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TRIAL EVALUATION OF FPC-1 FUEL PERFORMANCE CATALYST

BY

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INTRODUCTION

FPC-1 is a complex combustion catalyst, which when added to liquid hydrocarbon fuels at a ratio of 1:5000 effectively improves the combustion reaction, resulting in increased engine efficiency and reduced fuel consumption.

Field and laboratory tests alike indicate a potential to reduce fuel consumption in diesel fleets in the range of 4% to 9%. This report summarizes the results of controlled back to-back field tests conducted with the cooperation of Golden Gem Growers, Umatilla, Florida with and without FPC-1 added to the fuel. The test procedures applied were the Carbon Balance Exhaust Emission Test at a given load and engine speed. At two seperate RMP's, 1700 and 1500.

he Carbon Balance Test includes an analysis of engine exhaust with and without FPC-1 treated fuel.

EQUIPMENT TESTED

2 - 237 Macks
1 - 235 Mack
1 - 300 Mack
1 - 250 Mack

TEST EQUIPMENT

The equipment and instruments involved in the carbon balance test program were:

Sun Electric SGA-9000 non-dispersive, infrared analyzer (NDIR) for measuring the exhaust gas constituents, HC (unburned hydrocarbons as hexane gas), CO, CO2, and 02.

An IMC and a Fluke high temperature thermometer and probes for measuring exhaust gas and ambient temperature.

TEST PROCEDURE

The carbon balance technique for determining changes in fuel consumption has been recognized by the U.S. Environment Protection Agency (EPA) since 1973. The method relies upon

the measurement of engine exhaust emissions to determine fuel consumption rather than direct measurement (volumetric or gravimetric) of fuel consumption. The method produces a value of engine fuel consumption with FPC-1 relative to a baseline value established with the same vehicle.

Engine speed and load are duplicated from test to test, and measurements of exhaust and ambient temperature are made. Under these conditions a minimum of five readings were taken for each parameter after stabilization of the exhaust temperature. Five units were tested for both baseline and treated fuel segments. Each test unit was tested under steady-state conditions at 1700 and 1500 rpm. Table 1 summarizes the test results.

Results indicate a reduction in fuel consumption for all units tested. The general trend of improved (reduced) fuel consumption is within the general parameters of reduced fuel consumption achievable by the use of FPC-1 Fuel Performance Catalyst. All regulated emissions were also reduced.

Also, a qualitative smoke reduction test was performed during the Golden Gem Growers Test. This was done by attaching a 25 micron filter to the exhaust gas sampling train for both the baseline and treated fuel test segments. The filter traps unburned fuel exhausted from the engine as visible smoke or particulate. The filters used during the treated fuel segment of the test was cleaner indicating a significant reduction in smoke while using FPC-1 treated fuel.

In addition, Unit 83 was dropped from the test because of a rebuilt engine between test.

CONCLUSION

The series of test conducted on a number of Mack powered equipment confirm that the addition of FPC-1 to the fuel will reduce fuel consumption.

1. The reduction in fuel consumption in the fleet average 7.05%.

2. The emission levels of unburned hydrocarbons (HC) were reduced 42.5%. Carbon dioxide (CO2) emissions were reduced 7.1%.

3. Also, the particulate filter trap comparison indicated FPC-1 treated fuel burns cleaner and emits less smoke.