



Crewsaver®

SERVICE MANUAL

ERGOFIT 190 TWIN CHAMBER

LIFEJACKET FOR THE SOCIETE
NATIONALE DE SAUVANTAGE
EN MER

Crewsaver®

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Service Bulletins and Amendments Register

No.	Description	Date


Scope

This manual covers the servicing of the Ergofit 190N twin chamber Lifejacket for the Societe Nationale de Sauvantage en Mer.


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1.1 Introduction

- 1.1.1. This Service Manual will be published on the Crewsaver website (www.crewsaver.com). Click on LOGIN/AR EA PARTNER at the bottom of the screen. Personnel who have been trained in the servicing procedures for this lifejacket will be issued with a Username and Password to enable them to access the download section. Each manual carries an Issue Number and records of issue are logged by Crewsaver to ensure that the service network maintains correct and up to date servicing information. Emails will be sent regarding any new Issues. Periodically service bulletins may be issued which will be published on the Crewsaver website (www.crewsaver.com). Emails will also be sent. It is the service station's responsibility to regularly check the website for any new bulletins and to ensure inclusion within the servicing manual. The service bulletin register at the front of the Manual should be completed.
- 1.1.2. The information referenced in each section, follows a standard servicing procedure by which the inspection should take place.
- 1.1.3. This servicing manual details information to enable regular maintenance and servicing of the lifejacket to help prolong the life of the product and ensure it functions correctly.
- 1.1.4. The manual should be used as a reference document following training in servicing procedures instructed by Crewsaver personnel. The manual also details the equipment and parts needed for correct maintenance to be performed.
- 1.1.5. Servicing must be carried out annually at a service station authorised by the manufacturer.  1 yr
- 1.1.6. Regular servicing is to be carried out by qualified personnel trained by Crewsaver and holding a valid servicing certificate. Certificates are valid for a period of 3 years.

1.2 Product Description

- 1.2.1. The Ergofit 190N PFD. Lifejackets are twin chamber Level 150 twin chamber Lifejacket for the Societe Nationale de Sauvantage en Mers (Inflatable lifejackets).
- 1.2.2. The lifejacket is approved to both SOLAS/MED  and CE approved to BS EN ISO 12402-3.
- 1.2.3. The lifejackets are easy to don.
- 1.2.4. The buoyancy of the jacket is provided by two chambers with a 3.5 psi relief valve oral tube on each chamber to ensure the full buoyancy is achieved whether on single or double chamber inflation. This feature enables the jacket to continue to operate providing full buoyancy even in the eventuality that one of the firing heads fails.
- 1.2.5. The high buoyancy of this lifejacket allows it to be suitable when the user is wearing heavy clothing and immersion suit.
- 1.2.6. This lifejacket can be inflated manually, as well as automatically when entering the water. This lifejacket has a permanent crutch strap and is fitted with a light that is operated when the lifejacket inflates. The lifejacket can also be supplied with a factory fitted spray hood that conforms to BS EN ISO 12402-8.
- 1.2.7. The Ergofit syle outer cover is made from a hard wearing material and is fastened by a zip. The colour of the outer cover is orange for operational use or blue for training purposes.

1.3.1 Data Sheet

Features:	Ergofit 190N Twin Chamber
Chamber Buoyancy:	190N
Buoyancy Category:	Level 150N
Cover Colour	Orange (Operational) Blue (Training)
UK (MCA) Approved	–
SOLAS Approved	Yes
ISO Approved	Yes
Cylinder size	Yes 38 gm Qty x2
UML Mk.5 Automatic Head UML	Yes Qty x2
Oral inflation tubes	Yes Qty x2
Pressure relief valves	Yes Qty x2
Hard wearing cover	Yes
Whistle - fitted	ty x2aYesa
Retro-reflective tape	aYe
Dual Lifting Becket - fitted	Ye2s Qty x
Light - fitted	Yes
Spray Hood - fitted	Yes
Dual Crotch straps - fitted	Yes
Fall Arrest Harness	–
Closure method	Quick Burst Zip

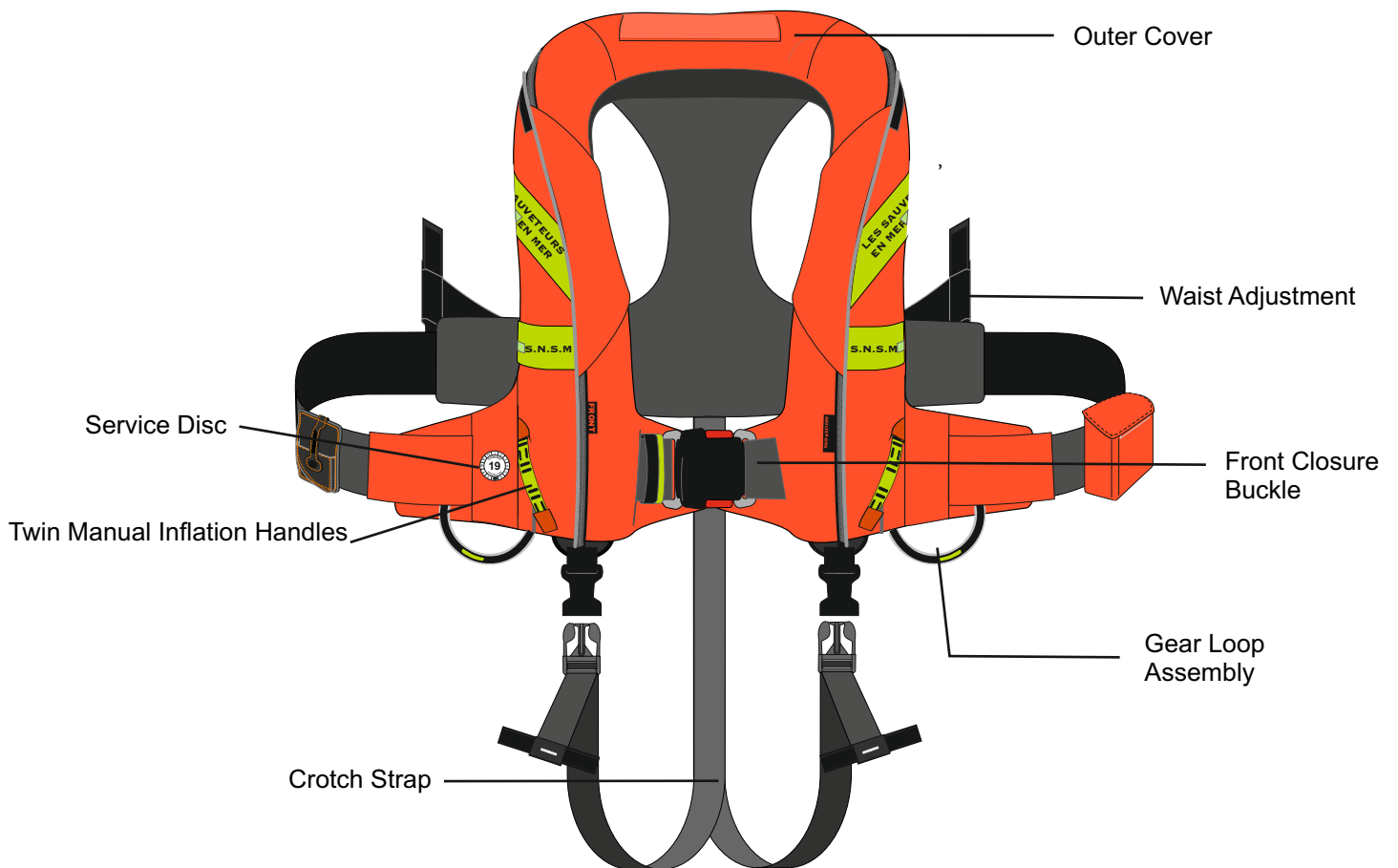
1.4.1 General Features - Ergofit 190 Twin Chamber



