Chapter 1
FUSELAGE

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DESCRIPTION

Introduction

1. This chapter gives a general description of the fuselage structure together with the procedure for its dismantling into the main components; the structure is also extensively illustrated in A.P.101B-1900-6A.

General

2. The fuselage is approximately circular in cross section and apart from a composite lower nose fairing and tail cone, is of stressed skin throughout. Transport joints at formers 372F, 204F, and 428A divide the fuselage into four sections. Note that fuselage formers between stations 510F and 487.5A are identified by their distance in inches, fore and aft of the front spar datum. When Mod.569 is embodied, the extra formers are identified by their distance in inches aft of the datum face of former 487.5A. The sections are nose fairing, front fuselage, centre section and rear fuselage, from front to rear respectively (fig.1).

3. Except at the transport joints and elsewhere where reinforcement is necessary, the skin plating is supported by lipped channel-section formers and top-hat rolled-section fore-and-aft stringers, the stringers being attached to angle plates which are riveted to the outer edge of the formers. Stressed skin plating is attached to the structure, in most cases by flush-finished countersunk rivets. Major components are bolted together utilising close-tolerance, reamed holes and certain bolts are torque loaded during assembly.

4. High strength aluminium-alloy or magnesium alloy are mainly used in the structure. Aluminium-alloy sheet plating is usually to Specification D.T.D.687 or L.72, extruded bar is to D.T.D.363 and forged bar to D.T.D.683 (alternative is D.T.D.364). Magnesium alloys are to Specification D.T.D.626 or 118 (sheet plating), D.T.D.88C (forgings) and D.T.D.721A (castings).

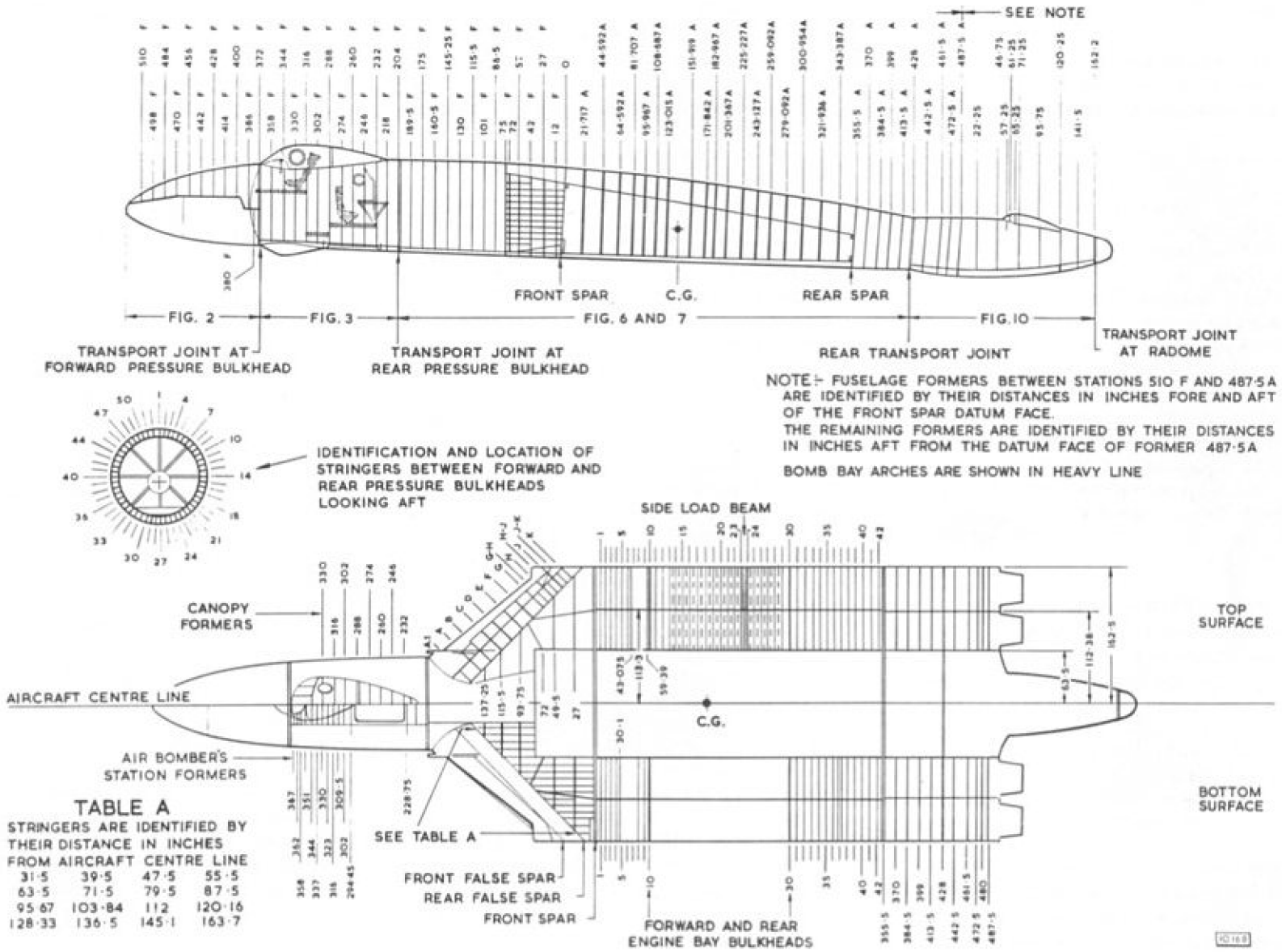

Fig. 1 Former and rib positions

NOSE FAIRING

General (fig.2)

5. The nose fairing is in two sections, an upper portion of metal construction and a lower portion consisting of a one-piece composite moulding covering the lower two-thirds of the nose fairing.

6. The metal portion is built up of two rolled section longerons with arc-shaped formers and channel-section stringers. An attachment angle at the rear is provided to secure the nose metal portion to the fuselage. Skin plating is of aluminium-alloy. A framework consisting of longitudinal, vertical and transverse beams provides the mounting for an H2S scanner or, when the scanner is not fitted, a ballast box. Metal brackets attached to the formers accommodate the N.B.C. pneumatic system, air bomber's window de-icing system tank, flight refuelling system probe and piping and its associated nitrogen purge system, and various items of radar equipment. Release assemblies, to support the radome moulding, are mounted on the longerons.

▶ 6A. The Terrain Following Radar pod,(fig.2A) ◀ mounted on a structure at the front of the nose metal fairing, is positioned in azimuth to within 0.020 in of a line parallel to the centre line of the aircraft and pitched 1 deg 30 min ± 6 min nose up to the front fuselage longitudinal datum. The pod is bolted to a carrier rail which slides into a mounting rail on the structure and is located firmly in position by three spigots engaging in close tolerance holes in the mounting rail. A spring-loaded pin engages in a hole at the front of the carrier rail to lock the assembly in position. A further locking pin hole is provided towards the rear of the carrier rail to lock the carrier rail when the pod is partially withdrawn during H2S radome removal. The pod is faired to the nose by a fibre glass fairing, secured by bolts to the radome, which also fits over a block pinned to the carrier rail locking pin. A Neoprene rubber seal, fitted over the joint between the fairing and the pod is secured by two jubilee clips. An air intake, fitted around the bottom of ▶ the pod with its intake flutes blanked off by wedges, locates between the fairing ◀ and the pod and is secured by the clip securing the joint seal to the pod. A domed blanking cap can be fitted in lieu of the pod and fairing, using the fairing securing points on the radome.

7. Below the metal portion is the radome moulding which is of half-wave double-sandwich design. It consists of an outer and inner layer of glass fibre reinforced plastic, between which, there are two layers of a low density core material known as Hycar, a middle layer of glass fibre, twice the thickness of the outer layer, complete the double sandwich. The outer surface of the forward area is finished with Neoprene (pre-mod.2403) or Polyurethane Spec. D.T.D.5580 (post-mod.2403) as a protection against the weather elements. A cut-out at the front accommodates the Terrain Following Radar pod. The cut-out is heavily reinforced with glass fibre layers which provide the mounting for the pod fairing securing anchor nuts. The upper edge of the radome moulding is bolted to a rolled-section longeron carrying steel dowels and quick-release fasteners. The radome is located by the steel dowels, engaging holes in the longerons of the nose metal section, and secured to the front pressure bulkhead and the longerons of the nose metal section by the quick-release fasteners. At the rear end, the radome is strengthened with a light-alloy semi-circular former. Two louvres, one at each side and to the rear of the moulding, exhaust air after it has been used to cool the radar equipment mounted in the nose.

Equipment compartments

8. On the port side at the rear of the fairing, is a light-alloy compartment with an access door for the stowage of emergency equipment. Behind this compartment is a further light-alloy stowage for a destructor unit. A light-alloy compartment is provided on the starboard rear side for the stowage of a second destructor unit.

FRONT FUSELAGE

General

9. The front fuselage, which is circular in shape constitutes the crew's pressurised cabin and contains all controls necessary to fly the aircraft and operate all services. This section has been designed and manufactured to withstand the heavy and variable loads, due to pressurisation, to which it is subject, and it is sealed against pressure losses. Structurally the section is built up of a forward and rear pressure bulkhead and a series of circular, lipped-channel-section formers; bulkhead and formers are joined together with longitudinal rolled top-hat-section stringers, except at skin plating butt-joints where T section stringers are used. The structure is covered externally with aluminium-alloy skin plating and internally with insulating panels.

10. Attached to the forward bulkhead is the nose fairing and to the rear bulkhead the nosewheel unit mounting brackets. The crew's floor is built on two levels; the lower floor, which accommodates three crew members, extends from formers 316F to 232F and is of cross beam and intercostal construction skinned on the upper surface. An upper built-up structure of a similar construction, extending from the forward bulkhead to former 316F, raises the pilots' seats above the crew's floor; the upper floor is strengthened to take the reaction forces of the ejection seats mounted upon it.

11. Below the structure are cut-aways suitably re-inforced with an aluminium-

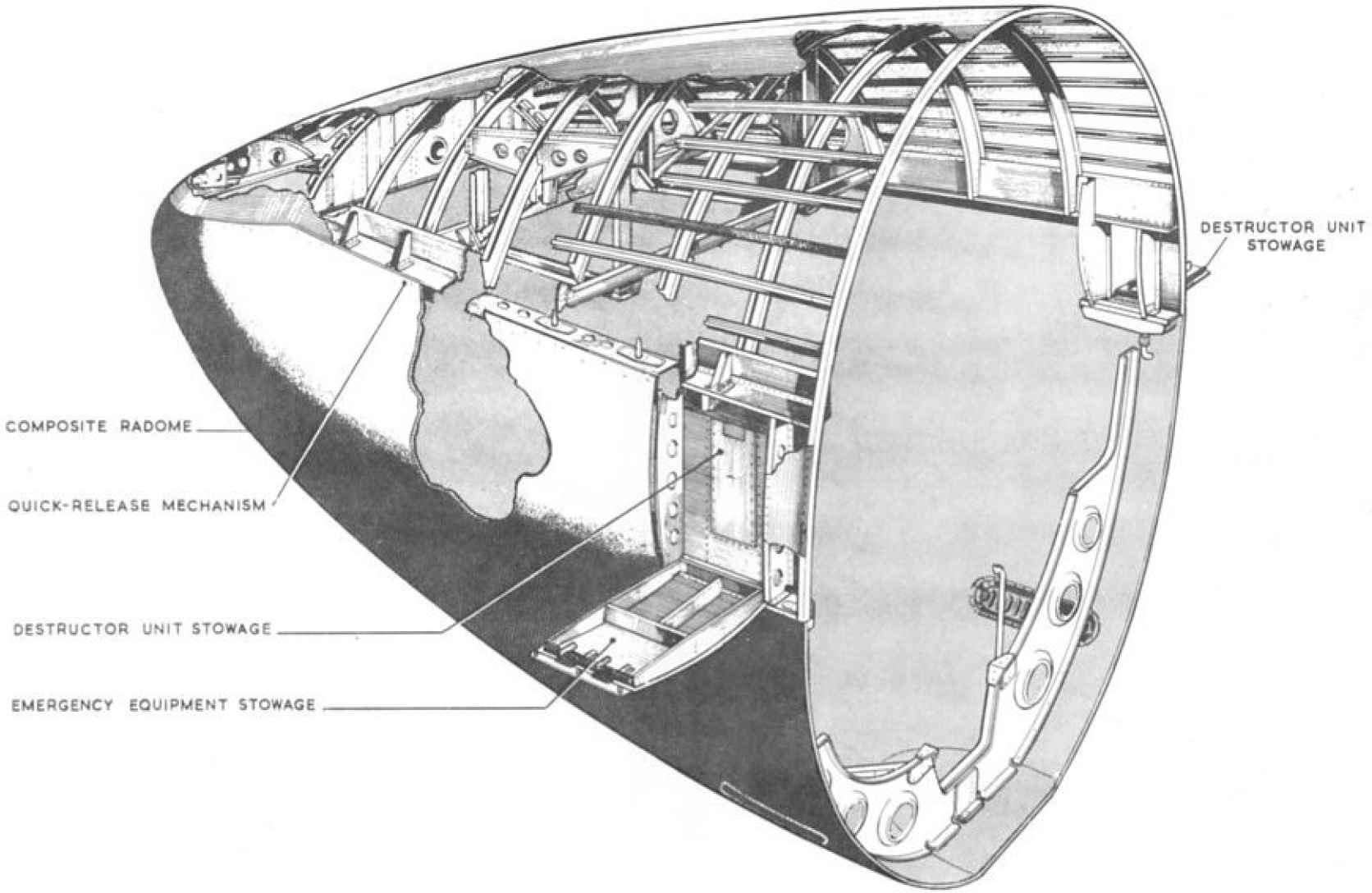

Fig. 2. Nose fairing

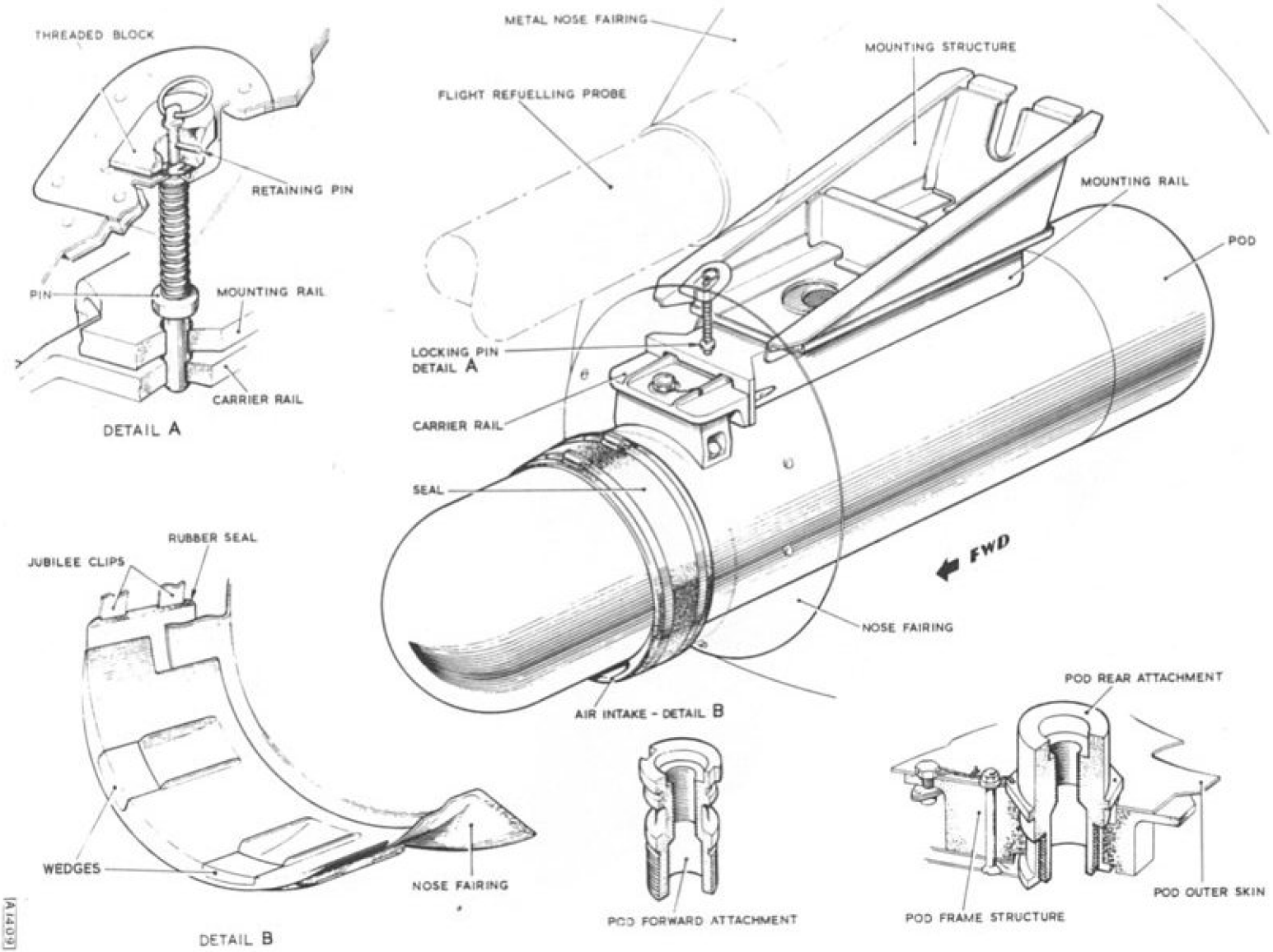

Fig. 2A T.F.R. pod installation
▶ *Mod. 2480* ◀

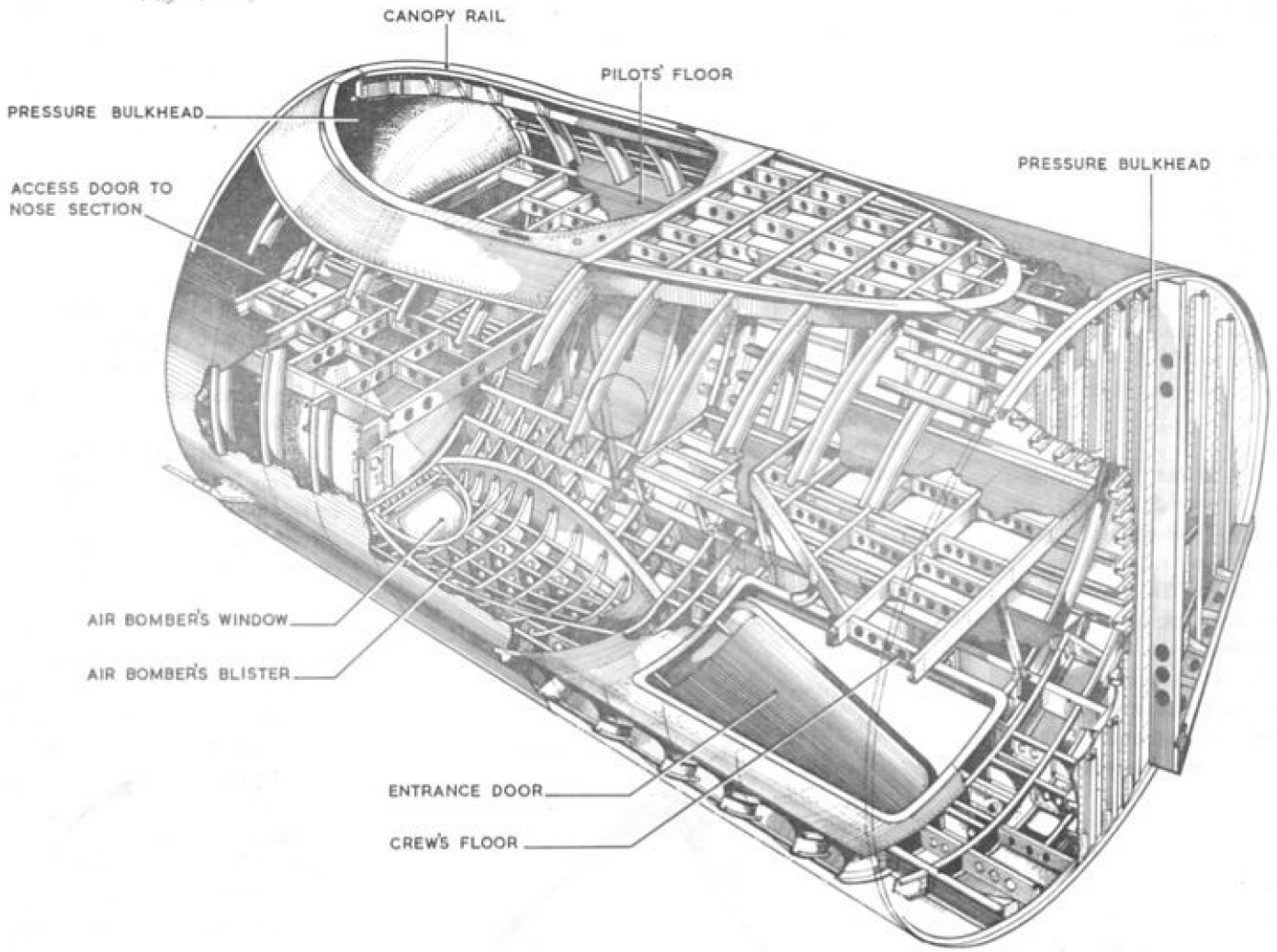

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Fig. 3. Front fuselage.

alloy pressing to accommodate a flush-fitting entrance door and with channel-section longerons for an air bomber's blister. At the top of the structure is an opening with a reinforced fabricated edge member upon which the canopy sits.

Front pressure bulkhead

12. The forward bulkhead, constructed entirely in aluminium alloy and forming the attachment for the nose fairing, is a domed, circular pressing manufactured in eight segments riveted together and reinforced with jointing straps. Around the periphery are support ring sections to which the nose fairing is bolted and the nose radome attached with quick-release fasteners.

13. Located centrally in the bulkhead is a circular, dished door to provide access to the inside of the nose fairing, hinged at its upper edge and held in the closed position by handwheels, which fit in the three clamp brackets around the door aperture. A forged magnesium-alloy ring reinforces the bulkhead at this position. Above the door is an aperture with inner and outer reinforcement rings and a mounting assembly to accommodate a combined valve unit of the air-conditioning system.

Rear pressure bulkhead

14. The rear pressure bulkhead, constructed in aluminium-alloy, consists of a flat 14 s.w.g. web plate extensively strengthened on the aft face with vertical and horizontal top-hat section stiffeners and with a reinforcing channel around the edge to cater for pressurization load and nose-wheel reaction forces.

15. An assembly, on the rear face of the bulkhead, to which the nose-wheel mounting brackets are bolted, consists of two vertical, channel-section beams, braced with two diagonal side beams and a landing angle ring sector.

16. Flying control rods, engine control rods, and pressurization ducts pass through the bulkhead, loss of air pressure from the cabin is prevented by gland-type seals.

Windscreen

17. Three electrically heated windscreen window panels are fitted in a light alloy forged frame mounted on the forward portion of the cockpit rail. The construction of each panel is in accordance with the modification standards indicated on fig.15E and 15F. At each side of the mounting frame is a triangular direct-vision window consisting of a double glass vinyl sandwich outer panel and a Perspex inner panel. Each direct-vision window opens inward when a handle with tie-rod assembly is operated (fig.4). To prevent internal misting, small silica gel units are connected to the air space of each direct-vision window (Sect.3, Chap.8). Electro-hydraulically operated wipers are provided for each of the three main windows. Attached to the windscreen base forging is a rain deflector.

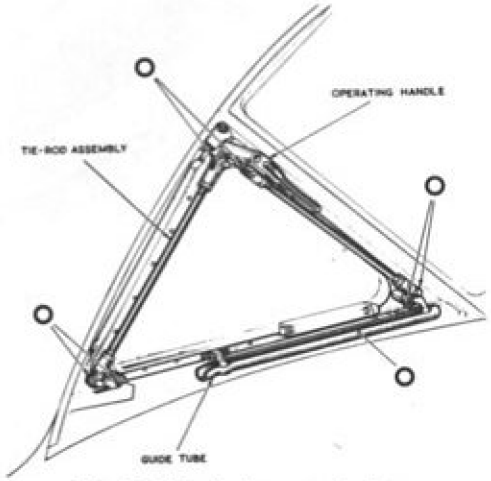


Fig.4 D.V. window mechanism

Canopy

18. The canopy, (fig.5), which can be jettisoned in an emergency, is of stretch-formed, double skin construction, over channel-section hoops and top-hat section stringers. At former 288F position there is an intermediate pressure bulkhead constructed of a double light-alloy skin with top-hat section stiffeners between. The space at the rear of the intermediate bulkhead provides accommodation for the dinghy stowage container (Sect.3, Chap.11).

19. Towards the forward end of the canopy are circular, toughened glass windows, one on the port and one on the starboard side, the structure at these positions being strengthened with reinforcing rings. Between the double skins of the canopy and of the intermediate bulkhead, are heat insulating layers of fibreglass contained within a waterproof septum. Four attachment forks locating in bomb release type units and two hinged bracket arms secure the canopy in position. The release units are secured to the cockpit rail and contained within sealed boxes, which are connected to atmosphere by drain pipes. An inflatable seal is fitted between the canopy and the cockpit rail, details of this system are given in Sect.3, Chap.7. Details of the canopy release are given in Sect.3, Chap.11.

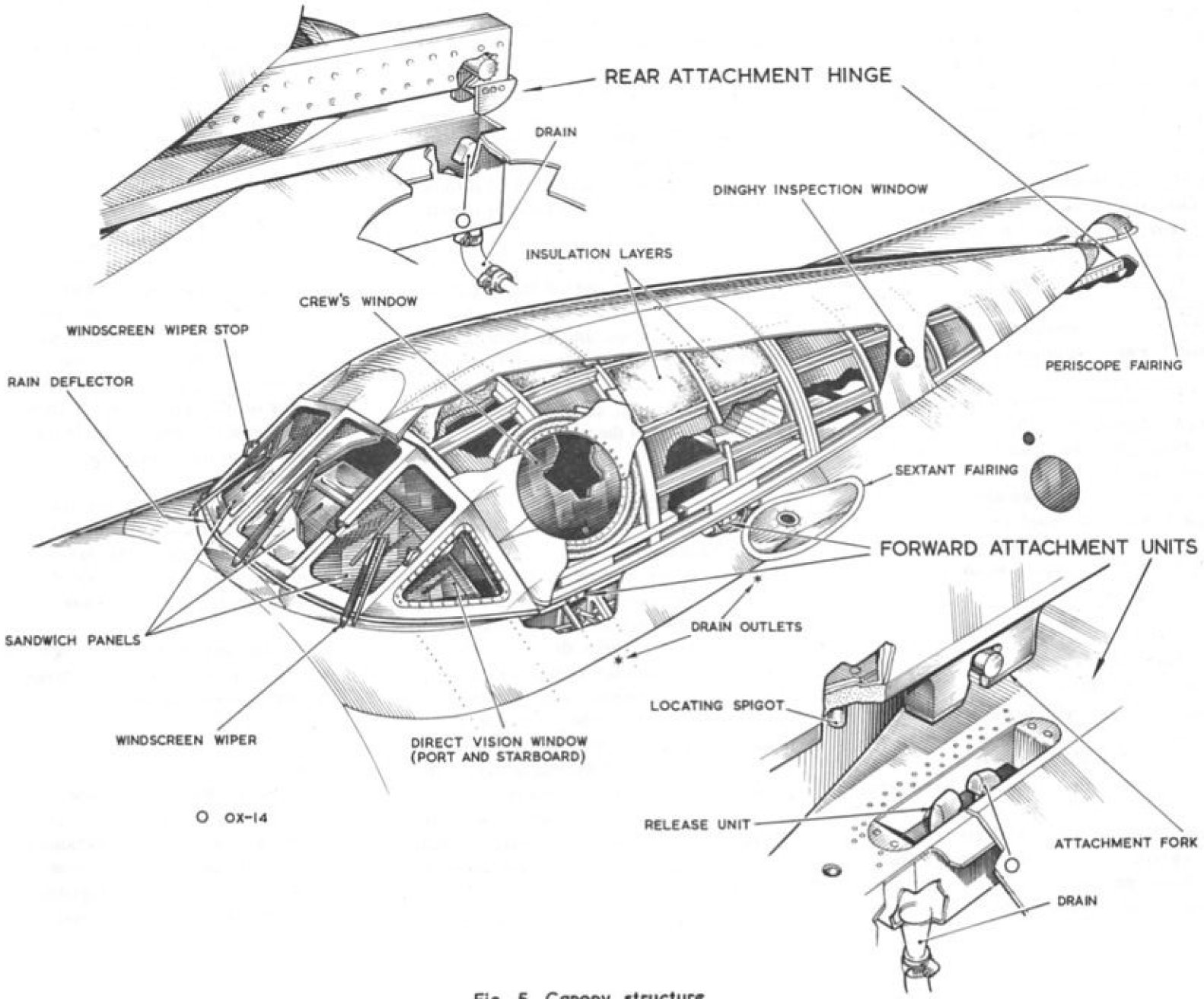


Fig. 5. Canopy structure

Entrance door

20. Situated in the bottom of the front fuselage is the main entrance door which is also used as the emergency escape exit for the crew members. Structurally the door consists of a pressed angle frame strengthened with two longitudinal members, the door hinges being attached to the forward extremities of the members, and with transverse stiffeners. Inner and outer skin plating with a heat-insulating layer between completes the structure. An inflatable seal is provided between the door and the front fuselage frame and a pneumatically operated door opening and closing system is provided. Details of the pneumatic system are given in Sect.3, Chap.7.

20A. To minimise corrosion and provide automatic drainage Mod.2202 introduces two water drain valves and drain holes located in the keel area aft of the crew entrance door. The valves are normally open when the aircraft is unpressurized and closed to prevent loss of pressurized air when pressure in the cabin reaches 2.5 lb/in^2. A typical water drain valve is shown in fig.5A.

Air bomber's blister

21. Extending from the front pressure bulkhead to former 302F in the bottom of the front fuselage is the air bomber's blister. At this position the fuselage formers are cut away and reinforced with fore-and-aft longerons. Bolted to the longerons at each former position are curved frame members, reinforced with longitudinal intercostals, forming a blister shape. Inner and outer skin plating with a heat insulating layer between covers the structure.

21A. When Mod.2202 is embodied two water drain valves and drain holes are provided at the lowest point in the bomb aimer's blister. The water drain valves are similar to those described in para.20A. To facilitate drainage and minimise corrosion in the bomb aimer's blister Mod.2202 also provides for the removal of the existing insulation blankets which are replaced by Plastazote panels. Fluid is routed in the direction of the drain holes by chemical paraffin wicks (fig.5A).

22. In the forward end of the blister is a laminated optically-flat window which is semi-circular in shape and is inclined at an angle of 25 deg. to the horizontal. Forward of, and above the window, is a torsion member of box construction to cater for bending and twisting loads about the window.

CENTRE SECTION

General (fig.6 and 7)

23. The centre section main structure is formed by the front and rear spars, bomb bay ribs and, at the wing joints, by transport ribs. Extending forward from the front spar is a portion of the circular fuselage, housing fuel tank compartments and forming the nose-wheel unit bay. On each side of the nose-wheel bay are the engine air intake structures consisting of diaphragm ribs skinned internally to form the air intake apertures. Aft of the nose-wheel bay and fuel tank compartments is the bomb bay, centrally disposed in the centre section and formed by bomb arches and inner ribs.

24. On each side of the bomb bay the structure is divided into engine compartments by centrally disposed engine ribs whilst at the rear of these compartments are the jet pipe tunnels. Above the rear end of the centre section is a dorsal fin fairing which is a pressed rib and skin assembly.

Spars

25. The front and rear spars are constructed similarly and consist of an upper and a lower machined, extruded boom joined together with plate webs and vertical stiffeners. At each outboard extremity is fitted an accurately machined forging of the correct angle to give the desired sweepback of the main plane. The forging on the rear spar is at a different angle from that at the front spar since the rear sweep is less than at the leading edge.

26. On the rear spar the upper boom is continuous across the aircraft but, since the jet pipes extend below the lower boom and therefore break the continuity of the boom, it is strengthened with circular steel forgings.

27. The joint of the outer wing to the centre section spar booms is a straightforward double shackle joint in each case.

Ribs

28. Inner ribs on each side of the bomb bay to which the bomb bay arches are attached, are of rolled-section boom and web construction. The centre rib which separates the engine compartments is of rolled-section boom and plate webs over

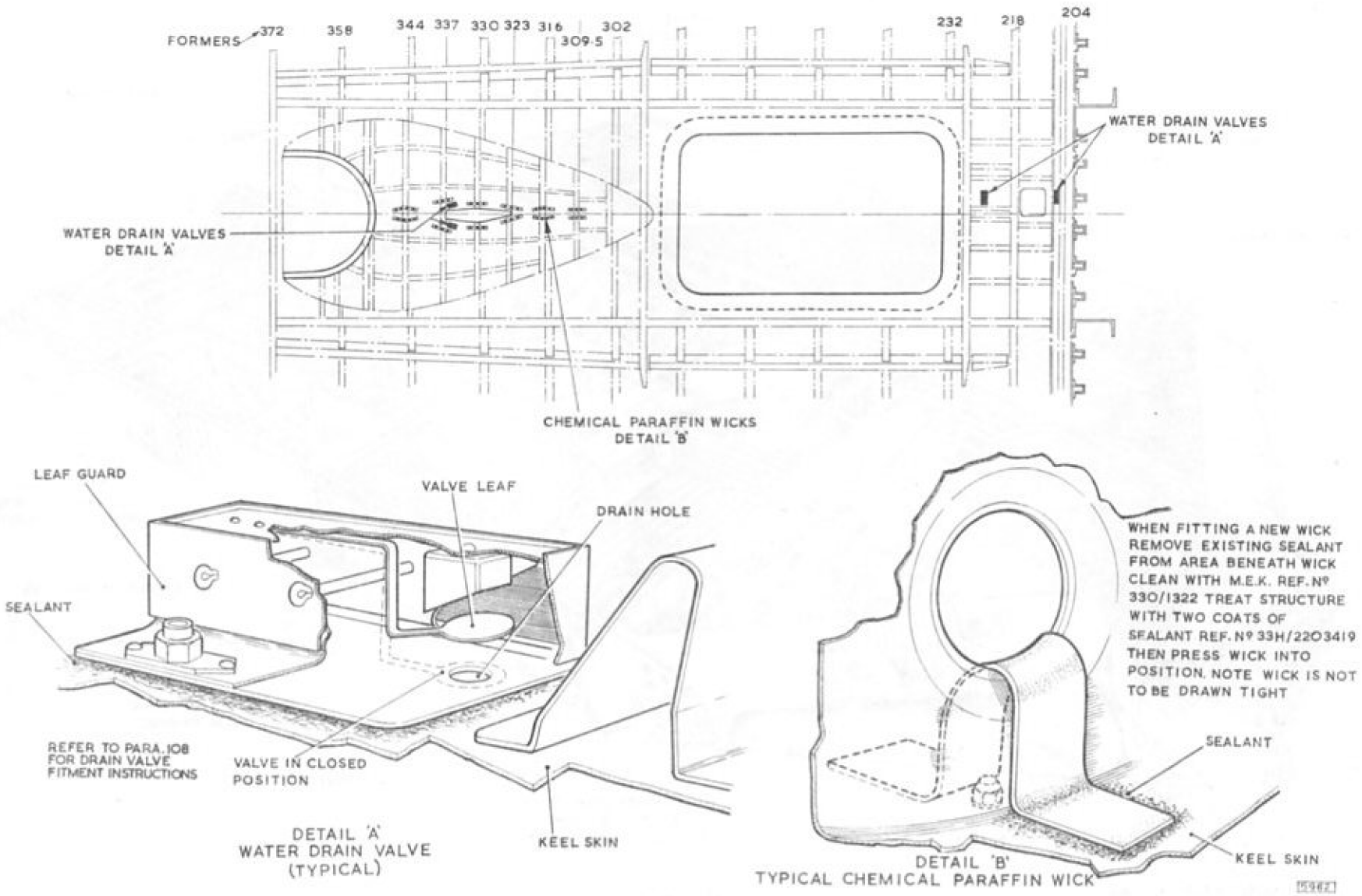


Fig. 5A Pressure cabin keel drainage

◀ *Drain valve fitment instructions deleted* ▶

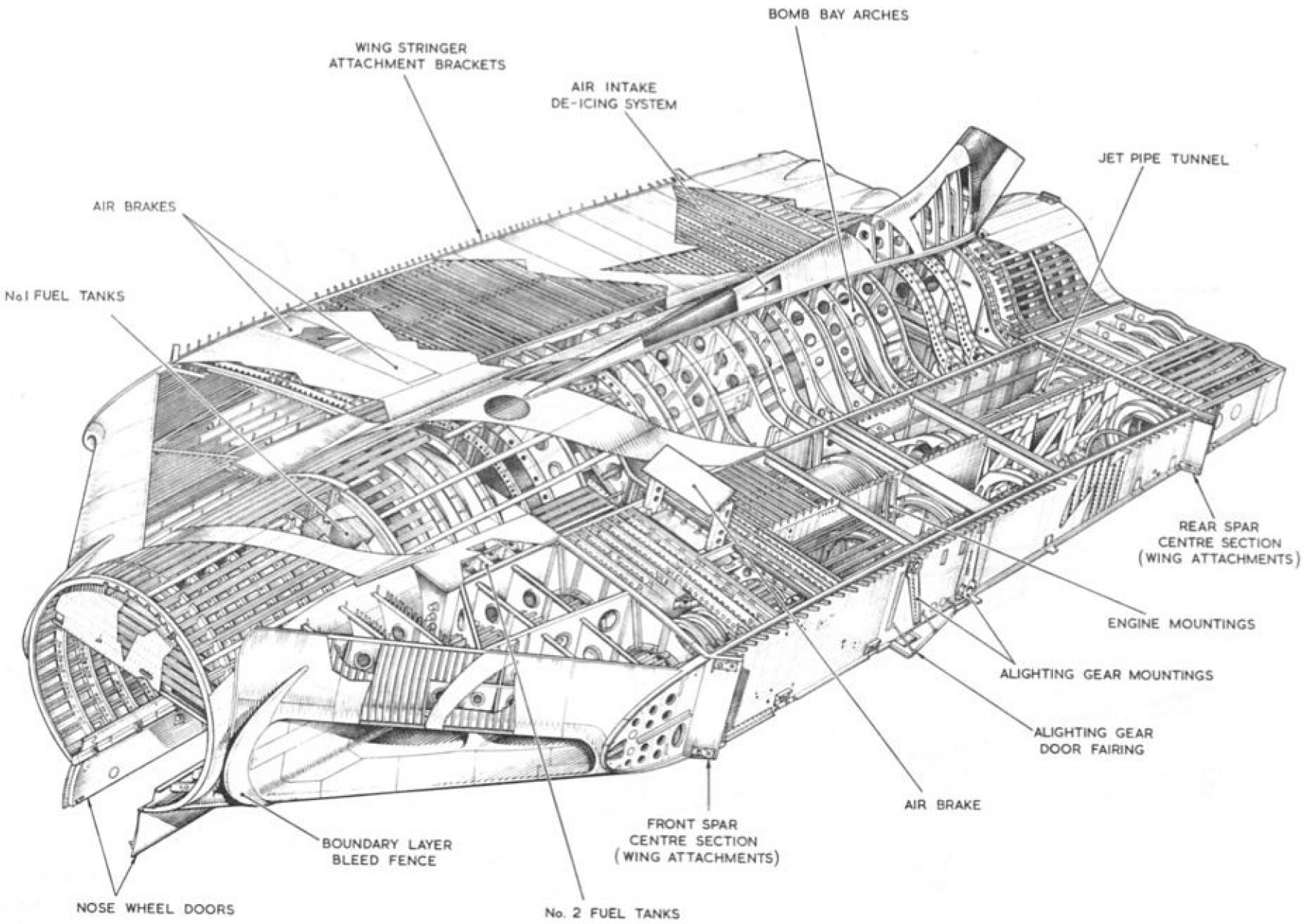


Fig. 6 Centre section (1)

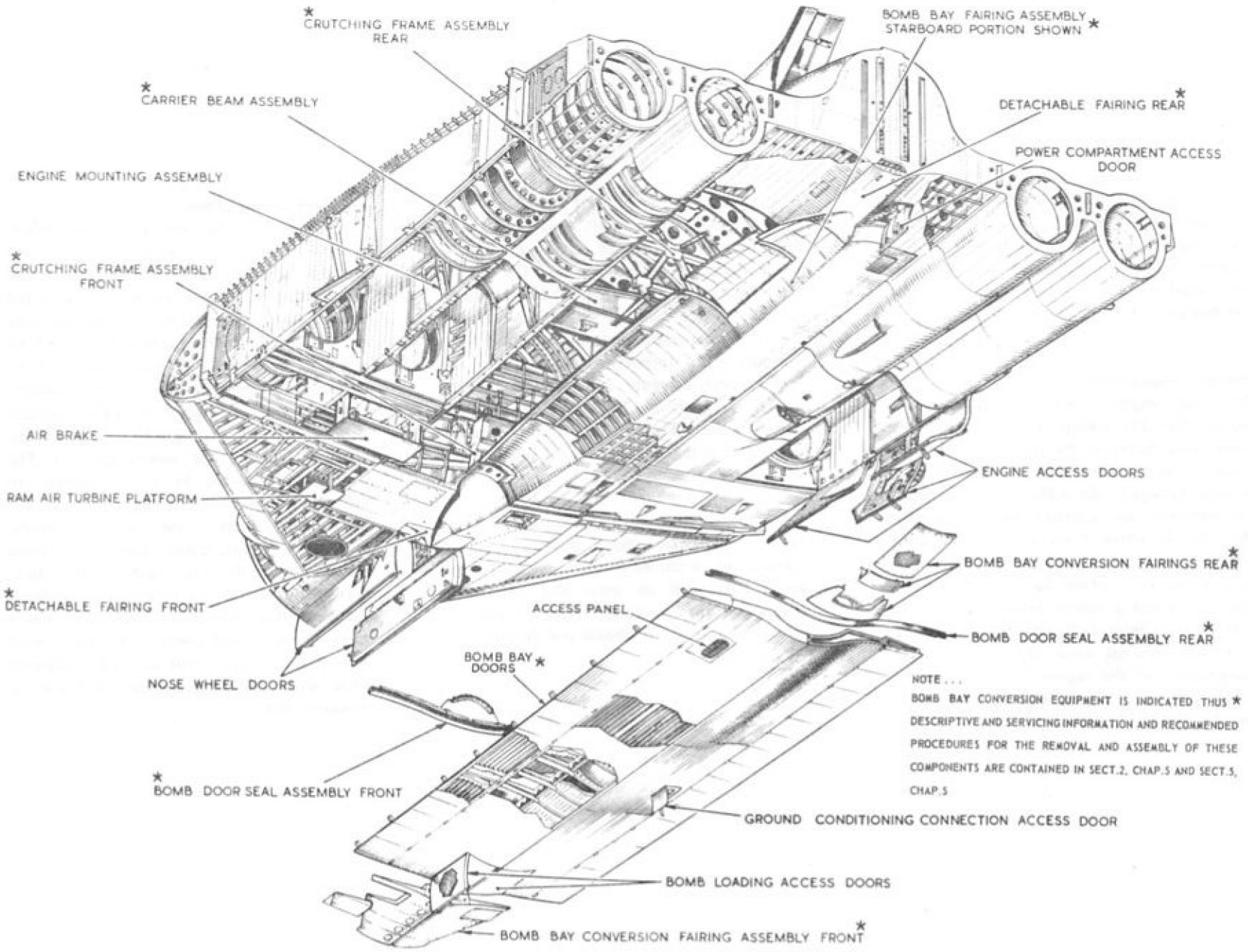


Fig.7 Centre section (2)

the majority of its length with a Warren girder construction for its rear portion, the vertical and diagonal members again being of rolled section. Lipped-channel-section box-brackets are riveted to the engine ribs to accommodate the drag posts of the air brakes.

