Forklift training

TAHOE SUPPLY COMPANY

Did you know that everyone cannot operate a lift truck?

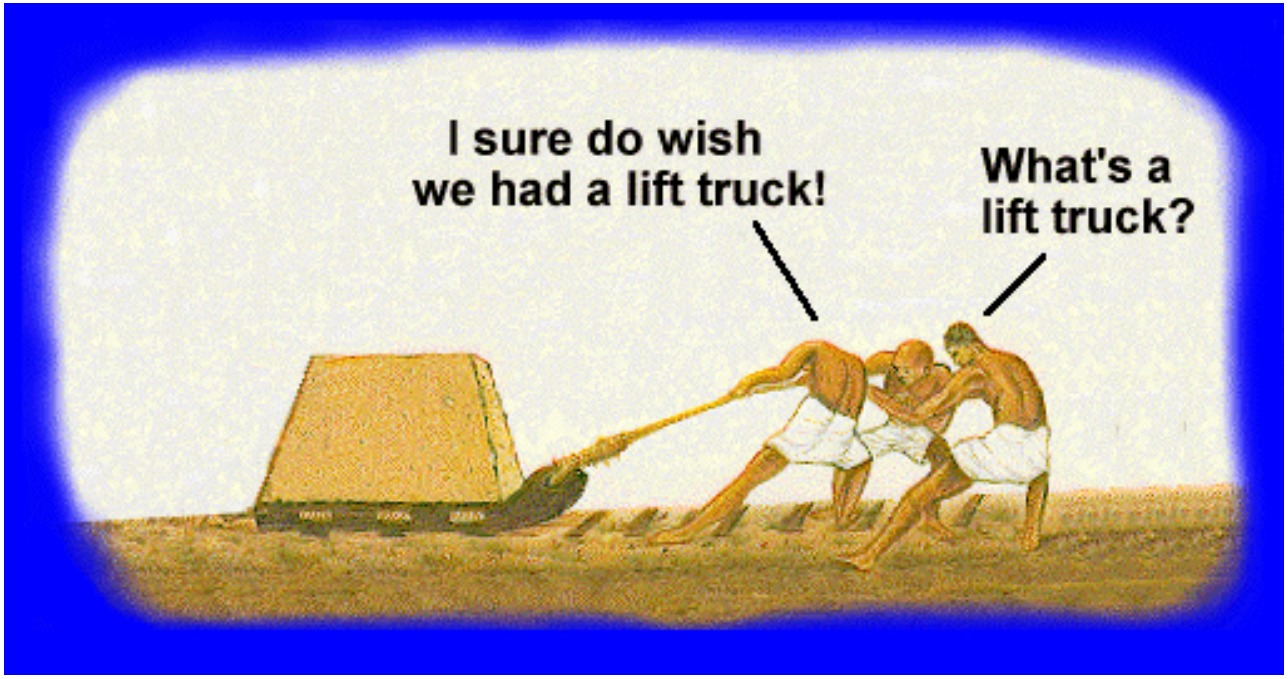
- Operating a lift truck (often called a forklift) is a specialized job that requires training and authorization by your organization as a qualified operator. Operating a lift truck is an important job. So important that the federal government requires that all lift truck operators be trained and authorized by their organizations. OSHA federal regulation CFR1910.178 states that "Only trained and authorized operators shall be permitted to operate a powered industrial truck."
- The purpose of this training is to help you become a qualified powered industrial truck (lift truck) operator -- an operator who has the knowledge and skills to operate a lift truck in a safe and professional manner. So let's get started

Because operating a lift truck is an important job, your training will focus upon two major areas:

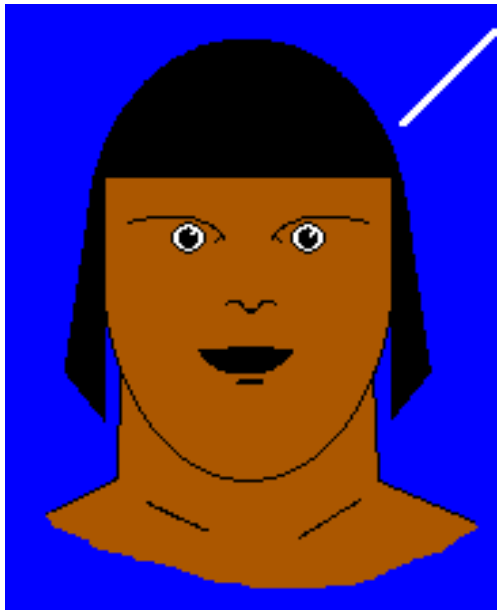
- Lift Truck Knowledge - During this CBT program, you will learn about:
  - types of lift trucks
  - lift truck operation
  - lift truck safety
  - lift truck maintenance
  - lift truck refueling and recharging. Operating Skills - You will also have an opportunity to gain hands-on experience operating a lift truck in a variety of situations.

- If you qualify at the end of your training, your employer will award you a lift truck certificate of achievement.

Since the beginning of time, man has needed to lift and move heavy objects.



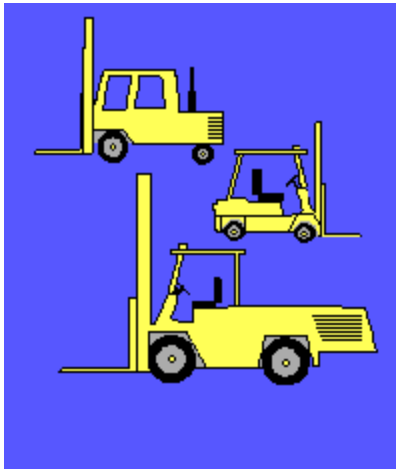
A lift truck?



- I, Sedak, dream that one day in the future, people will operate machines that will lift hundreds, no, thousands of pounds. These machines will allow one person to do in a day what it takes us weeks to do. These machines will have wheels, be powered by gas or electricity, and have large forks on them which can slide under large loads. The person who will operate this machine will be like a superhuman.

  Ahhh, Sedak. I think you've been in the sun too long!

Types of lift trucks

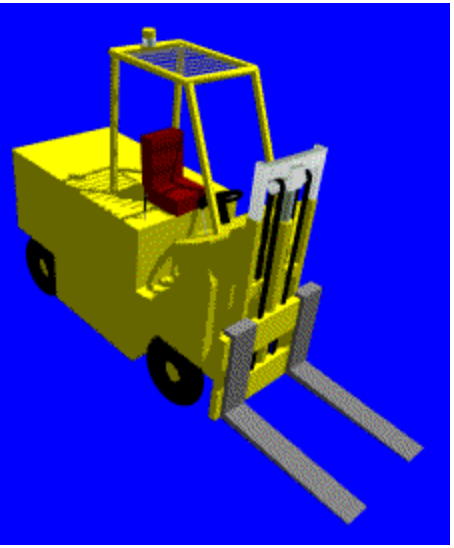


- If Sedak were alive today, he would be amazed by the number of different types of lift trucks used today. There are four basic types of lift trucks:
- 1. Diesel powered
  2. Electric powered
  3. Gasoline powered
  4. LP-Gas powered
- Different types of environments require different types of lift trucks. Check with your supervisor or safety office to confirm that you are using the correct type of lift truck for your work area.

Other Types of Equipment

- There are many types of powered industrial trucks that are used for lifting and transporting loads. The focus of this course, however, is on sit down rider counterbalanced lift trucks. It should be noted, however, that the safety precautions presented in this course are applicable to any type of powered industrial truck.

The modern lift truck is an amazing piece of machinery.

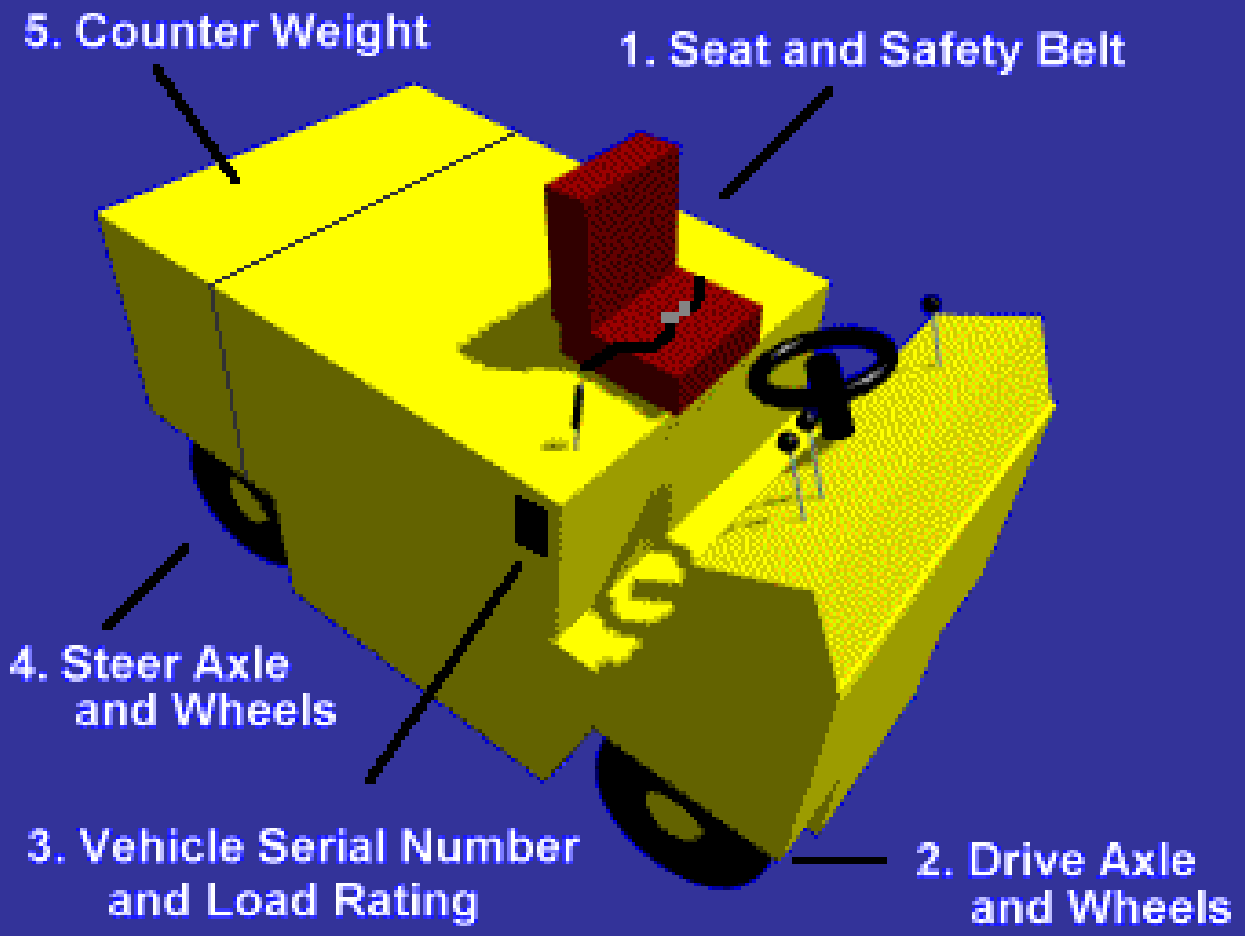


Did you know that lift trucks:

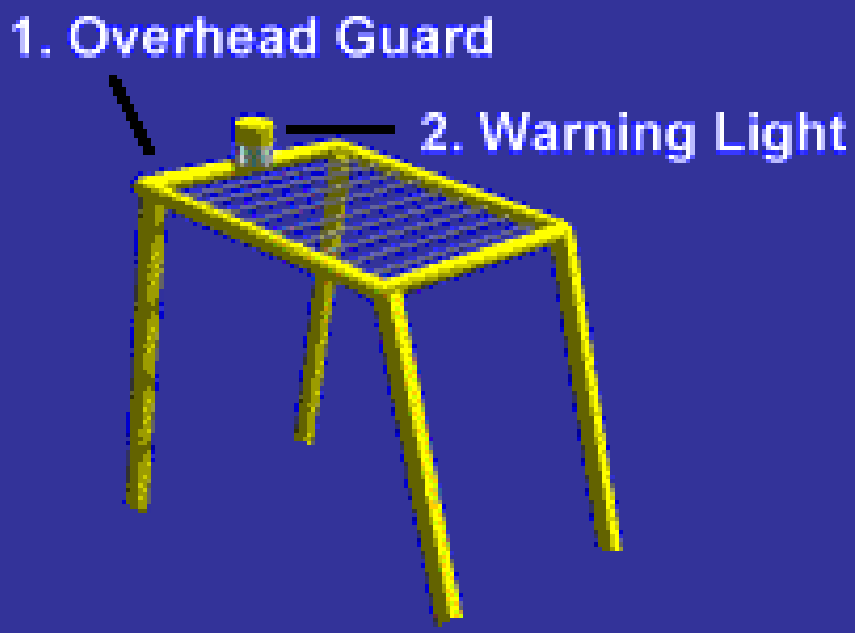
- Often weigh more than a car or light truck?
- Are extremely powerful?
- Use rear wheel steering?
- Can turn in a tighter circle than most vehicles?
- Are often less than four feet wide?

Let's take a few moments to look more closely at the major parts of a lift truck..

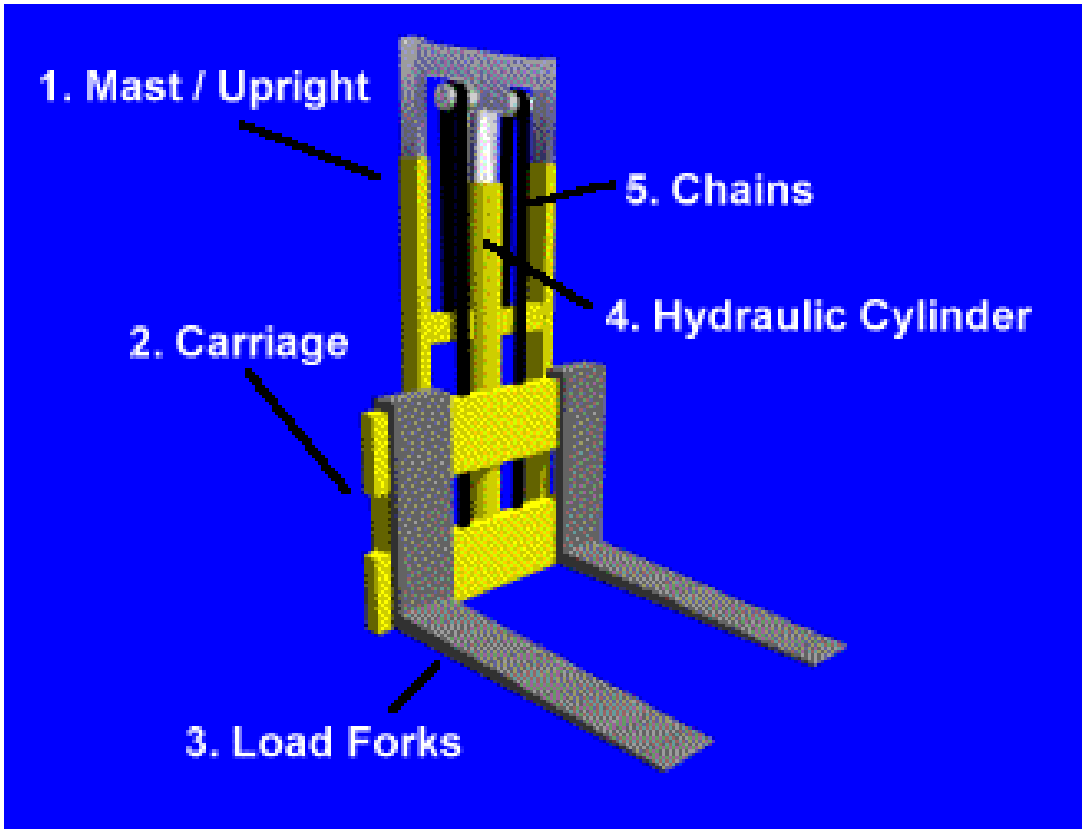
Truck Body


5. Counter Weight
1. Seat and Safety Belt
4. Steer Axle and Wheels
3. Vehicle Serial Number and Load Rating
2. Drive Axle and Wheels

Overhead Guard

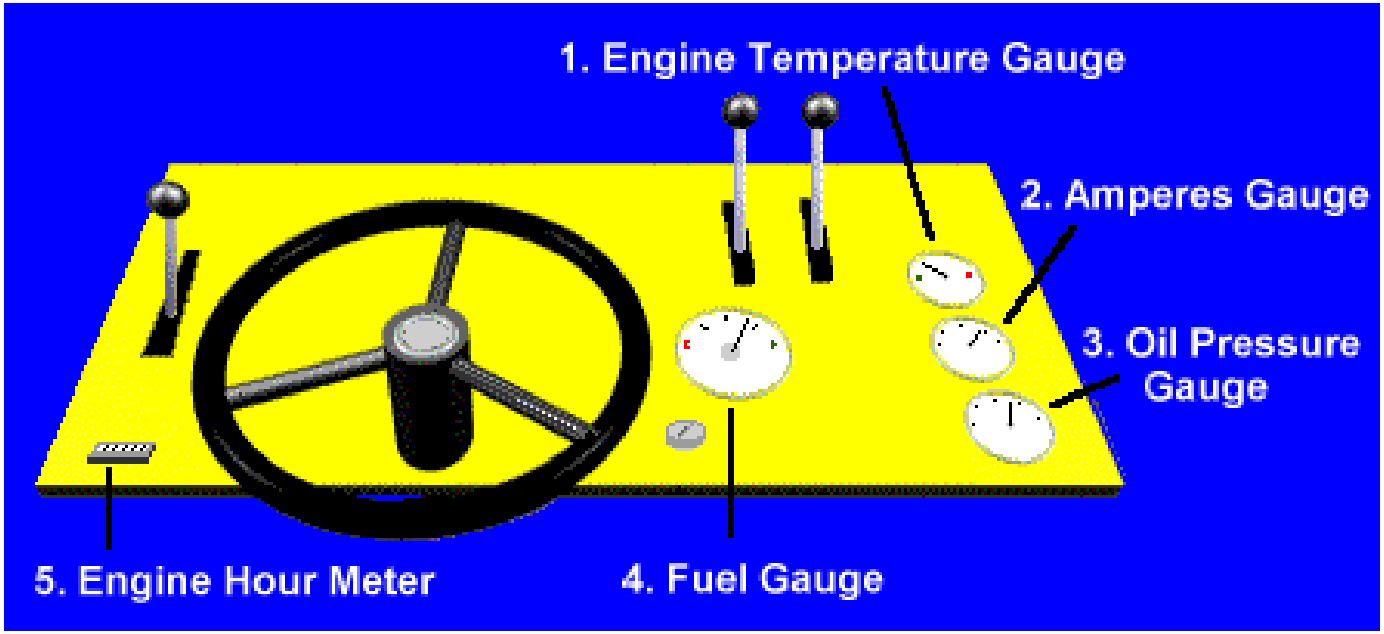


Hydraulic Lift



For more information, study the operator's manual for the specific lift truck you will be operating.

