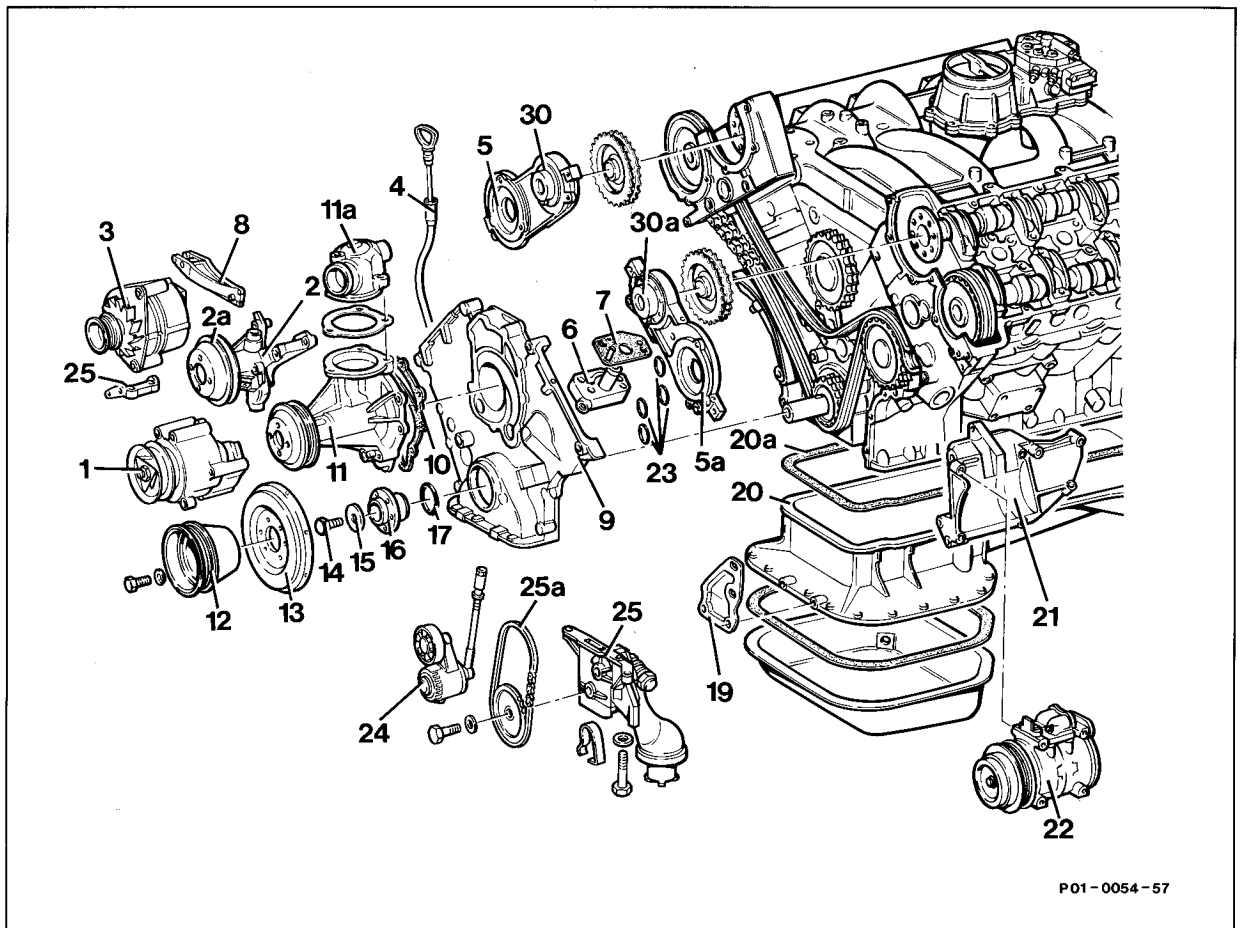


01-2100 Removing and installing timing case cover

Operation no. of operation texts and work units or standard texts and flat rates
01-0080, 8009

A. Engine 119.960



P01-0054-57

Viscous fan clutch	remove, install (20-3120).
Bolts of belt pulley fan support	slacken, tighten (10 Nm, step 2).
Front covers at top (30, 30a)	remove, install (01-2120).
Poly V-belt and tensioning device (24)	remove, install (13-3450).
Engine	set to 45° before ignition TDC at No. 1 cylinder (step 5).
Bottom engine compartment panel	remove, install (step 6).
Left exhaust pipe and cover of starter mounting	detach, attach (step 7).
Engine retaining lock	insert (step 8), special tool 116 589 01 40 00.
All four camshaft gears together with timing chain	mark and pin, special tool 111 589 03 15 00 (steps 9 and 10).

Nut at left and right camshaft adjuster	slacken, tighten (65 Nm, step 12).
Alternator (3) together with carrier (8)	remove, install, seal bolts (step 13).
Chain tensioner (6)	remove, install (05-3100).
Top slide rails	remove, install (05-3350).
Both camshaft adjusters (5, 5a) partially	remove, install (05-2170).
Coolant at radiator	drain, pour in (20-0100).
Coolant hoses at fan carrier (2) and thermostat housing	take off, install (step 18).
Fan carrier belt pulley (2a)	unscrew, screw on (step 19).
Air pump (1) with angle bracket (25)	remove, install (step 20).
Fan carrier (2)	remove, install (step 21).
Belt pulley (12) with vibration damper (13) and hub (16)	remove, install (03-3420).
Radial seal (17)	remove, install (03-3240).
Coolant pump cover (11a)	remove, install (step 24).
Coolant pump (11)	remove, install (step 25).
Carrier with guide pulley	remove, install (step 26).
If air conditioning fitted: air conditioning compressor (22) with lines connected	detach, attach (step 27).
TDC sensor	remove, install (step 28).
Carrier (21), air conditioning compressor or guide pulley	remove, install (step 29).
Oil pump (25)	remove, install (18-2100).
Dipstick guide tube (4)	remove, install. Special tool 117 589 00 31 00 (step 31).
Top section of oil sump (20)	detach, install (01-3100).
Bolts of timing case cover at front and on cylinder head	unscrew, screw on (steps 33, 38 and 39).
Timing case cover (9) with oil pump chain (25a)	remove, install (steps 34 to 37).
O-rings (23) of timing case cover	renew.
Leaktightness	check.

