

## Toothed Belt

### Special tools and workshop equipment required

- ◆ Tightener pulley wrench -T40009-
- ◆ Crankshaft holder -3242-
- ◆ Torque wrench (5-60 Nm) -VAG 1783-
- ◆ Ratchet insert 1/4" -VAS 6234-
- ◆ Puller -T40001- with claws -T40001/2-
- ◆ Camshaft adjustment -T40005-
- ◆ Locking pin -T40011-
- ◆ Spanner wrench -3212-

### Removing



#### Note

Before raising the vehicle on a hoist (wheels off the ground), activate the vehicle lift mode. Refer to →*Suspension, Wheels, Steering; Rep. Gr.43.*

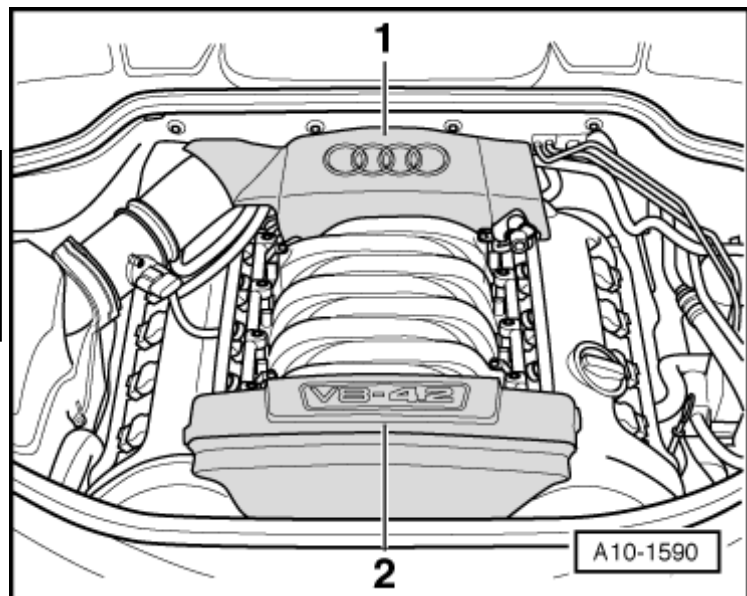
- Remove the front bumper. Refer to →*Body Exterior; Rep. Gr.63.*
- Remove the lock carrier. Refer to →*Body Exterior; Rep. Gr.50.*
- Remove the ribbed belt. Refer to → *Chapter „Ribbed Belt“.*
- Remove the engine cover -2- upward.
- Remove the upper left and upper right toothed belt guards.



#### Caution

**Only turn over the engine at the crankshaft in the direction of engine rotation (clockwise).**

- Rotate the crankshaft in the direction of engine rotation using the crankshaft toothed belt gear bolt to the cylinder 5 Top Dead Center (TDC) marking.



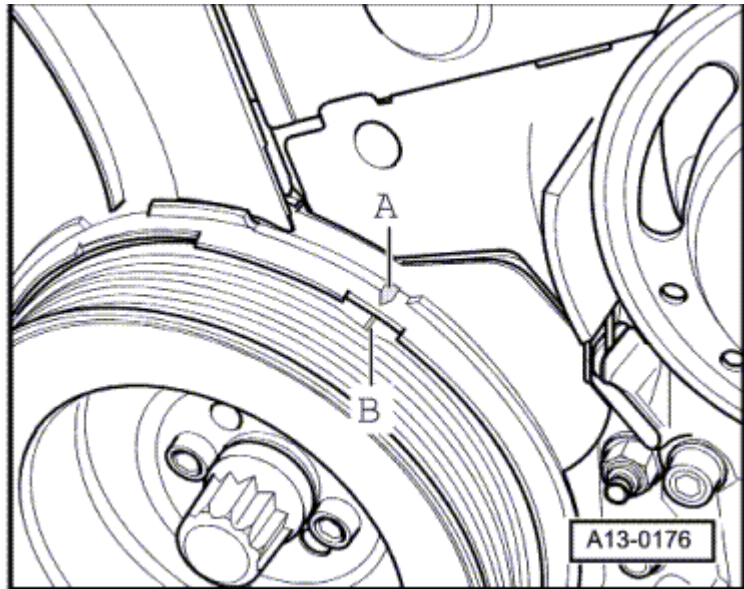
- ◆ Notch -B- aligns with the mark -A-



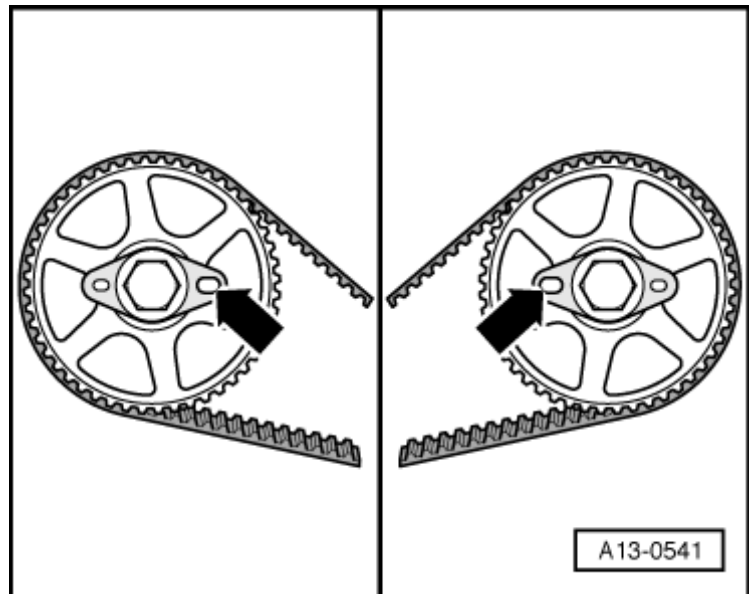
#### Note

Turning over the engine is performed at the center bolt of the crankshaft.

