Proper Belt Tensioner Adjustment

1990-2005 Mazda Miata Supercharger Systems

SYMPTOM

The KraftWerks automatic belt tensioner rattles at idle or light throttle application

CAUSE

Belt tension is too loose, causing the tensioner to bounce off bottom stop.

CORRECTIVE ACTION

Adjust belt tensioner off of bottoming stop. Belt tension set to minimum 4mm.

ADJUSTMENT PROCEDURE

The KraftWerks automatic belt tensioner system can only function correctly if it is adjusted correctly when installed. The static idler must be adjusted initially to provide at least 4mm of pre-tension on the automatic drive belt system. The more distance from the unloaded position you apply to the automatic tensioner the more tension you apply to the serpentine belt. 4 to 6mm of pre-tension provides the perfect balance of pre-load on the belt while at the same time extending belt life. In some cases the static tension setting of 4mm is too close during light throttle applications and the tensioner will hit its bottoming stops during light throttle applications. If you are experiencing this rattle noise, simply increase the static belt tension to give yourself more pre-load. Max pre-load tension recommended is 10mm.

Remove the belt from the system and put an “adjustment mark” at the top of the unloaded automatic tensioner using a thin permanent marker. The “adjustment mark” will run across the stationary tensioner housing and the auto tensioner arm. This mark will be your measuring point for tensioner adjustment. Route the belt around all pulleys except the crank pulley. Loosen the 14mm static idler retaining nut just enough for the static idler assembly to move on the supercharger bracket and loosen the 10mm headed static tensioner bolt until the static tensioner is at its loosest point. Using a 21mm socket and ratchet, “walk” the serpentine drive belt onto the crankshaft pulley while turning the crankshaft in a clockwise direction. This is an acceptable procedure as the belt is only being tensioned by the automatic tensioner spring and it will not harm the serpentine drive belt. Once the serpentine belt is in place continue to rotate the crankshaft and make a visual check to make sure the serpentine belt is completely seated in all of the pulleys correctly.

Install a 3/8” square ratchet into the square socket of the automatic belt tensioner and rotate the ratchet clockwise. This will release tension off of the serpentine drive belt system. Tighten the 10mm headed static idler bolt until the long “leg” of the serpentine drive belt that travels from the supercharger pulley back to the crank pulley has tension on it. Let go of the 3/8” ratchet and visually check how far apart your adjustment marks are. Push the automatic belt tensioner pulley towards supercharger unit (counter clockwise) to take all of the free-play out of the belt and recheck your adjustment marks.

On initial start up you may want the adjustment marks to be 7-10mm apart as the belt will stretch during its initial break-in and cause the adjustment marks to become closer together. Once you have adjusted the static tensioner so that the automatic tensioner has enough static tension tighten the 14mm hex nut and the 10mm static adjuster nut to lock the settings. Start the car and rev the engine aggressively a few times to see where adjustment marks end up. The adjustment marks should almost come back together when the engine rpm is brought up aggressively. This adjustment will provide perfect belt tension and long belt life. This adjustment should be checked after the first 100 miles of operation and readjusted as needed once the belt does its initial break-in stretch.

TECHNICAL INFORMATION

The KraftWerks Miata automatic belt tensioner system is designed to give consistent belt tension to the supercharger drive belt while extending the life of the belt. This is accomplished by using a spring loaded tensioner to the belt drive system. This spring loaded tensioner combined with a static idler for initial tension adjustment will keep consistent tension during acceleration and deceleration when the belt stretches and returns to its original length. Serpentine drive belts act like rubber bands when they are loaded and unloaded. A wide, short, thick rubber band does not stretch as easily as a thinner, longer, rubber band stretches. In the Miata 4 rib serpentine drive belt system the serpentine drive belt will stretch and return to normal length thousands of times during its operation. In the 90-05 Miata models, the drive belt system was a fixed tension system that put high stress on the drive belt. In the 2006 and later MX-5 models, they came equipped with an automatic belt tensioner system. KraftWerks has incorporated this modern style automatic belt tensioner system into the KraftWerks supercharger systems and it has proven to be an extremely robust addition to the 90-05 Miata models.

The automatic tensioner spring tension rises as the tensioner is pulled through its travel. The least amount of preload provides the least amount of belt tension and thus provides the longest belt life. The KraftWerks serpentine belt system has been designed so that there is extremely good belt “wrap” on the supercharger pulley and thus does not require heavy belt tension. You can adjust the belt tension to be any amount above the recommended 4mm but it won’t provide any significant improvement in belt grip. This same automatic belt tensioner system is used in personal KraftWerks street cars and race-winning race cars for three years with zero failures using the 4mm pre-tension settings.

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