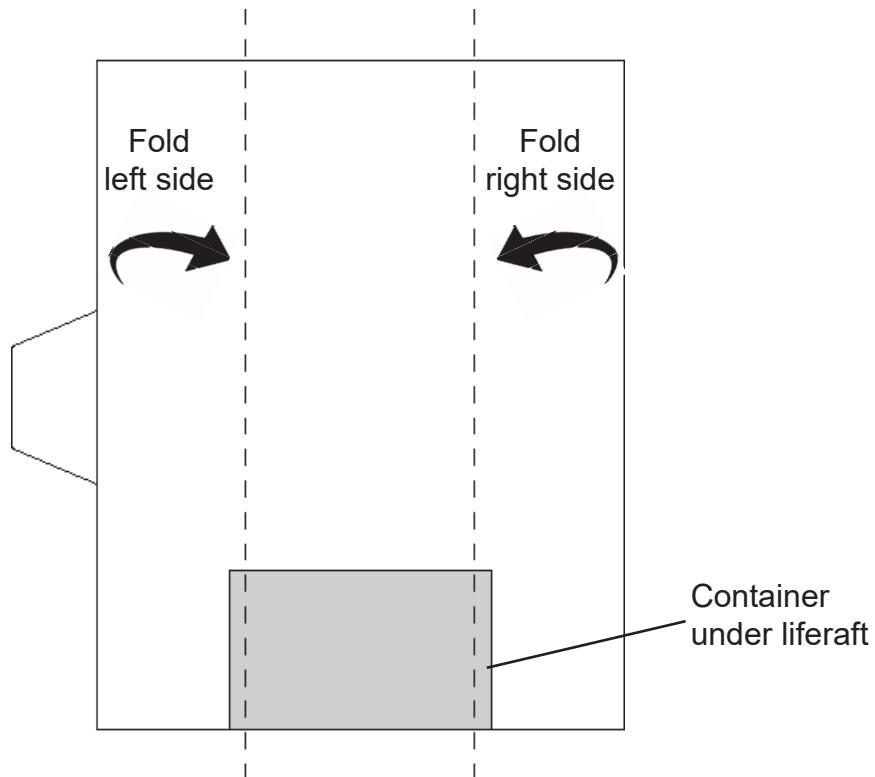
FIGURE 880
4-8 PERSON ONLY - Wrap arch tube around internal lamp

8.41 Pack the Throwover liferaft into the Low Profile container.
Refer to **Figure 881**.

8.41.1 4 Person (SOLAS A and B pack) in size N133 Low Profile container.

- (a) Fold the 4 person (SOLAS A and B pack) liferaft.
 - (i) Fold the right side of the liferaft into the centre.
Refer to **Figure 881 (i)**.
 - (ii) Fold the left side of the liferaft into the centre.
Refer to **Figure 881 (i)**.
- (b) Put the boarding ramp on top of the right side fold.
Refer to **Figure 881 (ii)**.
- (c) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 881 (ii)**.
- (d) Locate the drogue and attach it to the drogue patch.
- (e) Put the rolled up drogue on top of the left side fold.
Refer to **Figure 881 (ii)**.
- (f) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (g) Use three full folds to fold the liferaft into the container. Make sure each fold is as tight as possible. Refer to **Figure 881 (iii)**.
- (h) Wrap the polyethylene sheet around the outside of the rolled liferaft
- (i) Tuck the overlap of polyethylene sheet under the folded liferaft.
- (j) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (k) Refer to step 5.40 to install the painter sachet.

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ii



iii

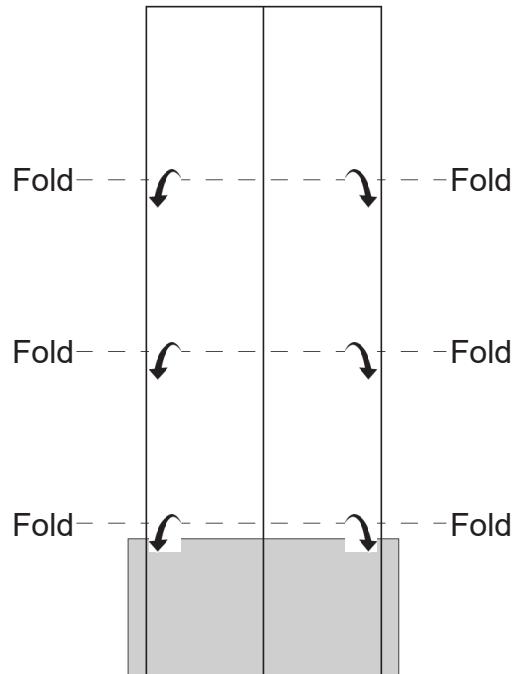


FIGURE 881
Fold the 4 Person liferaft into the N133 Low Profile container

8.41.2 6 Person (SOLAS A-Pack) in size N134 Low Profile container.
Refer to **Figure 882**.

- (a) Fold the 6 person (SOLAS A-Pack) liferaft.
 - (i) Fold the right side of the liferaft into the centre.
Refer to **Figure 882 (i)**.
 - (ii) Fold the left side of the liferaft into the centre.
Refer to **Figure 882 (i)**.
- (b) Tuck the boarding ramp under the left side fold.
Refer to **Figure 882 (ii)**.
- (c) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 882 (ii)**.
- (d) Locate the drogue and attach it to the drogue patch.
- (e) Put the rolled up drogue on top of the left side fold.
Refer to **Figure 882 (ii)**.
- (f) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (g) Use three full folds to fold the liferaft into the container. Make sure each fold is as tight as possible. Refer to **Figure 882 (iii)**.
- (h) Wrap the polyethylene sheet around the outside of the rolled liferaft
- (i) Tuck the overlap of polyethylene sheet under the folded liferaft.
- (j) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (k) Refer to step 5.40 to install the painter sachet.

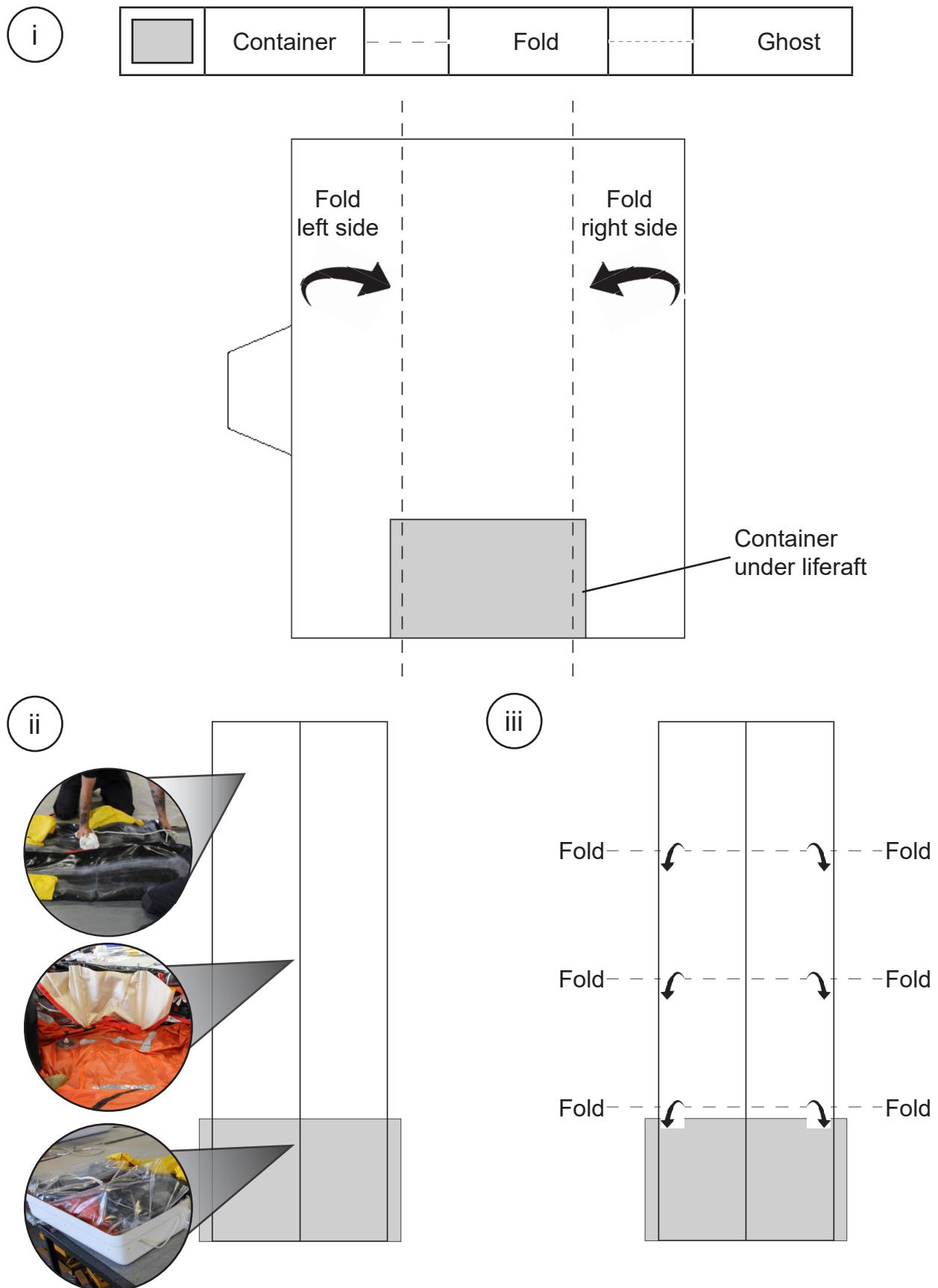


FIGURE 882
Fold the 6 Person (SOLAS A-Pack) liferaft into the N134 Low Profile container

8.41.3 6 Person (SOLAS B-Pack) in size N133 Low Profile container.
Refer to **Figure 883**.

- (a) Fold the 6 person (SOLAS B-Pack) liferaft.
 - (i) Fold the right side of the liferaft into the centre.
Refer to **Figure 883 (i)**.
 - (ii) Fold the left side of the liferaft into the centre.
Refer to **Figure 883 (i)**.
- (b) Tuck the boarding ramp under the left side fold.
Refer to **Figure 883 (ii)**.
- (c) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 883 (ii)**.
- (d) Locate the drogue and attach it to the drogue patch.
- (e) Put the rolled up drogue on top of the left side fold.
Refer to **Figure 883 (ii)**.
- (f) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (g) Use a half fold to fold the liferaft one time towards the container.
Refer to **Figure 883 (iii)**.
- (h) Use three full folds to fold the liferaft into the container. Make sure each fold is as tight as possible. Refer to **Figure 883 (iii)**.
- (i) Wrap the polyethylene sheet around the outside of the rolled liferaft
- (j) Tuck the overlap of polyethylene sheet under the folded liferaft.
- (k) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (l) Refer to step 5.40 to install the painter sachet.

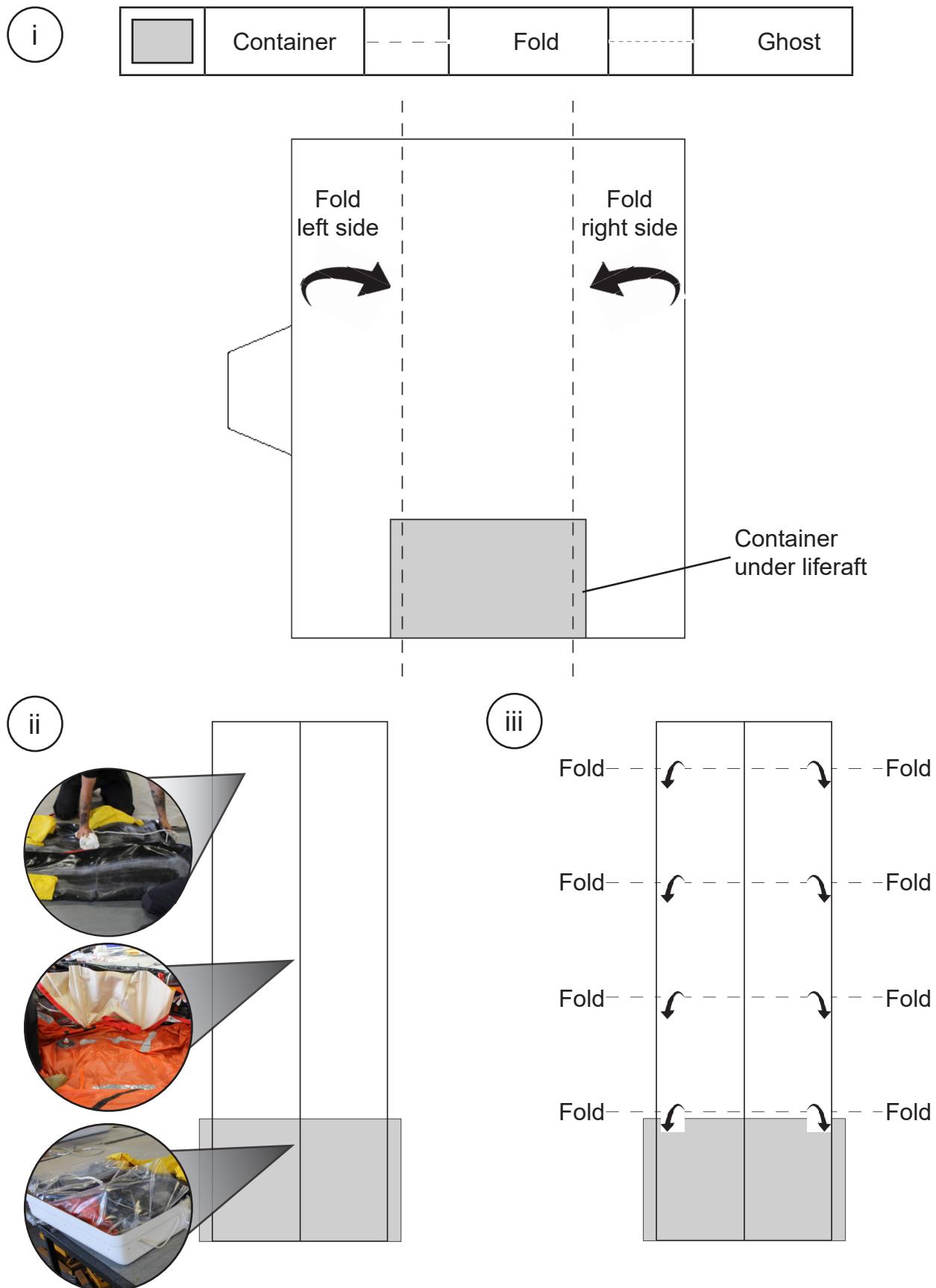


FIGURE 883
Fold the 6 Person (SOLAS B-Pack) liferaft into the N133 Low Profile container

8.41.4 8 Person (SOLAS A-Pack) in size N135 Low Profile container.
Refer to **Figure 884**.

- (a) Fold the 8 person (SOLAS A-Pack) liferaft.
 - (i) Fold the right side of the liferaft into the centre.
Refer to **Figure 884 (i)**.
 - (ii) Fold the left side of the liferaft into the centre.
Refer to **Figure 884 (i)**.
- (b) Tuck the boarding ramp under the left side fold.
Refer to **Figure 884 (ii)**.
- (c) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 884 (ii)**.
- (d) Locate the drogue and attach it to the drogue patch.
- (e) Put the rolled up drogue on top of the left side fold.
Refer to **Figure 884 (ii)**.
- (f) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (g) Use four full folds to fold the liferaft into the container. Make sure each fold is as tight as possible. Refer to **Figure 884 (iii)**.
- (h) Wrap the polyethylene sheet around the outside of the rolled liferaft
- (i) Tuck the overlap of polyethylene sheet under the folded liferaft.
- (j) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (k) Refer to step 5.40 to install the painter sachet.

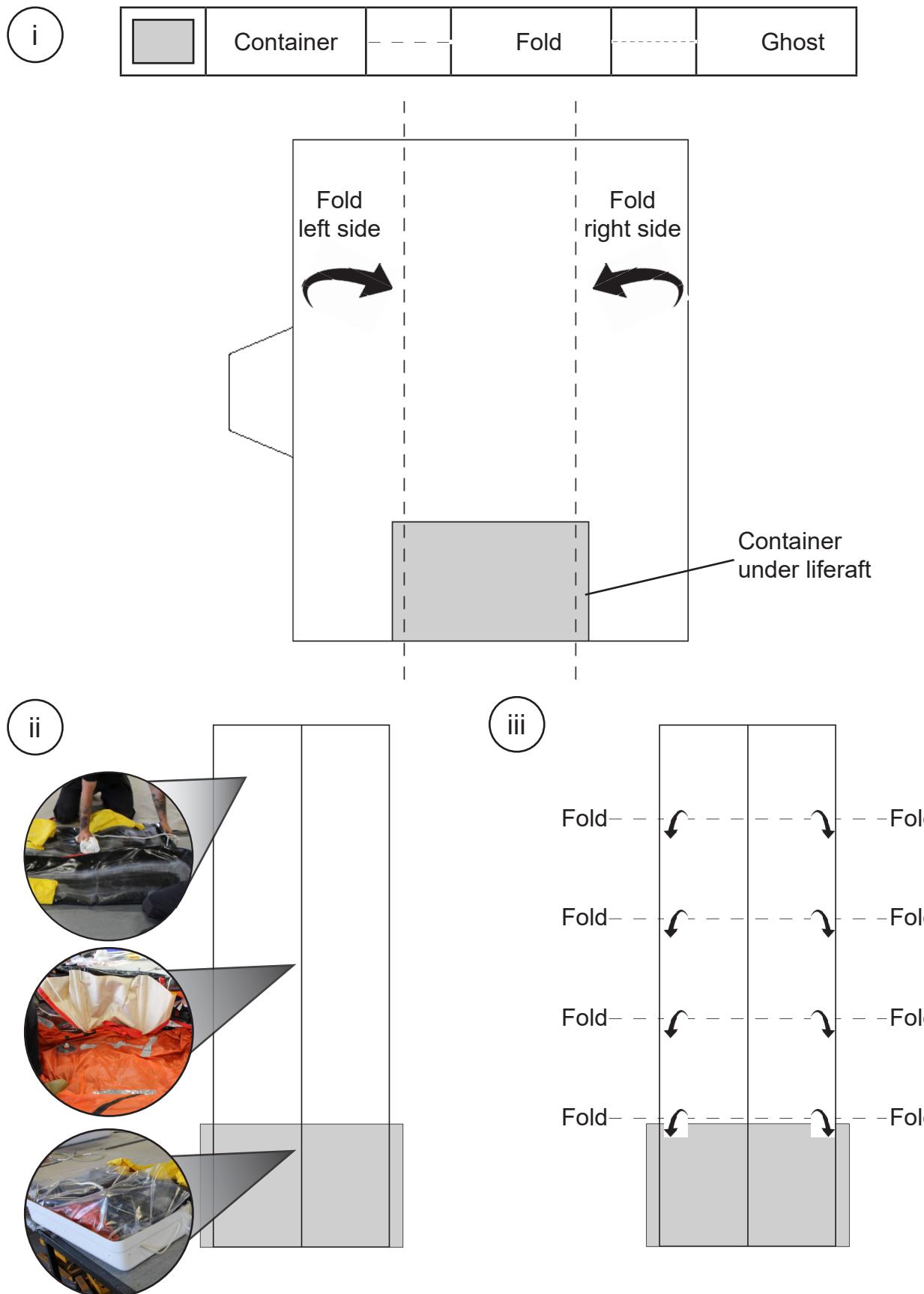


FIGURE 884
Fold the 8 Person (SOLAS A-Pack) liferaft into the N135 Low Profile container

8.41.5 8 Person (SOLAS B-Pack) in size N134 Low Profile container.
Refer to **Figure 885**.

- (a) Fold the 8 person (SOLAS B-Pack) liferaft.
 - (i) Fold the right side of the liferaft into the centre.
Refer to **Figure 885 (i)**.
 - (ii) Fold the left side of the liferaft into the centre.
Refer to **Figure 885 (i)**.
- (b) Tuck the boarding ramp under the left side fold.
Refer to **Figure 885 (ii)**.
- (c) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 885 (ii)**.
- (d) Locate the drogue and attach it to the drogue patch.
- (e) Put the rolled up drogue on top of the left side fold.
Refer to **Figure 885 (ii)**.
- (f) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (g) Use four full folds to fold the liferaft into the container. Make sure each fold is as tight as possible. Refer to **Figure 885 (iii)**.
- (h) Wrap the polyethylene sheet around the outside of the rolled liferaft
- (i) Tuck the overlap of polyethylene sheet under the folded liferaft.
- (j) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (k) Refer to step 5.40 to install the painter sachet.

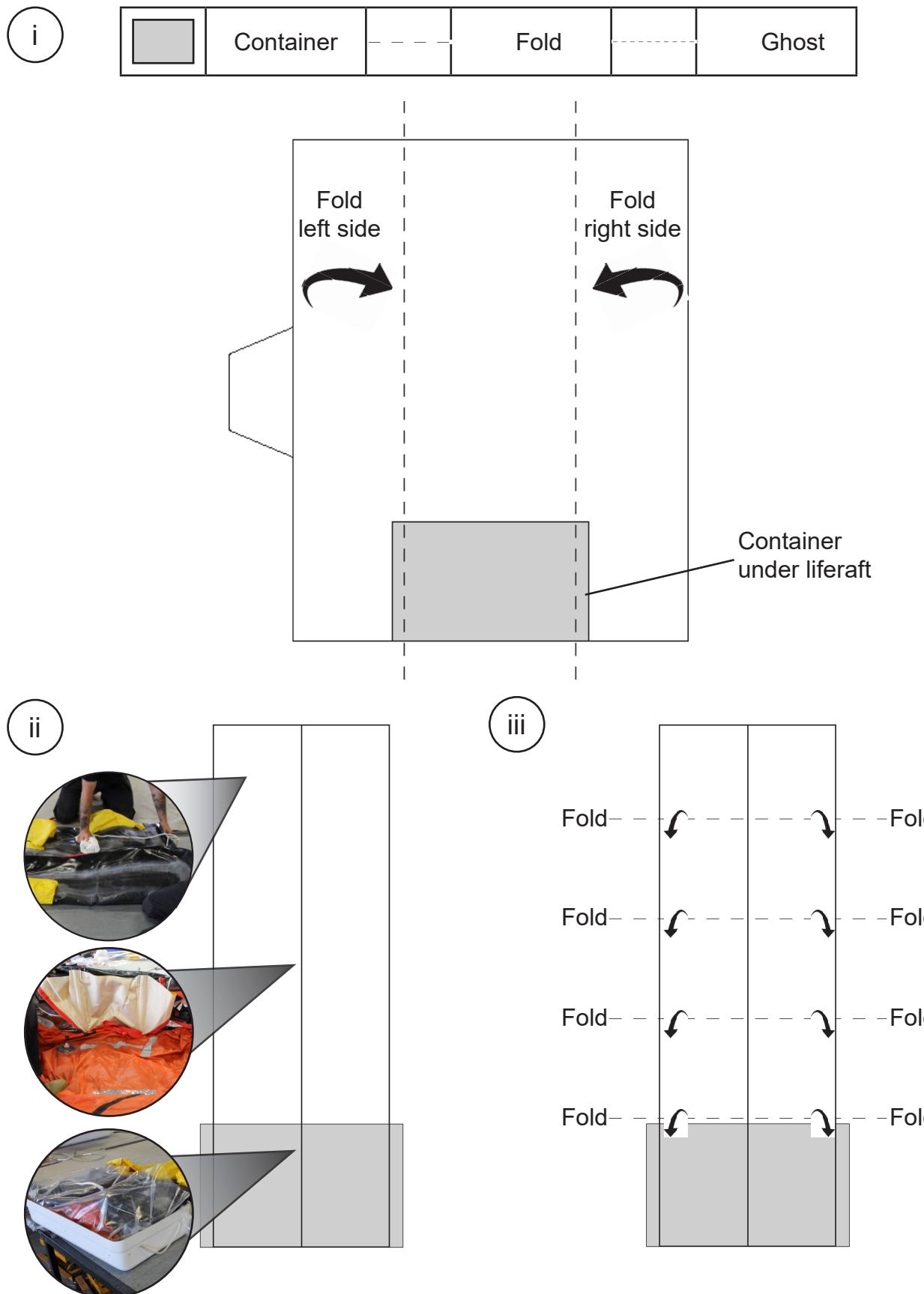
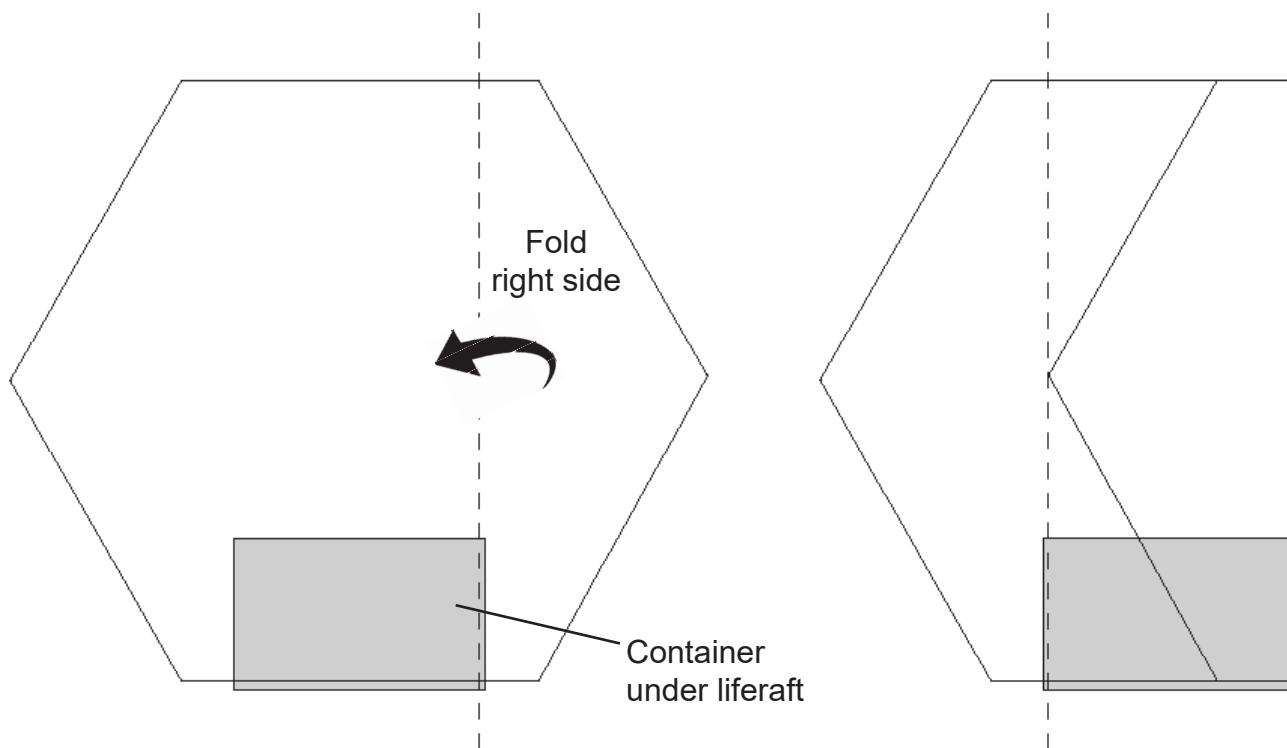


FIGURE 885
Fold the 8 Person (SOLAS B-Pack) liferaft into the N134 Low Profile container

8.41.6 10 or 12 Person (SOLAS A-Pack) in size N135 Low Profile container.
Refer to **Figure 886**.

- (a) Fold the 10 or 12 person (SOLAS A-Pack) liferaft.
 - (i) Fold the right side of the liferaft to the width of the container.
Refer to **Figure 886 (i)**.
 - (ii) Fold the left side of the liferaft over the right side fold.
Refer to **Figure 886 (i)**.
 - (iii) Fold the left fold back to the width of the container.
Refer to **Figure 886 (ii)**.

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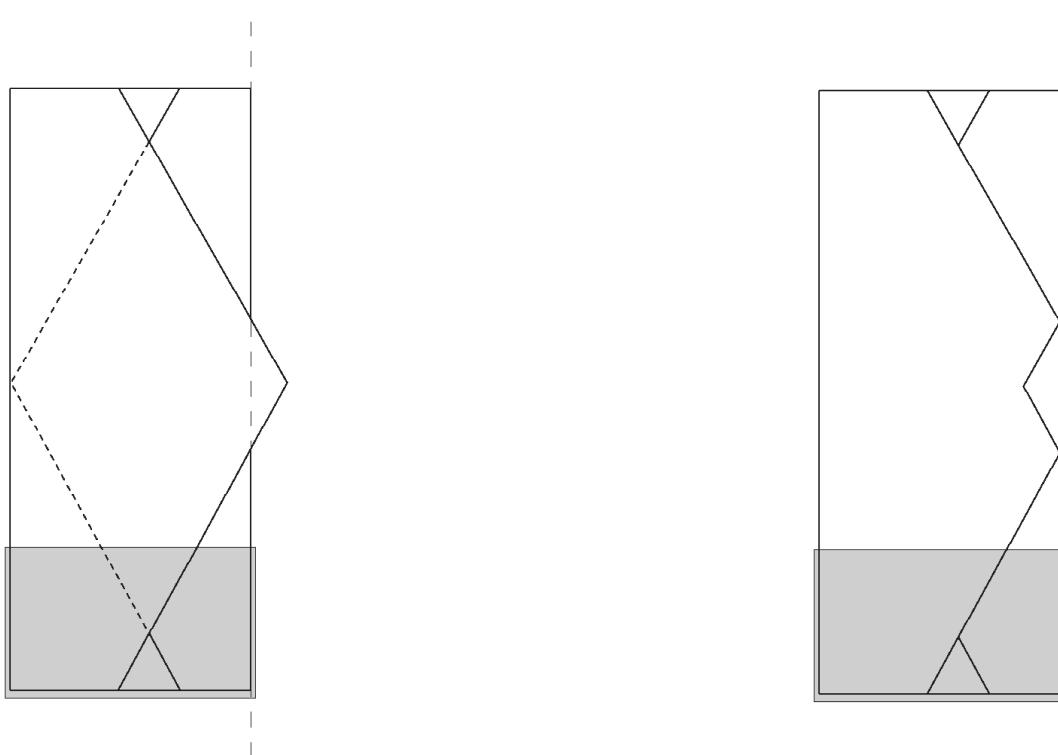
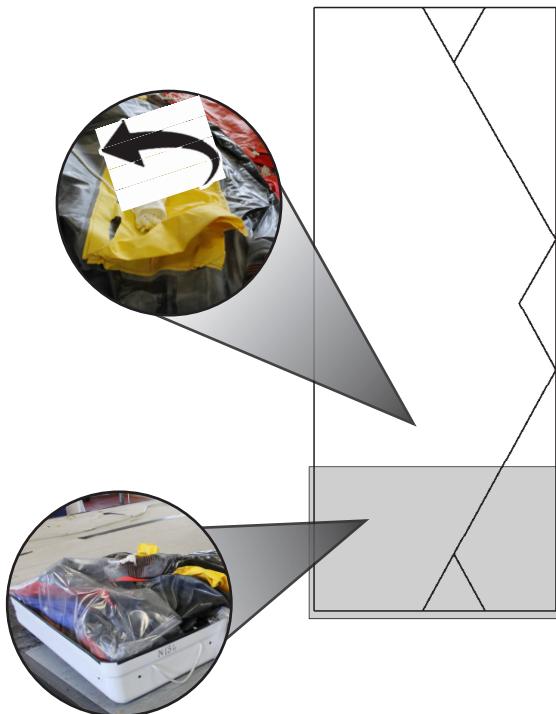


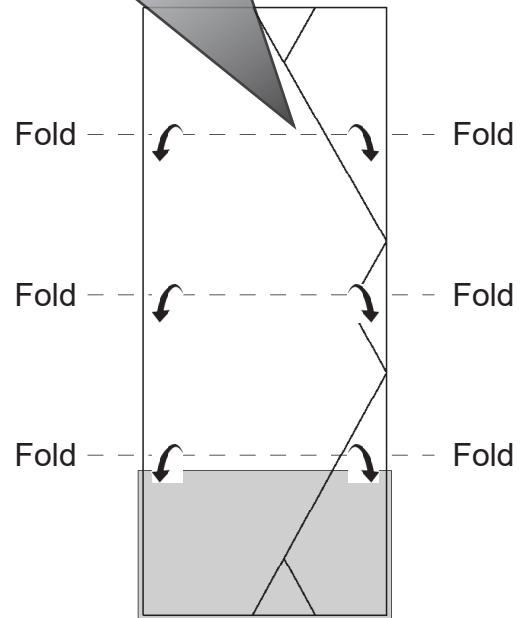
FIGURE 886
Fold the liferaft into the N135 Low Profile container

- (b) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 886 (iii)**.
- (c) Locate the drogue and attach it to the drogue patch.
- (d) Put the rolled up drogue below the water pocket.
Refer to **Figure 886 (iii)**.
- (e) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (f) Fold the liferaft into the container:
Refer to **Figure 886 (iv)**.
 - (i) Use one full fold to fold the liferaft one time towards the container.
 - (ii) Twist the boarding ramp and push it down on top of the liferaft.
 - (iii) Use two full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (g) Wrap the polyethylene sheet around the outside of the rolled liferaft. Refer to **Figure 886 (v)**.
- (h) Tuck the overlap of polyethylene sheet under the folded liferaft.
Refer to **Figure 886 (v)**.
- (i) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (j) Refer to step 5.40 to install the painter sachet.

iii



iv



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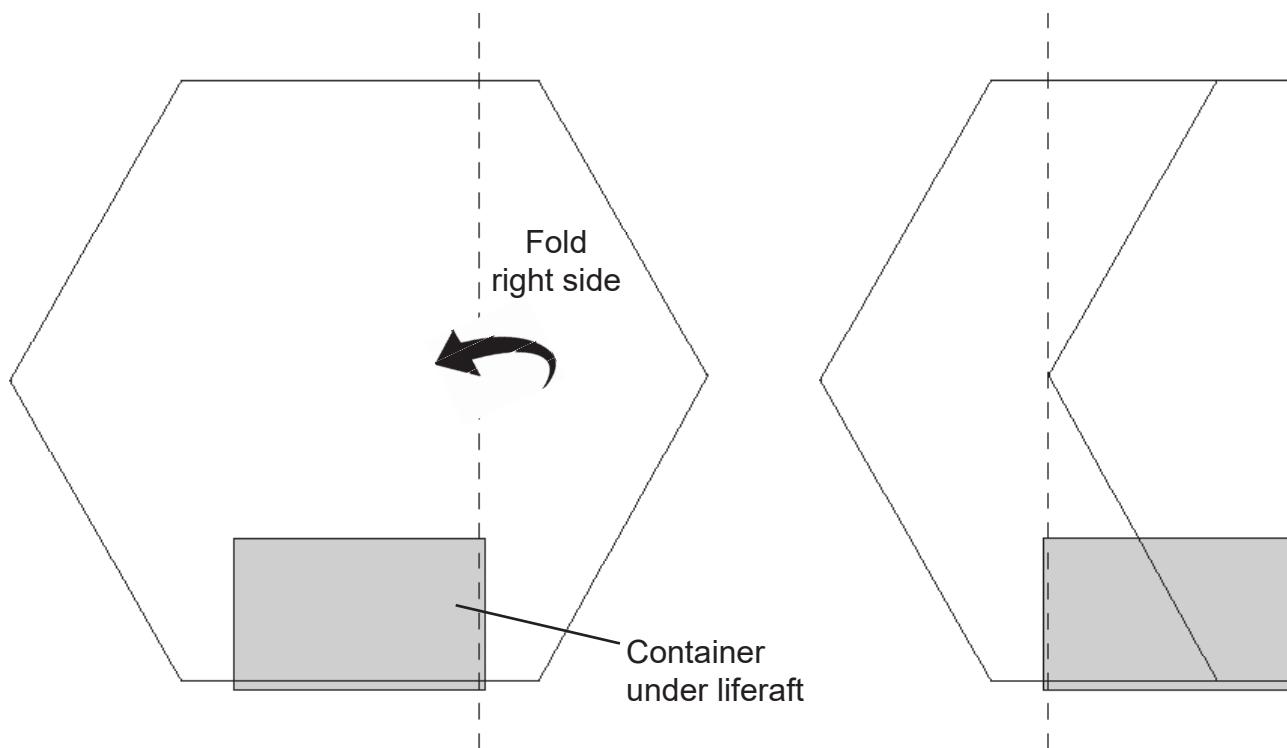


FIGURE 886
Fold the liferaft into the N135 Low Profile container

8.41.7 10 or 12 Person (SOLAS B-Pack) in size N134 Low Profile container.
Refer to **Figure 887**.

- (a) Fold the 10 or 12 person (SOLAS A-Pack) liferaft.
 - (i) Fold the right side of the liferaft at the width of the container.
Refer to **Figure 887 (i)**.
 - (ii) Fold the left side of the liferaft over the right side fold.
Refer to **Figure 887 (i)**.
 - (iii) Fold the left side fold back over.
Refer to **Figure 887 (ii)**.

i



ii

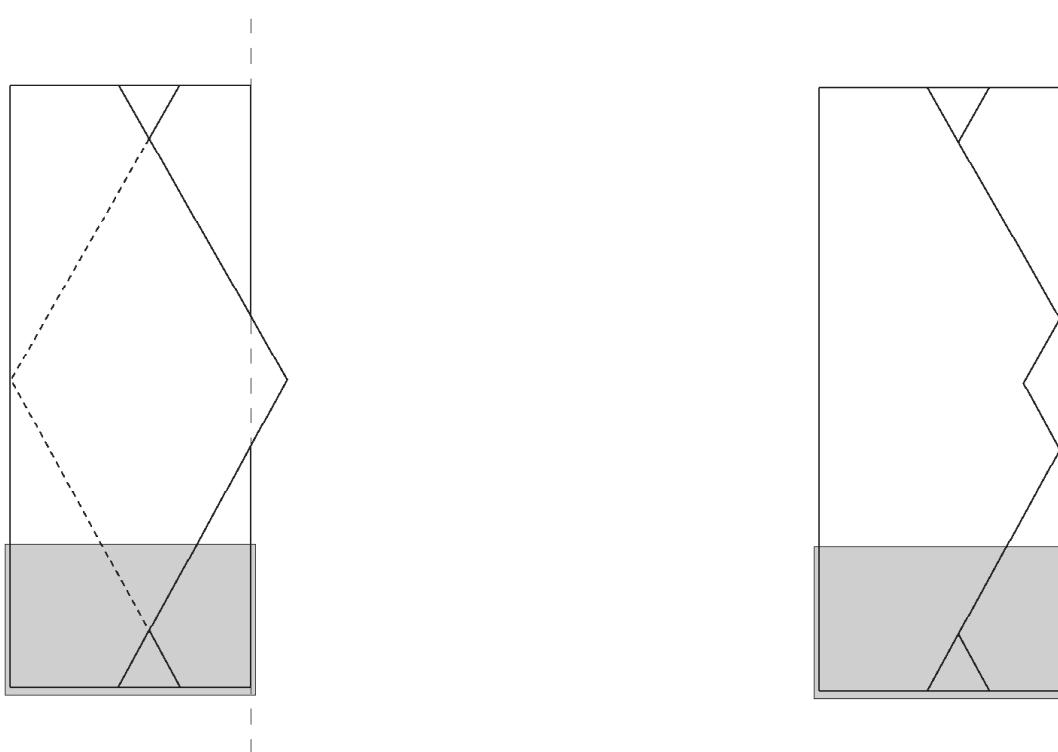
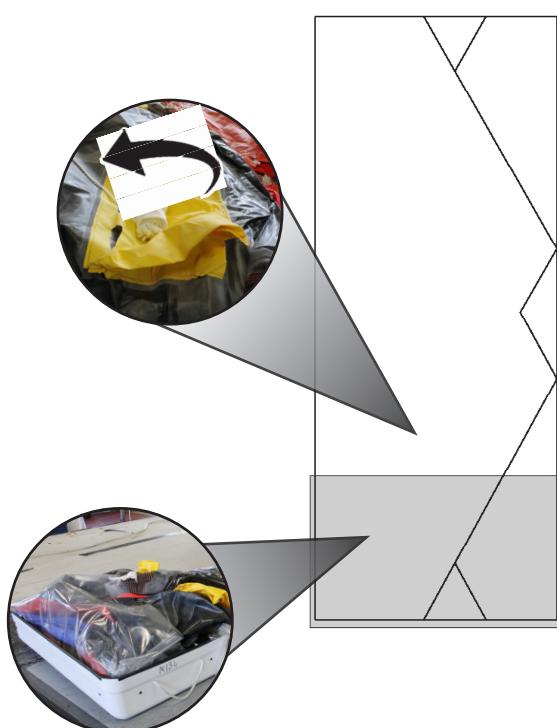


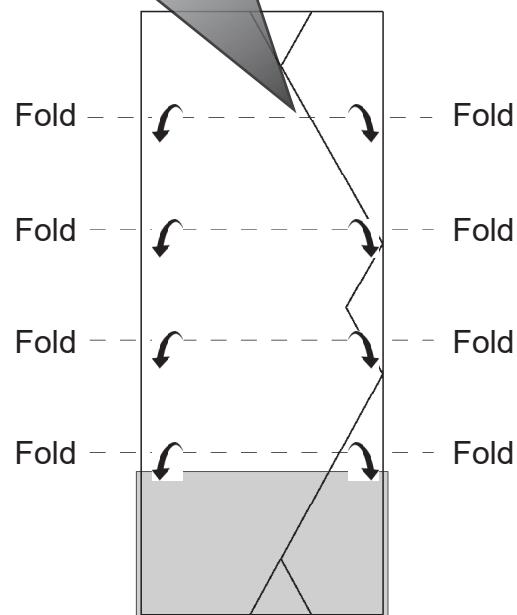
FIGURE 887
Fold the liferaft into the N134 Low Profile container

- (b) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 887 (iii)**.
- (c) Locate the drogue and attach it to the drogue patch.
- (d) Put the rolled up drogue below the water pocket.
Refer to **Figure 887 (iii)**.
- (e) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (f) Fold the liferaft into the container:
Refer to **Figure 887 (iv)**.
 - (i) Use one full fold to fold the liferaft towards the container.
 - (ii) Twist the boarding ramp and push it down on top of the liferaft.
 - (iii) Use three full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (g) Wrap the polyethylene sheet around the outside of the rolled liferaft. Refer to **Figure 887 (v)**.
- (h) Tuck the overlap of polyethylene sheet under the folded liferaft.
Refer to **Figure 887 (v)**.
- (i) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (j) Refer to step 5.40 to install the painter sachet.

iii



iv



v

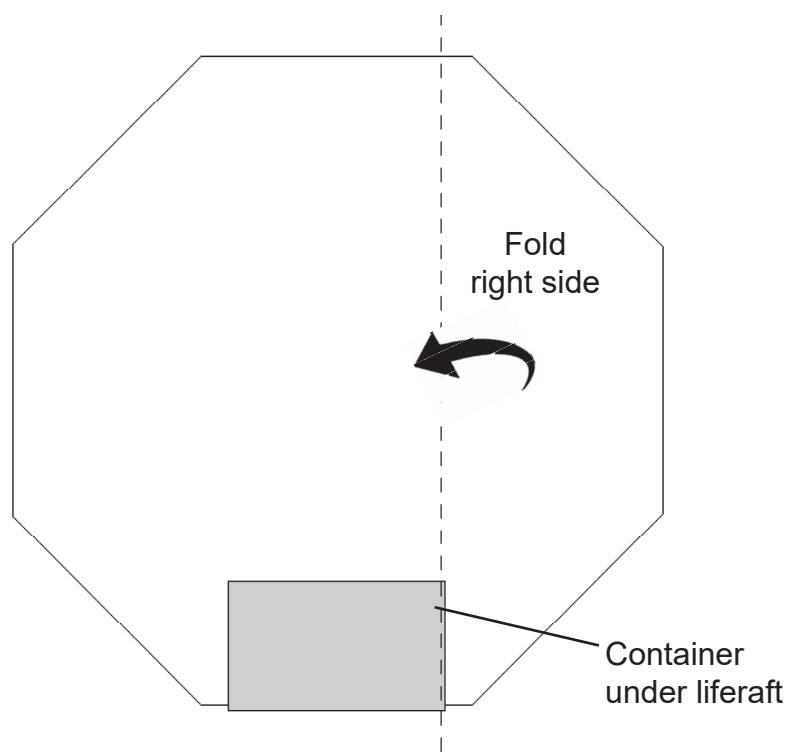


FIGURE 887
Fold the liferaft into the N134 Low Profile container

8.41.8 16 or 20 Person (SOLAS A-Pack) in size N136H Low Profile container.
16 Person (SOLAS B-Pack) in size N136 Low Profile container
Refer to **Figure 888**.

- (a) Fold the 16 or 20 person (SOLAS A-Pack and B-Pack) liferaft.
 - (i) Fold the right side of the liferaft at the width of the container.
Refer to **Figure 888 (i)**.
 - (ii) Fold the right side fold of the liferaft back over.
Refer to **Figure 888 (ii)**.

i



ii

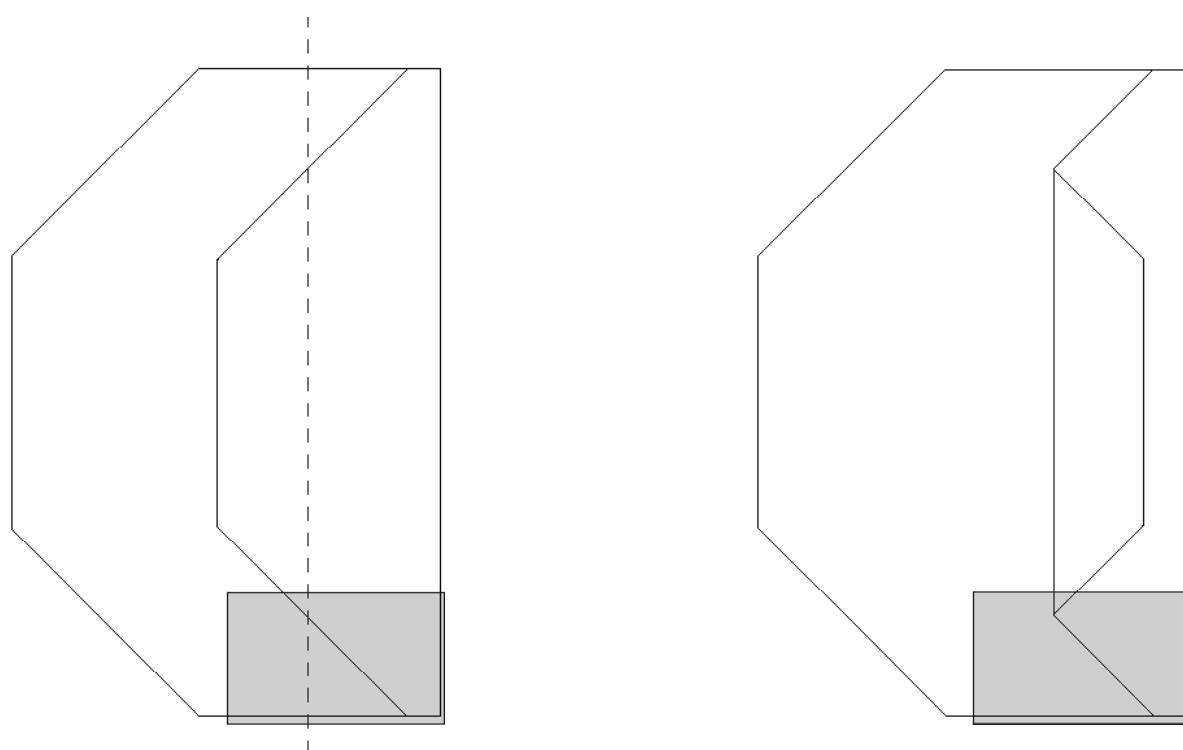
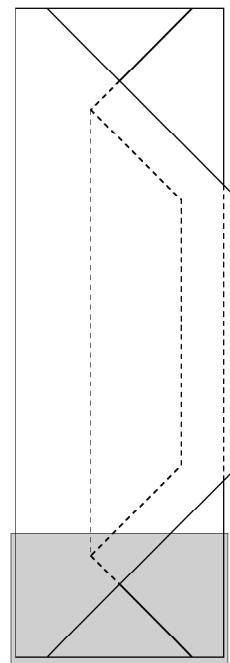
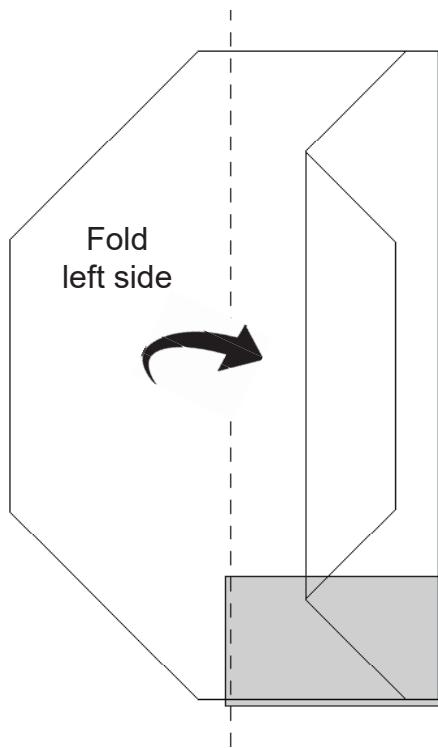


FIGURE 888
Fold the 16 or 20 Person liferaft into the Low Profile container

- (iii) Fold the left side of the liferaft at the width of the container.
Refer to **Figure 888 (iii)**.
- (iv) Fold the left side fold of the liferaft back over.
Refer to **Figure 888 (iv)**.

iii



iv

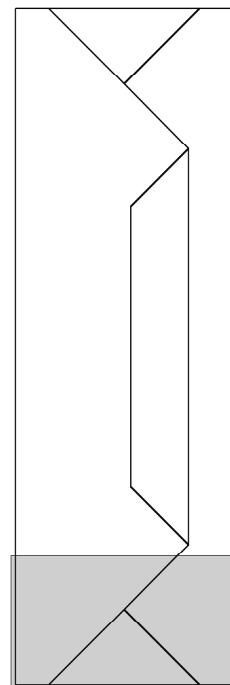
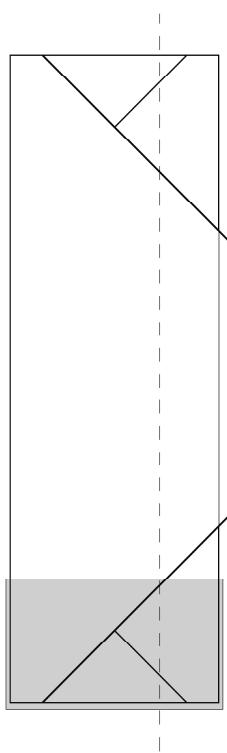
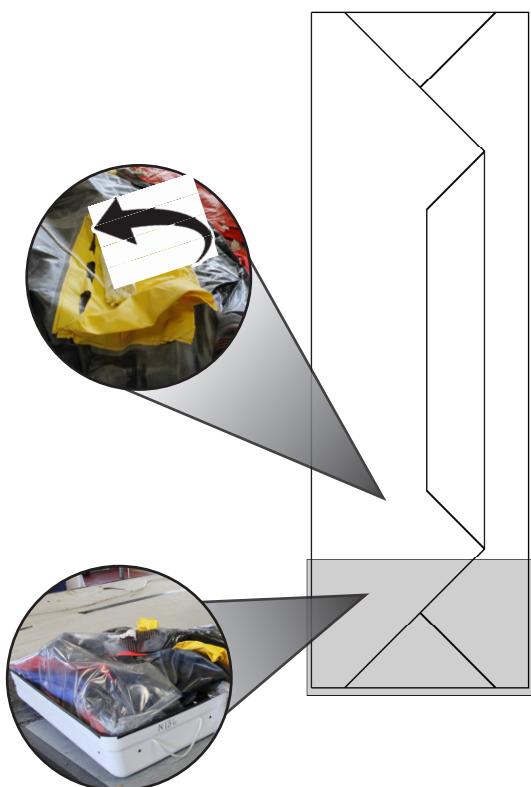


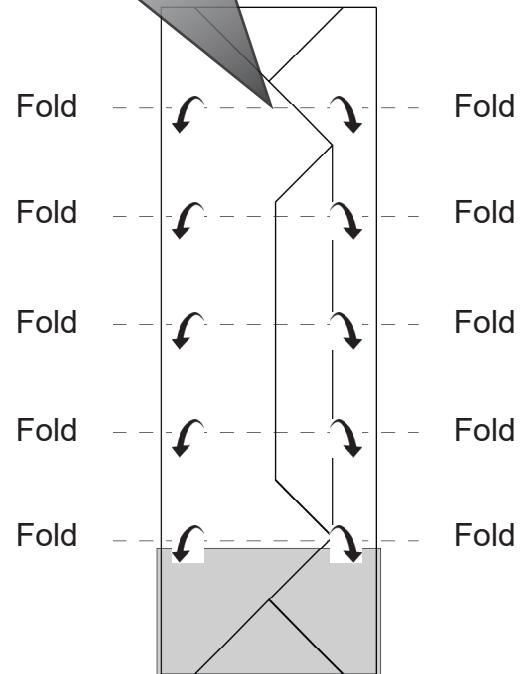
FIGURE 888
Fold the 16 or 20 Person liferaft into the Low Profile container

- (b) Wrap the polyethylene sheet over the front of the liferaft.
Refer to **Figure 888 (v)**.
- (c) Locate the drogue and attach it to the drogue patch.
- (d) Put the rolled up drogue below the water pocket.
Refer to **Figure 888 (v)**.
- (e) Reach into the liferaft and make sure that the knife is flat along the buoyancy tube.
- (f) Fold the liferaft into the container:
Refer to **Figure 888 (vi)**.
 - (i) Use one full fold to fold the liferaft towards the container.
 - (ii) Twist the boarding ramp and push it down on top of the liferaft.
 - (iii) Use four full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (g) Wrap the polyethylene sheet around the outside of the rolled liferaft. Refer to **Figure 888 (vii)**.
- (h) Tuck the overlap of polyethylene sheet under the folded liferaft.
Refer to **Figure 888 (vii)**.
- (i) Use black 400 mm tape to attach the identification tube ring to the edge of the container.
- (j) Refer to step 5.40 to install the painter sachet.

v



vi



vii



FIGURE 888
Fold the 16 or 20 Person liferaft into the Low Profile container

8.42 Install the painter sachet:

WARNING: THE OPERATING MECHANISM IS ARMED. TAKE EXTREME CARE WITH THE ACTIONS THAT FOLLOW.

- (a) Put the painter sachet along the back of the container.
Refer to **Figure 889 (i)**.
- (b) Adjust the painter sachet extension so that the distance from it to the painter exit is between 100 - 150 mm (4" - 6"). Make sure that the open end of the painter sachet is as near as possible to the painter exit hole on the container.
- (c) Make sure 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.
- (d) Use self-adhesive tape to attach the painter sachet to the polyethylene sheet. Refer to **Figure 889 (ii)**.

8.42.1 Put the rubber sheathed end of the painter line through the painter retaining block.

8.42.2 Put the painter retaining block into the cut-out in the container.
Refer to **Figure 889 (iii)**.

8.42.3 Put the top half of the container on top of the folded liferaft.

i



ii



iii

Painter retaining block



FIGURE 889
Attach the painter sachet

- 8.43 Put two ratchet straps around the container. Make sure that the ratchet straps do not cover the container strap grooves. Refer to **Figure 890**.



FIGURE 890
Put two ratchet straps around the container

- 8.44 Tighten the ratchet straps uniformly around the container. Make sure that the upper half of the container mates with the lower half of the container correctly.
- 8.45 Continue to close the container slowly while you alternate from one strap to the other.
- 8.46 Use either method that follows to help position the top half of the container:

- 8.46.1 Use a rubber mallet to strike the container.

CAUTION: THE EDGES OF THE SPATULA MUST ALL BE RADIUSED AND SMOOTH TO AVOID DAMAGE TO THE LIFERAFT. CHECK CONTINUOUSLY TO MAKE SURE THAT NO PART OF A LIFERAFT BECOMES TRAPPED BETWEEN THE CONTAINER LIPS AS THEY CLOSE AND THAT THE SEAL IS MADE.

- 8.46.2 Use a hardwood or spatula to lever the top half of the container against the bottom half.

- 8.47 Check that the painter retaining block on the painter line does not become displaced.

WARNING: YOU MUST STAND TO ONE SIDE OF THE STRAP WHEN YOU APPLY TENSION OR CRIMP THE STRAPS.

WARNING: YOU MUST WEAR PROPER CLOTHING AND EYE PROTECTION. PROPER FOOTING AND BALANCE MUST BE MAINTAINED WHEN YOU OPERATE THE EQUIPMENT. WHEN YOU APPLY TENSION USE SHORT HAND STROKES ONLY.

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

CAUTION: YOU MUST ATTACH CRIMPS ON THE OPPOSITE SIDE OF THE CONTAINER TO THE ROLL OF THE LIFERAFT.

NOTE: To encapsulate crimps with a heat-shrink sleeve the procedures that follow must be observed.
Refer to **Chapter 11, Illustrated Parts List** for part numbers.

- 8.48 Put a heat-shrink sleeve on each container strap. Keep the strap ID tag as close as possible to the crimp. The maximum installed separation between the ID tag and crimp is 10 mm.
- 8.49 Adjust the ends of each strap so that the outer most strap end is facing upwards and is approximately 25 mm (1") above the rim of the container. Refer to **Figure 891**.
- 8.50 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. Refer to **Figure 891**.
- 8.51 Safety the strap with a crimp. Refer to **Figure 891**.

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

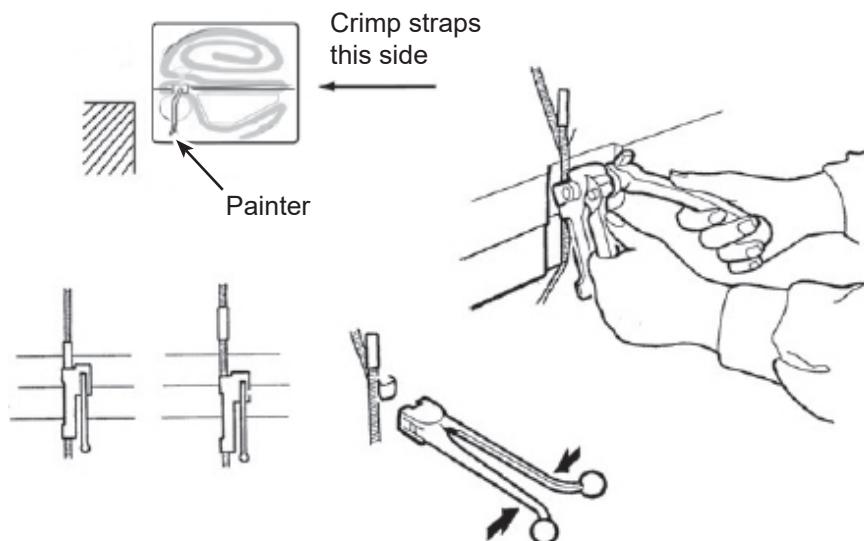


FIGURE 891
Crimp each container strap on opposite side to roll

CAUTION: DO NOT TRIM OFF THE STRAP ID TAG.

- 8.52 Use scissors to carefully cut the tail of the strap as close as possible to the crimp. The maximum distance permitted between the end of the tail and the crimp is 15 mm.

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

CAUTION: USE THE CORRECT HEAT-SHRINK TOOL. REFER TO **CHAPTER 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS.**

CAUTION: DO NOT OVERHEAT THE STRAP. DO NOT POINT THE HEAT GUN DIRECTLY AT THE STRAP. IF YOU SEE DISCOLOURATION IN THE STRAP, IT HAS BEEN OVERHEATED. IN THIS CASE IT MUST BE DISCARDED, REMOVED AND REPLACED.

- 8.53 Set the heat gun to the correct temperature.

- 8.54 Use the heat gun on a test heat-shrink sleeve to make sure that the heat gun is at the correct temperature.

NOTE: The heat-shrink sleeve will soften and will be able to encapsulate.

NOTE: If the heat-shrink sleeve melts then the heat gun temperature is too high.

- 8.55 Put the heat-shrink sleeve over the entire crimp and tail. Make sure the heat-shrink sleeve overlaps in both directions by at least 5 mm.
- 8.56 Use the heat gun to apply heat evenly over the heat-shrink sleeve:
Refer to **Figure 892**.
 - 8.56.1 Use the heat gun to heat the rear of the heat-shrink sleeve evenly from both left and right hand sides. Make sure that the entire crimp and tail are completely encapsulated.
- 8.57 Do the steps that follow to make sure that the heat-shrink sleeve has sealed tight against the strap:
 - 8.57.1 Put on protective gloves.
 - 8.57.2 Use your fingers to pinch the ends of the heat-shrink sleeve while it is cooling.
- 8.58 Put 'DO NOT CUT' tape over the top of the straps in each container strap groove.
- 8.59 Remove the ratchet straps.
- 8.60 This completes the packing sequence for the N-Series Low Profile container.
The container is now ready for labelling.
Refer to **Chapter 11, Illustrated Parts List**.

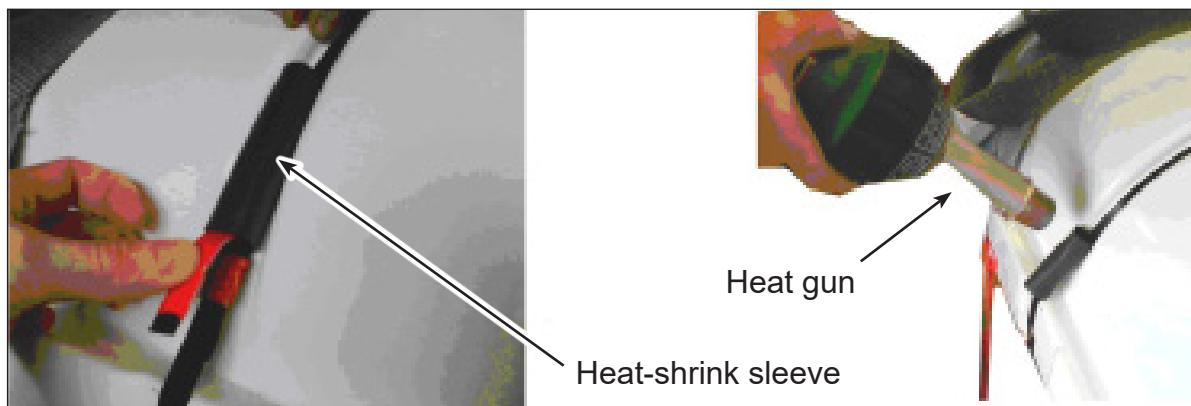
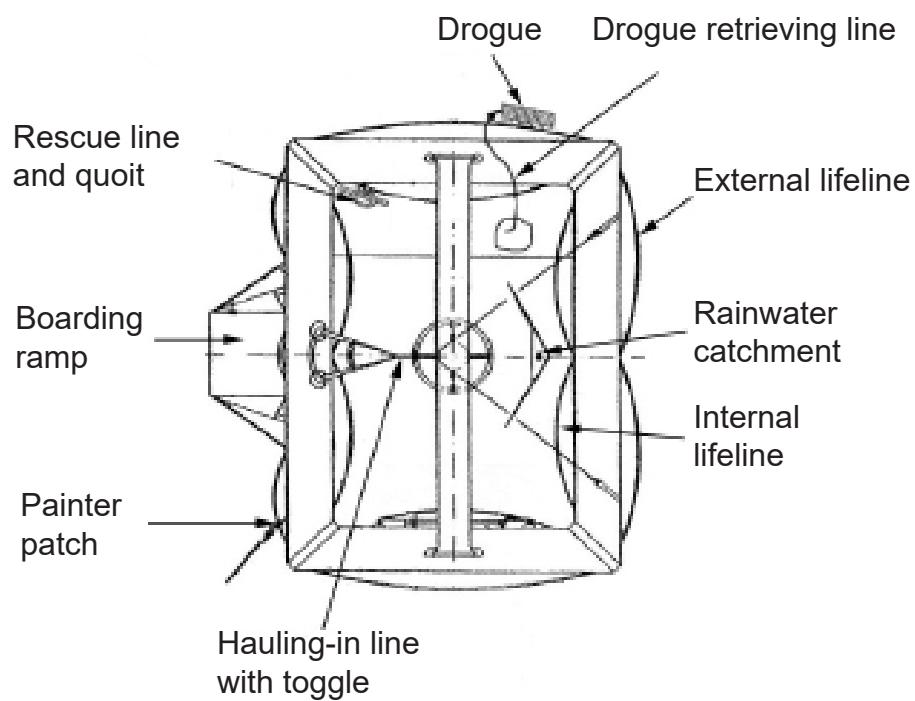


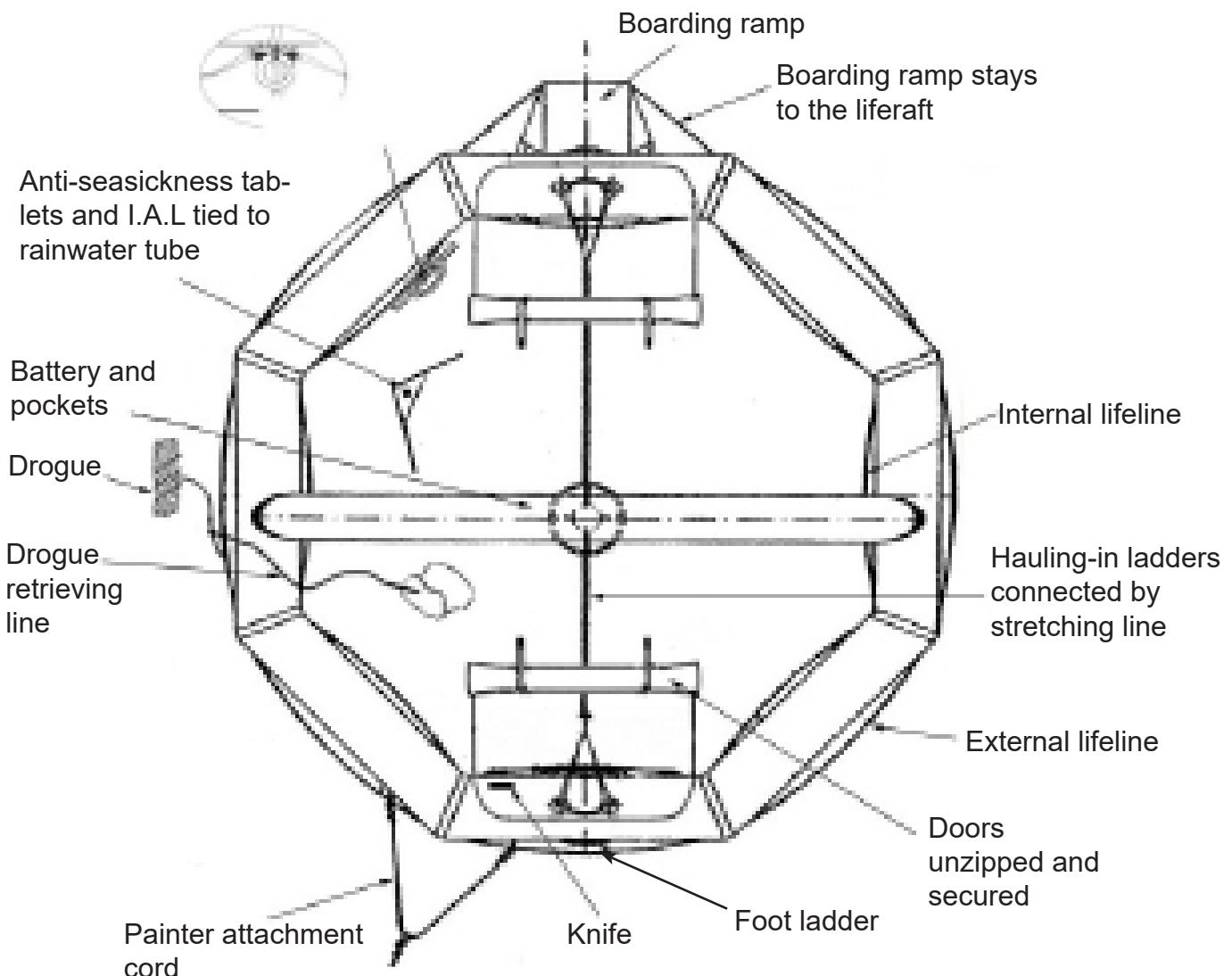
FIGURE 892
Heat-shrink sleeve and heat gun

9. Pack a Throwover liferaft into a N-Series Xtrem container:

NOTE: Paddles are not installed at this stage.

