



## Common Diesel Fuel Problems – Slow Starting

Diesel engines are sometimes slow to fire and produce hazy blue or white smoke from the exhaust. This commonly occurs when starting a cold engine on a day when the temperature is less than 5 deg C and is associated with the following properties of the fuel.

### CETANE INDEX

Cetane index describes the ignition delay or ease of starting of the fuel. The Australian Standard specifies a cetane index of 46 minimum by method ASTM D976 with no upper limit. This property has most impact in cold weather when a diesel engine using a fuel with a cetane of 46 will take longer to start than engines using a diesel fuel with a higher cetane. In warmer weather a cetane index of 46 will have no impact. The cetane index of a diesel fuel is a function of the crude oil used and the processing used to make it and can vary from 46 to 60 in Australia depending on the location.

### DENSITY

High density diesel fuel has higher energy content so that less fuel is used. However in older diesel vehicles the high density fuel can cause hard starting because it is usual for a high density fuel to have a low cetane, although this is not always guaranteed because it is dependent on the refining processes used. High density diesel fuels are associated with good fuel economy. The Australian Standard for Diesel fuel specifies a density of 0.82 to 0.86; this is equivalent to a 4.9% variation in fuel economy so a diesel fuel with a density of 0.86 will go 4.9% further than a diesel fuel with a density of 0.82.

### SUMMARY

Some diesel fuels can be slow to start and produce blue smoke when temperatures are below 5 deg C, once started the fuel works fine and can provide fuel economy benefits. The problem is most common with older engines with mechanical injection settings and can be reduced by adjustment of the injection system.

**For further information, please call the BP Lubricants and Fuel  
Technical Helpline 1300 139 700 local call  
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