



# **1926 Construction Materials Handling, Storage, Use, and Disposal**

# Materials Handling, Storage, Use, and Disposal

- Lesson Overview
  - Types of material handling equipment.
  - Hazards associated with material handling activities
  - Prevention of hazards associated with material handling equipment
  - Employer requirements to protect workers from material handling hazards

# Materials Handling

## Types of Equipment

Conveyors



Source: OSHA

Powered  
Industrial Trucks



Source: TEEX-Harwood

## Types of Equipment

### Cranes



Source: OSHA

### Slings



Source: OSHA

# Factors Contributing to Injuries

- Weight and bulkiness of objects
- Bending, twisting, turning movements



Source: OSHA



Source: OSHA

## Hazards

- Improper operation of equipment
- Accumulated materials or clutter



Source of photos: OSHA

## Hazards

- Unsafe conditions of materials or containers
- Flammability or toxicity of some materials



Source: OSHA

## Hazards

- Weight of materials
- Binding ties or other devices that secure bundles or bound materials



Source: OSHA



Source: OSHA



## Hazards

- Falling objects
- Lifting, pushing, pulling, or otherwise manually moving large, heavy items



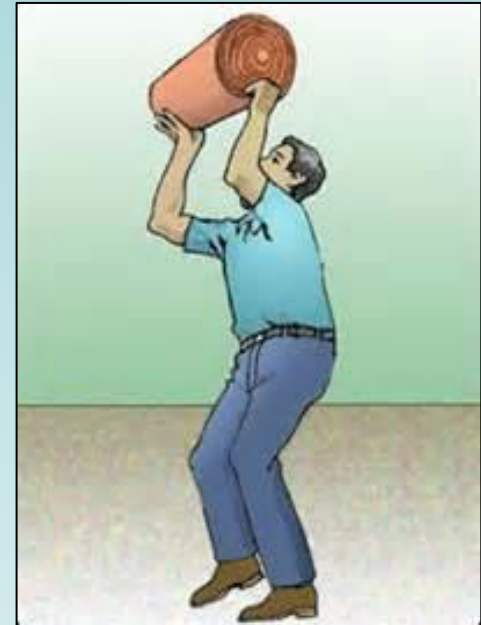
## Hazards

- Improperly stacked materials
- Struck-by or caught in/between hazards



## Injuries

- Types of injuries commonly reported
  - Sprains, strains, tears
  - Soreness and pain
  - Bruises and contusions
  - Cuts, lacerations, and punctures



Source: OSHA

## Injuries

- Examples of events or exposures leading to injuries
  - Contact with objects and equipment
  - Transportation incidents
  - Exposure to harmful substances or environments



Source: OSHA



Source: OSHA

## Injuries

- Falls, slips, trips, or loss of balance
- Repetitive motion
- Overexertion



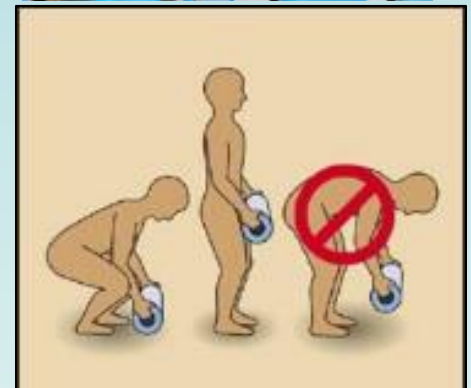
Source: OSHA



Source: OSHA

## Preventing Hazards

- Moving materials manually
  - Use devices to assist with holding loads
  - Wear PPE
  - Use proper lifting technique
  - Seek help for oversized loads
  - Use blocking materials



## Preventing Hazards

- Cranes
  - Major types of crane accidents
    - Contact with power lines
    - Overturns
    - Falls
    - Mechanical failure



Source: OSHA

## Preventing Hazards

- Hoisting tons of material, steel, and concrete with cranes
- Operated only by thoroughly trained and competent workers



Source: OSHA

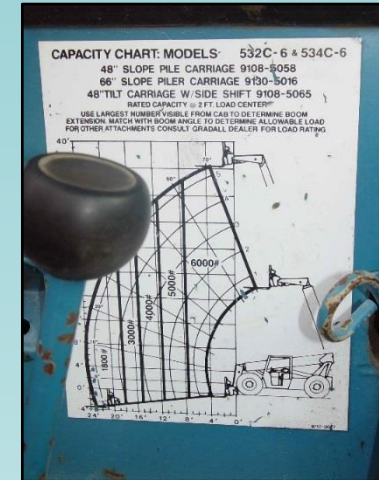


Source: TEEX - Harwood



## Preventing Hazards

- Eliminate/reduce crane hazards by:
  - Knowing
    - Load
    - Capacity of the crane
    - When the load is safe to lift
  - Always checking crane load chart and never exceed load limits



