Chapter 12

LIFE JACKET, MK.7

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Aircrew life jacket, Mk 7, consisting of:—	*Ref. No.* 22C/2275
Waistcoat	*Ref. No.* 22C/
Stole, complete with oral inflation valve	*Ref. No.* 22C/
Cylinder, CO_2, Mk 4, 34 gr	*Ref. No.* 6D/9432080
Head, operating, Type M	*Ref. No.* 6D/1624
Valve, oral inflation, Mk 2	*Ref. No.* 22C/1429
S.A.R.B.E., Mk. 1, or S.A.R.B.E., Mk. 2	*Ref. No.*
Draw rod (nylon) radio beacon stowage	*Ref. No.* 22C/1862
Lamp, Type B	*Ref. No.* 5A/4216
Fluorescine sea marker	*Ref. No.* 22C/1185
Heliograph	*Ref. No.* 27H/2107
Ground/Air emergency code	*Ref. No.* 27C/2366
Whistle	*Ref. No.* 22C/1186
Life line, 250 lb	*Ref. No.* 22C/1739

Note . . .

For detailed information on S.A.R.B.E. reference should be made to AP2554E, Vol 1, and for the lamp and battery to AP4343, Vol 1 and Vol 1, Book 3.

Fig. 1. Life jacket Mk 7

Note.—*On later production jackets the battery pocket is further forward.*

Introduction

1. The aircrew Mk 7 life jacket (fig. 1) consists of a waistcoat containing a stole which can be inflated with carbon dioxide (CO_2) from a small cylinder. "Topping-up" or deflation is through an oral inflation valve provided for this purpose. The life jacket may be worn over a pressure-breathing waistcoat, a suitably positioned aperture in the jacket providing a passage-way for the oxygen connection to the waistcoat. Design of the stole cover attachment is such as to allow unrestricted inflation of the stole even when parachute harness is worn.

2. In the assembled condition, the stole cover is furled and retained in position by nylon press stud fasteners. The fasteners are forced open by the gas pressure when inflation takes place. When the stole is inflated, its lobe tips must be brought close to the body to ensure correct angle of flotation. Pull cords are fitted on the bottom of each lobe to achieve this condition. Two looped straps (beckets), normally hidden by the furled stole cover, but readily accessible after stole inflation, provide suitable attachments for lifting a survivor from the water. Straps are suspended from the base of the jacket for the attachment of a dinghy pack and dinghy lanyard.

3. Items of equipment carried in, or on, the jacket are listed in the Leading Particulars. The jacket, complete with its equipment, is worn like a simple waistcoat over all other flying clothing.

4. ◀The life jacket was originally designed to accommodate S.A.R.B.E. Mk. 1, illustrated in fig. 3, but a later requirement calls for the use of S.A.R.B.E. Mk. 2, in the first instance as an alternative to Mk 1, but later as a standard item. S.A.R.B.E. Mk 2 has a battery which is 1 in smaller in depth than that of the Mk 1, and this necessitates the packing out of the stowage pocket as described in para. 16.▶

DESCRIPTION

Waistcoat and stole

5. The waistcoat (fig. 2), which incorporates the stole cover, is made of cotton gabardine dyed yellow, and the stole is made of rubber-proofed fabric. The life jacket is fastened at the front by three buttons, with adjustment for girth provided by a webbing waistband fitted with non-slip buckles. Looped webbing straps are attached at the front lower end of the jacket for the attachment of the dinghy pack and dinghy lanyard.

6. A D-ring on the right-hand edge of the stole cover forms an anchorage point for the oxygen mask tube. It can also be utilised for connecting the life lines from the jackets of other survivors.

7. An opening at the back of the waistcoat provides access for the insertion and removal of the stole and is closed by a sliding fastener. Another opening on the right-hand stole cover provides a passage for the oral inflation tube, which is attached to the stole.

8. Pockets are provided for the stowage of:—

CO_2 cylinder
Heliograph and ground/air emergency code card
Battery of a beacon transmitter
Beacon unit
Fluorescine sea marker
Whistle and lanyard
Sea-activated cell and lamp

The locations of the stowages are shown in fig. 1 and 2.

