CHAPTER

4

FLYING CONTROLS

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LIST OF ILLUSTRATIONS

General

1. The flying control system is operated by chain and cable with tie rods on the control column, chain on the elevator trim tab jack, and push rods and levers for rudder and elevator controls in the boom rear end. The elevator trim system is operated by teleflex control from a cockpit hand wheel to a mid position on rib 1, thence by cables to the trim tab jack. It will be seen on fig. 3, 4, and 5, that a colour coding system is shown on either side of turnbuckles to facilitate the correct assembly. The control locking positions for rigging are shown in Sect. 4, Chap. 3.

Control column

2. The control column is a vertical tubular steel member, incorporating at its lower end a transverse torque tube, to either end of which a double ended lever is attached (*see fig.* 1 *and* 2). The lower ends of the levers are located in fittings at floor level, permitting fore and aft movement about these points, thus providing the elevator control. An inertia weight projecting forward is attached to an arm which is in turn bolted to the control column tube. Aileron control is provided by a spade-grip extension piece, hinged at the top of the column, accommodating a parking lever and gun firing button.

Aileron control

3. The aileron control is connected to a sprocket, which is in turn connected by tie rods and chains to an oval sprocket at the bottom of the column. The oval sprocket is integral with a quadrant to which the operating cable ends are bolted. Pulleys located either side of the cockpit, carry the cables from the quadrant through the bulkheads to a pulley assembly positioned on the face of No. 1 wing rib (*see Sect.* 4, *Chap.* 3). The top pulley of the assembly changes the direction of the cable, and conducts it to an aileron differential wheel located on the rear face of the false spar. Two pulleys, located on the left and right-hand sides of the aft face of No. 4 bulkhead, carry the balance cable to the differential wheel through pulleys on the face of No. 1 wing rib. The position of the turn-buckles for adjustment is shown in fig. 3.

Aileron tabs

4. Servo trim tabs are fitted to both ailerons, and may only be adjusted on the ground to suit the flying characteristics of the particular aircraft. The tab trailing edge may be raised or lowered by adjusting the length of its connecting rod, or by altering the setting of the tab connecting link (*see Sect.* 4, *Chap.* 3).

Elevator controls

5. The control column transverse torque tube (*see para.* 2) is connected, through a lever and connecting rod, to a quadrant pulley located on the left and right-hand sides of the cockpit. Cables are bolted to the quadrant, and pass through the bulkheads to a pulley assembly positioned on No. 1 wing rib (*see Sect.* 4, *Chap.* 3). Cable direction is then changed to the aft face of the false spar, which bears an oval pulley assembly positioned on the tail boom centre line. The oval pulley provides a lower gear ratio at small control angles and a progressively higher gearing at increasing control column movement. The cables are bolted to this assembly, and are carried through fairleads to a lever assembly in the boom rear end, and lever movement is transmitted to the elevator via a lead-filled control rod, connected to a lever located on the elevator torque shaft (*see Sect.* 4, *Chap.* 3).

6. A bungee cord is located on a light frame fitting at the starboard boom-to-wing joint, and stretches to the elevator control lever in the boom rear end. Its function is to assist the pilot in recovering the aircraft from a diving attitude.

7. Cable adjustment poirts are shown in fig. 4.

Elevator tabs

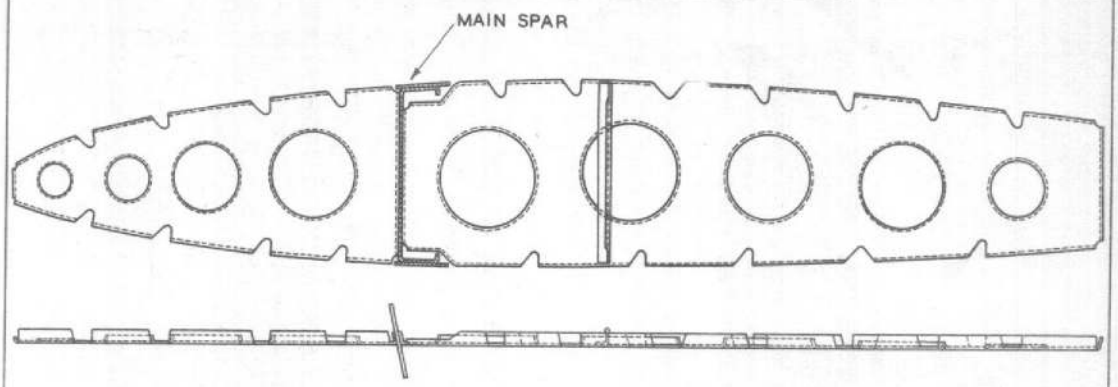
8. A servo tab is fitted which is also under the pilot's control. The tab movement is provided by a handwheel, actuating teleflex controls to which cables are attached. Trim pulleys are conveniently positioned on No. 1 wing rib and on the false spar for changing direction of the cables to the port boom. The cables are carried by fairleads to pulleys in the rear end of the boom, then into the tail plane to a chain on the trim jack. A connecting rod transmits movement from the jack to the tab.

