

## 氢燃料发动机怠速控制策略制定及参数整定

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关键词: 氢燃料 发动机 怠速 控制策略 参数整定

摘要: 将某型号汽油机改造成氢燃料发动机, 对氢燃料发动机怠速工况下回火现象的生成机理进行理论分析, 制定了氢燃料发动机怠速控制策略。通过大量的怠速试验, 优化标定了不同控制参数(电子节气门开度、点火提前角、点火闭合时间、氢气喷气正时), 对转速控制、回火发生现象进行综合整定。用增量式PID控制算法对怠速进行稳定性研究, 并对比例系数、积分系数、微分系数以及控制周期进行整定, 得到了比较好的PID控制参数, 实现了高怠速和低怠速的稳定控制, 达到了优化控制目标。 A hydrogen-fueled engine was developed. The idle speed control strategy of hydrogen-fueled engine was established via the theoretical analyses on the mechanism of backfire phenomena of idle speed state. Through a great deal of idle speed experiments, parameters (position of electronic throttle, spark advance angle, ignition dwell angle, and hydrogen injection timing) optimization and the causes of speed fluctuation and backfire were analyzed. The idle speed control stability of hydrogen-fueled engine was studied with increment PID arithmetic. Meantime, PID parameters (proportion coefficient, integral coefficient, differential coefficient and control period) were regulated to favorable values. The experimental results showed that the high stability of both high and low idle speeds was realized and the target of optimization was achieved.

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