

# Forklift Training - General



# Section 29 in The Factories Act, 1948

## 1[29. Lifting machines, chains, ropes and lifting tackles.—

- (1) In any factory the following provisions shall be complied with in respect of every lifting machine (other than a hoist and lift) and every chain, rope and lifting tackle for the purpose of raising or lowering persons, goods or materials:
- —(a) all parts, including the working gear, whether fixed or movable, of every lifting machine and every chain, rope or lifting tackle shall be

# Section 1 [29 (continued)]

- [b] (i) of good construction, sound material and adequate strength and free from defects;
- [b] (ii) properly maintained; and
- [b] (iii) thoroughly examined by a competent person at least once in every period of twelve months, or at such intervals as the Chief Inspector may specify in writing; and a register shall be kept containing the prescribed particulars of every such examination;

# Section 1[ 29 (continued)

[c] (i) lifting machine and no chain, rope or lifting tackle shall, except for the purpose of test be loaded beyond the safe working load which shall be plainly marked thereon together with an identification mark and duly entered in the prescribed register; and where this is not practicable, a table showing the safe working loads of every kind and size of lifting machine or chain, rope or lifting tackle in use shall be displayed in prominent positions on the premises;

[c] (ii) while any person is employed or working on or near the wheel track of a travelling crane in any place where he would be liable to be struck by the crane, effective measures shall be taken to ensure that the crane does not approach within 2[six metres] of that place. 3[six metres] of that place."

- For the purposes of this section a lifting machine or a chain, rope or lifting tackle shall be deemed to have been thoroughly examined if a visual examination supplemented, if necessary, by other means and by the dismantling of parts of the gear, has been carried out as carefully as the conditions permit in order to arrive at a reliable conclusion as to the safety of the parts examined.
- Explanation.—In this section,—[\(a\)](#) “lifting machine” means a crane, crab, winch, teagle, pulley block, gin wheel, **transporter** or runway;  
3[(b) “lifting tackle” means any chain sling, rope sling, hook, shackle, swivel, coupling, socket, clamp, tray or similar appliance, whether fixed or movable, **used in connection with the raising or lowering of persons, or loads by use of lifting machines.**]

# STATUTORY TRAINING AS PER SCHEDULE CHAPTER 104/SECTION 27A

The occupier of a factory shall ensure that the classes or description of persons employed in the factory set out in the first column of the Schedule attend the «safety» «training» «courses» conducted by the Occupational «Safety» and Health «Training» and Promotion Centre or other «training» institutions approved by the Chief Inspector set out opposite thereto in the second column thereof.

Forklift Operators: any person who drives or operates a forklift truck in a factory attends Forklift Driver's «Training» Course.

# FUNDAMENTALS

- ❖ Only trained and evaluated operators can drive forklifts
- ❖ Employer certifies successful completion of training and evaluation
- ❖ Operators can only drive the types of forklifts on which they have been trained

# FUNDAMENTALS

❖ SKILL

❖ MECHANICAL KNOWLEDGE

❖ KNOWLEDGE OF WORKPLACE HAZARDS



# Forklift rules to follow

- ❖ Don't stand or pass under raised forks
- ❖ Only handle stable, safely arranged loads
- ❖ Only handle loads within truck's rated capacity

# Forklift rules to follow

- ❖ Place forks under load as far as possible
- ❖ Only tilt load forward while depositing it
- ❖ High-lift rider trucks need overhead guards to protect operator

# Forklift rules to follow

- ❖ Use a safety platform to lift people
- ❖ Forklifts must be approved for hazardous locations
- ❖ Watch where you are going

# Forklift rules to follow

- ❖ Never drive up to anyone standing in front of a fixed object
- ❖ Allow no riders
- ❖ Keep arms, legs in truck

# Forklift rules to follow

- ❖ Keep the load close to the ground
- ❖ Keep to the right
- ❖ Obey speed limits



# Forklift rules to follow

- ❖ Slow down, sound horn where vision is obstructed
- ❖ Maintain safe distances (3 truck lengths) when following other trucks
- ❖ Do not pass a truck at dangerous locations

# Forklift rules to follow

- ❖ No stunt driving or horseplay
- ❖ Ensure enough clearance at overhead locations
- ❖ Stay within loaded/rated capacity

# Forklift rules to follow

- ❖ Use mechanical dock locks or set brakes of highway trucks before driving on trailer.
- ❖ Follow any special precautions



# Forklift rules to follow

- ❖ Keep aisles free when parking forklift
- ❖ Lower forks, neutralize controls, shut off engine, and set brakes when truck is unattended.

# Training on job

- ❖ Engine and motor operation
- ❖ Steering and maneuverability
- ❖ Visibility

# Training on job

- ❖ Fork and attachment adaptation, operation, use and limitations
- ❖ Vehicle capacity, stability
- ❖ Inspection and maintenance

# Workplace-related training

- ❖ Surface conditions

- ❖ Composition of loads

- ❖ Load manipulation

# Workplace-related training topics

- ❖ Pedestrian traffic
- ❖ Narrow aisles, restricted areas
- ❖ Hazardous locations



# Workplace-related training topics

- ❖ Ramps, sloped surfaces
- ❖ Closed environments
- ❖ Unique, potentially hazardous environments

# Important Facts to take care

- ❖ Driver has limited visibility
- ❖ Rear-wheel steering
- ❖ Different centers of gravity
- ❖ Know your controls

# Engine , motor operation & Steering control

- ❖ Knowing how a truck is powered helps to understand the truck's capabilities, limitations
- ❖ Rear-end steering
- ❖ Non-standard steering wheel



