

At the first maintenance job,
then every 15 000 km / 10 000 miles

Engine M 100, 116, 117

Adjustment values in mm (engine cold)

Engine model	M 100	M 116, 117
Intake	0.10 ¹⁾	0.10 ¹⁾
Exhaust	0.25	0.20

1) 0,15 mm for extended ambient temperatures below -20° C (-13° F)

Tightening torques

	Nm	(kpm)
Hex-hd. bolt for fixing cylinder head cover	5	(0,5)
Torque of adjusting screw for valve clearance adjustment	20-40	(2,0-4,0)

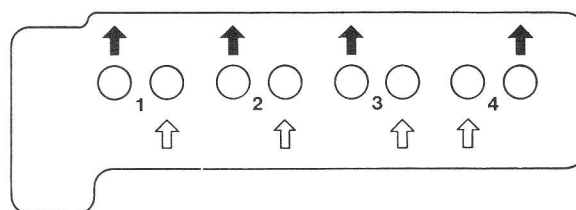
Special tools

M 100	Valve adjustment wrench	000 589 32 07 00
M 116, 117	Valve adjustment wrench	000 589 14 01 00 replaced by 116 589 00 01 00
All engines	Socket SW 27	001 589 65 09 00
All engines	Contact handle for cranking engine (attachment of compression pressure recorder 001 589 46 21 00)	001 589 46 21 08

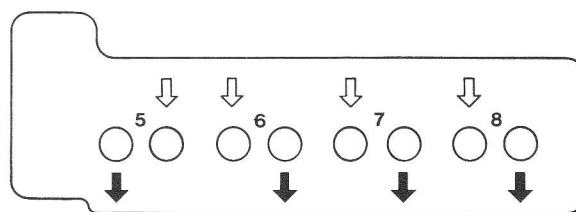
Note

Check and adjust valve clearance with the engine cold.

Note arrangement of intake and exhaust valves. In the case of engines M 116 and M 117 the valves on cylinders 4 and 5 are arranged asymmetrically.