FIGURE 893
Preparation for packing assembly of 6-8 Person Throwover for
N-Series Xtrem container

Retaining strap around
rescue line and quoit



NOTE: Paddles are not installed at this stage.

NOTE: The picture illustrated is 25 Person liferaft. Layout will be similar for other TO liferafts.

FIGURE 894
Preparation for packing assembly for 10-16 Person Throwover for
N-Series Xtrem container

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

- 9.1 Put the liferaft neatly on a packing table in an open area with enough room to manoeuvre the container during packing.
- 9.2 Put the inflation valves adjacent to the edge of the packing table. Make sure that all cordage is neat and tidy.

Do the steps that follow when most of the air has naturally escaped from the liferaft:

- 9.2.1 Connect a vacuum device to a deflation adapter and remove all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
 - 9.2.2 As the air in each buoyancy tube is removed adjust the buoyancy tubes so that they lie flat on each other.
- 9.3 <Not Used>
 - 9.4 <Not 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 SAFE CLAMPING DEVICE WHEN ATTACHING OR REMOVING AN OPERATING HEAD

- 9.5 Remove the transit plug from the operating head.
- 9.6 Refer to **Appendix 12** for guidance on installing and checking a Leafield GIST operating head.
- 9.7 <NOT USED>

FIGURE 895
<NOT USED>

WARNING: THE OPERATING HEAD MUST BE TIGHT ON THE CYLINDER VALVE.

CAUTION: THE ACTUATOR CABLES ARE NOT INTERCHANGEABLE.

- 9.8 The actuator cables are colour coded for application. The white overmould (longer cable) is used with white operating head.

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

- 9.9 Upturn the edge of the liferaft to reveal the cylinder stowage pocket/straps.

- 9.10 Use the pocket/straps to attach the cylinder into the cylinder stowage arrangement, take care not to trap the righting strap. Refer to **Figure 896**.

- 9.11 The cylinder must be orientated so that one of the top operating head outlet runs parallel with the base of the liferaft Refer to **Figure 896**.

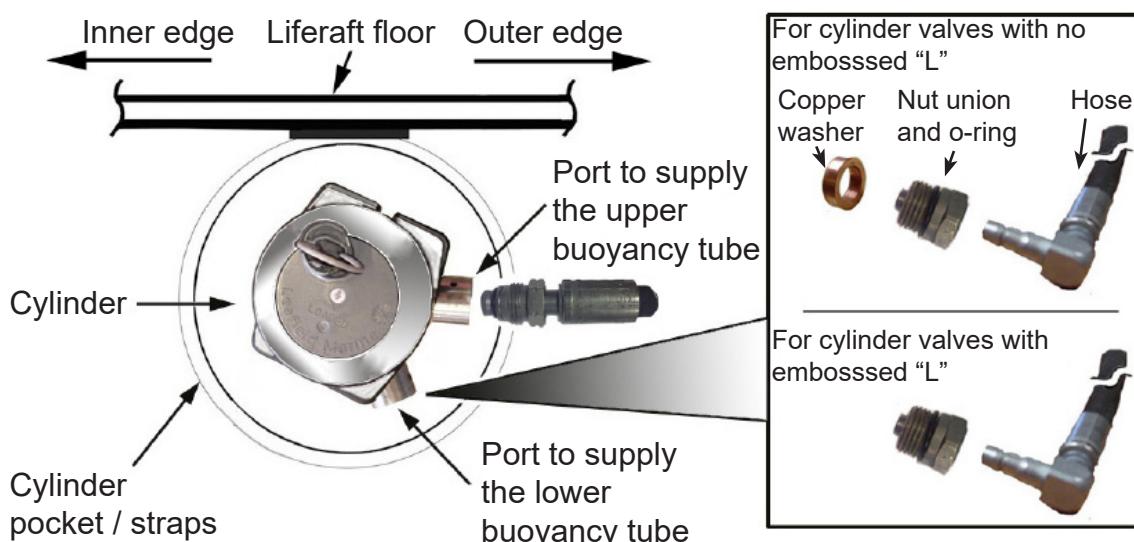


FIGURE 896

Use the pocket/straps to attach the cylinder to the liferaft (straps shown)

9.12 Attach the cord to the cylinder neck.

9.12.1 <Not used>

9.12.2 Liferaft with velcro straps:

- (a) Use a reef knot and four half hitches with two turns of 238 kg f / 525 lbf nylon cord (450 mm long) to tie the cylinder neck securely to the adjacent loop patch on the floor.
- (b) Tape the flying ends.

9.13 Remove the recoil / transit caps from the cylinder valve.

Refer to **Figure 895**.

9.14 Check inflation hoses for damage and replace if necessary. Refer to **Appendix 14** for guidance on inspection the inflation hose. Connect each inflation hose. Refer to **Figure 895**. Torque the hose connections as stated in **Chapter 1, TABLE 101**.

If the bottom buoyancy hose needs to be replaced a double end bayonet type is used.

NOTE: There are two options available to connect hose to the operating head.

9.14.1 Use a copper washer, nut union and O-ring to connect the hose if the cylinder valve has no embossed 'L'.

9.14.2 Use a nut union and O-ring to connect the hose if the cylinder valve has an embossed 'L'

9.14.3 Use one turn of white tape with a pull tail on each hose connection to show that they have been torqued.

9.14.4 Replace the sealing O-ring at each service.

CAUTION: MAKE SURE THAT THE COVER PROTECTION DOES NOT OBSTRUCT THE TOP OF OPERATING HEAD AND H-PACK ASSEMBLY.

9.15 Put a length of N-Series protective foam webbing through each pair of holes in the lower protective foam. Refer to **Figure 897 (i)**.

9.16 Insert the upper and lower pieces of N-Series protective foam onto the operating head.

- 9.17 Put the two lengths of N-Series protective foam webbing through each pair of holes in the upper protective foam.
- 9.18 Tie the N-Series thin webbing to attach the upper and lower pieces of N-Series protective foam together. Refer to **Figure 897 (ii)**.
- 9.19 Put the liferaft flat on the table.

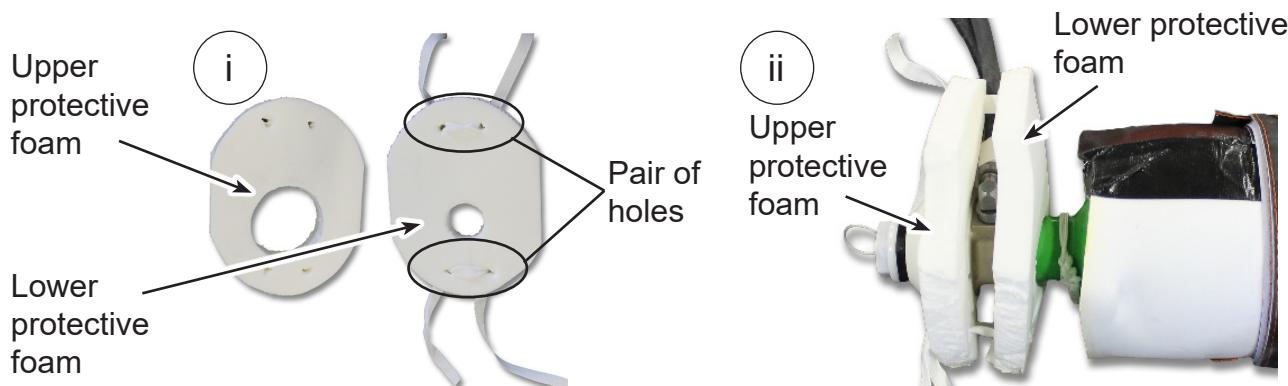


FIGURE 897
N-Series protective foam for the operating head

- 9.20 Grasp the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container.
 - 9.20.1 Put the cylinder at the back of the container and with the operating head close to the container corner. Refer to **Figure 898**.
 - 9.20.2 Leave space to allow for straight pull of line to reduce pull force values.
 - 9.20.3 The operating head must be between 150 mm to 200 mm from the end of the container.

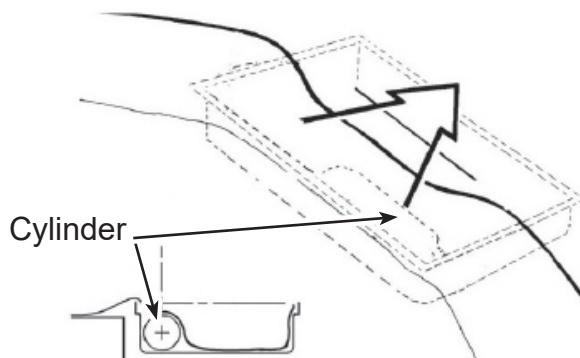


FIGURE 898
Cylinder position

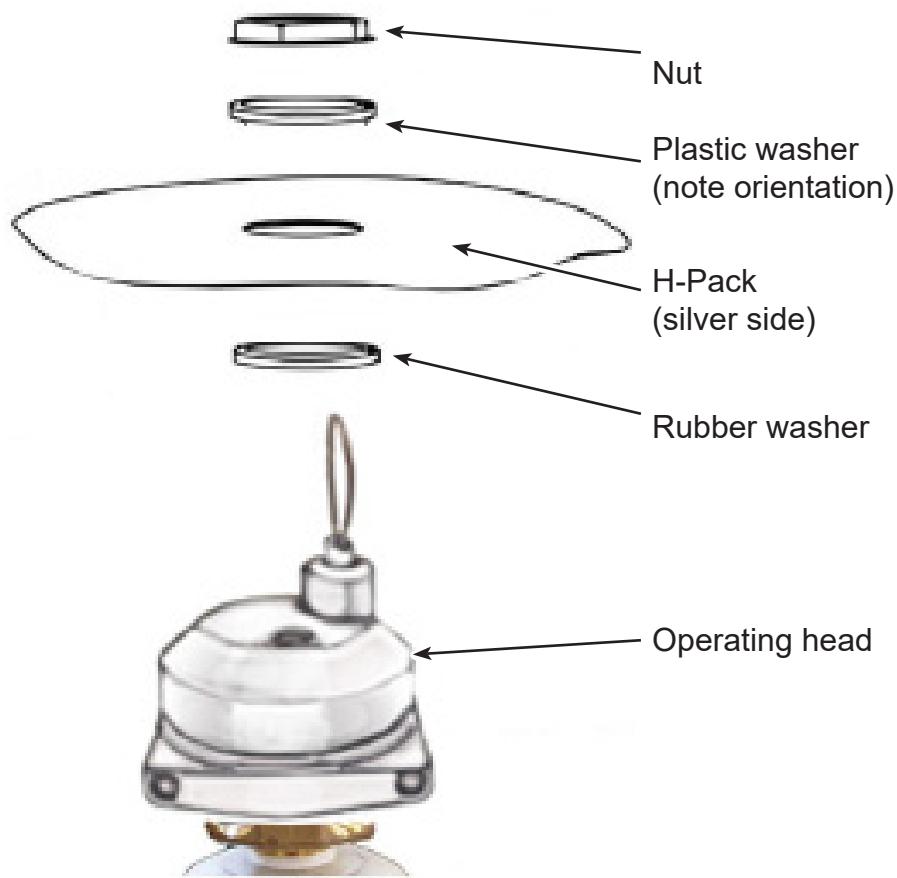
9.21 Attach the operating head to the H-Pack:
Refer to **Figure 899**.

9.21.1 Use extreme care and remove the locking nut and gasket from the operating head.

9.21.2 Align the operating head with the opening in the H-Pack.

9.21.3 Assemble the operating mechanism to the H-Pack. Refer to **Figure 899**.

9.21.4 Put the nylon nut over the threads of the operating mechanism and torque to stated value. Refer to **Chapter 1, TABLE 101**.



Operating mechanism shown exploded for clarity

FIGURE 899
Attach the operating head to the H-Pack

- 9.22 Use 100 mm black adhesive tape to temporarily attach the painter sachet to the lower half of the container. Refer to **Figure 899A**.

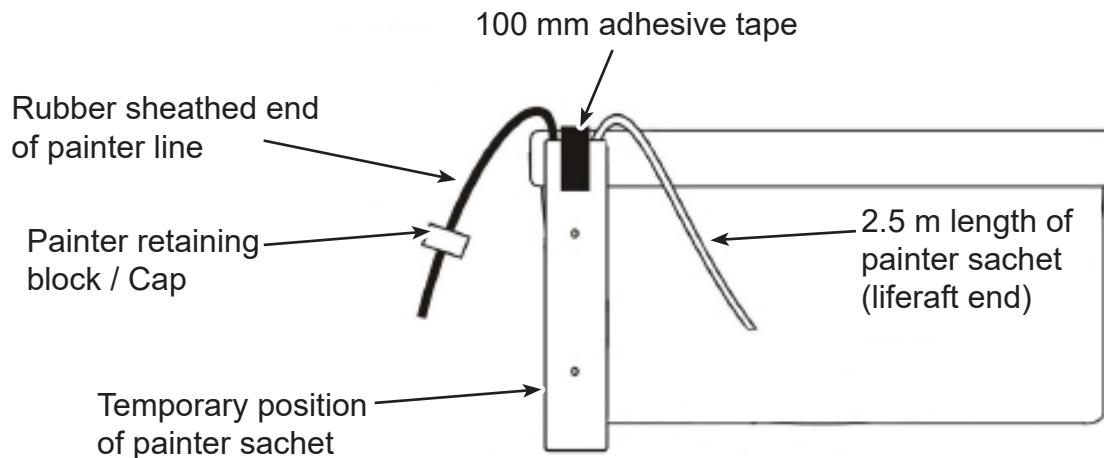


FIGURE 899A
Attach painter sachet to the container

- 9.23 Put the actuation cable of the operating mechanism through the centre of the braid of the painter line.

- 9.24 Put the remaining painter line back through the actuation cable.
Refer to **Figure 899B**.

WARNING: THE OPERATING MECHANISM IS NOW ARMED. YOU MUST TAKE EXTREME CARE DURING ALL ACTIONS THAT FOLLOW.

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

- 9.25 Lightly tug on the painter cord to make sure that the painter cord is firmly attached to the operating head. Refer to **Figure 899B**.

- 9.26 Apply two turns of white tape around the painter cord. Refer to **Figure 899B**.

- 9.27 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.

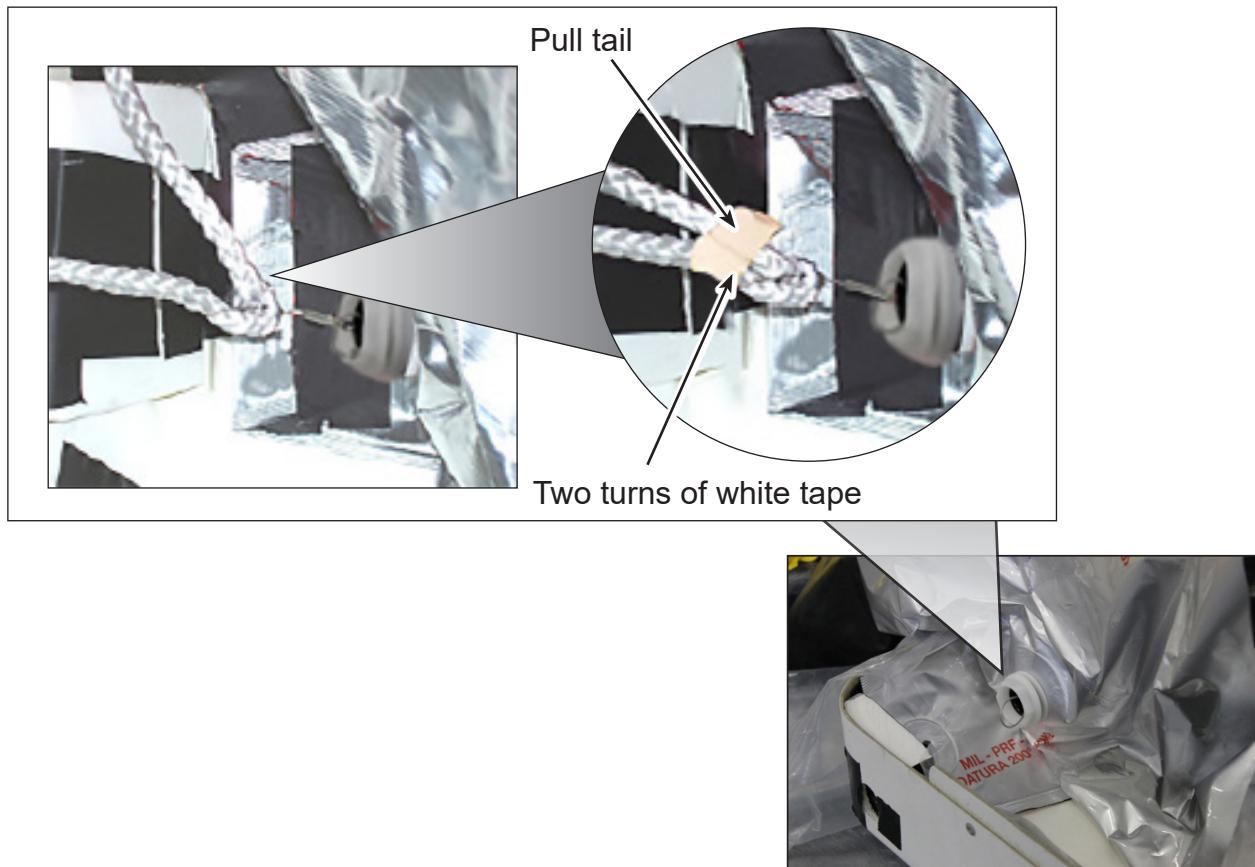


FIGURE 899B
Attachment of painter line to the actuation cable

- 9.28 Measure 250 mm between the operating head and the painter cord.
Refer to **Figure 899C**.
- 9.29 Use a permanent black marker to mark the firing point.
Refer to **Figure 899C**.

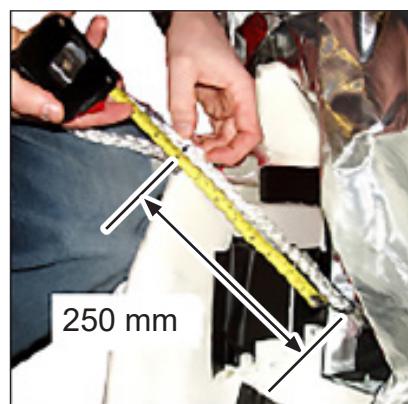


FIGURE 899C
Mark the firing point

9.30 Find the painter attachment hole on the H-Pack.

9.31 Use a fid and half knot to tie the unsheathed end of the painter line to the H-Pack attachment hole. Refer to **Figure 878** and **Figure 899D**.



FIGURE 899D
Attachment of painter line to the H-Pack

9.32 Use white tape to tape the flying end.

9.33 Pull the unsheathed end of the painter line until a black pre-marked point is visible 1500 mm from where the line exits the sachet.

9.34 Extract a further 600 mm of painter line from the sachet.

9.35 Put the liferaft floor area down into the recesses towards each end of the container.

CAUTION: YOU MUST REPLACE THE PAINTER LINE IF IT IS FRAYED.

9.36 Put the rubber sheathed end of the painter line through the painter retaining block. Refer to **Figure 899A**.

9.37 Do the steps that follow for the Emergency packs and two-piece paddles:

CAUTION: FOR 10-20 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING-IN LADDER. MAKE SURE THAT NO PARTS OF THE CANOPY OR DOOR ARE TRAPPED BENEATH THE PACKS.

CAUTION: FOR 4-8 PERSON MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE ARCH TUBE.

9.37.1 Insert the emergency pack. Refer to **Figure 899DD**:

- (a) Make space inside the liferaft that is in the container base.
- (b) Put the emergency pack inside the liferaft.

NOTE: Make sure to push the emergency pack flat against the container bottom

- (c) Use a vacuum to remove any excess air from the emergency pack.



FIGURE 899DD
Insert the emergency pack

9.37.2 Insert the equipment bag and paddles. Refer to **Figure 899E**:

- (a) Put the equipment bag inside the liferaft on top of the emergency pack.

NOTE: Make sure the equipment bag is below the lower container boundary

- (b) Use a vacuum to remove any excess air from the equipment bag.
- (c) Put the paddles inside the liferaft alongside the equipment bag.

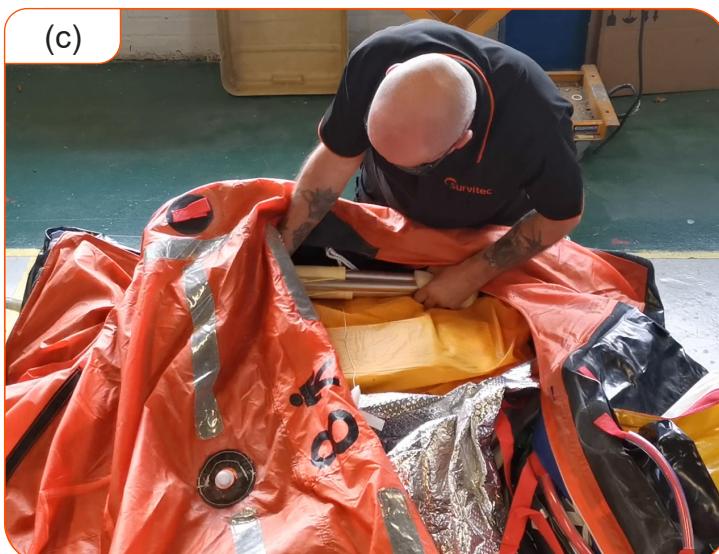
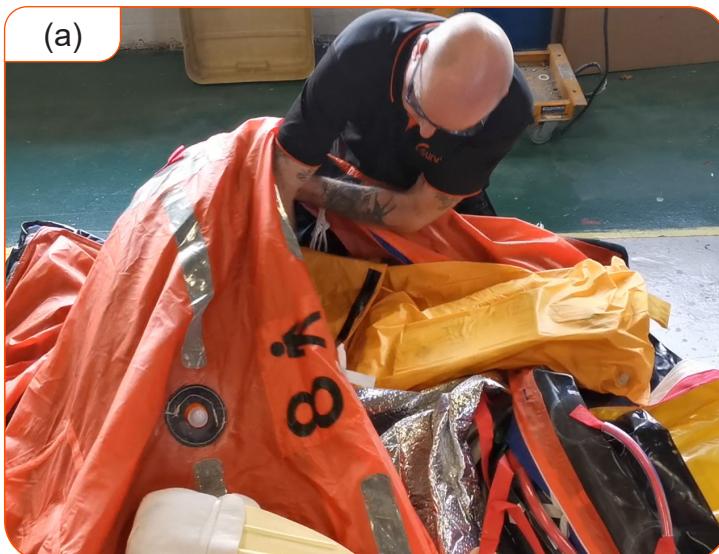
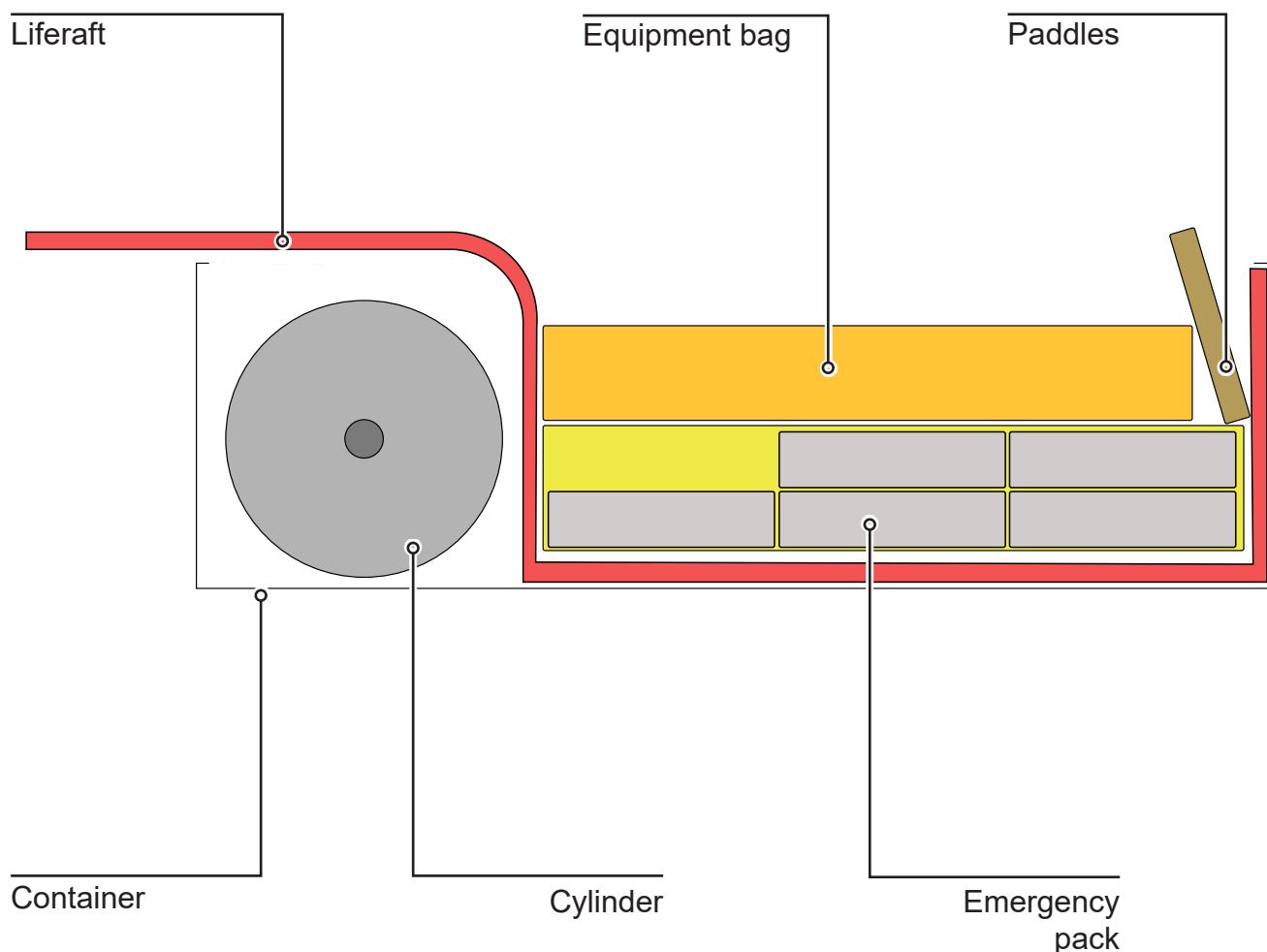


FIGURE 899E
Insert the equipment bag and paddles

9.37.3 Use 50 lb cord and an overhand knot to attach the two-piece paddles to the inner lifeline.



**Side view layout of cylinder, emergency pack, equipment bag and paddles
(8 Person used as an example)**

9.38 Do the steps that follow for inside the H-Pack:

9.38.1 Use a bowline knot to tie the short internal line on the inside of the H-Pack to the liferaft painter patch.

9.38.2 Tape the flying ends (100 +/- 50 mm).

9.38.3 Put the hauling-in ladder over the E-Pack(s). (10, 12 and 16 Person liferafts only)

9.39 Connect a suction hose to each of the two deflation points and deflate the buoyancy tubes fully.

(a) One on each buoyancy tube.

9.40 The step that follows is for the RL5 internal lamp only:

Enter the liferaft by the rear door and connect the switch activator to the internal lamp.

CAUTION: 4-8 PERSON ONLY: FOLD THE ARCH TUBE AROUND THE INTERNAL LAMP.

9.40.1 Fold the arch tube around the internal lamp and secure with 1 turn of 25 mm (1") tape. Refer to **Figure 899EE**.

NOTE: This will make sure that the tension line does not interfere with the lighting switch. Make sure that the knife is installed and that the flaps of the pocket are closed correctly.

9.41 Pull the canopy towards the container.

9.41.1 Make sure that the internal lamp is not in the way off the hauling-in ladder.

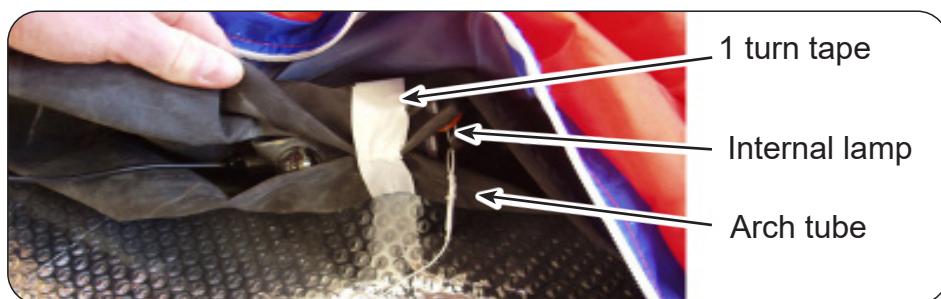


FIGURE 899EE

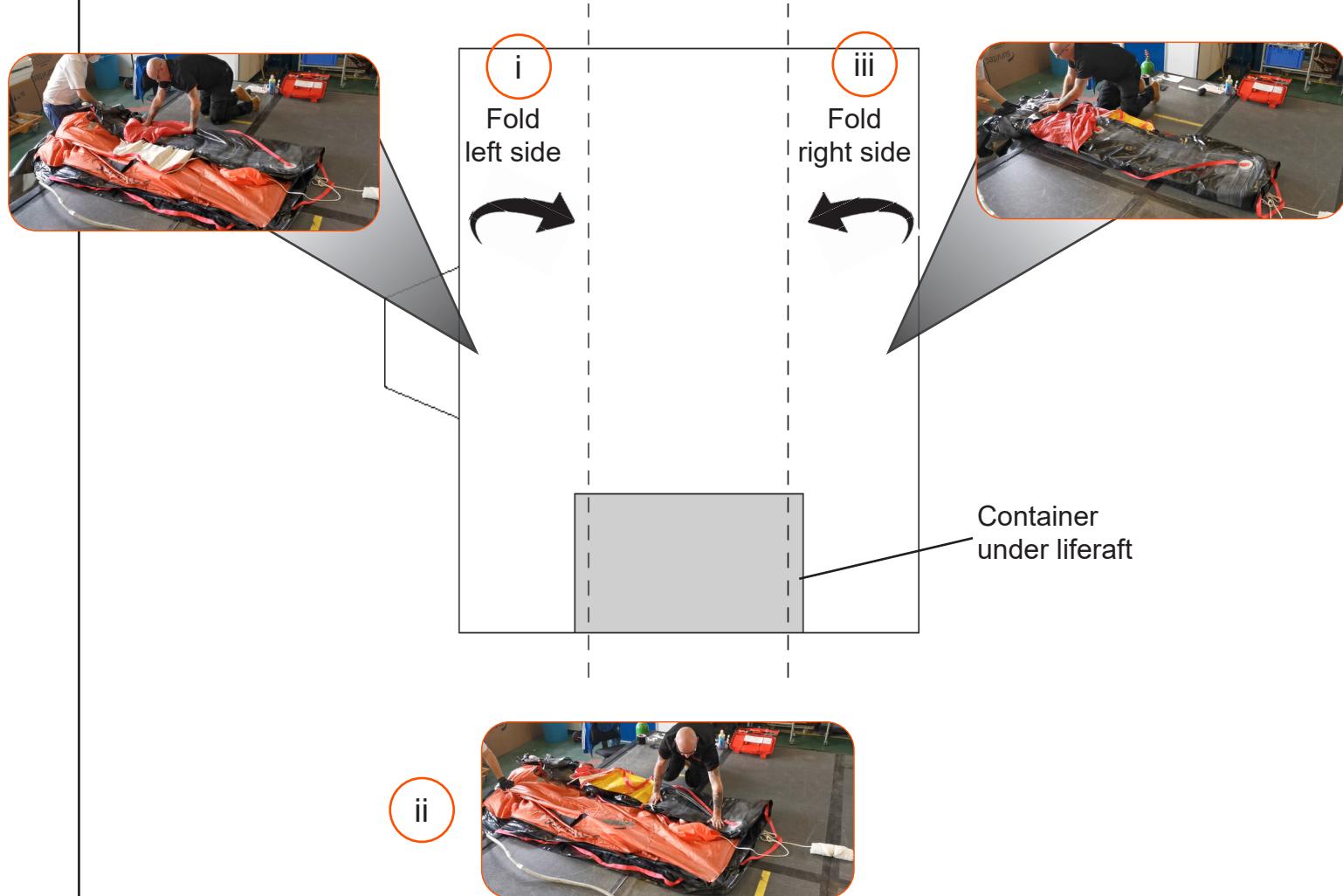
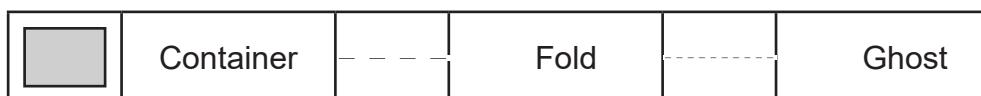
4-8 PERSON ONLY - Wrap the arch tube around the internal lamp

9.42 Pack the Throwover liferaft into the Xtrem container:

9.42.1 6 Person (SOLAS A-Pack) in size N137H Xtrem container.

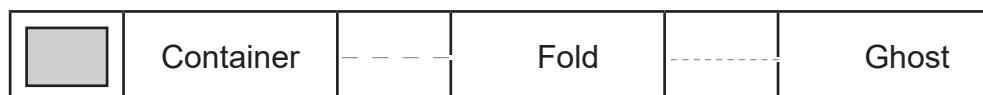
(a) Fold the liferaft;

- (i) Fold the left side of the liferaft.
- (ii) Fold the boarding ramp back onto the top of the left side fold.
- (iii) Fold the right side of the liferaft. This will over lap onto the left side fold.

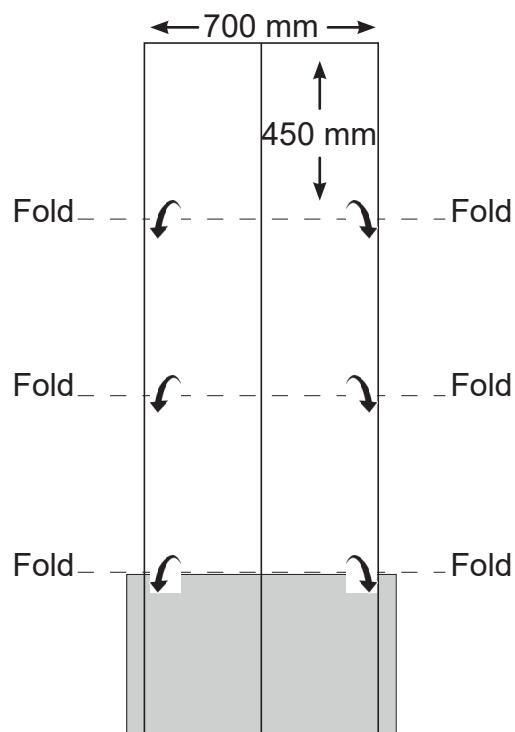

Fold the liferaft

- (iv) Put the rolled up drogue on top of the folded liferaft.
 - (v) Use three full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (b) Refer to step 6.41 to seal the H-Pack.

iv



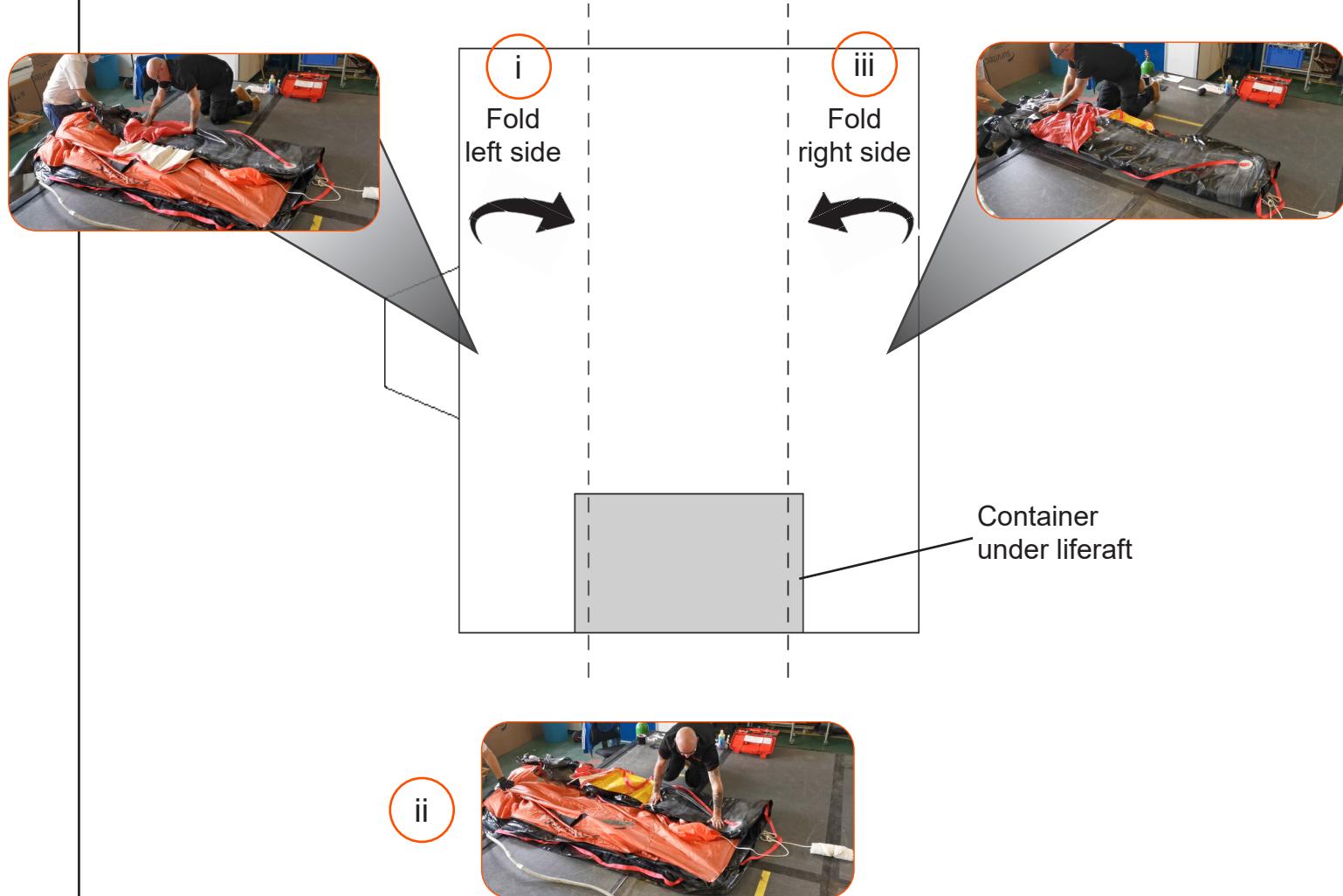
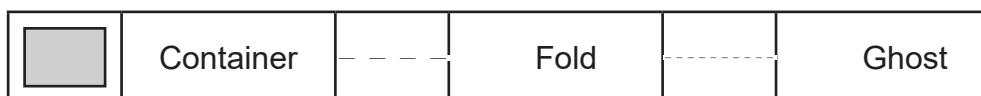
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**Fold the liferaft into size N137 Xtrem container**

9.42.2 6 Person (SOLAS B-Pack) in size N137 Xtrem container.

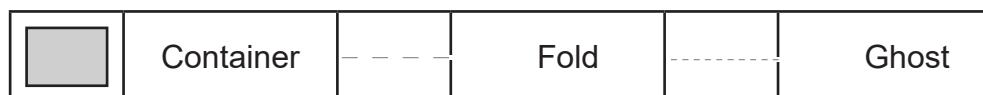
(a) Fold the liferaft;

- (i) Fold the left side of the liferaft.
- (ii) Fold the boarding ramp back onto the top of the left side fold.
- (iii) Fold the right side of the liferaft. This will over lap onto the left side fold.

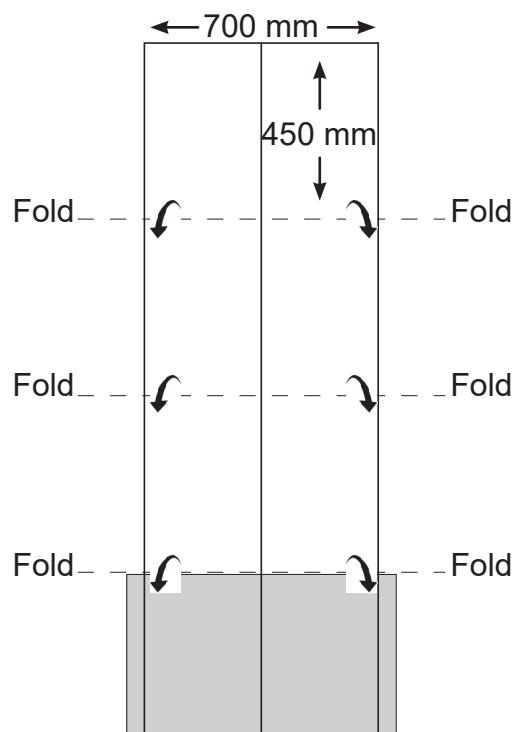
**Fold the liferaft**

- (iv) Put the rolled up drogue on top of the folded liferaft.
 - (v) Use three full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (b) Refer to step 6.41 to seal the H-Pack.

iv



v

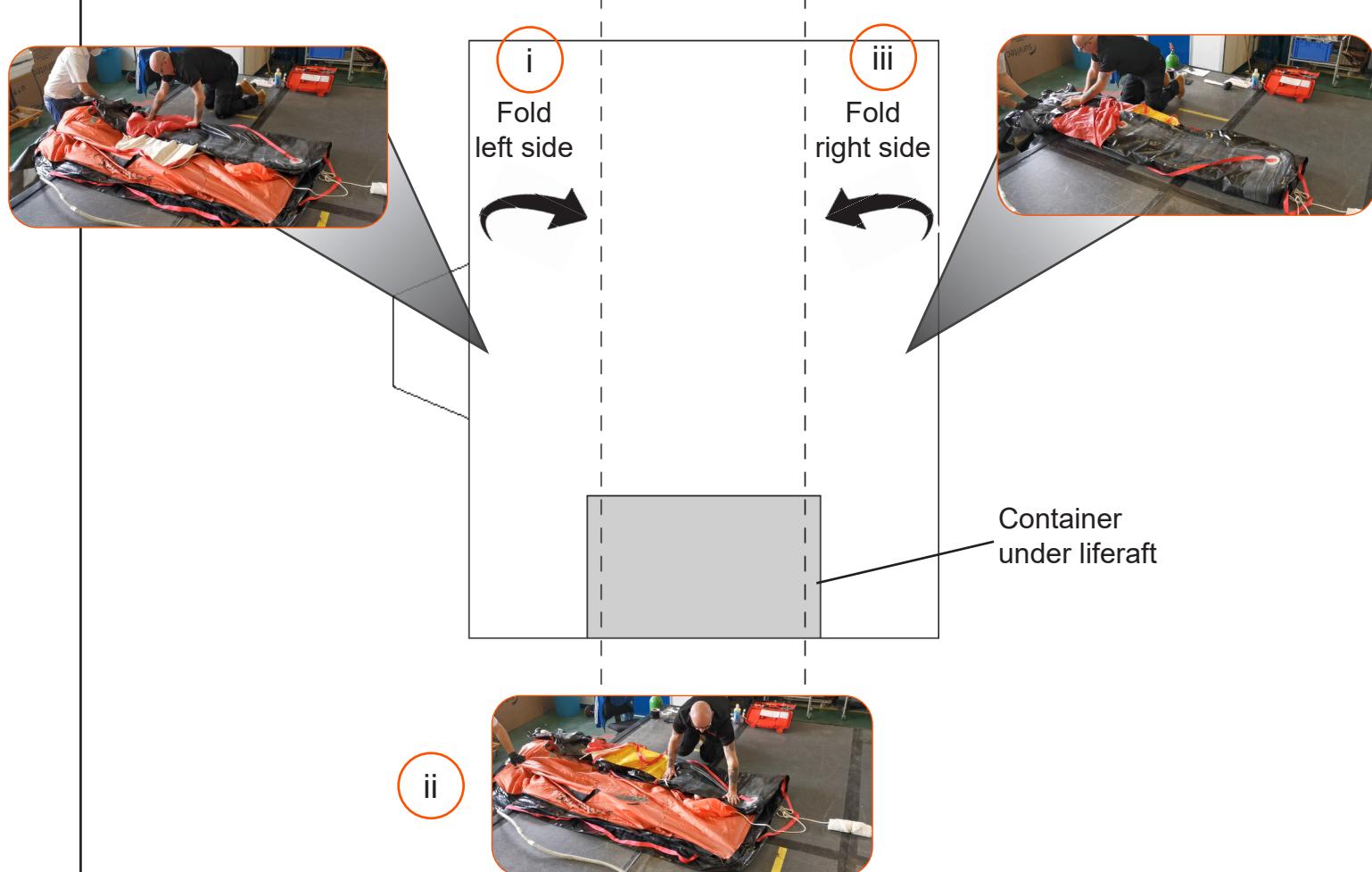
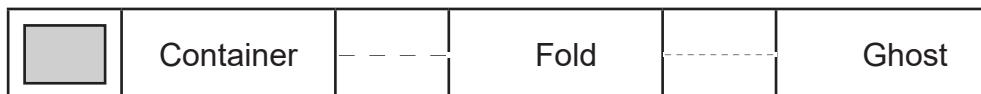
**Fold the liferaft into size N137 Xtrem container**

9.42.3 8 Person (SOLAS A-Pack) in size N138H Xtrem container.

- (a) Fold the liferaft;

NOTE: Keep boarding ramp tapered to avoid overlap with top up valves. It is critical to position the top up valves so they are not stacked on top of each other, as this will lead to a high point

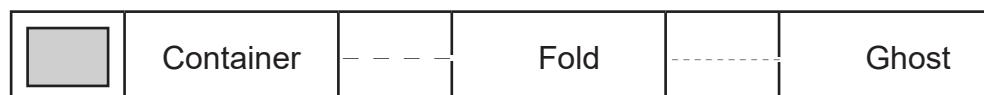
- (i) Fold the left side of the liferaft.
- (ii) Fold the boarding ramp back onto the top of the left side fold.
- (iii) Fold the right side of the liferaft. This will over lap onto the left side fold.



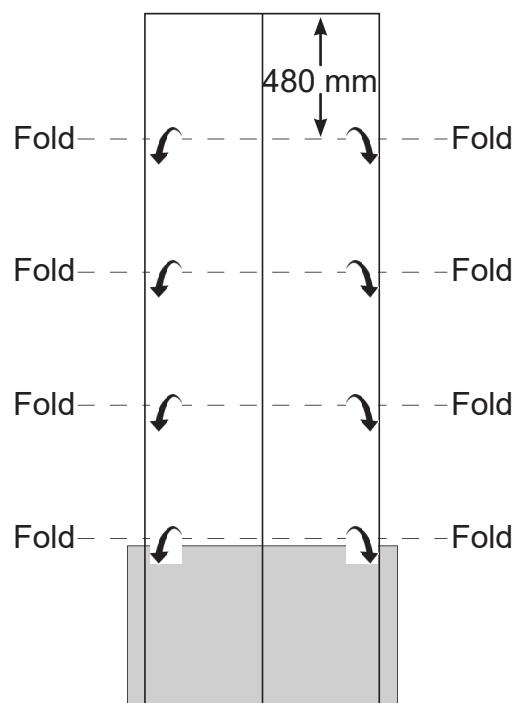
Fold the liferaft

- (iv) Put the rolled up drogue on top of the folded liferaft.
 - (v) Use four full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (b) Refer to step 6.41 to seal the H-Pack.

iv



v

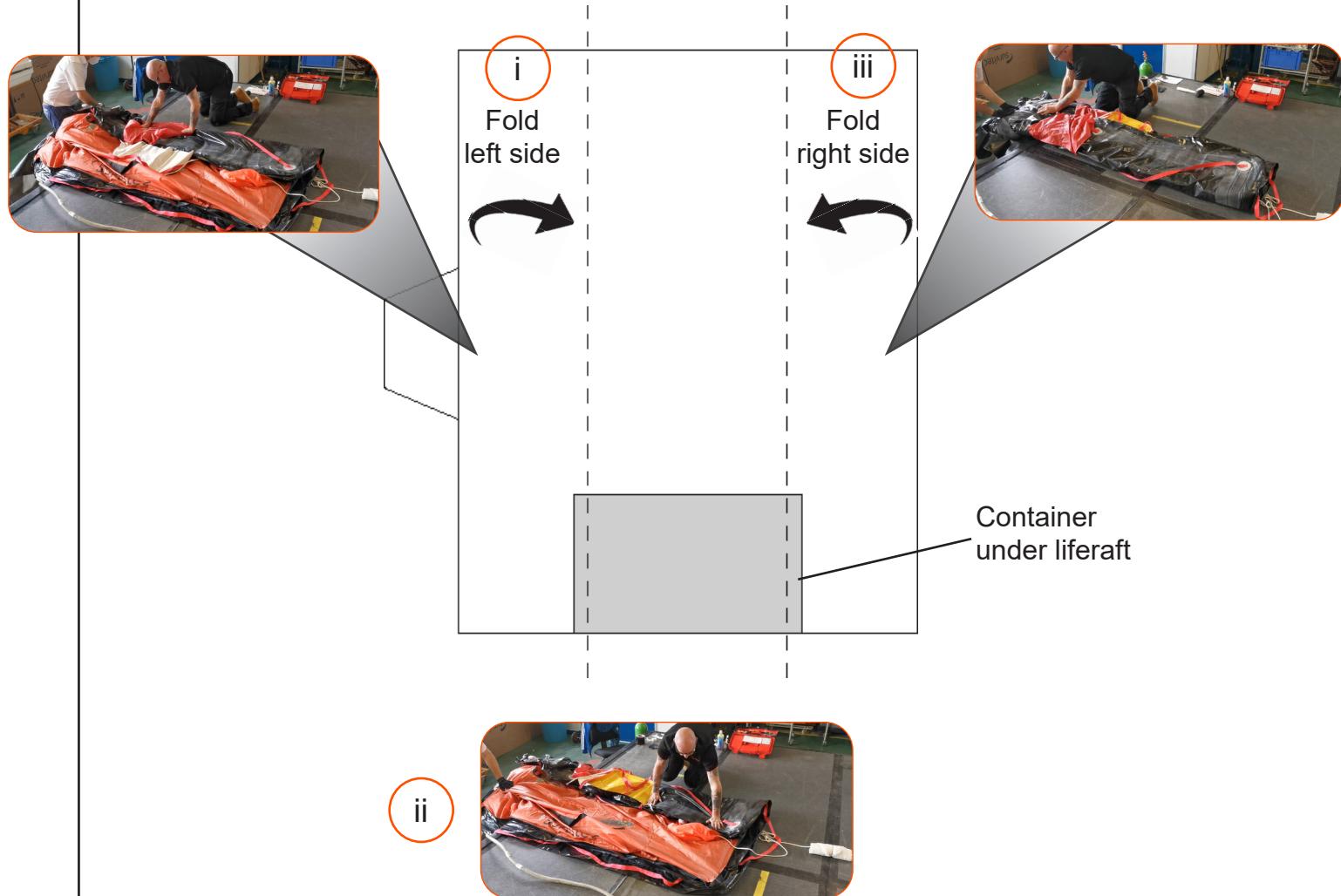
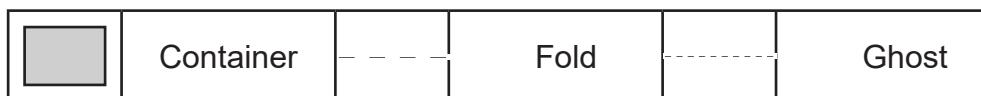


Fold the liferaft into size N138H Xtrem container

9.42.4 8 Person (SOLAS B-Pack) in size N138 Xtrem container.

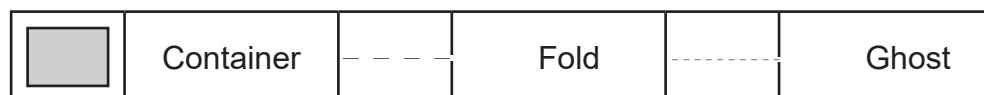
(a) Fold the liferaft;

- (i) Fold the left side of the liferaft.
- (ii) Fold the boarding ramp back onto the top of the left side fold.
- (iii) Fold the right side of the liferaft. This will over lap onto the left side fold.

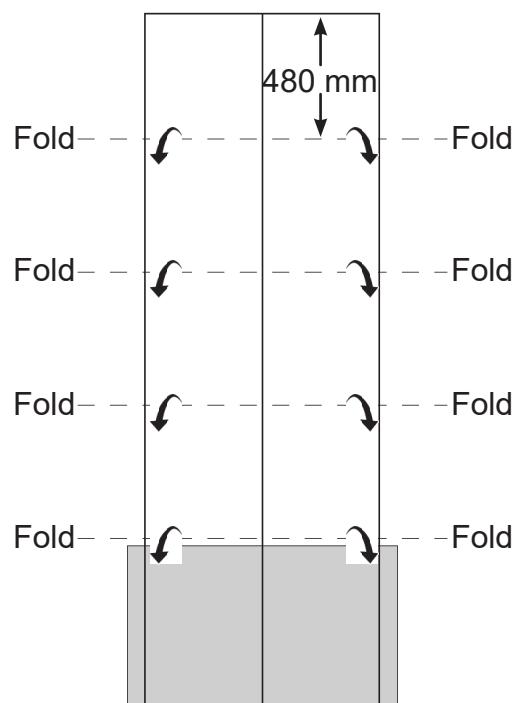
**Fold the liferaft**

- (iv) Put the rolled up drogue on top of the folded liferaft.
 - (v) Use four full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (b) Refer to step 6.41 to seal the H-Pack.

iv



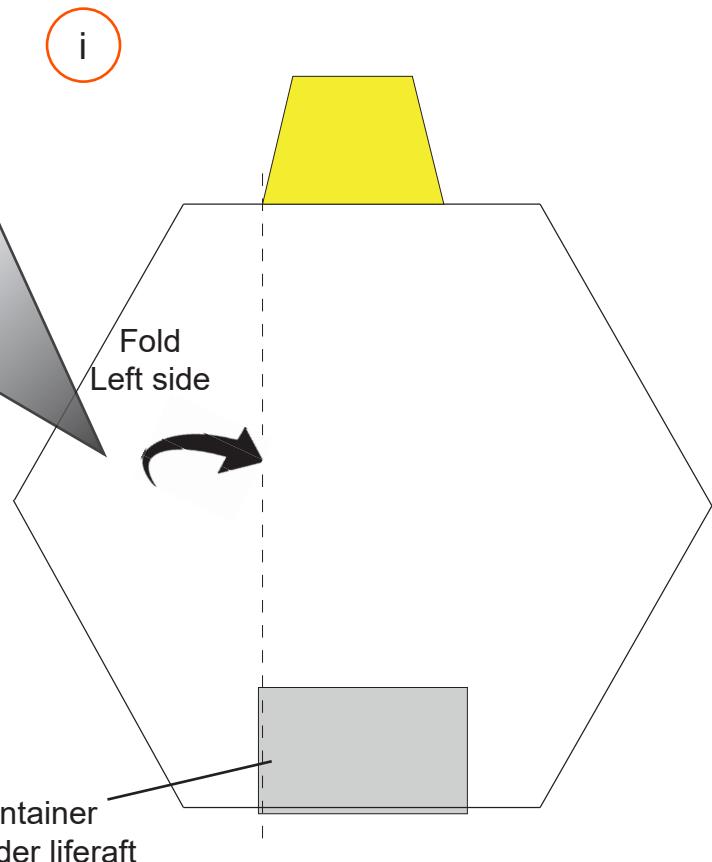
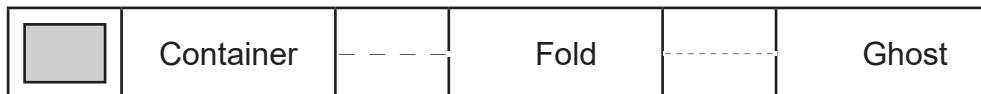
v

**Fold the liferaft into size N138H Xtrem container**

9.42.5 10 or 12 Person (SOLAS A-Pack) in size N139H Xtrem container.

(a) Fold the 10 or 12 person (SOLAS A-Pack) liferaft.

(i) Fold the left side of the liferaft to the width of the container.

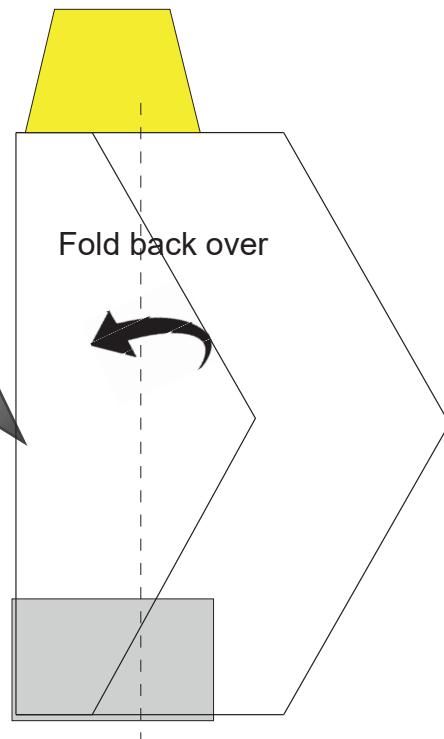


Fold the liferaft

(ii) Fold the left side back over again to the width of the first fold.



ii

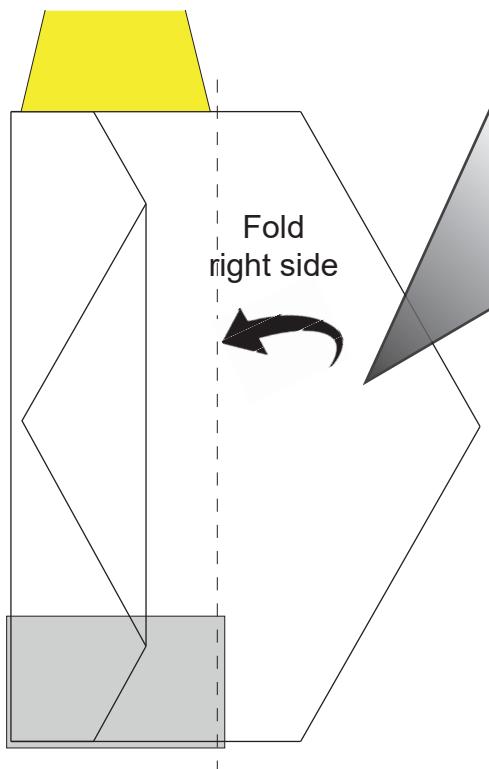


Fold the liferaft

(iii) Fold the right side of the liferaft.



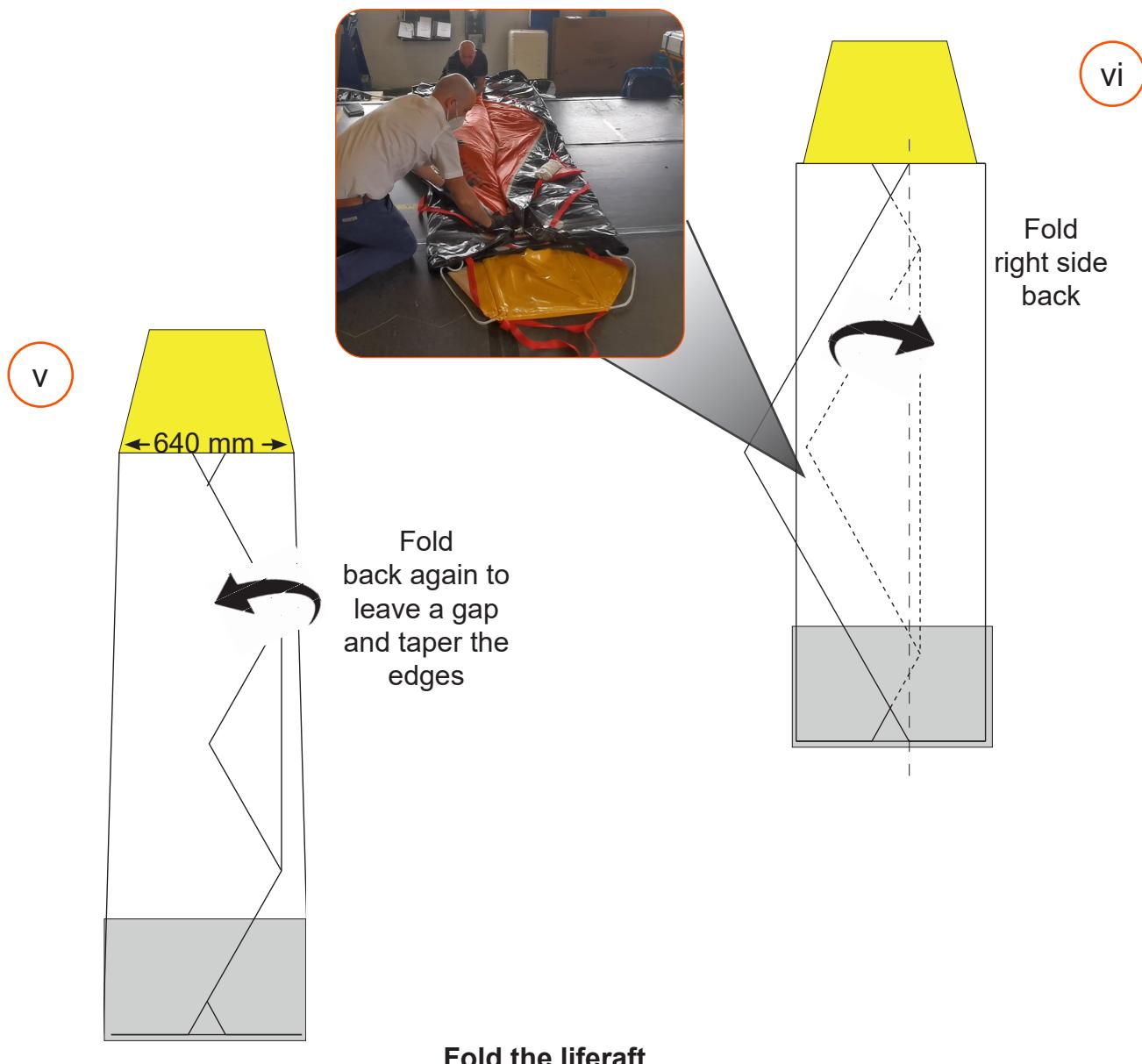
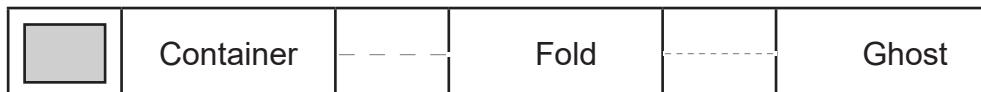
iii



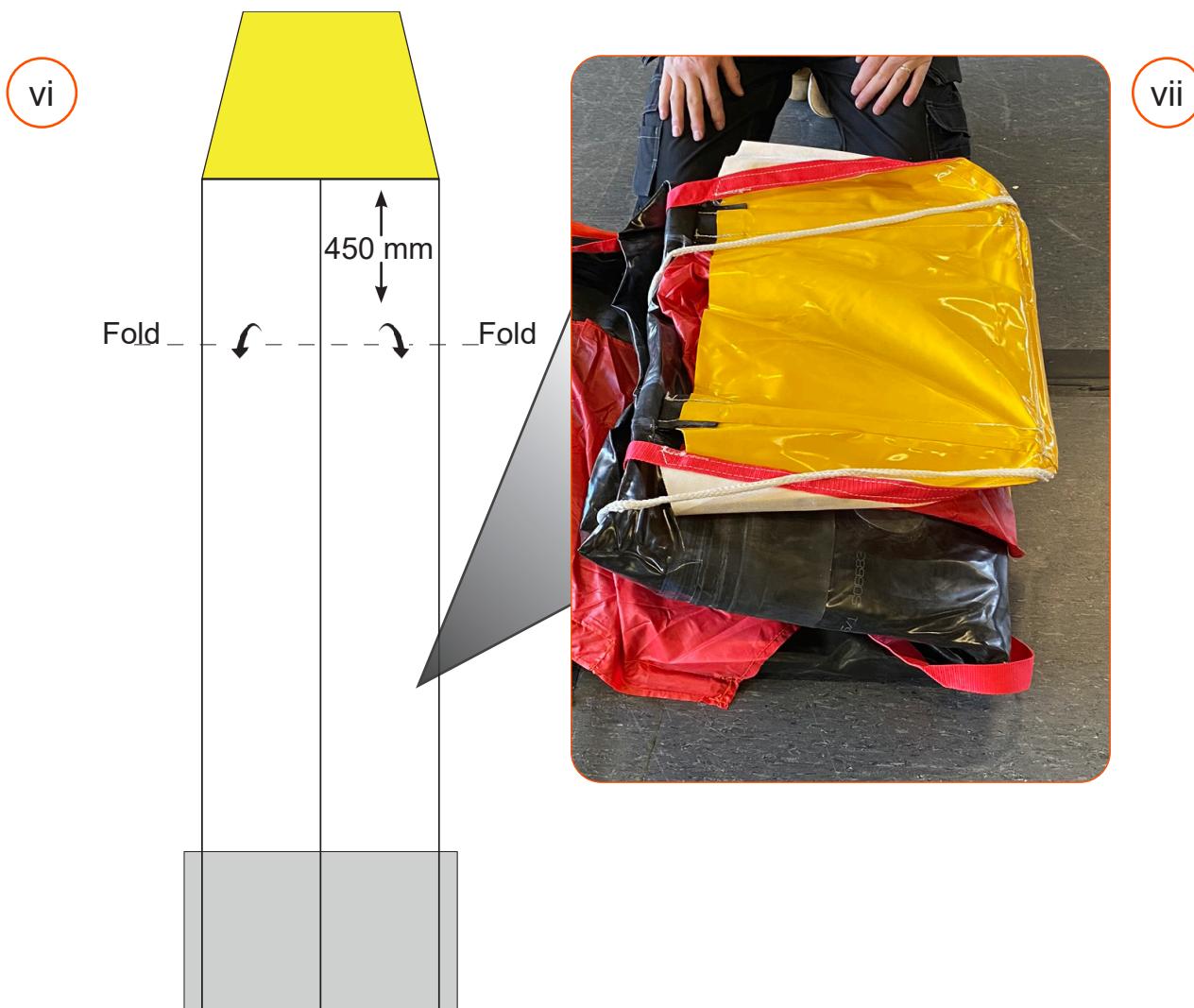
Fold the liferaft

- (iv) Fold the right side back over again past the first fold.
- (v) Fold the previous fold back again leaving a gap between itself the width of the container.

