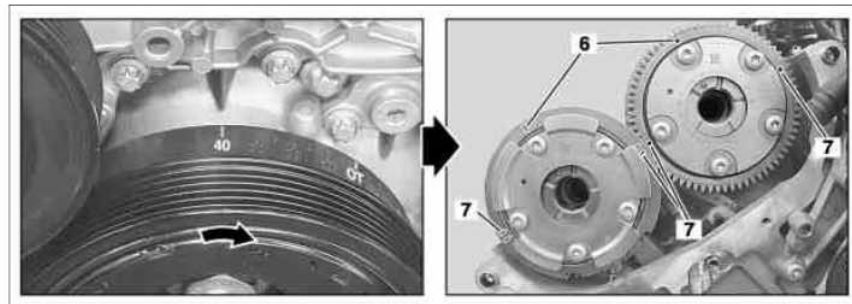



P05.10-2238-09

- 1 Exhaust camshaft
- 2 Intake camshaft
- 3 Old timing chain
- 4 New timing chain
- 5 Pulse wheel markings
- 6 Markings on camshaft adjuster
- 7 Markings on camshaft adjuster



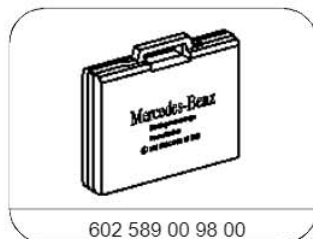
P05.10-2239-04

☒	Removing		
1 ⓘ	Disconnect battery ground cable Notes on battery		AR54.10-P-0003EW AH54.10-P-0001-01A
2 AP	Remove spark plugs Replace spark plugs		AP15.10-P-1580EW
3	Remove exhaust and intake camshafts (1, 2) at right cylinder head		AR05.20-P-6992EW
4	Disconnect old timing chain (3)	☑ ☑ ☑ ☑	AR05.10-P-7601-01VA *602589009800 *602589023300 *602589056300 *602589056301
☒	Install		
5	Draw in new timing chain (4)	☑ ☑	AR05.10-P-7601-04VA *602589009800 *272589036300
6	Rivet new timing chain (4)	☑ ☑ ☑ ☑ ☑	AR05.10-P-7601-02VA *602589009800 *272589003900 *272589006300 *272589016300 *271589016300

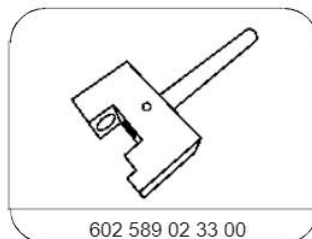
		<b>Nm</b>	*BA05.10-P-1007-01B
7	Crank engine at crankshaft in direction of rotation of engine to a <b>55° crank angle before ignition TDC</b> on first cylinder (305° marking on belt pulley)	See "Check basic position of camshafts with front cover installed at cylinder head at a <b>55° crankshaft angle before ignition TDC</b> ".   <b>i</b> The markings (5) on pulse wheels of intake and exhaust camshaft (1, 2) on the left cylinder head must be located centrally in bores for camshaft Hall sensors. If this is not the case, turn engine at crankshaft in direction of engine rotation through one revolution.	AR05.20-P-6010EW  *001589650900
8	Crank engine at crankshaft in its direction of rotation through a 95° crank angle to a <b>40° crank angle after ignition TDC</b> on first cylinder		
9	Install intake camshaft (1) and exhaust camshaft (2) on right cylinder head in the basic position	<b>i</b> Markings (6) point upwards and markings (7) align with contact surfaces on the cylinder head covers. See "Check basic position of camshafts with front cover removed at the cylinder head at <b>40° crankshaft angle after ignition TDC</b> ".	AR05.20-P-6992EW  AR05.20-P-6010-01VB
10	Crank engine at crankshaft in the direction of rotation of the engine and check that the basic position of the camshafts for an installed front cover on the cylinder head is at a <b>55° crank angle before ignition TDC</b> (305° marking on the belt pulley)	<b>i</b> The markings (5) on pulse wheels of intake and exhaust camshafts (1, 2) must be located centrally in bores for camshaft Hall sensors.	AR05.20-P-6010EW
11	Install spark plugs Replace spark plugs		AP15.10-P-1580EW
12	Connect ground cable to battery		AR54.10-P-0003EW
	<b>⚠ Danger!</b>	<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	AS00.00-Z-0005-01A
13	Carry out an engine test run and check engine for leaks	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	

**Nm** Timing chain, chain tensioner

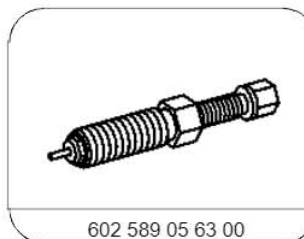
Number	Designation		Engine 272	Engine 273
BA05.10-P-1007-01B	Bolt for timing chain rivet element (reference value)	Nm	32	32



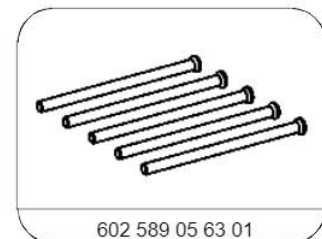
Case



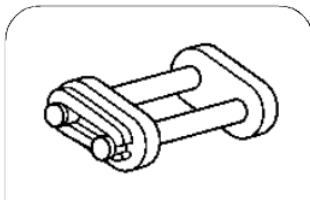
Chain separating tool



Thrust spindle

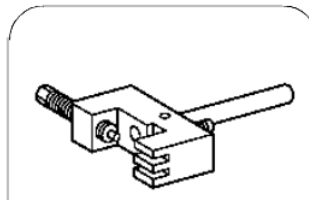


Thrust pins



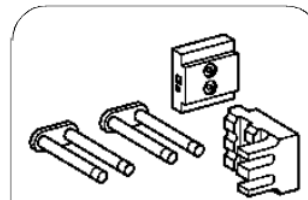
272 589 03 63 00

Assembly link



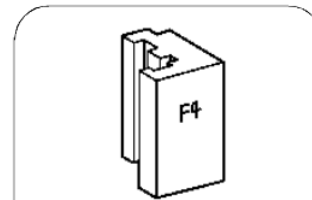
272 589 00 39 00

Riveting tool



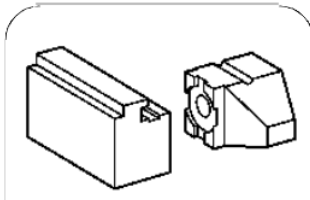
272 589 00 63 00

Assembly inserts



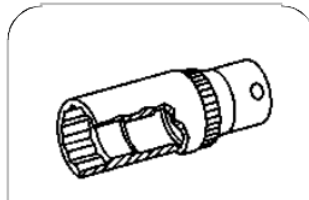
272 589 01 63 00

Guide



271 589 01 63 00

Assembly inserts



001 589 65 09 00

Wrench socket

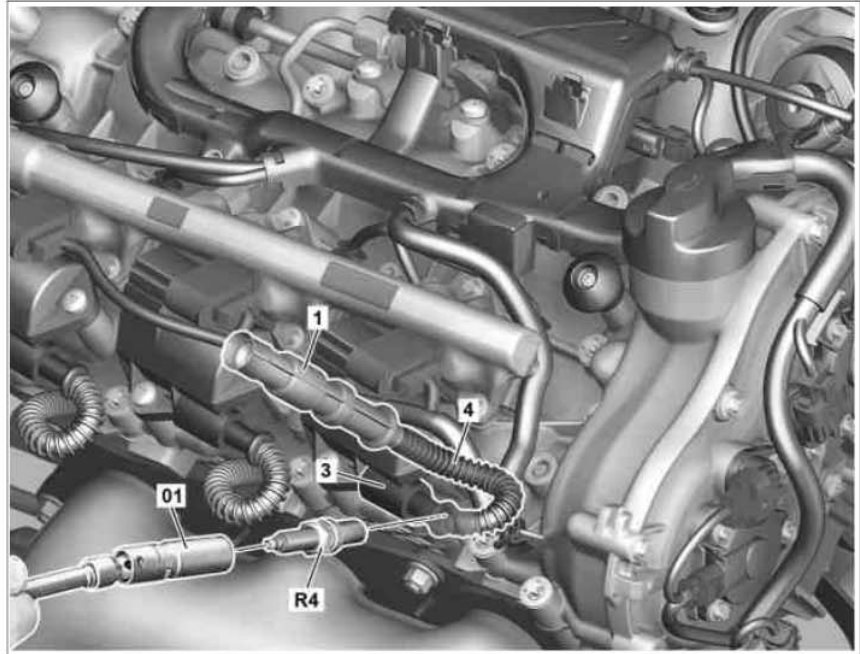
ENGINE 157, 272, 273, 276, 278 in MODEL 212

ENGINE 157, 276, 278 in MODEL 218

ENGINE 272, 273, 276, 278 in MODEL 207




Shown on engine 272.983 in model 212.057

- 01 Spark plug wrench
- 1 Spark plug connector
- 3 Ignition coil connector
- 4 Ignition cable
- R4 Spark plugs



P15.10-2349-06

	<b>Remove/install</b>		
<b>Danger !</b>	<b>Risk of death</b> caused by contact with parts conducting high voltages.	Do not touch parts which conduct high voltages. Persons who have electronic implants (e.g. cardiac pacemakers) should never perform any work on the ignition system.	AS15.10-Z-0001-01A
<b>Danger !</b>	<b>Risk of injury</b> . Skin or eye injuries may result when handling hot or glowing objects.	Wear protective gloves, protective clothing and safety glasses, if necessary.	AS00.00-Z-0002-01A
	Notes on avoiding damage through contamination and foreign objects		AH00.00-P-5000-01A
	Notes on avoiding damage to ignition system		AH15.10-P-0002-01V
1	Switch off ignition		
2	Open engine hood		
3	Remove ignition coils	Model 207 except engine 276, 278 Model 212 except engine 157, 276, 278 ENGINE 276, 278 in MODEL 207 ENGINE 157, 276, 278 in MODEL 212, 218	AR15.12-P-2003CV AR15.12-P-2003EW AR15.12-P-2003FH AR15.12-P-2003EL
4 	Detach spark plug connectors (1) from spark plugs (R4)	ENGINE 272.982/983/984 <b>Installation:</b> Observe correct assembly of spark plug connector and ignition coil connector (1, 3) and correct routing of ignition lines (4). Puller	AR15.12-P-1010-01CDE  *272589013300
	<b>Check</b>		
5	Check spark plug connector (1)	Check for damage, deformation and crack formation, replace if necessary.	
6	Check ignition coil plug (3) and ignition lines (4)	ENGINE 272.982/983/984 Check for damage, deformation and crack formation, replace if necessary.	

