Chapter 13

BRAKE PARACHUTE

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LIST OF ILLUSTRATIONS

DESCRIPTION

Introduction

1. This chapter contains a description of the brake parachute installation, gives certain servicing operations and recommends the method of installation. Fig.1 shows the parachute stowage and the door release mechanism, fig.2 shows the jettison hook assembly together with its operating mechanism. For details of the electrical installation refer to Book 2, Sect.6, Chap.10 of this publication.

General information on parachutes is given in A.P.1182A, Vol.1.

General

2. The brake parachute assembly (Ref.No.15D/629, Type, LB 54 Mk.1), is housed in a built-in stowage in the top of the fuselage, aft of the rudder, and faired off by a fixed front fairing and a single door which is hinged at its forward edge. The door release/lock mechanism and the jettison hook, by which the parachute is attached to the aircraft, are electrically operated, each having two actuators coupled in randem.

3. Normally the parachute is used to supplement the drag of the wheel brakes, when the aircraft has reached the ground, to reduce the landing run. It can also be used as an emergency brake or to assist braking in bad conditions, e.g., icy runway.

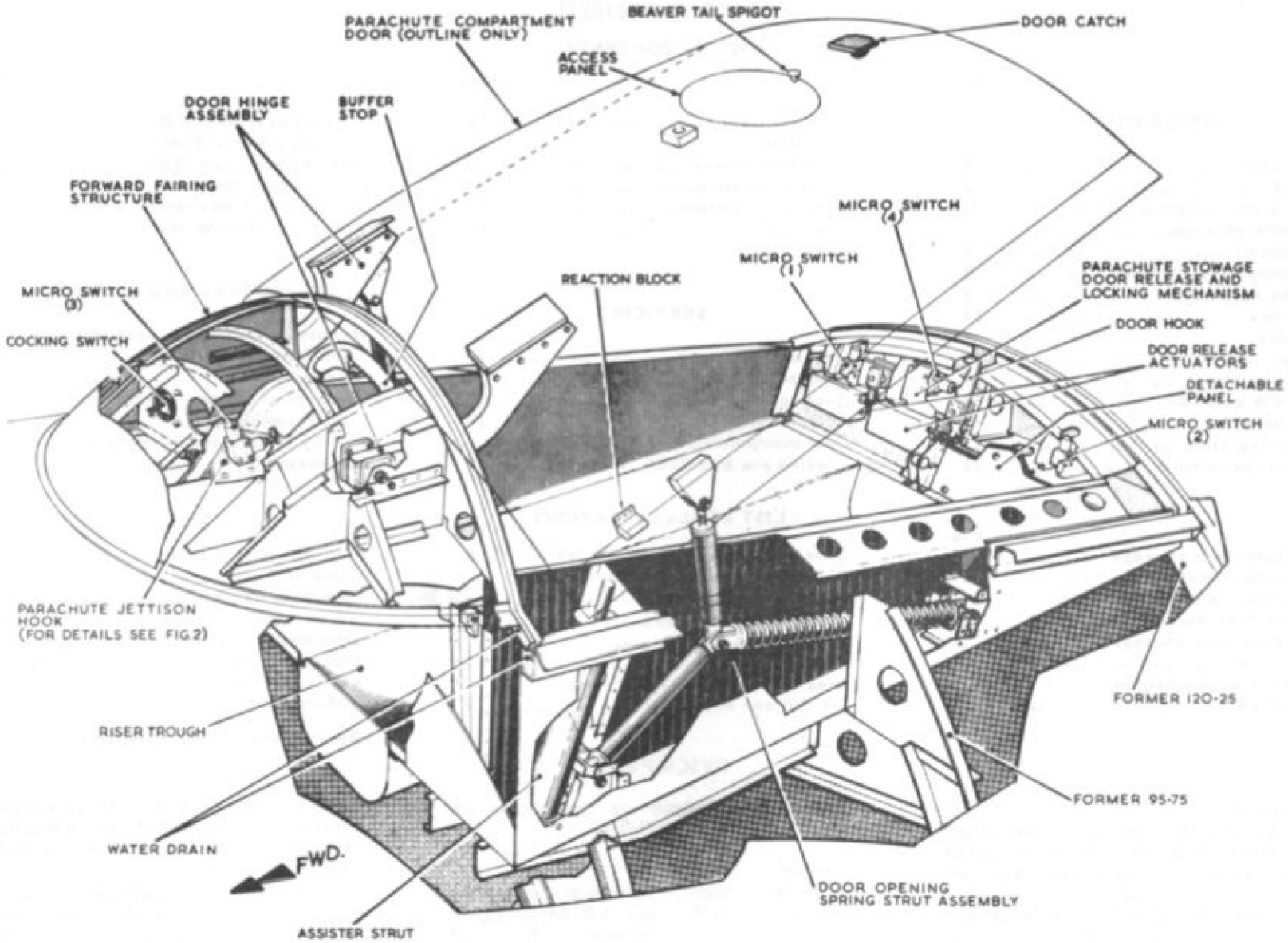

Fig. 1. Brake parachute stowage

CONTROLS AND INDICATOR

4. Two switches located on the starboard side of the first pilot's instrument panel control the actuators for parachute stream and jettison. Normally the switches are operated together, being coupled by a split toggle link, but either can be used should a failure occur in the other, in which case a slower operation of the selected service would result. The down position selects STREAM and the up position selects JETTISON/OFF to release the parachute from the aircraft. A magnetic indicator (doll's eye), fitted on the ground intercomm. panel, is revealed when the small access panel located in the lower starboard side of the rear fuselage is raised; it is energised black when the parachute door is locked and all switches and relays are in their correct positions ready for a stream operation. A cocking switch, situated in the fixed front fairing of the stowage on the starboard side, is used when installing the parachute assembly in the aircraft and is marked DOOR HOOK - PARA. HOOK.

PARACHUTE STOWAGE

5. The parachute stowage is a box-type built-in structure in the rear fuselage above the E.C.M. equipment compartment. The double side-walls of the stowage incorporate sections of the moisture draining system and house the door opening struts. A longitudinal trough in the base of the stowage accommodates the parachute riser when the pack is correctly stowed. At the rear, occupying the width of the stowage, is a compartment containing the door release/lock mechanism, this normally being covered by a removable panel. The structure surrounding this aft compartment is suitably reinforced against impact from the parachute shackle after release, and thick rubber padding on the front face of the removable panel provides additional protection. The embodiment of Mod.1837 deletes the rubber padding from the removable panel and introduces a plywood panel which is secured by screws to the forward face of the detachable panel The drag beam structure with the jettison hook and associated mechanism is forward of the stowage and is covered by the fixed front fairing. A rubber-padded tubular-steel guard is provided, over the jettison hook and below the fixed fairing, to resist any flaying motion by the shackle assembly during jettison.

WATER DRAINS

6. To prevent water from seeping into the stowage, water drain troughs are provided beneath each edge of the door. Water which runs into these troughs is ducted overboard through light alloy tubing at the front and rear of the stowage on the port side of the aircraft. Branch pipes in this tubing also drain the stowage floor the spring strut compartments and the special tool recess. All joints in the water drain troughs and in the corners of the stowage where water leakage may occur are sealed with a mixture of Bostik 1752 and Bostik 1790(Ref.No.33H/9450627 and 33H/2202125).

DOOR OPENING MECHANISM

7. Selection of STREAM on the cockpit control switches will energise the actuators in the door release/lock mechanism to retract and disengage the lever from the door catch. The door is then thrust open by two spring strut assemblies, which are aided initially by two spring-loaded struts bearing directly on to two reaction blocks mounted on the underside of the door. The port side struts are shown in fig.1, the starboard side arrangement is identical.

8. With the door closed and locked, the spring struts and assister struts are compressed, the elbow-joint coupling of the tubular struts having moved in an arc formed by the forward lower struts swivelling in their fixed bottom mountings. The door is held in the closed position, against the thrust of the strut assemblies, by the electrically actuated lever engaged in the door catch. The method of setting the door release/lock mechanism is given in para. 34.

JETTISON MECHANISM

9. The jettison mechanism located at the forward end of the stowage, consists of a pivot-mounted jettison hook and a fixed block attached to a drag beam. The drag beam is part of the aircraft structure and houses the jettison hook operating mechanism, a system ot cam-levers and rollers operated by two electrical actuators which are controlled from the cockpit.

10. Selection of the JETTISON position on the cockpit control switches will energise the actuators to retract, moving the cam-levers away from the stop link to unlock the assembly. Further movement of the cam-levers brings their cam-faces into contact with the rollers on the stop link, forcing the link to swivel downward. The stop link is connected, through a strut link, to the lower end of the jettison hook, which is drawn aft as the stop link pivots downward. This movement opens the hook, and the parachute shackle and restraining strop are released. To prevent the jettison hook damaging the stop link pivot bolt at the end of its travel, a steel striker block bolted to the hook contacts a rubber buffer in the form of a bush fitted to the stop link pivot bolt. At this stage the hook restraining lever catch will engage, under the influence of the tension spring at its aft end, with the block in the arm of the jettison hook to hold the hook in the open position. This device prevents damage being caused to bearings, micro switches etc., by arresting the jettison hook operating mechanism before any recoil action occurs.

