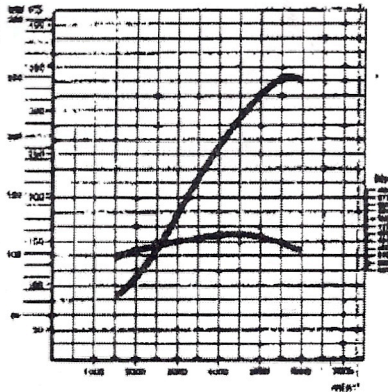
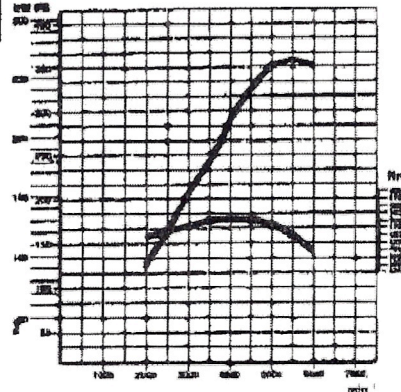
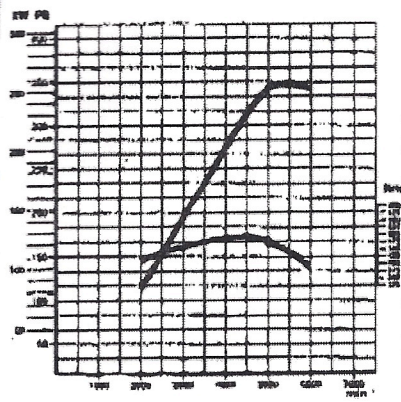
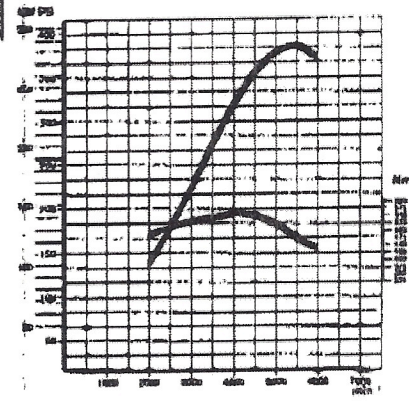


TECHNICAL DATA

Engine	AMG M117 - 5,01 - 4V	AMG M117 - 5,61 - 4V
working method	four-stroke - Otto w/KE-fuel injection	four-stroke - Otto w/KE-fuel injection
No. of cylinders	8	8
cylinder positioning	V-shaped 90°	V-shaped 90°
bore	96,5 mm	96,5 mm
stroke	85 mm	94,8 mm
total engine capacity	4973 cm ³	5547 cm ³
compression ratio	9,8 : 1	9,8 : 1
firing order	1-5-4-8-6-3-7-2	1-5-4-8-6-3-7-2
max. revolutions/min.	6000 rpm	6000 rpm
nominal output at rpm	250 KW (340 PS) 5750	265 KW (360 PS) 5500
nominal torque at rpm	457 Nm 4500	510 Nm 4000
power + torque curves		

TECHNICAL DATA

Engine	AMG M117 - 6,0l - 4V with catalyst	AMG M117 - 6,0l - 4V without catalyst
working method	four-stroke - Otto w/KE-fuel injection	four-stroke - Otto w/KE-fuel injection
No. of cylinders	8	8
cylinder positioning	V-shaped 90°	V-shaped 90°
bore	100 mm	100 mm
stroke	94,8 mm	94,8 mm
total engine capacity	5953 cm ³	5953 cm ³
compression ratio	9,8 : 1	9,8 : 1
firing order	1-5-4-8-6-3-7-2	1-5-4-8-6-3-7-2
max. revolutions/min.	6000 rpm	6000 rpm
nominal output at rpm	257 KW (350 PS) 5500	283 KW (385 PS) 5500
nominal torque at rpm	500 Nm 4500	566 Nm 4000
power + torque curves		

TECHNICAL DATA**INSTALL CAMSHAFTS****Valve timing in degrees (°) crank angle, for 2 mm valve stroke**

