

# Lower Sulphur Diesel

## – What does this mean?

Lower sulphur diesel is cleaner, safer and allows new vehicle technologies to be used.

- Many new vehicles emissions technologies require lower sulphur diesel in order to operate. These new technologies will help to reduce several harmful emissions and increase engine efficiency.
- Diesel currently has large amounts of sulphur in it. That sulphur, when used in a diesel vehicle, produces sulphur oxides and particulates. Both sulphur oxides and particulates have been linked to several health problems, especially respiratory problems.

The Petroleum Products Specifications Regulations 2002 will require oil distributors to provide this new cleaner, safer fuel from August 2004.

Most diesel consumers will not notice any change in the operation of their engine. But, when lower sulphur diesel is first introduced in August 2004, there may be a temporary increase in fuel injection pump seal failures for some vehicles (most likely pre-1995 Japanese or Korean light diesel vehicles).

Diesel owners should:

- Check for signs of a seal failure and have seals replaced if a failure occurs,
- Establish or maintain a routine maintenance program.

Owners of some kinds of vehicles may wish to replace fuel injection pump seals at their next service.

### *When will this happen?*

The timetable below shows when sulphur levels will have to be lowered. In practice, diesel with reduced sulphur levels may be supplied several months in advance to ensure all diesel is compliant by the required date.

August 2004	500ppm
January 2006	50ppm
By 2009-2010	10-15ppm

The final shift to sulphur levels of 10-15 ppm hasn't been put into regulation yet but is intended. The timing of this final shift will be reviewed in 2005.

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### ***How will diesel change?***

Diesel currently contains up to 3000 parts per million (ppm) of sulphur. The new lower sulphur diesel will contain at the most 600ppm and on average 500ppm of sulphur.

Reducing the sulphur content of diesel can result in changes to several fuel characteristics other than sulphur levels. Many of these characteristics, such as conductivity and lubricity, will be dealt with by the oil industry. This means there will be a smooth transition to the new diesel for most engines.

The desulphurisation process will probably also reduce the level of aromatic compounds in diesel. This reduction in aromatic content could affect some seals.

### ***How will the change affect seals?***

Seals in contact with diesel of high aromatic content often absorb the aromatic compounds, which makes the seals swell. If diesel with a lower aromatic content is then used, the seals may shrink back. The combination of seal shrinking and pre-existing ageing effects such as compression set or twisting can lead to seal failure and leaks.

Overseas and domestic experience suggests that the seals most susceptible are Nitrile Butadiene Rubber (NBR) seals in Bosch type Denso or Zexel rotary fuel injection pumps. More specifically, older (at least 6 years) cover seals and throttle shaft O-ring seals may be affected. These susceptible components occur most often in pre-1995 Japanese or Korean light diesel vehicles.

Some diesel owners may wish to replace fuel injection pump seals before the change to lower sulphur diesel. The Ministry's research suggests the introduction of lower sulphur diesel simply emphasises the need for regular maintenance of diesel engines. But diesel owners and mechanics should look for the tell tale signs of a fuel pump leak such as a reduction in fuel efficiency, smoky exhaust or visible signs of a diesel leak.