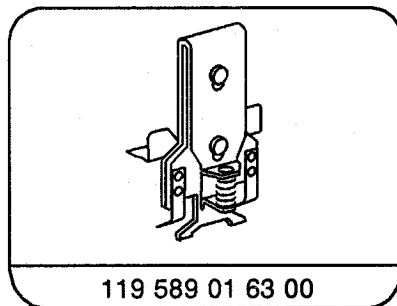
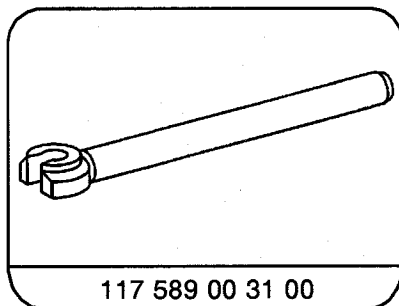
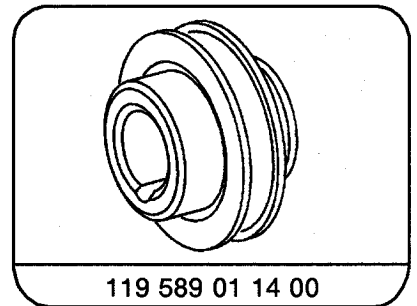
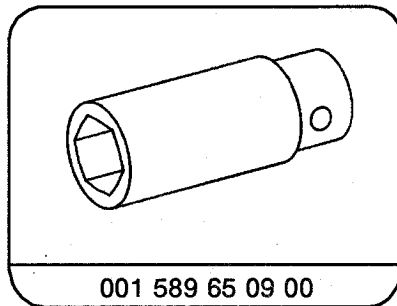
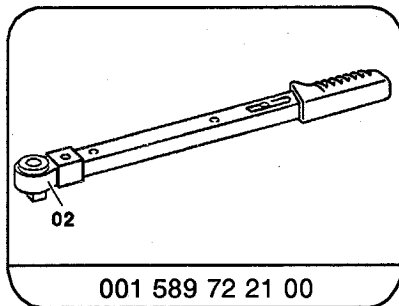
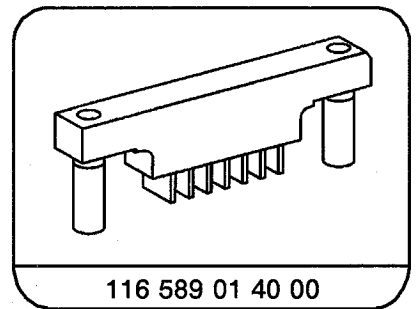
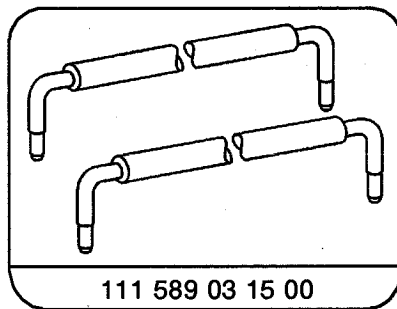
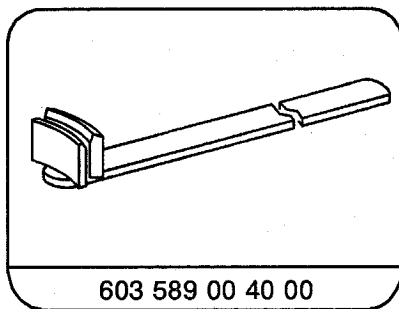
Tightening torques in Nm

Armature of camshaft adjuster	7
Nut of camshaft adjuster	65
Angle bracket to fan bearing bracket	25
Bolts of belt pulley to hub	35
Coolant pump to crankcase	21

Tightening torques in Nm

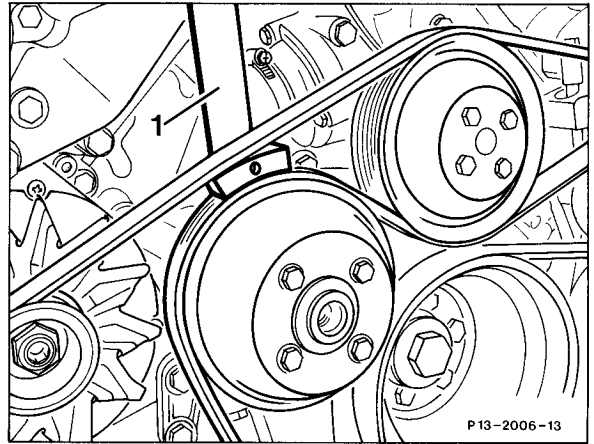
Air conditioning compressor or guide pulley to carrier	21
Bracket of air conditioning compressor to crankcase	21
Bolts of cylinder head to timing case cover	21
Radiator drain plug (reference value)	1.5-2
Belt pulley to fan carrier	10
Timing case cover to crankcase	21
Mounting bracket of alternator	21

Special tools



Removing, installing

- 1 Remove viscous fan clutch (20-3120).
- 2 Slacken bolts of fan belt pulley, using tool (1) 603 589 00 40 00 to hold tight.
- 3 Remove front covers at top (01-2120).
- 4 Remove poly V-belt and tensioning device (13-3450).

