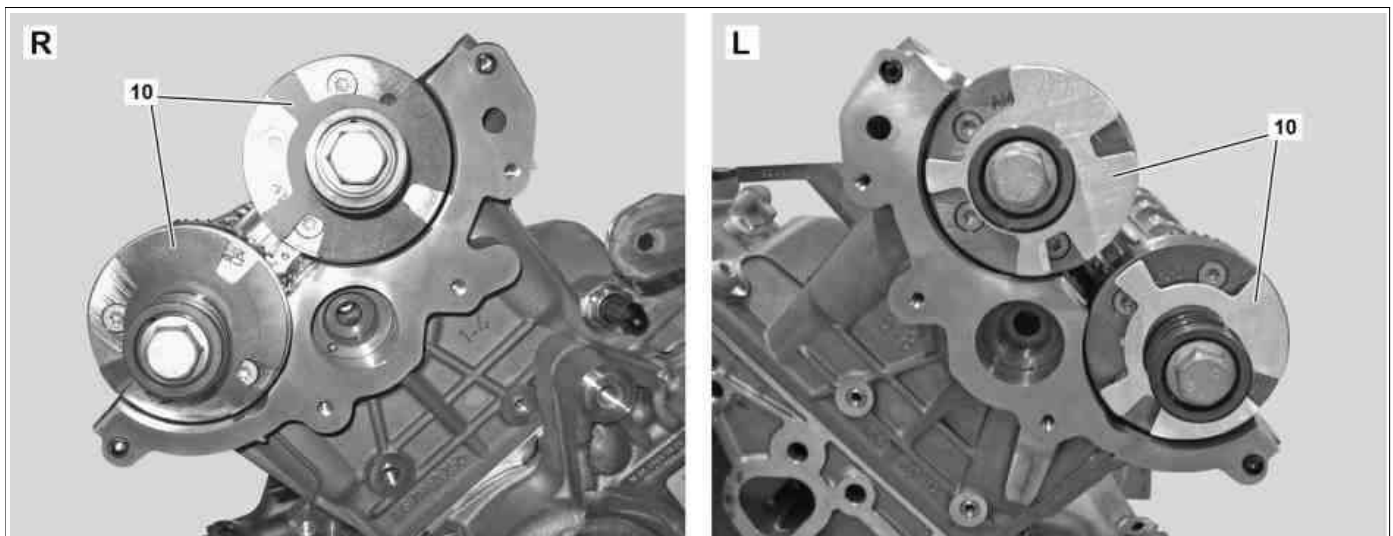


P05.20-2276-09

Shown on right cylinder head model 211

- | | | | | |
|-------|-------|-------|-------|-------|
| 01 | 01 | 01 | 01 | 01 |
| 1 | 1 | 1 | 1 | 1 |
| 2 | 2 | 2 | 2 | 2 |
| 3a | 3a | 3a | 3a | 3a |
| 3b | 3b | 3b | 3b | 3b |
| 4 | 4 | 4 | 4 | 4 |
| 4a | 4a | 4a | 4a | 4a |
| 4b | 4b | 4b | 4b | 4b |
| 5 | 5 | 5 | 5 | 5 |
| 6 | 6 | 6 | 6 | 6 |
| 7 | 7 | 7 | 7 | 7 |
| 8 | 8 | 8 | 8 | 8 |
| 9 | 9 | 9 | 9 | 9 |
| 10 | 10 | 10 | 10 | 10 |
| 11 | 11 | 11 | 11 | 11 |
| 12a | 12a | 12a | 12a | 12a |
| Y49/4 | Y49/4 | Y49/4 | Y49/4 | Y49/4 |
| Y49/5 | Y49/5 | Y49/5 | Y49/5 | Y49/5 |
| Y49/6 | Y49/6 | Y49/6 | Y49/6 | Y49/6 |
| Y49/7 | Y49/7 | Y49/7 | Y49/7 | Y49/7 |