Engine compartments

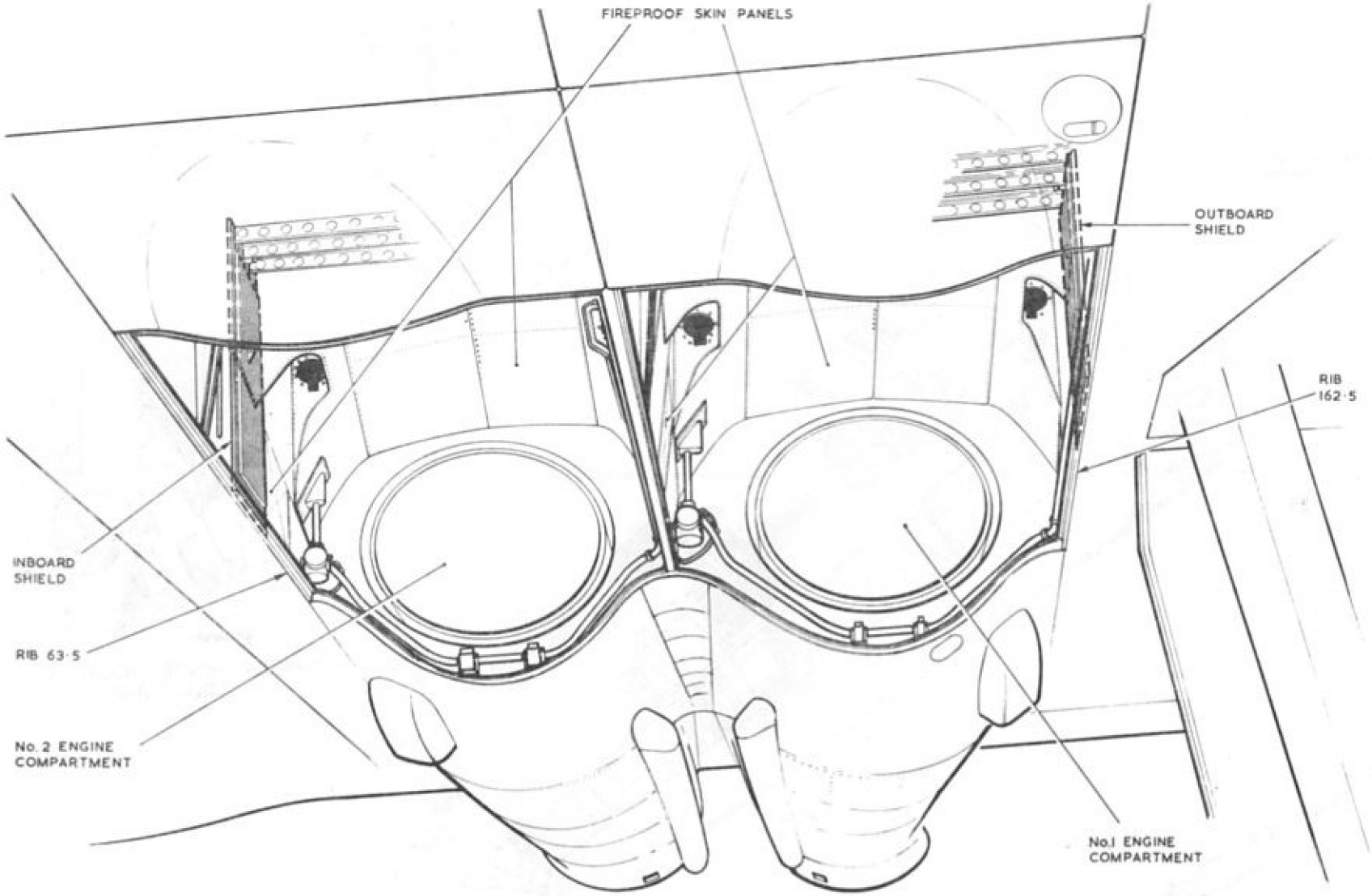
29. The engine compartments are skin plated, the skin plating being supported by intercostals between the main ribs; the top flange of the intercostals is riveted to the skin plating. Internally the walls and roof of each compartment are screened with detachable skin panels which form a fireproof lining around the engine. A gap in the lining accommodates a turbine disc protection shield (para.29A) and a canopy arrangement at the rear of each lining facilitates engine hoisting. The skin material used depends upon the temperature of the region, but the fireproof lining and most of the skin plating are of stainless steel.

29A. Protection shields are fitted in each compartment to prevent serious damage occuring to the airframe in the event of a turbine disc 'escaping' (fig.7A). The shields each consist of a 3 s.w.g. (0.252 in thick) titanium plate mounted on a slightly larger 3/8 in thick titanium plate and are attached to the outboard (transport) rib in No.1 and No.4 engine compartments and to the inboard (bomb bay) rib in No.2 and No.3 engine compartments. The shields protrude through the fireproof lining and cover the full depth of the particular rib.

30. Below each engine compartment are hinged, removable access doors. They are constructed of curved formers and reinforcing intercostals with an inner and outer skin completing the structure. Hinges are attached to the bomb bay rib inboard and the transport rib outboard.

Fuel tank compartments

31. Forward of the front spar in the circular portion of the centre section are fuel tank compartments. They are built up of circular-shaped, channel-section formers and pressed diaphragms and are skinned internally to form compartments for the fitment of No.1 and No.2 bag-type, flexible fuel tanks. In front of the tank compartments is the nose-wheel unit housing constructed of top-hat section stringers and skin plating with a cut-out in the lower surface for the nose-wheel unit. The cut-out is bounded by two longerons, to restore the section strength, which are fabricated from plate web extrusions; nose-wheel compartment doors of pressed frame and double skin construction, manufactured in two separate sections, complete the contour of the compartment when in the closed position. At the forward end of the compartment is a light transport angle which forms the attachment for the pressure cabin.



VIEW ON UNDERSIDE OF ENGINE COMPARTMENTS LOOKING AFT

PORT SIDE SHOWN – STARBOARD SIDE SIMILAR

[7.19]

Fig. 7A Arrangement of turbine disc protection shields

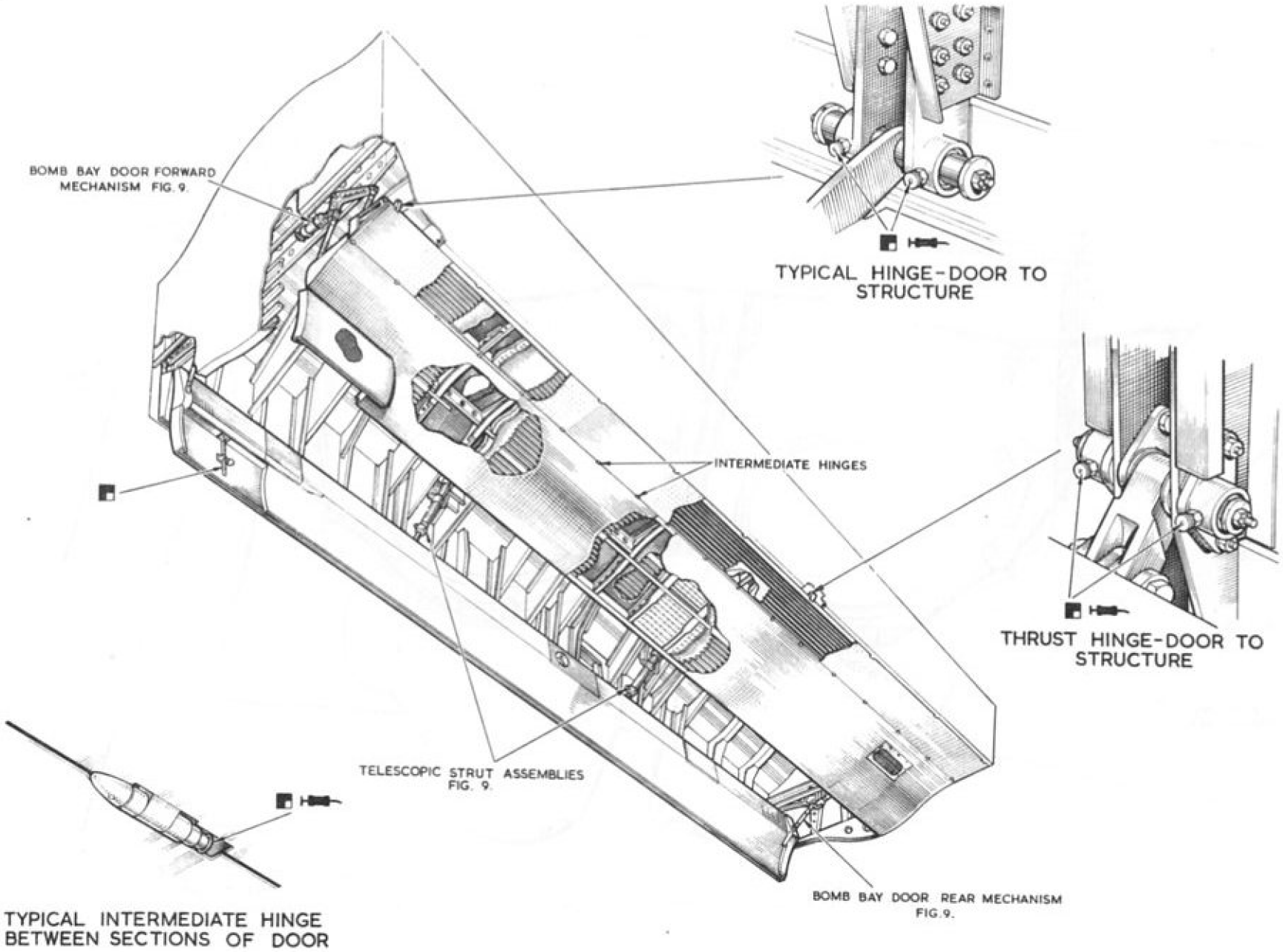


Fig. 8 Bomb bay doors

Bomb bay

32. The bomb bay, a single compartment occupying the full length of the fuselage between the front and rear spars, consists of a series of arch-shaped members some of which carry the bomb stores. The arch members vary in construction and, in general, those which are disposed where the loading is greatest, are of light-alloy web with manipulated extruded booms. The remainder are of built-up box section. Between the arches longitudinal intercostals are fitted where extra strength is demanded by the loading. Skin plating over this region is attached to top-hat rolled section stringers which extend from front to rear of the sections.

Bomb bay doors

33. Enclosing the bomb bay is a pair of hydraulically-operated bomb doors which fold when opened. Each bomb door consists of two half-portions, the division being longitudinal, joined together by centrally disposed hinge assemblies. The halves are each constructed from two long beam members, made from plate web and extruded section, transverse pressed profile ribs and fore-and-aft intercostals and are covered with a corrugated skin assembly of an inner and outer skin with corrugations between to give increased stiffness to the doors. Hinged doors are fitted at the forward end of the inner bomb doors to allow examination of the bomb load on a returned aircraft and also to facilitate bomb loading when certain types of carriers are used. Twelve micro switches, Dowmic Type C1831Y, are employed for bomb door position indication, jettison relay and to connect the electrical supply to the bomb door seal system unimatic valves. Four of these switches, mounted two to port and two to starboard by the inner bomb door to outer bomb door

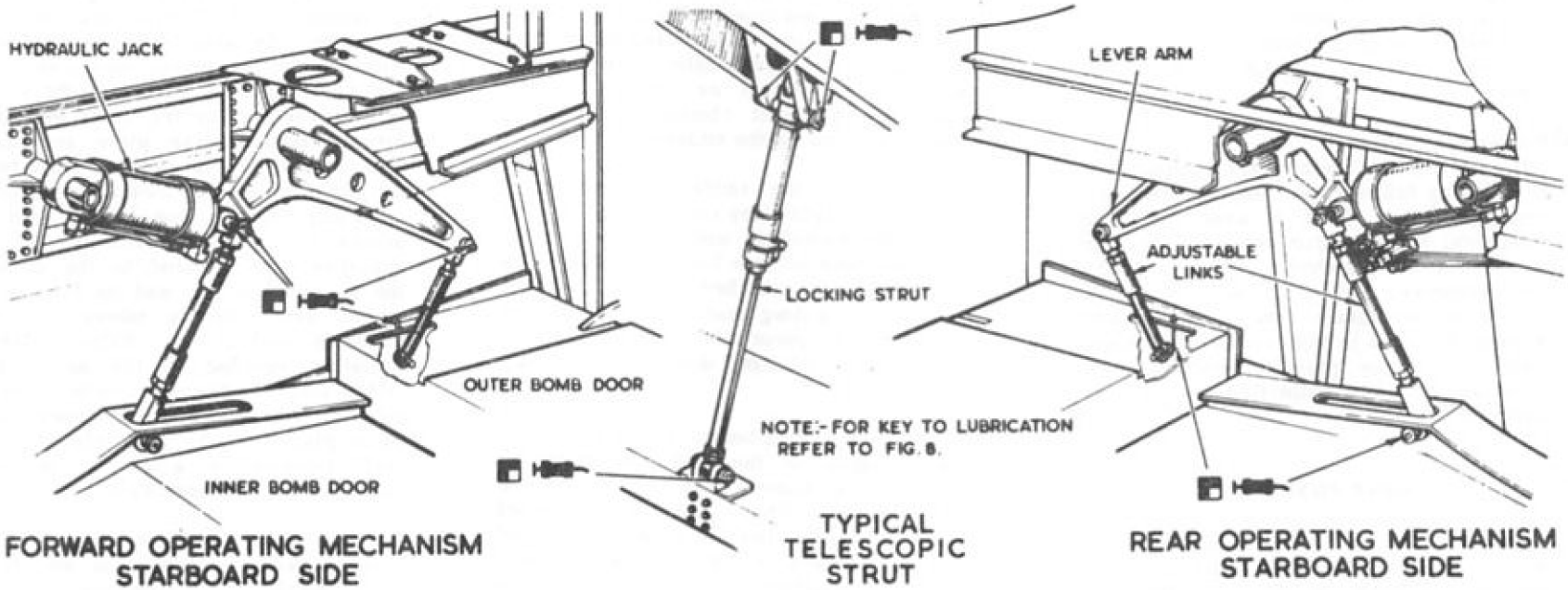


Fig.9 Bomb bay door mechanism

hinge, function to operate the bomb door position indicator. The remaining eight switches, mounted in pairs, are secured at the port and starboard sides on the forward face of the forward bomb door jack beam and the port and starboard sides on the aft face of the rear bomb door jack bulkhead. One switch of each pair functions in the normal stores circuit and the additional switch of each pair functions in the special stores circuit.

Bomb bay conversion

34. Bomb bay conversion, for the carriage of special stores is achieved by the embodiment of Mod.200. Fig.7 shows the centre section of the aircraft with the normal bomb doors removed and the conversion, fairings fitted. For information regarding change of role reference must be made to Sect.2, Chap.5 or 5A of this book.

Power compartment

34A. Aft of the bomb bay, a compartment bounded by the rear spar and rear transport joint at former 428A is used to house electrical power components. A door in the lower skin provides access to the compartment. Aircraft with Mod.2290 embodied incorporate two air intakes and exhaust fairings in the compartment lower skin. These provide ventilation to alleviate moisture collection in the compartment.

REAR FUSELAGE

General

35. The rear fuselage (fig.10), which consists of three sections - centre, port and starboard - is constructed almost entirely of light-alloy pressings and forms the support structure to carry the jet pipe detachable end caps, airborne equipment and the complete tail cone radome.

36. Circular formers, attached to triangular section 16 s.w.g. light-alloy longerons and box section 20 s.w.g. light-alloy crossbeams, form the centre structure. A bulkhead, included in the structure at former 487.5A, forms part of the support structure for the rudder control power units and divides the structure fore-and-aft. The forward partition, between the transport former 428A and the bulkhead, contains the tail bumper structure, rudder control system and a servicing platform, accessible through an aperture in the underside. The aft portion, the airborne equipment compartment, (Sect.3, Chap.16) contains additional reinforcing in the roof structure to accommodate lifting hoists for the installation or removal of the airborne equipment through three large doors provided on the underside.

37. Aft of the rudder, a box-shaped stowage of light-alloy construction houses the brake parachute and forward of this, the parachute jettison hook and associated mechanism is attached to the fuselage structure by a drag beam assembly. When installed, the parachute is faired off by a single forward hinged door (Sect.3, Chap. 13).

38. Manipulated beams, bolted to attachment angles on the port and starboard sides of the formers, are attached to the inboard engine ribs. Extending outboard from the engine ribs are spectacle-shaped pressed formers to which the jet pipe end caps are attached. The skin plating is supported by transverse-top-hat section stringers, except at the skin plating joints where T-section is used, the stringers being secured by attachment brackets to the formers and diaphragms.

39. Slung below and between the tunnel structure of the two starboard jet pipes are two vertical beams supporting two horizontal counterpoise plates. These plates, of honeycomb construction, are faired off on each side and forward end. To provide additional support, hinge assemblies and the attachment fairings on the outboard side and the attachment fairings on the inboard side of the counterpoise plates are secured to the jet pipe tunnel structure curvature. The inboard fairings are secured with screws to attachment angles riveted to the structure curvature. The hinges and the slotted holes for the attachment screws of the outboard fairing permit movement due to structural flexing during flight. The fairing secured to the front end of the forward counterpoise plate and the jet pipe tunnel curvature, incorporates an air intake which provides a flow of cooling air along the jet pipe fairing skin. A rubber lining which acts as an echo suppressor is secured to the inside of the forward fairing and to the jet pipe tunnel skin directly above the intake in the forward fairing. Echo suppression is also provided in the aerial cavity in the rear counterpoise plate. On Blue Steel aircraft Mod.870 introduces counterpoise plates on the port side of the aircraft mounted in a similar manner to those on the starboard side.

40. A triangular shaped fairing of light-alloy between the fuselage and the jet pipes completes the structure. Provision is made for the mounting of tail navigation lights above and below the fuselage.

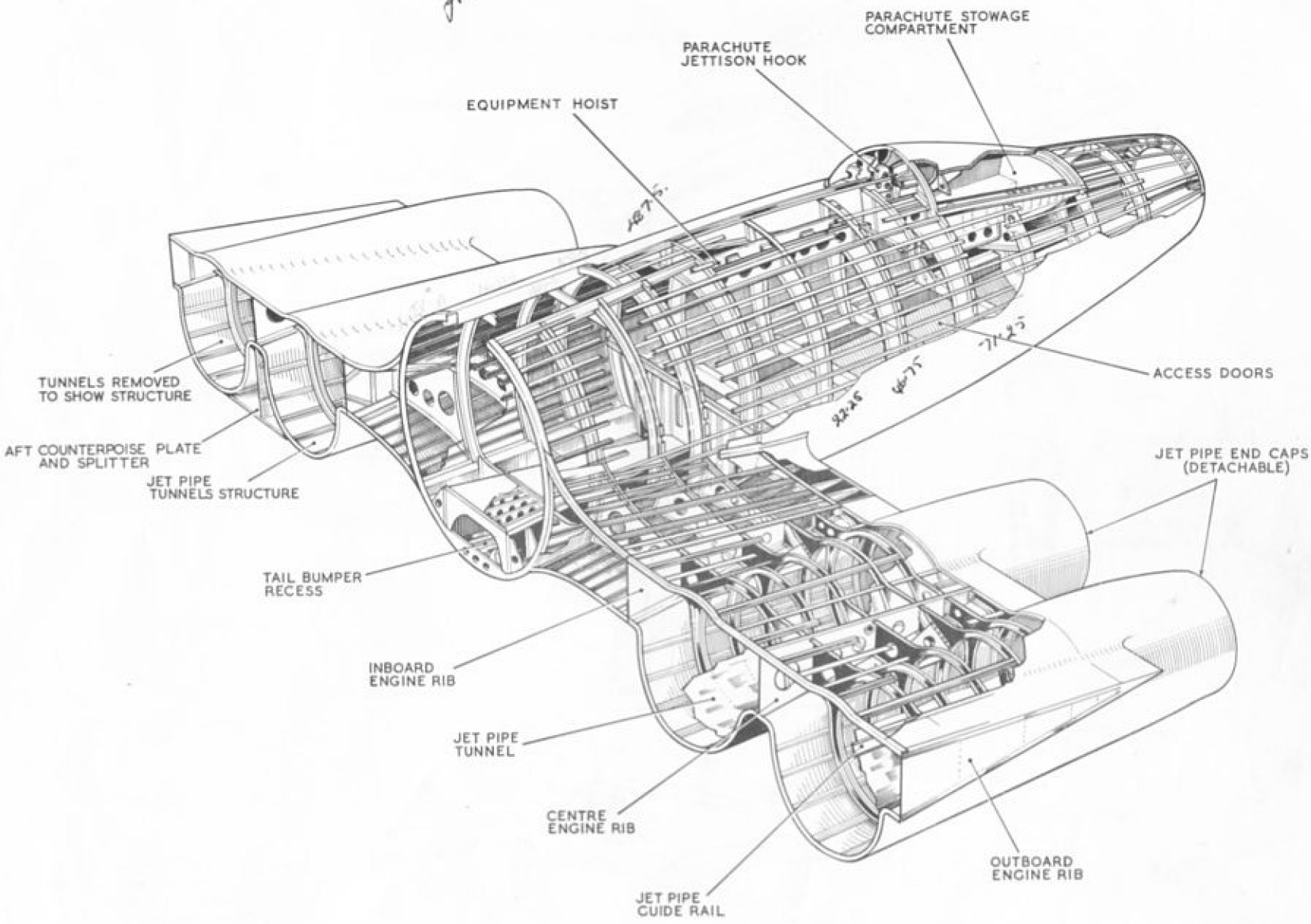


Fig. 10. Rear fuselage.

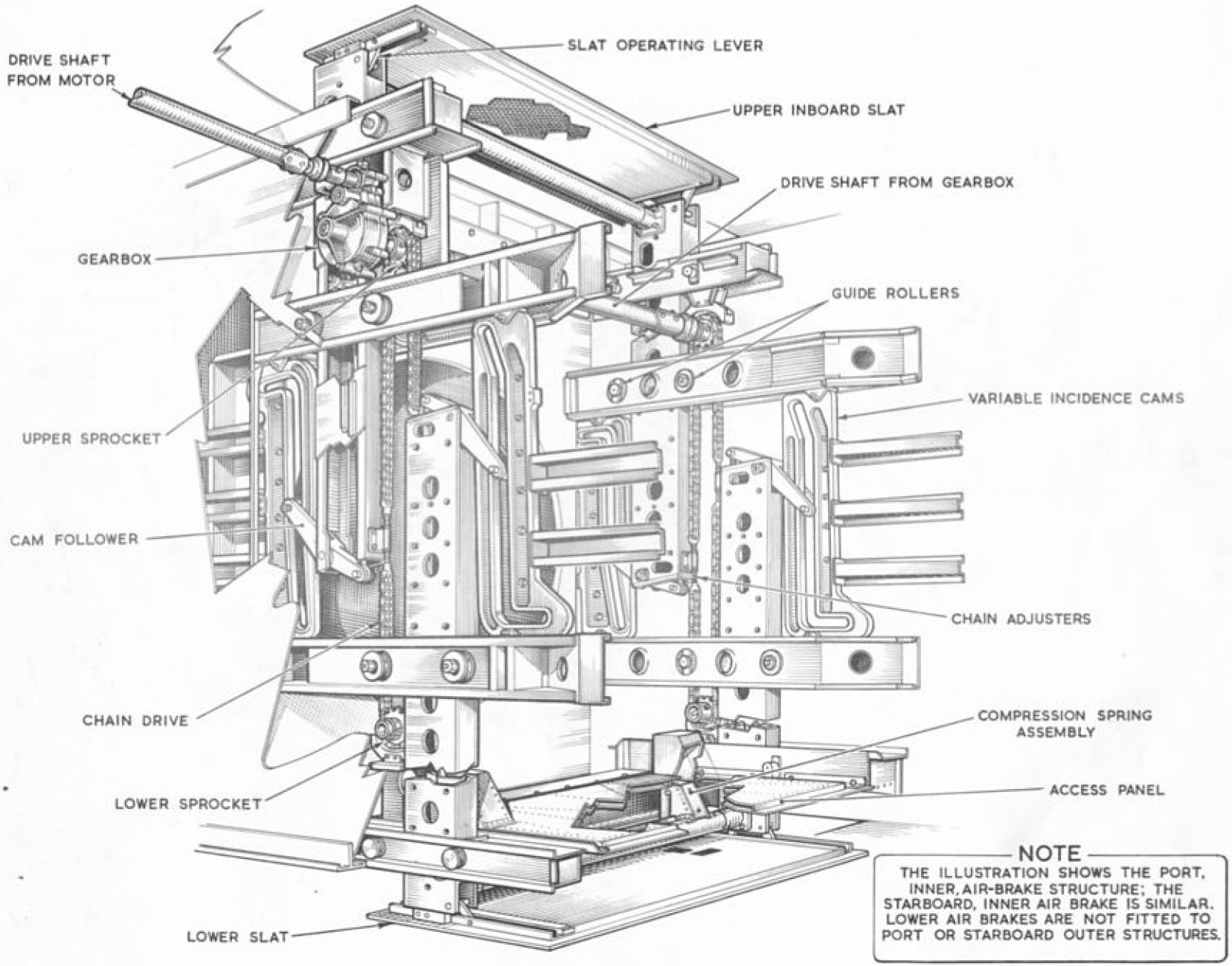


Fig. 11 . Air brake structure

AIR BRAKES

General

41. Electrically-operated slat-type air brakes are mounted in the centre-section of the aircraft, above and below the engine air intakes, and are controlled by switches in the pilots' cockpit. Should the air brakes be opened, with the access doors at the forward end of the inner bomb doors, in the fully open position, fouling with possible consequent damage will occur. The following warning is displayed on a label adjacent to the air brake selector switch in the cockpit.

WARNING . . .
Do not operate the air brake switches if the access doors at forward end of inner bomb doors are in fully open position.

42. The air brakes comprise rotatable slats mounted on box-section drag posts, the slats being of honeycomb construction. Four posts are provided, an upper and a lower pair, which, when extended or retracted, move in opposition to spool-type rollers attached to the main structure ribs on either side of the air intake tunnel. Each pair is bolted at its outer ends to a tube which braces the posts together to form a twin-post unit, each unit mounting a single slat, hinged for part rotation and operated by push-pull tubes, lever and cam-follower housed in each post. This mechanism is functioned by drag post travel, the cam follower travelling in its cam track and drag post extension being controlled by micro switches.

43. An endless chain assembly is accommodated between the upper and lower pair of drag posts, between an upper drive sprocket and a lower idling assembly, and comprises two cams joined by an adjuster block on each post. All upper sprockets are interconnected by a common drive shaft which extends span-wise in ball-jointed sections between the sprockets and a motor-driven gearbox, mounted centrally in the centre section. Operation of the gearbox rotates the shaft and, via the sprockets and chains, extends or retracts the drag post according to the direction of rotation. Microswitches, operated by cam strips fitted on the top port strut, limit the air brake movement.

SERVICING

DRY AIR SANDWICH PANELS

44. The direct vision windows in the pilots' windscreen and the circular windows in the canopy and crews' compartment, each contain a dry air sandwich type window panel. To prevent internal misting of the windows, small individual silica gel systems are provided at each panel. Frequent checks are to be made to ensure that the air space between inner and outer panels is being maintained in a moisture free condition.

TESTING

45. For information on the silica gel systems refer to Sect.3, Chap.8 of this book.

LUBRICATION

46. Lubrication points of the structure are given on the illustrations within this chapter; entrance door lubrication is given in Sect.3, Chap.11. A minimum quantity of oil OX-14 should be used to lubricate the hinges and catches of the D.V. windows and canopy mechanism.

EMERGENCY EQUIPMENT STOWAGES

47. Checks should be made, at frequent intervals, of the external stowage catch mechanism in the nose section of the aircraft for wear and serviceability. These catches should be lightly lubricated with oil OX-14.

BALLAST WEIGHTS

48. Provision is made in the front and rear fuselage for the stowage of ballast, necessary when either the scanner or the airborne equipment is removed from the aircraft. Ballast weight container Part No. 1/Z8401 is fitted to the scanner mounting beam assembly in the nose section of the aircraft and socket plates Part No. 27/Z9980 to the cannister mountings in the rear fuselage. For additional information on the rear fuselage equipment, refer to Sect.3, Chap.16 of this book. The loading of ballast weights at these positions is in accordance with instructions contained in the loading of a C.G. data in Sect.2, Chap.3.

ENTRANCE DOOR

49. During operations involving the removal of the main entrance door jacks, the following instructions should be noted:

The door must not be allowed to open, when the jacks are disconnected, further than the distance normally allowed by full extension of the jacks, otherwise damage could result to the hinge assembly and/or its mounting structure. It is advised that, where possible, only one of the jacks is removed at any one time. Failing this, a locally made restraining device – either a strut or ropes – should be used.

Functional checks and adjustments

50. When servicing operations necessitate the removal and consequent refitting of a main entrance door, the following checks must be done. Refer to fig.12 and proceed:-

(1) Check that the weather seal and pressure seal in the door aperture are secure and serviceable.

(2) Check that the hinge pins move freely in the bushes of the hinge brackets and door hinge arms.

(3) Offer the door to the aircraft and complete the hinge assembly by inserting the hinge pins. Washers, included in this assembly are to be fitted, one on each side of the door hinge arms.

(4) Close the pneumatic system ground isolation cock, then disconnect and remove the door operating jacks. This permits manipulation of the door through its full operating range without interference.

(5) Using a soft pencil to mark the outer skins, establish the centre line of the door at its trailing edge and the underside fuselage skin just aft of the door aperture.

(6) Move the door, by hand, through its full operating range to check for full and free travel.

NOTE . . .
If, during this check, the lockpins engage fully in their respective housings, and the door and fuselage centre lines agree, it may be assumed that door alignment is satisfactory.

(7) Should difficulty be experienced in closing and/or locking the door, check for misalignment of components or pre-stop interference as follows:-

(a) If door and fuselage centre lines do not agree one hinge bracket must be shimmed out until correct line-up is achieved. Shims, up to 20 s.w.g. max., may be inserted behind the hinge bracket toward which the door appears to swing.

NOTE . . .
Should either hinge bracket require shims, it will be necessary to raise the fuselage inner skin, i.e., the area just forward of the door, to gain access to the hinge bracket securing bolts. Particular care must be exercised when drilling out the pop rivets which secure this skin.

(b) Check that the apertures in the former at the hinge assembly, provide sufficient clearance around the hinge arms throughout the door operating range. Aperture edges may be dressed to provide this clearance.

(c) Check that the door stops, at each side of the door, do not engage before the door is closed and locked. Should this occur a thin slice of rubber may be removed from the door stops buffers.

(d) Check that the lockpins enter their respective lock housings smoothly and to the extent required, i.e., until the lockpin shoulder sealing washer abuts the face of the lockpin housing. This can be observed through cut-outs in the inner skin, it should be noted that it may be necessary to move the door closing handle slightly away from the closed position to assist

observation taking care not to move the lockpins. A gap between the washer and housing face indicates inadequate penetration; this may be caused by a foul in the system or incorrect adjustment of the connecting rod between the main operating lever and the torque shaft lever. Nominal setting for this rod is 48.50 in between centres. No other adjustment is provided.

(8) With the door closed and locked, check the gap between the door outer skin and the surrounding fuselage skin. Clearance should be in accordance with the Table on fig.12. The door assembly may be moved laterally by varying the thickness of the washers at either side of the hinge arms, or longitudinally by inserting shims behind the door hinge brackets, bearing in mind the shim limitations, para.50 (7)(a).

(9) Check and adjust, if necessary, the door closing valve (detail C). The gap between the valve operating lever and the end of the external push-button plunger should be 0.5 ± 0.01 in.

NOTE . . .
The internal and external door opening handles must not be used to withdraw the lockpins the 0.125 in quoted in operation (10).

(10) The microswitch (detail E) should be adjusted so that, when the lockpins are withdrawn 0.125 in from the locked position, the lamps on the main operating lever housing will change green to red.

(11) Ensure that the door is supported (para.49) and move the operating lever through its full range to the stop at the emergency position. Check and adjust, if necessary, the sequence valve (detail F) in the lever housing. The plunger should be depressed 0.094 in when the lever reaches the stop.

(12) Microswitch (detail D) should be adjusted with the door open, so that a gap of 0.05 ± 0.02 in exists between the tip of the switch plunger and the end of the spring-loaded rod.

(13) Check that the pneumatic ram has 0.35 in travel before operating the torque shaft (detail G).

(14) Fit the operating jacks to the aircraft and make the pneumatic connections.

(15) Lightly smear the inside of the holes in the jack attachment brackets on the door with jointing compound JC5A Ref.No.33H/2247400.

(16) Locate the operating jacks eye-ends within the fork brackets, lightly smear the attachment bolt shank and under the head with jointing compound JC5A Ref.No.33H/2247400, fit the bolt with the head inboard.

(17) Lightly smear the bolt thread with grease XG-287, fit the washer and nut, torque load the nut to 10-12 lb ft and lock with a split pin.

