

气压驱动式自动换挡执行机构优化设计 Optimal Design of Pneumatic Automatic Transmission Actuator

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摘要: 提出了一种纯气动AMT自动换挡系统设计方案,并运用气体热力学和动力学相关理论建立换挡气缸热力学模型。依据整车换挡指标的变化特点,设计Simulink环境下的仿真试验,检测了不同换挡气缸设计尺寸对腔室压力变化率和腔室建压时间的影响,确定了换挡气缸优化设计目标和影响参数指标。最后,通过正交平衡优化试验方法,实现气动AMT换挡系统执行气缸的优化设计。 A pure AMT pneumatic automatic transmission actuator is designed, and the theoretical thermodynamic model of the shifting cylinder is set up by using the gas thermodynamics and kinetics. Based on changing characteristics of shift indicators in vehicle, the Simulink simulation is designed. Through testing different shift cylinder size impacting on the rate of change of chamber pressure and set up time of chamber pressure, clear shift cylinder optimization design objectives are established. Finally, through a balanced optimization of orthogonal test method, optimal design of AMT implementation pneumatic cylinder transmission system is achieved.

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