AMG Engine	Intake Valve		Exhaust Valve	
	opens after TDC	closes after BDC	opens before BDC	closes before TDC
5,0l - 4V	8°	32°	32°	8°
5,6l - 4V	8°	32°	32°	8°
6,0l - 4V	8°	32°	32°	8°

Valve clearance in mm, for cold engine (20°)

Intake	0,20 - 0,25
--------	-------------

Exhaust	0,30 - 0,35
---------	-------------

Tightening torques**Nm**

screws for valve cover

8

screws for camshaft sprocket wheels

80

chain tensioner on the cylinder head

25

union nut for chain tensioner

90



INSTALL. INSTRUCTIONS M117 - 4V GRUPPE 01.21.1

TECHNICAL DATA

REMOVE CYLINDER HEADS

Tightening torques

Nm

cylinder head screws	1st stage	40
	2nd stage	50
	setting period	10 minutes
	3rd stage	60
cylinder head screws	M8	25
screws for valve cover		8
screws for camshaft sprocket wheels		80
chain tensioner on the cylinder head		25
union nut for chain tensioner		90

Special tools

screw driver socket B	8 mm	1/2"	bent
screw driver socket A	8 mm	3/8"	100 mm long
screw driver socket C	6 mm	3/8"	220 mm long
screw driver socket D	5 mm	3/8"	160 mm long
screw driver socket E	4 mm	3/8"	55 mm long
bolt removing tool I	pivot pin		116 589 20 33 00
threaded bolt J	M6 x 100		100 589 00 34 00
wrench socket K	27 mm	1/2"	001 589 65 09 00

TECHNICAL DATA**INSTALL CYLINDER HEADS**

Tightening torques		Nm
cylinder head screws	1st phase	40
	2nd phase	50
	setting period	10 minutes
	3rd phase	60
cylinder head screws	M8	25
screws for valve cover		8
screws for camshaft sprocket wheels		80
chain tensioner on the cylinder head		25
union nut for chain tensioner		90

Special tools

screw driver socket A	8 mm	3/8"	100 mm long
screw driver socket B	8 mm	1/2"	bent
screw driver socket C	6 mm	3/8"	220 mm long
screw driver socket D	5 mm	3/8"	160 mm long
screw driver socket E	4 mm	3/8"	55 mm long

1.4 Tightening sequence for the cylinder head screws

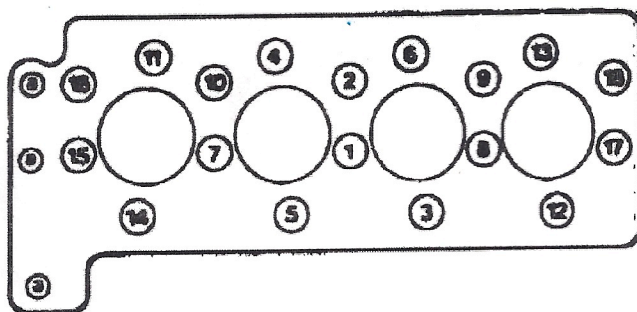


diagram 8

cylinder head right

Note:

screws 3, 5, 12 and 14 in intake port (picture 9)
screws 4, 6, 11 and 13 in exhaust port (picture 10)

1.5 Tightening torques in Nm

Engine AMG - M117 - 4V		M117 5.01	M117 5.61	M117 6.01
cylinder head screws (allen screws)	1st stage	40	40	40
	2nd stage	50	50	50
	setting period	10 minutes		
	3rd stage	60	60	60
all screws "a"	(M 8)	25	25	25

Note:

Tighten screws "a" last with the given torque.

2.5 Tightening sequence for the cylinder head screws

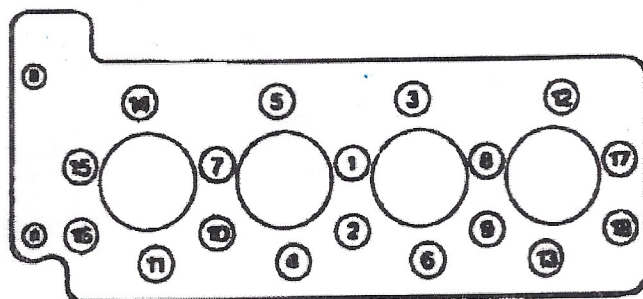


diagram 14

cylinder head left

Note:

screws 3, 5, 12 and 14 in intake port (picture 15)

screws 4, 6, 11 and 13 in exhaust port (picture 16)

2.6 Tightening torques in Nm

Engine AMG - M117 - 4V		M117 5.01	M117 5.61	M117 6.01
cylinder head screws (allen screws)	1st stage	40	40	40
	2nd stage	50	50	50
	setting period	10 minutes		
	3rd stage	60	60	60
all screws "a"	(M 8)	25	25	25

Note:

Tighten screws "a" last with the given torque.

