Glow Plugs: Dos, Don'ts, Tech, and Tips  
The nitro engines we use in RC are amazing machines. With just four moving parts (carburetor valve, crankshaft, connecting rod, and piston), they produce incredible power for their weight. One of the most critical components to Nitro performance is the glow plug. The glow plug is like the spark plug in a full-size cars engine but instead of using an electric spark to ignite the fuel/air mixture, a metal filament is heated and stays hot, literally glowing orange while in use. A faulty or non-functioning glow plug is a chief cause of won't start/won't run engine trouble, and choosing the wrong plug can also diminish engine performance. Here's everything you need to know about glow plugs to make sure you get the most from your nitro engine.  
  
Use the stock plug first:   
If your engine includes a glow plug, use it. The manufacturer has taken the time to select the best plug for all around performance. If your engine doesn't include a plug the recommended type should be indicated in your engines manual. No manual available? Get a "medium" plug. Most engines use "medium" plugs because they fall in between the "cold" and "hot" extremes to suit most operating conditions.  
  
Turbo and standard plugs:   
Most engines are designed for standard glow plugs, which use a copper washer (proper term gasket) to seal the plug against the engines head. Turbo plugs do not have copper gaskets. Instead, they have a conical tip that mate with a precisely machined recess in the head. Turbo plugs are not interchangeable with standard plugs. They are longer and threaded differently than standard plugs.  
  
Understanding "hot" and "cold" plugs:   
Glow plugs are assigned heat ratings, usually "cold" "medium" or "hot". A plugs heat rating is determined primarily by the diameter of its wire element and the size of the opening the filament sits in. The filament is the part of the glow plug that actually glows. A "colder" plug will generally have a filament made out of thicker wire and vice versa. The size of the opening for the filament will be smaller in a "cold" plug and vice versa. Cooler plugs use a smaller opening. For most plug brands, a lower number indicates a "hotter" plug. For example, Nova Rossi C4S is the hottest Nova Rossi standard plug and C8S is the coldest standard plug. Plug length is also a consideration if you're looking at turbo plugs. Longer turbo plugs are hotter, and shorter plugs or colder. The longer body contains a longer wire element that produces more heat. Nova Rossi turbo plugs also have an "F" or "C" designation. "F" stands for "frio" which means cold. C stands for "caliente" which means hot.  
  
When do i need a hot or cold plug:   
A medium plug is going to be the best choice most of the time because most of us run Nitro RC when it's 60 to 80 degrees Fahrenheit out (15 - 26 degrees Celsius for you Celsius fans") If it's cold outside, a hotter plug may be needed. The fuel should burn at the same temperature within the engine no matter how cold it is outside. A hotter plug will help the engine maintain the correct operating temperature in colder conditions. If it is cooler than 60 degrees Fahrenheit try a hotter plug then you you're currently using. On the flip side, consider a colder plug in hot/humid conditions. If you're burning up plugs and they don't seem to last when it's hot out you're definitely running a plug that is too hot.  
  
Preventing ping:  
Detonation, also known as "pinging" can be a problem in any internal combustion engine. Detonation occurs when the fuel/air mixture ignites as soon as it enters the combustion chamber instead of at the proper moment in the combustion cycle. Detonation is revealed by a loud pinging sound, hence the term "ping". Detonation/pinging is usually caused buy too much compression or by using glow plugs that are too hot. If left unchecked, pinging can cause pitting of the piston and sleeve, and it compromises performance. To stop pinging use a cooler plug or install a .002 inch shim between the heat sink head and case to reduce compression.  
  
6 tips to improve plug life:   
1) Remove the crud before you remove the plug.  
Before you remove or install a glow plug, clean the area around the plug mounting hole. Do this with the engine upside down so that debris does not enter the engine.   
2) New plug, new gasket.  
When installing a new standard plug, always use the new gasket included with the plug to ensure a proper seal against the head. Discard the old gasket with the old plug.  
3) Remove glow starter promptly.  
Running the engine with the glow starter attached will quickly wear out the plug. Glow plugs generally don't run as hot in actual operation as when they are heated by the glow starter. The extra heat produced by the glow starter will shorten the lifespan of the plug.  
4) Avoid running the engine to empty.  
Don't pinch your engines fuel line to stop it, or allow the engine to run the tank dry. The engine runs very lean as it burns the last of the fuel in the line comma which may damage the plug and decrease its useful life. The best way to stop a nitro engine is to snub the flywheel. (Paul’s comment…I take issue with this…control line engines run out of fuel…and RC engines can land idling.)  
5) Keep your plugs packaged.  
Loose plugs are prone to collecting dirt and debris that may foul the element or the element may be damaged by tool tips or hardware, depending on where you store them in your toolbox. Keep your plugs safe in their packs until you are ready to install them. It is also much easier to identify a plugs spec while it's in the package.  
6) Don’t over-tighten the plug.  
Once the plug snugs up against the head, it is tight enough. Further tightening increases the odds of stripping or galling the threads in the aluminum head. Over tightening can also warp the head, which can result in an air leak.

**How to read a glow plug!**



**Plug 1. Tune is too lean as the coil is going inwards; coil can break and drop into engine.**

**Plug 2. Engine has a good tune not too rich or too lean.**

**Plug 3. Engine is too rich the coil is dark due to too much fuel, will cause issues starting and running.**

**Plug 4. Old glow plug…it’s likely time to change it if it’s not glowing like it used to, coil is still quite whitish and/or greyish, an indication that the tune was OK.**