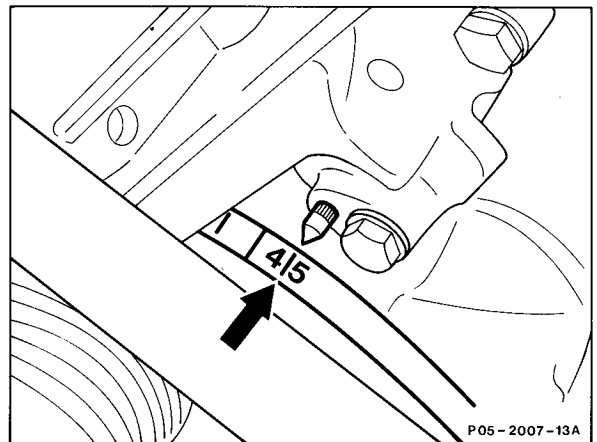


- 5 Set engine to 45° before ignition TDC at No. 1 cylinder.

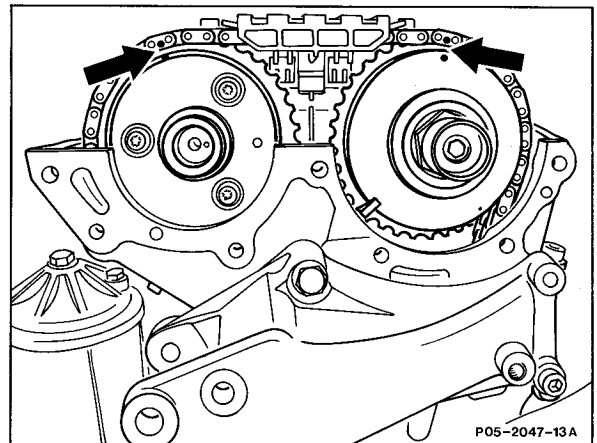
- 6 Unscrew bottom engine compartment lining (Maintenance Manual 6190).

- 7 Unscrew left exhaust pipe and cover of starter mounting.

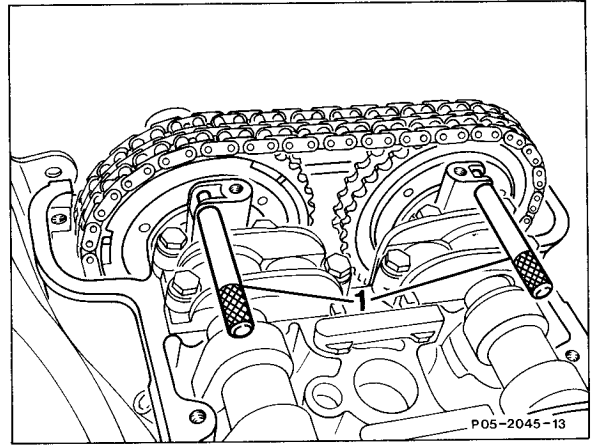
- 8 Use locking tool 116 589 01 40 00 to prevent engine from turning.



- 9 Mark all four camshaft timing gears and the timing chain with coloured dots (arrows).



10 Secure all camshaft gears on left and right side with pins (1) 111 589 03 15 00 to prevent them turning.

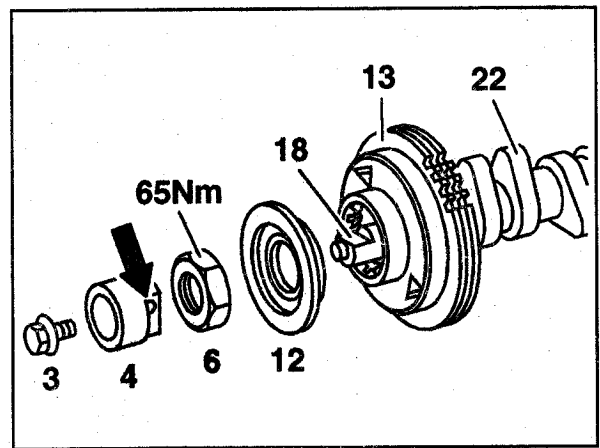


11 Unscrew armature (4) of camshaft adjuster.

Installation note

The roll pin (arrow) in the armature (4) must be aligned with the flat face on the timing plunger (18).

12 Slacken nut (6) on left and right camshaft adjuster.



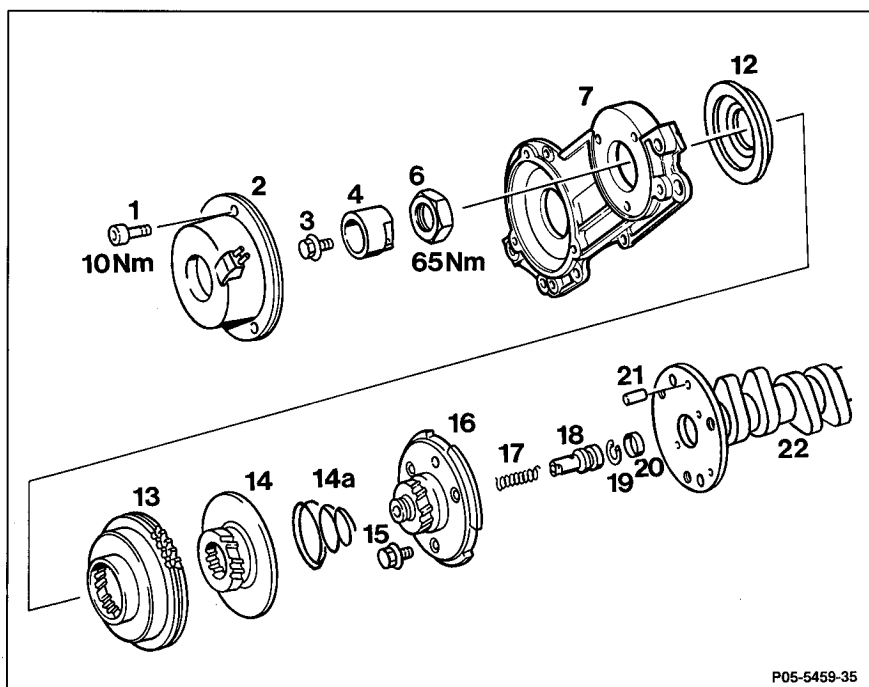
13 Remove alternator together with carrier.

