

Recommended Installation Procedure
ATech Fuel Injection Drive Tensioner 979736
AUDI 3.0L W19 V6 TDI Engine
(23 March 06)

Caution:

The procedure to access the timing belt tensioner and all other timing driven components must be done according to the car manufacturer's guidelines.

Engine temperature:

1. 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 a tensioner onto a hot engine.** (For reference, the minimum engine cooling period is 4 hours in tropical climatic regions).

Crank and Camshaft TDC position setup:

2. Rotate the crankshaft **CLOCKWISE ONLY** to **TDC** (Top Dead Center) position (i.e. #1 cylinder firing position). Review AUDI's guidelines on how to locate and lock the crankshaft and camshaft positions at TDC.

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 2 more full rotations with the camshafts to the timing marks. This is to be accomplished while the belt is still attached. Also, DO NOT at anytime rotate the crankshaft and the camshafts when the timing belt is removed.

Belt and Timing Belt Tensioner removal

Once the procedure for setting the TDC is completed according to AUDI's guidelines:

3. Loosen the M8 Mounting Bolt and rotate the tensioner's installation shaft away from the belt to release the belt tension.
4. Remove the timing belt, the tensioner's mounting bolt and the old tensioner. It is recommended to replace the timing belt during the replacement of the tensioner.

Initial Setup of the Timing Belt Tensioner

5. Install the new tensioner (Fig. 2) on the bracket of engine ensuring that the anti-rotation Index Tab of the base plate is engaged in the slot in the bracket of engine (Fig. 3).
6. Rotate the installation shaft on the tensioner using 8mm Allen Key to the approximate "7 O'clock position" (Fig. 4). This will maximize the belt clearance for ease of installation. Hand tighten (lightly) the mounting bolt on the bracket.

Installation of the Timing Belt Tensioner and the Belt

7. Install the timing belt being careful to engage the appropriate teeth of all the corresponding sprockets as per drive layout (Fig.1).
8. Using a 13mm wrench to prevent the rotation of the mounting bolt, rotate the Installation Shaft **COUNTERCLOCKWISE** with 8mm Allen Key. The tensioner assembly will move against the belt and the Alignment Ridge on the arm will eventually start to move **COUNTERCLOCKWISE**.
9. Continue rotating the installation shaft in the counterclockwise direction **1** (Fig. 5) so that the ridge passes the nominal notch and stops at load stop as shown in Detail **1** (Fig. 5).

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Then rotate the installation shaft in the clockwise direction **2** (Fig. 5) to have the ridge pass the nominal notch and stop as shown in Detail **2** (Fig. 5). After cycling the tensioner as mentioned, rotate the installation shaft in the counterclockwise direction **3** only (Fig. 5) so the ridge aligns within the edges of the nominal notch as shown in Detail **3** (Fig. 5).

10. Once the nominal position is achieved, prevent the rotation of the installation shaft and torque the mounting nut to **21~26 Nm** (Fig. 6).

Caution: Do not over-torque the Mounting Bolt.

Verification of the Nominal Position

11. Remove the 8mm Allen Key, the 13mm wrench, and all other tools for setting the TDC position.

12. Rotate the crankshaft two (2) complete revolutions clockwise MANUALLY for proper seating of the belt and re-align the crankshaft back to TDC.

Check the following:

- Crankshaft mark is aligned.
- Camshaft sprocket mark is aligned.

If the alignment of any of the sprockets is not correct, the belt has to be taken off and the installation procedure has to be repeated starting at step 2.

Caution:

