

ADA

Technology Demonstration of Qualified Vehicle Modifier (QVM) Compressed Natural Gas (CNG) and Gasoline Fueled Ford F-150 Series Bifuel Prep Vehicles at Ft. Hood, Texas

**INTERIM REPORT
TFLRF No. 354**

by

R. A. Alvarez

**U.S. Army TARDEC Fuels and Lubricants Research Facility (SwRI)
Southwest Research Institute
San Antonio, TX**

**Under Contract to
U.S. Army TARDEC
Petroleum and Water Business Area
Warren, MI 48397-5000**

Contract No. DAAK70-92-C-0059

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**E. C. Owens, Director
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13. ABSTRACT (Maximum 200 words) A technology demonstration of Ford F-150 series bifuel [compressed natural gas (CNG) or gasoline] Qualified Vehicle Modifier (QVM) vehicles was conducted at Ft. Hood, Texas. This U.S. Army TACOM sponsored fleet consisted of 72 General Services Administration (GSA) owned, Army leased 1995 bifueled Ford F-150 1/2 ton pickup trucks. The data that this demonstration would yield included overall engine performance, vehicle operation and maintenance, fuel economy, and assessment of exhaust emissions. As a result of this demonstration program, the data has shown that the bifueled vehicle fleet's performance was extremely. Mechanically, the vehicles performed equally satisfactorily with gasoline and CNG fuel. The combined gasoline and CNG fuel economy calculated from actual usage data shows a nine percent decrease when compared to the regulated federal test procedures (FTP) calculations. FTP emissions tests were performed on two selected vehicles using CNG and gasoline fuels initially at 4,000 miles and at the end of the test. The data showed dramatic reductions in non-methane organic gas, non-methane hydrocarbons, and carbon monoxide when operated on CNG. There was, however, a small increase in oxides of nitrogen emissions with CNG.			
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EXECUTIVE SUMMARY

Problems and Objectives: 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, Texas. This Tank Automotive/Armaments Command 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.

FOREWORD/ACKNOWLEDGMENTS

This work was performed by the U.S. Army TARDEC Fuels and Lubricants Research Facility (TFLRF) located at Southwest Research Institute (SwRI), San Antonio, Texas, during the period August 1994 through May 1997 under Contract No. DAAK70-92-C-0059. The work was funded by the U.S. Tank-Automotive Command and administered by the U.S. Army Tank-Automotive RD&E Center, Petroleum and Water Business Area, Warren, Michigan. Mr. Luis Villahermosa (AMSTAR-D/210) served as the TARDEC contracting officer's representative and project technical monitor.

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TABLE OF CONTENTS

Section	Page
I. BACKGROUND	1
II. INTRODUCTION	1
III. PROGRAM OBJECTIVES	2
IV. DETAILS OF DEMONSTRATION	2
A. General	2
B. Fleet Vehicle Description	3
C. Data Collection	8
D. Fueling Stations	9
1. Gasoline	9
2. Compressed Natural Gas	9
V. RESULTS OF DEMONSTRATION	9
A. Fleet Test Results	9
1. General	9
2. Fuel Economy	9
3. Fuel System Unscheduled Maintenance	10
4. Vehicle Performance	15
5. Resolution of User Concerns	15
a. Cold/Hot Starts	15
b. 0-50mph Full-throttle Acceleration Tests	18
B. Emissions Testing	20
1. General	20
2. FTP Exhaust Emissions and HFET Fuel Economy	20
VI. CONCLUSIONS	22
VII. LIST OF REFERENCES	24

APPENDICES

- A Mileage and Fuel Usage Summaries for Bifuel Vehicles
- B 3-Bag Gasoline/CNG FTP Emissions and HFET Test Results on Vehicle
Nos. G247 and G232: 4,000 Miles and End of Test Evaluations

LIST OF TABLES

Table	Page
1. Description of Test Vehicles at Start of Test	4
2. Summary of Test Vehicle Data Miles and Combined CNG/Gasoline Consumption ..	10
3. Averaged Unburned FTP Regulated Emissions and Highway Fuel Economy Test (HFET) Results	21

LIST OF ILLUSTRATIONS

Figure	Page
1. Bifuel Truck	6
2. Schematic of CNG Component Locations and Natural Gas Tank Configurations	7
3. Gasoline and CNG Usage by Vehicle Throughout Program	12
4. Total Mileage Accumulation by Vehicle	13
5. Fuel Economy by Vehicle	14
6. Averaged Combined Gasoline and CNG Actual Fleet Data vs. Combined Averaged FTP Data	15
7. Individual Cold Start Test Results	16
8. Individual Hot Start Test Results	16
9. Averaged Cold Start Test Results	17
10. Averaged Hot Start Test Results	17
11. Timed Acceleration Runs	19
12. Average Accelerations	19
13. Comparison of Averaged Unburned Hydrocarbons	21
14. Comparison of Averaged Unburned Hydrocarbon Emissions Results	22

LIST OF ACRONYMS

AFV	Alternative- Fueled Vehicles
AMFA	Alternative Motor Fuels Act
CAA	Clean Air Act
CNG	Compressed Natural Gas
CO	Carbon Monoxide
DOD	Department of Defense
EPA	Environmental Protection Agency
FTP	Federal Test Procedures
GSA	General Services Administration
GVW	Gross Vehicle Weight
HFET	Highway Fuel Economy Test
LDT	Light-Duty Truck
LEV	Low Emission Vehicle
NMHC	Non-methane Hydrocarbons
NMOG	Non-methane Organic Gases
NO _x	Nitrogen Oxides
OEM	Original Equipment Manufacturer
QVM	Qualified Vehicle Modifier
SwRI	Southwest Research Institute
TACOM	U. S. Army Tank-Automotive and Armaments Command
TARDEC	U.S. Army Tank- Automotive Research, Development and Engineering Center
TFLRF	TARDEC Fuels and Lubricants Research Facility
THC	Total Hydrocarbons
TMP	Transportation Motor Pool

I. BACKGROUND

Section 400-AA of the Alternative Motor Fuels Act (AMFA) of 1988, Public Law 100494, established The Federal Light Vehicle Program.(1)* The AMFA's aim is to incorporate alternative-fuel vehicles (AFVs) into government fleet operations and evaluate their performance. The Department of Energy (DOE) is responsible for implementing the AMFA with the assistance of other agencies.(2) Federal fleets, as defined in the Energy Policy Act (EPACT) of 1992, are required to comply with Executive Order 13031 in their acquisitions of AFVs.(3,4) Natural gas has demonstrated considerable potential as a cleaner-burning fuel for motor vehicles than gasoline. Also, the number of compressed natural gas (CNG) fuel vehicles has increased dramatically since the start of the AMFA program. Substituting cleaner-burning alternative fuels in motor vehicles has drawn considerable attention in the last decade. The driving forces for this substitution are the reduction of crude oil dependence and the reduction or elimination of some pollutant emissions, especially ozone-forming hydrocarbons. Increased use of alternative "clean burn" fuels for motor vehicles has escalated to a prominent role in the ongoing air pollution control strategies for California and the federal government.(5)

II. INTRODUCTION

This technology demonstration was sponsored by the U.S. Army Tank-automotive Research, Development and Engineering Center (TARDEC). (6) During the second quarter of 1995 the General Services Administration (GSA) made an acquisition of over 100 Ford F150 bifuel (CNG or gasoline) Qualified Vehicle Modifier (QVM) pickup trucks. The vehicles were distributed between Ft. Hood, Texas and Ft. Bliss, Texas. Sixty-six vehicles assigned to the Ft. Hood Transportation Office were selected for the demonstration program. Six additional vehicles were added to the program as they arrived at Ft. Hood. A CNG fueling facility was constructed at the Ft. Hood transportation motorpool in support of the CNG demonstration program.

*Underscored numbers in parentheses indicate references at the end of the document

Liaison/coordination meetings with transportation motor pool (TMP) personnel, U-Tech Services Corporation Project Manager, and the GSA Fleet Management Office at Ft. Hood were conducted by the monitor from the U.S. Army TARDEC Fuels and Lubricants Research Facility (TFLRF), located at Southwest Research Institute (SwRI) in San Antonio, Texas.

III. PROGRAM OBJECTIVES

The objectives of the technology demonstration of QVM bifuel (CNG or Gasoline) vehicles were as follows:

- To demonstrate the acceptability of bifuel GNG or gasoline vehicles in support of AMFA, and in a Department of Defense U. S. Army activity in support of post-camp and station operations;
- To quantify vehicle performance, fuel economy, engine performance and maintenance;
- To assess regulated emissions using both gasoline and CNG fuels

IV. DETAILS OF DEMONSTRATION

A. General

The TMP division at Ft. Hood assigned the bifuel vehicles to the different sections and units in the same manner as the regular vehicles without regard to driving cycles and mission requirements. The only concession was assigning the vehicles within the area in which the CNG-fueling facility was available to the drivers. The vehicles were dispatched on a weekly basis, and the drivers were instructed to turn in the previous week's operational information prior to the next week's dispatch.

Meetings were held with TMP and U-Tech Corporation staff to coordinate the selection of two test vehicles for emissions testing. The U-Tech project manager handled the selection of vehicles for emissions testing to minimize the impact that random selection of critical-use vehicles would incur. The vehicles were transported from Ft. Hood to SwRI for testing, which required a turnaround of

five working days. Testing included the Federal Test Procedure (FTP) for regulated emissions and Highway Fuel Economy Test (HFET). Testing was conducted at 4,000 miles and at the end of the test. The TFLRF monitor visited Ft. Hood quarterly to liaise with GSA and TMP fleet managers, and to solicit user comments on the operability of the test vehicles.

B. Fleet Vehicle Description

The 72 GSA-owned, Army-leased vehicles used for the demonstration were 1995 Ford F150 bifuel ½-ton pickup trucks with a gross vehicle weight (GVW) rating of 6,200 lbs. (Figure 1). The vehicles were converted to use CNG by Southern Union Gas Company in Austin, Texas, under Ford Motor Company's QVM Ford F-Series 4.9L bifuel prep vehicle program. Unique features of the 4.9L engine included exhaust-valve seat inserts, hard-faced exhaust valves, corrosion-resistant intake valves, hardened intake valve seats, positive valve rotation, and revised intake-valve springs. Collectively, these features insured improved valve train durability. Other components included upgraded front springs to accommodate the gaseous fuel system and unique vehicle identification that provided service technicians with vehicle conversion data. The F Series vehicles modified for natural gas included natural gas tank (in-bed, 8.4 equivalent gallons), natural gas tank (under body, 3.8 equivalent gallons), natural gas fill receptacle, natural gas system shut-off valve, natural gas regulator assembly, 4.9L gaseous fuel prep engine, gasoline tank (18.2 gallons), and gasoline filler. Figure 2 illustrates the prep vehicle CNG modifications.⁽⁷⁾ The vehicles tested at Ft. Hood were configured as Package #1 (Figure 2b). The power train consisted of a 4.9L engine coupled to an E40D automatic transmission. All trucks were equipped with air conditioning and power steering.

Table 1 lists the characteristics of the test vehicles, including odometer reading and test start date.

Table 1. Description of Test Vehicles at Start of Test										
Vehicle Bumper No.	Year	Make & Model	Engine Size	No. of Cyl.	Auto Trans	GVW*	Tire Size	Odometer	Date	Test Fuel
G200	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7030	07/01/96	Gas/CNG
G201	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	8170.	07/01/96	Gas/CNG
G202	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7867	07/01/96	Gas/CNG
G203	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3784	07/01/96	Gas/CNG
G204	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	4711	07/01/96	Gas/CNG
G205	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	10947	07/01/96	Gas/CNG
G206	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6688	07/01/96	Gas/CNG
G207	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5363	07/01/96	Gas/CNG
G208	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7865	07/01/96	Gas/CNG
G209	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3468	07/01/96	Gas/CNG
G210	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6163	07/01/96	Gas/CNG
G211	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5658	07/01/96	Gas/CNG
G212	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5802	07/01/96	Gas/CNG
G213	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	11736	07/01/96	Gas/CNG
G214	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2791	07/01/96	Gas/CNG
G215	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3283	07/01/96	Gas/CNG
G216	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6086	07/01/96	Gas/CNG
G217	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	10116	07/01/96	Gas/CNG
G218	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6440	07/01/96	Gas/CNG
G219	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6803	07/01/96	Gas/CNG
G220	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	4991	07/01/96	Gas/CNG
G221	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3928	07/01/96	Gas/CNG
G222	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	4471	07/01/96	Gas/CNG
G223	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3483	07/01/96	Gas/CNG
G224	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2937	07/01/96	Gas/CNG
G225	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5912	07/01/96	Gas/CNG
G226	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7065	07/01/96	Gas/CNG
G227	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	8726	07/01/96	Gas/CNG
G228	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3582	07/01/96	Gas/CNG
G229	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3498	07/01/96	Gas/CNG
G230	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7538	07/01/96	Gas/CNG
G231	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2444	07/01/96	Gas/CNG
G232	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3880	07/01/96	Gas/CNG
G233	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6883	07/01/96	Gas/CNG
G234	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2640	07/01/96	Gas/CNG
G235	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6325	07/01/96	Gas/CNG
G236	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5172	07/01/96	Gas/CNG
G237	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5510	07/01/96	Gas/CNG

Table 1. Description of Test Vehicles at Start of Test										
Vehicle Bumper No.	Year	Make & Model	Engine Size	No. of Cyl.	Auto Trans	GVW*	Tire Size	Odometer	Date	Test Fuel
G238	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2780	07/01/96	Gas/CNG
G239	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	10651	07/01/96	Gas/CNG
G240	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	4055	07/01/96	Gas/CNG
G241	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5558	07/01/96	Gas/CNG
G242	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7183	07/01/96	Gas/CNG
G243	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6997	07/01/96	Gas/CNG
G244	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7537	07/01/96	Gas/CNG
G245	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5577	07/01/96	Gas/CNG
G247	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	4743	07/01/96	Gas/CNG
G248	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	6664	07/01/96	Gas/CNG
G249	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	3426	07/01/96	Gas/CNG
G250	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2544	07/01/96	Gas/CNG
G251	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	4085	07/01/96	Gas/CNG
G252	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	2825	07/01/96	Gas/CNG
G253	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	5994	07/01/96	Gas/CNG
G254	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	8356	07/01/96	Gas/CNG
G255	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	8231	07/01/96	Gas/CNG
G256	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	437	07/01/96	Gas/CNG
G257	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	554	07/01/96	Gas/CNG
G258	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	243	07/01/96	Gas/CNG
G259	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	33	08/01/96	Gas/CNG
G260	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	306	09/01/96	Gas/CNG
G261	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	98	10/01/96	Gas/CNG
G262	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	211	10/01/96	Gas/CNG
G263	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	259	10/01/96	Gas/CNG
G264	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	9260	01/01/97	Gas/CNG
G265	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	8748	01/01/97	Gas/CNG
G266	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	7512	12/01/97	Gas/CNG
G267	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	18799	12/01/97	Gas/CNG
G268	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	23412	12/01/97	Gas/CNG
G269	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	24394	12/01/97	Gas/CNG
G270	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	18587	12/01/97	Gas/CNG
G271	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	18587	12/01/97	Gas/CNG
G272	1995	Ford F150	4.9L	6	T-2	6,200	P235/75Rx15	18587	12/01/97	Gas/CNG

*GVW = Gross Vehicle Weight



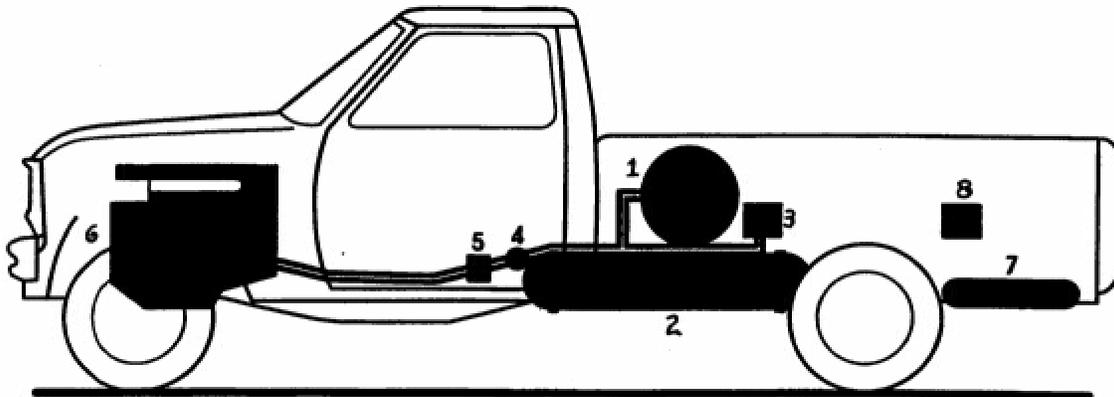
Figure 1a. Front view of bifuel truck



Figure 1b. Rear view of bifuel truck

Ford QVM Program Typical Ford F-Series Modified For Natural Gas

Fuel System Component Locations



- 1) Natural Gas Tank (In-bed)
- 2) Natural Gas Tank (Underbody)
- 3) Natural Gas Fill Receptacle
- 4) Natural Gas System
Manual Shut-off Valve
- 5) Natural Gas Regulator Assembly
- 6) 4.9L Gaseous Fuel Prep Engine
- 7) Gasoline Tank (18.2 Gallons)
- 8) Gasoline Filler



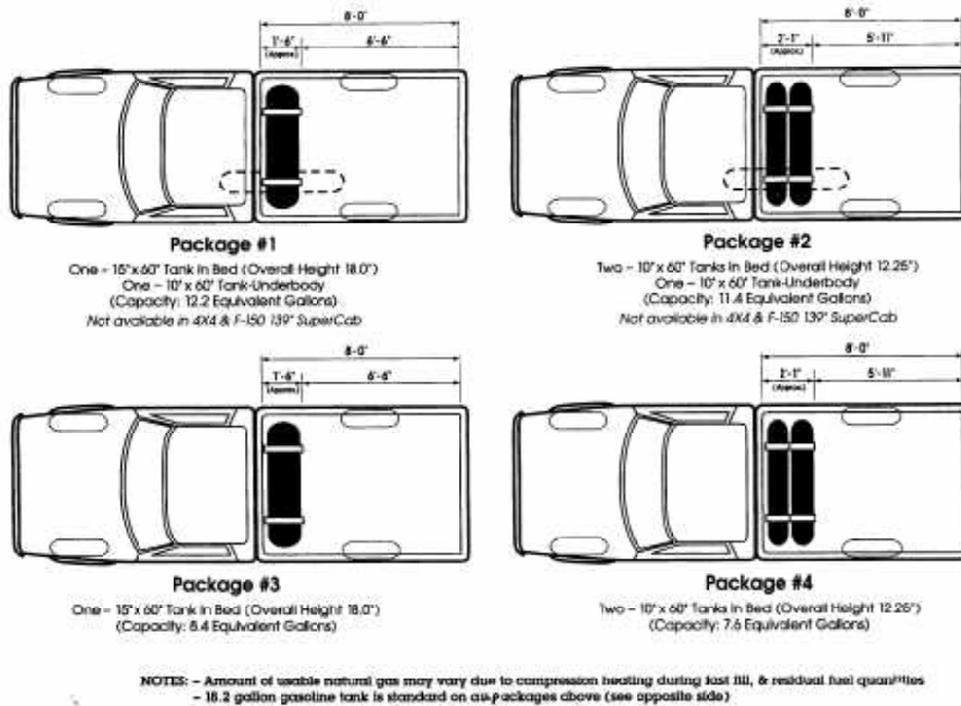
For more information, call 1-800-ALT-FUEL



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Figure 2a. Schematic of CNG Component Locations

Natural Gas Tank Configurations:



**Figure 2b. Natural Gas Tank Configurations:
 Package No. 1 - Natural Gas Tank Configuration for Vehicles at Ft. Hood**

C. Data Collection

Data were provided in the following formats by the following sources at Ft. Hood:

Monthly Utilization Record – U-Tech Services at the Ft. Hood TMP provided a consolidated recap of the month’s usage data. The form contained the previous month’s ending odometer reading and the present end-of-month reading for each vehicle in the program. Total month’s usage was calculated and reported. TMP dispatch personnel mailed the forms to TFLRF.

Gasoline and CNG Fuel Issue # Record - Ft. Hood TMP administrative personnel provided TFLRF with the monthly automated gasoline and CNG fuel issue record, which included date, vehicle tag number, odometer reading, and total gallons dispensed.

Fuel Wetted Component Repair - The GSA Fleet Management Office, provided the TFLRF monitor with reports of fuel component repairs.