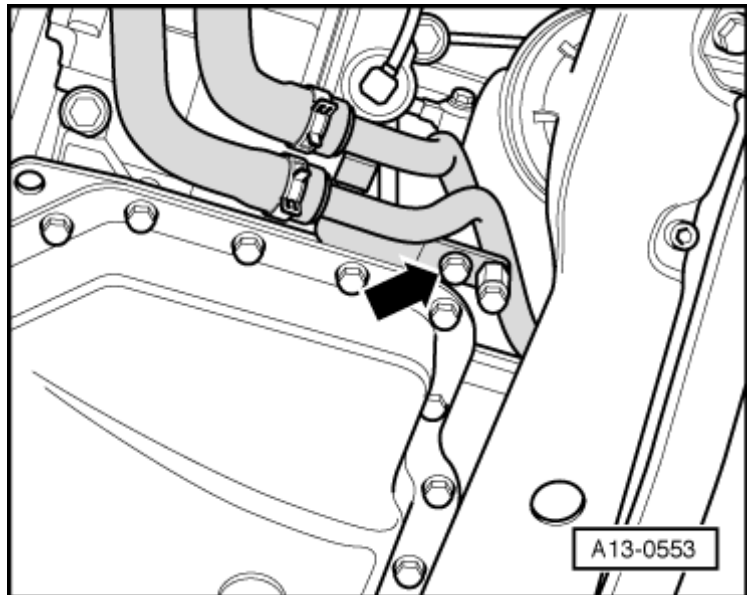
- Check the position of the camshafts:



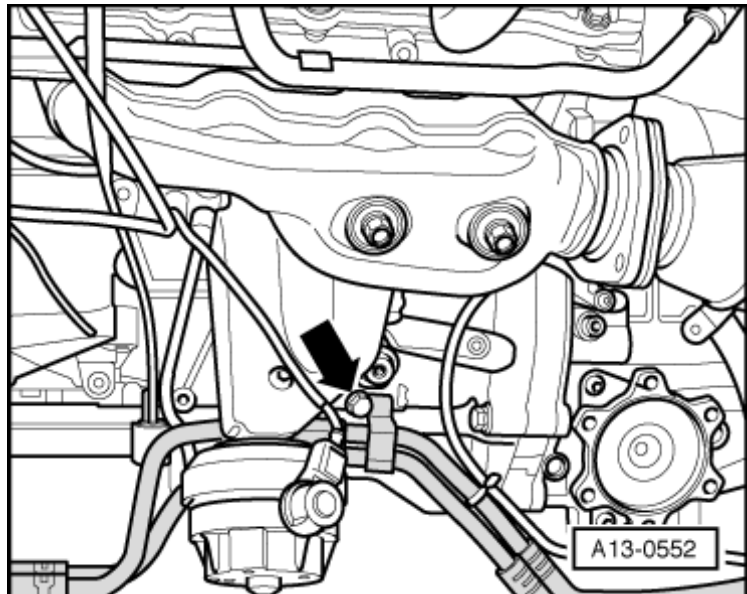
- ◆ The large holes -arrows- on the securing plates of the camshaft gears must align on the inside.
- In case they do not align, turn one more rotation.



- Remove the coolant pipe bolt -arrow- from oil pan.



- Remove the coolant pipe bolt -arrow- from the engine block.



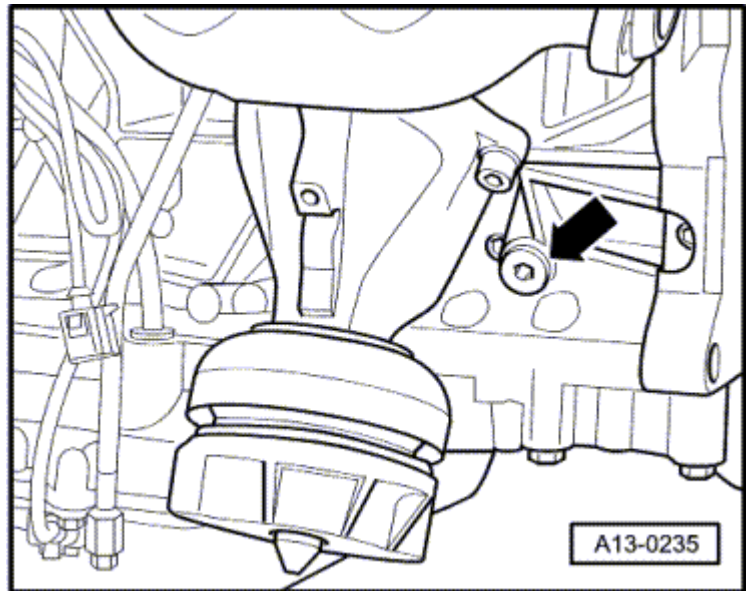
- Remove the locking bolt -arrow- for the TDC mark.

**Note**

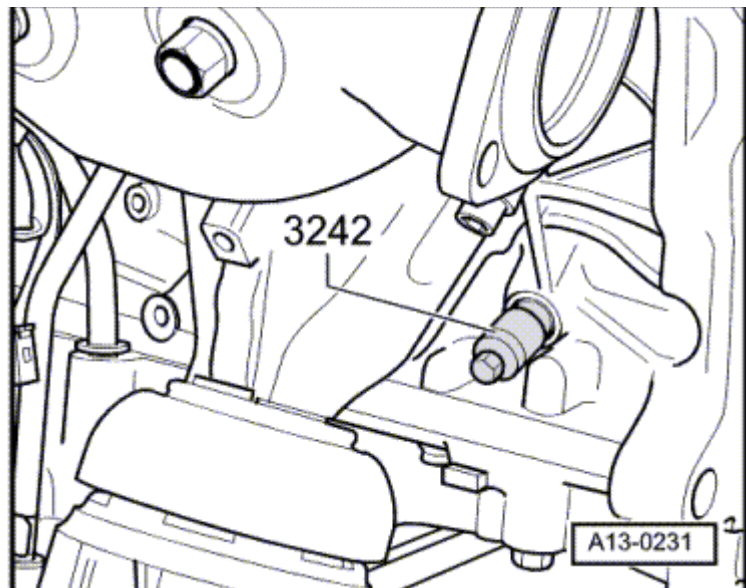
*In the crankshaft, a TDC bore is located exactly behind the locking bolt (can be felt by touch).*

