

PART 4 (43)
GEARBOX
M 30—M 40
120, 140

CARS

SERVICE MANUAL

CONTENTS

Specifications	1
Tools	2
Description	3
Repair instructions	5
Work which can be carried out with the gearbox installed	5
Removing	6
Dismantling	7
Inspecting	9
Assembling	9
Fitting	13
Fault Tracing	14

Illustrations A and B

SPECIFICATIONS

(Concerning gearbox with overdrive [M 31, M 41], see also "P, Part 4 [43], Overdrive")

Type designation	M 30	M 40 "
Reduction ratios:		
1st speed	3.13: 1	3.13: 1
2nd speed	1.55: 1	1.99: 1
3rd speed	1: 1	1.36: 1
4th speed	—	1: 1
Reverse	3.25: 1	3.25: 1
Number of teeth for the various gears:		
Input shaft	19 teeth	19 teeth
Intermediate shaft, drive gear	27 "	27 "
gear for 1st speed	15 "	15 "
gear for 2nd speed	22 "	20 "
gear for 3rd speed	—	23 "
gear for reverse	14 "	14 "
Mainshaft, gear for 1st speed	33 "	33 "
gear for 2nd speed	24 "	28 "
gear for 3rd speed	—	22 "
gear for reverse	32 "	32 "
Reverse	19 "	19 "
Lubricant*)	Gear oil	
viscosity	SAE 80	
Oil capacity*)	0.75 litre (1.32 Imp. pints = 1.58 US pints)	

*) Concerning lubricant and oil capacity for gearboxes with overdrive, see "P, Part 4 (43), Overdrive".

TOOLS

The following special tools are used for repairs on the gearbox

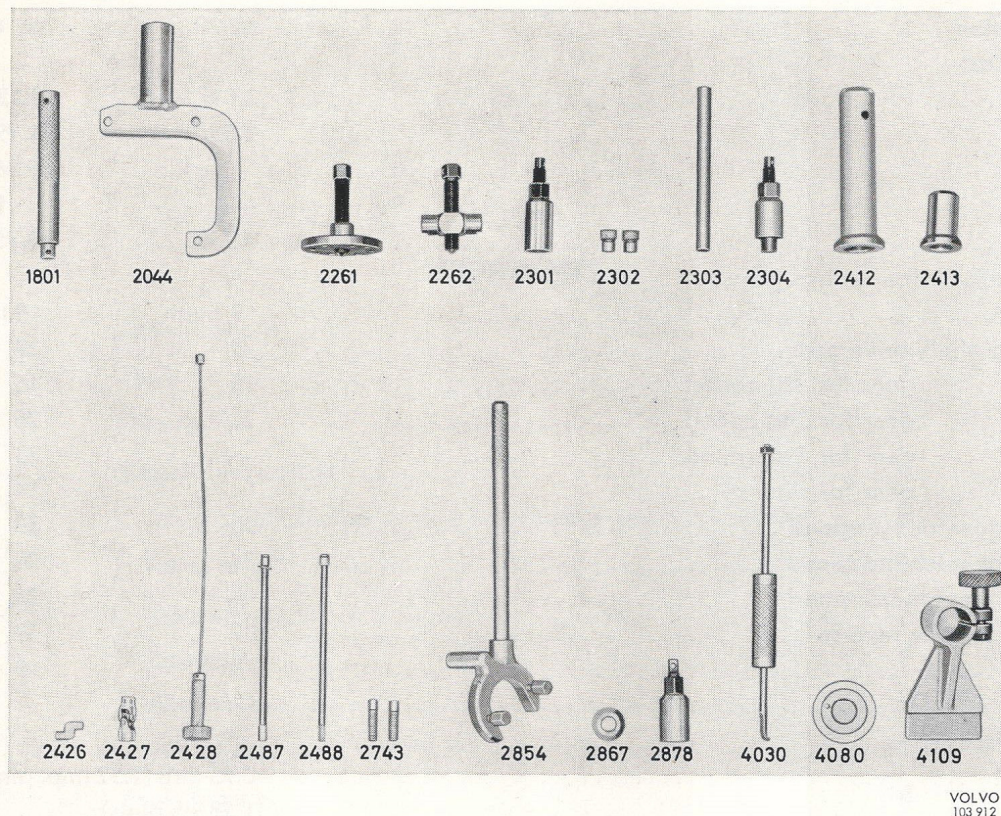


Fig. 1. Special tools

- | | | | |
|----------|--|----------|---|
| SVO 1801 | Standard handle 18×200 mm. | SVO 2428 | Wire spanner for screwing and unscrewing gearbox bolts (for vehicles with B 16 engine). |
| SVO 2044 | Fixture for gearbox when dismantling and assembling. (Used together with SVO 4109.) | SVO 2487 | Hex spanner 3/8" for upper gearbox bolts (for vehicles with B 18 and B 20 engines). |
| SVO 2261 | Puller for round flange. | SVO 2488 | Hex spanner 8 mm (5/16") for upper gearbox bolts (for vehicles with B 18 engine). |
| SVO 2262 | Puller for flange with u-forks. | SVO 2743 | Dowels for gearbox. |
| SVO 2301 | Extractor for removing reverse shaft with milled groove. | SVO 2854 | Counterhold for flange (handle used only for automatic transmission). |
| SVO 2302 | Drift for thrust washer. Used (2) together with SVO 2303 for fitting the idler gear. | SVO 2867 | Drift for fitting oil seal in cover for input shaft. |
| SVO 2303 | Drift for fitting idler gear. | SVO 2878 | Extractor for removing reverse shaft with turned groove. |
| SVO 2304 | Press tool for fitting flange. | SVO 4030 | Extractor for oil seal on flange. |
| SVO 2412 | Drift for fitting bearing on input shaft, for bearing in rear cover for output shaft (early prod.) and for fitting input shaft in housing. | SVO 4080 | Drift for fitting bearing on rear cover, late prod. |
| SVO 2413 | Drift for fitting oil seal in rear cover. | SVO 4109 | Stand for fixture SVO 2044. |
| SVO 2426 | Key for locking and tightening gearbox bolts (for vehicles with B 16 engine). | | For removing gearboxes on the 140-series, the following tool is also used: |
| SVO 2427 | Universal joint for spanners SVO 2426, SVO 2487 and SVO 2488. | SVO 2727 | Suspension tool for engine (see Fig. 22). |

DESCRIPTION

(Concerning gearbox with overdrive (M 31, M 41), see also "P, Part 4 (43) Overdrive")

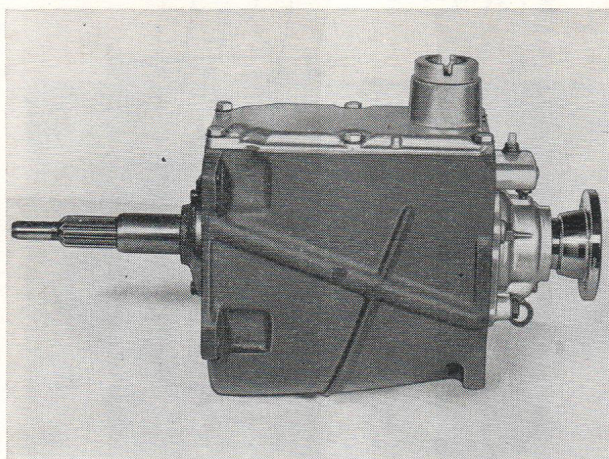
VOLVO
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Fig. 2. Gearbox M 40

The new Volvo fully synchronized gearboxes have type designation M 30 and M 40. The M 30 is a three-speed and the M 40 a four-speed gearbox. A fully synchronized gearbox means that there is synchroni-

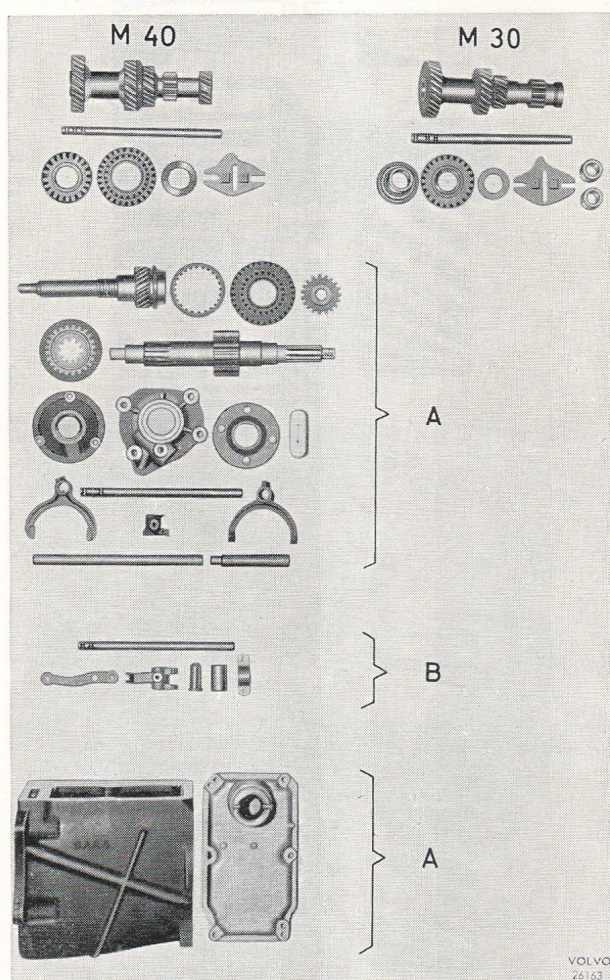
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Fig. 3. Comparison between components,
M 30—M 40

