

April 12, 2011

Installation procedure for Timing Belt Tensioner of VW EA288 MDB 3 & 4 Cylinder Engines

Engine temperature

The tensioner must be installed on the engine at room temperature by allowing the engine and tensioner to stabilize to the same relative ambient temperature for proper belt tension adjustment.

Do not attempt to install the tensioner onto a hot or warm engine.

Note: This note is particular important for installation procedure when applied to the timing drive readjustment on previously assembled engines.

1. Position Crankshaft and Camshaft Top Dead Center and lock in position using locking pins or fixtures
2. Position the Timing Belt Tensioner and the mounting bolt. The hook-up tab of the tensioner must locate into the hook-up slot of the cylinder head as shown in Figure 1.

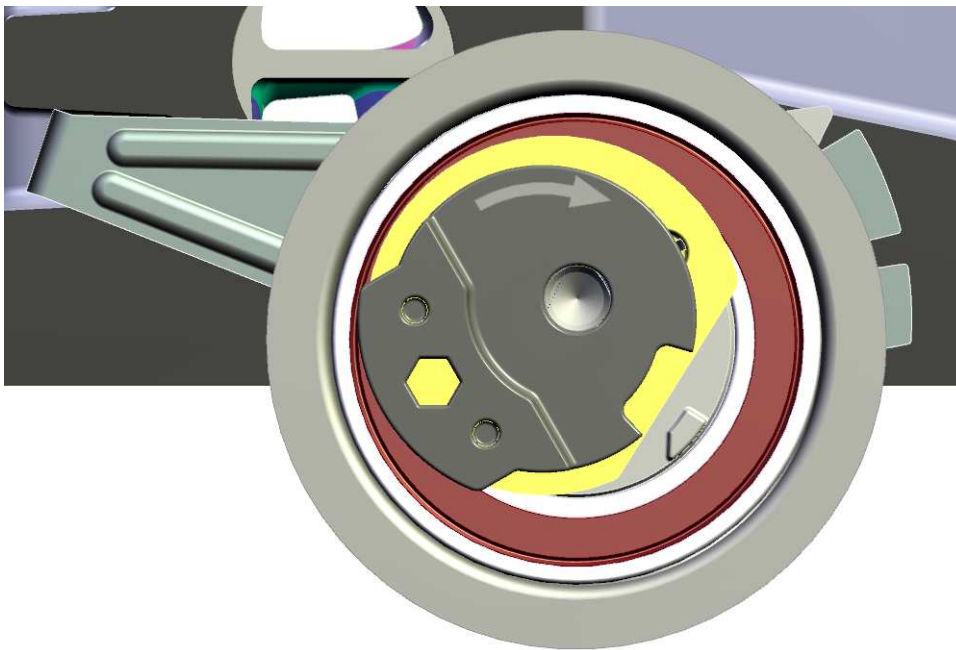


Figure 1 Initial installation position of Timing Belt Tensioner

3. The installation shaft on the tensioner should be in position shown in Figure 1. This will maximize the belt clearance for ease of installation. If necessary rotate installation shaft using a 6mm Hex Allen Key to achieve this position.
4. Tighten the mounting bolt of the tensioner with a **torque of 3+/-1 Nm (hand tight the bolt)**.

5. Install the timing belt being careful to engage the appropriate teeth of all the corresponding sprockets as per timing drive layout starting with the crankshaft and working counter clockwise.

Note: If difficult to install belt due to short belt the idler pulley can be installed after fitting belt.

6. Using an appropriate wrench to prevent the rotation of the tensioner-mounting bolt, rotate the installation shaft clockwise with a 6 mm hex Allan key.

The tensioner assembly will move against the belt, the arm pointer will start to move clockwise. Continue rotating the installation shaft to load the arm pointer to pass the nominal position (in the center of the arm pointer notch), until the arm pointer indicator will be half-way between the nominal position slot and the end of the base plate as in Fig 2. This position is called over-tension position.

Lock the tensioner in this position by applying 25 Nm torque to the mounting bolt.