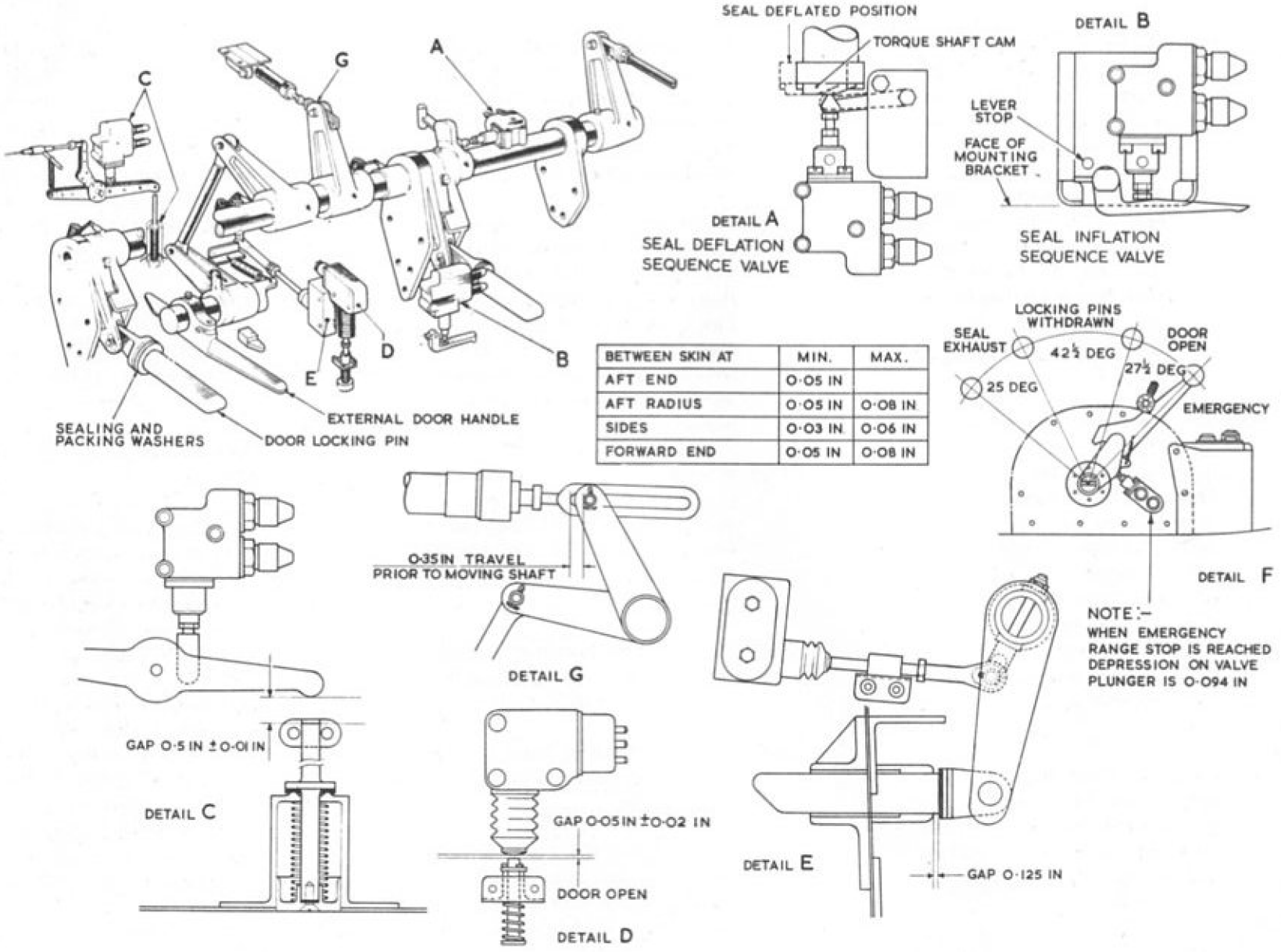
(18) Open the pneumatic system ground isolation cock and ensure the door closing system pneumatic cylinder is replenished to 2 000 lb/in^2

(19) Set up the inflation/deflation mechanism of the cabin door seal as follows:-

(a) Place a strip of masking tape along the quadrant of the door internal operating handle (Sect 3, Chap.11, fig.7) to facilitate marking door handle positions.

(b) Holding both door locking pins in the fully extended position slowly move the internal handle in the door open direction until either of the locking pins begins to retract and mark the handle position on the quadrant masking tape. Release the door handle.

(c) Make a further mark on the quadrant tape 0.6 in from the first mark towards the door closed position.



BETWEEN SKIN AT	MIN.	MAX.
AFT END	0·05 IN	
AFT RADIUS	0·05 IN	0·08 IN
SIDES	0·03 IN	0·06 IN
FORWARD END	0·05 IN	0·08 IN

Fig. 12 Entrance door mechanism adjustment

A1421

(d) Remove the adjustment tappet cover from the cam operated door seal deflation valve (fig.12, detail A).

(e) At the door operated seal inflation valve (fig.12, detail B) depress the valve plunger to simulate door closing and ensure that the seal inflates. With the plunger still depressed slowly move the door internal operating handle towards the open position and note the point at which the seal begins to deflate.

(f) If the seal does not begin to deflate exactly at 0.6 in mark established at sub-para. (c) adjust the tappet of the cam operated valve to achieve deflation at this mark.

NOTE . . .

(1) Adjustment in by one flat of the tappet moves the seal deflation point 0.1 in further away from the lock pin movement datum mark established at sub-para. (b).

(2) At this point it may be necessary to fit a new locally manufactured pivot bracket to re-position the operating arm pivot point. It may also be necessary to re-position the deflation valve to maintain alignment with the operating lever and this is achieved by elongating the valve mounting bracket attachment holes.

(g) On completion preserve adjustments by tightening the locknut on the deflation valve tappet and recheck that the seal deflation point still coincides with the 0.6 in datum mark.

(h) Screw the tappet of the door operated inflation valve (fig. 12, detail B) fully in.

(j) Remove entrance door access ladder.

(k) Switch on 28V dc supply and close door from inside the cabin ensuring that the door lock pins fully engage and the green indicator lamp is illuminated.

(l) Screw out tappet on door operated inflation valve one flat at a time until the seal begins to inflate.

(m) Screw out tappet a further seven flats and preserve the setting by tightening the locknut with a thin 4BA spanner ensuring that no movement occurs between the tappet and valve plunger.

(n) Open entrance door internal handle and that the seal deflates.

(p) Close entrance door inside the cabin ensurin the locking pins fully e the seal inflates and the indicator lamp is illumi

(q) Switch off 28V dc supp refit the access ladder.

(r) Ensure all fittings are and refit tappet cov deflation valve.

(s) Ensure door seal is secu correctly located makin that the seal retainer clenching the seal too t

(20) If the inner skin has been op.7(a), secure to original c with the appropriate pop Reference must be mad A.P.101B-1900-6A of this ation for information reg rivets, sealing etc.

Sequence checks

51. A complete functional check sho made, operating the door from insid outside the aircraft. Operation o components may be observed by a stationed inside the aircraft adjacent torque shaft. Proceed as follows:-

(1) Ensure that the pneumatic cy serving the door systems ar charged.

(2) Plug in a ground electrical supply.

(3) Ensure that all loose equipment is removed from the vicinity of the door.

(4) Close the door from inside the aircraft, using the cable control in the crew's floor. The following sequence of operations should occur:-

(a) The lever at the end of the cable will rotate and depress the plunger of the door closing valve (detail C) admitting a flow of air to the 'UP' side of the operating jacks.

(b) The door closes and the lock-pins engage. Door seal sequence valve (detail B) operates, when the lever is moved upward by the door, and air is admitted to the door seal.

(c) Microswitch (detail D) is tripped by the spring-loaded plunger which is pushed upward by the door, followed by microswitch (detail E) which is tripped by the lock-pin lever link connection. These two microswitches govern the flow of current to the indicators, a lamp at the starboard side of the nosewheel bay, two lamps on the lever housing and a magnetic indicator (doll's eye) on the pilots' centre panel. The lamp in the nosewheel bay will illuminate green, the lamps on the lever housing will change from red to green and the indicator will show black.

(5) Open the door from inside the aircraft by operating the control lever. Move the lever slowly and the following will occur:-

(a) As the lever is moved through the first 25 deg the cam lever on the port side of the torque shaft will rotate, allowing the plunger of the sequence valve (detail A) to ride the cam and extend. Air will exhaust from the door seal.

(b) The next 42½ deg of lever movement to the gate withdraws the door lock pins. When this occurs, the microswitches (details D and E) are again tripped and the lamps on the lever housing will change - green to red, simultaneously the doll's eye indicator on the pilots' centre panel will display white and the lamp in the nosewheel bay will extinguish. The door will now open under its own weight.

(6) Close the door from inside the aircraft, using the cable control in the crew's floor. The sequence of operations detailed in operation (4) should occur.

(7) Reduce the door (open) system air cylinder pressure to 500 lb/in^2.

WARNING . . .
Personnel must keep well clear of the door when emergency opening checks are being carried out.

(8) Open the door from inside the aircraft as for an emergency by operating the control lever through its full range. The sequence of operations will at first be as detailed in operations (5) (a) and (b). Continue moving the lever through the final 27½ deg, the plunger on the sequence valve (detail F) will be depressed and air from the system will be admitted to the 'DOWN' side of the operating jacks to open the door.

(9) Release the control lever from the gate by operating the spring catch and repeat operation (6).

(10) With a maximum pressure of 500 lb/in^2 in the door (open) system air cylinder, open the door from inside the aircraft by operating the DOOR OPENING EMERGENCY switch located on the navigator's panel. Operation of the switch causes a unimatic valve in the door (open) system to open and pass air to the torque shaft operating jack which in turn rotates the torque shaft causing the door to open automatically. The sequence of operations and associated indications is similar to that described in operations (5) (a) and (b) and (8) when the door is opened by use of the manual control lever.

(11) Select the DOOR OPENING EMERGENCY switch OFF and secure the switch guard in position.

(12) If the manual control lever has fully engaged in the quadrant gate release the lever by operating the spring catch. Repeat operation (6).

(13) With a maximum pressure of 500 lb/in^2 in the door (open) system air cylinder, open the door from inside the aircraft by selecting the EMERG. DOOR OPEN switch, mounted on the front face of the rear crew members table between the Nav. (Plotter) and AEO positions, to the right to ON. The sequence of operations and associated indications is similar to that described in operation (10).

(14) Select the EMERG. DOOR OPEN switch to centre OFF and secure the switch guard in position.

(15) Repeat operation (12).

(16) With a maximum pressure of 500 lb/in^2 in the door (open) system air cylinder, select the EMERG. DOOR OPEN switch to the left to ON. The sequence of operations and associated indications is similar to that described in operation (10).

(17) Ensure the manual control lever is fully engaged in the quadrant gate. Replenish the door system air cylinder pressures to 2 000 lb/in^2 to test the rams, valves and piping at maximum working pressure.

(18) Select the EMERG. DOOR OPEN switch to centre OFF and secure the switch guard in position. Release the manual control lever from the quadrant gate.

(19) Close the door from outside the aircraft using the push-button control in the underside just aft of the door aperture. The sequence of operations should be the same as in operation (4).

(20) Open the door from outside the aircraft using the external control handle adjacent to the push-button. The handle when operated, will turn the torque shaft and the sequence of operations and indication should be similar to that described in operations (5) (a) and (b).

52. Ensure that all locknuts are secure and locking devices are correctly applied.

53. A cabin pressure test should be carried out in accordance with instructions contained in Sect.3, Chap.8 of this Publication.

BOMB DOOR SETTING

54. The bomb doors, when set correctly should follow the general contour of the aircraft, and the gap between the seals of the inner bomb doors, in the closed position should be 0.1 $^{+0.054}_{-0.014}$ in. The tolerance is increased to $^{+0.130}_{-0.030}$ in. at the forward end of the bomb doors where the hinged access doors are situated. Assuming the bomb door jacks are set correctly as described in para.56, adjustments to obtain correct setting are made on the adjustable links of the operating mechanism followed by the adjustment of the bomb door free moving telescopic strut. Details of the method of setting these components are given in later paragraphs.

55. Fore-and-aft the doors are not adjustable, but for checking purposes the manufacturer's interchangeability dimensions may be used as a reference. Clearance between the forward end of the bomb doors and the front spar seal structure in 0.741 $^{+0.040}_{-0.010}$ in and between the rear end of the bomb doors and the rear spar seal structure is 0.814 $^{+0.040}_{-0.010}$ in.

BOMB DOOR JACK ADJUSTMENT

56. Installation of bomb door jacks is a reversal of the removal procedure described in para.71, the fork-end being adjusted to suit the aircraft pick-up points. The manufacturer's nominal pin centre setting for the closed position is 16 in, but a tolerance of -0.25 in, is allowed for setting purposes. To adjust the jacks when setting:-

(1) Select bomb doors OPEN on the cockpit selector switch and place the selector switch guard Ref.No. 26DC/95054 in position.

(2) Disconnect the bomb door free moving telescopic strut from the outer bomb door and secure it to a point where operation of the bomb doors will not cause a foul.

(3) Attach the bomb door slinging equipment to the brackets provided as described in the key to fig.22 op. (3), (4) and (5).

(4) Disconnect the bomb door jacks from the bomb door mechanism levers.

(5) Remove the selector switch guard and select doors CLOSED. Ensure that no fouls occur between the jacks and the adjacent structure.

(6) Remove fuses 602, 638, 639 and 922 from the port fuselage fuse and relay panel 3P.

(7) Using the equipment fitted in op. (3) close one bomb door.

(8) Remove the locking wire securing the locknuts and spanner grip on the fork-ends of the jacks of the closed door. Adjust the fork-ends, as necessary.

(9) Lower the bomb door, transfer the bomb door slinging equipment to the other door, repeat op. (7) and (8) and lower the bomb door.

(10) Wirelock the locknuts and spanner grips on the fork-ends of the jacks.

(11) Replace the fuses removed in op. (6) and select bomb doors OPEN and fit the selector switch guard.

(12) Connect the jacks to the bomb door mechanism levers.

OUTER BOMB DOOR LINK ADJUSTMENT

57. The links are installed to suit the pick-up points on the aircraft. The manufacturer's nominal pin centre setting is 10.45 in, but for setting purposes the fork-ends may be adjusted within normal safety limits. To adjust the fork-ends:-

(1) Select bomb doors CLOSE, check the amount of adjustment required.

(2) OPEN the bomb doors to give a gap of 18 to 24 in between the inner bomb doors. Remove fuses 602, 638, 639 and 922 from the port fuselage fuse and relay panel 3P.

NOTE . . .
It is necessary to open the bomb doors to remove the link to bomb door attachment pin.

(3) Disconnect the greasing tube from the link to bomb door attachment pin, remove the pin retaining plate and the pin.

(4) Release the link fork-end locknut, adjust the fork-end as necessary and connect the link to the bomb door.

(5) Replace the fuses removed in op. (2), select bomb doors CLOSE and check accuracy of adjustment.

(6) When adjustment is satisfactory select bomb doors OPEN and remove the fuses as laid down in op.(2).

NOTE . . .
Ensure bomb door does not foul on elevator control run.

(7) Check the link fork-end for safety and tighten the locknut. Fit the link attachment pin securing plate and fit the greasing tube.

(8) Replace the fuses removed in op.(6) and select bomb doors CLOSE. Check the alignment of the eye-end of the telescopic strut with its attachment on the bomb doors. Adjust the eye-end, if necessary as described in para.59.

INNER BOMB DOOR LINK ADJUSTMENT

58. The links are installed to suit the pick-up points on the bomb doors and operating mechanism. The manufacturer's nominal pin centre setting is 20.22 in, but for setting purposes the links may be adjusted within normal safety limits. To adjust the links:-

(1) Select bomb doors CLOSE and place the bomb door selector switch guard in position.

(2) Release the locknuts of the adjustable links.

(3) Adjust the links, as necessary, by turning the barrels with a 3/16 in tommy bar.

(4) Check the eye-end and fork-ends for safety and tighten the locknuts.

BOMB DOOR TELESCOPIC STRUT ADJUSTMENT

59. The telescopic struts are installed to suit the pick-up points on the aircraft and bomb doors. The maximum pin centre dimension is 33.24 to 33.74 in, and strut travel dimension is 16.94 in. To adjust the struts:-

(1) Select bomb doors CLOSE and place the bomb door selector switch guard in position.

(2) Remove the locking wire from the eye-bolts, locknuts and spanner grip on each strut.

(3) Remove the pins connecting the struts to the bomb doors.

(4) Adjust the eye-bolt of each strut until the attachment pins can just be inserted.

(5) Remove the pins and shorten each strut by 1½ turns of the eye-bolt. Fit the attachment pins.

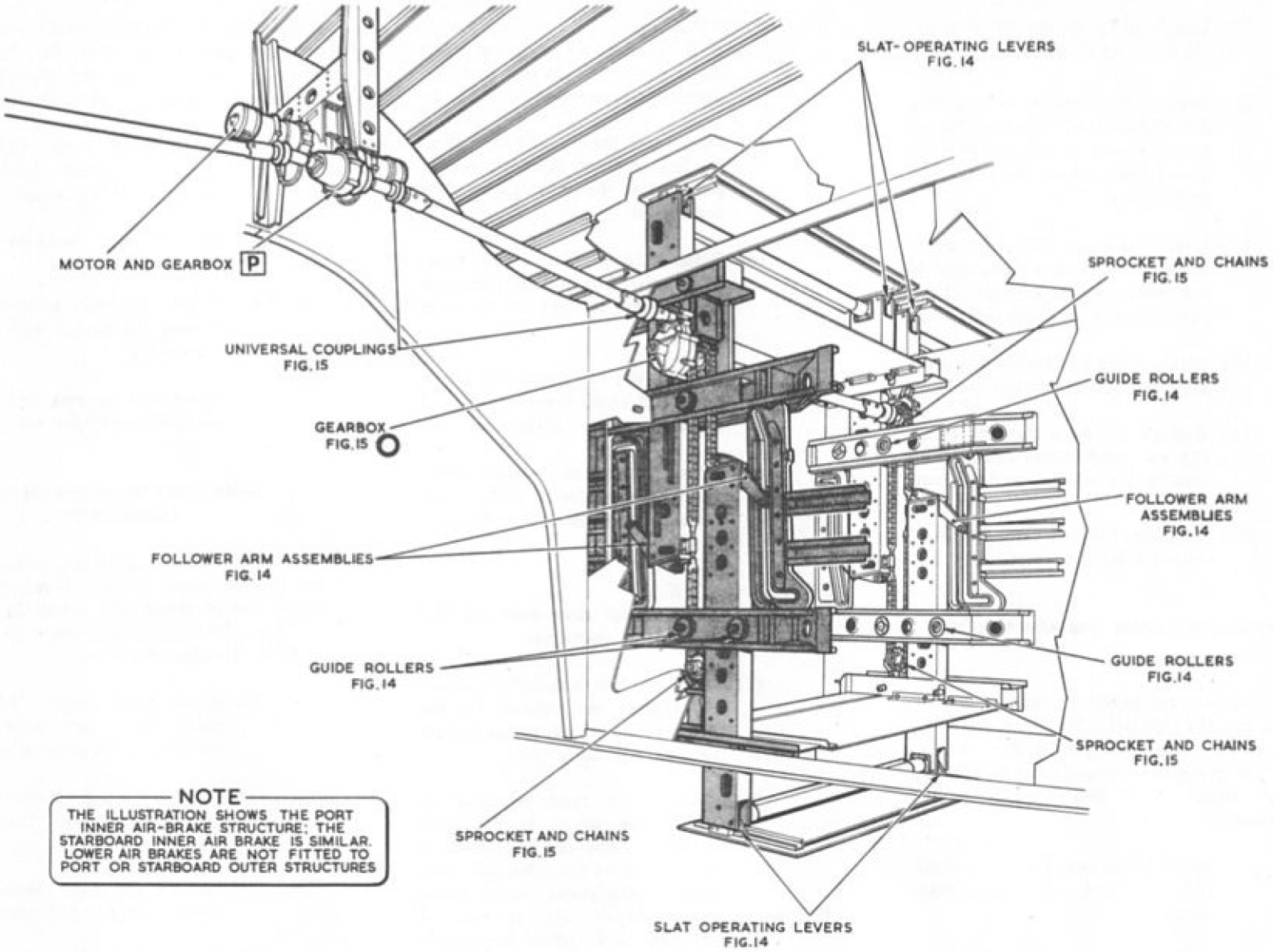


Fig. 13 Air brakes – lubrication (1)

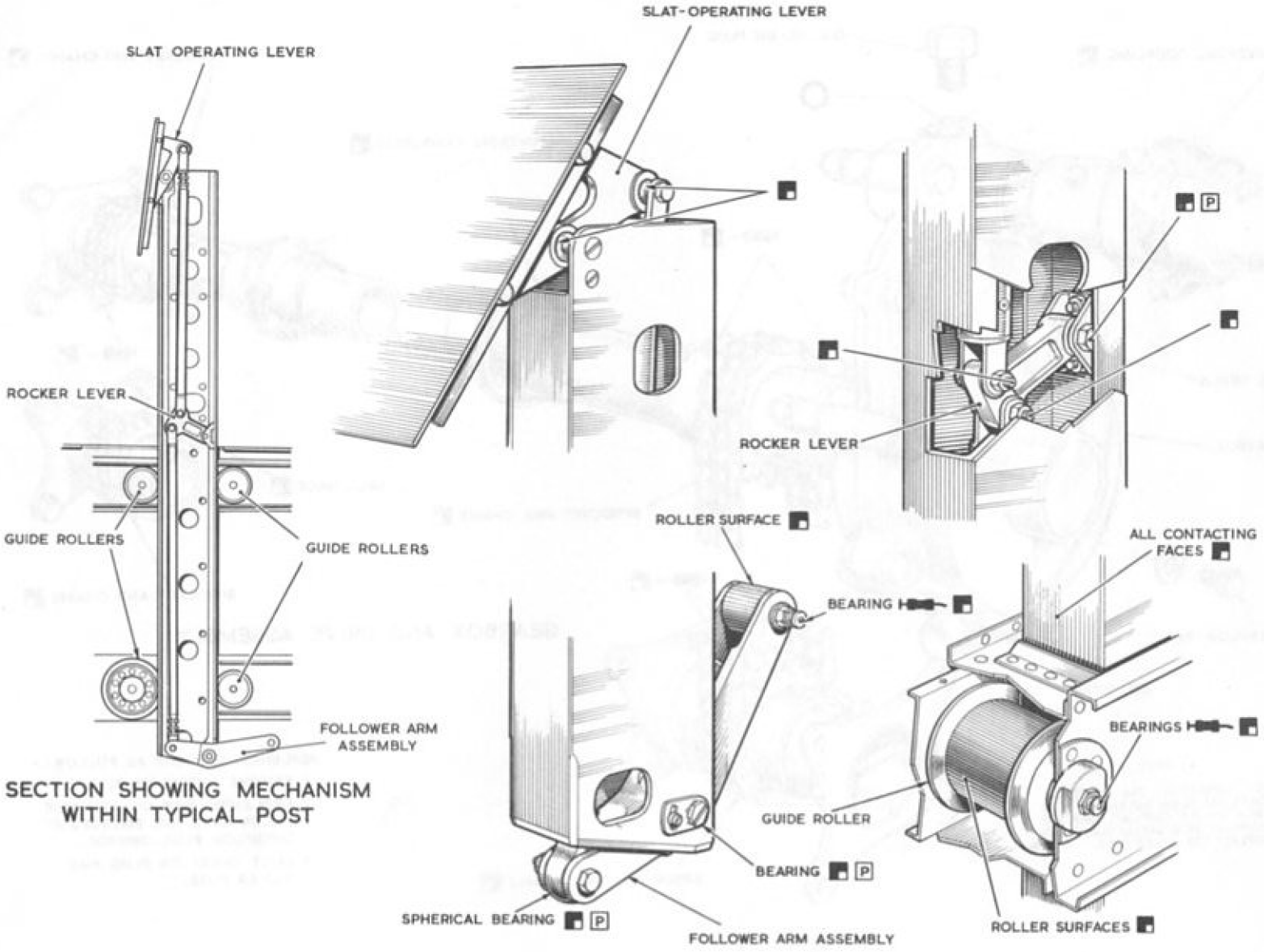


Fig.14. Airbrakes - lubrication (2).

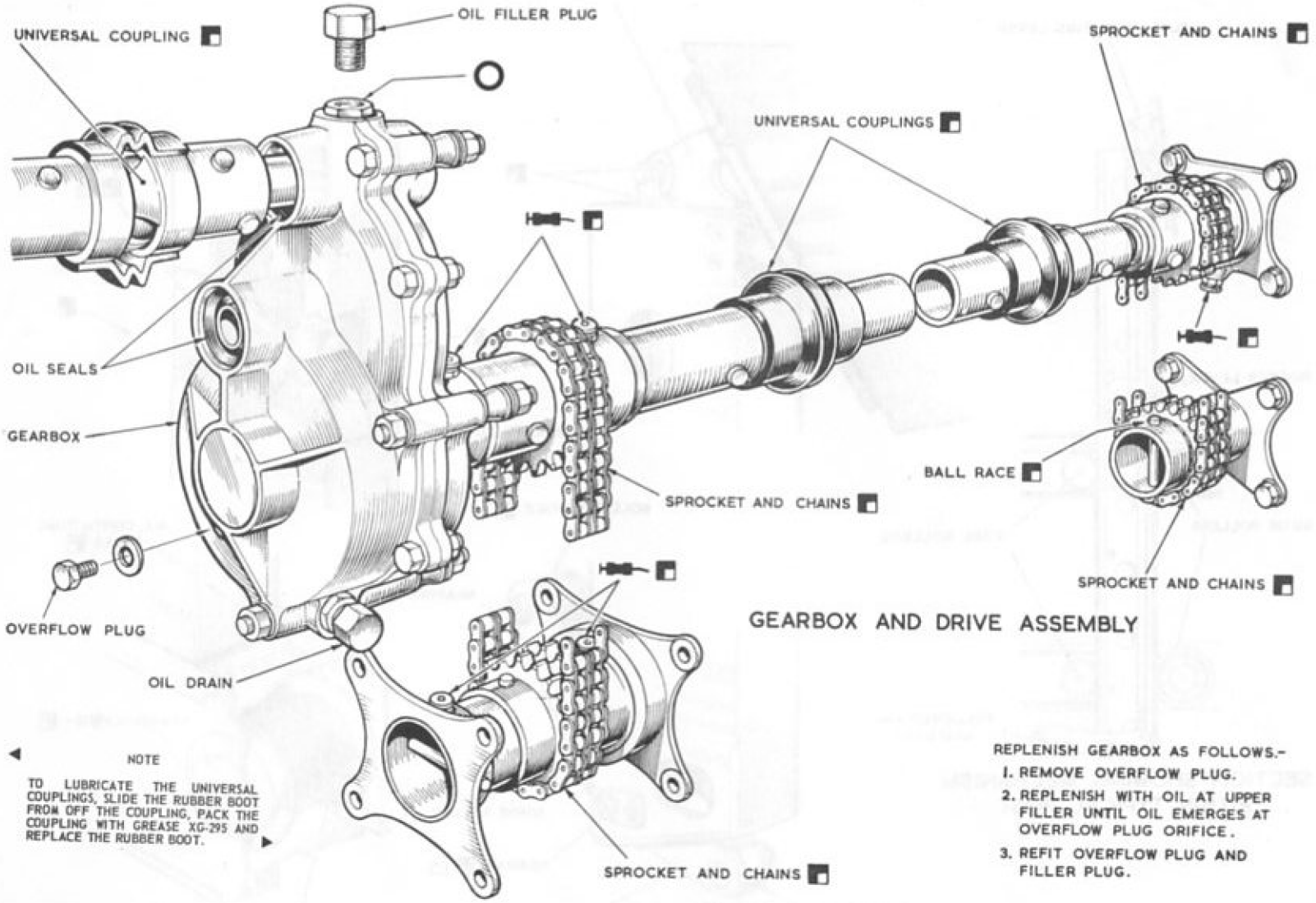


Fig. 15. Air brakes – lubrication (3)

(Lubrication altered)

RESTRICTED

(6) Secure the eye-bolts, locknuts and spanner grips and wire-lock in the approved manner.

ADJUSTMENT OF POWER COMPARTMENT ACCESS DOOR CATCHES

60. To adjust the catches on the power compartment door:-

(1) Adjust the hooks of the catches until the ends of the operating levers are approximately 0.25 in clear of the door surface when the hooks are fully engaged on their securing rods. The handle is set 0.25 in clear of the skin so that final movement to the skin line will pull the door in and take up any play in the mechanism and flexibility in the structure.

(2) Wirelock the catches.

(3) Close the door (para.61).

(4) Apply a weight of 90 to 100 lb at each catch in turn and check that the door does not protrude below the fuselage skin line.

METHOD OF CLOSING THE POWER COMPARTMENT ACCESS DOOR

61. To clear the power compartment access door:-

(1) Lock the forward and rear catches.

(2) Check the security of the forward catch by releasing the rear catch and attempting to open the door.

(3) Check the security of the rear catch by reversing the procedure in op.(2).

(4) If the door remains secure in both cases the mechanism setting is satisfactory.

(5) Release the door and secure again, fastening the front catch first.

BOMB DOOR MICROSWITCH SETTING

61A. Whenever servicing is carried out which entails the adjustment of the bomb door operating jacks, the bomb door microswitches must be checked and adjusted, if necessary, as follows:-

(1) Close the bomb doors.

(2) Locate and remove the eight micro-switch striker pins from the mount-

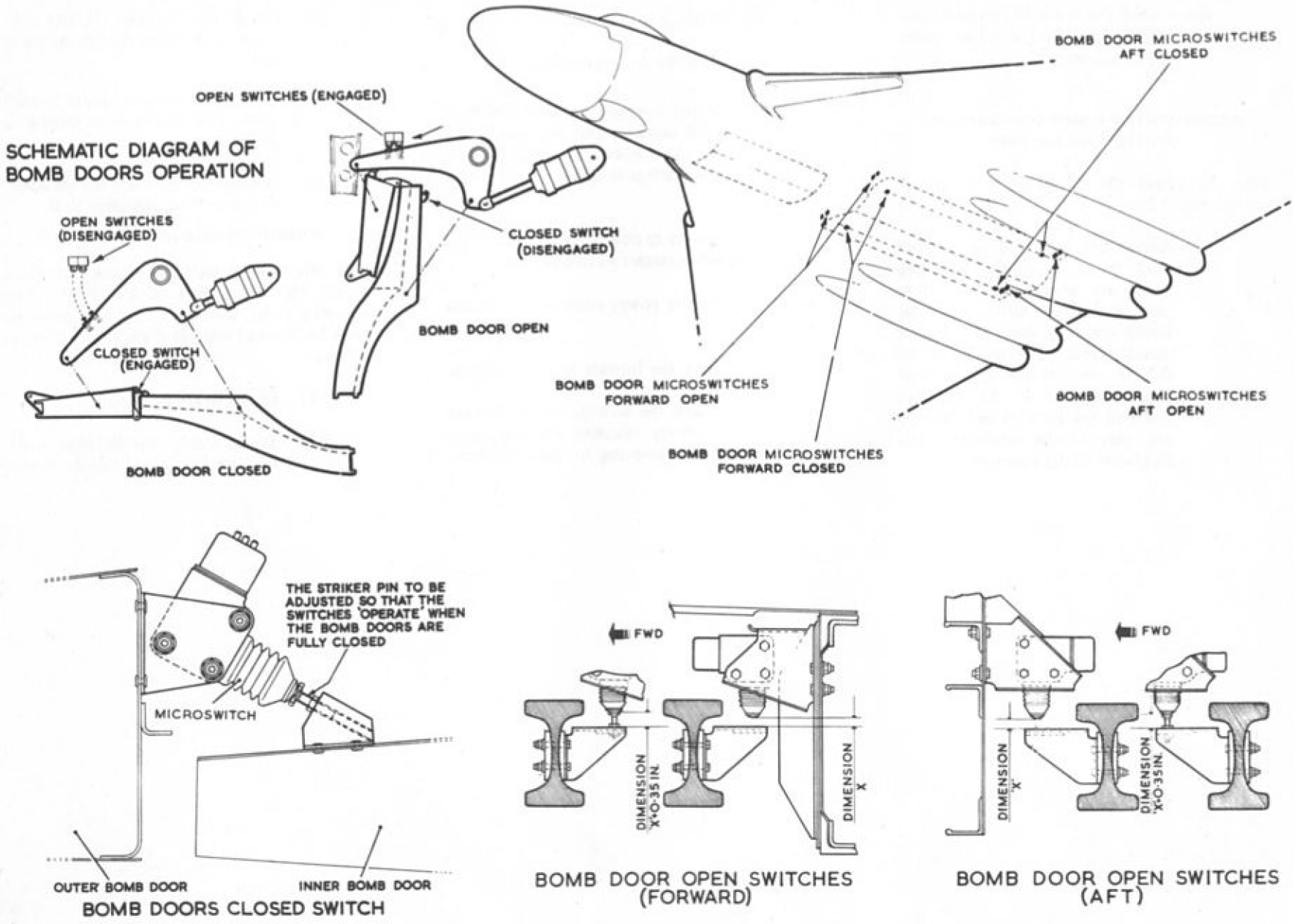


Fig. 15A Bomb door microswitch setting

ing brackets on the forward and rear bomb door operating levers.

(3) Open the bomb doors, measure and note the distance between the end of each micro switch plunger and the top face of the respective striker pin mounting bracket (dimension X, fig.15A).

(4) Close the bomb doors and fit the striker pins to their respective mounting brackets.

(5) Adjust each striker pin so that the measurement from the striking surface of the pin to the top surface of the striker pin bracket is the measurement obtained in op.(3) plus 0·35 in. Tighten the striker pin locknuts.

(6) Adjust the bomb doors closed micro switch striker pins until the micro switches just operate, then unscrew the striker pins a further 0·125 in. Tighten all the striker pin locknuts.

(7) Open the bomb doors and check that the eight bomb door open micro switches do not bottom.

(8) Carry out a bomb door function check to ensure that the micro switch setting is satisfactory.

FITTING ANTI-GLARE VISORS

61B. The pilots' anti-glare visors are retained in the stowed and operative positions, with the knurled screw fully loosened, by pins on the catch, mating with dimples drilled on the visor hinge adjuster. The stowed position is flat against the inside of the canopy and the operative position is tight against the coaming. Two dimples 1/8 in. diameter, drilled diametrically opposite for each of the two positions, must be drilled deep enough to retain the visors in the operative position with a weight of 10½ oz. on the port and starboard visors and 21 oz. on the centre visor, suspended at the points shown on fig.15B.

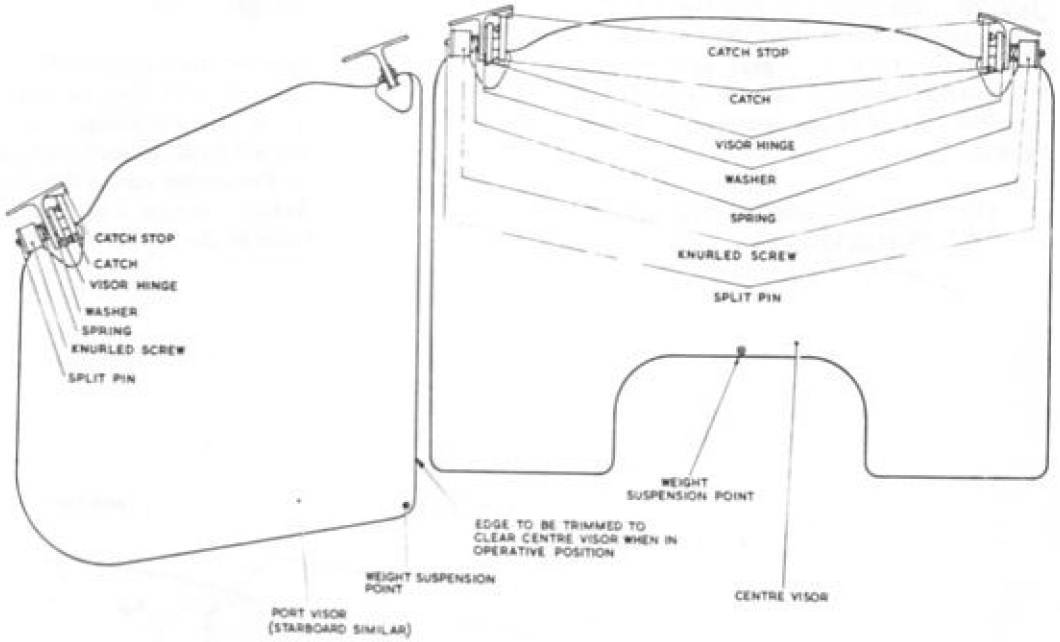


Fig.15B. Fitting anti-glare visors

T.F.R. POD MOUNTING CHECKS

61C. To check the longitudinal angle of the pod mounting proceed as follows:-

(1) Remove the pod (para.74B) and fit the carrier rail in the mounting rail.

(2) Locate the two 3/8 in. diameter holes in inboard rib web in the main-wheel bay. Insert a 3/8 in. diameter rod in each hole and place a straightedge across the rods. Using an inclinometer placed on the straightedge check and note the aircraft rigging angle.

(3) Clamp a straightedge on the rigging face of the pod carrier rail, i.e., the undersurface of the starboard side of the rail.

(4) Using an inclinometer check and note the angle of the straightedge fitted in op.(3). This angle minus the angle obtained in op.(2) is the angle of the pod to the horizontal which must be 1 deg. 30 min. ± 6 min. If the H2S radome and scanner are not fitted a weight compensating allowance of plus 2 min. must be made.

61D. A.T.F.R. pod alignment fixture Part No. 1/U.2220, comprising box Part No. 1/U.2223, and alignment fixture Part No. 1/U.2224, is provided to check a suspect pod mounting after structural damage or a heavy landing. To check the pod mounting alignment proceed as follows:-

(1) Jack the aircraft to rigging position (Sect.2, Chap.4).

(2) Remove the T.F.R. pod and carrier rail (para.74B).

(3) Remove the alignment fixture Part No. 1/U.2224 from the box and fit it to the mounting rail in the aircraft nose. Ensure that the pegs, on the carrier rail of the alignment fixture, engage correctly in the holes in the mounting rail and that the locking pin engages fully in the hole in the hole in the carrier rail.

(4) Fit the compass sighting rods Ref. No. 26DC/95594 and 26DC/95595 to the attachment brackets at formers 75F and 487.5A respectively.

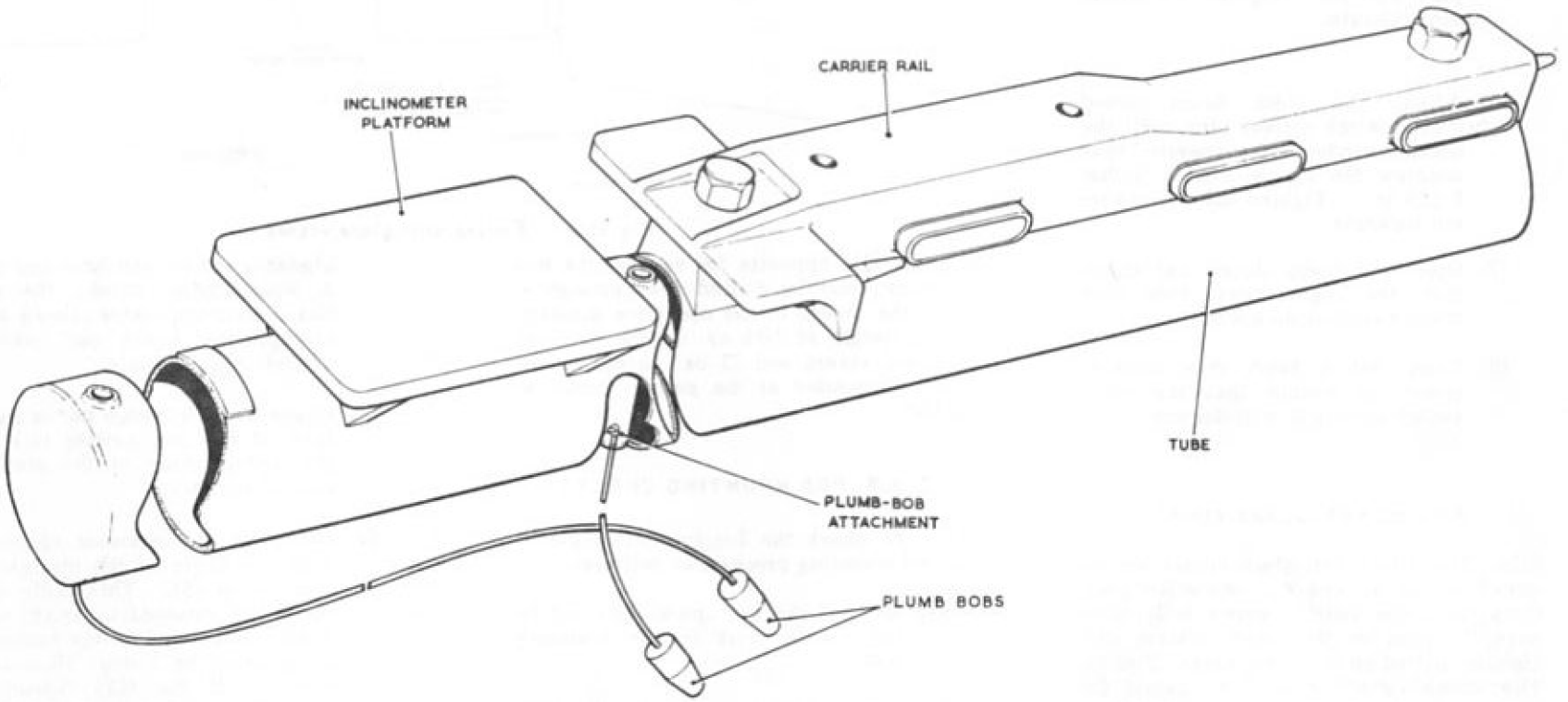


Fig.15C T.F.R. pod alignment fixture

(5) Ensure that the plumb bobs on the alignment fixture are fully suspended and stationary.

