Chapter 2 MAIN PLANE

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LIST OF ILLUSTRATIONS

INTRODUCTION

1. The main plane is a light-alloy cantilever member built up from five main sections:—

(1) Centre plane, which is integral with the fuselage intermediate centre section.

(2) Port and starboard intermediate plane sections.

(3) Port and starboard outer plane sections.

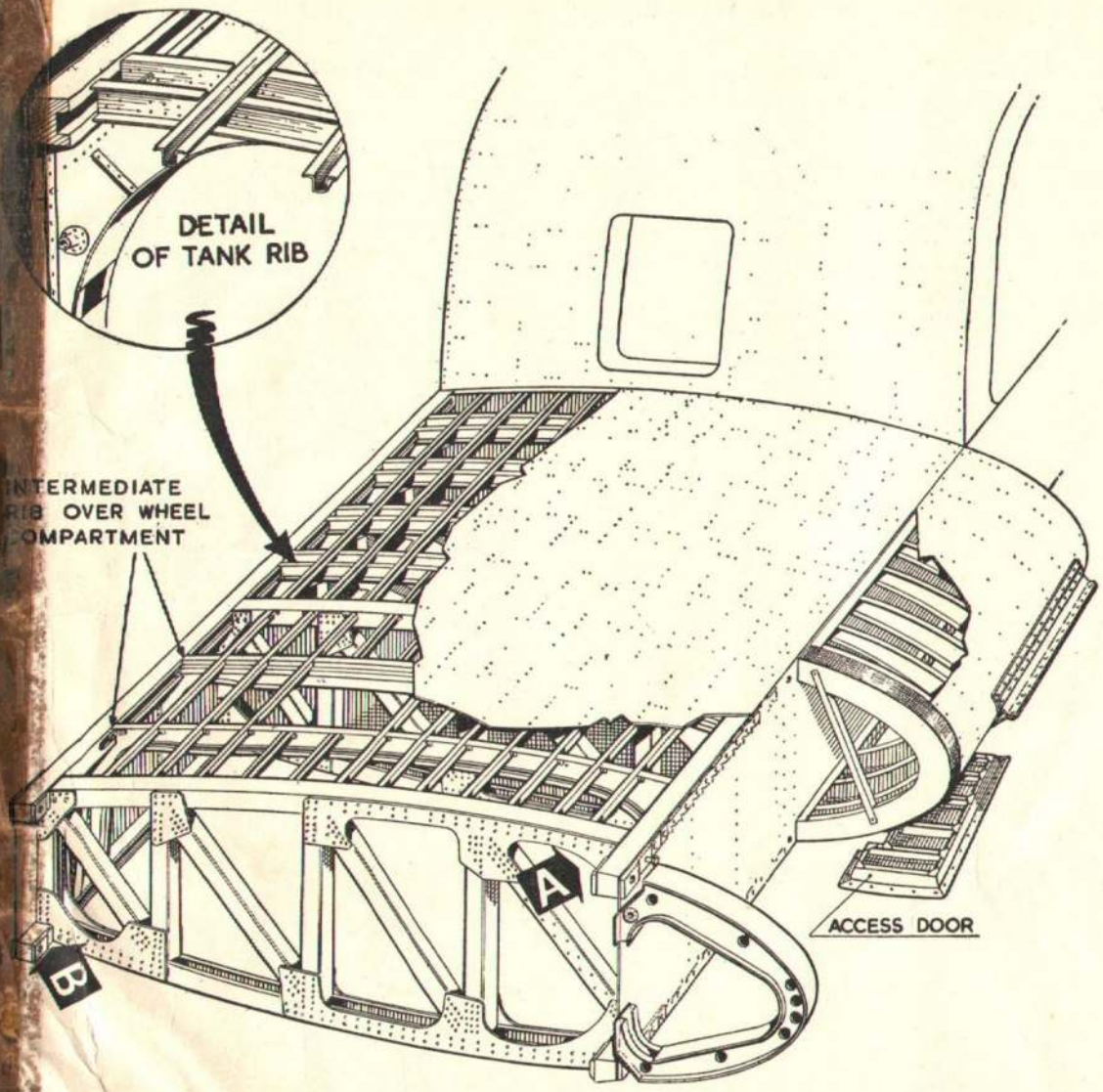
DESCRIPTION

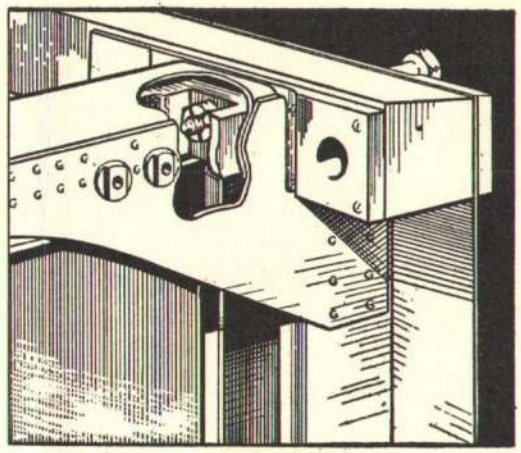
A rib location diagram will be found in Sect. 2, Chap. 4. Dihedral is confined to the intermediate and outer sections which taper outboard in plan and elevation. Detachable trailing edges are fitted to the centre and intermediate sections and the outer sections have detachable wing tip trailing edges. The centre plane has detachable leading ed

SPARS

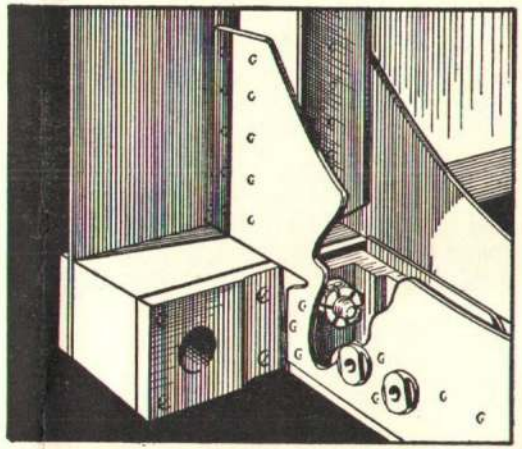
Spar booms

2. These are of light alloy and are machined to the required section from extruded b





DETAIL A



DETAIL B

Fig. 1 Centre plane

(1) The four centre plane booms are milled out to channel section between the fuselage and engine ribs. The lower front spar boom is also milled out where it passes across the fuselage and the lower rear spar boom has a light-alloy reinforcing strip bolted to its forward face where it crosses the fuselage and extending on either side to a point beyond the innermost No. 1 tank rib. At their ends the booms are reinforced by steel plates attached by countersunk screws (*fig.* 1) which strengthen the bolt holes for fitting the intermediate plane section attachment shackles.

(2) The intermediate spar booms have full cross-sectional areas at each end and, on the front spar, are milled to channel section over their full length ; the rear spar booms are gradually reduced to L-section toward their outboard ends. All four spars have steel reinforcing plates at the inboard ends similar to those in (1).

(3) A sharp decrease in depth of the outer plane spar booms is made beyond their inboard ends and a further gradual decrease is made toward their outer ends. The thickness of all four is constant throughout. The front booms are shorter than the rear booms which are bent towards each other to form the wing tip contour.

Spar webs

3. Eight web sections make up each complete main plane spar web. Their edges abut and are joined by riveted or bolted joint plates. These sections are located as follows :—

(1) Centre plane spars : two web plates jointed at the centre with front and rear plates and rivets. Inside the fuselage, at each side, the webs are extended upwards, forming lugs which are riveted to, and form part of, the webs of formers 6 and 12.

(2) Intermediate section spars : two web sections joined by riveted joint plates.

(3) Outer section spars : single webs. The shorter front spars have pressed light-alloy extensions to form the wing tip contour, whilst the rear spar webs extend to the tip formed by the booms.

4. Vertical lengths of angle strip for attaching ribs are riveted to the inner faces of the webs, and to the outer faces where there are fixed leading or trailing edges. The spar booms are attached to the webs by rivets, or by double ended studs at those portions where detachable leading or trailing edges are fitted.

Spar joints

5. The joints between each main plane outer section and its adjacent intermediate section and the joints between the latter sections and the centre plane are made at the spar boom ends by shackles machined from forged steel and bolts of high tensile steel which are a reamed fit. At each joint a gap of $\frac{1}{16}$ in. is left between the ends of the booms. The inboard rear shackles have a $\frac{1}{16}$ in. step on one face which can be used, by reversing them, to take up mis-alignment of the boom ends. In addition, the web plates are secured at each joint by a web joint plate in conjunction with mild steel bolts (*fig.* 15).

RIBS

Nose ribs

6. The various types of light-alloy nose ribs are shown in the illustrations. The outer flanges are cut away to let in T-section skin stiffeners.

Centre plane tank ribs (*fig. 1 and 2*)

7. The four tank ribs at each side are of double formation separated by stiffening channels. Plating is riveted to the inside flanges which are shaped to receive the nose and top of the No. 1 tanks.

Engine ribs

8. These are fabricated from large heavy-gauge channel-section members jointed by gusset plates and secured to the spar booms by attachment forks bolted to the top and bottom of the rib ends (*fig.* 1, *detail A and B*). Between the attachment forks the ends of these ribs are also bolted to the spar webs. Plating, to exclude dirt thrown up by the main wheels, is riveted to each inboard engine rib.

Intermediate section centre ribs (*fig. 4*)

9. No. 1 rib consists of two channel-section booms, with a web between stiffened by vertical lengths of top-hat section, and No. 18 is of light girder construction. The remainder are internally flanged and skinned over to form a continuous housing for No. 2, 3 and 4 tanks. The inboard ribs are cut away at the top to form an opening for a tank assembly panel. Single and double ribs alternate between ribs 1 and 41 beyond which the ribs are single and more closely spaced. Two pulleys are fitted to rib 18 to enable tanks No. 3 and 4 to be hauled into position.