P05.20-2327-08

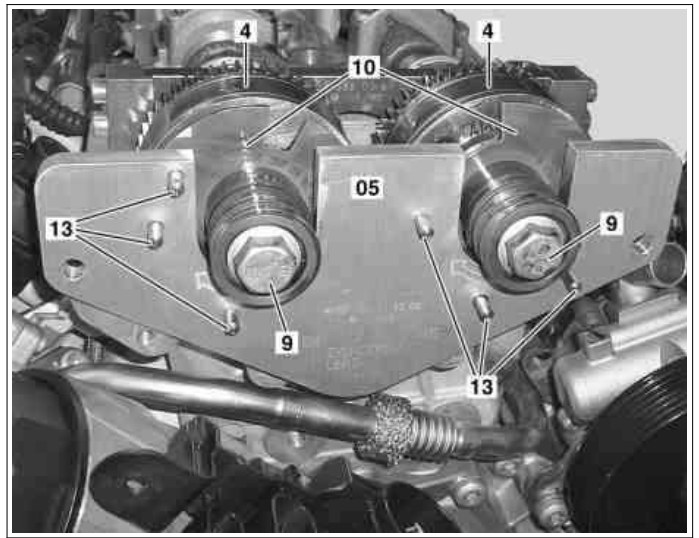
Right-hand cylinder head

10 Center valve with segment plate

Left-hand cylinder head

10 Center valve with segment plate

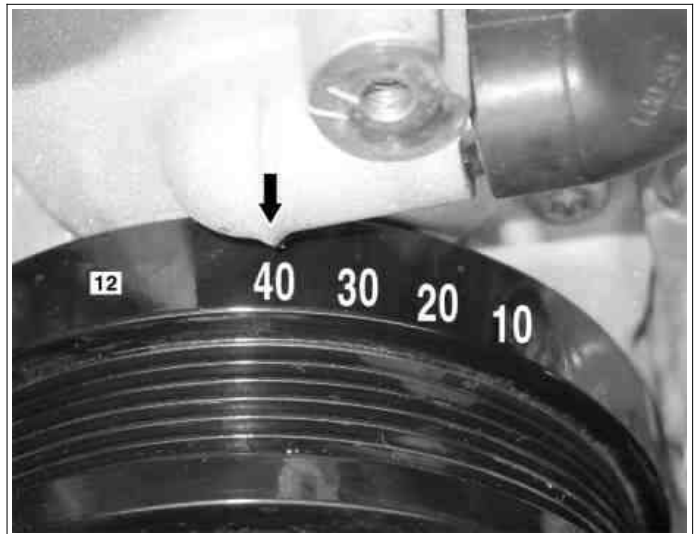
- 05 Locating plate
- 4 Camshaft adjuster
- 9 Bolts
- 10 Center valve with segment plate
- 13 Centering pins



P05.20-2289-11

- 12 Belt pulley

Arrow Marking on the timing case cover








P05.20-2280-11


Modification notes

7.12.09	"Lock gear backlash" has been added	Step 12.2	AR05.20-P-7201-05AMG
6.8.09	Value changed: Bolt, camshaft adjuster on camshaft, 1st stage Value changed: Bolt, camshaft adjuster cover on cylinder head		*BA05.20-P-1001-02J *BA05.20-P-1002-02J

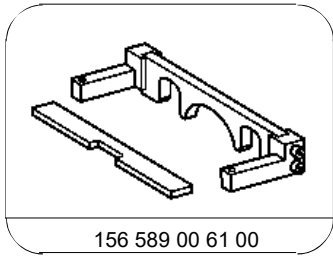
	Removing		
	Risk of injury caused by fingers being pinched or crushed when removing, installing or aligning hoods, doors, trunk lids, liftgates or sliding roof	Keep body parts and limbs well clear of moving parts.	AS00.00-Z-0011-01A
	Notes on self-locking nuts and bolts		AH00.00-N-0001-01A
1	Switch off ignition		
2	Remove partition wall between wheel wells	Model 251	AR62.30-P-2400RT
3	Remove air filter housing	Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR09.10-P-1150GZS AR09.10-P-1150CMG AR09.10-P-1150TMG AR09.10-P-1150SMG AR09.10-P-1150RMG
4	Remove spark plugs	Only if it is not possible to crank engine due to high compression. Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR15.12-P-1010GZS AR15.12-P-1010CMG AR15.12-P-1010TMG AR15.12-P-1010SMG AR15.12-P-1010RMG

5	Rotate engine at crankshaft center bolt in direction of rotation of the engine to a 40° crankshaft angle after top dead center (TDC)	The 40° marking (12) on belt pulley must be aligned with the marking on the timing case cover (arrow).	
6	Loosen oil dipstick guide tubes (11) on cylinder head and turn to the side	When removing camshaft adjuster (4) on the right. Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR18.40-P-3510GZS AR18.40-P-3510CMG AR18.40-P-3510TMG AR18.40-P-3510SMG AR18.40-P-3510RMG
7	Remove cylinder head covers (1)	Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR01.20-P-5014GZS AR01.20-P-5014CMG AR01.20-P-5014TMG AR01.20-P-5014SMG AR01.20-P-5014RMG
8	Insert holding device (01) at camshafts (2)	See "Check basic position of camshafts". 	AR05.20-P-6010AMG *156589006100
9.1	Disconnect electrical connectors (3a, 3b) on left camshaft intake solenoid (Y49/4) and left camshaft exhaust solenoid (Y49/6)	When removing camshaft adjuster (4) on the left. Mark electrical connectors (3b) with different colors to avoid mixing up the connectors during installation.	
9.2	Disconnect electrical connectors (3a, 3b) on right camshaft intake solenoid (Y49/5) and right camshaft exhaust solenoid (Y49/7)	When removing camshaft adjuster (4) on the right. Mark electrical connectors (3b) with different colors to avoid mixing up the connectors during installation.	
10	Remove bolt from ground strap (5) at caps (7, 8)		
11	Remove bolts (6) on cap (7, 8)		
12.1	Insert safety screws in the bores (4b) on the rear of the camshaft adjuster (4)	The safety screws are required for locking the gear backlash adjustment (4a) of the camshaft adjuster (4).	
12.2	Lock gear backlash play compensation (4a) at camshaft adjuster (4)	For camshaft adjuster (4) without threads in bore (4b). Compressing tool	AR05.20-P-7201-05AMG *156589016300
13	Remove bolts (9)		
14	Remove camshaft adjuster (4) and center valve with segment plate (10)	Observe identification for intake and exhaust camshaft adjusters. Mark central valve with segment plates (10) relative to intake and exhaust camshaft adjusters.	
	Install		
15	Insert camshaft adjuster (4) and center valve with segment plate (10)	Camshaft adjuster (4) can be inserted at any desired position. Insert washer (12a) before inserting camshaft adjuster (4).	
16	Screw in bolts (9)	Only screw in bolts (9) so that center valve with segment plates (10) can be turned.	
17.1	Remove securing screws at rear of the camshaft adjuster (4)		
17.2	Remove tensioning tool for locking gear backlash play compensation (4a) at Remove camshaft adjuster (4)	For camshaft adjuster (4) without threads in bore (4b). Compressing tool	AR05.20-P-7201-05AMG *156589016300
18	Check basic position of camshafts (2)	Check camshaft position on both cylinder heads.	AR05.20-P-6010AMG
19	Bring central valve with segment plates (10) on left cylinder head into the installation position	See picture L	
20	Bring central valve with segment plates (10) on right cylinder head into the installation position	See picture R	
21	Place locating plate (05) on front side of cylinder head	Observe respective side of locating plate (05). Turn center valve with segment plate (10) in such a way that centering pin (13) of locating plate (05) engages in cutouts on segment plates (10). Then tighten bolts (9) and remove locating plate (05). 	*BA05.20-P-1001-02J *156589003200
22			
23	Screw bolts (6) into cap (7, 8)		*BA05.20-P-1002-02J

