

Recommended Installation Procedure

ATech Timing Belt Tensioner 979656

AUDI 2.0L 4-Cyl FSI Engine

Release Date: 22. August 2005

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 locking points. 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 Mounting Nut 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 nut 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 engine mounting stud ensuring that the anti-rotation Index Tab of the base plate is engaged in the slot in the engine cylinder head.
6. Rotate the installation shaft on the tensioner using the 2-Pin Installation Tool (Fig. 3) to the approximate "1 O'clock position" (Fig. 4). This will maximize the belt clearance for ease of installation. Hand tighten (lightly) the mounting nut on the stud.

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) starting with the crankshaft and moving **CLOCKWISE** to the left side idler, tensioner and camshaft, then **COUNTERCLOCKWISE** to the water pump and right side idler being last component.
8. Using a 13mm wrench to prevent the rotation of the mounting nut, rotate the Installation Shaft **COUNTERCLOCKWISE** with the 2-Pin Installation Tool (Fig. 5). The tensioner assembly will move against the belt and the Alignment Ridge on the arm will eventually start to move **CLOCKWISE**.
9. Continue rotating the installation shaft in the counterclockwise direction **1** (Fig 5) so that

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the ridge passes the nominal notch and stops as shown in Detail **1** (Fig. 5). 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 only direction **3** (Fig. 5) so the ridge aligns within the edges of the nominal notch (Fig. 6).

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

Caution: Do not over-torque the Mounting Nut.

Verification of the Nominal Position

It is highly recommended to use a mechanic's mirror to verify the location of the nominal setting of the tensioner in the event that this area is not visible from any other direction.

11. Remove the 2-Pin Installation Tool, the 13mm wrench, and all other tools for setting the TDC position.
12. Rotate the crankshaft 2 complete revolutions clockwise MANUALLY for further 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. There is a risk of damaging the engine for missed timing.

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 2-pin Installation Tool and retain the installation shaft's position while loosening the mounting nut with a 13mm Wrench. The mounting nut and the tensioner do not need to be removed.
15. Prevent the mounting nut from rotating and cycle the installation shaft so that the ridge cycles through the nominal position (Fig. 5) and then rotate the Installation Shaft COUNTERCLOCKWISE only until the arm Alignment Ridge moves clockwise to align within the Notch on the front plate (Fig. 6).
16. Re-torque the Mounting Nut to **21~26 Nm** while preventing the Installation Shaft from turning by holding it with the 2-Pin Installation Tool.

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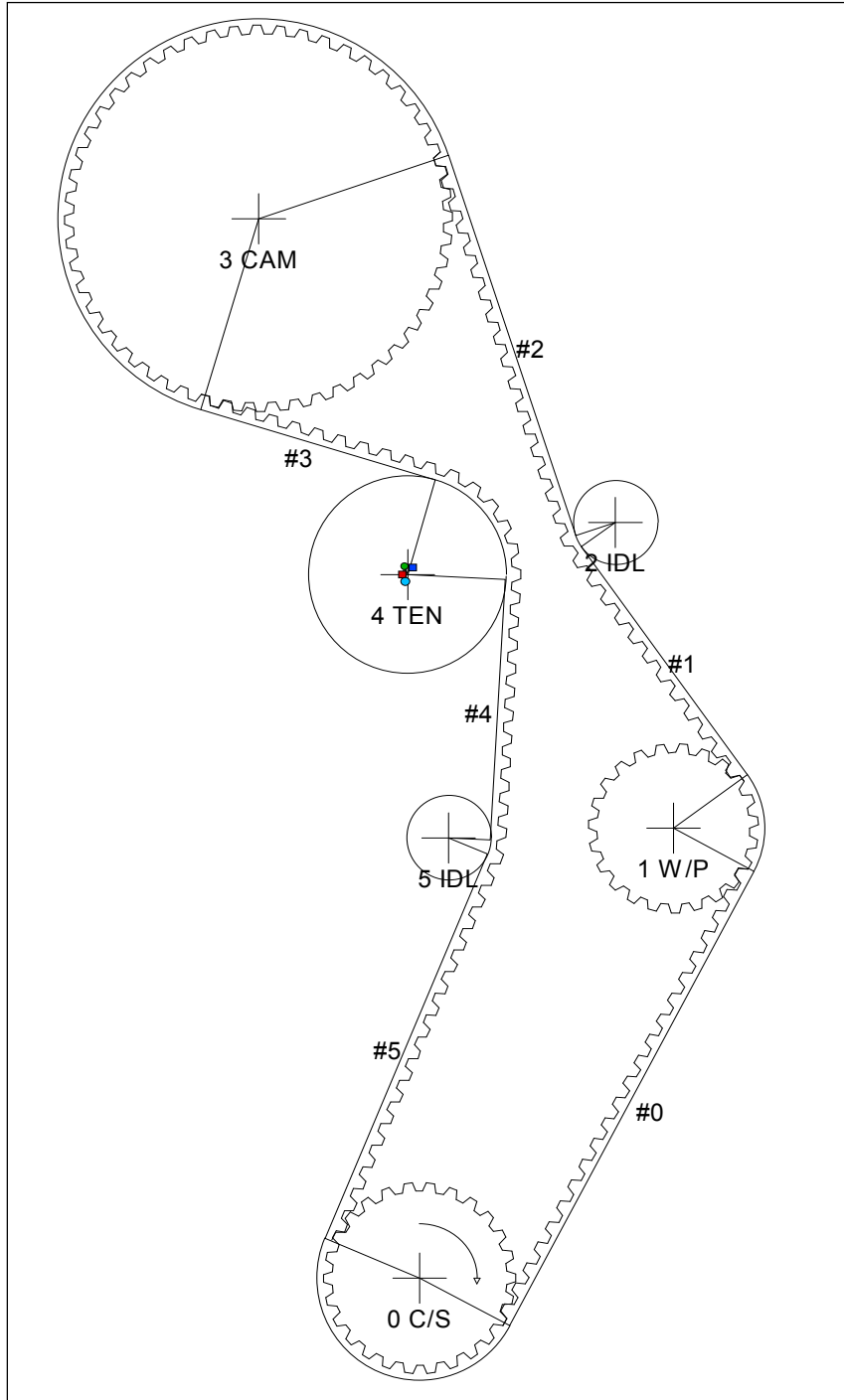
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17. Verify the proper installation of the tensioner by repeating steps #11, #12 and #13.