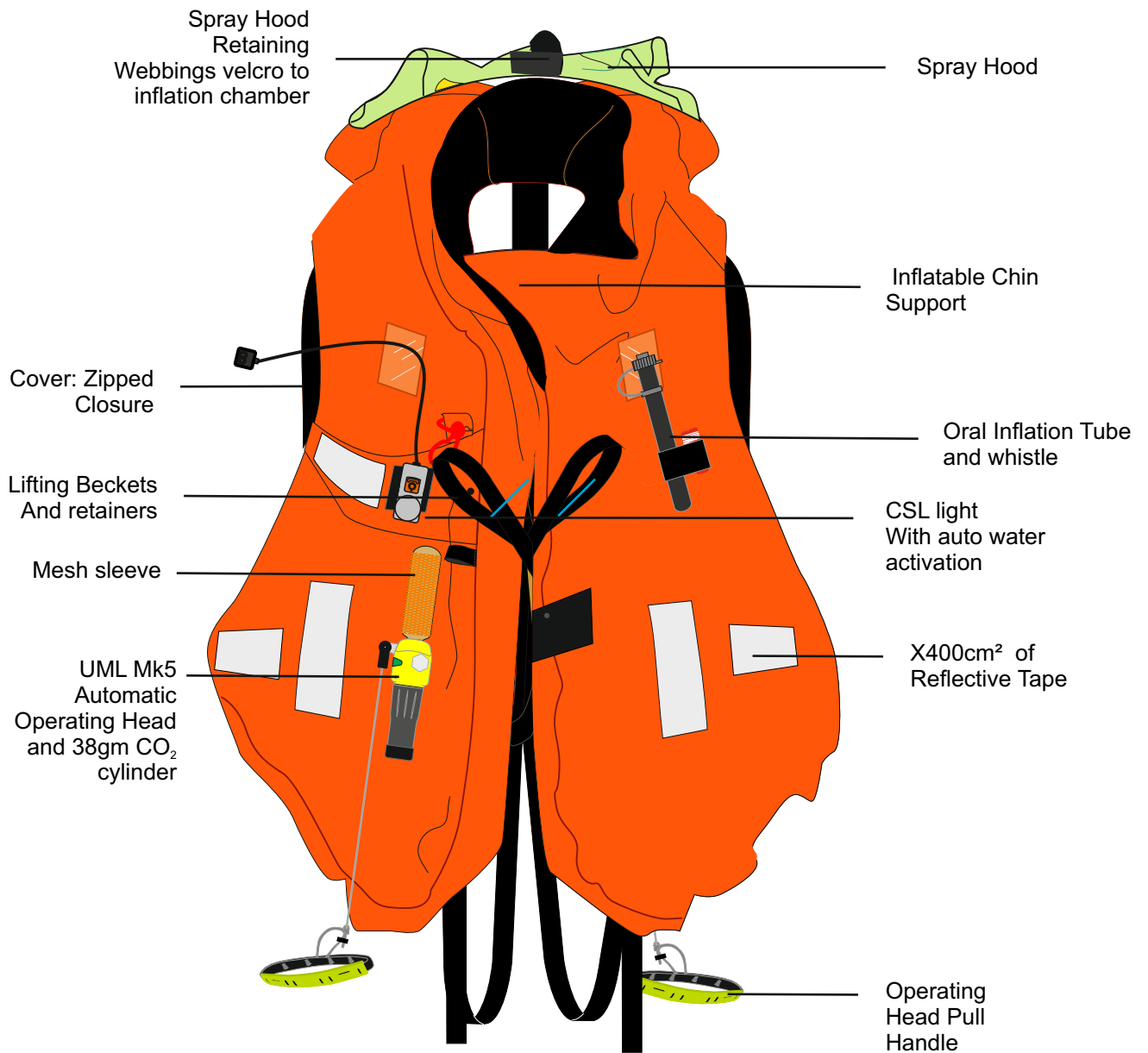
SOLAS Ergofit 190N jacket - OPERATIONAL



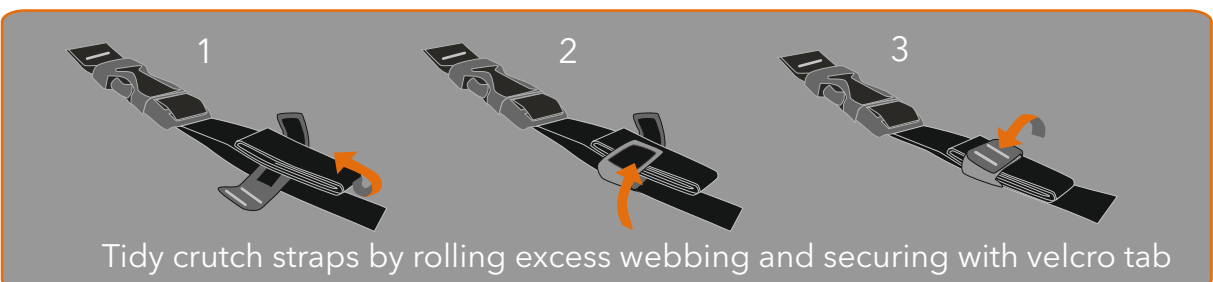
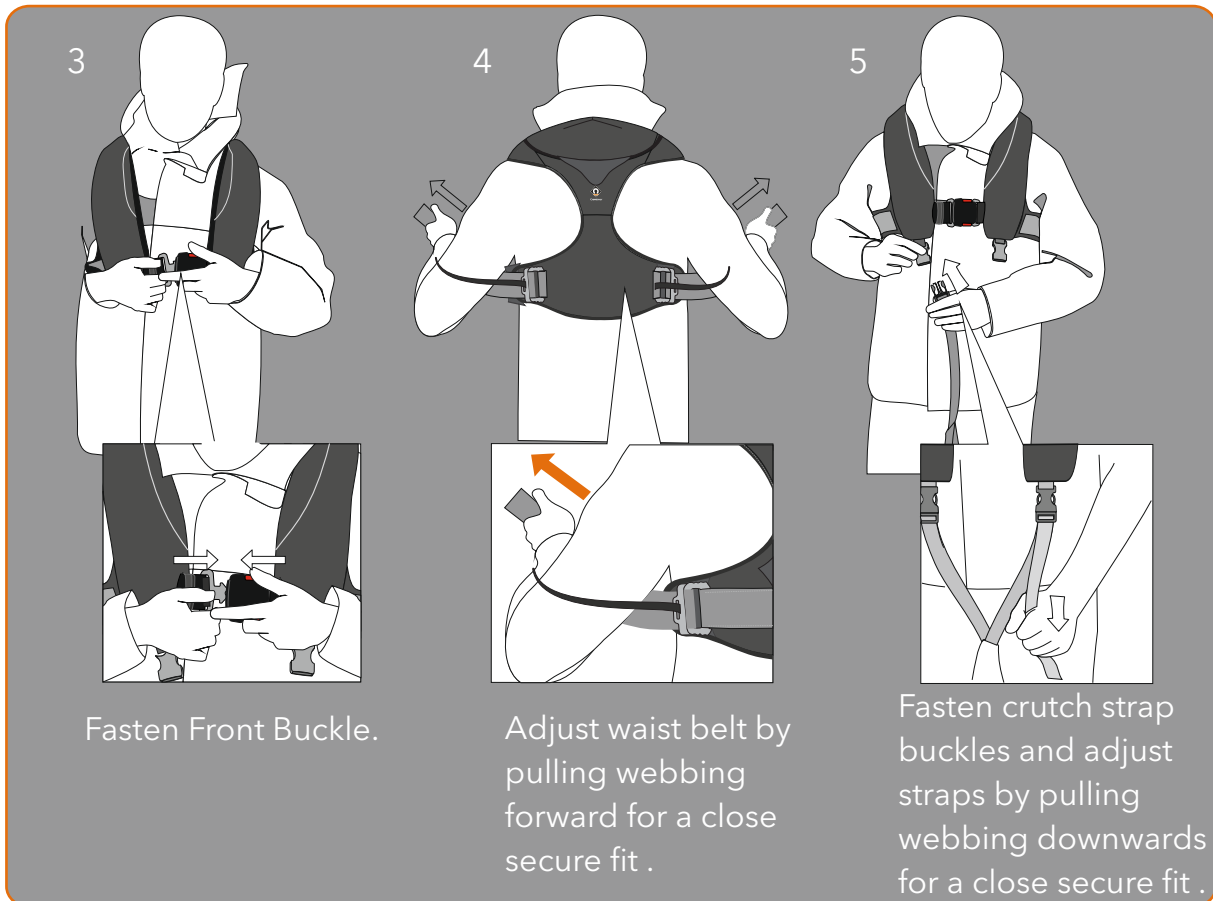
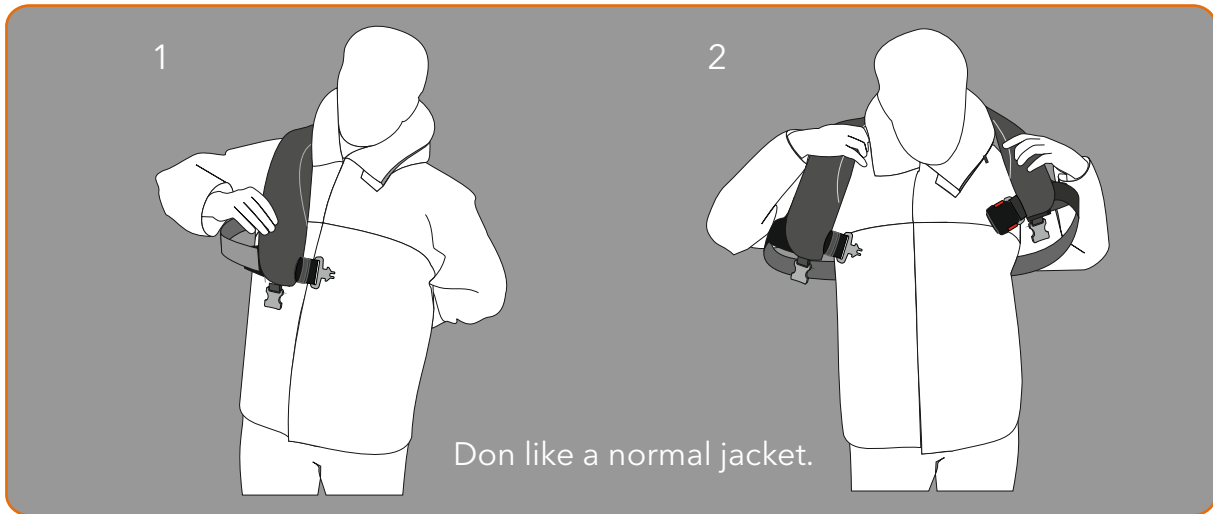
SOLAS Ergofit 190N jacket Training jackets



1.4.2 General Features - Ergofit 190N Twin Chamber



1.5.1 Donning Instructions - Ergofit 190N Twin Chamber



2.1 Service Stations

- 2.1.1 Service stations shall comply with the following as a minimum;
 - 2.1.1.1 Servicing of Inflatable Lifejackets shall be carried out in a fully enclosed area only.
 - 2.1.1.2 The area shall be well lit and protected from direct sunlight
 - 2.1.1.3 The temperature and humidity shall be sufficiently controlled to ensure that the servicing of inflatable Lifejackets may be carried out successfully.
 - 2.1.1.4 The area shall be efficiently ventilated but free from draught
 - 2.1.1.5 Sufficient tools (including specialist tools) shall be available to ensure Lifejackets may be disassembled, tested and reassembled in accordance with this Manual. These shall include but not limited to:
 - 2.1.1.5.1 Manometers and pressure gauges
 - 2.1.1.5.2 Oil free and dry air supply
 - 2.1.1.5.3 Scales for weighing Gas Cylinders
 - 2.1.1.5.4 Crewsaver Service tool kit (See 2.6). This is recommended but similar calibrated devices may also be used.
 - 2.1.1.6 Stock of materials and components to allow efficient servicing with readily available replacement parts to ensure a prompt service for the customer.
 - 2.1.1.7 Only personnel trained and certified in accordance with Crewsaver requirements are approved to carry out Servicing and Maintenance. They must be holders of a valid Certificate issued by Crewsaver.
 - 2.1.1.8 The service station shall be of an approved standard.
 - 2.1.1.9 Procedures shall be introduced to ensure that service bulletins, Manuals and replacement parts are obtained from Crewsaver.
 - 2.1.1.10 Subsequent to initial approval and thereafter the service station shall be subject to regular surveillance by Crewsaver.
 - 2.1.1.11 The service station must comply and have met all QA criteria in the Crewsaver servicing protocol file.

