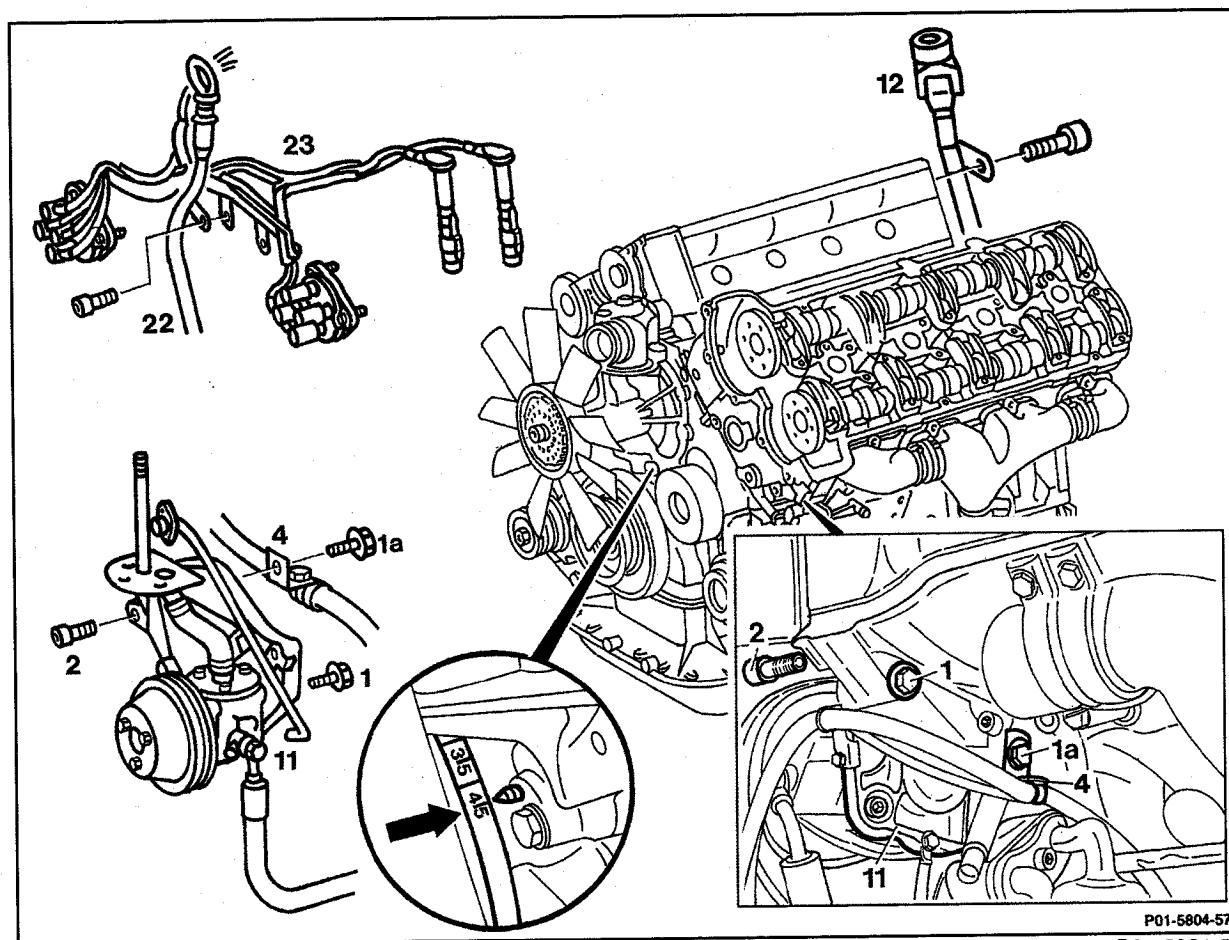


01-4150 Removing and installing cylinder heads

Preceding work:
Coolant drained (20-0100).
Cylinder head covers removed (01-0500).

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

A. Models 124, 140, 210



P01-5804-57
P01-5804-57

Intake manifold	remove, install.
Front cover at cylinder head to be removed	remove, install (01-2120).
Guide rail of cylinder head at cylinder head to be removed	remove, install (05-3350).
Camshaft adjuster at cylinder head to be removed	remove, install (05-2170).
Left cylinder head: bolts (1), (1a) and (2)	unscrew, screw on (21 Nm).

Retaining plate with power steering pump (11)
and oil lines connected place to the side, install.

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.

