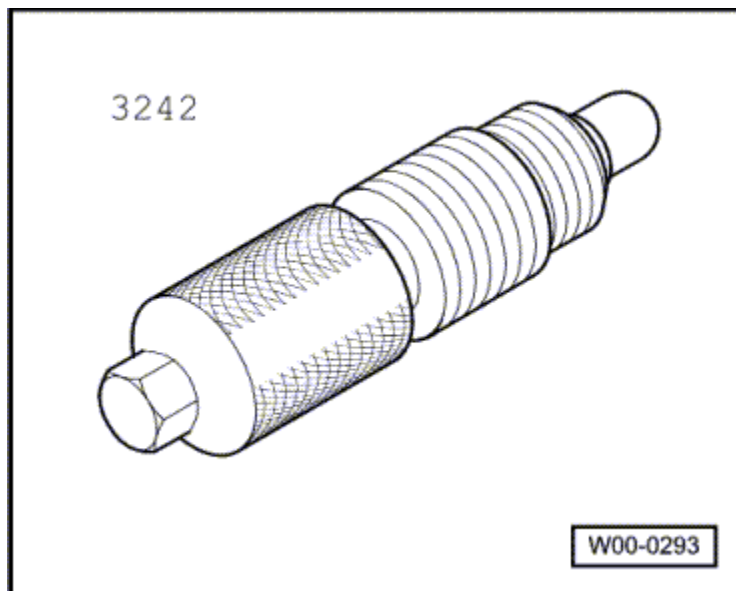


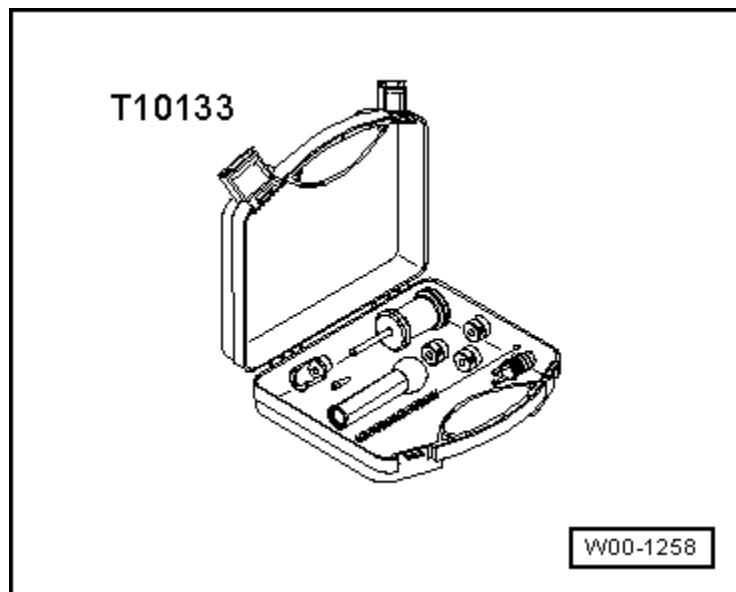
## Removing and installing camshafts

### Special tools and workshop equipment required

- ◆ Locking pin -3242-



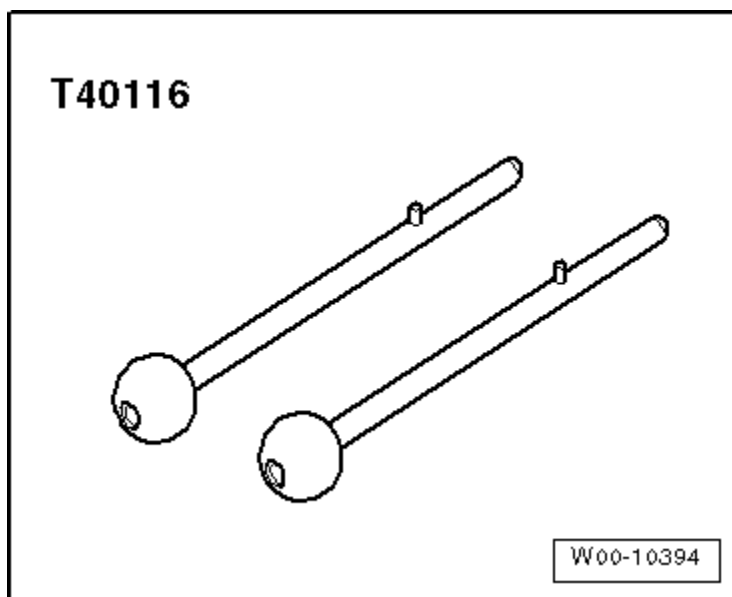
- ◆ Impact extractor attachment -T10133/3-  
from tool set for FSI engines -T10133-