(6) Using the plumb bobs and sighting rods check that the plumb lines align coincidental to within ± 0.020 in with a line parallel to a line through the sighting rods.

(7) Using an inclinometer on the platform on top of the alignment fixture check that the nose up inclination is 1 deg 30 min ± 6 min. If the H2S scanner and radome are not fitted a weight compensating allowance of plus 2 min. must be made.

(8) On completion of check, remove the alignment fixture and sighting rods, refit the TFR pod and carrier rail (para 74C), lower the aircraft and remove the ground equipment.

TFR POD COOLING

61E. During ground running of the Terrain Following Radar induced air cooling must be applied to the pod.

Pressure cabin keel drainage

61F

(1) Water drain valves must be periodically blown through from inside cabin, using a low pressure air supply. Blowing into valve drain hole from outside cabin, in an endeavour to clear obstruction, is not advisable since this has effect of moving obstructing debris further into structure, to possibly cause a future obstruction. If obstruction cannot be cleared by blowing from inside cabin, use a pair of tweezers in a careful attempt to extract debris. If tweezers are not successful, remove valve cover and carefully clean out valve. Do not, in any circumstances, prod into drain hole otherwise valve leaf spring may be damaged.

(2) Paraffin wicks, especially those subjected to high temperature, tend to become hard during service and thus fail to transfer water. Remove hard wicks and fit serviceable replacement wicks.

REMOVAL AND ASSEMBLY

General

62. The procedure for dismantling the fuselage into its main components is given pictorially on the removal illustrations. Only the dismantling operations are given in detail since installation is a reversal of the removal procedure. Where differences do occur they have been included on the keys to the removal illustrations.

SEALING COMPOUNDS

General

63. General notes on the method of sealing are given in the following paragraphs and in some instances details are included on the dismantling illustrations. Full details of sealing techniques using Araldite 121N are given in AP 101B-1900-6A to which reference must be made if further information is required. Information on Thiokol sealants is given in the following paragraphs. Pressurisation checks must be carried out as described in Sect.3, Chap.8, when windscreen, cabin window, air bomber's window, periscope and sextant mounting seals have been disturbed during removal operations.

63A. The Thiokol sealants used are two-part compounds, base compound and accelerator supplied in pre-measured quantities of base and accelerator. The accelerator must be stirred in its own container until an even streak-free colour is obtained and then added to the base and stirred until an even streak-free colour is obtained. Vigorous and excessive stirring must be avoided as the increase in temperature caused by vigorous stirring combined with the increase in temperature caused by the chemical action of adding the accelerator to the base, reduces the application and cure times of the mixed compound. To facilitate mixing it is recommended that the rim of the base container be removed completely. Immediately the

▶ accelerator is added to the base the mixture commences curing to a solid rubbery state. The following are definitions of terms applied to the mixture during the transition period:-

Pot life

Is the period of time within which the mixed sealant has a viscosity such that it may be successfully and efficiently applied by a specified method.

Work life

Is the time required for a mixed sealant to reach an initial rubbery state i.e., to exhibit the first traces of elasticity when pulled out to a length of one inch.

Tack-free time

Is the time at which the surface of the mixed sealant no longer exhibits adhesive properties.

Cure time

Is the time for the mixed compound to reach a final rubbery state whereby its cured properties, e.g., strength, elongation and hardness, attain those specified by the manufacturer.

The lives and times given in Table 1 apply at a temperature of 75 deg F and a relative humidity of 50 per cent. A fall in temperature of 10 deg will double the time, a rise in temperature of 10 deg F will halve the time.

63B. In addition to the sealants in Table 1, PR 1005L Ref. No. 33H/2244759 is used. This is a one part synthetic rubber solution which is applied by brush and acts as a barrier material. Overcoating of the Thiokol sealants by PR 1005L hastens the cure of the sealants and provides a smooth tough flexible cover.

Application of sealants

64. It is of the utmost importance if successful adhesion of sealant is to be achieved that all surfaces to be sealed be thoroughly cleaned of all grease, oil, wax, old sealant and other contamination. To prepare a surface:-

(1) Prior to using Araldite 121N, remove the old sealing compound and clean the surface using Trichloroethane Ref. No. 33D/2201949.

(2) Prior to using Thiokol sealants, clean the surface using Methyl Ethyl Ketone (MEK) Ref. No. 33C/2203584 applied with clean lint-free cloth. Final cleaning of the surface must be carried out immediately prior to sealant application. If application of sealant is delayed the surface must be re-cleaned before proceeding.

The tools available for Thiokol sealant application are as follows:-

Ref.No.	Tool
3AP/2042840	Gun, air operated (for use with sealant cartridges)
1B/1275208	Gun, manually operated
1B/1275210	Cartridge
1B/1275211	Nozzle, 6 in x 1/16 in
1B/1275212	Nozzle, 8 in x ¼ in

Windscreen sealing

65. With the exception of window panels to Mod.1901 and 2226 standard all window panels (fig.15F) have a ridged sealing strip moulded to the panel surrounds, consequently additional sealant is not required and must not be used. On window panels to Mod.1901 and 2226 standard (fig.15E) additional sealant is required and Thiokol PR1422 or Boscoprene 2100 is used to seal the gap around the top and side edges of each panel's outer glass layer.

Transport joints

66. Surfaces should be bolted together before the sealing mixture loses its tackiness. Bolts must be dipped in the sealing mixture before assembly.

WINDSCREEN INSTALLATION

Removal – centre or side window panel

67. Proceed as follows:-

(1) Disconnect electrical cables from terminal block on panel. Wrap and stow cable ends.

(2) Remove demisting pipes, stand by compass and wiper arms, from frame. ◀

TABLE 1

LIFE OF SEALANTS

Sealant	Approximate times (hours)			
	Pot life	Work life	Tack free time	Cure time
P.R.1301-1 Ref. No.33H/NIV.	0.5	1	9	16
P.R.1422-½ Ref. No.33H/2203110	0.5	1	4.5	10
P.R.1422-2 Ref. No.33H/2203109	2	4	2.4	40

(3) Support panel and remove panel securing screws together with windscreen wiper stops.

NOTE . . .
A panel clamping frame is released on removing screws from panels of Mod.1901 and 2226 standard. All other panels have integral clamping frames.

(4) Remove panel by pressing it from frame.

Fitment - centre or side window panel

67A. Proceed as follows:-

(1) Thoroughly clean panel mounting frame (para.64), ensuring that all traces of old sealing compound are removed from the panel seating area. Where necessary repair the seating using Araldite 121N.

(2) Check electrical values of replacement panel (Sect.6, Chap.13) and examine panel surfaces for damage. (Protective adhesive paper on surfaces should not be removed until installation is complete).

(3) Apply thin smear of petroleum jelly (Vaseline) to panel surrounds and seating areas, the jelly to act as a parting agent.

(4) Place panel in frame, taking care not to damage Thiokol seal and panel surfaces. Support panel in position.

(5) Correctly position windscreen wiper stops on outside of frame, insert panel attachment screws and, where applicable (para.67(3)), offer up clamping frame.

(6) Tighten screws evenly until panel is loosely secured in frame.

(7) Position panel in frame so that there is a gap of 0.03 to 0.07 in around the top and side edges of the panel outer glass layer.

(8) Tighten screws evenly and progressively, those through the electrical terminal blocks being torque loaded to 7 ± 1 lb in (Excessive tightening of these screws will damage the blocks).

(9) Connect and test windscreen electrical heating system (Sect.6, Chap.13).

(10) Satisfy requirements of para.65.

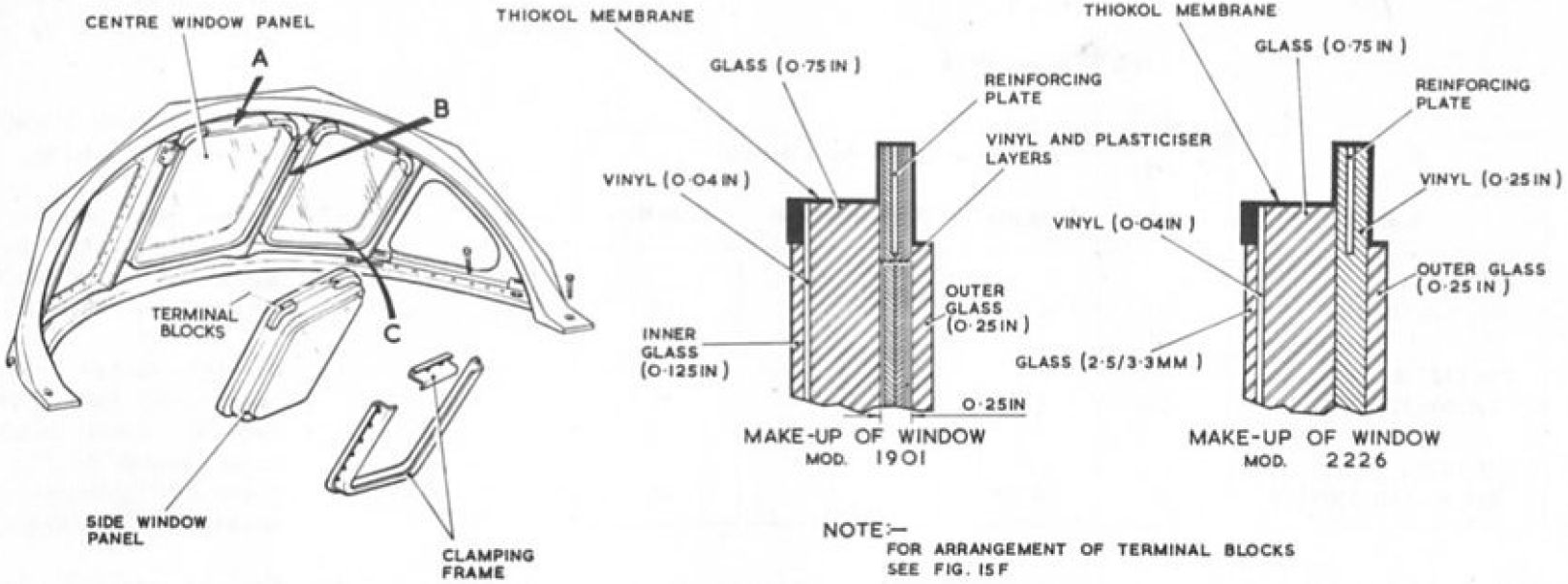
(11) Restore the windscreen thermal demisting, windscreen wiper and compass systems. Check these systems for correct functioning.

Removal/fitment - d.v. window

67B. To remove either direct vision window, release window locking mechanism by pulling release handle down through approximately 80 deg, hinge window down until clear of frame, lift aft hinge out of slot in guide tube then slide windows aft until forward hinge disengages from guide tube. To fit window reverse removal procedure.

Removal of windscreen frame

67C. Refer to fig.19.



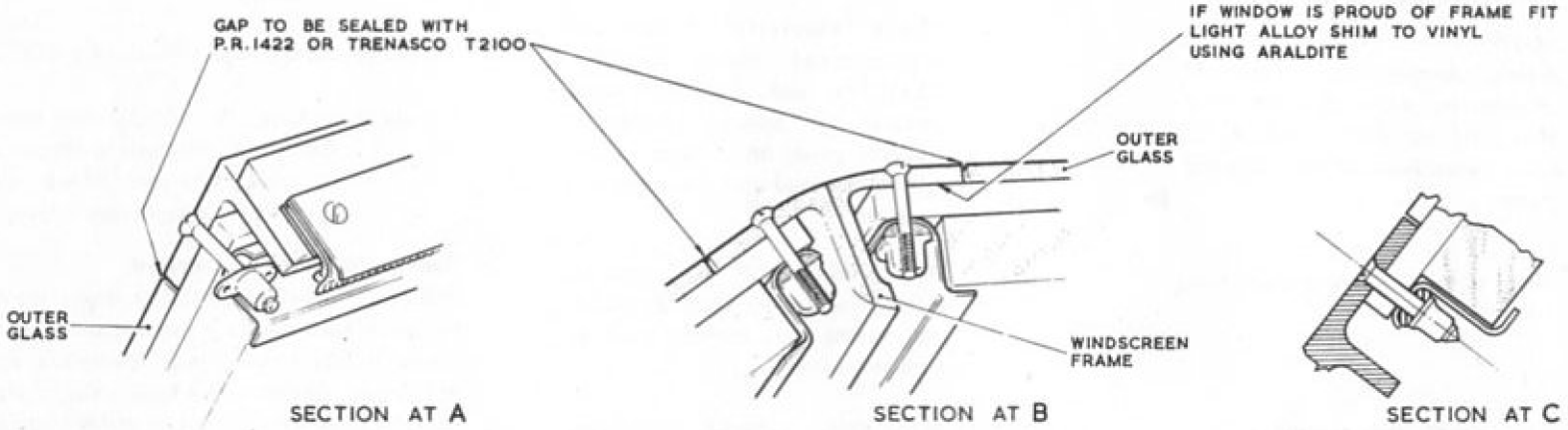


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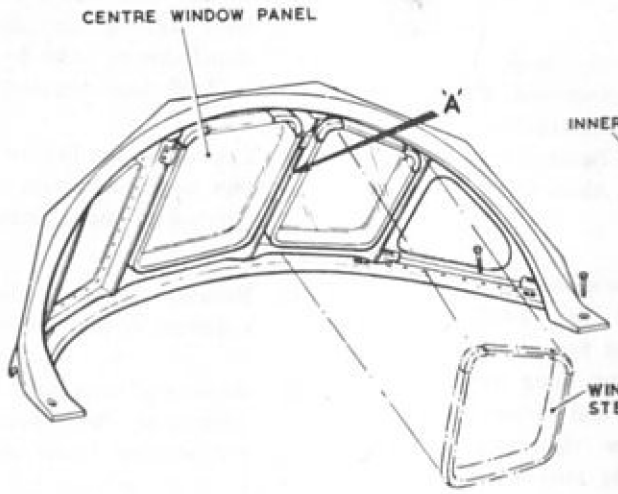
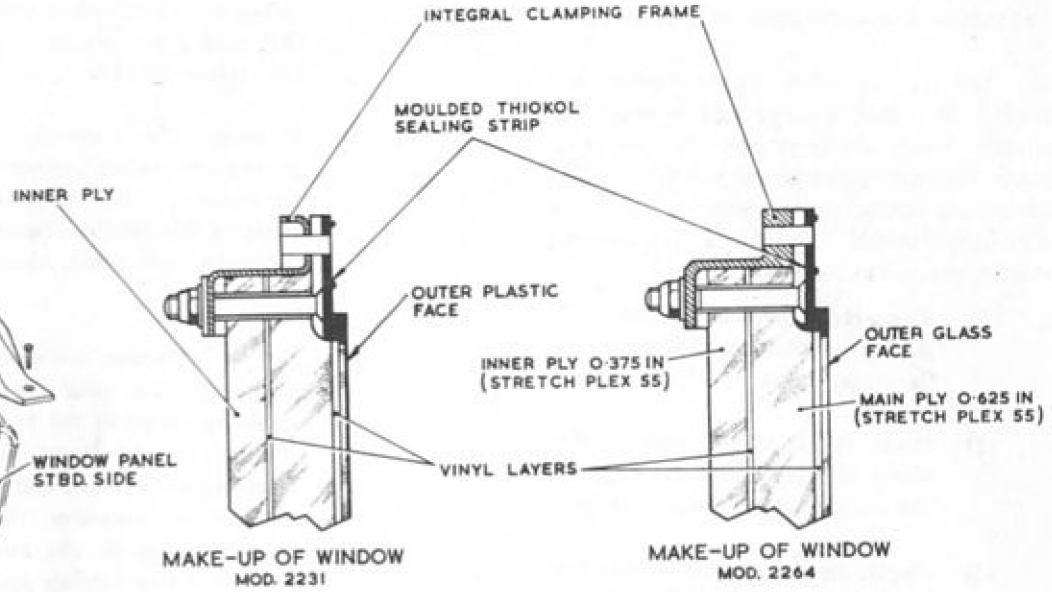
Fig. 15E Windscreen window panels–fitment details–Mod 1901 & 2226

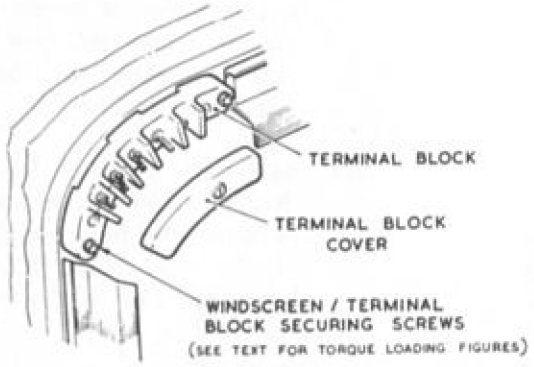


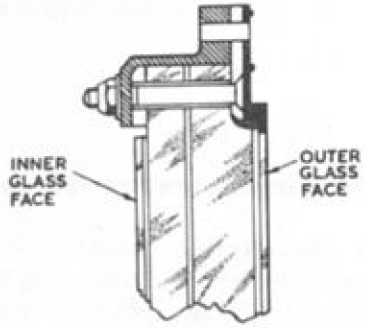


NOTE:- BOSTIK SEALANT MUST NOT BE USED WHEN FITTING THESE WINDOWS. ADEQUATE SEALING IS PROVIDED BY THE MOULDED STRIPS ON THE SURROUNDS OF EACH WINDOW

NOTE:- MOD. 2231, 2264 AND 2365 WINDOW PANELS ARE FITTED TO STBD. SIDE OF WINDSCREEN FRAME ONLY (CO-PILOT'S POS)

NOTE:- MOD. 2402 INTRODUCES PORT (1ST PILOT'S POSITION) AND CENTRE WINDOW PANELS OF SIMILAR CONSTRUCTION TO MOD. 2365 PANEL.





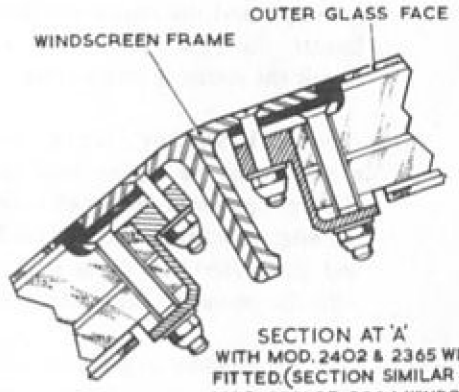


Fig. 15F Windscreen window panels-fitment details-Mod. 2231, 2264, 2365 and 2402

◄ Mod 2402 incorporated ►

PRESSURE CABIN WINDOW INSTALLATION

68. The pressure cabin circular windows are fitted with a glazing compound between the window Vinyl interlayer and the mounting frame. This glazing compound is Araldite 121N the mixing instructions of which are given in A.P.101B-1900-6A. To fit a replacement window proceed as follows:-

(1) Remove, completely, the old glazing compound and degrease the mounting frame.

(2) Cover the faces and edge of the Vinyl interlayer and the edge of the outer glass layer with Vaseline.

(3) Apply an even layer of Araldite glazing compound, thicker than is eventually required, in the mounting frame.

(4) Apply a fillet of Araldite to the angle formed by the Vinyl interlayer and the toughened glass. Ensure that the fillet does not impair the retaining ring seating.

(5) Press the window firmly and evenly into the frame until the glazing compound exudes all round the edges internally and externally and the outer glass layer is flush with the pressure cabin outer skin.

(6) Bolt the window in position using the retaining ring. Tighten the bolts sufficiently to retain the window in the position given in sub-para.(5).

(7) Scrape all exuded glazing compound from edges and allow the glazing compound to harden for a minimum of 6 hours.

(8) Remove the window, inspect glazing compound surface and, if necessary, fill indentations ensuring that the flush finish of the surface is maintained. Allow filling to harden.

(9) Fit the window, complete with retaining ring and the small retaining clamp at the top of the window, to the frame using the retaining screws, nuts and washers. Uneven or excessive tightening must be avoided, the nuts need little more than nipping up.

(10) Finally apply a liberal coating of Thiokol P.R.1422 around the inside glass layer edge, the retaining ring and the securing nuts. Fill the gap between the outer glass layer and the pressure cabin skin with Thiokol P.R.1422.

AIR BOMBER'S WINDOW INSTALLATION

68A. The air bomber's window is bedded into the structure using Thiokol sealing compound P.R.1301-1 Ref.No. 33H/NIV. between the window Vinyl interlayer and mounting frame. To fit a replacement window proceed as follows:-

(1) Remove the 50 - 2 B.A. screws securing the defective window.

NOTE . . .
It will be necessary to remove the leading edge fairing strip and the bolts securing the de-icing fluid distributor in order to gain access to the forward retaining bolts.

(2) Disconnect the hot air distributor pipe to give adequate clearance for removal of the defective window.

(3) Remove the inner clamping ring followed by the defective window.

(4) Remove all traces of the old sealing compound and thoroughly clean the window frame and clamping ring using M.E.K. Ref.No. 33C/1322 and clean lint free cloth.

(5) Temporarily fit the replacement window complete with clamping ring and check that a clearance of 0.03 to 0.11 in exists between the outer glass layer and the skin aperture. Trim, if necessary, the window frame and front cover strip to obtain the clearance. Remove the window.

(6) Apply two coats of P.R.1005L Ref.No. 33H/91 to the inner face of the window frame and the edge of the skin flange. Allow the barrier material to dry between coats.

(7) Thoroughly mix Thiokol sealant P.R.1301-1 and allow to stand until it reaches the consistency of soft putty.

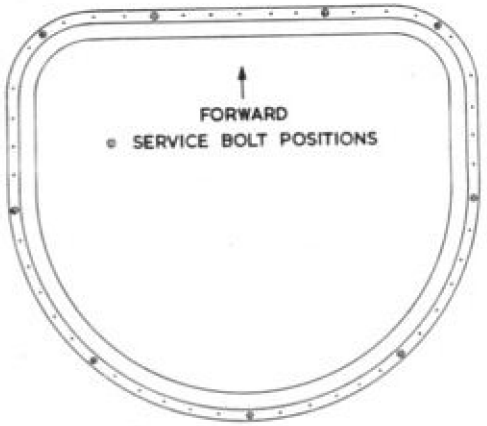


Fig. 15G **Air bomber's window service bolt positions**

(8) Temporarily seal the window securing bolt holes in the window frame by applying masking tape along the outer skin line.

(9) Using a gun dispenser or a spatula, apply the sealing compound to the window frame in a continuous layer approximately 0.125 in. thick. Allow the applied sealing compound to settle until it has no tendency to run, does not impair the insertion of the attachment bolts and maintains the 0.125 in. thickness.

(10) Apply a fillet of sealing compound in the angle formed by the window Vinyl interlayer and the inner toughened glass. Ensure that the fillet does not impair the clamping ring seating.

(11) Apply a thin film of Vaseline to the mating face of the window and the outside angle of the clamping ring to act as a parting agent.

(12) Insert the window into the frame and apply an even pressure to the centre of the window until the sealing compound exudes all round the edges, internally and externally, and the outer glass layer is flush with the outside skin.

(13) Remove the masking tape sealing the bolt holes, fit the clamping ring and secure the window by tightening the securing bolts in balanced sequence.

NOTE . . .
Excessive tightening of the bolts must be avoided, they need little more than nipping up.

(14) Remove all exuded sealing compound using a clean lint free cloth and M.E.K.

(15) Apply a coat of barrier material P.R.1005L (Ref.No. 33H/91) to the outer skin joint, to the bolt heads, and the inner clamping ring along the line of anchor nuts and covering the inner sealing compound joint.

(16) Reconnect the hot air distributor pipe ensuring that the air distribution is parallel to and does not impinge on the inner glass layer.

(17) Allow a cure time of at least 16 hours before cabin pressurisation is applied.

CANOPY CIRCULAR WINDOW

69. To remove the circular window from the cabin canopy proceed as follows:-

(1) Remove the sun blind and anti-flash screen from the runners on each side of the window.

(2) Remove the locking wire securing the inhibitor cartridge tubing to the connection on the window. Remove the inhibitor cartridge from its mounting clip.

(3) Remove the nuts and washers from the 34 2 B.A. screws securing the window to the canopy frame.

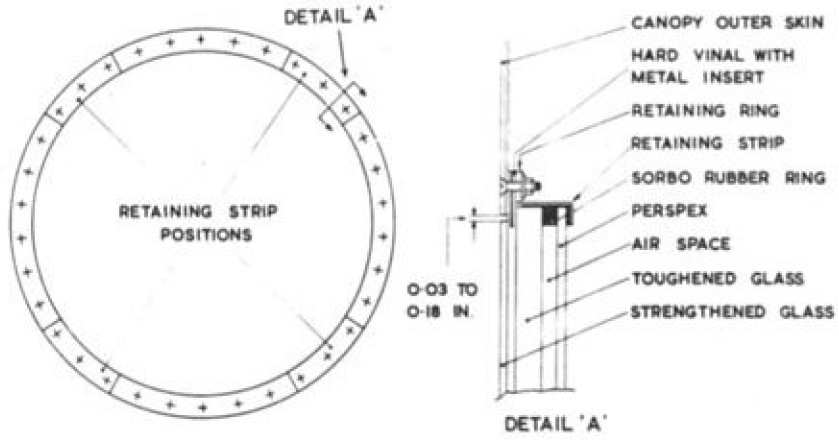
(4) Remove the four window retaining strips and the window retaining ring.

(5) Remove the 34 2 B.A. screws and remove the window from the canopy frame.

69A. The canopy circular window is fitted with a glazing compound - Araldite 121N - between the window Vinyl interlayer and the mounting frame. Mixing instructions for the glazing compound are given in A.P.101B-1900-6A. To fit a replacement window proceed as follows:-

(1) Remove completely, the old glazing compound from the mounting frame and thoroughly degrease the frame.

NOTE . . .
Great care must be exercised when removing old glazing compound



◀ Fig. 15H Canopy circular window ▶

from the frame otherwise the frame may be damaged.

(2) Temporarily fit the window retaining ring to the mounting frame on the canopy, bolt the window in position. The position of the window is governed by the inhibitor cartridge which must be fitted in its mounting clip with the collar on the cartridge bearing against the clip and the tubing connected to the window. The inhibitor connection on the port window faces forward and on the starboard window faces to the rear.

(3) Check that a clearance of 0.03 to 0.18 in. exists between the outer glass layer of the window and the surrounding external skin. Trim the external skin panel, if necessary, to obtain this clearance. Remove the window.

(4) Cover the outer face and edge of the Vinyl interlayer and the edge of the outer glass layer with a thin even coat of Vaseline.

(5) Apply an even layer of Araldite compound, thicker than is eventually required, to the mounting frame.

(6) Apply a fillet of Araldite compound in the angle formed by the Vinyl interlayer and the inner glass layer. Ensure that the fillet does not impair the seating of the retaining ring.

(7) Press the window firmly into the frame, in the position arrived at in item (2). until the glazing compound is exuded all round the window edges, internally and externally. The outer glass layer outer surface must not be more than 0.025 in. above or below the outer skin surface.

(8) Secure the window in position using the retaining ring and the 34 screws, washers and nuts. Tighten the screws evenly and just sufficient to hold the window in the position.

(9) Remove all the exuded compound and leave the window in position for at least 6 hours to allow the glazing compound to harden.

(10) At the end of this period, carefully remove the window, inspect the glazing compound and, if necessary, fill any indentations, ensuring that the flush face of the surface is maintained. Allow the filling to harden.

(11) Remove the Vaseline applied in item (4) fit the window and retaining ring to the canopy in the same position as in item (2) and (7). Fit the 34 retaining screws and place the four retaining strips in position (fig.15H).

(12) Fit washers and nuts to the retaining screws and tighten. Excessive and/or uneven tightening must be avoided, the screws need little more than nipping up.

(13) Apply a liberal coating of Thiokol P.R.1422 to the edge of the Vinyl interlayer and over the window securing nuts.

(14) Fit the inhibitor cartridge in the

mounting clip and connect the tube to the connector on the window. Secure the tube to the window connector with five complete turns of 22 s.w.g. locking wire (Ref.No.30A/3339).

(15) Fit the sun blind and anti-flash screen.

(16) Fill the gap between the outer glass layer and the canopy outer skin with Thiokol P.R.1422

PERISCOPE SEXTANT MOUNTINGS

70. Sextant mountings are easily removed by disconnecting an electrical cable and removing the screws securing the mountings to the fuselage. A new mounting is provided with four Langite seals, two of which are stuck to it. The other two should be stuck to the fuselage with orange shellac (Ref.No. 33A/172) before the mounting is installed.

BOMB DOOR JACK

71. To remove a bomb door jack:-

(1) Select bomb bay doors CLOSED.

(2) Remove fuses 602, 638, 639 and 922 from the port fuselage fuse and relay panel 3P.

(3) Enter the bomb bay through the access doors at the forward end of the bomb doors and disconnect the swivel link block from the bracket securing it to the bomb door mechanism structure.

(4) Disconnect and blank off the hydraulic pipes leading to the swivel link block. Release the connections slowly.

(5) Remove the bolt connecting the bomb door jack to the bomb door mechanism lever.

(6) Remove the taper pins and bolts locking the spacer bushes and bearings to the bomb door jack attachment pin.

(7) Remove the bomb door jack attachment pin using an extractor (Ref.No. 26DC/95058).

NOTE . . .
After installation of the bomb door jack, bleed the hydraulic circuit as described in Sect.3, Chap.6.

BOMB DOOR MECHANISM LEVER

72. To remove a bomb door mechanism lever:-

(1) Select bomb doors open and place the bomb door selector switch-guard in position.

(2) Disconnect the bomb door jack fork-end and the adjustable links from the bomb door mechanism lever.

(3) Remove the taper pins and bolts locking the spacer bushes and bearings to the lever attachment pin.

(4) Remove the lever attachment pin with the extractor (Ref.No. 26DC/95058).

ENTRANCE DOOR

Entrance door removal

73. To remove the main entrance door:-

(1) Select the entrance door open.

(2) Close the pneumatic system ground isolation cock.

(3) Disconnect the door from the operating jacks, taking suitable precautions (para.49) to prevent the door from swinging downwards and damaging the structure around the hinge assembly.

(4) Remove the access panels from the fuselage inner skin - adjacent to hinge points - to provide access to the hinge pins. Support the door.

(5) Remove the hinge pins and washers from the hinge assemblies. The washers may be of different thickness and a note should be made of the location and thickness of each washer. (para.50(8) refers).

(6) The door may now be lowered from the aircraft.

Installation

74. To fit the entrance door, reverse the above procedure. If a replacement door is to be fitted to the aircraft however, certain adjustments may be required before correct

functioning of the entrance door or its associated mechanisms is achieved. Information on the various checks recommended to prevent maladjustment of the main entrance door, or its associated mechanisms, is contained in para.49 to 53 of this chapter.

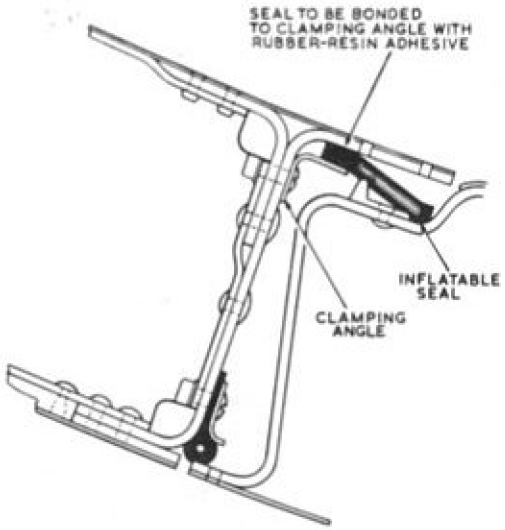
Door seal

74A. The entrance door inflatable seal is retained in its operating position with fore and aft, side, and corner angle-section clamping strips. The clamping strips are secured to the door frame with 4 B.A. mushroom-head screws and anchor nuts. Should any section of the clamping strip be removed or any part of the seal be disturbed, the adhesive bond between clamping angle and seal is destroyed and must be replaced before any attempt is made to operate the door seal inflation system. To fit an inflatable seal or replace the bond in any section distrubed proceed as follows:-

(1) Thoroughly clean and dry the mating surfaces - clamping angle and mating face of rubber seal, Bostik cleaner No.6104 is recommended for use in preparing these surfaces.

(2) Apply an even film of rubber resin adhesive (Ref.No. 33H/72) to the clamp surface of the angle and the mating face of the seal. Information on the use of adhesives is given in A.P.1464B, Vol.1, Part 2, Sect.4, Chap.6.

(3) When the adhesive is dry (normally in 15 to 20 minutes), locate the seal in the door frame. Simple



◀ Fig. 15J Section showing attachment of seal ▶

U-clamps (local manufacture) may be used at this stage to retain the seal in its correct position.

(4) Locate the clamping angle sections, one each side, fore and aft and at the four corners. Pressure must be applied in such a manner that no air pockets are formed between the mating surfaces.

(5) Fit all clamping angle securing screws and tighten evenly, ensuring that no stretch or ripple is introduced in any part of the seal.

Trimming

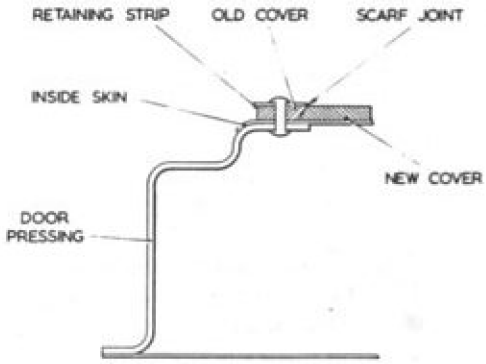
74B. The inside surface of the entrance door is covered with Neoprene edged with light-alloy retaining strips riveted to the inside surface skin. To avoid removing the retaining strips with the resultant enlargement of the close tolerance rivet holes when replacing the cover, it is recommended that the old cover be removed by cutting around the inside periphery of the retaining strips. Care must be taken to avoid damaging the inside skin by score marks. Trim the edge of the new cover and the remains of the old cover retained under the strips, to form a scarf joint of approximately 30 deg as shown on fig.15K. Secure the new cover in position with adhesive Titebond 22 (Ref.No. 33H/9995814) or Titebond 24 (Ref.No. 33H/9156565) ensuring that the scarf joint is firmly bonded.

TERRAIN FOLLOWING RADAR POD

Removal

74C. To remove the Terrain Following Radar pod from the aircraft nose section proceed as follows:-

(1) Remove the jubilee clips securing the seal to the pod and the pod fairing. Remove the seal and clips.



◀ Fig. 15K Entrance door trim replacement ▶

▶ (2) Remove the five bolts securing the fairing to the H2S radome. Remove the fairing and the pod air intake.

(3) Gain access to the rear of the pod and disconnect the flexible ducting at the coupling section.

(4) Remove the bolts securing the two halves of the rear cover except the bottom bolt in each half.

(5) Swivel the two halves of the rear cover apart and undo the cable plug from the rear of the pod.

NOTE . . .
The grommet, which protects the cable where it passes through the rear cover, remains on the cable.

(6) Replace the two halves of the rear cover and fit the securing bolts.

(7) Lift the pod carrier locking pin clear of the carrier rail and completely withdraw the pod.

If the pod is not being replaced, remove the carrier rail from the pod, fit the carrier rail in the mounting rail ensuring that the locking pin engages correctly and fit the blanking cap.

Assembly

74D. To fit the pod in the aircraft nose section proceed as follows:-

(1) Remove the blanking cap, if fitted, and retain for subsequent fitting when required.

(2) Remove the pod carrier rail from the mounting rail and fit the carrier rail to the pod. Lock the attachment bolts with 22 swg locking wire (Ref.No.30A/9437135).

(3) Insert the pod in the aperture, lift the locking pin and fit the carrier rail into the mounting rail.

(4) Push the pod fully in to engage the carrier rail spigots in the holes in the mounting rail, and engage the locking pin in the carrier rail.

NOTE . . .
The triangular block pinned to the locking pin must be fully home in the recess in the nose section otherwise the pod to nose section fairing cannot be fitted.

(5) Gain access to the rear of the pod and connect the flexible ducting at the coupling section.

(6) Remove the bolts securing the two halves of the rear cover to the pod.

(7) Connect the cable plug to the rear of the pod and refit the rear cover.

NOTE . . .
Ensure that the grommet is fitted correctly to the halves of the rear cover.

(8) Fit the fairing over the pod and secure it with five bolts to the H2S radome fit the pod air intake.

(9) Fit the pod to fairing seal and secure it in position with the two Jubilee clips. Ensure that the clip tightening screws are at the top.

NOTE . . .
Ensure that, when tightening the seal to pod clip the air intake is not disturbed.

Fairing and blanking cap sealing

74E. This is by a seal on the trailing edge of the fairing and blanking cap. The seal, formed from Thiokol PR 1422/2 must be 0.030 to 0.10 in. thick by 1 in. wide except at the top centre where the width increases to 2 in. The thickness can be increased where required to cater for irregularities in the contour of the nose section. To ensure correct sealing it is recommended that the fairing and blanking cap are fitted only to the individual aircraft. To form a seal when fitting a new component or when a damaged seal has been removed proceed as follows:-

(1) Dry fit component to check contour of nose section and ascertain if local areas of extra thickness of seal is required. When checking the fairing ensure correct alignment around the pod.

(2) Remove component and thoroughly degrease the area to which the seal is to be attached.

(3) Apply a light smear of Vaseline to the seal seating area on the metal nose section and the H2S radome.

(4) Mix and apply a layer of Thiokol, thicker than is eventually required, to the area degreased in op.(2). ◀

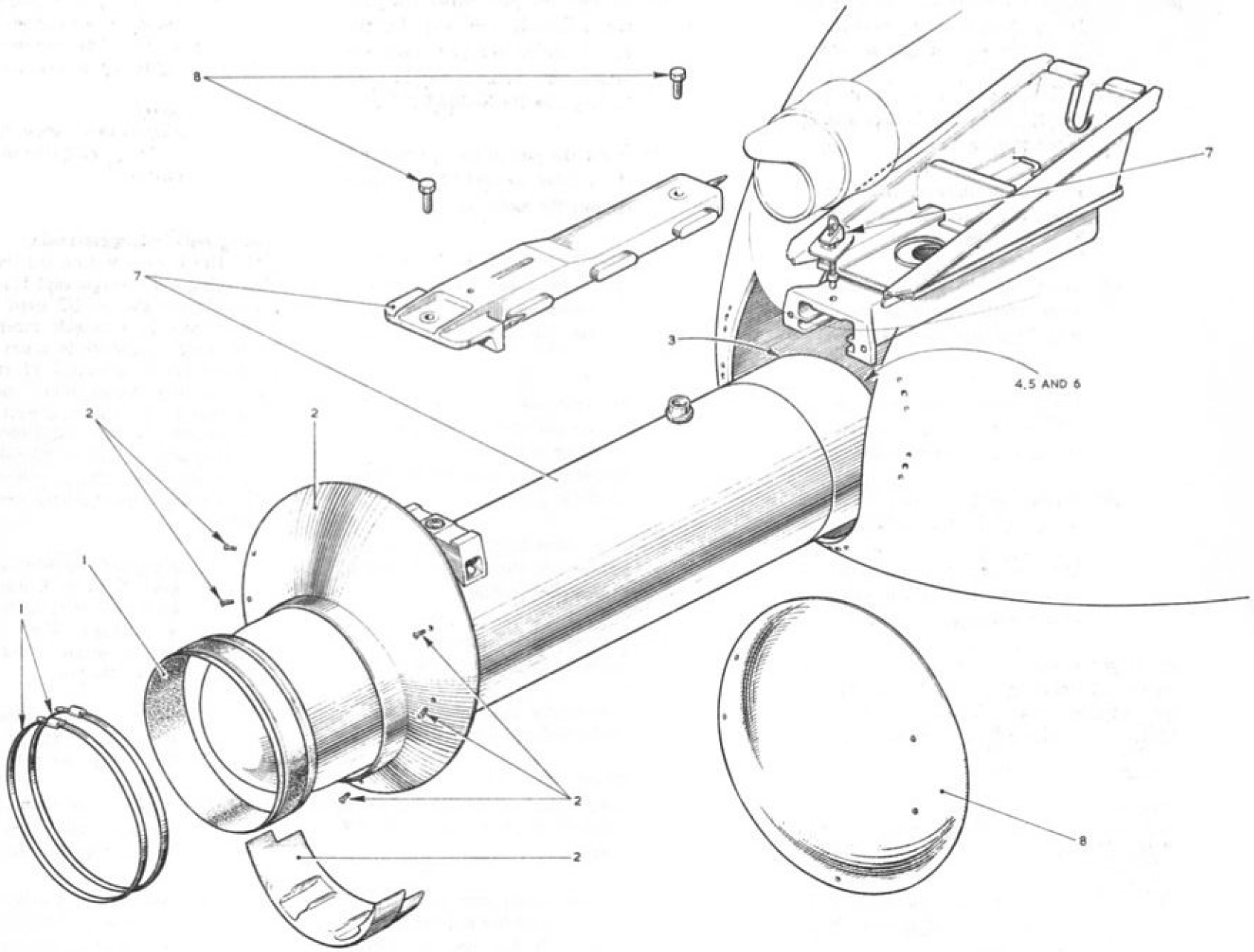


Fig. 15L. T.F.R. pod removal

▶Mod 2480◀

(5) Fit the component ensuring true alignment and fit the attachment bolts. Gently tighten the bolts sufficient to ensure the seal is fully seated and the thickness of the seal is 0.30 to 0.1 in.

(6) Allow the seal to cure in-situ for at least 36 hours in a temperature of approximately 24 deg C.

(7) Remove the component after curing and trim surplus sealant from the trailing edge and remove the Vaseline applied in op.(3).

NOSE RADOME

General

75. Although little difficulty is anticipated when the nose radome is to be removed, a procedure, keyed to fig.16, is provided in the following paragraph. When a radome is to be fitted however, certain preliminary checks and adjustments are necessary to ensure a correct and trouble free attachment, these measures are included in the installation procedure.

Removal

76. To remove a nose radome refer to fig.16 and proceed in the following manner:-

(1) Remove the TFR pod (para 74C).

(2) Remove the cover plates from the anchor bracket attachment recess on each side of the metal nose section.

(3) Attach the anchor brackets (Ref. No. 26DC/95091) to the metal nose section, ensuring that the button in the recess engages in the bracket.

(4) Attach a hoist (refer to Sect.2, Chap.4) to each anchor bracket by means of the hook on top of the hoist.

(5) One man, wearing rubber soled plimsolls and equipped with a torch, should now enter the radome through the hinged circular access door in the forward pressure dome and establish contact with the personnel outside.

(6) Pass the ball-end of each hoist cable through the hole in the base of the longeron on each side of the metal nose, then instruct the man inside to engage each ball securely in the socket of the mating radome longeron.

(7) Position trolley (Ref. No. 26DC/95100) under the radome.

(8) The hoist operators should now take up the slack on both hoist cables.

(9) Instruct the man inside to release the 21 toggle fasteners securing the radome internally, and then to leave the radome.

(10) Release the external quick-release catches which secure the radome to the front pressure dome angle, and those below the access doors on each side of the nose.

(11) Ensure that the weight is safely taken on the hoist, then release the safety release fasteners (painted red), two each side near the top of the radome.

(12) Lower the radome gently to release the dowel pins, make frequent checks to ensure that no fouling of components or structure occurs. The rear end of the radome must be supported until the trolley is reached.

(13) When the radome rests on the trolley detach the ball-ends and winch up so that the cable and ball-ends pass through the holes in the metal nose longerons, then disengage the hoists from the brackets.

Installation

77. To ensure correct assembly of a radome to an aircraft, attachment assemblies are to be adjusted to individual radomes as required. To fit a radome proceed in the following manner:-

NOTE . . .
It is essential that the scanner unit, or ballast (596 lb with box) be installed in the nose section before a radome is fitted, otherwise, correct assembly will be difficult to achieve.

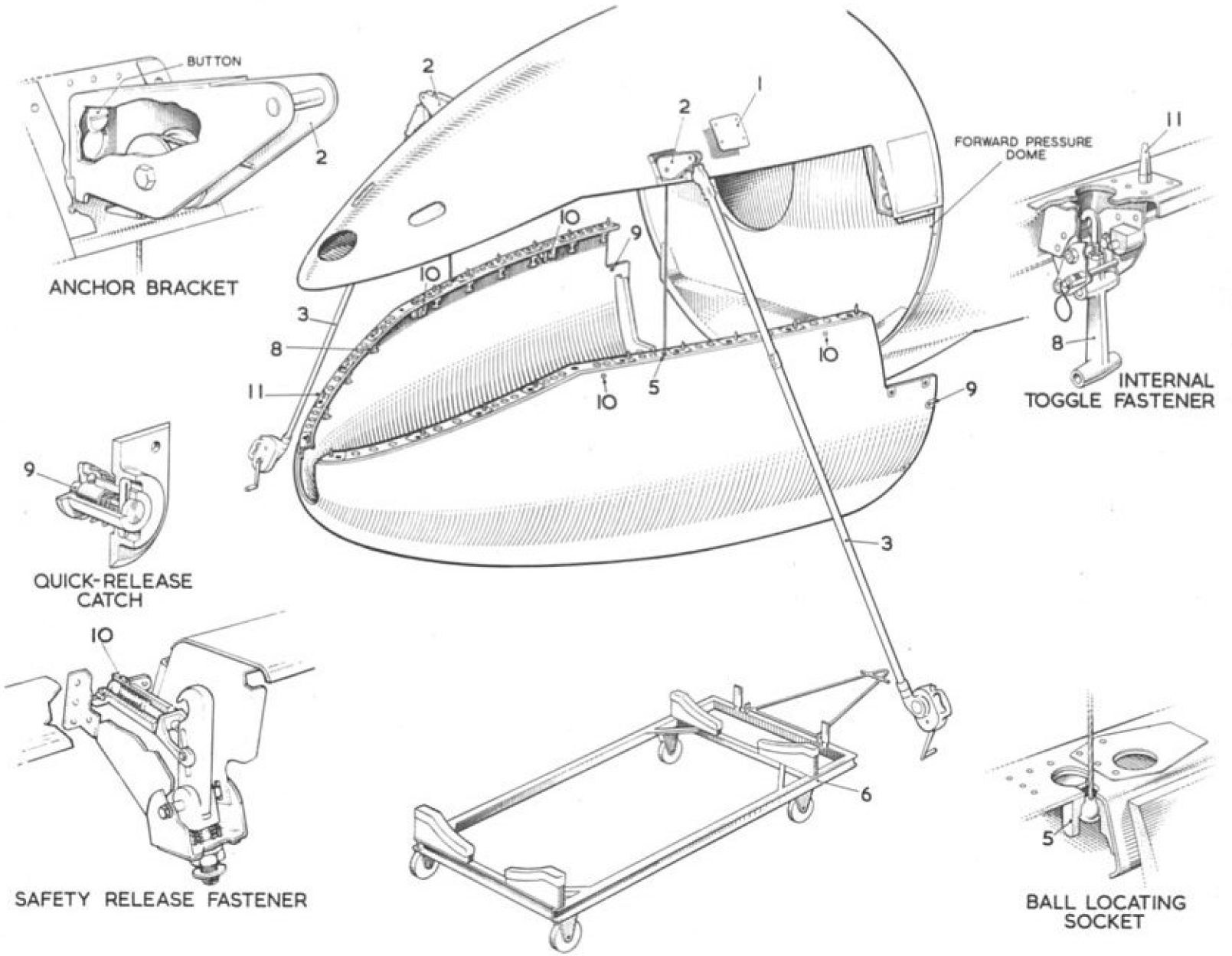


Fig. 16 Removal of nose radome

(1) To facilitate individual adjustment of the radome attachment catches, locate the attachment shoes on the front pressure dome angle and, after removing the split pins, slacken off the four nuts which clamp each lock plate in position, i.e., just sufficient to allow sliding movement. Similarly, slacken off the attachment brackets below the port and starboard access doors.

(2) Position the radome, mounted on the trolley, below the metal nose. Slacken off the adjusting nuts of the four safety release fasteners, so that the slot in the catch lever is horizontal, i.e., in the free condition.

(3) Adjust the toggle fastener hooks, if necessary, so that approximately three threads protrude above the locknut, ensuring at the same time, that the open side of each hook faces outboard, and that the elastic cord is through the toggle lever and anchored to the longeron flange. Check also that the quick-release fasteners are clean and free moving.

(4) Attach the two hoists as detailed in para.76, op.(4) and (5).

(5) Pass the ball-end of each cable through the hole in the base of the metal nose longerons and allow the cables to run out until it is possible to engage each ball in the radome longeron socket.

(6) Both hoists must now be operated slowly and simultaneously to raise the radome. Frequent checks must be carried out during this lift to ensure that radome equipment does not foul the aircraft structure and/or components. As the radome approaches the nose section, lift speed must be reduced to a minimum and special care must be exercised to ensure that the dowel line is true and that the mating longerons, i.e., nose section and radome, are kept parallel. Hoisting should continue slowly until the safety release catches engage.

(7) At this stage, one man wearing rubber soled plimsolls and equipped with a torch, should enter the radome to make necessary preparations for final assembly. Adjustments are carried out in the following manner:-

(a) Ensure that the safety release fastener catches are fully engaged then tighten the nuts on the fork-ends. This will draw the radome further towards the metal nose.

(b) Release the elastic cords from the toggle fastener levers and, beginning at the front, engage the fasteners alternately port and starboard. Any hooks found to be 'high' or 'low' must be marked appropriately.

(c) The nuts on the fork-ends of the safety release fasteners must now be slackened off, the radome evacuated, then lowered on to the trolley.

(8) Hooks requiring adjustment must receive one complete turn in the appropriate direction.

(9) Repeat op.(6) and (7) (a) and (b), engaging all toggle fasteners for complete longeron to longeron contact.

(10) Check that all external quick release catches engage, begining at the two bottom catches and working upward. This will ensure correct locking plate alignment.

NOTE...
It will be found that the bottom rear portion of the radome tends to sag away from the pressure dome angle. If one man pushes the radome up to true contour whilst another engages the two bottom catches, the task should present little difficulty.

(11) When all catches on the pressure dome angle and those below the port and starboard access doors are secure, an overall examination must be made to assess general fairing-in, longeron alignment, etc., of radome to metal nose. Defects must be marked and rectified when the radome is lowered. Slight adjustment to the periphery of the metal nose, if required, may be achieved by gently manipulating the longeron flange inward or outward to suit the radome.

(12) Release and lower the radome in accordance with the removal sequence given, and carry out the necessary adjustments.

(13) Tighten and split-pin lock the nuts on the attachment shoes on the pressure dome angle and those below the port and starboard access doors.

(14) Tighten the locknuts on the toggle fastener hooks ensuring that the hooks remain facing outboard.

(15) The radome is now ready for final installation, after which the hoists and hoist brackets may be removed and the longeron recess cover plates replaced.

(16) Fit the T.F.R. pod as described in para.74D.

KEY TO FIG.17

REMOVAL OF NOSE METAL FAIRING

To remove the nose metal fairing:-

(1) Ensure that all electrical supplies are off.

(2) Remove the T.F.R. pod (para.74C).

(3) Remove the H2S radome (para.76).

(4) Discharge the aft cylinder of the entrance door pneumatic system.

(5) Discharge and remove the H2S and, when fitted, the N.B.C. pneumatic system air storage cylinder (Sect.3, Chap.7).

(6) Drain and remove the air bomber's window de-icing system fluid tank.

(7) Remove the flight refuelling probe and associated equipment, when fitted, (removable fittings Mod.39, S.O.O.) (Sect.4, Chap.2).

(8) Disconnect the following services on, or forward of, the front pressure bulkhead. Blank off all pipes:-

(a) Electrical and radar.

(b) De-icing system.

(c) H2S scanner and, if fitted, N.B.C. pneumatic system.

(d) Cabin pressurisation system.

(e) Calculator static line.

(f) Flight refuelling system (fixed fittings).

(g) Air bomber's window de-icing system drain.

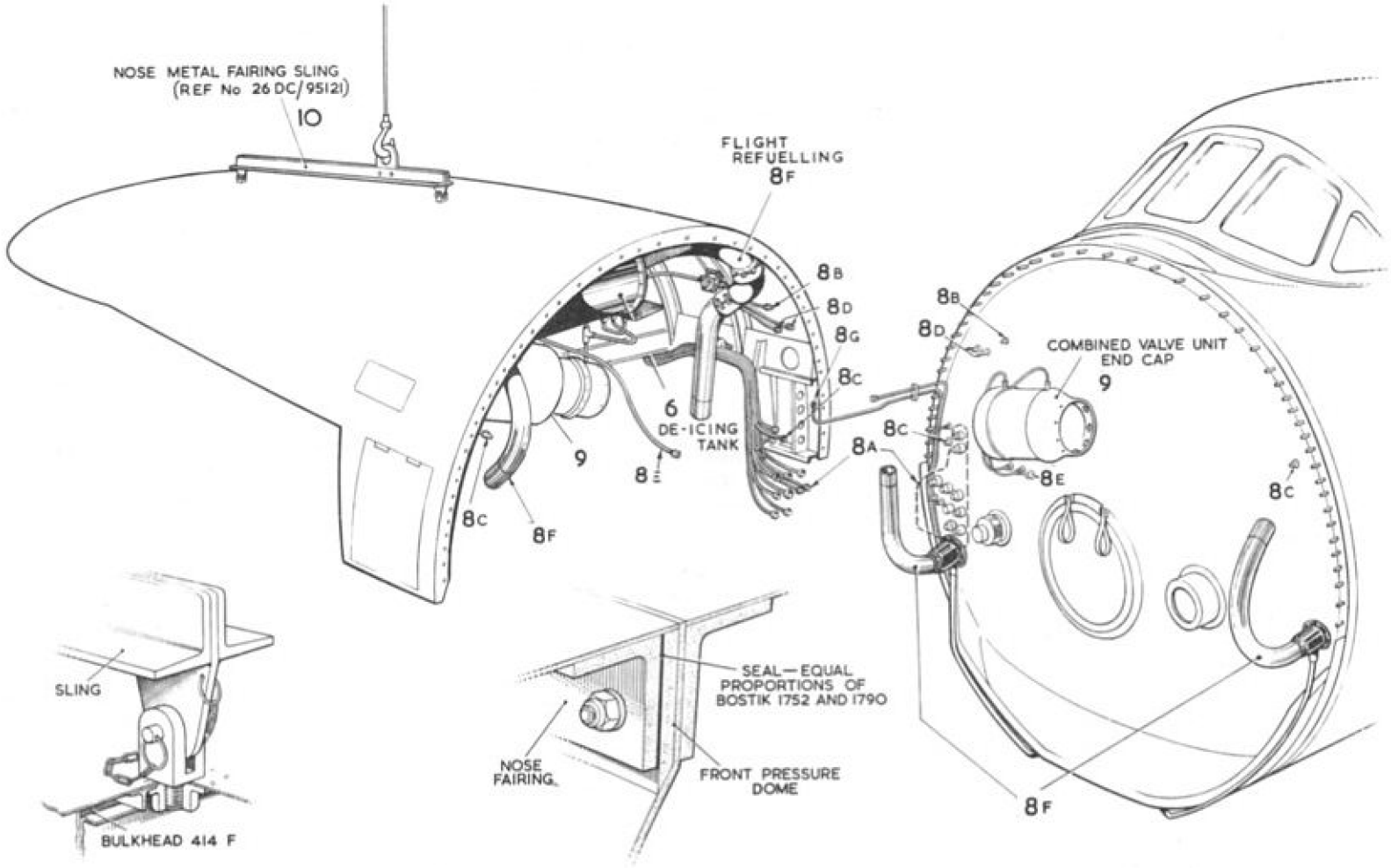
(9) Disconnect the cabin pressurisation system combined valve unit, by unscrewing the sleeve connecting the end cap of the combined valve unit to the shroud unit on the decompression valve. Push the sleeve back on the shroud to complete the division of the unit.

(10) Remove the plug screws from the lifting blocks situated on the longitudinal centre line of the fairing top skin at formers 414F and 470F and attach the lifting sling (Ref.No.26DC/95121).

(11) Prepare a trolley to carry the nose fairing after removal.

(12) Attach a crane to the lifting sling and just take the weight of the nose fairing. Remove the nuts from the studs attaching the nose fairing to the front fuselage.

(13) Move the nose fairing from the front fuselage and when clear lower gently on to the trolley.



SLING ATTACHMENT

TRANSPORT JOINT SEAL

Fig. 17. Removal of nose metal fairing
(◂ Changes to number sequence ▸)

KEY TO FIG.18
CANOPY REMOVAL

To remove the canopy proceed as follows:-

(1) Ensure that the safety pins are fitted in the main gun sear and time delay unit of each ejection seat.

(2) Ensure that the Pip-pin has been removed from the vertical operating lever on the canopy mechanism and the attached safety pin inserted into the jettison gun sear.

(3) Discharge the contents of the air storage cylinders using an adapter, (Ref.No. 4G/6246), at the test points in the pneumatic system.

(4) Ensure that the safety pins are removed from the canopy control lever gate on each side of the cockpit.

(5) Remove the canopy jettison gun as follows:-

(a) Remove the split pin, collar and shackle pin securing the operating arm to the jettison gun sear but DO NOT REMOVE THE JETTISON GUN SAFETY PIN.

(b) Remove the attachment pin attaching the jettison gun piston to the thrust bracket.

(c) Lift the linkage into the jettison gun channel and carefully manoeuvre the jettison gun until it can be lifted upward from the channel and removed.

(6) Disconnect the cables at their point of attachment to the restrictor pin on the time delay unit of each seat.

(7) Push down the quadrant lever on the side of the time delay mechanism to just below the bottom of the guard and disconnect the canopy control valve operating cable. This will prevent a tradesman working in the cockpit from accidentally pulling the cable and moving the valve to the operative position without realizing he has done so when the pneumatic system is empty. Charging the system with the valve in the operative position could result in damage to the canopy release mechanism if the Pip-pins were in position in the pilots' canopy control handle quadrants.

NOTE...

(1) When the cable to the quadrant lever on the side of the time delay mechanism is connected, always ensure that the quadrant lever fork end is returned to its position just above the base of the guard to prevent the cable eye-end springing off.

(8) Replace the set screw in the upper side of the canopy with a canopy lifting eyebolt (Ref.No.26DC/95189). Attach the lifting equipment to the eyebolt with the sling inclined approximately 15 deg. rear of vertical.

(9) Operate the canopy control lever on either side of the cockpit. This frees the canopy from the attachments and by lifting slightly rearward it can now be removed.

Detailed instructions on setting the canopy jettison mechanism is given in Sect.3, Chap.11. When fitting a canopy observe the following:-

1. Fit the canopy and check the gap between the canopy and the cockpit rail. If the gap is 0·01 in. or less, no further action is necessary and the assembly of the canopy can proceed. If the gap is in excess of 0·01 in., seals must be secured to the cockpit rail around the release unit apertures, using Bostik C.S.2558, the thickness of seal used depending on the gap. The seals are as follows:-

Ref.No. 26DC/8254	1/64 in.thick
Ref.No. 26DC/8255	1/32 in.thick
Ref.No. 26DC/8256	1/16 in.thick
Ref.No. 26DC/8253	3/16 in.thick

2. Where seals are secured to the cockpit rail, french chalk must be sprinkled on the seals prior to fitting the canopy.

3. When the canopy is installed ensure that the fork-end on the vertical operating lever mates correctly with the spigots on the operating cross shaft, and check that the canopy control valve is in the exhaust position before charging the pneumatic system.

WARNING...

On installation of a canopy it is important that the release cables are connected to the time delay unit of each seat. After installation of the canopy and prior to charging the pneumatic system an inspection must be carried out to ensure that the control valve is in the fully exhausted position. This position is indicated by the lining up of the white lines on the valve lever and on the bottom guard plate.

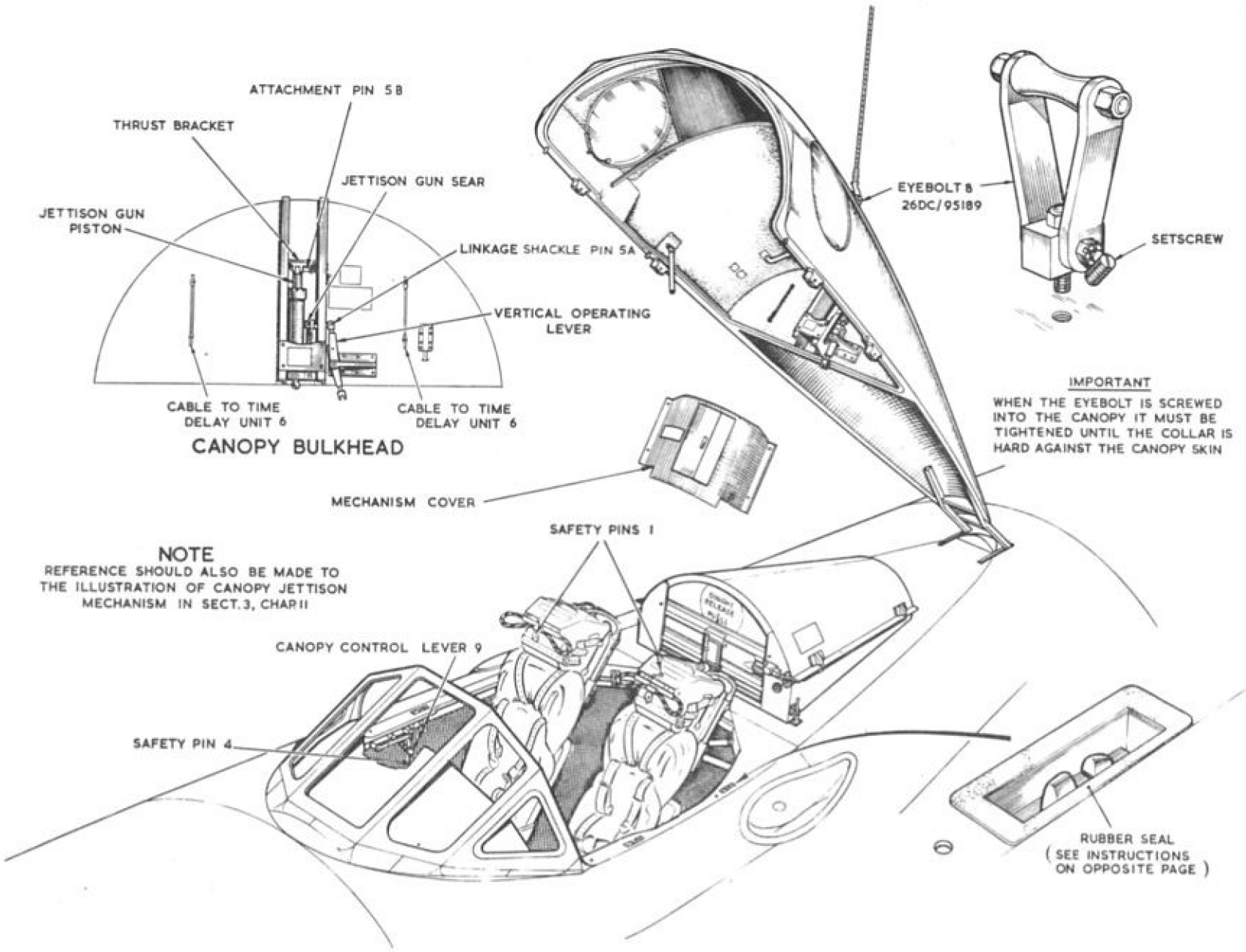
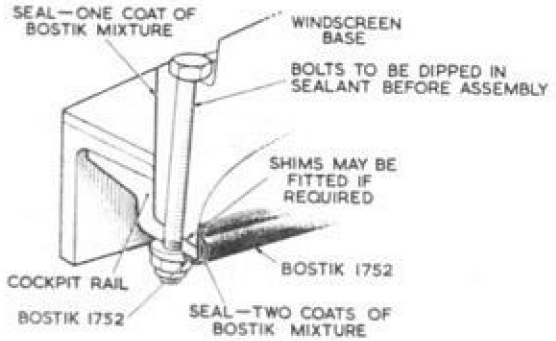
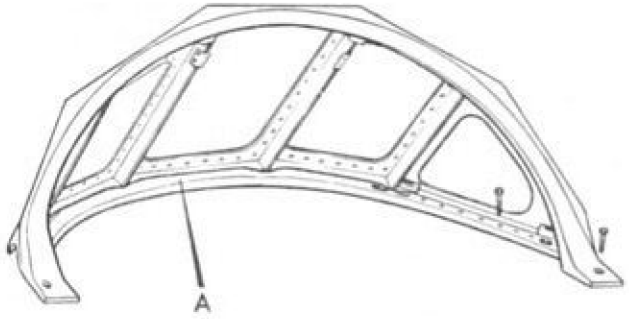


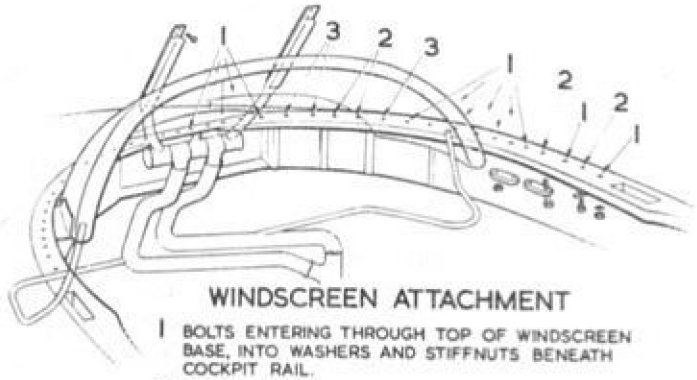
Fig. 18 Canopy removal



SEALING MIXTURE — EQUAL PROPORTIONS OF BOSTIK 1752 AND 1790

SECTION AT A





WINDSCREEN ATTACHMENT

1 BOLTS ENTERING THROUGH TOP OF WINDSCREEN BASE, INTO WASHERS AND STIFFNUTS BENEATH COCKPIT RAIL.

2 BOLTS ENTERING BENEATH COCKPIT RAIL, INTO WASHERS, CAGE NUTS OR WIRE INSERTS IN WINDSCREEN BASE — ALL WIRE-LOCKED.

3 AS 2 — WITHOUT WASHERS.

PROCEDURE

REMOVE DIRECT VISION WINDOWS (PARA. 67B).

REMOVE WINDSCREEN WINDOW PANELS (FIG.15E AND 15F).

DISCONNECT THERMAL DE-MISTING SYSTEM DUCTING FROM WINDSCREEN FRAME.

REMOVE ACCESS PANELS IN COCKPIT COAMING AND REMOVE FRAME ATTACHMENT BOLTS.

LIFT COMPLETE FRAME ASSEMBLY FROM FRONT FUSELAGE.

FGLT

Fig. 19 Removal of windscreen frame

KEY TO FIG.20

REMOVAL OF PERISCOPE SIGHTING HEADS

◀ To remove a periscope sighting head:-

1. The periscope tube must be dismantled and removed in sections in accordance with procedure in Sect.7, Chap.4. Discard the locking washer and, in the case of the lower sighting head, retain the compression washer and 'O' ring seal introduced by Mod.2289.

2. Release the nuts and bolts on the clamp and lever at the top and bottom of the mirror operating extension spindle and disconnect the extension spindle by sliding it off the mirror operating spindle.

3. Ensure the demisting plugs are disconnected (one in the case of the lower head, two at the upper head).

   NOTE. . .
   Mod.2265 breaks the upper and lower periscope sighting heads each into three components:- baseplate assembly, heated window and fairing casting. This enables a faulty window or baseplate to be replaced whilst the fairing casting remains in the aircraft.

4. Remove the eight screws attaching the baseplate to the fairing.

5. Remove the two screws attaching the electrical contact block and the twelve screws attaching the heated window to the fairing casting.

NOTE. . .
The replacement of a sighting head component is a reversal of the removal procedure with the following observations:-

(a) The electrical contact block, heated window and baseplate attachment screws are to be sealed with Locktite Ref.No. 33H/2202572 and the baseplate attachment screws wire-locked in pairs.

(b) Ensure the compression washer Part No. Z157-1192 and 'O' ring seal Part No. 30-781-1017-53 are seated correctly in the lower sighting head (detail A).

(c) When assembling the periscope tube to the sighting head use a new locking washer Part No. Z157-125

(d) The mirror operating extension spindle must be installed in the following manner:-

   (i) Position the operating lever, located on the underside of navigator's table, against the inboard stop.

   (ii) Connect the mirror operating extension spindle to the mirror operating spindle.

   (iii) Rotate the spindle (clockwise direction viewed looking up at the upper sighting head and anti-clockwise viewed looking down at the lower head) to the stop. Ensure freedom and full range of movement between stops.

   (iv) Tighten the nuts and bolts on the clamp and lever at the top and bottom of the extension spindle. ▶

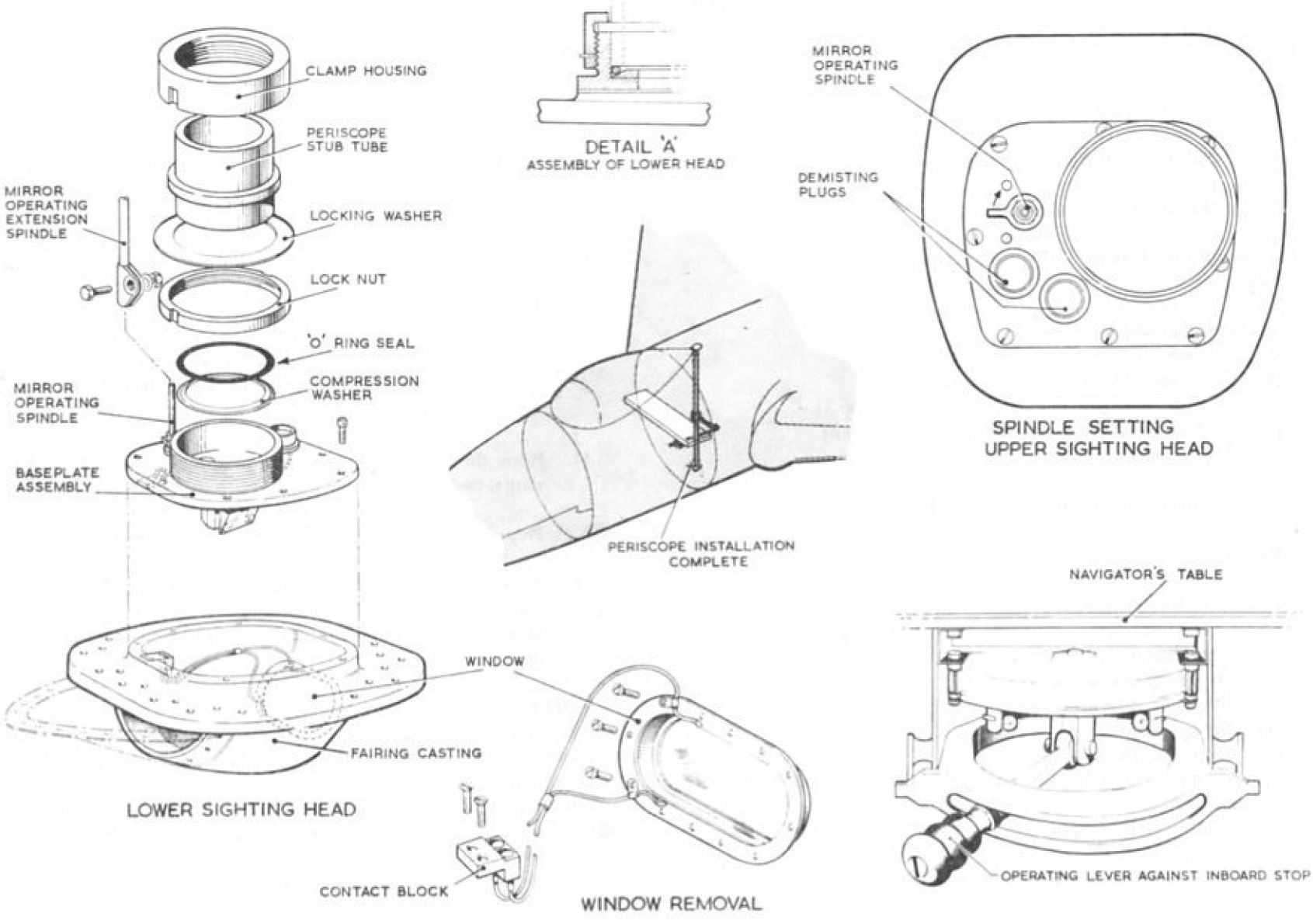


Fig. 20 Removal of periscope sighting heads
◄ Mod. 2265 and 2289 ►

KEY TO FIG.21

REMOVAL OF FRONT FUSELAGE

To remove the front fuselage:-

1. Check that all removable equipment is taken from the fuselage.

2. Ensure that all electrical services are off.

3. Discharge any oil from the hydraulic brake accumulators (Sect.2, Chap.2).

4. Discharge the following services:-
   (a) Oxygen system (Sect.3, Chap.10).
   (b) Emergency air system (Sect.3, Chap.7).
   (c) Entrance door pneumatic system (Sect.3, Chap.7).
   (d) Hydraulic brake accumulator air (Sect.3, Chap.6).
   (e) N.B.C. pneumatic system (Sect.3, Chap.7).

5. Jack the aircraft as illustrated in Sect.2, Chap.4.

6. Remove the nose-wheel unit (Sect.3, Chap.5).

7. Disconnect the following services forward, on or aft of, the rear pressure bulkhead. Blank off all pipe lines.
   (a) Pitot head pipes.
   (b) Oxygen system.
   (c) Electrical, radar and radio.
   (d) Flying controls.
   (e) Hydraulic and brake systems.
   (f) Engine, ram air turbine, emergency air and parking brake controls.
   (g) Flight refuelling pipes.
   (h) Emergency air pipe.
   (j) N.B.C. pneumatic system and vent pipes.

8. Disconnect and remove fire extinguishers.

9. Release the king clamps on ducting to cabin air conditioning and ventilated suit systems and the jubilee clip connection in the duct from the ram air valve.

10. Attach the crew nacelle sling Ref.No.26DC/95007 to the following attachment points:-
    Forward — The two rear release units part of the canopy rear attachment assemblies.
    Aft — Two threaded lifting blocks situated on the rear pressure bulkhead between stringers 4 and 5 and 49 and 50.

11. Hook the sling to the crane and raise the crane hook until the sling is taut.

◀12. Prepare the front fuselage trolley Ref.No.26DC/95101.▶

13. Remove all nuts and bolts connecting the front fuselage to centre section.
    Move the front fuselage from the centre section and lower gently on to the trolley.

NOTES. . .
When the front fuselage is installed and the air-conditioning and ventilated suit system connections are remade, new seals must be used at the joints.
When the engine control rod seals at the rear bulkhead are assemblied, the cavity in the bearing housing must be packed with grease XG-287 and care must be taken to ensure that the threaded portion of the control rod does not damage the bearing surface.

NOTE :-

1 ENGINE AND PARKING BRAKE CONTROL RODS (7F) DISCONNECTED FORWARD OF THE REAR PRESSURE BULKHEAD AND WITHDRAWN, AFTER REMOVAL OF THE BULKHEAD SEALS, THROUGH THE BULKHEAD WHEN THE FUSELAGE IS LIFTED FROM THE CENTRE SECTION.

2 ALL CONNECTIONS NOT ANNOTATED ARE ELECTRICAL, RADIO OR RADAR (7C).

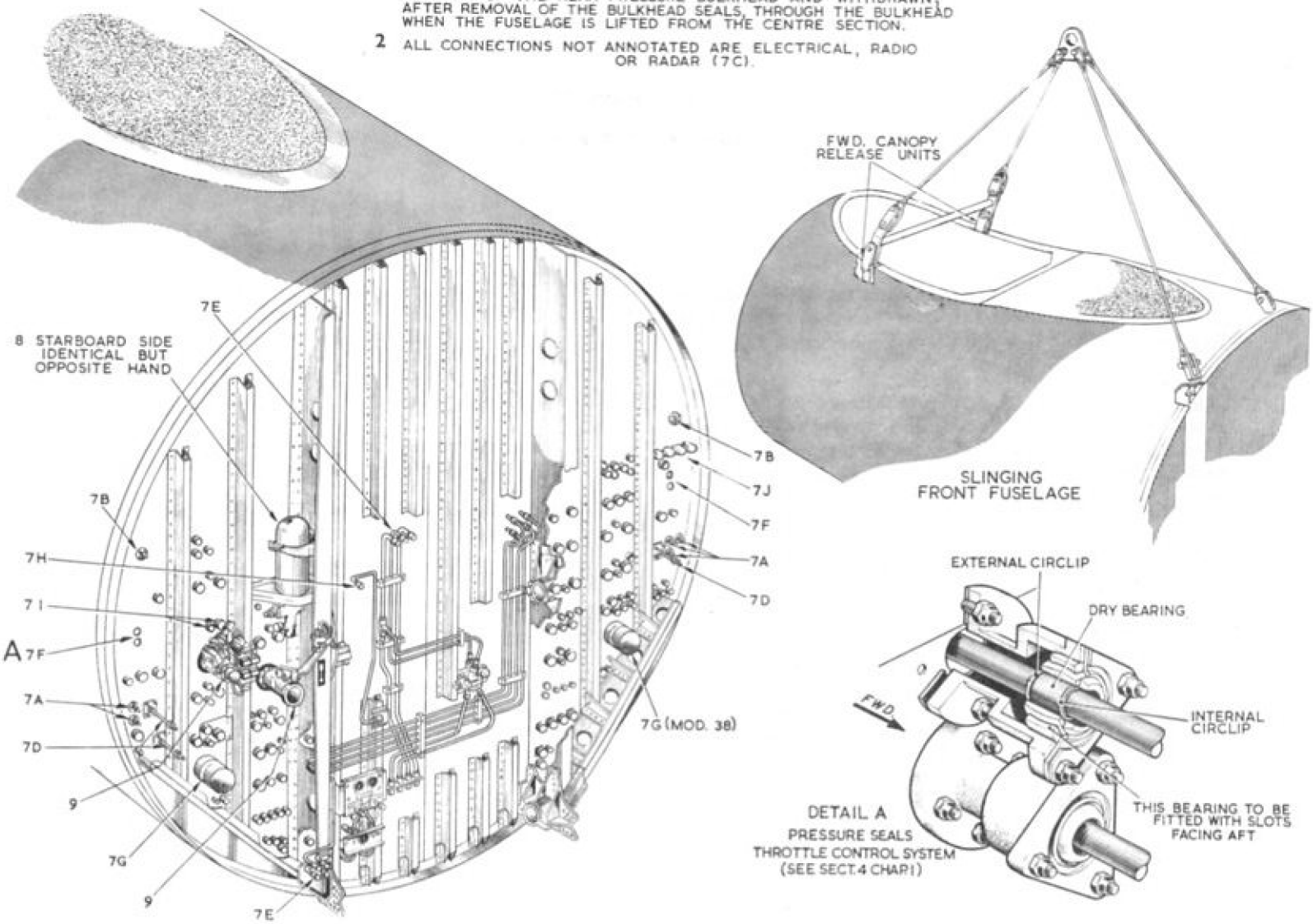


Fig. 21 Removal of front fuselage
(Mod 2304)

KEY TO FIG.22

BOMB BAY DOOR REMOVAL

To remove the port bomb bay door:-

1. Select bomb bay doors open; when the bomb doors are fully open, place the bomb door selector switch guard (Ref.No.26DC/95054) in position.

