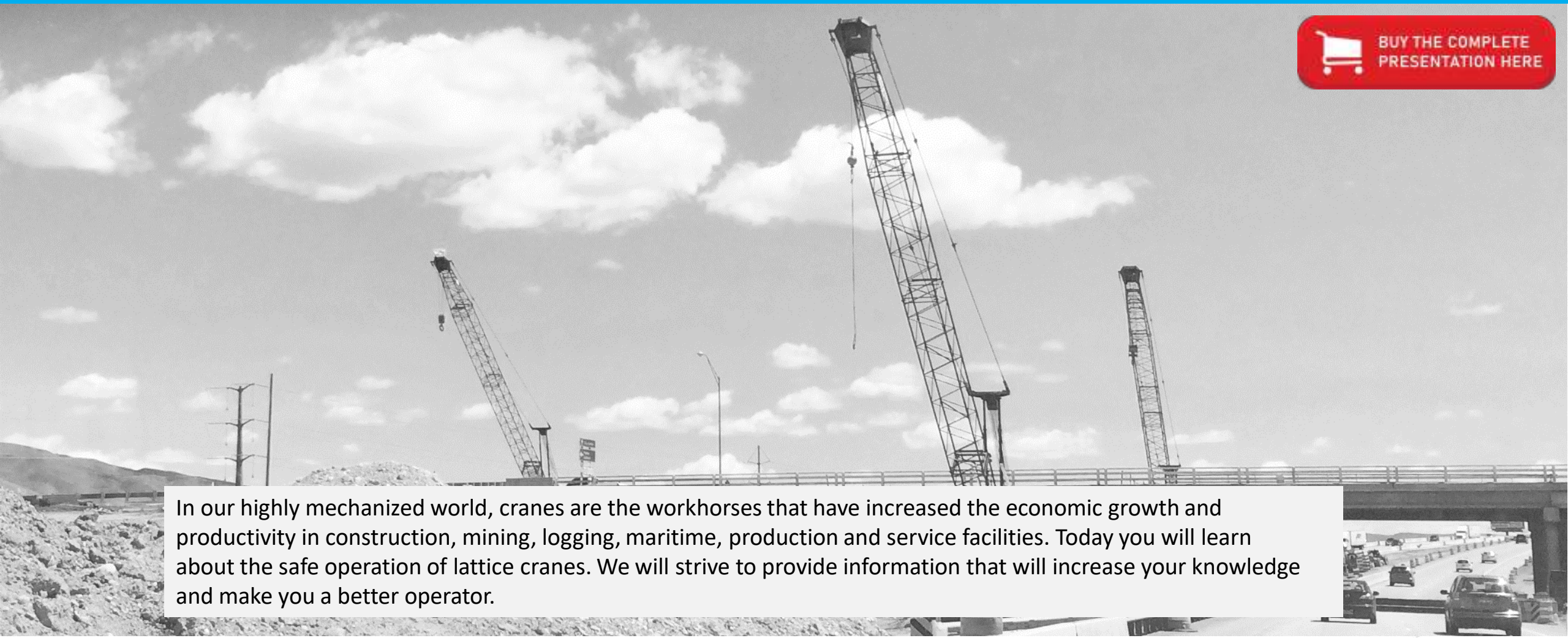
# Welcome to *The Hard Hat Training Series*





In our highly mechanized world, cranes are the workhorses that have increased the economic growth and productivity in construction, mining, logging, maritime, production and service facilities. Today you will learn about the safe operation of lattice cranes. We will strive to provide information that will increase your knowledge and make you a better operator.

HARD HAT TRAINING SERIES

SAFETY PROVISIONS, inc.



