Chapter 4B FLYING CONTROLS - COCKPIT CONTROLS

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LIST OF ILLUSTRATIONS

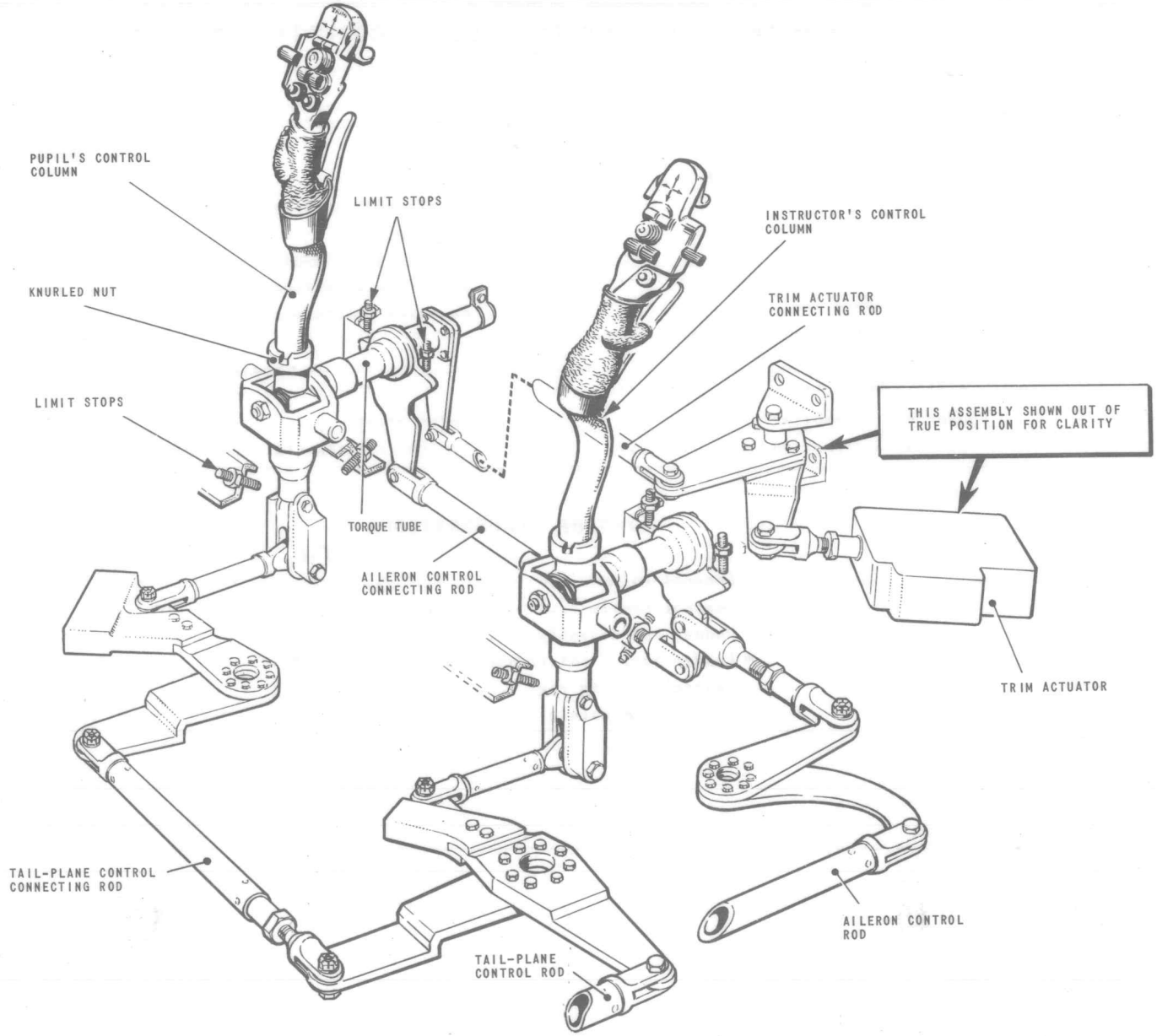

FIG. 1. CONTROL COLUMNS

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DESCRIPTION

Control columns *(fig.1)*

General information

1. The control columns are linked together, so that their movements are identical. Each control column consists of a lower and upper member and a control handle, the upper member, complete with the control handle, being detachable to allow for operational requirements and to facilitate servicing. Each complete column, mounted on a structure bolted to the cockpit floor, pivots fore-and-aft for tail-plane control, but only the upper member and handle pivot laterally for aileron control. ▶◀

Note...

