

# Chapter 6 Transmission

For modifications, and information applicable to later models, see Supplement at end of manual

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## Specifications

### Type

Comfort .....	Four forward speeds and reverse
Super .....	Five forward speeds and reverse

### Reduction ratios

1st .....	3.910:1 early, 3.909:1 later
2nd .....	2.055:1
3rd .....	1.348:1 early, 1.342:1 later
4th .....	0.963:1 early, 0.964:1 later
5th (where applicable) .....	0.831:1
Reverse .....	3.615:1
Final drive:	
Four-speed .....	4.462:1 or 4.071:1
Five-speed .....	4.071:1

### Lubrication

Oil type/specification .....	Fiat ZC 90 gear oil (Duckhams Gear Oil 90Z – also see note at foot of page 19)
Oil capacity .....	2.36 litres (4.15 Imp pints)

### Torque wrench settings

	Nm	lbf ft
Selector fork lock bolts .....	19	14
Crownwheel bolts .....	69	51
Gearshaft nuts (main and secondary shaft) .....	122	90
Flywheel housing to engine bolts .....	78	58
Flywheel housing to gearcase bolts .....	45	33
Driveshaft inboard gaiter flange bolts .....	1.0	0.7
Final drive tapered roller bearing cap bolts .....	25	18

### 1 General description

The transmission (gearbox and final drive) is mounted in line with the engine.

Four or five forward speeds, and reverse are provided according to model.

Synchromesh is provided on all forward speeds. On 1st and 2nd it is of baulk ring type, while on 3rd, 4th and 5th it is of Porsche spring segment type.

The gearchange lever is floor-mounted, operating through rod linkage.

### 2 Maintenance

**Note:** The latest recommendation for transmission oil is given in the Specifications, and on page 19. However, a multigrade engine oil such as Duckhams Hypergrade may safely be used if wished – refer to the note on page 19.

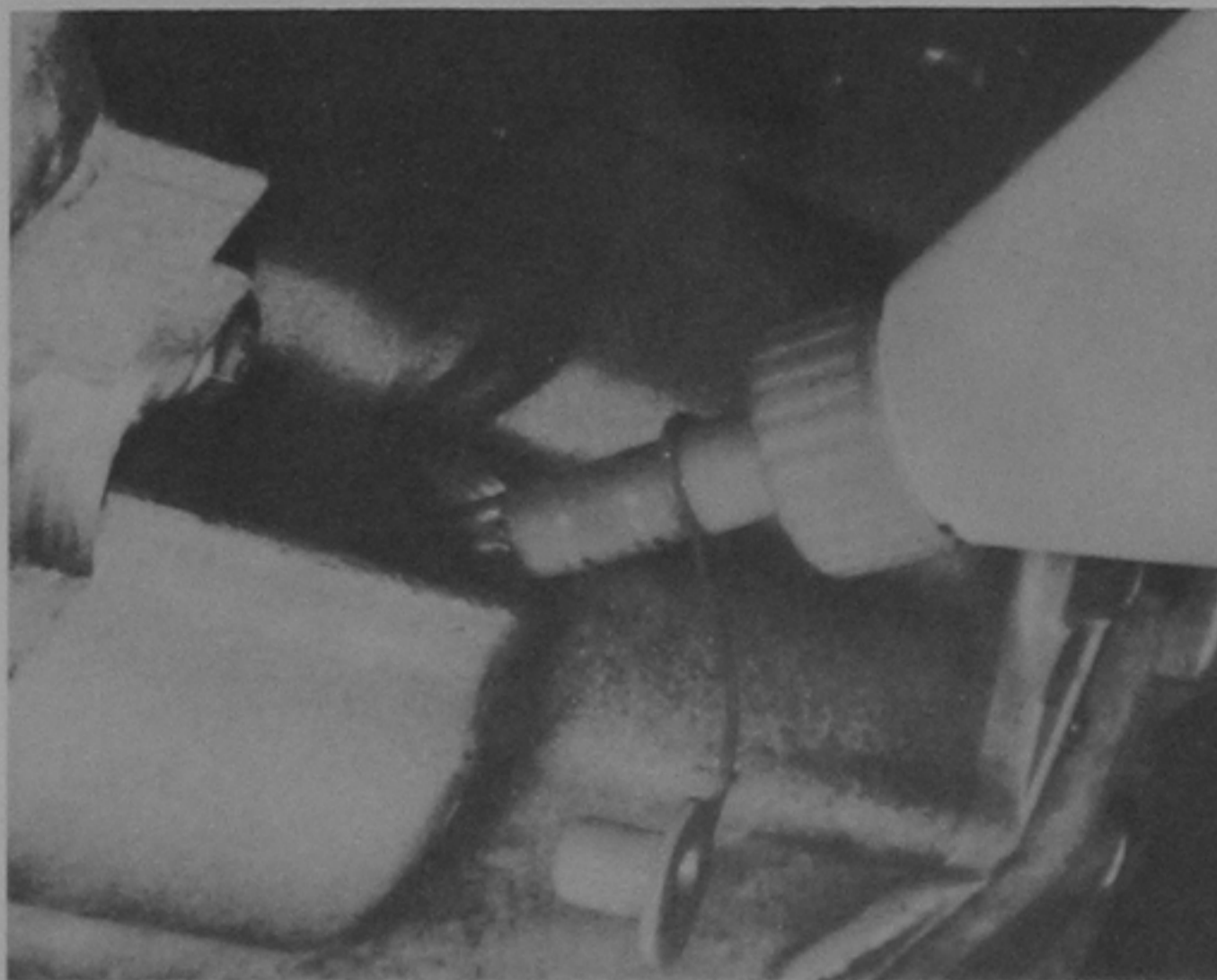
1 At the intervals specified in Routine Maintenance and with the transmission cold and the car standing on level ground, unscrew and remove the oil filler/level plug. If oil just starts to dribble out then the

oil level is correct. If it does not, add oil of the correct grade to bring it up to level. Refit the plug (photo).

2 At the intervals specified in Routine Maintenance drain the transmission oil hot by removing the filler/level plug and the drain plug. When the oil has ceased dripping, refit the drain plug and refill the transmission with the correct grade and quantity of oil. Screw in and tighten the filler/level plug.

**3 Gearchange lever and linkage – removal, refitting and adjustment**

- 1 Access to the gearchange lever ball cup, spring and clamp may be obtained by sliding the bellows up the lever.
- 2 The connecting pivot pin can be removed after the cover has been removed from the underside of the lever beneath the car.
- 3 On some models, the gearchange linkage incorporates two adjustable rods. Set the linkage in the following way.
- 4 Position the gearchange lower relay lever parallel to the plane of the relay lever support.
- 5 Set the gearchange shaft lever in neutral.
- 6 Release the locknut and alter the length of the adjustable rod (A) until the external control lever connects with the upper relay lever.
- 7 Place the gearchange lever in neutral.
- 8 Release the locknut and alter the length of the adjustable rod (B) until the external control lever connects with the gear control rod.



2.1 Topping up transmission oil

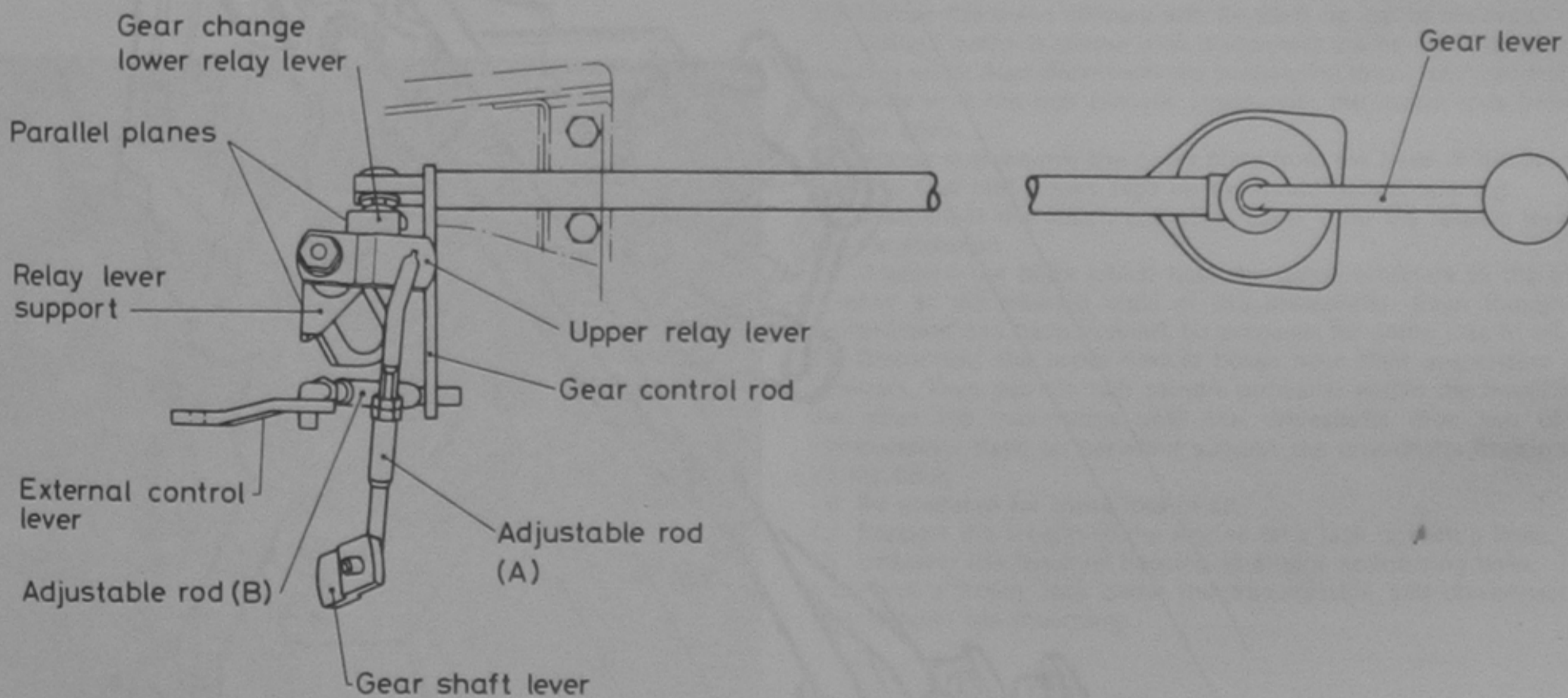


Fig. 6.1 Adjustable type gearchange linkage (Sec 3)

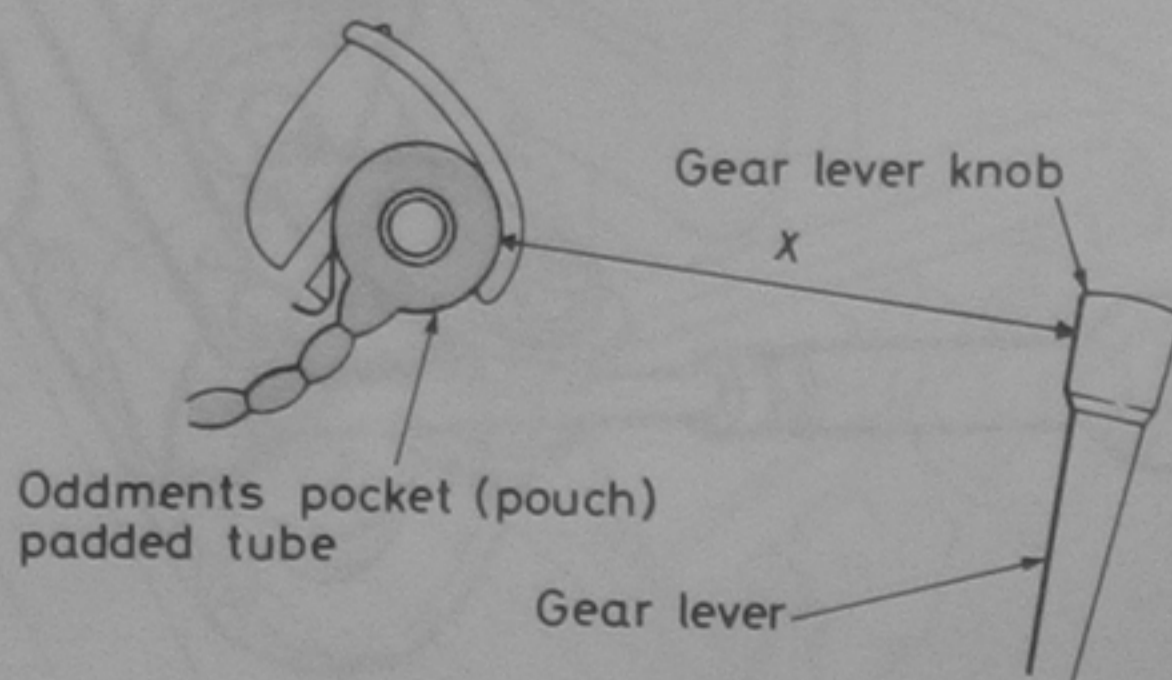
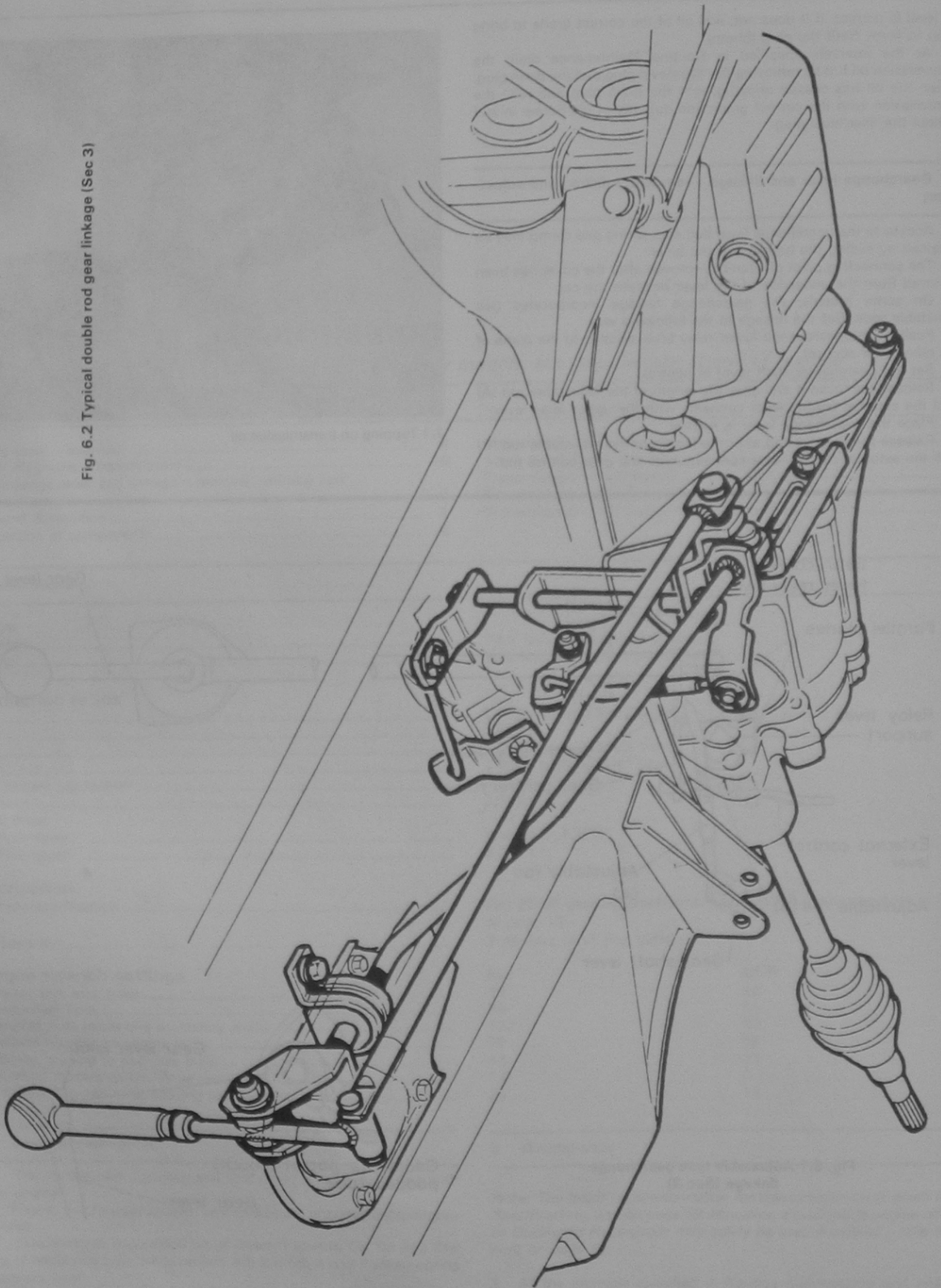
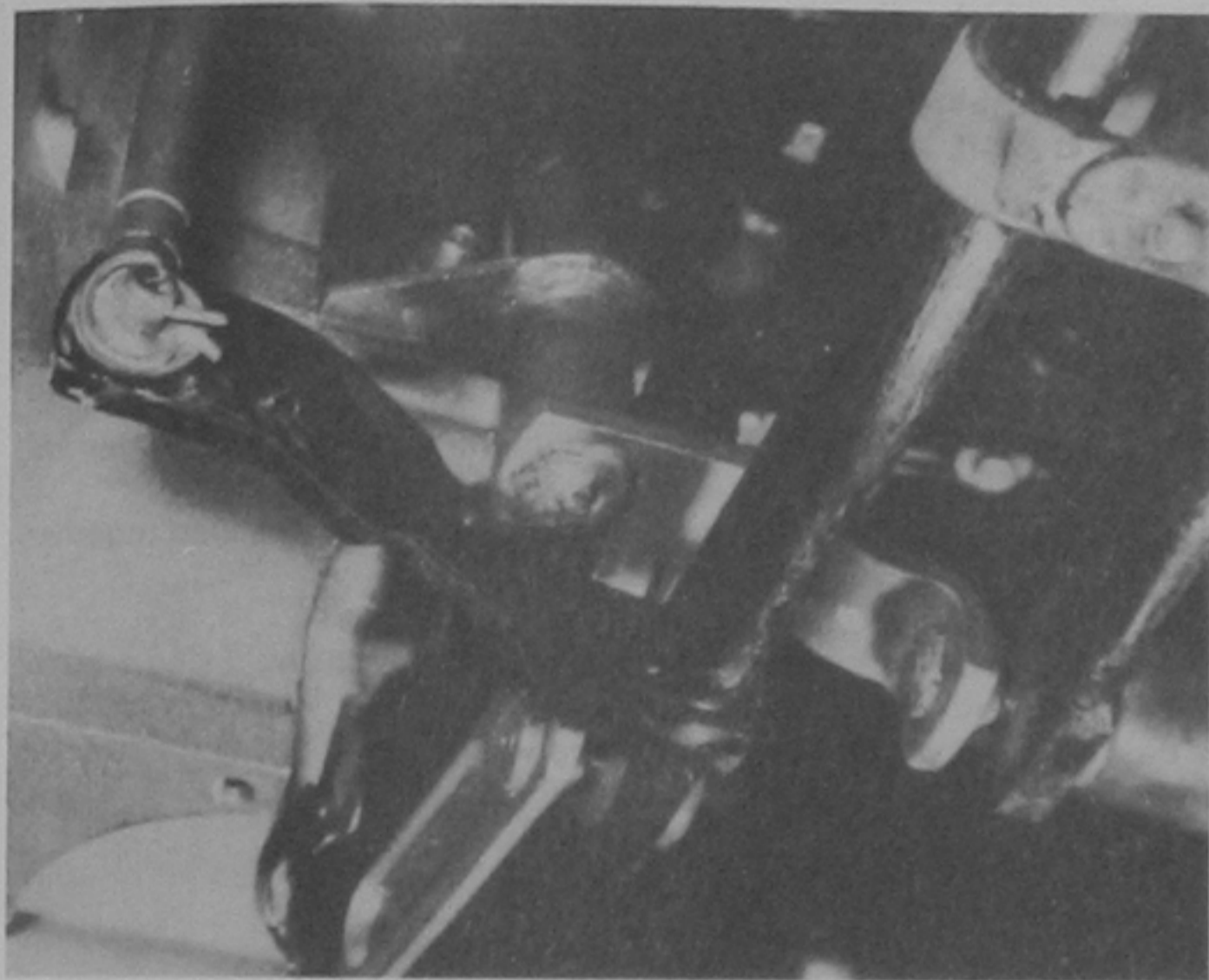


Fig. 6.2 Typical double rod gear linkage (Sec 3)

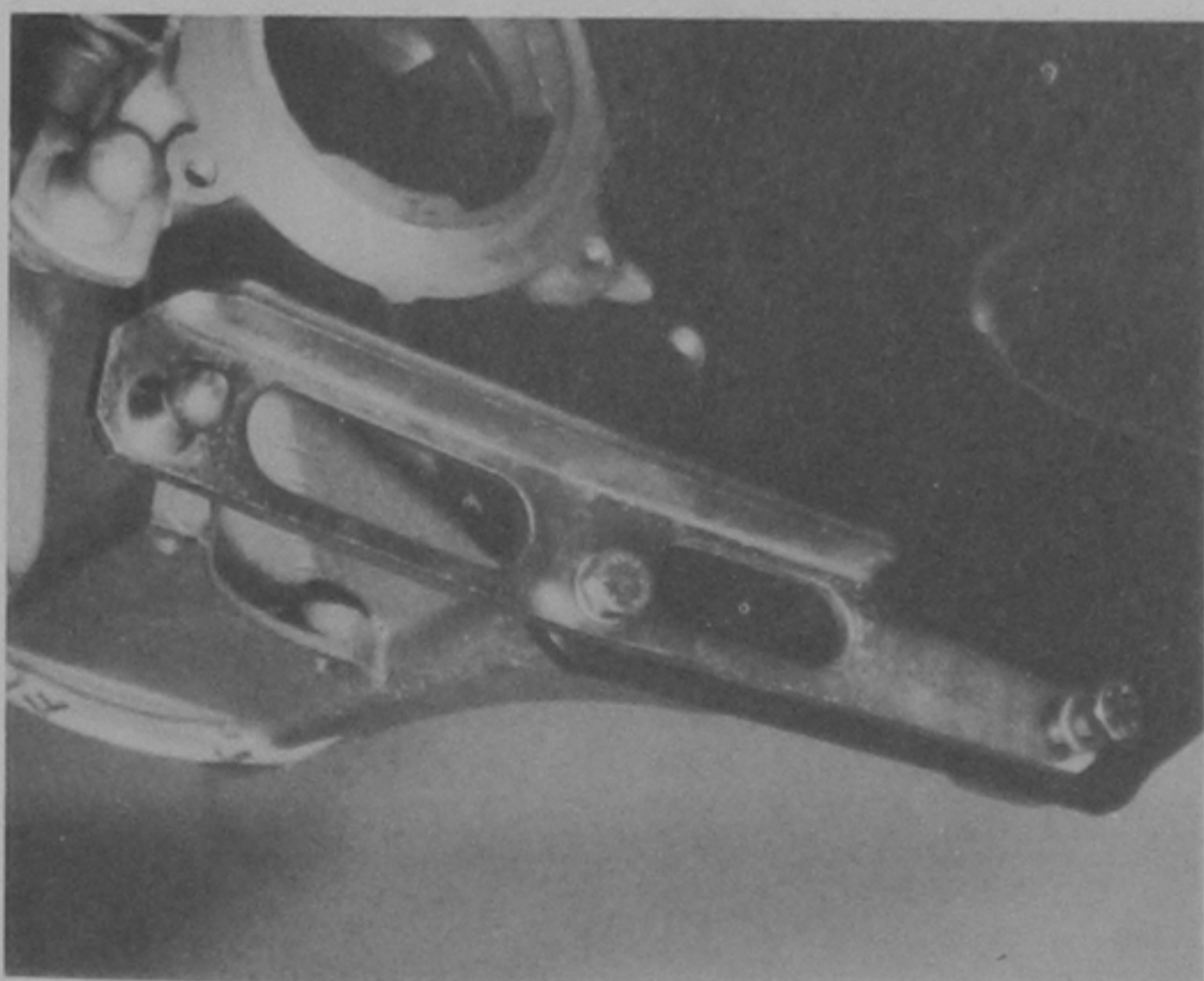


9 Working inside the car, check that the distance (X) from the gear lever knob to the padded tube of the front parcels shelf is between 170.0 and 200.0 mm (6.7 and 7.9 in).

10 On other models, the linkage is of single or double rod welded type without provision for adjustment (photos).



3.10A Welded type gearchange link rods



3.10B Gearchange rod ball stud support

#### 4 Transmission – removal and refitting

1 This Section describes removal of the transmission leaving the engine in the car. Removal together with the engine for later separation is described in Chapter 1.

2 Drain the transmission oil.

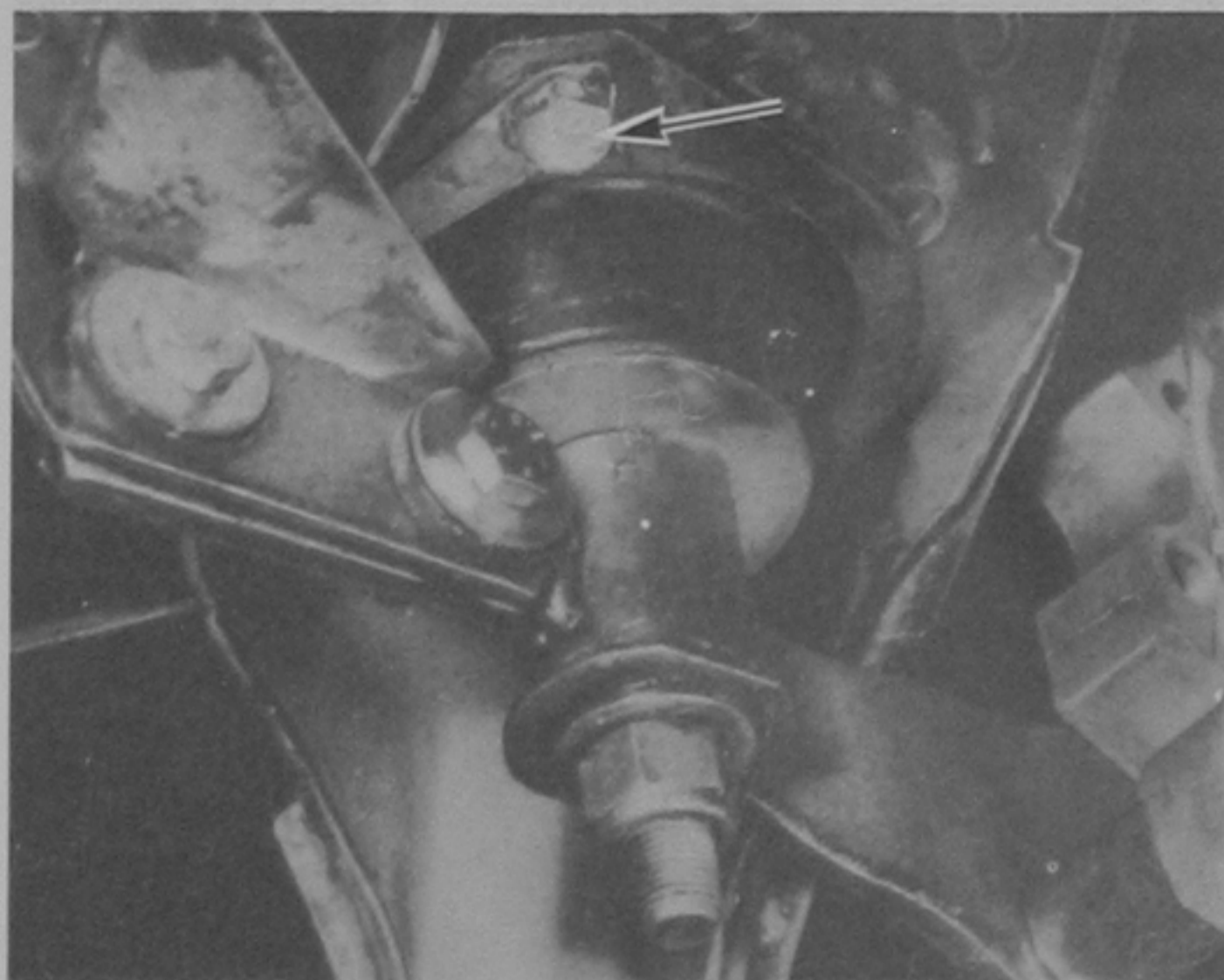
3 Open the bonnet. Remove the spare wheel.

4 Disconnect the speedometer drive and the leads from the reversing lamp switch on the transmission.

5 Disconnect the gearchange linkage. Do this by prising off the link rod ball ends and spring clip noting the fitted sequence of the bushes.

6 Still working under the car, unbolt the bottom mounting arm from the transmission and exhaust pipe. Bend back the lock tabs and unbolt the flexible mounting (photo).

7 Disconnect the exhaust downpipe from the manifold.



4.6 Transmission lower mounting arm. Bolt locktab arrowed

8 Disconnect the leads and unbolt and remove the starter motor.

9 Raise the front of the car, support securely and remove the front roadwheels.

10 Unbolt the brake calipers and tie them up out of the way.

11 Using a balljoint splitter tool, disconnect the tie-rod ends from the steering arms. Also disconnect the suspension lower track control arm balljoints from the hub carriers. Disconnect the radius rods from the control arms.

12 Unbolt and remove the cover plate from the base of the flywheel housing. One bolt is very high up by the driveshaft opening.

13 Disconnect the clutch operating cable from the release lever on the transmission.

14 Unscrew the bolts which hold the gaiter retainers to the transmission at the inboard ends of the driveshafts. Even though the transmission has been drained, be prepared for some loss of oil.