D. Fueling Stations

1. Gasoline

The gasoline fueling station at Ft. Hood is a DOD-operated facility located at the TMP. The station is a card lock automated facility, and the fuel is delivered to underground tanks by a local refinery under contract.

2. Compressed Natural Gas

The CNG fueling station is co-located adjacent to the gasoline fueling station. It is also a card lock automated facility. The station is equipped with a 425-cfm compressor, a 100-gallon-equivalent capacity storage tank, and a two-nozzle dispenser with Sherex quick disconnects with a maximum fill pressure of 3,000 psi.

V. RESULTS OF DEMONSTRATION

A. Fleet Test Results

1. General

The 72 test vehicles accumulated 1,148,217 miles of operation from July 1996 through July 1998. Monthly mileage and fuel-usage summaries for each test vehicle are included in Appendix A.

2. Fuel Economy

A summary of the fuel economy data for the test vehicles is presented in Table 2. Individual summaries for each of the 72 test vehicles are included in Appendix A. The fuel economy, calculated from usage data on the bifuel vehicles, is a combination of gasoline and CNG fuels. The energy conversion for the Ft Hood area was 128 cubic feet of natural gas per equivalent gallon. Figures 3a and 3b show gasoline and CNG usage by vehicle throughout the program. Figures 4a and 4b show the total mileage accumulation by vehicle. The highest mileage accumulation was 68,356 miles and the lowest was 2,761 miles. Figures 5a and 5b are a presentation of fuel economy by vehicle. Fuel economy ranged from 9.7 to 32.3 mpg, with an average of 14.2 mpg. Figure 6 shows the averaged combined gasoline and CNG actual fleet data compared to the combined averaged FTP results. The

EPA mileage specification report (8) for the 1995 F150 series trucks with the 4.9L engine lists the city driving cycle gasoline fuel economy at 14.9 miles per gallon. The actual fleet data show a fuel economy difference of approximately 4.9 percent between the averaged FTP results and the EPA’s mileage specification report. This difference can be attributed to the duty cycle of the vehicles.

3. Fuel System Unscheduled Maintenance Actions

The test vehicles were under manufacturer’s warranty throughout the demonstration program. An authorized Ford dealership in Killeen, Texas performed all unscheduled repairs on the bifuel vehicles. Collectively, the vehicles’ performance was highly satisfactory. Twenty-seven unscheduled CNG-related maintenance actions were performed on 16 of 72 vehicles during the demonstration program. The most prevalent faults reported were gas leaks and failure to start on CNG. All vehicles underwent an in-bed mounted, CNG-tank re-strapping modification to prevent shifting. The warranty work was performed under Ford’s Technical Service Bulletin recall No. 95011F.

Vehicle Bumper No.	Total Program Miles	Gallons CNG	Gallons Gasoline	Gallons Total	Miles/Gallon
G200	15,069	914.4	349.0	1263.4	11.9
G201	97,33	404.5	399.1	803.6	12.1
G202	34,955	978.1	1616.9	2595.0	13.5
G203	11,220	193.8	428.8	622.6	18.0
G204	18,945	556.9	350.0	906.9	20.9
G205	18,801	824.8	650.5	1475.4	12.7
G206	25,398	288.4	498.0	786.4	32.3
G207	9681	414.2	322.6	736.9	13.1
G208	18,306	860.8	496.0	1356.8	13.5
G209	23,175	690.3	1211.9	1902.2	12.2
G210	7,149	226.4	388.9	615.3	11.6
G211	9,772	545.1	215.0	760.1	12.9
G212	11,520	415.4	970.9	970.9	11.9
G213	22,549	825.2	553.2	1378.5	16.4
G214	8,010	275.5	375.4	650.9	12.3
G215	10,237	390.8	301.2	692.0	14.8
G216	10,157	453.4	297.3	750.8	13.5
G217	17,950	1007.1	341.4	1348.5	13.3
G218	16,617	900.5	446.0	1346.6	12.3
G219	12,368	457.0	656.0	1113.0	11.1
G220	13,215	538.8	524.1	1062.9	12.4
G221	26,867	697.0	1459.5	2156.5	12.5
G222	10,962	328.6	450.1	778.7	14.1
G223	8,580	229.2	439.8	669.0	12.8
G224	8236	346.6	261.6	608.2	13.5

Table 2. Summary of Test Vehicle Data Miles and Combined CNG/Gasoline Consumption					
Vehicle Bumper No.	Total Program Miles	Gallons CNG	Gallons Gasoline	Gallons Total	Miles/Gallon
G225	11,320	384.9	487.5	872.4	13.0
G226	15,715	730.8	246.6	977.4	16.1
G227	22,349	649.7	487.7	1137.4	19.7
G228	6,960	359.5	148.9	508.5	13.7
G229	11,080	437.4	504.3	941.7	11.8
G230	18,273	684.7	1466.4	1466.4	12.5
G231	8,914	274.6	401.6	676.2	13.2
G232	68,356	1760.5	3121.7	4882.2	14.0
G233	11,537	411.3	490.0	901.3	12.8
G234	5,812	153.3	326.4	479.7	12.1
G235	14,575	379.6	495.6	875.2	16.6
G236	52,033	2201.1	1543.4	3744.4	13.9
G237	15,620	446.9	366.3	813.2	19.21
G238	33,296	806.8	1435.8	2242.7	14.9
G239	29,889	743.2	595.2	1338.4	22.3
G240	54,917	1473.4	2582.1	4055.5	13.5
G241	9,393	328.9	441.5	770.5	12.2
G242	8,329	345.3	283.6	628.8	13.3
G243	17,133	935.1	327.5	1262.6	13.6
G244	14,438	492.3	643.0	1135.3	12.7
G245	13,963	513.5	433.9	947.4	14.7
G247	19,079	728.8	625.9	1354.7	14.1
G248	11,567	429.2	226.4	655.6	17.6
G249	14,922	568.7	328.4	897.1	16.6
G250	12,845	433.9	338.2	772.2	16.6
G251	9,537	551.3	428.4	979.7	9.73
G252	10,570	440.6	556.3	996.9	10.6
G253	10,965	360.6	318.1	678.8	16.2
G254	14,763	850.6	335.0	1185.6	12.5
G255	15,672	498.2	374.2	872.5	17.9
G256	17,184	379.8	638.1	1018.0	16.9
G257	16,118	416.6	420.1	836.7	19.2
G258	11,647	287.1	422.1	709.2	16.4
G259	10,720	307.4	550.9	858.3	12.5
G260	13,764	363.3	684.0	1047.3	13.1
G261	9,600	447.8	349.5	797.2	12.0
G262	7,617	275.8	394.7	670.5	11.4
G263	9,066	304.9	449.6	754.5	12.0
G264	14,318	471.5	623.7	1095.2	13.1
G265	8,741	348.5	314.4	662.8	13.2
G266	7,729	272.1	487.7	662.8	15.9
G267	2,761	94.8	100.5	487.7	14.1
G268	2,868	74.1	154.2	195.3	12.6
G269	3,830	198.6	126.2	228.4	11.8
G270	3,892	186.7	100.1	324.8	13.6
G271	6,372	165.1	107.2	286.8	23.4
G272	53,144	3761.6	4280.5	272.2	12.4

