

Ergonomic Assessment

Disengaging King Pin

Concern Details

Task Description:

To disconnect the trailer from a fifth wheel truck, drivers have to pull the king pin to disengage the locking mechanism. Forces to pull the king pin are excessive, measuring from 30-40 kg. The space and clearance to pull the king generally only enables one hand to reach and pull the king pin.

Evaluation:

Some of the population may not be able to disengage the king pin with only one hand as the required forces exceed the strength capabilities of population [1]. When forces exceed strength capabilities, it hinders an individual's ability to perform the task, and the higher the portion of the population not capable of performing a task, the greater the risk of overexertion injury.

The high forces to disengage the king pin results in increased risk of injury to the workforce. Forces for disengaging the king pin exceed both one-handed and two-handed pull guidelines [2] as well as two handed push / pull guidelines [3]



Countermeasures

- **Worker:**
 - o When parking the trailer, place trailer properly on level ground and preferably on a trailer pad.
 - o Prior to pulling the king pin, lower landing gear then snug truck to king pin.
 - o Use a pin puller long enough to clear truck wheels so you can use two hands to pull the king pin.
 - o Ensure good technique which includes putting both feet under edge of tires with knees on tire, keep back straight, use two hands on pin puller, contract arms and lean back.

- **Company:**
 - o Ensure adequate preventative maintenance for tractors and trailers, including lubrication of the king pin locking mechanism.
 - o Purchase trucks with quarter fenders instead of full fenders to increase space for two hands.
 - o Investigate leverage tool

References

- [1] Department of Trade and Industry (DTI). (2000). Strength Data for design safety – Phase 1, Government and Consumer Safety Research, London.
- [2] Mital, A., Nicholson, A.S. and Ayoub, M.M., A Guide to Manual Material Handling, 2nd Ed. Taylor and Francis Ltd., 1997
- [3] Eastman Kodak Company. (2004) Kodak's Ergonomic Design for People at Work (2nd Edition) (S. N. Chengalur, S. H. Rodgers, and T. E. Bernard, Eds.) John Wiley and Sons, Inc., New Jersey.