D. SETTING OF CAMSHAFT BASIC POSITION

1. Setting of camshaft basic position on left side of engine

1.1 The first cylinder is positioned at TDC.

1.2 It is the position of the bucket tappets of the 6th cylinder that is measured.

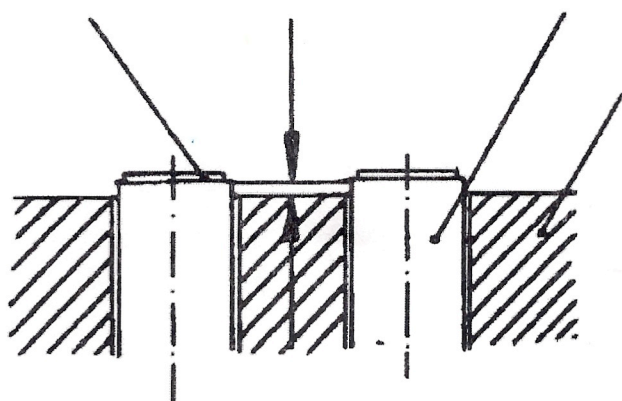


diagram 22

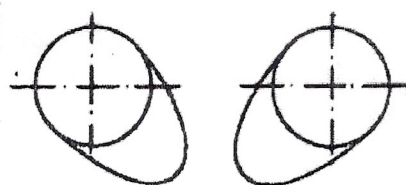
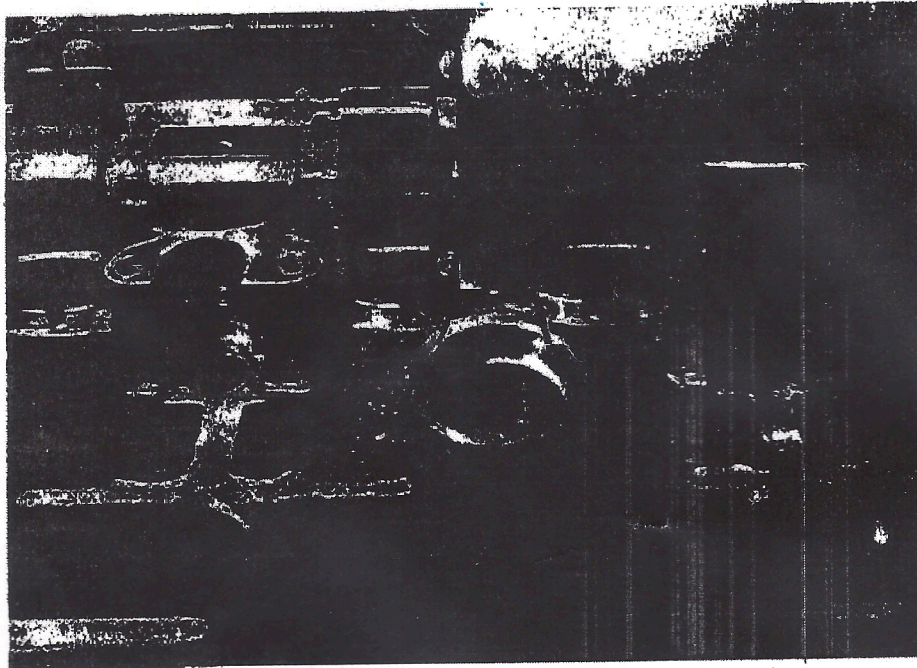


diagram 23

1.3 The value h should be for the

- exhaust camshaft: $\overset{0,7}{\cancel{5,9}} \text{ mm}$
- intake camshaft: $\overset{0,9}{\cancel{5,2}} \text{ mm}$

