

**Recommended Installation Procedure (18 Jan 08)**  
ATech Timing Belt Tensioner (979572) VM MOTORI 2.5L Diesel, Common Rail Engine

**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).

**Crankshaft and Camshafts TDC position setup:**

2. Rotate the crankshaft **CLOCKWISE ONLY** to **TDC** (Top Dead Center) position (i.e. #1 cylinder firing position). Follow VM MOTORI's guidelines to locate and lock the crankshaft and camshafts positions at TDC. For this application:
  - Align crankshaft to the 3 o'clock position and lock it in position using a locking pin to locate the flywheel.
  - Lock camshafts in position using insert pins through the cylinder head after removing the blanking plugs.
  - Align the fuel injection pump sprocket with the timing mark on the back cover.

**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 camshaft 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 camshaft when the timing belt is removed.**



**Belt and Tensioner removal**

3. Once the procedure for setting the TDC position is completed, loosen the tensioner mounting bolt and rotate the tensioner away from the belt.
4. Remove the mounting bolt and the **OLD Tensioner**. It is recommended to replace the timing belt during the replacement of the tensioner.

**Installation of the Timing Belt Tensioner and the Belt**

5. Ensure the flywheel and the camshafts are locked properly. Hold the camshaft sprockets and loosen each camshaft sprocket bolt using the VM recommended tool. Hand tighten each camshaft sprocket bolt only.
6. Ensure the Fuel Injection pump sprocket is aligned at the timing mark.
7. Install the new tensioner (Fig. 2) on the engine and ensure it is seated on the mounting surface properly, and that the spring tang of the tensioner (Fig. 3) is against the dowel pin on the engine. Hand tighten (lightly) the mounting bolt.
8. 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 working counterclockwise **ONLY** : C/S → F/P → Idler → camshafts → Idler → W/P → tensioner.
9. Ensure the belt is tight between the sprockets. Rotate the tensioner away from the belt (Fig. 3) and engage the belt on the tensioner.
10. Engage 2-PIN installation tool into the 2 Ø3.3mm holes on the tensioner front plate and rotate it clockwise only while holding the mounting bolt with a wrench to prevent it from rotation. The tensioner assembly will move against the belt and the arm pointer notch will eventually start to move **CLOCKWISE** (Fig. 4).

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11. Continue rotating the front plate with the 2-PIN installation tool until the notch on the arm pointer travels beyond the spring tang  $10^{\circ}\sim 15^{\circ}$  or  $4\sim 5$  mm. Lock the tensioner in this position by tightening the mounting bolt to  **$25\pm 3$  Nm** (Fig. 5).
12. Hold the camshaft sprockets and tighten the bolts to the specified torque as per VM Motori's specifications.

### Verification of the Nominal Position

13. Remove all tools and rotate the crankshaft at least two (2) complete revolutions **clockwise manually** for proper seating of the belt until the crankshaft is aligned with the corresponding mark at TDC position on the engine.

Check the following:

- Crankshaft mark is aligned.
- Camshaft sprockets locking pins can be fitted smoothly.
- Fuel injection pump 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 crankshaft and the engine block is missed, do not rotate the Crankshaft counterclockwise to the correct position, but rather rotate the Crankshaft 2 more full CLOCKWISE rotations to the alignment points.**

