Check the valve residual (L3)

Commercially available tools:

- Depth gauge

Special tools:

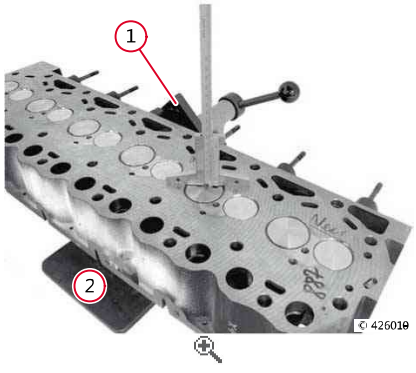
- Support stand: 120900
- base plate: 120910

WARNING

If the wear limit of the inserted valve seat and/or the valve is reached, replace them.

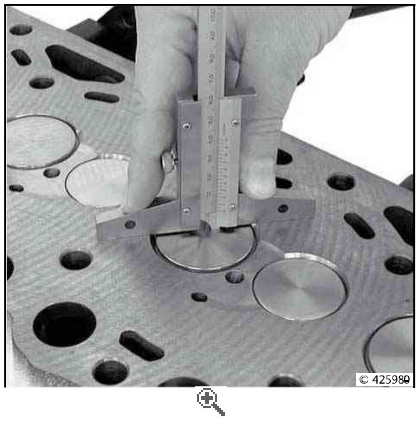
Check the valve residual

- Disassemble the cylinder head.
  See para. Disassembly and assembly of the cylinder head (L3)
- Assemble the support stand (1) on the base plate (2).
- Assemble the cylinder head on the support stand.



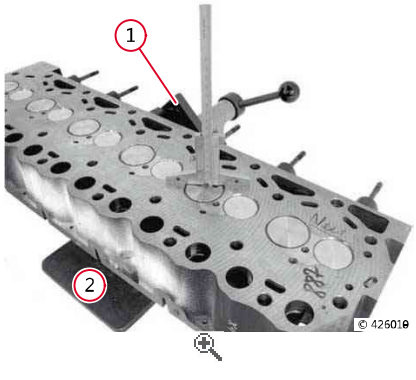
1.

- Measure the valve residual from the centre of the valve head with respect to the sealing surface of the cylinder head.
  See para. Test and adjustment data (L3)



2.

- Disassemble the cylinder head from the support stand (1).
- Disassemble the base plate support stand (2).
- Assemble the cylinder head.
  See para. Disassembly and assembly of the cylinder head (L3)



3.

Crankshaft check (L3)

Commercially available tools:

- Magnetic stand for measurements
- Palmer
- Internal bore meter
- Prisms
- Hardness tester

Special tools:

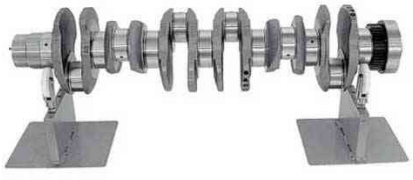
- Dial gauge: 100400

Note

Perform modification on the outer side, on the flywheel side of the crankshaft. H = polished main bearing pin P = polished big end bearing pin. In the event of crankshaft wear, have the crankshaft repaired at one of our service centres.

Check the hardness of the main journal

- Disassemble the crankshaft.
  See para. Assembly and disassembly of the crankshaft (L3)
- Rest the crankshaft on the prisms.



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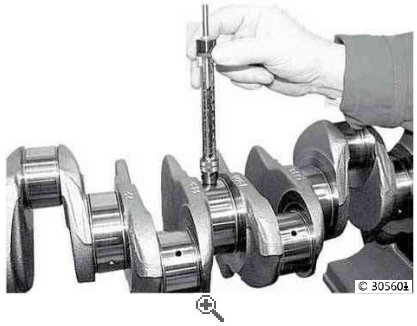
1.

- Measure the hardness of the crankpin with the hardness tester.
  See para. Test and adjustment data (L3)

Note

The measurement values must be converted using the tester table.

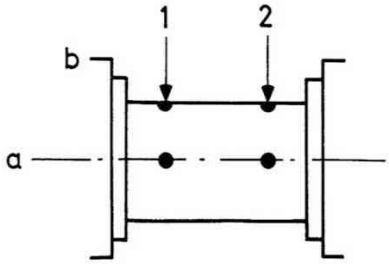


© 305601

2.

