Installation of bearings Step by step

Details – flat bearing shells







Diameter and roundness measurements on locating holes and connecting rods The tightening specifications must be observed for every machining and measurement process. As the diagram shows, two measurement processes are necessary: 1. The measurement of the locating hole (without bearing shell) 2. The measurement of the bearing bore

Calculate the mean from these measured values A and B and compare with measured value C. The result tells you whether the bore is round. If you find a difference between values A and B, this is a cover offset with half the difference.

Inspection

Permissible taper:	
Nidth	Taper
up to 25 mm	max. 3 µm
25 to 50 mm	max. 5 µm
50 to 120 mm	max. 7 µm



Misalignment of the locating hole • Permissible total misalignment:

0.02 mm • Misalignment between adjacent bores: 0.01 mm



Width up to 30 over 30 over 50

Checking the bearing shells

- 1. Kolbenschmidt supplies the bearing shells ready to fit, whatever the undersize grade. The bearings must not be remachined.
- 2. Make a comparison with the removed bearing. This is the only way you can be sure that you have selected the right bearing.



Locking lugs

With this assembly device, the bearing shell is correctly positioned. The locking lugs on the bearing shells are used purely for facilitating manual installation. The lugs are an obstacle during mechanical engine assembly, however. For this reason, various bearing shells in new engines are no longer equipped with locking lugs.



Oiling the bearing shells

Use an oil can. A brush may transfer dirt particles from the oil container.



Free spread of the bearing shells

Measured across the parting faces, the bearing shell is larger than the diameter of the bore. This produces good contact with the wall of the bore during installation, preventing the bearing from twisting or falling out.



Press fit with protrusion

The circumferential length of the bearing shells is longer than the bore. This circumferential length is elastically shortened during installation. The tension produced in this way generates the contact pressure that ensures the bearing remains correctly seated.







Final inspection of the crankshaft

or the shaft diameter the tolerances stated in the catalogue apply. ndividual checks for ompliance with oundness and parallelism tolerances.

Permissible out-ofroundness max. one quarter of the shaft tolerance.

Maximum values for tapered, convex or concave ground shafts:

	loleranc
0 mm	3 µm
to 50 mm	5 µm
mm	7 µm

Inspection – radial eccentricity

A concentricity check must be performed for each reconditioned crankshaft, especially after rehardening. The permissible radial eccentricity is measured supported on the outer main bearing journals.

Permissible misalignment of the main bearing journals: Adjacent journal 0.005 mm Total 0.010 mm

These tolerances are standard values unless different figures are specified by the manufacturer.



Measuring radii



The radii must be dimensionally accurate as per the manufacturer's specification. Overly small radii result in crankshaft fracture. Compliance with surface quality and dimensional tolerance specifications is particularly important with radius hardened journals.

Surface roughness

Exceeding the specified tolerance for the journal surface quality leads to increased wear.

The surface roughness should have an arithmetic mean roughness Ra (CLA) of 0.2 μm max. (corresponds to approx. Rt 1 μ m max.). The same applies to the thrust faces of the flanged bearing.



Tightening specifications

Strictly follow the tightening specifications. This is important to obtain the prescribed pressure and fit, ensuring firm bearing seating and perfect running clearance.



Inspection – axial clearance

The flanged bearing is designed with extra width for reconditioning purposes. If you grind the crankshaft to match this bearing shell width, you will adhere to the correct axial clearance.





All engine components must be sufficiently

lubricated. In newly installed engines, in particular,

the oil requires some time to reach all the individual



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Countdown





Hardness test

Sufficient hardness depth is available on the crankshafts to enable grinding to all undersize grades without rehardening. An exception to this is if the journal has been softened as a result of overheating. Nitrided shafts must always be retreated.

Attention: During crankshaft reconditioning, inspections for cracks must be carried out after aligning, after hardening and after grinding.



Inspection – bolts

Expansion bolts increase in length. If they reach a maximum length or a minimum di ameter, they must be replaced. The same applies to mechanically damaged bolts.



Information on the product range can be found in our catalogue "Engine Bearings". Or ask your local Motorservice partner. We have also provided a lot more information for you at www.ms-motorservice.com and on our Technipedia at www.technipedia.info.

