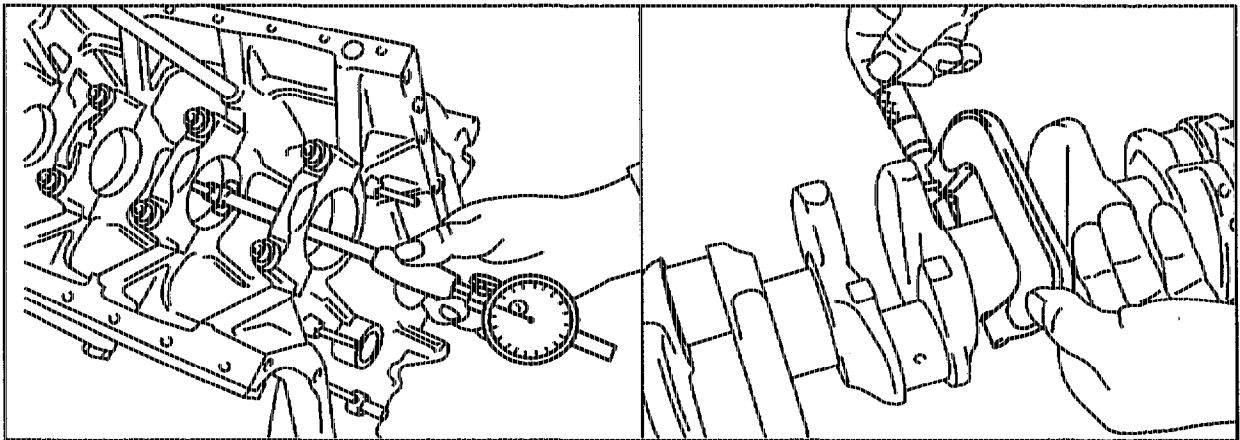


## 03-3200 Measuring crankshaft, fitting new bearings

Preceding work:  
Crankshaft removed  
Engine disassembled, cleaned  
Crankshaft inspected, cleaned

Operation no. of operation texts and work units or standard texts  
and flat rates:

### Mounting crankshaft radially in bearings



P03-5358-53

Crankshaft bearing cap .....	install, tighten (30 Nm).
Bearing bore $\varnothing$ .....	measure, note.
Crankshaft bearing journal $\varnothing$ .....	measure, note (03-3190).
Bearing shells .....	match, see table "Bearing shells for crankshaft".

#### Example:

Bearing bore dia $\varnothing$	62.51 mm
Crankshaft journal $\varnothing$	- <u>57.95 mm</u>
	4.55 mm
Radial bearing play	- <u>0.04 mm</u>
	4.51 mm : 2
Bearing shell thickness	<u>2.25 mm</u>

see table "Bearing shells for crankshaft"

Top bearing shell "blue"

Bottom bearing shell "blue"



When determining different bearing shells, match  
thicker bearing shell to the bearing cap.

Likely radial bearing play .....	calculate.
Bolt holes .....	blow clean.
Bearing shells .....	insert into crankcase and bearing cap.
Bearing cap bolts .....	tighten (30 Nm).
Bearing Ø .....	measure.
<b>Radial bearing play (real play)</b> .....	calculate.
(Specification 0.035–0.045 mm)	
Bearing cap .....	remove.
Bearing shells in crankcase .....	oil.
Crankshaft at bearing points .....	oil.
Bearing caps with bearing shells .....	oil, install.
Thread and contact surface of bolts .....	oil, install.