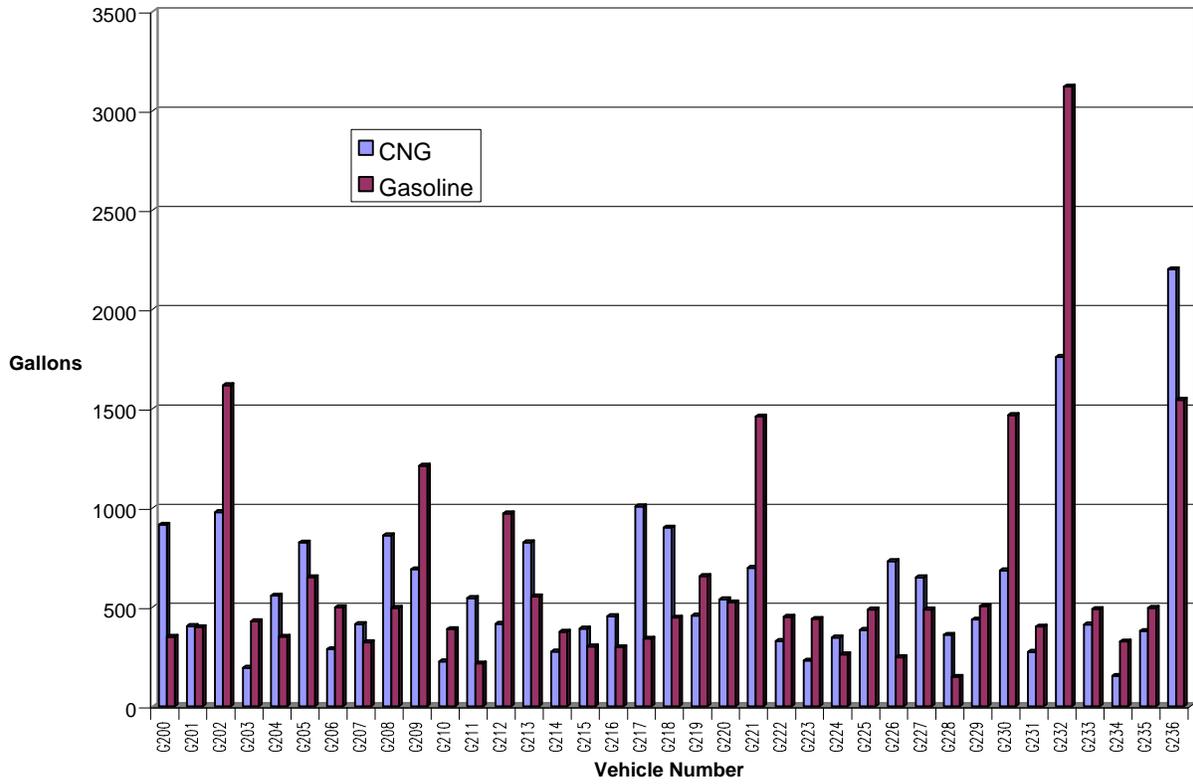


Figure 3a. Gasoline and CNG Usage by Vehicle Throughout Program

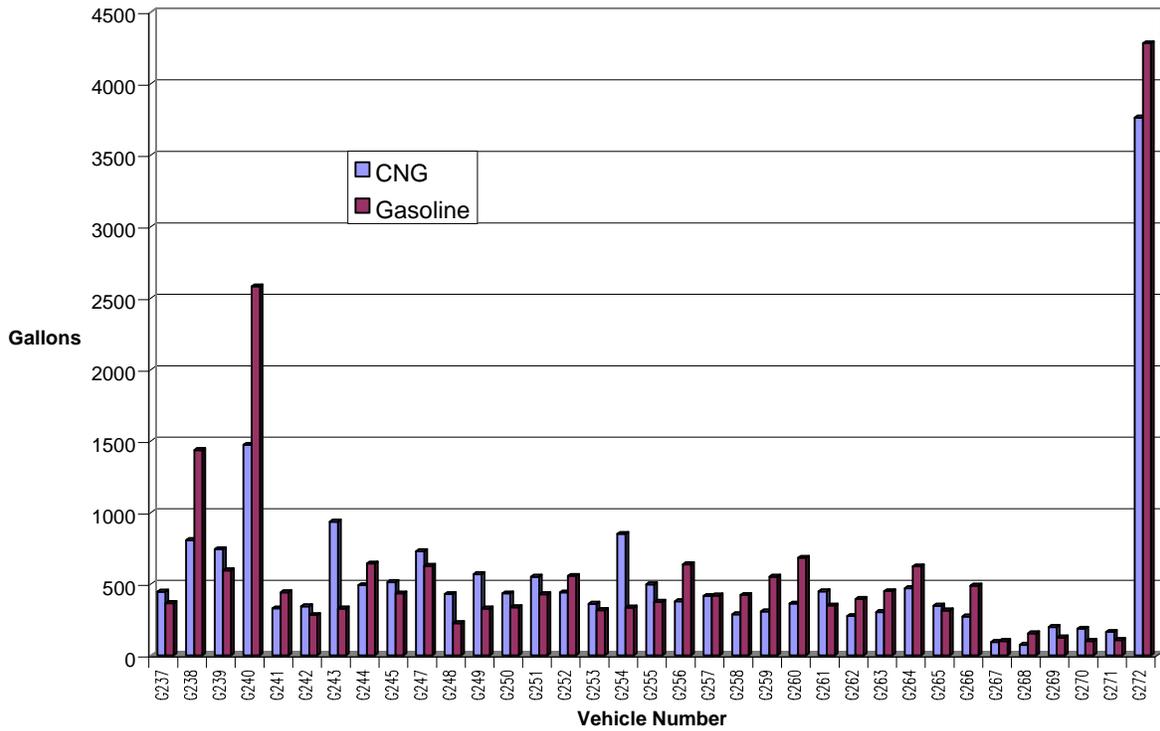


Figure 3b. Gasoline and CNG Usage by Vehicle Throughout Program

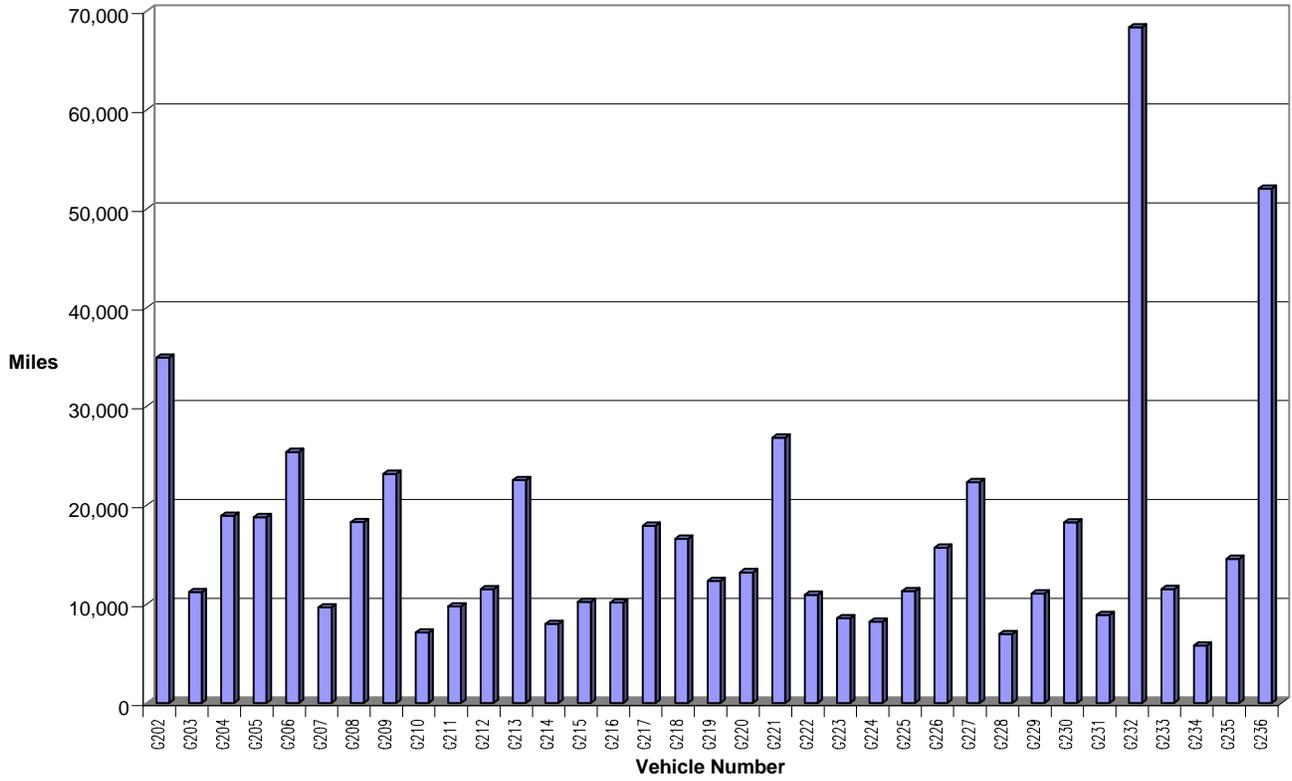


Figure 4a. Total Mileage Accumulation by Vehicle

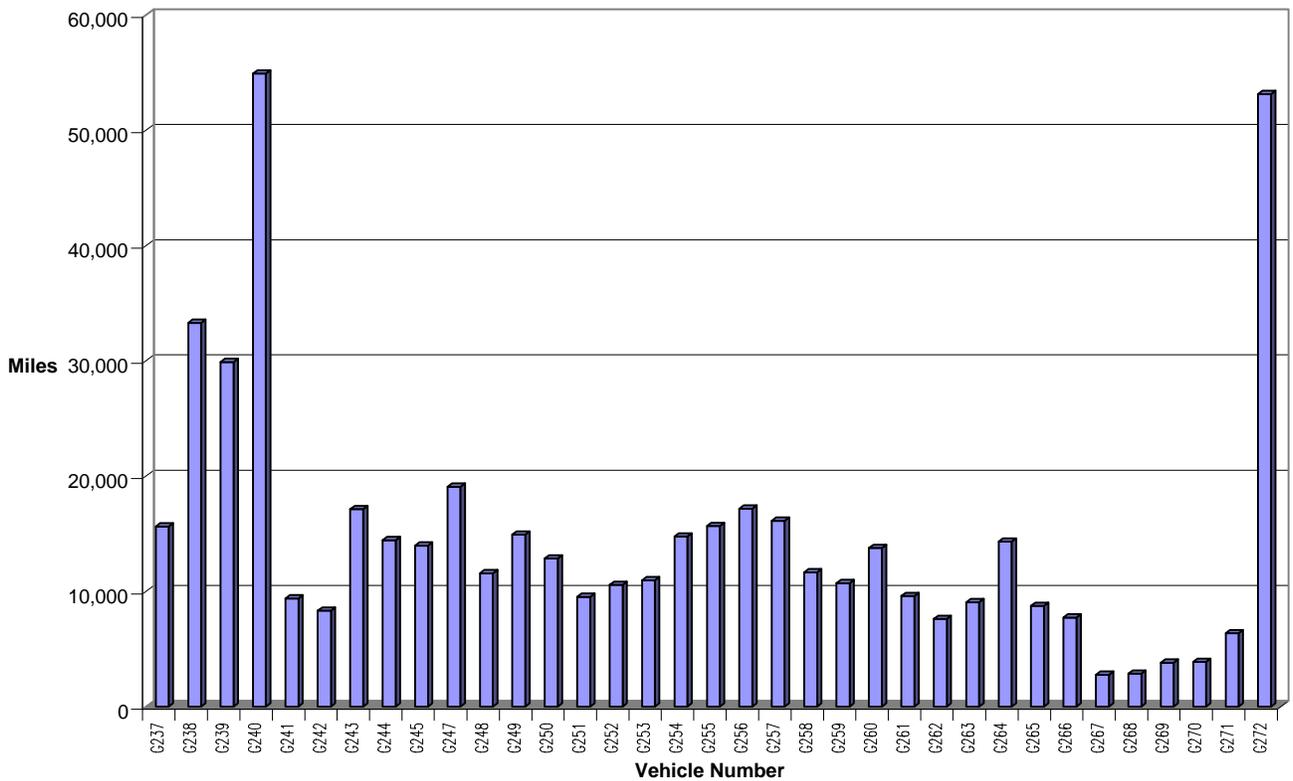


Figure 4b. Total Mileage Accumulation by Vehicle

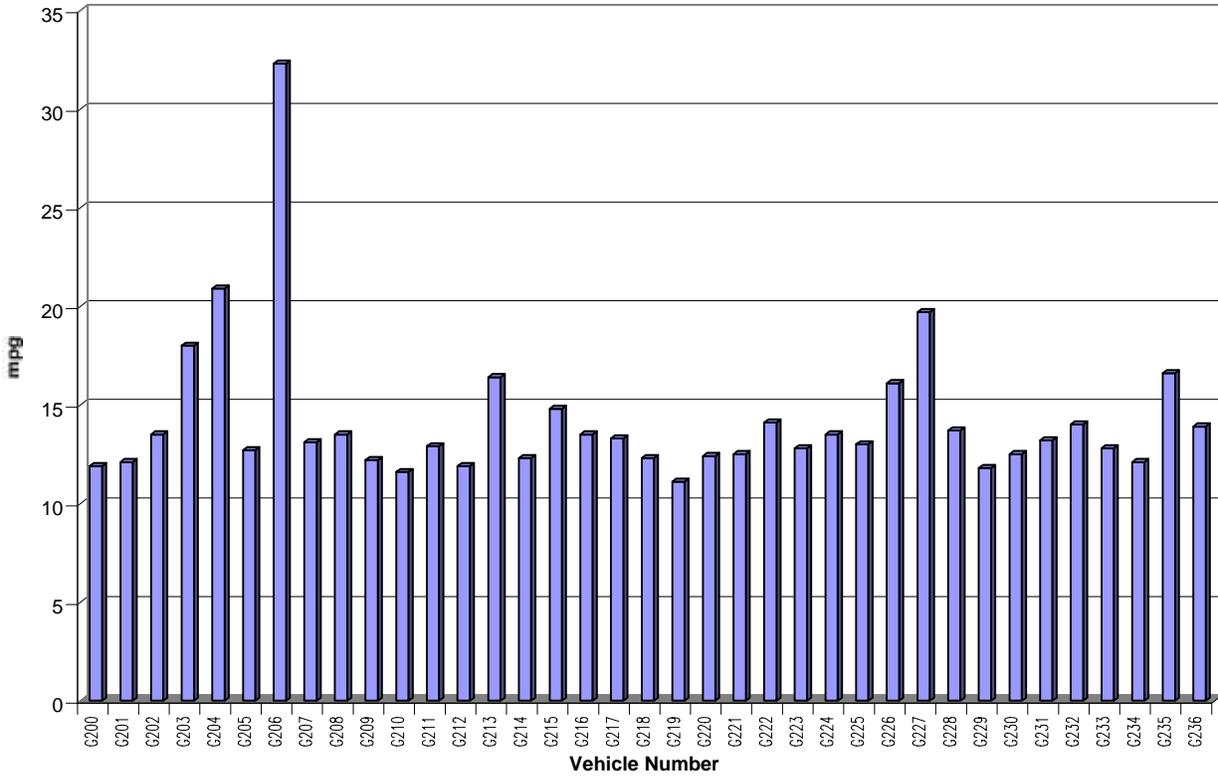


Figure 5a. Fuel Economy by Vehicle

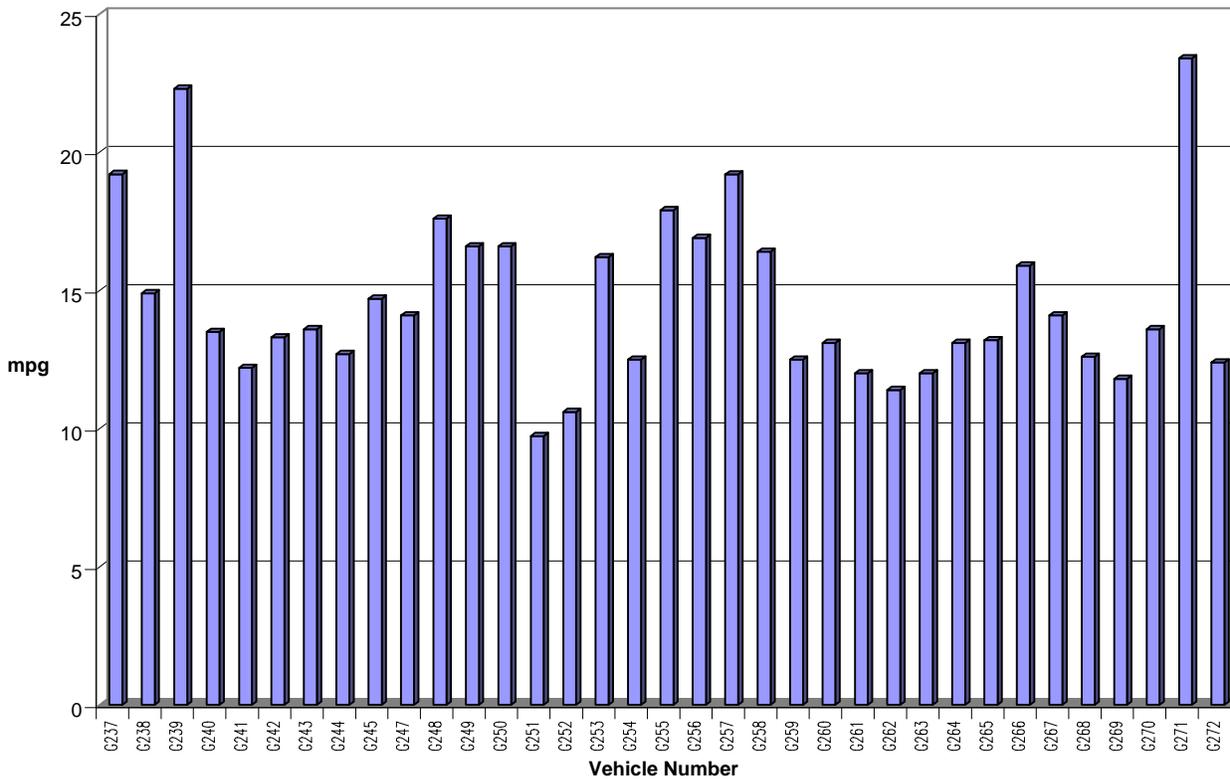


Figure 5b. Fuel Economy by Vehicle

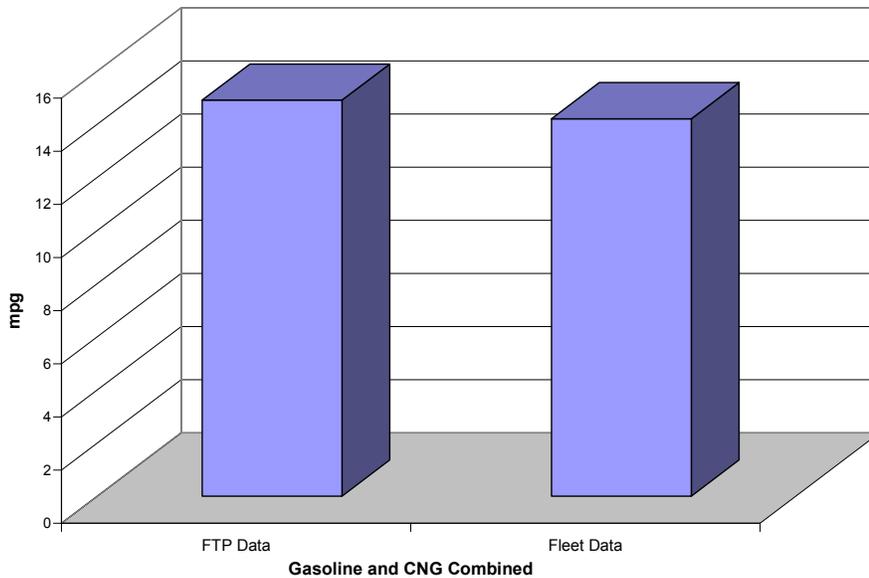


Figure 6. Avgd. Combined Gasoline and CNG Actual Fleet Data vs. Combined Avgd FTP Data

4. Vehicle Performance

The performance of the test vehicles was assessed by conducting interviews with vehicle operators at each quarterly visit. The operators were for the most part very satisfied with vehicle performance while operating on CNG. The most prevalent performance problems reported on the bifueled vehicles were “hard to start,” “lack of power,” and “acceleration.”

5. Resolution of User Concerns

It was the practice throughout the demonstration program to investigate users’ concerns on the operability of the bifueled vehicles. Therefore, drivers’ comments were solicited at every site visit. Without exception, every driver queried complained of the vehicle’s longer starting time, lack of power, and acceleration while using CNG fuel. Early into the program, TFLRF staff conducted cold/hot start and full-throttle acceleration tests using CNG and gasoline fuels to determine the severity of the complaint.

a. Cold/Hot Start Tests

Two cold and two hot starts were performed on a single bifuel vehicle. Engine cranking time to start was recorded in seconds. Results showed that the cranking time required to start the engine increased an average of 1.1 seconds during the cold-start phase and 1.3 seconds during the hot-start phase while using CNG fuel. Figures 7 through 10 show the individual and averaged cold/hot start test results.

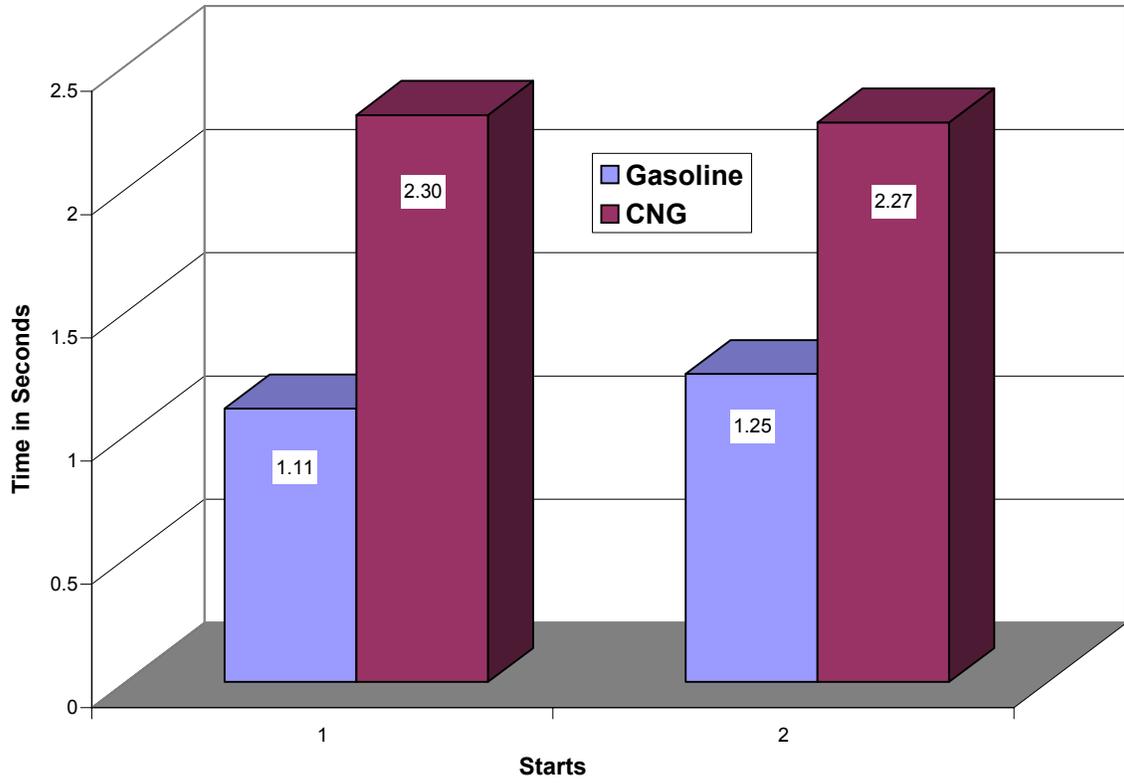


Figure 7. Individual Cold Start Test Results

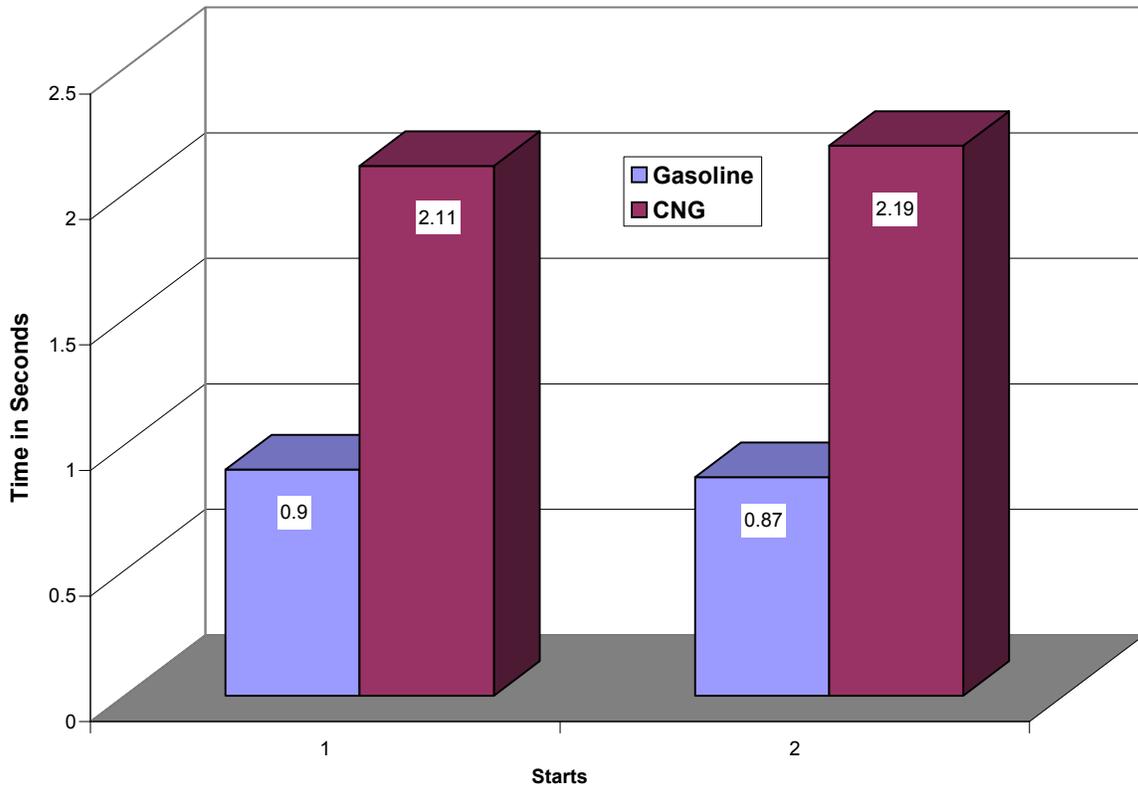


Figure 8. Individual Hot Start Test Results

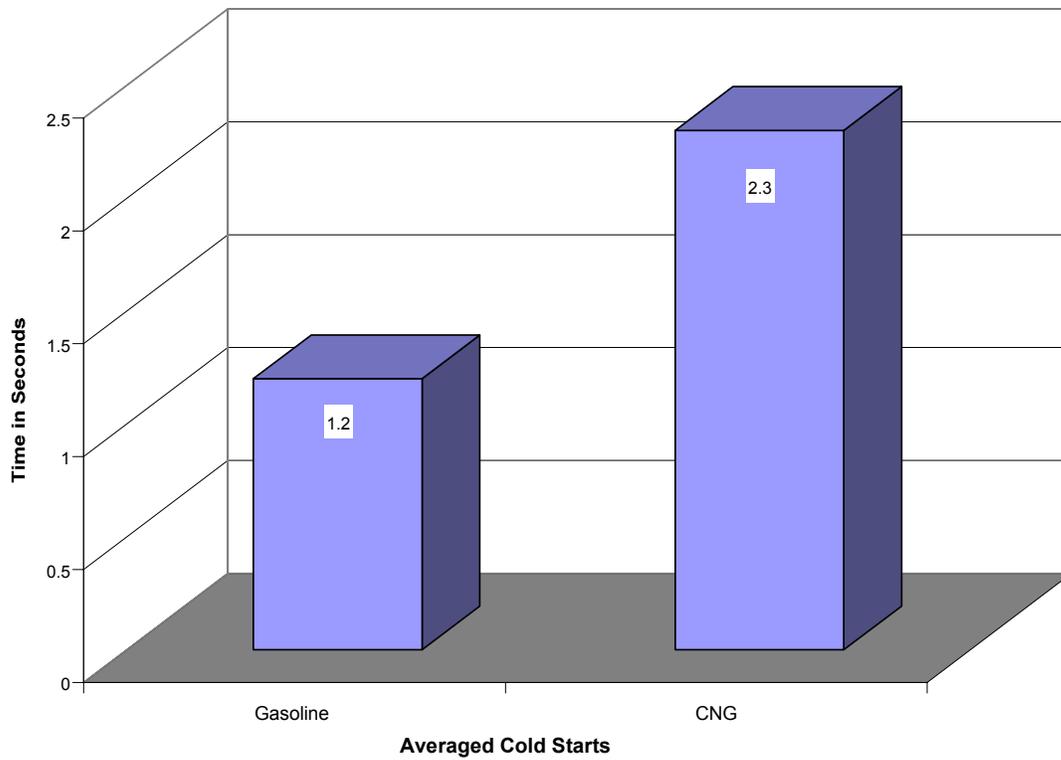


Figure 9. Averaged Cold Start Test Results

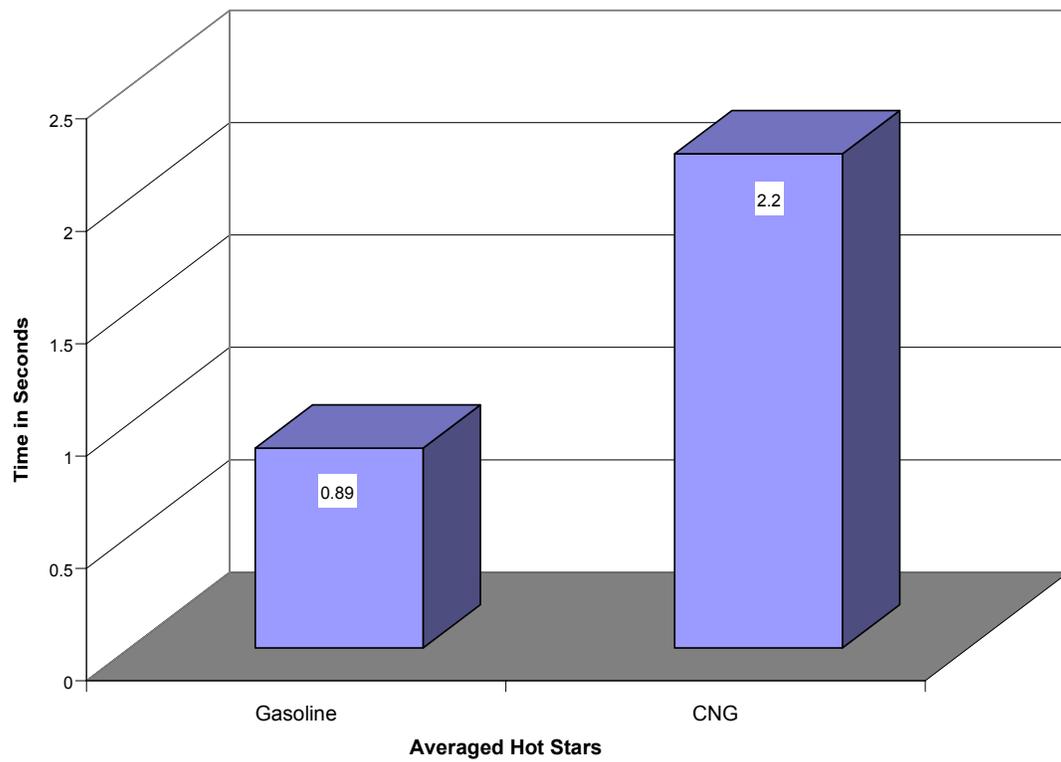


Figure 10. Averaged Hot Start Test Results

b. 0-50mph Full-throttle Acceleration Tests

The full-throttle acceleration tests measure the amount of time that is required to reach a given speed. The acceleration times of a given engine are a function of the work produced by the engine. The developed work and subsequent rate of work (power) are a function of the volume and energy of the injected fuel. The fuel-energy density and the injected volume determine the energy content of the injected fuel. Combustion factors that determine power availability with a fuel are the thermal efficiency of the combustion and the energy conversion processes. The aforementioned factors all contribute to the work and power development of an engine, which affect the vehicle acceleration times when a fuel conversion is made. Power loss was expected because of the lower volumetric heating value of CNG compared to gasoline; therefore the volume of fuel delivered with CNG would have lower energy content than the equivalent gasoline. Full-throttle, 0-50mph accelerations were performed on a single bifuel vehicle using gasoline and CNG fuels. Twelve individual runs were performed with each fuel. Six acceleration runs were performed in each direction. The time in seconds to reach 50mph was recorded for each run. To stabilize engine temperature and performance, the vehicle was operated a minimum of two miles at normal operating conditions after each of the six acceleration runs. Results of the acceleration runs while operating with CNG versus unleaded gasoline showed that the average elapsed time to accelerate from 0 to 50mph increased three seconds. These data are summarized in Figures 11 and 12. The increase in acceleration time with CNG is within the expected parameters based on the difference in energy content between CNG and gasoline fuels. (9)