2.2 On Receipt Inspection

- 2.2.1 On receipt of the Lifejacket(s), check the state of the packaging before opening and notify the owner and the company delivering the package of any defects or damage.
- 2.2.2 On opening the package, check the contents for their general condition and quantity.
- 2.2.3 Prepare Servicing Record Sheet.
- 2.2.4 Visually inspect the cover and inflation chamber for damage, abrasion, contamination etc. in accordance with this manual.
- 2.2.5 Note replacements required on the record sheet.
- 2.2.6 Unless obvious damage is evident, test the Lifejacket in accordance with Section 6. If it is considered that the damage found would cause the Lifejacket to fail the tests then corrective action shall be carried out prior to testing.
- 2.2.7 Damaged areas shall be marked using wax based crayon only. Marks shall be made with a small circle or cross. Ballpoint, rollerball or other forms of ink shall not be used. If in doubt refer to Crewsaver for guidance.
- 2.2.8 Repairs to the outer cover and the webbing are not permitted.
- 2.2.9 Repairs to welded components including the inflation chamber are expressly forbidden.

2.3 General Care

- 2.3.1 The Lifejacket should be stowed in accordance with the manufacturer's instructions
- 2.3.1.1 Lifejackets should be stowed in a dry compartment. Avoid high humidity, such as a car boot.
 - 2.3.1.2 Lifejackets should have stowage facilities which are provided with a method to encourage moisture removal.
 - 2.3.1.3 Lifejackets should be stowed vertically, for example hung on hooks, in order that any trapped water or condensation can drain away naturally.
 - 2.3.1.4 Lifejackets should be rinsed in fresh water and dried thoroughly after use.

WARNING

Prior to sponging or washing remove automatic capsules from the firing mechanism. Allow to dry thoroughly afterwards.

- 2.3.2 Contaminants such as oil or diesel fuel may be sponged off immediately with clean water and allowed to dry naturally.
- 2.3.3 Mud can be removed with a stiff (not wire) brush when dry.
- 2.3.4 The outer cover may be hand washed in good quality mild detergent in cool water (40°C). Rinse well, drip dry naturally in air.
- 2.3.5 Sponge the inflation chamber with pure soap solution only. Rinse in clean water immediately, inflate and allow to dry naturally in air.

WARNING

Do not use proprietary cleaning fluids, thinners, spirits or similar substances.

- 2.3.6 In cases of severe contamination the unit shall be deemed beyond economic repair and the customer advised to purchase a replacement lifejacket.

WARNING

Make sure you know how to use and fit this Lifejacket before an emergency occurs. Always try and inflate the Lifejacket in the water. If already inflated, cross arms over the chest before jumping.

- 2.3.7 It is advised that personnel are familiarised with the operation of all Lifejackets and lifesaving appliances.

2.4 Lifejacket Servicing Tools

Fig. 2.4 Table of Tools Required

Description	Type
Crewsaver Servicing Tool Kit A fine screw driver or tool suitable for removing gaskets Roller Scissors or good quality trimming shears "Chinagraph" pencil Fine point indelible pen Scales to weigh gas cylinders Adaptor/tee piece for testing inflation chambers. Manometer Timing Device Thermometer Clean and dry air supply 450mm wide bag sealer (3mm element) Crewsaver Venturi Vacuum System Back pressure test unit Suitable large surface area for the work to be carried out	0-1000gram (+1/-1 grams) 0-500Mbar 0-40°C

2.5 Lifejacket Service Record Sheet

- 2.5.1 An electronic copy of the sheet is available to aid reproduction (or copy next page).
- 2.5.2 Each lifejacket serviced should be recorded either individually or as a batch, showing the serial numbers and the work performed during the service.
- 2.5.3 The service record sheet should be signed and a copy given to the owner certifying that the lifejacket has been serviced.
- 2.5.4 All replacement parts should be noted - recording either the serial numbers of the component or the expiry date.
- 2.5.5 The record sheet shown on the next page is a recommended version. Similar record sheets, including the same information, may also be used.



Crewsaver®

CERTIFICATE NUMBER:

LIFEJACKET SERVICINGSCHEDULE

W/O Number:

TYPE	
CUSTOMER	
VESSEL	
LAST LAST OF DAT	BY SERVICED SERVICE

SERIALNUMBER /S:

CHAMBER INSPECTION	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	COMMENTS
GENERAL CONDITION		
WELDS		
WEBBINGS		
RETRO TAPE		
WHISTLE		
ORAL TUBES		
RELIEF VALVES		
MANIFOLDS		
Schrader VALVES		
CYLINDERS		
LIGHT		
CYALUME POCKET		
BUDDY LINE		

INFLATION MECHANISM	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	COMMENTS
OPERATING MECHANISM		
CORD		
AUTOMATIC CAPSULE		
WASHERS		
RETAINING NUT		
RETAINING CLIP		
TOGGLE		

SPRAY HOOD	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	COMMENTS
FABRIC		
ATTACHMENT		
VELCRO		

COVER	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	COMMENTS
MATERIAL		
VELCRO		
ZIP		

WEBBINGS	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	COMMENTS
WAIST / BELT HARNESS		
BACK STRAP		
LIFTING BECKET		
CROTCH STRAP		
BUCKLES		
STITCHING		

PRESSURE TEST RESULTS

TIME		FRONT CHAMBER	REAR CHAMBER
ON			
OFF			

RELIEF VALVE TEST RESULTS

	FRONT CHAMBER	REAR CHAMBER
OPEN		
CLOSE		

REPAIREDCOMMENTS (ITEMS)

SERVICED BY:

DATE:

Section 2

2.6 Lifejacket Servicing Tool Kit



Cylinder Torque Strap



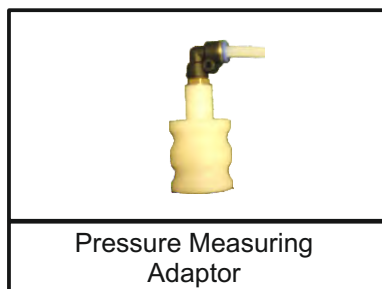
UML Mk5 Auto Socket



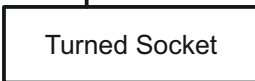
Manometer



Valve Extraction Tool



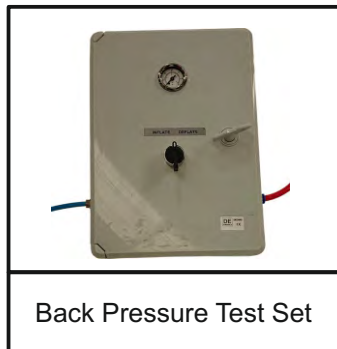
Pressure Measuring Adaptor



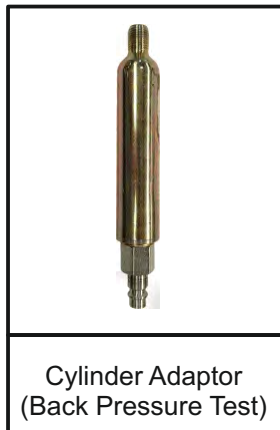
Turned Socket



Inflation Adaptor



Back Pressure Test Set



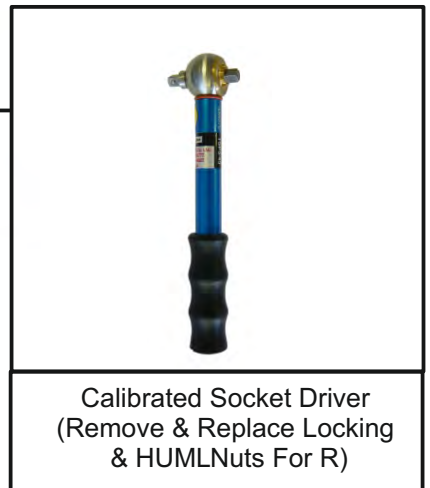
Cylinder Adaptor (Back Pressure Test)



Calibrated Star Socket Driver (Operating Head)



Calibrated Socket Driver (Tighten Cylinder)



Calibrated Socket Driver (Remove & Replace Locking & HUMLNuts For R)



Calibrated Torque Driver (Schrader Valve)

3.1 Unpacking

- 3.1.1 Open the velcro tabs on the front of the lifejacket cover. To avoid damaging the lifejacket zip, pull apart the zip, and open the zip via the quick burst elements, holding the cover on either side. (Refer to Section 3.2).

WARNING: All defects should be noted onto the service record sheet

- 3.1.2 Once the zip has opened insert the a finger and slide it around the zip of the lifejacket. The lifejacket cover should now be fully opened and the inflation chambers visible. Both sides of the zip should be apart with the zip slider free to move back around the lifejacket to the start.

WARNING: All defects should be noted onto the service record sheet.

- 3.1.3 Remove the operating mechanisms.