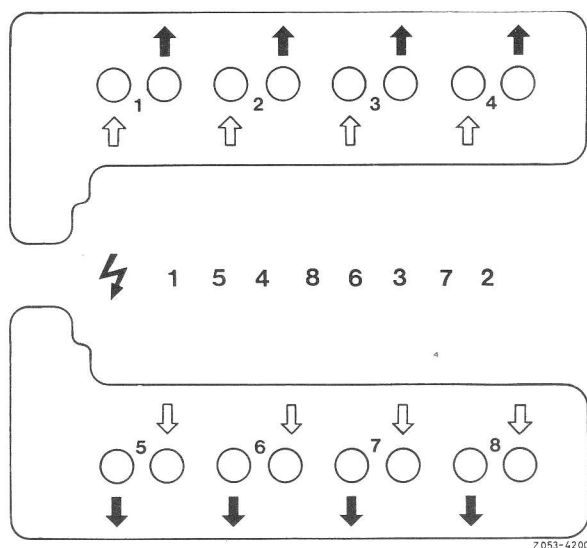


⚡ 1 5 4 8 6 3 7 2

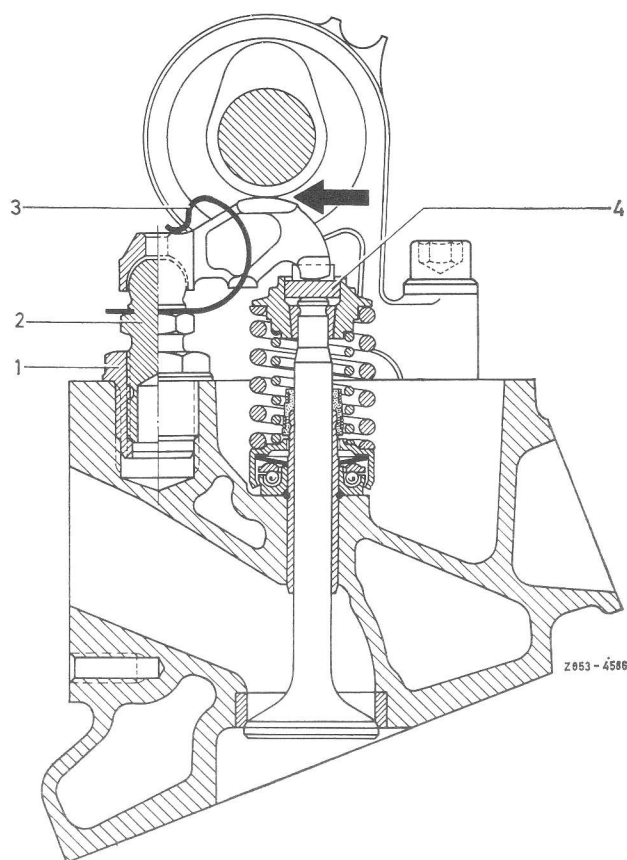


Z053-4199

Engine M 116, 117



Engine M 100



If there is insufficient adjustment available replace pressure piece (4). They are available in various thicknesses (see Spare Parts Catalogue).

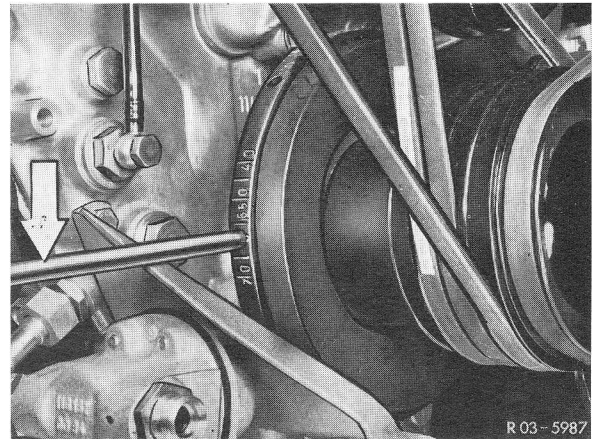
If the torque of the adjusting screw is below 20 Nm (2.0 kpm), replace adjusting screw (2) or adjusting screw (2) with threaded bush (1).

Adjustment

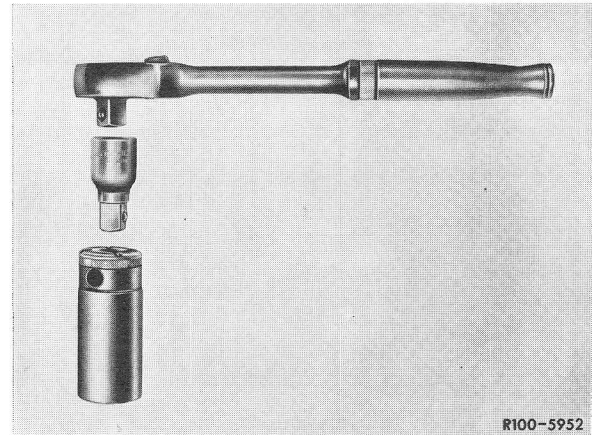
- Measure valve clearance between the sliding area of the rocker arm and the cam base circle of the camshaft (arrow).

For this purpose, the engine can be cranked as follows:

a) Turn engine with a rod 8 mm dia., at the vibration damper.



b) By means of tool combination on hex. bolt for attaching hub or pulley to crankshaft.



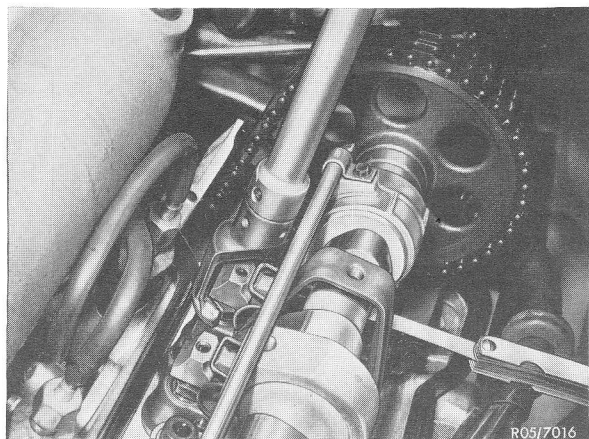
c) With starter. For this purpose, connect contact handle to + battery and terminal 50.



Attention! The engine **must not** be turned using the hex. bolts on the **camshaft gears**.

Do **not** turn crankshaft **backwards**.

