

Plug-in混合动力汽车能量管理策略优化设计 Optimization of Plug-in Hybrid Electric Vehicle Energy Management Control Strategy

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摘要: 应用PSAT前向仿真软件及矩阵分割全局优化算法,对并联式Plug-in混合动力汽车(PHEV)在不同电能消耗续航里程(CDR)下的能量管理策略进行了优化设计研究。结果表明:PHEV电能消耗续航里程越大,优化控制参数对整车经济性影响越小;小CDR优化控制参数的整车平均经济性能好于大CDR优化控制参数;利用优化设计得到的PHEV能量管理策略可以使整车平均等价油耗降至2.70 L/(100km),相对于原型车经济性提高了近58%。By using powertrain system analysis toolkit (PSAT) which is kind of software with forward simulation approach and divided rectangles (DIRECT) global optimization algorithm, an energy management control strategy for a parallel plug-in hybrid electric vehicle (PHEV) on different charging depleting range (CDR) were studied. The results show that as the CDR increases, the impact of control strategy parameters on PHEV economic performance becomes smaller. By applying small-CDR optimal control parameters to PHEV, its average economic performance is better than that of large-CDR optimal control parameters. The final optimal energy management control strategy can reduce PHEV average equivalence fuel consumption to 2.70L/(100km), which is 58% lower than that of prototype vehicle.

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