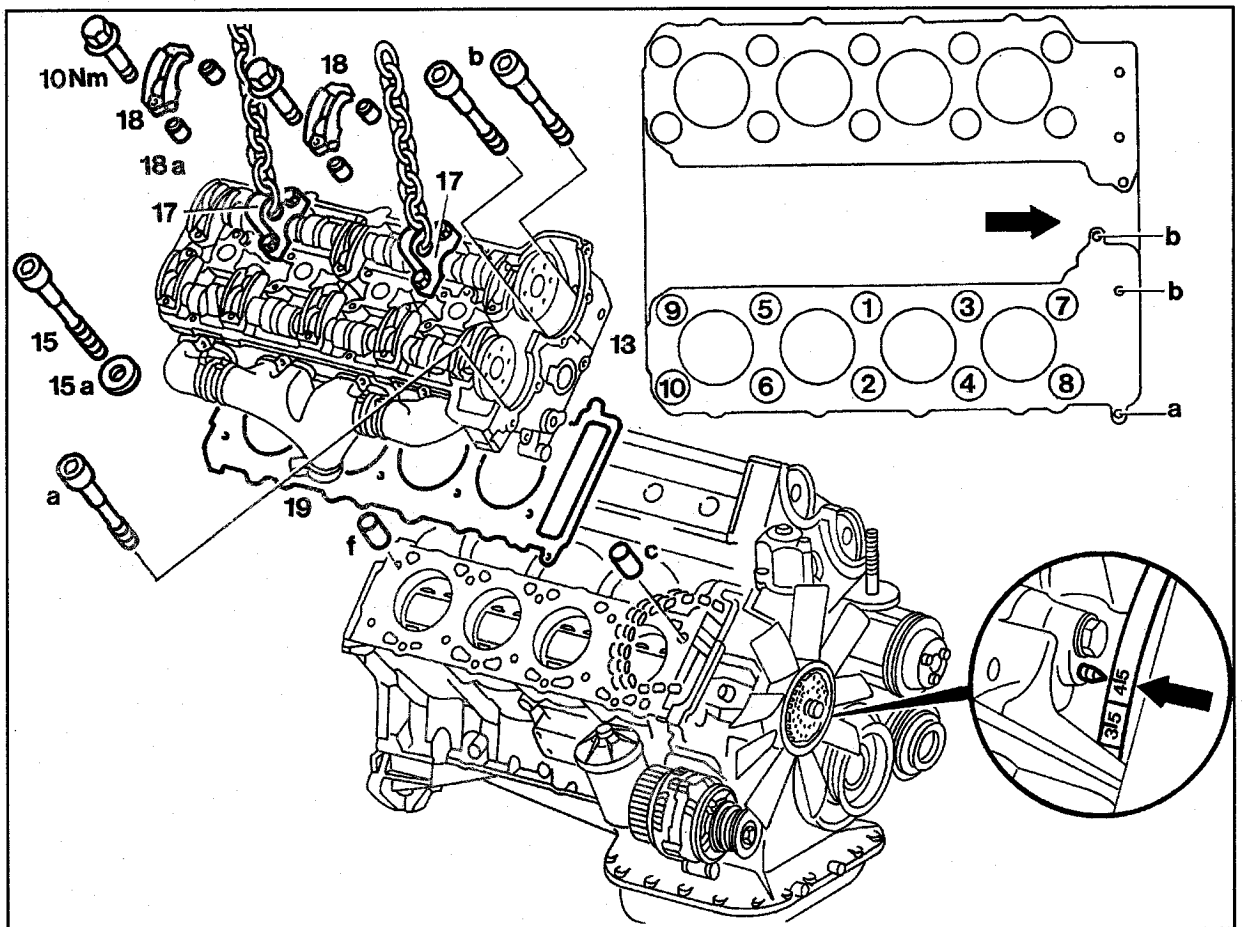
Right cylinder head: dipstick guide tube (22) unbolt, bolt on.

Guide rail (23) for ignition cables remove, install.

Right cylinder head: dipstick guide tube (12),
automatic transmission unbolt, bolt on.

Front exhaust system at exhaust manifold unbolt, bolt on (49-0170).

