

WHEN YOUR CAR EATS BELTS

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Not again! You crank the car through a turn and the steering suddenly gets almost rock hard. Both your heart and the steering wheel seem to stop. As you apply more muscle to the steering wheel, you hear sharp squealing from under the hood. On the dash, the alternator warning light shines brightly. As your vital signs normalize, you remember that you've had this happen before: The accessory drive belt for the power-steering pump either is slipping badly or has popped off.

Today's drive belts, particularly the ribbed belts, are supposed to last for years. You even know people who've never had to change them. Why do you have repeated belt problems?

The answer is that something's wrong with your belt's drive. Don't just put on a new belt, grumble and wait for the next belt failure. Find out why your car has an appetite for drive belts. Then make a more durable repair.

First, inspect all of the belts and each of the pulleys. Twist over each belt and check it thoroughly. On a simple V-belt, look at the sidewalls, and if they're glazed, that's a sign of slippage—typically caused by improper adjustment, but possibly a sign of a bad pulley, too. On a multiribbed belt look carefully for missing chunks of rubber. Specifically check for gaps at least a half-inch or longer on adjacent ribs.

If the belt hasn't lasted long, the reason will be found during inspection of the pulleys. There are lots of reasons why some cars eat belts.

Feel The Tension

Most newer cars and trucks use a single, serpentine belt (see "How it Works," below) to drive a lot of accessories. These belts typically are tensioned by an idler pulley with an automatic tensioner. Just because there's an automatic tensioner doesn't mean it's working right. Any of the root causes discussed below can result in a belt getting chewed up fast, or popping off the pulleys.

There's a tension indicator on the idler and it should be reasonably close to

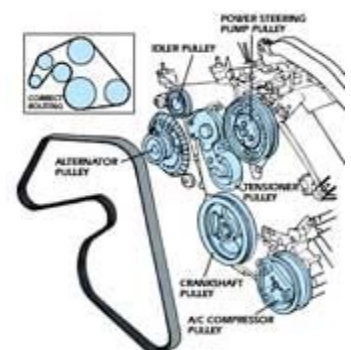
DEGREE OF DIFFICULTY



EASY



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midpoint. It should not be resting on the stop tab at the "loose" end. If it is at the stop—or very close—the belt has stretched and should be replaced before it pops off. You just put in a new belt, you say? Maybe you routed the belt incorrectly. Yes, it is possible to get the belt wrapped around all the pulleys in what seems to be the right way but have it wrong. Check the belt-routing diagram, which on many cars is on an underhood label.

Correct routing of serpentine belts is not easy, especially in a crowded engine compartment. Incorrect routings may almost fit, so check the routing diagram or the owner's manual.

Are you sure you have the right belt? Just because the tension indicator is in the right place doesn't mean you have the correct belt. It's hard to eyeball the difference between 7-rib and 8-rib belts, and if the pulleys have more or fewer grooves, the belt won't sit right. Even if the number of grooves matches, it's possible to install the belt too far inboard. While you're looking at the tensioner, also check for cracks in the housing which would allow it to flex enough for trouble.

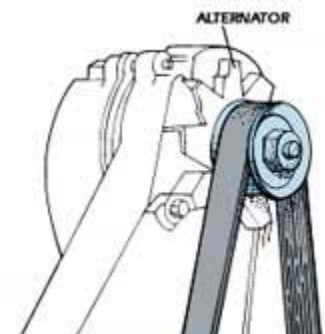
Nothing obviously wrong yet? If the belt is still on the pulleys, run the engine and eyeball the accessory drive. If the tensioner is vibrating a lot but the pulleys are running smoothly, the damper bushing is bad and you'll have to install a new tensioner.

Put a wrench on the spring tensioner. Usually there's a square hole for a ratchet or breaker bar drive, and occasionally you can use one of those. If the tensioner on your transverse-engine car is buried so deep down between the pulleys and the suspension tower that you can barely see it, check out the assortment of special long, thin wrenches designed for those installations at your local auto parts store. The leading makers of these specialty tools will have theirs on display (Lisle Tools, K-D/Dannaher and Schley/SP). With the wrench on the tensioner, apply some light torque in the disconnect direction, and if the wrench moves very easily a short distance and then gets stiff, the tensioner housing spring either is out of position or broken. This condition often causes the tensioner and its idler pulley to vibrate.

Not today? Keep applying effort with the wrench, and you should feel uniform spring tension all the way to the belt-off position. If you feel binding or lost motion at any point, replace the tensioner. Never "let go" of a tensioner. Aside from the possible physical danger, the sudden release can cause internal parts of the tensioner to snap (including the spring). Release it very gradually. If you do need a new tensioner, don't think you have to get it from a dealer. Reputable aftermarket tensioners are available from automotive parts stores.

Playing With Pulleys

If there's wobble in the idler or any one of the other accessory pulleys, the pulley could be cracked or worn loose. Just one damaged pulley anywhere in the accessory drive also can affect the operating appearance of the tensioner. Replace the wobbling pulley—easier said than done on some accessories. Besides the problems of near-impossible access on a front-drive's engine, you may need to rent a special pulley-puller tool if you don't own one.



