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## News – The very significant ‘ethanol in petrol problem’ – Higher levels are almost here – Latest information

Published: April 20, 2020

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Online version:

<https://www.wheels-alive.co.uk/news-the-very-significant-ethanol-in-petrol-problem-higher-levels-are-almost-here-latest-information/>



Photograph courtesy Anthony Henson.



Increasing ethanol content in petrol – an update on the story so far, which affects many more recent models as well as classics – by Dave Moss.

*(Photographs used in the main text by Kim Henson).*

## What's happened so far...

In July 2018, the Government published a consultation and call for evidence along with proposals on changes relating to the future supply and sale of petrol containing ethanol. The first and most controversial part of that consultation sought views on whether and when to introduce “E10” petrol to forecourts, whether ongoing availability of the current petrol grade should be ensured, and if so how best to achieve this. Less controversially, other questions focussed on the introduction and wording of standardised fuel labelling – to appear on new vehicles, at filling stations and dealerships, and how it might best be introduced. The Government issued its response to points raised in this second section back in February 2019, and a link to that document is contained in the references at the end of this feature.

## Recent rumpus, confusion and consternation.

Concern set in following press reports in March 2020 on the Government's long delayed response to the first, more important part of that consultation. Many reports didn't explain the full implications – which are important for all vehicle users from classic vehicle owners to the average driver-on-the-street. There was a pretty good reason for this – the lengthy Government response was snappily entitled “E10 petrol, consumer protection and the E10 consumer message”, quite sufficient to make your eyes glaze over – while giving few clues that it contained much detailed thinking on what might happen to petrol supplies in Britain in coming years. A link to the full document can also be found in the references section at the end of this feature.



## Who responded – and what good did it do?

There were just one hundred responses to the E10 consultation sections, forty-two of them from various corporate bodies, amongst them fifteen trade associations, eleven motoring organisations, one hydrogen, seven biofuel and six fossil fuel suppliers – and a solitary fuel retailer. Perhaps surprisingly though, some fifty-seven private individuals also responded.

The Government says the common issues and themes which emerged from the responses received are helping to inform decisions on the best way forward.

## Where are we now?

Easily the most widely available UK unleaded petrol is graded as “Premium.” It’s also designated “E5,” and rated at 95 RON. (Research Octane Number.) Some forecourts also stock a “Super” 97-99 RON unleaded, also designated E5, and invariably more expensive. Existing UK legislation requires that fuels designated E5 must be blended to contain no more than 5% renewable ethanol. Typically today the actual content is around 4.6% to 4.8%.

Legislation has existed since 2013 which allows E10 fuel, with an ethanol content up to 10%, to be legally sold in Britain, and this became the reference fuel used in all new car fuel consumption and emissions figures published from 2016. Despite this, it’s still absent from British forecourts, and several explanations for this delay are advanced in the consultation response documentation.

At a retail fuel industry level, worries about breaching competition law have prevented separate companies from agreeing to switch together. Conversely there’s been no appetite to “go it alone,” because of a perception that customers might desert one brand of filling stations – to buy fuel from competitors still selling the familiar E5 blend which had chosen not to switch.

For drivers, probably the most important issue is that while the vast majority of modern petrol vehicles could use E10 without problems, some cannot. Taking advice from the

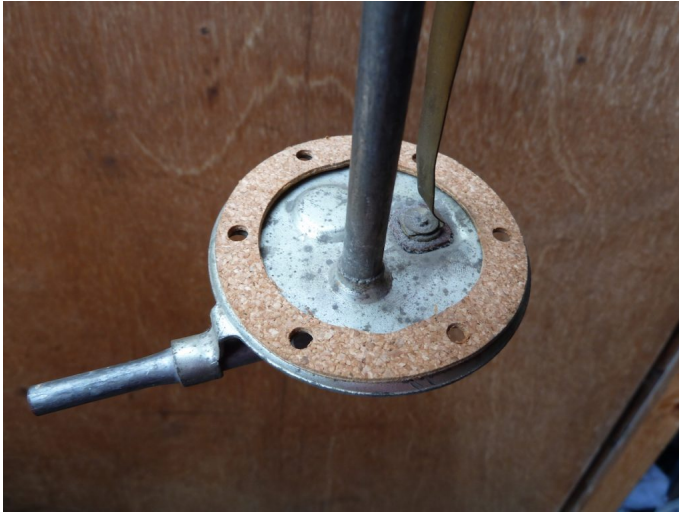


Society of Motor Manufacturers and Traders, the Government believes these are mostly specific family cars from the late 1990s and early 2000s, of which around 400,000 such vehicles were estimated to be on UK roads in 2019, though the ageing process is ensuring numbers are falling steadily.