11. When the nose of the stop link

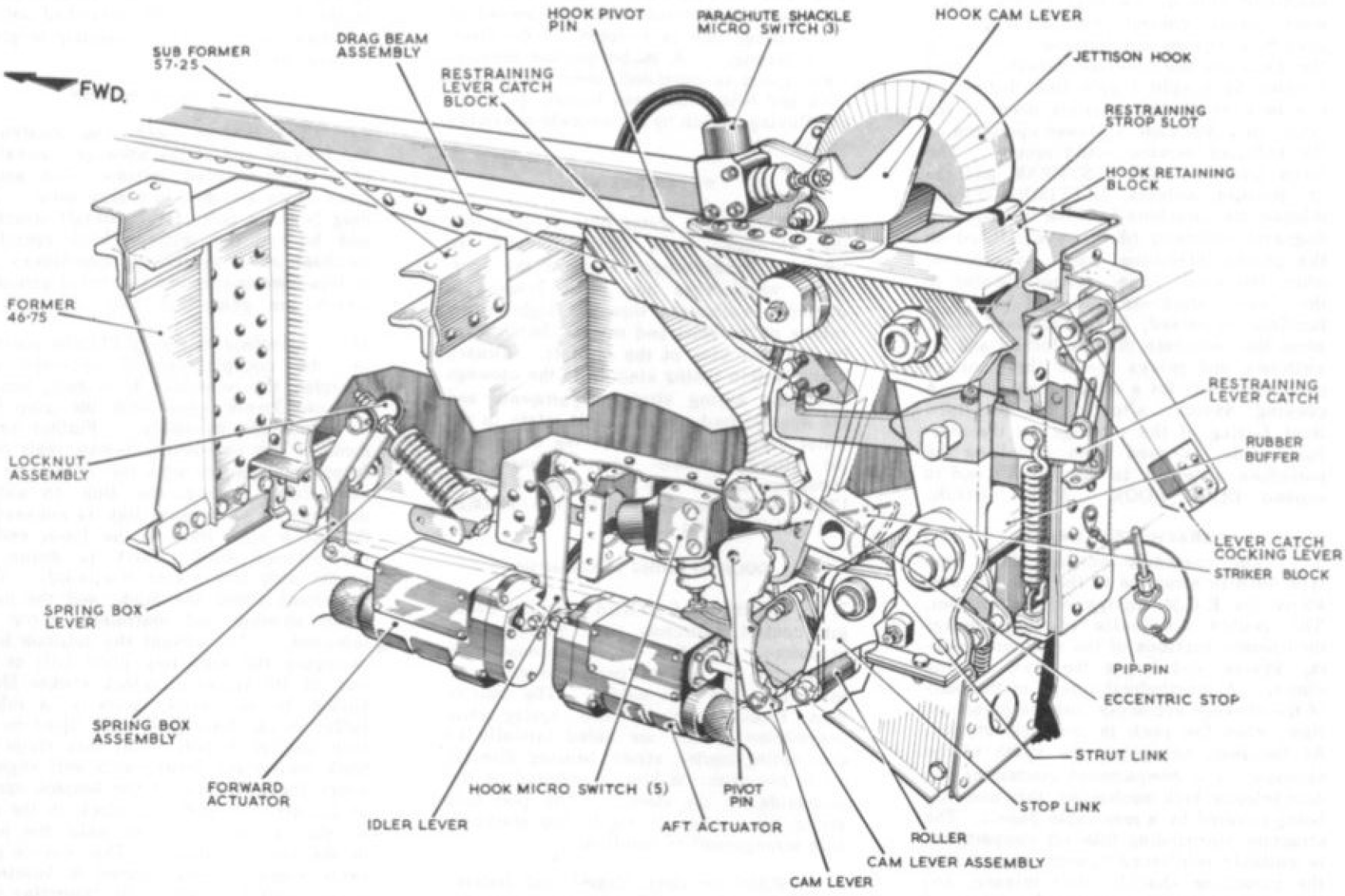

Fig. 2. Jettison-hook mechanism
«Mod. 1898»

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approaches top dead centre of the cam-lever roller it exerts a high load on the roller which is transmitted, through the actuating rods, to the actuators. To prevent overloading the actuators this momentary high load is absorbed by a spring box, fitted at the forward end of the assembly and connected by a pivoted lever to the rod of the forward actuator. Setting procedure for the jettison hook operating mechanism, is given in para.35 and illustrated in fig.3.

ACTUATORS

General

12. Each of the cockpit switches operates one pair of actuators, one in the jettison hook mechanism and one in the door release/lock mechanism. Should failure occur in any one circuit or its associated actuator, the mechanism of the selected service will be operated at half speed and half travel, by the remaining unit. In the case of the jettison hook, this movement will be sufficient to unlock the cam lever assembly, the hook will then be opened fully by the pull of the parachute; similarly, the door release/lock mechanism movement will be sufficient to unlock the door due to the large over-travel obtained when both actuators operate.

Operation

13. The actuators of the jettison mechanism retract to open the jettison hook when the cockpit switches are set to JETTISON; they also retract automatically if the door opens in flight (para.24). The actuators extend and close the jettison hook when, with the cocking switch in the PARA. HOOK position, micro switch (3) is depressed by placing the parachute shackle in the jettison hook. The actuators of the door release/lock mechanism retract to unlock the door when the cockpit switches are set to STREAM; they extend and lock the door when, with the cocking switch in the DOOR HOOK position, micro switches (1) and (2) are depressed by the door. It should be noted that although some of the functions of the micro switches have been given, reference should be made to Book 2 of this publication for complete information on their functions.

PARACHUTE ASSEMBLY

14. The parachute assembly consists of a main canopy of concentric rings, a riser, which connects the main canopy to the jettison hook mechanism (para.9), an extractor parachute, and packs for the main and extractor parachutes.

Main parachute

15. A 45 foot ring-slot parachute constitutes the main canopy. It has 56 rigging lines which are bound together by a keep ring at a point 10 feet from their end. This 10 foot length forms the riser and is protected by a canvas sleeve. Secured to the riser, at a point indicated by a thick black line, is a woggle mounted snap hook which is used in conjunction with the restraining cable to prevent the parachute from swinging after it has been deployed.

16. A light-alloy line shackle, attached to the end of the riser is connected to a steel ring shackle by a shear pin. A bolt fitted with two clamp washers passes through the line shackle, the washers bear on the faces of the ring shackle to reduce the tendency of the fork end to splay out under high loads. When the parachute assembly is installed in the aircraft the ring shackle rests inside the jettison hook, which is secured to the aircraft structure. The shackle assembly is protected by a fabric and felt sock.

Restraining strop

17. The purpose of the restraining strop is to prevent the parachute riser fouling the aircraft structure during a crosswind landing, or when the aircraft turns. One end of the strop, located in a slot in the hook-retaining block of the jettison-hook mechanism, is held in position with the parachute shackle, by the jettison hook. From this point the cable passes round a steel tube in a bracket attached to the removable panel which covers the door release/lock mechanism. The other end of the strop is attached to the snap hook on the parachute riser.

Extractor parachute

18. The vane-type extractor parachute is spring-loaded by a helical coil spring, 24 in. in length, housed in a pocket running vertically down from the canopy vent. The canopy is 102 in. in diameter, has six vanes and twelve gores. This parachute is secured to the end of the beaver tail of the main pack (para.19) by four continuous loops of 1,200 lb. nylon cord, bound as a single 18 in. strop.

Parachute packs

19. The main pack is divided into two parts, one containing the canopy and the other the rigging lines. The canopy is folded and stowed in the pack concertina fashion, with the metal vent ring lying flat on the base of the pack; this part of the pack is then closed by nylon cord side-lacing. The rigging lines, stowed horizontally on the lower flap of the pack are held in position in stowage loops at the sides of the flap. The lower flap terminates in a 'beaver tail' which incorporates a flat metal ring for attachment to the spigot on the parachute stowage door. The main pack is secured to the canopy apex by four continuous loops of 1,200 lb. nylon bound as a single 6 in. strop. The extractor pack is of the simple envelope type with two small side flaps and two longer horizontal top and bottom flaps. This pack is firmly secured to the 'beaver tail' of the main

pack by 700 lb. nylon cord. On aircraft pre Mod.2049 the extractor parachute pack is held closed, against the spring-loading of the parachute, by two ripcord pins which are attached, via a branched cable, to the two snap hooks, attached by cables to the stowage door. The snap hooks are fitted to face in opposite directions with the loops of the attachment cables secured together with six loops of 22 s.w.g. copper wire, three loops of wire on each side of the attachment cable loop. On aircraft post Mod.2049 the pack is held closed by a transit tie which is removed during installation, the pack then being held closed by the stowage door.

20. The parachute packs and the extractor parachute remain attached to the main canopy during the landing, but can be detached and replaced separately, if required, during servicing operations on the parachute assembly.

OPERATION

Parachute stream

21. Selection of STREAM on the cockpit switches causes the door release/lock actuators to retract; this moves the door hook, about its pivot, away from the roller of the door catch. When this movement is complete, the spring-strut assemblies and the spring-loaded assister struts force the stowage door open. On aircraft pre Mod.2049 the branched cable which is attached to the two clips on the inside face of the door, pulls the pins from the extractor parachute pack, to release the extractor parachute. On aircraft post Mod.2049 the spring of the door releases the flaps of the extractor parachute pack Simultaneously the 'beaver tail', which is attached to the inside of the door, is pulled taut; this causes the extractor parachute to be ejected, upwards and aft.

22. The extractor parachute is ejected into the airstream, clear of the pack and the stowage, where it is deployed by its spring loading. This movement causes the release cable, attached to the extractor parachute, to withdraw the attachment pin which secures the ring of the beaver tail to the spigot on the inside of the door, allowing the beaver tail to be pulled clear. The extractor parachute developes just aft of the tail structure and pulls the main parachute pack out of the stowage and clear of the aircraft.

23. Continued 'pull' by the extractor parachute together with the action of the main pack leaving the stowage causes the rigging lines of the main parachute to be released from their stowage loops and draw the brake parachute free of its pack to develop in the airstream. Drag produced by the developed parachute reacts along the rigging lines up the riser to the ring shackle and is then transferred to the main structure of the aircraft through the jettison hook and drag beam assembly.

Parachute jettison

24. Selection of the cockpit switches to the JETTISON position retracts the actuators of the jettison mechanism and, through the cam-lever assembly, opens the jettison hook. This releases the parachute ring shackle and the ball end of the restraining strop, and the parachute assembly is jettisoned. The hook will be held in the open position by the release catch lever.

Automatic jettison

25. In the event of an unselected stream taking place, due to the door opening inadvertently, the jettison hook opens automatically, releasing the parachute assembly before the main canopy can develop. This is arranged electrically if the micro switches (1) and (2) (fig.1) are released when the cockpit switches are not in the STREAM position.

