

## Tightening Torques in kpm

Hex. bolts for attaching cylinder head covers			0.5
Hex. bolt for attaching camshaft gear			10
Cylinder head bolts	with cold engine	1st tightening step	3
		2nd tightening step	5
Camshaft bearing bolts to cylinder head			5

## Special Tools

Socket spanner insert 8 mm		000 589 38 07 00
Removal and installation tool for rocker arm		116 589 00 61 00

## Note

Never remove both camshafts together. **When replacing a camshaft, the pertinent rocker arms should also be replaced.**

## Removal

- 1 Remove cylinder head covers.
- 2 Unscrew spark plugs.
- 3 Remove rocker arm (05.1–230).

- 4 Set piston of 1st cylinder to ignition TDC, removing the cover on the pulley and cranking the engine with the tool combination shown in Fig. 1.

**Do not crank engine on hex. bolt of camshaft gears.**

- 5 Loosen camshaft gear, **secure** timing chain and camshaft gear **with binding wire**, so that the timing chain cannot skip.

- 6 Knock camshaft gear from camshaft.

- 7 Unscrew fastening bolts of camshaft bearings.

**Caution!** Use socket spanner insert for loosening and tightening fastening bolts (Fig. 2).

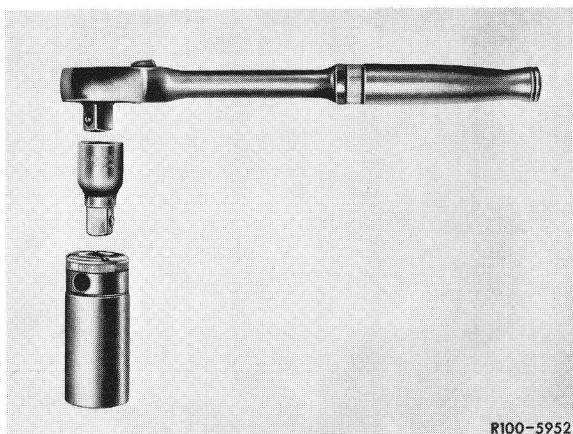


Fig. 1

# 05.1 Removal and Installation of Camshaft

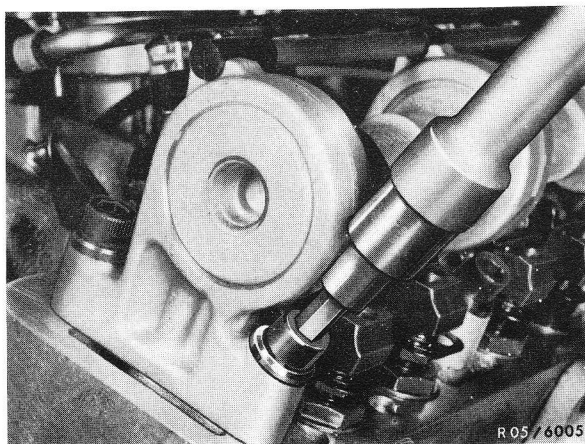


Fig. 2

**8** Lift off camshaft with camshaft bearings and remove camshaft from camshaft bearings.

## Installation

**9** Lubricate bearing points of new camshaft and carefully install camshaft into camshaft bearings (Fig. 3).

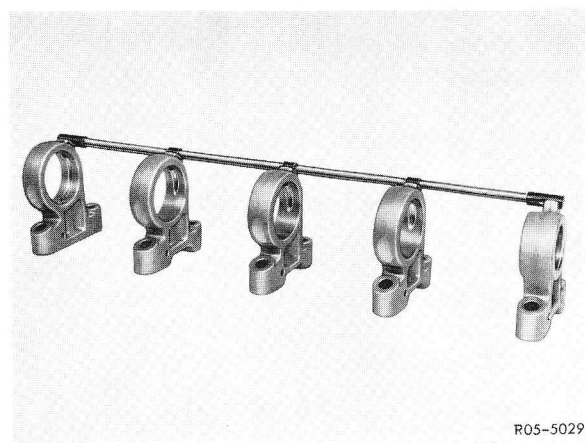


Fig. 3

**10** Place camshaft with camshaft bearing on cylinder head and tighten in steps from inside out. **Watch out for easy operation of camshaft.**

**Note:** On the lefthand camshaft the outer fastening bolt of the rear camshaft bearing must be inserted into the camshaft bearings prior to mounting the camshaft (to accomodate the brake unit).