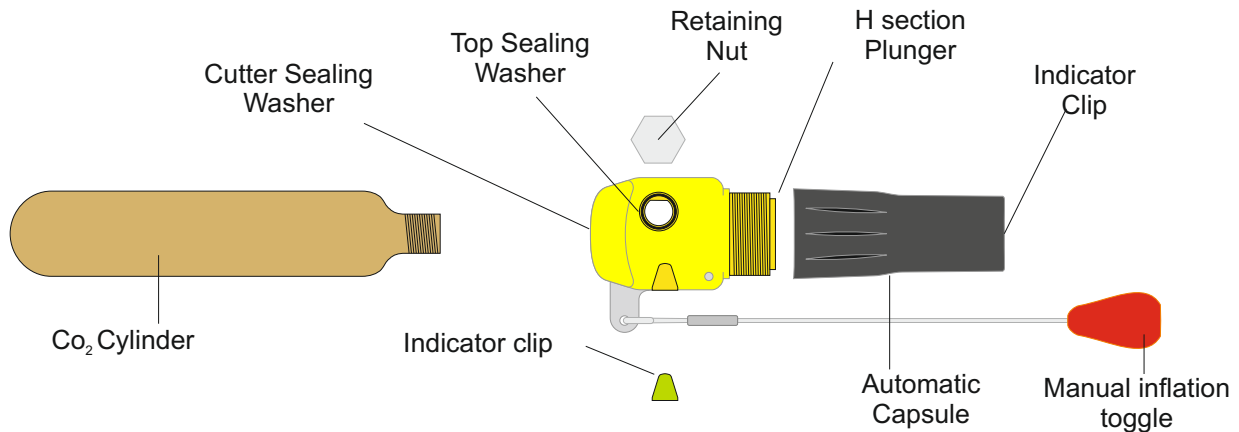
3.1.3.1 Following unpacking refer to Fig 3.2 - UML Mk5 Operating Heads:

- 3.1.3.1.1 Automatic Only. Unscrew the Automatic Capsule if fitted from the operating mechanism. Place to one side for testing and reassembly later. See Section 6 for details.
- 3.1.3.1.2 Carefully remove the inflation cylinder by unscrewing it from the operating mechanism. Retain for further Inspection. Refer to Section 5.
- 3.1.3.1.3 Remove Operating Mechanisms by unscrewing the retaining screw on the top of the inflation mechanism. Retain for further Inspection. Refer to Section 5.
- 3.1.3.1.4 Remove and discard sealing washers.

- 3.1.4. For Cleaning. Refer to Section 4.

- 3.1.5. Carry out visual inspection. Refer to section 5.

Fig 3.2 UML Mk5 Operating Head



- 3.2.1 Unscrew the Automatic firing capsule from the end of the operating head. This should be carried out before the removal of the CO₂ cylinder to ensure no damage to the operating pin. The Capsule must be replaced if it expires before the date of the next annual service or capsule has been used. Refer to Section 5.5.
- 3.2.2 Unscrew the CO₂ cylinder from the operating head. Once the cylinder has been removed, remove the Cutter sealing washer. This must be replaced with new part on re-assembly. Take the cylinder and check to see if the cylinder has been used. This should be performed by check weighing. If under the minimum weight as displayed on the cylinder body, discard in a safe manner. Refer to Section 5.3.
- 3.2.3 Unscrew the retaining nut from the top of the firing head, using 9/16" socket or spanner. Check for corrosion and discard if corroded. Remove the top sealing washer. This must be replaced with a new part on re-assembly.
- 3.2.4 Remove the operating head from the manifold which is welded to the inflation chamber fabric. Remove the bottom sealing washer. This must be replaced with a new part on re-assembly.
- 3.2.5 Check the pull cord and toggle for fraying or damage.

Fig 3.2 Unpacking the Ergofit 190N Twin Chamber

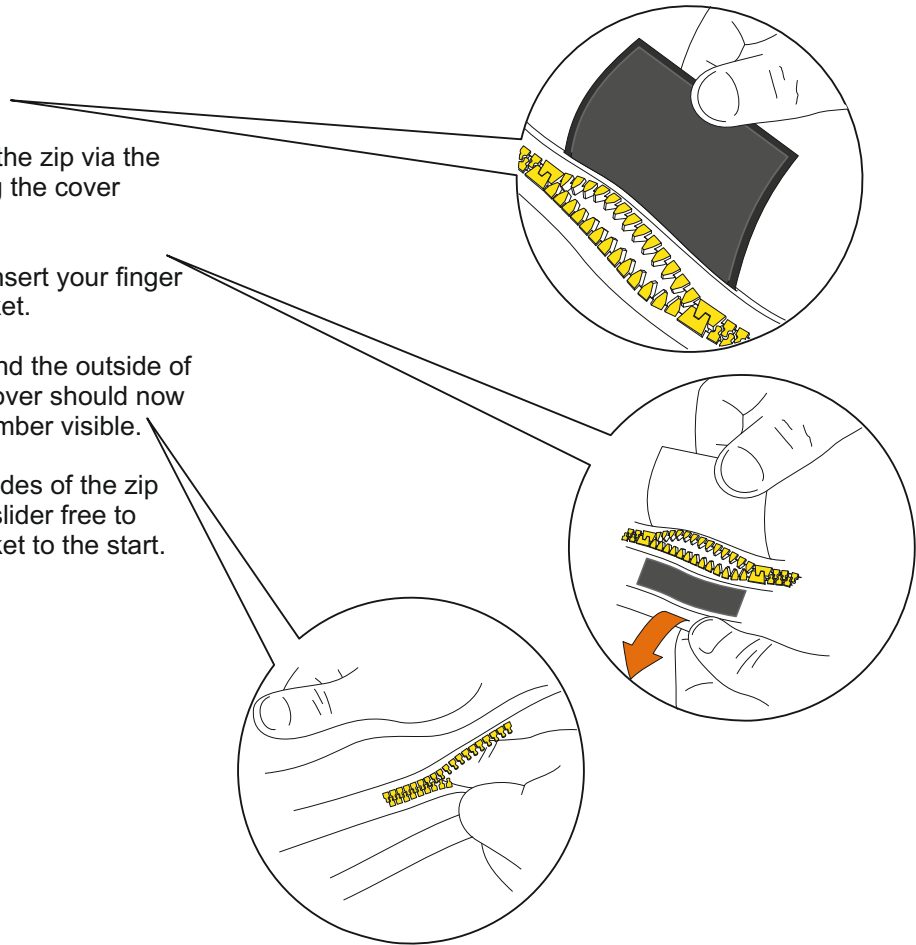
1. Open the velcro tab.

2. Pull apart the zip, opening the zip via the quick burst elements, holding the cover either side.

3. Once the zip has opened insert your finger and slide it around the lifejacket.

Undo the zip all the way around the outside of the lifejacket. The lifejacket cover should now be open and the inflation chamber visible.

Fully separate the zip. Both sides of the zip should be apart, with the zip slider free to move back around the lifejacket to the start.



4.1 Cleaning Lifejackets

- 4.1.1 The current standard cover of the Ergofit Societe Nationale de Sauvetage en Mer can be cleaned with care. In the event that contamination is such that the materials are inherently damaged refer to section 7.
- 4.1.2 For all types of cover, mud can be removed with clean water and the zip can be cleaned with a stiff (not wire) brush when dry.
 - 4.1.2.1 Contaminants such as oil or diesel fuel may be sponged off immediately with clean water and allowed to dry naturally.
 - 4.1.2.2 Mud can be removed with a stiff (not wire) brush when dry.
 - 4.1.2.3 Covers may be hand washed in good quality mild detergent in cool water (40°C). Rinse well, air drip dry.
- 4.1.3 Sponge the inflation chamber with ONLYSOLUTION SOAP PURE. Rinse in clean water immediately, inflate and air dry.

WARNING: Do not use proprietary cleaning fluids, thinners, spirits or similar substances.

5.1 Outer Cover Inspection

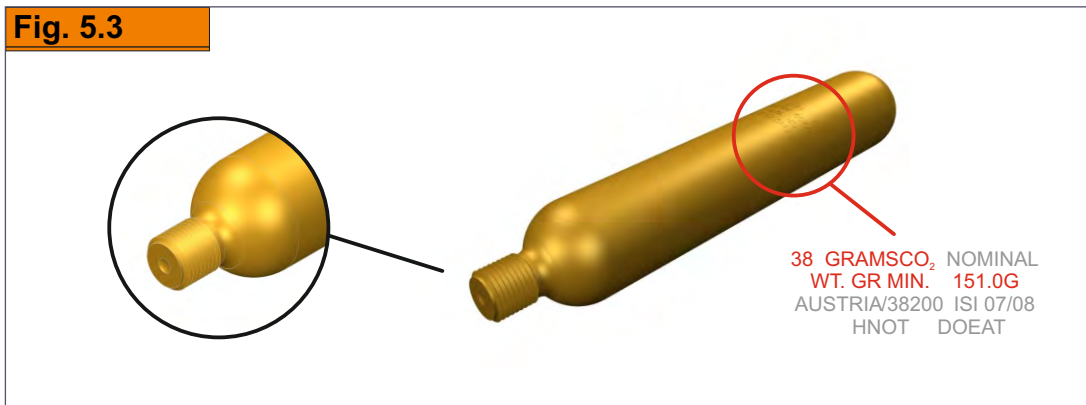
- 5.1.1 Visually inspect the cover material for wear, abrasion, pulled threads, contamination, cuts and holes.
 - 5.1.2 Carefully examine the zips and the slider for wear, broken teeth or slider and worn or fraying tape.
 - 5.1.2 If necessary the cover may be washed. Refer to Section 4.
 - 5.1.3 Repairs to the outer cover are not permitted.
 - 5.1.4 If it is considered that the cover is so badly damaged that the lifejacket is no longer serviceable, the customer shall be advised and offered a replacement lifejacket.
- NOTE: Due to the construction of this lifejacket no individual cover is available for replacement, therefore the lifejacket as a whole must be replaced.