Right cylinder head

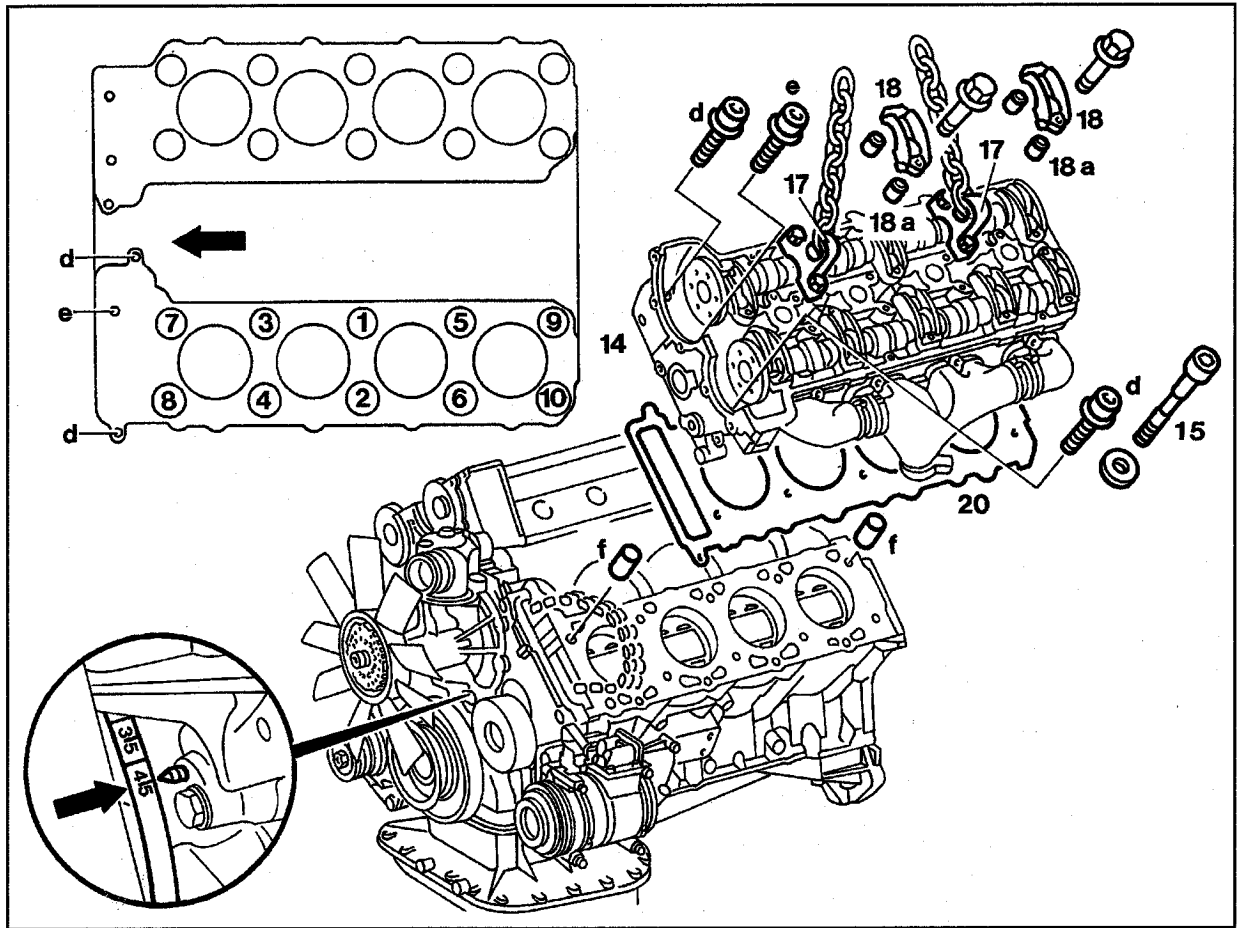


P01-5805-57

- a M8 x 120 hexagon socket fit collar bolt or bolt + washer
- b M8 x 74 hexagon socket fit collar bolt or bolt + washer

- c Roll pin
- f Dowel sleeve

Left cylinder head



P01-5806-57

- d M8 × 50 hexagon socket bolt + washer
- e M8 × 75 hexagon socket bolt + washer
- f Dowel sleeves

Right-hand cylinder head: fit collar bolts or bolts + washers (a) and (b) to timing case cover

unscrew, screw on (25 Nm).

Note:

When performing repairs, install fit collar bolts or the bolts + washers depending on the bolts used previously.

Left-hand cylinder head: bolts (d) and (e) to timing case cover

unscrew, screw on (25 Nm).

Cylinder head bolts when engine cold slacken with screwdriver bit in stages in reverse order of tightening diagram, beginning with 10, remove, special tool 119 589 00 10 00.

Note

Models 124, 140: cylinder head bolt 10 cannot be removed with cylinder head installed; for this reason, raise and secure.

Model 210: cylinder head bolts 9 and 10 of both cylinder heads cannot be removed with cylinder head installed; for this reason, raise and secure. On "closed-deck" crankcases, the cylinder head bolts installed have different lengths; refer to bolt diagram.

First and fourth camshaft bearing caps (18) of inlet camshaft
Bracket (17)

slacken, unscrew.
bolt on with bearing cap bolts and dowel sleeves (18a) instead of first and fourth camshaft bearing caps (18), unbolt, special tool 119 589 01 40 00.

Engine hoist
Cylinder heads (13) and (14)
Cylinder head contact surface
Tapped holes of cylinder head bolts

attach to bracket (17).
raise, remove.
examine (01-4180).
clean.



Free of oil and water.

Cylinder head gaskets (19) and (20)

replace.



The cylinder head gasket is not watertight until the engine has reached normal operating temperature, in other words until a swelling process has taken place. For this reason, the cooling system must not be pressure-tested until after the engine has reached normal operating temperature.

Cylinder heads (13) and (14)
Dowel sleeves (f) or roll pins (c)
Cylinder head bolts (15)

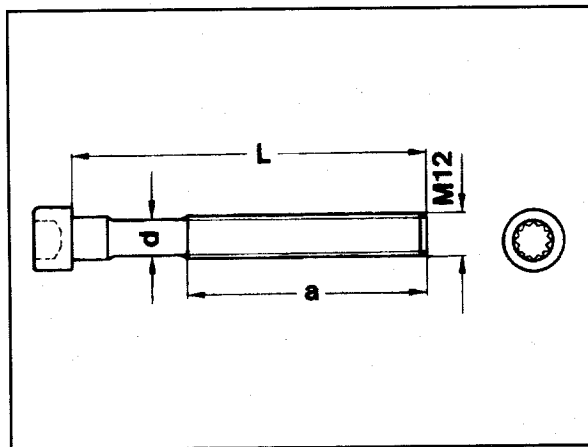
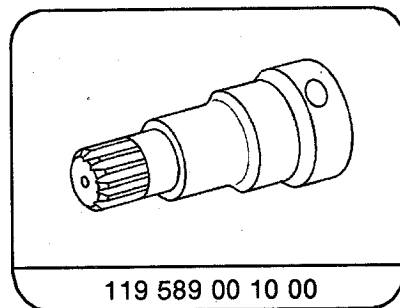
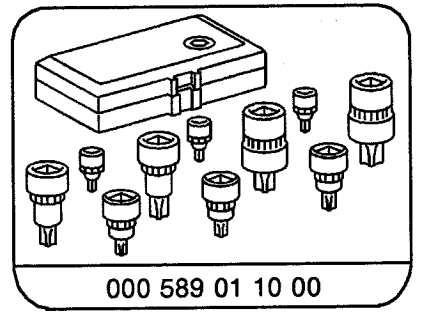
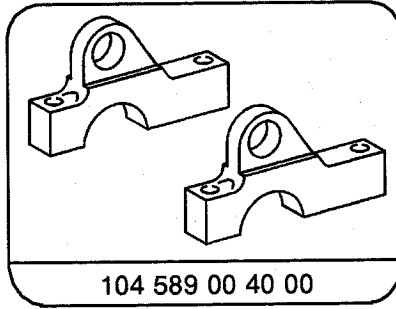
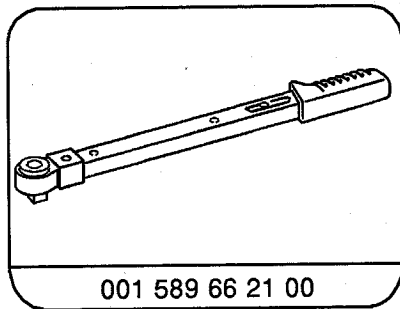
install.
note.
examine.

Note

The cylinder head bolts (15) are subjected to a certain permanent stretch each time they are tightened. If the maximum length is exceeded (see table), the bolts should be replaced with new ones.

