



Assembly and disassembly of the connecting rod drum (L3)

Readily available commercial tools:

- Rotation angle gauge: 8190

Special tools:

- Assembly device: 130490
- Piston ring compression collar 130660 (98 mm)
- Piston ring compression collar 130670 (101 mm)

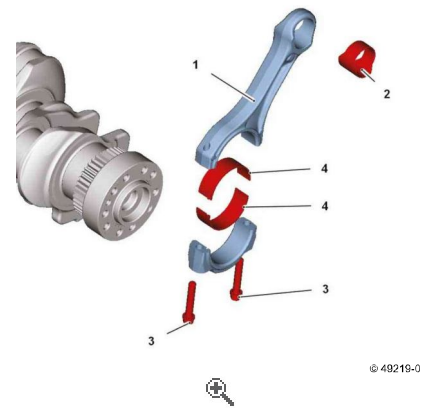
WARNING



The allocation of the connecting rod drum and flanged bearing cover must be maintained. If the connecting rod drum and the flanged bearing cover are switched when assembled, the connecting rod drum will not be usable! Do not damage the breaking surfaces of the connecting rod drum and flanged bearing cover!

Disassembly of the connecting rod drum

1	Connecting rod drum	
2	Connecting rod small end bush	
3	Screw	
4	Connecting rod bearing	Standard
970	Connecting rod bearing	Degree of undersizing



1.

- o Disassemble the cylinder head.



Construction unit

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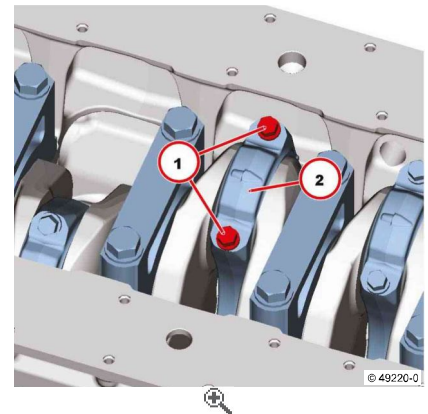
- o Remove the oil suction pipe.



Construction unit

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- o Move the connecting rod pins to the bottom dead centre.
- o Remove screws (1).
- o Remove flanged bearing cover (2).
- o Remove the bearing shell.



WARNING



Do not place the connecting rod bearing cover on the break section.

2.



Note

3.

Put the components to one side in the order in which they were removed. Note the cylinder order.

- o Disassemble the piston and connecting rod drum.



WARNING

The allocation of the connecting rod drum and flanged bearing cover must be maintained. If the connecting rod drum and the flanged bearing cover are switched when assembled, the connecting rod drum will not be usable! Do not damage the

breaking surfaces of the connecting rod drum and flanged bearing cover!



Note

Put the components to one side in the order in which they were removed. Note the cylinder order.

- o Disassemble the pistons.



Construction unit

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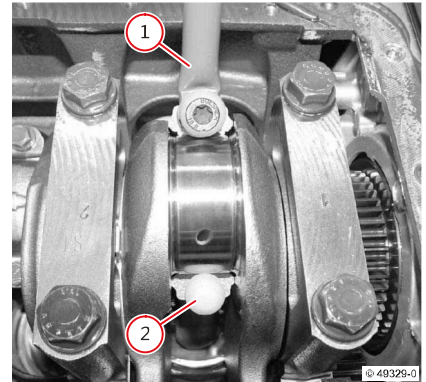
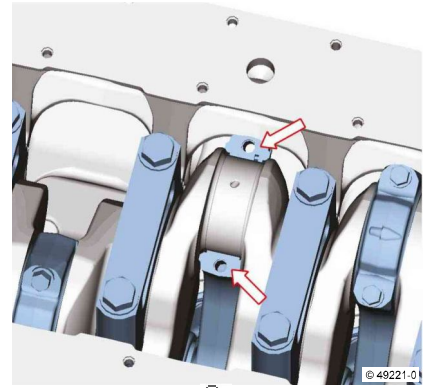


WARNING

Do not damage the break sections of the connecting rod drum!

4.

- o Tighten the assembly device (1).
- o Insert the protective plug (2).