If the aircraft is to be flown with the starboard control column removed the autopilot cut-out switch on the rear pressure bulkhead must be wire-locked in position 1. This will make the electrical supply available to the engage switch on the port control column (Sect.7, Chap.3).

Lower members

2. For fore-and-aft movement, the lower and upper members of each control column move as one unit pivoting in the mounting structure. Communication between the fork-end at the bottom of the lower members and the tail plane p.f.c.u. is by control rods.

Upper members

3. The upper members pivot laterally about their attachment to the lower members and rotate torque tubes which terminate in levers. On the port control column the torque tube is combined with a centring unit *(Chap.4C)*. Control rods connected to the levers transmit movement to the control run which operates the aileron p.f.c.u. The control columns above floor level are detachable and are held in position by a collar and a locknut. A slot and spigot ensure that the columns are aligned in their seatings.

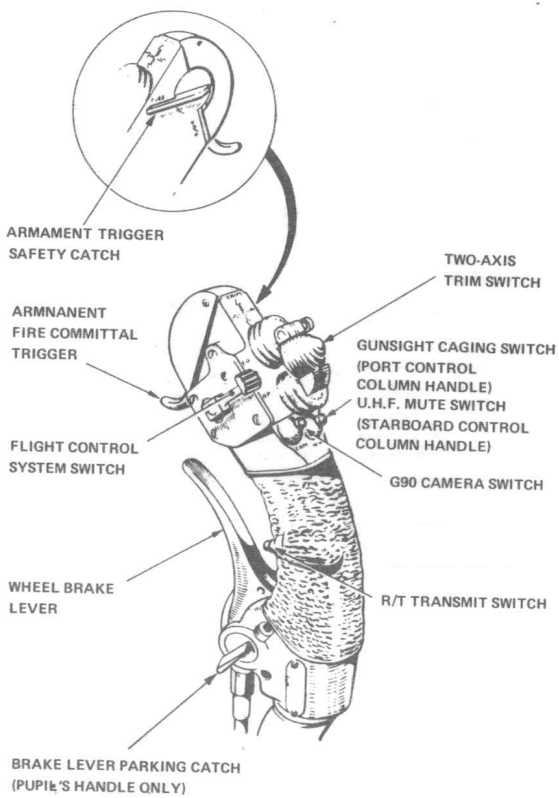

Fig.2. Control handle

Control handles (port, fig.2)

4. A control handle is fitted to the upper member of each control column. At the base of the handle is the wheel brake lever with its associated parking catch on the port side. A press-to-transmit switch is housed in a boss, halfway up the grip on the port side. The top of the handle accommodates switches for the camera, flight control system and tail-plane and aileron trim. At the front of the handle is the armament firing trigger with its safety catch on the starboard side. Datum marks for control column rigging are inscribed on the port side of the handle. The starboard control handle is designed for left-hand use and the switches and controls are opposite hand to those on the port handle. The starboard handle has no wheel-brakes parking catch.

Limit stops (fig.1)

5. Fore-and-aft movement of the control columns, for tail-plane control *(Chap.4E)*, is limited by adjustable stops screwed into the mounting structures. The aft stops, i.e., control columns forward, are accessible from outside the mounting structures; the forward stops can be adjusted through cut-outs in the starboard side of the mounting structures. Lateral movement of the control columns, for aileron control, is limited by adjustable stops, accessible externally, at the forward end of the mounting structures.