Outer section centre ribs

10. With the exception of the pulleys, rib 19 is similar to rib 18 ; the remainder are of pressed sheet with lightening holes and vertical flutes.

Trailing edge ribs

11 These are of pressed sheet with lightening holes. The lower aft portion of all trailing edge ribs up to and including rib 12 of the intermediate plane section are cut away and a false spar which carries the flap hinges is attached. After rib 12 the ribs are shorter and shaped at their aft ends to receive the nose of each aileron (*fig.* 5 *and* 6).

CENTRE PLANE (*fig. 1*)

12. The centre plane is integral with the fuselage intermediate centre section. A stabilising plate is fitted at one edge by a double row of countersunk screws to the

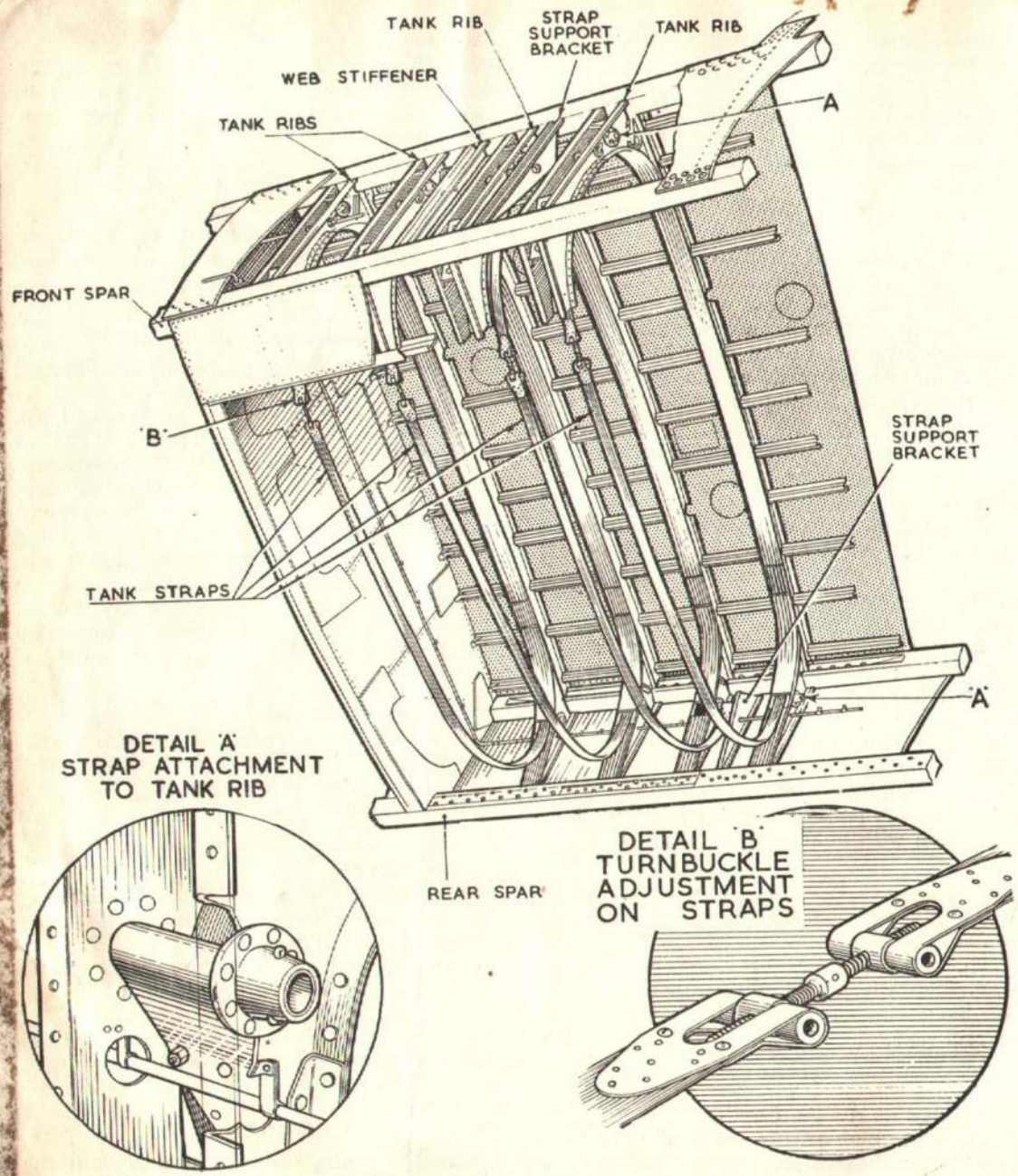


Fig. 2. No. 1 Fuel tank compartment—starboard

upper surface of the top boom of each spar between the fuselage sides. The other edges of these plates are reinforced by rectangular section bar.

13. The rear spar web is extended below the bottom boom to form a support for the intermediate centre section longeron shoe brackets and the floor intercostals. Below the front spar is a floor support plate bolted to the front faces of the longeron forward shoe brackets and riveted to the floor intercostals. The centre of this plate is supported by a plate bolted to the lower boom and web of the front spar (*Chap.* 1). The space between the floor and the spar is closed by flexible sealing strip.

No. 1 fuel tank compartments (*fig. 2*)

14. These are formed by the tank ribs, the fuselage skin, the spar webs and the web on each inboard engine rib. To retain the tanks in position, four steel straps with turnbuckle fasteners are secured to the end of the tank ribs as shown in the illustration.

No. 1 fuel tank assembly panels (*fig. 3 and 4*)

15. A large detachable panel is provided in the underside of each centre plane tank compartment. Each is of light-alloy sheet with top-hat-section stiffeners and is attached by bolts. The attaching frame is formed by the following :—

(1) Angle strip, shaped to the wing contour, riveted to the fuselage.

(2) The rear edge of the bottom skin which is reinforced and covers the lower front portions of the tank ribs.

(3) Inboard engine ribs.

(4) Bottom face of the rear spar lower boom.

Anchor nuts are provided where necessary.

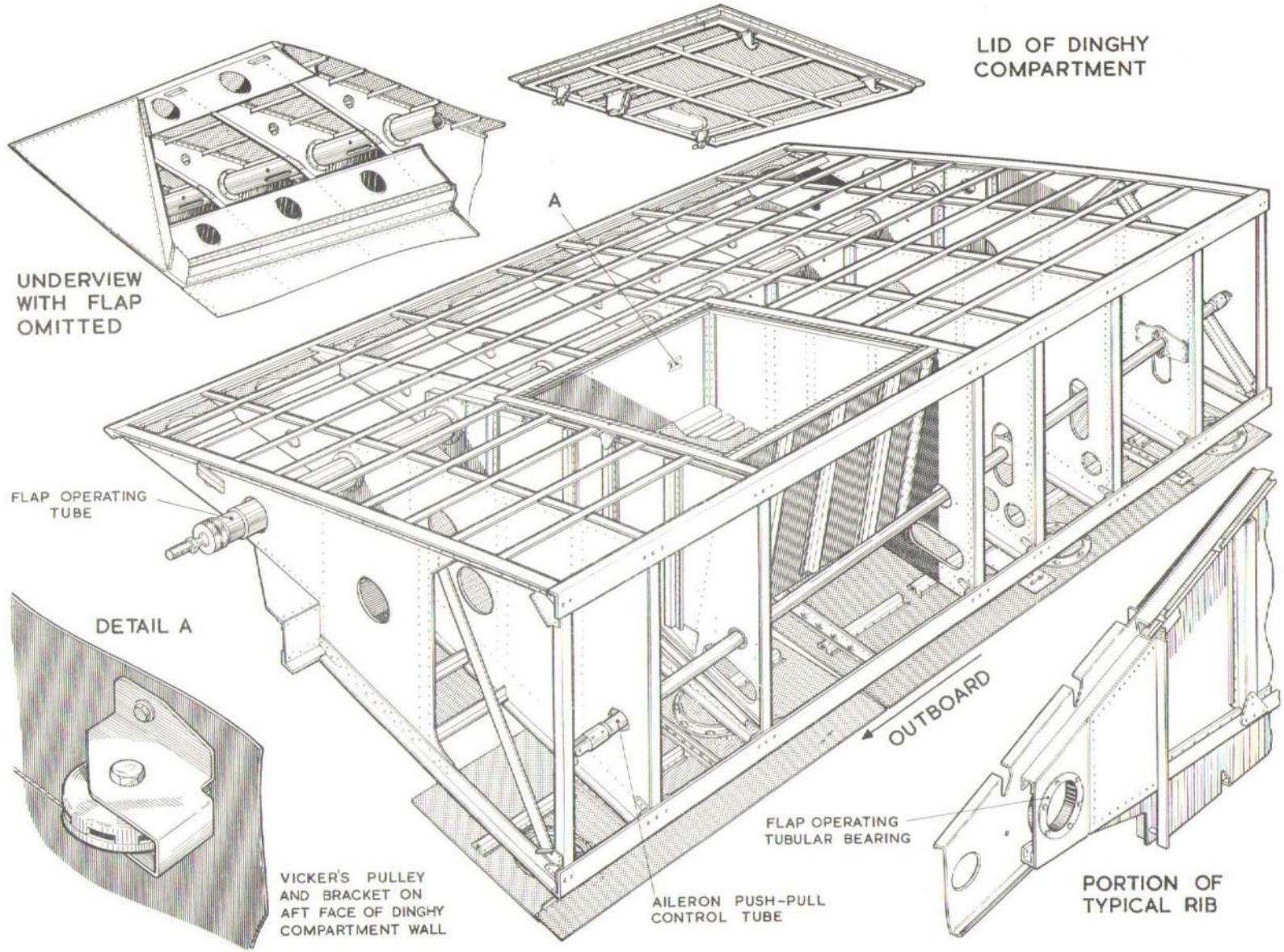


Fig.3. Centre plane trailing edge

Main wheel compartments

16. Outboard of each No.1 fuel tank is a main-wheel compartment between the engine ribs. Undercarriage beams are attached to the forward face of the front spar, each by two main bolts which pass through the associated engine ribs attachment forks, the spar booms and web. Smaller bolts secure the beams to the spar web between the booms. The centre plane top skinning is reinforced between the engine ribs by two intermediate ribs and twelve stringers. Stringers 8 and 9, counting from forward, are omitted between the two ribs to allow clearance for the wheel tyre when retracted.

