



Removing and installing the lubricating oil pan (heavy duty version)

- Packing compound

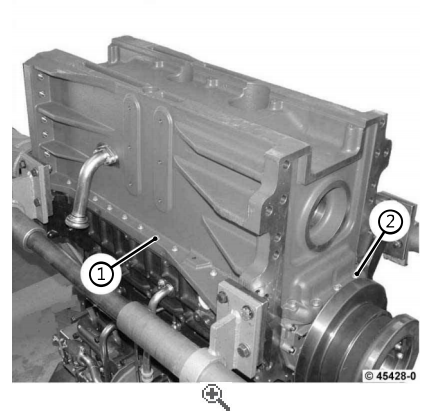


NOTE:

Collect leaking operating substances in suitable vessels and dispose of according to regulations. The engine oil should be filled according to the operating manual.

Removing the lubricating oil pan

- Remove oil dipstick.
- Remove screw cap.
- Drain, collect and dispose of engine oil according to regulations.
- Turn the engine on the assembly block.
- Unscrew all screws (1).
- Unscrew all screws (2).
- Lift the lubricating oil pan with the workshop crane.



1.

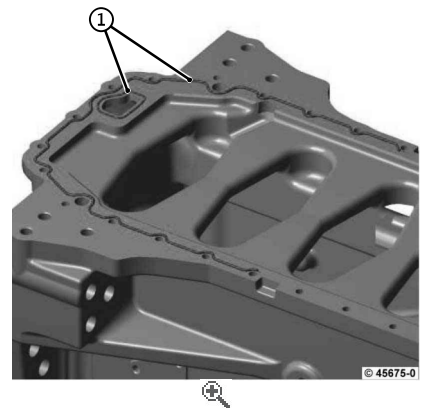
Installing the lubricating oil pan



NOTE:

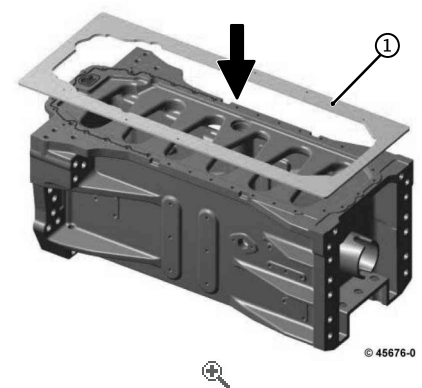
The sealing surfaces must be dry and free from grease and dirt.

- Clean sealing surfaces.
- Mount new gaskets (1).



1.

- Mount template (1).



2.

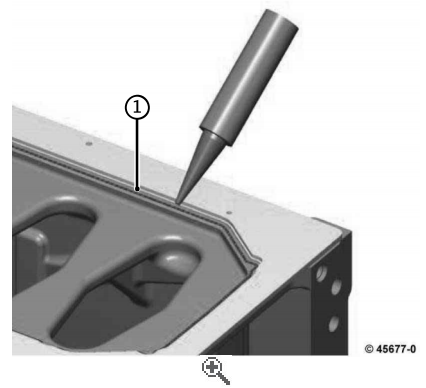
NOTE:



Apply sealant along the template contour (1) evenly. Apply the sealant in an even stream (about 3.5 mm thick).

- Apply sealant evenly.

- o Remove template (1).



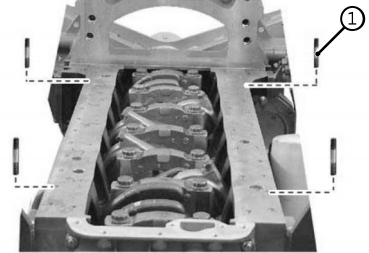
3.



ATTENTION!

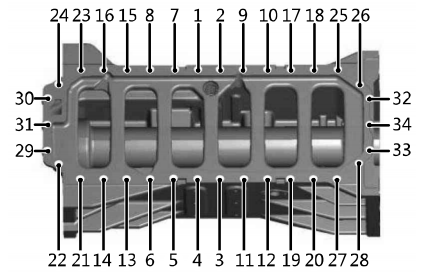
Do not move the lubricating oil pan any more. Observe the drying time for the packing compound.

- o To align the lubricating oil pan, screw four pin bolts (1) diagonally opposed into the crankcase.
- o Lower the lubricating oil pan down carefully onto the crankcase.
- o Align the lubricating oil pan in the appropriate installation position with the pin bolts.
- o Mount lubricating oil pan.
- o Unscrew the pin bolts.



4.

- o Fasten all screws.
- o Tighten the screws according to the tightening sequence.
- o See para.
- o Tighten screw plug.
- o See para.
- o Insert oil dipstick.
- o Fill engine oil according to operating instructions.



5.



