Chapter 3
TAIL UNIT

(Completely revised)

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LIST OF ILLUSTRATIONS

DESCRIPTION

General

1. The tail unit comprises a single tail plane and elevator with twin fins and rudders. It is supported by two cantilever tail booms which project from the stub booms on the main plane. The fins, which are built integrally with the after portion of the tail booms, support the rudders, the interposed tail plane, the tail plane extensions and the elevator. The pressure head for the A.S.I. and the tail navigation lamp are located on the port fin and in the tail fairing of the port boom respectively. The various components of the tail unit are shown in fig. 4.

Tail boom and fin

2. The tail boom is an oval-section, light-alloy structure consisting of a series of equally spaced diaphragms to which is riveted the light-alloy skin coverings. The latter is reinforced with longitudinal stringers. An L-section casting, riveted to the forward end of the boom, provides the attachment face. Built integrally with the rear end of the tail boom is the fin. Details of the construction are clearly shown in fig. 1 and 2.

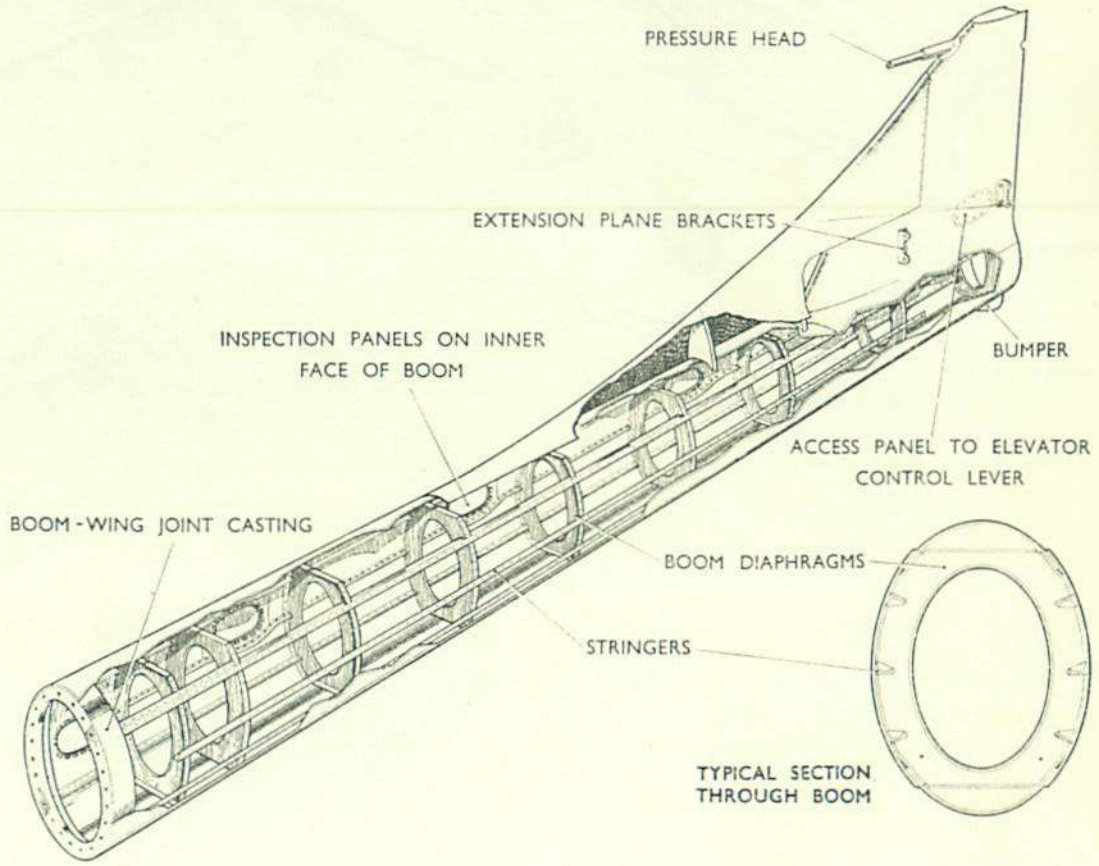


Fig. 1. Tail boom

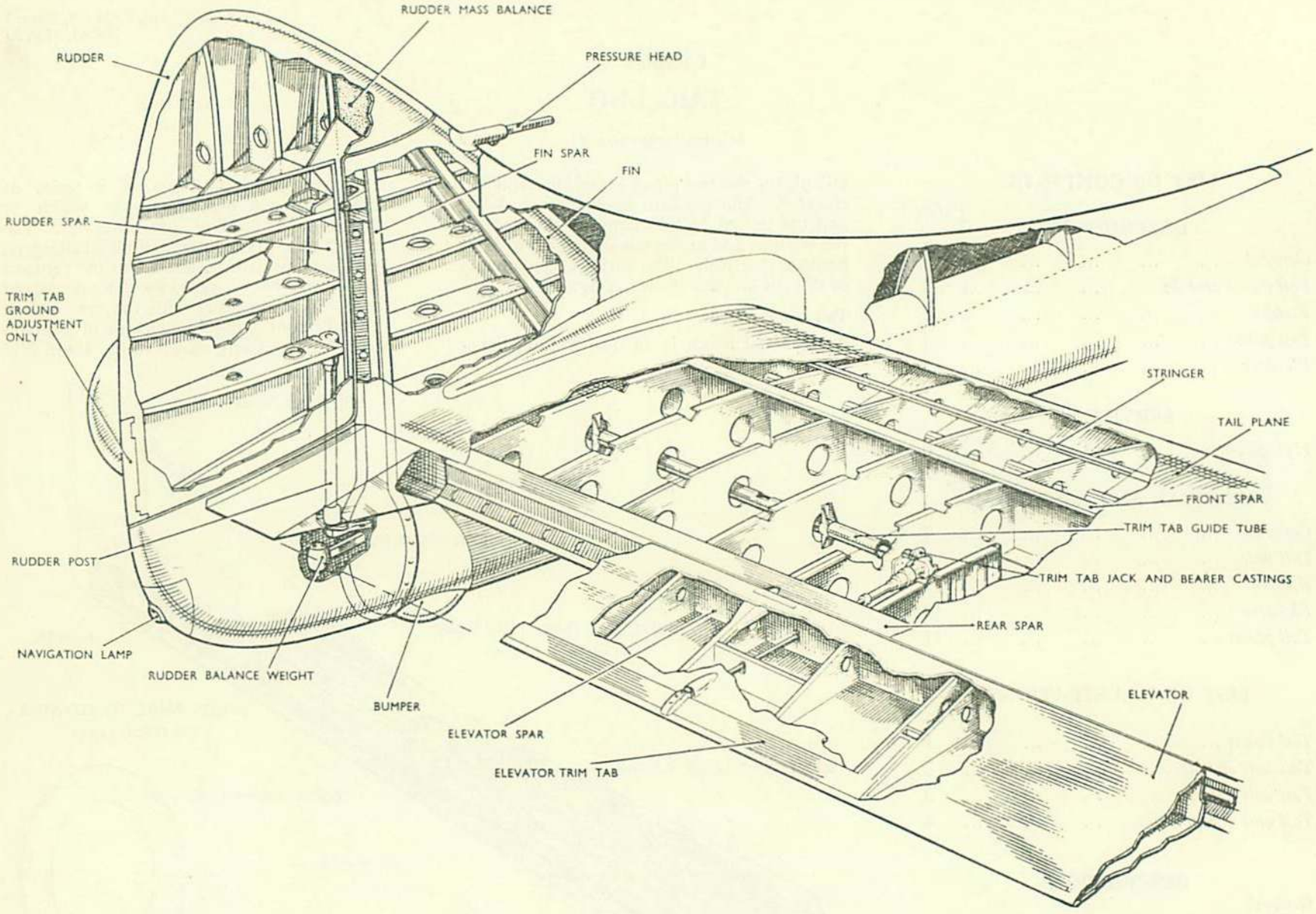
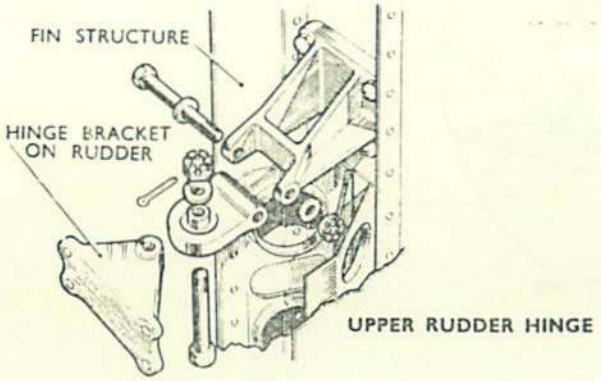
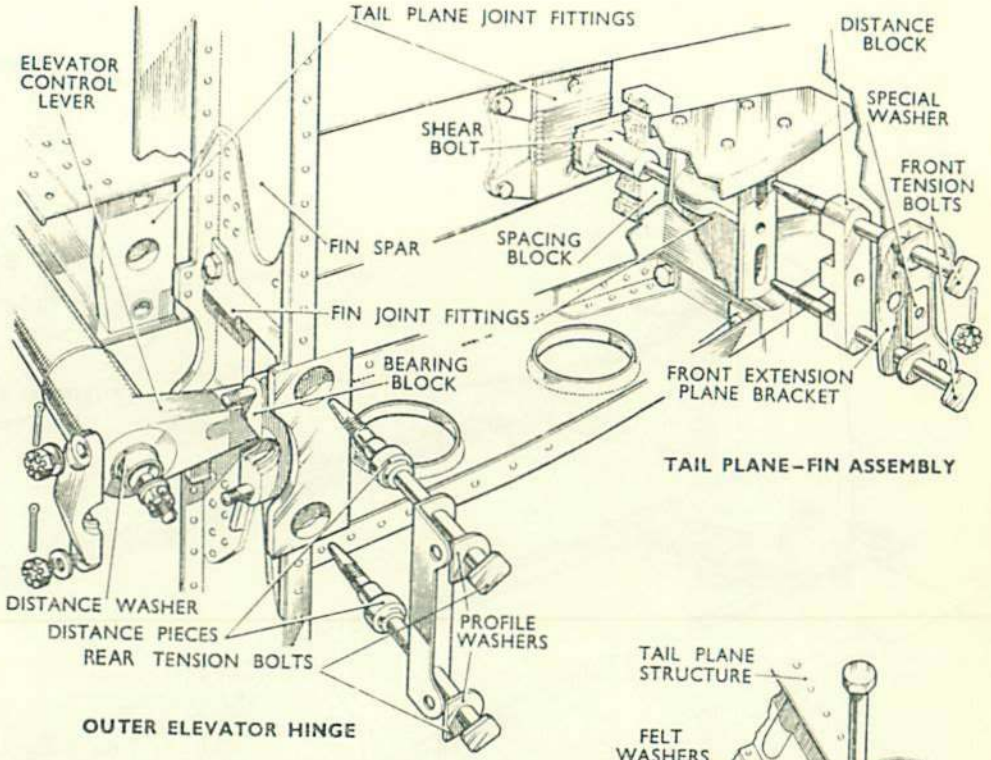