- ◆ Locating pins -T40116-
- ◆ Electric drill with plastic brush attachment
- ◆ Safety goggles
- ◆ Sealant → [Electronic parts catalogue](#)

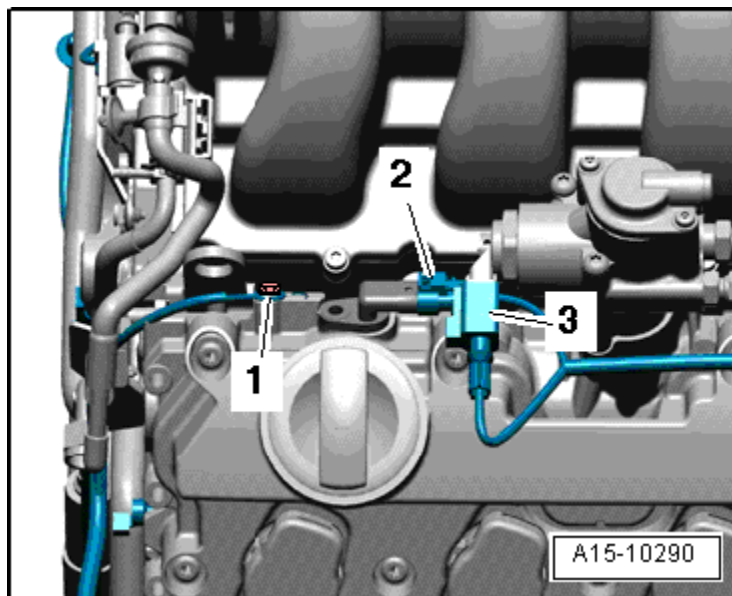
 **Note**

*The following description is for removing and installing on cylinder head (left-side).*



**Removing**

- Engine removed and in position on scissor-type assembly platform -VAS 6131 A- with gearbox attached.
- ñ Remove camshaft timing chains from camshafts → [Chapter](#).
- ñ Unscrew earth wire -1- from retaining frame.
- ñ Unplug electrical connectors -2- and -3-.
- ñ Remove high-pressure pump → [Rep. gr.24](#).