Source: TEEX - Harwood



# Preventing Hazards

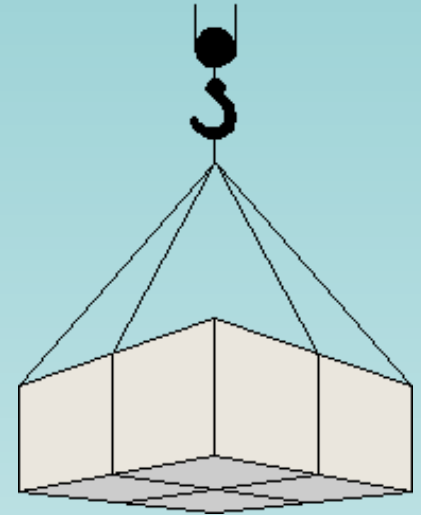
- Inspection of crane by a qualified person
  - Modified, repaired, or adjusted
  - Post-assembly
  - At least every 12 months
  - Equipment not in regular use
- Visual inspection by a competent person
  - Prior to each shift
  - Monthly



Source: OSHA

## Preventing Hazards

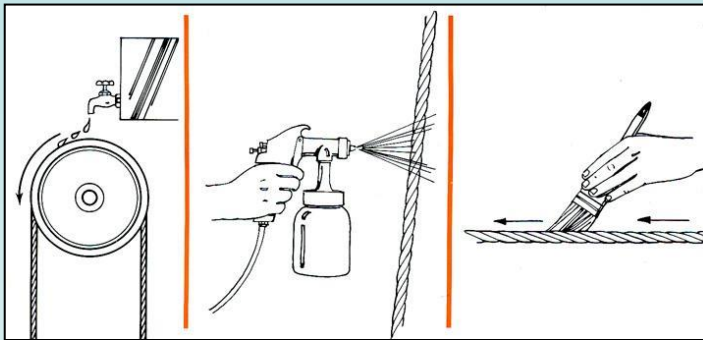
- Slings
  - Connect a crane hook to a load
  - Proper selection
  - Inspection



Source of photos: OSHA

## Preventing Hazards

- Reduce sling hazards by:
  - Lubrication
  - Do not shorten with knots, bolts, or other devices, or kink legs
  - Keep clear of loads
  - Avoid sudden movement



Source: OSHA



Source: OSHA

## Preventing Hazards

- Forklifts
  - Main causes of injuries
    - Forklift overturns
    - Forklift striking workers on foot
    - Persons crushed by forklifts
    - Persons falling from forklifts



## Preventing Hazards

- Illegal forklift operators
  - Anyone under 18
  - Anyone not properly trained and certified



Source of photos: OSHA

## Preventing Hazards

### – Driving the forklift

- Obstructed vision
- Travel path
- Approaching people
- Elevated platform
- Seat belts and ROPS
- Raising/lowering forks
- Safe distance



Source of photos: OSHA

# Preventing Hazards

- Elevating workers with forklift
  - Standing on forks
  - Lifting personnel
  - Approved lift platform
  - Restraining means



Source: OSHA



## Preventing Hazards

- Driving forklift on grades/ramps
  - Use extreme caution
  - No turns
  - Tilting and raising load
  - Point load up the incline



Source of photos: OSHA

## Preventing Hazards

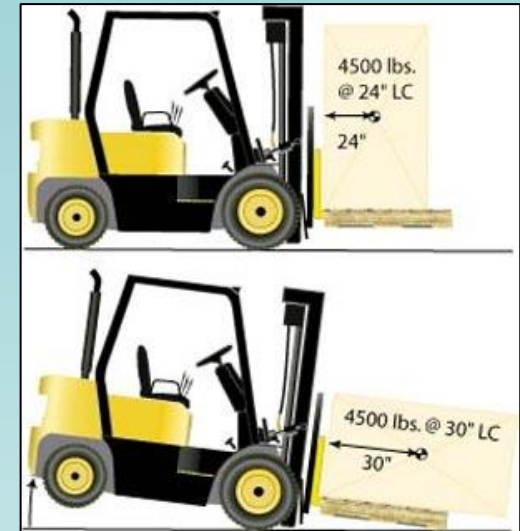
- Forklift operating speed
  - Tip-overs
  - Turning
  - Avoiding collisions
  - Wet and slippery floors
  - Ascending/descending
  - Obstructed vision



Source of photos: OSHA

## Preventing Hazards

- Avoiding Excess Weight
  - Do not exceed weight capacity of forklift
  - Center loads and secure to keep from shifting to maintain balance of weight



Source: OSHA

## Preventing Hazards

- Use of dock boards for loading/unloading
  - Bridging space
  - Securing portable dock boards
  - Handholds for dock boards