- | | |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Cylinder head bolts (15) | oil at thread and at contact surface of bolt head. |
| Cylinder head bolts (15) with washers (15a) | insert. |
| Cylinder head bolts | tighten in stages in sequence of tightening diagram, beginning with 1. Tightening torques see table. |

Special tools



P01-0072-13

Cylinder head bolts (twelve-point socket with "closed-deck")

Thread Ø	D		M12
Stretch shank Ø	d	when new	10.75 ± 0.05 mm
Thread length	a		135 mm
Bolt length	L	when new	160 ± 0.8 mm
		max. bolt length	162.70 mm

Cylinder head bolts (twelve-point socket with "open-deck")

Thread Ø	D		M12
Stretch shank Ø	d	when new	10.75 ± 0.05 mm
Thread length	a	short bolt	135 mm
		long bolt	190 mm
Bolt length	L	when new	
		short bolt	160 ± 0.8 mm
		long bolt	218 ± 0.9 mm
		max. bolt length	
		short bolt	162.70 mm
		long bolt	221.60 mm

Tightening torques in Nm and tightening angle

Cylinder head bolts, engine cold ¹⁾	1st stage	55
	2nd stage	90° tight. angle
	3rd stage	90° tight. angle
Bolts of camshaft bearing caps	M7	15
Bolts of cylinder head timing case cover	M8	25

¹⁾ Moisten washers and thread and contact surface of bolts with oil before installing.

Bolt diagram

"closed-deck"

cylinder head bolts 1 to 10 =

M12 x 160 mm

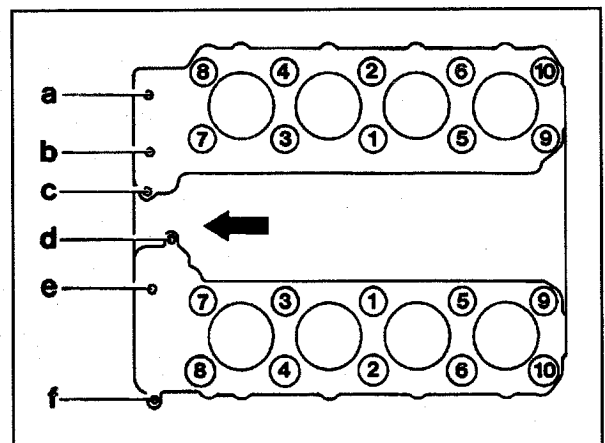
"open-deck"

cylinder head bolts 1, 3 and 5 =

M12 x 218 mm

cylinder head bolts 2, 4, 6, 7, 8, 9, 10 =

M12 x 160 mm



P01-5035-13

Note**Cylinder head bolts**

Cylinder head bolts match with washers.

"closed-deck" cylinder head bolts are phosphatized, washers chrome-plated.

"open-deck" cylinder head bolts are chrome-plated, washers are phosphatized.

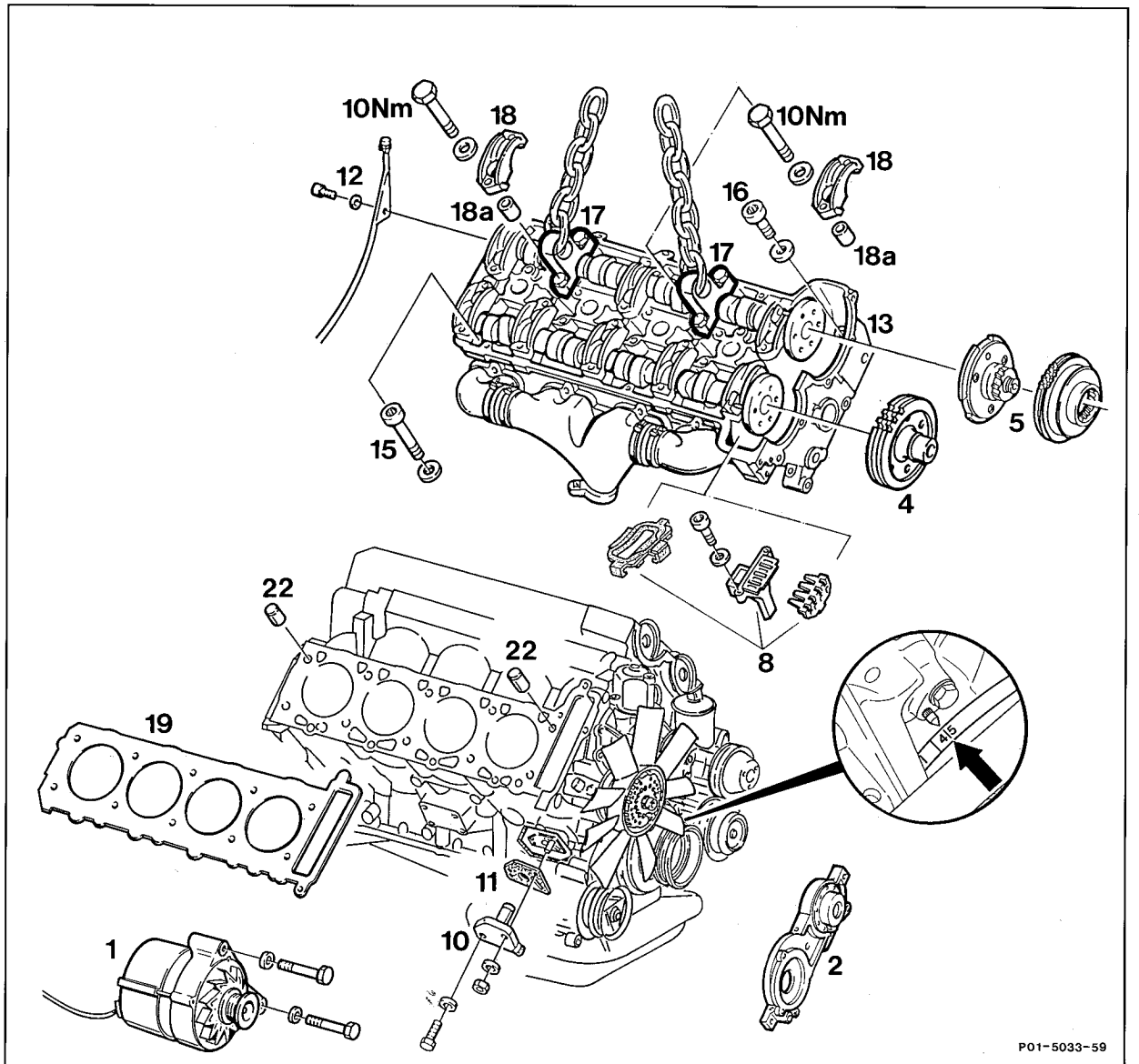
No "HELI-COIL" inserts are installed in crankcase of "open-deck" version.

