INTRODUCTION

Course Objectives

At the end of this course, you will be able to explain these subjects:

- Lift truck fundamentals
- The principles of balance, stability, and capacity
- Describe the importance of the preoperational inspection and how to perform the visual and operational inspection
- Explain safety guidelines for operating lift trucks
- Safe load handling techniques
- Define safety guidelines for refueling internal combustion trucks
- Define safety guidelines for changing and charging industrial batteries for electric trucks

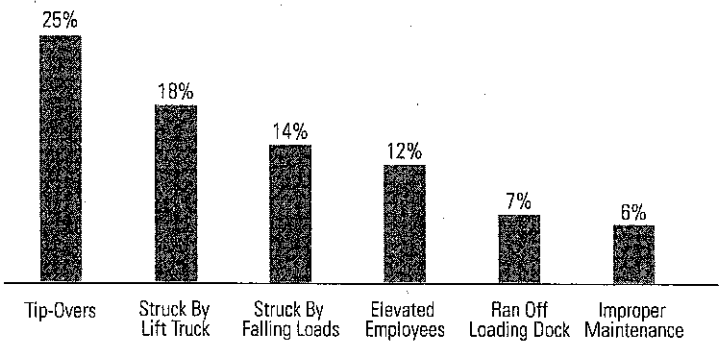
Why Is Operator Safety Training Important?

- Reduce the risk of personal injury.
- Reduce the risk of product and property damage.
- It's the law!

Average Numbers Of Injuries

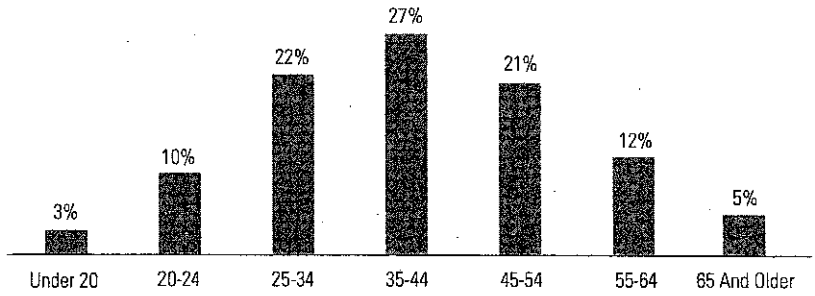
- 107 . – Fatalities
- 34,000 – Serious injuries
- 62,000 – Nonserious injuries.

Major Causes Of Lift Truck Accidents



The number 1 cause for these types of accidents is carelessness.

Fatalities By Age Group



Importance Statement

The importance to you and your company is:

- To reduce the risk of personal injury to you and to your fellow employees
- To reduce the risk of damage to company property, including:
  - Product
  - Equipment
  - Building structure.
- To comply with Federal OSHA regulations.

End of Introduction

Lift Truck Accident Exercise

Read the following accident report and indicate the possible causes of the accident.

1. A construction worker's foot was seriously crushed when a lift truck tipped over, pinning the worker under it. The worker had been sent to a parking lot to get cement material when the accident occurred. Police did not find any visible defects on the truck, nor did they find any obstacles in the parking lot that may have been in the worker's path. However, there were skid marks near where the lift truck tipped over. The left skid mark was 21 feet long, and the right mark was 19 feet long.

2. A lift truck operator, who was impaled by the lift truck he was driving after he left the machine, is expected to recover from abdominal and back injuries sustained in the accident. Authorities reported that the operator left the truck to do work in front of the truck when the lift truck moved forward. However, the police were not sure whether the lift truck engaged itself or if it was left in gear.

3. A construction worker was killed when a large wooden box he was working in fell. The worker was standing in the box when a lift truck operator raised it so he could reach gypsum board he was nailing. When the lift truck operator began backing up to lower the worker, the box started to fall. The worker attempted to jump from the box, but it fell on him.

