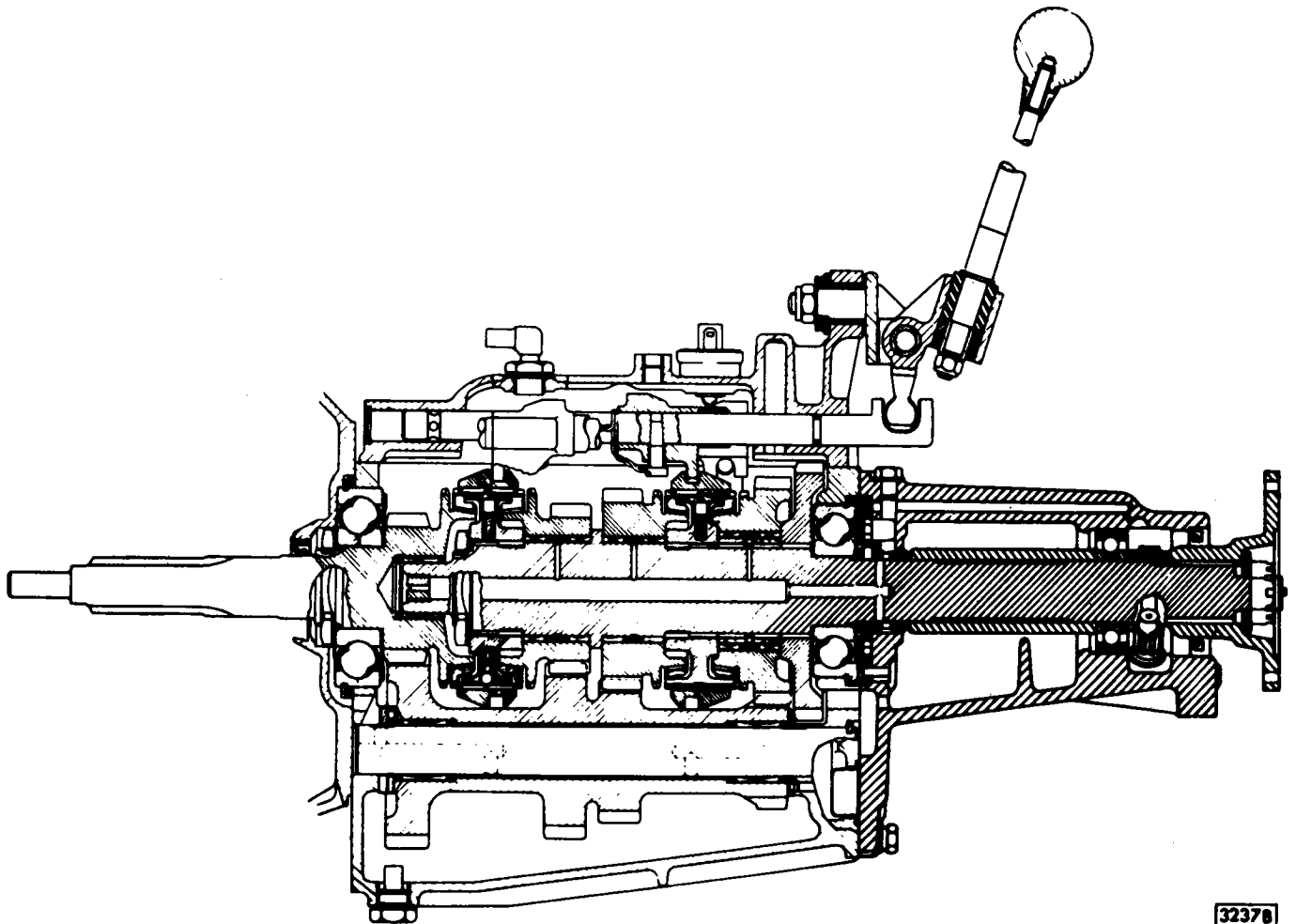


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32378



## DRIVE FLANGE

### Remove and refit

37.10.01

#### Removing

1. Remove engine and gearbox — 12.37.01.
2. Remove clutch assembly — 33.10.01.
3. Remove split pin.
4. Remove castellated nut.
5. Draw drive flange from shaft.

#### Refitting

Reverse operations 1 to 5, using new split pin.

**NOTE:** Fit four bolts before tapping drive flange home on splines.

## REAR EXTENSION

### Remove and refit

37.12.01

#### Removing

1. Remove drive flange — 37.10.01.
2. Remove setscrew and spring washer and withdraw speedometer drive assembly.
3. Remove seven setscrews and spring washers retaining rear extension.
4. Draw rear extension from third motion shaft. Remove all traces of old gasket from rear face of gearbox.
5. On front face of rear extension break staking and remove three countersunk head screws securing oil pump gear housing.
6. Enter two screws in tapped holes and evenly tighten down to withdraw gear housing.
7. Mark gears with ink to ensure correct refitting.
8. Recover oil pump drive sleeve and distance tube.
9. Drift rear oil seal from rear extension.
10. Recover speedometer drive gear.
11. Remove ball bearing race, examine, and replace if necessary.

#### \*\*Refitting\*\*

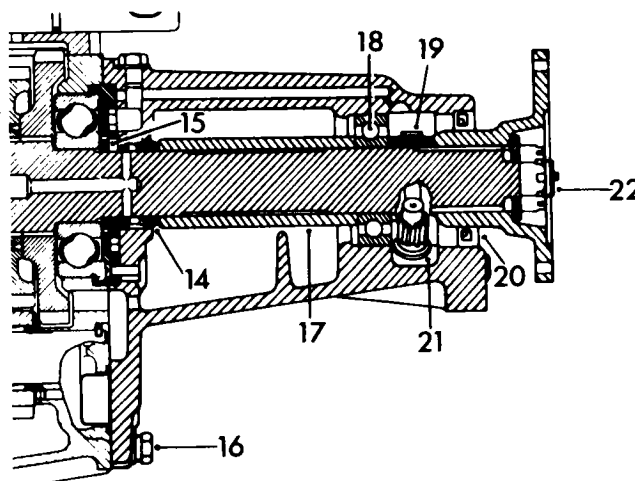
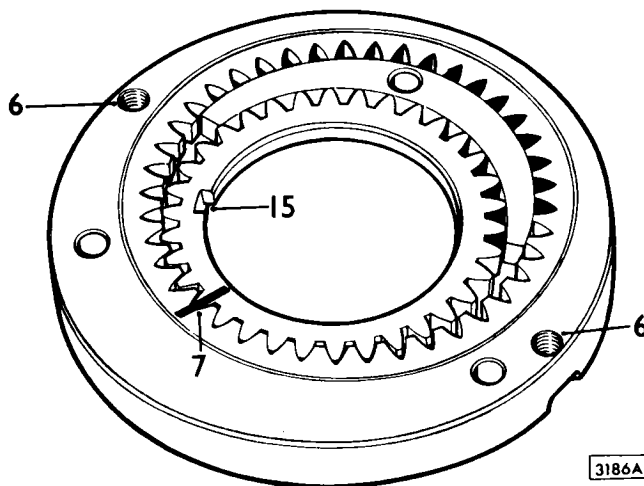
12. Assemble gears to oil pump housing, as marked in operation number 7, and secure housing to gearbox extension using three countersunk head screws.
13. Stake screw heads.
14. Fit oil pump drive sleeve to oil pump gear, long shoulder first.
15. Using new paper gasket, fit rear extension to gearbox.

**NOTE:** Ensure oil pump drive sleeve pin engages with gear.

16. Retain rear extension with seven setscrews and spring washers.
17. Place distance tube into rear extension on shaft.
18. Place ball bearing race on third motion shaft and gently drift home into rear extension.
19. Fit speedometer drive to third motion shaft.
20. Place rear oil seal in position, and tap into position.