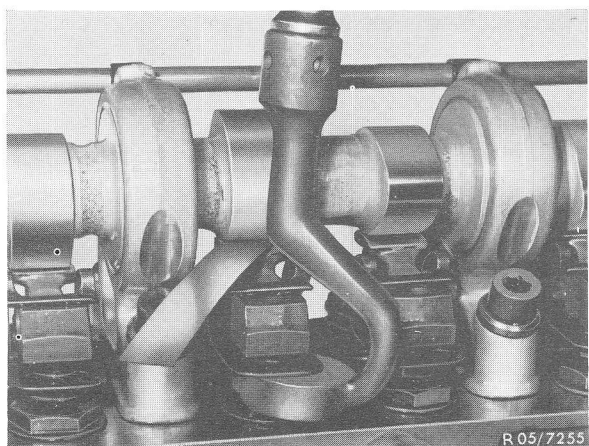
Valve clearance is correctly adjusted, when the slip gauge indicates a tight fit.



Valve adjusting wrench 000 589 32 07 00

- If necessary, adjust valve clearance by turning the adjusting screw (2) with valve adjusting wrench and torque wrench.
- In the case of engines M 116 and M 117 check the tensioner springs (3) for perfect seating in the recess on the adjusting screw (2).
- Before fitting cylinder head covers, check seals and renew if found necessary.

Engine M 100



Valve adjusting wrench 116 589 00 01 00

Engine M 116, 117

During first maintenance job,
then every 15 000 km / 10 000 miles

Engine M 114 115 130 180

Adjusting Values in mm

	with engine cold (approx. 20°C)	with engine warm (60°C ± 15°C)
Intake	0.10 ¹⁾	0.15 ¹⁾
Exhaust	0.20	0.25

1) 0.05 mm more for extended ambient temperature below – 20°C (–4°F).

Tightening Torques

		Nm	(kpm)
Hex. bolt for attaching cylinder head cover	M 114, 115, 130, 180	5	(0.5)
	M 115 with 4-bolt attachment and stop	15	(1.5)
Torque of adjusting screw for valve clearance adjustment		20–40	(2.0–4.0)

Special Tools

M 114	Valve adjusting wrench	115 589 00 01 00 ¹⁾
M 115		superseded by
M 130		000 589 32 07 00
M 180	Valve adjusting wrench	000 589 39 07 00
All engines	Socket SW 27	001 589 65 09 00
All engines	Contact handle for cranking engine (attachment of compression pressure recorder	001 589 46 21 08 001 589 46 21 00)

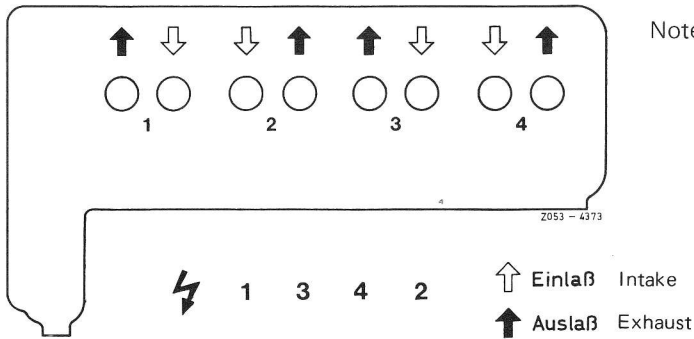
1) This valve adjusting wrench is not applicable for engine M 114,980.

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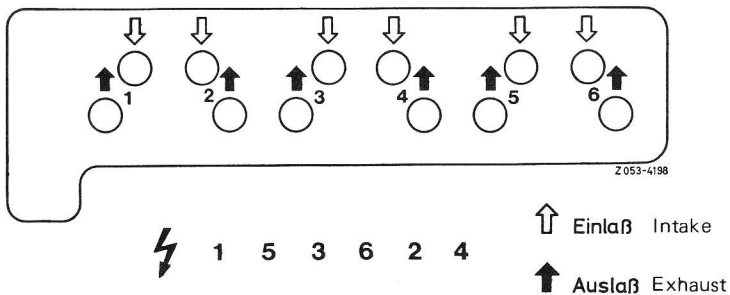
Note

Check or adjust valve clearance with engine cold or warm.