The Government also accepts there is another group of non-compatible vehicles, under the generic heading of “classics,” from further back in time, whose numbers are not declining anything like so fast – if at all. This group includes cars, commercials, motorcycles and various types of petrol-powered machinery, all of which was designed for use with neat – and in many cases leaded – petrol, with no ethanol content. Though a relatively modest number overall, for this reason there has been understandable pressure from the old vehicle movement in general for continued availability of E5 petrol.







Materials used for fuel system floats and seals in older vehicles (examples shown in the photographs above) were not designed for use with petrol containing ethanol, and can disintegrate if exposed to it; the higher the level of ethanol, the more severe is the problem – and potentially this can cause a serious fire risk..

## Consultation questions, options, costs – and justifications

The 2018 consultation proposed introduction of E10 Premium grade petrol while maintaining availability of both the current E5 95 RON – which the Government likes to call “protection grade” fuel – and 97-99 RON grades. Opinions were sought on this approach, to allow continued use of non-E10 compatible vehicles, and mirroring the choice offered in countries like France and Germany, where all three grades are widely available. The Government’s preferred option was to require “large” filling stations – those retailing over 3 million litres a year, to have both E10 and E5 Premium grades available “until at least 31 December 2020,” with an alternative of allowing such stations to choose which E5 grade to offer. The consultation also asked whether this “large filling stations” criteria was appropriate, and for other suggestions to ensure E5 availability.

In its response, the Government says that moving from E5 to E10 fuel will reduce the UK’s petrol vehicle CO<sub>2</sub> emissions. Its statistics show that 744 million litres of ethanol were blended into E5 petrol sold in Britain in 2017/2018, calculated to have reduced CO<sub>2</sub>



emissions by around 880,000 tonnes. Raising the blend to the E10 level, it says, could potentially bring further savings of 700,000 tonnes.

While this would be a clear ecological bonus, drivers would face increased fuel costs. The Department for Transport (DfT) says ethanol contains just 65% of the energy in fossil petrol, so the original change to E5 brought an inevitable slight fuel consumption increase in vehicles using it... and a future switch to E10 will repeat that process.

According to the DfT, which details the relationship between fuel energy content and distance travelled in a risk assessment accompanying the Government response, driving a given distance needs around 1.7% more E10 petrol than E5. Relating this to fuel costs and greenhouse gas savings, the document says use of E10 in compatible cars reduces overall CO2 emissions by about 1.8% over E5 – but fuel costs increase by an estimated 1.6%. It also calculated that fuel costs for cars incompatible with E10 would increase by around 8%, because their drivers were anticipated to move to the more expensive E5 “Super” grade petrol, if it remained available, for which the DfT assumed a notional extra cost of 10p per litre over E10 in its analysis.

Elsewhere, this consultation contained an absolutely key question for classic vehicle owners. Having touted the possibility of an uncomfortably close “end of December 2020” E5 availability cut-off date, the consultation asked for views... on how long E5 fuel should remain on sale... There were questions also for those in the fuel retail, distribution and supply areas on foreseeable commercial challenges for the “three grade” policy outlined above..

## Key consultation responses

Though, on the face of it, input from retail distribution and supply areas might not appear directly relevant to drivers, their responses revealed important underlying issues. Equipping modern fuel forecourts is an expensive business, and operators raised major concerns regarding not only costs, but also the complexity and timescale involved in adding another petrol grade. It was pointed out that the UK supply chain has evolved around today’s “two-



petrol-grade-plus-diesel” retail choice. Petrol production, delivery and forecourt systems have developed around this situation, with “Premium” petrol currently taking a 95% market share, and “Super” grade the rest.