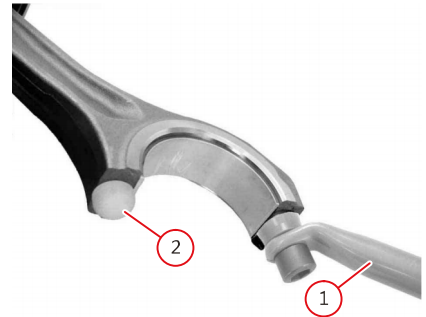


5.



Note

To better represent the operation, the assembly of the assembly device (1) and the protective plug (2) is shown on a removed connecting rod drum.



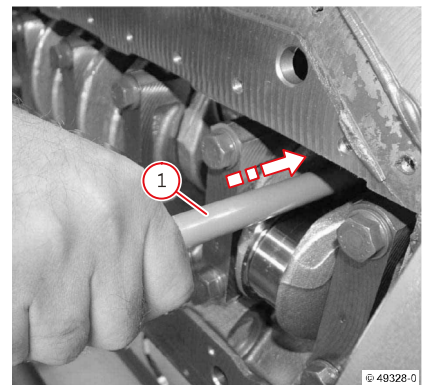
6.

- o Remove the piston making pressure with the assembly device.
- o Disassemble the assembly device and the protective plug.
- o Remove the connecting rod drum and the piston in the correct assembly and placement position.



WARNING

The allocation of the connecting rod drum and flanged bearing cover must be maintained. If the bearing drum and cover are exchanged during assembly, the drum is unusable! Do not damage the breaking surfaces of the bearing drum or cover!



7.

Assembly of the connecting rod drum

- o Install the piston.

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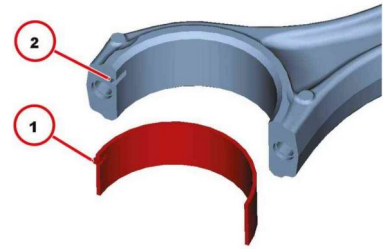


- o Insert the connecting rod bearing shell into the connecting rod drum.

WARNING



Take care to couple the bearing shells. The anti-twist safety (1) must enter the groove (2).



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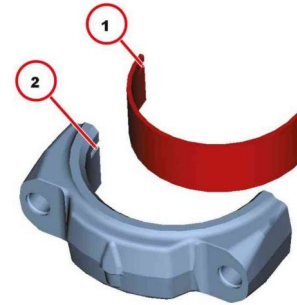
1.

- o Insert the connecting rod bearing shell into the relative flanged bearing cover.

WARNING



Take care to couple the bearing shells. The anti-twist safety (1) must enter the groove (2).



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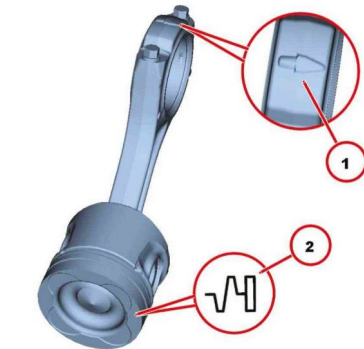


2.

WARNING



The arrow (1) on the connecting rod bearing cover is facing the flywheel. The flywheel/crankshaft symbol (2) is facing the flywheel.



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3.

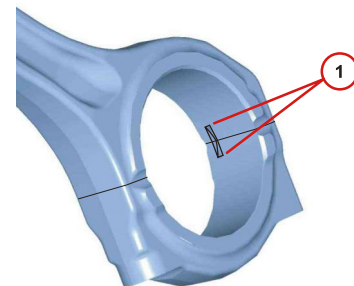
- o Insert the connecting rod bearing shell into the relative flanged bearing cover.

Note



Ensure that the bearing shells are matched correctly. The anti-twist retainer must locate correctly in the groove (1).

- o



© 43460-0



4.

- o Insert the protective plug (1) in the connecting rod drum.
- o Install the assembly device on the connecting rod drum.