Leading edge (fig.1)

17. This is in two parts, one on each side of the fuselage extending outboard to the inboard nacelle. Each part is formed by ten pressed, C-shaped, flanged ribs. The upper and lower ends of these ribs are riveted to channel section members which are secured by nuts to studs in the front spar booms. A large access panel covers an opening cut in the underside of the leading edge and a small inspection door is provided at the bottom of the panel (refer to the illustration). Leading edge spoilers, introduced by Mod.420 are fitted above the access panel, to serve as a stall warning device.

Trailing edge (fig.3)

18. There are two trailing-edge sections, one each side of the fuselage. The forward corners of the ribs are riveted to lengths of extruded angle section which are secured to the studs on the rear spar. The aft end of each rib is secured to an extruded acute angle section to form the trailing edge. A dinghy stowage compartment, provided in each section, is covered by a detachable panel held in position by two catch hooks forward and two latches aft.

19. The underskinning is arranged in three parts as follows:-

(1) Assembly panels retained by screws.

(2) Plating aft of these panels.

(3) Aft of the plating, which ends at a false spar for attaching the flap hinges, are stiffening plates with flanged lightening holes.

The flaps, when UP, cover the stiffening plates and form the wing skin, flush with the skinning forward of the false spar. The aileron control push-pull rods pass through flanged holes in the lower front portion of the ribs and the flap-operating tubes slide in circular fibre bearings fixed to each rib aft of the false spar.

INTERMEDIATE SECTIONS (fig.4)

20. These have integral leading edges which are cut away at each outboard power plant sub-frame. Mounting channels, at ribs 7 and 8, are bolted to the forward face of the front spar and, at their lower ends, have attachment forks to which the front of the associated sub-frame is bolted. The rear lug on each sub-frame is bolted to a fitting which is attached to the rear spar and rib 7A (detail C). The construction of the ribs to form the tank housing tunnel is shown in the illustration.

No.2, 3 and 4 fuel tank assembly panels (fig.4).

21. An outer skin is riveted to a joggled T-section frame and spot-welded to flanged stiffening ribs lying fore-and-aft in line with each main plane rib. An inner skin is pop-riveted to the rib flanges and to pressed, flanged edge members attached to the frame.

Trailing edge sections (fig.5)

22. Construction is similar to that of the centre plane trailing edge up to rib 12, beyond which the ribs are shorter to accommodate the inboard aileron. The ends of these outer ribs are covered by shroud skinning which at the bottom is riveted along its edge to angle strip connecting the lower rear corners of the ribs. Two intermediate stringers are provided under the top plating. Aileron hinge arms are secured through the skin to double ribs 14 and 18.

Equipment

23. The services and equipment in each intermediate plane are as follows:-

(1) Two picketing shackles, one between ribs 2 and 2A and the other between ribs 17A and 17B. Hinged access doors are provided in the underside of the leading edge (Sect.2, Chap.1).

(2) De-icing inserts in the leading edge and the associated piping (Sect.3, Chap.9).

(3) Airspeed indicator piping in the leading edge. This is led round the end of No.4 tank to a point just forward of the rear spar, where it passes outboard to the outer plane section (Section 5).

(4) An electrical services conduit which is clipped to the upper portion of each nose rib.

OUTER PLANE SECTIONS (fig.6)

24. Each outer plane section has a fixed trailing edge extending to rib 37, beyond which it is detachable. Rib 19, at the inboard end, is of light girder construction. The general construction is shown in the illustration; nose, centre and trailing edge ribs being attached by angles riveted both to the ribs and the spar webs. Inboard, the spar webs are reinforced by an additional thickness of web plate. Ribs 38 and 40 have no corresponding trailing edge ribs and a detachable trailing-edge section is fitted to studs on the aft face of the rear spar which extends to the wing tips. The corresponding trailing edge ribs and a detachable trailing-edge section is fitted to studs on the aft face of the rear spar which extends to the wing tips. The front spar which ends at rib 38, carries a pressed

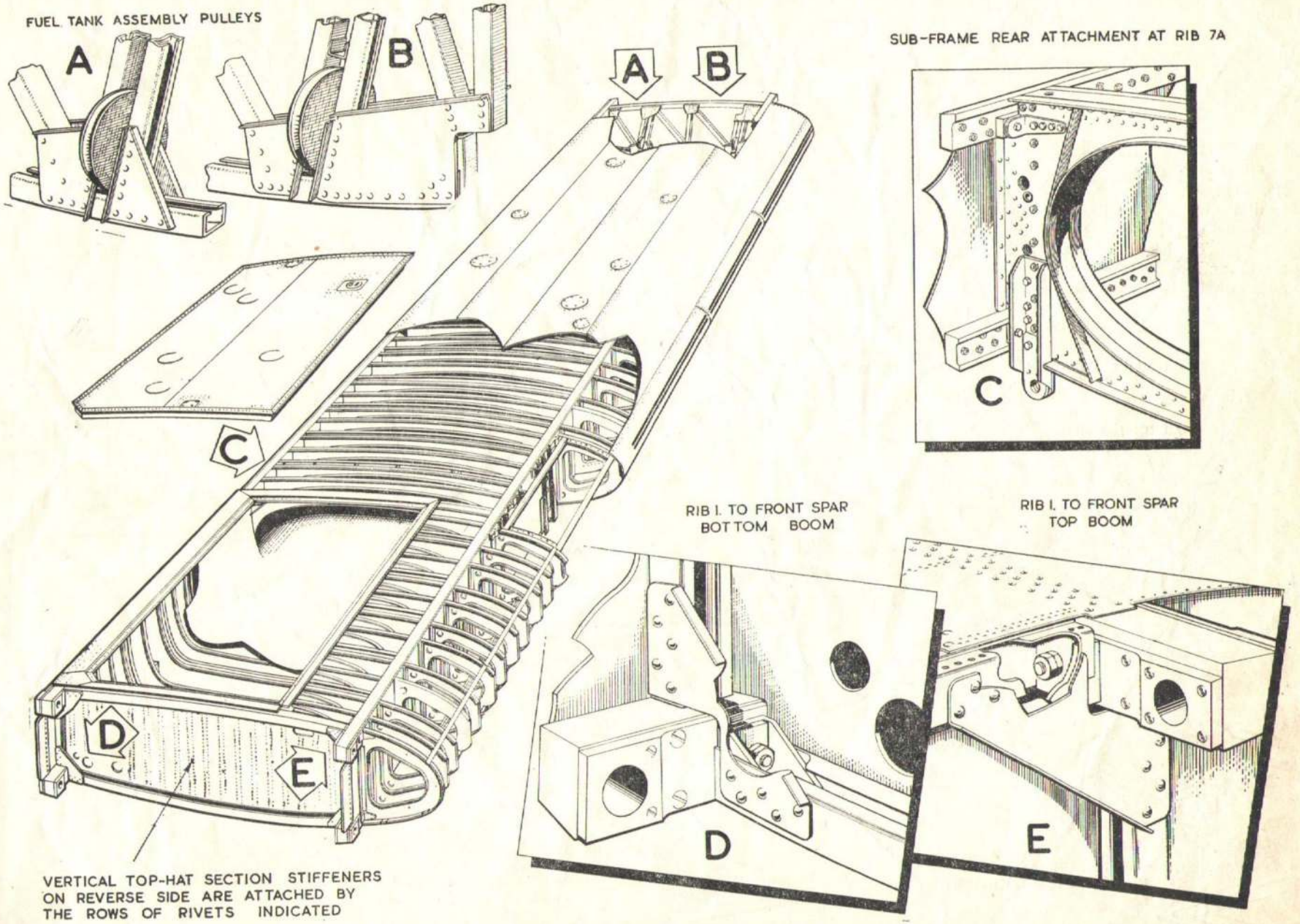


Fig. 4. Main plane—intermediate Section

flanged, wing-tip extension. Rib 40 carries two lateral ribs on its outboard face which extend to the V-section end sweep. There is no plating or end sweep section over the portion between the end of the front spar extension and nose rib 40. This part is covered by a transparent fairing, inside which is installed the navigation light.

Detachable wing tip trailing edges (*fig.* 7)

25. These are formed by a front pressing of similar contour to that of the rear spar outboard of rib 37. Four fluted ribs are attached to the aft face of the pressing by rivets and angle strips ; the inner rib is adjacent to the fixed trailing edge rib 37 when the member is attached to the outer plane section. The ends of the front pressing and ribs are riveted to a V-section end sweep. Outboard of rib 40 there is no plating, the wing tip contours being completed by an aluminium sheet fairing attached by 2 B.A. countersunk bolts to flanges riveted to the outboard face of rib 40 and to the flanges of the forward pressing. Holes are drilled in the pressing which correspond with the attachment studs on the outer plane section rear spar.

Equipment

26. The equipment in each outer plane is as follows :—

(1) A retractable landing lamp, type K, which is installed immediately aft of the front spar in the undersurface, between ribs 19 and 21. Part of rib 20 is cut away, and the skinning aft of the cut-out for the lamp is reinforced by a top-hat section stiffener between ribs 19 and 21 (*A.P.*1095*A*, *Vol.* 1, *Sect.* 8, *Chap.* 9).

