
Analysis of double-flow transmissions and selection of a rational design to be used in the flywheel energy storage drive of a vehicle

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Using the methodology suggested, we compared double-flow transmission designs with a single three-link differential and a hydrostatic path that are to be used in the flywheel energy storage drive of a vehicle equipped with a combined power plant comprising an internal combustion engine and a secondary power source. We developed an algorithm and calculated power flow parameters for a double-flow flywheel drive. We analysed double-flow transmissions and selected a rational design to be implemented in a vehicle. We estimated the effect that the operating speed range of a flywheel energy storage system and the internal gear ratio of a three-link differential may have on the power transmitted by a hydrostatic mechanical drive. We provide an assessment of how limiting the gear ratio of a hydrostatic transmission may affect the power transmitted and the speed range of a double-flow drive.

Keywords: combined power plant, flywheel energy storage, hydromechanical drive, flywheel, operating speed range, transmission, vehicle

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