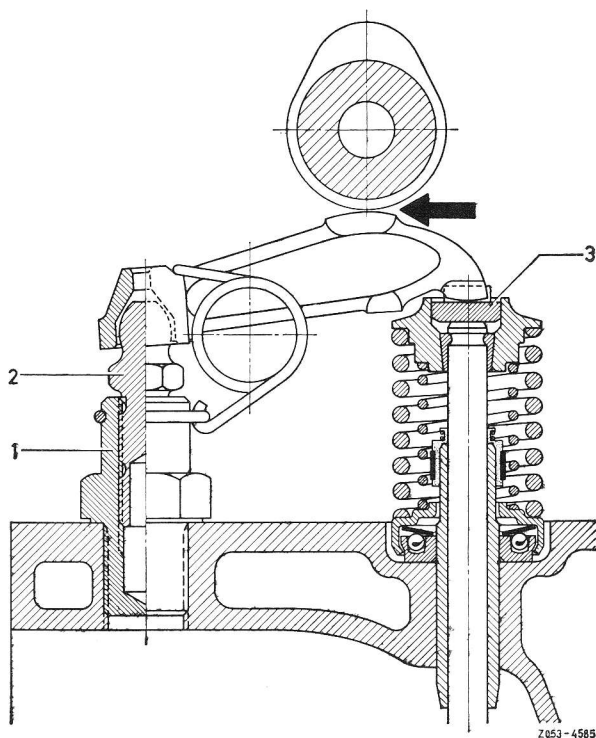
Note arrangement of intake and exhaust valves.



Engine M 115



Engine M 114, 130, 180



If there is insufficient adjustment available replace pressure piece (3). They are available in various thicknesses (see Spare Parts Catalogue).

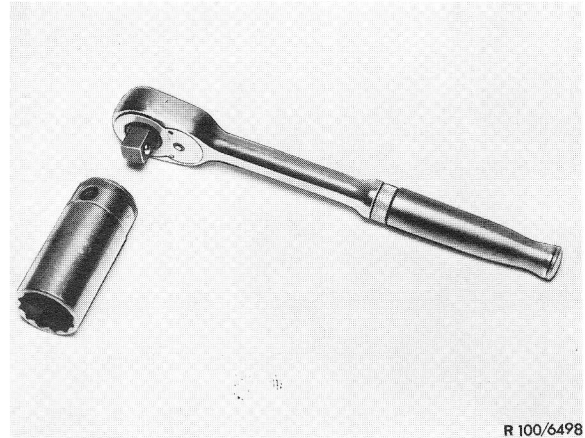
If the torque of the adjusting screw is below 20 Nm (2.0 kpm) replace adjusting screw (2), or adjusting screw (2) with threaded bush (1).

Adjustment

- Measure valve clearance between the sliding area of the rocker arm and the cam base circle of the camshaft (arrow).

For this purpose, the engine can be cranked as follows:

a) By means of tool combination on hex. bolt for attaching balancing disc to crankshaft.

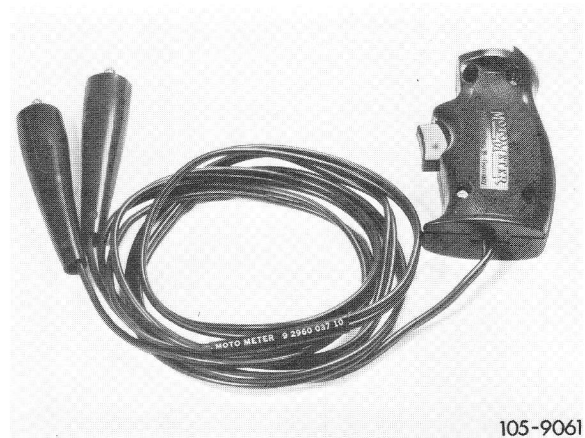


R 100/6498

b) With starter. For this purpose, connect contact handle to + battery and terminal 50.

Attention! The engine **must not** be turned using the hex.-hd. bolt on the **camshaft gear**.

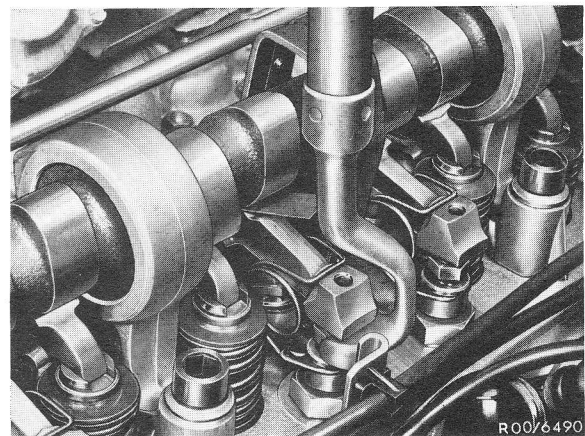
Do **not** turn crankshaft **backwards**.