(2) A retractable taxying lamp in the undersurface, between centre ribs 30 and 31 (*A.P.*1095*A*, *Vol.* 1, *Sect.* 8, *Chap.* 8).

(3) A flux detector unit and mounting between centre ribs 27 and 28, port side only. An access door is provided in the top skin.

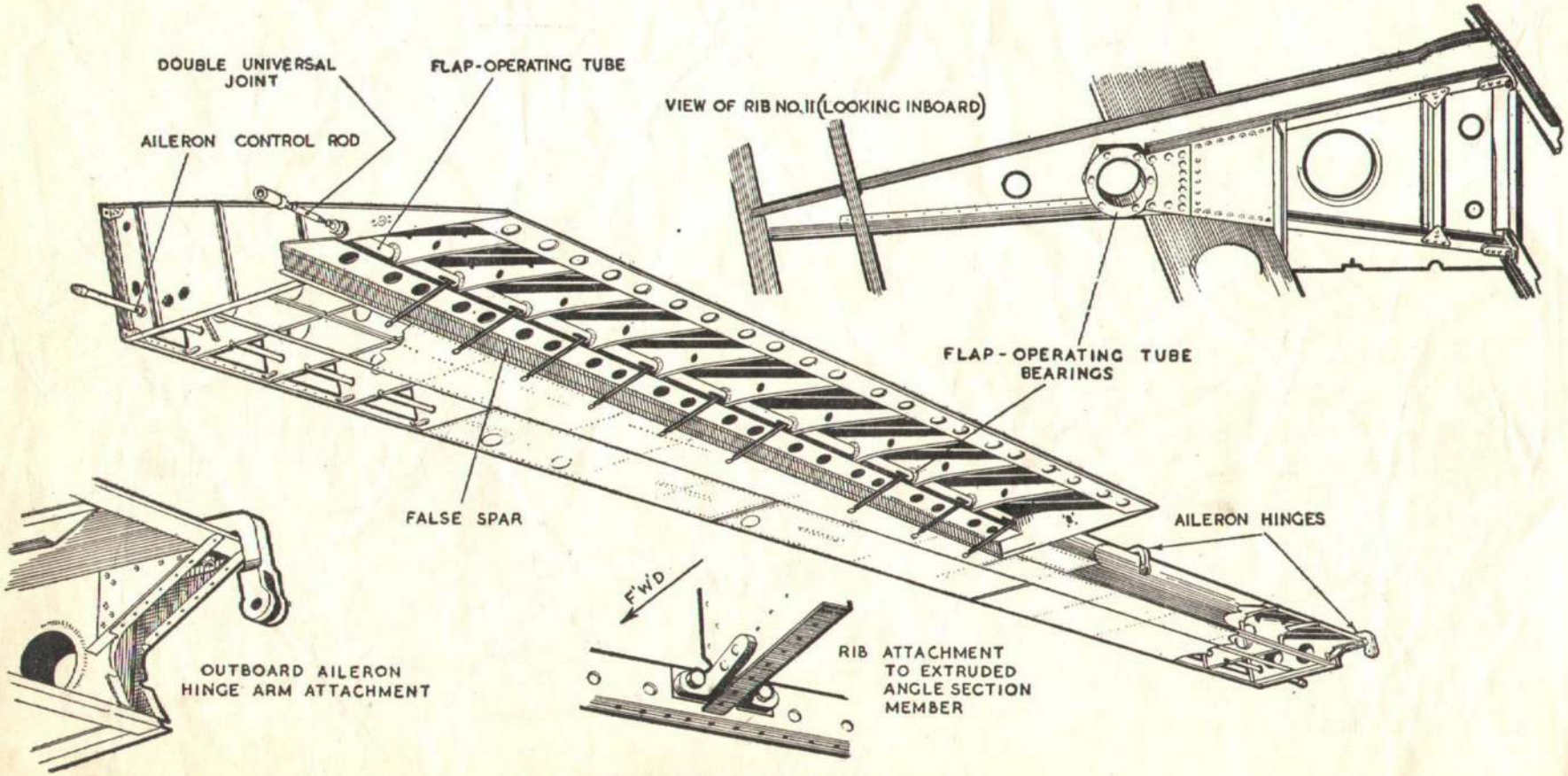


Fig. 5. Main plane—intermediate trailing edge section

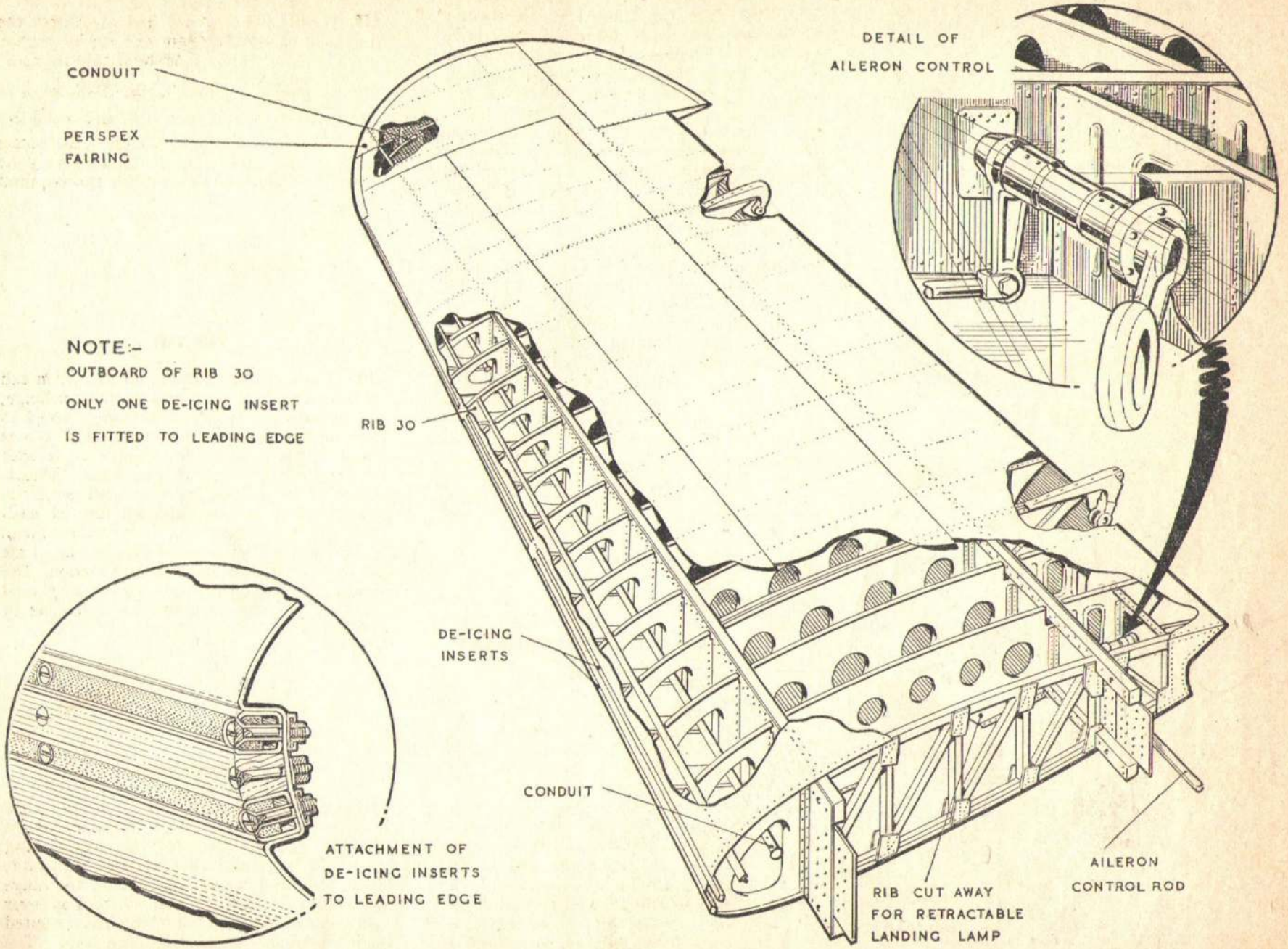


Fig 6. Main plane—outer section

(4) Mountings for radar aerials which are stiffened by brackets bolted to their adjacent ribs. Details of these mountings will be found in Sect. 6.

(5) A mounting for an A.S.I. pressure head in each wing between ribs 20 and 21 forward of the rear spar. An access door is provided in the top skin.

(6) De-icing units in the leading edge (*fig.* 6) and the associated piping (*Sect.* 3, *Chap.* 9).

(7) An electrical services conduit in the leading edge which carries the wiring to the taxying lamp and navigation lamps.

