

## Common Rail Injection Explained

Increased government regulation and the push to lessen greenhouse gas emissions in recent years, has led to the modern high-pressure injection systems. Unit Injector and Common Rail design have transformed the plodding, black smoking, and inefficient diesels of yesterday into the sporty, fuel-efficient and clean diesel vehicles of today. This is the New Clean Diesel.

The Common Rail system in particular gives engine developers the freedom they need to reduce exhaust emissions even further, and especially to lower engine noise. The particular design of Common Rail, with its flexible division of injection into several pre, main and post-injections, allows the engine and the injection system to be matched to each other in the best possible way. In the Common Rail accumulator injection system, the generation of the injection pressure is separate from the injection itself.

Diesel fuel is drawn from the fuel tank by a fuel transfer pump. After the transfer pump draws the fuel from the tank it will pass through at least one primary fuel filter. A high-pressure pump generates in an accumulator &ndash; the rail &ndash; a pressure of up to 1,600 bar (determined by the injection pressure setting in the engine control unit), independently of the engine speed and the quantity of fuel injected. The fuel is fed through rigid pipes to the injectors, which inject the correct amount of fuel in a fine spray into the combustion chambers. The Electronic Diesel Control (EDC) controls extremely precisely all the injection parameters &ndash; such as the pressure in the Rail and the timing and duration of injection &ndash; as well as performing other engine functions.

### Advantages of the Common Rail Diesel System

The electronically controlled common rail system has many advantages:

- Increased Performance (more torque at low engine speeds)
- Reduced fuel consumption
- Less exhaust and emissions
- Quieter running engine

### WARNING

Common rail diesel fuel systems operate at very high pressure and can cause severe injury. Fuel pressures of up to 2000bar may be present. Never attempt to service or repair any Common Rail or pressurized fuel system without the proper equipment and training.