

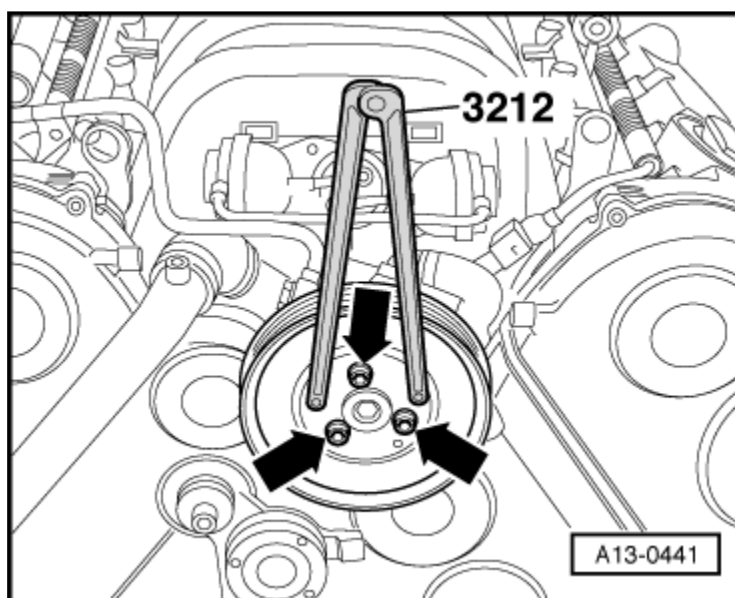
Toothed Belt

Special tools and workshop equipment required

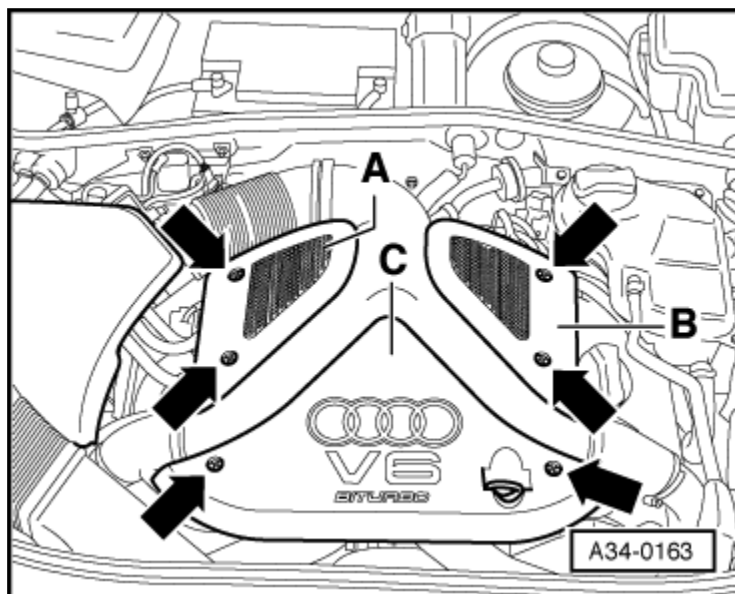
- ◆ Counter-holder tool -3036-
- ◆ Spanner Wrench -3212-
- ◆ Crankshaft Holder -3242-
- ◆ Camshaft Locating Tool -3391-
- ◆ Puller -T40001- with Claws -T40001/2-
- ◆ Locking Pin -T40011-

