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INFLUENCE OF BIODIESEL ON INJECTION, FUEL SPRAY, AND ENGINE CHARACTERISTICS

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ABSTRACT

This paper discusses the influence of biodiesel on the injection, spray, and engine characteristics with the aim to reduce harmful emissions. The considered engine is a bus diesel engine with injection M system. The injection, fuel spray, and engine characteristics, obtained with biodiesel, are compared to those obtained with mineral diesel under peak torque and rated conditions. The considered fuel is neat biodiesel from rapeseed oil. Its density, viscosity, surface tension, and sound velocity are determined experimentally and compared to those of mineral diesel. The experimentally obtained results are used to analyze the most important injection, fuel spray, and engine characteristics. Furthermore, the influence of biodiesel usage on lubrication is presented briefly. The results indicate that, by using biodiesel, harmful emissions (NOx, CO, HC, smoke, and PM) can be reduced to some extent by adjusting the injection pump timing properly while keeping other engine characteristics within acceptable limits. Furthermore, the results indicate better lubrication conditions when biodiesel is used.

KEYWORDS

biodiesel, diesel engine, injection characteristics, fuel spray, emission, lubrication

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