

# Fork Lift Safety



## Is Forklift Training Necessary?

- About 100 deaths each year
- About 95,000 accidents each year
- Over 34,000 injuries each year
- Bankruptcy

## Is Forklift Training Necessary?

- 13,000 lost work days
- Feet were the most commonly injured body part.

## If Forklift Training Necessary?

- Most injuries were caused by being
  - caught in
  - under
  - between objects

## Course Objectives

- Better & Safer Operators
- Less property damage
- Lower maintenance costs
- Increased efficiency
- Inspecting and operating a forklift
- Comply with OSHA requirements

## Authorized Operator

- It is a violation of Federal law for anyone under 18 years of age to operate a forklift or
- anyone over 18 years of age who is not properly trained and certified to do so.



## Authorized Operator

- Only trained and authorized personnel are permitted to operate a forklift
- Keep unauthorized employees off of forklifts
- Keep pedestrians away from the operating zone of a forklift
- Lock out unsafe lifts as determined in a pre-operation inspection

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## Operating Hazards

- Workplace hazards: ramps, railroad tracks, slippery floors, poor lighting, congestion
- Loads: large or bulky, uneven weight, broken pallets, poorly stacked
- Pedestrians: horseplay, unaware of forklift areas, not paying attention

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## Nameplate

- OSHA requires a legible nameplate
- Includes modifications & attachments
- Capacity
- Load center

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## Types of trucks....

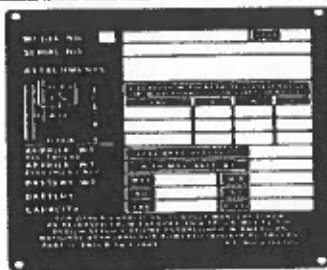
- Gas
- LPG
- Diesel
- Electric

Which type do you drive?

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## Mechanics of a Forklift

- Load Limit
  - Weight
  - Center of Gravity



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## Mechanics of a Forklift

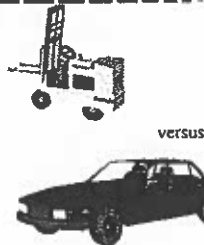
***What happens if we overload the fork lift?***

***The truck becomes less stable, requires increased maintenance & failure of vital parts.***

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## Driving Characteristics

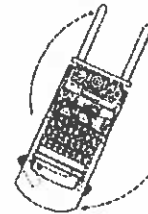
- Much heavier
- Various weight & sizes
- Move loads up & down
- No springs/shocks
- Smaller wheel base
- Even small bumps can dislodge load



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## Rear Wheel Steering

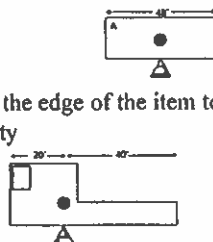
- Rear wheel steering is different than what you are used to driving.
- The rear end of the truck swings.



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## Center of Gravity

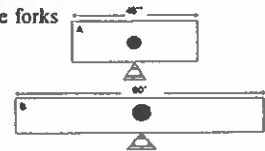
- Balance point
- Distance from the edge of the item to the item's center of gravity



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## Load Center

- Distance from vertical face of the forks to the load's center of gravity
  - A: Load center = 24"
  - B: Load center = 40"

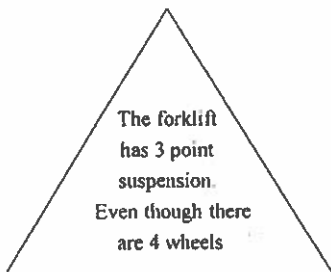


- 1 inch = 100 lbs
- Important reason for keeping the load resting against the vertical face of forks

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## The Stability Triangle

The forklift has 3 point suspension. Even though there are 4 wheels

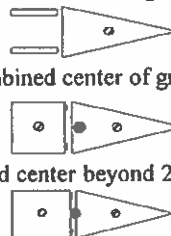


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## Stability Triangle

### 3-point suspension

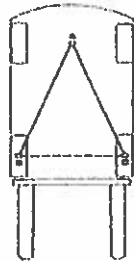
- Forklift's center of gravity
- Combined center of gravity
- Load center beyond 24"



