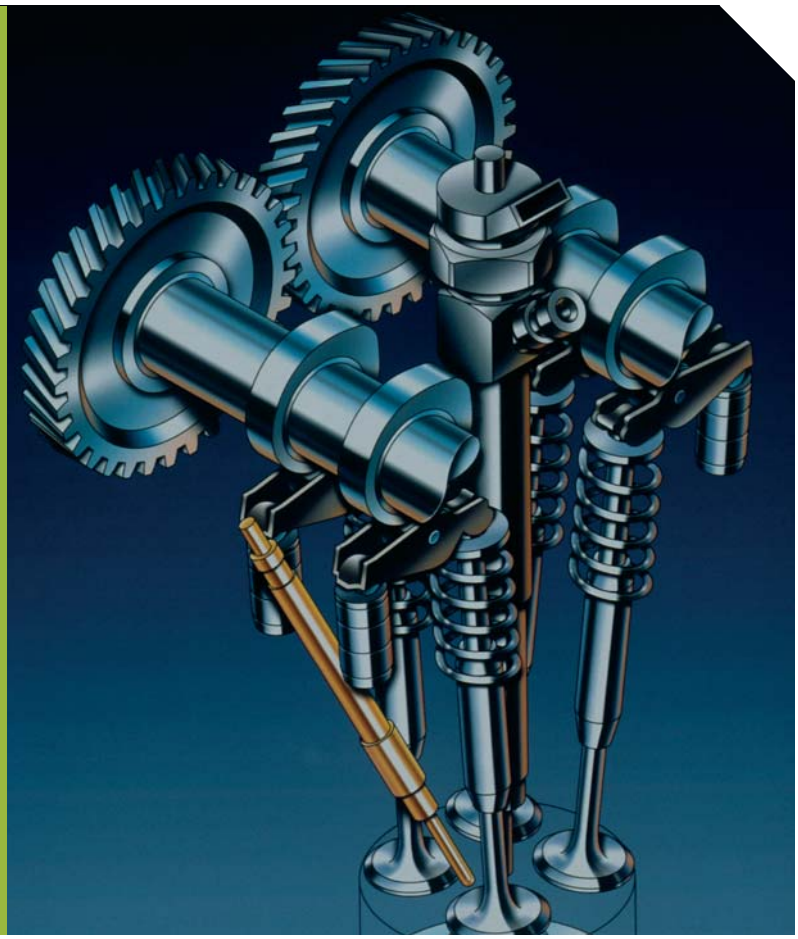
Multi-injection diesel engines

Distributing the quantity of diesel fuel over several injection cycles optimises combustion. This technique helps to reduce emissions and engine noise.



RENAULT COMMUNICATION

BASIC FACTS

The speed of reaction of electronic injectors allows the use of multi-injection. The overall amount of diesel vaporised in the engine combustion chambers is divided into several squirts to optimise combustion while the piston is moving. This technology enables some engines on smaller vehicles to meet the requirements of the Euro 4 standard, without the need for a particulate filter.

IN SHORT

Up to five separate squirts distribute the vaporised diesel fuel in the engine's combustion chambers to optimise combustion.

HOW DOES IT WORK?

The injection computer commands the injector opening time and the phasing of each squirt to provide an amount of fuel which optimises combustion in terms of polluting emissions and noise.

There are several injection cycles:

• **Pre-squirt, principal squirt and rapid post-squirt:**
In this first cycle, the pre-squirt preheats the combustion chamber prior to the principal squirt, which enhances combustion. The principal squirt is dictated by the engine power required, and hence by the position of the accelerator. The rapid post-squirt has a dual function. Firstly, it enables the residues of the primary injection to be "reburned", and as a result, reduces particulate emissions and unburned hydrocarbons. In addition, occurring as the piston descends, it increases engine torque.

• **Double pre-squirt and principal squirt:**
Here, the double pre-squirt ensures that the energy from the combustion of the principal squirt is released gradually. This reduces carbon monoxide emissions and unburned hydrocarbons by optimising combustion of the mixture. In addition, it reduces combustion noise.

• **Five squirts:**
This engine cycle consists of two pre-squirts, one principal squirt and two post-squirts, a mode of operation that combines the advantages of the previous modes. The function of the second post-squirt is to enrich the mixture and/or increase the temperature of the exhaust gases so that the particulate filter always operates at maximum efficiency.