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0: Crankshaft, 1: Water Pump, 2: Idler, 3: Camshaft,
4: Timing Belt Tensioner, 5: Idler

Figure 1: Timing Drive Layout for Audi 2.0L FSI

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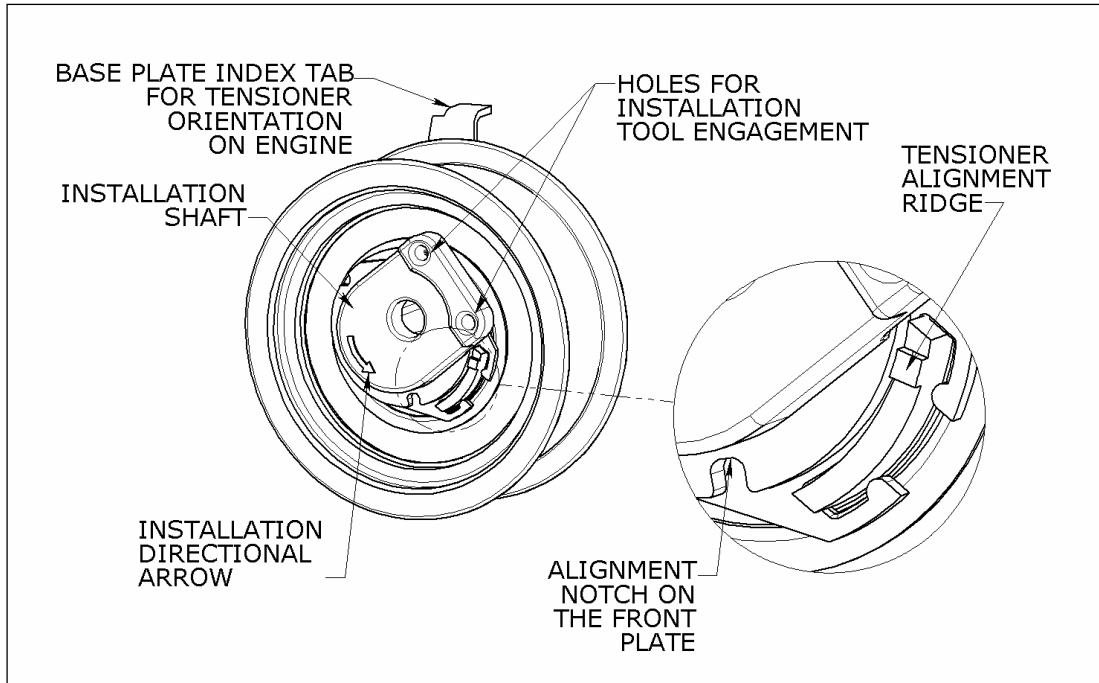