Installation instruction

The bolts must be coated with sealant when fitted.

14 Remove chain tensioner (05-3100).

15 Remove top slide rails (05-3350).



P05-5459-35

16 Detach both camshaft adjusters by unscrewing nut (6) and raising timing chain. Take off cover with ring (12) and camshaft gear (13) together with adjusting piston (14) and spring (14a).

Installation Instruction

Fit timing chain onto the markings beginning at the left exhaust camshaft.

17 Drain coolant at radiator (20-0100).

18 Remove coolant hoses at the fan carrier and thermostat housing.

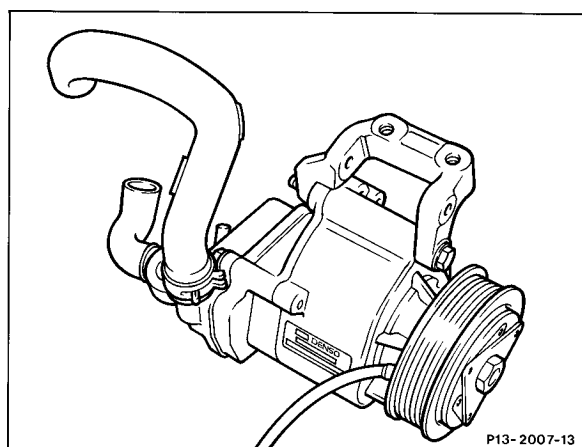
19 Unscrew belt pulley of fan carrier.

20 Unscrew air pump with angle bracket and take off.

Installation instruction

Install angle bracket free of tension.

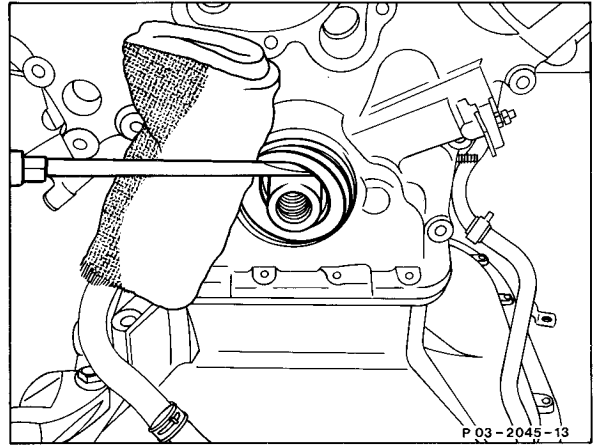
21 Unscrew fan carrier from crankcase.



P13-2007-13

22 Remove belt pulley together with vibration damper, hub and seal (03-3420).

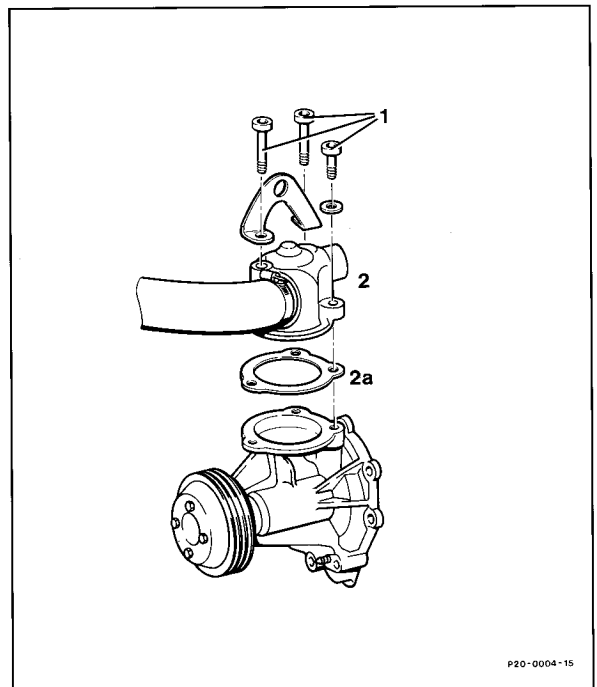
23 Remove radial seal (03-3240).



24 Unscrew bolts (1), take off cover (2) of coolant pump with engine lifting eye.

Installation instruction

Renew gasket (2a).

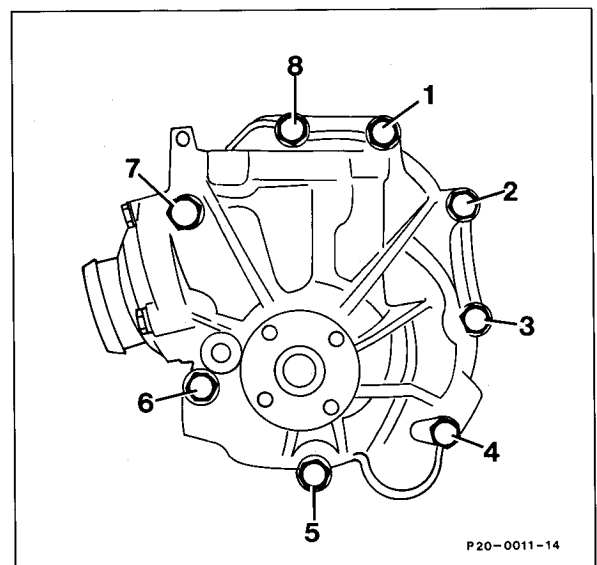


25 Unscrew coolant pump, take off.

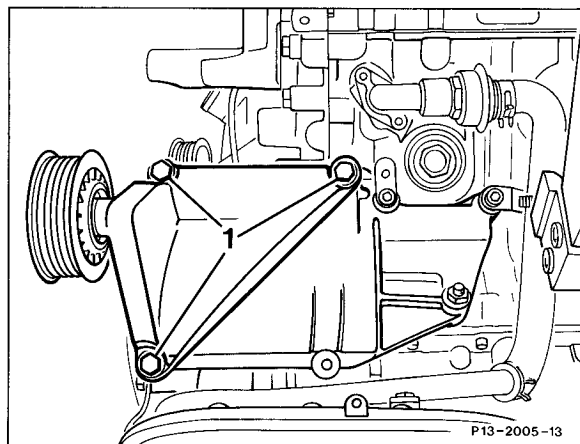
Installation instruction

Replace gasket, install bolts with washers as specified in diagram.