9. Flaps are fitted to enable the pockets, except the CO_2 cylinder pocket, to be closed and the lead from the battery to the beacon to be covered. This latter flap is located under the stole covers. The covering flap for the beacon is fitted with a series of beckets on each side and these are held together to close the pocket by a nylon draw rod. The rod is fitted with a finger ring which provides an easy grip for withdrawing it to gain access to the beacon. The finger ring is retained, until required, by a fabric loop fitted with a press stud.

10. The CO_2 cylinder pocket is open-ended and is fitted with two lengths of cotton webbing used to retain the CO_2 cylinder by being tied round the neck of the gas outlet union. The pocket is closed by a sliding fastener.

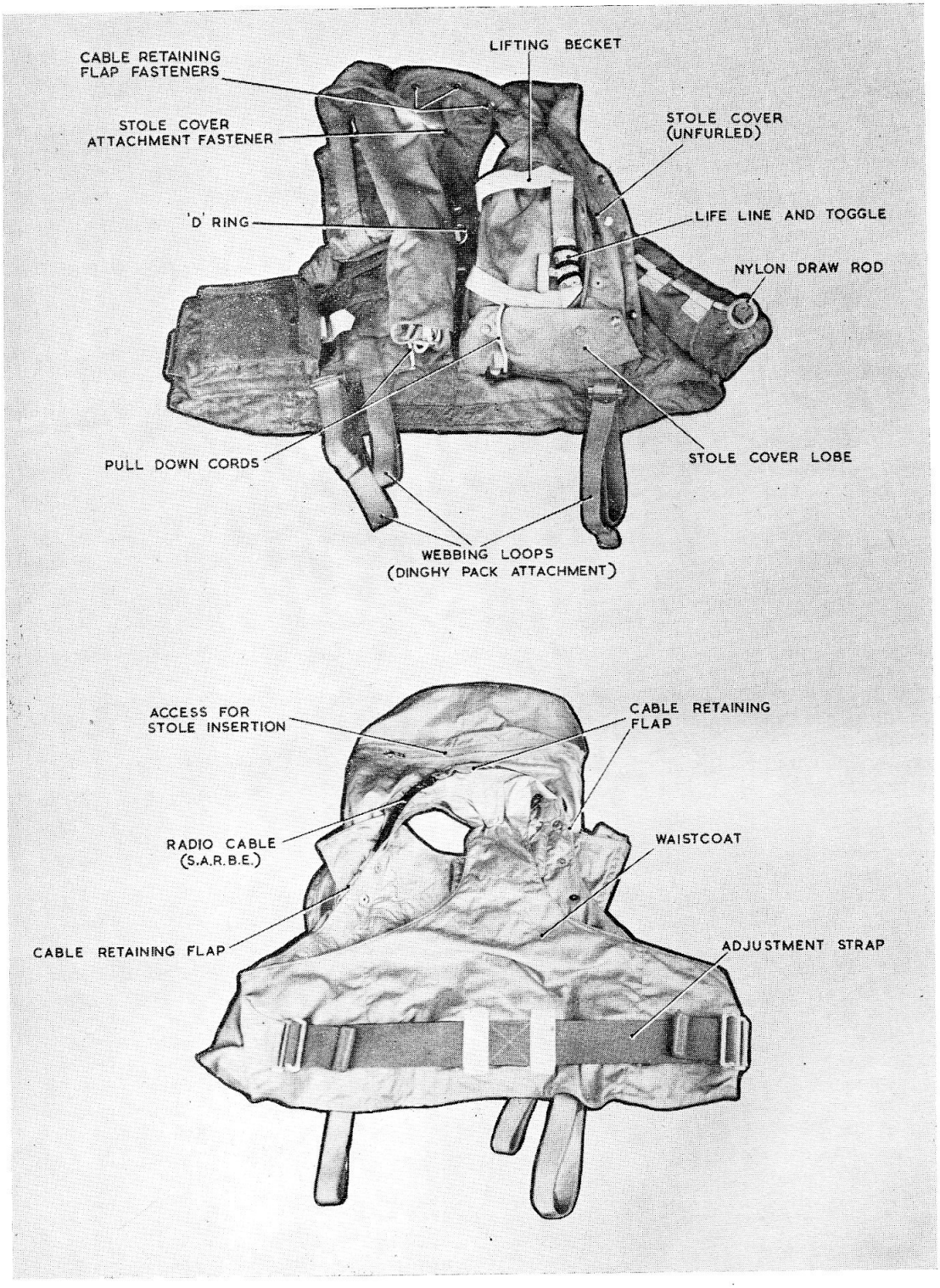

Fig. 2. Life jacket details

Note.—*On later production jackets the battery pocket is further forward*

Life line

11. The life line is a length of 250 lb nylon cord. One end of the cord is secured to the left-hand lifting becket and the other to a wooden toggle. The line is hanked and retained in position along the webbing strap by three bands of $\frac{1}{4}$ in P.V.C. tape (Ref. No. 33B/769), which are wrapped tightly round the strap and the cord at locations $\frac{1}{2}$ in from each end and at the centre close to the toggle. Each band is wrapped twice round and then stuck down.

Inflation mechanism

12. This mechanism comprises a CO_2 cylinder, a Type M operating head and the connection to the stole. The connection on the stole is a Schrader valve mounted in a rubber housing which is cemented to the stole. For detailed information on the cylinder and the charging head, reference should be made to AP1182C, Vol 1.

Oral inflation valve

