

AIR PUBLICATION

108C-0502-1

(formerly A.P.1182A,
Vol. 1 (2nd Edition),
Sect. 11, Chap. 7)

PARACHUTE BRAKE ASSEMBLIES

TYPE L.B.2 Mk. 3

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL

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Ministry of Defence

FOR USE IN THE

ROYAL AIR FORCE

(Prepared by the Ministry of Technology)

AMENDMENT RECORD SHEET

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MODIFICATION RECORD

Mod. No.	A.L. No.	Mod. No.	A.L. No.	Mod. No.	A.L. No.	Mod. No.	A.L. No.

PARACHUTE BRAKE ASSEMBLY, TYPE LB. 2, Mk. 3

(Landing Brake for Lighting Aircraft)

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Introduction

1. The LB.2 Mk. 3 parachute assembly is housed in a removable container installed in the rear fuselage of the Lightning Aircraft and is used to reduce the landing run of the aircraft.

2. The parachute assembly has a 16 ft. diameter ribbon type canopy fitted with detachable rigging lines which terminate at a metal connector. The connector is attached to a cable block on the end of a steel twin cable assembly, the other end of the cable being attached to a strong point on the aircraft. If damaged, the detachable rigging lines can be easily replaced without the aid of special equipment.

Operation

3. Operation of the assembly is initiated by opening the parachute compartment doors, which are operable from the cockpit. Opening of the doors simultaneously withdraws two ripcords, one attached to each door, from cones on the container flaps, thereby releasing the spring-loaded auxiliary parachute into the airstream. The drag of the auxiliary parachute withdraws the pack from the container and, at the same time, the twin cables from their stowage. As the cables are pulled taut the canopy is deployed, rigging lines first. The auxiliary parachute and the pack remain attached to the canopy apex throughout the operating sequence. At the end of the landing run, the parachute assembly is jettisoned by the manual operation of a release situated in the aircraft cockpit.

DESCRIPTION

Assembly

4. The parachute assembly Type LB.2 Mk. 3 (Ref No. 15D/922) consists of:—

Ref. No.	Nomenclature
15D/831	Canopy, Type F.16, Mk.2 (white) less rigging lines.
15D/955	Rigging lines (20 off)
15D/964	Parachute connector assembly (AML 12040)
15D/954	Pack, Type LB.2/F.16/Mk.3

15D/626	Auxiliary parachute Type R40, Mk.1
15D/824	Gaiter assembly
15D/828	Breaking tie loop
15D/825	Auxiliary strop
15D/861	Sleeve, apex strop
26DK/33486	Rip cord (2 off)

The following equipment is not part of the parachute assembly but is required to complete the packing for installation in the aircraft:—

Ref. No.	Nomenclature
26DK/21563	Container
15D/940	Elastics, container flap, $\frac{1}{4}$ in. dia. \times $4\frac{1}{2}$ in. lg. (6 off)
26DK/34323	Twin cable, 4 ton or
26DK/37027	Twin cable, 5 ton Cable block assembly Cable clamps (1 pair) Rip cord (2 off) Washer, AML 12328 (2 off), used only in conjunction with the 4 ton Twin cable (Ref. No. 26DK/34323)

Pack

5. The pack (fig. 1 and 2) is a rectangular box-shaped bag, open at one end and having a slotted wall at the other to prevent air pressure building up and damaging the pack. Two flaps are sewn inside the open end, the larger flap being fitted with rigging line stowage loops, rigging line protection flaps and mouth locking loops: when the pack is closed, the mouth locking loops mate with slots in the smaller flap. Two beackets, one at the top and the other at the bottom edge of the open end serve to secure a breaking tie loop when the twin cable s connected to the packed parachute assembly. Adjacent to the slotted end wall is a triangular metal D-ring, which is retained by two webbing bridles sewn to the top and bottom faces of the pack, the bridles being protected by a leather sleeve where they pass through the D-ring. For added strength, a webbing strap is passed through the D-ring and sewn to the pack. Permanently secured to the D-ring is a connecting strap, the free end of which passes into the pack and used to attach the parachute to the pack. The

D-ring also serves as an attachment for the auxiliary parachute connecting strop. A cover flap is sewn at the inside of the slotted end wall adjacent to the D-ring and serves to prevent the stowed canopy from spilling out of the pack. Sewn to the bottom face of the pack is an auxiliary flap which mates with flaps on the parachute container.

Apex strop sleeve

6. The apex strop sleeve, illustrated in fig. 1 and 2, is made from khaki canvas, reinforced with leather at the wider end. Sewn to the wider end of the sleeve are two beackets through which a nylon cord is passed to secure the sleeve in position over the D-ring at the top of the strop. The sleeve protects the nylon pack fabric against searing due to contact with the taut apex strop as

the pack turns inside out during deployment of the assembly.

Auxiliary parachute and strop

7. The auxiliary parachute (fig. 3) is based on the vane type, having the rigging lines running free from the canopy to the bottom of the spring. The ends of the rigging lines are zig-zag stitched together outside the crown of the canopy; their centres are formed into an eye to which the auxiliary strop is secured. The auxiliary parachute must be replaced if the free length of the spring is less than 21 inches. The auxiliary strop is made from 3,300 lb. tubular nylon having its ends formed into loops. One end is secured to the eye in the auxiliary parachute rigging lines and the other end to the D-ring at the end of the pack by larkshead knots.



Fig. 1. Pack: outside: flaps opened to show apex strop sleeve



Fig. 2. Pack: inside out



Fig. 3. Auxiliary parachute

Canopy and detachable rigging lines

8. The canopy (fig. 4) is hem-rigged, of ribbon construction, 16 ft. in diameter and having 20 gores, each with the base measurement of 30.4 inches \pm manufacturing tolerances. Being hem-rigged, there are no rigging lines passing across the canopy. Ten vent lines, the ends of which are stitched to the radial ribbons, are arranged to cross the vent area at the apex. Attachment loops are sewn to the radial ribbons at the periphery and provide the means of attaching the rigging lines to the canopy. The rigging lines are doubled and stitched at both ends. One end is used in securing the line to the canopy with a larkshead knot and the other end carries a lug which is subsequently assembled to the parachute connector. Details of the construction are:—

- (1) The horizontal ribbons are 2 in. wide nylon, equally spaced from periphery to vent. There are 30 such ribbons, No. 6, 12, 19 and 25 (numbered from the periphery upwards) being 1,000 lb., and the remainder 300 lb. minimum breaking strength.
- (2) The vertical ribbons are $\frac{5}{8}$ in. wide nylon having a minimum breaking strength of 70 lb.
- (3) Radial ribbons are 2 in. wide 1,000 lb. nylon.
- (4) The vent is reinforced with 1 in. wide 3,300 lb. nylon and the periphery with 2 in. wide 1,000 lb. nylon.

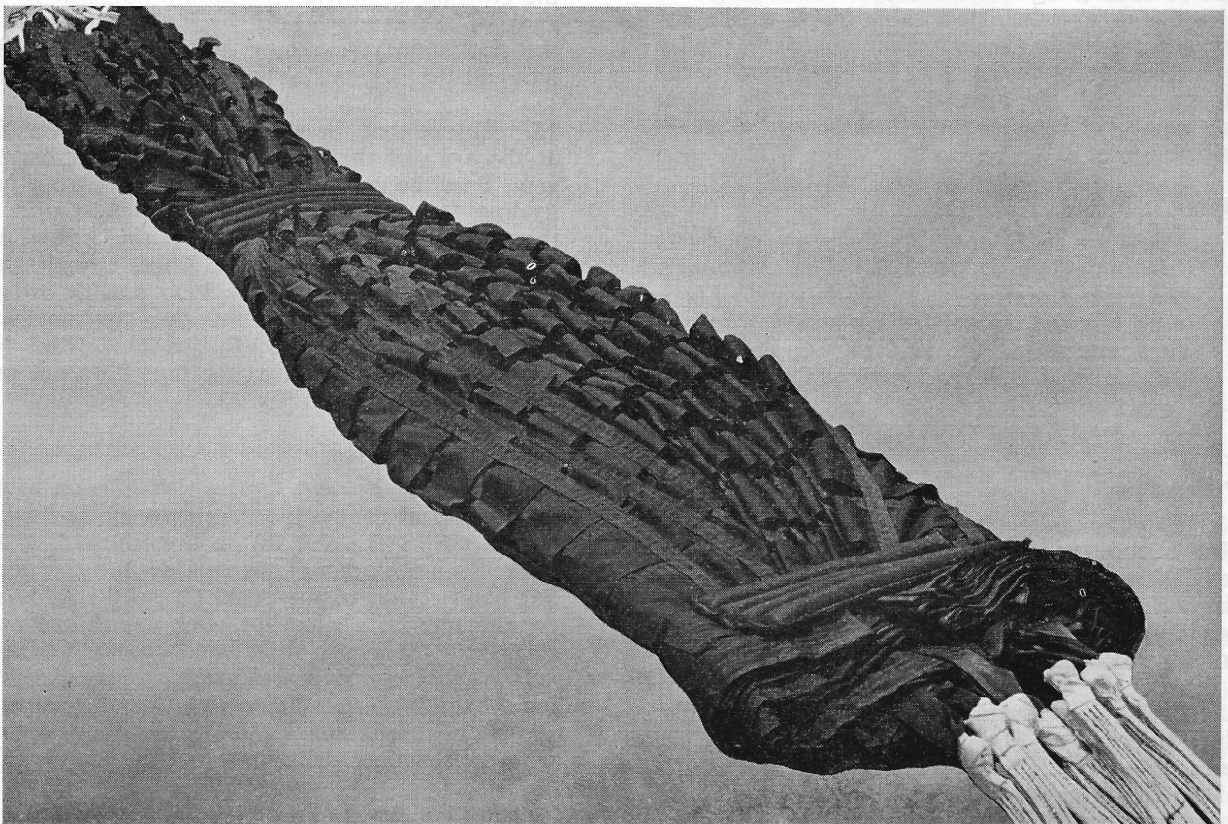


Fig. 4. Canopy

(5) The rigging line attachment loops are of double, 1 in. wide, 1,000 lb. nylon.

