

## SECTION 7 .. REAR PUMP AND GOVERNOR

To remove the rear pump and governor, it is unnecessary to take the gearbox out of the car. First drain the oil as described in Chapter 2 and then remove the following units

- Sump and side cover (Section 3)
- Control valve unit (Section 4)
- Parking brake bracket (Section 5)

Front and rear servo units (Section 6)

If the governor only is to be removed, it is not necessary to take off the two servo units.

### REMOVAL FROM GEARBOX

#### *Governor*

Using a scribe, mark the edge of the governor drive flange and the governor body for rematching on assembly, then unscrew the two retaining setscrews and separate the governor assembly from the driving flange.

#### *Rear pump and governor*

Withdraw the pump-to-front servo oil pipe as illustrated in fig. 1,

Rotate the output shaft until the large (G.1) governor weight faces towards the front of the gearbox. Unscrew the two retaining setscrews and withdraw the assembly from the gearbox in the manner illustrated in fig. 2. If the gearbox is in the car, support the pump with one hand while removing the two setscrews.

### DISMANTLING

Dismantling of the governor and rear pump is limited to that described in the following paragraphs. If wear or damage should necessitate the renewal of a part not covered by these dismantling instructions, either the governor or the pump must be changed as a unit.

- \* When a pump is renewed, the driving gear on the output shaft must be carefully examined for wear. This gear should be renewed if it is worn excessively or if the gears are noisy on subsequent road test.

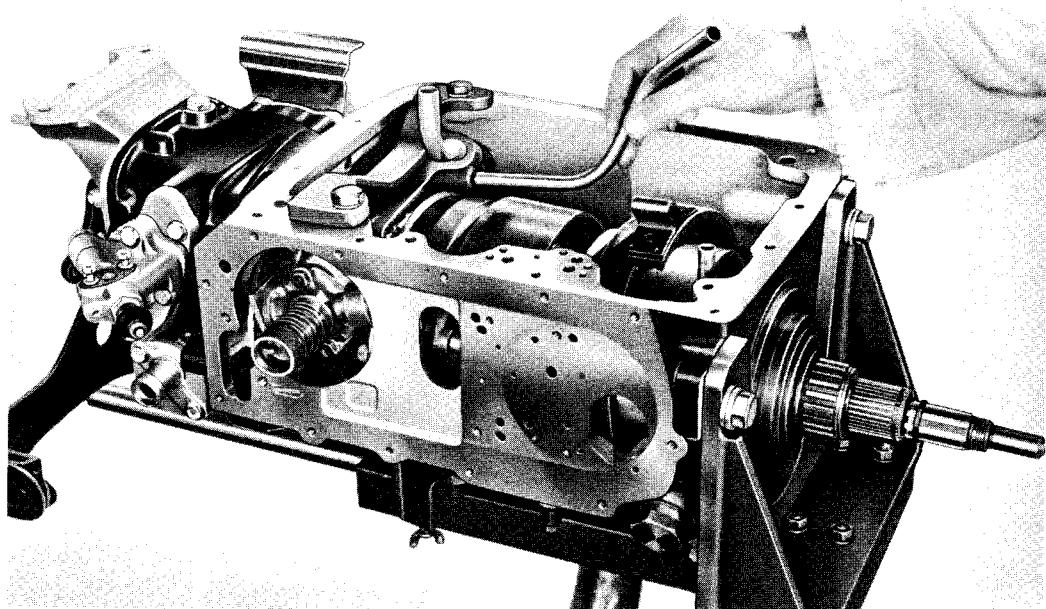
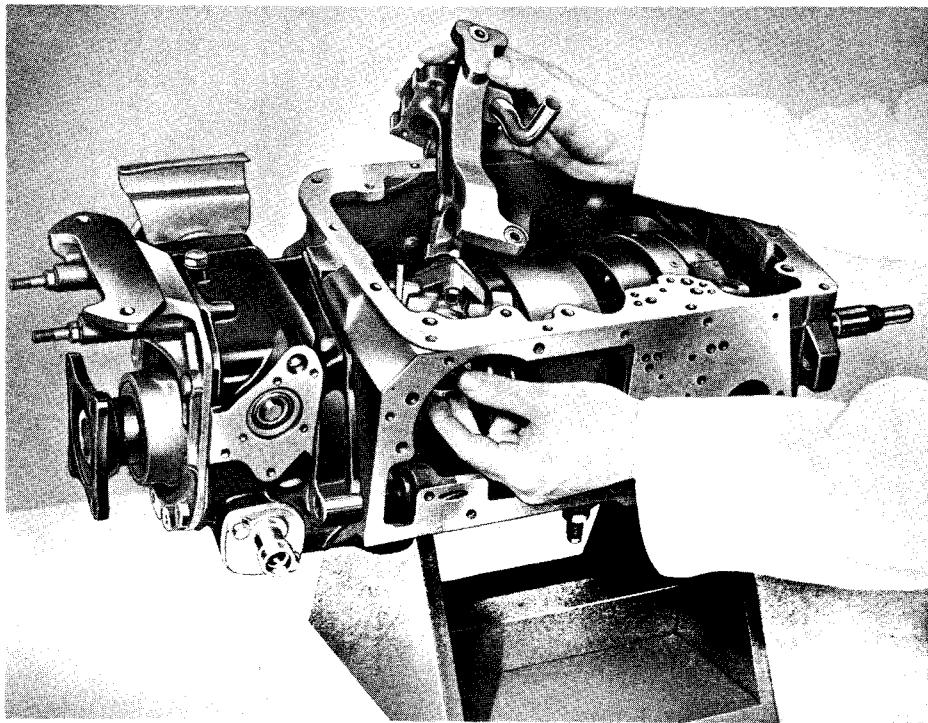