15 Disconnect the brake flexible hoses from their suspension strut retainers. Then pull the hub carriers outwards within the flexibility of the strut top mountings until the driveshafts drop out of the transmission. Have an assistant support the driveshafts from impact on the floor.

16 Be prepared for some loss of oil.

17 Support the weight of the engine on a jack or with a hoist.

18 Unscrew the flywheel housing to engine connecting bolts.

19 Place a trolley jack under the transmission and disconnect the transmission top mounting.

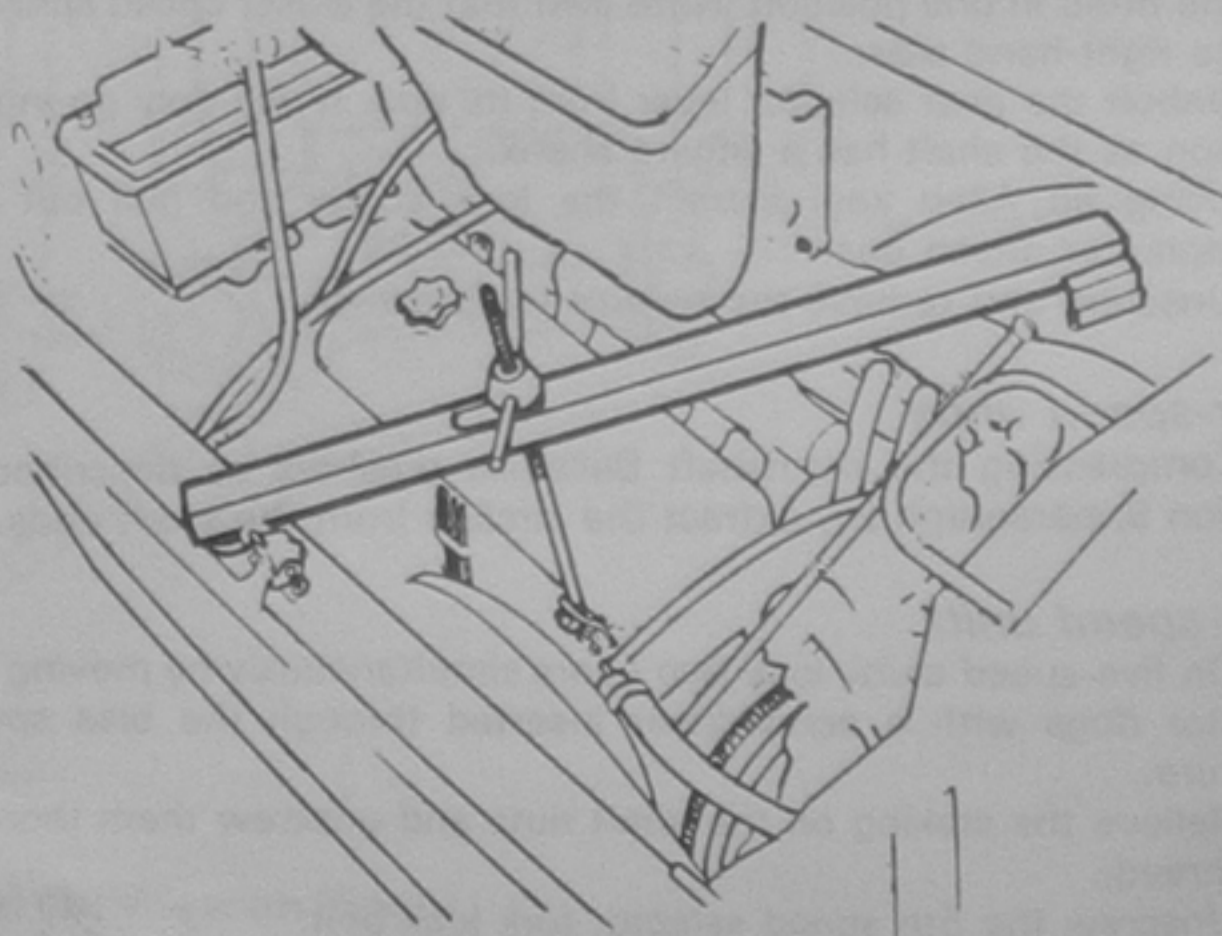


Fig. 6.3 Tool for supporting engine (Sec 4)

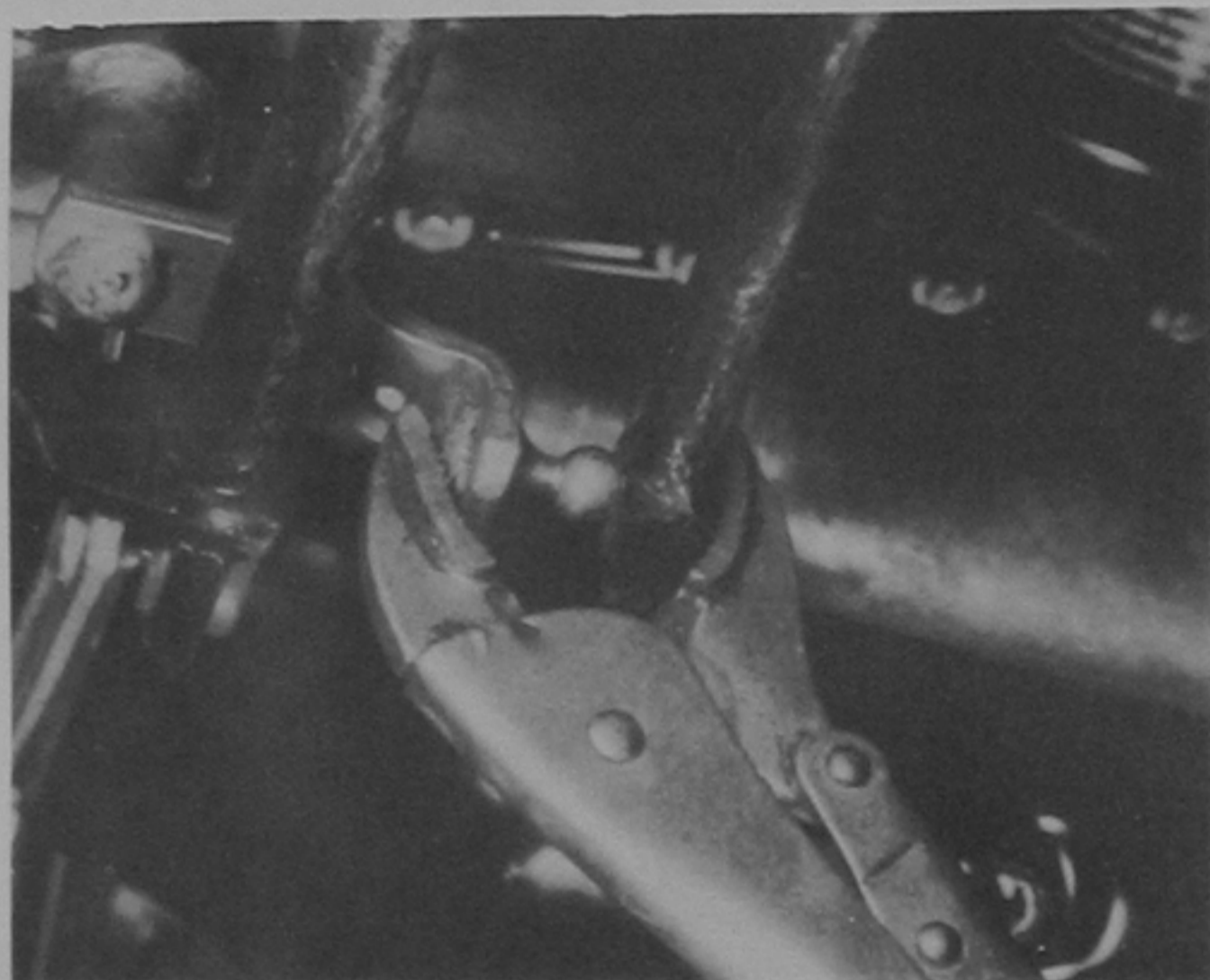
20 The transmission is now ready for removal, check that everything has been disconnected.

21 Working within the engine compartment and with an assistant gently lowering the transmission jack, pull the transmission from the engine and lower it to the floor.

22 Refitting is a reversal of removal, but if the clutch has been disturbed, make sure that it has been centralised as described in Chapter 5.

23 Check the clutch adjustment, refill the transmission with oil, apply the footbrake two or three times to bring the pads up against the discs.

24 Use self-locking grips to connect the gear link rod balls and sockets (photo).



4.24 Using grips to connect gearchange link rods

## 5 Transmission – removal of main assemblies

1 With the transmission removed, clean away external dirt and grease using paraffin and a stiff brush or a water-soluble solvent.

2 Remove the clutch release bearing from the bellhousing.

3 Disconnect the gearchange selector link rod.

4 Unscrew the bolts which connect the bellhousing and gearcase. Note that one bolt is inside the bellhousing.

5 Unbolt the detent spring plate and extract the springs and balls. The blue painted spring is at the reverse lamp switch end.

6 Stand the gearbox upright on the bellhousing flange.

7 Unbolt the rear cover to expose the 5th speed gears and synchromesh (five-speed) or shaft circlips (four-speed).

8 Unbolt the pressed steel cover to expose the gear bias springs.

9 Unscrew the nut and withdraw the gear engagement lever from the reverse spring cap. Note the master spline so that the lever can only be fitted in one position. Note also that the closer coiled spring is on the right-hand side.

10 Unbolt the gear selector lever from its dog. It will only go in one position as the shaft has a square shank.

11 Using an Allen key, extract the lock screw and pull out the speedometer driven gear.

12 Unscrew and remove the reverse lamp switch.

### Four-speed units

13 Compressing the mainshaft Belleville washers as described in Section 9, paragraph 27, extract the circlips from the shaft ends.

### Five-speed units

14 On five-speed units, lock two gears simultaneously by moving the selector dogs with a screwdriver inserted through the bias spring aperture.

15 Relieve the staking on the shaft nuts and unscrew them (normal RH thread).

16 Unscrew the 5th speed selector fork lock bolt.

17 From the mainshaft pull off 5th speed gear, the synchromesh unit selector fork and gear bush.

18 Pull 5th speed gear from the secondary shaft, then unbolt and remove the intermediate cover and its gasket.

### All units

19 Pull the gearcase upwards and at the same time have an assistant tap the ends of the shafts downwards with a plastic or copper-faced hammer which will release the bearings and allow the casing to be removed.

20 Unbolt the reverse idler lockplate and draw out the reverse idler gear and shaft, reverse selector shaft and fork or 5th/reverse selector shaft as applicable.

21 Unscrew the selector fork lock bolts and withdraw 1st/2nd and 3rd/4th selector shafts. Remove the selector forks.

22 Note that the 1st/2nd selector fork is closest to the bellhousing. Note also that the three adjacent shaft notches are furthest from the bellhousing (photo).

23 Retrieve the large interlock plungers from the casing passages and the smaller one from its hole in the 3rd/4th selector shaft.

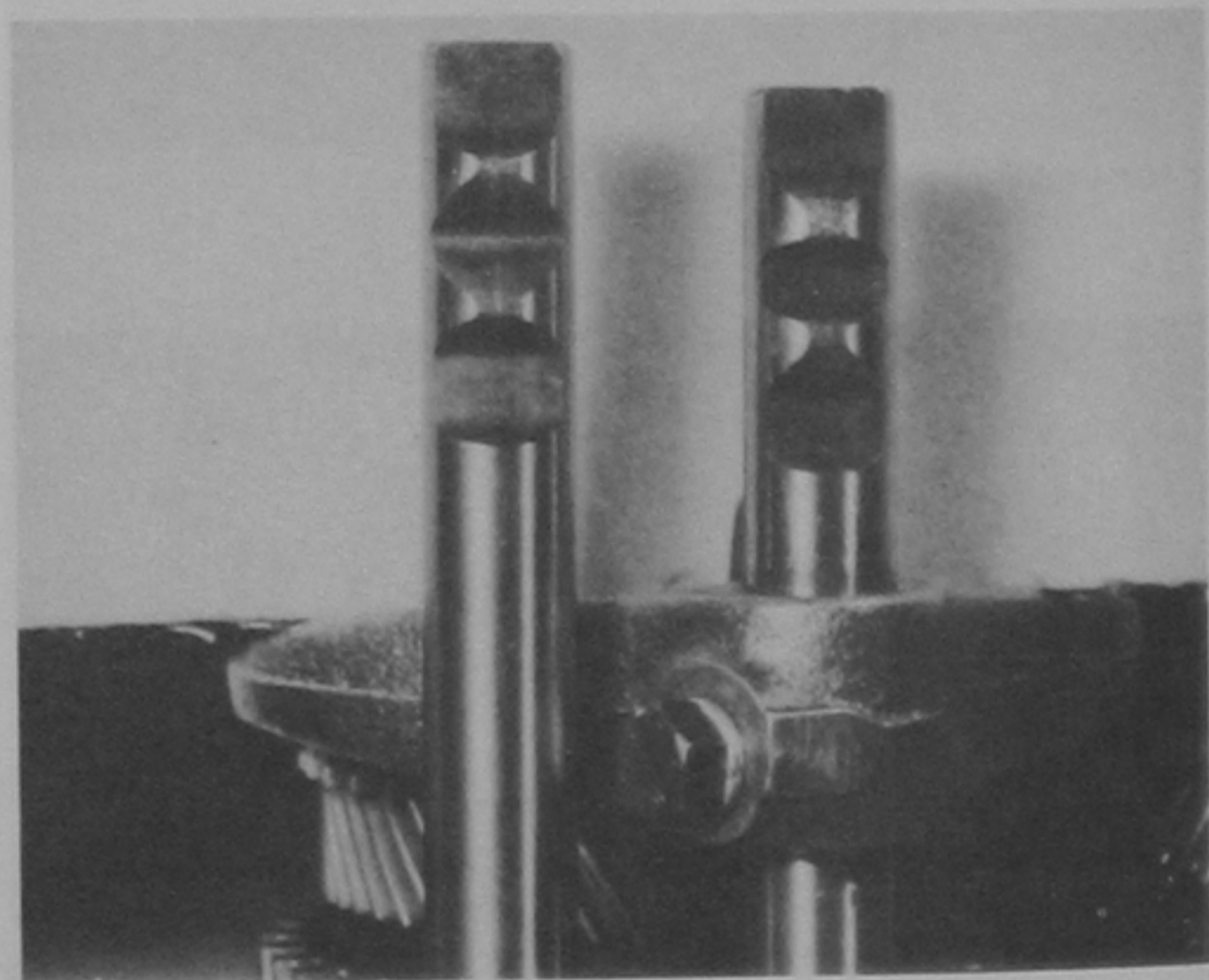
24 Withdraw both shaft/geartrains simultaneously, meshed together.

25 Lift out the final drive/differential.

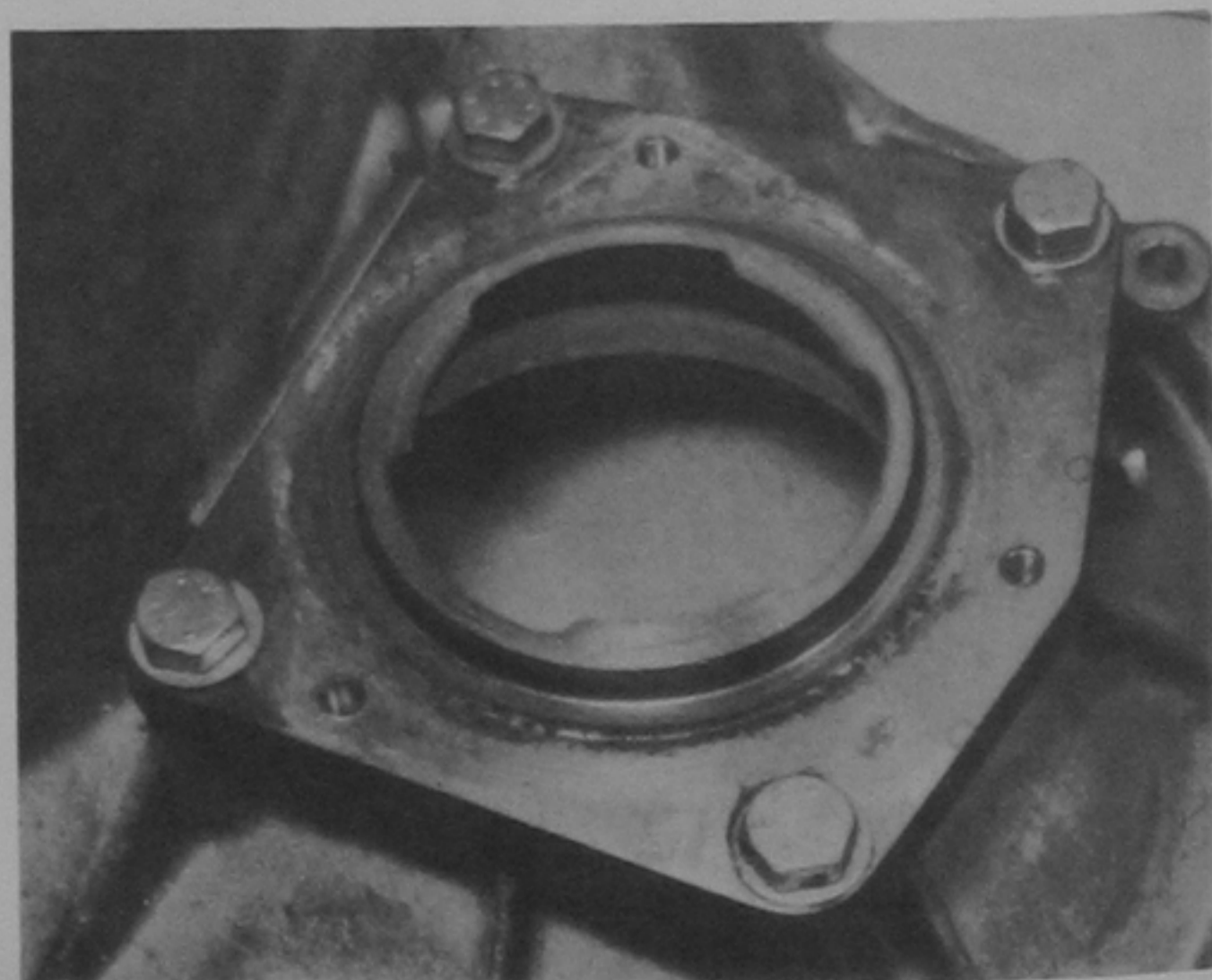
26 Remove the small magnet from the casing.

27 If necessary, remove the bearings from the casing, using a puller or tubular drift.

28 If necessary, the differential flanges can be unbolted (photo).



5.22 Selector shaft notches and 3rd/4th selector fork



5.28 Differential flange

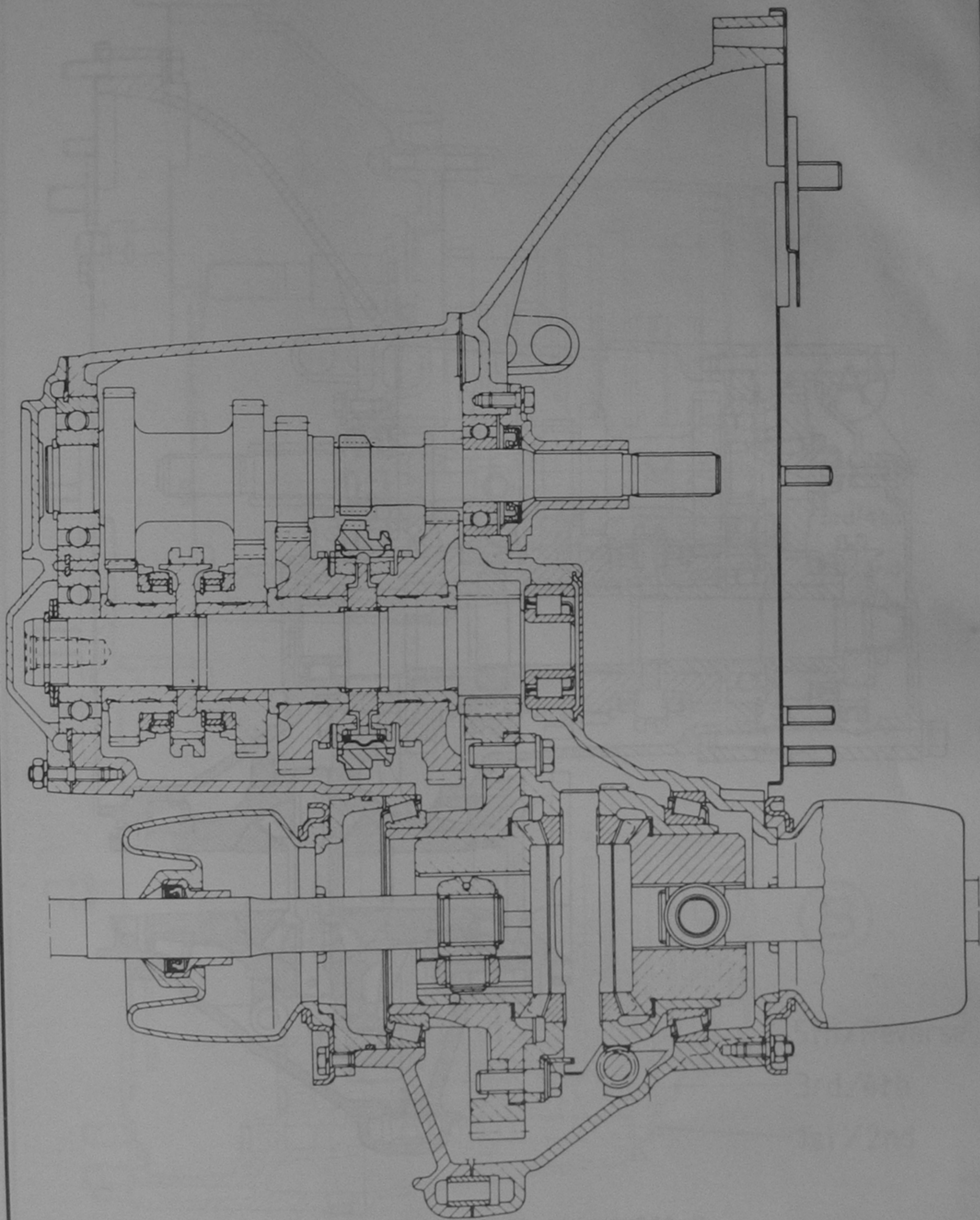


Fig. 6.4 Sectional view of four-speed transmission (Sec 5)

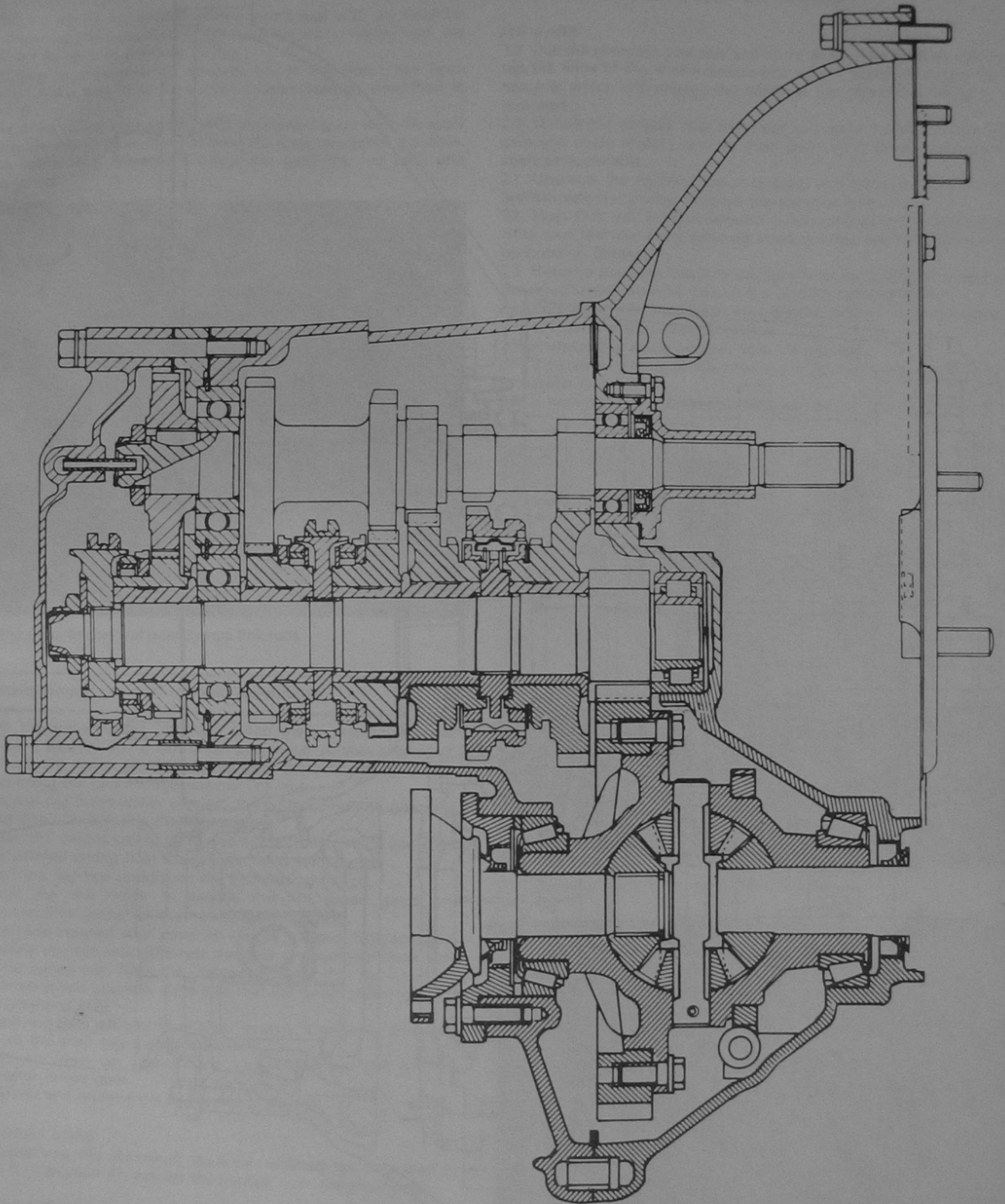


Fig. 6.5 Sectional view of five-speed transmission (Sec 5)

