



SERVICE MANUAL

TRUCKS

L 385

Export Service Department

AKTIEBOLAGET

VOLVO

GÖTEBORG . SWEDEN

PART 3

TRANSMISSION

DESCRIPTION

Type K transmissions for the L 385 series are fitted with five forward gears and one reverse. All gears, except the 1st and reverse gears, are synchronized. The transmission is available in two different models called K 12 and K 13. K 12 is designed with the 4th gear as high gear and the 5th as overdrive. K 13 has low gear ratios throughout with the 5th designed as direct. The position of the different gears is shown in Fig. 3-1. The power way through the transmission of the various gears, is illustrated in Figs. 3-2 to 3-6. Fig. 3-7 and Illustration 3-A show the construction of the transmission.

The transmission housing, which is cast in one piece, is constructed with openings, partly for inspection and partly in order to make the installation of the power take-off possible.

The clutch housing (1) is fitted to the front of the transmission (see Illustration 3-A). The retainer (97) for the main drive pinion (95) is likewise fitted at the front. The retainer is also a guide for the clutch release bearing (99). At the rear end of the transmission housing, the handbrake bracket (51) is fitted.

The main drive pinion is carried in a ball bearing (6) placed in the front end of the housing. The front of the mainshaft (54) lies in a roller bearing (92) at the rear of the main drive pinion. The rear is cradled in a ball bearing (52) which is placed at the rear end of the housing. The countershaft (68) lies in two ball bearings (66 and 80) at the ends of the housing. The reverse shaft (43) is pressed into the rear end of the cover and a bracket in the transmission housing. The shaft is locked by means of a lock washer (45).

Except for the first and reverse speeds of the transmission, all gears are chamfered, thus quiet running is achieved.

The synchronizing devices (28 and 36) facilitate the gear changing, at the same time as reducing wear on the dog clutch.

The type reference, part and production numbers of the transmission are marked on a plate fixed on the left-hand side of the transmission.

REPAIR INSTRUCTIONS

(See page 3-13 for work that can be carried out without removing the transmission).

REMOVAL

1. Remove the plate which lies over the transmission.
2. Remove rod (1, Fig. 3-8) from the handbrake lever.
3. Remove the cotter pin (5) on the yoke lever and the bolts (2) on the handbrake lever bracket. Remove the handbrake lever and pull rod.
4. Remove the cotter pin (8) from the lever (7).
5. Uncouple the return spring (3) for the clutch pedal.
6. Free the clutch pull rods from the cross-shaft (6) and from the lever.
7. Remove the cross-shaft by removing the bolts for its attachment (4) in the transmission. Collect the seats, sockets and springs.
8. Drive out the cylindrical pin (14, Illustration 3-A) on the gearshift lever and remove lever.
9. Loosen the speedometer cable (1, Fig. 3-9).
10. Unbolt propeller shaft from brake drum and loosen the bracket (2, Fig. 3-10) for the center bearing from the crossmember. Lower the propeller shaft and remove.
11. Remove support member (5, Fig. 3-9) from under transmission.
12. Place a jack under the transmission and loosen the nuts which secure same to the flywheel housing. Then move the transmission so far back that the main drive pinion comes free from the clutch, then lower the jack and move the transmission from under the truck.

DISASSEMBLY AND ASSEMBLY

When methods differ between the different designs regarding the disassembling and assembling of the transmission, one must, before any repairs are carried out, be quite certain of the gearbox references (K12 or K 13) and the production number. The work can then be carried out, according to the instructions which deal with the respective design.

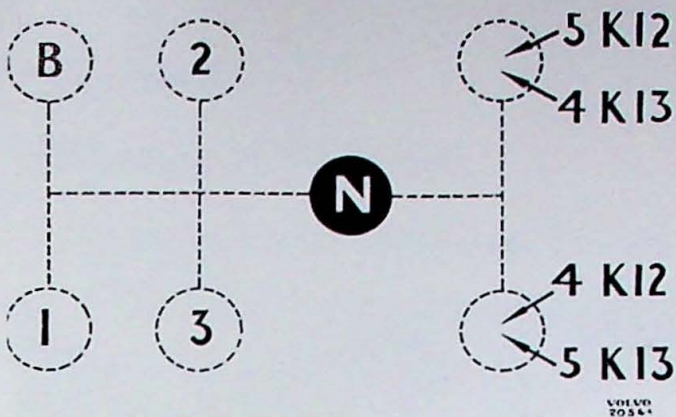


Fig. 3—1. Positions of various gears.

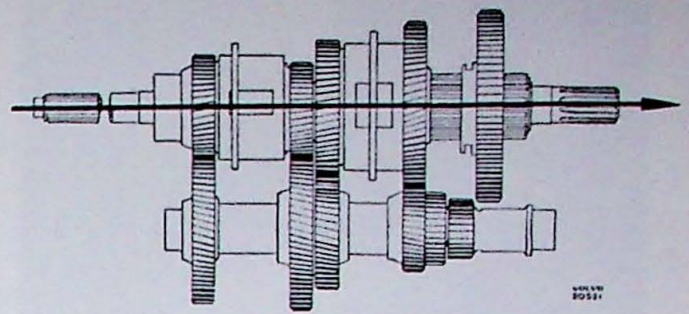


Fig. 3—5. 4th speed gear, K 12.
5th speed gear, K 13.

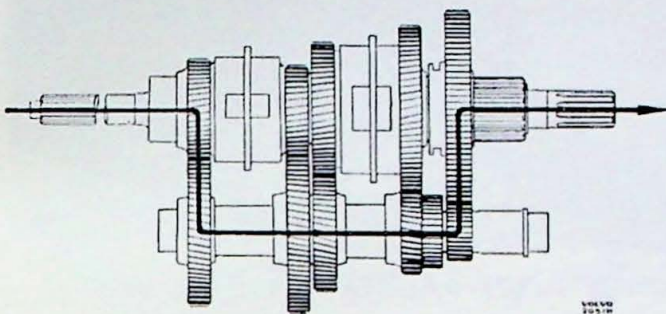


Fig. 3—2. 1st speed gear.

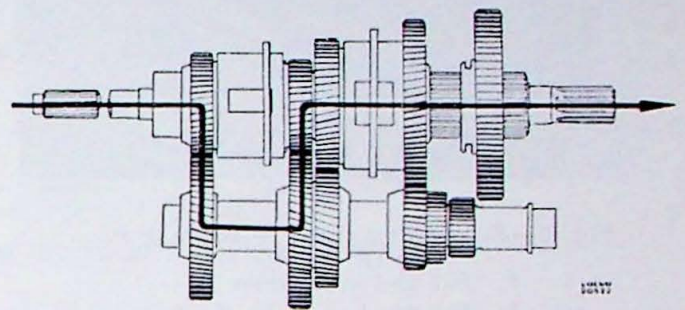


Fig. 3—6. 5th speed gear, K 12.
4th speed gear, K 13.

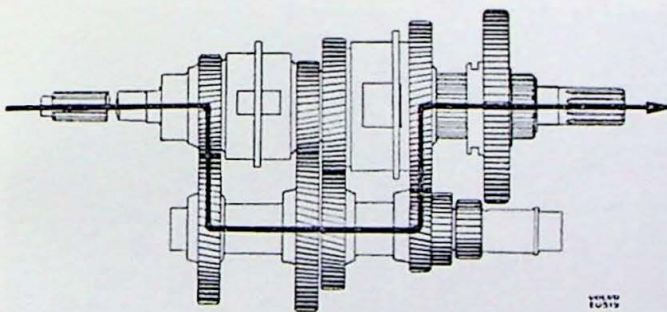


Fig. 3—3. 2nd speed gear.

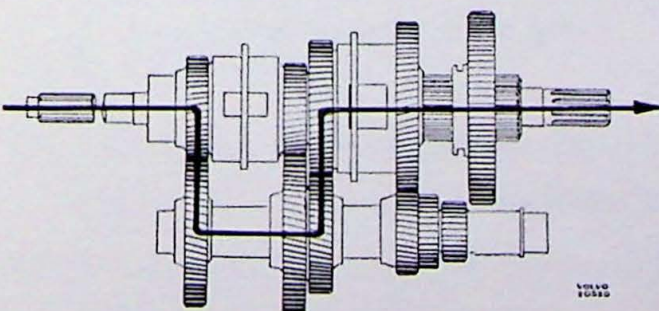


Fig. 3—4. 3rd speed gear.

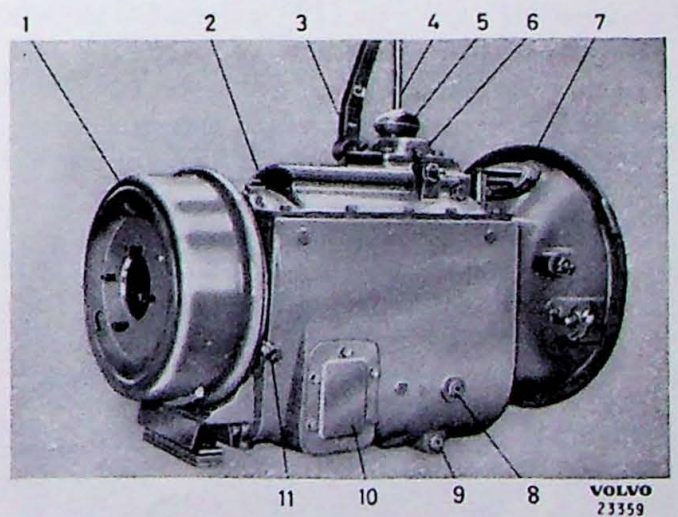


Fig. 3—7. K 12-13 Transmission.