NOTE: Make sure to taper the edges at the boarding ramp to 640 mm wide.



- (vi) Make a 450 mm fold in from the boarding ramp.
- (vii) Fold the boarding ramp back on top of the previous fold.



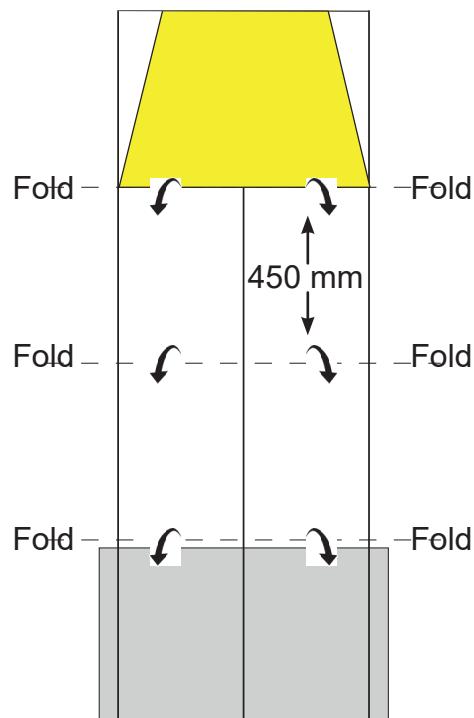
Fold the liferaft into size N139H Xtrem container

(viii) Use three folds to fold the liferaft into the container. Make sure each fold is as tight as possible.

- (b) Refer to step 6.41 to seal the H-Pack.



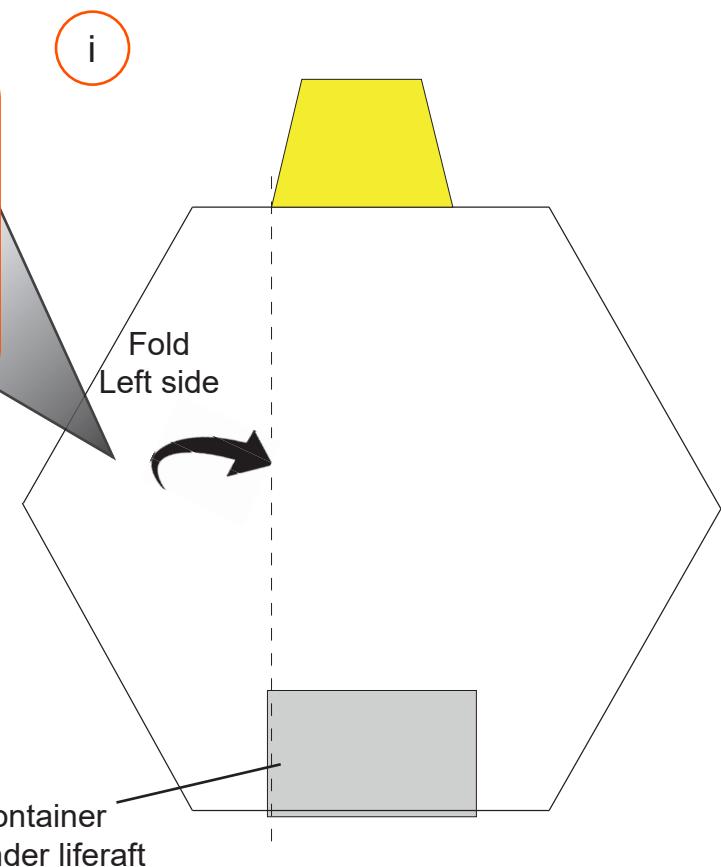
viii



Fold the liferaft into size N139H Xtrem container

9.42.6 10 or 12 Person (SOLAS B-Pack) in size N139 Xtrem container.

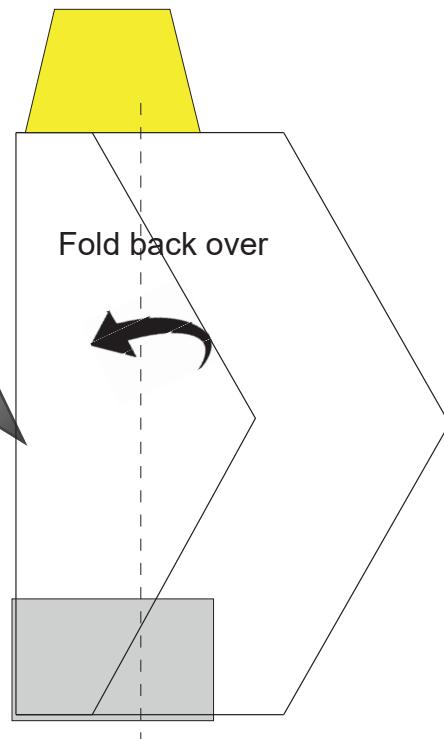
- (a) Fold the 10 or 12 person (SOLAS B-Pack) liferaft.
 - (i) Fold the left side of the liferaft to the width of the container.

**Fold the liferaft**

(ii) Fold the left side back over again to the width of the first fold.



ii

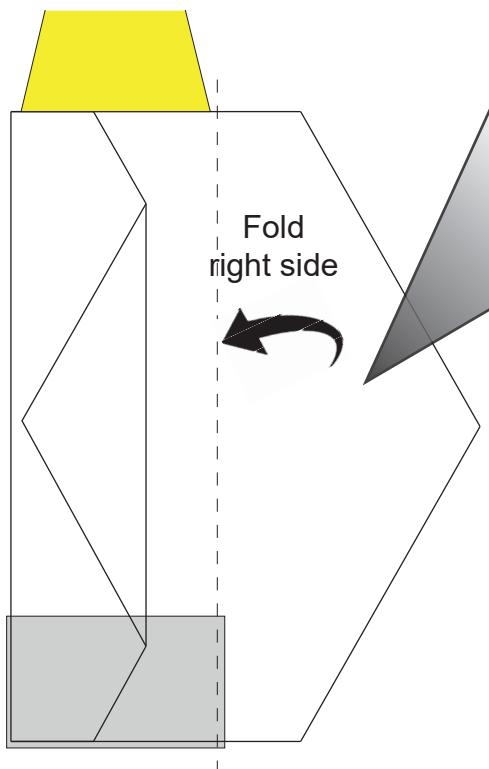


Fold the liferaft

(iii) Fold the right side of the liferaft.



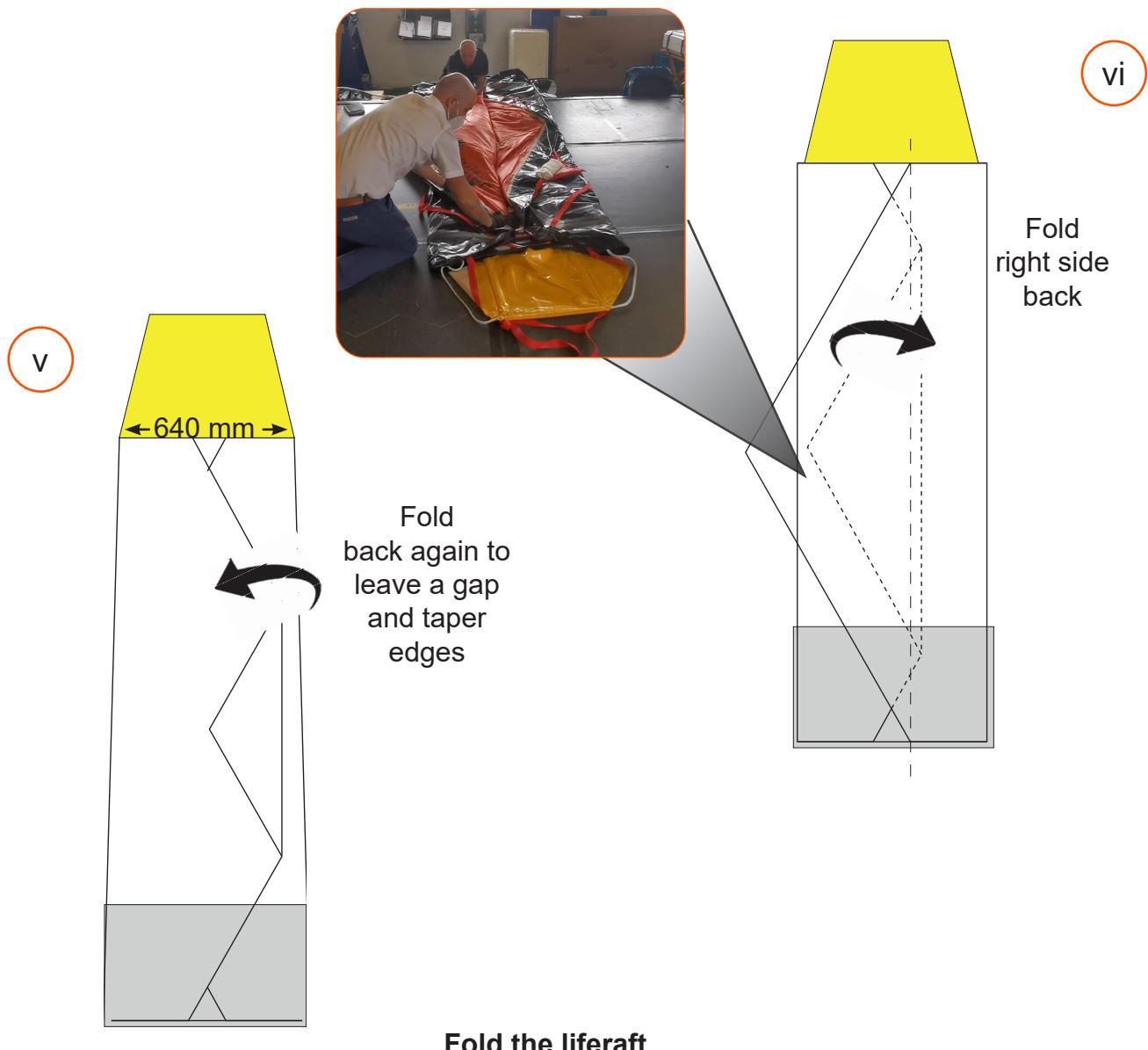
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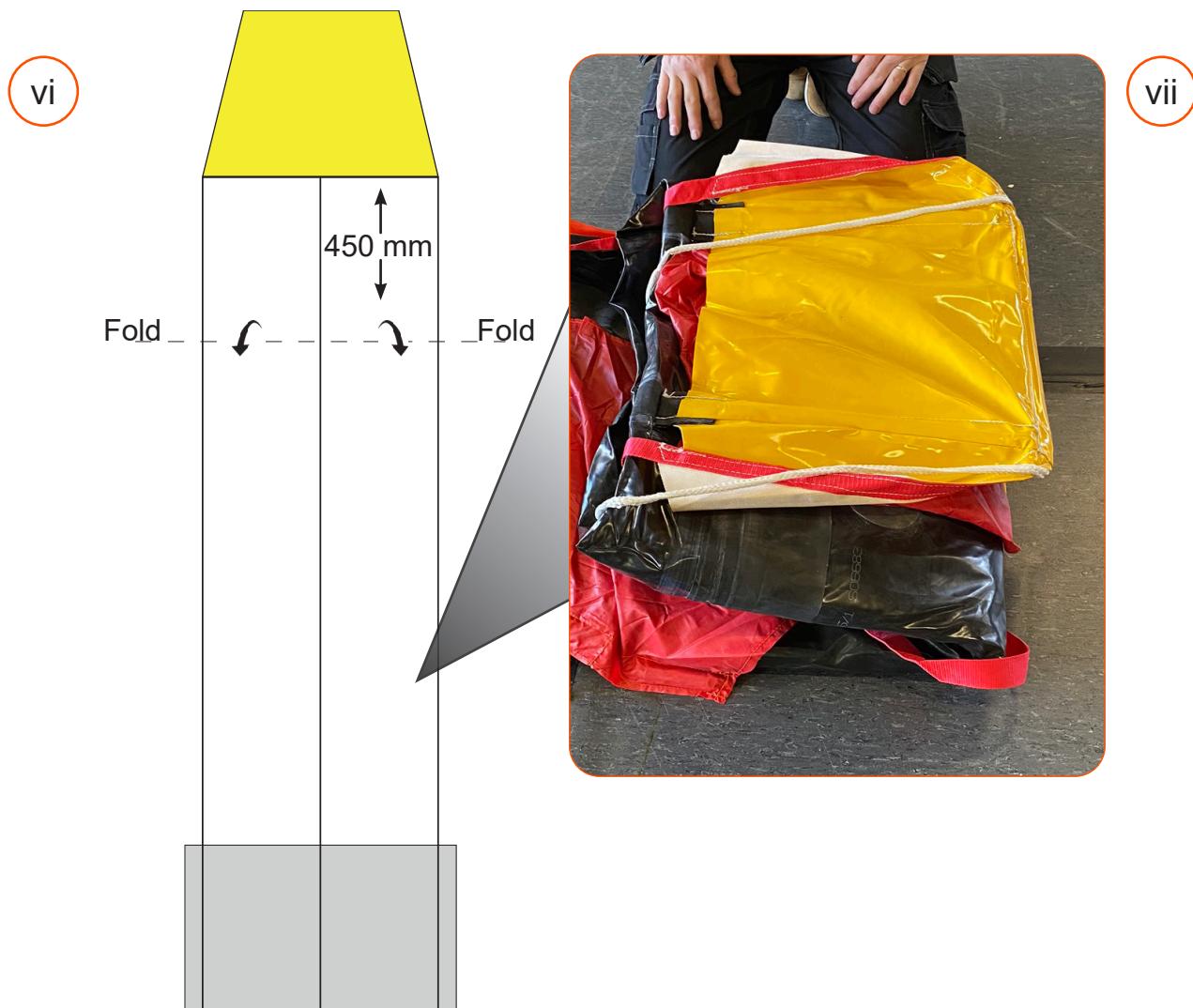
Fold the liferaft

- (iv) Fold the right side back over again past the first fold.
- (v) Fold the previous fold back again leaving a gap between itself the width of the container.

NOTE: Make sure to taper the edges at the boarding ramp to 640 mm wide.



- (vi) Make a 450 mm fold in from the boarding ramp.
- (vii) Fold the boarding ramp back on top of the previous fold.



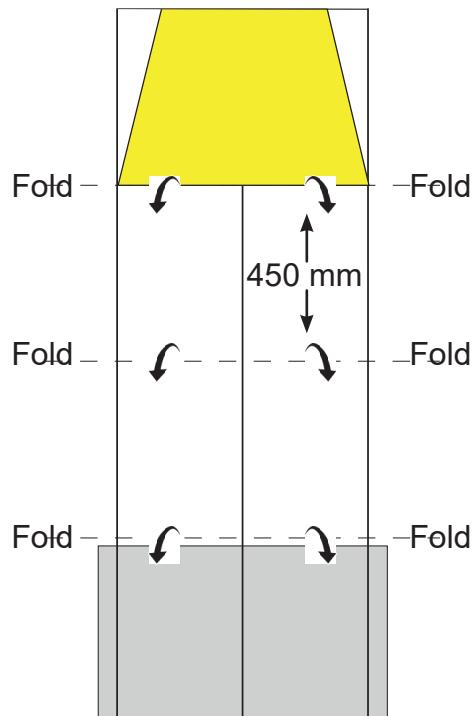
Fold the liferaft into size N139H Xtrem container

(viii) Use three folds to fold the liferaft into the container. Make sure each fold is as tight as possible.

(b) Refer to step 6.41 to seal the H-Pack.



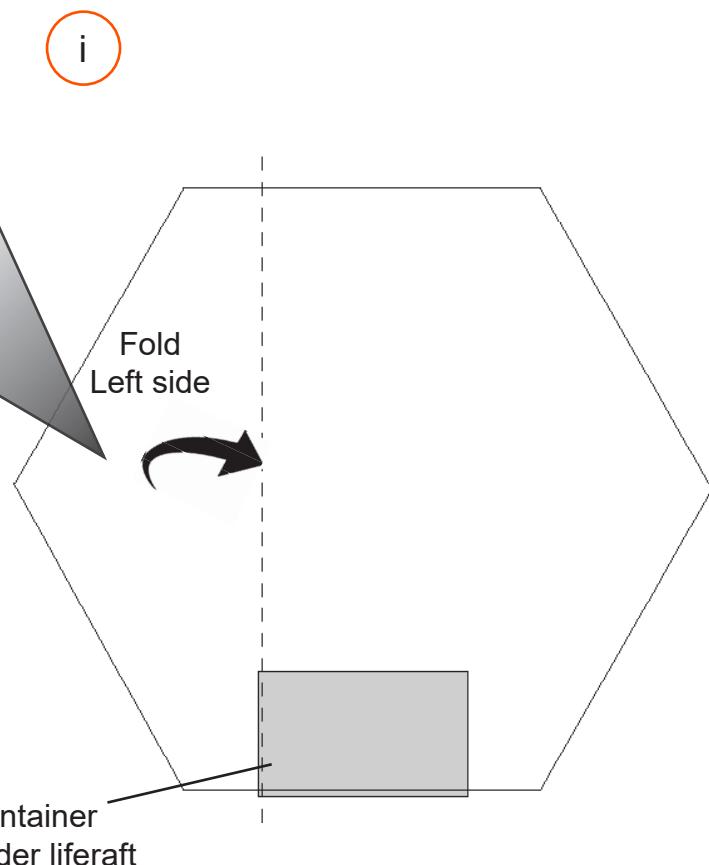
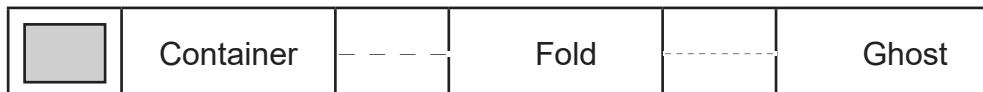
viii



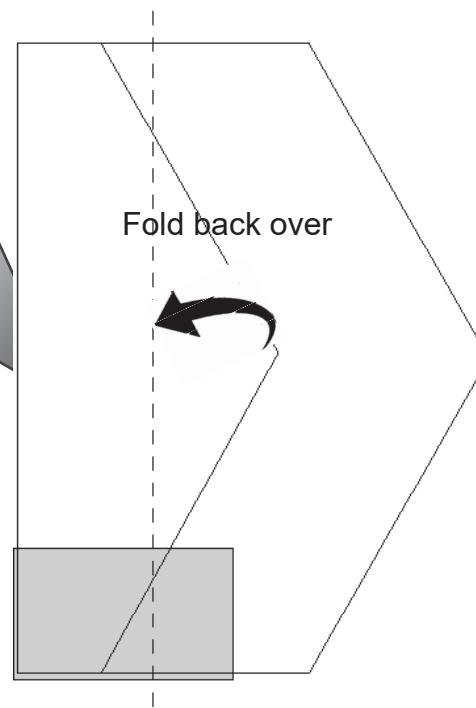
Fold the liferaft into size N139H Xtrem container

9.42.7 16 Person (SOLAS A-Pack) in size N140H Xtrem container.

- (a) Fold the 16 person (SOLAS A-Pack) liferaft.
- (i) Fold the left side of the liferaft to the width of the container.

**Fold the liferaft**

(ii) Fold the left side back over again to the width of the first fold.

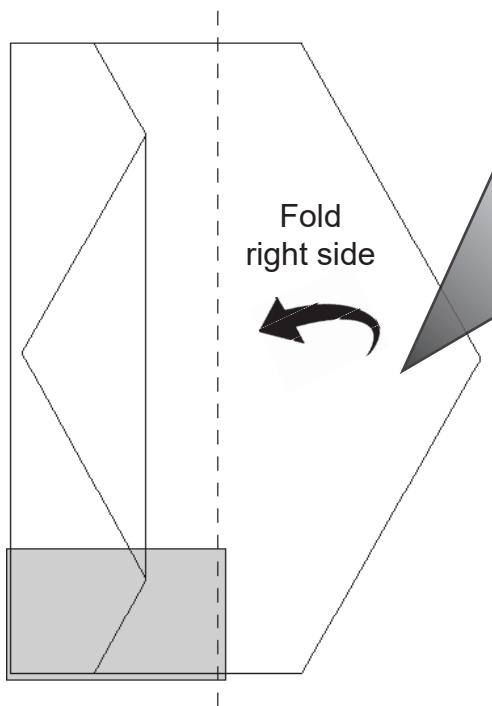


Fold the liferaft

(iii) Fold the right side of the liferaft.



iii

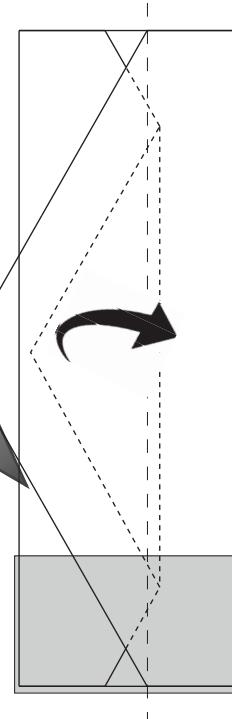


Fold the liferaft

- (iv) Fold the right side back over again past the first fold.
- (v) Fold the previous fold back again leaving a gap between itself the width of the container.



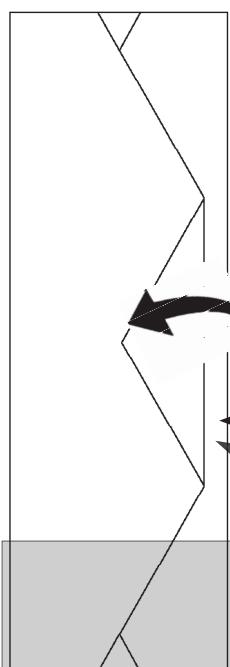
iv



v

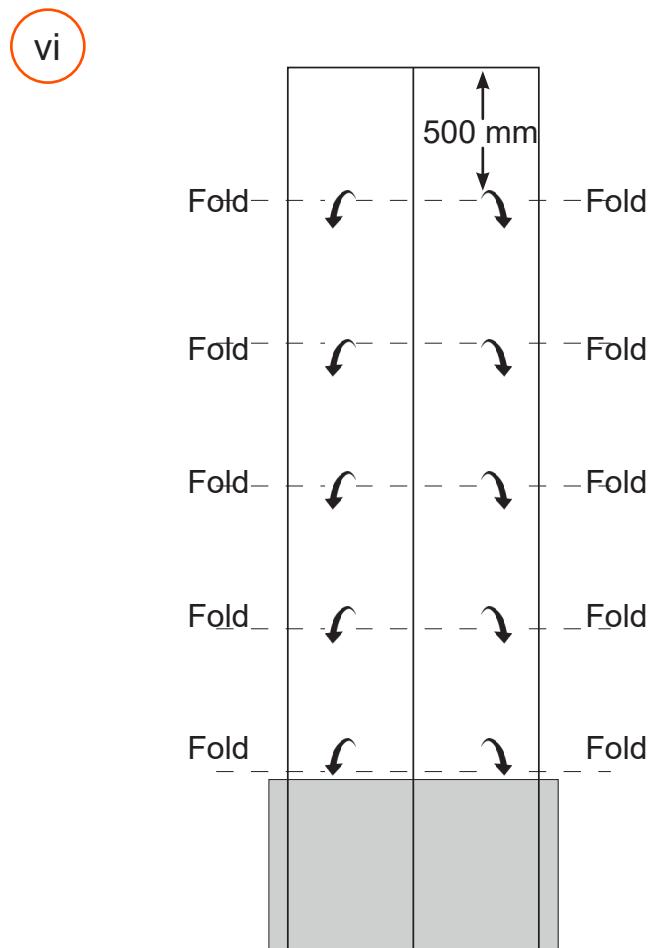
Fold back again to leave a gap

90 mm gap



Fold the liferaft

- (vi) Use five full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (b) Refer to step 6.41 to seal the H-Pack.

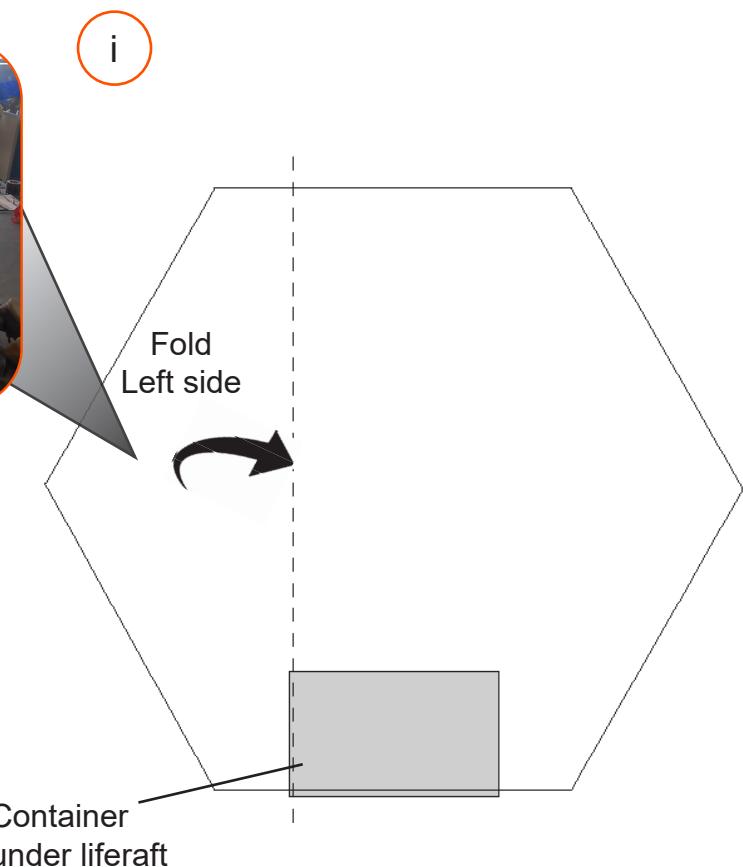


Fold the liferaft into size N140H Xtrem container

9.42.8 16 Person (SOLAS B-Pack) in size N140 Xtrem container.

(a) Fold the 16 person (SOLAS B-Pack) liferaft.

(i) Fold the left side of the liferaft to the width of the container.

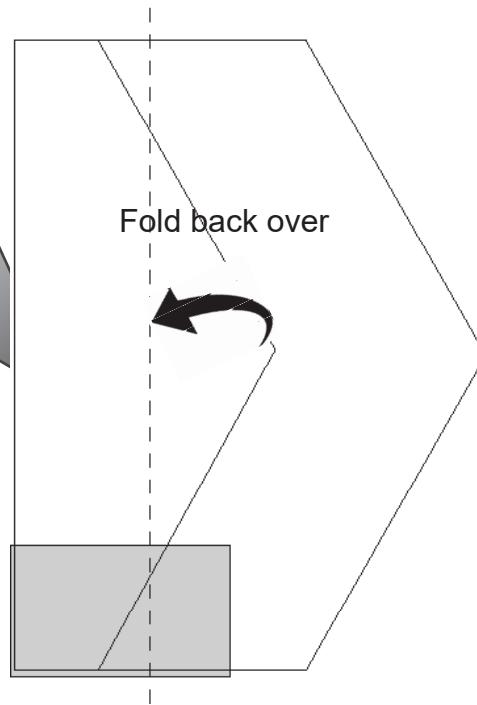


Fold the liferaft

(ii) Fold the left side back over again to the width of the first fold.



ii

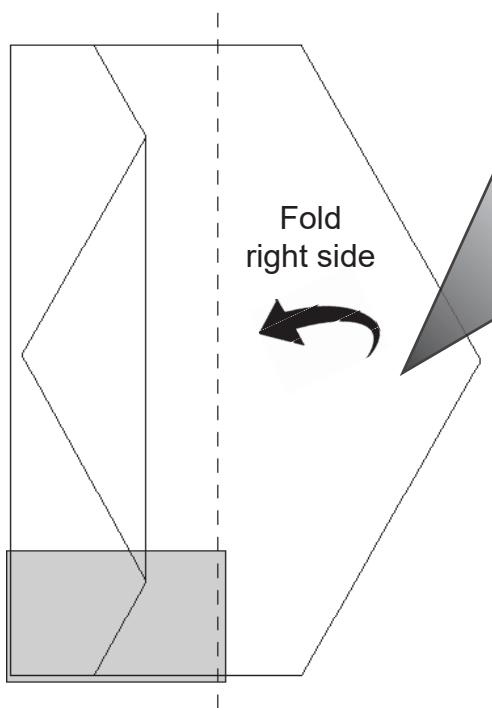


Fold the liferaft

(iii) Fold the right side of the liferaft.

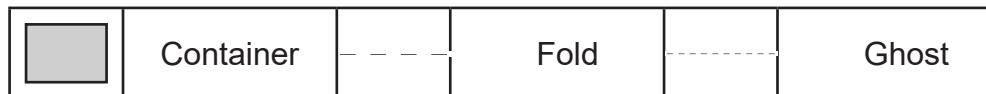
	Container		Fold		Ghost
--	-----------	--	------	--	-------

iii

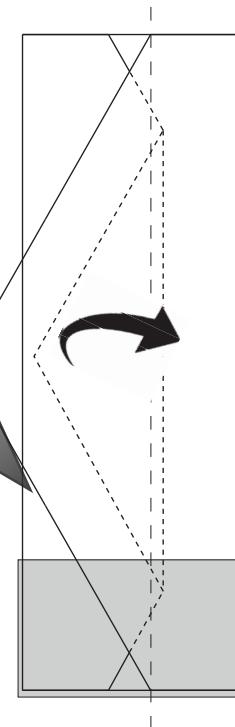


Fold the liferaft

- (iv) Fold the right side back over again past the first fold.
- (v) Fold the previous fold back again leaving a gap between itself the width of the container.



iv



v

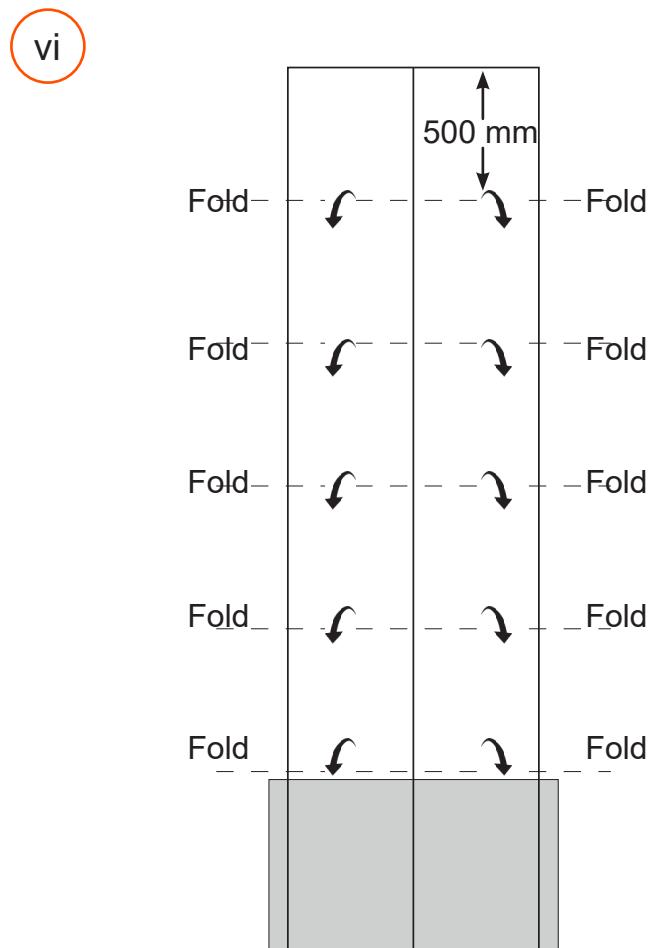
Fold back again to leave a gap

90 mm gap



Fold the liferaft

- (vi) Use five full folds to fold the liferaft into the container. Make sure each fold is as tight as possible.
- (b) Refer to step 6.41 to seal the H-Pack.



Fold the liferaft into size N140H Xtrem container

WARNING: THE HEATED WELDING HAND TOOL AND WELDED AREAS ARE VERY HOT. IT IS IMPERATIVE TO TAKE CAUTION WHEN YOU USE THE HEATED WELDING HAND TOOL TO AVOID INJURY.

- 9.43 Use the heated welding hand tool to weld the two sheets of the H-Pack together:
- 9.43.1 Make sure that the painter sachet is in the correct position.
Refer to **Figure 899N (i)**.
 - 9.43.2 Plug the heated welding hand tool into a suitable mains outlet. Leave alone to heat up on setting three for 5-10 minutes to allow the tool to stabilise.
 - 9.43.3 Do a test of the heated welding hand tool on a sample H-Pack to make sure that it is at the correct temperature and is functioning correctly.
 - 9.43.4 Gently try to pull the welded edges apart to test the welds. Make sure that they are firmly welded together.
 - 9.43.5 Do step 6.41.3 again if you are in doubt. Avoid pleats if it is possible.
 - 9.43.6 Start at the left corner of the H-pack.
 - 9.43.7 Put the two sheets inside the tool and clamp the jaws of the tool together by squeezing the tool handles firmly for 3-5 seconds then release hand pressure.
 - 9.43.8 Seal the two sheets together along the 150 mm section (the length of the tool) and then slide the tool along the length of the sheet and clamp again to seal the next section. Refer to **Figure 899N (ii)**.

NOTE: Overlap each weld by a minimum of 10 mm lengthwise to make sure that there are no unsealed gaps left between the sheets.

- 9.43.9 Complete the heat seal so that it leaves 15 mm nominal weld width (minimum 10 mm) from the edge of the H-Pack.
- 9.43.10 The heated welding hand tool should be worked around the perimeter of the H-Pack until the liferaft is close to being concealed within the two sheets.
- 9.43.11 Gently pull the welded edges apart to test the welds.
- 9.43.12 Do the relevant steps again to seal the two sheets if they have came apart.

i

Painter sachet
position



ii

Direction of weld

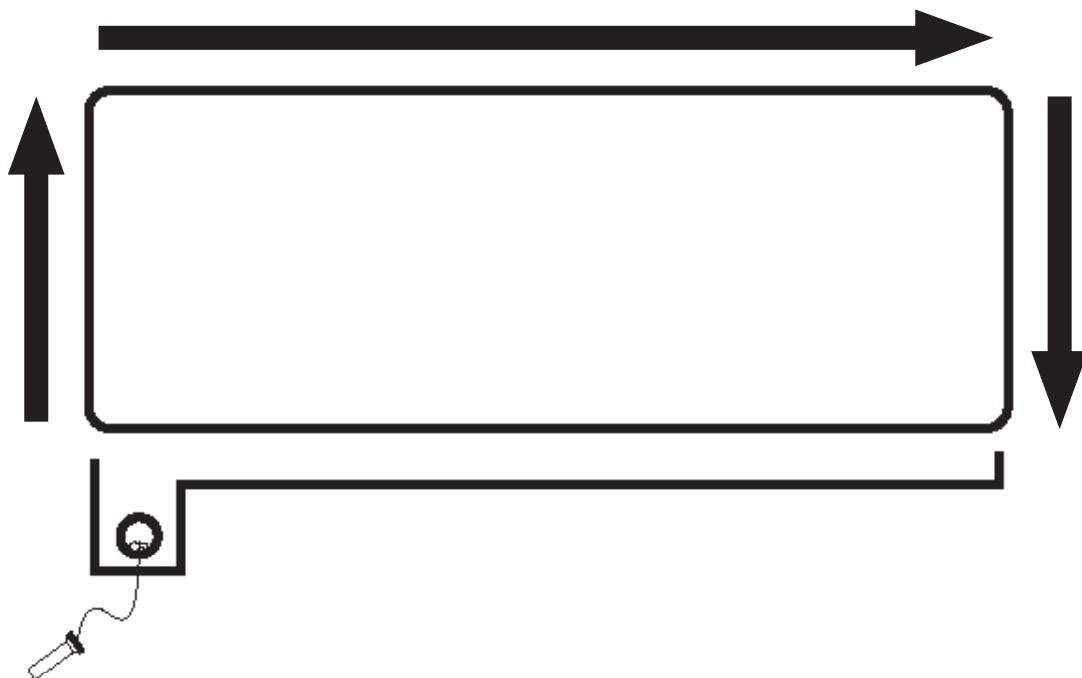


FIGURE 899N
Seal the H-Pack

9.43.13 Remove the vacuum valve plug and insert a vacuum line with correct adaptor.

9.43.14 Shaping the H-Pack

(a) Rubber mallet method. Refer to **Figure 899O**:

(i) Use a soft rubber mallet to shape the liferaft to the correct dimensions as you vacuum the H-Pack.



FIGURE 899O
Rubber mallet method for shaping the H-Pack

(b) Ratchet strap method:

- (i) Wrap the polyethylene sheet over the H-Pack.
- (ii) Put the top half of the container onto the folded liferaft.
- (iii) Use two ratchet straps to close the top half of the container while the vacuum is removing the air from the H-Pack
- (iv) Wait until the container looks like it is closed.
- (v) Lift the top half of the container off and check the H-Pack has been shaped correctly.

**Ratchet strap method for shaping the H-Pack**

- 1.1.1 Refer to **Chapter 5, Section 3 Testing and Troubleshooting**, to perform the post operational packing vacuum test.
 - 1.1.2 If a leak is detected repair it with the heat sealing tool.
 - 1.1.3 Refer to **Chapter 5, Section 4 Repair to the H-pack** if the leak cannot be found or repaired.
- 1.1 Use a bowline knot to tie the identification tube to the painter attachment hole on the H-Pack. Refer to **Figure 899P**.
 - 1.2 Make sure that the identification tube is attached outside of the container.
 - 1.3 The red ribbon of the identification tube must pass between the lower container lip and the polyethylene seal strip, so that the red plastic anti-wicking ring is external but as close to the seal strip as possible.

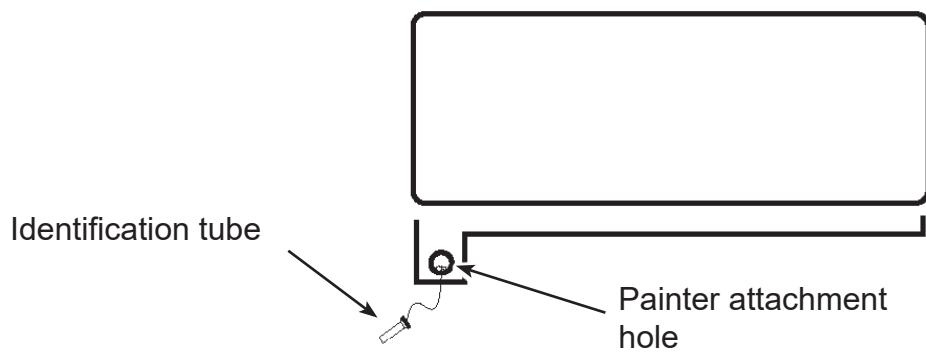


FIGURE 899P
Attach the liferaft identification tube

- 9.43.15 Refer to **Chapter 5, Section 3 Testing and Troubleshooting**, to perform the post operational packing vacuum test.
- 9.43.16 If a leak is detected repair it with the heat sealing tool.
- 9.43.17 Refer to **Chapter 5, Section 4 Repair to the H-pack** if the leak cannot be found or repaired.



FIGURE 899Q
Put two ratchet straps around the container

- 9.44 Use a bowline knot to tie the identification tube to the painter attachment hole on the H-Pack. Refer to **Figure 899P**.
- 9.45 Make sure that the identification tube is attached outside of the container.
- 9.46 The red ribbon of the identification tube must pass between the lower container lip and the polyethylene seal strip, so that the red plastic anti-wicking ring is external but as close to the seal strip as possible.

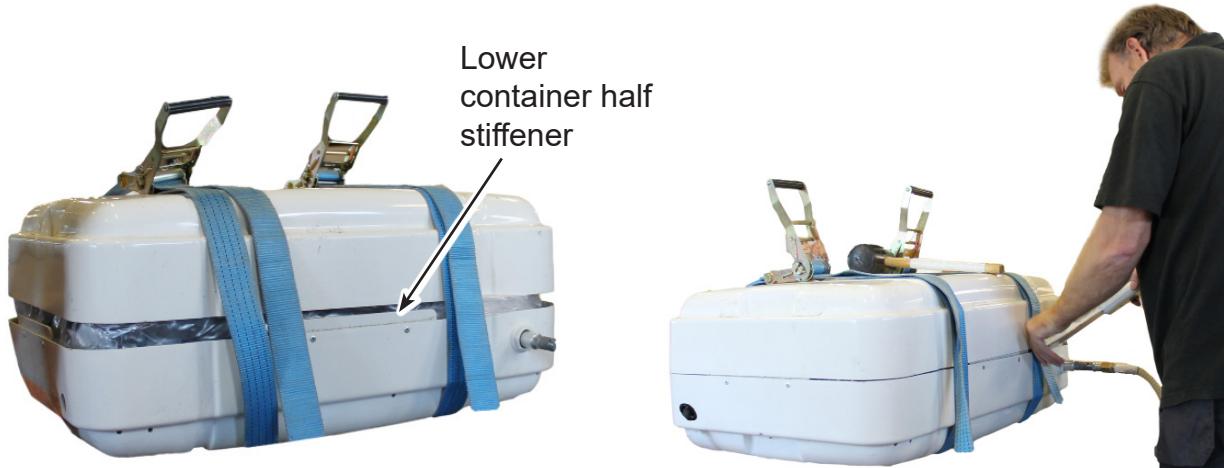


FIGURE 899R
Bring the upper container half over the lower container half stiffener

- 9.47 Wrap the polyethylene sheet over the H-Pack.
- 9.48 Tuck the overlap of polyethylene sheet into the container.
- 9.49 Put the top half of the container onto the folded liferaft.
- 9.50 Put two ratchet straps around the container. Make sure that the straps do not cover the container strap grooves in the container. Refer to **Figure 899Q**.

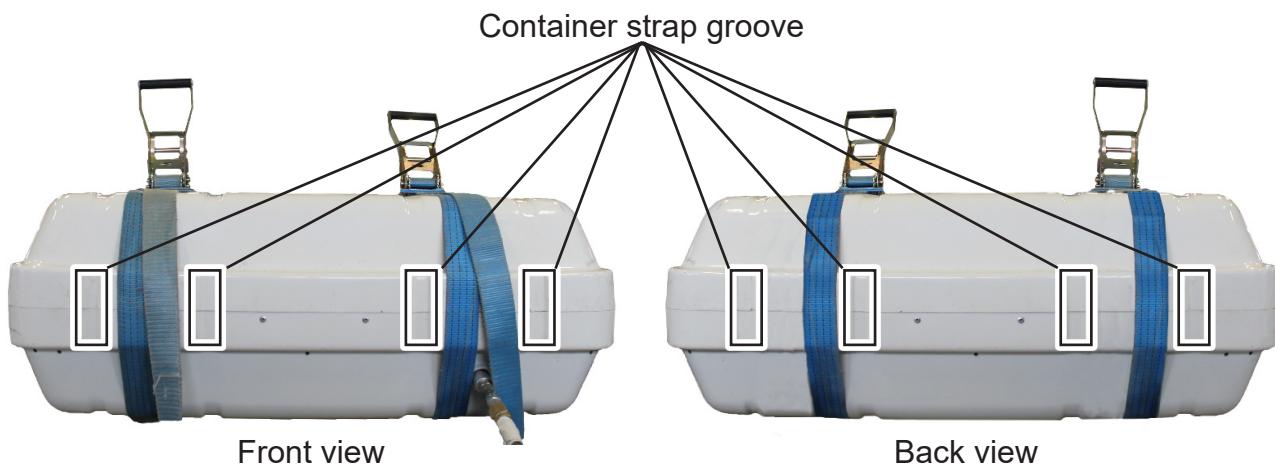


FIGURE 899S
Location of container strap grooves (N139H shown)

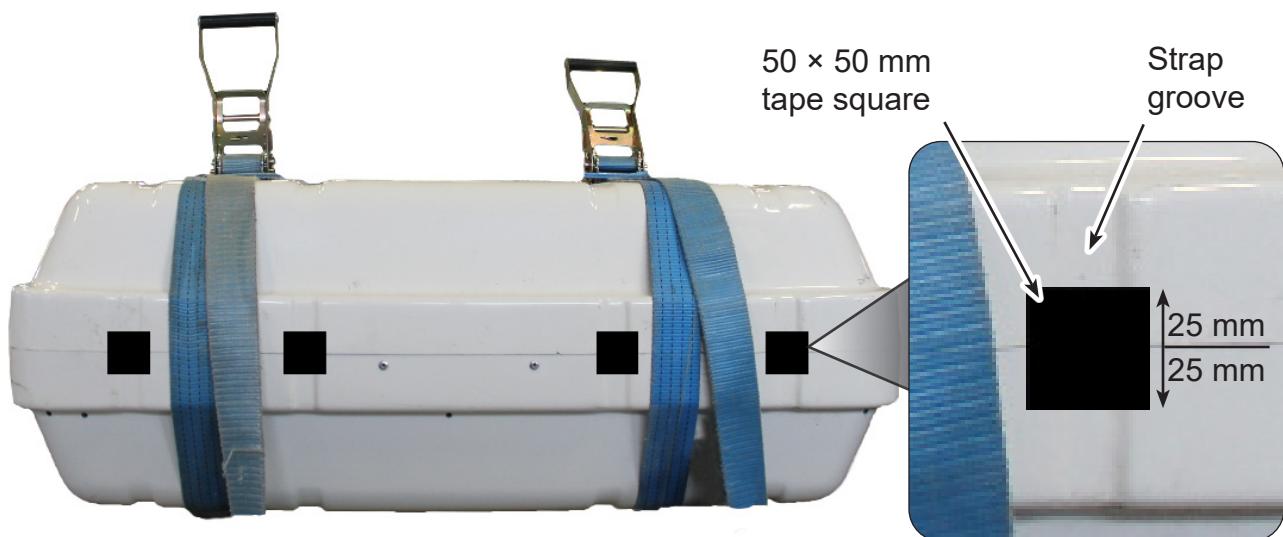


FIGURE 899T
Put the tape square on each container strap groove (N139H shown)

CAUTION: MAKE SURE THAT THE CONTAINER IS NOT DEFORMED.

9.51 Tighten each of the ratchet straps in turn to minimise distortion of the container.

CAUTION: THE EDGES OF THE SPATULA MUST BE RADIUSED AND SMOOTH TO AVOID DAMAGE TO THE H-PACK.

9.51.1 If it is required use a metal spatula to help bring the upper container half over the lower container half stiffeners.

Refer to **Figure 899R**.

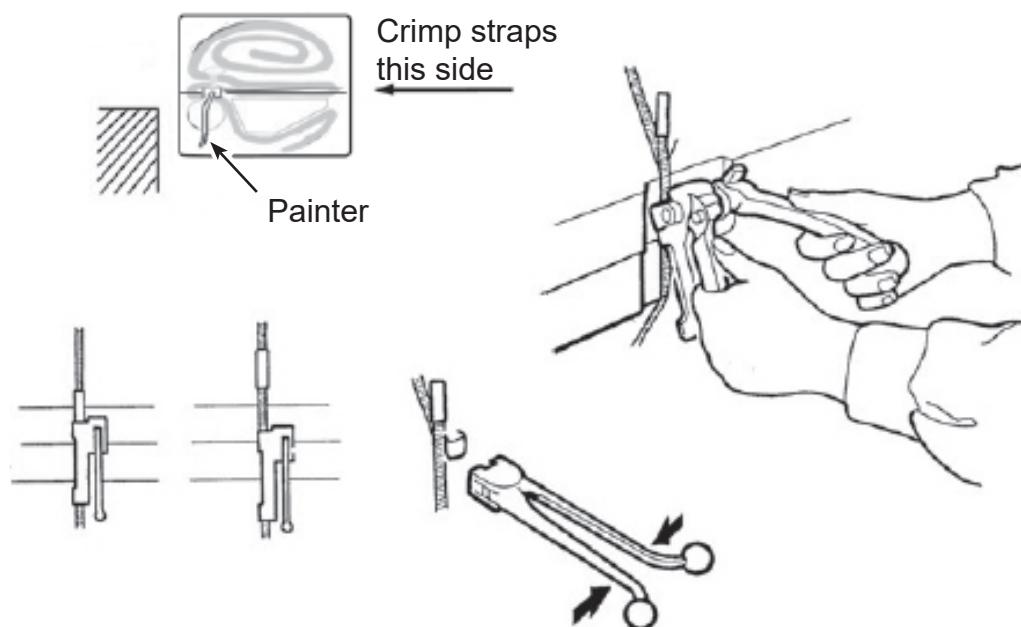


FIGURE 899U
Crimp each container strap on opposite side to roll

- 9.52 Continuously check to make sure that no part of the liferaft or H-Pack is trapped between the container.
- 9.53 Check the retaining block on the painter line to make sure that it is not displaced.
- 9.54 Use 50 mm self-adhesive tape to create 50 × 50 mm tape squares for each container strap groove. Refer to **Figure 899S**.
Refer to **Chapter 11, Illustrated Parts List** for 50 mm self-adhesive tape part number.
- 9.55 Put the tape square on each container strap groove so that it covers approximately 25 mm of each strap groove. Refer to **Figure 899T**.

WARNING: YOU MUST STAND TO ONE SIDE OF THE STRAP WHEN YOU APPLY TENSION OR CRIMP THE STRAPS.

WARNING: YOU MUST WEAR PROPER CLOTHING AND EYE PROTECTION. PROPER FOOTING AND BALANCE MUST BE MAINTAINED WHEN YOU OPERATE THE EQUIPMENT. WHEN YOU APPLY TENSION USE SHORT HAND STROKES ONLY.

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

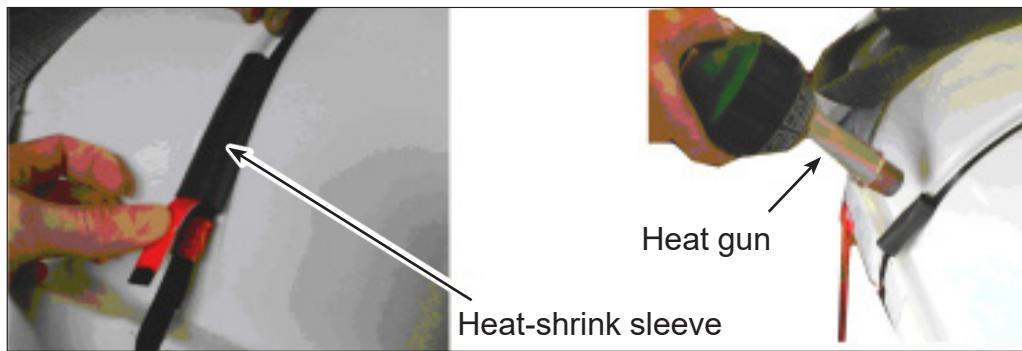


FIGURE 899V
Heat-shrink sleeve and heat gun

CAUTION: YOU MUST ATTACH CRIMPS ON THE OPPOSITE SIDE OF THE CONTAINER TO THE ROLL OF THE LIFERAFT.

NOTE: To encapsulate crimps with a heat-shrink sleeve the steps that follow must be observed.
Refer to **Chapter 11, Illustrated Parts List** for part numbers.

- 9.56 Put a heat-shrink sleeve on each container strap. Keep the strap ID tag as close as possible to the crimp.

NOTE: The maximum installed separation between the ID tag and crimp is 10 mm.

- 9.57 Adjust the ends of each strap so that the outer most strap end is facing upwards and is approximately 25 mm (1") above the rim of the container. Refer to **Figure 899U**.



FIGURE 899W
Put 50 mm tape on the container join (N140 shown)

9.58 Apply the tensioning tool to the strap at a point half way across the container join. Operate the handle to tension the strap until the base of the tensioning tool rests in the lower container rim. Refer to **Figure 899U**.

9.59 Safety the strap with a crimp. Refer to **Figure 899U**.

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

CAUTION: DO NOT TRIM OFF THE STRAP ID TAG.

9.60 Use scissors to carefully cut the tail of the strap as close as possible to the crimp. The maximum distance permitted between the end of the tail and the crimp is 15 mm.

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

CAUTION: USE THE CORRECT HEAT-SHRINK TOOL. REFER TO **CHAPTER 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS.**

CAUTION: DO NOT OVERHEAT THE STRAP. DO NOT POINT THE HEAT GUN DIRECTLY AT THE STRAP. IF YOU SEE DISCOLOURATION IN THE STRAP, IT HAS BEEN OVERHEATED. IN THIS CASE IT MUST BE DISCARDED, REMOVED AND REPLACED.

9.61 Set the heat gun to the correct temperature.

9.62 Use the heat gun on a test heat-shrink sleeve to make sure that the heat gun is at the correct temperature.

NOTE: The heat-shrink sleeve will soften and will be able to encapsulate.

NOTE: If the heat-shrink sleeve melts then the heat gun temperature is too high.

- 9.63 Put the heat-shrink sleeve over the entire crimp and tail. Make sure the heat-shrink sleeve overlaps in both directions by at least 5 mm. Make sure that you use the correct heat-shrink sleeve. Refer to **Chapter 11, Illustrated Parts List, TABLE 1121B.**
- 9.64 Use the heat gun to apply heat evenly over the heat-shrink sleeve:
 - 9.64.1 Use the heat gun to heat the rear of the heat-shrink sleeve evenly from both left and right hand sides. Make sure that the entire crimp and tail are completely encapsulated. Refer to **Figure 899V.**
- 9.65 Do the steps that follow to make sure that the heat-shrink sleeve has sealed tight against the strap:
 - 9.65.1 Put on protective gloves.
 - 9.65.2 Use your fingers to pinch the ends of the heat-shrink sleeve while it is cooling.
- 9.66 Remove the ratchet straps.
- 9.67 Put 50 mm self-adhesive tape around the container join and on top of the tape squares and straps. Refer to **Figure 899W.**
- 9.68 Disconnect the vacuum hose.
- 9.69 Insert the vacuum valve plug.
- 9.70 This completes the packing sequence for the N-Series Xtrem container.
The container is now ready for labelling.
Refer to **Chapter 11, Illustrated Parts List.**

10. Container labelling

- 10.1 Check that all labels are fitted and positioned correctly and securely. Please refer to **Chapter 11, Section 3 Container label identification and position.**
- 10.2 Record the liferaft details, onto the liferaft identification label and insert it into the identification tube. Check for legibility and correct details.
- 10.3 The liferaft identification container and any excess tether webbing shall be tucked between the container strapping and the container.
- 10.4 Tape the IAL compact disc to the container.
- 10.5 This completes the packing sequence and the liferaft is now ready for installation.

CHAPTER 9

STORAGE CONDITIONS AND INSTRUCTIONS

Section	Title	Page
1	General	903
2	Liferafts that have not been operationally packed	903
3	Storage limiting period	904
4	Storage of batteries.....	905

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1. General

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

2. Liferafts that have not been operationally packed

- 2.1 A liferaft that is not operationally packed must be stored in a room that:
 - 2.1.1 Can be maintained at a temperature of 15 to 21°C (59 to 70°F)
 - 2.1.2 Is free from direct sunlight
 - 2.1.3 Has a dry atmosphere
 - 2.1.4 Is free from corrosive fumes or other harmful contamination
- 2.2 Remove accessories that are easily detachable. Attach transit caps and recoil caps to the cylinder. Obey proper procedures on how to store the gas cylinder.
- 2.3 Deflate the liferaft until the fabric creases are sharp and well defined. Refer to Chapter 8, ASSEMBLY AND REPACKING.
- 2.4 Fold the liferaft to a manageable size.
- 2.5 Wrap opaque polyethylene film around the liferaft. This will protect it against the effect of UV light. The polyethylene must be in accordance with ISO 2230 Section 5.2.
- 2.6 Tie a label to the liferaft recording the following:
 - 2.6.1 Liferaft Type, Mark and Serial Number.
 - 2.6.2 Date of last inflation test.
 - 2.6.3 Date of last service.

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

- 2.7 Store the liferaft above floor level, preferably on slatted shelving to permit air circulation.
- 2.8 Store the liferaft accessories, except the gas cylinders, with the liferaft.
- 2.9 Attach dust caps to the hoses. If dust caps for the hoses are not available, use adhesive tape to keep dirt out of the hoses.

3. Storage limiting period

- 3.1 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:
 - 3.1.1 unfolded and inspected, before further storage, or
 - 3.1.2 serviced and tested, before being operationally packed for installation on a vessel.
- 3.2 A liferafts which is 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. Refer to Chapter 5, TESTING AND TROUBLESHOOTING.
- 3.3 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 holes in the bottom of the container point straight down; make sure they are not blocked by dirt. Do not deliberately make containers wet.
 - 3.3.1 Do not direct water from hoses at containers.
 - 3.3.2 Do not leave containers in flooded places.
- 3.4 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, contact a Service Station to repack the liferaft as soon as possible.
- 3.5 If you need to move a container do not roll it. Get help to lift the container.
- 3.6 Operationally packed liferafts are approved for use on board ship for at least 12 months. National Authorities may grant extensions to the original operational period. At the end of a period of operational use, **Survitec Group** recommend that all liferafts should immediately be opened for inspection and service. Any contaminants inside the container must be removed before they cause damage.

4. Storage of batteries

- 4.1 The lamps are powered by a battery which contains lithium-sulphur dioxide. These chemicals become neutralised when the cell is fully discharged. Obey these guidelines:
 - 4.1.1 Store batteries at temperatures less than 50°C (122°F).
 - 4.1.2 For storage, the batteries must be isolated from materials which are flammable. Subject to satisfactory condition on receipt, they may remain in their original transit containers.
 - 4.1.3 If you think a battery is damaged, obey Chapter 4, INSPECTION AND CHECKING.

WARNING: BATTERIES ARE NOT A FIRE RISK, BUT CAN CAUSE A HEALTH RISK IF INVOLVED IN A FIRE. OBEY LOCAL REGULATIONS TO DISPOSE OF DAMAGED BATTERIES.

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CHAPTER 10

SPECIAL TOOLS, EQUIPMENT AND MATERIALS

Section	Title	Page
1	Special tools.....	1003
2	Equipment.....	1004
3	Materials	1005

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	Part No.
1. Special tools	
1. Steel hand roller	05290024
2. Spatula (125 × 25 × 3 mm) (5" × 1" × 1/8")	05290055
3. Solution brush:	
12 mm wide	05290004
25 mm wide	05290006
38 mm wide	05290007
4. 'Instantair' couplings:	
Female	20603001
Male (plug tail)	05290107
5. Spanner - Open end (3/8" BSP hose connector)	—
6. Packing machine (painter/operating line)	15389001
7. Ratchet strap	05654009
8. Tensioning tool - Container straps	04876009
9. *Crimp securing tool - Container straps	04877009
10. *Torque tools	
Leafield A10 PRV (fitting tool inner)	08320009
Leafield A10 PRV (fitting tool outer)	08321009
11. *Torque tools	
Leafield B10 PRV (fitting tool inner)	08320009
Leafield B10 PRV (fitting tool outer)	08556009
12. Spanner, inlet valve, Leafield	08200009
13. Grease, Aero Shell 14	07968009
14. Silicone grease, 4 Compound	09050003
15. Filling bung, Leafield	08252009
16. Cylinder valve filling tool, Leafield	08253009
17. *Torque drive assembly, Leafield	08218009

* This tool must be serviced regularly.

¹ This tool is for EV Silver Series.

18.	*Torque Resetting tool, Leafield operating heads	08254009
19.	Deflation adaptor tool	DSB80733040
20.	Test socket tool	DSB80733050
21.	Vent plug tool	DSB00801800
22.	*Torque tool, screw nut	DSB00724451
23.	*Torque tool, lower part	DSB01106810
24.	Fid	08457009
25.	Heat gun, 230 V (heat shrink sleeve)	08244009
26.	Heat gun, 110 V (heat shrink sleeve)	08245009
27.	* ¹ Torque spanner, 32 mm (indicator nut)	—
28.	* ¹ Torque spanner, 36 mm (humidity indicator)	—
29.	¹ Torque spanner	06754009
30.	* ¹ Torque tool (indicator housing, test valve & clamping nut)	—
31.	* ¹ Torque tool (plug) (vacuum test)	—
32.	Vacuum valve plug tool	50292005
33.	Heat sealing tool 15 cm (110 V)	08179009
34.	Heat sealing tool 15 cm (240 V)	07981009
35.	Standard airline "A8" adaptor	20944001

2. Equipment	Part No.
1. Vacuum cleaner with hose	—
2. Digital manometer (0-2000 mb)	06295009
3. Thermometer (hang-on thermometer)	—
4. Rubber tubing, (manometer connection)	—
9.5 i/d × 12.7 o/d × 3.2 mm long ($\frac{3}{8}$ " i/d × $\frac{1}{2}$ " o/d × $\frac{1}{8}$ " long)	
5. Air supply, dry and oil-free, for inflation	—
80 to 100 psig (5.6 to 7.0 kg/cm ²) regulated to 2 psig (140 g/cm ²)	

* This tool must be serviced regularly.

¹ This tool is for EV Silver Series.

3. Materials	Part No.
1. Solution of non-detergent soap and water	—
2. Lint-free cloth, clean and dry	—
3. Adhesive, Bostik 486 / Alpha S5001	
5 litre container	02868009
1 litre container	04929009
4. Methyl Ethyl Ketone (MEK)	04528009
5. Self-adhesive waterproof tape	
Cloth-backed, black, 100 mm (4") wide	04834009
PVC, white, 25 mm (1") wide	02096004
6. Tape, double sided, 25 mm (1") wide	08485009
7. Tape, double sided, 25 mm (1") wide	TA175
8. Fabric, main structure and buoyancies	
Rubber/nylon, NK205/2, black	DSB00220020
or	
RFD1070, 1N2RUB, black	08449009
9. Fabric, outer canopy	
Nylon, single-ply (RFD 1044/1)	06785009
or	
Nylon, single-ply (RFD 1044/2)	08006009
or	
Nylon, single-ply	DSB00202430
10. Fabric, inner canopy, nylon, single-ply	06315009
11. Toluene solvent (500 ml)	41445001
12. Layflat tubing, polyethylene, 50 mm (2") (DL Lanyard and bowsing line)	03224012
13. Layflat tubing, polyethylene, 100 mm (4") (painter line)	05815009
14. Cord, terylene, 22.5 kgf (50 lbf)	02236006

15.	Cord, nylon, 238 kgf (525 lbf)	00933009
16.	Thread, nylon, 4 kgf (9 lbf)	02426001
17.	Thread, Linen, Breaking, 3.2 kgf (7 lbf) (Bowsing line and drogue)	02414006
18.	Thread, cotton, scarlet (Painter sachet tie-off)	02403001
19.	Seal, self-adhesive, Mk 10 / Mk 14 container (10 × 19 mm)	05606009
20.	Seal, self-adhesive, Mk 16 / Mk 18 container (10 × 38 mm)	06475009
21.	Polystyrene (50 × 100 × 1000 mm) (Packing MK 14 container)	04884009
22.	Tape, self-adhesive, "DO NOT CUT"	15384002
23.	Water ballast bag	07757020
24.	Cylinder paint repair kit	08866009
25.	Leak detection kit (This kit is sufficient to test 40 cylinders)	45435001

CHAPTER 11

ILLUSTRATED PARTS LIST

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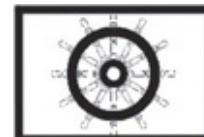
1. GENERAL

- 1.1 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) and inches (").

NOTE: For information on Emergency Pack types, contents and part numbers, refer to Chapter 7, EMERGENCY PACKS AND EQUIPMENT.

NOTE: The 'Wheelmark' symbol indicates an MED-compliant item.