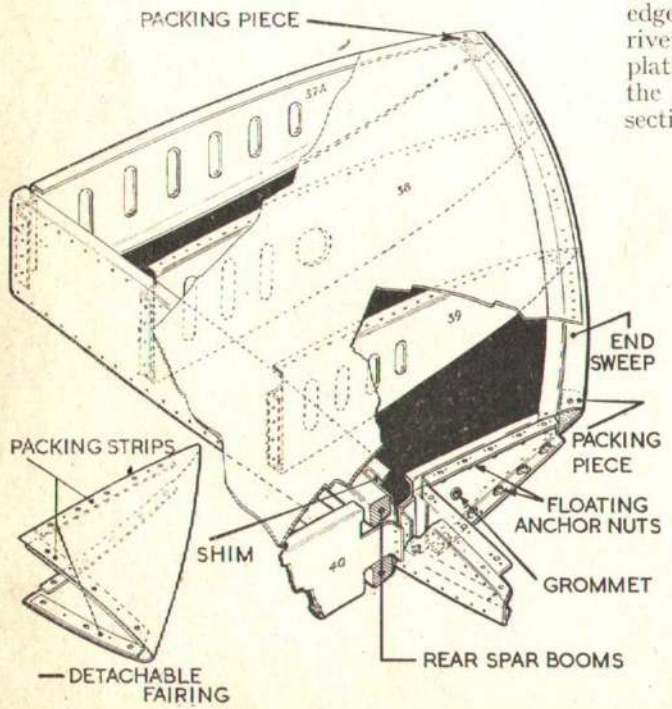


Fig. 7. Wing tip—detachable portion

AILERONS (*fig.* 8)

27. These are constructed of light alloy throughout. A spar of pressed sheet with top and bottom flanges is riveted between the rear flanges of pressed nose ribs which have each a flanged lightening hole, and the forward flanges of after ribs which have lightening holes and flutes. The skin of the leading edge is preformed and is thicker than, and lapped under, the rest of the skinning ; the lapped joint is riveted along the spar flanges. Recesses formed in the leading edge of the adjacent ends of the inner and outer aileron accommodate the control arm and linkage from the control rod in the main plane trailing edge. The arm is located by bolts on an aileron joint tube which has flanged ends. These are bolted to two corners of rectangular laminated plates which have their two other corners bolted to the end castings of the ailerons. The whole recess is covered by a detachable fairing which is slotted to suit the control linkage. The aft ends of the ribs are joined by a trailing-edge V-section, to the edges of which are riveted the aft edges of the top and bottom plating. The ribs are numbered 1—13 in the inner section, and 14—28 in the outer section.

AILERON HINGES AND TRAILING-EDGE CORDS

28. The hinges are formed by heavy section lugs bolted to the rear face of the spar which is reinforced on its forward face by a length of pressed channel of the same section as the spar. Ball bearings are provided in the hinges which are located between ribs 4 and 5, and 11 and 12, in the inner section, and between ribs 16 and 17, and 25 and 26 in the outer section. Trailing edge cords (*Sect.* 3, *Chap.* 4) are fitted to the inboard end of the inner section.

MASS-BALANCE

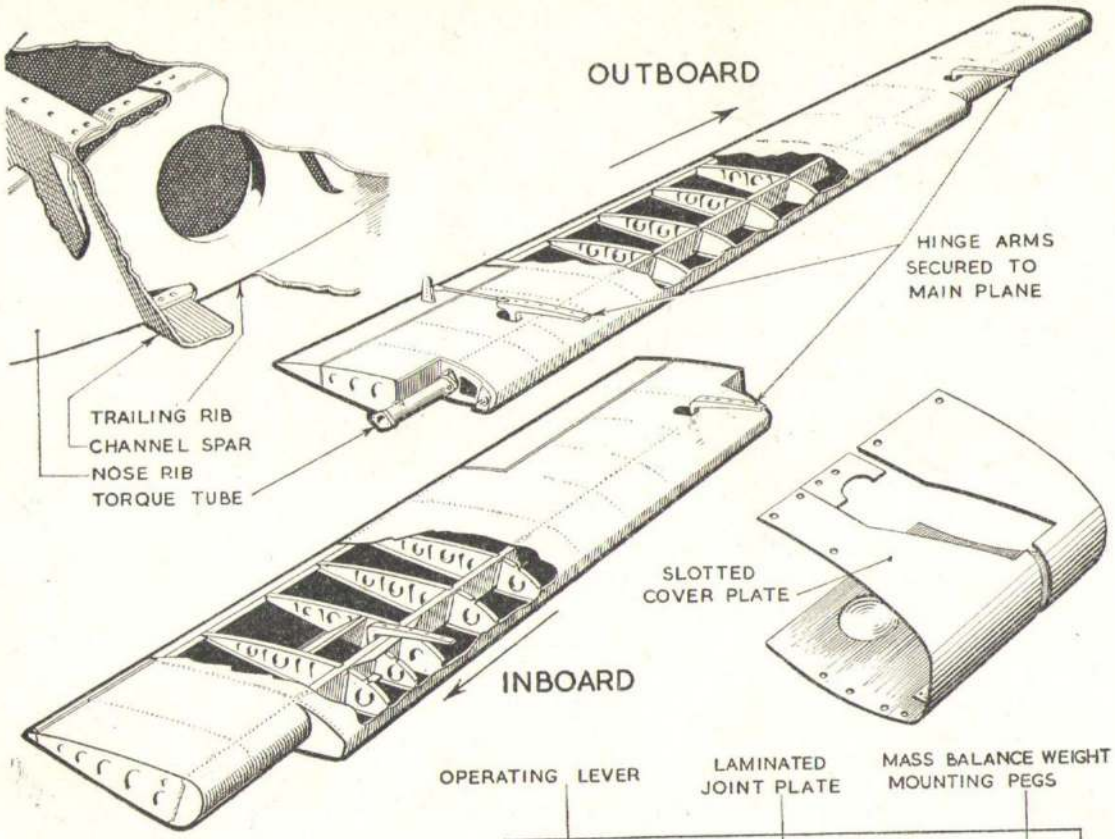
29. Lead weights are bolted along the inside of the leading edge and the weight for each inboard section must be within the same limits, namely $20\frac{1}{2}$ lb. $^{+\ 1}_{-\ 0}$ lb. Balance discs are fitted over bolts (one $\frac{1}{4}$ lb. and one $\frac{3}{8}$ lb.) at each side of the forward edge of the recess for the link tube. Up to 12 discs may be fitted to each bolt to establish the required balance.

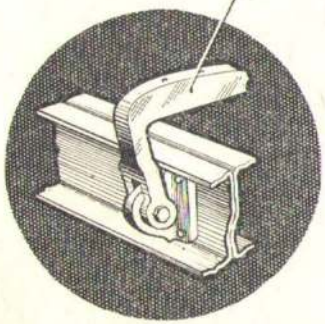
TRIM TABS

30. Each aileron section carries a trim tab attached to the aileron by a piano-type hinge, an operating arm assembly being riveted to the undersurface of each tab. The tab is built up on a light-alloy channel spar with five ribs covered with 26 s.w.g. skin. Adjustment of these tabs is by a hand wheel on the gearbox at the outboard side of each pilot's seat. These wheels actuate control cables which turn a screw jack mounted aft of the spar in each inner aileron section. The jacks operate control rods which are pinned to the operating arm on the underside of each tab.

BALANCE TABS

31. At the inboard end of each outer aileron section there is a balance tab of similar construction to the trim tabs, operated automatically by an adjustable connecting-rod between a fork on the hinge arm between ribs 16 and 17 and a lever with six adjustment holes which is mounted on the upper surface of each tab. The method of adjusting these connecting-rods is described in Sect. 3, Chap. 4.





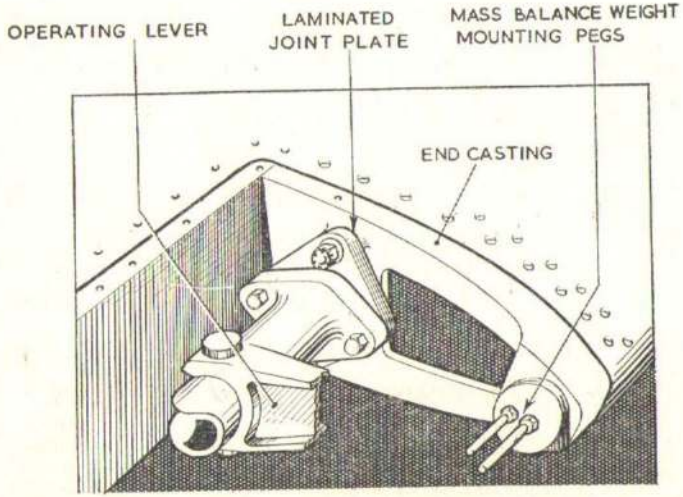


Fig. 8. Ailerons

FLAPS (*fig. 9*)

32. The split-trailing edge type flaps are in three port and three starboard sections :—

(1) Inboard, between the fuselage and inboard nacelles

(2) Outboard

(3) Flap extension

The last two sections are located under the inner portion of the intermediate trailing-edge section. The system of construction is shown in the illustration. The spar is a flanged U-section pressing riveted to a strip of plate and to the skinning. Flanged-bobbins, each between two flanged diaphragms, are riveted inside the spar and carry twin bearing bushes for the actuating link eye-bolts. Attachment between the forward ends of the ribs and channel-section hinge members is reinforced by gusset plates, that of the ribs to the spar by angle-section strips, and the trailing edge is reinforced by a strip which has lightening holes and is riveted to the trailing-edge member and to the rib upper flanges.

SERVICING

RIGGING

33. The incidence setting of the main plane is given in Leading Particulars. Instructions for rigging an assembled aircraft, routine checks and adjustment after flight testing are given in Sect. 2, Chap. 4 of this volume.

LUBRICATION

34. Lubrication points in the main plane are confined to systems and flying controls. The lubrication of these points is therefore illustrated in the relevant chapter in this volume.

