

Short Reach Plugs Blind Head Engines

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Posted: Wed May 02, 2007 10:06 pm Post subject: Short Reach Plugs Blind Head engines

I have been using NGK A5/6 18 mm plugs in my vintage Flyers. During the current rebuild of one of the engines I embarked upon a measurement exercise of the cylinder blocks and other spare blocks. I was measuring compression heights against the numbers stamped on the blocks and apart from the fact that none of my measurements matched the stated height I set to wondering why we use short reach plugs where the plug is shrouded by the ferrule. Apart from lowering the compression ratio the shrouding effect of the electrode being recessed 10 mm or so within the ferrule must present a delay to combustion. On the engines I am rebuilding I have made new ferrules to take 18mm plugs following the spares scheme pattern but I am now considering making 14 mm ferrules to take long reach plugs.

Could anyone comment on these observations.

Paul Whitehead

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Posted: Thu May 03, 2007 9:55 am Post subject:

You are pretty well correct in your suspicion about the effect of recessing the spark plug electrodes.

Unlike diesel engines that rely on the whole gas charge swirling the petrol engine relies on micro-turbulence, mini tornadoes if you like, to propagate the flame front. The difference is due to the way the fuel is mixed with the air.

Just as there is more than one way of skinning a cat so there are several ways in which the mixture within the cylinder gets ignited, one of the most desirable is the transfer of flame between adjacent micro-turbulent cells.

Any solid surface creates drag on any passing fluid, the rougher the surface the thicker the layer and the greater the drag. This explains the reason why the racers put so much effort into smoothing ports and combustion spaces. It therefore follows that putting the source of ignition down what is in effect a rough hole, (the thread), is not on the face of it the smartest move! Not only is it probable that the hole will kill turbulence around the electrodes but as a result it will have the effect of retarding ignition, (which can be compensated for), and slowing the whole combustion process which is more of a problem particularly as quite a lot of unburnt gasses go out of the exhaust port on a 2-stroke anyway.

The whole subject is a minefield of cause and effect, it rapidly gets terribly complicated. Whole lives and indeed forests have been used up on the subject and even after 100 years or so we still get less than 25% of the energy out of the fuel in useful work . . .