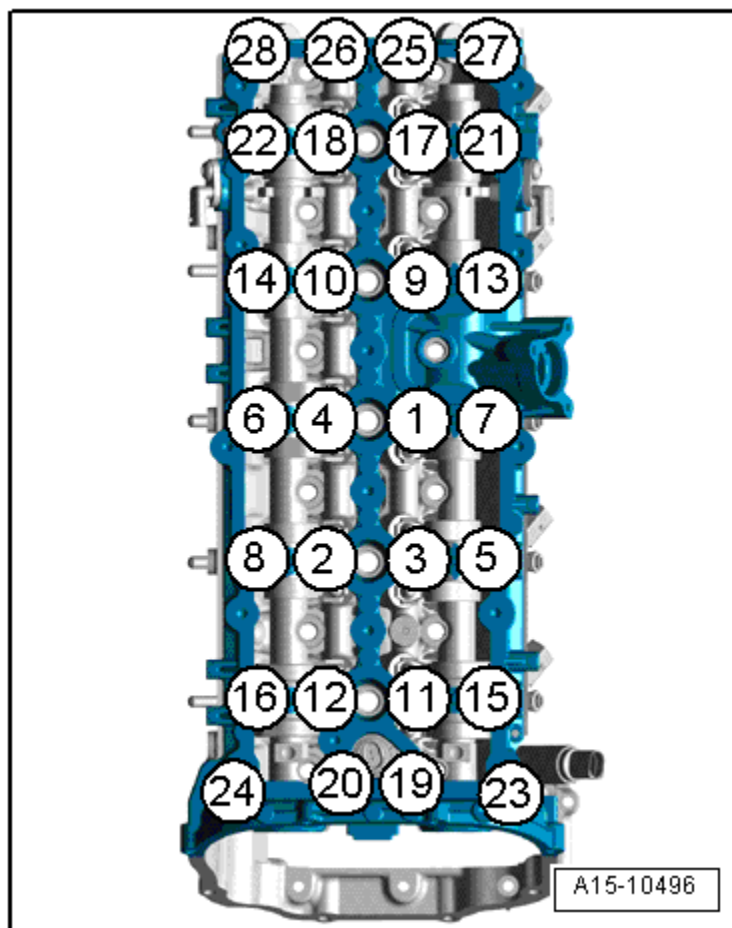


- ñ Slacken retaining frame bolts in the sequence -28 ... 1-.

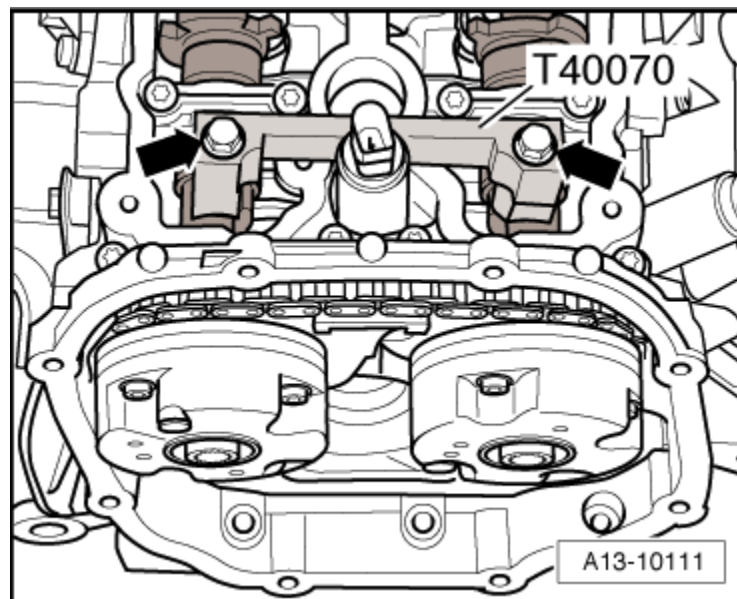
**Note**

Perform the same procedure (laterally reversed) on retaining frame (right-side).

- ñ Carefully release retaining frame from bonded joint and set it down on a soft surface on workbench.



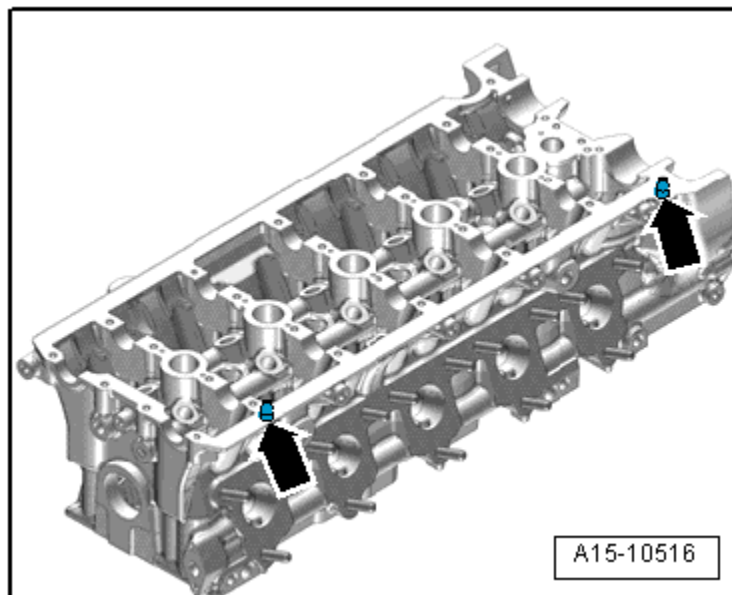
- ñ Remove camshaft clamp -T40070- at left cylinder head.
- ñ Mark and remove camshafts.





