C-03-02: Demonstration of Hybrid-Fuel Compress Ignition System
Final Report – September 30, 2009

The subject project was a major initiative by the New York State Department of Transportation to test alternative fuel strategies in our medium and heavy duty truck fleet. It is generally recognized that BioDiesel can be effective for limited reductions in petroleum consumption but there are also significant operational challenges in cold climate regions. The Hybrid Fuel or Dual Fuel compressed ignition system was identified as a possible solution to achieve more significant petroleum displacement and due to its superior environmental affects. This system is designed to reduce petroleum consumption by up to 80%, and when combined with a simple oxidation catalyst, could reduce emissions below the 2009 federal emissions standard.

In unofficial post installation tests, the emissions indicated an air contaminant reduction of up to 85% from pre installation baseline tests and we achieved an unexpected mileage increase of 20%. For various reasons we are unable to identify the fuel actually displaced as a result of this system. Our fuel card is listed as diesel fuel since this is still the primary fuel for this engine, therefore all CNG dispensed is erroneously coded as diesel fuel. The only way to correct this would be to have separate cards for each fuel type but at this point operational issues would not justify the benefit of requiring separate fuel cards. Also in an attempt to overcome resistance to change and also to assure operability of our critical snow and ice fleet we installed an on/off toggle switch on the dashboard to resolve potential issues. This proved to be unnecessary and actually counterproductive as drivers would “test the system” by operating the on/off switch unnecessarily. We did lose two units prematurely due to major accident damage but there was no escape of gas from the CNG fuel system in either incident although there was diesel fuel spilled in at least one of the accidents.

The tangible benefits from this test program are:

1) This system is a model for advanced dedicated natural gas engines. Cummins/Westport is producing pilot diesel ignition natural gas engines which we plan on purchasing in our future fleet.

2) This program was prominent in the decision by many towns on Long Island to require waste haulers to use natural gas powered trash trucks and to begin converting their heavy duty fleets to natural gas.

The overall benefits from this program would rate it highly successful but there is insufficient statistical data as previously noted. In addition to the lack of data there are other lessons learned if we were to expand this program but instead we are focusing on the dedicated CNG engines in our future fleet.

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