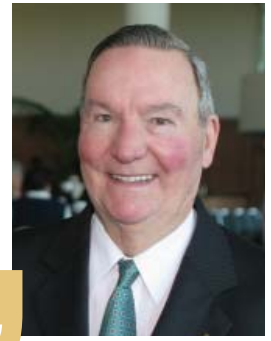


Common Rail Diesel Engines, the new Buzz Word!

What's different about these engines, and what are the benefits?



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CONVENTIONAL DIESEL ENGINES

The major change is the mechanism for injecting the fuel into the cylinders, and how the fuel injection is controlled.

Until recently, fuel was injected into pre-combustion chamber/s, or directly into the cylinder/s from an In-line or a Rotary Injection Pump via an individual pipe/s connected to each Injector.

The fuel injection pressure was controlled to approximately 2,240 pounds per square inch, (152 times barometric pressure), by spring force in the injectors, and the volume was controlled by a combination of throttle and engine-driven governor settings.

The fuel reached the cylinder/s in very fine spray form via single or multiple holes, when the injection pressure exceeded the spring tension setting in the injector body.

Excess fuel was returned to the fuel tank after cooling the injectors, and to help keep the fuel cool.

Engines started on full rack setting, and clouds of smoke (partly burnt fuel) emitted from the exhaust system then, and upon heavy acceleration.

Environmental concerns for reduced exhaust emissions world wide, have resulted in the requirement for reduced levels of Carbon Monoxide, Carbon Dioxide, Oxides of Nitrogen and Sulphur.

Engine Manufacturers have responded by producing more efficient engines fitted with Common Rail Petrol and Diesel Engines, Turbo-Chargers, Catalytic Converters, Intake and Exhaust Systems etc.

These have resulted in increased performance and efficiency for the same engine capacity together with cleaner exhaust emissions.

COMMON RAIL DIESEL ENGINES

The Fuel Injection System fitted to these engines is very different.

Fuel is fed to the fuel pump that is usually a "Cam and Ring" design at much higher pressure than the earlier systems, and from there to a "Common Rail" to which the Individual injection pipes are connected.

The pressures in this type of system operate at between 23,000 to 29,000 pounds per square inch, (156 bar to 197 bar), more than 10 times previous pressures. Injection pipes and Injectors must be replaced as a pair.

Some use hydraulic pressure to inject the fuel, but most use computer controlled solenoids to control the timing and duration of injection. Some monitor and adjust individual quantities of fuel injected at idle to smooth the engine and reduce diesel knock.

In some instances these systems inject a small quantity of fuel before Top Dead Centre to start the combustion process and have up to five injections during the Power Stroke.

On some, the Injectors have multiple holes not much larger than the diameter of a hair. Some designs dump a small quantity of fuel from the injectors after shut-down to reduce residual line pressure.

Special protective clothing is mandatory when working on these systems.

A Laptop Computer is necessary to make any adjustments to the Engine Management.

The main Enemies of these Systems are Foreign Matter and Water in the Fuel. Bio-Fuels can absorb 15% of their Alcohol content of water from the atmosphere.

PRO-MA DT5 DIESEL TREATMENT helps:

- Control and dissipate water absorption
- Clean sludge and deposits from the fuel
- Lubricate and assist the combustion
- Reduce exhaust emissions