Removing

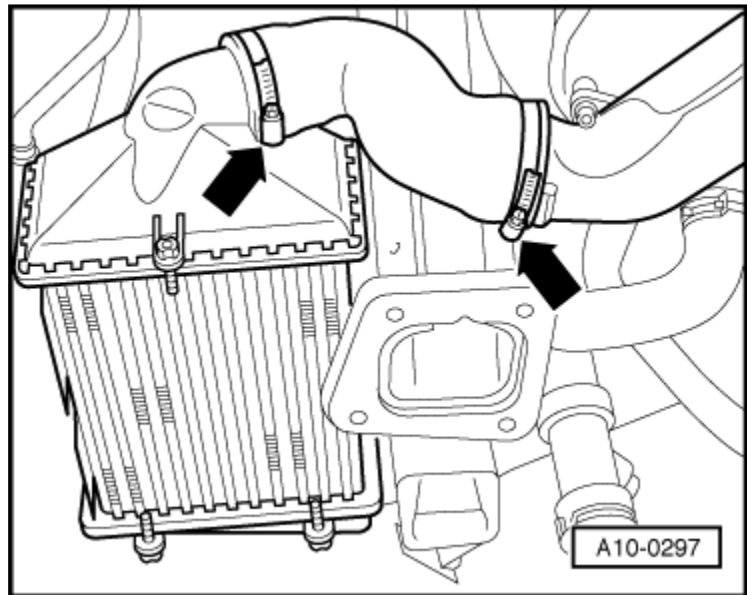
- Remove ribbed belt. Refer to → Chapter „Ribbed Belt“.
- Remove viscous fan. Refer to → Chapter „Viscous Fan“.
- Remove power steering pump ribbed belt pulley -arrows- by counterholding with the Spanner Wrench -3212-.



- Remove engine cover -C- by loosening the fasteners -arrows-.



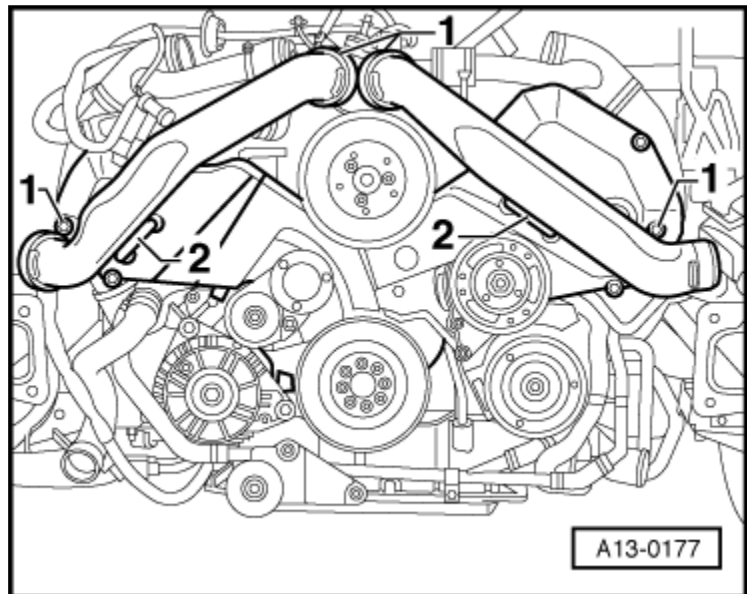
- Remove upper left and right air guide hoses between the charge air cooler and air guide pipe -arrows-.



- Remove bolts -1- and air guide pipes.

**Note**

Be careful of the retaining tabs -2-.



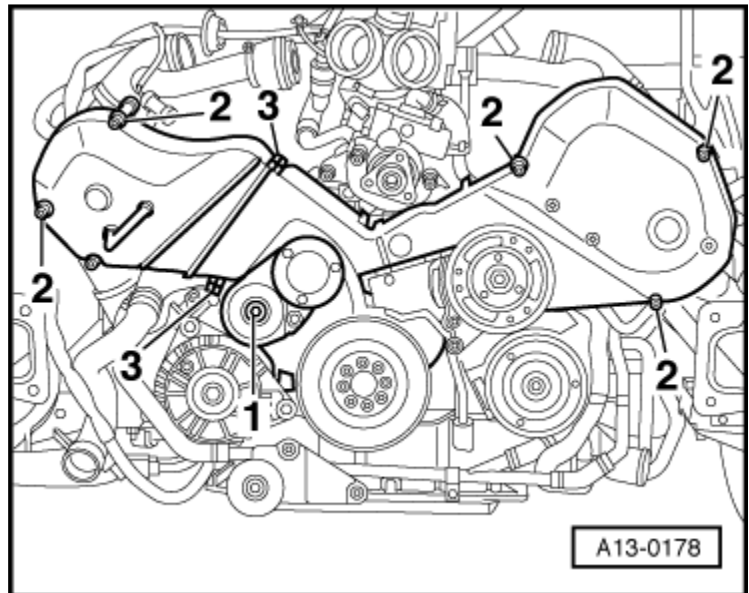
- Remove bolt -1- and the ribbed belt tensioner.
- Remove left, right and center toothed belt guards by loosening the fasteners -2- and -3-.