4. A lift truck operator was seriously injured when he was crushed between the mast and the chassis of the machine he was working on. The operator apparently climbed up on the lift truck to attach a chain to the load he was lifting when he slipped on the controls. This caused the mast to tilt backwards, trapping the operator.

5. An employee was struck by a lift truck when entering one of the company's major entrances. The employee suffered severe leg injuries. The police chief says it is possible that the two parties did not see each other. The accident is being investigated by the company.

Course Introduction: Review

1. Which is NOT a reason for operator safety?
   A. Reduce the risk of personal injury.
   B. Protect company assets.
   C. Increase productivity at any cost.
   D. Comply with Federal OSHA regulations.

2. What is the NUMBER ONE TYPE of lift truck accident?
   A. Improperly maintained lift trucks
   B. Tip-over
   C. Employee falls off forks.
   D. Lift truck runs off loading dock.

3. What is the NUMBER ONE CAUSE for lift truck accidents?
   A. Machine failure
   B. Pedestrians
   C. Other lift trucks
   D. Carelessness

SECTION 1
LIFT TRUCK FUNDAMENTALS

Section 1 Objectives

At the end of this section, you will be able to:

1. Define the characteristics of a professional lift truck operator.
2. Explain the importance of the various warning plates and decals on a lift truck and those contained in the Operation and Maintenance Manual.
3. Describe the differences between lift trucks and automobiles.
4. Describe lift truck components and their functions.

Importance Statement

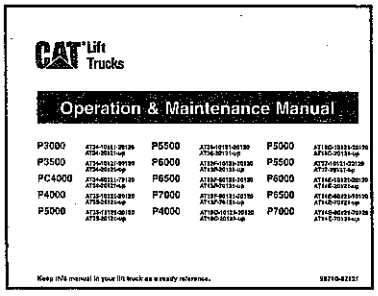
It is important that you:

1. Reduce the risk of injury to you and your fellow employees.
2. Understand the importance of your job and the qualities it takes to be a professional lift truck operator.
3. Increase your knowledge of your truck regarding safe operation.
4. Reduce the risk of product and property damage at your company.

Qualities Of A Professional Lift Truck Operator

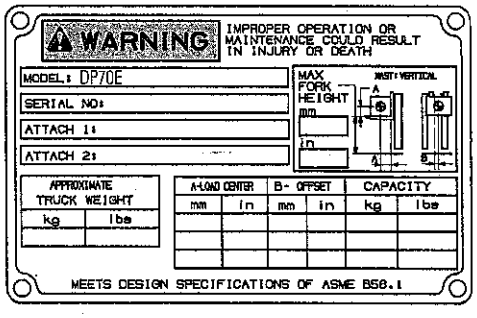
- Is responsible.
- Arrives on time.
- Is rested, alert, and physically prepared.
  – If you are under prescribed medication that causes drowsiness, contact your supervisor.
- Is knowledgeable about company rules.
- Wears required protective clothing and equipment.
- Uses safety equipment including the operator restraint system.
- Has a desire to learn.
- Is skilled and works to improve those skills.
- Keeps vehicle under complete control.
- Removes jewelry if required.

Operation and Maintenance Manual



Read and fully understand the Operation and Maintenance Manual for the truck you will operate.

Legal Plates



By law, all lift trucks must display this warning.