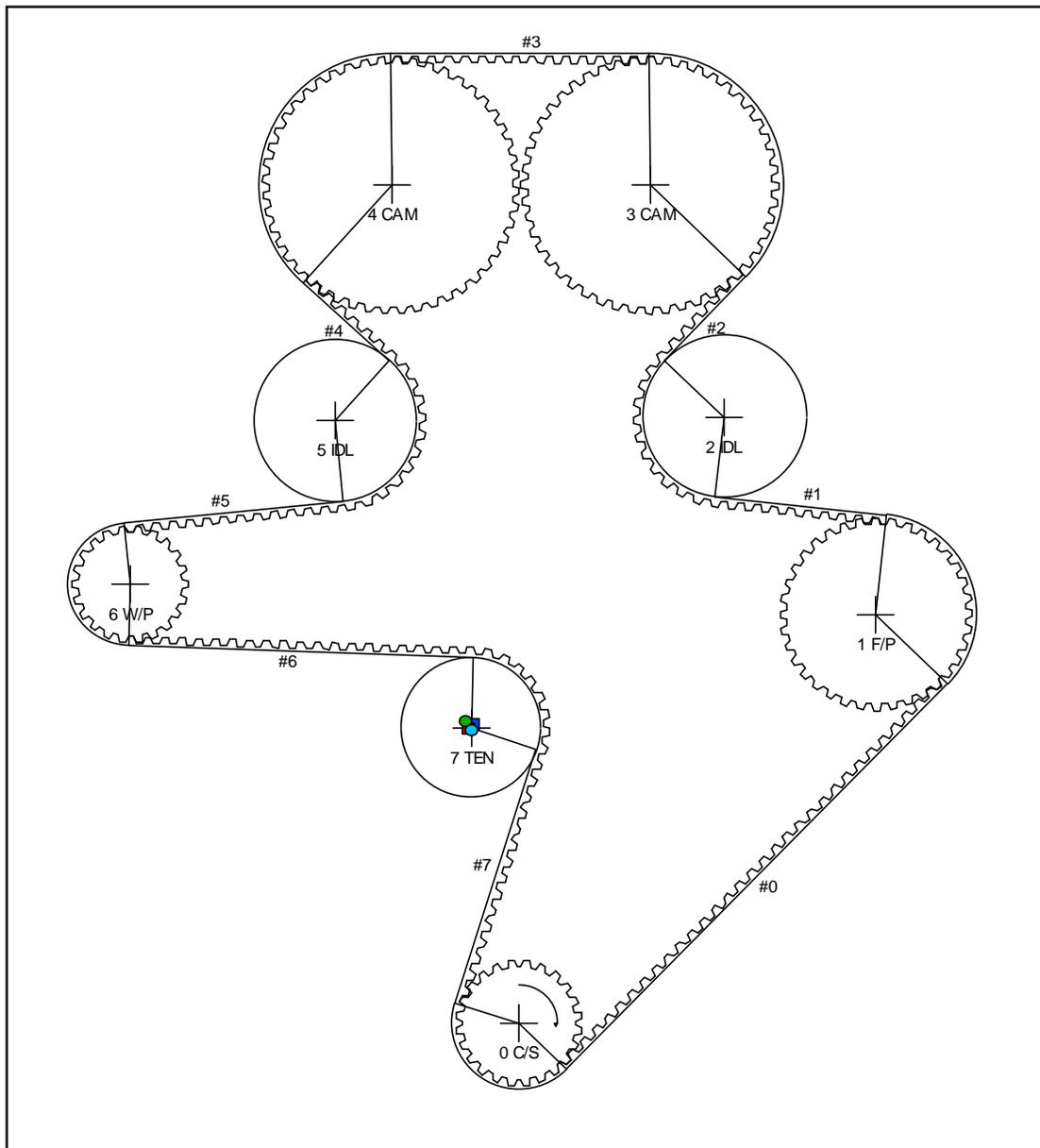


14. Check the position of the notch on the Arm Pointer.
  - If the notch on the arm pointer aligns with the spring tang @TDC, the installation is complete (Fig. 6).
  - If not, proceed as follows. The installation needs to be re-adjusted until the proper position is achieved.

### Readjustment

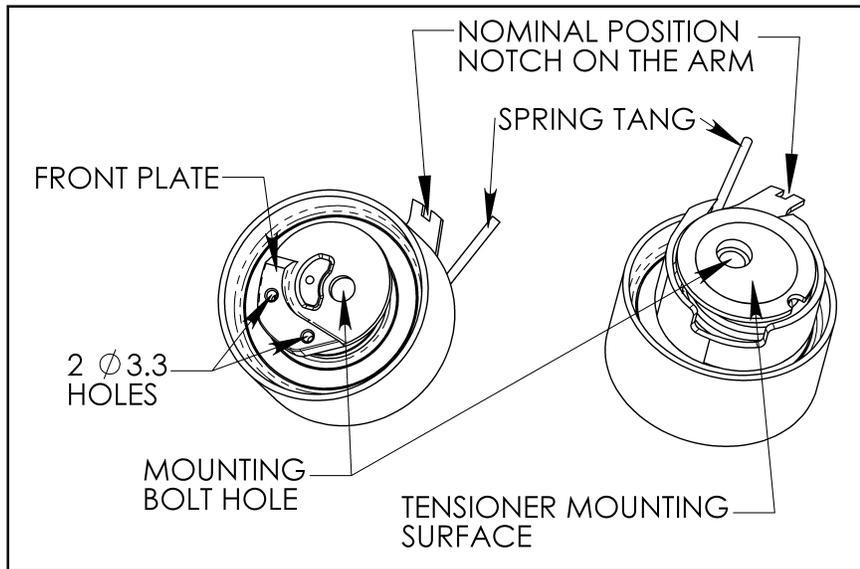
15. Engage the 2-PIN installation tool into the 2  $\varnothing 3.3$ mm holes on the tensioner front plate and retain its position while loosening the mounting bolt with the wrench. The mounting bolt and the tensioner need not be removed.
16. Prevent the mounting bolt from rotating and cycle the pivot shaft with the 2-PIN installation tool so that the notch on the arm pointer cycles around the spring tang a few times.
17. Rotate the pivot shaft **CLOCKWISE** only with the 2-PIN installation tool until the arm pointer moves clockwise to align with the spring tang (Fig. 6). Re-tighten the mounting bolt to  **$25\pm 3$  Nm** torque while preventing the pivot shaft from turning by holding it with the 2-pin tool.
18. Remove all tools. Repeat steps #13 and #14.