A. Identical components

B. Not fitted on M 30

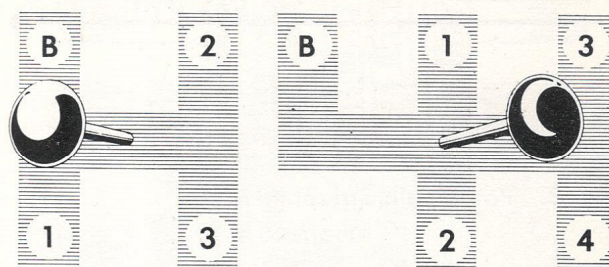
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Fig. 4. Gear lever positions -

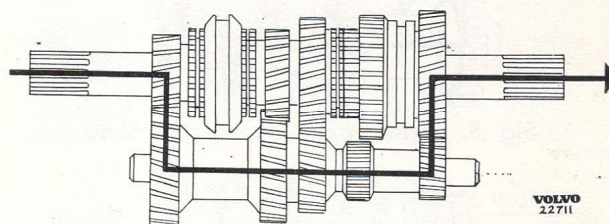
VOLVO
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Fig. 5. Power path, 1st speed, M 40

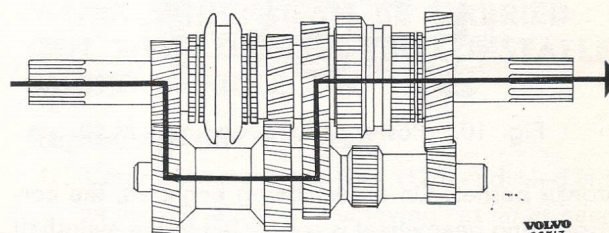
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Fig. 6. Power path, 1st speed M 30
2nd speed M 40

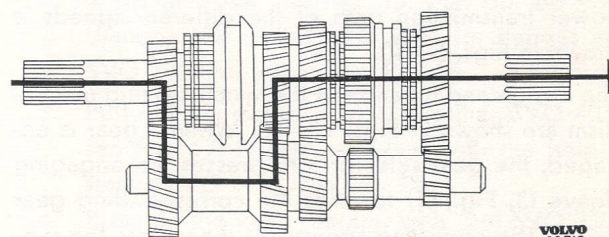
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Fig. 7. Power path, 2nd speed M 30
3rd speed M 40

zation on all the forward gears. The two types of gearboxes are constructed with as many mutual components as possible, see Fig. 3. The structural differences chiefly consist in the 1st gear on the M 40 mainshaft being replaced by a spacer sleeve and the 2nd and 3rd gears becoming 1st and 2nd gears respectively. The displaceable reverse drive on the M 40 has been fixed by means of two spacer sleeves on the M 30.

The construction of the gearboxes is shown in Figs. 2, 3 and Illustrations A and B. All gears with the exception of reverse are in constant mesh with one another. In neutral the gears on the mainshaft rotate freely. For this reason they are provided with

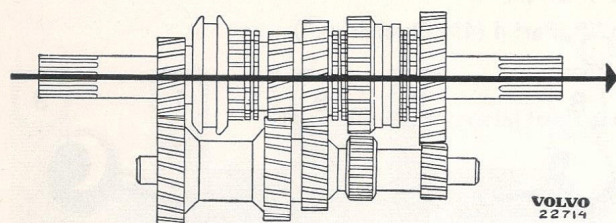


Fig. 8. Power path, 3rd speed M 30
4th speed M 40

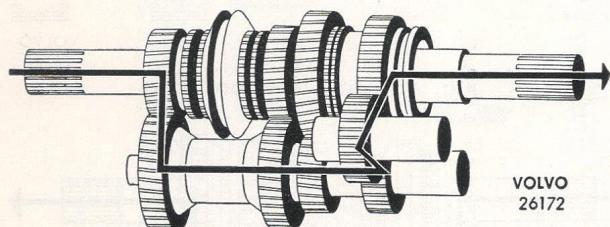


Fig. 9. Power path, reverse gear M 30

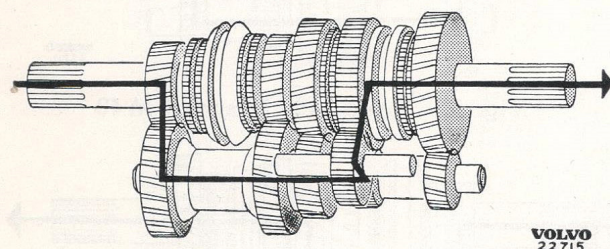


Fig. 10. Power path, reverse gear M 40

bronze bushes. On a gear being engaged, the corresponding gear wheel is connected to the mainshaft by means of an engaging sleeve.

The gear lever positions are shown in Fig. 4. The power transmission path of the different speeds is shown in Figs. 5—10.

The design and function of the synchronizing mechanism are shown in Figs. 11—13. When a gear is engaged, the gear selector fork presses the engaging sleeve (3, Fig. 11) towards the corresponding gear wheel. The engaging springs (4) then press the synchronizing cone (2) against the cone on the gear wheel (1). If the synchronizer and gear wheel are rotating at different speeds, the synchronizing cone will turn in relation to the engaging sleeve. However, the synchronizing cone is prevented from turning more than half a tooth-width by the engaging springs, see Fig. 12. The teeth on the synchronizing cone then have half their width in contact with the teeth on the engaging sleeve and in this way prevent it from engaging. Due to the friction between the synchronizing cone and the cone on the gear wheel, the gear wheel attains the same rotational speed as the synchronizer. When they are both rotating at the same speed, the engaging sleeve is able to turn back the synchronizing cone and the gear engages, see Fig. 13.

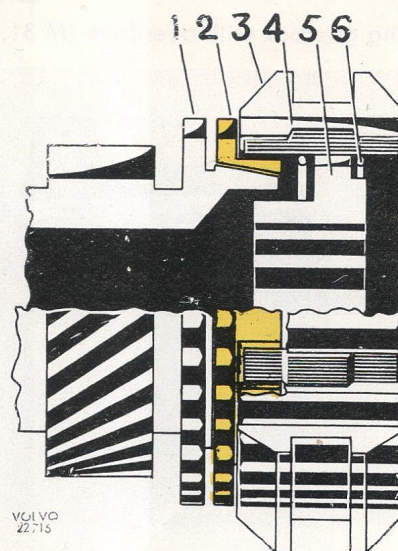


Fig. 11. Neutral position

- | | |
|-----------------------|----------------------|
| 1. Ring gear | 4. Engaging spring |
| 2. Synchronizing cone | 5. Synchronizing hub |
| 3. Engaging sleeve | 6. Spring |

