

HYBRID ELECTRIC BUS DESIGN, DEVELOPMENT, AND TEST

Program Capabilities:

The project was performed for a foreign client and consisted of leading the program and conducting most of the work to perform a hybrid component system design and integration onto a city service bus chassis.

SwRI performed initial modeling and simulation work to assist the client with selection of the proper size engine, battery, and motor systems. Using these selections, SwRI also assisted with the specification and procurement of these systems. SwRI then designed and procured the auxiliary systems that were necessary to maintain proper operation of all the hybrid systems.

A bus chassis was sent to SwRI with only an engine and transmission installed. SwRI designed and developed an automated manual transmission (AMT) for this vehicle. SwRI also developed the control hardware and software for supervisory control of the engine, motor and battery systems. SwRI's controller performed full control of all of the auxiliary systems and the AMT system functions. All of the hybrid system components and the control systems components were installed by SwRI.

Once the vehicle buildup was complete, SwRI installed the vehicle on its development chassis dynamometer to modify and improve the operation of the hybrid control strategy and all other vehicle system functions. This development work allowed SwRI to improve the vehicle significantly during the hardware development phase of the program.

SwRI then installed the vehicle on its heavy duty emissions chassis dynamometer to accurately measure performance, fuel economy and emissions on the vehicle while driving numerous different driving profiles. The test results showed that the vehicle was able to make significant improvements compared to the conventional vehicle in both performance and fuel economy. It was important for the client that SwRI was able to meet all of the performance and fuel economy targets specified by the client.



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