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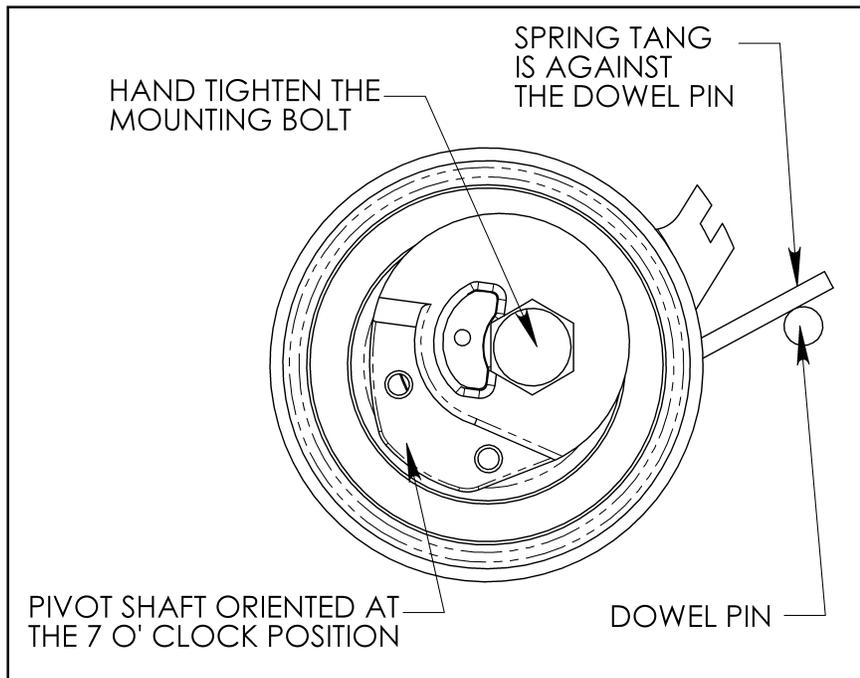


**Figure 1. Timing Drive Engine Layout**  
0: Crankshaft 1: Fuel Pump 2: Idler 3/4: Camshaft sprockets 5: Idler 6: Water Pump 7: Tensioner

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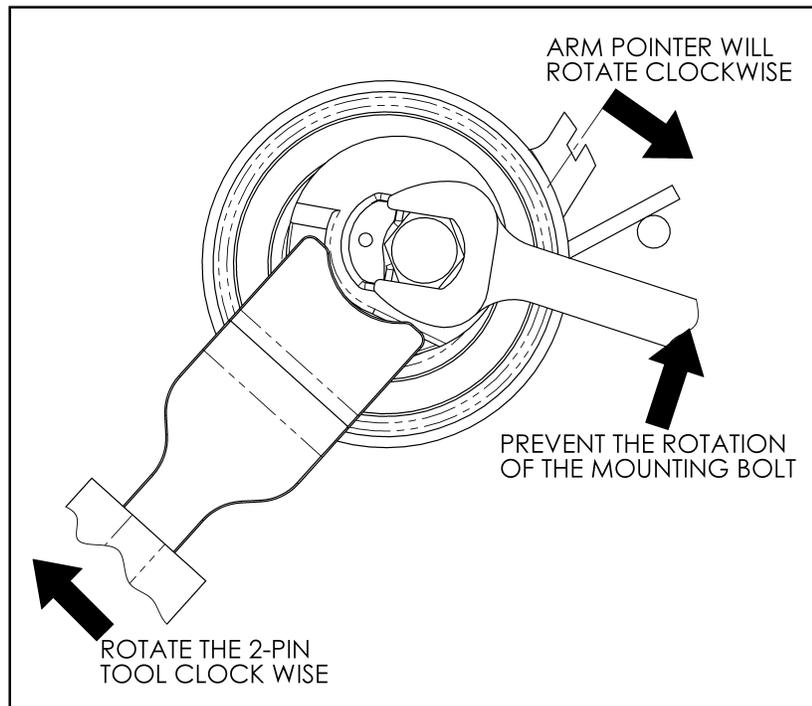


