Contact Potential Difference Sensor to Monitor Flowing Oil Properties (#2463)

A method and system using a contact potential sensor to monitor properties of flowing oil

Inventors at Georgia Tech have developed a method and system for contact potential sensing of dielectric properties of a fluid. This electrochemical sensor can continually evaluate the condition of lubricating oil. It can provide data on not only the motor oil but also the engine it's protecting. The method and system include a contact potential sensor, an open or closed loop for passing a fluid past the sensor, measuring a contact potential to characterize dielectric properties of the fluid and outputting the dielectric property information for analysis and response.

Benefits/Advantages

- **Real-time:** provides real-time electrochemical analysis of engine oil by placing sensors in the oil flow
- **Cheaper:** by monitoring for early signs of engine damage, this technology can help avoid expensive repairs
- **Increased oil life expectancy:** owners can extract maximum life from their increasingly expensive motor oil

Potential Commercial Applications

- Monitoring flowing oil, fluids, or other gaseous environments

Background/Context for This Invention

A variety of mechanical systems, such as engines, require means to monitor the quality of oil used for lubrication and other functionalities. A number of methods exist for performing this function, but have numerous disadvantages including gross insensitivity to critical operating conditions to which oil is subjected, inability to be utilized in many applications due to structural size or geometry limitations, inability to sense other than ferromagnetic debris in the oil, and too specific a measure of oil degradation thereby

ignoring many other indicators of oil condition.

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More Information

Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/contact-potential-difference-sensor-monitor-flowing-oil-properties

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot