

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)

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

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

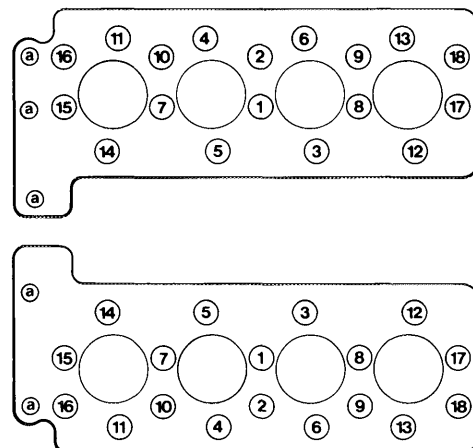
Note

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!

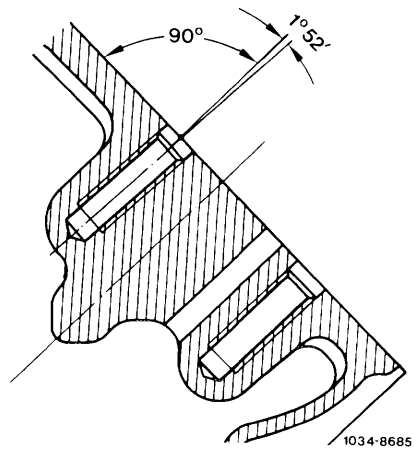
The threaded holes 15, 7, 1, 8 and 17 for the cylinder head bolts M 10 x 165 on the camshaft bearings are drilled at an angle in the crankcase.



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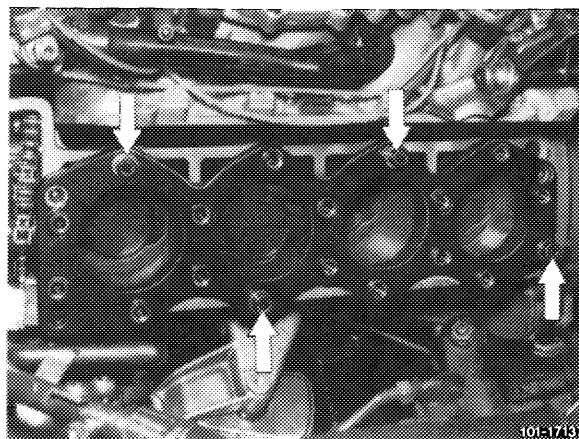
These threaded holes are not vertical to the crank-case mating surface, but at an inclination of $1^{\circ} 52'$ to the engine outside.

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 $1^{\circ} 52'$ inclination **using the drilling jig**.



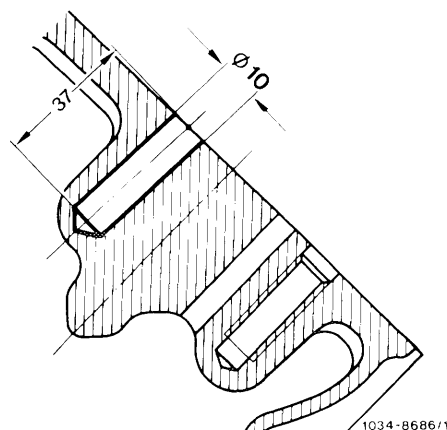
Reconditioning

- 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).

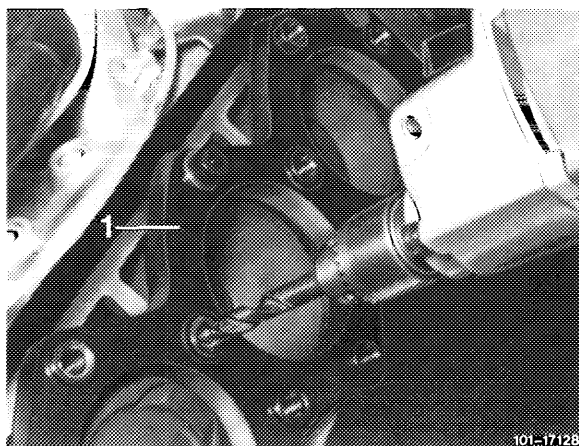


- 3 Using an HSS spiral drill 10 mm dia., drill core hole approx. 37 mm deep while lubricating with honing oil.

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.

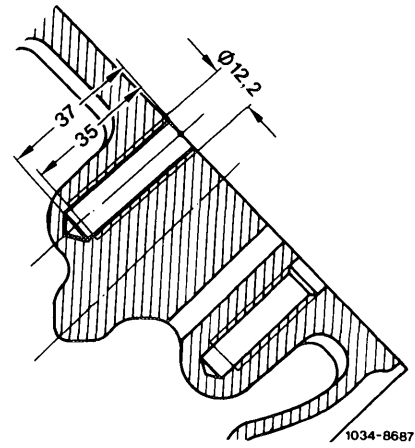


5 Precut the Heli-Coil installation thread as deep as possible using the tap with guide shaft section. To do so, lubricate the tap with honing oil.

6 Carefully blow out chips.

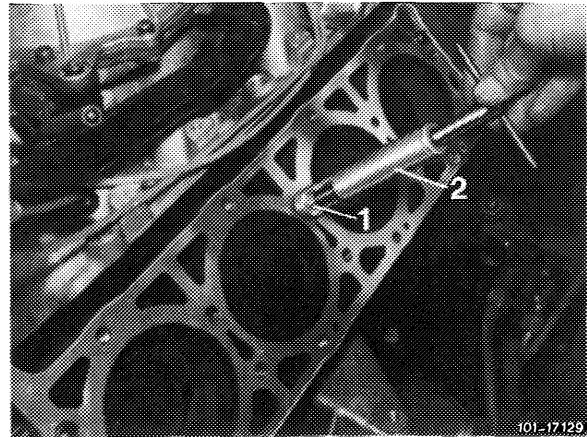
7 Cut Heli-Coil installation thread using Heli-Coil tap M 10 (outside diameter 12.0 mm), item No. 0140 0100104, approx. 35 mm deep, while lubricating the tap with honing oil.

8 Carefully blow out chips.



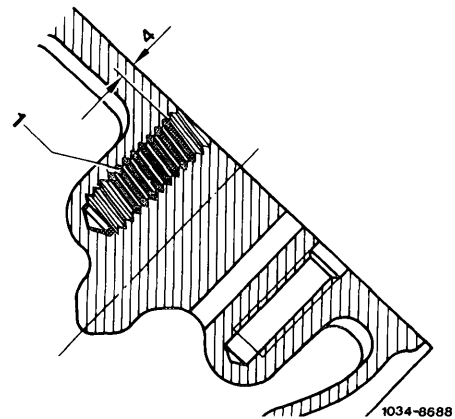
9 Screw in oil-coated Heli-Coil threaded insert (1), part No. 000 997 58 15, (Heli-Coil standard item No. 01 30 0100025), using hand installer M 10 (2), item No. 0150 0410000-1.

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.