Rudder controls

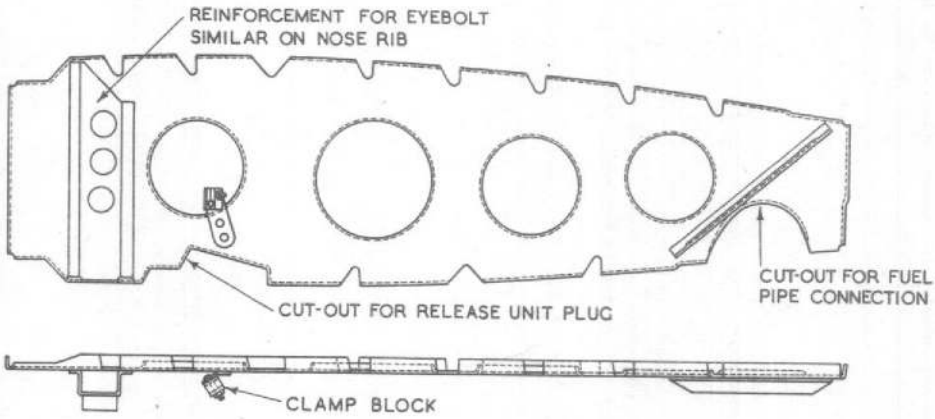
9. The rudder controls consist of pendulum-type rudder pedals which are located on a layshaft forward of the control column. The pedals are adjustable independently for reach, by lifting them against the tension of a spring. The run of the cables (*see fig.* 5), to the rudder control lever in the boom rear end is similar to that of the elevator cables (*see para.* 5).

Rudder tabs

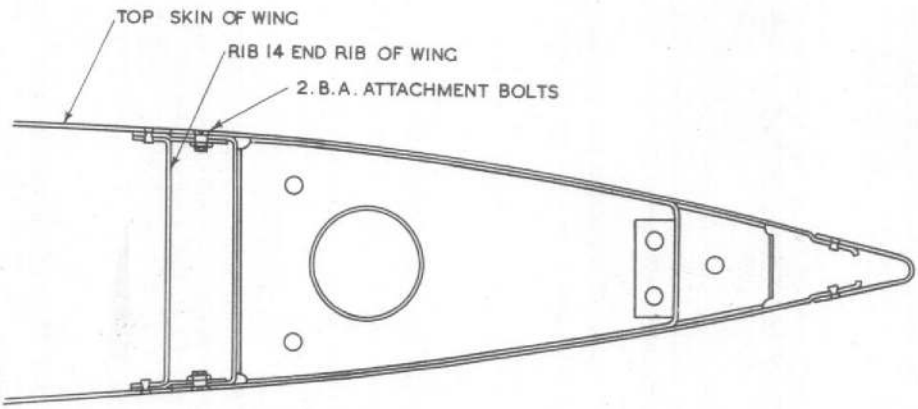
10. Trim tabs are fitted, but they are not servo operated. They may be adjusted on the ground to correct flying irregularities by unscrewing a wire-locked bolt that passes through an elongated hole in a bracket at the base of the tab, and turning the tab to the desired position.



TYPICAL LIGHT RIB



CENTRE RIB 6
(REINFORCED FOR TANK JETTISON GEAR)