Gauges and How They are Read
(Gasoline, LP & Diesel Powered)



Truck Gauges and How They are Read

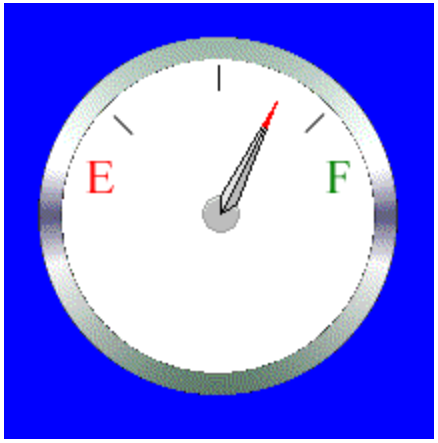
(All Industrial Trucks)

Engine Hour Meter

The Engine Hour Meter records the total number of hours that an engine has been used. Because this information is used to schedule maintenance, you will need to record this number on your Daily Inspection Report.

Truck Gauges and How They are Read

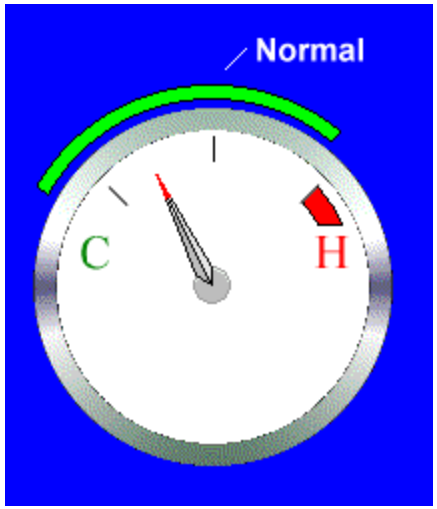
(Gasoline, LP & Diesel Powered)



- The Fuel Gauge indicates the fuel level and is similar to those found in cars and trucks. "F" means full, while "E" means empty. Always check the fuel level of your lift truck during your daily inspection.

Truck Gauges and How They are Read

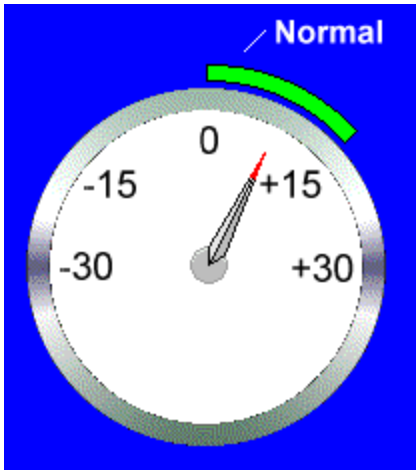
(Gasoline, LP & Diesel Powered)



- The Engine Temperature Gauge indicates the engine temperature and is similar to those found in cars and trucks. "H" means hot, while "C" means cold. Never operate a lift truck which is overheating. Turn it off and notify your supervisor or maintenance department.

Truck Gauges and How They are Read

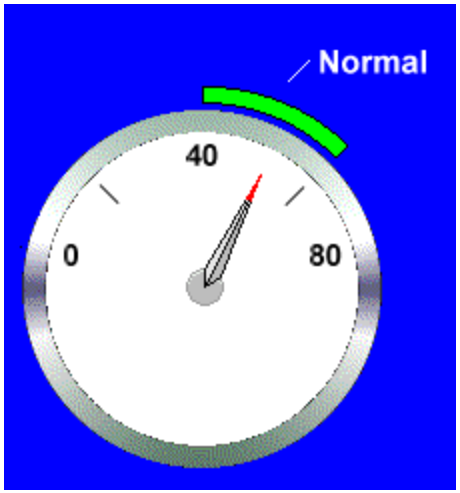
(Gasoline, LP & Diesel Powered)



- The Amperes Gauge indicates that the engine's electrical generator is producing electricity. (+) readings mean the generator is working. (-) readings mean something is wrong, and that battery power is being used to run the engine. Always return a lift truck for maintenance, if the amperes gauge is showing (-) readings.

Truck Gauges and How They are Read

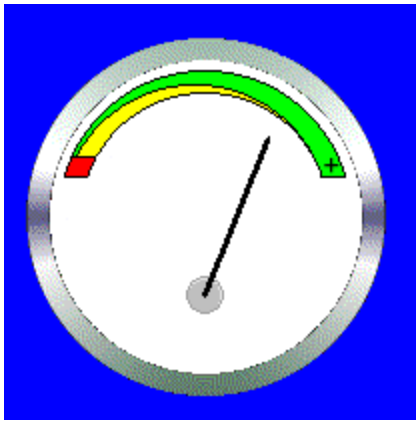
(Gasoline, LP & Diesel Powered)



- The Oil Pressure Gauge indicates the oil pressure inside the engine. Oil pressure readings that are low or drop to "0" indicate that there is a serious problem with the engine. Never operate a lift truck with oil pressure problems. Turn the engine off, and notify your supervisor or the maintenance department.

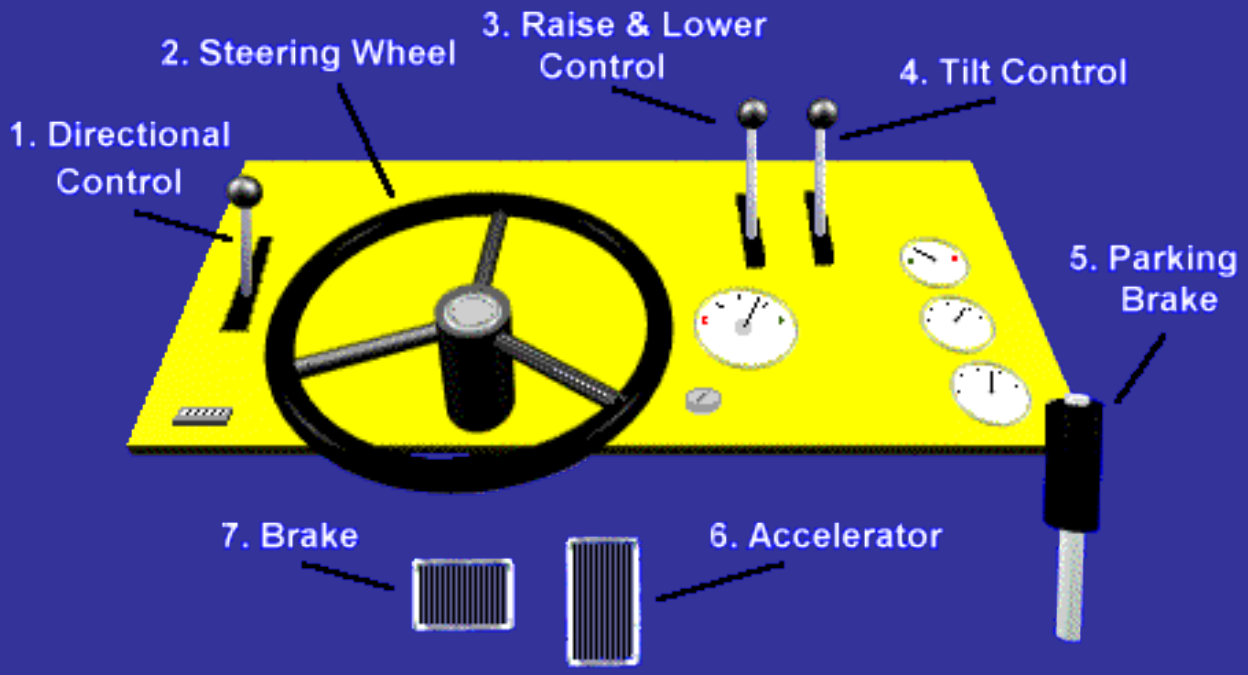
Truck Gauges and How They are Read

(Electric Power)



- Electric powered trucks have a Battery Capacity Gauge, instead of a fuel gauge.

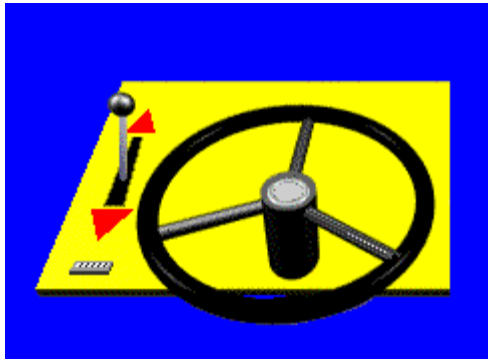
Truck Controls



Truck Controls
(All Industrial Trucks)
Steering Wheel

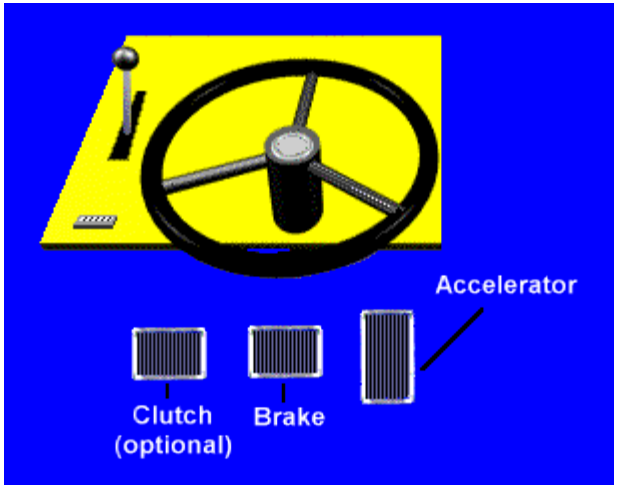
- The Steering Wheel in an industrial truck operates like one in a car or truck.

Truck Controls
(All Industrial Trucks)
Directional Control



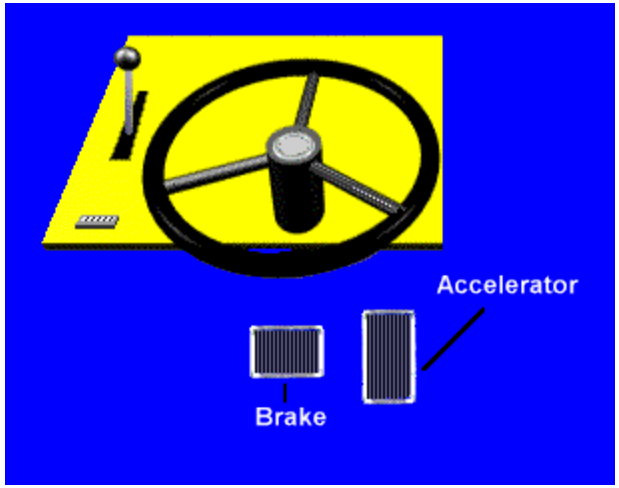
Most trucks are equipped with a Directional Control, which allows you to select to move the truck forward or backward.

Truck Controls
(Gasoline, LP & Diesel Powered)
Pedals



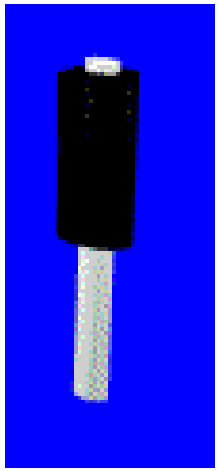
All trucks have an Accelerator pedal and a Brake pedal. Some trucks have a Clutch, which allows shifting into higher forward gears.

Truck Controls
(Electric Powered)
Pedals



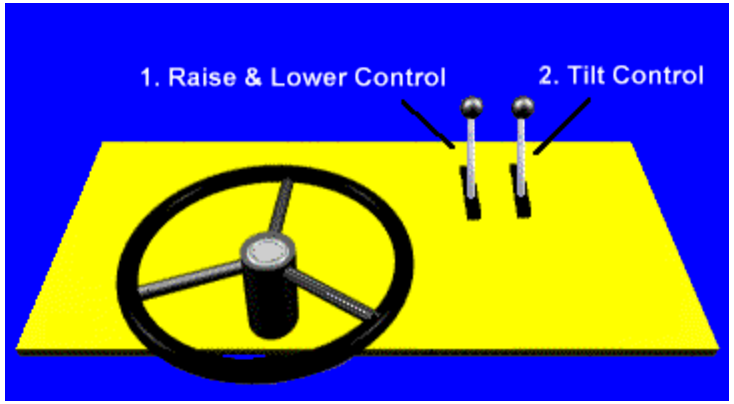
Electric powered trucks have an accelerator pedal and a brake pedal.

Truck Controls
(All Trucks)
Parking Brake



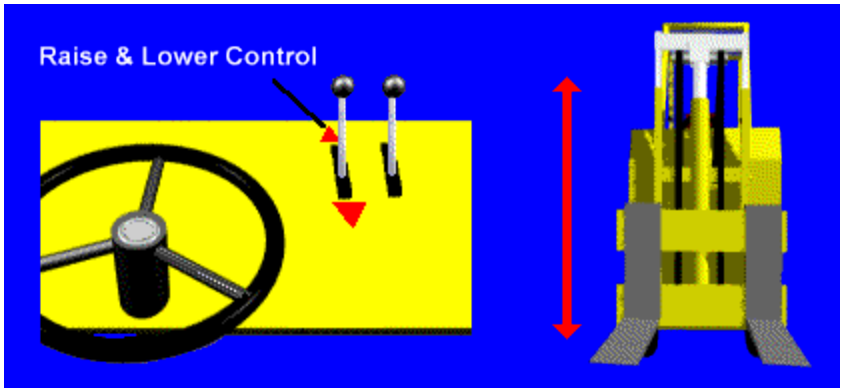
All trucks are equipped with a Parking Brake. You should always set the parking brake whenever you leave a truck. NOTE: the top of some brake handles may be turned to adjust the tightness of the brake. Be sure to tighten the parking brake so there is no danger of the truck rolling when it is left unattended.

Hydraulic Lift Controls
(All Industrial Trucks)



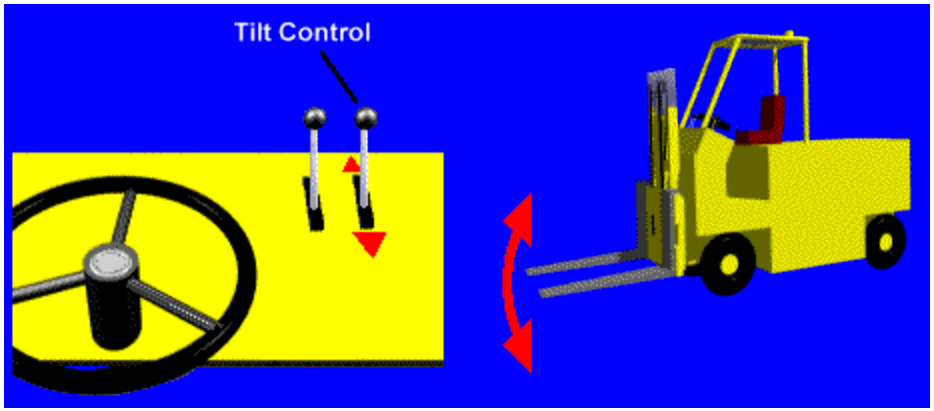
All trucks are equipped with two basic hydraulic lift controls.

