



Office of
Transportation Technologies

Ultrasafe, Ultra Low-Emission School Bus

Protecting our children today and tomorrow, while proving-out a new state-of-the-art natural gas engine

A program spearheaded by the Department of Energy's Office of Transportation Technologies (OTT) has developed a new school bus packed with sophisticated features that likely make it the safest heavy-duty passenger vehicle ever made. Among other high-tech accessories, the bus includes sensors that alert the driver to activity on the sides of the bus before pulling away, a windshield-

addition, the bus runs on a newly developed heavy-duty engine fueled by cleaner natural gas, protecting children and the community from breathing the smoke and particulates emitted by conventional bus engines, and ultimately, helping protect the country from the dangers of dependency on foreign oil.



Secretary of Energy Hazel O'Leary and Secretary Frederico Pena of the U.S. Department of Transportation tour Envirobus 2000 along with other dignitaries.

displayed instrument panel, and a hologram STOP sign that provides a high-visibility method of halting oncoming traffic. The bus also features a new chassis design, which isolates its fuel within the frame rail, offering maximum protection from side impacts. In

The effort is an innovative and highly visible component of OTT's mission to bring the benefits of cleaner and domestically sourced alternative fuels to every facet of the transportation sector. Developing their vision of the "Bus of the Future" in 1993, OTT,

through its National Renewable Energy Laboratory (NREL), invited private-sector companies to work with them to help make the concept a reality. Nearly all major American bus and engine manufacturers submitted proposals, and OTT selected a cost-shared partnership proposed by a team including Blue Bird Manufacturing, John Deere Power Systems Group, Southwest Research Institute, and CNG Cylinder Company. Like most of the proposers, the team chose natural gas as the fuel to be used in their design of OTT's Ultrasafe, Ultra Low-Emission School Bus.

Showcasing an innovative new engine, already in demand. Based on a natural gas engine used successfully in stationary applications, the Deere 6081HFN rates more horsepower than any other engine its size—250 hp at 2,200 rpm in a standard 8-liter, six-cylinder design. Operators will immediately notice the difference in power—the sluggishness of previous heavy-duty natural gas engine systems is gone—replaced with pick-up and performance nearly identical to that of conventional diesel vehicles.

In addition, the Deere 6081HFN is the first completely electronically controlled heavy-duty natural gas engine, incorporating a range of sensors that monitor air/fuel ratio, exhaust emissions and other operating variables, constantly regulating operations to ensure that it is always running at an optimum mileage and performance level.

The result is an engine that handily meets the stringent California Ultra Low Emission Vehicle requirements, emitting nearly zero particulates and demonstrating an order of magnitude reduction in nitrogen oxide (NO_x) and smog-producing compounds. Icing on the cake is the fact that initial data suggests that the efficiencies of the engine could make the Ultrasafe, Ultra Low-Emission School Bus the first natural gas bus in operation with fuel costs approaching or possibly even less than those of conventional diesel vehicles. These facts have not been lost on fleet operators in California and around the country, who are anxiously looking for ways to meet increasing emissions regulations within ever-tightening budgets.

Intense interest has led Blue Bird Manufacturing to include the engine in at least three school and commercial bus production models, and the company has already received orders for more than 100 vehicles.

Breakthroughs result from a government/industry partnership. The enthusiasm of the partners and their success makes this effort a prime example of what can be accomplished when government and industry innovators join forces. OTT identified the opportunity, set the parameters, helped bring together the partners and provided initial funds; the private-sector ran with the ball, bringing in world-class expertise and contributing funding and resources more than triple that of the government. The result, in less than a year, is a commercial product that meets a pressing industry need, as well as societal needs for safety, energy security and cleaner air.

Partnership continues to push the envelope. Unveiled during 1996 Earth Day activities and currently touring the country, the Ultrasafe, Ultra Low-Emission School Bus is opening up the eyes of Americans to the benefits to be offered both by sophisticated onboard electronics and by the innovative application of alternative-fuel technologies. Meanwhile, the team that built the bus is looking to improve the engine that makes it possible, with goals including increasing the compression ratio, further reducing NO_x emissions and developing new engine components to offer even greater efficiency and power. Through their efforts, vehicles like the Ultrasafe, Ultra Low-Emission School Bus may soon be standard issue in municipalities and school districts across the United States.



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