2. SUB-CHAPTERS

2.1 Marine MkIV liferaft

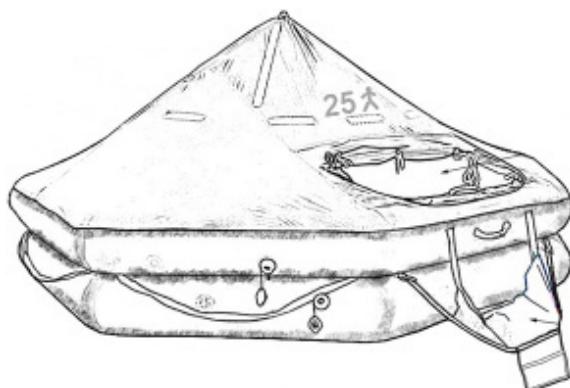


FIGURE 1101
Typical Marine
MK IV Throwover liferaft

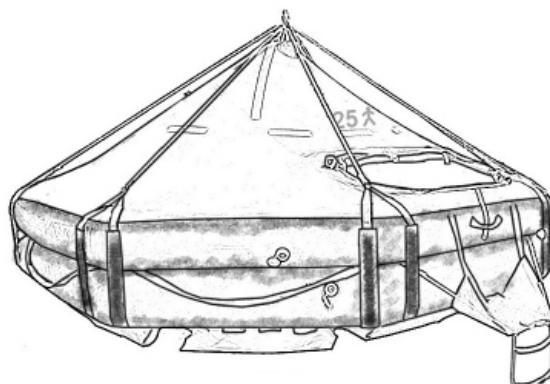


FIGURE 1102
Typical Marine
MK IV Davit-launch liferaft

2.2 Hull assembly

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

- 2.2.1 All-liferaft spares: items (including valves and fabrics) which are universal to all liferaft sizes.
These spares form an integral part of, or are attached to, the core liferaft before specific customer and individual authority requirements are applied.
- 2.2.2 Liferaft-specific spares: items which differ depending on liferaft size.
These spares form an integral part of, or are attached to, the core liferaft before specific customer and individual authority requirements are applied.

Each sub-section gives the description, part number(s) and application of each spare item.

NOTE: When ordering spare parts for a DSB liferaft prefix the part number with an 'R' unless the DSB part number has been given. DSB part numbers are prefixed with 'DSB'.

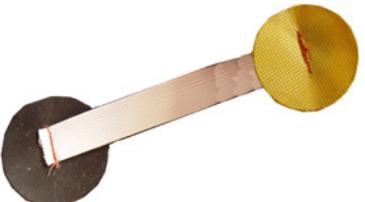
2.2.1 All liferaft spares

	Description:	Internal lamp unit (RL5)	
	Found on:	Bottom centreline of archtube	
	Part number:	RFD P/N:	12869009
		DSB P/N:	12869009
		EV P/N:	12869009
	Description:	External lamp unit (RL5)	
	Found on:	Top of canopy	
	Part number:	RFD P/N:	12870009
		DSB P/N:	12870009
		EV P/N:	12870009
	Description:	Internal lamp unit (RL6)	
	Found on:	Bottom centreline of archtube or canopy interior	
	Part number:	RFD P/N:	12866009
		DSB P/N:	12866009
		DBC P/N:	12866009
		EV P/N:	12866009
		<Not Used>	
		Zodiac P/N:	12866009
	Description:	External lamp unit (RL6)	
	Found on:	Top of canopy	
	Part number:	RFD P/N:	12868009
		DSB P/N:	12868009
		DBC P/N:	12868009
		EV P/N:	12868009
		<Not Used>	
		Zodiac P/N:	12868009

	Description:	Floating knife
	Found on:	Upper buoyancy inside liferaft
	Part number:	DSB00904040
	Description:	Rubber plug
	Found on:	Rain catchment tube assembly
	Part number:	DSB00107110
	Description:	Drogue (without swivel)
	Found on:	Drogue patch assembly
	Part number:	45510101
	Description:	(OPTI) Zip puller
	Found on:	Canopy doorway
	Part number:	DSB00913440
	Description:	(YKK) Zip puller
	Found on:	Canopy doorway
	Part number:	08952009
	Description:	Rescue line and quoit assembly
	Found on:	Inner lifeline
	Part number:	45932001

	Description:	Quoit
	Found on:	Rescue line and quoit assembly
	Part number:	11501009
	Description:	Strap
	Found on:	Rescue line and quoit assembly
	Part number:	45932011
	Description:	Boarding ramp
	Found on:	Upper / lower buoyancy
	Part number:	4 Person (TO) 51643011
		6 Person (TO) 51643012
		8 Person (TO) 51643013
		10 Person (TO) 51643014
		12 Person (TO) 51643014
		16 Person (TO) 51643015
		20 Person (TO) 51643016
		25 Person (TO) 51643017
		12 Person (DL) 51643021
		16 Person (DL) 51643022
		20 Person (DL) 51643023
		25 Person (DL) 51643024

	Description:	Inflate/deflate valve
	Found on:	Upper/lower buoyancy and arch tube
	Part number:	DSB00812180
	Description:	Cap, inflate/deflate valve
	Found on:	Upper/lower buoyancy and arch tube
	Part number:	DSB00810070
	Description:	Inlet check valve, 2.2 mm (Yellow)
	Found on:	Lower buoyancy
	Part number:	08423009
	Description:	Inlet check valve, 2.8 mm (Purple)
	Found on:	Upper buoyancy
	Part number:	08424009
	Description:	A10 PRV, 2.8 psi (Green dot)
	Found on:	(Throwover liferafts) Upper and Lower buoyancy
	Part number:	08223009
	Description:	A10 PRV, 3.5 psi (Red dot)
	Found on:	(Davit-launch liferafts) Upper and Lower buoyancy
	Part number:	08424009
	Description:	Cap
	Found on:	A10 PRV
	Part number:	06400009

	Description	B10 PRV, 2.8 psi (Green dot)
	Found on:	(Throwover liferafts) Upper and Lower buoyancy
	Part number	08554009
	Description	B10 PRV, 3.5 psi (Red dot)
	Found on:	(Davit-launch liferafts) Upper and Lower buoyancy
	Part number	08555009
	Description	Cap
	Found on:	B10 PRV
	Part number	08557009
	Description	Fabric, rubber-coated nylon. Coated on both faces.
	Found on:	DSB00220020
	Part number	08449009
	Description	Floor retaining strap
	Found on:	Liferaft floor (inside)
	Part number	DSB20697042
 	Description	Tape, retro-reflective (50 mm)
	Found on:	07909009
	Part number	04760009
	Description	Fixing strip
	Found on:	Liferaft floor (outside)
	Part number	DSB80220430

2.2.2 Liferaft specific spares

Hauling-in ladder stretching line			
Liferaft size (persons)	Maximum length		Part number
	(metres)	(feet)	
4			
6	3.30	10.8	DSB20697092
8			
10	3.10	10.2	DSB21097091
12	3.60	11.8	DSB21297091
16	4.30	14.1	DSB21697091
20	5.25	17.2	DSB22097091
25	5.75	18.9	DSB22597091

Additional items (hauling-in ladder stretching line)			
Item	Description	—	Part number
	Rubber band	—	08442009

TABLE 1101
Hauling-in ladder stretching line

Drogue retaining line			
Liferaft launch type	Maximum length		Part number
	(metres)	(feet)	
Throwover			
Davit	2.00	6.5	02299006

TABLE 1102
Drogue retaining line

			 	
Liferaft		Part number		
Size (Persons)	Launch Type	Cylinder- retaining pocket		
4	Throwover	DSB20697063	Part number	
6			Cylinder-retaining strap (x2)	Cross patch
8			51071001	51073001
10	DSB21297063	51071002		
12			Throwover	
			Davit	
16	DSB22097063		51071002	
20	DSB22097063			
	DSB22597063			
25	DSB22597063			DSB22596063
	Davit			

TABLE 1103
Cylinder-retaining pockets and straps



Paddle, one-piece		
Part number	Description	Liferaft / container application
05121009	815 mm long	All MK 10, MK 14 and MK 20 types
05122009	500 mm long	All MK 16 and MK 18 flat-pack types

TABLE 1104
Paddle, one-piece



N-Series paddles		
Part number	Description	Liferaft / container application
11944009	Two-piece (1.2 m)	All N-Series container types

TABLE 1104A
Two-piece paddles

	Description	Tablet, anti-seasickness (pack of 60)		
	Found on:	Rainwater catchment tube		
	Part number	12864009 (RFD)		
		Allocation by liferaft size		
	Liferaft size	4-10 TO	12- 20 TO and DL	20-25 TO and DL
	Quantity (packs)	1	2	3

NOTE:

Anti-seasickness tablets are country-dependant so part numbers will vary.

Refer to *Appendix 1 - Marine Equipment Directive Variations*.

TABLE 1105
Anti-seasickness tablets

Typical appearance of insulated floor assembly	Liferaft		Insulated floor
	Size (persons)	Launch type	Part number
	4	Throwover	51161001
		Davit	—
	6	Throwover	50850001
		Davit	—
	8	Throwover	50851001
		Davit	—
	10	Throwover	50852001
		Davit	—
	12	Throwover	50853001
		Davit	50853002
	16	Throwover	50854001
		Davit	50854002
	20	Throwover	50855001
		Davit	50855002
	25	Throwover	50856001
		Davit	50856002

TABLE 1106
Insulated floor assemblies

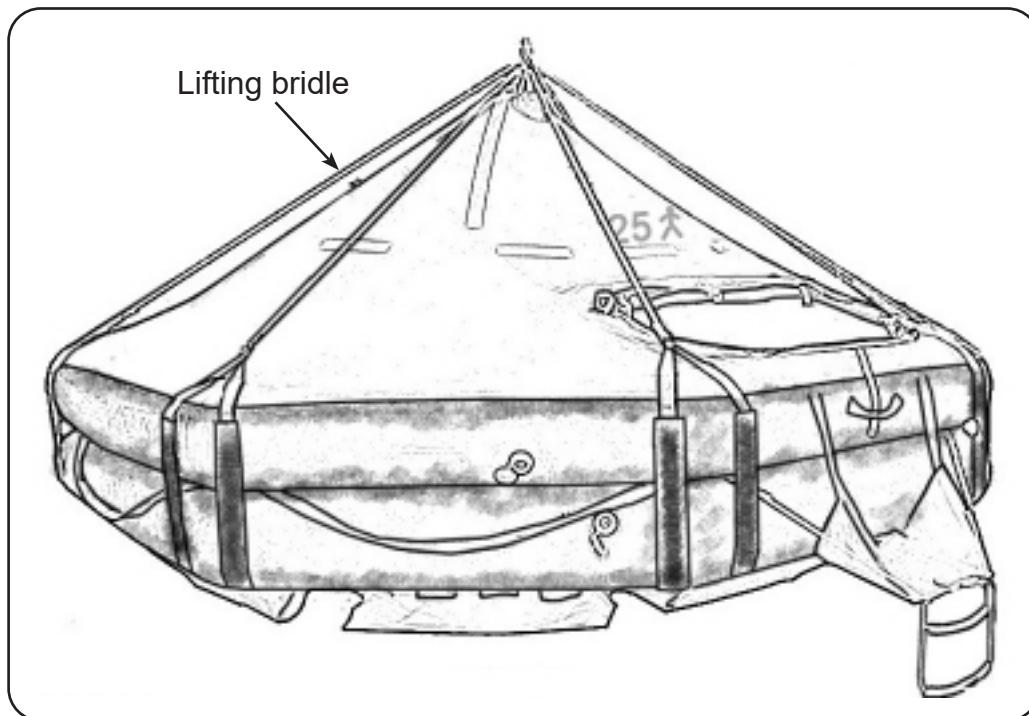


FIGURE 1103
Typical lifting bridle - Davit Launch liferafts only

Liferaft size	Lifting bridle (DL liferafts only)
	Part number
12 DL	50950001
16 DL	50950002
20 DL	50950003
25 DL	50950004

Container-retaining line (5.5 m)	12 - 25 DL liferafts	P/N 0659009
----------------------------------	----------------------	-------------

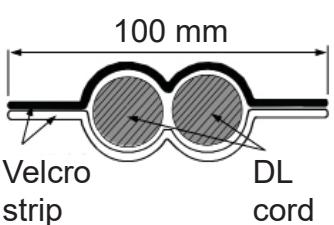
Additional parts		
	Description	Velcro fastener (100 mm × 25 mm)
	Quantity	8 (4 × 2)
	Part number male:	05622009
	Part number female:	05812009

TABLE 1107
Davit-launch lifting bridle assemblies

2.3 GRP Container Assembly spares

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.

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

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

- (i) Launch method, that is, Throwover or Davit-launch.
- (ii) 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).
- (iii) E-pack option(s) used.
- (iv) Liferaft size.
- (v) Customer preference (container MK number).

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

Throwover

- (a) 4N containers
- (b) MK 10 containers
- (c) MK 10 Silver series containers
- (d) MK 14 containers
- (e) MK 16 containers
- (f) MK 18 containers
- (g) G21 containers

Davit-launch

- (h) MK 10 containers
- (i) MK 14 containers
- (j) MK 20 containers

N-Series containers

- (k) Low Profile
- (l) Xtrem

Container information, inflation equipment and foam protection

- (m) Containers: universal spares
 - (n) Containers: liferaft-specific spares
 - (o) Container label identification and position
- 2.5 Inflation equipment: universal spares
 - 2.6 Foam protection pads

2.3.1 New strap/sleeve assemblies

- (a) When you order any of the strap/sleeve assemblies given in TABLE 1108, you will receive the new, black design.
- (b) The part numbers and brand details of the new strap/sleeve assemblies have not changed.

2.3.2 Existing strap/sleeve assemblies

- (a) You can continue to use your stock of coloured strap/sleeve assemblies.
- (b) Make sure that you use the correct strap/sleeve assemblies:
 - (i) Check the part number of a strap/sleeve assembly before you install it.
 - (ii) Do not select a strap/sleeve assembly by colour.

2.3.3 Strap and sleeve assemblies used:

- (a) TABLE 1108 illustrates the strap and sleeve assemblies used in this Chapter and their corresponding brand part number.

Strap/sleeve assembly	Strap length (metres)	Strap/sleeve assembly part number	Brand	Sleeve colour
D508	2.1	41423001	RFD	Black label with white print
		41423002	EV	
		41423003	Survitec Group	
		41423004	Survitec Zodiac *	
		41423006 **	Survitec Group	
		50406001	DSB	

- * Please use sleeve protections (S/C Z7646S (P/N ZC13754)) for Survitec Zodiac branded crimps.
- ** This part number must be used for all N-Series Xtrem liferafts. It features a longer crimp than standard.

TABLE 1108
Strap/sleeve assembly brand part numbers

(a) 4N Throwover GRP containers

The following sub-section details the part numbers for the 4N container:



4N

4N Throwover containers							
Container size	Liferaft	Heavy weight (up to 36 metres stowed height)				Strap and crimp	
		Part numbers			E-pack option	Part number and Description	Qty
		Complete	Upper	Lower			
4N	6	—	R50371001	R50371002	B	D508 (2.8 m) Refer to TABLE 1108	4
	8						

TABLE 1109
4N Throwover GRP Container

- (b) MK 10 Throwover standard-weight and heavy-weight GRP containers

The following sub-section details the part numbers for MK 10 Throwover container spares:



Size 3



Size 4



Size 6



Size 7



Size 9

FIGURE 1105
MK 10 Throwover GRP containers

MK 10 Throwover containers						
Container size	Liferaft	Standard-weight (up to 18 metres stowed height)			Strap and crimp	
		Part numbers			E-pack option	Part number and Description
		Complete	Upper	Lower		
3	4	42271031	42271131	42271231	A/B	D508 (2.1m) Refer to TABLE 1108
	6				B	
	8				B	
4	6	42271041	42271141	42271241	A	4
	8				A	
	10				B	
	12				B	
6	10	42271061	42271161	42271261	A	6
	12				A	
	16				B	
7	16	42271071	42271171	42271271	A	8
	20				B	
	25				B	
9	20	42271091	42271191	42271291	A	10
	25				A	

TABLE 1110
MK 10 Throwover GRP container information (up to 18 metres stowed height)

MK 10 Throwover containers						
Container size	Liferaft	Heavy-weight (up to 36 metres stowed height)			Strap and crimp	
		Part numbers			E-pack option	Part number and Description
		Complete	Upper	Lower		
3	4	17938031	17938131	17938231	A/B	D508 (2.1 m) Refer to TABLE 1108
	6				B	
	8				B	
4	6	17938041 R17938041	17938141 R17938141	17938241 R17938241	A	4
	8				A	
	10				B	
	12				B	
6	10	17938061	17938161	17938261	A	6
	12				A	
	16				B	
7	16	17938071	17938171	17938271	A	8
	20				B	
	25				B	
9	20	17938091	17938191	17938291	A	10
	25				A	

NOTE:

GRP containers which are approved for a maximum stowage height of 36 metres can be used as an alternative to GRP containers which are approved for a maximum stowage height of 18 metres.

CAUTION: 18 METRE CONTAINERS **MUST NOT BE USED AS ALTERNATIVE TO 36 METRES.**

The existing part numbers for GRP containers with a maximum stowage height of 18 metres are not obsolete and you can continue to use any stock of these part numbers.

You can continue to order the existing part numbers from Survitec Group Ltd. but you will possibly receive the alternative part number.

TABLE 1111
MK 10 Throwover GRP container information (up to 36 metres stowed height)

(c) MK 10 EV Silver Series

The following sub-section details the part number for the MK 10 silver series container spares:

Silver Series Flat-Pack Containers						
Rated Capacity	A-Pack		B-Pack		Strap and crimps	
	Complete	E-pack option	Complete	E-pack option	Part number	Qty
6	E99991577	A	E99991578	B	D508 (2.1m) Refer to TABLE 1108	4
8	E99991576	A	E99991578	B		4
10	E99991574	A	E99991575	B		4
12	E99991574	A	E99991575	B		4

TABLE 1112
MK 10 Silver Series Flatpack Containers Throwover GRP container information

(d) Mk 14 Throwover GRP containers

The following sub-section details the part numbers for the MK 14 Throwover GRP container spares:



Size 14



Size 17

FIGURE 1106
MK 14 Throwover GRP containers

MK 14 Throwover containers								
Container size	Liferaft	Standard weight (up to 18 metres stowed height)				Strap and crimp		
		Part numbers			E-pack option	Part number and Description	Qty	
		Complete	Upper	Lower				
12	6	21041001	21041011	21041021	A/B	D508 (2.8m) D508 (2.5m) Refer to TABLE 1108	4	
	8							
14	10	50973101	50973012	50973022	A		6	
	12				—			
	16				—			
	20				B			
17	20	50915012	50915111	50915212	A	8		
	25				A/B			

MK 14 Throwover containers							
Container size	Liferaft	Standard weight (up to 36 metres stowed height)				Strap and crimp	
		Part numbers			E-pack option	Part number and Description	Qty
		Complete	Upper	Lower			
14	10	50262012	50262021	50262031	A	D508 (2.8m) D508 (2.5m) Refer to TABLE 1108	8
	12				A/B		
14	16				A/B		
	20				B		
17	16	50915012	50915111	50915212	A		10

TABLE 1113 (i)
MK 14 Throwover GRP container information

MK 14 Throwover containers							
Container size	Liferaft	Standard weight (up to 18 metres stowed height)				Strap and crimp	
		Part numbers			E-pack option	Part number and Description	Qty
		Complete	Upper	Lower			
14	10	R50973101	R50973012	R50973022	A	508 (2.8m) D508 (2.5m) Refer to TABLE 1108	6
	12				—		
14	16				—		
	20				B		
17	20	R50915012	R50915111	R50915212	A		8

MK 14 Throwover containers							
Container size	Liferaft	Standard weight (up to 36 metres stowed height)				Strap and crimp	
		Part numbers			E-pack option	Part number and Description	Qty
		Complete	Upper	Lower			
14	10	R50973101	R50973012	R50973022	A	D508 (2.8m) D508 (2.5m) Refer to TABLE 1108	8
	12				A/B		
14	16				A/B		
	20				B		
17	16	R50915012	R50915111	R50915212	A	Refer to TABLE 1108	10
	20	R50915012	R50915111	R50915212	A		
	25				A/B		

TABLE 1113 (ii)
MK 14 Throwover GRP container information

(e) Mk 16 Throwover GRP Flat-Pack containers

The following sub-section details the part numbers for the MK 16 Throwover GRP container spares:

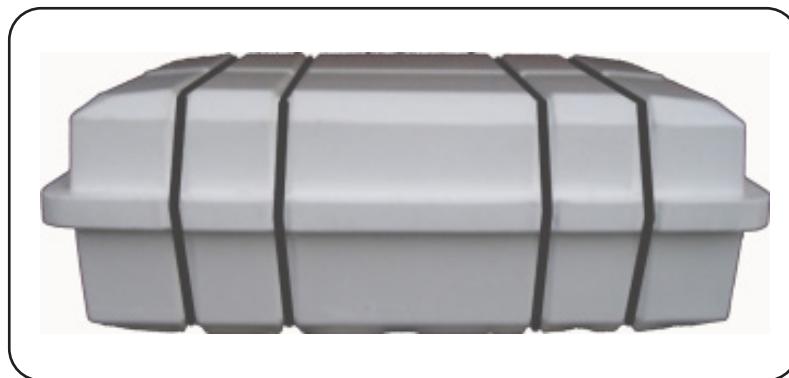


FIGURE 1107
MK 16 Throwover GRP container

MK 16 Throwover containers							
Container size	Liferaft size	(up to 18 metres stowed height)				Strap and crimp	
		Part numbers			E-pack option		
		Complete	Upper	Lower	Part number and Description	Qty	
2	12	42301001	42301011	42301021	A	D508 (2.1 m) Refer to TABLE 1109	4

TABLE 1114
MK 16 Throwover GRP container information

(f) Mk 18 Throwover (TO) GRP Flat-Pack containers

The following sub-section details the part numbers for the MK 18 Throwover GRP container spares:



Size 1



Size 3

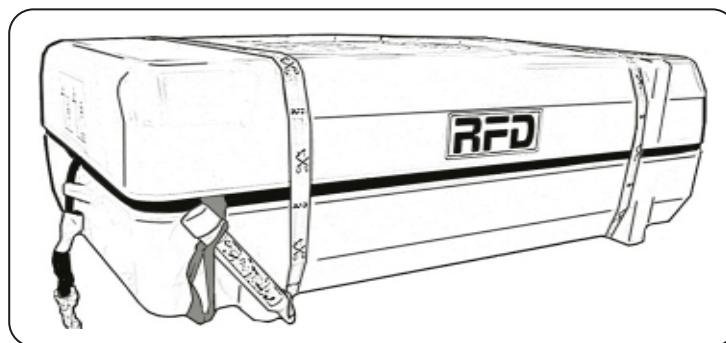
FIGURE 1108
MK 18 Throwover (TO) GRP container

MK 18 Throwover containers						
Container size	Liferaft size	(up to 36 metres stowed height)			Strap and crimp	
		Part numbers				
		Complete	Upper	Lower	E-pack option	Part number and Description
1	4	43042002	43042101	43042202	A/B	D508 (2.8 m) Refer to TABLE 1108
	6				B	
3	6	43043002	43043101	43043202	A/B	2
	8				A/B	

TABLE 1115
MK 18 Throwover (TO) GRP container information

(g) G21 GRP Flat-Pack container (B-pack)

The following sub-section details the part number for the G21 GRP container spares:



Size 17

FIGURE 1109
G21 GRP container

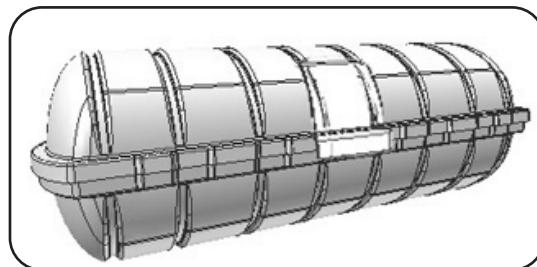
G21 Throwover container							
Container size	Liferaft size	(up to 18 metres stowed height)					Strap and crimps
		Complete	Upper	Lower	Cover	E-pack option	Part number
17	12	08547009	—	—	—	B	D508 (2.1m) Refer to TABLE 1108

G21 Container		
Item	Description	Part number
Seal strip	Container seal	06475009

TABLE 1116
G21 container information

(h) Mk 10 Davit-launch (DL) GRP containers

The following sub-section details the part numbers for MK 10 Davit-launch GRP container spares



Size 9

FIGURE 1110
MK 10 Davit-launch (DL) GRP containers with davit ring cover

MK 10 Davit-launch containers						
Container size	Liferaft size	(up to 36 metres stowed height)				
		Complete	Upper	Lower	Cover	E-pack option
4	12	50948041	50948141	50948241	50948341	B
6	12	50948061	50948161	50948261	50948361	A
	16					B
7	16	50948071	50948171	50948271	50948371	A
	20					B
	25					B
9	20	50948091	50948191	50948291	50948391	A
	25					A

TABLE 1117 (i)
MK 10 Davit-launch (DL) GRP container information
(including DSB LR07 Klappe method)

MK 10 Davit-launch containers						
Container size	Liferaft size	(up to 36 metres stowed height)				
		Complete	Upper	Lower	Cover	E-pack option
4	12	R17938041	R17938141	R17938241	—	B

TABLE 1117 (ii)
MK 10 Davit-launch (DL) GRP container information
(including DSB LR07 non-Klappe method)

NOTE: Refer to Appendix A-9 for DSB packing method.

MK 10 Davit-launch containers						
Container size	Liferaft size	Straps		Crimps		Hand loops
		Part number and description	Qty	Part number and description	Qty	
4	12		4		6	2
6	12		6		8	2
6	16	D508 (2.1m) Refer to TABLE 1108		04874009	12	DSB80303360 2
7	20		10			
	25					
7	20					
9	25					

TABLE 1118 (i)
MK 10 Davit-launch (DL) GRP container information (including DSB LR07 KLAPPE method)

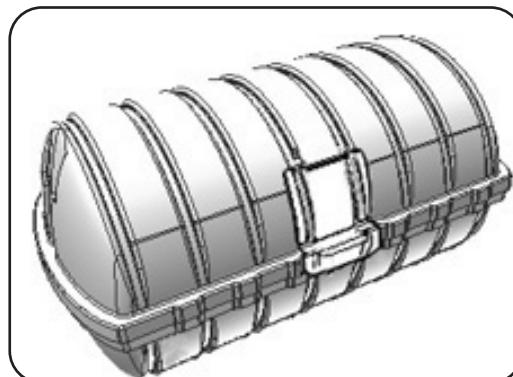
MK 10 Davit-launch containers						
Container size	Liferaft size	Straps		Crimps		Hand loops
		Part number and description	Qty	Part number and description	Qty	
4	12	D508 (2.1m) Refer to TABLE 1108	4	04874009	8	DSB80303360 4

TABLE 1118 (ii)
MK 10 Davit-launch (DL) GRP container information (including DSB LR07 non-KLAPPE method)

NOTE: Refer to Appendix A-9 for DSB packing method.

(i) Mk 14 Davit-launch (DL) GRP containers

The following sub-section details the part numbers for the MK 14 Davit-launch GRP container spares:



Size 17

FIGURE 1111
MK 14 Davit-launch (DL) GRP container

MK 14 Davit-launch containers						
Container size	Liferaft size	(up to 36 metres stowed height)				
		Complete	Upper	Lower	Cover	E-pack option
14	12	50973001	50973021	50973011	50973031	A
	16					B
17	16	50915042	50915141	509152424	50915061	A
	25	50915042	50915051	50915034	50915061	A and B

TABLE 1119 (i)
MK 14 Davit-launch (DL) GRP container information
(including DSB LR07 Klappe method)

MK 14 Davit-launch containers						
Container size	Liferaft size	(up to 36 metres stowed height)				
		Complete	Upper	Lower	Cover	E-pack option
14	12	R50973101	R50973022	R50973012	—	A
	16					B
17	16	R50915012	R50915111	R50915212	—	A
	20					A and B
	25					A and B

TABLE 1119 (ii)
MK 14 Davit-launch (DL) GRP container information
(including DSB LR07 non-Klappe method)

NOTE: Refer to Appendix A-9 for DSB packing method.

MK 14 Davit-launch containers					
Container size	Liferaft size	Part number and description	Straps Qty	Crimps Qty	Hand loops
14	12		6	R04874009	
	16	D508 (2.8m)		8	
	16	D508 (2.5m)			
		Refer to TABLE 1108			
17	20		10	04874009	12
	25				

TABLE 1120 (i)
MK 14 Davit-launch (DL) GRP container information (including DSB LR07 KLAPPE method)

MK 14 Davit-launch containers					
Container size	Liferaft size	Part number and description	Straps Qty	Crimps Qty	Hand loops
14	12		6	R04874009	
	16	D508 (2.8m)		12	
	16	D508 (2.5m)			
		Refer to TABLE 1108			
17	20		10	04874009	20
	25				

TABLE 1120 (ii)
MK 14 Davit-launch (DL) GRP container information (including DSB LR07 non-KLAPPE method)

NOTE: Refer to Appendix A-9 for DSB packing method.

(j) Mk 20 GRP Flat-Pack containers

The following sub-section details the part numbers for the MK 20 GRP container spares:

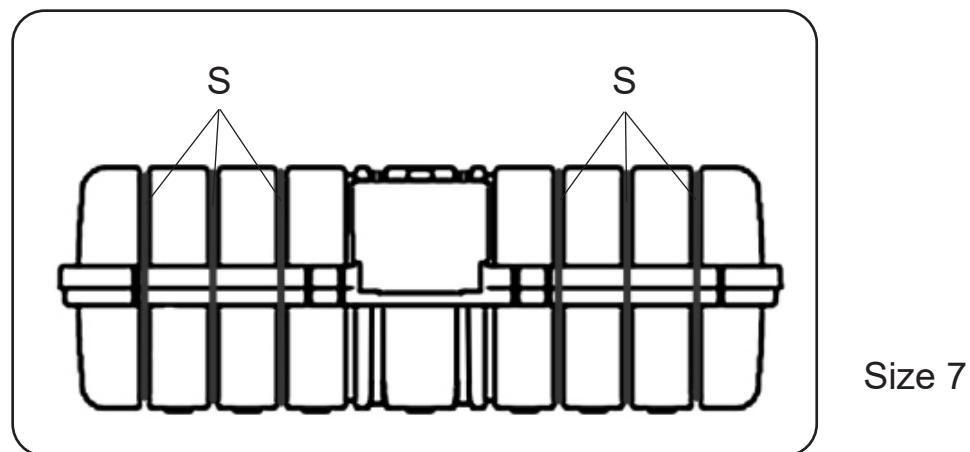


FIGURE 1112
MK 20 GRP container

MK 20 Davit-launch container							
Container size	Liferaft size	(up to 36 metres stowed height)					Strap and crimps
		Complete	Upper	Lower	Cover	E-pack option	Part number
7	25	45290003	45290013	45290023	—	A/B	D508 (2.5m) Refer to TABLE 1108

Mk 20 Container		
Item	Description	Part number
Rubber strip	50 x 6 x 90 cm	07996009
Adhesive	—	02868009

TABLE 1121
MK 20 container information

(k) N-Series Low Profile containers

The following sub-section details the part numbers for the N-Series Low Profile container spares:

Container size	Liferaft Capacity	Complete Part Number	Upper Part Number	Lower Part Number	E-Pack Option	Part Number and description
N133	4	52886003	52886031	52886032	A/B	D508 (2.1 m) Refer to TABLE 1108
	6				B	
N134	6	52886004	52886041	52886042	A	
	8				B	
N135	12	52887001	52887011	52887012	B	D508 (2.1 m) Refer to TABLE 1108
	8				A	
	10				A	
N136	12	52888001	52888011	52888012	B	D508 (2.1 m) Refer to TABLE 1108
	16					
	16	52888002	52888021	52888022	A	
N136H	20				A/B	

TABLE 1121A
N-Series Low Profile container information

(I) N-Series Xtrem containers

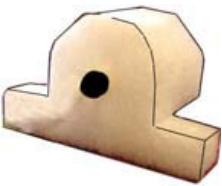
The following sub-section details the part numbers for the N-Series Xtrem container spares:

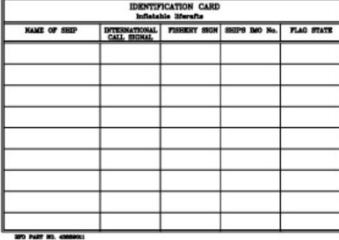
Container size	Liferaft Capacity	Complete Part Number	Upper Part Number	Lower Part Number	E-Pack Option	Part Number and description	Quantity	
N137	6	52904001	52904011	52904012	B	D508 (2.1 m) Refer to TABLE 1108 and the notes below Table 1108 regarding the N-Series Xtrem	2	
N137H	6	52905001	52905011	52905012	A		2	
N138	8	52906001	52906011	52906012	B		2	
N138H	8	52907001	52907011	52907012	A		2	
N139	10	52908001	52908011	52908012	B		4	
	12						4	
N139H	10	52909001	52909011	52909012	A		4	
	12						4	
N140	16	52910001	52910011	52910012	B		4	
N140H	16	52911001	52911011	52911012	A		4	

TABLE 1121B
N-Series Xtrem container information

(m) Containers: universal spares

The following sub-section details the container spares universal to all liferaft sizes:

	Description	Block, Painter Retaining
	Application:	4N containers only
	Part number	R50369001
	Description	Painter retaining block
	Found on:	All liferafts
	Part number	20883001
	Description	Painter sachet assembly
	Application:	Refer to TABLE 1122
	Description	Strap and Crimp
	Application:	Refer to TABLE 1108
—	Description	Release hand loops
	Application:	DL liferaft ONLY
	Part number	DSB80303360

—	Description	Extra crimps, 2 off
	Application:	DL liferaft ONLY
	Part number	04874009
	Description	Container assembly for liferaft identification label
	Found on:	All liferafts
	Part number	43858001
	Description	Liferaft identification label
	Application:	All liferafts
	Part number	43859011
—	Description	Container foam block
	Application:	All containers
	Part number	50152001
	Description:	Container plug D30 (for painter hole)
	Found on:	N-Series containers
	Part number:	Z6023
	Description:	50 mm self adhesive tape
	Found on:	N-Series Xtrem containers
	Part number:	Z6017

Liferaft capacity	Container size	H-Pack size	Part Number
6	N137H	MK4 Xtrem 6/8P	52992003
	N137		
8	N138H	MK4 Xtrem 6/8P	52992003
	N138		
10	N139H	MK4 Xtrem 10/12P	52992002
	N139		
12	N139H	MK4 Xtrem 10/12P	52992002
	N139		
16	N140H	MK4 Xtrem 16P	52992001
	N140		

TABLE 1121A
N-Series Xtrem H-Pack sizes

Container	Part Number	Brand
Xtrem	S/C Z7646S (P/N ZC13754)	Survitec Zodiac
	50450001	All other brands
Low Profile	50450001	All brands

TABLE 1121B
N-Series heat-shrink sleeve

(n) Containers: liferaft-specific spares

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

Liferaft launch type	Maximum installation height (metres)			
	18	25	36	56
Throwover	15323111	15323121	15323131	21204051
Davit				

NOTE:

TABLE 1122 above quotes maximum installation height. It should be understood that actual painter cord length is 10 metres longer than the maximum installation height. For instance, a container at 36 metres installation height has an actual painter cord length of 46 metres.

TABLE 1122
Painter sachet assembly - applications

(o) Container label identification and position

This sub-section gives the container label identification and position for the most commonly used container types:

NOTE:

Please refer to Pages 1178-1184 for DSB container labelling.

Legend			
10 16	Brand-specific labels	6	Universal labels

Unitor branded containers:

Unitor throw-over (TO) and davit launch (DL) liferafts have been packed into containers using Unitor branded labels. The Unitor brand is to be discontinued, branded labels have now been made obsolete. You must now use Survitec branded labels when packing these liferafts. Refer to **Appendix 15**.

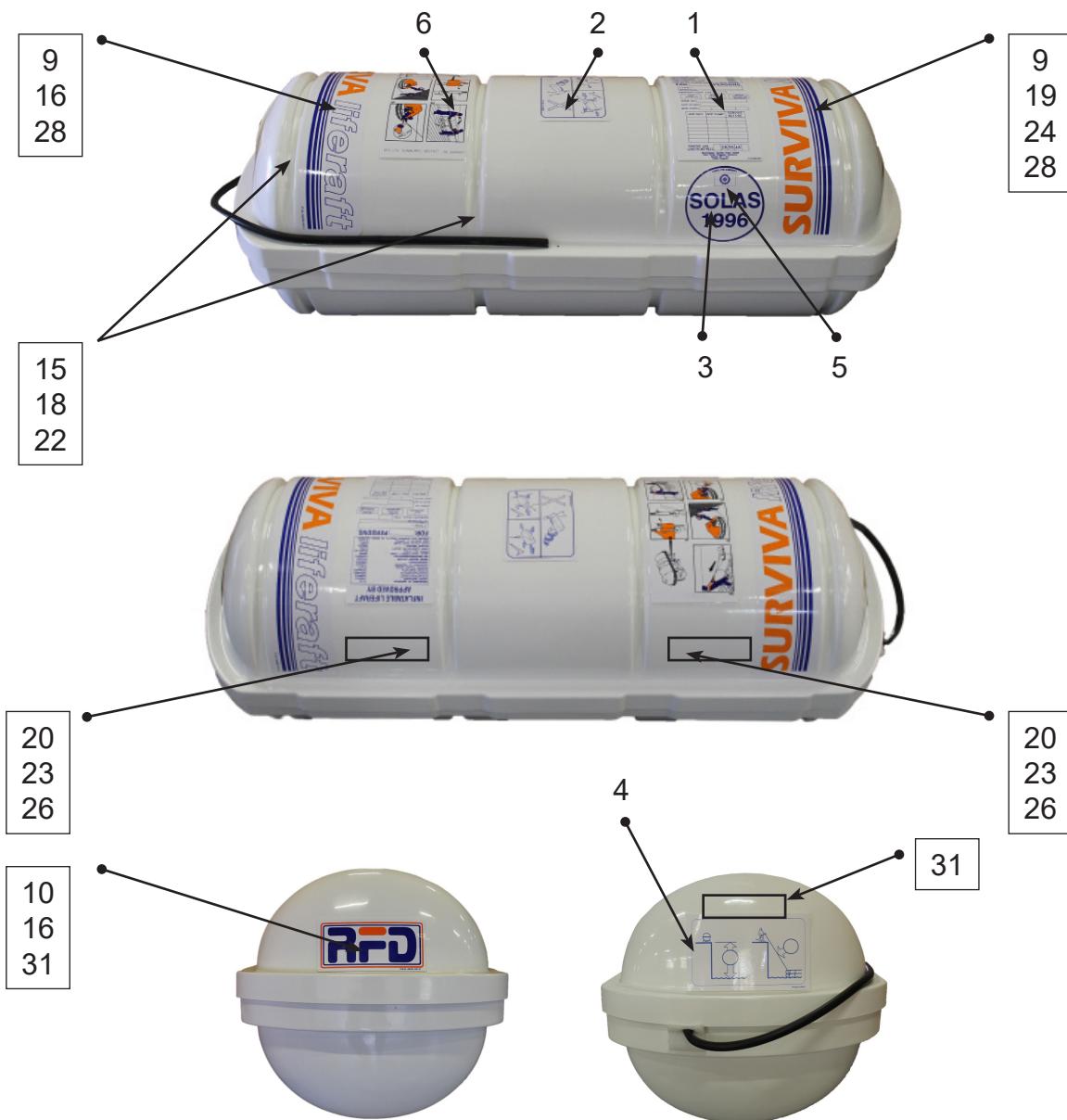


FIGURE 1113
Labels for Mk 10 size 3 Throwover container

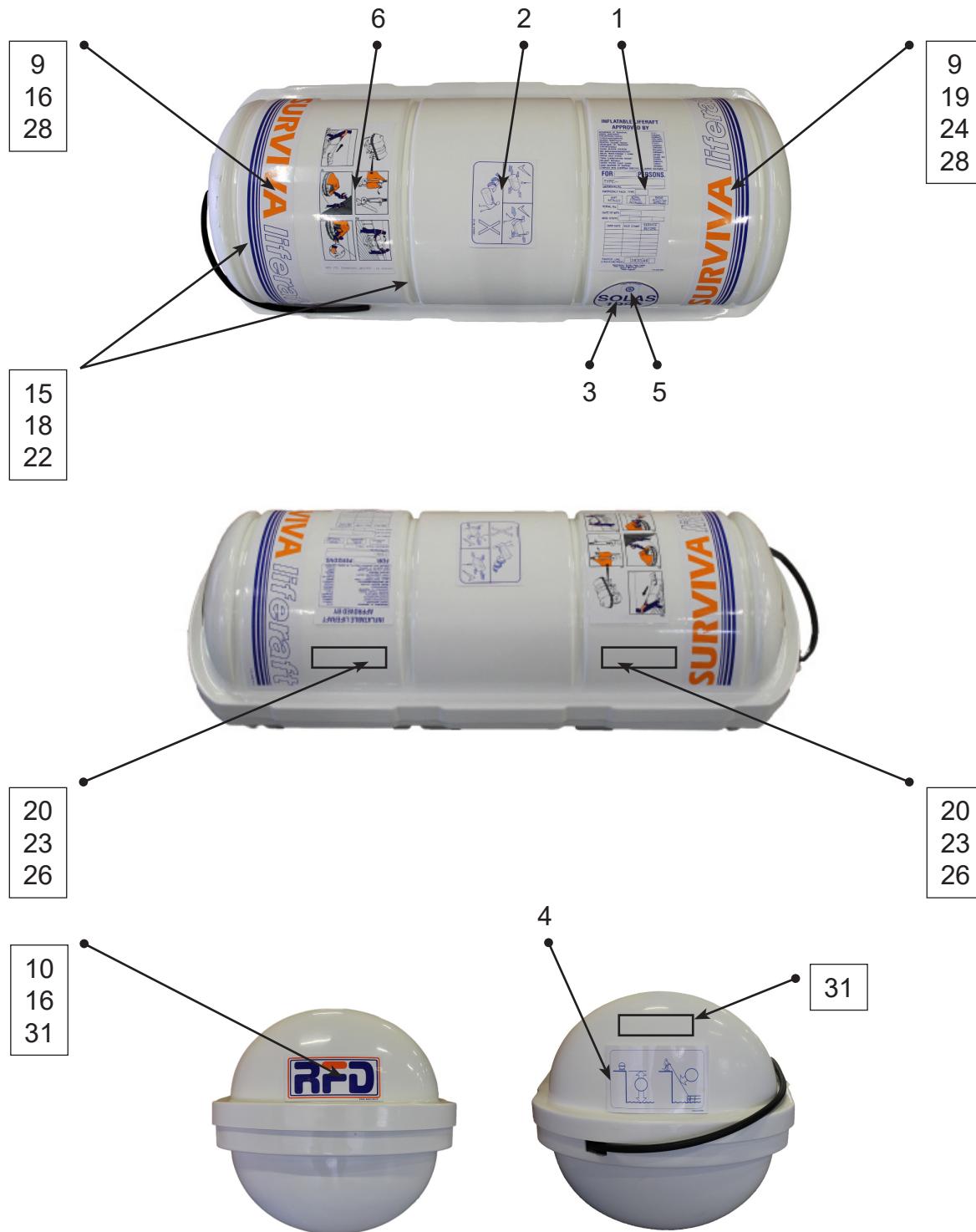


FIGURE 1114
Labels for MK 10 size 4 Throwover container

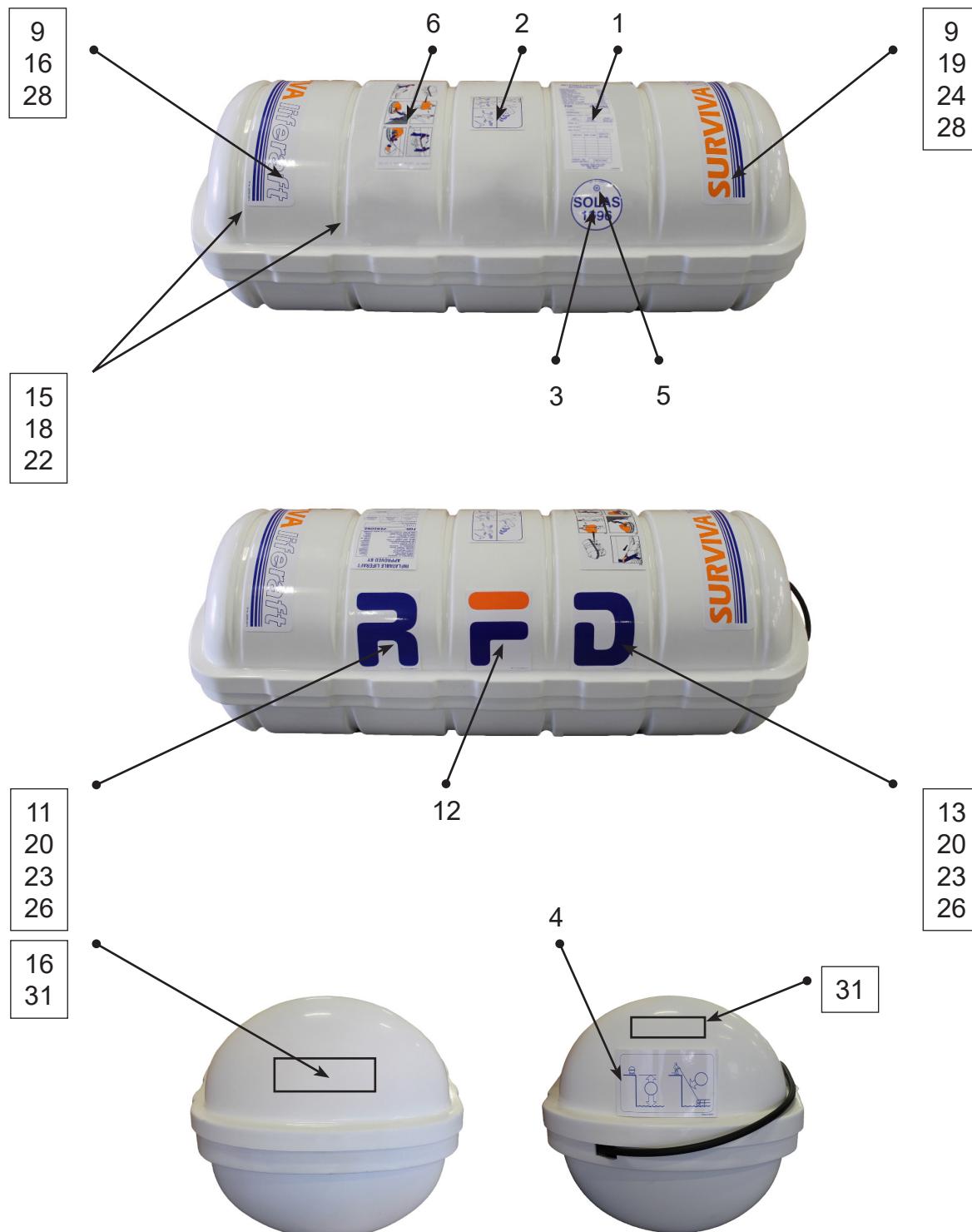


FIGURE 1115
Labels for MK 10 size 6 Throwover container

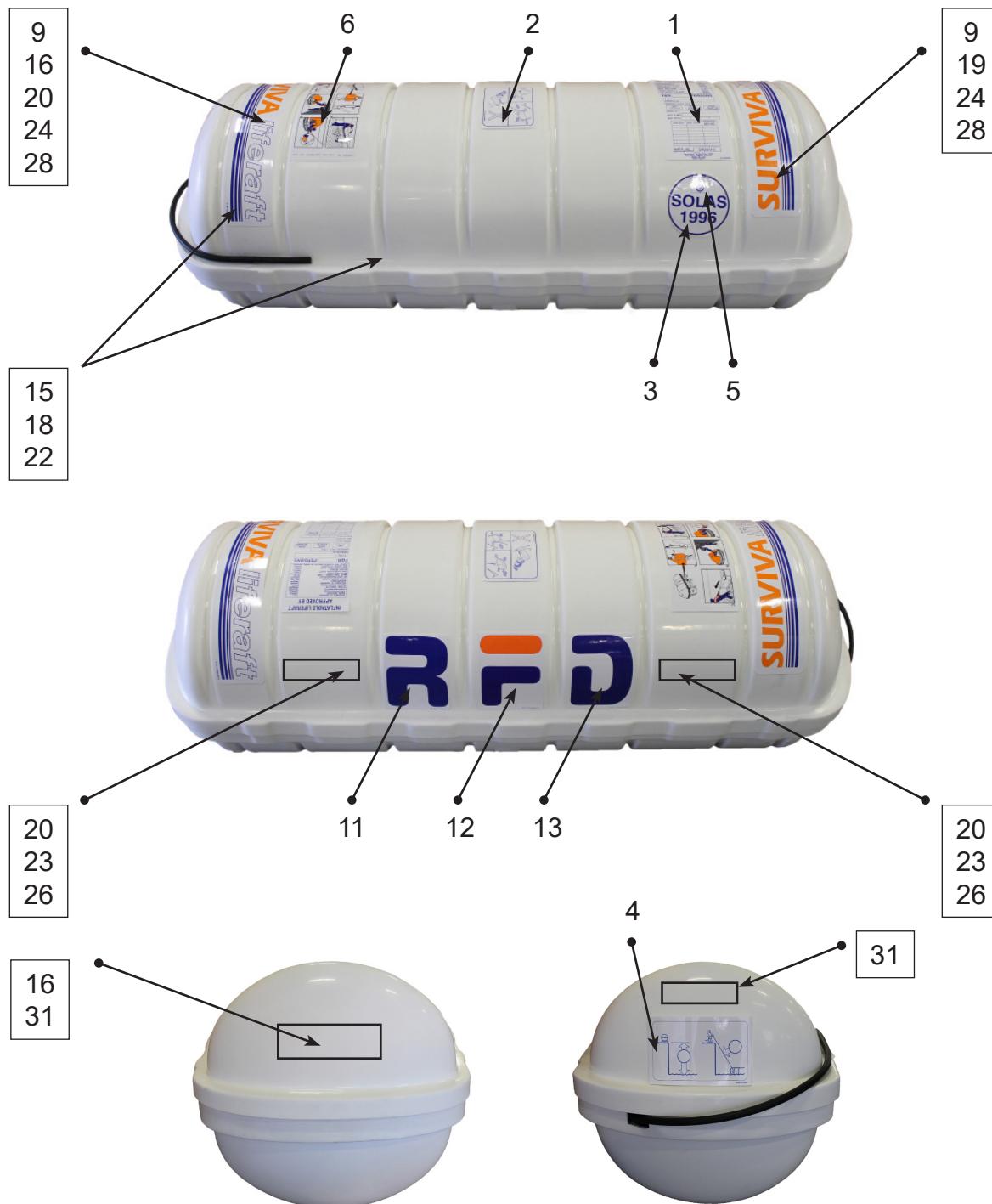


FIGURE 1116
Labels for MK 10 size 7 Throwover container

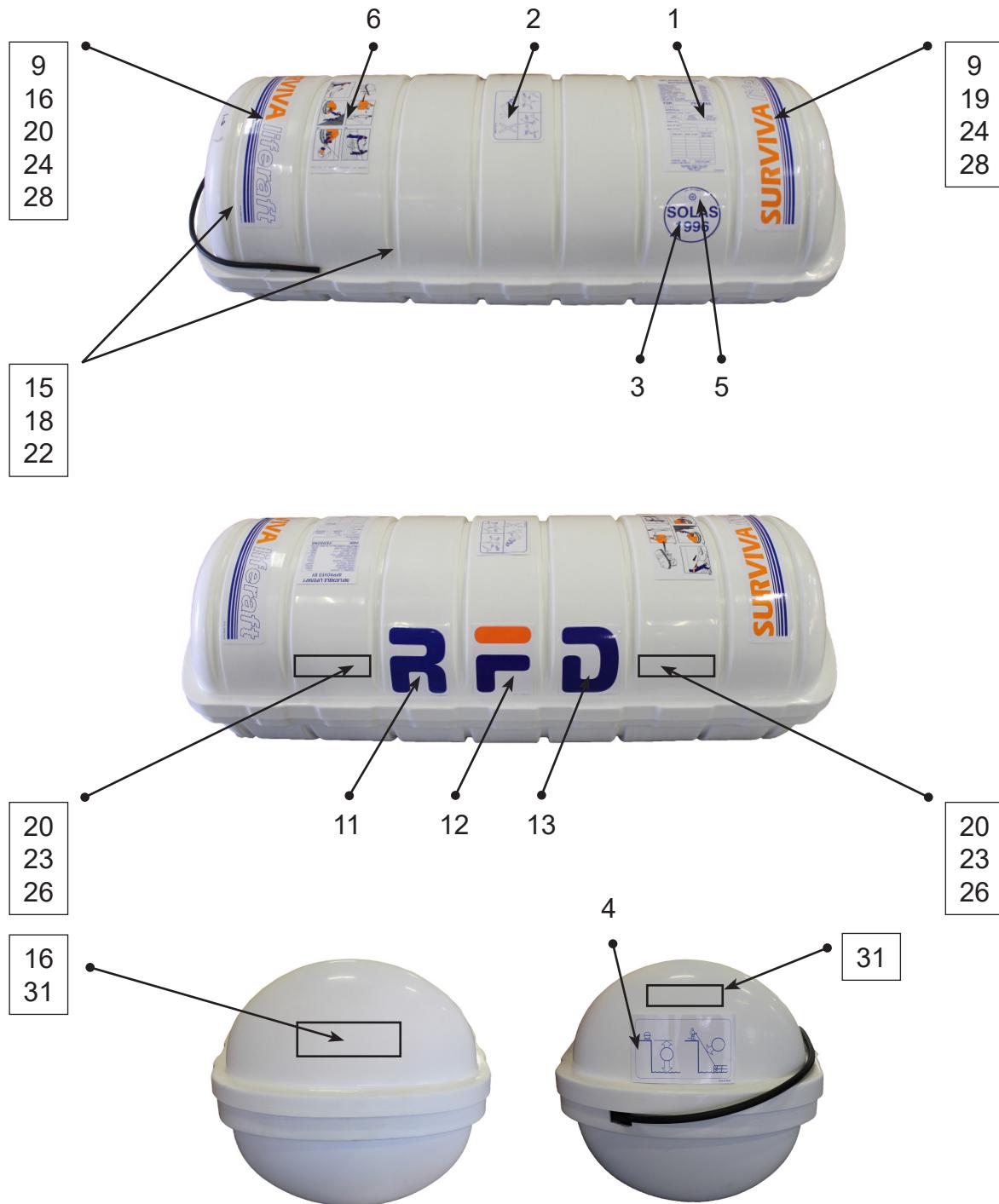


FIGURE 1117
Labels for MK 10 size 9 Throwover container



FIGURE 1118
Labels for MK 14 size 12 Throwover container



FIGURE 1119
Labels for MK 14 size 14 Throwover container



FIGURE 1120
Labels for MK 14 size 17 Throwover container



FIGURE 1121
Labels for MK 16 size 2 Flat-Pack container



FIGURE 1122
Labels for MK 18 size 1 Flat-Pack container



FIGURE 1123
Labels for MK 18 size 3 Flat-Pack container

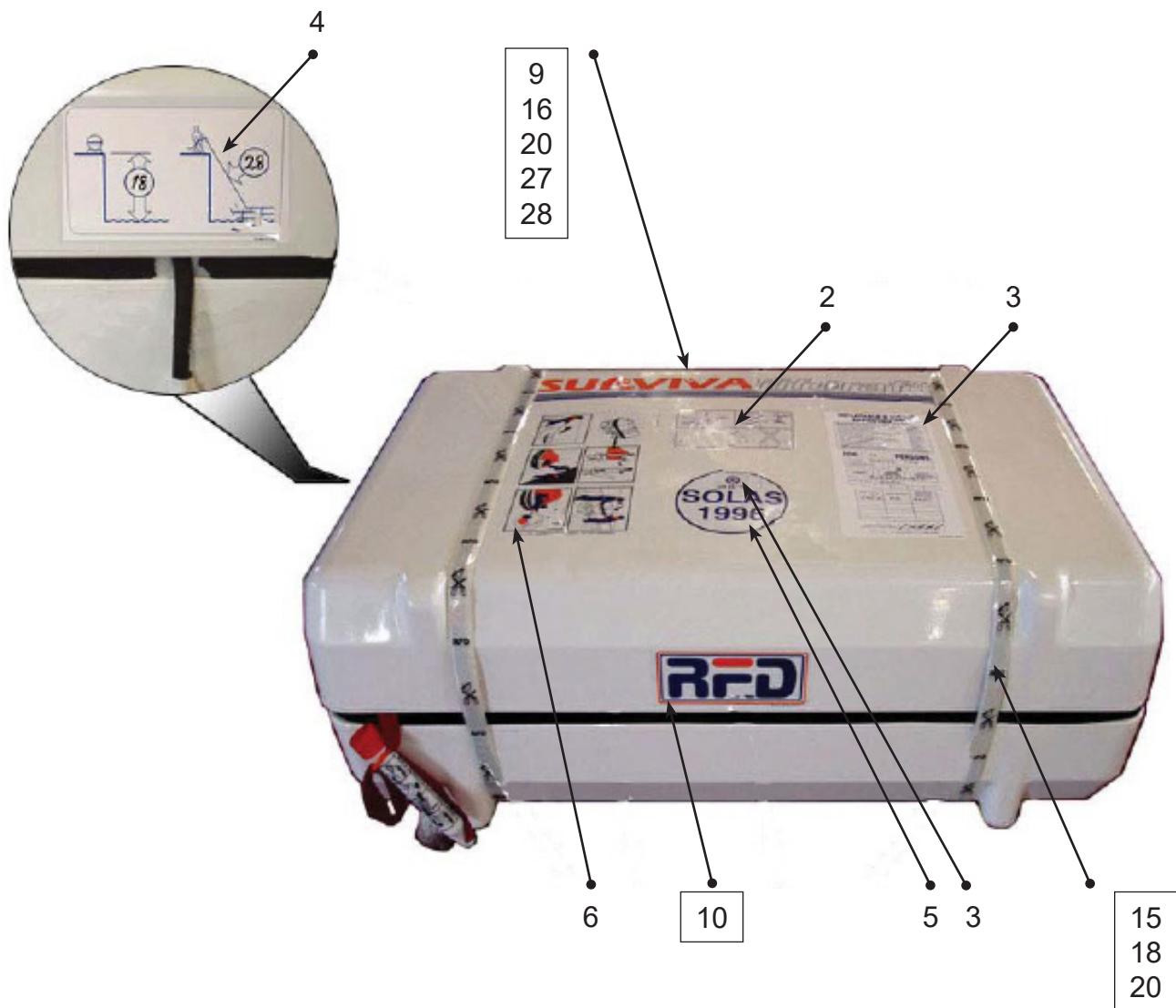
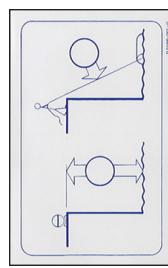
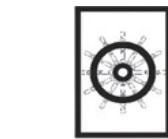
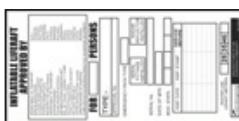
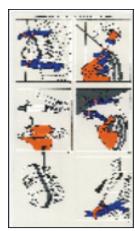


FIGURE 1124
Labels for G21 size 17 Flat-Pack container

Universal labels for Throwover liferafts (except for DSB LR07):



Container	Position 1		Position 2		Position 3		Position 4		Position 5	
	Label, Data	Label, DO NOT ROLL	Label, SOLAS 96	P/N 04819001	P/N 41144001	P/N 43869001	P/N 21196001	P/N 43973001		
MK 10 size 3	1	1				1	1		1	1
MK 10 size 4	1	1				1	1		1	1
MK 10 size 6	1	1				1	1		1	1
MK 10 size 7	1	1				1	1		1	1
MK 10 size 9	1	1				1	1		1	1
MK 14 size 12	1	1				1	1		1	1
MK 14 size 14	1	1				1	1		1	1
MK 14 size 17	1	1				1	1		1	1
MK 16 size 2	1	1				1	1		1	1
MK 18 size 1	1	1				1	1		1	1
MK 18 size 3	1	1				1	1		1	1
G21 size 17	1	1				1	1		1	1



Container	Position 6	Position 7	Position 8
	Label, Visual Inspection	Compact disc, Immediate Action List	Leaflet, installation
MK 10 size 3	1	1	1
MK 10 size 4	1	1	1
MK 10 size 6	1	1	1
MK 10 size 7	1	1	1
MK 10 size 9	1	1	1
MK 14 size 12	1	1	1
MK 14 size 14	1	1	1
MK 14 size 17	1	1	1
MK 16 size 2	1	1	1
MK 18 size 1	1	1	1
MK 18 size 3	1	1	1
G21 size 17	1	1	1

NOTE: The Poster Launch procedure, the I.A.L compact disc and the installation leaflet are attached to the container in a plastic bag for new liferafts only.

Use the labels that follow for RFD-branded Throwover liferafts:



Container	Position 9 'SURVIVA LIFERAFT'	Position 10 Label, Trademark 'RFD'	Position 11 Label, Trademark 'R'	Position 12 Label, Trademark 'F'	Position 13 Label, Trademark 'D'
MK 10 size 3	P/N 20765001	P/N 06231001	P/N 20958011	P/N 20958021	P/N P/N 20958031
MK 10 size 4	2	1	N/A	N/A	N/A
MK 10 size 6	2	N/A	1	1	1
MK 10 size 7	2	N/A	1	1	1
MK 10 size 9	2	N/A	1	1	1
MK 14 size 12	2	1	N/A	N/A	N/A
MK 14 size 14	2	2	N/A	N/A	N/A
MK 14 size 17	2	2	N/A	N/A	N/A
MK 16 size 2	1	2	N/A	N/A	N/A
MK 18 size 1	2	2	N/A	N/A	N/A
MK 18 size 3	2	2	N/A	N/A	N/A
G21 size 17	1	1	N/A	N/A	N/A



Container	Position 14	Position 15
	Poster, Launch Procedure	Tape, 'DO NOT CUT'
MK 10 size 3	1	A/R
MK 10 size 4	1	A/R
MK 10 size 6	1	A/R
MK 10 size 7	1	A/R
MK 10 size 9	1	A/R
MK 14 size 12	1	A/R
MK 14 size 14	1	A/R
MK 14 size 17	1	A/R
MK 16 size 2	1	A/R
MK 18 size 1	1	A/R
MK 18 size 3	1	A/R
G21 size 17	1	A/R

Use the labels that follow for EV-branded Throwover liferafts:



—



Container	Position 16	Position 17	Position 18
	Label, Trademark 'EV'	Poster, Launch Procedure	Tape, 'DO NOT CUT'
MK 10 size 3	P/N 15310672	P/N 021174021	P/N E50300106
MK 10 size 4	2	1	A/R
MK 10 size 6	2	1	A/R
MK 10 size 7	2	1	A/R
MK 10 size 9	2	1	A/R
MK 14 size 12	2	1	A/R
MK 14 size 14	2	1	A/R
MK 14 size 17	2	1	A/R
MK 16 size 2	?	1	A/R
MK 18 size 1	1	1	A/R
MK 18 size 3	1	1	A/R
G21 size 17	1	1	A/R

Use the labels that follow for New Wave-branded Throwover liferafts:



-GUARDIAN-



—

Container	Position 19	Position 20	Position 21	Position 22	Position 23
	Label, 'GUARDIAN'	Label, 'NEW WAVE GUARDIAN'	Poster, Launch Procedure	Tape, 'DO NOT CUT'	Label, 'NEW WAVE'
P/N 40-NW1002	P/N 40-NW1001	P/N 40-NW1004	P/N 15384002	P/N 40-NW1003	
MK 10 size 3	1	N/A	1	A/R	2
MK 10 size 4	1	N/A	1	A/R	2
MK 10 size 6	1	N/A	1	A/R	2
MK 10 size 7	2	N/A	1	A/R	2
MK 10 size 9	2	N/A	1	A/R	2
MK 14 size 12	2	N/A	1	A/R	2
MK 14 size 14	2	N/A	1	A/R	2
MK 14 size 17	2	N/A	1	A/R	2
MK 16 size 2	?	?	1	A/R	?
MK 18 size 1	N/A	1	1	A/R	N/A
MK 18 size 3	N/A	1	1	A/R	N/A
G21 size 17	N/A	1	1	A/R	N/A

NOTE: Please use the P/N for Tape 'DO NOT CUT' at Position 22 for all brands except RFD, DSB and EV.

Use the labels that follow for Oceanmaster-branded Throwover liferafts:



Container	Position 24 Label, OCEANMASTER LIFERAFT	Position 25 Poster, Launch Procedure	Position 26 Label, SURVITEC SURVIVAL PRODUCTS	Position 27 Label, SSPI OCEANMASTER
	P/N 40-SSPI-201	P/N 40-SSPI-144	P/N 40-SSPI-202	P/N 40-SSPI-2007
MK 10 size 3	1	1	—	N/A
MK 10 size 4	1	1	2	N/A
MK 10 size 6	1	1	2	N/A
MK 10 size 7	2	1	2	N/A
MK 10 size 9	2	1	2	N/A
MK 14 size 12	2	1	2	N/A
MK 14 size 14	2	1	2	N/A
MK 14 size 17	2	1	2	N/A
MK 16 size 2	N/A	1	N/A	2
MK 18 size 1	N/A	1	N/A	2
MK 18 size 3	N/A	1	N/A	2
G21 size 17	N/A	1	N/A	1

NOTE: Please use the P/N for Tape 'DO NOT CUT' at Position 22 for all brands except RFD, DSB and EV.

Use the labels that follow for Elliot Crewsaver-branded Throwover liferafts:

Container	Label, CREWSAVER	Position 28	Position 29
		Label, ELLIOT	Poster, Launch Procedure
MK 10 size 3	P/N 2RA1249-1	P/N 3RA1527-1	P/N 02174051
MK 10 size 4	2	2	1
MK 10 size 6	2	2	1
MK 10 size 7	2	2	1
MK 10 size 9	2	2	1
MK 14 size 12	2	2	1
MK 14 size 14	2	2	1
MK 14 size 17	2	2	1
MK 16 size 2	?	?	1
MK 18 size 1	2	2	1
MK 18 size 3	2	2	1
G21 size 17	2	2	1

NOTE: Please use the P/N for Tape 'DO NOT CUT' at Position 22 for all brands except RFD, DSB and EV.

NOTE:

Use the following labels for Survitec Zodiac-branded Throwover liferafts



—

Container	Position 30	Position 31
	Poster, Launch Procedure	Label, SURVITEC ZODIAC
MK 10 size 3	1	2
MK 10 size 4	1	2
MK 10 size 6	1	2
MK 10 size 7	1	2
MK 10 size 9	1	2
MK 14 size 12	1	2
MK 14 size 14	1	2
MK 14 size 17	1	2
MK 16 size 2	1	N/A
MK 18 size 1	1	N/A
MK 18 size 3	1	N/A
G21 size 17	1	N/A

NOTE: Please use the P/N for Tape 'DO NOT CUT' at Position 22 for all brands except RFD, DSB and EV

The containers that follow are for Mk 10 Davit-launch liferafts.