**Caution**

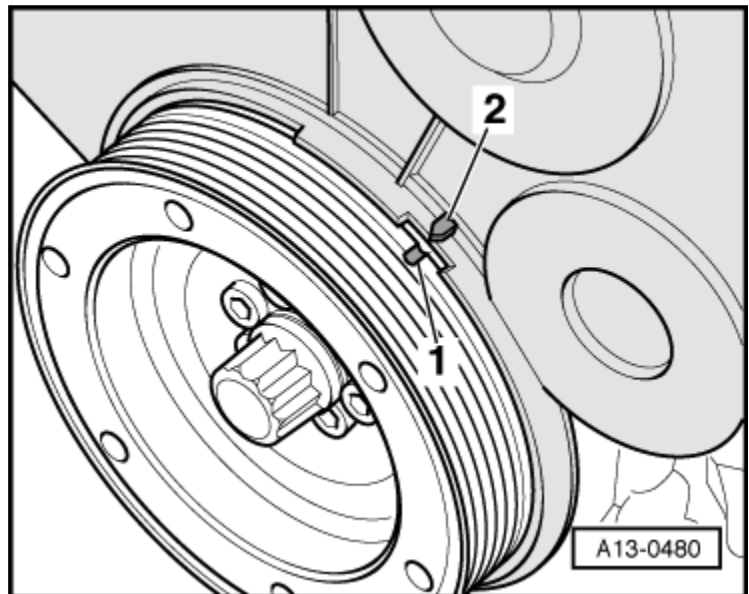
Components could be destroyed by the toothed belt jump off.

Only rotate the crankshaft in the direction of engine rotation.

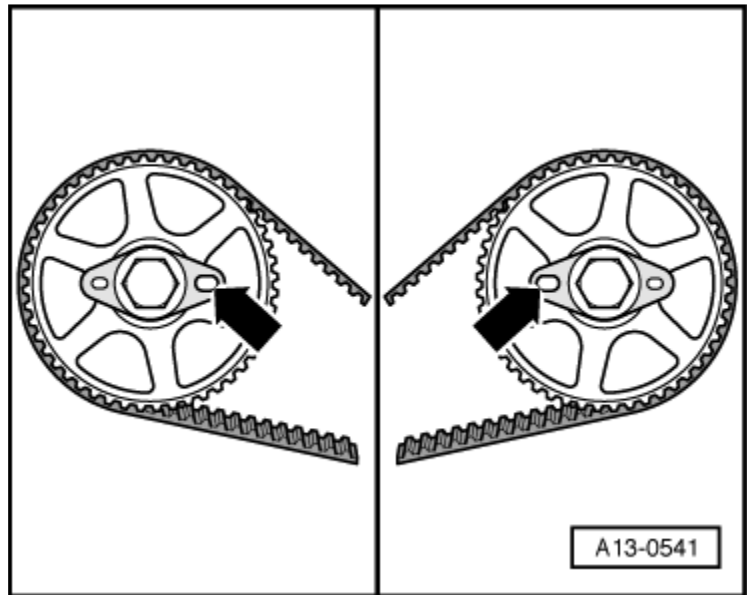
- Adjust the crankshaft to the “TDC” marking in the direction of engine rotation at the toothed belt sprocket bolt.



