

L U B E

T E C H N I - G R A M



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More on “Bio-Fuels”

I continue to receive inquiries concerning the promotion of bio-fuels as alternatives for diesel fuel. Even country-western star and Texas legend Willie Nelson has been promoting its use as part of his on-going support of North American farmers. In fact, he and three business partners recently formed a company called Willie Nelson’s Biodiesel that produces and distributes biodiesel. The product called...Bio Willie...is made from vegetable oils, mainly soybeans.

Basically, **bio-fuel** is defined as 100% bio-fuel and is made from any fat or vegetable oil...typically soybean oil. It contains no petroleum but can be blended with diesel fuel at any level...a typical blend is 20%. The term **biodiesel** is generally used to define a blend of bio-fuel and petroleum diesel. Biodiesel is a viable alternative fuel for diesel engines and it can have many positive attributes. Currently, its use is pretty much relegated to federal, state and municipal fleet usage as dictated. Biodiesel does, however, have potential *negative attributes* that prospective consumers should be aware of and this is the purpose of this publication:

Potential Concerns

Engine Power/Fuel Economy Loss

- Biodiesel may decrease engine power output and increase fuel consumption
 - Heating value of biodiesel is lower than petroleum diesel
 - Oxygen content of biodiesel is higher

NO_x Emissions

- Biodiesel may increase NO_x's
 - Depends on engine design and base stock of biodiesel
 - Increase in unsaturated fats typically yields higher NO_x
 - Adding cetane improver can lower NO_x.
- Effects comparable to percentage of biodiesel used.

Component Compatibility

- Hoses
 - 100% Bio-fuel may adversely effect some elastomers such as natural or nitrile rubber over time and could deteriorate hoses



... to keep it running

- Metal
 - Bio-fuel and biodiesel blend will form high sediment levels when in contact with brass, bronze, copper, lead, tin and zinc

Filter Plugging

- Biodiesel is a mild solvent
- Biodiesel may loosen sediments and accumulated material on fuel system surfaces
- May need to replace fuel filters more frequently at start up

Viscosity

- Biodiesel typically has higher viscosity than petroleum diesels
- Blending bio-fuel with petroleum diesels will increase the viscosity of the base fuel

Storage Stability/Corrosion

- Most biodiesel is good for only six (6) months in tanks
 - Air (containing moisture) enters tank through vent pipes
 - Air increases oxidation (breakdown) of fuel and forms insoluble materials
 - Free water accelerates corrosion and fuel degradation
 - Presence of water can promote microbiological contaminants
 - Additives are needed to improve stability, minimize corrosion and deter microbiological growth

Cold Flow

- Heavier viscosity and increased oxygen content of biodiesel hinder cold flow

Injector Deposits

- Biodiesel may increase injector deposits
- More viscous biodiesels typically yield more injector deposits

As previously stated, currently, bio-fuel is a viable alternative fuel for diesel engines where Government incentives or legislation dictates that it be used (federal, state and local municipalities, mass transit and public school accounts, etc.)... and it can have positive attributes in the scramble to meet lower diesel engine emissions. But, at present, it is not considered a cost-effective alternative for major private fleet operations. And, as shown above, the use of biodiesel alternative fuels can leave fleet managers with a variety of trade-off problems. Fortunately, fleet managers can rely on SWEPCO's 501 Premium Diesel Fuel Improver for use with their current diesel fuel supply to optimize fuel efficiency, reduce emissions and prevent the operational problems throughout the entire life of their equipment. SWEPCO 501 Premium Diesel Fuel Improver and SWEPCO 501 PDI "Winter Formula" pay dividends to the fuel users that far exceed their nominal treatment costs.