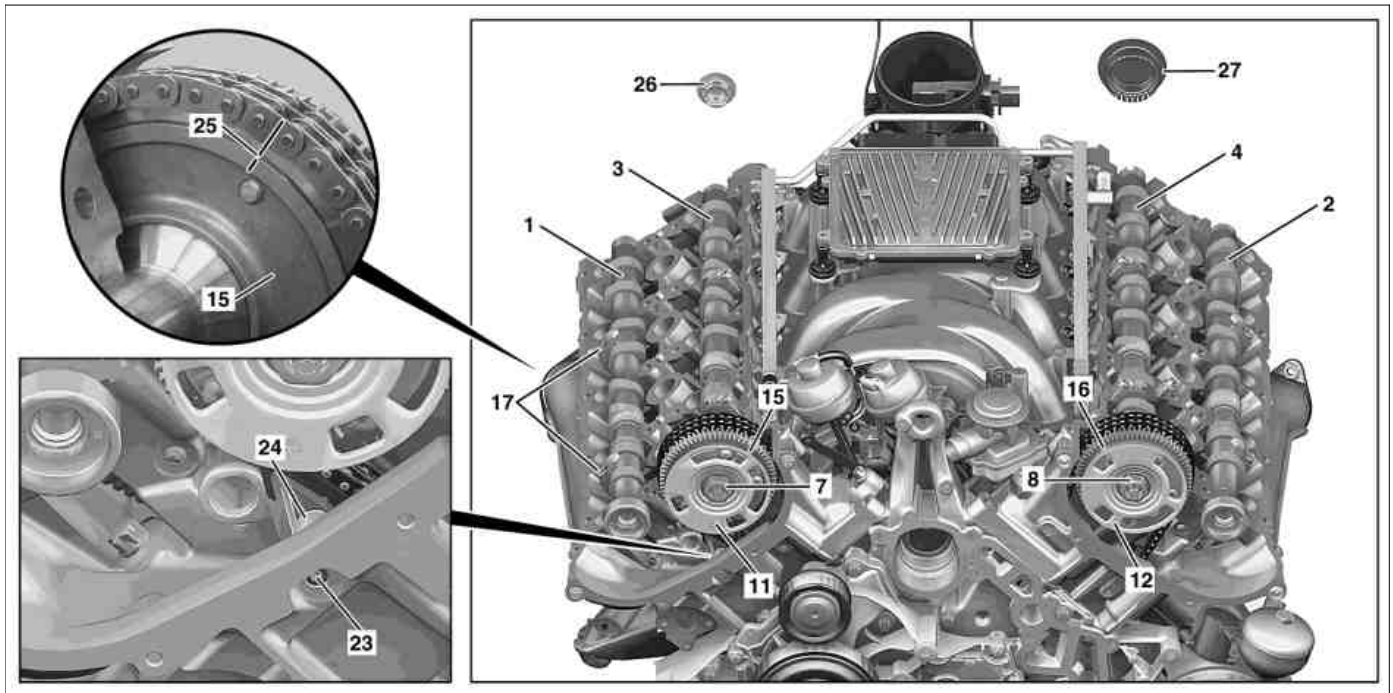


ENGINE 272 in MODEL 203, 209

Camshaft adjuster for intake camshafts

ENGINE 273 in MODEL 209

Camshaft adjuster for intake camshafts

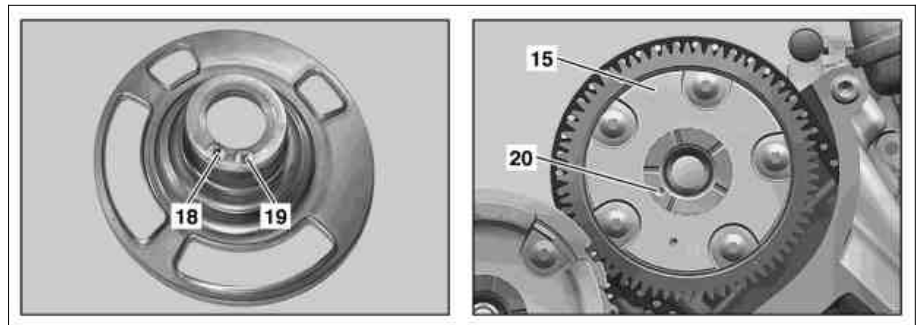


P05.20-2246-09

- 1, 2 Exhaust camshaft
- 3, 4 Intake camshaft
- 7, 8 Center valve of intake camshaft
- 15 Camshaft adjuster for intake camshaft
- 18 Dowel pin
- 19 Pin
- 20 Bore in camshaft adjuster

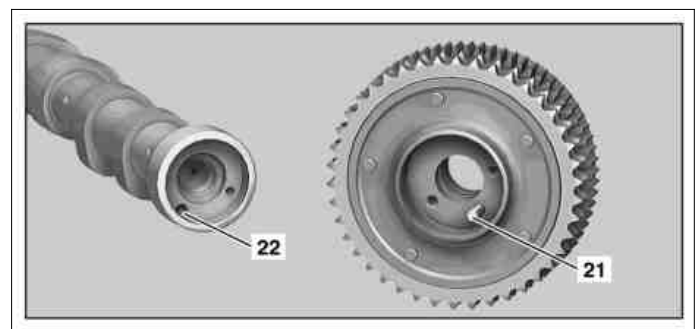
- 11, 12 Pulse wheel for intake camshaft
- 15, 16 Camshaft adjuster for intake camshaft

