

At the first maintenance job

Engine M 100 116 117

**Tightening torque, at appr. 80° C (176° F) cooling water temperature**

Observe sequence diagram!

Engine model	M 100		M 116 M 117	
	<b>Nm</b>	(kpm)	<b>Nm</b>	(kpm)
M 12 x 1.5 bolts	90	(9.0)	60	(6.0)
M 8 bolts	25	(2.5)	25	(2.5)

**Special tools**

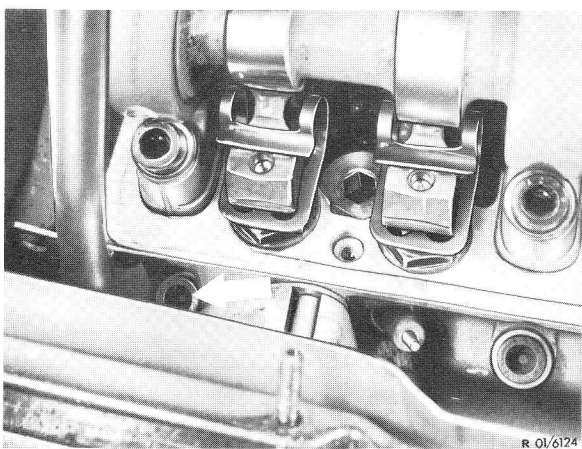
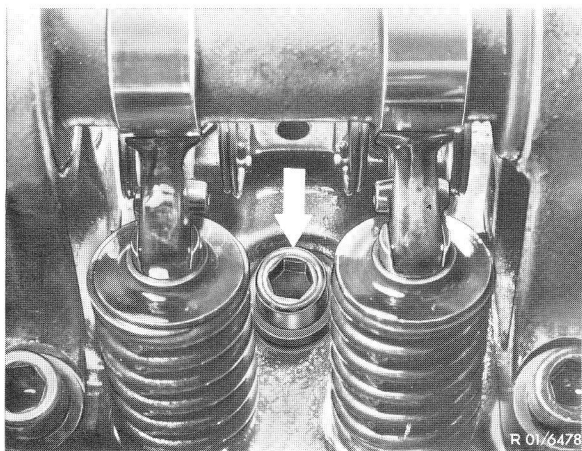
Engine model	M 100	M 116 M 117
Allen wrench socket SW 10 mm, 51 mm lg., 3/8" square	standard	—
Allen wrench socket SW 10 mm, 140 mm lg., 1/2" square	000 589 05 07 00	—
Allen wrench socket SW 8 mm, offset, 1/2" square	—	116 589 00 13 00
Allen wrench socket SW 8 mm, offset, 105 mm lg., 1/2" square	—	000 589 34 07 00
Allen wrench SW 8 mm, 3/8" square	—	117 589 01 07 00
Allen wrench socket SW 6 mm, 425 mm long		187 589 03 07 00 replaced by 116 589 03 07 00

**Note**

Run engine to a cooling water temperature of 80° C (176° F)

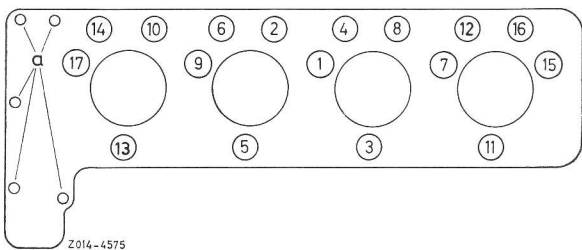
**Retightening**

- In the case of engine M 100, the retaining clip and cylinder head cover must be removed for access to the cylinder head bolts (see arrow).



- For the engines M 116.982 and M 117.982 with automatic transmission unscrew the oil pipe on the cylinder head and press to the side.