- 1.4 To obtain the value h the caliper square is to be placed on the edge (not on the shims) of the two bucket tappets (picture 24).



picture 24

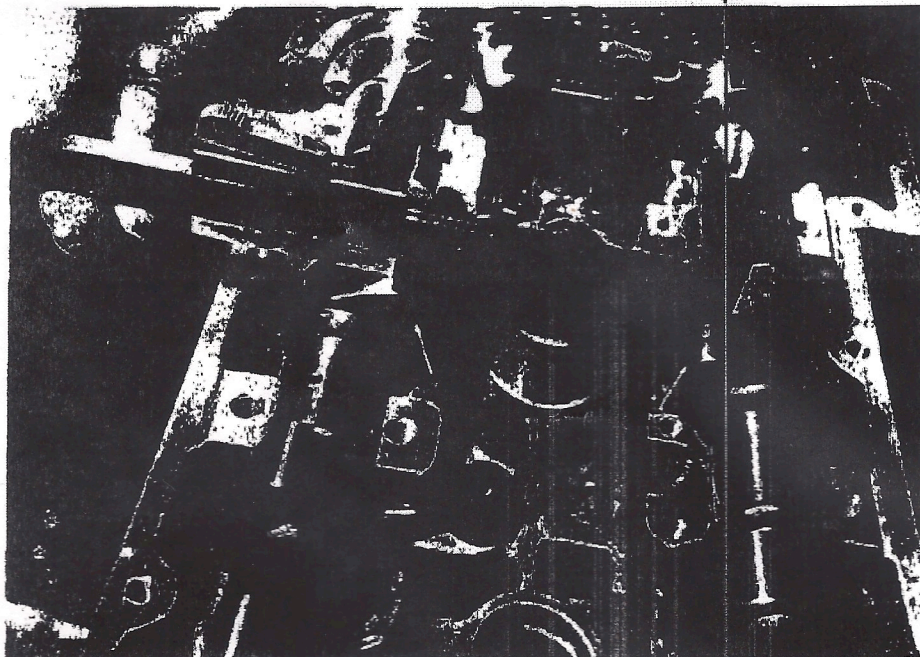
Note:

As a rule, replace all worn adjustment shims.

2. Setting of camshaft basic position on right side of engine

2.1 The first cylinder is positioned at TDC.

2.2 It is the position of the cams of the first cylinder with respect to each other that is measured.



picture 25

2.3 Move the camshafts to this symmetrical position so that the distance $A = 78,5 \text{ mm}$. (picture 26)

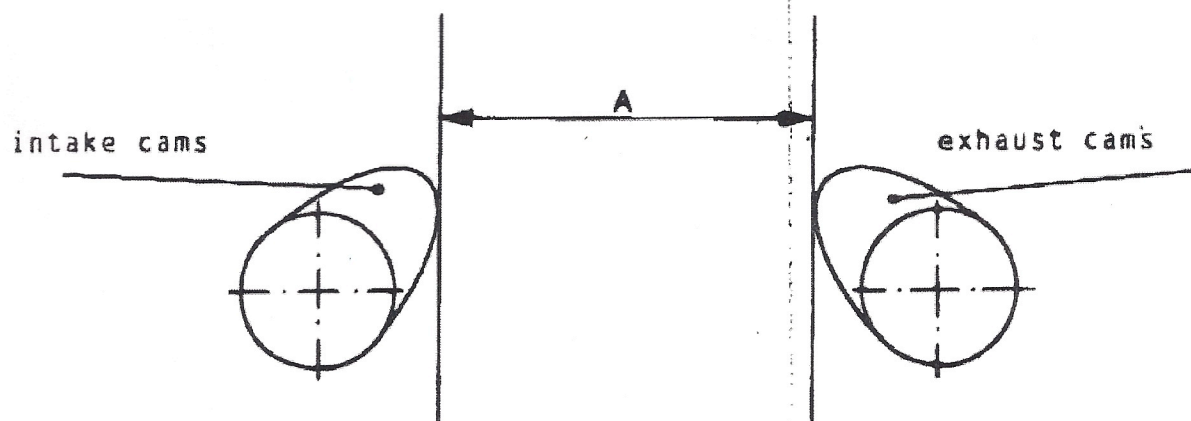


diagram 26

2.4 Turn the exhaust camshaft approximately 10° to the inside (in the direction of the intake camshaft).

As a reference point the new distance $A' = 76$ mm.

