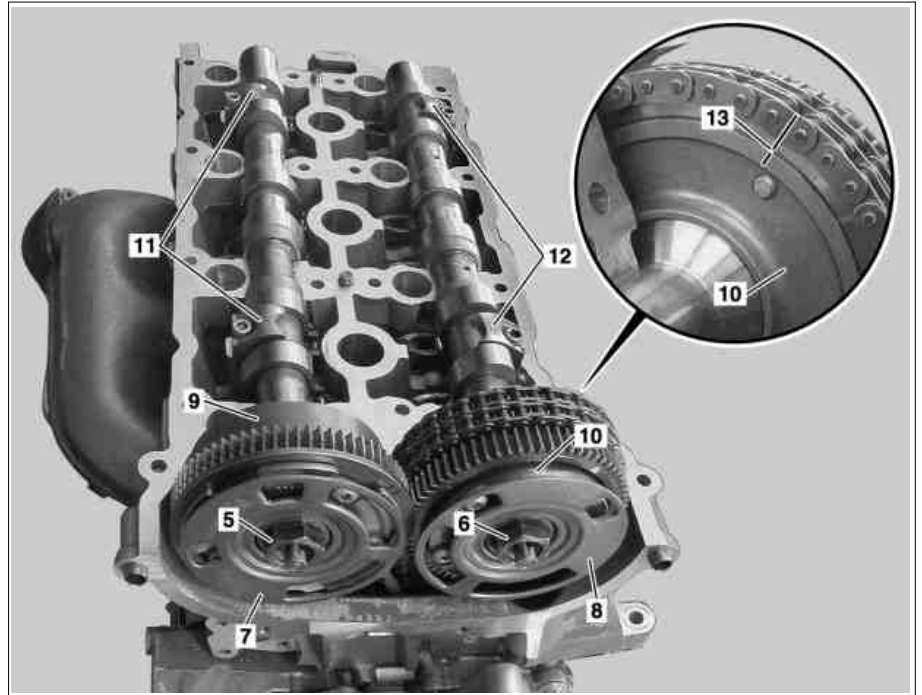


- ENGINE 272.920 in MODEL 203.052 /252 /752
- ENGINE 272.940 in MODEL 203.054 /254, 209.354 /454
- ENGINE 272.960 in MODEL 203.056 /256 /756, 209.356 /456
- ENGINE 272.970 in MODEL 203.087 /287
- ENGINE 272.941 in MODEL 203.092 /292
- ENGINE 273 in MODEL 209

Shown on right cylinder head

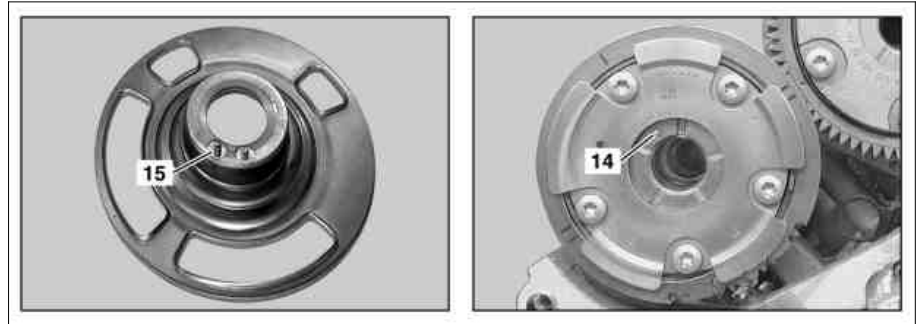
- 5 Center valve of exhaust camshaft
- 6 Center valve of intake camshaft
- 7 Pulse wheel of exhaust camshaft
- 8 Pulse wheel for intake camshaft
- 9 Camshaft adjuster of exhaust camshaft
- 10 Camshaft adjuster for intake camshaft
- 11 Auxiliary bearing cap of exhaust camshaft
- 12 Auxiliary bearing cap of intake camshaft
- 13 Color coding



P05.20-2165-06

Shown on camshaft adjuster of exhaust camshaft

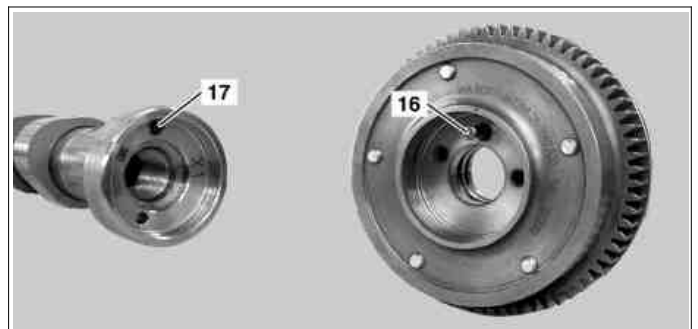
- 14 Bore in camshaft adjuster
- 15 Dowel pin in pulse wheel



