

What Destroys Voltage Regulators and Diodes?

Alternator output diodes act as one-way gates, rectifying the “AC” alternators produce naturally, and allowing only “DC” charging output. Voltage regulators are basically miniature computers, designed to limit/control alternator output.

As solid state devices, diodes and regulators are normally extremely reliable. However, both components operate in a brutal, high under-hood heat environment. Coupled with alternator size/weight restrictions, these components perform near their maximum heat tolerances.

What pushes diodes and regulators past their design limits?

- 1) Prolonged Maximum Charging Output – Except for brief periods, alternators should not operate at more than 75% of rated output, and thus should not be used to charge extremely low batteries. Adding special accessories (big stereo, etc.) may also overheat a stock alternator.
- 2) Corroded Wiring – Any corroded connections/wiring along the charging system’s output path to the battery creates excessive resistance, causing the alternator to run abnormally hot.
- 3) Older Batteries – As batteries age, they also corrode internally, developing increased resistance and reduced storage capacity, thus overheating and/or overworking the alternator.
- 4) Abnormal Voltage Spikes – The battery and other surge suppression devices absorb routine system voltage spikes. However, millisecond spikes well over 100 volts may result from: A) Shorts within the battery, B) Failure of a surge suppression device, or C) Improper alternator or battery hookup/disconnect procedures - as well as improper jump starting procedures.

Lastly, when a battery begins deteriorating, it may still crank the engine every day. As a result, the battery is often overlooked as the source of “an alternator problem.” Often, the only clue to a bad battery is multiple alternator replacements due to damaged diodes or voltage regulators.

Regulator



Rectifier

