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Study on the development of a fuzzy logic control electromagnetic actuated CVT system (Article)

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Abstract

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Electromagnetic actuated continuously variable transmission (EMA-CVT) system consists of two pairs of electromagnetic actuators (solenoid) attached with primary and secondary pulley in order to develop the attraction and repulsive forces. Kinematics of EMA is established for electromagnetic actuation and clamping force. This study also focused on fuzzy logic based controller (FLC) to precisely control for pushing and pulling the sheaves. The EMA-CVT performance with controller is 28% more than that of without controller. The solenoids of the EMA were activated by varying the current supply with the (FPID) to maintain the non-linearity of the EMA in response of the vehicle traction torque demand. Result shows that 12.5 amp and 14.00 amp current supply is needed for pulling and pushing respectively. The acceleration time of the 1/4 scale car has been recorded as 5.5 s with the response of drive wheels torque. Copyright © 2013 Inderscience Enterprises Ltd.

SciVal Topic Prominence ⓘ

Topic: Transmissions | Variable speed transmissions | modified recurrent

Prominence percentile: 77.213 ⓘ

Author keywords

Accelerating time Electromagnetic actuated continuously variable transmission EMA-CVT FLC FPID Fuzzy logic controller Fuzzy-proportional-derivative-integrator Transmission loss

Indexed keywords

Engineering uncontrolled terms: Accelerating time Continuously variable transmission EMA-CVT FLC FPID Fuzzy logic controllers Fuzzy-proportional-derivative-integrator Transmission loss

Engineering controlled terms: Controllers Electromagnetism Fuzzy logic Solenoids Variable speed transmissions

Engineering main heading: Electromechanical actuators

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