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基于遗传算法的EPS系统参数优化

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摘要 根据纯电动大客车电动助力转向（EPS）系统工作的具体要求，开发了适合纯电动大客车EPS系统使用的循环球式电动助力转向器，建立了纯电动大客车循环球式EPS系统动力学模型及整车二自由度转向模型。在此基础上提出了系统转向路感、转向灵敏度以及转向操稳性的概念，并根据多元函数有约束优化问题的特点应用遗传算法对系统参数进行了优化设计。仿真结果表明：基于遗传算法优化的系统参数提高了系统的转向路感和转向操稳性。

关键词 车辆工程,电动助力转向系统, 路感, 操稳性,遗传算法

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Parameter optimization of EPS system based on genetic algorithm

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Abstract According to the requirements of the electrical power steering(EPS) system in the pure electric power bus, a recirculating ball type EPS system was developed. A model for the recirculating ball type EPS system of the pure electric power bus and a 2 DoF complete bus model were built. The concepts of steering such as the road feeling, the sensitivity, and the operation stability were introduced. The EPS system parameters were optimized by a genetic algorithm based on the principle of the constrained optimization of the multivariated function. The simulation results show that the optimization of the EPS system parameters improves effectively the road feeling and the operation stability of steering.

Key words

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