SECTION SHOWING ATTACHMENT OF WING TIP

FIG 3 — **MAIN PLANE DETAILS (I)** — FIG 3

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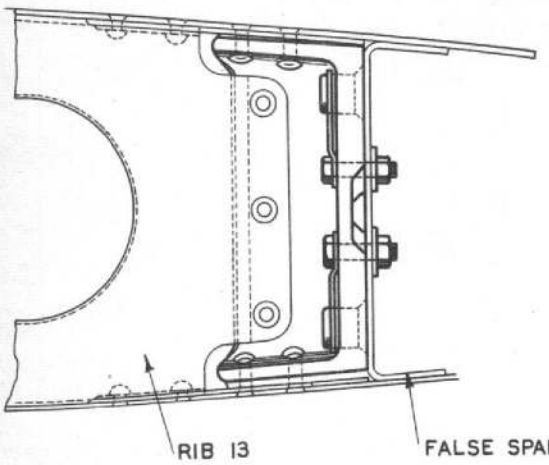
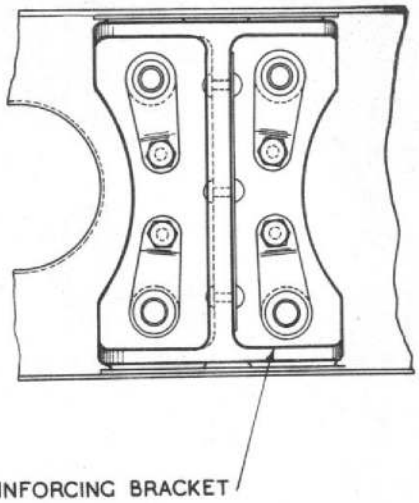
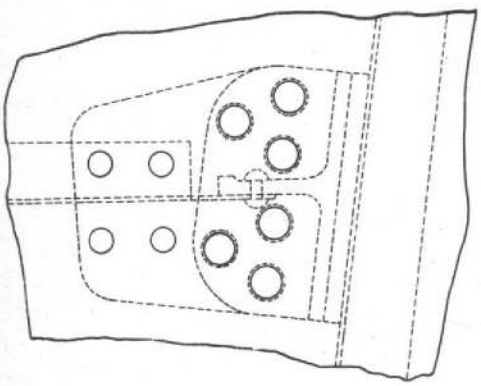
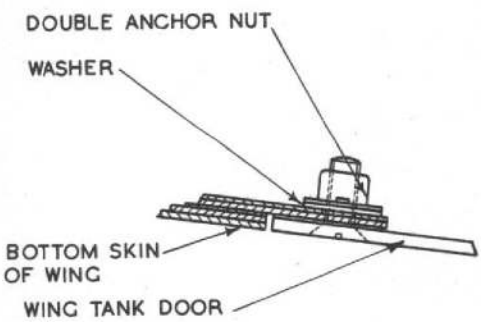
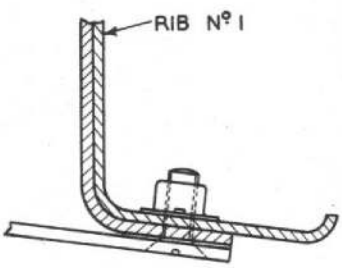






REINFORCING BRACKET ON RIB Nº 13
(SIMILAR TO BRACKETS ON RIBS 7 & 10)



