AVIATION TECHNICAL BULLETIN

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OLD SPARK PLUGS BETTER THAN NEW ONES? NEVER!

Well, there may be times when you might think old plugs were better. Under certain circumstances an old spark plug might have been firing a cylinder which developed a roughness after new plugs were installed.

Why? Let's look and see how this might happen.

Assume that we have a carbureted engine that has a leaking intake pipe near the cylinder connection that was not noticed during the inspection. The old spark plugs which were replaced with new ones were worn and had gaps in the area of .022 - .025 inch. The new plugs had good electrodes and a nice .016 - .017 inch gaps. But after installing these new plugs the engine developed a low power roughness that did not exist before. Ah ha! A faulty spark plug, right? Perhaps not. It might be an intake pipe leak, but why?

In this case it takes both the intake leak and the new spark plug to cause the trouble. The new spark plug actually gave a less intense spark than the old one as spark intensity across the gap is directly related to gap size and electrode configuration and condition. Also the spark intensity required to give proper ignition for combustion is directly related to mixture strength or fuel/air ration.

In a normally aspirated engine, the atmospheric pressure without will always be greater than manifold pressure within thus the leaking intake pipe allows air to enter the cylinder - resulting in an excessively lean mixture which requires a higher intensity spark for satisfactory ignition. Depending on the size of the leak, all cylinders could be affected as this leakage does not pass thru the carburetor and no fuel is metered for this extra amount of air. In this case the old plug might have fired the cylinder while the new plug did not have sufficient intensity to fire this abnormally lean cylinder. Does this make the old plug better? NO! While one cylinder may have benefited it and all others suffered from the over lean mixture condition.

This condition would be most prevalent at low powers or idle due to the greater pressure differential. Fuel injected, supercharged and turbocharged engines will react to an intake leak also, but to a lesser degree and in a different way depending upon the size and location of the leak.

NEW SPARK PLUGS ARE ALWAYS LESS EXPENSIVE THAN TROUBLE!

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