(6) The vent lines and detachable rigging lines are $\frac{9}{16}$ in. wide 1,500 lb. nylon.

Parachute connector assembly

9. The parachute connector assembly, which can be seen in fig. 12 and 14, consists of two side plates held rigidly together by a stepped bolt, a locking bush and a nut. As shown in fig. 14, the stepped bolt passes through the cable block of the twin cable assembly, thus attaching the cable to the parachute. When a 4 ton cable is attached, two washers are fitted to the stepped bolt and serve as spacers between the ends of the cable block and the inner faces of the connector side plates; these washers are not fitted if a 5 ton cable is used (see Note in para. 10). The outer face of each side plate has two recesses at the wider end, each recess having two holes in which the ends of a pair of rigging line attachment pins are located. Each of the four rigging line attachment pins has six spaces which are fitted between the lines to keep them equally spaced. The pins are radially grooved at both ends and are locked in pairs by retaining plates which pass between the grooves in each pair. The retaining plates are secured to the outer faces of the connector side plates by screws that pass through the plates into anchor nuts riveted to the inner surfaces of the side plates.

Cable and cable block assembly

10. The cable and cable block assembly, which can be seen in fig. 13 and 18, is a twin length of 4 or 5 ton cable having a cable block at one end for attachment to the parachute connector, and a cylindrical fitting at the other for attachment to the strong point in the aircraft. Secured to the cables is a pair of clamps for the attachment of a breaking tie loop.

Note . . .

The 4 ton cable assembly is for use only with Lightning Mk. 1, 1A, 2, 3, 4 and 5 aircraft; the 5 ton assembly is for use only with Lightning Mk. 2A, 6 and T.55 aircraft which incorporate Mod. No. 4072 to take account of this higher A.U.W. and increased speed factor.

PACKING INSTRUCTIONS

Preparation

11. Lay the canopy full length on a packing table, No. 1 gore uppermost. Remove all twists and tangles from the rigging lines and inspect them for damage. If any damaged lines are found, they must be replaced in accordance with the instructions contained in para. 40.

12. Fold the canopy in the standard manner. Special attention is necessary when folding the gores to ensure that they are neat. The final width of the folded canopy should be approximately the same as the width of the pack (fig. 4).

13. Check that the sleeve is fitted to the apex

strop. If the sleeve is found to be damaged, renew it as follows:—

(1) Take the new apex strop sleeve and feed the apex strop through it from the wider end. Position the wider end of the sleeve over the D-ring so that the beackets on the sleeve cover the upper edges of the D-ring (fig. 5).

Note . . .

Threading of the apex strop through the sleeve is greatly assisted by tying to the free end of the strop a suitable length of cord attached to a weight.

(2) Pass a single length of 245 lb. nylon cord, D.T.D.481. Cord No. 3 (Ref. No. 15D/484), through the beackets at the end of the apex strop sleeve and around the triangular portion of the D-ring. Pull the cord tight so that the sleeve fits snugly around the upper portion of the D-ring and tie off with a reef knot and a stop knot. Trim off the excess cord.

(3) Run the apex strop sleeve through the hand to ensure that it is free from twists and kinks and is fully extended.

(4) Slide the free end of the sleeve back up the strop for 2 to 3 inches and, using a single length of No. 18 waxed linen thread, B.S. F.34/18's/3 (Ref. No. 32B/498), make three stitches across the width and through the reinforcing at the open end of the sleeve and through the strop (fig. 5).

14. Place the pack, auxiliary flap downwards, on the packing table with the mouth adjacent to the apex of the canopy. Fold back the open end of the pack until the seams of the mouth locking flap and the rigging line stowage flap are exposed.

15. Ensure that the sleeves round each vent line at the apex of the canopy are central across the vent. Pass the end of the sleeved apex strop, protruding from the mouth of the pack, round all the vent lines crossing the apex of the canopy and tie off tightly with a bowline knot. Lay the free end of the strop against the loop passing around the vent lines and bind the two together with several turns of 1 inch adhesive tape (Ref. No. 32B/2202350). Ensure that the tape does not pass around any vent lines (fig. 6).

Stowing the canopy

16. Position the vent flap, which is sewn to the inside wall of the pack adjacent to the D-ring, so that it covers the slot in the bottom wall of the pack. Push the apex of the canopy into the upper left hand corner of the pack. Grasp the folds approximately 2 ft. below the pack mouth and push them into the upper right hand corner. Continue stowing the canopy in a zig-zag fashion, distributing the folds so that the wedge-shaped section of the pack is maintained and the periphery is level with the seams of the mouth locking flap (fig. 7).

Stowing the rigging lines

17. Separate the rigging lines into two groups, with lines 1 to 10 in one group and 11 to 20 in

the other. Grasp the grouped lines at a point away from the periphery approximately equal to the length of the pack. Make a bight and push it into the far end of the pack on top of the stowed canopy (fig. 8) ensuring that the rigging lines that remain outside the pack are of equal length.

18. Fold the mouth locking flap down over the stowed canopy and pass the slots in the flap over the matching locking loops on the rigging line stowage flap, ensuring that both groups of lines emerge between the locking loops (fig. 9). Draw a bight of each group of rigging lines outwards through the adjacent locking loop so that approximately 1 in. of the bight protrudes through the loop. When drawing the bights through, ensure that the free portions of the lines lie uppermost in the locking loops (fig. 9).

19. Turn the pack so that the mouth faces the operator. Gather the two groups of rigging lines together and make the first stowage in the top left hand stowage loop. Continue stowing the lines in a zig-zag fashion, making the final stowage in the lower right-hand loop (fig. 10). The ends of the rigging line bights should protrude through the stowage loops to the edges of the reinforcing strips to which the stowages are attached and the length of lines remaining unstowed should be sufficient to reach the left-hand edge of the stowage flap. Neatly fold the rigging line protection flaps over the stowed rigging lines (fig. 11).

20. Fold the stowage flap over towards the mouth of the pack, taking care that the rigging lines are not withdrawn from the stowage loops and that the rigging line protection flaps remain in position over the stowed rigging lines. Secure the stowage flap by passing single lengths of No. 12 linen thread, B.S. F.34 (Ref. No. 32B/656), through the becketts on the flap edge and the mating becketts adjacent to the mouth locking loops. Ensure that each becket is in contact with its mating becket, tie off the ends of thread using double reef knots, and trim off the excess. Fig. 12 shows the flap secured.

Connecting the cable assembly to the parachute

21. The cable is either the 4 ton assembly (Ref. No. 26DK/3423) or the 5 ton assembly (Ref. No. 26DK/37027) depending upon the Mk. of aircraft for which the cable is required (see Note in para. 10). Connect the cable assembly to the parachute as follows:—

Note . . .

While performing these operations ensure that the rigging lines remain completely stowed within the stowage loops.

(1) Release the pair of clamps immediately behind the cable block assembly by removing the securing screw at the centre. Position the breaking tie loop centrally between the two cables so that the longer side of the loop at the centre is away from the cable block. Refit the clamps to the cable so that they pass through the centre loop and secure them with

the screw and locking washer provided (fig. 13).

(2) Pass the gaiter assembly, small end first, over the cable block assembly and on to the cable.

(3) Unscrew the nut and withdraw the stepped bolt from the parachute connector; it is unnecessary to remove the locking bush.

(4) If a 4 ton cable assembly is to be connected, insert the cable block assembly into the parachute connector. Place one washer, AML 12328 (Ref. No.) at each side of the cable block, within the connector. Pass the stepped bolt up through the holes in the connector, the cable block, the two washers and the locking bush. Refit and tighten the nut. Fig. 14 shows the cable assembly attached to the parachute connector.

Note . . .

If a 5 ton cable assembly is to be connected, proceed as instructed in sub-para. (4) above, but do not fit the two washers (AML 12328).

(5) Draw the gaiter over the parachute connector, having first aligned the tunnels with the breaking tie loops. Ensure that the ends of the breaking tie loops are free at the smaller end of the gaiter (fig. 15).