- | | |
|-----------------------|---------------------------------------|
| 1. Brake drum | 8. Oil filler plug |
| 2. Transmission cover | 9. Drain plug (magnetic) |
| 3. Handbrake lever | 10. Inspection cover (power take-off) |
| 4. Gearshift lever | 11. Speedometer cable spindle |
| 5. Rubber cap | |
| 6. Upper cover | |
| 7. Clutch housing | |

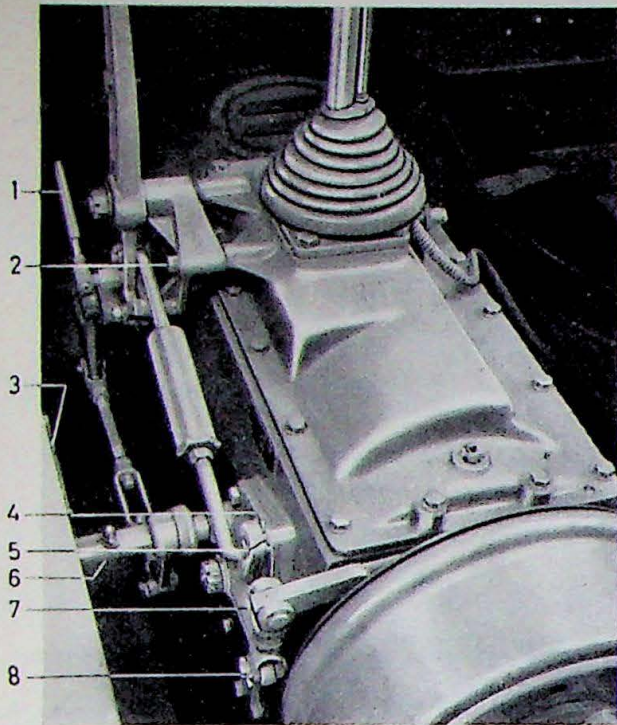


Fig. 3—8. Transmission fitted in truck.

1. Pull rod to oil filter
2. Bolt for handbrake bracket
3. Return spring for clutch pedal
4. Attachment for cross-shaft
5. Cotter pin
6. Cross-shaft
7. Lever for handbrake
8. Cotter pin

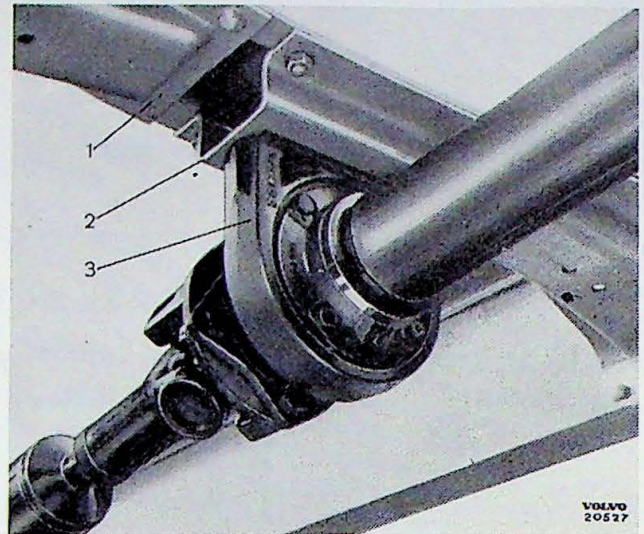


Fig. 3—10. Propeller shaft center bearing.

1. Cross-member
2. Bracket
3. Center bearing

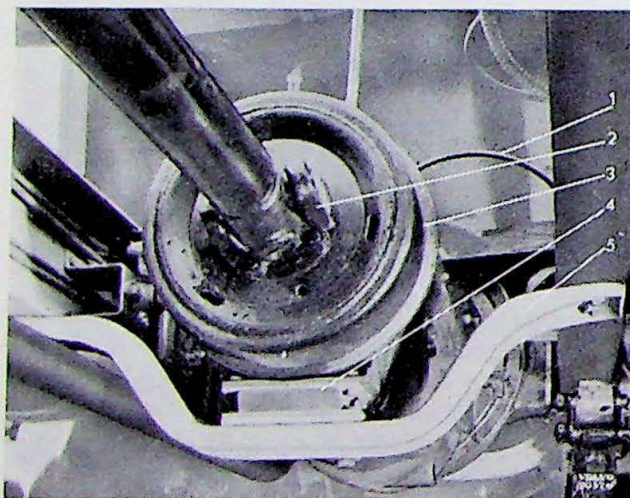


Fig. 3—9. Transmission rear mounting.

1. Speedometer cable
2. Forward universal joint
3. Brake drum
4. Mounting
5. Support member

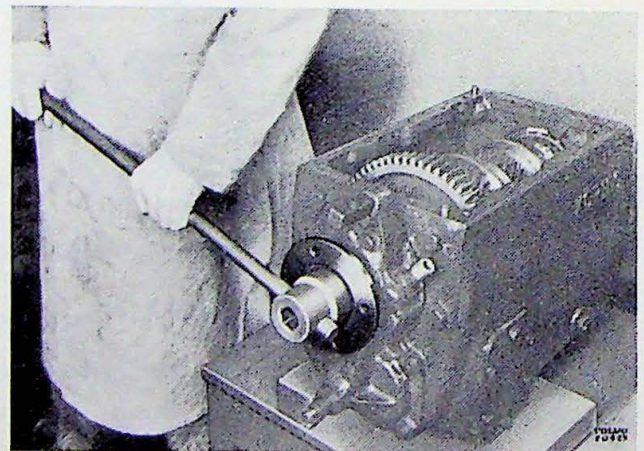


Fig. 3—11. Removing flange nut.

DISASSEMBLY

Disassembly of Transmission

1. Loosen the lubrication hose (101) from the clutch housing (1). Unhook the spring (100) of the clutch release bearing (99) and remove.
2. Undo the bolts which attach the clutch housing to the transmission housing and lift away. If necessary, carefully tap with a soft headed hammer. Remove the gasket.
3. Remove the speedometer drive spindle (11, Fig. 3-7) from the brake retainer.
4. Loosen the bolts of the transmission cover (19) then lift this and the gasket away at the same time.
5. Release brake drum (62).
6. Engage two gears and loosen the nut on the mainshaft flange, Fig. 3-11.
7. Pull off the companion flange (56) with a standard puller. Loosen the brake backing plate (48) with shoes and the cover plate (60).
8. Remove the bolts on the main drive pinion retainer (97). Fit two bolts (the long transmission cover bolts can be used) in the retainer puller holes and tighten them evenly. The retainer (97) with sleeve (95) and ball bearing (91) can then be removed.
9. Remove the lock ring (88) on the bearing (6) on the main drive pinion (4).

The main drive pinion on existing models is fitted with a torsion rod. Transmissions with production numbers below about 2590 have a main drive pinion of the conventional type. The retainer (97) is then fitted with a seal ring. This is removed when required by splitting with a chisel. Take care not to damage the retainer. Disassembly and assembly are similar in both cases.

10. Fit puller SVO 2096 as shown in Fig. 3-12 and tighten the screws on the puller until the bearing leaves the housing and the main drive pinion.

K 12 Transmission

11. Remove the protector washer (86) and the lock ring (85) from the front cover using a large pair of lock ring pliers (Fig. 3-13).
12. Remove the brake retainer (51) and the countershaft cover. Drive out the seal (57) by using a suitable drift.
13. Remove the speedometer gears (53) and the spacer sleeve (55).

14. Remove the lock ring (58) for the mainshaft rear ball bearing, fit tool SVO 1381 B and pull out the bearing (Fig. 3-14).

K 13 Transmission

11. Remove the brake retainer (51) and the countershaft cover.
12. Drive out the seal (57) by using a suitable drift. Remove the speedometer gears (53) and the spacer sleeve (55).
13. Remove the lock ring (58) for the mainshaft rear ball bearing, fit tool SVO 1381 B and pull out the bearing (Fig. 3-14).
14. Remove the protector washer (86) on the main drive pinion and the lock ring (85) in the housing (Fig. 3-13). Lift the mainshaft backwards in the housing so that the synchronizing device (28) for the 4th and 5th speed gears and the main drive pinion do not accompany it.

K 12 and K 13 Transmissions

15. Lift up the main drive pinion and the forward part of the mainshaft. Then lift the main drive pinion out of the housing, Fig. 3-15.
16. The cylindrical roller bearing (92) is pulled out by using puller SVO 2097 after the lock ring (25) has been removed, Fig. 3-16.

