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

Table of Contents
Inside Front Cover Signature Page ABSTRACT .................................................... iii 中文摘要 ..................................................... iv
ACKNOWLEDGEMENTS .............................................. v TABLE OF CONTENTS ............................................ vi
LIST OF FIGURES .............................................. ix List of TABLES ............................................. xiii
Chapter I. INTRODUCTION ....................................... 1 1.1 Energy Demand ............................................. 1 1.2 Environmental Effects Of Fossil Fuel Use ................... 3 1.3 Imperative Need Of Hybrid Technology ....................... 4 1.4 Literature Review ......................................... 5 1.5 Statement of the problem and Objective .................... 6 1.6 Approach .................................................. 7
Chapter II. Fundamentals of Hydraulic Hybrid Vehicle ........... 9 2.1 Hybrid Vehicle ............................................ 9 2.1.1 Historic Brief of Hybrid Vehicle ........................ 9 2.1.2 Classifications of hybrid vehicle ......................... 10
   2.2 Hydraulic Hybrid Vehicle ............................. 13 2.2.1 Fundamental of Hydraulic Hybrid Vehicle ................. 13 2.2.2 Parallel HHV ........................................... 15 2.2.3 Series HHV ............................................. 17 2.2.4 Power split HHV ........................................ 19
Chapter III. ANALYSIS AND MODELING OF PHHV .................... 21 3.1 Structure of PHHV ........................................ 21 3.1.1 Proposed Structure ..................................... 21 3.1.2 Combustion Engine ...................................... 23 3.1.3 Vehicle System ......................................... 29 3.1.4 Hydraulic Pump/Motor ................................... 32 3.1.5 Accumulator ............................................ 36 3.1.6 Mechanical coupler ..................................... 41 3.2 Modeling of PHHV ......................................... 43 3.2.1 Internal Combustion Engine Model ..................... 45 3.2.2 Vehicle Dynamics model ................................. 47 3.2.3 Hydraulic Pump/Motor Model ............................ 49 3.2.4 Accumulator Model ..................................... 52 3.2.5 Transmission .......................................... 54 3.2.6 Hydraulic auxiliary component blocks ................... 55
Chapter IV. CONTROL STRATEGY AND SIMULATION FOR FUEL ECONOMY OF A PHHV ........................................... 58 4.1 Control strategy ........................................ 58 4.1.1 Rule-based power management strategy ................... 59 4.1.2 Improved control strategy .............................. 62 4.2 Simulation of PHHV ....................................... 63 4.2.1 Engine Throttle Controller ............................. 65 4.2.2 Regenerative Braking Performance ....................... 68 4.3 Optimization of operating power engine for fuel economy ... 71 4.3.1 Case Study 1-The 1st driving cycle ..................... 71 4.3.2 Case Study 2-The 2nd driving cycle ..................... 74 4.3.3 Case Study 3-The 3rd driving cycle ..................... 77
Chapter V. CONCLUSION ........................................ 81 REFERENCES ................................................... 83

REFERENCES