



Impact of Reducing Sulphur in Diesel Fuel

The sulphur content of diesel fuel is being lowered to comply with National and international standards to improve air quality and to enable new technology engines to be introduced. The current sulphur content of diesel is less than 10 parts per million and has been introduced 1st January 2009. This will ensure that Australia will have diesel fuel of a quality consistent with international standards and will enable the import of latest technology low emission and high economy diesel engines from Europe and the United States. The Ultra low sulphur diesel will enable improvements in urban and workplace air quality by reducing diesel exhaust particulate emissions and reducing output of oxides of nitrogen which is linked to smog.

Low sulphur diesel fuel is made by refining crude types that are naturally low in sulphur or by further refining diesel fuel using a process called hydrofining which removes the sulphur, which is then used to make fertiliser.

Comparison with Australian Standard for Diesel Fuel 3570

Low sulphur diesel fuel meets all the requirements of the current Australian Standard for Diesel fuel. Properties such as cloud point, cetane, and distillation meet the requirements of the standard and are no different because the sulphur content has been reduced. In fact the process of removing sulphur will improve properties such as storage life. All diesel fuel sold in Australia must comply with the National Fuel Quality Standards of 2000, Diesel Determination of 2001.

Impact on Lubricity

Sulphur compounds in diesel fuel act as natural lubricants for fuel system components such as fuel pumps and injectors. Removing sulphur reduces the natural lubricity of the fuel. To ensure that this does not cause problems, lubricity is measured by additional testing during the manufacturing process. If lubricity does not meet accepted international standards then it is treated with an additive at the refinery. BP Low Sulphur Diesel fuel is tested to ensure that it always meets recognised international and manufacturers standards for diesel fuel lubricity as measured by the ASTM D 6079 High Frequency Reciprocating Rig.

Impact on Seals in Fuel Pumps

Seals and O rings in fuel pumps can react to fuels of different composition by swelling or shrinking. Changes in fuel composition happen due to changes in the manufacturing process to meet summer or winter requirements, due to different crude types being used and due to the refining processes used to remove sulphur. Fuel pumps on equipment more than 8 years old contain seals made of buta-n rubber that tends to harden with age and crack. The cracked seals tend to leak when diesel fuel composition changes, this is normal and means that the fuel pump needs maintenance. The solution is to replace the seals with new ones.

What will happen as ultra low sulphur diesel fuel is introduced?

For the majority of vehicles there will be no perceptible change except that exhaust smoke will be reduced, crankcase oil soot levels may also decline because less soot is being produced. Diesel fuel pump repairers may sometimes notice a grey deposit on fuel pump components; this will be the lubricity additive providing additional protection to the fuel pump. Not all additives produce the grey film.

Operators of some equipment more than 8 years old with rotary and CAV type pumps (vehicles and tractors) may notice some weeping of fuel around the pump body, this is an indication that the fuel pump seals are old and need to be replaced with new seals depending on how serious the leak. Operators with tractors with CAV pumps where there is a shaft seal between the engine crankcase and the fuel pump should check crankcase oil levels frequently. Any leakage of the crankcase seal will see oil levels rise.

When will zero sulphur diesel be introduced?

It has been recommended that from January 1st 2009 diesel fuel Australia wide should contain no sulphur. This fuel will contain no more than 10 part per million of sulphur as of this date. It is unlikely that Zero sulphur will be introduced in the near future.

**For further information, please call the BP Lubricants and Fuel
Technical Helpline 1300 139 700 local call
or visit www.bp.com.au/fuelnews**