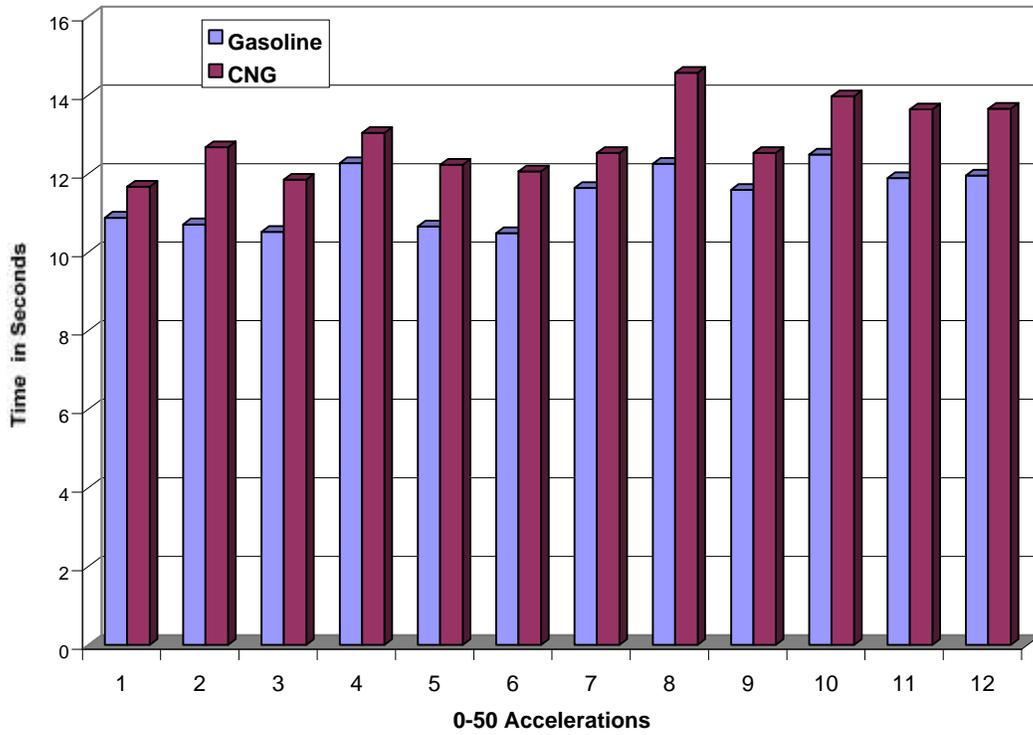


Figure 11. Timed Acceleration Runs

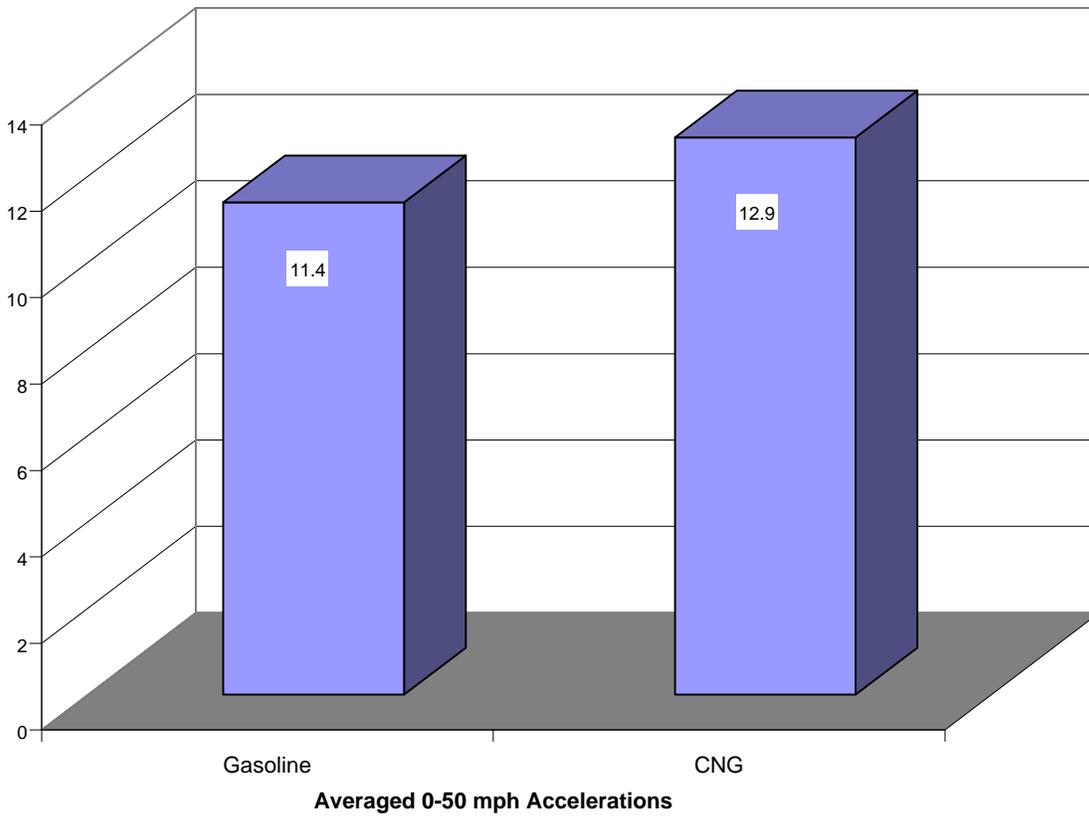


Figure 12. Average Accelerations

B. Emissions Testing

1. General

The objective of testing the exhaust and evaporative emissions was to provide a method to compare the unburned hydrocarbons while operating with both CNG and gasoline fuels, and assess the benefits and/or penalties of using CNG as an alternative fuel.

Two test vehicles were selected for emissions testing at 4,000 miles and end of test mileage; however, at the end of the test, one of the originally selected vehicles had accumulated limited mileage (15,000). Therefore, the highest mileage fleet vehicle (81,000) was substituted and tested instead. This would demonstrate the effect of heavy usage on tailpipe emissions. The testing was conducted by the Department of Emissions Research at SwRI (an EPA-certified emissions testing laboratory). The vehicles were tested utilizing the FTP schedule for light-duty vehicles. (10)

2. FTP Exhaust Emissions and HFET Fuel Economy

The exhaust emissions of three bifuel vehicles were quantified using the Light-Duty Vehicle FTP. The bifuel vehicle emission measurements were determined while operating the vehicles on gasoline and CNG. The exhaust emission measurements were made at 4,000 miles for vehicles G247 and G255. End of test measurements were made at end of test mileage on vehicles G247 and G232 (substituted vehicle). The FTP exhaust emissions and HFET fuel economy results are included as Appendix B.

The averaged FTP unburned exhaust emissions, highway fuel economy test results at two mileage intervals, and overall averaged results are shown in Table 3. Also shown are the EPA's standards for total hydrocarbons (THC [gasoline exhaust only]), non-methane hydrocarbons (NMHC), carbon monoxide (CO), and oxides of nitrogen (NO_x). Methane hydrocarbons constitute 93 percent of CNG composition; therefore, the EPA standard for total hydrocarbons applies to gasoline fuel only.

Figure 13 compares the averaged FTP unburned hydrocarbons emissions with the EPA's standards for light duty vehicles. The THC standard applies to gasoline fuel only.

Table 3. Averaged Unburned FTP Regulated Emissions and Highway Fuel Economy (HFE) Test Results

Test Fuel	Gasoline			CNG		
	Miles	4,000	EOT	Average	4,000	EOT
Exhaust Emissions						
THC, g/mile	0.61	0.7	0.66	2.7	2.47	2.6
NMHC, g/mile	0.41	0.55	0.48	0.06	0.00	0.03
CO, g/mile	3.92	4.98	4.45	1.09	2.90	1.99
Nox, g/mile	0.86	0.81	0.84	0.95	0.82	0.89
NMOG, g/mile	0.42	0.58	0.50	0.12	0.15	0.14
HFE, mpg	23.51	23.47	23.49	23.70	23.67	23.96

EPA Standards

THC, 0.8 g/mile*

NMHC, 0.32 g/mile

CO, 4.4 g/mile

Nox, 0.7 g/mile

* = Gasoline Only

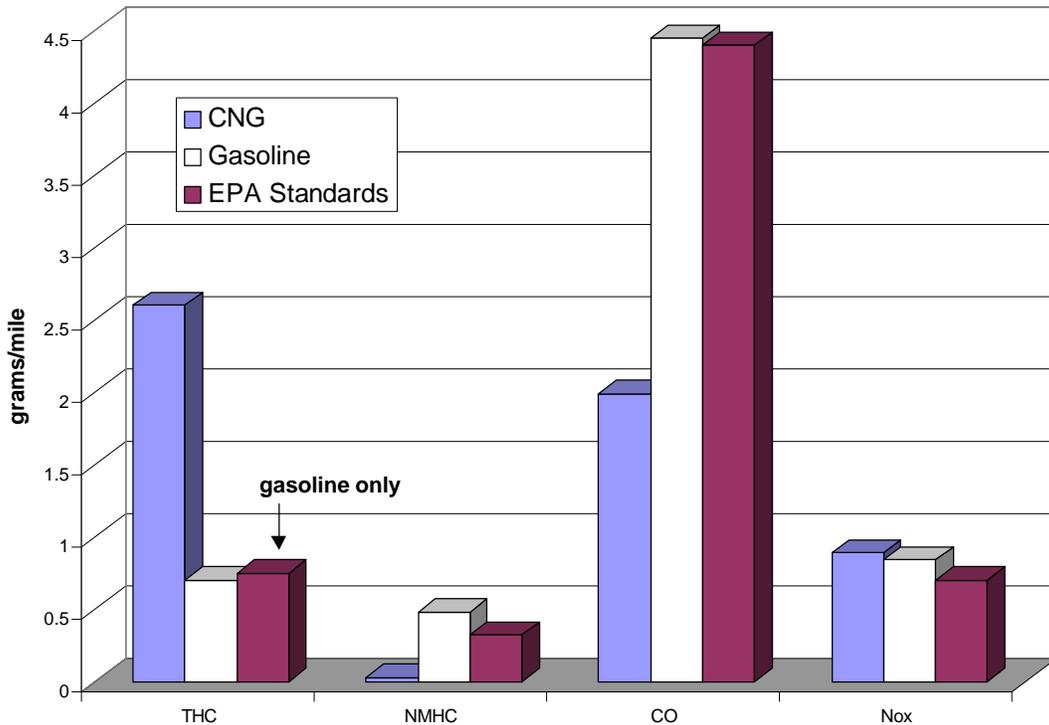


Figure 13. Comparison of Averaged Unburned Hydrocarbon Emissions Results

Figure 14 shows the averaged unburned hydrocarbon emissions at two mileage intervals for the three vehicles. Figure 14 reveals the Total Hydrocarbon (THC), Non-Methane Organic Gas (NMOG), and Non-Methane Hydrocarbon (NMHC) response for each fuel. As expected, the THC response is substantially higher for CNG use. The NMOG and NMHC results indicate substantial reductions in higher molecular weight hydrocarbon emissions when CNG is used.

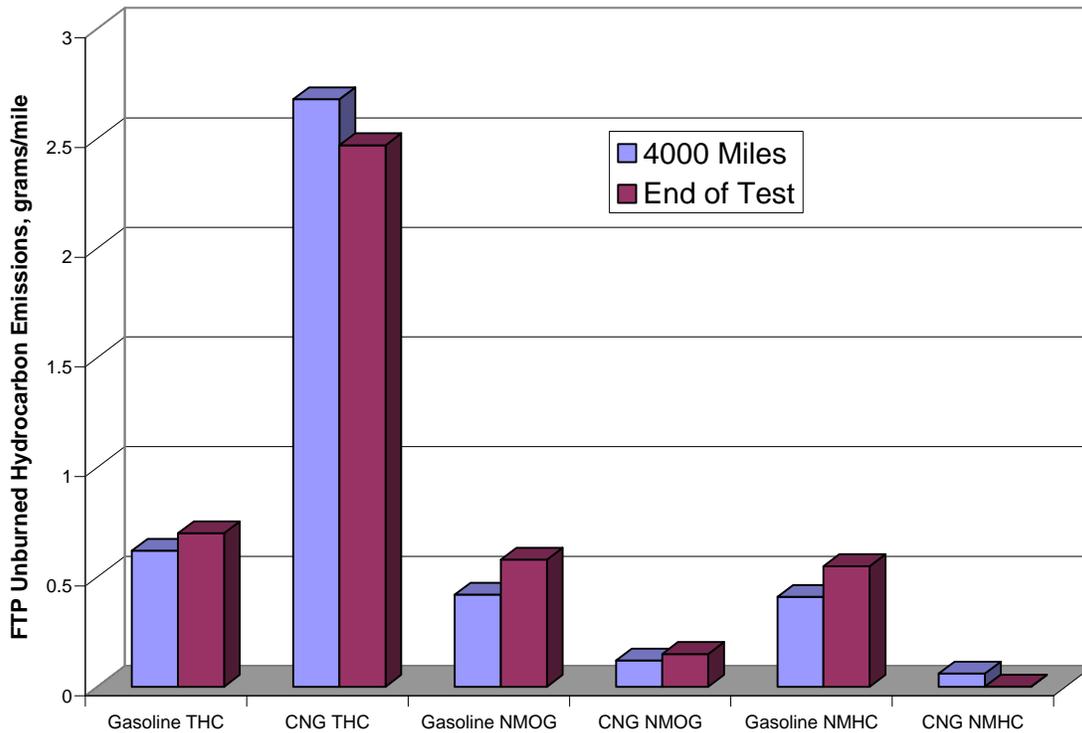


Figure 13. Comparison of Averaged Unburned Hydrocarbon Emissions Results

VI. CONCLUSIONS

Use of the Ford F150 QVM bifuel vehicle at Ft. Hood, Texas demonstrated that operation of bifuel vehicles in support of post-camp and station operations is feasible. The ability of the bifuel vehicles to use either compressed natural gas (CNG) or gasoline permitted the assignment of the vehicles to sections with areas larger than the maximum range of the vehicle in the CNG mode. The bifuel vehicles were readily accepted as a viable alternative to the dedicated gasoline vehicle.

The Ford bifuel vehicles proved to be highly reliable in that only a few fuel-component maintenance actions were recorded during the 24-month long demonstration. The drivers' most prevalent performance problems reported while operating with CNG were hard starting, lack of power, and acceleration. Hot/cold starts and full throttle acceleration tests were performed on one bifuel vehicle. Results indicated that the cranking time in the CNG mode increased an average of 1.2 seconds, and acceleration time to reach 50 mph during the full throttle evaluations increased 1.5 seconds.

The averaged combined CNG and gasoline fuel economy calculated from actual usage data shows an 4.7-percent decrease compared to the combined Federal Test Procedure (FTP) results. This difference can be attributed to the short start-and-stop duty cycle of the test vehicles during the demonstration program.

The exhaust emission levels were fairly consistent at each mileage interval regardless of fuel used. The vehicles operating on CNG demonstrated significant reductions in non-methane organic gas (NMOG), non-methane hydrocarbons (NMHC), and carbon monoxide (CO) emissions compared to gasoline operation. Operation with CNG, however, reveals a slight increase in oxides of nitrogen (NO_x) emissions compared to gasoline operation.

CNG usage at Ft. Hood was 51.3 percent compared to gasoline usage. Instructions to the drivers were to use only one tank full of gasoline per month; however, in order to demonstrate the actual driver response to the bifuel vehicle concept, the one tank full ruling was not enforced. With the CNG fueling facility adjacent to the gasoline pumps, the use of CNG was expected to be far greater than that of gasoline. However, there is always the usual resistance exhibited by drivers when a fleet is changed from a trusted fuel such as gasoline to an "experimental" fuel such as CNG with a limited track record.

VII. LIST OF REFERENCES

1. Section 400-AA of the Alternative Motor Fuels Act (AMFA), 1998.
2. Section 11 of Executive Order 12759 Dated 17 April 1998.
3. Energy Policy Act of 1992.
4. Executive Order 13031, Dated.
5. The Clean Air Amendments, 1990.
6. Contract DAAK70-92-C0059, Work Directive 35.
7. Ford Motor Company Brochure No. 133993
8. Automotive News Report, dated 23 October 1994.
9. Dorm, P., Mauro, A. M., and Herbsman, S., "The Properties and Performance of Automotive Fuels", Society of Automotive Engineers (SAE) Publication No. 861178, 1986.
10. Code of Federal Regulations Title 40: Part 86, Subpart B, "Emissions Regulations for 1977 and Later Vehicles and New Light-Duty Trucks Test Procedure."

APPENDIX A
MILEAGE AND FUEL USAGE SUMMARIES FOR BIFUEL VEHICLES

JULY 1996

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	968	86.9	0.0	86.9	11.14
G201	441	26.5	7.5	34.0	12.97
G202	980	49.6	13.1	62.7	15.63
G203	354	21.5	1.6	23.1	15.32
G204	854	10.6	12.7	23.3	36.65
G205	1342	72.7	40.7	113.4	11.83
G206	1265	19.3	19.6	38.9	32.52
G207	644	34.4	13.8	48.2	13.36
G208	1001		68.2	68.2	14.68
G209	128	0.0	10.0	10.0	12.80
G210	730	17.4	27.7	45.1	16.19
G211	671	45.6	5.0	50.6	13.26
G212	508	53.8	0.0	53.8	9.44
G213	1142	51.0	24.8	75.8	15.07
G214	447	20.6	15.1	35.7	12.52
G215	568	16.4	19.0	35.4	16.05
G216	659	36.2	13.2	49.4	13.34
G217	925	61.6	15.3	76.9	12.03
G218	820	55.7	27.4	83.1	9.87
G219	309	26.8	32.0	58.8	5.26
G220	772	50.6	23.2	73.8	10.46
G221	167	0.0	10.3	10.3	16.21
G222	479	13.3	26.3	39.6	12.10
G223	284	6.4	0.0	6.4	44.38
G224	283	18.1	11.0	29.1	9.73
G225	571	20.8	23.8	44.6	12.80
G226	412	22.2	7.0	29.2	14.11
G227	1827	44.3	30.4	74.7	24.46
G228	290	16.7	0.0	16.7	17.37
G229	638	34.5	0.0	34.5	18.49
G230	897	66.7	22.7	89.4	10.03
G231	606	18.1	20.7	38.8	15.62
G232	130	11.2	10.3	21.5	6.05
G233	514	0.5	34.1	34.6	14.86
G234	676	24.5	40.9	65.4	10.34
G235	798	17.7	53.8	71.5	11.16
G236	486	44.5	0.0	44.5	10.92
G237	690	30.4	19.8	50.2	13.75
G238	182	14.1	0.0	14.1	12.91
G239	823	0.0	0.0	0.0	0.00
G240	2003	35.7	162.0	197.7	10.13
G241	457	22.1	13.6	35.7	12.80
G242	245	11.2	3.4	14.6	16.78
G243	976	50.1	13.6	63.7	15.32
G244	678	42.7	16.1	58.8	11.53
G245	690	34.4	11.0	45.4	15.20
G247	1003	73.4	10.5	83.9	11.95
G248	280	13.0	8.0	21.0	13.33
G249	479	37.0	0.0	37.0	12.95
G250	724	46.2	0.0	46.2	15.67
G251	269	8.5	7.0	15.5	17.35
G252	267	24.5	13.1	37.6	7.10
G253	212	14.3	9.2	23.5	9.02
G254	657	34.3	23.2	57.5	11.43
G255	631	30.2	13.3	43.5	14.51
G256	556	22.8	26.3	49.1	11.32
G257	262	0.0	14.0	14.0	18.71
G258	630	51.5	19.7	71.2	8.85
G259	559	11.8	34.1	45.9	12.18

