

Crankshaft Assembly Overview



Note

Secure engine to assembly stand using Engine and Transmission Holder -VAS 6095- when performing repair work. Refer to → [Chapter „Engine, Securing on Assembly Stand“](#).

1 - Bolt

- 22 Nm
- For bearing cap
- Replace
- Tightening order, refer to → [Fig. „Crankshaft Bearing Cap, Installing“](#)

2 - Alignment Bushing

- Insert in cylinder block

3 - Drive Sprocket for Oil Pump

- Removing and installing, refer to → [Chapter „Oil Pump Drive Chain Sprocket“](#)

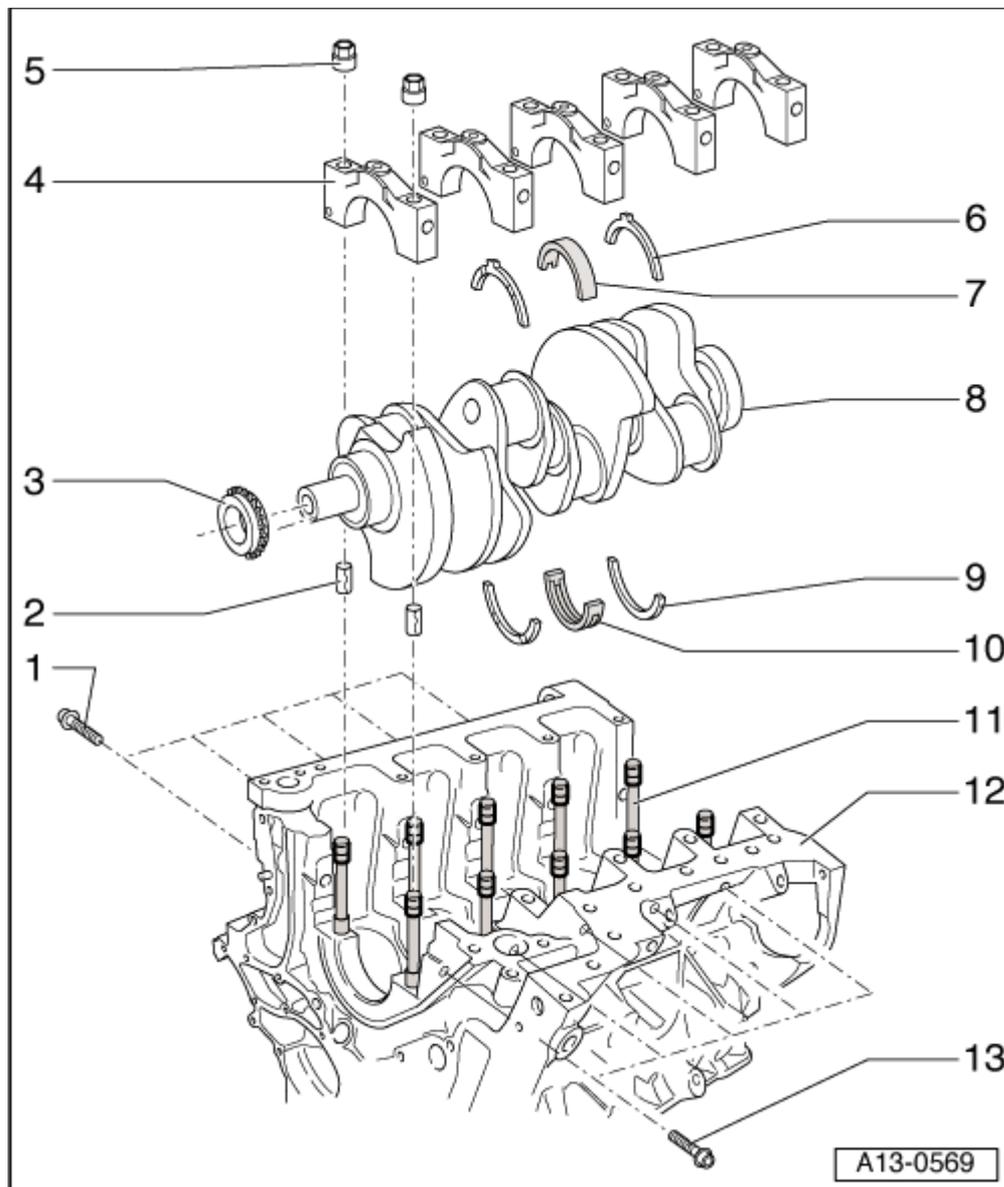
4 - Bearing Cap

- Observe identification, refer to → [Fig. „Crankshaft Bearing Cap Identification“](#)
- Removing, refer to → [Fig. „Crankshaft Bearing Cap, Removing“](#)
- Installing, refer to → [Fig. „Crankshaft Bearing Cap, Installing“](#)

5 - Nut

- 35 Nm plus an additional 90° turn
- For bearing cap
- Replace
- Tightening order, refer to → [Fig. „Crankshaft Bearing Cap, Installing“](#)

6 - Thrust Washer



- ❑ Only on 3rd crankshaft bearing
- ❑ Lubricating grooves face outward
- ❑ Observe locating point
- ❑ Measuring crankshaft axial clearance, refer to → Chapter „Axial Clearance, Measuring“

7 - Bearing Shell