Rudder bar assemblies

General information (fig.3 and 4)

6. Both rudder bar assemblies consist

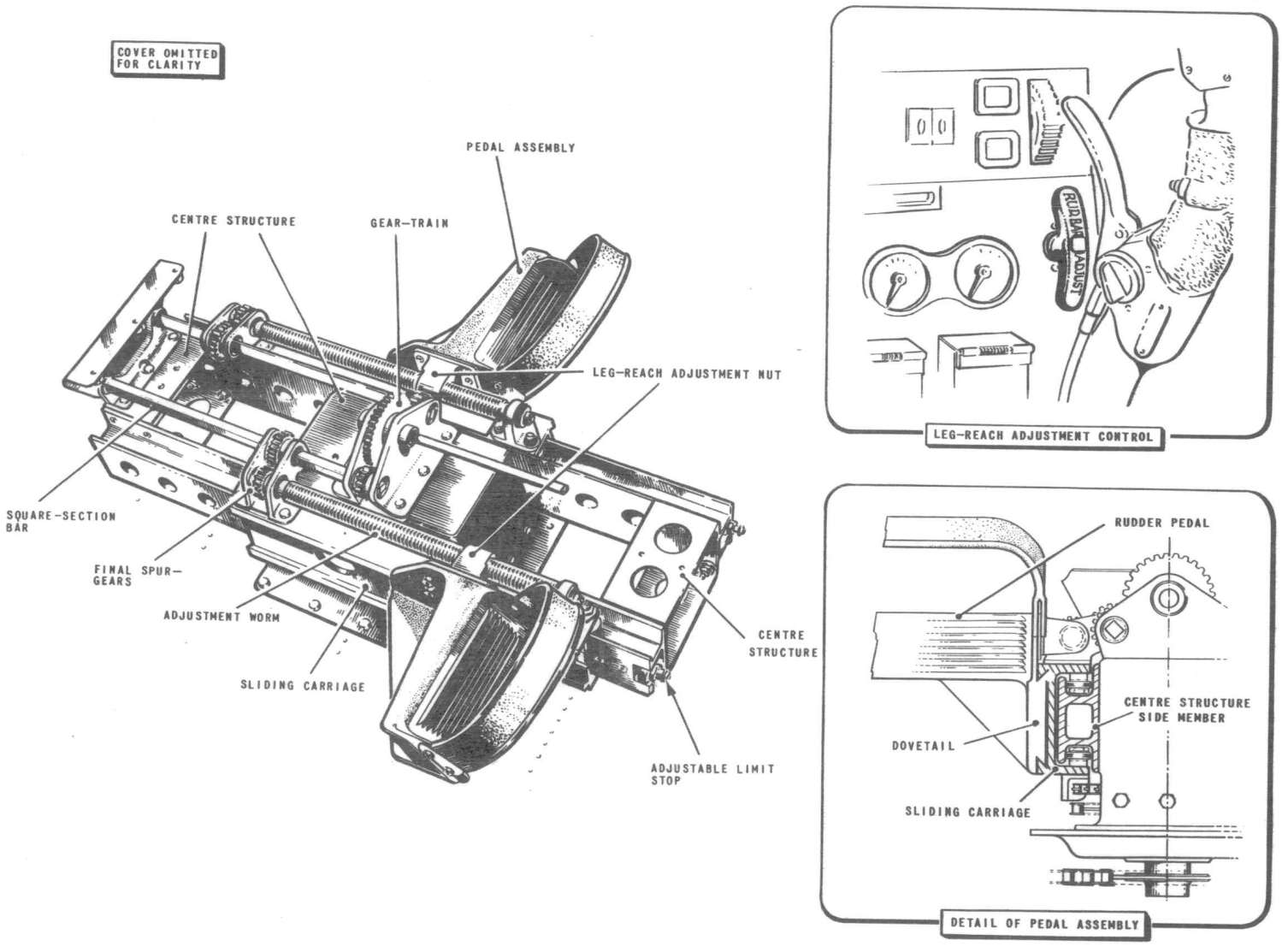

FIG.3. RUDDER BAR ASSEMBLY

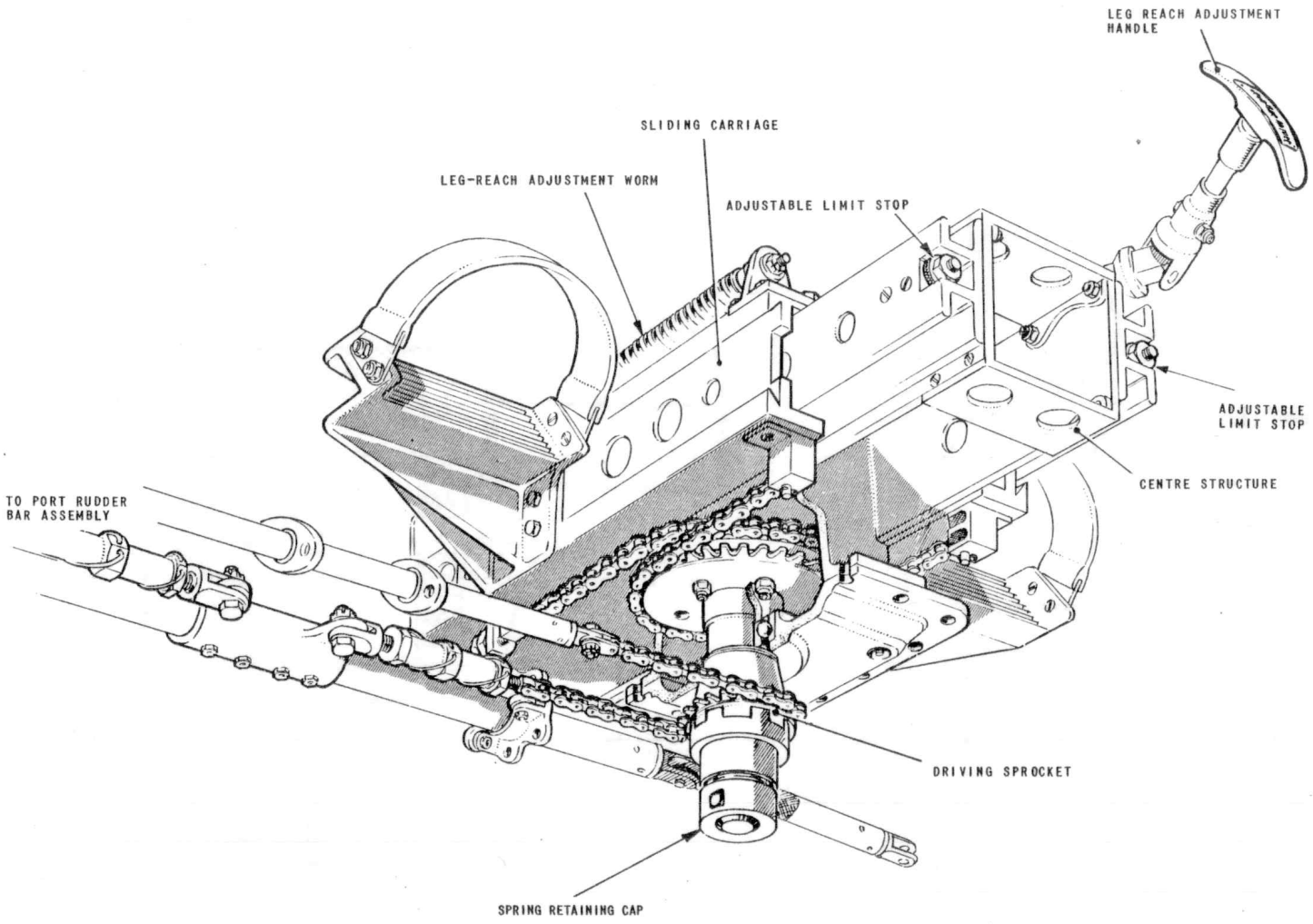

FIG. 4. RUDDER BARS - INTERCONNECTION

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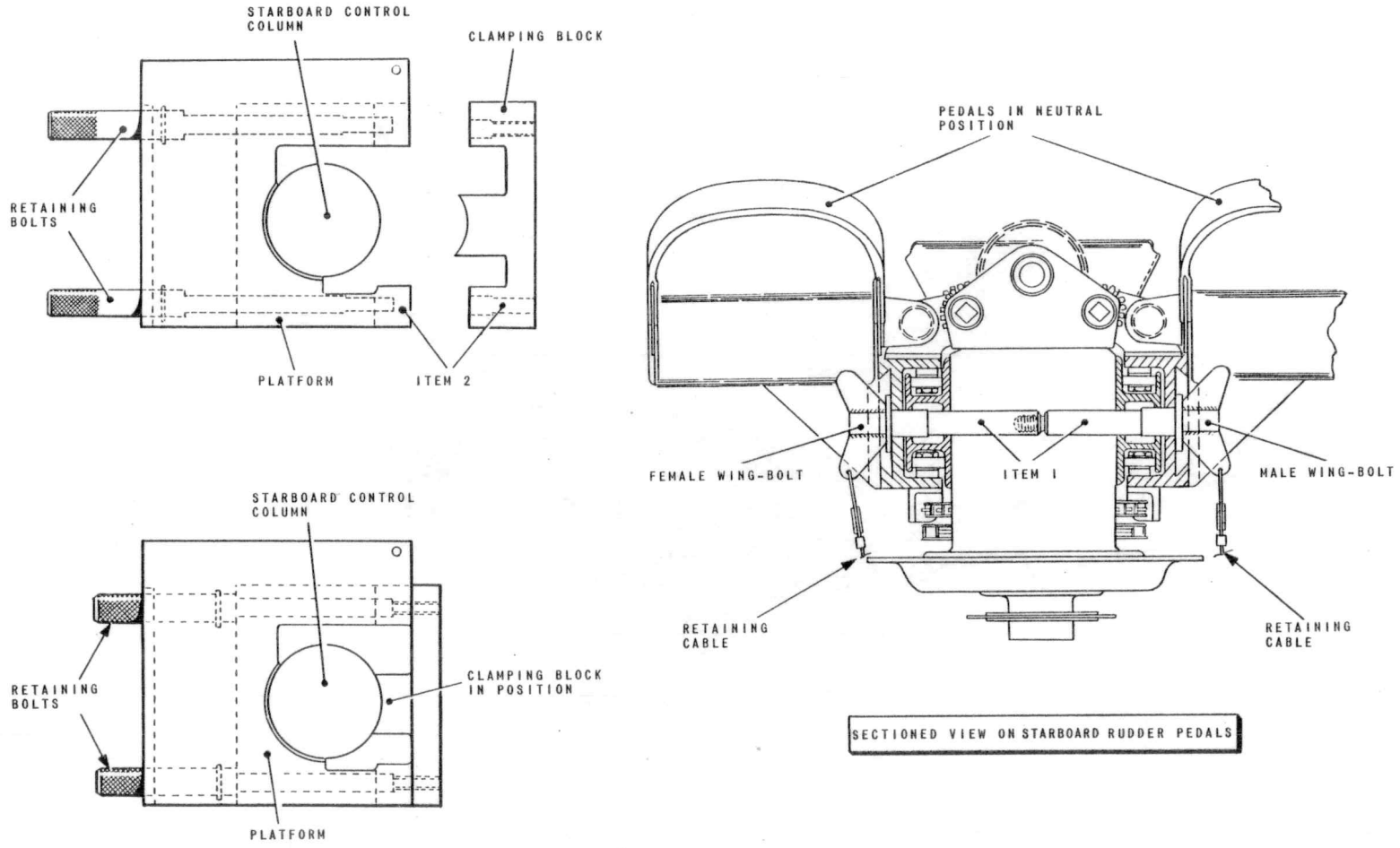

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FIG. 5. NEUTRAL - SETTING RIG

basically of a centre structure, two sliding carriages and two pedal assemblies. H-section sides on the centre structure are utilized as rails on which vertical and horizontal bearings, attached to the sliding carriages, move to produce true fore-and-aft movement of the pedals. The side member of each pedal assembly is a dovetail which fits into a corresponding guide in the outboard side of the sliding carriage, and an adjustment worm on each carriage positions its respective pedal assembly in the guide. Carriage movement on both rudder bar assemblies is synchronized by a system of chains and sprockets.

