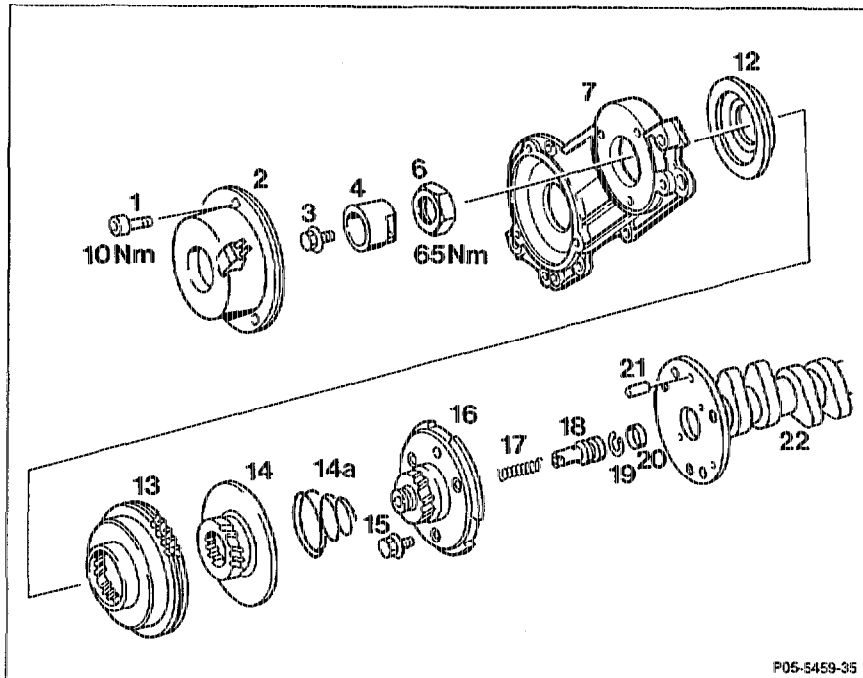


05-2170 Removing and installing camshaft adjuster



Both front covers remove, install (01-2120).

Note

For left camshaft adjuster remove only left cover, for right camshaft adjuster only right cover.

Piston of cylinder 1 set to 45° before ignition TDC (step 2).

All four camshafts secure with pins, special tool 111 589 03 15 00 (step 3).

Timing chain with all four camshaft sprockets ... mark relative to each other (check marking when installing) (step 4).

Chain tensioner remove, install (05-3100).

Top guide rails remove, install (05-3350).

Note

Remove only right guide rail for right camshaft adjuster.

Left exhaust camshaft sprocket unbolt, bolt on (18 Nm).

Armature (4), nut (6), cover (12), right camshaft
sprocket (13) with adjusting piston (14),
conical spring (14a) and flanged shaft (16)

unbolt, take off, fit on, bolt on (steps 8 and 9).

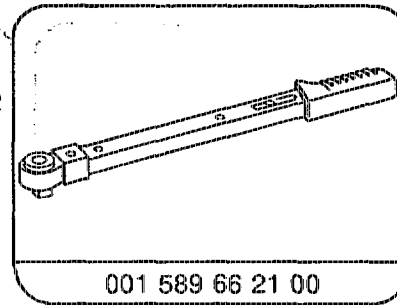
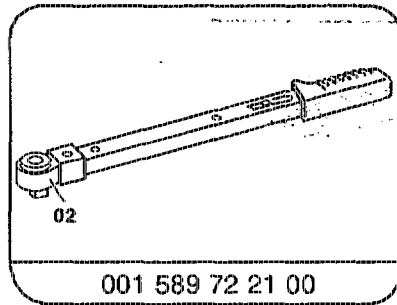
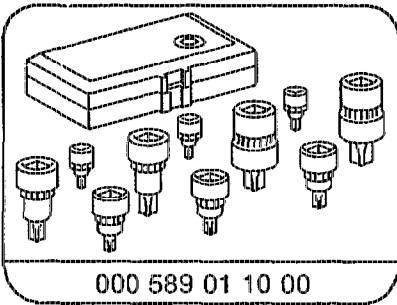
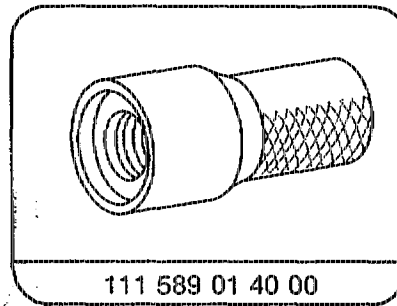
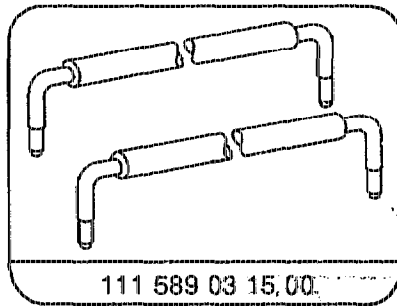
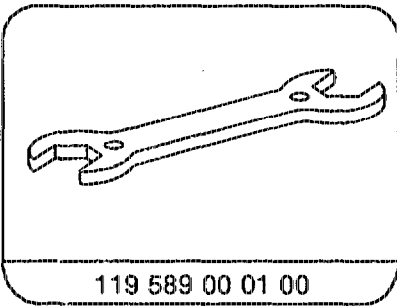
Note