NOTE. There is a recess in the shaft above the bearing for the puller. The steel cone (26) may not be removed.
17. Move the mainshaft backwards and pull off the synchronizing device (28) for the 4th and 5th speed gears. Lift the shaft out of the housing but allow the gear (69) for 1st speed and reverse remain. The shaft is moved up so that the 2nd speed gear (39) passes out through the recess cast into the upper part of the transmission housing. Lift up the 1st speed gear.

Disassembly of Mainshaft

1. Remove the lock ring (30) for the 5th speed gear, (4th on K 13). Use special pliers or two screw drivers. Lift the gear out, whereby the thrust washer (31) will follow. The steel cone (29) must not be removed.
2. After having pulled off the 3rd speed gear (34) with a standard puller, the steel bushing (33) for the 5th speed gear (4th on K 13) will follow, Fig. 3-17.
3. Remove the synchronizing device (36) for the 2nd and 3rd gears. The hub (38) for the synchronizing device is attached with two keys (37). A press must be used to remove this hub and the bushing (35) for the 3rd speed gear.

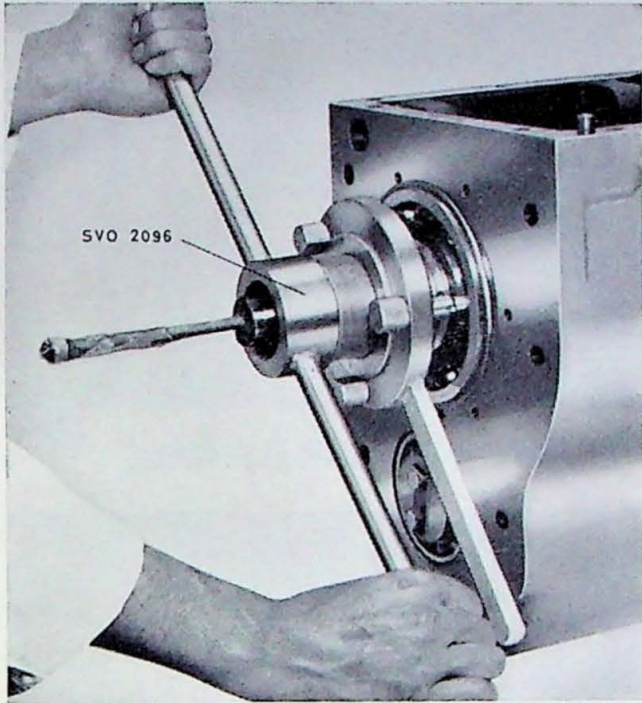


Fig. 3—12. Removing the main drive pinion bearing.

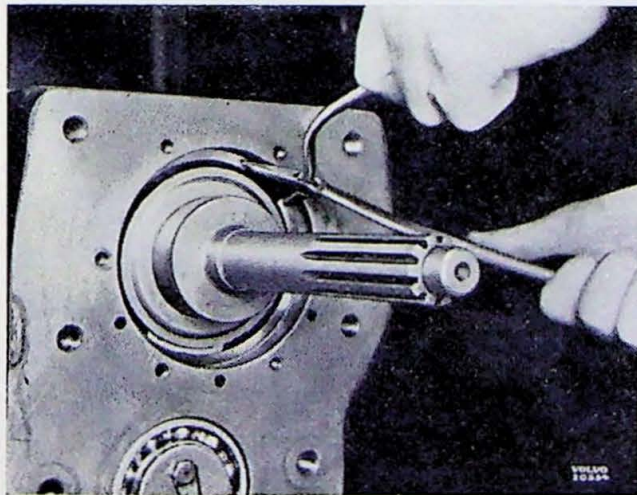


Fig. 3—13. Removing the lock ring.

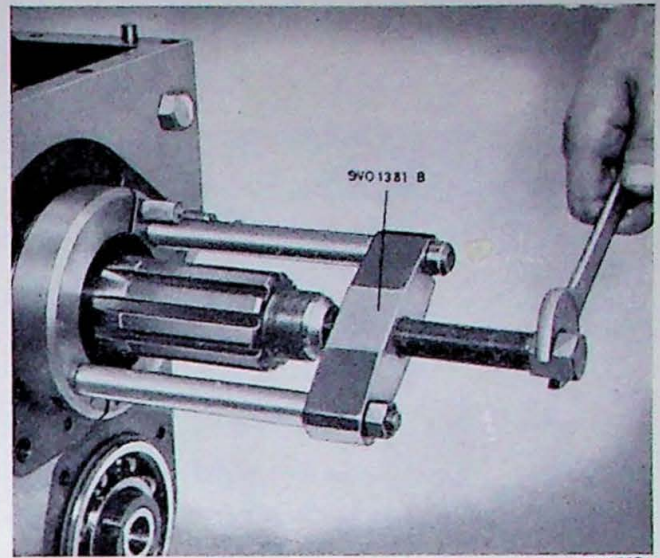


Fig. 3—14. Removing the mainshaft rear bearing.

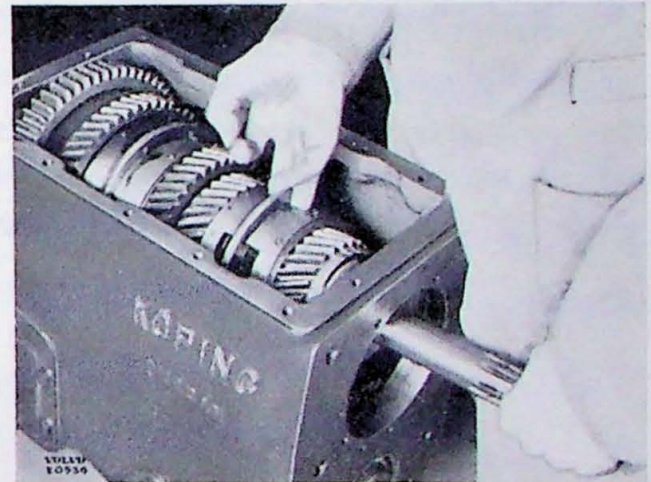


Fig. 3—15. Lifting out the main drive pinion.

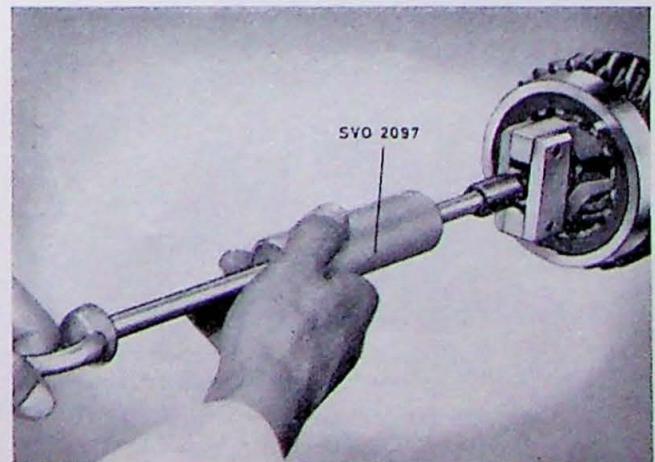


Fig. 3—16. Removing the mainshaft support bearing.

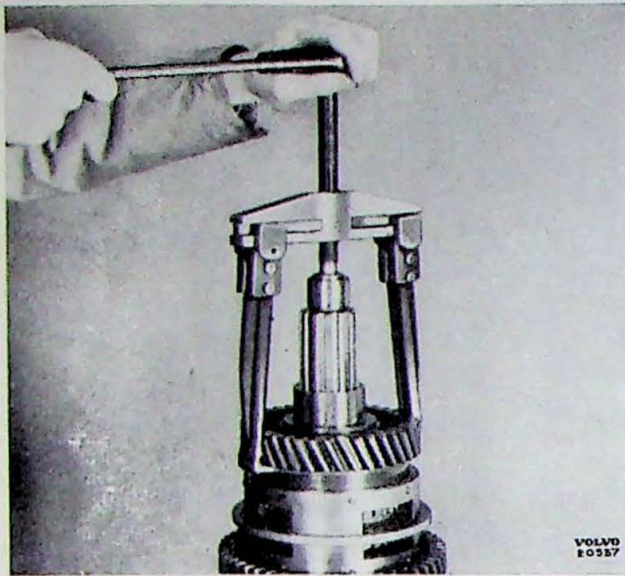


Fig. 3—17. Removing the 3rd speed gear (4th on K 13).

