Forward

Safe and efficient operation of a lift truck requires skill and alertness on the part of the operator. It is the responsibility of the employer to make sure that the operator can see, hear, and has the physical and mental ability to operate the equipment safely. (Hyster Company)

Table of Contents

"Funding and support for this project has been provided by the State of Washington, Department of Labor & Industries, Safety & Health Investment Projects."

VIGILANT℠
counsel for employers

Forklift Training for Operators

Start your class with an opener that gets their attention.
Example:
Why should we care if operators are trained?
Question:
Has anyone in the group been involved or witnessed a forklift accident? Ask if they would like to share with the group? Share a story you know about with your class. Could any of these happen to us?

Let the class know there will be a test at the end of the presentation. Each person will have to receive 80% correct before passing this training course.

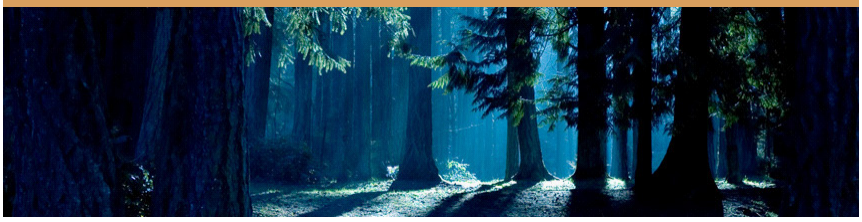
Why Forklift Operators Should be Trained

- Approximately 85 forklift fatalities and 34,900 serious injuries occur every year in the United States
- Fatal Accident Types
  - **42%** Forklift overturn
  - 25% Crushed between vehicle and a surface
  - 11% Crushed between two vehicles
  - 10% Struck or run over by a forklift
  - 8% Struck by falling material
  - 4% Fall from platform on the forks

Discuss main causes of forklift fatalities. Could it happen to anyone of us?

Course Overview

- **Types of Forklifts**
- **General Requirements**
- **Truck Related Topics**
- **Work Related Topics**
- **Operator Evaluation**
- **Pedestrian Awareness**



We will cover each of these areas.

Types of Forklifts

Seven Classes of Forklifts

- Class I **-** Electric motor rider trucks
- Class II - Electric motor narrow aisle trucks
- Class III - Electric motor hand trucks or hand/rider trucks
- Class IV - Internal combustion engine trucks (solid/cushion tires)
- Class V - Internal combustion engine trucks (pneumatic tires)
- Class VI - Electric and internal combustion engine tractors
- Class VII - Rough terrain forklift trucks

Each trainer may customize this page to fit the type of forklifts they use at their location.

Example:
If your location has Propane powered forklifts with pneumatic tires it would be a Class V. You could highlight Class V to bring their attention to it.
Class V - Internal combustion engine trucks (pneumatic tires)
You could also add pictures of forklifts at your location.

Once you have identified the class of forklift in your facility, ask the group what hazards are associated with the operation of that particular type of forklift.

Be sure that the typical hazards associated with your workplace are covered.

General Requirements

Regulations

- Forklift operator must be at least 18 years old
- Overhead guards, view above can not be blocked
- No modification that affects capacity without manufacturer's approval
- Capacity data plate
- Seat belts
- No Passengers

You have to be 18 years old to work in an industrial environment and this includes operating equipment like a forklift. We will look at each of the following items in the next few slides.

If any of these do not apply at your workplace, tell your group they don't apply to our workplace.

Overhead Guard — View Can Not Be Blocked

What is wrong with this picture?
Operators must have an unobstructed view for stacking or lifting overhead. Clear covers are available from manufactures. Mention any other behaviors/things you've seen operators do that could obstruct their view.

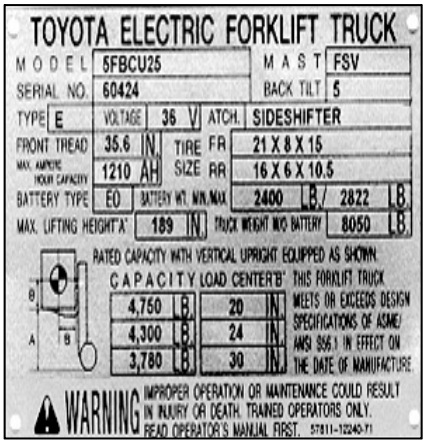
If this doesn't apply skip this slide.