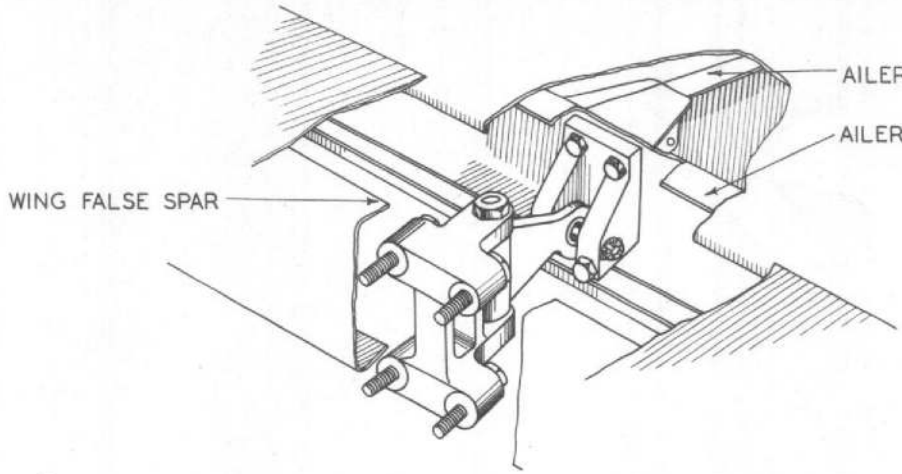


SECTION SHOWING TANK DOOR FIXING

FIG. 4

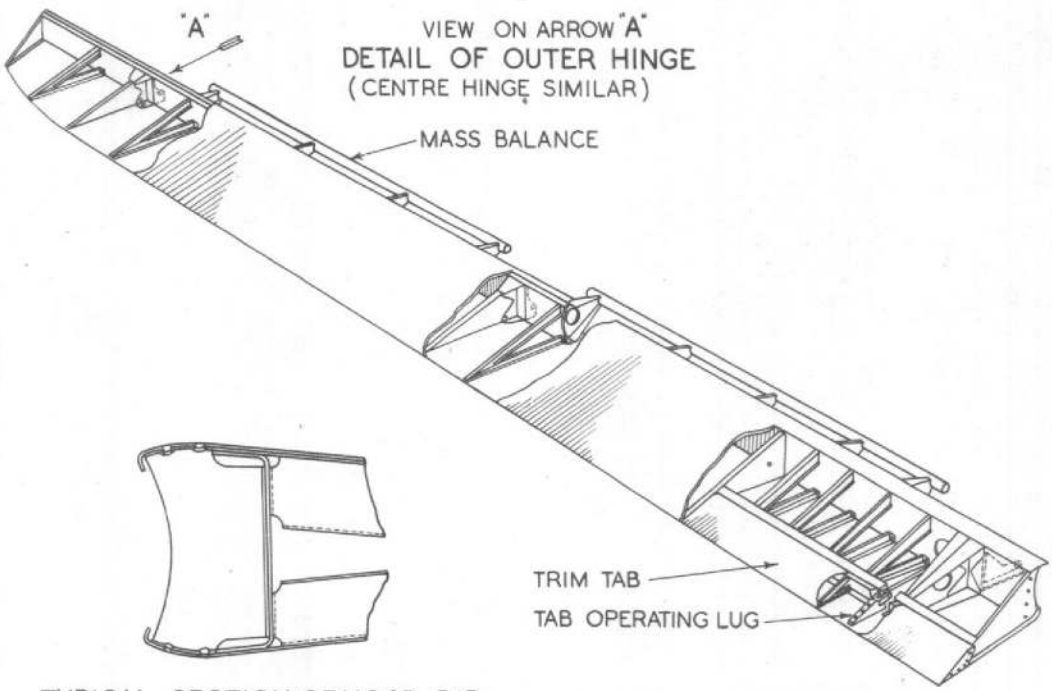
MAIN PLANE DETAILS (2)

FIG. 4



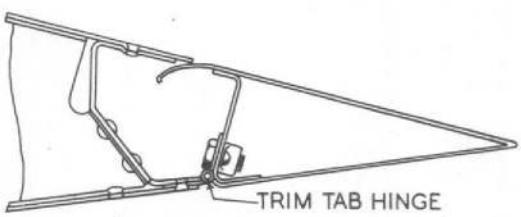
VIEW ON ARROW "A"

DETAIL OF OUTER HINGE
(CENTRE HINGE SIMILAR)