Note

Measurement diagram of the main journals on points 1 and 2 in surfaces a and b.



© 364242

3.

Check the diameter of the main bearing pins

- Measure the main bearing pins with the palmer.
  See para. Test and adjustment data (L3)

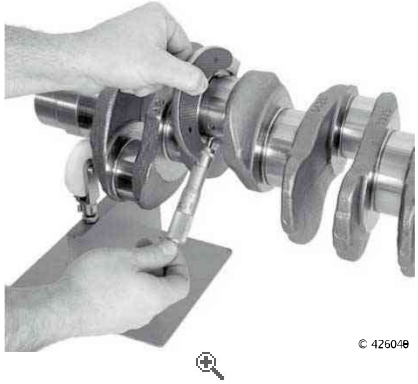
> **Note**
>
> Measurement points, see diagram.

1.

Check the diameter of the connecting rod pins

- Measure the main journal with the palmer.
  See para. Test and adjustment data (L3)

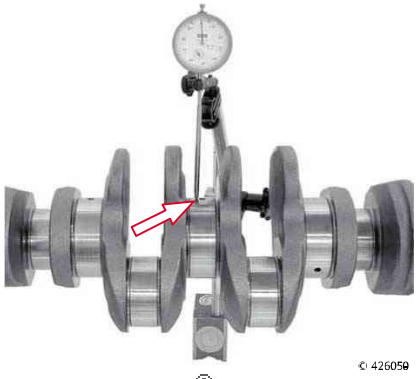
> **Note**
>
> Measurement points, see diagram.



1.

Check the coaxiality

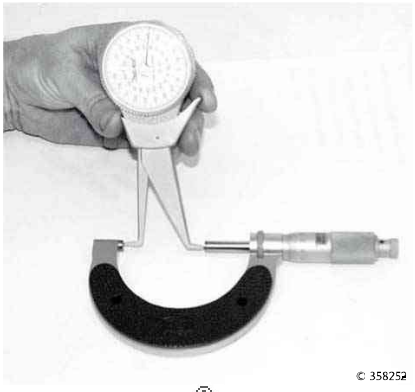
- Apply the magnetic stand for measurements.
- Insert the dial gauge.
- Apply the preloaded probe on the main bearing pins (arrow) and adjust the dial gauge to "0".
- Uniformly turn the crankshaft and check the coaxiality.
  See para. Test and adjustment data (L3)
- Remove the magnetic stand for measurements.
- Disassemble the dial gauge.



1.

Measuring the length of the flanged bearing

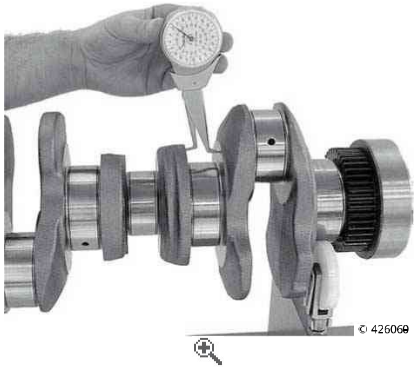
- Adjust the palmer to 32 mm.
- Push the internal bore meter between the test surfaces of the palmer and bring to "0".



1.

- Measure the width of the flanged bearing using the internal bore meter between the support surfaces of the thrust rings.
- Make a note of dimension (a).
  See para. Test and adjustment data (L3)

> **Note**
> The measurement (a) is necessary to determine endfloat.

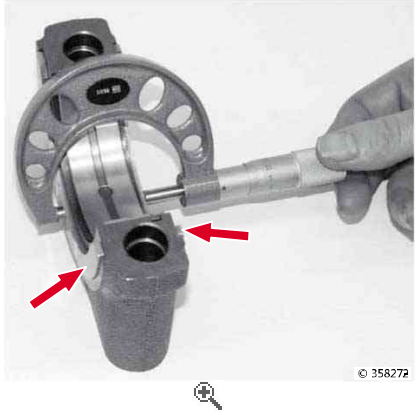


2.