No Modifications That Affect Capacity

What's wrong with this picture?
Ask the class if they have seen any modifications like this?
Any modifications should be reported to a supervisor.

Modifications can not be made without written approval from the manufacturer.

Forklift Data Plate


TOYOTA ELECTRIC FORKLIFT TRUCK

MODEL	5FBCU25	MAST	FSV
SERIAL NO.	60424	BACK TILT	5
TYPE E	VOLTAGE 36 V	ATCH.	SIDESHIFTER
FRONT TREAD	35.6 IN.	TIRE SIZE FR	21 X 8 X 15
MAX. AMPERE HOUR CAPACITY	1210 AH	SIZE RR	16 X 6 X 10.5
BATTERY TYPE	EO	BATTERY WT. MIN./MAX.	2400 LB. / 2822 LB.
MAX. LIFTING HEIGHT 'A'	189 IN.	TRUCK WEIGHT W/O BATTERY	8050 LB.

RATED CAPACITY WITH VERTICAL UPRIGHT EQUIPPED AS SHOWN.

CAPACITY	LOAD CENTER 'B'
4,750 LB.	20 IN.
4,300 LB.	24 IN.
3,780 LB.	30 IN.

THIS FORKLIFT TRUCK MEETS OR EXCEEDS DESIGN SPECIFICATIONS OF ASME/ANSI B56.1 IN EFFECT ON THE DATE OF MANUFACTURE.

WARNING IMPROPER OPERATION OR MAINTENANCE COULD RESULT IN INJURY OR DEATH. TRAINED OPERATORS ONLY. READ OPERATOR'S MANUAL FIRST. 57811-12240-71

- Regulations require a legible nameplate
- Includes information about the forklift and attachments
- Describes:
  Capacity and Load Center

Data Plates contain:

- Capacity information, including load center information.
- 24 inch load center is the industry standard.
- Type of forklift
- Attachment information
- Model and serial numbers

The data plate must be legible; if it can not be read, report it on your daily inspection and/or tell a supervisor.

New data plates can be ordered from the manufacturer.

Seat Belt or Fall Protection

What is the company policy on seat belts, what will happen if an operator is not wearing his or her seat belt?

Seat belts are required. If your forklift does not have a seat belt, contact the manufacturer for a new seat with seat belt attached.

When fall protection is used there will have to be separate training on the use and care of fall protection.

No Passengers

- Only the operator can ride on the forklift
- Unless the forklift is designed for passengers, do not give anyone a ride

Ask the class if they have seen any one riding on a forklift. What possible injuries could occur?

Unattended Forklift

What are the rules for an unattended Forklift

Ask the group, what the requirements are for an unattended forklift.

25 feet away from the forklift
Not in view
Forks or other attachment lowered
Controls in neutral
Power shut off
Set the brake

Basic Safety

- Don’t travel forward with the load raised
- Travel in reverse if the forward view is obstructed by the load

When traveling with a load raised you may not see a low overhead hazard like traveling through a door opening.

Basic Safety

- Don’t pin anyone between a fixed object
- Don’t drive forward or back up to anyone who is standing in front of a fixed object

Ask for any examples the group might have. Have a few examples if needed.

Basic Safety

Don’t pass under elevated portion of the forklift

Have you seen this? What would you do if someone tried to pass under an elevated load?

Basic Safety

- 90 degree turns
- Tail swing---Danger Zone
- Rear wheels point outward when turning

When anyone walks up to the side of the forklift be sure to stop and give them time to move away from the forklift. What are possible injuries from being struck by a forklift or running over a foot?

Basic Safety

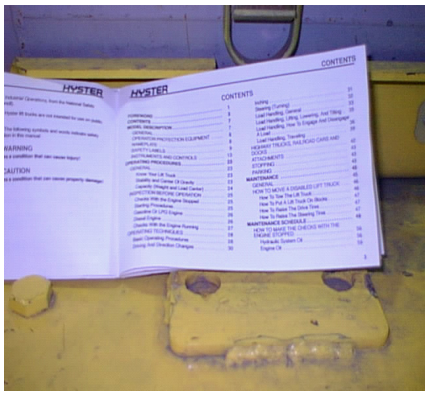
- Use three point technique for getting on and off the forklift
- Travel forward with a load unless the load blocks your view
- Stay three forklift lengths from other forklifts
- Always keep arms and legs inside the confines of the forklift

1. Forklifts have steps with anti-slip surfaces and grab handles to provide three points of contact while getting on and off the forklift. Many injuries occur while mounting and dis-mounting forklifts.
2. If your vision is obstructed while traveling forward, you have to travel in reverse.
3. In some facilities three lengths would not be possible. Always allow safe working distance between forklifts.
4. Ask why you need to keep arms and legs inside the confines of the forklift.