Danger, Warning, And Caution Labels

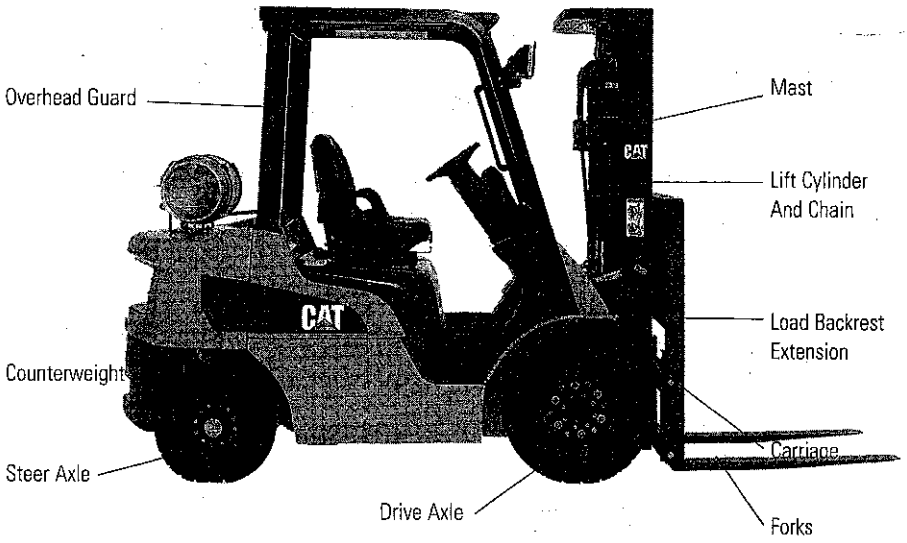
Danger If not avoided, will cause death or serious injury.

Warning If not avoided, can cause death or serious injury.

Caution If not avoided, may cause minor or moderate injury.

Differences Between Lift Trucks And Automobiles

	Lift Trucks	Automobiles
Personal transportation	No	Yes
Vehicle weight	Greater than 5,000 lbs.	Less than 5,000 lbs.
Steering	Rear	Front
Training	Yes	Yes
Surfaces	Various compact	Various
Loads	Carried outside wheel base	Carried within wheel base
Braking	Two-wheel braking	Four-wheel braking
Center of gravity	Dynamic	Fixed
Visibility	Limited	High

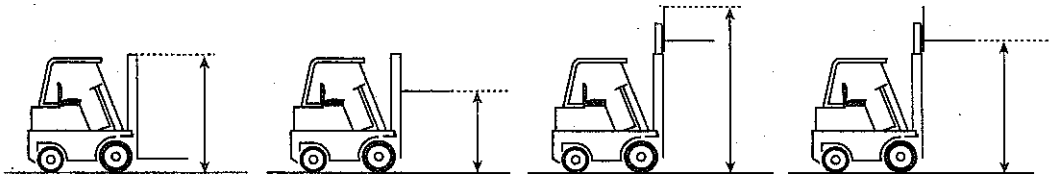


Lift Truck Terminology

Forks	Engage the load and support it.
Carriage	Component to which the forks or other attachments mount. It is mounted to the mast.
Load Backrest Extension	Component attached to the carriage in order to prevent the load from shifting backward when the carriage is lifted.
Mast	Vertical assembly of interlocking rails on which the load is lifted and lowered. Supports the forks, carriage and load backrest extension.
Overhead Guard	Protective framework fitted over the operator compartment to protect the operator from falling objects.
Directional Control Lever	Engages truck transmission to travel forward, reverse or remain in neutral.
Lift Cylinders	Provide hydraulic power to raise and lower the mast.
Tilt Cylinders	Provide hydraulic power to tilt the mast forward or back.
Hydraulic Levers	Control movement of the mast, tilt cylinders and any attachments the truck is equipped with.
Drive Axle	Transmits power from the transmission to the drive tires allowing the truck to move forward.

Drive Tires	Front tires, contain the brakes.
Steer Axle	Directs the rear wheels in steering.
Counterweight	Added to the rear of the frame to ensure that a load can be lifted at a given capacity.
Fuel Port	Component used to refuel gas and diesel engines.
Engine/Battery Compartment	Contain the engine systems for internal combustion trucks and the industrial battery for electric trucks.

