SAFETY TRAINING

Forklift Safety Training

Training & Certification

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Forklift Operator Training Handbook

According to 29 CFR 1910.178 powered industrial truck operators will receive training on the following topics:

- ❑ **Authorized Operators**
- ❑ **Forklift Overview**
- ❑ **Differences between Forklifts and Autos**
- ❑ **Forklift Stability**
- ❑ **Pre-Inspection Procedures**
- ❑ **Operation Procedures**
- ❑ **Post Operations**
- ❑ **Maintenance**
- ❑ **Fueling/Recharging**

Introduction

Operating a forklift requires skill, training and experience. Although it may seem as easy as driving a car, there are many factors that make driving a forklift much more difficult. Learning how to operate a forklift safely can help to prevent accidental injuries and possible death. The goal of forklift safety training is to help you achieve a work environment that is accident free and meets OSHA regulations. Accidents will happen, so it is best to be prepared.

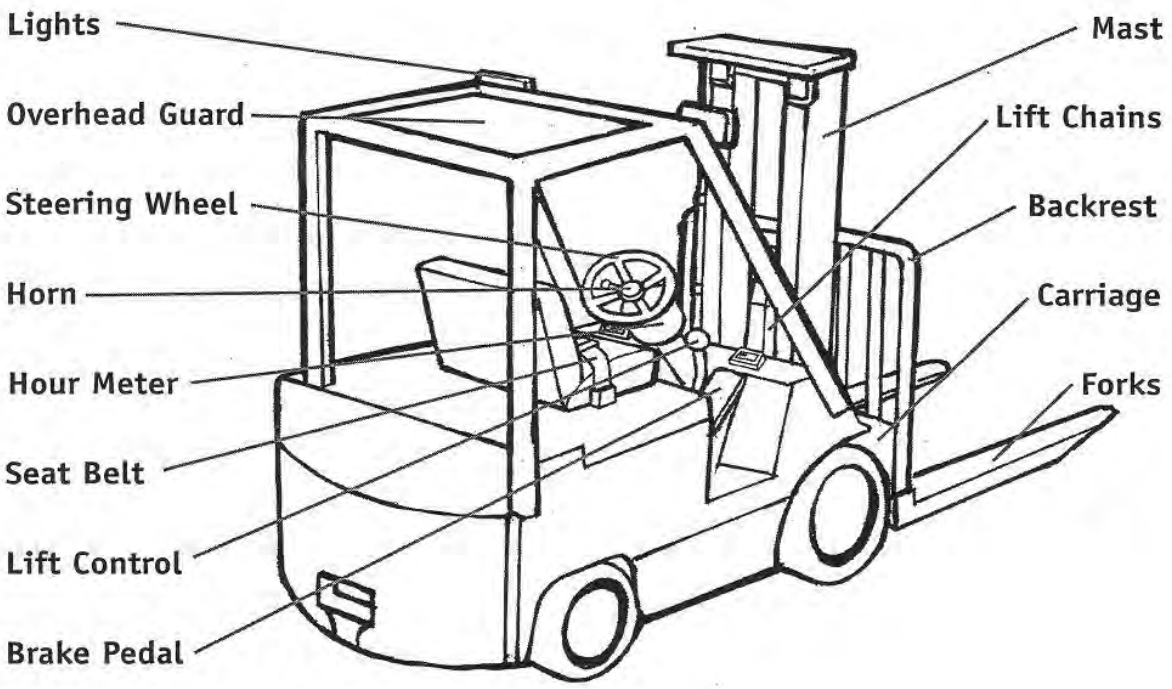
This handbook will help guide you through the steps of how to operate a forklift safely. Topics you will learn about include:

1. How to safely operate a forklift.
2. Pre- and post-operation procedures.
3. Inspection and maintenance of the forklift.

A properly operated forklift, along with carefully followed safety procedures, will go a long way towards reaching the goal of a safe working environment at all times.

What is a Forklift?

A forklift is one type of powered industrial truck that comes in different shapes, sizes and forms. A forklift can be called a pallet truck, rider truck, fork truck, or lift truck. Yet, the ultimate purpose of a forklift is the same – to safely allow one person to lift and move large heavy loads with little effort. For the purpose of this training, a forklift is a small or large industrial truck with a power-operated pronged platform (commonly known as forks.)



A forklift operator should be aware of the multiple parts on a forklift (see diagram above) in order to safely operate the forklift and be able to detect when an unsafe vehicle needs to be removed from service. Be sure to familiarize yourself with the parts on the forklift used within your company.

Note: The diagram above may or may not represent the type of forklift used in your company. Your instructor will be able to tell you which type of forklift you will be trained on.

Why is safety important where forklifts are concerned?

The Bureau of Labor statistics estimates that approximately 90,000 forklift accidents occur annually that result in employee injuries, lost time or death. The four most common forklift-related deaths involve forklift overturns, workers on foot being struck by forklifts, workers being crushed by a forklift and drivers falling from forklifts. It is estimated that inadequate training causes 20-25% of the accidents. So during your forklift safety training, always keep in mind that you are being trained for safety of not only yourself, but of others around you as well.

Authorized Operators

How can I become an certified forklift operator?