**Caution**

*On engines fitted with dowel pins - arrows- for retaining frames, use roll-pin drift to drive out dowel pins.*



**Installing**



**Note**

- ◆ Renew the bolts tightened with specified tightening angle.
- ◆ Renew gaskets and seals.
- Crankshaft -1- locked in position with locking pin -3242-.



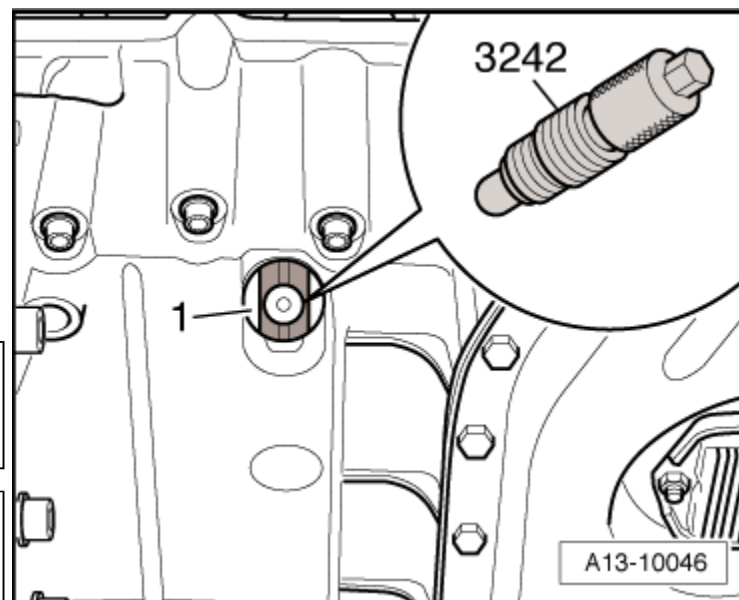
**WARNING**

**Wear safety goggles.**



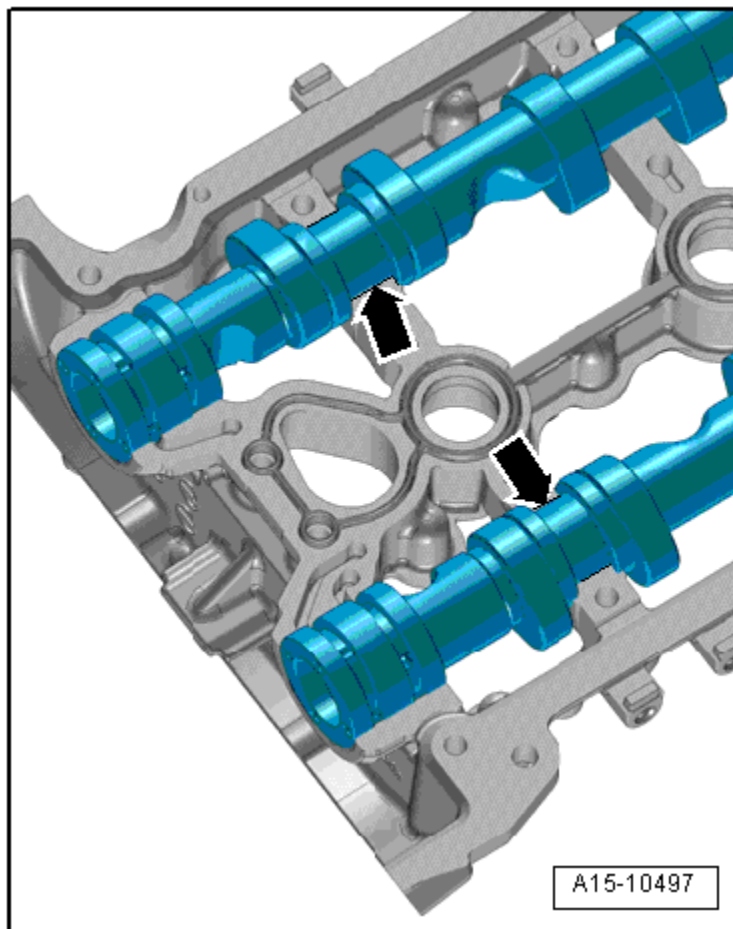
**Caution**

**Make sure that no sealant residue gets into the cylinder head or the bearings.**

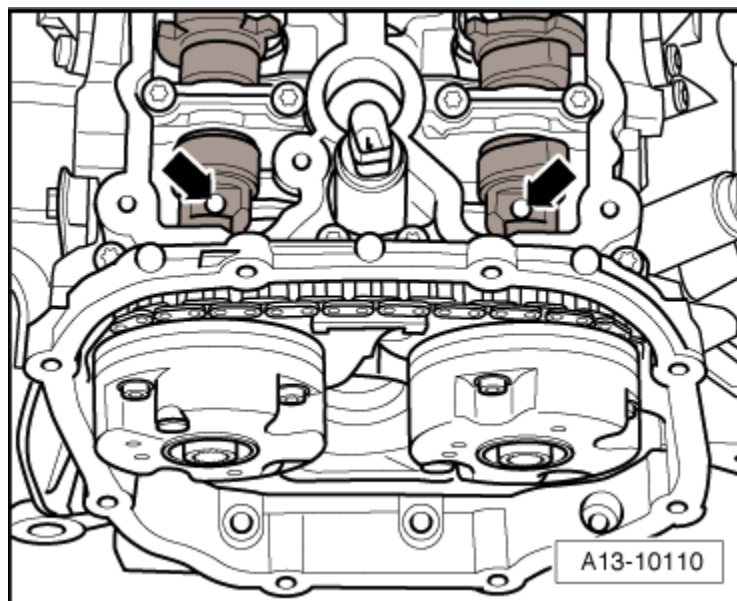


