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Vehicle crash compatibility between road traffic in Pakistan

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Recent developments in road safety have placed particular emphasis on crash compatibility between different vehicles as well as between vehicles and pedestrians during a traffic collision as a key aspect of crash worthiness. Vehicle Underride/Override is a major cause of fatalities between incompatible vehicles. However, the main focus of recent researchers has been limited to compatibility between HGVs and passenger cars and SUVs and passenger cars in developed countries, notwithstanding the fact that about 3/4th of the 1.2 million worldwide traffic fatalities occur in developing countries. The objective of this research is to study the crash compatibility amongst the diversity of vehicles in Pakistan, Crash compatibility between three and four-wheeled vehicles are categorized and placed into sets and subsets according to specific vehicle classification criteria. These vehicle sets and subsets are then analyzed using pre-defined categories of vehicle compatibility: Geometric compatibility, mass compatibility, and speed compatibility. The findings of this research indicate a strong geometric and mean speed incompatibility between different vehicle classes and an overall geometric incompatibility between passenger cars and Goods Vehicles. The difficulty in regulating compatibility and the lack of government will is a huge issue. A major policy shift is needed to change the focus from individual vehicle crash worthiness on a selected class (i.e., Passenger cars) to a collective approach considering all traffic diversity.

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A CFD investigation into effects of combustion chamber geometry on engine performance and amount of pollutant emissions in a SI engine

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A CFD simulation has been carried out to investigate the effects of combustion chamber geometry on engine performance and the amount of pollutant emissions in a 4-cylinder SI engine. The results obtained by the baseline case have been firstly validated with the experimental data and good results have been achieved. Totally, 23 different sketches of combustion geometries have been modeled and the effects of various parameters have been analyzed in detail. CFD simulation has been performed in MBT condition at 3000 rpm. The results show using the optimum sketch can reduce the amount of pollutant emissions while the other engine parameters remain constants.

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