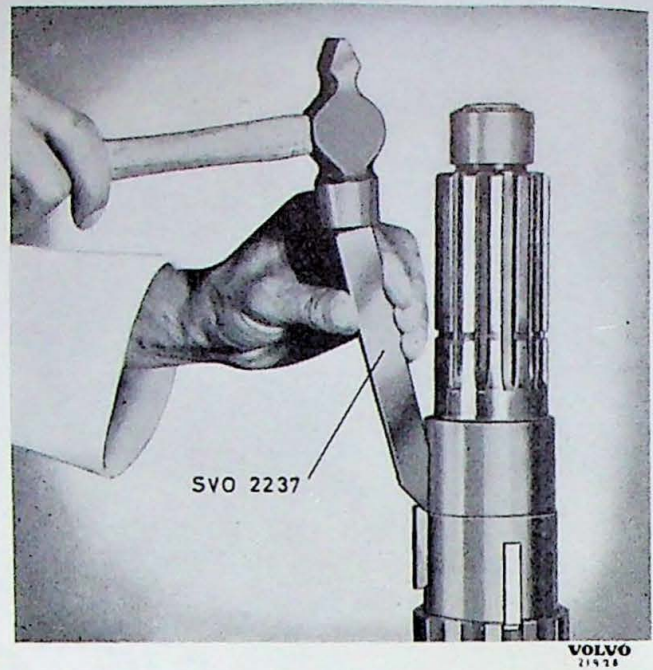


Fig. 3—19. Removing the keys.



Fig. 3—18. Removing the synchronizing device hub from the mainshaft.

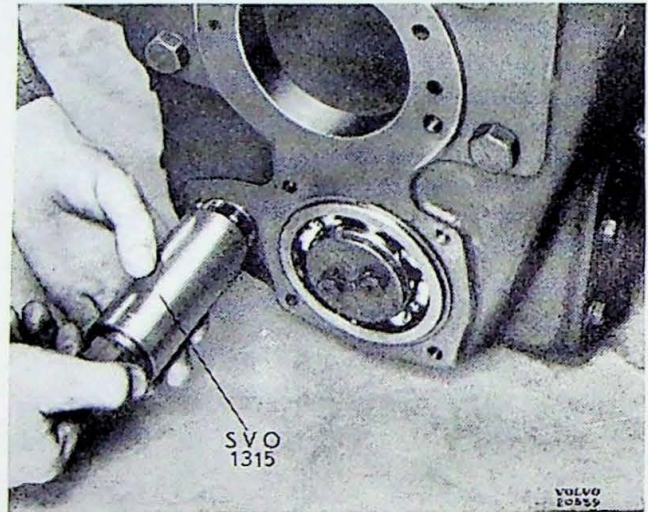


Fig. 3—20. Removing the reverse gear shaft.

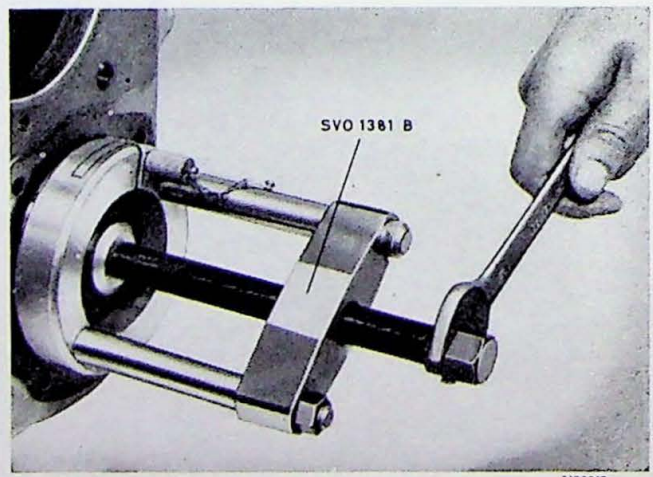


Fig. 3—21. Removing the bearing from the countershaft.

4. Put the shaft in the press, support against the gear (39) and press against the forward end of the shaft. The shaft cannot be pressed out in one go because the keys (37) catch in the gear (39) when this is pressed out. One must, therefore, press out the shaft about 5 mm (1/5") and then put in washer SVO 1640 between the hub and the gear.
5. Press out the shaft again, this time to a distance equal to the thickness of the washer. The hub will have to be pressed out about 50 mm (2") before it is loosened from the shaft. One must, therefore, build up with washers SVO 1640-1642 little by little, until the hub is loose. See Fig. 3-18. The washers should be turned so that the keys (37) come in their openings. See Figure. After having finished the pressing, hold the shaft so that it does not fall and get damaged. Lift off the bushing and hub.
6. Knock the keys (37) loose with tool SVO 2237, Fig. 3-19, and remove the gear. The inner ring (93) of the roller bearing (92) on the end of the shaft, is very difficult to remove. One can try to loosen it by means of a drift. If a new bearing is to be fitted, one can grind an opening in the ring and then break it after the lock ring is removed. Take care that the shaft does not become damaged.

Disassembly of Reverse Gears

1. Remove the bolt (46) for the lock washer (45). Fix tool SVO 1315, in accordance with Fig. 3-20. Move the sleeve over the shaft and screw in the nut so far that the shaft can be pulled out by hand.
2. Lift up the reverse gears and remove the needle bearing (44) and spacer (42).

Disassembly of Countershaft

1. Undo bolts (63 and 82 respectively) for washers (64 and 81 respectively) at the ends of the countershaft and remove.
2. With the help of a metal drift and hammer, drive the countershaft so far back that both the bearings leave their positions in the transmission housing.
3. Loosen the lock ring (65) on the rear bearing (66) and remove with the help of puller SVO 1381 B, Fig. 3-21. Remove the protector washer (67).
4. Now lift the countershaft, together with the gears, out of the housing and place it in a press where the gears should be pressed off the shaft. First press off the ball bearing (80) and gear (78) from the front of the shaft. See Fig. 3-22. Remove the key (83) and spacer (77).

5. Press off the next gear (76) and remove the lock key. Press the 3rd speed gear (74) off the shaft. Remove the lock key (73) and spacer (72). Finally, press the 2nd speed gear (70) off the shaft and remove the key (71).

Disassembly of Transmission Cover

1. Loosen the catch for 1st and reverse gears and remove. See Fig. 3-23.
2. Remove the bolts of the upper cover (18) and lift away. Remove the lock pin (16).
3. Remove the intermediary lever (15). Take out the springs (9) and balls (10), which prevent the gearshift rails from sliding out of positions.
4. Turn the gearbox cover and withdraw the safety devices for the lock screws of the gearshift forks. Remove these. Loosen the cover (5) at the front.
5. Drive out the rail (8) for the 4th and 5th speed gearshift fork (17) and remove same, together with spacer (11). After that, drive out the rail (7) for the 2nd and 3rd gears and remove the gearshift fork (20), flange and spacer (21), see Fig. 3-24.
6. Lastly, drive the rail (22) for the 1st and reverse gears out of the cover and put aside the gearshift fork (40), spacer and companion flange.

If any of the rails will not come out of the cover, no force must be used. It may be that some of the other rails are not in their correct position, in consequence of which the other rails have locked.

The center shaft is furnished with a cylindrical pin which is held in position by a slotted pin. The cylindrical pin is used as a means of bringing about the movement from one lock pin to the other. The lock pins can be removed by loosening a bolt on one side of the transmission cover.

INSPECTION

After the transmission is disassembled, all parts must be thoroughly cleaned and, after that, inspected. Also thoroughly inspect the rest of the transmission parts which are not disassembled. Begin by examining the teeth of the different gears. Gears which are damaged or worn must be changed. If such a gear is installed again, it is possible that the whole transmission can be ruined through some of the damaged teeth breaking. If a gear is damaged or worn out, one should always make it a rule to also change the gear running in contact with the damaged gear.

The steel bushing for the 3rd and 5th speed (4th on K 13) gear should then be examined. If it so happens that they have noticeably worked loose when they are placed in their respective gears or if they show signs of having broken, they must be changed. If the bearing surface is scratched, the gear must also be examined.

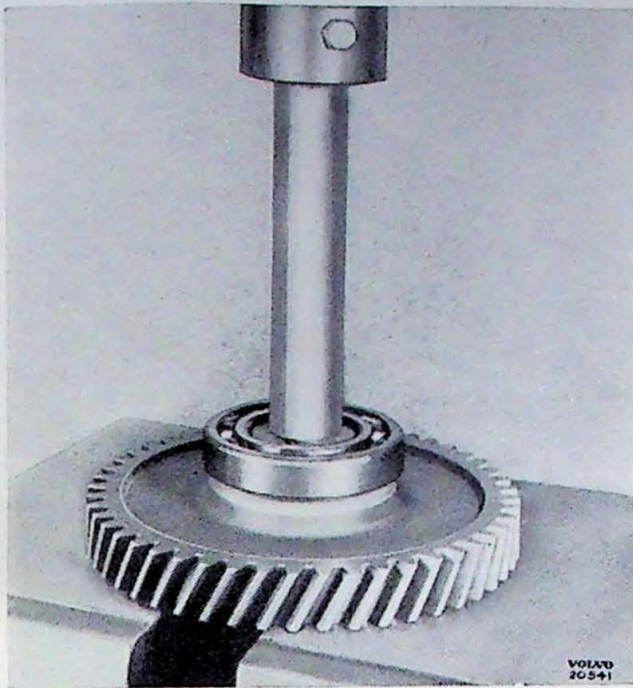


Fig. 3—22. Pressing the countershaft out of the bearing.