Tell stories to demonstrate these points of what you have seen.

Truck Related Topics

Operators Manual



Operating procedures, warnings, precautions, controls and instrumentation are listed in the operator's manual for the type of vehicle operated.

You should have an operators manual for one of the facilities forklifts as an informational guide. The operators manual contains valuable information on operator protection, equipment and operating procedures. Refer to the table of contents. Ask your audience if they know where to get the operators manual for their forklift.

Controls and Instrumentation

- Review the owner's manual
- Review control labels and control functions (Some controls are marked, others may not be)
- There is no continuity in control functions among manufacturers

Even two of the same model forklifts could be different. Ask someone in the class who drives two forklifts if they are the same or how they are different.

This is very important if it's the first time on a different forklift.

Forklift vs. Automobiles

Exercise #1

Ask the class, "What are the differences between a forklift and a car?" Have your class write down or discuss all the differences they can think of.

Then transition to the slide below for the answers.

Forklifts vs. Automobiles

Forklift	Automobile
• 3-Point Suspension	• 4-Point Suspension
• Poor Vision-Mast	• Vision, good large windows
• Rear Wheel Steering	• Front Wheel Steering
• Tail Swing	• Weight distribution
• Counterweighted	• Designed for passengers.
• Designed to lift, stack, tier, etc.	
• Weight 4 to 5 tons	• Weight 1 to 1.5 tons

Discuss the differences:
Which ones were missed?

Talk about the differences of each point.

Exercise

Exercise #2
Pass out the handout, have the group fill in the blanks.
Your copy of the handout is on page 32.

The purpose of this exercise is to prepare the audience for the next slide: the Pre-Shift Inspection.

Pre-Shift Inspection

1. All Fluid levels
2. Tires
3. Hoses, Belts, Cables
4. Mast, Forks, Attachments
5. Horn, Alarms
6. Steering, Brakes, Gauges, Controls,
7. Fuel, Battery level

Regulations require a pre-shift inspection must be done before each shift. This inspection must be documented.

A check list works well. Show them your company checklist or use the one provided on page 33.

Brakes, controls, lights and alarms should be checked once the forklift is started.

Lifting Personnel

- Guard rails
- Secured to lift truck
- Controls attended at all times
- Operator in seat when raising/lowering
- No point-to-point travel except at slow speed and platform lowered
- Guard the mast (shear point)
- WA requires tilt be secured

Discuss each point. Does your lifting basket include each of these?

Lifting Personnel

How many things do you see wrong with this picture?

Stacking Material

- Stacking and un-stacking on racks

While stacking and un-stacking on racks, pay close attention to clearances. Talk about some of the issues you've seen at your facility.

Loading Docks

- Working around loading docks

Extra caution must be used when working on a loading dock. Know where you and your forklift are at all times.

- Make sure wheels are chocked/blocked when loading or unloading trailers.
- If you have a dock plate, make sure it is secured.
- If you are loading a trailer, walk inside the trailer and check the trailer floor.
- Make sure the trailer front is supported if the truck is not attached.
- Never leave a forklift running inside a trailer; you could have carbon-monoxide buildup.

Capacity

As operators, what's the capacity of your forklift?

Ask the group, "How much weight do you think this forklift can lift?"

Capacity

Read the information on the data plate. This forklift is a remanufactured rigger special.

This forklift can lift 80,000 lbs. at 24 inch load center in first gear only.

