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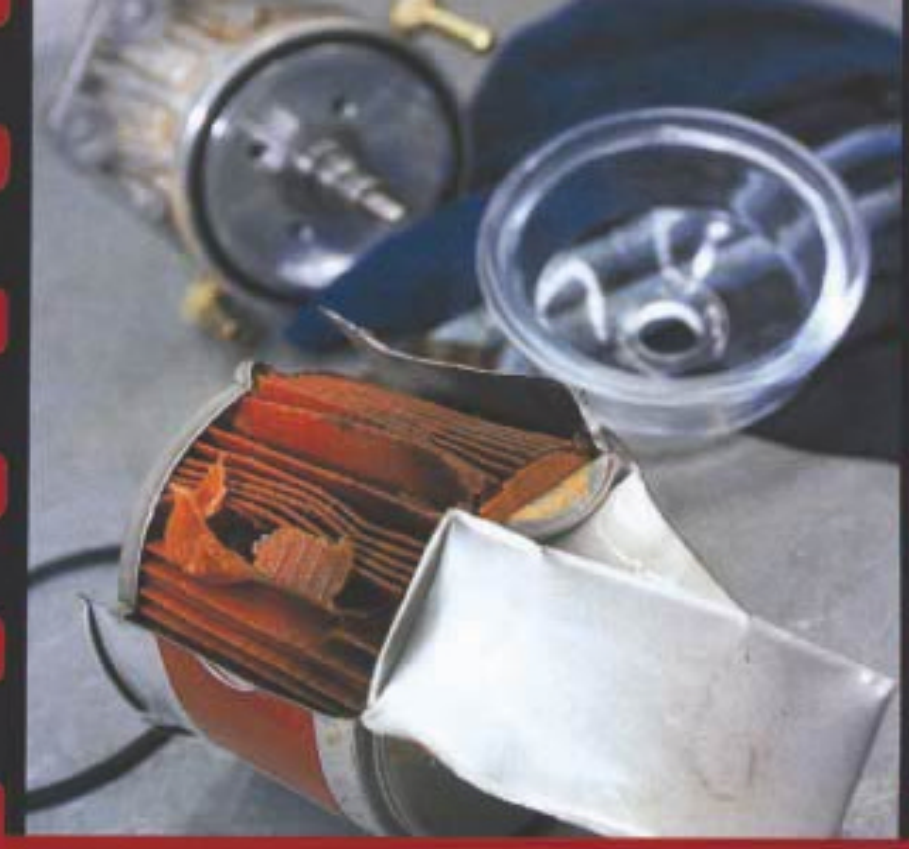


BUGGING OUT

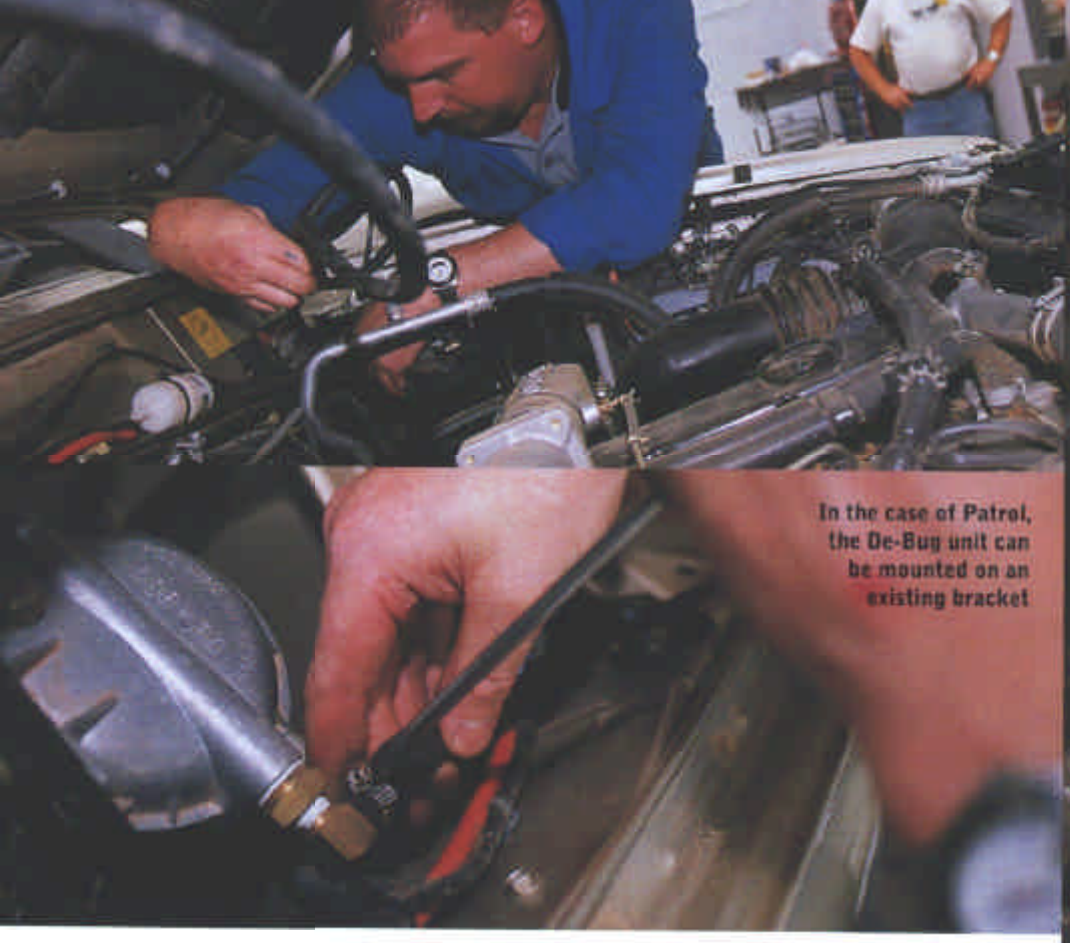
Think your fuel tank is safe from damaging organisms? Think again. RON MOON reports on a new way to de-bug your tank