**NOTE:** Ensure oil seal seats square.

21. Fit speedometer drive assembly and secure using one setscrew and spring washer.
22. Refit drive flange.



37.10.01  
37.12.01

**BELL HOUSING****Remove and refit****37.12.07****Removing**

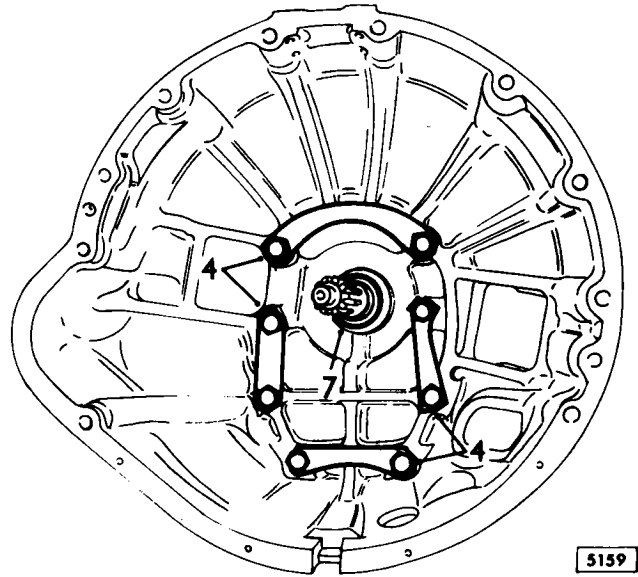
1. Remove engine and gearbox – 12.37.01.
2. Remove clutch assembly – 33.10.01.
3. Remove withdrawal assembly – 33.25.12.
4. Tap back locking tabs and remove eight setscrews.
5. Remove bell housing.
6. Remove all traces of gasket from front face of gearbox.
7. Remove oil seal from bell housing.

**Refitting**

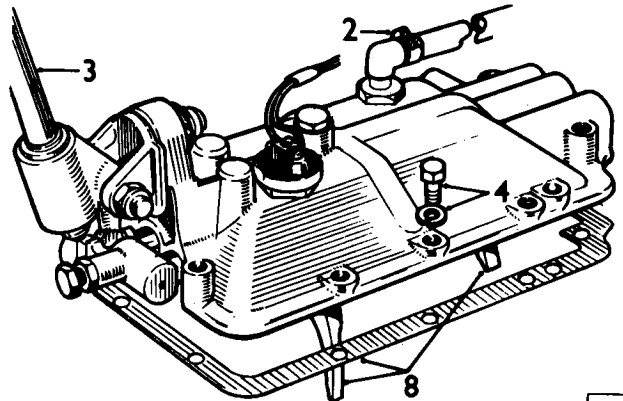
8. Fit new oil seal to bell housing, lip towards gear box.
9. Cover first motion shaft splines with adhesive tape to protect oil seal.
10. Using new gasket, slide bell housing over first motion shaft.
11. Secure bell housing to gearbox using eight setscrews.

**NOTE:** Fit lock plates beneath screws and turn up tabs.

12. Refit withdrawal assembly.
13. Replace clutch assembly.
14. Refit engine and gearbox.



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**TOP COVER****Remove and refit****37.12.16****Removing (gearbox in situ)**

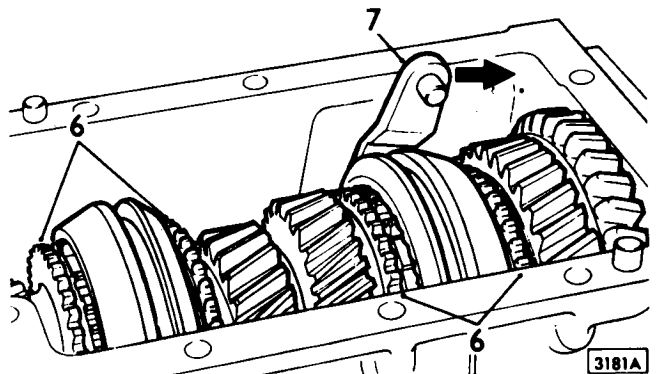
1. Remove gearbox tunnel cover – 76.25.07.
2. Slacken pipe clip on gearbox top cover breather hose; disconnect reverse light cable.
3. Place gear lever in neutral position.
4. Remove ten setscrews and spring washers securing top cover, and lift cover from gearbox.

**NOTE:** Setscrews are of different lengths.

5. Clean all traces of gasket from cover and gearbox.

**Refitting**

6. Ensure gearbox and selectors are in neutral position.
7. Ensure reverse idler gear out of mesh by pushing lever towards rear of gearbox.
8. Using new paper gasket place top cover in position on gearbox. Ensure selector forks engage synchro assemblies.
9. Secure using ten setscrews, noting varying lengths.
10. Refit top cover breather hose and secure pipe clip; reconnect reverse light cable.
11. Refit gearbox tunnel cover.



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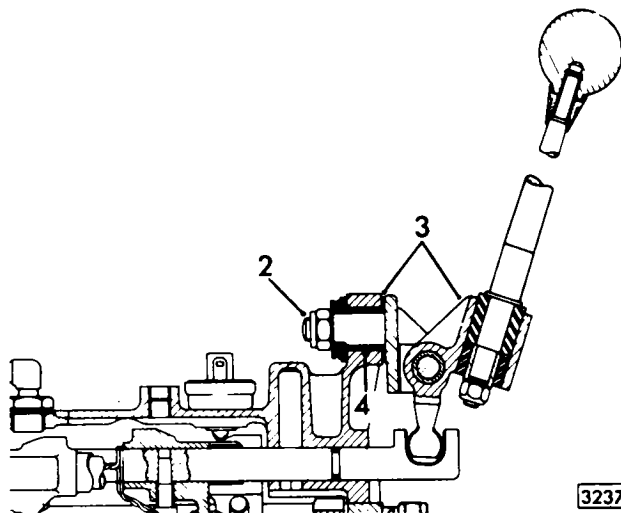
## TOP COVER

### Overhaul

37.12.19

#### Dismantling

1. Remove top cover — 37.12.16.
2. Remove self locking nut and recover coil spring, flat washer and fibre washer securing gear lever assembly to top cover.
3. Withdraw gear lever and recover remaining fibre washer.
4. Press bush from pivot jaw housing.
5. Remove locking wire and remove retaining screws from selector forks and locating arm.
6. Withdraw 3rd/top selector rod and collect selector fork, spacing tube and interlock ball.
7. Withdraw 1st/2nd selector rod and collect selector fork, spacing tube and loose interlock pin in rod.
8. Withdraw reverse selector rod, fork and locating arm.



