FLUID POLISHING INC

THE FUEL POLISHING PROFESSIONALS

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FUEL POLISHING OF DIESEL FUEL TANKS:

THE IMPORTANCE OF CLEAN DIESEL FUEL AND DANGERS OF BAD DIESEL FUEL

FUEL POLISHING OF DIESEL FUEL TANKS

Fluid Polishing Inc. is an organization of fuel polishing professionals aimed at getting people to understand that their fuel tank needs attention, especially, as diesel fuel begins to degrade in 60-90 days from the date of manufacture.

Basically, the following services are offered:

- Removal of water and sludge from the fuel tank
- Identifying the causes of poor fuel filter life and loss of power and poor injector performance
- Testing the automated fuel polishers
- Testing for water and sludge in the fuel tank
- Replacing the fuel filters on automated systems and system inspections
- Adding fuel treatments and anti-gel for fuel tanks
- Developing a fuel service program to keep the diesel fuel clean
- Processing of up to 36,000 gallons of diesel fuel in 8 hours from a single machine. (Fluid Polishing Inc., 2017)

Fuel polishing of diesel fuel tanks is of utmost importance and should be given appropriate considerations as diesel fuel being stored for use is the most critical components of a diesel engine; hence, the need to make it available and fit for use as

required. Diesel fuels are unstable organic hydrocarbons, naturally and they tend to degrade over time depending on several factors. Immediately fuel breaks down, some form of insoluble and gummy contaminants are formed within the fuel stock, coupled with solid particulate and water; all of which contribute largely to the wear and failures of the fuel system component.

What a bad diesel tank looks like

A diesel fuel tank that has adequate and proper maintenance is believed to out-perform one that is poorly or inadequately managed and maintained. A right method of approach is the one that employs corrective measures that allow for stable and clean fuel. Thus, the following solutions are brought about: money is saved on fuel and repairs, less diesel fuel is burned, a greener planet is encouraged and down time is prevented with the cost of putting a generator as back up in place, overridden. (AXI International, 2016)

THE DANGER OF BAD DIESEL FUEL TO ENGINES

In addition, fuel polishing systems are critical to diesel-powered engines' survival and longevity. A point of failure as fuel contamination is removed in the process of fuel polishing and as we all agree that for efficiency and reliability, modern engines and other fuel systems need clean fuel. Diesel that is left untreated is open to constant attack from water, microbial growth and other solid particulates- even after they might have been cleaned.

Acceptably, diesel fuel filter elements are expected to last about a thousand hours or more while the injectors, 15,000 hours. The instability of the diesel fuel, however causes the formation of solids and the clogging of the diesel fuel filters owing from the accumulation of the tank sludge- eventually ruining the injectors and causing the engines to smoke.

Moreover, the solids formed in turn accumulate in the bottom of the diesel fuel tank, forming a coating on the walls of the tank, plugging the fuel filters and adversely impacting the efficiency of the combustion. In addition, some dark smoke are produced from the exhaust while acids that degrade injectors and fuel pumps are formed- telling badly on the performance of the engine and eventually, ruining the equipment. Furthermore, it is important to keep water out of the tank as much as possible. This, coupled with the natural degradation of diesel fuel is another big issue that requires urgent attention. The excess fuel the engine is not using is recirculated, continually and exposed to extreme heat and pressure causing the agglomeration of asphaltenes that are in the fuel. The asphaltene agglomeration often leads to the formation of larger clusters and solids that are difficult to burn.

Also, premature failure of some parts of the engine also arise from dirty fuel and this is more pronounced in equipment with HPCR fuel systems. Hard particulate causes problems with the moving parts of the fuel system; causing starting problems, poor engine performance and failure of the engine.

"Clean Diesel" = Cleaner Diesel Fuel + Advanced Engines + Effective Emissions Controls

A partial functional failure within a fuel injection system is generally one that reduces the performance or efficiency of the injector and thus the overall performance or efficiency of the asset. The symptoms of such performance failures within an injection system may include the following:

- Low power from the engine
- Reduced engine RPM
- Increased fuel consumption
- Poor cycle times or low speed
- Smoke
- Lower gear selection
- Noise
- Poor starting
- Poor idle

HOW LONG UNTIL DIESEL FUEL DEGRADES

Diesel fuel is believed to have a long shelf-life and expected to get multiple years of life out of stored diesel- according to the U.S. Army regulations between the 50s and 60s. Meanwhile, the reverse is the case if there is no enough treatment is some ways- less than a year can be obtained from the fuel. Why does diesel fuel go bad? Simply put, it goes bad when exposed to some natural processes which exposes it to quality-attack. The longevity of diesel is now measured in months, rather than years, for usable life of diesel.

To truly understand how long fuel can last; it is paramount to know that diesel fuel is carbon based petrochemical and that oxidation, as a process commences immediately after the departure of the fuel from the refinery, when the sediments and gums that are responsible for clogging begin to form. There is no particular figure that expresses the number of days or months diesel fuel can stay before going bad. Meanwhile, fuel industries claim diesel fuel can be stored 6 months to 1 year before it begins degrading, if and only if, it is kept clean, cool and dry (Exxon) while some others believe it can be stored longer than 12 months if the fuel was purchased clean and dry and from a supplier that is reliable, if relevant fuel quality and stability was achieved through the use of additives to increase the lubricity, increase the number of Cetane and finally, if there is a regular testing of the fuel, constant maintenance and polishing by Fluid Polishing Inc.