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## Stability Triangle

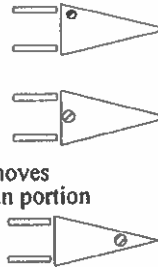
- POINT A  
Center of the steering axle (where the axle is mounted on the frame of the truck)
- POINT B & C  
Center of the 2 drive wheels



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## Combined Actions

- Center of gravity moves side to side
- Center of gravity moves forward
- Center of gravity moves backward to the thin portion of the triangle



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If a truck makes too fast a turn, the center of gravity moves outside of the triangle, causing the truck to tip over.

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## Tipping Over

- Do not jump
- Hold onto the steering wheel
- Brace your feet
- Lean away from the fall

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## Inspection

- Daily, pre-shift inspection is required
- Inspection your truck at the beginning and at the end of your shift
- Frequent and thorough inspections will help keep trucks in safe and efficient operating condition. It will help prevent breakdown and costly delays.

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## Preoperation Inspection

- As an authorized operator, it is your responsibility to make sure your forklift functions properly
- OSHA requires preoperation inspections
- Company wants to comply with OSHA and be sure equipment is maintained



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## Operator's Checklist

Operator's Daily Checklist should contain some of the following data:

- |   |                                     |   |
|---|-------------------------------------|---|
| <input type="checkbox"/> Date of Inspection | <input type="checkbox"/> Truck #    | <input type="checkbox"/> Fuel             |
| <input type="checkbox"/> Operator           | <input type="checkbox"/> Model #    | <input type="checkbox"/> Engine Oil       |
| <input type="checkbox"/> Department         | <input type="checkbox"/> Serial#    | <input type="checkbox"/> Radiator Coolant |
| <input type="checkbox"/> Shift              | <input type="checkbox"/> Hour Meter | <input type="checkbox"/> Hydraulic Oil    |

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## Checklists

- ☐ Each type of vehicle is unique
- ☐ Daily checklists for each type of vehicle are available from the truck manufacturer.
- ☐ It is recommended that the manufacturer's instructions on vehicle maintenance and owner's and operator's responsibilities also be consulted.

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## Walk Around

- ☐ Forklift properly disengaged
  - Forks down, key off, neutral gear, parking brake on
- ☐ Left/right side
  - Tire condition, tight lug nuts, no debris around axle, overhead guard is solid, no debris behind the mast

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## Walk Around

- ☐ Front
  - Forks in good shape, fork pins in place, backrest solid, mast & chains greased, hoses in good shape
- ☐ Rear
  - Counterbalance bolt is tight, radiator clear of debris

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## In the Seat

- ☐ Nonmoving checks
  - Gauges, lights, horn, back-up alarm, blinking warning light, operate the tilt & lift mechanism, check the parking brake
- ☐ Moving checks
  - Put on the seat belt, check the running brakes, check the steering
- ☐ Look for oil or water leaks on the floor

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## Inspections

If a problem is found during inspections have a qualified mechanic correct all problems.

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## Inspections

Forklift operators are often authorized to perform some of their own maintenance but the OSHA standard includes specific training requirements for forklift operators who change and charge batteries, handle propane tanks, fuel diesel or gasoline engines, and otherwise repair and maintain power industrial trucks.

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## Loading/Unloading



### Height Lift Limits

- The height of the load must be limited. It may become wobbly or shift & fall
- Be aware of clearance below sprinklers, low doorways and piping and overhead installations

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## Loading/Unloading

- Only stable or safety arranged loads shall be handled
- Restack unstable loads
- Only loads within the rate capacity of the truck should be handled
- Any long or high (including tiered) loads should be adjusted not to affect capacity

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## Loading/Unloading

- Caution shall be exercised when handling off-center loads which cannot be centered.
- Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load
- A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.

