

## EGR对柴油机工作过程影响的一维模拟

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摘要: 根据柴油机的基本结构,利用BOOST软件建立带有EGR系统增压直喷柴油机一维工作模型。将柴油机车架试验获得的最佳EGR率MAP图作为一维模型中EGR控制单元的控制MAP图,建立了模拟形式下EGR系统控制单元,实现了柴油机在使用EGR后,不同工况EGR率在柴油机转速和负荷连续变化形式下,EGR对柴油机工作全过程影响的一维模拟。以柴油机转速1900r/min、10%负荷工况点为例,模拟计算结果表明,柴油机在使用EGR后空燃比、缸压、缸内温度和排气温度都有所下降,缸内气体质量有所增加,与柴油机车架试验获得的结论吻合。According to the basic structure of diesel engine, 1-dimensional model of TDI diesel engine with EGR system was established. An EGR control unit was constructed using the optimum EGR rates map of diesel engine test experiment as control map of EGR control unit. Subsequently, a 1-dimensional simulation about the influence of EGR on the whole operating process of diesel engine was carried out, and it was realized that EGR rates was continuously changing with diesel engine rotate speed and load when EGR was used in diesel engine. Taking diesel engine rotate speed 1900r/min and load 10% as an example, the simulation results show that A/F ratio, cylinder pressure, the temperature in the cylinder and exhaust gas temperature are decreased and the gas mass in the cylinder is increased when EGR is used in the diesel engine. All conclusions of simulation are identical with that of the diesel engine test experiment.

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