Changes to Specifications of Non-road Gas Oil (Red Diesel)

The SMMT Off Highway Engine and Equipment Group (OHEEG) wish to highlight some important changes to the specifications of Gas Oil (Red Diesel) for use in non-road mobile machines (NRMM) such as construction equipment, agricultural harvesters and agricultural tractors. The changes will also affect red diesel used for inland waterway vessels.

The changes will require additional care during the handling & storage of red diesel, and, during the transition period may require additional attention to the fuel systems of the NRMM.

Background

The 2009/30/EC amendment to the European Fuel Quality Directive, 98/70/EC, requires that, from 1st January 2011, all gas oil for use in all NRMM must contain no more than 10 milligrams of sulphur per kilogram of fuel. This is a reduction of 99% (from the current 1000 mg/kg limit) and brings the sulphur level in the NRMM fuel to the same low level as already exists in the (white) diesel used by road vehicles. Fuel with such a low sulphur limit is often referred to as 'sulphur free'

The change to sulphur-free fuel is required in order to enable the introduction of engines that comply with the latest EU NRMM engine emissions standards. Sulphur progressively and permanently degrades the emission control systems of these engines and can damage the engine itself.

Fuel standards for 'Red Diesel'

'Red Diesel' is reference to gas oil containing a red marker dye. This dye is used to indicate that the fuel is subject to a different taxation category to that applied to diesel used in road vehicles. This is the primary reason why red diesel is a lower cost than road diesel.

Red Diesel is used in non-road machines, stationary engines, heating plant & marine vessels. Historically the specification of the fuel used in all these applications was fairly similar. Now there will be distinctly different types of red diesel according to purpose for which it will be used.

In the UK, British Standard (BS) 2869 covers the land-based grades and the 2010 update to this standard, BS 2869:2010, which introduced the required 10mg sulphur per kg fuel limit, became effective from 15th November. The grade required for NRMM is Class A2: 'Automotive distillate fuel for non-road mobile machinery'.

As the new sulphur limit is the same as for the diesel for use in road vehicles, the oil industry expects to meet part of the demand for sulphur-free red diesel by supplying road fuel with the red excise marker dye added for NRMM use. The road diesel specification, EN590:2009, allows the inclusion of up to 7% FAME (Fatty Acid Methyl Ester), the basis for Bio-diesel. The UK Department for Transport (DfT) has estimated that diesel with up to 7% FAME could account for around 25% of the fuel supplied for NRMM use (depending upon fuel supplier).

Effects on Machines

Sulphur-free red diesel with up to 7% FAME is compatible with existing engine technologies providing the fuel is kept in good condition. However, as FAME acts as a solvent and can degrade some rubber components found in older machines and fuel storage systems, the following is recommended:

- Examine fuel systems following the switch to the new fuel and ensure that any seals or pipes found to be leaking are replaced.
- If any older machinery is being serviced, replace fuel seals and pipes as a precaution.
- Replace fuel filters after the first 2 to 3 tank fills of the new fuel.

Fuel Storage

Because of the changes to the properties of the fuel, increased care will be needed in the storage of fuels containing FAME. The oxidation stability of this fuel will be poorer than that of current gas oil. Over time oxidation can precipitate solids which have the potential to block filters in distribution or equipment fuel systems. Also gas oil containing FAME will be more prone to bacterial growth if water is present. It is recommended that:

- All water is removed from tanks and monthly checks are conducted to ensure they remain free of water (this may require modification to some tanks).
- Sight gauges should be examined for signs of leakage, particularly on older tanks, and any leaking seals should be replaced.
- If tanks are to be cleaned and serviced it is advisable to replace fuel seals as a, one-off, precautionary exercise.
- Replace fuel filters after 2 to 3 deliveries / turnover of the fuel.
- Ensure that the content of the tanks is turned over every 6 to 12 months to help prevent blockage of filters.

Further information

Ensure your fuel supplier is aware that the fuel you are purchasing is for NRMM. The supplier should supply you with a fuel that is fit for purpose and be able to give advice on the sulphur and bio-content of the fuel.

Further advice is also available from the Department for Transport website:

http://www.dft.gov.uk/pgr/roads/environment/fuel-quality-directive/

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