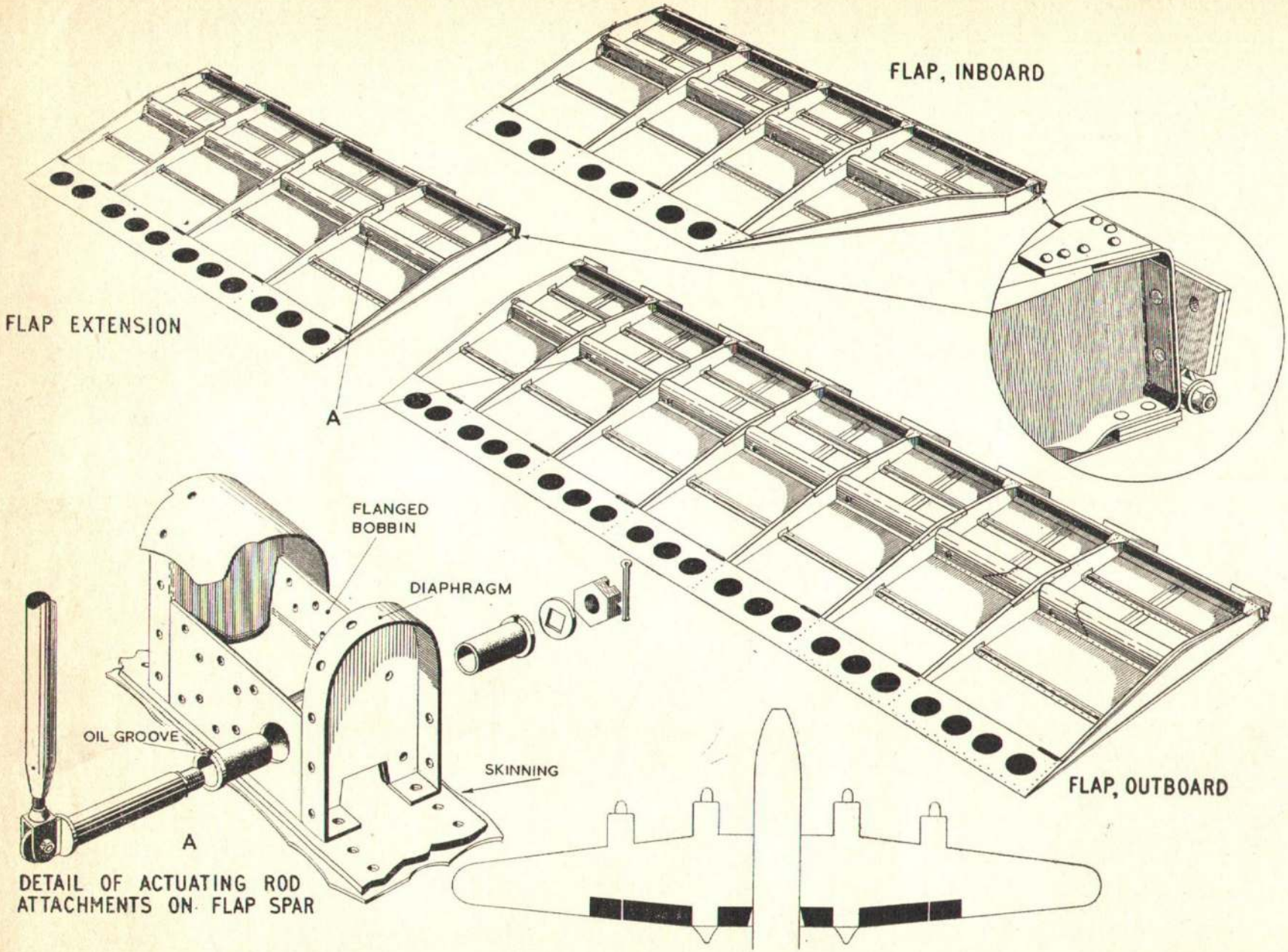

FLAP, INBOARD
FLAP EXTENSION
A
FLANGED BOBBIN
DIAPHRAGM
OIL GROOVE
SKINNING
A
DETAIL OF ACTUATING ROD ATTACHMENTS ON FLAP SPAR
FLAP, OUTBOARD

Fig. 9. Flaps

REMOVAL AND ASSEMBLY

REMOVAL NOTES

35. Notes regarding hydraulic system connections, pop-riveted panels, bonding, locking and sealing are contained in Sect.2, Chap.4. Where removal instructions are included on an illustration, operations with numbers shown in brackets are depicted on the illustration.

Aileron trim tab cables

36. When disconnecting a cable, weights or some system of tying should be used to prevent the cable unwinding from the control box or screw jack drums.

ASSEMBLY OF MAIN PLANE SECTIONS

37. The instructions in the following paragraphs cover the initial assembly procedure only. Any flying faults which are observed during flight testing are to be corrected in the manner described in Sect.3, Chap.4 under ADJUSTMENT AFTER FLIGHT TESTING.

38. When fitting main plane sections, the gantries and lifting beams illustrated in Sect.2, Chap.4, are necessary to enable the section being fitted to be accurately placed whilst joining the spar booms and webs.

Intermediate to centre plane (fig.14 & 15)

39. When a component has been removed, assembly is the reverse of removal. The incidence of each member is fixed by the web joint plates and associated bolts and no adjustment should normally be necessary after flight testing.

Fitting a new component

40.

(1) Ensure that the fuel tank assembly panel has been fitted.

(2) Attach the intermediate plane to the centre plane by fitting the shackles, shackle pins, shims (front spar only), nuts and front and rear washers, but do not tighten the nuts. The shackle pins must not be driven into the holes of the joints with any form of hammer, the holes must be correctly aligned and the pins pushed in. Shackle the front booms first; clearance between the boom ends must be 0·010 to 0·062 in.

NOTE...

Although it is unlikely that the spar ends will not line up correctly, a step formed by a difference in distance between the front and rear spars of the centre and intermediate sections can be corrected by utilising the step provided on the rear spar shackles (these are normally fitted with the step facing away from the spar booms).

(3) Using a suitable straight edge, align the intermediate section with the centre plane to bring the ends of the spar booms level.

(4) When the intermediate section has been correctly positioned, tighten and torque load the spar boom shackle pins and nuts, using spanners Ref.No.26EA/32635 at the front spar and Ref.No.26EA/32636 at the rear spar, to the following values:-

Front spar	75-125 lb.ft.
Rear spar	160-200 lb.ft.

The washers under the nuts may be trimmed, if necessary, to enable the split pin holes to line up at these torque loadings; a suitable protective coating must then be applied to the trimmed surface.

(5) The web plates on the replacement intermediate section should now be drilled using a pilot drill and ferrule through the existing holes in the centre plane spar webs. Then drill the holes to size using a Morse letter V (0·377 in.) drill. After drilling, insert the web plate attachment bolts, fit the washers and nuts, then tighten.

NOTE...

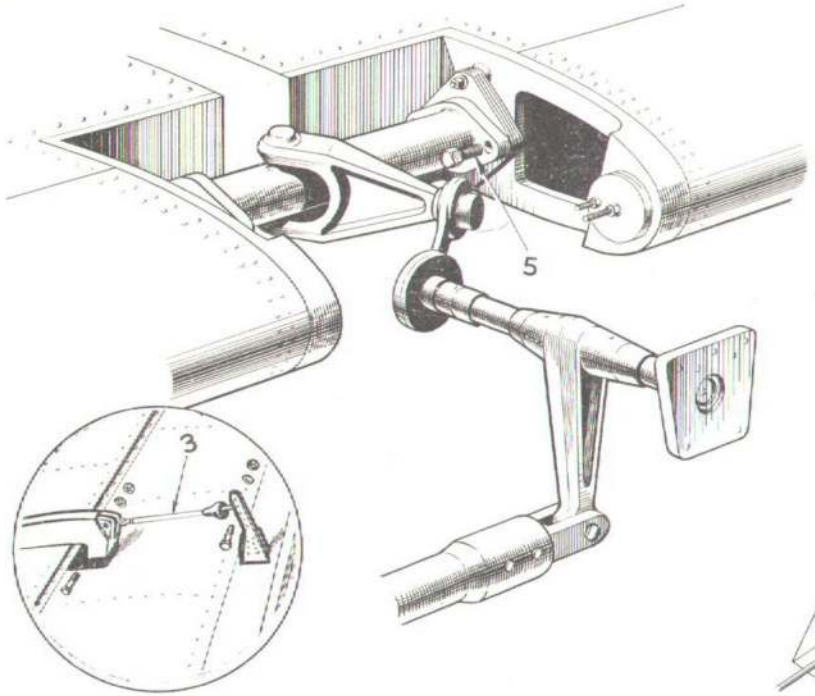
Before assembly all contact surfaces, including the shanks and under the heads of the shackle pins, must have grease ZX-28 applied to them. It is important that the grease is well rubbed in and not merely smeared over the surface, and that none comes into contact with the threads of the shackle pins. Immediately after assembly the joint is to be cocooned with Bostik sealing compound 1752 (Ref.No.33C/1339).