TYPICAL SECTION OF NOSE RIB

FOR AILERON DIFFERENTIAL UNIT
SEE **SECT. 4 CHAP. 3**



SECTION THROUGH TRIM TAB AT RIB 2 OF AILERON

FIG 7

AILERON

FIG 7

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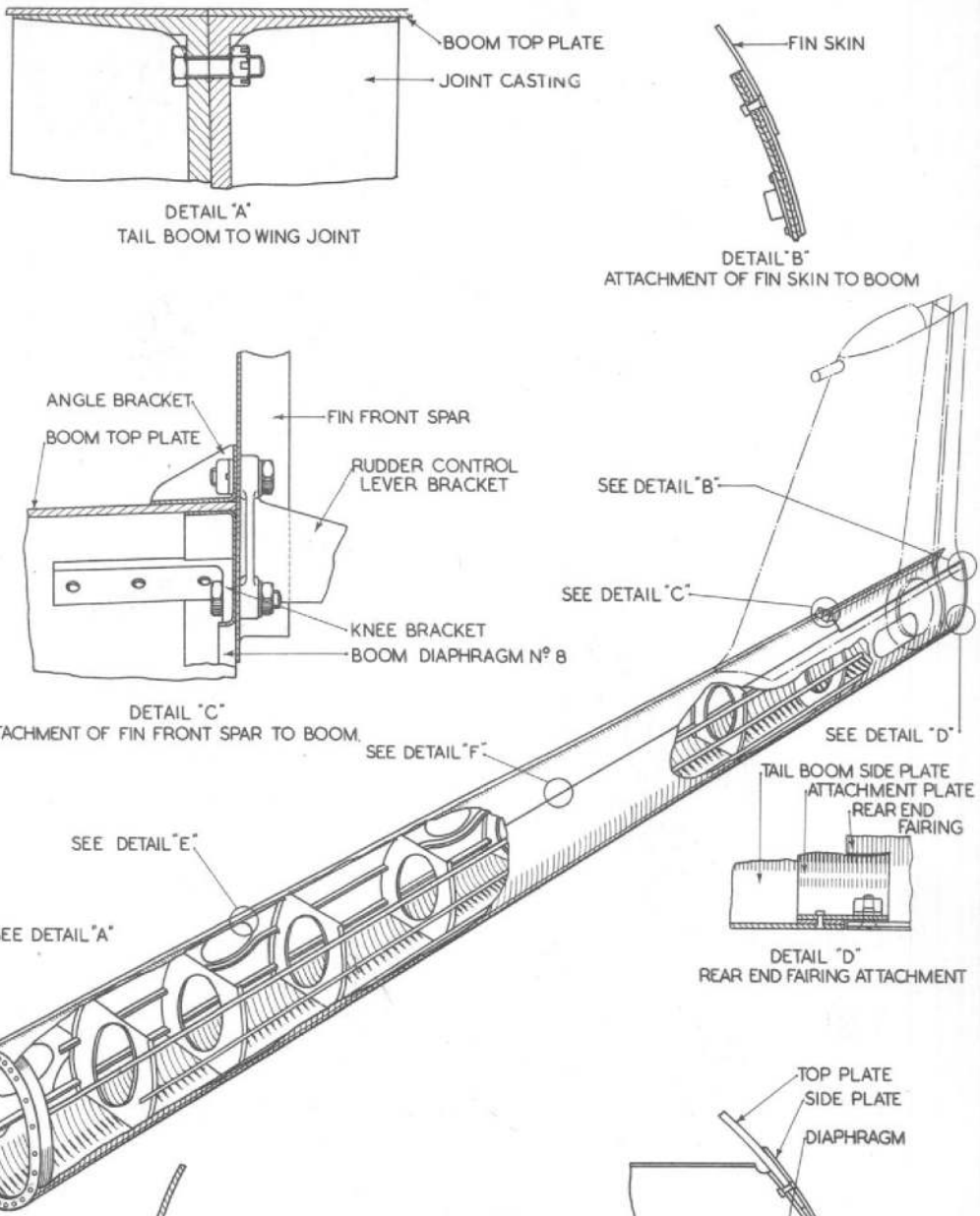