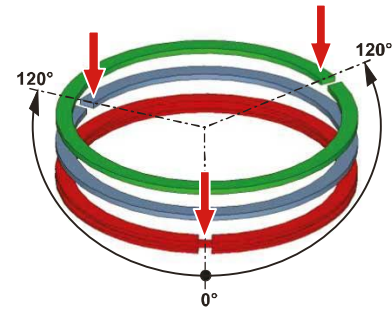
© 43524-0



5.

- Offset the piston ring joints by: 120°.
- Spring washer position: 180°

	<p>Note</p> <p>Never rotate the piston rings.</p>
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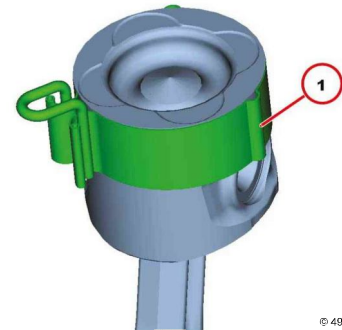


© 41046-0



6.

- Lightly oil the cylinder sliding surface, piston, piston rings and connecting rod pins.
 - Piston diameter: 98 mm
- Compress the piston rings with a compression collar (1) 130660.
 - Piston diameter: 101 mm
- Compress the piston rings with a compression collar (1) 130670.

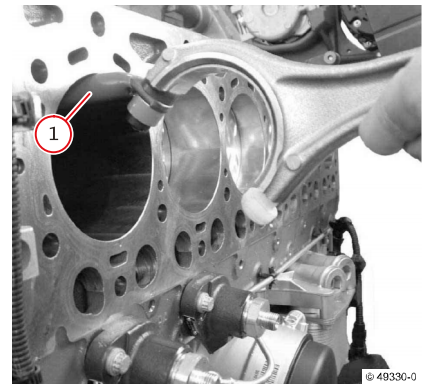


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7.

- Move the lifting bearing to a lowered position.
- Insert the piston and connecting rod drum together with the assembly device in the cylinder liner.




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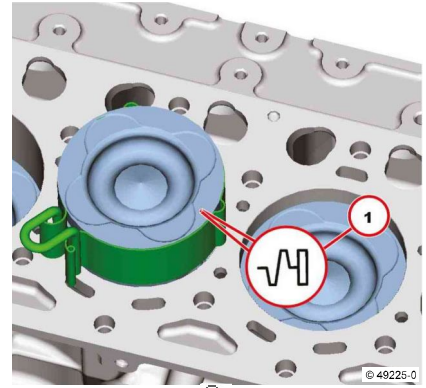


8.

- Rotate the crankpins to bottom dead centre

	<p>Note</p> <p>Pay attention to the piston cylinder allocation. Mark the assembly position on the bottom of the piston. The flywheel/crankshaft symbol (1) must be facing the flywheel. The piston ring blocking tape must rest flat on the crankcase.</p>
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- Insert the piston in the cylinder with the connecting rod drum.



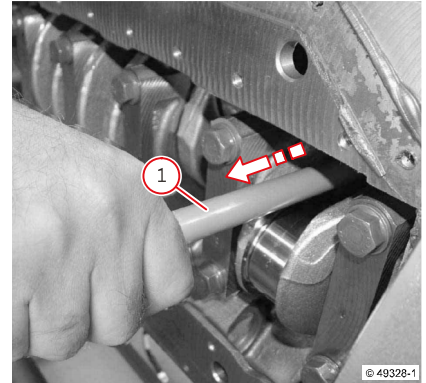
9.

- o Use the assembly device (1) to tighten the connecting rod drum until it is aligned with the manoeuvre pin.
- o Disassemble the assembly device and the protective plug.

WARNING




Do not damage the break sections of the connecting rod drum!



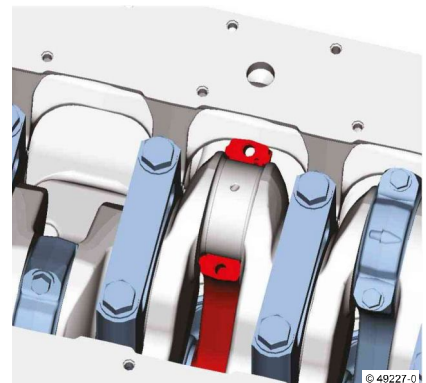
10.

