



How to properly read the carburetor jetting

The wrong way

First of all, I have to say that the usual way of reading the jetting by the color of the sparkplug insulator nose is wrong. The color of the insulator is influenced by the jetting and the **heat range** of the sparkplug. So an improper heat range sparkplug with correct jetting or an correct sparkplug with wrong jetting will produce an color that will mislead you in reading the jetting. Let's make some examples;

1. Your jetting is ok, and your sparkplug is of an relatively hot heatrange. The color of the insulator nose will result of a bright gray - white color. It will make you think that your jetting is lean and make you enrich the jetting. The result is loss of power or/and fouled sparkplug..
2. Your jetting is lean and your sparkplug heatrange is too cold. The color of the insulator nose will result brown, making you think that everything is ok. But you may end up overheating.

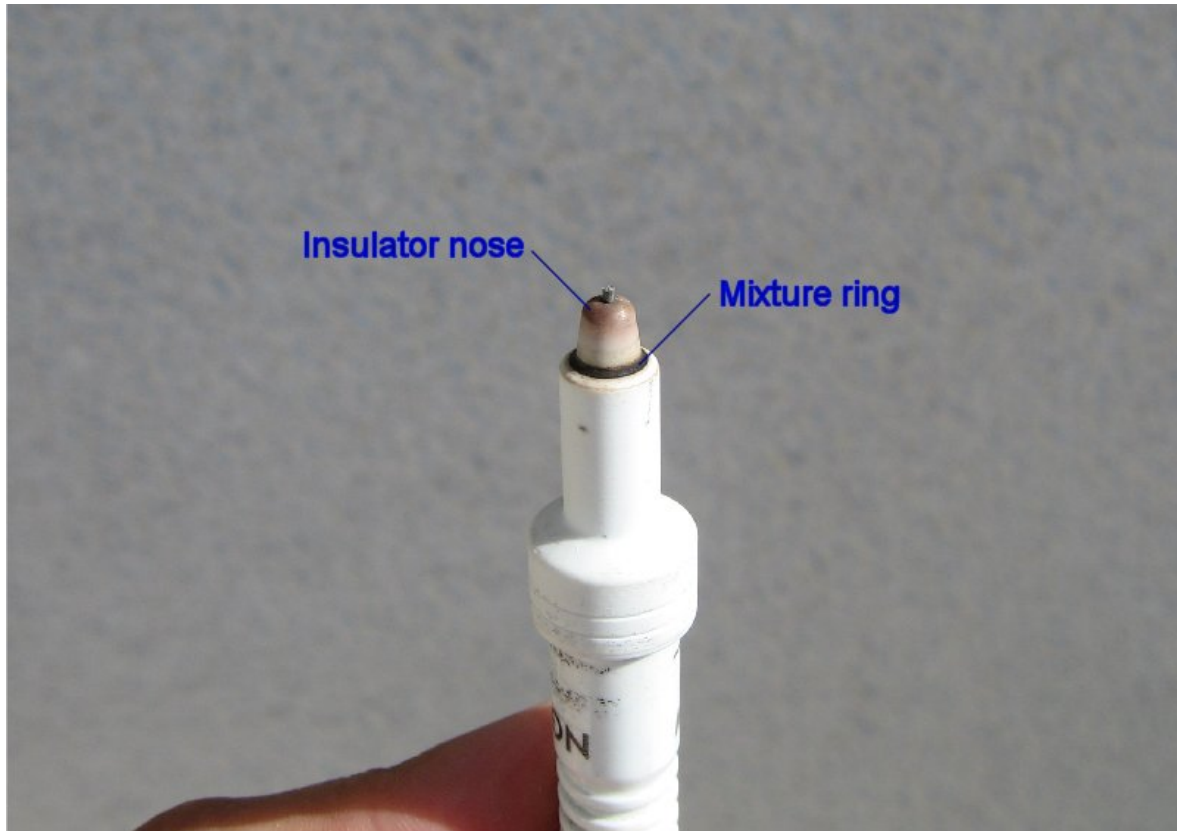
The proper way

Some facts about the sparkplug:

The sparkplug insulator nose must attain the self-cleaning temperature. This is the temperature at which the carbon deposits that form on the nose, burn away. If the sparkplug doesn't reach the self cleaning temperature, the constantly forming carbon deposits won't burn away, and the result will be an fouled sparkplug.

On the other hand, too hot of a heatrange may not remove the heat sufficiently and cause electrodes meltdown and other associated overheat problems.

The mixture ring



This sparkplug is an NGK B9EGV it was used for about 3 races on our racing ZIP SP. The **insulator nose** is quite clean, that tells us that the heatrange was properly selected. The metal part was removed, so we can clearly see what we should look for; the **mixture ring**. The mixture ring forms on the bottom of the insulator nose. It tells us how the engine is jetted.

From the mixture ring on the picture above, we can say that jetting was close to perfect.

If the jetting would be too rich, the mixture ring would thicken, scale up towards the nose tip.

If the jetting would be too lean, the mixture ring would become thinner towards the bottom. If the ring would become really thin or entirely disappear, then we could have big overheating problems.

Yes, it's simple as that. However a much bigger problem is to properly see the mixture ring without destroying the sparkplug each time we

check the jetting. An good eye with good sunlight may be enough to see inside, or else lens with additional light should be used.

Choosing the right sparkplug

Choosing the right sparkplug is key for good performance. Start by using the sparkplug recommended by the manufacturer of your cylinder. Then after running with your engine in the way it supposed to be used (racing on kart tracks, sprints...), you should be able to determine if the sparkplug heatrange is correct. As mentioned before, the right heatrange will make the insulator nose clean.

If the insulator nose gets carbon deposits on it, the sparkplug is too cold for the use you have.

If the insulator nose gets light gray or white, and/or the electrodes show signs of meltdown, then the heatrange is too hot.

The main guideline is, the more time the gas is fully opened, the colder the sparkplug is required.

On a daily used engine there is no need to sharply tune it, so jetting is usually on the rich side to prevent from having overheating problems, but if the engine is used for races, every bit of power should be extracted from it, so jetting should be adapted to weather and track. These are some guidelines to set the jetting:

Cold, dry (high or no clouds) - air pressure is high; bigger jets.

Rainy, fog (low clouds, fog) - air pressure is low, humidity in air; smaller jets.

Long, straight race track - bigger jets, colder sparkplug heatrange.

Short, closed track - smaller jets, hotter sparkplug.