Toolbox Talks – Safety in Mounting & Dismounting Construction Equipment

Introduction
Each year in the construction industry several thousand lost-time injuries occur to operators, drivers, and mechanics working with construction equipment. Many of these injuries are associated with getting on or off a machine. Sprains, fractures, and other injuries occur when personnel jump down from all types of equipment, dismount from large track-type machines which have traditionally afforded poor access, and slip or fall from wet, slippery, or poorly maintained access systems.

Among the many lost-time injuries annually associated with mounting or dismounting, a large group involves trucks of all sizes. The next most frequently involved types of equipment are bulldozers and backhoes.

Recently, a review of statistics was made of operators injured while mounting and dismounting construction equipment. Research was undertaken to determine causes and develop practical solutions. Three approaches to reducing injuries were defined: (1) operator training to encourage proper mounting and dismounting practices; (2) retrofit and maintenance to provide improved access systems; and (3) greater consideration of the problem at the design level to afford easier access for the operator and to reduce maintenance required to keep access systems functional.

This bulletin concentrates on the two areas where management and supervision in the construction industry have the capacity and the responsibility to make improvements: operator training, and the retrofit and maintenance of access systems.

Three-Point Contact
Understanding and incorporating the three-point contact concept of mounting and dismounting procedures is crucial to reducing the potential for injury. The concept applies regardless of the quality of condition of access systems. All operators and maintenance personnel should be alerted to its importance.

Several fundamental factors are connected with this concept. Three points of contact are necessary at all times for personnel to maintain stability while getting on or off a machine. To do this, a person must at all times maintain contact with one hand and two feet, or two hands and one foot. He or she then forms a triangle of contact points which will change in form while he mounts or dismounts.

It is important to remember two other factors: first, when the triangle is incomplete, the operator is in a potentially unstable position which could lead to a fall; and second, stability will be maximum when the center of the triangles formed by the operator as he mounts or dismounts, and the center of mass of the operator as he moves are close together. Otherwise, the operator’s stability will be reduced.

This means that access systems should be positioned to minimize the necessity for lateral movement, especially when the operator is proceeding from one step to another. The greater the lateral movement, the more likely the operator will be in an unstable position. This is because his or her center of gravity will probably be located so that his or her weight is not distributed evenly to the points of support.

The concept of a balanced three-point contact applies not only to operator training, but to retrofit, maintenance, and design of equipment, because it is hard to maintain three-point contact where access systems are inadequate.
Operator Training
Even where access systems are less than ideal, adherence to proper procedures based on fundamental concepts such as the three-point contact, mounting and dismounting facing the machine, and avoiding jumps will reduce the incidents of operator injury considerably.

Instructions in Mounting and Dismounting Procedures
Operators should be instructed in proper mounting and dismounting procedures for each piece of equipment they use. The following points should be emphasized:

- Maintain three-point contact at all times during movement, and break three-point contact only upon reaching the ground, the cab, or a stable platform.
- Mount and dismount facing towards the equipment.
- Take conscious time in both mounting and dismounting.
- Get on and off the vehicle consistently at the safest access position (normally designed by the manufacturer).
- Allow only authorized persons on equipment.
- Persons other than the operator should not get on a machine unless it is necessary, and under normal circumstances, they should not get on or off the machine unless it is stationary.

Other personnel should advise the operator of their intent to mount or dismount, and should use a signaling system if necessary.
Our safety evaluations, reports and recommendations are made solely to assist your organization in reducing hazards and the potential of hazards and accidents. These recommendations were developed from conditions observed and information provided at the time of our visit. They do not attempt to identify every possible loss potential, hazard or risk, nor do they guarantee that workplace accidents will be prevented. These safety evaluations, reports and recommendations are not a substitute for ongoing, well-researched internal safety and risk management programs. This report does not warrant that the property inspected and its operations are compliant with any law, rule or regulation.

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