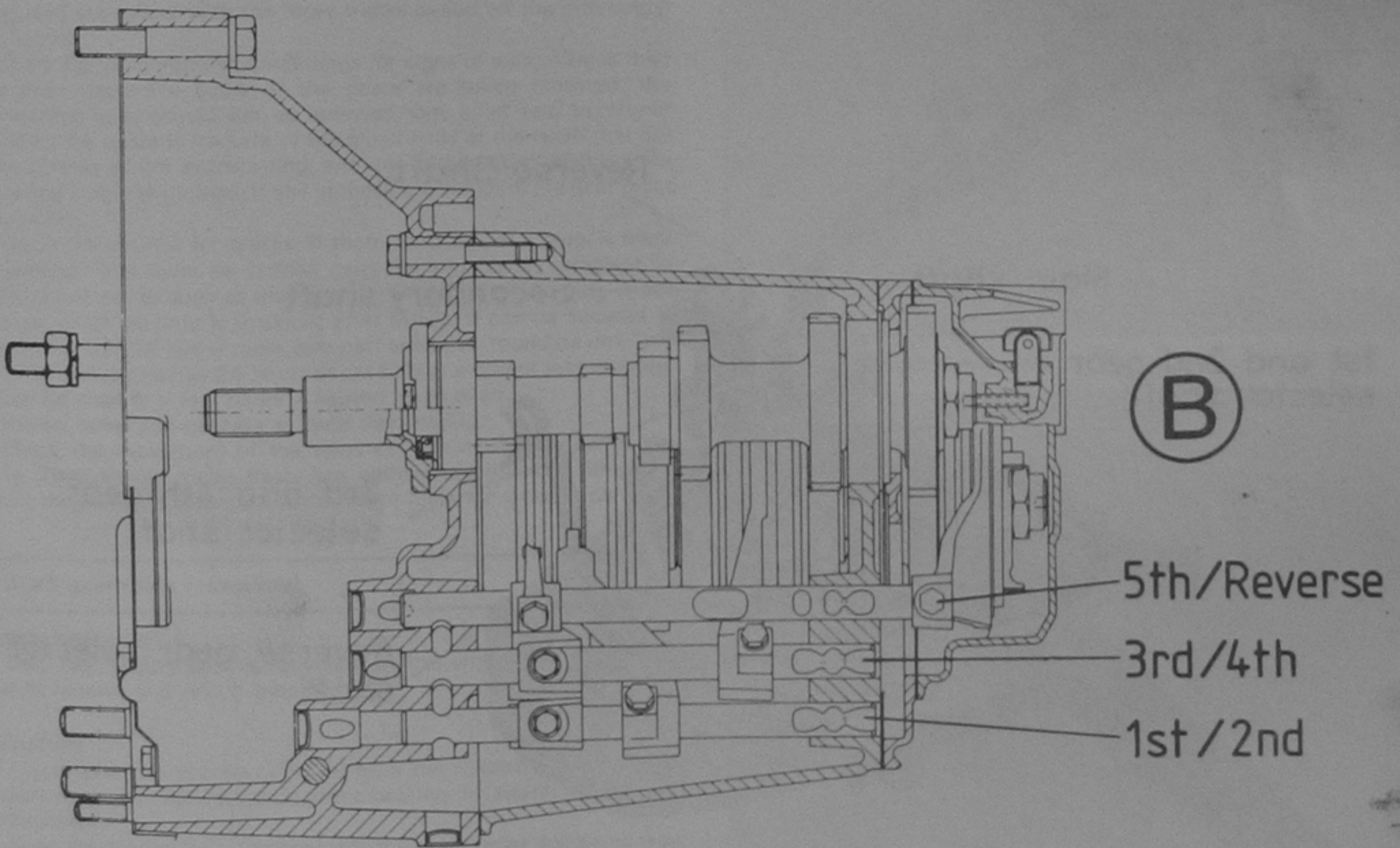
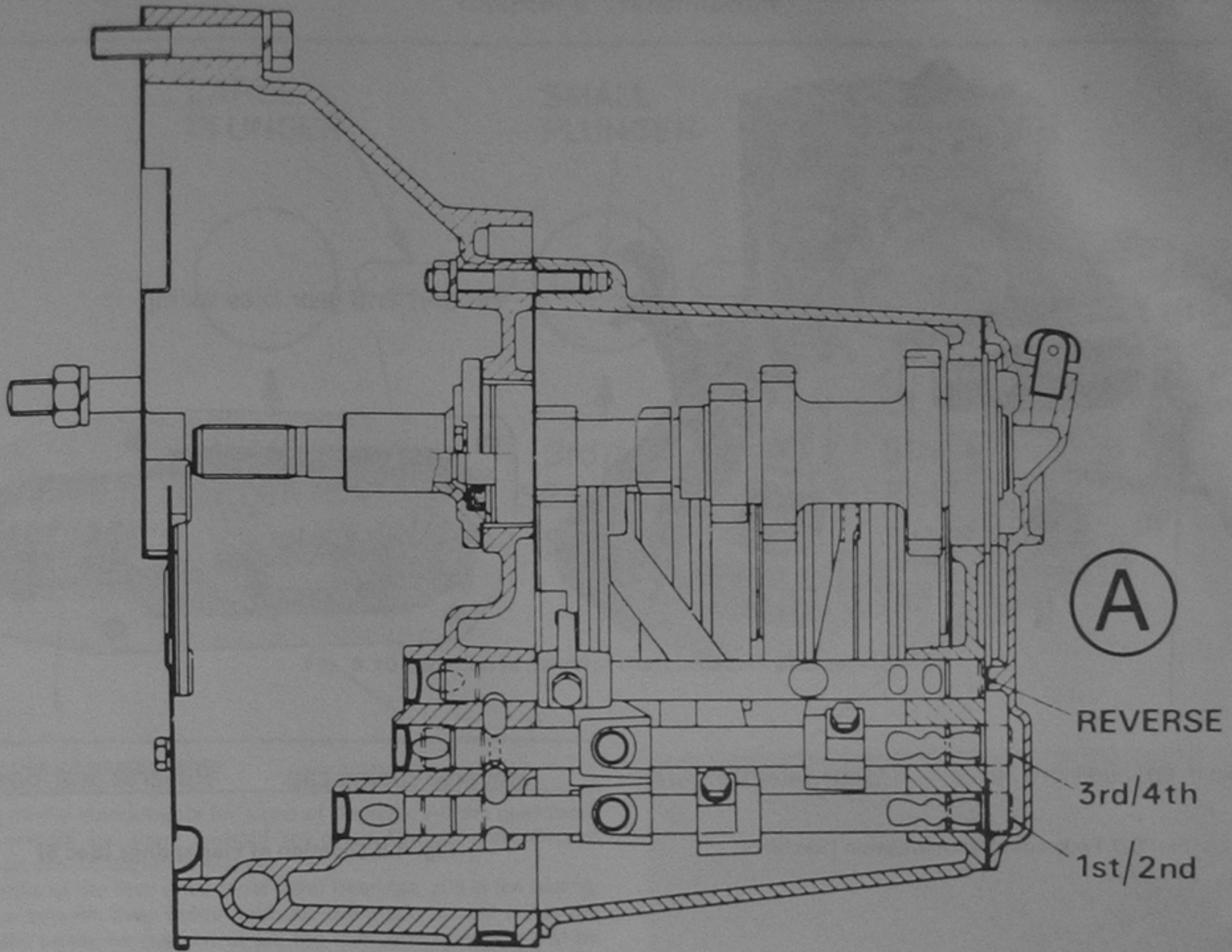
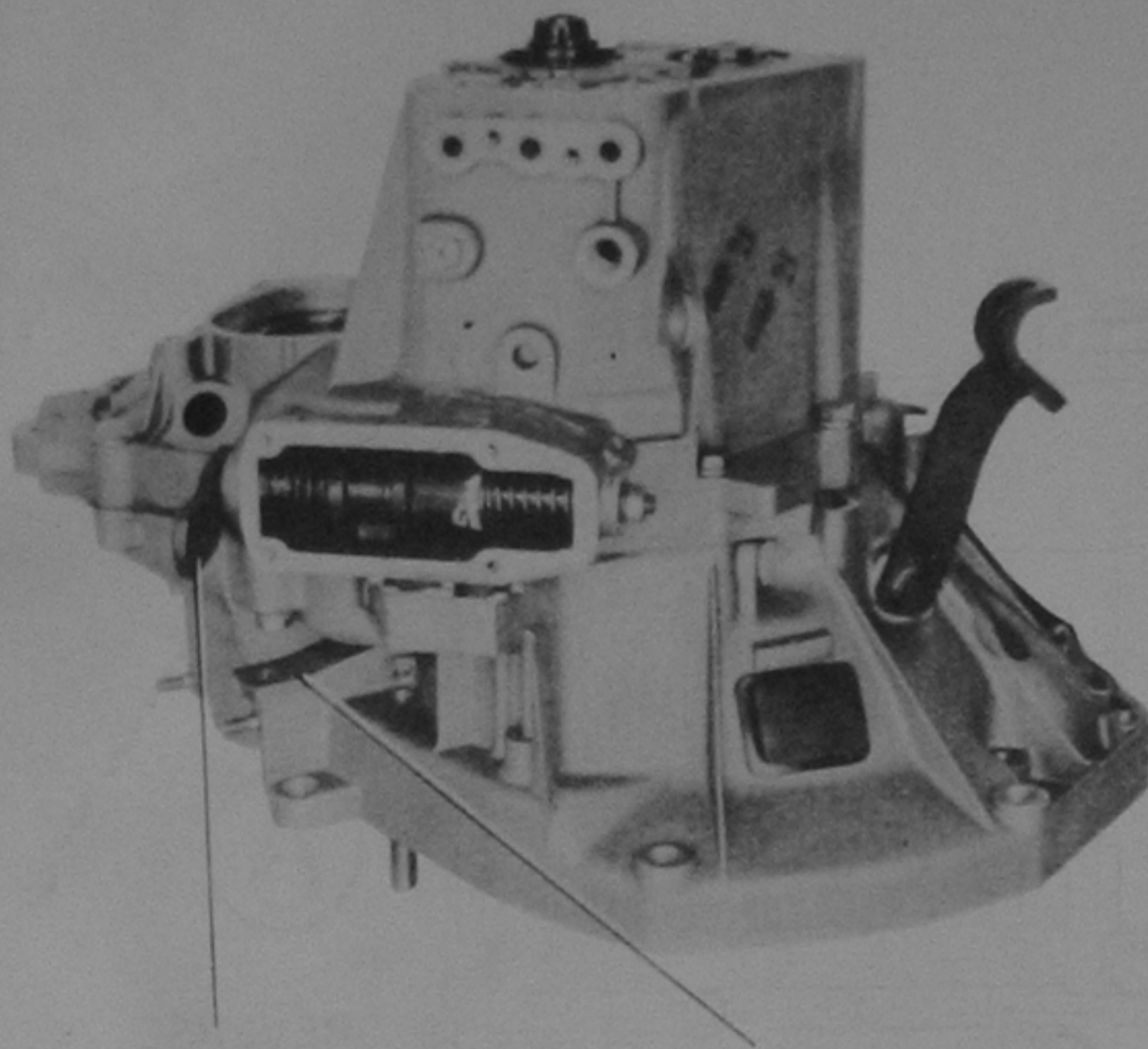


Fig. 6.6 Location of selector shafts (Sec 5)

1 Four-speed

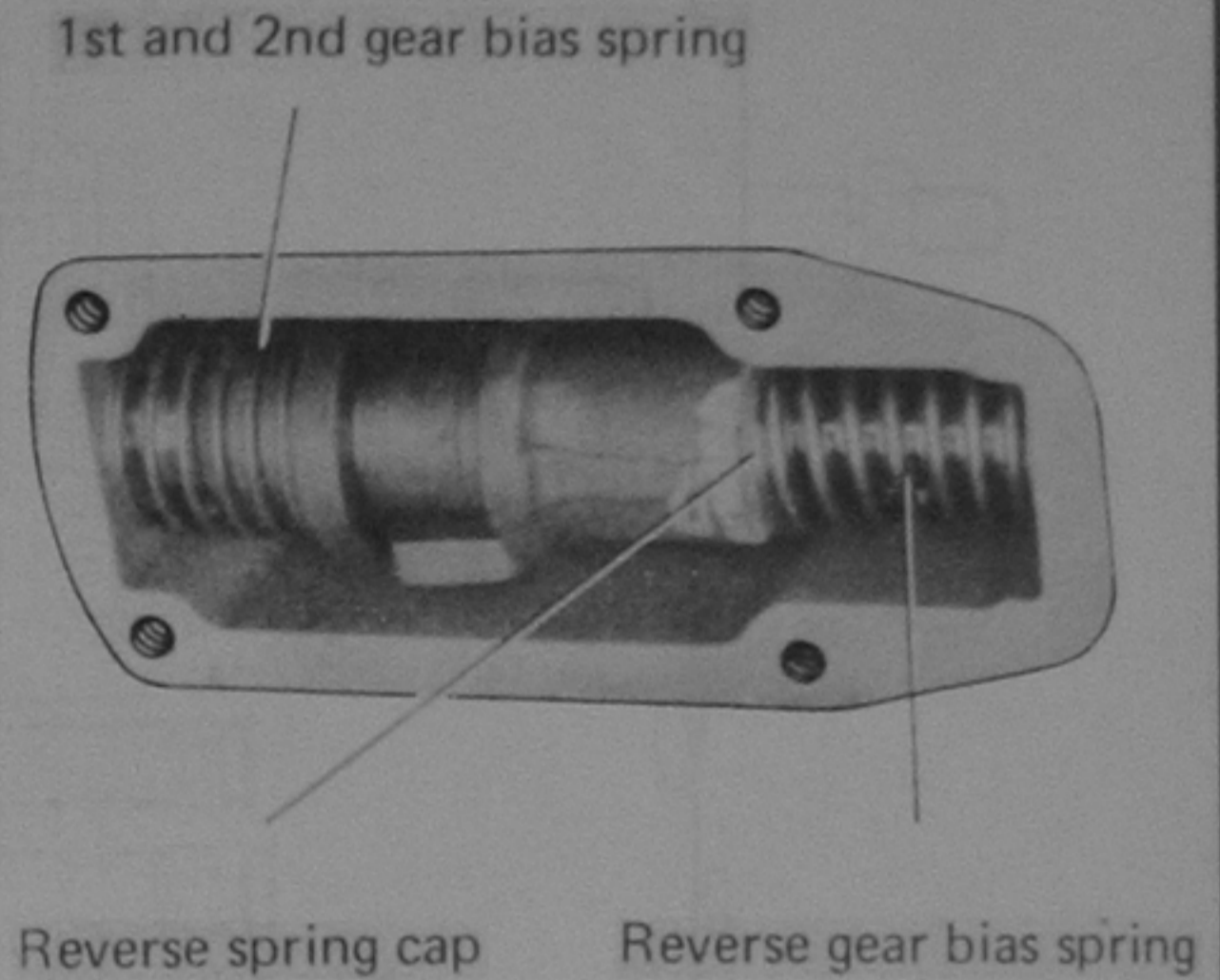
b Five-speed





Gear engagement lever      Gear selector lever

Fig. 6.7 Four-speed transmission (Sec 5)



1st and 2nd gear bias spring      Reverse spring cap      Reverse gear bias spring

Fig. 6.8 Location of bias springs (Sec 5)

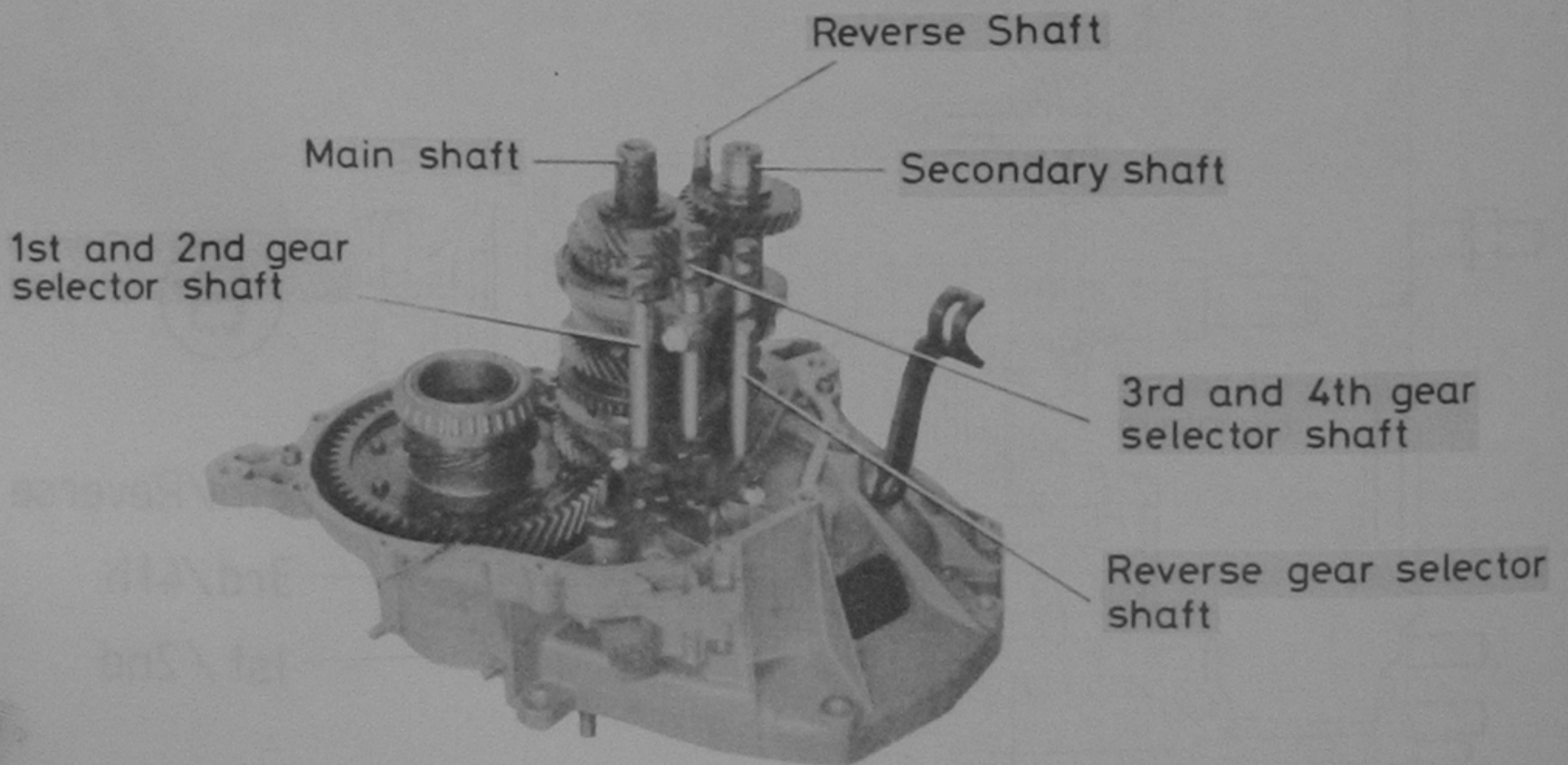
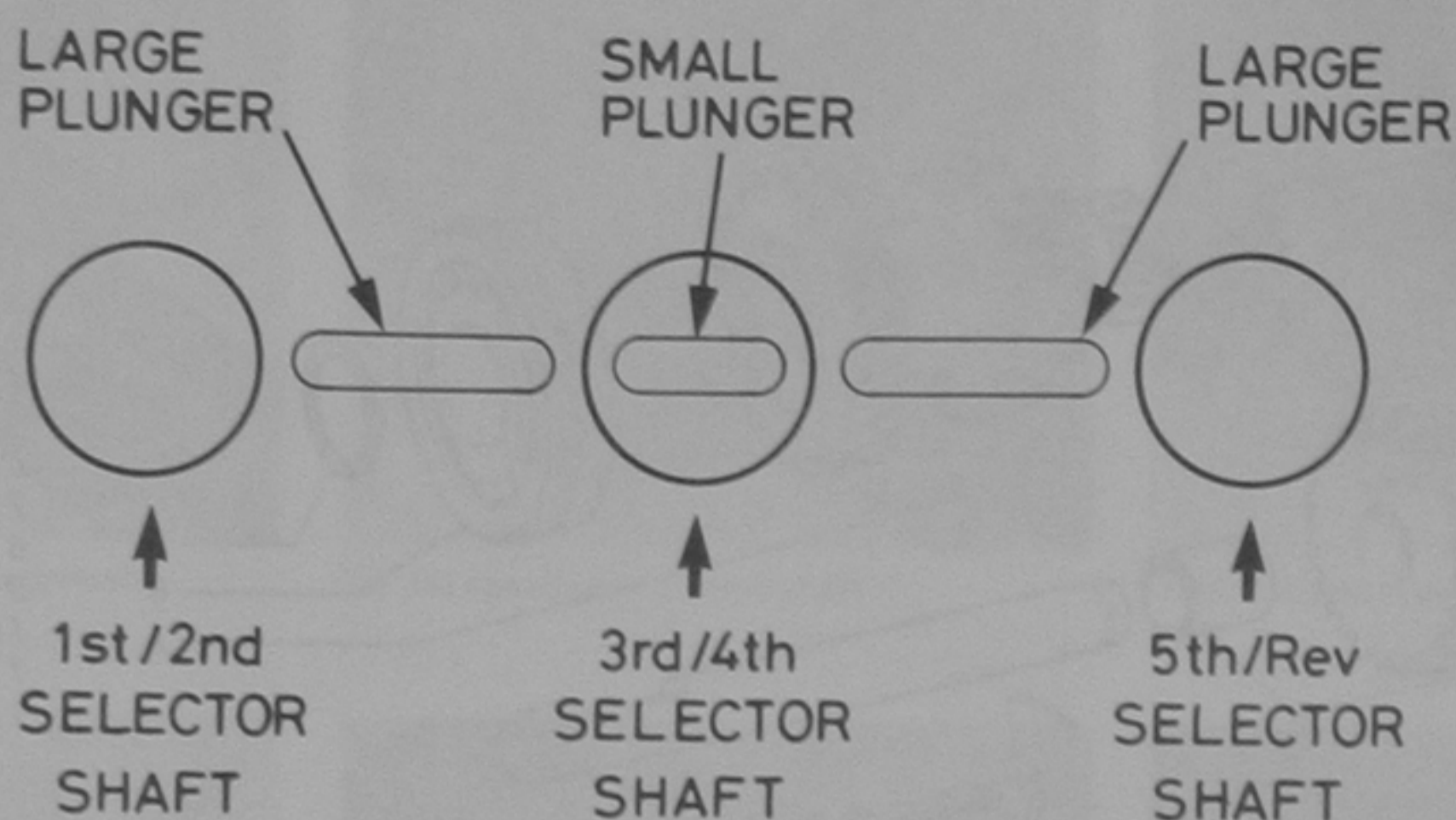


Fig. 6.9 Gearcase removed from four-speed transmission (Sec 5)



H.1577B

Fig. 6.10 Location of selector shaft interlock plungers (Sec 5)

## 6 Inspection of components

- 1 Check all the components for signs of damage. All the gear teeth should be smooth and shiny, without any chips. The ball and rollers of the bearings should be unblemished.
- 2 The tracks of the final drive taper roller bearings, still in the casing, should be a smooth, even colour without any mark. Should either the rollers or the tracks be marked at all, the complete bearing must be renewed. In this case, the outer tracks must be extracted from the casing, and the rollers with the inner tracks pulled off the differential cage halves.
- 3 Check the synchromesh baulk rings for signs of wear. Check their fit in their respective gears. If the gears are being renewed, the synchromesh units should also be renewed. One point easy to miss in examining the gears is fracture of the small ends of the teeth that are on the outside of the synchro-ring, and are an extension of the teeth for the dog clutch to engage. If any of these are chipped, the gear must be renewed.
- 4 Check the casings for cracks. If there are leaks at a plug, it must be renewed. This must be tapped carefully into place, sufficient to expand it but not enough to distort it too much. If a new plug is not available, or its security is in doubt after fitting, it can be secured in place with a layer of epoxy resin, two part adhesive, round its rim. This type of adhesive requires 24 hours to set fully at ambient temperature, but can be used in a few hours if heated in an oven.
- 5 Renew seals and gaskets at each dismantling.
- 6 Check the movement of the selector rods in their bores in the casing. They should move freely but without appreciable sideplay. Inspect the sliding surfaces of the selector forks for wear or damage.

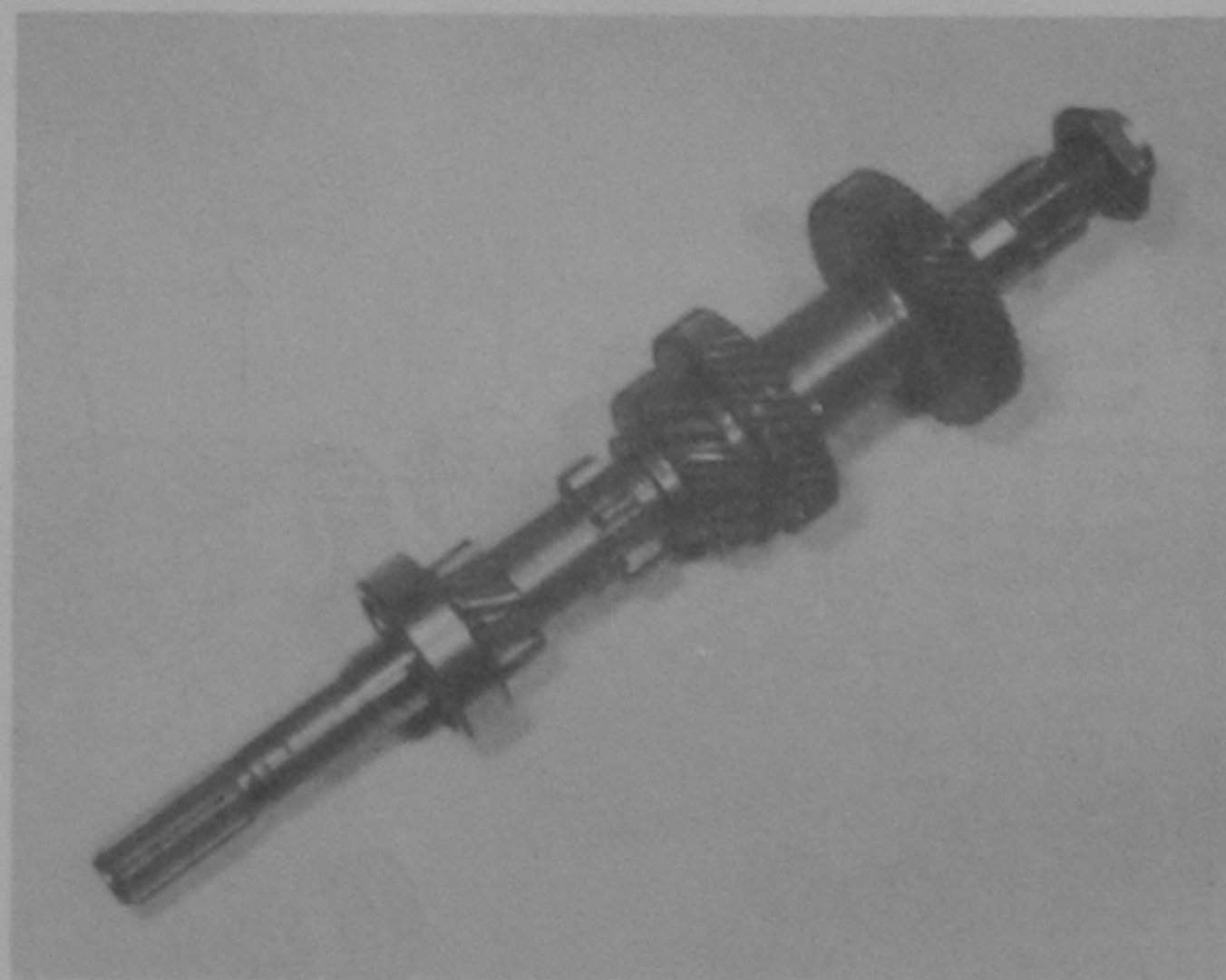
## 7 Shaft geartrains – overhaul

### Secondary shaft

- 1 Only the bearing can be renewed on this shaft. Use a puller or press to remove and refit it (photo).

### Mainshaft

- 2 All components can be removed from the mainshaft using hand pressure only, with the exception of the bearing, for which a puller will be required.
- 3 Keep the dismantled components in the exact order and same way round as they were originally fitted.
- 4 A worn synchromesh unit is best renewed complete – especially if there has been a history of noisy gearchanging – or if the synchromesh could be easily 'beaten'.
- 5 With all parts clean, renewed (where necessary) and lightly lubricated, assemble the mainshaft in the following sequence (photo).



