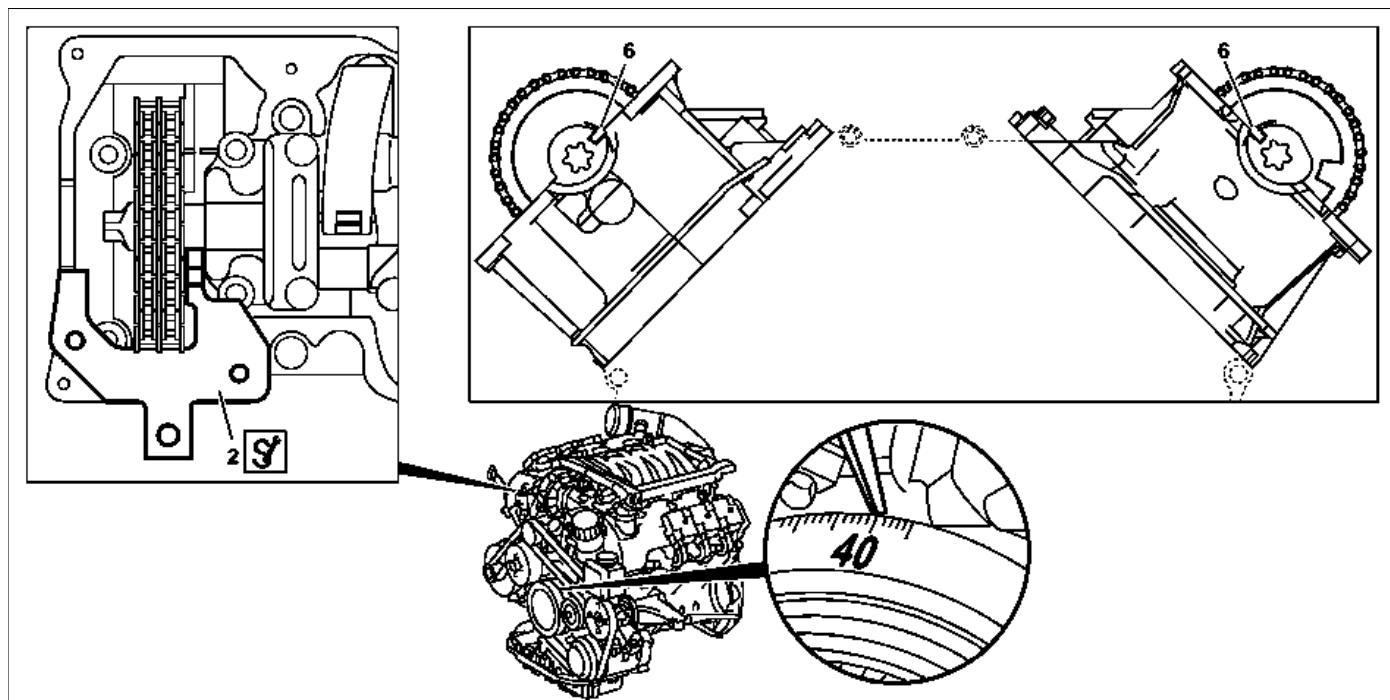


ENGINE 112
ENGINE 113.962 in MODEL 463.206 /240 /241 /247 /248 /249 /254
ENGINE 113.982 in MODEL 463.243 /246
ENGINE 113 (except 113.995) in MODEL 129, 163, 202, 203, 208, 209, 210, 211, 215, 220, 230

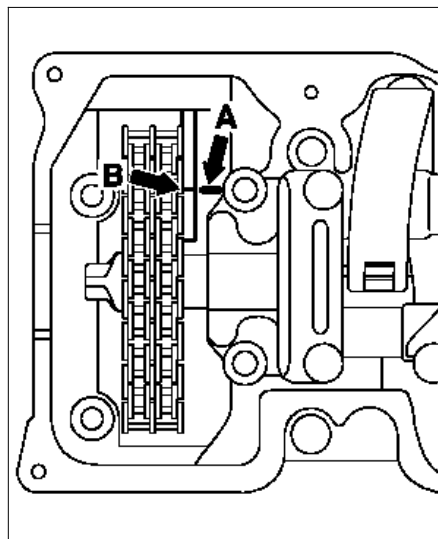


P05.10-0310-09

Shown on engine 112
Inspect basic position of balancing shaft only engine 112

- A Pin on crankcase
B Notch in balancing weight

6 Slot in camshaft



P03.20-0256-02

	Remove/install		
1	Remove cylinder head covers	Air filter located at vehicle side. Air filter located on engine side.	AR01.20-P-5014B AR01.20-P-5014BV
2.1	Unbolt combination valve (on right)	 Only for engines with air pump.  Installation: Replace Gasket of combination valve. 	*BA09.20-P-1001-01D
	Checking		
3	Inspect timing	Engine 112.910/911/912/920/921/922 /923/940/941/942/942/944/945/946/947 /949, Engine 113.940/941/ 942/943944/960// 961 /962/963/965/967/968/980/981/982/984 /987/990/991/992, Engine 113.960 with cylinder shutoff code 479 see: ↓	