Removing and installing the crankshaft

Special tools:

- Dial gauge 5.9035.068,0

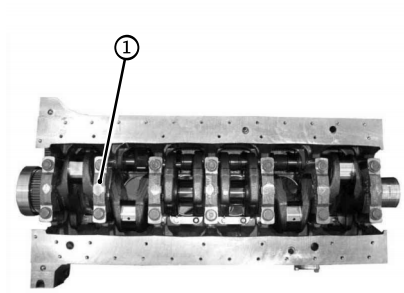
Removing crankshaft



NOTE:

Use socket wrench insert.

- Remove piston and connecting rod.
[See para.](#)
- Remove front cover.
[See para.](#)
- Remove gearcase.
[See para.](#)
- Unscrew all screws (1).



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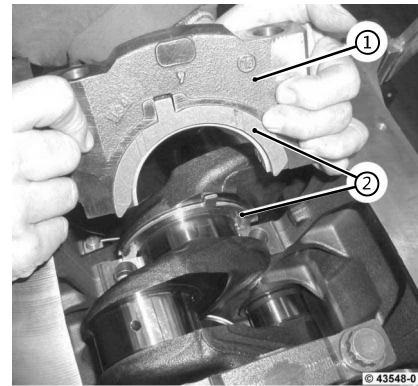
1.



NOTE:

Lay out components in the order in which they should be installed.

- Remove fit bearing cover (1) and main bearing cover.
- Remove lower thrust ring halves (2).



© 43548-0



2.



NOTE:

Remove bearing shells according to the order of assembly.

- Lift out the crankshaft.
- Place crankshaft on prism.
- Remove upper bearing shells and upper thrust ring halves from crankcase.
- Remove both thrust ring halves.



© 43549-0



3.

Installing the crankshaft



NOTE:

Ensure that the installation location is free from faults.

- Insert upper main bearing shells.



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1.



NOTE:

Ensure that the installation location is free from faults.

- Insert lower main bearing shells in the respective main bearing cover.



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2.

- Prepare internal measuring device:
 - Mount probe bolt for the appropriate measuring range in the internal measuring device.
 - Mount dial gauge with approx. 1 mm pre-tension in the internal measuring device.
 - Set micrometer gauge to 85 mm.
 - Balance the internal measuring device between the test surfaces of the micrometer gauge and set the meter to the reversal point of the pointer to "0".



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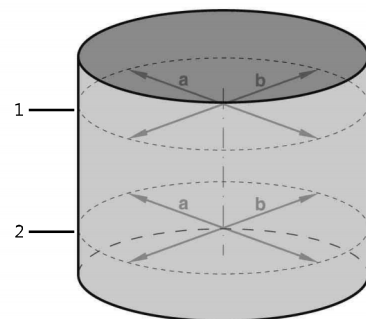


3.



NOTE:

Diagram for measuring the main bearing diameter at the points "a" and "b" in the levels "1" and "2".



© 37239-1



4.



NOTE:


Ensure that the installation location of the upper bearing shells is free from faults.


- Install main bearing cover.
- Tighten screws .
See para.
- Insert internal measuring device.
- Measure main bearing diameter.

- o Removing the main bearing cover.

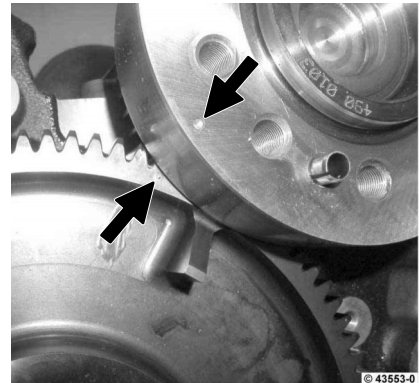


5.


 **NOTE:**
The markings (arrows) must be in line when the crankshaft is installed. A help mark (colour) can be made.

 **NOTE:**
Make sure that the markings match up.

- o Oil bearing shells with engine oil.
- o Position camshaft.
- o Make sure that the markings match up.

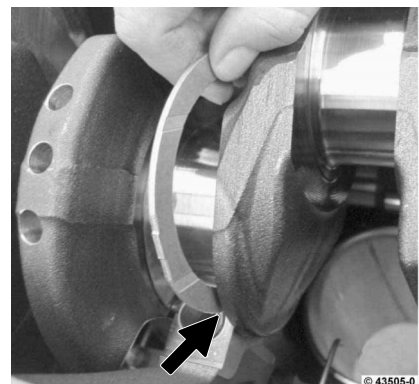


6.


