

# Glow Plugs / Glow Fuel What's the Magic?

You hook up 1.5 volts to the glow plug, turn the engine over, and when you remove the voltage it keeps running.



## Glow Plugs

- The main component of a glow plug is a coil of platinum wire
- During the combustion cycle the platinum becomes very hot
- A catalytic reaction begins between the platinum and the methyl alcohol vapor as it enters the cylinder from the crankcase
- This reaction causes the platinum to glow and ignites the compressed fuel air mixture
- The process continues until the fuel is exhausted

(Platinum is widely used as a catalyst. It will convert methyl alcohol vapors ( $\text{CH}_4\text{O}$ ) into formaldehyde ( $\text{CH}_2\text{O}$ ) on contact, glowing red hot in the process. This effect is used to make small hand warmers. Breathalyzers also use this characteristic)

## Glow Plug Heat Range

- **Cold Plugs** are used when the methyl alcohol content is low (Nitro higher than 20%)
- **Cold plugs** have a larger surface area which compensates for less methyl alcohol
- **High Nitro methane** means less methyl alcohol
- **Hot Plugs** are used when the methyl alcohol content is high (Nitro 5 to 15%)
- **Hot Plugs** have a smaller surface area and are used when the Nitro methane content is low



## **Which Heat range to use**

- If you are using fuel with 80% or higher methyl alcohol, use a hot plug.
- O.S. #8 plugs are medium to hot
- If you are using fuel with 70% - 75% methyl alcohol, use a medium glow plug  
O.S. A5 would work for this fuel mix

## **Idle Bars**

- Idle bars are used to keep the catalyst action going, by stopping raw fuel from getting on the platinum wire

# Why Do We Use Nitromethane, and What is it?

- We use it because it adds power!
- Nitro must be heated to at least 96 deg for it to ignite
- Nitro adds more oxygen to the combustion cycle because of its chemical formula
- Model aircraft fuel contains about 10% nitro methane. Nitro methane's chemical formula is  $\text{CH}_3\text{NO}_2$ .
- For comparison, gasoline is typically  $\text{C}_8\text{H}_{18}$
- The oxygen in nitromethane's molecular structure means that nitro methane does not need as much atmospheric oxygen to burn -- part of the oxygen needed to burn nitro methane is carried in the fuel itself.
- You need 14.6 kilograms of air to burn a kilogram of gasoline, and only 1.7 kilograms of air for the same amount of nitro methane to burn. A cylinder can only hold so much air on each stroke.

Reference:

<http://nitromethane.borgfind.com/>

<http://members.aol.com/bentleyflyers/glowplugs.html>

## SURFACE AIR

**R5** - A racing plug so durable it can survive leaner needle settings and high-nitro/high-rpm 1/8 scale racing. (OSMG2694)

**P8** - Cold enough to outlast the hottest "heats". For Turbo head engines. (OSMG2698)

**RE** - Created specifically for the .30 Rotary P-49 - R/C's only Wankel engine! (OSMG2688)

**A5** - Slightly "cooler" than the #8, and ideal for the constant "on/off" throttle action in 1/10 and 1/8 scale racing. (OSMG2693)

**P-7** - An all-season, medium-heat plug for Turbohead engines. (OSMG2695)

**#8** - A medium-hot plug for 1/8 scale racing and most .12-.21 car, boat and truck engines. (OSMG2691)

**P-6** - A hot choice for all .12-.21 Turbo head engines. (OSMG2696)

**LC3** - A long-reach hot plug created for the Traxxas® TRX 2.5 (.15) Racing Engine and other 1/10 scale off-road engines. (OSMG2700)

**A3** - A hot plug with the longest life and lowest cost of any O.S. sport plug. Great for beginners and .12-.15 engine break-in. (OSMG2690)

**P3** - An ultra-hot plug for the 187Z and other Turbo head engines. (OSMG2699)

**F** - The plug for all O.S. multi-cylinder and 4-stroke engines. Long reach - long life. (OSMG2692)

**A5** - A medium-cold plug ideal for engines .60 and larger. (OSMG2693)

**#8** - A medium-hot plug suitable for most 2-stroke flight engines. A flier favorite! (OSMG2691)

**A3** - A long-lasting hot plug for most 2-strokes up to .60. (OSMG2690)

