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Component Search:

1999 Mercedes Benz E 320 4MATIC Sedan (210.082) V6-3.2L (112.941)

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AR05.20-P-6020AU Set the Basic Position of Camshafts

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Set the basic position of camshafts

Shown on engine 112

1	Copper-plated plate	4	Scribe mark on right-hand camshaft sprocket
2	Locating plate for right camshaft	5	Scribe mark on left-hand camshaft sprocket
		6	Groove of camshaft

P05.20-0313-09

Modification notes			
26.11.97	M112/113 Operation note modified	Step 3	AR05.10-P-7800C

☒	Remove		
1	Remove cylinder head covers	Air cleaner mounted on vehicle. Air cleaner positioned at engine side.	AR01.20-P-5014B AR01.20-P-5014BV
2	Check basic position of camshafts	If the basic position of the camshafts is not correct: Turn engine to 40° after ignition TDC at cylinder 1. ⓘ The engine must not be turned back; otherwise the timing chain can get jammed.	AR05.10-P-6858V
3	Remove chain tensioner	Engine 112 in model 211.080/082/261/265 /260/282, Engine 113 in model 211.083/270/283 Engine 112.945 in model 463.209/232/233 /244/245/250, Engine 112 in model 163, 129, Engine 113.962 in model 463.206/240/241 /247/248/249/254, Engine 113 (except 113.965/961) in model 210, 208, 202, 163, 129, Engine 113.982 in model 463.243/246	AR05.10-P-7800C

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		<p>Engine 112 in model 170, 202, 203, 208, 209, 210, Engine 113 in model 163,174/175, 209 Engine 112 in model 211.061/065, 220, 230,467, Engine 113 in model 211.070/076/278, 215.373/374/375, 220.070/073/074/075 /083/084/170/173/174/175/183/184/875, 230.474/475</p>	<p>AR05.10-P-7800CA AR05.10-P-7800AM</p>
4	Remove camshaft Hall sensor	<p>Engine 112 in model 211.080/082/261/265/290/282, Engine 113 in model 211.083/270/283 Engine 112.945 in model 463.209/232/233/244/245/250, Engine 112 in model 129, 163, 170, 202, 203, 208, 209,361/365/461/465, 210, 211.061/065, 220, 230,467, Engine 113 (except 113.990/991) in model 129, 163, 202, 208, 209,375/376/475/476, 210, 211.070, 215, 220, 230.474/475, Engine 113.962 in model 463.208/240/241/247/248/249/254, Engine 113.962 in model 463.243/246 Engine 113.990 in model 211.078/278, Engine 113.991 in model 215.374, 220.074/174</p>	<p>AR15.10-P-2000A AR15.10-P-2000RVK</p>
5	Remove right-hand camshaft sprocket	<p><input type="checkbox"/> Lift timing chain from camshaft sprocket. <input checked="" type="checkbox"/> Open wrench <input checked="" type="checkbox"/> Insertion tool <input checked="" type="checkbox"/> Torque wrench</p>	<p>*112589000100 *112589010300 *001589722100</p>
6	Remove left-hand camshaft sprocket	<p><input type="checkbox"/> Lift timing chain from camshaft sprocket. <input checked="" type="checkbox"/> Open wrench <input checked="" type="checkbox"/> Insertion tool <input checked="" type="checkbox"/> Torque wrench</p>	<p>*112589000100 *112589010300 *001589722100</p>
25	Install		
7	Rotate left-hand camshaft to the basic position and fit locating plate to the camshaft	<p><input checked="" type="checkbox"/> Open wrench <input type="checkbox"/> Groove of camshaft (6) must point to the center of the cylinder head cover separating surface in direction of inner V. <input checked="" type="checkbox"/> Locating plate <input type="checkbox"/> Place locating plate flush onto left cylinder head and insert into the groove (6) of the camshaft. <input type="checkbox"/> At 40° ATDC on cylinder 1 the camshaft can be turned without the valves coming into the contact with the piston</p>	<p>*112589000100 *112589013200</p>
8	Rotate right camshaft in basic position and insert locating plate for right camshaft (2) in the camshaft	<p><input checked="" type="checkbox"/> Open wrench <input type="checkbox"/> Groove of camshaft (6) must point to the center of the cylinder head cover separating surface in direction of inner V. <input checked="" type="checkbox"/> Locating plate <input type="checkbox"/> Place locating plate for right camshaft (2) flush onto the right cylinder head and insert into the groove of the camshaft (6). <input type="checkbox"/> At 40° ATDC on cylinder 1 the camshaft can be turned without the valves coming into the contact with the piston</p>	<p>*112589000100 *112589003200</p>
9	Install left-hand camshaft sprocket	<p><input type="checkbox"/> Place timing chain onto camshaft sprocket. <input checked="" type="checkbox"/> Insertion tool <input type="checkbox"/> Bolt of camshaft sprocket engine 112, 113 except 113.969</p>	<p>*112589010300</p>