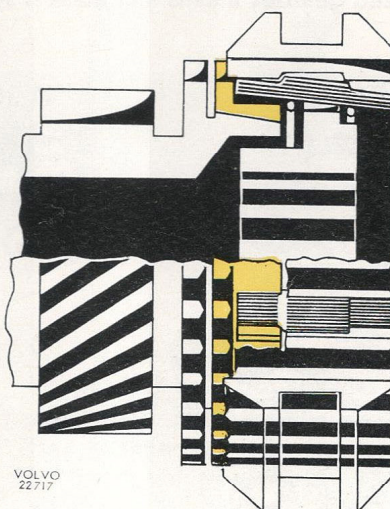


Fig. 12. Synchronizing

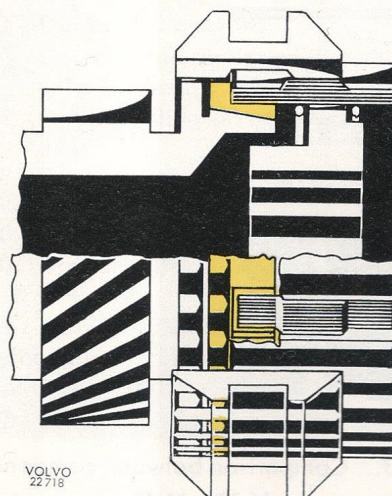


Fig. 13. Gear engaged

REPAIR INSTRUCTIONS

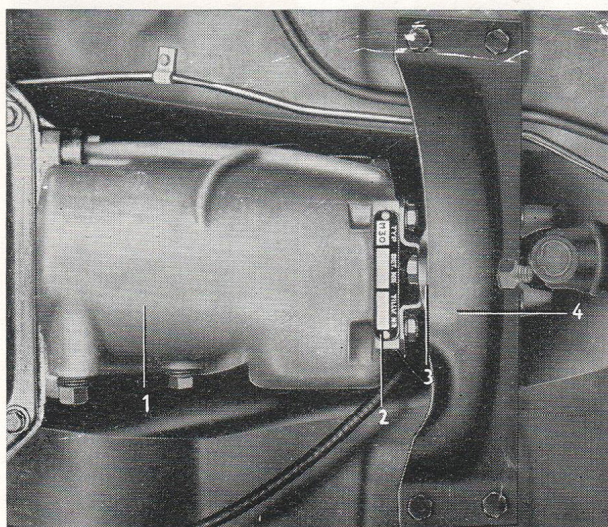


Fig. 14. Gearbox installed, 120

- | | |
|-----------------|----------------------|
| 1. Gearbox | 3. Rubber cushion |
| 2. Number plate | 4. Supporting member |

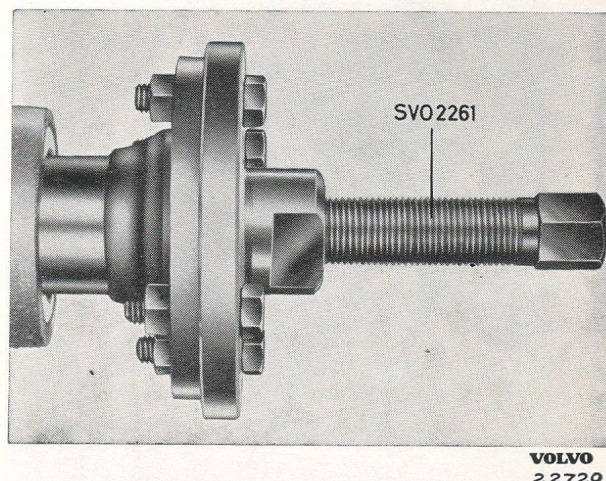


Fig. 16. Removing the yoke (flange)

WORK WHICH CAN BE CARRIED OUT WITH THE GEARBOX INSTALLED IN THE VEHICLE

Replacing the oil seal

1. Carry out operations 1—4 (120) and 1—5 (140) under the heading "Removing" as far as necessary.
2. Slacken the yoke (flange) nut. Use SVO 2854 as a counterhold, see Fig. 15. Pull off the yoke (flange). Use puller SVO 2261 for flanges and SVO 2262 for yokes, see Fig. 16.
3. Pull out the old oil seal with puller SVO 4030, see Fig. 17. Fit the new seal with the help of sleeve SVO 2413, see Fig. 18.
4. Press on the yoke (flange) with tool SVO 2304, see Fig. 19. Fit the remaining parts.

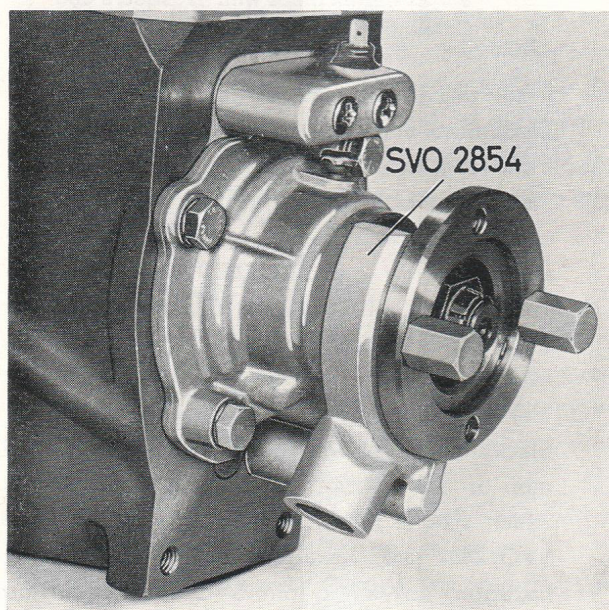


Fig. 15. Counterhold for yoke (flange)

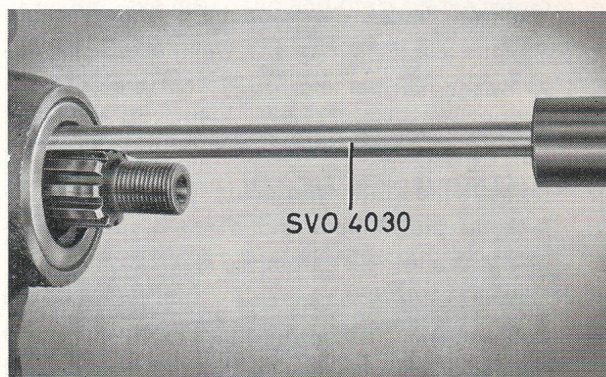


Fig. 17. Removing the oil seal

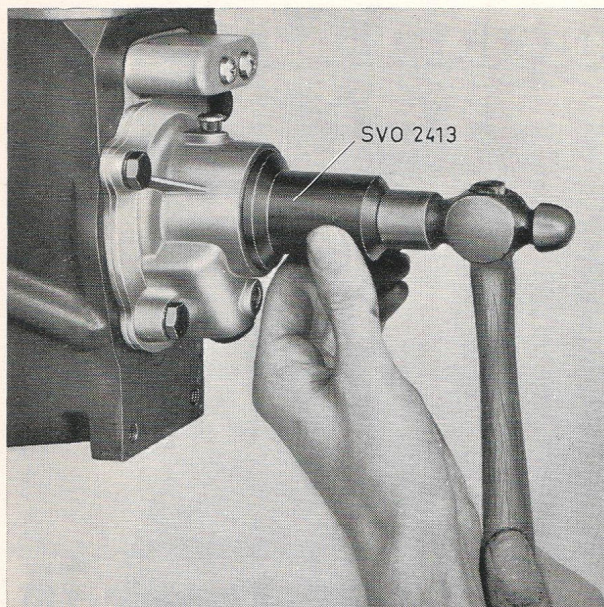


Fig. 18. Fitting the oil seal

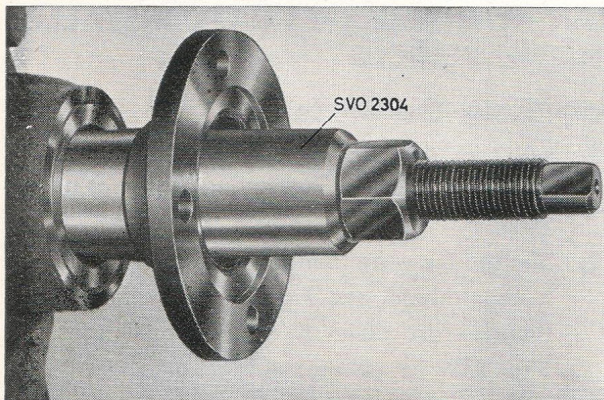


Fig. 19. Fitting the yoke (flange)

REMOVING, 120

1. Drain off the coolant. Disconnect the upper radiator hose and the hoses from the engine to the heater. Take off the exhaust pipe at the manifold flange. Disconnect the battery cable and the cable to the oil pressure gauge. Unscrew the thermometer body and sender of the oil pressure gauge. Disconnect the throttle control.
2. Remove the rubber protector and gear lever.
3. Jack up the vehicle and place blocks underneath. Drain the oil from the gearbox.
4. Support under the gearbox with a jack. Loosen and remove the supporting member under the gearbox. Disconnect the front universal joint from the gearbox yoke (flange). Disconnect the speedometer cable. Place a wooden block be-

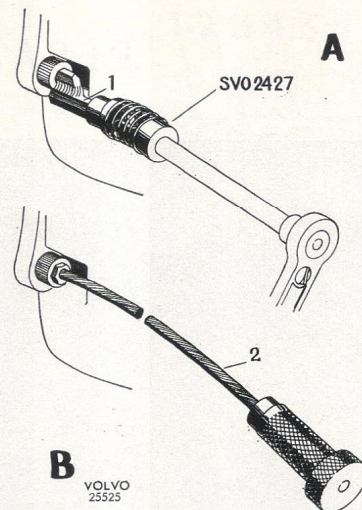


Fig. 20. Removing the gearbox bolts, vehicles with B 16 engine

- | | |
|------------------------------|-------------|
| A. Slackening and tightening | 1. SVO 2426 |
| B. Screwing in and out | 2. SVO 2428 |