 **NOTE:**
Oil grooves of the thrust ring halves face the crankshaft web face.

 **NOTE:**
Insert thrust ring halves between crankcase and crankshaft web (arrow).

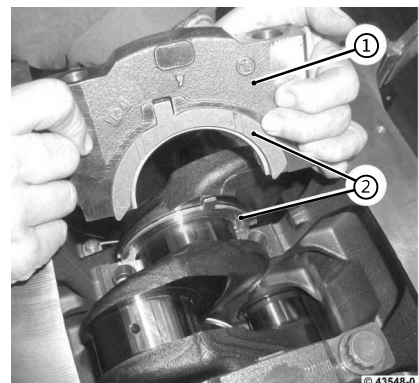
- o Install upper thrust ring halves according to measured axial clearance.




7.

 **NOTE:**
Ensure that the installation location of the lower bearing shells is free from faults.

- o Oil bearing shells with engine oil.
- o Place on main bearing cover (1) and lower thrust ring halves (2).

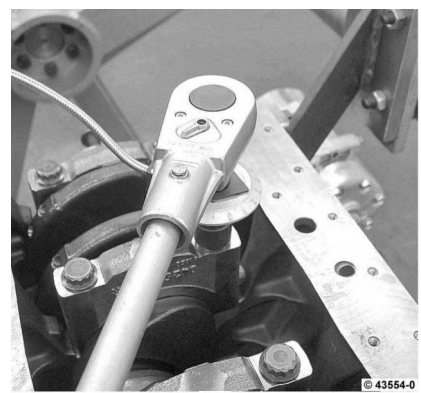


8.

 **NOTE:**
Observe the tightening sequence: From centre main bearing cover outwards.

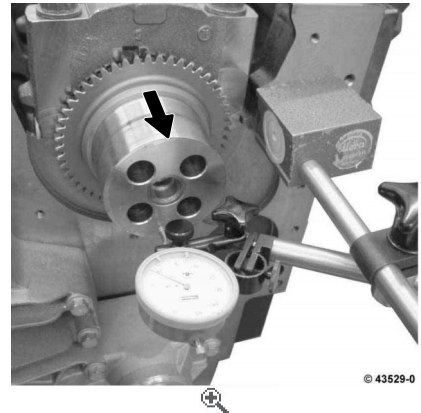
- o Tighten main bearing cover with rotation angle disc.
See para.
- o Install piston and connecting rod.
See para.
- o Install front cover.

- See para.
- Install gearcase.
- See para.



9.

- Check axial backlash of crankshaft.



10.



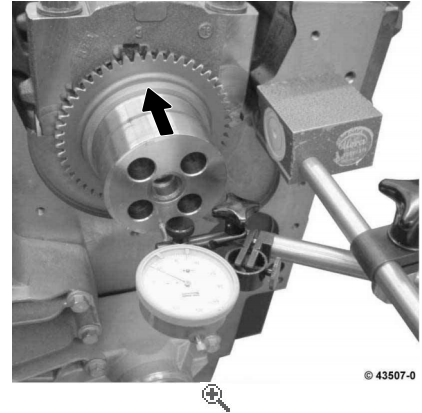
Checking the axial clearance of the crankshaft

Special tools:

- Dial gauge 5.9035.068,0

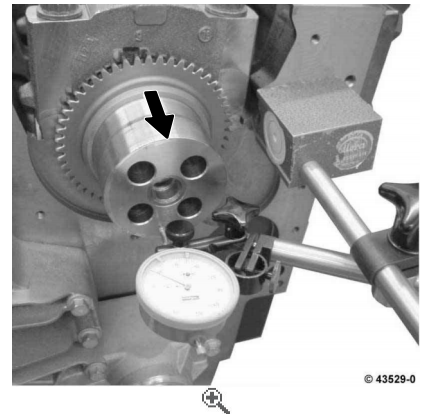
Checking the axial backlash

- Mount magnetic measuring stand.
- Insert dial gauge.
- Apply stylus to the crankshaft end with pre-tension.
- Press crankshaft in direction of arrow.
- Adjust dial gauge to "0".



1.

- Press crankshaft in direction of arrow.
- Read off measured value.
See para.



2.

- Measure the strength of thrust ring halves.
See para.
- Select thrust ring halves according to measured value.



3.



NOTE:

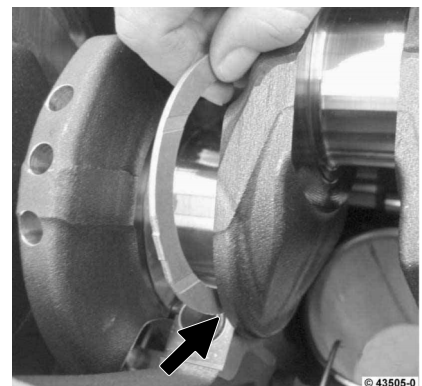
Oil grooves of the thrust ring halves face the web face of the crankshaft.



NOTE:

Insert thrust ring halves between crankcase and crankshaft web (arrows).

- Install upper thrust ring halves according to measured axial clearance.



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