Check the endfloat

- Apply the thrust ring halves on the flanged bearing cover (arrows).
- Measure the width with the palmer.
- Make a note of dimension (b).

> **Note**
> The measurement (b) is necessary to determine endfloat.



1.

- Determine the endfloat.
  See para. Test and adjustment data (L3)

> **Note**
> Use the corresponding halves of the thrust ring (arrow).
> See para. Test and adjustment data (L3)

Calculation example:	
Target:	Endfloat
Measured value:	(a) = 32.2 mm
	(b) = 32.1 mm
Calculation:	Dimension (a) - dimension (b)
The results of all this are:	= 0.1 mm

2.

Visual inspection

- Inspect the sliding surfaces (1) of the crankshaft O-rings.
- Inspect the ring gear (2).
- Assemble the crankshaft.
  See para. Assembly and disassembly of the crankshaft (L3)

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1.

T.$77.21.B0.04.00.00.01 - v1

Replace the crankshaft O-ring (flywheel end) (L3)

Commercially available tools:

- Bradawl: 8198
- Assembly lever: 9017

Special tools:

- Assembly tool: 142830

- Self-tapping screw
- Washer

Removal of the crankshaft oil seal

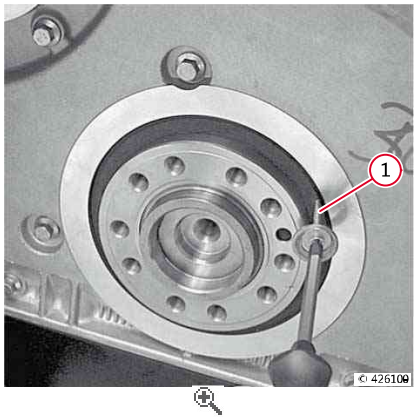
- Remove the flywheel.
  See para. Assembly and disassembly of the flywheel (L3)
- Using a bradawl, make a hole about 3 mm in diameter in the old crankshaft oil seal.

WARNING

Do not damage the gearbox cover or the crankshaft.

1.

- Insert a self-tapping screw (1) with washer.



2.

- Extract the crankshaft O-ring using the assembly lever.
- Carefully examine the crankshaft O-ring sliding surfaces.

3.

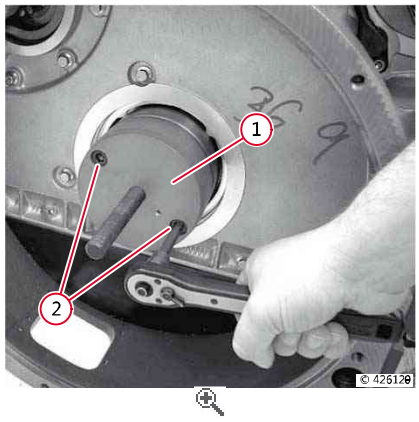
Fit the crankshaft O-ring

- Fit guide bush (1).

- Tighten screws (2).

Note

The holes in the guide bush must be aligned with the threaded holes in the crankshaft flange.

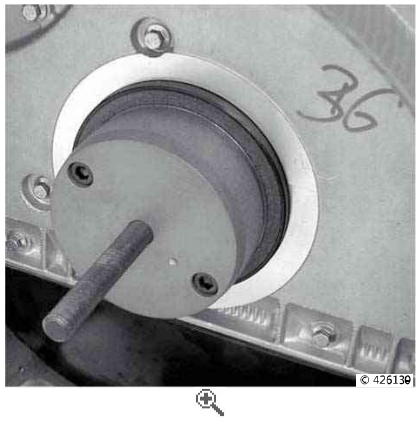


1.

- Lightly oil the lip of the crankshaft O-ring.
- Carefully place the crankshaft O-ring on the sliding surface.

Note

The seal lip should be facing the engine crankcase.

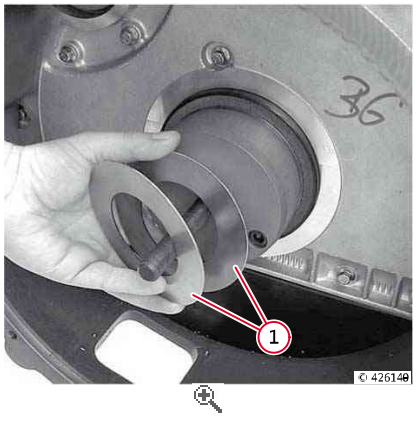


2.

