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Gone are the days of filling up your tank and forgetting about it.

If you have a modern common rail injection engine or are considering buying a new engine then the following is for you.

With increasing legislation, OEM manufacturers are under increasing pressure to produce ever more environmentally friendly engines and the holy grail of reduced fuel consumption. They can be applauded for the technical advances, but what are they?

Arguably Rudolph Diesel invented the diesel and his fuel system changed little for almost 100 years, then the accountants started running the businesses and in came the need for more power from smaller engines with reduced fuel consumption and now reduced emissions. The OEM's played with the timing, the valves and then turbocharging solved most problems, and then the attention went to the fuel system.

For years Injection pressure was linked to engine speed and was typically 3/4000 psi, they were crude, simple systems but extremely reliable and operated on the pressure of the fuel; imagine an engine doing 3000 RPM is injecting at 25 times a second.

Development brought the common

rail, injection pressures to 35,000 psi using solenoid operated injectors, but the electricity was too slow. Latest technology brings 65,000 psi, with pizzo-electric injectors (imagine your BBQ fire lighter in reverse) these systems are so advanced they can inject up to 7 times more during just one compression stroke, at 3000rpm that's the equivalent of 175 times a second, repeat 175 times a second!

To achieve this, the injection valves are so light you would not even know you were holding them!

But with all this advancement, the humble diesel fuel has not changed a jot, indeed the quality is falling. Sulphur has been completely removed so lubricity additive has to be added and now Bio-diesel is causing the fuel to be unstable, leading to many incidents of deposits and lacquering. Additionally in a modern marine engine a molecule of fuel is subject to immense heat and pressure many times before it is actually burnt in the engine, diesel is not designed to act as a coolant, it is a fuel to be burnt.

Water is another enemy, traditional diesels could handle a relatively small amount but not a modern engine, water can mix with fuel (especially if



using an enzyme additive), this can lead to rusting of internal components when the engine is stopped and in some cases, has become superheated steam at the injector nozzle tip and blown off the tip of the nozzle leading to major engine failure.

Modern diesel has to have additives but low oil prices have left a very competitive market for the suppliers, and they are on focussing costs and additives are a cost so they add the very bare minimum, and of course some don't. If you have a common rail engine we recommend a deposit control additive as a minimum, if you store diesel which is very possible as boats are tied up for prolonged periods over winter, then stabilisers have to be reintroduced as modern diesel degrades in a few months.

If you would like to know more contact us sales@marship.eu for an information pack or read the articles sales@marship.eu

