

Help prevent being caught in between equipment and machinery

Risk Control Services from Liberty Mutual Insurance



Highlights:

- Identify controls to help reduce the likelihood of injuries or fatalities.
- Educate workers on safe work practices.

This reference note was created in collaboration with the National Occupational Research Agenda (NORA) Construction Struck By workgroup.

Almost all construction projects use machinery with moving or rotating parts. “Caught-in between” hazards are present on most job sites and are among the construction industry’s leading causes of death and injury. These injuries result from being squeezed, caught, crushed, pinched, or compressed between two or more objects or between parts of an object.

Using equipment and machinery might seem safe, but it requires training to educate workers on safe work practices. Often, workers must repair or perform maintenance on machinery and equipment, which puts them at risk for potential injuries ranging from amputations and fractures to death.

When working with machinery and equipment, the following controls should be considered and may be required by the Occupational Safety and Health Administration (OSHA).¹ When properly applied, these controls can help ensure workers are working safely and help reduce the likelihood of injuries from being caught in between machinery.

Emergency guards, stops, and barricades

- Place guards and barricades on machinery and equipment to help prevent contact with moving parts.
- Attach guards so workers cannot remove them. When available, install interlocking guards that require a special tool for removal.
- Install emergency stop systems to shut down the machine. Ensure markings for emergency shut-off switch are present, and conduct periodic testing to ensure they are functional.
- Evaluate equipment points of operation, transmission parts, rotating parts, etc., and determine if protection is required or is missing.
- Eliminate the need to remove guards for simple maintenance tasks by extending lube points.²

Safeguards

Select safeguards that offer the best protection, and verify that they are installed properly and comply with appropriate OSHA, American National Standards Institute (ANSI),³ and other related standards.

Safeguards should:

- Prevent contact with moving machine parts.
- Be secure.
- Protect from falling objects.
- Create no new hazards.
- Allow machinery to operate without impeding normal operations.
- Enable safe lubrication and machinery maintenance.

Training

Train supervisors, equipment operators, and workers on safe work practices to help prevent caught in or between equipment injuries. Everyone on-site should be trained to understand the hazards and what to do in an emergency.

- Ensure that only qualified personnel perform maintenance and repairs.
- Train qualified personnel and workers on equipment lockout/tagout procedures when completing maintenance work.
- Ensure qualified personnel inspect guards for damage, and repair or replace guards before re-energizing and restarting equipment.
- Ensure any stored energy is bled (air, hydraulics, capacitors, etc.) before maintenance and repair work begins.
- Ensure workers understand how to stop equipment if another worker becomes entangled.
- Post warning signs to alert workers and bystanders of potential dangers.

Worker clothing

All workers should arrive each day at the jobsite in appropriate attire based on their role and tasks. Communicate to workers that clothing requirements are in place to help protect them from machine entanglement risks. Workers are more likely to comply with clothing requirements if they understand why they are important.

Select appropriate clothing for the task:

- Avoid loose or baggy clothing:
 - Pants and shirts should fit comfortably; however, pants should not be so long that they can become entangled in machinery.
 - Shirt sleeves should fit appropriately and shirttails should be tucked in.
- Do not wear jewelry.
- Tie back long hair and, if possible, tuck it into clothing.
- If gloves are needed, ensure they fit properly. Safety gloves should fit snugly but not too tightly.⁴

References

1. Occupational Safety and Health Administration (OSHA). Standard 29 CFR 1910 29 CFR 1910 Subpart O, Machinery and machine guarding.
2. OSHA 3170, Safeguarding equipment and protecting employees from amputations.
3. ANSI B 11.0-2020, Safety of machinery.
4. OSHA, Personal protective equipment.

Additional resources

See Liberty Mutual Insurance Construction Safety Talk 18, Maintaining machinery, as a toolbox talk resource for your crew.



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