**Figure 2. Timing Belt Tensioner**

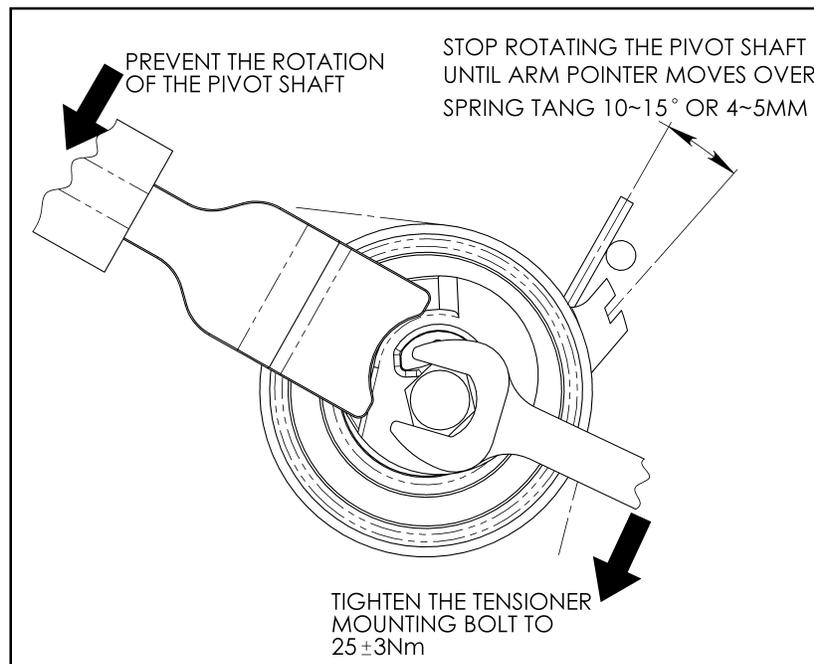


**Figure 3. Tensioner's initial setup**

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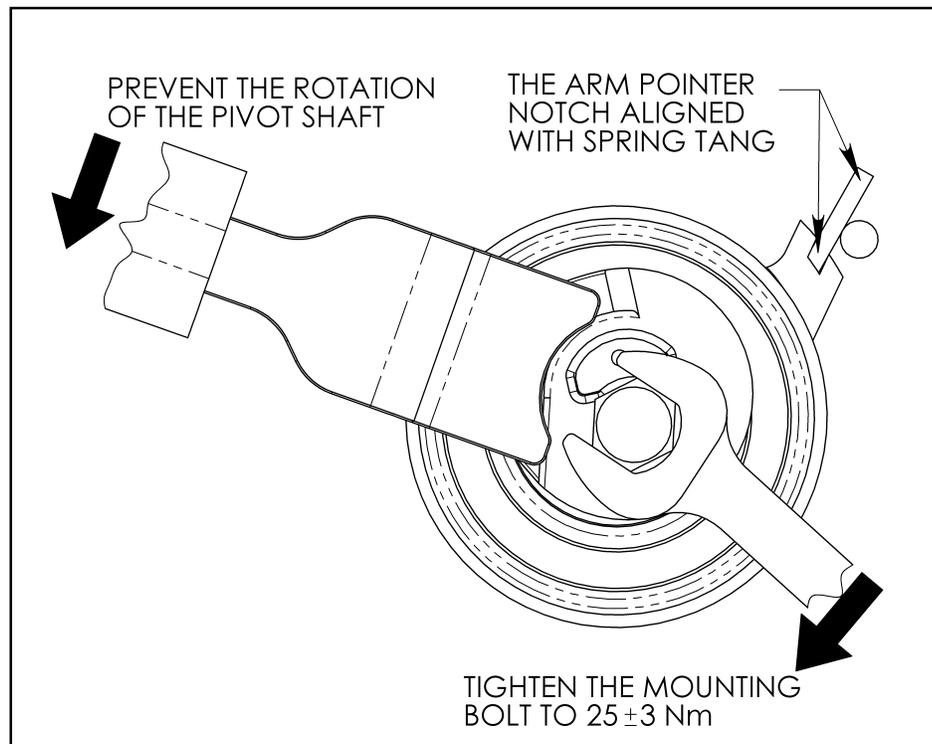


**Figure 4. Tensioner Rotation Illustration during Installation**



**Figure 5. Tensioner shown at maximum arm travel.**

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**Figure 6: Tensioner shown at nominal position properly**