5.2 Inflation Chamber Inspection

- 5.2.1 Visually inspect the inflation chamber material for wear, pulled threads, contamination or signs of mistreatment.
- 5.2.2 Visually inspect all welds.
- 5.2.3 Visually inspect all webbings in accordance with Section 5.6
- 5.2.4 Visually inspect the whistle and its attachment to the lifejacket for mistreatment, defects, and fraying of the cord and its attachment.
- 5.2.5 Test Lifejacket in accordance with Section 6.

5.3 Gas Cylinders

- 5.3.1 Visually examine:
 - 5.3.1.1. For Corrosion (All cylinders corroded with red rust or with visible pitting must be replaced).
 - 5.3.1.2. Pierced or damaged piercing disc.
 - 5.3.1.3. That the two cylinders have the correct gas charge - 38gm.
- 5.3.2 Check Min Weight of Cylinder against that marked on the barrel.



Remedial Action: If any of the above conditions are found to be incorrect the cylinder shall be replaced. See Section 9.

5.4 Mouth Inflation Valve

- 5.4.1 Visually inspect for damage.
- 5.4.2 Test in accordance with Section 6.

Remedial Action: These items are not repairable. Refer to Section 9 for replacement part.

5.5 Inflation System

- 5.5.1 Visually inspect the Operation of the Manual or Automatic Mechanism for:
 - 5.5.1.1 Operation of the Manual override lever. This shall move easily and freely.
 - 5.5.1.2 Operation of the firing pin cam action. Similarly this shall be a smooth action when the lever is operated.
 - 5.5.1.3 Firing Pin centre discharge hole clear.
 - 5.5.1.4 Activation cord for fraying and damage.
 - 5.5.1.5 Moulded body for cracks and damage. Special attention to be given to the areas around the operating lever/body connection pin.
 - 5.5.1.6 Check the Automatic plunger (Automatic Head Only) at the base of the unit when depressed moves the firing pin and that the plunger and the firing pin return to their original positions when released.

Remedial Action: In the event that the Operating Mechanism fails any of the above inspection procedures, the complete unit shall be replaced. No Repairs are allowed. Refer to Section 9 for the part number of the relevant replacement part.

- 5.5.2 Visually inspect the Operation of the Automatic Capsule on the automatic Operating Head:
 - 5.5.2.1 Check plug is in place at the base of the capsule.
 - 5.5.2.2 New Capsules are to be fitted where the expiry date is before the next annual service of the lifejacket. Current capsules are marked with the month and year of expiry.
 - 5.5.2.2.1 If the capsule is to be replaced – Re-fit the old capsule and carry out operational tests. Refer to section 6.

5.6 Webbings

- 5.6.1 Visually inspect for damage:
- 5.6.1.1. Fraying
 - 5.6.1.2. Pulled Threads
 - 5.6.1.3. Broken Stitches

Remedial Action: No repairs are allowed. In the case of damage being found, return the Lifejacket to Crewsaver.

5.7 Buckles

- 5.7.1 Visually inspect all buckles used on the webbings for signs of damage or corrosion.

Remedial Action: No repairs are allowed. In the case of damage being found, return the Lifejacket to Crewsaver.

5.8 Labelling/Markings

- 5.8.1. Check all Markings and Labelling are clear and legible.

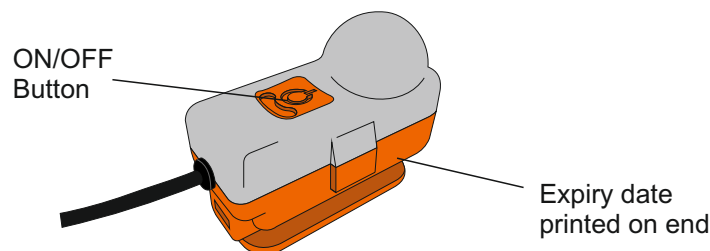
Remedial Action: No repairs are allowed. In the case of damage being found, return the Lifejacket to Crewsaver.

5.9 Lights (if fitted)

- 5.9.1 The Crewfit Societe Nationale de Sauvantage en Mer - 150N Lifejacket is fitted with the Crewsaver CS-SL2 Water Activated Light.

Visually inspect the light for signs of damage to:

- 5.9.1.1. The switch.
 - 5.9.1.2. the cable.
 - 5.9.1.3. the lens and its mounting or housing.
- 5.9.2 Check expiry date on battery. The expiry date must exceed the date of the next annual service. If the light has expired or expires before the next service then it must be replaced. (See Section 9).



- 5.9.3 Test the assembly as detailed in Section 6.
- 5.9.4 Check the expiry date (Fig. 1) and replace light if necessary.
- 5.9.5 These lights are not repairable; if the light fails inspection it must be replaced with a replacement CS-SL2 light.

6.1 Inflation Chambers

6.1.1. Air Holding Test. (Both Chambers must be tested independently)

6.1.1.1 Connect through a suitable Tee piece and adaptor, the oral tube with the oral valve in the open position, to a graduated water manometer (or a similar digital device for measuring back pressure).

6.1.1.2 Slowly inflate the lifejacket from a regulated supply until manometer reads 200mbar

Warning: Regulated supply pressure must not exceed 20psi.

6.1.1.3 Close off the air supply and leave for 10 minutes to ensure pressure is stable.

6.1.1.4 Check and record the pressure and temperature reading on the Service Record Sheet.

6.1.1.5 Leave for 30 minutes.

6.1.1.6 Check and record the pressure and temperature reading on the Service Record Sheet.

The maximum difference in the two pressure readings (pressure drop) allowed is 10%. The temperature differential shall be within plus or minus 3 degrees of the original reading. For each degree Centigrade rise in temperature subtract 2.5 mbar. For each degree Centigrade drop in temperature add 2.5 mbar to the readings to obtain the actual pressure variation. Should the temperature variation be outside 3 degrees either way then the test shall be repeated.

6.1.1.7 Repeat for the other chamber.

6.1 Inflation Chambers cont.

- 6.1.1.7. If Lifejacket fails the Air holding test inspect as follows.
- 6.1.1.7.1 With the lifejacket inflated carefully brush or spray the surface with a weak solution of soap and water or alternatively lower the lifejacket into a tank of water to observe for bubbles.
- 6.1.1.7.2 Identify and mark the source of leakage. Wash off in clean water and allow to dry naturally in air.
- 6.1.1.7.2.1 Special Attention to be given to:
- Schrader Valve
 - Oral Tube/ Top-up Valve
 - Oral Tube/Relief Valve
- 6.1.2 Subsequent to the air holding test in para 6.1, slowly inflate the lifejacket until the relief valve vents (opens). Record the pressure reading on the manometer. See 6.2.2 below regarding type of Relief Valve.
- 6.1.2.1. Allow the pressure to relieve through the valve until the relief valve reseats (closes). Record the pressure reading. Note: Relief valves should operate at 3.5psi. Relief valves that do not operate within the 3.5 - 4.0 psi range must be replaced.
- 6.1.2.2. The Opening (vent) and closing (reseat) reading shall be within 15% of the original reading. Note: Valves that fail to reseat within the 15% tolerance must be replaced.
- 6.1.3 If the test is satisfactory deflate the Lifejacket in preparation for re-assembly. Refer to Section 8.
- 6.1.3.1. Insert the inverted oral valve dust cap into the top of the oral valve and expel the air. Lifejackets may also be deflated using the Venturi Vacuum System. For the part number, refer to Section 9.
- 6.1.4 Effect repairs in accordance with the Repair Procedures within the limits defined in Section 7.
- 6.1.5 Subsequent to remedial action being taken (see Section 7), retest the lifejacket in accordance with Section 6.

6.2 Valves

- 6.2.1. Oral Valve.
- 6.2.1.1. When removing the test adapter from each oral valve check that the oral valve reseats. If in doubt this may be checked by placing the valve underwater.
- 6.2.2 Relief Valve
- 6.2.2.1. Relief valves should be tested as detailed in 6.1.2.1, if defective, the relief valve must be changed. Refer to section 9 for replacement part.
- 6.2.3 Schrader Valve
- 6.2.3.1. Should a leak be found in the Schrader Valve the faulty core must be removed and a new valve inserted using the Torque Screwdriver from the tool kit.

6.3 Inflation Mechanisms

- 6.3.1 Operational Test for Manual Operation.
- 6.3.1.1. Remove the operating mechanism from the lifejacket. With the cylinder also removed, pull the lever on the side of the operating head, and check that the firing pin is visibly moving inside the open end.
- 6.3.1.2. If the lever does not move, or the firing pin is not clearly moving, the operating head must be replaced. Refer to Section 9 for part number.
- 6.3.2 Operational Test for Automatic Operating Heads (to be performed when capsules have expired).
- 6.3.2.1. Remove the operating mechanism from the lifejacket and remove the cylinder.
- 6.3.2.2. Assemble the expired capsule onto the body of the operating mechanism.
- 6.3.2.3. Place the complete unit into water and check that the unit operates within 5 seconds.
- 6.3.2.4. If the mechanism fails to pass repeat test replace the complete unit. Refer to Section 9 for part Number of the replacement part.

NOTE: All failures of this test must be reported to Crewsaver. Crewsaver may require the failed units to be returned. Please do not discard.

