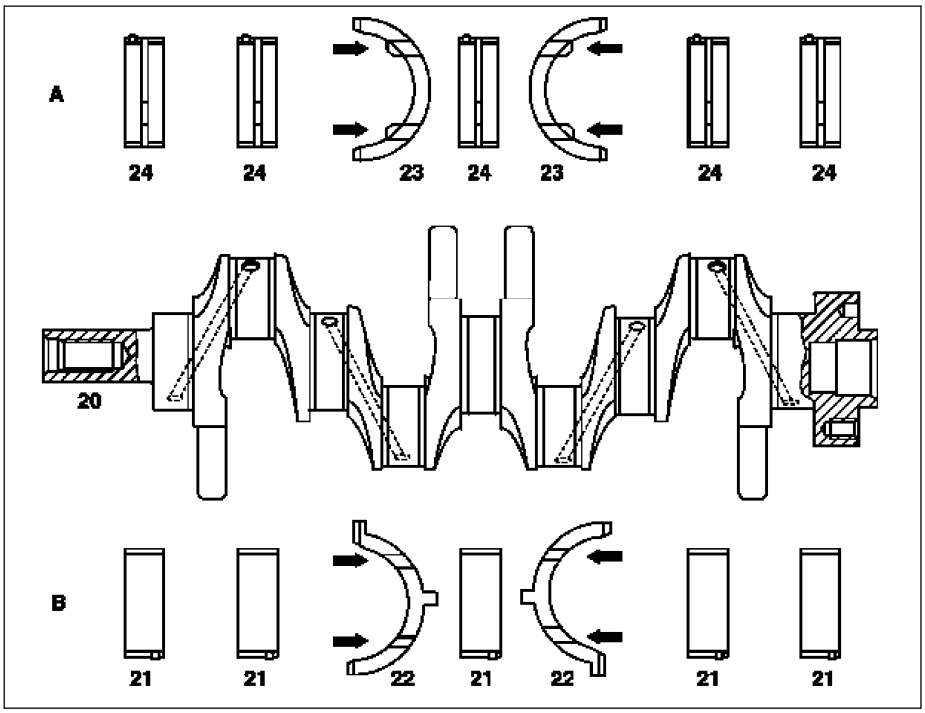
ENGINE 601, 602, 603 (except 602.98)

Shown on engine 601

The thrust washers (22) in the bearing cap each have two retaining lugs as an anti-twist lock.

The oil grooves (arrow) in the thrust washers (22) and (23) must point toward the thrust shoulders of the crankshaft.

A Crankcase
B Bearing cap
20 Crankshaft
21 Main bearing in bearing cap
22 Thrust washers (axial bearings) in bearing caps
23 Thrust washers (axial bearings) in crankcase
Engine 601 3. main bearing = fit bearing
Engine 602 4. main bearing = fit bearing
Engine 603.5 main bearing = fit bearing
24 Main bearing in crankcase



P03.20-0216-06

	Remove		
1	Remove crankshaft	Nm **Installation**: Inspect length of bolt of crankshaft bearing cap, replace if necessary (2nd version) Nm Pay attention to fit Bearing diagram	*BA03.20-P-1001-01A *BA03.20-P-1002-01A AH03.20-P-4351-02A AH03.20-P-4351-01AW
2	Clean engine parts	After bearing damage has occurred, it is necessary to remove any swarf from the conrod bores and from the crankshaft and crankcase oil galleries ↓ Clean main oil gallery, seal	ra01006010130x
	Inspect		
3	Inspect conrod, repair if necessary	After a bearing damage has occurred: Replace conrods which have suffered overheating because of bearing damage (blue discoloration). The conrod shank must not have any cross scores and notches.	AR03.10-P-6111AW
4	Inspect crankshaft	After a bearing damage has occurred: Visual inspection! If damage is present ↓ Inspect crankshaft, repair	ra03006010318x

