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Numerical and experimental study on the effect of cab - extender on the flow characteristics of a tractor-trailer (Article)

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Abstract

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The aerodynamic drag on trucks can be reduced by use of active and passive techniques. In this work a passive method of using a cab-extender that is attached to the rear of the tractor is attempted. This cab-extender will help in reducing the drag force that act on the truck by minimizing the gap between the tractor and trailer. In this study, a tractor-trailer model was fabricated and tested in a low speed wind tunnel for its aerodynamics characteristics and the effect of cab-extender was also studied. Later Solid Works CFD package was used to study numerically the effect of this cabextender on the aerodynamics of the truck and the results were validated against the experimental results. Finally using CFD approach the best angle of the cab-extender was reported for minimum drag. © 2019 Penerbit Akademia Baru.

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2 Hsu, F.-H., Davis, R.L.
Drag reduction of Tractor-trailers using optimized add-on devices
(2010) *Journal of Fluids Engineering, Transactions of the ASME*, 132 (8), art. no. 084504. Cited 14 times.
http://scitation.aip.org.ezproxy.um.edu.my/getpdf/servlet/GetPDFServlet?filetype=pdf&id=JFEGA4000132000008084504000001&idtype=cvips&prog=normal
doi: 10.1115/1.4001587
View at Publisher

3 Altaf, A., Omar, A.A., Asrar, W.
Review of passive drag reduction techniques for bluff road vehicles
(2014) *IIUM Engineering Journal*, 15 (1). Cited 8 times.

4 Sudin, M.N., Abdullah, M.A., Shamsuddin, S.A., Ramli, F.R., Tahir, M.M.
Review of research on vehicles aerodynamic drag reduction methods
(2014) *International Journal of Mechanical and Mechatronics Engineering*, 14 (2), pp. 35-47. Cited 14 times.
http://www.ijens.org/Vol_14_I_02/145302-6868-IJMME-IJENS.pdf

5 Mohamed-Kassim, Z., Filippone, A.
Fuel savings on a heavy vehicle via aerodynamic drag reduction
(2010) *Transportation Research Part D: Transport and Environment*, 15 (5), pp. 275-284. Cited 42 times.
www.elsevier.com/inca/publications/store/3/1/1/5/3/
doi: 10.1016/j.trd.2010.02.010
View at Publisher

6 Chowdhury, H., Moria, H., Ali, A., Khan, I., Alam, F., Watkins, S.
A study on aerodynamic drag of a semi-trailer truck (Open Access)
(2013) *Procedia Engineering*, 56, pp. 201-205. Cited 15 times.
http://www.sciencedirect.com.ezproxy.um.edu.my/science/journal/18777058
doi: 10.1016/j.proeng.2013.03.108
View at Publisher

7 Altaf, A., Omar, A.A., Asrar, W.
Passive drag reduction of square back road vehicles
(2014) *Journal of Wind Engineering and Industrial Aerodynamics*, 134, pp. 30-43. Cited 8 times.
doi: 10.1016/j.jweia.2014.08.006
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