Limit stops (fig.3 and 4)

7. Adjustable stops in the form of knurled nuts, to limit rudder pedal travel, are provided at the aft end of the H-section sides of the centre structures.

Leg-reach adjustment (fig.3)

8. Micrometer-type adjustment for leg reach is obtained by pulling out and turning the T-handle, marked RUD.BAR ADJUST, fitted on instrument panels 3 and 5. Turning the handle clockwise shortens, and counter-clockwise lengthens, the leg reach. A drive connects the T-handle to a gear-train on the rudder bar centre structure and the outer follower-gears each drive a square-section bar on which they are fitted. The square-section bars are a sliding fit through the driving-gears on the sliding carriage gear assemblies, and enable the rudder pedals, with their associated sliding carriages, to move fore-and-aft whilst still in constant mesh with the adjustment mechanism. After the desired adjustment has been obtained the T-handle must be turned to the vertical position and pushed in to lock the adjustment gear.

Trim switches

9. Rudder trim is controlled by two 2-way switches marked RUDDER TRIM mounted above the port and starboard consoles. Aileron and tail-plane trim is effected by dual 4-way switches fitted on both control handles *(fig.2)*. The switches are moved fore-and-aft for tail-plane trim and laterally for aileron trim *(Sect.6, Chap.3)*.

Flap selector switches

10. Two flap selector switches are fitted, the instructor's on the starboard, and the pupil's on the port side of instrument panel A1. The pupil's (port) selector is marked UP-DOWN; the instructor's (starboard) is marked UP-mid-position-DOWN. The instructor's switch is also a master switch, enabling him to override any flaps selection made by the pupil; in the mid-position it completes the circuit to the pupil's switch, but in the flaps UP or DOWN position, it renders the pupil's switch ineffective *(Sect.6, Chap.3)*. The selectors control the solenoids of an electro-hydraulic selector valve which directs the flow of hydraulic fluid to the flap jacks *(Chap.6)*. If the flaps are left down, a pitot pressure switch, operating at 250 knots, returns them during flight to up.

Air brake selectors

11. Dual air-brake selector switches are fitted, one on the instructor's and one on the pupil's No.2 engine power control handle. The instructor's switch overrides any selection made by the pupil. Moving either switch to the aft position selects air brakes OUT; forward movement selects air brakes IN. The switches are spring-loaded to the centre off position.

Position indicators

12. A combined position indicator, showing the trim position about the three axes of the aircraft, the air-brakes position, and the 'air brakes in and locked' condition, is mounted on instrument panel A1; the flap position indicator is mounted adjacent and above, on panel A1.

SERVICING

WARNING

The relevant safety precautions detailed on the LETHAL WARNING marker card must always be observed before entering the cockpit or performing any operations upon the aircraft.

Lubrication

◀ 13. Details of lubrication are shown in fig.6 and the key to lubricant and application symbols, together with their full designations, are to be found in Leading Particulars. ▶