		Loctite 5970 sealant	*BR00.45-Z-1013-01A
24	Mount ground strap (5) on cap (7, 8)		*BA05.20-P-1004-02J
25	Contact intake camshaft solenoid, left (Y49/4) and exhaust camshaft solenoid, left (Y49/6) or intake camshaft solenoid, right (Y49/5) and exhaust camshaft solenoid, right (Y49/7)		
26	Remove holding device (01) on camshafts (2)		*156589006100
27	Install cylinder head covers (1)	Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR01.20-P-5014GZS AR01.20-P-5014CMG AR01.20-P-5014TMG AR01.20-P-5014SMG AR01.20-P-5014RMG
28	Install oil dipstick guide tube (11)	If camshaft adjuster (4) on the right side was removed. Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR18.40-P-3510GZS AR18.40-P-3510CMG AR18.40-P-3510TMG AR18.40-P-3510SMG AR18.40-P-3510RMG
29	Install spark plugs	If it is not possible to crank engine due to high compression. Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR15.12-P-1010GZS AR15.12-P-1010CMG AR15.12-P-1010TMG AR15.12-P-1010SMG AR15.12-P-1010RMG
30	Remove partition wall between wheel wells	Model 251	AR62.30-P-2400RT
31	Install air filter housing	Model 164, 251 Model 204, 212 Model 209, 211, 219 Model 216, 221 Model 230	AR09.10-P-1150GZS AR09.10-P-1150CMG AR09.10-P-1150TMG AR09.10-P-1150SMG AR09.10-P-1150RMG
	Checking		
32	Risk of accident caused by vehicle starting off by itself when engine is running. Risk of injury caused by contusions and burns during starting procedure or when working near the engine as it is running Carry out engine test run	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.  Inspect engine for leaks.	AS00.00-Z-0005-01A
33	Conduct new calibration of sensor rotor of camshaft adjuster (4) using STAR DIAGNOSIS Connect STAR DIAGNOSIS and read out fault memory	 When removing camshaft adjuster (4) new calibration is always necessary.	AD00.00-P-2000-04A

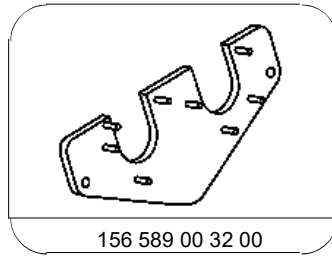
 **Camshaft, camshaft adjustment**

Number	Designation	Engine 156
BA05.20-P-1001-02J	Bolt, camshaft adjuster on camshaft M12 Stage 1 Nm 45	
	Torque Angle Gauge needed for this step. Stage 2 ∟° 90	
BA05.20-P-1002-02J	Bolt, camshaft adjuster cover to cylinder head M6 Nm 10	
BA05.20-P-1004-02J	Bolt, engine wiring harness ground to camshaft adjuster cover Nm 9	



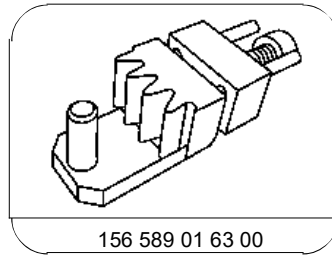
156 589 00 61 00

Holding device



156 589 00 32 00

Locating plate



156 589 01 63 00

Compressing tool

Repair materials

Number	Designation	Order number
BR00.45-Z-1013-01A	Loctite 5970 sealant	A 003 989 98 20