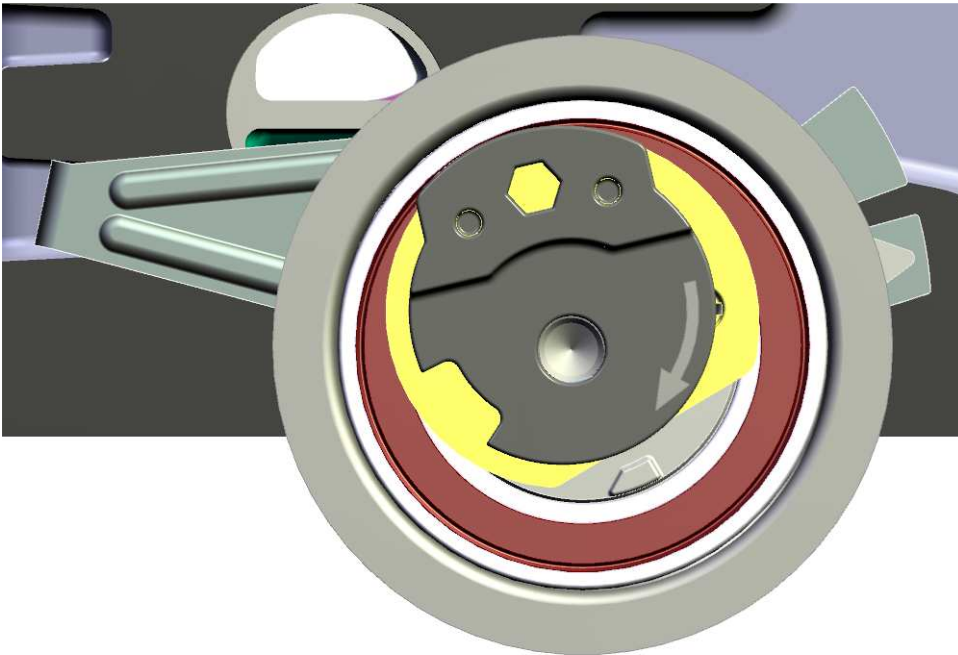


Figure 2 Over-tension position of Timing Belt Tensioner

Installation Check

7. Tensioner pointer has to be inside of the installation window, defined to be in the range of -3.0 to $+3.0$ degrees of the nominal position (review Fig.3, 4 and 5). The correct position of Tensioner must be verified by the following

- 1) Remove the 6mm Allan key and wrench from tensioner, the camshaft pinning device and the crankshaft-locking pin.
- 2) Rotate the crankshaft at least two (2) complete revolutions clockwise manually, for proper seating of the belt, until the crankshaft is repositioned at the TDC position and re-lock the crankshaft.

Caution: *If the alignment of the TDC position is missed, do not rotate the Crankshaft counterclockwise to the correct position, but rather rotate the crankshaft two (2) more full rotations to the TDC position*

- 3) Is Tensioner arm at nominal position, Figure 3?

Yes: Installation complete, remove cam & crank locking devices.

No: Adjust tensioner with following method.