AUGUST 1996

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	951	0.0	68.2	68.2	13.94
G201	53	0.0	13.9	13.9	3.81
G202	848	23.1	52.0	75.1	11.29
G203	580	9.5	27.0	36.5	15.89
G204	761	11.9	26.2	38.1	19.97
G205	1209	0.0	92.6	92.6	13.06
G206	1181	6.9	48.7	55.6	21.24
G207	427	8.8	27.7	36.5	11.70
G208	587	7.7	25.4	33.1	17.73
G209	1926	0.0	151.3	151.3	12.73
G210	539	0.0	44.0	44.0	12.25
G211	491	12.1	23.3	35.4	13.87
G212	0			0.0	0.00
G213	1105	16.6	38.3	54.9	20.13
G214	392	5.8	25.9	31.7	12.37
G215	447	7.9	27.2	35.1	12.74
G216	508	8.7	12.0	20.7	24.54
G217	1099	18.1	47.6	65.7	16.73
G218	790	18.1	47.0	65.1	12.14
G219	361	0.0	26.5	26.5	13.62
G220	996	17.1	65.5	82.6	12.06
G221	3180	0.0	285.8	285.8	11.13
G222	627	0.0	38.5	38.5	16.29
G223	259	13.9	14.5	28.4	9.12
G224	354	6.2	11.0	17.2	20.58
G225	33	0.0	13.6	13.6	2.43
G226	1079	14.9	45.3	60.2	17.92
G227	1243	12.4	29.5	41.9	29.67
G228	218	7.0	0.0	7.0	31.14
G229	645	8.3	58.7	67.0	9.63
G230	1198	17.0	74.4	91.4	13.11
G231	449	7.0	21.7	28.7	15.64
G232	1771	0.0	150.6	150.6	11.76
G233	476	0.0	41.4	41.4	11.50
G234	386	0.0	29.1	29.1	13.26
G235	628	8.6	36.3	44.9	13.99
G236	409	8.3	13.8	22.1	18.51
G237	1141	3.4	55.7	59.1	19.31
G238	127	0.0	13.4	13.4	9.48
G239	1149	0.0	24.6	24.6	46.71
G240	808	0.0	52.3	52.3	15.45
G241	364	5.3	19.6	24.9	14.62
G242	327	0.0	5.8	5.8	56.38
G243	830	19.0	39.6	58.6	14.16
G244	840	7.2	37.0	44.2	19.00
G245	899	7.0	37.6	44.6	20.16
G247	1199	25.7	66.9	92.6	12.95
G248	456	4.5	23.4	27.9	16.34
G249	766	18.8	3.7	22.5	34.04
G250	468	7.7	23.9	31.6	14.81
G251	190	0.0	12.0	12.0	15.83
G252	457	8.4	13.5	21.9	20.87
G253	503	0.0	24.2	24.2	20.79
G254	747	14.0	36.1	50.1	14.91
G255	403	8.3	13.0	21.3	18.92
G256	904	3.0	53.1	56.1	16.11
G257	0	0.0	0.0	0.0	0.00
G258	712	7.3	50.1	57.4	12.40
G259	699	16.4	44.6	61.0	11.46
G260	0	0.0	0.0	0.0	0.00

SEPTEMBER 1996

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	887	66.1	12.0	78.1	11.36
G201	762	24.3	38.9	63.2	12.06
G202	1010	9.1	105.7	114.8	8.80
G203	681	9.3	36.6	45.9	14.84
G204	1439	23.1	19.7	42.8	33.62
G205	1032	9.2	66.6	75.8	13.61
G206	1946	33.7	35.8	69.5	28.00
G207	0	8.3	0.0	8.3	0.00
G208	1058	56.1	14.2	70.3	15.05
G209	2633	12.8	236.7	249.5	10.55
G210	169	0.0	26.7	26.7	6.33
G211	428	33.0	11.0	44.0	9.73
G212	624	6.6	44.0	50.6	12.33
G213	866	38.0	14.0	52.0	16.65
G214	543	14.3	37.6	51.9	10.46
G215	219	9.6	11.1	20.7	10.58
G216	516	23.9	26.0	49.9	10.34
G217	589	23.9	23.1	47.0	12.53
G218	795	55.6	22.5	78.1	10.18
G219	424	8.6	40.7	49.3	8.60
G220	642	28.0	34.0	62.0	10.35
G221	3073	6.7	261.0	267.7	11.48
G222	842	11.3	24.5	35.8	23.52
G223	210	0.0	24.5	24.5	8.57
G224	345	17.2	16.9	34.1	10.12
G225	518	8.0	41.3	49.3	10.51
G226	923	60.7	16.8	77.5	11.91
G227	1520	9.1	28.4	37.5	40.53
G228	404	26.7	8.3	35.0	11.54
G229	673	19.3	49.7	69.0	9.75
G230	953	43.4	42.1	85.5	11.15
G231	746	15.9	33.2	49.1	15.19
G232	1699	12.9	143.7	156.6	10.85
G233	600	3.0	43.0	46.0	13.04
G234	415	28.2	13.2	41.4	10.02
G235	893	25.5	27.3	52.8	16.91
G236	322	23.8	0.0	23.8	13.53
G237	815	32.2	31.7	63.9	12.75
G238	1222	10.7	67.0	77.7	15.73
G239	897	0.0	0.0	0.0	0.00
G240	1912	8.6	186.5	195.1	9.80
G241	425	7.7	11.6	19.3	22.02
G242	0	0.0	0.0	0.0	0.00
G243	758	34.5	13.4	47.9	15.82
G244	514	27.6	38.3	65.9	7.80
G245	578	21.8	30.8	52.6	10.99
G247	602	27.8	18.4	46.2	13.03
G248	1045	1.1	37.5	38.6	27.07
G249	589	27.8	19.1	46.9	12.56
G250	651	0.0	37.5	37.5	17.36
G251	140	0.0	13.9	13.9	10.07
G252	419	0.0	37.5	37.5	11.17
G253	567	7.6	34.6	42.2	13.44
G254	342	28.0	10.9	38.9	8.79
G255	739	8.2	20.7	28.9	25.57
G256	1231	14.8	40.7	55.5	22.18
G257	0	0.0	0.0	0.0	0.00
G258	992	38.1	41.1	79.2	12.53
G259	508	23.9	31.6	55.5	9.15
G260	509	0.0	38.3	38.3	13.29
G261	274	6.6	5.7	12.3	22.28

OCTOBER 1996

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	781	58.4	0.0	58.4	13.37
G201	491	19.9	16.7	36.6	13.42
G202	837	6.2	73.6	79.8	10.49
G203	494	9.2	33.3	42.5	11.62
G204	276	27.2	34.8	62.0	4.45
G205	1470	58.7	49.7	108.4	13.56
G206	1734	9.4	14.1	23.5	73.79
G207	416	9.3	8.3	17.6	23.64
G208	732	40.7	16.7	57.4	12.75
G209	2244	10.7	172.4	183.1	12.26
G210	283	0.0	13.2	13.2	21.44
G211	362	30.5	0.0	30.5	11.87
G212	501	5.9	40.7	46.6	10.75
G213	1309	47.9	28.4	76.3	17.16
G214	572	17.8	30.2	48.0	11.92
G215	341	9.7	12.0	21.7	15.71
G216	448	16.6	6.0	22.6	19.82
G217	980	66.3	5.2	71.5	13.71
G218	745	48.9	7.0	55.9	13.33
G219	379	19.3	24.9	44.2	8.57
G220	606	29.8	28.0	57.8	10.48
G221	4075	0.0	340.9	340.9	11.95
G222	599	17.7	37.4	55.1	10.87
G223	162	10.0	13.1	23.1	7.01
G224	325	18.8	0.0	18.8	17.29
G225	440	0.0	31.8	31.8	13.84
G226	838	34.4	11.7	46.1	18.18
G227	418	0.0	38.5	38.5	10.86
G228	234	16.5	0.5	17.0	13.76
G229	428	8.1	23.1	31.2	13.72
G230	1213	50.8	33.6	84.4	14.37
G231	492	25.7	15.2	40.9	12.03
G232	3298	16.0	268.1	284.1	11.61
G233	577	20.0	40.9	60.9	9.47
G234	244	0.0	21.7	21.7	11.24
G235	968	18.1	40.4	58.5	16.55
G236	317	23.5	14.3	37.8	8.39
G237	664	22.3	16.0	38.3	17.34
G238	4860	16.8	356.6	373.4	13.02
G239	500	4.0	34.4	38.4	13.02
G240	1304	10.1	117.7	127.8	10.20
G241	403	0.0	14.2	14.2	28.38
G242	508	29.0	1.5	30.5	16.66
G243	860	58.8	0.0	58.8	14.63
G244	563	9.1	28.1	37.2	15.13
G245	676	51.3	0.0	51.3	13.18
G247	362	8.0	29.0	37.0	9.78
G248	0	0.0	0.0	0.0	0.00
G249	843	48.9	0.3	49.2	17.13
G250	417	30.7	12.8	43.5	9.59
G251	338	11.7	25.0	36.7	9.21
G252	459	9.7	40.0	49.7	9.24
G253	390	5.5	12.6	18.1	21.55
G254	711	56.3	0.0	56.3	12.63
G255	1386	23.8	46.4	70.2	19.74
G256	712	17.1	26.9	44.0	16.18
G257	849	9.0	13.3	22.3	38.07
G258	314	17.1	12.0	29.1	10.79
G259	751	0.0	41.4	41.4	18.14
G260	378	0.0	37.9	37.9	9.97
G261	515	29.7	14.6	44.3	11.63
G262	70	4.6	5.1	9.7	7.22
G263	185	0.0	12.1	12.1	15.29
G264	223	6.2	18.2	24.4	9.14

NOVEMBER 1996

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	536	33.0	9.1	42.1	12.73
G201	322	16.9	12.7	29.6	10.88
G202	771	2.5	41.2	43.7	17.64
G203	436	16.0	25.2	41.2	10.58
G204	959	19.1	11.5	30.6	31.34
G205	1089	48.4	0.0	48.4	22.50
G206	1800	10.8	88.8	99.6	18.07
G207	569	33.9	22.4	56.3	10.11
G208	964	32.9	21.2	54.1	17.82
G209	638	0.0	70.5	70.5	9.05
G210	405	0.0	28.7	28.7	14.11
G211	349	26.6	1.1	27.7	12.60
G212	380	4.8	30.8	35.6	10.67
G213	709	17.9	26.1	44.0	16.11
G214	530	0.0	31.1	31.1	17.04
G215	275	0.0	13.9	13.9	19.78
G216	409	24.7	8.4	33.1	12.36
G217	848	66.5	0.0	66.5	12.75
G218	590	20.1	0.0	20.1	29.35
G219	337	5.6	2.2	7.8	43.21
G220	566	9.3	23.4	32.7	17.31
G221	1092	0.0	75.0	75.0	14.56
G222	391	5.9	24.7	30.6	12.78
G223	111	0.0	11.4	11.4	9.74
G224	302	8.9	18.3	27.2	11.10
G225	267	0.0	26.6	26.6	10.04
G226	533	36.4	0.0	36.4	14.64
G227	869	10.4	0.0	10.4	83.56
G228	144	0.0	12.1	12.1	11.90
G229	288	8.4	11.8	20.2	14.26
G230	494	18.7	31.1	49.8	9.92
G231	337	16.1	24.1	40.2	8.38
G232	2650	9.7	178.9	188.6	14.05
G233	306	10.6	11.2	21.8	14.04
G234	192	0.0	12.2	12.2	15.74
G235	475	0.0	13.5	13.5	35.19
G236	301	0.0	20.2	20.2	14.90
G237	448	13.1	11.4	24.5	18.29
G238	1562	0.0	133.2	133.2	11.73
G239	456	0.0	34.5	34.5	13.22
G240	2183	7.0	136.8	143.8	15.18
G241	528	26.5	28.5	55.0	9.60
G242	181	9.1	6.5	15.6	11.60
G243	734	42.2	10.9	53.1	13.82
G244	414	9.7	22.5	32.2	12.86
G245	619	6.4	38.2	44.6	13.88
G247	316	6.4	10.0	16.4	19.27
G248	0	0.0	0.0	0.0	0.00
G249	576	21.1	12.6	33.7	17.09
G250	212	15.6	0.0	15.6	13.59
G251	449	19.6	10.4	30.0	14.97
G252	294	13.4	0.0	13.4	21.94
G253	289	13.8	10.1	23.9	12.09
G254	451	25.1	10.8	35.9	12.56
G255	1701	9.9	24.3	34.2	49.74
G256	1131	7.9	25.0	32.9	34.38
G257	583	21.4	29.6	51.0	11.43
G258	43	1.1	5.0	6.1	7.05
G259	483	0.0	34.4	34.4	14.04
G260	475	0.0	36.0	36.0	13.19
G261	303	13.3	12.5	25.8	11.74
G262	238	0.0	23.7	23.7	10.04
G263	341	0.0	37.4	37.4	9.12
G264	883	40.3	22.1	62.4	14.15

DECEMBER 1996

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	615	32.0	11.0	43.0	14.30
G201	348	18.1	13.7	31.8	10.94
G202	2314	15.2	114.2	129.4	17.88
G203	495	0.0	28.0	28.0	17.68
G204	469	37.2	13.4	50.6	9.27
G205	718	36.6	18.0	54.6	13.15
G206	713	10.0	25.4	35.4	20.14
G207	479	11.3	14.8	26.1	18.35
G208	899	59.5	11.5	71.0	12.66
G209	194	7.9	11.4	19.3	10.05
G210	492	11.9	38.7	50.6	9.72
G211	289	18.1	0.0	18.1	15.97
G212	317	0.0	30.1	30.1	10.53
G213	843	32.1	26.9	59.0	14.29
G214	410	9.5	37.2	46.7	8.78
G215	149	9.9	8.9	18.8	7.93
G216	182	7.3	0.0	7.3	24.93
G217	932	61.6	9.8	71.4	13.05
G218	620	50.4	26.2	76.6	8.09
G219	534	9.6	15.0	24.6	21.71
G220	480	20.0	32.6	52.6	9.13
G221	273	0.0	41.7	41.7	6.55
G222	289	8.1	23.7	31.8	9.09
G223	225	0.0	22.3	22.3	10.09
G224	346	9.9	9.4	19.3	17.93
G225	289	0.0	18.9	18.9	15.29
G226	305	14.0	11.7	25.7	11.87
G227	1336	21.6	44.9	66.5	20.09
G228	211	9.6	0.0	9.6	21.98
G229	245	7.0	28.0	35.0	7.00
G230	640	18.9	28.5	47.4	13.50
G231	318	1.1	29.8	30.9	10.29
G232	4847	39.9	248.3	288.2	16.82
G233	287	11.2	10.6	21.8	13.17
G234	118	2.2	9.1	11.3	10.44
G235	613	19.0	24.2	43.2	14.19
G236	210	10.3	11.6	21.9	9.59
G237	496	30.5	16.6	47.1	10.53
G238	1592	0.0	72.1	72.1	22.08
G239	531	0.0	11.3	11.3	46.99
G240	5020	25.7	268.9	294.6	17.04
G241	379	0.0	23.8	23.8	15.92
G242	367	7.5	24.3	31.8	11.54
G243	722	56.2	0.0	56.2	12.85
G244	464	18.0	37.1	55.1	8.42
G245	564	17.8	16.8	34.6	16.30
G247	421	21.6	9.2	30.8	13.67
G248	404	8.1	22.5	30.6	13.20
G249	732	31.7	13.6	45.3	16.16
G250	370	3.7	22.0	25.7	14.40
G251	507	29.1	16.9	46.0	11.02
G252	303	0.0	38.4	38.4	7.89
G253	256	14.0	10.5	24.5	10.45
G254	575	45.9	0.0	45.9	12.53
G255	397	1.4	19.1	20.5	19.37
G256	400	6.9	21.0	27.9	14.34
G257	584	8.8	13.5	22.3	26.19
G258	469	7.1	7.6	14.7	31.90
G259	389	5.9	25.2	31.1	12.51
G260	763	10.9	51.4	62.3	12.25
G261	366	11.6	21.9	33.5	10.93
G262	293	7.1	25.5	32.6	8.99
G263	332	14.3	22.7	37.0	8.97
G264	828	7.4	60.6	68.0	12.18

JANUARY 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	615	52.1	11.0	63.1	9.75
G201	291	10.9	28.1	39.0	7.46
G202	331	0.0	31.6	31.6	10.46
G203	382	0.0	28.2	28.2	13.55
G204	737	18.6	0.0	18.6	39.62
G205	849	61.0	11.0	72.0	11.79
G206	1096	12.6	23.5	36.1	30.40
G207	558	37.1	12.7	49.8	11.20
G208	852	24.8	34.3	59.1	14.42
G209	217	2.9	19.9	22.8	9.51
G210	310	9.6	26.2	35.8	8.66
G211	377	23.9	11.9	35.8	10.53
G212	327	7.2	31.5	38.7	8.45
G213	184	5.4	11.4	16.8	10.95
G214	248	0.0	21.8	21.8	11.40
G215	326	0.0	12.5	12.5	26.04
G216	446	32.4	0.0	32.4	13.77
G217	605	41.2	0.0	41.2	14.68
G218	700	42.7	0.0	42.7	16.39
G219	376	9.1	31.8	40.9	9.19
G220	407	9.3	23.0	32.3	12.60
G221	197	0.0	22.2	22.2	8.86
G222	335	0.0	10.9	10.9	30.73
G223	106	0.0	5.0	5.0	21.20
G224	270	0.0	12.6	12.6	21.43
G225	411	8.3	23.1	31.4	13.09
G226	478	29.1	0.0	29.1	16.43
G227	900	11.6	21.9	33.5	26.87
G228	197	11.1	21.9	33.0	5.97
G229	612	16.4	30.3	46.7	13.09
G230	771	19.8	26.3	46.1	16.72
G231	220	0.0	10.3	10.3	21.36
G232	4036	25.7	160.9	186.6	21.63
G233	402	12.2	33.2	45.4	8.86
G234	192	0.0	20.2	20.2	9.50
G235	421	11.0	14.1	25.1	16.77
G236	208	0.0	12.2	12.2	17.04
G237	367	0.0	12.1	12.1	30.31
G238	6006	23.9	234.8	258.7	23.22
G239	727	18.3	68.1	86.4	8.42
G240	3713	27.6	159.5	187.1	19.85
G241	242	8.0	13.5	21.5	11.25
G242	288	21.9	6.6	28.5	10.11
G243	630	28.7	19.3	48.0	13.13
G244	514	8.5	13.9	22.4	22.95
G245	344	9.0	16.4	25.4	13.56
G247	853	9.4	46.1	55.5	15.38
G248	211	9.9	11.0	20.9	10.10
G249	726	18.0	6.4	24.4	29.74
G250	290	6.2	16.0	22.2	13.06
G251	463	23.2	21.7	44.9	10.31
G252	239	0.0	11.7	11.7	20.50
G253	290	8.6	0.0	8.6	33.72
G254	535	41.4	9.9	51.3	10.43
G255	694	0.0	26.8	26.8	25.91
G256	861	0.0	42.5	42.5	20.26
G257	637	6.1	62.6	68.7	9.27
G258	424	0.0	34.9	34.9	12.14
G259	385	0.0	21.8	21.8	17.65
G260	423	0.8	31.8	32.6	12.96
G261	50	0.0	0.0	0.0	0.00
G262	429	21.9	30.0	51.9	8.26
G263	787	13.1	26.6	39.7	19.81
G264	684	0.0	56.5	56.5	12.12
G265	257	0.0	6.3	6.3	41.12
G266	297	0.0	3.4	3.4	87.35

FEBRUARY 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	632	45.0	0.0	45.0	14.04
G201	366	0.0	23.5	23.5	15.61
G202	196	0.0	20.4	20.4	9.59
G203	218	0.0	34.3	34.3	6.35
G204	580	35.3	0.0	35.3	16.43
G205	808	25.9	29.3	55.2	14.65
G206	1128	0.0	14.6	14.6	77.10
G207	513	26.9	13.4	40.3	12.72
G208	744	17.1	21.4	38.5	19.33
G209	101	0.0	0.0	0.0	0.00
G210	251	0.0	21.7	21.7	11.58
G211	348	29.3	3.4	32.7	10.66
G212	435	0.0	32.8	32.8	13.26
G213	315	0.0	23.7	23.7	13.30
G214	214	0.0	10.2	10.2	21.00
G215	463	8.6	27.1	35.7	12.96
G216	433	16.4	19.2	35.6	12.15
G217	278	8.2	11.0	19.2	14.48
G218	800	37.9	49.0	86.9	9.20
G219	855	28.1	74.3	102.4	8.35
G220	476	9.5	36.9	46.4	10.25
G221	302	0.0	26.6	26.6	11.34
G222	467	12.5	34.9	47.4	9.85
G223	402	0.0	26.9	26.9	14.94
G224	55	10.4	16.3	26.7	2.06
G225	292	5.5	30.0	35.5	8.23
G226	579	27.5	15.2	42.7	13.56
G227	920	13.6	13.0	26.6	34.60
G228	220	0.0	0.0	0.0	0.00
G229	855	12.5	68.5	81.0	10.55
G230	824	38.1	19.3	57.4	14.35
G231	221	0.0	20.9	20.9	10.56
G232	2687	8.4	86.8	95.2	28.24
G233	289	0.0	10.3	10.3	28.06
G234	176	0.0	13.2	13.2	13.33
G235	749	18.4	24.1	42.5	17.62
G236	307	0.0	22.1	22.1	13.89
G237	345	16.4	8.5	24.9	13.85
G238	2567	15.2	123.6	138.8	18.49
G239	954	24.0	54.2	78.2	12.20
G240	5010	10.2	265.7	275.9	18.16
G241	551	5.3	41.8	47.1	11.70
G242	471	25.2	19.7	44.9	10.49
G243	727	40.5	19.8	60.3	12.06
G244	788	15.8	66.4	82.2	9.59
G245	299	0.0	12.8	12.8	23.36
G247	903	30.0	54.4	84.4	10.70
G248	354	23.2	2.1	25.3	14.01
G249	204	8.0	7.3	15.3	13.30
G250	504	13.9	26.7	40.6	12.41
G251	614	41.0	44.7	85.7	7.16
G252	288	0.0	35.6	35.6	8.09
G253	456	14.9	12.6	27.5	16.58
G254	506	30.8	11.3	42.1	12.01
G255	363	0.0	12.7	12.7	28.52
G256	595	0.0	47.5	47.5	12.54
G257	1452	30.4	54.4	84.8	17.13
G258	637	0.0	65.7	65.7	9.70
G259	557	0.0	47.3	47.3	11.78
G260	478	0.0	40.3	40.3	11.86
G261	368	13.4	35.5	48.9	7.53
G262	371	5.9	22.0	27.9	13.32
G263	289	0.0	28.6	28.6	10.09
G264	648	0.0	50.7	50.7	12.79
G265	0	0.0	0.0	0.0	0.00
G266	694	9.4	32.6	42.0	16.51

