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Comparison of Regenerative Braking Efficiencies of MY2012 and MY2013 Nissan Leaf

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Abstract

The use of kinetic energy recovery systems (KERS) is the best solution presently available to dramatically improve the energy economy of passenger cars. The paper presents an experimental analysis of the energy flow to and from the battery of a MY 2012 and a MY 2013 Nissan Leaf covering the Urban Dynamometer Driving Schedule (UDDS). The two vehicles differ for the integration of the electric drivetrain component, plus a different use of the electric motor and the regenerative brakes, in addition to a different weight. It is shown that while the efficiency propulsive power to vehicle / power from battery are basically unchanged, at about 87-89 %, the efficiency power to the battery / braking power to vehicle are significantly improved from values of about 70-80 % to values of 72-87 %. The analysis provides a state-of-the-art benchmark of the propulsion and regenerative braking efficiencies of electric vehicles.

Keywords: electric vehicles, regenerative braking, vehicle efficiency

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