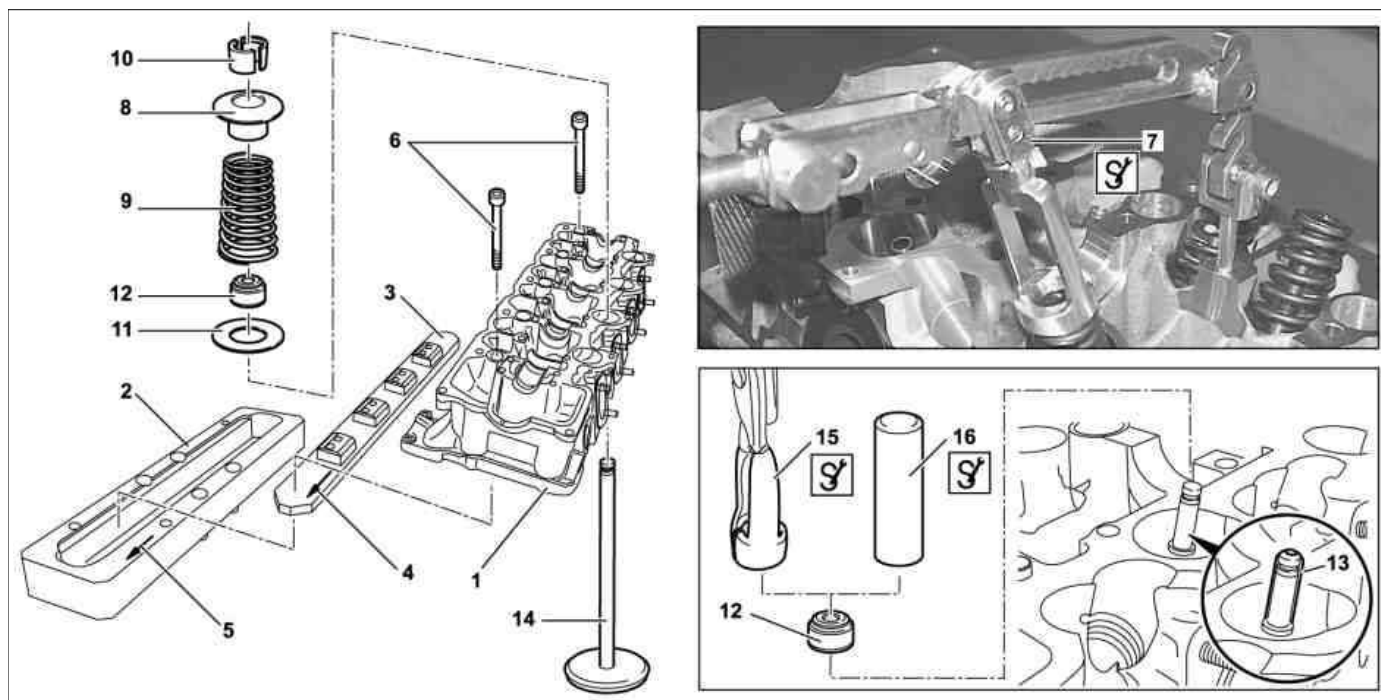


AR05.30-P-3511AV	Remove/install valves	4.12.06
ENGINE 112 in MODEL 129, 163, 170, 202, 203, 208, 209, 210, 220		
ENGINE 113 in MODEL 129, 163, 202, 203, 208, 209, 210, 211.076 /276, 215.373 /374 /375, 220, 230.474 /475		
ENGINE 112.945 in MODEL 463.209 /232 /233 /244 /245 /250		
ENGINE 113.962 in MODEL 463.206 /240 /241 /247 /248 /249 /254		
ENGINE 113.982 in MODEL 463.243 /246		
ENGINE 112.913 in MODEL 211.061 /261		
ENGINE 112.949 in MODEL 211.065 /265		
ENGINE 113.967 in MODEL 211.070 /270		



