

## Overview

Hand cranking of truck landing gear is a common task performed by truck drivers to raise or lower trailers. The shoulder is at risk for injury while cranking due to the required force and possibly restricted body posture.

The objective of this laboratory-based study was to examine how body posture and the load resistance during cranking affect scapular posture and shoulder muscle activities.

Twelve males operated a custom-built cranking simulator with two postures, sagittal and frontal, with resistance loads of 0, 10 and 20 newton-meter. The biomechanical effects of cranking were measured using a 3-D motion tracking system, and muscle activity using electromyography (EMG) during trials of 5 crank rotations each.

## Shoulder assessment for truck drivers while hand cranking landing gear

Occupational cranking operations: The scapula perspective

*Applied Ergonomics*, 2018

Jia-Hua Lin, PhD and Xu Xu, PhD

### Key Findings

Study findings include:

- Motion analysis demonstrated that cranking in the frontal posture increases the shoulder impingement risk compared to the sagittal posture, regardless of the resistance level. This is due to the large range of motion needed in this posture.
- EMG results showed that the shoulder muscles do more work when cranking in the frontal posture compared to the sagittal posture, particularly when resistance is high.

Best practices for truck drivers are:

- When raising the trailer, the driver should stand in the sagittal posture with one shoulder near the trailer and eyes facing the cab. This posture allows full body strength to be used. The sagittal posture does require a firm grip on the handle, as it is under some tension and could strike the worker if the grip should slip.
- When lowering the trailer, the driver can face the trailer and crank the landing gear in the frontal posture.

### Impact

The best practices identified in this study can help reduce truck drivers' risk for injury such as shoulder rotator cuff syndrome. Additionally, the findings from this study can be applied to other hand crank tasks such as to open and close heavy-duty valves, or to turn handles in certain manual tools.

Find the article here:

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