THE IMPORTANCE OF CLEAN DIESEL FUEL THAT FLUID POLISHING INC CAN DELIVER USING FUEL POLISHING SERVICES

Several years before today, diesel fuel used to be different from what we have now. Before 2006, the refining of oil was done by distillation, providing an unstable fuel and fuel degradation, not a common issue.

A large number of persons are ignorant of the fact that the gasoline's they buy at the pump already has a level of detergent for the fuel injectors and intake valves, hence the requirement by the Federal Government concerning the amount of detergent the fuel should contain. What importance do these detergents offer? They provide benefits for diesel engines by removing the deposits that are built up in some certain areas. The right amount of fuel is engineered by the injector to deliver the appropriate amount of fuel into the combustion chamber and deliver it in the right manner. To ascertain the dirtiness of diesel fuel, testing is the first stage, after which it can be polished before dispensing. This has the advantage of ensuring only clean, dry fuel inside the much valuable equipment or machines. Diesel filters are not created equally, in that while some remove just rocks and sticks, others remove as much as 99.9% of all contaminants down to the size of 1 Micron. Filtering out particles and polishing adequately help increase the efficiency rate of the machine and protecting them while extending the life of the on board filters.

Meanwhile, a complete and absolute polishing process involves more than just filtering. Summarily, the following are the benefits of clean diesel fuel and fuel polishing:

- Polishing improves the cleaning and lubrication of the injection system
- There is less likelihood of fuel injectors to fail
- The maintenance expenses are kept lower
- The buildup of sludge becomes less of a problem or issue to worry about

- There is smooth running of the engine with less smoke
- There is more reliable fuel for outages as well as emergencies

THE COST OF HAVING DIESEL FUEL INJECTORS BEING REPLACED DUE TO BAD FUEL CLOGGING THE INJECTORS AND THE DOWN TIME THAT IT WILL COST THEM

Diesel fuel injectors are very important in the functioning of a vehicle because it is from them that car's engine get gasoline for mobility. This very important role as well as the moving parts of the component makes it somewhat difficult for drivers to identify the problems with the fuel injector. Large sum of money can be saved when and if these crucial component of the machine is given due attention. Undeniably, there are certain problems with the diesel fuel injectors, with some being able to correct easily while others require replacement. This replacement, however, comes at a huge cost. Dirty fuel injectors, clogged fuel injectors, a fuel injector that does not open, fuel injector that does not close, that leaks, etc are some of the problems a diesel fuel injector can encounter.

Clean fuel injectors are a must for an engine to maintain peak performance, economize fuel and emissions. When diesel fuel injectors clog, restrictions within the 8-10% range would cause misfire or other symptoms of the injectors failing. The inability of the injectors to flow at optimum rate causes the 02 sensor to read the unburnt oxygen, leading to a lean condition. the computer then compensates for this by increasing the "on" time of all the injectors in the older multi-port systems-eventually causing an overly rich fuel condition in the other cylinders. On the average, fuel injectors are believed to tend to fail after 80,000 miles and little

maintenance is required during normal scheduled maintenance. Consequently, simple debris presence in the injectors may require a simple injection flush as a cost-effective means of improving the fuel injector performance while for cooked-on residue, a full ultrasonic cleaning might be required to get the engine back into shape. However, for old or inexpensive injectors, the best solution may be replacement. Replacing a diesel fuel injector is between $272-346 with the labor costs estimated between $123-156 with the parts priced between $149-190, excluding taxes and fees. The total therefore is within the range of $550-650.

THE FAILURE CHAIN REACTION OF BAD DIESEL FUEL

The greatest damage are caused within a diesel engine fuel system by water and particles; as contaminants. They contribute to failure as well as are responsible for the two sources of secondary failure points within an engine and the degradation of the fuel. Failure within a fuel injection system are in two classes, namely: partial functional failure and catastrophic functional failure. The partial functional failure within a fuel injection system is that which reduces the performance or efficiency of the injector over time and in turn, the overall performance. It precedes the catastrophic functional failure, which cause the engine to cease functioning. These failures are dramatic, sort of and highly visible to operations and come with a large sum of money being spent with accompanying downtime.

The failure chain reaction is explained as follows:

- Initiation of the injector valve and nozzle damage
- Leakage of fuel through the valve mating surfaces
- Generation of localized hot spot through the leakage zone to cause fuel oxidation
- Reduction of the fuel pressure at nozzle

- Reduction in the volume of fuel delivered with the engine management system being compensated by an increase in the injection event time
- Reduction in the atomization of fuel
- Generation of soot within the cylinder
- Increase in emissions
- Power loss
- Partial functional failure point
- Increase in leakage rate as wear continues
- Increase in consumption of fuel as the controller of the engine tries to compensate for leakage
- Visible and audible failure signs
- Full functional failure point

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