# Steering and maneuvering

- ❖ Rear-end steering
- ❖ Many trucks do not have a standard steering wheel
- ❖ Operator may need to steer in reverse
- ❖ Operator may need to steer with one hand
- ❖ Additions/modifications may affect stability, safe operation

# Operator visibility

- ❖ Loads can restrict vision
- ❖ Look in the direction you're traveling
- ❖ Watch for overhead obstacles

# Operator visibility

- ❖ Ensure adequate clearance
- ❖ Check blind spots to side and rear
- ❖ Ensure adequate clearance
- ❖ Check blind spots to side and rear

# Forks

- ❖ Attachments can cause restrictions/limitations to operation
- ❖ Operate trucks with attachments as being partially loaded, de-rate capacity accordingly

# Vehicle capacity

- ❖ Only handle loads within truck's rated capacity
- ❖ Capacity is found on nameplate



# Vehicle capacity

❖ Understand limitations for:

- how much weight can be handled
- how high the load can be raised
- how far the load's center of gravity can be from truck's vertical load rest

# Vehicle stability

- ❖ Center of gravity shifts when load is raised
- ❖ Truck is less stable with raised load
- ❖ Moving an unstable truck can result in tipover
- ❖ During a tip-over:
  - Stay with vehicle and lean away from direction of fall
  - Don't jump downward while truck is tipping
- ❖ Keep load at lowest practical point

# Inspection and maintenance

- ❖ Follow procedures and schedules
- ❖ Keeps forklifts operating safely
- ❖ Inspect for damage, defects, unusual conditions



# Inspection and maintenance

## ❖ Perform safety checks before operation

- Fork pins and stops
- Cowling and body parts
- Fuel levels
- Belts, hoses, tires

# Inspection and maintenance

- ❖ Perform safety checks before operation
  - Brakes, steering, controls, hour meter, lights, horn
  - Remove unsafe trucks from service
  - Repairs must be made by authorized person
  - Remove vehicles from service that emit sparks
  - Don't operate trucks with fuel leaks
  - Remove trucks from service that operate in excess of normal operating temperature
  - Check water mufflers daily

# Fueling/charging of batteries

- ❖ Exposes workers to hazardous chemicals
- ❖ Involves electrical hazards, heat build-up, generation of gas
- ❖ Be aware of all hazards involving fueling and battery handling

# Fueling/charging of batteries

- ❖ Keep flames, sparks, arcs from fueling areas
- ❖ Smoking is not allowed in fueling/charging areas
- ❖ Keep tools and metallic objects from top of uncovered batteries

# Operators to possess all the information they need

- ❖ Operating instructions

- ❖ Warnings

- ❖ Precautions

# Workplace-specific information

- ❖ Loads handled
- ❖ Pedestrian traffic
- ❖ Traffic routes
- ❖ Unique hazards of the facility

# Retraining/re-evaluation

## ❖ Triggered by certain events:

- Accidents
- Near-misses
- Assignment to different type of truck
- Changes in work environment
- Observation of unsafe operation

# Retraining/re-evaluation

- ❖ Evaluate at least every 3 years
- ❖ Avoid duplication of training





REVIEW /TIME OUT TIME

# Forklift accident statistics

85 to 100 workers in the U.S. are killed every year in forklift accidents.

Fatal Accident Type	Per Cent
Crushed by vehicle tipping over	42%
Crushed between vehicle and a surface	25%
Crushed between two vehicles	11%
Struck or run over by a forklift	10%
Struck by falling material	8%
Fall from platform on the forks	4%

Approximately 35,000 serious injuries and 62,000 non-serious injuries involving forklifts occur in the United States every year. OSHA estimates 11% of all forklifts are involved in accidents every year.



[View Fatality examples](#)

Source: Monash University – Australia

# Washington State forklift accidents & citations

13 employees were killed in forklift-related accidents from 2014-2017

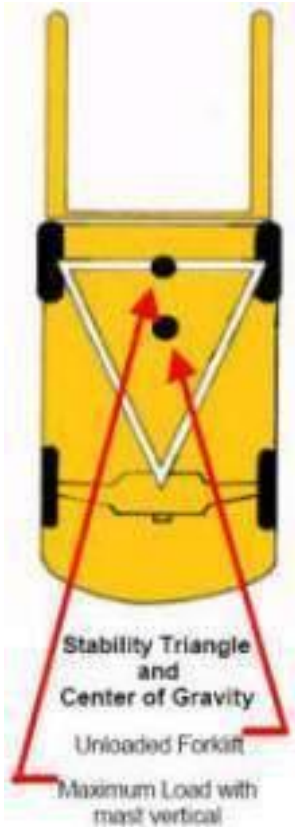
1000+ employees were seriously injured (had to take time off from work to recover) in forklift-related accidents in the years 2015, 2016 & 2017