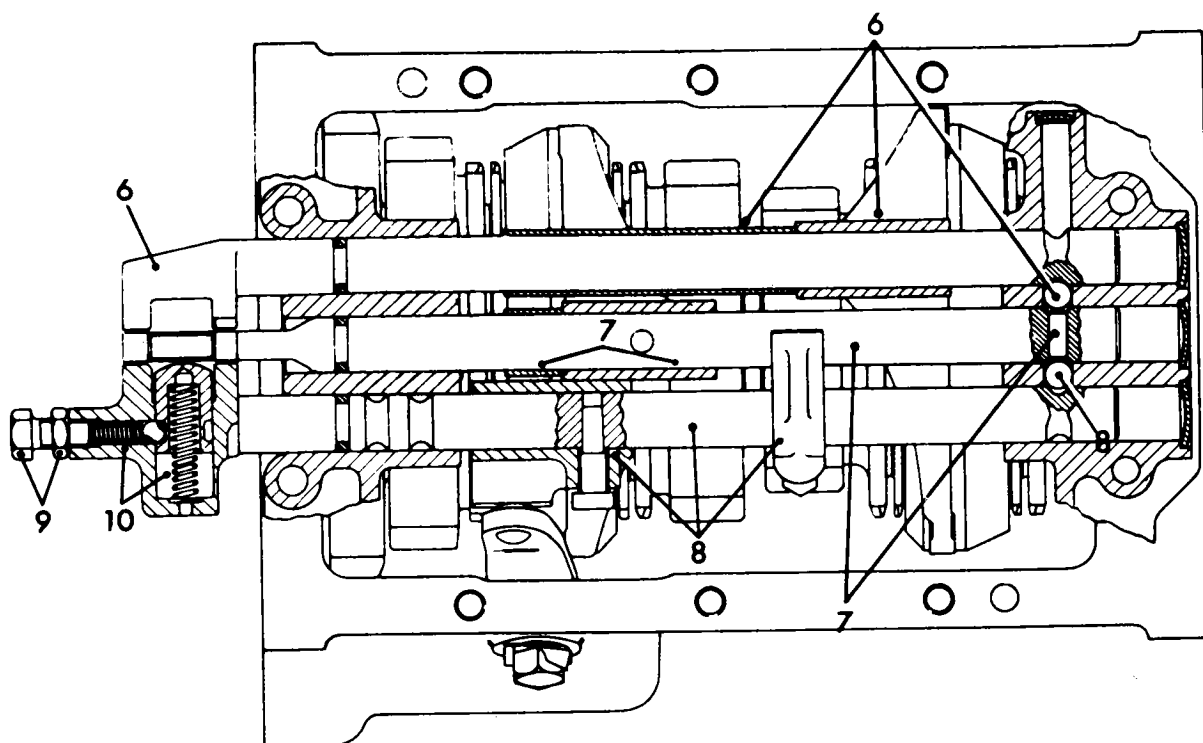
3237D

**NOTE:** Collect reverse rod detent plunger, ball and spring. Collect interlock ball.

9. Release locknut on reverse selector, and slacken setscrew.
10. Recover detent plunger, stop spring, detent ball and spring.

#### Inspection

11. Examine all components for scores and undue wear. Examine ball bearings for pitting. Check springs for length against new items.
12. Remove 'O' ring seals from selector rods, and fit new.



3239A

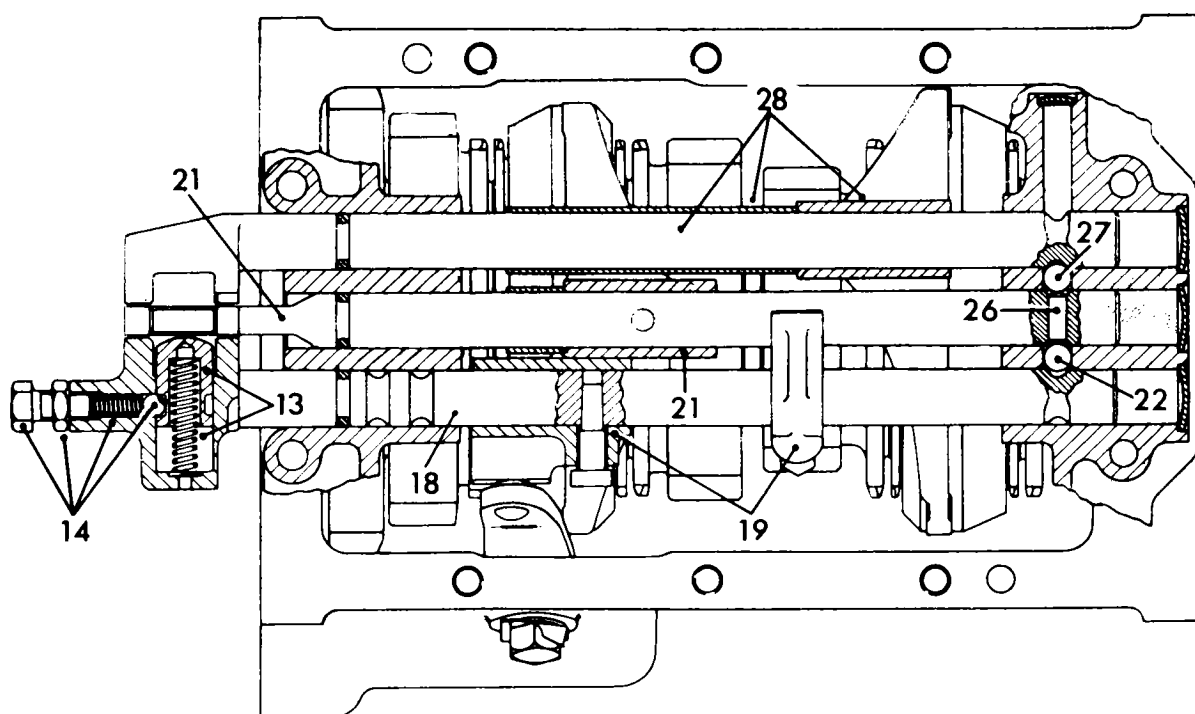
## Assembling

13. Fit detent plunger and spring to reverse selector rod.
14. Fit detent ball, spring setscrew and lock-nut.
15. Press detent plunger fully home, and tighten setscrew to lock plunger.
16. Slowly slacken setscrew until plunger is released and detent ball engages in groove.
17. Restrain setscrew and tighten locknut.
18. Place reverse selector rod detent spring, plunger and ball in its housing. Depress plunger and fit selector rod.
19. Fit selector fork and locating arm to reverse selector rod.
20. Fit retaining screws.
21. Fit 1st/2nd selector rod into cover far enough to collect selector fork and spacing tube.
22. Place top cover on its side, reverse selector rod downwards, and carefully push an interlock ball through 1st/2nd selector rod hole at front of top cover. Locate ball in hole in casting, against groove in reverse selector rod.
23. Push 1st/2nd selector rod into hole to retain ball in groove.

**NOTE:** Take care not to push ball ahead of rod.

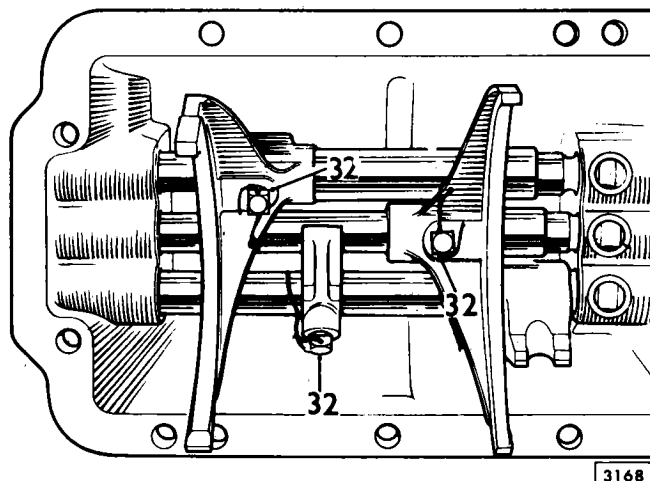
24. Fit retaining screw to 1st/2nd selector fork.
25. Check interlock by ensuring selector rods will not move together, and that moving one locks the other.
26. Carefully place interlock plunger through 3rd/top selector rod hole at front of top cover. Gently manipulate 1st/2nd rod until plunger drops through.
27. Ensure reverse and 1st/2nd selector rods level and carefully push second interlock ball through 3rd/top hole to rest in hole in casting.
28. Pass 3rd/top selector rod through hole in top cover and fit selector fork and spacing tube.
29. Push 3rd/top selector rod into hole to retain ball in groove.

