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**ROLLS-ROYCE AUTOMATIC GEARBOX**


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## SECTION 11 — FRONT OIL PUMP

The front pump is mounted in the front of the gearbox, concentric with the mainshaft. The pump rotor is keyed to the front drive shaft and rotates with it. The pump body is located by a dowel washer on one of the setscrews which secure the pump to the gearbox casing.

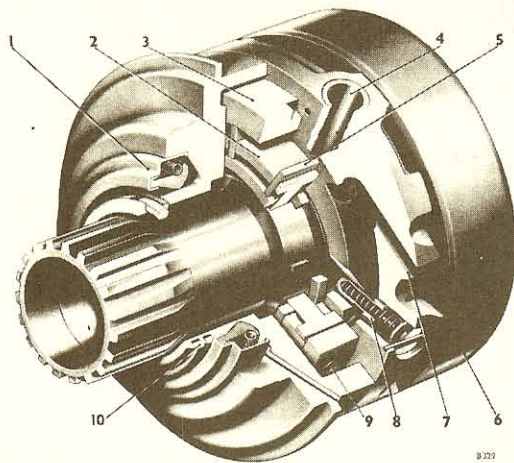


Fig. 16 Front pump

- |                               |                                      |
|-------------------------------|--------------------------------------|
| 1 OIL SEAL                    | 6 DRIVE SHAFT AND FRONT ANNULUS GEAR |
| 2 ROTOR                       | 7 OUTLET                             |
| 3 SLIDE                       | 8 RELIEF VALVE                       |
| 4 PRESSURE CONTROL VALVE PORT | 9 PRIMING SPRINGS                    |
| 5 VANE                        | 10 PISTON-RING TYPE SEALS            |

The rotor carries seven sliding vanes which contact the inner diameter of a variable delivery slide (see Fig. 16). The slide can move diametrically across the rotor, from a position of maximum eccentricity on one side to the corresponding position on the opposite side. This movement progressively changes the oil eccentricity space between the rotor and slide, thus controlling the pump delivery. Maximum delivery is obtained on full eccentricity, reducing to zero as the slide moves towards the concentric point; opposite eccentricity causes the pump to return oil from the rear pump to the gearbox sump. The slide position thus controls the delivery from both front and rear pumps.

A concentric pair of coil springs holds the slide in the maximum delivery position in order to prime the pump rapidly on starting. According to the demands of the hydraulic system, a pressure control valve varies the oil flow through ports directing pressure to the outer surfaces of the slide, so moving it into the delivery position required.

The controlling forces in the pressure control valve are pump output (main) pressure and throttle pressure. Main pressure action on the spring-loaded valve tends to reduce pump delivery, while T.V. pressure assists the spring in opposing main pressure and increasing pump delivery. T.V. pressure thus causes pump output to increase with increased throttle openings.

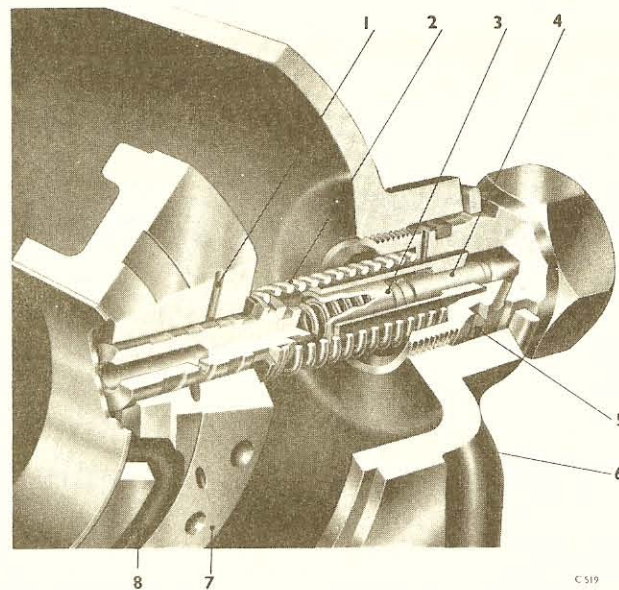


Fig. 17 Pressure control valve

- |                             |                     |
|-----------------------------|---------------------|
| 1 OIL PASSAGE TO PUMP SLIDE | 5 SEALING RING      |
| 2 RETURN SPRING             | 6 GEARBOX CASING    |
| 3 REVERSE BOOSTER PLUG      | 7 PUMP CASING       |
| 4 T.V. OIL REGULATOR PLUG   | 8 OIL DELIVERY DUCT |

When Reverse is selected, additional pressure is required to hold on the reverse cone clutch, and this pressure is directed to act on the reverse booster plug (see Fig. 17), thus overtaking T.V. pressure and boosting pump delivery pressure to a level sufficient to hold the reverse clutch firmly engaged. A relief valve is fitted to the pump to fix a maximum limit on the pressure in the system.

The pump draws oil from the gearbox sump through a fine gauze filter and delivers it to the valve housing of the front servo. Here it is joined by delivery from the rear pump through a non-return ball valve. This valve prevents the front pump from discharging through the rear pump, although a small bleed bypasses the valve to allow the front pump to maintain oil in the rear pump and pipe when the car is stationary or in reverse gear.