FIG. 1

TAIL BOOM

FIG. 1

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FIG. 2

TAIL UNIT STRUCTURE

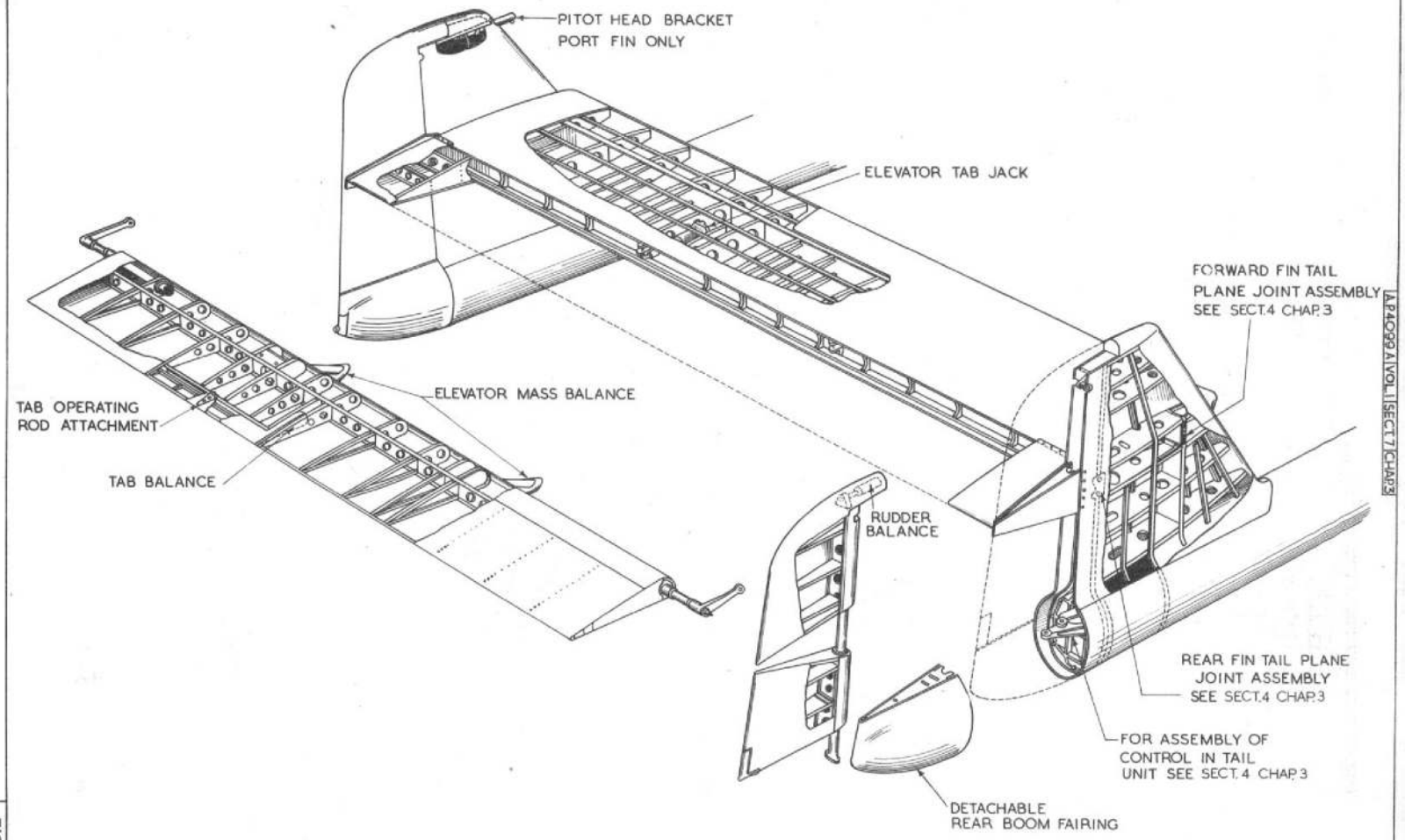

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FIG. 2