Capacity

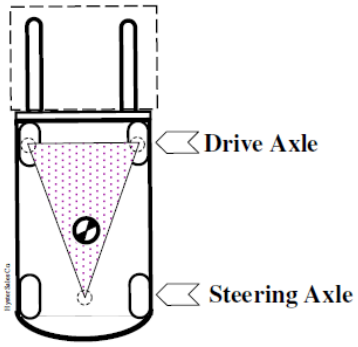
Ask the group what could have happened in this picture. Did you notice how all four tires are off the floor and the forklift is sitting on the main mast? The forklift was overloaded; the operator tried to back up and turn with the load raised. The next slide will show you what happened.

Capacity

This forklift was over capacity. The operator raised the load, backed up and turned at the same time. The center of gravity moved outside of the stability triangle and the forklift tipped over.

What is the Stability Triangle?

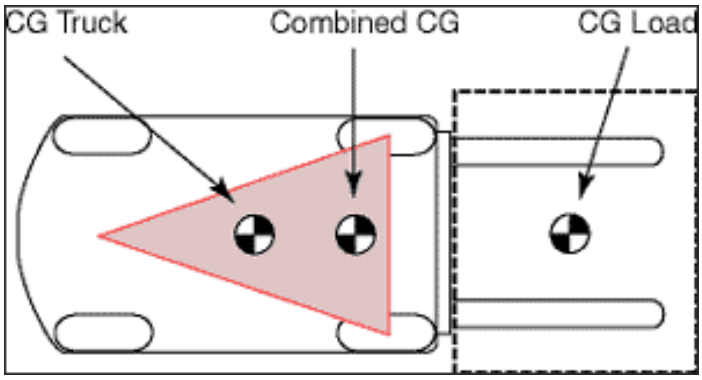
Stability Triangle



- Most forklifts have a three-point suspension system.
- These three points form a triangle called the stability triangle.

When the vehicle's center of gravity falls within the stability triangle, the vehicle is stable and will not tip over. When the center of gravity combination falls outside the stability triangle, the vehicle is unstable and may tip over. This is one of the most important concepts for you to know about operating a forklift.

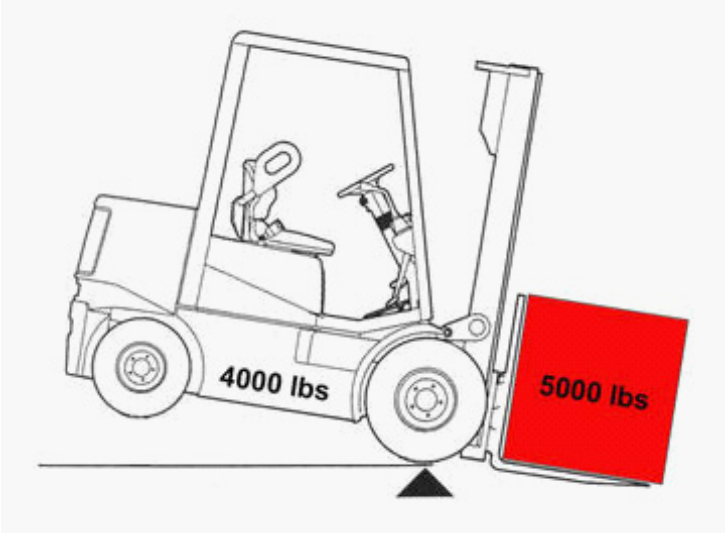
Center Of Gravity



The forklift has a center of gravity and the load has a center of gravity. As a load is lifted, the two form a combined center of gravity. As long as the combined center of gravity remains inside the stability triangle the forklift will not tip over.

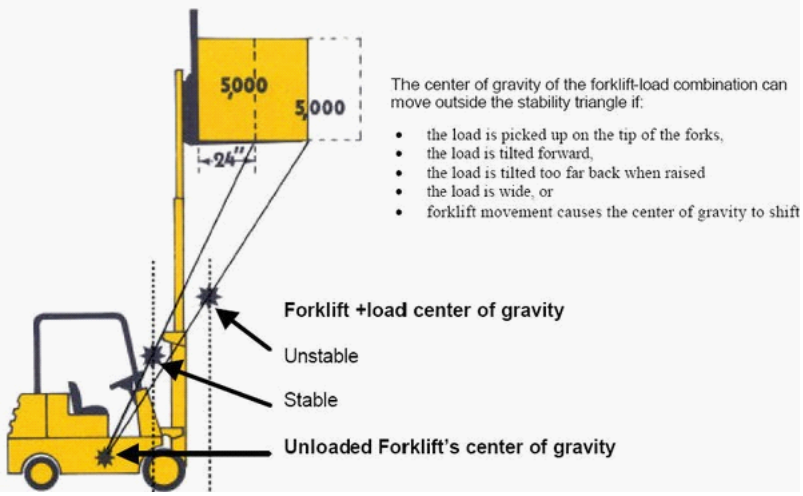
Demonstrate by using the chair exercise we used in the first part of the class.

