

Fuel for thought?



Your mower starts to make a ‘CHUG CHUG CHUG’ noise, before losing power and finally cutting out with 6 hours left of the day and approximately 3 jungles-worth of grass still to cut. A list of possible mechanical problems, huge repair bills and disappointed customers race through your mind...until you realise a splash of petrol is all that’s needed. After searching for that elusive funnel in the back of the van and sloshing the contents of a heavy jerry can into a tiny fuel tank via unwieldy nozzle, the mower splutters back into life and you forget about petrol for a few more hours.

We rely heavily on petrol as a fuel source, but often give it little thought...until it runs out. Most of us - me included - don’t think twice about what we put in the tank when we’re rushing to get work done or thinking of the next site visit. After all, it all comes from the same hole in the ground, right?

Whilst petrol all originates from the same place, its composition is increasingly being changed. Just a look at the petrol station forecourt highlights this, with a myriad of coloured nozzles and brand names with promises of ‘extra power’ and ‘cleaner engines’.

In this article I suggest it is worth paying a little more attention to what you’re running your machinery on in the future. Due to legislation, petrol as we know it is changing and, if you haven’t already noticed a difference, you soon will. If you don’t pay attention to what you’re putting in the tank in the future, filling up may cost you more than you bargained for.

Most readers will have heard of the term ‘biofuel’, which is broadly defined as fuel derived from plant or animal matter. Fossil fuels are commonly combined with ethanol, which you’ll probably have seen written on pumps at petrol stations. Ethanol can be produced via a process of fermentation from any raw material which contains a high proportion of sugar or starch, and is commonly derived from plant materials including sugar cane, sugar beet and molasses.

Currently, most standard unleaded petrol sold in the UK contains 5% bioethanol – called E5. Ethanol is used in petrol due to the Renewable Energy Directive, which was signed by all EU member states in 2009 – including the UK – and requires 10% of road transport energy to be from renewable energy sources by 2020. Using ethanol is a way of increasing the percentage of renewable energy sources in line with the directive and reducing reliance on fossil fuels.

The government is currently considering increasing the amount of ethanol content in fuel to 10%, and has issued a call for evidence on whether and how E10 petrol should be introduced in the UK. Although no decision has been announced, the UK is likely to follow other European countries such as German and France, who have been selling E10 since 2011 and 2009 respectively.

Whilst increased ethanol use is of benefit to the environment, it does pose challenges to owners of petrol-powered equipment, and members should be aware of potential issues:

1. Ethanol can cause problems in older machinery by dissolving soft materials used in parts such as seals and gaskets, which were not designed to be immersed in ethanol. Prolonged exposure to ethanol can result in parts failing, resulting in leaks or poorly running engines. At 5% ethanol content, there is likely to be degradation of components. An increase to 10% will increase this significantly.
2. Petrol with ethanol has a short storage life, with some mechanics suggesting this may be as little as 1 month before it becomes unusable. The reason for this is that, when petrol containing ethanol mixes with water (either in liquid or condensation form) it absorbs it. Once saturated with water, the ethanol separates from the fuel along with the water, meaning the water is likely to settle within parts of the engine such as the fuel tank, carburettor or fuel injection system. Consequently, landscape equipment containing petrol with ethanol which has been stored for a period of several months (for example, mowers left over winter) may be difficult to start and require stale fuel draining from the fuel system prior to use. Water is damaging to engine components, particularly if left for long periods.
3. When in long term storage (for example, during the winter), fuel containing ethanol may become acidic and cause corrosion of aluminium, zinc and galvanised materials, brass, copper and lead/tin coated steels – all of which are likely to be found within older engines.

The photos below show the effect of leaving petrol containing ethanol in a machine for a prolonged period. Water absorbed by ethanol has caused significant corrosion of the carburettor, which will prevent the machine from functioning correctly.



Figure 1 and 2: Corrosion on float bowl of carburettor caused by ethanol water absorption. Image kindly supplied by Aspen Fuels



Modern engines produced within the past 5 – 10 years are generally compatible with petrol containing ethanol, to the extent that the materials used in their manufacture are completely resistant to the potentially corrosive effects. BALI members Makita and Honda have confirmed all recent products can be run on petrol with an ethanol content of up to 10% without any problem.

Honda has advised, however, that use of E10 petrol may affect efficiency of machinery – an argument which is backed up by the motoring press. *What Car?* magazine recently noted an increase in fuel consumption of 10% in modern cars in a recent test. Honda have suggested running older landscape equipment on E10 fuel may result in engines not meeting strict Euro 5 emissions regulations, although all new models produced will comply with Euro 5 emissions regulations whilst running on E10 fuel.

Owners of older equipment who wish to avoid running their equipment on ethanol have several options:

1. Aspen is a brand of fuel which is formulated without any ethanol. Consequently, it is suitable for use in older engines where components may be vulnerable to ethanol attack as well as in new engines. Aspen is available nationwide.
2. Some brands of super unleaded petrol do not contain ethanol. Esso, for example, states on its website that, with the exception of Devon, Cornwall, the Teeside area and Scotland, all 'Synergy Supreme+' fuel is ethanol free.
3. As part of their consultation, the government have suggested petrol with a 5% ethanol content may be made available for owners of machinery which is sensitive to ethanol. This had not been confirmed at time of writing but does suggest some retailers may continue to supply fuel with a lower ethanol content in the future.

Regardless of equipment age, however, is the need to ensure the correct procedure is followed prior to medium and long-term storage of machinery. Guidance differs between manufacturers. Makita, for example, suggest ensuring all fuel is emptied from machines prior to a prolonged period of storage. Other manufacturers suggest an additive – commonly called fuel stabilisers - may be poured into the fuel tank prior to machine storage which petrol from deteriorating. Aspen fuel may also be used as a long-term storage option due to its zero-ethanol content.

Modern machinery is faster, more powerful and efficient than ever before, and the industry has come to expect relentless progress from manufacturers of all types of equipment. However, machinery must use sophisticated technology to meet stringent emissions regulations. Whilst performance and efficiency are not mutually exclusive, users play an increasingly important role in ensuring machinery is running at optimum efficiency.

Links

Government consultation document

<https://www.gov.uk/government/consultations/e10-petrol-consumer-protection-and-fuel-pump-labelling>

Aspen fuels

<https://aspenfuel.co.uk/>

Makita

<http://www.makita.co.uk/>

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