**Quantitative Evaluation of an On-Highway Trucking Fleet to Compare #2 ULSD and B20 Fuels and their Impact on Overall Fleet Performance**

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**Goals:**
- Statistically analyze idle time, temperature, engine load, and engine speed data to develop an equation for predicting fuel economy based on these factors
- Perform engine oil analysis to explore the possibility of an oil service interval extension
- Analyze lab testing results of cetane number, lubricity, energy content, density, and viscosity to quantitatively differentiate #2ULSD and B20 fuels
- Create performance maps for a particular engine running on both fuel types

**Statement of Problem:**
A study is being performed on a local trucking fleet that has been running 10 trucks on #2 Ultra-Low Sulfur Diesel and another 10 trucks running on B20. The data collection started on January 1, 2007 and will continue for one calendar year, ending on December 31, 2007. These trucks are equipped with data collection units that monitor information in the engine control module and store the data on the internet. This data includes fuel economy, idle time, truck speed, engine load, and engine speed.

Dynamometer testing will be performed in order to create performance maps of a particular engine running on both fuel types. Performance maps include torque and horsepower curves as well as fuel consumption curves.

Laboratory-based fuel testing will be performed to quantify the differences in the two fuel types. The testing will analyze cetane number, energy content, density, viscosity, and lubricity. The lab based testing will provide some insight as to how the fuel should perform in the field.

A financial comparison will take into consideration the cost of the fuels and their respective fuel economy, the fleet repair and maintenance costs, and the fuel filter and oil service intervals as well as any other factors that could significantly impact the operating costs of the trucking fleet.

**Current Activities:**
Data is being collected and organized in order to build statistical based models that will help predict overall fleet performance based on which fuel type is being utilized.

Current research also includes the exploration of the cause of a fuel filter plugging issue which has shortened the fuel filter service interval by at least half.