Shear pin

26. Should the parachute be streamed at an excessive speed the braking load would damage either the parachute assembly or the aircraft structure. To prevent this damage occurring the ring shackle is attached to the line shackle by a 1 9/16 in. diameter light-alloy shear pin; this allows the parachute assembly to break away from the aircraft before its braking load becomes excessive. The pin, which is designed to shear at a load of 103,000 lb. ± 5 per cent., is dyed red and marked Mk.2 A/C. ONLY. In the event of a shear pin being sheared, the ring shackle must be throughly checked for damage, distortion, etc., and rectified or replaced as necessary.

NOTE . . .

The maximum speed at which the parachute can be streamed is 145 knots, but any parachute streamed at a speed above 135 knots must be scrapped.

WARNING . . .

Personnel must keep well clear when the parachute-compartment door is tested since it opens with considerable force.

SERVICING

General

27. Servicing the brake-parachute assembly should be to the same standard as that detailed in A.P.1182A, Vol.1. There is no limit to the number of permissible streaming operations provided that the serviceability does not fall below the requirements given in A.P.1182A, Vol.1, Following a stream, and after examination, the parachute may be packed and installed in the aircraft provided that it has not been exposed to extreme climatic conditions.

28. Routine servicing consists of airing, examination, and packing, at the stipulated intervals, or more frequently is necessitated by the ingress of moisture during aircraft installation life.

COMPARTMENT MECHANISM

29. Periodic lubrication of the compartment mechanism is the only servicing normally required; this should be carried out in accordance with A.P.101B-1902-4. Grease nipples are provided at the pivot points of the spring strut assemblies and the jettison hook mechanism. These and other moving parts of the installation must be lubricated as indicated on fig.4 and 5. An oil channel, fitted with a screwed plug, is drilled in the top end of each spring strut to enable 5 cm^3 of oil OX-16 to be introduced into the spring struts at the periods specified in A.P. 101B-1902-4. All surplus lubricant must be removed and care must be taken to ensure that no oil or grease comes into contact with the parachute assembly. Locking wire used on the installation must be 22 s.w.g. Ref. No. 30A/3339.

Door opening mechanism

30. If, during servicing or replacement operations adjustment is required on the parachute compartment door operating mechanism, the adjustable upper lever must be set to a nominal 9.3 in between attachment bolt hole centres. If further adjustments, on the levers are required, it is important that the port and starboard levers are kept to the same length.

ACTUATOR CHECK

31. Mechanisms for the jettison hook and door hook will still operate if one actuator in the mechanism is unserviceable, therefore a check must be carried out after each stream, and when called for in A.P.101B-1902-4 to prove that both actuators in each mechanism are operating.

32. Indication of failure of an actuator in the jettison hook mechanism is given by the jettison hook not opening to its full extent, making it necessary to force the hook open against the stop link spring in order to insert the ring shackle. Indication of failure of a door hook actuator is given by the restricted travel of the door hook, which when in the open position, will only just clear the door catch roller.

DOOR MANIPULATION

33. During servicing operations which necessitate the opening or closing of the parachute compartment door on aircraft pre Mod.2240, the special tool Pt. No. 1U/2068 must be used. This tool is provided to control the door against the upward thrust of the spring strut assemblies. Prior to fitting the tool an inspection must be carried out on the tool attachment points and the surrounding area for damage and security. To close the door, refer to fig.6 and proceed:-

(1) Locate and PRESS as indicated, the small hinged flap in the top fuselage structure just aft of the parachute stowage, to expose the tool attachment lug.

(2) Attach the fork-end fitting, at the base of the tool, to the lug, using the Pip-pin provided.

(3) Remove the door attachment hook from the sliding block on the tool and engage it with the cross-bar in the small recess at the aft end of the door top surface. The hook is engaged pointing forward and upward with its pad aft of the recess.

(4) Turn the handwheel up the screwed rod until contact is made with the stop collar at the top of the rod, then raise the sliding block until the door attachment hook can be assembled to it using the Pip-pin provided.

(5) The door can now be closed by turning the handwheel down the screwed rod.

(6) Before the door is moved down, ensure that the cocking switch is selected PARA. HOOK, otherwise the door lock mechanism will operate in the normal manner and when the microswitches (1) and (2) are tripped by the door, the actuators will be energized to move the door hook lever to the locked position, both operations occuring in rapid succession and in most cases, faster than final movement of the door to the fully closed position can be achieved with the handwheel. Also ensure parachute is properly packed and stowed. If undue force is needed to compress parachute when closing door, the door may be damaged.

(7) When the handwheel is screwed firmly down, the door is fully closed and is then locked by selecting DOOR HOOK on the cocking switch. When the doll's-eye shows black the door is locked and the tool may be removed. Note that the doll's-eye will only show black if the jettison hook is also closed.

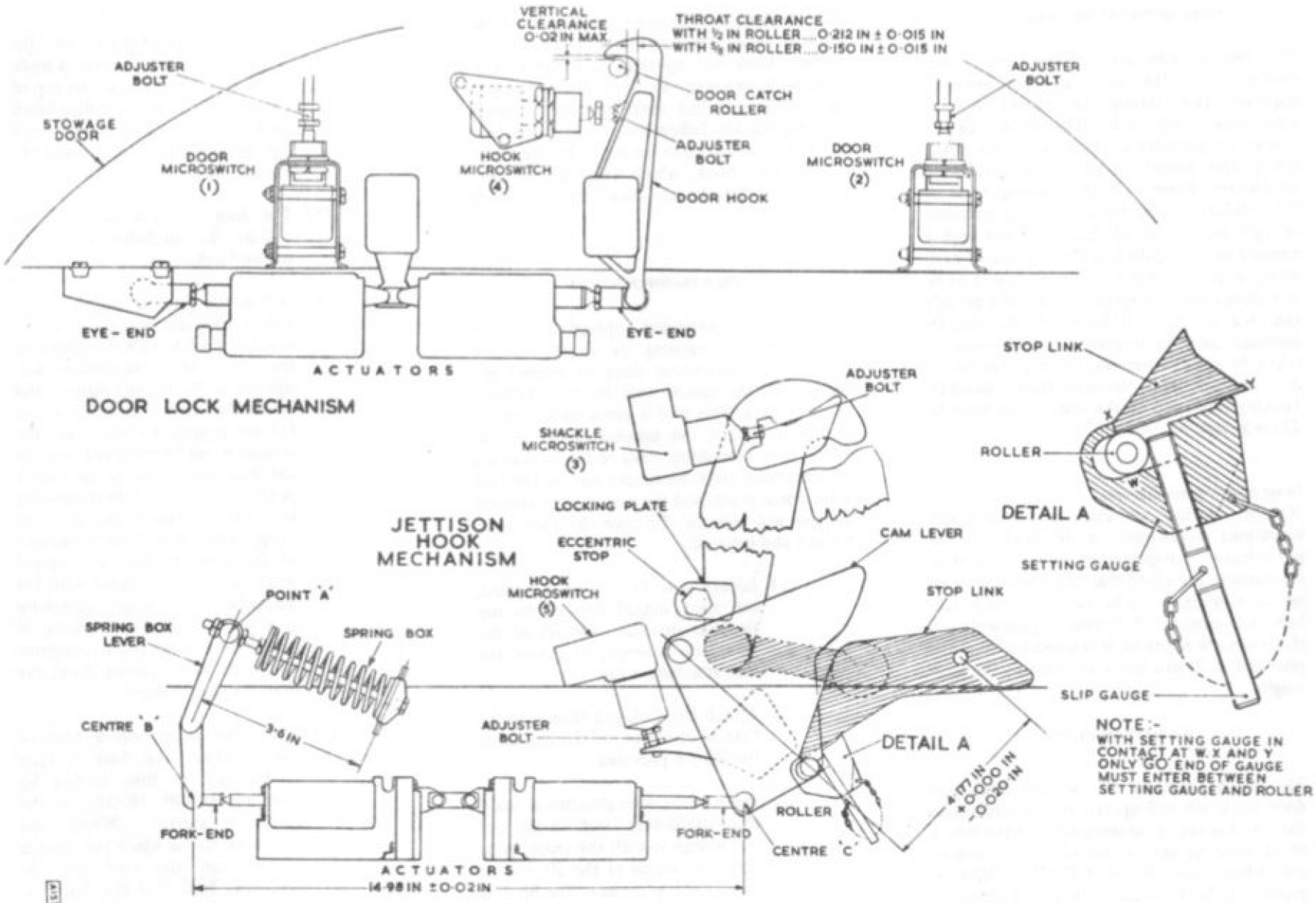

Fig. 3 Setting door release/lock and jettison-hook mechanism

Amended clearances

33A. When it is necessary to open or close the parachute compartment door on aircraft post Mod.2240 the hoisting equipment listed below is to be used:-

Part No.		
A42/1	Hoist 5 cwt	One set
A41/163	Handle 9 in	
A41/101	Extension tube 36 in	
1U/1613	Adapter head	
191D/10734	Hoist adapter bracket	1 off

WARNING . . .
Personnel are to keep clear of the doors during winching operations.

To close the door proceed as follows:-

(1) Ensure 28V d.c. ground power supply is connected and energized.

(2) Open E.C.M. compartment doors.

(3) Remove hoist adapter bracket from stowage, fit to mounting and secure with lock pin (fig.6A, detail A).

(4) Attach hoist adapter head to adapter bracket with adapter hook aft and secure with lock pin (fig.6A, detail B).

(5) Remove bung from hole in skin above guide tube.

(6) Run out hoist cable sufficient to reach door closing bracket.

(7) Feed hoist cable through guide tube, lift guard plate on door closing bracket, fit cable end into spherical adapter and secure in position with guard plate (fig.6A, detail C).

(8) Operate hoist winch to fully close door.

(9) Select cocking switch to DOOR HOOK and check that dolls eye is black, indicating the door is closed.

NOTE . . .
The dolls eye will only show black if the jettison hook is also closed.

