



# Dry burning LPG is no friend of cylinder heads

## Tech Talk

With Brendan Quirk



**F**LASHLUBE Australia recently sent in one of their upper-cylinder lubricant kits for us to have a look at.

The kit is designed to be fitted to either gas fuelled cars or perhaps those older cars running on unleaded petrol when they were originally designed (in the '60s maybe) to run on leaded petrol.

The lead in the petrol served two purposes. The compound of lead raised the octane rating of the fuel, in other words it slowed it from igniting in hot temperatures so that higher compression ratios could be used on engines without detonation and without the need for more highly refined and more expensive petrol.

So engine makers designed higher compression engines for better performance but fuel refining processes did not have to be upgraded. The fuel companies just dumped in some lead compounds.

These lead compounds also served to lubricate the valve seats. The inlet and exhaust valves operate in one of the most harsh environments in the engine. The valves are subject to the fuel burning beneath them at massively high pressures, the exhaust valve has to open and pass incredibly hot gases to the outside

via the exhaust system and the inlet valve is then rapidly cooled down by the fresh, relatively cold, charge of intake air and fuel vapor coming into the cylinder.

The metal valves move rapidly up and down in the cylinder-head banging closed on a very thin "seat" of metal. The tremendous heat involved and the tap, tap, tap of the valves is something akin to a blacksmith's hammer trying to beat out a piece of red-hot metal, especially where the exhaust valve is concerned.

The lead compound in the fuel deposited a "soft" lining of lead between the valve and the seat it banged into. This acted as a sort of cushion between the valve and the seat and kept both the valve and the seat from quickly wearing out or deforming.

Modern engines have ultra hard valves and seats so despite the lack of lead in the fuel they don't tend to wear out as much. In engines fuelled with even unleaded petrol there tends to be a slight lubricating effect (but no lead compounds) which also helps to prolong valve and valve seat life.

Now when you use gas (LPG), as an increasingly large number of motorists are doing, there is no lubrication benefit for the valves. They run very dry and also

very hot as the combustion temperatures of the gas fuel tend to be much higher than that of the petrol vapor.

So the wear factor is up and that factor is upped again by higher temperatures.

Enter Flashlube.

Essentially this device is an "oil" reservoir, a metering device and a means of conveying the oil to the inlet and exhaust valves inside the cylinder head.

There is a fluid reservoir of 400cc, an adjustable screw valve which effectively makes the hole in the bottle bigger or smaller allowing more or less upper cylinder lubricant to flow, and some rubber tubing which carries the oil to the engine's intake manifold where a suction is applied to the tube and hence to the fluid in the reservoir.

So effectively the device is adding a small amount of special oil to the fuel going into the engine (let's say LPG for argument's sake).

The system looks to be reasonably well made, parts including brackets and screws are included and there doesn't appear to be any reason why it would not work.

There are various suggestions about



how to attach it to your engine so it is effective but unless you have reasonable knowledge about manifold vacuum and so on, you may have to get your local mechanic to fit it for you.

Whether or not the system works in saving the valves from long term damage is, as much as anything else, in the hands of those who developed the formula for the lubricating fluid which Flashlube, not unexpectedly, says should be bought only from them or any implied warranty will be void. The kit comes with a 500cc bottle of valve saver fluid which looks like low viscosity sewing machine oil and is enough to treat 500 litres of fuel.

Perhaps the only drawback to the system comes about because it needs to be simple and universal rather than tailor-made for specific vehicles and sophisticated.

At present the amount of valve saver fluid mixed with the engine fuel is based on the amount of vacuum in the inlet manifold. In other words, more suck equals more upper-cylinder lubricant. The major drawback here is the intake manifold vacuum is highest at idle and lowest at full throttle openings. In other words more upper cylinder lubricant is sucked in at idle than at full throttle, the reverse of what would be the ideal situation.

That is not to say the system won't work, just that the fluid delivery could be much better regulated with a metering pump. But then that would not fit all cars and the cost of the kit (\$75), would have to rise dramatically.

The other inconvenience is that the screw valve has to be adjusted to allow for a certain number of drops of oil to flow

per minute. This can be a little hit and miss.

But the system was developed in 1985 and according to Flashlube is selling at the rate of 5000 kits a week in Europe.

That is probably testament enough to it's effectiveness without a spiel from a freight firm saying they have used the Flashlube kit on a 1991 LPG fuelled Mitsubishi Triton which has covered 530,000km since being converted to gas, presumably without any major drama.

The message here is clear. The Federal Government might be paying you \$2000 to convert your car to LPG but unless you protect the cylinder head on your converted car you could just as quickly be having to spend \$2000 or so on a new valves and a new cylinder head.

In these regular columns we try to answer reader's technical questions of a general nature or explore a technical aspect of motoring. Email your questions to [car@qnp.newsltd.com.au](mailto:car@qnp.newsltd.com.au) or write to Brendan Quirk, GPO Box 130, Brisbane, 4001



THE Flashlube kit for providing upper cylinder lubricant to gas fuelled engines.



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