Center Of Gravity



Another way to look at it — the drive wheels act as a fulcrum point. A fulcrum point acts like a teeter totter. The stability of any forklift is directly affected by the capacity.

Center of Gravity

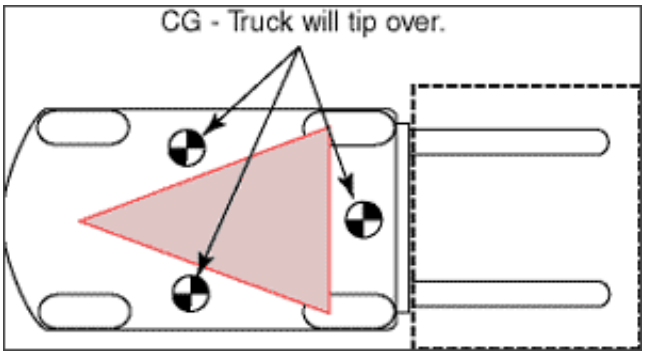


The forklift center of gravity and the load center of gravity form a combined center of gravity. As the load is lifted the combined center of gravity can move outside the stability triangle if:

- The load is picked up on the tip of the forks
- The load is tilted forward
- The load is tilted too far back when raised
- The load is wide, or — forklift movement causes the center of gravity to shift

What happens if you go down a slope or up that same slope with the load lifted in the air?

Center Of Gravity

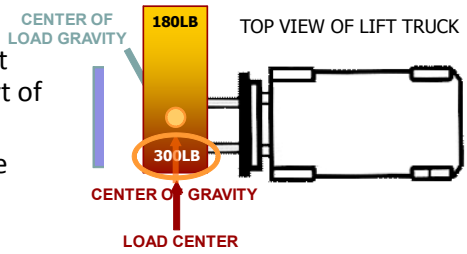


Lateral stability is a truck's resistance to overturning sideways.
Dynamic stability refers to the idea that an unloaded forklift's center of gravity and a loaded forklift's combined center of gravity can shift outside of the stability triangle as a result of certain movements, such as sudden stops and starts, turns, or operating on grades.

If you lift more than the forklift's capacity, your back wheels will come off the ground. What happens when you turn to the right with a load or turn to the left with a load? Where will the center of gravity be when traveling up a slope or down a slope?

Determine a Load's Center of Gravity

- Center of gravity is the balance point
- Load center is the point where the heaviest part of the load is located
- Pick up load on the side closest to its center of gravity



What happens to the Center of Gravity when we have a side heavy load? Does this affect the combined center of gravity? The center of gravity is the balance point of the load. The exact point on which the entire load will balance. For loads that are composed of consistent material, the balance point will be near the center of the load. If the load is inconsistent — that is, it contains materials of different weights and/or lengths — the load center will be on the side with the heaviest material. For example, if a pallet contains bricks on one side and pillows on the other, the center of gravity would be closer to the side with the bricks.

Tip Over Safety Procedure

- Always wear your seat belt
- Hold onto the steering wheel
- Brace your feet
- Lean away from the fall
- Keep your body inside the cage

Have you seen anyone get close to the edge of a ramp? What should you do?

Forklift Fueling--Propane

- Shut down the engine while fueling. Use required PPE, gloves and face shield. You should have long sleeves covering your arms.
- Handle all tanks and/ or hoses carefully. Propane can cause freezing type burns if it comes into contact with skin.
- If you detect a leak, remove the forklift from service until repairs can be made.

Extra precautions need to be taken with forklifts powered by propane. Has anyone ever been burned by propane? Propane burns are similar to a bad frost bite. If you smell propane anytime other than when you're refueling shut the forklift off and contact a supervisor. Never start the motor if there is a leak.