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Valve clearance is correctly adjusted, when the slip gauge indicates a tight fit.

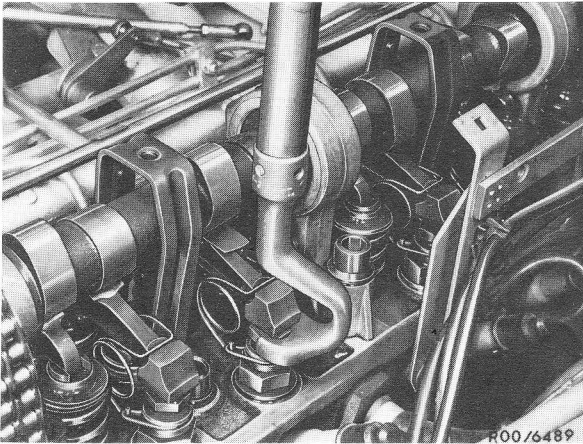
- If required, adjust valve clearance by turning adjusting screw (2) with valve adjusting and torque wrench.



R 00/6490

Engine M 180

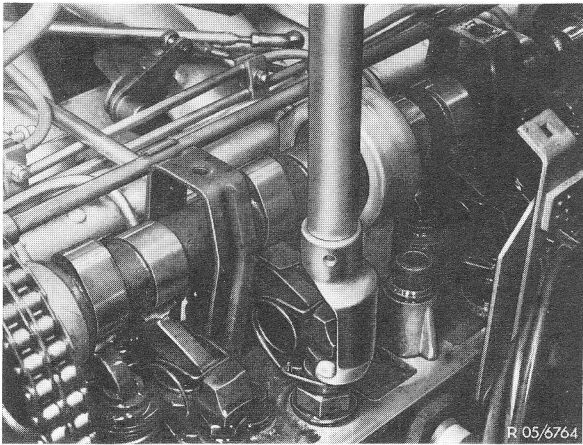
Valve adjusting wrench 000 589 39 07 00



Valve adjusting wrench 115 589 00 01 00

- Before fitting cylinder head cover, check seals and renew if found necessary.

Engines M 114.920, 115, 130



Valve adjusting wrench 000 589 32 07 00

Engines M 114, 115, 130

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Diesel Engine OM 615 616

Adjusting Values in mm

	with engine cold (approx. 20°C)	with engine warm (60°C ± 15°C)
Intake	0.10 ¹⁾	0.15 ¹⁾
Exhaust	0.35	0.35

1) 0.05 mm more for extended ambient temperature below – 20°C (– 4°F).

Tightening Torque		Nm	(kpm)
Hex. bolts for attaching cylinder head cover	OM 615	5	(0.5)
	OM 616	15	(1.5)

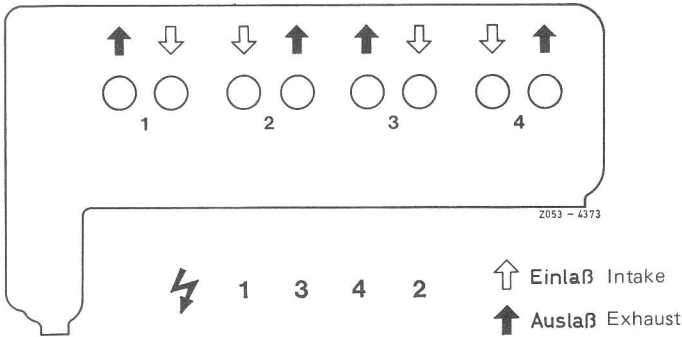
Special Tools

Valve adjusting wrench SW 14 mm offset (2 each)	621 589 01 01 00
Holding wrench for valve spring retainer	621 589 00 03 00 superseded by 615 589 00 03 00
Socket SW 27	001 589 65 09 00
Contact handle for cranking engine (attachment of compression pressure recorder 001 589 46 21 00)	001 589 46 21 08

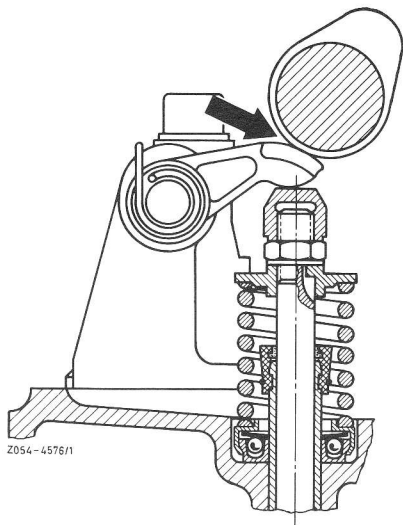
Note

Check and adjust valve clearance with the engine
cold or hot.