(10) Operate hoist winch to loosen hoist cable, lift guard plate, release cable end from spherical adapter then close and secure guard plate.

(11) Remove hoist cable from guide tube, take out hoist adapter head lock pin and remove hoist.

(12) Fit and secure bung to hole above guard tube.

(13) Remove hoist adapter bracket and secure in stowage.

Opening

34. When used to open the door on aircraft pre Mod 2240, the tool is assembled in a similar manner to that described for door closing, except that the handwheel is turned down the rod to hold the sliding block firmly at the base of the tool. The door is thus held in the closed position by the handwheel which, after the door is unlocked by selecting STREAM on the cockpit switches, is turned up the rod, allowing the door to open under the influence of the spring strut assemblies.

Opening

34A. To open the door on aircraft post Mod 2240, assemble the equipment as for door closing (para 33A), operate the door hoist winch to tension the cable and hold the door in the closed position. Select STREAM on pilots' selector switches to release door hook, then operate the hoist winch to open the door.

DOOR LOCK SETTING

35. The door lock and the rear microswitches (1), (2) and (4) are set up from inside the stowage with the door closed. Reference must be made to fig.3 when carrying out the following procedure:-

(1) Remove the detachable panel which covers the door-lock mechanism. On aircraft with Mod 1837 embodied it will be necessary to remove the plywood panel before the detachable panel. Unlock the adjuster bolts for microswitches (1), (2) and (4) and screw in each bolt fully. Ensure that the actuators are connected with their eye-ends screwed fully in.

(2) Ensure that the cockpit switches are in the JETTISON/OFF position and connect an external power supply to the aircraft.

(3) Raise the jettison hook release catch cocking lever and insert the Pip-pin to secure the catch lever so that the jettison hook is free to close. Selected PARA. HOOK on the cocking switch and depress the parachute shackle microswitch (3) by hand to close the jettison hook.

(4) When the hook is fully closed, remove the Pip-pin from the catch lever and stow the hook release catch cocking lever flat against the bulkhead and secure with the Pip-pin.

(5) Remove the circular access panel located in the parachute compartment door and enter the stowage. Close the compartment door using the special tool pre Mod 2240 (para 33), or hoisting equipment post Mod 2240 (para 33A), when the door is fully closed select DOOR HOOK on the cocking switch. The tool must be left in position holding the door closed.

(6) Unscrew the adjuster bolt for the door microswitch (1) until the microswitch is just tripped. Measure the extension of the adjuster bolt and unscrew the bolt a further 0.125 in, tighten the adjuster bolt locknut.

NOTE . .
The tripping point of the door microswitch (1) can be ascertained by listening for the door hook actuators starting to operate.

◀ (7) Check vertical clearance between door hook and door catch roller does not exceed 0.020 in. Clearance is adjusted by shims between door catch and door.

NOTE . . .
If clearance is excessive with all shims removed, it is permissible to fit a locally manufactured roller of $^{5}/_{8}$ in diameter. If clearance is still excessive change the brake parachute compartment door.

(7A) When the door hook actuators are fully extended, adjust both actuator rod eye-ends evenly to obtain throat clearance between door hook and door catch roller, measured at the position shown in fig.3, as follows:-

½ in diameter roller–0.212 in ± 0.015 in
$^{5}/_{8}$ in diameter roller–0.150 in ± 0.015 in

This clearance is best checked from within the brake parachute compartment using appropriate size drill shanks as gauges, or by use of plasticine. Lock actuator rod eye-ends. ▶

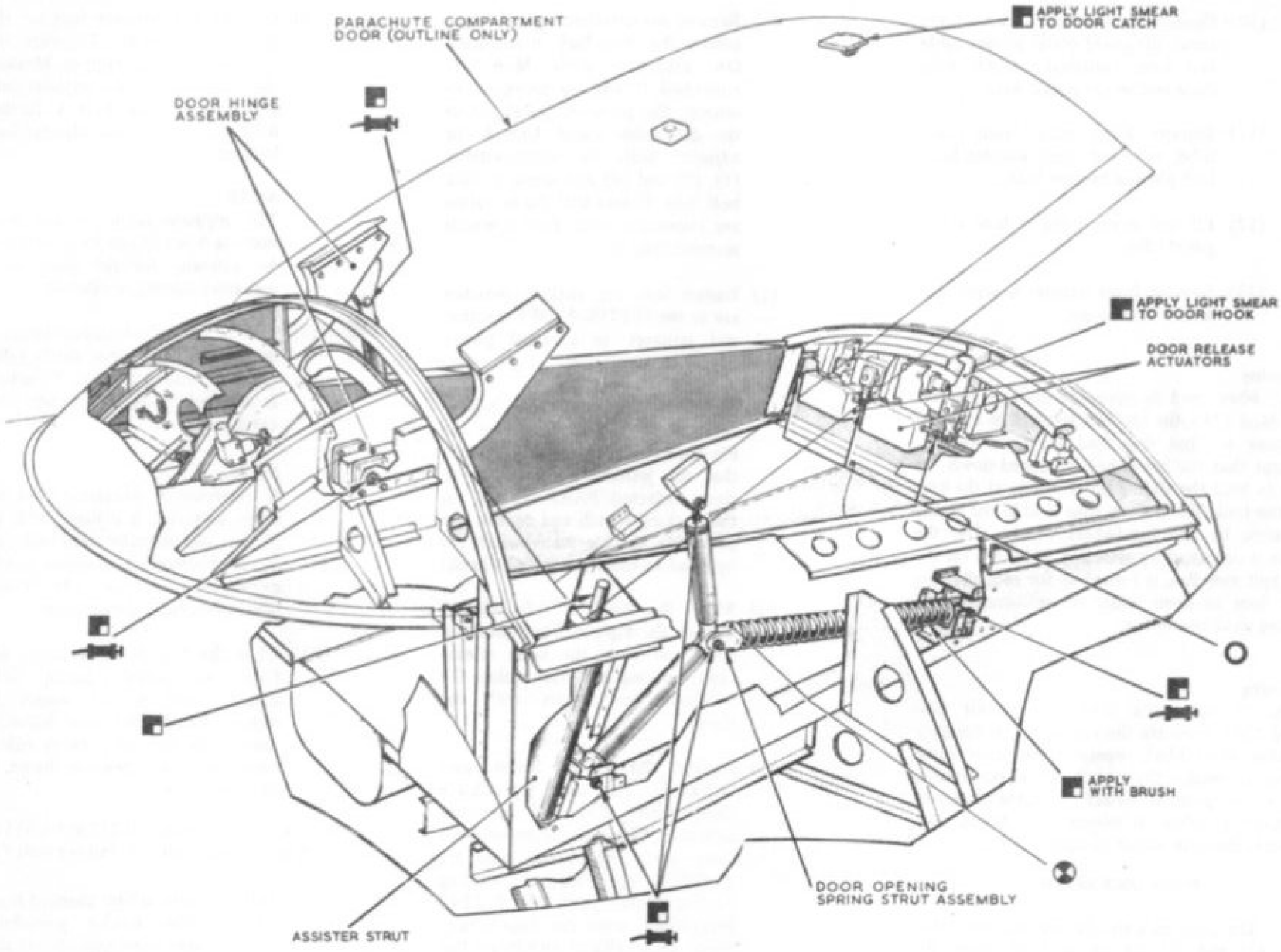

Fig. 4 Brake parachute stowage—lubrication

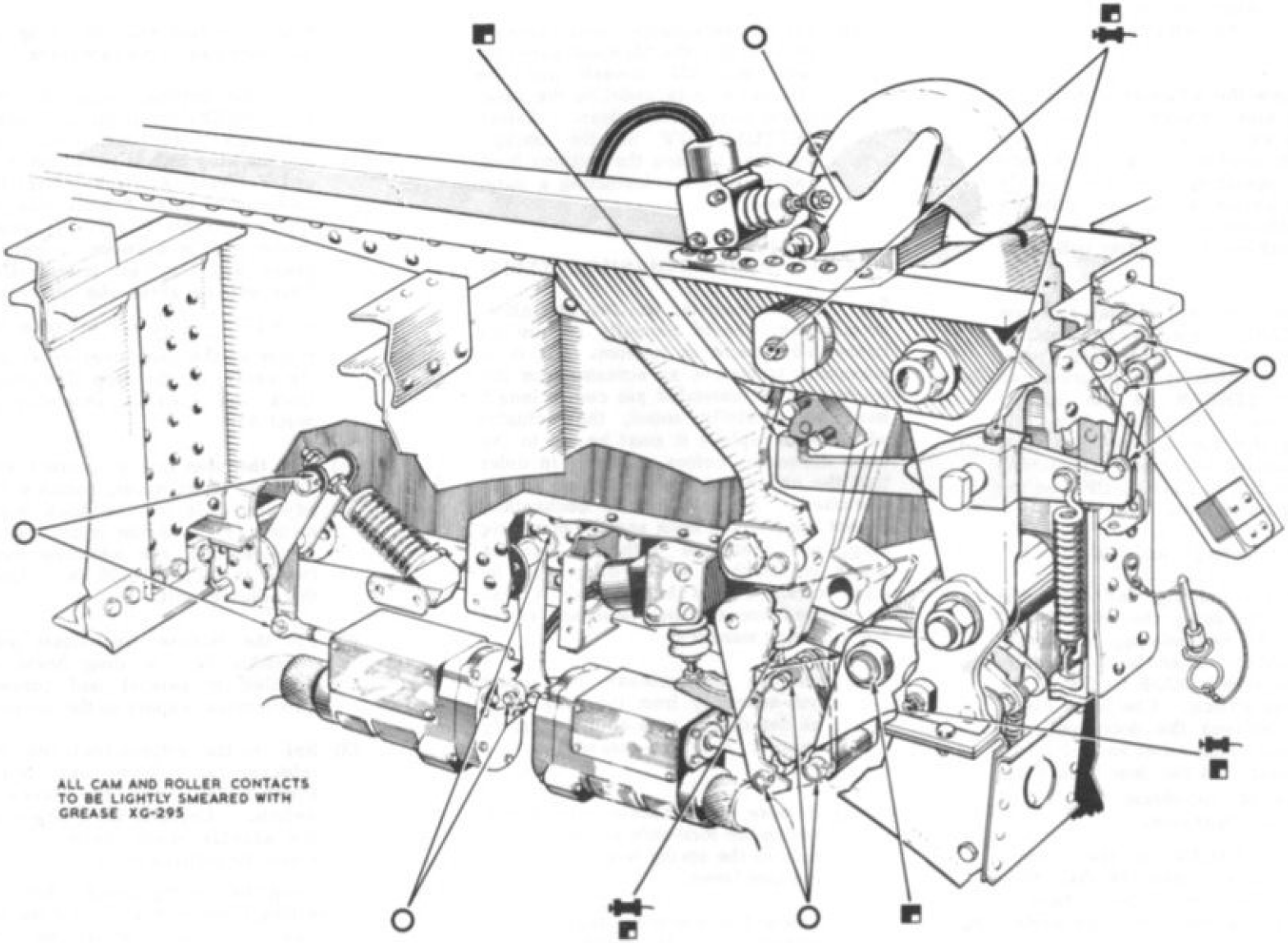

Fig. 5. Jettison hook mechanism—lubrication

(8) Unscrew the adjuster bolt on the door hook until the door hook micro switch (4) is just tripped. Tighten the adjuster bolt locknut.