LATTICE CRANE OPERATOR SAFETY TRAINING

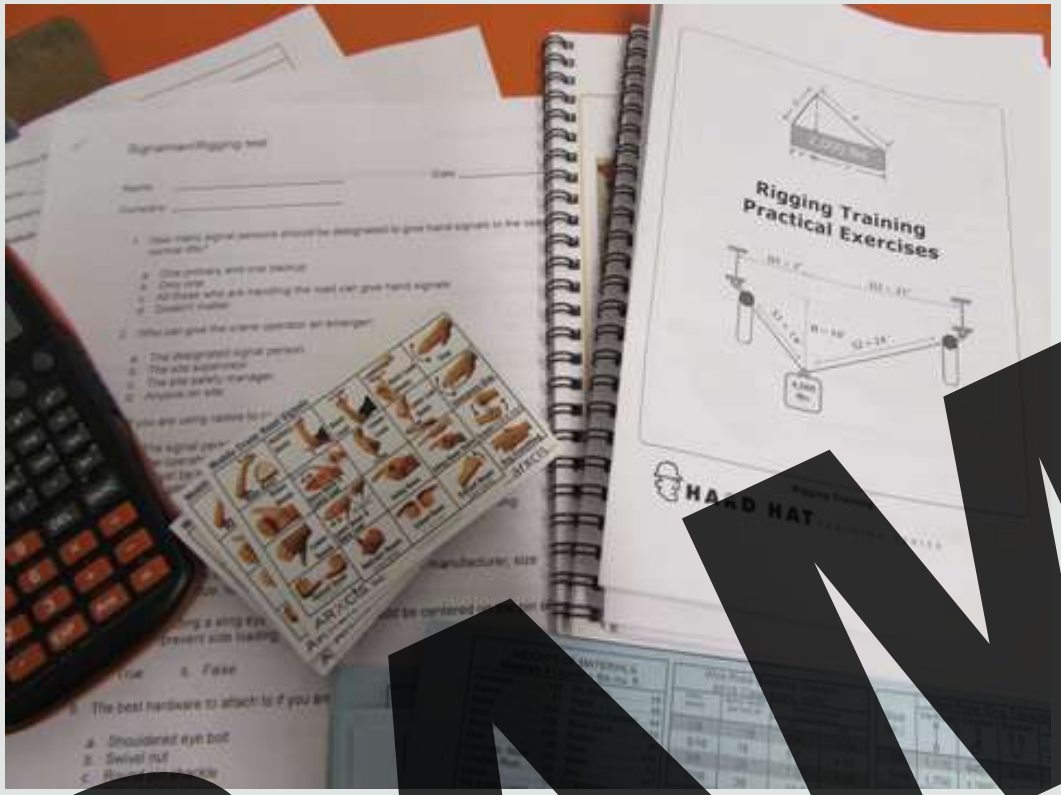
## Did you know?