7.1 Secondary shaft (five-speed)



7.5 Mainshaft (five-speed)

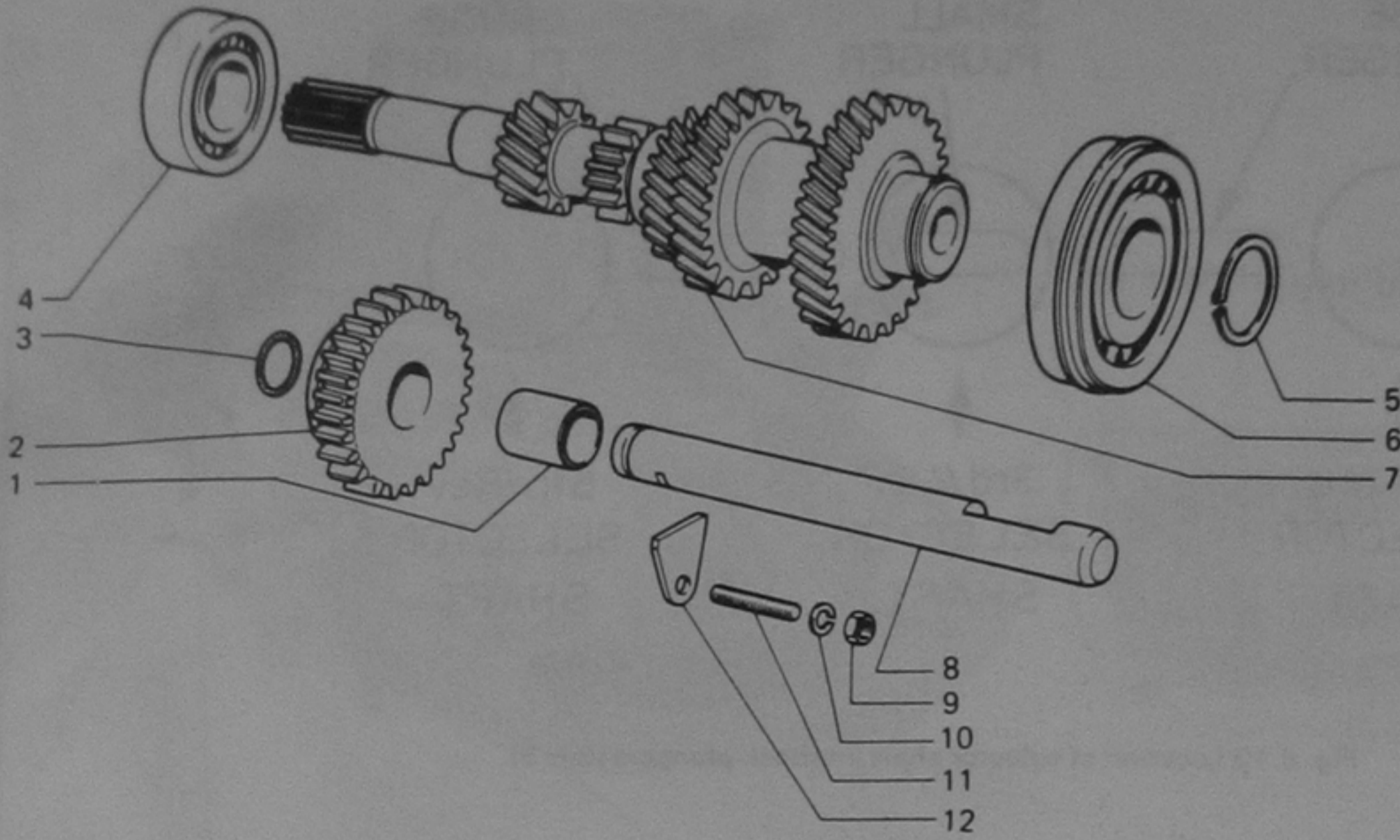
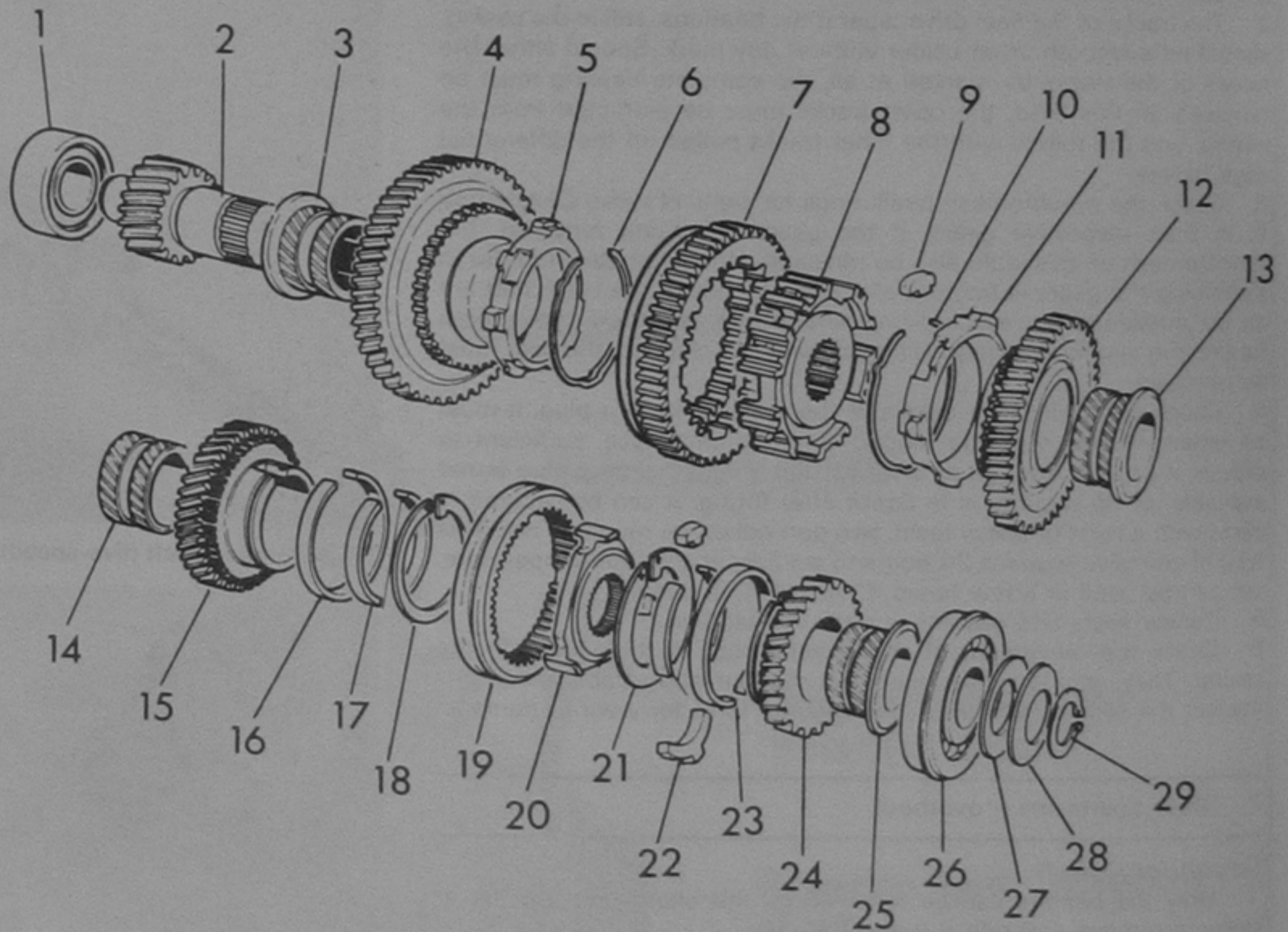


Fig. 6.11 Secondary and reverse shafts (Sec 7)

- 1 Bush
- 2 Reverse idler gear
- 3 Oil seal
- 4 Bearing
- 5 Circlip
- 6 Bearing
- 7 Input shaft/gear assembly
- 8 Idler shaft
- 9 Nut
- 10 Lockwasher
- 11 Stud
- 12 Lockplate

Fig. 6.12 Mainshaft components (four-speed) (Sec 7)

- 1 Bearing
- 2 Pinion gear to final drive (crownwheel)
- 3 Bush
- 4 1st speed gear
- 5 Synchroniser (balk ring)
- 6 Spring ring
- 7 1st/2nd synchro sleeve with reverse gear
- 8 1st/2nd synchro hub
- 9 Sliding key
- 10 Spring ring
- 11 Synchroniser (balk ring)
- 12 2nd speed gear
- 13 Bush
- 14 Bush
- 15 3rd speed gear
- 16 Synchroniser ring
- 17 Drive spring
- 18 Snap ring
- 19 3rd/4th synchro sleeve
- 20 3rd/4th synchro hub
- 21 Snap ring
- 22 Sliding key
- 23 Synchroniser ring
- 24 4th speed gear
- 25 Bush
- 26 Bearing
- 27 Belleville washer
- 28 Belleville washer
- 29 Circlip



6 Slide on the 1st speed gear bush (photo).  
 7 Fit the 1st speed gear (photo).  
 8 Fit the 1st/2nd synchro sleeve/reverse gear with baulk rings. The sleeve groove must be towards the shaft pinion gear (photos).  
 9 Fit 2nd speed gear (photo).  
 10 Warm and fit 2nd and 3rd gear bushes followed by 3rd speed gear (photos).  
 11 Fit 3rd/4th synchro hub so that the completely circular oil groove is towards 3rd speed gear. Fit 3rd/4th synchro sleeve (photos).

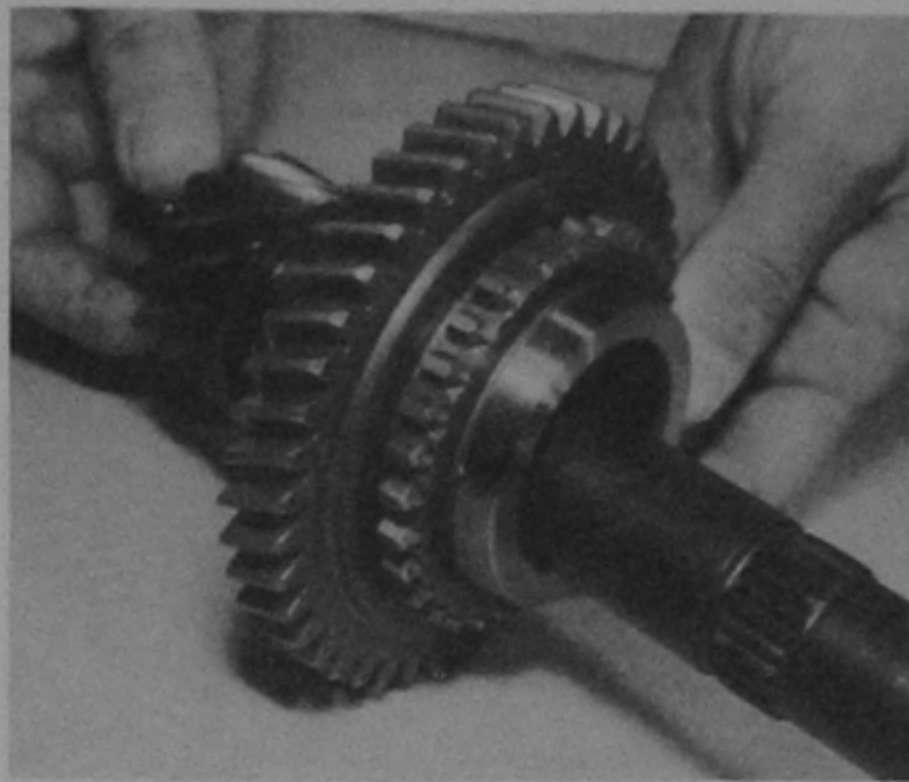
12 Warm and fit the bush together with 4th speed gear (photo).  
 13 The shafts are now ready for assembling into the casing as described in Section 9.

**8 Differential – overhaul**

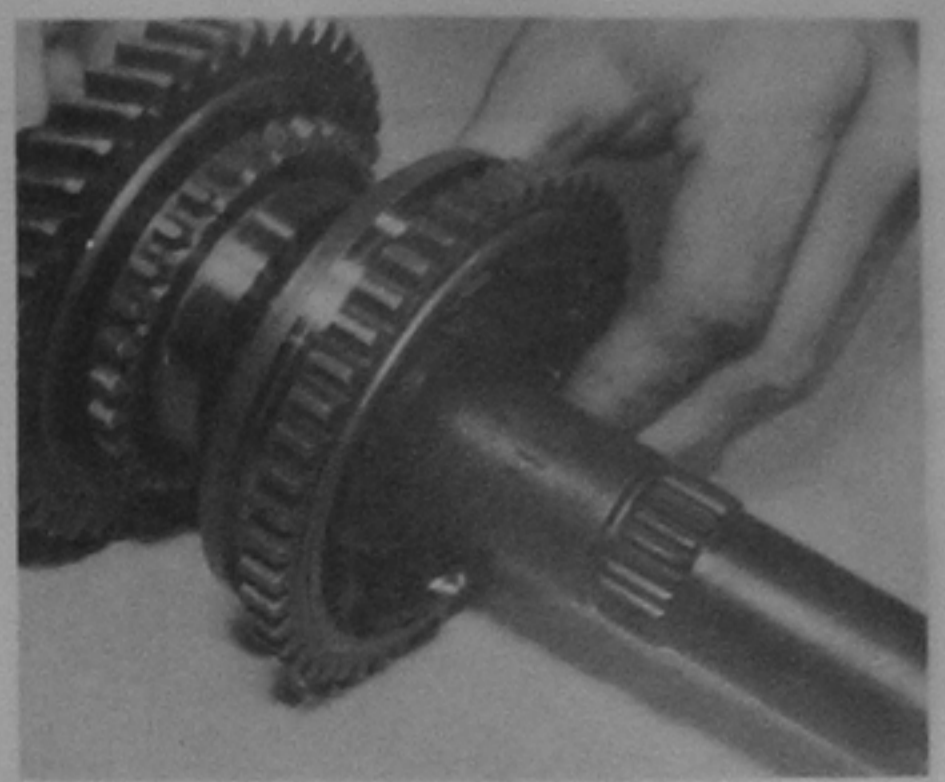
1 The speedometer drivegear can be removed from the differential case using a drift (photo).



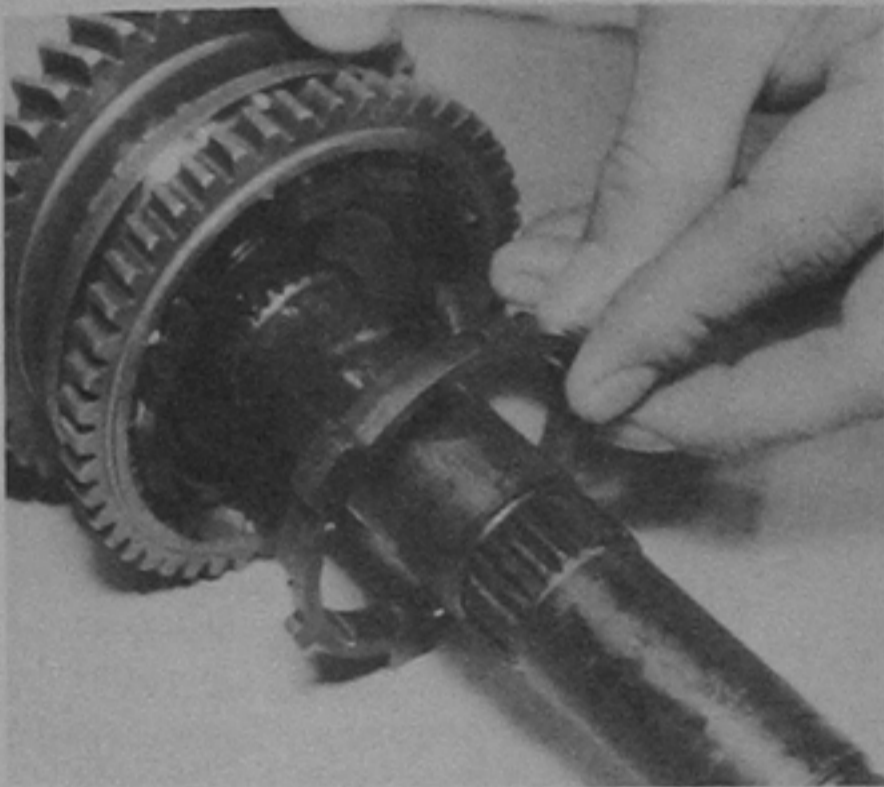
7.6 1st speed gear bush on mainshaft



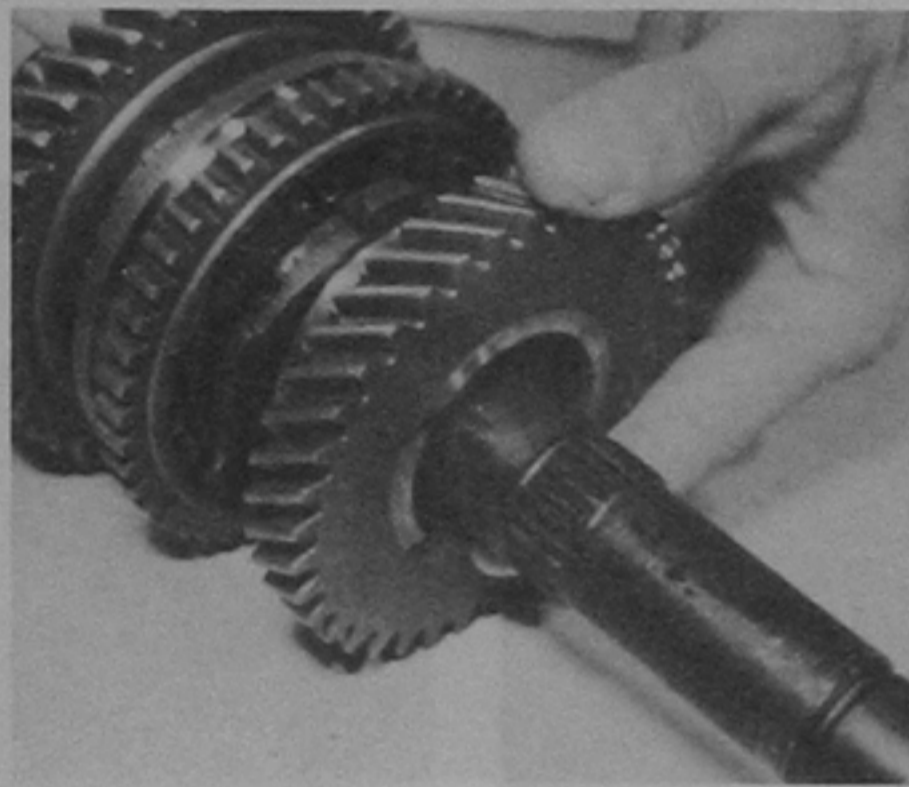
7.7 1st speed gear on mainshaft



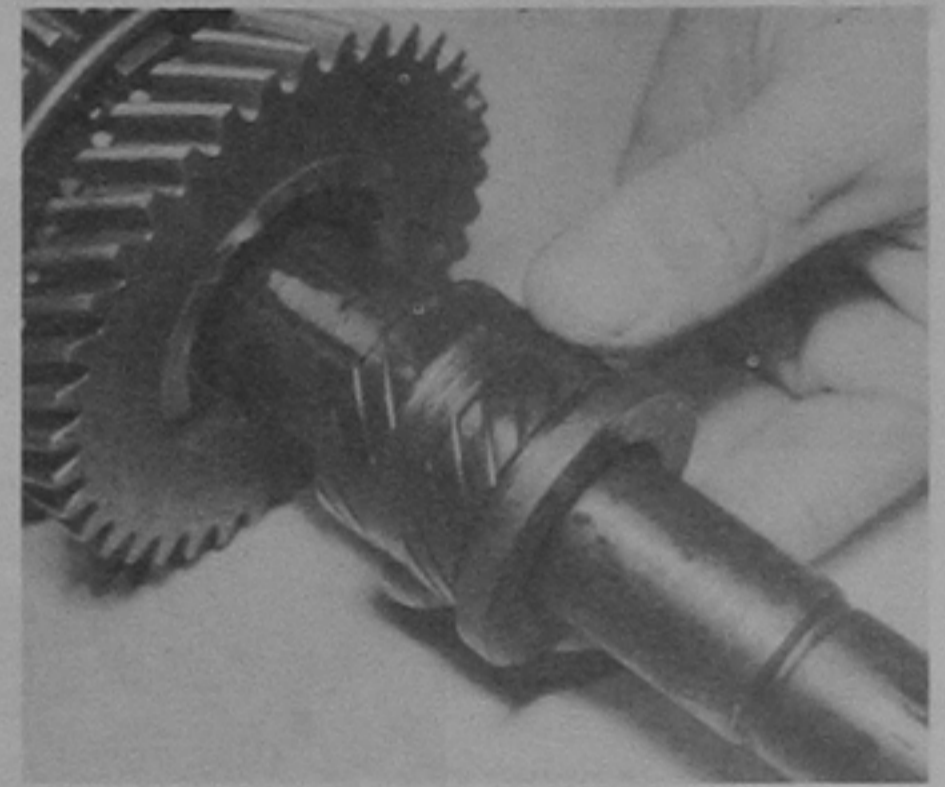
7.8A 1st/2nd synchro sleeve with reverse gear



