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Effects of FPC® on Low Sulfur Diesel Fuels

Concerns have been expressed about the effects of FPC® on low sulfur diesel fuels and the effect the low sulfur may have on the benefits produced by FPC® use. The short answer is that there is no effect. FPC® does not work on the sulfur in the fuel it works on the carbon and as such the reduction in sulfur in fuel will not influence the benefits FPC® provides.

A brief history and outline

The goal of the EPA is the reduction of harmful emissions from internal combustion exhaust. To a large extent this has been accomplished in gasoline engines with the addition of catalytic converters and the use of oxygenated fuels like ethanol blends. The cleanup of diesel emissions are now being investigated by the EPA. The first step of a multi step process is to remove the sulfur from the fuel because the sulfur gasses poison the catalytic converters and eliminate the benefits they provide. Once the sulfur is removed then these additional devices can be required and the emission reductions can be achieved. This is where we are today with the regulation to remove sulfur from current limits of about 500 ppm to the new limit of 15 ppm.

What does FPC® do

FPC® influences the combustion of liquid hydrocarbon fuels by providing catalytic effects to the carbon conversion process during combustion. The fundamental thermodynamic process of internal combustion is the conversion of carbon-carbon and carbon-hydrogen bonds to carbon-oxygen and hydrogen-oxygen bonds. The difference between the energy of formation of the C=O and H-O bonds and the energy of reaction in breaking the C-C and C-H bonds is the net energy released during the combustion process. It is this net energy that is converted to work by the engine. The conversion of heat (BTU's) to work (ft-lb) is the process played by the internal combustion engine. The BTU's are liberated by the combustion process. FPC® plays a part in making the combustion process more efficient. This is done by reducing the amount of unburned products ("CO" carbon monoxide, "HC" unburned hydrocarbons and "C" soot or particulate matter) in the emissions. This reduction in unburned products increases the BTU's liberated during combustion thus providing more horsepower or providing lower fuel consumption.

Conclusions

Since the benefits of FPC® use are derived from the catalytic effects of the FPC® on the carbon transformation processes during combustion it is evident that the amount of sulfur in the fuel is not a consideration. Therefore, the benefits of FPC® will not be reduced by the

reduction in sulfur in the fuel and in fact will remain the same regardless of the sulfur content. This is indeed the case as has been reported by FPC® users who are already using the lower sulfur grade fuels and still seeing expected benefits. Whatever the source, petroleum fuels like gasoline, diesel, heave fuel oils, biofuels like flak seed oils, corn oils, soy bean oils or coal liquefaction fuels, the benefits of FPC® are the same. All organic hydrocarbon fuels will provide an increase in horsepower or a reduction in fuel consumption with the use of FPC®.

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