If only the left camshaft adjuster is removed, the
right one remains installed.

Armature (4), nut (6), cover (12), left camshaft
sprocket (13) with adjusting piston (14),
conical spring (14a) and flanged shaft (16)

take off, unscrew, screw on and fit on
(steps 10 to 19).

Special tools

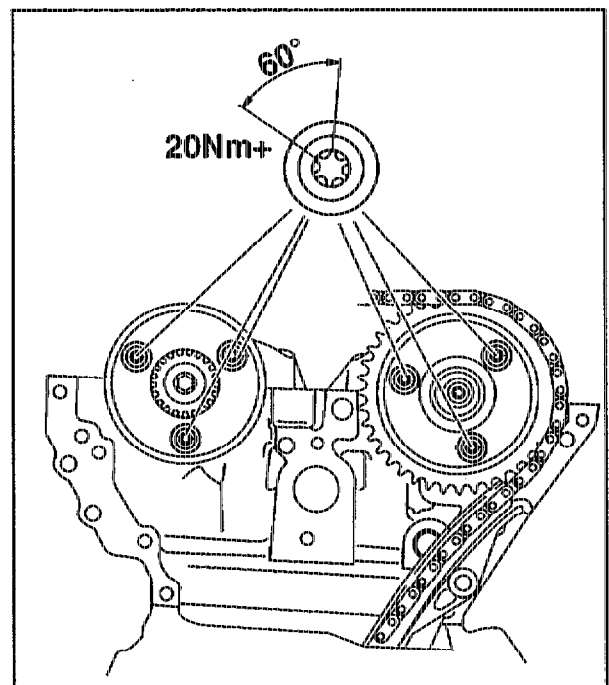


Tightening torques in Nm and tightening angle

Bolt of armature to control piston	1st version bolt + washer ¹⁾	7
	2nd version collar bolt ²⁾	
	Initial torque	5
	Angle of rotation	90°
M 20 × 1,5 nut		65
Flange shafts to camshaft Torx T 40	1st version bolt + washer ¹⁾	18
	2nd version collar bolt ²⁾	
	Initial torque	20
	Angle of rotation	60°

¹⁾ Replace with 2nd version when performing repairs

²⁾ Use only once



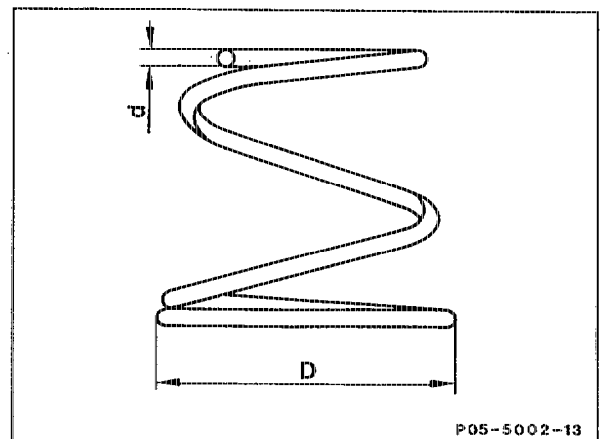
P01.10-0264-15

Note

Conical spring	Size (d)	Size (D)
Engine 119.96	2.1 mm	51.7 mm
Engine 119.97		
1st version ³⁾	2.1 mm	51.7 mm
2nd version ³⁾	2.9 mm	53.3 mm
3rd version ⁴⁾	3.0 mm	53.3 mm
Engine 119.98	3.0 mm	53.5 mm