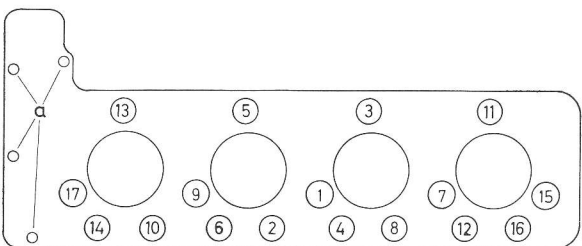
Tightening sequence diagram cylinder head bolts



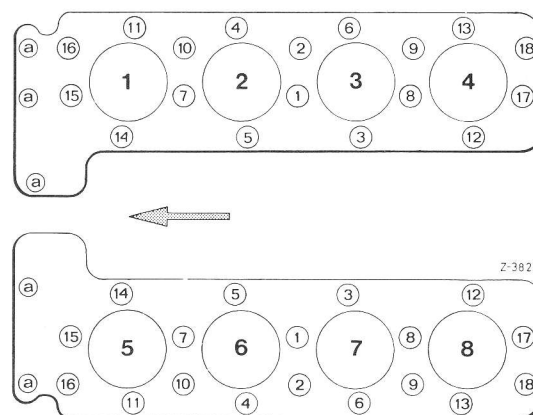
- Starting with 1, in the sequence shown in the diagram, loosen the bolts slightly and retighten to the prescribed torque.

- Retighten the M 8-bolts "a" (see diagram) with Allen wrench.

- Check and adjust valve clearance (item 753).



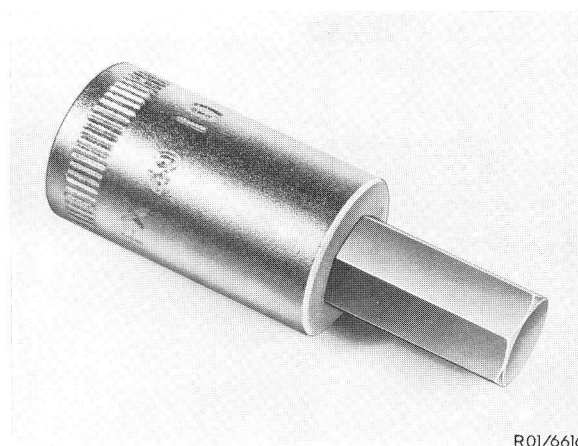
Engine M 100



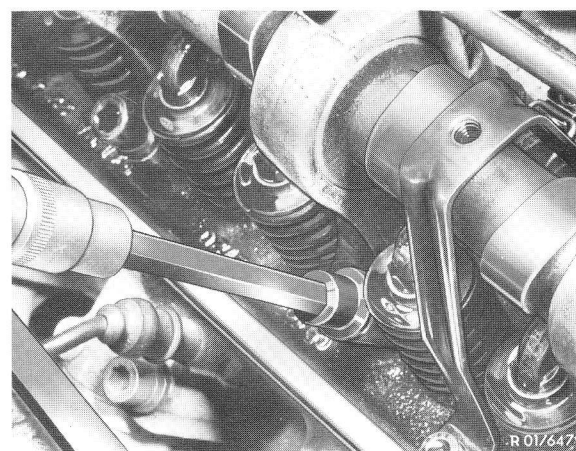
Engine M 116 M 117

**Engine M 100**

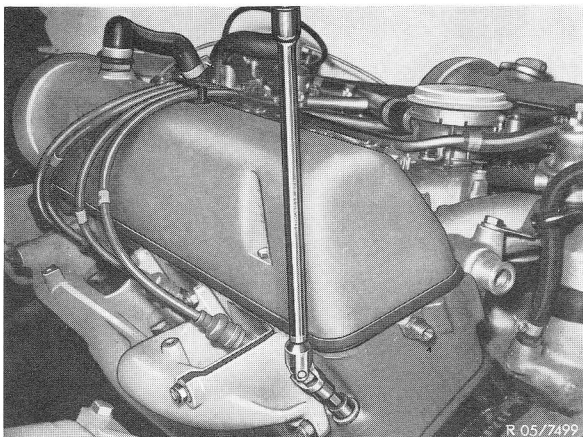
Two different Allen wrench sockets are required for retightening the cylinder head bolts.



