



SERVICE MANUAL

TRUCKS

L 385

Export Service Department

AKTIEBOLAGET

VOLVO

GÖTEBORG, SWEDEN

this should be turned to face the front end of the engine.

In cases where a connecting rod is replaced, the new connecting rod should be marked with the same number as the old one.

Connecting rods are always classed in accordance with their weight. The letter showing to which class the connecting rod belongs (see Fig. 1-70) is stamped immediately above the bearing cap joint. Only connecting rods bearing the same weight letter may be fitted in the one and the same engine. Tables showing the weight classifications are in the specifications. When fitting the connecting rods make sure that the guide pin which locates the connecting rod bearing cap axially is firmly in position. It should be secured longitudinally by staking the outer edges of the hole.

The cavities for the connecting rod bearings are fitted with recesses for the projections on the back of the bearing shells. It is important to ensure that the bearing shells are turned the right way when fitting so that the above-mentioned guide projections engage correctly in the recesses and that the oil holes in the bearing index with the holes in the connecting rods.

CAMSHAFT AND CAMSHAFT BEARINGS

Inspection

The camshaft should be carefully checked for alignment and wear on the bearing surfaces and cam faces. If the engine is to run well after reconditioning it is important to pay special attention to the cams in order to determine that there is no uneven wear since this can cause wobbling valve operation and subsequent exhaust valve breakage. The cams may be diagonally worn in an axial direction. In less severe cases, this can be adjusted by polishing the cam in question. If there are any signs of serious damage or severe wear, the camshaft should be replaced. The out-of-roundness of the bearing journals or the wear on them may not exceed 0.07 mm (0.0025"). If there is any reason to suspect cracks or material faults in the camshaft it should be Magnaflux tested. Replace the camshaft if the bearing journals are seriously worn or the camshaft is cracked. Camshaft bearings must be replaced when wear has reached 0.05 mm (0.002").

Replacement of Camshaft Bearings

The bearings are pressed into position and should be reamed or line-reamed after being pressed in so that replacement of the camshaft bearings with the exception of the front bearing can only be carried out when the engine is complete reconditioned. Special tools are required for this purpose.

When the new bearings are being pressed in, great care should be taken to ensure that the oil holes index correctly with the corresponding oil channels in the block.

AUXILIARY DRIVE GEARS

Removing

1. Remove the auxiliary drive gear cover in accordance with instructions 3-4 under "Replacement of Auxiliary Drive Gears" on page 1-23.
2. Bend up the lock washer and remove both the bolts retaining the idler gear to the bearing journal. Remove the gear.
3. Remove the bolts retaining the bearing journal on the block and remove the bearing journal.
4. Take off the nut and then remove the camshaft gear by using puller SVO 2116 (Fig. 1-73).
5. Pull off the crankshaft gear using tool SVO 1011 A.
6. Remove the fuel injection pump drive gear with puller SVO 2116.

Inspection

The auxiliary drive gears should be inspected with particular attention to the teeth which should not be marked in any way nor should show any signs of filings. The teeth may not be bent or deformed in any way. The degree of wear may not be such that the tooth flank clearance is so great as to cause noisiness when the engine is idling. If the clearance should be so large or the gears in any way defective so that replacement is necessary, all gears should be replaced at the same time.

Check that the cross keys fit well in their keyways.

Examine the bushing and bearing journal for the idler gear. If looseness exceeds 0.1 mm (0.004") the bushing and possibly also the journal must be replaced. When replacing the bushing, it is pressed out and the new bushing pressed in by using tool SVO 2141. Make sure that the lubricating holes in the bushing index correctly with the corresponding holes in the gear. After being pressed in, the bushing should be reamed to a light running fit on the journal. Blow the oil channels clean after reaming is completed.

Assembly and fitting

Each individual gear is marked with a punch mark opposite either a tooth or the recess between two teeth. The correct settings of the auxiliary drive gears are shown in Fig. 1-79. The camshaft gear and the fuel injection pump drive gear are marked so that they can be used alternatively for both functions as shown in Fig. 1-78.

Assembly is commenced by first pressing on the crankshaft gear with tool SVO 2099 and then turning the crankshaft until there is compression on number 1 cylinder.