		Inlet Outlet Engine 112, 113	*BE05.20-P-1001-02F *BE05.20-P-1002-02F AH05.20-N-0100-01A
i	Camshaft code number and assignment		
4	Position engine to 40° after ignition TDC of cylinder 1	i Rotate engine at crankshaft in direction of rotation until 40° marking on belt pulley/ vibration damper is aligned with marking on timing case cover. Slots at camshafts must be pointing in direction of inner V. ! The engine must not be turned back; otherwise the timing chain can get jammed.	
5	Check basic position of camshafts	i Place locating plate for right camshaft (2) flush onto the right cylinder head and insert into the groove in the camshaft (6). Proceed the same way with the left-hand camshaft in the left-hand cylinder head.   If both locating plates cannot be inserted into the grooves: ↓ Set the basic position of camshafts.	*112589003200 *112589013200 AR05.20-P-6020AU
6.1	Inspect basic position of the balancing shaft	Only for Engine 112, see figure. i The markings of the pin at front crankcase (A) and the notch in the correctional weight (B) on the front end of the correctional weight point to each other. The two scribe marks can be seen through the left timing case duct at a depth of about 22 cm from the cylinder head cover joint surface.	
7	Install in the reverse order		

Test values for timing

Number	Designation		Engines 112.910/ 911 left- hand	Engines 112.910/ 911 right- hand	Engines 112.912/ 913/920/ 921/922/ 923 on the left
BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC °CA	24.9	26.5	26.9
		closes after BDC °CA	20.2	21.8	23.2
BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC °CA	28.1	26.5	29.1
		opens after BDC °CA	-	-	-
		closes before TDC °CA	13.1	11.5	14.1

Test values for timing

Number	Designation		Engines 112.912/ 913/920/ 921/922/ 923 right	Engines 112.940/941/ 942/943/944/ 945/946/947/ 948/949/951/ 976 left
BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC °CA	28.5	24.9
		closes after BDC °CA	24.8	25.9

BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC	°CA	27.5	31.5
		opens after BDC	°CA	-	-
		closes before TDC	°CA	12.5	12.1

Test values for timing

Number	Designation			Engines 112.940/941/ 942/943/944/ 945/946/947/ 948/949/951/ 976 right	Engines 113.940/941/942 /943 left
BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC	°CA	26.5	31.9
		closes after BDC	°CA	27.5	28.2
BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC	°CA	29.9	24.1
		opens after BDC	°CA	-	-
		closes before TDC	°CA	10.5	9.1

Test values for timing

Number	Designation			Engines 113.940/941/ 942/943 on the right	Engine 113.944
BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC	°CA	33.5	26
		closes after BDC	°CA	29.8	34
BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC	°CA	22.5	34
		opens after BDC	°CA	-	-
		closes before TDC	°CA	7.5	14

Test values for timing

Number	Designation	Engines 113.960/ 961/962/ 963/964/ 965/967/ 968/971 left	Engines 113.960/ 961/962/ 963/964/ 965/967/ 968/971 right	Engines 113.980/ 981/982/984 right and left
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BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC °CA	30.9	32.5	25
		closes after BDC °CA	25.7	27.3	39
BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC °CA	23.2	21.6	35
		opens after BDC °CA	-	-	-
		closes before TDC °CA	9.1	7.5	15

Test values for timing

Number	Designation	Engines 113.987/988 989/990//991 992/993/995 left and right			
BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC °CA	25.7		
		closes after BDC °CA	33.7		
BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC °CA	31.5		
		opens after BDC °CA	-		
		closes before TDC °CA	11.3		

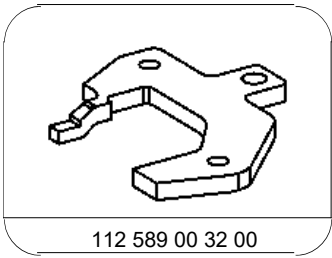
Test values for timing

Number	Designation	Engine 113.960 with code 479 right		Engine 113.960 with code 479 left
BE05.20-P-1001-02F	Timing of inlet valve with 2 mm play and used timing chain	opens after TDC °CA	36.9	28.5
		closes after BDC °CA	28.5	14.8
BE05.20-P-1002-02F	Timing of exhaust valve with 2 mm play and used timing chain	opens before BDC °CA	24.3	27.5
		opens after BDC °CA	-	-
		closes before TDC °CA	14.1	12.5

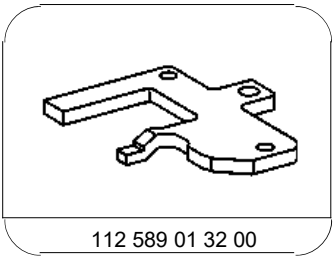
Intake manifold

Number	Designation	Engines 112, 113
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BA09.20-P-1001-01D	Bolt, intake manifold to cylinder head M8 Nm 20	



Locating plate



Locating plate