7	Remove spark plugs (R4) from the cylinder heads using spark plug wrench (01)	<p><b>Installation:</b> It is essential to adhere to the tightening torque as it influences the position of the spark plug electrodes in the cylinder. An incorrect tightening torque causes misfires which can lead to damage to the engine and catalytic converter damage</p> <p> Spark plug to cylinder head</p> <p> Motor 272, 273 Spark plug wrench</p> <p> Motor 157, 276, 278 Spark plug wrench</p>	<p>*BA15.10-P-1001-01C</p> <p>*112589010900</p> <p>*278589000900</p>
8	Install in the reverse order		

 Spark plugs

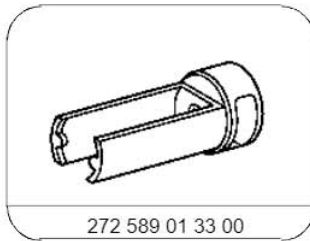
Number	Designation		ENGINE 157	ENGINE 272
BA15.10-P-1001-01C	Spark plug to cylinder head	Nm	23	23

 Spark plugs

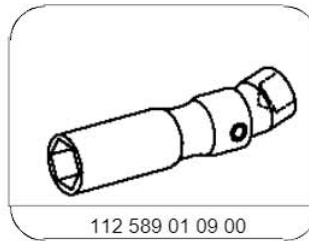
Number	Designation		ENGINE 273	ENGINE 276
BA15.10-P-1001-01C	Spark plug to cylinder head	Nm	23	23

 Spark plugs

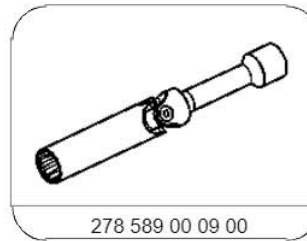
Number	Designation		ENGINE 278
BA15.10-P-1001-01C	Spark plug to cylinder head	Nm	23



Puller

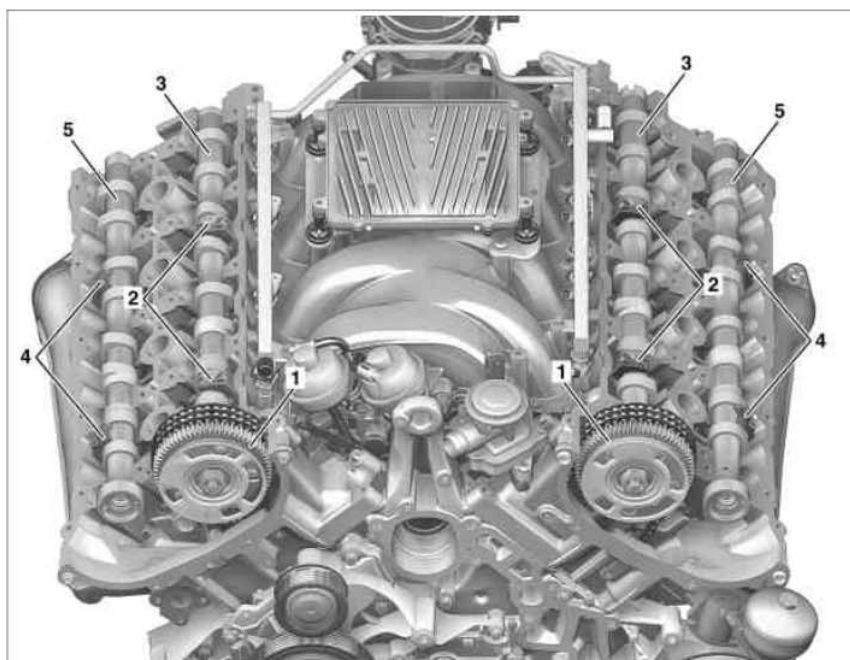


Spark plug wrench






Spark plug wrench

- 1 Camshaft adjuster for intake camshaft
- 2 Auxiliary bearing cap of intake camshaft
- 3 Intake camshaft
- 4 Auxiliary bearing cap of exhaust camshaft
- 5 Exhaust camshaft

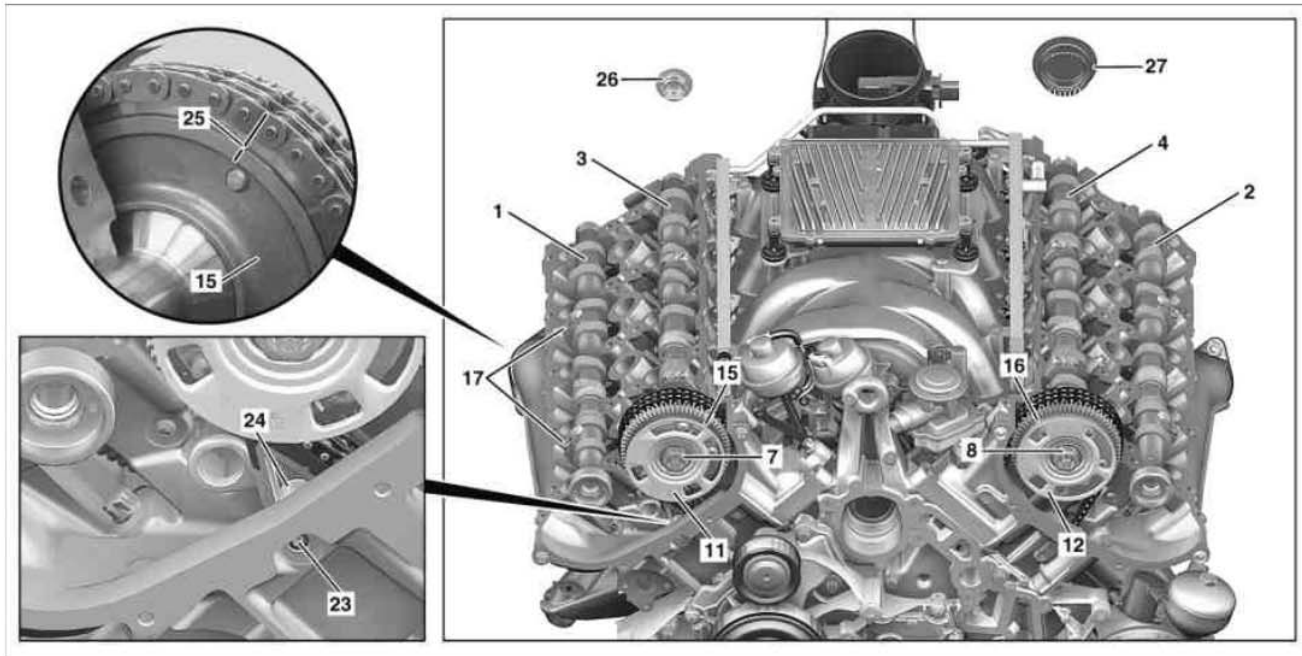


P05.20-2270-06

		<b>Remove/install</b>	
	The ground line on the battery must <b>always</b> be detached before beginning work on the fuel system otherwise pressure will be lost in the fuel system through opening a vehicle door or the trunk lid	Model 212.057	
<b>Remove intake camshafts</b>			
1	Remove respective camshaft adjusters (1)		AR05.20-P-7201EWE
2	Remove auxiliary bearing cap (2) and intake camshaft (3)	Nm	*BA05.20-P-1010-02A
<b>Remove exhaust camshafts</b>			
3	Remove respective camshaft adjusters		AR05.20-P-7201EWA
4	Remove respective cylinder head cover	Right cylinder head cover, except model 212.057 Right cylinder head cover, model 212.057 Left cylinder head cover, except model 212.057 Left cylinder head cover, model 212.057	AR01.20-P-5012EL AR01.20-P-5012ELD AR01.20-P-5013EL AR01.20-P-5013ELD
5	Take off auxiliary bearing cap (4) and remove exhaust camshaft (5)	Nm	*BA05.20-P-1010-02A
6	Install in the reverse order		
 <b>Danger!</b>	<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	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
7	Conduct engine test run and check engine for leaks		

#### Camshaft, camshaft adjustment

Number	Designation	Engine			
		272	273		
BA05.20-P-1010-02A	Bolt, auxiliary bearing cap to cylinder head	Stage 1	Nm	8	8
		Stage 2	∠°	-	-

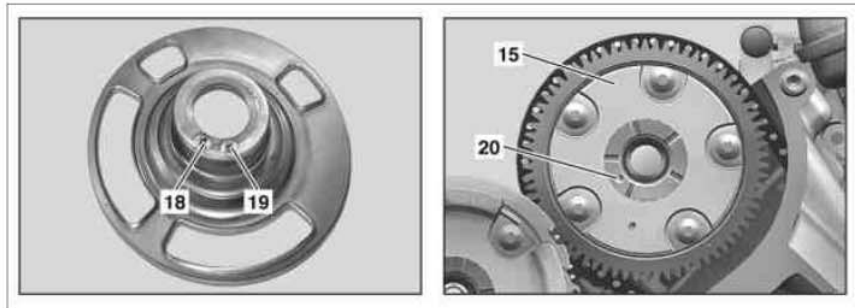


P05.20-2246-09

- 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

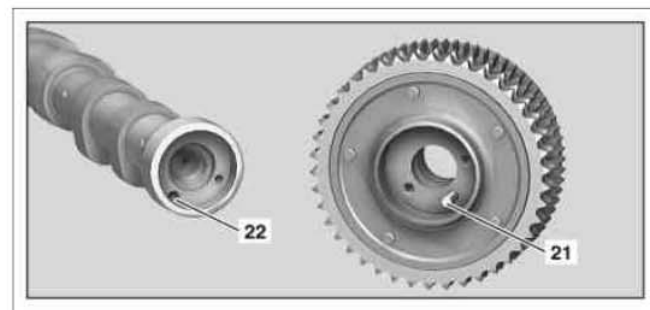
- 11, 12 Pulse wheel for intake camshaft
- 15, 16 Camshaft adjuster for intake camshaft

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



P05.20-2248-04

- 21 Dowel pin in camshaft adjuster
- 22 Fitted bore for intake camshaft






P05.20-2249-10

⊗ ⊗	<b>Remove/install</b>		
i	The ground line on the battery must <b>always</b> be detached before beginning work on the fuel system otherwise pressure will be lost in the fuel system through opening a vehicle door or the trunk lid	Type 212.057	
1	Remove air filter housing		AR09.10-P-1150EWS

2	Remove chain tensioner	<b>i</b> <b>Installation: Install new chain tensioner.</b> The previously installed chain tensioner must not be reinstalled because during removal, its pressure pin is pressed into the end position. The thrust pin latch prevents this return stroke. This would overstretch the timing chain on reinstalling.	AR05.10-P-7800EW
	<b>Removal on right cylinder head</b>		
3	Remove camshaft adjuster for right exhaust camshaft (1)		AR05.20-P-7201EWA
4	Remove cap (26)		
5	Detach center valve (7)	<b>i</b> Observe loosening direction. <b>⚙</b> <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. <b>Nm</b>	AR05.20-P-7201-06VA  *BA05.20-P-1009-02A
6	Remove right cylinder head cover	Except model 212.057 Type 212.057	AR01.20-P-5012EL AR01.20-P-5012ELD
7	Mark timing chain relative to the camshaft adjuster (15) using color codes (25)	<b>i</b> Engine positioned at 40° crankshaft angle after ignition TDC. <b>i</b> <b>Installation:</b> Check position of intake camshaft (3) based on color coding (25).	
8	Remove tensioning rail (24)		AR05.10-P-8127EW
9	Remove center valve (7) and pulse wheel (11)	<b>⚠</b> 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>⚙</b> <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>i</b> <b>Installation:</b> Lubricate center valve (7) at contact surface with pulse wheel (11) before assembly. <b>i</b> <b>Installation:</b> Align dowel pin (18) on pulse wheel (11) with bore (20) in camshaft adjuster (15).	
10	Lift timing chain and pull off camshaft adjuster (15) from intake camshaft (3) towards the front	<b>i</b> <b>Installation:</b> Lubricate contact surfaces to intake camshaft (3) and camshaft adjuster (15) before mounting camshaft adjuster (15). <b>i</b> <b>Installation:</b> Align color coding (25) on camshaft adjuster (15) and timing chain with each other. Align dowel pin (21) in camshaft adjuster (15) with fitted bore (22) in intake camshaft (3).	
	<b>Removal on left cylinder head</b>		
11	Remove camshaft adjuster for exhaust camshaft (2)		AR05.20-P-7201EWA
12	Remove cap (27)		
13	Detach center valve (8)	<b>i</b> Observe loosening direction. <b>⚙</b> <b>Installation:</b> Tightening of center valve (8) may only take place for a removed chain tensioner. Malfunctions of camshaft adjustment can occur otherwise. <b>Nm</b>	AR05.20-P-7201-06VA  *BA05.20-P-1009-02A
14	Remove cylinder head cover	Except model 212.057 Type 212.057	AR01.20-P-5013EL AR01.20-P-5013ELD
15	Mark timing chain relative to camshaft adjuster (16) using color codes (25)	<b>i</b> Engine positioned at 40° crankshaft angle after ignition TDC. <b>i</b> <b>Installation:</b> Check position of intake camshaft (4) based on color coding (25).	
16	Remove center valve (8) and pulse wheel (12)	<b>⚠</b> 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). <b>⚙</b> <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). <b>i</b> <b>Installation:</b> Lubricate center valve (8) at contact surface with pulse wheel (12) before assembly.	