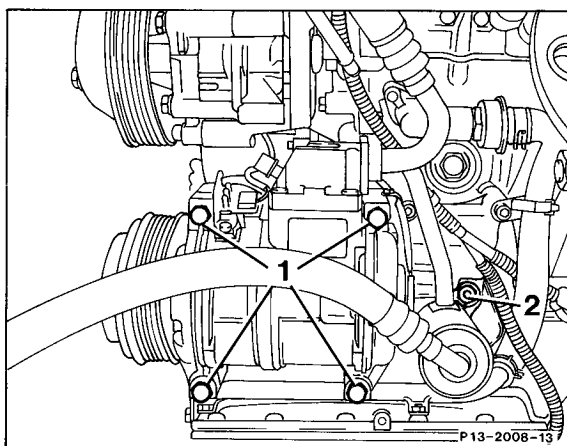
- | | |
|----------------|----------------|
| 1 Bolt M8 × 60 | 5 Bolt M8 × 60 |
| 2 Bolt M8 × 60 | 6 Bolt M8 × 90 |
| 3 Bolt M8 × 60 | 7 Bolt M8 × 35 |
| 4 Bolt M8 × 85 | 8 Bolt M8 × 65 |



26 Unscrew bolts (1) with washers. Take off carrier with guide pulley.

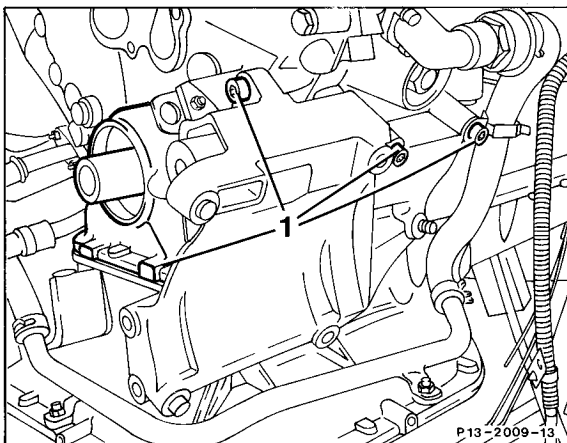


27 If air conditioning fitted: unscrew bolts (1) with washers and nut (2). Place air conditioning compressor to the side with lines connected.



28 Unscrew TDC sensor on timing case cover and take off.

29 Unscrew bolts (1) with washers, take off bracket.



30 Remove oil pump (18-2100).

31 Use a plastic-headed hammer to knock out dipstick guide tube upward.

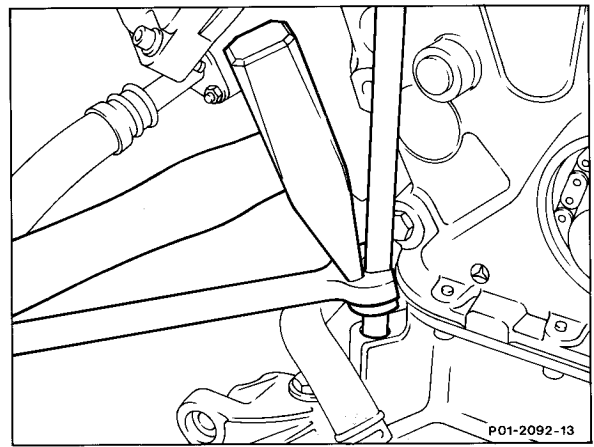
Installation instruction

Use special tool 117 589 00 31 00 to knock in dipstick guide tube.

32 Unscrew top section of oil sump and lower oil sump downward (01-3100).

33 Unscrew bolts on front of timing case cover and on cylinder head. Refer to steps 37 and 38 for bolt diagram.

Bolt diagram, see steps 38 and 39.



34 Take off timing case cover and detach the oil pump chain from the crankshaft gear when performing this step.



Do not damage cylinder head gaskets.

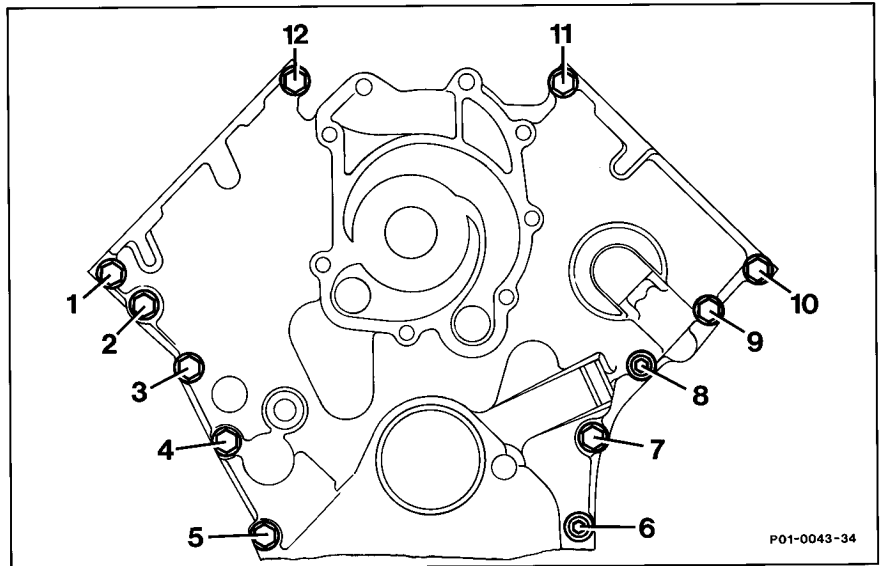
Installation instruction

Renew all four O-rings for sealing the water ducts.