2. Remove the pins connecting the self-locking struts or, (subsequent to Mod.1273) the telescopic struts, to the outer bomb bay door, secure the struts to the nearest point to prevent interference with removal operations. Replace and secure the pins in the strut attachment brackets on the outer bomb bay door.

3. Attach the two hoists (refer to Sect.2, Chap.4) to their respective anchor brackets adjacent to each self-locking strut mounting.

4. Thread a sling (Ref.No.26DC/95073) through each locking strut attachment bracket on the outer bomb door, using the locking strut attachment pins already fitted (Item 2).

5. Engage the hoist cable hooks with the slings at each position and operate the hoists until the cables are just taut.

6. Remove the pins connecting the bomb door adjustable links at the forward and rear ends of the bomb bay, to the inner bomb door.

7. Remove the pins connecting the outer bomb door adjustable links at the forward and rear end of the bomb bay, to the bomb door mechanism lever.

8. Lower the doors by carefully operating the hoists, until the main hinge pins are accessible.

9. Remove all hinge pins, except those at the extreme forward and rear hinges.

10. Place padding between the outer surfaces of the inner and outer bomb door.

11. Prepare a trolley (Ref.No.26DC/95230) and position it below the bomb doors.

12. Remove the remaining main hinge pins and carefully lower the doors on to the trolley.

13. Repeat this operation to remove the starboard bomb bay doors.

NOTE...
Refer to Sect.3, Chap.1, para.54, for the bomb door setting procedure which follows their installation.

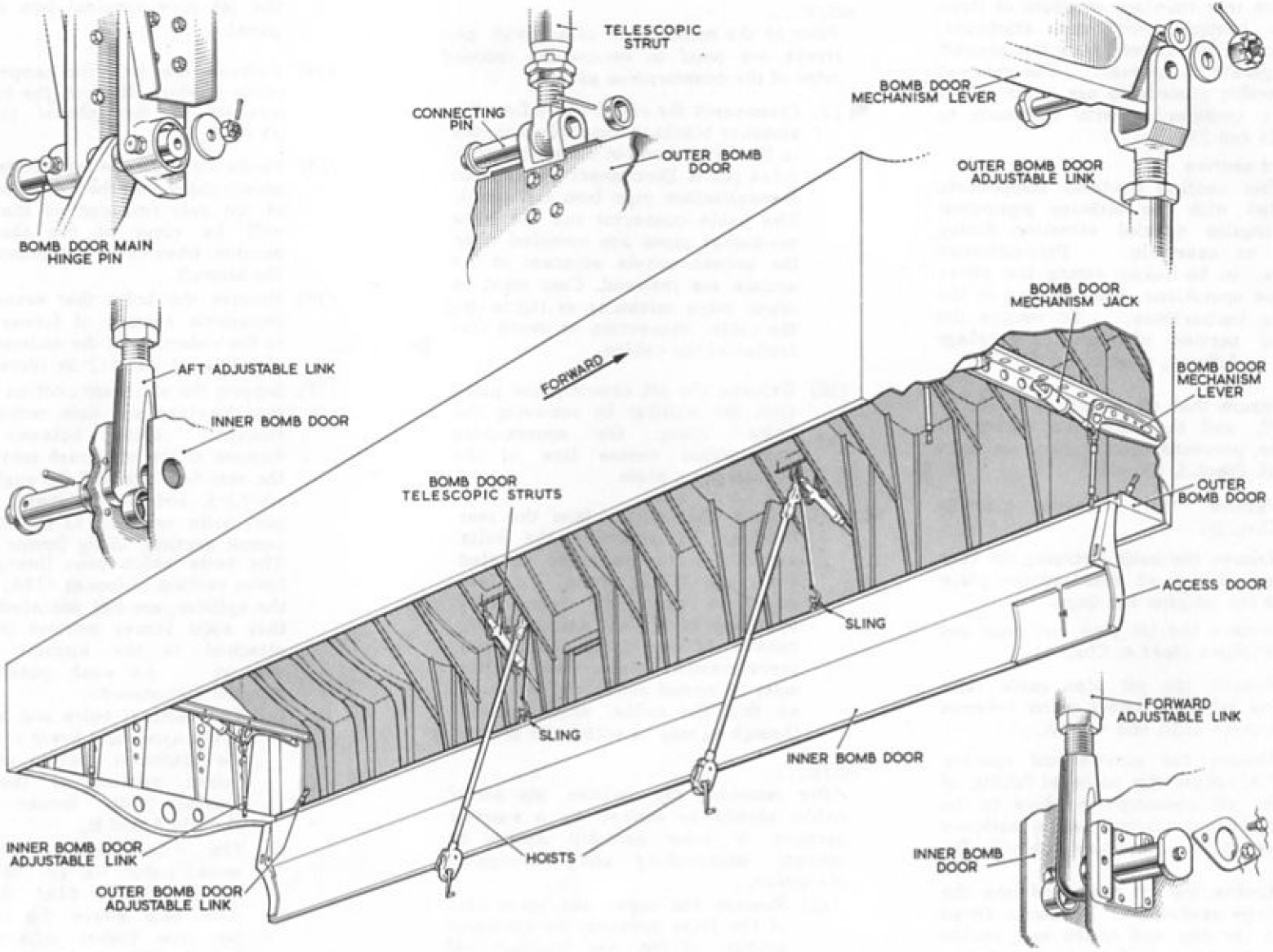


Fig.22. Bomb door removal.

REAR FUSELAGE

General

78 The rear fuselage consists of three sections - centre, port and starboard, each section is removed from the aircraft as a separate component. The removal and assembly procedures are given in the following paragraphs, with reference to fig.23, 24 and 25.

Starboard section

79 This section contains components associated with the airborne equipment which require special attention during removal or assembly. Precautionary measures, to be taken during the above mentioned operations, are included in the following instructions. To remove the starboard section of the rear fuselage proceed as follows, refer to fig.23.

(1) Ensure that all electrical power is off, and that the line valves in the pressurisation system are also off. (Sect.3, Chap.16)

(2) Remove No.5 elevon (Sect.3 Chap.2).

(3) Remove the bolts securing the rear end of the aft counterpoise plate to the jet pipe end caps.

(4) Remove the jet pipe end caps and jet pipes (Sect.4, Chap.1).

(5) Remove the jet pipe guide rails and jet pipe tunnel skins between formers 413A and 442·5A.

(6) Remove the screws and spacers that secure the outboard fairing of the aft counterpoise plate to the Z-channel mounted on the outboard jet pipe curvature (detail D).

(7) Remove the top hinge rod from the hinge assembly. Locknuts. fitted to the rear end of the rod, enable it to be pulled or turned during this operation (detail D).

(8) Remove the screws that secure the inboard side of the counterpoise plate to the fairing on the outboard jet pipe skin curvature.

NOTE...
Prior to the embodiment of Mod.963, pop rivets are used to secure the inboard edge of the counterpoise plate.

(9) Disconnect the aerial cable from the aerial or blanking assembly mounted in the forward end of the aft counterpoise plate. Disconnect the flexible pressurisation pipe from the aerial. The cable connector and the pressurisation pipes are revealed when the access panels adjacent to the aerials are removed. Care must be taken when releasing or tightening the cable connectors to avoid distortion of the cables.

(10) Release the att counterpoise plate from the splitter by removing the bolts along the approximate longitudinal centre line of the counterpoise plate.

(11) Detach the splitter from the rear fuselage by removing the bolts securing it to the angle mounted along rib 112.38 (detail F). Care must be exercised during this operation to prevent damage being caused to the aerial cable and pressurisation pipes. The splitter must be moved aft as well as down so that the cable, which passes through it, may be withdrawn intact.

NOTE...
After removing the splitter, the aerial cable should be marked by a warning pennant or other suitable method to prevent mishandling and consequent distortion.

(12) Remove the upper and lower skin of the joint between the starboard section of the rear fuselage and the centre section, i.e., between rib 63·5 and stringer 118 on the lower surface.

(13) Remove the jet pipe temperature cable fairlead which is mounted on the jet pipe tunnel skin adjacent to the jet pipe terminal box access panel.

(14) Release the jet pipe temperature cable conduit clip from the bracket mounted on the inboard side of rib 63·5.

(15) Partly withdraw the jet pipe temperature cables into the centre section of the rear fuselage so that they will be clear of the starboard section when it is withdrawn from the aircraft.

(16) Remove the bolts that secure the removable section of former 428A to the underside of the undersurface skinning at rib 112·38 (detail E).

(17) Support the starboard section of the rear fuselage and then remove the transport bolts between the formers of the starboard section of the rear fuselage and the angles on rib 63·5, and the horizontal transport bolts securing to the aircraft centre section. along former 428A. The bolts which pass through the lower section of former 428A, above the splitter, are left undisturbed as this split former section remains attached to the aircraft centre section. As each position is reached disconnect:-

(a) The vertical bolts and screws in the upper and lower joints of the starboard section and the centre section of the rear fuselage at former 428A (details A and B).

(b) The clip securing the aft aerial cable to, rib 63·5 adjacent to former 428A, the aircraft skin above the inboard jet pipe tunnel adjacent to former 428A, and the aircraft skin adjacent to the removable section of former 428A at the rib 112·38.

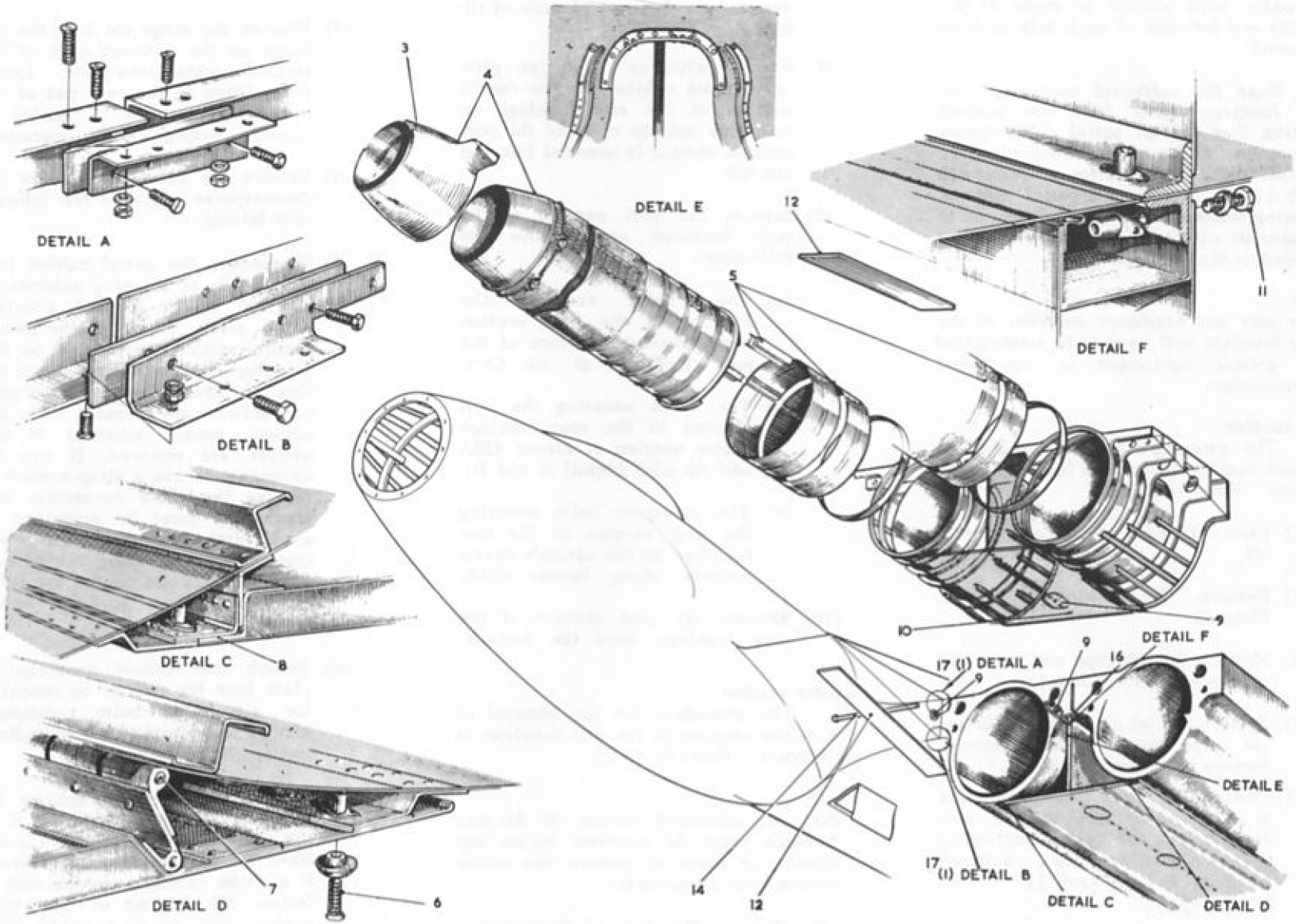


Fig.23. Removal of starboard section - rear fuselage (Mod.2193)

NOTE...
To avoid possible confusion during assembly note should be made of the length and location of each bolt as it is removed.

80 Ease the starboard section of the rear fuselage away from the aircraft ensuring that the aft aerial cable clears the cut-out in the undersurface skinning adjacent to the fixed section of former 428 at rib 112·38. If the aft aerial cable is not being removed, it should be secured to the aircraft structure to prevent it being damaged or distorted.

NOTE...
The port and starboard sections of the rear fuselage will have to be manhandled as ground equipment is considered unnecessary.

Port section

81. The procedure for the removal of the port section of the rear fuselage is as follows. Refer to fig.24.

(1) Ensure that all electrical power is off.

(2) Remove No.4 elevon (Sect.3, Chap.3).

(3) Remove the jet pipe end caps and jet pipes (Sect.4, Chap.1).

(4) Remove the jet pipe guide rails and jet pipe tunnel skins between formers 413A and 442·5A.

(5) Remove the upper and lower skins at the joint between the port section and the centre section of the rear fuselage, i.e., between rib 63·5 and stringer 117 on the lower surface.

(6) Remove the jet pipe temperature cable fairlead which is mounted in the jet pipe tunnel skin adjacent to jet pipe terminal box access panel.

(7) Release the jet pipe temperature cable conduit from the bracket mounted on the inboard side of rib 63·5.

(8) Partly withdraw the jet pipe temperature cables into the centre section of the rear fuselage so that they will be clear of the port section when it is removed from the aircraft.

(9) Support the port section of the rear fuselage and remove the following:-

(a) The bolts securing the formers of the port section and the centre section of the rear fuselage at rib 63·5.

(b) The bolts securing the port section to the rear fuselage centre section at former 428A and rib 63·5 (detail A and B).

(c) The transport bolts securing the port section of the rear fuselage to the aircraft centre section along former 428A.

(10) Remove the port section of the rear fuselage from the aircraft.

Centre section

82. The procedure for the removal of the centre section of the rear fuselage is as follows. Refer to fig.25.

NOTE...
Port and starboard section of the rear fuselage must be removed before any attempt is made to remove the centre portion from the aircraft.

(1) Remove the forward counterpoise plate front fairing.

(2) Remove the screws and spacers that secure the outboard fairing of the forward counterpoise plate to the Z-channel mounted on the outboard jet pipe curvature skin.

(3) Remove the hinge rod from the top hinge on the outboard side of the forward counterpoise plate. Lock-nuts, fitted to the rear end of the rod, enable it to be pulled or turned during this operation.

(4) Remove the bolts that secure the counterpoise plate to the inboard side fairing.

◄ (5) Disconnect the aerial cables from the aerials or blanking assemblies mounted in the forward, counter-poise plate. Also, at the aerial pressurisation connections on the counterpoise plate disconnect the flexible pipes. The cable and pipe connections are revealed when the access panels adjacent to the aerials are removed. It may be necessary to use a strap wrench to release the cable connection and great care must be exercised to avoid distorting the cable when this operation is being carried out. At former 428 disconnect the bulk-head connection for the aerial tuning unit. ►

(6) Detach the forward counterpoise plate from its splitter by removing the attachment bolts positioned along the approximate longitudinal centre line of the plate.

◄ (7) Detach the forward splitter by removing the bolts securing it to the angle mounted along rib 122.38. When the splitter is being removed it must be carefully manipulated to follow the contour of the aerial cables and pressurisation pipes which pass through it. ►

(8) Remove the aerial cable guards from around the base of the rudder control lever bottom hinge box.

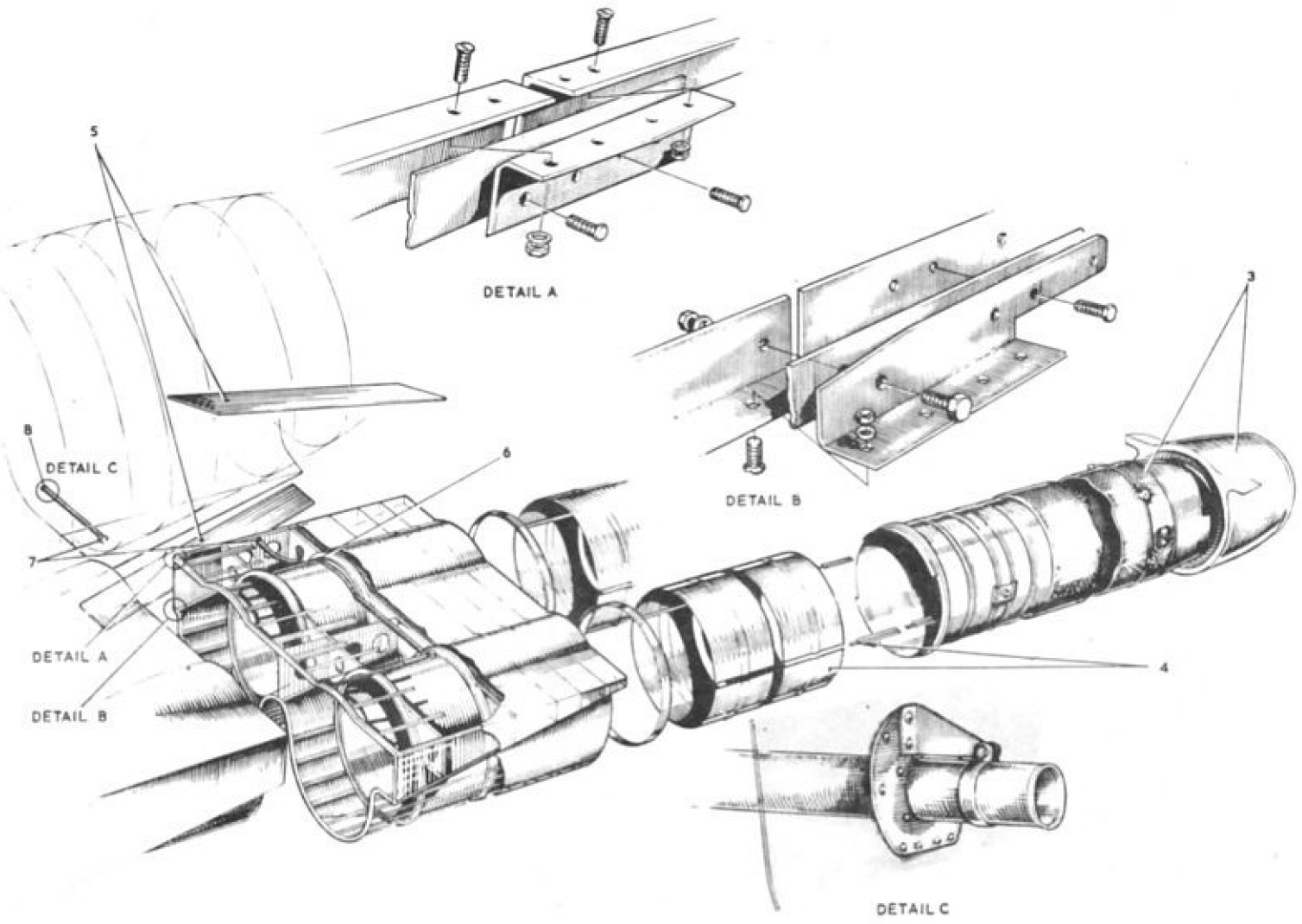


Fig. 24 Removal of port section – rear fuselage

NOTE . . .

The installed shape of the aerial cables is very important and every endeavour must be made, when removing them from the aircraft, to retain their original contour.

(9) Detach the aerial cables from the aircraft in the following order:-

11/T4507
12/T4507
13/T4507

Cable attachment points are located at the following positions:-

(a) Connectors on former 461.5A in the centre section of the rear fuselage. It is important that the 4B.A. bolts in the connector mountings are removed before the connectors are broken otherwise the cables will be distorted.

(b) Fairlead on the rudder control lever bottom hinge box.

(c) Fairlead at the access panel in the starboard side of the rear fuselage centre section, just aft of former 428A. The panel may be removed at the same time.

(d) Clips at the junction of rib 63.5 and former 428A.

(e) Clips over the centre of the inboard jet pipe tunnel.

(f) Fairlead at former 428A at the position taken by the aft end of the forward splitter.

(g) Clips on the splitter attachment angle running along rib 112.38.

(10) Remove the centre and aft main access doors below the rear fuselage centre section. Disconnect the pressurisation pipe on the forward access door and remove the door.

(11) Remove the airborne equipment cannisters (Sect.3, Chap.16).

(12) Drain the water/glycol system if necessary.

(13) Remove the tail radar head (Sect.3, Chap.16).

(14) Remove the brake parachute (Sect.3, Chap.13).

(15) Remove receiver Type 17170 and power unit Type 17203 (Sect.9, Chap.1).

(16) Remove the rudder power units drip tray and the rudder power units (Sect.3, Chap.4) and remove the rudder (Sect.3, Chap.3).

(17) Remove the drip tray from below the rudder bottom hinge.

(18) Disconnect the water glycol tank pressurisation pipe at former 428A.

(19) Disconnect the hydraulic reservoir pressurisation pipe at former 428A.

(20) Remove the rudder control rod inboard of the torque lever on the port side of the fuselage and the lever between the rudder control lever hinge box and the auto-stabilizer unit.

(21) Remove the rivets securing the rudder control lever bottom hinge box to the rear fuselage.

(22) Disconnect and unclip all electrical, radar and radio leads between the rear fuselage and the centre section, also remove the port and starboard cable support rods between former 428A and former 442.5A. Coil and stow, all cables to clear the rear fuselage during removal.

(23) Remove the port and starboard J.P.T. control amplifiers and datum setting resistances from former 428A.

(24) Remove the access panel on the port side of the rear fuselage. This access panel and the panel removed in sub-para.(9) item (C) gives access to the transport joint bolts, in the trailing edge stubs.

(25) To gain access to the transport joint bolts through former 428A, enter the power compartment and remove the oxygen storage cylinders and electrical equipment on the front face of the rear bulkhead (detail A).

(26) Remove the window launching compartment access panel and remove the window launching equipment to gain access to the lower transport bolts. Window launching equipment is replaced by ballast carrying equipment when Mod.743 is embodied.

(27) Position the rear fuselage trolley under the rear fuselage. Raise the support beams until the weight of the rear fuselage is just taken by them.

(28) Remove the attachment bolts around the tail bumper box at former 428A (detail B).

(29) Remove the bolts at the transport

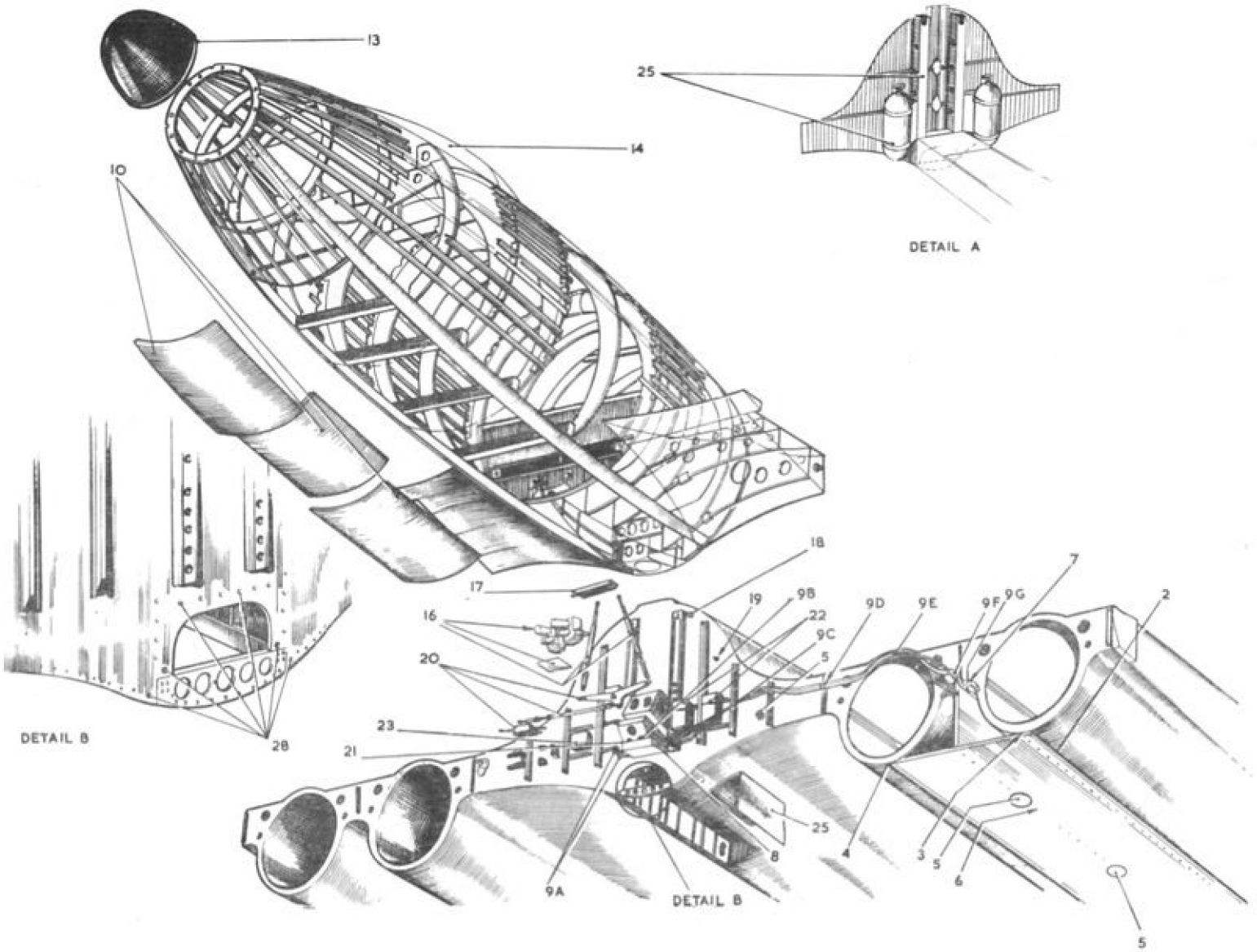


Fig.25 Removal of centre section – rear fuselage
(Mod. 2304)

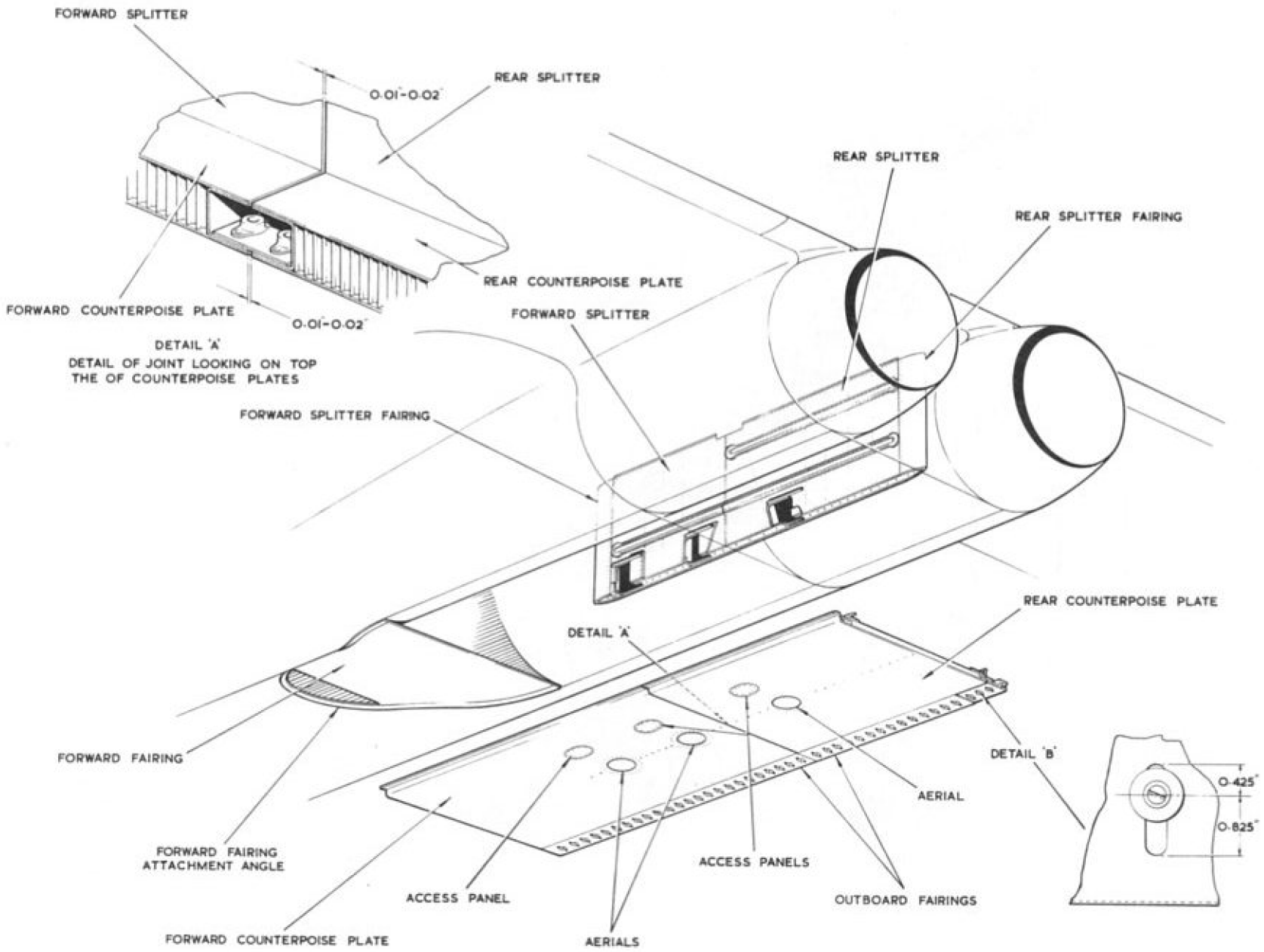


Fig. 26 Assembly of counterpoise plates and splitters

joint between the rear fuselage and the aircraft centre section.

(30) When all transport joint bolts have been removed check that all connections, electrical cable, conduit, pipe lines, etc., between the rear fuselage and the centre section have been disconnected and are in no danger of being fouled by the rear fuselage.

(31) Move the rear fuselage away from the aircraft.

ASSEMBLY OF REAR FUSELAGE

Centre section

83. Assembly of the centre portion of the rear fuselage to the aircraft centre section is a reversal of the procedure given in para.82 of this chapter. Assembly of the counterpoise plates and splitters is given in para.86.

Port section

84. The assembly procedure for the port section of the rear fuselage is a reversal of that given in para.81 of this chapter.

Starboard section

85. The assembly of the starboard section of the rear fuselage is a reversal of the procedure given in para.79 of this chapter. Prior to the fitting of the starboard section, ensure that the aerial cables and the pressurisation pipes to the counterpoise aerials and splitters are correctly positioned along former 428A and that suitable precautions are taken to protect them against damage during the assembly operation.

Assembly of counterpoise plates and splitters

86. To assemble the counterpoise plates and splitters to the aircraft proceed as follows:-

(1) Secure the forward aerial cable to the angle mounted along rib 112.38.

(2) Raise the forward splitter - during this operation the two aerial cables and pressurisation pipes must be fed through the splitter, ensuring that the cables are routed correctly without distortion. Secure the splitter by the attachment bolts to the angle mounted along rib 112.38.

(3) Raise the rear splitter into position, observing the same precautions as in (2) when feeding the aerial cables through the splitter. Secure the splitter by the attachment bolts to the angle mounted along rib 112.38.

(4) Check that a clearance of 0.010 to 0.020 in. exists between the forward and rear splitter.

(5) Raise the forward counterpoise plate into position and secure it to the forward splitter by the bolts which pass through the plate along its approximate longitudinal centre line.

(6) Secure the counterpoise plate to the inboard jet pipe fairing.

(7) Engage the half hinge of the counterpoise plate outboard side with the hinge assembly on the outboard jet pipe curvature by inserting the hinge rod.

(8) Secure the counterpoise plate outboard fairing to the Z-section member attached to the outboard jet pipe curvature skin. The securing screws and spacers should assume a central position in the slot of the fairing with the aircraft on the ground. The clearance on each side of the spacers is to allow for flexing of the structure during flight.

(9) Secure the butt strap to the rear end of the forward counterpoise plate and the joint plates to the inboard and outboard counterpoise fairings.

(10) Repeat sub-para. (5), (6), (7) and (8) on the aft counterpoise plate.

NOTE . . .
The aft end of the inboard Z-section member is secured to the jet pipe end cap by screws.

(11) Check that a clearance of 0.010 to 0.020 in. exists between the two counterpoise plates.

(12) Secure the forward flange of the rear counterpoise plate to the butt strap - sub-para. (9). Screws are used for this joint.

(13) Fit the forward counterpoise plate front fairing.

(14) Fit the aerials or blanking assemblies to the fore and aft counterpoise plates. Fit the aerial pressurisation pipes to their connections on the counterpoise plates and connect the aerials.

NOTE . . .
If the aerials are not to be fitted, the pressurisation pipes are to be connected to their respective stowages.

(15) Fit the aerial access panels to the counterpoise plate.

AIR BRAKE OPERATING MECHANISM

Actuator removal

87. To remove the air brake actuator situated in the bomb bay roof between bomb arches 44.592F and 64.592F proceed as follows:-

(1) Isolate, electrically, the air brakes system by removing 28 volt fuses 640 and 551 from panels 3P and 4P respectively and the 200 volt fuses 81 and 152 from panels 18P and 19P respectively.

(2) Disconnect the electrical plug connections from both actuator motors.

(3) Remove the drive shaft, port and starboard, connecting the actuator to the gearboxes (para.89).

(4) Suitably support the actuator. Remove the split pins, slotted nuts and washers from the eight 2 B.A. bolts securing the actuator to the beam, between bomb arches 44.592F and 64.592F.

(5) Remove the eight 2 B.A. bolts and lower the actuator from the aircraft.

Gearbox removal

88. To remove the airbrakes gearbox, mounted on the inboard face of rib 63.5 between bomb arches 44.592F and 64.592F, proceed as follows:-

(1) Extend the airbrakes to the HIGH DRAG position and isolate, electrically, the air brakes system by removing the 200 volt fuses 81 and 152 from panels 18P and 19P respectively and the 28 volt fuses 640 and 551 from panels 3P and 4P respectively.

(2) Remove the main drive shaft which connects the air brakes actuator to the gearbox (para.89).

(3) Remove the 5/16 in B.S.F. stiffnuts and the 3/8 in plain washers from the five double-threaded shoulder bolts which secure the gearbox to rib 63.5. These stiffnuts and washers are located on the outboard face of rib 63.5.

(4) Withdraw the gearbox to clear the splined drive connecting the gearbox to the top sprocket and shaft assembly on rib 63.5.

NOTE . . .
After removing the gearbox care must be exercised to ensure that damage is not caused to the threads of the double-threaded shoulder bolts.

Drive shaft removal

Main drive shaft

89. To remove the main drive shaft which connects the air brake actuator to the gearbox on rib 63.5 proceed as follows:-

(1) Extend the brakes to the HIGH DRAG position and isolate, electrically, the air brakes system as given in para.87(1).

(2) Remove the split pins, ¼ in B.S.F.

slotted nuts and washers from the two taper pins securing the drive shaft to the gearbox on rib 63.5. Remove the two taper pins.

(3) Remove the split pins, ¼ in B.S.F. slotted nuts and saddle washers from the three taper pins securing the end fitting to the inboard end of the drive shaft. Remove the three taper pins.

(4) Remove the split pin, ¼ in B.S.F. slotted nut and saddle washer from the taper pin securing the inboard ball joint to the drive shaft end fitting. Remove the taper pin.

(5) Push the drive shaft inboard end fitting into the drive shaft, to disengage the adapter from the actuator splined drive.

(6) Pull the drive shaft inboard to disengage the outboard adapter from the splined drive of the gearbox.

Inboard drive shaft

90. To remove the drive shaft connecting the sprocket and shaft on rib 63.5 to the sprocket and shaft assembly on the engine centre rib proceed as follows:-

(1) Extend the air brakes to the HIGH DRAG position and isolate, electrically, the air brakes system as given in para.87(1).

(2) Relieve the tension from the drive chains by undoing the turnbuckles with which they are connected to the follower arms.

(3) Remove the split pins, 5/16 in B.S.F. slotted nuts and saddle washers from the two taper pins securing the drive shaft inboard ball joint to the sprocket shaft at rib 63.5. Remove the taper pins.

(4) Remove the split pins, 5/16 in B.S.F. slotted nuts and washers from the two taper pins securing the outboard adapter to the outboard ball joint. Remove the taper pins.