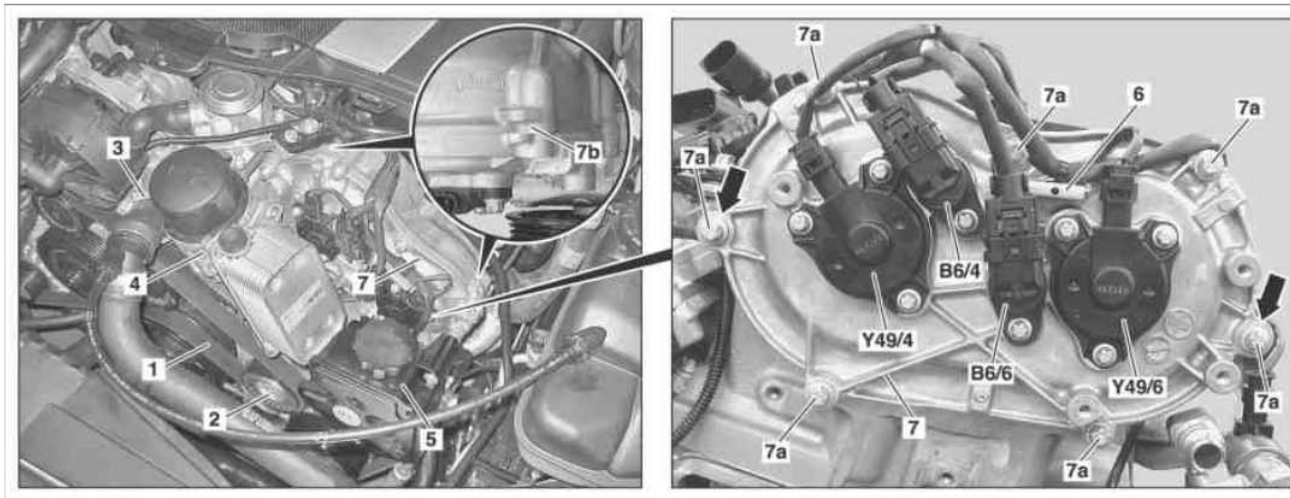
		<b>i</b> <b>Installation:</b> Align dowel pin (18) for pulse wheel (12) with fitted bore (20) in camshaft adjuster (16).	
17	Lift timing chain and detach camshaft adjuster (16) forwards from the intake camshaft (4)	<b>i</b> <b>Installation:</b> Lubricate contact surfaces to intake camshaft (4) and camshaft adjuster (16) before the mounting camshaft adjuster (16). <b>i</b> <b>Installation:</b> Align color coding (25) on camshaft adjuster (16) and timing chain with each other. Align dowel pin (21) in camshaft adjuster (16) with fitted bore (22) in intake camshaft (4).	
18	Install in the reverse order		
	<b>Checking</b>		
 <b>Danger!</b>	<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 Conduct engine test run and check engine for leaks	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
19			

 **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

ENGINES 272, 273 in MODEL 212





Front cover at left cylinder head



P01.30-2237-08

1	Poly-V-belt	7	Front cover	B6/6	Left exhaust camshaft Hall sensor
2	Poly-V belt tensioning device	7a	Bolts	Y49/4	Left intake camshaft solenoid
3	Coolant thermostat housing	7b	Prying lugs	Y49/6	Left exhaust camshaft solenoid
4	Oil filter housing				
5	Power steering expansion reservoir	B6/4	Left intake camshaft Hall sensor		
6	Clamp				

	Remove/install		
	Information on preventing damage to electronic components due to electrostatic discharge		AH54.00-P-0001-01A
1	Turn key in ignition lock to position "0"		
2	Remove bottom engine compartment paneling		AR61.20-P-1105EW
3	Drain coolant at radiator		AR20.00-P-1142EWS
	Notes on coolant		AH20.00-N-2080-01A
4	Remove left engine intake air duct and front engine cover	See Remove air filter housing.	AR09.10-P-1150EWS
5	Remove poly-V belt (1) and poly-V belt tensioning device (2)		AR13.20-P-0001EWS
6	Remove coolant thermostat housing (3)		AR20.10-P-2460EW
7	Remove oil filter housing (4)		AR18.20-P-3471EW
8	Remove expansion reservoir (5)		AR46.25-P-1000EWL
9	Disconnect electrical connectors on left intake camshaft Hall sensor (B6/4) and left exhaust camshaft Hall sensor (B6/6)		
10	Disconnect electrical connectors on left intake camshaft solenoid (Y49/4) and left exhaust camshaft solenoid (Y49/6)		
11	Detach clamp (6)		
12	Remove bolts (7a) from front cover (7)		*BA01.30-P-1006-010
13	Carefully loosen front cover (7) on lifting lugs (7b) and detach from the front	Pay attention to fitted sleeves in area of outer threaded connections (arrows). <b>Installation:</b> Apply sealant to the front cover (7). Loctite sealant 5970	AH01.30-P-1000-02V *112589002500 *BR00.45-Z-1013-01A
	Notes on sealant path for front cover to cylinder head		
	<b>Clean</b>		
14	Clean sealing surfaces on cylinder head, on cylinder head cover and on front cover (7)	Do not use any sharp-edged tools or abrasive paper as this will damage the sealing surfaces. Loctite 7200 Cleaning spray, Loctite 7063 (150ml)	AR01.00-P-0050-01A *BR00.45-Z-1038-04A *BR00.45-Z-1046-04A

15	Detach left intake camshaft Hall sensor (B6/4) and left exhaust camshaft Hall sensor (B6/6) from front cover (7)	When replacing the front cover (7)	
			*BA15.10-P-1002-03E
16	Detach left intake camshaft solenoid (Y49/4) and left exhaust camshaft solenoid (Y49/6) from front cover (7)	When replacing the front cover (7)	
			*BA15.10-P-1003-03E
17	Install in the reverse order		
	<b>Checking</b>		
 <b>Danger!</b>	<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	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
18	Conduct engine test run and check engine for leaks		

#### Cylinder head

Number	Designation		Engine 272	Engine 273
BA01.30-P-1006-010	Bolt, front cover to cylinder head	M6	Nm 9	9

#### Position sensor

Number	Designation		Engine 272	Engine 273
BA15.10-P-1002-03E	Bolt, camshaft Hall sensor to front cover on cylinder head	Nm	8	8
BA15.10-P-1003-03E	Bolt, camshaft solenoid to front cover to cylinder head	Nm	8	8



112 589 00 25 00

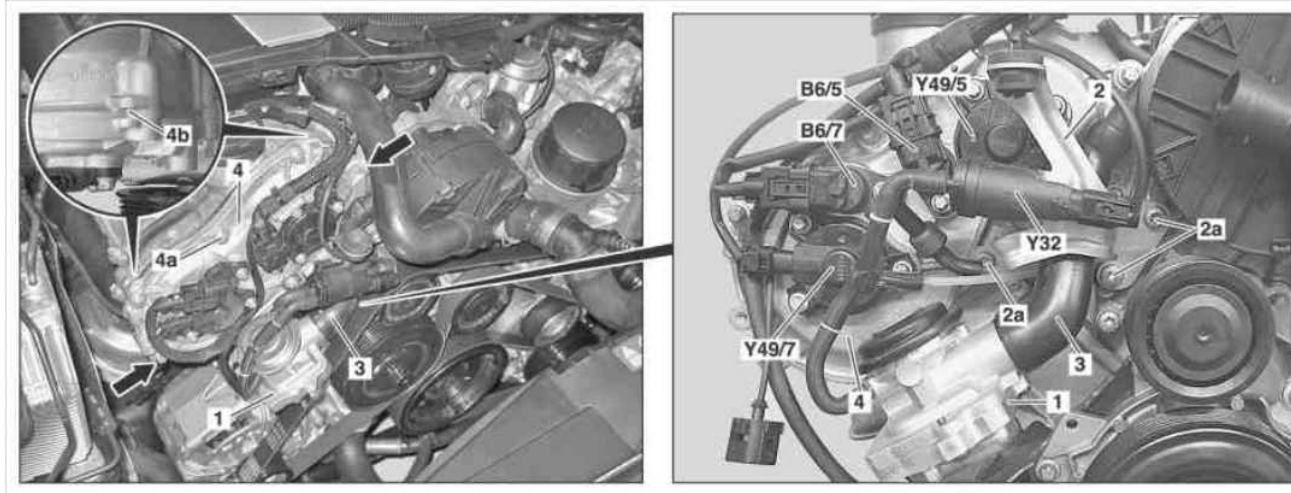
Squeeze gun

#### Repair materials

Number	Designation	Order number
BR00.45-Z-1013-01A	Loctite sealant 5970	A 003 989 98 20
BR00.45-Z-1038-04A	Loctite 7200	Henkel Loctite Deutschland GmbH Arabellastrasse 17 81925 München Germany Tel. +49 899268-0 Fax + 49 899101978 www.Loctite.de
BR00.45-Z-1046-04A	Cleaning spray, Loctite 7063 (150ml)	A 001 986 71 71 10

ENGINES 272, 273 in MODEL 212

Front cover at right cylinder head



P01.30-2238-08

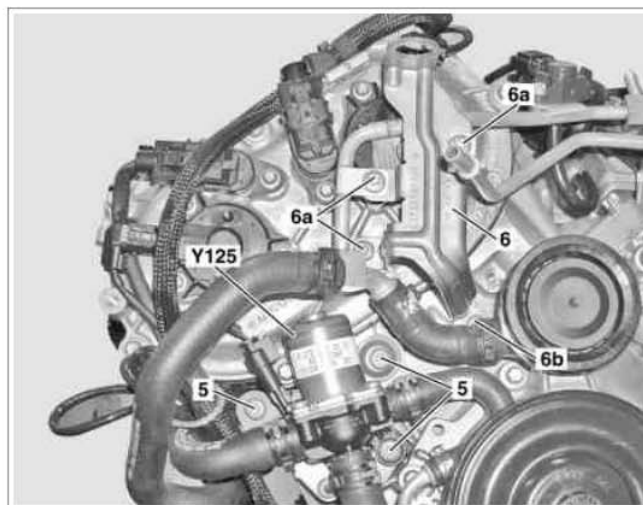
- 1 Air shutoff valve
- 2 Bracket
- 2a Bolts
- 3 Hose
- 4 Front cover
- 4a Screw

- 4b Prying lugs
- B6/5 Right intake camshaft Hall sensor
- B6/7 Right exhaust camshaft Hall sensor

- Y32 Air pump switchover valve
- Y49/5 Right intake camshaft solenoid
- Y49/7 Right exhaust camshaft solenoid

- 5 Bolts
- 6 Bracket
- 6a Bolts
- 6b Screw

Y125 Low-temperature circuit shutoff valve



P01.30-2319-11

	<b>Remove/install</b>		
	Information on preventing damage to electronic components due to electrostatic discharge		AH54.00-P-0001-01A
1	Turn key in ignition lock to position "0"		
2	Remove bottom engine compartment paneling		AR61.20-P-1105EW
3	Remove front engine cover	Pull the front engine cover upward and out of the mountings.	
4	Remove right engine intake air duct	See "Remove air filter housing".	AR09.10-P-1150EWS AR14.30-P-7200EW
5	Remove air shutoff valve (1) at the right cylinder head	Except model 212.057	
6	Remove bolts (2a) and set bracket (2) for front engine cover with air pump switchover valve (Y32) to one side	Except model 212.057 Do not detach lines at the air pump switchover valve (Y32). 	*BA01.30-P-1009-010
7	Remove hose (3)	Except model 212.057	