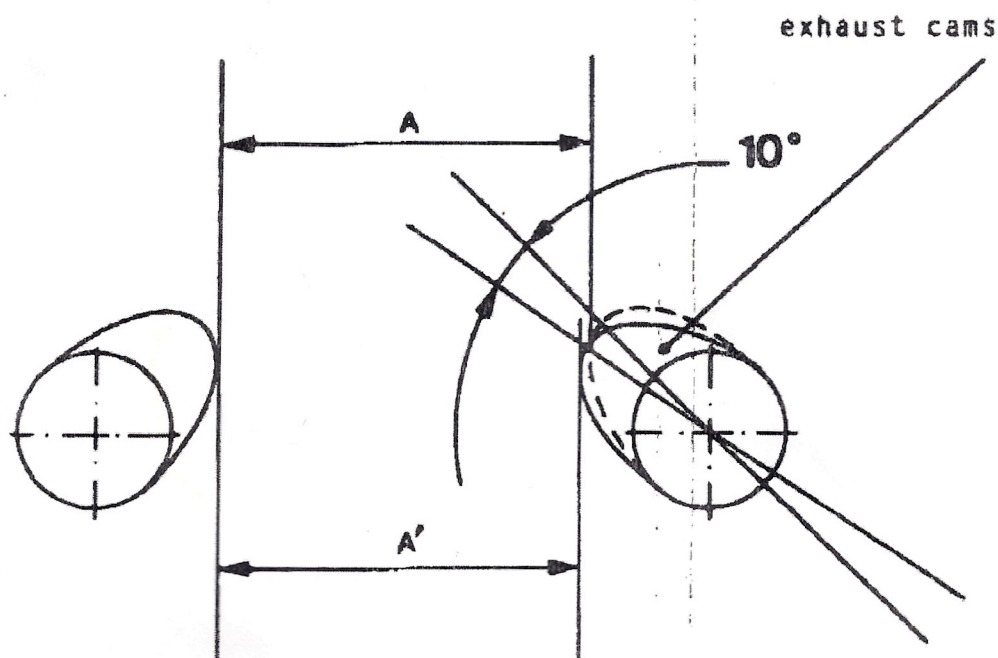


diagram 27

TECHNICAL DATA**CHECK AND ADJUST VALVE TIMING****Adjustment Data for AMG Engines**

AMG Engine	Valve timing for 2 mm valve stroke and no valve clearance		Valve clearance for cold engine in mm	
	intake valve opens after TDC	exhaust valve closes before TDC	intake valve	exhaust valve
M117-5.01-4V	8°	8°	0,20 - 0,25	0,30 - 0,35
M117-5.61-4V	8°	8°	0,20 - 0,25	0,30 - 0,35
M117-6.01-4V	8°	8°	0,20 - 0,25	0,30 - 0,35

Specified spark plugs

AMG Engine	Europe			Japan		
	Bosch	Beru	Campion	Bosch	Beru	Campion
M117-5.01-4V	H 5 DC	14 K-5 DU	S-6 YC	H 7 DC	14 D-7 DU	S-9 YC
M117-5.61-4V	H 5 DC	14 K-5 DU	S-6 YC	H 7 DC	14 D-7 DU	S-9 YC
M117-6.01-4V	H 5 DC	14 K-5 DU	S-6 YC	H 7 DC	14 D-7 DU	S-9 YC

Tightening torques

	Nm
screws for valve cover	8
screws for camshaft sprocket wheels	80
screws for chain tensioner on the cylinder head	25
union nut for chain tensioner	90