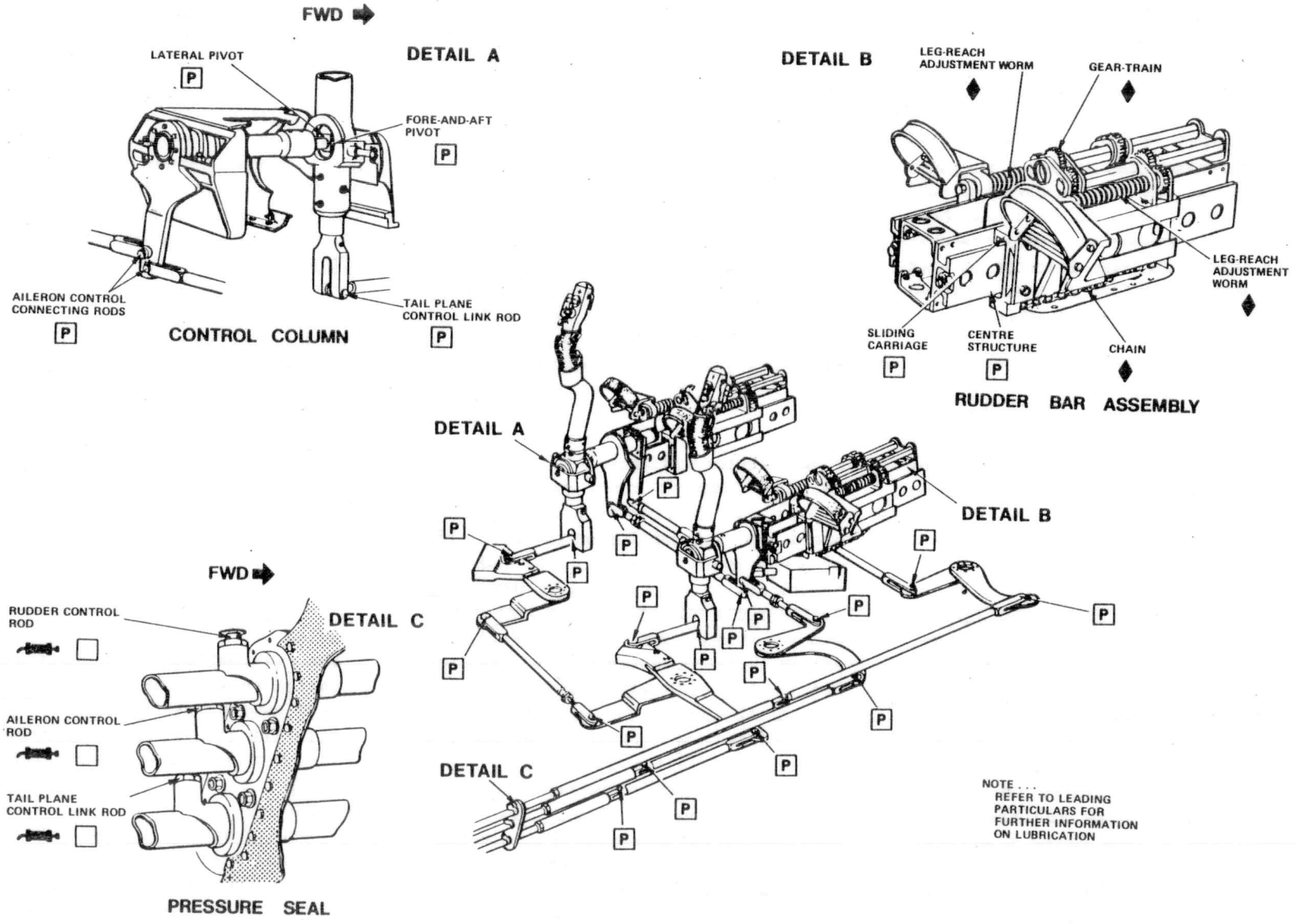

FIG. 6. LUBRICATION POINTS

◀ REDRAWN ▶

◀ **Neutral-setting rig** *(fig.5)*

14. The neutral-setting rig Ref.No. 26DK/95828 is provided for rigging purposes only. Control locking for parking or picketing is not necessary as the flying controls are irreversible. ▶

To fit the neutral-setting rig:-

(1) Adjust the starboard rudder pedals for long-leg reach until the forward movement of the pedal assemblies uncovers the 5/8 in. dia. holes in the sliding carriages.

(2) Set the rudder pedals to the neutral position to align the two 5/8 in.dia. holes.

(3) Insert the male and female wing-bolts through the 5/8 in.dia. holes in the sliding carriages and screw the two bolts together.

(4) Unfasten the control column gaiter and the clip securing the brake cable and wiring loom. Remove the clip.

(5) Position the platform of item 2 at the base of the starboard control column.

(6) Slide the clamping block into position and secure it to the platform with the two retaining bolts.

(7) After work has been completed and the neutral-setting rig removed refit the clip and secure the gaiter.