



THE ROYAL ENFIELD



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ACE Cafe Racer

TESTING TOWERS



Fuel Additives...

I'll be honest, I'm not a huge fan of oil and fuel additives, or 'snake oil' as they are sometimes cruelly referred as. I tend to think that modern oils and fuel have all the ingredients that a modern vehicle needs, straight from the manufacturer, without needing lacing with exotic juices. The key word of course is 'modern'. The evolution of fuel and oil products are not always in step with older-technology vehicles.

There has been a huge outcry in vintage vehicle circles about the change in the recipe for petrol - as supplied by most petrol stations. We have been through the change to unleaded fuel, most people coped with that quite easily, using lead additives or modifications to the valves in their vehicles' engines. The current problem is the amount of ethanol they are now adding to petrol and the disastrous effects it can have on an older vehicle.

Ethanol, also called ethyl alcohol, pure alcohol, Egrain alcohol, or drinking alcohol, is a volatile, flammable, colourless liquid. Best known as the type of alcohol found in alcoholic beverages, ('Moonshine') it is also used in thermometers, as a solvent and as an alcohol fuel. Ethanol is made by fermenting and distilling starch crops, such as corn. It can also be made from cellulosic biomass such as trees and grasses. Ethanol is good for our agricultural economy and helps us reduce our dependency on foreign petroleum products. On the 'green' side they are aimed at improving air quality and reducing air pollution from fuel emissions. The permitted ethanol content in petrol of 5% rises this year to 10%. We are led to believe supermarket fuels may have the highest levels of blended fuel. While this may be good for the domestic farmer and our environment, ethanol could cause serious problems to your engine and fuel system. Generally vehicles built after 1996 have been designed with biofuels in mind, but earlier cars and engines with carburettors are going to need help.

One of the problems with ethanol blended fuel is water accumulation in the fuel tank - ethanol absorbs water from the air. The water condenses in the fuel tank and will pull the ethanol out of suspension with the petrol. This is bad news because it strips the

octane out of the petrol, leaving you with a layer of octane-poor fuel on top and a water-ethanol layer mixture on the bottom. If this gets sucked into the combustion chamber, you will have poor starting and very rough running with potential engine damage. I had this problem with a BMW motorcycle I own. I started using the Ethomix additive and to my surprise it has stopped this problem on the bike.

Ethanol when mixed with water readily forms gums in the fuel system much quicker than fuel without ethanol. The gum coats fuel system components including filters, carburettors, injectors, throttle plates and will then form varnish and carbon deposits in the intake, on valves, and in the combustion chamber. To be honest I have always found that unleaded fuel gave these problems before ethanol reared its ugly head.

Ethanol blended fuel gives lower fuel mileage along with decreased performance and acceleration. Ethanol contains less chemical energy than petrol does, and this means less mileage for the driver. 3-5% drops in mileage are expected. Whether you would notice that on a cranky old motorcycle is open to debate.

Ethanol is a strong, aggressive solvent and will cause problems with rubber hoses, O-rings, seals, and gaskets. These problems are worse during extended storage when significant deterioration could take place. Hoses may delaminate, O-rings soften and break down, and fuel system components made from certain types of plastics could either soften or become hard and brittle, eventually failing. Components made from brass, copper, and aluminium may oxidise. The dissolved plastics and resins now in the fuel could end up blocking fuel filters or creating gummy deposits. This is a real problem for older vehicles.

Bikes with fibreglass fuel tanks or rusty metal tanks that have been repaired using pour-in resin repair kits can have leaks, as the ethanol will break down and pick-up some of the materials the tanks are made from. Indeed the resin used to line the inside of the tank can peel away and turn to jelly!

We are advised that the following materials should be changed, avoided or regularly checked, on vehicles run on blended fuel. Zinc and galvanised materials, brass, copper, lead / tin coated steel. Aluminium, neoprene (seals), urethane rubber, acrylonitrile-butadiene hoses, polybutene terephthalate, polyurethane, nylon 66, fibreglass-reinforced polyester and epoxy resins, shellac and cork.

That is quite a list to keep an eye on so the promise of an additive that can do the donkey work for us is quite attractive. But which do we choose?

The Federation of British Historic Vehicle Clubs has endorsed a handful of products that have been tested by their members and found to actually work. I've been using Ethomix for the last 18 months and find it works well on my BMW adventure bike as mentioned before. I haven't had any problems with my Royal Enfields that I can put down to ethanol in the fuel being the culprit, but I have started adding it to my ancient WDCO war bike 'just in case'. I think my lack of problems with the Enfields is because they are used all the time, whereas the BMW spends most of its life in storage.

There is usually no problem in combining additives. The manufacturer of Ethomix states that there is no problem using it combined with lead replacement additives.

There was a time when these additives seemed very expensive, but due to the high cost of petrol these days the relative cost to treat the fuel is not so bad.

Further reading <http://www.fbhvc.co.uk/legislation-and-fuels/fuel-information/>



Compared to ordinary gasoline, ethanol lowers the toxic levels in vehicle exhaust emissions—reducing air pollution, improving human health, and reducing greenhouse gas emissions.

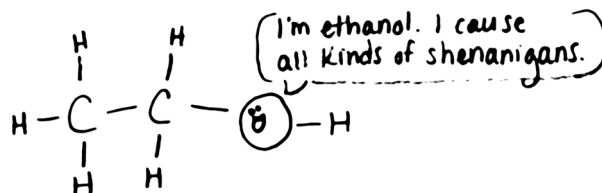
*Research at the University of Nebraska (2009) found that direct-effect greenhouse-gas (GHG) emissions from ethanol are estimated to be equivalent to a **48% to 59%** reduction compared to gasoline.*

*The Environmental Protection Agency recognizes that corn ethanol provides a **21% to 52%** GHG reduction compared to ordinary gasoline, depending on whether you consider global indirect land use change.*

*Global ethanol production and use is estimated to have reduced greenhouse-gas emissions by 100 million metric tons in 2012, according to energy experts – the equivalent to taking **20.2 million vehicles** off the road.*

Ethanol has some material incompatibilities. It dries out low quality buna rubber components found in hoses, diaphragms and gaskets.

Ethanol attracts water preferentially over gasoline. Large amounts of water can actually cause ethanol to “separate” from gasoline.





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