Manipulating the Center of Gravity in order to Reduce Rollover Rates in Sports Utility Vehicles

Courialis, Vasili

The present study was conducted to determine how to reduce rollover rates in Sports Utility Vehicles. A remote controlled toy model Sports Utility Vehicle was modified, in order to simulate the effects of an actual passenger SUV rolling over, while turning at a certain rate of speed. Since, the toy model was designed to prevent rollovers, its center of gravity was altered, to cause the vehicle to tip over, based on its maximum speed and turning radius. It was hypothesized that lowering the model's center of gravity, adding a counterforce and or stiffening the suspension system, would contribute to lessening the probability of rollover. Twenty trials were conducted using different weight distributions and varying centers of gravity, in order to ensure the vehicle's stability. The active independent variables consisted of redistributing the weight on the top and bottom platforms and the raising and lowering the center of gravity, of the modified vehicle. The active dependent variable consisted of the vehicle flipping as it turned. The active constants are the speed and the turning radius of the automobile. The results indicated that only one combination of weight distribution, at a specific center of gravity, would provide sufficient stability thereby maintaining stability, as the vehicle entered its turn. This was found in trial twenty when the vehicle did not roll over. It ensured utmost control for the vehicle. The findings supported the methodology, which resulted in identifying future practical applications, to reduce rollover rates in Sports Utility Vehicles, in the automotive industry.

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