- Notch -1- aligns with marking -2-.



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



- Remove the sealing plugs for the “TDC” marking from the cylinder block.

**Note**

A TDC bore is located in the crankshaft right behind the sealing plugs.

**WARNING**

Risk of injury.

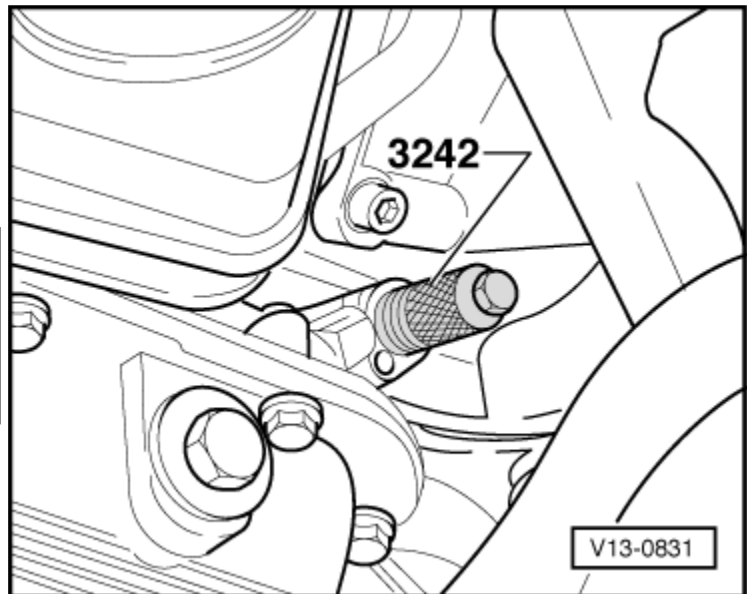
Do not turn the crankshaft while touching the TDC opening with a finger.

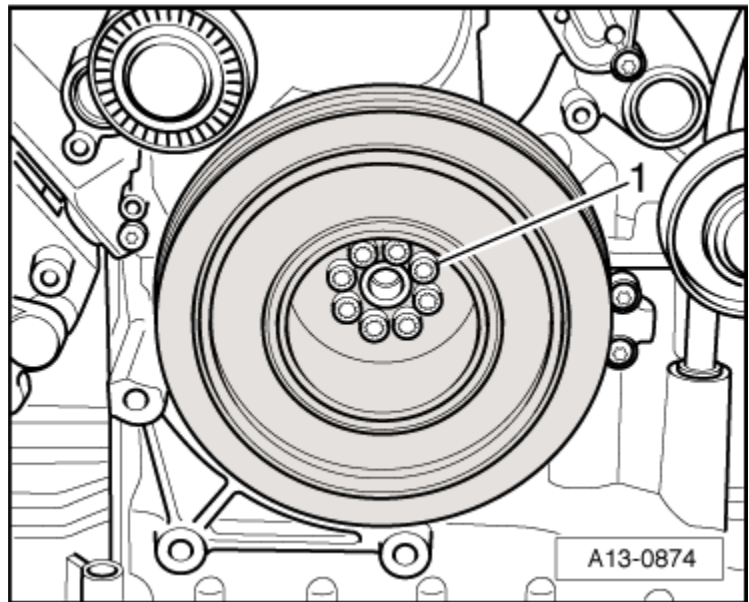
- Install the Crankshaft Holder -3242- in the bore and tighten it to 20 Nm. If necessary, move the crankshaft back and forth slightly to center the bolt.