- o Delicately press the connecting rod drum against the connecting rod pins.

WARNING




Do not bend the connecting rod drum with the crankshaft.



11.


Assembly of the flanged bearing cover

WARNING

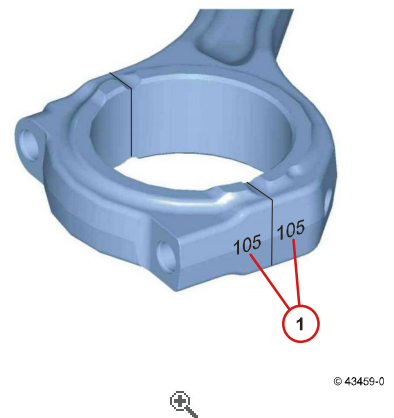


Pay attention to coupling the flanged bearing cover. The numeric marks (1) on the connecting rod drum and on the connecting rod bearing cover must be identical and positioned in front of each other during assembly.

WARNING




The allocation of the connecting rod drum and flanged bearing cover must be maintained. If the connecting rod drum and the flanged bearing cover are switched when assembled, the connecting rod drum will not be usable! Do not damage the breaking surfaces of the connecting rod drum and flanged bearing cover!



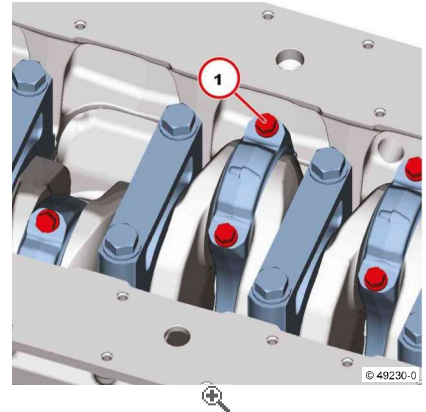
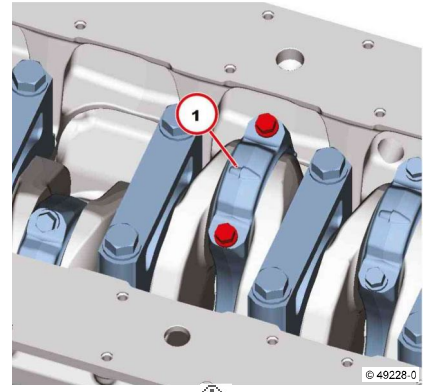
1.

- o Fit the cover (1) and the connecting rod bearing shell.

WARNING



The screws must be renewed after being removed.



2.

- o Tighten the new screws (1).
 - Stage 1: 30 Nm
- o Tighten the new screws using the rotation angle gauge.
 - Stage 2: 60°
 - Stage 3: 60°
- o Fit the oil suction pipe.

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- o Assemble the cylinder head.

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3.


Technical data

Test data and settings

ID no.	Designation	Additional information	Value
P02 95	Position of piston ring gaps	offset relative to one another	120°
P02 96	Spacing between spring washer gap and piston ring gap, oil scraper ring		180°

Tightening torque

ID no.	Designation	Screws type	Indications/observations	Value
A02 020	Connecting rod bearing cover in correspondence of the connecting rod drum		Stage 1: use the new screws. Oil screws	30 Nm
A02 020	Connecting rod bearing cover in correspondence of the connecting rod drum		Grade 2:	60°
A02 020	Connecting rod bearing cover in correspondence of the connecting rod drum		Stage 3:	60°

	Note
When tightening fasteners to the specified torque using a torque wrench, a torque dispersion of +/- 10 % is permitted.	



Connecting rod drum check (L3)

Readily available commercial tools:

- Palmer
- Rotation angle gauge: 8190
- Internal bore meter
- Connecting rod tester

Special tools:

- Dial gauge: 100400

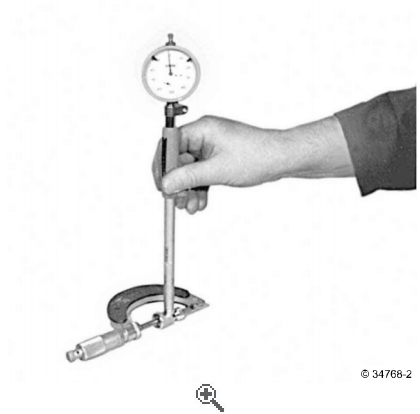
WARNING



The allocation of the connecting rod drum and flanged bearing cover must be maintained. If the connecting rod drum and the flanged bearing cover are switched when assembled, the connecting rod drum will not be usable! Do not damage the breaking surfaces of the connecting rod drum and flanged bearing cover!

