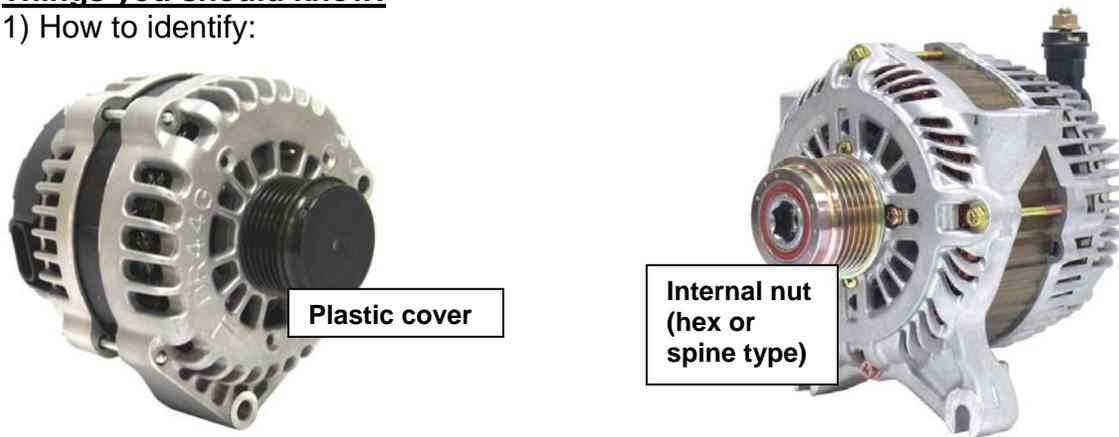


Clutch Pulleys on Late Model Alternators

You've probably already seen them: a pulley with a black plastic cover on it, or one with an extra thick hub and an internally splined or allen type nut. These are "clutch pulleys," or at least they started out that way ten years ago. Since then they have evolved in design and have become very common on alternators over the last ten years. There are clutch pulleys, decoupler pulleys, dampening pulleys and designs that are combinations of the three technologies. (We'll just call them clutch pulleys.) The clutch pulley allows the alternator's heavy rotor to overrun, absorbing shock, each time the alternator cycles on and off (about 3 times per second). The result is smoother idle, no belt chirp, increased life of alternator, power steering pump, water pump, serpentine belt and automatic belt tensioner. It is important to understand how to handle and test this newer technology.

Things you should know:

1) How to identify:



2) Alternator Spin Test. Many customers like to hand spin the alternator from the pulley... just to make sure it turns smoothly. If it has a pulley clutch it will only spin one direction (the clutch will free-spin the other way).

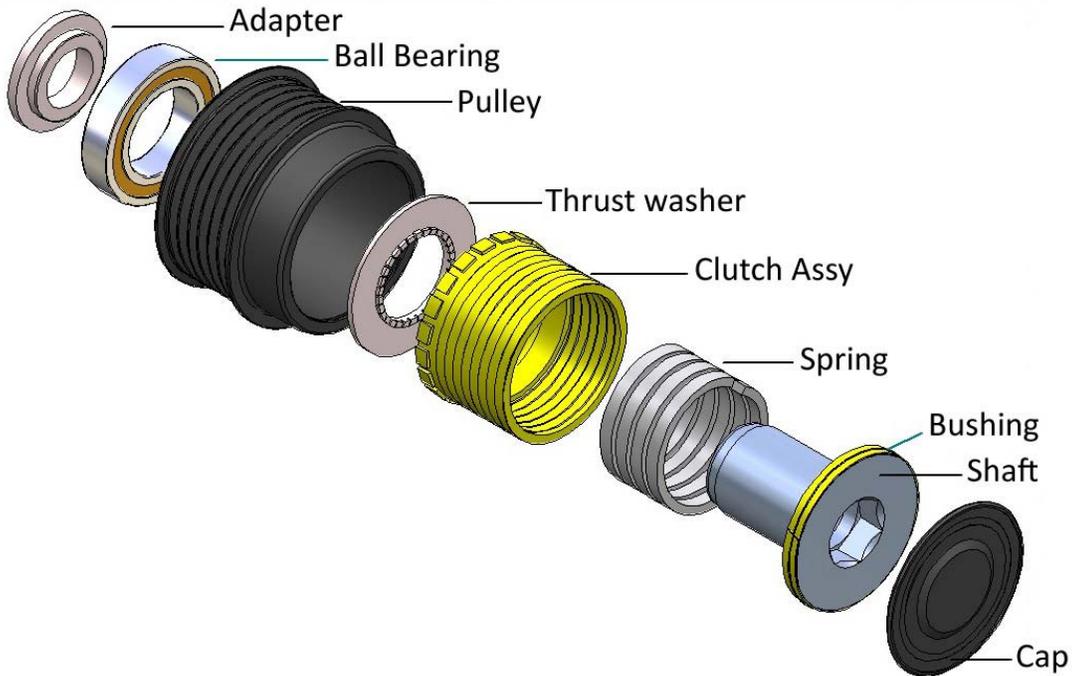
3) Clutch Spin Test. The clutch should turn smoothly one direction and lock up the other. If you spin the pulley by hand, then quickly stop it, the rotor will continue to turn inside the alternator (just a little bit). If the pulley is seized, has two-way rotation, or is noisy, the alternator will need to be replaced.