- ❑ For bearing cap without oil groove
- ❑ Do not interchange used bearing shells (mark)
- ❑ Insert new bearing shells for cylinder block with proper color marking, refer to → Fig. „Allocation of Crankshaft Bearing Shells for Bearing Cap“

8 - Crankshaft

- ❑ Measuring axial play, refer to → Chapter „Axial Clearance, Measuring“
- ❑ Radial clearance, measuring, refer to → Chapter „Radial Clearance, Measuring“
- ❑ Do not turn crankshaft when measuring radial play
- ❑ Crankshaft dimensions, refer to → Chapter „Crankshaft Dimensions“

9 - Thrust Washer

- ❑ Only on 3rd crankshaft bearing
- ❑ Lubricating grooves face outward
- ❑ Measuring crankshaft axial clearance, refer to → Chapter „Axial Clearance, Measuring“

10 - Bearing Shell

- ❑ For cylinder block with oil groove
- ❑ Do not interchange used bearing shells (mark)
- ❑ Insert new bearing shells for cylinder block with proper color marking, refer to → Fig. „Allocation of Crankshaft Bearing Shells for Cylinder Block“

11 - Studs

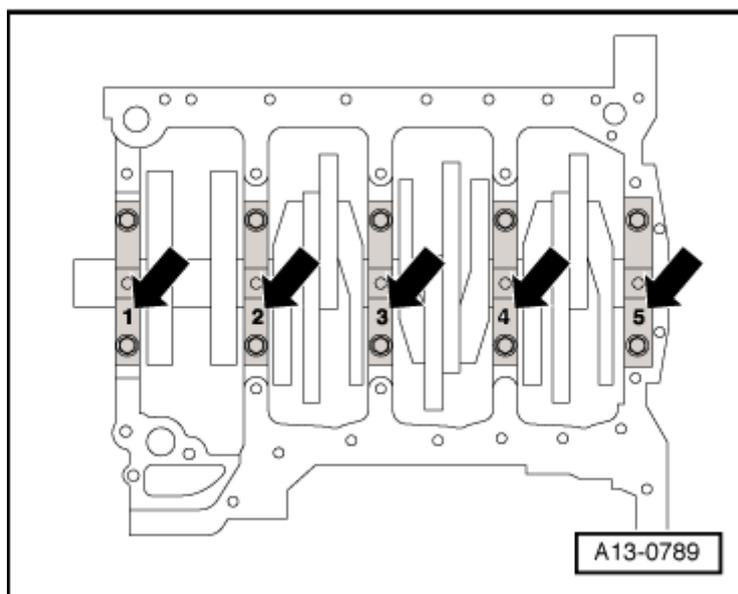
12 - Cylinder Block

13 - Bolt

- ❑ 22 Nm
- ❑ For bearing cap
- ❑ Replace
- ❑ Tightening order, refer to → Fig. „Crankshaft Bearing Cap, Installing“