**NOTE:** Take care not to push ball ahead of rod.



## SYNCHROMESH GEARBOX

30. Fit locating screw.
31. Check interlock by ensuring selector rods will not move together, and that moving one locks both the others.
32. Check tighten four locating screws and wirelock each to its fork.
33. Fit new bush to pivot jaw housing. Lightly ream to size, using jaw pivot pin as a gauge.
34. Fit fibre washer to gear selector pivot jaw pin.
35. Push pin through bush in top cover and secure with fibre washer, flat washer, coil spring and self locking nut.
36. Refit top cover.



## GEAR CHANGE LEVER ASSEMBLY

### Remove and refit

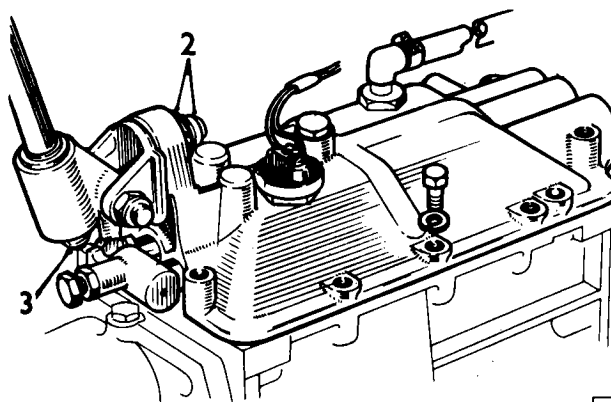
37.16.04

#### Removing

1. Remove gearbox tunnel cover — 76.25.07..
2. Remove self locking nut and recover coil spring, flat washer and fibre washer securing gear lever assembly to top cover.
3. Remove self locking nut and special washer securing gear change lever to gear selector lever.
4. Taking care not to damage threads, tap gear lever up through bush.
5. Recover one plain washer.

#### Refitting

Reverse operations 1 to 5.



## GEAR CHANGE LEVER DRAUGHT EXCLUDER

### Remove and refit

37.16.05

#### Removing

1. Disconnect battery — 86.15.19.
2. Remove console assembly — 76.25.01.
3. Remove six drive screws securing draught excluder ring.
4. Remove draught excluder.

#### Refitting

Reverse operations 1 to 4.

37.12.19  
37.16.04  
37.16.05



## GEAR CHANGE LEVER ASSEMBLY

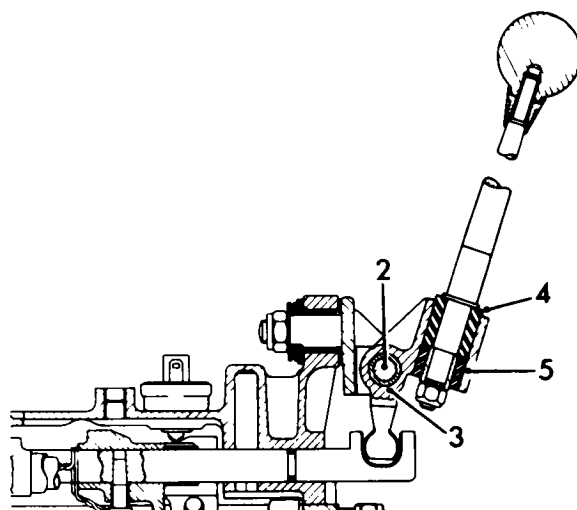
## Overhaul

37.16.10

**NOTE:** Remove gear change lever assembly — 37.16.04. Bush in gearbox top cover for gear selector pivot jaw pin is normally included in top cover overhaul and if replacement is necessary top cover may have to be removed.

## Dismantling

1. Remove self locking nut securing pivot pin in pivot jaw.
2. Tap pivot pin from pivot jaw and recover two fibre washers and one spring washer.
3. Using a suitably sized mandrel, tap, or press pivot pin bush from selector lever.
4. Prise upper bush from selector lever.
5. Using a suitably sized mandrel, tap, or press lower bush from selector lever.



## Reassembling

6. Fit new lower bush to selector lever, pressing in from underside, until rubber is flush with selector lever.
7. Press new upper bush into selector lever.
8. Fit new pivot pin bush to selector lever. Lightly ream to size, using pivot pin as gauge.
9. Locate selector lever between pivot jaws and retain using pivot pin, spring washer, tufnol washer, selector lever and tufnol washer.
10. Secure pivot pin using self locking nut.
11. Refit gearchange lever assembly.

## GEARCHANGE SELECTORS

## Remove and refit

37.16.31

**NOTE:** Follow procedure given under 37.12.19, top cover overhaul, as necessary to change selectors.



## GEARBOX ASSEMBLY

### Overhaul

37.20.04

**NOTE:** Remove engine and gearbox – 12.37.01.  
Remove clutch assembly – 33.10.01.  
Remove bell housing – 37.12.07.  
Remove rear extension – 37.12.01.  
Remove top cover – 37.12.16.

### Dismantling

1. Remove fibre plug at front end of countershaft.
2. Drive out countershaft from front of gearbox casing.

**CAUTION:** Ensure rear thrust washer (pegged to casing) drops down in clockwise direction, viewed from rear of casing, as countershaft is withdrawn. This is to avoid trapping the washer with reverse gear when driving mainshaft forward.

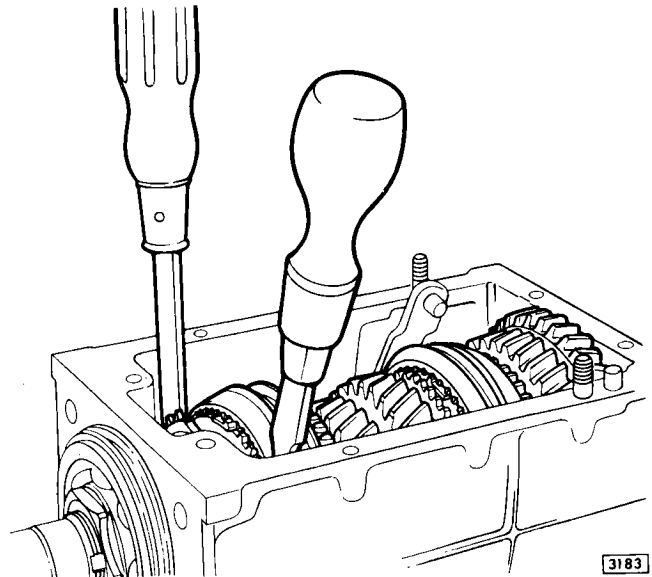
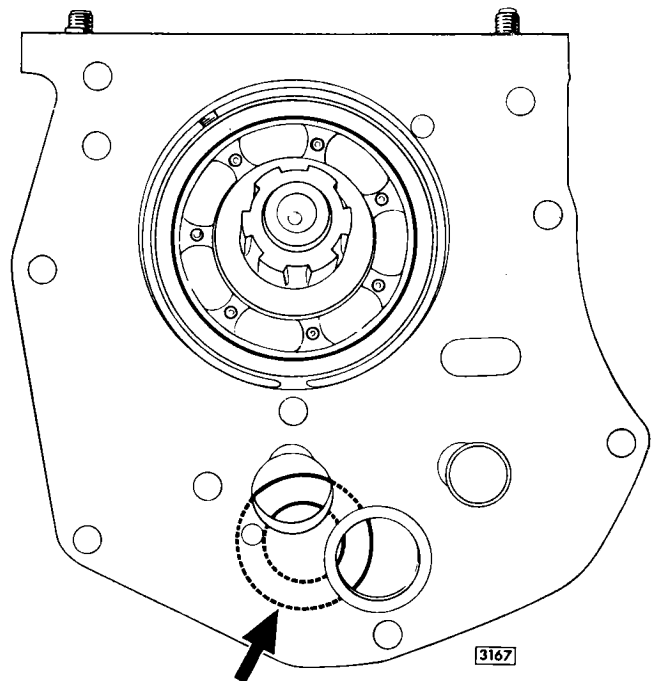
3. Rotate first motion shaft until cutaway portions of driving gear are facing top and bottom of casing.