PICS BY STUART GRANT

Type in 'diesel fuel' and 'bugs' into a web search engine and you'll come up with the 7000 or more entries every time. Start reading and you'll begin to think you are in some sci-fi plot: organ- isms live in some weird and wonderful places and have effects on metal and rubber components you'd normally reserve for strong acids, abrasives or even nuclear radiation.

Most of us wouldn't imagine diesel fuel was somewhere living organisms could survive, let alone thrive and multiply, but this is not the case. To be correct these 'bugs' really live in the water-fuel interface – existing in the water and feeding off the hydrocarbons in the fuel. And, while there are more than 250 types of fungi and bacteria that can live in this toxic environment there are only a couple of dozen which actually feed on the fuel and produce waste. Apart from the bacteria and fungi there are forms of yeasts and sulphate-reducing bacteria that can occur in the fuels and oils. They are all referred to as Hydrocarbon Utilizing Micro-organisms (HUM-bugs)and while that name may seem a little cute, what they do is anything but.

HUMbugs - just a couple of micron, or smaller in size – can live in a wide range of fuels including synthetic oils, some solvents, normal petrol, jet fuel, kerosene, avgas, diesel and crude oil; the last few are especially prone to infestation. They feed on the energy in the fuel and as they grow (up to a rate that sees them doubling in number every 20 minutes!) they form mats or long strings of gel-like green, brown or black slime (in petrol it can be clear). They also produce waste products which includes water, sludge, gums and acids and they will consume rubber gaskets, o-rings, tanks linings and more.



In the case of Patrol, the De-Bug unit can be mounted on an existing bracket

Carried through the fuel system bugs will cause many problems including restricted fuel flow, blocked filters, uneven atomisation of the fuel, incomplete combustion and poor fuel economy, while cylinders can develop cool spots resulting in uneven wear to the rings and cylinder bores. The acids the bugs produce can find their way into the lubricating oil causing corrosion at the bottom end of the engine. Some species of bugs create acids that remove ions from the atomic structure of metals and this is the main cause of corrosion in fuel pumps and injectors.

Sounds pretty horrific, doesn't it?

However, as we said earlier, the bugs really live in the water-fuel interface so one could assume if there is no water in the fuel, then all would be fine and dandy. That's true, but the problem is ensuring there is no water, or bugs, in any of the fuel you receive, or no moisture being generated in your fuel tank with condensation from those cool desert or mountain nights we all enjoy while away four-wheeling. For four-wheelers refueling out of 200-litre drums, jerry cans, or dodgy, little used hush servos, the problem becomes even more commonplace and acute.

This is not a new problem, but as injector systems and vehicle engines become more sophisticated, tolerances decrease and fuel atomisation becomes finer, the problems caused by HUMbugs are much more severe. As well, over the years I've been involved with 4X4 Australia, it seems reports of crook fuel, or contaminated fuel, are becoming more common. Luckily, there are a few ways to protect your engine.

Firstly, your vehicle fuel tank needs to be clean and free of any foreign substances, including water. Keep a good check on your fuel filter - one with a glass howl-type water trap is the best and easiest. If you find water in the filter you can bet there's more in the tank and it will be there for a long time just waiting for the right conditions for the HUM bugs to breed and infest your fuel system. Fuel contaminated badly with HUMbugs will smell foul and a bit like rotten eggs.

As the fuel flows through the De-Bug unit any bugs are destroyed by strong magnetic fields

To keep hugs under control an algaecide or biocide can be added to the fuel on a regular basis. But this is expensive and dead hugs drop to the bottom of your tank and form a sludge which has to be removed otherwise it will give bugs a safe place to wait and, when conditions are right, to multiply.

