车辆传动系统虚拟样机建模与验证 Virtual Prototyping Modeling and Validation of Vehicle Transmission System

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摘 要： 为实现在设计阶段对车辆传动系统性能进行预测，以目前广泛应用的液力机械传动系统的组成和工作原理为基础，提出了可闭锁式液力变矩器和换挡离合器两个关键部件级，以及整个系统级虚拟样机建模方法，并进一步分析建立了相对应的数学模型。以起步工况试验的动力输入特性和操纵方式作为模型的输入条件对其进行了验证。通过仿真与试验测试结果对比，表明所建立的模型正确、合理并具有较高的精度。 A modeling method for virtual prototyping models of hydrodynamic torque converter with locked function, shifting clutch and vehicle transmission system was presented, and dynamics models were also established by analyzing the models based on the configuration and the principle of a hydro-mechanical transmission system widely used in vehicle transmission, to predict the performance of vehicle transmission system in design phrases. The virtual prototyping models were validated by the power input character and operating manner of start process test. Contrast of the simulation and test results shows that the virtual prototyping model is correct, reasonable and has higher accuracy.

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