(6) Feed the ends of the breaking tie loop, without twisting, through the appropriate tunnels on the gaiter. Pass a single length of 245 lb. nylon cord D.T.D.481, Cord No. 3 (Ref. No. 15D/484), through the four becketts around the centre of the gaiter. Pull the cord tight and tie off the ends using a double reef knot and a stop knot. Trim off the excess cord (fig. 15). Ensure that the becketed ends of the breaking tie loop remain free.

(7) Pass a single length of No. 18 waxed linen thread, B.S. F.34/18's/3 (Ref. No. 32B/498), through one of the two becketts at the wider end of the gaiter, round and under the gaiter, and through the other becket. Pull the gaiter tight around the rigging lines so that the surplus material is underneath. Arrange the surplus equally on each side and fold it upwards towards the becketts. Pull the thread tight around the gaiter and tie the ends together with a double reef knot and stop knot (fig. 15). Trim off the excess thread.

Closing the pack

22. Unfold the turned back edge of the pack. Take about 2 ft. of single length of 245 lb. nylon cord, D.T.D.481 Cord No. 3 (Ref. No. 15D/484) and, using a soft pencil or crayon, make two marks on the cord $8\frac{1}{2}$ inches apart and approximately equidistant from both ends. Pass the cord through the lower becket at the end of the pack, leaving equal lengths of cord on either side. Pass each end of the cord up through the adjacent becket on the breaking tie loop on either side of the gaiter. Pass the ends, from opposite directions, through the

upper becket at the end of the pack. Pull up the ends of cord so that the marks coincide when the free lengths of cord are crossed upon the top of the becket. Tie off over the top of the becket with a double reef knot and a stop knot. Trim off the excess cord. Fig. 16 shows the completed tie.

Note . . .

Experience has shown that the mouth of the gaiter has sometimes become damaged in use and enabled the gaiter to slip over the connector and up the rigging lines, which could restrict parachute inflation. To prevent this, the gaiter is to be secured with a tie of 245 lb. nylon cord (fig. 16) as follows:—

- (1) *Using a 3 ft. length, pass one end through one of the breaking tie tunnels from the smaller end of the gaiter, turn it back over the outside of the tunnel and tie it to the standing part with a bowline.*
- (2) *Pass the free end between the twin cables and through the other tunnel. Pull tight and tie the free end to that part leading into the tunnel, using another bowline.*

Attaching the auxiliary parachute

23. If the auxiliary parachute and pack have been separated, fit them together as follows:—

- (1) Attach the connecting strop to the auxiliary parachute by passing the short loop through the eye in the rigging lines, then threading the long loop through the short loop and pulling up tight to form a larkshead knot.
- (2) Attach the auxiliary parachute to the pack by passing the free end of the connecting strop through the D-ring and drawing the auxiliary parachute, apex first, through the long loop and pulling up tight to form a larkshead knot (fig. 17).

Stowing the cable in the container

24. Stow the twin cables in the container as follows:—

- (1) Ensure, especially if the parachute has been streamed, that the twin cables are free from twists, so that they run parallel to each other and are of equal length.
- (2) Mark the twin cables at a point 10 ft. 3 in. from the centre of the pin in the aircraft attachment fitting.
- (3) Lay the remainder of the cables in the bottom of the container, without twisting, in two lays to form a 'double 8' configuration. Ensure that no part of the second lay is interwoven with the first, and that the cable block assembly is adjacent to the centre of the deeper side of the container as shown in fig. 18.
- (4) Pass one end of a single length of nylon cord, D.T.D.786 (latest issue), Cord No. 3/47 (Ref. No. 15A/1258), down through one of the holes in the end of the container base and up through the adjacent hole. Enclose the twin cable with the ends of the cord and tie off tightly with a double reef knot and stop

knot. Trim off the excess cord. Repeat the tie at the other three sets of holes in the base (fig. 18).

(5) Make a separate tie at the 10 ft. 3 in. position marked at (2), using single lengths of nylon cord, D.T.D.786, Cord No. 3/47 (Ref. No. 15A/1258), round each section of the twin cable, each tie passing through one of the holes in the centre of the top edge of the shallow side of the container, tying off in a double reef knot and a stop knot (fig. 18).

STOWING THE PACK IN THE CONTAINER

Preparation

25. From the inside of the container, secure 4½ in. elastics in each of the two holes in the deeper wall and pass the free ends up through the eyelets in the top centre flap. Temporarily attach the free ends to the wall of the container. Lay all the flaps and the locking loops over the edges of the container so that the inside is clear.

26. Turn the pack over and position it centrally in the container, auxiliary flap uppermost. At the same time arrange the auxiliary strop so that it passes under the front left hand corner of the pack and emerges at the centre of the shallow wall, adjacent to the cable ties. Ensure that the D-ring is turned down towards the base of the container and that the gaitered parachute connector lies parallel to the side wall and as far as possible towards the top right-hand corner of the container (fig. 19).

27. Lay the connecting strop across the top of the pack, ensuring that it does not pass round the twin cables, and secure it between the two becketts, offset from the centre of the pack, with a single length of No. 18 waxed linen thread B.S. F.34/18's/3 (Ref. No. 32B/498). Pass one end through the becketts and tie off using a double reef knot and a stop knot (fig. 19). Fold back the auxiliary flap so that it lies over the auxiliary strop (fig. 20).

28. Fold over the apron flap attached to the deeper wall of the container so that it lies on top of the pack. Fold over the apron locking loops attached to the shallower wall of the container, ensuring that the left-hand locking loops lie UNDER the twin cables, and pass the ends up from the underside through the corresponding slots in the apron flap (fig. 20).

29. Fold the connecting strop round the right-hand edge of the auxiliary flap and lead it towards the left-hand side of the container. Draw a fold in the strop through the left-hand apron locking loop; ensure that the strop is not twisted and that the part leading off towards the auxiliary parachute is on top. Approximately 1 in. of the fold should protrude through the loop. Lead the strop across the pack and make a similar stowage in the right-hand locking loop in the same manner (fig. 20).

30. Flatten the pack in the container, working as much bulk as possible towards the ends. Bring over the two side flaps bearing the cones, followed by the quarter flaps and the centre flap, in that order (fig. 21).

31. Insert a length (not less than 2 ft.) of 150 lb. nylon cord through each cone and a similar length through each grommet in the centre flap (fig. 21). Pass the cones up through the grommets in the quarter flaps and centre flap using the "pulling up" cords and insert a temporary locking pin through each cone. The temporary pins should be inserted from the outside of the cones, towards the centre of the pack (fig. 21).

Stowing the auxiliary parachute

32. Place the bottom end of the auxiliary parachute spring on top of the apron flap so that it is just clear of the centre flap. Compress the spring and push the top under the centre flap until the edge is against the deeper wall of the container. Using a packing stick, push the bottom of the spring until it is under the centre of the top coil.

33. Spread out the loose material of the auxiliary parachute and neatly tuck as much as possible equally beneath the side flaps, ensuring that it is not bunched up. Tuck the remaining material under the top of the auxiliary parachute spring (fig. 22).

Note . . .

It is essential that no material is trapped beneath the base of the spring as this could prevent the correct emergence of the auxiliary parachute during the operation of assembly.

34. Fold the unstowed part of the connecting strop neatly across the pack above the stowed portion (fig. 22). Fold over the auxiliary flap and pass the "pulling-up" cords through the grommets. Using both pairs of cords, and maintaining a constant pull on the cones, draw the cones up through the grommets in the auxiliary flap; withdraw the temporary pins and replace them after the cones have been drawn through the grommets. The pins should be inserted in the cones in the same direction as before.

35. Remove the temporary pins and fit the rip pins by passing them through the cones in the opposite direction so that they point towards the ends of the container as directed on the label (fig. 23). Remove both sets of pulling-up cords from the assembly and safe tie each rip-pin with a single length of scarlet locking thread (Ref. No. 15A/181).

Completing the stowage in the container

36. Fit one $4\frac{1}{2}$ in. pack elastic to each of the side flaps; the eyelets will be found adjacent to the end walls and just beneath the quarter flaps. Attach the free ends of the elastics on the deep wall of the container to the eyelets on the centre flap. Fit the remaining two $4\frac{1}{2}$ in. elastics to the pairs of eyelets on each quarter flap (fig. 23). It is essential that the elastics are fitted hooks downwards to the pack. Coil the cable neatly as shown, tying the coils together with a suitable cord to prevent them from trailing during transit to the aircraft. These ties must be removed when installing the assembly.

INSTALLATION

37. Installation instructions are in A.P.4700. It is imperative that each ripcord is connected to the door on the **OPPOSITE SIDE** of the parachute compartment and not to the adjacent door. Any other arrangement will lead to fouling of the rip pins and consequent failure of the equipment. The twin cables must be free from twists between the aircraft attachment point and the parachute container.

SERVICING

38. Servicing is to be in accordance with A.P. 1182A, Vol. 4, or the superseding A.P.108C-5F series, at the intervals stated therein. In addition, the complete assembly is to be examined after each occasion on which it has been streamed.

