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Volume 7, Issue 6, March 2019, Pages 44-47

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

Idres, M. [✉](#), Okasha, M.

Department of Mechanical Engineering, International Islamic University Malaysia, PO Box 10, Kuala Lumpur, 50728, Malaysia

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 [i](#)

Topic: Hybrid vehicles | Fuel economy | Power split

Prominence percentile: 99.482 [i](#)

Author keywords

[HEV](#) [Hybrid electric vehicle](#) [Mode switching](#) [Multimode](#) [Optimization](#) [Plug-In](#) [Powertrain](#)

Funding details

Funding sponsor	Funding number	Acronym
Ministry of Higher Education, Malaysia	FRGS15-231-0472	

Funding text

Authors are grateful to the Ministry of Higher Education Malaysia (MOHE) for financial support through FRGS15-231-0472. A special thanks is due to Mike Sasena from The MathWorks for the help developing MATLAB codes.

ISSN: 22773878

Source Type: Journal

Original language: English

Document Type: Article

Publisher: Blue Eyes Intelligence Engineering and Sciences Publication

References (13)

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