Note: *Tolerance on nominal position – -3.0° $+3.0^{\circ}$, see Figures 4 & 5*

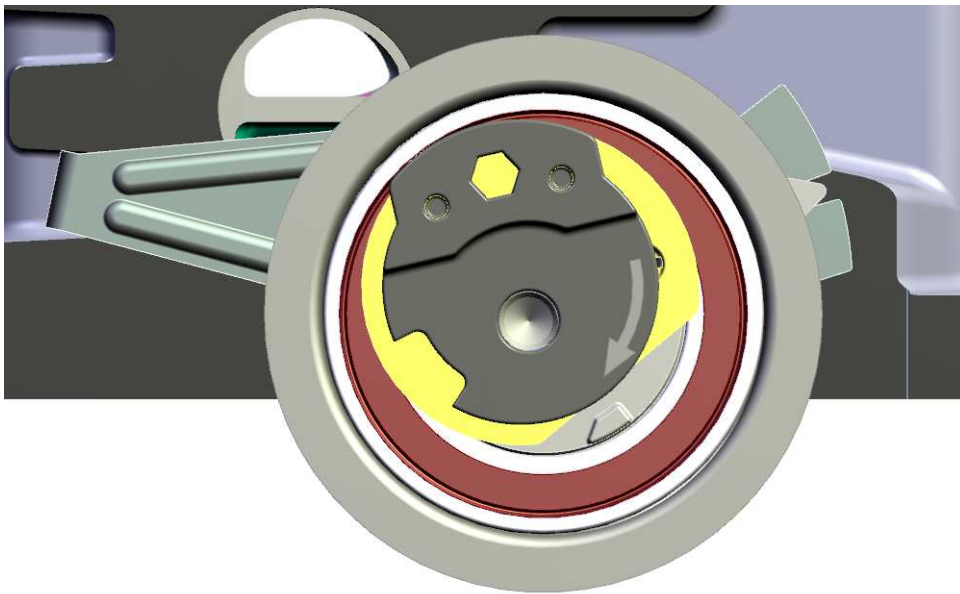


Figure 3 Nominal position of Timing Belt Tensioner

- 4) Engage the 6mm hex Allan key and retain the installation shaft's position while loosening the mounting bolt with the wrench.

- 5) Slowly rotate the installation shaft with the hex Allan key counter-clockwise. This must be a continuous movement, until the arm pointer moves counter-clockwise (from right to left) to align with the base plate notch, Figure 3.
- 6) Maintain the installation shaft position with the Allan key and tighten the mounting bolt to a torque of 25 Nm.
- 7) Remove the 6mm Allan key and wrench from tensioner, the camshaft pinning device and the crankshaft-locking pin.
- 8) Rotate the crankshaft at least two (2) complete revolutions clockwise manually, for proper seating of the belt, until the crankshaft is repositioned at the TDC position and re-lock the crankshaft.
- 9) Is Tensioner arm at nominal position, Figure 3?
Yes: Installation complete, remove cam & crank locking devices.
No: Repeat tensioner adjustment method.

Note:

At the end of the installation procedure, the tensioner has to be in the designed installation position, ensuring the proper belt tension and correct setting of timing belt drive.

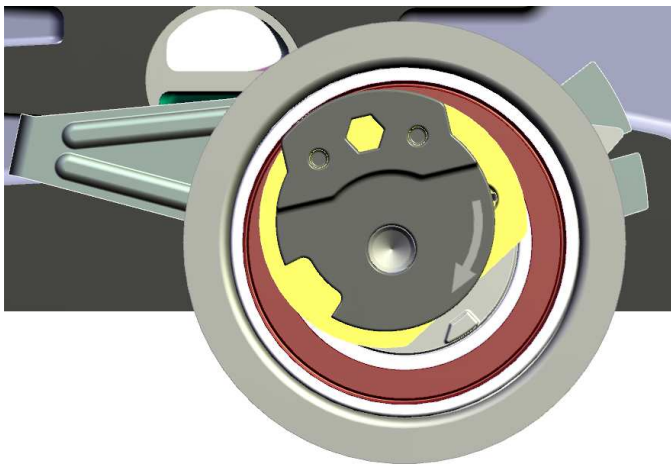


Figure 4 Nominal position -3.0 degrees

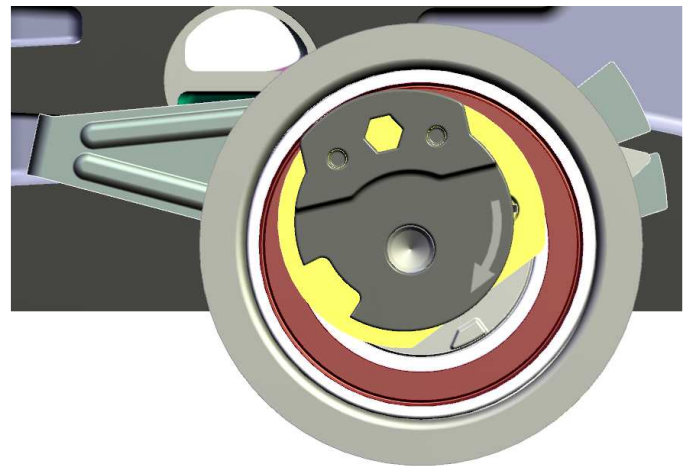


Figure 5 Nominal position +3 degrees