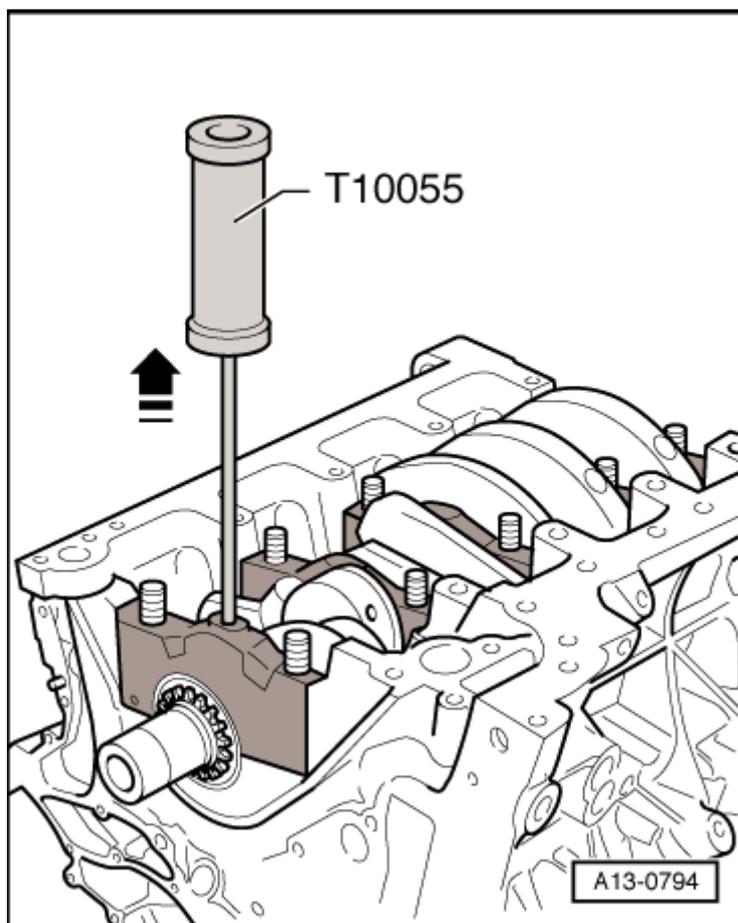
Crankshaft Bearing Cap Identification

- ◆ Bearing 1 is located on the belt pulley side.



Crankshaft Bearing Cap, Removing

- Remove crankshaft bearing cap bolts or nuts.
- Remove crankshaft bearing caps from cylinder block using -T10055-.



Allocation of Crankshaft Bearing Shells for Cylinder Block

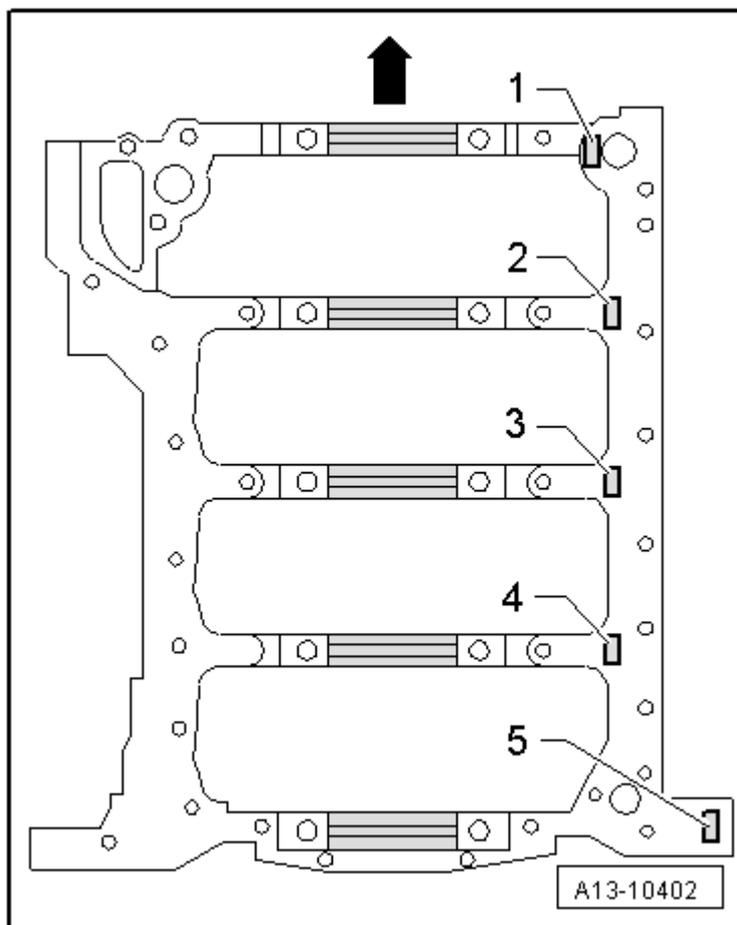
Bearing shells with the correct thickness are allocated to the cylinder block in the factory. Colored dots on bearing shells serve for identifying bearing shell thickness.



