



Fuel Burn Rate Comparison -Final Report- 1 MW GenSet



This test was used to determine the effect of **BestLine's Diesel Fuel Treatment (DFT)** upon fuel efficiency.

Fuel Consumption:

The fuel supply was routed from a manifold on the refueling truck through a new fuel flow meter from GPI.

This flow meter was used as the primary method of determining the fuel burn rate by comparing how much fuel was added to the main onboard fuel tank as compared to how much was remaining after it was drained back into the refueling truck through this same flow meter.

The onboard 1000 gallon fuel tank was fully drained and documented via the fuel tank drain at the bottom / outside fuel drain port after each testing cycle. (See photo.)



External fuel drain fitting.



The data was collected by two CD & Power technicians throughout the process.

The testing protocol was strictly adhered to and recorded to ensure the engine was operated under the same scenario for both baseline and comparison testing.

Engine Power / Load Center:

The engine power was controlled and measured by a one Megawatt (MW) load center.

Engine No	37235022	Displacement	30x1860	L in3	Valve Link Cold	(spec)	Warranty Start Date	EGS	DDI EM TC-CAC	
Family	D5730D1GX03	Stroke Injection Timing	13.5	° BTDC	Torque	0.432x0.017		IMPORTANT ENGINE INFORMATION: This engine conforms to U.S. EPA regulations for large off-highway and stationary diesel engines. 2008 with California regulations for heavy-duty off-road diesel cycle engines as applicable. For constant speed use only. THIS ENGINE IS CERTIFIED TO OPERATE ON DIESEL FUEL.		
Model	QST30-G5 NR2	Fuel Rate @ Advertised Power	436	gpa2/stroke	Exhaust	0.613x0.032				
S.D. No	10111	NOx FEL	6.4	PM FEL	2.0	Advertised Power	kWHP	RPM	kWHP	RPM
EPA Family	6CEXL030.AAQ	Assembled by Cummins Engine Co., Inc. U.S.A. 4970746			Standby		at 1500	1112x1490	at 1800	
CPL	1176	WARNING: Injury may result and warranty is voided if fuel rate, speed or altitude exceeds published maximum values for this model and application.			Prime		at 1500	1007x1350	at 1800	

Testing Protocol:

The test consisted of a 1 MW generator and Load Center capable of applying a load to the generator to simulate actual loads under normal operation.



Testing Protocol: continued

1. Each test (one without any fuel additive, and one BestLine Diesel Fuel Treatment added to the fuel), was conducted three times with one refueling event at the start of the test and drained fully and measured at the completion of the test.
2. The measured remaining fuel was subtracted from the amount of fuel added at the beginning test to reveal the burn rate for the three cycles of testing.
3. In addition to the test protocol outlined below, there was a one hour cleanout cycle after the baseline tests were conducted that used BestLine Diesel Fuel Treatment premixed with the fuel at a ratio of three (3) ounces per 10 gallons. This cleanout cycle was performed to prepare the engine for the second round of testing and to ensure better accuracy and stability of the test. This cleanout cycle was run at full power and load.

Fuel Burn Test	Time	RPM
Idle / no load	20 minutes	650
Full speed with LB fan only	3 minutes	1800
Full speed with LB @ 200 kw load	2 minutes	1800
Full speed with LB @ 500 kw load	20 minutes	1800
Full speed with LB @900 kw load	20 minutes	1800
Full speed with LB fan only	5 minutes	1800
Idle / no load cool down	3 minutes	650
Engine shut down	1 minute	0
Total time for each test	74 minutes	

Average Without BestLine DFT	Average With BestLine DFT
225 gallons of fuel added	150 gallons of fuel added
110.8 gallons reclaimed	48.7 gallons reclaimed
114.2 gallons burned	101.3 gallons burned
Performance Results:	11.3% decrease in fuel consumption

Test was conducted by CD & Power technicians.

1. Owen Charles Date: 5/24/15

2. Marcos Jetmore Date: 5/26/15

Participants:

Owen Charles: CD and Power technician.

Marcos Jetmore: CD and Power technician

Perry Anderson: BestLine Lubricants VP Sales.

Test Certified by CD & Power as accurate and reliable

X Owen Charles Date: 5/26/15