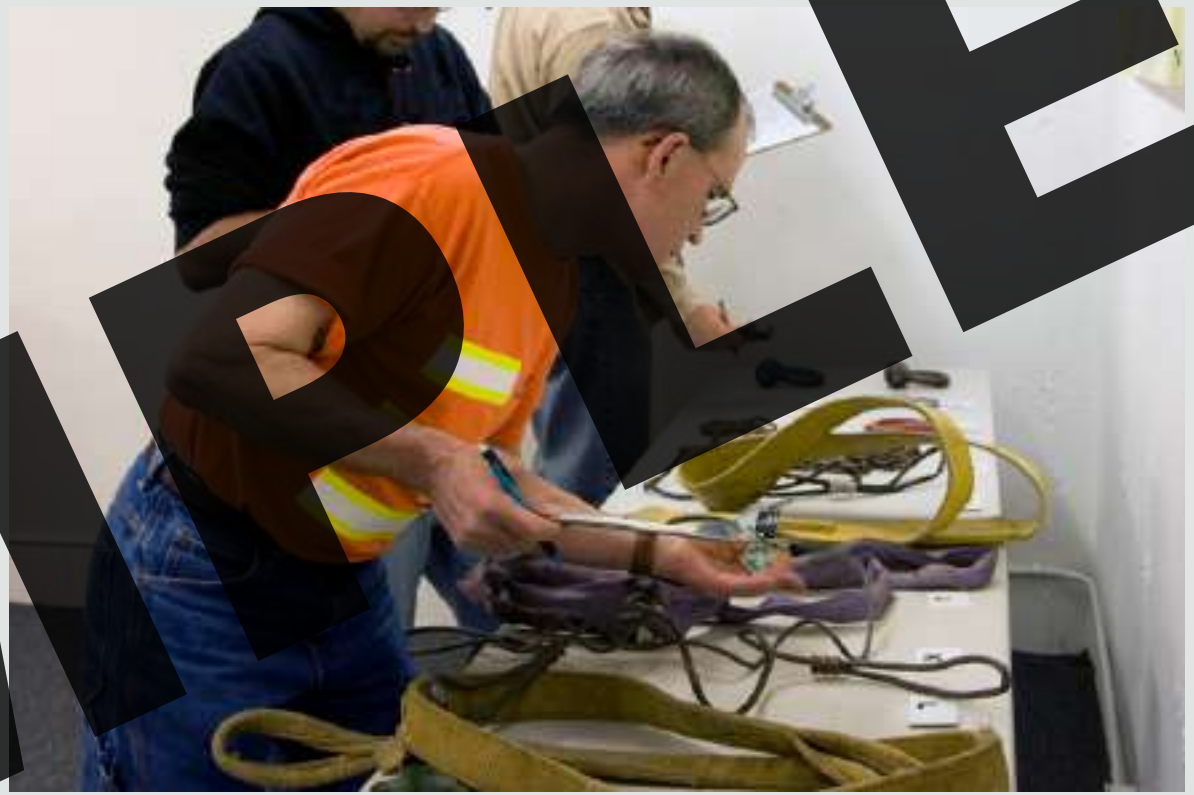
**Regulations specify that an operator *must* take a refresher course if any of the following apply:**

- The operator is observed operating the equipment in an **unsafe** manner (e.g., no seat belt, reckless driving, etc.)
- The operator is involved in an **accident *or*** a **near miss**
- The operator received a **poor evaluation** for performance
- The operator is required to **use a different type of machine *or* attachment**
- Workplace conditions have changed

Additionally, 1926.64(g)(2) states that "The employer…shall determine the appropriate frequency of refresher training.

In line with OSHA requirements, anyone who operates heavy equipment must receive training prior to operating the machine on their own. OSHA requirements for refresher training are also very specific.





Additionally, any workers who will be rigging or overseeing rigging in any degree must receive training specific to their assigned responsibility. This training should include how to properly rig a load, as well as how to inspect the rigging gear prior to it use.

OSHA's standard also says that each operator must be re-evaluated every three years to see if they are still competent to operate the equipment. A so-called "free-pass" cannot be awarded based on experience or age.


Initial training, as well as any evaluations or refresher courses must be documented with the name of the person or persons who taught the class or conducted the evaluation. Although OSHA doesn't require wallet cards as proof of training, many companies and worksites do require onsite proof that you have been trained. At the very least, in the case of an investigation, OSHA will want to see proof of proper and consistent training (in the way of training outlines, class lists, training goals, tests, certificates, etc.)



During this training, we'll take a look at the functionality and components of a crane. We'll also show you why it's important to conduct a thorough pre-shift inspection each day before using the equipment.



We will look at machine stability and the importance of knowing the crane's capacity.




We'll emphasize the importance of planning each job and setting up the machine and site properly to avoid hazards and obstacles around the worksite. We'll also review the most common hazards and read some real accident stories.