PARACHUTE RIGGING INSTRUCTIONS

Rigging the parachute

39. When it is necessary to fit a complete set of rigging lines and a parachute connector, the following procedure must be strictly observed:—

(1) Fit a rigging line (Ref. No. 15D/955) to each attachment loop at the periphery of the canopy with a larkshead knot, ensuring that all the rigging lines pass through the canopy attachment loops in the same direction. Before tightening the knots, form becketts at the ends of the canopy attachment loops. Bind over each knot with two or three turns of 1 inch white adhesive tape (Ref. No. 32B/2202350). Fig. 24 shows the method of attaching the lines.

(2) Extend the canopy full length on the packing table, with No. 1 gore uppermost.

(3) With the canopy away from the operator, separate the rigging lines into four groups arranged across the table from left to right in the following order: Left-outer 10 to 6; left-inner 5 to 1; right-inner 20 to 16; right-outer 15 to 11. Fig. 25 shows the lines laid out in the correct order.

(4) Place the parachute connector on the table, with the nut and locking bush uppermost and the wide end adjacent to the rigging lines, then proceed as follows:—

(a) Remove the screws holding the retaining plates and withdraw the plates from between the grooved pins.

(b) Unscrew the nut on top of the locking bush and remove the top plate.

(c) Remove all but one spacing washer from each pin. Fig. 26 shows the connector at this stage.

(5) Arrange groups of five lines on each of the four pins, placing a spacing washer between each rigging line connecting lug and above the top lugs. Check the lines individually to ensure that all twists are removed

before placing them on the pins in the following order:—

	Left- outer	Left- inner	Right- inner	Right outer
Top	6	1	20	15
	7	2	19	14
	8	3	18	13
	9	4	17	12
Bottom	10	5	16	11

Fig 27 shows the parachute connector with groups of lines No. 10 to 6 assembled on the left-outer pin with line No. 6 uppermost, and lines No. 5 to 1 on the left-inner pin with No. 1 uppermost.

(6) Re-fit the top plate to the parachute connector. Replace and tighten the nut on the top of the locking bush, insert a retaining plate between the grooves in each pair of pins and secure them with the screws provided. Fig. 28 shows the rigging lines attached to connector.

Renewing damaged rigging lines

40. When it is necessary to renew one or more damaged lines, proceed as follows:—

(1) Remove the top plate from the parachute connector as described in para. 39(4).

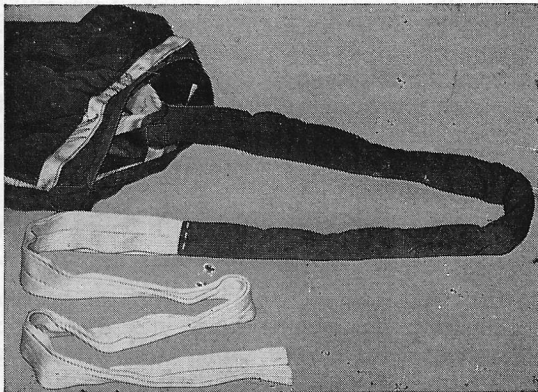


Fig. 5. Apex stop sleeve secured

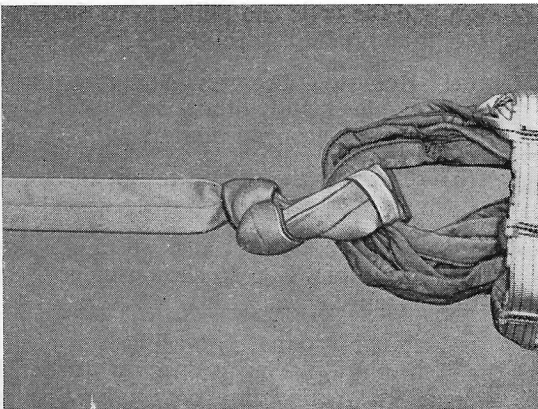


Fig. 6. Apex stop tied to canopy vent lines

(2) Trace the damaged line from the canopy down to the connector. Remove the lugs and spacing washers from the pin(s), together with those above the damaged line on each pin.

(3) Remove the tape and unfasten the larks-head knot securing each damaged rigging line to the canopy attachment loop at the periphery, noting from which side of the attachment loop the line is withdrawn.

(4) Fit a new rigging line to each attachment loop now vacant, by passing the line through the loop from the same side from which the damaged line has been withdrawn and securing with a larkshead knot. Before drawing tight, form a becket at the end of the canopy attachment loop as shown in fig. 24. Renew the tape over the knot.

(5) Remove all twists from each new rigging line and from those lines which have been removed from the connector. Replace the rigging line lugs and spacing washers on the parachute connector pins as described in para. 39.

(6) Check the sequence of all rigging lines in accordance with para. 39.

(7) Re-assemble the parachute connector by following the instructions of para. 39(6).

