

## ➤ E10 petrol comes back to haunt us

# FUEL FOR THOUGHT



The UK government and the introduction of a new blend of petrol containing ethanol to the pumps, which will be known as E10 petrol, is under consultation. Although there is a risk that E10 could cause damage to older vehicles such as TVRs, the government is under considerable pressure to reduce greenhouse gas emissions, to comply with strict European targets. The latest blend of ethanol in the new petrol could be introduced by 2020 or even as soon as 2017.

Ethanol is not a new discovery for use as a fuel. Henry Ford, back in 1896, designed and built his first vehicle to be run off corn alcohol which is more or less the same product as what we now call ethanol.

It would seem that the only way forward for the UK to meet the emissions targets, which call for 10 per cent of transport energy to come from renewable sources by 2020, is to introduce the new blend of ethanol petrol, E10. The amount of ethanol contained in petrol at present is about 5per cent and is known as E5, depending in which part of the UK you fill your tank, the petrol company that is supplying it and the depot that it is originating from. I would doubt very much if you could guarantee any consistency in that either. Most petrol companies will disclose the amount of ethanol content that is in their fuels, but some refuse to provide this information and are not so forthcoming, which makes it difficult to know exactly what we are actually putting into our tanks, the damage that it may be doing and what to do about it to protect our cars' components that are vulnerable to this blend of petrol. This really isn't good enough for the motorist, especially considering the high price that we all pay for it.

Petrol companies have been allowed to supply ethanol E10 petrol since 2013, but for fear of causing damage to some older vehicles and motorcycles and the likelihood of the price of petrol increasing to an estimated 1p per litre extra for consumers to purchase at the pumps, the new E10 blend of petrol has so far been put on hold from being introduced at the pumps in the UK.

Further implications are a loss of energy by around 30 per cent, making it far less efficient than pure petrol. Cars having larger engines seem to run more efficiently on E10 than the smaller engined ones, it has been found. Overall, it is far less efficient and your car will do less mpg, as well as costing you more at the pumps to do so.

According to tests that have been carried out on a variety of vehicles using E5 and E10 fuels, there is a reluctance for the engine to start in cold weather; also stalling at idle, flat spots and hesitation and carburettor icing have also been reported. Carburettor icing is caused by certain atmospheric conditions, usually when the air is humid and there is a temperature drop in the venturi, which then causes the fuel vapour to freeze.

Another issue that has been found during these tests is 'vapour lock' - the volatility of ethanol is higher than petrol and this causes the fuel to vaporise faster.

This occurs when a hot engine is switched off and then restarted again soon after. The residual heat vaporises the fuel from liquid to gas and as a result the fuel pump is unable to pump the liquid fuel to the engine as the fuel is now vapour, and this causes the engine to fail to start until the engine cools down and the vapour disperses, allowing liquid fuel to again flow through the pump.

Other disadvantages when using ethanol fuel blends with engines designed for petrol are: metal corrosion, attacking zinc, brass, copper to name just a few. Aluminium and alloys fare quite well with 10 per cent ethanol, but become damaged when subjected to 25 per cent ethanol.



A deterioration of plastic and rubber in the fuel system components from the solvents contained in ethanol will also dislodge pieces of sediment and deposits from fuel tanks and fuel lines, which in turn will clog fuel injectors, carburettors and also fuel filters, and there will be a need to change the fuel filter on a regular basis, perhaps even adding another second fuel filter to the fuel system, between the fuel tank and the fuel pump, for greater protection to the fuel pump from debris.

Internal engine components could also be damaged, or even destroyed, with water absorption, fuel phase separation and a shortened fuel storage life of 90 days, and that is in ideal environmental conditions, unless your car has a vented tank, as some of ours do of course, then the product life is vastly reduced to just 30 - 45 days. These are all reasons why ethanol blends are restricted to low mixtures here in this country, or at least are for the moment. Fuel phase separation occurs when the fuel is exposed to water, E10 gas will contaminate and should then be discarded.

Whereas petrol blends without ethanol will have a shelf life of many years, the shelf life of E10 is much lower, because of its affinity to not only attract, but to also absorb, water. In lower fuel octane, the ethanol petrol blend provides some of the octane rating, but when phase separation occurs, the octane rating of the remaining fuel in the tank can drop by as much as three points.

Many consumers will add extra additives to their petrol tanks, which deceptively claim that they will prevent ethanol water absorption by alcohol.



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Photograph courtesy of:  
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There is no additive product with this capability in existence as all alcohols attract water by nature and it is this 'water absorbing' properties that make ethanol in petrol most problematic and difficult to manage.

The best measure that you can take to manage the shorter shelf life of E10 is to refill the tank often with high quality fresh petrol, from major petrol companies' filling stations, at a busy location with a high throughput as a result the fuel in the tanks of the filling station should be replenished on a regular basis, offering less chance for the fuel to be contaminated. Purchase the highest octane fuel available, to help make sure that your engine is getting at least the minimum octane for a good performance. It would also be a good idea to make a note of the date that you purchased petrol, then you will know how long that fuel has been sitting in the tank. Some would say that they will keep their tanks near to empty and only fill the tank with enough fuel for the journey they are taking, but given the inaccuracy of some of our fuel gauges, in the future I can see a lot of cars stranded by the roadside, having run out of fuel when using this practice.