³⁾ On engines 119.97 replace 1st and 2nd version by 3rd version when performing repairs

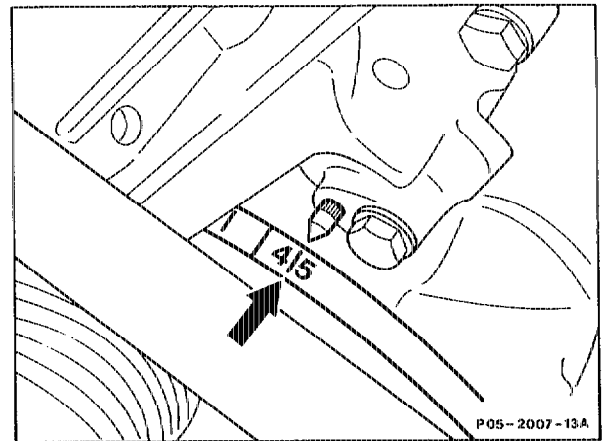
⁴⁾ Standard as of 12/1992



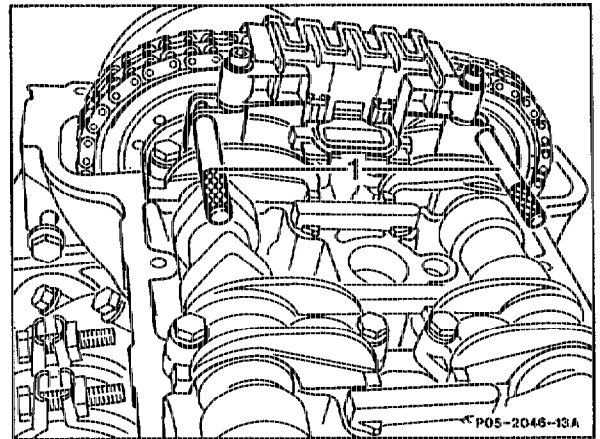
P05-5002-13

Removal

- 1 Remove both front covers (01-2120).
(Remove only left-hand cover for left-hand camshaft adjuster, right-hand cover for right-hand camshaft adjuster.)
- 2 Set piston of No. 1 cylinder to 45° before ignition TDC.



- 3 Secure all four camshafts with pins (111 589 03 15 00).

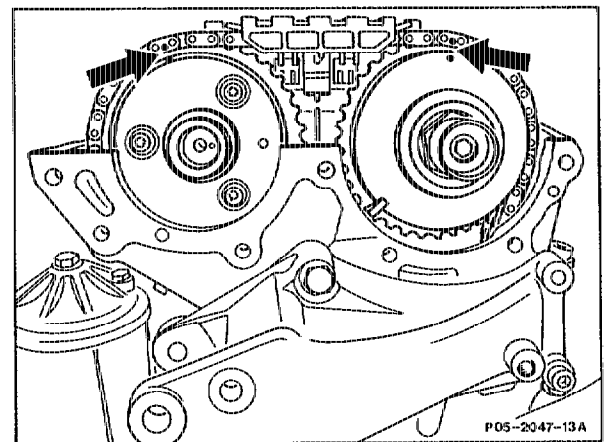


- 4 Mark timing chain with all four camshaft timing gears together (arrows).

