

Gas Oil (Red Diesel) Fuel Specifications for Construction Plant

This alert advises owners and users of potential problems if the incorrect specification of fuel is used in mobile and static construction plant, particularly machines fitted with EU Stage V engines

1.0 Introduction

Diesel-powered engines used in modern construction plant are becoming more sophisticated to reduce exhaust emissions and improve fuel consumption and plant manufacturers are continuously improving the technologies used within plant diesel engines. This is particularly relevant to EU Stage V engines. To eliminate potential problems, it is essential that plant owners and users are using the correct specification fuel for their machines, as specified by the plant manufacturer. Failure to do so may result in costly engine breakdowns and recovery costs, which are unlikely to be covered by the manufacturer's warranty.

Where plant is on site for long periods or hired on a non-operated basis, the plant owner needs to ensure that their customers and those responsible for refuelling the machine are aware of what fuel specification grade must be used.

2.0 Recommendation

Plant owners and users of plant must:

- a. **Check that the fuel obtained complies with the plant manufacturer's specification;**
- b. **Ensure that all those responsible for re-filling a machine are aware of the correct fuel specification that should be used.**

3.0 Fuel Specifications

There are currently four specifications of diesel fuel commercially available in the UK:

- a. White road diesel that meets European Standard BS EN 590+A1:2017 – This fuel has a maximum sulphur content of less than 10mg of sulphur per kg of fuel (10ppm);
- b. Red diesel (Gas Oil) that meets European Standard BS EN 590+A1:2017 – This is available from a number of fuel distributors in the UK and has a maximum sulphur content of less than 10mg of sulphur per kg of fuel (10ppm);
- c. Red diesel (Gas Oil) that meets British Standard BS 2869 Class A2 – This fuel has a sulphur content of less than 10mg of sulphur per kg of fuel (10ppm);
- d. Red diesel (Gas Oil) that meets British Standard BS 2869 Class D – This fuel has a maximum sulphur content of 1000mg of sulphur per kg of fuel (1000ppm).

In 2011, it became a requirement that all fuel used in non-road mobile machinery must comply with EU Ultra Low Sulphur Diesel (ULSD) regulations and must therefore contain no more than 10mg of sulphur per kg of fuel. Since white road diesel (DERV) was already ULSD compliant at this time, it is often believed that the specifications for red diesel and white diesel have been identical since the regulation change. **This is not the case.**

There are two recognized standards of red diesel (Gas Oil) that are currently in use: BS 2869 Class A2 and BS 2689 Class D.

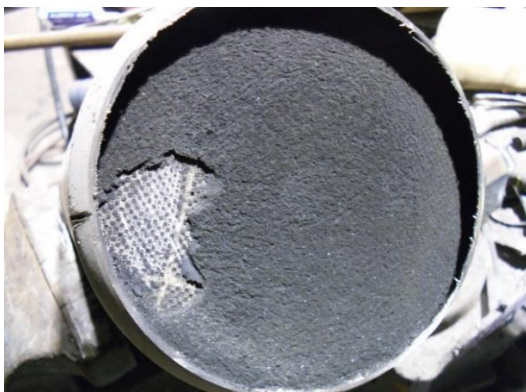
Class A2 has a maximum sulphur content of 10ppm and is used for excepted vehicles, while Class D has a maximum sulphur content of 1000 ppm and can only be used for heating or static generators.

NOTE: An “excepted vehicle” is one listed in Schedule 1 of the Hydrocarbon Oil Duties Act 1979 and includes (but not limited to) mobile cranes, dumpers, excavators, telehandlers, rollers and mobile crushers.

Neither of these the standards however, meet the specification for white road diesel (BS EN 590:2013+A1:2017, *Automotive fuels. Diesel. Requirements and test methods*). One of the key differences in specification between Class A2 Gas Oil and Road Diesel is in the fuels’ cetane values.

BS EN 590 has a higher cetane value than BS 2869, which means it has a shorter ignition delay and therefore burns more efficiently and cleanly, leaving fewer deposits in the engine’s fuel injection combustion chamber.

4.0 Examples of the problems that can arise from the use of fuel of the wrong specification



Blocked Particulate Filter



Blocked Exhaust Gas Recirculation Valve



Damaged Injectors



Blocked Fuel Filter