

05-2210 Matching camshafts and mounting

Timing in degrees crank angle (°CKA) at 2 mm valve lift ¹⁾ and new timing chain

Camshaft code number ²⁾	Inlet opens ATDC ^{3) 5)}	Inlet closes ABDC ³⁾	Exhaust opens BBDC	Exhaust closes BTDC ⁵⁾
21, 23 ⁶⁾ 43 ⁷⁾ , 45 ⁸⁾ , 33 ⁹⁾ , (34) ⁴⁾	36°	36°	–	–
19, 24 ⁶⁾ , 41 ⁷⁾ , 47 ⁸⁾ , 35 ⁹⁾ , (36) ⁴⁾ 57 ¹⁰⁾	–	–	30°	13°
59 ¹¹⁾ (60) ⁴⁾	34°	34°	–	–
57 (58) ⁴⁾ 65 (66) ⁴⁾	–	–	31°	14°

1) Permissible difference: ± 2.0 °CKA.

2) Camshaft code number on 3rd camshaft bearing or stamped on camshaft flange from rear with paint.

3) Camshaft adjuster in "retarded" position.

4) Repair size camshaft with 0.5 mm larger bearing diameter.

5) These readings can be obtained at the vibration damper.

6) Shaft diameter 30 mm since 8/89 (only USA; Japan).

7) Modified cam shape with steel bucket tappet since 8/89.

8) Centre axial location since 11/89.

9) Modified cam shape since 2/90.

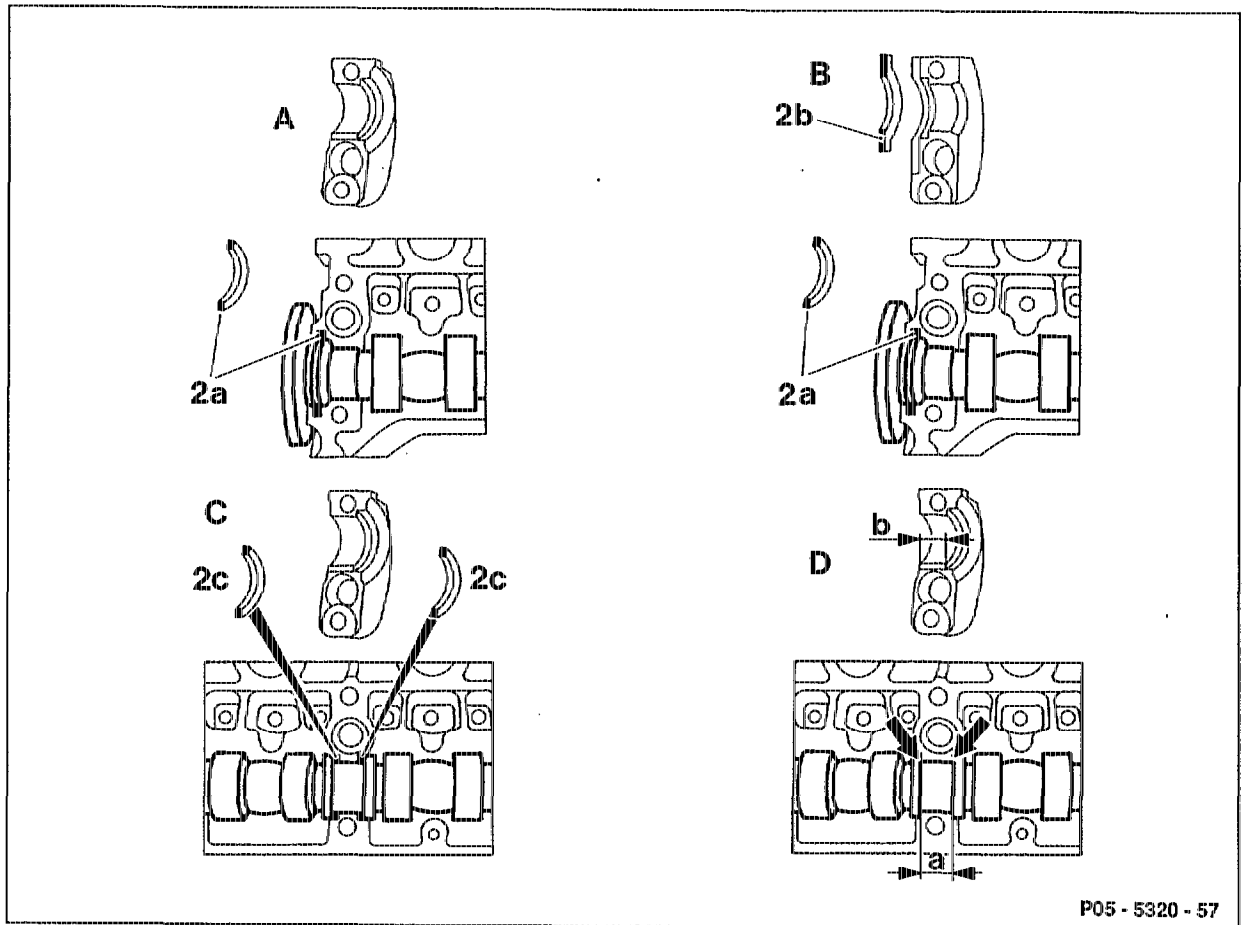
10) since 04/91

11) since 03/91

Test data

	When new	
	Standard size	Repair size
Camshaft bearing dia.	29.947 – 29.960	29.434 – 29.450
Camshaft bearing play	Radial	0.040 – 0.074
	Axial	0.060 – 0.210

Camshaft axial mounting



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2a	Bottom thrust washer	104 051 01 73
2b	Top thrust washer	104 051 00 73
2c	Bottom thrust washer	120 051 00 73

