

Top climbing a tower crane: Ensuring safe assembly and dismantling

Top climbing a tower crane is hazardous work that must only be performed by qualified workers. Failure to follow the manufacturer's instructions may result in a structural failure that puts lives and property at risk. This bulletin provides an overview of this potential hazard and discusses how to reduce the risk.

How top climbing works

Top climbing is a common way of assembling or dismantling a tower crane on a construction site. A top climbing guide is a structure that is installed around the tower crane's mast. The guide is used to create a gap for adding or removing mast sections.

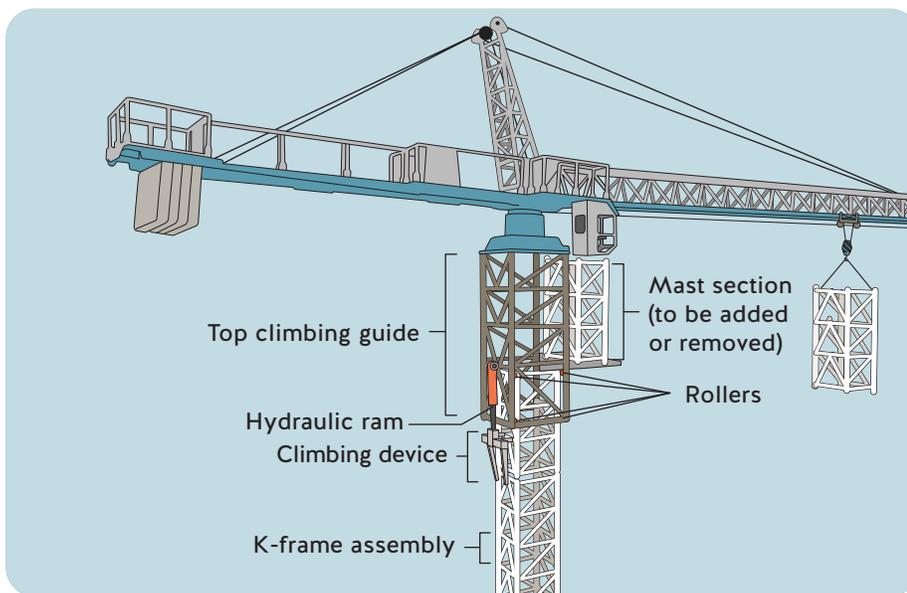
Rollers are located at the middle and bottom of the top climbing guide on all four corners. When the system is weight-balanced, the rollers allow the guide to travel smoothly up and down the mast.

The top climbing guide includes:

- A hydraulic pump and ram
- A climbing device made up of a support shoe and a climbing traverse or cross-member (depending on the manufacturer)

The guide uses these parts to climb up or down the mast. Workers operate the guide manually.

The mast sections include K-frame assemblies that provide horizontal supports for the climbing device to push on. The ram raises the entire upper structure



A top climbing guide is shown installed around a tower crane's mast. The guide is used to create a gap for adding or removing mast sections.

of the tower crane. This creates a gap in the mast that allows a single mast section to be either added or removed.

What is the hazard?

If the climbing device is placed on a K-frame horizontal support that is too high up the mast structure, the ram can push the top climbing guide too high. In this situation, the rollers in the middle of the top climbing guide may be positioned above the top of the mast structure and be unsupported. This puts the top climbing guide and the upper structure of the crane at risk of collapse.

A crane collapse can harm workers, pedestrians, property, and structures located within the toppling distance of the crane.

Responsibilities

Employers must ensure that the assembly supervisor and the lead hand are experienced and competent in all aspects and each phase of top climbing.

Workers engaged in top climbing activities must be:

- Qualified
- Provided with information, instruction, training, and supervision to perform their work safely

Prime contractors must ensure that employers, supervisors, and workers perform their work in compliance with these requirements.

Records should be requested to confirm the assembly supervisor's and workers' training and experience on the specific make and model of crane.

What does *qualified* mean?

Under the Occupational Health and Safety Regulation, *qualified* means "being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination thereof."

In some cases, a crane may be operated at the same time and in the same location as other work activity. In these situations, the employer or prime contractor must organize and coordinate the work of everyone on site so that the crane operation can be carried out safely.

Safe work practices

The assembly supervisor and workers must follow the tower crane manufacturer's procedures. These procedures include placing the climbing device on the appropriate K-frame horizontal support.

Instructions and procedures for tower crane assembly, dismantling, or top climbing must be established before such operations begin. The instructions and procedures must be adapted to the site conditions and communicated to all workers involved in top climbing operations.

Legal and regulatory requirements

Workers Compensation Act

- [Section 21, General duties of employers](#)
- [Section 24, Coordination at multiple-employer workplaces](#)

OHS Regulation

- [Section 14.12, Manual and instructions](#)
- [Section 14.13, Inspection, maintenance and repair](#)
- [Section 14.34, Operator qualifications](#)
- [Section 14.38, Safe lifting](#)
- [Section 14.73.2, Tower crane erection](#)
- [Section 14.79, Manual and records](#)

Standards

[CSA Standard Z248 Code for Tower Cranes](#)