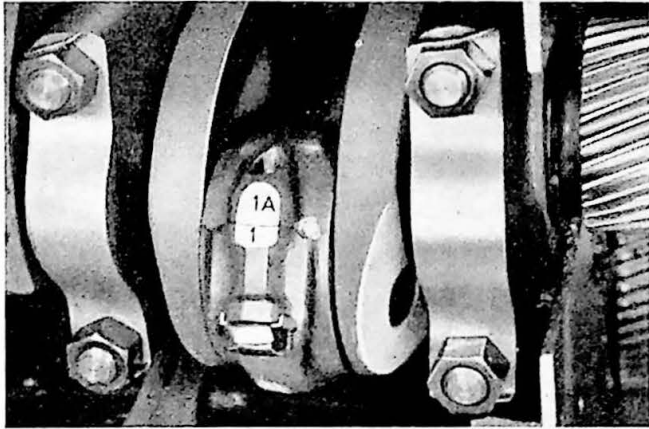


Fig. 1-70. Connecting rod marking.

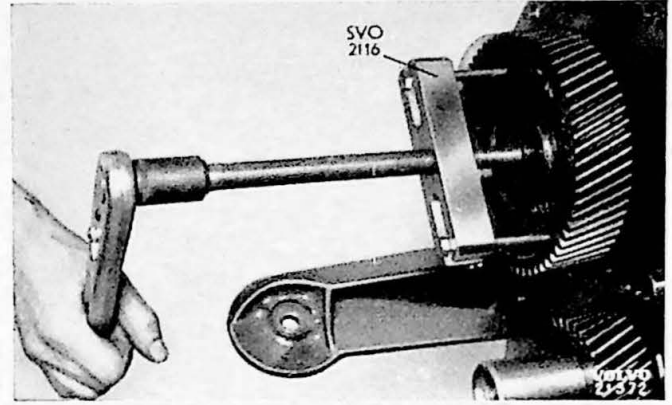


Fig. 1-73. Removing camshaft gear.

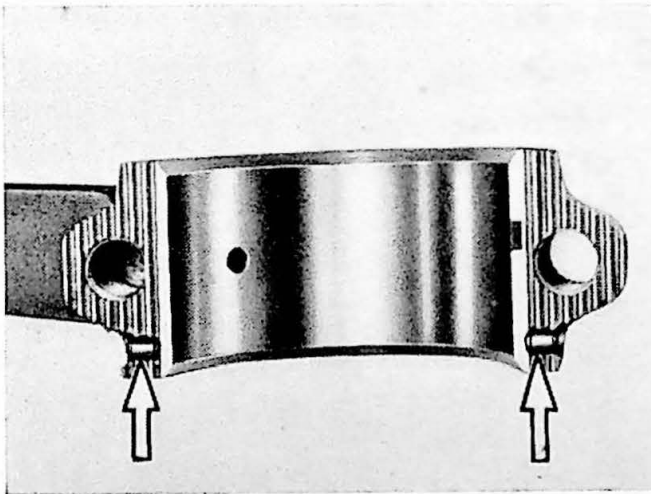


Fig. 1-71. Guide pins for bearing cap.

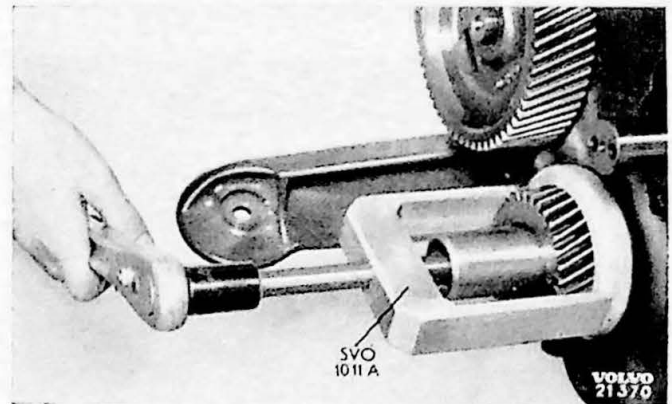


Fig. 1-74. Removing crankshaft gear.

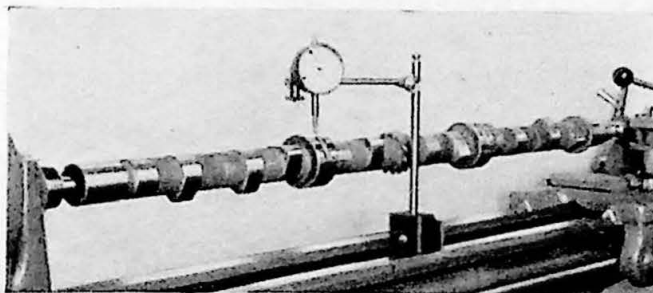


Fig. 1-72. Alignment of camshaft.