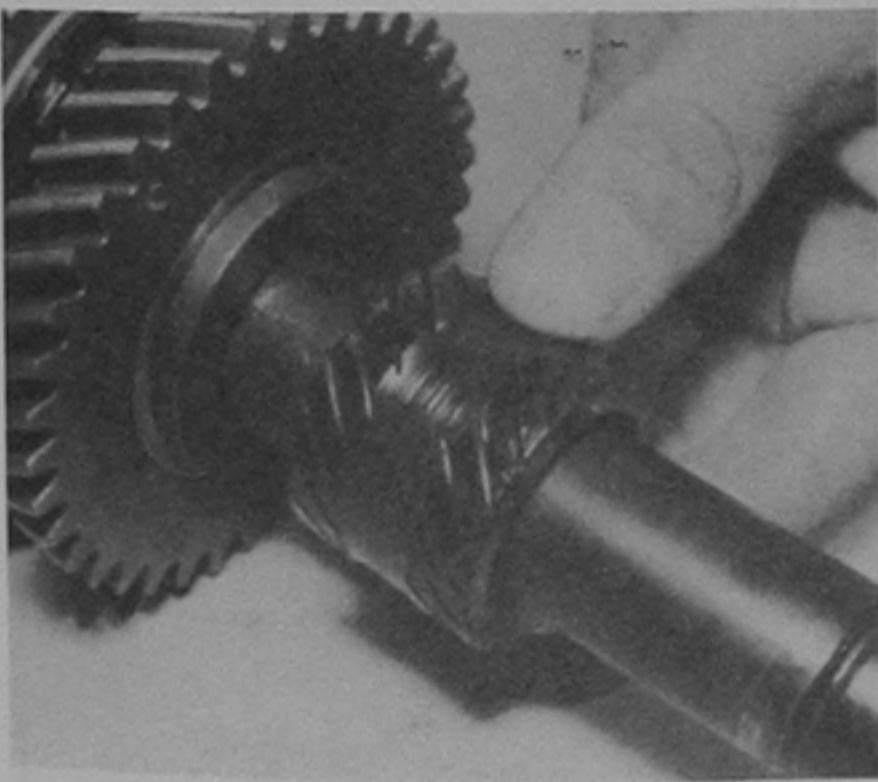
7.8B Fitting baulk ring to mainshaft



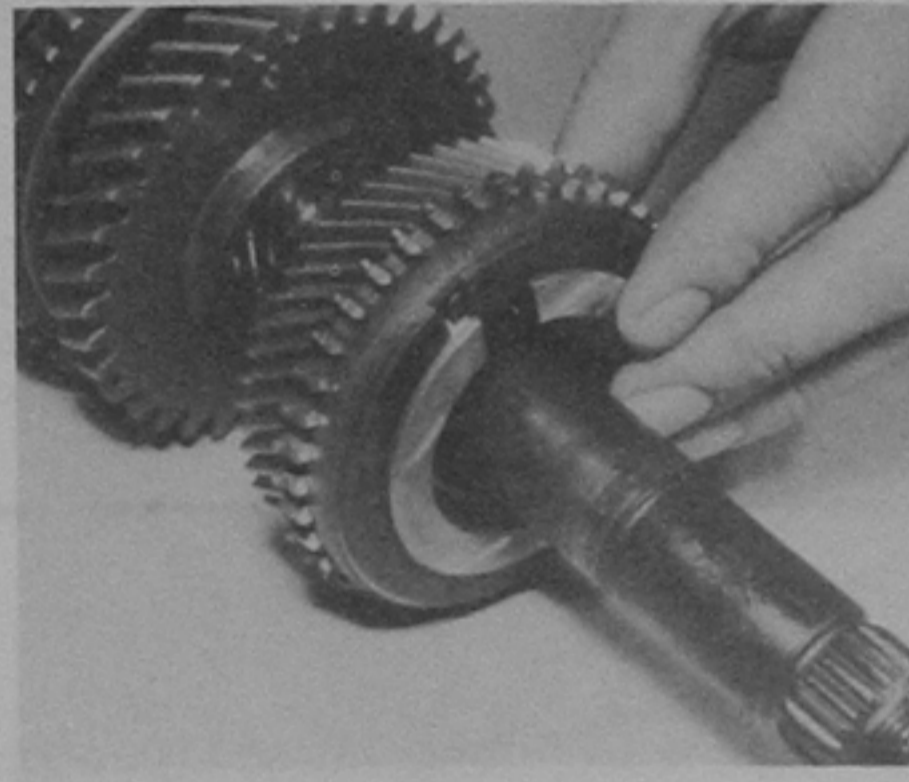
7.9 Fitting 2nd speed gear to mainshaft



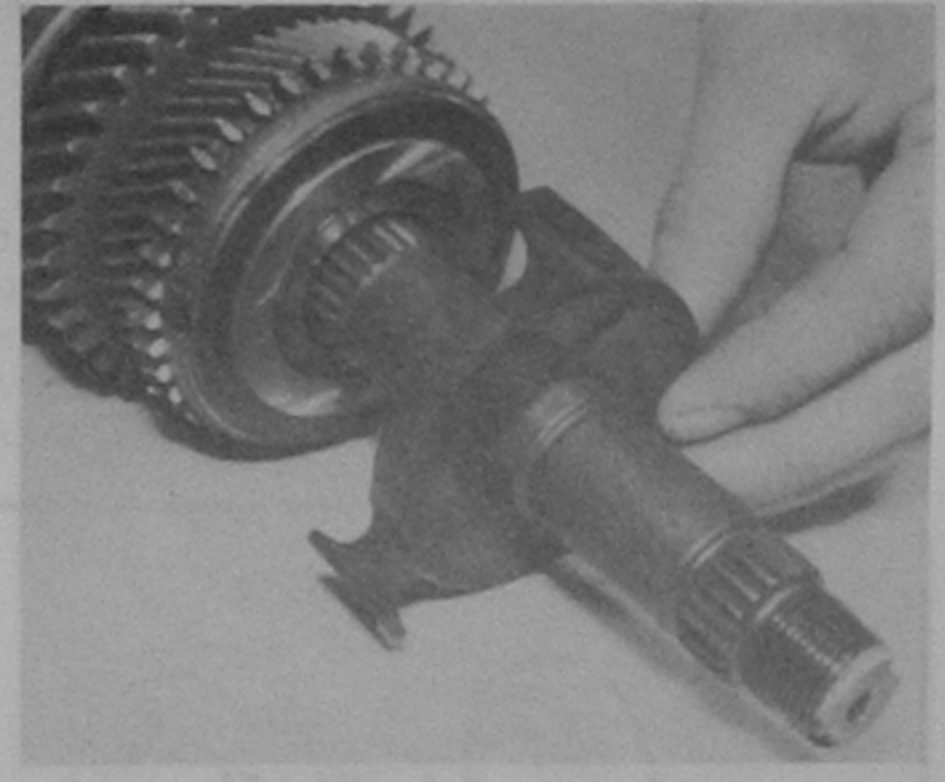
7.10A 2nd speed gear bush



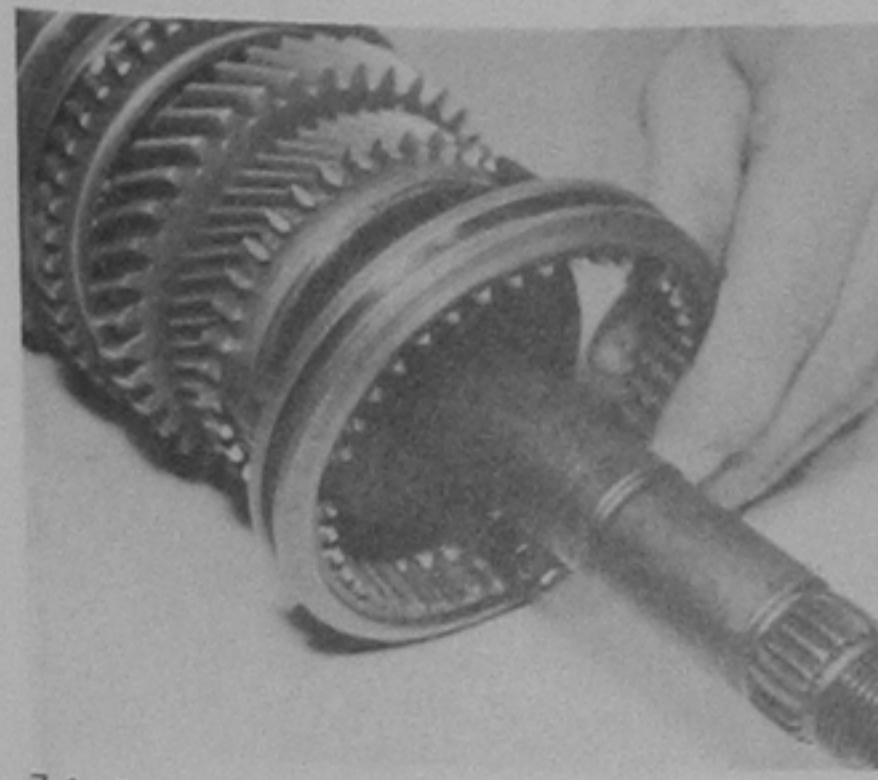
7.10B 3rd speed gear bush



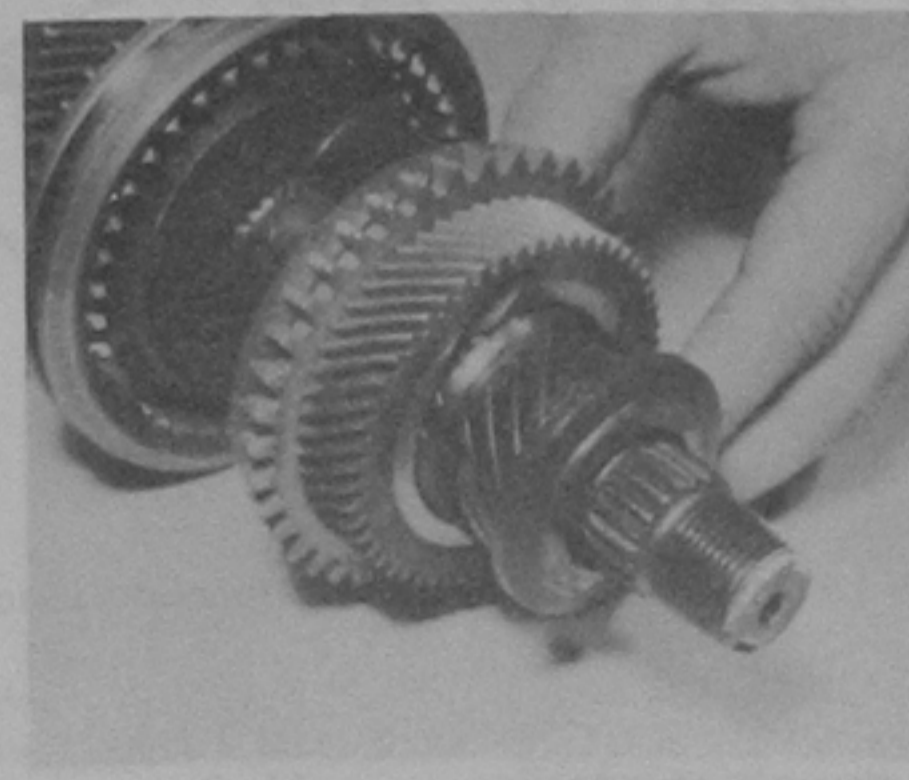
7.10C 3rd speed gear



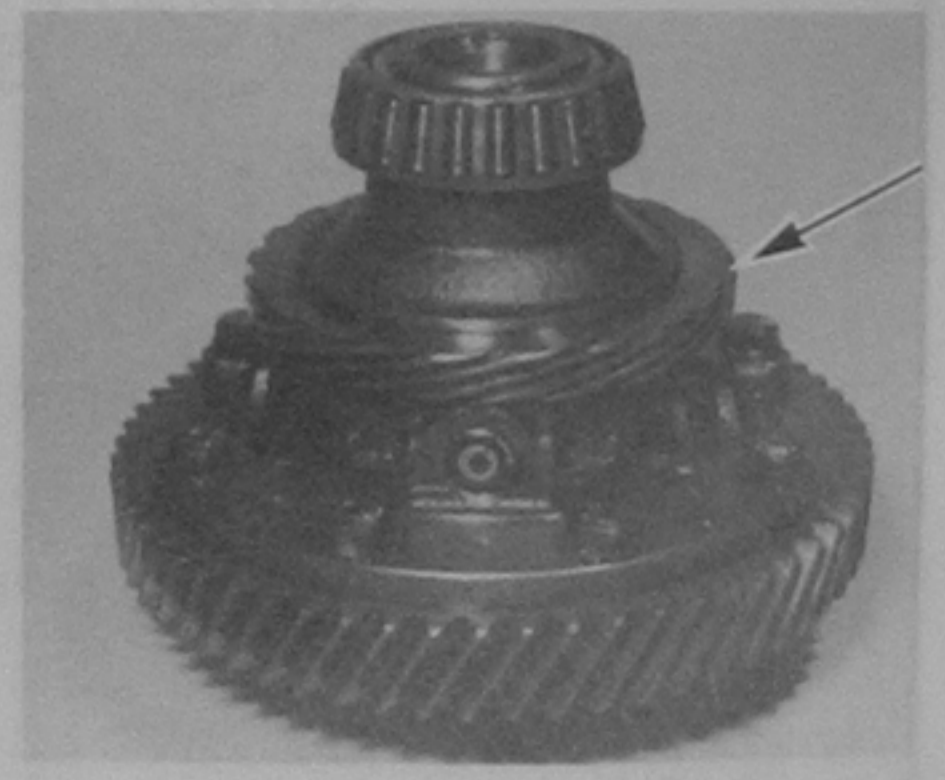
7.11A 3rd/4th synchro hub



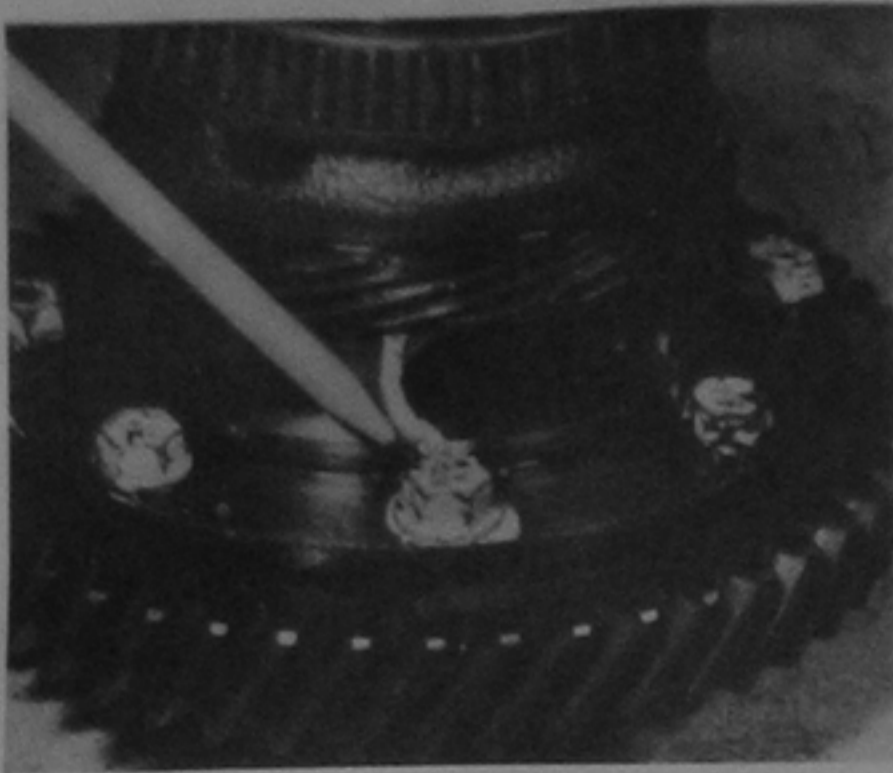
7.11B 3rd/4th synchro sleeve



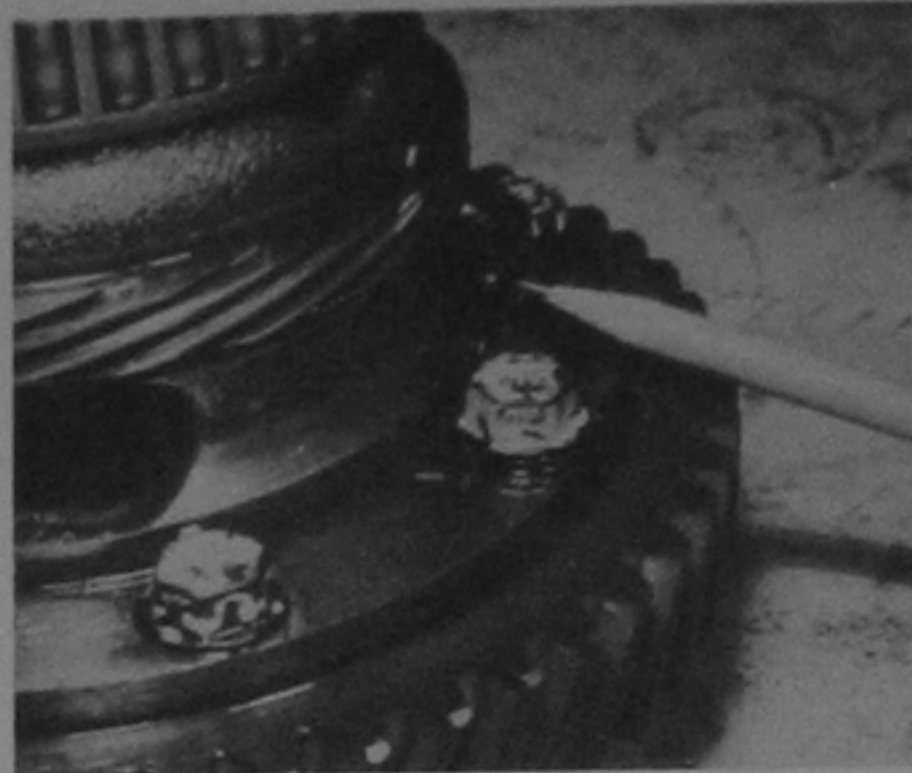
7.12 4th speed gear and bush



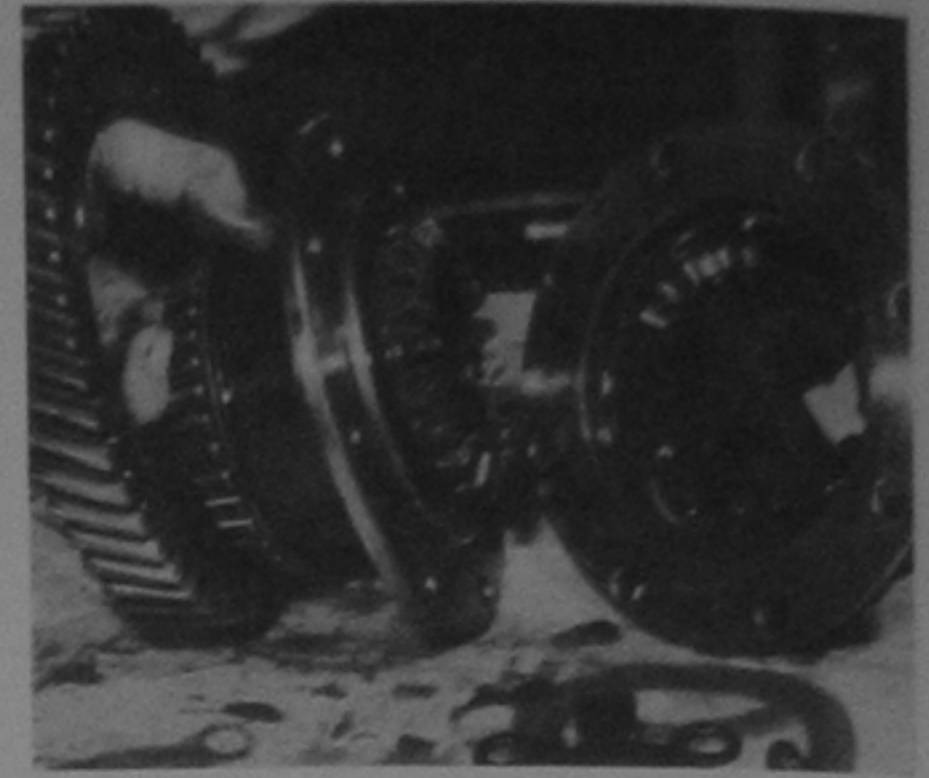
8.1 Differential and speedo drive gear (arrowed)



8.2A Crownwheel bolts



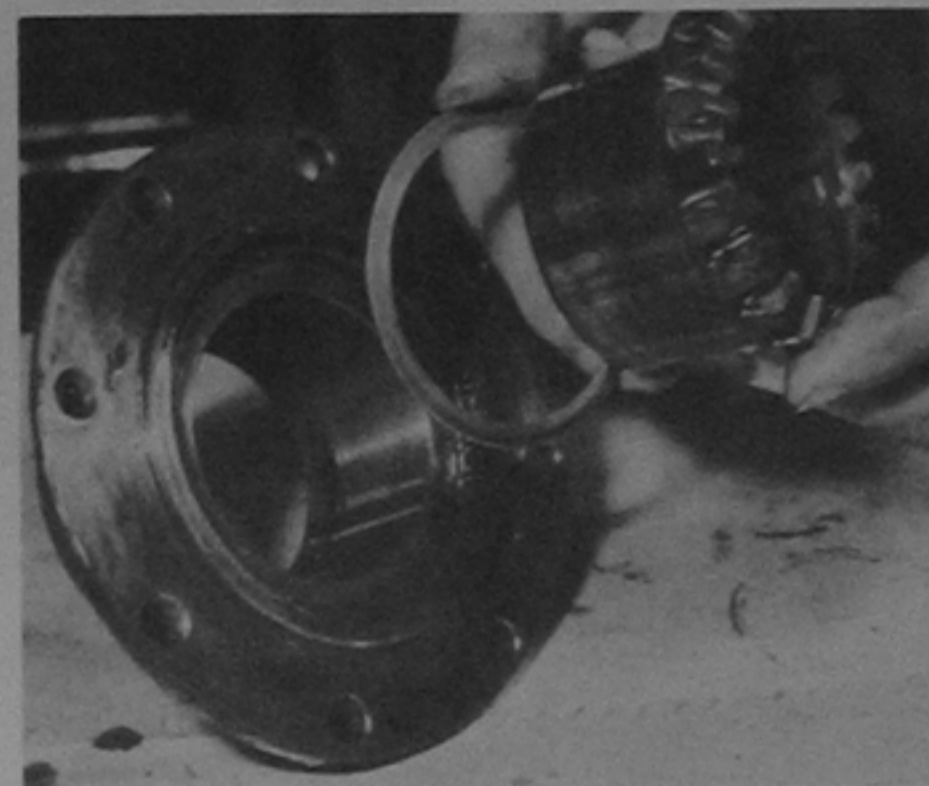
8.2B Differential planet gear pinion shaft lockplate



8.2C Differential dismantled



8.2D Removing differential planet gears



8.3 Differential side gear and thrustwasher

- 2 Unscrew the crownwheel bolts and separate the two halves of the differential cage and the crownwheel. The lockplate for the pinion shaft will also be released (photo). Remove the planet gears.
- 3 Take out the bevel side gears and thrust washers (photo).
- 4 Remove the tapered roller bearings if to be renewed.

- 5 Reassembly is a reversal of the dismantling procedure. Tighten the bolts in diagonal sequence to the specified torque. If new bearings are being fitted, drive them into place carefully and evenly, applying the drift to the inner tracks. Set the preload of these bearings as described in Section 9.

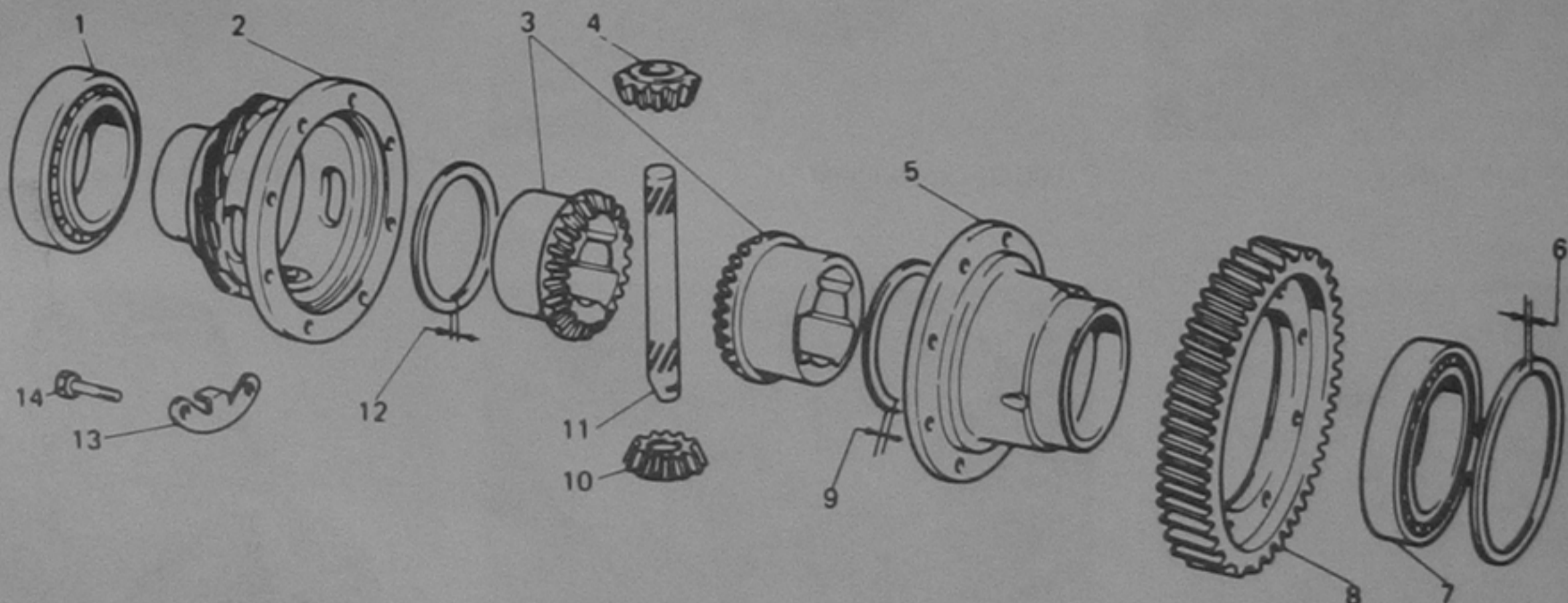
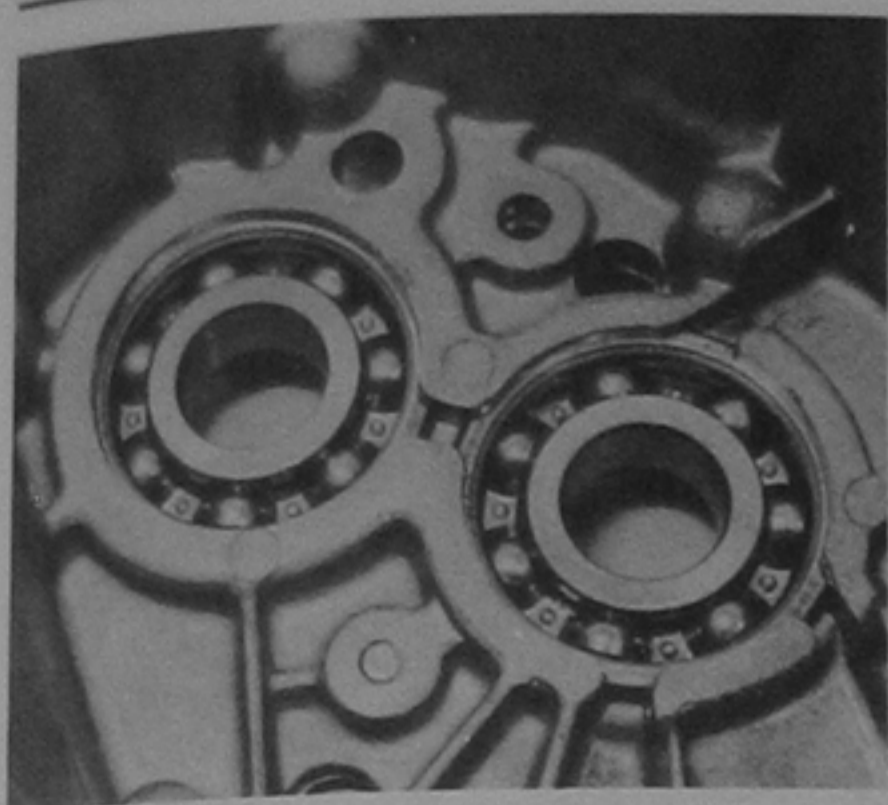


Fig. 6.13 Differential/final drive components (Sec 8)

- |                             |                             |                      |                  |
|-----------------------------|-----------------------------|----------------------|------------------|
| 1 Differential case bearing | 5 Differential half case    | 9 Thrust washer      | 12 Thrust washer |
| 2 Differential half case    | 6 Spacer                    | 10 Pinion bevel gear | 13 Lockplate     |
| 3 Side gears                | 7 Differential case bearing | 11 Pinion gear shaft | 14 Bolt          |
| 4 Pinion gear               | 8 Crownwheel                |                      |                  |



9.2A Shaft bearings in casing



9.2B Shaft bearing in casing



9.3 Fitting magnet

**9 Transmission – reassembly**

- 1 As work proceeds, oil the components liberally with gear oil.
- 2 Fit the shaft bearings to the casings (photos).
- 3 Fit the magnet (photo).
- 4 Lower the differential/final drive into position, with speedometer drivegear uppermost (photo).
- 5 Mesh the geartrains together and fit them simultaneously into the

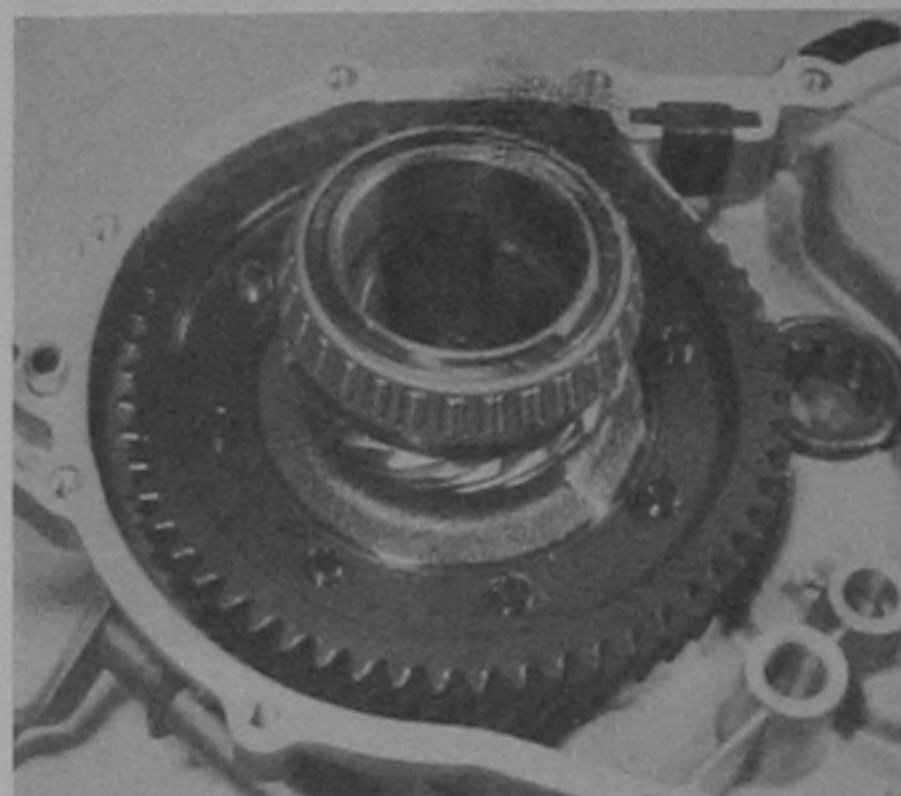
casing (photo).

6 Locate the selector shaft interlock plungers in the casing as shown in Fig. 6.10. A pencil magnet is useful for this (photo).

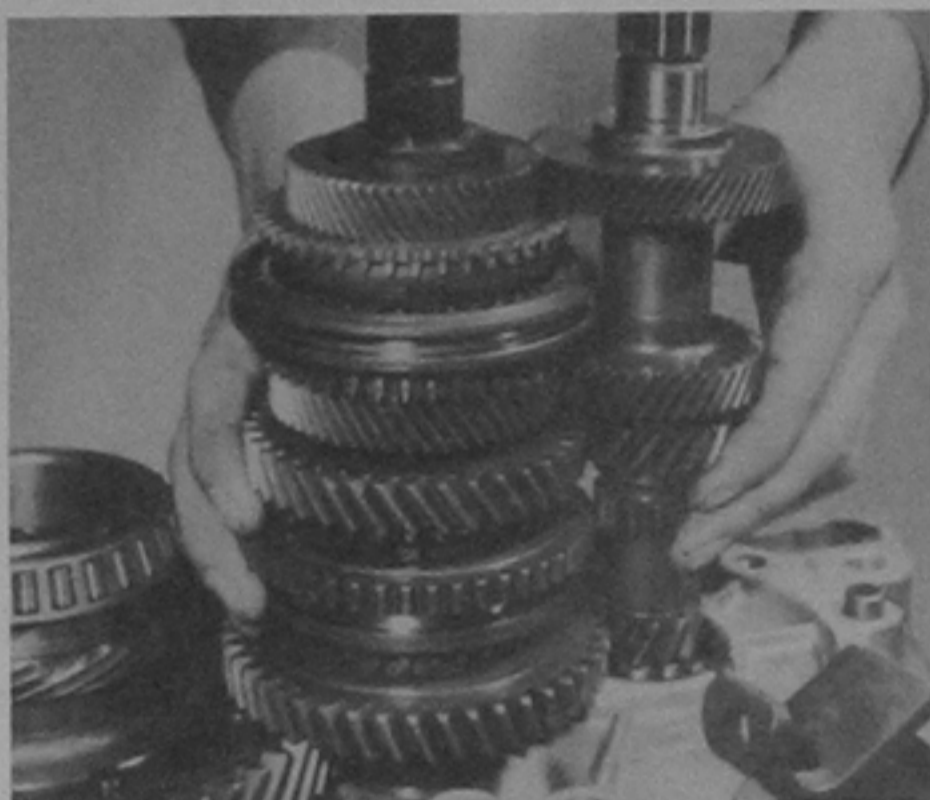
7 Locate the 1st/2nd and 3rd/4th selector forks in their synchro sleeve grooves.

8 Fit the 1st/2nd and 3rd/4th selector shafts passing them through the holes in the forks. Make sure that the small interlock plunger is in its hole in the 3rd/4th selector shaft (photo).

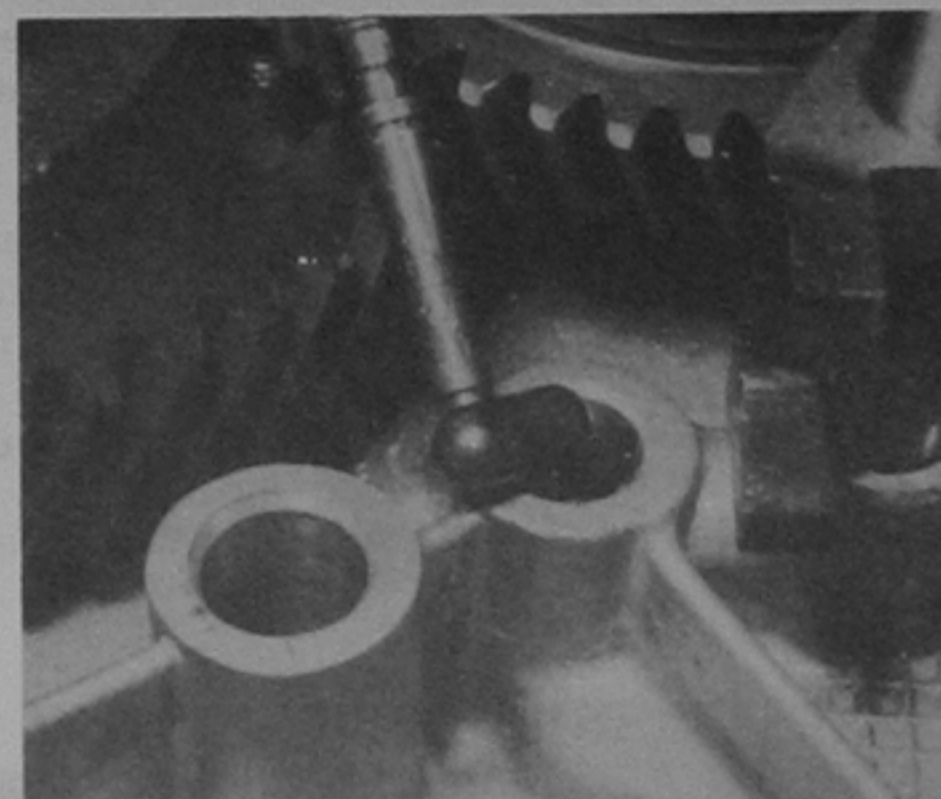
9 Screw in and tighten the fork locking bolts (photos).