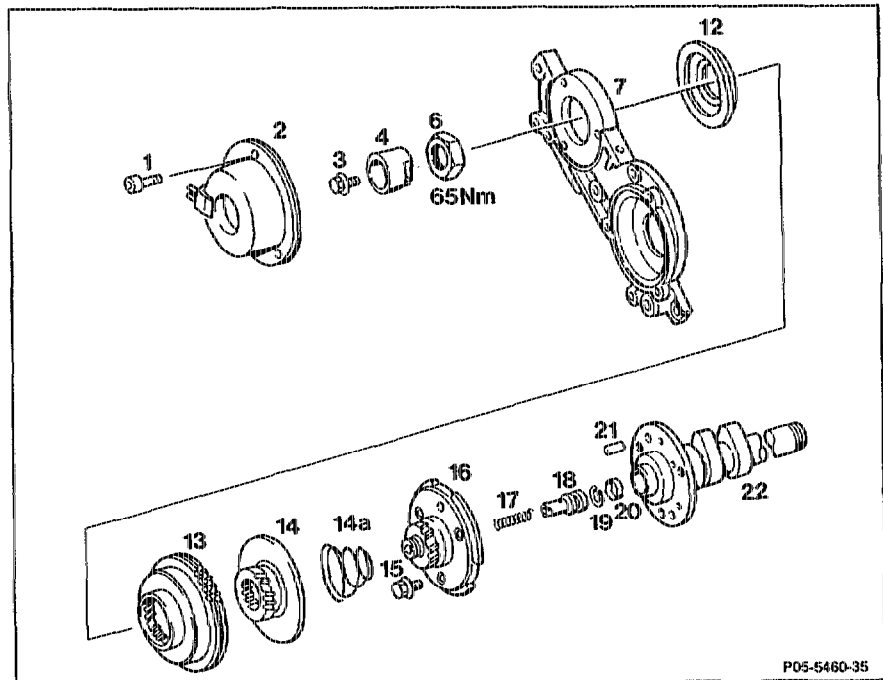
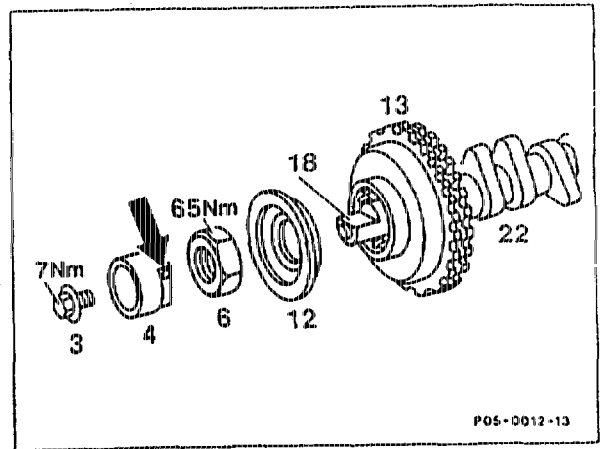
Installation Instruction

Fit on the timing chain in the opposite direction of rotation of engine, beginning at the left exhaust camshaft gear. The markings made previously must again agree.

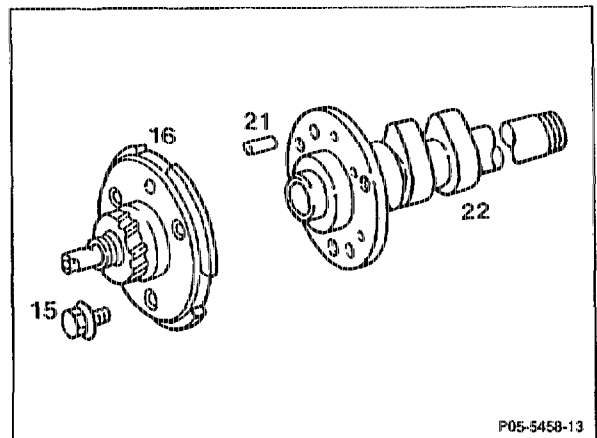
- 5 Remove chain tensioner (05-3100).
- 6 Remove top guide rails (05-3350).
Remove only right guide rail for right camshaft adjuster.
- 7 Remove right exhaust camshaft sprocket.



8 Unscrew bolt (3) holding armature (4) in position on face (arrow). Pull off armature (4). Tightening torque 7 Nm.



9 Take off nut (6), cover (12), left-hand camshaft gear (13) with adjusting piston (14) and conical spring (14a). Unscrew bolts (15) and take flange shaft off intake camshaft.

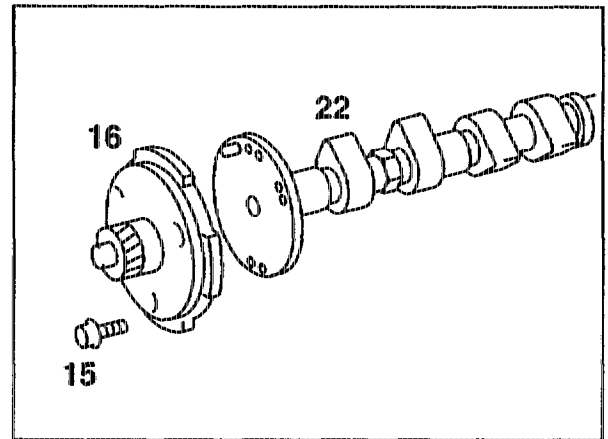


Installing

10 Bolt flange shaft (16) onto inlet camshaft (22); pay attention to dowel pin.

Note

Replace collar bolts (15); use only once.