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			*BA05.20-P-1001-01B
10	Install right-hand camshaft sprocket	Place timing chain onto camshaft sprocket. Insertion tool Bolt of camshaft sprocket engine 112, 113 except 113.969 	*112589010300 *BA05.20-P-1001-01B
11	Install camshaft Hall sensor	<p>Engine 112 in model 211.080/082/261/265 /280/282, Engine 113 in model 211.083/270/283</p> <p>Engine 112.945 in model 463.209/232/233 /244/245/250, Engine 112 in model 129, 163, 170, 202, 203, 208, 209.361/365/461/465, 210, 211.061 /065, 220, 230.467, Engine 113 (except 113.990/991) in model 129, 163, 202, 208, 209.375/376/475/476, 210, 211.070, 215, 220, 230.474/475, Engine 113.982 in model 463.206/240/241 /247/248/249/254, Engine 113.982 in model 463.243/246</p> <p>Engine 113.990 in model 211.076/276, Engine 113.991 in model 215.374, 220.074 /174 </p>	AR15.10-P-2000A AR15.10-P-2000RVK *BA15.10-P-1002-03A
12	Install chain tensioner	<p>Engine 112 in model 211.080/082/261/265 /280/282, Engine 113 in model 211.083/270/283</p> <p>Engine 112.945 in model 463.209/232/233 /244/245/250, Engine 112 in model 163, 129 Engine 113.982 in model 463.206/240/241 /247/248/249/254, Engine 113 (except 113.965/961) in model 210, 208, 202, 163, 129, Engine 113.982 in model 463.243/246</p> <p>Engine 112 in model 170, 202, 203, 208, 209, 210, Engine 113 in model 163.174/175, 209</p> <p>Engine 112 in model 211.061 /065, 220, 230.467, Engine 113 in model 211.070/076/276, 215.373/374/375, 220.070/073/074/075 /083/084/170/173/174/175/183/184/875, 230.474/475</p>	AR05.10-P-7800C AR05.10-P-7800CA AR05.10-P-7800AM
	Check		
13	Checking timing Check general notes on valve timing, scribe marks	<p>Engines 112, 113</p> <p> The engine must not be turned back; otherwise the timing chain can get jammed.</p>	AR05.10-P-6858V AH05.10-P-1000-01A
14	Install cylinder head covers	<p>Air cleaner mounted on vehicle. Air cleaner positioned at engine side.</p>	AR01.20-P-5014B AR01.20-P-5014BV

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Camshaft

Number	Designation			Engine 113.940/941/ 942/943/944/ 948/961/962/ 963/965/966/ 967/968/969/ 980/981/982/ 984/986/992	Engine 112 except 112.951
BA05.20-P-1001-01B	Bolt of camshaft sprocket	M12 x 45	Stage 1 Nm	50	50
			Stage 2 . *	90	90

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Nm Camshaft

Number	Designation			Engine 113.950 with code 479	Engine 113.987/988/ 990/993
BA05.20-P-1001-01B	Bolt of camshaft sprocket	M12 x 45	Stage 1 Nm	50	50
			Stage 2 . *	90	90

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Nm Camshaft

Number	Designation			Engine 113.991
BA05.20-P-1001-01B	Bolt of camshaft sprocket	M12 x 45	Stage 1 Nm	50
			Stage 2 . °	90

