

Re-bedding of Crankshaft

Change: Paragraphs marked with an x have been added or changed

Job No.

03-9

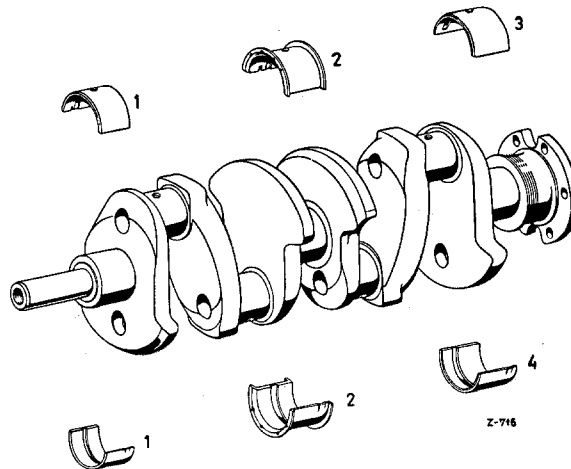


Figure 03-9/1

Crankshaft and Crankshaft Bearings, OM 636

- x 1 Bearing shells of front main bearing (the two bearing shells are similar)
- 2 Bearing shells of the lapped bearing (the two bearing shells are similar)
- 3 Upper bearing shell half at the flywheel end (with H-shaped lubricating groove)
- 4 Lower bearing shell half at the flywheel end (with normal lubricating groove)

Clearances between Crankshaft Journals and Main Bearings

Typ	Radial *	Axial ** \varnothing	Overlap of bearing shell halves
OM 636	0.05 to 0.07 mm	0.05 to 0.08 mm	± 0.00 to $+0.025$ x
OM 621	0.045 to 0.065 mm	0.1 to 0.175 mm x	

* The radial play specified in this table is an average clearance which must always be adhered to. The bearing shell halves of the main bearings and big-end bearings are supplied for all overhaul stages ready for installation.

** The 2nd main bearing is designed as a lapped bearing. The two bearing shells on **OM 636** are furnished with a thrust collar, which is 1 mm wider from the 1st overhaul stage on. There are also lapped bearing shells available with the collar 1 mm wider but with standard bore for special repair cases. Formerly, only the upper bearing shell half was designed as a lapped bearing. A 2nd bearing shell half with thrust collar can be installed without difficulties in these engines in case of repair.

On the **OM 621**, the 2nd main bearing cap (fitted bearing cap) has one butting plate each on both sides which are fastened by two tensioning pins (see Figure 03-5/10 and 03-5/11).

The butting plates are available in the following thicknesses:

2 mm (standard), 2.05 mm, 2.10 mm, 2.15 mm, 2.20 mm, 2.25 mm, 2.30 mm, and 2.35 mm. The deviation from the rated measure is in each case -0.020 to -0.027 mm. The butting plate halves should be so selected that with the journal width of the fitted bearing of the crankshaft, the correct axial play results.

x **The OM 621 engine is now provided with two fitted collar bearing shell sections, one in the cylinder crankcase (upper bearing shell section), and one in the crankshaft bearing cap (lower bearing shell section).**

x **Note:** For the repair stage bearing shell sections the fitted collar bearings are also available at an oversize width 0.5 mm wider.

When making repairs be sure to install two fitted bearing shell sections and refinish in such a manner that together with the pin width of the center crankshaft bearing the specified axial clearance of 0.1–0.175 mm is obtained. Wear limit = 0.30 mm. If the engine is disassembled for other reasons the fitted collar bearing should be replaced already at 0.2 mm clearance.

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For the **OM 621**, the three upper bearing shells (1, 2 and 3) and the lower centre shell (2), which are provided with one oil bore and one lubrication groove, are identical and can be interchanged provided the bearings are new. The two lower bearing shell sections (1 and 3) are also identical and interchangeable (refer to Fig. 03-9/1; if bearing shells 2 on the OM 621 are still without collar, be sure to use fitted collar bearings for the second crankshaft bearing from now on only.

The crankshaft bearings should be exchanged as a complete set of three bearings, i.e., of six bearing shells.

The tolerance of the bearing shells amounts to ± 0.01 with a diameter of 59.519 mm for the OM 636 and 74.519 mm for the OM 621. Considering the housing bore of 59.500–59.519 mm, for the OM 636 and 74.500–74.519 mm for the OM 621, an overlap of -0.01 to $+0.03$ results. Practically, it is not possible to measure this small overlap, which is not necessary, since the bearing shells are supplied ready for installation. **With the specified diameter of the basic bores in the cylinder crankcase this overlap will result by itself.**

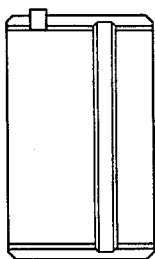


Figure 03-9/2

Lower bearing shell of the 3rd crankshaft bearing (flywheel side) for OM 636

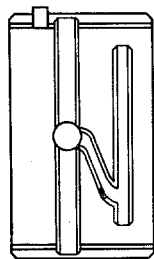


Figure 03-9/3

Upper bearing shell with bore and "H" lubricating groove of the 3rd crankshaft bearing (flywheel side) for OM 636