(5) Remove the split pin, 2 B.A. slotted nut and washer from the taper pin securing the sprocket shaft to the bearing cap on the inboard face of the engine centre rib. Remove the taper pin.

(6) Remove the split pins, ¼ in B.S.F. slotted nuts and plain washers from the two taper pins securing the adapter to the sprocket shaft at the inboard face of the engine centre rib.

(7) Push the adapter into the sprocket shaft on the engine centre rib until the adapter clears the outboard ball joint.

(8) Pull the drive shaft outboard until the inboard adapter is clear of the sprocket shaft at rib 63.5. Remove the drive shaft from the aircraft.

Outboard drive shaft

91. To remove the drive shaft connecting the sprocket and shaft assembly on the engine centre rib to the sprocket and shaft assembly on rib 162.5 proceed as follows:-

(1) Extend the air brakes to the HIGH DRAG position and isolate, electrically, the air brakes system as given in para.87(1).

(2) Remove the split pin, ¼ in B.S.F. slotted nut and plain washer from the taper pin securing the ball joint, at the inboard end of the drive shaft, to the adapter secured to the sprocket shaft at the engine centre rib. Remove the taper pin.

(3) Remove the split pin, ¼ in B.S.F. slotted nut and plain washer, from the taper pin securing the ball joint, on the outboard end of the shaft, to the adapter, secured to the sprocket shaft on rib 162.5. Remove the taper pin.

(4) Remove the split pins, ¼ in B.S.F. slotted nuts and saddle washers from the two taper pins securing the adapter to the sprocket shaft at rib 162.5. Remove the taper pins.

(5) Push the adapter into the sprocket shaft at rib 162.5 until the adapter clears the ball joint on the outboard end of the drive shaft.

(6) Pull the drive shaft outboard until the ball joint, on the inboard end of the drive shaft, clears the adapter secured to the sprocket shaft at the engine centre rib. Remove the shaft from the aircraft.

Actuator assembly

92. Fitting an air brake actuator to the beam,

between bomb arches 44.592F and 64.592F, is the reverse of the removal sequence given in para.87 with the following observations:-

(1) Position the supply cable clip brackets of both motors at 12 o'clock.

(2) Position the port rubber gaiter, covering the flexible drive joint, slightly to starboard to avoid a foul with the motor brake inspection cover fixing nut. Wire-lock the gaiter in this position using approved 22 s.w.g. stainless steel wire.

Gearbox assembly

93. Prior to fitting a replacement gearbox to rib 63.5 the five double-threaded shoulder bolts, used to secure the gearbox to the rib, must be fitted in the attachment holes in the periphery of the gearbox casing. The bottom attachment bolt Ref.No. 26DC/5572 the two centre and two top attachment bolts Ref.No. 26DC/5573 are all secured to the gearbox using 3/8 in plain washers Ref.No. 28W/9419466 and 3/8 in B.S.F. stiffnuts Ref.No. 28M/10292. The gearbox must first be fitted, temporarily, to the rib with the drive shafts and adapters assembled and the positions of the drive shaft attachment taper pins determined. The method of determining the position and the drilling and reaming of the taper pin holes is given in para.94 and 95. On final assembly ensure that the two dowel bolts (para.97, item (1)) locate correctly in the two holes in the gearbox casing. Of the five gearbox attachment bolts the bottom bolt is secured to the rib using a 3/8 in plain washer Ref.No. 28W/9419489 and a 5/16 in B.S.F. stiffnut Ref.No. 28M/4095807. The two centre attachment bolts must have a 3/8 in plain washer Ref.No. 28W/9419489 between the shoulder of the bolt and the rib and two 5/16 in plain washers Ref.No. 28W/9419488 under the 5/16 in B.S.F. attachment stiffnuts Ref. No. 28M/4095807. The two top attachment bolts are secured to the rib using a 5/16 in plain washer Ref.No. 28W/9419488 and a 5/16 in B.S.F. stiffnut Ref. No. 28M/4095807.

Main drive shaft assembly

94. To fit a replacement main drive shaft, which connects the actuator to the gearbox on rib 63.5, the actuator must be fitted to the aircraft and the gearbox temporarily fitted to rib 63.5. Refer to fig.27 and proceed as follows:-

(1) Assemble the ball joint Ref.No. 26DC/11318 to the outboard end of the drive shaft, ensuring that the jaws of the ball joint are positioned in line as shown in fig.27. Mark off, to the dimensions given in fig.27, the position of the taper pin which secures the ball joint to the shaft end adapter. Drill and ream the hole to suit the taper pin Ref.No. 26DC/8047, fit the taper pin, saddle washer Ref.No. 28W/18749, ¼ in B.S.F. slotted nut Ref.No. 28M/1011467 and 1/16 in split pin.

(2) Assemble the ball joint Ref.No. 26DC/11318 to the adapter Part No. 3/F8792 which fits in the inboard end of the drive shaft. Ensure that the jaws of the ball joint are positioned in line as shown in fig.27. Mark off, to the dimensions given in fig.27, the position of the taper pin securing the ball joint to the adapter. Drill and ream the hole to suit the taper pin Ref.No. 26DC/9753 and temporarily fit the taper pin.

(3) Assemble the splined adapter Ref.No. 26DC/1724 to the inboard end of the inboard ball joint. Mark off, to the dimensions given in fig.27 the position of the taper pin which secures the adapter to the ball joint. Drill and ream the hole to suit the taper pin Ref.No. 26DC/8047 and fit the taper pin, saddle washer Ref.No. 28W/18749, ¼ in B.S.F. slotted nut Ref.No. 28M/1011467 and 1/16 in split pin.

(4) Fit the adapter Part No. 3/F8792 into the inboard end of the drive shaft to give a measurement of 48.67 in between the centres of the inboard and outboard ball joints. Ensure that the jaws of the inboard ball joint are positioned in line as shown in fig.27. Drill and ream the three taper pin holes through the drive shaft and adapter, from the pre-drilled pilot holes in the shaft outer sleeve, to suit the taper pins Ref.No. 26DC/9753.

(5) Fit the adapter Ref.No. 26DC/4458, to the outboard end of the outboard ball joint. Remove the taper pin fitted in op.(2) and push the adapter Part No. 3/F8792 into the drive shaft. Install the drive shaft in the aircraft, engaging the adapter Ref.No. 26DC/4458 with the gearbox drive and, by pulling the adapter Part No. 3/F8792 out of the drive shaft, engage the splined adapter Ref.

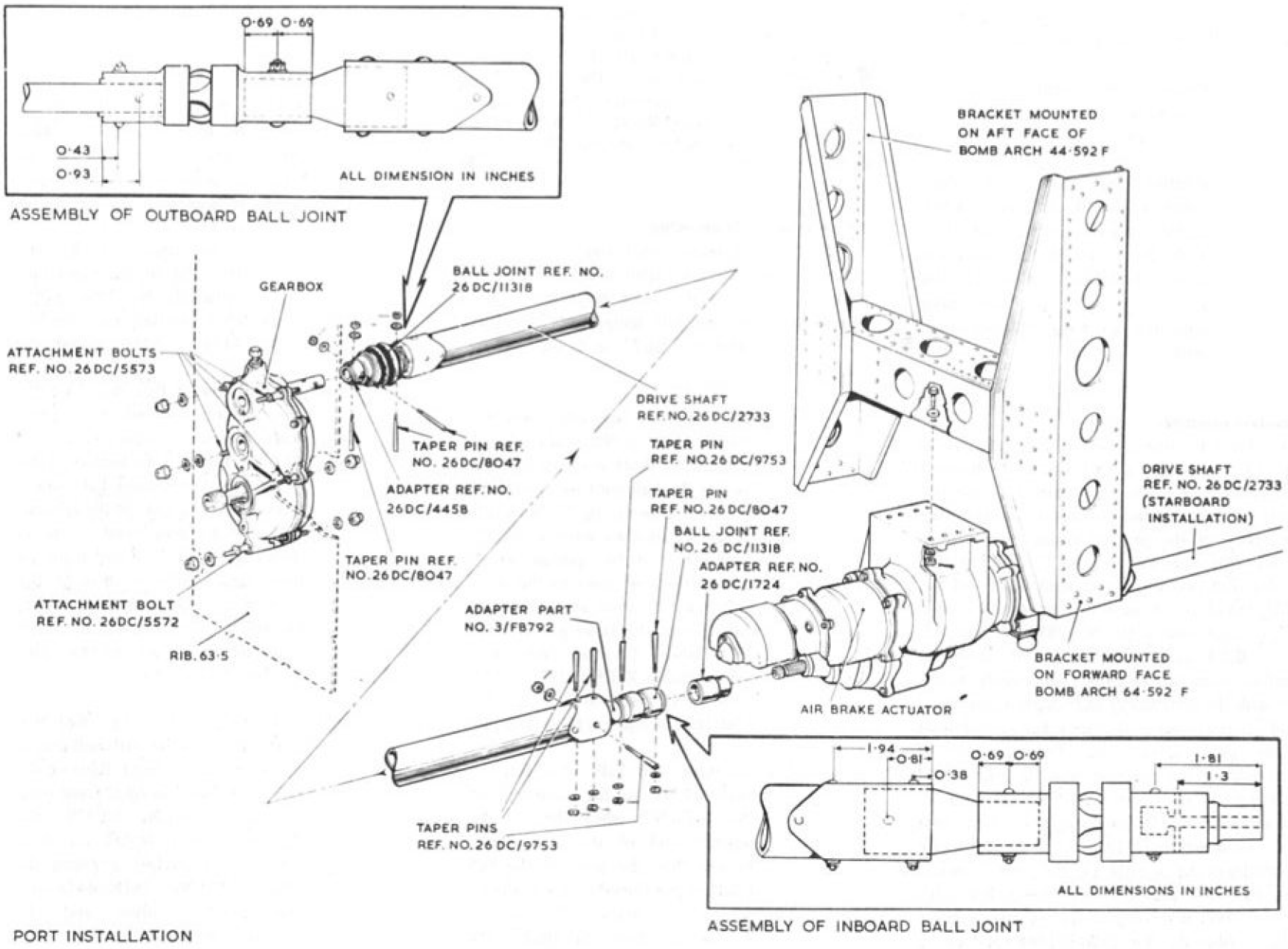


Fig. 27 Air brakes drive mechanism (1)

◄Drive shaft ref. no. changed►

No. 26DC/1724, with the actuator drive. Temporarily fit the two taper pins which secure the adapter, Part No. 3F/8792, to the shaft and the taper pin which secures the ball joint to the adapter.

(6) Mark off and drill a 1.60 m m hole through the inboard ball joint Ref.No.26DC/11318 and the inboard adapter Ref.No.26DC/1724, 1.3in. from the inboard end of the adapter as shown on fig.27. Position the drive shaft so that the actuator drive just covers the safety hole, mark the exact location of the drive shaft adapter on the gearbox drive.

(7) Remove the drive shaft and the gearbox from the aircraft to a bench and assemble the drive shaft to the gearbox in the position determined in op.(6).

(8) Mark off, to the dimensions given in fig.27, the position of the two taper pins which secure the outboard ball joint and the adapter to the gearbox drive. Drill and ream the holes to suit the taper pins, Ref. No. 26DC/8047.

(9) Deburr all the holes and remove the swarf.

(10) Pack the ball joints with grease XG-295 and fit the dust covers.

(11) Fit the gearbox to rib 63·5 as given in para.93.

(12) Install the drive shaft as given in op.(5).

(13) Fit the three taper pins, Ref. No. 26DC/9753, which secure the adapter in the inboard end of the drive shaft, fit saddle washers, Ref. No. 28W/14996, ¼ in. B.S.F. slotted nuts, Ref. No. 28M/1011467, and 1/16 in. split pins.

(14) Secure the outboard ball joint and adapter to the gearbox with two taper pins, Ref. No. 26DC/8047, saddle washers, Ref. No. 28W/18749, ¼ in. B.S.F. slotted nuts, Ref. No. 28M/1011467, and 1/16 in. split pins.

Inboard drive shaft assembly

95. To fit a replacement inboard drive shaft which connects the top shaft and sprocket assembly on rib 63·5 to the top shaft and sprocket assembly on the engine centre rib, refer to fig.28 and fig.29 details A and B and proceed as follows:-

(1) Fit the adapter, Part No. 4/F9577, on the inboard end of the inboard ball joint Ref. No. 26DC/11318. Mark off and drill two 1/8 in. diameter holes, diametrically opposite, through the adapter and the ball joint to the dimensions given in fig.28. Countersink the two holes on the adapter, externally, and rivet the adapter to the ball joint using two 1/8 in. dia. rivets Ref. No. 26DC/10695.

(2) Fit the ball joint complete with adapter on the inboard end of the inboard drive shaft Ref. No. 26DC/4449 and fit a ball joint Ref. No. 26DC/11318 on the outboard end of the drive shaft.

(3) Position the ball joints to give a measurement of 30·818 in. between the centres of the ball joints. Ensure that the jaws of the ball joints are lined up as illustrated in fig.28.

(4) Mark off, to the dimensions given in fig.28 the positions of the two taper pins which secure the inboard ball joint to the drive shaft end adapter. Drill and ream the holes to suit the taper pin Ref.No. 26DC/1456 at the inboard position and taper pin Ref. No. 26DC/9610 at the outboard position. Temporarily fit the taper pins.

(5) Mark off, to the dimensions given in fig.28, the position of the two taper pins which secure the outboard ball joint to the drive shaft end adapter. Drill and ream the holes to suit the taper pin Ref. No. 26DC/9610 at the inboard position and the taper pin Ref. No. 26DC/1456 at the outboard position. Temporarily fit the taper pins.

(6) Engage the inboard ball joint with the shaft Ref. No. 26DC/4460 of the top shaft and sprocket assembly on rib 63·5.

(7) Engage the outboard ball joint with the adapter Ref. No. 26DC/4456 fitted in the inboard end of the shaft, of the top shaft and sprocket assembly on the engine centre rib. This is achieved by removing the two taper pins securing the sprocket and adapter to the shaft and the taper pin securing the shaft to the bearing sleeve, pushing the adapter into the shaft, lining up the inboard drive shaft and pulling the adapter out to engage it in the ball joint.

NOTE...
Ensure that the inboard drive shaft is lined up with the shaft and sprocket assemblies as shown in fig.28.

(8) Temporarily fit the taper pins removed in op.(7) and position the adapter Ref. No. 26DC/4456 so that the taper pins are disposed centrally in the adapter slots.

(9) Mark off to the dimensions given in fig.29 detail B, the position of the taper pins which secure the outboard ball joint to the adapter. Drill and ream the holes through the ball joint and the adapter to suit the taper pins, Ref. No. 26DC/

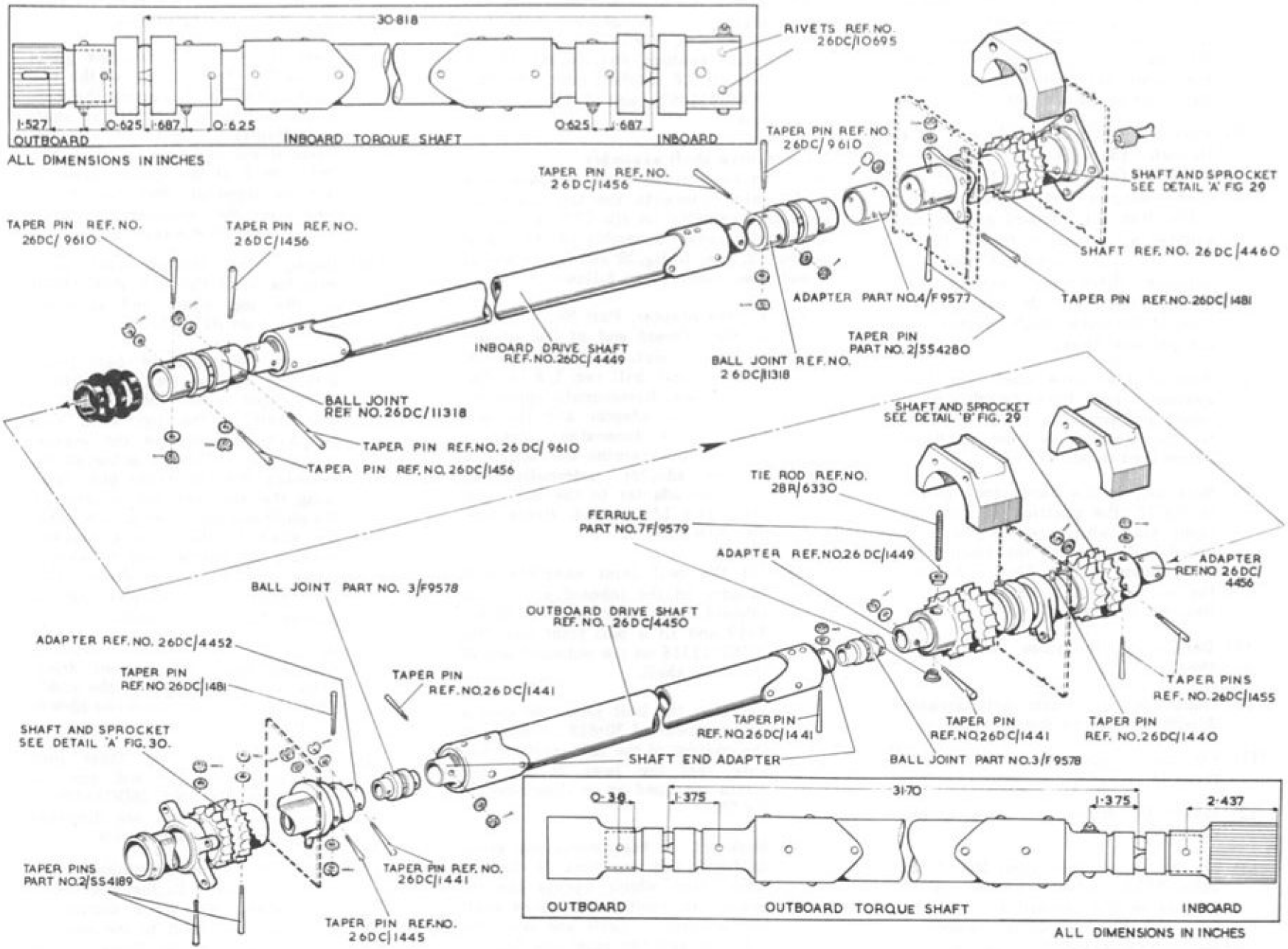


Fig. 28. Air brakes drive mechanism (2)

◄ Correction to dimensions – outboard torque shaft ►

9610, in the outboard position, and Ref. No. 22DC/1456, in the inboard position.

(10) Mark off to the dimensions given in fig.29 detail A, the position of the taper pins which secure the inboard ball joint to the shaft of the shaft and sprocket assembly at rib 63·5. Drill and ream the holes to suit the taper pin, Ref. No. 26DC/1481, in the outboard position, and Part No. 2/SS4280, in the inboard position.

(11) Remove the taper pins fitted in op.(8), push the adapter into the shaft and remove the inboard drive shaft.

(12) Deburr all the holes and remove the swarf.

(13) Fit the inboard drive shaft as given in op.(6) and (7).

(14) Fit the taper pin, Ref. No. 26DC/1440, which secures the sprocket shaft to the bearing assembly on the inboard face of the engine centre rib; fit saddle washer, Part No. 20/SS3703, 2 B.A. slotted nut, Ref. No. 28M/13121 and 1/16 in. split pin.

(15) Fit the two taper pins, Ref. No. 26DC/1455, which secure the sprocket, the socket and the adapter, to the shaft of the shaft and sprocket assembly, at the engine centre rib. Fit ¼ in. plain washers, Ref. No. 28W/9418921, ¼ in. B.S.F. slotted nuts, Ref. No. 28M/1011467, and 1/16 in. split pins.

(16) Fit the two taper pins, Ref. No. 26DC/9610, in the outboard position and, Ref. No. 26DC/1456, in the inboard position, which secure the outboard ball joint to the adapter. Fit saddle washer, Ref. No. 28W/14996, 5/16 in. B.S.F. slotted nut, Ref. No. 28M/13122, to the outboard taper pin and saddle washer, Ref. No. 28W/14996, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, to the inboard taper pin and insert split pins.

(17) Fit the two taper pins, Ref. No. 26DC/1481, in the outboard position and Part No. 2/SS4280, in the inboard position, which secure the inboard ball joint to the shaft of the shaft and sprocket assembly on rib 63·5. Fit saddle washer, Part No. 19/SS3703, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, to the outboard taper pin and saddle washer, Part No. 23/SS 3703, 5/16 in. B.S.F. slotted nut, Ref. No. 28M/13122, to the inboard taper pin and 1/16 in split pins.

Outboard drive shaft assembly

96. To fit a replacement outboard drive shaft, which connects the top shaft and sprocket assembly at the engine centre rib to the top shaft and sprocket assembly at rib 162·5, refer to fig.28, fig.29 detail B and fig.30 detail A and proceed as follows:-

(1) Fit a ball joint Part No. 3/F9578 to the shaft end adapter at each end of the outboard drive shaft. Position the ball joints in line as shown on fig.28 and to give a measurement of 31·7 in. between the centres of the ball joints.

(2) Mark off, to the dimensions given in fig.28, the position of the taper pin which secures the ball joint to the shaft outboard end adapter. Drill and ream the hole to suit the taper pin Ref.No.26DC/1441. Temporarily fit the taper pin.

(3) Mark off, to the dimensions given in fig.28 the position of the taper pin which secures the ball joint to the shaft inboard end adapter. Drill and ream the hole to suit the taper pin Ref. No. 26DC/1441. Temporarily fit the taper pin.

(4) Engage the inboard ball joint, with the adapter fitted in the outboard end of the shaft, of the top shaft and sprocket assembly on the engine centre rib.

(5) Engage the outboard ball joint with the adapter fitted in the inboard end of the shaft of the top shaft and sprocket assembly at rib 162·5. This is achieved by removing the taper pin which secures the adapter to the shaft and the taper pin which secures the adapter and bearing sleeve to the shaft. After removing the taper pins push the adapter into the shaft, line up the drive shaft and pull the adapter out of the shaft to engage the outboard ball joint on the drive shaft. Temporarily fit the two taper pins removed to facilitate this operation.

(6) Position the drive shaft with the jaws of the ball joints in line as shown on fig.28.

(7) Mark off, to the dimensions given in fig.30 detail A, the position of the taper pin which secures the outboard ball joint to the adapter. Drill and ream the hole to suit the taper pin Ref. No. 26DC/1441. Spot face the small diameter hole in the adapter 0·625 in. dia. x 0·03 in. deep. Temporarily fit the taper pin.

(8) Mark off, to the dimensions given in fig.29 detail B, the position of the taper pin which secures the inboard ball joint to the adapter. Drill and ream the hole to suit the

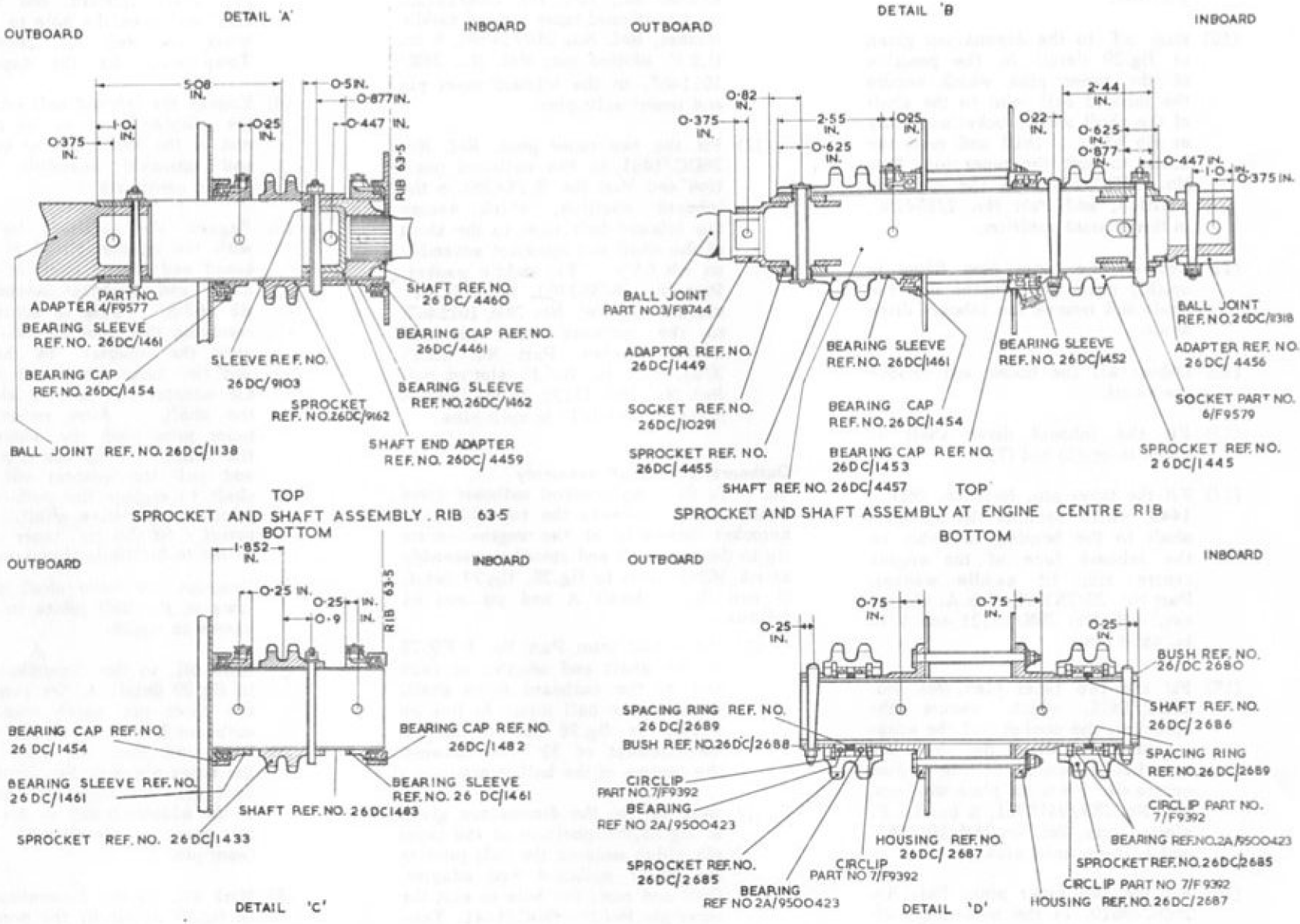


Fig. 29. Air brakes sprocket and shaft assemblies (1)

taper pin, Ref. No. 26DC/1441. Spot face the small diameter hole in the adapter 0·625 in. dia. x 0·03 in. deep.

(9) Remove the taper pins temporarily fitted in op.(5) and (7). Push the adapter into the shaft at rib 162·5 and remove the drive shaft.

(10) Deburr all the holes and remove the swarf.

(11) Fit the drive shaft as given in op.(4) and (5).

(12) Fit the taper pin Ref. No. 26DC/1445 which secures the bearing sleeve on rib 162·5 to the shaft, and saddle washer, Part No. 24/SS 3703, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, and 1/16 in. split pin.

(13) Fit the taper pin Ref. No. 26DC/1481 which secures the adapter to the shaft at rib 162·5, the saddle washer, 19/SS3703, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, and 1/16 in. split pin.

(14) Fit the taper pin, Ref. No. 26DC/1441 which secures the outboard ball joint to the adapter, and ¼ in. plain washer, Ref. No. 28W/9418921, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, and 1/16 in. split pin.

(15) Fit the taper pin, Ref. No. 26DC/1441, which secures the inboard ball joint to the adapter and ¼ in. plain washer, Ref. No. 28W/9418921, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, and 1/16 in. split pin.

Sprocket and shaft assembly

Rib 63·5 - top

97. To fit a replacement top sprocket and shaft assembly at rib 63·5, refer to fig.29 detail A and proceed as follows:-

(1) Assemble the bearing cap, Ref. No. 26DC/4461, the bearing sleeve, Ref. No. 26DC/1462, and the bearing, Ref. No. 2A/9500427. Secure the assembly, grease nipple at the top, to the outboard face of rib 63·5, using ¼ in. B.S.F. bolts, Ref. No. 28D/1011030, in the fore and aft positions and, dowel bolts, Ref. No. 26DC/1465, in the top and bottom positions. Fit ¼ in. plain washers, Ref. No. 28W/9418920, ¼ in. B.S.F. stiffnuts, Ref. No. 28M/7002430.

(2) Assemble the bearing cap, Ref. No. 26DC/1454, bearing sleeve, Ref. No. 26DC/1461 and bearing, Ref. No. 2A/9500427. Secure the assembly, grease nipple at the top, to the diaphragm outboard of rib 63·5 using ¼ in. B.S.F. bolts, Ref. No. 28D/1011030, ¼ in. plain washers, Ref. No. 28W/9418921, and ¼ in. B.S.F. stiffnuts, Ref. No. 28M/10290.

(3) Fit the sleeve, Ref. No. 26DC/9103, in the shaft end adapter, Ref. No. 26DC/4459, and fit the adapter into the shaft, Ref. No. 26DC/4460.

(4) Position the sprocket, Ref. No. 26DC/9162, and the shaft end adapter on the inboard end of the shaft, to the dimensions given in fig.29 detail A.

(5) Mark off, to the dimensions in fig.29 detail A, the positions of the two taper pins which secure the sprocket, the shaft end adapter and the sleeve to the shaft. Drill and ream the outboard hole to suit the taper pin, Ref. No. 26DC/1455 and, the inboard hole to suit the taper pin, Part No. 1/SS4280.

(6) Remove the sprocket from the shaft.

(7) Insert the shaft through the outboard bearing assembly, fit the sprocket on the shaft and insert the shaft in the inboard bearing assembly.

(8) Secure the sprocket, the shaft end adapter and the sleeve, to the shaft, by temporarily fitting the taper pins.

(9) Position the shaft, as shown in fig.29 detail A, and mark off the position of the taper pin which secures the shaft to the outboard bearing sleeve. Drill and ream the hole to suit the taper pin, Ref. No. 26DC/1440.

(10) From the two existing holes, positioned fore and aft, on the inboard bearing sleeve, drill to a depth of 0·4 in. into the shaft and adapter, using a 3·8 mm. drill.

(11) Remove the taper pins fitted in op.(8) and remove the shaft from the bearing assemblies. As the shaft is withdrawn remove the sprocket from the shaft.

(12) Remove the shaft end adapter from the shaft.

(13) Open up the two holes, drilled in the shaft in op.(10), using a 4·9 mm. drill.

(14) Tap a 2 B.A. thread in each of the holes drilled in the shaft end adapter in op.(10).

(15) Spot face the small diameter holes in the sprocket, the outboard hole to 0·625 in. dia. x 0·03 in. deep, the inboard hole to 0·75 in. dia. x 0·03 in. deep.

(16) Deburr all the holes and remove swarf.

(17) Assemble the shaft, the sprocket, the shaft end adapter and the sleeve as given in op.(7).

(18) Fit the taper pins, Ref. No. 26DC/1455, outboard and Part No. 1/SS 4280 inboard, which secure the sprocket, the shaft end adapter and the sleeve, to the shaft. Fit 5/16 in. plain washer, Ref. No. 28W/9419403, 5/16 in. B.S.F. slotted nut, Ref. No. 28M/13122, on the inboard taper pin and a ¼ in. plain washer, Ref. No. 28W/9418921, ¼ in. B.S.F. slotted nut, Ref. No. 28M/1011467, on the outboard taper pin; fit 1/16 in. split pins.

(19) Fit the taper pin, Ref. No. 26DC/1440, securing the shaft to the outboard bearing sleeve, saddle washer, Part No. 20/SS3703, 2B.A. slotted nut, Ref. No. 28M/13121, and 1/16 in. split pin.

(20) Secure the inboard bearing sleeve and the shaft, to the shaft end adapter with the bolts, Part No. 12/F9312, being inserted into the tapped holes, op.(10), (13) and (14). Lock the bolts together using 22 s.w.g. locking wire, Ref. No. 30A/3339, the locking wire must pass round the circumference of the bottom of the bearing sleeve.

Rib. 63·5 - bottom

98. To fit a replacement bottom sprocket and shaft assembly at rib 63·5 refer to fig.29 detail C and proceed as follows:-

(1) Position the sprocket, Ref. No. 26DC/1433, on the shaft, Ref. No. 26DC/1483, and mark off the position of the taper pin. Drill and ream the hole to suit the taper pin, Ref. No. 26DC/1440. Spot face the small diameter hole 0·625 in. dia. x 0·03 in. deep and temporarily fit the taper pin.

(2) Assemble the bearing sleeve, Ref. No. 26DC/1461, the bearing cap, Ref. No. 26DC/1482, and the bearing, Ref. No. 2A/9500427, on the inboard end of the shaft and bearing sleeve, Ref. No. 26DC/1461, the bearing cap, Ref. No. 26DC/1454, and the bearing, Ref. No. 2A/9500427, on the outboard end.

(3) Position the complete assembly between rib 63·5 and the diaphragm outboard of rib 63·5. Secure the bearing assemblies to the structure. grease nipples at the top, using ¼ in. B.S.F. bolts, Ref. No. 28D/1011030, ¼ in. plain washers, Ref. No. 28W/9418921, and ¼ in. B.S.F. stiffnuts, Ref. No. 28M/10290.

(4) Mark off, to the dimensions given in fig.29 detail C, the position of the taper pins which secure the bearing sleeves to the shaft. Drill and ream the holes to suit the taper pins. Ref. No. 26DC/1440.

(5) Remove the nuts, washers and bolts, securing the bearing assemblies to the structure and remove the complete assembly.

(6) Remove the bearing assemblies and the sprocket from the shaft. Deburr all the holes and remove the swarf.

(7) Fit the sprocket on the shaft and secure in position with the taper pin, Ref. No. 26DC/1440, 2 B.A. plain washer, Ref. No. 28W/9419402, 2 B.A. slotted nut, Ref. No. 28M/13121, and a 1/16 in. split pin.

(8) Assemble the bearing assemblies on each end of the shaft and fit the taper pins Ref. No. 26DC/1440, saddle washers, Part No. 20/SS3703, and 2 B.A. slotted nuts, Ref. No. 28M/13121.

(9) Fit the complete assembly to the aircraft securing the bearing assemblies to the structure as detailed in op.(3).

(10) Lubricate the bearing assemblies with grease XG-295.

Engine centre rib - top

99. To fit a replacement sprocket and shaft assembly at the top on the engine centre rib refer to fig.29 detail B and proceed as follows:-

(1) Assemble the sprocket, Ref. No. 26DC/1445, and the splined socket, Part No. 6/F9579, to the inboard end of the shaft, Ref. No. 26DC/4457.

(2) Mark off, to the dimensions given in fig.29 detail B, the position of the two taper pins which secure the sprocket and the splined socket to the shaft.

NOTE...

The red lining up mark on the end of the splined socket must line up with the centre of the small diameter end of the taper pin hole nearest to it.

(3) Drill and ream the two holes to suit the taper pins, Ref. No. 26DC/1455. Spot face the small diameter holes in the sprocket 0·625 in. dia. x 0·03 in. deep. Remove the sprocket and splined socket from the shaft.

(4) Assemble the sprocket Ref. No. 26DC/4455 and the splined socket,

Ref. No. 26DC/10291, to the outboard end of the shaft.

(5) Mark off, to the dimensions given in fig.29 detail B, the position of the ferrules which secure the sprocket and the splined socket to the shaft.

NOTE...
The red lining up mark on the end of the splined socket must line up with the centre of one of the ferrule holes.

(6) Drill and ream the holes to suit the ferrules, Part No. 7/F9579. Spot face the holes in the sprocket 0·875 in. dia. x 0·03 in. deep. Remove the sprocket and splined socket from the shaft. Deburr the holes and remove the swarf.

(7) Fit the sprocket and splined socket to the outboard end of the shaft and fit the splined adapter, Ref. No. 26DC/1449, into the socket. Ensure that the red lining up marks on the socket and the adapter coincide and that the slots in the adapter line up with the holes drilled in op.(6).

(8) Fit the ferrules in the holes drilled and reamed in op.(6) and fit the screwed tie rod, Ref. No. 28R/6330, lock the tie rod by riveting over the ends.

(9) Assemble the bearing sleeve, Ref. No. 26DC/1452, the bearing cap, Ref. No. 26DC/1453, and two bearings, Ref. No. 2A/9500427, to the inboard face of the rib. Assemble the bearing sleeve, Ref. No. 26DC/1461, the bearing cap, Ref. No. 26D/1454 and one bearing, Ref. No. 2A/9500427, on the outboard face of the rib. Ensure that a spacer, Part No. 6F/8796, is fitted between the bearings in the inboard assembly. Secure the bearing assemblies to the rib with ¼ in. B.S.F. bolts, Ref. No. 28D/12814, ¼ in. plain washers, Ref. No. 28W/9418921, and ¼ in. B.S.F. stiffnuts, Ref. No. 28M/10290.

(10) Fit the shaft through the bearing assemblies inserting it from the outboard side.

(11) Assemble the sprocket, the splined socket and the splined adapter, Ref. No. 26DC/4456, to the inboard end of the shaft. Ensure that the red lining up marks on the socket and the adapter coincide and that the slots in the adapter line up with the holes drilled and reamed in op.(3). Temporarily fit the taper pins.

(12) Set the shaft in position to the dimensions given in fig.29 detail B. Mark off the position of the taper pins which secure the shaft to the bearing sleeves.

(13) Drill and ream the holes through the bearing sleeves and the shaft to suit the taper pins, Ref. No. 26DC/1440.

(14) Remove the taper pins and parts fitted to the shaft in op.(11), and remove the shaft from the bearing assemblies.

(15) Deburr the holes and remove the swarf.

(16) Fit the shaft in the bearing assemblies and assemble the parts to the shaft as in op.(1) and (11). Temporarily fit the taper pins which secure the parts to the shaft and also the taper pin which secures the shaft to the inboard bearing sleeve.

NOTE...
The fitting of the washers, nuts and split pins to the three inboard taper pins is carried out after assembly of the inboard drive shaft as detailed in para.95.

(17) Fit the taper pins, Ref. No. 26DC/1440, which secure the shaft to the outboard bearing sleeve, saddle washer, Part No. 20/SS 5703, 2 B.A. slotted nut, Ref. No. 28M/13121 and 1/16 in. split pin

(18) Lubricate the bearing assemblies with grease XG-295.

Engine centre rib - bottom

100. To fit a replacement sprocket and shaft assembly at the bottom on the engine centre rib refer to fig.29 detail D, and proceed as follows:-

(1) Secure the housings, Ref. No. 26DC/2687, one on the outboard face and one on the inboard face of the engine centre rib, using ¼ in. B.S.F. bolts, Ref. No. 28D/12638, ¼ in. plain washers, Ref. No. 28W/9418921, and ¼ in. B.S.F. stiffnuts, Ref. No. 28M/10290. The bolts are fitted with the head outboard.

(2) Fit the shaft, Ref. No. 26DC/2686, through the housings.

(3) Assemble the sprocket, Ref. No. 26DC/2685, two bearings, Ref. No. 2A/9500423, a spacer ring, Ref. No. 26DC/2689, two circlips, Part No. 7/F9392, and the bush, Ref. No. 26DC/2680, on each end of the shaft.

(4) Mark off, to the dimensions given in fig.29 detail D, the position of the taper pins which secure the shaft to the housings and the bushes to the shaft.