MARCH 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG			
G200	792	55.3	12.0	67.3	11.77
G201	411	0.0	36.9	36.9	11.15
G202	459	0.0	32.9	32.9	13.93
G203	110			0.0	0.00
G204	428	26.5	10.7	37.2	11.50
G205	1383	35.5	57.4	92.9	14.88
G206	201	0.0	21.8	21.8	9.22
G207	533	19.5	27.2	46.7	11.42
G208	959	40.4	30.2	70.6	13.59
G209	325	1.6	22.4	24.0	13.56
G210	227	0.0	12.0	12.0	18.96
G211	420	10.4	13.1	23.5	17.89
G212	726	0.0	62.7	62.7	11.58
G213	1126	30.9	39.0	69.9	16.10
G214	185	0.0	23.8	23.8	7.77
G215	504	16.8	23.4	40.2	12.55
G216	479	8.3	11.8	20.1	23.83
G217	1007	62.0	8.1	70.1	14.36
G218	630	38.6	20.5	59.1	10.66
G219	461	8.5	24.7	33.2	13.90
G220	2493	5.4	25.7	31.1	80.21
G221	129	12.7	18.5	31.2	4.13
G222	603	15.7	24.1	39.8	15.14
G223	406	15.7	24.1	39.8	10.19
G224	358	9.0	0.0	9.0	39.78
G225	574	0.0	30.8	30.8	18.63
G226	592	27.8	0.0	27.8	21.29
G227	979	17.1	20.3	37.4	26.20
G228	164	9.4	10.7	20.1	8.15
G229	368	0.0	30.2	30.2	12.18
G230	882	36.8	39.1	75.9	11.63
G231	233	12.4	19.9	32.3	7.21
G232	3363	15.4	238.3	253.7	13.26
G233	389	10.8	24.2	35.0	11.12
G234	193	0.0	13.0	13.0	14.85
G235	765	18.8	30.9	49.7	15.40
G236	418	0.0	34.2	34.2	12.23
G237	627	24.6	11.2	35.8	17.51
G238	638	2.2	71.7	73.9	8.63
G239	875	16.7	66.0	82.7	10.59
G240	3275	15.9	235.1	251.0	13.05
G241	174	8.9	12.3	21.2	8.22
G242	425	2.1	15.3	17.4	24.40
G243	585	49.5	0.0	49.5	11.82
G244	470	6.4	23.0	29.4	16.00
G245	531	15.5	23.1	38.6	13.77
G247	983	39.4	47.9	87.3	11.26
G248	694	24.6	29.9	54.5	12.73
G249	553	20.8	20.9	41.7	13.26
G250	433	6.6	21.4	28.0	15.46
G251	605	36.8	9.3	46.1	13.12
G252	402	0.0	23.5	23.5	17.14
G253	267	8.8	24.6	33.4	8.00
G254	649	56.0	0.0	56.0	11.59
G255	670	0.0	23.4	23.4	28.58
G256	730	0.0	41.9	41.9	17.41
G257	1055	8.4	57.4	65.8	16.04
G258	57	0.0	10.6	10.6	5.37
G259	491	0.0	36.9	36.9	13.31
G260	526	0.0	36.8	36.8	14.29
G261	494	12.3	12.4	24.7	20.02
G262	292	3.4	22.9	26.3	11.12
G263	441	7.1	42.7	49.8	8.85
G264	701	0.0	59.8	59.8	11.72
G265	119			0.0	0.00
G266	366	2.5	12.3	14.8	24.75

APRIL 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	723	60.4	0.0	60.4	11.97
G201	234	11.0	13.0	24.0	9.74
G202	1762	19.8	130.6	150.4	11.71
G203	69			0.0	0.00
G204	484	13.8	11.6	25.4	19.07
G205	538	18.0	27.3	45.3	11.88
G206	1657	22.0	44.4	66.4	24.94
G207	620	24.4	10.5	34.9	17.77
G208	621	43.2	4.4	47.6	13.06
G209	269	0.0	16.8	16.8	15.98
G210	181	0.0	14.0	14.0	12.93
G211	387	27.6	0.0	27.6	14.02
G212	486	0.0	37.8	37.8	12.87
G213	1271	58.4	8.6	67.0	18.98
G214	241	3.9	10.9	14.8	16.24
G215	282	5.1	14.5	19.6	14.40
G216	370	17.0	23.7	40.7	9.10
G217	1020	72.0	5.1	77.1	13.23
G218	570	37.7	9.3	47.0	12.12
G219	694	0.0	55.7	55.7	12.46
G220	1391	9.6	36.9	46.5	29.89
G221	367	0.0	18.2	18.2	20.18
G222	524	6.6	34.4	41.0	12.78
G223	408	0.0	27.1	27.1	15.08
G224	381	0.0	27.5	27.5	13.12
G225	447	5.8	35.7	41.5	10.76
G226	652	40.2	0.0	40.2	16.22
G227	1467	12.2	29.7	41.9	35.01
G228	218	16.7	3.4	20.1	10.87
G229	291	7.6	12.4	20.0	14.59
G230	604	8.2	31.1	39.3	15.36
G231	125	4.3	7.5	11.8	10.64
G232	3242	33.0	234.3	267.3	12.13
G233	307	10.7	13.0	23.7	12.95
G234	283	0.0	12.8	12.8	22.11
G235	836	7.9	47.7	55.6	15.03
G236	304	14.1	22.1	36.2	8.40
G237	494	24.2	5.0	29.2	16.94
G238	98	0.0	7.9	7.9	12.39
G239	1613	18.4	43.4	61.8	26.10
G240	1452	10.2	109.4	119.6	12.15
G241	192	2.9	9.0	11.9	16.12
G242	303	9.3	16.4	25.7	11.79
G243	795	61.3	0.0	61.3	12.97
G244	631	16.7	29.1	45.8	13.78
G245	929	32.8	42.2	75.0	12.38
G247	1043	43.3	25.8	69.1	15.09
G248	328			0.0	0.00
G249	806	29.4	30.7	60.1	13.41
G250	555	32.6	0.0	32.6	17.02
G251	211	10.7	14.5	25.2	8.37
G252	463	0.0	77.3	77.3	5.99
G253	294	0.0	0.0	0.0	0.00
G254	714	42.8	11.8	54.6	13.09
G255	215	8.2	4.4	12.6	17.10
G256	683	7.5	60.2	67.7	10.09
G257	278	0.0	0.0	0.0	0.00
G258	524	9.0	36.3	45.3	11.56
G259	510	0.9	26.9	27.8	18.36
G260	1207	0.0	99.8	99.8	12.10
G261	632	19.2	33.9	53.1	11.91
G262	379	0.0	36.3	36.3	10.43
G263	457	0.0	37.7	37.7	12.11
G264	829	0.0	64.7	64.7	12.81
G265	450	11.0	32.3	43.3	10.38
G266	706	5.8	54.9	60.7	11.63

MAY 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	694	45.5	9.8	55.3	12.55
G201	443	0.0	42.8	42.8	10.35
G202	1810	15.3	134.0	149.3	12.13
G203	674			0.0	0.00
G204	963	24.9	12.5	37.4	25.72
G205	1103	39.4	40.6	80.0	13.79
G206	565	17.3	13.0	30.3	18.65
G207	428	16.8	30.4	47.2	9.08
G208	553	31.9	8.3	40.2	13.75
G209	1308	0.7	99.1	99.8	13.11
G210	213	0.0	23.9	23.9	8.90
G211	392	26.4	0.0	26.4	14.85
G212	513	0.0	42.0	42.0	12.23
G213	884	37.8	27.7	65.5	13.51
G214	464	0.0	30.9	30.9	15.00
G215	255	0.0	30.9	30.9	8.24
G216	222	9.1	26.5	35.6	6.24
G217	849	42.7	20.7	63.4	13.38
G218	900	47.5	40.3	87.8	10.26
G219	817	8.0	54.0	62.0	13.18
G220	589	17.6	29.2	46.8	12.59
G221	848	0.0	52.8	52.8	16.06
G222	388	6.4	33.3	39.7	9.78
G223	430	0.0	41.4	41.4	10.38
G224	274	8.9	14.5	23.4	11.69
G225	563	0.0	33.8	33.8	16.66
G226	814	52.0	5.8	57.8	14.08
G227	574	6.8	11.3	18.1	31.77
G228	132	7.0	0.0	7.0	18.86
G229	390	15.6	25.1	40.7	9.58
G230	953	18.2	59.3	77.5	12.30
G231	528	4.1	35.9	40.0	13.20
G232	4689	19.0	354.5	373.5	12.56
G233	351	10.7	22.4	33.1	10.62
G234	144	0.0	25.0	25.0	5.76
G235	460	15.8	24.5	40.3	11.41
G236	625	0.0	39.3	39.3	15.91
G237	573	0.0	34.3	34.3	16.72
G238	533		44.3	44.3	12.04
G239	1067	10.0	12.3	22.3	47.87
G240	2212	12.3	153.3	165.6	13.36
G241	337	7.7	11.1	18.8	17.92
G242	330	0.0	26.4	26.4	12.50
G243	850	46.4	11.6	58.0	14.66
G244	599	20.0	41.7	61.7	9.71
G245	469	7.6	11.5	19.1	24.54
G247	654	38.4	8.0	46.4	14.09
G248	282	25.4	12.3	37.7	7.48
G249	879	36.8	31.5	68.3	12.88
G250	527	0.0	34.3	34.3	15.35
G251	399	18.9	37.6	56.5	7.06
G252	603	7.2	42.9	50.1	12.03
G253	161	7.2	13.9	21.1	7.65
G254	447	33.0	0.0	33.0	13.55
G255	454	7.9	13.4	21.3	21.27
G256	557	0.0	13.3	13.3	41.75
G257	568	0.0	21.8	21.8	26.03
G258	295	0.0	14.5	14.5	20.30
G259	427	0.0	39.3	39.3	10.87
G260	891	0.0	65.4	65.4	13.62
G261	488	25.2	25.7	50.9	9.59
G262	400	4.2	38.0	42.2	9.49
G263	400	0.0	47.8	47.8	8.37
G264	798	0.0	62.7	62.7	12.72
G265	272	10.1	11.7	21.8	12.47
G266	612	44.1	9.3	53.4	11.47

JUNE 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	571	38.2	10.4	48.6	11.75
G201	396	18.0	13.6	31.6	12.52
G202	2046	0.0	178.2	178.2	11.48
G203	627	0.0	33.9	33.9	18.51
G204	749	25.3	21.3	46.6	16.09
G205	1250	43.0	47.5	90.5	13.81
G206	736	0.0	25.3	25.3	29.11
G207	411	9.4	15.0	24.4	16.84
G208	670	23.0	27.2	50.2	13.35
G209	1307	8.4	140.2	148.6	8.79
G210	142	8.0	10.5	18.5	7.66
G211	533	22.5	31.4	53.9	9.88
G212	588	4.4	40.5	44.9	13.09
G213	1326	51.2	15.1	66.3	20.00
G214	254	8.8	15.2	24.0	10.59
G215	603	0.0	23.5	23.5	25.69
G216	385	15.4	21.9	37.3	10.34
G217	865	66.1	5.1	71.2	12.16
G218	1210	66.1	10.4	76.5	15.82
G219	964	16.6	46.1	62.7	15.38
G220	514	9.0	31.2	40.2	12.80
G221	1048	6.3	156.0	162.3	6.46
G222	586	6.4	12.4	18.8	31.14
G223	513	0.0	32.3	32.3	15.90
G224	329	9.0	29.7	38.7	8.49
G225	502	0.0	34.2	34.2	14.70
G226	638	24.2	11.9	36.1	17.66
G227	412	15.1	27.9	43.0	9.59
G228	179	17.0	1.0	18.0	9.94
G229	426	10.7	22.7	33.4	12.77
G230	1033	23.3	46.6	69.9	14.79
G231	837	12.9	40.8	53.7	15.58
G232	3263	19.1	246.5	265.6	12.28
G233	349	11.2	25.7	36.9	9.47
G234	189	0.0	13.0	13.0	14.54
G235	324	12.5	24.4	36.9	8.79
G236	312	8.2	21.1	29.3	10.64
G237	795	21.1	26.6	47.7	16.68
G238	1802	10.4	139.7	150.1	12.00
G239	923	26.2	74.8	101.0	9.14
G240	2302	14.1	206.4	220.5	10.44
G241	227	14.1	24.3	38.4	5.91
G242	213	7.4	20.8	28.2	7.55
G243	665	53.7	0.0	53.7	12.38
G244	884	12.2	41.2	53.4	16.54
G245	517	16.6	21.9	38.5	13.44
G247	730	22.0	29.3	51.3	14.22
G248	640	28.5	0.0	28.5	22.46
G249	1050	6.4	43.1	49.5	21.19
G250	657	14.9	28.9	43.8	14.99
G251	464	28.9	8.0	36.9	12.57
G252	553	0.0	45.8	45.8	12.08
G253	357	9.3	14.6	23.9	14.92
G254	837	56.1	10.3	66.4	12.61
G255	103	6.4	10.6	17.0	6.06
G256	1010	0.0	82.1	82.1	12.31
G257	690	20.6	22.9	43.5	15.87
G258	269	14.3	23.9	38.2	7.04
G259	437	0.0	34.1	34.1	12.83
G260	858	2.6	71.4	74.0	11.60
G261	563	16.5	27.7	44.2	12.74
G262	473	5.4	34.9	40.3	11.75
G263	320	0.0	36.6	36.6	8.73
G264	940	0.0	63.4	63.4	14.83
G265	581	32.5	11.2	43.7	13.29
G266	536	26.2	6.6	32.8	16.34

JULY 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	691	51.1		51.1	13.52
G201	225	25.4		25.4	8.86
G202	2242	115.9		115.9	19.34
G203	829	0.0		0.0	0.00
G204	1442	46.9		46.9	30.75
G205	1053	104.9		104.9	10.04
G206	683	20.6		20.6	33.16
G207	379	30.8		30.8	12.31
G208	725	46.0		46.0	15.76
G209	330	23.8		23.8	13.87
G210	113	0.5		0.5	226.00
G211	496	23.3		23.3	21.29
G212	601	38.6		38.6	15.57
G213	1185	82.4		82.4	14.38
G214	466	20.9	11.2	32.1	14.52
G215	692	34.7		34.7	19.94
G216	466	32.6		32.6	14.29
G217	1057	82.3		82.3	12.84
G218	1070	66.3		66.3	16.14
G219	243	15.0		15.0	16.20
G220	613	55.3		55.3	11.08
G221	638	22.2		22.2	28.74
G222	396	20.5		20.5	19.32
G223	365	14.3		14.3	25.52
G224	796	34.2		34.2	23.27
G225	672	48.9		48.9	13.74
G226	847	56.6		56.6	14.96
G227	526	21.1		21.1	24.93
G228	351	18.7		18.7	18.77
G229	510	35.1	6.0	41.1	12.41
G230	866	73.5		73.5	11.78
G231	180	6.9		6.9	26.09
G232	3929	192.7		192.7	20.39
G233	438	25.5		25.5	17.18
G234	219	9.6		9.6	22.81
G235	533	24.0		24.0	22.21
G236	339	18.0		18.0	18.83
G237	750	35.0		35.0	21.43
G238	282	23.0		23.0	12.26
G239	1852	41.3		41.3	44.84
G240	3332	228.9		228.9	14.56
G241	283	17.4		17.4	16.26
G242	342	20.4		20.4	16.76
G243	880	53.9		53.9	16.33
G244	278	23.7		23.7	11.73
G245	290	18.2		18.2	15.93
G247	1436	102.5		102.5	14.01
G248	335	31.9		31.9	10.50
G249	662	34.4		34.4	19.24
G250	757	44.9		44.9	16.86
G251	482	52.4		52.4	9.20
G252	343	23.4		23.4	14.66
G253	879	15.1	9.3	24.4	36.10
G254	726	64.4		64.4	11.27
G255	207	25.1		25.1	8.25
G256	862	55.9		55.9	15.42
G257	1661	69.0		69.0	24.07
G258	372	19.4		19.4	19.18
G259	350	15.9		15.9	22.01
G260	510	27.6		27.6	18.48
G261	26	5.6		5.6	4.64
G262	286	25.6	11.7	37.3	7.67
G263	289	17.8		17.8	16.24
G264	829	55.4		55.4	14.96
G265	491	36.6		36.6	13.42
G266	0	0.0		0.0	0.00

AUGUST 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	687	57.1	0.0	57.1	12.03
G201	0	0.0	0.0	0.0	0.00
G202	1191	89.6	0.0	89.6	13.29
G203	965	0.0	0.0	0.0	0.00
G204	939	39.7	0.0	39.7	23.65
G205	1103	107.1	0.0	107.1	10.30
G206	277	26.7	0.0	26.7	10.37
G207	0	0.0	0.0	0.0	0.00
G208	673	41.8	0.0	41.8	16.10
G209	445	42.5	0.0	42.5	10.47
G210	248	25.3	0.0	25.3	9.80
G211	526	36.0	0.0	36.0	14.61
G212	859	55.0	13.5	68.5	12.55
G213	851	60.3	0.0	60.3	14.11
G214	229	16.2	0.0	16.2	14.14
G215	415	37.7	0.0	37.7	11.01
G216	342	24.7	0.0	24.7	13.85
G217	1002	59.6	0.0	59.6	16.81
G218	870	74.1	0.0	74.1	11.74
G219	340	41.2	0.0	41.2	8.25
G220	657	51.2	0.0	51.2	12.83
G221	531	48.1	0.0	48.1	11.04
G222	268	19.1	0.0	19.1	14.03
G223	531	34.5	0.0	34.5	15.39
G224	466	25.9	0.0	25.9	17.99
G225	250	20.3	0.0	20.3	12.32
G226	550	33.7	0.0	33.7	16.32
G227	803	56.7	0.0	56.7	14.16
G228	182	14.6	0.0	14.6	12.47
G229	476	42.8	0.0	42.8	11.12
G230	1320	100.8	0.0	100.8	13.10
G231	0	0.0	0.0	0.0	0.00
G232	1523	183.2	0.0	183.2	8.31
G233	334	21.7	0.0	21.7	15.39
G234	194	11.5	0.0	11.5	16.87
G235	427	16.1	0.0	16.1	26.52
G236	7975	500.3	0.0	500.3	15.94
G237	660	22.4	0.0	22.4	29.46
G238	642	49.4	0.0	49.4	13.00
G239	1347	21.1	0.0	21.1	63.84
G240	1159	83.6	0.0	83.6	13.86
G241	428	40.0	0.0	40.0	10.70
G242	354	24.1	0.0	24.1	14.69
G243	400	38.7	0.0	38.7	10.34
G244	1313	67.8	0.0	67.8	19.37
G245	516	38.9	0.0	38.9	13.26
G247	447	38.0	0.0	38.0	11.76
G248	350	32.9	0.0	32.9	10.64
G249	356	24.7	0.0	24.7	14.41
G250	588	42.4	0.0	42.4	13.87
G251	329	43.2	0.0	43.2	7.62
G252	238	20.1	0.0	20.1	11.84
G253	906	25.8	0.0	25.8	35.12
G254	753	47.6	0.0	47.6	15.82
G255	395	15.1	0.0	15.1	26.16
G256	614	0.0	0.0	0.0	0.00
G257	789	18.8	0.0	18.8	41.97
G258	288	23.4	0.0	23.4	12.31
G259	487	42.6	11.6	54.2	8.98
G260	532	41.2	0.0	41.2	12.91
G261	179	7.7	0.0	7.7	23.25
G262	93	5.8	0.0	5.8	16.03
G263	677	33.2	0.0	33.2	20.39
G264	716	54.7	0.0	54.7	13.09
G265	248	25.5	0.0	25.5	9.73
G266	0	11.6	7.2	18.8	0.00