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## Loading/Unloading

- Inspect load for stability, projections, damaged pallets before lifting
- Never place weight on the back of lift truck to increase its capacity
- Towing always done from rear towing pin
- Extreme care should be used when tilting the load forward or backward, particularly when high tiering

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## Loading -- Stacking & Tiering

- Check load to be sure it is safe to pick up
- Don't leave an unstable, unsafe load that might endanger someone else later
- Carry the load centered & titled back
- Be sure you have clearance

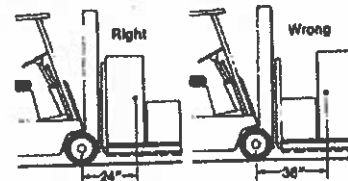
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### Loading /Unloading Procedures for Stacking & Removing a Load

1. Maneuver *slowly*
2. Watch *rear end swing*
3. Approach rack *head on*
4. *Stop* before raising load
5. Place load *securely* before removing fork
6. *Lower fork* to floor before moving
7. **NEVER TRAVEL WITH LOAD RAISED!**

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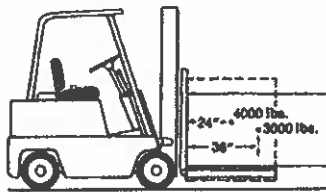
### Place heaviest weight near truck



See Saw Principle

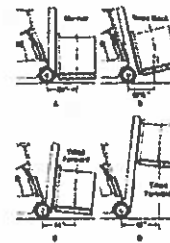
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### Load Weight vs. Load Center



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### Effects of tilting the mast



When traveling & elevated

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### Loading/Unloading

Before raising a load, understand:

- Approximate weight of the load
- Location of the load's center of gravity

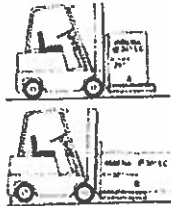
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### Load Placement

**ALWAYS drive  
with a balanced  
load.**

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Rule of Thumb: Decrease the weight of the load by 1,000 pounds for every 12" load center extends beyond rated distance.



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## Traveling

- All traffic regulations shall be observed including authorized plant speed limits
- Operate at safe speeds
- Keep the vehicle under control at all times
- Maintain approximately three (3) vehicle lengths from any other vehicles

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## Traveling

- Always look in the direction of travel
- If load blocks view, travel in reverse
- Travel with the forks DOWN (6" off ground)
- When moving, the mast must not be raised
- When turning, watch rear end swing

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## Traveling

- Slow down for wet and slippery floors
- Avoid loose objects or holes
- Keep body inside the cage
- Never eat or drink
- No stunt driving or horseplay
- Make sure clear all overhead installations, lights, pipes, sprinkler systems, etc.

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## Traveling

### Overhead Guard

- It is to be used as protection against falling objects.

It is there ONLY to protect you from falling objects

Is NOT designed to withstand the falling of a full capacity load

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## Traveling

### WARNINGS!!

- ALWAYS give a warning when you approach...
- People
- Intersections



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## Traveling

- ❑ Never carry passengers
- ❑ Pedestrians always have the right-of-way
- ❑ A person is not allowed to stand or pass under the elevated portion of any truck, whether loaded or empty
- ❑ Never drive up to someone standing in front of a fixed object such as a bench

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## Traveling on Ramps

- ❑ Never turn on a ramp
- ❑ On ramps the load should be upgrade
- ❑ Ascend or descend ramps slowly
- ❑ Safe distance from edge or ramps or docks

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## Traveling near or on Railroads

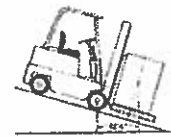
- ❑ Railroad tracks are crossed diagonally
- ❑ Never park within 8 feet of the center of railroad tracks

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## Driving on Inclines

### NEVER TURN ON AN INCLINE !

The load should always be kept UPGRADE if there is more than a 10% incline.

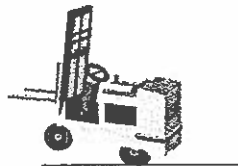


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## Traveling on Docks

A carelessly driven truck can slip off the edge or into recessed areas with tragic results

BE SURE of the following...