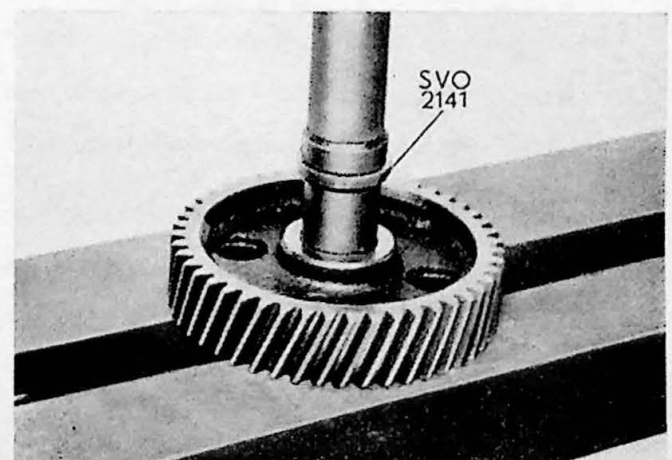


Fig. 1-75. Fitting bushing.

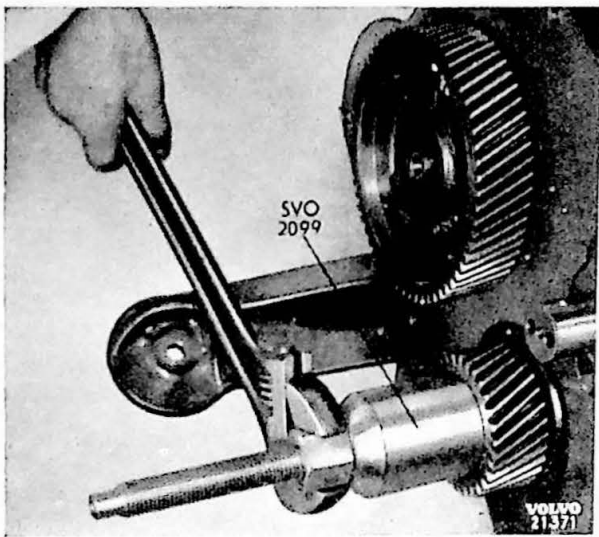


Fig. 1—76. Fitting crankshaft gear.

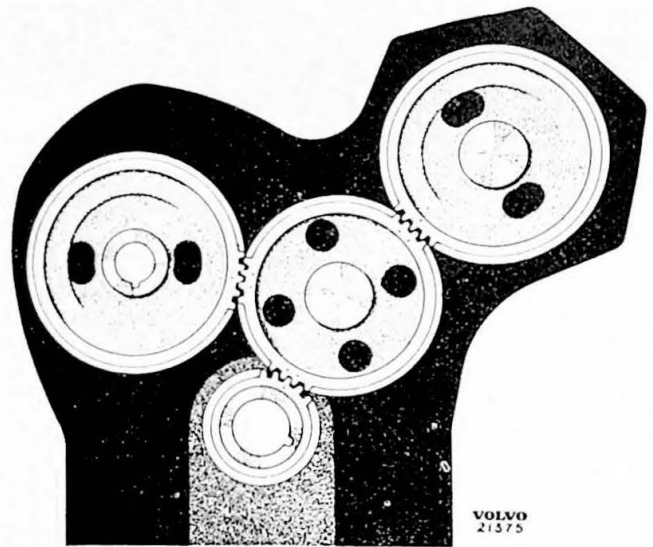


Fig. 1—79. Auxiliary drive gear settings.

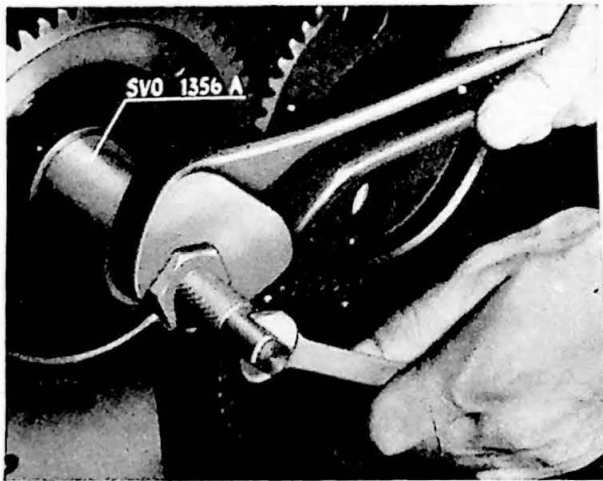


Fig. 1—77. Fitting camshaft gear.

