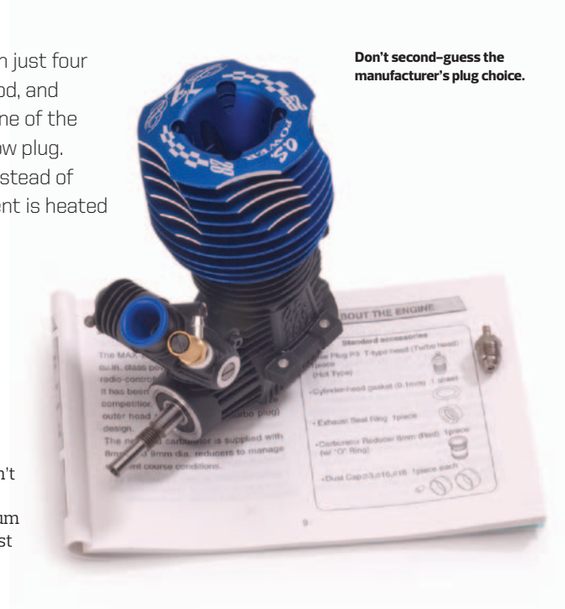
GLOW PLUG DOs, DON'Ts, TECH, AND TIPS

Engine trouble? Check your plug!

BY **THE *RC CAR ACTION* TEAM** PHOTOS **PETER HALL**

You can bet every car on this grid has a fresh glow plug.

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 car's 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 nonfunctioning 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.



Don't second-guess the manufacturer's plug choice.

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 engine's 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.

A turbo plug (left) has a conical tip that seals against a beveled opening in the engine's head. A standard plug (right) uses a soft copper gasket washer (not shown) to seal against the head.

"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 engine's head. "Turbo" plugs do not have copper gaskets. Instead, they have a conical tip that mates 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.

Installing a shim beneath the heat-sink head to reduce compression can cure pinging.

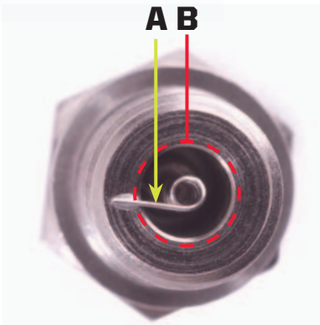
UNDERSTANDING "HOT" AND "COLD" PLUGS

Glow plugs are assigned heat ratings, usually "cold," "medium," or "hot." A plug's 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. Colder plugs use a smaller opening. For most plug brands, a lower number indicates a hotter plug. For example, a Novarossi C4S is the hottest Novarossi standard plug, and a 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 are colder. The longer body contains a longer wire element that produces more heat. Novarossi turbo plugs also have an "F" or "C" designation; F stands for "frio," which means cold; C stands for "caliente," which means hot.

These plugs are color coded to show they're "hot" (red) and "cold" (green).

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 60–80°F out (15–26°C 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's cooler than 60°F, try a hotter plug than 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, you're definitely running a plug that's too hot.



The size of the wire filament (A) and the diameter and depth of the plug opening (B) are two factors that determine the plug's heat range.

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 by 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 0.002-inch (two-thousandths-inch) shim between the heat-sink head and case to reduce compression.

6 TIPS TO IMPROVE PLUG LIFE

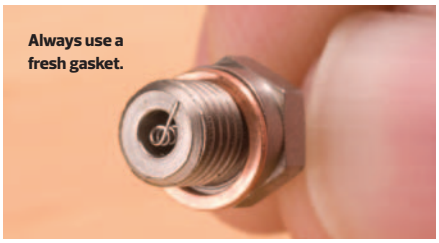
Remove the crud before you remove the plug

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.

That crud around the plug could fall into your engine; clean it first.

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.



Always use a fresh gasket.

Stubbing the flywheel to stop the engine will help prevent lean running that can damage the glow plug.

Avoid running the engine to empty

Don't pinch your engine's 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, which may damage the plug and decrease its useful life. The best way to stop a nitro engine is to stub the flywheel.

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're ready to install them. It's also much easier to identify a plug's specs while it's in the package.

Keep your plug in the pack so that it stays clean and you can see its specs.

Don't Hulk-out on the plug. Just snug it up.

Don't overtighten the plug

Once the plug snugs up against the head, it's tight enough. Further tightening increases the odds of stripping or galling the threads in the aluminum head. Overtightening can also warp the head, which can result in an air leak.

Remove the 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're heated by the glow starter. The extra heat produced by the glow starter will shorten the life span of the plug.

Don't run your car with the glow starter attached. If that's the only way the engine will stay running, it's time for a new plug.