Check the connecting rod small end bush

- o Prepare the internal bore meter:
 - Fit the probes for the corresponding measurement interval in an internal bore meter.
 - Fit the dial gauge with a preload of approx. 1 mm in the internal bore meter.
 - Set the bracket measurement screw to 39 mm.
 - Apply the internal bore meter between the test surfaces of the palmer and in the return point of the pointer, bring the dial gauge to "0".

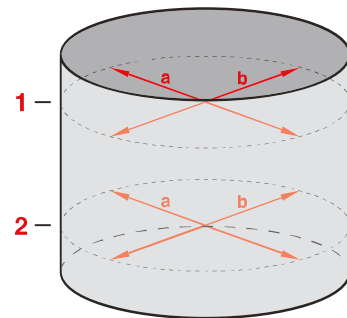


1.



Note

Measurement diagram of the connecting rod small end bush in points "a" and "b" in surfaces "1" and "2".



2.

- o Insert the internal bore meter.
- o Apply the internal bore meter to the measurement points required occasionally and read the value measured in the return point of the pointer.
 - Nominal value: 40 (+ 0.045, + 0.035) mm



Note

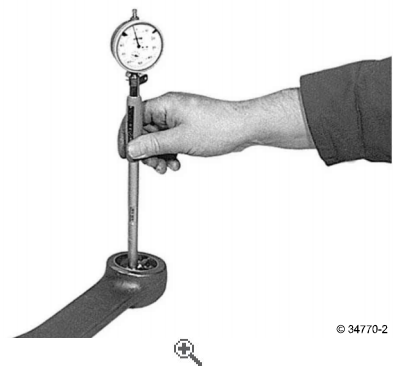
Pressed connecting rod small end bush. Measurement points, see diagram.

- o Make a note of the measured value, dimension A.



Note

Dimension A is used to determine the piston pin clearance.



3.

Calculate the piston pin clearance



Note

1.

The clearance of the piston pin results from the difference between the inner diameter of the connecting rod small end bush (dimension A) and the diameter of the piston pin (dimension B).



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- o ■ Nominal value: 0.035 - 0.051 mm

Calculation example:

Target:	Piston pin clearance
Data:	
Measured value:	(A) = 40.045 mm
Calculation:	(B) = 40.006 mm
Dimension (a) - dimension (b)	
The results of all this are:	= 0.039 mm

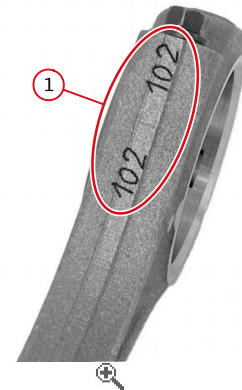
Check the connecting rod bearing hole

- o Apply the flanged bearing cover.

WARNING



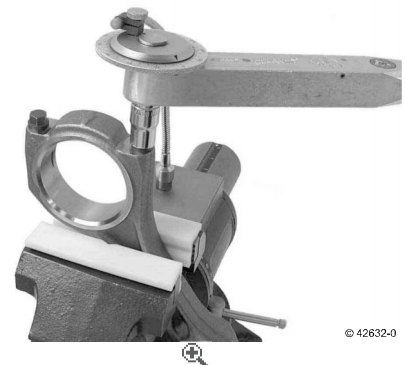
Pay attention to coupling the flanged bearing cover. The numeric marks (1) on the connecting rod drum and on the connecting rod bearing cover must be identical and positioned in front of each other during assembly.



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1.

- o Alternatively tighten the screws with the rotation angle gauge and the box spanner insert.
 - Stage 1: 30 Nm
 - Stage 2: 60°
 - Stage 3: 60°



© 42632-0


2.

