



# **COMMON DIESEL FUEL PROBLEMS NUMBER 1**

This is the first in a series of guides designed to help in resolving fuel problems.

## **DIESEL ENGINES - LACK OF POWER AND HARD STARTING**

These are signs that not enough fuel is getting through to the engine to provide the required power from combustion. This indicates a partial blockage of the fuel system. The most likely place for a blockage is at the main fuel filter, situated on the fuel line between the fuel tank and the engine. The fuel filter is a bowl containing a disposable cartridge made of corrugated paper designed to remove dirt particles greater than 10 micron in diameter. Some filters will also remove water which is collected in a trap and must be drained at regular intervals.

The quickest way to resolve the problem is to get a sample of the fuel from the fuel tank before the filter in a clean glass jar and look at it in a good light. If the fuel is clear and bright then changing the fuel filter should fix the problem. If the fuel is hazy or has particles floating in it, it will block filters and it should be replaced before the filter is changed.

**NOTE** Clear and bright means that the fuel contains no visible water drops or particulates and is free of haze or cloudiness. The filter bowl itself often contains water drops and dirt, this is normal and would not usually cause filter blockage unless there was too much.

The common causes of filter blockage are:-

## **SUSPENDED WATER**

Suspended water appears as a haziness in the fuel and is normally a cold season problem. When diesel fuel cools down during storage dissolved water will be released as small droplets. If the droplets do not drop to the bottom they will form a haze. This can be seen on cold mornings after overnight storage and it will disappear when the fuel warms up. Generally seen as a greasy emulsion on blocked filters which disappears when the filter is dried. This problem can be resolved by ensuring that any settled water is drained from the tank each morning.

## **SUSPENDED PARTICULATE MATTER**

Dirt, rust or oxidised fuel may form a fine suspension of brown or red particles, causing a greasy black deposit on the fuel filter. Laboratory analysis of the filter and fuel may be required to establish the cause. Resolution of the problem may require change of fuel and/or improved fuel storage management.

## **WAX**

Under cold conditions wax can be seen as a light yellow suspension in the fuel. When the fuel is cooled below the temperature at which the wax comes out of solution (cloud point) it can block filters by forming a yellow waxy deposit. This is a result of using the incorrect fuel for the season or region, eg. using summer grade ADF in winter or bringing an ADF from warmer areas to a colder area during winter. The problem can be fixed by waiting for the fuel to warm up and changing the filter or by lowering the cloud point by the addition of up to 30% of heating oil to the fuel. To help prevent waxing problems you should always ensure that all fuel is changed over to fresh fuel by May at the latest. There is a two month lead time in the distribution of the fuel to ensure that all fuel available by May is winter grade for the cold period between the start of May and the end of July.

## **FUNGAL CONTAMINATION**

Fungal contamination is a symptom of poor water draining. It is normally associated with long standing free water, hazy fuel, suspended water and dirt. Fungals are detected as a black/brown chocolate mousse blocking filters. Laboratory analysis of the filter and fuel may be required to confirm that active fungal growth is present. Fixing this problem will require changing of filters, frequent and regular draining of water, slime, sediment and hazy fuel from all storage tanks. Serious contamination may require thorough tank cleaning and treatment with a biocide. Normally a warm season problem. Prevention is by frequent and regular draining of all water.

## **ADDITIVES**

Sometimes customers treat fuels with additives, if they are not mixed with the fuel correctly then they may block filters. The appearance of the filters and contents of the filter bowl will depend on the additive used. Sometimes the additive will discolour water in the filter bowl so it looks like fuel. Combustion improvers may look waxy. The first use of detergent additives will probably carry rust and dirt on to the filter. The problem is usually fixed by changing the filter after finding out what additives are used.

## **NOTE**

A problem with one truck is indicative of a problem with fuel on the trucks' tank. Problems with a number of trucks indicates a problem in the main storage tank and investigations should concentrate on that tank.

**For further information, please call the  
BP Lubricants and Fuels Technical Helpline  
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