

H₂HYDROGEN

TECHNOLOGY APPLICATIONS, INC.

Hybrid Hydrogen Oxygen System (HHOS) Tested

Summary

In 100-mile open road tests on October 21, 2003, the HHOS Electrolyzer installed with a heavy duty alternator and no additional power supply increased gas mileage in the prototype test vehicle from 33.0 miles per gallon to 40.56 miles per gallon without increasing water or oil temperatures or decreasing battery voltage.

Test Equipment

On **October 21, 2003**, in Tampa, Florida, Hydrogen Technology Applications, Inc. demonstrated and tested its patent pending Hybrid Hydrogen Oxygen System in a prototype vehicle. The test was an on-road test conducted on Interstate 275 in Pinellas County, Florida, with three individuals aboard the vehicle at all times.

Prototype Vehicle: A 1994 1.9L 4-cylinder Ford Escort Wagon with manual transmission retrofitted with the HHOS.



Prototype System: The HHOS that was demonstrated and tested included the following main components:

1. **Heavy Duty Alternator** used as a replacement for the vehicle's factory unit. Size of the heavy-duty alternator is minimally larger than the factory unit.
2. **Electrolyzer** utilized to create the Hydrogen/Oxygen mixed gas, measuring 12" high by 8" wide by 24" long and weighing approximately 30-35 lbs when completely filled with water/electrolyte solution (3 gallons). On the prototype vehicle (1994 Ford Escort Wagon) the Electrolyzer is mounted in the front passenger compartment.
3. **The vehicle's standard issue 12 volt battery** was the only battery utilized in this current test. The two auxiliary batteries that had been utilized by the system to store and provide the electrical power in the Test Track Event of May 19, 2003, were removed from the vehicle and not utilized by the HHOS in this test.

The HHOS produces Aquygen™ Gas at low pressure (less than 50 PSI) on demand while the vehicle is running, while utilizing the vehicle's 12-volt electrical system to power the Electrolyzer. Aquygen™ Gas is not stored on board the vehicle. It is immediately mixed with the vehicle's traditional fuel supply in the engine's combustion chamber (via the vehicle's existing vacuum system) and consumed during the combustion cycle.

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Test and Demonstration Results

Three 100-mile tests were conducted on Interstate 275 on Tuesday, October 21, 2003. The air temperature at the time of all tests was 86° F.

The first test was conducted with the prototype vehicle operating with the HHOS on. The prototype vehicle was topped off with fuel from a local filling station fuel pump and ran the 100 miles test (50 miles one-way, 50 miles back) at 60 mph with the AC off. The prototype vehicle was then topped off with fuel from the same station, same fuel pump, and it was determined that the prototype vehicle consumed 2.465 gallons of fuel. For this 100-miles test, the prototype vehicle averaged **40.56 mpg**.

The second test was conducted with the prototype vehicle operating on gasoline only. The prototype vehicle was topped off with fuel from the same local filling station, same fuel pump, and ran the 100 miles test (50 miles one-way, 50 miles back) at 60 mph with the AC off. The prototype vehicle was then topped off with fuel from the same station, same fuel pump, and it was determined that the prototype vehicle consumed 3.03 gallons of fuel. For this 100-miles test, the prototype vehicle averaged **33.0 mpg**.

The third test was conducted with the prototype vehicle operating with the HHOS on but the Aquygen™ Gas was vented into the open atmosphere. The prototype vehicle was topped off with fuel from the same local filling station, same fuel pump, and ran the 100 miles at 60 mph with the AC off. The prototype vehicle was then topped off with fuel from the same station, same fuel pump, and it was determined that the prototype vehicle consumed 3.41 gallons of fuel. For this 100 miles test, the prototype vehicle averaged **29.3 mpg**.

Test #	Miles Driven	HHOS Amps	Starting Battery Voltage	Ending Battery Voltage
1	100	165	12	12
2	100	0	12	12
3	100	165	12	12

Table 1: HHOS Demonstration Electrical System Results

This document is published at http://hytechapps.com/aquygen/hhos_test_20031021.pdf.
More information about the HHOS is available at <http://hytechapps.com/aquygen/hhos>.