Transport Fuels:
Ethanol (E10, P100 and E85)

Overview

Ethanol is growing in popularity as a replacement fuel for petrol.

Ethanol is blended with petrol and sold as E10 (10% ethanol and 90% petrol, by volume), P100 (98RON octane with up 10% ethanol), and E85 (85% ethanol and 15% petrol).

E10 and P100 is suitable as a petrol replacement for many vehicles, without any modification.

E85 has quite different characteristics to petrol and, as such, is only suitable for a small range of models (at present).

What is ethanol?

Ethanol is common alcohol, produced from the fermentation of starches and sugars from plants or agricultural waste and distilled. Wastes from grains and sugarcane industries are common primary feedstocks for ethanol production in Australia, avoiding impacts on food production and native forests.

A range of other primary industry waste products are being investigated for cost-effective ethanol production.

Being sourced from organic waste products, pure ethanol is a renewable fuel and has very low full fuel cycle greenhouse gas emissions. Ethanol blends offer significant reductions in greenhouse gas emissions when compared to petrol alone.

Can my vehicle run on ethanol fuels?

Ethanol blends used in Australia are petrol replacements and, as such, are only suitable for spark ignition (petrol) engines.

E10

E10 is a suitable blend for *most* petrol vehicles sold in Australia since 1986, as a direct substitute for unleaded petrol.

Before use, it is important to confirm your vehicle's compatibility with the manufacturer, or on-line at the Federal Chamber of Automotive Industry's website.[∞]

If your vehicle is compatible, you can switch between E10 and petrol as needed.

Be aware that ethanol *can* act as a cleaning agent for your vehicle's fuel system. While beneficial, it is possible that your vehicle will run less efficiently on the first tank – particularly in older vehicles. Changing the

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fuel filter after the first couple of tanks may improve its performance.

Effectively, the E10 blend extends the petrol supply, reducing the environmental impacts of petrol use and reducing Australia's dependence on petroleum imports.

E10 is available in several octane numbers: 94RON (Ethanol / regular petrol); 98RON (Ethanol / 95RON petrol); and 100RON (Ethanol / 98RON petrol).

P100

P100 is a high octane (minimum 98RON) premium unleaded petrol that contains up to 10% ethanol. It is appropriate for vehicles that require premium fuel, provided they are E10 compatible.

E85

E85 is suitable only for a small number of compatible vehicles, such as 'flex-fuel' (Holden) or 'biopower' (Saab) vehicles. Currently, most vehicles *cannot* operate on E85.

Vehicles compatible with E85 can also run on petrol or E10, interchangeably. Compatible vehicles are able to sense the ethanol proportion and adjust the engine management system as needed.

E85 is rated at around 108RON. This permits higher compression ratios, torque (acceleration capability) and performance improvements. The Australian V8 Super Cars motor racing series has used E85 since the 2009 season.

Like E10, E85 can also 'clean' your vehicle's fuel system, and the vehicle may benefit from a fuel filter change after the first couple of tanks.

Cost effectiveness of ethanol blends

Pure ethanol has lower energy density than petrol. A litre of E10 has 3% less energy than petrol, which is unlikely to be noticed. A litre of E85 has about three-quarters of the energy of a litre of petrol.

Fortunately, ethanol blends tend to be cheaper, per litre, than petrol. The most cost effective option for your vehicle will depend on the price of petrol – regular, 95RON or 98RON – and the price of the ethanol blend that is compatible with your vehicle.

As a rule of thumb, E10 needs to be just a few cents cheaper per litre to offer cost savings. E85 needs to be around ¾ the price of petrol. For a more accurate comparison see the fuel price calculator on our website.

Where do I buy ethanol fuels?

Ethanol is being sold at an increasing number of South Australian service stations. See the SABER fuel map on our website for outlets that sell P100, E10 and E85.

Why consider Ethanol?

- Most petrol vehicles can use E10, if not E85, without modification.
- Compared to petrol, greenhouse gas emissions are around 7% lower using E10 and up to 80% lower using E85.
- Using an ethanol blend results in lower emissions of particulate matter, carbon monoxide and benzene.
- It is domestically sourced, reducing Australia's dependence on oil imports.
- Depending on whether your vehicle can adapt to the higher RON, ethanol blends may improve performance.

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- Ethanol blends give you flexibility in fuel choice and potential cost savings.

What issues are there?

- Avoid damage: Before using ethanol, ensure your vehicle is compatible.
- Performance *may* be affected the first couple of times you run your vehicle on ethanol blended fuel as it will clean the fuel lines. Don't be alarmed; consider a new fuel filter.
- Older vehicles *may* have a small amount of water at the bottom of the fuel tank. Ethanol can incorporate this water, and *may* result in the vehicle running less efficiently on the first tank.
- Ethanol blended fuels are not suitable for long term storage or marine use due to their water attracting properties.

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See Also:

- *South Australian Biofuel and Electric Vehicle Recharge (SABER) fuel map*
- *Fuel Cost calculator*
- *Transport Fuels*
- *Transport Fuels: Conventional Fuels*
- *Transport Fuels: Liquefied Petroleum Gas (LPG)*
- *Transport Fuels: Natural Gas (CNG and LNG)*
- *Transport Fuels: Biodiesel (B5, B20 and B100)*
- *Transport Fuels: Emerging and Future Fuels*
- *Toolbox: Fuel Comparison*

External Links:

- *FCAI Ethanol Compatibility List*

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