#### Special tools

Drilling jig for threaded bores for cylinder head bolts in crankcase



117 589 02 23 00

Tap with guide shaft



117 589 00 70 00

#### Conventional tools

Heli-Coil tap M 10 Item No. 0140 0100104

Heli-Coil threaded insert M 10 Standard item No. 0130 0100025 (part No. 000 997 58 15)

Heli-Coil hand installer M 10 Item No. 0150 0410000-1

e.g. Böllhoff & Co., D-4800 Bielefeld 14

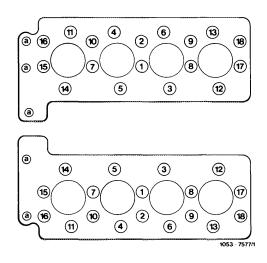
# Note

If damaged threads are discovered during removal or installation of the cylinder head, Heli-Coil threaded inserts part No. 000 997 58 15 must be installed for all cylinder head bolts of the cylinder bank concerned. The threaded inserts have a length (screwed in) which corresponds to **2.5 times** the diameter of the cylinder head bolts (14 threads).

For threads with difficult access, use an angular drilling machine with a chuck for drills with 10 mm diameter to avoid that the engine has to be removed.

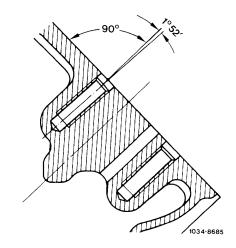
# Caution!

The threaded holes 15, 7, 1, 8 and 17 for the cylinder head bolts M  $10 \times 165$  on the camshaft bearings are drilled at an angle in the crankcase.



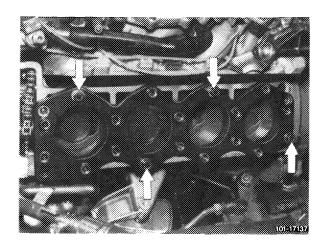
These threaded holes are not vertical to the crank-case mating surface, but at an inclination of  $1^{\circ}$  52' to the engine outside.

In order to prevent pressure points on the cylinder running surfaces due to the relatively long Heli-Coil inserts, the respective core holes must be drilled vertically or at 1° 52′ inclination using the drilling iia.



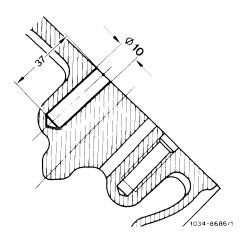
# Reconditioning

- 1 Bolt drilling jig onto the cylinder bank concerned.
- 2 Cover cylinder bores, coolant openings and chain case (minute aluminum-silicon chips damage the cylinder running surface and the piston).

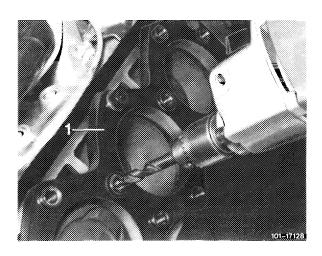


3 Using an HSS spiral drill 10 mm dia., drill core hole approx. 37 mm deep while lubricating with honing oil.

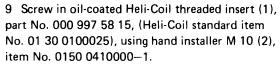
Core hole diameter should be a minimum of 10 mm and a maximum of 10.3 mm.



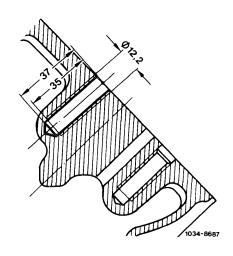
4 Remove drilling jig and blow out chips.

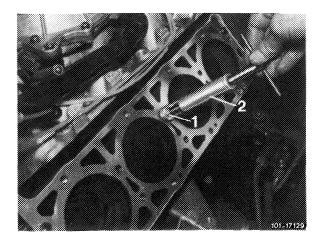


- 5 Precut the Heli-Coil installation thread as deep as possible using the tap with guide shaft section. To do so, lubricate the tap with honing oil.
- 6 Carefully blow out chips.
- 7 Cut Heli-Coil installation thread using Heli-Coil tap M 10 (outside diameter 12.0 mm), item No. 0140 0100104, approx. 35 mm deep, while lubricating the tap with honing oil.
- 8 Carefully blow out chips.



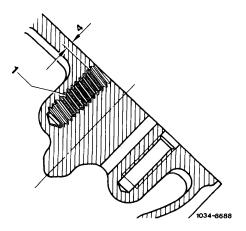
To do so, screw Heli-Coil insert (1) with the driving end to the front into the hand installer (2) until the first winding projects 3/4. Align the hand installer over the tapped hole and screw in the Helicoil insert (1) without pressure by turning the spindle.





### Caution!

The uppermost thread must be positioned approx. 4 mm below the crankcase mating surface.



10 Screw a cylinder head bolt into the inserted thread and check for misalignment and easy operation.

The screw-in depth should be approx. 29 mm.

**Note:** The driving end of the Heli-Coil threaded insert is not removed as is usual, but remains on the threaded insert.