8	Remove bolts (5) and place low-temperature circuit shutoff valve (Y125) to one side with lines connected	Model 212.057 	*BA01.30-P-1019-01O
9	Remove bolts (6a), loosen bolt (6b) and swivel holder to the side	Model 212.057 	*BA01.30-P-1018-01O
10	Disconnect electrical connectors on right intake camshaft solenoid (Y49/5) and right exhaust camshaft solenoid (Y49/7)		
11	Disconnect electrical connectors on right intake camshaft Hall sensor (B6/5) and right exhaust camshaft Hall sensor (B6/7)		
12	Remove bolts (4a, 7 pieces) from front cover (4)	<b>Installation:</b> Check seating of the seal for the oil dipstick guide tube in the oil pan to avoid oil leakage.  	*BA01.30-P-1006-01O *BA01.45-P-1006-01M
13	Carefully loosen front cover (4) on lifting lugs (4b) and detach from the front  Notes on sealant path for front cover to cylinder head	Pay attention to fitted sleeves in area of outer threaded connections (arrows). <b>Installation:</b> Apply sealant to front cover (4).  Loctite sealant 5970	AH01.30-P-1000-02V *112589002500 *BR00.45-Z-1013-01A
	<b>Clean</b>		
14	Clean sealing surfaces on front cover (4), on cylinder head cover and on cylinder head	Do not use any sharp-edged tools or abrasive paper as this will damage the sealing surfaces. Loctite 7200 Cleaning spray, Loctite 7063 (150ml)	AR01.00-P-0050-01A *BR00.45-Z-1038-04A *BR00.45-Z-1046-04A
15	Detach right intake camshaft Hall sensor (B6/5) and right exhaust camshaft Hall sensor (B6/7) from front cover (4)	When replacing the front cover (4)  	*BA15.10-P-1002-03E
16	Detach right intake camshaft solenoid (Y49/5) and right exhaust camshaft solenoid (Y49/7) from front cover (4)	When replacing the front cover (4)  	*BA15.10-P-1003-03E
17	Install in the reverse order		
	<b>Checking</b>		
<b>Danger!</b>	<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 Conduct engine test run and check engine for leaks	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
18			

#### Cylinder head

Number	Designation		Engine 272	Engine 273
BA01.30-P-1006-01O	Bolt, front cover to cylinder head	M6	Nm 9	9
BA01.30-P-1009-01O	Bolt, switchover valve bracket to cylinder head	M6	Nm 9	9
BA01.30-P-1018-01O	Bolt, NT circuit coolant line bracket to cylinder head or cylinder head front cover		Nm 9	-
BA01.30-P-1019-01O	Bolt, shutoff valve bracket to cylinder head		Nm 9	-

#### Oil pan

Number	Designation		Engine 272	Engine 273
BA01.45-P-1006-01M	Mounting bolt for oil dipstick guide tube	Nm	9	9

**Nm** Position sensor

Number	Designation		Engine 272	Engine 273
BA15.10-P-1002-03E	Bolt, camshaft Hall sensor to front cover on cylinder head	Nm	8	8
BA15.10-P-1003-03E	Bolt, camshaft solenoid to front cover to cylinder head	Nm	8	8



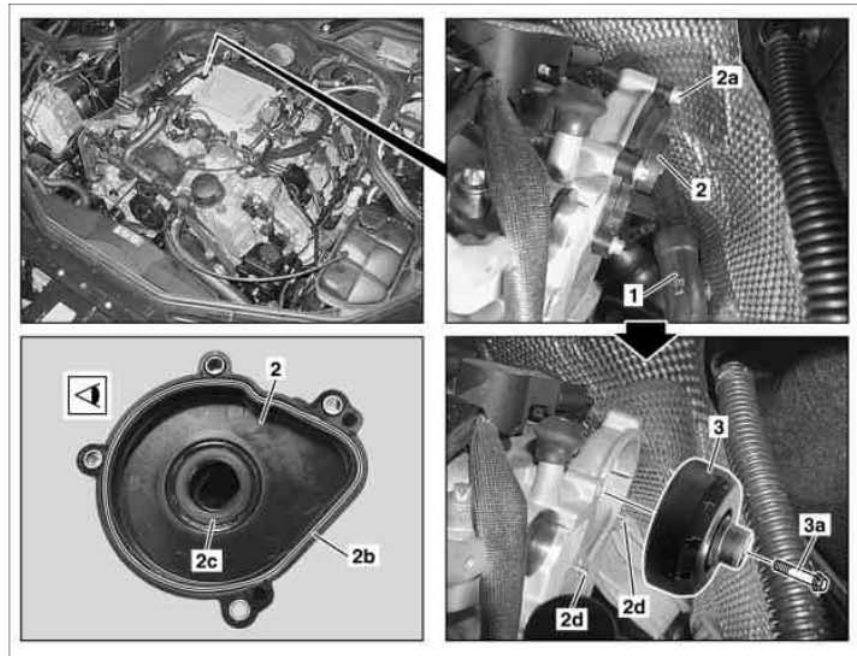
112 589 00 25 00

Squeeze gun

**Repair materials**

Number	Designation	Order number
BR00.45-Z-1013-01A	Loctite sealant 5970	A 003 989 98 20
BR00.45-Z-1038-04A	Loctite 7200	Henkel Loctite Deutschland GmbH Arabellastrasse 17 81925 München Germany Tel. +49 899268-0 Fax + 49 899101978 www.Loctite.de
BR00.45-Z-1046-04A	Cleaning spray, Loctite 7063 (150ml)	A 001 986 71 71 10

- 1 Crankcase ventilation hose
- 2 Centrifuge cover
- 2a Screw
- 2b Gasket
- 2c Radial shaft seal
- 2d Dowel pins
- 3 Centrifuge
- 3a Screw



P01.20-2131-06

	<b>Remove/install</b>		
1	Remove air filter housing		AR09.10-P-1150EWS
2	Detach hose (1) at centrifuge cover (2)		
3	Remove bulkhead between wheel wells	Engine 272.983 <b>Installation:</b> Ensure that rubber strips are seated correctly on bulkhead.	
4	Unscrew bolts (2a, 4 each) and remove centrifuge cover (2)	Intercept engine oil that flows out with an absorbent rag. <b>Installation:</b> Check seal (2b) and radial shaft sealing ring (2c) for wear and damage and replace centrifuge cover (2) if necessary. The fitted pins (2d) determine the installation position of the centrifuge cover (2). 	*BA01.20-P-1001-01L
5	Remove bolt (3a) and remove the centrifuge (3)	Left-hand thread 	*BA01.20-P-1002-01L
6	Install in the reverse order		
	<b>Checking</b>		
<b>Danger!</b>	<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	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
7	Carry out an engine test run and check engine for leaks		
8	Check engine oil level Engine oil and filter change		AP18.00-P-0101EW

## Crankcase ventilation, cylinder head cover

Number	Designation	Engine 272	Engine 273
BA01.20-P-1001-01L	Bolt, centrifuge cover to cylinder head/cylinder head cover	Stage 1 Nm 6	6

		Stage 2	Δ°	90	90
BA01.20-P-1002-01L	Bolt, centrifuge to camshaft sprocket	Stage 1	Nm	6	6
		Stage 2	Δ°	90	90

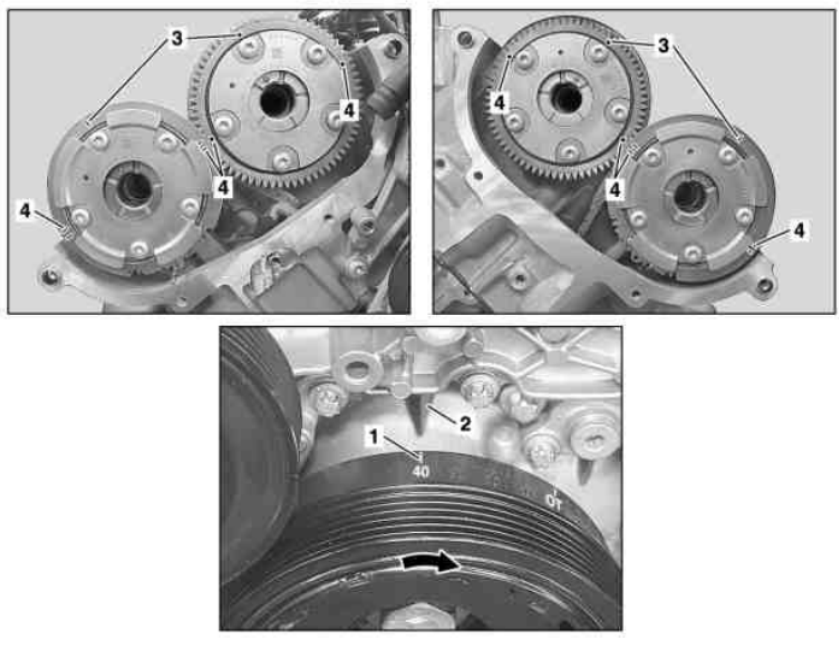


**Shown without pulse wheels on the camshaft adjusters**

- 1 Crank the engine at the crankshaft in  
Turn the direction of engine rotation  
(arrow) to 40° crank angle after ignition  
TDC.

**i** The 40° marking (1) on the belt pulley must be aligned with the positioning edge (2) on the timing case cover.

The markings (3) on the camshaft adjusters face upward, and the markings (4) align with the contact surfaces on the cylinder head covers.



P05.20-2164-06

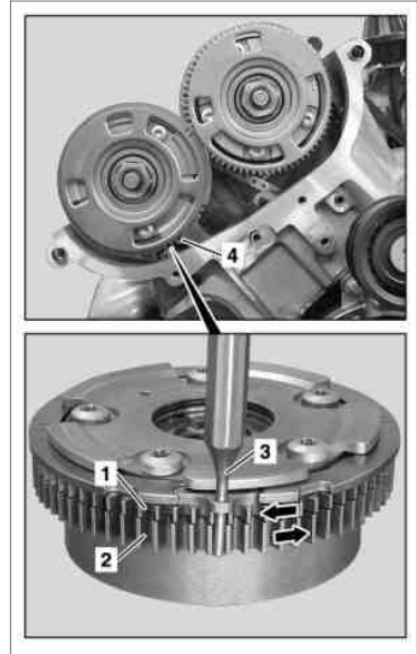
⚠ The tooth flanks (1, 2) are held against each other by spring pressure and should not be skewed, otherwise the camshaft adjuster will be irreparably damaged

1 Insert the drift (3, diameter 3mm) into the bore (4) of the cover plate and lock the tooth flanks (1, 2) with each other.

**i** Push the drift (3) through to the end of tooth flank (2).

To allow the drift (3) to be inserted more easily, align the tooth flanks with each other (in the direction of the arrows).

Shown on camshaft adjuster, engine 273.965



P05.20-2160-03

Shown on camshaft adjuster, engine 272.968



P05.20-2322-01

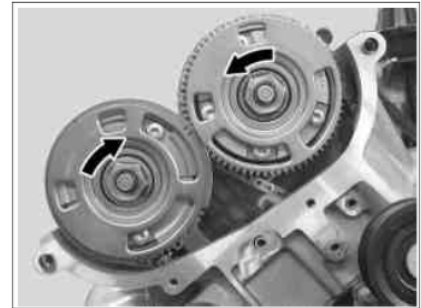
**Nm** Camshaft, camshaft adjustment

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

**i** Counterhold camshafts at the rear with a Torx screwdriver bit using a suitable tool to unfasten and fasten the center valves. Before installing, the center valves must be lubricated with oil on the contact surfaces with the pulse wheels.

**Center valves of right cylinder head**

- 1 Loosen the center valves in the direction of the arrow.
- 2 Tighten the center valves against the direction of the arrow.



P05.20-2161-01

**Center valves of left cylinder head**

- 3 Loosen the center valves in the direction of the arrow.
- 4 Tighten the center valves against the direction of the arrow.