Figure 2: Timing Belt Tensioner shown as shipped

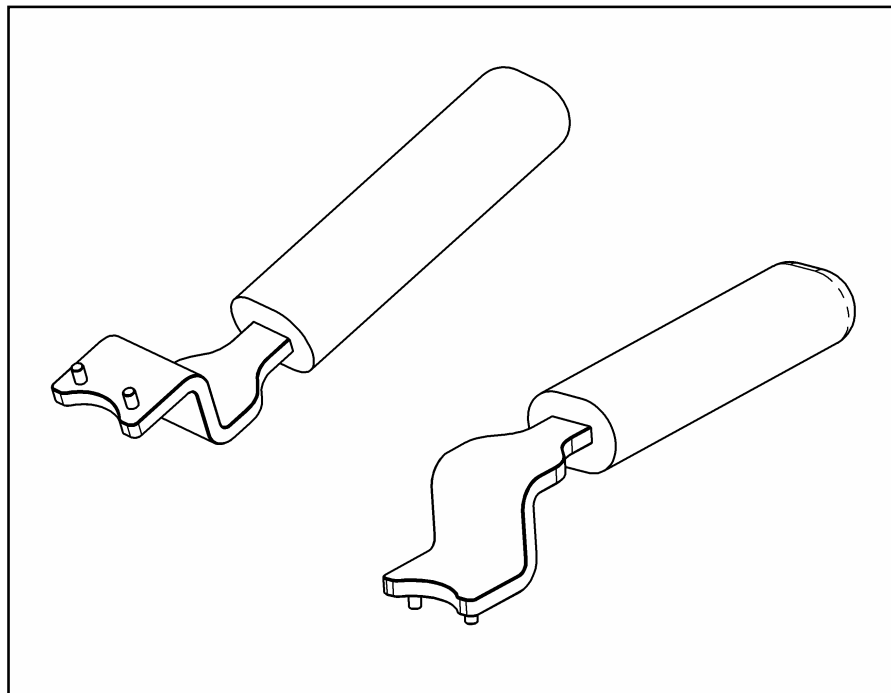


Figure 3: 2-Pin Installation Tool
(Schley 86400 or Matra V159 or Snap-on YA8640)

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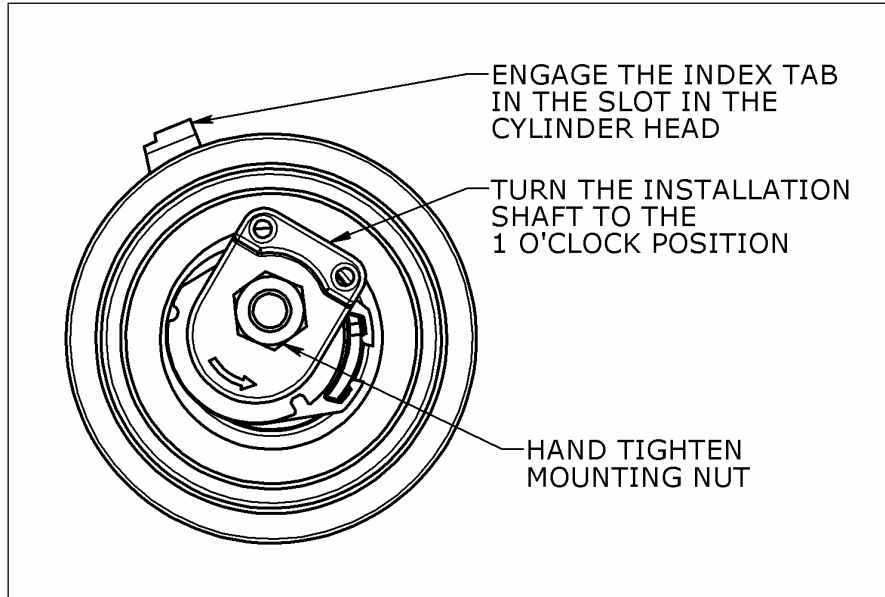