Fig. 2. Tail unit structure

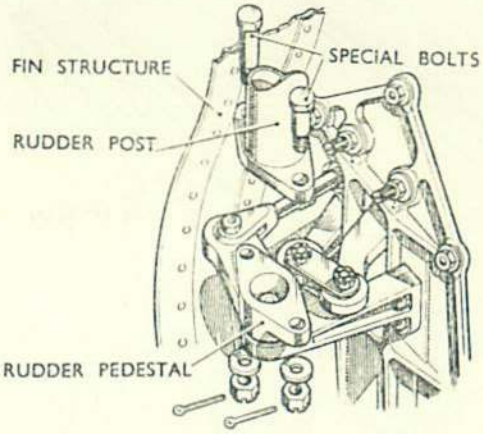


UPPER RUDDER HINGE

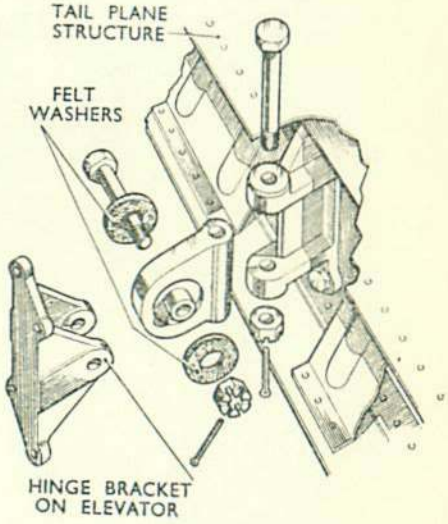


TAIL PLANE–FIN ASSEMBLY

OUTER ELEVATOR HINGE



LOWER RUDDER HINGE



INNER ELEVATOR HINGE

Fig. 3. Tail unit details

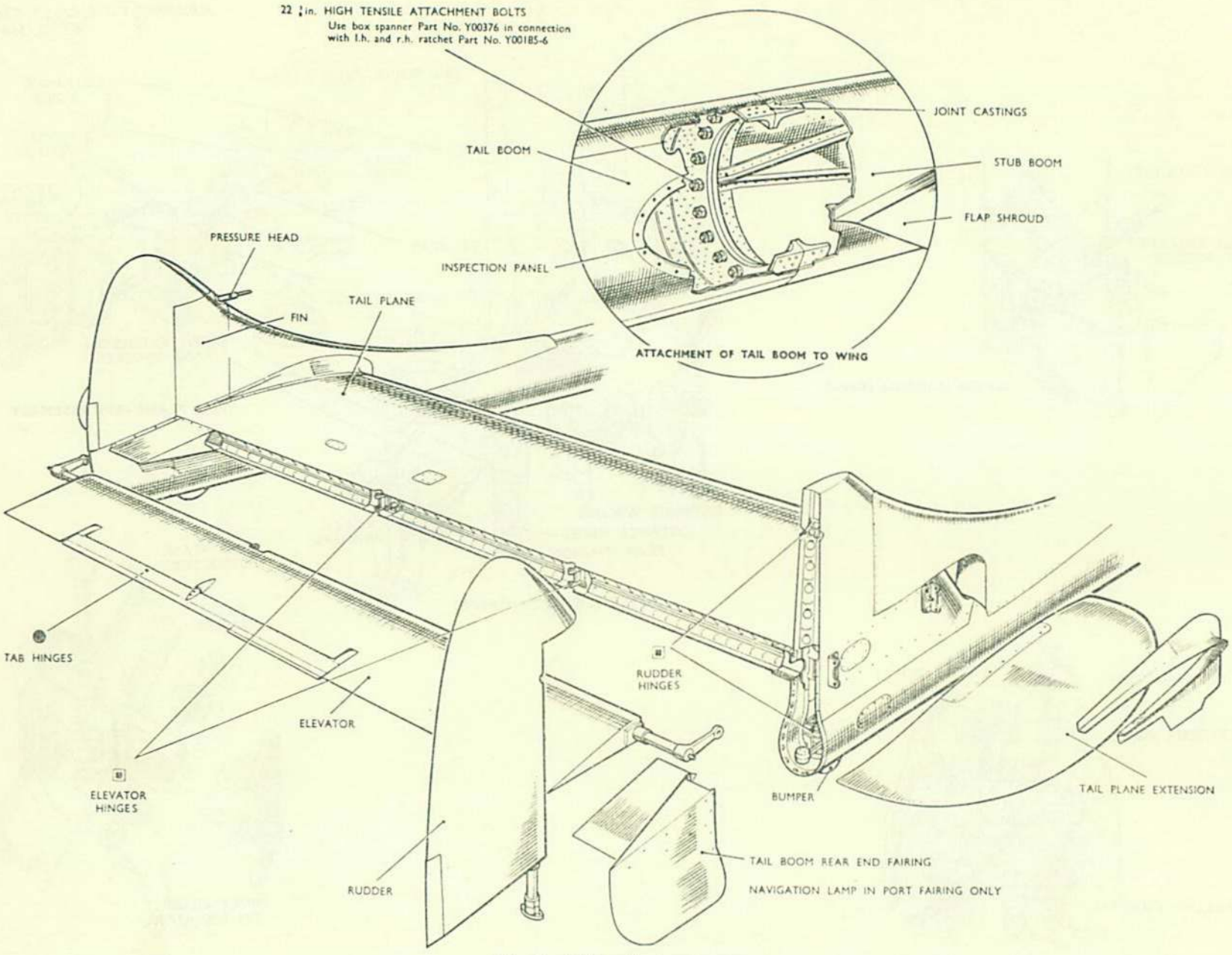


Fig. 4. Tail unit components

Rudder

3. Each rudder is built up from a tubular rudder post and a channel-section spar to which are attached the light-alloy flanged ribs (*fig.* 2). The skin is riveted to the spar and ribs and encloses the mass-balance weight in the horn of each rudder. A small trim tab is fitted to the base of each rudder. The setting of the rudder controls and the adjustment of the trim tab are described in Chap. 4.