35 Clean sealing surfaces and coat sealing surface of timing case cover with sealant 002 989 47 20 10.

36 Coat cylinder head gaskets with engine oil.

37 When fitting on timing case cover, fit the oil pump chain onto the crankshaft gear with a bent sheet of metal.



38 Screw on timing case cover. Install bolts with washers 1, 5, 7, 9, 10, 11 and 12 and tighten to 21 Nm.

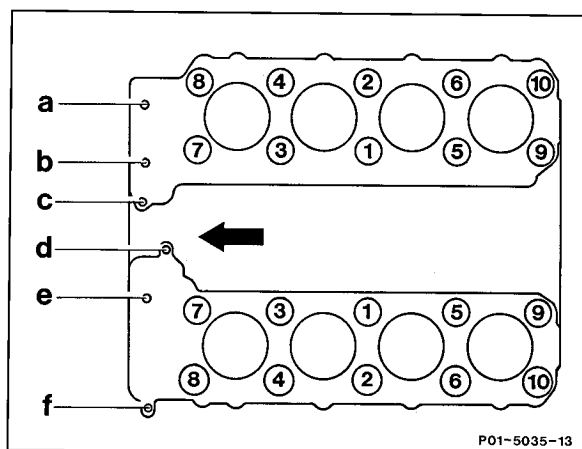
1	Bolt	M8 × 50
2	Bolt	M8 × 75
3	Bolt	M8 × 70
4	Bolt	M8 × 150
5	Bolt	M8 × 50
6	Hexagon socket bolt	M8 × 80
7	Bolt	M8 × 30
8	Hexagon socket bolt	M8 × 60
9	Bolt	M8 × 50
10	Bolt	M8 × 50
11	Bolt	M8 × 50
12	Bolt	M8 × 50

39 Tighten bolt-and-washer assemblies of cylinder heads to timing case cover as shown in diagram with a torque of 25 Nm.

- | | | |
|---|------------------------------|----------|
| a | Hexagon socket bolt + washer | M8 × 120 |
| b | Hexagon socket bolt + washer | M8 × 90 |
| c | Hexagon socket bolt + washer | M8 × 75 |
| d | Hexagon socket bolt + washer | M8 × 50 |
| e | Hexagon socket bolt + washer | M8 × 75 |
| f | Hexagon socket bolt + washer | M8 × 50 |

40 Install in the reverse order as from step 30.

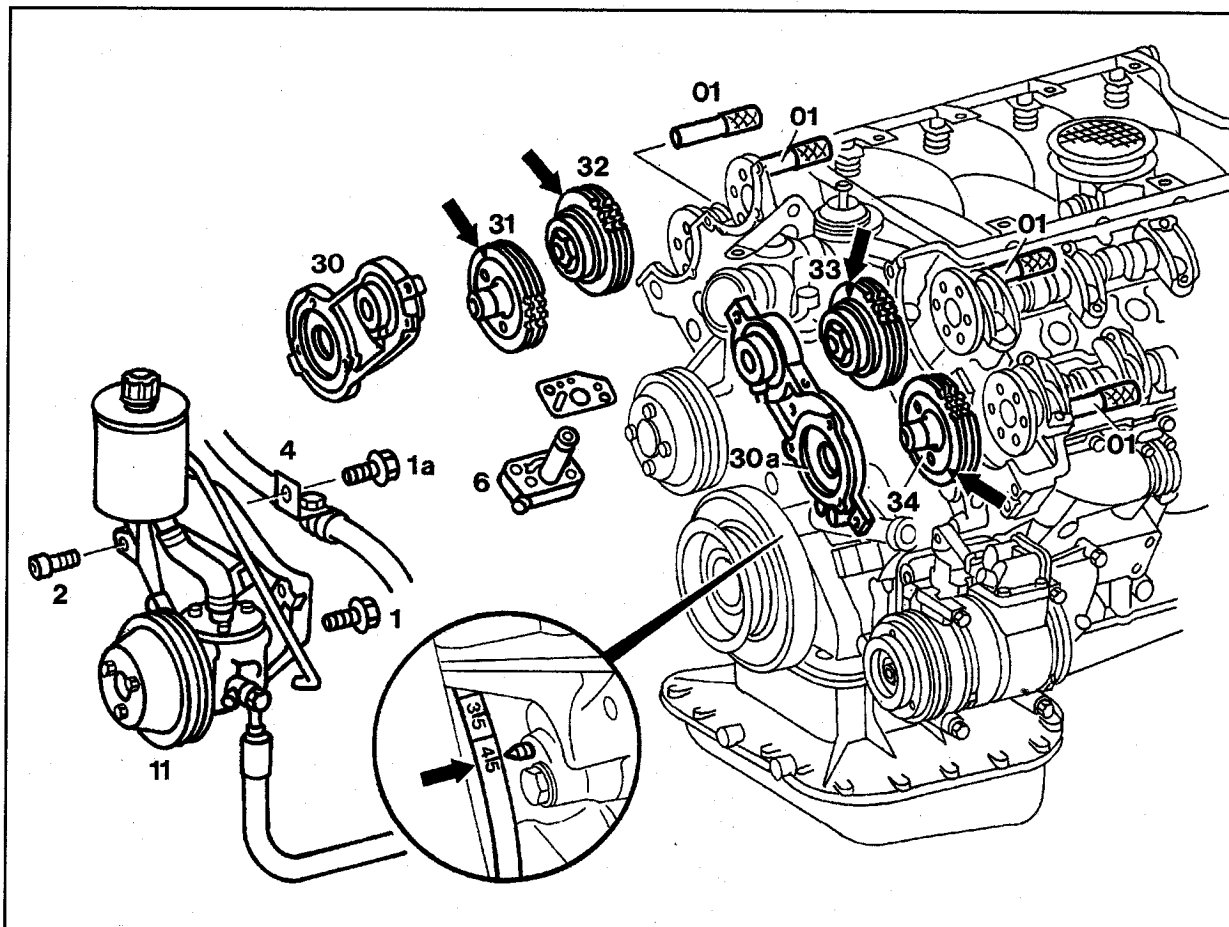
41 Check for leaks.