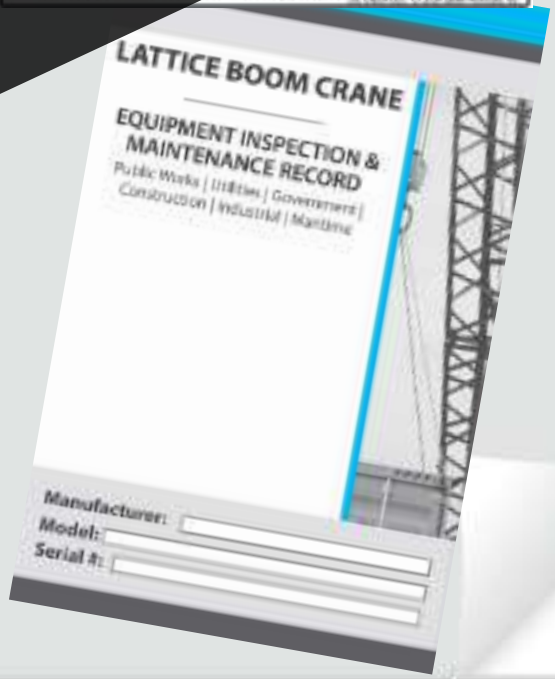



Finally, we will review proper rigging practices and how to calculate the stresses in slings. We'll also review safe operation practices and hand signals for mobile cranes.

By the time you complete this training with both the written and practical exams, you should be ready to operate a lattice boom crane. You will be familiar with the equipment used by your company, have an increased knowledge of how to set up and safely operate it, and be able to recognize and avoid the most common hazards associated with their use.

Only trained and authorized personnel should be permitted to operate the lattice crane. Before using the machine, the operator must:

- Read and understand the manufacturer's operating instructions and safety rules.
- Receive training by a qualified person on the contents of the manufacturer's instructions and safety rules.
- Read and understand all decals, warnings, and instructions on the work platform.
- On a daily basis, before the equipment is used, perform a thorough inspection.



Familiarity with your crane begins with the operator's manual and warning labels. Usually the operator's manual is found in a compartment behind the seat. It is required to be on the machine at all times, intact, and legible. Everyone who operates the machine must have read and be familiar with the safe operations portion of it. This manual also has guides for inspection, maintenance, and federal standards.