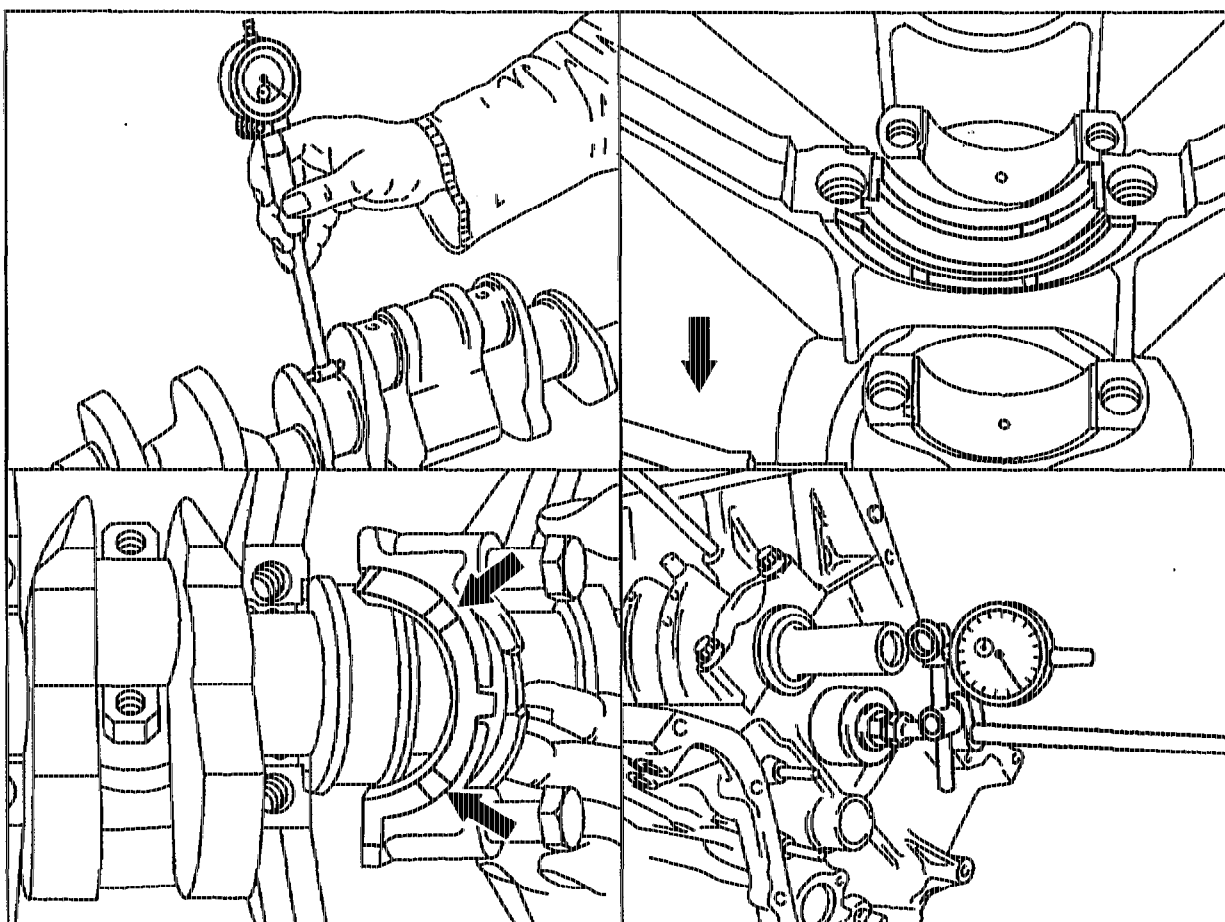
Bolts .....

tighten to tightening torque and tightening angle (55 Nm + 90° tightening angle).



Rotate crankshaft while tightening the bolts in order to detect any jamming in good time.

## Mounting crankshaft axially in bearings



P03-5359-57

Fit bearing width at crankcase and at fit bearing cap .....  
 Fit bearing width at crankshaft .....  
 Thrust washers .....