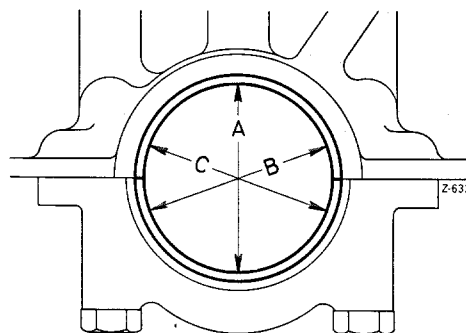


Figure 03-9/4

1. Clean the separating surfaces of the bearing caps and of the crankcase, then screw on the bearing caps and tighten the bolts with a torque of 8 mkg for the OM 636 and 9 mkg for the OM 621.
2. Clean the basic bores, then use an internal dial gauge to measure them in the three directions A, B, and C (see Figure 03-9/4 and 03-9/5). The dia. of the basic bores amounts to 59.500–59.519 mm for the OM 636 and 74.500–74.519 mm for the OM 621.

For checking the conicity of the bores, the measures are taken at front and at rear in the bore.

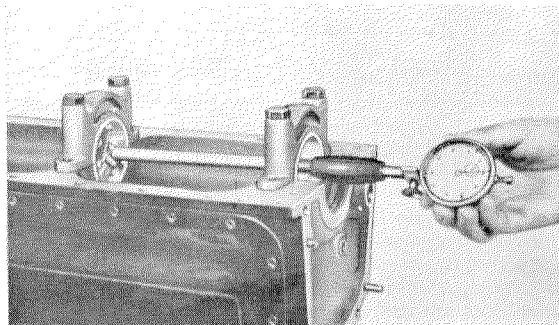


Figure 03-9/5

Permissible out-of-round 0.01 mm
Permissible conicity 0.01 mm.

3. If dislocated, apply slight hammer blows to move the caps back in the centre position. The cap has its centre position if the measuring results are identical in the direction B and C (see Figure 03-9/4).

Note: Any damaged or cracked bearing cap should be replaced by a finished replacement cap. The basic bore should be measured in direction A, B and C (see Figure 03-9/4).

If the bore in direction A exceeds 59.519 mm with the OM 636 or 74.519 mm with the OM 621, re-machine the bearing cap at its separating surface until the measure lies within 59.500–59.519 mm for the OM 636 and 74.500–74.519 mm for the OM 621. To achieve a favourable overlap the measure 59.500 or 74.500 should be achieved.

If the measure B is different from the measure C, the bearing cap is dislocated or distorted. As a remedy, the dowel pin bores can be accordingly re-machined and the bearing cap aligned with respect to the basic bore in the cylinder crankcase.

If the bore in direction A is less than 59.500 or 74.500 mm, the bearing cap should be turned. Before machining, the boring bar should be properly aligned with respect to the basic bore. By no means, should the tool remove stock from the cylinder crankcase. The tool should only slightly contact the basic bore in the cylinder crankcase and should remove stock only from the bearing cap.

The permissible misalignment with respect to the basic bore is 0.02 mm.

4. Clean the basic bores in the bearing caps and in the cylinder crankcase, fit the shells, place the bearing caps and tighten with 8 mkg for the OM 636 and 9 mkg for the OM 621. Regarding the OM 636, the bearing shells of the 3rd crankshaft bearing (flywheel side) must not be confounded. The bearing shell with the bore and the "H" lubricating groove should be placed into the basic bore of the cylinder crankcase (see Figure 03-9/3).

5. Measure the bearing bores in the same way as the basic bores (see Figure 03-9/4 and 03-9/5).

The dia. of the crankshaft bearings with fitted shells is standard 54.99–55.02 mm for the OM 636 and 69.99–70.02 mm for the OM 621; deduct 0.25 mm each for the repair sizes I, II, III and IV.

The specified radial or running clearance of 0.05–0.07 mm for the OM 636 and 0.045 to 0.060 mm for the OM 621 must be strictly observed.

6. After grinding the crankshaft, measure the width of the fitted bearing journal (B) (see Figure 03-6/1) and re-machine the collar of the fitted bearing of the **OM 636** equally on both sides, so that the specified axial clearance of 0.05 to 0.08 mm results. The boring bar should be properly aligned with respect to the bearing bore so that the butting surfaces are exactly rectangular with respect to the bearing bore when machining.

With the **OM 621**, the butting plates for the 2nd crankshaft bearing cap (fitted bearing cap) should be so selected and mounted that with the journal width of the fitted bearing of the crankshaft, the specified axial play of 0.1–0.175 mm results (see Job No. 03-5/7, item 10).

- x **The OM 621 engine is now provided with fitted collar bearing shell sections in the cylinder crankcase and the crankshaft bearing cap. In the event of repairs be sure to install two fitted collar bearing shell sections and machine them in such a manner that with the pin width of the center crankshaft bearing the specified axial play of 0.1 to 0.175 mm is obtained.**

7. Install crankshaft (refer to Job No. 03-5/7).