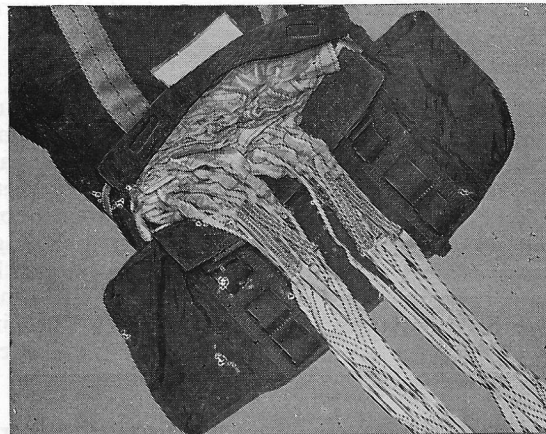


Fig. 7. Canopy stowed



Fig. 8. First section of rigging lines stowed on top of canopy

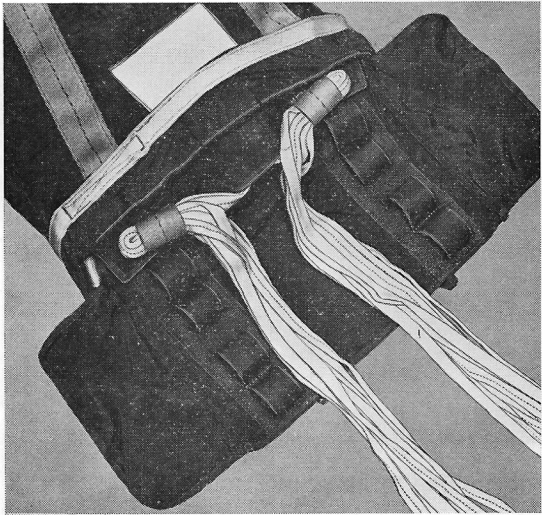


Fig. 9. Pack mouth locked

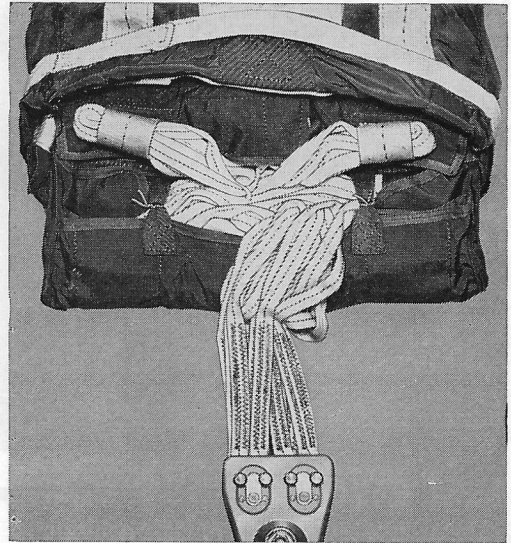


Fig. 12. Rigging line stowage flap secured

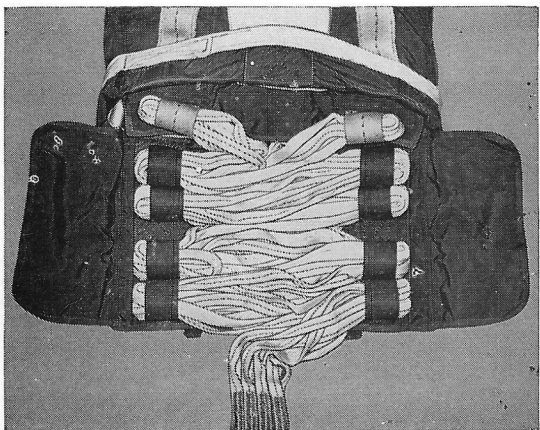


Fig. 10. Rigging lines stowed

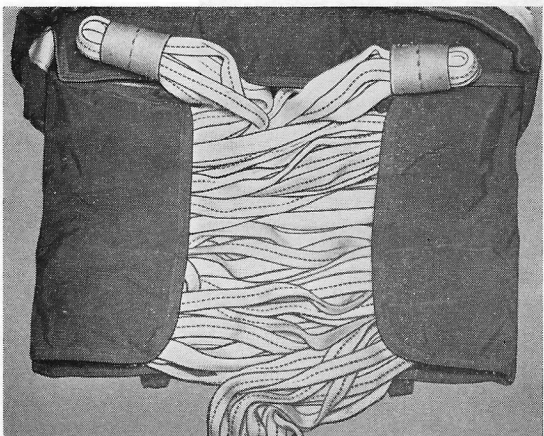


Fig. 11. Rigging line protection flaps folded over stowed rigging lines

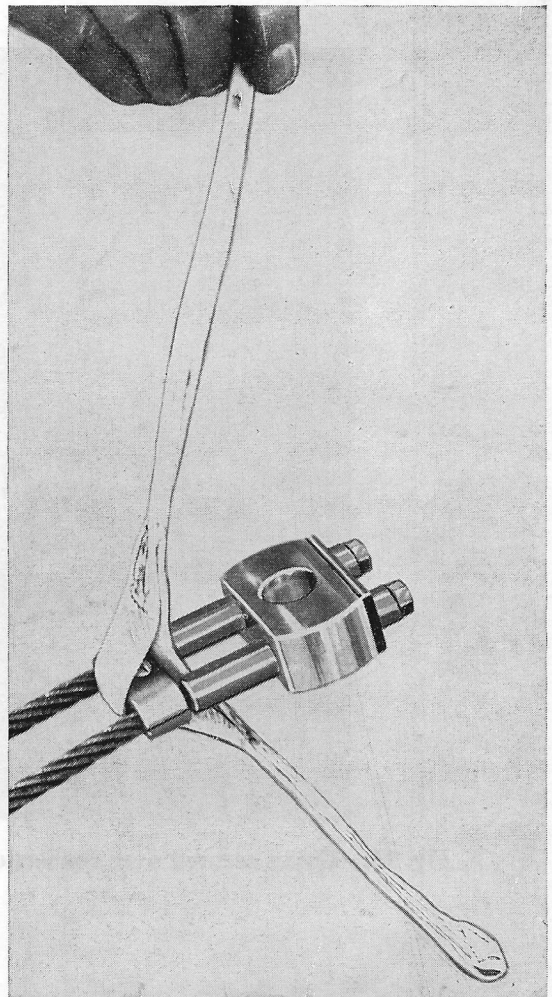


Fig. 13. Method of fitting breaking tie loop to cable assembly

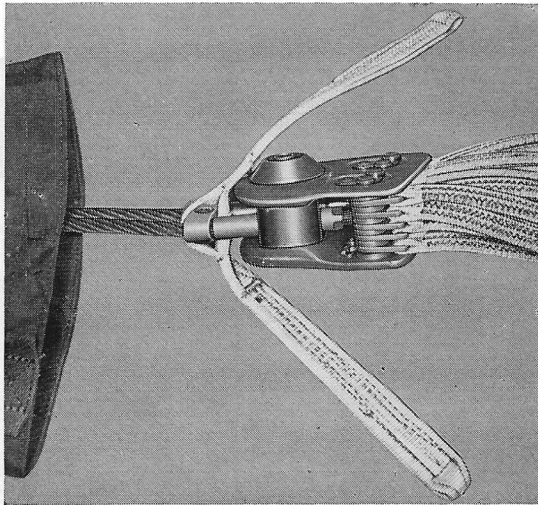


Fig. 14. Cable assembly passed through gaiter and assembled to parachute connector



Fig. 15. Gaiter secured over connection: breaking tie loop passed through gaiter tunnels