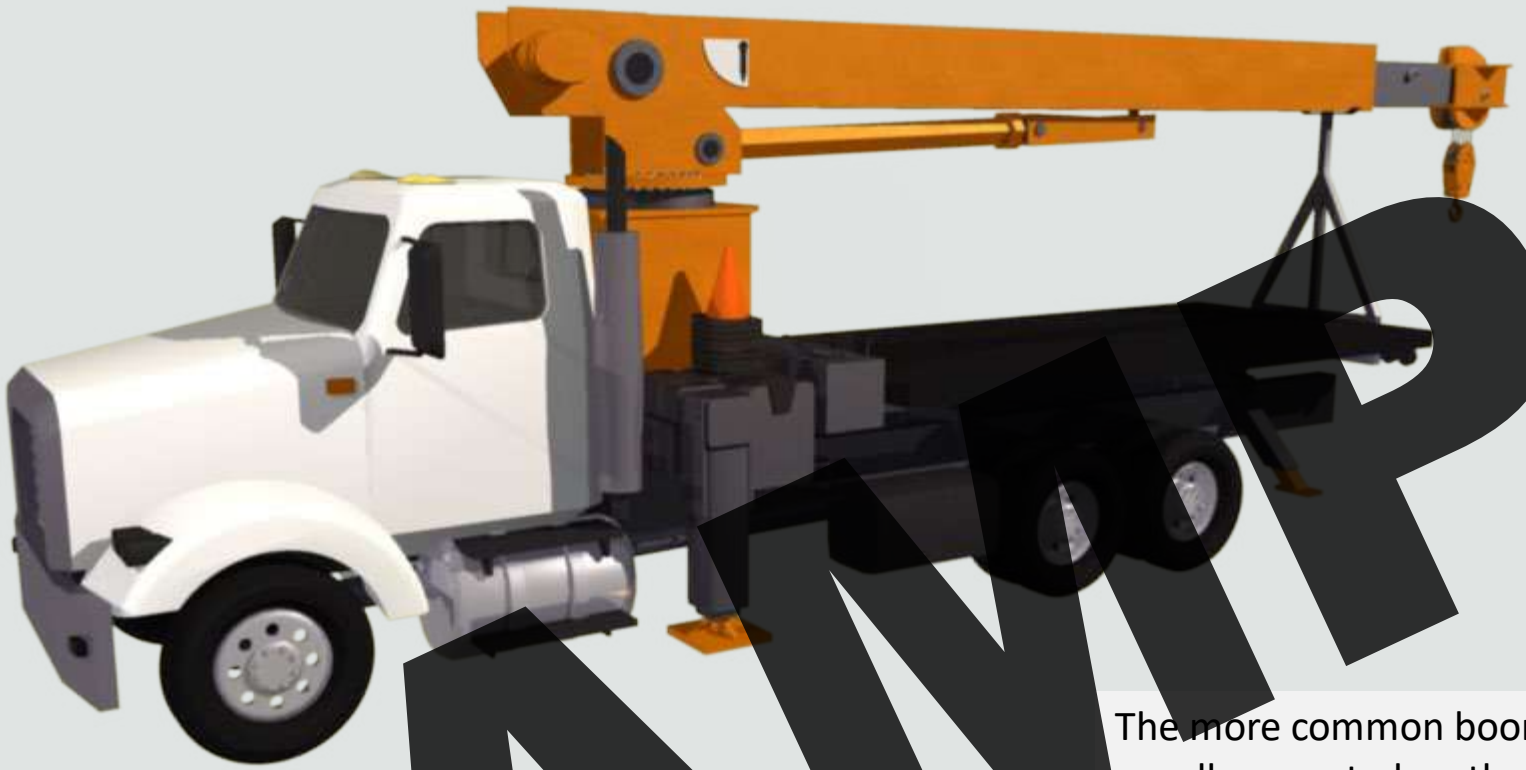

These are some of the main OSHA and ANSI standards for cranes. Many states have additional standards, as do some industries. It's your responsibility to know all federal, state and local rules that apply to your machine and jobsite. If you are not sure, ask your supervisor or safety coordinator.

## Types of Mobile Cranes

Strictly defined, mobile cranes are any type of crane that is mounted on a chassis that can be transported to and from a worksite and maneuver around that worksite.

The smallest of these are utility boom trucks. They are mounted on work vehicles and are used by most utility and public works departments.

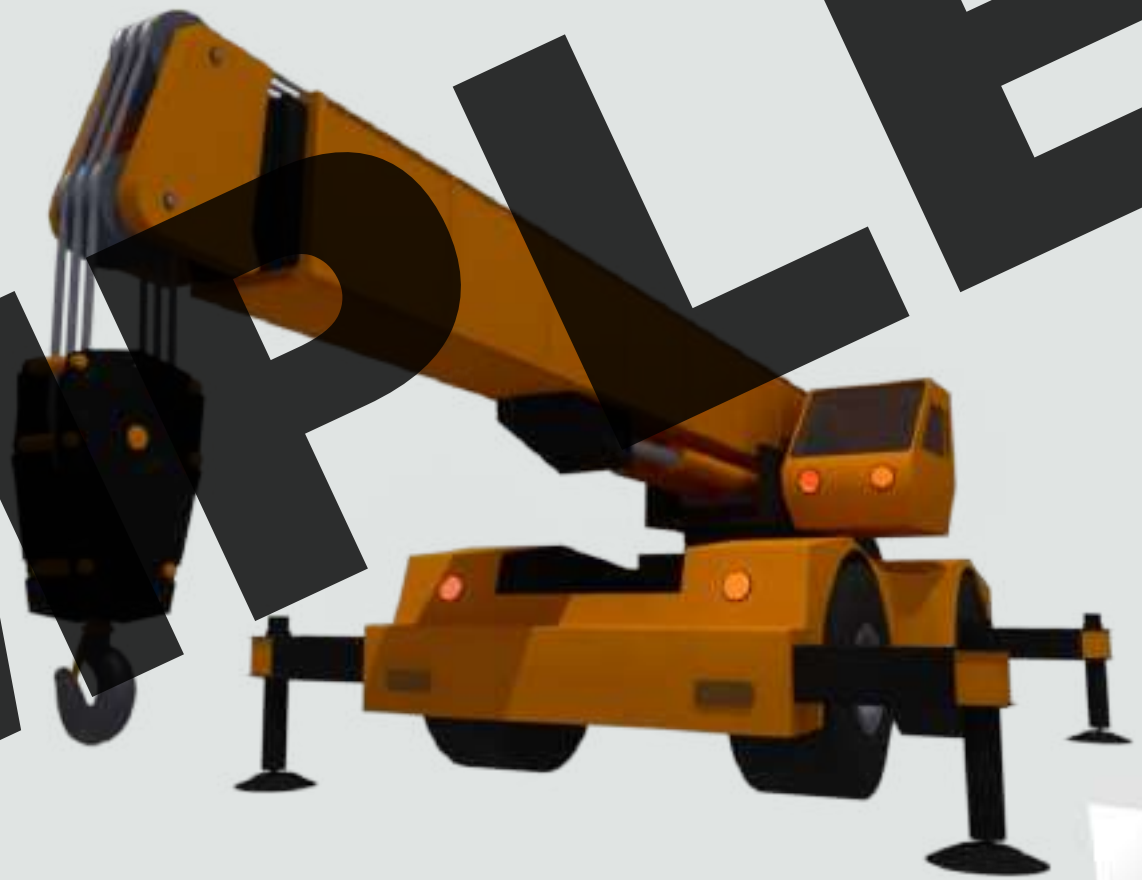
Articulating boom trucks are sometimes referred to as knuckle trucks because the boom folds up when stowed. These are very versatile cranes that are especially effective on sites where there are overhead obstructions. Many of these have just a hook on the end of the boom rather than a hoist line and winch.