Note arrangement of intake and exhaust valves.



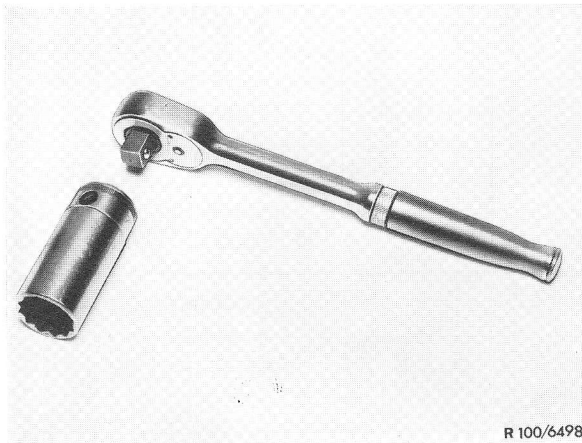
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Adjustment

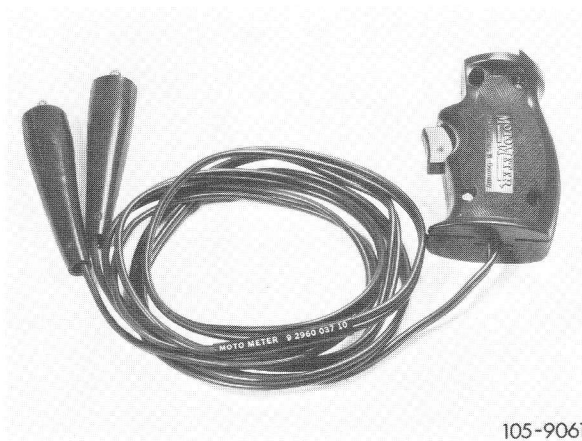
- Measure valve clearance between sliding area of the rocker arm and the cam base circle of the camshaft (arrow). Position camshaft so that **the cam lobe is vertical** to the cam base circle.

Valve clearance is correctly adjusted, when the slip gauge indicates a tight fit.



For this purpose, the engine can be cranked as follows:

- By means of tool combination on hex. bolt for attaching balancing disc to crankshaft.

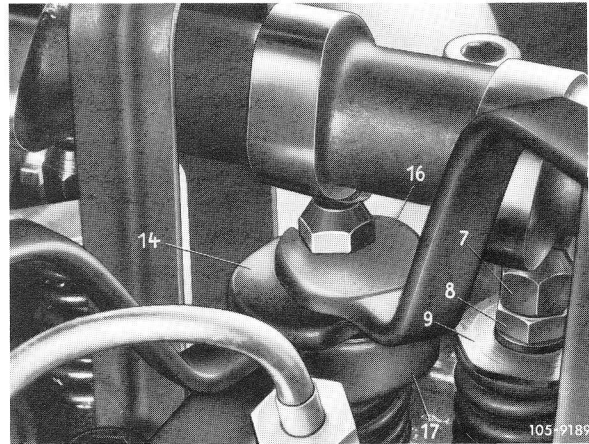


- With starter. For this purpose, connect contact thicknesses (see spare parts list).

Attention! The engine **must not** be turned using the hex.-hd. bolt on the **camshaft gear**.

Do **not** turn the crankshaft **backwards**.

- Fit holding wrench (17) onto hex. of valve retainer.
- Loosen cap nut (7) for this purpose counterhold hex.-hd nut (8) on the valve with the valve adjusting wrench (14).
- Adjust valve clearance by turning the cap nut.
- After adjustment, lock cap nut by tightening the hex.-hd. nut.
- Recheck valve clearance.
- Before fitting cylinder head cover, check seals and renew if found necessary.