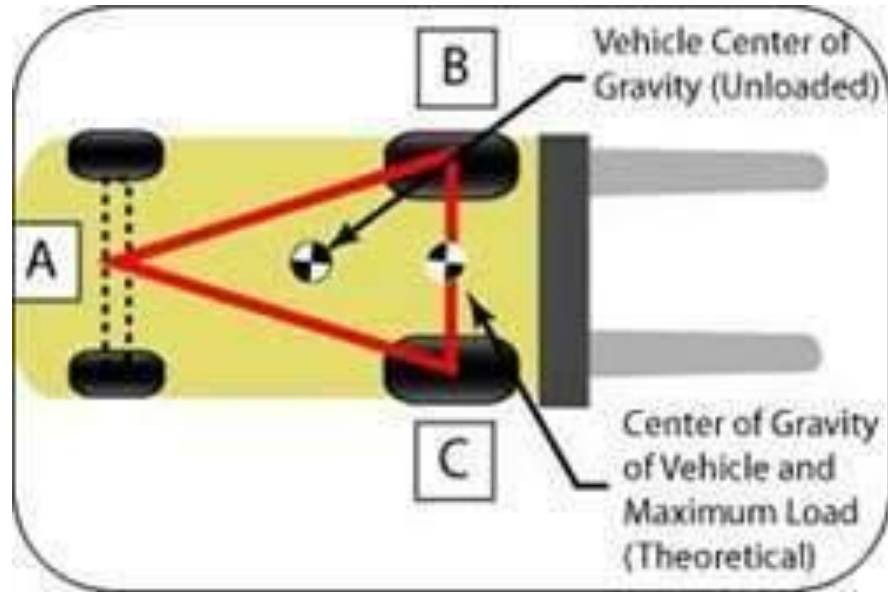
The 5 most common citations by Safety inspectors involving forklifts in last three years were as follows:

- lack of training
- no seatbelt or not using seatbelt
- no inspection of the forklift for defects
- modification of forklift without manufacturer's approval
- no nameplate or unreadable nameplate