The industry also indicated that while some forecourts could possibly supply a third grade from some nozzles, identifying such sites is not easy, as tank storage, pipework and dispenser arrangements vary greatly. The feeling was that adapting sites to take a third petrol grade is more complicated than it sounds, and, when including planning and licensing implications, could take over two years – and be costly to implement.

Several related issues were also raised, including difficulties of accurate demand forecasting, efficient fuel distribution to retailers, and significant changes required at fuel supply terminals such as new fuel storage tanks – again with lengthy timescale and cost implications. Drivers, meanwhile, might well anticipate that the significant new costs associated with introducing a “three grade” system right down the line would probably be passed on through increased fuel prices...

Concerns were also expressed about possible consumer resistance to E10, the feeling being that its introduction could be challenging if E5 Premium grade fuel simultaneously remained widely available. It was felt drivers were likely to stick with fuel they knew, and low E10 uptake would bring further fuel industry costs – while the Government’s hoped-for greenhouse gas savings might not be fully realised.

Classic vehicle owners pointed out that many older petrol vehicles aren’t approved for use with fuel containing more than 5% ethanol, with such vehicles potentially needing expensive modification work to use E10 – and in some cases conversion may prove impossible. Thus this group stressed the need for continuing E5 availability beyond the end of 2020 – and into the foreseeable future. Motoring organisations saw benefits in keeping “Premium” E5 available for those whose vehicles, for whatever reason, were not approved for E10 use. It was suggested that such vehicles may be driven by those least able to afford increasing petrol costs, so keeping the cheaper E5 grade available was a valued policy. However, a



counter-argument was also advanced – that older vehicles were more polluting, so Government should not prioritise policies minimising costs for those covering significant mileage in such vehicles.

## What has come out of the 2018 consultation?

Several firm waypoints have emerged on the road to E10 fuel availability in Britain:

The response paper suggests that much thought has gone into likely problems and pitfalls associated with the appearance and acceptance of E10 fuel. Worries expressed by classic vehicle owners, and those of the industry where adding it as a third forecourt petrol choice was seen as costly and complex, with no guarantee of rapid takeup, appear to have been heeded. The Government has apparently accepted that a lower ethanol fuel must remain available, though it's clear also that further reducing vehicle CO2 emissions will be its central ambition driving forward E10 acceptance.

In tandem with the consultation, experience on E10 takeup in various European countries has been taken into account. In France and Germany, which introduced E10 Premium 95 fuel while continuing sales of E5 Premium 95, drivers proved more reluctant to move to E10 – when compared to countries such as Finland and Belgium, where E5 has remained available only as Super grade fuel – leading to a quicker and more comprehensive E10 uptake.

This experience has led the Government to choose a simpler two-grade approach as its preferred route forward, in which E10 Premium 95 RON will become Britain's "standard" forecourt petrol blend. It expects to achieve this by requiring all filling stations – with some exceptions for remote areas and specialist, low volume retailers – to make their high-volume petrol offering E10 "Premium." Emerging E5 fuel policy is that it should remain widely available only in "Super" grade – but beyond the end of December 2020.

From experience in other countries, the DfT believes that a carefully managed E10 introduction, on a given date and with nationwide publicity, will deliver the best chance of





rapid and smooth acceptance. Clear benefits are seen in a Government-led E10 introduction programme, undertaken via a coordinated industry-wide roll out – an approach also favoured by the fuel industry.

## Working towards a switch to E10

Seeing tighter emissions targets ahead, and to avoid the “no-one wants to be first” dilemma, the Government has concluded that a smooth E10 roll out requires an agreed nationwide changeover, with – as far as practical – all filling stations selling over a million litres of fuel a year changing to E10 “Premium” 95 octane petrol in a co-ordinated way at the same time. Key elements proposed within this are a single nationwide introduction date, a centrally organised communications and vehicle compatibility information campaign – informing drivers about what’s happening and why the new fuel is being introduced, and easy access “database-style” information on vehicle suitability for the new fuel. Such a campaign would, according to the DfT, help minimise confusion and complexity for motorists, and ensure they face the same choices at filling stations as they do at present.

