

# Ultra Low Sulfur Diesel Fuel and Fuel Filter Service Intervals

What is Ultra Low Sulfur Diesel (ULSD)? It is diesel fuel that contains a maximum of 15 parts per million (ppm) of sulfur content. The Federal Environmental Protection Agency (EPA) established a standard requiring that 80% of all refinery output be ULSD effective June 1, 2006. The purpose of this requirement was to reduce the sulfur content and (in conjunction with other changes) emissions that contribute to acid rain and other environmental and health concerns. This brings the quality of diesel used in North America closer to the quality and chemistry of the diesel fuel presently used in Europe and other parts of the world. For the past several years, low sulfur diesel fuel (LSD – max 500 ppm sulfur) has been sold for on highway use. Diesel fuel for non highway use that contains a maximum of 5000 ppm sulfur may still be available at some locations, although phase-out will likely occur soon.

Each of these fuels is often identified by the letter S and the fuel's maximum sulfur content. For example, ULSD is identified as S15, low sulfur diesel as S500 and non highway high sulfur diesel as S5000.

A by-product of the shift to S15 may be temporary shortened fuel filter service life. Similar to alternative fuels such as biodiesel, the change to ULSD may loosen deposits throughout the chain of diesel fuel distribution, effectively cleaning the systems. (For additional information about the impact of biodiesel on fuel filter usage, see FMC Technical Service Bulletins 07-02 and 06-01.) Therefore, dispensing pump filters and on-vehicle filters may encounter high levels of contamination due to the "cleansing" effect of the ULSD S15. Normal fuel filter service intervals should return once the system is "cleaned up". Because of the potential for accelerated fuel filter need when changing over to ULSD, fleets should monitor their vehicular and dispensing pump filtration inventory and usage.

As shown in the table, there is a scheduled roll out for the manufacturing and availability of ULSD S15. It is important to note that the state of California has mandated that all on highway diesel fuel be ULSD as of September 1, 2006.

Dates for On Highway ULSD Fuel			
Source	Action Required	U.S.	Calif.
Refinery & Import	Produce/Import a minimum of 80% for on highway use	6/1/06	
	Produce/Import all (100%) on highway diesel as ULSD	6/1/10	6/1/06
Terminals	Locations choosing to sell ULSD must meet 15 ppm max	9/1/06	
	All (100%) on highway diesel must meet 15 ppm max	10/1/10	7/15/06
Retail Locations	Locations choosing to sell ULSD must meet 15 ppm max	10/15/06	
	All (100%) on highway diesel sold must meet 15 ppm max	12/1/10	9/1/06
<b>NOTE:</b> Non highway target for conversion to lower sulfur fuels as of 6/1/2007 for S500 and 6/1/2010 for S15. Marine and locomotive target for conversion to lower sulfur fuels as of 6/1/2007 for S500 and 6/1/2012 for S15.			

In order to prevent the incorrect sulfur content diesel fuel from being dispensed, the EPA has established specific dispensing pump labeling regulations. The EPA regulations apply to all retail sites and commercial sites. Examples of labels containing the required information as set forth in regulation EPA 40

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CFR 8.570 are shown below (provided by the API). In California, the label requirement is not an issue since only S15 diesel is now sold for on highway use.

**ULTRA-LOW SULFUR HIGHWAY DIESEL FUEL (15 ppm Sulphur Maximum)**

**REQUIRED** for use in all model year 2007 and later highway diesel vehicles and engines.

Recommended for use in all diesel vehicles and engines.

**LOW SULFUR HIGHWAY DIESEL FUEL (500 ppm Sulphur Maximum)**

**WARNING**  
Federal law **prohibits** use in model year 2007 and later highway vehicles and engines.

Its use may damage these vehicles and engines.

**NON-HIGHWAY DIESEL FUEL (May Exceed 500 ppm Sulfur)**

**WARNING**  
Federal law **prohibits** use in highway vehicles or engines.

Its use may damage these vehicles and engines.

All 2007 and newer on highway diesel engines must use S15. However, 2006 and earlier on highway diesel engines may use either S15 or S500.

While the chemistry is similar, there are some performance properties that are different between ULSD S15 and LSD S500. One of the most talked about differences is diesel fuel's ability to lubricate the system components. During the processes used to reduce the sulfur content of the diesel fuel to the 15 ppm or less, other natural lubricating agents are also removed. As a result of this loss of lubricity, the topic of fuel additives has become a much discussed item. All additives for on highway diesel fuel must comply with the sulfur content and labeling requirements established by the EPA.

Other popular topics associated with ULSD S15 include the energy content of the fuel and other performance / maintenance concerns. ULSD does in fact have a lower energy content (BTU/gal), however, it's important to remember 2007 and newer engines are specifically designed to perform with this fuel.

**FOR ADDITIONAL INFORMATION, CONTACT:**

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