# Forklift Stability Triangle

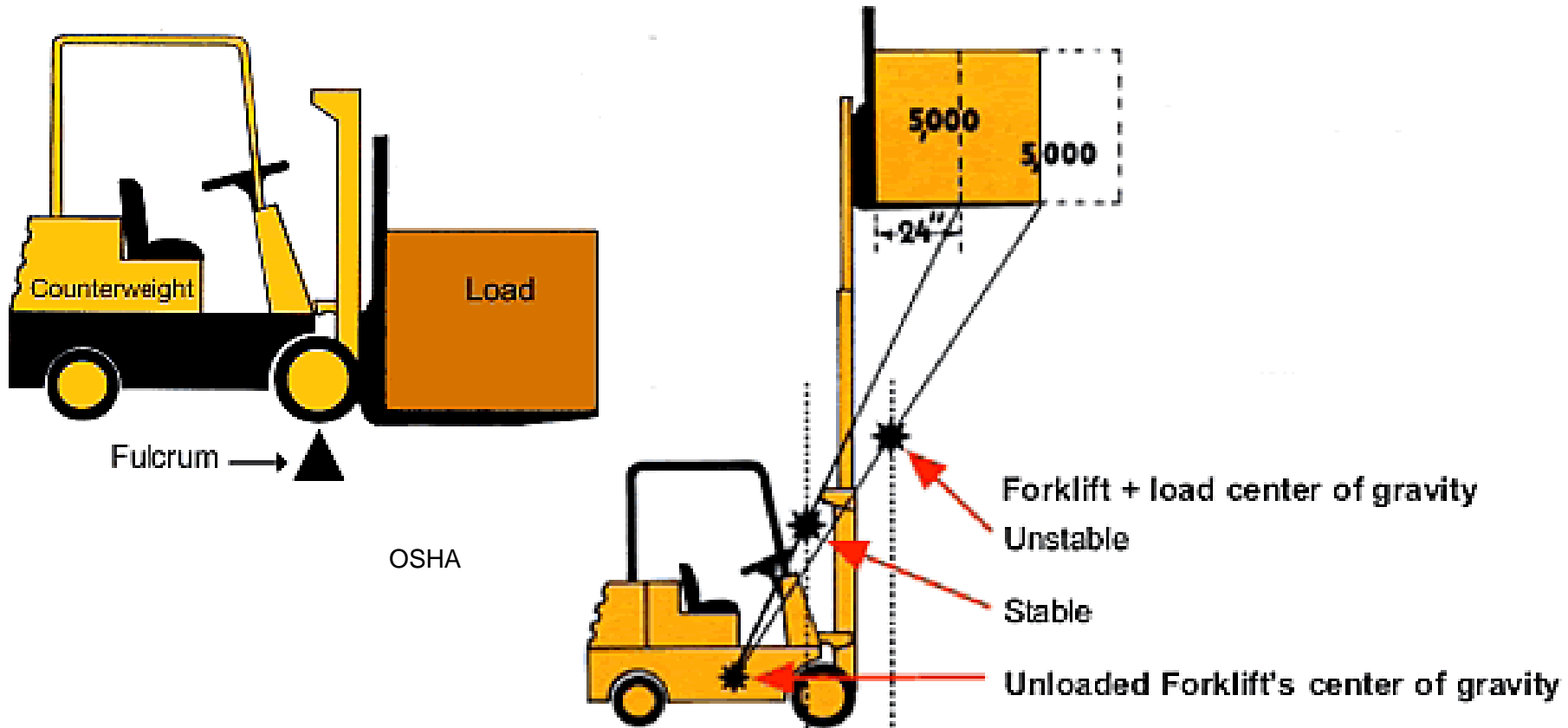


OSHA



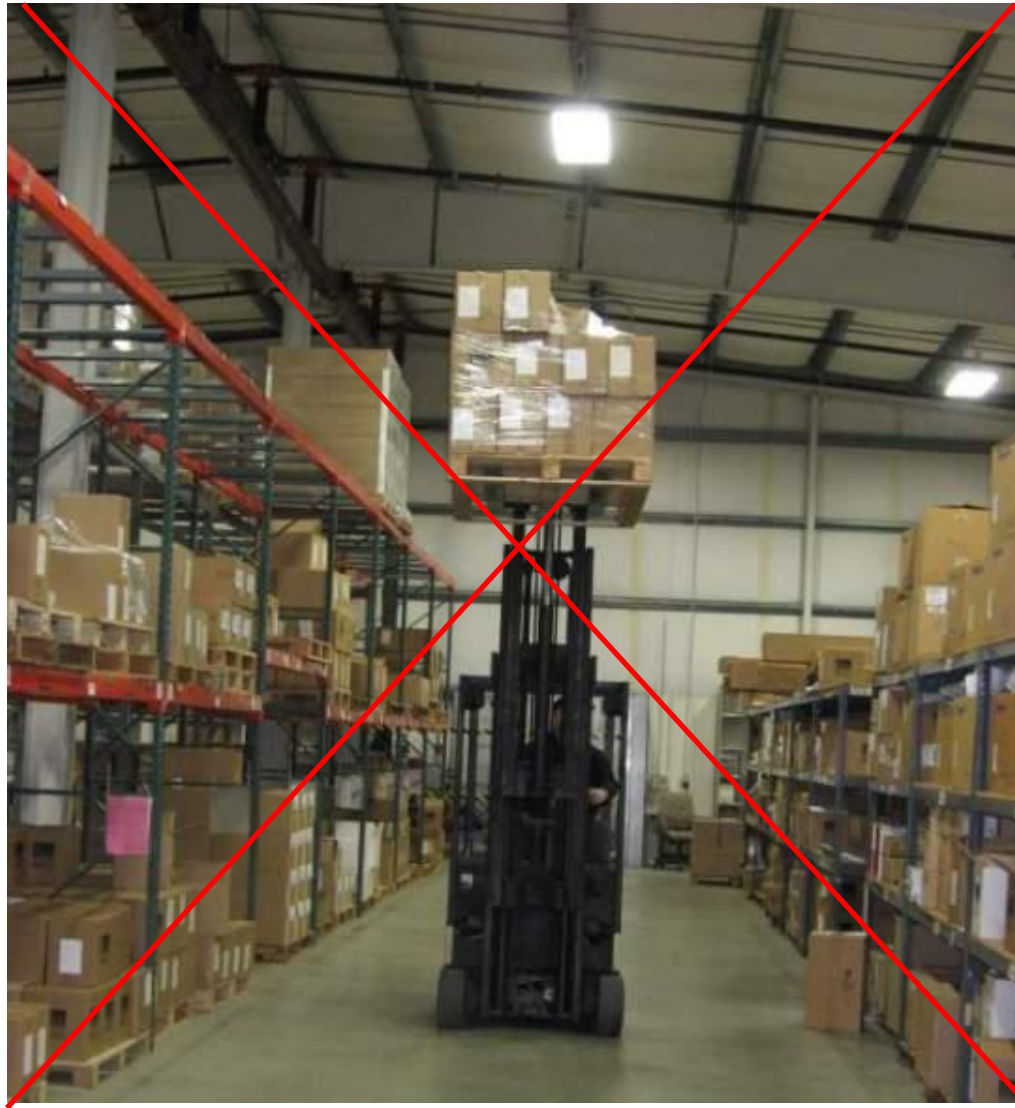
Almost all counterbalanced powered industrial trucks supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When this point is connected to the front wheels with imaginary lines, this three-point support forms a triangle called the stability triangle. So long as the center of gravity remains within this stability triangle, the truck is stable and will not tip over.

# How loads affect forklifts

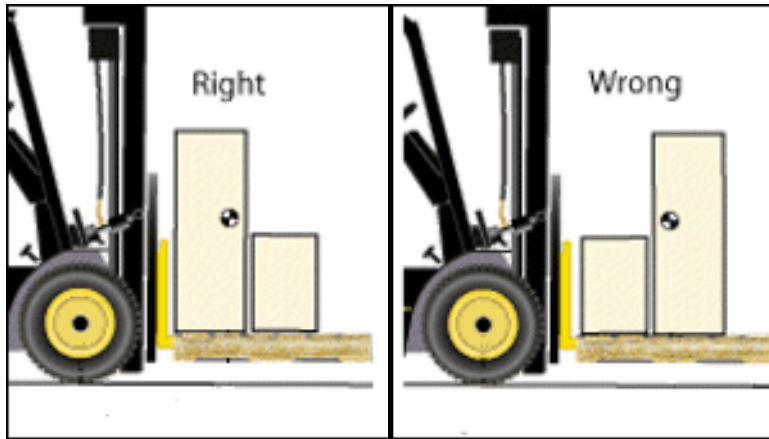


A forklift balances a load with a counterweight at the back. The front wheels act as a fulcrum or balance point. The center of gravity moves upward when the forks are raised.

# Don't travel with a raised load



# Forklift Load Capacity



OSHA



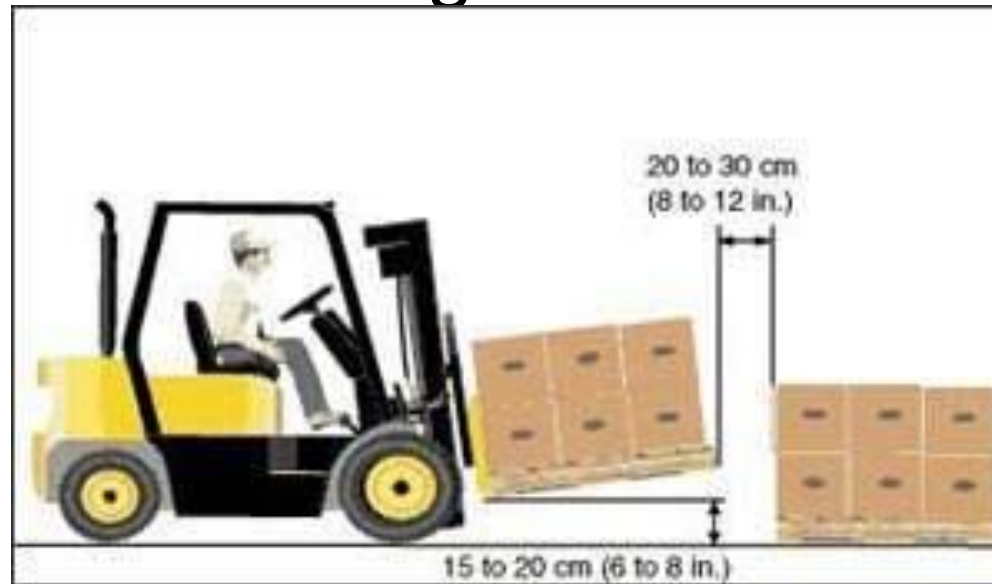
While carrying a load near the maximum allowable capacity, be aware of the following:

Danger of tipover

Danger of losing load

Danger of being struck by falling load

# Moving the load



OSHA

Use extra caution when handling loads that approach the truck's maximum rated capacity:

Tilt the mast & forks back and position the heaviest part of the load against the carriage.

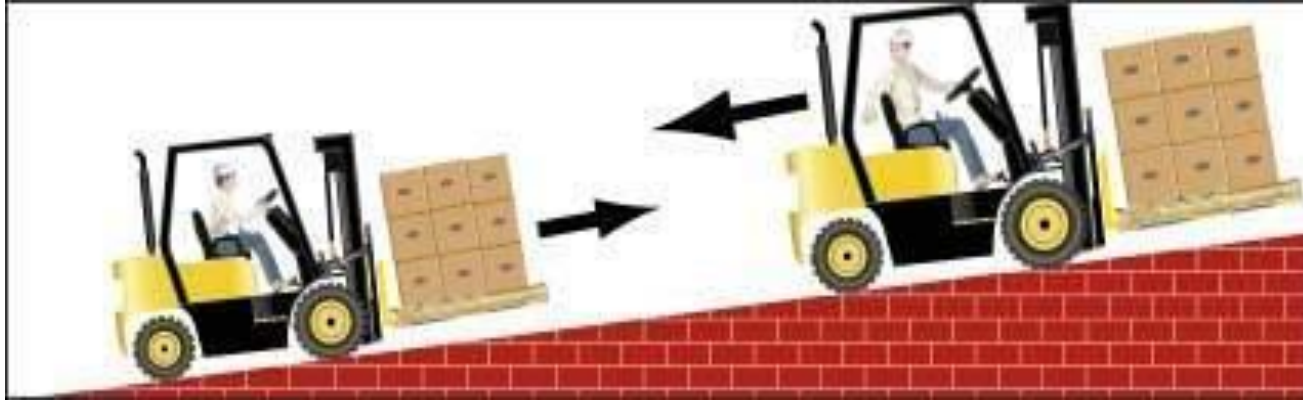
Travel with the mast tilted back to keep the load stable.

Never travel with the load tilted forward. Tilting the load forward increases the load distance and makes the load less stable

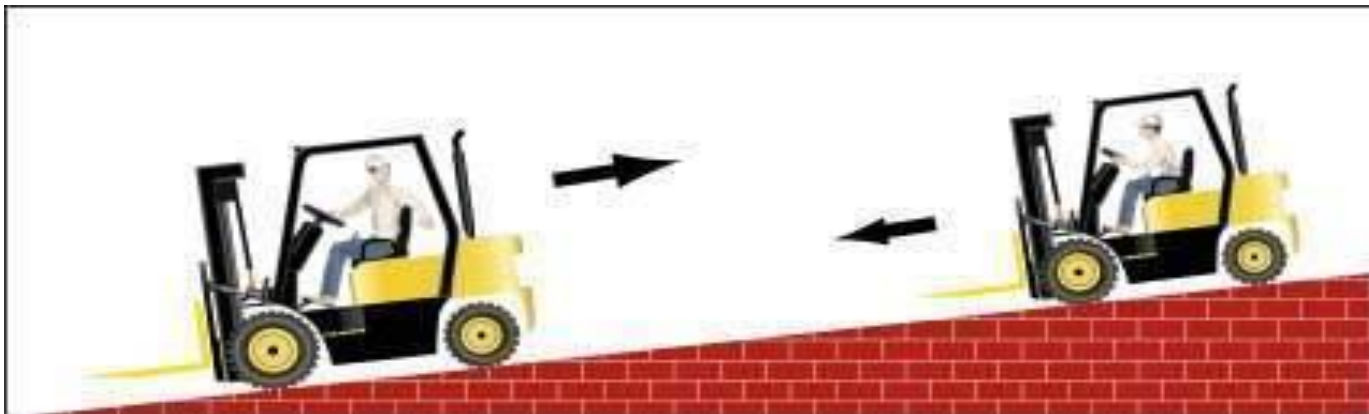


# Driving on an incline

Always drive with the load on the uphill side - go backwards driving down the incline and frontwards going up the incline to prevent tipping or losing control of the forklift.