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## Traveling on Docks

- ❑ Inspect the dock plate
- ❑ Make sure the dock plate is secured
- ❑ Check the trailer floor condition
- ❑ The floor capacity can support your weight

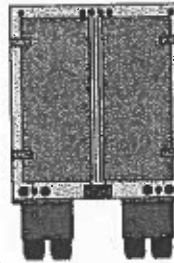
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## Traveling on Docks

- Trailer wheels are chocked
- Nose of the trailer is supported by the tractor or a fixed jack
- Avoid the Edge!!

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## Loading Trailers



### RAMPS

Both the load and truck are less stable. Stopping distance must be increased. Be sure forks have clearance.

### LIGHTING

Bright dock - Dark truck. Allow time for adjustment.

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## Loading Trailers

- Tractorless trailers must be supported under the fifth wheel to prevent tipping
- Trailer must be secured to dock with dock lock, chocks, etc.
- Not all trailers are **Drive-In** trailers, make sure it can handle the weight of the lift and load.

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## Parking

- Lower the forks
- Forks on floor
- Set gear to neutral
- Set the parking brake
- Turn off the key
- Remove the key



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## Refueling

- Refuel only in designated areas
- Shut off engine and lights
- No welding, open flames, sparks
- NO SMOKING
- Spillage should be avoided. If spillage occurs it should be carefully washed away or completely evaporated
- Replace fuel cap before starting engine

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## Refueling

- If you detect a leak, DO NOT start the engine, Pull it outdoors
- No truck shall be operated with a leak in the fuel system. The leak must be corrected.
- If using a propane tank, before charging, close tanks manual shut off valve and left the engine run until it stalls

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## Propane Refueling

- Propane is a combustible, compressed gas
- Propane leaks are detected by:
  - Distinct odor
  - Hissing sound
  - Frost on fittings
- PPE: gloves, safety glasses

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## Battery Charging

- During charging batteries give off hydrogen gas, which is flammable. Recharge only in an area where there is ventilation and no sources of ignition.
- Inspect battery connectors for damage
- No smoking in battery-charging area
- Immediately clean up electrolyte spills

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## Battery Charging

### Personal Protection Needed:

- face mask – chemical type goggles/face shield
- acid-resistant gloves
- an apron
- Eye wash and/or shower
- Large amounts of water for flushing if there is a spill
- Fire extinguisher

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## Battery Charging

### Procedures for charging:

- Check vent caps for proper functioning
- Leave battery compartment cover on to avoid electrolyte spray
- Wash away any spilled electrolyte
- Set truck brakes
- Avoid any metallic objects (keys, tools, rings, etc.) because of electrical arcing.

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## Training Requirements

- Effective March 1, 1999
- Required to establish an internal Certification program facility specific
- If previous training meets new requirements, it may stand for one year
- Must be Hand On as well as classroom training

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## Training Requirements

### Who can train operators?

#### People who have:

- - Knowledge
- - Training
- - Experience

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## Training Program

Training shall consist of a combination of:

- Formal instruction
- Practical training
- Evaluation of the operator's performance in the workplace – hands on & written

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## Training Program Content, Truck Related

- Instructions for operation
- Similarities / Differences to Automobiles
- Control/ Instrument use.
- Engine Operation
- Steering/ Maneuvering
- Fork/ Attachment
- Vehicle capacity, stability, inspection, refueling and recharging

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## Training Program Content, Workplace Related

- Surface Conditions
- Load composition/ stacking/ stability
- Pedestrian routes/ traffic
- Narrow/ restrictive aisles
- Hazardous locations
- Ramps/ slopes

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## Evaluation/ Refresher Training

Refresher training shall be provided when:

- - near miss accident
- - unsafe operation observed
- - different trucks are used
- - evaluation reveals deficiencies
- - workplace layout changes

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## Evaluation/ Refresher Training

A performance evaluation must be completed every 3 years

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## Operator Qualifications

Forklift operators should:

- - Have at least 20/40 vision
- - Not be color blind
- - Have no seizing disorders
- - Have adequate hearing
- - Not be a challenge employee

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## Emergency Procedures

If there is a leak of gas or flammable liquid  
Report it immediately  
Use fire extinguisher if you  
know how to

DO NOT PARK blocking  
any emergency exit.