- ñ Remove sealant residue from cylinder head and retaining frame using a rotating plastic brush or similar.
- ñ Clean sealing surfaces; they must be free of oil and grease.
- ñ Lubricate running surfaces of camshafts.

- ñ Insert camshafts into retaining frame.
- Camshafts must be in correct position in axial bearings -arrows- in retaining frame.
- ñ Turn retaining frame upside down with camshafts fitted, keeping hold of the camshafts in the retaining frame.



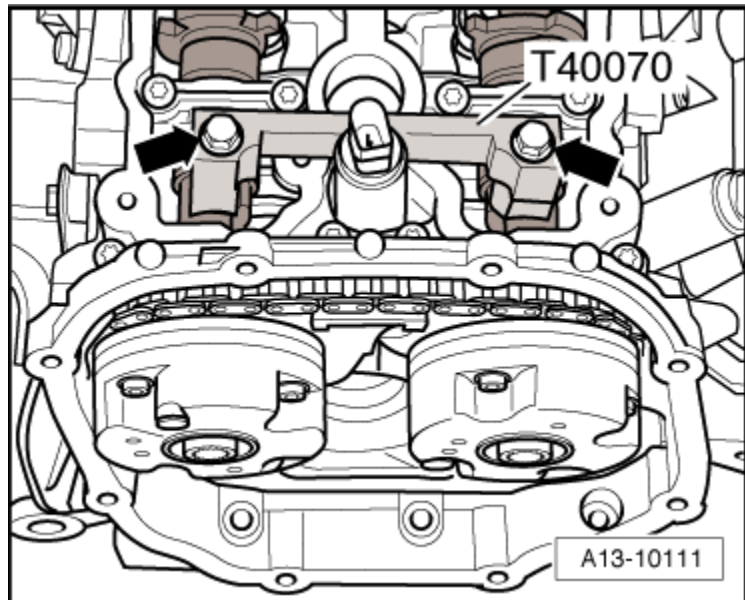
- ñ Turn the camshafts until the threaded holes -arrows- point upwards.
- ñ Check that camshafts are still in correct position in axial bearings in retaining frame.