**Note**

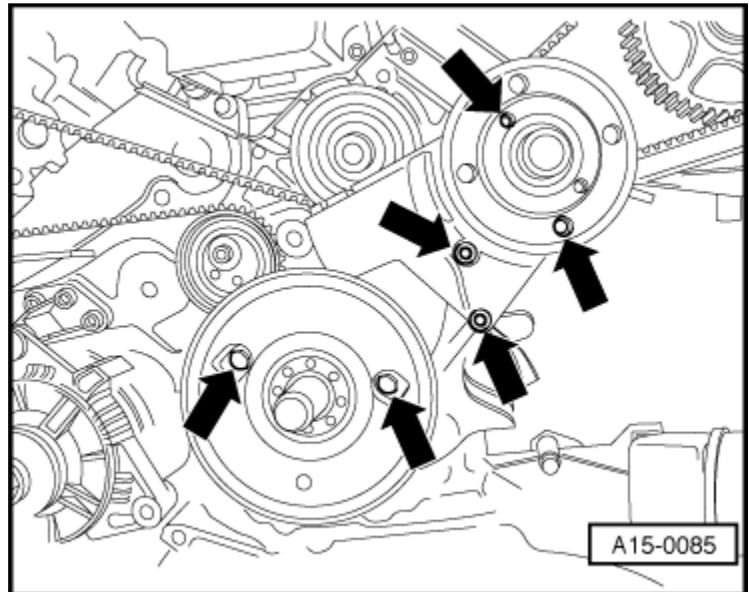
Do not remove the crankshaft toothed belt sprocket bolt to remove the vibration damper.

- Remove bolts -1- and the vibration damper.





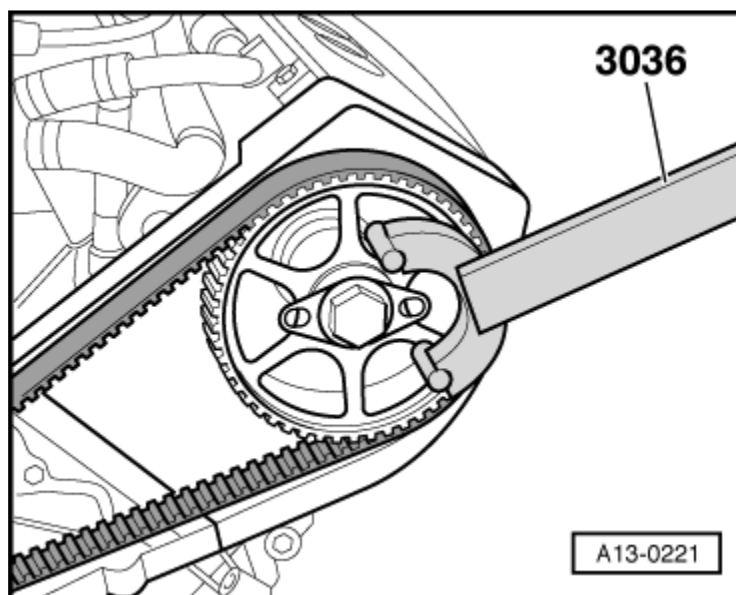
- Remove bolts -arrows-, the lower timing chain cover and the viscous fan ribbed belt pulley.



- Loosen the bolts on both camshaft gears using the Counterhold Tool -3036-.

**Note**

The bolts remain loose but screwed in.



- Remove the left and right camshaft gears from the cone with the Puller -T40001- with Claw -T40001/2-.