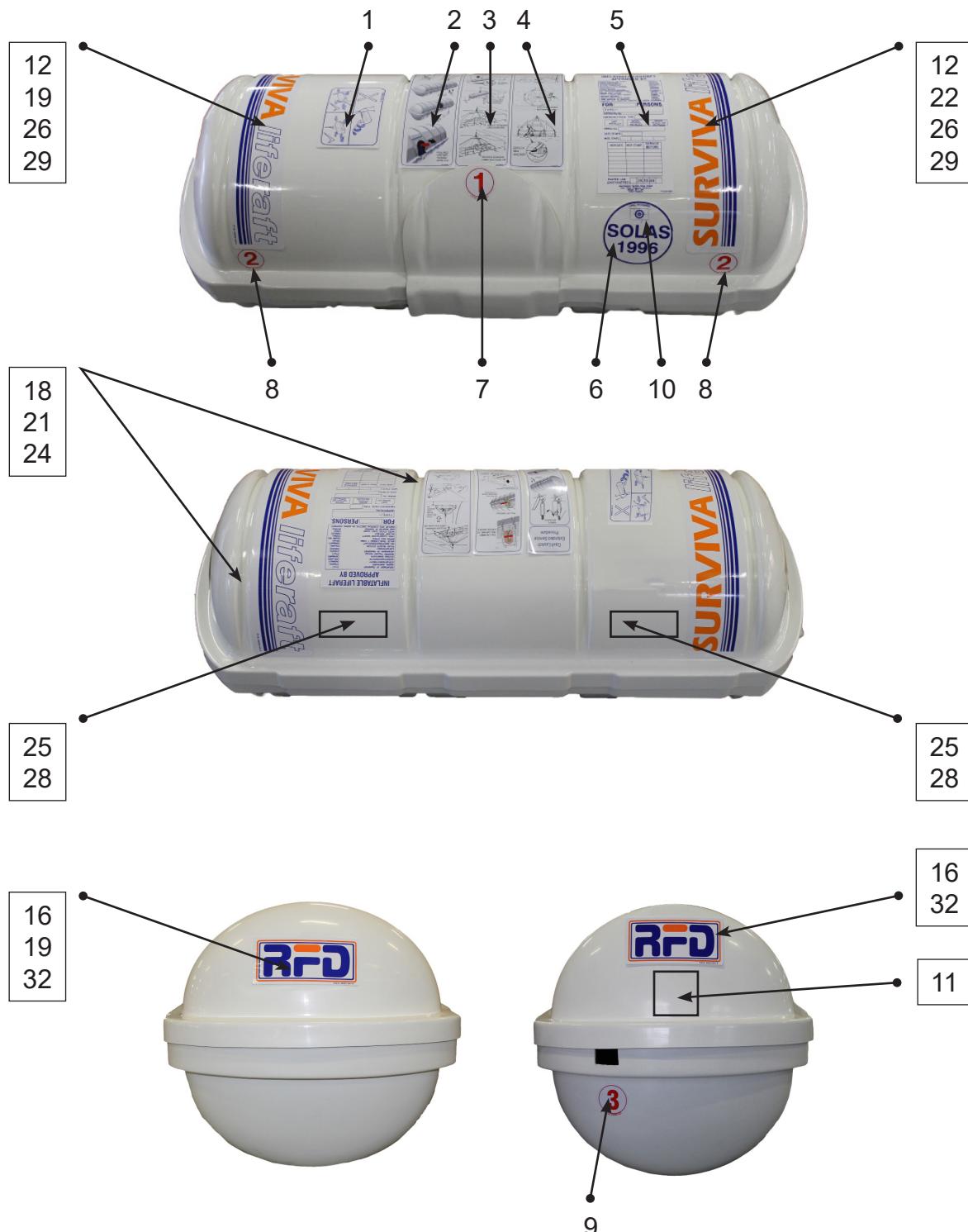


FIGURE 1125
Labels for Mk 10 size 4 Davit Launch container

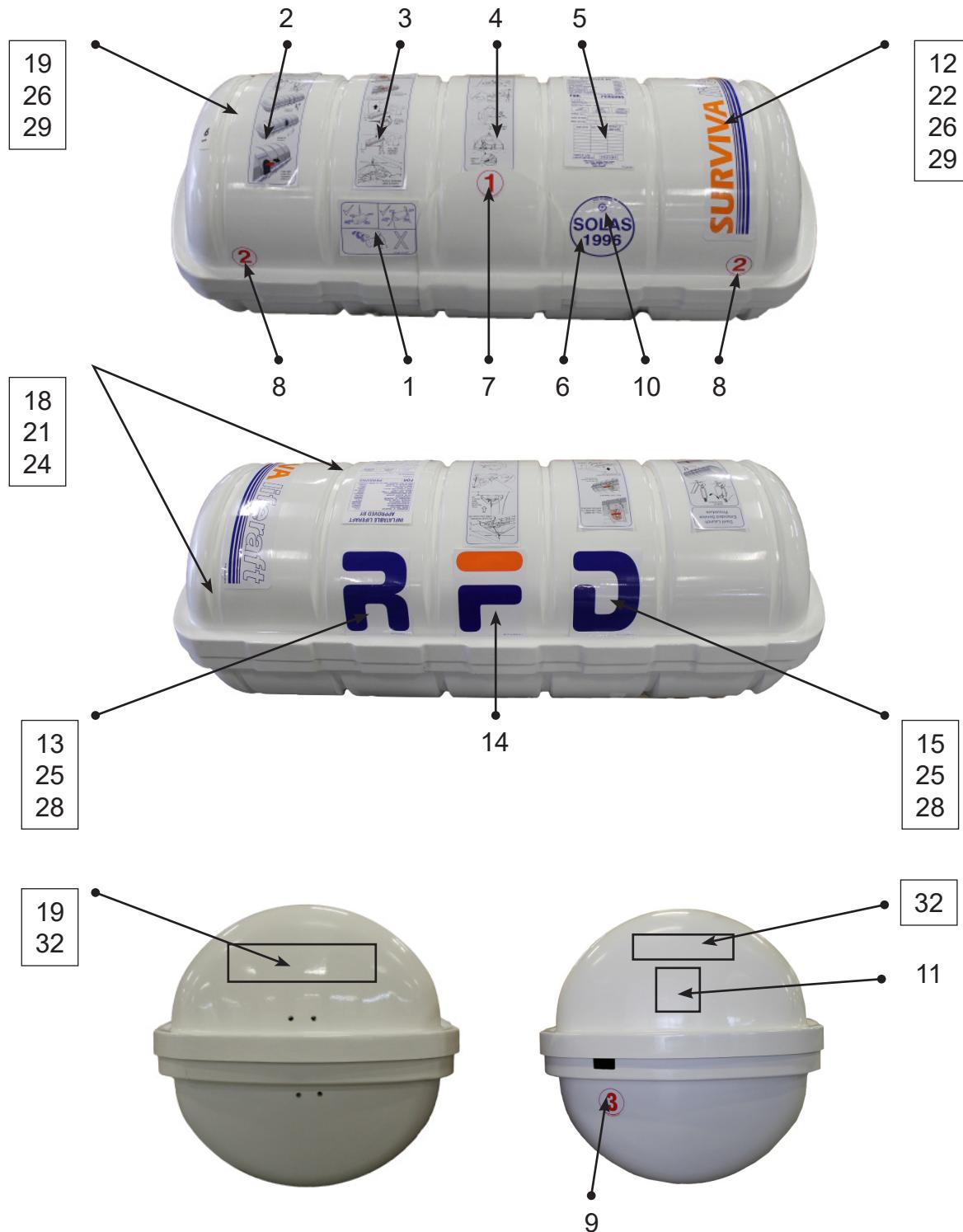


FIGURE 1126
Labels for MK 10 size 6 Davit Launch container

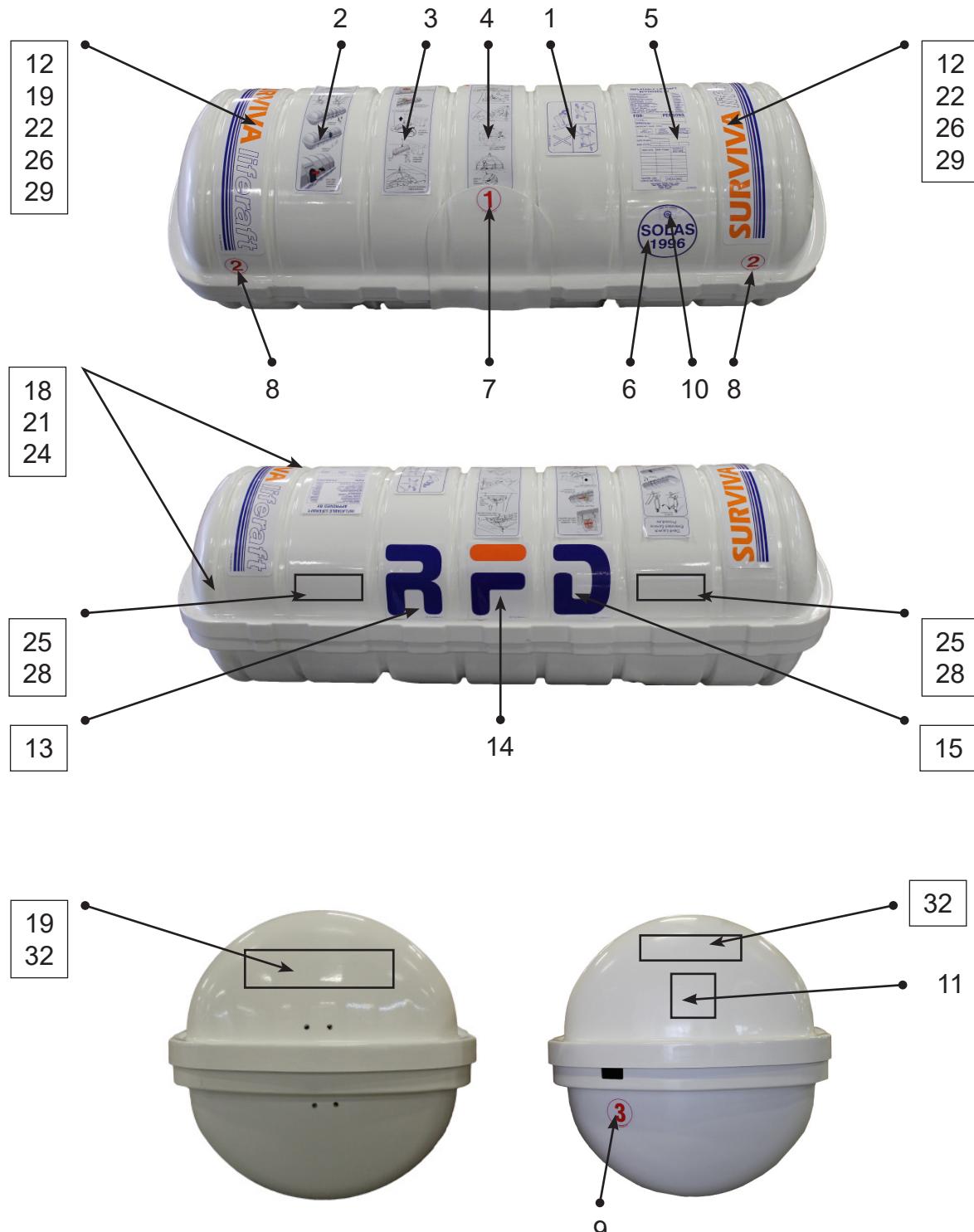


FIGURE 1127
Labels for MK 10 size 7 Davit Launch container

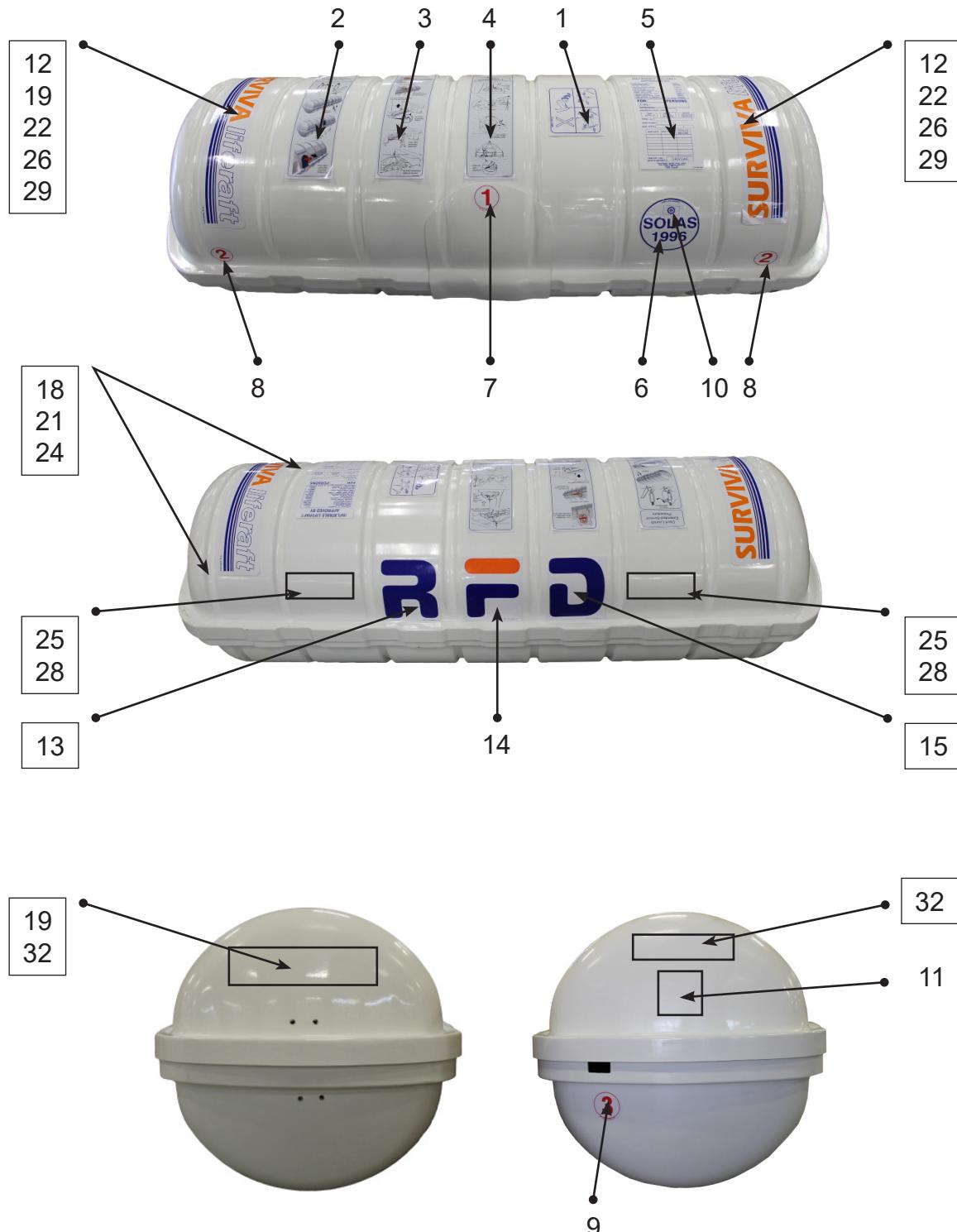


FIGURE 1128
Labels for MK 10 size 9 Davit Launch container



FIGURE 1129
Labels for MK 14 size 14 Davit Launch container



FIGURE 1130
Labels for MK 14 size 17 Davit Launch container

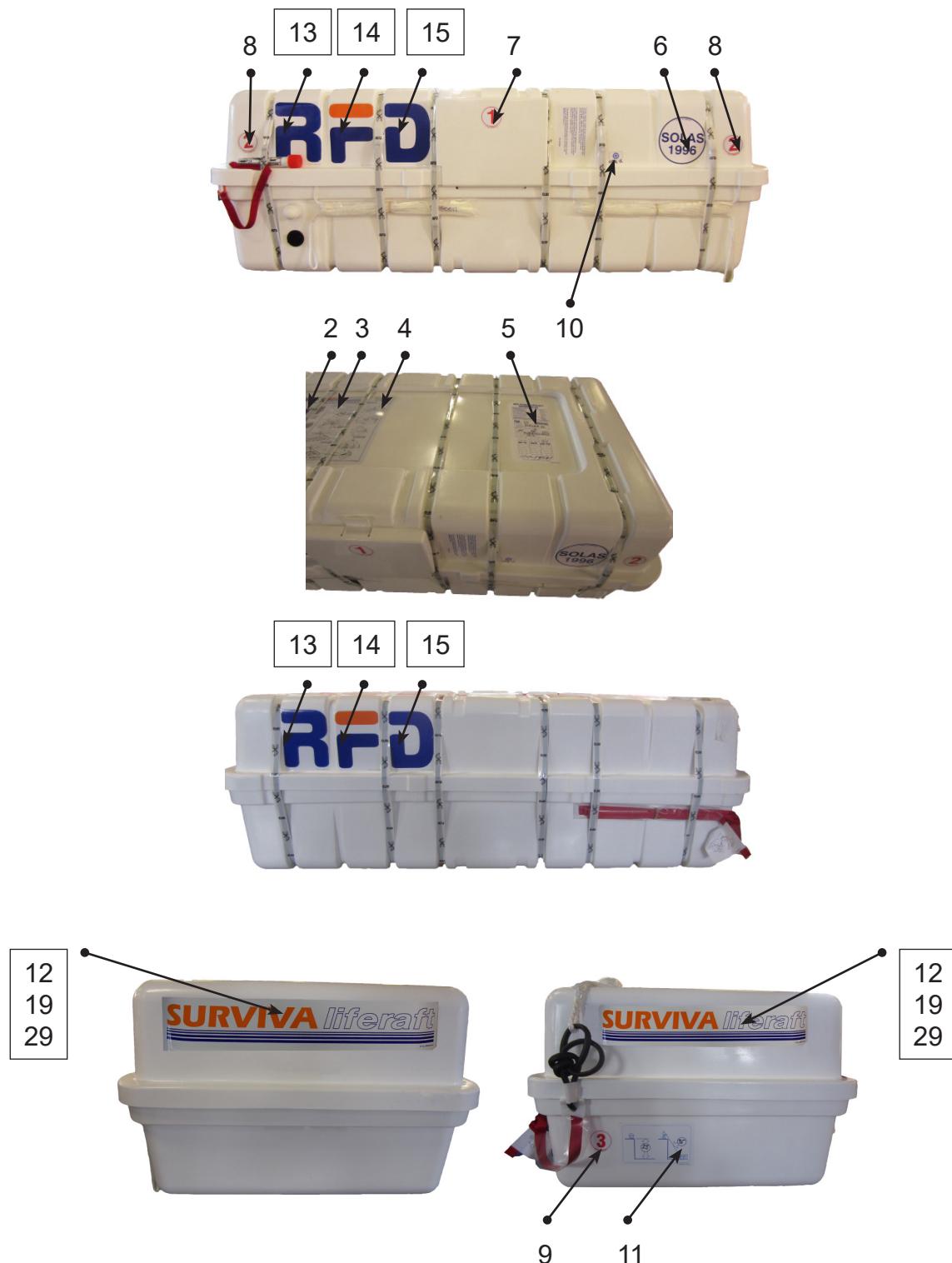
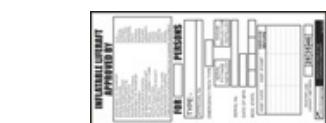
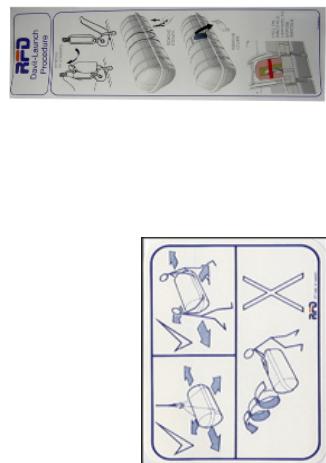


FIGURE 1131
Labels for MK 20 size 7 Davit Launch container

Universal labels for Mk 10 Davit Launch liferafts



Container	Position 1	Position 2	Position 3	Position 4	Position 5
	Label, DO NOT ROLL	Label, DL Launch	Label, DL Launch	Label, DL Launch	Label, Data
MK 10 size 4	P/N 41144001	P/N 50906002	P/N 50906003	P/N 50906004	P/N 04819001
MK 10 size 6	1	1	1	1	1
MK 10 size 7	1	1	1	1	1
MK 10 size 9	1	1	1	1	1
MK 14 size 14	1	1	1	1	1
MK 14 size 17	1	1	1	1	1

Container	P/N 41144001	P/N 45425021	P/N 45425031	P/N 04819001
MK 20 size 7	—	1	1	1



Container	Position 6	Position 7	Position 8	Position 9	Position 10	Position 11
	Label 'SOLAS 96'	Label '1'	Label '2'	Label '3'	Label, Wheelmark	Label, Maximum Drop / Painter Length
MK 10 size 4	P/N 43869001	P/N 20085011	P/N 20085021	P/N 20085031	P/N 43973001	P/N 21196001
MK 10 size 6	1	1	2	1	1	1
MK 10 size 7	1	1	2	1	1	1
MK 10 size 9	1	1	2	1	1	1
MK 14 size 14	1	1	2	1	1	1
MK 14 size 17	1	1	2	1	1	1
MK 20 size 7	1	1	2	1	1	1



Container	Position 18A	Position 18C
	Compact disc, Immediate Action List	Leaflet, Installation
	P/N 50976001	P/N 45409001
MK 10 size 4	1	1
MK 10 size 6	1	1
MK 10 size 7	1	1
MK 10 size 9	1	1
MK 14 size 14	1	1
MK 14 size 17	1	1
MK 20 size 7	1	1

NOTE: The Immediate Action List compact disc and the installation leaflet are attached to the container in a plastic bag for new liferafts only.

Use the following labels for RFD-branded Davit Launch liferafts



Container size	Position 12	Position 13	Position 14	Position 15	Position 16
	Label, 'SURVIVAL LIFERAFT'	Label, Trademark 'R'	Label, Trademark 'F'	Label, Trademark 'D'	Label, Trademark 'RFD'
P/N 20765001	P/N 20958011	P/N 20958021	P/N P/N 20958031	P/N 062231001	
MK 10 size 4	2	N/A	N/A	N/A	2
MK 10 size 6	1	1	1	1	N/A
MK 10 size 7	2	1	1	1	N/A
MK 10 size 9	2	1	1	1	N/A
MK 14 size 14	2	N/A	N/A	N/A	2
MK 14 size 17	2	N/A	N/A	N/A	1
MK 20 size 7	1	2	2	2	—



Container size	Position 17	Position 18
	Poster, Launch Procedure	Tape 'DO NOT CUT'
	P/N 02174011	P/N 15384001
MK 10 size 4	1	A/R
MK 10 size 6	1	A/R
MK 10 size 7	1	A/R
MK 10 size 9	1	A/R
MK 14 size 14	1	A/R
MK 14 size 17	1	A/R
MK 20 size 7	1	A/R

NOTE: The launch procedure poster is attached to the container in a plastic bag for new liferafts only.

Use the following labels for EV-branded Davit Launch liferafts



Container	Position 19		Position 20		Position 21	
	Label, Trademark 'EV'	P/N 15310672	Poster, Launch Procedure	P/N 02174021	Tape 'DO NOT CUT'	P/N E50300106
MK 10 size 4	2		1		A/R	
MK 10 size 6	2		1		A/R	
MK 10 size 7	2		1		A/R	
MK 10 size 9	2		1		A/R	
MK 14 size 14	2		1		A/R	
MK 14 size 17	2		1		A/R	
MK 20 size 7	2		1		A/R	

Use the following labels for New Wave-branded Davit-launch liferafts



Container	Position 22	Position 23	Position 24	Position 25
	Label, 'GUARDIAN'	Poster, Launch Procedure	Tape 'DO NOT CUT'	Label, 'NEW WAVE'
	P/N 40-NW1002	P/N 40-NW1004	P/N 15384002	P/N 40-NW1003
MK 10 size 4	1	1	A/R	2
MK 10 size 6	1	1	A/R	2
MK 10 size 7	2	1	A/R	2
MK 10 size 9	2	1	A/R	2
MK 14 size 14	2	1	A/R	2
MK 14 size 17	2	1	A/R	2
MK 20 size 7	—	—	—	—

NOTE:

Please use the P/N for Tape 'DO NOT CUT' at Position 21 for all brands except RFD, DSB and EV.

Use the following labels for Ocean Master-branded Davit Launch liferafts



Container	Position 26	Position 27	Position 28
	Label, OCEANMASTER LIFERAFTS	Poster, Launch Procedure	Label, SURVITEC SURVIVAL PRODUCTS
P/N 40-SSPI-201	P/N 40-SSPI-144	P/N 40-SSPI-202	
MK 10 size 4	2	1	2
MK 10 size 6	2	1	2
MK 10 size 7	2	1	2
MK 10 size 9	2	1	2
MK 14 size 14	2	1	2
MK 14 size 17	2	1	2
MK 20 size 7	—	—	—

NOTE:

Please use the P/N for Tape 'DO NOT CUT' at Position 21 for all brands except RFD, DSB and EV.

Use the following labels for Elliot Crewsaver-branded Davit-launch liferafts

Container	Position 29		Position 30
	Logo, CREWSAVER	Logo, ELLIOTT	
	P/N 2RA1249-1	P/N 3RA1527-1	P/N 02174051
MK 10 size 4	2	2	1
MK 10 size 6	2	2	1
MK 10 size 7	2	2	1
MK 10 size 9	2	2	1
MK 14 size 14	2	2	1
MK 14 size 17	2	2	1
MK 20 size 7	2	2	1

NOTE: Please use the P/N for Tape 'DO NOT CUT' at Position 21 for all brands except RFD, DSB and EV.

Use the following labels for Survitec Zodiac-branded Davit-launch liferafts



Container	Position 31	Position 32
	Poster, Launch Procedure	Logo, SURVITEC ZODIAC
	P/N 02174041	S/C Z63757 (P/N ZC2114)
MK 10 size 4	1	2
MK 10 size 6	1	2
MK 10 size 7	1	2
MK 10 size 9	1	2
MK 14 size 14	1	2
MK 14 size 17	1	2
MK 20 size 7	—	—

NOTE:

Please use the P/N for Tape 'DO NOT CUT' at Position 21 for all brands except RFD, DSB and EV.

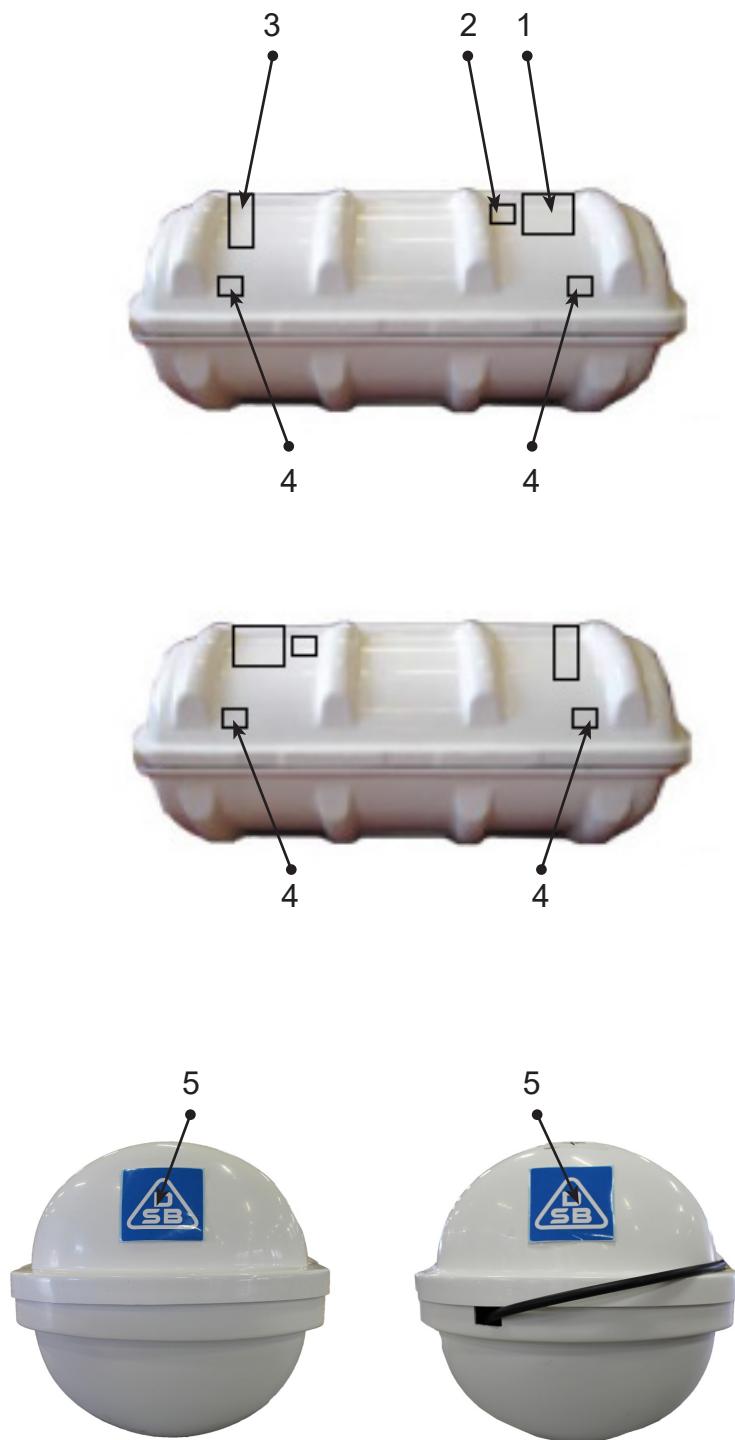


FIGURE 1132
Labels for 4N DSB LR07 Throwover container

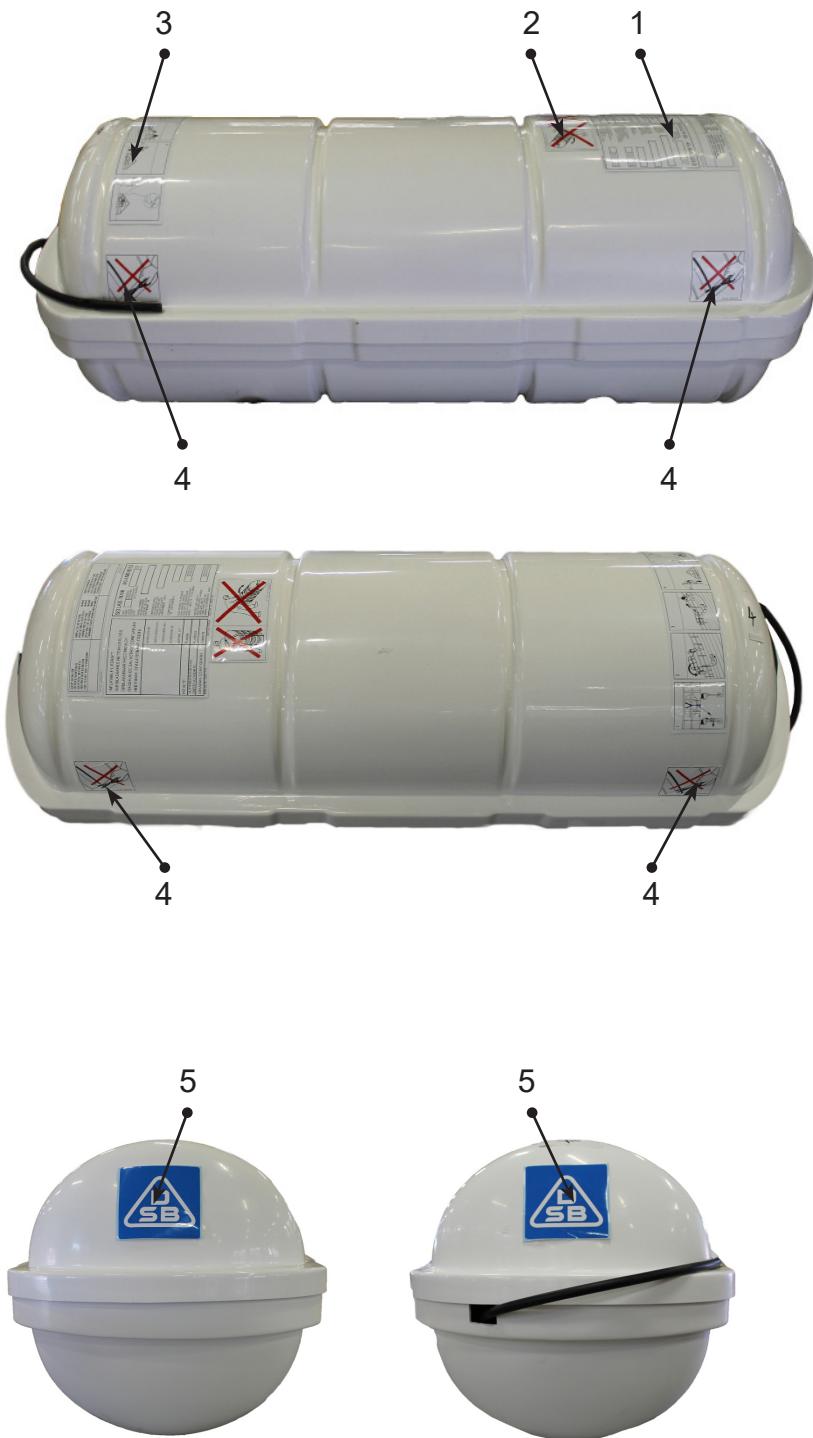


FIGURE 1133
Labels for MK 10 size 4 DSB LR07 Throwover and Davit Launch containers

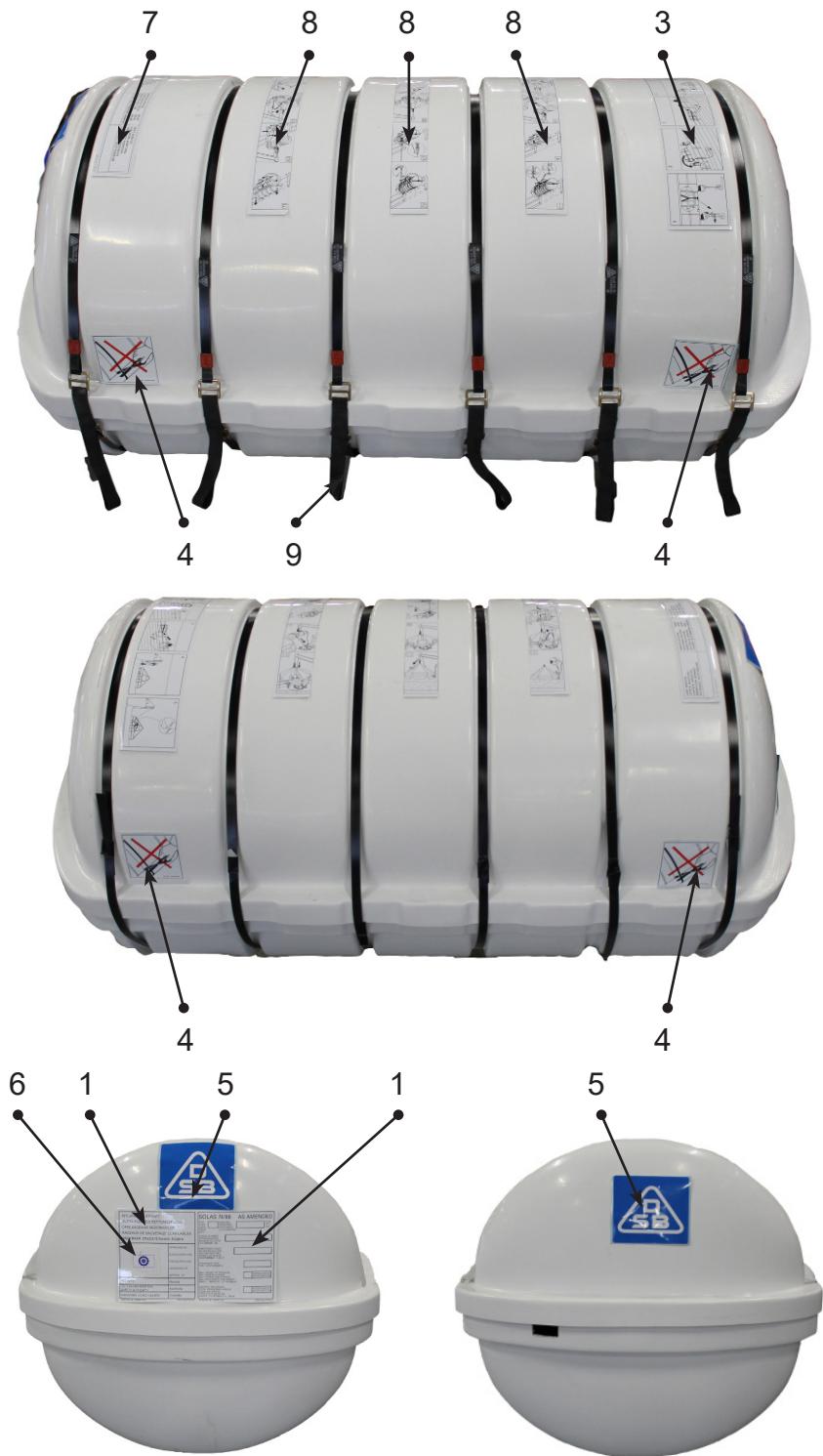


FIGURE 1134
Labels for MK 14 size 14 DSB LR07 Throwover and Davit Launch containers

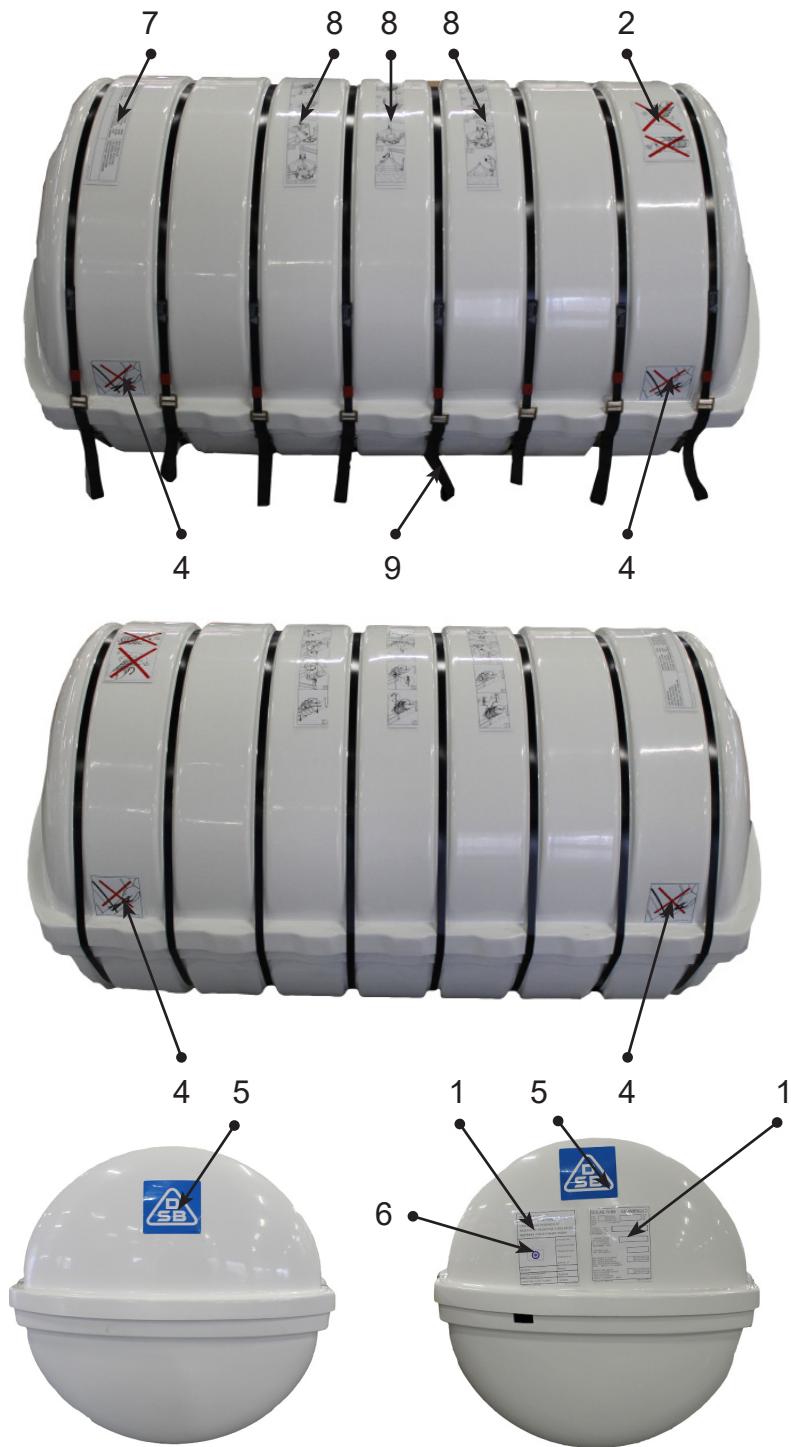
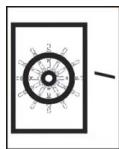
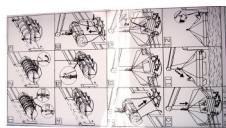


FIGURE 1135
Labels for MK 14 size 17 DSB LR07 Throwover and Davit Launch containers

Use the following labels for DSB LR07 liferafts.



Container	Position 1 Label, Liferaft ID and dates	Position 2 Label, "Do not put container on edge / Do not roll"	Position 3 Label, Throwover pictorial	Position 4 Tape Label, "Do not remove" DSB	Position 5 Label, 'DSB'
	P/N 00941100	P/N 00950270	P/N 00941370	P/N 00903111	P/N 00904710
4N size 6 and 8	1	1	1	A/R	2
MK 10 size 4	1	1	1	A/R	2
MK 14 size 14	1	1	1	A/R	2
MK 14 size 17	1	1	1	A/R	2



Container	Position 6 Label, Wheelmack	Position 7 Label, service	Position 8 Label, Davit Launch pictorial	Position 9 Hand loop	Position 10 Tape 'DO NOT CUT'
P/N R43973001	P/N 00953440	P/N 00941070	P/N 80303360	P/N R15384002	
4N size 6 and 8	—	—	—	4	A/R
MK 10 size 4	1	1	1	4	A/R
MK 14 size 14	1	1	1	6	A/R
MK 14 size 17	1	1	1	8	A/R



Container	Position 11		Position 12
	Compact disc, Immediate Action Leaflet		Leaflet, installation
4N size 6 and 8	1	1	P/N R50979001
MK 10 size 4	1	1	P/N 45409001
MK 14 size 14	1	1	
MK 14 size 17	1	1	

NOTE:

The Poster Launch procedure, the I.A.L compact disc and the installation leaflet are attached to the container in a plastic bag for new liferafts only.

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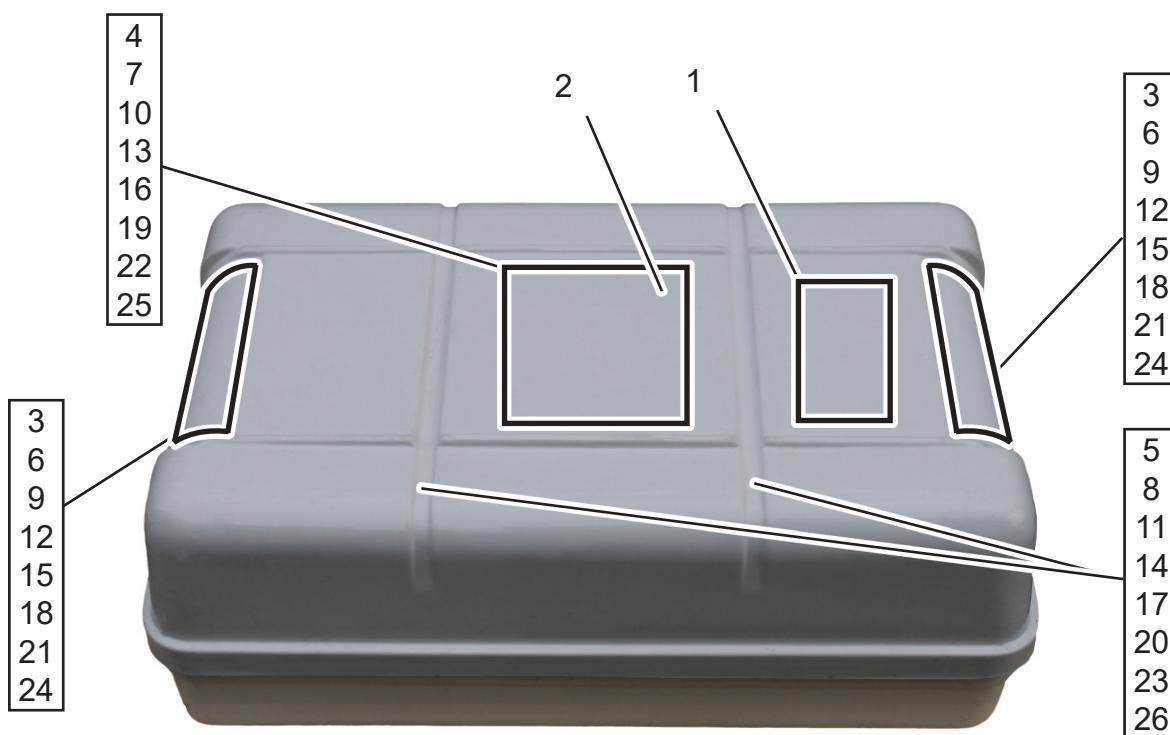


FIGURE 1135A
Labels for N-Series Low Profile N133 and N134 container (N134 shown)

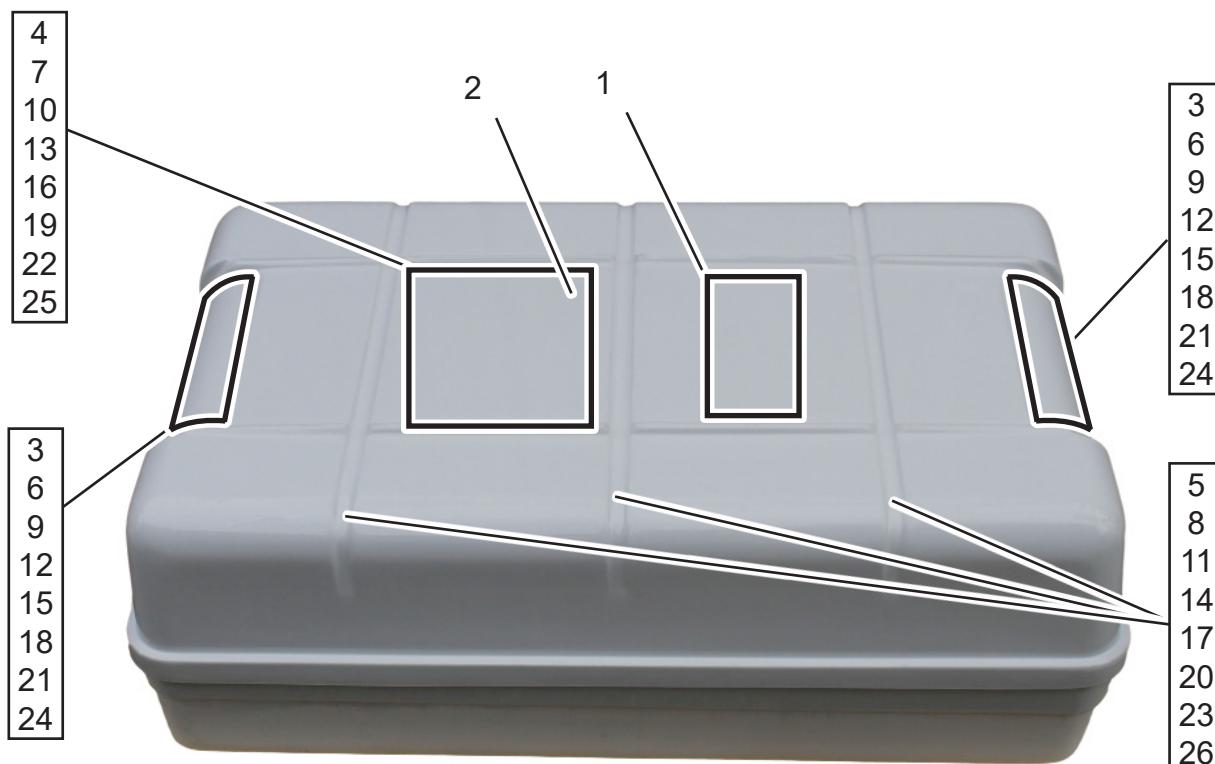
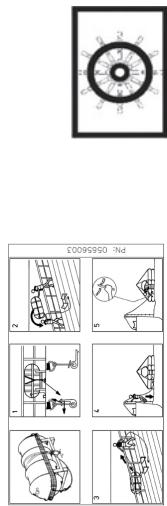


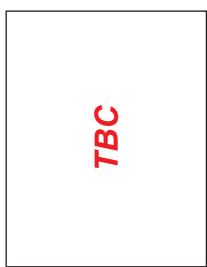
FIGURE 1135B
Labels for N-Series Low Profile N135, N136 and N136H container (N135 shown)

Universal labels for N-Series Low Profile containers:



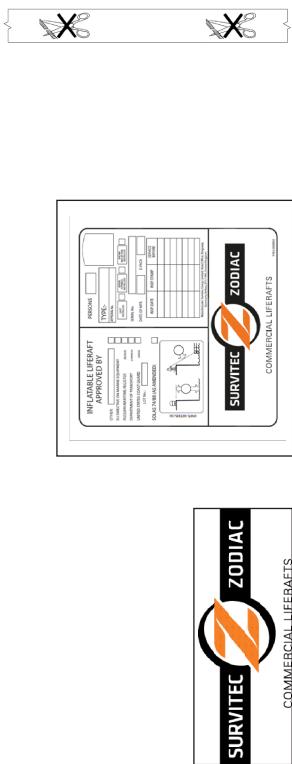
N-Series Low Profile Container size	Position 1		Position 2	
	Label, Launch instructions	P/N: 05656003	Label, Wheelmark	P/N 43973001
N133	1		1	
N134	1		1	
N135	1		1	
N136	1		1	
N136H	1		1	

Use the labels that follow for RFD-branded N-Series Low Profile containers:



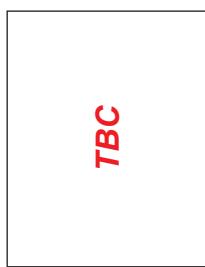
N-Series Low Profile Container size	Position 3	Position 4	Position 5
	Label, Trademark 'RFD' P/N: 06231001	Data label P/N 53004001	Tape, DO NOT CUT P/N 15384001
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for Survitec Zodiac-branded N-Series Low Profile containers:



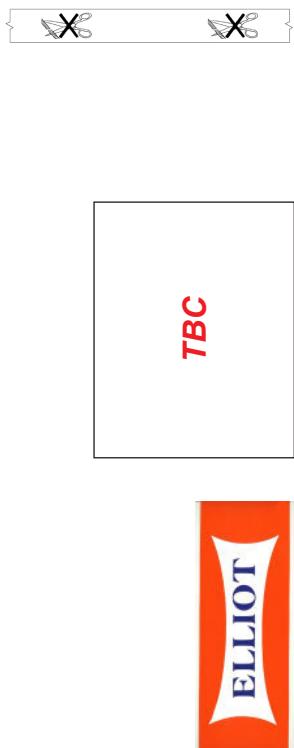
N-Series Low Profile Container size	Position 6	Position 7	Position 8
	Label, SURVITEC ZODIAC S/C Z63757 (P/N ZC2114)	Data label	Tape, DO NOT CUT
		P/N 53004002	P/N 15384002
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for DSB-branded N-Series Low Profile containers:



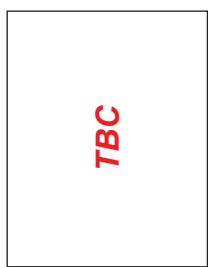
N-Series Low Profile Container size	Position 9	Position 10	Position 11
	Label, DSB	Data label	Tape, DSB DO NOT CUT
P/N: DSB00904710	P/N 53004003	P/N 53004003	P/N DSB00903111
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for Elliot-branded N-Series Low Profile containers:



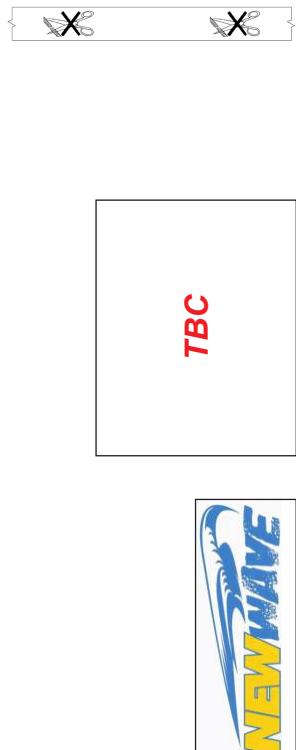
	Position 12	Position 13	Position 14
N-Series Low Profile Container size	Label, Elliot	Data label	Tape, DO NOT CUT
	P/N: 3RA1527-1	P/N 53004004	P/N 15384002
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for Crewsaver-branded N-Series Low Profile containers:



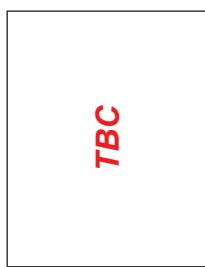
N-Series Low Profile Container size	Position 15	Position 16	Position 17
	Label, Crewsaver	Data label	Tape, DO NOT CUT
	P/N: 2RA1249-1	P/N 53004005	P/N 15384002
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for New Wave-branded N-Series Low Profile containers:



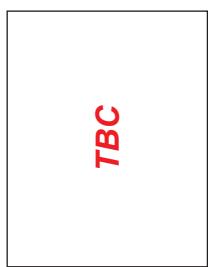
N-Series Low Profile Container size	Position 18	Position 19	Position 20
	Label, New Wave	Data label	Tape, DO NOT CUT
	P/N: 12034009	P/N 53004006	P/N 15384002
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for SSPI-branded N-Series Low Profile containers:



N-Series Low Profile Container size	Position 21	Position 22	Position 23
	Label, SSPI	Data label	Tape, DO NOT CUT
	P/N: 12031009	P/N 53004007	P/N 15384002
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

Use the labels that follow for DBC-branded N-Series Low Profile containers:



—

	Position 24	Position 25	Position 26
N-Series Low Profile Container size	Label, DBC P/N: 52699001	Data label P/N 53004008	Tape, DO NOT CUT P/N 15384002
N133	2	1	A/R
N134	2	1	A/R
N135	2	1	A/R
N136	2	1	A/R
N136H	2	1	A/R

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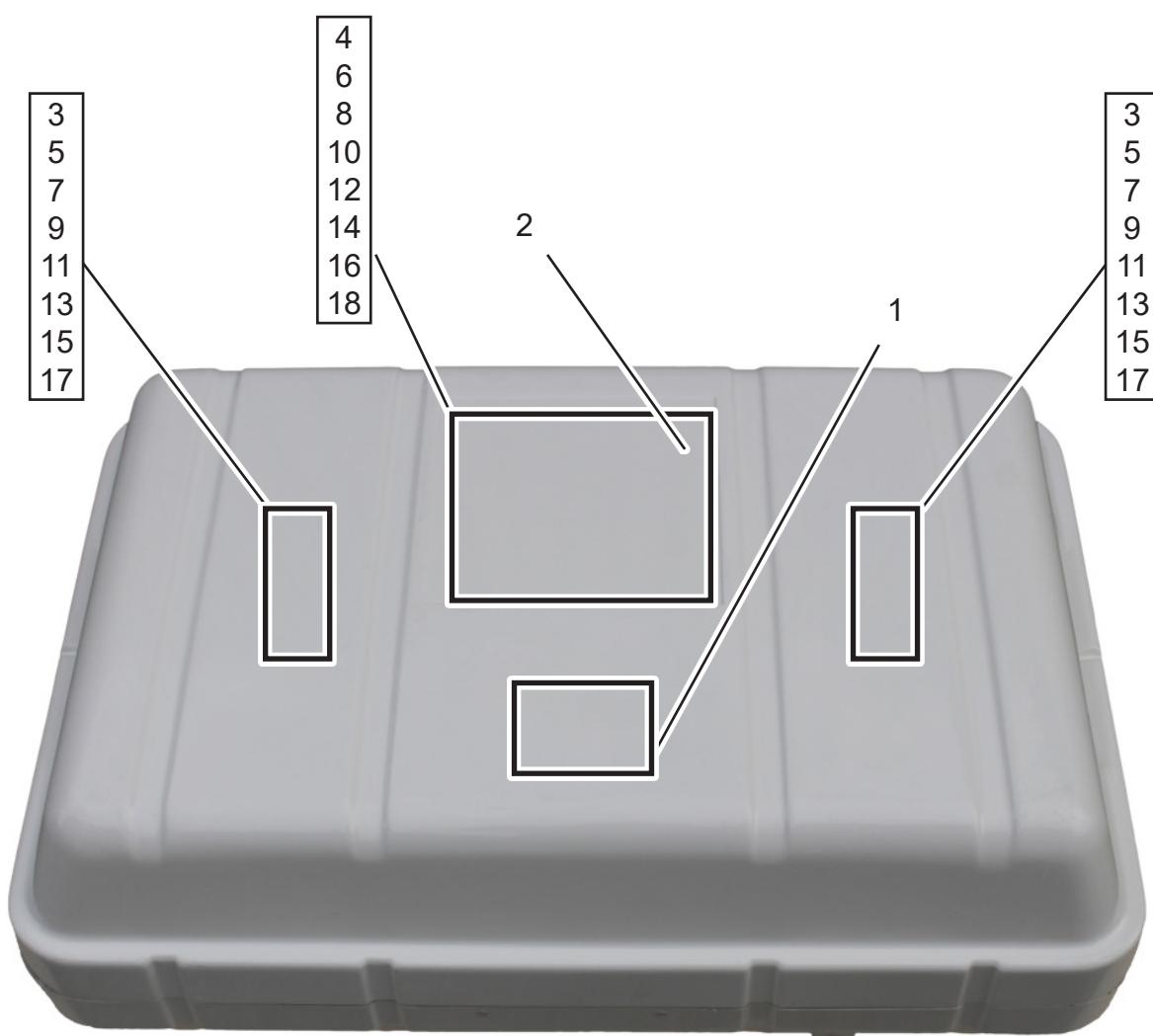
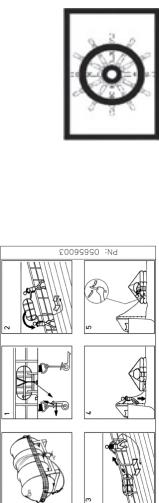


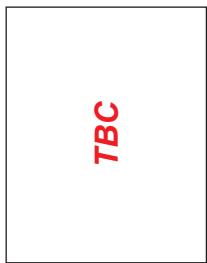
FIGURE 1135C
Labels for N-Series Xtrem containers (N139H shown)

Universal labels for N-Series Xtrem containers:



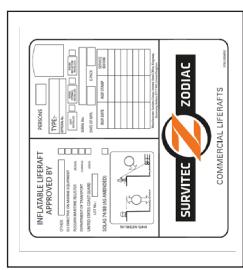
N-Series Low Profile Container size	Position 1	Position 2
	Label, Launch instructions	Label, Wheelmark
	P/N: 05656003	P/N 43973001
N137	1	1
N137H	1	1
N138	1	1
N138H	1	1
N139	1	1
N139H	1	1
N140	1	1
N140H	1	1

Use the labels that follow for RFD-branded N-Series Xtrem containers:



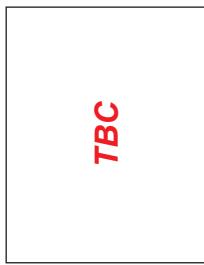
N-Series Xtrem container size	Position 3 Label, Trademark 'RFD' P/N: 06231001	Position 4 Data label P/N 53004001
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

Use the labels that follow for Survitec Zodiac-branded N-Series Xtrem containers:



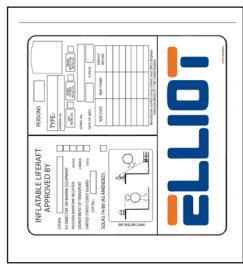
N-Series Xtrem container size	Position 5 Label, SURVITEC ZODIAC S/C Z63757 (P/N ZC2114)	Position 6 Data label P/N 53004002
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

Use the labels that follow for DSB-branded N-Series Xtrem containers:



N-Series Xtrem container size	Position 7		Position 8	
	Label, DSB	P/N: DSB00904710	Data label	P/N 53004003
N137	2		1	
N137H	2		1	
N138	2		1	
N138H	2		1	
N139	2		1	
N139H	2		1	
N140	2		1	
N140H	2		1	

Use the labels that follow for Elliot-branded N-Series Xtrem containers.



N-Series Xtrem container size	Position 9	Position 10
	Label, Elliot	Data label P/N 53004004
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

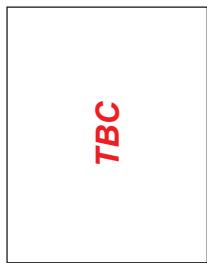
Use the labels that follow for Crewsaver-branded N-Series Xtrem containers:

TBC

—

N-Series Xtrem container size	Position 11 Label, Crewsaver P/N: 2RA1249-1	Position 12 Data label P/N 53004005
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

Use the labels that follow for New Wave-branded N-Series Xtrem containers:



N-Series Xtrem container size	Position 13	Position 14
	Label, New Wave	Data label
	P/N: 12034009	P/N 53004006
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

Use the labels that follow for SSPI-branded N-Series Xtrem containers.

