

Emission Analysis of Stationary Diesel Engine Using Diesel-Additive Blends †

Arman Suthar ^{1,*}, Chandan Kumar ¹, Kunj Bihari Rana ²

¹ Department of Mechanical Engineering, SKIT, Jaipur-302017, India; armaansuthar2014@gmail.com (A.S.); chandan.kumar@skit.ac.in (C.K.);

² Rajasthan Technical University, Kota-324010, India; kunj.216@skit.ac.in (K.B.R.);

* Correspondence: armaansuthar2014@gmail.com (A.S.);

† Presented at Environmental Toxicology: Impact on Human Health (Environ Tox 2021)

Received: 5.11.2021; Revised: 18.11.2021; Accepted: 20.11.2021; Published: 30.11.2021

Abstract: Nowadays, many environmental problems have arisen due to the excessive use of petroleum products. The rapid pace of urbanization and automotive vehicles has resulted in a significant reduction in the Air Quality Index. Due to serious environmental problems and depleting fossil fuel reserves, it has become essential to find a clean alternative fuel to improve CI engine performance and control its emissions. From the literature review, 2-ethoxy ethyl acetate and nitromethane have been found booming additives due to their better combustion properties. The present study has been a step forward in the experimental analysis of a non-road VCR diesel engine using different diesel-2-ethoxy ethyl acetate-nitromethane ternary fuel blends to optimize the blends and compression ratio. The results showed a huge amount of decrement in emissions level and simultaneously enhancement in engine performance.

Keywords: diesel; 2-ethoxy ethyl acetate; nitromethane; VCR diesel engine; emissions.

© 2021 by the authors. This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Funding

This research received no external funding.

Acknowledgments

The authors are grateful to Swami Keshvanand Institute of Technology, Management and Gramothan (SKIT), Jaipur, for providing the research facility to conduct this study.

Conflicts of Interest

The experimental work presented in the paper has been done at the corresponding author's affiliated Institute. The paper Reports original work done by the authors. It has not been published anywhere. This paper is very helpful for those planning to work in alternative fuels, particularly the analysis part of the paper. In this study, the effect of engine operating parameters on performance and emissions with diesel-2-ethoxy ethyl acetate-nitromethane ternary blends were studied experimentally. This paper gives an insight on merits and limitations of using diesel-2-ethoxy ethyl acetate-nitromethane ternary blend as an alternative fuel.