

Hydrogen And HCNG ICE Vehicle Testing

HCNG Vehicles

2000 Ford F-150 up to 30% HCNG Blended Fuels

Factory HCNG engine, 5.4L V-8, 230 horsepower
Supercharging, ignition modifications, and exhaust gas recirculation
Onboard hydrogen storage (Factory-installed steel carbon fuel tank, 3,600 psi, 85L capacity)
Fleet testing - 31,678 miles: 15% HCNG - 22.6 miles/GGE, 30% HCNG - 23.5 miles/GGE

2001 Ford F-150 up to 50% HCNG Blended Fuels

SVO heads, exhaust intercooler, supercharging, exhaust gas recirculator, and ignition modification
Onboard hydrogen storage (3 hydrogen-rated fuel storage tanks, polymer liner, carbon fiber reinforced shell, 3,600 psi, 3kg capacity)

1999 Dodge Van on 15% HCNG Blended Fuel

5.2L V-8 equipped from factory with no modifications, 150 horsepower
OEM 3,600 psi fuel tanks
Fleet testing - 71,000 miles

APS Fleet

Arizona Public Service Utility Meter Reader Fleet
Bi-fuel (CNG/gasoline) conversion base vehicles (GM, DC)
Normally operates on gasoline or CNG
Placed on 15% HCNG for study
No maintenance or operational issues over 1,600 Fueling events and 190,000 miles using 10,600 GGE of 15% HCNG

Public Fleet

Private party bifuel conversions
Includes OEM and modified bifuel vehicles normally operating on gasoline or CNG
Placed mostly on 15% HCNG for study
One vehicle experienced catalytic converter failure and one operator experienced poor engine performance (withdrew)
350 fueling events and 36,000 miles (estimated) using 1,800 GGE of HCNG blends

H2 Vehicles

Ford F-150 16-valve

5.4L V-8, 100% hydrogen, 5 speed manual transmission, fuel injected, supercharged, & 1,365 lbs payload
Onboard hydrogen storage (3 Dynetek tanks, aluminum inner vessel-fiberglass wrap, 3,000 psi, 6.5 kilograms)
Fleet testing - 3,500 miles: 17.0 miles/GGE

Ford F-150 32-valve

5.4L V-8, 100% hydrogen, automatic transmission, fuel injected & supercharged
Onboard hydrogen storage (3 Dynetek tanks, aluminum inner vessel-carbon wrap, 5,000 psi, 15 kilograms)
Fleet testing - 7,500 miles: 15.3 miles/GGE

Chevrolet Silverado 1500HD Crew Cab 2WD LS

6L V-8, 180 horsepower, 4-speed automatic, fuel injected, supercharged and intercooled
Onboard hydrogen storage (3-150L aluminum lined - carbon-fiber reinforced tanks, 5,000 psi, 10.75 kilograms)
Anticipated 15 miles/GGE

1998 Mercedes Sprinter Van

100% hydrogen and fuel injected
Onboard hydrogen storage (3 steel hydrogen tanks, 3,600 psi, 115 liters)
Fleet testing ~7,000 miles: ~15 miles/GGE

Cummins Set Generator

100% Hydrogen and 10 to 50% HCNG Blends
Fuel injected
Cummins 8.3L I-6 Engine and 100kW generator
50% EGR with twin turbochargers



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