

基于电介质介电常数测量的油液在线监测技术研究

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摘要：

润滑油的劣化过程蕴含着发动机的故障信息，在这一过程中其介电常数会有对应的变化。提出了一种基于电介质介电常数测量的油液在线监测方法，并对监测原理进行了介绍，设计了油液在线监测系统包括电容传感器、微小电容变化量检测电路及相应的测试分析软件。对不同污染度的润滑油进行了检测实验，结果表明该系统能够准确有效地监测油液的介电常数的变化，可为发动机更换润滑油及故障诊断提供参考依据。

关键词：故障诊断；在线监测；介电常数；电容传感器

A Study of Online Oil Monitoring Technology Based on Dielectric Constant Measurement

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Abstract:

Engine's malfunction information is contained in the process of lubricating oil wearing off. Meanwhile, the oil's dielectric constant has some change during the process. The method of online oil monitoring based on dielectric constant measurement is proposed, and the principle for oil monitoring is introduced. Oil monitoring system is also developed, which includes capacitance sensor, tiny capacitance detecting circuit and software of monitoring and analysis. Experiments are carried out on lubricating oil with different contamination. The results show that change of lubricating oil's dielectric constant can be detected effectively and properly, which has some reference meaning in lubricating oil replacing and fault diagnosis.

Keywords: fault diagnosis; online monitoring; dielectric constant; capacitance sensor

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