Note

-Arrow- points to belt pulley side.

Allocation of bearing shells to cylinder block is identified with a letter by each bearing.

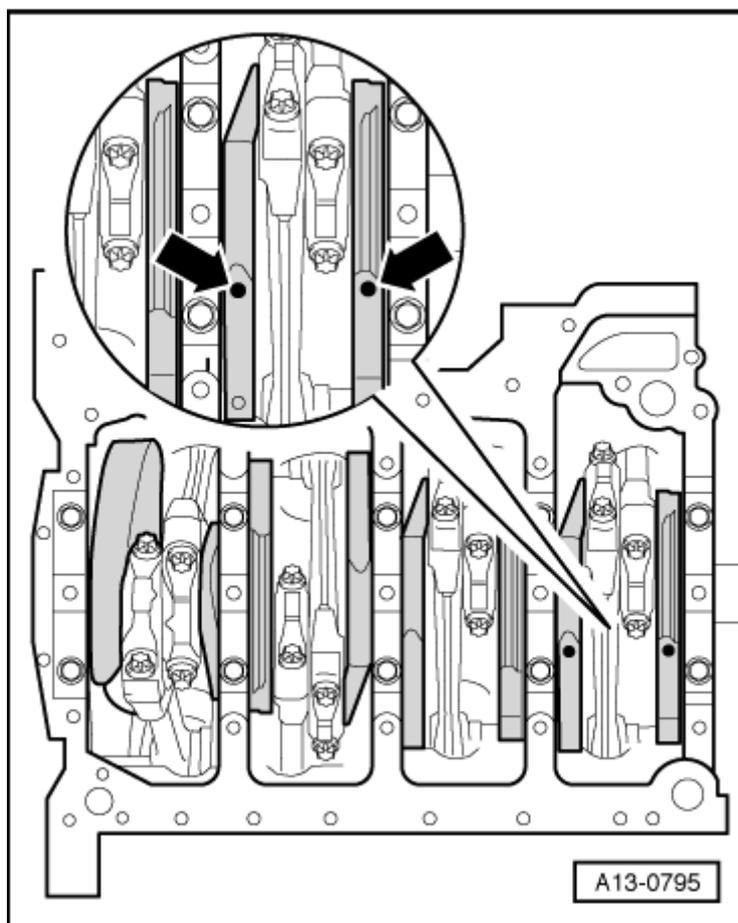


Letter on cylinder block	Color of bearing
G	Yellow
B	Blue
R	Red

Allocation of Crankshaft Bearing Shells for Bearing Cap

Bearing shells with correct thickness are allocated to bearing cap at factory. Colored dots on the bearing shells serve for identifying bearing shell thickness -arrows-.

Allocation of bearing shells to crankshaft is marked at crankshaft counterweight by colored dots.



Crankshaft Bearing Cap, Installing

- Replace bolts -A- and nuts -1 through 10-
- Inserting alignment bushings into cylinder block.
- Tighten bearing cap nuts or bolts in the following sequence:
 - 1 - Hand-tighten bolts -A-
 - 2 - Tighten the nuts -1 to 10- to 35 Nm.
 - 3 - Tighten nuts -1 through 10- 90° (1/4 additional turn) using a rigid wrench.
 - 4 - Tighten the bolts -A- to 22 Nm.
 - 5 - Tighten bolts -A- 90° (1/4 turn) further using rigid wrench.

