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Energy management strategy development of a forklift with electric lifting device

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ABSTRACT

In recent years, the forklift is facing two challenges energy saving and environmental. However, the hydraulic forklift has low transmission efficiency and energy efficiency. To solve the problem, this paper proposes an approach for the lifting hydraulic cylinder replaced by ball screw device.

The lifting system is controlled directly with an electric motor drive instead of pump. First, we analyzed the working condition and energy flows of the forklift and proposed an energy recovery system for forklift. Second, we built the system model including supercapacitor model, vehicle model and the simulation model in AMESim. Due to the markedly changing loads, supercapacitor with high specific power and high durability seems the best choice for energy storage system. In addition the study of rule-based energy management control strategies

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