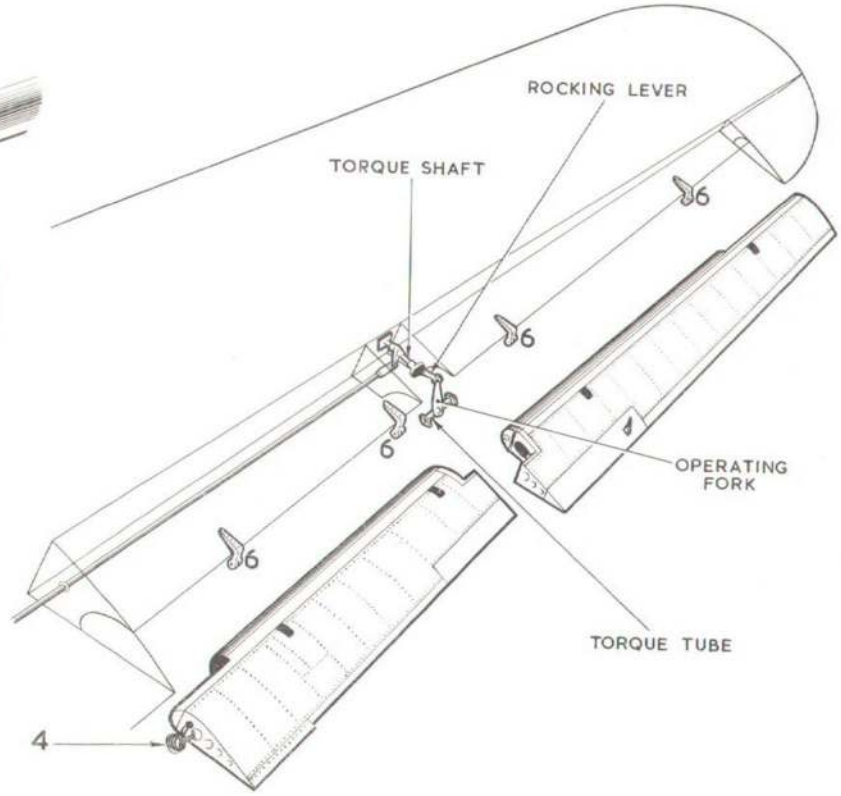
Adjustment of incidence

41. It will be noted that replacement intermediate plane sections fitted as described in the previous paragraph are set to a nominal incidence (4 deg.) in line with the centre plane, but refer to Sect.2, Chap.4 for the actual initial settings. It is impracticable to plan any initial adjustment of the incidence to suit the opposite side of the wing as the factors involved are too uncertain. Any adjustments necessary after flight testing the aircraft are described in Sect.3, Chap.4, under ADJUSTMENT AFTER FLIGHT TESTING.

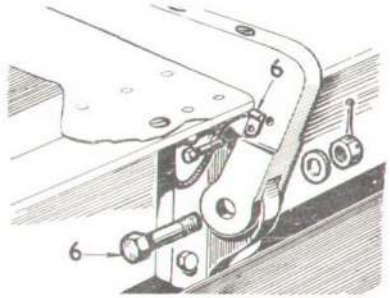
Outer to intermediate plane (fig.14 & 15)

42. This operation is carried out in a manner similar to that described in the preceding paragraphs. When a replacement outer section is being fitted the web joint plates are drilled in a manner similar to those on an intermediate section using Morse F (0·257 in.) drill for the





1. Lower the flaps.
2. Remove the detachable nose cover at the aileron joint.
3. Remove the balance tab operating rod by disconnecting at the aileron hinge and lever.
4. Disconnect the aileron trim tab operating cables at the turnbuckles inboard of the trailing edge rib 30 (clamp the cables at the bobbin of the jack, between aileron ribs 11 and 18, otherwise difficulty may be experienced in assembly. Access is through a detachable door in the bottom skin of the aileron). Release the fairleads in the trailing edge and withdraw the cables from the main plane. Coil and tie the cables to the aileron.
5. Remove the two bolts securing each end of the torque tube to the laminations bolted to the nose forging.
6. Support the inboard and outboard portions of the aileron. Remove the bolts from the hinge brackets and release the bonding connections at the trailing edge rib 14. Access to the hinge brackets is through detachable doors in the bottom skin of the aileron.



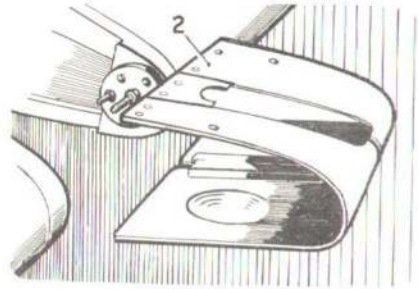
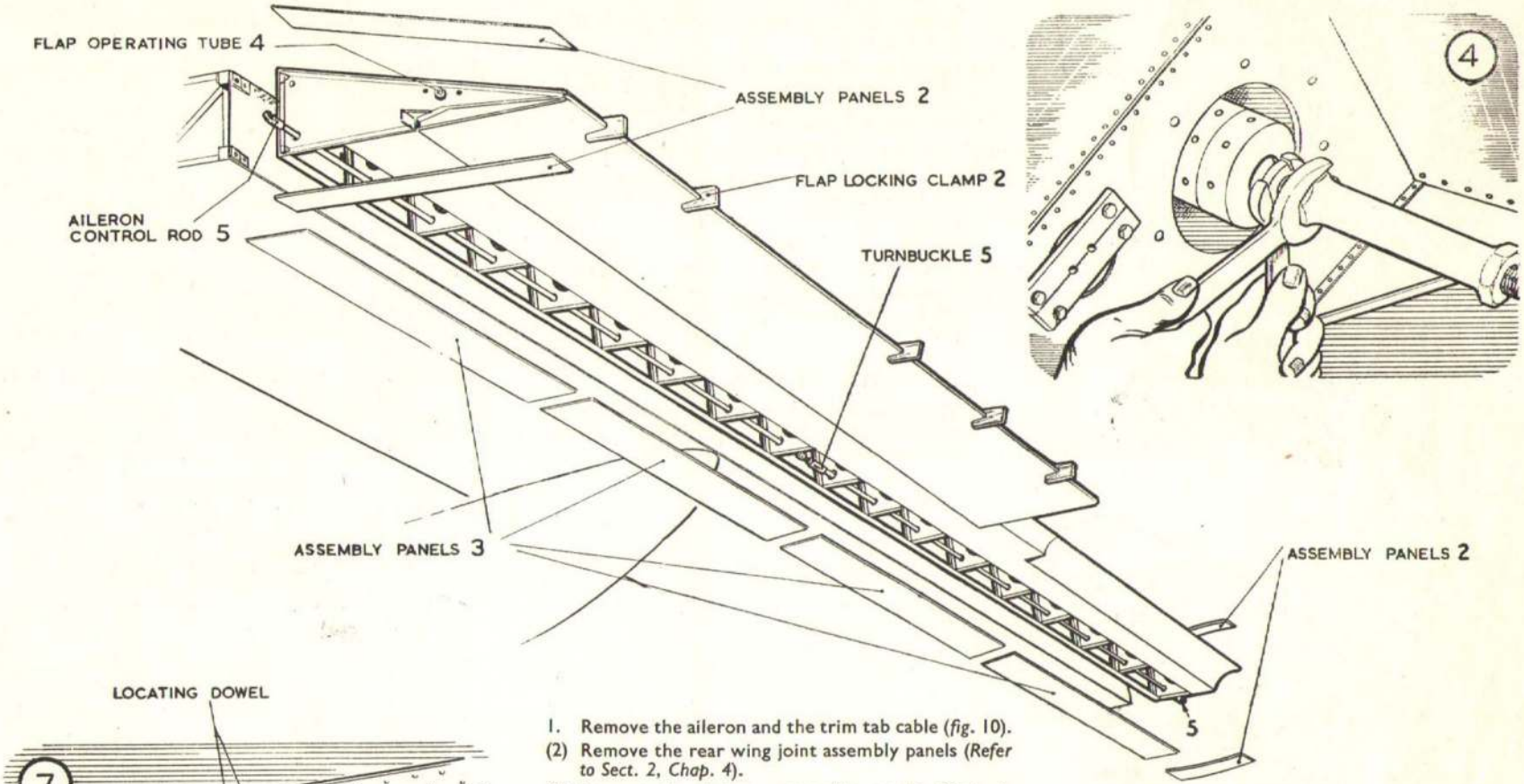
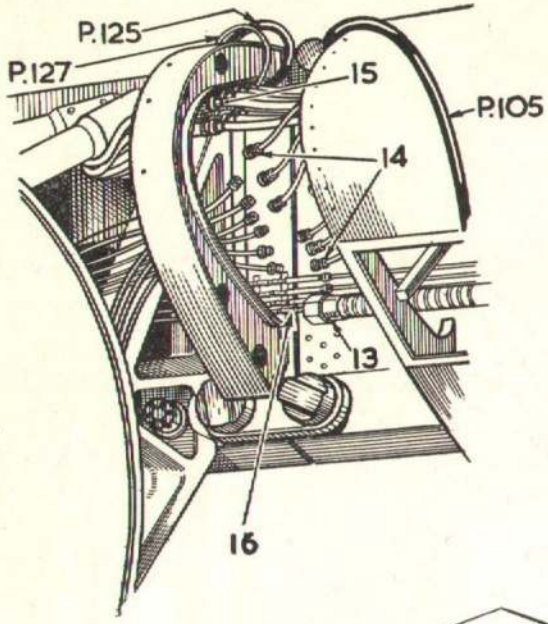


Fig.10. Removal of ailerons



1. Remove the aileron and the trim tab cable (*fig.* 10).
(2) Remove the rear wing joint assembly panels (*Refer to Sect. 2, Chap. 4*).
(3) Remove the bottom assembly panels (*Sect. 4, Chap. 2*).
(4) Disconnect the flaps operating tube, close the flaps and clamp to the trailing edge.
(5) Disconnect the aileron control rod at the intermediate lever and at the outboard ends. Unfasten all push-pull rod bearings from the ribs in the trailing edge. Disconnect the adjusting turnbuckle in the rod and bring both halves of the rod to free them from the intermediate lever and the outboard lever.
6. Support the trailing edge.
(7) Remove the nuts from the attachment studs on the rear spar booms.
8. Withdraw the member from the locating dowels and studs.

Fig. 13. Removal of intermediate plane trailing edge



Outer Plane

1. Remove the wing joint assembly panels (*Refer to Sect. 2, Chap. 4*).

(2) Disconnect all electrical cables to the navigation light, taxying lamp and landing lamp, the flux detector unit (*port only*) and the Rebecca aerials (*two port and one starboard*).

(3) Disconnect the pipe to the A.S.I. pressure head.

(4) Disconnect the de-icing fluid pipe union aft of the branch pipe.

5. Remove the aileron and its operating gear (*fig.* 10).

6. Sling the outer plane (*Refer to Sect. 2, Chap. 4*).

(7) Remove the shackles and joint plate from front and rear spar joints (*fig.* 15) and lower the outer plane.

