Hand Positions and Forces during Truck Ingress

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Many truck drivers are injured each year due to falls while getting into and out of their vehicles. Design guidelines for steps and handholds are not based on biomechanical data and do not reflect a systems approach to design. As part of a broader effort to improve ingress/egress safety, a laboratory study was conducted to quantify driver postures and motions for a wide range of step and handhold configurations. Data from thirty men and women with a wide range of body size were analyzed to determine the location of the right hand and the force exerted on the aft handhold during the initial phase of ingress. Drivers grasped the external handhold at between 90 and 110 percent of stature above the ground. Peak hand forces averaged 25 percent of body weight, although heavier drivers did not exert significantly more force. Handhold position affected hand force only when the lower step was relatively far from the handhold.