Source: OSHA

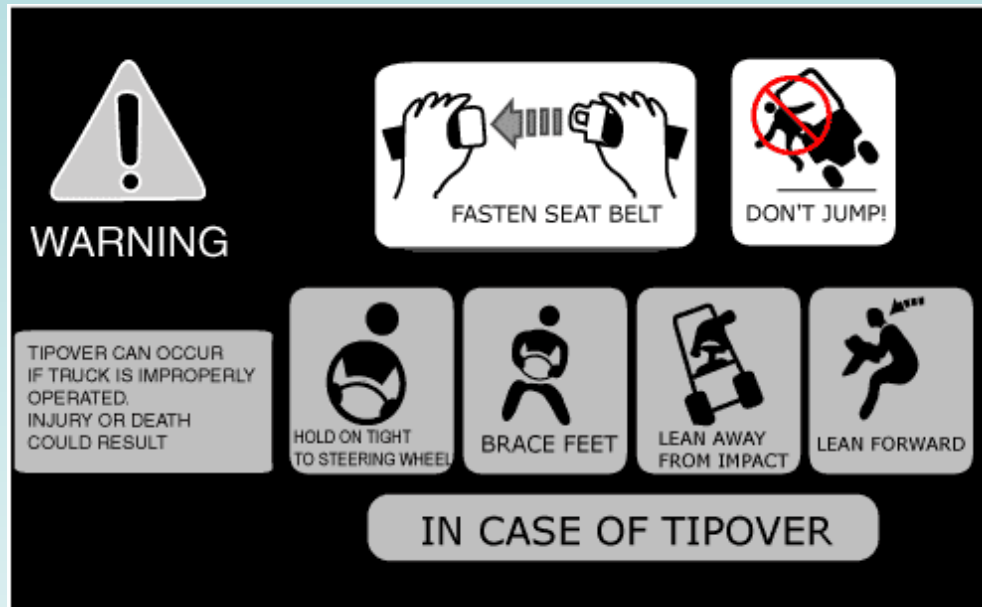
## Preventing Hazards

- Exiting the forklift
  - Set brake, lower forks/lifting carriage, neutralize controls
  - Stand-up type forklift
- Riding the forklift
  - No passengers allowed
  - Exception – seat is provided



## Preventing Hazards

- Avoiding struck-by/crushed-by
  - Don't jump from an overturning, sit-down type forklift
  - Stay with the truck, hold on firmly, and lean in the opposite direction of the overturn



# Preventing Hazards

- Forklift training – do not operate a forklift without proper training and licensing.
- Reporting damage – any damage or problems that occur to a forklift during a shift should be reported to the supervisor.



Source: OSHA

## Preventing Hazards

- Earth-moving equipment
  - Scrapers
  - Loaders
  - Crawlers
  - Bulldozers
  - Off-highway trucks
  - Graders
  - Tractors





# Preventing Hazards

- Earth-moving equipment
  - Seatbelts
  - Reverse gear not used unless that piece of equipment has:
    - Back-up signal alarm or
    - Signaler
  - Operator properly trained



Source: OSHA

# Employer Requirements

- Comply with OSHA standards related to materials handling, including:
  - Training requirements, including requirements for forklift training.
  - Inspection requirements



Source of photos: OSHA



## Employer Requirements

- Comply with manufacturers' requirements and recommendations for materials handling equipment.



## Recognizing Hazards

Identify potential hazards and possible solutions:

Protruding  
screws



Lumber pile  
is too high.  
It could fall  
on the  
worker

Source of photos : OSHA

## Recognizing Hazards

Identify potential hazards and possible solutions:



Unstable  
brick stack

Source: OSHA



Poor  
housekeeping

Source: TEEX - Harwood

## Recognizing Hazards

Identify potential hazards and possible solutions:

Damaged  
strap



Blocks  
improperly  
stacked



# Knowledge Check

1. How old do you have to be to operate a forklift, regardless of training?

a. 16

b. 18

c. 21

d. 25

**b. You must be at least 18 years old to operate a forklift.**

# Knowledge Check

2. One good way to prevent materials handling hazards is to \_\_\_\_.
    - a. Refuse to allow personnel to ride equipment without a seat and seatbelt
    - b. Report all damaged equipment immediately
    - c. Operate within manufacturer's specifications
    - d. All of these.
- d. All of these are good ways to prevent materials handling hazards.**



# Knowledge Check

3. Which of the following is a method for eliminating or reducing crane operation hazards?
- a. Operators should know how much they are lifting as well as the rated capacity of the crane.
  - b. A competent person should visually inspect the crane once a year.
  - c. Never exceed the load limit by more than 10%.
  - d. All of these.
- a. Crane operators should know how much they are lifting and the rated capacity of the crane.**

# Knowledge Check

4. Employers must comply with OSHA standards related to materials handling, including training and \_\_\_\_\_.
  - a. Equipment
  - b. Operations
  - c. Inspection
  - d. All of these.

**c. Employers must comply with OSHA standards for training and inspection.**

# Materials Handling

Through the Alliance between OSHA's 10 Regional Offices and the Elevator Contractors of America (ECA), Elevator Industry Work Preservation Fund (EIWPF), International Union of Elevator Constructors (IUEC), National Association of Elevator Contractors (NAEC), National Elevator Industry Educational Program (NEIEP), and National Elevator Industry Inc. (NEII), collectively known as The Elevator Industry Safety Partners, developed this Materials Handling Industry Specific Training for informational purposes only. It does not necessarily reflect the official views of OSHA or the U.S. Department of Labor. May 2021

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# Materials Handling