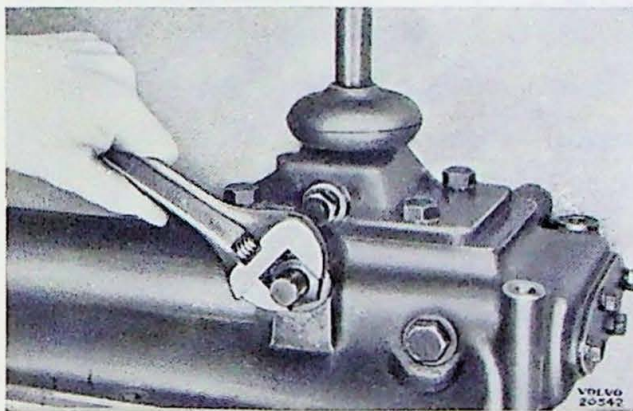


Fig. 3—23. Removing the reverse gear catch.

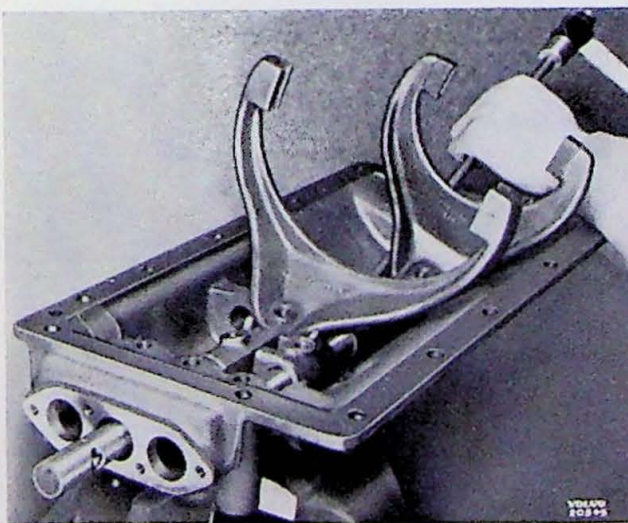


Fig. 3—24. Driving out the gearshift rails.

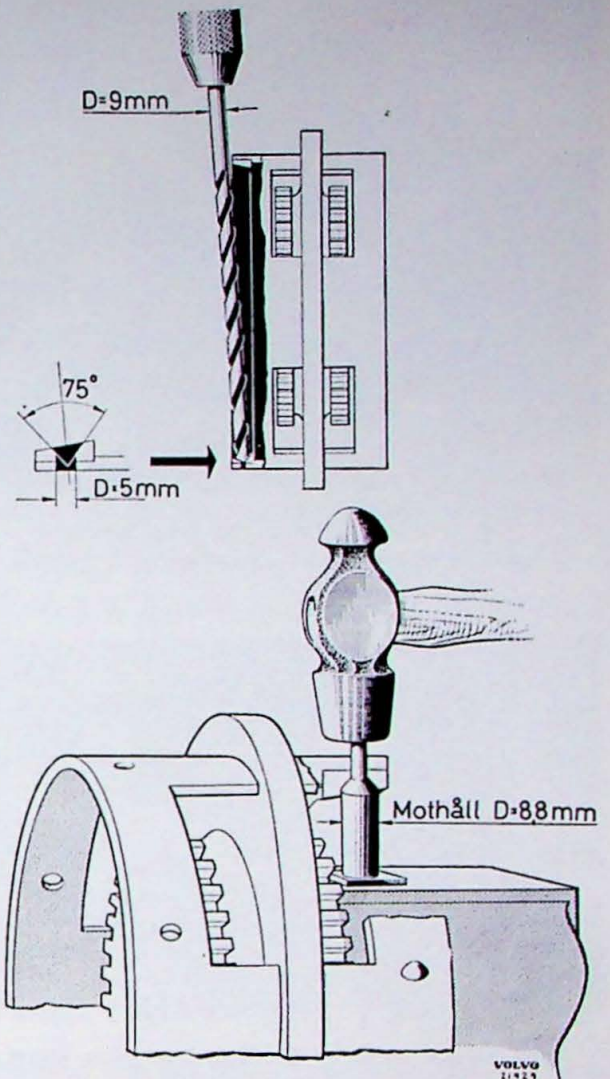


Fig. 3—25. Replacement of synchronizing cone.

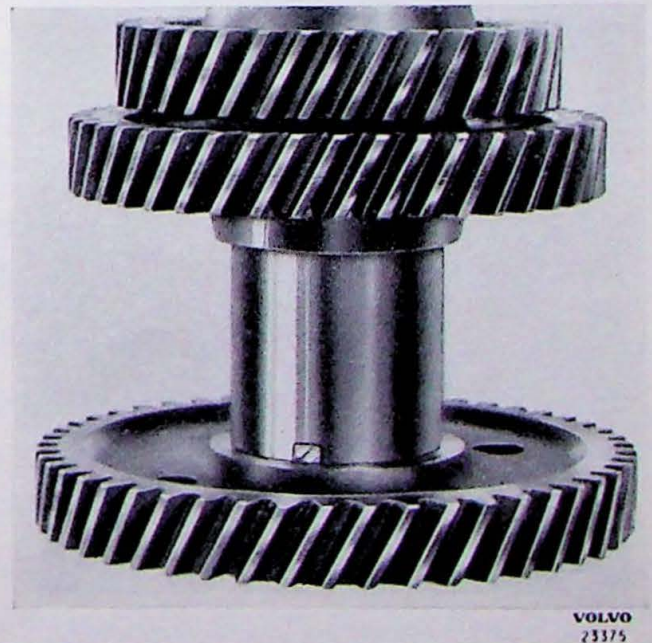


Fig. 3—26. Assembling the countershaft.

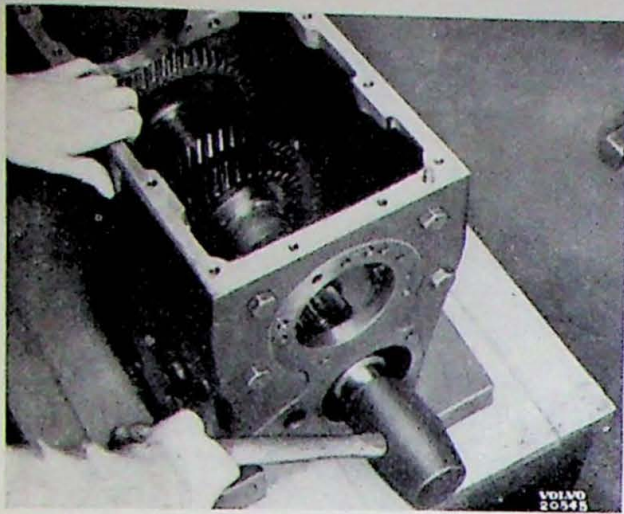


Fig. 3—27. Fitting the countershaft.

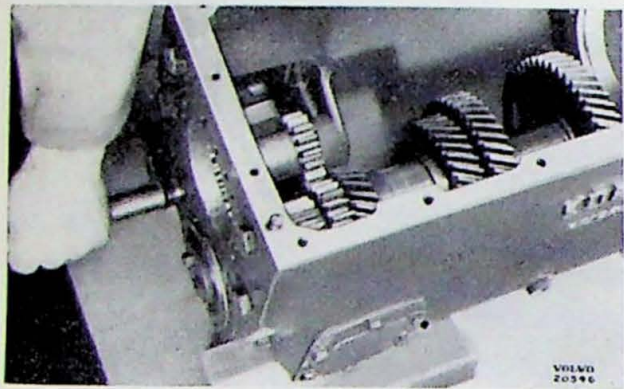


Fig. 3—28. Fitting the reverse gear shaft.

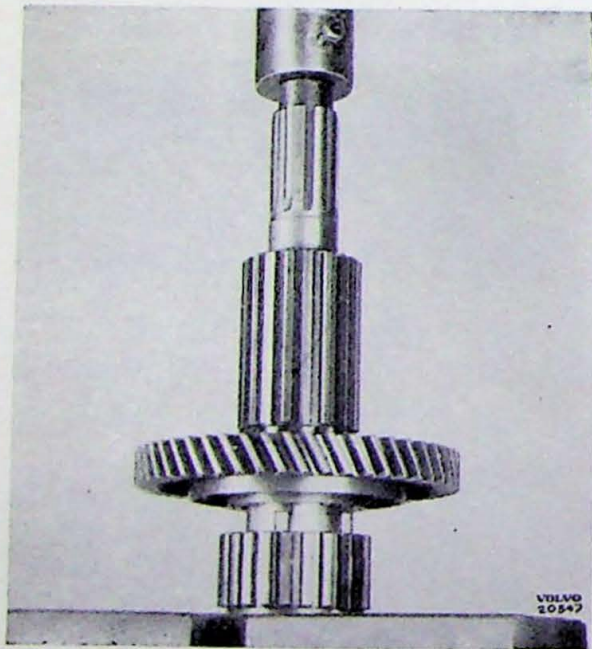


Fig. 3—29. Fitting the synchronizing hub on the mainshaft.

