

Initial Preparation:

- **Caution: The procedure to access the timing belt tensioner and all other timing driven components must be done according to DAIMLERCHRYSLER PL's guidelines.**
- **The mounting of the TBT is done on the engine with a *M8 Mounting Bolt*.**

Cold Engine – Cold tensioner:

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 cool tensioner onto a hot engine or vice versa.** (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), see Fig.2 (a) and (b).

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 rotations with the camshafts to the timing position. This is to be accomplished while the belt is still attached.

Belt and TBT Tensioner removal

3. Once the procedure for setting the TDC is completed, loosen the *M8 Mounting Bolt* and rotate the TBT's installation shaft away from the belt (Clockwise) to release the belt tension and maximize the belt clearance with TBT.
4. Remove the timing belt, the tensioner's *M8 Mounting Bolt* and the OLD TBT.

Initial Setup of the TBT (Timing Belt Tensioner)

5. Install new TBT (see Figs.3) on the engine ensuring that the tensioner's *Spring Tang* is seated into the slot in the aluminum bracket, which is still mounted on the engine block. See Figure 4 and 5.
6. Rotate the installation shaft on the tensioner with a 1/4" Square Key **CLOCKWISE** until the tensioner pivot shaft is stopped by a boss on the bracket, see Figs. 3 and 4. This will maximize the belt clearance with TBT for ease of installation. Hand tighten (lightly) the *M8 Mounting Bolt*.

Installation of the TBT and the Belt

7. Install the timing belt being careful to engage the appropriate teeth of all the corresponding sprockets as per drive layout (see Fig.1) starting with the crankshaft and working counterclockwise.
8. Using a 13mm Wrench to prevent the rotation of the mounting bolt, turn the *Installation Shaft* **COUNTERCLOCKWISE** (Indicated arrow shown on TBT front plate, see Figs.3) with a 1/4" Square Key. The Tensioner assembly will move against the belt and the *Arm Pointer* will eventually start to move **CLOCKWISE**.
9. Continue rotating the Installation Shaft until the **Arm Nominal Notch** aligns with **Spring Tang**, (see Fig. 3 and 6). Tighten the tensioner in this position by torquing the *M8 Mounting Bolt* to **30±3 Nm**
Caution: Do not over-torque or under-torque mounting Bolt.

Verification of the Nominal Position

10. Remove the 1/4" Square Key, the *Wrench*, and any other tools used for the alignment of the TDC position.
11. Rotate the Crankshaft 2 complete revolutions **CLOCKWISE manually** for proper seating of the belt until the crankshaft is repositioned at the TDC position.

Timing alignment:

- ◆ Check the **TDC** alignment of the crankshaft and the camshafts, see Fig. 2 (a) and (b). If the alignment of all sprockets are within the guidelines, proceed to step 12 for checking the TBT arm pointer alignment.
- ◆ If any of the crankshaft or camshaft sprockets are not aligned at the TDC position, the belt has to be removed and the installation procedure has to be repeated starting at step 2.