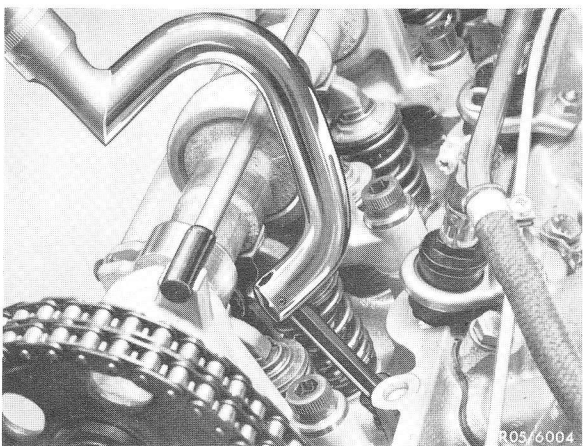
Standard Allen wrench socket SW 10



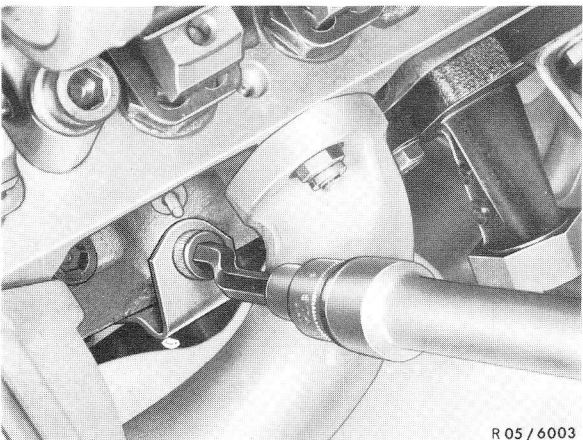
Allen wrench socket 000 589 05 07 00



Allen wrench socket 117 589 01 07 00



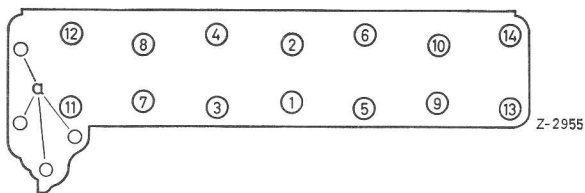
Allen wrench socket 116 589 00 13 00



Allen wrench socket 000 589 34 07 00

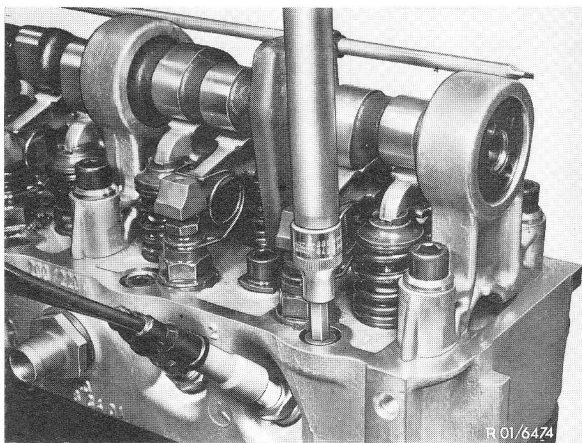
#### Engine M 116 and M 117

Three different Allen wrench sockets are required for retightening the cylinder head bolts.



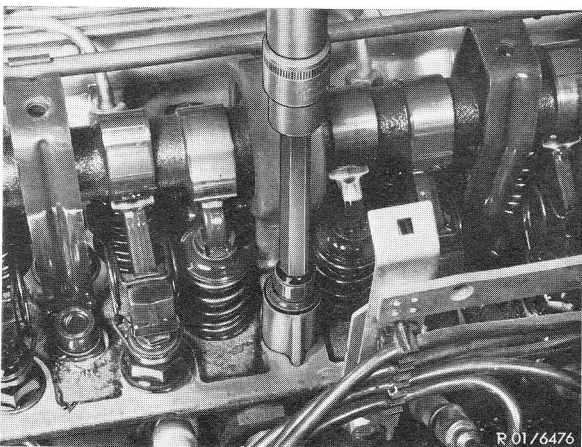
Engine M 114, 130, 180

- Check valve clearance and adjust (item 753).