HELI-COIL inserts may be used when performing repairs.

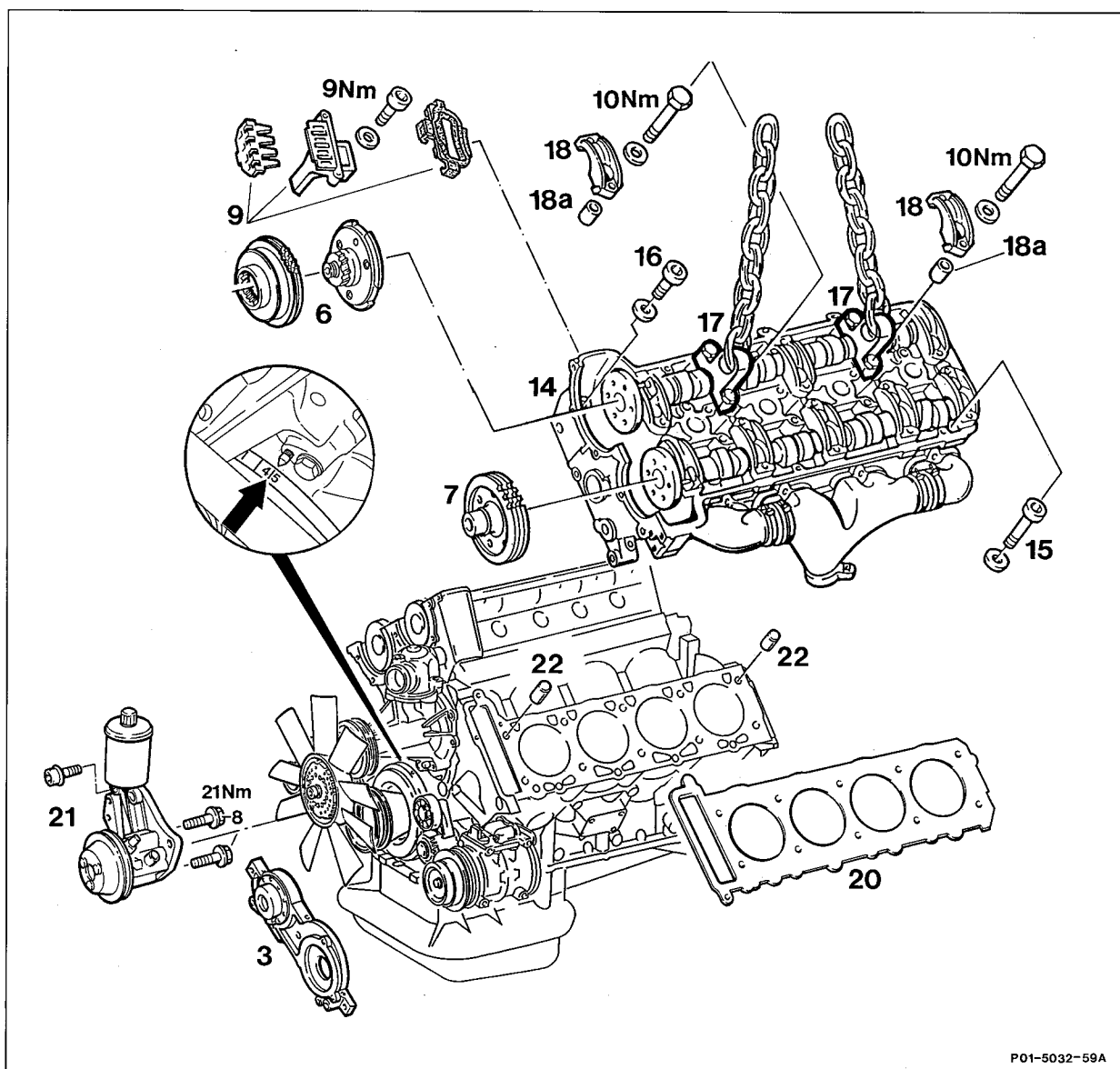
B. Model 129 with engine 119.960

Right cylinder head

Operation no. of operation texts and work units or standard texts
and flat rates
01-5800-5855



Left cylinder head



P01-5032-59A

- | | |
|---------------------------------------------------------------------------------------------------|----------------------------------------------|
| Hood | raise to vertical position (01-0080). |
| Ground cable at battery | disconnect, connect. |
| Coolant | drain, pour in (20-0100). |
| Poly V-belt | slacken, tension (13-3420). |
| Left cylinder head: power steering pump (21)
with mounting plate and lines/wiring connected .. | unbolt, place to the side, bolt on (step 5). |
| Right cylinder head: alternator (1) | unbolt, place to the side, bolt on. |
| Cylinder head covers | remove, install (01-0500). |

Front cover of cylinder head to be removed (2) or (3)	remove, install (01–2120).
Engine at cylinder 1	position to 45° before ignition TDC (step 11).
All four camshaft sprockets (4), (5), (6) and (7) together with timing chain	mark (step 12).