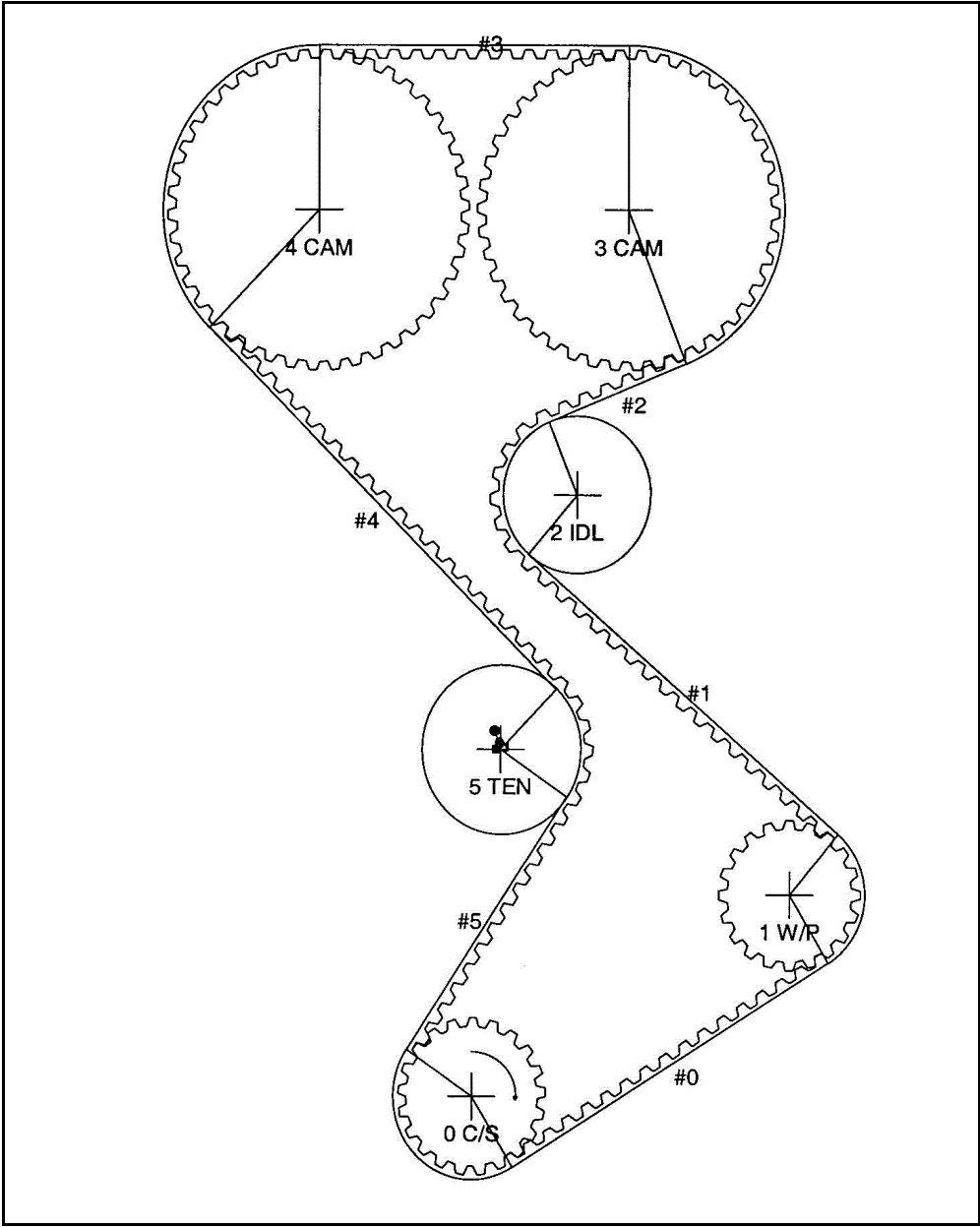
Caution: If the alignment of the crankshaft and its corresponding mark on the engine is missed, do not rotate the Crankshaft counterclockwise to the correct position, but rather rotate the Crankshaft 2 more full rotations to the alignment point.

12. Check the position of the *Arm Nominal Notch*.
If the Spring Tang aligns within *Arm Nominal Notch*, see Fig.6. The installation is complete.
If not, proceed with step #13. *The installation needs to be readjusted until the proper position is achieved.*

Readjustment

13. Engage the 1/4" Square Key and retain the installation shaft's position while loosening the Mounting Bolt with the Wrench. The mounting bolt and the *Tensioner* do not need to be removed.
14. Rotate the *Installation Shaft* with the 1/4" Square Key until the Spring Tang (see Fig.3) aligns within *Arm Nominal Notch*, see Figs 6.
15. Re-torque the *Mounting Bolt* to **30 ±3 Nm** while preventing the *Installation Shaft* from turning by holding it with the 1/4" Square Hex Key.
16. Repeat step #10, #11 and #12.

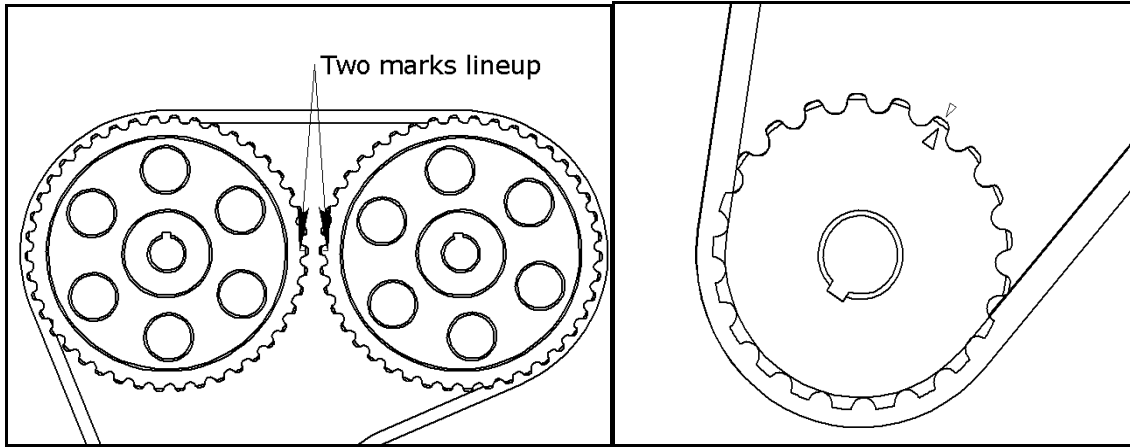
Recommended Installation Procedure (11/DEC/2003)
ATech Timing Belt Tensioner (979589) DAIMLERCHRYSLER 2.4L Inline4 SFI