(9) Unscrew the adjuster bolt for the door micro switch (2) until the micro switch is just tripped, this is indicated by the dolls eye indicator operating when the shackle micro switch is tripped. Unscrew the adjuster bolt a further 0.125 in. and tighten the adjuster bolt locknut.

◀ (10) Ensure that the special tool pre Mod.2240, (para.34) or hoisting equipment post Mod 2240 (para. 34A) is correctly in position and ▶ select STREAM on the cockpit switches. Open the door fully using the special tool (para.34) or hoisting equipment (para.34A) and select JETTISON/OFF on the cockpit switches.

(11) Repeat items (3) and (4).

◀ (12) Enter the stowage and close the door fully using the special tool (para.33) or hoisting equipment (para.33A). When the door is fully ▶ closed select DOOR HOOK on the cocking switch. Check the clearance between the door hook and the door catch roller and adjust, if necessary, on the door hook micro switch (4) to obtain the 0.15 ± 0.015 in. clearance.

◀ (13) Select STREAM on the cockpit switches and open the door fully using the special tool (para.34) or hoisting equipment (para.34A). ▶

◀ (14) On completion of the door lock setting, ensure that adequate clearance exists between the micro switch striker arm and the lightening hole in the rear shroud through which it passes (minimum clearance ▶ 0.1 in.).

(15) Fit the detachable panel removed in item (1), the plywood panel on post Mod.1837 aircraft and the circular access panel to the parachute compartment door. Select JETTISON/OFF on the cockpit switches to open the jettison hook and prepare for installing a parachute.

JETTISON-HOOK MECHANISM SETTING

36. The mechanism, as set on initial installation, should normally require no further adjustment in service. If it is necessary to remove an actuator from the mechanism its extended pin centre length must be carefully noted, the actuator which is to replace it must be set to the same dimension before assembly in order that the setting of the mechanism is undisturbed. All parts of the mechanism, except the jettison hook and the eccentric stop, are contained within a housing which is attached to the drag beam by eight bolts. To set the assembly it must be removed from the drag beam and set in the following manner:-

(1) Remove the release mechanism sub-assembly from the drag beam as detailed in para.40 and suitably support the sub-assembly on a bench.

(2) Remove the shackle pins which secure the fork-ends of the actuator rods to the spring box lever and to the cam lever.

(3) Connect an electrical supply to the actuators. Fully extend the actuator rods and adjust their fork-ends until the dimension 14.98 ± 0.025 in. is obtained between their pin centres (B and C, fig.3). Adjustment on the fork-ends must be kept as near equal as is possible. Lock the fork-ends.

(4) Attach the fork ends to the spring box lever and to the cam lever.

(5) With the setting gauge (Ref.No. 26DC/95508) in position and making contact with the cam lever roller and the stop link at positions W, X and Y (detail A, fig.3) adjust the locknuts at point A until only the 'GO' end of the 'GO/NO GO' gauge can be inserted between the setting gauge and the cam lever roller. This setting gives the dimension of $4.177 \begin{smallmatrix} +0.00 \\ -0.02 \end{smallmatrix}$ in. between the centre of the cam lever roller and the centre of the stop link pivot. Lock the locknut assembly at point A.

(6) With the stop link in contact with the cam lever roller, unscrew the adjuster bolt for the hook micro switch (5) until the micro switch is depressed, the maximum overtravel is 0.02 to 0.05 in. Lock the adjuster bolt.

(7) Fit the release mechanism sub-assembly to the drag beam as detailed in para.41 and connect an electrical supply to the aircraft.

(8) Release the jettison hook from the release catch lever and select PARA.HOOK on the cocking switch. Depress the plunger on the shackle micro switch (3) to close the jettison hook.

(9) Using the setting gauge, check the setting given in item (5). If required minor adjustments within the limits laid down in item (3) can be made to the fork-ends of the jettison hook actuator rods.