- 24 Tensioning rail
- 25 Color coding
- 26, 27 Cap



P05.20-2248-04

- 21 Dowel pin in camshaft adjuster
- 22 Bore in camshaft























P05.20-2249-10

**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 3	

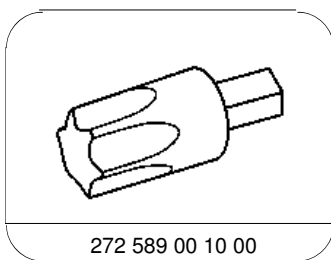
	<b>Remove/install</b>		
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1	Turn key in ignition lock to position "0"		
2	Remove air filter housing		AR09.10-P-1150QB
3	Remove chain tensioner	M24×1.5 M22×1.5  In case of engine 272, both chain tensioners can be removed whereby for engine 273 only chain tensioner with thread M22×1.5 is installed.  <b>Installation: Install new chain tensioner with thread of M22 ×1.5.</b> 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.	AR05.10-P-7800QB AR05.10-P-7800QC
	<b>Right-hand side</b>		
4	Remove camshaft adjuster for right exhaust camshaft (1)		AR05.20-P-7201QB
5	Remove cap (26)		
6	Detach center valve (7)	 <b>Installation:</b> The center valve (7) may only be tightened when chain tensioner is removed, otherwise this can lead to malfunctioning of camshaft adjustment.  Observe loosening direction.  	AR05.20-P-7201-06VA *BA05.20-P-1009-02A *272589001000
7	Remove the right cylinder head cover		AR01.20-P-5014QC
8	Mark timing chain relative to the camshaft adjuster (15) using color codes (25)	 Engine positioned at 40° crankshaft angle after ignition TDC.  <b>Installation:</b> Check position of intake camshaft (3) based on color coding (25).	
9	Remove tensioning rail (24)		AR05.10-P-8127QB
10	Remove center valve (7) and pulse wheel (11)	 Check dowel pin (18) and pin (19). If a dowel pin (18) or pin (19) is sheared off then this must be removed from camshaft adjuster (15).  <b>Installation:</b> Always replace pulse wheel (11). When tightening center valve (7) there is a risk that dowel pin (18) or pin (19) may shear off at pulse wheel (11).  <b>Installation:</b> Lubricate center valve (7) at the contact surface with the pulse wheel (11) before assembly.  <b>Installation:</b> Align dowel pin (18) for pulse wheel (11) with fitted bore (20) in camshaft adjuster (15).	
11	Remove timing chain from camshaft adjuster (15) and detach camshaft adjuster (15) forwards from intake camshaft (3)	 <b>Installation:</b> Lubricate contact surfaces to intake camshaft (3) and camshaft adjuster (15) before mounting camshaft adjuster (15).  <b>Installation:</b> Align color coding (25) on camshaft adjuster (15) and timing chain with each other. Align the dowel pin (21) in the camshaft adjuster (15) with fitted bore (22) in intake camshaft (3).	
	<b>Left-hand side</b>		
12	Remove camshaft adjuster for the left exhaust camshaft (2)		AR05.20-P-7201QB
13	Remove cap (27)		
14	Detach center valve (8)	 <b>Installation:</b> The center valve (8) may only be tightened when chain tensioner is removed, otherwise this can lead to malfunctioning of camshaft adjustment.  Observe loosening direction.  	AR05.20-P-7201-06VA  *BA05.20-P-1009-02A *272589001000
15	Remove left cylinder head cover		AR01.20-P-5014QB
16	Mark timing chain relative to the camshaft adjuster (16) using color codes (25)	 Engine positioned at 40° crankshaft angle after ignition TDC.  <b>Installation:</b> Check position of intake camshaft (4) based on color coding (25).	

17	Remove center valve (8) and pulse wheel (12)	<p>⚠ Check dowel pin (18) and pin (19). If a dowel pin (18) or pin (19) is sheared off then this must be removed from camshaft adjuster (16).</p> <p>⚙ <b>Installation:</b> Always replace pulse wheel (12). When tightening center valve (8) there is a risk that dowel pin (18) or pin (19) may shear off at pulse wheel (12).</p> <p><b>i</b> <b>Installation:</b> Lubricate center valve (8) at the contact surface with the pulse wheel (12) before assembly.</p> <p><b>i</b> <b>Installation:</b> Align dowel pin (18) for pulse wheel (12) with fitted bore (20) in camshaft adjuster (16).</p>	
18	Remove timing chain from camshaft adjuster (16) and detach camshaft adjuster (16) towards the front from intake camshaft (4)	<p><b>i</b> <b>Installation:</b> Lubricate contact surfaces to intake camshaft (4) and camshaft adjuster (16) before the mounting camshaft adjuster (16).</p> <p><b>i</b> <b>Installation:</b> Align color coding (25) on camshaft adjuster (16) and timing chain with each other. Align the dowel pin (21) in the camshaft adjuster (16) with fitted bore (22) in intake camshaft (4).</p>	
19	Install in the reverse order		
	<b>Checking</b>		
20	<p><b>⚠ Danger!</b></p> <p><b>Risk of accident</b> caused by vehicle starting off by itself when engine is running. <b>Risk of injury</b> 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

**Nm Camshaft, camshaft adjustment**

Number	Designation		Engine 272	Engine 273
BA05.20-P-1009-02A	Center valve for pulse wheel/ camshaft adjuster to camshaft	Nm	145	145



272 589 00 10 00

Torx screwdriver bit T60