P05.30-2027-09

- | | |
|---|--|
| 1 Cylinder head | 9 Valve spring |
| 2 Assembly board | 10 Valve collets |
| 3 Insertion plate | 11 Valve disk (bottom) |
| 4 Direction of travel arrow (insertion plate) | 12 Valve stem seal |
| 5 Direction of travel arrow (assembly board) | 13 Protective sleeve for valve stem seal |
| 6 Bolts | 14 Valve |
| 7 Assembly tool (valves) | 15 Pliers |
| 8 Valve disk (top) | 16 Drift |

	Remove/install		
Danger!	Risk of death caused by vehicle slipping or toppling off the lifting platform.	Align vehicle between columns of vehicle lift and position four support plates at vehicle lift support points specified by vehicle manufacturer.	AS00.00-Z-0010-01A
1	Remove cylinder head (1)	Model 163.154/ 157 / 172/ 174/ 175 Model 129 with engine 112,113 Model 202, 208, 210 with engine 113 Model 170, 202, 208, 210, 220 with engine 112 Model 211.076/276, 215.374, 220, 230.474 /475 with engine 113 Model 203 except 203.764, 209, 211 Model 463.2 with engine 112, 113 Model 203.764 Model 215.373 /375	AR01.30-P-5800MV AR01.30-P-5800B AR01.30-P-5800BA AR01.30-P-5800PV AR01.30-P-5800GV
2	Mount cylinder head (1) onto the assembly board (2) with the associated insertion plate (3)	Insert insertion plate (3) with arrow indicating the direction of travel (insertion plate) (4) pointing to the front and, according to the cylinder head, for the right or left side into the assembly board (2).	

		 Mount cylinder head (1) with its front end pointing to the arrow indicating the direction of travel (assembly board) (5) with one bolt (6) each at the front and rear onto the assembly board (2). The cylinder head (1) can be mounted on the assembly board (2) without removing the exhaust manifold.  Assembly board	*112589115900
3	Attach assembly tool (valves) (7) to cylinder head (1) and position vertically at the valve disk (top) (8)	 Use parts 2, 3, 4, 5, 7, 14, 19 from the valve assembly tool case (valves) (7).  Valve assembly tools case	*111589256100
4	Remove valve disk (upper) (8) and valve disk (lower) (11)	 Press valve spring (9) together with assembly tool (valves) (7), remove split valve spring retainer locks (10)  Check valve disk (top) (8) and valve disk (bottom) (11) for formation of burrs, replace if necessary.  The valve springs (9) of the inlet valves and exhaust valves are identical.  Magnetic pin  Magnetic finger	*210589004000 *116589066300
5	Use pliers (15) to remove valve stem seals (12)	 Installation: Fit protective sleeve for valve stem seal (13) onto valve stem. Oil valve stem seal (12) and press on with drift (16). The protective sleeve for the valve stem seal (13) must be removed from the valve stem after pressing on the valve stem seal (12).  Pliers  Drift	*606589003700 *119589004300
6	Remove cylinder head (1) from assembly board (2)		
 Danger!	Risk of explosion and poisoning caused by the melting down or improper handling of sodium-filled valves. Risk of injury caused by skin contact with sodium resulting in heat or chemical burns. Remove valve (14)	Do not open sodium-filled valves. Wear protective gloves and safety glasses when handling damaged valves.  Installation: Check surface of valve stems for roughness and formation of ridging (visual inspection or with a nail). Replace valves (14) with a rough stem surface or formation of burrs. Grind new or reused valves (14) with valve grinding compound before installation. Exhaust valves with sodium filling	AS05.30-Z-0001-01A
7			
	Disposal of sodium-filled valves		OS05.30-P-0001-01A
	Checking		
8	Check valves (14)	 Intake and exhaust valves must not be machined.  If the specified tolerances are below the required limit, the valve (14) must be replaced to ensure functioning. Valve disk Ø Valve disk height Valve seat angle (α) Valve stem Ø Valve length	AR05.30-P-4201-01AV *BE05.30-P-1001-01E *BE05.30-P-1002-01E *BE05.30-P-1003-01E *BE05.30-P-1004-01E *BE05.30-P-1005-01E
9	Inspect valve guides, replace if necessary		AR05.30-P-3731AV
10	Install in the reverse order		

