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Past Issues

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A hole in the cash bucket

If you need to protect your fleet against slimy HUMbugs, engine misfires and disastrous downtime, then you need to look at an issue that normally only receives attention when it is too late - water in diesel fuel. And it is particularly apt to look at this issue now given that the recent floods have no doubt contaminated diesel fuel storage sites all over the country. The good news is that fleet operators can be much more proactive than merely calling in their fuel suppliers to conduct checks when engine damage is widespread. Water in diesel fuel also favours the growth of HUMbugs - yes there is such a term - that shortens filter life and with winter upon us, it is good to know that ice crystals can block the system in extreme cold. Don't be a victim - fight the slimy HUMbug urges FleetWatch technical correspondent, Dave Scott.

When drivers call in at the start of their trips reporting loss of power, excessive white exhaust smoke and engine misfiring combined with erratic idling, you know it will be a bad day.

Anyone who has experienced water contamination in diesel fuel supply tanks knows this can cost anywhere upwards of R10 000 per engine in damage to fuel injection systems - and then add to that figure for the day or two off the road in lost production. If the water has been able to by-pass the water trap separator on a Cummins N14 engine, the damage to fuel injection systems will cost in the region of R25 000 and more.

Diesel fuel acts as lubricant for injector pumps and injectors and the presence of water causes rust and seizures. Electronically managed engines experience spring breakage inside the injectors. What stares at you through all of this is the replacement of injectors, fuel pipes, fuel pumps and trucks limping home on reduced power. The effects of poor combustion will also lead to burning of pistons and rings.

The multiplying effect of water contamination in a fleet of diesel powered vehicles is horrific. It can, in fact, bring a business to a smoky halt. Whether the fleet is young or old, the fact remains that this type of damage is not warrantable. You are on your own with the consequences.

Water water everywhere

The usually dry South African climate has lulled transport people into complacency when it comes to managing the protection of fuel systems. The cascade of events that leads to water in diesel starts with a dirty yard that has blocked drainage outlets. A wet summer floods the transport yard and swamps the fuel storage tank sump covers which, in turn, have never been correctly fastened down and checked for perfect sealing. A devil's engine brew is thus mixed and prepared for dispensing to the fleet.

Water is the most common contaminant that accumulates in fuel through the simple lack of monitoring of storage systems. Ever present in the atmosphere, water ingress can also result from:

- Storage tanks breathing in humid air after a temperature change.
- Water in the air condensing when the temperature drops.
- Dissolved water separating out when the temperature of diesel fuel drops.
- Condensation also occurs as hot fuel returning from injectors flows back into the cooler fuel tank. As the temperature decreases, fuel holds less dissolved moisture. Free water in liquid form is heavier than diesel fuel and settles in the slow flow, or low areas of a fuel system.
- Water leaking in fuel tanks during transport - poor housekeeping practices on the part of suppliers can be a major undetected contributor to the problem.

The slimy problem of HUMbugs

Water in fuel allows the existence of fungus and bacteria that live in the water while feeding off the hydrocarbons found in fuel. These contaminants are called Hydrocarbon Utilizing Microorganisms, or go by the acronym of HUMbugs.

A microbial problem is evident when the spores become active and multiply forming colonies and mats of growth. Colonies then spread through the fuel system wherever moisture, or even trace amounts of moisture are present.

Bacterial problems in fuel are characterized by shorter fuel filter life, evidenced through black slime over the entire surface of the filter media. Draining the fuel system will reduce microbial activity but not eliminate it. Once microbial activity has started in a diesel fuel system, the only way to eliminate it is to treat the system with a biocide. Biocides are classed as very hazardous substances and should be used in consultation with your fuel supplier. Laboratory tests will confirm the presence of HUMbugs.

Ignorance and attitude

Ignorance compounds the problem. Many drivers of medium and heavy trucks haven't a clue what some of the dash warning lights mean. When the water trap separator lamp glows - if the truck is fitted with one - more often than not the driver will overlook this provided that the vehicle does not stop or overheat. In any event, the average age of South Africa's 275 000 truck fleet, over 3,5 ton GVM, exceeds 11 years so most of our trucks are not even fitted with water trap separators.

It appears to be a real problem to get drivers to drain water off braking system air bottles. The times I have checked the drain valves on air pressure vessels have indicated water is an unchecked part of safety critical braking systems, causing damage to expensive brake valves. If vital brake checks are disregarded, how are we ever going to install an ethic of monitoring the condition of the fuel system?

Fix the cause not the symptom

A clearly written fuel policy is a good starting point. Policy sets the standards, specifications, procedures and training required to control the purchase, storage and dispensing of fuel supplies. Without the benchmarks set in a fuel policy document, there can be no way of enforcing discipline. 'If you can't tell me what to do and how to do it, then anything goes'!

Here are a few suggestions that should not only be incorporated in the fuel policy and procedures document, but should form part of daily operational procedures to hold the slimy HUMbugs at bay:

- Purchase fuel from reputable suppliers to a guaranteed specification. In this case, SABS 342 covers the quality of diesel fuel.
- Install good housekeeping procedures - cleanliness, drainage, secure sealing of inlet valves, breathers that are unclogged and do not draw in contaminants.
- Check the fuel tanks for water just before, then some time after delivery. Regular checks should also be made using 'water finding paste' to accurately detect the presence of water. Visual checks are too imprecise.
- Ensure that the fleet, regardless of age, is equipped with water trap separators. Modern trucks, even down to the small Toyota Dyna and Mercedes-Benz Sprinter are equipped with water trap separators and warning lights on the driving console. Cummins Engine Company wrote this into their specifications with effect from September 1991.
- Train drivers and maintenance staff on the importance of ensuring that water trap separators are attended to regularly - and what the warning lights are telling them. Don't neglect this and only attend to it when a breakdown occurs.
- Keep fuel tanks filled up when parking vehicles overnight. The condensation that forms in an empty diesel fuel tank at night with a drop in temperature is a problem in some areas.

The final word goes to Uli Schaaf at DaimlerChrysler: "All I know is that water contamination costs us and the industry a lot of money and nobody is ever responsible! Perhaps the chemical industry can come up with a Litmus type of test that can easily be done by anyone, including the drivers at the pump."

Fuel supply companies please take note of this comment.

References:
1. Ian Simpson - Komatsu Southern Africa
2. Uli Schaaf - DaimlerChrysler
3. John Kisbey-Green - Cummins Diesel Sales & Service
4. Graham Howse - Toyota SA Trucks
5. Raymond L. Abraham - Shell South Africa