



## Side Gapping Spark Plugs

*Ian Hissey*

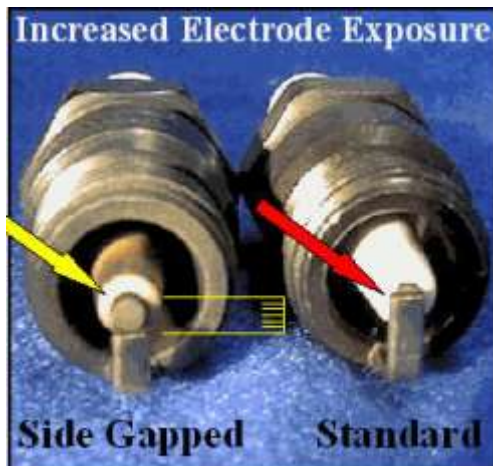
This discussion represents changes I have made to my XJ-SC V12 HE 6.0 engine, but the principal can be used on all spark plugs for any engine.

The standard spark plug listed for a HE V12 engine is an NGK BR6EF gapped at **0.8mm (0.031")**.

With installation of the Wolf computer, removing distributor and installing coil packs, I then changed to a colder NGK BPR7EFS-15 spark plug, with 1.5mm gap, and a projected electrode.

The normal spark plug has the spark igniting inside the plug close to the edge of the head thread; using a projected electrode means the spark is away from the thin edge of the head firing more in the combustion chamber. Together with all my other changes the engine now produces over 400HP.

**For a V12 distributor engine, the normal 1.5mm gap must be reset to 0.9mm (0.035"), and for an XK distributor engine set the spark plug you are using to 0.6mm (0.025").**



The next change was to side gap the spark plugs.

As seen in the photos, nearly the entire centre electrode can be seen from the bottom of the plug as compared to the standard version being completely shrouded from view.

This modification exposes more generated spark to combustion chamber, thereby more completely igniting the air/fuel charge instead of the spark being forced to propagate in a sideways direction, not directly into majority of the combustion mix.

While some may debate amount of Horsepower, Torque & Fuel economy increases, there is no disputing side gapped plugs significantly improve

spark propagation as well as reduce plug fouling and loading up, with no sacrifice to your wallet.

The sharper edges also encourages the spark to ignite quicker and stronger, much like striking an arc with a welder on an edge rather than a flat surface.





## Side Gapping Spark Plugs cont'd



Use a felt marker to mark the ground tip in line with the side of the centre electrode.



Hold the spark pug firmly in vice for cutting



Using a hack saw or dremel, carefully cut the ground electrode at the marking to produce finished result as shown in photo on right.

*\*Do not\* nick any part of the centre electrode or porcelain!*



With a small file, carefully smooth edges of the electrode arm to remove any remaining burrs, keeping the edges clean and sharp.



Now adjust gap on whichever spark plug model you are using

For a V12 distributor engine, the normal 1.5mm gap must be reset to **0.9mm (0.035")**,

and for an XK distributor engine set to **6mm (0.025")**.





The increased electrode exposure guides the angle of the flame front down towards the centre of the combustion chamber promoting a faster, more complete and even burn thus increase power, performance and fuel mileage as well as reducing plug fouling.

However, there is one minor drawback; the centre electrode wears one side quicker due to the spark now being directed to one specific area on the plug edge, rather than a random path all around the electrode point.



Even though the plugs wear slightly quicker, the modified plugs can cost less than Iridium plugs.

NGK BPR7EFS-15 are \$ 4.40 each

NGK Iridium IX BPR5EIX-11 \$21.75 each

Normal spark plugs can be more readily changed, leaving fresh new plugs during your engine's operation more of the time than with the costly iridium plugs.



#### HOW SIDE GAPPING WORKS:

- 1 closer gap allows for easier ignition
- 2 angled surfaces allows the ignited spark to grow in size to exceed that of normally shaped plugs.
- 3 as spark column flows along the electrode surface it grows outwards in size towards the combustion chamber and down towards the piston creating a larger spark presence but with an easier starting spark for situations where more spark is needed, such as high compression cylinders, high rpm's and increased fuel conditions as well as preventing "spark blow-out" in nitrous and super/turbo charging applications.

