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# Briefing: Guidance on automotive diesel in cold weather

- **During very cold weather some diesel-powered engines may experience difficulties with starting. These problems arise from the formation of wax crystals, which block fuel filters and lines.**
- **UK diesel is manufactured to the European standard BS EN 590 and the specification of diesel is changed during winter months (16th November to 15th March) in order to improve cold weather performance properties of the fuel.**
- **The UK is in a zone that specifies that diesel remains free of wax crystals down to minus 15 degrees Centigrade (known as the cold filter plugging point test CFPP)**
- **With sustained temperatures below this level, particularly in exposed areas or when a vehicle is left idle for several days, blocking of filters or fuel lines may occur making it difficult to start the vehicle.**
- **This paper gives some basic guidance which should be read in conjunction with the manufacturer's handbook for the vehicle.**
- **Under no circumstances should heat sources be applied to fuel systems that involve naked flame or other ignition sources.**

## Background

The composition of diesel fuel is complex. It is made up of many different hydrocarbons and additives in order to meet desired performance measures and comply with the relevant fuel specification.

UK diesel is manufactured to an agreed European standard known as BS EN 590. The blending of diesel is changed during winter months (16th November to 15th March) in order to improve the cold weather performance of the fuel, as specified in BS EN 590.

The UK is in a zone that specifies that in winter the fuel should operate down to at least minus 15 degrees Centigrade to avoid problems of wax crystals in the fuel crystallizing and blocking filters/fuel lines.

All diesel fuel contains wax. It is considered an important diesel component because of its high cetane value (a measure of the fuel's resistance to premature combustion). Normally the wax remains liquid but when diesel fuel gets cold enough the wax starts to crystallize and solidify. If the temperature is sufficiently low, enough crystals will form to block the fuel filter/fuel lines, making the engine difficult to start.

## Guidance

There are a number of practical measures that can be taken to avoid or reduce problems, including the following:

- Read your vehicle operating manual closely. Some modern vehicles have heated filters and fuel lines that are temperature activated during the start up phase. To be fully effective, this may require some delay during the start up sequence before activating the starter motor.
- It may be advisable to sit in the vehicle with engine running for several minutes before moving off in order to aid build up to working temperature.
- If possible, park your vehicle in a garage overnight or in a more sheltered area near a building. An old blanket covering the bonnet and radiator grille may provide further protection.
- Avoid parking the vehicle with the front facing into the wind.
- If it is impossible to move the vehicle due to snow, try to run the engine daily in order to maintain movement in the fuel system and generate heat.

**Under no circumstances should heat be applied to fuel systems that involve naked flame or other potential sources of ignition.**

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