Hydraulic Lift Controls
(All Industrial Trucks)
Raise & Lower Control



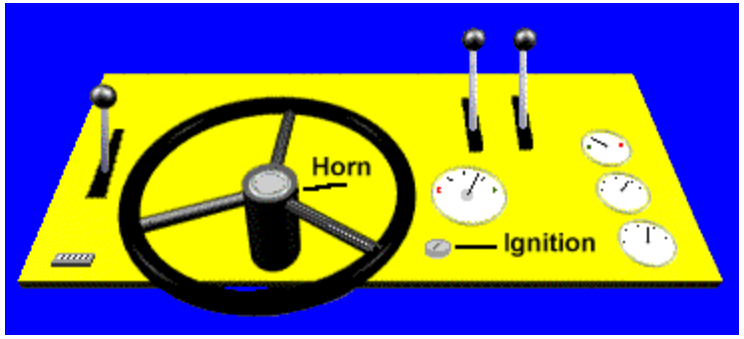
The Raise and Lower Control allows you to raise the forks up or lower the forks down. Pull the lever back, and the forks will go up. Push the lever forward, and the forks will go down.

Hydraulic Lift Controls
(All Industrial Trucks)
Tilt Control



- The Tilt Control allows you to tilt the forks up or down. Push the lever forward, and the forks will tilt down. Pull the lever back, and the forks will tilt up.

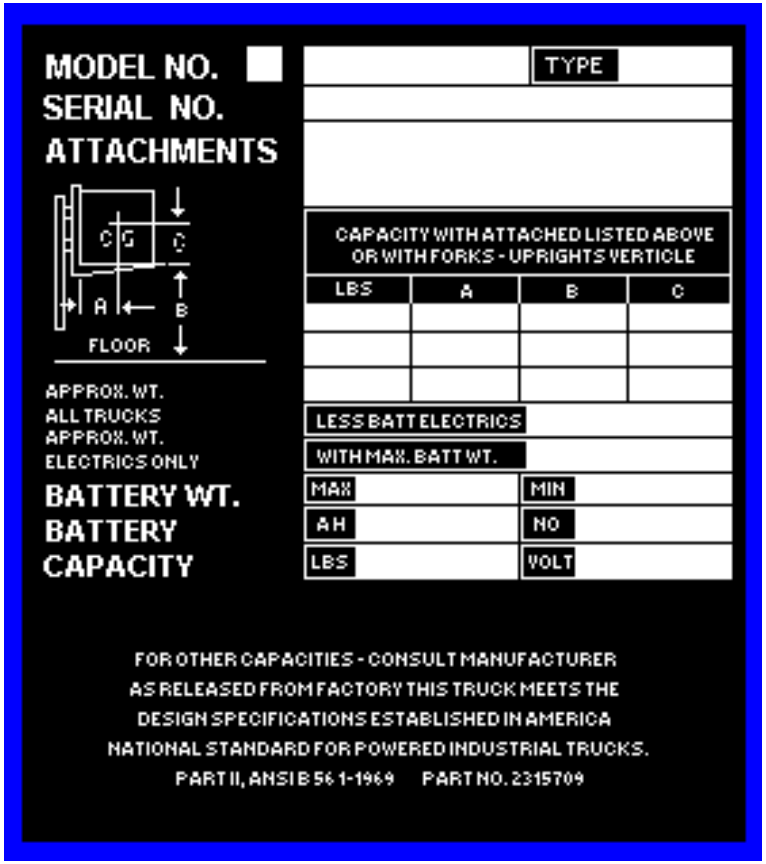
Switches
(All Industrial Trucks)



- Trucks are equipped with a horn to sound warnings to others who may be in your operating area.
- Ignition or Turn On / Off switch. Most industrial trucks require that a key be used to start and turn off the truck.

- Because there are many different types of industrial trucks (lift trucks) used today, take time to read the operator's manual for the specific truck(s) you will be operating. Be sure to learn the location and operating procedures for all:
- * Gauges
  * Controls (levers and pedals)
  * Switches

Data Plates



- All industrial trucks have a Data Plate attached to the truck body. Data plates display important information concerning the truck's:
- - Type
  - Capacity
  - Load Center
  - Truck Weight
- Read and remember the data for the trucks you operate.

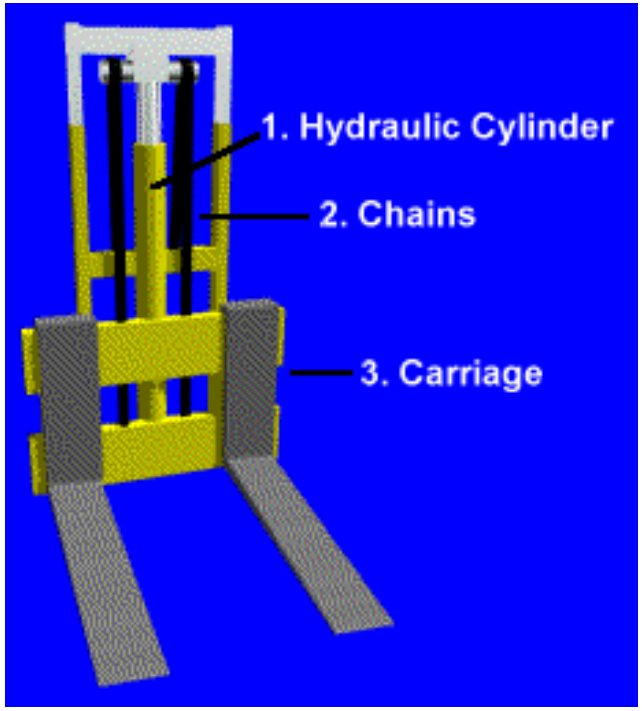
Tire Types

Solid tires are designed for use inside on smooth, dry surfaces. They should not be used outdoors or on rough surfaces.

Pneumatic tires (tires filled with air) are designed for use on improved surfaces, and may be used outdoors, as well as indoors.

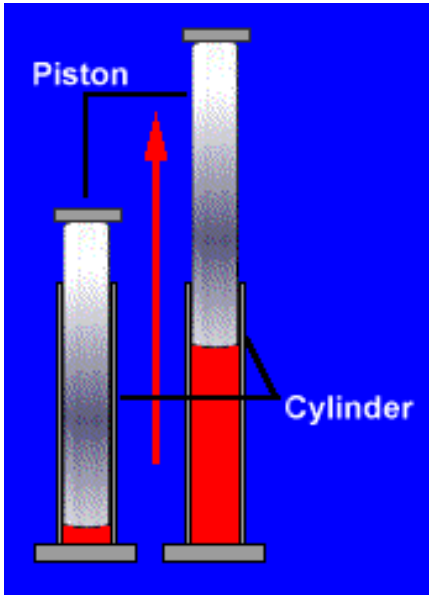
- Tires, like industrial trucks, are designed for specific types of jobs. Always check to make sure you are using the right type of equipment for each job.

Lifting System



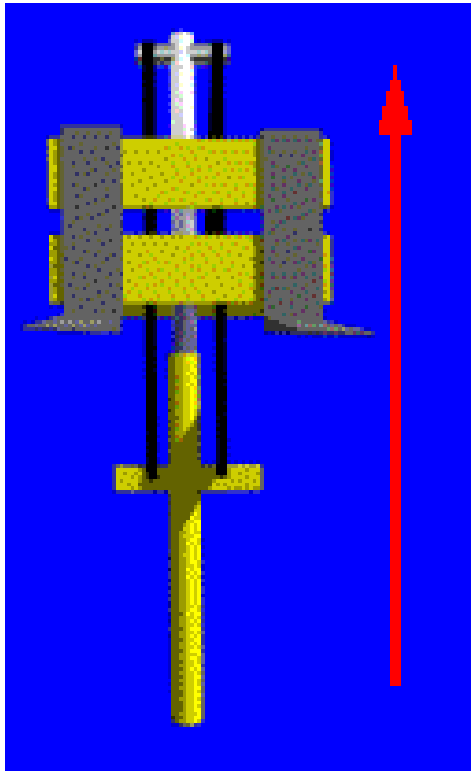
- The lifting system on lift trucks includes chains attached to a hydraulic cylinder.

Lifting System



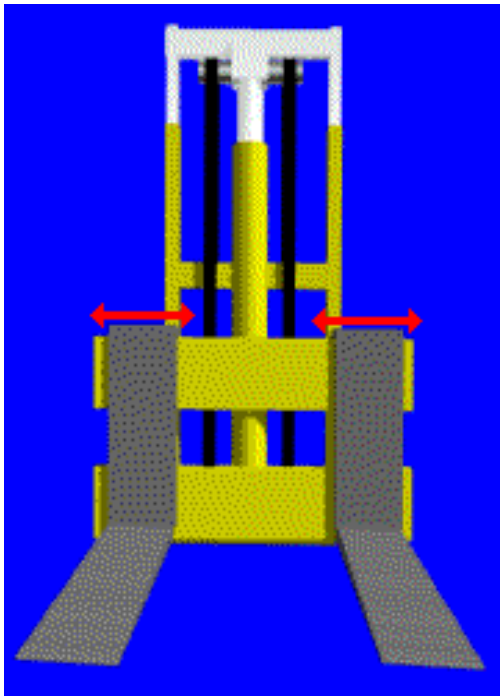
- When the cylinder is filled with hydraulic fluid, it forces the piston to move upward.

Lifting System



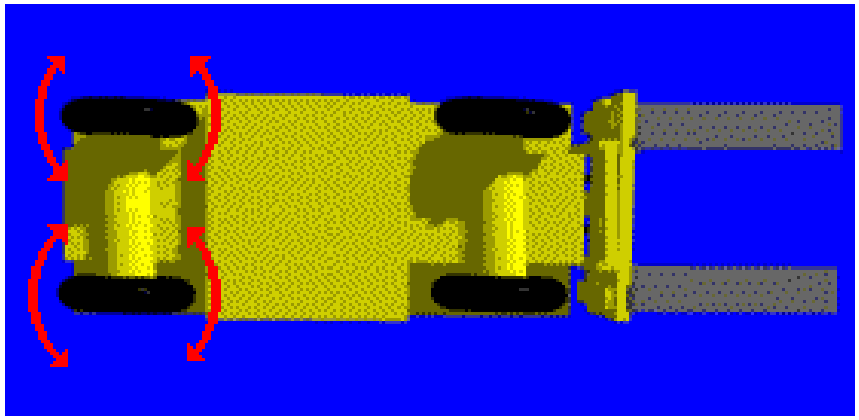
- The upward movement of the piston and the chains lift the forks to the desired level.

Lifting Forks



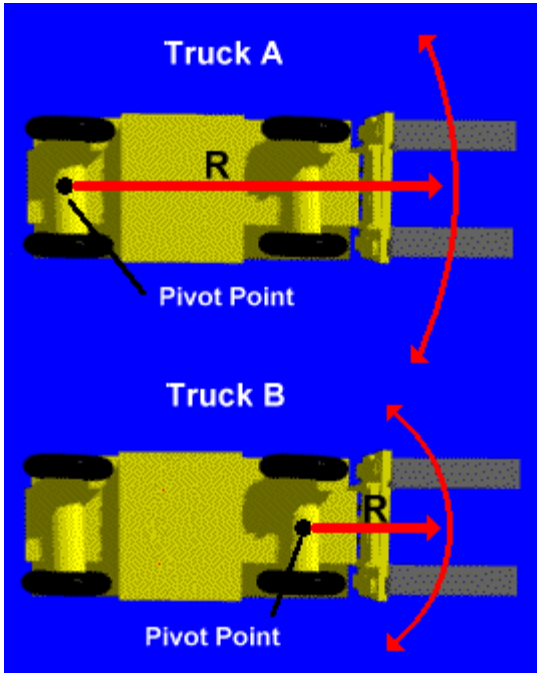
- The lifting forks on your lift truck can be moved from side to side to adjust for different types of loads. While most lift trucks require that this be done by hand, some have special controls for adjusting the forks.

Rear Wheel Steering



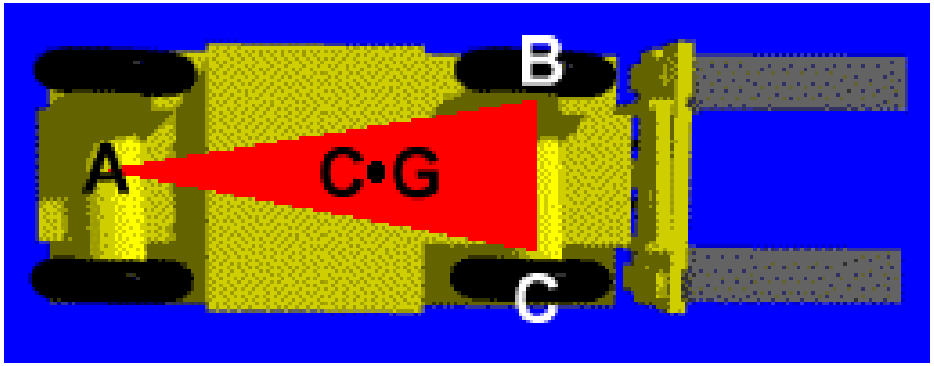
- Unlike a car or truck, lift trucks use the rear wheels for steering.

Rear Wheel Steering



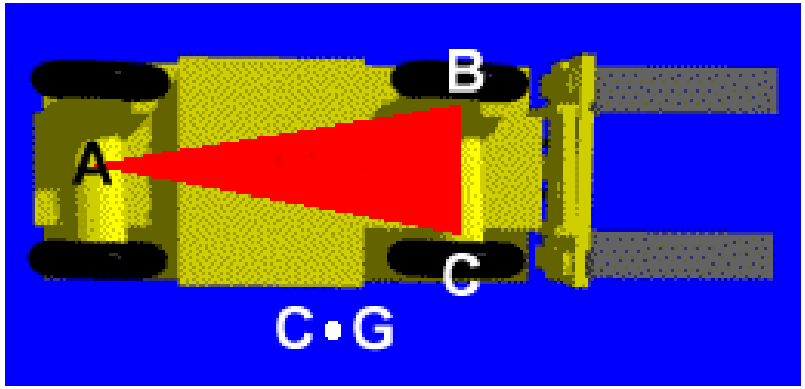
- Rear wheel steering gives you greater control of the truck when you are using the forks. Note the larger turning arc produced by truck "A" using front wheel steering versus the arc produced by truck "B" using rear wheel steering.

Stability Triangle



- If you were to raise a lift truck up and look at its underside, you would see that the support points for the truck are located at points A, B, and C. The triangle formed between points A, B, and C is called the Stability Triangle. The lift truck will not tip over as long as the center of gravity remains inside the triangle. (The center of gravity is the point within a lift truck where there is equal weight all around it.)

Stability Triangle



However, if the center of gravity shifts outside the stability triangle, the lift truck will tip over. The center of gravity within a lift truck can be moved by:

*Traveling with an elevated load;

*Trying to carry too heavy a load;

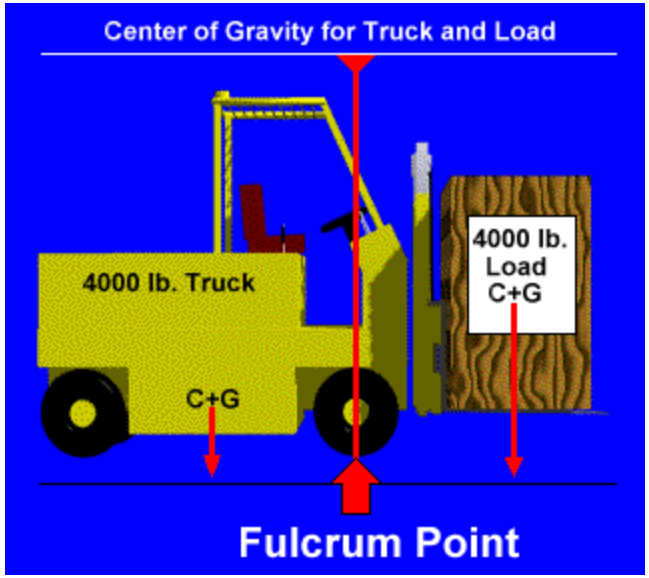
*Trying to turn the lift truck while it is moving too fast;

*Operating the lift truck on a hill or incline;

*Starting or stopping too fast;

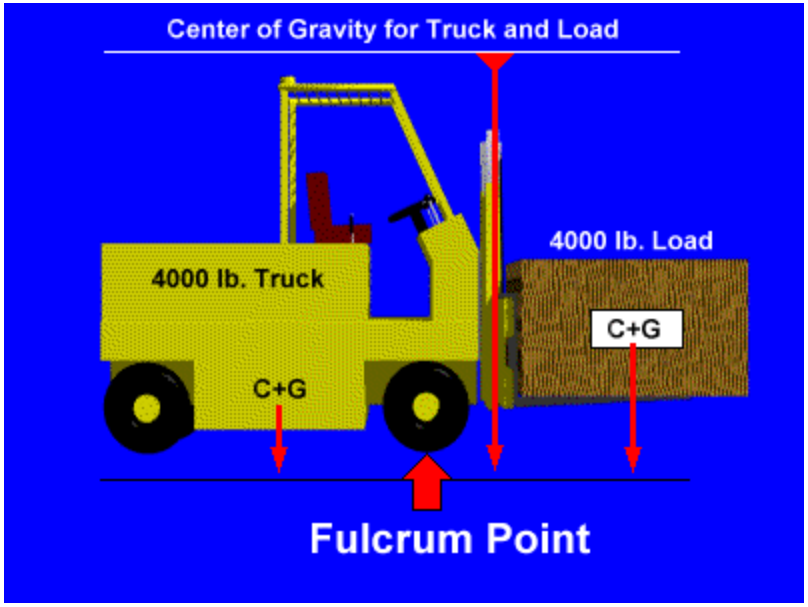
*The jerky operation of the hydraulic system.