Fig. 1 Removing pump-to-front servo oil pipe



**Fig. 2 Removing front pump and governor**

#### **Governor**

The only parts which can be removed from the governor assembly are the oil sealing rings and the G.2 valve and sleeve.

The G.2 valve can be withdrawn with its sleeve after removing the retaining plate as shown in fig. 3, but the oil sealing rings need not be removed unless they are found to be damaged.

If either a G.1 or G.2 valve becomes unserviceable, the particular assembly should be renewed, as neither G.1 nor G.2 weights should be removed. On some governors, the G.2 valve has no additional weight fitted to its stem, thus allowing removal of the sleeve from the valve, but should either part be damaged, it should not be renewed separately.

#### **Rear pump**

Unscrew the four retaining setscrews and remove the pump cover, then mark the outer face of the annulus gear and withdraw by tilting the unit and shaking into the palm of the hand.

#### **INSPECTION**

Check the material of the governor driving flange, and if it is made of aluminium, the complete governor and pump assembly should be exchanged for one fitted with a steel flange.

Clean all the components thoroughly, flush out the oilways with clean petrol or paraffin and blow through with compressed air. Examine all parts for cracks and burrs.

#### **Governor**

Check the mating of the governor and driving flange faces with engineer's blue; if either face is distorted, renew the complete assembly as the surfaces must not be scraped.

Wear of the governor tower is unlikely, but if signs of rubbing are evident, it should be carefully inspected in conjunction with the bore of the parking brake bracket. Wear of this nature is usually caused by the tower running out of true. Details of the run-out check and methods of rectification are given under refitting to the gearbox.

