

ASSESSMENT OF FUEL AND ECOLOGICAL EFFICIENCY OF APPLICATION OF BIOFUEL FOR ENGINE OF HYBRID ELECTRIC CAR

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In this work the fuel and ecological efficiency of the exploitation process of a hybrid vehicle with alternating drive of a propeller from a reciprocating ICE in the mode of electric and mechanical transmission is investigated.

To do this, a selection of appropriate exploitation models has been made from standardized stationary testing cycles. The work of the ICE in the mode of mechanical transmission is in line with the cycle ESC (in accordance with UNECE Regulation No. 49) and in the mode of electric transmission, that is, as a diesel generator, cycles C1, D1, D2, F and G2 (in accordance with ISO 8178-4:2017).

The physical and chemical properties of motor fuel of biological origin in comparison with oil of petroleum origin are analyzed. The data of bench motor researches of diesel engine 2Ch10.5/12 in cases of its operation on pure mineral, pure biodiesel from rapeseed oil as well as a number of their mixtures are considered. It was established that the technical and economic performance of this engine when transferring it to work on 100 % biodiesel fuel somewhat worsen, and ecological are improving for the entire area of engine operating regimes.

For assessing of the fuel and ecological effect of transferring the ICE of hybrid vehicle to the consumption of biodiesel fuel and selection of rational model of its exploitation in diesel-generator mode was used the mathematical apparatus of complex fuel and ecological criterion of prof. Parsadanov as the most suitable for such assessment of the number of known.

The ranking of the studied models of exploitation of the diesel-generator is performed both on the basis of fuel and ecological efficiency and on the basis of effect of application of biodiesel fuel. Results of the ranking presented on Fig. 1.

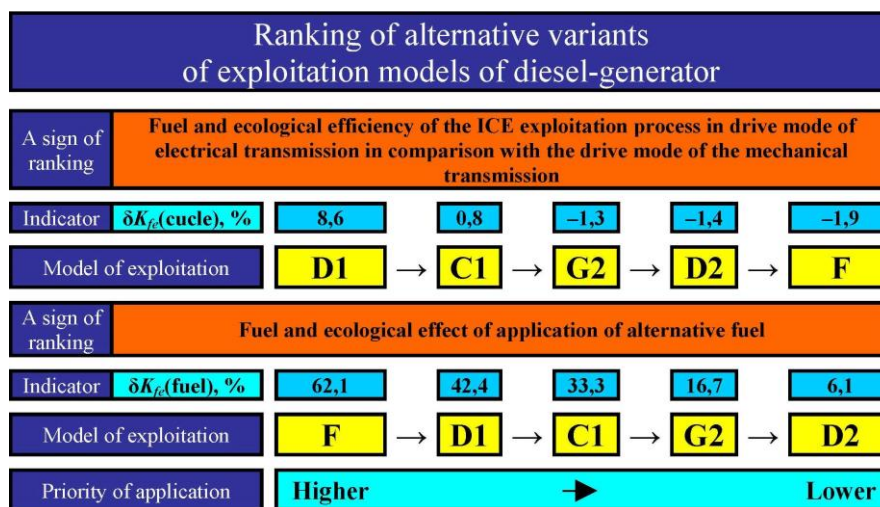


Fig. 1 – The ranking of the studied models of exploitation of the diesel-generator