When choosing a torque wrench, see to it that only 50—70% of its range are used; e.g. for a tightening torque of 3.75 kpm, a torque wrench with a range of 0—6 kpm should be used.

Footnotes for the tables on pages 50—53

1) Prior to the assembly of the cylinder head bolts, thread and contact area of the latter as well as the shims should be coated with oil.
Precisely observe the prescription on the sequence of the torque and on the gradual tightening of the cylinder head bolts (refer to pages 55—58).

2) Following assembly of the cylinder head, drive engine warm under low load until a cooling water temperature of 80 °C is reached. After having the engine operated with this cooling water temperature for approximately 5 minutes, tighten the cylinder head bolts according to the values specified under "warm engine".
Re-tightening should be carried out after an additional mileage of 300—1000 km.
Attention: When tightening the cylinder head bolts, the necessary re-tightening is likely to be omitted, as the loosening torque is in most cases higher than the specified tightening torque causing reading to be above the nominal tightening value in the first tightening phase.
To ensure that the cylinder head gasket is really subject to a compression in accordance with the specified belt torque, proceed as follows when re-tightening the cylinder head bolts:
In the sequence of the bolt scheme, slightly loosen each bolt, and only then **tighten** it to the specified tightening torque. In no case loosen all studs in one operation to be tightened thereafter.

3) When tightening the rocker arm bearing bracket belts, the rocker arms should not be loaded by the camshaft.

4) The nuts for tightening the flange of the injection valve must be tightened such that the clearance from the upper edge of the plastic flange to the bearing area of the intake pipe is 33 ± 1.0 mm.

5) To obtain with security a proper seating of the pipe connection sealing rings, tighten pipe connections to 3.0 kpm and loosen, re-tighten again to 3.0 kpm and loosen again, then finally tighten to 3.0 + 0.5 kpm. Make sure that the threads of the pipe connections are coated with tallow prior to screwing in. In addition, tighten the attachment screw of the clamping jaw lock between the pipe connections applying a torque of 0.5 + 0.2 kpm (excessive tightening may cause a leak at the low or high pressure side of the injection elements when the injection pump housing is distorted).

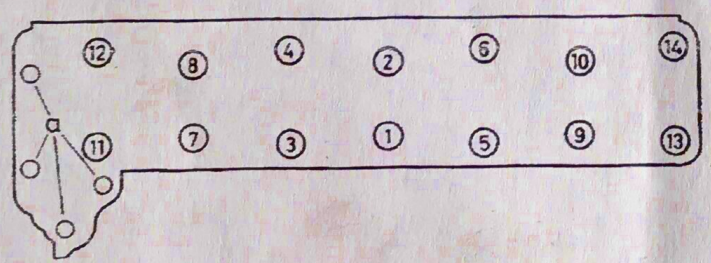
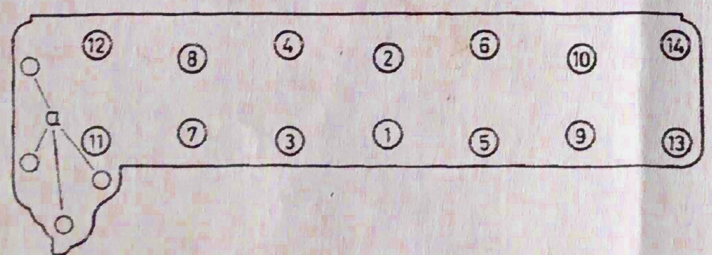
6) The big end bearing bolts on the M 100 engine should only be tightened with the prescribed torque.

7) Only tighten to 9 kpm on M 115 engines.

Vaive Adjustment (cold):
Intake: 0.10mm
Exhaust: 0.20mm

Re-torque Hot

Diagram for Sequence and Table for Gradual Tightening of Cylinder Head Bolts M 12

Engine	Diagram for sequence of tightening cylinder head bolts	Gradual tightening, tightening torque in kpm			
		1. Stage	2. Stage	3. Stage	Control
		with cold engine			at 80° C KW[1])
M 130	 Z-2955	4[2]) 29	7[2]) 50	10[2]) 72 ft/lbs	11[2]) 80 ft/lbs
M 108 M 129 M 114 M 180 M 127	 Z-2955	4 29	6 43	8 58 ft/lbs	9 66 ft/lbs

All other bolts "a" with thread M 8 should be tightened by using a manual wrench.
The cylinder head bolts should be loosened in reverse order, i.e. starting from backwards.
1) KW = cooling water temperature.
2) Replace 10 K bolts by 12 K bolts.