



Technology Demonstration of QVM CNG and Gasoline Fueled Ford F-150 Series Bifuel Prep Vehicles at Ft. Hood, Texas

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Problem and Objective: A technology demonstration of Ford F-150 series bi-fueled [compressed natural gas (CNG) or gasoline] Qualified Vehicle Modifier (QVM) vehicles was conducted at Ft. Hood, TX. This TACOM-sponsored effort was in support of Section 400-AA of the Alternative Motor Act (AMFA) of 1988, the Clean Air Act (CAA) Amendments of 1990, and the Energy Policy Act of 1992. The objectives of the program were to demonstrate the acceptability of alternative-fueled vehicles in a Department of Defense (DoD) U.S. Army activity in support of installation operations, to quantify vehicle performance and fuel economy, and to assess exhaust emissions using CNG and gasoline fuel in selected vehicles.

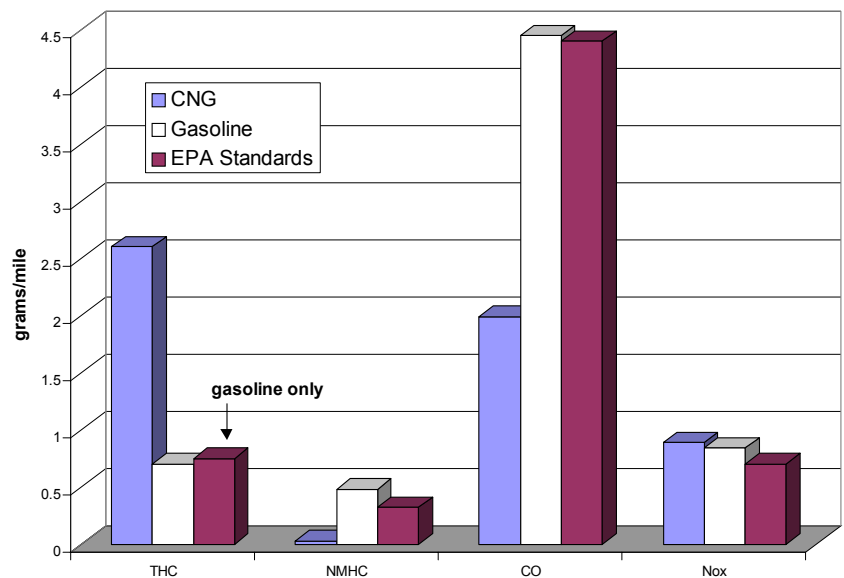
Importance of Project: With emphasis on finding methods to reduce the amount of pollutants in the air, CNG fuel definitely offers a viable alternative. This technology demonstration provided real-world utilization and performance data on QVM CNG and gasoline bifueled vehicles. Also, the previous fleet of dedicated CNG vehicles presented a problem in that random vehicle assignments were not possible due to restricted range. With the introduction of bifueled vehicles, range was no longer a factor and vehicles were assigned anywhere within the operating area.

Technical Approach: The fleet of General Services Administration (GSA)-owned, Army leased bifueled vehicles was placed under the direction of the Ft. Hood Transportation Division. The vehicles were randomly assigned to the different service sections to be used in daily mission requirements. Sixty-six vehicles were initially selected by the transportation officer to provide the data required. Additional vehicles were included into the program upon arrival at Ft. Hood. Designated drivers of the bifueled vehicles attended classes that covered topics such as program background and objectives, CNG description and fueling procedures, and data collection procedures.

Accomplishments: More than 1,000,000 miles of combined CNG and gasoline usage were accumulated during the program. There were no

major problems reported, and the drivers as well as section supervisors favorably received the vehicles. The most prevalent complaints while operating with CNG fuel were the limited range and the prolonged starting time. Mechanically, the vehicles performed satisfactorily and very few maintenance problems were reported. Federal Test Procedures (FTP) exhaust emissions testing was performed at Southwest Research Institute on three selected vehicles initially at 4,000 miles and at the end of the test. The selected vehicles when operated on CNG showed dramatic reductions in Non-Methane Organic Gas, Non-Methane Hydrocarbons, and Carbon Monoxide. There was a small increase in Oxides of Nitrogen emissions while using CNG. Fuel economy was equivalent with CNG and gasoline when compared to FTP results.

Military Impact: U.S. military installations continue to provide an excellent avenue to introduce alternative fuels. Therefore, the data accumulated during this demonstration program can be used in the decision-making process of assigning GSA bi-fueled vehicles to military installations. Also, the demonstration clearly shows the need for alternative fueling infrastructure in the immediate vicinity of the fleet.



Comparison of Averaged Unburned Hydrocarbon Emissions Results