

Your Reliable Guide for Power Solutions

To fulfill our commitment to be the leading supplier in the power generation industry, the Clifford Power Systems, Inc. team ensures they are always up-to-date with the current power industry standards as well as industry trends. As a service, our **Information Sheets** are circulated on a regular basis to existing and potential power customers to maintain their awareness of changes and developments in standards, codes, and technology within the power industry.

Diesel Generator Set Fuel System Preventative Maintenance

Fuel system maintenance is critical to the reliable performance of a diesel generator system. Regular maintenance assures system reliability and lowers long-term operating costs.

Principal reasons for and benefits of fuel system maintenance: (See diagram for maintenance points)

System performance: Diesel engine won't provide full power and may not start if fuel systems do not provide correct fuel and volume pressure. (*Diesel fuel without additives deteriorates over time. See Contaminants*)

Environmental compliance: Proper maintenance is required to ensure no ground contamination due to fuel leakage and spillage.

Safety: System integrity must be maintained to ensure fuel is stored and delivered safely.

System Performance: Diesel fuel issues affecting performance that regular maintenance will identify include:

Water in the system: Water vapor accumulates and condenses in fuel tanks. Water can also enter the system through leaking fuel caps, if present in newly delivered fuel and through loose connections or structural flaws.

Contaminants: Diesel fuel is subject to contamination. It also will deteriorate over time because of chemical processes known as oxidation and polymerization. Certain microbes also grow in diesel fuel. These changes increase the particular matter in the fuel and shorten the life of filtration systems. Rust, dirt and sludge build up in the system over time and smaller particulates can bypass filters to accelerate engine wear.

Maintenance actions to reduce water and contaminates in the fuel system: Maintenance schedules must have steps to maintain clean fuel and take the following actions - (See chart for maintenance periods)

- Exercising generators regularly through the year will use up stored fuel before it can degrade.
- Fitting a fuel/water separator between the engine and either the system's day-fuel tank or the bulk tank will prevent any water in the fuel from reaching the engine. Check separators monthly and remove any water.
- Open water drains during every routine inspection to remove water from the system.
- Change filters according to manufacturer specifications. Check between changes to see if they are collecting increased levels of particulates or sediment.
- Diesel fuel should be tested once a year for stability and any microbial contamination.
- Fuel that will be stored a year or longer should be treated with additives for increased stability.
- Remove inspection ports provided in bulk and day tanks and use an inspection lamp to examine all components. Replace any inspection port gaskets that were removed.
- Fuel systems with day tanks should be checked every six months during light duty cycles. Generators used daily for long hours to provide primary power should be inspected monthly.
- Verify there is fuel in the system and all gauges are working.

Environmental and Safety: Maintenance checks will find leaks from corrosion and faults in the fuel system.

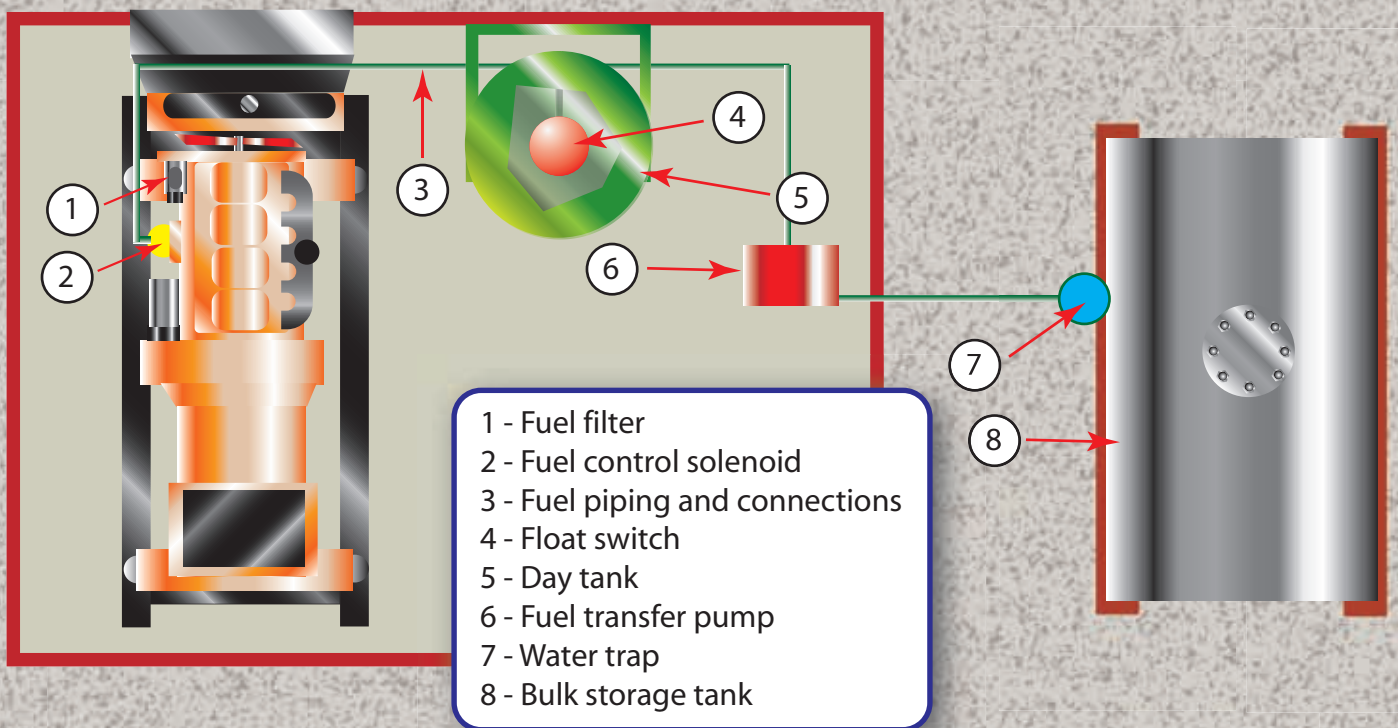
Maintenance actions to prevent any environmental and safety issues: The following will be visual checks:

- Visually check the entire system while maintenance is being performed. Look for any cracks, corrosion or evidence of leakage. Look for loose pipe fittings to the tank, fuel float valves and filters.
- Tighten and inspect all hose clamps. Verify all fuel hoses are in good condition with no cuts or splitting.
- Check connections between bulk tank, day tank, filtration system and diesel engine.
- Make sure all electrical connections are working and able to function as required. Electrical connections and wiring insulation adjacent to fuel lines should be examined for fire safety.
- Inspect the insides and outsides of all tanks at least once a year for leaks, damage or rust..
- If pumps require frequent priming, check for faulty valves, seals leaking or plumbing air leaks.

Chart - Typical Fuel System Maintenance Points and Schedule for a Diesel Generator Set

Fuel System Maintenance Items	Method of Checking and Action to Take					Frequency of Check
	Visual	Record	Change	Drain	Test	
1 Bulk fuel tank level		X				Weekly
2 Day tank level		X				Weekly
3 Day tank float switch	X				X	Weekly
4 Fuel control solenoid	X				X	Weekly
5 Fuel filter	X		X			Annually
6 Fuel filter water trap	X			X		Weekly
7 Water from fuel tank		X		X		Weekly
8 Hoses and connections	X		X			Weekly
9 Vents	X					Annually
10 Piping and connections	X					Annually
11 Wiring in fuel system	X					Weekly
12 Fuel quality					X	Annually

Diagram - Fuel System Maintenance Points



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