(10) With the stop link in contact with the top of the cam-lever roller,

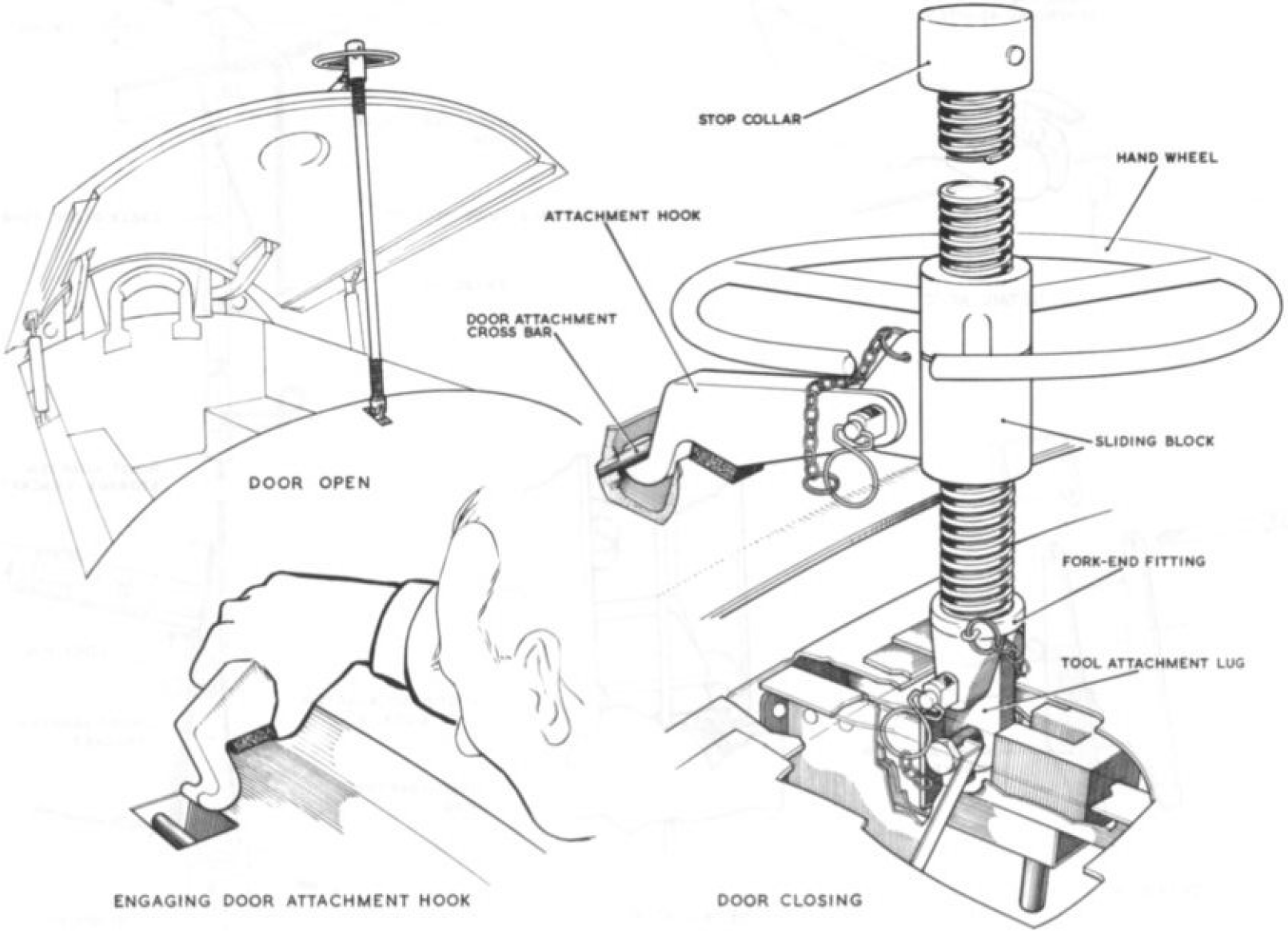

Fig. 6. Door manipulation — closing tool

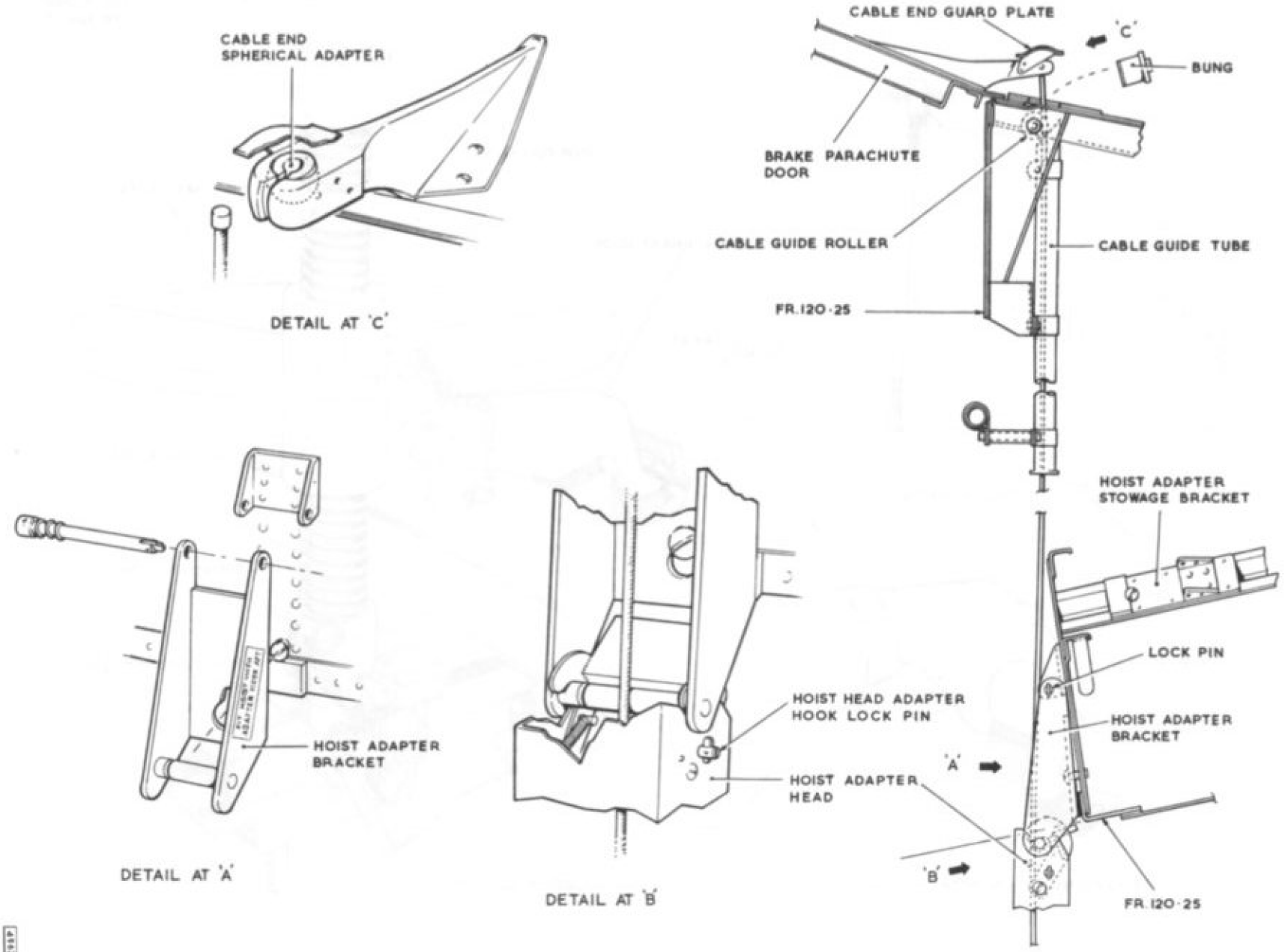

Fig. 6A Door manipulation using mini hoist and attachments

rotate the eccentric stop until contact is just made with the forward profile of the jettison hook. During this adjustment check that the setting gauge as in item (5) to ensure that the setting is not disturbed by excessive pressure being exerted on the hook by the eccentric stop. Lock the eccentric stop by the locking plate.

NOTE...
If, after adjustment, it is found that the locking plate locking screw hole does not line up with the anchor nut an additional hole can be drilled in the locking plate.

(11) With the cocking switch in the DOOR HOOK position open the jettison hook electrically by depressing the door hook micro switch (4).

(12) Release the jettison hook from the release catch lever and select PARA.HOOK on the cocking switch. Insert the parachute ring shackle in the jettison hook and unscrew the adjuster bolt on the hook cam lever until the shackle micro switch (3) is depressed 0.125 in. passed the tripped position, this will close the jettison hook. Lock the micro switch adjuster bolt.

(13) To open the jettison hook and set up the installation to receive the parachute assembly, the cocking switch must be placed in the DOOR HOOK position. The door hook micro switch (4) must then be depressed by hand.

AUTOMATIC JETTISON TEST

37. The automatic opening of the jettison hook (para.25) can be tested as follows:-

(1) Ensure that the cockpit switches are in the JETTISON/OFF position and that the jettison hook release catch cocking lever is in the correct position, i.e., raised for disengage, then connect an external power supply to the aircraft.

(2) Select PARA.HOOK on the cocking switch. Move the hook cam lever by hand to depress micro switch (3), this will close the hook. Insert a suitable wedge under the cam lever to maintain this condition.

(3) When the hook has fully closed, select DOOR HOOK on the cocking switch.

(4) With the parachute-compartment door open, depress the door micro switches (1) and (2) by hand until the door hook has fully closed and the dolls-eye is energised black.

(5) Release micro switches (1) and (2). The jettison hook should now open automatically.

(6) To open the door hook, and set the mechanisms to receive the parachute assembly, select STREAM on the cockpit switches. When the door hook has fully opened, move the cockpit switches to JETTISON/OFF.

(7) Ensure that the release catch cocking lever is stowed flat to the bulkhead and secured with Pip-pin.

REMOVAL OF PARACHUTE ASSEMBLY

38. To remove the parachute assembly from the aircraft the following procedure should be adopted:-

◀ (1) Secure the special tool, (para.33, 34 and fig.6) or hoisting equipment in position (para.33A, 34A and fig.6A).

(2) With an external power supply connected to the aircraft select STREAM on the cockpit switches.

REMOVAL AND ASSEMBLY

(3) On aircraft pre Mod.2049 remove the access panel from the stowage door and disconnect the rip-pin cable from the snap-hooks on the underside of the door.

(4) Open the door sufficiently to release the beaver tail from the spigot, on the underside of the door, by withdrawing the securing pin. At the same time on aircraft post Mod.2049, insert a hand to hold the flaps of the extractor parachute pack closed. ▶

(5) Using the special tool or hoisting equipment allow the door to rise to its fully open position. Disconnect and remove the tool or hoisting equipment.

(6) On aircraft post Mod.2049 secure the extractor parachute pack flaps with a transit tie.

(7) Using a red transit tie, secure the beaver tail to the becket on the main pack.

(8) Remove the parachute packs from the stowage.

(9) Disconnect the restraining strop from the woggle on the riser.

(10) Open the jettison hook by selecting JETTISON on the cockpit switches.

(11) Remove the shackle and riser from the stowage.

(12) Tie the pack in the folded position using two 700 lb. red transit ties to link the beckets at the bottom corners of the pack to those on the pack directly above them.

INSTALLATION OF PARACHUTE ASSEMBLY

39. To install the parachute assembly in the aircraft proceed as follows:-

(1) Check that both actuators in each mechanism are serviceable as detailed in para.31 and 32.

(2) Remove the access panel in the front fairing.

(3) Ensure that the cockpit switches are in the JETTISON/OFF position and connect an external power supply to the aircraft.

(4) Move the cocking switch to the PARA.HOOK position.

(5) Ensure that the jettison hook release catch is disengaged (para.35 (3)) with the Pip-pin inserted.

(6) Ensure that the line and ring shackles pivot about the shear pin. Adjust, if necessary, on the bolt passing through the line shackle to ensure that excessive pressure is not exerted on the ring shackle fork end.

(7) Place the ball end of the restraining strop in the jettison hook and fit the strop locating block into the slot in the hook retaining block. Place the parachute ring shackle in the jettison hook. This action will cause the hook to close.

NOTE...
The ring shackle must be positioned carefully to ensure that it

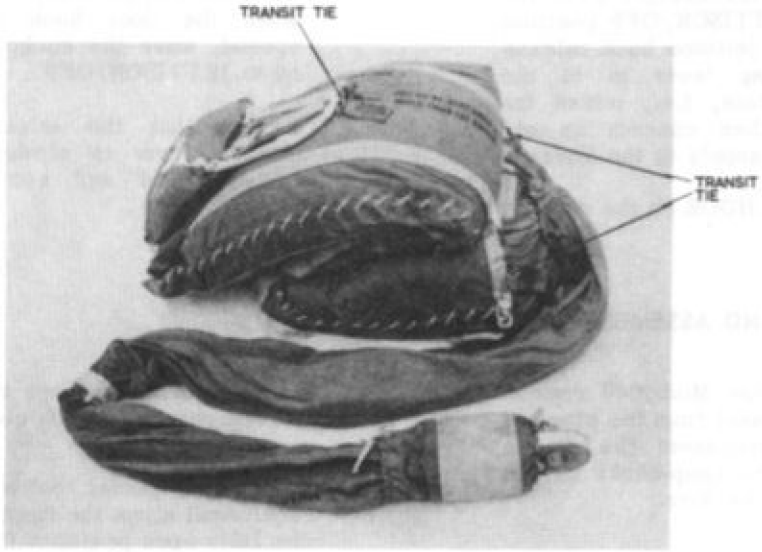

Fig.7. Parachute assembly
(‹ Mod 2049 ›)

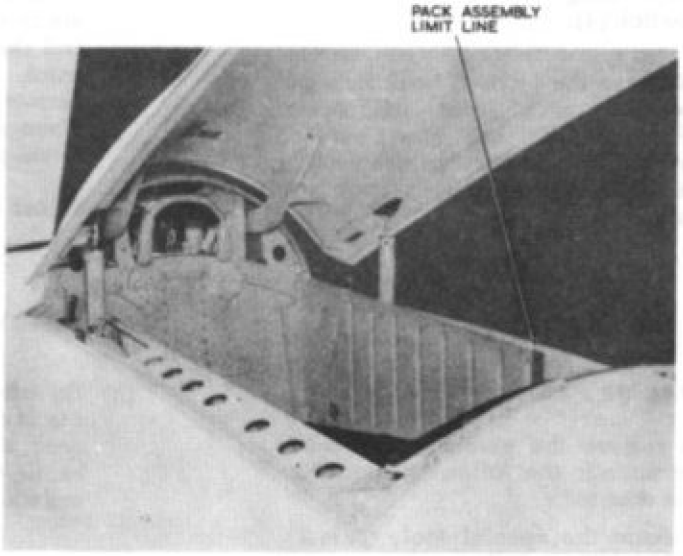

Fig.8. Stowage ready to receive parachute assembly
(‹ Mod 2049 ›)

