

LPG vs Diesel

Is LPG now a better 4WD bet than diesel?



The writing's been on the dunny wall for years: increased demand for fossil fuel will continue to push up prices. However, Australia produces shed loads of liquefied petroleum gas (LPG), which we export very cheaply and sell to motorists relatively cheaply – around half the price of petrol and as little as a third the price of diesel. These proportions may change in 2011, if the Federal Government introduces an LPG excise that adds 2.5 cents a litre a year until it is capped in 2015 at 12.5 cents per litre. At present there is zero excise.

What is LPG

Until diesel climbed above the \$2/litre mark in some bush servos there wasn't a huge amount of interest in the LPG alternative, but now, for those diesel-savvy readers who don't know much about LPG, here's a brief intro.

LPG is a mixture of propane and butane, although the butane proportion is rising steadily as propane demand approaches supply. These gases are heavier than air and become liquid under relatively low pressure.

There is no possibility of Australia running out of LPG in the foreseeable future and, with nearly 4000 retail outlets for LPG, an around-Australia trip on gas fuel is easily done. But there's no such thing as a free lunch and to enjoy the cost savings of LPG you have to pay for an LPG kit. It's not possible to fit quality components and do a professional LPG installation job for less than about \$2500 and the most efficient sequential vapour injection designs are up around the \$4000 mark.

'Payback time' – the period of use necessary to justify the LPG investment - varies greatly, but the LPG Association website has a payback calculator that does the job accurately. The much-discussed LPG-fitment-rebate scheme - \$1000 cash-back for buying an LPG-powered vehicle or \$2000 for converting a petrol machine - is of no value to commercial vehicle owners and buyers, because it doesn't apply to business vehicles or those bought on novated leases.

Engine Compatibility

LPG burns more cleanly than petrol, with slightly less output per litre, but when that efficiency loss is measured against its lower purchase price, the attraction of LPG is obvious.

The negative aspects of LPG on engine life are the fuel's dry vapour and hotter burning nature. This hotter combustion can cause valve seat recession problems in engines that aren't designed for it.



The good news is that many petrol 4WD vehicle engines are warranted for use with LPG. For example, Ford produces the Territory with a dedicated LPG-only E-Gas engine. Holden has a warranted dual-fuel conversion for the Alloytec V6 that powers the Colorado ute. It's a modern sequential vapour injection system that costs \$3900 and makes very little difference to petrol power and torque figures.

From Fumigation to Gas Injection

The original LPG system design 'gassed' the incoming air charge in the inlet manifold, in the same way a carburettor did. The petrol to gas changeover was simple, with one fuel mixture replacing the other in the manifold.

When electronic petrol injection took over from carburettors petrol engines gave much better fuel consumption. However, old-style LPG fumigation systems couldn't 'plug into' the engine's computerised electronic control and there was a marked drop in fuel efficiency when running on LPG.



Making this type of dual-fuel engine operate well on petrol and LPG was tricky, which is why Ford and Mitsubishi opted for dedicated-LPG Falcons and Magnas.

The latest sequential vapour injection LPG systems are 'plug and play' types that use the engine's ECU to control their LPG injectors, so there's very little difference when running on petrol or LPG. Sequential vapour injection is expensive, but is by far the best route for a dual-fuel system.

LPG vs Diesel

Modern light commercial diesels are more thermally efficient than petrol or LPG engines, thanks to compression ignition, turbo-charging, intercooling and high-pressure common-rail injection.

The modern diesel engine uses less fuel than a similar-output fuel injected petrol engine under heavy engine load conditions, such as when towing heavy trailers or driving in soft sand.

However that economy advantage is distorted by pump prices that currently see petrol some 20 percent cheaper in metro areas and LPG almost a third the price of diesel.

For 4WDs that do plenty of formed-surface kilometres the petrol/LPG or straight-LPG routes may well be the cheapest fuel-use solutions.