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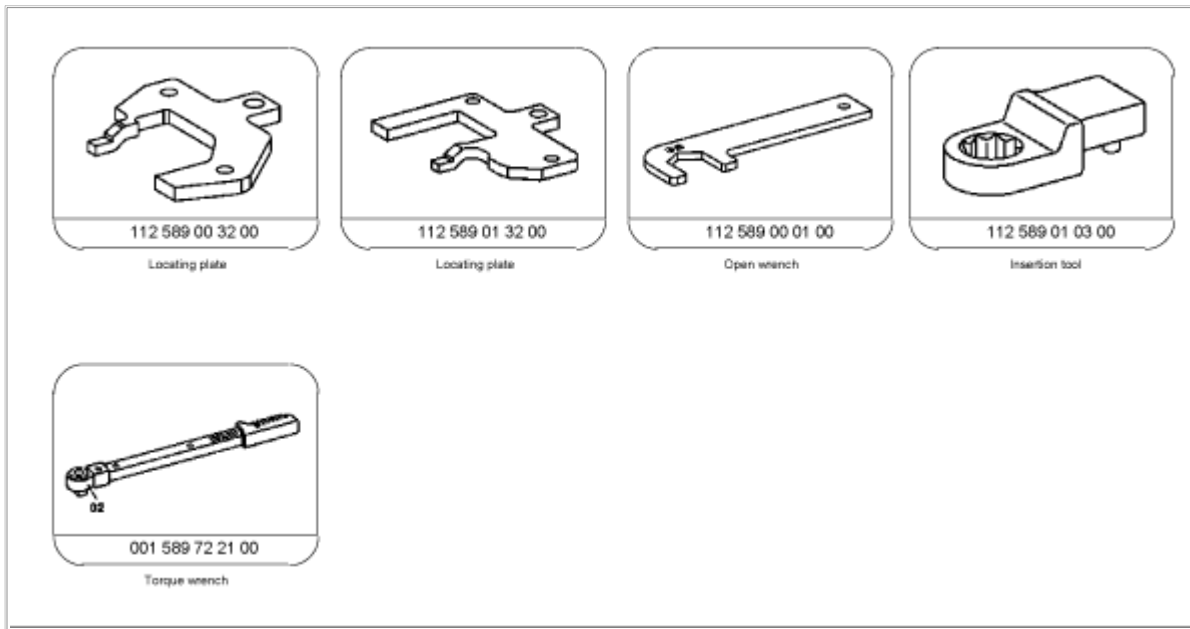
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Nm Position sensor

Number	Designation	Engine	Engine	Engine
		112.910/911/ 912/ 913/914/915/ 916/917/920/ 921/922/923/ 940/941/942/ 943/944/945/ 946/947/949/ 951/953/954/ 955/980/981/ 970/972/973/ 975	113.940/941/ 942/943/944/ 948/960/961/ 962/963/965/ 966/967/968/ 969/980/981/ 982/984/986/ 992/993	113.987/ 988/ 990/ 991
BA15.10-P-1002-03A	Camshaft Hall sensor to cylinder head	Nm	8	8

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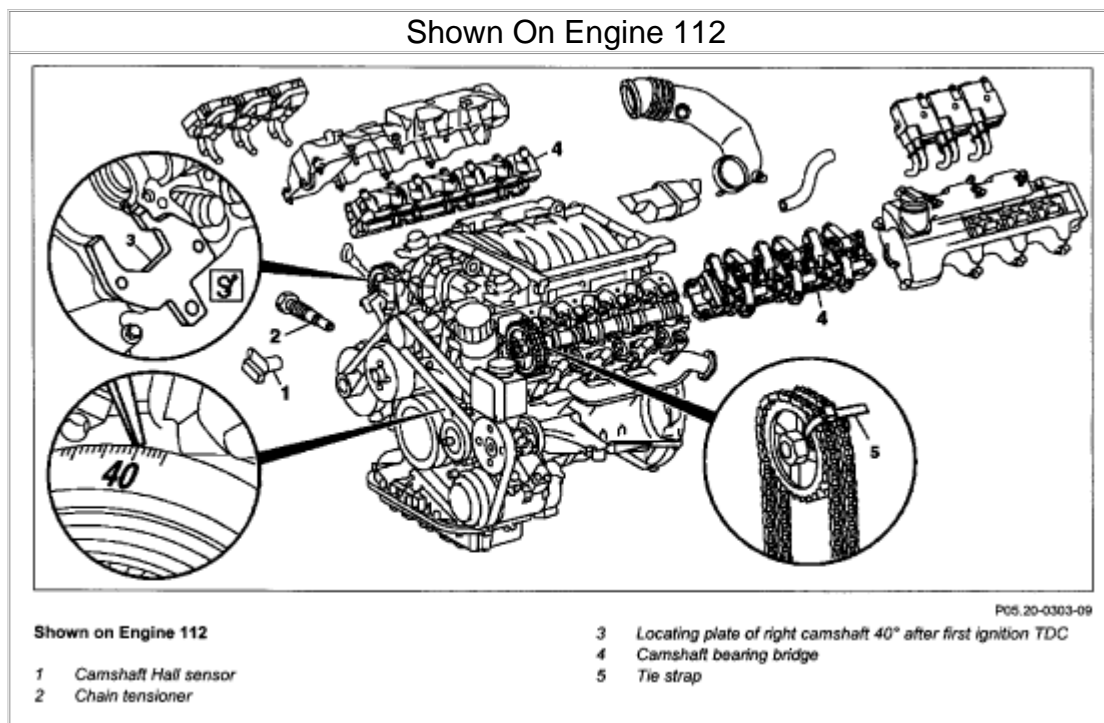
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AR05.20-P-6992AU Remove/Install Camshafts