P05.20-2167-04

Shown on camshaft adjuster of exhaust camshaft

- 16 Dowel pin in camshaft adjuster
- 17 Bore in camshaft









P05.20-2166-10

Modification notes

14.9.07	Use the Torx screwdriver bit T60 to counterhold camshafts, added		AR05.20-P-7201-06VA
26.11.07	Installation note on install new chain tensioner, added	Step 13	

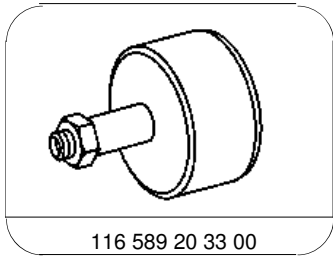
	Remove/install	
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<p>⚠ Danger!</p> <p>1</p>	<p>Risk of injury caused by fingers being pinched or crushed when removing, installing or aligning hoods, doors, trunk lids, liftgates or sliding roof</p> <p>Open engine hood and raise to vertical position</p>	<p>Keep body parts and limbs well clear of moving parts.</p> <p>Model 203</p> <p>Model 209</p>	<p>AS00.00-Z-0011-01A</p> <p>AR88.40-P-1000P</p> <p>AR88.40-P-1000Q</p>
<p>2</p>	<p>Remove air filter housing</p>		<p>AR09.10-P-1150QB</p>
<p>3</p>	<p>Remove front covers from cylinder heads</p>	<p>Front cover on the right</p> <p>Front cover on the left</p>	<p>AR01.30-P-5700QB</p> <p>AR01.30-P-5700QC</p>
<p>4</p>	<p>Remove centrifuge</p>		<p>AR01.20-P-2100QB</p>
<p>5</p>	<p>Turn engine at crankshaft in direction of engine rotation to 40° after ignition TDC and check position of camshafts</p>		<p>AR05.20-P-6010-01VB</p>
<p>6</p>	<p>Lock the gear backlash compensation of the camshaft adjuster (9) at the exhaust camshaft</p>	<p>⚠ The tooth flanks are held against each other by spring pressure and should not be skewed, otherwise the exhaust camshaft camshaft adjuster (9) will be irreparably damaged</p>	<p>AR05.20-P-7201-05VA</p>
<p>7</p>	<p>Loosen exhaust camshaft center valve (5) and intake camshaft center valve (6)</p>	<p>i Observe loosening direction. Counterhold the camshafts at the rear while loosening the center valves. Do not unscrew center valves (5, 6).</p> <p>Nm</p> <p>⚙</p>	<p>AR05.20-P-7201-06VA</p> <p>*BA05.20-P-1009-02A</p> <p>*272589001000</p>
<p>8</p>	<p>Remove cylinder head covers</p>	<p>Left cylinder head cover</p> <p>Right cylinder head cover</p>	<p>AR01.20-P-5014QB</p> <p>AR01.20-P-5014QC</p>
<p>9</p>	<p>Remove the center valve (5) of the exhaust camshaft, and remove the exhaust camshaft pulse wheel (7)</p>	<p>⚠ Check exhaust camshaft (7) pulse wheel for a sheared off pulse wheel (15) dowel pin or pin. Remove the sheared pin or the pulse wheel dowel pin (15) from the exhaust camshaft camshaft adjuster (9).</p> <p>⚠ Installation: Always replace exhaust camshaft pulse wheel (7). When tightening the exhaust camshaft center valve (5), there is a risk of shearing off the pulse wheel dowel pin (15) and the pin on the exhaust camshaft pulse wheel (7). Before assembling, oil the exhaust camshaft center valve (5) at the contact surface with the exhaust camshaft pulse wheel (7).</p> <p>i Installation: Align the pulse wheel (15) dowel pin on the exhaust camshaft (7) pulse wheel to the fitted hole on the camshaft adjuster (14).</p>	
<p>10</p>	<p>Counterhold the exhaust camshaft at the rear and pull off the exhaust camshaft camshaft adjuster (9) from the exhaust camshafts towards the front</p>	<p>⚙</p> <p>i Installation: The contact surfaces on the camshaft and exhaust camshaft camshaft adjuster (9) must be oiled before assembling the exhaust camshaft camshaft adjuster (9).</p> <p>i Installation: Align camshaft adjuster (16) dowel pin to fitted hole of the camshaft (17) in the exhaust camshaft.</p>	<p>*272589001000</p>
<p>11</p>	<p>Detach the auxiliary bearing cap (11) of the exhaust camshaft, and take out the exhaust camshaft</p>	<p>Nm</p>	<p>*BA05.20-P-1010-02A</p>
<p>12</p>	<p>Identify the timing chain with respect to the camshaft adjuster (10) of the intake camshaft with color coding (13)</p>	<p>i Engine positioned at 40° crankshaft angle after ignition TDC.</p> <p>i Installation: Check the position of the intake camshaft using the color coding (13).</p>	
<p>13</p>	<p>Remove chain tensioner</p>	<p>M24×1.5</p> <p>M22×1.5</p> <p>i In case of engine 272, both chain tensioners can be removed whereby for engine 273 only chain tensioner with thread M22×1.5 is installed.</p>	<p>AR05.10-P-7800QB</p> <p>AR05.10-P-7800QC</p>