- ñ Fit camshaft clamp -T40070- to inlet camshaft and exhaust camshaft as shown in illustration and tighten bolts to 25 Nm.

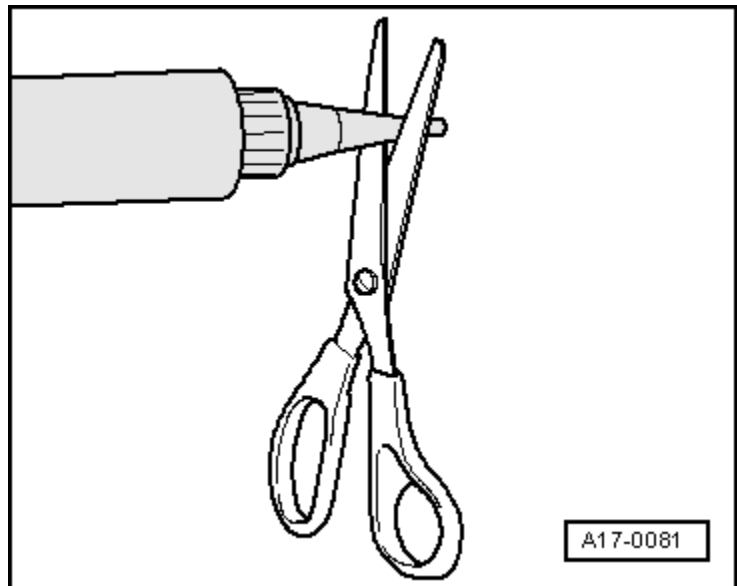


**Note**



*Note the use-by date of the sealant.*

- ñ Cut off tube nozzle at front marking (diameter of nozzle approx. 2 mm).



- ñ Turn retaining frame back up.
- ñ Fit new gasket -2- in grooves on retaining frame.

**Note**

*The sealant beads must not be thicker than specified, otherwise excess sealant could enter the camshaft bearings.*

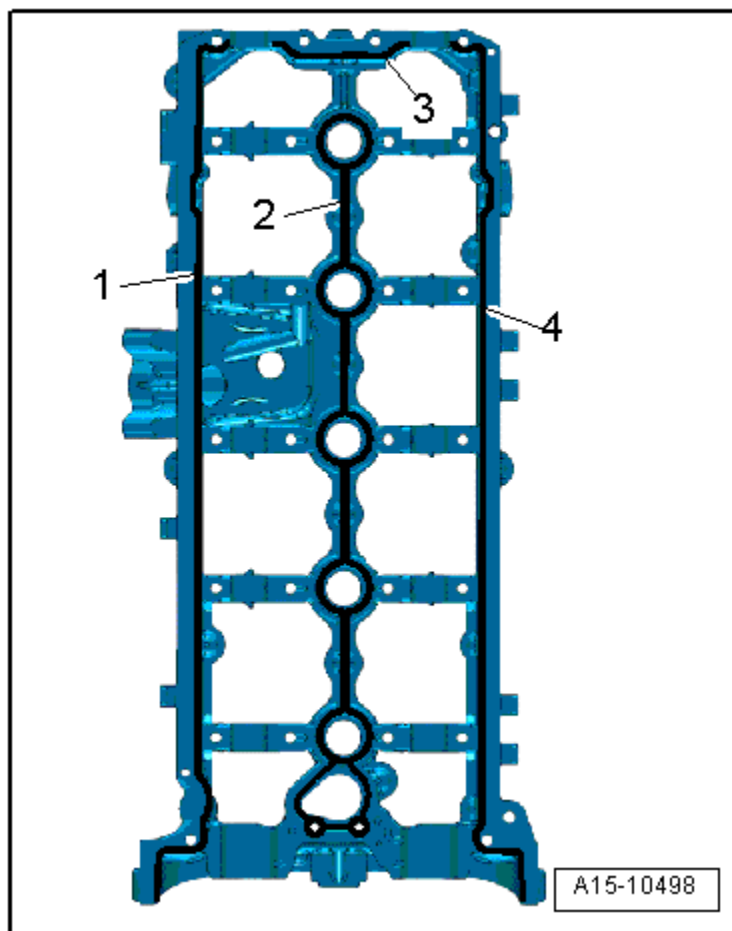
- ñ Apply the beads of sealant -1, 3, 4- onto the clean sealing surfaces of the retaining frame as illustrated.