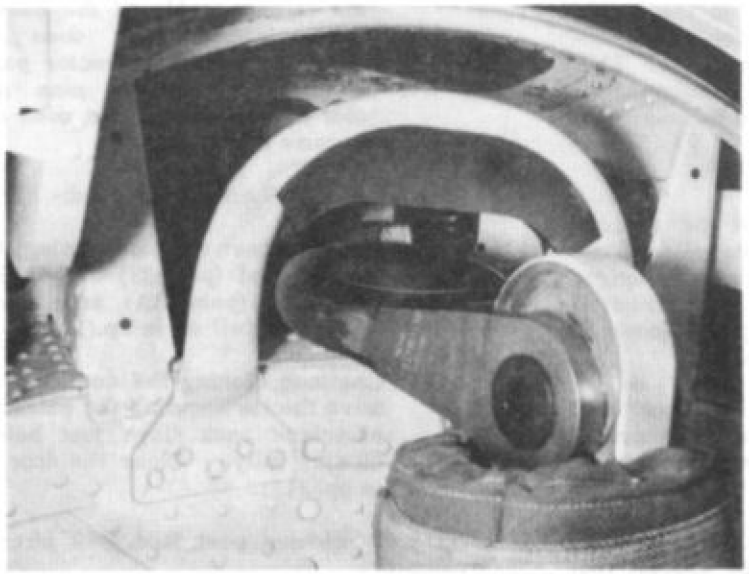

Fig. 9. Insertion of shackle and strop in jettison hook

Fig. 10. Attachment of restraining strop to riser

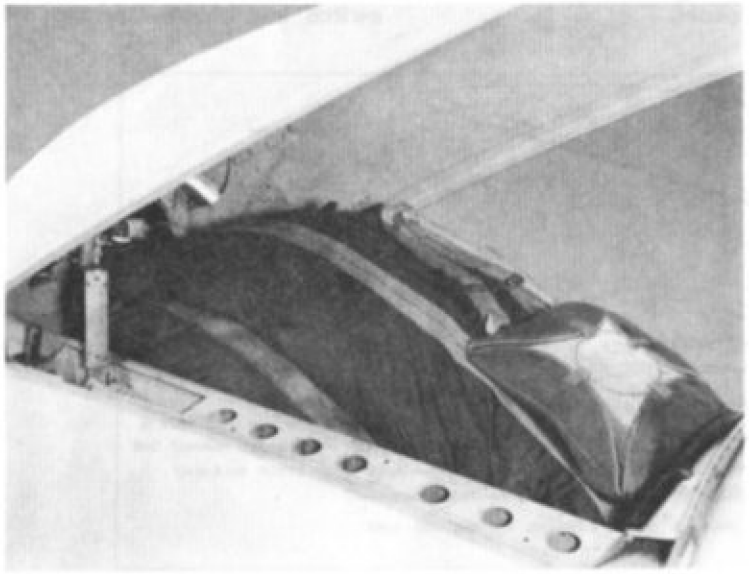

Fig. 11. Parachute assembly correctly stowed

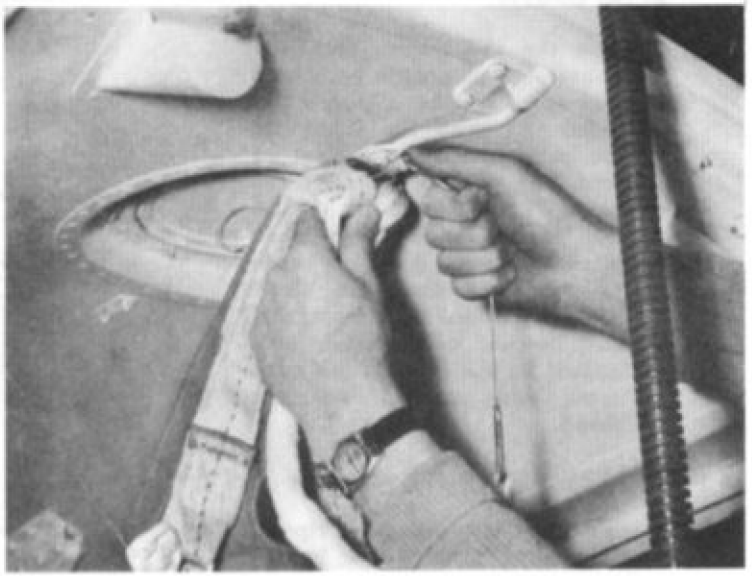

Fig. 12. Attachment of beaver tail to spigot

is not fouled by the jettison hook as it closes. Care must also be taken to ensure that the strop locating block remains in its correct position.

(8) Release the catch lever and stow the cocking lever flat to the bulkhead, secure the lever with the Pip-pin.

(9) Pivot the line shackle about the shear pin until the riser lies vertically down the front bulkhead of the stowage. The riser must then be stowed along the trough in the base of the stowage with the restraining strop beneath it. Pass the restraining strop round the steel tube in the strop bracket at the rear of the stowage and secure its thimble end to the snap-on clip of the woggle on the riser and lead the remainder of the riser forward in the trough to the front bulkhead of the stowage.

(10) Remove the red transit ties and maneouvre the parachute pack into the stowage in the shape of a flattened 'S', with the first fold of the pack assembly forward of the red line on the sides of the stowage. The pack is in its correct shape for stowage when supplied and care must be taken to maintain the downward slope at the rear of the pack assembly so that the end of the main pack is located on the floor of the compartment and against the rear bulkhead.

On pre Mod.2049 aircraft proceed:-

(11) Ensure that the branched rip-pin cable passes through the beaver tail then partly close the parachute compartment door using the special tool (para.33) or hoisting equipment (para.33A). When the door is sufficiently lowered place the flat metal ring to the beaver tail over the spigot on the inside of the door and secure it in position with the attachment pin. This pin, attached to the release cable, must be inserted from the rear side of the spigot.

NOTE...
During insertion of the pin ensure that the spring clip is engaged correctly around the spigot and that it has not been distorted by catching the exposed loops of the extension strop.

(12) Continue to close the door until the rip-pin cable can be connected to the snap hooks on the underside of the door.

(13) Close the door fully by turning the handwheel of the special tool firmly down (para.33 (5)) or operating hoisting equipment (para.33A). Fit the door access panel.

NOTE...
Ensure that during door closing, the release cable of the beaver tail attachment pin does not catch under the extractor parachute pack rip-cord pins and that the attachment pin does not become dislodged.

On post Mod.2049 aircraft proceed:-

(14) Partly close the door using the special tool (para.33) or hoisting equipment (para.33A) and attach the beaver tail as in op.(11).

(15) Continue closing the door and remove the tie securing the extractor parachute pack flaps just before closing fully. Close the door as in op. (13).

On both pre and post Mod.2049 aircraft proceed:-

(16) Select DOOR HOOK on the cocking switch and check that the dolls-

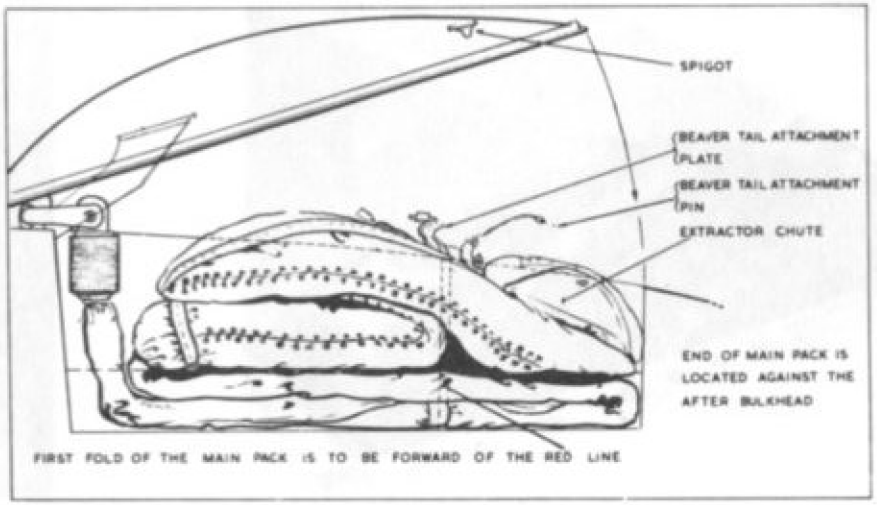

Fig.13 Brake parachute before door closing
(Mod.2049)