6.4 Back Pressure Test

- 6.4.1 The Back Pressure Test is only to be carried out when the inflation mechanism has been fitted to the Schrader valve.
- 6.4.2 The inflation mechanism is pressure tested for leakage (pressure drop). See following instruction;
 - 6.4.2.1. Fit the automatic or manual inflation mechanism to the 'D' post.
 - 6.4.2.2. Firmly screw the cylinder adaptor by hand into the inflation mechanism. See Fig 6.4.1.
 - 6.4.2.3. Connect the cylinder adaptor to the pressure test unit. See Fig 6.4.2.
 - 6.4.2.4. Pressurise the inflation mechanism by turning the control on the test unit to INFLATE. See Fig 6.4.3.
 - 6.4.2.5. Let pressure rise to between 25 and 30psi.
 - 6.4.2.6. Release control to its vertical position (minor pressure decrease over 2 seconds is ok).
 - 6.4.2.7. Release the pressure by turning the control to DEFLATE.
- 6.4.3 If the pressure does not stabilise after 2 seconds and continues to drop then this must be rectified.
- 6.4.4 Disconnect the test unit, remove the cylinder adaptor and check the following;
 - 6.4.4.1. Sealing washers either side of the inflation mechanism.
 - 6.4.4.2. Trapped cylinder cover or other item under the inflation mechanism.
 - 6.4.4.3. Damage to the 'D' post seating.
 - 6.4.4.4. Cross threaded chrome nut.
 - 6.4.4.5. The cylinder sealing washer.
 - 6.4.4.6. The Schrader or Pang valves in the 'D' post.
 - 6.4.4.7. The inflation mechanism itself, although this is the least likely.
- 6.4.5 If there is no decrease in pressure, disconnect the test unit and remove the cylinder adaptor.
- 6.4.6 Fit by hand the gas cylinder required for that design of lifejacket.
- 6.4.7 Fully tighten the gas cylinder using the torque wrench set to 4Nm and the belt adaptor.
- 6.4.8 Continue with packing the lifejacket.

Fig 6.4 Back Pressure Test

Fig. 6.4.1



Fig. 6.4.2



Fig. 6.4.3



6.5 Retro Reflective Tape

- 6.5.1 If the retro reflective tape shows any signs of degradation the following tests shall be carried out in accordance with Marine Guidance Note MGN 105 (M+F) Issued by the UK Marine and Coast guard Agency March 1999.
- 6.5.1.1. Place a new piece of the same retro-reflective material to, and on the same plane as, a representative piece of material fitted to the appliance.
 - 6.5.1.2. Pour water over both pieces of material.
 - 6.5.1.3. Using a powerful torch or "Aldis" lamp held at eye level, compare the performance of the two pieces of material from a distance of 10 Metres.
 - 6.5.1.4. If a noticeable deterioration in performance is observed then the retro-reflective material on the appliance should be replaced.
 - 6.5.1.5. Dry off the lifejacket before repacking.

6.6 Lights

- 6.6.1 Testing Procedure for lights fitted to lifejackets.
- 6.6.1.1. Crewsaver CS-SL2 Water Activated Light.
Test the light by pressing the switch. The light must flash, press the light switch again to turn the flashing off (This will not affect the automatic operation of the light). If the light does not flash, the unit has expired and must be replaced.
 - 6.6.1.2. Operation should be checked during the lifejacket servicing.

7.1 Outer Cover

7.1.1 No repairs are permitted to the outer cover.

7.2 Inflation Chamber

7.2.1 No repairs are permitted to the inflator fabric or its assembly, due to the construction of this lifejacket.

7.2.2 Components attached to the inflator may be repaired in line with the limits defined below.

7.3 Gas Cylinders

7.3.1 No repairs permitted. For the Part No. of the replacement part refer to Section 9

7.3.2 Please ensure cylinders are disposed of in accordance with local regulations.

Treat empty cylinders as steel for recycling purposes.

7.4 Valves

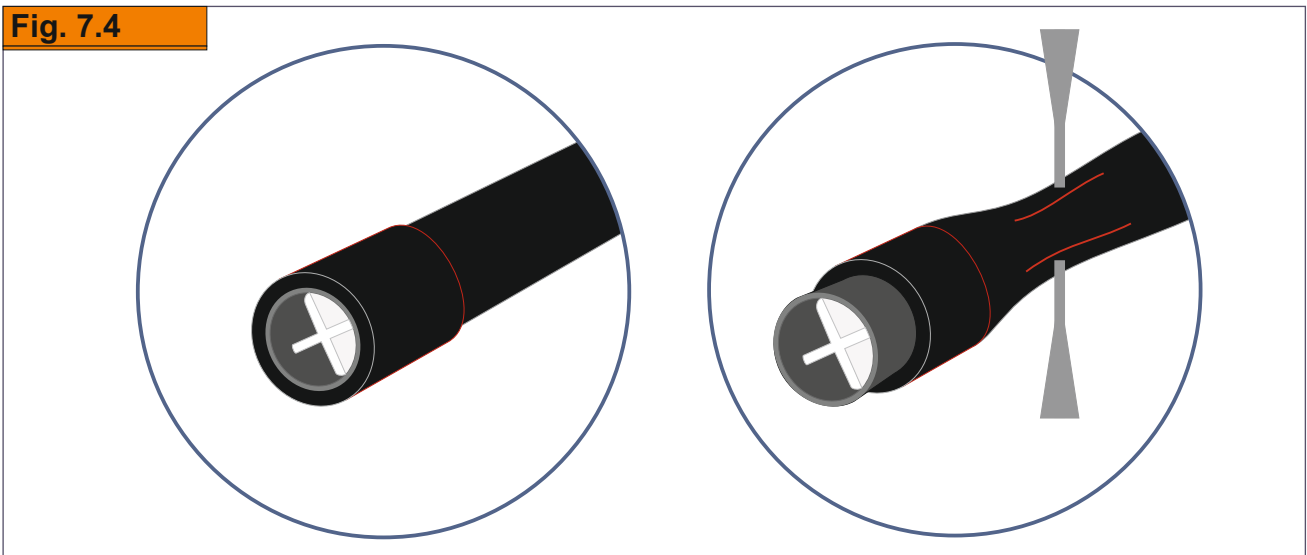
7.4.1 No repairs permitted. For the Part No. of the replacement parts refer to Section 9

7.4.2 Replacement of the Oral valve may be achieved by.

7.4.2.1 Carefully removing the defective unit by applying force, with a blunt instrument, behind the oral valve Squeezing the tube and gently pushing the valve out.

7.4.2.2 Push the replacement valve into the oral tube.

Fig. 7.4



7.5 Inflation System

7.5.1 A Schrader core is located inside the Valve Stem.

7.5.1.1 Remove and replace using the calibrated torque driver for Schrader Valves set to 0.32 - 0.36 Nm. Refer to Section 9 for the Part No. of the replacement part.

WARNING: Only fit replacement Schrader Valves obtained from Crewsaver.

7.5.2 Operating Mechanism.

7.5.2.1 No repairs permissible. Replace the complete unit.
Refer to Section 9 for the Part No. of the replacement part.

7.6 Webbing

7.6.1 No repairs are permitted to the webbing on the lifejacket. Lifejackets with damaged webbing (including crutch straps) should be returned to Crewsaver.

7.7 Buckles

7.7.1. These components are not repairable or replaceable. Lifejackets with damaged buckles should be returned to Crewsaver.

7.8 Spray Hood

7.8.1. No repairs are permitted. Lifejackets with damaged spray hoods should be returned to Crewsaver.

8.1 Assembly

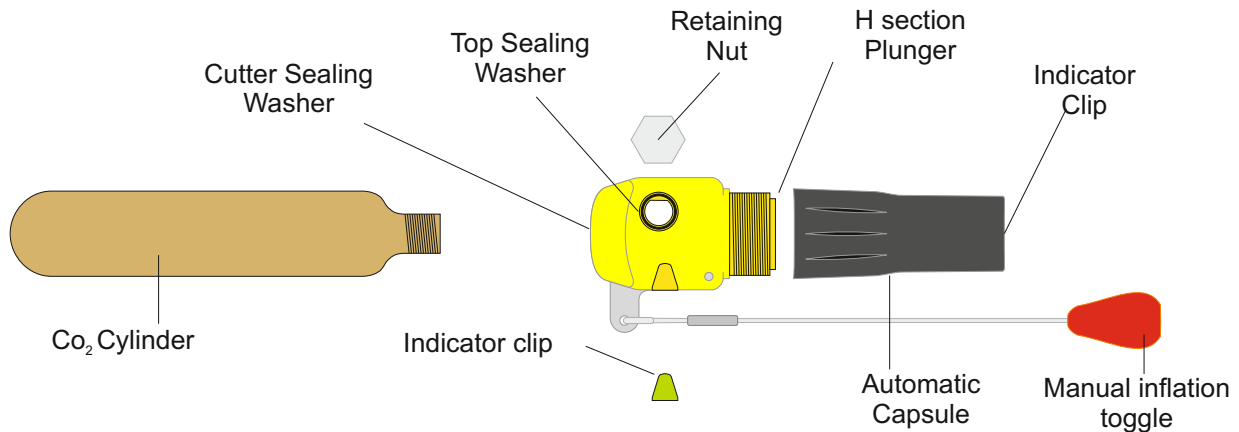
- 8.1.1 Ensure the whistle is positioned and tied in correctly.
- 8.1.2 Expel the air from the chambers by inverting the dust caps on the oral tubes. Lifejackets may also be deflated using the Crewsaver Venturi Vacuum System. For the part number, refer to Section 9.
- 8.1.3 Assemble the Operating Mechanism to the inflator.
 - 8.1.3.2 For United Moulders Mk5 Automatic Operating Mechanisms. See Fig 8.2.
 - 8.1.3.2.1 A new retaining clip must be fitted. Refer to Section 9 for replacement parts.
 - 8.1.3.2.2 Fit the new automatic firing capsule to the operating head, screw hand tight.
 - 8.1.3.2.3 Locate Operating head onto the Manifold ensuring operating head seals are in place.
 - 8.1.3.2.4 Tighten the retaining nut onto the body using the Calibrated torque driver provided in the Crewsaver servicing tools. Note: Retaining nut must be tightened to between 2.5 and 2.7 Nm.
 - 8.1.3.2.5 Carry out the Back Pressure Test. Refer to Section 6.
 - 8.1.3.2.6 Hand tighten the cylinder firmly by hand. Then check using the torque wrench (4Nm) and cylinder belt from the toolkit.

Warning: Care must be taken not to 'cross thread' the connection.