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Engine M 110

Adjusting Values in mm

	with engine cold (approx. 20°C)	with engine warm (60°C ± 15°C)
Intake	0.10 ¹⁾	0.15 ¹⁾
Exhaust	0.25	0.30

1) 0.05 mm more for extended ambient temperatures below – 20°C (– 4°F).

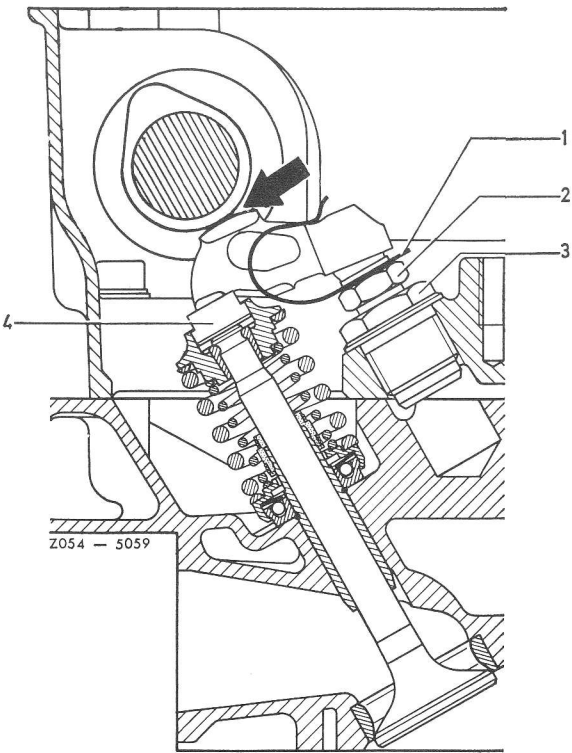
Tightening Torques

	Nm	(kpm)
Cap nuts and bolts for attaching cylinder head cover	5	(0.5)
Torque of adjusting screw for valve clearance adjustment	20–40	(2.0–4.0)

Special Tools

Valve adjusting wrench ¹⁾	110 589 00 01 00
Socket SW 27	001 589 65 09 00
Contact handle for cranking engine (attachment of compression pressure recorder 001 589 46 21 00)	001 589 46 21 08

1) Valve adjusting wrench Part No. 000 589 32 07 00 can be used after grinding off bottom edge.

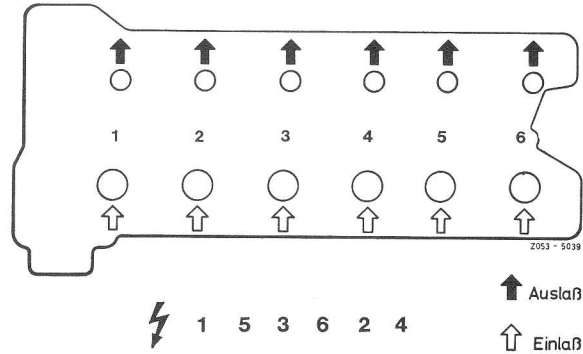


Note

Check or adjust valve clearance only with engine cold.

Observe arrangement of intake and exhaust valves. Replace thrust piece (4), if adjustments can no longer be made as required. They are available in various thicknesses (see spare parts list).

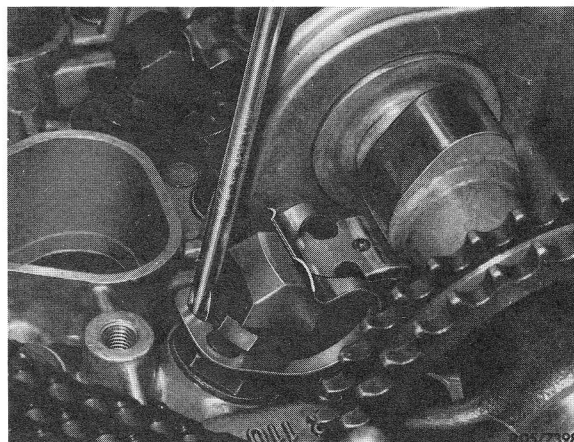
If the torque of the adjusting screw is below 20 Nm (2.0 kpm) replace adjusting screw (2) or adjusting screw (2) with threaded bush (3).