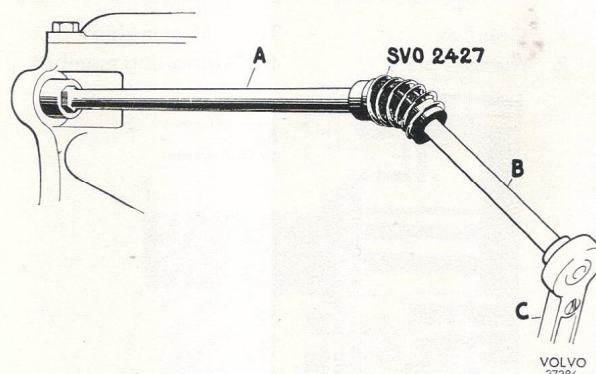


Fig. 21. Removing the gearbox bolts, vehicles with B 18 engine

- A. SVO 2487 or 2488
 B = Extension piece with $\frac{3}{8}$ " square end
 C = Ratchet handle

tween the engine and cowl and lower the jack. Disconnect the leads for the back-up light.

5a. Vehicles with B 16 engine:

Slacken the bolts which hold the gearbox to the clutch casing with the help of spanner SVO 2426 and swivelling joint SVO 2427, see A, Fig. 20. Tool SVO 2428 is then used for screwing out the bolts, see B, Fig. 20. Pull out the gearbox to the rear.

b. Vehicles with B 18 or B 20 engine:

Slacken the gearbox retaining bolts with an 8 mm or $\frac{3}{8}$ " socket spanner depending on which size is fitted. For the upper bolts use SVO 2487 ($\frac{3}{8}$ " hexagon) or SVO 2488 (8 mm hexagon), swivelling joint SVO 2427, extension piece with $\frac{3}{8}$ " square end and ratchet handle, see Fig. 21. Pull out the gearbox to the rear.

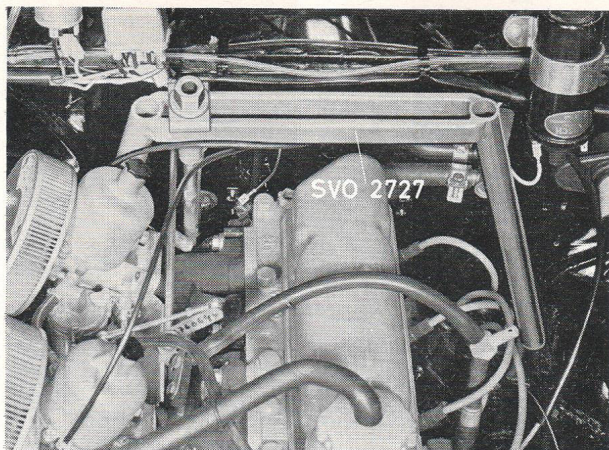


Fig. 22. Suspending the engine, 140

REMOVING, 140

1. Fix tool SVO 2727 on the engine, see Fig. 22. Place the lifting hook round the exhaust pipe.
2. Remove the rubber protector and gear lever.
3. Jack up the vehicle and place blocks underneath. Begin with the rear end. Drain the oil from the gearbox.
4. Loosen and remove the supporting member under the gearbox. Disconnect the front universal joint from the gearbox yoke (flange). Disconnect the speedometer cable. Disconnect the rear engine mounting and the bracket for the exhaust pipe.
5. Lower the rear end of the engine about 2 cm (0.8"). (The distance can be suitably adjusted with the nut on tool SVO 2727.) Then slacken the lines for the reversing lights and overdrive, if fitted.
6. Slacken the right upper and left lower gearbox bolts with spanner SVO 2487, swivelling joint SVO 2427, extension piece with 3/8" square end and ratchet handle, see Fig. 21. Fit the two guide pins SVO 2743, see Fig. 40. Slacken the other two bolts. Pull out the gearbox backwards and lower it.

DISMANTLING

The following description applies to gearboxes without overdrive. If the gearbox is fitted with an overdrive, unscrew the bolts in the rear end and remove the overdrive. Then carry out the operations described below as far as necessary:

1. Secure stand SVO 4109 and fixture SVO 2044 in a vice. Place the gearbox in the fixture.
2. Unscrew the bolts for the gearbox cover. Lift off the cover. Remove the springs and interlock balls for the selector rails.

3. Remove the cover over the selector rails. Unscrew the selector fork bolts.
- 4a. M 30:
Slide the selector fork backwards to the reverse position. Drive out the pin.
- 4b. M 40:
Slide the selector fork backwards to 1st speed position. Drive out the pin slightly (it must not foul the 1st speed gear wheel). Then move the selector fork forwards sufficiently to allow the pin to pass in front of the gear wheel. Drive out the pin.
5. Slide out the selector rails. When doing this, hold the selector forks so that they do not come askew and jam on the rails. Remove the selector forks.
6. Unscrew the bolts for the rear cover. Turn the cover so that it does not lock the shafts for the idler and reverse gears (early prod. only. On late prod. there is no locking tab). Drive out the shaft for the idler gear. **N.B. The shaft must be driven out backwards.** Let the idler gear fall into the bottom of the gearbox.
7. Pull out the mainshaft.
8. Unscrew the bolts and remove the cover over the input shaft. Prise out the oil seal from the cover with a screwdriver or similar.
9. Drive out the input shaft. If necessary, remove the circlip and press the ball bearing off the shaft.
10. Take out the idler gear. Pull out the shaft for the reverse gear. Use puller SVO 2301 for early prod. shafts with milled groove and SVO 2878 for shafts with turned groove, see Fig. 23. Take out the reverse gear and other parts.

Dismantling the mainshaft

M 30 Gearbox

- 1a. Gearbox with overdrive (M 31):
Remove the circlip and press off the rotor for the overdrive oil pump. Remove the circlip for the mainshaft rear bearing. Slide the engaging sleeve for 1st speed and reverse forwards. Place the shaft in a press and support under the rear cover. Press out the shaft as shown in Fig 24.
- 1b. Gearbox without overdrive:
Unscrew the yoke (flange) nut. Use tool SVO 2854 as a counterhold, see Fig. 15. Pull off the yoke (flange). Use puller SVO 2261 for flanges and SVO 2262 for yokes, see Fig. 16.
Slide the engaging sleeve for 1st speed and reverse forwards. Place the shaft in a press and

