

NAPA Micro-V[®] Belts: Belt Wear Alert

A wide-angle photograph of a multi-lane highway at sunset. The sun is low on the horizon, creating a warm orange glow and long shadows. Several cars are visible on the road, their headlights and taillights glowing. In the foreground, a NAPA Micro-V belt is shown in a curved, perspective view, highlighting its ribbed texture and blue and yellow colors.

**1 out of 5 vehicles on
the road needs a new belt.**

Make sure you're the one who installs it.



belts/hose

AN IMPORTANT MESSAGE
FROM NAPA BELTS/HOSE

One out of five vehicles—that’s an astounding fact if you consider how many vehicles are on the road today. It’s also a great opportunity for you to do the right thing for your customers—as long as you can identify the problem in time.

In the late 1990s, vehicle manufacturers began to phase out the use of Neoprene belts and install EPDM (Ethylene Propylene Diene Monomer) belts on new models.

EPDM is a superior technology with better performance characteristics, but like any wear part, these belts don’t last forever. As EPDM belts age, they don’t show wear the same way the older Neoprene ones do, so it may be harder to detect when they need to be replaced.

The “three-cracks-in-three-inches” rule of thumb doesn’t necessarily apply because the newer belts don’t crack as much as they age. So, you might not notice a worn belt at first glance.

With this new belt construction comes a new way of diagnosing belt wear. As a professional technician, you should be aware of how to accurately diagnose belt wear in EPDM belts, so you can recommend replacement at the appropriate time. This is important because it can add up to savings for your customers, and reduce comebacks and unnecessary warranty claims for you.

EPDM WEAR INDICATORS AND SYMPTOMS

Older Neoprene belts exhibit cracks as they age. They have a life expectancy of 50-60K miles, and can fail, resulting in a stranded vehicle. Although EPDM belts don't show cracks as early in their life cycle, they, too, can fail and strand the motorist.

As EPDM belts age, they gradually lose rubber material—similar to the way tires wear out. Over a period of 100,000 miles, a belt can lose up to 10% of its rib material. While this may not seem like a lot, the consequences can be significant.

The diagram on the right shows a new belt profile (top), and a worn belt (bottom)—with indicators to show the original profile. Material has been lost on both the side and top surfaces of the ribs, making the space between ribs wider. As more material is lost, the pulleys ride deeper into the belt grooves.

With sufficient material loss, the pulley ribs “bottom out” in the grooves and ride on the belt undercord. This reduces the surface contact on the v-rib sides, where the traction is generated. It also increases the effective belt length, lowering the tension in the system, which also reduces traction.

When the belt wears to this degree, several problems can occur, as indicated by the chart below.

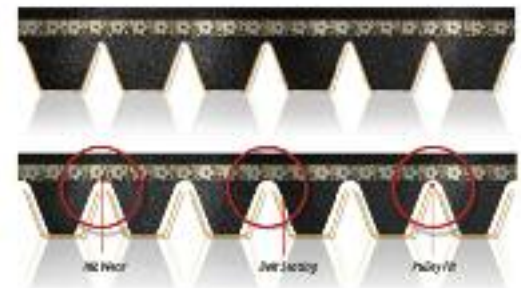
Belt wear after 100,000 miles



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 accelerated wear, belt slip, and contamination
- When water cannot channel out between the belt and pulley, hydroplaning (like a tire on a wet road) can result

BELT WEAR PROBLEMS

BELT SLIP—LOSS OF TRACTION

Like a tire, a worn belt can lose traction (slip) on the pulleys, particularly in high-load and/or wet conditions. Slip can cause belt/pulley temperatures to rise by up to 50%—leading to early accessory bearing failure.

HYDROPLANING

This occurs when water cannot be effectively channeled away between a worn belt and the pulleys. The belt then “hydroplanes” on a film of water, resulting in loss of power transmission to the accessories. This can often result in the “Check Engine” or “Alternator Charging” warning lights to come on.

ELONGATION

Material loss can also cause a change in the effective length of the belt, which can move the tensioner beyond its take-up range. This will reduce overall system tension, also lowering accessory performance.

MISALIGNMENT

Material loss and subsequent changes to effective length on belts can also cause misalignment, resulting in vibration and high heat, which can damage accessory bearings and cause accessories to fail. Misalignment can also be an indication that the internal components on the tensioner have failed.