Figure 4: Initial setup of the Timing Belt Tensioner

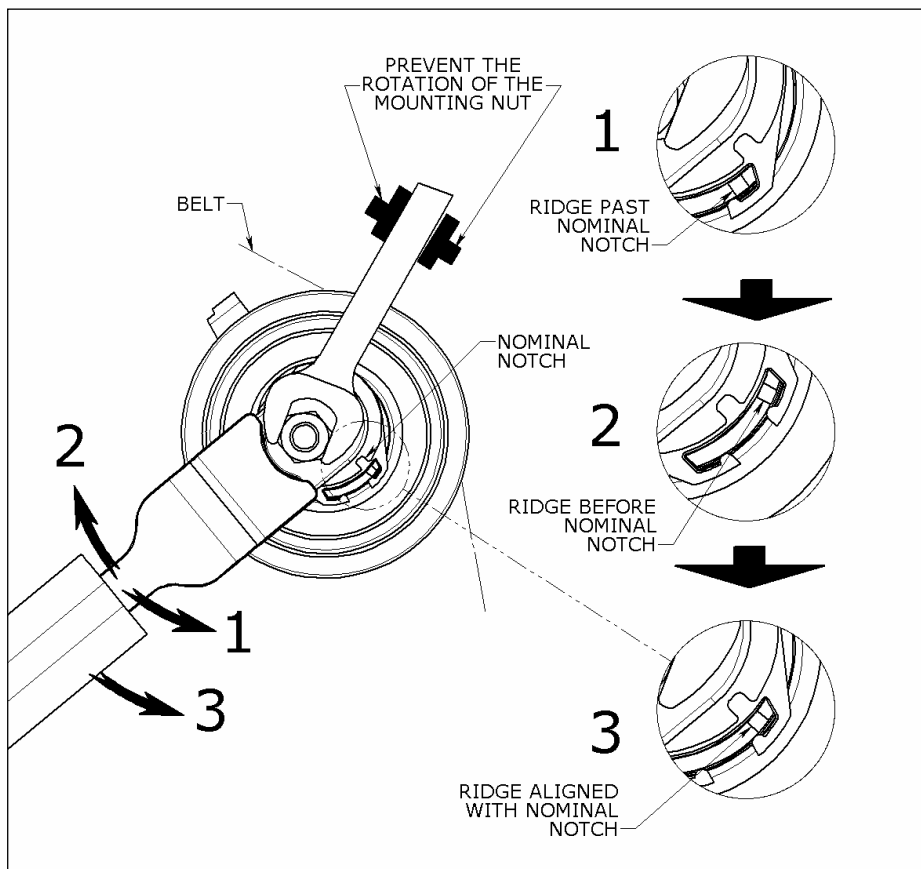


Figure 5: Tensioner Cycled before setting to Nominal Position

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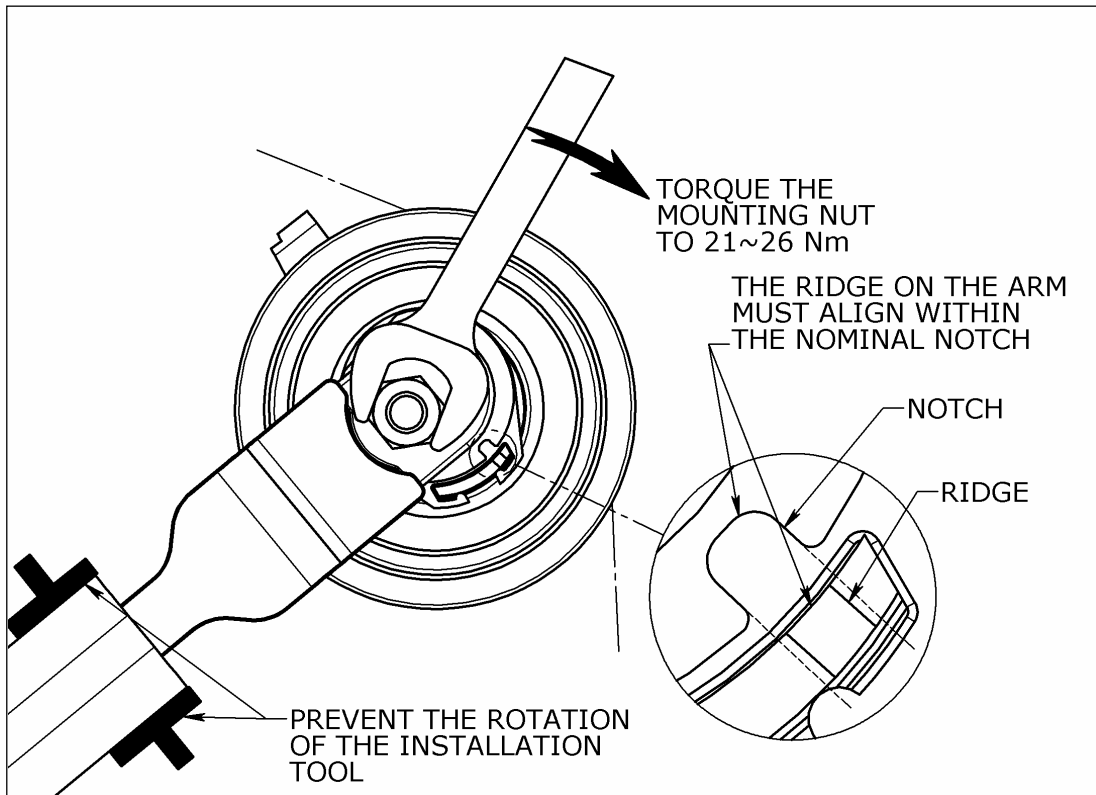


Figure 6: Tensioner Torqued at the Nominal Position