**11** The oil pipe for the external lubrication of the rocker arms need not be removed from the camshaft bearings for this job. But if for some reason or other, for example during the simultaneous replacement of the camshaft bearings, the oil pipe must be removed, be sure to replace the plastic connection pieces. These connection pieces are supplied in a set for each oil pipe.

When mounting the oil pipes, put connecting pieces into assembly position and check the three inner connecting pieces for unobstructed passage of oil bores prior to knocking on camshaft bearings. **Replace oil pipe if oil bores are obstructed.**

**12** Mount compensating washer in such a manner that the keyway at the notch is in mesh with the woodruff key of the camshaft (refer to arrow in Fig. 4).

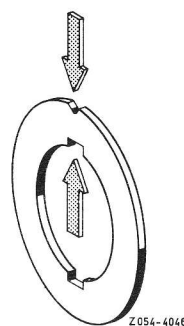


Fig. 4

**13** Place camshaft gear on camshaft, remove locking wire.

**14** Mount rocker arm (41) and tensioning spring (40). Make sure that the tensioning springs are correctly seated (Fig. 5).

**15** Adjust valve clearance (05.1-210).

**16** Check timing on both camshafts. Make corrections by using offset woodruff keys, if required (05.1-215).

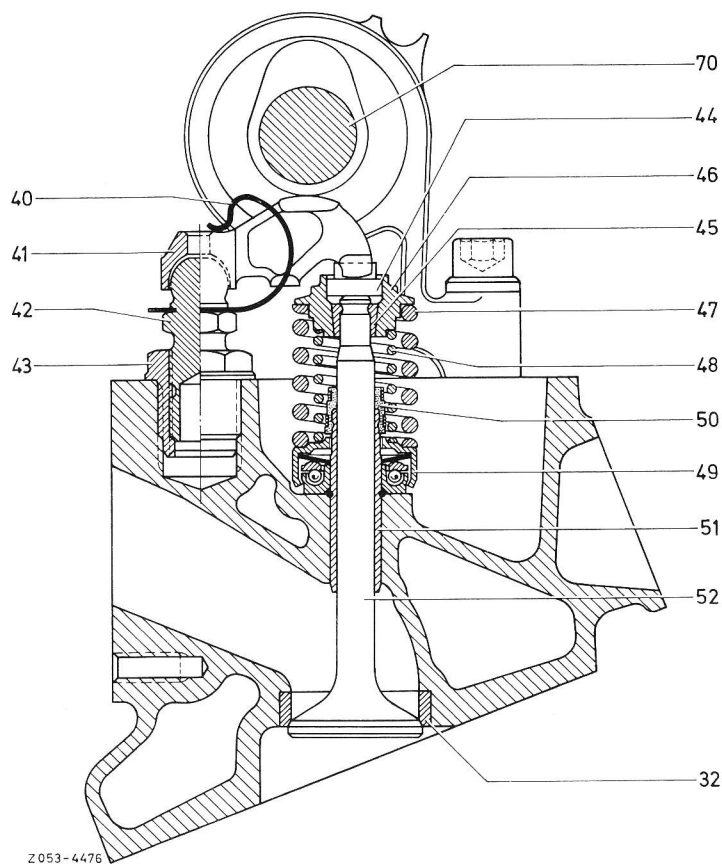


Fig. 5

## Valve timing

- 43 Threaded bushing
- 42 Ball pin
- 41 Rocker arm
- 40 Tensioning spring
- 70 Camshaft
- 44 Thrust piece
- 46 Valve spring retainer
- 45 Valve cone half
- 47 Outer valve spring
- 48 Inner valve spring
- 50 Valve seal
- 49 Rotocap
- 51 Valve guide
- 52 Exhaust valve
- 32 Valve seat ring

**17** Tighten bolts on camshaft gears. When tightening the bolts, counterhold camshaft gears by means of a round bar or the like, so that the chain drive and the chain tensioner are not put under load.

**18** Mount cylinder head covers. Watch out for correct seat of gaskets.

**19** Run engine and check for leaks.

**20** Check valve clearance after driving for approx. 500 km (05.1–210).