Allen wrench socket 000 589 38 07 00

Engine M 115



Allen wrench socket 000 589 05 07 00

Engine M 114, 115, 130, 180  
OM 615, 616

At the first maintenance job

Engine M 110

**Tightening torque, kpm at appr. 80° C (176° F) cooling water temperature**  
Observe sequence diagram

Cylinder head bolts M 12 x 1.5	9
Bolts M 8	2.5

**Special tools**

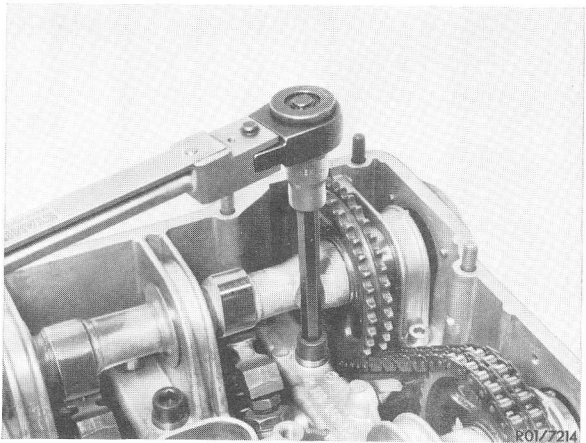
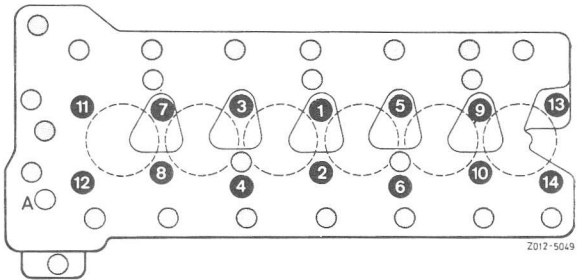
Allen wrench socket SW 10 mm, 140 mm long	000 589 05 07 00
Hex. socket wrench 3/8" SW 6 mm, 220 mm long Reduction 3/8" to 1/2"	e. g. Hazet no. 2748 e. g. Hazet no. 958 R-2
Socket SW 27	001 589 65 09 00

**Note**

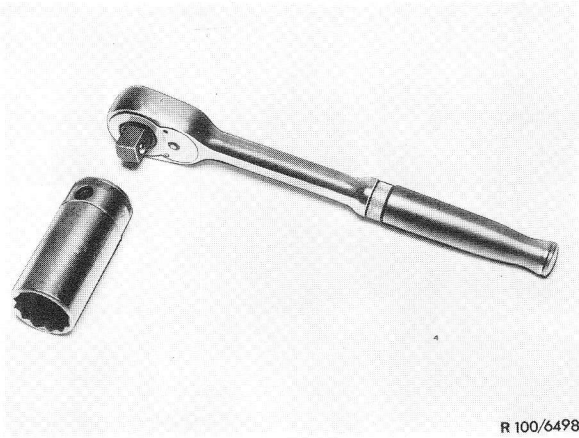
Run engine to 80° C (176° F) cooling water temperature.

**Retightening**

- Slightly loosen and then tighten cylinder head bolts individually in the sequence of the tightening pattern, starting with bolt No. 1, to specified torque. For this purpose, set camshafts in such a manner that the recesses on the camshafts are in vertical position in relation to the cylinder head bolts.



The engine can be cranked as follows:



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

**Caution!** Do **not** crank engine on fastening bolts of **camshaft sprockets**, do **not** rotate crankshaft **in reverse direction**.

b) With starter. For this purpose, disconnect cable 1 on ignition coil.

- Slightly loosen M 8 bolts for cylinder head and camshaft housing individually from inside out and tighten to specified torque. The M 8 bolt identified with "A" in tightening pattern cannot be additionally tightened.