[Notes](#)

Remove/Install Camshafts



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Remove

- 1 Remove cylinder head covers
 - Air cleaner mounted on vehicle.
 - Air cleaner positioned at engine side.
- 2 Position [piston](#) of cylinder 1 at **40 degrees** after TDC

NOTE:

- Rotate engine at [crankshaft](#) in direction of rotation until **40 degrees** marking on belt pulley/vibration damper is aligned with marking on timing case cover. The grooves on the camshafts must be pointing toward the inner V.
- Engine must not be rotated backwards.

- 3 Remove chain tensioner (2)
- 4 Remove camshaft Hall sensor (1)
- 5 Detach camshaft sprocket, take off

NOTE: Tie together camshaft sprocket and [timing chain](#) with cable strap (5).

- 6 Detach [camshaft bearing](#) bridge (4)

NOTE: Observe slackening diagram!

- 7 Remove camshaft

Install

- 8 Install camshaft

NOTE:

- Pay attention to camshaft marking when installing camshaft.
- See Camshaft code number and assignment.
- Oil the bearing surfaces!
- Camshafts must not be replaced individually for tolerance reasons.
- Pay attention to the correct position of the cap on the front end of the camshaft.

- 9 Attach [camshaft bearing](#) bridge (4)

NOTE: Observe tightening diagram.

- 10 Rotate camshaft into basic position
- 11 Fit on camshaft sprocket

NOTE: Take off cable strap (5)!

12 Install camshaft Hall sensor (1)

13 Install chain tensioner (2)

14 Check timing of engine

15 Install cylinder head covers

- Air cleaner mounted on vehicle.
- Air cleaner positioned at engine side.

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Conversion Calculator

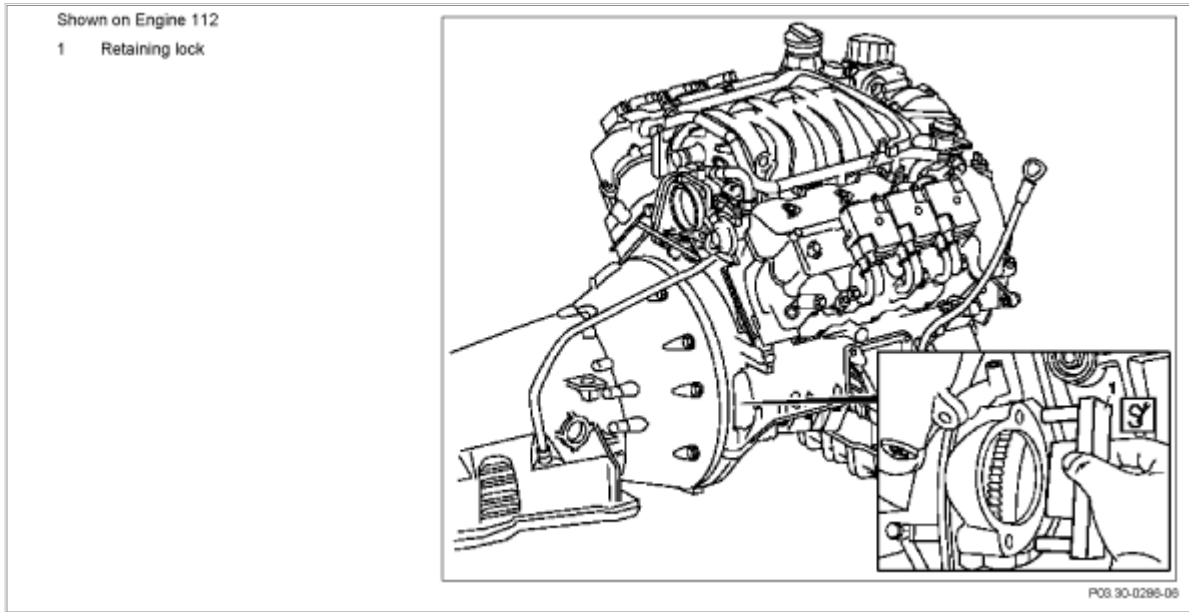
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AR03.30-P-5000B Remove/Install Retaining Lock For Crankshaft / Ring Gear

