

# Fuel Quality Directive - Red Diesel Requirements

## Introduction

1. EU Directive 2009/30/EC introduces a requirement that, from 1<sup>st</sup> January 2011, all red diesel must contain no more than 10 milligrams of sulphur per kilogram of fuel (virtually 'sulphur free').
2. Sulphur free red diesel is needed to ensure the reliable operation of pollutant emissions control systems, which will be fitted to new off-road equipment from 2011 to meet EU emissions requirements. Without sulphur free fuel these systems would suffer progressive and irreversible damage. The introduction of sulphur free fuel will have a number of direct and indirect impacts of which users will need to be aware. However, with proper handling, any problems are likely to be quite limited.
3. Legislative requirements for red diesel for other purposes will not change, however some fuel suppliers may choose to supply sulphur free red diesel for these applications as well.

## UK Red diesel Supply

4. At present UK fuel supply includes two 'diesel' grades, road diesel and red diesel (Gas oil) which is supplied for off-road equipment, coastal shipping, commercial heating applications and stationary equipment. Red diesel currently contains up to 1000 milligrams of sulphur per kilogram, but road diesel is already sulphur free. The oil industry has indicated that they expect to meet the sulphur free red diesel requirement largely by supplying road diesel for use in off-road equipment. Fuel suppliers will supply road diesel with a red excise marker dye added for off-road equipment use.
5. Because road diesel contains some biodiesel (up to 7%), much off-road equipment red diesel is also likely to contain biodiesel by 1<sup>st</sup> January 2011. Biodiesel blends of up to 7% are compatible with existing off-road equipment engines provided good housekeeping arrangements have been adhered to in storage of the fuel.

## Fuel Storage

6. Because of these changes in fuel quality increased care will be needed in the storage of sulphur free red diesel where this contains biodiesel. The oxidation stability of this fuel will be poorer than that of current red diesel. Over time oxidation can precipitate solids with potential to block filters in fuel systems. To minimise the likelihood of this occurring, it's recommended that users ensure a fuel turnover period of at least 6 months and at the most no longer than once every 12 months.
7. Sulphur free red diesel containing biodiesel will also be more prone to bacterial contamination than current red diesel. Bacterial growth can also potentially result in blockage of fuel filters and increased corrosion. Prolonged use of contaminated fuel could result in damage to engines. Bacterial growth can be prevented by eliminating water from fuel storage tanks and conducting monthly checks that tanks remain free of water. Where a bacterial growth outbreak has occurred this can be addressed by emptying and cleaning the tanks.
8. Sulphur free red diesel containing biodiesel is a better solvent than current red diesel. As a result it may pick up deposits already present in fuel storage systems and fuel tanks. To prevent those deposits from blocking filters, replacement of storage tank and engine fuel filters, outside the regular service interval, is recommended.

9. Fuel seals in sight gauges on older fuel storage tanks may be incompatible with sulphur free red diesel, irrespective of whether it contains biodiesel, and may require replacing. Users should examine sight gauges following the switchover to sulphur free red diesel. If there are signs of leakage they will need a replacement of these seals. If fuel storage tanks are serviced in advance of the introduction of sulphur free red diesel, it would be worth while getting fuel seals replaced as a precaution.

### **Compatibility of Off-Road Equipment with Sulphur Free Red diesel**

10. Modern off-road equipment should have no problems running on sulphur free red diesel. Indeed the road diesel that fuel suppliers are mainly likely to supply to meet the sulphur free requirement is produced to more demanding quality specifications than red diesel. Fuel seals and pipes in some older equipment may be incompatible with sulphur free red diesel and require replacing. Users should examine joints, seals and pipes in the fuel systems of their machinery following the switchover to sulphur free red diesel. If there are signs of leakage, seals and fuel pipes may need replacement. If equipment is being serviced in advance of the introduction of sulphur free red diesel, it would be worth while getting fuel seals and pipes replaced as a precaution.

### **Note**

Sulphur free red diesel will require improved fuel storage “housekeeping” arrangements. Tanks storing red diesel will need to be free of water and monitored monthly to ensure that they remain so. It is recommended that the turnover of the contents of the tank is every 6 months, but in any event, no less often than every 12 months. If a bacterial outbreak occurs in the fuel it will be necessary to empty and clean the tanks, or seek specialist help to tackle the outbreak with biocide additives and filtering. Users should replace fuel filters on storage tanks and off-road equipment as a one-off exercise, after 2 to 3 fuel tank throughputs, to prevent deposits picked up by the new fuel blocking filters.

Users of older off-road equipment and storage tanks with sight gauges should check for any signs of fuel leakage. If leakage does occur the equipment will need a one-off replacement of any leaking fuel seals or fuel pipes.

Most engines are fully compatible with this fuel. However, some fuel system components on older engines, in particular fuel seals and pipes, may not be compatible with sulphur free red diesel. Users of older equipment should examine fuel systems in the months following the switchover and replace seals or pipes with compatible ones if there are signs of leakage.