## Is a changeover really inevitable, and does it mean E5 eventually disappearing?

Background notes accompanying the earlier Government response and the new consultation strongly suggest that the route towards E10 introduction is already mapped out in detail, and a changeover is approaching fast. It may not quite yet be a “fait accompli,” but with most modern petrol cars unlikely to notice any change, the relentless march towards significant future vehicle emission reductions makes a move to E10 as Britain’s “mass market” petrol inevitable. The only real remaining question is exactly when it will happen.

On E5, the current proposal is for regulations to permit continued supply of “protection grade” fuel for not less than five years after E10 is first introduced. This is the longest period Government can enact such a regulation before it must be reviewed under existing legislation. After five years, any further E5 extension would be considered taking into account the situation and evidence available at review time.



## So what now... and when?

The official response to the 2018 consultation suggests that most concerns regarding difficulties faced by the industry, older “modern” and classic vehicle owners appear to have been taken on board in the recent exercise. Experience gained in other countries where E10 fuel has appeared has been studied, which should help in minimising practical problems associated with its introduction in Britain. Given these and other positive outcomes from the consultation, the next step in the process might seem rather surprising. It is... yet another consultation, which is already under way, described as “Focussed on the introduction of E10 in the UK.”

The interaction of gradually reducing numbers of incompatible vehicles and rising biofuel supply targets as part of the continuing drive to reduce vehicle emissions has created what the Government sees as a compelling argument for the introduction of E10 as soon as 2021. It currently proposes that a mandatory requirement to sell E10 Premium 95 RON would begin then, by which time the number of incompatible “daily use” cars is expected to be below 1% of the total parc – with the remainder nearing the end of their economic life. This timeline allows the new consultation process to be completed leaving up to a year in hand – giving time for industry and drivers alike time to prepare for the changeover after legislation is passed.

## What is this new consultation looking for?

Views are being sought on how E10 fuel could best be introduced with minimum inconvenience to drivers and industry. It’s seeking ways via which E10 effectively takes over the familiar position of E5 as Britain’s “main” Premium petrol grade. Informed by the feelings of respondents to the earlier consultation, to ease this changeover while leaving classic and less recent modern vehicle owners as happy as possible, the new proposal is that once E10 fuel is on sale, E5 will remain available – but only in 97-99 RON Super grade.



## Responding to the new consultation

The latest 32 page consultation document, which includes quite detailed explanatory background material, is already open for comments. A link to that, and a list of questions and methods of responding, can be found in the References section at the end of this feature.

The consultation closing date has been extended slightly to May 3rd due to the COVID-19 pandemic. The DfT is promising that a summary of responses, including the next steps it intends to take, will be published within three months of that date.

## References

Part 1 of the Government's response to the 2018 consultation - on the potential introduction of E10 fuel, can be found here:

[Gov. UK publications E10 petrol](#)

Part 2 of the Government's response to the 2018 consultation - on the introduction, wording and location of standardised fuel labelling, can be found here:

[Gov.UK publications road fuel labelling](#)

The complete original July 2018 consultation document can also still be seen, at [Gov.UK consultation E10 petrol labelling](#)

The new E10 consultation, which includes quite detailed explanatory background material, is open for comments until May 3rd 2020. It's a PDF available at:

[Gov.UK E10 consultation](#)

That document contains the consultation questions and details of how to respond. The list of



questions is also available here – as an open data file:

[Gov.UK/consultations and questions](#)

Existing information on vehicle compatibility with E10 fuel is available here:

ACEA car E10 compatibility guide [ACEA publications](#)

ACEM motorcycle/scooter E10 compatibility guide [ACEM compatability guide](#)

French E10 market share data: [French E10 market share data](#)

German E10 market share data: [German E10 market share data](#)

Finland E10 market share data: [Finland E10 market share data](#)

Belgium E10 market share data: [Belgium E10 market share data](#)

DVLA UK car scrappage rates: [Gov.UK UK car scrappage rates](#) (table VEH0211)

Everything you could possibly need to know about Research Octane Numbers (RON ):

[Wikipedia octane rating](#)

[Octane number information](#)

[Octane explained](#)

[Octane numbers and knock resistance](#)



## Further information:

### Vehicle compatibility with E10 fuel

The DfT has already undertaken detailed homework on vehicle compatibility, and has estimates showing that 96.6% of petrol cars in use in Britain in 2019 were E10 compatible. The remaining 3.4% represents around 700,000 cars classified as incompatible, of which it believes around 25% date from before 1985.

