

Nr./No. 1.91

M 551

Bedplates of nodular cast iron (GGG)

All manufacturers of engines and generating sets are obliged to adapt their products permanently to the conditions of the market and the up-to-date level of technology by continuous development.

Only by general application of the knowledge from research and development the high performance standard of MaK engines can be kept and guaranteed in the long run.

Within the scope of such a measure, extremely stressed big components have no more been made of cast iron but of nodular iron for some time now. Apart from an increased strength this material shows also a clear elongation i. e. characteristics which are steel-like and thus promise a longer life of the component parts.

Due to specific manufacturing reasons, the surface of the bearing pocket bore in bedplates of nodular iron is sensitive against dry sliding friction under high stress. Between bearing pocket and bearing shell, under certain circumstances, seizing might occur on these bedplates when turning out a bearing shell. In order to avoid such damages during removal and mounting, the bearing shell is to be relieved from the crankshaft weight.

As your engine has a bedplate of nodular iron (GGG) we recommend to contact your MaK office before inspection or exchange of the main bearings and discuss further details with them.

Due to the conversion to the new material with its higher strength, the admissible stress is higher as well allowing an increase of the pretension of the main bearing bolts in order to improve the security in view of possible inaccuracies in assembly. Therefore, it was determined to tighten the main bearing bolts on all bedplates of nodular iron of the engine type M 551 as follows:

Hydraulic tightening $p_{hydr.} = 730 \text{ bar}$

Mechanic tightening $p_{mech} = 500 \text{ Nm pretorque} + 170 \text{ degr. angle of rotation}$

In this connection please pay attention to the enclosed sheet of the operating and maintenance instructions which has been altered accordingly.



Do not place any part of your body over hydraulic components under pressure.

Attention:

The smallest bending radius for high pressure hoses is $r = 120$ mm.
Use hydraulic oil only. Store the tools protected against corrosion.

Note

The bearing caps and shells are marked with cylinder numbers and must not be interchanged.

In addition to the above intervals, the main bearings must be removed, inspected and measured when

- the foundation has been deformed or the crank web deflection has become excessive after piston seizure or grounding of a vessel and/or
- the big end bearings are in a bad condition (heavy scoring by dirt or heavy wear, for instance in the event of defective filters or poor lubrication).

Sequence of operations

1. Measuring the gap and the end clearance.
 - 1.1 Open the indicator valves.
 - 1.2 Remove the crank case doors on the camshaft and exhaust sides as well as the crank sealing case.
 - 1.3 Disconnect the oil feed pipe from the bearing cap.
 - 1.4 Measure the end clearance "s" (only at locating bearing, fig. 1).

$$s = s_1 + s_2$$

New mm	Limit mm
0.4 - 0.54	1.0

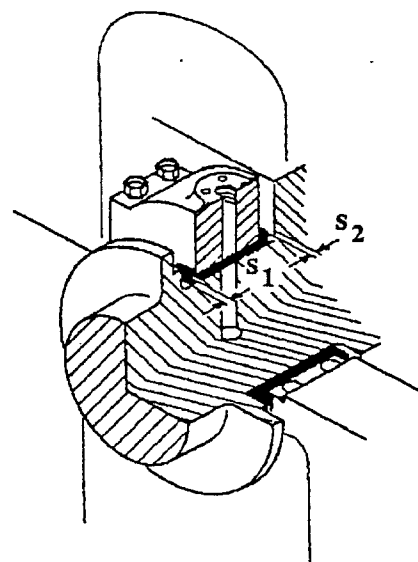


Fig. 1

- 1.4.1 If the limit clearance is exceeded:
Renew the pair of shells.
- 1.5 Measuring the gap "K" (fig. 2).
 - 1.5.1 Slacken hydraulically the bearing nuts 4 and 3 (exhaust side) to half of their prestress (365 bar) (see paragraph 4).

See also job cards 02.03.03/07/08/09
Spare parts list: 7.1200

2 men/3 h

Tools

Bolt retainer

W19 7.9100-6

See further tools on job card 02.05.01.09.



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Use hydraulic oil only.

Note

The bearing caps and shells are marked with cylinder numbers and must not be interchanged. New parts must be marked accordingly.

When fitting the bottom bearing shell, make sure that the dowel pin is not sheared off.

If the bearing studs have no control pins measuring of the stretch with the dial indicator (W20) will not be applicable.

Sequence of operations

1. Fitting the bearing shells.

1.1 Clean and oil the journal.

Note

The fitting of the bottom bearing shell always takes place by beginning with the exhaust side (fig. 1), because the bearing shell on the exhaust side is fixed inside the bearing housing with the pin (see fig. X).

Fig. 1

I = camshaft side

II = exhaust side

1.2 Fitting of the bottom bearing shell only with a lifted crankshaft

$$s = 0.28 \text{ mm}$$

between journal and bearing housing is to be checked on the dial (fig. 3).

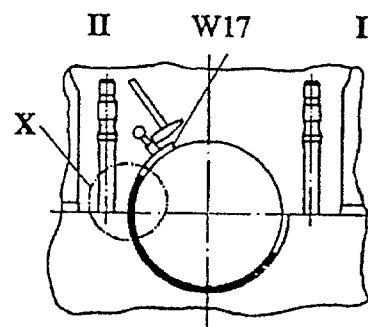
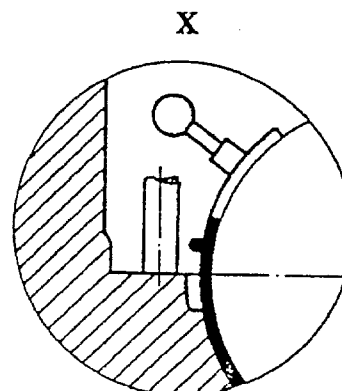


Fig. 1





Do not place any part of your body over hydraulic components under pressure.

Attention:

The smallest bending radius for high pressure hoses is $r = 120$ mm.
Use hydraulic oil only. Store the tools protected against corrosion.

Note

The bearing caps and shells are marked with cylinder numbers and must not be interchanged.

In addition to the above intervals, the main bearings must be removed, inspected and measured when

- the foundation has been deformed or the crank web deflection has become excessive after piston seizure or grounding of a vessel and/or
- the big end bearings are in a bad condition (heavy scoring by dirt or heavy wear, for instance in the event of defective filters or poor lubrication).

Sequence of operations

1. Measuring the gap and the end clearance.
 - 1.1 Open the indicator valves.
 - 1.2 Remove the crank case doors on the camshaft and