If no load on the forklifts, do the opposite with forks pointing down the ramp



# More reasons why forklifts tip over

Driving too fast around a corner

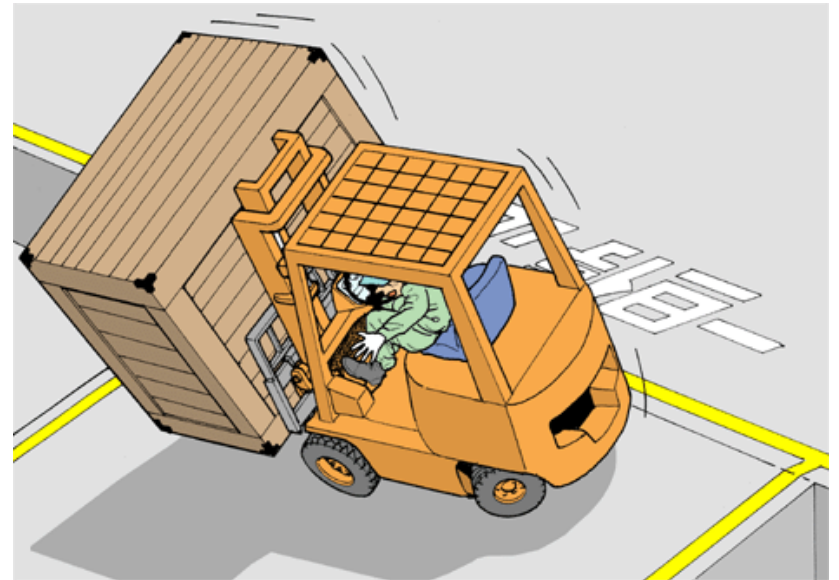
Driving off edge of platform, ramp, road or other surface

Driving an indoor forklift outdoors on rough, uneven ground

Turning on an incline or hill

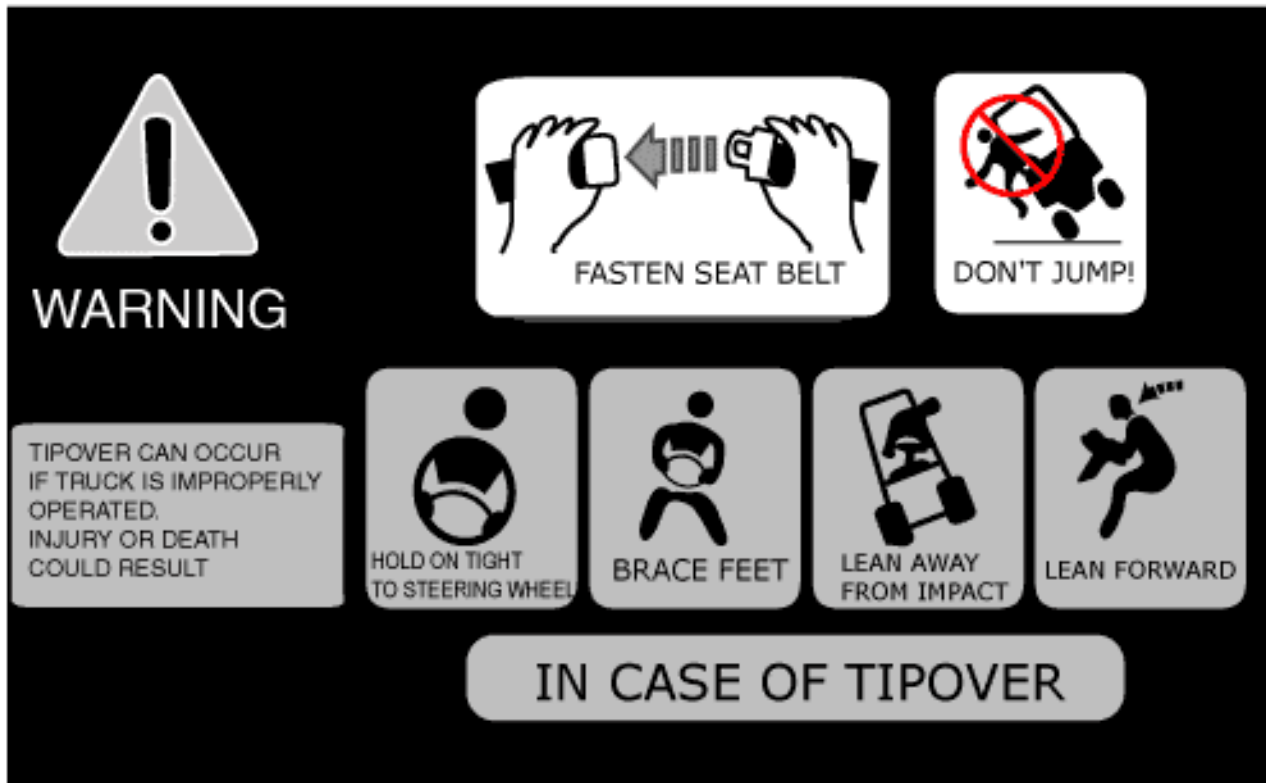


Source: RiteHite Doors



Source: JICOSH

# What do in case of a tip-over



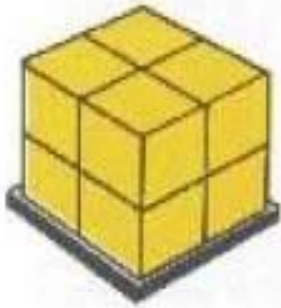
OSHA

If the forklift tips, keep your arms and legs inside and hold on to the steering wheel. Don't attempt to jump out – you can't move faster than the forklift can tip over. Most people who attempt to jump are killed by the impact of the overhead guard.

Tipover procedures for other types of forklifts may vary. For example operators of stand-up forklifts with rear-entry access should step backwards off the forklift if a tipover occurs.

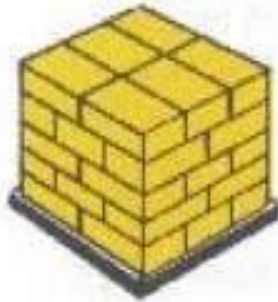
# Stacking loads on pallets

Loose loads are subject to falling. Off center loads can also be subject to falling or cause the forklift to tip over. The photos below show the correct way to load pallets.