**WARNING**

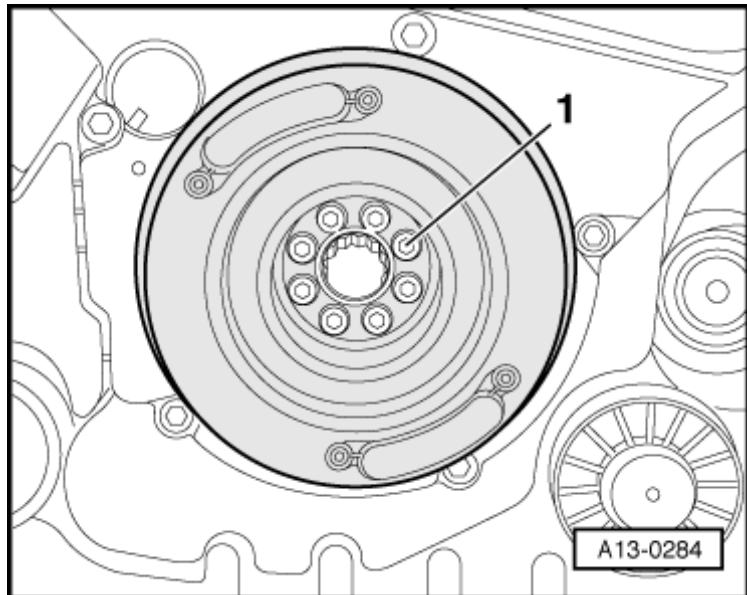
***Do not rotate the crankshaft while touching the TDC mark with your finger - danger of injury.***



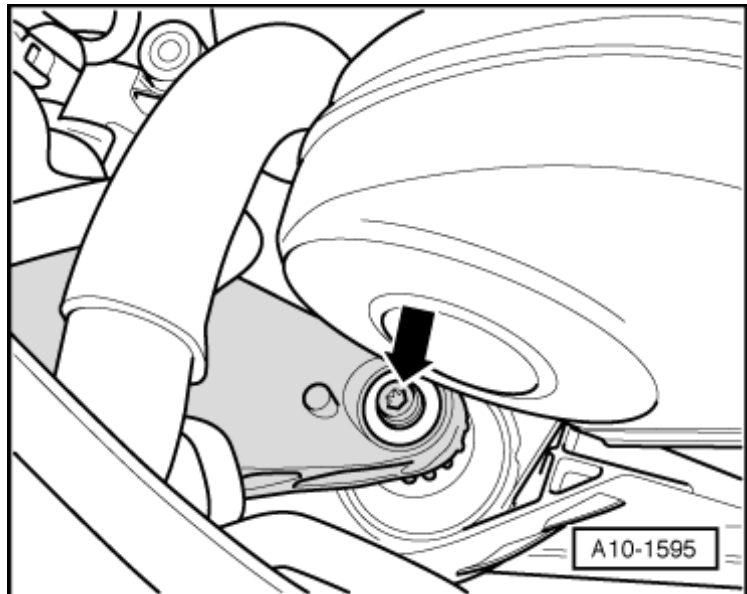
- Install the -3242- in the hole for the locking bolt in the upper oil pan.



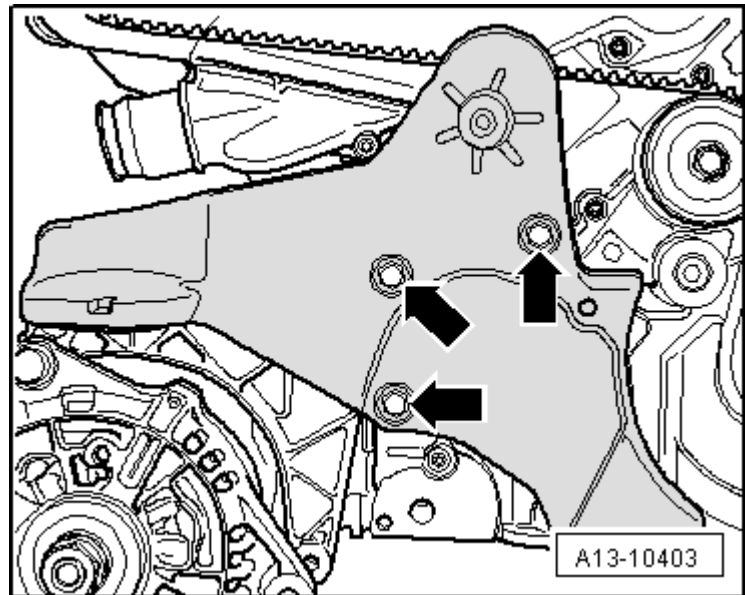
- Remove the vibration damper bolts -1- from the crankshaft.
- Remove the center toothed belt guard.



- Remove the torque support bolt -arrow- from the torque support valve -N382-.