NOTE: The replacement alternator for 2001- 2007 Town & Country, Caravan and Voyager now uses a dampening type pulley that cannot be tested by hand (it will feel solid).

4) Changing Pulleys. Special tools are required to install this pulley and properly set pulley nut torque. Changing pulley is NOT recommended.

5) Replacing With a Solid Pulley. Most clutch pulley alternators are designed by the OEM so that you cannot easily switch to a solid pulley. Even if you can, THIS IS NOT RECOMMENDED! Doing this will be harder on the alternator, engine and all belt driven engine components, and it will void the alternator remanufacturer's warranty.

6) What's inside a decoupler type clutch pulley?

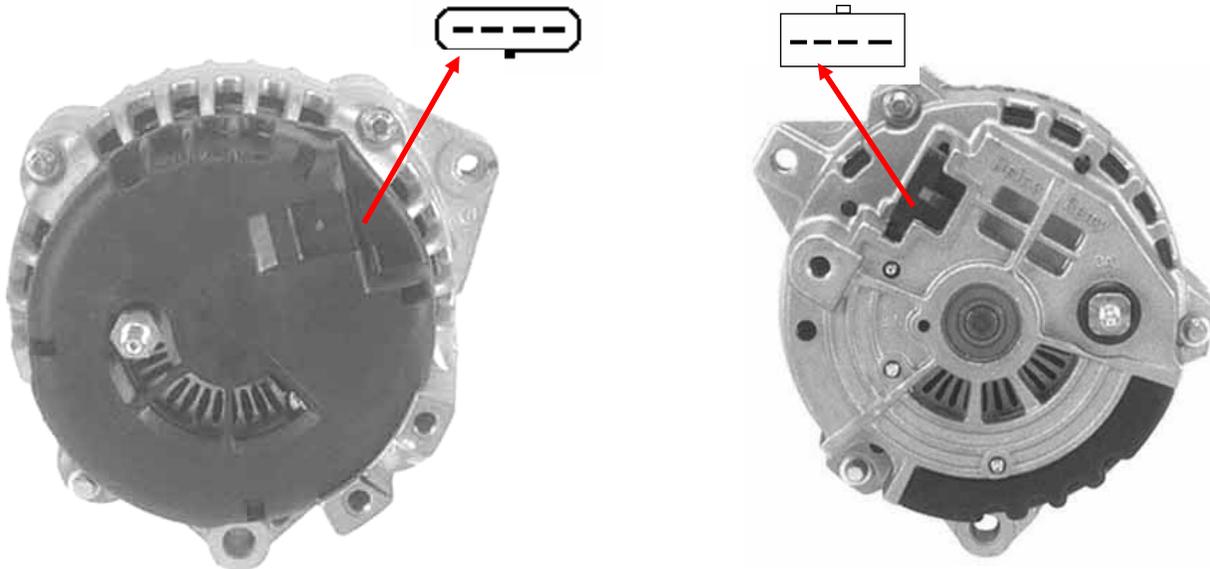


Testing CS Alternators With ASVR Regulators

General Motors has changed the voltage regulators that are used in their CS line of alternators. This new series of regulators is called ASVR. All Silicon Voltage Regulators. These regulators are used in both new alternators as well as in the aftermarket for existing alternators that have been around for years. What is essential to remember about these regulators is that they are far more susceptible to damage if tested or installed incorrectly.