5	Mount crankshaft radially in bearings	Inspection data of main bearing play Inspection data of conrod bearing play Inspection data of crankcase Inspection data of main bearing shells Inspection data of crankshaft bearing journal ∅ Inspection data of main bearing journal ∅ Nm Crankshaft bearing cap Nm Conrod bolt Nm Conrod bolt Radial mounting of the main bearings of standard size crankshafts is possible by **assigning** the color-coded bearing shells, refer to ↓ Assign crankshaft bearing shells	AR03.20-P-4355-01AW *BE03.20-P-1001-04C *BE03.20-P-1002-04C *BE01.40-P-1001-02D *BE03.20-P-1001-03B *BE03.20-P-1001-02C *BE03.20-P-1002-02C *BA03.20-P-1001-01A *BA03.10-P-1001-01C *BA03.10-P-1002-01C *001589322100 *WH58.30-Z-1055-12A *WH58.30-Z-1065-12A AR03.20-P-4360-01HA
6	Mount crankshaft axially	Inspection data of axial bearing play Inspection data of fit bearing journal width Nm Crankshaft bearing cap 	AR03.20-P-4355-02AW *BE03.20-P-1001-04C *BE03.20-P-1003-02C *BA03.20-P-1001-01A *001589322100 *363589022100 *WH58.30-Z-1055-12A *WH58.30-Z-1065-12A
7	Install in the reverse order		

Inspection data of crankshaft main bearing shells

Number	Designation			Engine 601, 602 except 602.982, 603
BE03.20-P-1001-03B	Main bearing shells standard dimension for crankcase and bearing cap ∅58.00 mm	Replacement part additional number (color coding blue)		52
		Bearing shell thickness	mm	2,255-2,260
BE03.20-P-1002-03B	Main bearing shells standard dimension for crankcase and bearing cap ∅58.00 mm	Replacement part additional number (color coding yellow)		54
		Bearing shell thickness	mm	2,260-2,265
BE03.20-P-1003-03B	Main bearing shells standard dimension for crankcase and bearing cap ∅58.00 mm	Replacement part additional number (color coding red)		56
		Bearing shell thickness	mm	2,265-2,270
BE03.20-P-1004-03B	Main bearing shells standard dimension for bearing cap ∅58.00 mm	Replacement part additional number (color coding white)		57
		Bearing shell thickness	mm	2,270-2,275
BE03.20-P-1005-03B	Main bearing shells standard dimension for bearing cap ∅58.00 mm	Replacement part additional number (color coding purple)		58
		Bearing shell thickness	mm	2,275-2,280
BE03.20-P-1006-03B	Main bearing shells repair size 1 for crankcase and bearing cap ∅57.70 mm	Bearing shell thickness	mm	2,37

BE03.20-P-1007-03B	Main bearing shells repair size 2 for crankcase and bearing cap ∅57.40 mm	Bearing shell thickness	mm	2,50
BE03.20-P-1008-03B	Main bearing shells repair size 3 for crankcase and bearing cap ∅57.20 mm	Bearing shell thickness	mm	2,62
BE03.20-P-1009-03B	Main bearing shells repair size 4 for bearing caps ∅56.90 mm	Bearing shell thickness	mm	2,75

Inspection data of crankcase

Number	Designation			Engine 601, 602.91/96, 603.91/96
BE01.40-P-1001-02D	Crankshaft bearing	Basic bore diameter	mm	62,500-62,519
		Basic bore width at fit bearing	mm	19,979-20,000
		Permissible out-of-roundness and conicity of basic bore	mm	0,02

Inspection data of crankcase

Number	Designation			Engine 603.97
BE01.40-P-1001-02D	Crankshaft bearing	Basic bore diameter	mm	62,500-62,519
		Basic bore width at fit bearing	mm	19,979-20,000
		Permissible out-of-roundness and conicity of basic bore	mm	0,02

Inspection data of crankshaft bearing clearance

Number	Designation			Engine 601, 602 except 602.982, 603
BE03.20-P-1001-04C	Main bearing play	Radial, when new	mm	0,03-0,05
		Radial, wear limit	mm	0,08
		Axial, when new	mm	0,10-0,25
		Axial, wear limit	mm	0,3
BE03.20-P-1002-04C	Conrod bearing play	Radial, when new	mm	0,020-0,065