13. The valve consists of two hollow cylindrical mouldings, one being a flanged mouthpiece and the other a flanged body into which the mouthpiece is fitted. Within the body a coiled compression spring is accommodated between an internal shoulder on the body and an external shoulder on the sliding mouthpiece. At its inner end the mouthpiece is secured by a rivet to a rubber sealing washer and a flanged retaining washer. In the 'closed' condition of the valve, the compression spring retains the rubber sealing washer in contact with a shoulder formed by a counterbore in one end of the body. The mouthpiece incorporates two tongue-shaped projections which, with the valve in the 'closed' condition, abut an internal shoulder in the body and prevent inadvertent depression of the mouthpiece and consequent loss of air pressure from the stole. Two grooves, diametrically opposite each other in the body, and of similar shape to the tongues, accept the tongues when the mouthpiece is rotated to bring them into alignment and then depressed.

14. For inflation of stole, the mouthpiece is rotated until the tongues are aligned with the grooves and then depressed by mouth as inflation is commenced. Depression of the mouthpiece forces the tongues into the grooves, compresses the spring and pushes the sealing washer away from its seating. Air flows through the bore of the mouthpiece and out, via two holes positioned diametrically opposite to each other in the mouthpiece walls, to the annular channel between mouthpiece and body and thence, through the passage-way between the 'lifted' sealing washer and its seating, to the stole. On withdrawal from the mouth, the spring forces the mouthpiece outwards, the sealing

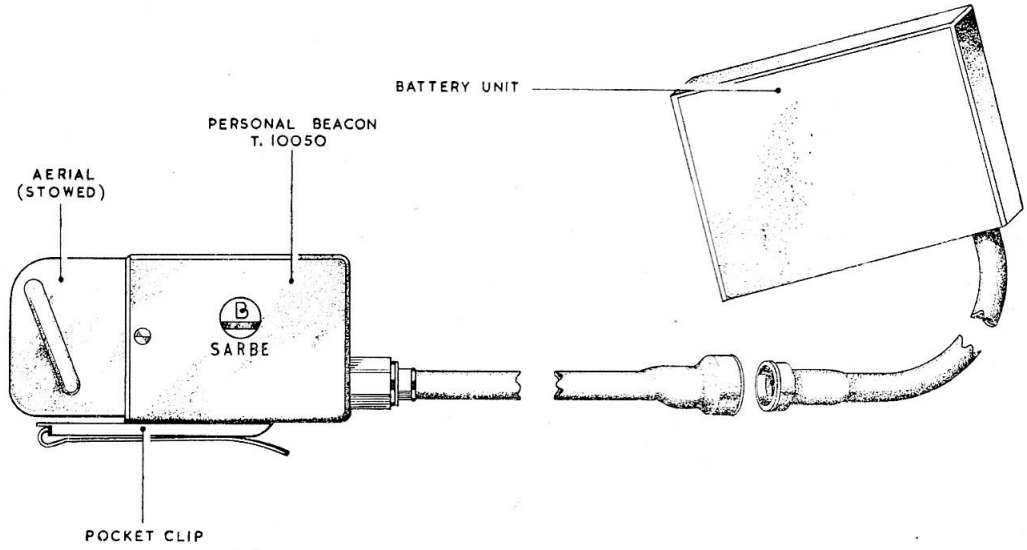

Fig. 3. Transmitter, Type T.10050 (S.A.R.B.E.)

washer returning to its seating to close the valve and function as a non-return valve. The mouthpiece is then rotated to move the tongues out of alignment with the grooves and so lock the valve in the closed condition.

