

ABSTRAK

Gaya hambat yang diterima oleh truk trailer cukup besar sehingga membuat konsumsi bahan bakarnya menjadi boros. Dalam rangka menekan hambatan pada truk trailer, penambahan *wind deflector* telah banyak dilakukan. Namun, nilai gaya hambat yang diterima masih cukup besar, sehingga konsumsi bahan bakarnya pun masih cukup tinggi dan boros. Dalam rangka mengurangi konsumsi bahan bakar truk trailer, maka penelitian ini difokuskan pada perhitungan penghematan bahan bakar pada truk trailer berdasarkan variasi sudut *wind deflector*. Metodologi yang digunakan pada penelitian ini adalah metode analitik-numeris. Adapun langkah-langkahnya secara umum meliputi: 1) membagi bodi truk trailer ke dalam 12 bagian dan menghitung sudut masing-masing bagian terhadap sumbu horizontal, 2) mengekstrak data tekanan dan tegangan geser dari simulasi numerik, 3) menghitung gaya hambat dan koefisien hambat menggunakan teknik perhitungan analitik, dan 4) menghitung konsumsi bahan bakar dan penghematannya berdasarkan koefisien hambatnya. Variasi sudut *wind deflector* pada penelitian ini adalah 0° , 25° , 40° , dan 50° . Hasil perhitungan menunjukkan bahwa sudut *wind deflector* 25° mampu menghasilkan nilai koefisien hambat yang paling rendah. Namun demikian, koefisien hambat paling rendah tidak berarti mampu menekan konsumsi bahan bakarnya, karena di variasi *wind deflector* 25° ini, konsumsi bahan bakarnya yang lebih tinggi dibanding variasi tanpa *wind deflector* (varian 0°).

Kata kunci: Konsumsi bahan bakar, truk trailer, *wind deflector*, koefisien hambat, analitik



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**CALCULATION OF TRAILER TRUCK FUEL CONSUMPTION DUE
TO CHANGES IN WIND DEFLECTOR ANGLE USING
NUMERICAL-ANALYTICAL METHOD**

ABSTRACT

The drag received by truck trailers is large enough to make fuel consumption wasteful. In order to reduce the drag on truck trailers, the addition of wind deflectors has been widely done. However, the value of the drag received is still quite large, so the fuel consumption is still quite high and wasteful. In order to reduce the fuel consumption of trailer trucks, this research focuses on the calculation of fuel savings on trailer trucks based on variations in wind deflector angle. The methodology used in this research is the analytical-numerical method. The steps generally include: 1) divide the trailer truck body into 12 sections and calculate the angle of each section with respect to the horizontal axis, 2) extract the pressure and shear stress data from the numerical simulation, 3) calculate the drag force and drag coefficient using analytical calculation techniques, and 4) calculate the fuel consumption and savings based on the drag coefficient. The wind deflector angle variations in this study are 0° , 25° , 40° , and 50° . The calculation results show that the wind deflector angle of 25° is able to produce the lowest value of drag coefficient. However, the lowest drag coefficient does not mean that it is able to reduce fuel consumption, because in this 25° wind deflector variant, the fuel consumption is higher than variant with no wind deflector (0° variant).

Keyword: *Fuel consumption, trailer truck, wind deflector, drag coefficient, analytic*

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