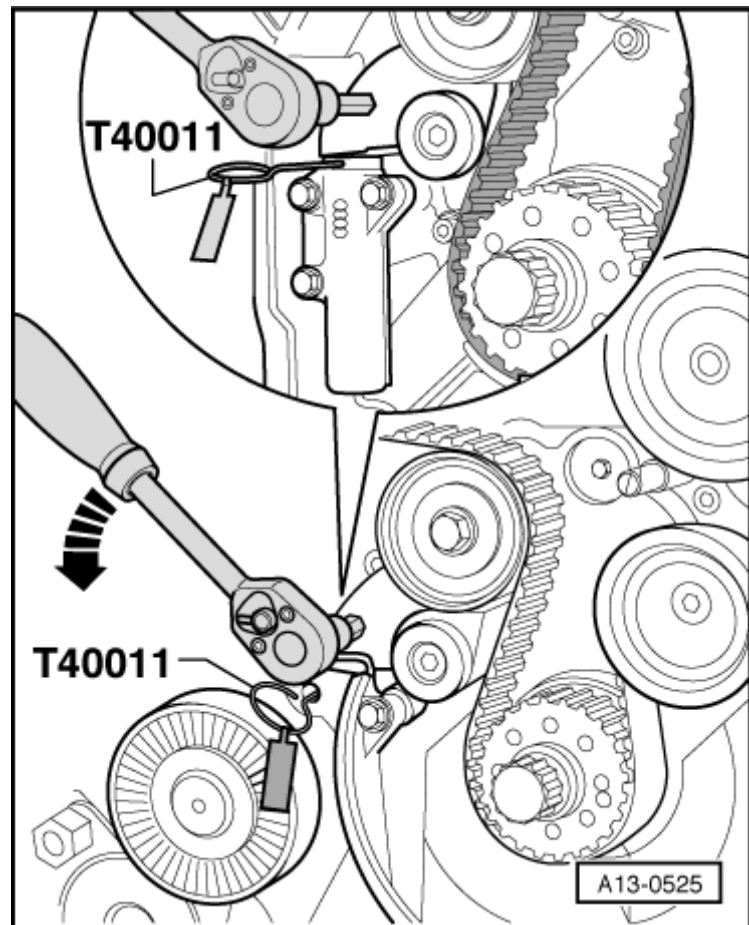
- Remove the bracket bolts -arrows- for the torque support valve.



- Using an 8 mm hex wrench, rotate the toothed belt tensioner in the -direction of the arrow- until the tensioning lever pushes the tensioning element together far enough so that the -T40011- can be inserted into the bore of the tensioning element piston and housing.

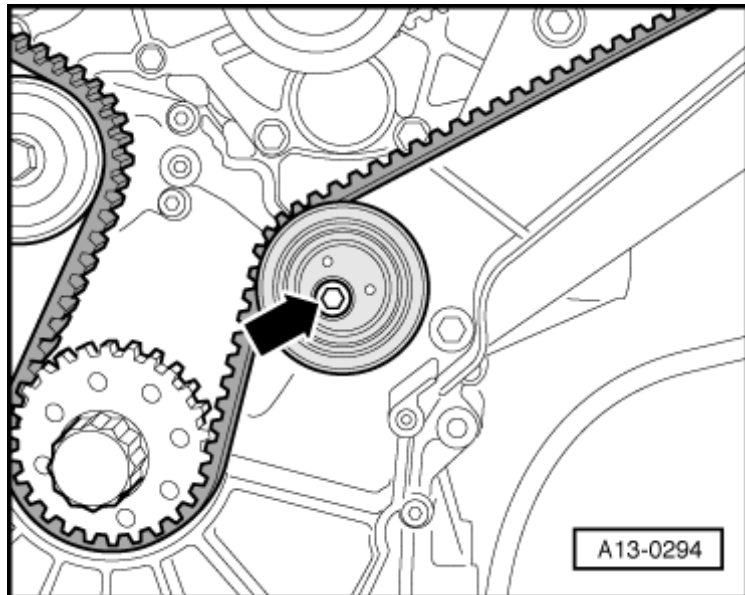
**Note**

- ◆ *When inserting, the bracket for the torque support valve remains installed. The -T40011- can be guided through a hole in the bracket to be inserted into the holes in the tensioner.*
- ◆ *The toothed belt tensioner is oil dampened. Compress it by slowly applying constant pressure.*
- ◆ *Mark the direction of rotation of the toothed belt. Reversed running direction can cause damage.*



- Loosen the eccentric roller bolt -arrow-.



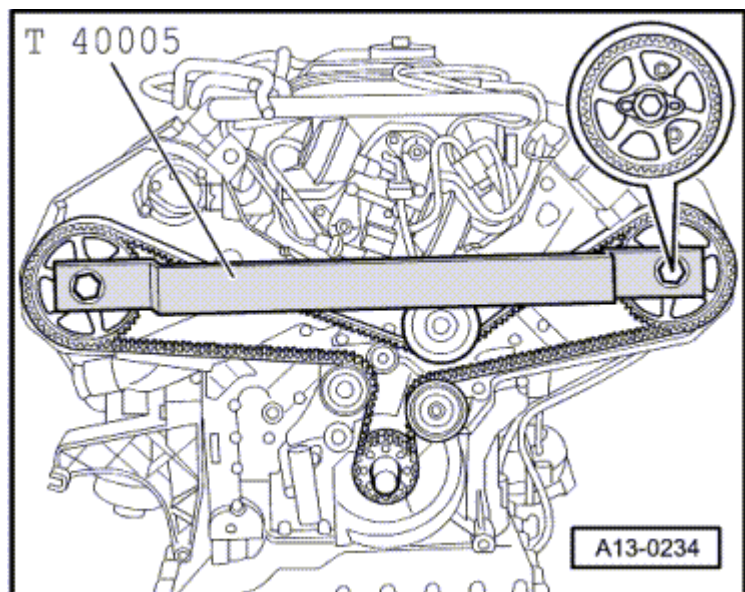


- Install the -T40005- in the camshaft securing plates.
- Loosen both camshaft gear bolts approximately 5 turns.

**Note**

The -T40005- serves as a retainer.

- Remove the -T40005-.



