

Dock Operations: Loading and Unloading Trucks and Rail Cars

Manually loading and unloading freight from trucks and boxcars is a common source of injury on the dock. It typically involves strenuous physical effort, with the worker required to lift, lower, reach, twist, and bend – sometimes hundreds of times a day. The potential for injury is always present. However, the risks can be significantly reduced if dock workers and management understand the factors that contribute to manual handling injuries such as low back pain, and muscle strains, and develop procedures to address them. Ergonomic solutions that eliminate or reduce manual loading and unloading will result in safer, more efficient dock operations.

1. Know the Injury Risk Factors

Risk factors that influence the potential for injury during manual loading and unloading are listed below. Examine your company's loading and unloading operations to identify which of these risks are present.

■ High Task Frequency

As the frequency of lifting increases, the maximum acceptable weight decreases – in other words, the more times you lift, the less weight your body can tolerate without strain over time. Besides loading and unloading, dock workers often rehandle the same load for staging, checking, receipt validation, sorting, packing, and order processing. This extra handling increases the likelihood of whole body fatigue and injury.

■ Awkward Object Size, Geometry, and Weight

The taller, bulkier, and heavier an object is, the greater the chance for injury. Muscle forces



and biomechanical stress to the low back are much higher when handling awkward loads.

■ Inadequate Object Coupling

Coupling is the interaction between the worker's hands and the object, and between the worker's feet and the floor. If the worker can't get a good grip on the object, there's a greater chance that he or she will drop it or slip and fall while carrying it. About 4% of all back injuries are associated with slips and falls.

■ Poor Load Distribution and Stability

Loads that are unstable and poorly distributed can cause injury not only by collapse, but by the unnecessary handling associated with unstacking and restacking items to improve their weight distribution. This is particularly true in congested areas.

**Near right: powered
stacker truck
Far right: gravity
roller conveyor**



■ Excessive Pushing/Pulling and Carrying Distances

An unnecessarily long distance from the loading dock to the truck or boxcar will increase the overall effort required to perform the job.

2. Eliminate Manual Operations If Possible

The best defense is to eliminate the risks by using mechanical rather than manual means to load and unload the freight wherever possible. When dealing with suppliers, specify that incoming shipments be unitized to allow mechanical handling in one of the following ways:

■ Pallets

Shipping a load on pallets allows for powered forklifts to move the loads onto and off of trucks.

■ Slip Sheets

When space constraints make palletized shipping impractical, unitizing the load on slip sheets

provides an alternative for powered loading/unloading.

■ Forklift Clamp Attachments

Adding special forklift clamp attachments to the load is another option that allows powered loading and unloading. This approach is especially suitable for shipping docks that handle large cartons, appliances, rolls, or bales.

■ On-Dock Loading System

An automatic, on-dock loading system allows an entire truckload to be staged on the dock, then moved as a complete unit into or out of the truck. Such systems are fast and efficient, but they are only feasible for operations where high-volume loads are standard, and a considerable amount of dock space is available.

3. Reduce the Risks for Remaining Manual Tasks

When manual loading and unloading cannot be eliminated, consider the use of a blend of

administrative and engineering controls to reduce the risk of injury.

■ **Plan Rest Breaks or Light Work Activity**

Schedule breaks or instruct workers to complete paperwork, pre-trip reports, or other productive light work activity in between manual handling tasks. Light work allows sufficient recovery time and lessens potential for whole body fatigue.

■ **Reduce Awkward Loads**

Look for ways to reduce the size of the object to be handled. Check whether product shippers can send smaller units. If this isn't possible, consider using mechanical handling aids or have workers seek help with awkward loads.

■ **Improve Load Distribution and Stability**

To keep loads stable and well-distributed, make sure the center of gravity is as close to the

ground as possible, with heavier items on the bottom of the stack.

■ **Redesign Workplace Layout**

Reduce unnecessary carrying distances by placing loads as close to the truck or boxcar as possible, or use carts or other mechanical handling aids.

■ **Use Platform-Lift Trucks**

Powered or manually operated platform-lift hand trucks and platform-lift stackers can raise and lower cartons, making it easier for the worker to move them in and out of the box.

■ **Use Conveyors**

Various types of conveyors both fixed and expandable designs – accordion-type or extending – are available to reduce manual effort and motion.

Notes

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