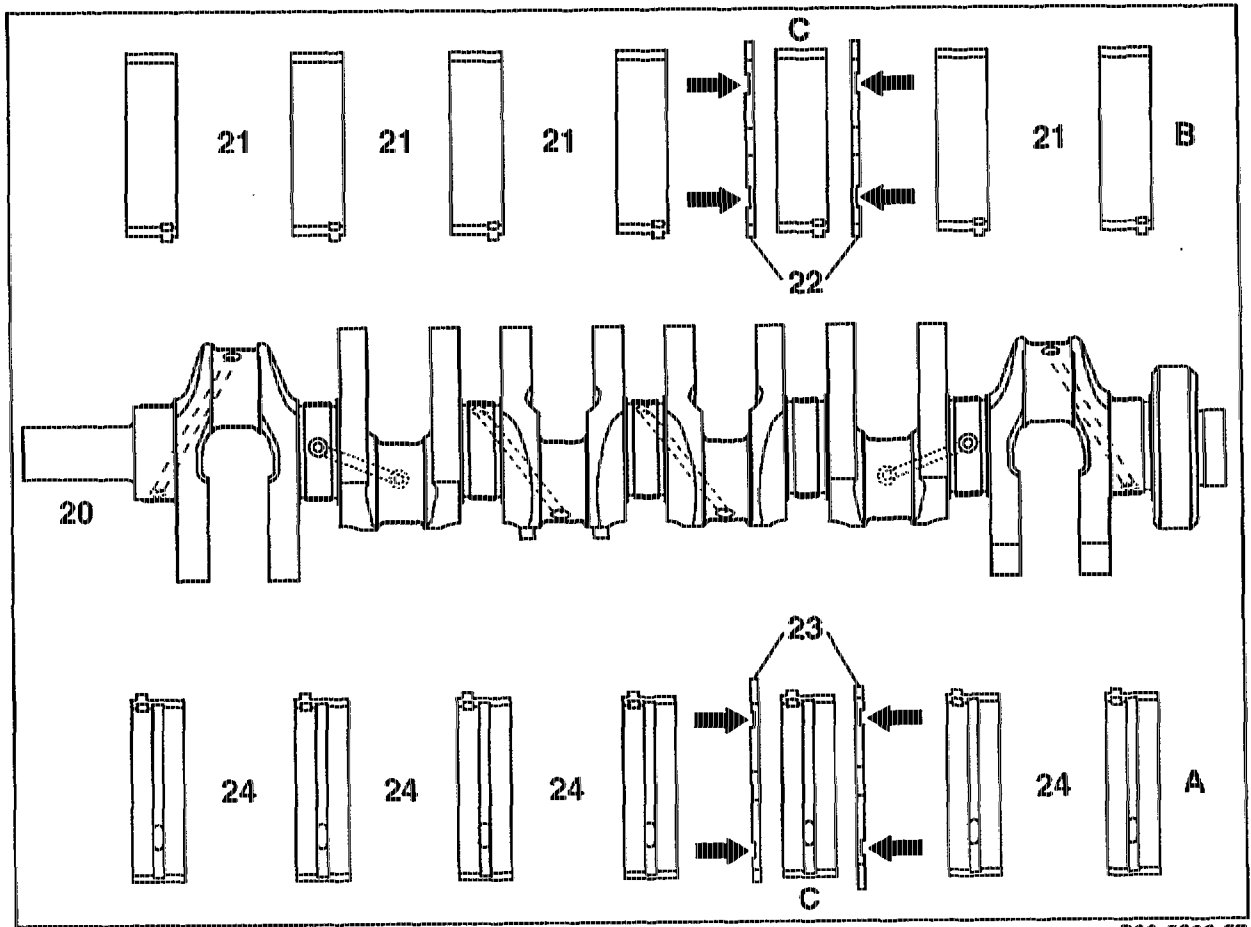
measure, note.  
 measure, note.  
 match.



Thrust washers of the same thickness must always be inserted on one side in the crankcase and in the bearing cap. The oil grooves must face toward the contact surface of the crankshaft and be oiled. The anti-twist lock is on the thrust washer in the bearing cap.

Likely axial bearing play ..... calculate.  
 Axial bearing play with crankshaft installed ..... measure. (Specification 0.100–0.250 mm).

### Bearing diagram of crankshaft



P03-5296-57

- A Bearing shells in crankcase
- B Bearing shells in bearing caps

### Finishing dimensions and identification of basic bores of crankcase

Bore $\varnothing$	Bearing points	Identification 1)	Size	Fit bearing width
62.500–62.506	1, 5, 7	1 chisel punch	Standard	19.979–20.000
62.506–62.513	1, 5, 7	2 chisel punches	Standard	19.979–20.000
62.513–62.519	1, 5, 7	3 chisel punches	Standard	19.979–20.000
62.500–62.506	2, 3, 4, 6	2 chisel punches	Standard	19.979–20.000
62.506–62.519	2, 3, 4, 6	3 chisel punches	Standard	19.979–20.000

1) The finishing tolerance stages are indicated by punch marks in the contact surface of the oil sump, in each case next to the crankshaft bearing.