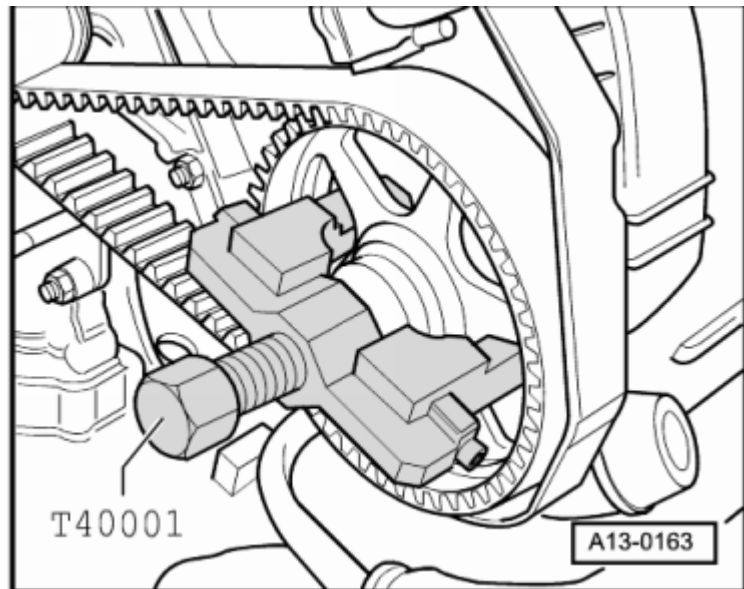
- Remove the left and right camshaft gears using the -T40001- with the -T40001/2-.
- Remove the toothed belt.

**Caution**

**Check the gears after removing. If dents are visible, replace the gears.**

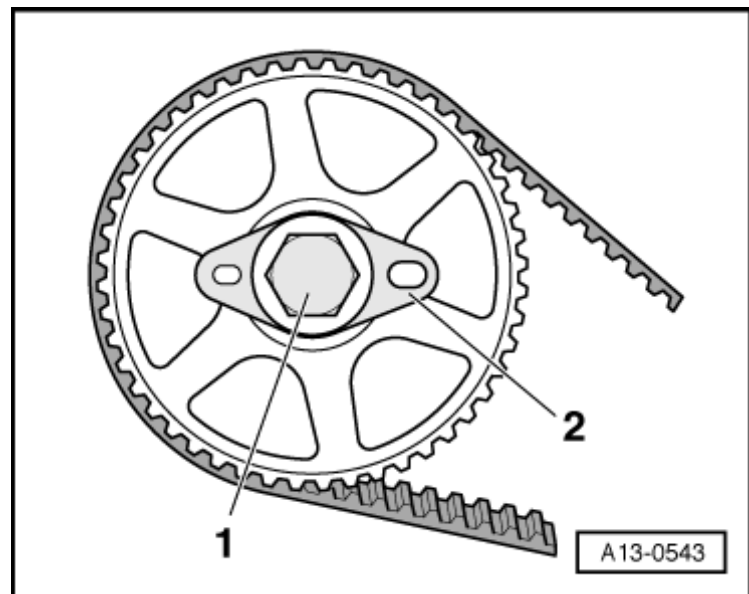
**Installing, (Adjusting Valve Timing)****Note**

When turning the camshaft, the crankshaft must not be at TDC. Valves and/or pistons may be damaged.



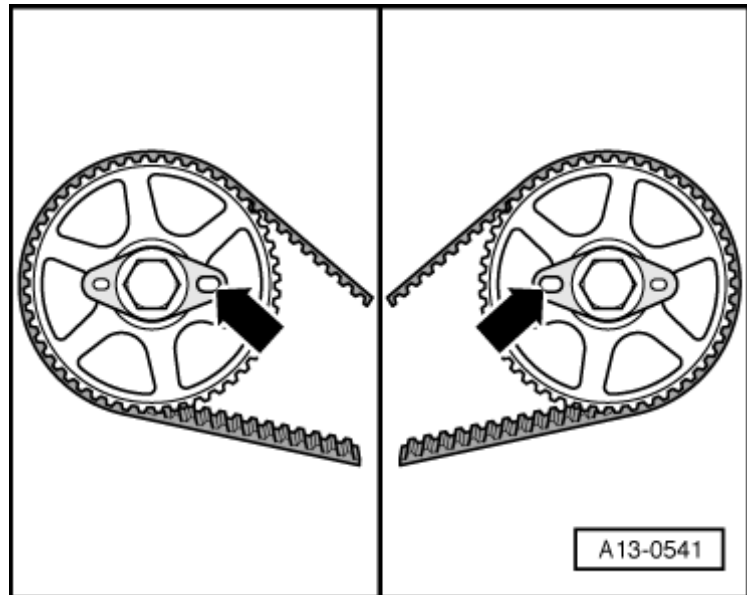
- Replace the bolts -1- for the camshaft gears and securing plates -2-.
- Grease the threads and head seating surfaces of the bolts for the camshaft gears.
- Install the bolts far enough so that they can still just be turned and do not tilt.
- Observe the proper seating of the securing plates on the camshafts.

Before installing the toothed belt, make sure the crankshaft and camshafts are set to TDC cylinder 5:

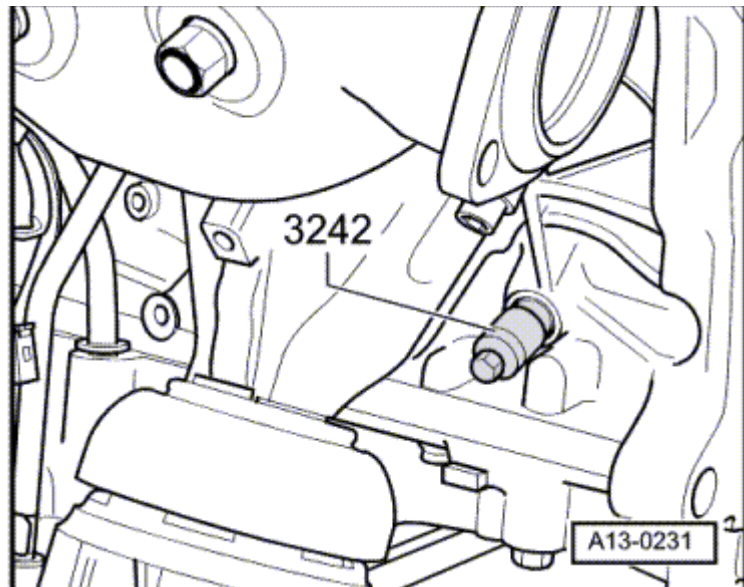


- ◆ The large holes -arrows- on the securing plates at the camshaft gears must align on the inside.