F. ADJUSTMENT OF VALVE TIMING**1. Order of measuring and adjusting**

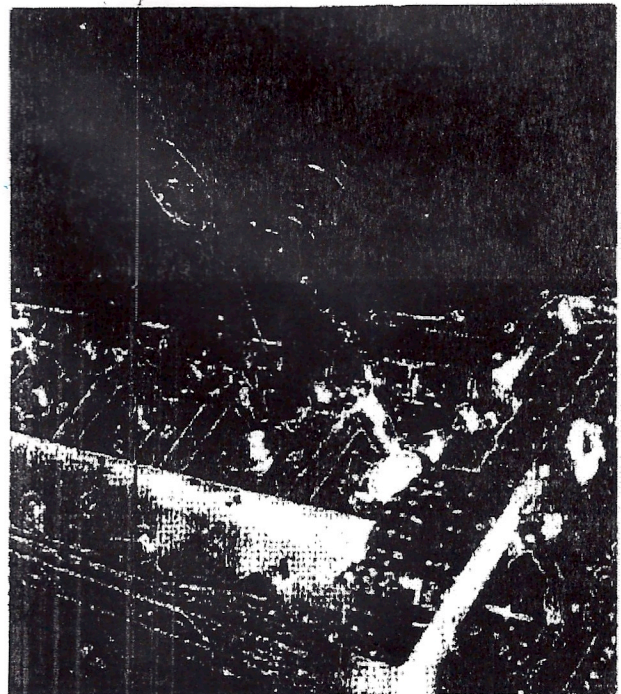
- 1.1 Intake valve of the sixth cylinder
- 1.2 Exhaust valve of the sixth cylinder
- 1.3 Intake valve of the first cylinder
- 1.4 Exhaust valve of the first cylinder

1.1 Check intake valve of the sixth cylinder

- Measure valve clearance.

Correct valve clearance: intake valve 0,20 mm
exhaust valve 0,30 mm

- Eliminate valve clearance.
- Attach gauge bracket to cylinder head.
- Attach gauge with extension pin to bracket with 3 mm pressed in.
- The pin must stand vertically to the adjustment shim of the bucket tappet.
- Position the large pointer to 0.



picture 38

-
- 1.1 - Turn the crankcase slowly in clockwise direction until the gauge pointer returns 2 mm to the 1 mm reading. The valve stroke is then 2 mm.
- In this position the value on the vibration damper must correspond to the value "Intake Valve Opens" (8° after TDC) in the table.
 - Tighten the screws of the camshaft and turn the engine once manually.
 - Check the valve timing again and, if necessary, readjust.

1.2 Check exhaust valve of the sixth cylinder

- Repeat process as described for intake valve 1.1.
- Exhaust valve closes 8° before TDC (end of closing).

Note:

After each adjustment tighten the screws and turn the engine before the valve timing is checked.

1.3 Check intake valve of the first cylinder

- Check and adjust the intake and exhaust valve timings for the first cylinder in the same manner as for the sixth cylinder.

Note:

In the event that one of the timing chain sprocket wheels has to be exchanged, the chain tensioner must be removed first.

- Tighten all the Allen screws on the camshaft sprocket wheels with 80 Nm.

ADJUSTMENT DIAGRAM

AMG - M117 - 4V

AE 8° v. OT

OT

EB 8° n. OT

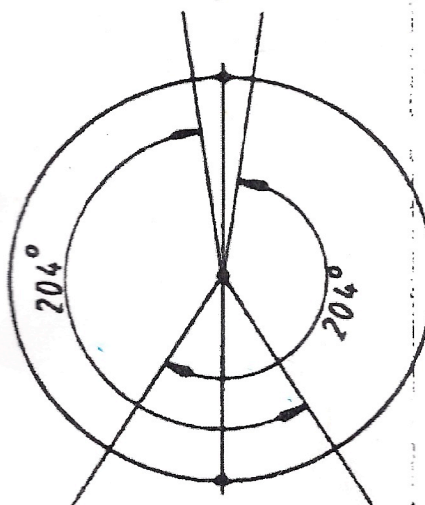


diagram 39

EE 32° n. UT

UT

AB 32° v. UT

EE = intake valve closes

EB = intake valve opens

AE = exhaust valve closes

AB = exhaust valve opens

diagram 39



INSTALL. INSTRUCTIONS M117 - 4V GRUPPE 01.21.1

TECHNISCHE DATEN

CHECK AND ADJUST VALVE CLEARANCE

Adjustment data in mm for cold engine (20°C)