Installation note

Check, adjust basic setting of camshafts (05–2230).

Chain tensioner (10)	remove, install (05–3100).
Top guide rails (8) and (9)	remove, install (05–3350).
Exhaust camshaft sprockets (4) and (7) and camshaft adjusters (5) and (6) at cylinder head to be removed	unbolt, install (05–2170).
Intake manifold	remove, install (14–1310).
Left cylinder head: coolant hose at rear	detach, attach.
Right cylinder head: dipstick guide tube (12), automatic transmission	unbolt, bolt on.
Exhaust system at cylinder head to be removed (13) or (14) at exhaust manifold	unbolt, bolt on.
Exhaust system at transmission bracket	slacken, tighten.
Right cylinder head: wiring harness at bottom right	unbolt, bolt on.
Cylinder head bolts (15) and bolts of timing case cover (16) at cylinder head to be removed ..	unscrew, special tool 119 589 00 10 00 (steps 20 to 21).
Bracket (17) of special tool 119 589 01 40 00 in place of camshaft bearing cap (18) at the cylinder head to be removed	attach, detach (step 22).
Engine hoist	attach to bracket (17), detach, special tool 119 589 01 40 00.
Cylinder heads (13) and (14)	take off, fit on (step 23).
Cylinder head contact surface	examine, face (01–4180).
Tapped hose of cylinder head bolts	clean.



Free of oil and water.

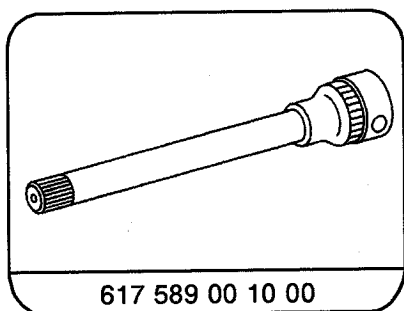
Cylinder head gaskets (19) and (20)	replace (step 26).
-------------------------------------------	--------------------



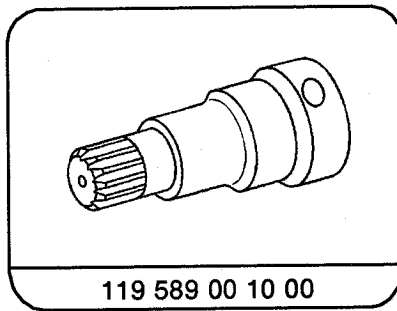
The cylinder head gasket is not watertight until the engine has reached normal operating temperature, in other words until a swelling process has taken place. For this reason the cooling system must not be pressure-tested until after the engine has reached normal operating temperature.

Cylinder head bolts (15)	examine, tighten (step 27 to 29).
--------------------------------	-----------------------------------

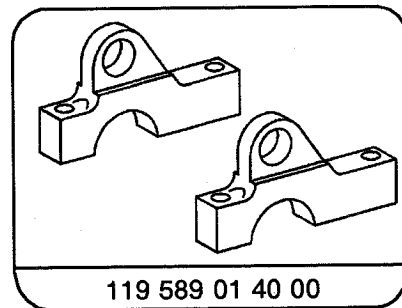
Special tools



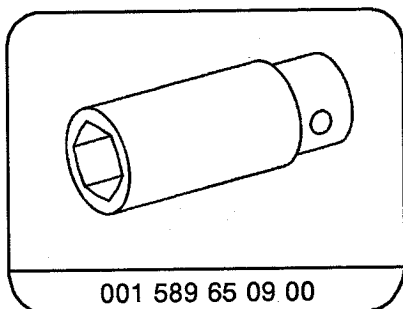
617 589 00 10 00



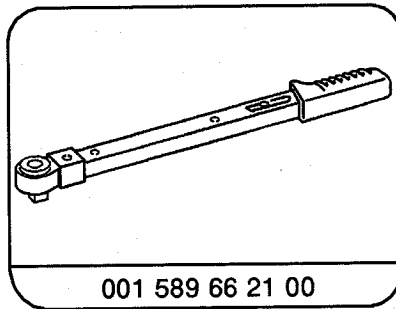
119 589 00 10 00



119 589 01 40 00



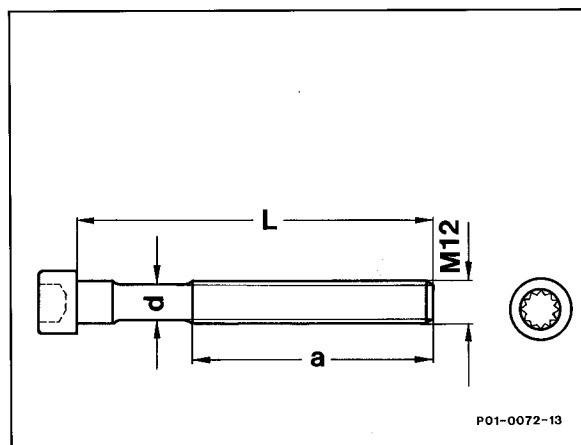
001 589 65 09 00



001 589 66 21 00

Cylinder head bolts (twelve-point socket head)

Thread dia.	D		M12
Stretch shaft dia.	d	When new	10.75 ± 0.05 mm
Length of thread	a		135 mm
Length of bolt	L	When new	160 ± 0.8 mm
		Max. bolt length	162.70 mm



Tightening torques in Nm

Cylinder head bolts, engine cold ¹⁾	1st stage	55
	2nd stage 90° angle of rotat.	
	3rd stage 90° angle of rotat.	
Bolts of cylinder head, timing case cover	M8	25
Bolts of camshaft bearing caps	M7	15

¹⁾ Moisten thread and contact surface of bolts and washers with oil before installing.