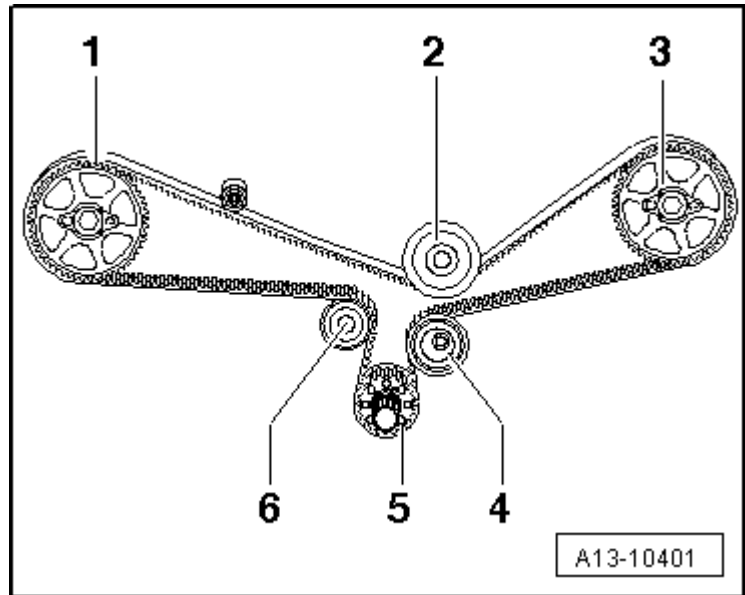




- ◆ The -3242- must be installed in the hole in the upper oil pan.



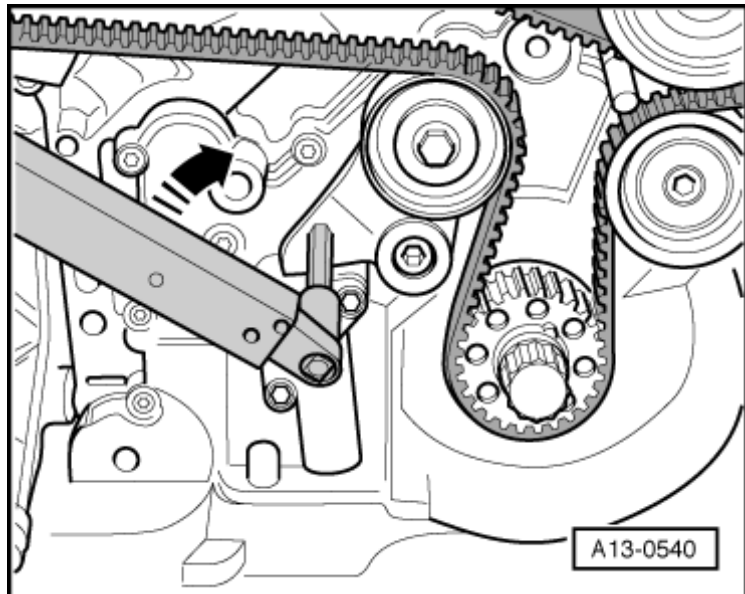
- Route the toothed belt in the following sequence: Crankshaft toothed belt gear -5-, eccentric roller -4-, tensioner -6-, left camshaft gear -3-, coolant pump -2-.
- Lastly, place the toothed belt on the right camshaft gear -1-.



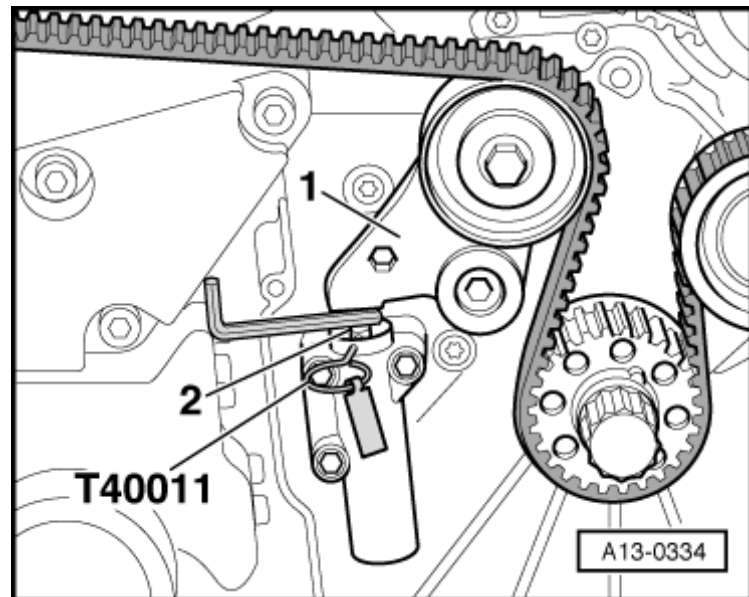
- Turn the tensioning lever twice at 40 Nm in the -direction of the arrow- to pretension the toothed belt.

**Note**

The next two illustrations are shown with the torque support bracket removed.



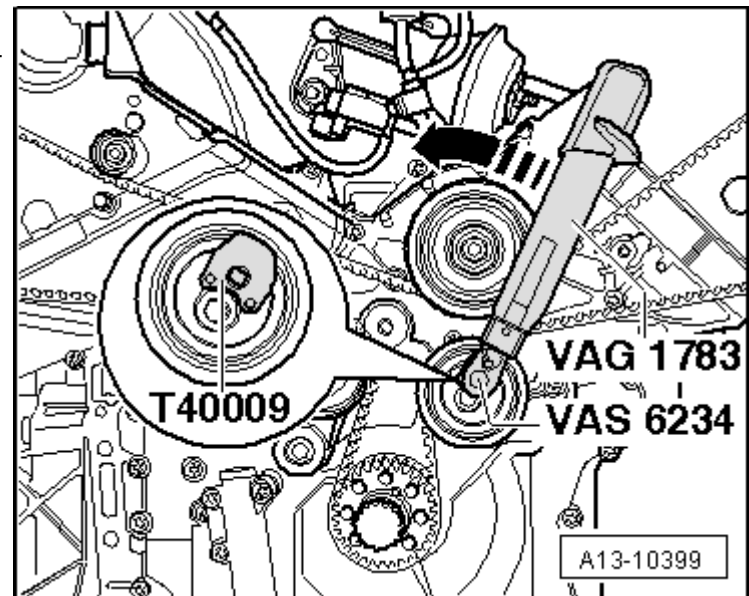
- Insert a 5 mm hex wrench flat between the tensioning lever -1- and tensioning element piston -2-.