Load Capacity



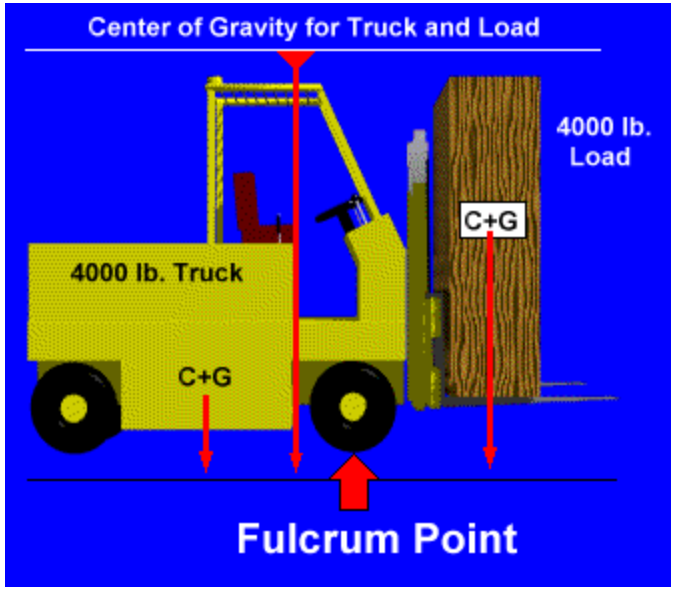
- The front wheels of a lift truck serve as the Fulcrum Point between the weight of the truck and the weight of the load being carried. If the weight of the load is equal to the weight of the truck, with equal distances between the centers of gravity, it is possible to "seesaw" a lift truck on its front wheels.

Load Capacity



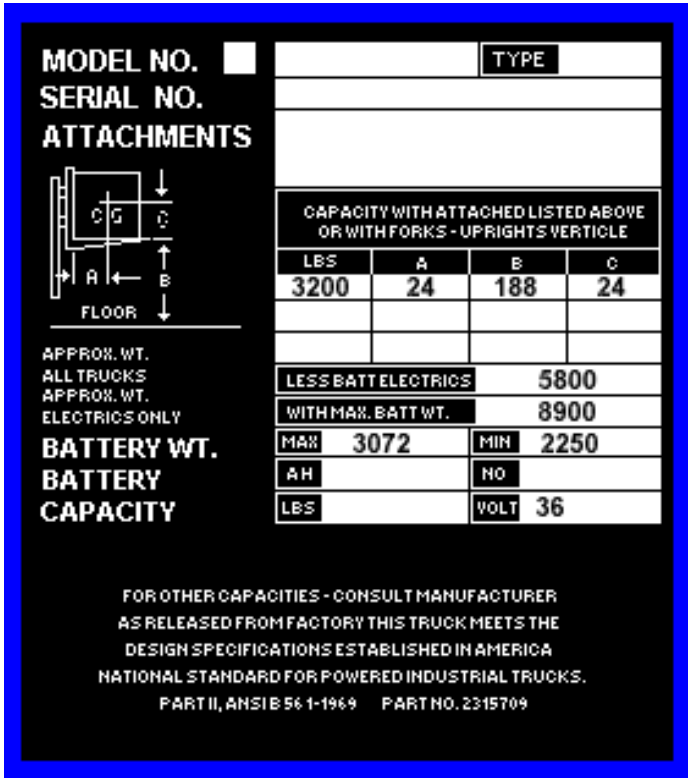
- If we rearrange the load so that the load's center of gravity is farther away from the fulcrum point, this will cause the center of gravity for both the truck and the load to shift beyond the front wheels of the truck, and the truck will tip forward.

Load Capacity



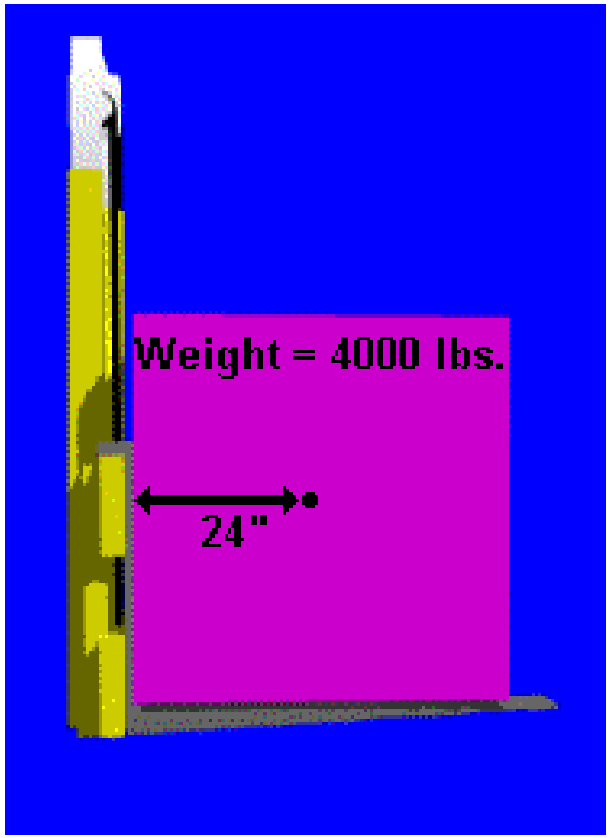
- If, on the other hand, we arrange the load so that the load's center of gravity is closer to the fulcrum point, this will cause the center of gravity for both the truck and the load to shift behind the front wheels of the truck. With this arrangement, there is no danger of the truck tipping forward.

Load Capacity



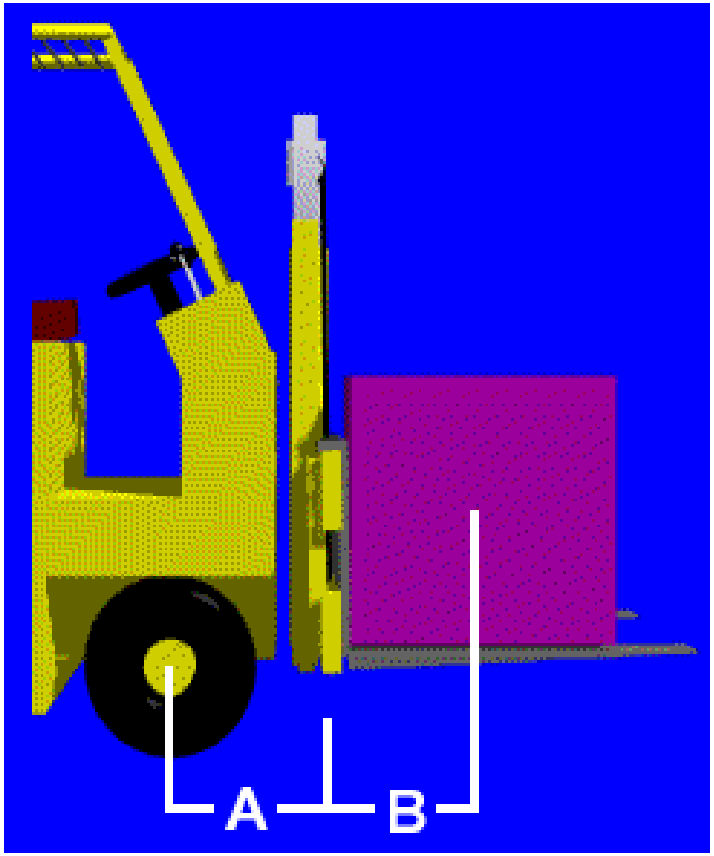
- Your most immediate source of information concerning the safe load capacity of a truck can be found on its data plate.
- The plate will give you information concerning the load capacity of the truck in pounds and the load center in inches.
- The lifting capacity described on this plate is 3200 pounds with an LC of 24 inches, up to a height of 188 inches from the floor.

Load Capacity



- For example, a truck might have a capacity of 4000 pounds at a 24 inch load center (LC). This means that the truck can lift 4000 pounds, if the center of gravity of the load is 24 inches from the face of the forks.

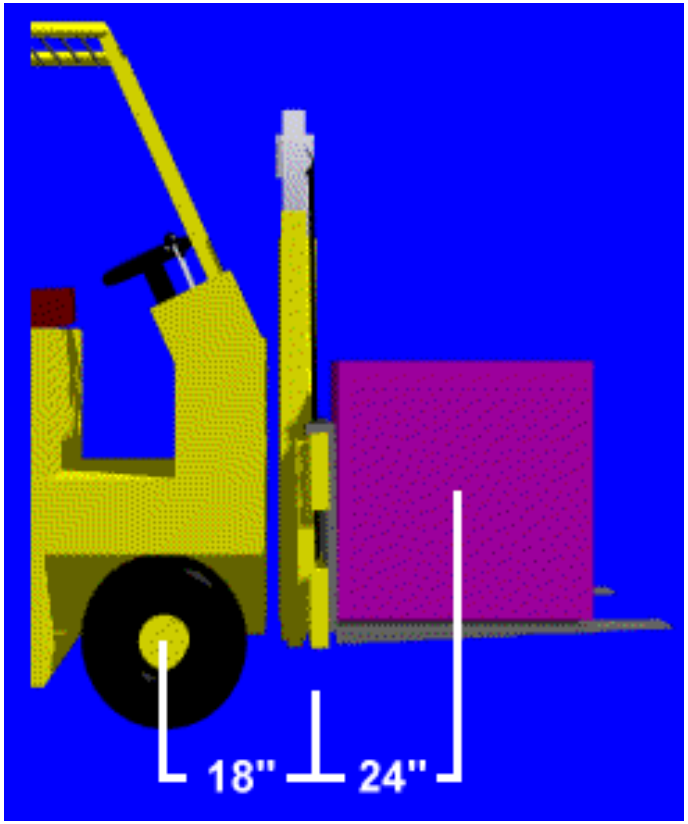
Inch Pound Equation



- There will be times, though, when the load center will be greater than 24". When this happens, you must determine the maximum capacity for the truck using the new load center. To do this, you must use the "Inch Pound Equation".
- **(A + B) x C = Inch Pounds**
- Where:
  A =the distance (in inches) from the center of the front wheels to the face of the forks

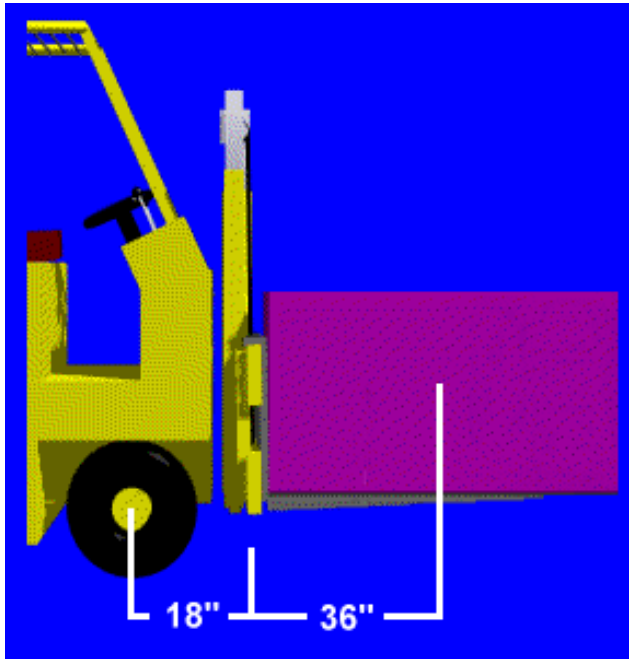
  B =the Rated Load Center (LC) (in inches)C =the truck's capacity at the Rated Load Center (in pounds)

Inch Pound Equation - Example



- You operate a lift truck that is rated at 5000 lbs. @ 24" LC. You must lift a load with an LC of 36". The distance from the center of the front wheels to the face of the forks is 18". What is the maximum weight you can lift?
- To solve the problem, you must break the problem into two steps.
  - Step 1:
    - You must first determine the maximum Inch Pound capacity of the truck. To do this, you must use the equation (A + B) x C = Inch Pound, where A = 18", B = 24", and C = 5000 lbs.
- (18" + 24") x 5000 lbs. = Inch Pounds
  (42") x 5000 lbs. = Inch Pounds
  210,000 Inch Pounds

Inch Pound Equation - Example

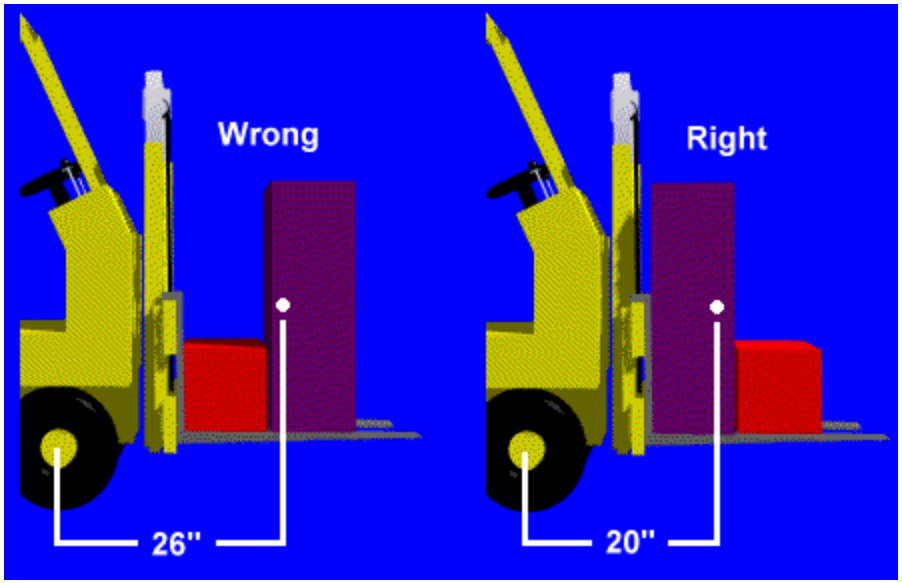


- Step 2:
  - Once you have determined the maximum Inch Pound capacity of the truck, you must now determine a new lift capacity for the truck using a Load Center of 36" instead of 24". Again, you need the equation (A + B) x C = Inch Pound, where A = 18", B = 36", C = ? lbs. and Inch Pounds = 210,000
- (18" + 36") x ? lbs. = 210,000 I.P.
  (54") x ? lbs. = 210,000 I.P.
- To determine the new capacity, you must divide 210,000 Inch Pounds by 54".
- ? lbs. = 210,000 Inch Pounds / 54"
- The new lift capacity of the truck is 3,888 lbs.

Attachment Weight

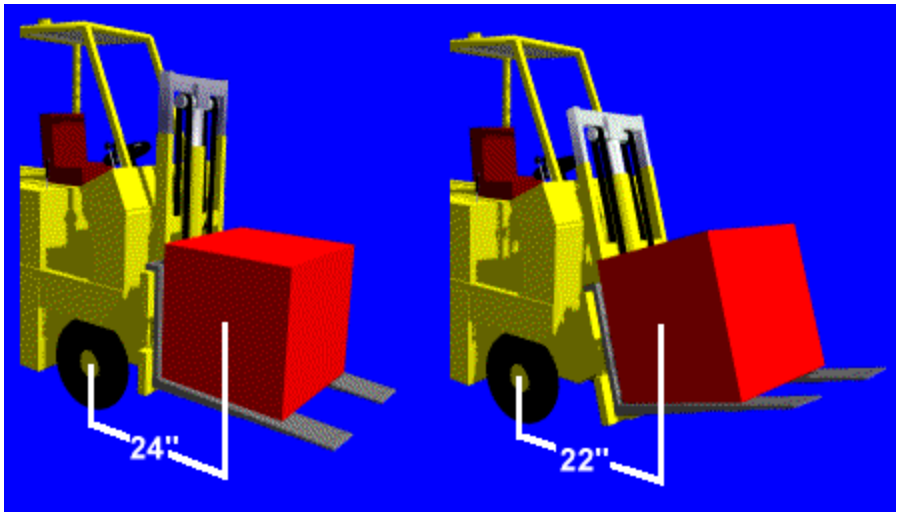
- Because you may change attachments (from forks, to barrel clamps, to a side loader), always compute the weight of the attachment as part of the load. For specific information concerning the weight of various attachments, consult the operator's guide or contact the manufacturer of the attachment.

