Considering Driver Balance Capability in Truck Shifter Design

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A person’s ability to perform a task is often limited by their ability to maintain balance. This is particularly true in lateral work performed in seated environments. For a truck driver operating the shift lever of a manual transmission, excessive shift forces can necessitate pulling on the steering wheel with the other hand to maintain balance, creating a potentially unsafe condition. An analysis of posture and balance in truck shifter operation was conducted using balance limits to define the acceptable range of shifter locations. The results are dependent on initial driver position, reach postures, and shoulder strength. The effects of shifter force direction and magnitude were explored to demonstrate the application of the analysis method. This methodology can readily be applied to other problems involving hand-force exertions in seated environments.

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