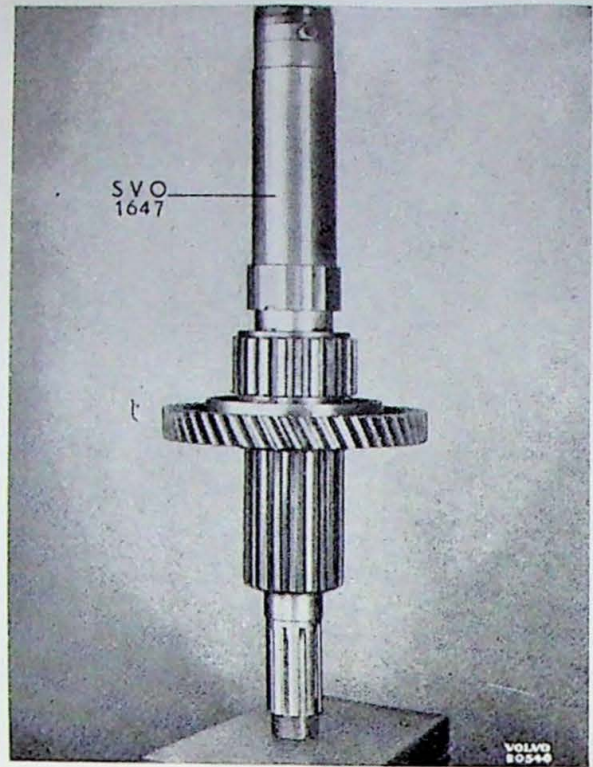


Fig. 3—30. Fitting the bushing for 3rd speed gear on the mainshaft.

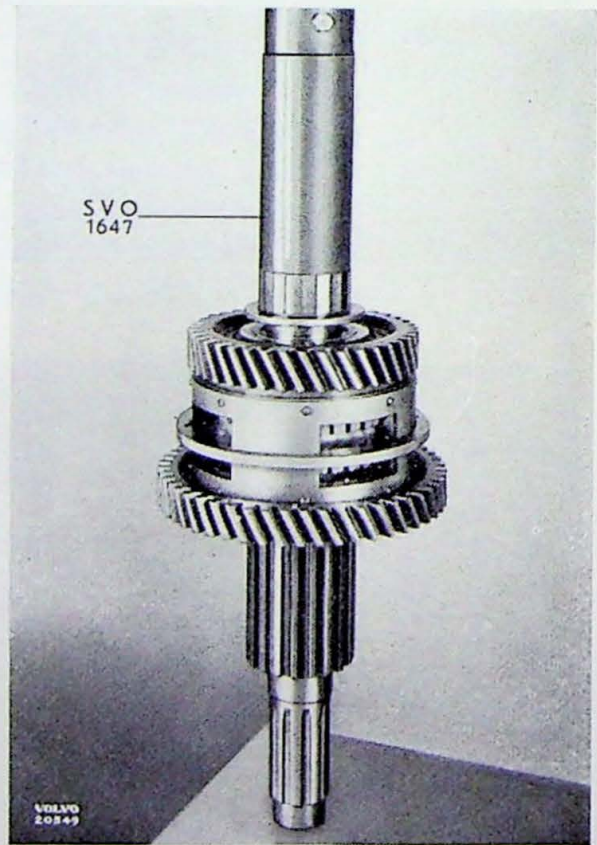


Fig. 3—31. Fitting the bushing for 5th speed gear on the mainshaft.

2. Press on the steel bushing (35) for the 3rd speed gear. Use sleeve SVO 1647 and place the bushing so that the notch in it grips round the hub key. See Fig. 3-30.
3. Place the synchronizing device (36) for the 2nd and 3rd gears on the shaft. Turn the riveted ring backwards. If this ring is missing, the device is stamped with "Fram" which is then to be turned forwards. Put on the 3rd speed gear (34) and press on the steel bushing (33) for the 5th or 4th speeds respectively. The bushing is fitted with a guide pin which will grip the splines of the shaft. Use sleeve SVO 1647. See Fig. 3-31.
4. Select a thrust washer (31) of a suitable thickness. When the correct washer is used, the lock ring (30) just enters the groove in the shaft, Fig. 3-32. Washers with the following thickness are available: 3.9-4.0-4.1-4.2-4.3-4.4-4.5-4.6 and 4.7 mm.
5. Place the 5th drive gear (32) (4th K 13) and thrust washer (31) on the shaft and fasten with a new lock ring (30). Install the lock ring with the help of SVO 1106 and SVO 1647. Make sure that the lock ring gets in the correct position.
6. Install the 1st and reverse gears (69) in the housing with the flange forward and slope 45° backwards. Move the rear end of the mainshaft through the gear and insert the shaft in it. Then place the gear in position. The drive gear (39) for the 2nd speed goes down through the moulded openings in the transmission cover.
7. Install the synchronizing device (28) for the 4th and 5th speeds. Turn the riveted ring backwards. If this is missing, the device is marked "Fram", which is then to be turned forwards.

Installation of the Main Drive Pinion on K 12

1. Press the roller bearing (92) in the main drive pinion (4) with tool SVO 1112 and lock with lock ring (25). Thread the protection washer (86) on the pinion.
2. Place the pinion in the housing and ensure that the bearing goes properly on the front end of the mainshaft. Install the lock ring (85) for the bearing (6) in the front.
3. Thread the rear bearing (52) and lock ring (58) on the mainshaft. Press the bearing into position with the help of socket SVO 1038 and press tool SVO 1498 at the same time as the bearing is driven in the housing. Use a rubber headed hammer so that the bearing is not damaged by dirt.

To prevent the pinion from rotating, place a driver or suchlike in the hole in the bolt. See Fig. 3-33. Let someone lift in the main drive pinion so that the bearing does not jam in the housing. Besides that, rotate the main drive pinion so that the gears are correctly installed and do not bend towards each other. Drive in the bearing so far that the lock ring rests against the housing.

4. Install a new pin for the speedometer drive gear (53) and install the spacer (55) and speedometer drive gear.
5. With drift SVO 1111, press the oil seal (57) into position in the bracket of the handbrake (51). Fasten on the gasket with shellac and install the bracket on the transmission housing with nuts which have been covered with shellac. Fit the lower cover. Moreover, the speedometer spindle must be installed. Fit the brake backing plate (48) with protector plate (60) and shoes.
6. Thread the ball bearing (6) on the main drive pinion. Secure tool SVO 1037 at the end of the housing and the spacer halves SVO 1036 between the main drive (24) on the main drive pinion and synchronizing device (28). See Fig. 3-34. Press in the bearing by turning the screw on the first-mentioned tool. Fig. 3-35. Put two gears in mesh at the same time so as to prevent the pinion from rotating.

The spacer halves are used for holding the pinion in such a position that the bearing first reaches the bottom at the shoulder of the pinion. Remove the spacer halves when the handle of the tool feels tight. Then tighten the screw further and press up to the lock ring in the housing at the same time as the main drive pinion comes into the correct position.

7. Install the lock ring (88) for the main drive pinion bearing. Turn the main drive pinion and check that it runs properly. If the main drive pinion is locked, despite that fact that the gears lie in neutral, a couple of light knocks on the synchronizing device usually help. Also check by engaging the different gears.
8. Fill the space between the torsion rod (96) and the main drive pinion (4) with heat resistant grease and fit the sleeve (95), the bearing (91) and retainer (97) with gasket on the main drive pinion.

Make sure that the marks on the sleeve and the torsion rod are opposite one another. Drive on the sleeve by striking lightly with a soft-headed hammer. Make sure that the retainer is fitted correctly (oil drain hole downwards) and then fit the bolts.

On early production main drive pinions, the seal ring is pressed into the retainer (97) using tool SVO 1111. Use shellac on the gasket and bolts and then fit the retainer.

9. Install the clutch housing. The gasket and bolts must be covered in shellac. Thread the clutch release bearing (99) and install the spring (100) and the lubrication hose (101) on the clutch housing. Install the lubrication hose so that it cannot come into contact with the clutch housing during the motion of the clutch release bearing.

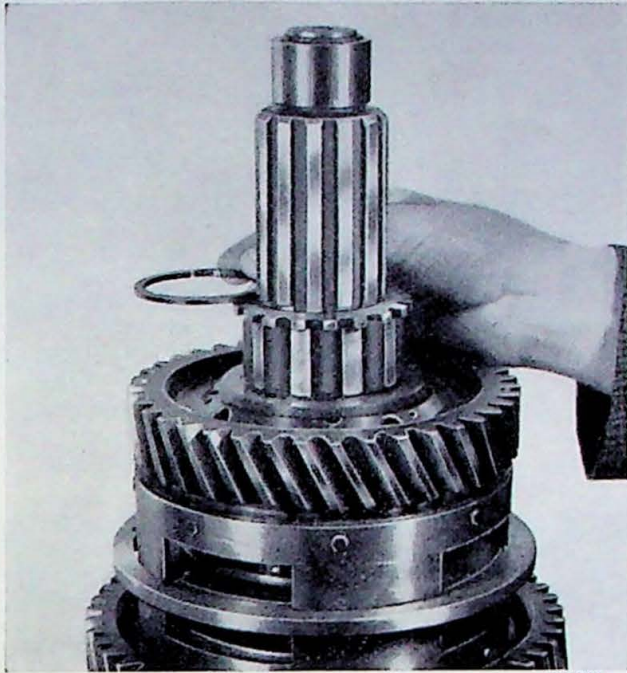


Fig. 3—32. Checking the lock ring.