B. Engine 119.97/98

Preceding work:
Tensioning device removed (13-3450).
Cylinder head covers removed (01-0500).

Operation no. of operation texts and work units or standard texts
and flat rates
01-5800



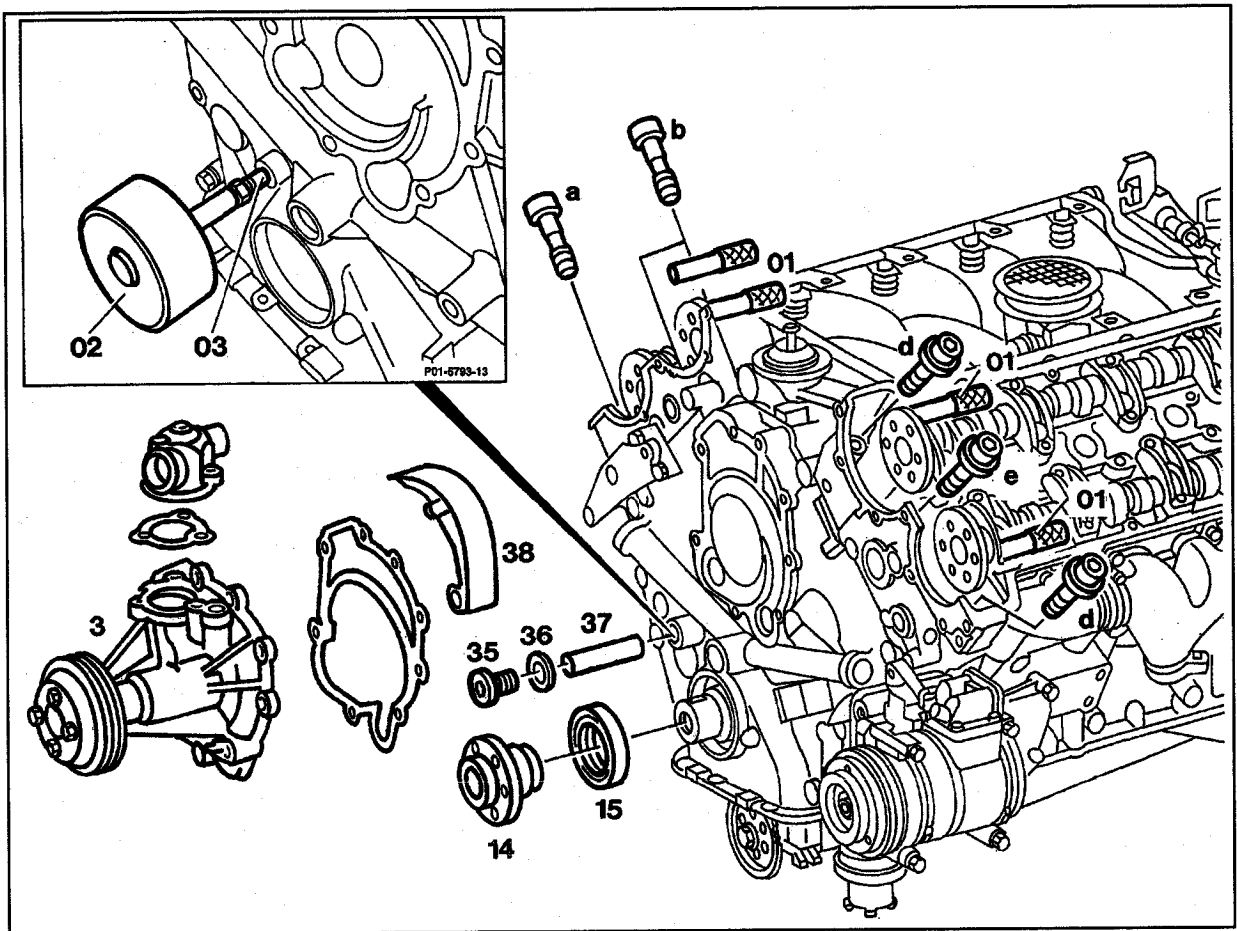
P01-5791-57

Cylinder 1	position to 45° before ignition TDC (arrow).
Camshafts	fix in position with pins (01), special tool 111 589 03 15 00.
Left cylinder head: bolts (1), (1a) and (2)	unscrew, screw on (21 Nm).
Mounting plate with power steering pump (11) and oil lines connected	place to the side, install.
Front covers at top (30) and (30a)	Installation note Coat bolt (2) with sealant 002 989 47 20 10. Engine 119.97: install bolt (1a) with retaining bracket (4) of wiring harness.
Timing chain	remove, install (01-2120). mark relative to camshaft sprockets (31), (32), (33) and (34) with coloured marking (arrows).

Chain tensioner (6)	remove, install (05-3100).
Camshaft adjusters (32), (33) and exhaust camshaft sprockets (31) and (34)	remove, install (05-2170).
Vibration damper	remove, install (03-3420).
Oil sump	detach, lower, bolt on(01-3100).



Do not damage oil sump gasket; remove oil sump, if necessary, and replace gasket (01-3100).



