




NUMBER 042

31/01/2011

## VAG 2.5 V6 TDI / Synchronous Drive / Installation Info.

<b>GATES REFERENCE:</b>	<b>5520XS, 5531XS, 5557XS &amp; related kits.</b>	
<b>MAKE:</b>	AUDI / SKODA / VOLKSWAGEN.	
<b>MODEL:</b>	A4, A6, A8, Allroad, Superb, Passat.	
<b>MOTOR:</b>	2.5 V6 TDI.	
<b>MOTOR CODE:</b>	AFB, AKE, AKN, AYM, BAU, BCZ, BDG, BDH, BFC.	

**Special attention needed:**

- 1) Camshaft wear on the early models (up to 2003): there are potential issues with insufficient lubrication of the camshafts. This will lead to power loss, insufficient combustion (exhaust smokes), possible shearing off of the (normal) rocker arms (Fig. 1); resulting in camshaft wear (Fig. 2), possible blockage and belt rupture. Later models equipped with "roller" rocking arms do not have this issue anymore.
- 2) Although the Timing Belt is tensioned by means of a hydraulic tensioner element, errors can be made during the tensioner setting, leading to premature belt failure.
- 3) In some cases a rough running vacuum pump (hard points) increases wear on the belt, possibly leading to premature failure.



Fig. 1

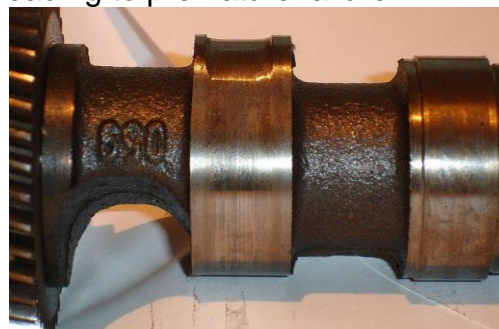


Fig. 2

**Recommendations (Engine has to be cold!!!):**

It is vital that the correct installation tools (to be found in GAT4450) are used in order to fit the belts correctly. To prevent premature belt failure, always follow the manufacturers' recommended fitting procedure.

- 1) Turn the engine clockwise until the 'OT' marking of the camshaft is centered, seen through the oil filling hole (oil filler cap removed) (Fig 3).

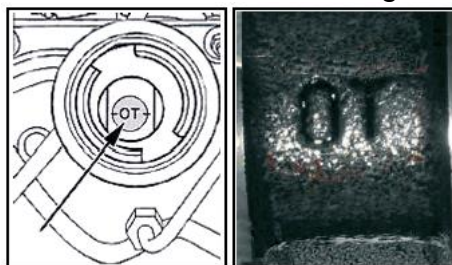


Fig. 3

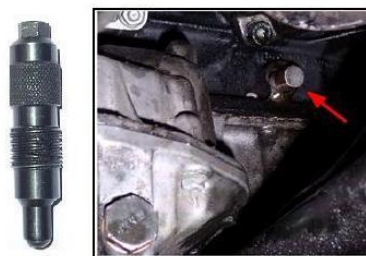


Fig. 4



- 2) Remove the TDC cap from the engine block and put in the crankshaft locking pin (GAT4401); which is used to retain the crankshaft at TDC position. The locking pin has to be screwed in via a threaded hole in the crankcase (Fig.4).
- 3) By removing both; the camshaft cover (cap) and the vacuum pump at the back of the cylinder heads, you will be able to put the camshaft setting plates (GAT4451) in the slots in the rear of each camshaft (Fig. 5). They are supplied with chains which are attached to a suitable engine part to prevent them from falling.

**NOTE:** Setting plates **can't** be used to hold the camshafts in place when releasing the sprocket bolts. They are only used to hold the correct timing position!