- 8.1.4 To re-pack the lifejacket see Figure 8.3.
- 8.1.5 Expel additional excess air, during the packing operation, from within the inflator by again inverting the cap on the oral tube and inserting it into the oral valve. When all excess has been expelled replace the cap.
- 8.1.6 Ensure that the Gear loop assembly is attached to the Lifejacket via the toggle into the cover and the webbing is attached to the split D-ring through the Gear loop sleeve.
- 8.1.7 Remove the self adhesive service disc and refit a new disc referring to the year of the next service.
NOTE- The month due service should be positioned on the notch of the disc. See Fig 8.4.
- 8.1.8 Mark Service Label on Lifejacket (using an indelible pen) and Service Record Sheet with the date of the service, together with the initials and certificate number of the person carrying out the service.
- 8.1.9 Ensure the serial number has been correctly recorded and that it is clearly marked on the Record Sheet.

Warning: The lifejacket folding procedures must be followed accurately to ensure that the lifejacket inflation mechanism operates and the lifejacket deploys correctly. The lifejacket shall not be folded and/or packed using any other method or procedure than that specified.

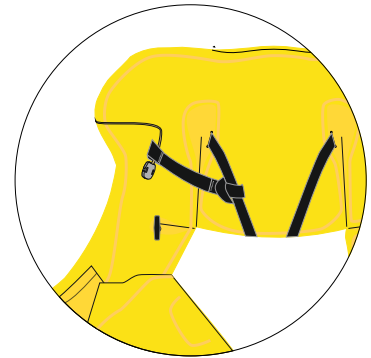
Fig 8.2 United Moulders Mk5 Operating Head



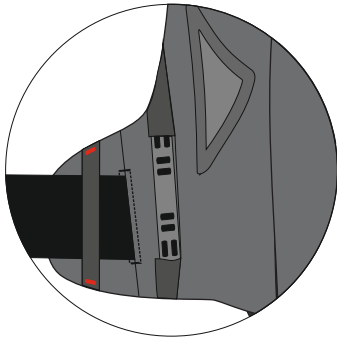
- 8.2.1 Ensure that the new bottom seal has been placed into the operating head. Before fitting the operating heads onto the manifolds, check that the schrader valves are fitted. If fitting a new schrader valve use a calibrated torque driver set to 0.32 - 0.36 Nm. Then place the operating head onto the manifold, so that the cylinder thread is pointing upwards.
- 8.2.2 Check the new sealing washer is in the recess on the top face of the operating head. With the top sealing washer in place, fit the retaining nuts. The retaining nuts should be screwed into place using a torque wrench or driver fitted with a 9/16" socket. The wrench or driver should be set to between 2.5 and 2.7 Nm. This will prevent damage to the operating head and ensure a good seal is maintained. Carry out the Back Pressure Test. Refer to Section 6.
- 8.2.3 Check that the Cutter sealing washer in the end of the operating head has been replaced and is correctly fitted. Fit the 38 gram CO₂ cylinder. Ensure that the cylinder has been check weighed before fitting to the lifejacket. Hand tighten the cylinder firmly by hand. Then check using the torque wrench (4Nm) and cylinder belt from the toolkit.
- 8.2.4 Fit the new automatic capsules onto the operating heads. The capsules fitted on the United Moulders Mk5 heads are the black Mk5i capsules. The capsules should be screwed tight to the ends. Make a note of the expiry dates on the service record sheet.
- 8.2.5 With the firing capsules fitted, fit the indicator clips. The clips are fitted by pressing them over the firing arms and in to the recess either side in the centre of the operating head. The clips will click into place, thereby preventing the arm from moving.

Fig 8.3 Repacking the Ergofit 190N Twin Chamber

Ensure hood webbing puller is placed above chamber collar and velcro tabs are secured.



Fix light activator to its elastic retainer at the back of the collar.



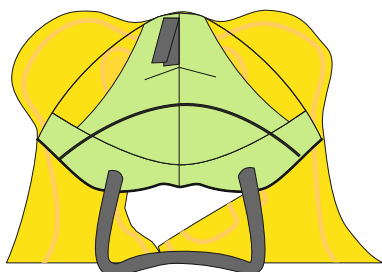
Ensure pull cord handle is located in its garage on outer cover.



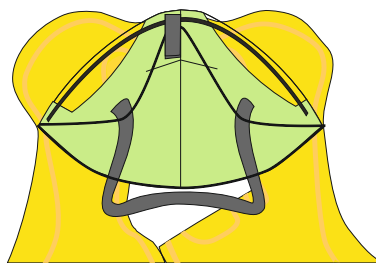
Ensure firing mechanism is armed correctly and green indicators are showing.

Lifting beackets should be fastened to the press studs on the inflator.

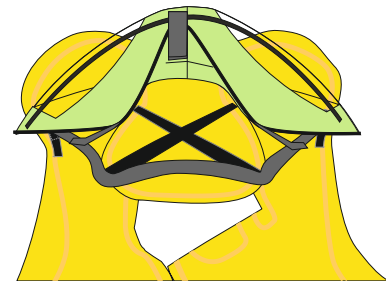
REPACKING THE SPRAYHOOD



Lay hood out so top seam with velcro retainers lays flat and straight.



Gather tubing and excess visor up and secure with velcro retainers.



Concertina hood so it lays flat against edge of the chamber. Affix velcro tabs on webbing to velcro retainers on chamber. Ensure webbing puller lays over the chamber collar.

Fig 8.3 Repacking the Ergofit 190N Twin Chamber (cont.)

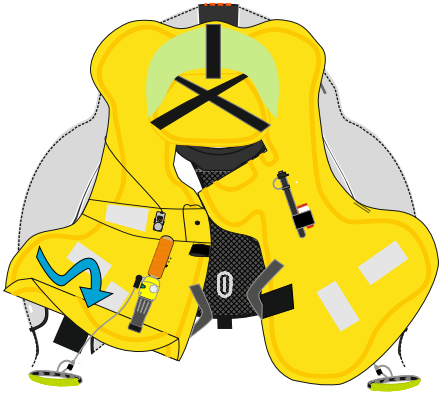
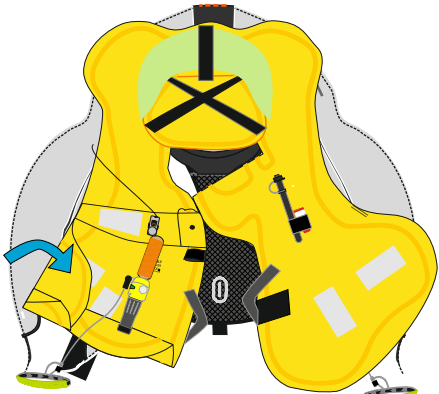

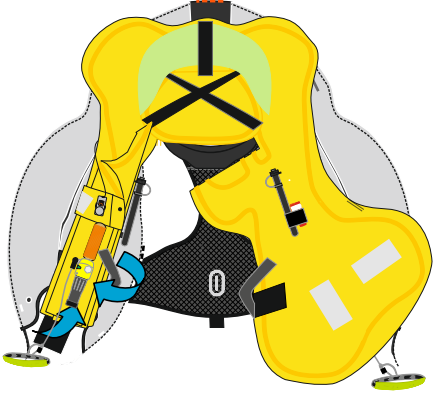
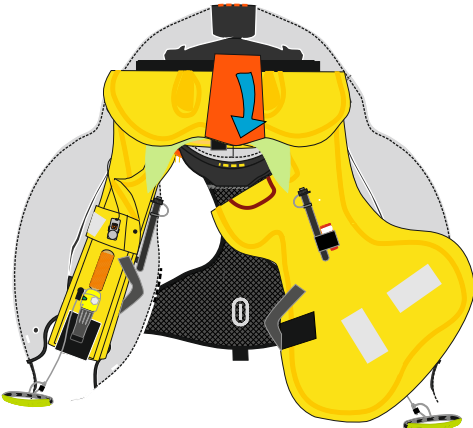
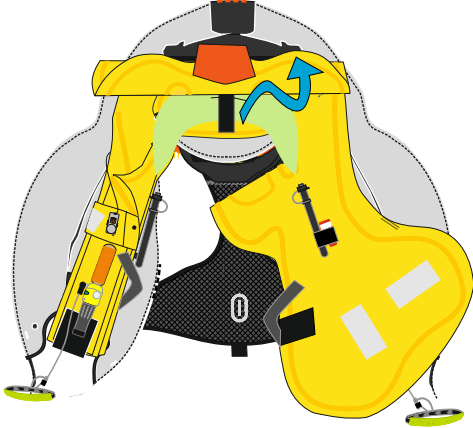
<p>1</p>  <p>Concertina bottom left side of Chamber. Ensure capsule lays on top of the fabric. Run the zip slider round to the left side of the jacket.</p>	<p>2</p>  <p>Fold outer left side of chamber over towards the centre.</p>
<p>3</p>  <p>Fold the inner edge of the chamber over towards the outside .</p>	<p>4</p>  <p>Fold the inner edge of the Chamber over again so that the inflation mechanism is visible on top and the pull handle extends out of the bottom of the cover. Fold protective cover up over the folded chamber and under the operating head.</p>
<p>5</p>  <p>Fold chamber collar down as far as it will go.</p>	<p>6</p>  <p>Fold the top edge back to make a concertina fold with the hood laying underneath.</p>

Fig 8.3 Repacking the Ergofit 190N TWIN CHAMBER (cont.)