When doing a pre- or post-test of any CS alternator in a store, it is important to observe three rules.

- 1) Always clamp on the battery cable first, and then push in the regulator plug.
- 2) NEVER remove the battery clamp or regulator plug before the alternator has come to a COMPLETE stop.
- 3) When removing the alternator always pull the regulator plug first, then remove the battery clamp.



Customers installing and removing these alternators from their vehicle need to exercise similar cautions. Always start any removal or installation process by removing the negative battery cable first.

CAUTION: Removing the battery cable from the back of an alternator (while it is running) to test the alternator is “Old School”. This will load dump voltage and destroy most all types of regulators, CS, import, or domestic.

Alternator Pulley Swapping: Things to Consider

There are times when it is necessary to transfer the customer's old pulley to his replacement alternator. Most Bosch type alternators are sold without a pulley. Nippondenso externally regulated alternators (for Chrysler vehicles) may require a different pulley than what comes on the replacement alternator. However, pulley swapping for other types of alternators should be avoided when ever possible.

Pulley Removal and Replacement: General

Use a ½ drive impact set to the maximum power setting. Pulley nuts are removed counter clockwise (even if the alternator was designed to run CCW). Save all parts so they can be replaced in the same order: pulley nut, lock washer, pulley, shaft key and pulley spacer (NOTE: lock washer, shaft key and pulley spacer are not used on all alternators). When installing the pulley use an impact only. Never insert anything into the alternator to attempt to hold the rotor while tightening the pulley nut. This will damage the rotor or the case!!!

WARNING: If pulley is NOT tightened correctly serious injury may occur!!!

1) Counter Clockwise Rotation

Some alternators have a shaft that rotates counter clockwise. The pulley nut for these alternators was installed in the factory with a thread locking compound and then torqued to specification. It is NOT possible to replace these pulleys properly, without disassembling the unit. CCW alternators are usually Nippondenso alternators coming from Honda vehicles. Do NOT remove a pulley from a CCW alternator. This will void the manufacture's warranty.

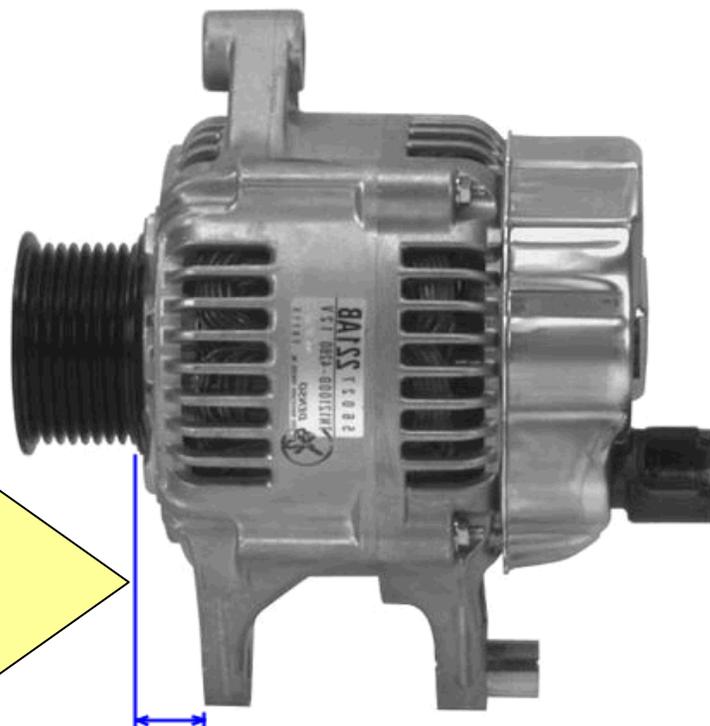
2) Shaft Size

The two most common shaft sizes for alternators are 15mm and 17mm. Some alternator part numbers include different OE versions (with different shaft sizes). Look at the shaft size before you make the swap. Many times pulleys will NOT interchange for this reason.

3) Pulley Offset

Pulley offset is the commonly overlooked when making a pulley swap. Things that effect pulley offset: pulley, pulley spacer, housing and bearing. If the offset changes by more that 2mm the customer may experience belt problems.

CAUTION: A JUMPED BELT CAN BE SERIOUS WHEN IT ALSO DRIVES THE WATER PUMP, P/S, ETC.!!!



Check pulley offset of the failed alternator; then make sure it is the same on the replacement alternator.