		<p>i Installation: Install new chain tensioner with thread of M22 ×1.5. The previously installed chain tensioner must not be reinstalled because during removal, its pressure pin is pressed into the end position. The pressure pin latch prevents this return stroke. This would overstretch the timing chain on reinstalling.</p>	
14	Remove tensioning rail bolt	<p>i Installation: Apply sealant to tensioning rail bolts.</p> <p></p> <p></p> <p>Loctite sealant 5970</p>	<p>AR01.30-P-5800-04V</p> <p>*116589013400</p> <p>*116589203300</p> <p>*BR00.45-Z-1013-01A</p>
15	Pull tensioning rail upward and out of engine		
16	Remove the center valve (6) of the intake camshaft and remove the intake camshaft pulse wheel (8)	<p> Check at the intake camshaft pulse wheel (8) whether the pulse wheel dowel pin (15) or the pin has been sheared off. Remove the sheared pin or pulse wheel dowel pin (15) from the intake camshaft camshaft camshaft adjuster (10).</p> <p> Installation: Always replace intake camshaft pulse wheel (8). When tightening the intake camshaft center valve (6), there is a risk of shearing off the pulse wheel dowel pin (15) or the pin on the intake camshaft pulse wheel (8). Before assembling, oil the intake camshaft center valve (6) at the contact surface with the intake camshaft pulse wheel (8).</p> <p>i Installation: Align the pulse wheel (15) dowel pin on the intake camshaft (8) pulse wheel to the fitted hole on the camshaft adjuster (14).</p>	
17	Pull out the intake camshaft camshaft adjuster (10) towards the front	<p>i Installation: The contact surfaces on the camshaft and intake camshaft camshaft adjuster (10) must be oiled before assembling the intake camshaft camshaft adjuster (10).</p> <p>i Installation: Align the intake camshaft camshaft adjuster (10) with the color coding marking (13) made on the timing chain and intake camshaft camshaft adjuster (10). Align the camshaft adjuster fitted pin (16) in the intake camshaft camshaft adjuster (10) to the fitted hole for the camshaft (17) in the intake camshaft.</p>	
18	Remove intake camshaft (12) auxiliary bearing cap and intake camshaft		*BA05.20-P-1010-02A
19	Install in the reverse order		
 Danger!	<p>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</p> <p>Conduct engine test run and check engine for leaks</p>	<p>Secure vehicle to prevent it from moving by itself.</p> <p>Wear closed and snug-fitting work clothes.</p> <p>Do not touch hot or rotating parts.</p>	AS00.00-Z-0005-01A
20			

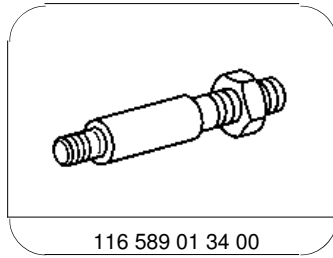
 **Camshaft, camshaft adjustment**

Number	Designation		Engine	Engine
			272	273
BA05.20-P-1009-02A	Center valve for pulse wheel/ camshaft adjuster to camshaft	Nm	145	145
BA05.20-P-1010-02A	Bolt, auxiliary bearing cap to cylinder head	Nm	8	8



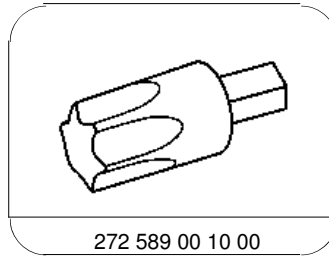
116 589 20 33 00

Impact extractor



116 589 01 34 00

Threaded stud



272 589 00 10 00

Torx screwdriver bit T60

Repair materials

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