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Optimization of driving mode switching strategy for a multimode plug-in hybrid electric vehicle (Article)

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Abstract

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Hybrid electric vehicles have become increasingly popular recently. Switching from internal combustion engine to battery as a clean source of energy is considered as a solution to reduce city pollution due to vehicle emissions. PHEV is a viable balance between the two sources of energy to achieve higher fuel economy with lower emissions. For a multimode PHEV, the car switches among three operation modes; namely electric mode, series mode, and parallel mode to maximize fuel economy based on the driving conditions. In this work, minimization of fuel consumption is used to optimize the mode switching strategy for a PHEV. The study is conducted using a reference vehicle that resembles 2014 Honda Accord Plug-in Hybrid vehicle. Global optimization with constraints using pattern search method is utilized. Starting from a switching strategy with $MPG_e = 30$, optimization increased fuel economy to $MPG_e = 51.4$ for a combined cycle (FTW75 and HWFET). Optimization proved to be a feasible method to improve mode switching strategy © BEIESP.

SciVal Topic Prominence

Topic: Hybrid vehicles | Fuel economy | Power split

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Author keywords

HEV | Hybrid electric vehicle | Mode switching | Multimode | Optimization | Plug-In | Powertrain

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