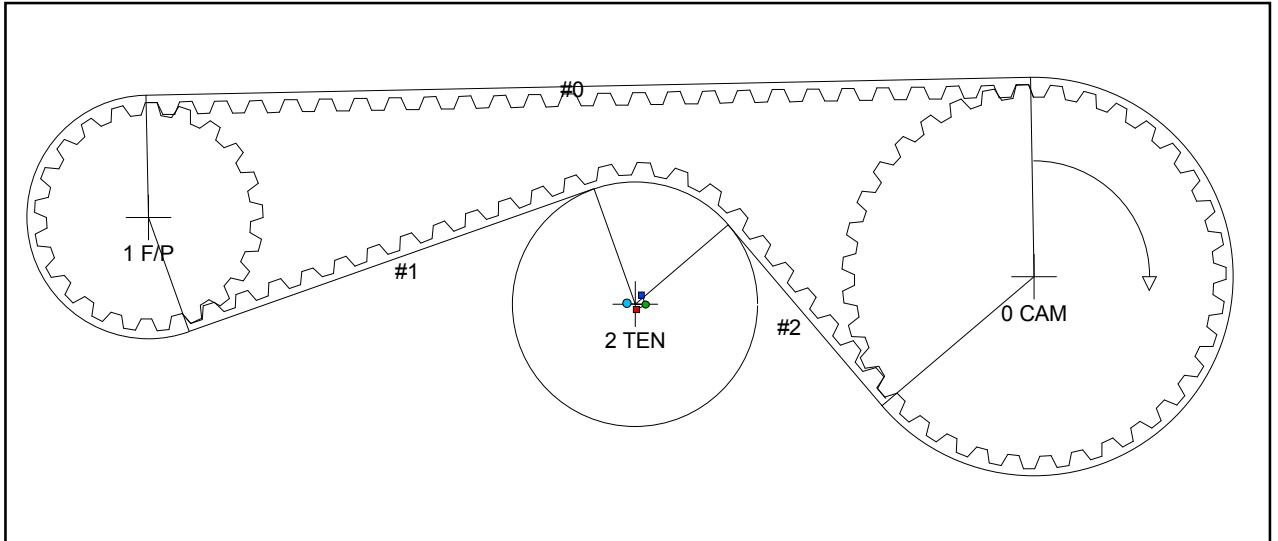
If the alignment of the TDC position is missed, do not rotate the Crankshaft counterclockwise to the correct position, but rather rotate the Crankshaft 2 more full rotations to the TDC position. If this procedure is not properly followed, engine damage will occur.

13. Check the tensioner Nominal Position with the engine set at TDC:
If the 2 edges of the arm Alignment Ridge is within the Alignment Notch on the front plate (Fig. 6), the tensioner is set at its nominal position and the installation is complete.
If not, the tensioner re-adjustment is required until the proper position is achieved, and so proceed as follows:

Re-adjustment

14. Ensure that the TDC position is not disturbed. Engage the 8mm Allen Key and retain the installation shaft's position while loosening the mounting bolt with a 13mm Wrench. The mounting bolt and the tensioner do not need to be removed.
15. Prevent the mounting bolt from rotating and cycle the installation shaft so that the ridge cycles around the nominal position (Fig. 5) and then rotate the Installation Shaft COUNTERCLOCKWISE only until the arm Alignment Ridge moves counterclockwise to align within the Notch on the front plate (Fig. 6).
16. Re-torque the Mounting Bolt to **21~26 Nm** while preventing the Installation Shaft from turning by holding it with the 8mm Allen Key.
17. Verify the proper installation of the tensioner by repeating steps #11, #12 and #13.

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0: Camshaft, 1: Fuel Pump, 2: Tensioner