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FIG 3

AILERON CONTROLS

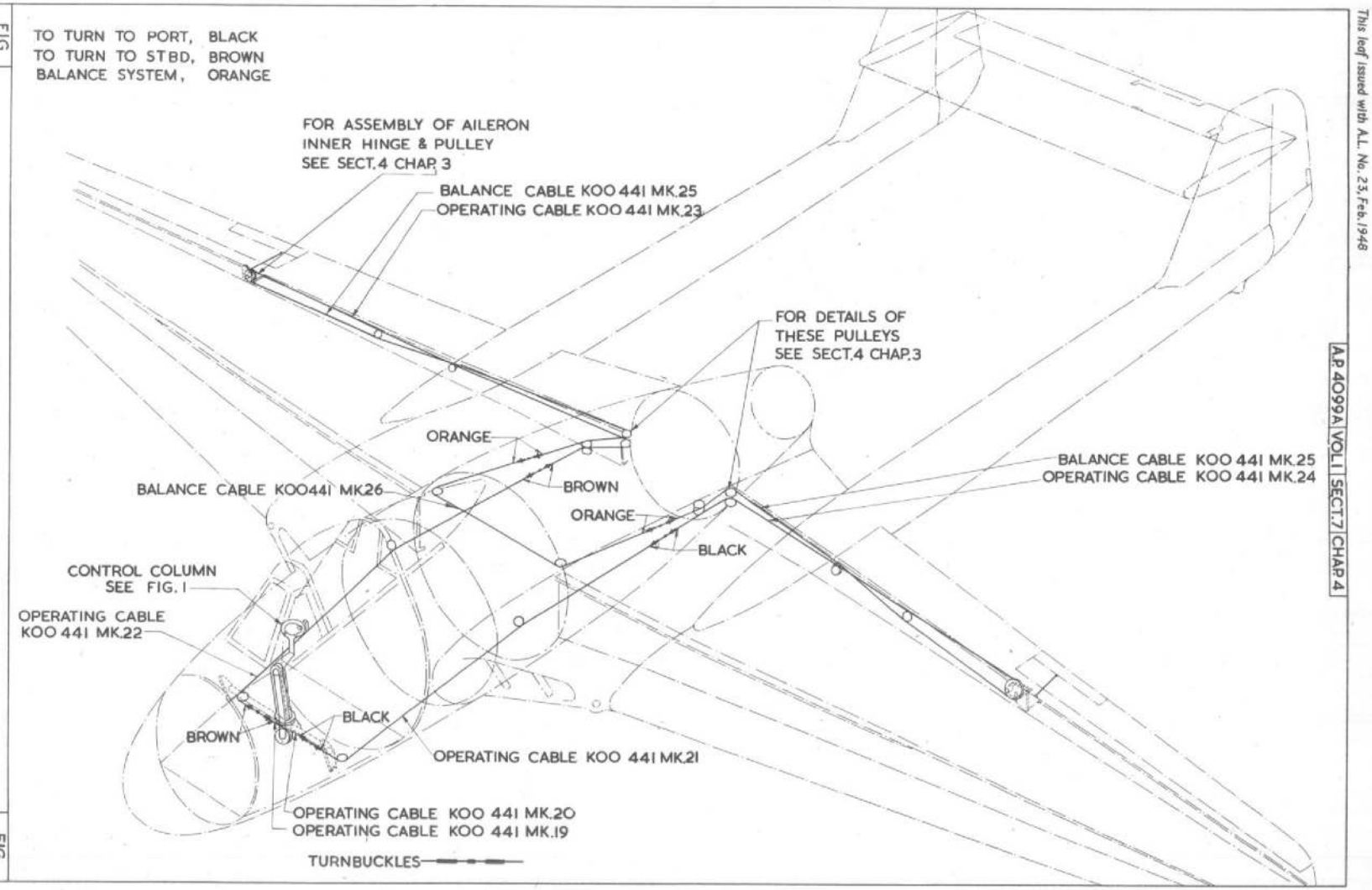

FIG 3

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ELEVATOR CONTROLS