Load Centering



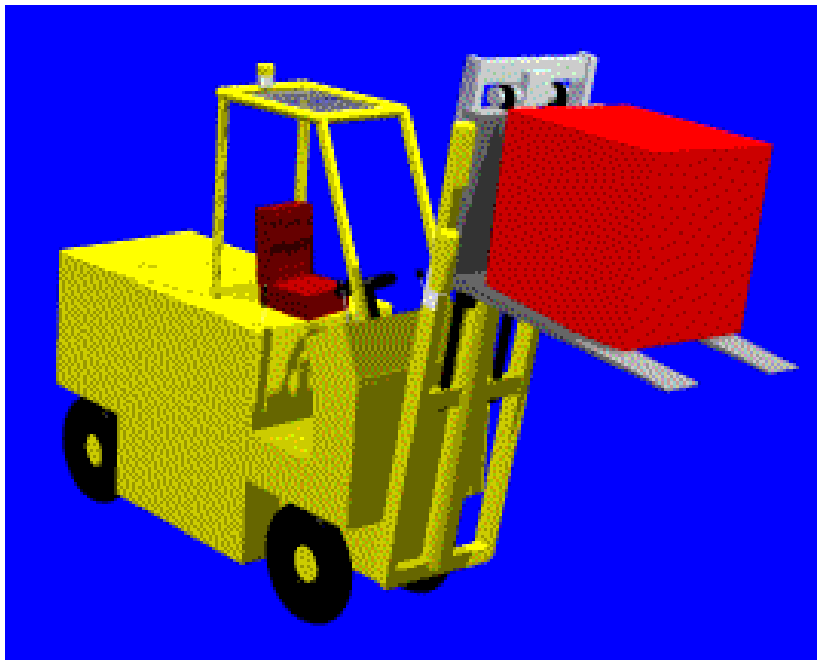
- When lifting and carrying several loads at once, always place the heaviest load against the back of the forks. Placing the heaviest loads near the back of the forks shifts the load center closer to the front wheels and makes for a more stable load.

Load Centering



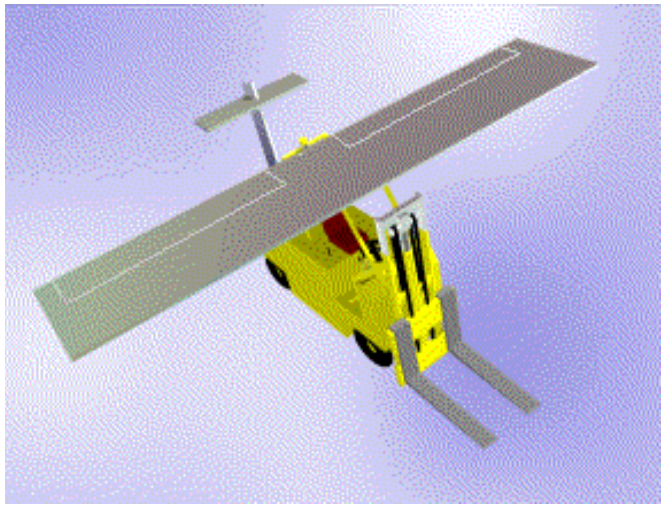
- You can increase the stability of a load by tilting the forks back. Tilting the forks back moves the load center closer to the front wheels.

Load Centering



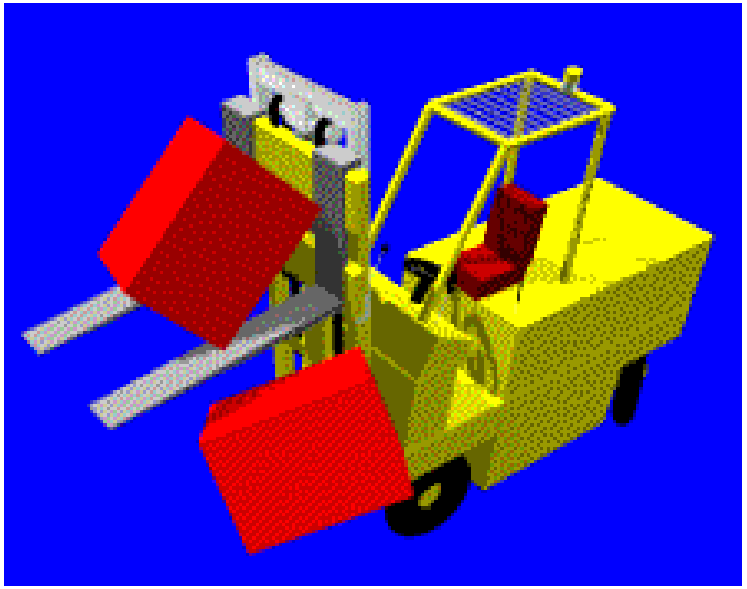
- On the other hand, tilting the forks forward shifts the load center away from the front wheels and creates a less stable load, especially when the forks are raised. You should never tilt the forks forward when they are raised, except to deposit a load.

Speed



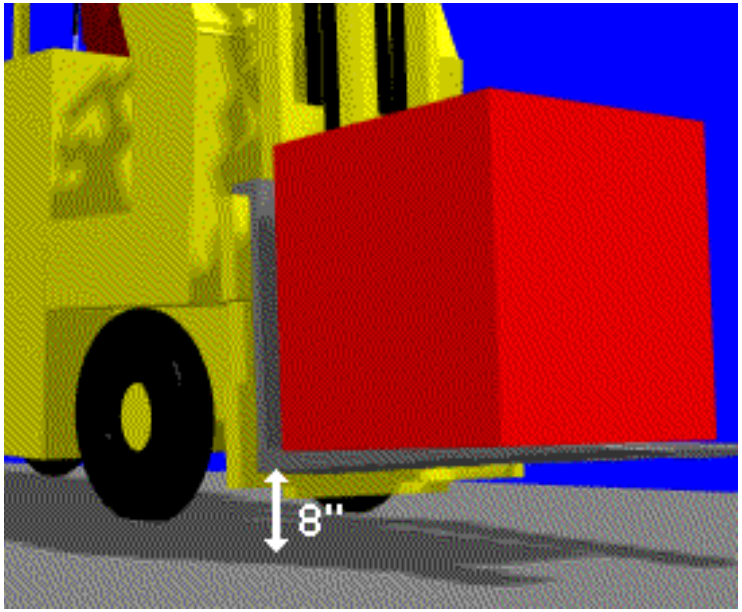
- Keep in mind that you are operating a lift truck, not a race car or jet fighter. In case of an accident, you don't have an ejection seat. Always start and stop smoothly, and KEEP YOUR SPEED DOWN!

Quick Turns



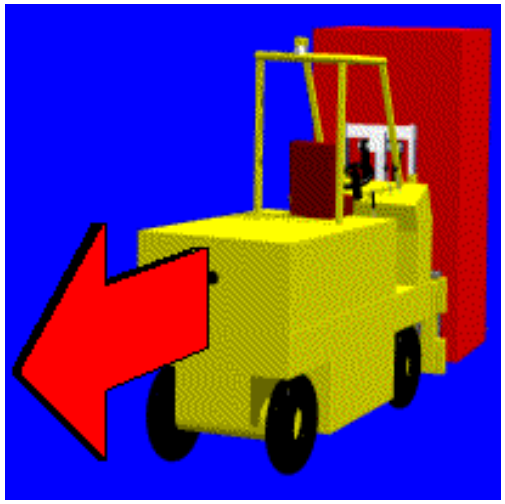
- The higher you lift a load, the more unstable it becomes. Always take extra care when making sharp turns with a raised load.

The 8 Inch Rule



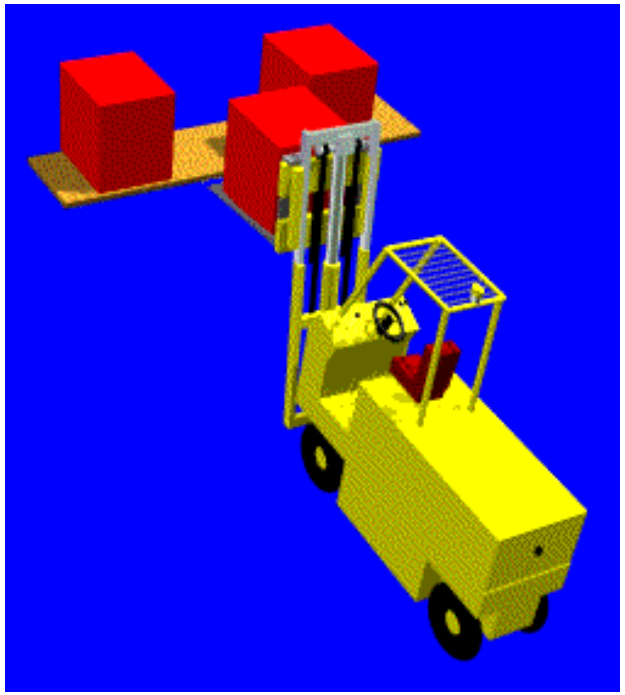
- When transporting loads, you should never raise your load more than 8 inches from the ground. Keep your load tilted back.

If Your View is Blocked



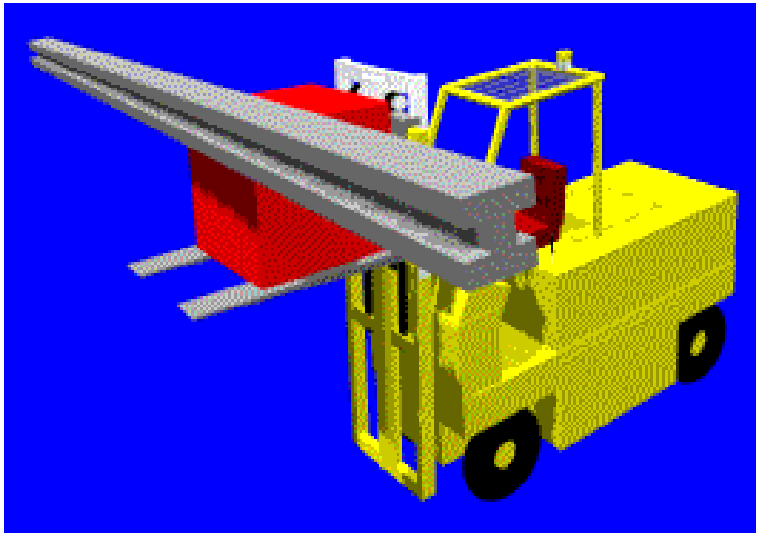
- If a load blocks your view, travel in reverse.

Right Angle Stacking



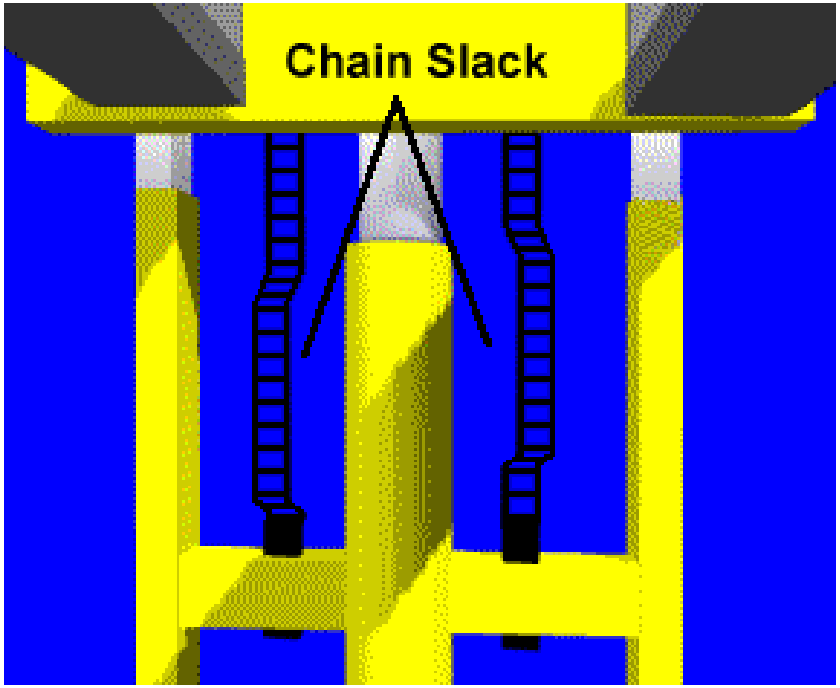
- There are times when you need to move your truck with a raised load, such as when you are right angle stacking. SLOW DOWN. Keep in mind that the higher you raise your load, the less stable it is.

Overhead Clearance



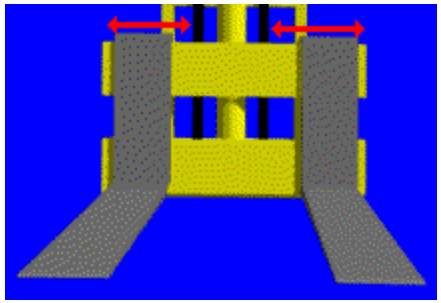
- As you lift and transport loads, it is important to watch for overhead obstructions such as beams and cables.

Chain Slack



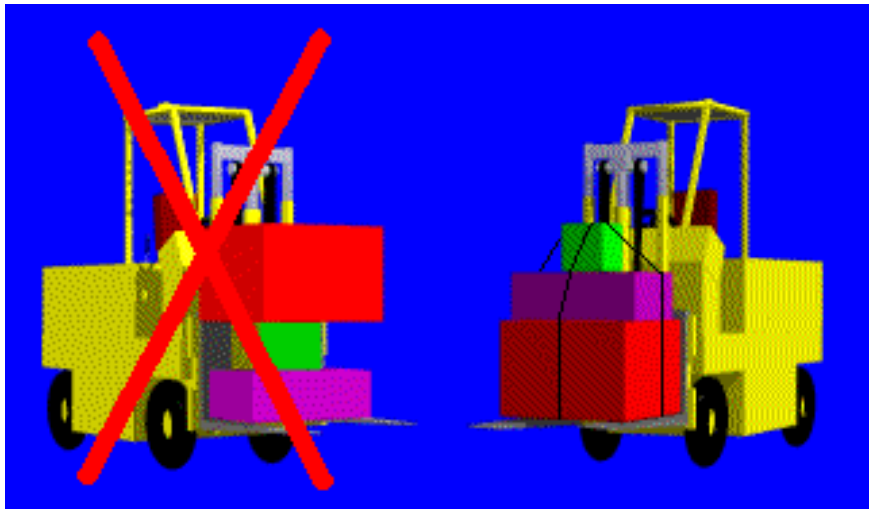
- Chain slack means there is a problem in the lift mechanism. You should always stay alert to any problems with the lift mechanism of your lift truck. When problems do occur, DO NOT ATTEMPT to repair the chains or hydraulic system. Call maintenance at once.

Center Your Loads



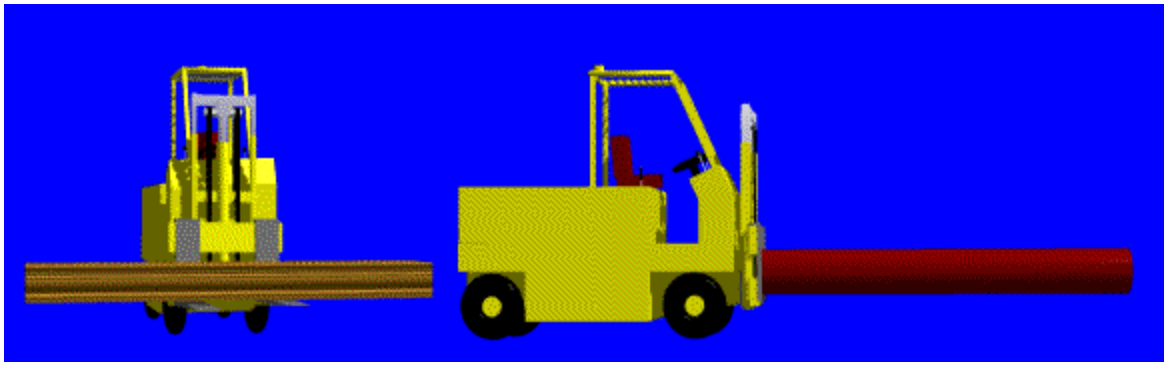
- Take time to adjust the forks on your lift to fit the load you will be carrying. Adjusting the forks outward for wide loads, helps you to center the load, and make it more stable.

Loose Loads



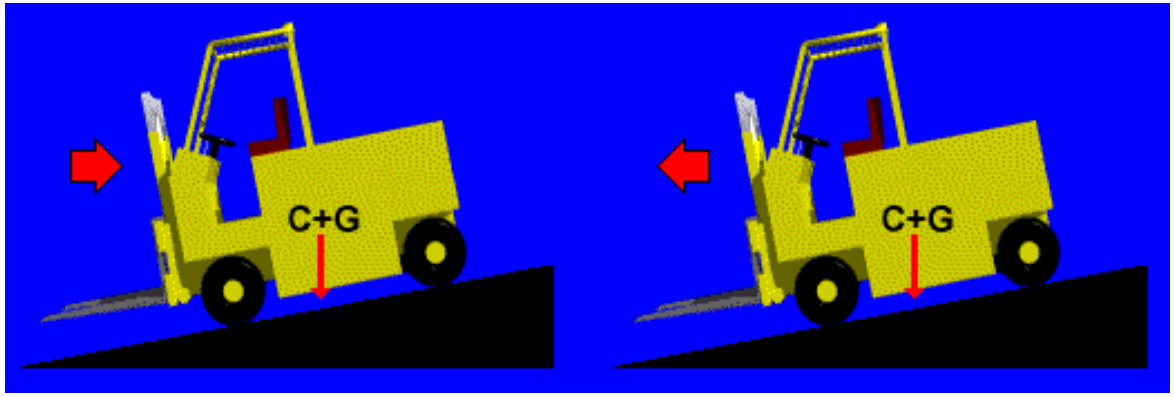
- Never try to lift or carry loose or poorly stacked loads. Correctly stack and bind loads to prevent an accident that could damage the load, your truck, pedestrians or YOURSELF.