[Notes](#)

Remove/Install Retaining Lock For Crankshaft / Ring Gear





Step 1

	Removal/installation		
Danger!	Risk of death caused by vehicle slipping or toppling off of the lifting platform.	Align vehicle between the four pillars of the hoist and position the four support plates at the hoist mounting points specified by the vehicle manufacturer.	AS00.00-Z-0010-01A
1	Remove starter	Model 203.065 /265 /764, Model 210.074/ 274, Model 215.373, Model 220.073/ 163/ 173 Model 202, 208 with engine 113	
		Model 463 with engine 112.945 Model 463 with engine 113.962 /962 Model 129, 211 except models 211.076 /276 with engine 113 Model 163 with engine 112, 113 Model 170 with engine 112.947/960	AR15.30-P-7100GW AR15.30-P-7100GV AR15.30-P-7100CS AR15.30-P-7100GH AR15.30-P-7100GA

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Steps 2-3

		<p>Model 463.322/323 with engine 112.910, Model 463.322/323 with engine 112.920, Model 202.088 with engine 112.915 Model 208.365 /465 with engine 112.940</p> <p>Model 463.322/323 with engine 112.912, Model 463.322/323 with engine 112.946, Model 463.322/323 with engine 113.988, Model 463.322/323 with engine 112.912, Model 463.322/323 with engine 112.955, Model 463.322/323 with engine 113.968, Model 209.376 /476 with engine 113.967</p> <p>Model 210.061 /261 /062 /262 /063 /263 / 663 / 065 /265 /081 /281 /082 /282 with engines 112, Model 210.070/270/083 /283 with Engine 113</p> <p>Model 215.378 and 220.178 /878 with engines 137.970</p> <p>Model 215, 220 and 230 with engines 275 Model 215.375 with engine 113 Model 220.070 /075 /170 /175 /875 with engine 113, Model 220.063 /065 /067 /165 /167 with engine 112</p> <p>Model 203.081 /084 /261 /284, 220.067 / 187 with Engine 112, Model 220.083 /084 /183 /184 with engine 113</p> <p>Model 230 with Engine 112, 113, Model 463.322/323 with engine 113, Model 215.374 with engine 113 Model 220.074 /174 with engine 113</p>	<p>AR15.30-P-7100ED</p> <p>AR15.30-P-7100P</p> <p>AR15.30-P-7100FF</p> <p>AR15.30-P-7100N</p> <p>AR15.30-P-7100H AR15.30-P-7100I</p> <p>AR15.30-P-7100PW</p> <p>AR15.30-P-7100R</p>
2	Insert retaining lock (1)	<p> Slide retaining lock (1) into starter opening and allow to latch in ring gear, if required crank engine at crankshaft in direction of rotation. Engines 112, 113, 137, 275:  Retaining lock</p>	*112589034000
3	Install in the reverse order		