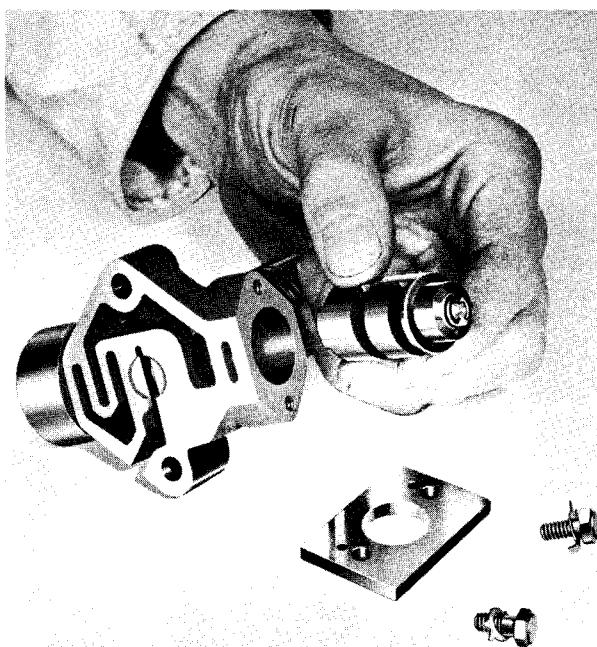


Fig. 3 Removing G2 valve and sleeve

Check the oil sealing rings for freedom or excessive clearance in their grooves ; if the periphery of a ring appears to have worn, remove the ring, insert it into the bore of the parking brake bracket and check that the gap is within the limits given in 'the summary of repair data' at the end of this chapter.

Ensure that the G.1 and G.2 valves operate freely.

#### Rear pump

Check the governor driving flange and steel skew gear retaining pins for security. On some rear pumps the skew gear retaining pin is a sliding fit in the drive shaft, but a tight fit in the gear and providing that the very minute rotational movement of the gear on the shaft does not suggest that the pin has worn or started to shear, the pump unit need not be renewed.

Check the mating of the pump cover and the pump body with engineer's blue. Small burrs may be removed, but the joint faces must not be scraped, as the machining marks are easily eliminated.

Examine the annulus gear pocket and the inner face of the pump cover for scoring and wear. If scoring is evident, check the drive shaft for bow with a dial indicator. Should the drive shaft be bowed, or the scoring of the gear pocket severe, renew the complete pump unit. When the pump cover only is affected, it

can be changed separately. If the oil pressure was found to be low during the fault diagnosis tests, this should be used as a guide when assessing score damage with a view to unit rejection.

Inspect the gears for worn or damaged teeth and check the oil inlet pipe for security in the pump body.

## ASSEMBLING

Assembling is the reverse of dismantling ; each part must be lubricated with clean gearbox fluid before being refitted.

The importance of cleanliness is emphasized, but rag should never be used owing to the danger of fluff entering the control system and fouling the various valves. Attention is drawn to the special instructions contained in the introductory notes at the beginning of this chapter and also the torque loading data and fits and clearances schedule given in the summary.

#### Governor

Refit the oil sealing rings to the governor tower, using the special tool as illustrated in fig. 4 ; if the rings are new, first check their gaps by inserting them into the bore of the parking brake bracket, then check their clearance in the grooves of the tower.

Insert the G.2 valve and sleeve into the governor body, making sure that the lip on the sleeve is toward the joint face of the governor body as illustrated in fig. 3. When the lip is correctly located, the opposite end of the sleeve will be flush with the body. Refit the retaining plate.

