

Remember...

Stanadyne Fuel Additives are the only ones that:

- Are made by a diesel fuel injection equipment company and;
 - Are approved by major diesel engine manufacturers including GM, Ford, VW, John Deere, Navistar, Caterpillar & AM General and;
 - Have been proven to perform the best in independent tests
- Stanadyne also offers several additives to address various diesel operability issues – contact your local Stanadyne Dealer for details

NOTE: more information about diesel fuels can be found in two position papers located in the "Library" at www.stanadyne.com

Stanadyne Diesel Fuel Additives comply with Federal Low Sulfur Requirements for use in Diesel Motor Vehicles and Nonroad Engines

For Stanadyne Products and Services
Contact your Local Stanadyne Authorized Dealer:

**CALL
Diamond Diesel Service, Inc.
at
1 800 4-DIESEL**

STANADYNE®

Stanadyne Corporation
92 Deerfield Road, Windsor, CT 06095, U.S.A.
Tel: (860) 525-0821; Fax: (860) 683-4581; www.stanadyne.com

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Diesel Fuel Update

from

Stanadyne Corporation

Diesel Fuels are changing and as a diesel engine owner or operator you want to know how you might be affected by these changes. You may have heard of Ultra Low Sulfur Diesel. ULSD (also referred to as S15) is now available in certain areas of North America and is mandated for on-highway use throughout the U.S. by the end of this year. You may also have heard of bio-diesel. This fact sheet will inform you of the advantages and disadvantages of these fuels and how Stanadyne's products and services can assist.

Ultra Low Sulfur Diesel

Beginning in 2006 diesel fuel for on-highway use must have no more than 15 parts per million sulfur. This is a 97% reduction from the previous limit of 500 ppm. Sulfur is removed from diesel fuel at the refinery by a process called hydro-treating which also affects the fuel in other ways. The American Society for Testing and Materials (ASTM) publishes the standard for mineral diesel fuel—ASTM D975 which the refineries comply with.

Advantages of ULSD

- + Reduced exhaust emissions
- + Improved cold startability and reduced white smoke at cold startup

Disadvantages of ULSD

- Higher Cost
- Lower energy content. Less BTU's per gallon means reduced power and fuel economy
- Possible premature fuel system wear. The process of removing sulfur can also reduce the natural lubricity of the fuel. There is now a lubricity specification in the D975 standard but it is not as high as what the fuel system manufacturers recommend.
- Compromised fuel stability. ULSD tends to be less stable and will deteriorate sooner than the previous diesel spec.
- Fuel System leaks. Reducing sulfur also reduces aromatics. This can result in rubber seals and hoses in some fuel system components shrinking and resulting in fuel leaks. NOTE: Stanadyne fuel systems do not use natural rubber seals but use Viton® seals instead

Bio-Diesel

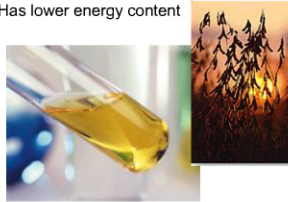
In addition to petroleum, Diesel fuel can also be made from various vegetable oils including Canola and Soybeans. The ASTM also has released a standard, D-6751 for bio-diesel fuels. Stanadyne as well as the other major fuel injection equipment manufacturers have determined that a blend of 5% bio-diesel that meets the ASTM D-6751 standard and 95% mineral diesel that meets the ASTM D-975 standard should not harm fuel system components. This blend is referred to as B5. As with ULSD, bio-diesel fuel also has various advantages and disadvantages including:

Advantages of bio-diesel

- + Reduced exhaust emissions
- + Made from a renewable resource
- + Almost no sulfur (in the bio-diesel itself)
- + Higher cetane value (51 min vs 40 min for mineral diesel)
- + Excellent lubricity

Disadvantages of bio-diesel

- Could harm certain elastomers (seals)
- Has poor resistance to oxidation especially when blended with ULSD. This results in spoilage and the formation of acids and varnishes
- Bio-diesel can absorb much more water than mineral diesel
- Has lower energy content



What Can Help?

As a major manufacturer of diesel fuel injection equipment for over 50 years, Stanadyne is familiar with fuel related problems such as water in fuel, low lubricity, and the ongoing problem of low cetane values in North American diesel fuels. Fortunately Stanadyne makes a diesel fuel additive that is designed to address these and other issues.

Stanadyne's Performance Formula all season fuel additive:



- ✓ Lubricates fuel system components to help prevent wear caused by low lubricity fuels
- ✓ Increases cetane value help starting, reduce smoke, increase power and fuel economy.
- ✓ Provides cold weather protection by reducing the fuel pour point by up to 40° F (22 °C)
- ✓ Helps to "de-mulsify" water so that the water separator can work more effectively. Stanadyne additives do not contain alcohol which can emulsify water into the fuel where it then comes out of suspension when the engine cools down and corrodes expensive fuel system components.
- ✓ Has a stabilizer to keep fuel fresher longer

Recommendations

- If using bio-diesel, fuel injection equipment manufacturers suggest a maximum 5% (B5).
- To protect sensitive (and expensive) fuel system components from excessive wear which can be caused by ULSD, use Stanadyne Performance Formula diesel fuel additive at every fill-up.