I had my senses rocked when our Patrol had just clocked up 17,000km and we were at Berrima Diesel Services for a tune-up and power upgrade. We found water in the fuel filter and also brown and black algae - a

INTRODUCING THE L140

The L140 sells for around $180 while the L500 sells for around $380. They can be installed anywhere in the fuel line before the primary fuel filter and, if possible, as close as you can to the fuel tank. Our L500 unit in the Patrol is mounted in the engine bay on the clutch and brake vacuum canisters bracket while a L140 unit on a friend's HiLux it is mounted on the **chassis rail** close to the fuel tank. Both are working fine.

THE BITS AND PIECES

The De-Bug unit outer bowl

Plastic spacers (go between each magnet)

Top of fuel bowl and mounting bracket

One of the magnets O-rings

O-rings

Central fuel feeder pipe

sure. sign everything was not as it should be and my fuel tank was home to a plethora of unwanted guests.

After fitting a Lucas fuel filter with glass bowl attached so I could check my fuel easily, I decided I'd fit a De-Bug Fuel Treat ment Unit. Now I have known about these units for sometime but like most people I had the 'She'll be right, mate!' attitude and thought I'd never require one. It's a hit crazy really - we rush off to buy the latest performance enhancing gear at the drop of a hat, but are a lot more reticent to buy gear that helps protect our vehicle's engine.

The De-Bug unit looks like a fuel filter unit but inside the housing is a series of strong magnets w hick the fuel flows past. As the fuel flows through the unit any bugs in the fuel are distorted and torn apart by the strong magnetic fields. The remains of these killed bugs are then passed through the normal fuel filter and burnt with the fuel.

These De-Bug units were developed and manufactured in New Zealand and are now distributed in Australia by Morison & Morison P/L and range in size from units capable of handling 140L/hour to thousands of litres per hour. For four-wheelers the L140 {14OL/hour) is suitable for four-cylinder diesel engines while the bigger L500 can easily handle all 4X4s and engines up to 370kW (500hp). They can also be connected in parallel, ie two L140's to give a total capacity of 280L/hr

Being a bit of a skeptic of such things, I went in search of users who have had fuel problems and have used the De-Bug units

CHECKING RESULTS

After an embarrassing `running out of fuel' mishap in Cape York, there were still no signs of bugs in Moonie's new de-bugged fuel filter. On his return to Melbourne Moonie took out the fuel filter and cut it up to see what it was like inside. Again it was perfectly free of algae, bacteria or fungus. Needless to say, he was rapt.

to cure them. A typical example was the Director of a charter boat in Moreton Bay. Their 42-foot cat, powered by twin Volvo diesel engines began suffering problems from contaminated fuel. While numerous attempts were made to clean the tanks and algae killers were used to treat all the fuel, the problem would reappear within three weeks, necessitating yet another filter change. Within two weeks of fitting a De-Bug unit the problem vanished and fuel filters now only get changed at regular service intervals, when they still look absolutely fine.

Another happy customer is the CFA workshop manager in Bairnesdale, Victoria. After contaminated fuel stopped a truck on its way to a fire, a De-Bug unit was installed. Now, many trucks and De-Bug units later they haven't had a bug problem and their fuel filter elements are as clean as the day they put them in.

The L1000 and L4000 De-Bug units also carry NATO part numbers while Volvo, after three years of testing, have them under their Quality Assured Products product line as QL, Fuel Decontaminator. It seems hundreds of other companies around the world have had similar positive reports on the De-Bug units.

My experiences since fitting the Dc-Bug unit are similar. Once we found the bugs in my filter, and we can rightly assume: in my fuel tank as well, we fitted the De-Bug unit at Brad Newham's Outback 4WD Centre in Bayswater, ph: 03 9761 ??22. That was at the 20,000km mark.

While up on Cape York - after about 12,000km had been clocked up with the unit installed - I got caught in the rather embarrassing situation of running out of fuel. It's a long story but. suffice to say, I made it into camp with the engine coughing and spluttering on the final dregs of fuel from my tank. In the fuel filter bowl the signs of water could be seen, but not one sign of any bugs.

Back in Melbourne we changed the fuel filter and we cut the filter element up to see what it was like. Again it was perfectly free of any sign of algae, bacteria or fungus.

It was enough to convince me t was onto a very good thing. Now, after the hug treatment, I can he assured the fuel my engine receives is as clean as it can be and t won't have any problems with filter blockages or acids eating injectors and the like.

Maintenance on the De-Bug units is minimal. Any sludge or water which settles in the bowl can be drained off at regular intervals while any metals from the fuel tank which congregates on the magnets can also he easily dislodged by removing the howl cover. After 25,000km I've checked the unit but have found no requirement to do either.

For more information contact Garth Morison at Morison & Morison 1111., ph: 03 9533 5446, email ga@morison.com.au or check out www. morison.com.au/de-bug.htm

Now I am confident my fuel is as clean as it can ever be