Note

Take off cylinder head together with camshafts and exhaust manifold once engine has cooled down.

Removing, installing

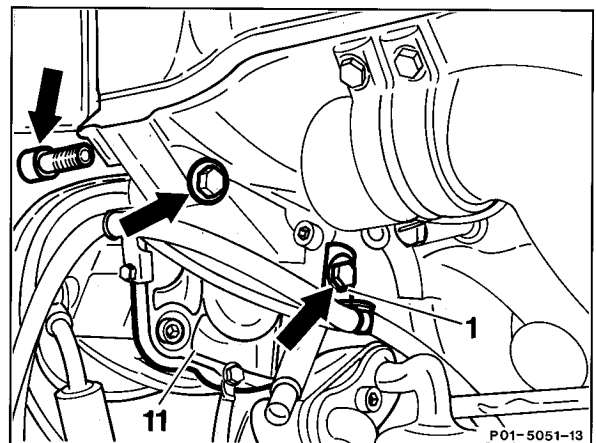
- 1 Raise hood to vertical position (01-0080).
- 2 Disconnect ground cable at battery.
- 3 Drain coolant at crankcase (20-0100).
- 4 Remove poly V-belt (13-3420).
- 5 Left cylinder head: unscrew bolts (arrows). Detach mounting plate with power steering pump (11) from tensioning device and place to the side with lines/wiring connected.

Installation note

The bolt which is screwed into the cylinder head from the front must be coated with sealant when installed.

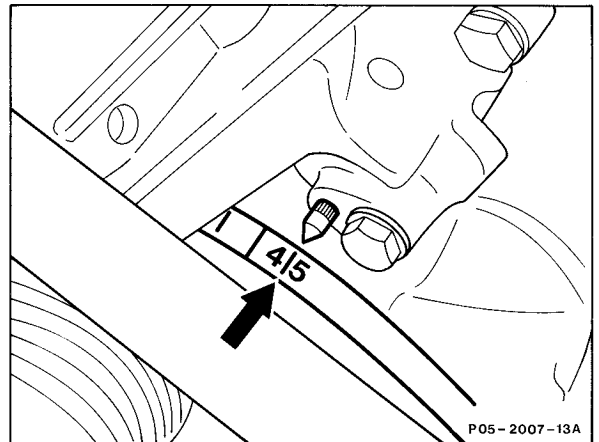
Pay attention to angle bracket (1) of wiring harness.

- 6 Right cylinder head: unbolt alternator from bracket and place to the side with wiring connected and secure.



- 7 Remove cylinder head covers (01-0500).
- 8 Remove front cover of cylinder head to be taken off (01-2120).

9 Rotate engine at cylinder 1 to 45° before ignition TDC.

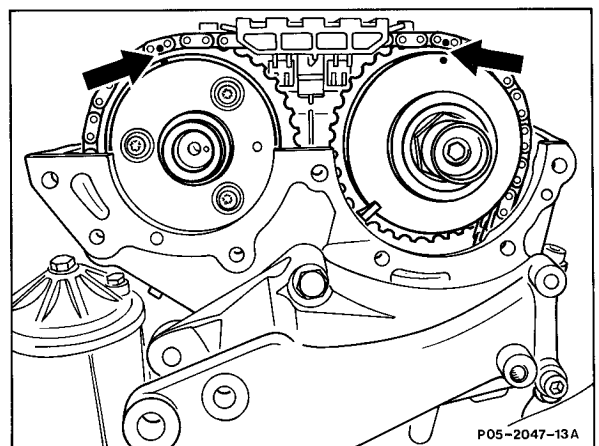


10 Mark all four camshaft sprockets and the timing chain with coloured dots (arrows).

Installation note

Examine, adjust basic setting of camshafts (05-2230).

- 11 Remove chain tensioner (05-3100).
- 12 Remove top guide rails (05-3350).
- 13 Unbolt exhaust camshaft sprockets and camshaft adjusters at the cylinder head to be removed (05-2170).



14 Remove intake manifold (14-1310).

15 Left cylinder head: detach coolant hose at the rear.

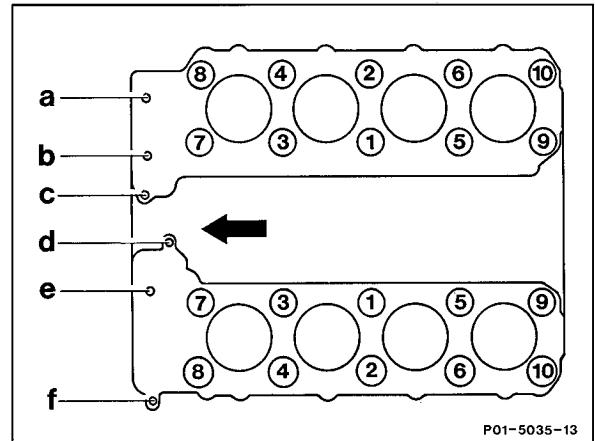
16 Right cylinder head: unbolt dipstick guide tube at rear of automatic transmission.

17 Unbolt exhaust system at the cylinder to be removed at exhaust manifold.

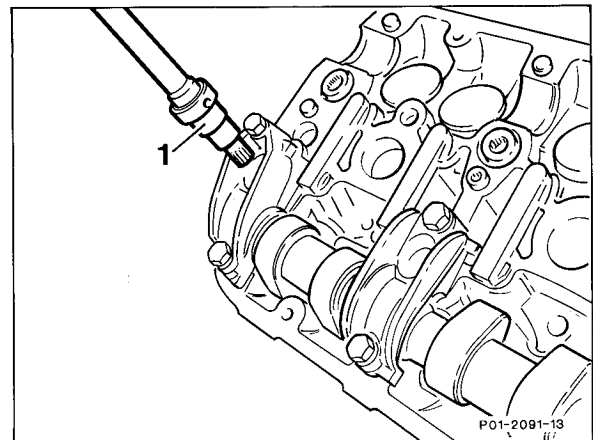
18 Detach exhaust system at transmission bracket.