- Width of beads of sealant: 2.5 mm.

**Note**

*The retaining frame must be installed within 5 minutes after applying the sealant.*

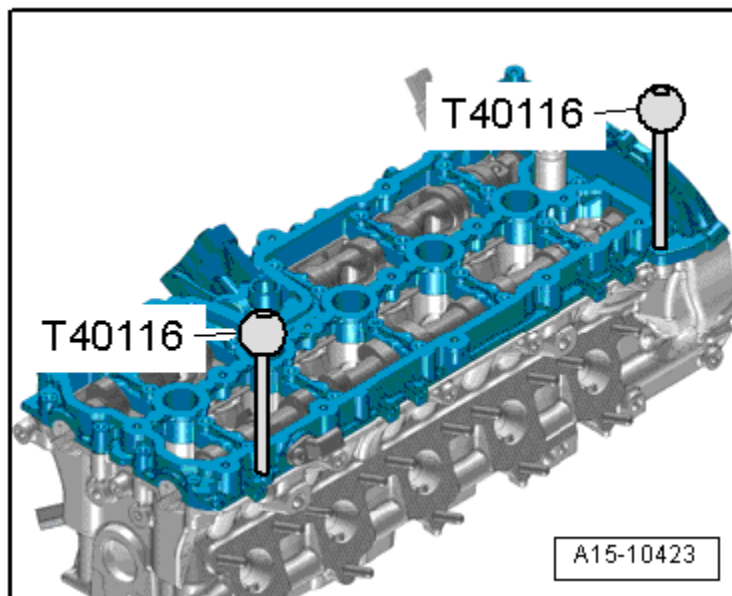
- ñ Fit retaining frame onto cylinder head.



- ñ Insert locating pins -T40116- in retaining frame and in cylinder head.

**Note**

*After installing the retaining frame, wait about 30 minutes for the sealant to dry.*





- ñ Renew bolts securing retaining frame for camshafts.

