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Fuel additives and a timely reminder about the effects of Ethanol in your petrol tank over the winter period

A bewildering selection of additives promises everything from squeezing more miles out of every gallon of petrol to cleaner engines and smoother running. But which ones work and are they really necessary?

Modern unleaded fuel is made up from a complex blend of refined hydrocarbons mixed with a small percentage (usually five percent in the UK) of ethanol. Fuel is sold by its octane rating and the Research Octane Numbers (RON) for commercially available petrol in this country is a minimum of 95RON for ordinary unleaded and 97RON for premium fuels such as BP Ultimate or Shell V-Power.

Unleaded fuel, or 98RON four star, was withdrawn from UK forecourts on 1 January 2000. Owners of older cars were then left with a serious dilemma of either having to have harder valve seats fitted to their car's cylinder head or dosing each tank of fuel with a lead-replacement additive such as Castrol Valvemaster.

Although refineries add MMT (methylcyclopentadienyl manganese tricarbonyl) to unleaded fuel to boost its octane level, lead replacement additives act as a substitute for the small amount of tetraethyl lead that was first added to motor spirit in the Twenties to stop engines suffering from pre-ignition or knocking. Pre-ignition is when the compressed fuel/air mixture in the combustion chamber ignites before the ignition sparks and over time, severe knocking or pinking can seriously erode the valve seats and the engine components.

These issues mainly affect classics with cast iron heads, as aluminium cylinder heads will usually be fitted with steel valve seats and using a lead replacement additive is a quick and efficient method of providing a chemical cushion around the valve seats to help prevent burning and pitting.

Automotive engine design and fuel technology has certainly come a long way since a squirt of upper cylinder lubricant was added to every gallon of Esso Extra. At the start of 1993 it became a legal requirement for all cars sold in the UK to be fitted with a catalytic converter and a lot of modern classics will be equipped with this type of exhaust system. There are several additives on the market, such as Cataclean, that claim to be able to successfully revive a tired catalytic converter. But just how these additives manage to survive the combustion process and end up in the catalyst defies logic, but testimonies on the product's website claims the additive works.

Fuel companies vary the blend of petrol sold in the UK four times a year, which means that autumn and winter fuels have a different volatility to spring and summer blends, as cold weather fuels will volatilise more easily. This is why a classic stored with a tank full of summer grade fuel may be harder to start on a very cold winter's day, but storing car with a full or partly filled tank of unleaded is a bad idea anyway.



ETHANOL

Modern fuels contain at least five percent of ethanol and this additive absorbs water from the atmosphere when left for any amount of time. The water part of this mixture is highly corrosive and will play havoc with a laid up vehicle's fuel lines, tanks and carburettor parts. While it is always recommended to store a classic with the least amount of fuel in the tank as possible, there are several fuel additives out there, such as Miller Oils EPS or Frost Ethomix that the manufacturers claim will stop unleaded fuel from breaking down and separating when stored and are definitely well worth using in a classic fuel system.

Octane boosters are popular fuel additives where the active ingredients in octane boosters vary and can include an extra dose of MMT or cheaper iron compound called ferrocene, but the latter can cause excessive engine wear and is banned in refineries. Other chemicals used to boost octane levels may include adding extra ethanol or one of a variety of aromatic alcohols such as toluene, xylene or benzene. However, the last three chemicals need to be used in significant amounts to result in any noticeable increase in performance if used in a road-going classic engine.

Dosing the fuel tank with regular application of proprietary fuel cleaner should do exactly what it says on the tin, but many motorists consider fuel additives to be nothing more than slick marketing and as such consider them unnecessary.

Modern branded unleaded fuel is blended with a number of additives at the refinery to make it suitable for use in today's lean burn engine. Some classic engines may run better on more expensive super unleaded, but this will still require a lead substitute to be added if the car is fitted with an unmodified cast iron head.

So should you use fuel additives in your classic? That's a loaded question and it's one the marketing guys will want you to say 'yes' to. Although there's a confusing selection of fuel additives currently on the market, lead replacement additives are definitely a must. However, many of the others are more like the preverbal Wild West 'snake oil' when used in a classic engine and will provide limited results for what is often a very healthy outlay.

Article supplied by *Keith M*