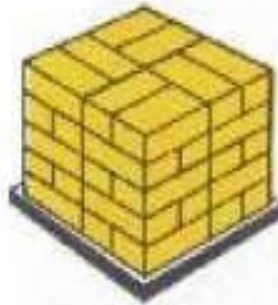
Block

The most common.  
The upper level may be unstable if not encircled with wire or strapping.



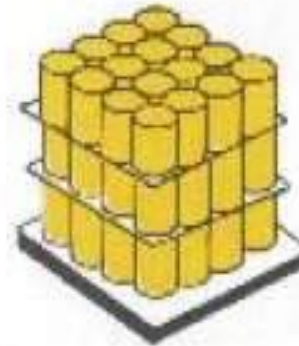
Brick

Containers are interlocked by turning each level 90 degrees.



Pinwheel

Used where brick pattern is unstable.



Irregular Stacking Patterns

Wood strips, plywood or heavy cardboard between layers can help stabilize castings, bags, and other irregular shapes.



Avoid using damaged pallets.



# Forklift Work Platforms

Never lift other workers on forks unless you use an approved work platform with railings as shown.



U.S. Army

**Dangerous!!**

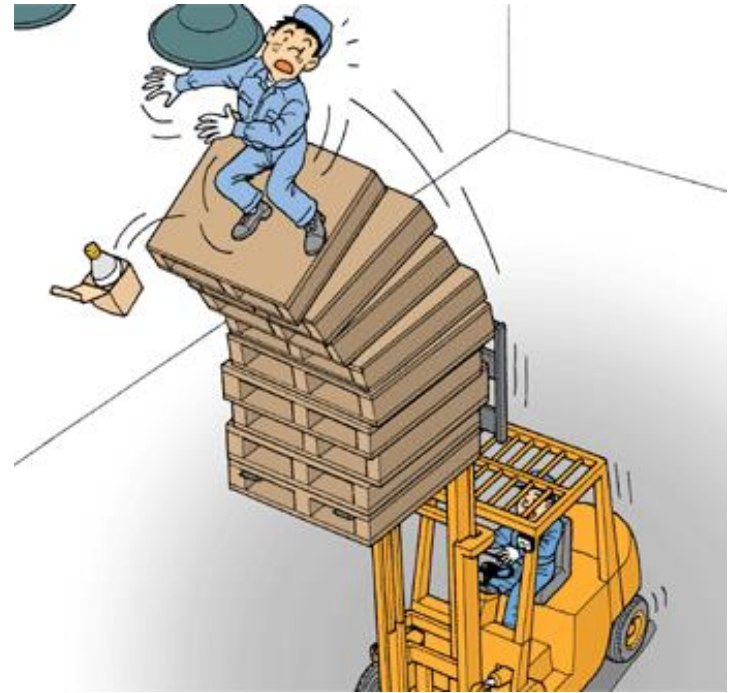
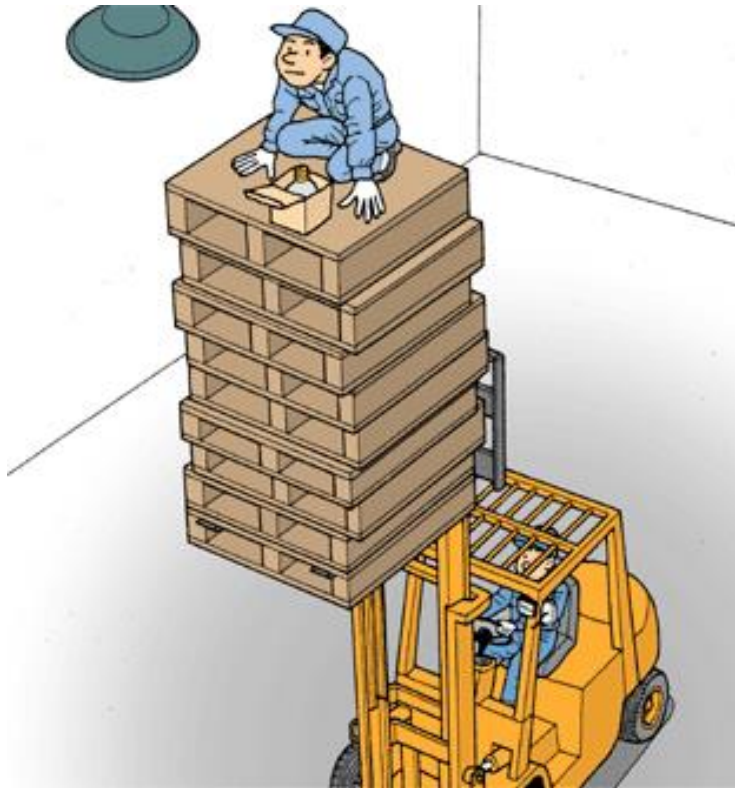


Source: Pelsue Co.

**Safe**



# An extremely dangerous practice



Source: JICOSH

**A risky way to change a light bulb!!**

# Forklift Work Platforms

Never lift other workers on forks unless you use an approved work platform with railings as shown.



U.S. Army

**Dangerous!!**



Source: Pelsue Co.

**Safe**



# Forklift-pedestrian accident example



Neither the pedestrian or the forklift operator were paying attention!!