A	Thrust washer at bearings 1 and 8 in bearing halves of cylinder head			Up to engine end no.
	Bottom thrust washer	104 051 01 73		104980 10 000060
	Front bearing cap	Inlet 104 051 13 03		104980 12 000053
	Front bearing cap	Exhaust 104 051 11 03		104981 10 000019 104981 12 000074
B	Two thrust washers each at bearings 1 and 8 in the bearing halves of cylinder head and in the camshaft bearing caps			As of engine no.
	Bottom thrust washer	104 051 01 73	104980 10 000061	Up to engine end no. 104980 10 000718
	Top thrust washer	104 051 00 73	104980 12 000054	104980 12 003032
	Front bearing cap	Inlet 104 051 20 03	104981 10 000020	104981 10 000157
	Front bearing cap	Exhaust 104 051 18 03	104981 12 000075	104981 12 000915
C	Two thrust washers each at bearings 4 and 11 in bearing halves of cylinder head			As of engine no.
	Thrust washer	120 051 00 73	104980 10 000719	Up to engine end no. 104980 10 004091
	Front bearing cap	Inlet 104 051 13 03	104980 12 003033	104980 12 017952
	Front bearing cap	Exhaust 104 051 11 03	104981 10 000158	104981 10 000789
			104981 12 000916	104981 12 007762
D	Without thrust washers at bearings 4 and 11 in bearing halves of cylinder head			As of engine no.
	Front bearing cap	Inlet 104 051 37 03	104980 10 004092	Engine 104990
	Front bearing cap	Exhaust 104 051 35 03	104980 12 017953	
			104981 10 000790	
			104981 12 007763	

Decision table engine 104.98

	Camshaft axial mounting			
Bucket tappet				
Carbide metal	A ¹⁾	B ²⁾	-	-
Steel	-	B	C	D
Camshafts				
Standard 21/19	A	--	-	--
Repair 33/35	-	--	C ³⁾	D ³⁾
Camshafts				
Standard 23/24, 43/41	--	B	-	--
Repair 33/35	-	--	C ³⁾	D ⁴⁾
Camshafts				
Standard 45/47	--	--	C	-
Repair 33/35	--	--	C	D ⁴⁾
Camshafts				
Standard 33/35, 57/59 ⁵⁾	--	--	--	D
Repair 33/35 ⁶⁾ 57/59 65	--	--	--	D

1) May only be fitted with camshafts with code numbers 21/19.

2) May only be fitted with camshafts with code numbers 23/24.

3) Together with cylinder head 104 010 10 20

4) Together with cylinder head 104 010 21 20

5) As of engine

980 10/50, 20/60 005792

980 12/52, 22/62 025654

981 10/50, 20/60 001134

981 12/52, 22/62 010894

6) Up to engine

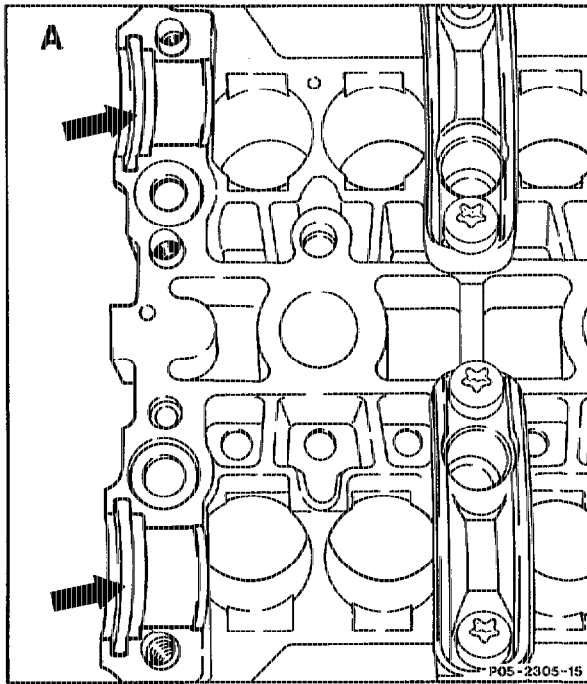
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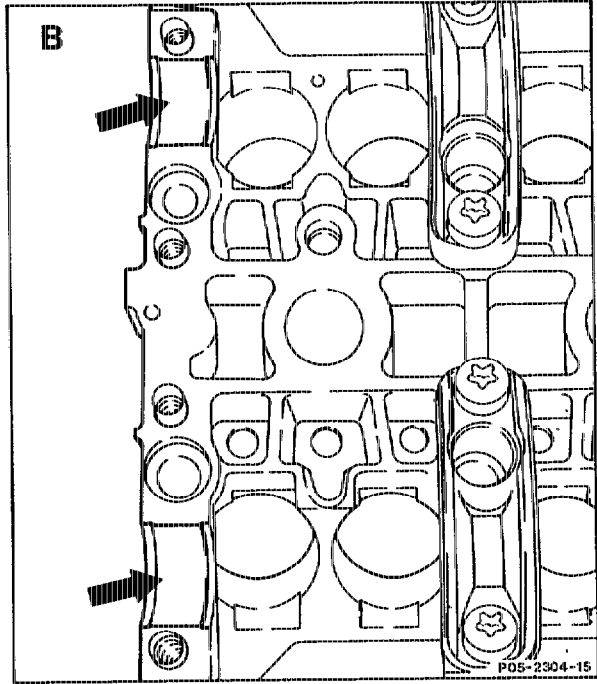
981 10/50, 20/60 001133

981 12/52, 22/62 010893

Note



Engine 104.98 up to 11/90
Cylinder head with thrust shoulder for axial mounting of camshafts at front (arrows).



Engine 104.98 as of 11/90
Engine 104.99
Cylinder head without thrust shoulder for axial mounting of camshafts at front (arrows).