Forklift Fueling—Diesel or Gasoline

- Shut the engine off while refueling
- Wear proper PPE, eye protection and gloves
- Make sure there are no open flames near by
- Make sure to use the correct fuel
- Replace cap when full and check for leaks

Cover each point.

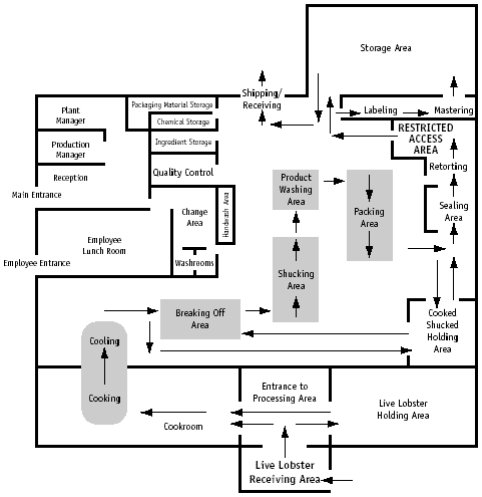
Battery Charging

- The charging area must have plenty of ventilation
- Wear PPE, eye protection and gloves
- Make sure charger is off before connecting it to the battery

Cover each point
An eyewash or eyewash with shower must be available when doing battery service beyond routine charging. Do you have plenty of ventilation at your facility? Does everyone wear their PPE? Why should you wear long sleeve shirts? Always make sure the charger is off before connecting the battery.

Workplace Related Topics

Hazard Mapping



Exercise #3

Have your audience draw a schematic of their facility/location

Hand out the Site Specific Workplace Hazard Analysis guide

Your copy is located on pages 34-36.

Have the class fill in hazards on their map.

Examples:

Uneven surfaces, broken concrete

Blind corners

High pedestrian traffic by a break room or bathroom

Ramps and other sloped surfaces

What about closed areas with air flow restrictions

Could there be carbon monoxide build up?

Ramps

Stay clear of ramp edges

Have you seen anyone get close to the edge of a ramp? What should you do?

Rail Road Tracks

- Drive diagonally across tracks
- Park 8 feet 6 inches or more from the center of the tracks.

If this does not apply to your location skip to the next slide.

Why would you want to cross the tracks diagonally?

8 feet 6 inches or more, why not 8 feet?

Overhead Clearances

- Overhead doors, pipes, roof or any other overhead hazards.

Has anyone seen this happen before? What about using a cell phone while operating a forklift?

Traveling

- Look in the direction of travel
- Make sure load is fully engaged
- Keep forks low when traveling
- Sound the horn
- Don’t speed
- Check clearance

Discuss each point:

These sound like common sense but remember the statistics:

- 10% of fatal accidents are struck by or run over by a forklift
- 42% of fatal accidents are forklift overturns

Operator Evaluation

- After initial training
- After refresher training
- At least once every three years

All operators must have their driving skills evaluated to ensure desired performance at least every three years.

This is a good time to discuss requirements for refresher training:

- Unsafe observation observed
- Accident or near miss
- Evaluation indicates need
- Different type of equipment
- Workplace conditions change

Sample form on pages 37 and 38.

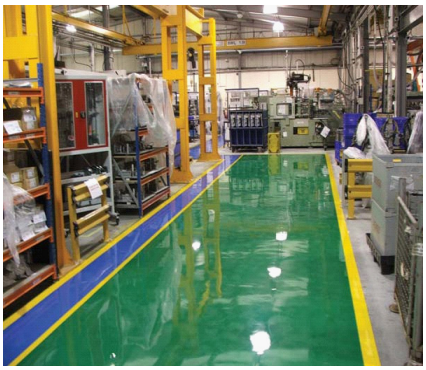
Pedestrian Awareness

- Tail Swing
- Braking Distance
- Visibility
- Walk Ways

Ask the group, if pedestrians should be trained about forklift hazards.

Tell stories to demonstrate these points of what you have seen.

Pedestrian Traffic



- Always keep walk ways clear
- Who has the right-of way, the forklift or the pedestrian?

Does your facility have clear painted walk ways for pedestrians? If not how does your facility handle traffic?

Discuss who has the right-of-way at your facility.

QUESTIONS?

- Time for a Test

Hand out test
Score the test how you want

Your copy and answer sheet are located on pages 39 and 40.