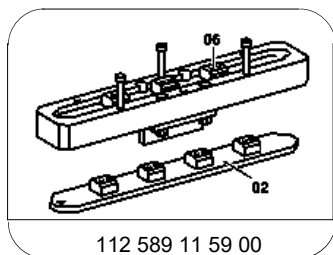
Check values for valves

Number	Designation	Engine 113.940/941/ 942/943/944	Engine 113.960/ 961/962/963/ 965/967/968/ 980/981/982/ 984/987/988/ 990/991/992/ 993/995

BE05.30-P-1001-01E	Valve disk Ø	Exhaust	mm	41 ± 0.1	43 ± 0.1
		Intake	mm	36 ± 0.1	38 ± 0.1
BE05.30-P-1002-01E	Valve disk height	Exhaust when new	mm	1.6	1.6
		Intake when new	mm	1.2	1.2
BE05.30-P-1003-01E	Valve seat angle (α)	Exhaust	∠°	45 ± 15'	45 ± 15'
		Intake	∠°	45 ± 15'	45 ± 15'
BE05.30-P-1004-01E	Valve stem Ø	Exhaust	mm	6.970	6.970
		Intake	mm	6.975	6.975
BE05.30-P-1005-01E	Valve length	Exhaust	mm	122.25 ± 0.2	121.80 ± 0.2
		Intake	mm	119.40 ± 0.2	119.10 ± 0.2

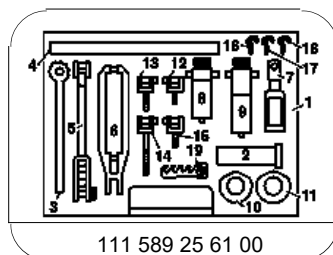
Check values for valves

Number	Designation			Engine 112.910/911	Engine 112.912/913/ 914/915/920/ 921/922/923/ 940/941/942/ 943/944/945/ 946/947/948/ 949/960
BE05.30-P-1001-01E	Valve disk Ø	Exhaust	mm	34 ± 0.1	41 ± 0.1
		Intake	mm	30 ± 0.1	36 ± 0.1
BE05.30-P-1002-01E	Valve disk height	Exhaust when new	mm	1.6	1.6
		Intake when new	mm	1.2	1.2
BE05.30-P-1003-01E	Valve seat angle (α)	Exhaust	∠°	45 (+15')	45 (+15')
		Intake	∠°	45 (+15')	45 (+15')
BE05.30-P-1004-01E	Valve stem Ø	Exhaust	mm	6.970	6.970
		Intake	mm	6.975	6.975
BE05.30-P-1005-01E	Valve length	Exhaust	mm	121.65 ± 0.2	122.25 ± 0.2
		Intake	mm	120.70 ± 0.2	119.40 ± 0.2



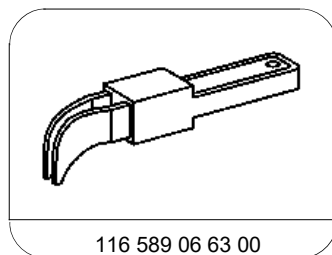
112 589 11 59 00

Assembly board



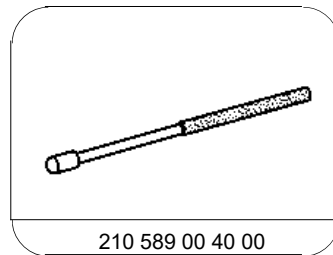
111 589 25 61 00

Case for valve installation tools



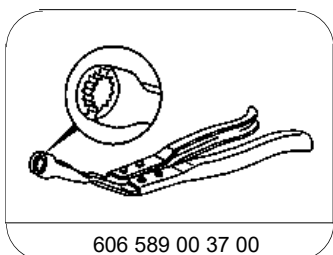
116 589 06 63 00

Magnetic finger



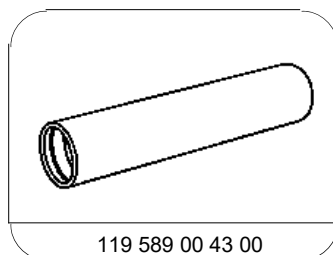
210 589 00 40 00

Magnetic pin



606 589 00 37 00

Pliers



119 589 00 43 00

Drift