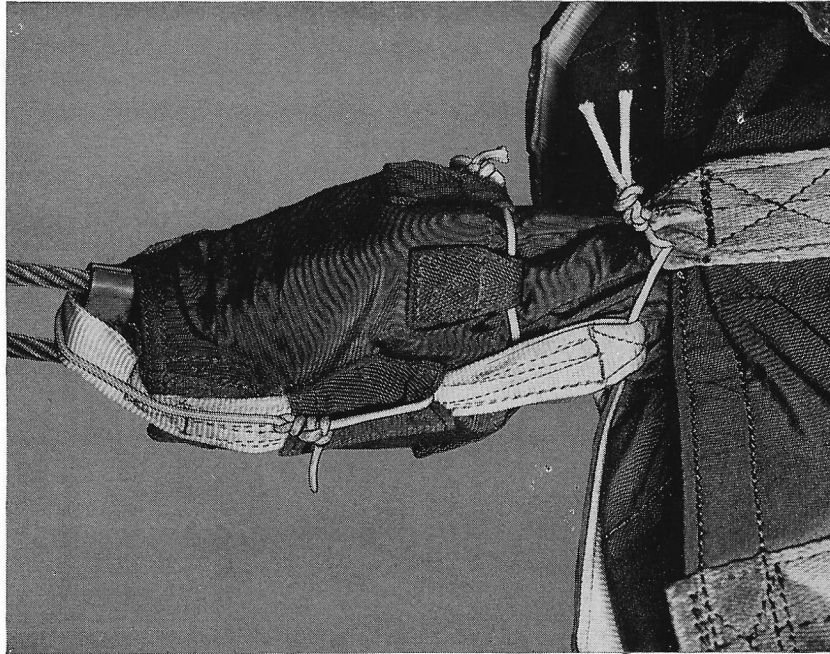


Fig. 16. Pack closed: garter anchored

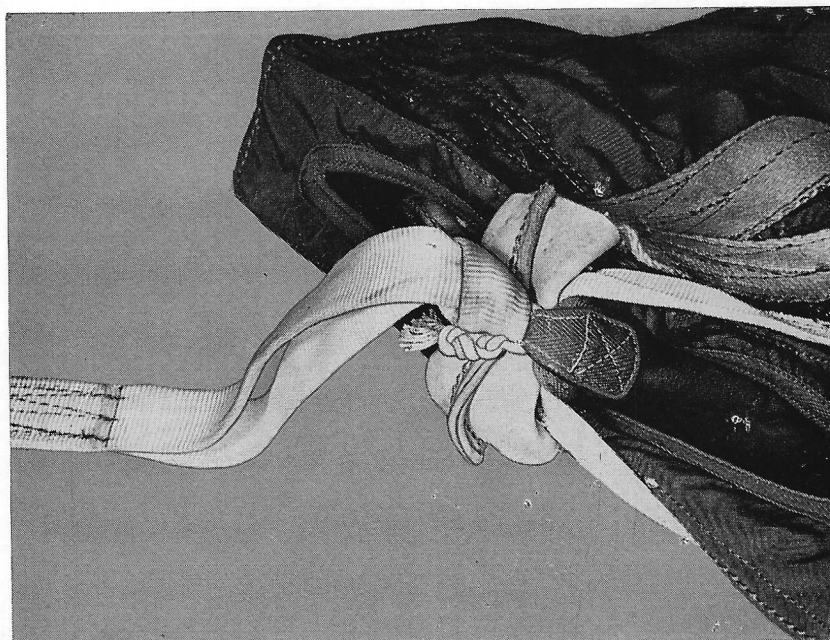


Fig. 17. Auxiliary parachute connected to pack

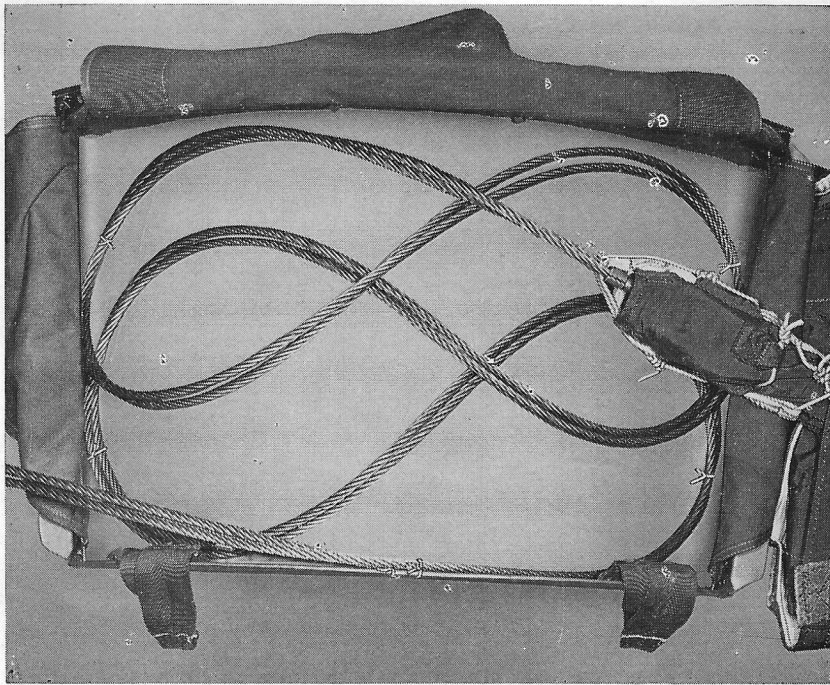


Fig. 18. Cables laid in container, ties completed

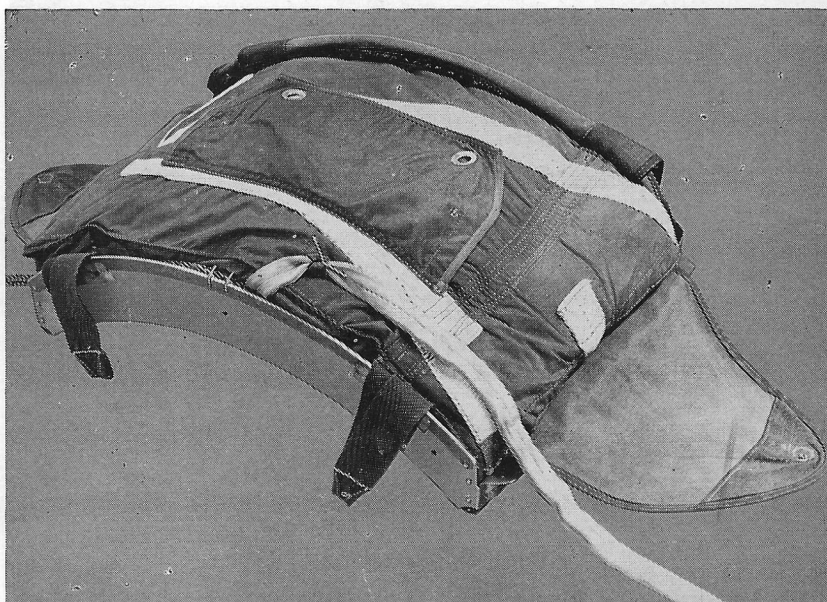


Fig. 19. Pack positioned in container: auxiliary parachute strop secured between becketts

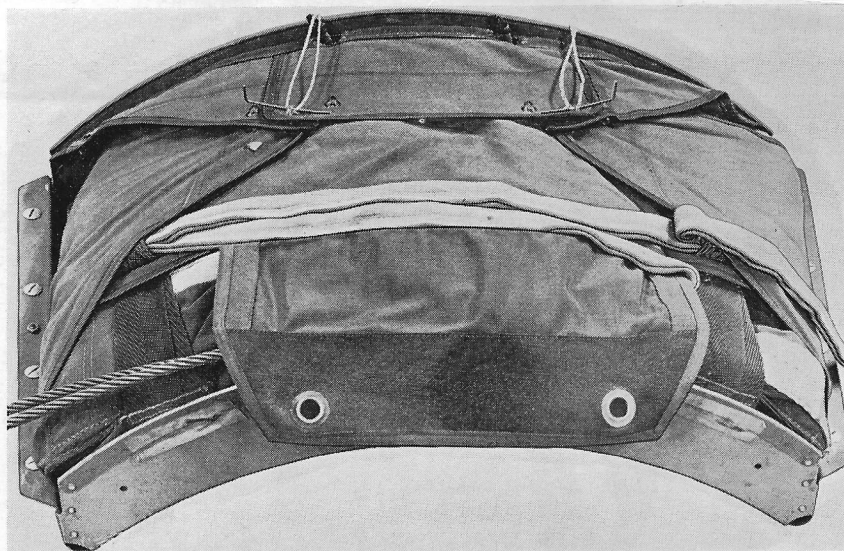


Fig. 20. Enclosing the pack in the container: first stage

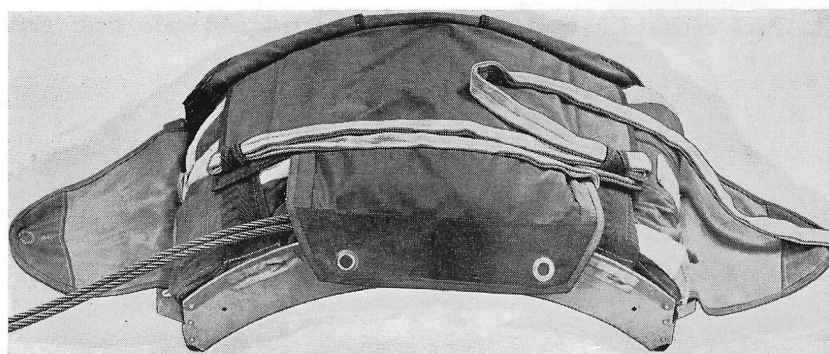


Fig. 21. Auxiliary parachute strop stowed in apron flap locking loops

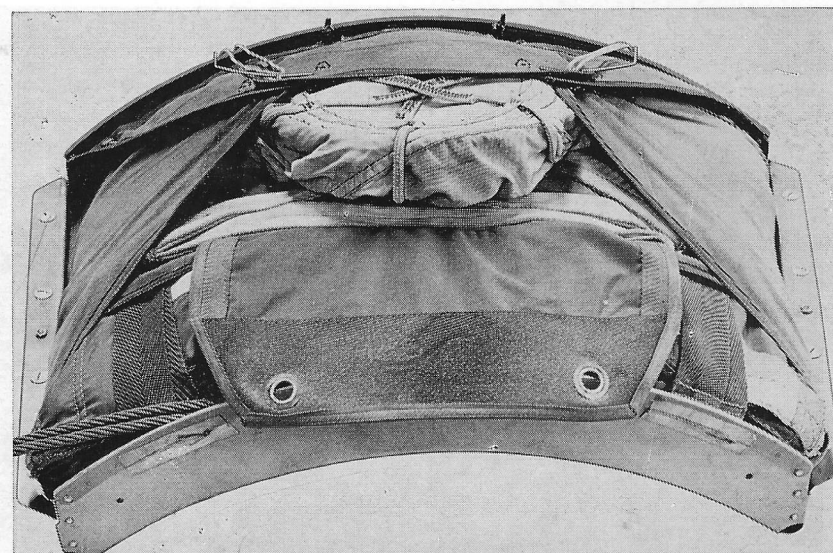


Fig. 22. Auxiliary parachute stowed

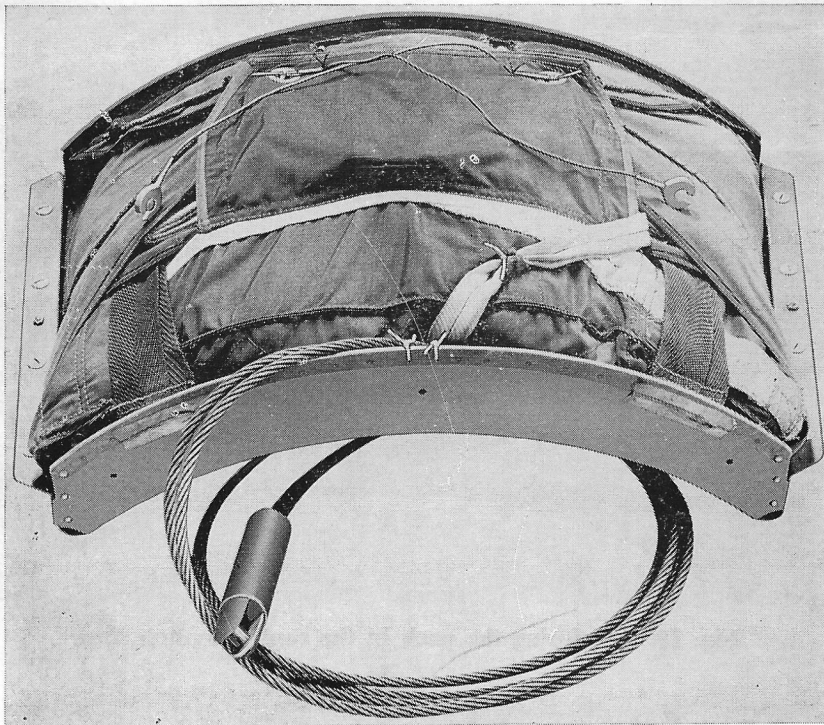


Fig. 23. Pack enclosed in container: rip cords fitted and safe tied: elastics fitted: cable coiled

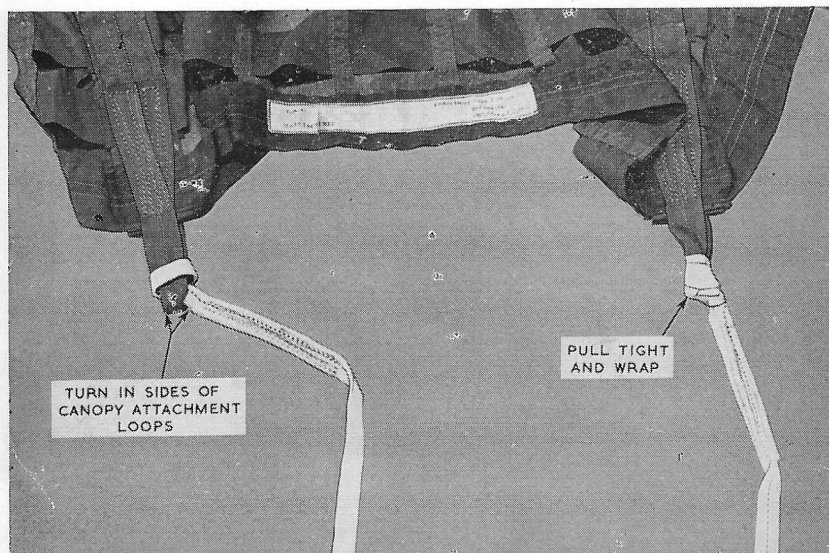


Fig. 24. Method of fitting and securing rigging lines to periphery attachment loops