9.4 Differential/final drive in casing



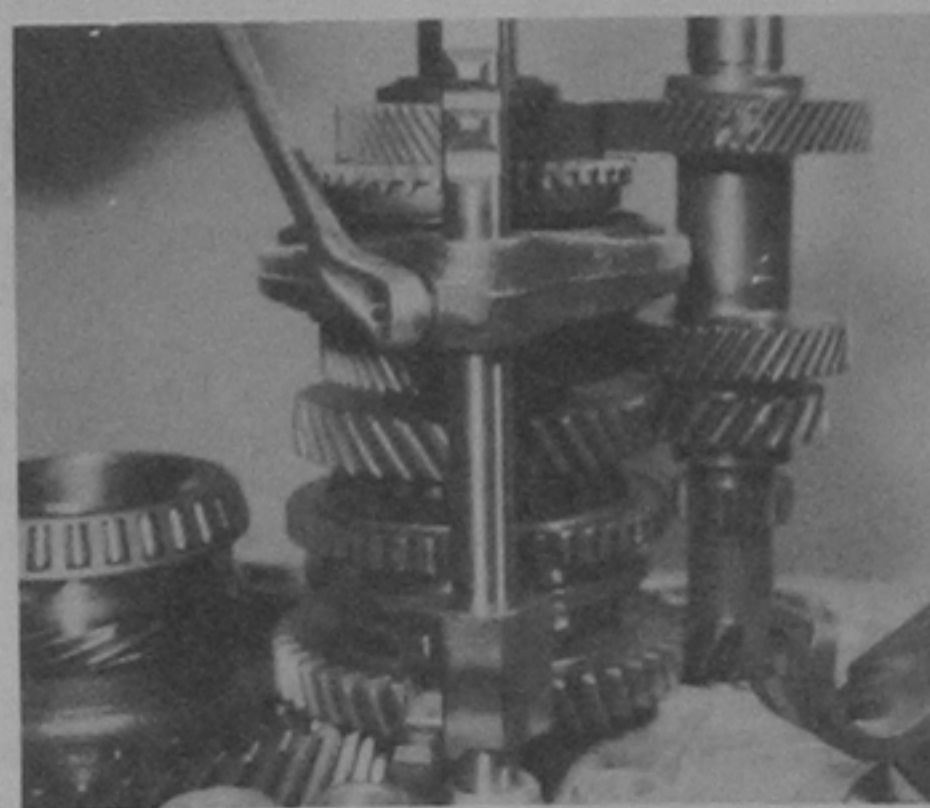
9.5 Fitting geartrains



9.6 Using a magnet to fit interlock plunger



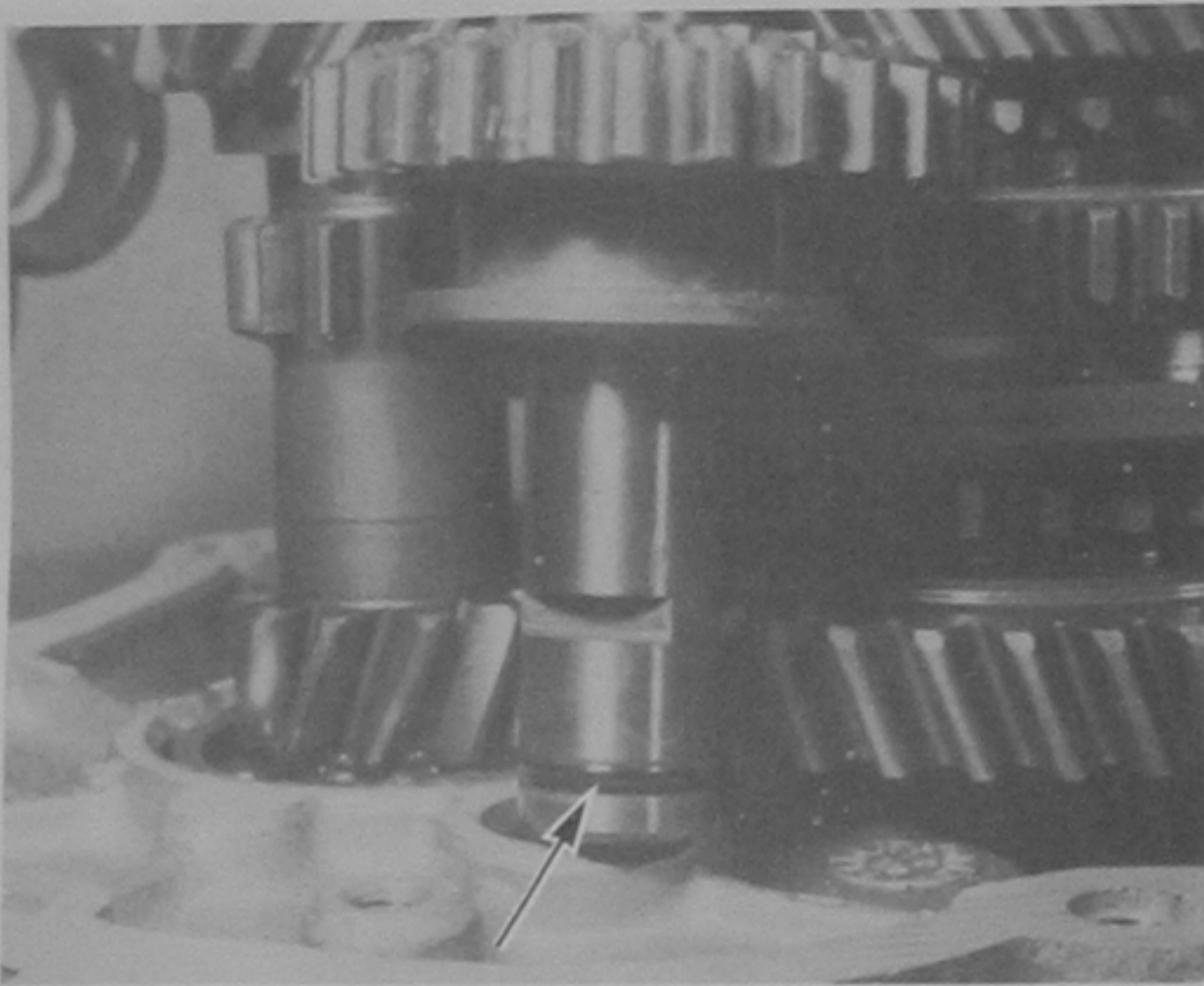
9.8 Interlock plunger in 3rd/4th selector shaft



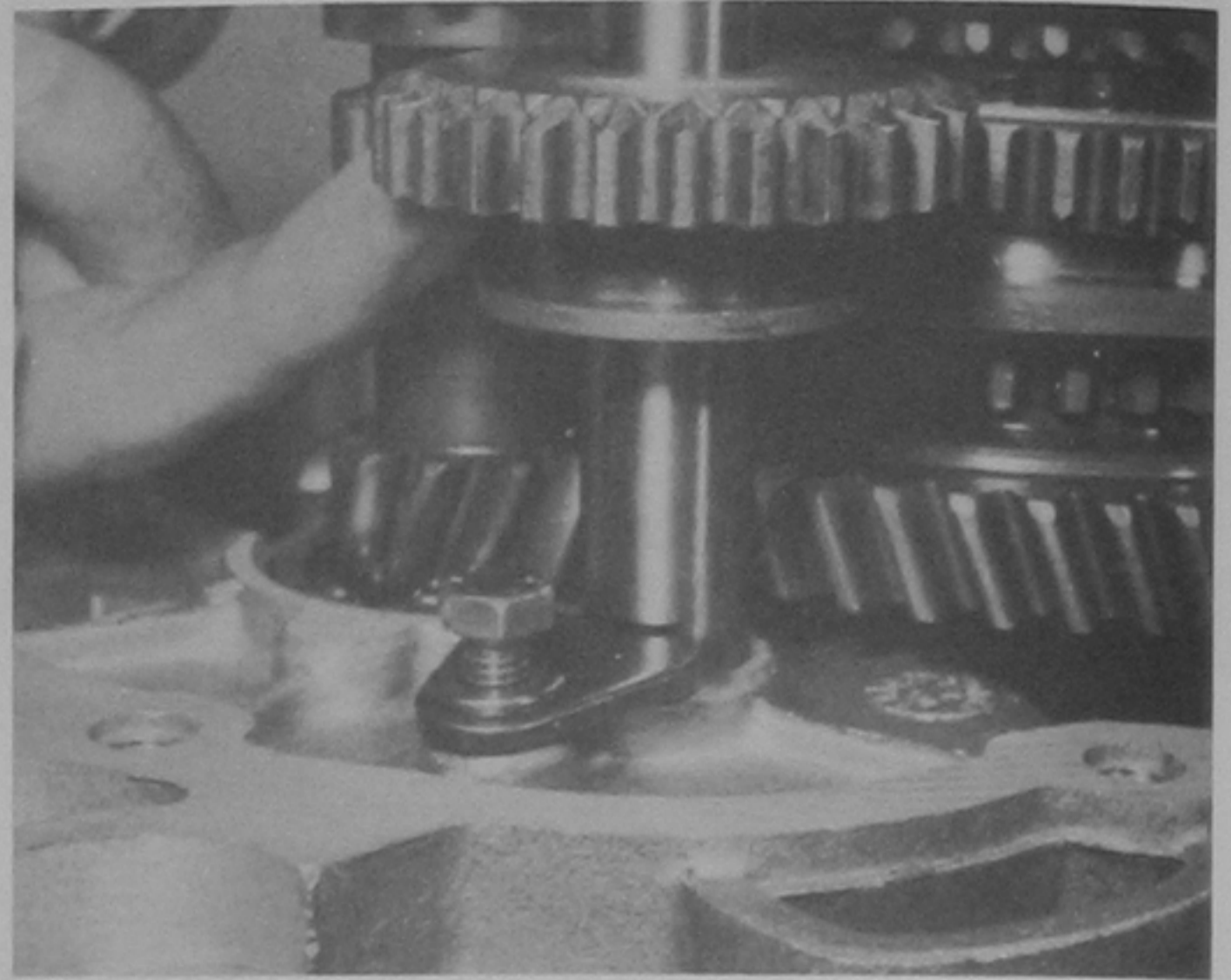
9.9A Tightening 3rd/4th selector fork lockbolt



9.9B Tightening 1st/2nd selector fork lockbolt



9.10 Reverse idler gear and shaft O-ring arrowed



9.13 Reverse idler shaft lockplate and bolt

10 Fit a new O-ring to the reverse idler shaft and fit the shaft and reverse idler gear (photo).

11 Fit the reverse selector fork (photo).

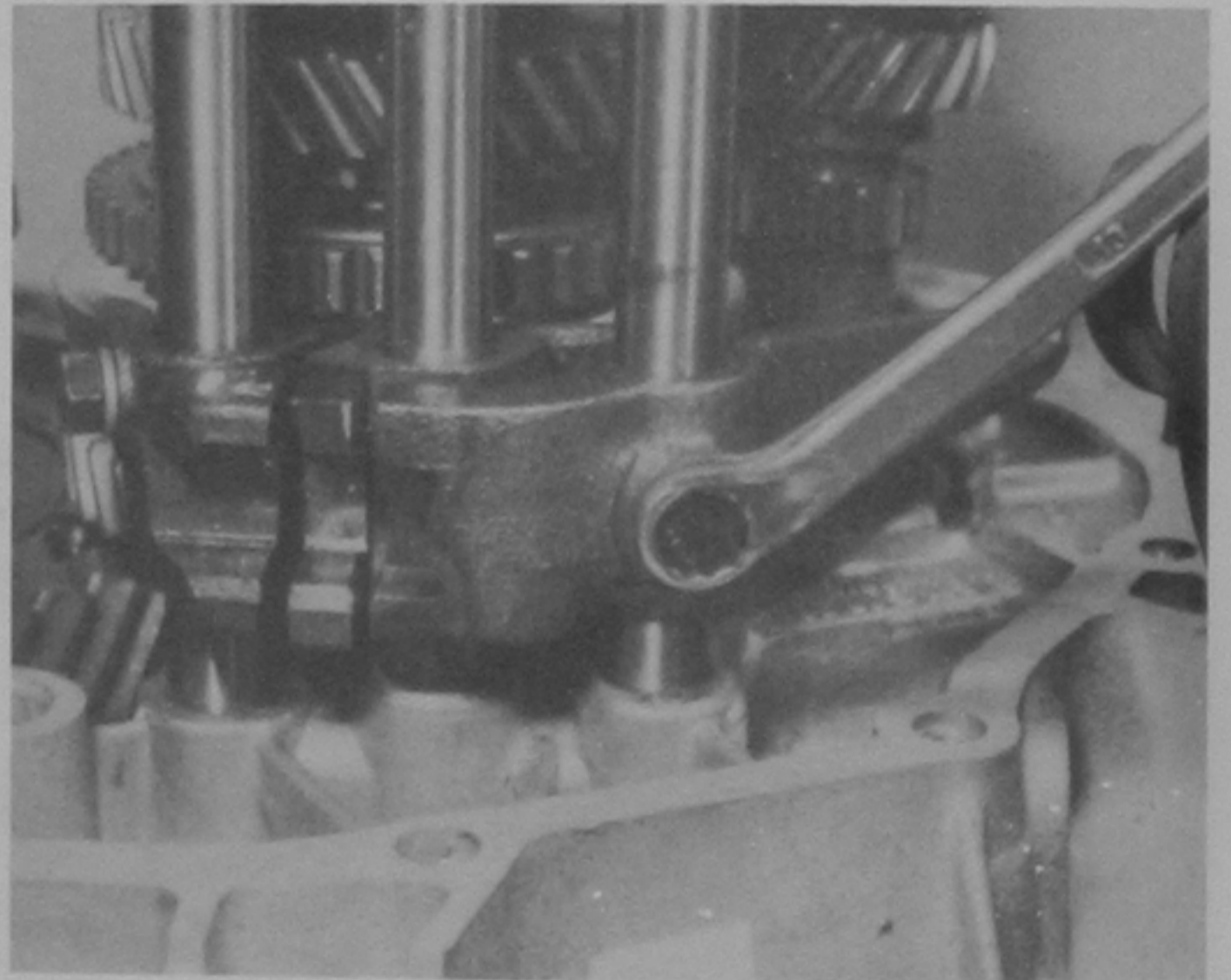
12 Fit 5th/reverse selector shaft.

13 Fit the reverse idler shaft lockplate (photo).

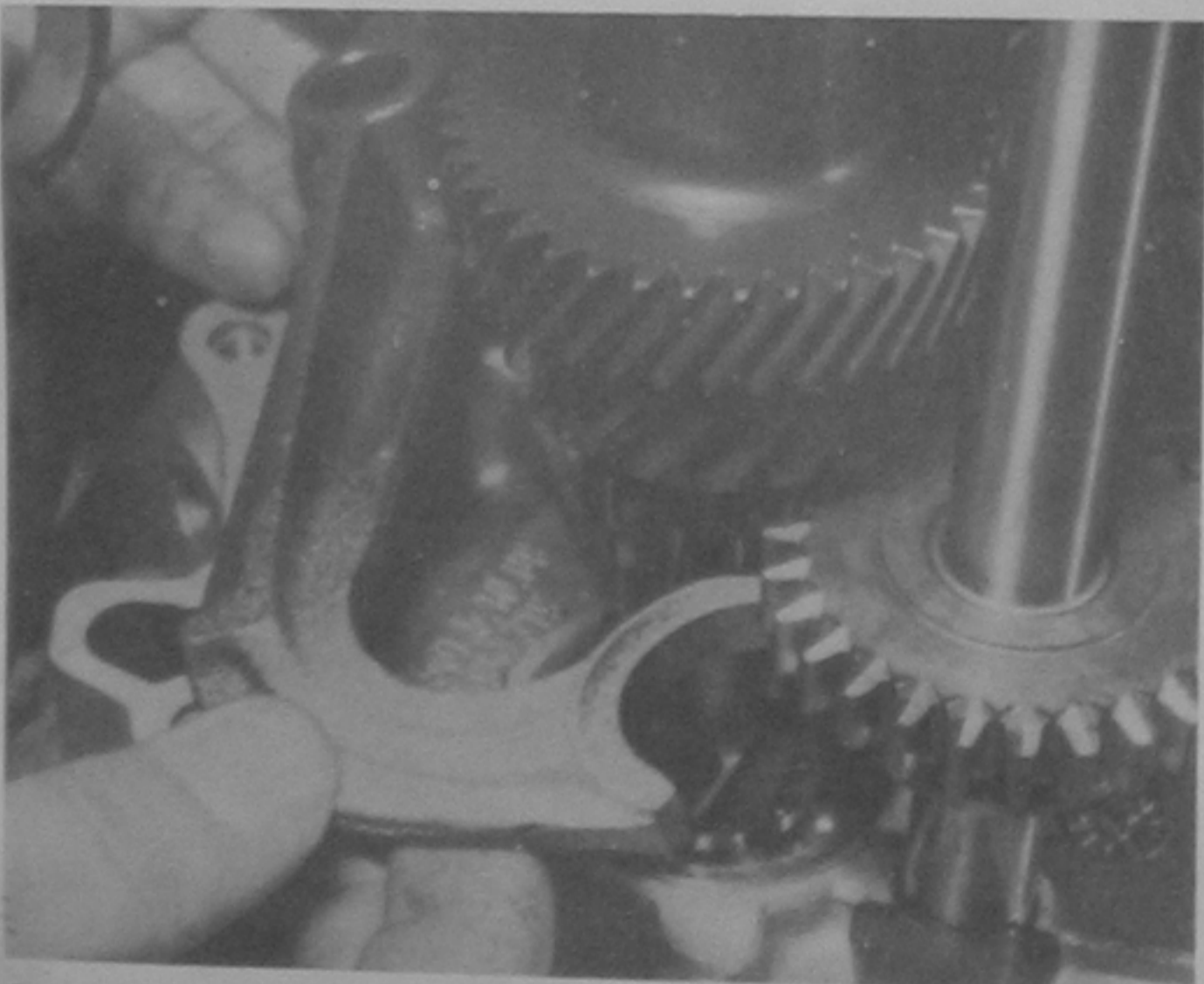
14 Bolt reverse selector fork to its shaft (photo).

15 If the differential bearings have been renewed, the bearing preload must now be calculated and adjusted by means of shims. This sounds very complicated, but in fact means that when the bearing cover is bolted down, it must exert just enough pressure to give the bearings the specified preload.

16 To do this work, a suitable depth gauge will be required. First, measure the depth of the bearing cover recess. Second, measure the projection of the cover's machined section (O-ring removed). Subtract one dimension from the other and add 0.08 mm (0.003 in). This is the thickness of the shim required. Where a depth gauge is not available, shims can be inserted into the housing recess until, when the bearing cover plate is fitted (and resting under its own weight), there is a gap between the plate and the edge of the bearing recess of between 0.08



9.14 Tightening reverse selector fork lockbolt



9.11 Reverse selector fork

and 0.12 mm (0.003 and 0.005 in). This method is not so accurate and will require the purchase of unnecessary shims.

17 If necessary, fit a new oil seal to the differential bearing cover.

18 Fit a new O-ring to the bearing cover and bolt it down, using a new paper gasket.

19 Lower the casing over the geartrains. Use a piece of tubing if necessary to tap the casing down around the shaft bearings. Always use a new flange gasket.

20 Screw in and tighten the casing bolts, noting the one inside the bellhousing (photo).

#### *Five-speed units*

21 Fit 5th speed gear to the secondary shaft (photo).

22 Fit 5th speed gear, the synchro unit, the selector fork and the gear bush as an assembly to the mainshaft. Note the Belleville washer on the synchro hub (photo).

23 Select two gears simultaneously to lock up the geartrains. This is

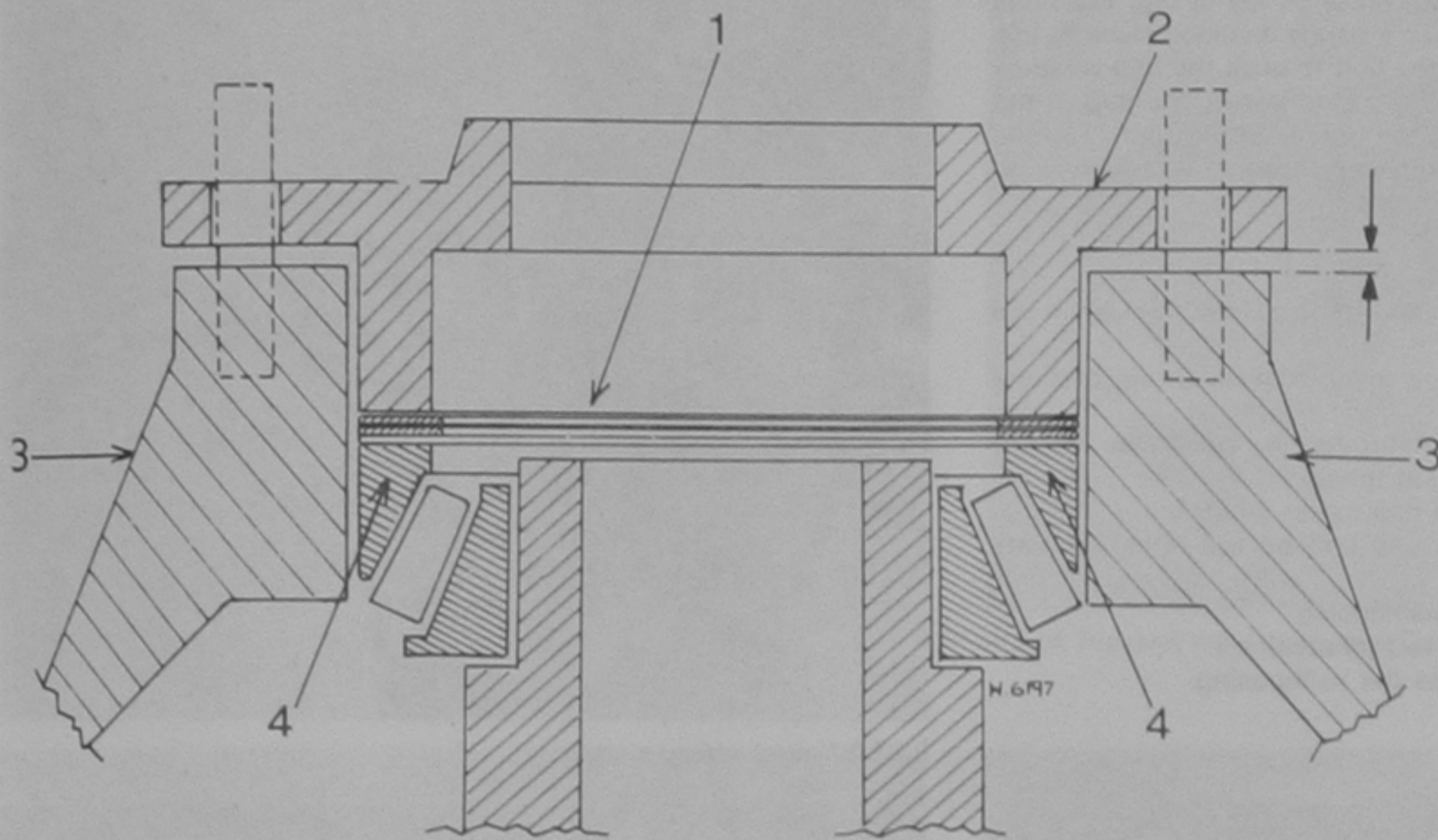
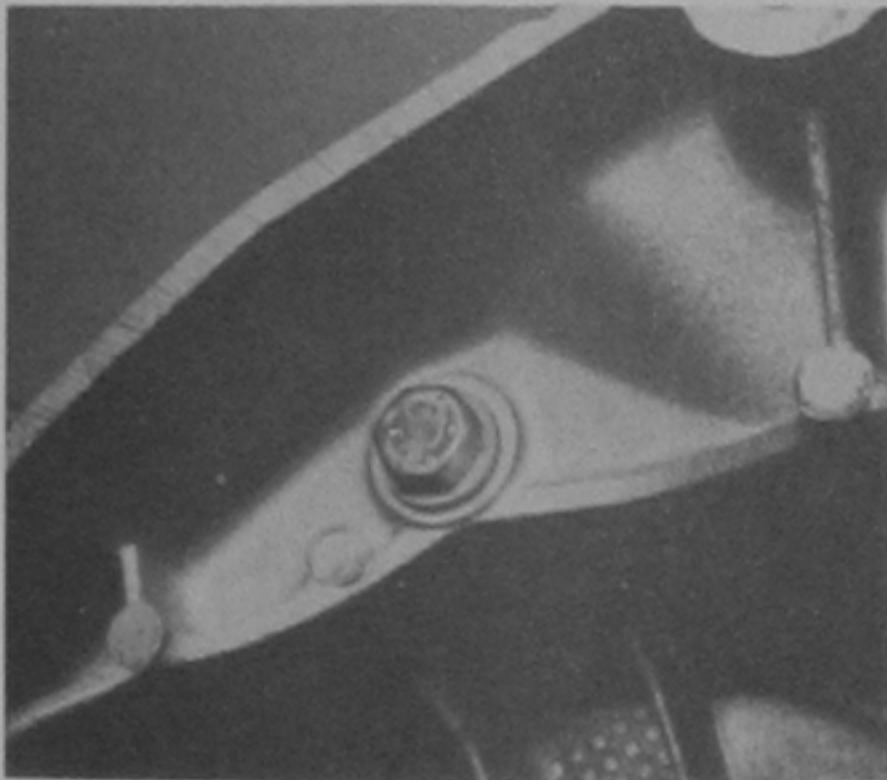
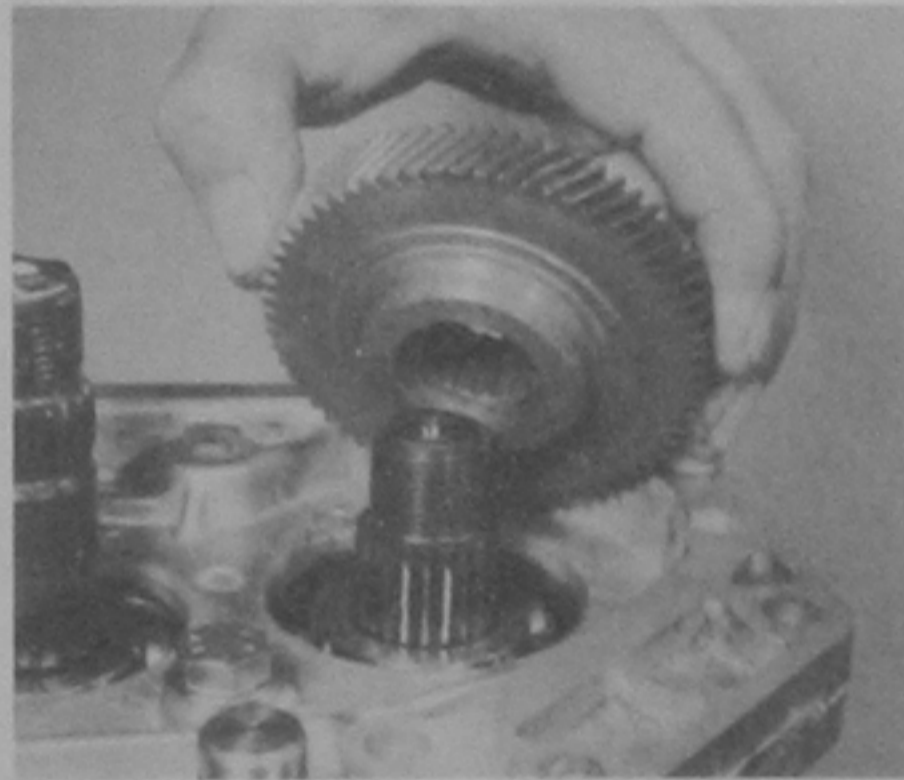


Fig. 6.14 Location of differential bearing preload adjusting shims (Sec 9)

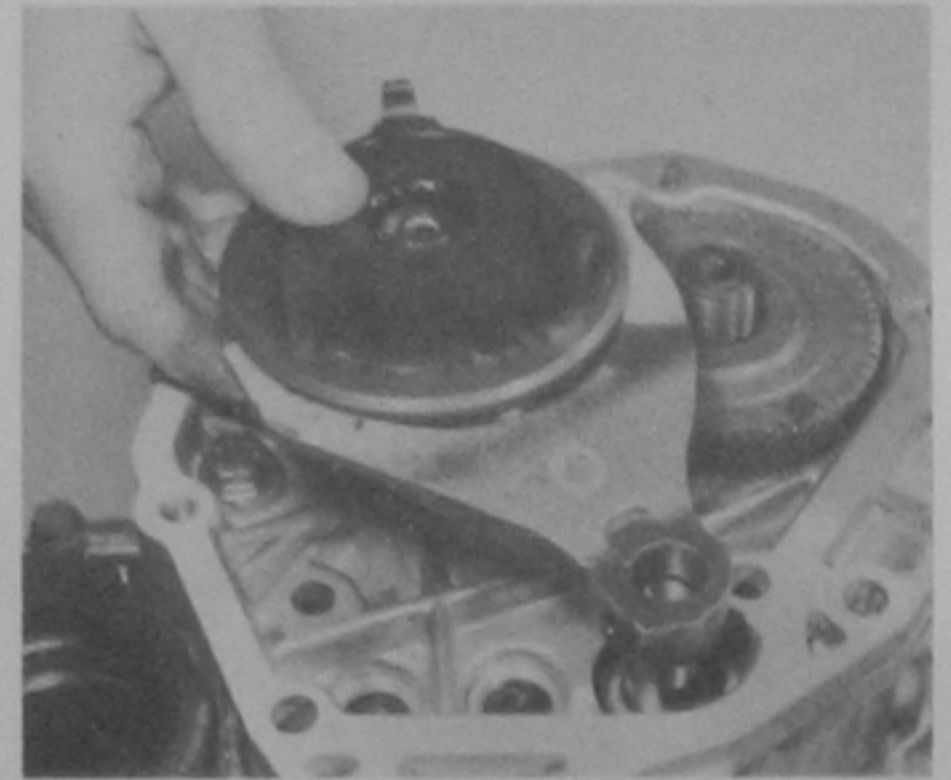
- 1 Shims
- 2 Bearing cover plate
- 3 Final drive housing
- 4 Bearing outer track



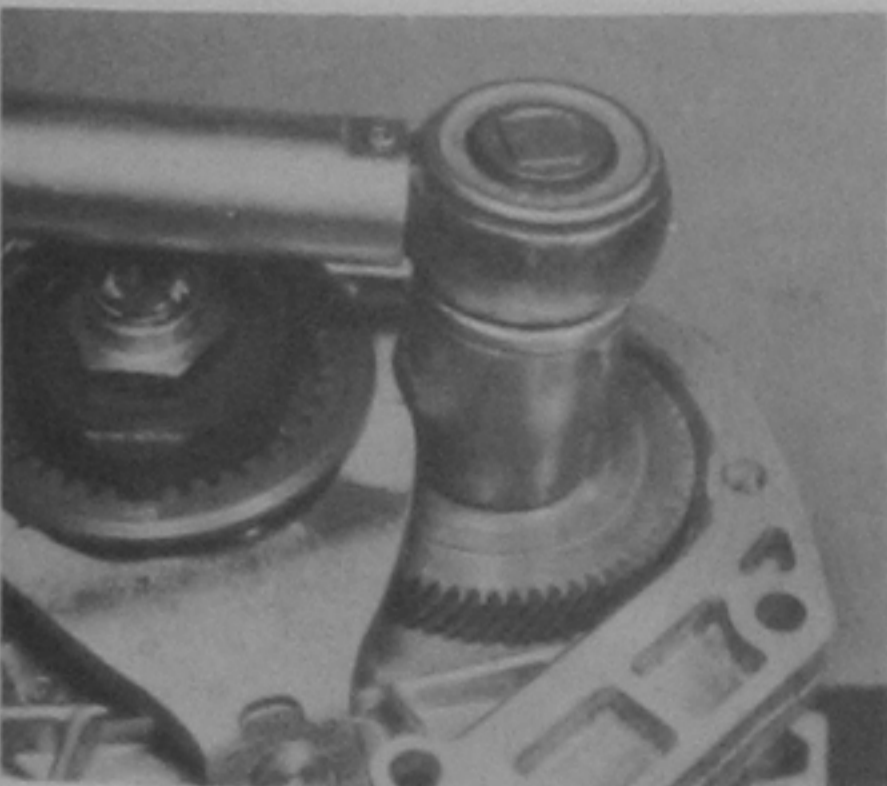
9.20 Casing bolt inside bellhousing



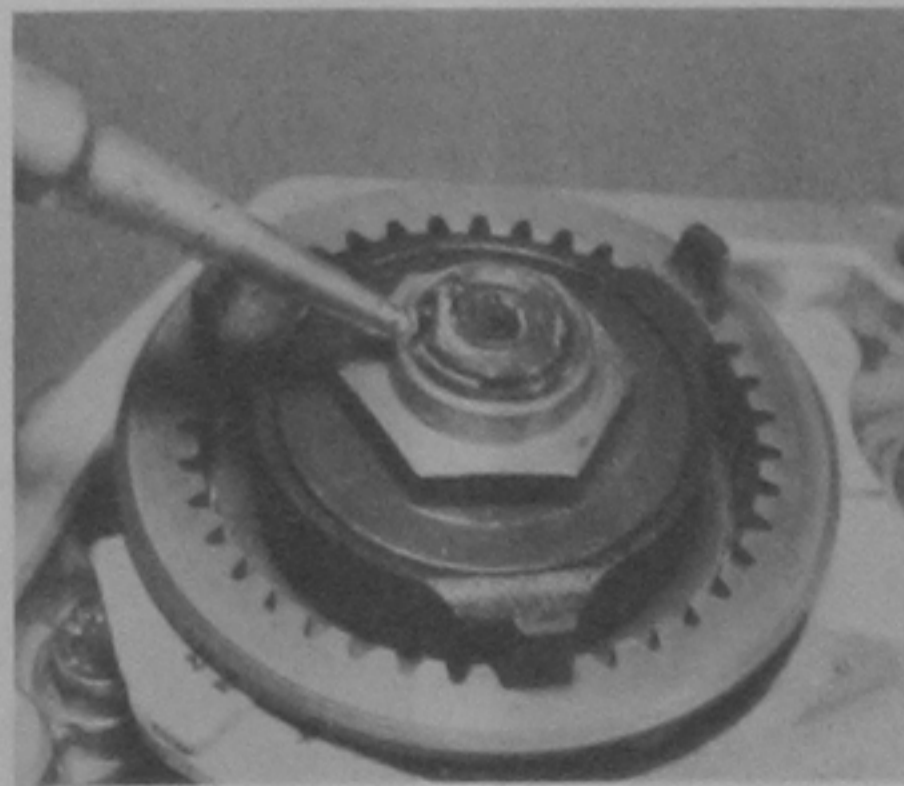
9.21 Fitting 5th speed gear to secondary shaft



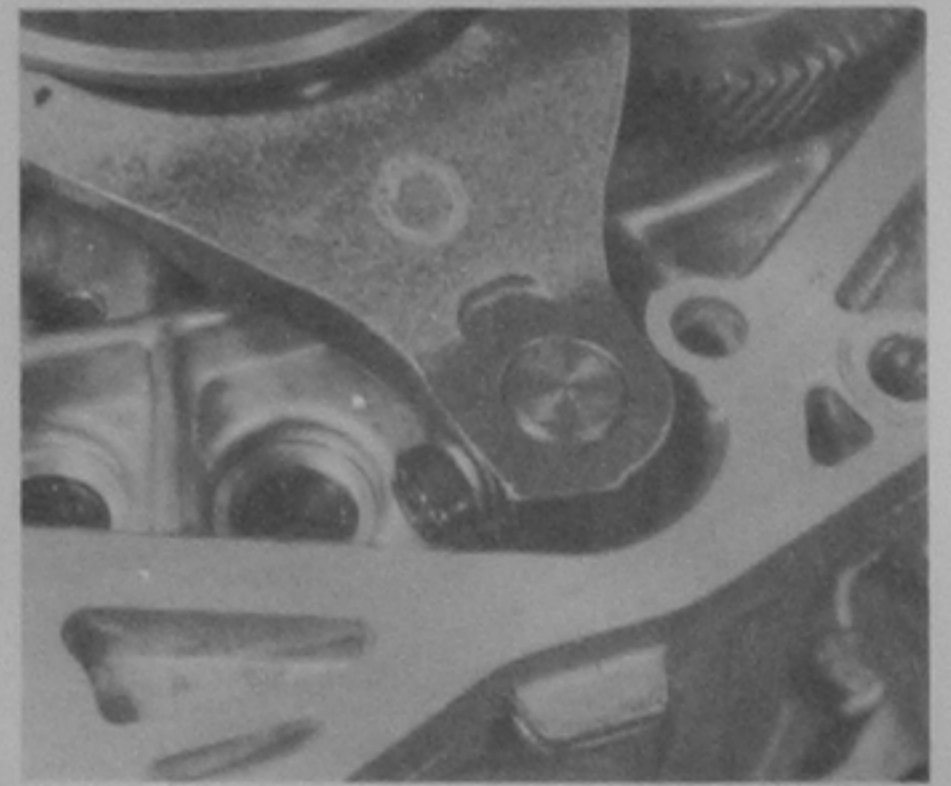
9.22 5th speed gear, fork and synchro being fitted to mainshaft



9.24A Tightening secondary shaft nut



9.24B Staking shaft nut



9.25 5th speed selector fork lockbolt

done by pushing up the 1st/2nd selector shaft by means of its dog, then pushing down the 5th/reverse fork.