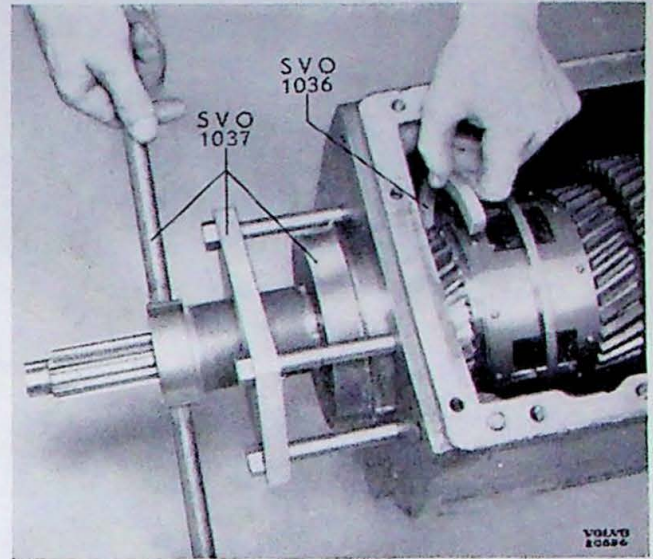


Fig. 3—34. Fitting the bearing on the main drive pinion, K 12.

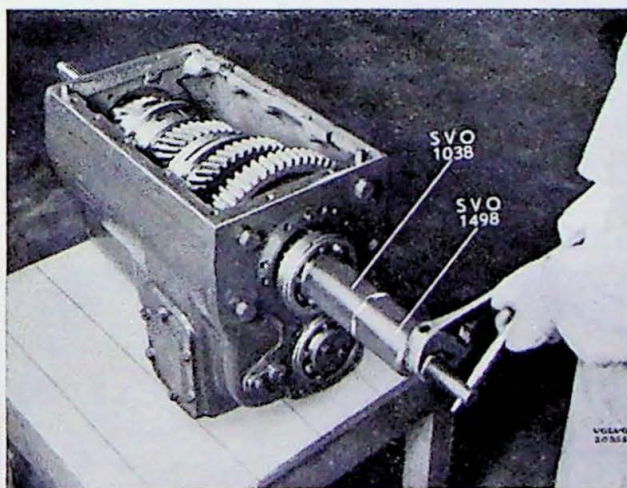


Fig. 3—33. Fitting the rear bearing on the mainshaft.

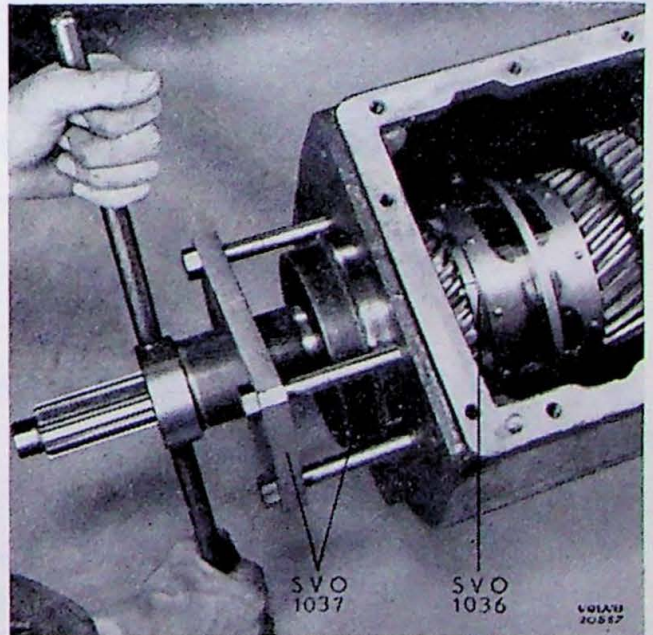


Fig. 3—35. Fitting the bearing on the main drive pinion, K 12.

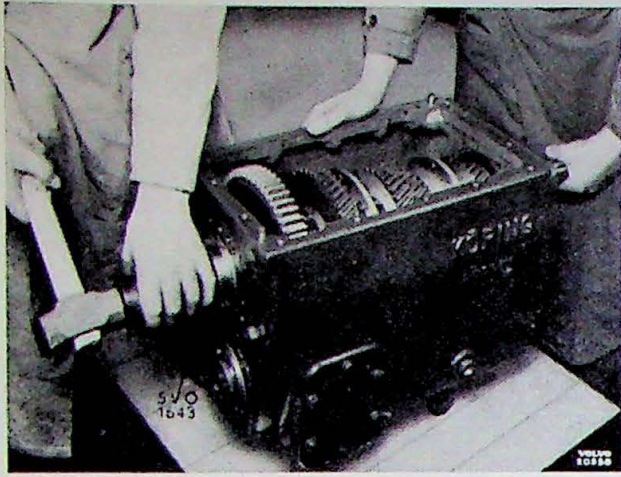


Fig. 3—36. Fitting the mainshaft.

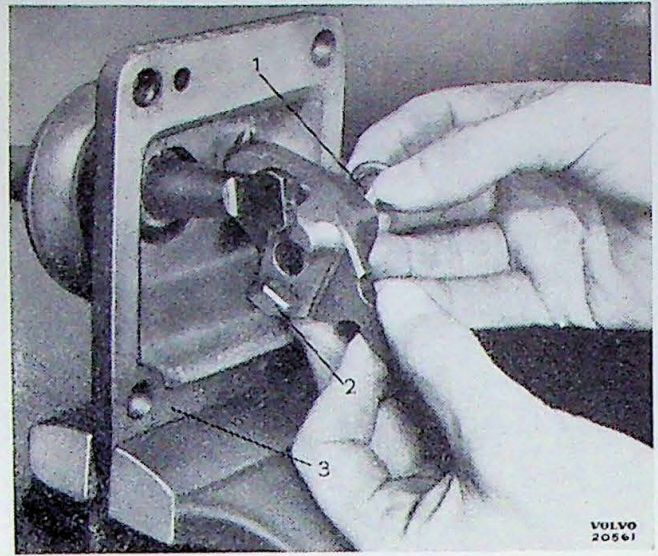


Fig. 3—39. Fitting the intermediate lever.

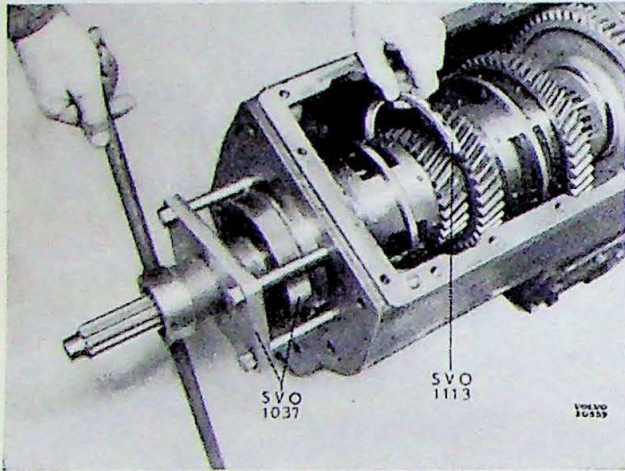


Fig. 3—37. Fitting the bearing on the main drive pinion, K 13.

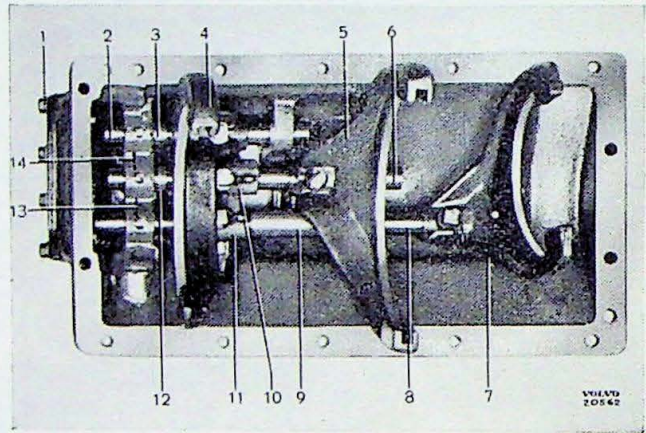


Fig. 3—40. Transmission cover.