Wide and Long Loads



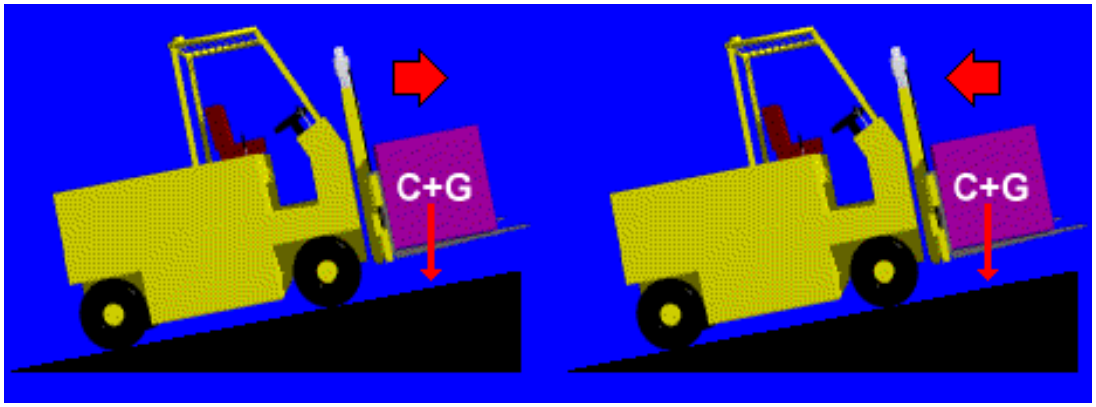
- Wide and long loads are more unstable than other loads. Wide loads require that you keep them low and watch the balance of the load. When lifting and carrying long loads, keep in mind the load center and lift capacity of your truck. With both wide and long loads, you will need more room to maneuver. So, slow down and watch your clearance.

Driving on Ramps and Inclines



- If you are driving an empty truck, travel in reverse up an incline, and forward down an incline. Note that the center of gravity for the truck is above the front drive wheels.

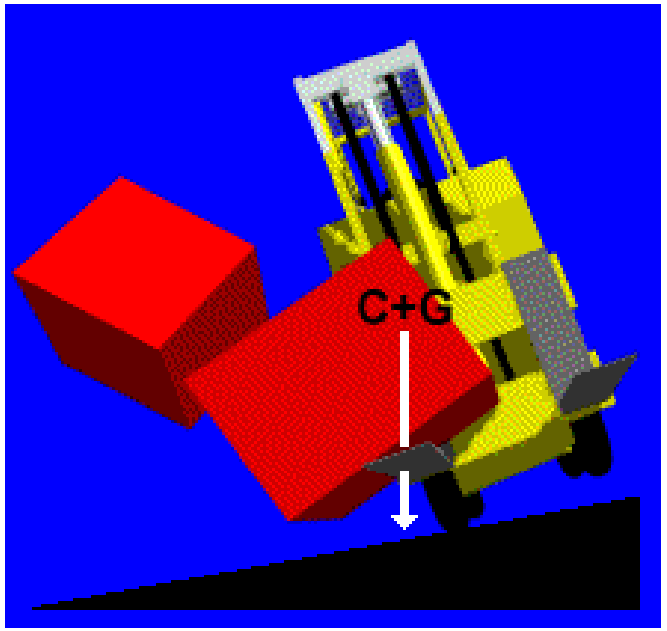
Driving on Ramps and Inclines



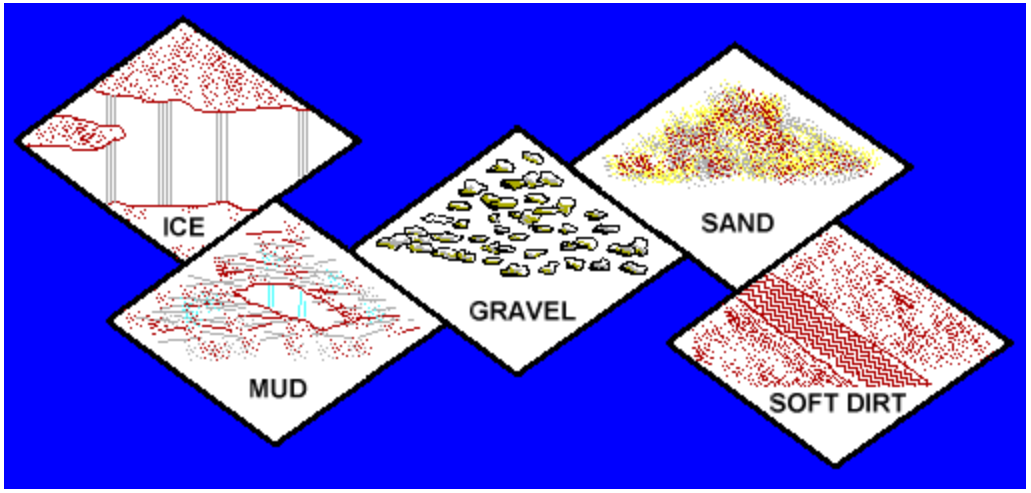
- If, on the other hand, you are driving a loaded truck, travel forward up an incline, and backward down an incline. Note that the center of gravity for the load is above the front drive wheels.

Driving on Ramps and Inclines

- NEVER turn while driving up or down a ramp or incline. NEVER drive across a ramp or incline. Because lift trucks are built "narrow," the center of gravity can quickly shift outside the stability triangle, causing the truck to tip over.

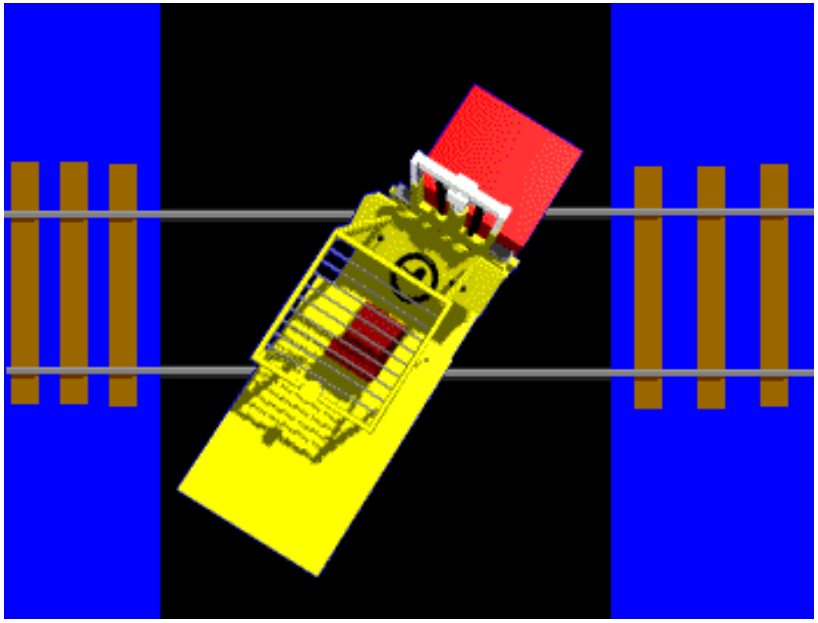


Driving on Various Surfaces



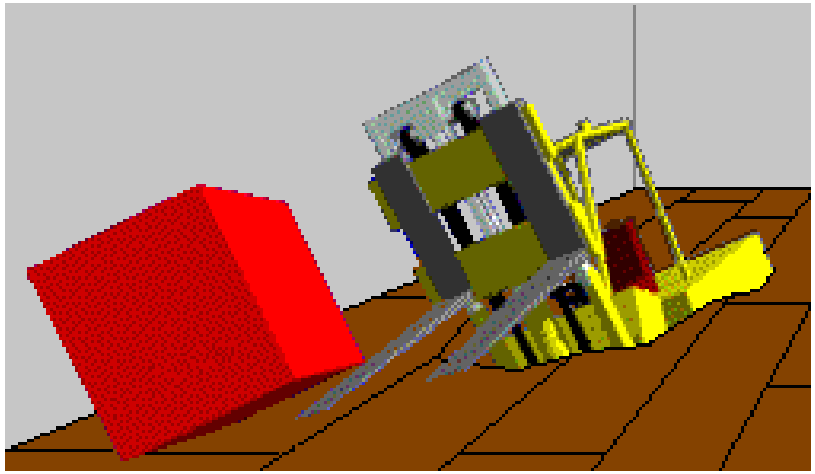
- Ice, mud, gravel, sand, and soft dirt all present potential problems for you and your lift truck. Avoid these unsafe surfaces, if at all possible. They can damage your lift truck or cause an accident.

Driving on Various Surfaces



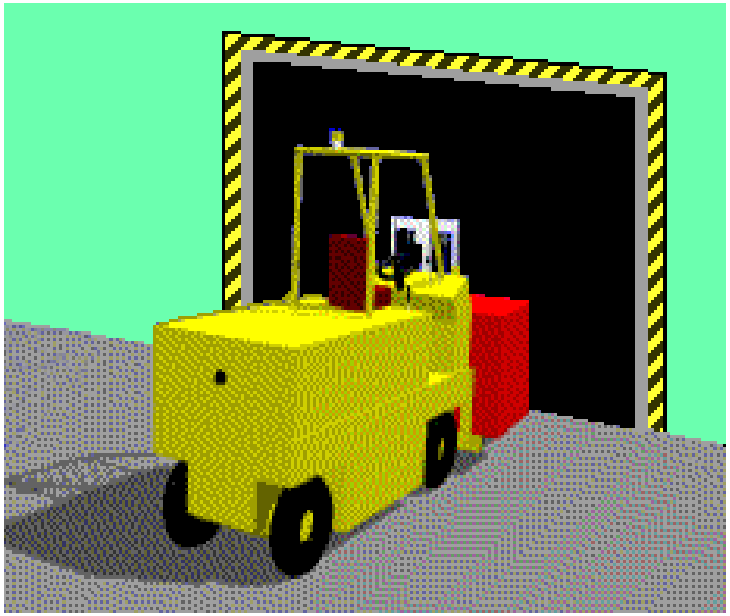
- Try to avoid rough spots and pot holes. If you cannot avoid a rough spot, slow down and cross it carefully, at an angle, one wheel at a time

Driving on Various Surfaces



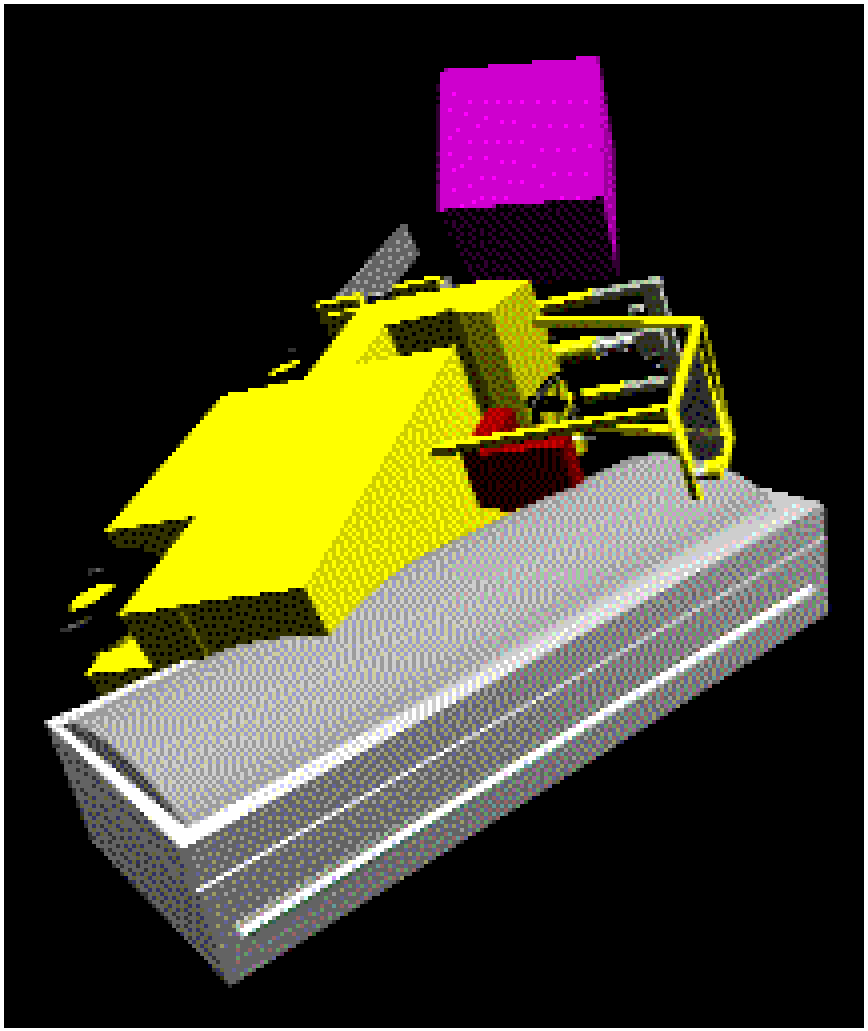
- Keep in mind that you are operating a piece of HEAVY equipment. Check with your supervisor to make sure that you are operating your lift truck in areas that will support both the truck and the load.

Elevators



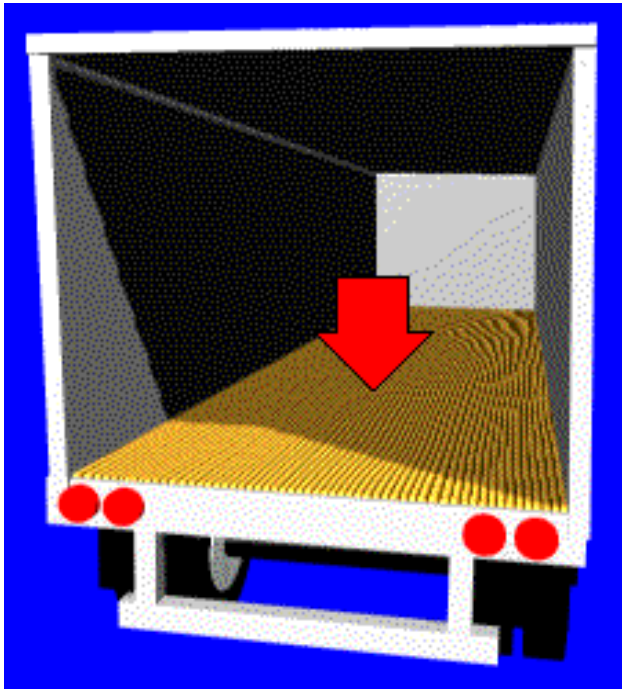
- Always know the maximum weight capacity of elevators and lifts before you use them. Don't forget to calculate the total weight of your truck and your load before entering an elevator.

Loading Docks



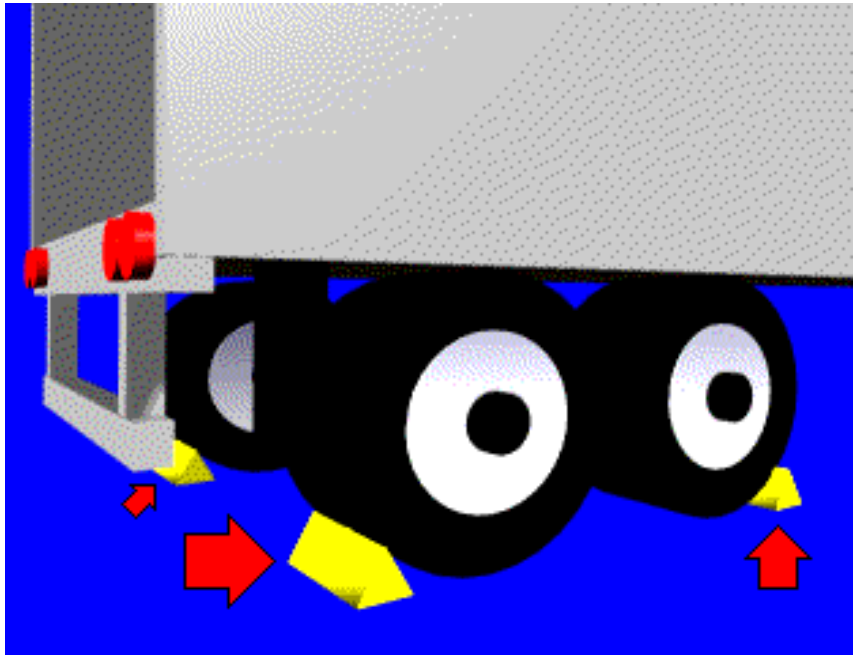
- Loading docks can be dangerous places. Always be aware of the edge of the dock. A fall from a loading dock in a lift truck can be fatal. Slow down, watch out for others, and live.