Intake	0,20 - 0,25
Exhaust	0,30 - 0,35

Tightening torques

Nm

screws for valve cover
spark plugs

8
10 - 20

Special tools

Order No.

spark plug spanner
adjustment tool

F
G

C7 58 0002
C7 05 0006

adjustment shim set

H

C7 05 0047

thickness in mm

thickness in mm

thickness in mm

3,25	3,65	4,05
3,3	3,7	4,1
3,35	3,75	4,15
3,4	3,8	4,2
3,45	3,85	4,25
3,5	3,9	4,3
3,55	3,95	4,35
3,6	4,0	4,4

2.6 Measuring example (intake, engine cold)

in mm

Actual value

0,35

Target value

0,20 - 0,25

Difference

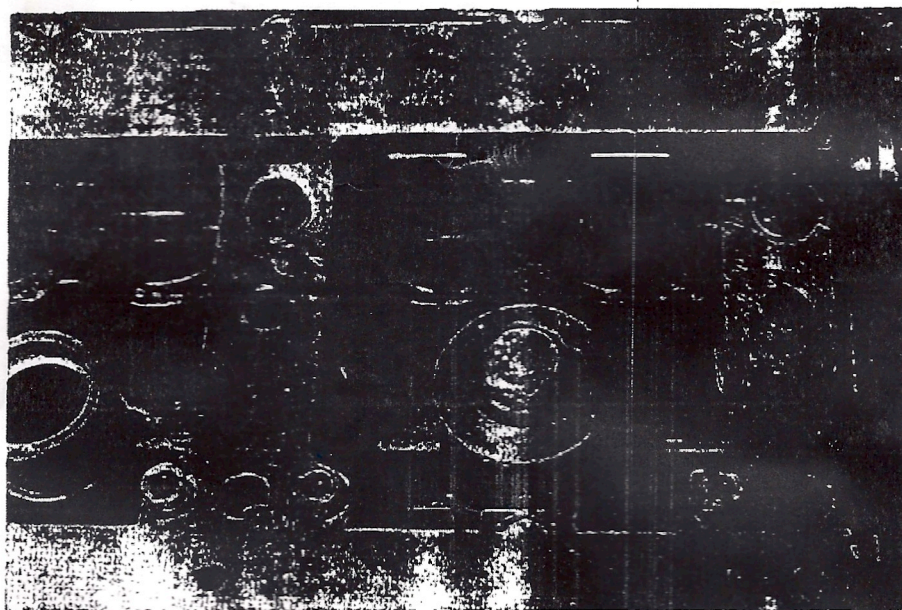
0,10 - 0,15

Thickness of the removed adjustment shim

3,25

Thickness of the shim to be installed

3,35 - 3,40



picture 42

Note:

When the valve clearance is too great the difference for the removed shim should be added on; when the valve clearance is too small the difference should be subtracted.



INSTALL. INSTRUCTIONS M117 - 4V GRUPPE 01.21.1

TECHNICAL DATA

ELECTRICAL SYSTEM

Specified spark plugs

AMG Engine	Europa			Japan		
	Bosch	Beru	Campion	Bosch	Beru	Campion
M117-5.01-4V	H 5 DC	14 K-5 DU	S-6 YC	H 7 DC	14 D-7 DU	S-9 YC
M117-5.61-4V	H 5 DC	14 K-5 DU	S-6 YC	H 7 DC	14 D-7 DU	S-9 YC
M117-6.01-4V	H 5 DC	14 K-5 DU	S-6 YC	H 7 DC	14 D-7 DU	S-9 YC

Firing point

Engine	Version or fuel type	Engine speed rpm	Firing pt. in crankshaft° before TDC vacuum		
			coding plug pos.	without	with
AMG - M117 5.01 - 4V	without catalyst	3500	S	27 - 31	41 - 45
			N	21 - 25	
AMG - M117 5.61 - 4V	without catalyst	3500	S	26 - 30	41 - 45
			N	20 - 24	
and AMG - M117 6.01 - 4V	with catalyst	3500	S	24 - 28	40 - 44
			N	18 - 22	
	super regular	3500	1	22 - 26	41 - 45
	super unleaded	3500	4	16 - 20	41 - 45