

## Automatic Belt Tensioner

by [Larry Carley](#) copyright 2019 AA1Car.com

The [serpentine belt](#) that drives the accessories on late model engines has an automatic tensioner that keeps the belt tight. Most people know the belts are a maintenance item and eventually have to be replaced. But many do not know the spring-loaded automatic tensioner that keeps a serpentine belt tight can also wear out or become weak. This can cause a variety of problems if the tensioner is not replaced when a new belt is installed.

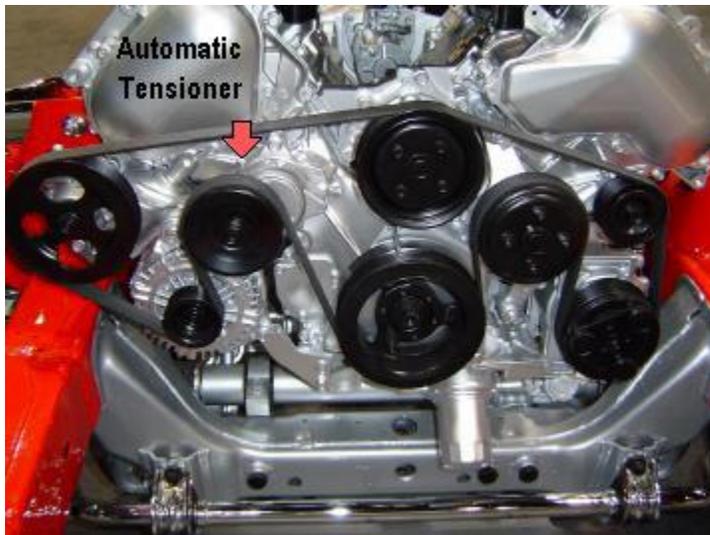
The automatic tensioner has a coil spring inside that applies just the right amount of force against the belt to keep it tight. The tensioner also provides a little "give" so it can absorb and cushion shock loads on the belt that occur when the A/C compressor clutch cycles on and off. What's more, the tensioner automatically compensates for wear and keeps the belt under constant tension.

Nothing lasts forever, not belts and not automatic tensioners. The typical service life of a serpentine belt is about 60,000 miles or five years. When the belt nears the end of its life, it may become cracked, glazed and noisy. Cracks on the underside of a serpentine belt are normal. However, if you see more than three cracks in a three inch section on any one rib, the belt has already used up 80% of its intended life. Replace it now.

If an aging belt is not replaced, it may break causing a loss of drive torque to all of the engine's accessories. When the water pump stops turning, the flow of coolant stops and the engine begins to overheat. When the alternator stops turning, there is no charging output and the battery starts to run down. When the power steering pump stops turning, the steering suddenly gets very stiff and hard to steer.

All too often, an old serpentine belt (or a broken belt) will be replaced with a new one. But the automatic tensioner is not inspected to make sure it is still working properly and is in good condition. This mistake can lead to rapid belt slippage, wear and repeat belt failures if the tensioner is weak or worn out.

Belt tension is critical. Too little tension may allow the belt to slip and squeal. Slippage also causes the belt to run hot and age prematurely. And if the belt is really loose, it may come off its pulleys. Too much tension on a belt may overload the belt as well as the shaft bearings on the water pump, alternator, power steering pump and air conditioning compressor, possibly leading to premature failures in these components, too.



*The automatic tensioner prevents the belt from slipping.  
A weak tensioner can allow the belt to slip and squeal.*

Belt tensioners were first used back in the late 1970s. These early units were fixed tensioners that required manual adjustment. Then automatic belt tensioners arrived in the mid-1980s. The spring-loaded design eliminated the need for manual adjustments and assured proper belt tension for the life of the belt. Because of this, the tensioner is often overlooked when a belt is replaced. Even so, the tensioner should always be inspected when changing a belt for the following reasons:

\* Rust or corrosion can jam the tensioner housing and prevent it from rotating freely. A frozen tensioner cannot maintain proper belt tension. Corrosion is usually a result of road splash, especially in areas where roads are heavily salted during the winter.

- \* Dirt or mud can also jam the tensioner housing.
- \* A loose or worn pivot arm can allow unwanted movement that results in belt noise and misalignment. Over time, this will increase belt wear and lead to premature belt failure.
- \* A worn bushing in the tensioner pulley can cause vibrations and noise. If the bushing seizes, it may cause the belt to snap.
- \* A weak or broken spring inside the tensioner can't maintain proper tension and the belt will slip. Springs lose tension over time from exposure to heat.
- \* Cracks or damage to the tensioner housing or pulley arm may prevent it from rotating smoothly and maintaining proper belt tension.

## **SYMPTOMS OF A BAD BELT TENSIONER**

Symptoms that typically indicate an automatic tensioner has reached the end of the road include:

- \* **Belt slipping (due to loss of tension).** Watch the tensioner arm movement while the engine is idling. There should be a gentle arm motion as accessories turn on and off (such as the A/C compressor clutch engaging and disengaging). If the tensioner pulley does not move at all, the tensioner may be stuck. You can test for this later with the engine off. Also watch for excessive chattering or tensioner arm oscillation while the engine is idling. This can be caused by a worn damper inside the tensioner. Excessive arm oscillation should be viewed as a warning sign that the damper has possibly failed or is failing and the tensioner needs to be replaced now. If it is not replaced, it can have a hammering effect on nearby accessories causing the shaft bearings on the accessory to fail.
- \* **Battery runs down** (because belt is slipping and not turning the alternator fast enough)
- \* **Belt glazing (caused by slipping).** Any glazing (shine) on the underside of the belt indicates that the belt has been slipping. Slippage can be caused by not enough spring tension on the tensioner, a failing component bearing, contaminated pulleys or an elongated belt.
- \* **Excessive movement or rocking of the tensioner pulley, or "belt flutter" when the engine is running.** This means the spring inside the tensioner is weak and/or the bushing is worn. The tensioner needs to be replaced.
- \* **Wobble in the tensioner pulley (or [idler pulley](#)).** Wobble means the bearings are shot.