The main issue that I can see with classic cars and especially in the world of TVRs, is very often the lack of use, or laying them up over the winter periods; it is then perhaps advisable to drain the fuel tank. "Should I drain the tank or not, during the lay up period?" is a difficult one to answer; if your tank is of the vented type and it is left full of fuel, there is a very high possibility that phase separation will take place and water in the fuel will be present within two months. Even after adding a fuel stabiliser, it would be necessary to drain the tank to stop damage from the water, and to dispense of the bad fuel. Should you be lucky enough to have a closed tank and a fuel stabiliser has been added to the fuel, it may be possible to leave the fuel in the tank for a period of six months. Before the engine is again started, it would be advisable to check the fuel if possible, by loosening the fuel tank drain plug and draining off a small amount of fuel into a glass jar. If water is present, you will see the separation of water at the bottom and fuel at the top; it would then be necessary to drain the fuel from the tank. Leaving the tank nearly empty with treated fuel, there would not be enough ethanol to absorb water, or for the fuel to turn bad. But a near empty tank could attract condensation to the walls with the change of temperatures, enabling more water to form, and there is a good chance that it will rust the sides and floor of the tank. This would happen in both closed and open vented tanks. So it seems that the answer is to drain out the fuel from a vented tank, but it may be possible to leave a tank full of treated fuel in a closed tank.

A closed tank will usually have a carbon canister fitted (sometimes referred to as a purge tank) for extra protection to the environment. Note that some aftermarket fuel caps will have a vent hole, so they will render a closed system open to the atmosphere, therefore changing the system to an open one.

The Society of Motor Manufacturers and Traders (SMMT), which represents the views of the motor industry, says that "the vast majority of cars which can't use E10 are older vehicles, and their number decreases every year as those cars are taken off the road. By 2020, just 3 per cent of petrol vehicles won't be compatible with E10."

Obviously, there is very little thought for those of us who are trying to preserve our TVRs for posterity? However, as a general rule, if your car was built after 2002 it should be fine, although there have been some exceptions to that and as recently as 2009. Since 2011, all new cars sold in the UK must be compatible with E10 fuel.

Not only can E10 be a problem for some of us TVR owners, and owners of older cars and motorcycles, it also poses a problem with petrol companies. Ethanol in petrol cannot be stored in their storage tanks, as it would attract water, but also it could cause the tanks to corrode, so it is not added at the refineries but usually added by the tanker drivers at the depots when they fill their tanker for delivery to the petrol retailers. We all need to be educated in the changes in fuel management, when the switchover to E10 alcohol blends of fuel is implemented. Hopefully, petrol retailers will also properly service their tanks before switching to ethanol blends, as any water remaining at the bottom of their tanks will immediately contaminate the new E10 fuel that is added.

A date for the switchover to E10 has not been given as yet, but there are those that believe that the introduction of E10 to our petrol station forecourts of some brands will start as early as January 2017. It has been recommended that a blend of E5 petrol will still be available alongside E10 when it is introduced. Petrol pumps dispensing a higher level than 5 per cent ethanol will have to have their pumps labelled as such. So it is important for us TVR owners to make sure that we are filling our tanks with the correct fuel; look at the labels stuck onto the pump and especially any that say: UNLEADED PETROL 95 E10 Not suitable for all vehicles: Consult vehicle manufacturer before use. BS EN 228. Do not fill your tank with it.



I really do hope that well before this fuel is introduced to our forecourts, the motorist is given good informative information by the petrol companies, as to what their fuel contains and generally what we all need to know about it.

In correspondence published this year, Patrick McLoughlin, the UK's Transport Secretary, set out plans to decarbonise the UK's transport sector in a letter to Energy and Climate Change Committee chair Angus Brendan. This includes plans for a proposed trajectory for increasing the supply of renewable transport fuel to meet the UK's renewable energy targets. The RTFO supports the government's policy on reducing greenhouse gas emissions from vehicles, by encouraging the production of biofuels that do not damage the environment. Most ethanol is largely derived from crops, but the Government will be looking at options on how to meet the EU requirements by shifting from crop-based biofuels towards renewable fuel from waste.

Jonathan Murray, head of policy and operations at the low Carbon Vehicles Partnership, said: "Currently around 7 per cent of transport energy comes from renewable sources." He went on to say that "recommendations were made last year to deploy the E10 petrol blend and also to introduce more waste biodiesel into diesel fuels, and that these measures would give the UK 'the best chance' of improving its renewable energy figure." "Petrol with a higher blend of ethanol has been anticipated in the motor industry for a long time and has been involved in various regulations and international standards," he told MPs. "This is about transition."

So it would seem that it is not all done and dusted just yet, certainly not so and **my advice is not to panic just yet.** There are many issues here and not all from the motoring community.

If an air of despondency has descended upon you about the future running and maintaining of our TVRs, then don't let it descend on you just yet; some forecourts will still have an alternative fuel. No doubt when E10 becomes fully available on our nation's forecourts, the market will also be flooded with various fuel conditioners, enhancers and products that will help to maintain the stability of the fuel that remains in our tanks for longer periods of time, such as the lack of use or laying the car up for the winter months. I have just given you some good reasons to remain vigilant, if and when E10 becomes the only available fuel.

E10 FUEL - TVR FRIENDLY?