- Tighten the toothed belt by turning the eccentric roller using the -T40009- and the VAG 1783- using the -VAS 6234- in the -direction of the arrow- and hold.
- ◆ Pre-tightening specification: 6 Nm
- Tighten the eccentric roller bolt.

**Note**

*Make sure that the position does not change while tightening.*

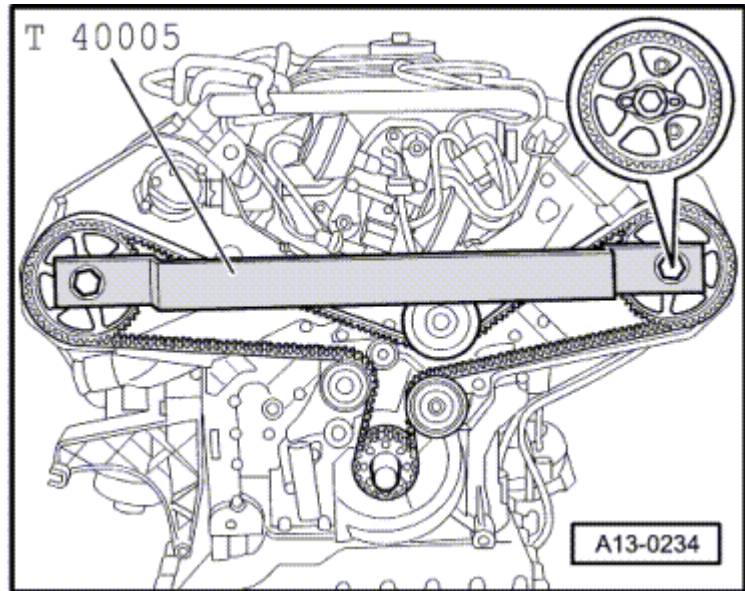


- Insert the -T40005- into the securing plates of both camshafts.
- ◆ Press in the -T40005- as far as possible.
- Tighten the camshaft gears.

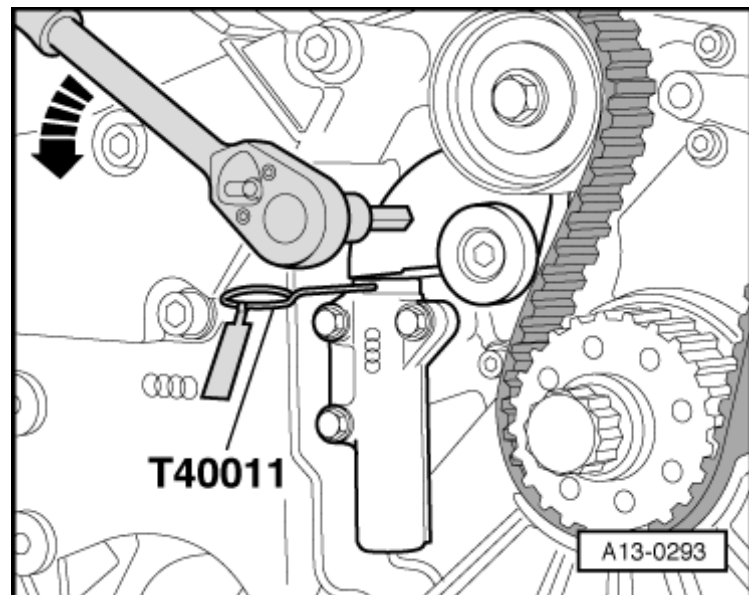
**Note**

*The -T40005- serves as a retainer.*

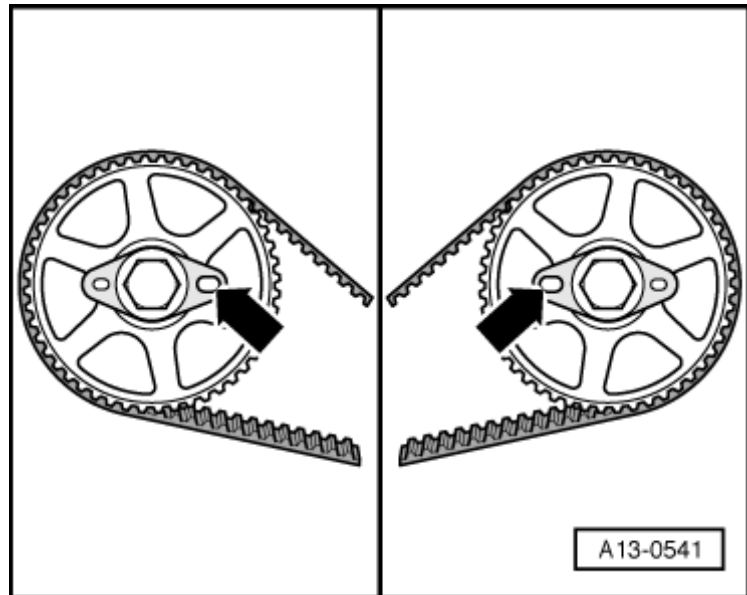
- Remove the -T40005-.
- Remove the 5 mm hex wrench.



- Rotate the tensioning lever using a 8 mm hex wrench in the -direction of the arrow- until the -T40011- can be removed.
- Remove the -3242-.
- Turn the crankshaft two complete rotations in direction of engine rotation until the crankshaft is at TDC cylinder 5 again.



- ◆ The large holes -arrows- on the securing plates for the camshaft gears must align on the inside.