(5) Drill and ream the holes to suit the taper pins, Ref. No. 26DC/8046. Spot face the small diameter holes in the housings and the bushes 0·437 in. dia. x 0·04 in. deep.

(6) Remove the parts fitted in op.(2) and (3), deburr the holes and remove the swarf.

(7) Assemble the parts as in op.(2) and (3) and fit the taper pins, securing the shaft to the housings and the bushes to the shaft, 2 B.A. plain washers, Ref. No. 28W/9419-402, and 2 B.A. stiffnuts, Ref. No. 28M/10288.

Rib 162-5 - top

101. To fit a replacement sprocket and shaft assembly at the top on rib 162-5 refer to fig.30 detail A and proceed as follows:-

(1) Assemble the bearing sleeve, Ref. No. 26DC/4453, the bearing cap, Ref. No. 26DC/1438, and the bearing, Ref. No. 2A/9500427, to the inboard face of rib 162-5, with the grease nipple at the bottom. Secure the bearing assembly in position using four ¼ in. B.S.F. bolts, Ref. No. 28D/1011030, four ¼ in. plain washers, Ref. No. 28W/9418921, and ¼ in. B.S.F. stiffnuts Ref. No. 28M/10290.

(2) Assemble the bearing sleeve, Ref. No. 26DC/1436, the bearing cap, Ref. No. 26DC/1439, and the bearing Ref. No. 2A/9500427, to the outboard face of rib 162-5 with the grease nipple at the bottom. Secure the bearing assembly in position using four ¼ in. B.S.F. bolts, Ref. No. 28D/1008145, four ¼ in. plain washers, Ref. No. 28W/9418921, and ¼ in.

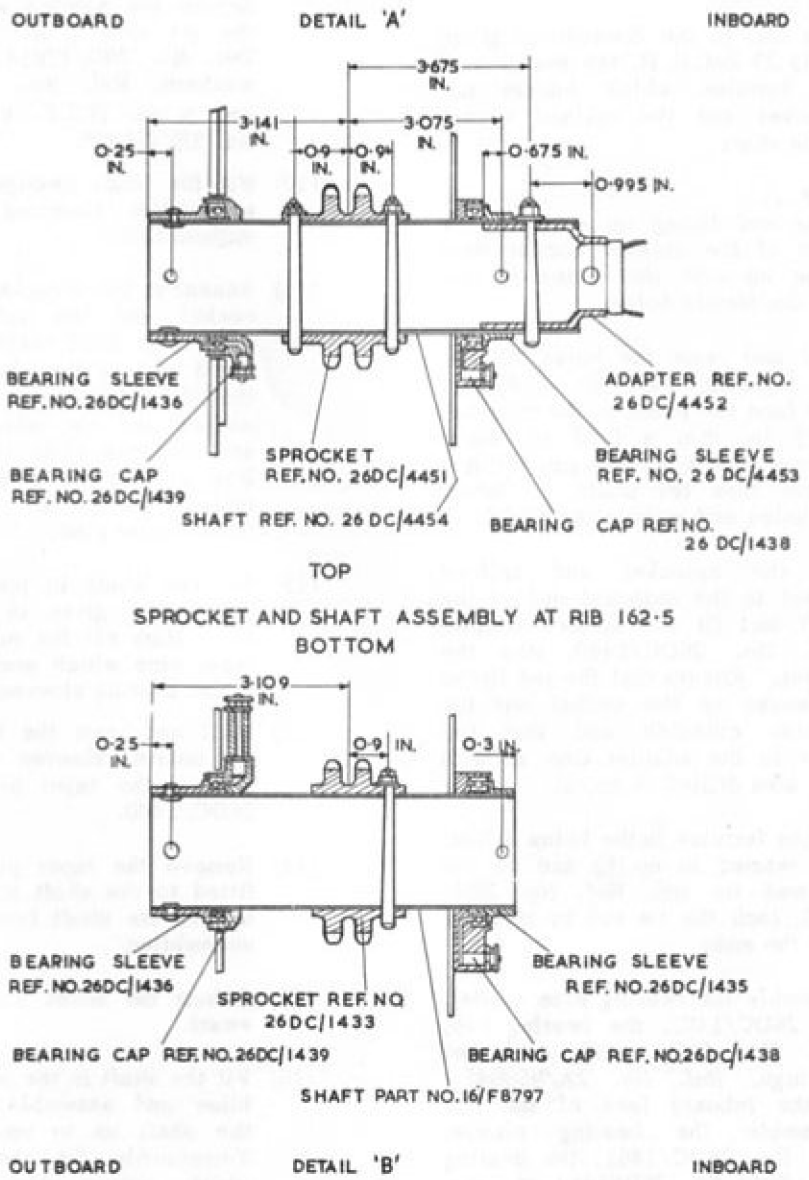


Fig.30. Air brakes sprocket and shaft assembly (2)

B.S.F. stiffnuts Ref. No. 28M/9480017

(3) Fit the shaft Ref. No. 26DC/4454 in the bearing assemblies, fit the sprocket on the shaft during this operation.

(4) Line up the outboard end of the shaft with the outboard edge of the outboard bearing sleeve. Mark off to dimensions shown in fig.30 detail A and, using a 4.9 mm drill, drill four holes for the rivets which secure the shaft to the securing sleeve.

(5) Position the sprocket and mark off the positions of the taper pins, which secure the sprocket to the shaft, to the dimensions given in fig.30 detail A. Drill and ream the holes to suit the taper pins Ref.No. 26DC/13713. Spot face the small diameter holes in the sprocket 0.687 in dia. x 0.03 in deep.

(6) Fit the adapter Ref.No. 26DC/4452 in the inboard end of the shaft. Position the adapter and mark off, to the dimensions given in fig.30 detail A, the positions of the taper pins which secure the adapter to the shaft and the adapter and the shaft to the inboard bearing sleeve.

(7) Drill and ream the holes to suit the taper pin Ref.No. 26DC/1481 which secures the adapter to the shaft and taper pin Ref.No. 26DC/1455 which secures the adapter and the shaft to the inboard bearing sleeve.

(8) Remove the adapter from the inboard end of the shaft.

(9) Remove the nuts, washers and bolts which secure the outboard bearing assembly to the rib. Remove the shaft complete with the outboard bearing assembly, as the shaft is withdrawn remove the sprocket from the shaft.

(10) Remove the outboard bearing assembly from the shaft.

(11) Deburr all the holes and remove the swarf.

(12) Fit the outboard bearing assembly on the shaft and rivet the bearing in position using four 3/16 in dia rivets Ref.No. 28Q/17960.

(13) Fit the shaft to the aircraft. As the shaft is being inserted from the outboard face of rib 162.5 fit the sprocket over the shaft.

(14) Engage the shaft in the inboard bearing assembly and secure the outboard bearing assembly to rib 162.5 as detailed in op.(2).

(15) Secure the sprocket to the shaft using the taper pins Ref.No. 26DC/13713. Secure the taper pins in position using ¼ in B.S.F. slotted nuts Ref.No. 28M/1011467, ¼ in plain washers Ref.No. 28W/9418921 and 1/16 in split pins.

(16) Fit the adapter to the inboard end of the shaft and temporarily fit the taper pins given in op.(7).

NOTE . . .
Fitting the washers, nuts and split pins to the two taper pins on the inboard end of the assembly is carried out after the assembly of the outboard drive shaft detailed in para.96.

(17) Lubricate the bearing assemblies with grease XG-287.

Rib 162.5 - bottom

102. To fit a replacement sprocket and shaft assembly, at the bottom on rib 162.5, refer to fig.30 detail B, and proceed as follows:-

(1) Assemble the bearing sleeve Ref.No. 26DC/1435, the bearing cap Ref.No. 26DC/1438 and the bearing Ref.No. 2A/9500427 to the inboard face of rib 162.5. Secure the assembly, with the grease nipple at the bottom using ¼ in B.S.F. bolts Ref.No. 28D/1011030, ¼ in plain washers Ref.No. 28W/9418921 and ¼ in B.S.F. stiffnuts Ref.No. 29M/9480017.

(2) Assemble the bearing sleeve Ref.No. 26DC/1436, the bearing cap Ref.No. 26DC/1439 and the bearing Ref.No. 2A/9500427 to the outboard face of rib 162.5. Secure the assembly, with the grease nipple at the top, using four ¼ in B.S.F. bolts Ref.No. 28D/1008151, four plain washers Ref.No. 28W/9418921 and four ¼ in B.S.F. stiffnuts Ref.No. 28M/9480017.

(3) Fit the shaft Part No. 16/F8797 through the outboard bearing assembly and fit the sprocket Ref.No. 26DC/1433 to the shaft. Fit the shaft through the inboard bearing assembly.

(4) Line up the outboard edge of the shaft with the outboard edge of

the outboard bearing sleeve. Mark off to the dimensions given in fig.30 detail B, the position of the four rivets which secure the shaft to the outboard bearing sleeve. With a 4.9 mm drill, drill four holes and temporarily secure the shaft to the bearing sleeve.

(5) Mark off the dimensions given in fig.30 detail B, the position of the taper pin which secures the shaft to the inboard bearing sleeve. Drill and ream the hole to suit the taper pin Ref.No. 26DC/1440 and temporarily fit the taper pin.

(6) Position the sprocket and mark off, to the dimensions given in fig.30, detail B, the position of the taper pin which secures the sprocket to the shaft. Drill and ream the hole to suit the taper pin Ref.No. 26DC/1440. Spot face the small diameter hole in the sprocket 0.625 in dia. x 0.03 in deep.

(7) Remove the taper pin fitted in op.(5) and remove the nuts, washers and bolts securing the outboard bearing assembly to the rib.

(8) Remove the shaft complete with the outboard bearing assembly and, as the shaft is being withdrawn, remove the sprocket.

(9) Remove the outboard bearing assembly from the shaft.

(10) Deburr all holes and remove the swarf.

(11) Fit the outboard bearing assembly on the shaft and rivet it in position using four 3/16 in dia. rivets Ref.No. 28Q/17960.

(12) Fit the shaft and outboard bearing assembly to rib 162.5. Insert the shaft from the outboard face of the rib. Fit the sprocket on the shaft and fit the shaft through the inboard bearing assembly.

(13) Secure the outboard bearing assembly to the rib as given in op.(2).

(14) Secure the shaft to the inboard bearing sleeve using the taper pin Ref.No. 26DC/1440, saddle washer Part No. 20/SS3703, 2 B.A. slotted nut Ref.No. 28M/5808573 and 1/16 in split pin.

(15) Secure the sprocket to the shaft using the taper pin Ref.No. 26DC/1440, saddle washer Part No. 20/SS3703, 2 B.A. slotted nut Ref.No. 28M/5808573 and 1/16 in split pin.

(16) Lubricate the bearing assemblies with grease XG-287.

FITTING AERIALS TO COUNTERPOISE PLATES

103. The S band aerial, or the blanking plate fitted in lieu of the aerial, is secured to the counterpoise plate with twelve 2 B.A. countersunk head screws - AS.1242/3C Ref.No. 28D/9709461, pre-Mod.1869 or AS.1242/4C Ref.No. 28D/1007976, post-Mod.1869. The L band aerial, M54, is secured with twelve round head screws, AS.1246/4C Ref.No. 28D/9710453, pre-Mod.1869 or AS.1246/5C Ref.No. 28D/1215078, post-Mod.1869. When fitting the L band aerial, M53, screws AS.1246/3C Ref.No. 28D/9140203 are used pre-mod.1869. The L band aerial bonding leads must be secured as shown on fig.31 using a 4 B.A. bolt Ref.No. 28D/1008149 and a 4 B.A. thick washer Ref.No. 28W/9419474.

TURBINE DISC PROTECTION SHIELDS

Outboard shield removal (fig.32)

104. With e.c.u. removed, proceed as follows:-

◀ (1) Disconnect and remove fire extinguisher system spray pipes from area of protection shield and blank off exposed pipe ends.

(2) In No.4 engine compartment only:-
Disconnect and remove rapid start pipe from area of protection shield and blank off exposed pipe ends.

(3) Unclip and stow flame switch cables. ▶

(4) Remove detachable fireproof roof panel.

(5) Drill out pop rivets attaching forward and rear fireproof skin panels to protection shield and peel skins back as necessary to facilitate remove of the shield.

(6) On starboard side only:-
Gain access to A.A.P.P.

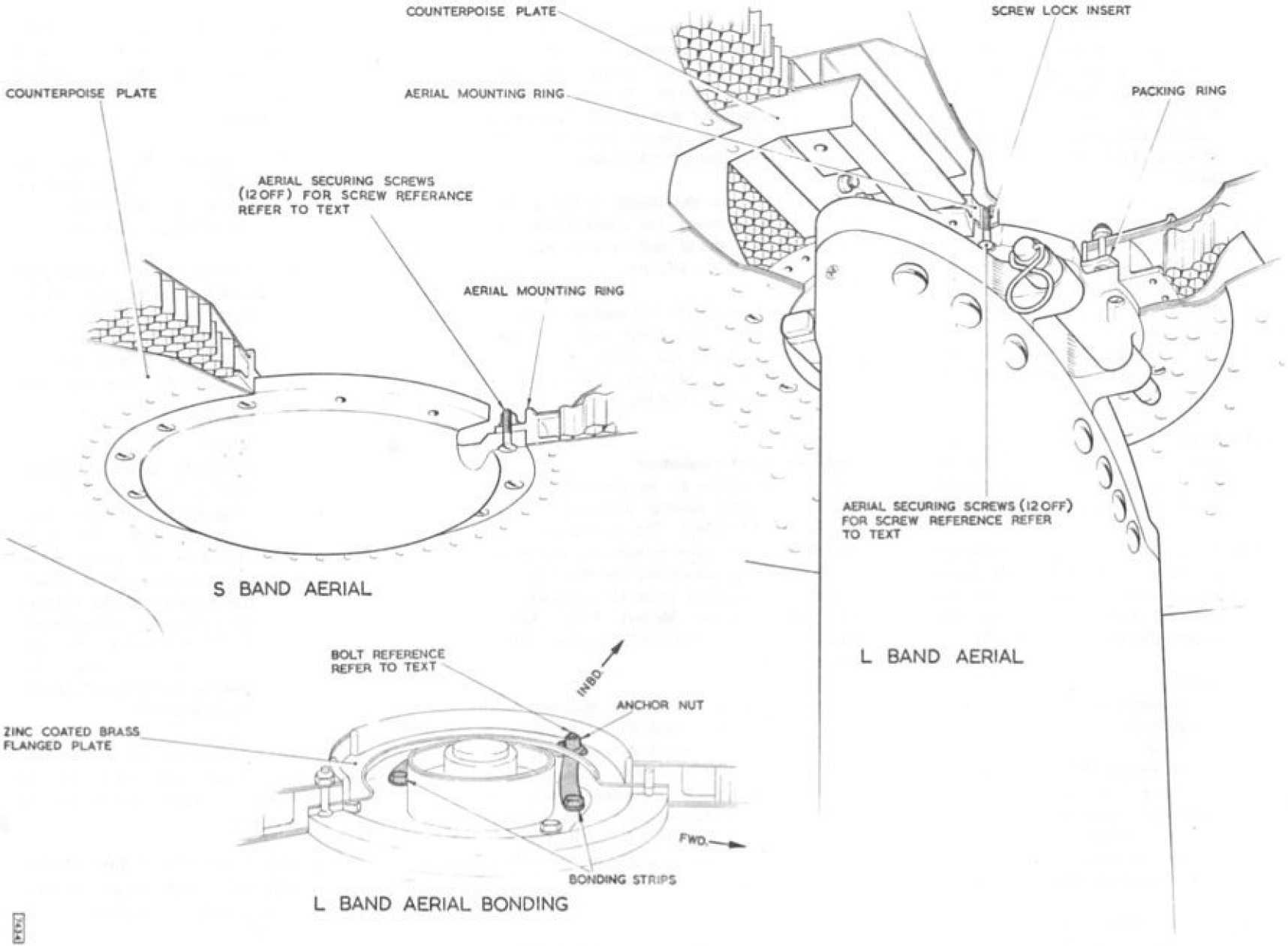


Fig. 31 Aerial mountings in counterpoise plates

compartment and remove clamp from air conditioning duct at forward top left-hand corner of compartment. Remove clamp from duct in roof of engine compartment and remove section of duct. Blank off exposed ends of duct.

(7) Attach a 2½ cwt mini-lift hoist Ref.No. 4GC/4232219 with a suitable length extension tube and with top sheath hook Ref.No. 4GC/5700 to hoist bracket in compartment roof and connect cable hook Ref.No. 4GC/1042863 to hoist bracket on shield. Take up slack in cable.

(8) Remove locking wire from the shield lower attachment bolts (8 off) and remove bolts, washers and shield lower edge sealing member.

(9) Using a screwdriver held in the saw cut in the end of the bolt shank and a ring spanner, remove the stiffnuts and washers from the upper attachment bolts (6 off).

NOTE . . .
As the shield is withdrawn from its attachments it will adopt a tilted attitude, it is therefore recommended that three men be engaged in the following operations - one on the ground to operate the hoist and two on a suitably positioned platform to assist in manoeuvring the shield.

(10) Maintain tension of the hoist cable and manoeuvre the shield away from the aircraft rib taking care to avoid damage to the upper attachment bolts, the lower attachment bosses and the fireproof skin panels. Remove the distance pieces from the upper attachment bolts holes.

(11) Lower the shield to the ground, disconnect the cable hook from the shield and remove the hoist from the aircraft.

(12) Remove the old sealing compound from the shield and rib mating surfaces and clean the surfaces using Methyl Ethyl Ketone (M.E.K.) Ref.No. 33C/1322.

Outboard shield installation

105. The shield is to be assembled to the aircraft rib with sealing compound J.C.5A Ref.No. 33H/2202495. The mating surfaces of the rib (i.e. the upper attachment angles and lower mounting plates) and the shield must be cleaned, immediately prior to application of the sealant, using Methyl Ethyl Ketone (M.E.K.) Ref.No. 33C/1322 applied with a lint-free cloth.

(1) Attach a 2½ cwt mini-lift hoist Ref.No. 4GC/4232219 with a suitable length extension tube and with top sheath hook Ref.No. 4GC/5700 to hoist bracket in compartment roof and connect cable hook Ref.No. 4GC/1042863 to hoist bracket on protection shield.

NOTE . . .
Three men are required for the following operation – one on the ground to operate the hoist and two on a suitably positioned platform to assist in manoeuvring the shield.

(2) (a) Support the shield and operate the hoist to raise the shield into alignment with the attachment fixtures.

(b) Manoeuvre the shield into position taking care not to damage the upper attachment bolts, the lower attachment bosses and the surrounding fireproof skin panels.

NOTE . . .
Ensure the upper attachment bolts and the lower attachment bosses align centrally with the holes drilled in the shield. When the attachments are finally tightened the shield will take up a position approximately 1/32 in lower. In this position the holes for riveting the fireproof skin are initially drilled.

(3) Attach distance piece to each upper attachment bolt (6 off) and loosely fit washer and stiffnut to each bolt.

(4) Align lower edge sealing member with shield and loosely fit each lower attachment washer and bolt (8 off).

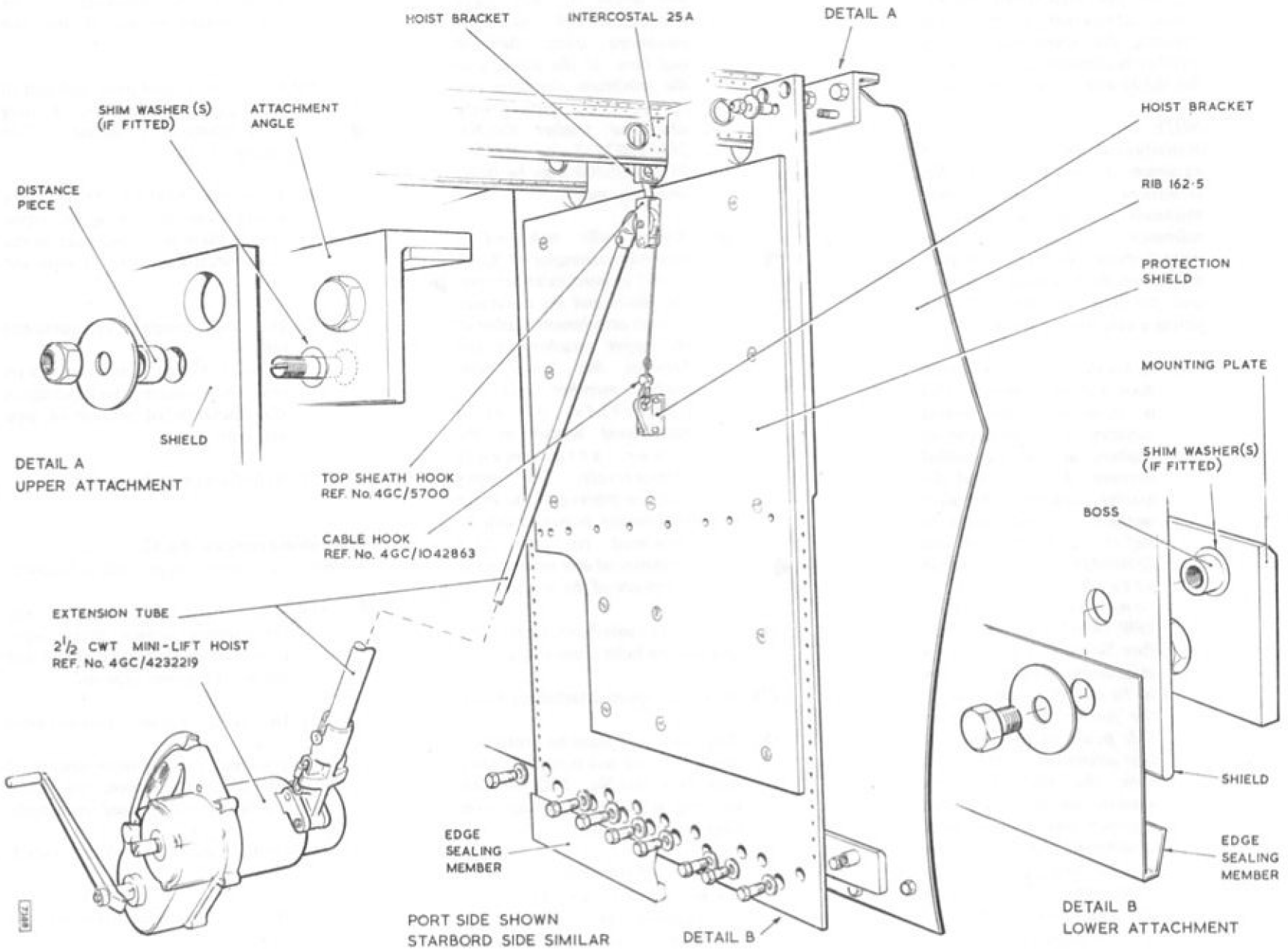


Fig. 32 Removal of outboard turbine disc protection shield

◄ Mod 2218, Amdt. 1 ►

(5) Tighten upper attachment nuts and lower attachment bolts evenly ensuring the lower edge sealing member is clamped firmly between the shield and rib mating surfaces.

NOTE . . .
Manufacturing difficulty is experienced in producing flat titanium plate of accurate thickness. A limited degree of tolerance is accepted by the manufacturer. To cater for such tolerances the following clearances and fits must be obtained when fitting a new protection shield.

(i) If, because of bow, the shield does not seat correctly, that is, it rocks on the mating surfaces, a combination of washers are to be added between the shield and the mating surfaces. The shim washers, a combination of Ref.No. 28W/1007697 and 28W/9436800 at the upper attachments and a combination of Ref. 28W/14305 and 28W/NIV, Part No. SP11/P at the lower attachments respectively are to be added at one or all of the four corner attachment bolt positions to obtain the best alignment of the shield with the rib. The shim washers are to be araldited together and to the upper attachment angles and lower mounting plates as appropriate. (For Araldite procedures, refer to A.P.101A-0600-6, Sect.2).

(ii) The length of each upper attachment bolt caters for maximum plate thickness and bow. If the plate is to the minimum thickness and flat, the appropriate additional washer Ref.No. 28W/1007697 or Ref.No. 28W/9436800 may be fitted under the nut.

(iii) When fully tightened a minimum clearance of 0.005 ± .002 in must exist between the shield and the underside of each attachment washer at the upper attachments and between the lower edge sealing member and the underside of each attachment washer at the lower attachments respectively. The upper distance pieces and the lower attachment bosses should be trimmed to give this clearance at any point on the periphery of the washer.

(6) Disconnect cable hook from shield and remove hoist from aircraft.

(7) Wire-lock lower attachment bolts.

(8) Rivet fireproof skins to protection shield forward and rear edges using pop-rivets Ref.No. 28Q/9417268 ensuring skin panels overlap lower edge sealing member.

(9) On starboard side only:-
Remove blanks from air conditioning duct removed in para.104 operation (6), ensure there is no blockage in the disconnected section of duct and refit.

(10) Fit fireproof roof panel and seal all small gaps in the fireproof skinning with Silastic 732, Sealastic 'C' or Silcoset 151.

(11) Remove blanks from fire extinguisher system spray pipes, ensure there is no blockage in the disconnected sections of pipe and refit.

(12) In No.4 engine compartment only:-
Remove blanks from rapid start pipe, ensure there is no blockage in the disconnected section of pipe and refit.

(13) Refit flame switch cables.

Inboard shield removal (fig.33)

106. With e.c.u. removed, proceed as follows:-

(1) Disconnect and remove fire extinguisher system spray pipes from area of protection shield and blank off exposed pipe ends.

(2) In No.2 engine compartment only:-
Disconnect and remove rapid start pipe from area of protection shield and blank off exposed pipe ends.

(3) Unclip and stow flame switch cables.

(4) Remove detachable fireproof roof panel.

(5) Drill out pop-rivets joining top and bottom angles together along lower edge of shield.

(6) Drill out pop-rivets attaching forward and rear fireproof skins to protection shield and peel skins back as necessary to facilitate removal of the shield.

(7) Attach a 2½ cwt mini-lift hoist Ref.No. 4GC/4232219 with a suitable length extension tube and with top sheath hook Ref.No. 4GC/5700 to hoist bracket in compartment roof and connect cable hook Ref.No. 4GC/1042863 to hoist bracket on shield. Take up slack in cable.

(8) Gain access to the bomb bay and remove stiffnut and washer from each lower attachment bolt (8 off) and from each upper attachment bolt (10 off).

NOTE . . .
The four corner attachment bolts may be found to be fitted in reverse of that shown in fig.33. This is a result of a procedure adopted during manufacturers initial fit.

(9) Withdraw the lower attachment bolts together with large washers under bolt heads and distance pieces.

(10) Withdraw the upper attachment bolts together with large washers under bolt heads and distance pieces.

NOTE . . .
As the shield is withdrawn from the aircraft rib it will adopt a tilted attitude, it is therefore recommended that three men be engaged in the following operations – one on the ground to operate the hoist and two on a suitably positioned platform to assist in manoeuvring the shield.

(11) Maintain tension of the hoist cable and manoeuvre the shield away from the aircraft rib taking care to avoid damage to the fireproof skin panels.

(12) Lower the shield to the ground, disconnect the cable hook from the shield and remove the hoist from the aircraft.

(13) Remove the old sealing compound from the shield and rib mating surfaces and clean the surfaces using Methyl Ethyl Ketone (M.E.K.) Ref.No. 33C/1322.

Inboard shield installation

107. The shield is to be assembled to the aircraft rib with sealing compound J.C.5A Ref.No. 33H/2202495. The mating surfaces of the rib (i.e. the upper packing pieces and lower support plates) and the shield must be cleaned immediately prior to application of the sealant, using Methyl Ethyl Ketone (M.E.K.) Ref.No. 33C/1322 applied with a lint-free cloth.

NOTE . . .
If the shield, fitted in No.3 engine compartment of a proof installation aircraft (XH 570, XJ 782 or XL 318) is replaced at a future date, the adjacently mounted airspeed transmitters and time delay unit in the bomb bay must first be remounted in accordance with the manufacturers drawings V17446 and V17447 respectively and the appropriate operations given in the modification leaflet.

(1) Attach a 2½ cwt mini-lift hoist Ref.No. 4GC/4232219 with a suitable length extension tube with top sheath hook Ref.No. 4GC/5700 to hoist bracket in compartment roof and connect cable hook Ref.No. 4GC/1042863 to hoist bracket on protection shield.

NOTE . . .
Three men are required for the following operation – one on the ground to operate the hoist and two on a suitably positioned platform to assist in manoeuvring the shield.

(2) (a) Support the shield and operate the hoist to raise the shield.

(b) Manoeuvre the shield into position taking care not to damage the fireproof skin panels.

NOTE . . .
Ensure the shield is aligned so that attachment bolts and distance pieces fit centrally within the bolt holes. When finally tightened the shield will take up a position approximately 1/32 in lower. In this position the holes for

riveting the fireproof skin are initially drilled.

(3) Insert each upper attachment bolt, washer and distance piece and loosely fit each washer and stiffnut.

(4) Insert each lower attachment bolt, washer and distance piece and loosely fit each washer and stiffnut.

(5) Tighten upper and lower attachment bolts evenly.

NOTE . . .
Manufacturing difficulty is experienced in producing flat titanium plate of accurate thickness. A limited degree of bow together with a thickness tolerance is accepted by the manufacturer. To cater for such tolerances the following clearances and fits must be obtained when fitting a new protection shield.

(i) If, because of bow, the shield does not seat correctly, that is, it rocks on the mating surfaces, a combination of washers are to be added between the shield and the mating surfaces. The shim washers, a combination of Ref.No. 28W/9419403 and 28W/9419455 at the upper attachments and a combination of Ref.No. 28W/1007697 and 28W/9436800 at the lower attachments respectively are to be added at one or all of the four corner attachment bolt positions to obtain the best alignment of the shield with the rib. The shim washers are to be araldited together and to the upper packing pieces and lower support plates as appropriate. (For Araldite procedures, refer to A.P.101A-0600-6, Sect.2). To ease the initial fit of the shield to the rib, the fitment of the attachment bolts at the shimmed positions may be reversed to that shown in fig.33.

(ii) The length of each attachment bolt caters for maximum plate thickness and bow. If the plate is to the minimum thickness and flat, the appropriate additional washer Ref.No. 28W/9419403 or 28W/9419488 may be fitted under the nut at the upper attachments and washer Ref.No. 28W/1007697 or 28W/9419488 may be fitted under the nut at the lower attachments respectively.

(iii) When fully tightened a minimum clearance of 0.005 ± .002 in must exist between the shield and the underside of each attachment washer at the upper attachments and between the shield attachment plates and the underside of each attachment washer at the lower attachments respectively. The distance pieces should be trimmed to give this clearance at any point on the periphery of the washer.

(6) Disconnect cable hook from shield and remove hoist from aircraft.

(7) Rivet fireproof skins to protection shield forward and rear edges using pop-rivets Ref.No. 28Q/9417268.

(8) Rivet shield lower edge top and bottom angles together using pop rivets Ref.No. 28Q/9417266.

(9) Fit fireproof roof panel and seal all small gaps in the fireproof skinning with Silastic 732, Sealastic 'C' or Silcoset 151.

(10) Remove blanks from fire extinguisher system spray pipes, ensure there is no blockage in the disconnected sections of pipe and refit.

(11) In No.2 engine compartment only:-
Remove blanks from rapid start pipe, ensure there is no blockage in the disconnected section of pipe and refit.

(12) Refit flame switch cables.

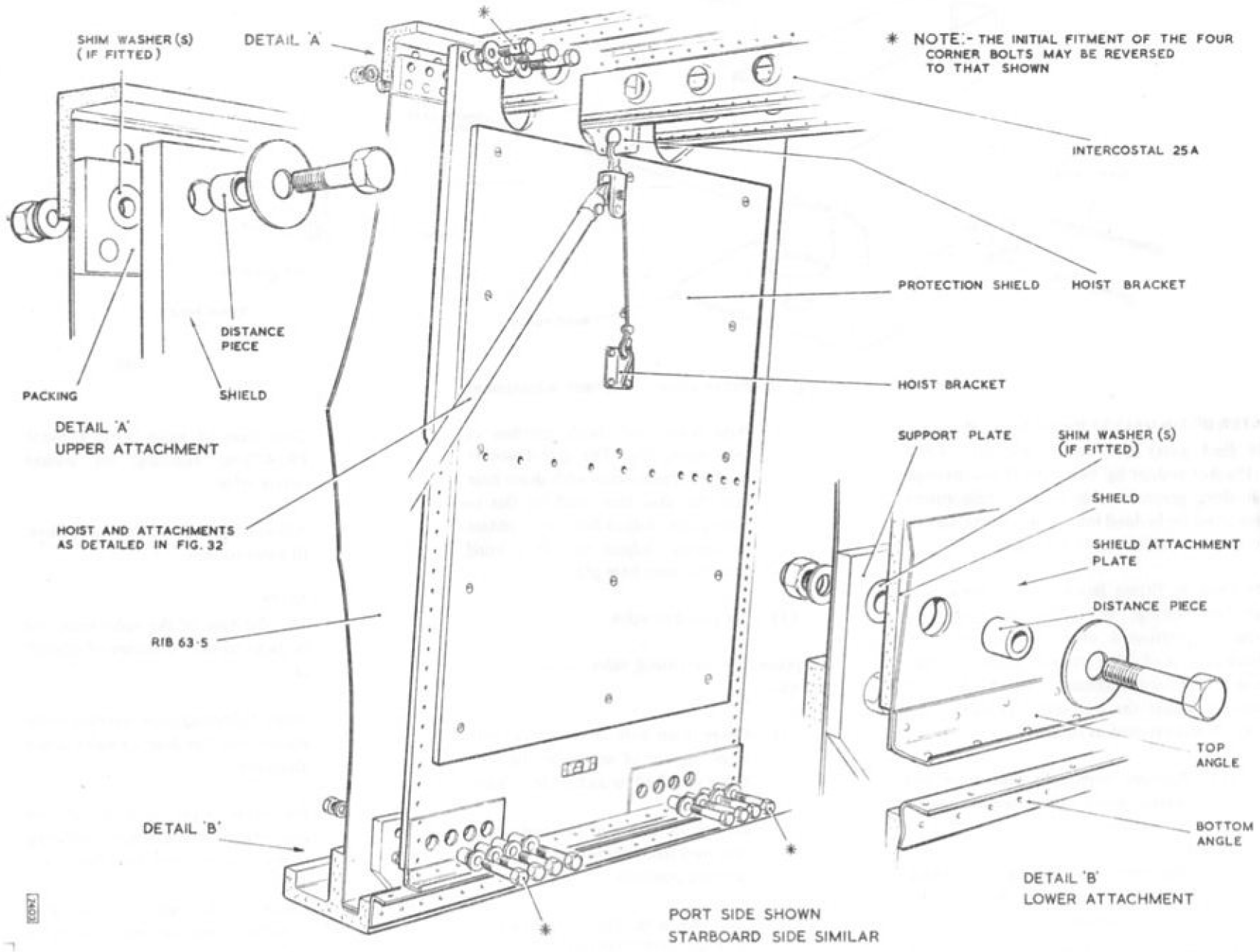


Fig. 33 Removal of inboard turbine disc protection shield

◄Mod. 2218, Amdt.1►

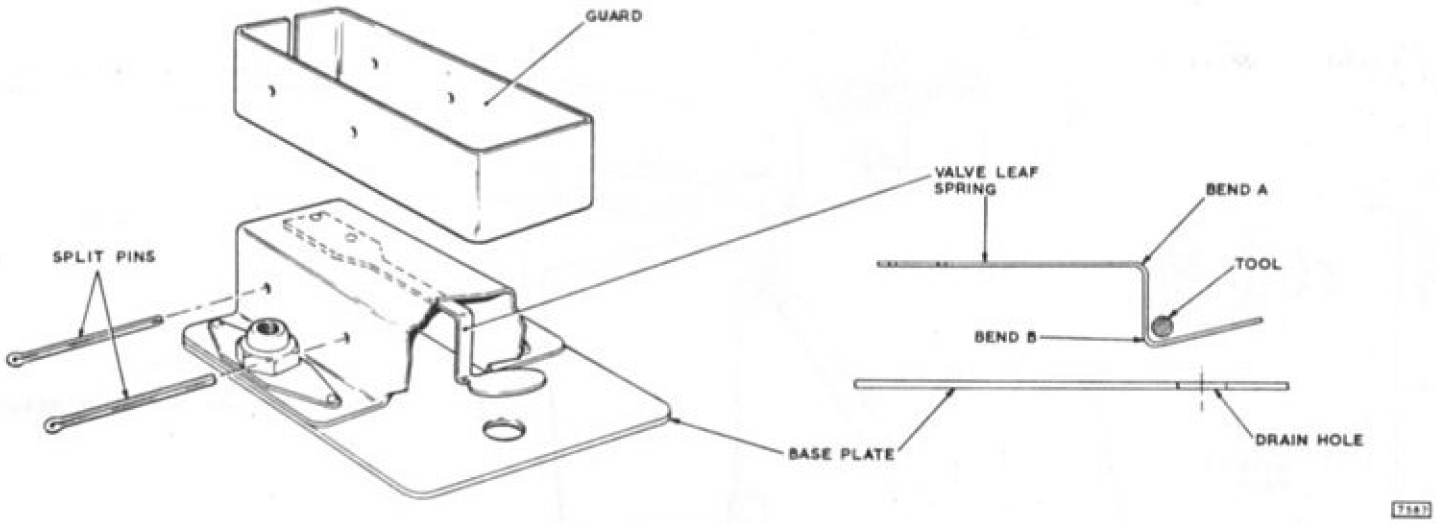


Fig. 34 Water drain valve leaf adjustment

WATER DRAIN VALVES (fig.5A and fig.34)

108. Each water drain valve is secured in a bed of Thiokol sealant by two bolts fitted through skin along pressure cabin keel. A replacement valve must be bedded into fresh sealant, having first removed all traces of old sealant.

109. Prior to fitting replacement valve ensure that leaf spring, in replacement valve, is correctly positioned over valve drain hole, otherwise loss of cabin pressure from hole may exceed permitted maximum. To check and if necessary adjust the leaf spring position refer to fig.34 and proceed as follows:-

(1) Remove both split pins from leaf spring guard, then remove guard from valve.

(2) Examine leaf spring for twist. Eliminate any twist by carefully counter-twisting.

(3) Using a scriber or similar tool lightly press leaf spring onto valve base plate and check position of leaf spring disc. The disc diameter shall be symmetrical with drain hole and the disc face shall be flat to base plate. Adjust bend A to obtain symmetry. Adjust bend B to bring disc flat onto base plate.

(4) Fit guard to valve.

The procedure for fitting valve to aircraft is as follows:-

(1) Cover drain hole in valve base with ½ in. square of sellotape, the tape being attached to underside of base.

(2) Ensure all traces of old sealant are removed from aircraft skin at valve bedding position.

(3) Coat skin with Thiokol PR1422-½ Ref.No. 33H/2203110 .

(4) Coat base of valve with Thiokol PR1422-½, ensuring no sealant enters valve.

(5) Allow sealant to become tacky then fit valve to skin.

NOTE . . .
The flat base of the valve must not be bent to suit curvature of aircraft skin.

When tightening valve securing bolts ensure that flat base of valve is not distorted.

(6) Pressurise cabin to 2 lb/in^2 and carefully cut out sellotape, ensuring that no pieces enter drain hole.

(7) Check that leakage rate from cabin is within specified limits. (Refer to Sect.3, Chap.8).