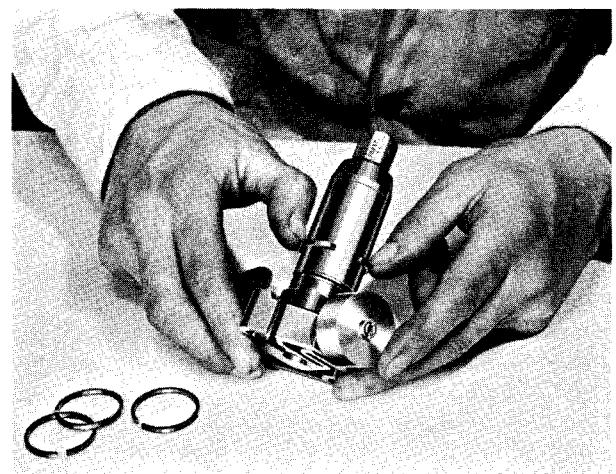


Fig. 4 Fitting governor oil sealing rings

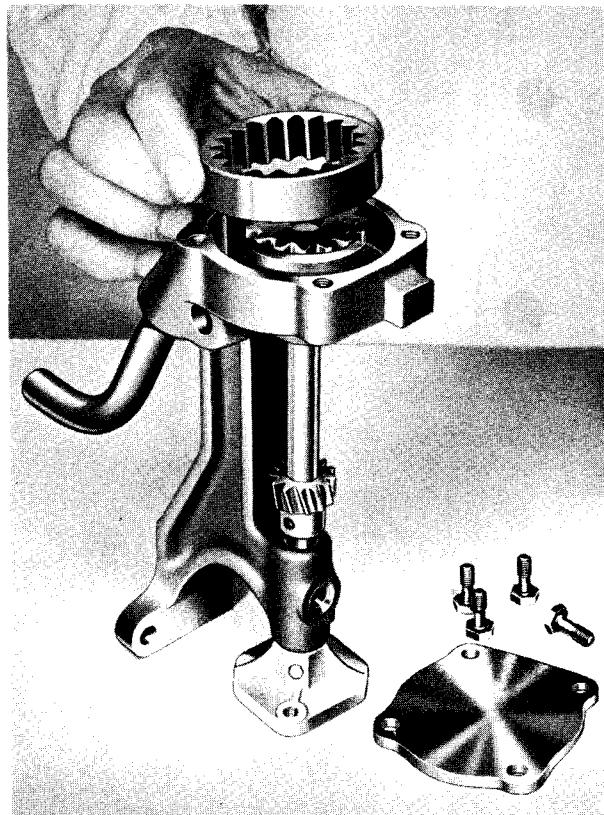


Fig. 5 Fitting annulus gear

#### Rear pump

Assembly of the pump is straightforward (fig. 5). Ensure that the outer face of the annulus gear is replaced correctly, and when the pump cover has been refitted, check that the drive shaft endfloat is not less than 0.002 in. Pour some clean gearbox fluid into the inlet pipe and then rotate the pump to check for freeness.

### REFITTING TO THE GEARBOX

#### Governor

Before refitting the governor body to the driving flange, the latter must be checked for swash, using a dial indicator as shown in fig. 6. Turn the pump shaft several times and check that the swash is within the limits given in the summary of repair data. If outside the limits, the pump unit will have to be changed and the check remade.

Mount the governor onto the driving flange, and if neither of the units have been changed, see that the

matching marks coincide; if a new unit is being fitted, it should be marked after the run-out check described later. Refit the two setscrews and tighten to the correct torque loading. Then, using a dial indicator as illustrated in fig. 7, check the run-out of the governor tower as follows,

With the stem of the indicator contacting the tower approximately 0.25 in. from its outer end, rotate the shaft several times. If the total run-out exceeds the limits given in the summary, remove the governor from its drive flange, turn it through 180 degrees and refit, then check again, if run out is still excessive, fit a new governor and repeat the check. If this does not bring the run-out within the limits, the rear pump and the governor must be renewed.

After completing the check, re-scribe if necessary the correlation marks on the governor and the driving flange; refit the parking brake bracket (Section 5), the