**NOTE:** Check endfloat of 1st, 2nd and 3rd gears on mainshaft to be within limits given. Endfloat limits can only be restored by fitting new parts.

1st gear – end float on mainshaft .13 – .18 mm (.005 in – .007 in.).

2nd gear – end float on mainshaft .13 – .20 mm (.005 in. to .008 in.).

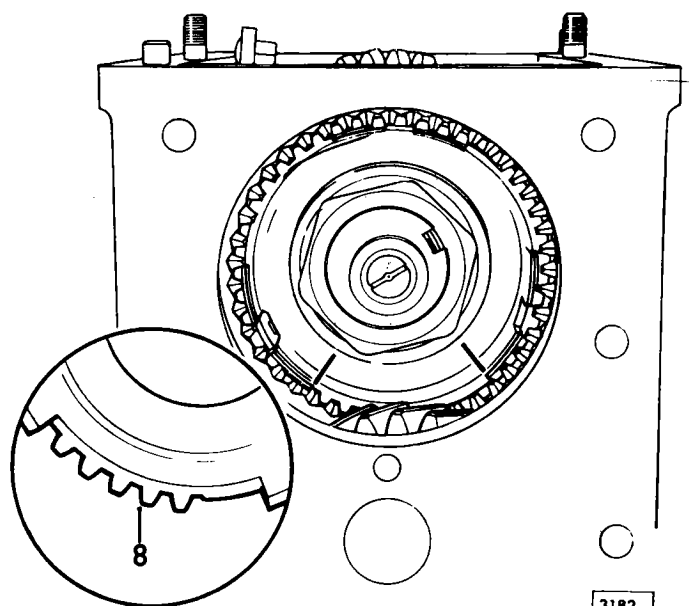
3rd gear – end float on mainshaft .13 – .20 mm (.005 in. to .008 in.).



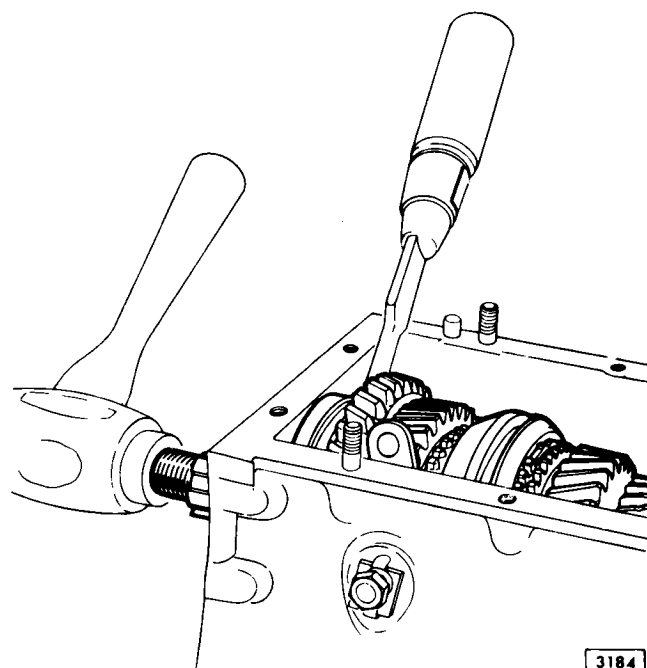
4. With the aid of two levers, ease first motion shaft and front bearing assembly forward until it can be withdrawn. Recover top gear synchro gear.
5. Remove spigot bearing from inside first motion shaft.
6. Tap back tab washer and remove large nut, tab washer and oil thrower.
7. Tap shaft sharply against a metal plate to dislodge bearing.
8. Rotate mainshaft until one of the cutaway portions of 3rd/top synchro hub is in line with countershaft.

**NOTE:** Otherwise hub will foul countershaft.

9. Tap or press mainshaft forward through rear bearing ensuring that reverse gear is kept tight against first gear.
10. Remove rear bearing from casing and fit hose clip to mainshaft to prevent reverse gear from sliding off.
11. Slacken reverse lever bolt until lever can be moved to rear.



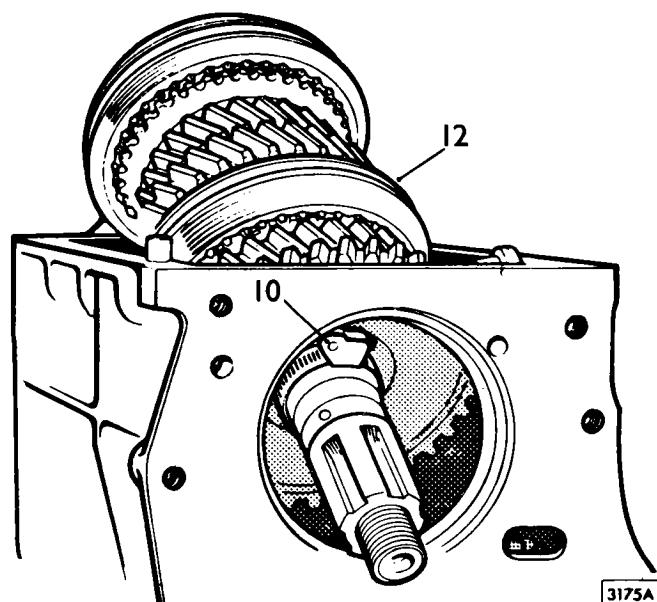
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12. Lift out mainshaft forward and upward.
13. Lift out countershaft cluster gear and collect needle bearings, inner and outer thrust washers, and retaining rings.
14. Withdraw reverse idler shaft and lift out gear.

**CAUTION:** Needle roller bearings are graded by size, and, if re-used, must be kept together as sets, and replaced in the location from which they were removed.