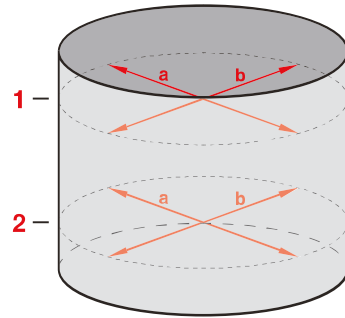
- o Prepare the internal bore meter:
 - Fit the probes for the corresponding measurement interval in an internal bore meter.
 - Fit the dial gauge with a preload of approx. 1 mm in the internal bore meter.

- Set the bracket measurement screw to 73 mm.
- Apply the internal bore meter between the test surfaces of the palmer and in the return point of the pointer, bring the dial gauge to "0".




3.

 **Note**
Measurement diagram of the connecting rod bearing hole in points "a" and "b" in surfaces "1" and "2".



4.

- Insert the internal bore meter.
- Apply the internal bore meter to the measurement points required occasionally and read the value measured in the return point of the pointer.
 - Nominal value: 73.6 (+ 0.019, + 0) mm

 **Note**
If the measured values diverse minimally, take additional measurements with new bearing shells.




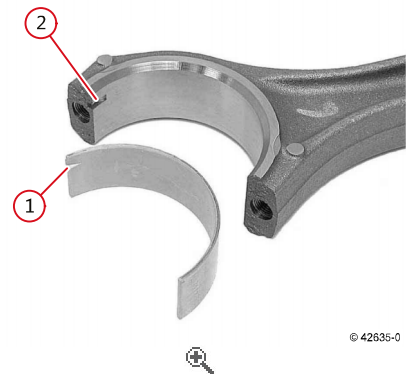
5.

Check the internal diameter of the connecting rod bearing shells

- Insert the connecting rod bearing shell into the connecting rod drum.

DANGER


 Take care to couple the bearing shells. The anti-twist safety (1) must enter the groove (2). The allocation of the connecting rod drum and flanged bearing cover must be maintained. If the connecting rod drum and the flanged bearing cover are switched when assembled, the connecting rod drum will not be usable! Do not damage the breaking surfaces of the connecting rod drum and flanged bearing cover!

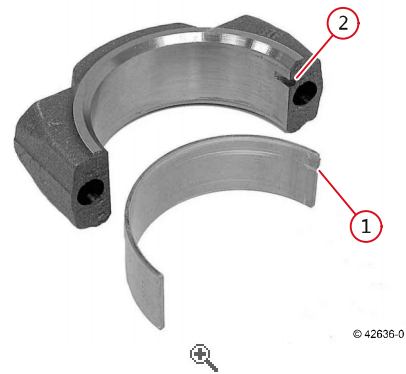


1.

- Insert the connecting rod bearing shell into the relative flanged bearing cover.

DANGER

 Take care to couple the bearing shells. The anti-twist safety (1) must enter the groove (2).



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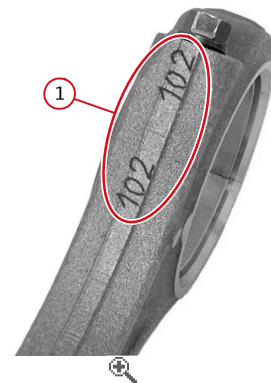
2.

- Apply the flanged bearing cover.

WARNING



The numeric marks (1) on the connecting rod drum and on the connecting rod bearing cover must be identical and positioned in front of each other during assembly.



© 42631-0

3.

- Alternatively tighten the screws with the rotation angle gauge and the box spanner insert.
 - Stage 1: 30 Nm
 - Stage 2: 60°
 - Stage 3: 60°



© 43012-0

4.

- Prepare the internal bore meter:
 - Fit the probes for the corresponding measurement interval in an internal bore meter.
 - Fit the dial gauge with a preload of approx. 1 mm in the internal bore meter.
 - Set the bracket measurement screw to 70 mm.
 - Apply the internal bore meter between the test surfaces of the palmer and in the return point of the pointer, bring the dial gauge to "0".



5.

Note



Measurement diagram of the internal diameter of the connecting rod bearing shells in points "a" and "b" in surfaces "1" and "2".

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