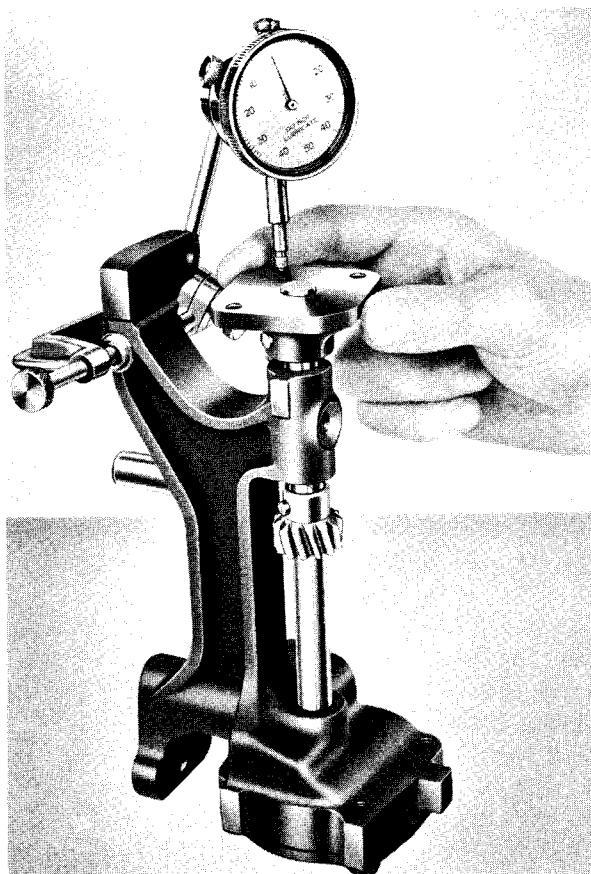


Fig. 6 Checking governor flange

control valve unit (Section 4), the side cover and sump (Section 3), then refill the gearbox with oil and prime the ride control unit as described in Chapter 2.

#### ***Rear pump and governor***

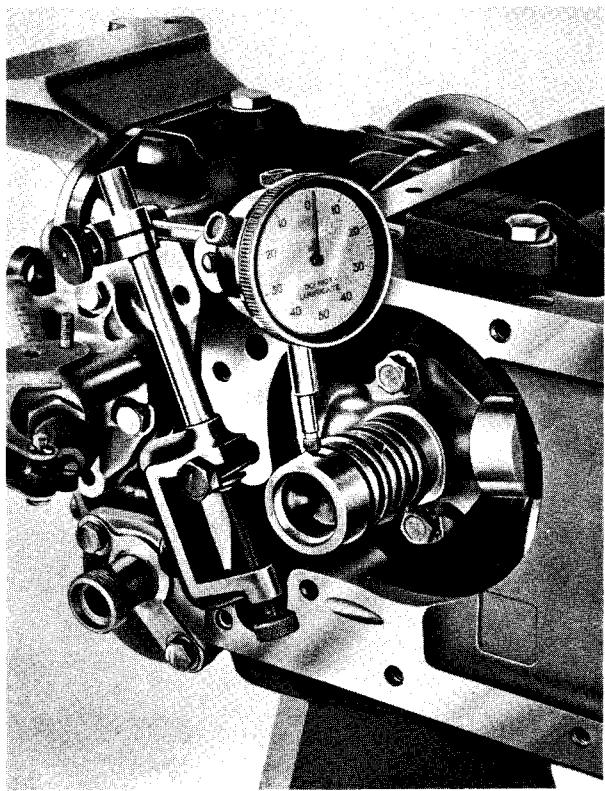
When both the rear pump and governor have been removed from the gearbox, the assembling and checking procedure is similar to that given under 'Refitting the governor.' It is, however, easier to make the swash and run-out checks before installing the combined assembly into the gearbox; in such cases, the dial indicator should be mounted on to the pump body.

After completing the checks, ensure that the mating surfaces of the gearbox and pump unit are free from burrs, especially in the vicinity of the bolt holes, then, with the G.1 weight facing towards the front of the gearbox, install the assembly at the same time rotating the governor slightly to mesh the gears. Refit and tighten the two retaining setscrews to the correct torque loading.

Refit the front and rear servo units (Section 6), the parking brake bracket (Section 5), the control valve unit (Section 4), the side cover and sump (Section 3), and then refill with oil and prime the ride control unit as described in Chapter 2.

#### **SERVICEABILITY CHECK**

After overhaul or fault rectification, a road test should be carried out to ensure that the gearbox functions correctly, particular attention being paid to that



**Fig. 7 Checking governor tower**

part of the test which led to the diagnosis of the fault. Details of the tests concerned are given in Chapter 2 under the heading 'Testing of the change points' and 'Oil pressure tests' (coasting with engine stopped).