Figure 1: Fuel Injection Pump System Layout for Audi 3.0L W19 TDI Engine

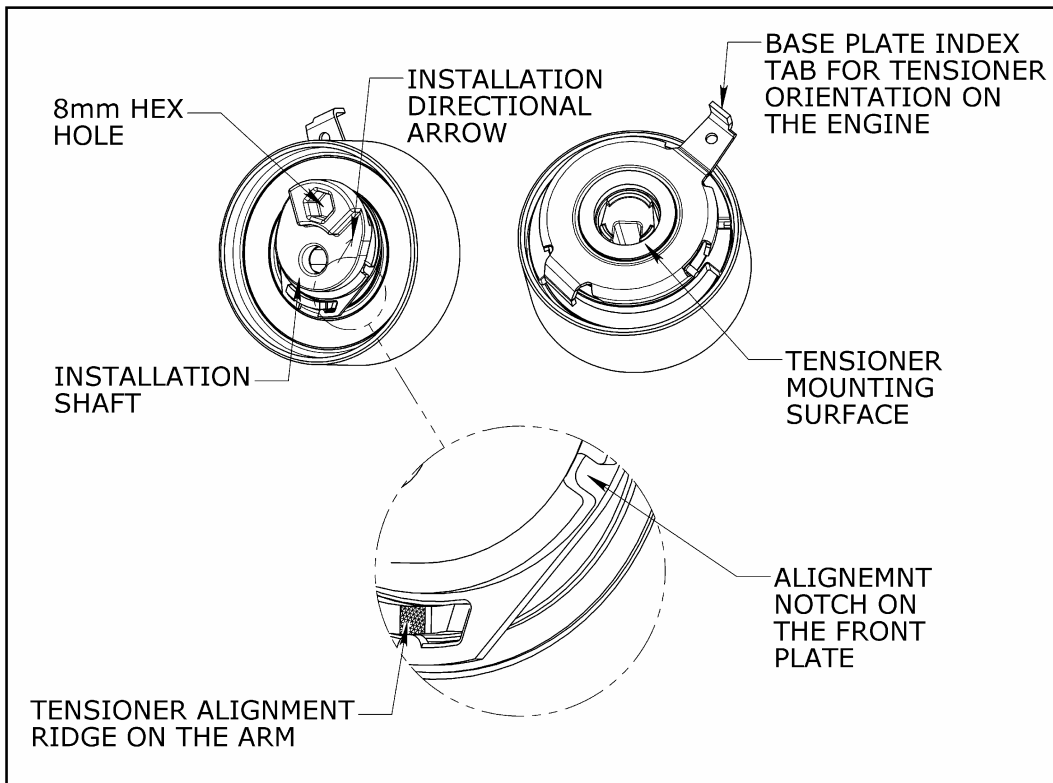


Figure 2: Tensioner shown as shipped

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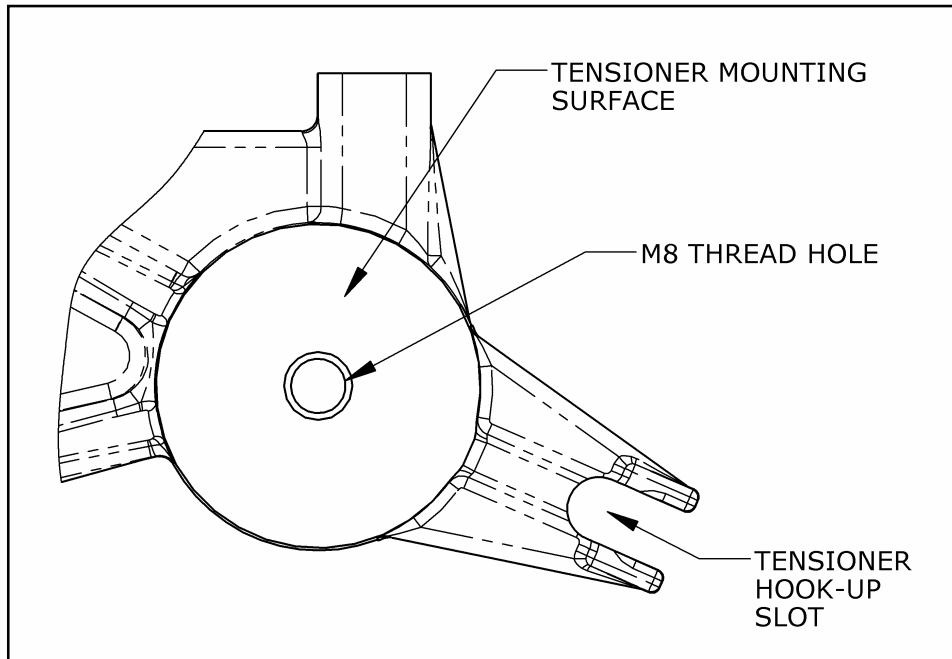