0: Crankshaft 1: Water Pump 2: Idler 3&4: Camshafts 4: Belt 5: Tensioner

Figure 1. TBT Layout for 979589 (DC US Minivan 2.4L Inline4 SFI)

Recommended Installation Procedure (11/DEC/2003)
ATech Timing Belt Tensioner (979589) DAIMLERCHRYSLER 2.4L Inline4 SFI



(a) Camshaft Aligned at TDC Position (b) Crankshaft Aligned at TDC Position

Figure 2. Camshaft and Crankshaft TDC Position

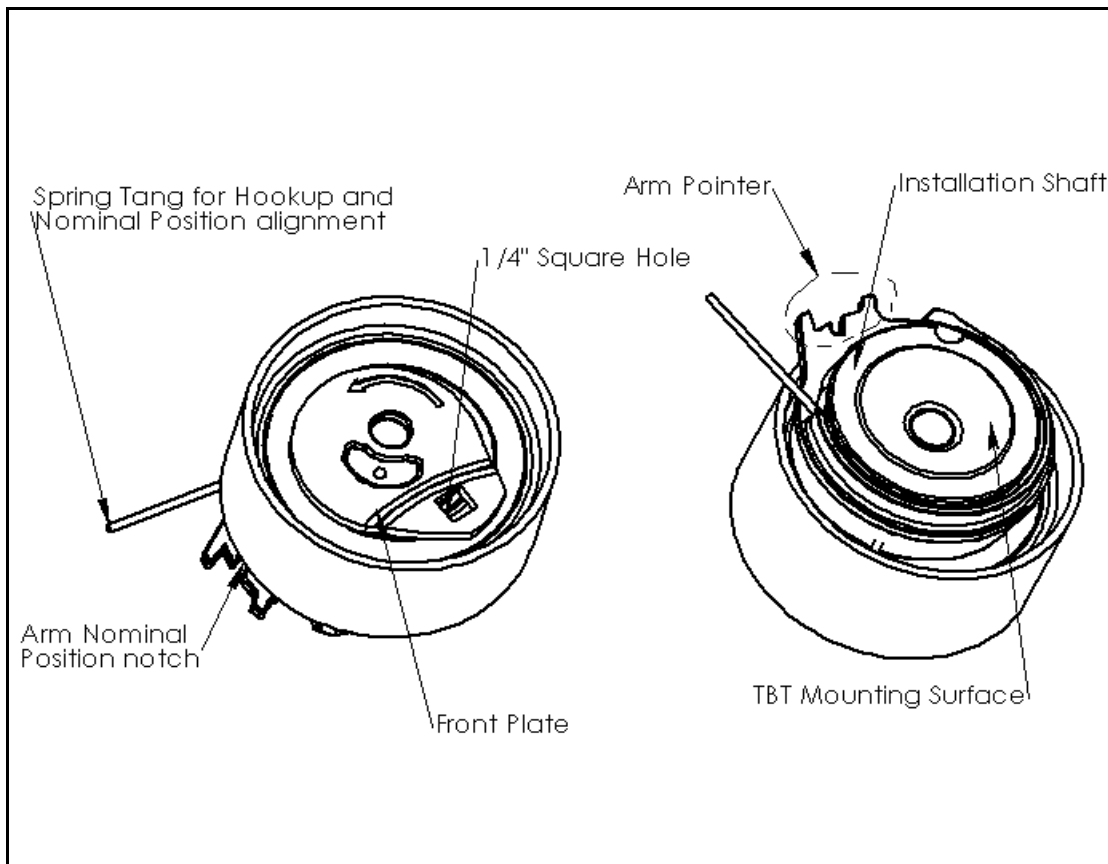


Figure 3. Tensioner Shown at Frearm

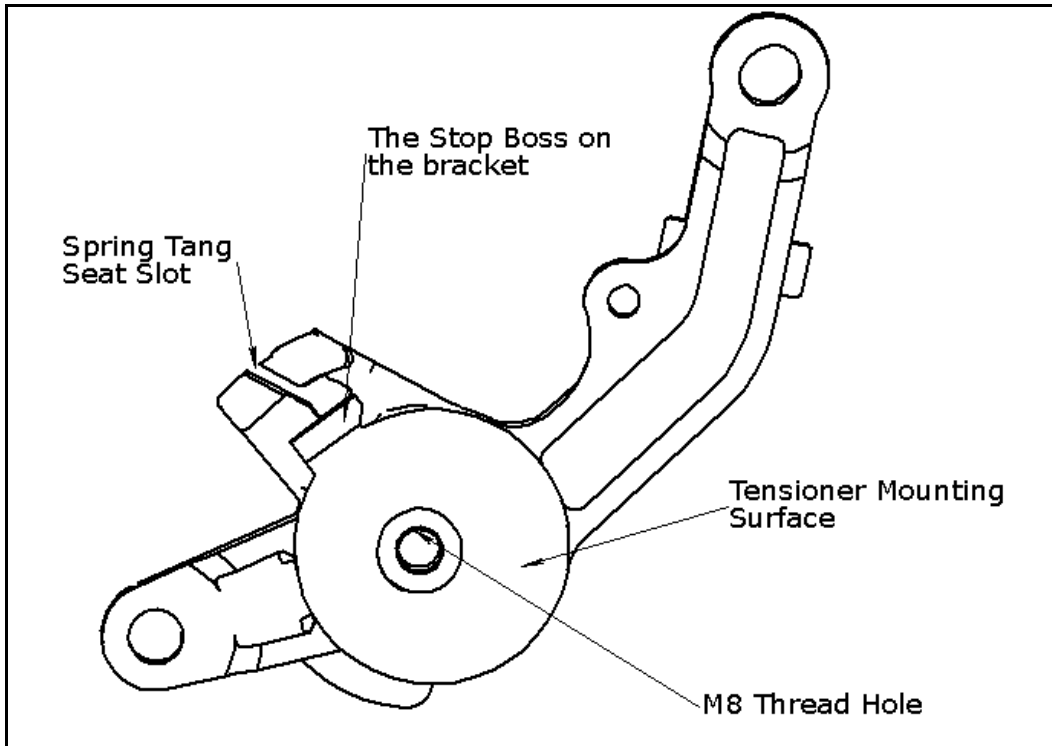


Figure 4. The Bracket of Initial Tensioner Assembly

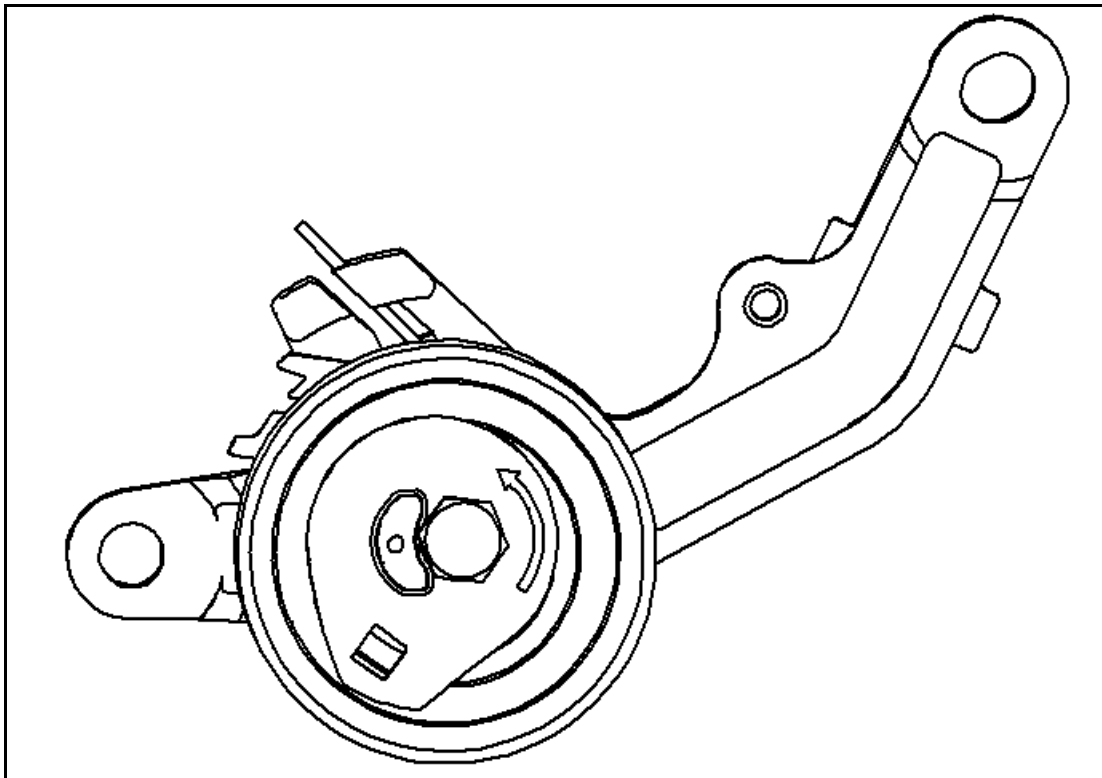