3175A



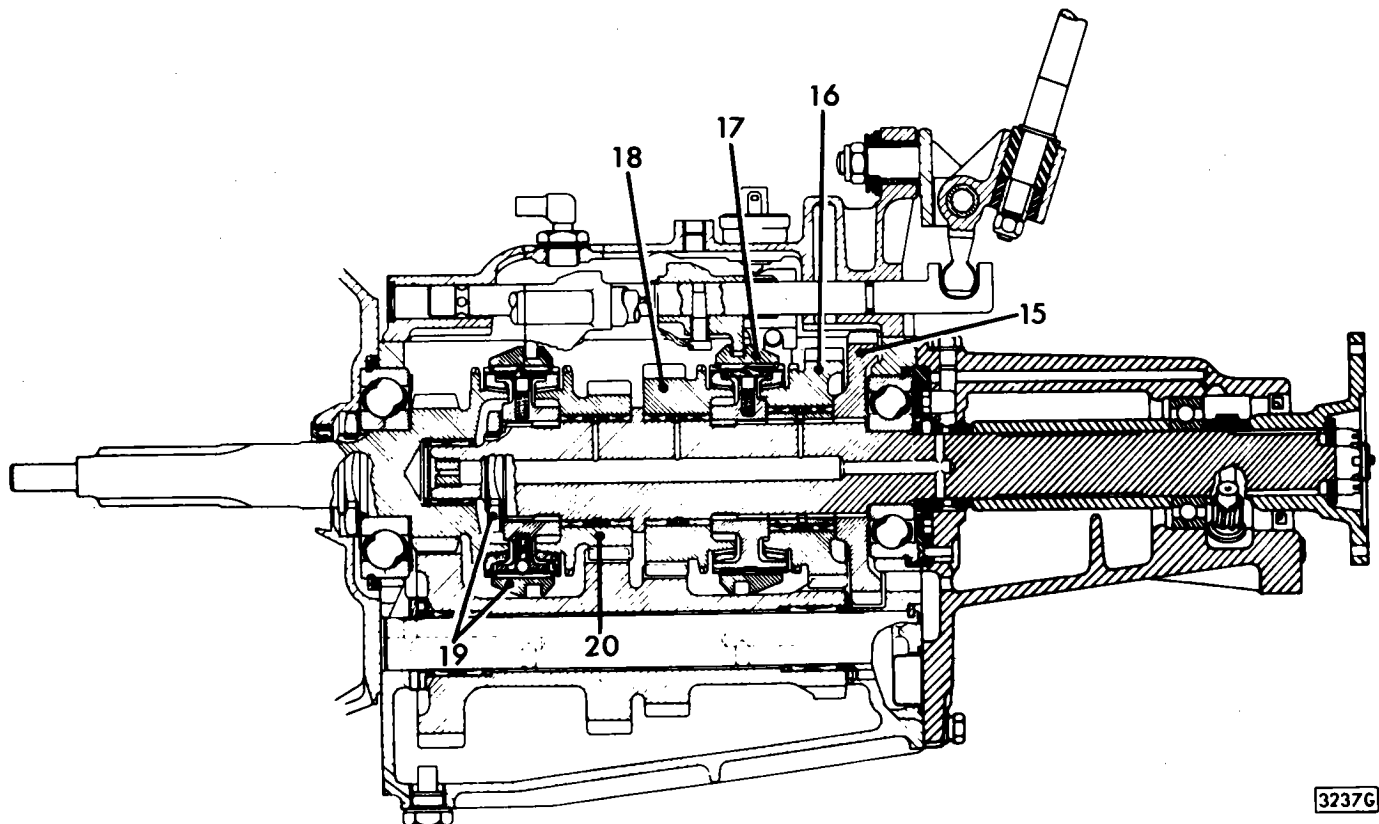
15. Remove hose clip retaining reverse gear and withdraw gear.
16. Withdraw 1st gear and collect 120 needle rollers, spacer and sleeve.
17. Withdraw 1st/2nd synchro assembly and collect two loose synchro rings.
18. Withdraw 2nd speed gear and collect 106 needle rollers. Leave spacer on mainshaft.
19. Tap back tab washer and remove large nut retaining 3rd/top synchro assembly from mainshaft. Collect loose synchro ring.
20. Withdraw 3rd speed gear and collect 106 needle rollers and spacer.
21. Wrap synchro assemblies, in turn, with cloth and push synchro hub from operating sleeve. Collect synchro detent balls and springs, thrust members, plungers and springs.

### Inspection

Check all components for undue wear, signs of overheating, scores, or excessive clearances. Thoroughly clean out gearbox casing.

Ensure oil-ways in mainshaft unobstructed by blowing out with shop airline, and thoroughly washing in solvent. Dry carefully.

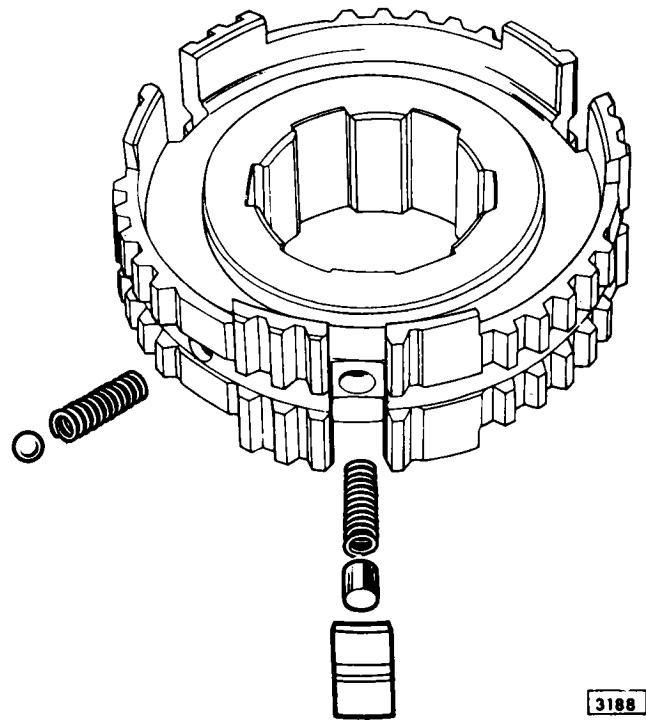
If needle rollers are to be replaced owing to damage, rollers of one grade only must be used at each location.



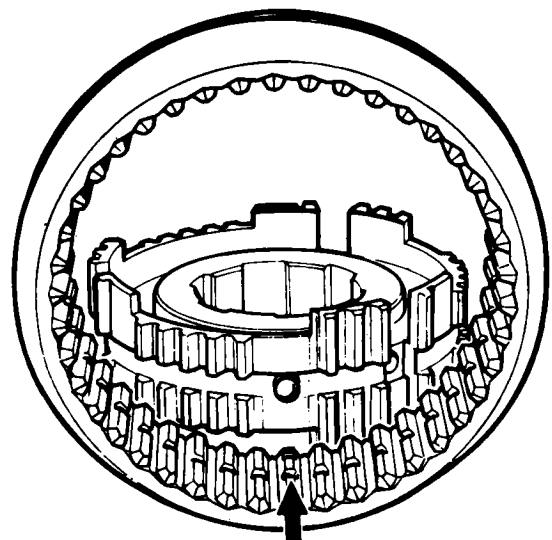
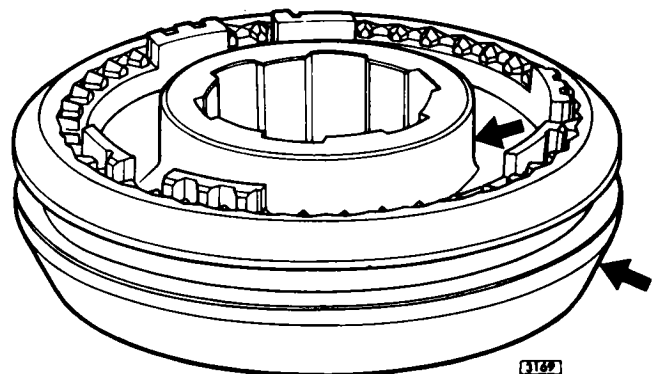
3237G

# Reassembling

22. Assembly procedure for both synchro assemblies is the same as synchro assemblies are identical.
23. Assemble synchro hub to operating sleeve with wide boss of hub on opposite side to wide chamfer end of sleeve.

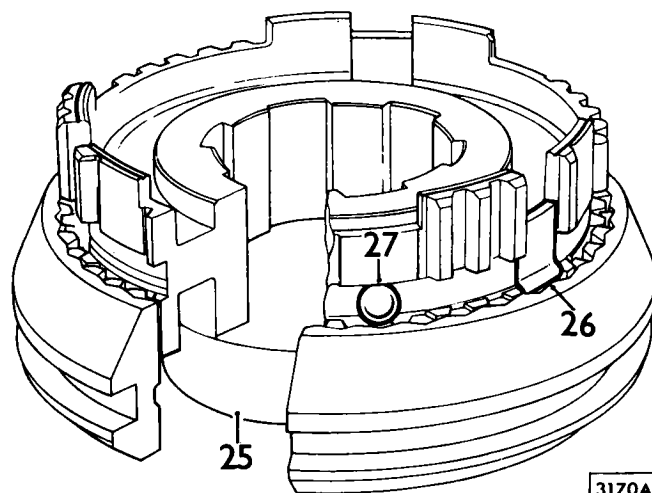


24. Assemble three balls and springs in line with operating sleeve teeth having three detent grooves.
25. Pack up synchro hub so that holes for balls and springs are exactly level with top of operating sleeve.