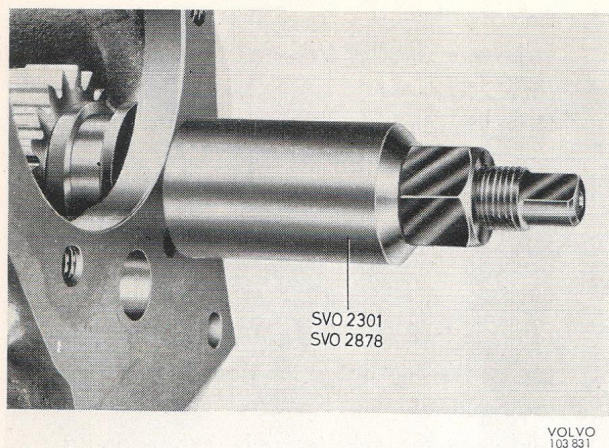


Fig. 23. Removing the reverse gear

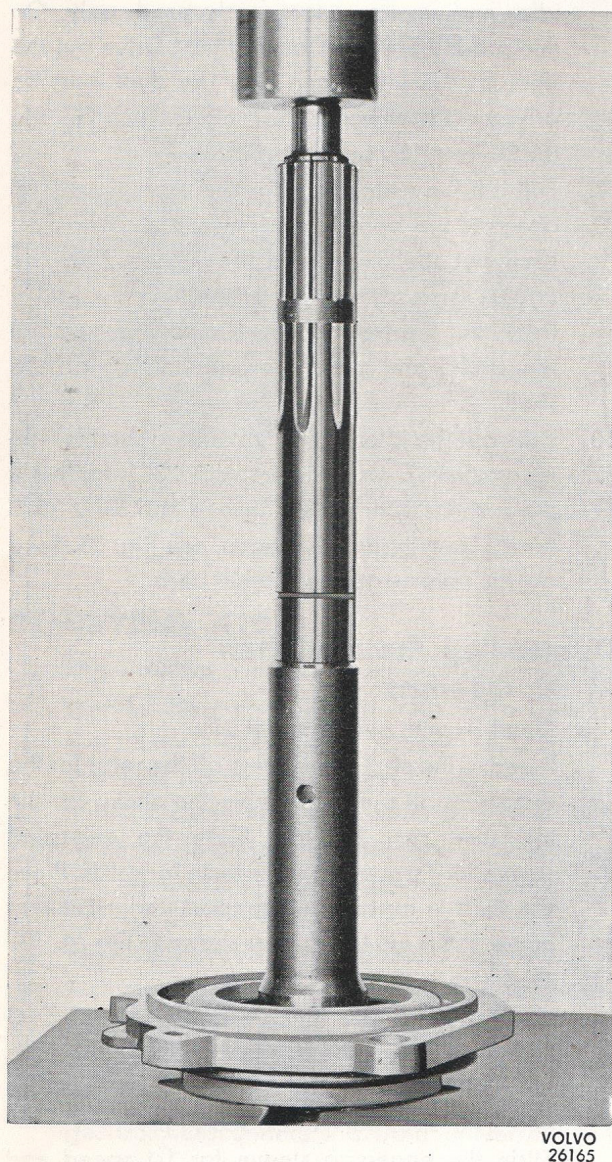


Fig. 24. Dismantling the mainshaft, M 31—M 41

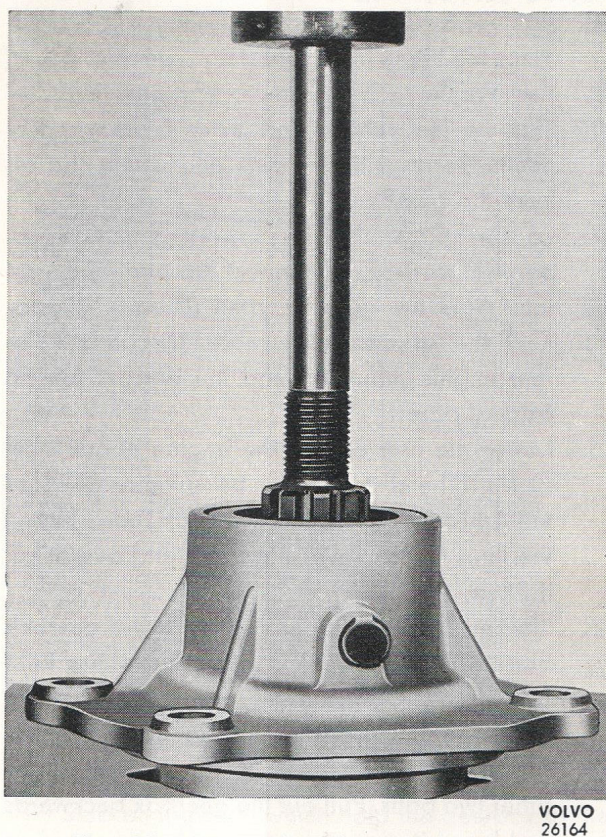


Fig. 25. Dismantling the mainshaft, M 30

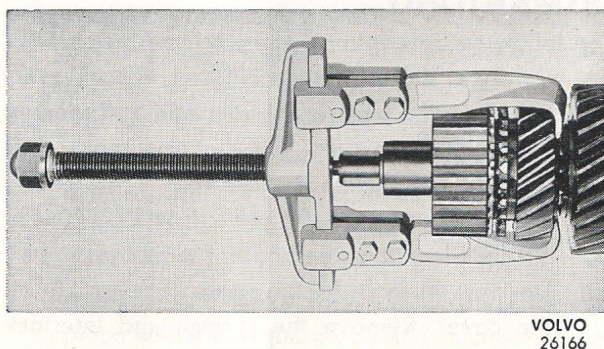


Fig. 26. Removing the front synchronizer

support under the rear cover. Press out the shaft with a drift, see Fig. 25.

2. Remove the thrust washer, spacer sleeve, engaging sleeves, yoke (flange) and snap ring from the shaft.
3. Remove the circlip on the front end of the shaft. Pull off the synchronizing hub and 2nd speed gear wheel with a suitable puller, see Fig. 26. Remove the thrust washer.
4. Reverse the circlip and then the thrust washer, 1st speed gear wheel, synchronizing cone and spring.
5. Remove the oil seal from the rear cover and take out the speedometer gear. If necessary, remove the circlip and press out the ball bearing.

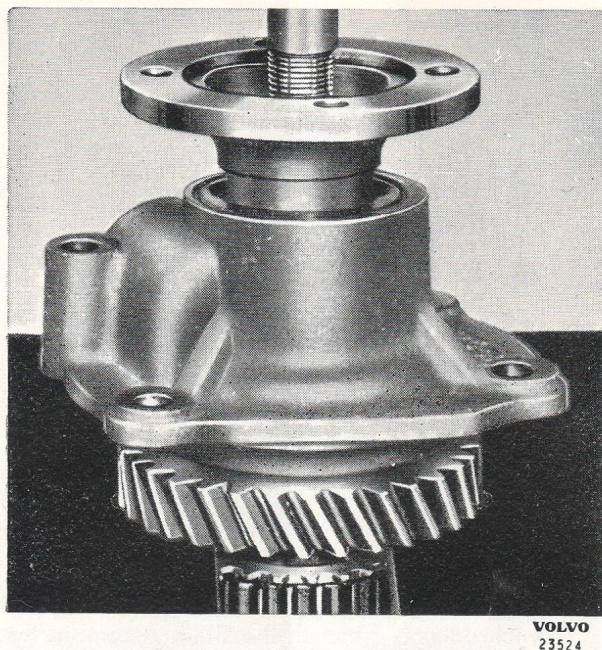


Fig. 27. Dismantling the mainshaft, M 40

M 40 Gearbox

- 1a. Gearbox with overdrive (M 41):
Remove the circlip and press off the rotor for the overdrive oil pump. Remove the circlip for the mainshaft rear bearing. Slide the engaging sleeve for 1st speed and 2nd speed forwards. Place the shaft in a press and support under the 1st speed gear wheel. Press out the shaft, see Fig. 24.
- 1b. Gearbox without overdrive:
Unscrew the yoke (flange) nut. Use tool SVO 2854 as a counterhold on the yoke (flange). Slide the engaging sleeve for 1st and 2nd speed forwards. Place the shaft in a press and a support under the 1st speed gear wheel. Press out the shaft with a drift, see Fig. 27.
2. Remove the synchronizing cone, thrust washer, engaging sleeves, engaging springs and snap rings from the shaft.
3. Remove the circlip on the front end of the shaft. Pull off the synchronizing hub and 3rd speed gear wheel with a puller. Remove the thrust washer.
4. Remove the circlip and then the thrust washer, 2nd speed gear wheel, synchronizing cone and spring.
5. Remove the oil seal from the rear cover and take out the speedometer gear. If necessary, remove the circlip and press out the ball bearing.

INSPECTING

Check the gear wheels, particularly for cracks or chips on the tooth surfaces. Damaged or worn gears must be replaced.

Check the synchronizing cones and all the other synchronizing components. Damaged or worn parts must be replaced.

Check the ball bearings, particularly for scoring or cracks on the races or balls.

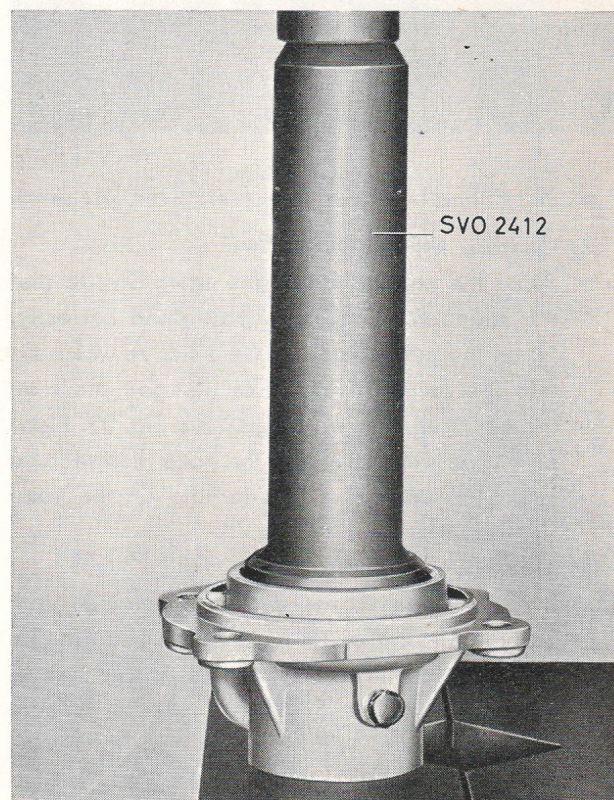


Fig. 28. Fitting ball bearing in rear cover, early prod.

ASSEMBLING

Assembling the mainshaft M 30 gearbox

1. Press the ball bearing into the rear cover. Use drift SVO 2412 for early prod. covers (Fig. 28) and SVO 4080 for late prod. covers. (Fig. 29.) Fit the circlip. There are different thicknesses of circlip, so select one which fits snugly in the groove.
2. Gearbox without overdrive:
Place the speedometer gear on the bearing in the rear cover. Press in the oil seal with drift SVO 2413, see Fig. 30.
3. Fit the snap rings, engaging springs and engaging sleeve for the 1st speed synchronizer on the mainshaft. Fit the snap rings correctly, see Fig. 31. Fit the spacer sleeve and thrust washer.

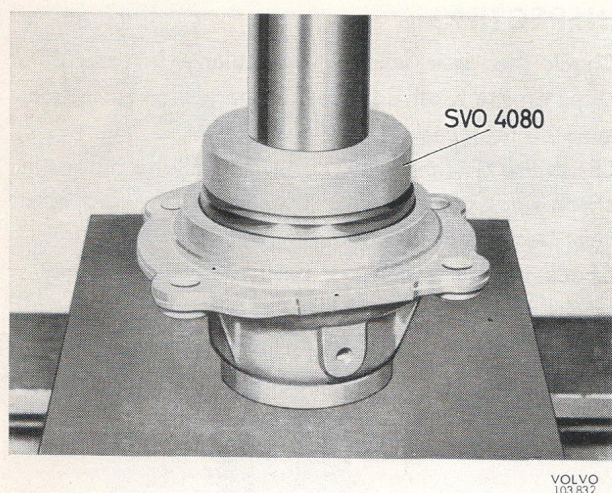


Fig. 29. Fitting ball bearing in rear cover, late prod.

4a. Gearbox without overdrive:

Place the rear cover on the shaft. Ensure that the speedometer gear is positioned correctly. Fit on the yoke (flange). Use a sleeve which fits into the recess in the yoke (flange), press on the cover and yoke (flange), see Fig. 32. Place on the washer and nut for the yoke (flange). Use tool SVO 2854 as a counterhold on the yoke (flange) and tighten the nut.

4b. Gearbox with overdrive (M 31):

Place the rear cover and ball bearing on a cushioning ring or sleeve as shown in Fig. 33. Place on the thrust washer and spacer sleeve. Press in the shaft. Select a circlip of suitable thickness and fit it. Fit the key, rotor for the oil pump and circlip.

5. Fit the synchronizing cone, 1st speed gear wheel and thrust washer on the shaft. Select a

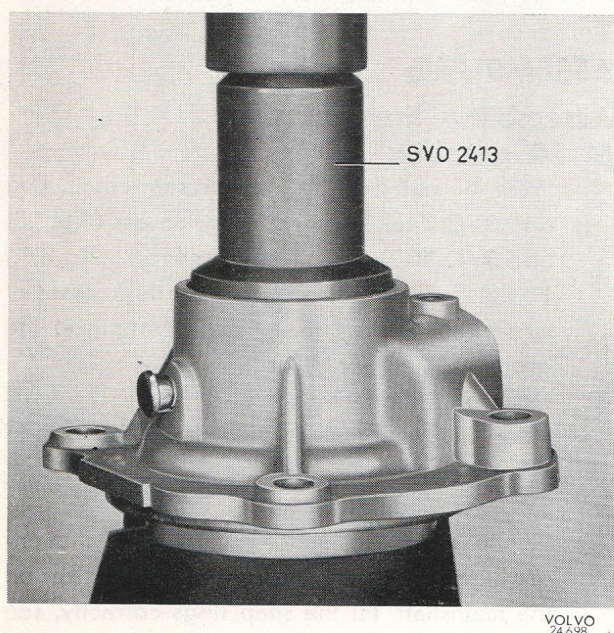


Fig. 30. Fitting oil seal in rear cover

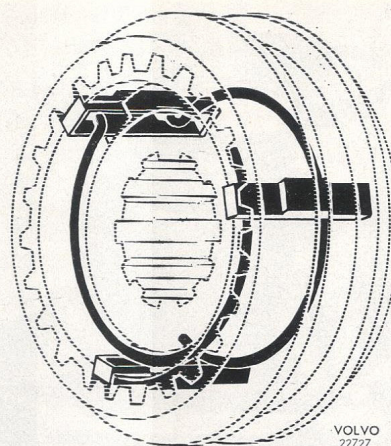


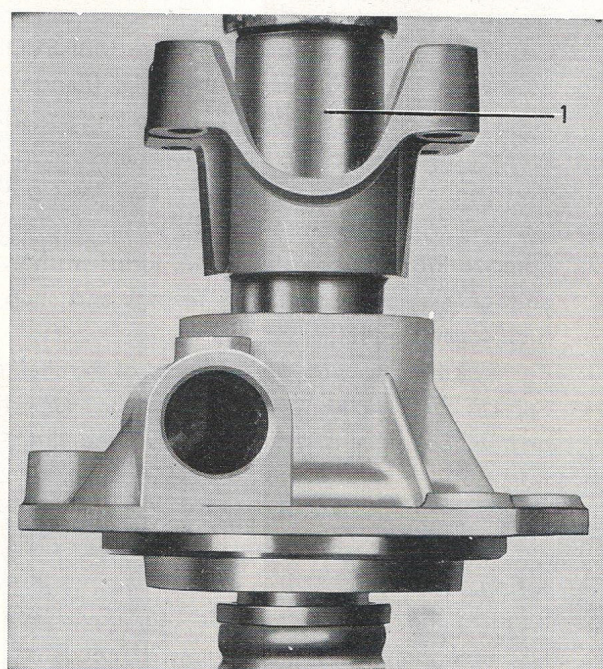
Fig. 31. Assembling the synchronizer

circlip which fits snugly into the groove on the shaft and fit the shaft.

6. Fit the thrust washer, 2nd speed gear wheel and synchronizing cone on the shaft. Assemble the 2nd and 3rd speed synchronizing parts. Fit the snap rings correctly, see Fig. 31. Then fit the synchronizer on the mainshaft. N.B. Ensure that the synchronizer is correctly fitted. The turned groove on the engaging sleeve should face **rearwards**. Select a circlip which fits snugly into the groove and fit it.

M 40 gearbox

1. Press the ball bearing into the rear cover. Use drift SVO 2412 for early prod. covers (Fig. 28) and drift SVO 4080 for late prod. covers (Fig. 29). Fit the circlip. There are different thick-