Loading Docks



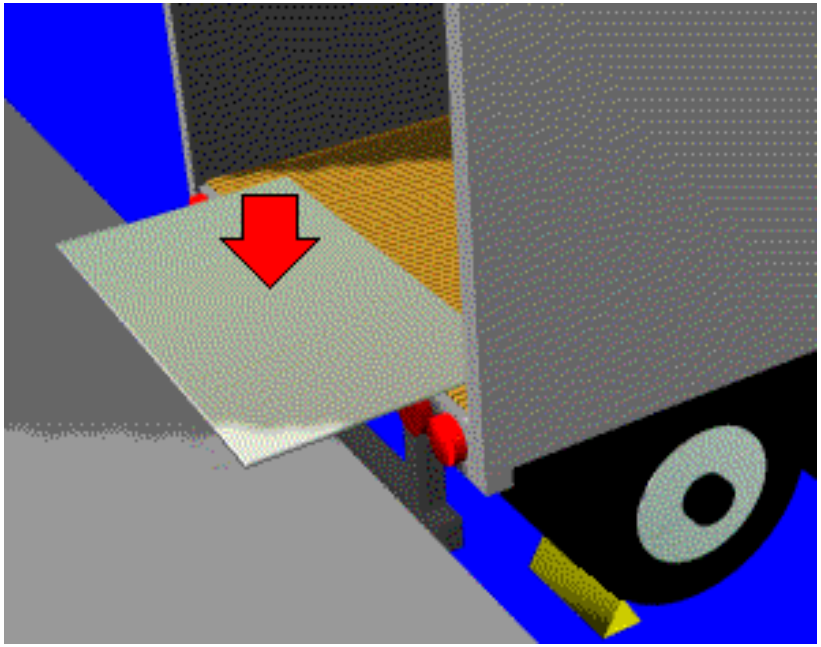
- Whenever you load or unload a trailer:
  1. Inspect the floor of the trailer to ensure that it will support the lift truck and the load.

Loading Docks



- 2.Make sure that the wheels of the trailer are chocked to prevent the trailer from moving.

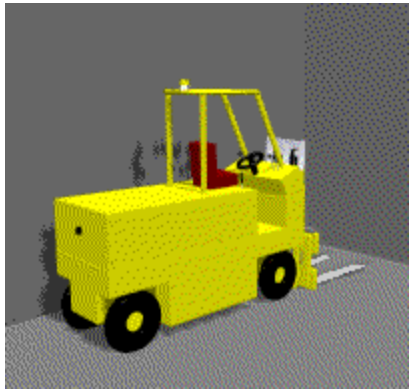
Loading Docks



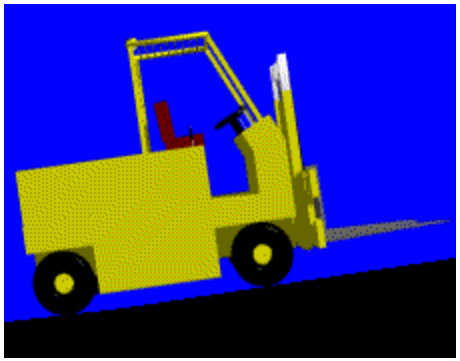
- 3. Make sure that dock plates, boards, and ramps are in place and secure.

Parking

You are responsible for your truck, even when you leave or park it.

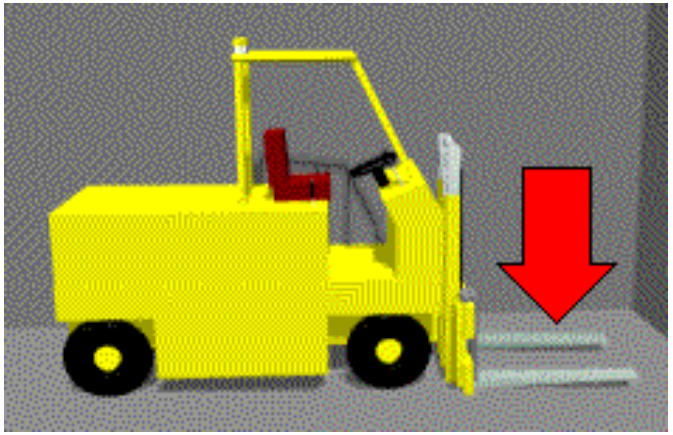


Always park your truck in a safe area that is away from traffic.

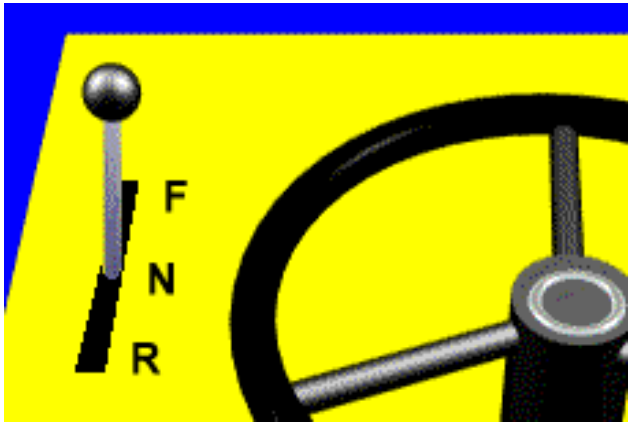


Never leave or park your lift truck on an incline.

Parking

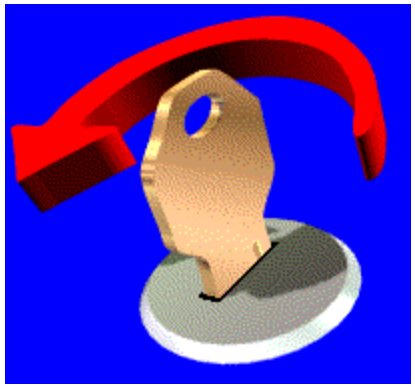


Always lower the forks until they are flat on the floor.

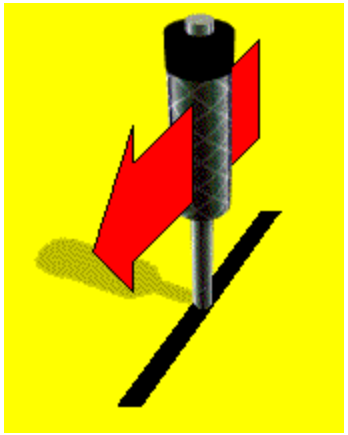


Set the directional control, so that it is in neutral.

Parking

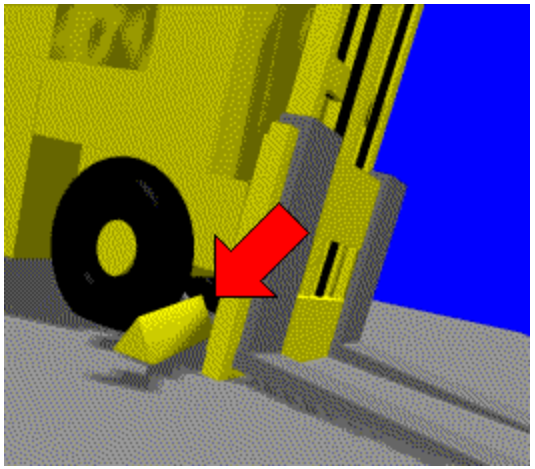


Turn off the engine and remove the key.



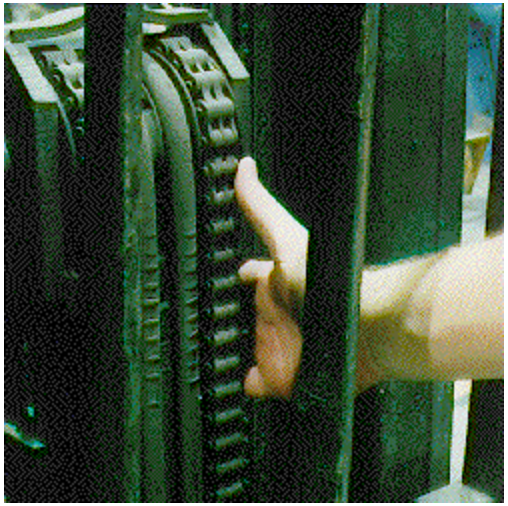
Set the parking brake.

Parking



- If you must park on uneven ground, be sure to block the wheels to prevent the lift truck from moving.

Pinch Points



- Watch where you place your hands and feet. Be aware of and stay clear of pinch points.

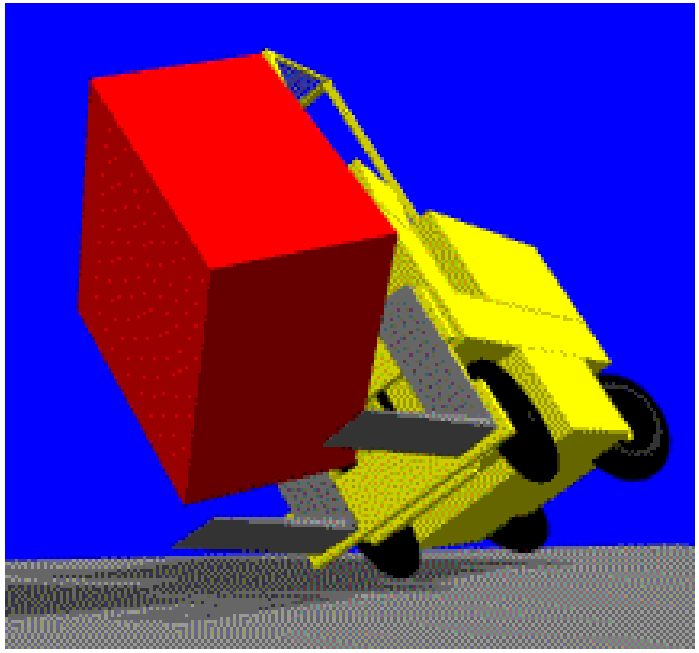
Stay in Your Truck

- Stay under the overhead guard. It is designed to protect you while you operate the truck.

Stay in Your Truck

- Staying in your truck includes your hands and feet.

Don't Jump!



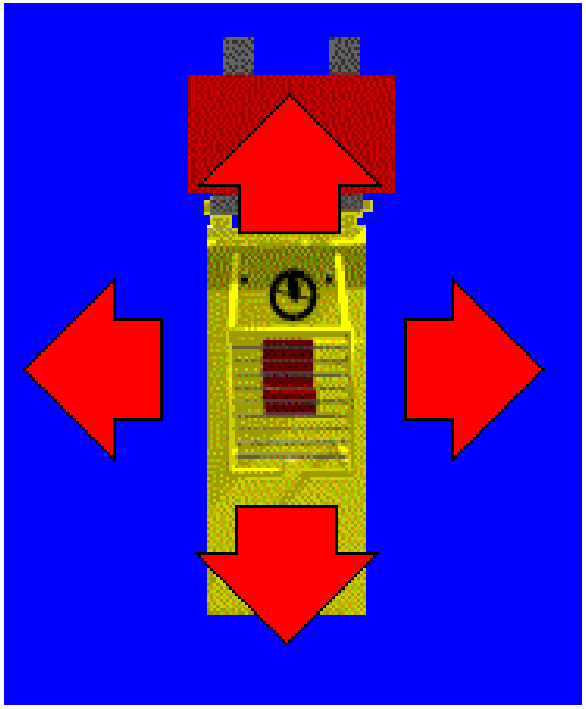
If your truck starts to tip over, DON'T JUMP!

1. Stay in your seat, and go with the truck.

2. Grip the wheel securely.

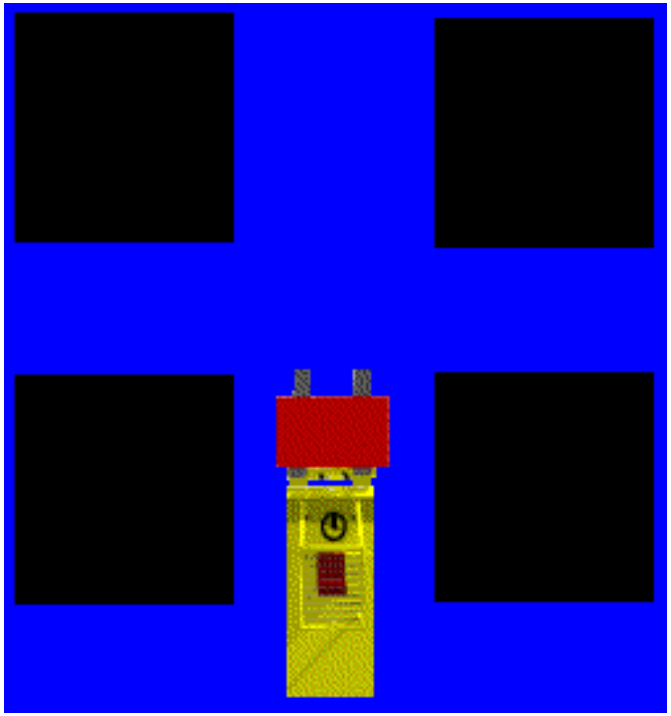
3. Brace yourself with your feet.

You are Responsible for Others



- Operating your lift truck safely means you are not only responsible for your safety, but also for the safety of the people around you. Always look out for others before moving your lift truck.

Intersections



- As you drive, watch out for people walking, and at intersections, slow down, look for traffic, and sound your horn frequently. Remember, ALWAYS come to a complete stop before changing direction.

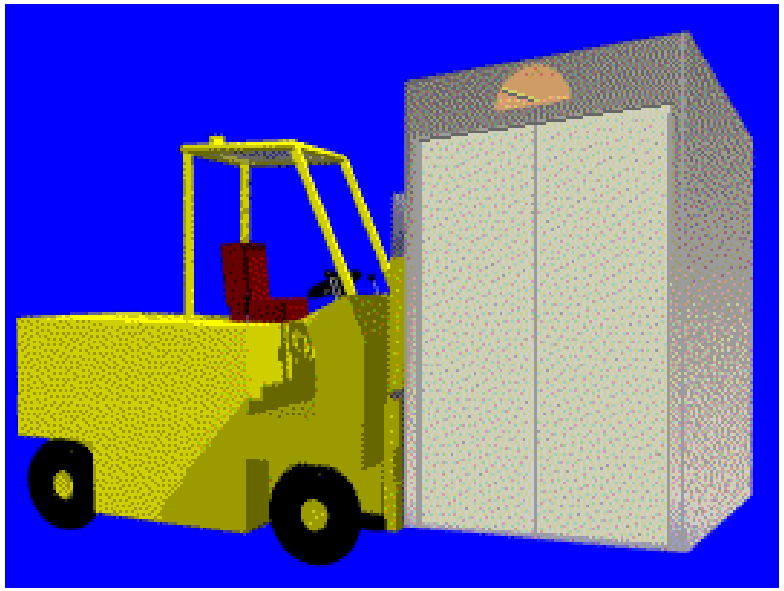
Raised Forks

- Never let anyone, including yourself, walk or stand under the forks when they are raised.

No Riders

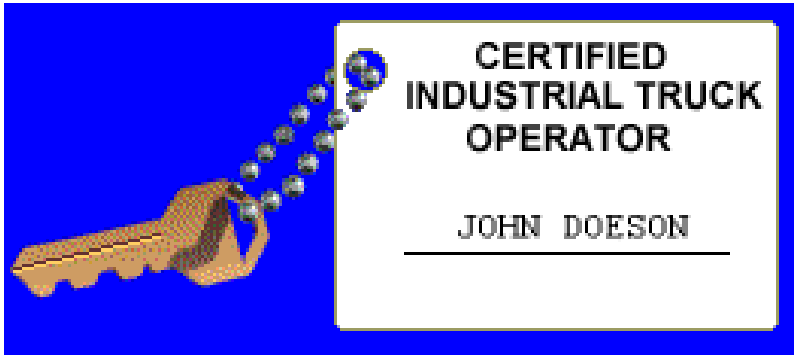
- Keep in mind that you are a lift truck operator, not a taxi service. You should never allow anyone to ride on your lift truck.

No Lifting



- You also do not operate an elevator service. Never attempt to lift anyone on your forks, without using a special basket designed for lifting people safely.

It's Your Lift Truck

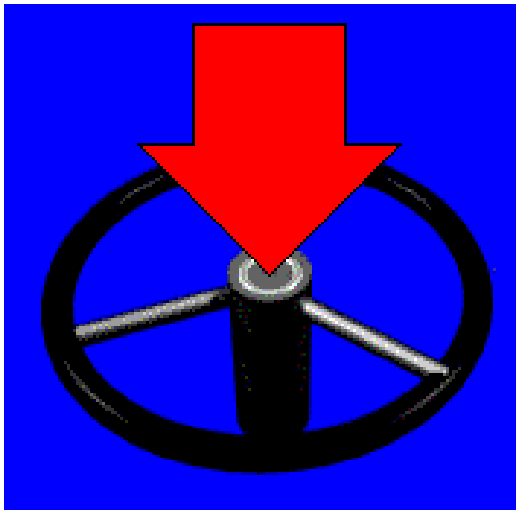


- Remember, it's your lift truck. Never let unauthorized personnel use it, and always remove the key when you have to leave your lift truck unattended.

Safety Devices

- Seat Belt - Most lift trucks are equipped with a seat belt. Use it!

