

How do Glow Plugs work?

A glow plug's temperature range is critical to proper performance. Small-block engines generally use warm to hot glow plugs, while big-block engines use plugs in the colder range. If you choose a plug in the wrong temperature range, you could be chasing the tune of your engine till the sun goes down. Changes of the relative temperature of the glow plug can be beneficial, however.

A combination of compression, heat and a catalytic reaction between the platinum in the glow-plug coil and the methanol in the fuel creates combustion in a nitro engine. Altering the heat range of your glow plug can alter the timing of the combustion process. Nitro engines don't have an ignition system that can be used to advance or retard combustion timing, but a hotter plug that causes ignition a little earlier in the combustion process can have the same effect. "Advancing" the ignition timing can increase overall power output, especially at higher rpm. There are limits, however, and installing too hot a plug causes pre-ignition (detonation) and risks damaging your engine.

It's a challenge to figure out a glow plug's temperature range. Manufacturers don't use a consistent and universal standard to rate the temperature ranges of their glow plugs. You will probably know the temperature of a plug relative to others within a given product line, but currently, no rating system allows comparisons among manufacturers. Here again, plain old experience with a variety of glow plugs will help you to know which are best for the effect you want.

"Reading" the glow plug is a tuning technique advanced by Ron Paris. It suggests that looking at the glow plug tells you something about how your engine is running. The element in a glow plug will turn gray in an engine that is close to the optimum fuel mixture. This method requires a new glow plug, as the element will eventually turn gray regardless of the needle settings; the length of time it takes to turn gray is the issue. Plugs that turn gray in just a tank or two of fuel (running at race pace, not diddling around) indicate a fuel mixture close to ideal—but also close to trouble. If the plug stays wet and shiny for a few tanks of fuel, you're in the safe zone; a little rich but safe. When the plug wire gets distorted or broken, however, you're in real trouble. It's a sure sign that the mixture is way too lean, or that there is too much compression and the engine is detonating.