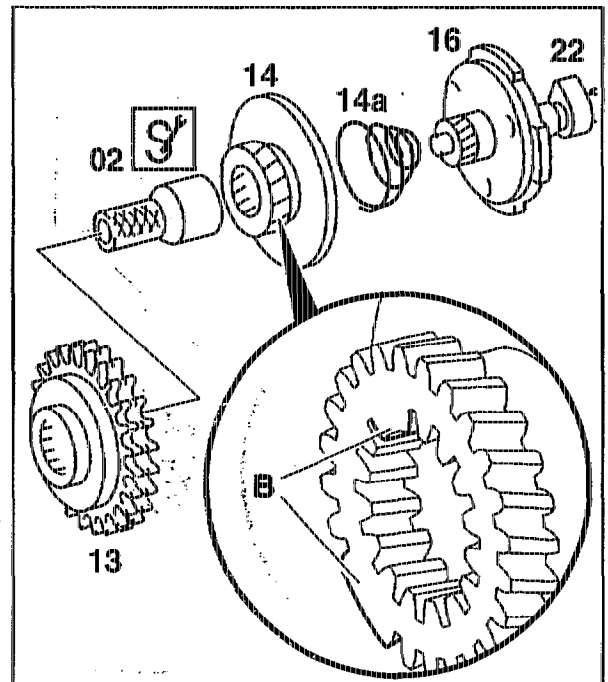


P05.20-0287-13

11 Insert spherical spring (14a) and push adjusting piston (14) onto flange shaft (16) in fixed position (block tooth B).

12 Screw on thrust nut (02), special tool 111 589 01 40 00.

13 Push inlet camshaft sprocket (13) into fixed position (block tooth B) onto splines of adjusting piston (14); hold timing chain up for this step.

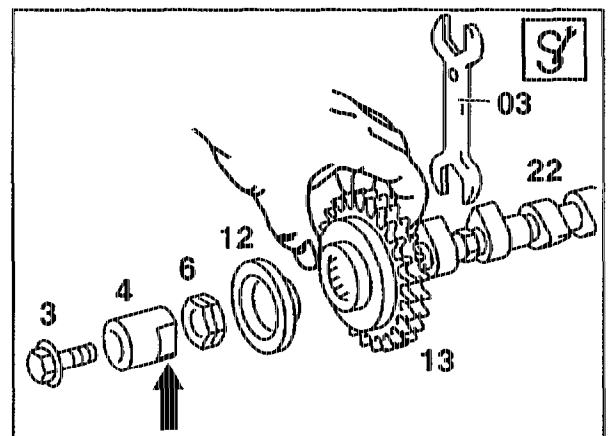


P05.20-0288-15

14 Unscrew thrust nut; hold camshaft adjuster together for this step.

15 Fit on cover (12).

16 Screw on nut (6) with its flat face pointing towards camshaft adjuster (securing slot at front).



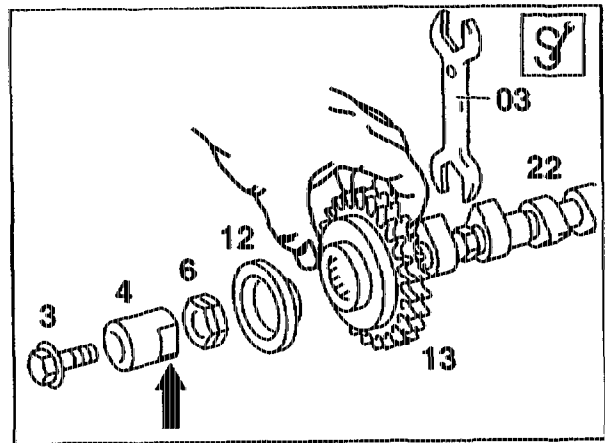
P05.20-0289-13

17 Tighten nut (6); counter-hold camshaft (22)
at hexagon with wrench (03), special tool
119 589 00 01 00.

18 Fit on armature (4) in fixed position.



Pay attention to operation 05-2175.



P05.20-0289-13