

Design and Development of Rotary Particle Depositor

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Abstract

This article deals with the design and development of the modified rotary particle depositor and its characteristics. This modified rotary particle depositor combines the design advantages of Direct Reading Ferrography and Analytical Ferrography, also it is versatile in its application over a range of wear particles. The effect of the rotation speed of the magnet holder, the flow rate of the oil sample, the concentration of particles, and the thickness of the glass plate are investigated. The speed of the magnet holder is controlled using an 'Arduino UNO' microcontroller and the flow of sample oil is controlled using micro pumps operated by an 'Arduino UNO' microcontroller. The oil sample used in a motorcycle or any gearbox is observed using an optical microscope. In the experimental setup, one strong permanent disc-shaped magnet is used. It has been observed that most of the wear particles in an oil sample were deposited around the outer diameter of the magnet where maximum magnetic flux field gradient is localized. A simple theory for the automation of the rotary particle depositor is presented with an experimental setup.

Keywords

Rotary, Particle Depositor, Direct, Reading, Ferrography

Biographies

Mr. Dattatraya S. Magar is an engineering graduate student. He has completed his Bachelors at Department of Production Engineering from Shri Guru Gobind singhji Institute of Engineering & Technology Nanded in 2018. And for his masters he is specializing in Mechatronics Engineering at Department of Manufacturing Engineering and Industrial Management from College of Engineering Pune.

Dr. Maheshwar D Jaybhaye is a professor at Department of Manufacturing Engineering and Industrial Management, College of Engineering, Pune, Maharashtra. He completed his Bachelors and Masters in Production Engineering and Ph.d in Mechanical Engineering. He has 15 years experience as a professor and researcher. His research interests include Robotics, Robot Dynamics, Reliability Engineering, Project Planning & Control, Computer Simulation & Analytical Tools. He has 30+ publications in National and International Journals and Conferences.