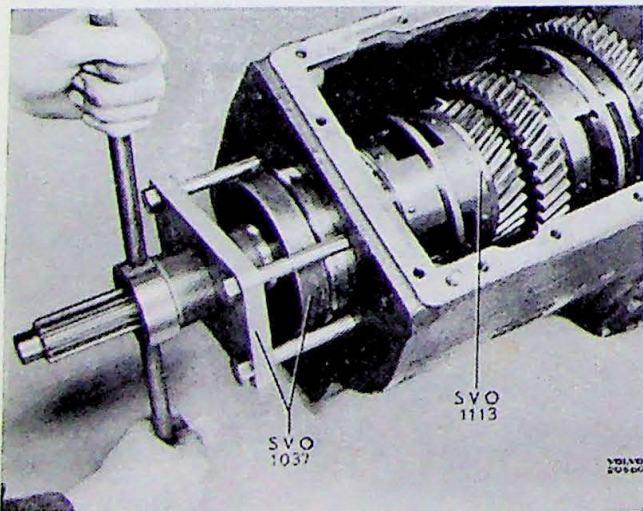


Fig. 3—38. Fitting the bearing on the main drive pinion, K 13.

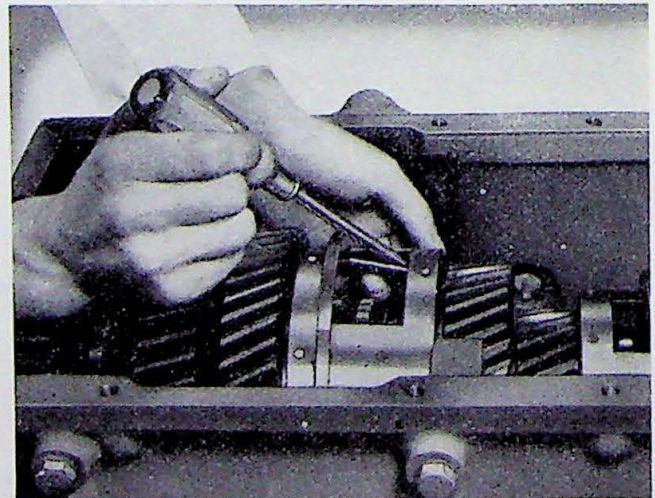


Fig. 3—41. Replacement of catch.

10. Make sure that the dust slinger is correctly fitted on the companion flange (56). Install the companion flange with the help of tool SVO 1498. See Fig. 3-38. The screws on the tool must be tightened to the bottom of the pinion. To prevent the pinion from rotating, set two gears in mesh at the same time. When pressing on the companion flange remove the tool, then install the lock washer and nut. Secure the nut with the lock washer. Fit the brake drum (62).

Installing of Main Drive Pinion on K 13

1. Press the guide bearing (92) in the main drive pinion (4). Use drift SVO 1112. Install the lock ring (25).
2. Place the main drive pinion in the transmission housing. Lift up the mainshaft about 13 mm (1/2") and work the pinions together. Install the lock ring (85) in the end of the housing.
3. Place the mainshaft as far back in the housing as possible but without allowing the main drive pinion and synchronizing device for the 4th and 5th speeds, to follow. Now press the bearing (52) and lock ring (58) on the mainshaft with the help of sleeve SVO 1038 and press tool SVO 1498. See Fig. 3-33.
4. With the help of tool SVO 1643, drive the bearing and shaft in the housing so far that the lock ring stops against the end of the transmission Fig. 3-36. Install the main drive pinion so that the bearing does not catch in the housing. Rotate the shaft all the time so as to ensure that none of the gears jam.
5. Install a new pin for the speedometer drive gear and thread on the spacer (55) and the speedometer drive gear (53).
6. Press the seal (57) in the bracket (51) for the handbrake, with tool SVO 1111. Fasten on a new gasket with shellac and install the bracket with bolts which have been covered with shellac. Fit the cover plate (60) and brake backing plate (48) with shoes.
7. Fix tool SVO 1037 and after fitting the washer (86) and bearing (6) on the main drive pinion, also place the spacer halves SVO 1113 between the synchronizing device (28) for the 4th and 5th gears and the 4th speed gear (32). See Fig. 3-37. Now press in the bearing with tool SVO 1037 to the bottom of the main drive pinion. Set two gears in mesh at the same time so that the shaft cannot rotate. Fig. 3-38. The spacer halves are used for holding the shaft in such a position that the ball bearing first reaches the bottom at the end of the pinion. When it feels tight in the handle of the tool, remove the spacer halves. Tighten the screw further, thereby pressing the bearing up to the lock ring in the housing at the same time as the main drive pinion gets in the right position.

8. Install the lock ring (88) for the bearing. Rotate the main drive pinion and check that it runs normally. If the main drive pinion is locked, even though the gears lie in neutral, give the synchronizing device a couple of light knocks to help. Also check that the other gears and shafts work properly by engaging the different gears in mesh.
9. Fill the space between the torsion rod (96) and the main drive pinion (4) with heat resistant grease and fit the sleeve (95), the bearing (91) and the retainer (97) with gasket on the main drive pinion (4).

Make sure that the marks on the sleeve and the torsion rod are opposite one another. Drive on the sleeve by striking lightly with a soft-headed hammer. Make sure that the retainer is fitted correctly (oil drain hole downwards) and then fit the bolts.

On early production main drive pinions, the seal ring is pressed into the retainer (97) using tool SVO 1111. Use shellac on the gasket and bolts and then fit the retainer.
10. Install the clutch housing. Cover the gasket and bolts with shellac. Thread on the clutch release bearing and fix the spring (100) and lubrication hose (101) on the housing. Install the lubrication hose so that it does not come into contact with the clutch housing during the motion of the clutch release bearing.
11. Make sure that the dust slinger is correctly fitted on the companion flange (56) and install same with the help of tool SVO 1498. The screw on the tool must be screwed to the bottom of the shaft. To prevent the shaft from rotating, set two gears in mesh at the same time. Tighten the nut and secure with lock washer. Fit the brake drum (62).

Assembly of Transmission Cover

1. Install the intermediate lever (2, Fig. 3-39) on the upper cover (3). Fasten with a bolt and nut, together with a spring washer. Moreover, install the gearshift lever in the cover with the cylindrical pin (14) Illustration 3-A. Thread on the rubber cap (12) and place the lock pin (1, Fig. 3-39) in the intermediate lever for the 1st speed and reverse gears.
2. Secure the transmission cover in a vise inside upwards. Install the gearshift rail for the 1st and reverse speeds (8, Fig. 3-40) and set on the companion flange (11), spacer (9), length 66 mm (2.19/32") and gearshift fork (7) in the afore-mentioned order. Secure the companion flange and shift fork in position on the rail. Secure the stop screws with lock wire.

3. Place one lock pin (13) in the cover into position between rails 6 and 8. If the lock pin and slotted pin are not installed on the gearshift rail (6) for the 2nd and 3rd speeds, do so. Insert the rail and place in the spacer (12), length 8 mm (5/16"), companion flange (10) and gearshift fork (5) by hand. Screw on the companion flange and shift fork and secure the bolts with wire.
4. Place the other lock pin (14) in the cover, into position between the rails (2 and 6). Insert the gearshift rail (2) for the 4th and 5th speeds and place on this the spacer (3), length 13 mm (33/64") and gearshift fork (4). Fasten the gearshift fork into position and secure the bolt. Note. If one of the last-mentioned rails is difficult to push in, first check that the lock pins lie in neutral position.
5. Install the cover (5, Illustration 3-A) at the front. Turn the transmission cover and install lock balls and springs (10 and 9 respectively).
6. Fit on the upper cover (18). Install the 1st and reverse speed catch in the gearbox cover.
7. Now check that all parts are correctly installed, that all screws and bolts are thoroughly secured and that gearshift forks and rail devices work as they should.
8. Fasten the gasket to the transmission with shellac and fit on the transmission cover. Check that all gears engage properly.

INSTALLATION

The transmission is installed in the opposite order to that used when removing.

Regarding installation and adjustment of rods and levers for the clutch operating mechanism, see Part 2.

WORK THAT CAN BE CARRIED OUT WITHOUT REMOVING THE TRANSMISSION

Replacement of Seal Ring

1. Disconnect the propeller shaft from the transmission. Loosen the center bearing and lower the propeller shaft. Remove the brake drum (62).
2. Engage 1st gear. Loosen the lock washer and the companion flange nut. Pull off the companion flange (56) using a standard puller.
3. Break the seal ring (57) using a sharp chisel. Take care not to damage the cover. Remove the seal ring. Fit a new seal ring using tool SVO 1111.
4. Fit other parts in reverse order to that used when removing. Use press tool SVO 1498 when fitting the flange.

Replacement of Catch in Synchronizing Device

1. Remove section of cab floor over transmission.
2. Loosen bolts and lift off transmission cover (19).
3. Jack up one of the rear wheels so that it rotates easily. Engage the gear on the synchronizing device of which the catch (27) is to be changed. Turn the main shaft by using the starter motor until one of the catches is accessible. Remove the catch by using a screwdriver, see Fig. 3-41. Fit a new catch. Turn the shaft and replace the other catches.
4. Fit other parts in opposite order to that used when removing.