

# Did You Just Rebuild That Alternator for Nothing?

COLUMN BY AL STEADMAN

There are many things that can turn an alternator light on, but the most common is a low output voltage condition due to an alternator component failure (e.g. brushes, rectifier, regulator, etc.). When faced with an illuminated charge light condition, do you simply remove the alternator and tear it down, assuming that the problem is inside the alternator, or do you take the time to properly diagnose it?



There are a few simple steps that need to be followed prior to alternator removal. Performing the standard AVR test, with a voltmeter, amp meter, and a quality load bank is a great place to start. A couple of lesser known diagnosis checks that are just as important are clutch pulley/isolating decoupler pulley (if equipped) function check, as well as belt tension check. Both of these simple checks can sometimes save you unnecessary alternator removal, which on some vehicles can take several hours. After all, in the rebuilding industry, time is money.

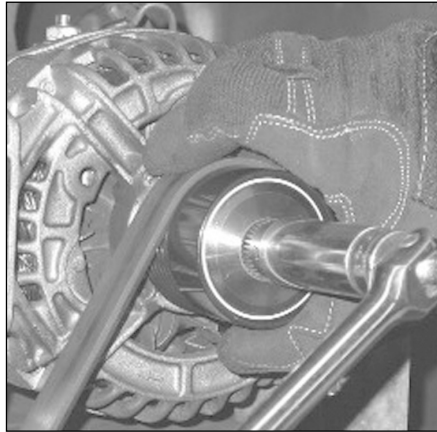
## Check No. 1 — Clutch pulley/IDP function check

When checking a clutch pulley or a Litens (RotoRx®) IDP for an illuminated charge light condition, follow the three simple steps below:

The shaft should spin smoothly in one direction and hold torque in the opposite direction.

Note: In the drive direction, clutch

- 1) Ensure engine is off and the belt is installed.
- 2) Remove the protective cap (with a small screwdriver or a pick).
- 3) Insert the proper tool into the shaft and rotate in both directions.



pulleys will immediately lock and the Litens IDP will have a “spring feel.”

If the shaft spins in both directions, or slips in the drive direction under load, then immediate replacement is required. This is known as a “free spin failure.” During a “free spin” condition, the pulley will rotate, but the alternator rotor will not. Insufficient rotor rpm is actually what causes the alternator not to charge properly and, in turn, illuminates the alternator light. If a “free spin” condition happens, replacing the clutch pulley or Litens (RotoRx®) IDP is all that is needed. If you have the proper installation tools, alternator removal may not be required.

## Check No. 2 — Belt tension check

Belt tension is another often overlooked check that should be performed when the charge light is illuminated. There are a couple different ways that manufacturers tension the accessory belt. There is the old style, which is strictly manual, and the more recent industry standard, automatic.

### Manual Tensioning

The manual tensioning method simply pivots one component to provide tension



Manual Tensioning



Automatic Tensioning

on the belt. This component could be an adjustable idler (that uses a jack screw), power steering pump bracket or the alternator itself. The manual tensioner, although simple, is prone to having tension control issues. The technician can, and often does, over or under tension the belt.

Over tensioning can cause premature bearing failure (alternator, water pump, idlers, etc.), as well as increased belt wear.

Under tensioning can cause the belt to slip, generate noises, build up heat and contribute to premature belt failure. Low tension can also lead to reduced alternator output due to slippage and can even cause the alternator light to come on. Read the repair manual and always tighten the belt to the proper manufacturers’ specs. Some manufacturers even have a re-tension procedure to address tension decay after the initial setting. This is generally required when replacing the belt with a new one.

Note: During any alternator removal, always inspect all of the engine’s belts. If any of the belts are worn or cracked, why not install a new one for the customer?

Selling a new belt at this time is one way that you can increase your shop’s revenue while looking out for the customer. Remember, a failed belt on the road may result in a comeback to your shop.

## Automatic Tensioning

The majority of vehicles today utilize a serpentine belt and an automatic belt tensioner to provide optimum belt tension during all conditions. This is great news for the technician, because it not only takes the guesswork out of tensioning, but it also makes it very easy to remove or install the belt. Even though automatic belt tensioners have evolved and durability has increased over the years, nothing lasts forever. Simply put, with underhood temperatures and the brutal salt and water environment they are subjected to, they do wear out eventually. Some things to look for are low tension caused by binding or seized tensioner, broken housing, noisy bearings in the pulley, or arm tilting.

Note: Always inspect the belt, as well as the automatic belt tensioner during alternator removal. If the belts are worn or cracked, or there is a problem with the automatic belt tensioner, be sure to replace these components at this time. Many automatic belt tensioners are easy to replace, often taking less than 20 minutes. Always replace the belt tensioner and the belt at the same time. They are designed to last about the same mileage.

Again, the last thing you want is a comeback due to a failure of something that could have been addressed while in your shop the first time. OE replacement belts and tensioners are available in the aftermarket through well-known suppliers such as Goodyear and Gates. They are available at your local parts supplier.

*Al Steadman is development specialist in the Product Engineering Department at Litens Automotive, Woodbridge, Ontario, Canada. He may be reached at [allen.steadman@litens.com](mailto:allen.steadman@litens.com).*