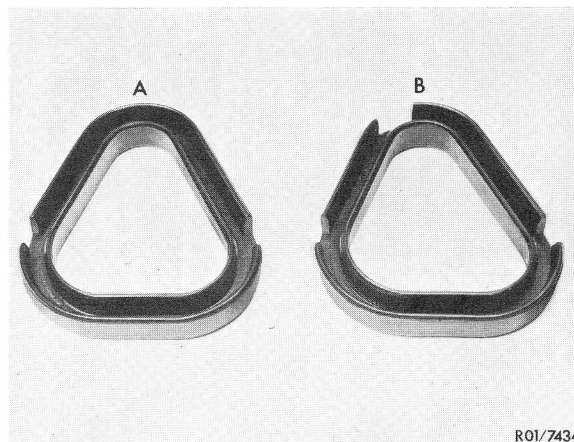
⬆ Auslaß Exhaust
⬆ Einlaß Intake

Adjustment

- Press off tension springs (1) with a screwdriver.



- Remove rubber gaskets.



- Measure valve clearance between sliding surface of rocker arm and cam base circle of camshaft (arrow).

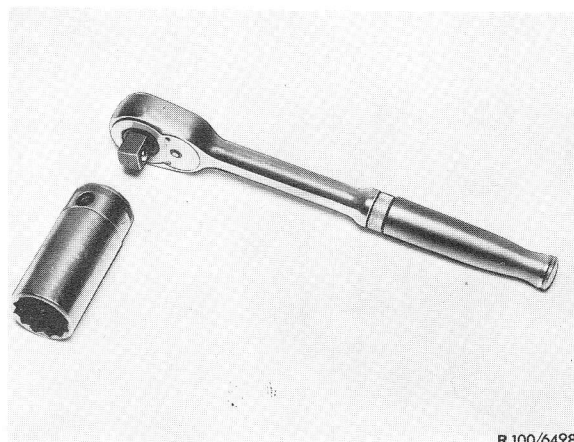
- A Spark plug holes 1, 3 and 5
B Spark plug holes 1 to 5

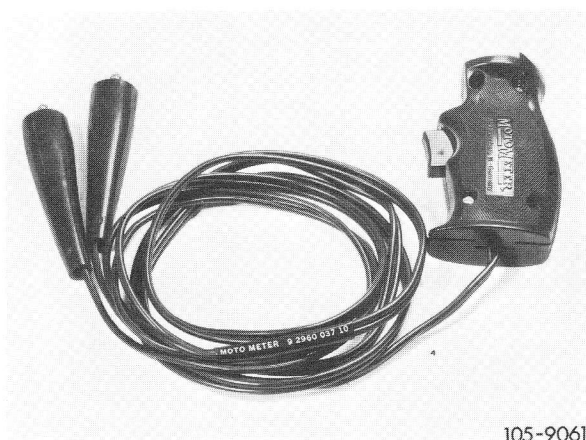
The engine can be cranked as follows:

- a) With combination tool on hex. bolt for attaching balancing disc to crankshaft.

Attention! The engine **must not** be turned using the hex.-hd. bolt on the **camshaft gear**.

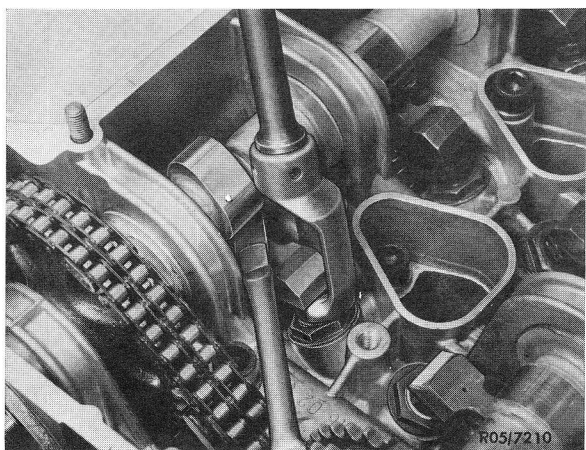
Do **not** turn the crankshaft **backwards**.





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b) With starter. For this purpose, connect contact handle to + battery and terminal 50.



Valve adjusting wrench 110 589 00 01 00

- Adjust valve clearance by turning adjusting screw with valve adjusting and torque wrench.

Valve clearance is correctly set when slip gauge indicates tight fit.

- Push tensioning springs (1) into ring grooves of adjusting screws after completing adjustments.
- Check gaskets prior to mounting cylinder head cover, renew according to condition.

Caution! Rubber gaskets are different (2 versions). Only gaskets version B will be supplied as spare parts.