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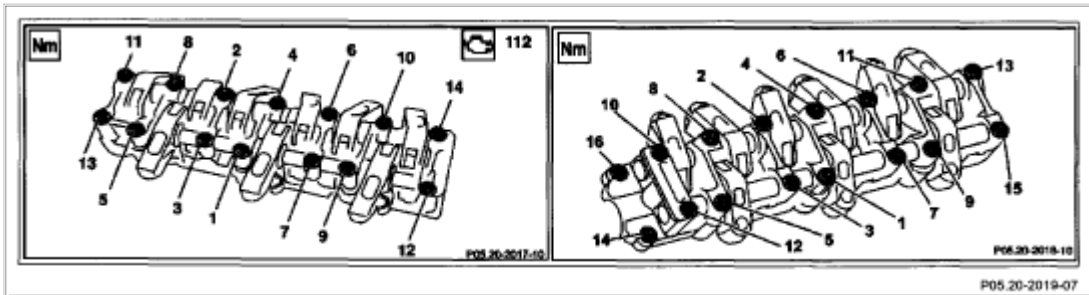
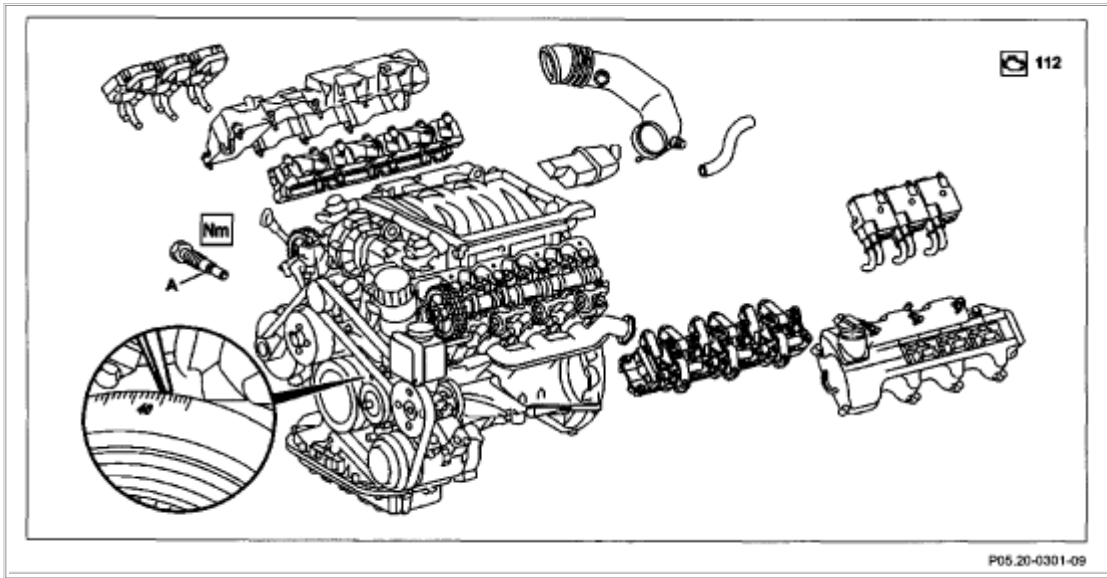
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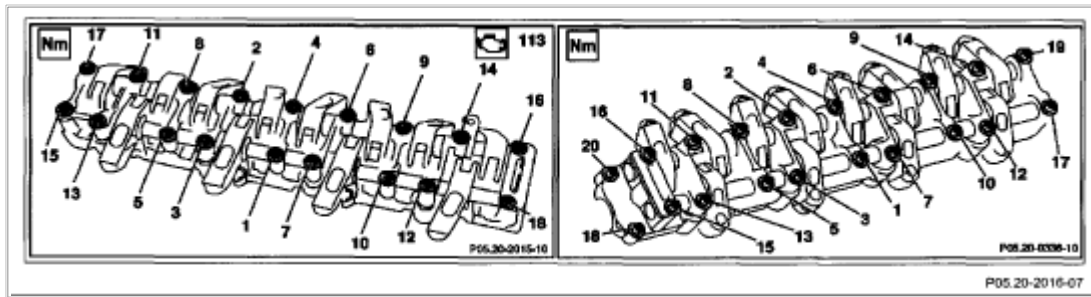
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Service and Repair

[Notes](#)

Remove/Install Camshaft Bearing Cap





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1 Remove cylinder head cover

- Air cleaner mounted on vehicle.
- Air cleaner positioned at engine side.

2 Position [piston](#) of cylinder 1 at **40 degrees** after TDC

NOTE:

- Engine must not be cranked backwards.
- Rotate engine at [crankshaft](#) in direction of rotation until **40 degrees** marking on belt pulley/vibration damper is aligned with marking on timing case cover.
- Grooves in the camshafts must point towards the "inner V".

3 Remove chain tensioner (A)

4 Remove camshaft bearing bridge

CAUTION: Tie camshaft sprocket and [timing chain](#) together with a cable strap to prevent the timing chain from skipping.

- Slacken bolts in stages in the opposite sequence to the torquing pattern.

CAUTION: See notes on installing camshaft bearing bridge.

5 Install in the reverse order.