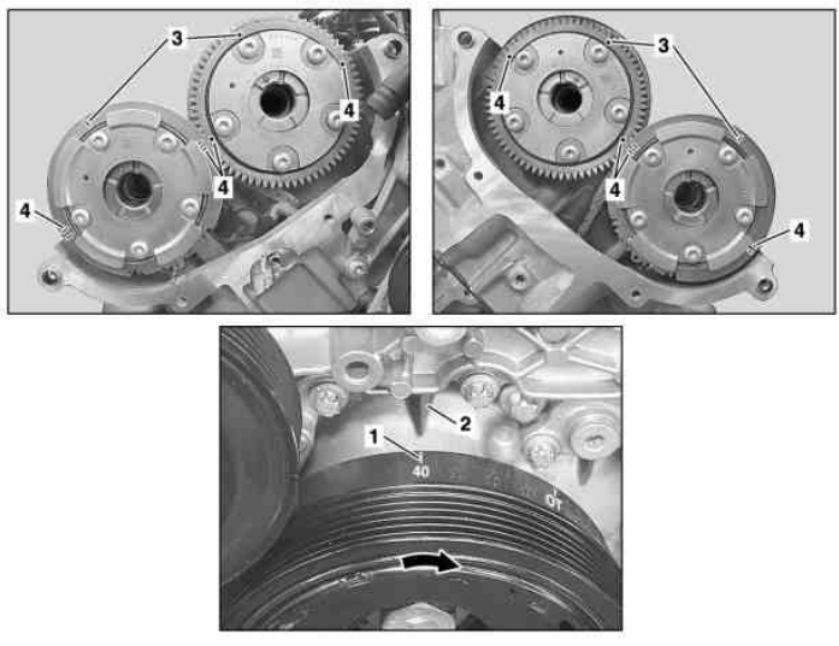
P05.20-2162-01

**Shown without pulse wheels on the camshaft adjusters**

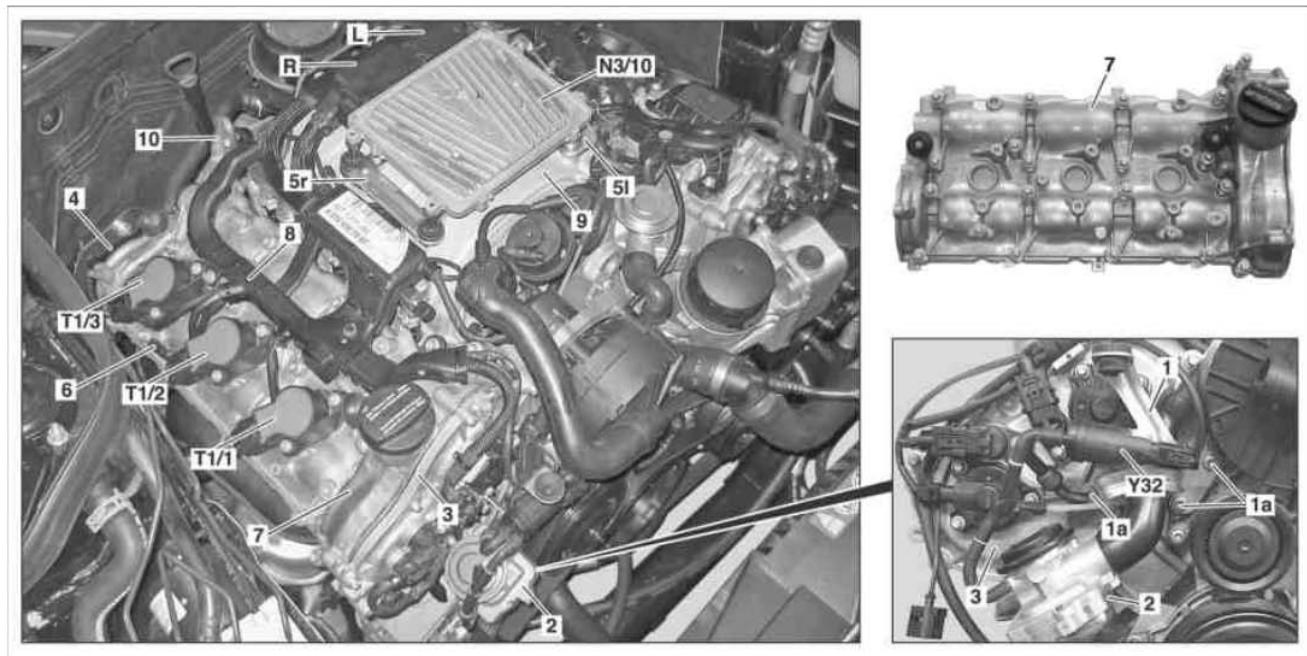
- 1 Crank the engine at the crankshaft in Turn the direction of engine rotation (arrow) to 40° crank angle after ignition TDC.

**i** The 40° marking (1) on the belt pulley must be aligned with the positioning edge (2) on the timing case cover.

The markings (3) on the camshaft adjusters face upward, and the markings (4) align with the contact surfaces on the cylinder head covers.












P05.20-2164-06



P01.20-2127-09

1	Bracket	5r	Right control unit bracket	N3/10	ME-SFI [ME] control unit
1a	Screw	6	Ground cable	Y32	Air pump switchover valve
2	Air shutoff valve	7	Cylinder head cover	L	Left connector
3	Front cover	8	Feed duct	R	Right connector
4	Cover	9	Resonance intake manifold		
5l	Left control unit bracket	10	Engine lifting eye		

		Remove/install		
		Information on preventing damage to electronic components due to electrostatic discharge		AH54.00-P-0001-01A
1		Turn key in ignition lock to position "0"		
2		Remove air filter housing		AR09.10-P-1150EWS
3		Remove bolts (1a) and remove bracket (1) for front engine cover with air pump switchover valve (Y32)	Nm	*BA01.30-P-1009-010
4		Remove right air shutoff valve (2)		AR14.30-P-7200EW
5		Remove front cover (3) on the right cylinder head		AR01.30-P-5700EWR
6		Remove ignition coils at right cylinder head		AR15.12-P-2003EW
7		Remove cover (4) on centrifuge		AR01.20-P-2100EWS
8		Disconnect right connector (R) at ME-SFI [ME] control unit (N3/10)		
9		Detach ME-SFI [ME] control unit (N3/10) from control unit brackets (5l, 5r) and lay to one side		Do <b>not</b> disconnect left connector (L) at ME-SFI [ME] control unit (N3/10).
10		Remove right control unit bracket (5r)	Nm	*BA07.08-P-1002-01A
11		Detach ground line (6) from cylinder head cover (7)	Nm	*BA01.30-P-1010-010
12		Remove feed duct (8) from resonance intake manifold (9), cylinder head cover (7) and rear right engine lifting eye (10) and place to one side	Nm Nm Nm	*BA15.18-P-1001-01B *BA15.18-P-1002-01B *BA15.18-P-1003-01B
13		Loosen bolts for cylinder head cover (7) in reverse order of tightening procedure and remove them	Engine 272 Engine 273 Nm	AR01.20-P-5014-03VA AR01.20-P-5014-03SX *BA01.30-P-1004-010

14	Carefully pry off cylinder head cover (7) from cylinder head	<p> To avoid damaging sealing surfaces, do <b>not</b> pound in the prying tool between the cylinder head cover (7) and the cylinder head.</p> <p> <b>Installation:</b> Apply sealing compound to cylinder head cover (7): Engine 272</p> <p>Engine 273</p> <p> Loctite sealant 5970</p>	<p>AH01.30-P-1000-08V</p> <p>AH01.30-P-1000-08SX</p> <p>*112589002500</p> <p>*BR00.45-Z-1013-01A</p>
 	Notes on sealant path for cylinder head cover		
	<b>Clean</b>		
15	Clean sealing surfaces at cylinder head and at cylinder head cover (7)	<p> Do not use any sharp-edged tools or abrasive paper as this will damage the sealing surfaces.</p> <p>Loctite 7200 Cleaning spray, Loctite 7063 (150ml)</p>	<p>AR01.00-P-0050-01A</p> <p>*BR00.45-Z-1038-04A</p> <p>*BR00.45-Z-1046-04A</p>
16	Install in the reverse order		
	<b>Checking</b>		
 <b>Danger!</b>	<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	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
17	Conduct engine test run and check engine for leaks whilst it is running		

#### Cylinder head

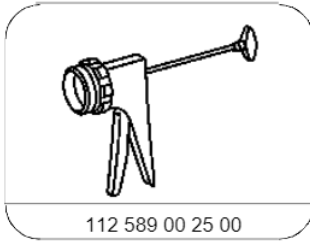
Number	Designation		Engine 272	Engine 273
BA01.30-P-1004-01O	Bolt, cylinder head cover to cylinder head	M7 Stage 1 Nm	12	12
		Stage 2 4°	90	90
BA01.30-P-1009-01O	Bolt, switchover valve bracket to cylinder head	M6 Nm	9	9
BA01.30-P-1010-01O	Bolt, ground line to cylinder head cover	M6 Nm	9	9

#### Control unit

Number	Designation		Engine 272	Engine 273
BA07.08-P-1002-01A	Bolt, control unit bracket to resonance intake manifold	Nm	8	8

#### Engine wiring harness

Number	Designation		Engine 272	Engine 273
BA15.18-P-1001-01B	Bolt, feed duct to resonance intake manifold	Nm	8	8
BA15.18-P-1002-01B	Bolt, feed duct to cylinder head cover	Nm	8	8
BA15.18-P-1003-01B	Bolt, feed duct to engine lifting eye	Nm	8	8

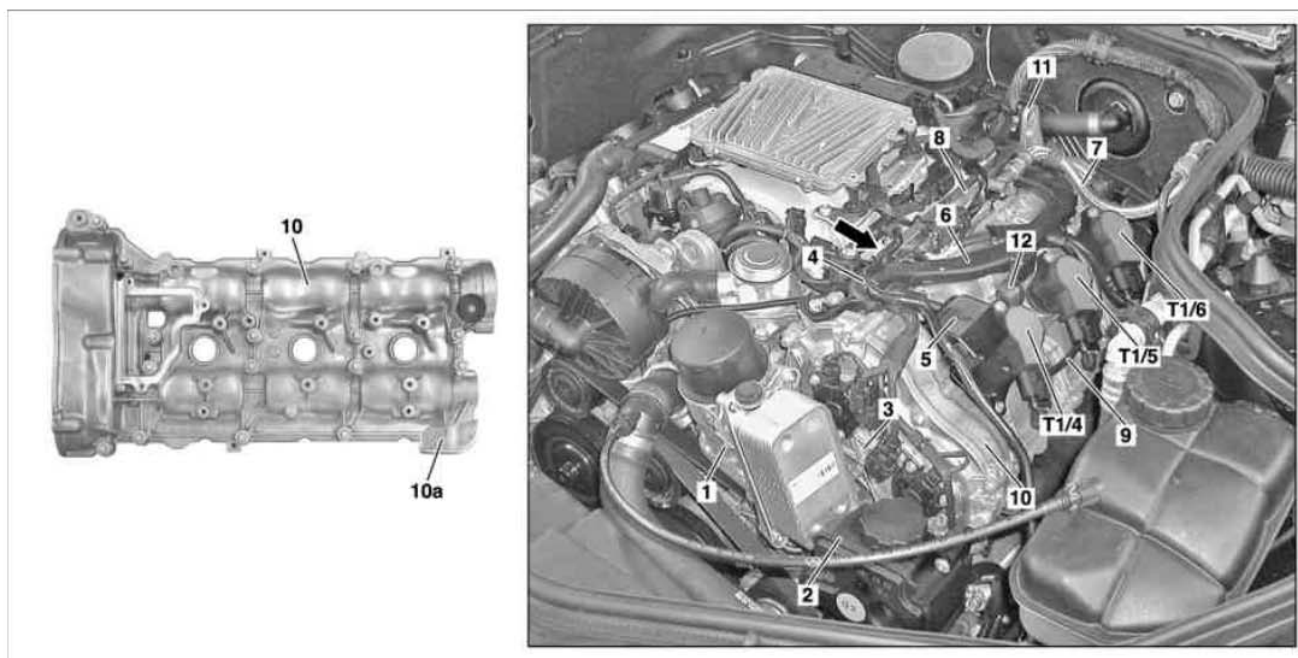


112 589 00 25 00

Squeeze gun

#### Repair materials

Number	Designation	Order number
BR00.45-Z-1013-01A	Loctite sealant 5970	A 003 989 98 20
BR00.45-Z-1038-04A	Loctite 7200	Henkel Loctite Deutschland GmbH Arabellastrasse 17 81925 München Germany Tel. +49 899268-0 Fax + 49 899101978 www.Loctite.de
BR00.45-Z-1046-04A	Cleaning spray, Loctite 7063 (150ml)	A 001 986 71 71 10



