The XXXI-st SIAR International Congress of Automotive and Transport Engineering
"Automotive and Integrated Transport Systems" (AITS 2021),
28th-30th October 2021, Chisinau, Republic of Moldova
Conference Series: Materials Science and Engineering, 2022, Vol. 1220, Nr. 1

Engine oil analysis to evaluate the degree of its wear during the period of operation of the vehicle

C. Zaharia, R. Niculescu, M. Năstase, A. Clenci, V. Iorga-Simăn

https://doi.org/10.1088/1757-899x/1220/1/012037

Abstract

The lubricating oil fulfills several purposes, such as: reducing friction processes, protecting the parts of the engine mechanism from wear, preventing the occurrence of corrosion phenomena, taking over and transporting or transferring impurities to the oil filter, lubricating the moving parts as well as their cooling.

The lubrication fluid of the internal combustion engine has a significant contribution on its service life and involves its proper functioning during operation. Changing the engine oil before reaching the manufacturer specified mileage and/or time corresponding to the planned preventive maintenance becomes an imperative action sometimes, but with negative effects on the operating costs of the vehicle.

Prolonged operation in different conditions could lead to the deterioration of the lubricating oil, respectively of its properties and quality. Thus, in order for the user to benefit from maximum engine performance, it is necessary to change the engine oil at well-defined time/running intervals. So, it is very important to know when the technical overhaul of the engine will be carried out because the late change of the engine oil can affect the parts of the engine mechanism and implicitly, the performance of the vehicle or the impossibility of driving. On the other hand, premature change of engine oil increases the costs, affects the environment considering the recycling process and resource depletion.

The authors of this paper used samples of SAE 5W30 engine oil and analyzed the following parameters: viscosity, density, flash point, contamination with fuel and solids, degree of oxidation, dispersion power. The information on the evolution during the period of operation (considered post-warranty period) of these parameters is the basis for the elaboration of engine maintenance strategies

considering the following three goals: the reliability, the operating costs of the vehicle and environmental issues.

Keywords: engine oil, lubrication fluids, lubricating oil

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