TBC



N-Series Xtrem container size	Position 15	Position 16
	Label, SSP	Data label
	P/N: 12031009	P/N 53004007
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

Use the labels that follow for DBC-branded N-Series Xtrem containers:

TBC

—

N-Series Xtrem container size	Position 17 Label, DBC	Position 18 Data label P/N 53004008
N137	2	1
N137H	2	1
N138	2	1
N138H	2	1
N139	2	1
N139H	2	1
N140	2	1
N140H	2	1

2.4 Inflation equipment: universal spares

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

	Description	Hose assembly (800 mm)
	Found on:	Leafield GIST inflation system
	Part number	08255009
	Description	Hose assembly (Double bayonet) (800 mm)
	Found on:	Leafield GIST inflation system (SB51/09)
	Part number	08718009
	Description	Union nut with O-ring
	Found on:	Hose assembly (Double bayonet) (bottom buoyancy)
	Part number	08719009
	Description	O-ring seal (Double bayonet (bottom buoyancy))
	Found on:	Union nut
	Part number	08787009
	Description	Washer, copper sealing
	Found on:	Union nut (bottom buoyancy) (Operating heads without embossed 'L')
	Part number	08742009
	Description	Operating Head (white)
	Found on:	Cylinder
	Part number	08426009

	Description	Actuator cable (white)
	Found on:	Cylinder
	Part number	08923009
	Description	Dust cap
	Found on:	Cylinder
	Part number	08322009
	Description	Transit/recoil plug
	Found on:	Cylinder
	Part number	08220009
	Description	Cylinder identity label
	Found on:	Cylinder
	Part number	41674001

Cylinders - Leafield inflation system								
Liferaft			Charged cylinder			Bare cylinder		
Size persons	Launch type	Part No.	CO ₂ charge kg (lb)	N ₂ charge kg (lb)	Part No.	Volume Litre (Inch ³)	Operating Head	Associated equipment
4	Throwover	50463025	1.98	0.06	41712001	3.5 (214)		
	Davit							
6	Throwover	50463034	3.38	0.14	50847001	5.34 (325.9)		
	Davit							
8	Throwover	50463034	3.38	0.14	50847001	5.34 (325.9)		
	Davit							
10	Throwover	50463035	5.38	0.27	41715001	8.20 (500.4)		
	Davit							
12	Throwover	50463035	5.38	0.27	41715001	8.20 (500.4)		
	Davit							
16	Throwover	50463036	7.18	0.36	50511001	13.40 (817.7)		
	Davit	50463037	8.8	0.44				
20	Throwover	50463037	8.8	0.44	50511001	13.40 (817.7)		
	Davit	50463038	10.77	0.54	41947001	16.90 (1031)		
25	Throwover	50463038	10.77	0.54	41947001	16.90 (1031)		
	Davit	50463039	12.57	0.63	50930001	18.80 (1147)		

TABLE 1124
Leafield inflation system: cylinder information (European TPED-Compliant)

TRIPLE APPROVED CYLINDERS - Leafield Inflation System								
Liferaft		Description charged cylinders			Bare cylinder		Associated equipment	
Size persons	Launch type	Part No.	CO ₂ charge kg (lb)	N ₂ charge kg (lb)	Bare Part No.	Volume Litre (Inch ³)	Operating Head	Adaptor Membrane Test Pressure (bar) Label
4	Throwover	51583051	1.98 (4.36)	0.06 (0.13)	51585001	3.5 (214)		
	Davit							
6	Throwover	51583052	3.38 (7.45)	0.14 (0.31)	51585002	5.34 (325.9)		
	Davit							
8	Throwover	51583052	3.38 (7.45)	0.14 (0.31)	51585002	5.34 (325.9)		
	Davit							
10	Throwover	51583054	5.38 (11.86)	0.27 (0.59)	51585004	8.20 (500)		
	Davit							
12	Throwover	51583054	5.38 (11.86)	0.27 (0.59)	51585004	8.20 (500)		
	Davit							
16	Throwover	51583056	7.18 (15.83)	0.36 (0.79)	51585006	13.4 (817.7)		
	Davit	51583057	8.8 (19.4)	0.44 (0.97)				
20	Throwover	51583057	8.8 (19.4)	0.44 (0.97)	51585006	13.4 (817.7)		
	Davit	51583058	10.77 (23.74)	0.54 (1.19)	51585007	16.80 (1025.2)		
25	Throwover	51583058	10.77 (23.74)	0.54 (1.19)	51585007	16.80 (1025.2)		
	Davit	51583059	12.57 (27.71)	0.63 (1.39)	51585008	18.80 (1147)		

TABLE 1125
Leafield inflation system: cylinder information (triple-approved cylinders)

2.5 Foam protection pads

2.5.1 Operating head and inflation system

	Description:	Protection pad, inlet check valve
	Found on:	Inlet check valve
	Part number:	50067002
	Description:	Webbing, 13 mm undyed polyester
	Found on:	Protection pad, inlet check valve
	Part number:	WE11
	Description:	Protection pad, operating head (outboard)
	Found on:	Operating head
	Part number:	50067006
	Description:	Protection pad, operating head (inboard)
	Found on:	Operating head (neck)
	Part number:	50067003

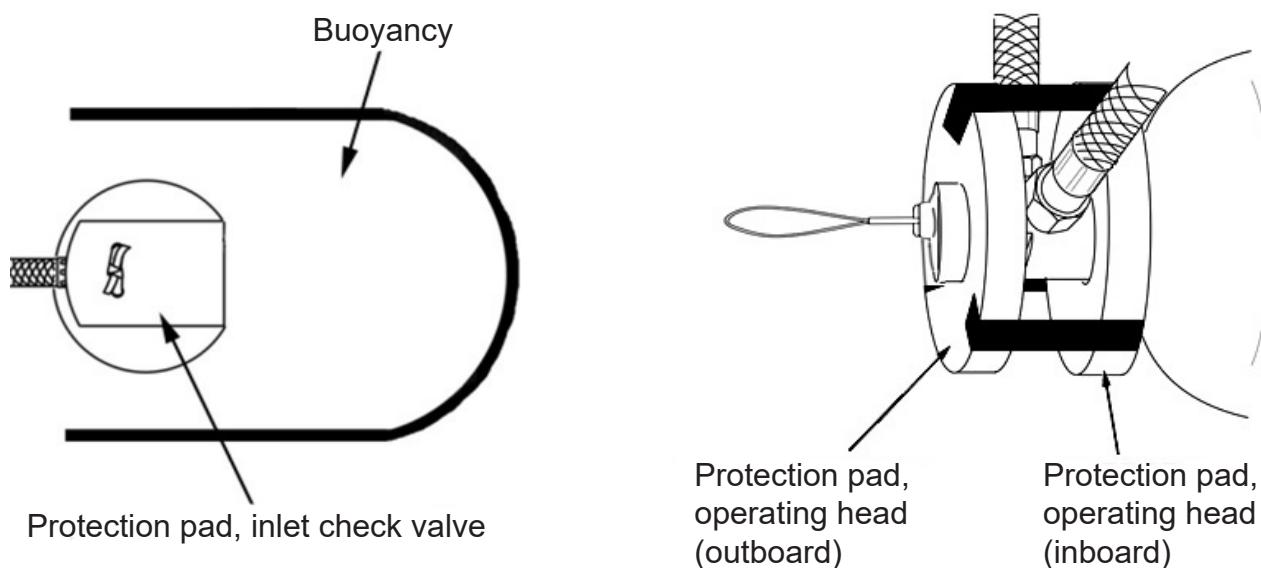


FIGURE 1136
Foam protection for operating head and inflation system

2.5.2 N-Series operating head and inflation system

	Description:	Protection pad, inlet check valve
	Found on:	Inlet check valve
	Part number:	50067002
	Description:	Webbing, 13 mm undyed polyester
	Found on:	Protection pad, inlet check valve and operating head
	Part number:	WE11
	Description:	N-Series protective foam, (upper)
	Found on:	Operating head (neck)
	Part number:	53011002
	Description:	N-Series protective foam, (lower)
	Found on:	Operating head (neck)
	Part number:	53011001

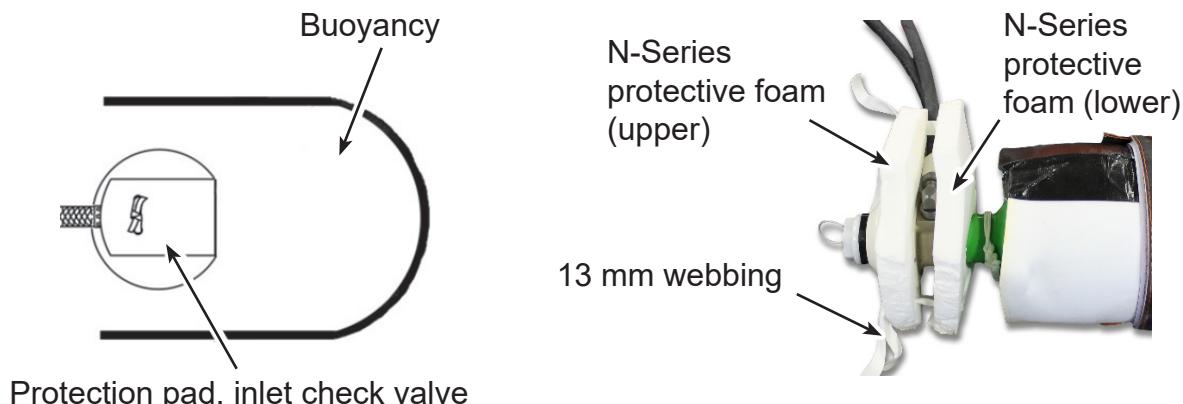
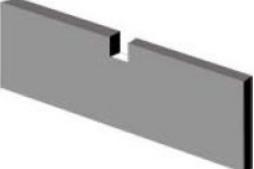
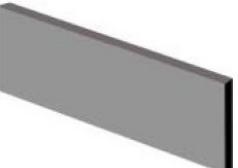
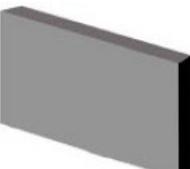
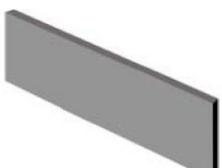


FIGURE 1137
Foam protection for inflation system and operating head

2.5.3 Containers

	Description	Polystyrene 1000 × 100 × 100 mm
	Found on:	MK 14 upper container
	Part number	04884009
	Description	Foam block
	Found on:	MK 20 container
	Part number	45283031
	Description	Lining foam (end)
	Found on:	MK 20 container
	Part number	50356004
	Description	Lining foam (end)
	Found on:	MK 20 container
	Part number	50356003
	Description	Lining foam (long side)
	Found on:	MK 20 container
	Part number	50356002
	Description	Lining foam (long side)
	Found on:	MK 20 container
	Part number	50356001

	Description	Protective Foam Block 4
	Found on:	N-Series Low Profile and Xtrem containers
	Part number	50152001

Appendix A-1

Marine Equipment Directive Variations

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

1. Emergency packs (Chapter 7)

First aid kit	(Substitute)
Immediate Action Leaflet	(Additional)
Radar reflector	(Substitute)
Anti-seasickness tablets	(Substitute)

First Aid Kit									
Country	Part number	4TO	6TO	8TO	10TO	12TO /DL	16TO /DL	20TO /DL	25TO /DL
Denmark	06782009	1	1	1	1	1	1	1	1
Finland	12865009	1	1	1	1	1	1	1	1
France	08951009	1	1	1	1	1	1	1	1
Germany	06567009	1	1	1	1	1	1	1	1
Greece	12873009	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
	08271009 *								
Norway	12865009	1	1	1	1	1	1	1	1
Poland	12865009	1	1	1	1	1	1	1	1
Portugal	12873009	1	1	1	1	1	1	1	1
Russia	06154009	1	1	1	1	1	1	1	1
Spain	12873009	1	1	1	1	1	1	1	1
Sweden	12873009	1	1	1	1	1	1	1	1
UK	12873009	1	1	1	1	1	1	1	1

NOTE: If the life of the current First Aid Kit expires before the next service replace the First Aid Kit.

- * The current Dutch First Aid Kit (P/N 06442009) has been discontinued. A replacement First Aid Kit (P/N 08271009) is now available.

TABLE A1-1
MED Variations- First-aid kit

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

TABLE A1-2
MED Variations- Immediate action leaflet

Radar Reflector			
Country	Part number	Alternative Radar Reflector (if applicable)	Radar Reflector mast
Denmark	41955011	Z2723 (ZC30100) *	41955021
Finland	06408009	08005009 / Z2723 (ZC30100) *	-
France	41955011	Z2723 (ZC30100) *	41955021
Germany	41955011	06067009 / Z2723 (ZC30100) *	41955021
Greece	06408009	08005009 / Z2723 (ZC30100) *	-
Italy	41955011	-	41955021
Norway			
Poland			
Portugal	06408009	08005009 / Z2723 (ZC30100) *	-
Spain			
Sweden			
UK	41955011	06067009	41955021

* Radar reflector S/C Z2723 (P/N ZC30100) does not need a mast.

TABLE A1-3
MED Variations- Radar Reflector

Anti-seasickness tablets		
Country	Part Number	Liferaft size
Denmark	12864009 ¹	4 - 25 TO 12 - 25 DL
Netherlands		
Finland		
France	12864009 (ZC30494) ²	
Germany		
Greece		
Italy	06107009 ³	6 TO
	06108009 ³	8 TO
	06109009 ³	10 TO
	06110009 ³	12 TO/DL
	06111009 ³	16 TO/DL
	06112009 ³	20 TO/DL
	06113009 ³	25 TO/DL
Norway	12864009 ¹	4 - 25 TO 12 - 25 DL
Poland		
Portugal		
Spain		
Sweden		
UK		

¹ If you are using P/N 12864009 refer to TABLE A1-6.

² If you are using S/C 12864009 (P/N ZC30494) refer to TABLE A1-5.

³ If you are using an Italian part number refer to TABLE A1-7.

TABLE A1-4
MED Variations- Anti-seasickness tablets

Allocation by liferaft size (Pack of 50)				
Liferaft size	4-8 TO	10 TO	12-16 TO and DL	18-25 TO and DL
Quantity of packs	1	2	2	3

TABLE A1-5
Anti-seasickness tablets: allocation by liferaft size (S/C 12864009 (P/N ZC30494))

Allocation by liferaft size (Pack of 60)			
Liferaft size	4-10 TO	12- 20 TO and DL	25 TO and DL
Quantity of packs	1	2	3

TABLE A1-6
Anti-seasickness tablets: allocation by liferaft size (P/N 12864009)

Allocation by liferaft size		
Liferaft size	4 - 25 TO	12 - 25 DL
Quantity of packs	1	1

TABLE A1-7
Anti-seasickness tablets: allocation by liferaft size (Italian part numbers)

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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.

1. General

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

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

New liferafts will be supplied with self adhesive labels in place of the metal plates currently being used. When you need to replace an existing plate or attach a label to a new container refer to the steps below:

- If a metal plate is currently being used it must be replaced with a metal plate. Refer to TABLE A2-1A for parts required and FIGURE A2-1A for positioning.
- If a label is to be replaced with a label refer to TABLE A-2-1B and FIGURE A2-1B for parts required.

Item	Description	RFD	REVERE
1	Approval plate	42026001	42152001
2	Inspection plate	42027001	42153001

TABLE A2-1A
Approval plate and inspection plate part numbers

Item	Description	Brands	Part number	Qty per liferaft
1	DYMO tape cassette, 6 mm white tape with black text (7 m per cassette)	For all brands	11845009	A/R
2	Self-adhesive label	SOLAS Liferafts	04819004	1

TABLE A2-1B
Label part numbers

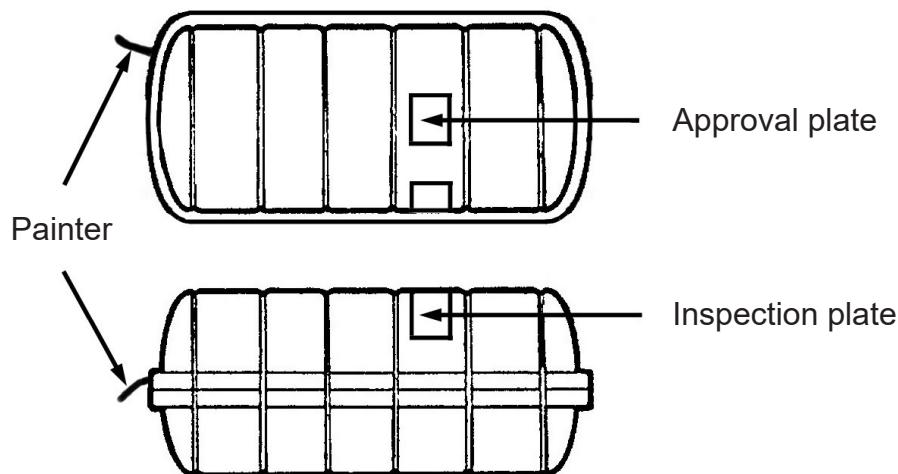


FIGURE A2-1A
Locations of approval plate and inspection plate:
plan view (top) and side view

INFLATABLE LIFERAFT APPROVED BY		
DEPARTMENT OF TRANSPORT (U.K.) MARINE MARCHANDE (FRANCE) STOFFARTSDIRECTORATE (NORWAY) SCHEEPVAARTINSPECTIE (HOLLAND) STATENS SKIBSTILSTYH (DENMARK) REGISTRO ITALIANO NAVALE (ITALY) DEPARTMENT OF TRANSPORT (CANADA) SJÖFARTSVERKET (SWEDEN) POLSKI REJESTR STATKÓW (POLAND) SEE-BERUFSGENOSSSENSCHAFT (GERMANY) MINISTERIO TRANS.TURISMO Y COM. (SPAIN) NIPPON KAMU KYOKAI (CLASS NK) (CHINA) CHINA CLASSIFICATION SOCIETY (CHINA) HELLENIC REPUBLIC (GREECE) UNITED STATES COAST GUARD (USCG) (U.S.A.) USSR REGISTER OF SHIPPING (RUSSIA)		
COMPLIES WITH EUROPEAN DIRECTIVE ON MARINE EQUIPMENT		
FOR [REDACTED] PERSONS.		
TYPE:-		
APPROVAL No.		
EMERGENCY PACK TYPE: [REDACTED]		
SART INSTALLED	AERIAL FITTINGS INSTALLED	RADAR REFLECTOR INSTALLED
SERIAL No. [REDACTED]		[REDACTED]
DATE OF MFR. [REDACTED]		LOT No. [REDACTED]
MOD. STATE. [REDACTED]		[REDACTED]
INSP. DATE	INSP. STAMP	SERVICE BEFORE
PAINTER LINE LENGTH (METRES). [REDACTED] 28 35 46 <small>Manufacturer: Survitec Group Limited Head Office, Kingsway, Dunmurry, Belfast, BT17 2AF. United Kingdom. P/N 04619004</small>		

FIGURE A2-1B
USCG SOLAS liferaft label

2. Emergency pack (Chapter 7)

The following items in each equipment pack must be USCG-approved:

First aid kit	(P/N 06273009)
Parachute flare	(P/N 04598009)
Hand flare	(P/N 04597009)
Buoyant smoke signal	(P/N 05645009)
Torch *	(P/N 06276009 or P/N 07966009 or P/N 06973009)
Signalling mirror	(P/N 06279009)
Fishing tackle	(P/N 06274009)
Food rations	(P/N 08069009 or 04776009 or 06857009)
Drinking water	(P/N 06277009 or 05163009)
Thermal protective aid	(P/N 06588009)

- * Please refer to Step 5 if you are using torch P/N 06276009.

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

Bailer	(with capacity of at least 2 litres - P/N 06290009 or P/N 52196001)
Sponge	(with volume, when saturated, of at least 750 cm ³ / 48 in ³ - P/N 06286009)
Paddles	(must be at least 1.2 metres (4 ft) long - P/N 06289009 or 11944009)
Tin opener	(must have a guard over sharp parts - P/N 07889009)

USA	Part number	Quantity per liferaft 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							

TABLE A2-2
Emergency pack variants

3. Gas cylinder assemblies

NOTE:

Some liferafts use the cylinders below installed, other liferafts have triple approved cylinders installed. Service stations must service the cylinders according to the cylinder installed.

Liferaft	Charged cylinders			Empty cylinders		
	Launch type	Charged Part no.	CO ₂ Charge (kg)	Bare Part no.	Volume (Litre) (inch ³)	Cylinder valve (including break stem)
4	TO	50463411	1.98	0.06	214	3.5 (214)
	DL	—	—	—	—	—
6	TO	50463412	3.38	0.14	42114001	7.80 (475)
	DL	—	—	—	42114001	7.80 (475)
8	TO	50463412	3.38	0.14	42114001	7.80 (475)
	DL	—	—	—	42114001	7.80 (475)
10	TO	50463413	5.38	0.27	42116001	10.65 (650)
	DL	—	—	—	42116001	10.65 (650)
12	TO	50463413	5.38	0.27	42116001	10.65 (650)
	DL	—	—	—	42116001	10.65 (650)
16	TO	50463414	7.18	0.36	42117001	15.44 (942)
	DL	—	—	—	42117001	15.44 (942)
20	TO	50463414	8.8	0.44	42117001	15.44 (942)
	DL	50463416	10.77	0.54	42120001	21.63 (1320)
25	TO	50463416	10.77	0.54	42120001	21.63 (1320)
	DL	50463417	12.57	0.63	—	—

TABLE A2-3
Cylinders and charge weights for the USA

4. Detail (Please refer to Chapter 4, INSPECTION AND CHECKING)

4.1 Gas inflation system

CAUTION: WHEN YOU CHARGE A GAS CYLINDER USE CO₂ TO FEDERAL SPECIFICATION BB-C-101 AND N₂ TO FEDERAL SPECIFICATION BB-N-411.

- 4.1.1 Check the date of the last hydraulic pressure test and proceed in accordance with the regulations of the Department of Transportation Subsection N (Dangerous Cargoes).
- 4.1.2 Check the external and internal condition of the cylinder must be checked in accordance with the regulations of the Department of Transportation Subsection N (Dangerous Cargoes).

5. Torch

If you are using the yellow torch shown in FIGURE A2-2 do the steps that follow:

- 5.1 Test the torch, spare bulb and batteries.
 - 5.1.1 Remove and retain any protective packaging from the torch.
 - 5.1.2 Fill a bucket or container with clean, plain water.
 - 5.1.3 Put the torch in the water. Make sure that the water fully covers the torch.
 - 5.1.4 Turn the torch until the lens is at the lowest point.
 - 5.1.5 Keep the torch in this position for a minimum of minutes.
 - 5.1.6 Remove the torch from the water.
 - 5.1.7 Do a visual inspection of the torch. Look the lens for signs that water entered the torch.
 - 5.1.8 If you see water in the lens, reject and discard the torch.
 - 5.1.9 Do a function test on the torch:
 - (i) Make sure that the ON/OFF switch and SIGNAL switch operate correctly.
 - (ii) If any of the switches do not operate correctly, reject and discard the torch.
 - 5.1.10 Use a cloth or paper towel to fully dry the torch.

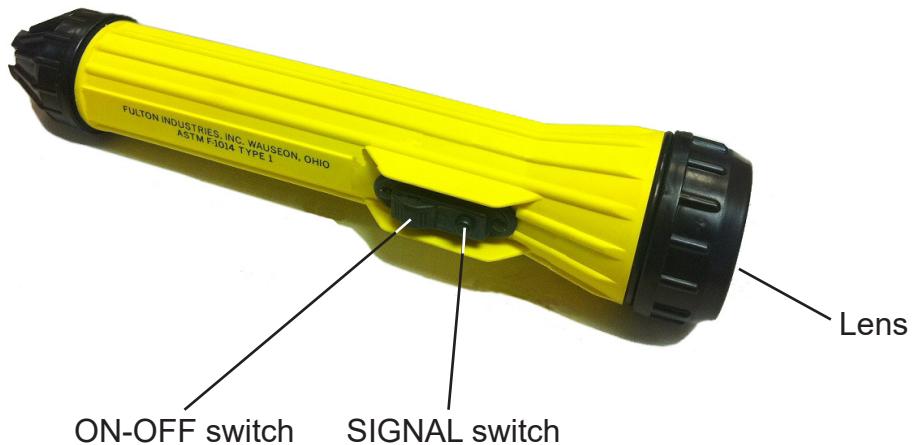


FIGURE A2-2
Existing torch (P/N 06276009)



FIGURE A2-3
New waterproof marine torch and accessories (P/N 07966009)



FIGURE A2-4
Battery sizes: 'D' (R20) (left) and 'C' (R14)

- 5.1.11 Make sure that the torch is off.
- 5.1.12 Put the torch back in the emergency pack.
- 5.1.13 If you rejected the torch:
 - (a) Replace it with P/N 07966009 or P/N 06973009.
 - (b) Remove the three spare 'D' (R20) batteries from the emergency pack. Refer to FIGURE A2-4.

NOTE: P/N 07966009 includes spare batteries.

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Appendix A-3

CANADA

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

1. General

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

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

2. E-pack (Chapter 7)

The following provisions in each equipment pack must be compliant as indicated in TABLE A3-1.

First aid kit (must be Transport Canada-approved)

Immediate action leaflet (French translation must be provided)

Canada	Part number	Quantity per liferaft							
		4TO	6TO	8TO	10TO	12TO / DL	16TO / DL	20TO / DL	21TO / 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							
Bag, polygrip	13404001	1	1	1	1	1	1	1	1
Torch	07966009	1	1	1	1	1	1	1	1
Thermal protective aid	05646009	2	2	2	2	2	2	2	2
Drogue	19056011	1	1	1	1	1	1	1	1

TABLE A3-1
 E-pack variants

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Appendix A-4

RECORDS OF CYLINDER CHEMICAL LEAK TEST

RECORDS OF CYLINDER CHEMICAL LEAK TEST Service Station Name: _____
 (as defined in Service Manual M269 P/N 08431009 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)
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)

Pass criteria is listed in service manual - Refer to relevant manual for details.

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 Survitec Group.

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Appendix A-5

Containers with drop heights between 36 m and 46 m

1. General

The following information details additional protection required for containers with drop heights between 36 and 46 metres.

2. Drop height 36 m - 46 m (6 - 25 TO and 16 - 25 DL liferafts only)

2.1 For liferafts with drop heights between 36 metres and 46 metres the following additions are required:

2.1.1 Strengthened container to absorb a higher impact is used.

2.1.2 56 m painter.

2.1.3 10% more drinking water in an additional valise.

2.1.4 Foam protection on:

Refer to FIGURES A5-01 to A5-08.

(a) External lamp

(b) Cylinder

(c) PRVs

(d) Inflate/deflate valves

(e) Graduated drinking vessel

(f) E-packs (refer to Chapter 7, EMERGENCY PACKS AND EQUIPMENT, method for 18 m - 36 m liferafts)

2.1.5 Two additional straps (1 at each end) are used to close the container.

Please refer to TABLE A5-03 for part numbers and quantities.

Throwover Liferafts 46 metres drop height			
Liferaft capacity	Container size	Part number	E-Pack option
6	MK 10 size 3	—	B
	MK 10 size 4	—	A
	MK 14 size 12	—	A
		—	B
8	MK 10 size 3	—	B
	MK 10 size 4	—	A
10	MK 10 size 4	—	B
	MK 10 size 6	—	A
	MK 14 size 14	—	A
		—	B
12	MK 10 size 4	—	B
	MK 10 size 6	—	A
	MK 14 size 14	—	A
		—	B
16	MK 10 size 6	—	B
	MK 10 size 7	43808071	A
	MK 14 size 14	—	A
		—	B
20	MK 10 size 17	—	A
	MK 10 size 9	—	A
	MK 10 size 9	—	B
	MK 14 size 14	—	B
25	MK 14 size 17	—	A
	MK 10 size 9	43808091	A
			B
	MK 14 size 17	—	A
			B

TABLE A5-1
25 person Throwover Liferafts

Davit-launch Liferafts 46 metres drop height			
Liferaft capacity	Container size	Part number	E-Pack option
16	MK 14 size 17	—	A
20	MK 10 size 9	—	A
	MK 14 size 17	—	A
	MK 14 size 17	—	B
25	MK 10 size 9	50948092	A
	MK 14 size 17	50915043	A
			B

TABLE A5-2
25 person Davit-launch Liferafts

Part number	Description	Quantity
21204051	Sachet assy. Painter (56 m)	1
06277009 or 05163009	Drinking water	Not less than 10% of E-pack allowance
20993021	Valise, 700 mm	
41295001	Packing straps and crimps	4
01999069	Protection cover	2
05339009	Plastazote foam	1
50152004	Pad protection	8
50152006	Pad protection	1
50067003	Pad protection (for RL4 External lamp)	1
50067006	Pad protection (for RL6 External lamp)	1

TABLE A5-3
Additional equipment for 25 TO and DL liferafts with
a drop height between 36 metres - 46 metres

- 2.1.6 Roll a protection cover (RFD P/N: 01999069) and place it inside the graduated drinking vessel.
- (a) Trim the protection cover to within 25 mm (1") of the graduated drinking vessel.
 - (b) Roll a second protection cover around the outside of the graduated drinking vessel.

NOTE: In the step that follows, fold 12 mm (½") of the tape back on itself to make a pull tab. This will make it easier to remove the tape.

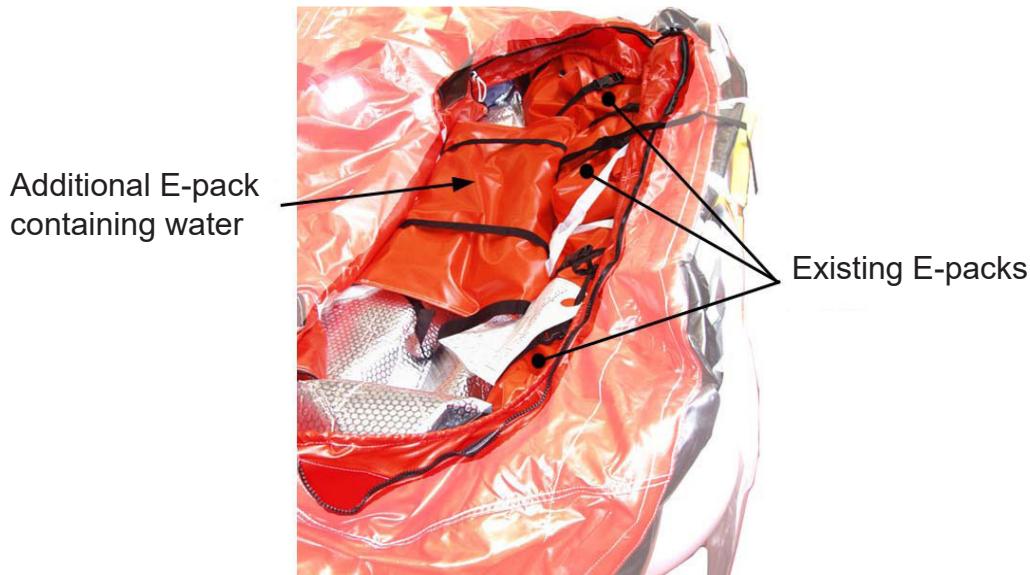
- (c) Use 25 mm (1") tape to hold the protection cover in position. Refer to Figure A5-1.
- (d) Place the graduated drinking vessel into E-pack 1.



FIGURE A5-1
Pack the graduated drinking vessel



FIGURE A5-2
Put protection foam on the external lamp



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

FIGURE A5-3
Packing position of additional water E-pack

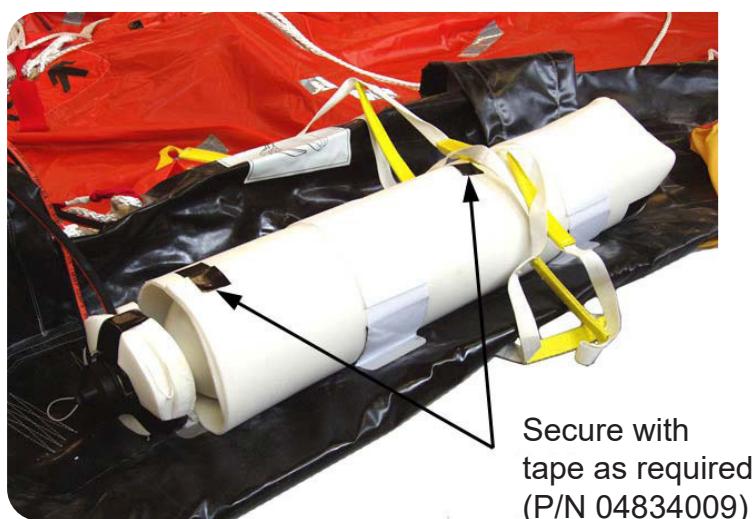


FIGURE A5-4
Protection foam for cylinder

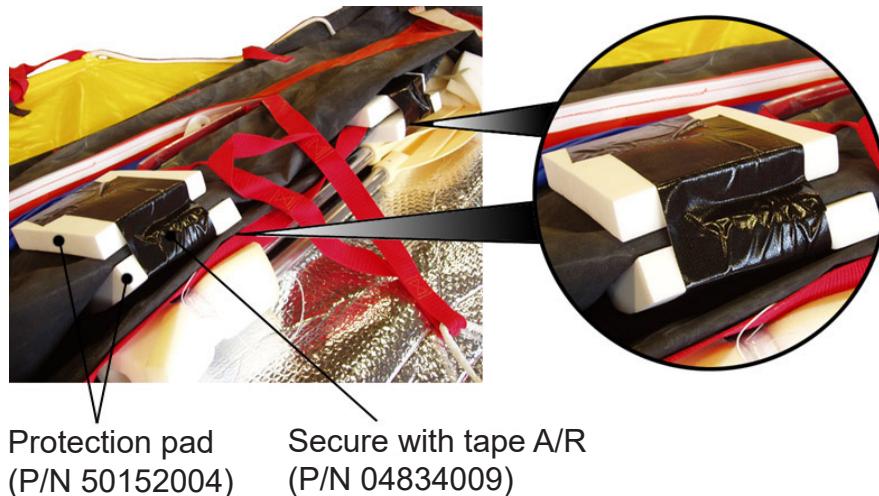


FIGURE A5-5
Inflate/deflate valve protection

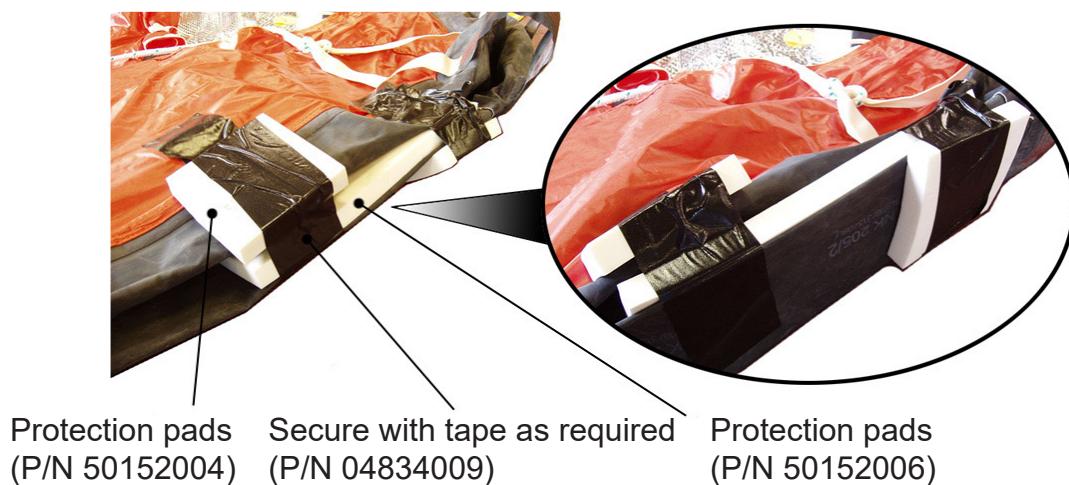


FIGURE A5-6
Pressure relief valve protection



FIGURE A5-7
Battery and internal lamp protection (archtube)

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Appendix A-6

25 Person liferaft - Overcapacity variant

Section	Title	Page
1	Description and Data	A6-3
2	Removal and Unpacking.....	A6-3
3	Cleaning.....	A6-3
4	Inspection and Checking.....	A6-3
5	Testing and Troubleshooting	A6-4
6	Repair	A6-4
7	Emergency packs	A6-4
8	Assembly and repacking.....	A6-4
9	Storage conditions and instructions	A6-7

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1. Description and Data

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

Part number	Description	Metres	Qty
05768009	Snap hook, safety	25	3
06823009	Throwing line	—	1
43978001	Patch, velcro	—	1
05002009	Firing line, short	5	1
44021001	Label, Overcapacity	—	3
20883001	Painter block retaining foam	—	2
05002009	Bowsing line (white/natural colour)	2.8	1
05502009	Bowsing line (red)	2.8	1
42088011	Label, painter	—	1
42089011	Label, bowsing	—	1
20739002	Patch, attachment (throwing line)	—	1
02236006	Break thread	—	A/R
20815001	Handle	—	2

TABLE A6-1
Additional items required for 25 person Overcapacity liferaft

2. Removal and unpacking

- 2.1 The removal and unpacking procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS-style inflatable liferafts.
 Refer to Chapter 2, REMOVAL AND UNPACKING.

3. Cleaning

- 3.1 The cleaning procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style inflatable liferafts.
 Refer to Chapter 3, CLEANING..

4. Inspection and checking

- 4.1 The Inspection and Checking procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS Style inflatable liferafts.
 Refer to Chapter 4, INSPECTION AND CHECKING..

5. Testing and trouble shooting

- 5.1 The testing and troubleshooting procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS-style inflatable liferafts.
Refer to Chapter 5, TESTING AND TROUBLESHOOTING.

6. Repair

- 6.1 The repair procedures for the 25 person Overcapacity liferafts are identical to those of the SOLAS-style inflatable liferafts.
Refer to Chapter 6, REPAIR.

7. Emergency packs

- 7.1 There emergency packs for the 25 person Overcapacity liferafts are identical to those of the SOLAS-style inflatable liferafts. To pack the emergency packs, refer to Chapter 7, EMERGENCY PACKS AND EQUIPMENT..

8. Assembly and repacking

- 8.1 The assembly and repacking for the 25 person Overcapacity liferafts are identical to those of the SOLAS-style inflatable liferafts, as given in Chapter 8, ASSEMBLY AND REPACKING, with the following exceptions:

8.2 Liferaft

- 8.2.1 The Overcapacity Liferaft is fitted with two additional loop patches in the locations shown in FIGURE A6-1. With the liferaft laid out flat, the red bowsing line is secured to the patch on the right, when viewing from the doorway closest to the inflation cylinders and the white/natural-coloured bowsing line is secured to the left. The lines are secured using a taped bowline knot. The snap hooks are fitted to the end of each line using a taped bowline knot.
- 8.2.2 For configuration Type A and Type B, the red line remains on the right, and the white on the left.
- 8.2.3 The firing line is replaced with a short firing line of length 5000 mm. 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.

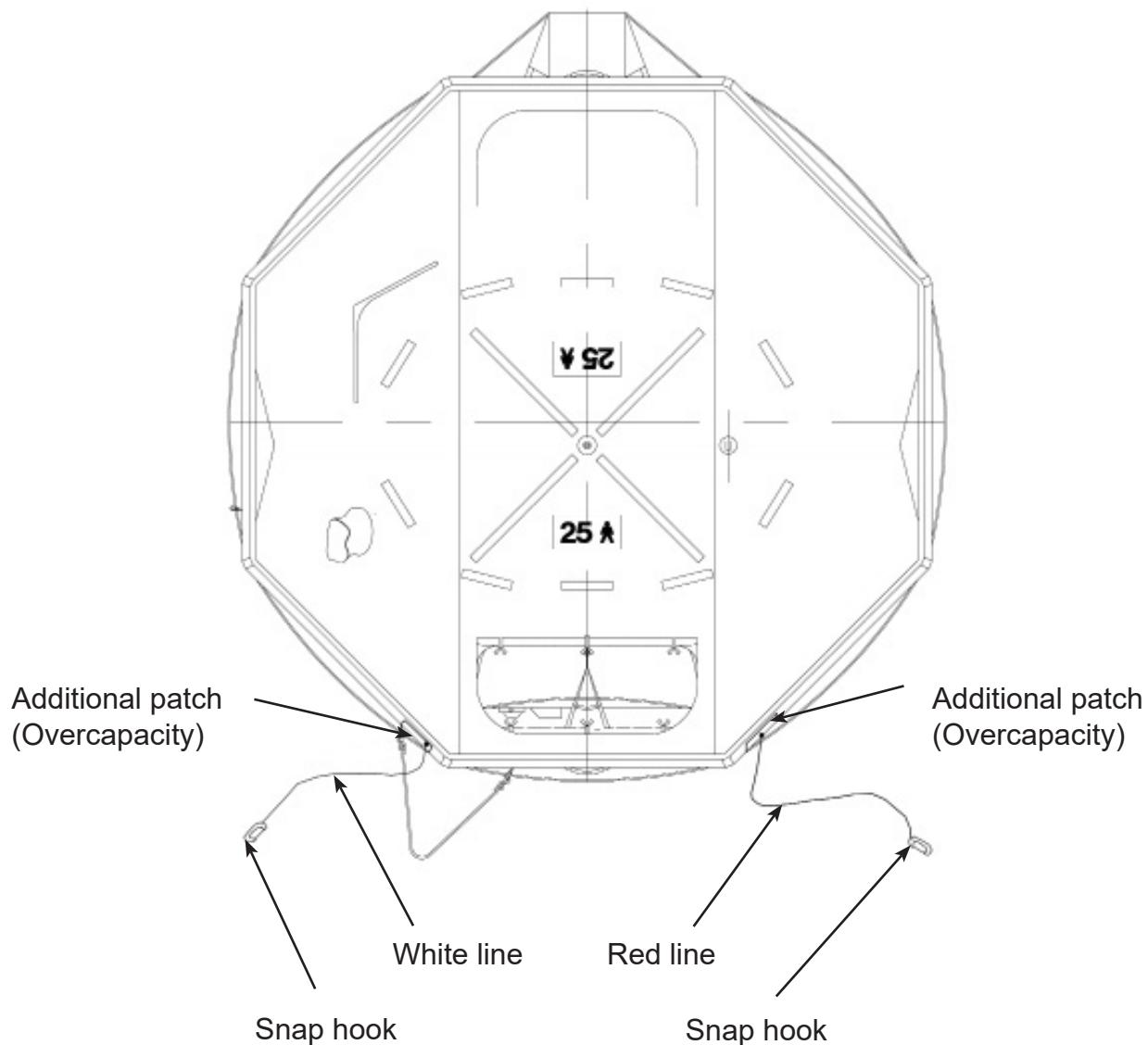


FIGURE A6-1
Location of additional patches on Overcapacity liferaft

8.3 Container

- 8.3.1 On the firing line end of the container the following items are positioned as shown in FIGURE A2.
- 8.3.2 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.
- 8.3.3 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	Metres	Qty
11756009	Throwing line	40	2
43978001	Touch-and-close fastener patch	—	—
44021001	Label, Overcapacity ¹	—	3
20883001	Foam, painter block retaining	—	2
42088011	Label, painter	—	1
42089011	Label, bowsing ¹	—	1
20739002	Patch attachment (throwing line)	—	1
20815001	Handle	—	2

¹ NOTE: Also located on opposite end from firing line.

TABLE A6-2
Container attachments



FIGURE A6-2
Position of additional patches, labels and handles



FIGURE A6-2
Position of additional patches, labels and handles

8.4 Packing

- 8.4.1 Obey Chapter 8, ASSEMBLY AND REPACKING to prepare the liferaft for packing. Make sure that the extra bowsing lines are on the side of the container opposite to the hinge side.
- 8.4.2 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 side, and the white line on the left side.
- 8.4.3 Before you close the container, check again that both lines are not trapped by any equipment, and then install the sealing blocks to the lines. Make sure that there is at least 1000 mm of each line outside the container.
- 8.4.4 When you have closed the container, for each bowsing line:
 - (a) Flake the extra bowsing line and snap hook.
 - (b) Use a single turn of breaking thread to attach the flaked bowsing line to the handle on the container. Refer to FIGURE A6-3.

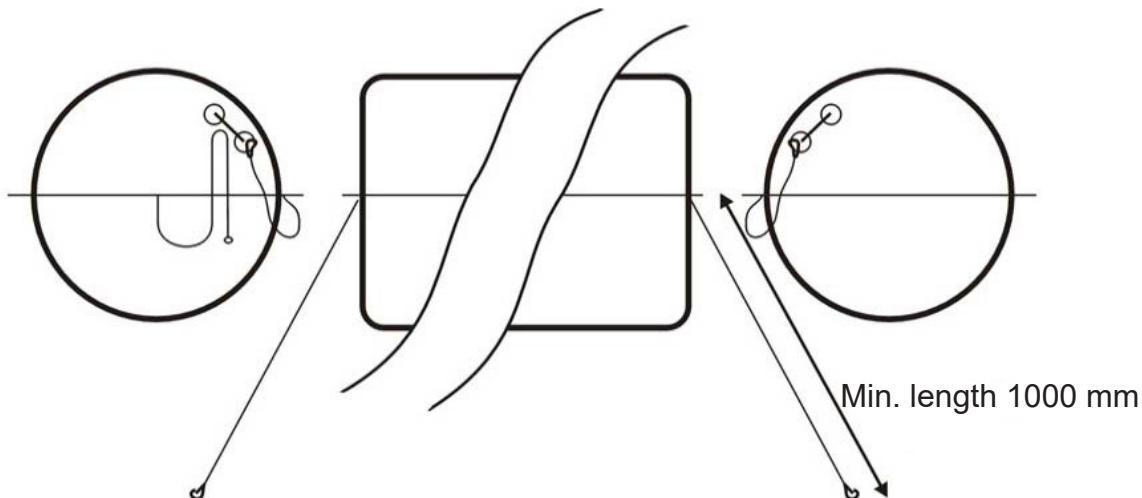


FIGURE A6-3
**Overcapacity liferaft - attach the operating line and
the snap hooks to the handles of the container**

9. Storage conditions and instructions

- 9.4.1 The storage conditions and instructions for the 25 person Overcapacity liferafts are identical to those of the SOLAS-style inflatable liferafts.
Refer to Chapter 9, STORAGE CONDITIONS AND INSTRUCTIONS.

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Appendix 7

Silver Series liferafts

Section	Title	Page
1.	Container preparation	3
2.	Packing a Throwover liferaft into a Flat-Pack container.....	7
3.	Test procedures	26
4.	Container labelling	29

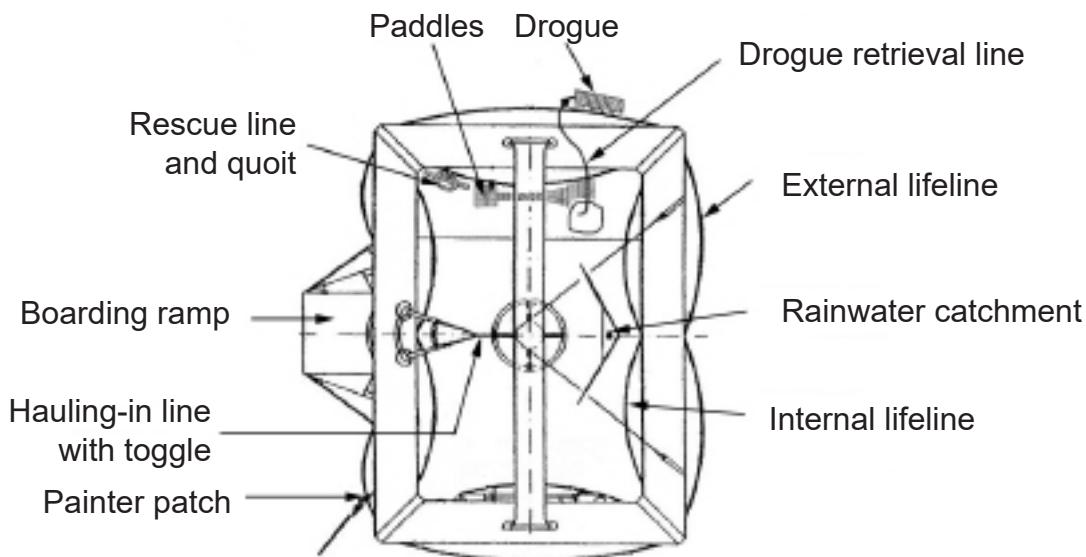
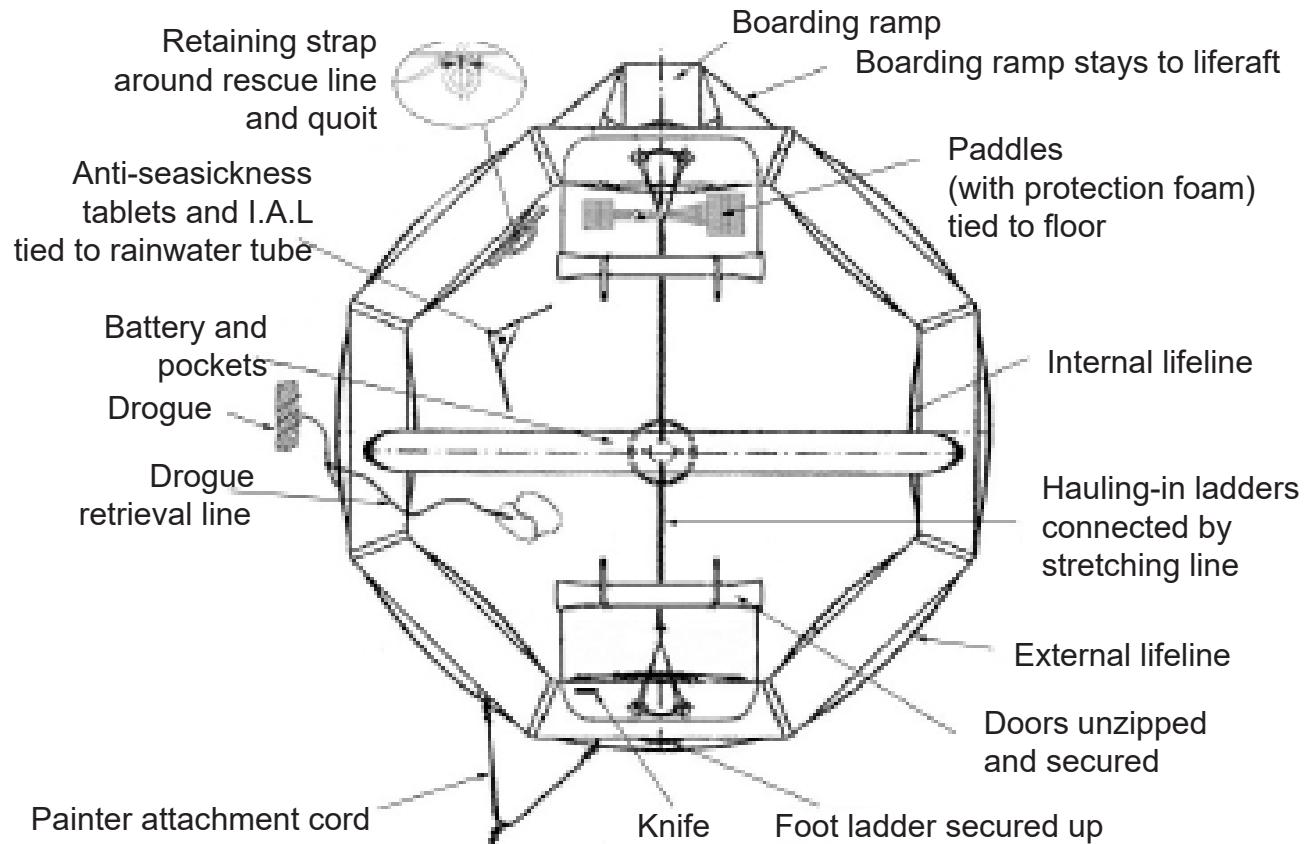


FIGURE A7-1
Preparation for packing assembly of 6-8 Person Throwover



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

FIGURE A7-2
Preparation for packing assembly for 10-25 Person Throwover

1. Container preparation

1.1 Flat-Pack:

The following preparation is used for 6-12 Person Throwover liferafts.

1.1.1 Fix protective foam to the inside of the container.

Refer to FIGURE A7-3. This protective foam prevents the cylinder operating head from impacting the container side, during handling and deployment.

NOTE: This protective foam will need to be cut to the correct size, depending on the container type being used.

1.1.2 Drainage slits:

- (a) The container has drainage holes. These holes allow water to escape. Plastic sheets are then placed inside the container before the liferaft is rolled inside

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF THERE ARE NO DRAINAGE SLITS IN THE PLASTIC SHEET.

- (b) Check that there are drainage holes in the bottom of the container.
- (c) Line the bottom half of the container with a polythene sheet. Refer to FIGURE A7-3.
- (d) Make sure that this sheet overlaps the front edge of the container by 200 mm (8").
- (e) Locate all drainage holes in the bottom of the container.
- (f) Make a 50 mm (2") slit in the plastic sheet where it aligns with the container drainage holes. Refer to FIGURE A7-4.

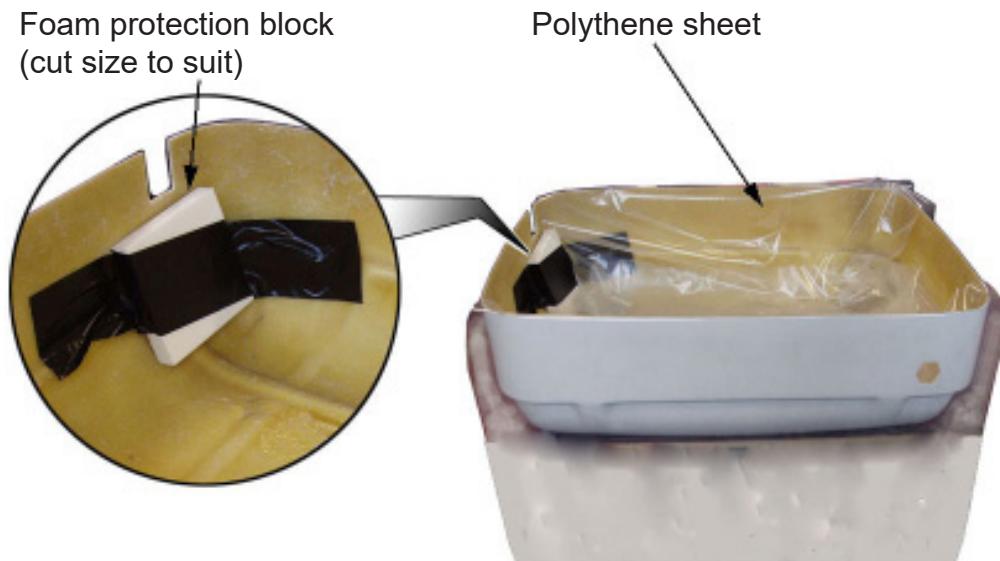


FIGURE A7-3
Preparation of Flat-Pack container

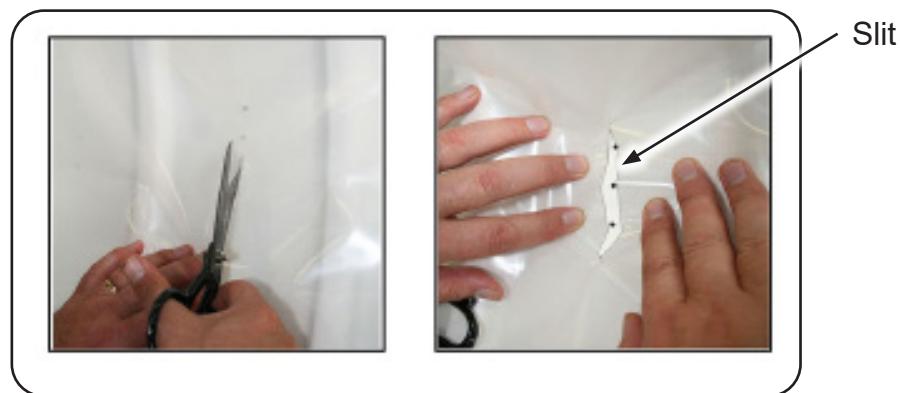


FIGURE A7-4
Make a slit in the plastic sheet

- 1.1.3 Flat-Pack containers are supplied with four small holes on both shorter sides of the upper half. These holes are used to allow handles to be attached to each end.
- 1.1.4 Put one 200 mm length of white 525 lbf cord into the loop at each end of one handle. Refer to FIGURE A7-5A.
 - (g) From outside the container, insert the ends of the white cord through the holes.
 - (h) Inside the container, take both cords and pull them fully into the container. Make an overhand knot as close as possible to the inside of the container. Refer to FIGURE A7-5B.
Tape the flying ends.
 - (i) Repeat the above step for the opposite handle.

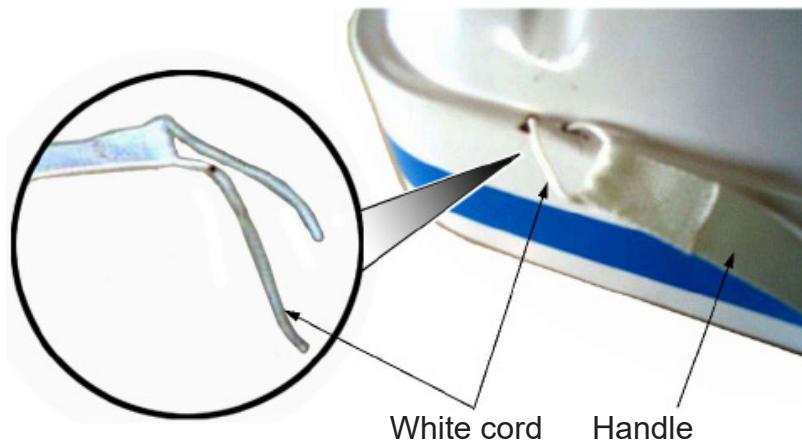


FIGURE A7-5A
Outside container - put handle cord through container

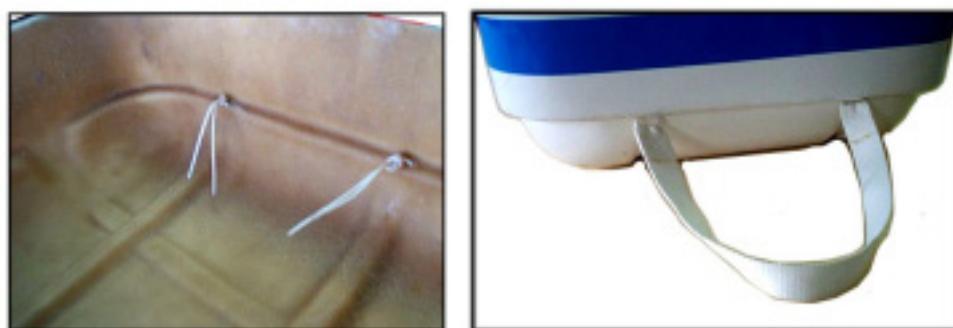


FIGURE A7-5B
Inside container - Tie handle cords

2. Packing a Throwover liferaft into a Flat-Pack container

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

- 2.1 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. Make sure that all cordage is neat and tidy.

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

- 2.1.1 Connect a vacuum device to a deflation adapter and evacuate all air from each compartment. Re-cap the inflate/deflate valves in each compartment.
 - 2.1.2 As each chamber is evacuated, adjust the buoyancies so that they lie flat on each other.
- 2.2 Before installing the cylinder, make sure that the black operating head has been replaced with the correct white model. Refer to FIGURE A7-6.

CAUTION: DISPOSE OF ALL BLACK OPERATING HEADS.

- 2.3 Refer to **Appendix 12** for guidance on installing and checking a Leaflet GIST operating head.

WARNING: DO NOT REMOVE THE RECOIL CAPS FROM THE CYLINDER VALVE YET.

- 2.4 Wrap the cylinder a sheet of white rubazote foam and secure with black tape.
- 2.5 Turn over the edge of the liferaft to reveal the cylinder stowage pocket. Place the cylinder into the cylinder stowage pocket.

The cylinder must be orientated so that the upper buoyancy cylinder valve outlet runs parallel with the base of the liferaft while the other runs perpendicular towards the water. Refer to FIGURE A7-7.

- 2.6 Using the cord attached cylinder stowage pocket tie the cylinder neck securely. Tie with 2 turns around the cylinder neck and a reef knot and several half hitches.
- 2.7 Remove the recoil caps from the operating head.

FIGURE A7-6
<NOT USED>

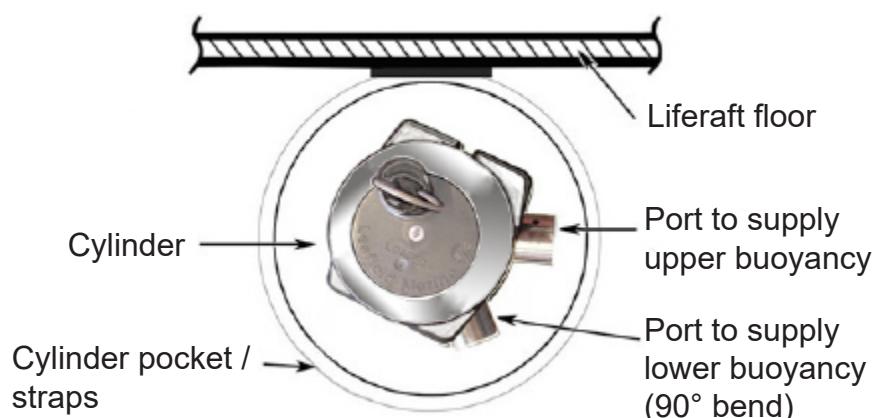


FIGURE A7-7
Cylinder attachment to liferaft

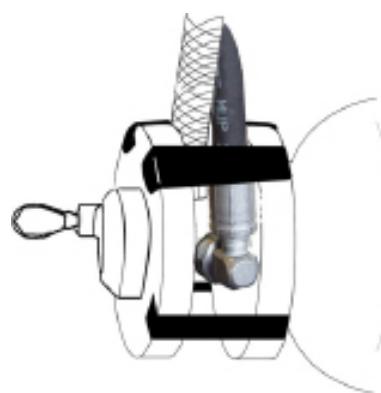


FIGURE A7-8
Protection pads for operating head

- 2.8 Connect each inflation hose. Refer to **Appendix 14** for guidance on inspection the inflation hose. Refer to FIGURE A7-6. Torque the hose connections as stated in Chapter 1, TABLE 101. Replace damaged or worn O-Rings if necessary. The bottom buoyancy uses the hose with the 90° ends.
 - 2.9 Insert two protection pads onto operating head. Make sure that the inflation hoses by pass each other as shown. Refer to FIGURE A7-8. Tape both pads together at either side of the upper buoyancy hose. Use 100 mm (4") adhesive tape. Lay the liferaft flat on the table again.
 - 2.10 Place the correct size of Hermetic bag (H-Pack), into the bottom half of the container.
 - 2.11 Remove the 36 mm nut and washer from the vacuum valve. Carefully place both nut and washer on a clean surface.
 - 2.12 Push the vacuum valve into the pre-cut location on the container. Refer to FIGURE A7-9. Holding the back of the vacuum valve, attach the washer and nut on the outside of the container. Hand tighten the nut.
 - 2.13 Use a torque wrench to tighten the vacuum valve nut to the correct torque. Refer to Chapter 1, DESCRIPTION AND DATA for torque values and to Chapter 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS.
 - 2.14 Open the H-Pack and let it hang outside of the container. Push the H-Pack down into the container. The inner painter line cordage will be visible. Refer to FIGURE A7-10.
 - 2.15 Tape the internal vacuum hose to the container rim. Refer to FIGURE A7-10.
 - 2.16 Grasp the liferaft and with the cylinder, drag the assembly over the container. Place the cylinder at the back of the container. The cylinder operating head must be close to the container corner. Refer to FIGURE A7-11.

Leave space to allow for straight pull of line to reduce pull force values.
 - 2.17 Using a permanent marker, check and mark each desiccant sachet with the current date and expiry date. Refer to FIGURE A7-11. Initial expiry date is determined as 12 months from the date of manufacture. Subsequent expiry dates will be from date of each service.
- CAUTION:** WHEN FOIL BAGS ARE OPENED, THE DESICCANT SACHETS INSIDE, MUST BE SEALED INSIDE THE H-PACK WITHIN 8 HOURS.
- 2.18 Place 10 desiccant sachets into the H-Pack, spaced out along the cylinder and base of the H-Pack. Refer to FIGURE A7-11.

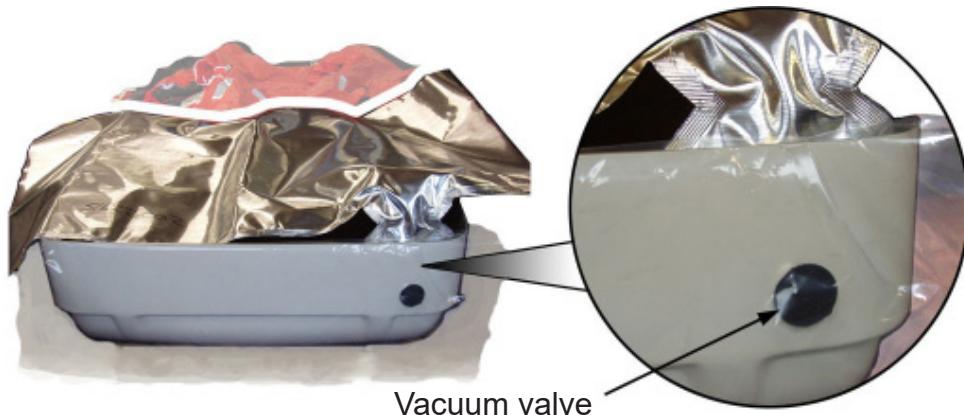


FIGURE A7-9

Insert the H-Pack

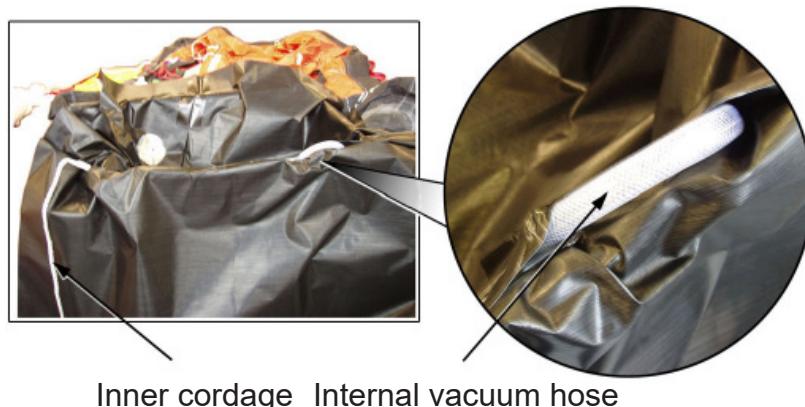


FIGURE A7-10
Inner painter line and internal vacuum hose

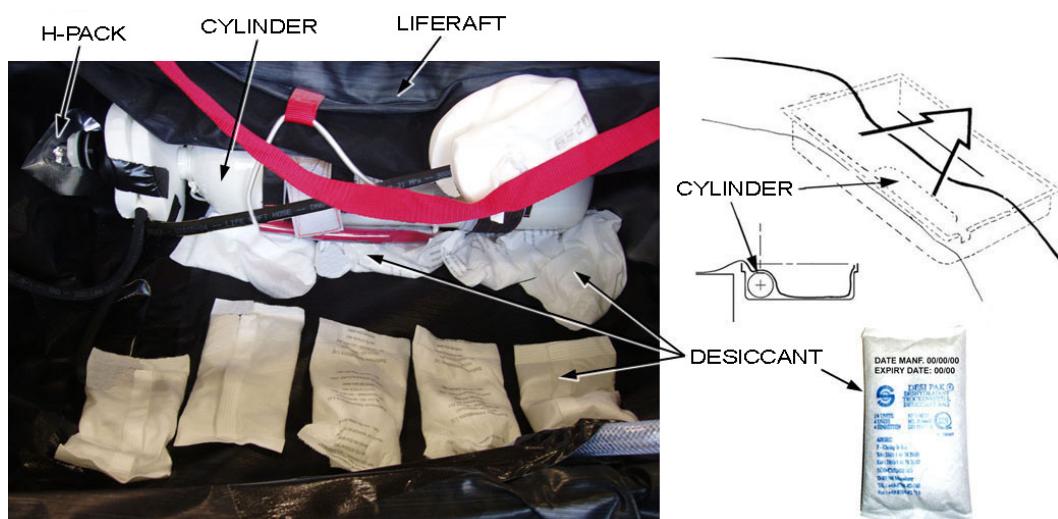


FIGURE A7-11
Cylinder placement and desiccant

- 2.19 Fold the liferaft back to reveal the operating mechanism.
- 2.20 Remove the operating head nut and washers. Insert the H-Pack onto the operating head and replace the washer and nut. Refer to FIGURE A7-12.
- 2.21 Use a torque wrench to tighten the operating head nut.
Refer to Chapter 1, DESCRIPTION AND DATA for torque values and to Chapter 10, SPECIAL TOOLS, EQUIPMENT AND MATERIALS.
- 2.22 Put the painter sachet on the polythene sheet and move it until the polythene sheet extends over the open end of the sachet and the painter rope by at least 100 mm (4") but no more than 150 mm (6"). Use tape to attach the painter sachet to the polythene sheet.
- 2.23 Make sure that 2.5 m (100") exits the painter sachet. Refer to FIGURE A7-13.
- 2.24 The firing point is 1.5 m (59") from the end of the line. Measure forward 250 mm from the firing point and mark it clearly. Refer to FIGURE A7-13.

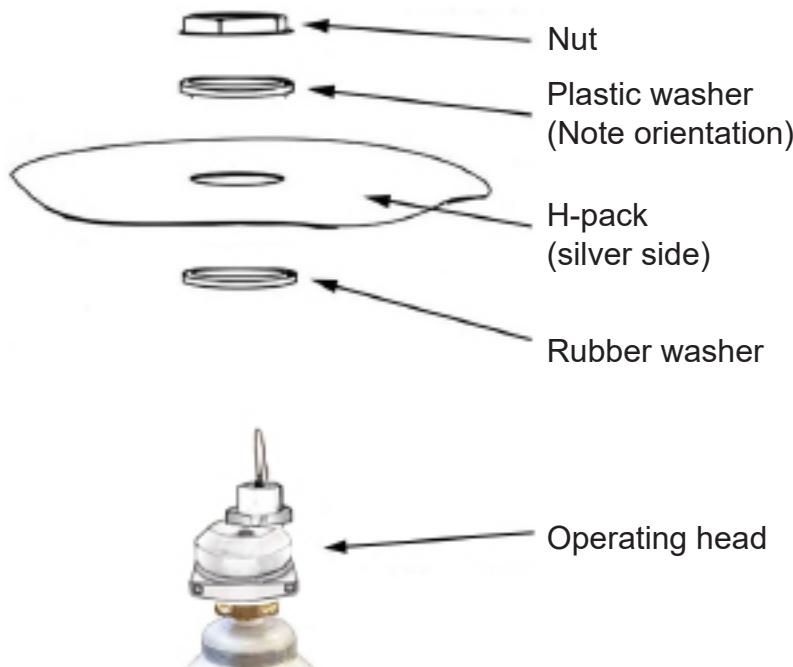


FIGURE A7-12
Operating head and H-Pack assembly (shown exploded for clarity)

- 2.25 Put the actuation cable of the operating mechanism through the painter line at the firing point mark. Thread the remaining painter line back through the actuation cable. Refer to FIGURE A7-14.

WARNING: THE OPERATING MECHANISM IS NOW ARMED. BE VERY CAREFUL DURING THE STEPS THAT FOLLOW.

- 2.26 Insert painter line through the hole in the H-Pack. Pull it through until the 250 mm mark has been reached. Refer to FIGURE A7-14. Tie the painter line off at this point, by splitting the cord and inserting the line through twice, then pull tight.

- 2.27 Wind two turns of white tape around the painter cord. Refer to FIGURE A7-14. 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.

- 2.28 Make sure that the painter cord is firmly attached to the operating head by lightly pulling on the cord. Refer to FIGURE A7-14.

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

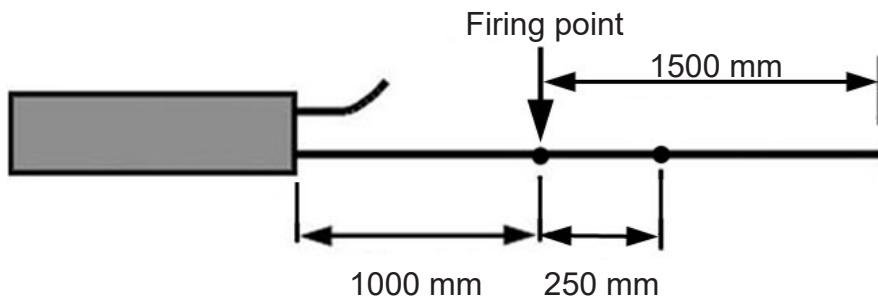


FIGURE A7-13
Painter assembly detail

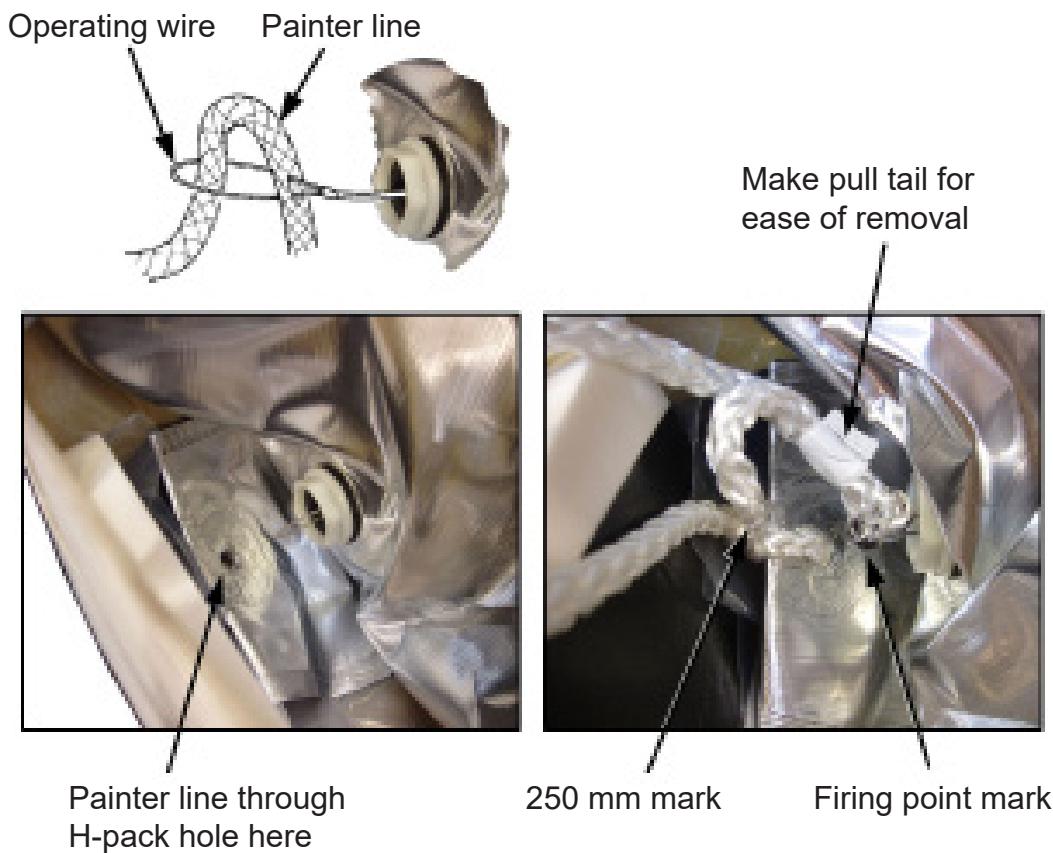


FIGURE A7-14
Operating head attachment

2.29 Using the painter line from the H-Pack, tie it to a strong point on the liferaft. Refer to FIGURE A7-15.

- (a) On 4/6/8 Person use the liferaft painter patch.
- (b) On 10/12 Person use the liferaft towing bridle.

NOTE: Make sure that the painter line can move freely along the liferaft towing bridle.

2.30 Set the painter sachet to the side of the container. Make sure that the open end of the painter sachet is close to the container at the painter line cut-out.

CAUTION: BE VERY CAREFUL DURING THE NEXT OPERATION SO THAT YOU DO NOT OPERATE THE INFLATION SYSTEM.

2.31 Put the boarding ladder neatly under liferaft against the cylinder. Refer to FIGURE A1-16.

NOTE: Applies to 10-12 Person ONLY.

2.32 Push the liferaft floor area down into the recesses towards each end of the container.

2.33 Pack the Emergency Pack valises for the liferaft. Make sure that the straps on each Emergency Pack valise are tight. Refer to Chapter 7, EMERGENCY PACKS AND EQUIPMENT.

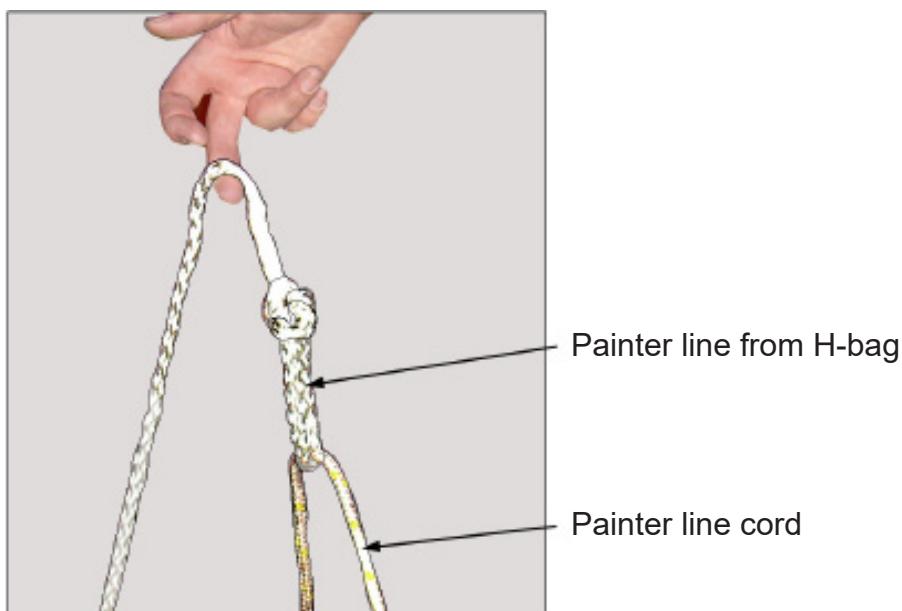


FIGURE A7-15
Tie painter line to painter cord (10/12 person liferaft only)

2.34 Place the No.1 Emergency Pack (containing survival items), into the container first. The pyrotechnics will help to keep the cylinder in its correct position. Refer to FIGURE A7-17.

2.35 Tie the paddles opposite to each other. Refer to FIGURE A7-18. Put protective foam over the ends of the paddles and radar reflector mast (if applicable).

CAUTION: FOR 10-12 PERSON MAKE SURE THAT THE EMERGENCY PACKS ARE PLACED UNDER THE HAULING-IN LADDER. MAKE SURE THAT NO PARTS OF THE CANOPY OR DOOR ARE TRAPPED BENEATH THE PACKS.

CAUTION: FOR 6-8 PERSON MAKE SURE THAT THE EMERGENCY PACKS ARE PLACED UNDER THE ARCH TUBE.

2.36 Insert the paddles and radar reflector mast (if applicable) at the front of the liferaft. Tie them to the inner life line, using 50 lbf (22 kgf) breaking thread.

- (a) Place the Radar mast under the paddles and tie securely.
- (b) Place the paddles and tie securely.

2.37 Place seven desiccant sachets on top of the No.1 Emergency Pack/ cylinder. Refer to FIGURE A7-17.

NOTE: Do not place the food on top of the cylinder.

2.38 Place the remaining emergency valise, containing food and water, on top. Keep the valises as flat as possible. Refer to FIGURE A7-17.

2.39 Using the straps on each valise, tie them to the inner lifeline. Use an overhand knot. This will secure the packs to the liferaft.

2.40 Connect a suction hose to each of the two deflation points and fully deflate the buoyancies. These are located at the rear door, 1 on each buoyancy.

2.41 Enter the liferaft by the rear door and connect the switch activator to the internal lamp.

CAUTION: 6-8 PERSON ONLY: WRAP THE ARCH TUBE AROUND THE INTERNAL LAMP. REFER TO FIGURE A7-19.

2.42 Wrap the arch tube around the internal lamp and secure with 1 turn of 25 mm (1") tape. Refer to FIGURE A7-19. This will prevent the tension line from interfering with the lighting switch. Make sure that the floating safety knife was installed and that the flaps of the pocket are correctly closed.

2.43 Open the liferaft fully out. Place the remaining ten desiccant bags on top of the liferaft pack. Refer to FIGURE A7-20A.

NOTE: FIGURE A7-16 is not used

Desiccant ($\times 7$)



Emergency pack 1



Food and water

NOTE: Liferaft and polythene sheet removed for clarity.

FIGURE A7-17
Positioning of Emergency Packs into liferaft

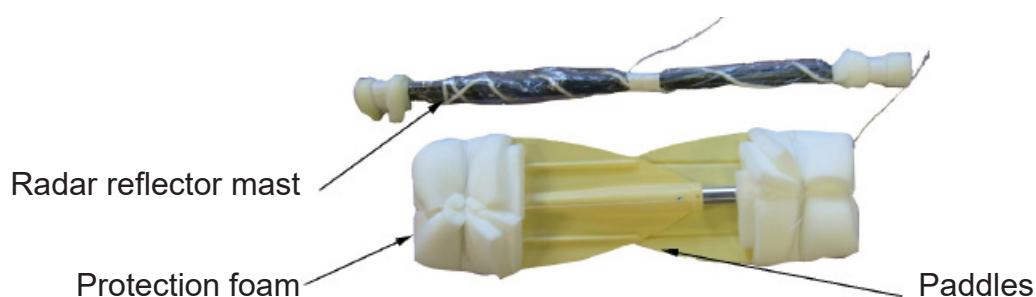


FIGURE A7-18
Paddles and radar reflector mast: arrangement and protection

- 2.44 Before folding the liferaft, pull the canopy towards the container.
- 2.45 Check that the internal lamp is not obstructing the hauling-in ladder cord.
Locate the drogue and attach it to the drogue patch.
 - (a) 4, 6, or 8 person liferafts.
 - (i) Place the rolled up drogue on top of the left side fold.
Refer to FIGURE A7-20D.
 - (b) 10, 12, 16, or 25 person liferafts.
 - (i) Place the rolled up drogue below the water pocket.
Refer to FIGURE A7-20E.

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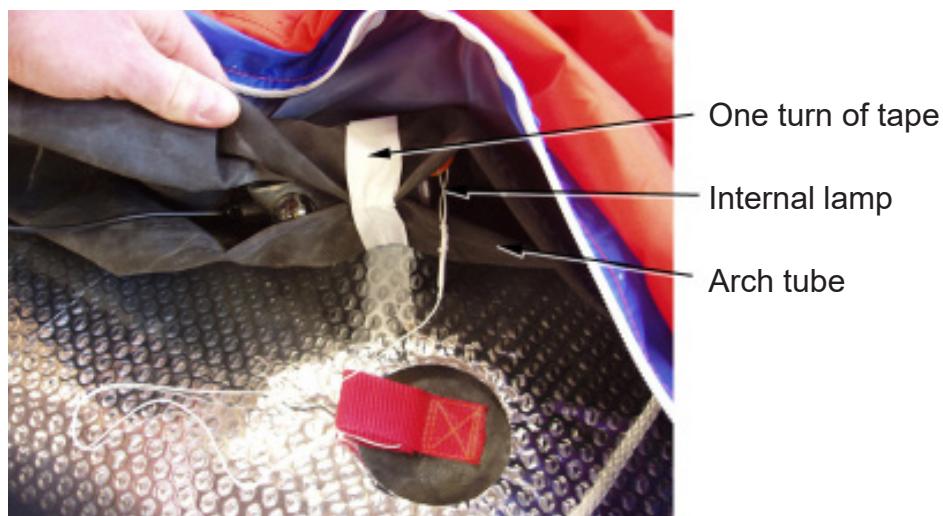


FIGURE A7-19
6-8 PERSON ONLY - Wrap arch tube around internal lamp



FIGURE A7-20A
Preparation of liferaft for folding



FIGURE A7-20B
Make sure that the lamp is not obstructed



FIGURE A7-20C
Pull canopy forward



FIGURE A7-20D
Place the drogue on the top of the left side fold



FIGURE A7-20E
Place the drogue below the water pocket

2.46 Prepare to start the sequence of liferaft folding;

NOTE: The boarding ramp must be twisted and folded down before rolling of liferaft can begin.

For the 6-8 liferaft the boarding ramp must be laid parallel with the fold.

2.46.1 Reach into the liferaft and make sure that the floating safety knife is flat along the buoyancy. Twist the boarding ramp and push it down on top of the liferaft.

2.46.2 Twist the boarding ramp and push down on top of the liferaft.

2.46.3 Flat-Pack container; Refer to FIGURE A7-21.

6 PERSON - 1 fold LHS, 1 fold RHS, then 2 folds.

2.46.4 Flat-Pack container; Refer to FIGURE A7-22.

8-12 PERSON - 1 fold LHS, 1 fold RHS, then 3 folds.

2.47 Pressing down as tight as possible, fold the liferaft towards and then into the container.

2.48 Wrap the H-Pack over the liferaft. Refer to FIGURE A7-23.

2.49 Tie the loose end of the painter line to the H-Pack, using a bowline knot. Refer to FIGURE A7-23. Tape the flying end.

2.50 Insert the rubberised end of the painter line through the foam container block.

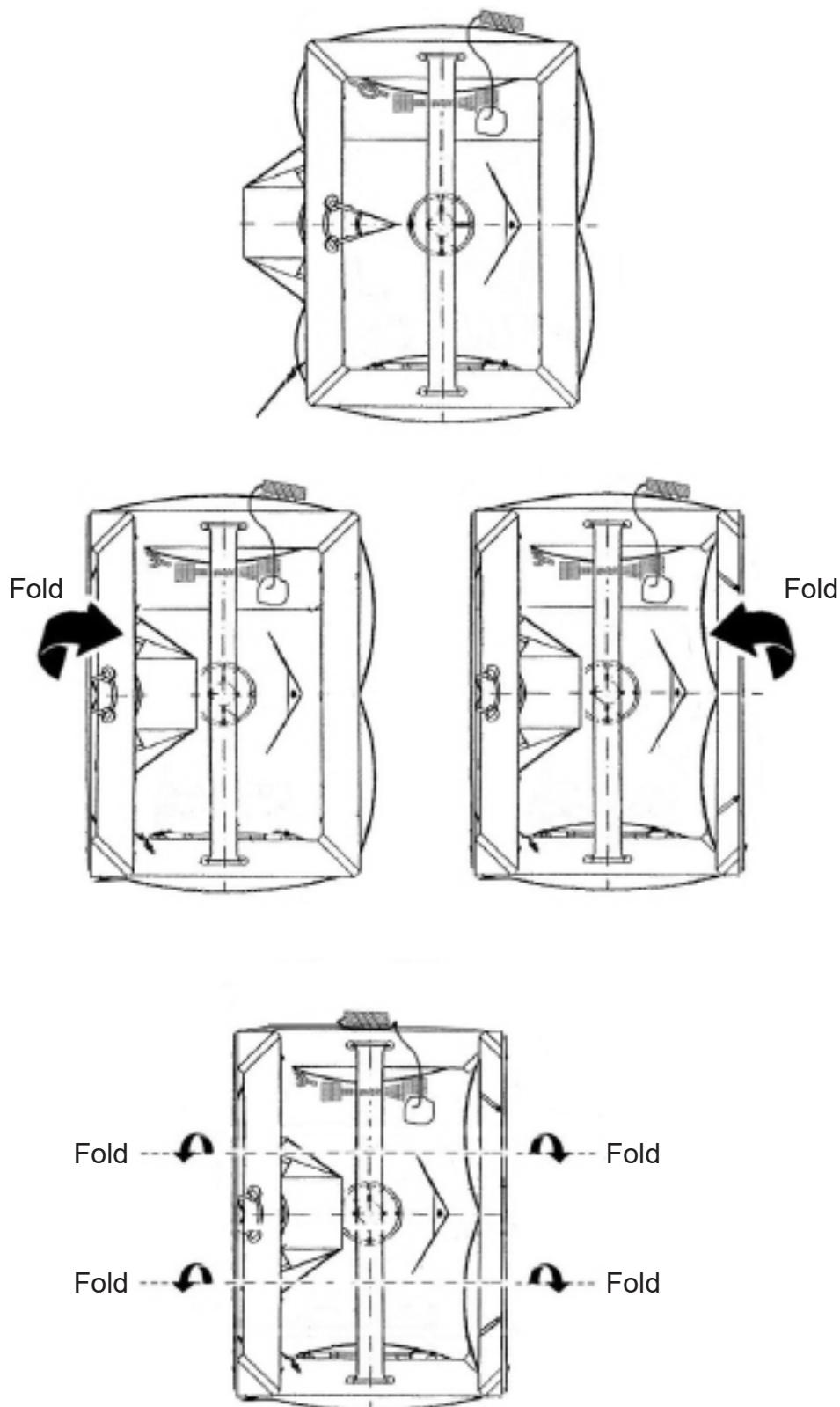


FIGURE A7-21
6-8 PERSON - Folding the liferaft into Flat-Pack container

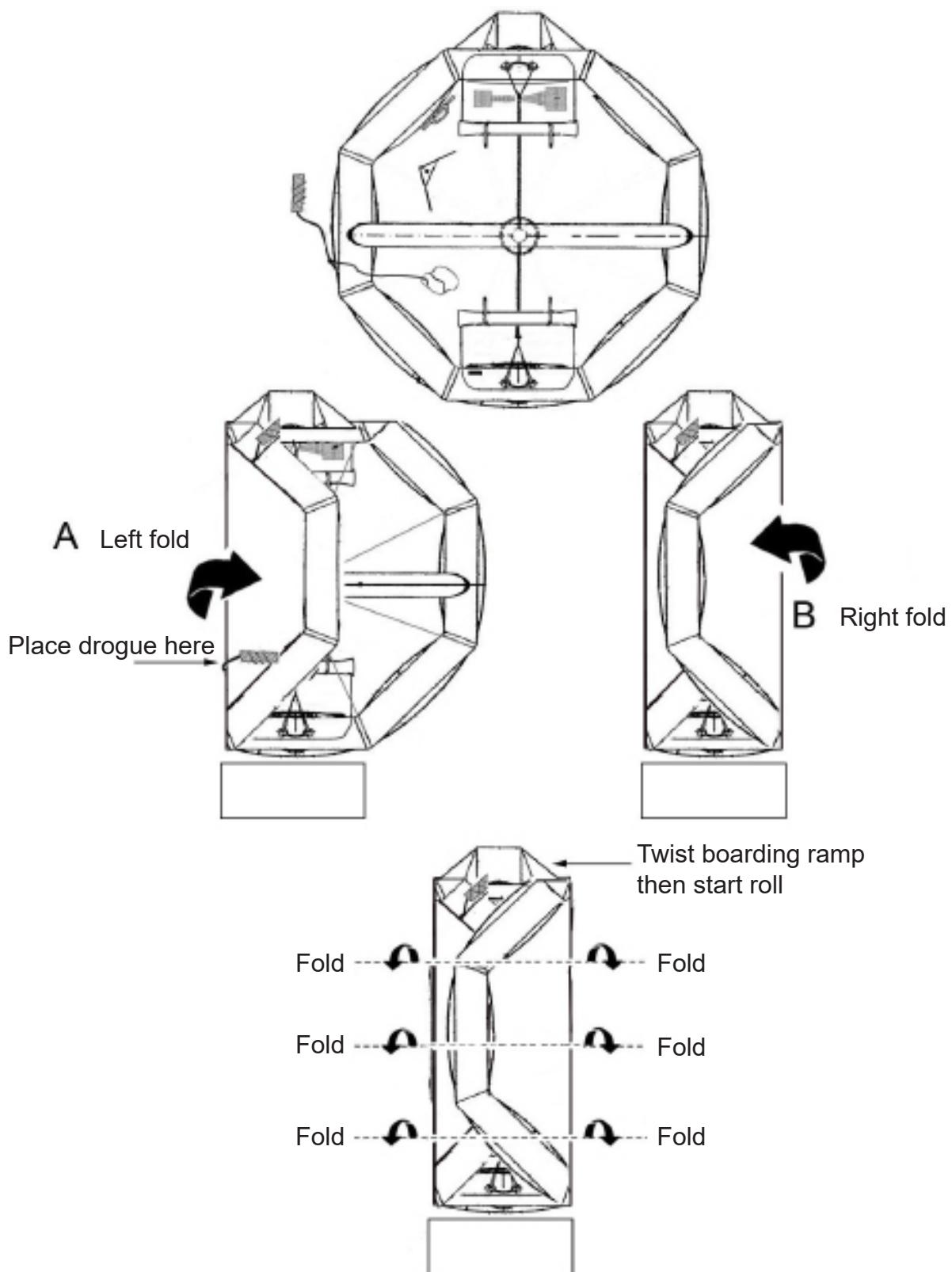


FIGURE A7-22
10-12 PERSON - Folding the liferaft



FIGURE A7-23
Wrap H-pack over liferaft



FIGURE A7-24
Heat seal

2.51 Prepare the 150 mm long welding hand tool (see listing Chapter 10).

WARNING: THE TOOL AND WELDED AREAS ARE VERY HOT. BE VERY CAREFUL WHEN USING THE SEALING TOOL TO AVOID INJURY. USE GLOVES.

2.51.1 Connect the tool to a suitable mains outlet. Select setting THREE. Do not touch the tool for 5-10 minutes to allow the tool to stabilise.

2.51.2 Test welds are to be carried out on a piece of sample H-Pack to ensure the tool is at the correct temperature and is functioning correctly.

Test the welds by gently pulling the welded edges apart. They must be firmly welded to each other. Repeat if in doubt. Avoid pleats if possible.

2.52 The two sheets of the H-Pack are joined together using the pre-heated welding tool. This tool is to be used as follows.

2.52.1 Starting at the left corner of the H-Pack, place the two sheets inside the tool and clamp the jaws of the tool together. Squeeze the tool handles together firmly for 5-10 seconds, then release hand pressure.
Refer to FIGURE A7-24.

2.52.2 Seal the two sheets together along the 150 mm section, (the length of the tool). Slide the tool along the length of the sheet and clamp again to seal the next section.

NOTE: Overlap each weld by at least 10 mm lengthwise to make sure that there are no unsealed gaps left between the sheets.

2.52.3 The heat seal must be completed so that it leaves 15 mm nominal weld width (minimum 10 mm) from the edge of the H-Pack.

CAUTION: BE VERY CAREFUL WHEN YOU SEAL THE CORNERS OF THE H-PACK. MAKE SURE THAT THEY ARE CORRECLY WELDED.

2.52.4 The heat-sealing tool should be worked around the perimeter of the H-Pack until it is completed enclosed.

2.52.5 Test the welds by gently pulling the welded edges apart.
They must be firmly welded to each other. Repeat if in doubt.

2.53 Attach the identification tube secuely to the H-Pack. Refer to FIGURE A7-25.

2.54 Remove the vacuum valve plug and insert a vacuum line with correct adaptor.

2.55 Remove the painter sachet from its temporary position on the side of the container.

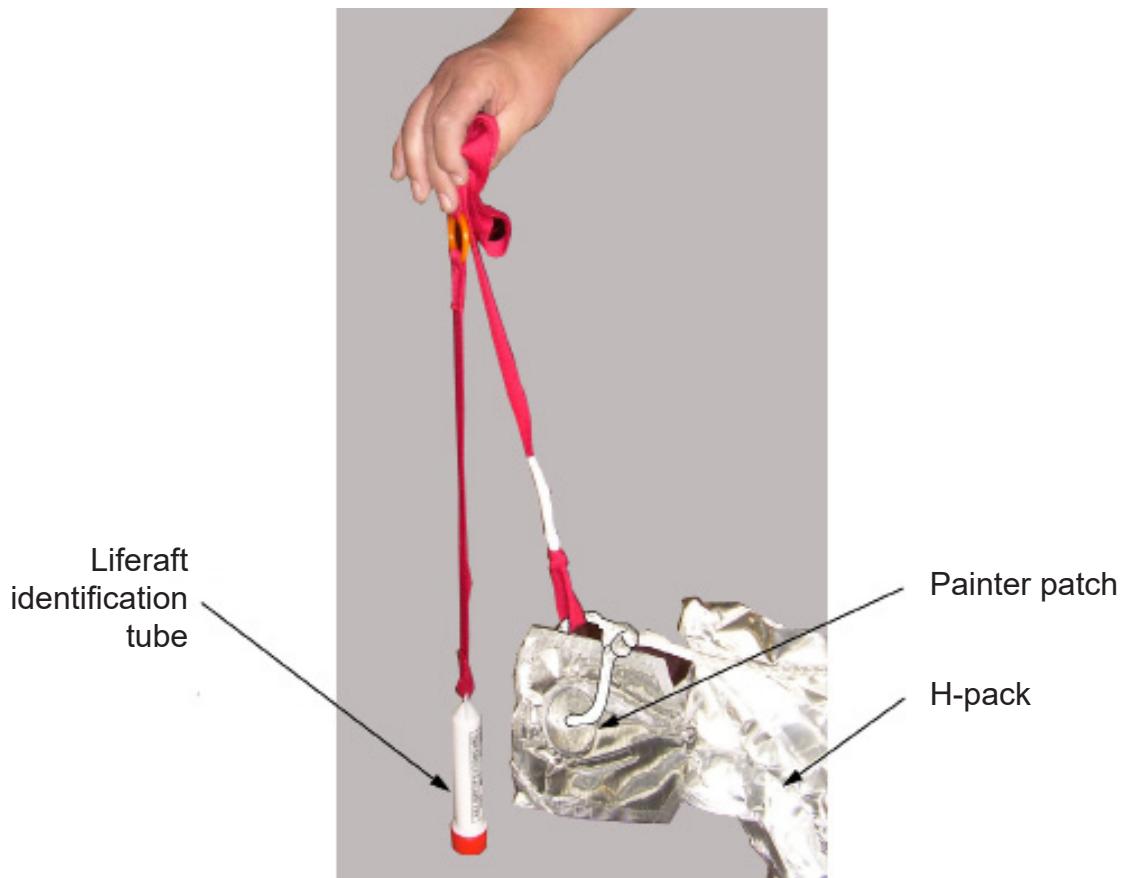


FIGURE A7-25
Tie identification tube to painter patch

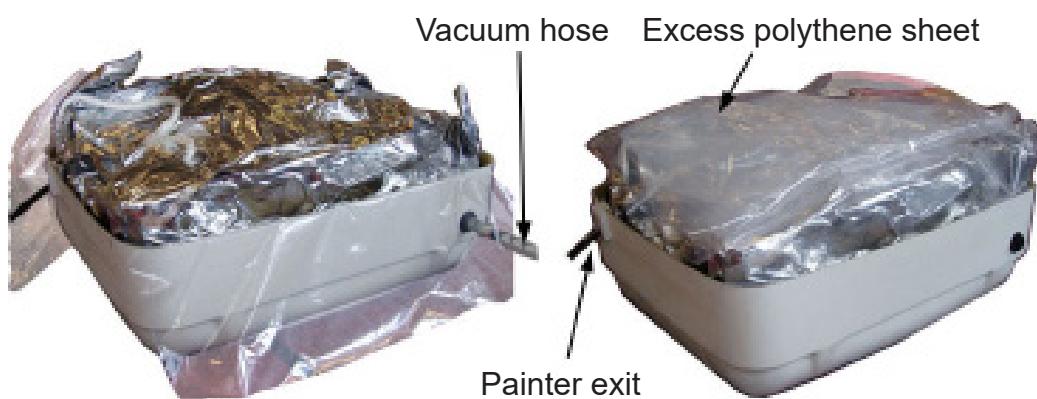


FIGURE A7-26
Vacuum H-Pack and wrap polythene sheet

- 2.56 Place the painter sachet along the back of the container. Attach the painter sachet to the H-Pack, using TA175 tape.
- Make sure that the painter cord is in line with and near to the painter exit hole.
 - Make sure that the painter cord can freely exit the sachet.
 - Adjust the painter sachet extension so that the distance from it to the painter exit is between 100-150 mm (4"-6").
- 2.57 As the H-Pack is being vacuumed, use a soft rubber mallet to shape the liferaft so that it will fit easily within the boundaries of the container,
- 2.58 If you find a leak, repair it with the heat sealing tool.
- 2.59 If the leak cannot be found or repaired, please refer to this Appendix 7, Section 3, Test procedures, Repair to the H-Pack.
- 2.60 When the H-Pack has been sealed tight, please refer to this Appendix 7, Section 3, Test procedures. Perform the Post-Operational Packing Vacuum Test (POPVT), before placing the lid onto the container.
- 2.61 If the POPVT is successful, wrap the remainder of polythene sheeting around the outside of the H-Pack. Place any excess on top of the H-Pack.
Refer to FIGURE A1-26.

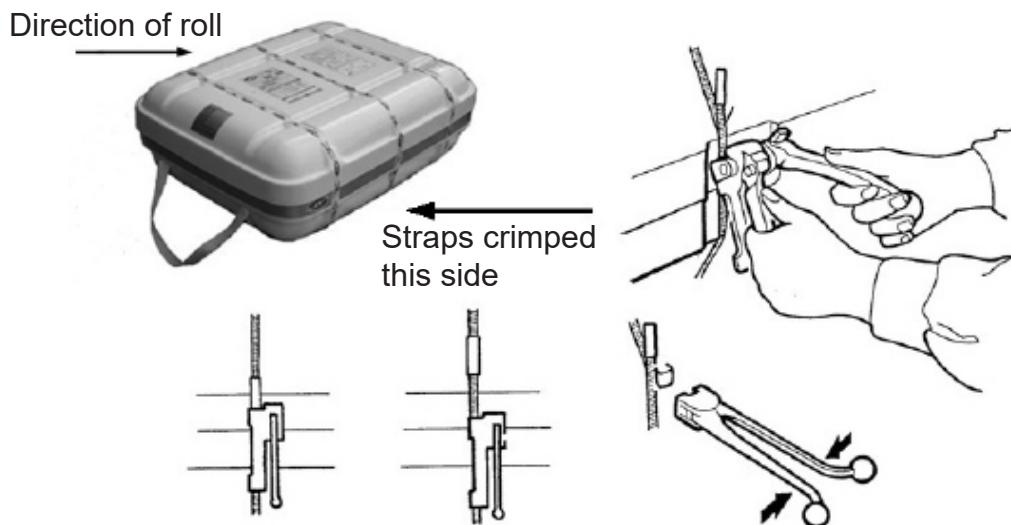


FIGURE A7-27
Crimp straps

WARNING: THE OPERATING MECHANISM IS NOW ARMED.
BE VERY CAREFUL DURING THE STEPS THAT FOLLOW.

- 2.62 Put the top half of the container over the H-Pack.
- 2.63 Please refer to this Appendix 7, Section 3, Test procedures, to perform the post operational packing vacuum test, (POPVT).
- 2.64 If the POPVT is successful, position the Identification tube ring at the edge of the container. Tape it securely into place.
- 2.65 Check that the painter retaining block has not become displaced.
- 2.66 Use ratchet straps to carefully pull the top half of the container into position.

WARNING: WHEN YOU TENSION OR CRIMP A STRAP, STAND TO ONE SIDE OF THE STRAP. USE PROTECTIVE CLOTHING AND EYE PROTECTION. MAINTAIN CORRECT FOOTING AND BALANCE WHEN YOU USE THE EQUIPMENT. USE SHORT HAND STROKES ONLY.

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

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

- 2.67 Obtain the straps and crimps. Tension and crimp each strap as follows:
 - 2.67.1 Adjust the ends of each strap so that the outermost strap end is facing upwards and is approximately 25 mm(1") above the rim of the container. Refer to FIGURE A7-27.
 - 2.67.2 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 using the crimping tool. Refer to FIGURE A7-27.

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

- 2.68 Put 'DO NOT CUT' tape over the top of the straps in each groove of the container.

- 2.69 Remove the ratchet straps.
- 2.70 This completes the packing sequence for the Flat-Pack, Throwover liferaft. The container is now ready for labelling. Please refer to Section 3 of this Appendix 7, for container labelling.

3. Test procedures

3.1 Post-Operational Packing Vacuum Test

CAUTION: SILVER SERIES LIFERAFTS MUST ONLY BE TESTED USING THE CORRECT MANOMETER.

After every service, each liferaft must be subject to this test. This ensures that the liferaft's hermetic seal has not been compromised during service. A record of this test must be completed on a form similar to that given in Chapter 5, TESTING AND TROUBLESHOOTING.. Such records must be kept by the service station for a minimum of 10 years after the service date.

These records must be available on demand, for inspection by staff of Eurovinil. A similar record must be made when a service station operationally packs a new liferaft.

Do this test after the top half of the container has been installed and the straps/crimps are installed. If desired the technician is permitted to perform this test prior to the installation of the container upper half. This will be an additional test and does not need to be recorded but does not negate the requirement to perform the official test.

3.2 Persons permitted to perform test

The Post-Operational Packing Vacuum Test may only be completed (including recording – see subsequent Section) by two technicians who are trained, qualified and competent in packing Eurovinil liferafts in question.

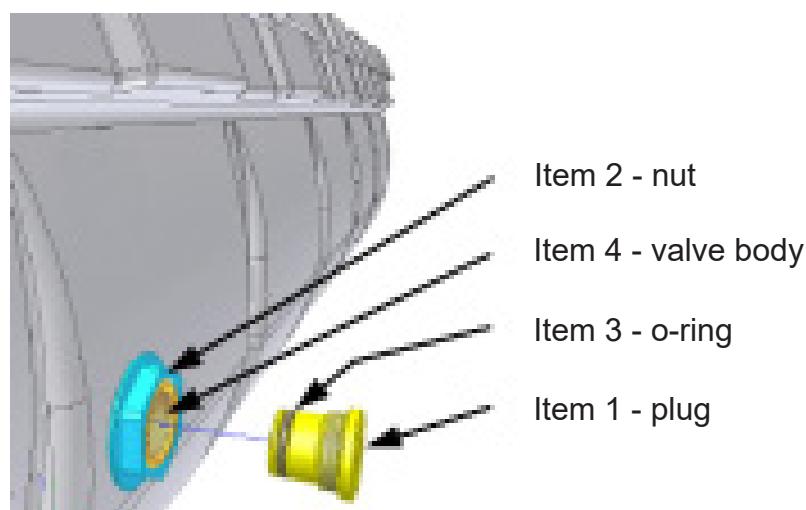


FIGURE A7-28
Exploded diagram of vacuum valve

3.3 POPVT Details

- 3.3.1 Ensure the nut, (Item 2 FIGURE A7-28), has been torqued correctly. Please refer to Chapter 1, TABLE 1 for correct torque values.
- 3.3.2 Remove Plug, (Item 1 FIGURE A7-28), using the correct tool and a suitable 3/8" square drive wrench.
- 3.3.3 Insert a standard airline A8 adaptor into the vacuum plug hole. Connect the airline to a vacuum capable of sustaining 5 psi (gauge).
- 3.3.4 Vacuum down the H-pack to between 5-6 psi, through the point from which the plug was removed.

CAUTION: A VACUUM OF 6 PSI MUST NOT BE EXCEEDED. WORK QUICKLY THROUGH THE FOLLOWING STEP ONCE VACUUM IS APPLIED. DO NOT LEAVE THE VACUUM ON FOR MORE THAN 20 MINUTES AT A TIME.

- 3.3.5 Record the "Start Pressure".
- 3.3.6 Do not touch the liferaft for at least five minutes.
- 3.3.7 Record the "End Pressure".

NOTE: "End Pressure" must not be corrected for atmospheric/temperature fluctuations. During the five-minute test it is permissible to temporarily bung the valve body using either the plug provided with the H-pack, or a clean rubber bung from a standard Leafield A8 top-up valve. If using the plug, this will form a reliable temporary seal when hand-tightened.

- 3.3.8 Calculate the % gain of pressure (equal to the percentage loss of vacuum). This is calculated as follows:

$$\% \text{ gain} = 100 \left\{ \frac{(\text{Start Pressure} - \text{End Pressure})}{\text{Start Pressure}} \right\}$$

- 3.3.9 Insert a deflator pin into the vacuum valve body and leave the liferaft to settle to atmospheric pressure. (This takes approximately 5-10 minutes). When atmospheric pressure has been reached, a pressure reading will return 0 psi
- 3.3.10 Fit the plug provided with the H-Pack (Item 1 FIGURE A7-28). Torque plug into vacuum valve body, using the correct tool and a calibrated 3/8" square drive torque wrench. Ensure that silicone grease does not come into contact with any threadforms on the plug or vacuum valve body.

NOTE: The plug supplied with H-Pack has an integral O-ring (Item 3 FIGURE A7-28). Silicone grease is already provided on the O-ring. This is sufficient for re-fitting the plug directly, provided the plug has been kept free of contaminants and grease provided hasn't been wiped off. If in any doubt, remove the O-ring using a suitable non-sharp implement and discard. Clean the plug using a clean lint-free cloth and refit a new O-ring coated liberally with silicone grease.

3.3.11 Pass/Fail Criteria

RAFT SIZE (persons)	6	8	10	12
PASS CRITERIA - % GAIN MUST NOT EXCEED	30	35	50	50

3.3.12 Results of the Post Operational Packing Vacuum Test, shall be recorded on the testing card. Refer to section 5. The Start Pressure, End Pressure and % gain are to be recorded. Pass/Fail must be deleted as appropriate. The operational technician or inspector's stamp must be put on the form.

3.4 Repair to the H-pack

If the container fails the vacuum pressure tests, please carry out the following steps:

- 3.4.1 Re-apply the vacuum test and check /listen for leaks around the H-Pack.
- 3.4.2 Check all welded seams, operating head seals, indicator valve and vacuum valve.
- 3.4.3 If a leak is detected, repair it with the heat sealing tool.
- 3.4.4 Finish the packing process.
- 3.4.5 Repeat the Post Operational Packing Vacuum Test.

4. Container labelling

- 4.1 Check that all labels are positioned correctly and attached securely.
Refer to FIGURE A7-29.
- 4.2 Please refer to Chapter 11, for container label identification.
- 4.3 Record the liferaft details onto the liferaft identification label and insert it into the liferaft identification tube. Check for legibility and correct details.
- 4.4 Flake any excess tether webbing.
- 4.5 Put the liferaft identification tube and flaked excess tether webbing between the container strapping and the container.
- 4.6 Only do the step that follows for brand new liferafts sent out by Eurovinil.
 - 4.6.1 Tape the IAL compact disc to the container.
- 4.7 This completes the packing sequence and the liferaft is now ready for installation.

5. Records of post operational vacuum test

- 5.1 Record the results of the post operational packing vacuum test on the testing card. Refer to FIGURE A7-29.

RECORDS OF POST OPERATIONAL PACKING VACUUM TEST Service Station Name
 (As defined in Service Manual M282 P/n 08807009) Service Station ID No. _____

Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (psi)	End Pressure (psi)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Pass criteria is dependent on raft size - Refer to relevant manual for details. 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 made available on demand for inspection by Eurovinil staff.							

 FIGURE A7-29
 Test card

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Appendix 8

Servicing a 13 Person Capacity Liferaft

Section	Title	Page
1.	General	3
2.	Embodyment date.....	3
3.	Equipment affected	3
4.	Parts required	3
5.	Equipment / Tools required	3
6.	Action	3



MARINE MKIV
SERVICE MANUAL

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1. General

- 1.1 To accommodate a weight of 98 kg per person, some off-shore appliances require a 13 person liferaft.

2. Embodiment date

- 2.1 Do this at the annual service of any 13 person liferaft.

3. Equipment affected

- 3.1 Marine MKIV, 13 person liferaft

4. Parts required

- 4.1 None.

5. Equipment / Tools required

- 5.1 None.

6. Action

- 6.1 Servicing of all MKIV 13 person liferafts must be serviced in accordance with the MKIV 16 person liferaft.
- 6.2 Apply the E-Pack items and quantities as used for the 16 person liferaft.

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Appendix A-9

DSB LR07L Davit-launch Liferafts

Davit-launch liferafts packed in this configuration have an alternative launching method compared to that defined in Chapter 8, ASSEMBLY.

NOTE: This Appendix applies to packing Davit-launch liferafts ONLY.

NOTE: Throwover liferafts are packed in accordance with Chapter 8, ASSEMBLY.

NOTE: This appendix is for the standard packing of a DSB LR07L Davit-launch liferaft. To pack a Davit-launch liferaft in accordance with the KLAPPE method please refer to Chapter 8 of this manual.

Section	Title	Page
1	Container preparation	2
2	Packing a standard DSB LR07L	4
	Davit-launch liferaft into a container	
3	Container labelling	20

1. Container preparation

- 1.1 The container seal, fitted to the top container half, must be replaced at every service. Use grey self adhesive foam strip. Refer to FIGURE A9-1A.
- 1.2 Protective foam blocks are required in the top container half, for the 16 person liferaft only. Please refer to TABLE A9-1A.
- 1.3 Put a protective foam block to the inside of the container.
Refer to FIGURE A9-1B.
This protective foam block prevents the cylinder operating head from impacting the container side during handling and deployment.
- 1.4 The two yellow DL straps must be placed in the container (before the polyethylene sheet) with the male connectors to the front. Both the yellow DL straps must be able to go around the cylinder.
- 1.5 Line the bottom half of the container with a 2.3 m polyethylene sheet.
Refer to FIGURE A9-1B .

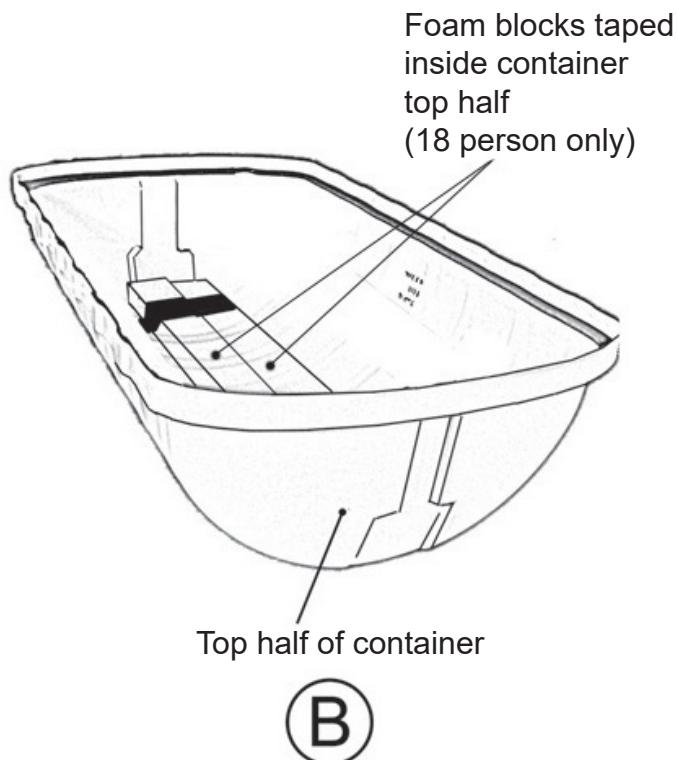


FIGURE A9-1A
Preparation of container MK 14

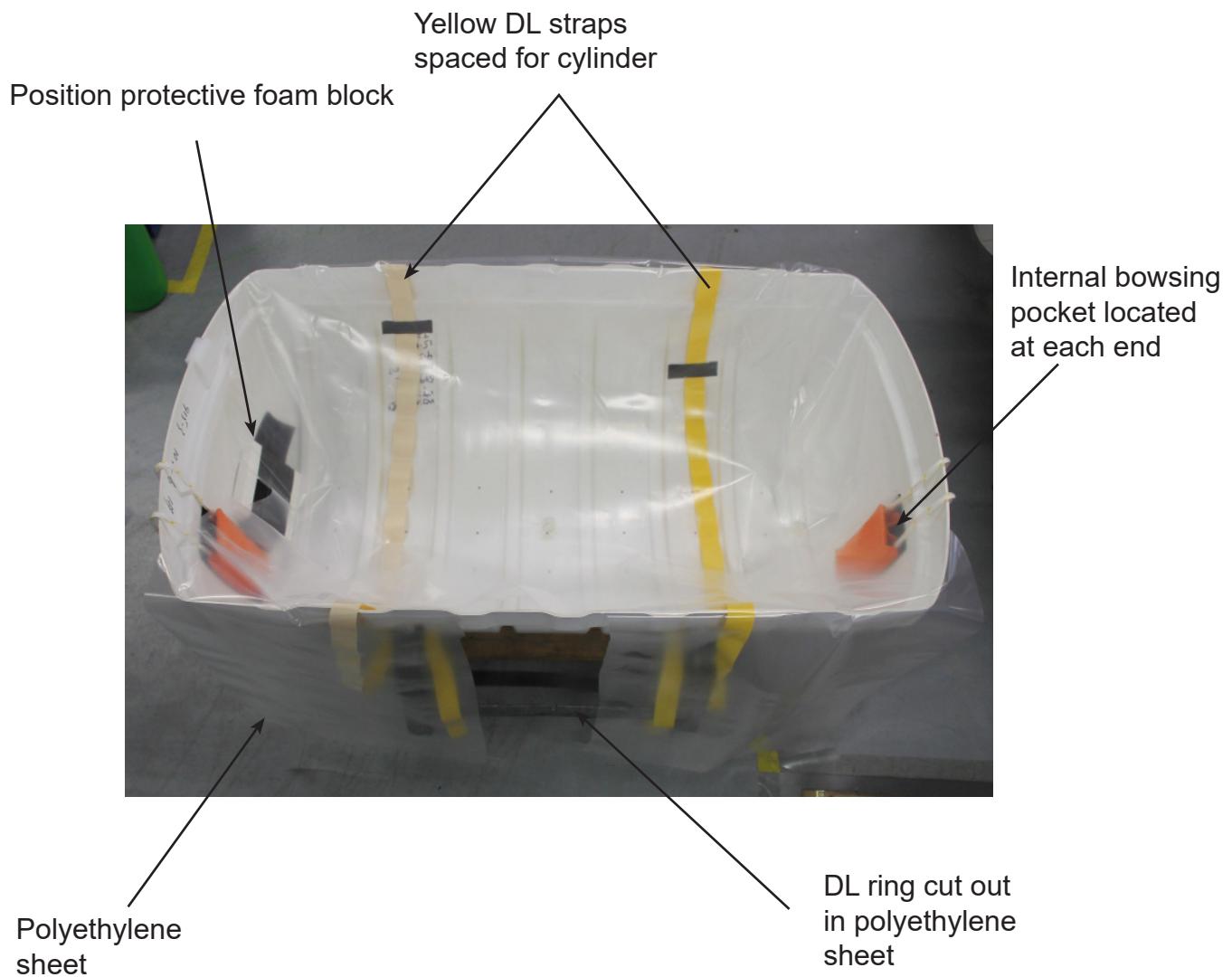


FIGURE A9-1B
Preparation of MK 14 Size 17 DL container base

Protective foam blocks		
MK 14 Size 17	Throwover	Davit-launch
Liferaft size	16	16
A-Pack	2	2

TABLE A8-1A
Number of protective foam blocks required

- 1.6 Make sure that the polyethylene sheet overlaps the front edge of the container by 200 mm. Use temporary lengths of tape to secure the polyethylene sheet in place.

1.6.1 Drainage holes/slits:

- (a) Drainage holes are made in all containers.
Refer to FIGURE A9-1C.
These drainage holes allow any build up of water to escape.
A polyethylene sheet is then put inside the container before the liferaft is rolled inside.

CAUTION: WATER CAN COLLECT INSIDE THE LIFERAFT IF DRAINAGE SLITS ARE NOT CREATED IN THE PLASTIC SHEET.

- (b) Check that the bottom of the container has drainage holes made.
(c) Line the bottom half of the container with a polyethylene sheet.
Refer to FIGURE A9-1D.
(d) Make sure that the polyethylene sheet overlaps the front edge of the container by 200 mm (8").
(e) Locate all drainage holes in the bottom of the container.
(i) Make a short slit in the polyethylene sheet where it aligns with the container drainage holes. Refer to FIGURE A9-1D.

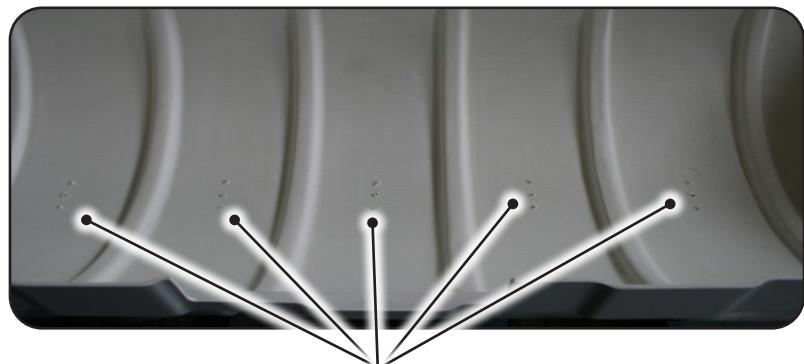


FIGURE A9-1C
Container drainage holes (cylindrical shown)

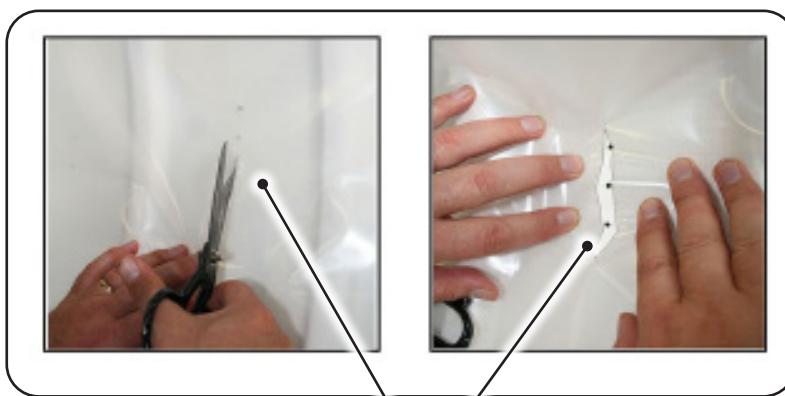


FIGURE A9-1D
Make a slit in the plastic sheet

CAUTION: DO NOT USE ANY OTHER PACKING METHOD.

2. Packing a standard DSB LR07 Davit-launch liferaft into a container

- 2.1 Put 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. Make sure that all cordage is neat and tidy.

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

- 2.1.1 Connect a vacuum device to a deflation adapter and evacuate all air from each compartments. Re-cap the inflate/deflate valves in each compartment.
- 2.1.2 As each chamber is evacuated, adjust the buoyancies so that they lie flat on each other.
- 2.2 Join the lifting bridle cords into four equal groups, at their mid point, using velcro tapes. Do this for each quadrant of the liferaft. Refer to FIGURE 801. This will keep cords away from the door openings and will also prevent entangling.
- 2.3 Refer to **Appendix 12** for guidance on installing and checking a Leaflet GIST operating head.

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

- 2.4 Upturn the edge of the liferaft to reveal the cylinder stowage pocket/straps. Refer to FIGURE A9-2. Slide the cylinder into the cylinder stowage arrangement, taking care not to trap the righting strap.

The cylinder must be orientated, so that the upper buoyancy operating head outlet runs parallel with the base of the liferaft while the other runs perpendicular towards the water. Refer to FIGURE A9-2.

- 2.5 Attach the cord to the cylinder neck.

- 2.5.1 Cylinder pockets: Using the cord attached to the cylinder stowage pocket, tie the cylinder neck securely. Put 2 turns around the cylinder neck and tie with a reef knot and 2 half hitches.

FIGURE A9-1E
<NOT USED>

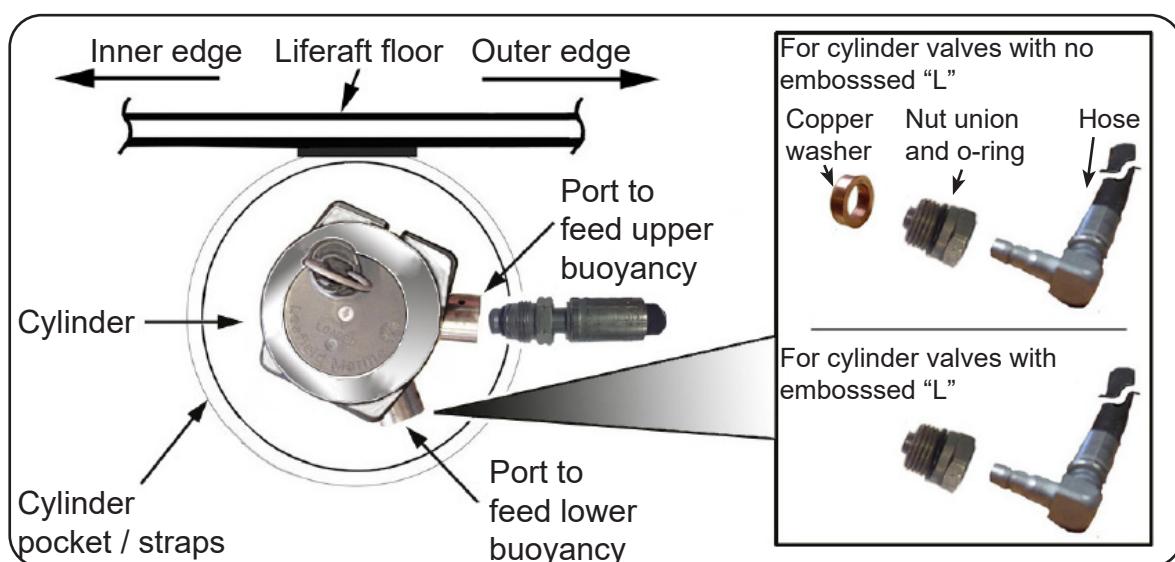


FIGURE A9-2
Cylinder attachment to liferaft

- 2.5.2 Cylinder straps: Tie the cylinder neck securely to the adjacent loop patch on the floor. Use a reef knot and several half hitches with 2 turns of 238 kgf / 525 lbf nylon cord, 450 mm long and tape the flying ends.
 - 2.6 Remove the recoil / transit caps from the operating head.
Refer to FIGURE A9-1E.
 - 2.7 Connect up each inflation hose. Refer to **Appendix 14** for guidance on inspection the inflation hose. Refer to FIGURE A9-2. Torque the hose connections as stated in Chapter 1, DESCRIPTION AND DATA TABLE 101.
 - 2.8 Insert two protection pads onto operating head and tape together, using 4 strips of 100 mm (4") adhesive tape. Refer to FIGURE A9-3.
Lay the liferaft flat on the table again.
 - 2.9 Mount the lower half of the container on a suitable strong trolley. Position the container next to the table with the two orange bowsing line pockets away from the table. Put operating head protective foam on the left side. 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 make rolling and packing easier.
 - 2.10 Grasp the edge of the liferaft and with the cylinder, drag the assembly over the container so that the cylinder lies correctly in the container.
Refer to FIGURE A9-3.
 - 2.10.1 MK 10 CONTAINER:
The top edge of the cylinder must be level with the inner container lip.
Refer to FIGURE A9-4 Detail A.
The operating head must be 100 mm from the container end.
 - 2.10.2 MK 14 CONTAINER:
The cylinder must be placed in the centre and with the operating head 100 mm from the container end. Refer to FIGURE A9-4 Detail B.
 - 2.11 The cylinder must be placed evenly, on top of the two yellow DL straps. This makes sure the that cylinder will lift out of the container, with the liferaft, during Davit-launch Adjust the straps accordingly so that the cylinder body is well placed onto them. Refer to FIGURE A9-3. Tape the straps into place.
- CAUTION:** MAKE SURE THAT THE TWO YELLOW DL STRAPS ARE CLEAR FROM THE CYLINDER NECK.

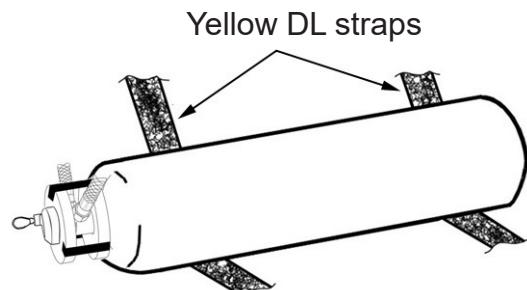
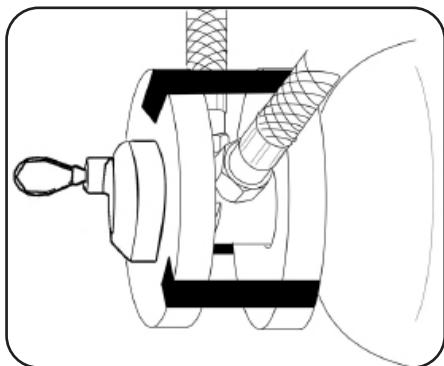


FIGURE A9-3
Operating heads protection pads

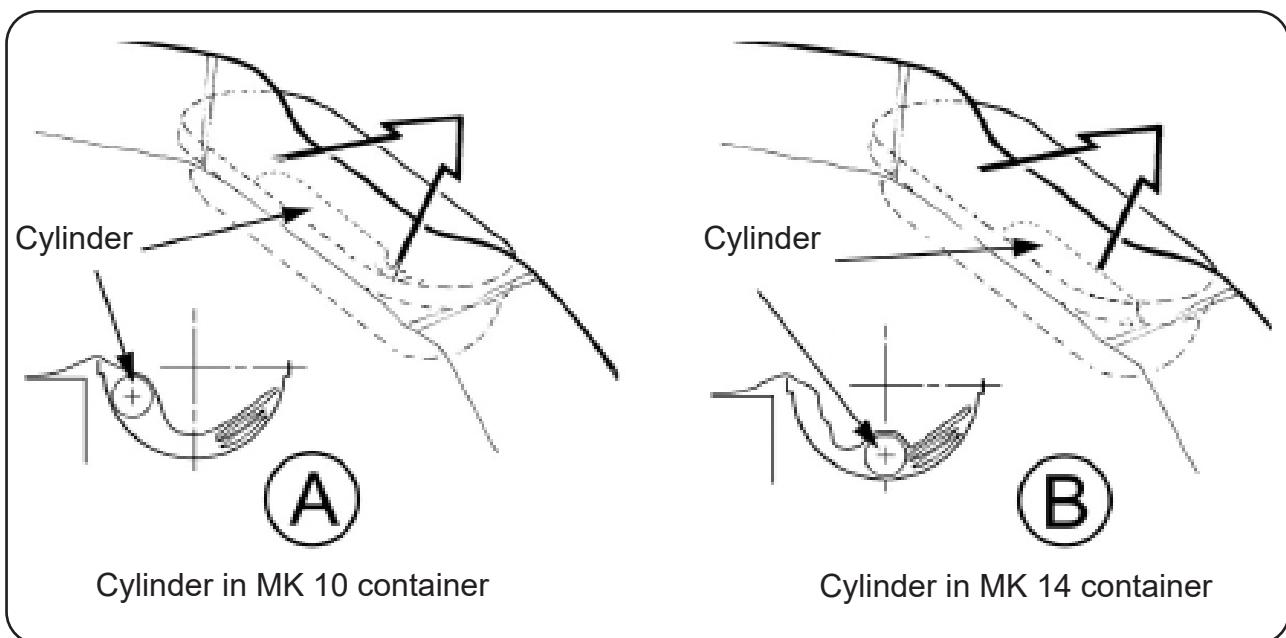


FIGURE A9-4
Cylinder position in the container

- 2.12 Push the liferaft floor area down into the recesses towards each end of the container.
 - 2.13 Pack the emergency pack valises for the liferaft.
Refer to Chapter 7, E-PACKS AND EQUIPMENT.
If present, place the valise(s) containing rations and water positioned furthest from the operating head end of the cylinder.
 - 2.14 Put the E-pack into the container first. This will help to keep the cylinder in its correct position.
- CAUTION:** MAKE SURE THAT THE E-PACKS ARE PLACED UNDER THE HAULING IN LADDER.
- 2.15 Fold back the liferaft so as to reveal the operating mechanism.
 - 2.16 Get the painter sachet. Wrap a polyethylene sheet, 915 mm × 800 mm (36" × 32"), around the end of the painter sachet and tape it in place.
The polyethylene sheet must extend over the open end of the sachet and the painter rope by at least 60 mm (2.5").
 - 2.17 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
Refer to FIGURE A9-5.

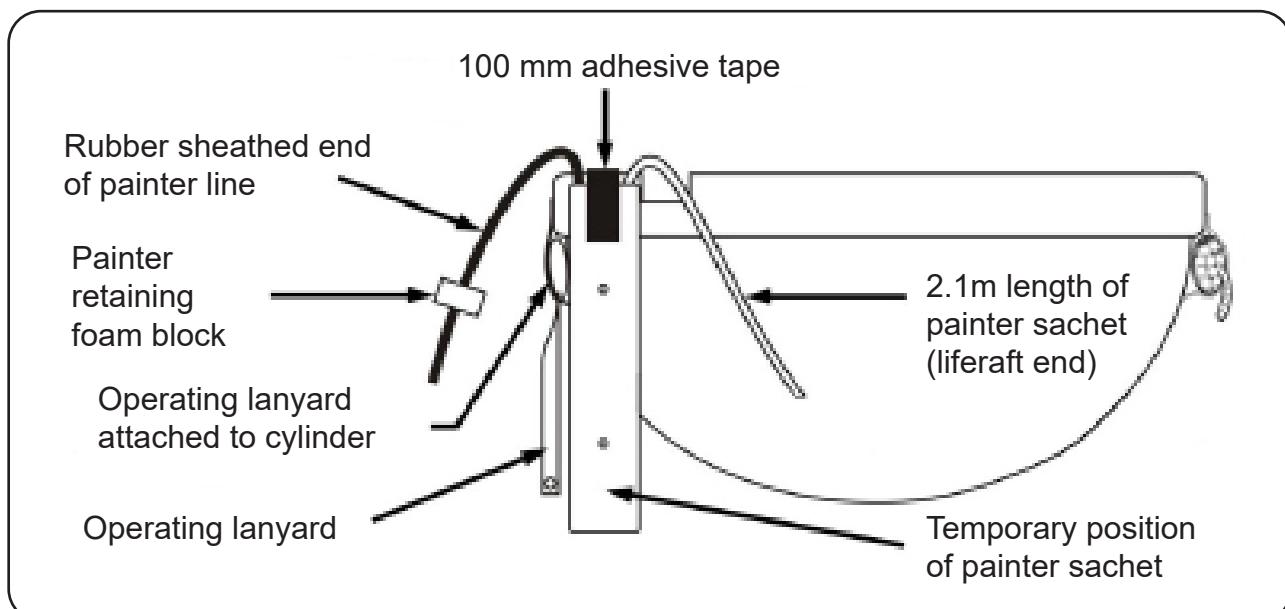


FIGURE A9-5
Attach THE operating lanyard and painter sachet to the container

CAUTION: BE VERY CAREFUL DURING THE NEXT OPERATION IN ORDER TO AVOID OPERATING THE INFLATION SYSTEM.

- 2.18 Put a 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.
- 2.19 Make sure that 2.5 m exits the painter sachet. Pull the 1.5 m end of the painter line taut. Place a 300 mm length of layflat tubing over the painter line.
- 2.20 At the firing point (1.5 m 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. Refer to FIGURE A9-6.

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

- 2.21 Locate the painter bridle attachment cord (for 6 and 8 Person it will be the painter patch) on the lower buoyancy. Attach the liferaft end of the painter to the painter cord. Refer to FIGURE A9-7. Use a fid tool and half knot, then tape the flying end. Refer to FIGURE A9-8.

NOTE: The painter can move freely along the bridle.

- 2.22 Locate the painter attachment patch on the lower buoyancy tube. Tie the liferaft identification tube, red webbing to the patch. Refer to FIGURE A9-9. Use a bowline knot and tape the flying end.
- 2.23 Position the remaining emergency pack valises into the container. For correct positioning please refer to Chapter 7, E-PACKS AND EQUIPMENT. Use the space available to minimise the vertical excursion of the valises. Make sure that the straps on each E-pack valise are tight.