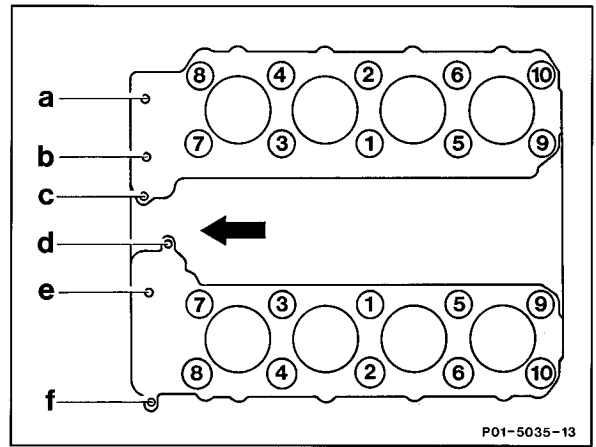
19 Right cylinder head: unbolt wiring harness at bottom right.

20 Unscrew bolts + washers (a), (b), (c), (d), (e), (f) of cylinder head to be removed.

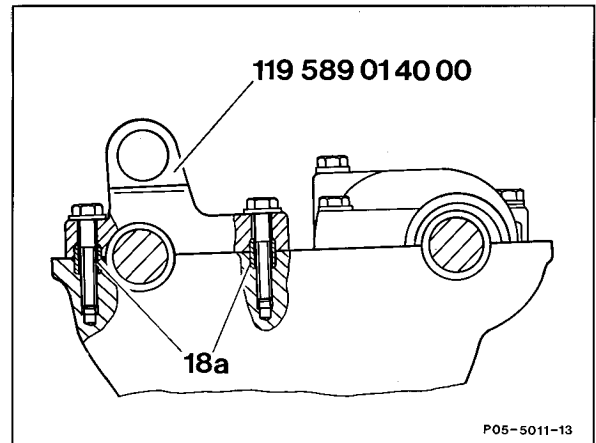


21 Slacken cylinder head bolts at the cylinder head to be removed with screwdriver insert (1) 119 589 00 10 00 in stages in reverse order of tightening diagram, beginning with 10, when engine cold.





22 Install bracket 119 589 01 40 00 at the cylinder heads to be removed. To do this, unbolt second and fourth camshaft bearing caps of the inlet camshaft at the right and left cylinder head, respectively, and install bracket with dowel sleeves (18a).



23 Attach engine hoist to bracket, raise cylinder heads and remove.



Do not damage guide rails and pay attention to exhaust manifold.

24 Examine cylinder head contact surface, face (01-4180).

25 Clean tapped holes of cylinder head bolts.



Free of oil and water.

01.1313-4150/15

26 Replace cylinder head gaskets.



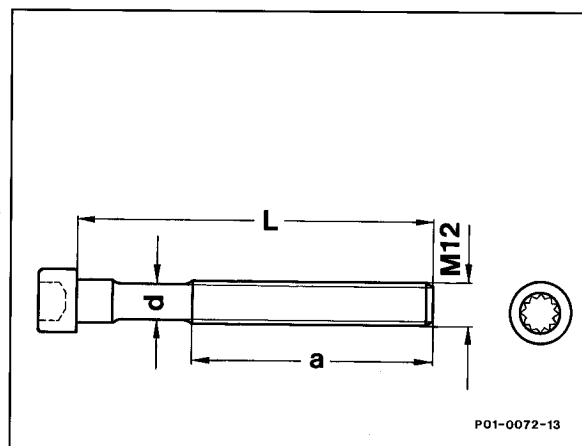
The cylinder head gasket is not watertight until the engine has reached normal operating temperature, in other words until a swelling process has taken place. For this reason, the cooling system must not be pressure-tested until after the engine has reached normal operating temperature.

Installation note

Pay attention to dowel sleeves or roll pins for fixing cylinder head in position on crankcase.

27 Examine cylinder head bolts. The cylinder head bolts are subject to a permanent stretch each time they are tightened. If the maximum length (L) of 162.70 mm is reached or exceeded before re-using, replace the bolts with new ones.

28 Oil the thread of the cylinder head bolts and the contact surface of the bolt heads and insert.



29 Tighten cylinder head bolts in stages in the order of the tightening diagram, beginning with 1.

1st tightening stage 55 Nm.

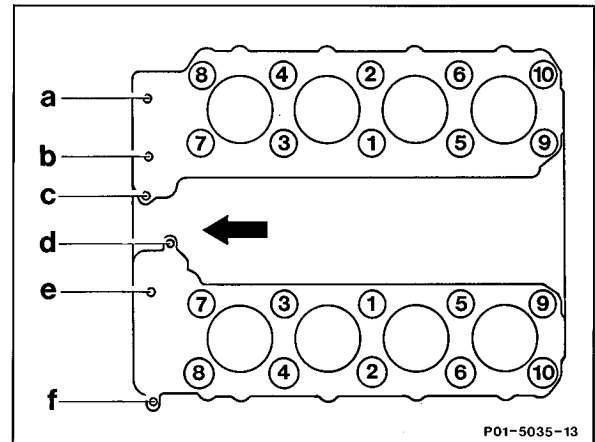
2nd tightening stage 90° angle of rotation.

3rd tightening stage 90° angle of rotation.

Installation note

Tighten bolts + washers according to diagram to 25 Nm once the intake manifold is installed.

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



30 Install in the reverse order.