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## Review

- Authorized Operators
- Vehicle Mechanics
- Inspections
- Loading/Unloading
- Traveling Rules
- Refueling
- Training

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## Review – Authorized Operators

- Only Authorized personnel are permitted to operator forklift
  - age of 18 or older
  - trained and certified
- Operator qualification
  - vision
  - disorders
  - hearing,

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## Review – Vehicle Mechanics

- Nameplate – is required & legible containing capacity, load center, modifications & attachments
- Type of Truck – Gas, LPG, Diesel, Electric
- Stability Triangle – 3 point suspension
- Load Limit – Weight, Center of Gravity
- Load Center

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## Review - Inspections

- Inspections must be performed daily before and after shift
- If at any time a vehicle is found to need a repair, defective, or unsafe, it should be taken out of service immediately until it has been restored to a safe operating condition
- All repairs are to be made by authorized personnel
- All regulations and/or standards in reference to repairs are to be followed

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## Review for Loading/Unloading

- READ & HEED the load limits on the nameplate. Don't overload.
- Remember the load center principle.
- Be extra careful on inclines. Drive slowly down ramps and allow extra stopping space. Be sure the load doesn't tilt and fall.
- Wear any needed safety equipment.
- Inspect your truck daily.

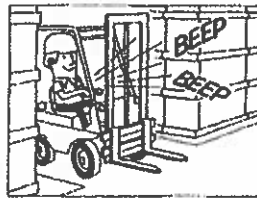
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## Review – Facility Hazards

- ❑ Never block exits or emergency equipment
- ❑ Be aware of clearance issues
- ❑ Avoid loose objects or holes
- ❑ Safe distance from edge or ramps or docks

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## Review – Safe Driving Rules



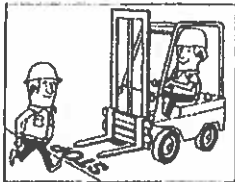
### **SLOW DOWN !**

#### **ESPECIALLY:**

- On Wet Floors
- At intersections
- For tight turns

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## Review – Safe Driving Rules



- ❑ Sound Horn at Blind Corners
- ❑ Give Pedestrians Right of Way
- ❑ Always face the direction traveling in

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## Operating a Lift Truck

- ❑ Only trained, authorized operators
- ❑ Immediately report forklift-related accidents
- ❑ Seat belts must always be worn
- ❑ No person should stand under elevated portion of lift truck
- ❑ Forklift controls operated only from driver's seat
- ❑ Never block exits or emergency equipment
- ❑ Smoking is not permitted

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## Review - Refueling

- ❑ Refuel in designate areas
- ❑ Shut off engine and lights
- ❑ NO Smoking, sparks, flames, etc.
- ❑ Be careful of leaks & spillage
- ❑ Use PPE

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## Review - Training

- ❑ Only trained and authorized personnel are permitted to operate a forklift
- ❑ Must be hands on as well as classroom training
- ❑ Performance evaluation must be completed every three (3) years
- ❑ Operators should pass operator qualifications

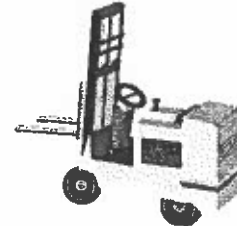
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REMEMBER

NEVER  
OVERLOAD A FORK LIFT

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Any  
questions ?