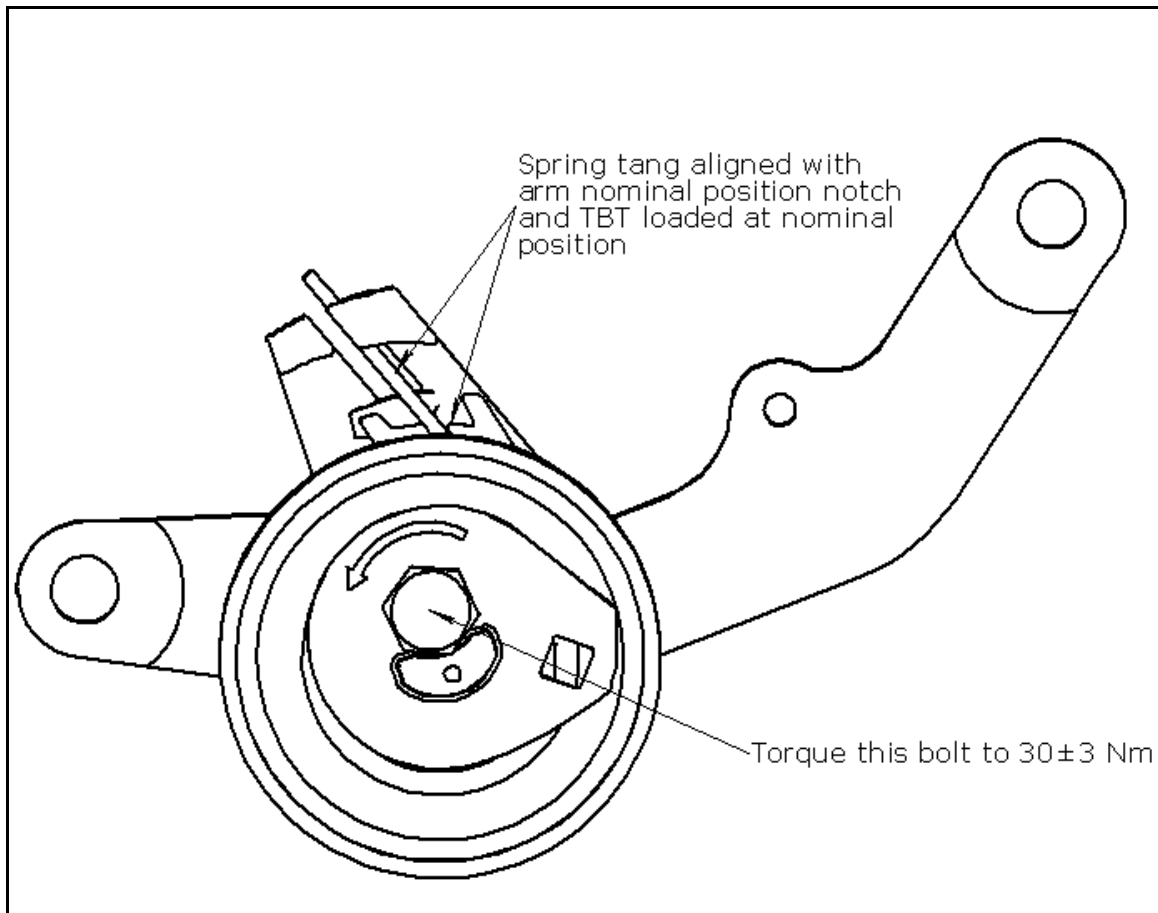


Figure 5. Tensioner Shown at Freearm Position as Installed

Recommended Installation Procedure (11/DEC/2003)
ATech Timing Belt Tensioner (979589) DAIMLERCHRYSLER 2.4L Inline4 SFI



**Figure 6. Tensioner Shown at Nominal Position
per Rotating Installation Shaft Counterclockwise**