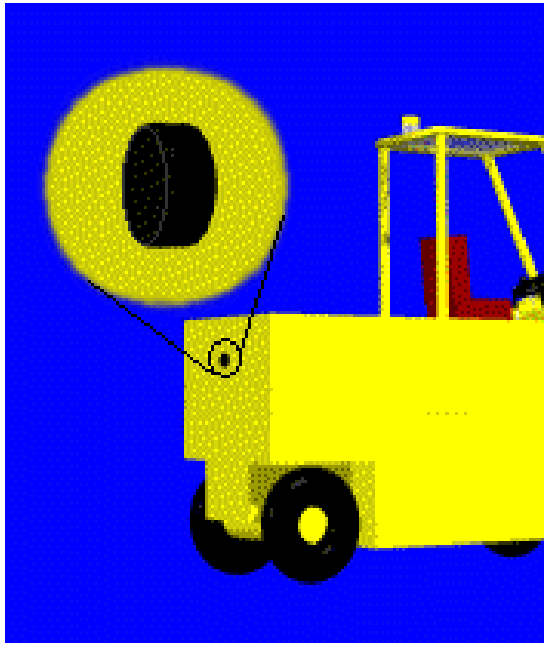
Safety Devices



Horn - Sound your horn:

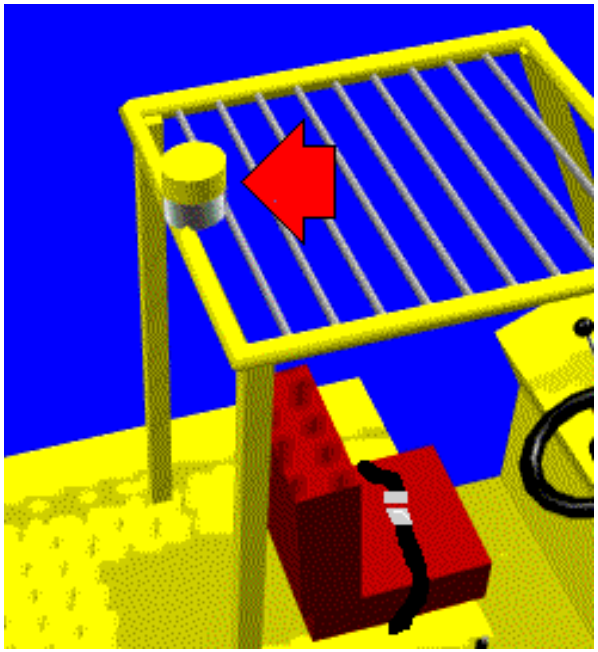
- Before backing up
- At intersections
- When traveling through doors
- Anywhere your vision is limited or blocked

Safety Devices



- Backup Alarm - Some trucks are equipped with a backup alarm that warns others that you are backing up. Don't forget to turn around, look, and sound your horn whenever you backup.

Safety Devices



- Warning Light - Some trucks are equipped with a yellow warning light that warns others that you are approaching, even at a distance.

Safety Devices

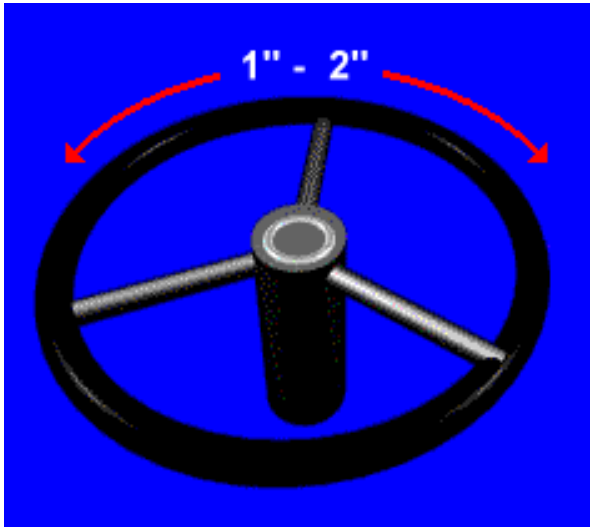
The most important safety device that is on your lift truck is YOU!

- Stay alert, watch out for others, as well as yourself.
- Monitor the condition of your truck and the area you are working in.
- Wear safety equipment when needed.
- Watch for NO SMOKING areas.
- Never use drugs or alcohol before coming to work or on the job.
- Be careful of over-the-counter or prescription drugs that may impair your ability to operate your lift truck safely.
- Remember that SAFETY is the most important part of your job when operating a lift truck.

Daily Inspection for All Lift Trucks

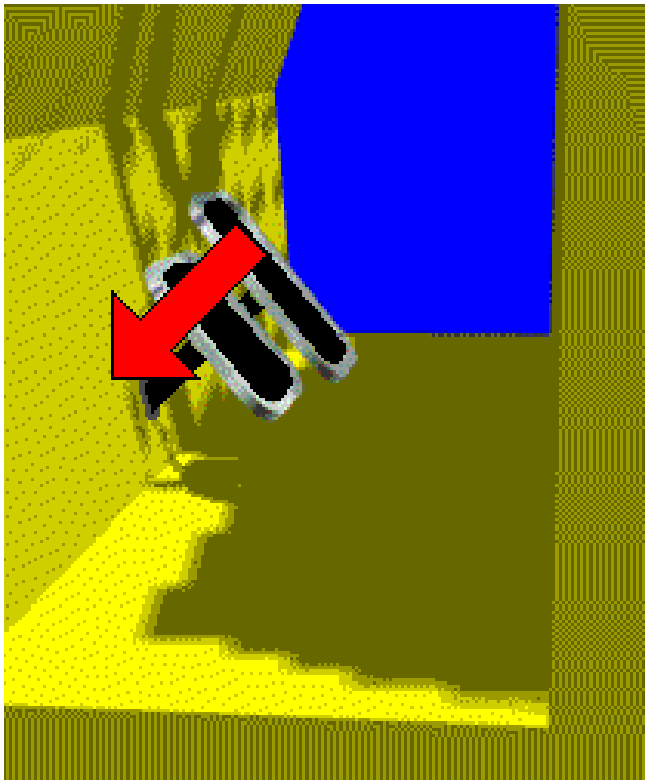
- Begin your daily inspection by checking the safety equipment on your lift truck. The safety equipment you must inspect daily is listed below:
- * Seat Belt
  * Warning Light
  * Backup Alarm
  * Horn

Daily Inspection for All Lift Trucks



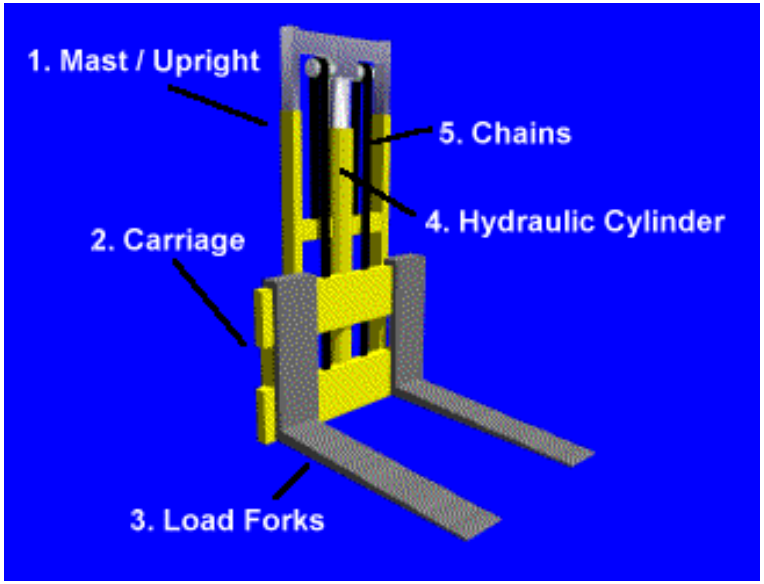
- Steering - Feel the steering action for a minimum of freeplay. The freeplay in steering should not be more than one or two inches in either direction that you turn the wheel.

Daily Inspection for All Lift Trucks



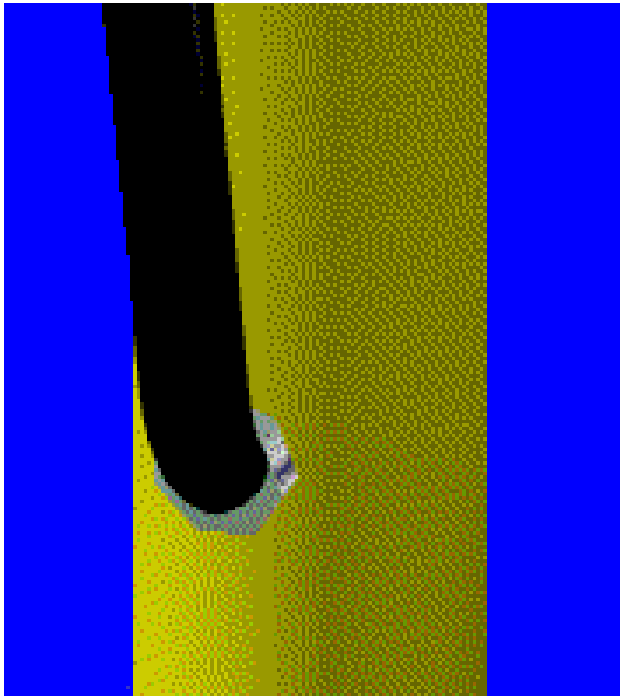
- Brakes - Test your brakes. They should depress smoothly and should not require excessive force to operate. When pressing the brakes, the pedal should not sink under continued pressure. When you drive your lift truck, the brakes should not grab or cause the truck to swerve. Brakes that make a grinding or screeching noise need immediate attention. Also, don't forget to check your parking brake.

Daily Inspection for All Lift Trucks



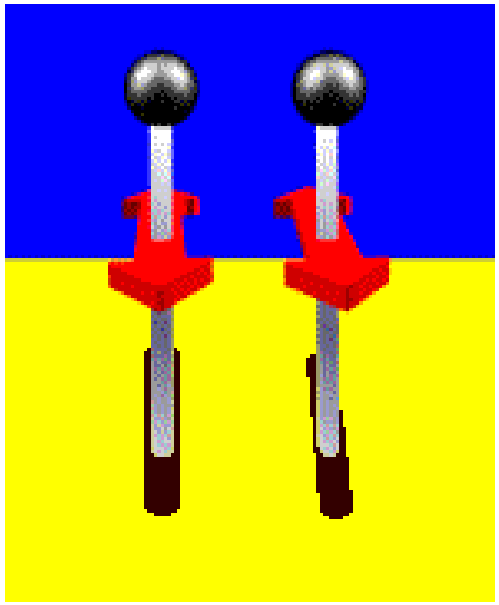
- Upright - Look for any broken, chipped, misaligned, warped or worn parts in the chains, hydraulic cylinder, mast/upright or forks. Remember, DO NOT PUT YOUR HANDS IN THE LIFT MECHANISM.

Daily Inspection for All Lift Trucks



- Hydraulic Hoses - Visually examine the hydraulic hoses and connections. Look to make sure the hoses are in good condition. Check for leaks around fittings and connecting points.

Daily Inspection for All Lift Trucks

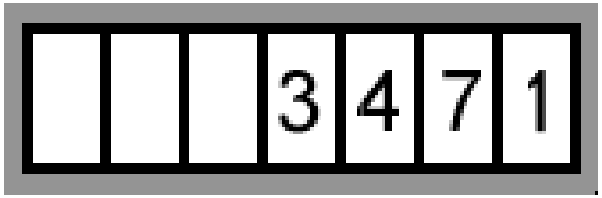


- Hydraulic Controls - The control levers should move smoothly and return to neutral when released. Feel for roughness in the action when the forks are raised or tilted. No slipping or moving of the forks or mast should occur when they are moved to a new position.

Daily Inspection for All Lift Trucks

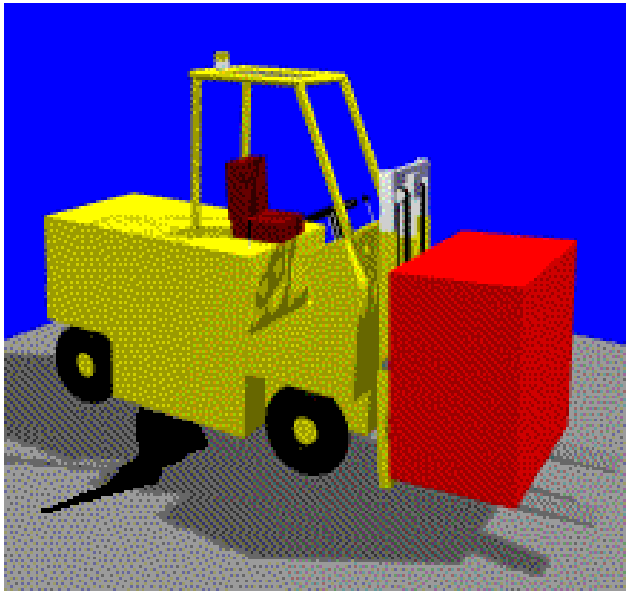
- Tires and Wheels - Visually inspect the tires. Look for damage, wear, missing bolts, or other signs that a tire is not in good condition.
- From time to time, check the air pressure in pneumatic tires. Always use a long tire gauge and face the tread, not the side of the tire, when checking tire pressure.

Daily Inspection for All Lift Trucks



- Hour Meter - During your inspection, note the engine hour meter. It is important for scheduling maintenance to keep your truck in good working order.

Daily Inspection for All Lift Trucks



- Leaks - Look for leaks. Brake fluid, transmission oil, radiator coolant, battery acid (electrolyte), or fuel can leak from your lift truck. DO NOT DRIVE a lift truck that has a leak. Call maintenance immediately.

Daily Inspection for Combustion Engine Lift Trucks

(Gasoline, LP & Diesel Powered)

- Fuel Level
- Oil level and Pressure
- Water Level
- Fan Belt
  - If you drive a lift truck which uses gasoline, LP, or diesel fuels, be sure to check the fuel level, oil level and pressure, water level, and fan belt.

Daily Inspection for Battery Powered Lift Trucks

- Battery plug connection
- Battery charge
- Battery load test
  - If you drive a battery powered lift truck, check the battery plug connection, battery charge, and load test the battery.

Daily Operator's Report

- It is your responsibility as a lift truck operator to inspect your lift truck daily. Part of the inspection process is to complete a Daily Operator's Report. This report is used by your organization to schedule maintenance, document any problems, and is required by many insurance companies. Remember, it's part of your job to fill out this report.

Refueling and Recharging

The greatest danger involved with refueling or recharging your lift truck is with fire. As a lift truck operator, you have a responsibility to refuel or recharge your lift truck safely. To safely refuel or recharge your lift truck, follow the steps listed below:

- Park your lift truck in a designated refueling / recharging area.
- Do not block doorways or access to production or emergency equipment.
- Make sure that the area you are using is well ventilated.
- Check to see that there is a fire extinguisher nearby..

Refueling Gasoline and Diesel Lift Trucks

Whenever you refuel a gasoline or diesel lift truck:

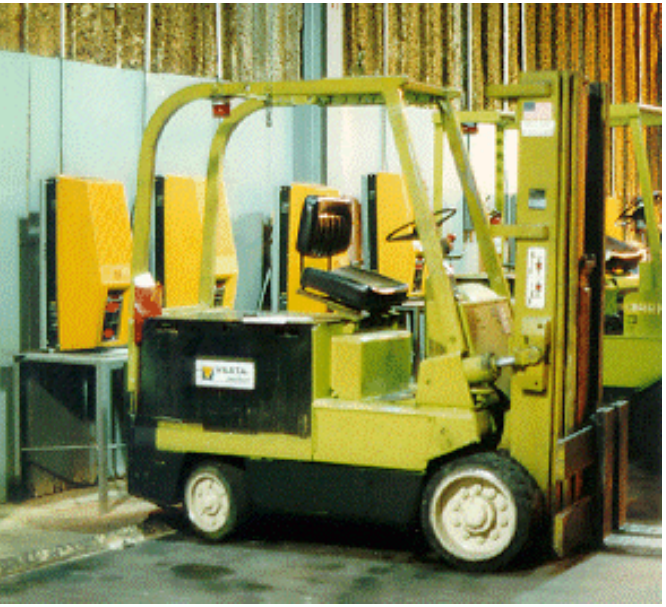
- Turn off the engine and any lights that may be burning on the lift truck.
- Do not smoke; make sure there are no open flames near your lift truck.
- Be sure there is contact between the spout and the fill pipe before pumping.
- Try not to spill any fuel. If you do, clean it up.
- If you must use a can to refuel, make sure it is an approved container for fuels.

Refueling LP (Liquid Propane) Lift Trucks

Whenever you refuel an LP lift truck:

- Before replacing an LP gas tank, close the shut off valve and let the engine run until it stalls.
- Turn off the engine and any lights that may be burning on the lift truck.
- Check for damage to connections and look for leaks.
- WARNING: Since LP gas is heavier than air, make sure there is plenty of ventilation before changing or refilling LP tanks.
- Do not smoke; make sure there are no open flames near the lift truck.

Recharging Electric Lift Trucks



Whenever you recharge an electric lift truck:

- Turn off the motor and any lights that may be burning on the lift truck.
- Do not smoke; make sure there are no open flames nearby.
- During the recharging process, batteries give off hydrogen gas. Make sure you recharge your battery in a well ventilated area.
- Be careful not to spill any battery acid (electrolyte). If you do, clean it up using an absorbent material.
- Because of the danger of electrical arcing, which will ignite hydrogen gas, keep tools and other metal objects away from the top of uncovered batteries. This includes rings and watches.
- Batteries, when they are recharging, produce heat. Be sure to keep the compartment lid open.
- Wear all prescribed safety equipment (face shield, rubber gloves, rubber apron, etc.).

Changing Batteries

If you are responsible for changing the battery on your lift truck, you should:

- Wear an apron, gloves, and face shield or goggles.
- Use a non-metallic boom or lift device to prevent sparking.
- Make sure there is an eye-wash station nearby.
- Securely strap the battery into place before operating the lift truck.