Accessory performance is directly affected by the condition of the drive belt. Material loss on Micro-V ribs of just 5% can affect accessory component performance.

WHEN TO RECOMMEND BELT REPLACEMENT

PREVENTIVE MAINTENANCE

First, determine the belt's age, through repair records or the customer's recollection. If the belt has 65,000 to 70,000 miles on it, and the vehicle is already in your shop, belt replacement is a relatively inexpensive addition to a preventive maintenance regimen.

OTHER ACCESSORY DRIVE REPAIRS

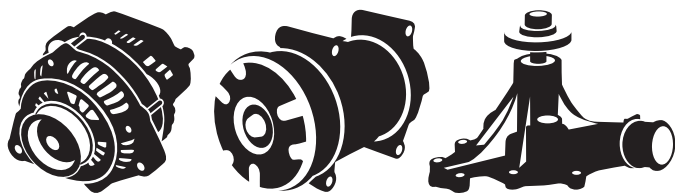
If you're already making an accessory drive repair, it makes sense to recommend replacement for a belt with significant mileage—essentially, the labor is free for the customer, future problems are prevented, and your profits are higher.

OBVIOUS SIGNS OF WEAR—

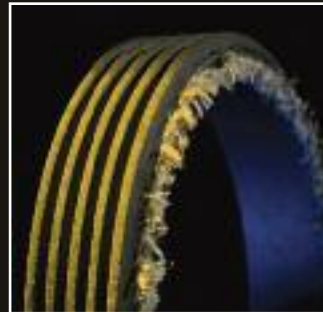
If the belt exhibits one or more of these symptoms (right), it needs to be replaced. If it fails, it could damage other system components in addition to stranding the motorist. Many warranty-claim failures on alternators and other parts are actually caused by worn or improperly adjusted belts. Warranty claims are bad for business—and customer satisfaction.

RULE OF THUMB

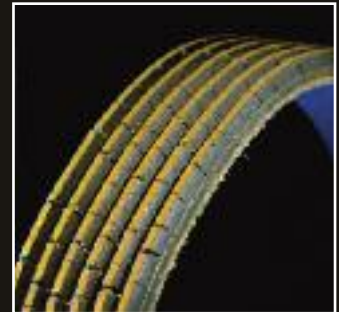
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Visual signs of belt wear



Abrasion/Misalignment



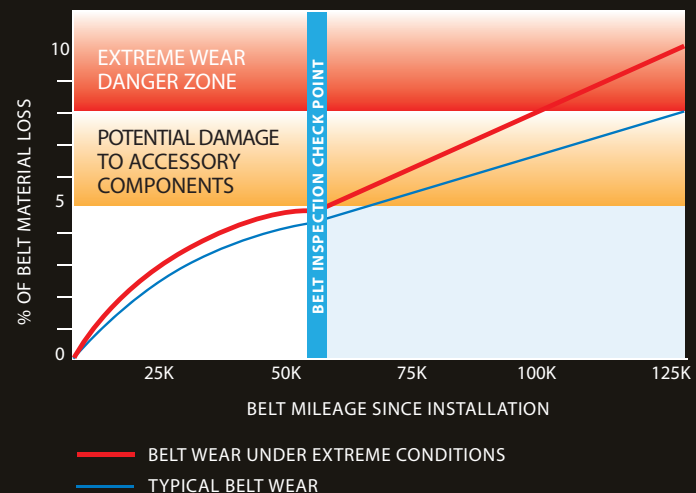
Cracking



Glazing



Pilling



TENSIONERS: WHY ARE THEY SO IMPORTANT?

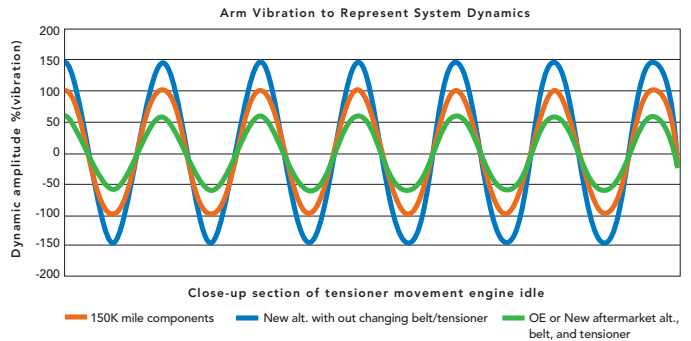
The automatic tensioner contributes a whole lot more to the ABDS (Accessory Belt Drive System) than meets the eye. When the belt is properly tensioned, everything else operates more efficiently and will deliver longer service life. If the tensioner is either improperly adjusted or has failed, other components in the system can wear out prematurely or fail catastrophically, leaving the vehicle owner stranded.