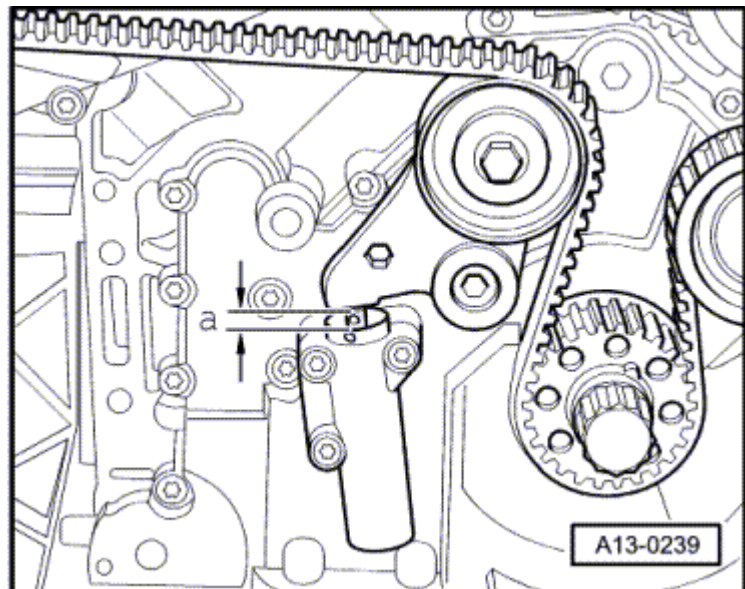
– Check dimension -a- between the tensioning lever and tensioning element.

◆ Dimension -a- =  $5.0 \pm 1.0$  mm



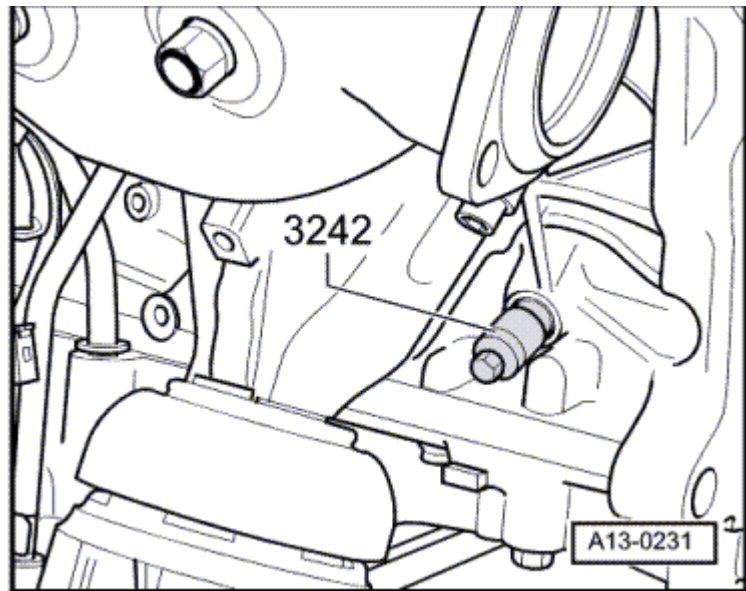
**Note**

*If dimension -a- is not obtained, repeat the adjustment.*



– To check the timing, install the -3242- in the hole in the upper oil pan again.





- Check the camshaft positions using the -T40005-.

**Note**

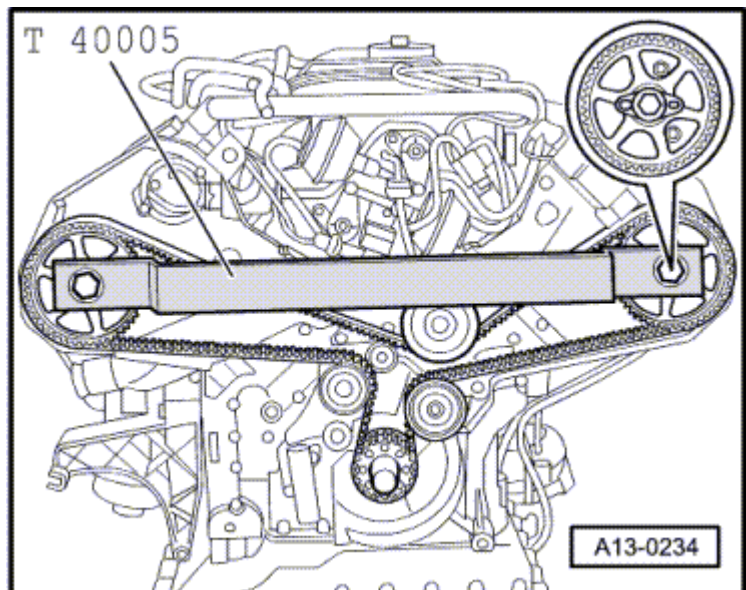
If the -T40005- cannot be inserted, repeat adjustment.

- Remove the -T40005-.
- Remove the -3242-.
- Install the locking bolt of the TDC marking into the upper oil pan using new sealing ring.

Further installation is performed in reverse order of removal, noting the following:

**Note**

- ♦ Replace the gaskets, seals and O-rings.
- ♦ Secure all hose connections using hose clamps appropriate for the model type, refer to the → [parts catalog](#).
- Install the ribbed belt. Refer to → [Chapter „Ribbed Belt“](#).
- Install the lock carrier with attachments. Refer to → [Body Exterior; Rep. Gr.50](#).
- Fill the cooling system. Refer to → [Chapter „Draining and Filling“](#).
- Install the torque support. Refer to → [Chapter „Torque Bracket and Support Valve Assembly Overview“](#).





**Note**

- ◆ *Only reuse the drained coolant if the cylinder head or engine block was not replaced.*
- ◆ *Dirty coolant must not be reused.*

**Tightening Specifications**

<b>Component</b>	<b>Nm</b>
Eccentric roller to cylinder block	45
Camshaft sprocket to camshaft	55
Locking bolt in upper oil pan	35
Vibration damper to crankshaft gear	22
Ribbed belt tensioner	43