Figure 3: Tensioner Mounting Surface

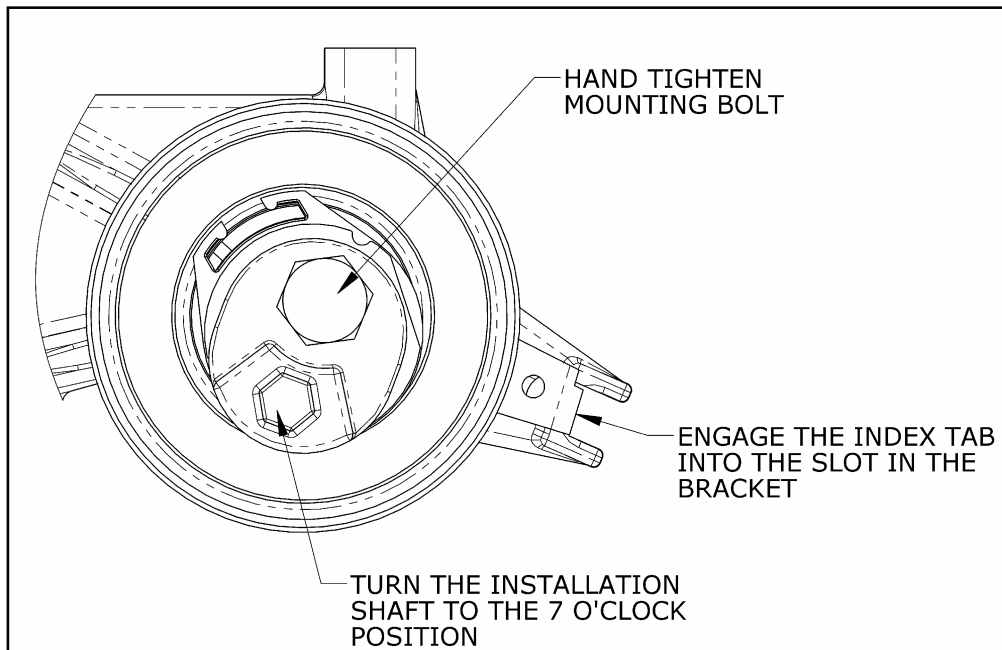


Figure 4: Initial setup of the Tensioner

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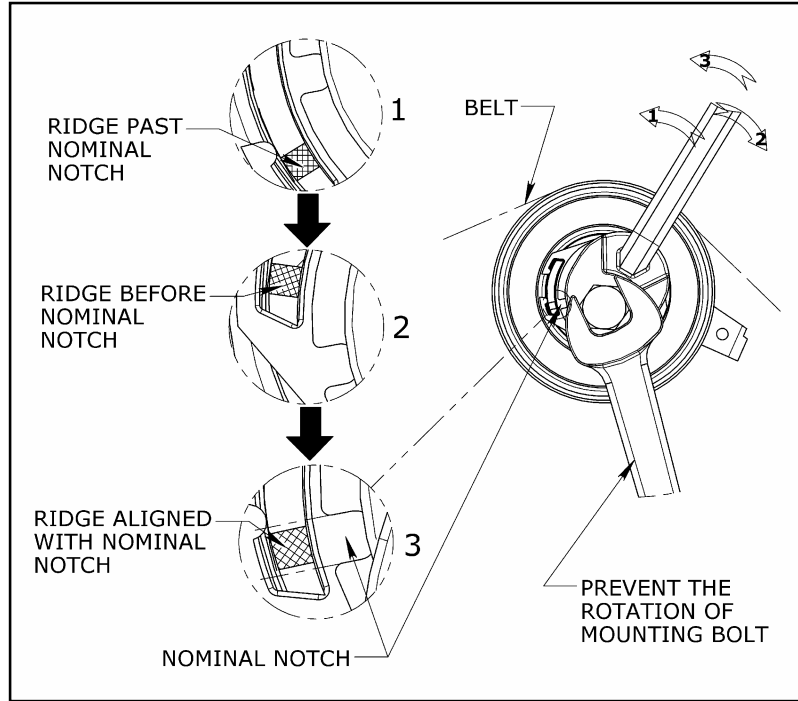


Figure 5: Tensioner Cycled before setting to Nominal Position

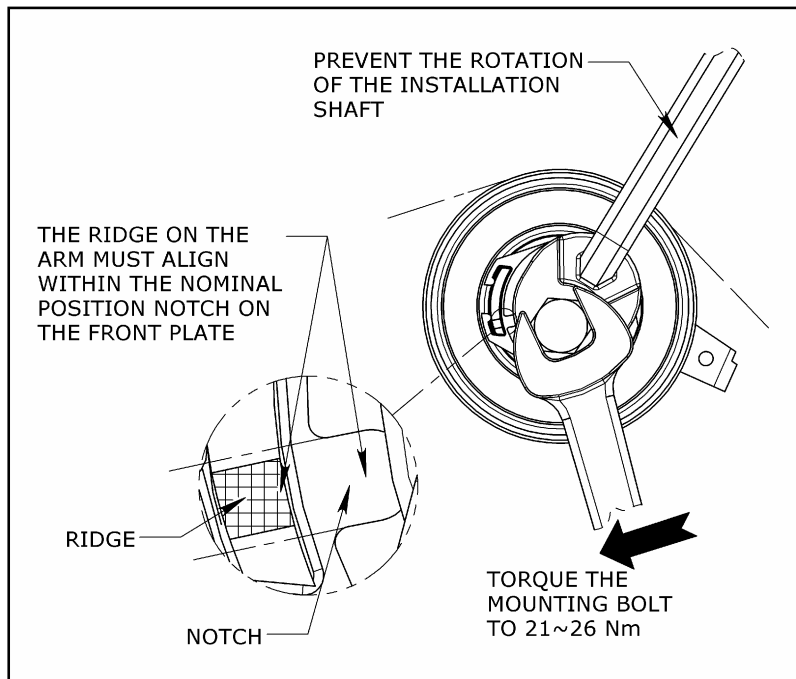


Figure 6: Tensioner Torqued at Nominal Position