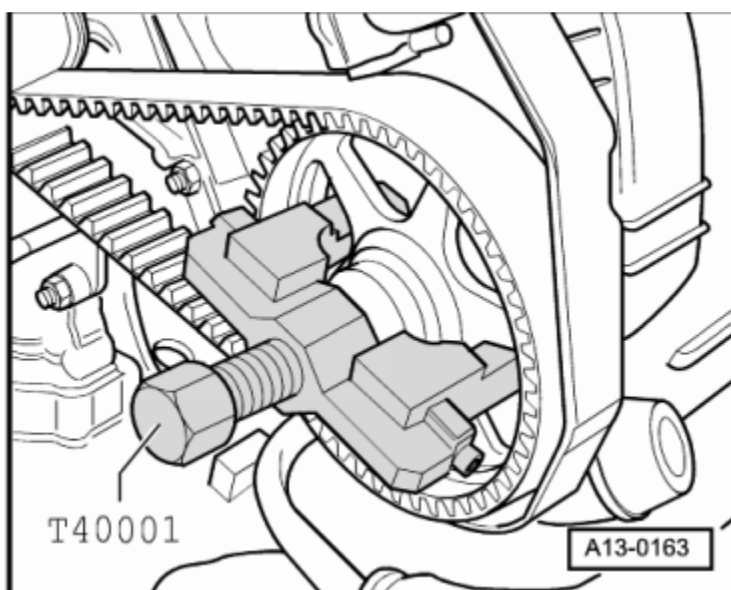
**Caution**

A used toothed belt could be destroyed if the running direction is reversed.

Before removing the ribbed belt, mark the running direction with chalk or a felt-tip pen for installation later.

**Note**

The toothed belt tensioner is oil-dampened. Compress it by slowly applying constant pressure.



- Rotate the toothed belt tensioner -1- clockwise -arrow- with an 8 mm hex socket wrench until the tensioning lever -2- presses the tensioning element -3- back far enough so the pressure piston can be secured with the Locking Pin -T40011-.
- Release the tension on the ribbed belt tensioning roller.
- Remove toothed belt.

Installing (Adjusting valve timing)

- Tightening specifications. Refer to → [Chapter „Toothed Belt Drive Assembly Overview“](#).

Installation is in reverse order of removal, note the following:

- Secure crankshaft using Crankshaft Holder - 3242-.
- Camshaft gears loosened.

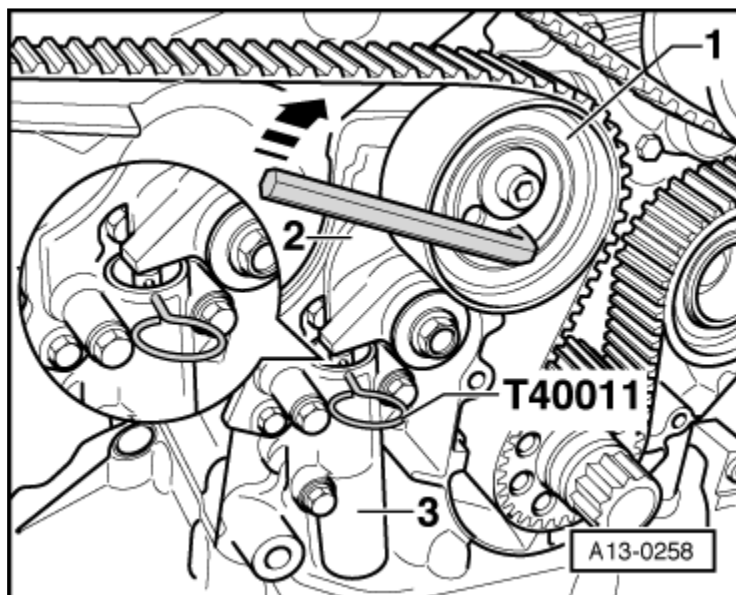
**Caution**

Risk of damaging valves and piston crowns.

