

## Dual-Mode Hybrid/Two-Mode Hybrid Accomplishment

DOE-funded research, in collaboration with Allison Buses and General Motors Corporation has led to the commercialization of a dramatically different hybrid transmission system for heavy-duty and light-duty applications. The Dual-Mode or Two-Mode hybrid system is an infinitely variable speed hybrid transmission that works with the engine and battery system and

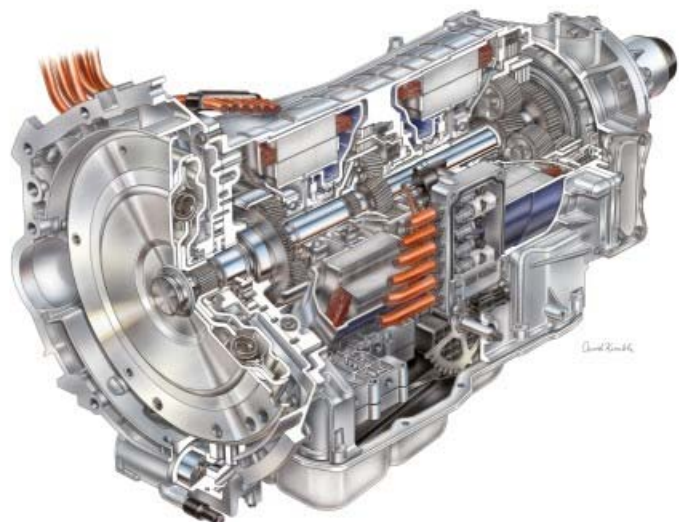


automatically chooses to operate in a parallel or series hybrid path to maximize efficiency and minimize emissions, fuel consumption and noise. Parallel and Series hybrid configurations are found on most hybrid vehicles today, both with their own pluses and minuses. The Dual-Mode/Two-Mode systems uses the positive characteristics from both systems to maximize fuel economy in whichever vehicle they are placed.

The Dual-Mode/Two-Mode system in buses are currently operating in Seattle, Philadelphia, Washington DC, Houston, Honolulu, Albuquerque, Aspen, Vancouver, Minneapolis/St. Paul, Chicago, Cleveland and Istanbul, Turkey. In-service fuel economy improvements range from 20-54% compared to conventional buses with Nitrous Oxide reductions up to 50%.



The Dual-Mode/Two-Mode system was originally designed, in collaboration with the U.S. Department of Energy and its industry partners, to be employed in heavy duty applications such as buses. After its success in real-world applications, the technology and technological know-how associated with the system, were adapted for light-duty applications. The Dual-Mode/Two-Mode system is now found in large SUV applications such as the Chevrolet Tahoe, Chrysler Aspen, and Dodge Durango. The Dual-Mode/Two-Mode system is slated to be downsized and will be featured in the new Saturn Vue 2-Mode.



The system is so popular BMW and other foreign auto manufacturers are looking to utilize the technology in their SUV applications.

With over 85,000,000 miles in transit revenue service, the Dual-Mode/Two-Mode advanced Nickel Metal Hydride energy storage system has yet to experience an end-of-life battery failure.