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## Skid Steer Safety



## Training Topics

- Definitions
- Uses
- Features
- Comparisons
- Safe Operating Procedures
- Surrounding Personnel
- ROPS & FOPS
- Fatalities
- Statistics
- Attachments
- Decals
- Accident Prevention
- Maintenance
- Key Points



## Background

- Compact
- Rugged
- Maneuverability



## Definitions

- Skid steer, skid loader, skid-steer loader, etc. is a rigid frame, engine-powered machine with lift arms used to attach a wide variety of labor-saving tools and attachments.
- The term "bobcat" is sometimes used as a generic term for skid-steer loaders.
- Four-wheel drive vehicles, with the left drive wheels independent of the right drive wheels, so that wheel speed and rotation determine direction of the loader and allow the loader to turn within its own tracks

## Uses

- The safe operation of skid steer loaders can address limitations including:
  - Lifting
  - Carrying
  - Pushing
  - Pulling
  - Use of only one hand
  - Walking
  - Reaching and bending

## Manufacturers

- Bobcat
- John Deere
- Gehl
- JCB
- Mustang
- New Holland
- Case IH



## Skid Steer Comparisons

- Loader or loaded front mounted buckets, roll over, tilt back and onto operator
- Lots of control levers in a tight space, easy to bump unintended
- Lift arms close to operator's area
- Pinch, shear and crush points close to the operator's area
- Entry and exit over the attachment and past operator's controls

## Features

- Rigid frame
- Operation (left independent of right)
- Mostly diesel motors
- FOPS/ROPS (all new designs)
- Cab, some enclosed with heat, AC, etc.
- One or two lift arms
- Auxiliary hydraulics

## Can Anyone Operate Them



## What's Wrong with this Picture



## Who Needs a Dirt Shower

- <https://www.youtube.com/watch?v=IA6BielzslI>



## Rolling

- <https://www.youtube.com/watch?v=GdFB0fNfhJ8>



## Right Back at You

- <https://www.youtube.com/watch?v=5al.8Fp-uWd>

## Training

- As we can see from the Videos Skid Steers can be dangerous and Deadly.
- Unfortunately the majority of workers across the Nation receive little to no Training.
- Through Training and understanding of the Hazards of Skid Steers we can reduce the likelihood accidents and injuries.

## Training

- Never Operate unless you have received formal and practical training.
- Never use skid steers to transport co-workers or for horseplay.
- Never walk underneath a raised bucket

## Statistics

- Research shows the majority of fatalities occur from individuals being hit by the skid steer or pinned by the arm of the skid steer



■ Struck/Pinned by arm  
 ■ Crushed between Bobcat & Object  
 ■ Other (Rollover, Collision, Etc.)

## Fatality Statistics

Between 1991 and 2004 there were 30 Recorded Fatalities



Operator Deaths	
Struck/Pinned by attachment	12
Rollover	1
Pinned between bobcat & attachment	1
Surrounding worker deaths	14
Crushed between Bobcat & attachment	12
Struck by wedge next to Bobcat	1
Fell from scaffolding struck by scaffolding	1
Total Deaths	30
Operator Deaths	16

## Breakdown of Fatalities

- 16 of the 30 deaths (53%) were inflicted on the operators of the machines, 14 of these by the arms of the machines.
- The other 14 deaths (47%) were inflicted on those outside of the cab who were not operating the machine.

### Fatality

- On July 24, 2004, a 19-year-old laborer with 8 days mining experience was injured at a crushed stone operation. The victim was operating a skid steer loader to clean spillage around the plant. He was found caught between the tilt cylinder assembly and the top front of the operator's cab. The victim was flown to a hospital where he died on August 6, 2004.

### Fatality

- On September 13, 2000, a skid loader operator, age 28, was fatally injured as he either leaned over in the seat or attempted to exit the skid loader and accidentally activated the controls, causing the bucket to lower and pin him between the cross-bar member of the boom and the frame structure.

### Fatality

- In 1991, an employee was attempting to remove the dirt scoop from a bobcat earth mover while he was still seated in the machine. The Employee unbuckled his seat belt, then leaned forward to release the levers that held the bucket in place. His knee or foot struck the bucket release pedal and the bucket lowered and crushed the employee against the frame. He was killed.

### Fatality

- The employee was working on the paving crew and bent down next to the dump truck. While bent down the bobcat backed up and crushed the employee between the dump truck and back of the bobcat. The employee was taken to the hospital and later was pronounced dead.

### Accident Prevention

#### Operator:

- The safety procedures, signs and electronic deterrents are all in place on the Bobcat for safe operation of the machinery.
- The operator should be trained and made aware of these dangers, but ultimately makes the choice of operating under safe conditions or not.