SEPTEMBER 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	915	0.0	67.7	67.7	13.51
G201	386	0.0	35.4	35.4	10.91
G202	0	14.4	17.8	32.2	0.00
G203	1094	0.0	62.4	62.4	17.54
G204	1389	0.0	62.4	62.4	22.27
G205	662	0.0	65.3	65.3	10.14
G206	577	0.0	24.9	24.9	23.14
G207	62	0.0	13.2	13.2	4.69
G208	644	10.5	50.9	61.4	10.48
G209	668	0.0	57.3	57.3	11.66
G210	328	0.0	43.6	43.6	7.52
G211	385	6.5	35.2	41.7	9.23
G212	658	8.0	59.7	67.7	9.72
G213	993	0.0	65.4	65.4	15.19
G214	193	0.0	20.6	20.6	9.37
G215	528	14.0	14.0	28.0	18.86
G216	266	0.0	11.5	11.5	23.23
G217	1069	5.7	87.6	93.3	11.45
G218	750	9.7	73.4	83.1	9.03
G219	548	0.0	52.4	52.4	10.45
G220	658	0.0	31.4	31.4	20.95
G221	793	0.0	67.8	67.8	11.70
G222	286	0.0	21.0	21.0	13.60
G223	372	0.0	41.4	41.4	8.99
G224	549	9.9	45.5	55.4	9.92
G225	396	0.0	36.3	36.3	10.90
G226	661	0.0	33.7	33.7	19.63
G227	904	7.9	64.5	72.4	12.49
G228	278	0.0	19.3	19.3	14.44
G229	477	0.0	30.5	30.5	15.62
G230	400	6.7	42.9	49.6	8.07
G231	0	0.0	0.0	0.0	0.00
G232	1043	43.4	172.4	215.8	4.83
G233	487	0.0	36.1	36.1	13.48
G234	224	0.0	32.0	32.0	7.00
G235	547	0.0	30.9	30.9	17.69
G236	7905	70.3	572.9	643.2	12.29
G237	576	0.0	19.3	19.3	29.92
G238	549	0.0	41.1	41.1	13.36
G239	1491	5.6	48.2	53.8	27.73
G240	2648	18.7	264.2	282.9	9.36
G241	703	0.0	50.4	50.4	13.96
G242	253	9.8	24.6	34.4	7.37
G243	691	0.0	57.9	57.9	11.93
G244	1857	28.8	163.2	192.0	9.67
G245	590	0.0	48.8	48.8	12.10
G247	954	5.4	70.9	76.3	12.51
G248	346	0.0	0.0	0.0	0.00
G249	439	0.0	25.5	25.5	17.19
G250	370	5.0	23.4	28.4	13.04
G251	551	0.0	76.6	76.6	7.19
G252	836	7.9	49.5	57.4	14.57
G253	482	0.0	36.3	36.3	13.28
G254	718	7.3	56.4	63.7	11.28
G255	265	7.7	27.9	35.6	7.45
G256	565	6.1	50.8	56.9	9.92
G257	1606	3.5	61.5	65.0	24.70
G258	272	0.0	25.8	25.8	10.56
G259	540	0.0	33.5	33.5	16.12
G260	611	7.6	57.4	65.0	9.41
G261	560	6.1	40.7	46.8	11.98
G262	0	0.0	0.0	0.0	0.00
G263	473	0.0	42.6	42.6	11.10
G264	1079	0.0	86.2	86.2	12.51
G265	310	0.0	28.9	28.9	10.71
G266	225	10.5	9.8	20.3	11.11

OCTOBER 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	747	55.6	8.0	63.6	11.74
G201	876	68.3	13.7	82.0	10.69
G202	497	24.7	0.0	24.7	20.12
G203	574	34.1	0.0	34.1	16.83
G204	427	33.1	0.0	33.1	12.90
G205	0	0.0	0.0	0.0	0.00
G206	1469	13.9	0.0	13.9	105.68
G207	163	0.0	10.0	10.0	16.28
G208	579	78.5	12.3	90.8	6.38
G209	501	0.0	0.0	0.0	0.00
G210	345	19.0	0.0	19.0	18.16
G211	340	22.5	0.0	22.5	15.11
G212	522	42.5	0.0	42.5	12.28
G213	1068	46.2	13.1	59.3	18.03
G214	277	23.8	0.0	23.8	11.64
G215	430	16.6	0.0	16.6	25.90
G216	375	24.3	0.0	24.3	15.43
G217	702	52.0	0.0	52.0	13.50
G218	660	9.0	58.3	67.3	9.81
G219	500	29.0	9.1	38.1	13.11
G220	362	23.1	14.0	37.1	9.76
G221	353	20.8	3.4	24.2	14.60
G222	515	26.5	10.1	36.6	14.06
G223	316	23.9	0.0	23.9	13.22
G224	420	21.1	0.0	21.1	19.91
G225	447	23.5	0.0	23.5	19.02
G226	723	40.0	9.1	49.1	14.73
G227	872	52.8	0.0	52.8	16.52
G228	97	0.0	0.0	0.0	0.00
G229	362	33.9	11.5	45.4	7.97
G230	220	19.2	0.0	19.2	11.46
G231	310	0.0	13.2	13.2	23.52
G232	1770	52.1	111.3	163.4	10.84
G233	440	35.4	9.0	44.4	9.91
G234	134	0.0	0.0	0.0	0.00
G235	585	22.9	9.2	32.1	18.25
G236	4220	231.7	16.8	248.5	16.98
G237	733	38.7	12.2	50.9	14.41
G238	469	36.8	0.0	36.8	12.74
G239	1655	47.7	11.9	59.6	27.76
G240	3368	194.7	7.4	202.1	16.67
G241	275	18.9	13.1	32.0	8.59
G242	178	9.1	0.0	9.1	19.56
G243	610	48.7	0.0	48.7	12.53
G244	261	33.9	0.0	33.9	7.70
G245	588	33.0	0.0	33.0	17.82
G247	1042	75.7	9.9	85.6	12.17
G248	293	22.9	8.0	30.9	9.48
G249	461	20.9	0.0	20.9	22.06
G250	176	0.0	5.2	5.2	33.91
G251	512	47.4	0.0	47.4	10.80
G252	562	28.0	9.6	37.6	14.94
G253	500	23.5	0.0	23.5	21.28
G254	1014	79.4	10.2	89.6	11.32
G255	117	0.0	0.0	0.0	0.00
G256	745	32.7	0.0	32.7	22.78
G257	1403	38.9	14.7	53.6	26.17
G258	279	22.0	0.0	22.0	12.68
G259	507	35.0	6.9	41.9	12.09
G260	594	47.2	0.0	47.2	12.58
G261	422	24.4	0.0	24.4	17.30
G262	134	0.0	12.4	12.4	10.84
G263	474	32.2	0.0	32.2	14.72
G264	942	79.4	0.0	79.4	11.86
G265	280	5.8	13.0	18.8	14.89
G266	0	0.0	0.0	0.0	0.00

NOVEMBER 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	168	19.9	0.0	19.9	8.44
G201	270	23.2	0.0	23.2	11.64
G202	1535	117.3	0.0	117.3	13.09
G203	258	11.2	0.0	11.2	23.04
G204	827	21.4	0.0	21.4	38.64
G205	1	0.0	0.0	0.0	0.00
G206	418	0.0	0.0	0.0	0.00
G207	514	6.3	22.0	28.3	18.14
G208	475	36.2	18.7	54.9	8.66
G209	251	20.0	0.0	20.0	12.55
G210	172	15.2	0.0	15.2	11.32
G211	246	21.6	0.0	21.6	11.39
G212	316	28.1	0.0	28.1	11.25
G213	769	48.1	0.0	48.1	15.99
G214	184	15.5	0.0	15.5	11.87
G215	260	30.3	0.0	30.3	8.58
G216	350	22.3	0.0	22.3	15.70
G217	925	71.9	0.0	71.9	12.87
G218	437	18.6	0.0	18.6	23.49
G219	350	29.5	0.0	29.5	11.86
G220	299	15.0	0.0	15.0	19.93
G221	284	36.0	0.0	36.0	7.89
G222	379	29.2	0.0	29.2	12.98
G223	187	17.6	0.0	17.6	10.63
G224	362	26.4	0.0	26.4	13.71
G225	374	26.2	0.0	26.2	14.27
G226	441	22.5	0.0	22.5	19.60
G227	708	55.9	0.0	55.9	12.67
G228	76	7.3	0.0	7.3	10.41
G229	19	0.0	0.0	0.0	0.00
G230	65	0.0	0.0	0.0	0.00
G231	259	0.0	12.4	12.4	20.90
G232	1077	0.0	0.0	0.0	0.00
G233	322	30.2	0.0	30.2	10.66
G234	60	9.3	0.0	9.3	6.45
G235	426	15.6	0.0	15.6	27.31
G236	2365	195.4	0.0	195.4	12.10
G237	548	13.2	0.0	13.2	41.52
G238	314	29.5	0.0	29.5	10.64
G239	1672	83.8	0.0	83.8	19.95
G240	3474	339.4	0.0	339.4	10.24
G241	282	15.2	0.0	15.2	18.55
G242	60	4.2	0.0	4.2	14.29
G243	279	24.6	0.0	24.6	11.34
G244	20	19.4	0.0	19.4	1.03
G245	549	39.6	0.0	39.6	13.86
G247	375	15.6	0.0	15.6	24.04
G248	340	23.0	0.0	23.0	14.78
G249	535	33.8	0.0	33.8	15.83
G250	249	12.9	0.0	12.9	19.30
G251	317	39.4	0.0	39.4	8.05
G252	455	35.9	0.0	35.9	12.67
G253	498	37.3	0.0	37.3	13.35
G254	633	51.4	0.0	51.4	12.32
G255	779	28.8	0.0	28.8	27.05
G256	614	49.2	0.0	49.2	12.48
G257	706	29.2	0.0	29.2	24.18
G258	121	11.6	0.0	11.6	10.43
G259	583	44.2	0.0	44.2	13.19
G260	458	34.6	0.0	34.6	13.24
G261	440	36.1	0.0	36.1	12.19
G262	215	0.0	20.0	20.0	10.77
G263	270	28.4	0.0	28.4	9.51
G264	831	58.4	0.0	58.4	14.23
G265	102	11.0	0.0	11.0	9.27
G266	441	25.4	2.3	27.7	15.91

DECEMBER 1997

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	392	26.9		26.9	14.57
G201	746	12.3		12.3	60.65
G202	1836	107.3	22.3	129.6	14.17
G203	259	19.8		19.8	13.08
G204	162			0.0	
G205	426	33.2		33.2	12.83
G206	575	13.2		13.2	43.56
G207	66	6.9		6.9	9.57
G208	561	37.7		37.7	14.88
G209	471	36.6		36.6	12.87
G210	206	22.7		22.7	9.07
G211	246	17.7		17.7	13.90
G212	499	32.4		32.4	15.40
G213	854	49.6		49.6	17.22
G214	68	7.8		7.8	8.72
G215	418	16.5		16.5	25.33
G216	270	24.3		24.3	11.11
G217	336	28.3		28.3	11.87
G218	859	40.4		40.4	21.26
G219	494	36.9		36.9	13.39
G220	560	47.1		47.1	11.89
G221	79				
G222	385	32.0		32.0	12.03
G223	247	11.7		11.7	21.11
G224	248	16.8		16.8	14.76
G225	252	23.2		23.2	10.86
G226	410	30.0		30.0	13.67
G227	605	35.0		35.0	17.29
G228	44	6.2		6.2	7.10
G229	341	29.9		29.9	11.40
G230	367	30.7		30.7	11.95
G231	361	26.1	10.8	36.9	9.80
G232	2339	187.9		187.9	12.45
G233	377	28.2		28.2	13.37
G234	63	1.3		1.3	48.46
G235	602	27.8		27.8	21.65
G236	3742	197.6	81.4	279.0	13.41
G237	536	3.9		3.9	137.44
G238	87	4.5		4.5	19.33
G239	2027	77.2		77.2	26.26
G240	939	67.9		67.9	13.83
G241	72	13.8		13.8	5.22
G242	154	12.6		12.6	12.22
G243	692	51.5		51.5	13.44
G244	625	25.5		25.5	24.51
G245	447	24.4		24.4	18.32
G246	0				
G247	504	38.2		38.2	13.19
G248	228	20.9		20.9	10.91
G249	1113	24.5		24.5	45.43
G250	111	6.7		6.7	16.57
G251	410	46.3		46.3	8.86
G252	449	39.0		39.0	11.51
G253	487	28.9		28.9	16.85
G254	818	61.5		61.5	13.30
G255	710	9.2		9.2	77.17
G256	623	42.9		42.9	14.52
G257	1127				
G258	159	12.2		12.2	13.03
G259	265	22.1		22.1	11.99
G260	473	40.6		40.6	11.65
G261	405	35.1		35.1	11.54
G262	372		34.4	34.4	10.80
G263	321	26.8		26.8	11.98
G264	922	59.0		59.0	15.63
G265	108				
G266	549	51.8		51.8	10.60

JANUARY 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	347	23.2	51.8	75.0	4.62
G201	773		63.7	63.7	12.14
G202	2019		130.8	130.8	15.44
G203	462		30.9	30.9	14.96
G204	753	10.0	39.1	49.1	15.32
G205					
G206	793		31.8	31.8	24.94
G207	318		24.0	24.0	13.24
G208	982	7.0	68.3	75.3	13.05
G209	34		17.5	17.5	1.94
G210	161		29.6	29.6	5.44
G211	285		27.8	27.8	10.24
G212	394	5.1	21.6	26.7	14.78
G213	966		55.9	55.9	17.27
G214	199		25.1	25.1	7.93
G215	410	8.4	34.9	43.3	9.46
G216	325		24.9	24.9	13.07
G217	337		20.3	20.3	16.60
G218	486		35.4	35.4	13.72
G219	356	7.7	28.3	36.0	9.90
G220	377		10.0	10.0	37.66
G221	403		31.3	31.3	12.89
G222	307		25.7	25.7	11.93
G223	190		27.1	27.1	7.01
G224	321	7.8	16.3	24.1	13.32
G225	290		30.4	30.4	9.53
G226	510		22.1	22.1	23.11
G227	791	6.9	48.4	55.3	14.31
G228	82				
G229	526		38.2	38.2	13.76
G230	1120		85.6	85.6	13.08
G231	402		44.5	44.5	9.04
G232	3473		266.7	266.7	13.02
G233	622		38.3	38.3	16.25
G234	51		16.7	16.7	3.06
G235	573		39.7	39.7	14.44
G236	2311		177.6	177.6	13.02
G237	496	7.8	33.3	41.1	12.07
G238	426		41.6	41.6	10.25
G239	1306		32.2	32.2	40.51
G240	2848		204.4	204.4	13.93
G241	389		36.1	36.1	10.79
G242	557		47.7	47.7	11.68
G243	672	5.1	45.1	50.2	13.38
G244	785		58.6	58.6	13.40
G245	471	4.6	32.5	37.1	12.71
G246	706		37.9	37.9	18.63
G247	380		30.1	30.1	12.61
G248	185		7.5	7.5	24.60
G249	823		42.6	42.6	19.32
G250	283		26.3	26.3	10.77
G251	420	7.2	47.9	55.1	7.63
G252	240		31.3	31.3	7.67
G253	695		54.6	54.6	12.73
G254	579	3.0	42.3	45.3	12.79
G255	414		32.9	32.9	12.60
G256	508		46.4	46.4	10.94
G257	1249		23.9	23.9	52.22
G258	221		39.7	39.7	5.57
G259	325		10.4	10.4	31.16
G260	444		32.2	32.2	13.79
G261	595		48.3	48.3	12.32
G262	261		21.0	21.0	12.43
G263					
G264	828		62.2	62.2	13.32
G265	403		43.9	43.9	9.17
G266	337		35.8	35.8	9.42
G267	267		13.62	13.6	19.60
G268	431		41.25	41.3	10.45
G269	438		38	38.0	11.53
G270	553		47.1	47.1	11.74
G271	314		33.09	33.1	9.49

FEBRUARY 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	503	34.8	15.5	50.3	10.00
G201	232	24.4		24.4	9.51
G202	745	31.7	9.2	40.9	18.20
G203	55		14.6	14.6	3.77
G204	396	20.9		20.9	18.95
G205	87	10.7		10.7	8.13
G206	415	10.4		10.4	39.90
G207	233	6.4		6.4	36.41
G208	902	55.2	16.8	72.0	12.52
G209	203	5.6		5.6	36.25
G210	195	14.2		14.2	13.73
G211	374	23.4		23.4	15.98
G212	391	28.1	12.0	40.1	9.75
G213	799	41.7	10.0	51.7	15.45
G214	245	15.9		15.9	15.41
G215	311	14.2		14.2	21.90
G216	298	2.5	12.0	14.5	20.55
G217	333	22.7		22.7	14.67
G218	554	39.6		39.6	13.99
G219	462	33.3	10.5	43.8	10.55
G220	385	24.3		24.3	15.84
G221	1650	41.8	6.0	47.8	34.50
G222	343	20.1		20.1	17.06
G223	305	13.7	10.5	24.2	12.61
G224	423	23.2	14.1	37.3	11.34
G225	345	20.6	5.4	26.0	13.27
G226	578	33.8	12.5	46.3	12.49
G227	640	37.3	10.5	47.8	13.38
G228	480	23.9	9.6	33.5	14.33
G229	411	33.3		33.3	12.34
G230	254	6.8	11.1	17.9	14.23
G231	262	14.7		14.7	17.82
G232	780	26.5	11.4	37.9	20.58
G233	516	34.4		34.4	15.00
G234	108	3.6		3.6	30.00
G235	599	16.1		16.1	37.20
G236	852	51.6		51.6	16.51
G237	471	17.4		17.4	27.07
G238	402	17.5	3.5	21.0	19.14
G239	1408	42.7	32.0	74.7	18.85
G240	348	17.3	9.6	26.9	12.95
G241	214	23.0	8.0	31.0	6.90
G242	470	17.6		17.6	26.70
G243	599	35.1	9.1	44.2	13.55
G244	1060	63.8	14.0	77.8	13.63
G245	454	21.9		21.9	20.73
G246	593	10.5		10.5	56.48
G247	820	58.3		58.3	14.07
G248	317	22.4	23.1	45.5	6.97
G249	532	29.3		29.3	18.16
G250	266	17.2		17.2	15.47
G251	321	35.1		35.1	9.15
G252	446	24.5		24.5	18.20
G253	466	25.2		25.2	18.49
G254	821	61.7		61.7	13.31
G255	407	23.4		23.4	17.39
G256	554	31.5		31.5	17.59
G257	367		6.0	6.0	61.17
G258	199	15.0		15.0	13.27
G259	404	20.9	11.9	32.8	12.31
G260	386	28.0	13.7	41.7	9.26
G261	597	30.3	11.2	41.5	14.38
G262	259	24.5		24.5	10.57
G263	244	19.7		19.7	12.39
G264	995	60.3		60.3	16.50
G265	469	55.1		55.1	8.51
G266	476	3.2		3.2	148.75
G267	166	5.4	14.54	19.9	8.32
G268	500	42.1		42.1	11.88
G269	619	51.7		51.7	11.97
G270	613	45.0		45.0	13.62
G271	368	23.5		23.5	15.66

