

用电控发动机点火能量控制与测试 Spark Energy Control and Measurement for Electronic-controlled Automotive Engine

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摘要: 针对车用电控天然气发动机, 开发出电控点火系统。为了客观评价电控系统的点火能量和优化电控点火系统, 参照SAE J973—1999标准, 设计出一套点火能量测试系统。采用稳压管串作为模拟负载, 通过数字示波器采集采样电阻两端的电压信号, 然后进行积分等运算, 从而得到点火能量的准确值。试验结果表明, 电控点火系统的点火能量能够有效量化评价。对于JL465Q5型车用电控天然气发动机, 当转速低于2500 r/min时, 初级点火线圈的闭合时间为6 ms; 转速在2500 r/min至5000 r/min时, 闭合时间为3 ms; 转速高于5000 r/min时, 闭合时间为2 ms。 The electronic-controlled ignition system was developed for automotive engines fueled with compressed natural gas (CNG). In order to evaluate the spark energy of the electronic-controlled system and optimize the electronic-controlled ignition system, referring to SAE J973—1999 standard, the spark energy measurement system was developed. Taking Zener string as simulation load, the voltage across the sampling resistance was acquired on time by digital oscilloscope, then the exact value of spark energy was obtained by integral calculations. The results show that the spark energy can be evaluated quantitatively and effectively. For the electronic-controlled automotive CNG engine JL465Q5, when the engine speed is lower than 2500r/min, the optimized charge time of the primary ignition coil is 6ms; when the engine speed is between 2500r/min and 5000r/min, the optimized charge time of the primary ignition coil is 3ms; when the engine speed is higher than 5000r/min, the optimized charge time of the primary ignition coil is 2ms.

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