Permissible difference of fit bearing contact surfaces laterally from rectangularity related to the diameter of the 1st and 7th crankshaft bearing point	0.03
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### Bearing shells for crankshaft bearings (replacement parts) 2)

Size	Bearing inner $\varnothing$	Color coding	Replacement part additional index	Bearing shell wall thickness <sup>3)</sup> in crankcase	Bearing shell wall thickness <sup>3)</sup> in bearing cap
Standard	58.00	blue	52	2.255–2.260	2.255–2.260
Standard	58.00	yellow	54	2.260–2.265	2.260–2.265
Standard	58.00	red	56	2.265–2.270	2.265–2.270
Standard 1	58.00	white-blue	57	–	2.263–2.268
Standard 1	58.00	white-yellow	58	–	2.268–2.273
Standard 1	58.00	white-red	60	–	2.273–2.278
Rep. 1	57.75	blue	52	2.375–2.380	2.375–2.380
Rep. 1	57.75	gelb	54	2.380–2.385	2.380–2.385
Rep. 2	57.50	blue	52	2.500–2.505	2.500–2.505
Rep. 2	57.50	yellow	54	2.505–2.510	2.505–2.510
Rep. 3	57.25	blue	52	2.625–2.630	2.625–2.630
Rep. 3	57.25	yellow	54	2.630–2.635	2.630–2.635
Rep. 4	57.00	blue	52	2.750–2.755	2.750–2.755
Rep. 4	57.00	yellow	54	2.755–2.760	2.755–2.760

2) A parts set with the replacement part additional indices 52, 54 and 56 consists in each case of a bearing shell for the crankcase and a bearing shell for the bearing cap.

Parts with the replacement part additional indices 57, 58 and 60 are supplied individually and should be used only for the bearing cap (without oil groove).

3) The thickest point measured in the middle of the bearing shell is the relevant thickness.

## Test data

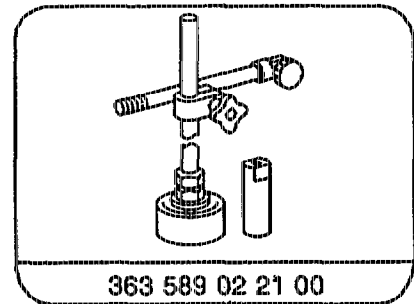
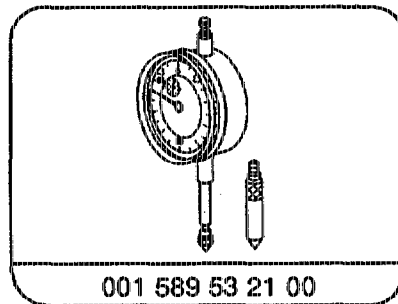
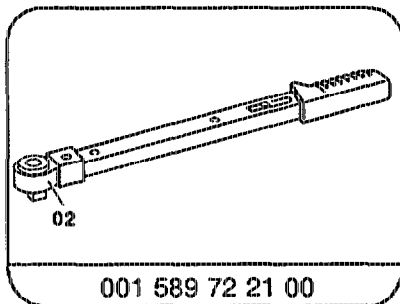
Crankshaft bearing play	radial	0.030 – 0.045
	axial	0.100 – 0.250
Conrod bearing play	radial	0.020 – 0.050

## Tightening torques in Nm or tightening angle

Bolts <sup>1)</sup> of crankshaft bearing caps	Tightening torque	55
	Tightening angle	90°

<sup>1)</sup> Re-use bolts up to a bolt length of max. 63.8 mm.

## Special tools



## Commercially available tools

### Quick-calipers for internal measurements

- Ø 20 – 40 mm
- Ø 40 – 60 mm
- Ø 60 – 80 mm

### Micrometer

- 0 – 25 mm
- 50 – 75 mm