MARCH 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200					
G201	310	27.2	11.3	38.5	8.06
G202	737	35.7	37.7	73.4	10.05
G203	819	24.3	41.0	65.3	12.55
G204	668		13.6	13.6	49.01
G205	980	43.9	28.9	72.8	13.46
G206	2571	14.7		14.7	174.90
G207	197	13.4		13.4	14.70
G208	852	41.4	10.0	51.4	16.57
G209	1022	51.2	42.8	94.0	10.88
G210	129	12.8		12.8	10.08
G211	359	23.3	5.3	28.6	12.55
G212	445	28.8		28.8	15.45
G213	1041	32.7	28.6	61.3	16.99
G214	349	24.4		24.4	14.30
G215	235	12.0		12.0	19.58
G216	552	29.8	12.6	42.4	13.03
G217	397	22.2	9.1	31.3	12.70
G218	368	22.5		22.5	16.36
G219	488	24.0	11.9	35.9	13.61
G220	400	17.4	16.2	33.6	11.90
G221	91	9.5	33.4	42.9	2.12
G222	374	18.2	11.6	29.8	12.56
G223	213	8.8		8.8	24.20
G224	249	15.6		15.6	15.96
G225	595	36.1	5.0	41.1	14.48
G226	612	34.8		34.8	17.59
G227	1093	49.5	13.9	63.4	17.24
G228	937	62.6	11.7	74.3	12.61
G229	401	25.1		25.1	15.98
G230	47	1.9	10.3	12.2	3.87
G231	567	16.3	14.7	31.0	18.28
G232	3456	170.1	79.7	249.8	13.84
G233	551	36.1	7.8	43.9	12.54
G234	53		14.0	14.0	3.79
G235	483	14.3	12.4	26.7	18.12
G236	3349	175.2	48.1	223.3	15.00
G237	752	14.0		14.0	53.71
G238	3023	127.7	72.3	200.0	15.11
G239	516	9.8		9.8	52.65
G240	1012	71.2		71.2	14.21
G241	394	16.7	10.5	27.2	14.47
G242	674	47.5		47.5	14.19
G243	441	31.0	11.2	42.2	10.44
G244	326	26.4	12.8	39.2	8.31
G245	665	28.5	14.9	43.4	15.32
G246	123	6.5		6.5	18.92
G247	556	35.0	8.3	43.3	12.84
G248	464	25.2	10.0	35.2	13.18
G249	796	16.7		16.7	47.66
G250	182	7.7		7.7	23.64
G251	616	55.3	10.0	65.3	9.43
G252	500	24.8	12.2	37.0	13.50
G253					
G254	943	54.2	9.5	63.7	14.79
G255	758	7.6	14.3	21.9	34.66
G256	634	34.9	8.0	42.9	14.78
G257	1156				
G258	240	16.9	9.2	26.1	9.21
G259	594	32.3	8.2	40.5	14.66
G260	567	42.9	14.3	57.2	9.91
G261	577	35.4	14.0	49.4	11.68
G262	403	26.7	11.2	37.9	10.63
G263	280	16.3	15.0	31.3	8.94
G264	856	28.5	47.6	76.1	11.25
G265	270	9.5		9.5	28.42
G266	235	17.6	14	31.6	7.44
G267	247	9.0	2.33	11.3	21.80
G268	580	35.2	6.01	41.2	14.07
G269	500	27.6	1	28.6	17.48
G270	666	40.6	12.96	53.6	12.43
G271	611	24.2	12.01	36.2	16.87

APRIL 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	431	28.5		28.5	15.12
G201	278	23.2		23.2	11.98
G202	384	22.6		22.6	16.99
G203	263	18.8		18.8	13.99
G204	693	33.7		33.7	20.56
G205	479	39.2		39.2	12.22
G206	1797	14.7		14.7	122.24
G207	466	34.5		34.5	13.51
G208	918	60.5		60.5	15.17
G209	1921	89.8		89.8	21.39
G210	372	20.7		20.7	17.97
G211	440	22.4		22.4	19.64
G212	299	23.3		23.3	12.83
G213	451	20.2	18.0	38.2	11.81
G214	244	20.5		20.5	11.90
G215	536	33.4		33.4	16.05
G216	511	25.4		25.4	20.12
G217	462	41.3		41.3	11.19
G218	402	35.4		35.4	11.36
G219	406	39.2		39.2	10.36
G220	519	41.0		41.0	12.66
G221	3595	193.9		193.9	18.54
G222	266	17.6		17.6	15.11
G223	298	24.7		24.7	12.06
G224	315	21.7		21.7	14.52
G225	547	46.5		46.5	11.76
G226	649	36.2		36.2	17.93
G227	873	63.1		63.1	13.84
G228	543	34.9		34.9	15.56
G229	385	28.1		28.1	13.70
G230	179	22.4		22.4	7.99
G231	153	38.3		38.3	3.99
G232	2053	107.6		107.6	19.08
G233	862	62.6		62.6	13.77
G234	562	18.8	14.1	32.9	17.08
G235	537	38.2		38.2	14.06
G236	2547	167.1		167.1	15.24
G237	615	31.0		31.0	19.84
G238	3270	218.0		218.0	15.00
G239	1277	25.1		25.1	50.88
G240	2744	168.5		168.5	16.28
G241	569	44.8		44.8	12.70
G242	361	32.4		32.4	11.14
G243	435	30.4		30.4	14.31
G244	167	6.7		6.7	24.93
G245	758	39.3		39.3	19.29
G246	1285	40.7		40.7	31.57
G247	159	14.8		14.8	10.74
G248	385	23.2		23.2	16.59
G249	783	48.3		48.3	16.21
G250	605	40.2		40.2	15.05
G251	489	63.2		63.2	7.74
G252	327	25.5		25.5	12.82
G253	314	18.7		18.7	16.79
G254	715	57.6		57.6	12.41
G255	275	28.3		28.3	9.72
G256	676	43.2		43.2	15.65
G257	39		11.0	11.0	3.54
G258	233	10.8		10.8	21.57
G259	563	37.5		37.5	15.01
G260	642	47.8		47.8	13.43
G261	633	45.1		45.1	14.04
G262	357	25.0	6.9	31.9	11.21
G263	692	49.3		49.3	14.04
G264	1012	19.4	45.6	65.0	15.57
G265	151	7.8		7.8	19.36
G266	85	3.9		3.9	21.79
G267	318		15.19	15.2	20.93
G268	540	49.7		49.7	10.87
G269	617	49.9		49.9	12.36
G270	668	45.0		45.0	14.84
G271	457	41.6		41.6	10.99

MAY 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	453	18.6	13.6	32.2	14.05
G201	226	18.0	=	18.0	12.56
G202	2382	170.9		170.9	13.94
G203	215	19.5	4.4	23.9	9.00
G204	1015	56.2	15.4	71.6	14.18
G205	159	21.3		21.3	7.46
G206	223	12.9		12.9	17.29
G207	644	51.0		51.0	12.62
G208	800	68.7		68.7	11.64
G209	3732	245.4	40.3	285.7	13.06
G210	374	27.7	7.0	34.7	10.77
G211	288	24.2		24.2	11.89
G212	344	34.7		34.7	9.91
G213	653	34.7		34.7	18.80
G214	307	27.8		27.8	11.05
G215	561	41.2	4.8	46.0	12.19
G216	385	33.1		33.1	11.62
G217	248	21.7		21.7	11.44
G218	43	11.0		11.0	3.91
G219	499	32.6		32.6	15.31
G220	421	38.6	3.3	41.9	10.06
G221	3477	269.3	8.5	277.8	12.52
G222	317	25.9	6.3	32.2	9.86
G223	255	27.5		27.5	9.27
G224	147	17.3	5.5	22.8	6.44
G225	918	62.0	2.6	64.6	14.22
G226	577	32.2	6.6	38.8	14.86
G227	782	51.8		51.8	15.11
G228	491	33.6	11.1	44.7	10.98
G229	415	34.3	7.1	41.4	10.04
G230	333	16.1		16.1	20.64
G231	599	42.2		42.2	14.19
G232	1877	97.4	53.3	150.7	12.46
G233	437	22.1		22.1	19.79
G234	264	17.1		17.1	15.41
G235	479	20.0	15.7	35.7	13.41
G236	3718	231.6	52.8	284.4	13.07
G237	457	30.5		30.5	14.97
G238	2643	207.1	13.1	220.2	12.00
G239	1827	218.6		218.6	8.36
G240	1851	105.8	43.1	148.9	12.43
G241	502	30.6		30.6	16.39
G242	474	25.5	7.2	32.7	14.52
G243	655	42.7	6.1	48.8	13.42
G244	108				
G245	392	28.9	7.4	36.3	10.80
G247	901	72.4		72.4	12.45
G248	192	25.78	6.7	32.5	5.91
G249	742	38.1		38.1	19.49
G250	252	27.92		27.9	9.03
G251	363	43.8	7.7	51.5	7.04
G252	387	42.1	8.4	50.5	7.67
G253	640	35.8	5.9	41.7	15.34
G254	386	31.4	6.3	37.7	10.24
G255	448	33.6		33.6	13.33
G256	719	54.3		54.3	13.23
G257					
G258	260	24.6	7.7	32.3	8.04
G259	613	44.7	5.8	50.5	12.14
G260	972	64.4		64.4	15.10
G261	526	37.9	19.1	57.0	9.23
G262	256	19.3	6.1	25.4	10.09
G263	909	64.4		64.4	14.11
G264	795	57.6	4.7	62.3	12.77
G265	375	31.5	8.5	40.0	9.38
G266	475	45.3	6.2	51.5	9.22
G267	263	9.57	8.6	18.2	14.47
G268	525	43.83		43.8	11.98
G269	528	43.04		43.0	12.27
G270	568	49.8	7.8	57.6	9.86
G271	421	25.24	0.9	26.1	16.11

JUNE 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	492	10.3	33.5	43.8	11.23
G201	409	28.7		28.7	14.27
G202	5311	42.4	308.5	350.9	15.14
G203	70				
G204	566	14.6		14.6	38.74
G205	623		53.1	53.1	11.73
G206	1097	11.0	23.8	34.8	31.52
G207	445	10.0	21.7	31.7	14.03
G208	555		36.1	36.1	15.37
G209	1048	45.6	71.6	117.2	8.94
G210	292	12.9	7.1	20.0	14.60
G211	274	4.2	17.4	21.6	12.67
G212	509		46.2	46.2	11.02
G213	991		54.2	54.2	18.28
G214	281	6.0	21.4	27.4	10.24
G215	507	31.6		31.6	16.05
G216	542		26.5	26.5	20.45
G217	559		50.4	50.4	11.09
G218	6500	44.9		44.9	144.73
G219	624		54.1	54.1	11.53
G220	475	4.1	31.1	35.2	13.49
G221	222	29.7		29.7	7.47
G222	221	10.2	6.5	16.7	13.23
G223	1626		118.3	118.3	13.74
G224	117	10.3		10.3	11.41
G225	642	5.3	42.7	48.0	13.37
G226	704	3.5	30.4	33.9	20.76
G227	341	12.0	30.0	42.0	8.12
G228	435	11.5	18.6	30.1	14.45
G229	566	12.4	39.8	52.2	10.83
G230	1261		105.3	105.3	11.98
G231	540	12.4	26.1	38.5	14.01
G232	5053	434.8		434.8	11.62
G233	807		66.1	66.1	12.21
G234	274	9.4	10.2	19.6	13.98
G235	329		14.8	14.8	22.23
G236	4417	45.5	283.3	328.8	13.43
G237	729	7.3	34.1	41.4	17.61
G238					
G239	1284	32.8	47.4	80.2	16.00
G240					
G241	665		73.4	73.4	9.06
G242	383	11.6	26.9	38.5	9.95
G243	858	10.2	62.2	72.4	11.85
G244	134				
G245	606		39.5	39.5	15.34
G247	1062		80.3	80.3	13.23
G248	1284	8.15	26.6	34.8	36.95
G249	1312		46.8	46.8	28.03
G250	551		43.5	43.5	12.67
G251	488		67.4	67.4	7.24
G252	439		22.2	22.2	19.77
G253	694		45.3	45.3	15.32
G254	631		44.7	44.7	14.12
G255	1238	4.8	31.8	36.6	33.81
G256	609	13.2	36.2	49.4	12.33
G257					
G258	343	34.5		34.5	9.95
G259	392	11.2	19.3	30.5	12.87
G260	1139	7.3	59.9	67.2	16.96
G261	632		39.7	39.7	15.92
G262	556	7.3	32.7	40.0	13.92
G263	457	8.5	41.1	49.6	9.21
G264	455		33.7	33.7	13.50
G265	183	10.0	2.7	12.7	14.40
G266	1038	13.0	14.8	27.8	37.34
G267	548		30.8	30.8	17.79
G268	635		59.6	59.6	10.65
G269	677	8.5	53.4	61.9	10.94
G270	651		53.3	53.3	12.21
G271	2083	9.22	28.4	37.6	55.37

JULY 1998

BUMPER NUMBER	MILES	GALLONS		TOTAL	MPG
		CNG	UNL		
G200	478	15.4	15.3	30.7	15.55
G201	444	8.2	13.9	22.1	20.14
G202	2712	64.8	162.9	227.7	11.91
G203	237	0.6	27.5	28.1	8.43
G204	969	6.9	45.0	51.9	18.66
G205	437	16.1	22.5	38.6	11.32
G206	481	8.3	42.4	50.7	9.48
G207	596	14.8	35.5	50.3	11.85
G208					
G209	1259	84.8	31.7	116.5	10.81
G210	272	8.5	14.3	22.8	11.92
G211	466	14.0	29.0	43.0	10.83
G212	278	8.1	9.7	17.8	15.58
G213	848	22.1	24.2	46.3	18.32
G214	468	16.0	7.2	23.2	20.17
G215	502	16.2	23.5	39.7	12.64
G216	418	18.4	41.3	59.7	7.00
G217	526	9.2	23.1	32.3	16.31
G218	5552	9.7	19.37	29.1	190.99
G219	547	28.4	61.9	90.3	6.06
G220	339	6.5	28.5	35.0	9.68
G221					
G222	775	5.4	43.7	49.1	15.77
G223	159	6.5		6.5	24.46
G224	221		13.0	13.0	17.00
G225	685	23.9	21.5	45.4	15.07
G226	610	24.1	6.8	30.9	19.75
G227	946	25.5	24.8	50.3	18.82
G228	353	8.5	20.8	29.3	12.06
G229	332	14.1	10.7	24.8	13.41
G230	1379	46.7	72.4	119.1	11.57
G231	169				
G232	4308	54.5	105.8	160.3	26.87
G233	497	14.2	22.8	37.0	13.43
G234	398	17.8	16.0	33.8	11.78
G235	525	11.3	11.8	23.1	22.76
G236	4074	184.1	99.7	283.8	14.35
G237	842	7.5	18.6	26.1	32.24
G238					
G239	1712	19.9		19.9	86.03
G240					
G241	338		26.8	26.8	12.62
G242	411	7.8	30.5	38.3	10.73
G243	789	22.3	7.7	30.0	26.31
G244	145	2.4		2.4	60.42
G245	522	16.0	28.6	44.6	11.70
G247	1086	16.1	71.5	87.6	12.40
G248	1314				
G249	633	20.4	26.2	46.6	13.59
G250	47	3.9		3.9	12.05
G251	399	24.9	29.4	54.3	7.35
G252	307	12.9	29.6	42.5	7.23
G253	362	5.3	11.0	16.3	22.21
G254	769	32.6	38.6	71.2	10.80
G255	591	40.8	34.6	75.4	7.84
G256	522	19.9	23.5	43.4	12.02
G257					
G258	408	6.1	26.2	32.3	12.65
G259			7.4	7.4	
G260	289	6.4	27.1	33.5	8.63
G261	250	22.9		22.9	10.92
G262	325	19.5		19.5	16.67
G263	313	9.7		9.7	32.27
G264	600		25.4	25.4	23.60
G265	460	7.3	44.3	51.6	8.91
G266	938	5.9	12.3	18.2	51.60
G267	268	8.7	11.37	20.1	13.35
G268	710	15.9	48.95	64.9	10.95
G269	574	20.1	25.49	45.6	12.59
G270	499	7.7		7.7	64.81
G271	1368		17.82	17.8	76.77
G272	911	6.1	28.21	34.3	26.55

APPENDIX B
3-BAG GASOLINE/CNG FTP EMISSIONS AND HFET TEST RESULTS ON VEHICLE
NOS. G247 AND 232: 4,000 MILES AND END OF TEST EVALUATIONS

Ft. Hood, Texas Bifuel Vehicle Fleet FTP & HFET Bag Data

VEHICLE #	G247			G255			G232						
	G41-22259			G42-70033			G42-31544						
FUEL	GASOLINE	CNG		GASOLINE	CNG		GASOLINE	CNG					
MILES	4,000	EOT	4,000	EOT	4,000	EOT	4,000	EOT	4,000	EOT			
THC	Bag 1 (g)	5.04	4.79	8.46	7.05	4.51	na	9.17	na	na	5.98	na	7.83
	Bag 2 (g)	1.30	0.91	10.65	9.25	1.43	na	11.97	na	na	2.23	na	12.84
	Bag 3 (g)	1.74	1.33	7.63	6.82	2.36	na	9.27	na	na	3.41	na	8.45
	FTP (g/mi)	0.60	0.50	2.50	2.15	0.63	na	2.85	na	na	0.90	na	2.78
	HFET (g/mi)	0.05	0.06	1.15	1.13	0.05	na	1.33	na	na	0.16	na	1.39
NMOG	Bag 1 (g)	4.45	4.34	0.49	0.41	4.07	na	0.67	na	na	5.70	na	0.59
	Bag 2 (g)	0.31	0.41	0.43	0.43	0.60	na	0.66	na	na	1.69	na	0.80
	Bag 3 (g)	1.16	1.05	0.17	0.39	1.79	na	0.20	na	na	3.01	na	0.62
	FTP (g/mi)	0.39	0.38	0.10	0.11	0.45	na	0.14	na	na	0.78	na	0.19
NMHC	Bag 1 (g)	4.28	4.28	0.25	<0.001	3.93	na	0.41	na	na	5.33	na	>0.001
	Bag 2 (g)	0.26	0.37	0.01	<0.001	0.60	na	0.16	na	na	1.57	na	>0.001
	Bag 3 (g)	1.11	1.02	0.25	<0.001	1.70	na	0.27	na	na	2.86	na	>0.001
	FTP (g/mi)	0.37	0.37	0.04	<0.001	0.44	na	0.07	na	na	0.73	na	>0.001
CH4	HFET (g/mi)	0.02	0.02	<0.001	<0.001	0.02	na	<0.001	na	na	0.09	na	>0.001
	Bag 1 (g)	0.71	0.52	7.60	7.05	0.54	na	8.10	na	na	0.67	na	7.83
	Bag 2 (g)	0.96	0.56	9.84	9.25	0.77	na	10.92	na	na	0.68	na	12.84
	Bag 3 (g)	0.58	0.32	6.84	6.82	0.61	na	8.33	na	na	0.56	na	8.45
CO	FTP (g/mi)	0.21	0.37	2.28	2.15	0.18	na	2.57	na	na	0.17	na	2.78
	HFET (g/mi)	0.04	0.04	1.06	1.13	0.03	na	1.23	na	na	0.07	na	1.39
	Bag 1 (g)	52.33	48.92	6.51	6.18	37.99	na	9.76	na	na	55.95	na	30.15
	Bag 2 (g)	0.88	4.92	0.21	0.11	1.28	na	0.21	na	na	4.47	na	12.35
	Bag 3 (g)	11.01	9.09	4.65	6.44	19.27	na	10.76	na	na	26.59	na	21.02
NOx	FTP (g/mi)	3.99	4.14	0.76	0.86	3.84	na	1.41	na	na	5.82	na	4.94
	HFET (g/mi)	0.02	0.19	0.02	0.01	0.04	na	0.01	na	na	0.48	na	0.09
	Bag 1 (g)	4.50	3.61	5.11	3.60	4.33	na	4.62	na	na	4.34	na	4.75
	Bag 2 (g)	2.73	2.38	3.17	2.19	2.56	na	2.90	na	na	2.66	na	2.72
	Bag 3 (g)	3.46	2.96	4.53	3.28	2.99	na	3.50	na	na	3.45	na	3.48
FE (mpg)	FTP (g/mi)	0.89	0.75	1.07	0.74	0.82	na	0.92	na	na	0.87	na	0.89
	HFET (g/mi)	1.08	0.97	0.82	0.77	1.05	na	0.73	na	na	1.30	na	0.84
	Bag 1	13.95	14.80	14.07	14.71	14.58	na	14.51	na	na	14.03	na	14.02
	Bag 2	14.38	14.87	13.92	14.37	14.71	na	14.24	na	na	14.21	na	13.77
	Bag 3	16.80	17.54	16.47	17.00	17.02	na	16.58	na	na	16.81	na	16.07
	FTP	14.88	15.53	14.57	15.10	15.25	na	14.88	na	na	14.82	na	14.40
	HFET	23.48	23.65	23.58	23.78	23.53	na	23.81	na	na	23.28	na	23.55