If the pulleys aren't wobbling but the belt isn't tracking well—seems to twist slightly or move in and out as it spins the accessories—there may be pulley misalignment. That is, one pulley is just too far forward or behind another. This happens on new cars when manufacturing tolerances are exceeded, but it doesn't just "develop" unless you did some front-of-engine work and failed to tighten all the accessory mountings carefully. It also could happen if an accessory recently was changed, and that accessory's pulley doesn't line up. (Did you just put in a new alternator? Power steering pump? Air-conditioning compressor? Water pump?)

If there's enough access room, lay a stiff mechanic's straightedge or a thin steel rod across the pulleys to help you decide if the pulley on that new accessory is misaligned. Unless you want to take back that accessory and check out another one, however, the only fix is to shim out the accessory with washers, which is a bit of cut-and-try.

Do some touchy-feely on the idler pulley. Try to turn it, and if it's seized, the tensioner has to go. If it turns, feel for roughness (which indicates a bad bearing) and if you come up with a dab of grease from the bearing area, that indicates a grease leak past a bad seal. Try to rock the pulley: In-and-out movement may be a sign of a loose bolt, but more likely a damaged pulley. If a pulley is steel and it's clearly rusted, that not only indicates the coating has worn off (normal, in time), but that it is damaging the underside of the belt and you have to replace it.

Pulley alignment okay and mountings are solid? No matter how badly they're buried, inspect all the pulleys. Look for chips and other physically damaged sections that also could come in contact with the belt. If any of the grooved pulleys are packed with road film, belt debris, etc., wire-brush them clean. If the smooth pulleys (idler and water pump) are obviously worn on the belt-tracking area, you'll have to install new ones or a new tensioner assembly.

Doing It By Hand

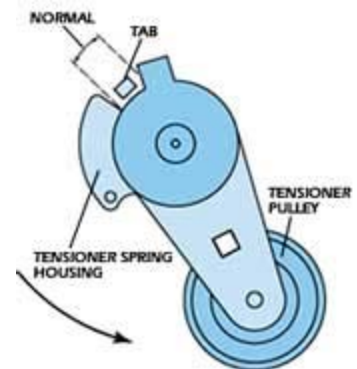
A lot of engines—particularly on Japanese cars—still have simple V-belts. Many also have ribbed belts with manual adjusters. The typical adjuster is a jackscrew—just loosen the lock bolt and turn the jackscrew, counterclockwise to loosen the belt, clockwise to tighten.

Even if the pulley is for a simple V-belt, it can accumulate debris in the groove. So clean it out with a wire brush, just as you would a multigroove. The days of getting an accurate sense of belt tension by pressing down on a belt with your thumb are long gone. It takes a tension gauge.

Although there are expensive professional gauges, we've found the Gate Krik-It gauges do a good job and fit into really tight places. And they're only \$11 for the V-belt type, \$18 for the ribbed belt. Look for the longest belt span you can reach, preferably at least a foot. Just lay the Krik-It gauge at midspan, press down slowly on the center until you hear a cricketlike click, then stop pressing. The gauge bar rises as it encounters belt tension, and stops when you stop pressing. You can lift the gauge away and read the point of alignment of the edge of the bar with the linear dial on the gauge housing. Just turn down the

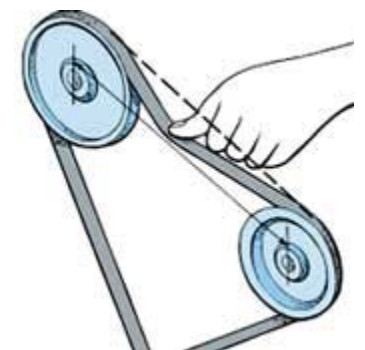
CLICK TO ENLARGE

Accessory drives wrap a long way around to provide adequate friction to prevent slippage.



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Most automatic tenioners provide a square hole for a 1/2-in. ratchet.



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Don't check for correct tenion with the time-honored one-thumb method. Use a gauge.

jackscrew to get the specified tension, then tighten the lock bolt.

You're probably familiar with "belt dressing," an aerosol spray for belt squeal. Use it only to make a quick check of the belt as a source of noise. Repeated use ruins most belts.



HOW IT WORKS: SERPENTINE BELT

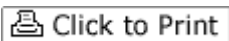
The serpentine belt is so named because its routing resembles the shape of a serpent. Carmakers developed the system so one belt would drive several, if not all, underhood accessories. A single belt, no matter how long, saves space under the hood since all the pulleys and accessories are on the same plane and there's no need to stack or stagger them. The ribbed side of the belt fits into grooved pulleys (each one a "mini" V), and the smooth back side of the belt often wraps around the water pump pulley and one or more idler pulleys. An idler is used to route the belt so there's plenty of "wrap" around each accessory pulley for good power transfer. To maintain adequate tension for good power transfer, and still eliminate the need for periodic adjustment, an automatic tensioner is usually used.

There's a nearly infinite variety of tensioner designs, but they all have a powerful coil spring inside. The poly-V belt design used on serpentine belts is capable of transmitting more power with less frictional loss than traditional V-belts. A properly installed and automatically tensioned serpentine belt system should remain troublefree for four to five years or 100,000 miles.

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