P01.20-2126-09

1	Oil filter housing	6	Feed duct	10	Cylinder head cover
2	Power steering expansion reservoir	7	Fuel pipe	10a	Heat shield
3	Front cover	8	Fuel distributor	11	Engine lifting eye
4	Purge line	9	Ground cable	12	Rubber mount
5	Oil separator				

	Remove/install		
<b>Danger!</b>	<b>Risk of death</b> 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	Turn key in ignition lock to position "0"		
2	Remove bottom engine compartment paneling		AR61.20-P-1105EW
3	Drain coolant at radiator Notes on coolant		AR20.00-P-1142EWS AH20.00-N-2080-01A
4	Remove air filter housing		AR09.10-P-1150EWS
5	Remove poly-V belt and poly-V belt tensioning device		AR13.20-P-0001EWS
6	Remove coolant thermostat		AR20.10-P-2460EW
7	Remove oil filter housing (1)		AR18.20-P-3471EW
8	Remove expansion reservoir (2)		AR46.25-P-1000EWL
9	Remove front cover (3) at left cylinder head		AR01.30-P-5700EWL
10	Detach the purge line (4) at separation point (arrow), unclip it from brackets on oil separator (5) and feed line duct (6) and place it to the side		
11	Reduce fuel pressure at service valve	Engine 272 	AR07.03-P-1460-01VA *BA07.03-P-1004-01B *119589046300
12	Detach fuel line (7) at fuel distributor (8)	Catch escaping fuel with an absorbent rag! Seal connections immediately with stop plugs.  	*BA07.03-P-1001-01B *129589009100
13	Remove ignition coils on left cylinder head		AR15.12-P-2003EW
14	Remove oil separator (5)		AR01.20-P-9750EWS
15	Detach ground line (9) from cylinder head cover (10)		*BA01.30-P-1001-01O
16	Remove left rear engine lifting eye (11)		*BA01.30-P-1005-01O



			*BA15.18-P-1003-01B
17	Remove feed line duct (6) from cylinder head cover (10)		*BA15.18-P-1002-01B
18	Detach front rubber mount (12) for air filter housing from cylinder head cover (10)		*BA01.30-P-1011-01O
19	Remove heat shield (10a)		*BA01.30-P-1017-01O
20	Remove vacuum pump	Engine 272	AR43.05-P-1320ED
21	Loosen bolts for cylinder head cover (10) in reverse order of tightening procedure and remove them	Engine 272 Engine 273 	AR01.20-P-5014-03VA AR01.20-P-5014-03SX *BA01.30-P-1004-01O
22	Pry off cylinder head cover (10) from cylinder head carefully  Notes on sealant path for cylinder head cover 	To avoid damaging sealing surfaces, do <b>not</b> pound in the prying tool between the cylinder head cover (10) and the cylinder head. <b>Installation:</b> Apply sealant to cylinder head cover (10) Engine 272 Engine 273  Loctite sealant 5970	AH01.30-P-1000-08V AH01.30-P-1000-08SX *112589002500 *BR00.45-Z-1013-01A
	<b>Clean</b>		
23	Clean sealing surfaces at cylinder head and at cylinder head cover (10)	Do not use any sharp-edged tools or abrasive paper as this will damage the sealing surfaces. Loctite 7200 Cleaning spray, Loctite 7063 (150ml)	AR01.00-P-0050-01A *BR00.45-Z-1038-04A *BR00.45-Z-1046-04A
24	Install in the reverse order		
	<b>Checking</b>		
<b>Danger!</b>	<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 Conduct engine test run and check engine for leaks	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
25			

#### Injectors, injection valves, lines

Number	Designation		Engine 272	Engine 273
BA07.03-P-1001-01B	Union nut, fuel line to fuel distributor	Nm	20	20
BA07.03-P-1004-01B	Protective cap on service valve	Plastic Nm	2	-
		Metal Nm	15	-

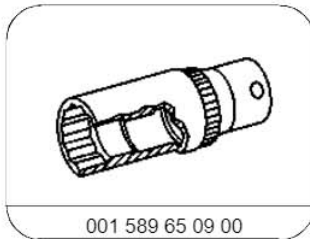
#### Cylinder head

Number	Designation		Engine 272	Engine 273
BA01.30-P-1001-01O	Bolt, ground line to front cover	M6 Nm	9	9
BA01.30-P-1004-01O	Bolt, cylinder head cover to cylinder head	M7 Stage 1 Nm	12	12
		Stage 2 $\angle^{\circ}$	90	90
BA01.30-P-1005-01O	Bolt, lifting eye to cylinder head	M8 Nm	20	20

7	Rotate engine at center bolt for crankshaft <b>in direction of engine rotation</b> by a 90° crank angle	<b>i</b> The thrust pin (1a) for chain tensioner (1) will be pushed out and tensions the timing chain.	
8	Install end cover (3)		
9	Install alternator		AR15.40-P-5032EW
<b>⚠ Danger!</b>	<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 Carry out an engine test run and check engine for leaks	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
10			

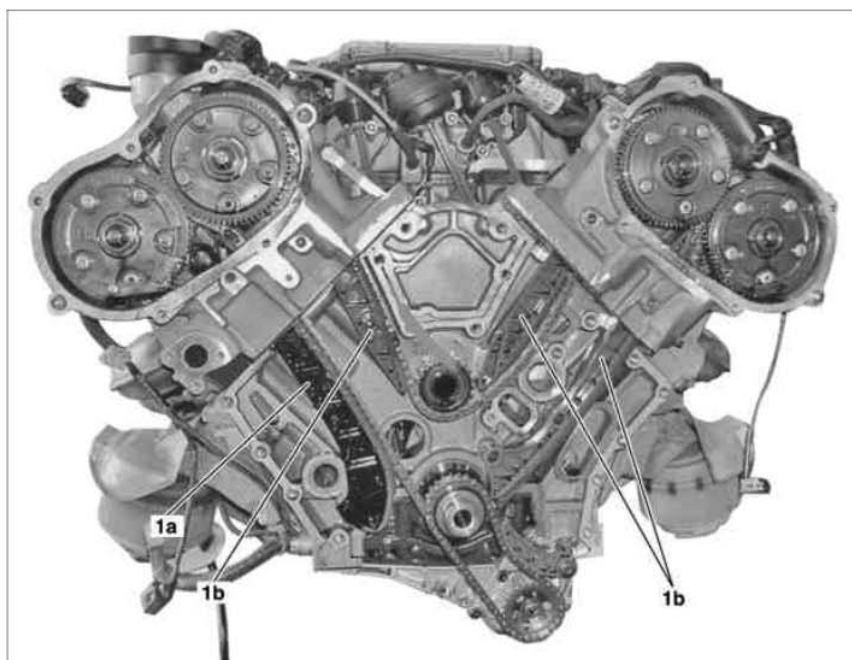
**Nm** Timing chain, chain tensioner

Number	Designation			Engine	Engine
				272	273
BA05.10-P-1008-01B	Chain tensioner on timing case	M22×1.5	Nm	70	70
BA05.10-P-1009-01B	Torque on unlock chain tensioner		Nm	70	70








Wrench socket

## 1a Tensioning rail

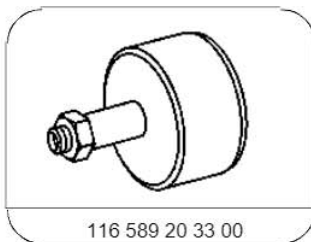


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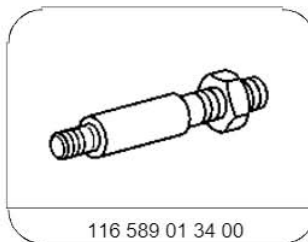
	Remove/install		
1	Remove camshaft adjuster	Camshaft adjuster of intake camshaft Camshaft adjuster of exhaust camshaft	AR05.20-P-7201EWE AR05.20-P-7201EWA
2	Remove tensioning rail bolt	   <b>Installation:</b> Apply sealant to tensioning rail bolts before assembly.  Loctite sealant 5970	AR01.30-P-5800-04V *116589203300 *116589013400 *112589002500 *BR00.45-Z-1013-01A
3	Pull tensioning rail (1a) upwards and out of timing case		
4	Install in the reverse order		



Squeeze gun



Impact extractor



Threaded stud

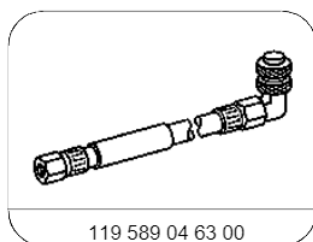
## Repair materials

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

BA01.30-P-1011-01O	Bolt, air filter housing rubber mount to cylinder head cover	M6	Nm	9	9
BA01.30-P-1017-01O	Bolt, heat shield to cylinder head	M6	Nm	9	9

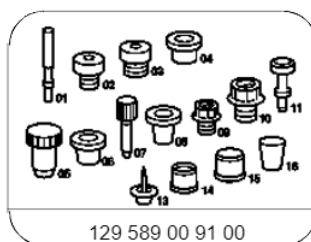
### **Nm** Engine wiring harness

Number	Designation		Engine 272	Engine 273
BA15.18-P-1002-01B	Bolt, feed duct to cylinder head cover	Nm	8	8
BA15.18-P-1003-01B	Bolt, feed duct to engine lifting eye	Nm	8	8



119 589 04 63 00

Pressure hose



129 589 00 91 00

Set of stop plugs



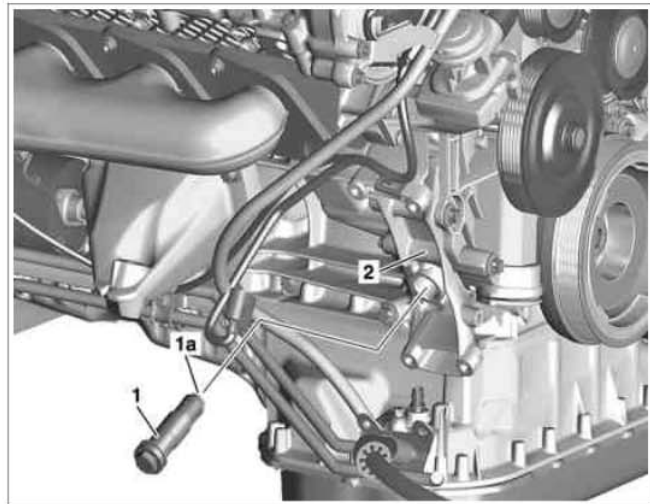
112 589 00 25 00

Squeeze gun

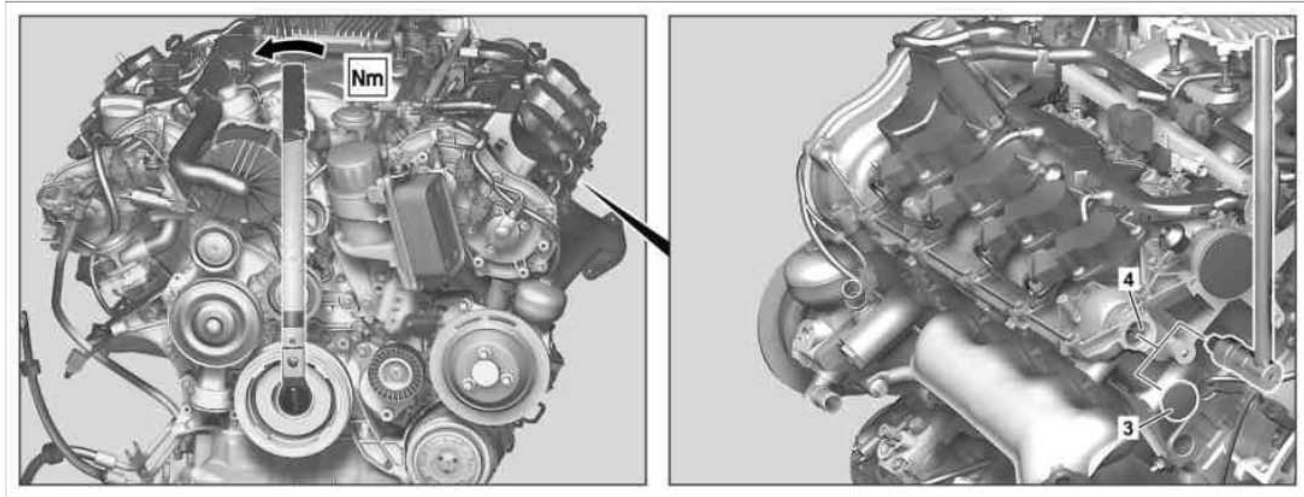
### Repair materials

Number	Designation	Order number
BR00.45-Z-1013-01A	Loctite sealant 5970	A 003 989 98 20
BR00.45-Z-1038-04A	Loctite 7200	Henkel Loctite Deutschland GmbH Arabellastrasse 17 81925 München Germany Tel. +49 899268-0 Fax + 49 899101978 www.Loctite.de
BR00.45-Z-1046-04A	Cleaning spray, Loctite 7063 (150ml)	A 001 986 71 71 10