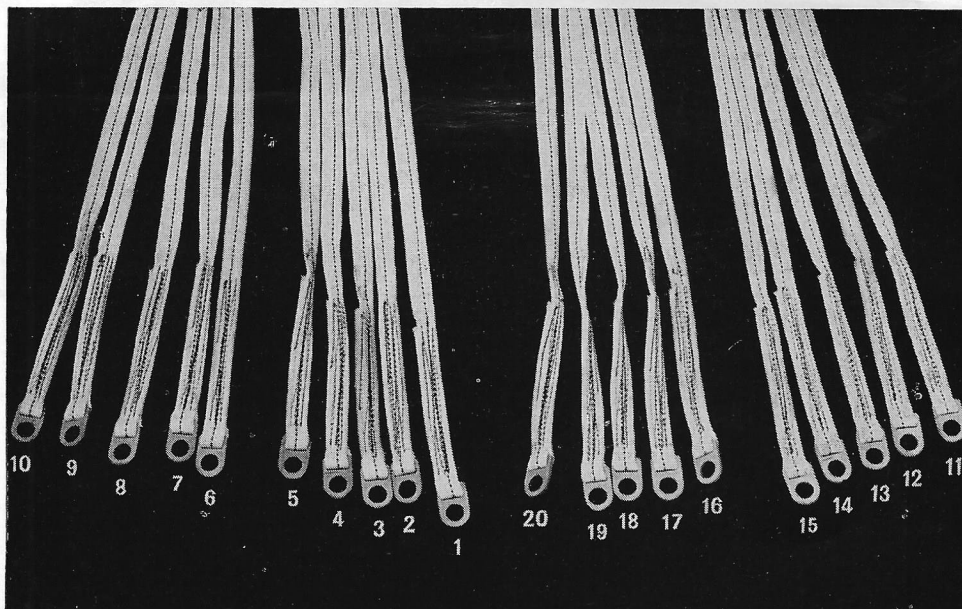


Fig. 25. Rigging lines laid out in correct sequence prior to assembling to parachute connector

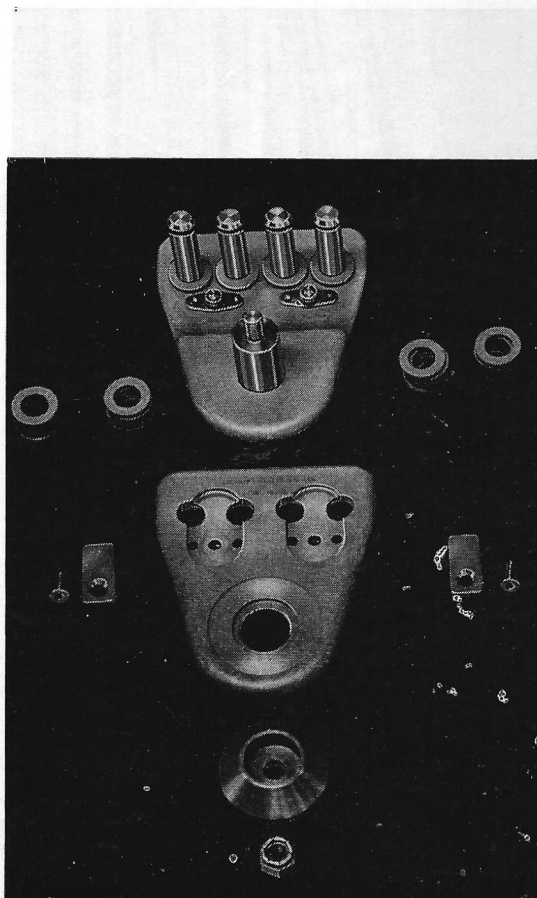


Fig. 26. Parachute connector dismantled prior to fitting the rigging lines

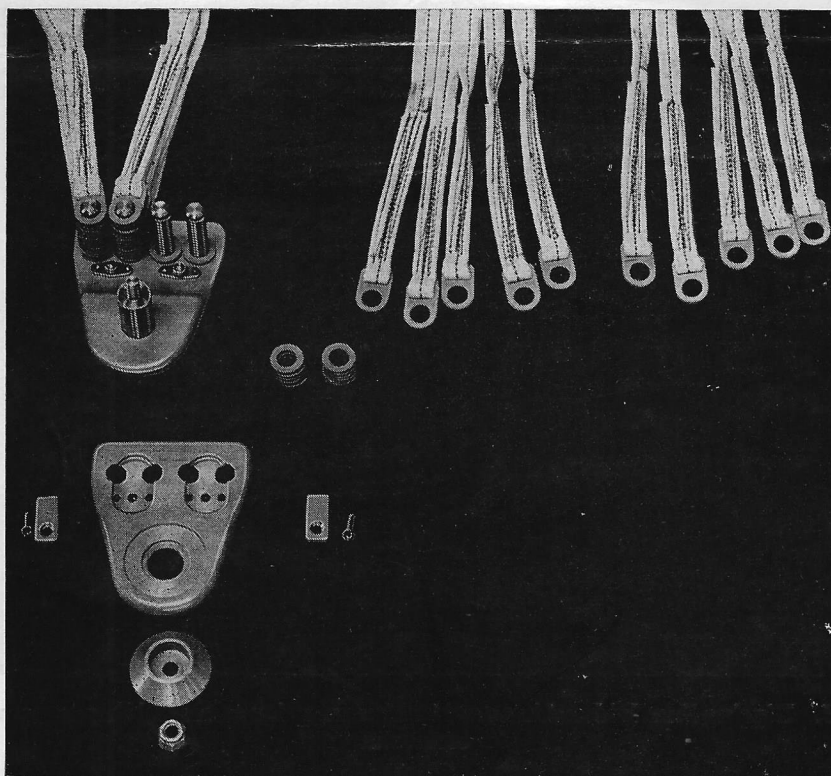


Fig. 27. Parachute connector with the two left-hand groups of rigging lines fitted.

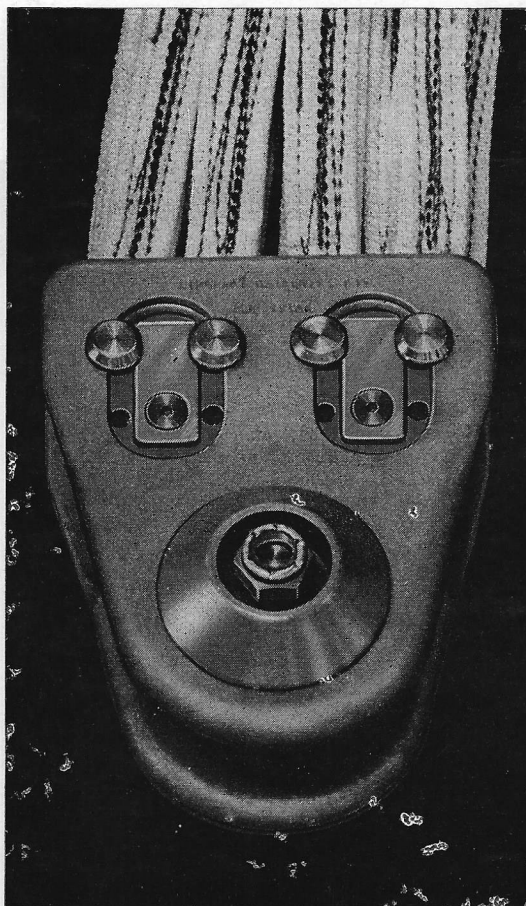


Fig. 28. Rigging lines fitted: parachute connector reassembled

- 7 OCT 1970

Mr Wright (CI)

MINISTRY OF DEFENCE

Amendment List No. 4

April, 1970

to

A.P.108C-0502-1.

PARACHUTE BRAKE ASSEMBLY TYPE L.B.2 MK. 3

REMOVAL AND INSERTION OF LEAVES

Remove and destroy the existing Insert the attached new page 9
page 9

AMENDMENT RECORD SHEET

Record the incorporation of this Amendment List and destroy this instruction sheet.

the other. Grasp the grouped lines at a point away from the periphery approximately equal to the length of the pack. Make a bight and push it into the far end of the pack on top of the stowed canopy (fig. 8) ensuring that the rigging lines that remain outside the pack are of equal length.

18. Fold the mouth locking flap down over the stowed canopy and pass the slots in the flap over the matching locking loops on the rigging line stowage flap, ensuring that both groups of lines emerge between the locking loops (fig. 9). Draw a bight of each group of rigging lines outwards through the adjacent locking loop so that approximately 1 in. of the bight protrudes through the loop. When drawing the bights through, ensure that the free portions of the lines lie uppermost in the locking loops (fig. 9).

