Design and construction of the University of Tennessee, Knoxville FutureTruck 2000/2001 parallel hybrid vehicle
Design and Construction of the University of Tennessee, Knoxville FutureTruck 2000/2001 Parallel Hybrid Vehicle 2002-01-1213

FutureTruck 2001 is a collegiate design competition sponsored by the U.S. Department of Energy and General Motors aimed at challenging engineering students from fifteen universities across the country to convert a stock, gasoline-powered Chevrolet Suburban to a hybrid vehicle. The goals of this competition are to dramatically increase fuel economy while maintaining stock performance, safety, and consumer acceptability. The modified vehicles will be judged in several different categories including greenhouse gas emissions, acceleration, trailer towing, and cost to manufacture. The competition site is at the GM Proving Ground in Milford, Michigan.

The University of Tennessee decided to utilize a parallel electric-assist hybrid for the Suburban's drivetrain configuration. This configuration was chosen for its simplicity and reliability. The stock 5.3L Vortec spark ignition engine was replaced by a 2.4L diesel provided by Alfa Romeo. Visual Computing Systems in partnership with Delco-Remy provided a prototype SEMA (segmented electric magnetic array) electric motor for engine assist. The stock drivetrain was retained from the transmission to the drive wheels.

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Vehicle Design Team Tennessee’s EcoCAR 2 vehicle is a series-parallel plug-in hybrid electric vehicle (PHEV), consisting of a 2.4 L LE9 engine fueled with E85 (85% ethanol and 15% gasoline) coupled to a UQM SR218H generator. Ethanol is a domestically produced, renewable fuel which has reduced lifecycle greenhouse gas emissions when compared to gasoline. The rear drive consists of a Remy HVH 250-115S motor mated to a BorgWarner eGearDrive. The energy storage system consists of seven 15s2p modules from A123 Systems, providing a nominal 340 volts with 40 Ah capacity. The vehicle will have a 34.4 Design and Construction of the University of Tennessee, Knoxville FutureTruck 2000/2001 Parallel Hybrid Vehicle. ADVISOR MODELING Proteus’s configuration is modeled in ADVISOR as a post-transmission parallel hybrid (i.e., a). Moreover, the GM engine can easily be mated to the 4L60E transmission used in the Suburban. Diesel engines, required for compression ignition of the fuel, creates high temperatures and pressures in the combustion â€¦ oil is Brayco, Micronic 881 manufactured by Castrol, a. MITHAT C. KISACIKOGLU Department of Electrical Engineering and Computer Science, The University of Tennessee Min H. Kao Building, 1520 Middle Drive Knoxville, TN 37996-2250 Work: 865-974-5428, Cell: 865 919 3205, [email protected] EDUCATION Ph.D. Electrical Engineering, May 2012 (Expected), The University of Tennessee, Knoxville, Tennessee Dissertation: Impact of vehicle-to-grid reactiveÂ Graduate Teaching Assistant, Electrical Engineering and Computer Science, University of Tennessee, Knoxville, Tennessee.Â Number of citations: 23 (Google scholar) M. C. Kisacikoglu, M. Uzunoglu, M. S. Alam Fuzzy logic control of a fuel cell/battery/ultra-capacitor hybrid vehicular power system, in IEEE Vehicle Power Propulsion Conf., Arlington, TX