The more common boom truck has a straight boom and is usually mounted on the front or rear of a flatbed truck. They are often seen in the construction industry and are favorites for delivering trusses and construction materials to worksites.

Trolley boom truck cranes are almost exclusively used for delivering concrete septic tanks and vaults to construction sites. Similar to the boom truck, the hook and block can trolley along the length of the boom and the boom can be lifted and swung.

Rough terrain cranes, also called RTs, and just that. They have huge balloon type tires that allow them to work in less than desirable terrain and are the only rubber-tired mobile crane that is rated to do pick and carries (crawler cranes can too). Although RTs can be driven on city streets for shorts distances, they are usually carried to a worksite on a trailer.



All terrain cranes (ATs) are a grand achievement of the hydraulic age. These cranes have many axles, extra large tires, and can be driven over the highway and ready to go at the worksite in a relatively short period of time. Many have capacities that can exceed 100 tons.



Lattice boom cranes may be mounted on either a truck chassis with wheels or on tracks. In this training, we'll cover the differences between them, as well as the principles and regulations these two types share.

Truck mounted lattice cranes are mounted on a truck chassis and can be driven over the highway. They consist of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. But they are not as versatile nor can they achieve the same capacities as the all terrain cranes.

Crawler cranes, however, are mounted on tracks and can be used in multiple configurations depending on the need. Compared to other cranes, they often have a higher capacity at greater heights and fixed boom lengths. Some can be fitted with booms and jibs that will allow it to reach heights of over 300 feet. The majority of these have lattice booms, and because they are mounted on tracks they can be set up and used in almost any environment, even poorer underfoot conditions that tend to prove hazardous for rubber-tired cranes. Unlike the truck-mounted alternative, the crawler crane can also be used to pick and carry loads. Unless transported on a barge, these cranes need to be disassembled and reassembled for transportation to and from the worksites.

The biggest advantage of the crawler crane over the truck-mounted crane is its ability to work in remote areas. Some areas may not be available to truck-mounted cranes because of the terrain. Also, the crawler crane's tracks create less damage to the work area or roadway while maintaining traction.

In all cases, however, the lattice cranes are set apart by their intricate lattice work booms, their capability to reach great heights, and the strength of their booms.

The lattice boom sections are made of a lightweight, thin-wall, high-strength alloy tubular or angle steel and are designed to take compression loads. The most common boom type is tubular.

# ANATOMY & COMPONENTS