Mast Terminology



Overall Lowered Height (OALH) | Free Fork Height (FFH) | Overall Raised Height (OARH) | Maximum Fork Height (MFH)

Overall Lowered Height (OALH)	The distance from the floor to the highest point on the truck (mast or overhead guard) when the forks are fully lowered.
Free Fork Height (FFH)	The distance the forks can be raised without increasing the overall height of the mast.
Overall Raised Height (OARH)	The distance from the floor to the top of the load backrest extension when the mast is fully extended.
Maximum Fork Height (MFH)	The distance from the floor to the top of the carrying surface of the forks when the mast is fully extended.
Lift Off	Closely associated with maximum fork height is the lift off dimension. This dimension accounts for about 4 to 6 inches of additional lift height necessary to store and retrieve pallets in the top rack position.

Mast Types

Simplex:	Consists of two rails: one outer and one inner rail. Free Fork Height (FFH) is at a minimum, usually 4-6 inches. Not recommended in higher tiered stacking applications.
Duplex:	Consists of two rails: one outer and one inner rail. Has greater FFH (50-60 inches) than a simplex mast due to the addition of a free lift cylinder. Can load and unload higher tiered stacks than simplex.
Triplex:	Consists of three rails: one outer and two inner rails. FFH is same as duplex (50-60 inches), but extends to greater heights. Can load and unload higher tiered stacks than duplex or simplex.

Quad: Consists of four rails: one outer and three inner rails. FFH is same as duplex or triplex masts (50-60 inches), but extends to much higher lift heights. The disadvantages of a quad mast is the extreme reduction in lifting capacity at these very high lift heights and decreased visibility through the mast.

Presence Detection System

Most Cat lift trucks include the Presence Detection System or PDS. This system reduces the risk of unintended movement of the lift truck when the operator leaves the seat. PDS includes the following items:

1. Transmission is disengaged when the operator leaves the seat.
2. Hydraulics are disengaged when the operator leaves the seat.
3. A seat belt icon appears on the truck's display when the operator has not fastened the seat belt.
4. A 30 second audible alarm sounds when the operator has not fastened the seat belt.
5. An indefinite alarm sounds when the operator leaves the seat and does not engage the parking brake.

Lift Truck Tires

Cushion tires:

- Smooth, dry surfaces
- Less traction than pneumatics
- Low ground clearance
- More compact dimensions
- Better lifting capacity at high lift heights
- Not intended for wet, rough or uneven surfaces.

Pneumatic tires:

- Indoor or outdoor use
- Better traction than cushion tires
- Greater ground clearance
- Larger dimensions than cushion tires
- Operates on various surfaces
- Optional solid or resilient.

The operating conditions will determine the type of tire that should be used in a specific application.

End of Section 1

Lift Truck Fundamentals: Course Review

1. All lift trucks are required to carry a warning that improper operation or maintenance could cause injury or death.

   True_____ False_____

2. Which is NOT a characteristic of a professional lift truck operator?

   A. Is responsible.

   B. Wears required protective clothing.

   C. Keeps vehicle under complete control at all times.

   D. Is capable of unloading a trailer in 15 minutes.

3. What are the differences between lift trucks and automobiles?

   A. Steering

   B. Vehicle weight

   C. Braking

   D. All of the above.

4. Cushion or solid tires operate best on what conditions?

   A. Wet, unbroken pavement

   B. Smooth, dry surfaces

   C. Railroad crossings

   D. Uneven or rough surfaces.

5. Federal OSHA regulations require all lift truck operators to be trained.

   True_____ False_____

6. You get better traction with a cushion tire lift truck than a pneumatic tire lift truck.

   True_____ False_____

7. If you are approaching a doorway, what mast dimension should you be aware of if you are operating your truck in a safe manner?

   A. Free fork height

   B. Overall height raised

   C. Overall height lowered

   D. Maximum fork height.

8. A lift truck equipped with a simplex mast may be used when higher tiered stacking of product is required.

   True_____ False_____

9. Name the five parts of the Presence Detection System:

A. _____

B. _____

C. _____

D. _____

E. _____