- 1 Chain tensioner
- 1a Pressure pin
- 2 Timing case cover



P05.10-2353-11



P05.10-2354-08

3 Cap

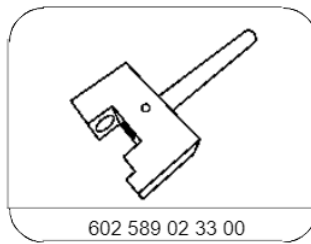
4 Left exhaust camshaft

<b>Removing</b>			
1	Rotate engine at crankshaft center bolt in direction of engine rotation to a 40° crankshaft angle after ignition TDC		<a href="#">*001589650900</a>
2	Remove alternator		<a href="#">AR15.40-P-5032EW</a>
3	Remove chain tensioner (1) from timing case cover (2)		
<b>Install</b>			
4	Screw new chain tensioner (1) into timing case cover (2) and tightened to prescribed torque	<b>Replace chain tensioner (1).</b> The previously installed chain tensioner (1) must not be reinstalled since, on removal of pressure bolt (1a), it is pressed into the end position and the locking device of the pressure bolt (1a) prevents its return stroke. This would overstretch the timing chain on reinstalling. 	<a href="#">*BA05.10-P-1008-01B</a>
5	Remove cap (3)		
6	Turn engine at center bolt on the crankshaft with prescribed torque <b>against direction of engine rotation</b> (arrow), while counterholding left exhaust camshaft (4) at rear with a suitable tool	This unlocks the chain tensioner (1). 	<a href="#">*BA05.10-P-1009-01B</a>



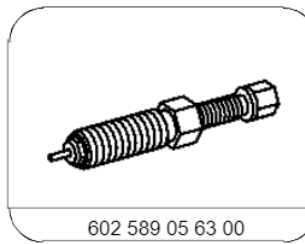
602 589 00 98 00

Case



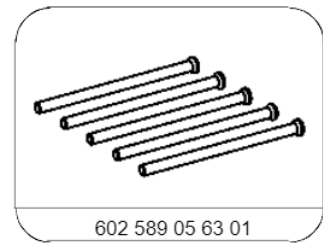
602 589 02 33 00

Chain separating tool



602 589 05 63 00

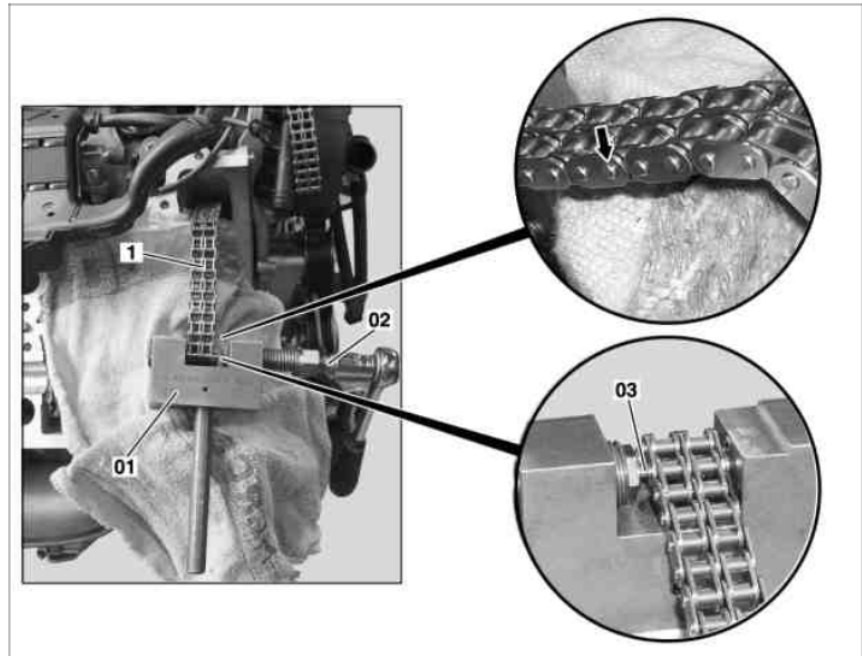
Thrust spindle



602 589 05 63 01

Pressure pins

- 1 Cover over timing case recess with a clean cloth.
  - i** The timing case recess must be secured against parts falling down. Parts that have fallen into the timing case recess must be removed.
- 2 Assemble the chain separating tool (01) and the pressure screw (02) together.
- 3 Fit the chain separating tool (01) at the timing chain (1).
  - i** Ensure that the pressure pin (03) lies at the pin (arrow) of a timing chain link.

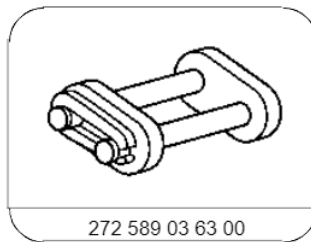


P05.10-2225-06

- 4 Screw in the pressure screw (02) and separate the timing chain (1).
  - i** Do not let the pins that have been pushed out fall into the timing case recess.
- 5 Remove the pressure screw (02) and take off the chain separating tool (01).




Case





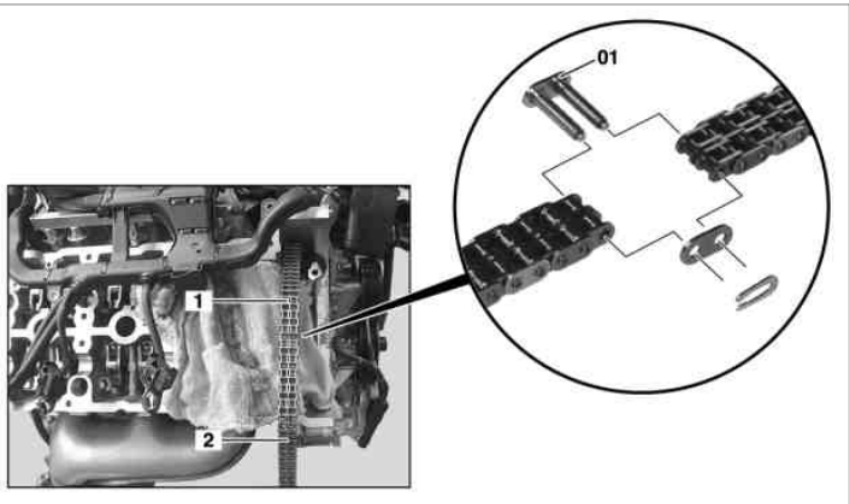
Assembly link

- 1 Cover over timing case recess with a clean cloth.

**i** The timing case recess must be secured against parts falling down. Parts that have fallen into the timing case recess must be removed.

- 2 Connect the new timing chain (2) and the old timing chain (1) with  the assembly link (01).

**i**  Fit the lock of the  assembly link (01) in the direction opposite to that in which the timing chain is drawn; otherwise it could get jammed on the slide rails and come off when the timing chain is drawn.



P05.10-2226-05

- 3 Remove the rags from the timing case recess.


**i** Otherwise, they could get pulled into the timing case recess when the engine is cranked.

- 4 Turn the crankshaft slowly in the engine's direction of rotation (arrow) and draw in the new timing chain (2) until the ends of the new timing chain (2) can be connected.

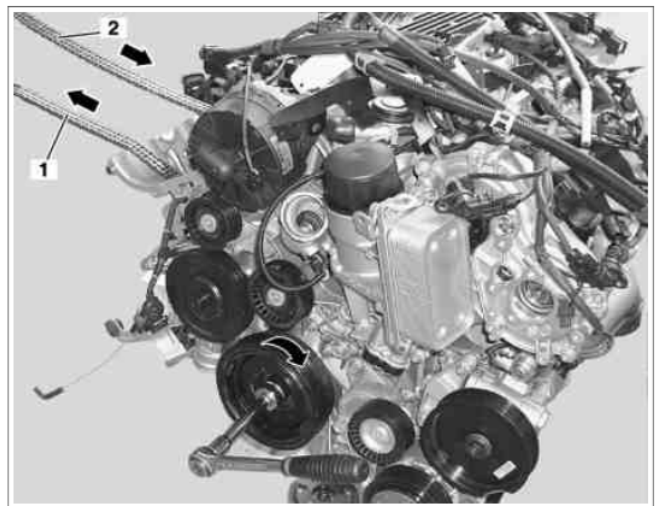
**i** As the new timing chain (2) is being drawn in (arrows), pull out the end of the old timing chain (1) evenly as it becomes free.

- 5 Cover over timing case recess with a clean cloth.

**i** The timing case recess must be secured against parts falling down. Parts that have fallen into the timing case recess must be removed.

- 6  Detach the assembly link (01), and separate the old timing chain (1) from the new timing chain (2).

**i** The assembly link (01) must be removed. The assembly link is only an aid for assembly and is not suitable for engine operation.



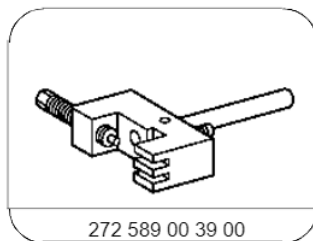
P05.10-2227-11

**Nm** Timing chain, chain tensioner

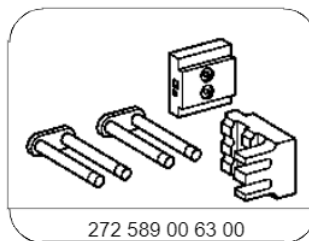
Number	Designation	Engine 272	Engine 273
BA05.10-P-1007-01B	Bolt for rivet element in timing chain (reference value)	Nm 32	32



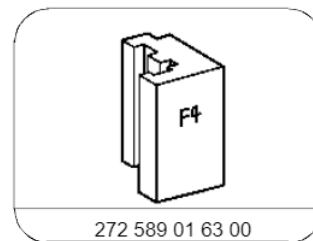
Case



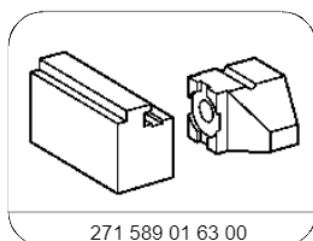
Riveting tool



Assembly inserts



Guide

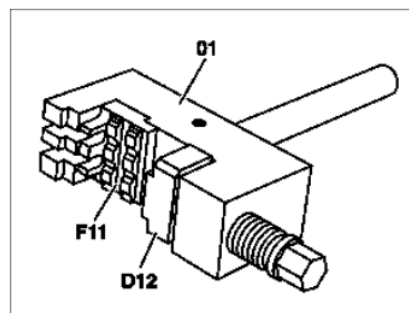


Assembly inserts

**i** When carrying out work on the timing case recess, safeguard this with a clean cloth to prevent items dropping down. Parts which have fallen into the timing case recess, must be removed.

**Press the riveted link into the press-fit center plate**

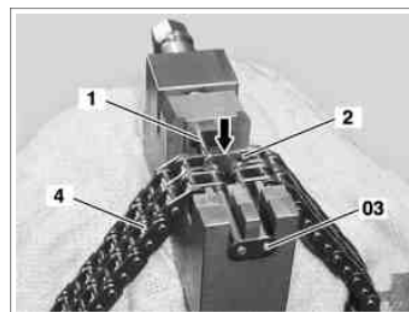
- Place the assembly insert (F11) in the rivet press tool (01) and fix in place with the mounting screw.
- Place the assembly insert (D12) in the rivet press tool (01).