\* **Belt or tensioner noise.** The tensioner should be quiet when the engine is running. Any squealing, rumbling, growling or chirping noises should be investigated to determine the cause. A mechanic's stethoscope can be used to pinpoint the source of the noise. The probe should be placed against the bolt in the center of the tensioner pulley wheel and/or idler pulley to listen for bearing noise. The idler pulley(s) should also be checked because the bearings in this component can wear out, too. The same goes for all the engine-driven accessories (water pump, alternator, PS pump and A/C compressor).

\* **Pulley damage.** Physical damage of any kind on the automatic tensioner pulley may indicate excessive tension or physical interference. If the pulley is damaged, replace the tensioner assembly not just the pulley. If an idler pulley is damaged, inspect the tensioner also because vibrations caused by a bad idler pulley may damage the tensioner.

## **BELT TENSIONER CHECKS**

Check the movement of the tensioner arm with the engine off. Use a socket with a long handle ratchet or breaker bar on the tensioner pulley center bolt to rotate the tensioner. There are no specifications for measuring the amount of resistance offered by the tensioner spring, but if the tensioner offers little resistance it may indicate a weak or broken spring. If it fails to move at all, the tensioner is jammed and needs to be replaced.

Watch for looseness in the arm when the tensioner is rotated. The arm should not wobble or twist. If it does, the tensioner bearings are worn and the unit needs to be replaced.

Also note the position of the arm on the automatic tensioner. Many units have marks on the housing that show the normal range the arm can pivot. If the position of the arm is outside these marks, it indicates a problem (the belt may be too long or too short, or the tensioner may be jammed).

Note the wear pattern on the tensioner and idler pulley(s). Misalignment and bearing wear can cause the belt to track off-center. This will cause the belt to wear quickly. The tensioner and idler pulley bearings can be checked by removing the belt and spinning the pulleys by hand. All pulleys should turn freely with no binding, roughness or wobble. Any binding, roughness or wobble means these parts are bad and need to be replaced.

Pulley alignment should also be checked to make sure there isn't a mounting problem in the belt drive system. Pulley alignment can be checked by placing a straight edge against the pulleys, or with a special laser alignment tool designed for this purpose. Any side abrasion on a belt usually indicates there is misalignment in the system. It must be found and corrected before installing a new belt.



## BELT TENSIONER REPLACEMENT TIPS

If the automatic belt tensioner has failed (and the engine has a lot of miles on it), it is probably a good idea to replace the idler pulley(s) at the same time. Why? Because the shaft bearings on all the pulleys will have the same amount of wear. If they are reaching the end of their service life, replacing them now will restore the pulleys to like-new condition and reduce the risk of a breakdown because of a belt or pulley failure.

Aftermarket automatic tensioners are often a better replacement choice than an original equipment tensioner, especially on older vehicle applications. Some OEM tensioners (Chrysler 3.0L, 3.3L and 3.8L, for example) were not very robust and have experienced a high failure rate over the years. Rather than simply copy these OEM tensioner designs with their inherent flaws, some aftermarket manufacturers have re-engineered their parts to overcome the weaknesses of the original design. As a result, some aftermarket replacement tensioners may not look exactly the same as the original. But there's a reason why: these parts have been redesigned to outperform and outlast the original parts they replace.

A special tool that may be needed when replacing a serpentine belt or automatic tensioner on a transverse-mounted engine in a front-wheel drive vehicle is a special serpentine belt removal tool. The tool has a long, flat extension handle that allows a socket to be placed on the tensioner bolt so the tensioner in a tight engine compartment can be easily rotated to relieve pressure on the belt. Without this tool, the job is nearly impossible on some vehicles.

Something else you may need is a belt routing diagram so the new belt can be properly routed around all of the pulleys. Pay attention when you are removing the belt, and if the underhood decal that shows how the belt is routed is missing draw a picture (or take a digital photo) so you know where the belt goes. Serpentine belts can be very confusing.



## STRETCHFIT SERPENTINE BELTS DO NOT USE AN AUTOMATIC TENSIONER

To save money, auto makers have eliminated the automatic tensioner for the serpentine belt on some late model vehicles. Applications include 2004 and up Mazda MPV & Tribute, 2005 & up Ford Escape and Taurus, 2007 & up Chrysler Sebring, Dodge Stratus and Dodge Nitro, some 2008 and up GMC and Chevy trucks, and 2008 and up Hummer H3.

On these vehicles, the serpentine belt has to be stretched over the last pulley when it is replaced. The trick is to route the belt as far as you can, then start it partially over the last pulley. You then rotate the engine by hand to finish pulling the belt over the pulley into place.

Gates has a special tool for this purpose that makes the installation much easier. For more information about StretchFit serpentine belts and their replacement, [Click Here](#) to view Gates instruction sheet.

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