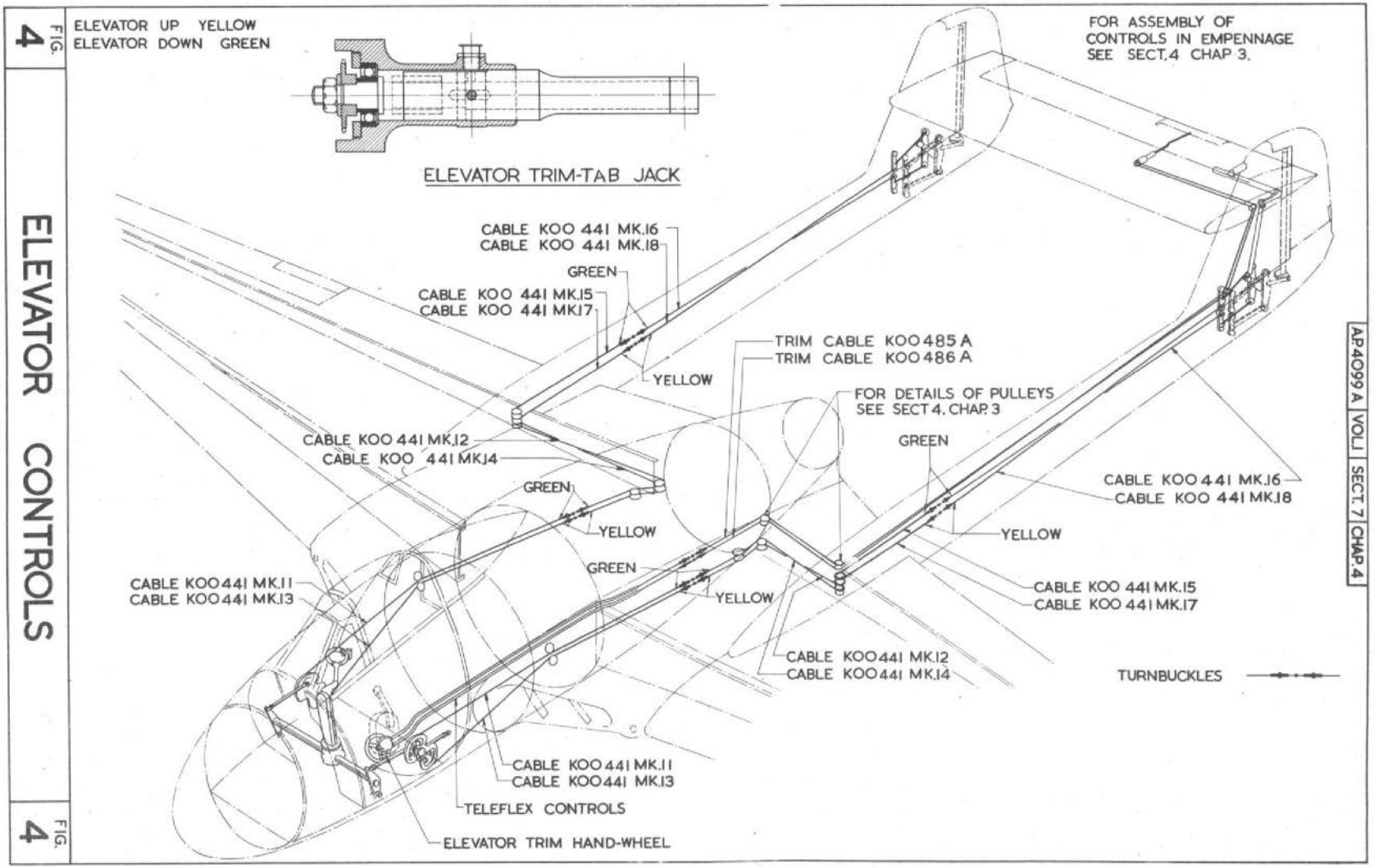

FIG 5

RUDDER CONTROLS

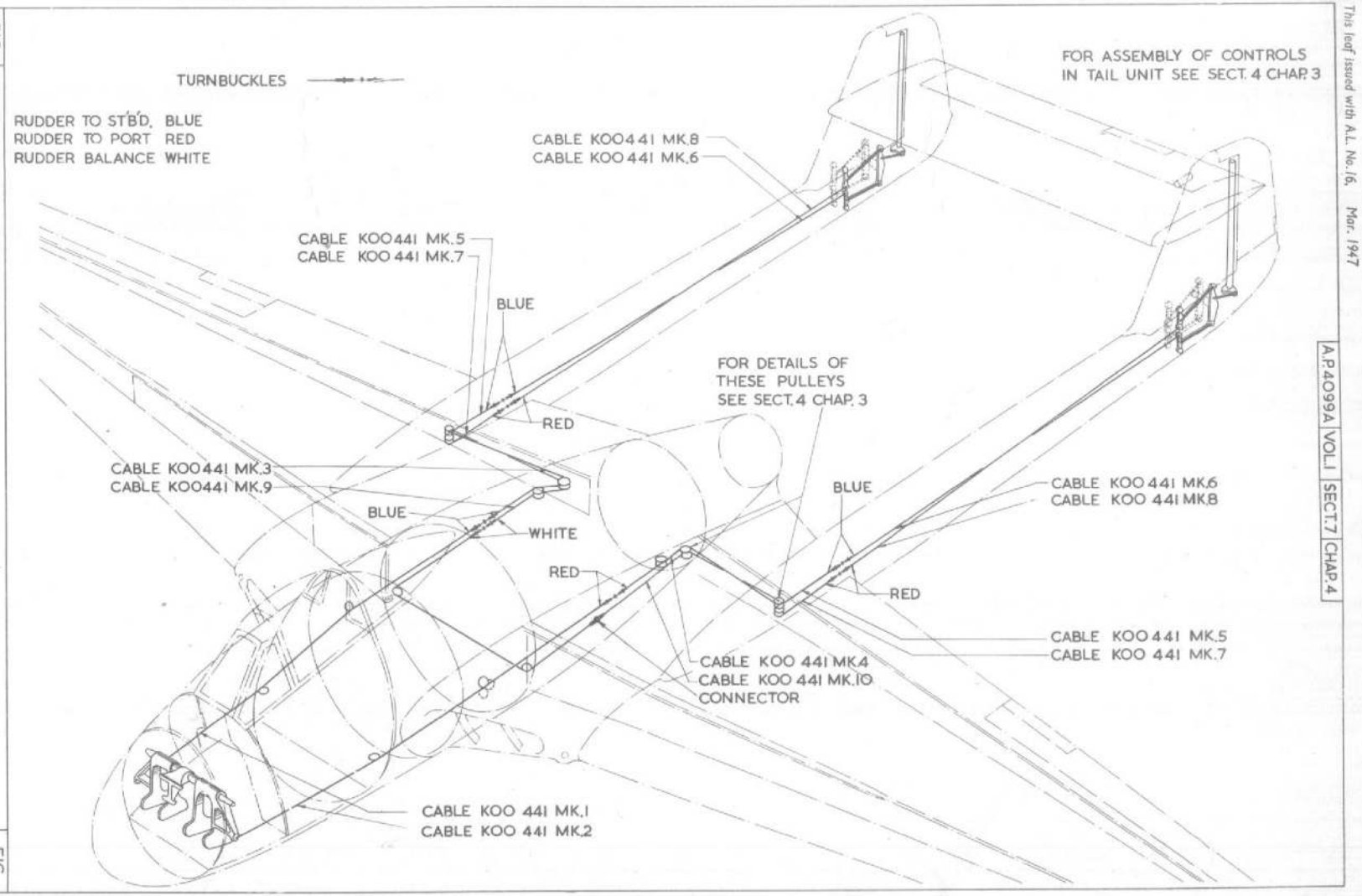

FIG 5

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