Category: Falls from Elevation

**Title: The Influence of Heavy Truck Egress Tactics on Ground Reaction Force**

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**Abstract**

Slips and falls during cab egress are an important cause of injuries to truck drivers. Previous work has shown that the egress tactics may influence risk. Inward-facing tactics (driver faces the truck) are universally recommended, but biomechanical evidence supporting this recommendation is sparse. As part of a laboratory study of truck driver ingress and egress behavior, the ground reaction forces during first contact with the ground on egress were recorded for both inward and outward facing egress tactics using interior and exterior handles aft of the door opening. The trials reported here were conducted with a step configuration typical of a conventional tractor-trailer cab. Seventeen male and three female truck drivers with a wide range of body size participated. Peak vertical ground reaction force (PFZ) averaged 1.53 times body weight (s.d. 0.43) for inward-facing tactic and 1.80 times body weight (s.d. 0.50) for the outward-facing tactic (difference significant with $p<0.01$). Handle position (interior vs. exterior) did not affect PFZ. PFZ with the outward-facing tactic was higher than PFZ inward-facing for 75% of the subjects. The average 17 percent increase in peak ground reaction force with the outward-facing tactic may indicate an increased risk of both cumulative and acute injury. Further analyses of these data will assess musculoskeletal loading associated with various tactics and step/handhold configurations.

**Objectives:** Determine the effect of truck egress tactic on ground reaction force.

**Methods:** A laboratory study using a reconfigurable vehicle mock-up was conducted. Ground reaction forces were measured using a force plate as twenty truck drivers exited the mock-up using two different tactics and two handle configurations.

**Results:** Peak vertical ground reaction forces were an average of 27% of body weight higher when drivers exited the cab facing outward than when then exited facing inward.

**Conclusions:** The significant increase in ground reaction force when drivers exit facing away from the cab may represent an increased risk of both acute and cumulative injury.

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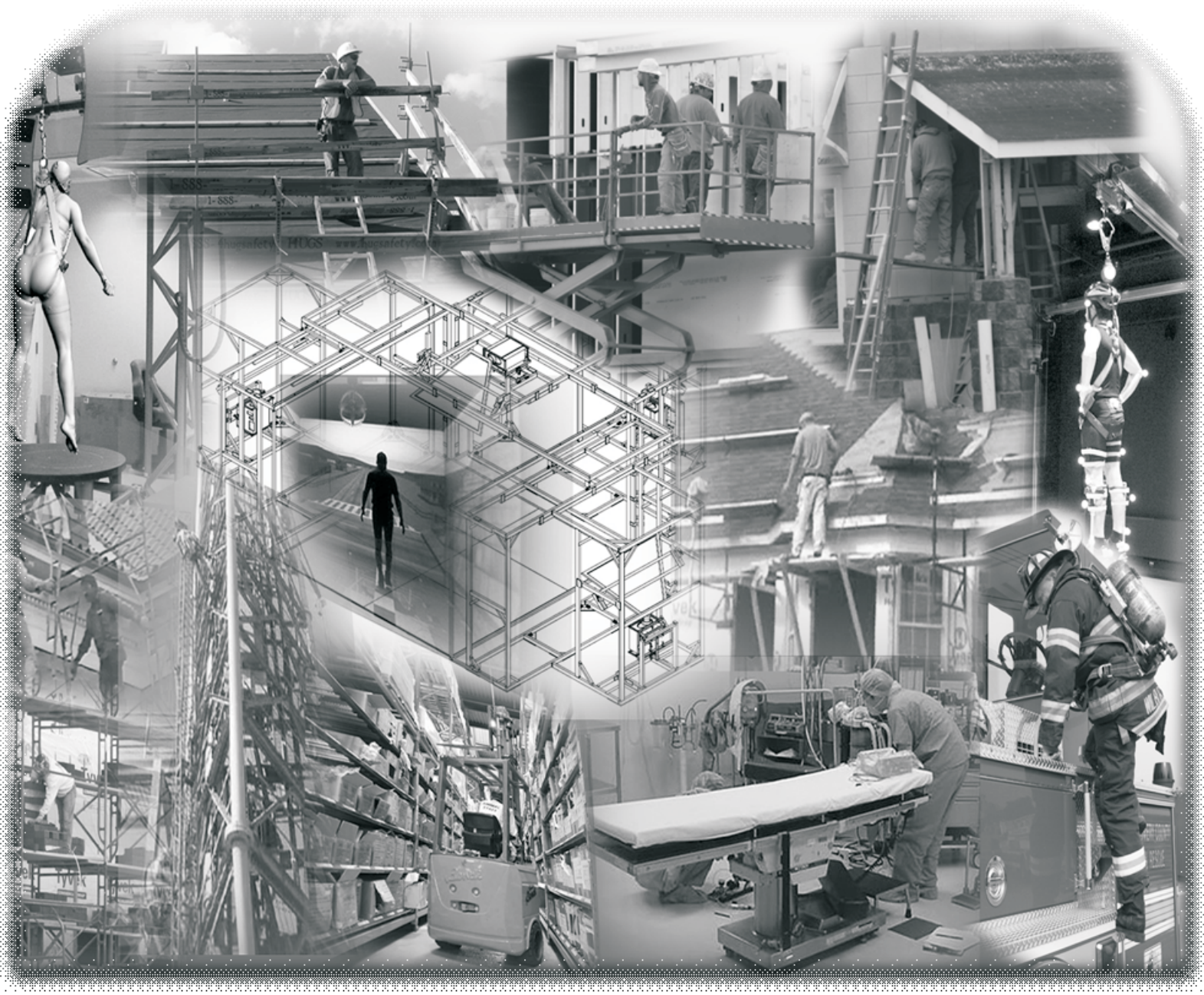

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