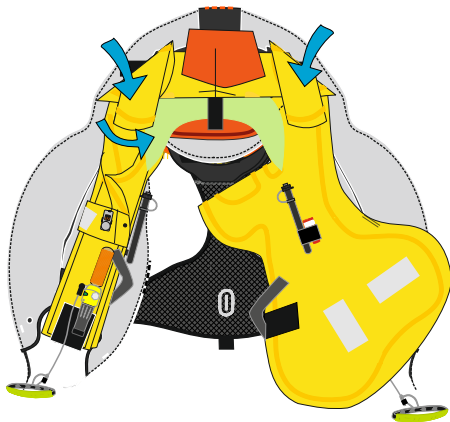
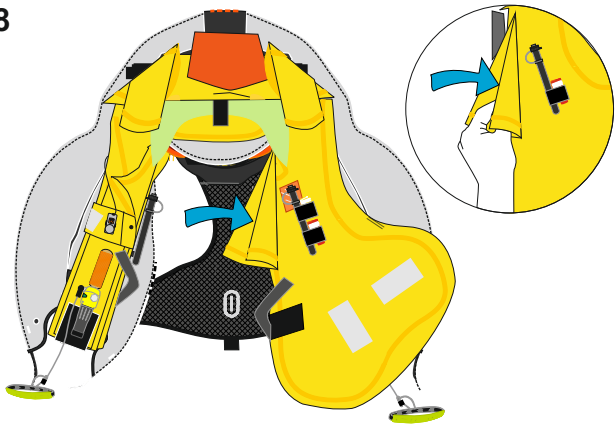
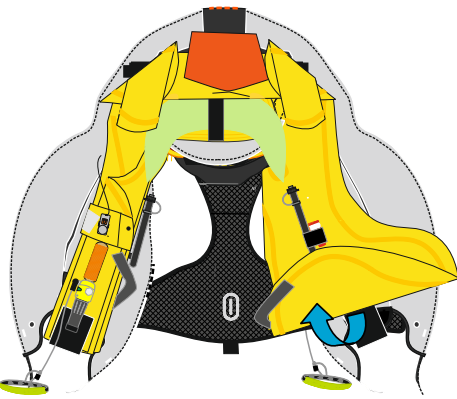
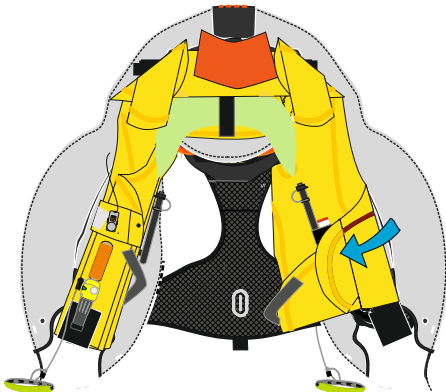
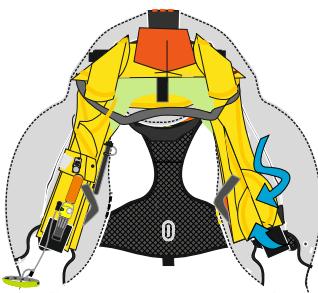
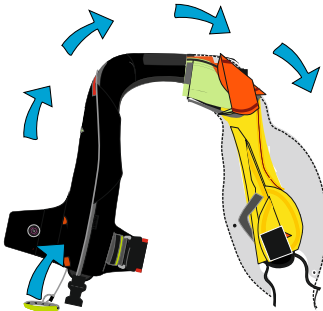

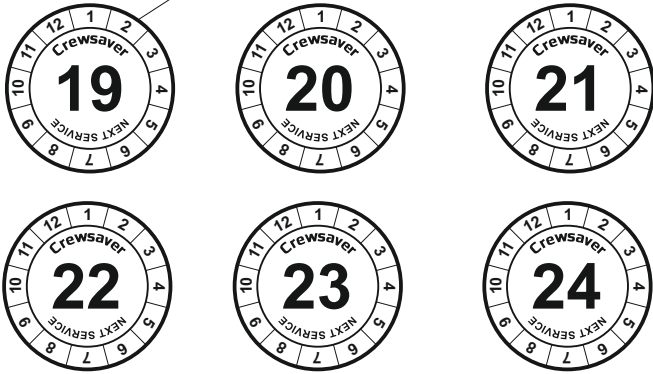
<p>7</p>  <p>Fold top corners of collar down . Tuck hood in and tuck the light cord between the cover and the back of the partially folded chamber.</p>	<p>8</p>  <p>Tuck chin support inside itself so there is a straight line from corner to corner.</p>
<p>9</p>  <p>Fold the bottom right edge of inflator up as far as it will go.</p>	<p>10</p>  <p>Fold outer edge over towards the centre as far as it will go.</p>
<p style="text-align: center;">FINAL 190N FOR INSTRUCTIONS TWIN CHAMBER</p> <div style="display: flex; justify-content: space-between;"> <div data-bbox="95 1523 470 2047"> <p>11</p>  <p>Concertina fold inner right edge over to fit and fold the protective cover up over the folded inflation chamber. Tuck everything inside cover and close cover using zip from the left side. Fixing velcro burst tabs as you go.</p> </div> <div data-bbox="470 1523 821 2047"> <p>12</p>  </div> <div data-bbox="821 1523 1489 2047"> <p>13</p>  <p>Tuck zip ends inside cover so the bottom of the jacket looks neat and tuck moulded lanyard handles into retainers.</p> </div> </div>	

Fig 8.4 Service Disc

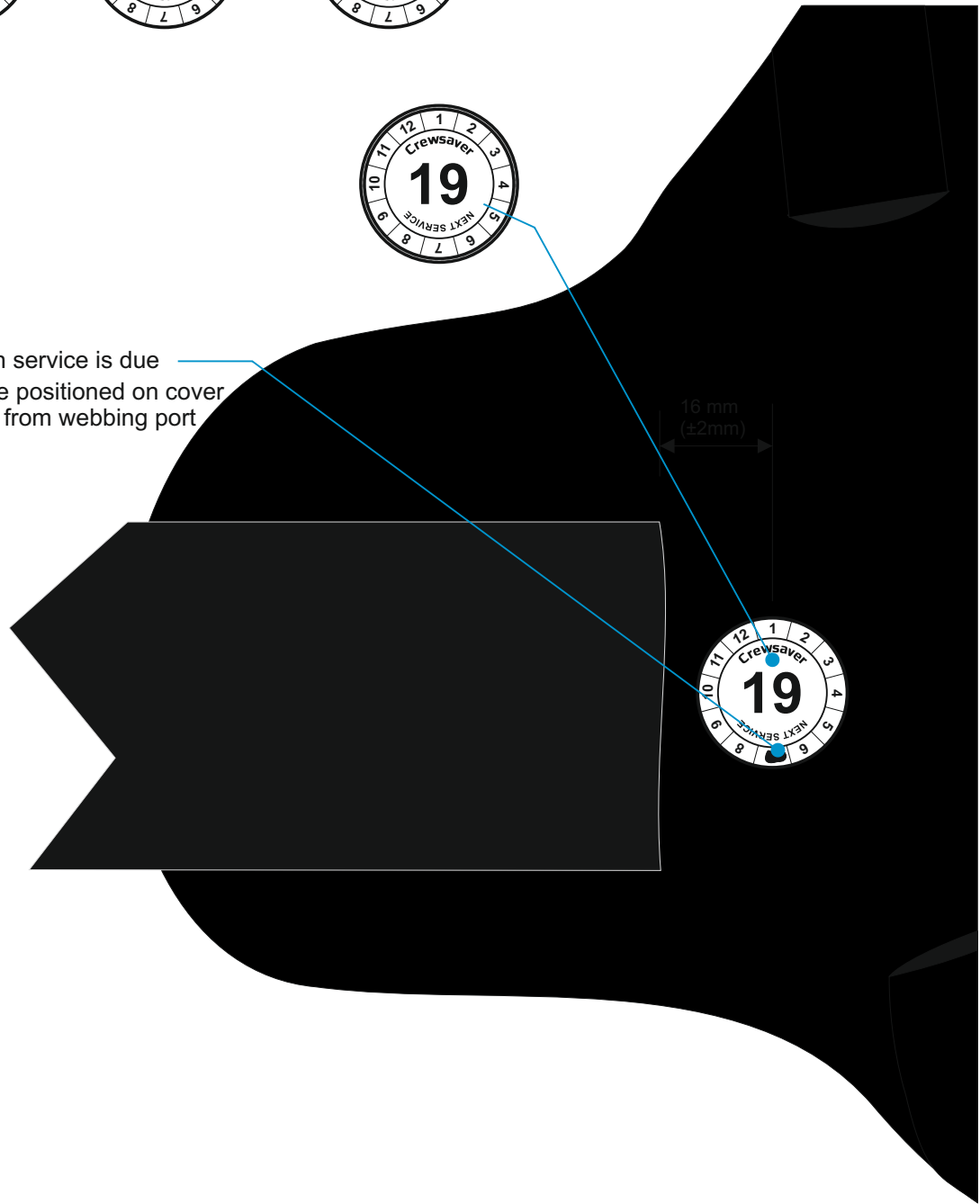
Self adhesive service disc

Note :Number in centre of disc refers to year of next service.

22mm DIA



Indicates month service is due
Service disc to be positioned on cover
right side 10mm from webbing port



9.1 Parts List

Product Description	Part Number
Mesh sleeve (120 mm)	10390
38 gram CO ₂ Cylinder	12045
Service. Schrader Valve	10049
United Moulders Mk5i Auto Capsule	10017
Rubber End for Capsule	900021
Operating Head Sealing Washer (Top and Bottom)	10373
Cylinder Sealing Washer	11048
Mk5 UML Auto Inflate Head and Cap set	11044
UML Mk5 Auto Head Retaining Clip	11043
Cap Nut for Inflation Gas Flange	10388
Whistle	10678
Whistle & Elastic Tube Attachment	12043
CSL Light	10226
Mouth Inflation Valve	10208
Mouth Inflation Valve Cap	10151
Pressure Relief Valve 3.5psi SOLAS 2010	11059
Venturi Vacuum System	10481
Servicing tool kit	10467
Cylinder adaptor for back pressure System	900042
Back pressure test unit	900041
Cylinder tightening tool	900040