

¹AN INFLUENCE OF THE INTERNAL COMBUSTION ENGINE CHARACTERISTICS UPON THE TRAFFIC SAFETY IN THE REGIMES OF OVERTAKING

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Abstract

The overtaking vehicles' manoeuvre is a very often cause of traffic accidents resulting in serious consequences. The influence of the engine as a vehicle's drive unit is rarely evaluated within the analyses of the causes leading to those accidents. On the other hand, a necessary condition for overtaking which is to be carried out in a safe manner is given through the vehicle's motion due to the specified acceleration values which primarily depend on the characteristics of engines and transmission. Therefore, what has been elaborated in the work itself is a model including the fundamental regularities of vehicles' motion in the regimes of overtaking, complete with the characteristics of engines, transmission and vehicles. The emphasis of the analysis has been placed on the engine as a drive unit, owing to which it has been necessary to develop adequate non – steady models that represent the only models able to define the characteristics of engines in the regimes of overtaking.

Modeling has been performed by using the *Simulink* and *SimDriveline* program from the *MathLab* program package. The developed model provides a complex analysis of all the factors influencing the overtaking manoeuvre: a driver, the engine, the transmission, a vehicle, positions and speeds of the vehicles involved in the overtaking process.

Key words: traffic safety, overtaking, drive unit, modeling.

UTICAJ KARAKTERISTIKA MOTORA SUS NA BEZBEDNOST SAOBRAĆAJA U REŽIMIMA PRETICANJA

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Rezime: Manevar preticanja vozila je veoma čest uzrok saobraćajnih nezgoda sa teškim posledicama. U analizama uzroka takvih nezgoda retko se ocenjuje uticaj motora kao pogonskog agregata vozila. S druge strane, za bezbedno izvođenje preticanja neophodno je kretanje vozila određenim vrednostima ubrzanja koja u prvom redu zavise od karakteristika

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motora i transmisije. Otuda je u radu razvijen model koji obuhvata osnovne zakonitosti kretanja vozila u toku preticanja, karakteristike motora, transmisije i vozila. Težište analize je bilo na motoru kao pogonskom agregatu, zbog čega je bilo potrebno razviti odgovarajuće nestacionarne modele koji jedino mogu da definišu karakteristike motora u režimu preticanja vozila.

Modeliranje je vršeno uz korišćenje programa *Simulink* i *SimDriveline* iz programskog paketa *MathLab*. Razvijeni model omogućava kompleksnu analizu svih uticajnih faktora na manevar preticanja: vozač, motor, transmisija, vozilo, položaji i brzine vozila koja ušestvuju u preticanju.

Ključne reči: bezbednost saobraćaja, preticanje, pogonski agregat, modeliranje.