24 Screw on two new shaft nuts, tighten to the specified torque and stake the nuts into the shaft grooves (photos).

25 Return the gears to neutral and then fit the 5th/reverse fork lock bolt (photo).

#### Four-speed units

26 Fit the two Belleville washers, their outer rims next to each other on the end of the shaft.

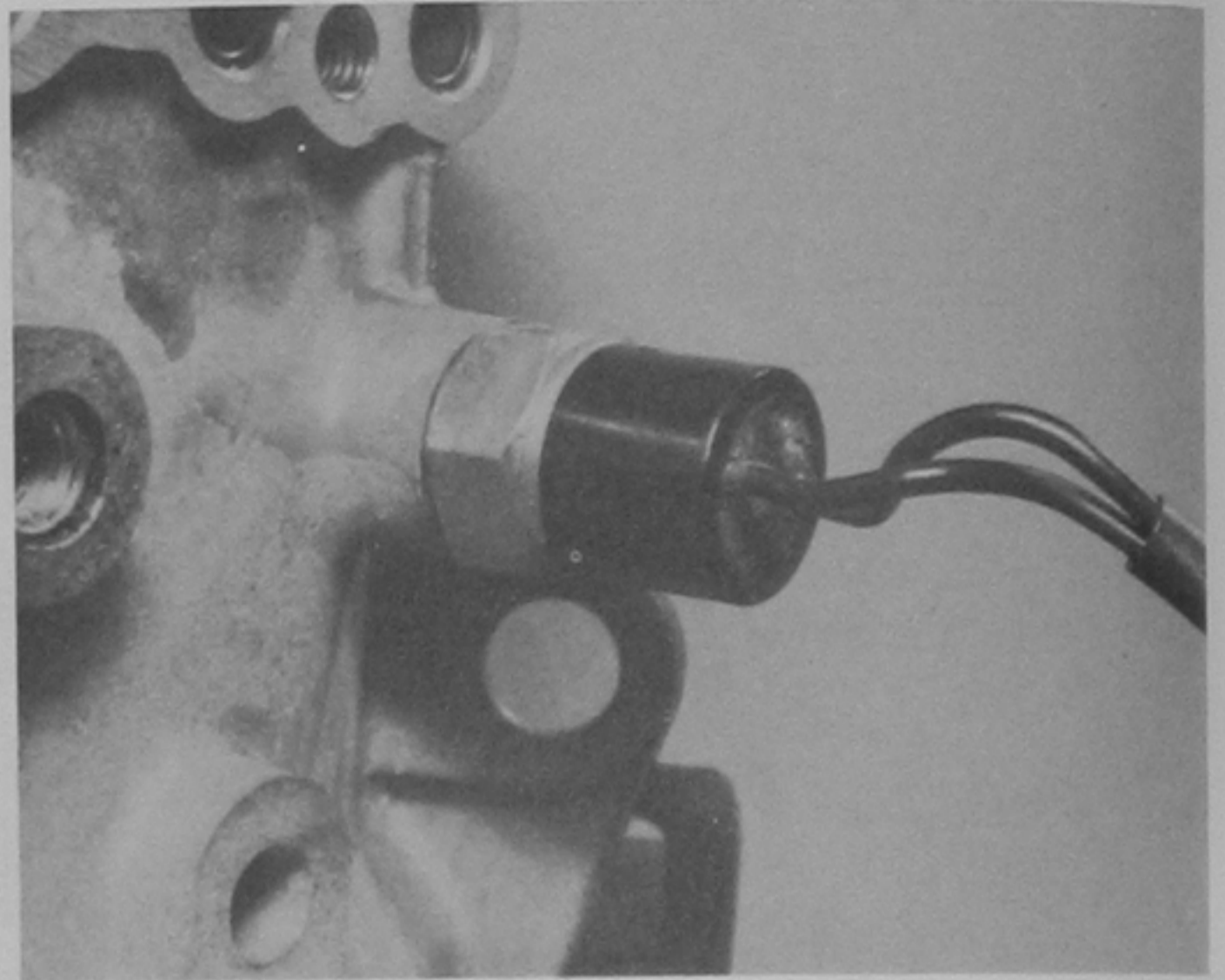
27 Fit the circlip. To get into its groove against the considerable pressure of the pair of washers, the latter must be compressed by a clamp. The end of the shaft is internally threaded, and the bolts fixing



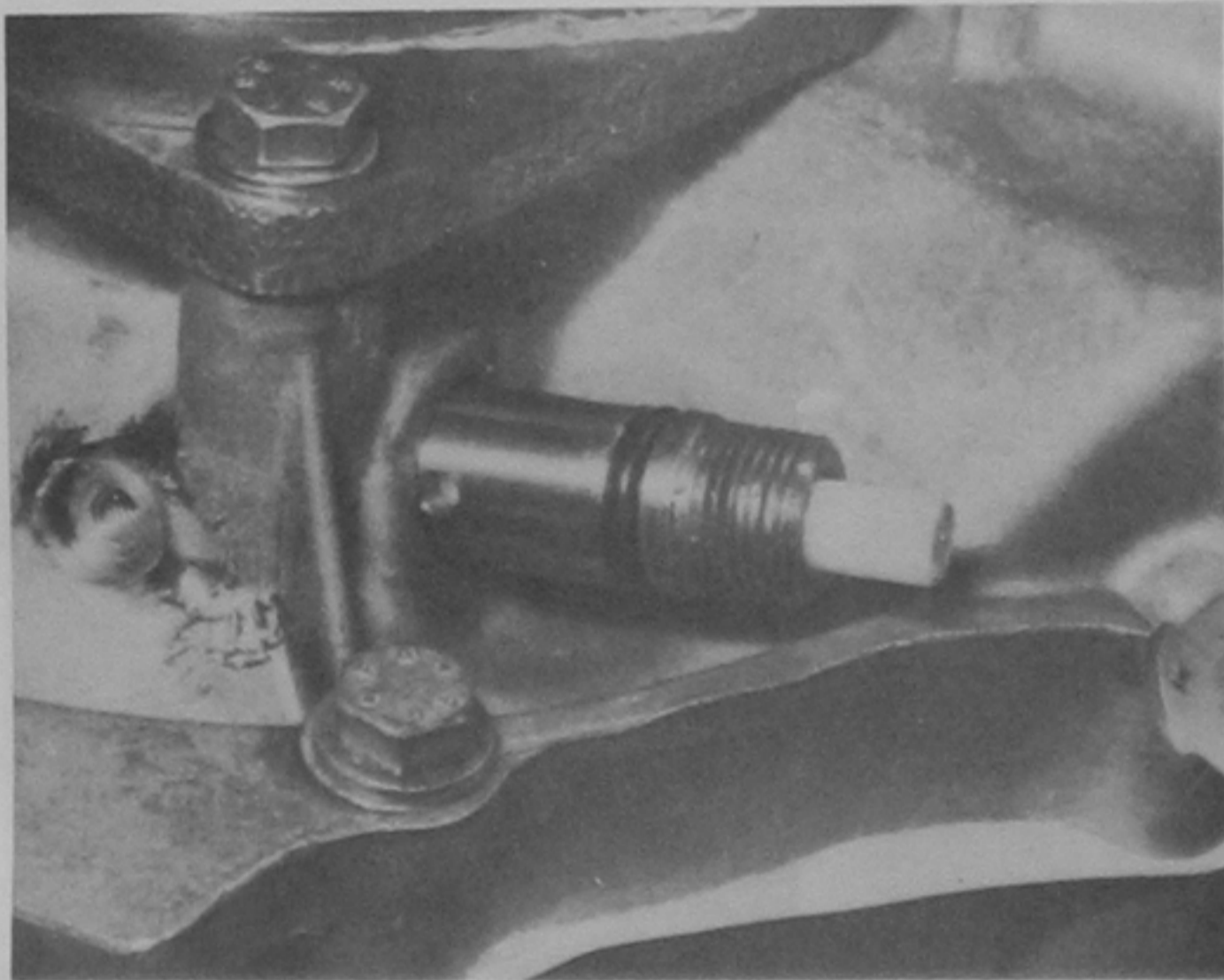
the transmission to the engine are the same thread. Select a socket just large enough to span the shaft but press on the circlip. The bolts are a bit long, so another socket makes a handy distance piece to use up the extra length of bolt. Screw in the bolt to push the two washers and the circlip down the shaft, watching carefully at the gap in the circlip to see when it is lined up with the groove in the shaft. Tap the circlip, which is trapped by the socket, with a small screwdriver, to push it into the groove. Release the press.

#### All units

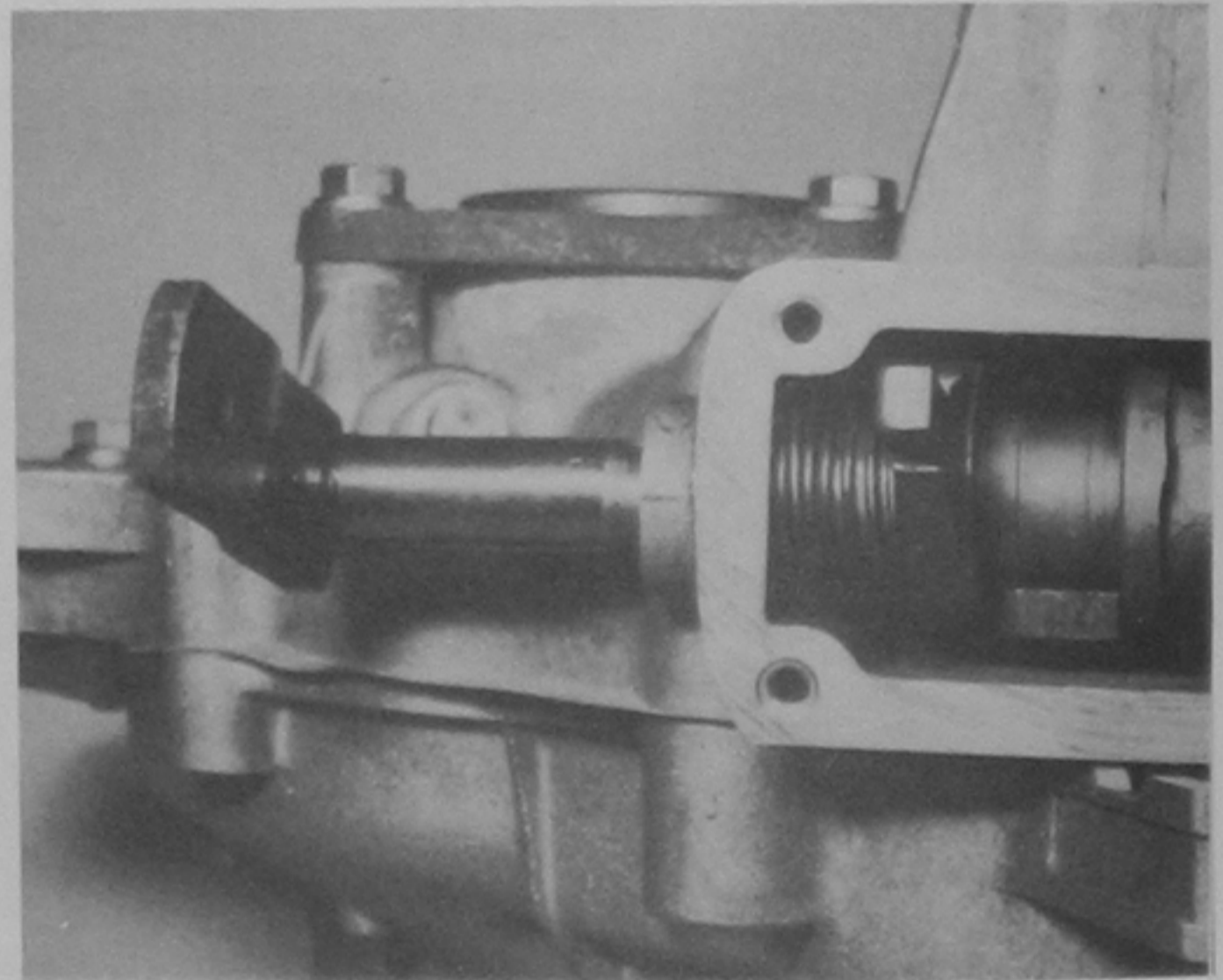
- 28 Fit the speedometer driven gear and its lockscrew. Screw in the reverse lamp switch (photos).
- 29 Reassemble the gear engagement lever, reverse spring cap and coil springs (photos).
- 30 Bolt on the pressed steel cover noting the 5th speed gear resistor spring. Always use a new cover gasket (photos).
- 31 Using a new gasket, bolt on the rear cover (photo).
- 32 Fit the detent balls and springs and bolt on the retaining plate (photos).
- 33 Reconnect the gearcasing and bellhousing.
- 34 Fit the gearchange selector link rod (photos).
- 35 Fit the clutch release bearing into the bellhousing.



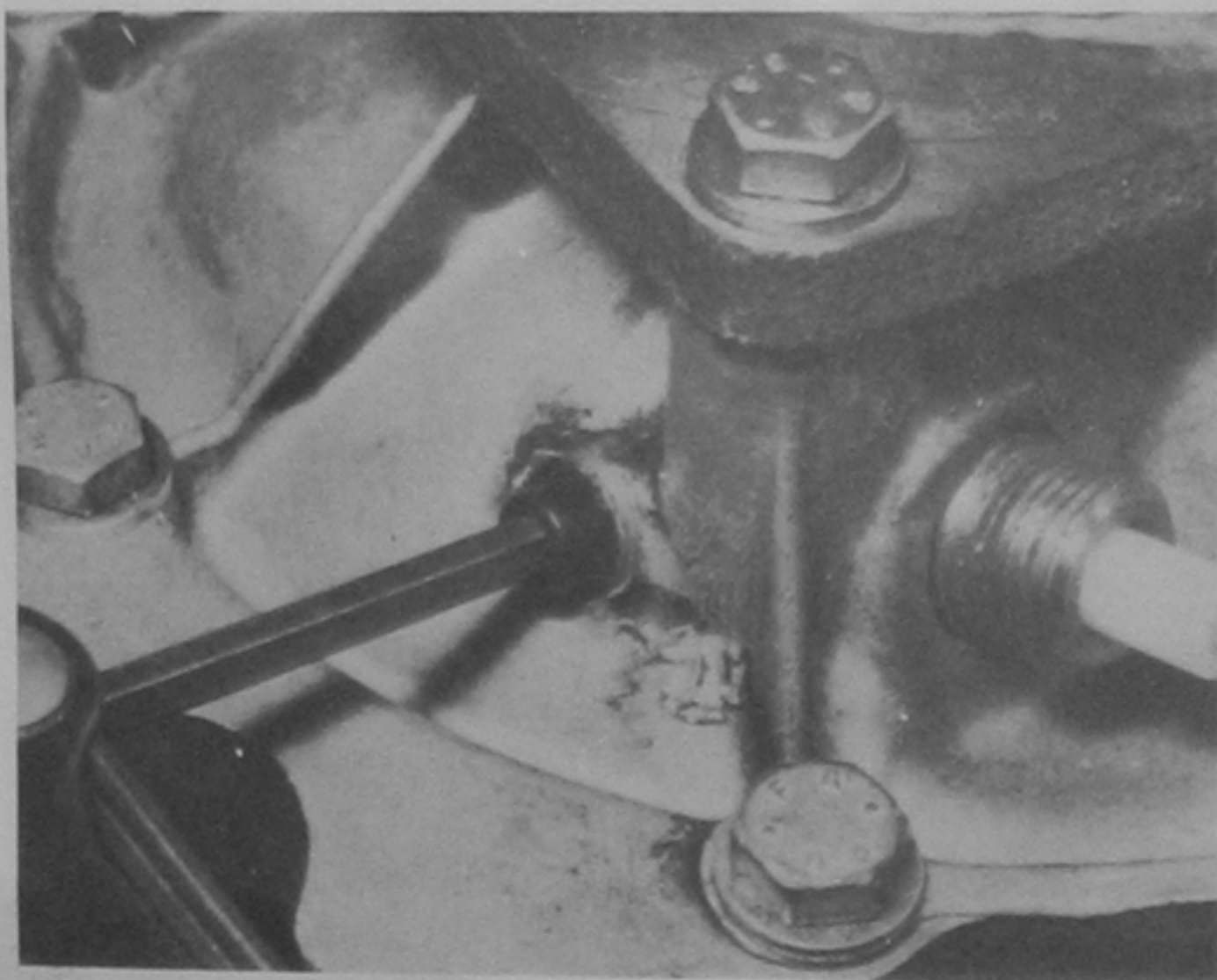
9.28C Reverse lamp switch



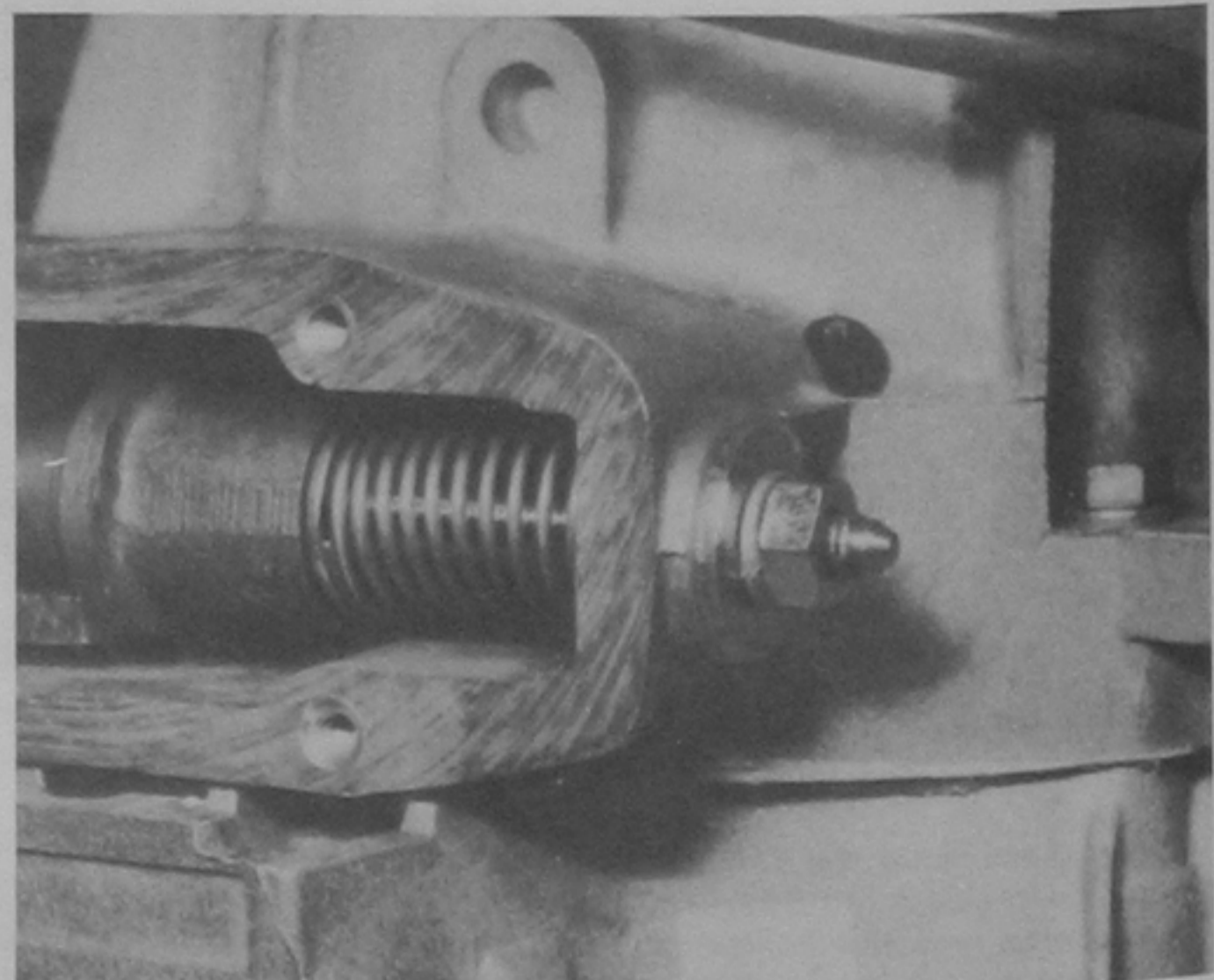
9.28A Speedo driven gear



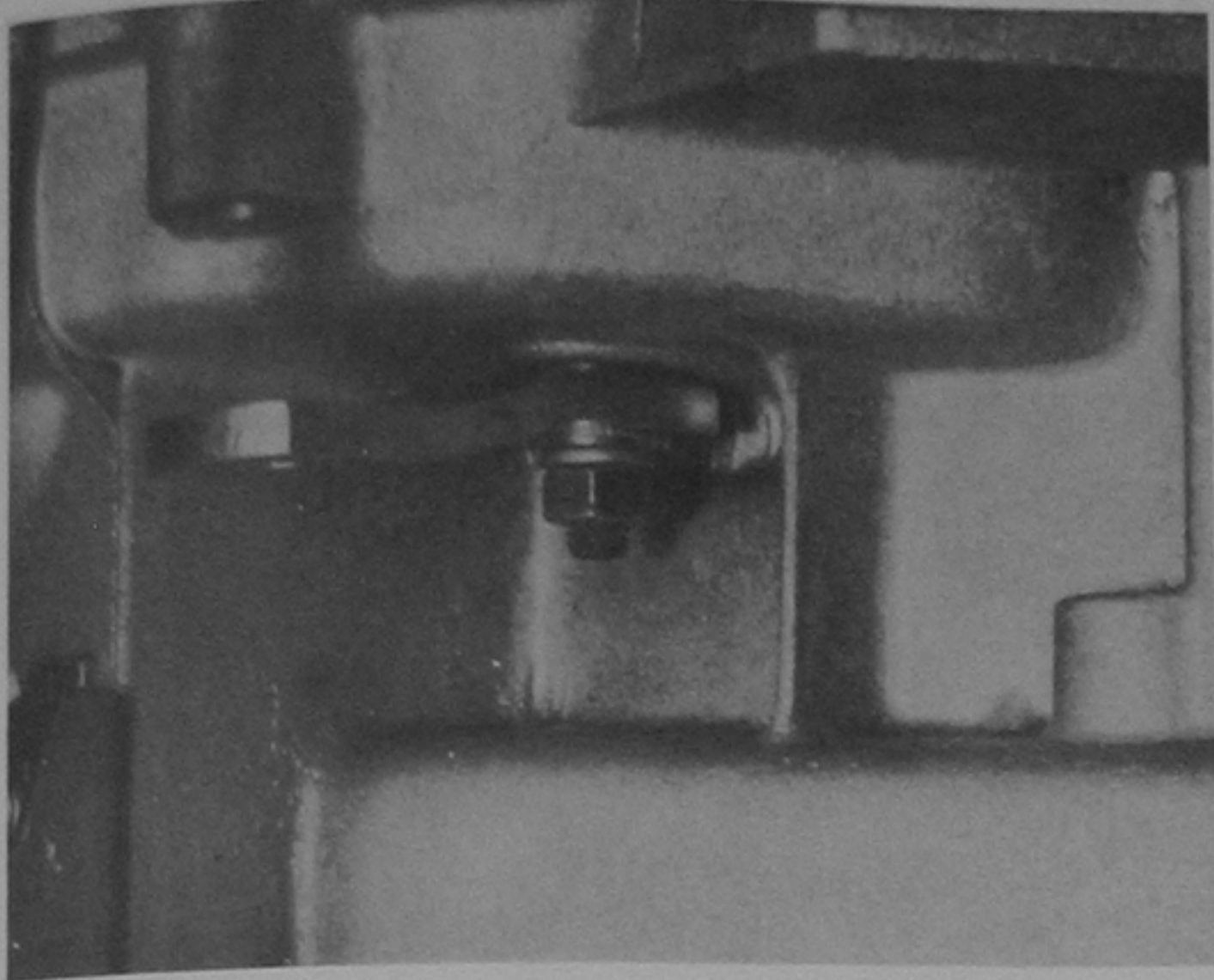
9.29A Fitting gear engagement lever



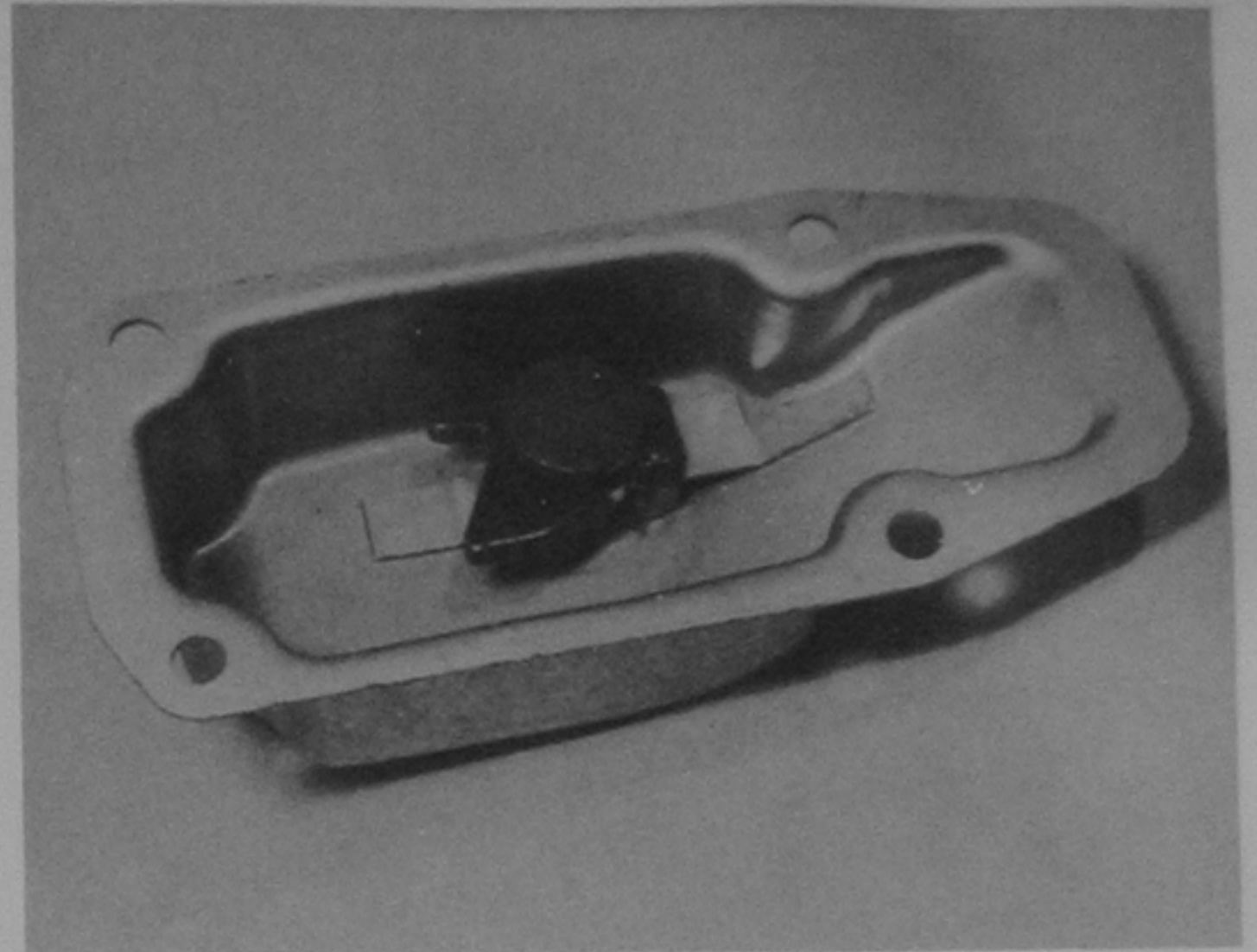
9.28B Speedo driven gear lockscrew



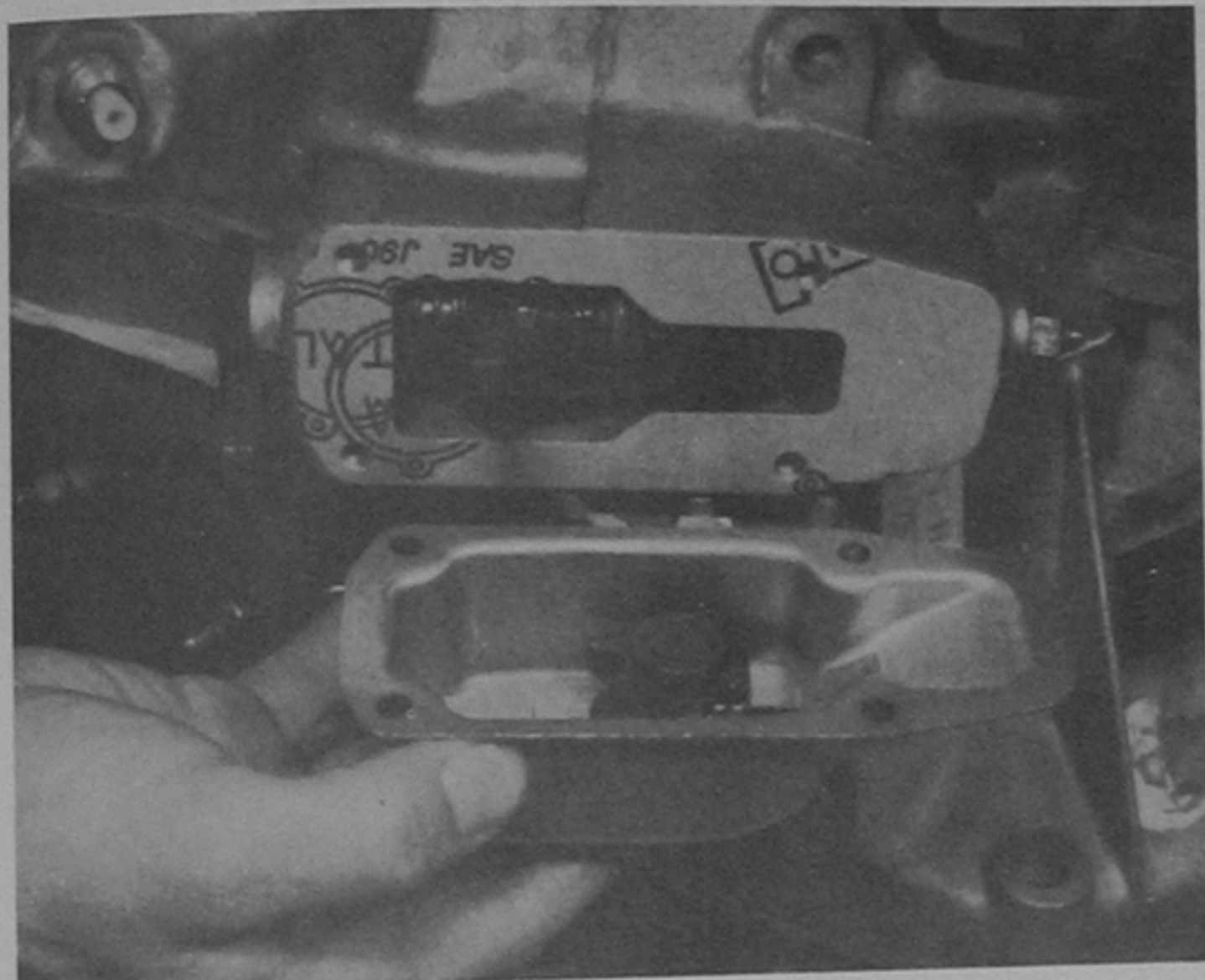
9.29B Gear engagement lever shaft nut



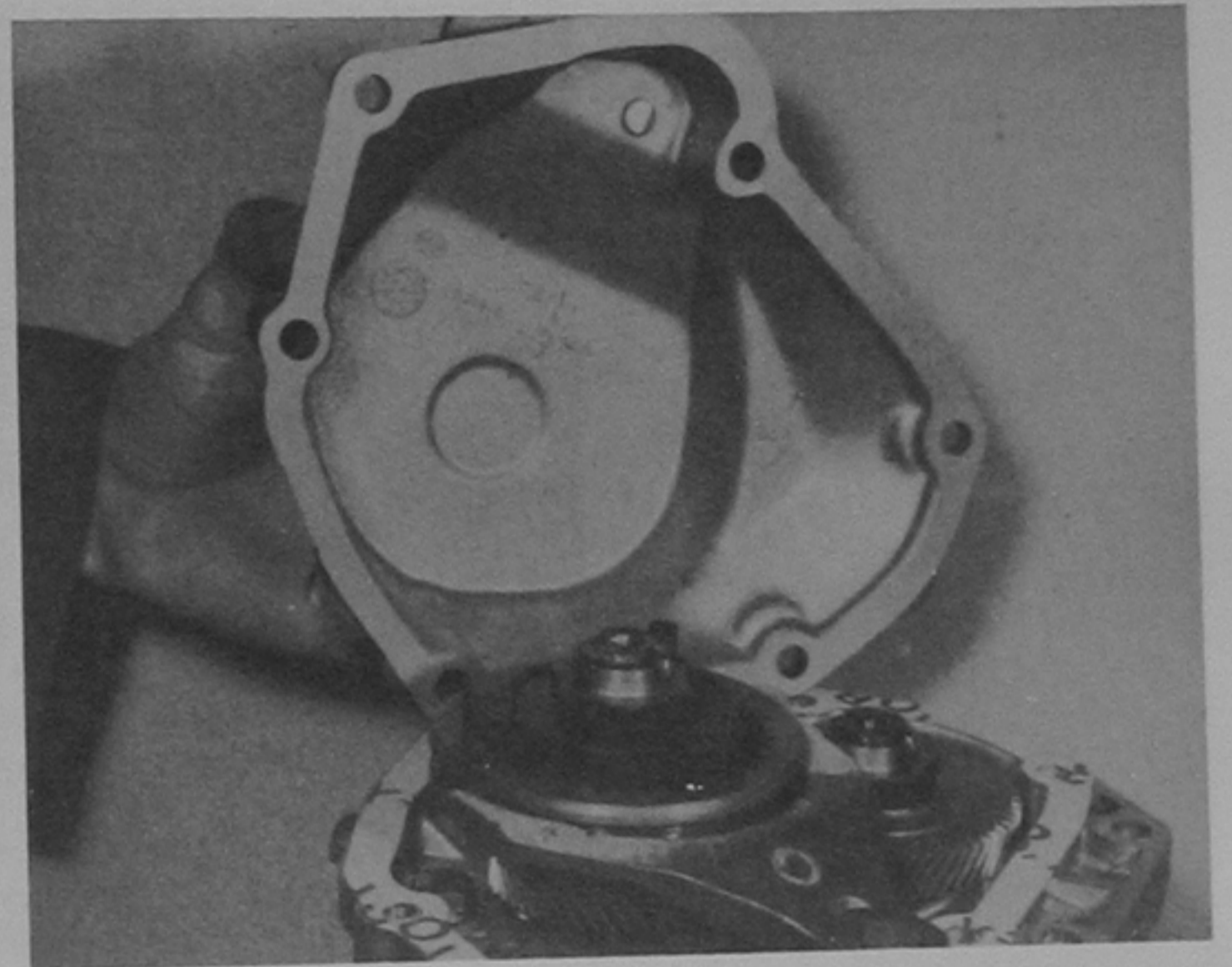
9.29C Gear selector lever and fixing nut



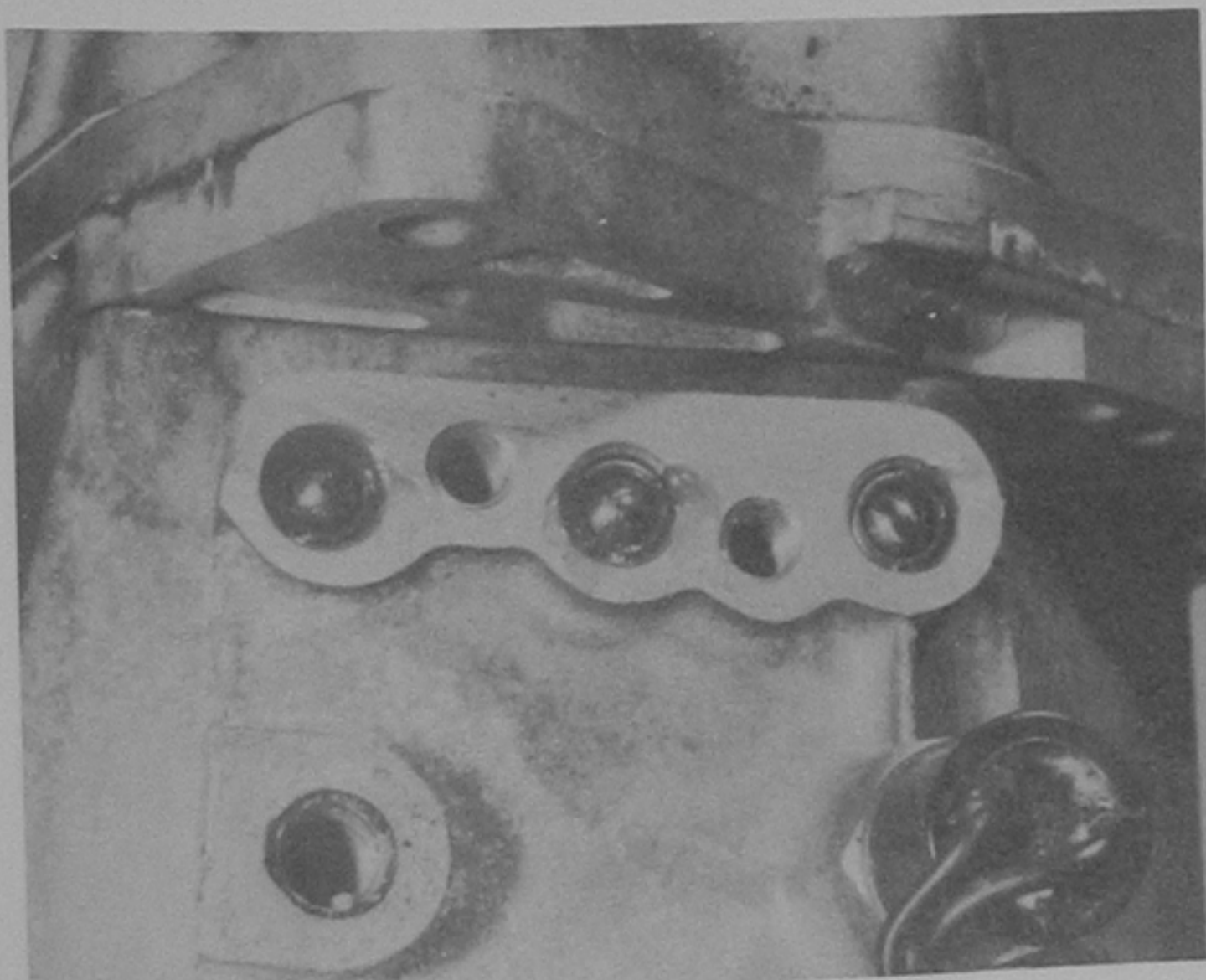
9.30A Pressed steel cover and 5th gear pawl and resistor spring



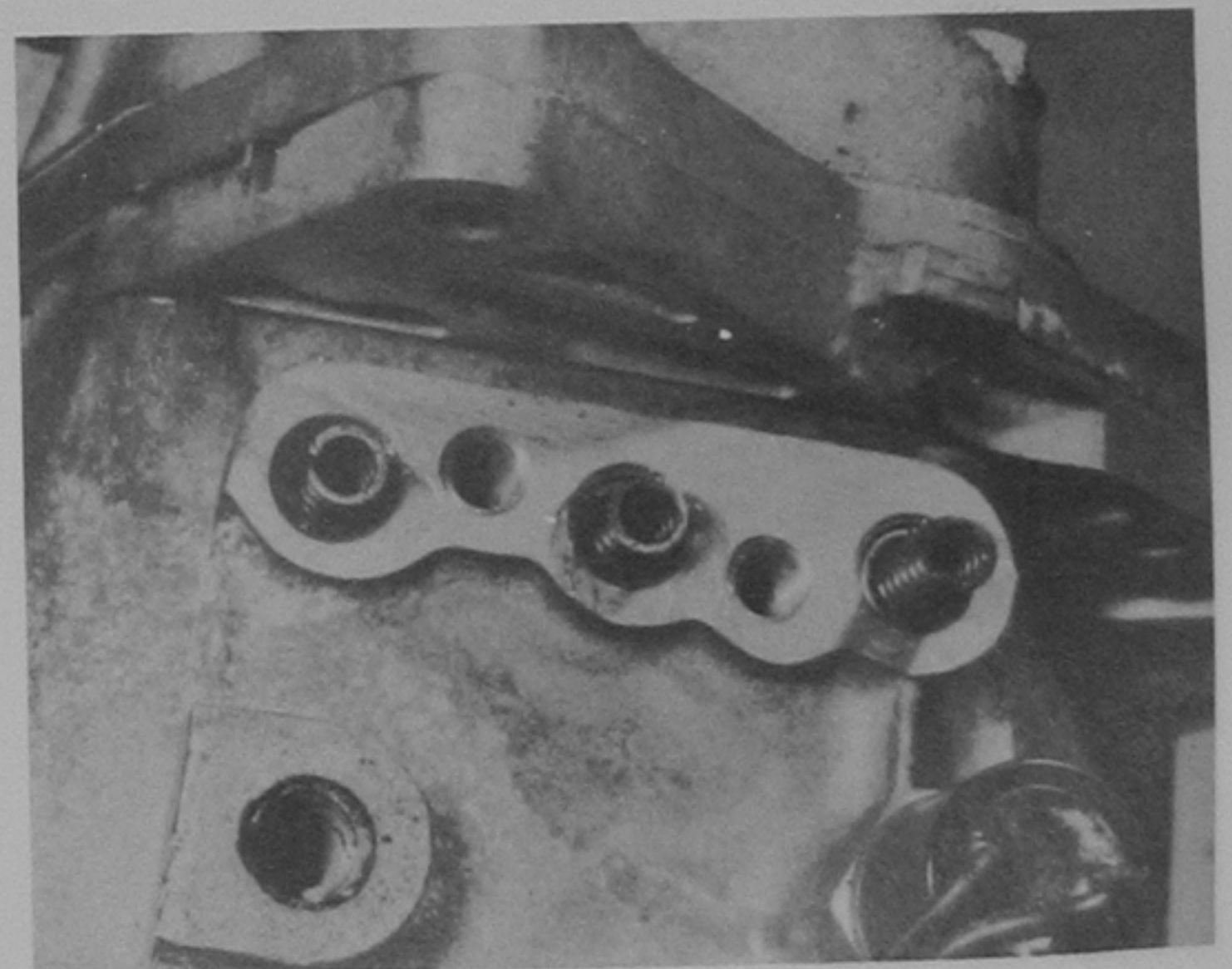
9.30B Fitting pressed steel cover and gasket



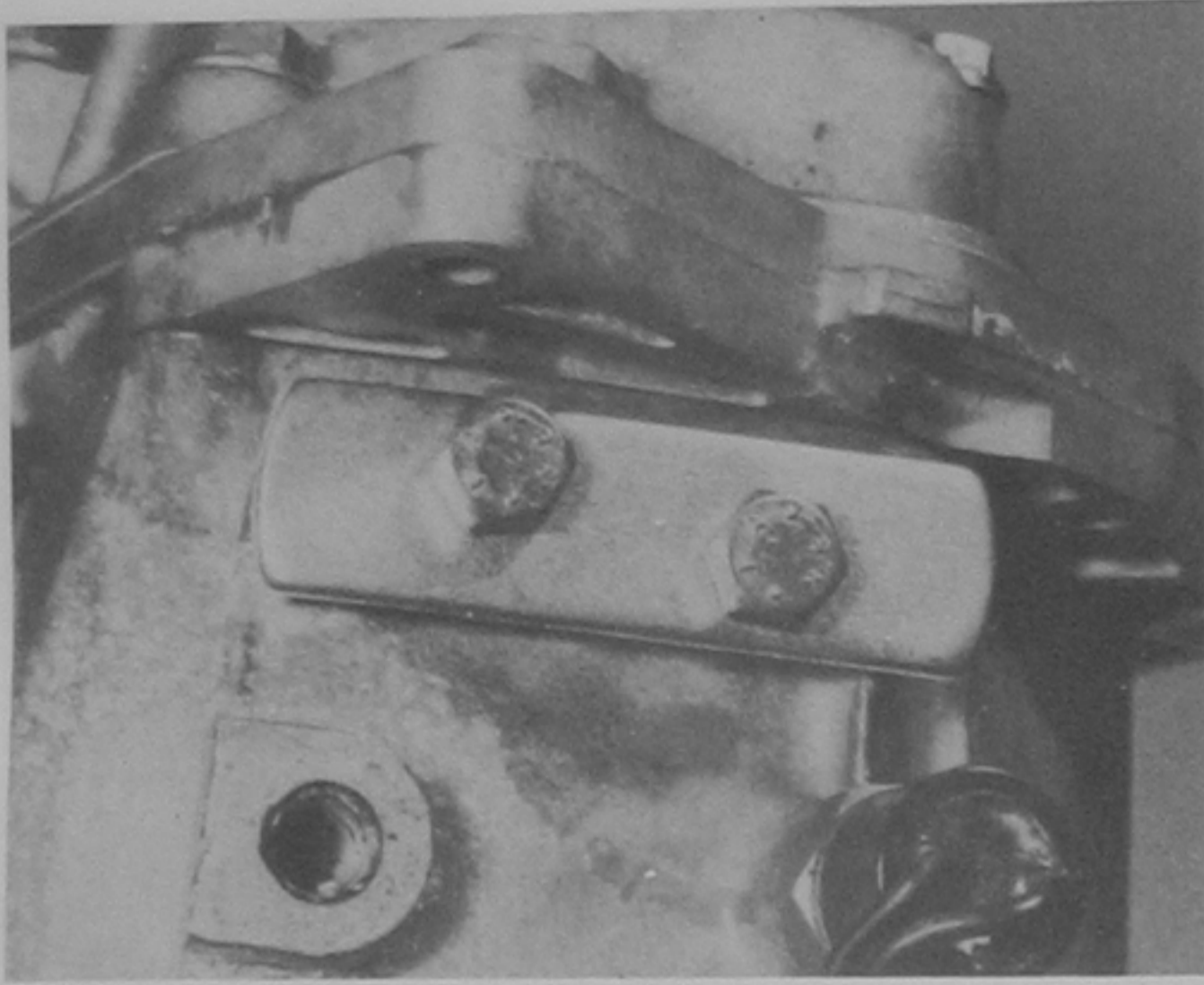
9.31 Fitting end cover and gasket



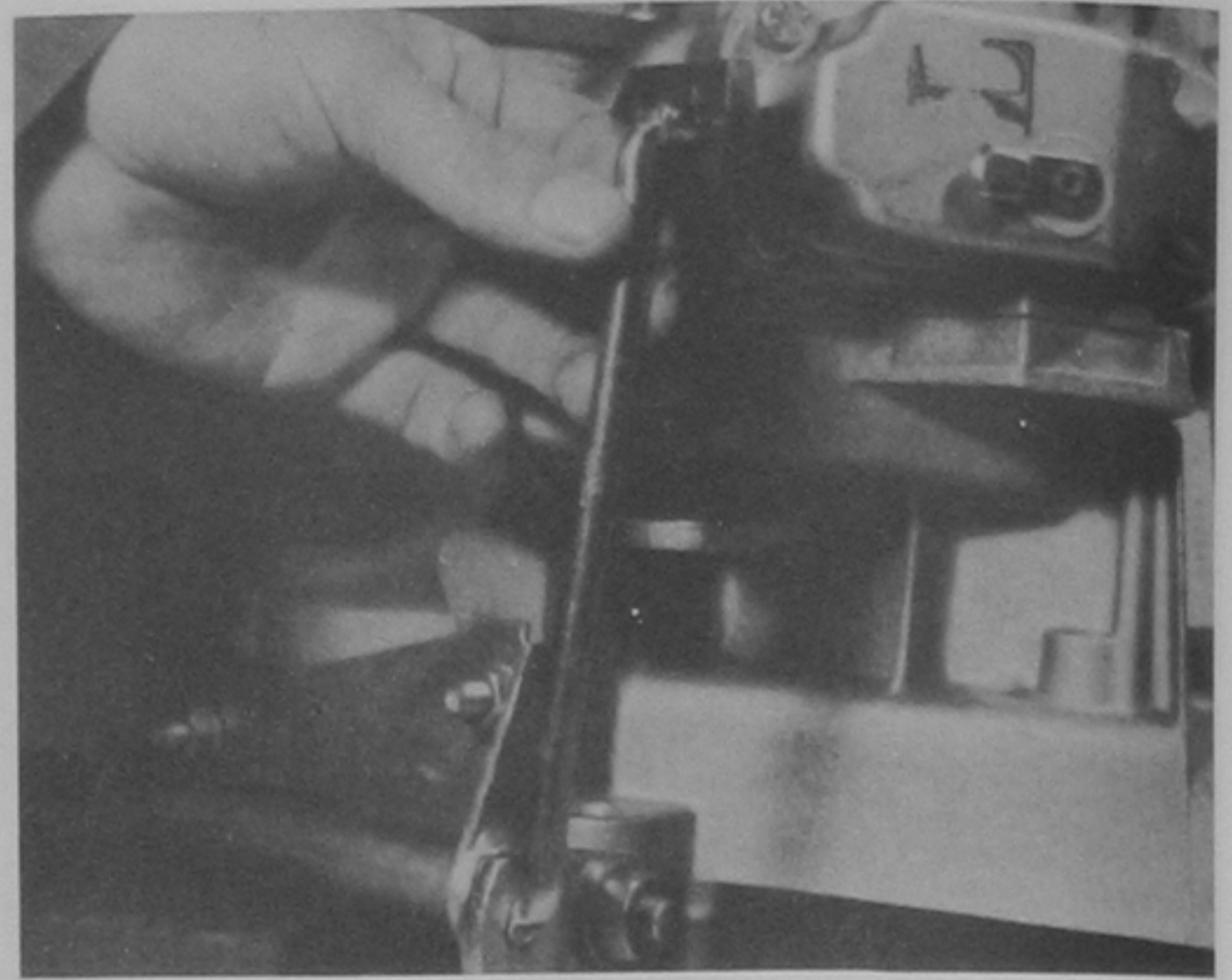
9.32A Detent balls



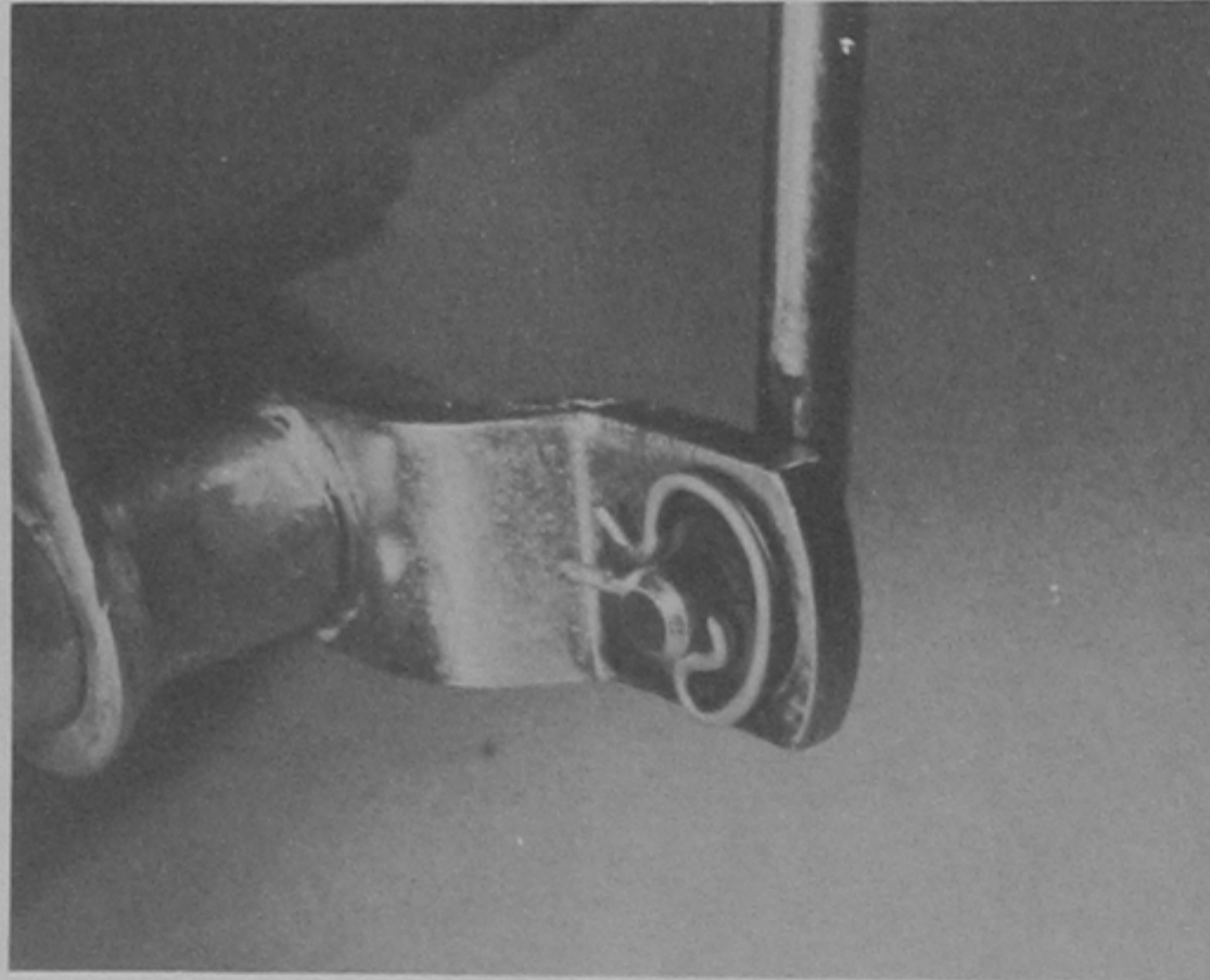
9.32B Detent springs



9.32C Detent spring retaining plate



9.34A Selector link rod



9.34B Selector link rod securing clip

## 10 Fault diagnosis – transmission

Symptom	Reason(s)
Weak or ineffective synchromesh	Synchro baulk rings worn, split or damaged Synchromesh units worn, or damaged
Jumps out of gear	Gearchange mechanism worn Synchromesh units badly worn Selector fork badly worn
Excessive noise	Incorrect grade of oil in gearbox or oil level too low Gear teeth excessively worn or damaged Intermediate gear thrust washers worn allowing excessive end play Worn bearings
Difficulty in engaging gears	Clutch pedal adjustment incorrect
Noise when cornering	Wheel bearing or driveshaft fault Differential fault

**Note:** It is sometimes difficult to decide whether it is worthwhile removing and dismantling the gearbox for a fault which may be nothing more than a minor irritant. Gearboxes which howl, or where the synchromesh can be 'beaten' by a quick gearchange, may continue to perform for a long time in this state. A worn gearbox usually needs a complete rebuild to eliminate noise because the various gears, if re-aligned on new bearings, will continue to howl when different wearing surfaces are presented to each other. The decision to overhaul therefore, must be considered with regard to time and money available, relative to the degree of noise or malfunction that the driver has to suffer.