

Since Nigel Elliot became the FBHVC's fuel specialist he has completely updated the 18 pages of material on fuels on our website. Hopefully you have all taken a moment to look. If not, we urge you to do so.

Nigel has recently provided some further advice on ethanol with respect to fuel additives. Please read below:

Ethanol and Aftermarket Fuel Additives

There are three key areas of concern with Ethanol compatibility with historic and classic vehicle fuel systems:

1. Corrosion of metal components
2. Elastomer compatibility - swelling, shrinking and cracking of elastomers (seals and flexible pipes) and other unsuitable gasket materials
3. Air/fuel ratio enleanment

Corrosion of Metal Components

Ethanol has increased acidity, conductivity and inorganic chloride content when compared to conventional petrol which can cause corrosion and tarnishing of metal components under certain conditions. These characteristics are controlled in the ethanol used to blend E5 and E10 European and UK petrol by the ethanol fuel specification BS EN15376 in order to help limit corrosion.

Corrosion inhibitor additives can be very effective in controlling ethanol derived corrosion and are recommended to be added to ethanol in the BS EN15376

standard. It is not clear if corrosion inhibitors are universally added to ethanol for E5 and E10 blending so as an additional precaution it is recommended that aftermarket corrosion inhibitor additives are added to E5 and E10 petrol.

These aftermarket ethanol corrosion inhibitor additives often called ethanol compatibility additives are usually combined with a metallic valve recession additive (VSR) and sometimes an octane booster and have been found to provide good protection against metal corrosion in historic and classic vehicle fuel systems.

Elastomer Compatibility

As the ethanol molecule is smaller and more polar than conventional petrol components, there is a lower energy barrier for ethanol to diffuse into elastomer materials. When exposed to petrol/ethanol blends these materials will swell and soften, resulting in a weakening of the elastomer structure. On drying out they can shrink and crack resulting in fuel leaks.

Some aftermarket ethanol compatibility

additives claim complete protection for operating historic and classic vehicles on E10 petrol. The FBHVC is not aware of, or has tested any additives that claim complete fuel system protection with respect to elastomer and gasket materials for use with E10 petrol. The FBHVC therefore recommends that elastomer and gasket materials are replaced with ethanol compatible materials before operation on E10 petrol.

Air/fuel Ratio Enleanment

Ethanol contains approximately 35% oxygen by weight and will therefore result in fuel mixture enleanment when blended into petrol. Petrol containing 10% ethanol for example, would result in a mixture-lean effect equivalent to approximately 2.6%, which may be felt as a power loss, driveability issues (hesitations, flat spots, stalling), but also could contribute to slightly hotter running. Adjusting mixture strength (enrichment) to counter this problem is advised to maintain performance, driveability and protect the engine from overheating and knock at high loads.

Modern 3-way catalyst equipped vehicles do not require mixture adjustment to operate on E10 petrol because they are equipped with oxygen (lambda) sensors that detect lean operation and the engine management system automatically corrects the fuel mixture for optimum catalyst and vehicle operation.

Operating Classic & Historic Vehicles on E10 Petrol

If you should decide to make the necessary vehicle fuel system modifications together with the addition of an aftermarket additive to operate your classic or historic vehicle on E10 petrol. The FBHVC strongly recommends that you regularly check the condition of the vehicle fuel system for elastomer and gasket material deterioration and metallic components such as fuel tanks, fuel lines and carburettors for corrosion. Some plastic components such as carburettor floats and fuel filter housings may become discoloured over time. Plastic carburettor float buoyancy can also be affected by ethanol and carburettors should be checked to ensure that float levels are not adversely affected causing flooding and fuel leaks.

Ethanol is a good solvent and can remove historic fuel system deposits from fuel tanks and lines and it is advisable to check fuel filters regularly after the switch to E10 petrol as they may become blocked or restricted. If your vehicle is to be laid up for an extended period of time, it is recommended that the E10 petrol be replaced with ethanol free petrol which is available from some fuel suppliers. Do not leave fuel systems dry, as this can result corrosion and the shrinking and cracking of elastomers and gaskets as they dry out.