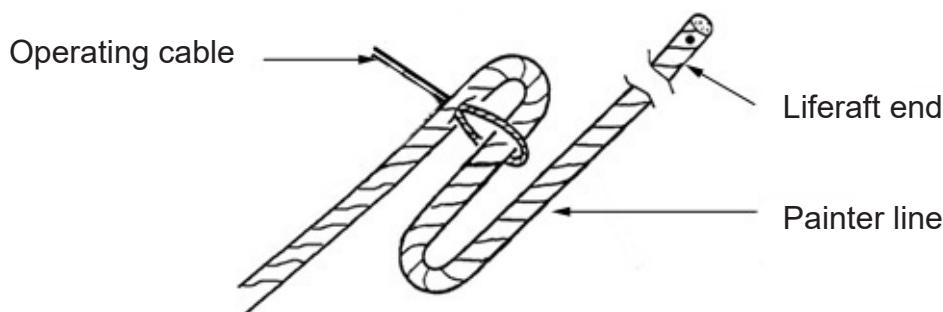


FIGURE A9-6
Tie painter line to painter patch

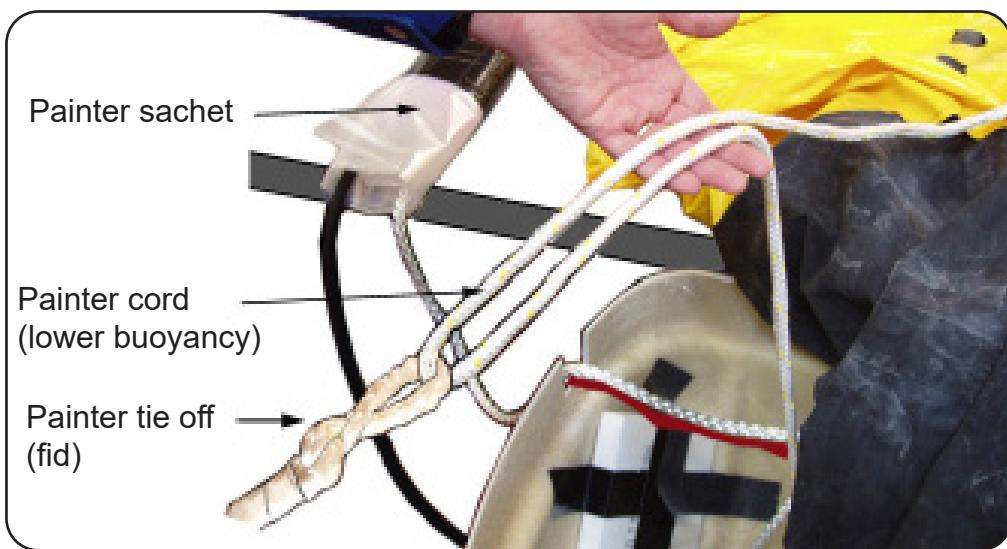


FIGURE A9-7
Tie painter line to painter patch

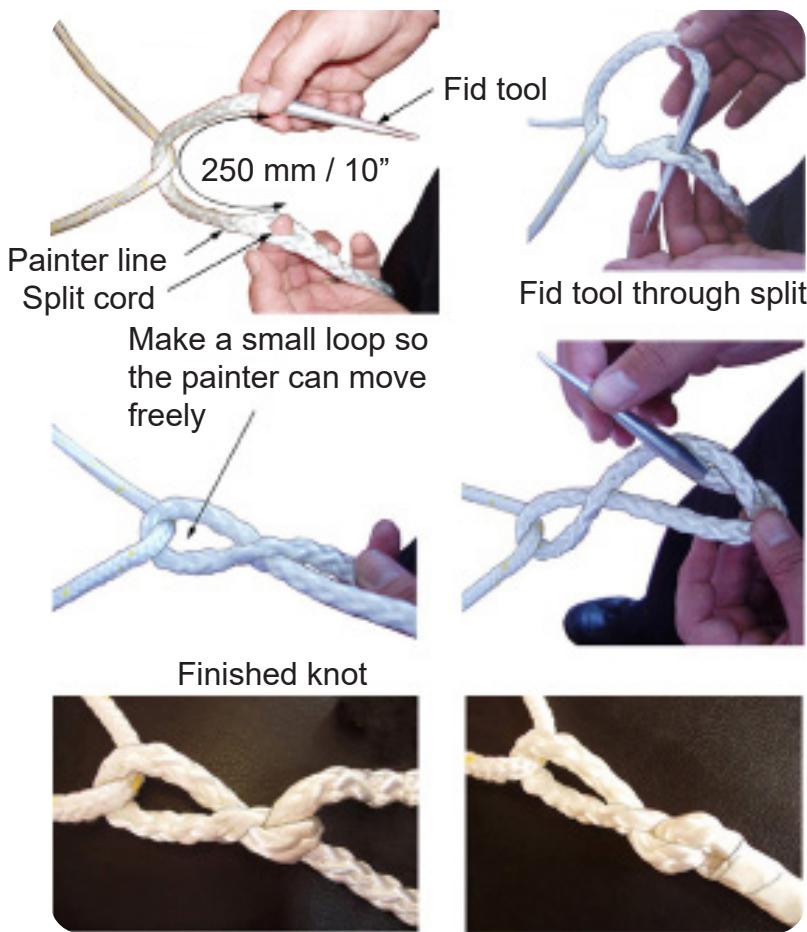


FIGURE A9-8
Use a fid to splice the painter line

CAUTION: MAKE SURE THAT THE E-PACKS ARE PUT UNDER THE HAULING-IN LADDER. MAKE SURE THAT NO PARTS OF THE CANOPY, DOOR OR ARE TRAPPED BENEATH THE PACKS.

- 2.24 Tie the bowsing lines to the bowsing patches. Use 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.
Refer to FIGURES 801 and A9-10.
Tie a figure of eight knot at the end of each bowsing line.
- 2.25 Retrieve the two bowsing line cords (which are white and yellow in colour).
Tie a bowsing line to each of the bowsing line patches on the liferaft, using a draw hitch knot. Refer to FIGURES 801 and A9-10.
- 2.26 Using 300 mm from the free end of both bowsing lines, create a bowline loop handle on the opposite end. Refer to FIGURE A9-10.
Place the bowsing line along side the container.
- 2.27 Flake the remaining bowsing line into the internal bowsing pockets.
Refer to FIGURE A9-10.

NOTE: Draw hitch knots must start "inside out". This will make the pulling action easier.

- 2.28 Secure the foot ladder to the liferaft using the velcro strap.
Refer to FIGURE A9-10.
- 2.29 Connect a suction hose to each of the three deflation points and deflate the buoyancies fully.
 - 2 at the rear door, 1 on each buoyancy .
 - 1 on the arch tube (if fitted).
- 2.30 Enter the liferaft by the rear door and connect the switch activator to the internal lamp .
- 2.31 Collect the boarding ramp foot ladder and velcro it securely to the boarding ramp. Refer to FIGURE A9-11

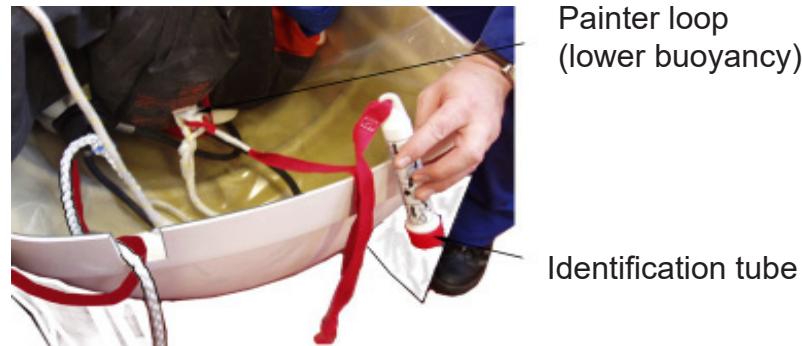


FIGURE A9-9
Tie Identification tube to painter cord

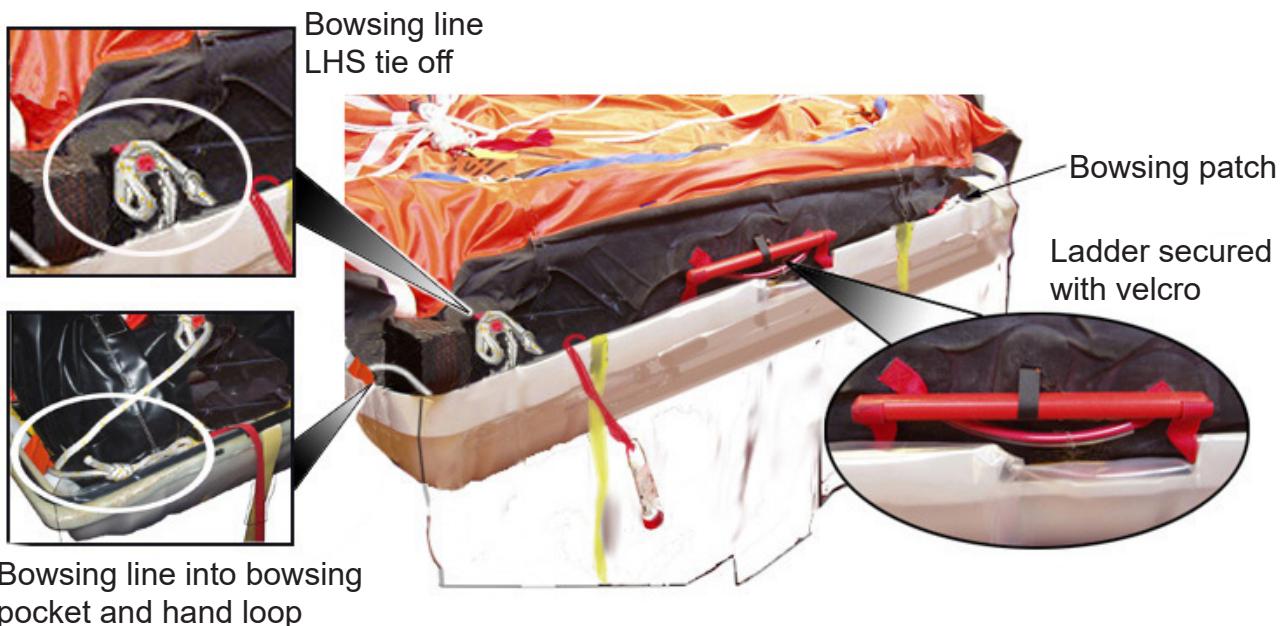
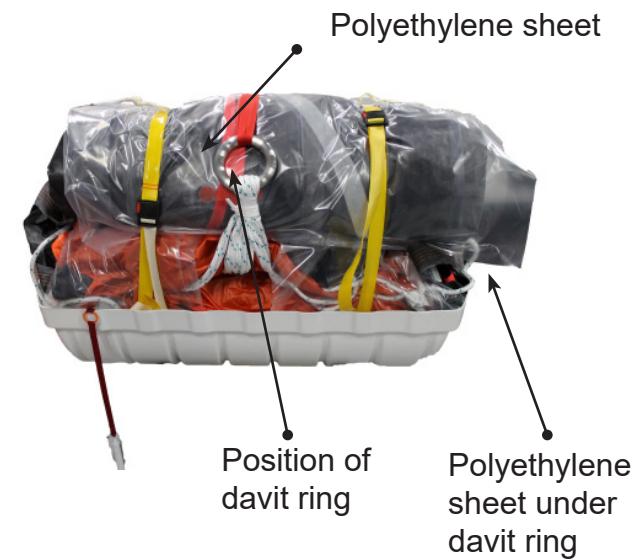


FIGURE A9-10
Secure bowsing lines and foot ladder



View of back
of container

FIGURE A9-11
Position of davit ring

- 2.32 Firmly grasp the floor and sides of the liferaft. Haul the liferaft forward, so that it covers the E-pack valises.

NOTE: The arch tube must be in line with the front of the container

- 2.33 Pull the davit ring forward. Put the leading edge of the davit ring in position as shown in FIGURE A9-11.

- 2.34 Tie a red ribbon through the davit ring using a figure of eight knot.
Refer to FIGURE A9-11.

- 2.35 Prepare to start the sequence of liferaft folding. Fold the LS of the liferaft over then back. Refer to FIGURE A9-12 and A9-13 Detail A.

- 2.36 Fold the RS of the liferaft over then back. Refer to FIGURE A9-13 Detail B.

- 2.37 Twist the boarding ramp and push it down on top of the liferaft.

- 2.38 Press down as tight as possible, roll the liferaft towards and then into the container. Refer to FIGURE A9-13.

- 2.39 Wrap the polyethylene sheeting around the outside of the folded liferaft, tucking the overlap under the fold. Refer to FIGURE A9-14.
Make sure that the polyethylene sheet does not obstruct the Davit ring or other items.

- 2.40 Fold the polyethylene cut-out flap under the davit ring. Refer to FIGURE A9-14.

- 2.41 Close and tighten both yellow DL straps by clipping them together. Keep buckles above the container edge. Refer to FIGURE A9-14.

- 2.42 Take the davit ring and place it high up onto the folded liferaft. Tape the red ribbon to the polyethylene sheet, using 50 mm strip of 100 mm black tape.
Then take each bowsing line loop and tape high on the folded liferaft using 50 mm strip of 100 mm black tape. Refer to FIGURE A9-14.

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



FIGURE A9-12
Liferaft with top half rolled

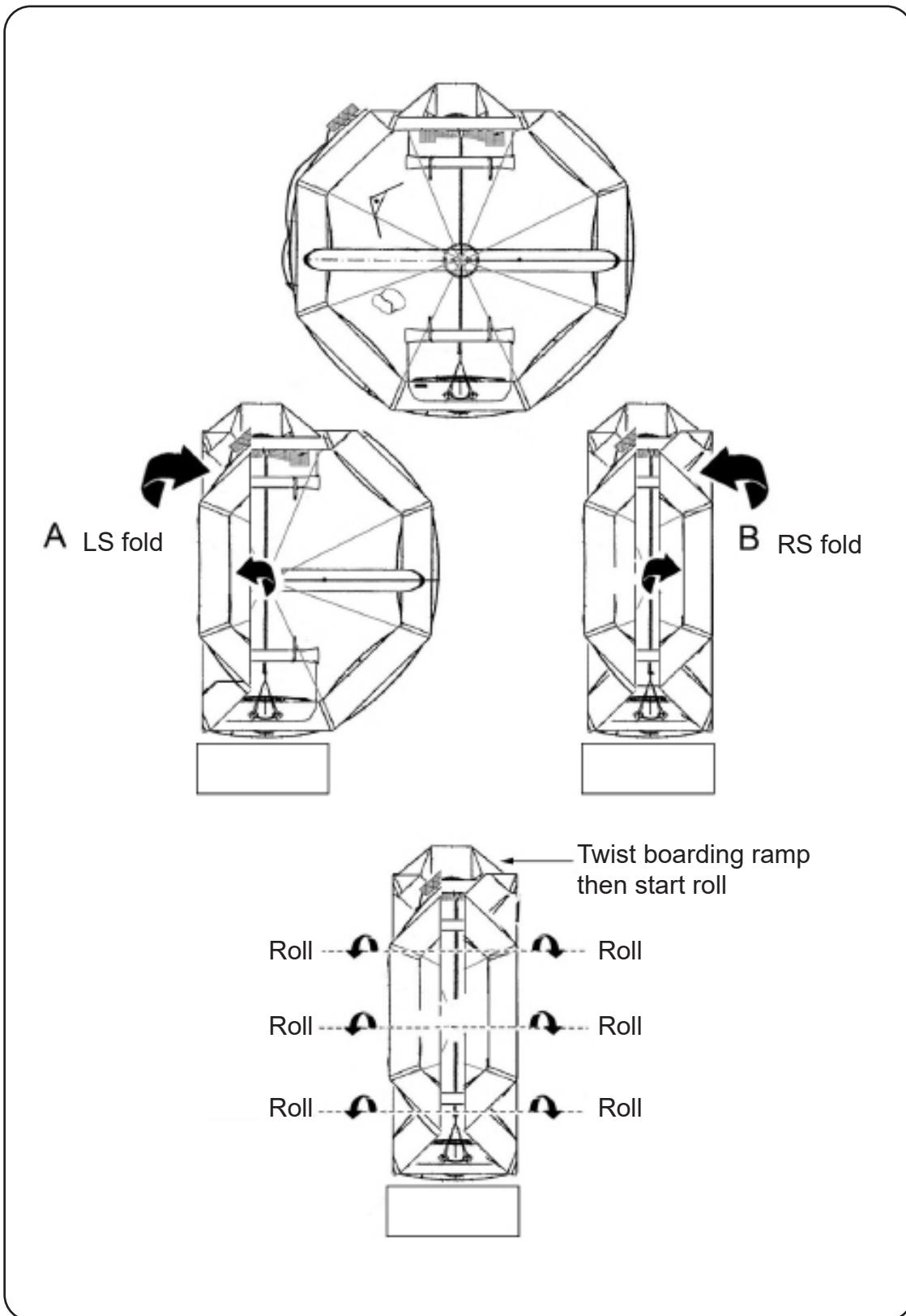


FIGURE A9-13
Fold the liferaft

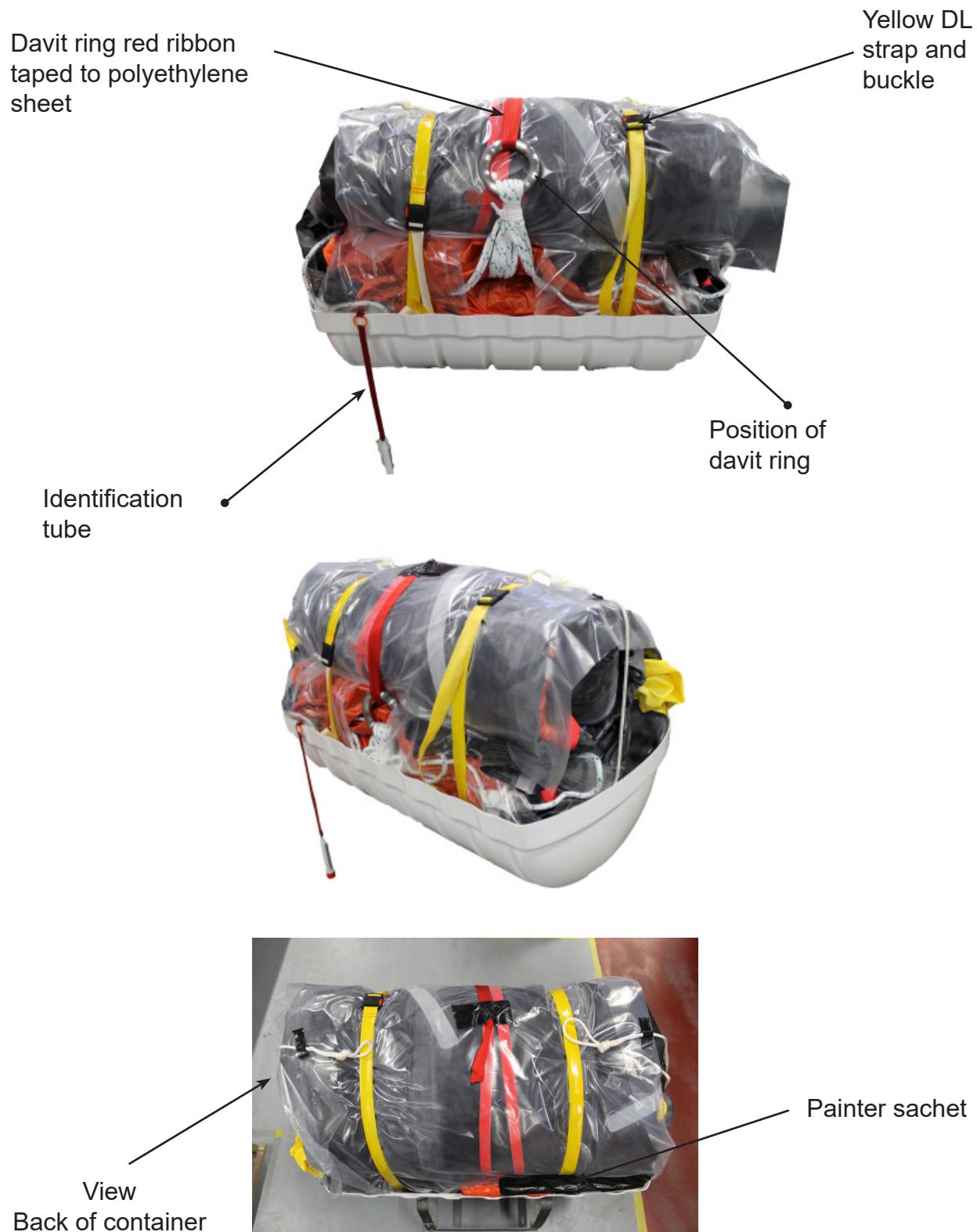


FIGURE A9-14
Position of painter sachet and davit ring

- 2.43 Place the painter sachet along the back of the container.
Refer to FIGURE A9-15.
 - 2.43.1 Make sure that the painter cord is in line with and near to the painter exit hole.
 - 2.43.2 Make sure that the painter can freely exit.
- 2.44 Secure the back of the painter sachet in place, with black tape. Tape the sachet to the polyethylene sheet. Refer to FIGURE A9-15.

CAUTION: MAKE SURE THAT THE PAINTER SACHET IS PUT OUTSIDE OF THE YELLOW DL STRAPS. IT MUST NOT BE TIGHTENED AS PART OF THE YELLOW DL STRAPS.
- 2.45 Make sure the that the open end of the painter sachet, is as near as possible to the painter exit position on the container. Refer to FIGURE A9-15.
- 2.46 Make sure 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.
- 2.47 Put the rubber sheathed end of the painter line through the painter retaining foam block. Put the painter retaining foam block into the cut-out in the container. Refer to FIGURE A9-15.
- 2.48 Put the top half of the container on top of the folded liferaft.
Refer to FIGURE A9-16.
- 2.49 Place ratchet straps around the container, making sure the straps do not cover the grooves in the container. Refer to FIGURE A9-16.

Tighten the ratchet straps uniformly around the container. Make sure that the upper half of the container mates with the lower half of the container correctly.
- 2.50 Close the rear of the container first. The yellow DL straps must be tightened alternately, each time the ratchet straps are tightened.
- 2.51 Place the excess yellow DL straps in along side of the container.

CAUTION: 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.
- 2.52 Continue closing the container 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. Refer to FIGURE A9-16.



FIGURE A9-15
Painter sachet positioning

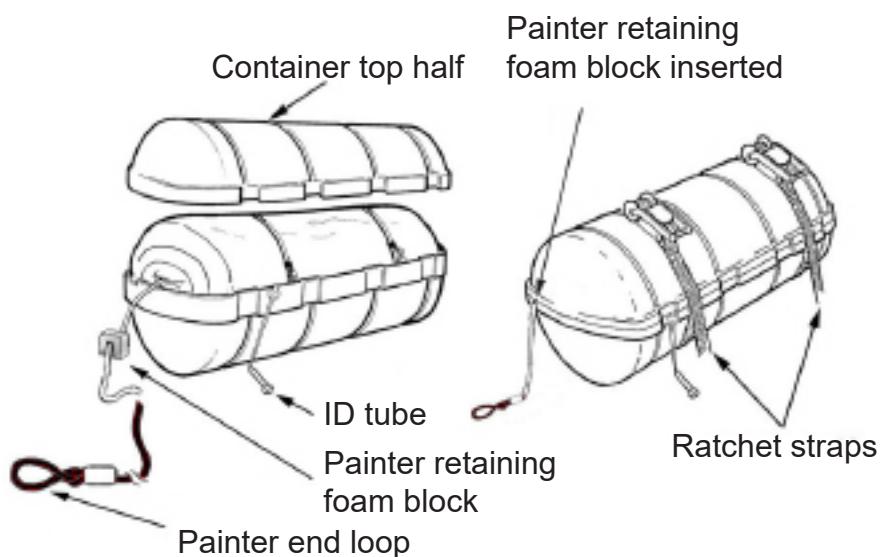


FIGURE A9-16
Container closing

2.53 Check that the painter retaining foam block on the painter line does not become displaced.

WARNING: WHEN TENSIONING OR CRIMPING STRAPS, YOU 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. REFER TO FIGURE A9-17. (I.E. ON A DL LIFERAFT THE CRIMPS ARE ATTACHED ON THE SIDE WHICH HAS THE DAVIT RING CUT-OUT).

2.54 Get the necessary number of hand loop straps and crimps.
Refer to FIGURE A9-17.

WARNING: MAKE SURE THAT THE TOP MARK HOLE ON THE HAND LOOPS FINISHES BELOW THE TOP BUCKLE BEFORE CRIMPING.

2.55 Get the metal straps and crimps. Tension and crimp each strap as follows:

2.55.1 Adjust the ends of each strap so that the outer most strap end is facing upwards and is approximately 25 mm (1 in) above the rim of the container. Refer to FIGURE A9-17.

2.55.2 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 using a crimping tool. Refer to FIGURE A9-17.

2.56 Remove the ratchet straps.

2.57 Please refer to Section 3 of this Appendix for container labelling.

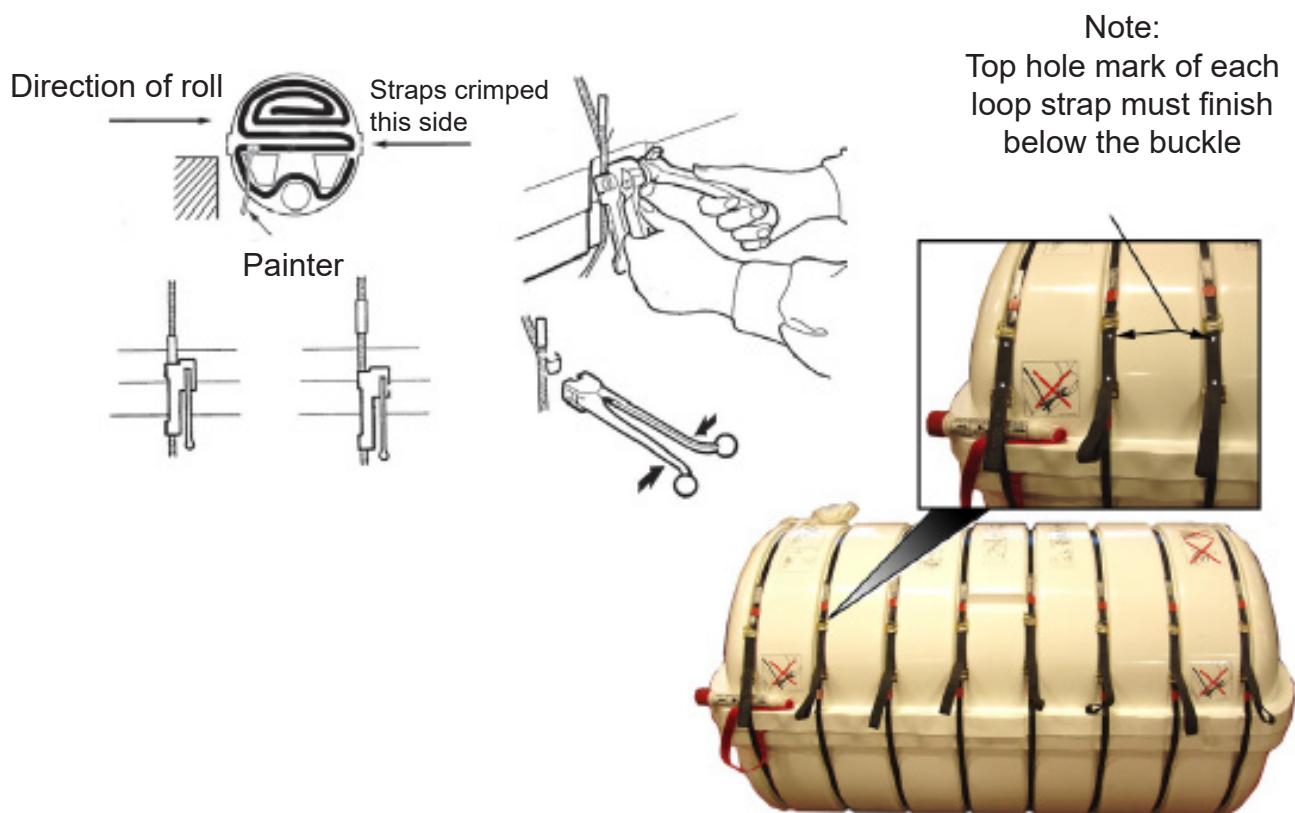


FIGURE A9-17
Crimping container straps

3. Container labelling

- 3.1 Check that all labels are attached and positioned correctly and securely. Please refer to Chapter 11, ILLUSTRATED PARTS LIST, Section 3 Container label identification and position.
- 3.2 Record the liferaft details, onto the liferaft identification label and insert it into the identification tube. Check for legibility and correct details.
- 3.3 The liferaft identification container and any excess tether webbing shall be tucked between the container strapping and the container.

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

Appendix A-10

POST OPERATIONAL PACKING VACUUM TEST RECORD

RECORDS OF POST OPERATIONAL PACKING VACUUM TEST

(As defined in Service Manual M269-00 p/n 08431009

Service Station Name _____

Service Station ID No. _____

Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)
Liferaft Serial Number	RAFT SIZE	Test Date	Start Pressure (PSI)	End Pressure (PSI)	% Gain	PASS/FAIL	Tested by (Name & Stamp)

Pass Criteria is dependant on raft size - Refer to relevant manual for details.

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 Survitec Group Ltd.

Appendix A-11

Marine Surviva Mk IV — Liferaft : Inspect and pack special bowsing line

1. Introduction

A variant of the Surviva Mk IV 25-person throwover liferaft has been equipped with a bowsing line.

An additional *bowsing* patch is attached to the bottom buoyancy chamber. When viewed from the front of the liferaft, it is positioned to the right of the cylinder, symmetric with the left painter patch. Refer to **Figure 1**.

The bowsing line is tied to the bowsing patch and its free end is retained outside the container for a length of 1.5 metres. Both ends of the bowsing line are protected with red heat-shrink tubing.

The liferaft is packed into a Mk 10 Size 9 Ferryman container (p/n 17938092) which has cut-outs for the bowsing line and painter.

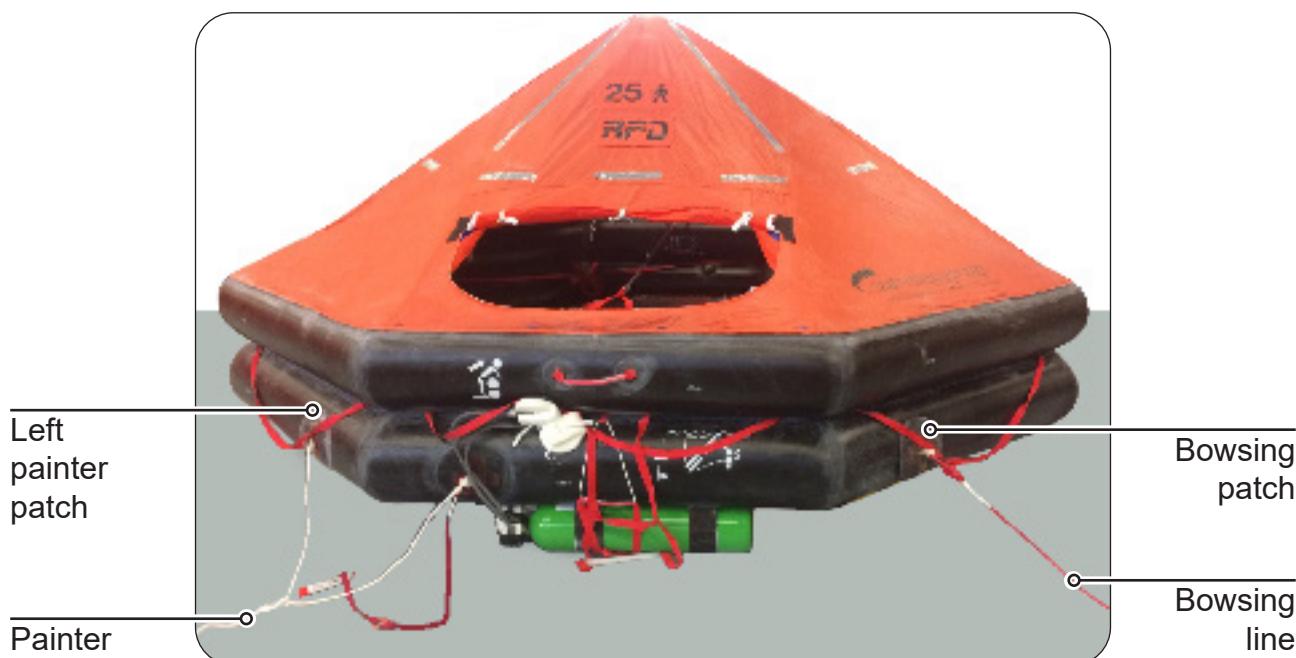


FIGURE 1
Bowsing patch

2. Equipment and vessels affected

Surviva Mk IV 25-person throwover liferafts equipped with a bowsing line.

3. Necessary parts

Part number	Description	Quantity per liferaft
51557002	Patch	1
42505003	Bowsing line sachet, 18 m	1
05779009	Heatshrink tubing, red, 19 mm	2500 mm
02096004	Self-adhesive tape, PVC, 25 mm, white	As required

If necessary, order these parts from Survitec Group.

4. Necessary equipment and tools

Standard equipment and tools for liferaft service.

5. Tasks

A. During servicing

- (1) Examine the bowsing patch. If you see damage, replace the bowsing patch.
- (2) Examine the bowsing line sachet, polythene sheet and heat-shrink tubing. If you see damage, obey 6.B. to replace the bowsing line sachet.

B. Replace the bowsing line sachet (if necessary)

- (1) Wrap a 915 × 800 mm polythene sheet around the open end of the bowsing line sachet.
- (2) Move the polythene sheet so that it extends over the open end of the bowsing line sachet by 125 ± 25 mm.
- (3) Use self-adhesive tape to attach the polythene sheet to the bowsing line sachet.
- (4) Pull 2000 mm of each end of the bowsing line from the bowsing line sachet.
- (5) Apply 500 mm of heat-shrink tubing to one end of the bowsing line.
- (6) Use a bowline knot to tie this end of the bowsing line to the bowsing patch. Wind self-adhesive tape around the knot.
- (7) Apply 2000 mm of heat-shrink tubing to the free end of the bowsing line.

C. Pack the liferaft

- (1) Put the free end of the bowsing line through the line retaining block.
- (2) Put the line retaining block into the cut-out on the bottom container half.
- (3) Adjust the bowsing line so that the line retaining block is approximately 1500 mm from the end. Make sure that the end of the heat-shrink tubing is inside the container.
- (4) Roll the liferaft towards the container.
- (5) Turn the bowsing line sachet so that it points in the opposite direction from the painter sachet and put it under the rolled liferaft.

- (6) Use self-adhesive tape to attach the bowsing line sachet to the liferaft.
- (7) Neatly hank any loose bowsing lines onto the bowsing line sachet.
- (8) Roll the liferaft into the container.
- (9) Obey M269-00 to service and pack the liferaft.

D. Installation

If the free end of the bowsing line is permanently attached to the vessel it must include a weak link for float-free capability. This weak link may be incorporated into a hydrostatic release unit system, which will maintain the full strength of the bowsing line in the non-float-free scenario.

6. Recording

- A. For each liferaft to which this service bulletin has been applied, complete the appropriate record card(s).
 - (1) Record details of the service onto the service record card.
In the appropriate field, write "SB 82/16 Ver.2 APPLIED".

Appendix A-12

Install and check Leaffield GIST operating head

- A. Put the Leaffield GIST operating head onto the cylinder valve. Refer to **Figure 1** for the correct position.

WARNING: DO NOT TURN THE LEAFIELD GIST OPERATING HEAD WHEN PUSHING IT INTO POSITION.

- B. Make sure that the Leaffield GIST operating head is fully pushed down into the correct position. Refer to **Figure 2**.
- C. Install the two clamp screws:
- (1) Put one clamp screw into each side of the cylinder valve.
 - (2) Make sure that the shaft of each clamp screw is correctly seated in the groove in the cylinder valve.
 - (3) Use a torque screwdriver to tighten the clamp screws until the gap between the clamps just begin to close. Refer to **Figure 3**.
 - (4) Do a check to make sure that the gap between the clamps is the same on each side of the operating head.



FIGURE 1
Correct position of Leaffield GIST operating head on Marine cylinder



FIGURE 2

Make sure that the Leafield GIST operating head is fully pushed down



FIGURE 3

Tighten the bolts until the gap begins to close

D. Torque tighten the clamp screws:

- (1) Use a torque screwdriver to tighten the clamp screws:

NOTE: This tool should be marked with red self-adhesive tape.
The calibrated torque '1.12 Nm' should be clearly written
on the tape.

- (a) Do one turn on the left clamp screw, then do one turn on the right clamp screw.
- (b) Do a check to make sure that the gap between the clamps is the same on each side of the operating head.
- (c) Do task 6.D.(1)(a) and (b) again until you get a torque of 1.12 Nm on each clamp screw.

CAUTION: WHEN YOU HAVE REACHED A TORQUE OF
1.12 NM, DO NOT USE A 1.12 NM TORQUE
SCREWDRIVER TO TIGHTEN AGAIN.

E. Check the gap between the clamps:

- (1) Use a set of feeler gauges to check the gap between the clamps.
 - (a) The minimum gap allowed is 1 mm each side.
- (2) If a Leafield GIST operating head does not meet the requirements detailed in task 6.E. (1) then it must be replaced with another GIST operating head. These can be purchased from Survitec Group Ltd.
 - (a) Do task 6.A thru task 6.E. (1) to install the Leafield GIST operating head.

F. Check the Leafield GIST operating head:

CAUTION: THE CHECKING PROCEDURE MUST BE COMPLETED BY ANOTHER SERVICE TECHNICIAN. IT MUST NOT BE COMPLETED BY THE SERVICE TECHNICIAN WHO INSTALLED THE LEAFIELD GIST OPERATING HEAD.

CAUTION: DO NOT USE THE SAME TORQUE SCREWDRIVER USED TO INITIALLY TIGHTEN THE CLAMP SCREWS. THIS COULD CAUSE THE CLAMP SCREWS TO BECOME OVER-TIGHTENED. USE A TORQUE SCREWDRIVER THAT HAS BEEN CALIBRATED TO A TORQUE OF 1 NM.

CAUTION: YOU MUST START THE CHECK PROCESS WITHIN 1 HOUR FROM WHEN THE INITIAL TORQUE OF 1.12 NM HAS BEEN APPLIED.

NOTE: This tool should be marked with yellow self-adhesive tape. The calibrated torque '1 Nm' should be clearly written on the tape.

(1) Check the Leafield GIST operating head has been torqued correctly. Use a torque screwdriver.

(2) Monitor each clamp screw during the checking process:

(a) If either of the screws turn more than $\frac{3}{4}$ of one turn on two consecutive operating heads, then do a check on the calibration of the 1.12 Nm and 1 Nm torque screwdrivers.

(b) If either of the screws turn more than $\frac{3}{4}$ of one turn then you must do task 6.E. to check the gap between the clamps.

G. Apply self-adhesive tape to the Leaffield GIST operating head:

- (1) Wind three turns of self-adhesive tape around the clamps of the Leaffield GIST operating head. Make sure that the clamps of the Leaffield GIST operating head are fully covered by the self-adhesive tape.
- (2) Use a permanent marker to write on the self-adhesive tape:
 - (a) Write the date on the self-adhesive tape. Refer to **Figure 4**.
 - (b) Write the approval number of the service technician, who has completed the checking procedure, on the self-adhesive tape. Refer to **Figure 4**.

**FIGURE 4**

Write the date and approval number on the self-adhesive tape

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Appendix A-13

Introduction of dymo tape on data labels

Each Marine liferaft has a data label attached to the outside of the container. The data label contains important information which is written in permanent ink.

It has been reported that this ink can fade which will mean the data on the data label becomes difficult to read.

In order to prevent this the information on the data label must be displayed using dymo tape. Refer to **Figure 1**.

Description	Part number	Quantity per liferaft
Dymo tape cassette, 6 mm TZe211 Brother tape, with black text	11845009	As required

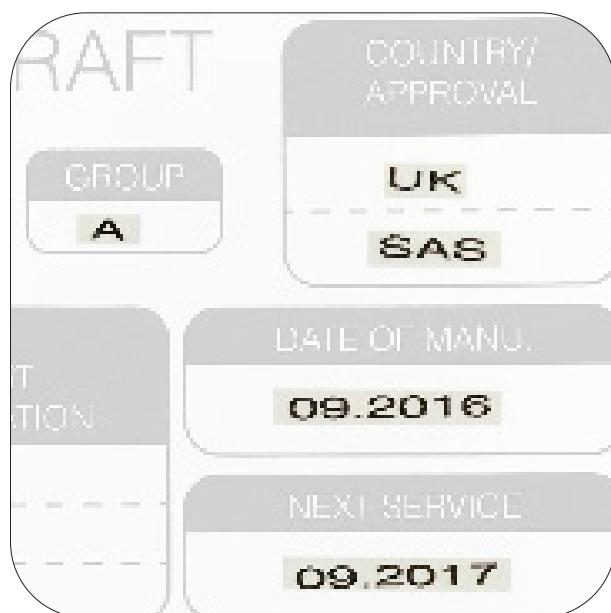


FIGURE 1
Dymo tape on a data label

- A. Copy the information from each field on the data label into a dymo label.
 - B. Clean the data label with hot soapy water and a lint-free cloth.
 - C. Use a dry, lint-free cloth to dry the data label.
- NOTE: If the data label needs replaced follow the instructions in the Service Manual to replace the label.
- D. Attach each dymo label to the data label in the correct location.
Refer to **Figure 2** thru **Figure 4** for typical examples.

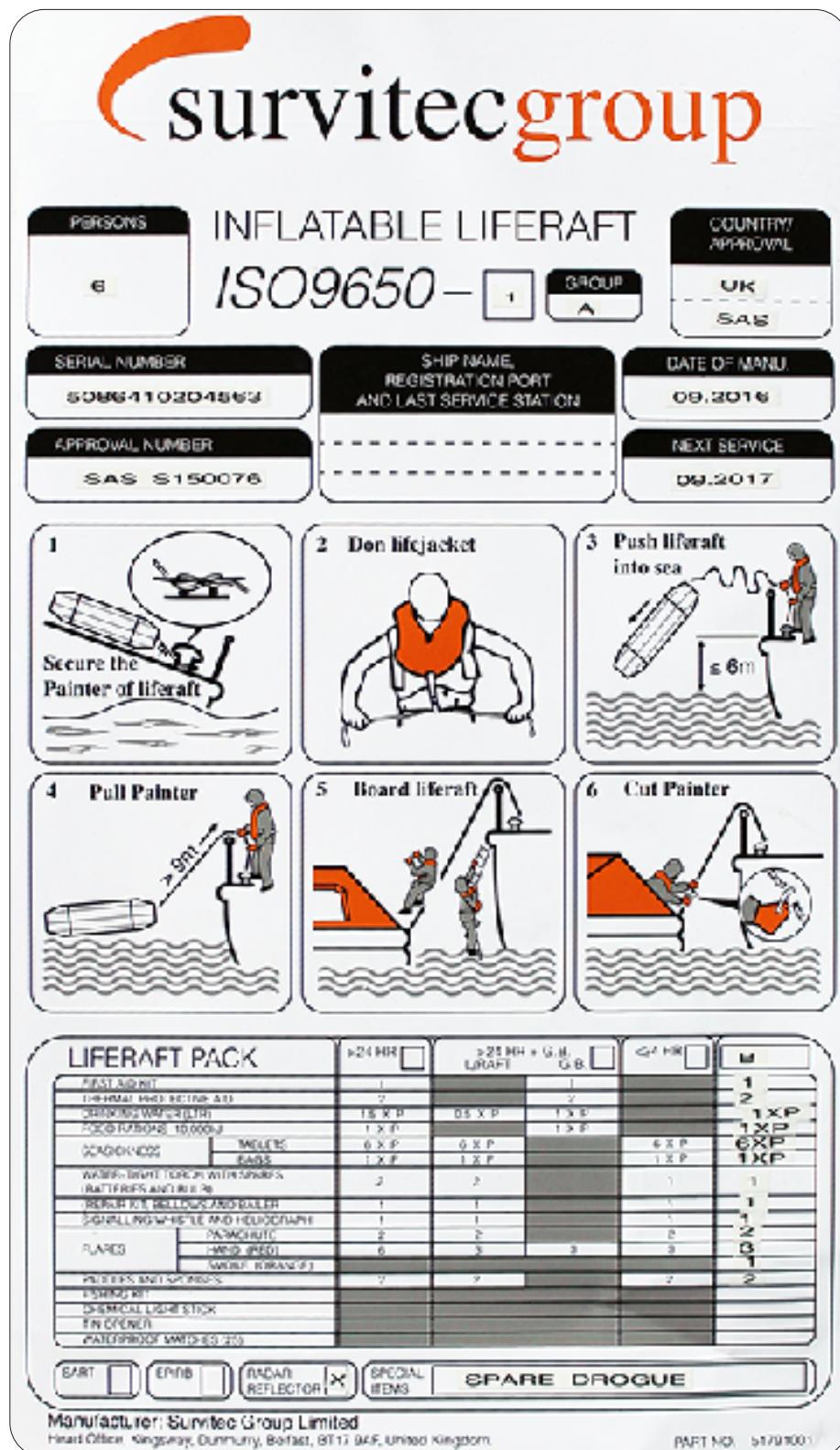


FIGURE 2
Example of data label with dymo tape

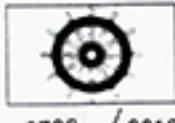
INFLATABLE LIFERAFT AUFBLASBARES RETTUNGSFLOSS OPBLAASBAAR REDDINGVLOT RADEAUX DE SAUVETAGE CONFLABLES НАДУВНАЯ СПАСАТЕЛЬНАЯ ЛОДКА		SOLAS 74/88 AS AMENDED		
 0736 / 2016	APPROVED BY ZUGELASSEN VON TOEGELATEN VAN ADMISSION DE ДОПУСК ОТ	FOR FUER VOOR POUR ДЛЯ	PERSONS PERSONEN PERSONNES ПАССАЖИРОВ	
		20	LR-07	TYPE TÜR ТИП
		SERIAL NUMBER SERIENNUMMER NUMERO EN SERIE СЕРИЙНЫЙ №	5086210208965	
		EMERGENCY PACK NOTAUSREUSTUNG NOODUITRUSTING PAQUET DE SURVIE АВАРИЙНЫЙ ПАКЕТ	A	
		CONTAINER-TYPE ТИП КОНТЕЙНЕРА	MK 14-17	
		Max. HEIGHT OF STOWAGE Max. AUFPSTELLHOEHE Max. OPSTELLING HOOGTE Max. HAUTEUR DE PLACEMENT МАКС. ВЫСОТА УСТАНОВКИ	25 METRES/METER METRE/МЕТРОВ	
		PAINTER LINE LENGTH REISS-FANGLEINEN-LÄNGE VANGLIJN LENGTE TIRER POUR GONFLER ДЛИНА РАЗРЫВНОГО ЛИНИЯ	35 METRES/METER METRE/МЕТРОВ	
DSB Art.-Nr.: 00941100		GB/D/NL/F/RUS	DSB Art.-Nr.: 00941100	
			GB/D/NL/F/RUS	
LAST SERVICE LETZTE WARTUNG LAATSTE INSPECTIE INSPECTION DERNIER ПОСЛЕДНЕЕ ОБСЛУЖИВАНИЕ		SERVICE-STATION, WARTUNGS-STATION, INSPECTIE-STATION, STATION DE SERVICE, СТАНЦИЯ ОБСЛУЖИВАНИЯ,	NAME NAME NAAM NOM ФАМИЛИЯ	NEXT SERVICE NAECHSTE WARTUNG VOLGENDE INSPECTIE INSPECTION PROCHAINE СЛЕДУЮЩЕЕ ОБСЛУЖИВАНИЕ
09.2016		DSB	09.2017	
Art.-Nr. 0.09.53.44.0		GB/D/NL/F/RUS		

FIGURE 3
Example of data label with dymo tape

**INFLATABLE LIFERAFT
APPROVED BY**

DEPARTMENT OF TRANSPORT	(U.K.)
MARINE MARCHANDE	(FRANCE)
STÖFARTSDIRECTORATET	(NORWAY)
SCHEEPVAARTINSPECTIE	(HOLLAND)
STATENS SKIBSTILSYN	(DENMARK)
REGISTRO ITALIANO NAVALE	(ITALY)
DEPARTMENT OF TRANSPORT	(CANADA)
SJÖFARTSVERKET	(SWEDEN)
POLSKI REJESTR STATKÓW	(POLAND)
SEE-BERUFSGENOSSENSCHAFT	(GERMANY)
MIN.DE TRANS.TURISMO Y COMM.	(SPAIN)
NIPPON KAIJI KYOKAI	(CLASS NK)
CHINA CLASSIFICATION SOCIETY	(CHINA)
HELLENIC REPUBLIC	(GREECE)
UNITED STATES COAST GUARD	(USCG)
USSR REGISTER OF SHIPPING	(RUSSIA)
COMPLIES WITH EUROPEAN DIRECTIVE ON MARINE EQUIPMENT	

FOR 20 PERSONS.

TYPE:- SURVIVA		
APPROVAL No.		
EMERGENCY PACK TYPE. A		
CART XXX INSTALLED	AERIAL XXX INSTALLED	RADAR REFLECTOR INSTALLED
SERIAL No. 5085910204119		
DATE OF MFR. 09.2016		
MOD. STATE.		
INSP. DATE	INSP. STAMP	SERVICE BEFORE
09.2016	716	09.2017
PAINTER LINE LENGTH (METRES).	XXXX 46	

Manufacturer: Survitec Group Limited
Head Office, Kingsway, Dunmurry,
Belfast, BT17 9AF.
United Kingdom.

P/N.04819001

FIGURE 4
Example of data label with dymo tape

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Appendix A-14

Inflation hoses : Guidance for inspection *during service and packing*

1. Introduction

Survitec Group liferafts include parts made by manufacturers other than Survitec Group. Documents produced by these manufacturers in support of parts include maintenance manuals and user guides, and are known as Manufacturers' Associated Publications (MAPs).

MAPs are available to download on the Survitec Group portal. This Service Bulletin reminds service stations that they must obey the MAP that follows:

Reference	Version	Title
M-07-UM-1HOSE	3	General user manual for <i>Leafield polar gas inflation hose</i>

A five-year service life on inflation hoses has been introduced.

For new design inflation hoses this service life starts on the Date of Installation (DoI).

NOTE: New design inflation hoses are exactly the same as the old design apart from the addition of the label, as shown in **Figure 1**.

NOTE: Old design inflation hoses can have no label. If they do have a label it will be the old design label as shown in **Figure 2**.

NOTE: Date of Installation is the date the hose is attached to the non-return CO₂ valve on the liferaft.

Each new inflation hose has an adhesive label with a field for DoI which must be completed at installation. Refer to Figure 1.

For old design inflation hoses this service life starts on the Date of Manufacture (DoM) of the inflation hose. **Refer to Figure 2.**

NOTE: Part numbers for the inflation hoses have not changed.

Part Number	Description
08718009	GIST DBL.RT.L inflation hose assembly (800 mm) ¹
08255009	GIST SGL.RT.L inflation hose assembly (800 mm) ²
08719009	Union push-fit valve (cylinder end)
08203009	Union push-fit valve inlet

¹ You will need one union push-fit valve and one union push-fit valve inlet to replace the GIST DBL.RT.L inflation hose.

² You will need one union push-fit valve to replace the GIST SGL.RT.L inflation hose.

Each inflation hose must meet the requirements of M-07-UM-1HOSE at each service.

2. Tasks

A. Download Manufacturers' Associated Publication

- (1) Log in to the Survitec Group portal.
- (2) Navigate to TECHPUBS.
- (3) Download the MAP that follows:

Reference	Version	Title
M-07-UM-1HOSE	3	General user manual for <i>Leafield polar gas inflation hose</i>

- (4) Add this MAP to your documentation library.
- (5) Obey the document provided by Leafield to inspect the inflation hoses.

NOTE: A reference copy is given in **Appendix 1**.
You must make sure that you use the latest revision.

B. Inspect each inflation hose

NOTE: Do the steps that follow for all liferafts except Extended Service Rafts (ESR) and ISO 9650. For these liferafts refer to Paragraph B (3).

(1) Old design inflation hose

NOTE: On an old design inflation hose the DoM of the inflation hose is either printed on the label or stamped on the ferrule at the end of the inflation hose. Refer to **Figure 2**.

NOTE: The service life of an old design inflation hose starts on the DoM of the inflation hose.

NOTE: It is acceptable to use any current stock of old design inflation hoses.

(a) Do a check on the DoM of the inflation hose.

(b) Discard and replace the inflation hose if:

- 1 the DoM is more than five years from today.
- 2 the DoM is more than five years before the next scheduled service.
- 3 the inflation hose does not comply with M-07-UM-1HOSE.

(2) New design inflation hose

NOTE: The Dol is the date on which the new design inflation hose was installed on the liferaft.

NOTE: The service life of a new design inflation hose starts on the Dol.

(a) Do a check on the Dol of the inflation hose.

(b) Discard and replace the inflation hose if:

- 1 the Dol is more than five years from today.
- 2 the Dol is more than five years before the next scheduled service.
- 3 the inflation hose does not comply with M-07-UM-1HOSE.

- (3) Extended Service Rafts (ESR) and ISO 9650 liferafts

NOTE: These liferafts are hermetically sealed in a foil bag.

- (a) Obey M-07-UM-1HOSE to inspect the inflation hose.

C. Replace an inflation hose

- (1) If an inflation hose is not satisfactory, obey the correct service manual to remove and discard it.
- (2) Install a new design inflation hose.
- (3) Use a permanent marker pen to write the Dol on each label on the inflation hose.

NOTE: Use the format DD

MM
YY



Figure 1
Label on new design Leaffield inflation hose with Dol data (example)

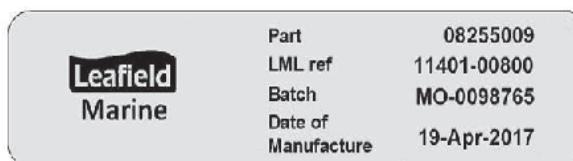


Figure 2
Label on old design Leaffield inflation hose with DoM data (example)

Appendix A-15

Discontinuation of Unitor brand

1. Introduction

Unitor throw-over (TO) and davit launch (DL) liferafts have been packed into containers using Unitor branded labels. The Unitor brand is to be discontinued, branded labels have now been made obsolete. You must now use Survitec branded labels when packing these liferafts.

2. Equipment affected

Unitor Mk IV (6-25 person) TO and DL liferafts packed into the containers that follow:

- Mk 10 Size 4 (TO)
- Mk 10 Size 4 (DL)
- Mk 14 Size 14 (TO)
- Mk 14 Size 14 (DL)
- Mk 14 Size 17 (TO)
- Mk 14 Size 17 (DL)

3. Necessary parts

Item	Part Number	Description	Container label quantity					
			Throw-over			Davit launch		
			Mk 10 Size 4	Mk 14 Size 14	Mk 14 Size 17	Mk 10 Size 4	Mk 14 Size 14	Mk 14 Size 17
1	53481001	Survitec label	2	2	2	2	2	2
2	02174071	TO launch poster *	1	1	1	1	1	1
3	50906101	DL cylindrical containers poster *	—	—	—	1	1	1
4	50906002	DL launch label	—	—	—	1	1	1

* Poster is put into a plastic sleeve which is attached to the container.
You can purchase these parts from Survitec.

4. Tasks

A. Obey the correct service manual to service and pack the liferaft.

B. Replace the Unitor branded labels with Survitec branded labels:

- (1) Remove the Unitor branded labels from the container:
Refer to **Figure 1A** and **Figure 1B**.

NOTE: Example container sizes are shown.

WARNING: THE HEAT TOOL CAN CAUSE YOU INJURY.

CAUTION: THE HEAT TOOL CAN CAUSE DAMAGE TO THE CONTAINER.

- (a) Use a heat tool to heat each container label.

CAUTION: TAKE CARE NOT TO CAUSE DAMAGE TO THE GEL ON THE CONTAINER.

- (b) Use a blunt scraping tool to remove the container labels from the container.

- (c) Discard the Unitor branded labels.

- (d) Make a clean, lint-free cloth moist with toluene.

- (e) Use the cloth to clean the target area.

- (2) Remove the Unitor branded labels from the plastic sleeve:
Refer to **Figure 1**.

- (a) Open the plastic sleeve.

- (b) Remove the Unitor branded labels from the plastic sleeve:

1 TO only: Remove the *launching procedure poster*.

2 DL only: Remove the *launching procedure poster* and *davit-launch procedure for liferafts in cylindrical containers* label.

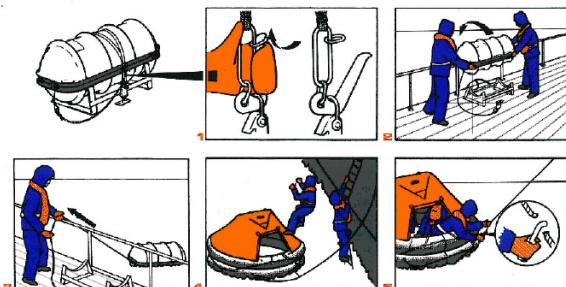
- (c) Discard the Unitor branded labels.

Item A

UNITOR liferaft

Attached to container

Item B

**UNITOR
LAUNCHING PROCEDURE**

In plastic sleeve

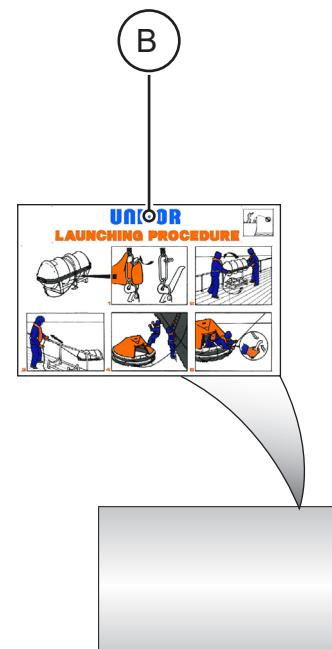
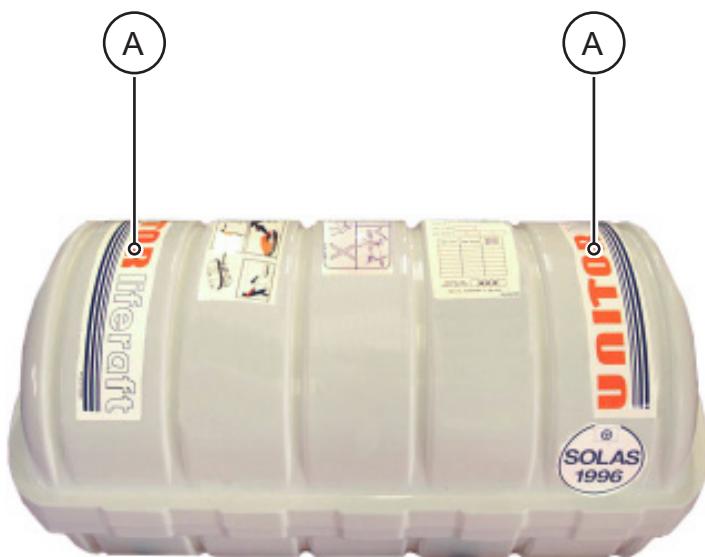


FIGURE 1A
Remove the Unitor branded labels
(Mk 14 size 14 TO container shown)

Item A



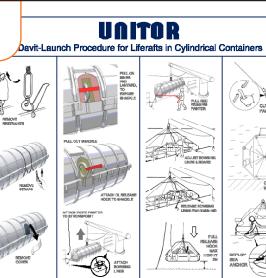
Attached to container

Item B



In plastic sleeve

Item C



In plastic sleeve

Item D



Attached to container

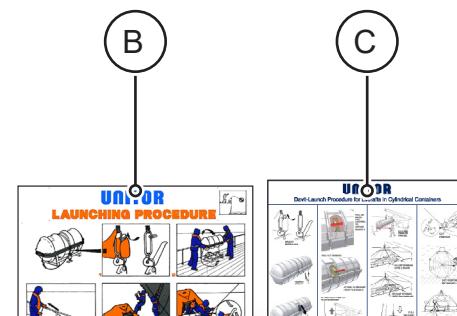
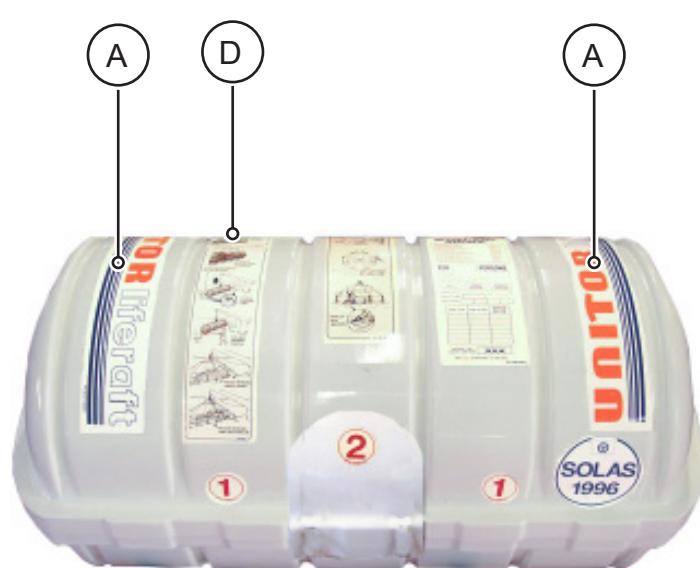


FIGURE 1B
Remove the Unitor branded labels
(Mk 14 size 14 DL container shown)

- (3) Attach the new Survitec branded labels:
- (a) Refer to **Figure 2** for the location of Survitec branded labels on the TO containers that follow:
- Mk 10 Size 4
 - Mk 14 Size 14
 - Mk 14 Size 17
- (b) Put the Survitec branded label (*item 2*) into the plastic sleeve which is attached to the container. Refer to **Figure 2**.

Item 1

SURVITEC

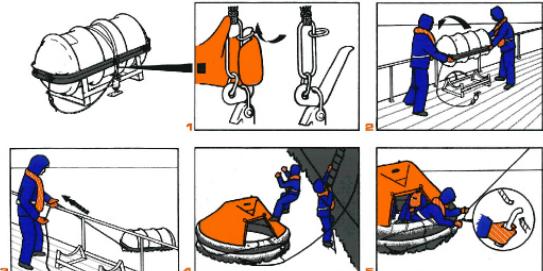
P/N 53481001

Attach to container

Item 2



LAUNCHING PROCEDURE



Put into plastic sleeve

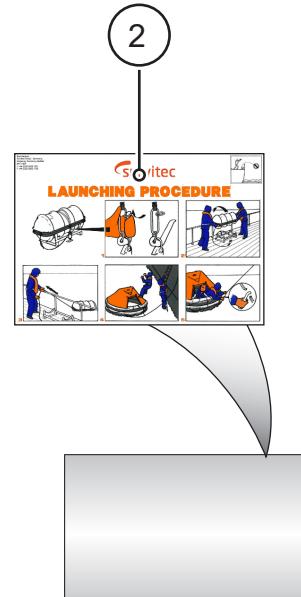


FIGURE 2
Attach the Survitec branded labels
(Mk 14 size 14 TO container shown)

- (c) Refer to **Figure 3** for the location of Survitec branded labels on the DL containers that follow:
 - Mk 10 Size 4
 - Mk 14 Size 14
 - Mk 14 Size 17
 - (d) Put the Survitec branded labels (*item 2* and *item 3*) into the plastic sleeve which is attached to the container. Refer to **Figure 3**.
- (4) Obey the relevant service manual to attach the necessary unbranded labels.

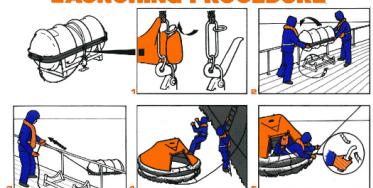
Item 1

SURVITEC

P/N 53481001

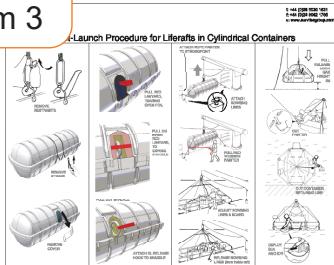
Attach to container

Item 2


LAUNCHING PROCEDURE


Put into plastic sleeve

Item 3

Launch Procedure for Liferafts in Cylindrical Containers


Put into plastic sleeve

Item 4

Davit-Launch Procedure


Attach to container

1

4

1

2

3

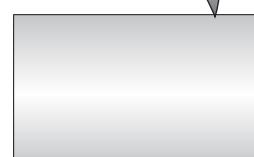
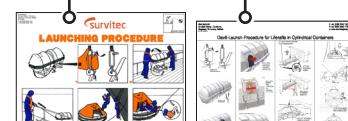


FIGURE 3
Attach the Survitec branded labels
(Mk 14 size 14 DL container shown)

C. Survitec Portal

- (1) The Unitor brand will no longer be supported on the Survitec Portal. The Unitor brand has been replaced with the Survitec brand. Refer to **Figure 4**.

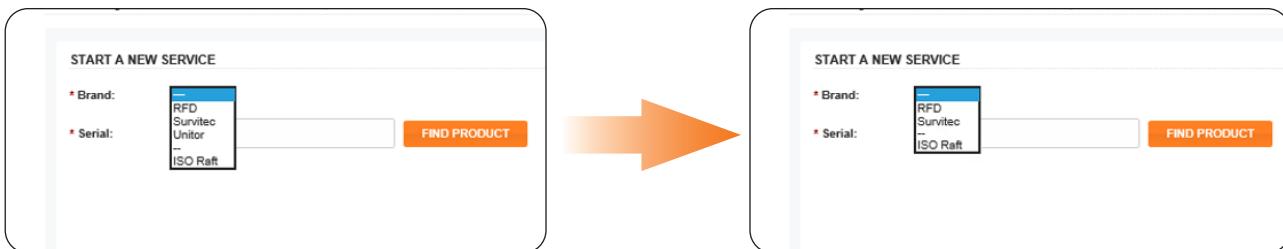


FIGURE 4
Unitor brand removed from Survitec Portal

- (1) The Unitor credits that remain will be automatically transferred to Survitec credits. Refer to **Figure 5**.

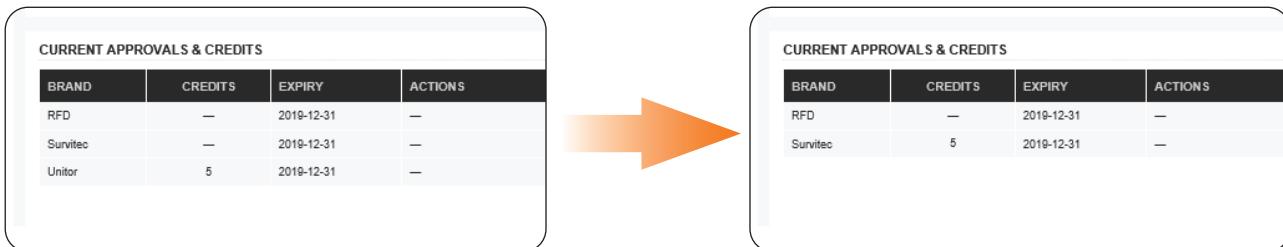


FIGURE 5
Unitor credits transferred to Survitec credits

5. Recording

- A. For each liferaft to which this is applied, complete the appropriate record card(s).
- (1) Record details of the service onto the service record card. In the appropriate field, write "SB 30/19 Ver.1 APPLIED".

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