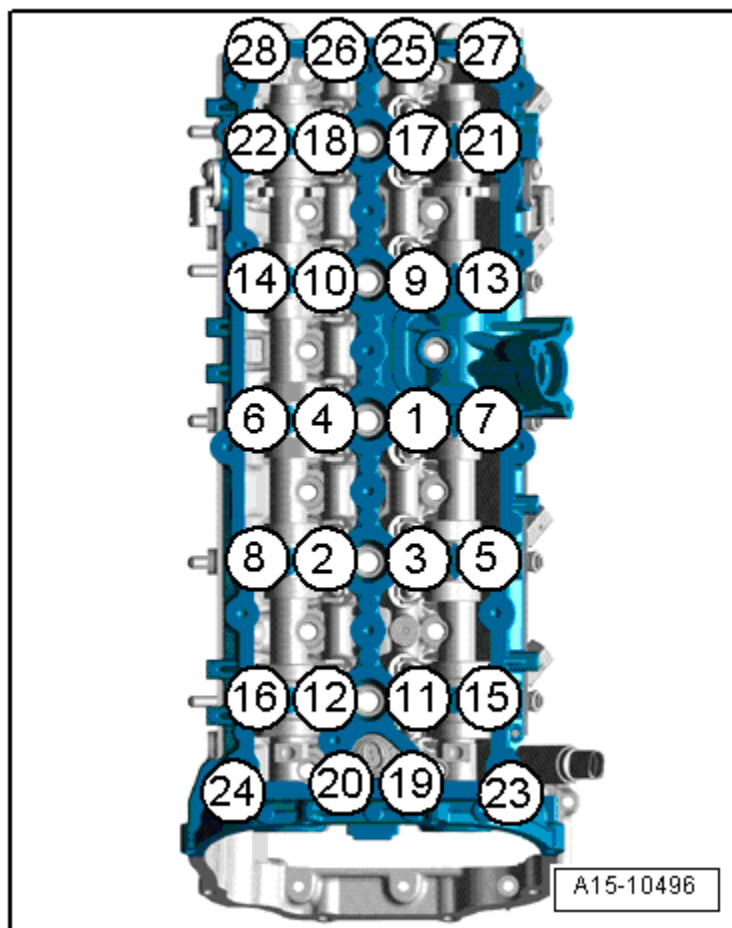


**Caution**

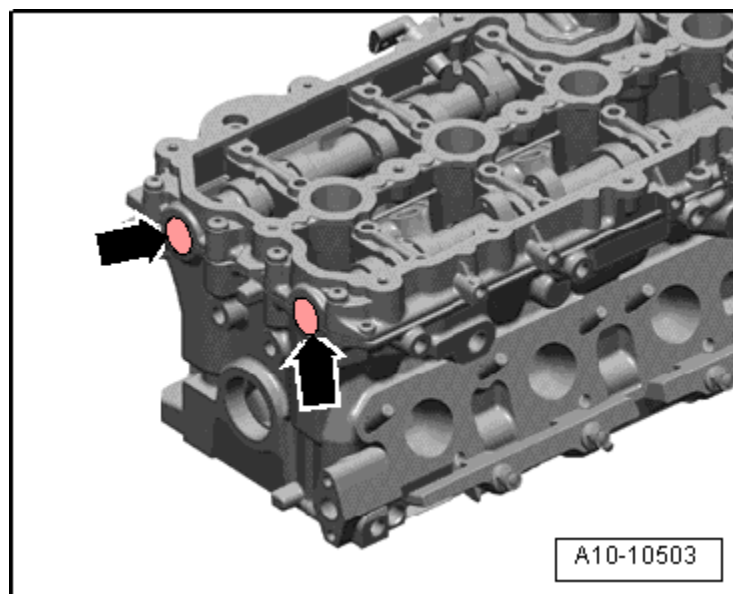
**Risk of damage to retaining frame for camshafts.**

**It is important to tighten the bolts securing the retaining frame as described.**

- ñ Tighten bolts securing retaining frame for camshafts → Fig..



- ñ Clean bores for sealing plugs in cylinder head; they must be free of oil and grease.
- ñ Coat outer circumference of sealing plugs - arrows- with sealant; refer to → [Electronic parts catalogue](#) for sealant.
- ñ Knock in sealing plugs until flush.





- ñ Use impact extractor attachment -T40116 - to pull out locating pins -T10133/3-.

Remaining installation steps are carried out in reverse sequence; note the following:

- ñ Install high-pressure pump →Rep. gr.24.
- ñ Position timing chains on camshafts → Anchor.
- ñ Install timing chain covers (left and right) → Anchor.
- ñ Install cylinder head cover: left-side → Chapter, right-side → Chapter.



#### Note

After working on the valve gear, turn the engine carefully at least 2 rotations by hand to ensure that none of the valves make contact when the starter is operated.

#### Tightening torques

- ♦ → Fig. ñRetaining frame for camshafts - tightening torque and sequenceî