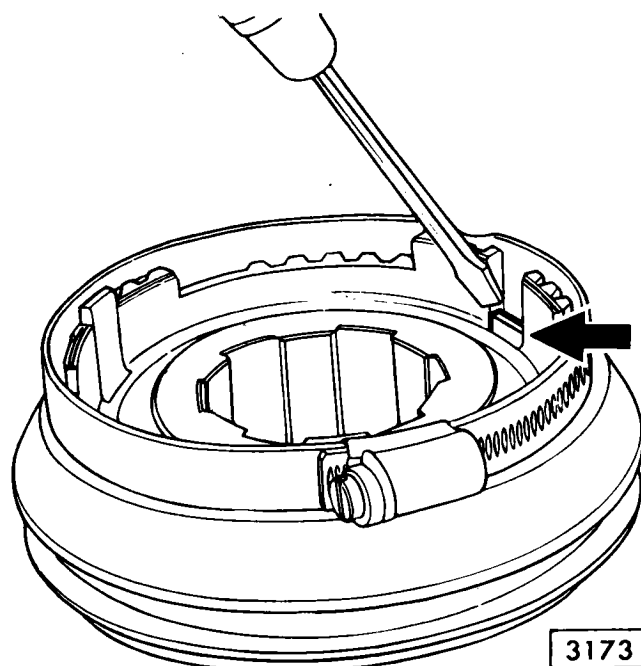
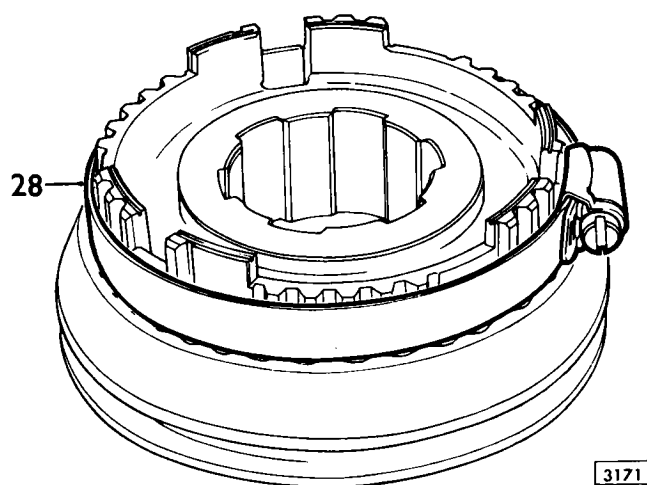


## SYNCHROMESH GEARBOX

26. Fit three springs, plungers and thrust members to their correct positions with grease. Press thrust members down as far as possible.
27. Fit three springs and balls to remaining holes.



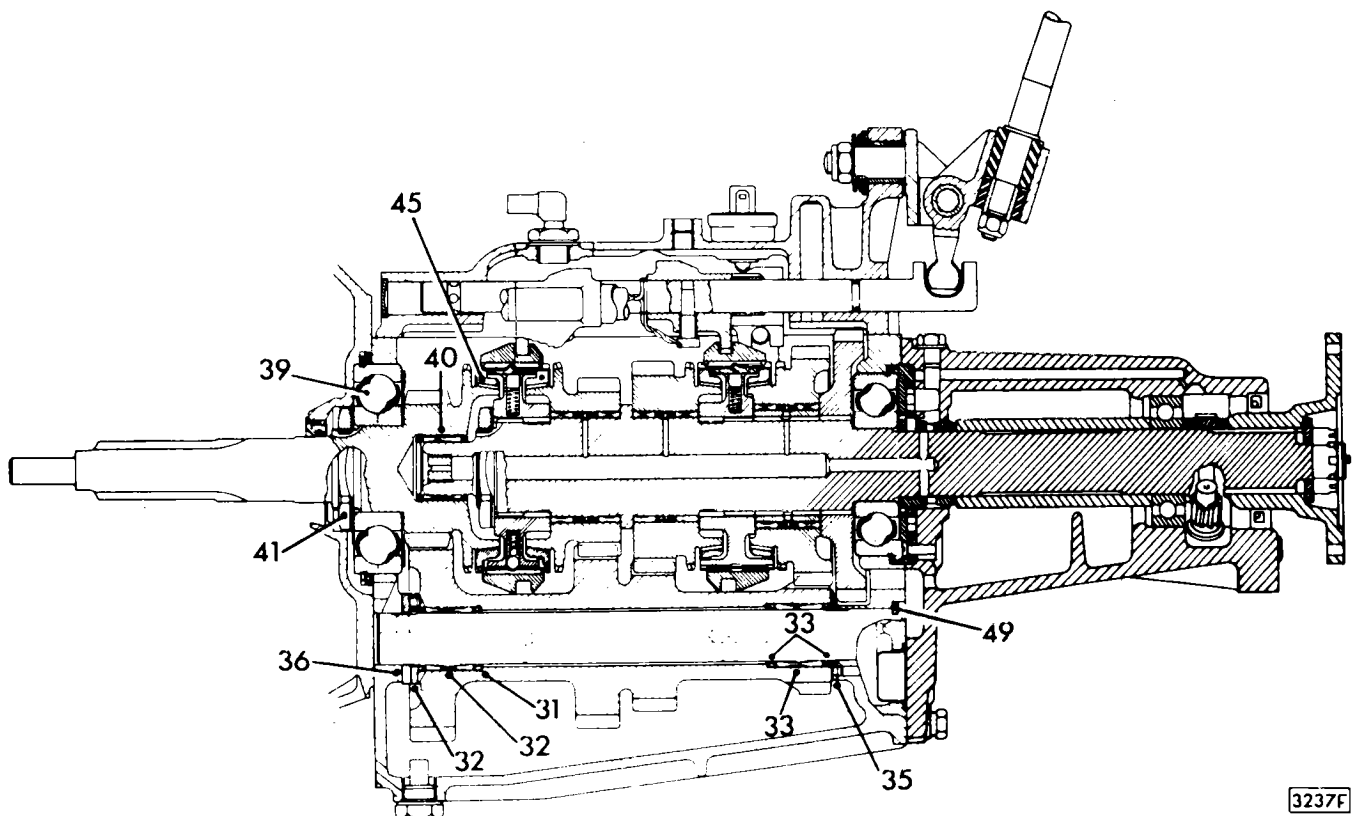
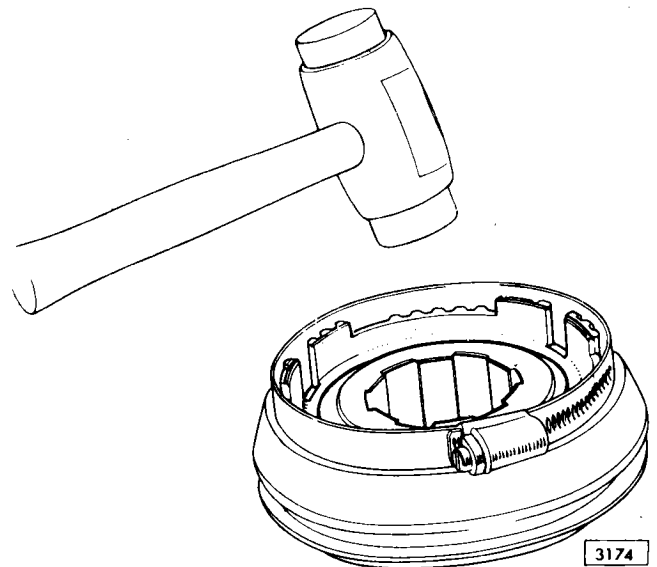
28. Compress springs with large hose clip or piston ring clamp and carefully lift synchro assembly from packing piece.
29. Depress hub slightly and push down thrust members with a screwdriver until they engage neutral groove in operating sleeve.
30. Tap hub down using hide or lead hammer until balls can be heard and felt to engage with neutral groove (second click).



