

Public Abstract

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Department:Mechanical & Aerospace Engineering

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Title:DESIGNING AND MODELING A SPLIT TORQUE HYDROSTATIC TRANSMISSION IN SERIES WITH A MANUAL TRANSMISSION FOR AN AUTOMOTIVE APPLICATION

Increasing petroleum prices have developed a strong demand for an invention to reduce fuel consumption, as well as cut the produced amount of carbon dioxide via consumed fuel. Hybrid vehicles are an effective invention in terms of the hybrid research area because they can accomplish a low fuel consumption rate, thus dropping the carbon dioxide volume that is produced correspondingly. The main goal of this research is to design and model a hydraulic hybrid transmission that has a controlled pressure displacement pump and a controlled displacement motor. The design will show reasonable safety factor numbers in the worst conditions of operation. In addition, modeling was done for the entire drive train including 16 equations that signify the mechanical path and the hydraulic path, which represent the Hydraulic Hybrid Transmission (HHT). HHT consists of a manual gear box that is mounted in series with a split torque device. The output from the power split device delivers power to the two power paths then combines again via a downstream spur gear. A Proportional-Integral control was designed to make the engine work near a wide open throttle line (WOT), which is the most efficient way for an engine to produce power.