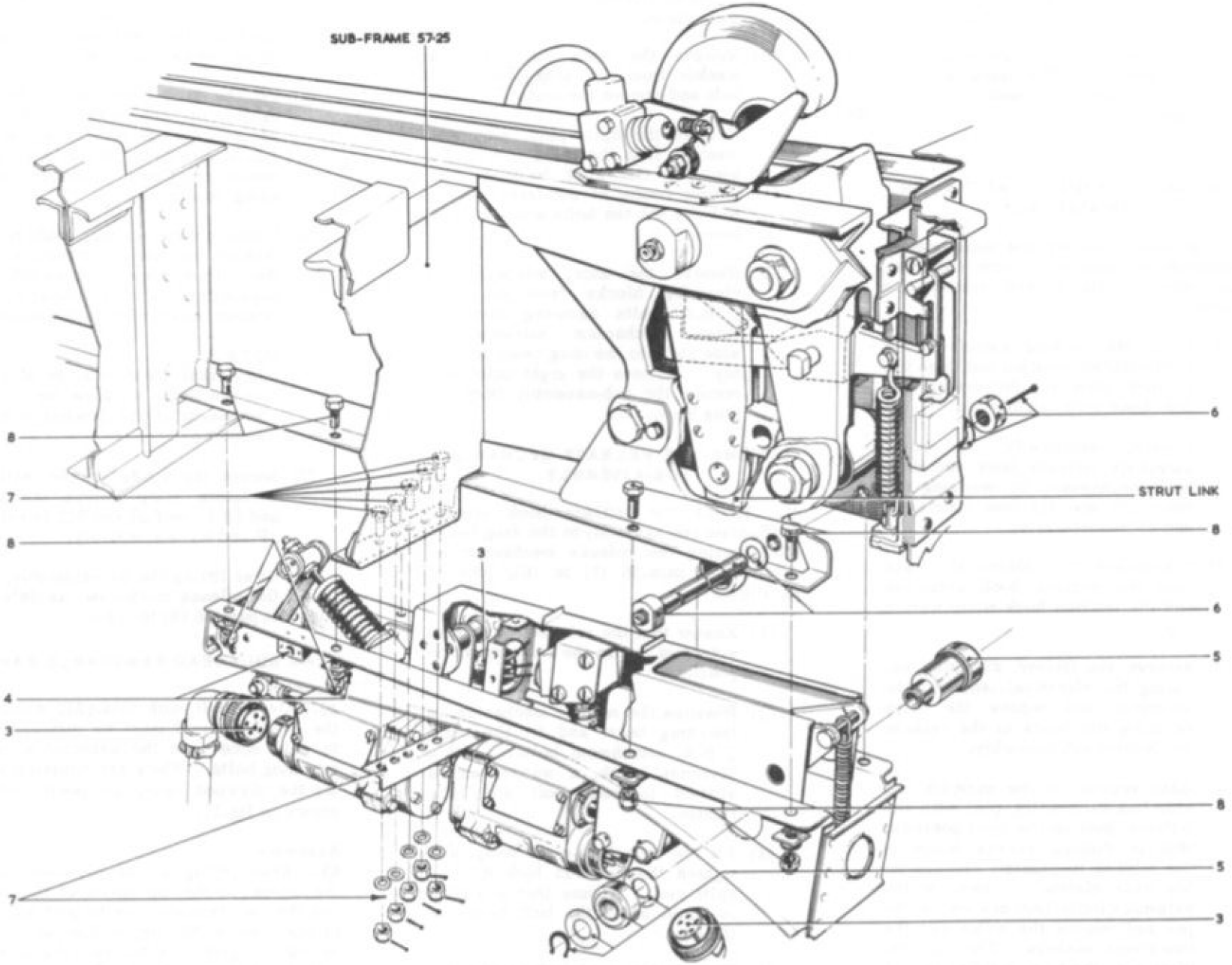

Fig. 14. Removal of release mechanism sub-assembly

eye shows black. Fit the access panel in the fixed fairing.

◀ (17) Remove the special tool or hoisting equipment. The installation is now complete and ready for stream operation. ▶

REMOVAL OF RELEASE MECHANISM SUB-ASSEMBLY

40. To remove the jettison hook release mechanism sub-assembly from the drag beam refer to fig.14 and proceed as follows:-

(1) Place the cocking switch in the DOOR HOOK position and open the jettison hook by depressing the door hook micro switch (4).

(2) Isolate, electrically, the brake parachute jettison hook and door hook mechanisms by removing the fuses 620 and 911 from panels 3P and 4P respectively.

(3) Disconnect the electrical leads from the jettison hook actuators and the jettison hook micro switch (5).

(4) Remove the Helvyn strapping securing the electrical leads to the actuators and remove the clips securing the leads to the release mechanism sub-assembly.

(5) Gain access to the strut-link to stop-link connecting pin, with the jettison hook in the open position; this is through access holes in the release mechanism sub-assembly side plates. Remove the external circlip from one end of the pin and remove the roller and the two thrust washers. The pin complete with the second roller and its associated thrust washers can be removed through the hole in the side plate.

(6) Remove the split pin, nut and washer from the stop link pivot bolt and remove the bolt.

(7) Remove the split pins, nuts and washers from the ten 2 B.A. bolts securing the joint boom to the bottom centre of sub-frame 57.25. Remove the ten bolts and the joint boom.

(8) Remove the nuts, washers and clamping blocks from the four 2 B.A. bolts securing each release mechanism sub-assembly side plate to the drag beam assembly. Remove the eight bolts and remove the sub-assembly from the drag beam.

FITTING THE RELEASE MECHANISM SUB-ASSEMBLY

41. To fit the jettison hook release mechanism sub-assembly to the drag beam, after setting the release mechanism as detailed in para.36 (1) to (6), proceed as follows:-

(1) Ensure that the release mechanism actuators are in the fully retracted position.

(2) Position the release mechanism to the drag beam and fit the eight 2 B.A. attachment bolts. Fit a clamping block, a washer and a stiffnut to each bolt and fully tighten.

(3) Fit the stop link pivot bolt, fully tighten the nut and lock it by a split pin. Ensure that a washer is fitted under the bolt head and the nut.

(4) Connect the strut link to the stop using the attachment pin. Ensure that the rollers are fitted with a thrust washer on each side. Secure the attachment pin in position using the external circlip.

(5) Fit the joint boom on the bottom centre of sub-frame 57.25 and secure it in position using the ten 2 B.A. attachment bolts fitted with washers and nuts. Lock the nuts using split pins.

(6) Connect the electrical leads to the release mechanism actuators and the jettison hook micro switch (5). Secure the leads, by clips, to the release mechanism sub-assembly.

NOTE...
Sufficient slack must be allowed on the leads to allow for 1.4 in. movement of the forward jettison actuator.

(7) Secure the leads to the jettison actuators using Helvyn strapping and fit fuses 620 and 911 to panels 3P and 4P respectively.

(8) After fitting the sub-assembly, set the release mechanism as detailed in para.36 (8) to (13).

REAR BULKHEAD REMOVABLE PANELS

Removal

42. On aircraft with Mod.1837 embodied the plywood panel must be removed first to gain access to the detachable panel retaining bolts. The eight retaining bolts for the plywood panel are positioned as shown on fig.15.

Assembly

43. When fitting a new plywood panel, the cut-out at the top centre of the panel and the two rebates, one to port and one to starboard at the top of the panel must be cut to give a minimum clearance of 0.10 in. between the panel and the compartment door protrusions.

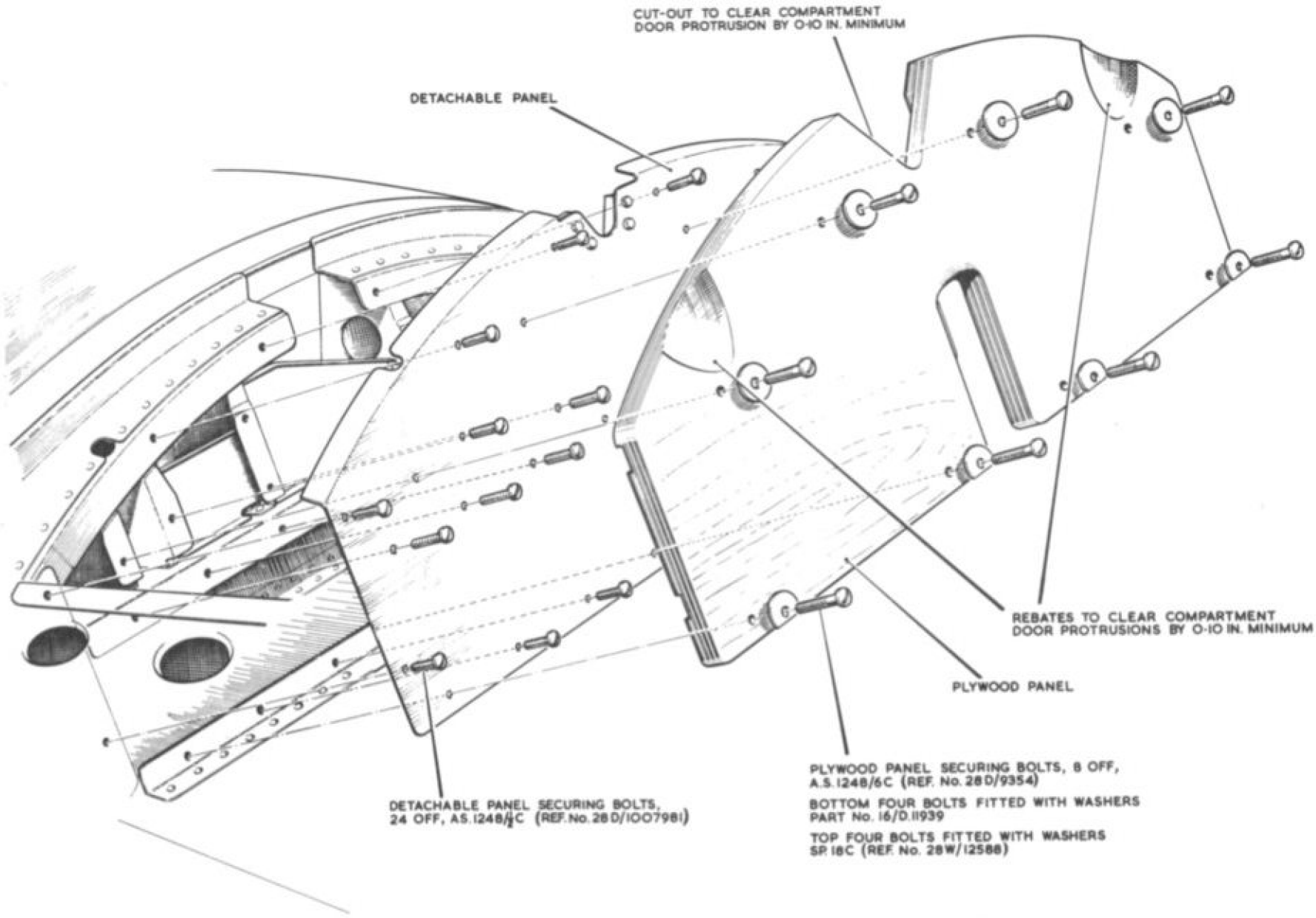

Fig. 15. Rear bulkhead removable panels.