31. Fit one retaining ring in front (large gear) end of cluster gear.
32. Locate 29 needle rollers with grease and fit inner thrust washer.

**CAUTION:** Ensure peg on washer locates in groove in cluster gear.

33. Fit a retaining ring, 29 needle rollers, and second retaining ring in rear of cluster gear.
34. Fit reverse idler gear, lever and idler shaft to casing.
35. Locate pegged rear washer on its boss with grease.
36. Locate outer thrust washer to front of cluster gear with grease.



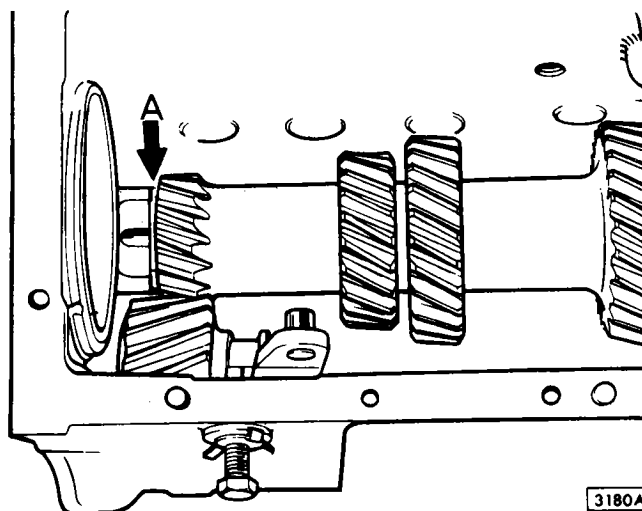
37. Carefully lower cluster gear into position, large gear to front of casing.
38. Insert a dummy countershaft and check clearance between rear thrust washer and cluster gear. Dimension A; 0.10 mm to .15 mm (0.004 in. to 0.006 in.).

**NOTE:** If necessary obtain selective outer thrust washers to adjust to these limits. (Large gear end of cluster gear).

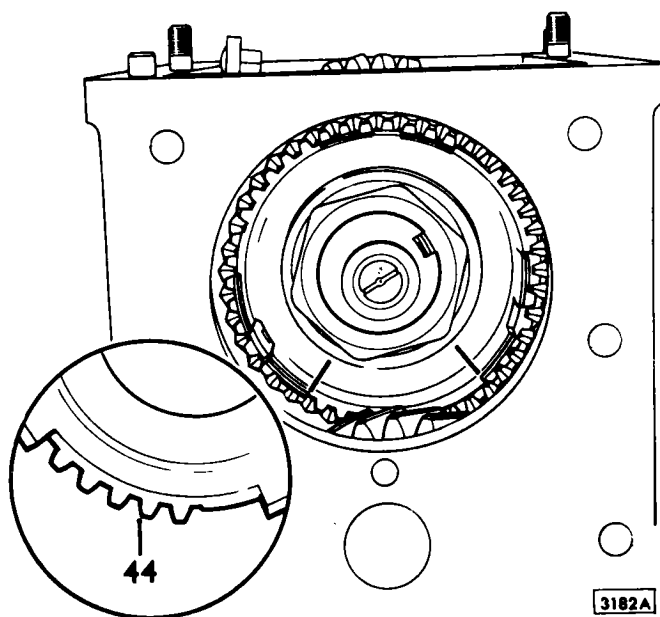
39. Fit front ball bearing to 1st motion shaft and press square to shoulder of gear.
40. Fit bearing race in rear of 1st motion shaft.
41. Retain ball bearing with new tab washer and nut. Turn down tab washer.

Using new parts as required by operation 3 or Inspection assemble mainshaft by reversing operations 15 to 20 inclusive.

42. Withdraw dummy countershaft and simultaneously substitute a thin rod. Keep rod in contact with dummy shaft until shaft is clear of casing.
43. Enter mainshaft through top of casing and pass rear of shaft through bearing hole.
44. Enter 1st motion shaft through front of casing with cutaway portions of driving gear at top and bottom.
45. Position synchro ring to locate on front face of 3rd/top synchro hub.
46. Tap 1st motion shaft into position entering front end of mainshaft into spigot bearing.
47. Hold 1st motion shaft in position, and, with a hollow drift, tap rear bearing into position.
48. Enter countershaft from rear to collect cluster gear. Withdraw thin rod and lever cluster gear up into mesh.
49. Tap countershaft, through from rear, fitting key before driving home.
50. Fit new fibre plug at front of countershaft bore.
51. Fit top cover.
52. Fit rear extension.
53. Fit bell housing.
54. Fit clutch assembly.
55. Fit engine and gearbox to car.



3180A



3182A

**REAR OIL SEAL****Remove and refit** 37.23.01**Removing**

1. Remove engine and gearbox — 12.37.01.
2. Remove drive flange — 37.10.01.
3. Remove oil seal.

**NOTE:** While removing oil seal, take care not to damage oil seal seat in rear extension.

**Refitting**

4. Fit new oil seal lip inwards.
5. Fit drive flange.
6. Fit engine and gearbox.

**FRONT OIL SEAL****Remove and refit** 37.23.06**Removing**

1. Remove engine and gearbox — 12.37.01.
2. Remove clutch assembly — 33.10.01.
3. Remove bell housing — 37.12.07.
4. Remove oil seal.

**NOTE:** While removing oil seal take care not to damage oil seal seat in bell housing.

**Refitting**

5. Fit new oil seal, lip towards gearbox.
6. Fit bell housing.
7. Fit clutch assembly.
8. Fit engine and gearbox to car.

**SPEEDOMETER DRIVE GEAR****Remove and refit** 37.25.01**Removing**

1. Remove engine and gearbox — 12.37.01.
2. Remove drive flange — 37.10.01.
3. Remove rear oil seal.

**NOTE:** While removing oil seal take care not to damage oil seal seat in rear extension.

4. Screw speedometer drive gear from pinion and withdraw from rear extension.

**Refitting**

Reverse operations 1 to 4.  
Use new oil seal.





## SPEEDOMETER DRIVE PINION

### Remove and refit

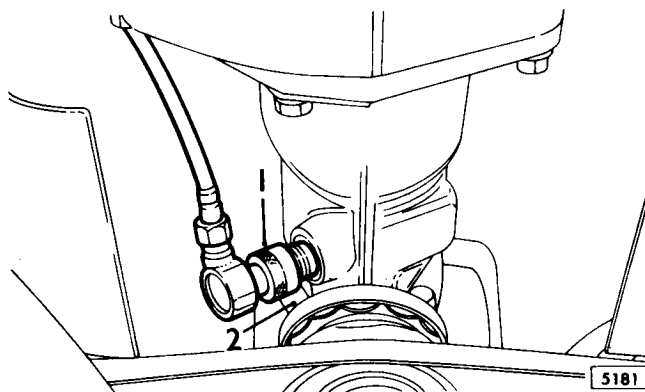
37.25.05

#### Removing

1. Beneath car, release sleeve securing right angle drive to pinion housing.
2. Remove setscrew and plain washer and draw pinion and housing from gearbox.

#### Refitting

Reverse operations 1 and 2.



## REVERSE LIGHT SWITCH

### Remove and refit

37.27.01

#### Removing

1. Remove gearbox tunnel cover — 76.25.07.
2. Detach cables from cable connector.
3. Unscrew reverse light switch.

#### Refitting

Reverse operations 1 to 4 using new gasket.