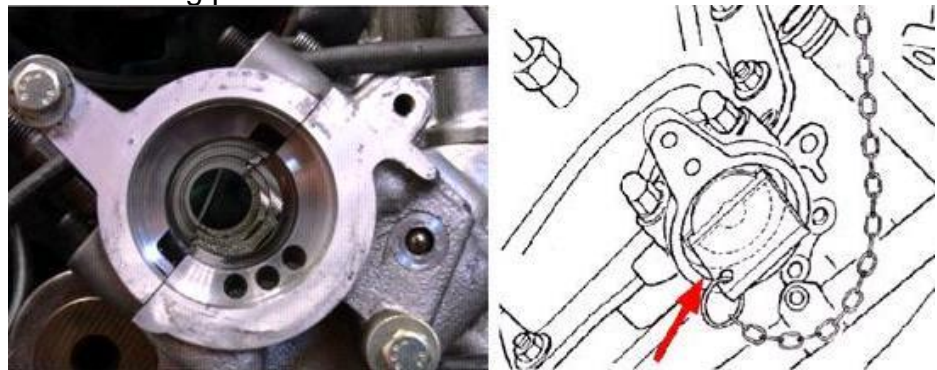


Fig. 5

- 4) Remove the 4 bolts from the injection pump (IP) vibration damper, and the damper. **Do not undo the central bolt!**
- 5) Insert the IP locking pin (GAT4440V2), slacken the tensioner nut, remove the IP belt, remove the ventilator support and the tensioner and remove the outer camshaft sprocket.
- 6) Rotate the main drive tensioner clockwise till the 2 mm pin (GAT 4360T1) can be fully inserted in the hydraulic element (Fig. 12).
- 7) While holding the camshaft sprockets, slacken the bolts and make the sprockets loose on the cones (GAT4848), remove the LH sprocket.
- 8) Check the engine is still at TDC position.
- 9) Hand tighten the bolt of the RH camshaft sprocket.
- 10) Remove the belt, the tensioner (pulley, lever, hydraulic element) and the idler.
- 11) Install a new idler. **ATTENTION!** The idler now has a countersunk hole (Fig 6), needing a shorter bolt (supplied in the kit). Not using the correct bolt will lead to incorrect clamping, with a sheared bolt as a result (Fig. 7).



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Fig. 6



Fig. 7

12) Install the rest of the tensioner system. The correct position of the lever and pin located behind the tensioner roller is important. (Fig 8)



Fig. 8

Correct

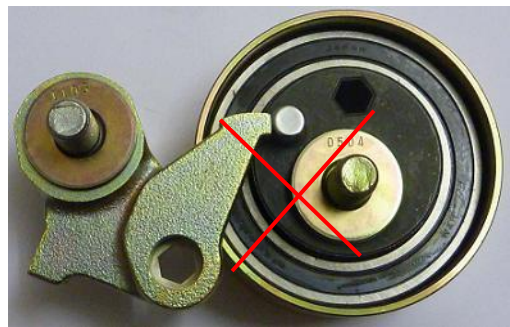


Fig. 9

Incorrect

Do not forget one washer behind the lever and one behind the tensioner pulley. Any incorrect contact of the lever arm with the pin on the tensioner, or lack of washer, will cause serious damage to the system; with belt failure as a result (Fig.10).



Fig. 10

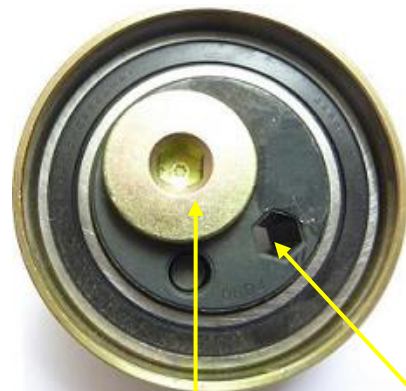
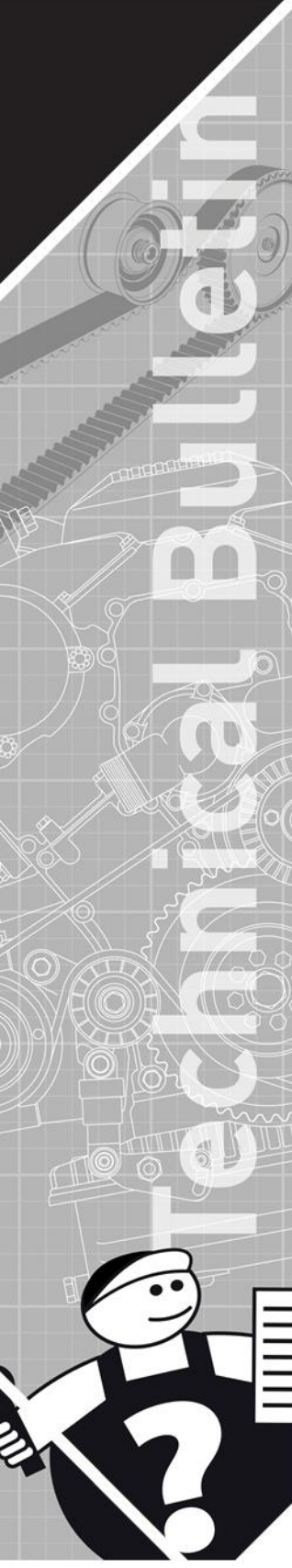


