



# TECH TIP

## ACCESSORY BELT DRIVE SYSTEM

### BULLETIN TT002-15

› MAKE:

All makes with a serpentine belt

› MODEL:

All models with a serpentine belt

› YEAR:

All years with a serpentine belt

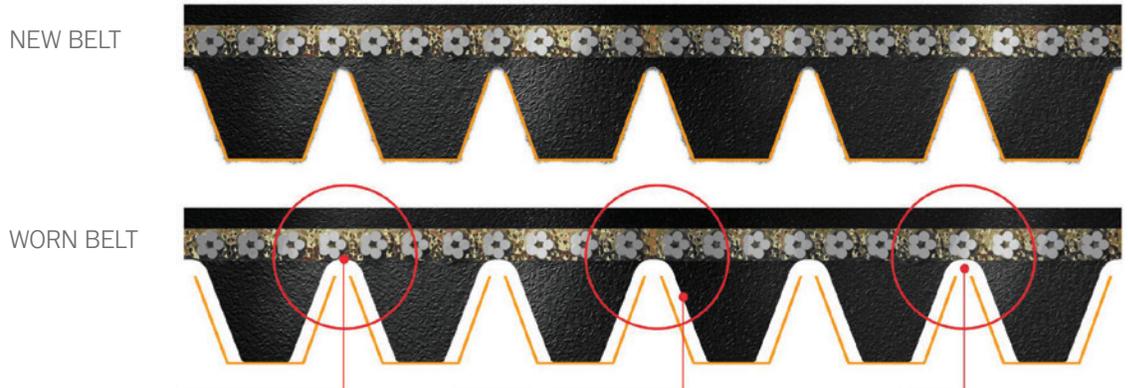
› ENGINE:

All engines with a serpentine belt

### Belt Inspection Changes

Standard industry belt diagnostics call for replacement of a serpentine belt if it shows three cracks in a three inch section. This is a good rule of thumb for Neoprene, but not so good for EPDM. EPDM belts inherently resist cracking because of the increased elasticity, so a visual check for cracks is not a true indicator of belt wear, especially since they can run 100,000 miles or beyond with no visual cracks. A far better indicator of wear on EPDM belts is material loss.

Serpentine belt drives are exposed to grit, rocks, salt, and water. Over time, these contaminants, along with slight misalignments, result in wear of the rubber rib surfaces. Like tires running on a highway, serpentine belts gradually lose material over time, which results in failure modes defined by changes in belt profile. One problem associated with material loss is how the belt fits around the pulley. Belts are designed to allow clearance between itself and the pulley. When material loss occurs, the clearance is lost; thus eliminating a way for water and debris to be passed between themselves and the system. This can result in belt hydroplaning.



#### RIB WEAR

Rounded Rib Tip - Material loss results in belt riding directly on top of pointed pulley tips. Belt can be sheared or slip off the drive

#### BELT SEATING

Material loss results in belt seating further down in pulley. This reduces wedging force necessary to transmit.

#### PULLEY FIT

Material loss reduces clearance between belt and pulley. Water and debris have difficulty passing between the two. Hydroplaning of belt can result.

#### BELT WEAR AFTER 100,000 MILES



NEOPRENE



EPDM

- › Over time, belt ribs lose material.
- › With material loss the space between the ribs increases
- › The belt can “bottom out” on the pulley.
- › This causes belt slip and accelerated wear.
- › When water cannot channel out between the belt and pulley, hydroplaning (like a tire on a wet road) can result.

## GOOD BELT



WHEN THE GAUGE REMAINS TIGHTLY SEATED AND RESISTS MOVEMENT, THE BELT HAS SUFFICIENT SERVICE LIFE LEFT.



THE GAUGE RIBS WILL CONTACT THE SIDES OF THE BELT MATERIAL AND THE BODY MAY REST SLIGHTLY ABOVE THE BELT SURFACE.

## WORN BELT



WHEN THE GAUGE ALLOWS LATERAL ROCKING MOTION, THE BELT IS IN NEED OF REPLACEMENT.



THE GAUGE RIBS WILL NOT CONTACT THE BELT MATERIAL AND THE GAUGE BODY WILL REST FLAT ON THE TOOL, ALLOWING MOVEMENT IN THE TOOL.

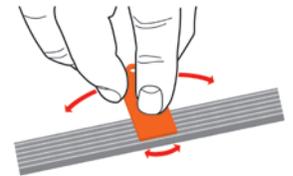
So if a technician cannot count on belt cracks as a wear indicator on newer belts, what options does he/she have? This is where, like on many modern vehicle systems, good detective work pays off. Today's technicians need to look at the whole package; from the belt/tensioner performance, to vehicle mileage, to the operation of every other system component. If problems are found anywhere in the Serpentine system, it is prudent to take a hard look back at the parts that transmit power to all drive components, which are the belt and tensioner. A persistent check engine light, reduced engine cooling, inconsistent power steering performance, or poor A/C system performance are all signs of belt slip caused by wear.

The slightest material loss in belts means more to a car's drivability than one might think. Changing a belt during another component's replacement is imperative to avoid comebacks. The best practice is to begin checking belts at 60,000 miles to ensure that the belt's rib are uncompromised and are not showing wear. Remember, as little as 5% rib material loss can create issues.

Measuring belt wear is now easier than ever with the Gates belt wear tool. To measure belt wear, simply press the belt wear gauge into the belt grooves using gentle pressure to hold the gauge against the belt; then attempt to pivot the gauge side-to-side. If the gauge remains tightly seated in the grooves and resists movement, then the belt has sufficient service life left. However, if the gauge pivots and exhibits side-to-side movement, then the belt is worn and the life of the belt has expired.



» With the engine off, press the gauge ribs into the belt grooves using gentle pressure to hold the gauge against the belt and seat the ribs.



» Attempt to rock the gauge in a lateral motion.

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