Sea-activated cell and lamp

15. The battery is stowed in the pocket, with its stud side forward, and with the retaining lanyard looped across the bottom of the battery so that when the battery is removed, no snagging occurs. The method of packing new lamps and batteries originally adopted resulted in the cable taking up a permanent set at the point where it emerges from the plug especially when the equipment had a long shelf life before being issued. As a result, when equipment has been brought into use or the cable disturbed during examination, there has been a tendency for the insulation to split and open at the point of set. This tendency has been aggravated by repeated tight wrappings during periodic servicing. At the intervals stated in Vol 4, special attention is to be given to the examination of the cable to ascertain whether splitting of the insulation has occurred. Lamps with exposed con-

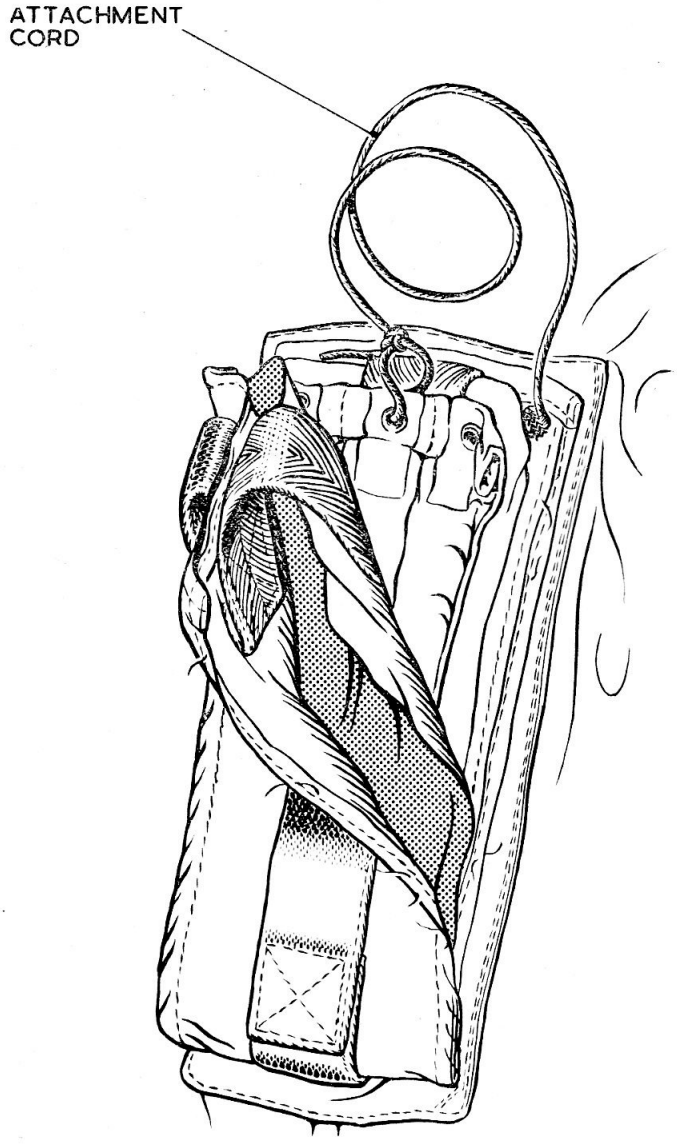

Fig. 4. Attachment of inner pack to life jacket

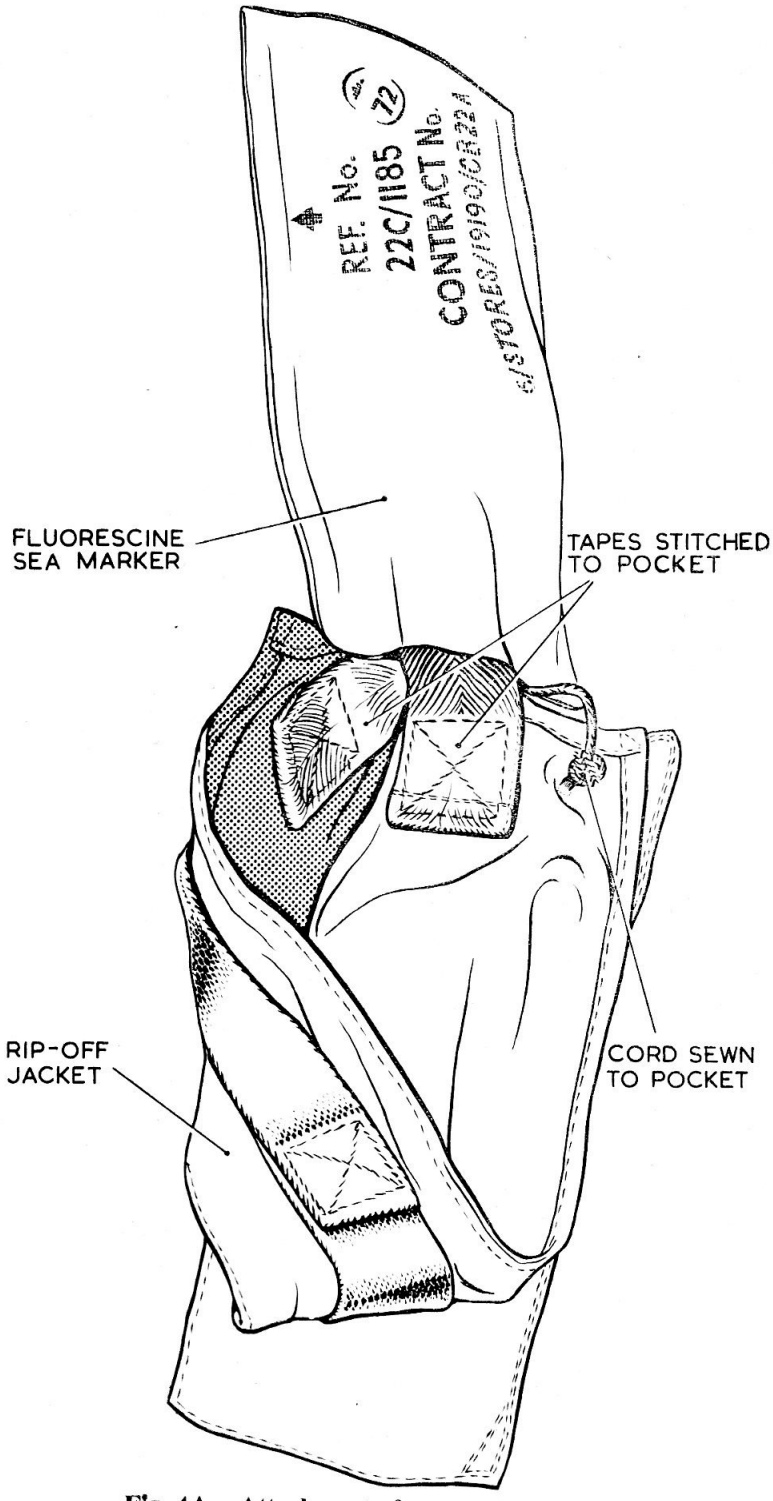

Fig. 4A. Attachment of sea marker to pocket

ductors are to be rejected, but those with marked or kinked cable may continue to be used if there is no splitting. When re-stowing lamps and batteries, the cable is to be led away from the plug in a bend of approximately 1 in across, wrapped round four fingers and the coil so formed secured to the plug side of the battery with a rubber band. The lamp is to be located in a suitable position for stowing flat side up on top of the flex. When stowing the equipment ensure that the loop leading from the plug is not flattened.

ASSEMBLING THE EQUIPMENT

Stowage of S.A.R.B.E.

16. ◀The battery is stowed, cable outlet to the front, in the pocket on the right-hand side of the waistcoat. If S.A.R.B.E. Mk 2 is being stowed the pocket must first be packed out with the making-up piece (Ref. No. 22C/2690) with the face marked 'TOP' uppermost. After the battery has been stowed it is to be secured by the restraining strap. The lead is routed under the stole, inside the retaining flap round the neck, and into the beacon pocket. The beacon is stowed in the pocket on the left-hand side of the waistcoat and any surplus length of lead should be stowed beside it.▶

Heliograph and ground/air emergency code card

17. These are stowed in the outer compartment of the battery pocket. The heliograph is secured by a lanyard and the emergency code card is protected by a fabric bag. The flap is fastened down with press studs.

