



DIESEL - Do you know what you are using?

*You've remembered to check the tank. Ordered your Red Diesel. Great, all set...
...but are your tractor engines?*

It would seem the days of filling up your fuel tank and forgetting about it are long gone!

Have you found....

- **The need to replace fuel filters more often?** (Diesel Bug)
- **Failing fuel injectors or Fuel Pumps?** (Lack of lubricant in the fuel)
- **Black excessive exhaust smoke?** (Deposits in the fuel system)
- **Increase in fuel consumption?** (Deposits in the fuel system)
- **Difficult Starting?** (Deposits in the fuel system, low Cetane number)
- **Fuel discolouration?** (Fuel degradation, or Diesel Bug)
- **Increase in oil consumption?** (Deposits in fuel system and injector)

Ignore any of the above and it will show as an engine breakdown or engine management will put the engine into "limp home mode"

Clean, dry, uncontaminated diesel is essential if you want reliability from modern engines.

Engine manufacturers now commonly refuse claims for warranty on fuel-related components owing to off-spec or contaminated fuel; especially modern, high end top of the range machinery.

Refiners sell fuel to use, not to store – they put in additives to maintain quality up to six months and recommend fuel is not stored much longer than this. Consider this; - Your fuel is probably at least two months

old when you get it, having been bought, sold and transferred up to seven times as it works through the supply chain. Can you guarantee that at each stage, it is not collecting debris?

With increasing Bio-diesel percentages, changes in temperature and general degradation, the fuel you finally have delivered, often already contains excess saturated water and potentially diesel bug.

But what is Diesel Bug?

Diesel is organic and absorbs water so provides the ideal environment for microscopic fungi, yeast and bacteria to feed and multiply. There are hundreds of different yeasts, fungi

and bacteria and the fuel absorbs them from the air. A combination of any can lead to the microbial infection commonly known as "Diesel Bug". Diesel Bug multiplies exponentially, doubling its size every 20 mins, just one millionth of a gram can grow into Biomass, a few centimetres thick in just 12 hours under ideal conditions and your diesel tank in the summer provides ideal conditions.

Your tank has.....A plentiful low sulphur fuel source in a dark perfectly still tank that gently warms up during the day, then cools at night adding more oxygenated water from condensation to fall to the bottom of the tank. Previously, high sulphur levels in fuel used to hold back the development of diesel bug.

Diesel Bug lives in the water and feeds of the fuel above, they excrete





removed the lead from Petrol and all the problems it caused?.....this is similar.

As you may be aware, there are two types of "Red Diesel" available.

By far the most common is A2 Gas oil but there is also the better quality, EN590 road fuel, with a red dye in it. From our market research this year, we found most Red Diesel suppliers only offered A2, very few offered EN590 with red dye.

Modern engines are tuned to perform with fuel having a Cetane number of at least 50 as in red diesel from EN590 fuel. Class A2 red diesel has a Cetane number of 46. The Cetane number is the measure of how quickly a fuel burns, so if you are having starting difficulties, particularly in winter then this may be worth considering.

The renewable fuels directive, require road fuel (EN590) to contain Bio Diesel (FAME) up to minimum 7%. What is not known is that A2 Gas oil can also contain up to 7% BioDiesel.

BioDiesel is highly hygroscopic and by-products of its production are glycerine and water.

A modern fuel problem shows itself in fuel system deposits and a classic sign of fuel degradation is gumming and lacquering. These deposits begin to coat the fuel system, resulting in smoking exhausts as fuel systems struggle to operate efficiently. This then leads to increased fuel consumption by up to 5% or more, before it becomes apparent. Hence, if you're using 4000 litres a month, that's an extra 50 litres of wasted diesel a week.

Tier 1 and 2 engines could most likely burn anything but now we have Tier 4, 5 and 6. These new Common rail engines operate at fuel pressures unheard of a few years ago: they have engine management systems that fire the injectors up to six times during the firing stroke, meaning the humble injector is firing at 100 times a second. They have piezo electric actuators because electricity operated solenoid injectors are too slow and have tolerances so small they are measured in a few microns (a human hair is 100 microns). These finely tuned machines need clean, dry precise fuel to operate efficiently as the manufactures have designed them.

like all living organisms and die after 24/36 hours. These dead bodies, adding to the excrement, cause the tell-tale sludge found in filters and are the first signs of a problem.

By the time you find it in your filters, there could be a significant layer of sludge on the bottom of the tank as fuel suction pipes never suck from the very bottom. As the sludge builds it becomes acidic, further accelerating the degradation of the diesel adding to the sludge build up.

The result of course, is engines failing to run, causing downtime, loss of revenue and unhappy customers, if you're a contractor.

What's happened?

Diesel has changed. Government, EU, commercial and environmental pressures have produced a diesel requirement very different to thirty years ago. Consider that refiners now extract twice as much fuel from a barrel of crude oil than they did in the 80's and the barrels are from oil fields that were classed uneconomical and of poor quality in the 90's leading to phenomenal technical changes in refinery techniques.

Fuel was then refined from low sulphur "sweet crude" (ie North Sea Brent Crude) and was simply refined and sold as it had been for decades, no one was concerned about sulphur in the environment.

However, sweet crude is getting expensive to source, so now "Sour Crude" (from Middle East etc) is becoming the norm.

Sour crude is a high sulphur high toxic crude oil refined to make diesel but needs special refining to achieve Ultra Low Sulphur Diesel (ULSD) and comply with government and environmental legislation.

Consequently, we have now opposite extremes; starting with high sulphur crude to make an almost zero sulphur diesel. This requires special "Hydro-treating" refining techniques that makes the diesel unstable which not only removes the sulphur but also removes the compounds that give the fuel lubricity.

Do you remember when they

What can you do?

- Only buy from a reputable trusted supplier. There is a lot of 'cheap' fuel around. A2 gas oil should have a lubricant added at manufacture but it's a cost and only the very minimum is added, (suspect suppliers even leave it out), which may result in rapid failure of fuel pumps and injectors.
- Marship recommends, along with the OEM manufacturers, using Red Diesel from EN590 road fuel, which is better regulated, has a higher Cetane number and often better lubricity.
- Ask your supplier- can they/will they deliver EN590 with red dye.?
- Drain the storage tanks of water from the drain valve (if you have one) at least once a week. Dewatering systems are available.
- Simply remove the water and you remove the Diesel Bug habitat.
- Treat the fuel with a detergent and lubricity improver to ensure deposits cannot form and the lubricity requirement is guaranteed, so that puts you in control of the quality of your fuel. Simply poured in during fuel delivery or with a dosing pump

Automatic Fuel additive Dosing Pump

Fuel deposits can easily be removed by continuous dosing with a multi-function additive put directly into the storage tank. It consists of a detergent, a lubricity improver and a biocide, to protect the tanks in the machines from Diesel Bug.

If you need to store fuel for longer than six months, then it may be beneficial to top up the additives introduced at manufacture.

A good multi-purpose treatment such as DieselAid® C added at 1 litre per 2000 litres should contain a Stabiliser, lubricity improver, emulsifier, detergent, cetane improver and a biocide. Added with the fuel at every delivery, DieselAid® C will ensure the fuel in your tank and in turn, your engine, has the best chance to deliver the intended power.

Marship is a new company to the agricultural market which specialises in diesel fuel, be it fuel conditioning, cleaning or maintaining and storing. They have a complete range for maintaining diesel and are happy to give advice free of charge.

You can contact Marship at sales@marship.eu. Tel: 01666 818791 www.marship.eu