

ANALYSIS OF CAR-TRAILER COMBINATION SYSTEMS TO REDUCE FISHTAILING

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ABSTRACT

The phenomenon of fishtailing has been an ever-ongoing issue as the utilization of Car- trailer Combination systems (CTCs) has grown rapidly as a means of transporting goods and services throughout the world. As a result, the study of CTCs has only grown in interest over time, with both scholars and researchers analyzing potential methods of helping to reduce fishtailing. For this project, a CAD assembly model of a CTC system will be analyzed to emulate and analyze this phenomenon, to help determine potential safety measures that can be made to reduce the occurrence of the phenomenon. The model will be tested on varying road conditions including Concrete, Asphalt, and Ice in both wet and dry conditions, a gust of wind will be applied to the trailer's center of mass as an impulse force. This force will then potentially cause the system to overall vibrate into a fish-tail syndrome, where the CTC system can then be analyzed for potential translational displacements, rotational speeds, and torque from the trailer rotating. The weight distribution of the trailer will also be tested to measure both good and bad tongue weight, where a block of mass inside the trailer will be moved towards the back and towards the front to change the center of mass location for each simulation. As a result of these analyses, potential methods to help reduce the phenomenon of fishtailing can be determined for each environment, with an emphasis on overall design improvements being expanded upon.

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