Fluorescine sea marker (fig. 4 and 4A)

18. This is the standard marker supplied in a pack, which is carried inside a rip-off pocket on the upper right-hand side of the waistcoat. To prevent damage to the pocket and ensure correct operation of the sea marker, the pack is to be attached in the following manner:—

(1) Firmly stitch the cord of the fluorescine pack to the top of the pocket and the retaining flap using No 50 linen thread, 8 to 12 stitches per inch.

(2) Firmly stitch one of the two tapes protruding from the pack to the top edge of the pocket and flap immediately below the top edge, using similar thread and making a 'gate' pattern.

(3) Fold the fabric flap, bringing the upper and lower edges together.

(4) Securely stitch the other tape to the free end of the flap immediately below the edge and opposite the first tape, again using No 50 thread, 8 to 12 stitches to the inch. Ensure that the stitches pass through the fabric and the webbing forming the pull loops.

(5) Join the edges of the flap to form a pocket enclosing the sea marker by stitching along both edges and the top with a continuous length of scarlet locking thread, making not less than four nor more than five stitches to the inch. It is essential that the stitching begins and ends near the folded edge or bottom of the pocket and is securely locked off.

Stole

19. Insert the stole into the outer cover through the opening at the back of the cover and inflate it slightly to make sure that it lies flat and is not twisted. Fasten the press studs at the bottom of each lobe. Bring the oral inflation tube through at the front of the cover and insert it under its retaining loop. Deflate the stole and ensure that the oral inflation valve mouthpiece is rotated to its 'locked' condition. Bring the Schrader connection through the aperture in the back left-hand side of the cover.

CO_2 cylinder and operating head

20. (1) Screw the cylinder, hand tight, into the operating head and fasten down the locking screw.

(2) Release the tape attached to the retaining clip in the coupling nut of the operating head and remove the clip.

(3) Remove the coupling nut.

(4) Ensure that the tip and threads of the Schrader block stem and the internal seating of the coupling nut are clean and undamaged.

(5) Screw the coupling nut finger tight, on to the Schrader block stem until the end of the stem meets the seating inside the nut and then, using two spanners, tighten the nut up another quarter turn.

(6) Push the gas outlet boss on the operating head into the nut with a slight twisting movement.

(7) Check that the alignment of the assembly is correct by feeling to ensure

that the flat surface of the Schrader block is in the same plane as the long axis of the gas cylinder and that the stole is not twisted.

(8) Insert the coupling nut retaining clip and bind the clip tape firmly round the union, once each side of the clip, pull tight and tie the ends of the tape together with a reef knot.

(9) Check the operating head to ensure that the sealing thread on the cap is intact.

(10) Place the cylinder into its stowage and bind the tapes secured to the bottom of the stowage securely round the neck of the union and tie the ends together tightly with a reef knot. These will then take the strain when the knob is pulled to operate the head.

Note . . .

It may not be possible to remove the tapes referred to in sub-para (8) *and* (10) *without damaging them. Damaged tapes are to be renewed.*

Preparation for flight

21. Parachute harness shoulder straps are to be passed underneath the CO_2 cylinder and operating head on the wearer's left shoulder, and underneath the fluorescine pack on the right shoulder. The waist straps of the parachute harness should be passed under the free ends of the stole cover. The safety harness straps can be passed over the life jacket.

Operation during a parachute descent

22. Life jacket inflation can be carried out during a parachute descent. After immersion in the sea, the lobes of the stole can be adjusted by the pull cords at the bottom of each lobe. This will pull the lobes closer to the body and provide the correct angle of flotation.

23. If either side of the stole container fails to burst open during inflation, the press stud fasteners holding it in position can be pulled free.

