ALTERNATOR

An alternator is an electromechanical device that converts mechanical energy into alternating current electrical energy. To produce electrical energy the alternator utilizes power from the vehicles engine to turn an electrical magnet (rotor) within a stationary set of coils wound around an iron core (stator). As the rotor spins inside the stator the magnetic lines of force induce a voltage in the stator windings.

RECTIFIER

The current produced in the stator is alternating current (A/C); your vehicle battery however can only use direct current (D/C). The alternating current is converted to direct current by sets of diodes in a package referred to as a rectifier. Diodes are basically one way electrical stop valves that let current pass in one direction, but stop it from going back in the opposite direction.

Diodes are not wear items. Used as intended a diode that is properly manufactured will last indefinitely. Diodes are however susceptible to damage from over heating. Most diodes failures are due to an alternator being used to charge a bad or dead battery. This is why it is extremely important that the batteries State of Charge and Load handling Capabilities are tested.

VOLTAGE REGULATOR

The last major component of the alternator is the voltage regulator. The voltage regulator can be located internally in the alternator or externally. The voltage regulator controls the amount of voltage an alternator will produce. Voltage regulators normally limit the voltage to between 14.2 and 15.2 volts. Most voltage regulators also have circuitry to control the alternator indicator light. Many of today's voltage regulators interact with the vehicles computer system and may require specialized knowledge and equipment to properly test.

ALTERNATOR FUNCTION

The function of an alternator is to supply the power needed for all electrical items on the vehicle, plus replenish the battery from the last start up. Keep in mind though, that the alternator is not a battery charger so much as it is a battery maintainer.

If the alternator has to recharge an overly discharged battery, the alternator will become overworked, which will shorten its life. This is largely due to the high amount of heat produced by the alternator during its charging process. The greater the amperage flowing through it, the higher the heat an alternator creates. So, anytime an alternator is replaced, the battery should be fully recharged with a battery charger or replaced.