

# The Control Strategy Development for Fuel Economy of a Parallel Hydraulic Hybrid Vehicle

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## ABSTRACT

Hybrid Vehicle (HV) is a new technology in automotive industry. Hydraulic Hybrid Vehicles (HHVs) can participate in reducing fuel consumption and environmental protection. HHVs are purely based on hydraulic hybrid technology and hydraulic components which are used widely day by day. Hydraulic hybrid vehicle has some advantages which the other kinds of HV don't have: high power density, not flammable, lightweight and so on. However, there are some limitations: low energy density, no power grid plug-in capability. Anyway, HHV should be considered as a good technology for fuel economy and environment. Based on Matlab/Simulink environment, especially the SimScape Toolbox inside, Parallel Hydraulic Hybrid Vehicle (PHHV) simulation model for the new system is developed in this thesis. The simulation models include all the main system components such as the vehicle, the oil tank, the accumulators, the hydraulic pump/motor and the internal combustion engine (ICE). The power management is implemented based on available hydraulic power and ICE's power. The main purpose is to evaluate the average fuel economy for the HHV with the added hydraulic hybrid system, then to establish the control strategy development for fuel economy of a PHHV. The models are tested basing on the urban driving cycles. The simulations results with various driving cycles and control strategies have shown significant improvement in the fuel economy for the constructed model of PHHV.

Keywords : Parallel Hydraulic Hybrid Vehicle、 IC Engine、 Accumulator、 Pump/Motor、 PHHV Simulation、 PHHV Control Strategy

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