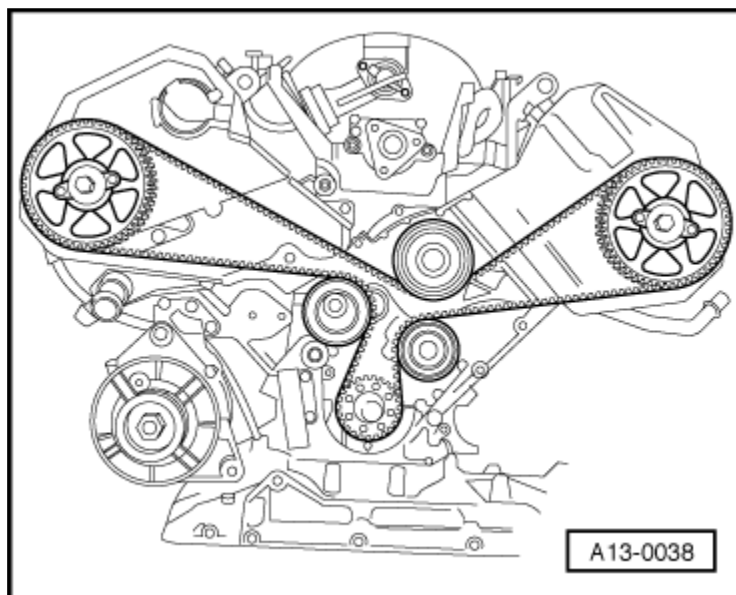
If camshafts are rotated, crankshaft may not rest with any piston at "TDC".

**Note**

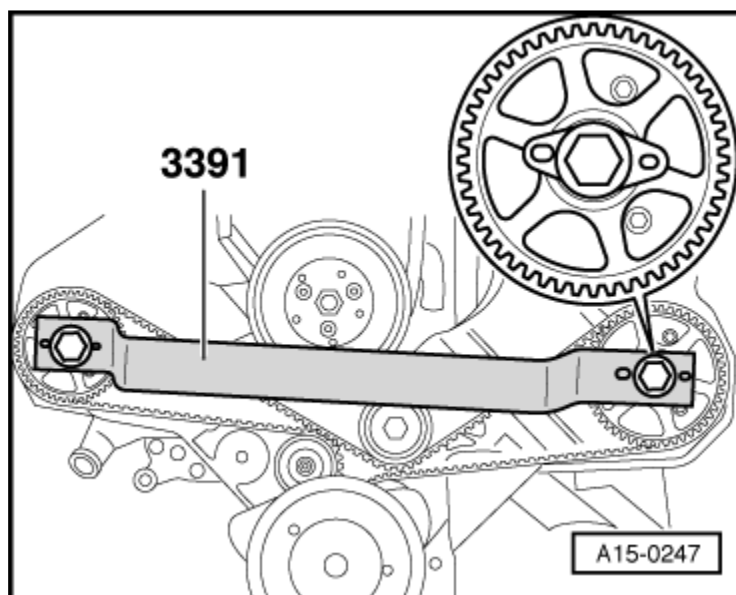
Adjust the valve timing as follows, even if the repair only requires the toothed belt to be removed from the camshaft gear.



- Position both camshaft gears with securing plates, washers and bolts.
- Securing plate installation position: The marking "front vorne" faces to the front or the marking "rear hinten" faces to the rear.
- Install both camshaft gears enough so they can still be rotated straight and do not tilt.
- Lay the toothed belt on all the gears and on the tensioning roller last as illustrated.



- Insert Camshaft Adjustment -3391- into securing plates of both camshafts.



- Rotate the toothed belt tensioning roller -1- clockwise -arrow- with an 8 mm hex socket wrench until the Locking Pin -T40011- can be removed.

Tension the tensioning roller before starting the engine for the first time:

- Position the torque wrench on the tensioning roller hex socket and rotate it to 15 Nm in the tensioning direction.
- This pretensions the tensioning roller.
- Tighten camshaft gears to 30 Nm.
- Remove Camshaft Adjustment -3391-.
- Tighten the camshaft gears to the final specification using the Counterhold Tool -3036-.
- Remove Crankshaft Holder -3242-.
- Install the TDC marking sealing plugs in the cylinder block → **Anchor**.
- Install air guide pipe → **Fig.**
- Install air guide hoses → **Fig.**
- Install power steering pump ribbed belt pulley. Refer to → **Suspension, Wheels, Steering; Rep. Gr.48**.
- Install viscous fan. Refer to → **Chapter „Viscous Fan“**.
- Install ribbed belt. Refer to → **Chapter „Ribbed Belt“**.