P05.10-2229-01

- Insert the riveted link (1), the centering fork (03) and the press-fit center plate (2) into the ends of the timing chain (4), and press the pins of the centering fork (03) into the holes of the press-fit center plate (2) and center the press-fit center plate (2).

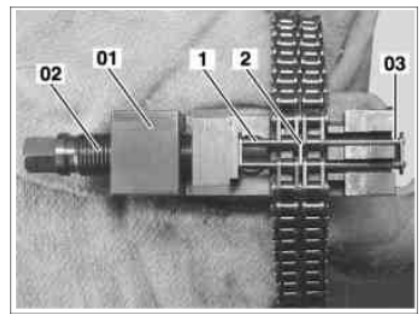
**i** Insert riveted link (1) from the rear.



P05.10-2230-01



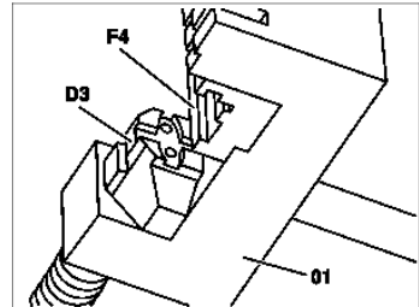
- 4 Screw in the pressure screw (02) at the rivet press tool (01), and press the riveted link (1) into the press-fit center plate (2) all the way to the backstop.  
 Ensure that the riveted link (1) and the rivet press tool (01) are aligned. While screwing in the pressure screw (02) ensure that the pins of the riveted link (1) are pressed into the holes of the press-fit center plate (2), and that the centering fork (03) that has been squeezed out does not fall into the timing case recess.
- 5 Remove the pressure screw (02) and take off the rivet press tool (01).



P05.10-2231-01

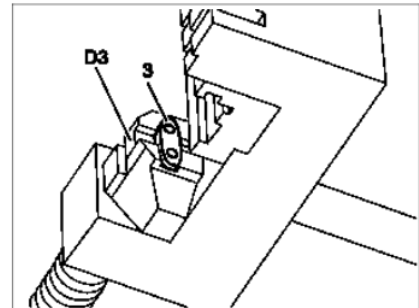
#### Press the outer plate on the riveted link

- 6 Place the assembly insert (F401) in the rivet press tool (01) and fix in place with the mounting screw.
- 7 Place the assembly insert (01D3) in the rivet press tool (01).



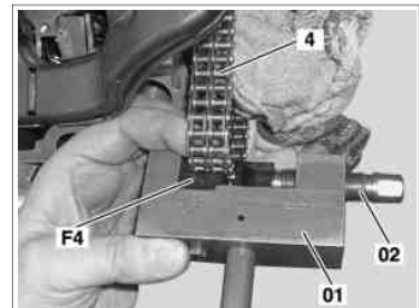
P05.10-2232-01

- 8 Insert the outer plate (3) into the assembly insert (D3).  
 The outer plate (3) is held magnetically.



P05.10-2233-01

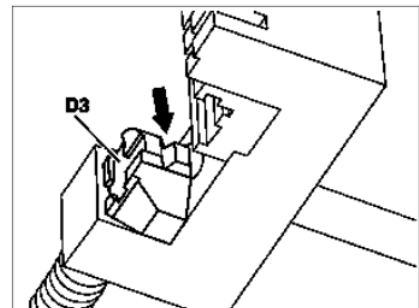
- 9 Place the rivet press tool (01) in such a way that the spacer webs of the assembly insert (F4) lies on the rolls of the timing chain (4).  
 Ensure that the riveted link (1) and the outer plate (3) are aligned.
- 10 Screw in the pressure screw (02) at the rivet press tool (01) until there is solid resistance.  
 While turning the pressure screw (02), ensure that the pins of the riveted link (1) are pressed into the outer plate (3).
- 11 Remove rivet press tool (01).










P05.10-2234-01

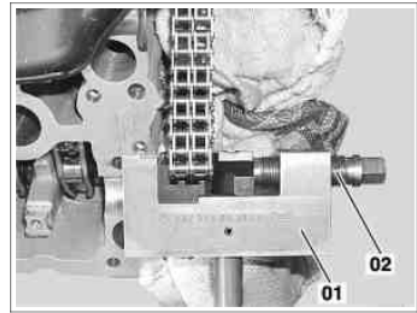
#### Rivet timing chain

- 12 Shift the assembly insert (D3) on the riveted section (arrow).



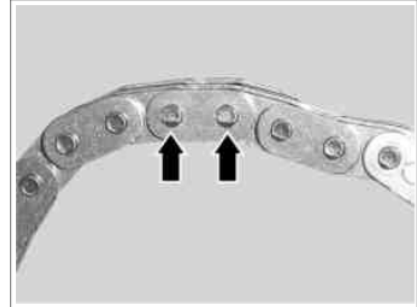
P05.10-2235-01

- 13  Place the rivet press tool (01) in the center of a riveted link (1) pin.  
 Rivet the pins of the riveted link (1) individually.
- 14  Tighten the pressure screw (02) at the  rivet press tool (01).  
 Tightening torque of the  pressure screw (02): reference value 32 Nm.
- 15  Remove rivet press tool (01).



P05.10-2236-01

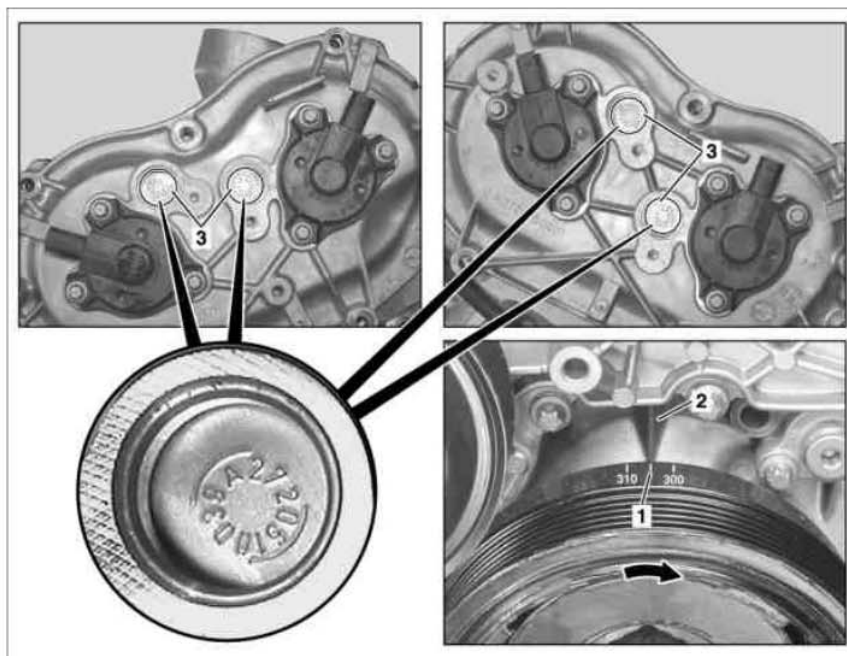
- 16  Inspect riveting (arrows), re-rivet if necessary.



P05.10-2237-01

## ENGINES 272, 273 in MODEL 212

- 1 Marking on belt pulley
- 2 positioning edge on timing case cover
- 3 Pulse wheel markings

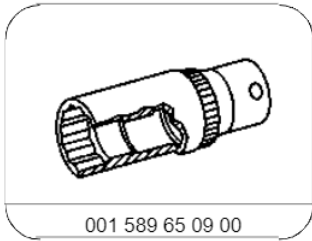


P05.20-2163-06

	<b>Remove/install</b>		
1	Remove front engine cover	See Remove air filter housing.	AR09.10-P-1150EWS
2	Remove Hall sensors on camshafts		*BA15.10-P-1002-03E
	<b>Checking</b>		
3	Turn engine at crankshaft in direction of rotation of engine (arrow) to a 55° crank before ignition TDC (305° marking on belt pulley) and check basic position of camshafts	<p> The 305° marking (1) on belt pulley must be aligned with positioning edge (2) on timing case cover and markings (3) on pulse wheels must be located in center of bores for Hall sensors. If necessary: ↓ Set basic position of camshafts.</p> <p></p>	AR05.20-P-6020EW *001589650900
4	Install in the reverse order		
<b>Danger!</b>	<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	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
5	Carry out an engine test run and check engine for leaks		

## Position sensor

Number	Designation	Engine 272	Engine 273
BA15.10-P-1002-03E	Bolt, camshaft Hall sensor to front cover on cylinder head	Nm 8	8

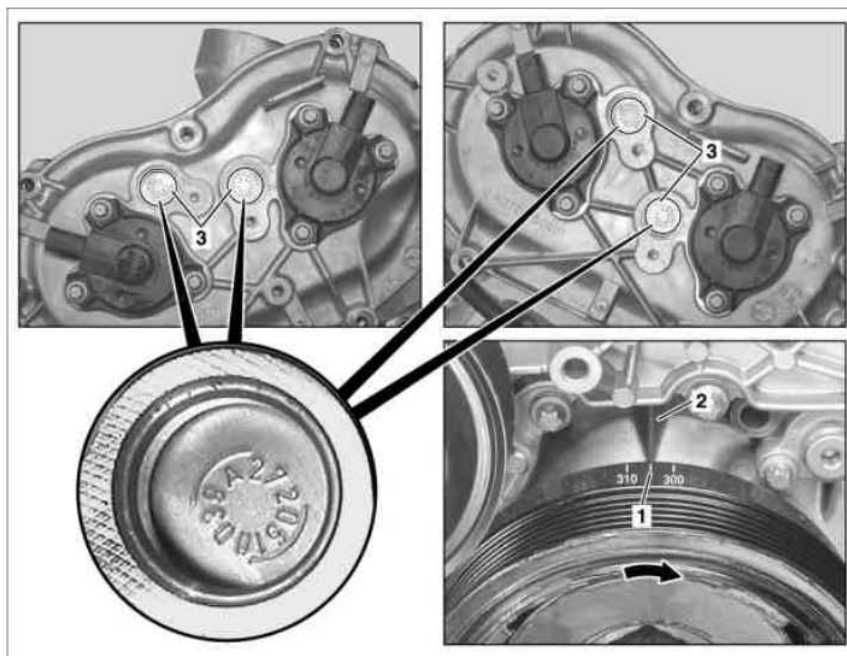


001 589 65 09 00

Wrench socket

## ENGINES 272, 273 in MODEL 212

- 1 Marking on belt pulley
- 2 positioning edge on timing case cover
- 3 Pulse wheel markings

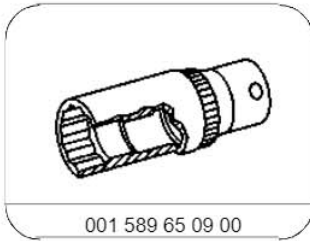


P05.20-2163-06

	<b>Remove/install</b>		
1	Remove front engine cover	See Remove air filter housing.	AR09.10-P-1150EWS
2	Remove Hall sensors on camshafts		*BA15.10-P-1002-03E
	<b>Checking</b>		
3	Turn engine at crankshaft in direction of rotation of engine (arrow) to a 55° crank before ignition TDC (305° marking on belt pulley) and check basic position of camshafts	<p> The 305° marking (1) on belt pulley must be aligned with positioning edge (2) on timing case cover and markings (3) on pulse wheels must be located in center of bores for Hall sensors. If necessary: ↓ Set basic position of camshafts.</p> <p></p>	AR05.20-P-6020EW *001589650900
4	Install in the reverse order		
<b>Danger!</b>	<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	Secure vehicle to prevent it from moving by itself. Wear closed and snug-fitting work clothes. Do not touch hot or rotating parts.	AS00.00-Z-0005-01A
5	Carry out an engine test run and check engine for leaks		

## Position sensor

Number	Designation	Engine 272	Engine 273
BA15.10-P-1002-03E	Bolt, camshaft Hall sensor to front cover on cylinder head	Nm 8	8



001 589 65 09 00

Wrench socket