SERVICING

24. Servicing is to be done in accordance with the instructions contained in, and at the periods stated in, Vol 4.

After immersion in salt water

25. The operating head, CO_2 cylinder, life jacket lamp and battery, sea marker, whistle, heliograph, ground/air emergency code and S.A.R.B.E. units are to be removed. The sea marker is to be discarded and the lamp and battery and the S.A.R.B.E. units returned to the electrical and radio bays respectively with attached labels giving details of the immersion. All remaining items, together with the life jacket, are to be thoroughly rinsed in successive changes clean, cold water and allowed to dry naturally away from all sources of artificial heat and sunlight. The CO_2 cylinder is to be serviced and then returned to the appropriate Maintenance Unit clearly marked 'This cylinder has been immersed in salt water'. After having been immersed in salt water, the life jacket is to be used for wet drills only.

Removal of inflation mechanism

26. If the cylinder is to be unscrewed from the operating head, whether for check weighing or for re-charging, the locking screw on the head must first be released. Failure to observe this precaution will result in damage to the threads on the cylinder.

27. Care should be exercised when removing the cylinder from the stole to prevent damage to the Schrader valve. Both the operating head and the Schrader valve should be held firmly while the coupling nut is unscrewed (using two spanners). It is very easy to pull the Schrader valve out of its mounting.

Testing the stole

28. During periodic servicing, the stole should be inflated, through the oral inflation valve, to check for correct unfurling of the stole cover and for satisfactory functioning of the valve.

29. (1) Remove the stole from its cover and take out the Schrader valve.

(2) Connect the Schrader valve stem to a manometer.

(3) Inflate the stole through the oral inflation valve to give a reading of 30 cm (11·75 in) on the manometer.

(4) Leave for 10 min. The reading on the manometer should not fall more

than 2 cm. If it does the stole is to be changed.

(5) If the leakage is within the limits of (4), refit the Schrader valve and deflate the stole.

(6) Test the oral inflation valve by turning the mouthpiece anti-clockwise to unlock it, depress and then release the mouthpiece, which should return under the action of the spring. If it fails to do so or is sluggish in action it is to be renewed.

Renewing the oral inflation valve

30. In the event of air leakage through the valve, the defective valve must be renewed. To renew a valve, proceed as follows:—

(1) Carefully remove the stole inflation tube from the valve body by rolling the tube towards the stole. The end of the tube should be eased off the valve body with the thumbs, bent backwards towards the stole and then rolled off. Alternatively the tube may be pushed off, but no attempt must be made to pull the valve out of the tube.

(2) Having removed the old valve, roll the tubing back and clean the inner surface to remove any foreign matter.

(3) Wet the outer surface of the new valve body with clean water, insert the valve body and unroll the tube.

Note . . .

French chalk is not to be used as a lubricant to assist in the insertion of valve into inflation tube.

(4) Test the stole as described in para 28 and 29.

Note . . .

When a new valve is fitted, ensure that the flat sides of the mouthpiece external flange are parallel with the flanged base of the inflation tube when the mouthpiece is in the "unlocked" position.

Waistcoat

31. Slight damage to the fabric may be repaired, providing there is no loss of strength. Tacking stitches, for securing the pull cords to the life jacket, should be $\frac{3}{4}$ to 1 in long of scarlet locking thread. The lifting beckets should also be tack-stitched in place to prevent them working out of the folded stole cover.

Cleaning of life jacket

32. A dirty life jacket may be treated as follows:—

(1) All ancillary items should be removed and the stole withdrawn from its cover.

(2) The jacket should then be washed in warm, not hot, water and emulsion detergent (Ref No 33C/1129). Washing is to take the form of gently rubbing and kneading to float out the dirt.

(3) After washing, the life jackets are to be rinsed in clean cold water until free from detergent suds.

(4) Jackets are to be hung to dry naturally away from artificial heat and strong sunlight.

(5) Every jacket which has been washed is to be examined in accordance with current instructions.

CO_2 cylinder life

33. Reference should be made to the appropriate chapter in AP1182C, Vol 1 for detailed information on the limitations and tests approved for these cylinders.

Other limitations

34. Until further notice, the following limitations are imposed:—

(1) Stole. Three replacement oral inflation valves.

(2) Oral inflation valve. Four immersions in salt water.

(3) Life jacket. Sixteen immersions in salt water.

When these limitations are reached, the items are to be renewed.

Folding a life jacket

35. With stole cover open, smooth and fold outwards the upper surface. Fold the loose tips upwards and fasten them in position with the press studs. Furl the left-hand and right-hand sides of the stole cover inwards and fasten in position with the press studs. Fold back the head rest and fasten in position with the press stud.

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