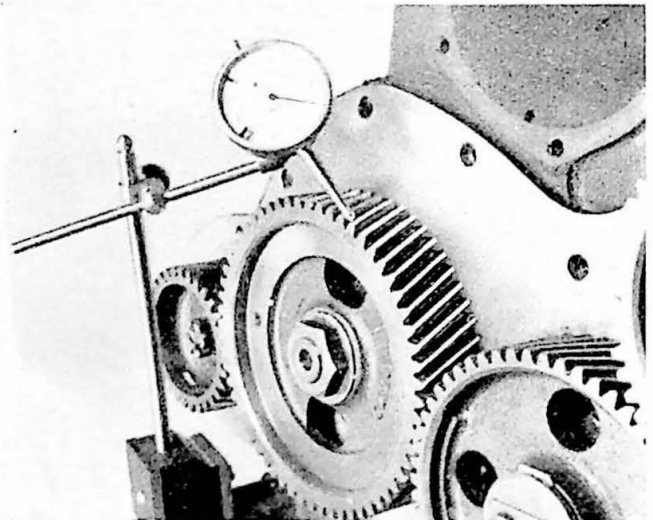


Fig. 1—80. Checking tooth flank clearance.

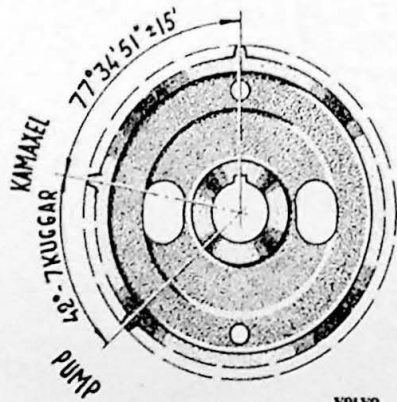


Fig. 1—78. Camshaft gear and fuel injection pump drive gear.

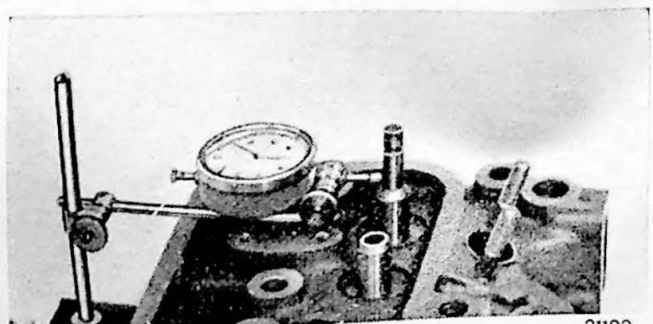


Fig. 1—81. Checking clearance.

Then press on the camshaft gear with press tool SVO 1356, tighten the nut and secure it with a lock washer.

The idler gear is then fitted on its journal, due attention being paid to the markings, and is tightened by means of two bolts which are then secured with lock washers.

Finally the fuel injection pump drive gear is fitted with the help of press tool SVO 1356 care being taken to ensure that the markings on the gear are in their correct positions.

The tooth flank clearance is then checked and this should be 0.03–0.07 mm (0.0018"–0.0027"). This clearance is measured either with a feeler gauge or a dial indicator as shown in Fig. 1-80.

When carrying out measurements with a dial indicator, first measure the clearance between the crankshaft gear and the idler gear. Then lock the idler gear and measure the clearance on the other gears. On early production engines when measuring tooth flank clearance for the fuel injection pump and vacuum pump drive gears, a special fixture must be used which follows the contours of the auxiliary drive gear casing and has been precision ground. This fixture is bolted into position on the intermediary plate to prevent any movement on this.

VALVES AND VALVE MECHANISM

Inspection

Valves and Valve Seats

The valve disks may not be burned or distorted and there should be no deep pitting in the contact surface towards the valve seat. The valve stem should be absolutely straight and wear should not exceed 0.02 mm (0.0008"). After grinding the edge on the valve disk should not be less than 1 mm wide (0.04") since otherwise heat conduction will not be sufficient. Valves which do not come up to this specification should be discarded.

The valve seats should be checked for cracks, the condition of the contact surface and looseness. Loose or cracked valve seats should be replaced. Burned valve seats can be adjusted by using a valve seat cutter or a Vibro-Centric grinder.

Valve Guides

Excessive looseness between the inlet valve stems and their guides causes oil losses. If the valve stems and guides are worn, the vacuum caused by the induction stroke of the piston will carry an excessive amount of oil and air to the combustion chamber. Oil which has passed through the inlet valve guides can easily be detected since there will be a thick deposit of carbon on the underside of the valve disks. Clearance between the valve stem and guide is measured by using a dial indicator. Fit a new valve. See Fig. 1-81. Since the diameter of the inlet and exhaust valves are not the same, care must be