19. Turn the pack so that the mouth faces the operator. Gather the two groups of rigging lines together and make the first stowage in the top left hand stowage loop. Continue stowing the lines in a zig-zag fashion, making the final stowage in the lower right-hand loop (fig. 10). The ends of the rigging line bights should protrude through the stowage loops to the edges of the reinforcing strips to which the stowages are attached and the length of lines remaining unstowed should be sufficient to reach the left-hand edge of the stowage flap. Neatly fold the rigging line protection flaps over the stowed rigging lines (fig. 11).

20. Fold the stowage flap over towards the mouth of the pack, taking care that the rigging lines are not withdrawn from the stowage loops and that the rigging line protection flaps remain in position over the stowed rigging lines. Secure the stowage flap by passing single lengths of No. 12 linen thread, B.S. F.34 (Ref. No. 32B/656), through the becketts on the flap edge and the mating becketts adjacent to the mouth locking loops. Ensure that each becket is in contact with its mating becket, tie off the ends of thread using double reef knots, and trim off the excess. Fig. 12 shows the flap secured.

Connecting the cable assembly to the parachute

21. The cable is either the 4 ton assembly (Ref. No. 26DK/3423) or the 5 ton assembly (Ref. No. 26DK/37027) depending upon the Mk. of aircraft for which the cable is required (see Note in para. 10). Connect the cable assembly to the parachute as follows:—

Note . . .

While performing these operations ensure that the rigging lines remain completely stowed within the stowage loops.

(1) Release the pair of clamps immediately behind the cable block assembly by removing the securing screw at the centre. Position the breaking tie loop centrally between the two cables so that the longer side of the loop at the centre is away from the cable block. Refit the clamps to the cable so that they pass through the centre loop and secure them with

the screw and locking washer provided (fig. 13).

(2) Pass the gaiter assembly, small end first, over the cable block assembly and on to the cable.

(3) Unscrew the nut and withdraw the stepped bolt from the parachute connector; it is unnecessary to remove the locking bush.

(4) If a 4 ton cable assembly is to be connected, insert the cable block assembly into the parachute connector. Place one washer, AML 12328 (Ref. No.) at each side of the cable block, within the connector. Pass the stepped bolt up through the holes in the connector, the cable block, the two washers and the locking bush. Refit and tighten the nut. Fig. 14 shows the cable assembly attached to the parachute connector.

Note . . .

If a 5 ton cable assembly is to be connected, proceed as instructed in sub-para.

(4) above, but do not fit the two washers (AML 12328).

(5) Draw the gaiter over the parachute connector, having first aligned the tunnels with the breaking tie loops. Ensure that the ends of the breaking tie loops are free at the smaller end of the gaiter (fig. 15).

(6) Feed the ends of the breaking tie loop, without twisting, through the appropriate tunnels on the gaiter. Pass a single length of 245 lb. nylon cord D.T.D.481, Cord No. 3 (Ref. No. 15D/484), through the four becketts around the centre of the gaiter. Pull the cord tight and tie off the ends using a double reef knot and a stop knot. Trim off the excess cord (fig. 15). Ensure that the becketted ends of the breaking tie loop remain free.

(7) Pass a single length of No. 18 waxed linen thread, B.S. F.34/18's/3 (Ref. No. 32B/498), through one of the two becketts at the wider end of the gaiter, round and under the gaiter, and through the other becket. Pull the gaiter tight around the rigging lines so that the surplus material is underneath. Arrange the surplus equally on each side and fold it upwards towards the becketts. Pull the thread tight around the gaiter and tie the ends together with a double reef knot and stop knot (fig. 15). Trim off the excess thread.

Closing the pack

22. Unfold the turned back edge of the pack. Take about 2 ft. of single length of 245 lb. nylon cord, D.T.D.481 Cord No. 3 (Ref. No. 15D/484) and, using a soft pencil or crayon, make two marks on the cord $8\frac{1}{2}$ inches apart and approximately equidistant from both ends. Pass the cord through the lower becket at the end of the pack, leaving equal lengths of cord on either side. Pass each end of the cord up through the adjacent becket on the breaking tie loop on either side of the gaiter. Pass the ends, from opposite directions, through the

upper becket at the end of the pack. Pull up the ends of cord so that the marks coincide when the free lengths of cord are crossed upon the top of the becket. Tie off over the top of the becket with a double reef knot and a stop knot. Trim off the excess cord. Fig. 16 shows the completed tie.

Note . . .

Experience has shown that the mouth of the gaiter has sometimes become damaged in use and enabled the gaiter to slip over the connector and up the rigging lines, which could restrict parachute inflation. To prevent this, the gaiter is to be secured with a tie of 245 lb. nylon cord (fig. 16) as follows:—

- (1) Using a 3 ft. length, pass one end through one of the breaking tie tunnels from the smaller end of the gaiter, turn it back over the outside of the tunnel and tie it to the standing part with a bowline.
- (2) Pass the free end between the twin cables and through the other tunnel. Pull tight and tie the free end to that part leading into the tunnel, using another bowline.

Attaching the auxiliary parachute

23. If the auxiliary parachute and pack have been separated, fit them together as follows:—

- (1) Attach the connecting strop to the auxiliary parachute by passing the short loop through the eye in the rigging lines, then threading the long loop through the short loop and pulling up tight to form a larkshead knot.
- (2) Attach the auxiliary parachute to the pack by passing the free end of the connecting strop through the D-ring and drawing the auxiliary parachute, apex first, through the long loop and pulling up tight to form a larkshead knot (fig. 17).

Stowing the cable in the container

24. Stow the twin cables in the container as follows:—

- (1) Ensure, especially if the parachute has been streamed, that the twin cables are free from twists, so that they run parallel to each other and are of equal length.
- (2) Mark the twin cables at a point 10 ft. 3 in. from the centre of the pin in the aircraft attachment fitting.
- (3) Lay the remainder of the cables in the bottom of the container, without twisting, in two lays to form a 'double 8' configuration. Ensure that no part of the second lay is interwoven with the first, and that the cable block assembly is adjacent to the centre of the deeper side of the container as shown in fig. 18.
- (4) Pass one end of a single length of nylon cord, D.T.D.786 (latest issue), Cord No. 3/47 (Ref. No. 15A/1258), down through one of the holes in the end of the container base and up through the adjacent hole. Enclose the twin cable with the ends of the cord and tie off tightly with a double reef knot and stop knot. Trim off the excess cord. Repeat the tie at the other three sets of holes in the base (fig. 18).

(5) Make a separate tie at the 10 ft. 3 in. position marked at (2), using single lengths of nylon cord, D.T.D.786, Cord No. 3/47 (Ref. No. 15A/1258), round each section of the twin cable, each tie passing through one of the holes in the centre of the top edge of the shallow side of the container, tying off in a double reef knot and a stop knot (fig. 18).

◀Ensure that a pair of cable clamps (Ref. No. 26DK/2680) are fitted to the twin cables, positioned near this tie and outside the container.▶

STOWING THE PACK IN THE CONTAINER

Preparation

25. From the inside of the container, secure 4½ in. elastics in each of the two holes in the deeper wall and pass the free ends up through the eyelets in the top centre flap. Temporarily attach the free ends to the wall of the container. Lay all the flaps and the locking loops over the edges of the container so that the inside is clear.

26. Turn the pack over and position it centrally in the container, auxiliary flap uppermost. At the same time arrange the auxiliary strop so that it passes under the front left hand corner of the pack and emerges at the centre of the shallow wall, adjacent to the cable ties. Ensure that the D-ring is turned down towards the base of the container and that the gaitered parachute connector lies parallel to the side wall and as far as possible towards the top right-hand corner of the container (fig. 19).

27. Lay the connecting strop across the top of the pack, ensuring that it does not pass round the twin cables, and secure it between the two becketts, offset from the centre of the pack, with a single length of No. 18 waxed linen thread B.S. F.34/18's/3 (Ref. No. 32B/498). Pass one end through the becketts and tie off using a double reef knot and a stop knot (fig. 19). Fold back the auxiliary flap so that it lies over the auxiliary strop (fig. 20).

28. Fold over the apron flap attached to the deeper wall of the container so that it lies on top of the pack. Fold over the apron locking loops attached to the shallower wall of the container, ensuring that the left-hand locking loops lie UNDER the twin cables, and pass the ends up from the underside through the corresponding slots in the apron flap (fig. 20).

29. Fold the connecting strop round the right-hand edge of the auxiliary flap and lead it towards the left-hand side of the container. Draw a fold in the strop through the left-hand apron locking loop; ensure that the strop is not twisted and that the part leading off towards the auxiliary parachute is on top. Approximately 1 in. of the fold should protrude through the loop. Lead the strop across the pack and make a similar stowage in the right-hand locking loop in the same manner (fig. 20).

30. Flatten the pack in the container, working as much bulk as possible towards the ends. Bring over the two side flaps bearing the cones, followed by the quarter flaps and the centre flap, in that order (fig. 21).