Fig. 32. Fitting rear cover, M 30
1. Sleeve

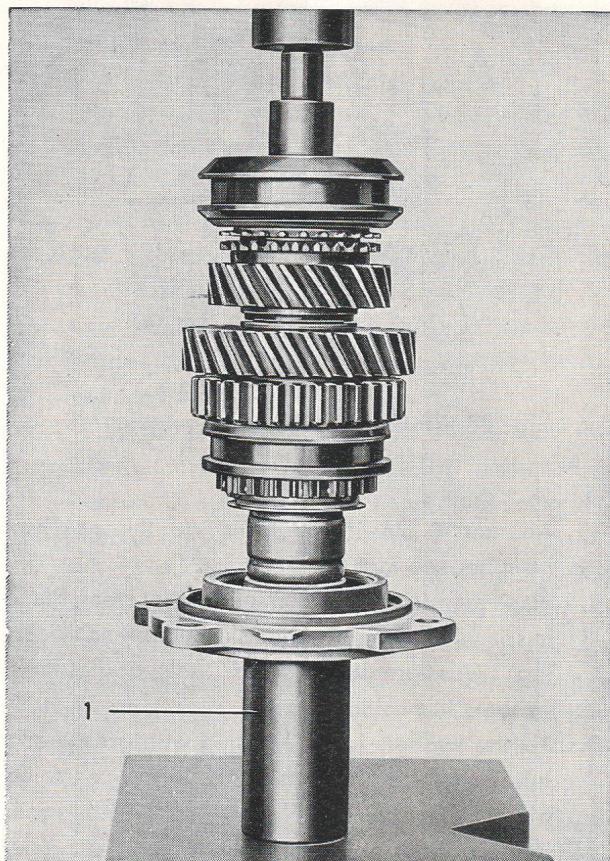


Fig. 33. Fitting rear cover, M 31
1. Sleeve

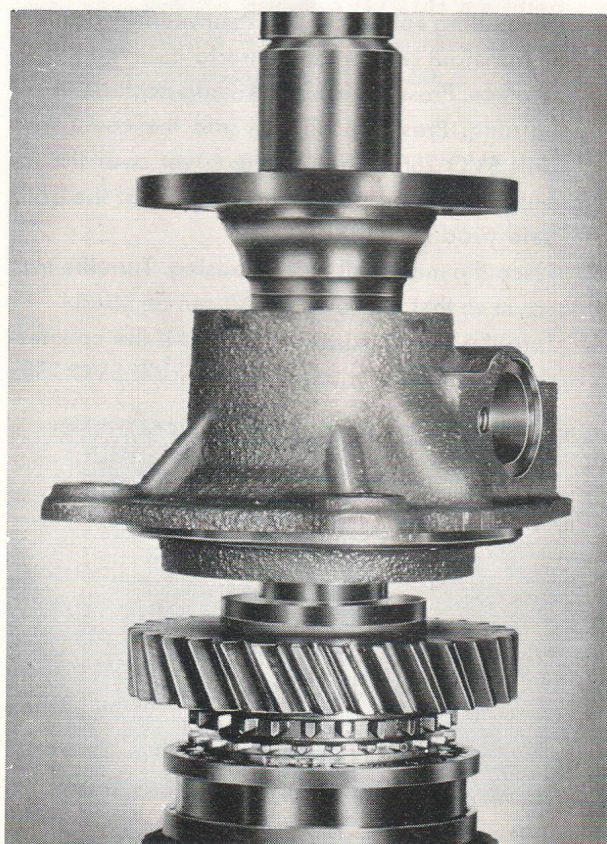


Fig. 34. Fitting rear cover, M 40

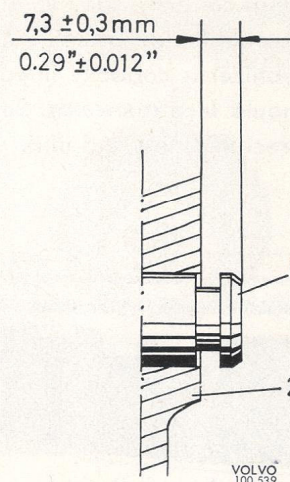


Fig. 35. Fitting the reverse shaft

1. Reverse shaft
2. Gearbox housing

nesses of circlip, so select one which fits snugly into the groove.

2. Gearbox without overdrive:
Place the speedometer gear on the bearing in the rear cover. Press in the oil seal with drift SVO 2413, see Fig. 30.
3. Fit the parts for 1st and 2nd synchronizer on the mainshaft. Fit the snap rings correctly, see Fig. 31.
- 4a. Gearbox without overdrive:
Fit the synchronizing cone, 1st speed gear wheel and thrust washer. Place the rear cover on the shaft. Ensure that the speedometer gear is positioned correctly. Fit on the yoke (flange). Use a sleeve which fits into the recess in the yoke (flange), press on the cover and yoke (flange), see Fig. 34. Place on the washer and nut for the yoke (flange). Use tool SVO 2854 as a counterhold on the yoke (flange) and tighten the nut.
- 4b. Gearbox with overdrive (M 41):
Place the rear cover and ball bearing on a cushioning ring or sleeve as shown in Fig. 33. Place on the thrust washer, 1st speed gear wheel and synchronizing cone. Press in the shaft. Select a circlip of suitable thickness and fit it. Fit the key, the rotor for the oil pump and circlip.
5. Fit the synchronizing cone, 2nd speed gear wheel and thrust washer on the shaft. Select a circlip which fits snugly into the groove on the shaft and fit it.
6. Fit the thrust washer, 3rd speed gear wheel and synchronizing cone on the shaft. Assemble the 3rd and 4th speed synchronizing parts. Fit

the snap rings correctly, see Fig. 31. Then fit the synchronizer on the mainshaft. N.B. Ensure that the synchronizer is correctly fitted. The turned groove should face **rearwards**. Select a circlip of the correct thickness and fit it.

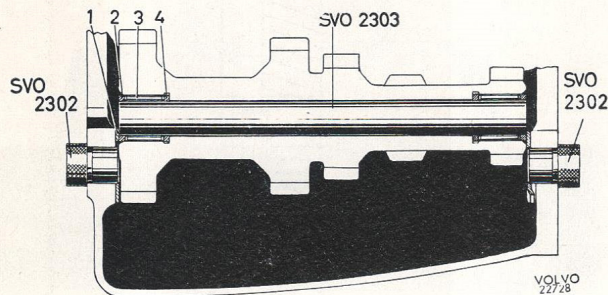


Fig. 36. Fitting the idler gear

- | | |
|------------------|-------------------|
| 1. Thrust washer | 3. Needle bearing |
| 2. Spacer washer | 4. Spacer washer |

Assembling the gearbox

1a. M 30 gearbox:

Fit the reverse gear, spacer sleeves and reverse shaft. Ensure that the groove in the reverse shaft is turned correctly (early prod.). The late prod. reverse shaft with turned groove is fitted so that it projects 7.0—7.6 mm (0.276—0.300") outside the gearbox housing, see Fig. 35.

1b. M 40 gearbox:

Fit the striker lever and striker. Fit the reverse gear and reverse shaft. Make sure that the groove in the reverse shaft (early prod.) is turned correctly. The late prod. reverse shaft with turned groove is fitted so that it projects 7.0—

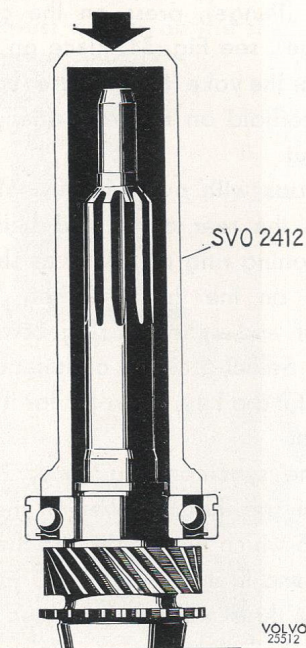


Fig. 37. Fitting ball bearing on input shaft

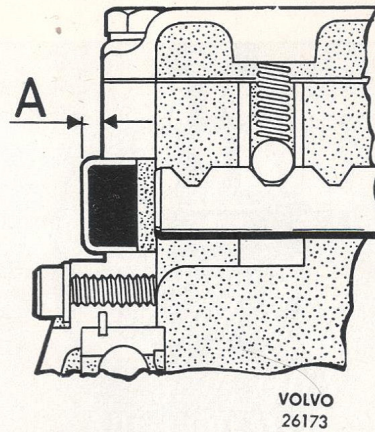


Fig. 38. Fitting end cap over selector rail
A=approx. 4 mm (0.16")

7.6 mm (0.276—0.300") outside the gearbox housing, see Fig. 35.

- Place mandrel SVO 2303 in the idler gear. Place in spacer washers and needles (24 in each bearing). Use grease to hold the needles and washers in position.
- Fix the washers to the housing with grease and guide them up into position with the centering plugs SVO 2302, see Fig. 36. Lay the idler gear in the bottom of the housing.
- Press the bearing onto the input shaft with the help of drift SVO 2412, see Fig. 37. Select a circlip of suitable thickness and fit it. Place the 14 bearing rollers for the mainshaft in position in the input shaft. Use grease to hold the rollers in place. Press the input shaft into position in the housing. Press the oil seal into the cover with drift SVO 2867. Then fit the cover over the input shaft. Do not forget the O-rings for the bolts (late prod.).
- Place the mainshaft in the housing. Turn the rear cover so that the countershaft can be fitted.
- Turn the gearbox upside down. Fit the countershaft from the rear. Hold against drift SVO 2303

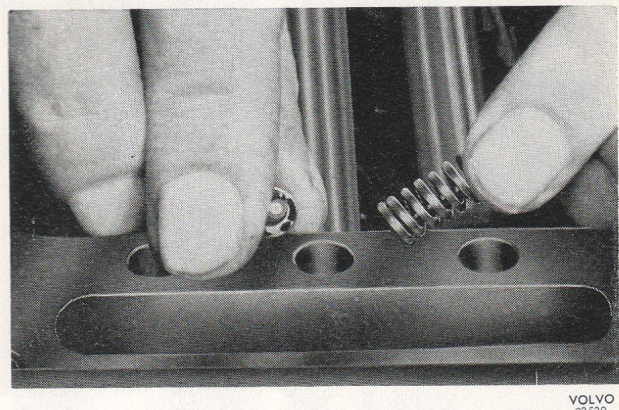


Fig. 39. Fitting interlock balls and springs

with the hand. Ensure that the thrust washers do not loosen and fall down.

7a. Gearboxes without overdrive:

Turn the rear cover correctly so that it locks the reverse shaft (early prod.). Fit the bolts for the cover.

7b. Gearboxes with overdrive:

Turn the rear cover correctly so that it locks the reverse shaft (early prod.). Make sure that the rotor for the overdrive oil pump is turned. Fit the overdrive. Use new locking washers for the intermediate flange.

8. Fit the selector rails and forks. Move over the selector fork to the rear position when fitting the pin. Use a new pin. Fit the cover over the selector rails.

N.B. If the end caps at the front end of the housing have been removed, these should be fitted in the same way as previously, i.e. the centre end cap should project about 4 mm (0.16") outside the face of the housing, see Fig. 38.

9. Place the interlock balls and springs in position, see Fig. 39. Fit on the gearbox cover. Check that all the gears engage and disengage freely.

FITTING

Make sure that the dowels SVO 2743 are fitted acc. to Fig. 40. Fitting is done in the reverse order to removal. Fill up the gearbox with oil.

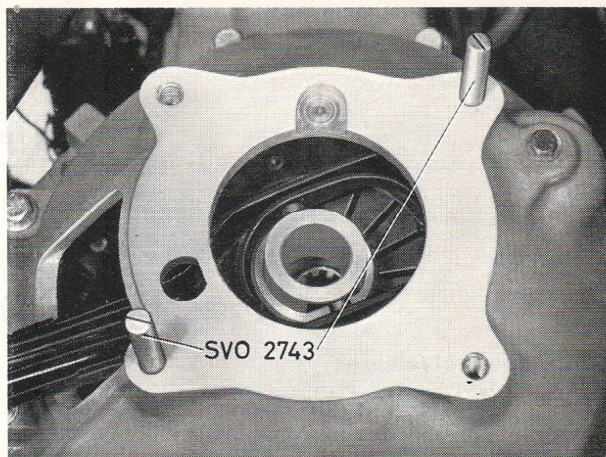


Fig. 40. Dowels for gearbox

FAULT TRACING

FAULT	
REASON	REMEDY

Gears difficult to engage

Clutch does not release.

Oil too thick.

Synchronizing mechanism worn.

Bearing bushes or gears worn.

Selector rails or gears binding.

Adjust or repair the clutch. See Group 41.

Check that the correct oil is used.

Replace the worn parts.

Replace damaged or worn parts.

Replace damaged or worn parts.

One of the gears jumps out

Worn bearings on shafts or gears.

Worn grooves in selector rails or weak springs.

Badly worn gears.

Gearbox out of alignment with flywheel housing.

Fit new bearings or bushes.

Replace damaged or worn parts.

Replace the worn gears.

Check the flywheel housing with a dial indicator gauge and adjust if necessary. (See Group 41.) Clean the contact surfaces.

Replace the bearing.

Pilot bearing in flywheel worn.

Noise

Oil level too low.

Worn or damaged bearings on shafts or gears.

Badly worn gears.

Top up with oil as necessary.

Replace the worn bearings or bushes.

Replace the worn gears.

Oil leakage

Sealing surface of yoke (flange) worn.

Rear oil seal and bearing worn.

Leakage between housing and rear cover.

Leakage between housing and front bearing cover.

Front oil seal worn.

Leakage between housing and cover.

Fit new yoke (flange) and oil seal.

Fit a new bearing and oil seal.

Fit a new paper gasket.

Fit a new paper gasket. Clean out the return hole.

Fit a new oil seal in the front bearing cover.

Fit a new cork gasket.

1. Gear lever
2. Cover
3. Washer
4. Spring
5. Cover
6. Sliding plate
7. Spring
8. Engaging spring
9. Engaging sleeve and gear wheel for reverse
10. Selector rail, 2nd and 3rd speeds
11. Synchronizing cone
12. Gear wheel for 1st speed
13. Bush
14. Thrust washer
15. Circlip
16. Thrust washer
17. Gear wheel for 2nd speed
18. Bush
19. Selector fork for 2nd and 3rd speed
20. Mainshaft
21. Selector fork, 1st speed and reverse
22. Spring
23. Interlock ball
24. Engaging sleeve, 2nd and 3rd speeds
25. Engaging spring
26. Snap ring
27. Synchronizing hub
28. Synchronizing cone
29. Ball bearing
30. Front cover
31. Roller bearing
32. Oil seal
33. Input shaft
34. Spacer washer
35. Thrust washer
36. Housing
37. Needle bearing
38. Countershaft
39. Spacer washer
40. Idler gear
41. Reverse shaft
42. Spacer sleeve
43. Reverse gear wheel
44. Bush
45. Spacer sleeve
46. Rear cover
47. Oil seal
48. Flange
49. Speedometer worm gear
50. Ball bearing
51. Air-venting nipple
52. Thrust washer
53. End casing
54. Selector fork for 1st speed and reverse
55. Striker

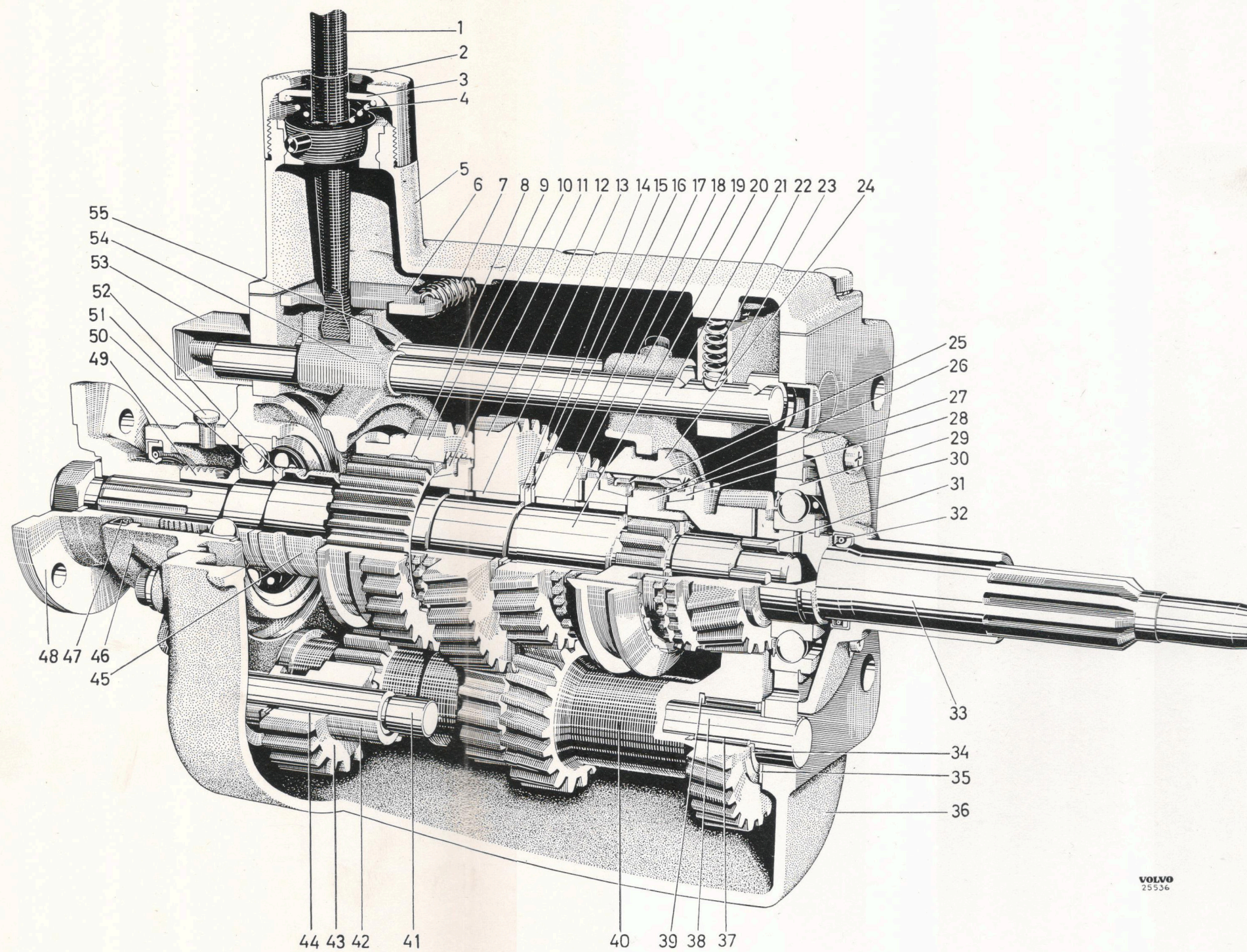


Illustration A. M 30 gearbox

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25536

NOTES

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