- Distanzscheiben (1) ansetzen.

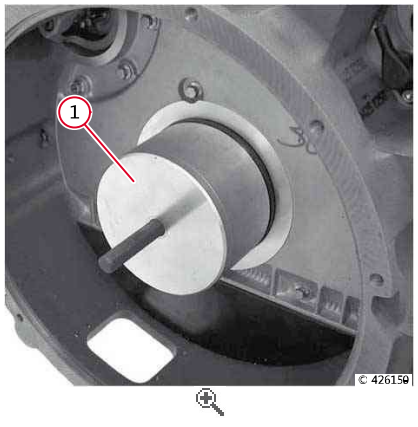
Note

Falls eine Einlaufrille am Kurbelwellenflansch vorhanden ist, besteht die Möglichkeit den Kurbelwellendichtring in drei Einbautiefen zu montieren: - Erstmontage = 2 Scheiben - 1. Reparatur - Einbaustufe = 1 Scheibe - 2. Reparatur - Einbaustufe = 0 Scheiben.



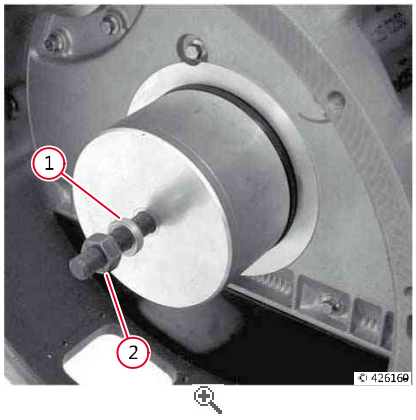
3.

- Fit installation bush (1).
- Push the crankshaft O-ring to the support.



4.

- Insert bearing (1).
- Screw in nut (2);

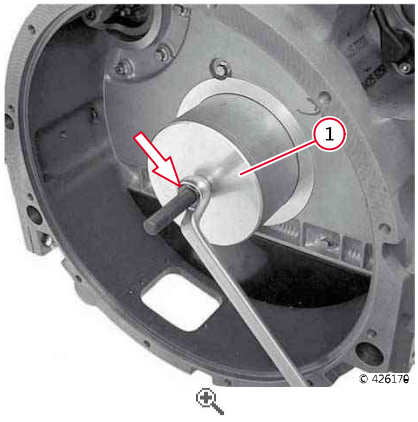


5.

- Screw in the nut until it seats against installation bush (1).

> **Note**
>
> The crankshaft oil seal is now installed at the correct depth.

- Remove the installation tool.
- Fit the flywheel.
  See para. Assembly and disassembly of the flywheel (L3)



6.

Replace the crankshaft O-ring (opposite end to flywheel) (L3)

Commercially available tools:

- Bradawl: 8198
- Assembly lever: 9017

Special tools:

- Assembly tool: 142670

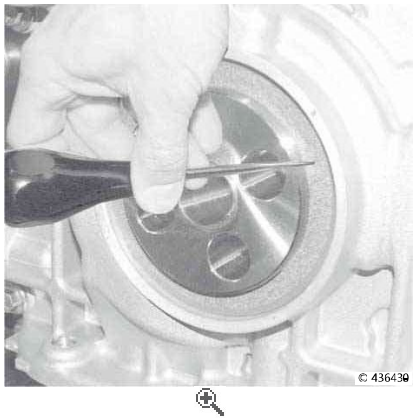
- Self-tapping screw
- Washer

Removal of the crankshaft oil seal

- Remove the torsional vibration damper
  See para. Disassembly and assembly of the torsional vibration damper (L3)
- Using a bradawl, make a hole about 3 mm in diameter in the old crankshaft oil seal.