### Accident Prevention

#### For Surrounding Workers

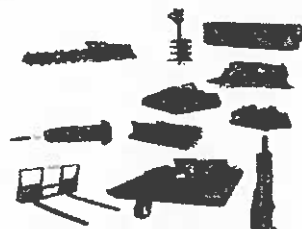
- Make sure surrounding workers are aware of the dangers of working near loud and powerful equipment that has limited operator visibility.
- Surrounding employees should always assume the operator does not see them.
- Use extreme caution when walking behind or directly to the side of the bobcat
- Surrounding workers must assume responsibility to stay out of harm's way.

## Know Your Skid Steer

- Prior to operating machines that are unfamiliar, read the manufacturers operator manual
- Become familiar with all controls and safety decals on every machine you operate



## Attachments



## Attachment Hazards

- Attachments create many pinch points and caught in between hazards
- Use extreme caution and follow the manufacturers recommendations when attaching and detaching equipment.
- Underground and Above ground Utilities
- Surrounding Personnel

## Safety Decals



## Safe Operating Procedures

- Always operate within the specific capacity of your equipment.
- Always look in the direction of travel.
- Always think about the hazards of the route you must take before you get there.
- Always operate your equipment at safe speed.

## Safe Operating Procedures

- 3 Points of Contact.
- Always wear seat belts
- Keep your entire body inside the machine at all times.
- Always look behind you before backing
- Avoid loose fitting clothes, loose or uncovered long hair, jewelry & loose personal articles

## Safe Operating Procedures

- o Know and use the required personal protective equipment before you start the job.
- o Never leave the skid steer bucket in a raised position when exiting.

## Safety Features

- o FOPS/ROPS (falling object protection, roll over protection)
- o Safety belt and/or restraint bar
- o Lift arm lockouts or lift arm supports
- o Seat interlocks
- o Back up sirens
- o Read the operator instructions

## Maintenance

- o When servicing the skid steers use all precautions recommended by the manufacturer.
- o Many of the skid steers have guards that can be used when servicing the hydraulic points.

## Training Video

### YouTube:

Bobcat Skid-Steer Loader Safety

<https://www.youtube.com/watch?v=dFWbblTQas>

## Key Points

- o Never use a Skid Steer unless trained
- o Always follow the manufacturers recommendations for safe handling and use.
- o Surrounding Personnel are at high risk as well.

Date:

Tuesday, November 21, 2023

Forklift and Skid Steerer Training

<u>Name</u>	<u>Facility</u>	<u>Signature</u>
Tony Fasce	Muscoot	
Sarah Velardo	Muscoot	<i>Sarah Velardo</i>
Joshua Renaud	Muscoot	<i>Joshua Renaud</i>
Faith McCauley	Muscoot	<i>Faith McCauley</i>
Martin Santegele	Saxon Woods	<i>Martin Santegele</i>
Antonio Amato	Croton Point	<i>Antonio Amato</i>
Jason Once	Croton Point	<i>Jason Once</i>
George Grace	Tibbets	
Keith Hannon	Tibbets	
Michael Vatai	Tibbets	
Brian Murphy	Tibbets	
Max Rivera	Sprain	<i>Max Rivera</i>
Sam V Melaniff	North County Trail	<i>Sam V Melaniff</i>
Christopher Peterin	North County Trail	<i>Chris Peterin</i>
Evelo Lopez	N/C	<i>Evelo Lopez</i>
Tamara Holliman	North County Trail	<i>Tamara Holliman</i>
Ernie Perez	North County Trail	<i>Ernie Perez</i>
EDISON DUMA	MERESTEAD	<i>Edison Duma</i>
Joseph Wymne	South County Trail	<i>Joseph Wymne</i>
Gurij Lynynets	South County Trail	<i>Gurij Lynynets</i>
Joseph Petruzzelli	South County Trail	<i>Joseph Petruzzelli</i>
Kevin Motta	South County Trail	<i>Kevin Motta</i>