Wing tip trailing edge

(8) Then remove the three access panels from the underside of the trailing edge section. Remove the nuts from the studs on the rear spar.

Intermediate plane

9. Remove the outboard power plant and sub-frame (*Refer to Sect. 4, Chap. 1*).

10. Remove all the fairing panels aft of the inboard firewall (*Refer to Sect. 4, Chap. 1*).

11. Remove the outboard undercarriage door and valance (*Sect. 3, Chap.5, refers*).

12. Remove the inner wing joint assembly panels (*Refer to Sect. 2, Chap. 4*).

(13) Disconnect the outboard engine fuel supply pipe.

(14) Disconnect all pipes at their unions outboard of the nacelle.

(15) Disconnect all electrical cables at the connection panel on the nose rib. Withdraw cables P125 and P127 from the conduit in the leading edge and disconnect cable P105 from the inboard relay panel.

(16) Disconnect the outboard engine control rods at the turnbuckles.

17. Remove the split pin and disconnect the aileron control push-pull rod at the intermediate lever at the end of the centre-section rear spar.

(18) Disconnect the flap operating tube.

19. Sling the intermediate plane (*Refer to Sect. 2, Chap. 4*).

(20) Remove the shackles and the joint plates from the front and rear spar joints (*fig.* 15) and lower the intermediate plane.

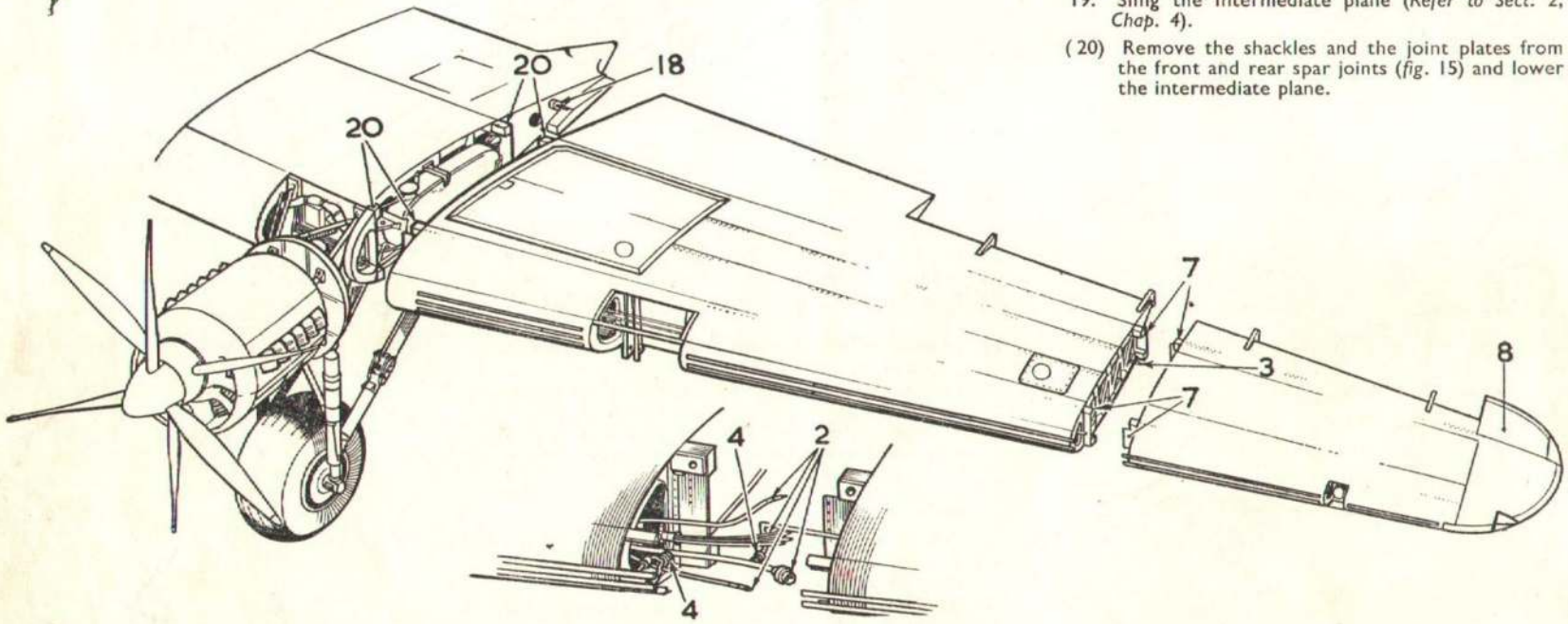


Fig. 14. Removal of main plane sections

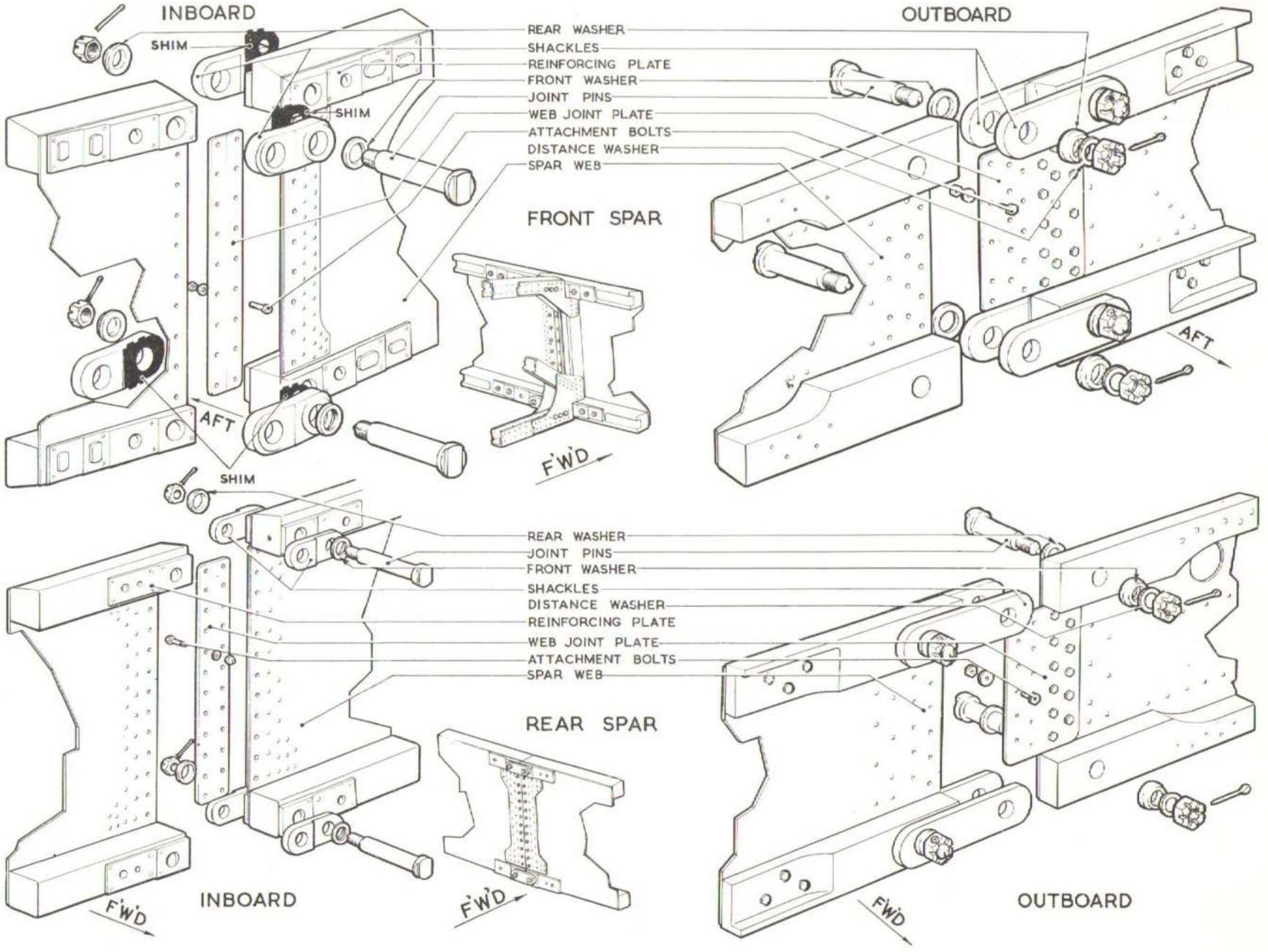


Fig. 15. Front and rear spar joints

final drilling. In this case the holes in the joint plate are countersunk with a 45 deg. drill sufficiently to open the hole at the surface of the plate to 0·32 in. This operation provides clearance for the radius under the bolt heads. The torque to be applied when tightening the shackle pin nuts is 133 lb.ft., less an amount up to 1/6 of a turn to permit insertion of the split pins. Use spanner Ref.No.26EA/16996.

◀ *NOTE...*
Before assembly all contact surfaces, including the shanks and under the heads of the shackle pins, are to have pigmented varnish jointing compound (Ref.No.33C/1264) applied to them; they must then be assembled whilst the compound is wet. Immediately after assembly the joint is to be cocooned with Bostik sealing compound 1752 (Ref.No.33C/1339). ▶

Trailing-edge sections (fig.12 and 13)

43. The trailing-edge sections are secured by nuts to studs on the rear spar. Access is provided by detachable panels in the trailing-edge section undersurface (fig.13). The assembly procedure is as follows:-

(1) Offer up the trailing-edge section to the main plane and check the overall surface continuity.

(2) Fit the securing nuts and washers, replacing the former by thinner H.T.S. self-locking nuts, if necessary, where shimming has been inserted. After the nuts have been tightened, the incidence should be checked again (Sect.2, Chap.4).

(3) Fit each detachable wing tip trailing edge.