# Forklifts have reduced visibility

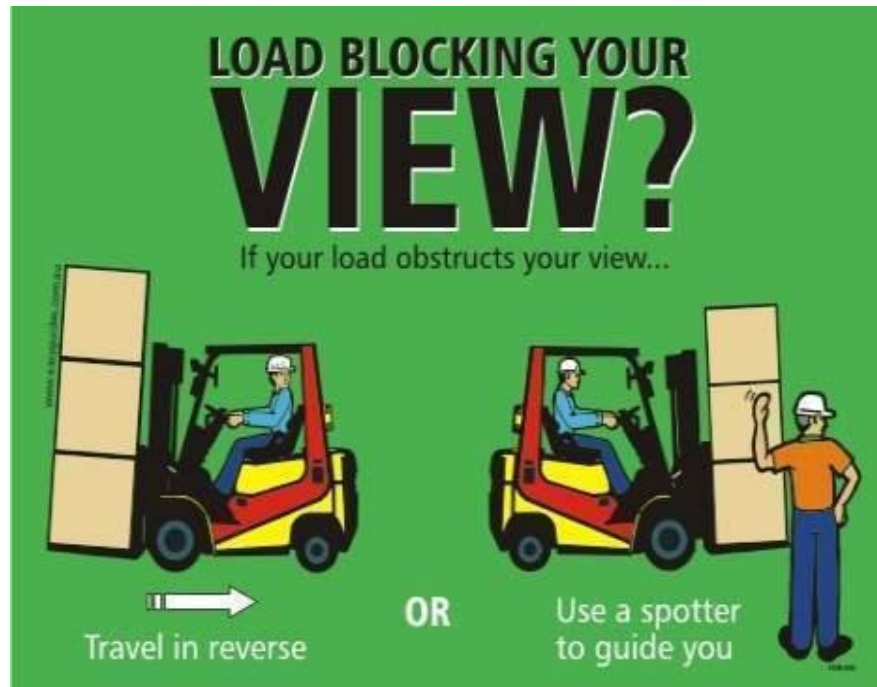
Both the forklift mast and a large load on the forks reduce forward visibility.



Older mast design



Newer mast design



In warehouses or other indoor workplaces, aisles of material, walls, doors and other building configurations can create blind corners.

# Loading truck trailers and railroad cars

Make sure:  
truck trailer wheels are chocked,  
dock board is secure and can  
handle weight,  
you use horn or warning lights  
when exiting trailer or railcar.



OSHA



OSHA

# Wide or irregular size loads



Source - New York Dept. of Health



OSHA

Distribute the weight evenly when carrying irregular sized loads.

Keep the center of gravity of the load as near as possible to the center going horizontally across the forks.

Keep the center of gravity of the load as near to the front wheels as possible.

# Loading/unloading High Storage Racks



When removing a load from a high rack:

Slowly back out with the load

Stop when it clears the rack

Lower the load to the floor

Don't lower the load while moving!

# Forklift do's and don't's

No one else on the forklift except the operator, unless the forklift has a seat for a rider.

Always drive with the forks lowered and lower forks to floor when parking the forklift.



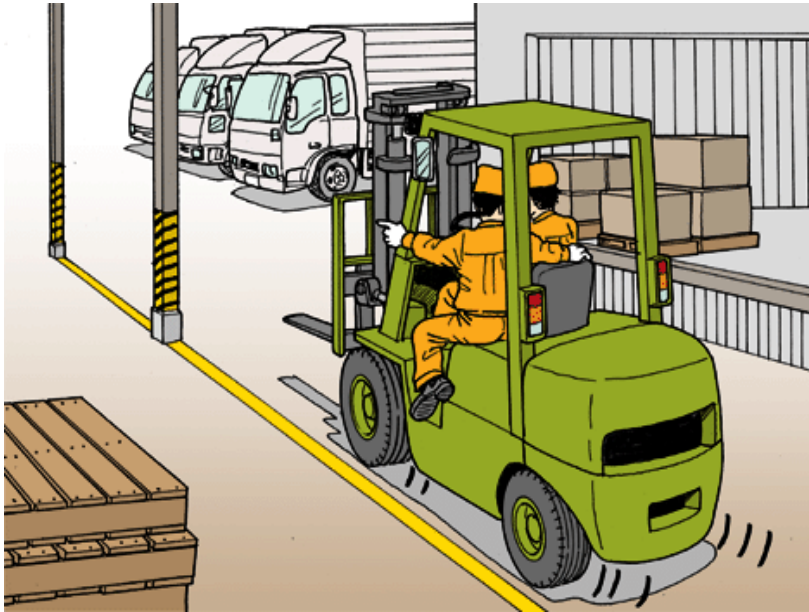
Source: JICOSH



Watch overhead clearances – especially entering or exiting buildings or when you are raising a load on the forks.

[Yale forklift company safety poster](#)

# The risk to a rider



A seasoned forklift operator sat next to the operator's seat while showing a new operator how to operate the forklift.

The new operator accidentally performed the wrong maneuver, causing the forklift to run into one of the pillars at the site. The worker who had been training him was crushed between the support pillar and the forklift.



# Stay out of the mast!!



While using a forklift to transport 15 cardboard boxes at once, some of the boxes started to slip. The operator climbed into the mast to adjust the falling boxes.

When the worker stepped between the operator's seat and the mast (without turning off the engine first) he accidentally hit one of the control levers, causing the mast to move. He was crushed between it and the overhead guard.



# No Speeding!!



Wikimedia commons



# Don't leave your forklift unattended

A forklift is considered "unattended" when the operator is 25 ft. or more away from the vehicle even if it remains in his view, or whenever the operator leaves the vehicle and it is not in his view.

When a forklift is left unattended, forks must be fully lowered, controls neutralized, power shut off, and brakes set. Wheels must be blocked if the truck is parked on an incline.

Wisconsin Dept of Health Services



Where's the operator??

When the operator of a forklift is within 25 ft. of the truck still in his view, the load engaging means must be fully lowered, controls neutralized, and the brakes set to prevent movement, but the power does not need to be shut off.

FOLLOW SIMPLE RULES & BE HAPPY