P01-5792-57

- a M8×120 hexagon socket fit collar bolt or M8×120 bolt+washer
- b M8×74 hexagon socket fit collar bolt or M8×74 bolt+washer
- d M8×50 hexagon socket bolt+washer
- e M8×75 hexagon socket bolt+washer

Coolant pump (3)	remove, install (20-2100).
Screwplug (35) with seal (36)	unscrew, screw on (15 Nm).

Installation note

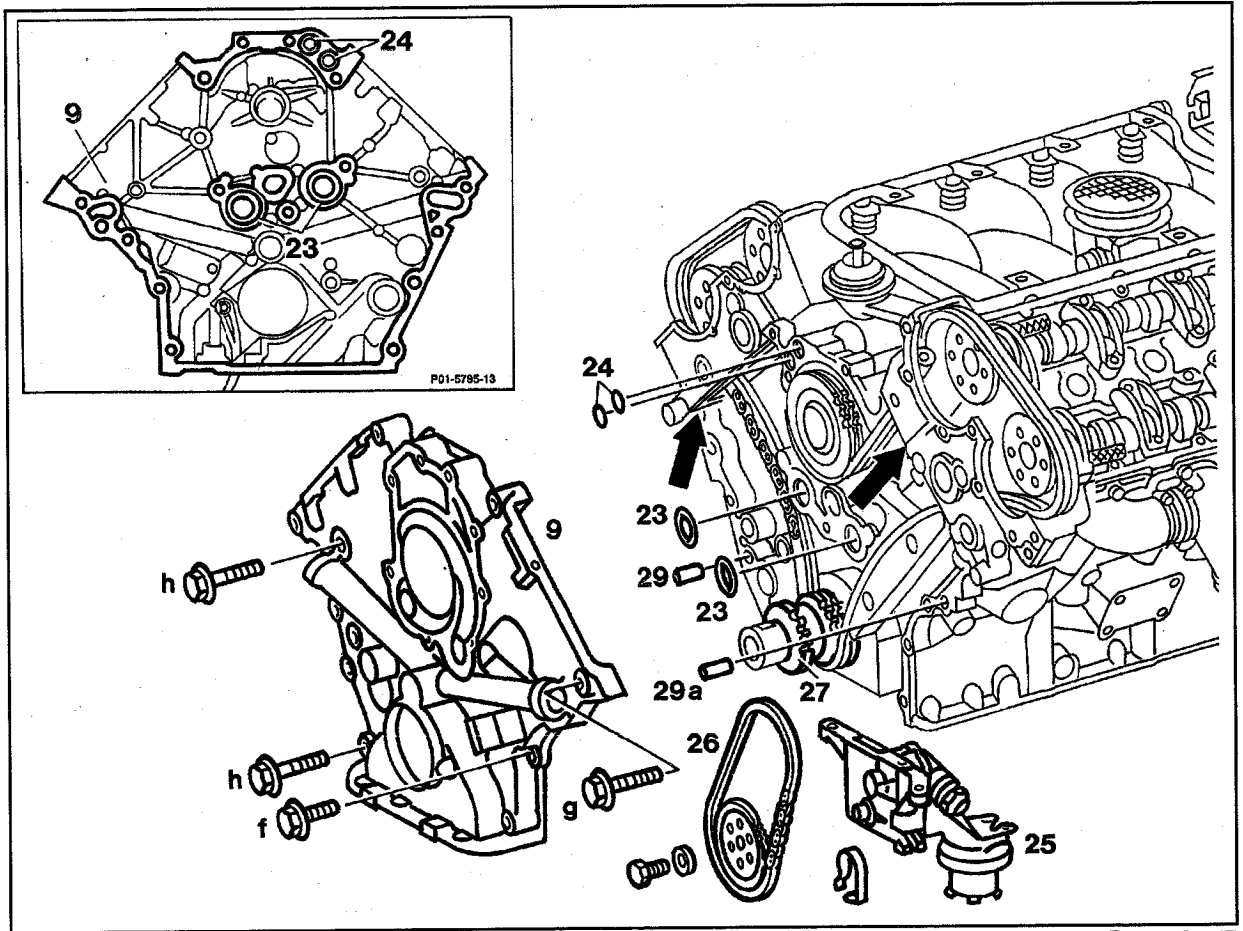
Replace seal (36) according to condition.

- Tensioning rail pin (37) remove with impact puller (02) and threaded insert (03), special tools 116 589 20 33 00 and 116 589 01 34 00.
- Tensioning rail (38) remove, install.
- Fit collar bolts (a) and (b) and bolts (d) and (e) of timing case cover unscrew, screw on (21 Nm).

Note

When performing repairs, fit collar bolts or the bolts + washers should be installed depending on the bolts fitted previously.

On engines 119.98, the center bolts (b and e) are discontinued; if the timing case cover is replaced on engines 119.97, it should be bolted on to the left and right cylinder head with two bolts each.



- f M8 x 30 bolt + washer
- g M8 x 40 bolt + washer
- h M8 x 50 bolt + washer

Front crankshaft radial seal (15)	remove, replace (03-3240).
Oil pump (25)	remove, install (18-2100).
Bolts (f), (g) and (h) at front of timing case cover (9)	unscrew, screw on (21 Nm).
Timing case cover (9)	take off, fit on.

Note

Use a bent piece of metal to detach oil pump chain (26) at the crankshaft sprocket (27) and attach.

Replace front crankshaft radial seal (03-3240).



Do not damage cylinder head gaskets (arrows).

O rings (23) and (24) for sealing the coolant ducts	replace.
Sealing surfaces	clean.
Sealing surfaces	coat with sealant 002 989 47 20 10
Cylinder head gaskets (arrows)	coat with engine oil.
Dowel sleeve (29) and dowel pin (29a)	note.
Leaks	check with engine running.

Special tools