Using DVLA database scrappage rates, by 2021 it expects the number of incompatible cars to be around 600,000, 50% of them being pre-1985 cherished vehicles. Looking further ahead, it predicts the total number of incompatible vehicles will decline to around 279,000 by 2030, with over 80% of them built before 1985.

From this work, the DfT has defined and analysed two “E10 incompatible” vehicle groups:

1. Classic or cherished vehicles: These are believed to comprise around half of the non-approved cars around today. Most have known and established concerns, though some are excluded simply because the maker is not available to deliver a definitive view on compatibility. Such vehicles are usually preserved for the long-term, with very few scrapped, and will include true classics (defined by the DfT as “over 40 years old”) as well as newer vehicles unlikely to be used as day-to-day family vehicles, amongst them sports cars, and so called “modern classics.”





2. Older everyday vehicles: This group includes older family cars, mostly manufactured in the early 2000s, and not listed as suitable for E10 fuel. Many utilise first generation direct-injection petrol engines, and their manufacturers are concerned fuel system faults may develop through prolonged E10 use. Also included here are cars from defunct manufacturers like Rover, who have ceased trading, so compatibility information is unavailable. As noted above, the passage of time is ensuring numbers of such vehicles are declining as they reach the end of economic life and are scrapped. Both the European car makers industry association ACEA and the European motorcycle industry association ACEM have already made available some useful compatibility information. Specific websites allowing motorists to easily check compatibility have been developed in most countries



where E10 has gone on sale, and the DfT says it plans to make a similar tool available if E10 gets a UK go-ahead. It also proposes to work with the fuel industry to ensure publicity materials are developed ahead of introduction, including concise point of sale compatibility guidance, and provision of a comprehensive communications campaign.

Cost-conscious motorists running any pre-2011 vehicle will surely want to check in good time whether their vehicle can use E10, since Government consultation responses are already inferring the remaining E5-based fuel option is likely to be considerably more expensive.

While specialist advice may be needed for classic cars in general, even checking of more modern cars may not be entirely straightforward. Depending on make and model, a combination of year of manufacture, exact engine type and sometimes a VIN number will usually determine compatibility. Nonetheless, some manufacturers offer quite detailed information to help determine whether E10 can be used; the DfT quotes the VW Golf as an example, stating that all models are approved – except some from the early 2000's, using first-generation 'FSI' direct injection engines. This could mean that a 1999 or 2007 Golf would be compatible, but an example made in 2005 may not be.

*Kim adds: At the time of writing (mid-April 2020) many fuel companies are using E5 (5% ethanol) in both their 95 octane and 97 octane fuels, but the situation is not clear-cut and may change; for the latest situation it is always wise to check with the individual firms concerned.*

*However it seems that at the moment Esso super unleaded petrol (97 octane 'Synergy Supreme+ Unleaded 97') does not contain ethanol, unlike their 95 octane 'standard' petrol.*

*According to their website (<https://www.esso.co.uk/fuels-faqs>), they say:*

*"The majority of unleaded 95 Octane petrol sold in the UK contains up to 5% ethanol as required under the Government's Renewable Transport Fuels Obligation (RTFO).*



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*There is currently no requirement for renewable fuel (such as ethanol) to be present in super unleaded (97 grade petrol).*

*Esso super unleaded petrol (Synergy Supreme+ Unleaded 97) is ethanol free (except in Devon, Cornwall, the Teesside area and Scotland). We would therefore advise anyone who has concerns about the presence of ethanol in petrol to use Synergy Supreme+ - providing they do not fill up in Devon or Cornwall, the Teesside area or Scotland."*