Tail plane

4. The tail plane comprises two channel-section spars to which are attached the nose and main ribs. The whole structure is covered with a light-alloy skin reinforced with spanwise stringers (*fig.* 2). The incidence of the tail plane is not adjustable. The two centre hinge brackets for the elevator are attached to the tail plane rear spar, whilst the bearing blocks for the two outboard elevator hinges (*fig.* 3) are attached to the rear spar of each fin. Small tail plane extensions are attached outboard of each fin.

Elevator

5. The elevator comprises a single channel-section spar to which light-alloy trailing edge ribs are attached and the whole is covered with a light-alloy skin (*fig.* 2). Torque tubes to which the control levers are fitted, project from each end of the elevator. At the end of each torque tube is a spigot which locates in a bearing block on the rear spar of each fin (*fig.* 4). A trim tab, which is adjustable from the cockpit, is fitted to the elevator. Full details of its mechanism together with the instructions for rigging the elevator, are contained in Chap. 4.

SERVICING

Flying controls

6. The main servicing operations on the tail unit are concerned with the mechanism of the flying controls which are fully described in Chap. 4 of this Section. The method of checking the rigging of the tail plane, also the location of drain holes and access panels is described and illustrated in Sect. 2, Chap. 4. The lubricant table in Sect. 2, Chap. 4 of this volume, identifies the lubricant symbols used in fig. 4.

REMOVAL AND ASSEMBLY

General

7. The following paragraphs give the sequence for the removal operations of the complete tail unit and its component parts. Unless otherwise stated, the order for assembly is in each instance the reverse of that given for removal.

Tail unit

8. The tail unit should be removed as follows:—

(1) Remove the inspection panels from the booms at the boom-to-wing joints.

(2) Lock the rudder and elevator controls at the rear of each boom and at the elliptical pulleys in the stub booms as described in Chap. 4. Disconnect the control cables at their turnbuckles at the boom-to-wing joints.

(3) *Port boom only.* Disconnect the elevator trim control cables, the A.S.I. pipes, the pressure head heater and the tail navigation lamp cables.

(4) Adequately trestle the tail unit and then remove the twenty-two special bolts securing each boom to the stub boom, using box spanner Part No. Y00376 in conjunction with the left and right-hand ratchet adapters Part No. Y00185-6 respectively (*Sect.* 2, *Chap.* 4).

Note . . .
When dismantling one boom only, it is important that the remaining parts of the tail unit should be adequately supported and weighted against spring.

Rudder

9. The procedure for the removal of either rudder is similar:—

(1) Remove the tail boom rear end fairing (*fig.* 4).

(2) Remove the split pins, nuts and special bolts securing the rudder post to the hinge pedestal (*fig.* 3).

(3) Support the rudder and remove the split pin, nut and horizontal hinge bolt from the upper rudder hinge.

Elevator

10. The elevator should be removed as follows:—

(1) Remove the tail boom rear end fairings, the rudders, the tail plane extensions (*fig.* 4) and the small detachable panel from the outboard surface of each fin (*fig.* 1).

(2) Disconnect the operating rods from the elevator control levers in each fin. Access is gained through the small detachable panel referred to in sub-para. 1.

(3) Remove the inspection cover from the lower surface of the elevator at the port centre hinge and disconnect the elevator tab push-rod.

(4) Remove the split pins, nuts and bearing cap from the bearing block on each fin rear spar to release the outboard elevator hinges (*fig.* 3).

(5) Support the elevator in the UP position and remove the split pins and nuts from the two vertical inner hinge bolts.

(6) Support the elevator in the DOWN position and remove the two centre hinge bolts from the top, then remove the elevator.

Tail plane

11. The removal of the tail plane can only be accomplished after the removal of the elevator and rudders (*para.* 9 *and* 10); then proceed as follows:—

(1) Remove the inspection panel from the upper surface of the tail plane above the trim tab jack (*fig.* 4), disconnect the cables from the sprocket chain and withdraw the cables from the tail plane.

(2) Unscrew and remove the two tension bolts from each side of the tail plane front spar, followed by the two tension bolts from each side of the rear spar (*fig.* 3). These tension bolts also secure the attachment brackets for the tail plane extensions.

(3) Support the tail plane and spring the fins apart slightly, then remove the tail plane.