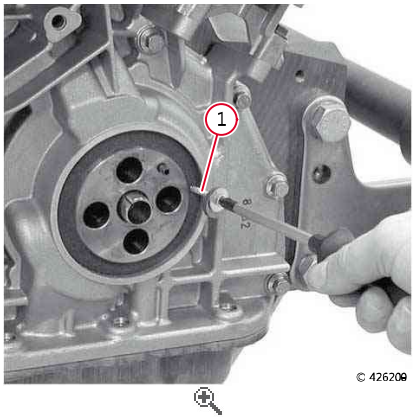
WARNING

Be careful not to damage the front cover or the crankshaft.



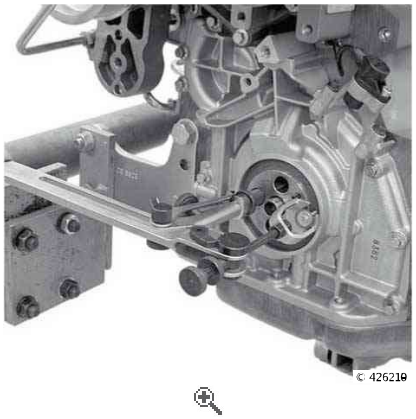
1.

- Insert a self-tapping screw (1) with washer.



2.

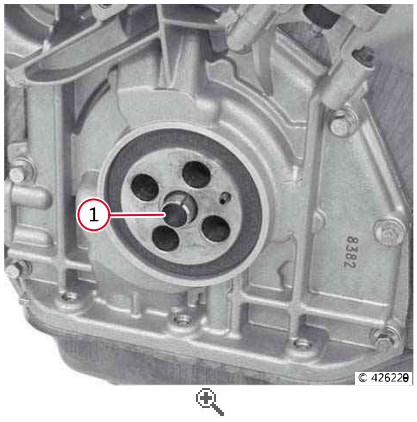
- Extract the crankshaft O-ring using the assembly lever.
- Carefully examine the crankshaft O-ring sliding surfaces.



3.

Assembly of the crankshaft O-ring

- Remove tightening bush (1).

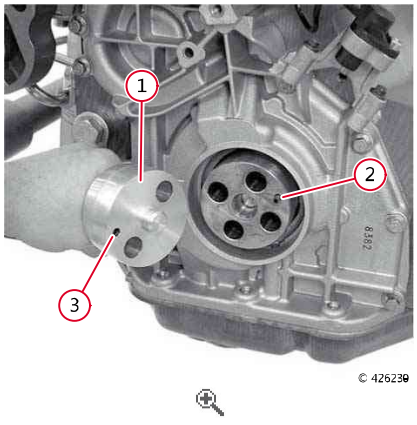


1.

- Fit guide bush (1).

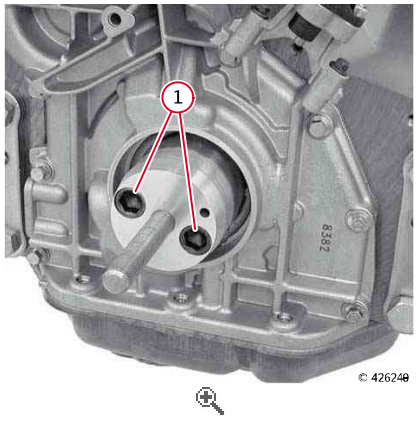
Note

Check that locating dowel (2) is aligned with hole (3).



2.

- Tighten (1) the screws.

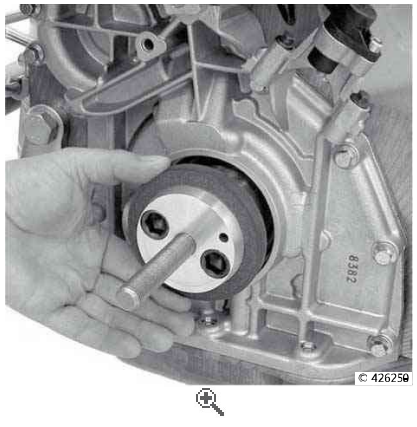


3.

- Lightly oil the lip of the crankshaft O-ring.
- Carefully place the crankshaft O-ring on the sliding surface.

Note

The seal lip should be facing the engine crankcase.



4.

- Fit spacer (1).

Note

If the crankshaft flange has an entry groove, the O-ring can be installed at three different depths: First assembly = 2 washers, 1st repair - assembly level = 1 washer - 2nd repair - assembly level = 0 washers.

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