Fig. 11

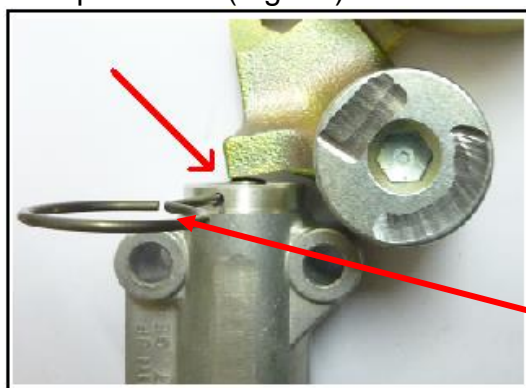
Fixing bolt

8 mm Allen key





- 13) Install a new belt in following order: crankshaft, right hand camshaft, tensioner, idler, water pump.
- 14) Put left hand camshaft sprocket into the belt, install the sprocket and the belt on the camshaft.
- 15) Install the camshaft bolts finger tight.
- 16) Turn the tensioner pulley slightly clockwise using an Allen key in the hexagonal slot (Fig 11). The lever comes to a stop on the tension piston rod (Fig. 12). Remove the hydraulic tensioner retaining pin.



Retaining pin

Fig 12

- 17) Turn the tensioner pulley anti-clockwise using a dynamometric wrench into the Allen key hole and applying a load of **15Nm** (CRITICAL) Because of the oil pressure in the hydraulic element, this will make the tensioner pulley move out of the lever (avoiding later contact (Fig. 10)) and tension the belt.
- 18) While you keep the pivot deflection lever in this correct position, torque the tensioner pulley fixing bolt (Fig 11) to **42 Nm**  
Now check the position of the hydraulic piston: Fig 13 shows the **correct** hydraulic piston position, Fig. 14 the incorrect position.

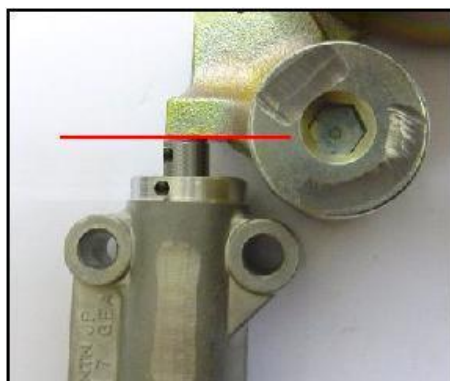


Fig 13

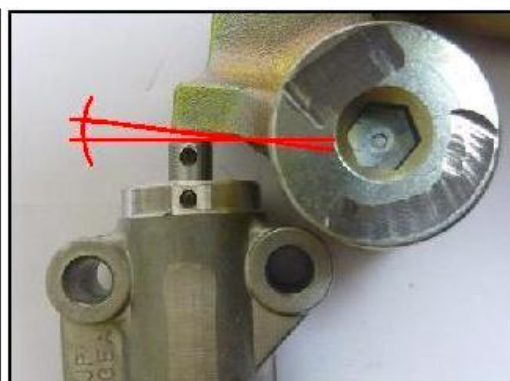


Fig 14

- 19) Torque the camshaft sprocket bolts to 75 Nm, while holding them in place with GAT4394.



- 20) Verify engine is still at its TDC, install a new IP tensioner (nut hand tight) and the ventilator support.
- 21) Install the outer camshaft sprocket, bolts hand tight in centre of slotted holes. Install a new belt.
- 22) **Use GAT4452 (Fig. 15) over tensioner nut**, turn the tensioner with an Allen key **anti-clockwise** till the pointer aligns, tighten the nut to 37 Nm with GAT4452 while holding the tensioner in its correct position with the Allen key!!! (Fig. 16). Remark: **DO NOT TENSION THE BELT BY TURNING THE TENSIONER CLOCKWISE**, this would lead to engine damage.
- 23) Tighten the 3 bolts to 22 Nm while holding the camshaft in place with tool: GAT4394.
- 24) Remove locking tools, turn engine 2 revolutions to TDC, insert locking tools, check pointer position (correct if needed); remove locking tools, fit IP vibration damper, torque bolts to 22 Nm, fit new camshaft cap.



Fig. 15

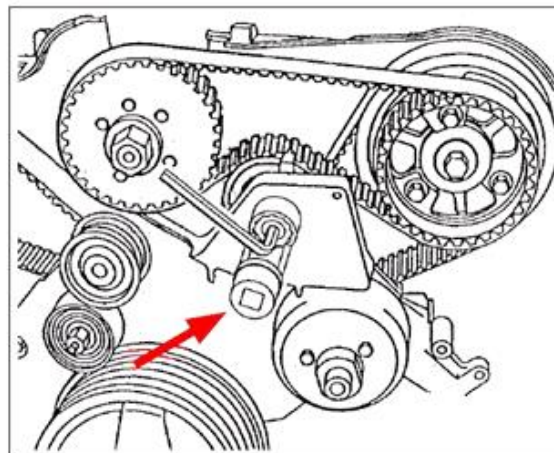


Fig. 16



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