Test values for crankshaft

Number	Designation	Engine 601 up to 06/84	Engine 601 as of 07/84, 602 except 602.98, 603

BE03.20-P-1001-02C	Crankshaft bearing journal ∅	Standard size	mm	57,940-57,965	57,940-57,965
		1st repair size	mm	57,700-57,715	57,700-57,715
		2nd repair size	mm	57,450-57,465	57,450-57,465
		3rd repair size	mm	57,200-57,215	57,200-57,215
		4th repair size	mm	56,950-56,965	56,950-56,965
BE03.20-P-1002-02C	Conrod journal ∅	Standard size	mm	47,940-47,965	47,940-47,965
		1st repair size	mm	47,700-47,715	47,700-47,715
		2nd repair size	mm	47,450-47,465	47,450-47,465
		3rd repair size	mm	47,200-47,215	47,200-47,215
		4th repair size	mm	46,950-46,964	46,950-46,964
BE03.20-P-1003-02C	Fit bearing journal width	Standard size	mm	26,500-26,520	24,500-24,533
		Repair size	mm	26,600-26,620	24,600-24,633
			mm	26,700-26,720	24,700-24,733
			mm	26,900-26,920	24,900-24,933
				27,000-27,020	25,000-25,033

Inspection data of crankshaft bearing cap bolts

Number	Designation			Engine 601, 602 except 602.982, 603
BE03.20-P-1001-01B	Bolt of crankshaft bearing cap (2nd version)	Thread diameter	M	11
		Length (L) when new	mm	62,0
		max. length (L)	mm	63,8
		Fig. see		AR03.20-P-4351-03A

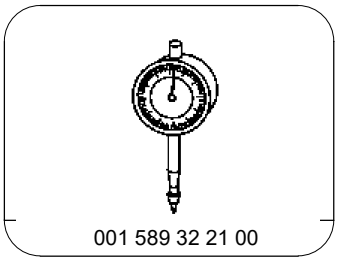
Nm Crankshaft bearing cap

Number	Designation				Engine 601, 602, 603 except 602.98
BA03.20-P-1001-01A	Bolt crankshaft bearing cap	M11	1st stage	Nm	55
			2nd stage	∡ °	90
BA03.20-P-1002-01A	Bolt of crankshaft bearing	M12		Nm	90

Nm Conrod

Number	Designation	Engines 601, 602 except 602.98, 603 except 603.970 up to 11/90 603.970 up to 8/90	Engines 601, 602 except 602.98, 603 except 603.970 as of 12/90 - 10/92 603.970 as of 9/90 - 10/92	Engines 601, 602 except 602.98, 603 as of 11/92

BA03.10-P-1001-01C	Conrod screw (stretch shank)	1st stage	new	Nm	-	45	40
			used	Nm	-	40	-
		2nd stage		∡ °	-	90	90
		Fig. see			-	AR03.10-P-6111-01AW	AR03.10-P-6111-01AW
BA03.10-P-1002-01C	Conrod bolt (stretch bolt)	1st stage		Nm	30	-	-
		2nd stage		∡ °	90	-	-
		Fig. see			AR03.10-P-6111-01AW		



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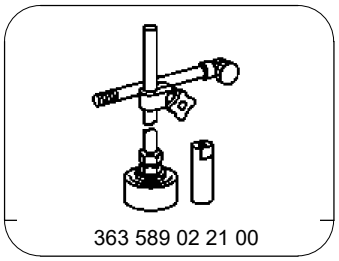
Dial gage



363 589 02 21 00

Dial gage holder

Commercially available tools (see Workshop Equipment Manual)

Number	Designation	Make (e.g.) g.)	Order number
WH58.30-Z-1055-12A	Setting gage for micrometer	Hahn und Kolb Borsigstr. 50 70469 Stuttgart www.hahn-kolb.de	
WH58.30-Z-1065-12A	Quick calipers for internal measurements	Hahn und Kolb Borsigstr. 50 70469 Stuttgart www.hahn-kolb.de	