It is a misconception that automatic belt tensioners are “hard parts” that do not wear out. Tensioners are wear parts that should be evaluated for service life when replacing the serpentine belt, water pump, alternator, A/C compressor or any of the accessory components. The tensioner is a relatively inexpensive part to replace, and can help protect the other components from undue stress and premature failure.



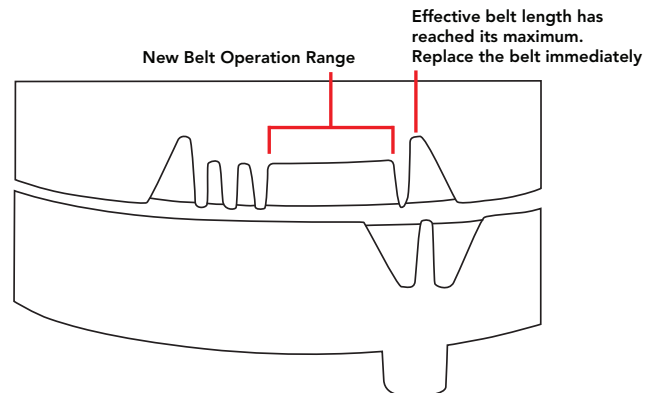
Look for the Tensioner Belt Wear Indicator found on many Automatic Belt Tensioners

Accessory Drive Vibration with New/Worn Parts



- Arm vibration is minimized with a new, alternator, belt, and tensioner ■
- After 150,000 miles the worn alternator, belt, and tensioner cause increased vibration ■
- When replacing an alternator without replacing the belt and tensioner, arm vibration is increased as the worn belt and tensioner do not dampen the new component effectively. ■
- Excessive arm vibration results in belt noise and bearing wear to accessory drive components.

How to Read the Tensioner Belt Wear Indicator



ALTERNATOR PROBLEMS? IT MIGHT BE THE BELT

A significant number of alternator warranty claims turn out to be caused by some other component in the system—and often due to a worn belt and/or improper tension. Belt slippage can create significant heat, which can damage bearings in any ABDS component, including the alternator. Slippage can also reduce charging capacity, affecting other electrical components. Make sure that the belt and tensioner are not worn out and that the belt tension is correct—keep your customer on the road.

If you're already performing an ABDS repair, you can save your customer money and increase your profit at the same time. The chart below shows how much, using an alternator replacement as an example.

Belt inspection and replacement at the time of any accessory replacement will reduce your alternator comebacks.



Examples of labor savings utilizing alternator and/or belt replacement:

Toyota Camry	2.2L	Ford Taurus	3.0L
Alternator w/Belt	\$51.00	Alternator w/Belt	\$58.00
Alternator Only	\$51.00	Alternator Only	\$58.00
Belt Only	\$42.50	Belt Only	\$44.49
Savings	\$42.50*	Savings	\$44.49*

*All costs based on average labor pricing for scenarios listed. Savings derived from replacing the belt at the time of alternator replacement versus separate belt replacement.

OPPORTUNITY IS EVERYWHERE

Understanding new belt technology is good business. Timely belt and tensioner evaluation and replacement benefits your customers, your reputation and profitability. There may be more belt replacement business out there than you think—consider these facts:

- 1 According to a "Be Car Care Aware" study, 20% of vehicles on the road today need a belt. That's a lot of vehicles.
- 2 Vehicle owners have little warning when it comes to impending belt failure. You have the opportunity to build trust by informing them before there's a major problem.
- 3 Consumers are not well informed about the functions of the ABDS belt, or its importance in keeping the vehicle running properly. Your expertise is valuable.
- 4 68% of passenger cars and light trucks in operation are over 5 years old. The average age of vehicles is 9.5 years. Many vehicles are near the end of their belt service life. Be sure to check.