Receiving your certification for a forklift is very similar to gaining a driver's license for an automobile. You will be trained under the direct supervision of an experienced forklift operator and must successfully complete the following three parts of training:

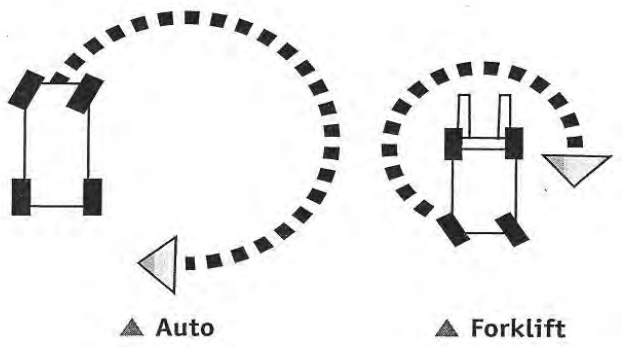
- Formal instruction such as lecture, discussion, interactive computer learning, videotape and/or written material;

- Practical training that includes hands-on demonstrations by the trainer and exercises by the trainee (on the type of forklift you will use for work); and
- An evaluation of the effectiveness of the training by observing your performance while doing actual work using the forklift.

Once you have been trained, you will then be re-evaluated at least once every three years. However, your supervisor may require you to go through refresher training if: you have been involved in an accident or near-miss accident; you have received an evaluation that reveals you are not operating the truck safely; you are assigned to drive a different type of truck; or a condition in your workplace changes in a manner that could affect the safe operation of the truck.

Differences Between Forklifts and Autos

Steering



Operating a forklift is different than driving an automobile in many ways. For example, in most autos, the front wheels steer the vehicle in the direction you want to turn or travel. However, on a forklift, the rear wheels control the steering. The rear end of the forklift swings in a circle around the front wheels that support most of the load you're carrying. Because of this large turning circle, always check to make sure there is room for the rear end to swing because it can swing out further than you expect and possibly cause an accident.

Braking & Suspension

There is also a difference between a forklift's and an auto's capability to stop. Most autos have a front and rear brake system that allows the vehicle to stop quickly. A forklift, on the other hand, has rear steering that makes it difficult to stop a forklift quickly. In an auto the steering system works together with the brakes to guide you to a smooth stop. But, the rear steering on a forklift can make it difficult to swerve and react quickly. Therefore, remember to drive at a safe speed and be aware of your surroundings.

A forklift has a 3-point suspension unlike a car's 4-point suspension.

Weight of a forklift versus an auto

Although a forklift is smaller than a car a forklift may be two to three times heavier. The average forklift can weigh from 3,000 to 4,500 pounds. In order to balance heavy loads and help prevent the forklift from tipping over, a large counterweight is mounted on the rear of the forklift.

This counterweight is a part of the forklift's structure and should never have anything added to it in an attempt to balance the load out.

Stability

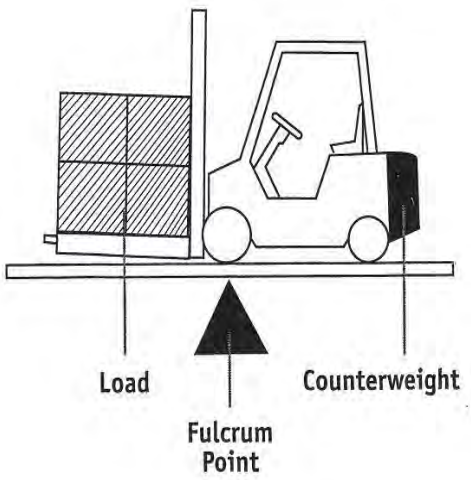
Forklift stability is an important topic because the leading cause of death and serious injury involving forklifts stems from overturns caused by forklift instability. Forklift stability can be described by four elements: the fulcrum point, center of gravity, the stability triangle and the load center.

Fulcrum Point

The fulcrum point may sound complicated, but think of it this way:

As children we all played on seesaws, which have a board that is balanced in the middle by a support piece. This support piece is what is called the fulcrum point.

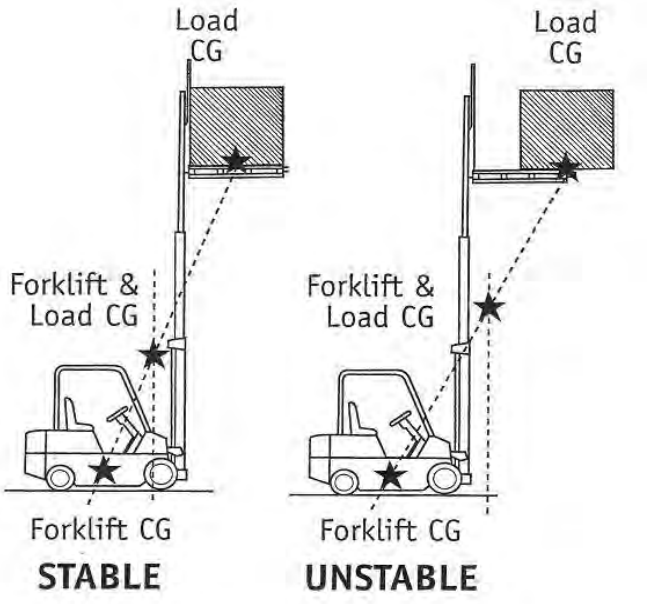
On a forklift, the fulcrum point is the front wheels. The fulcrum point serves as a support piece to balance the load and counterweight. The illustration displays this concept.



Center of Gravity (CG)

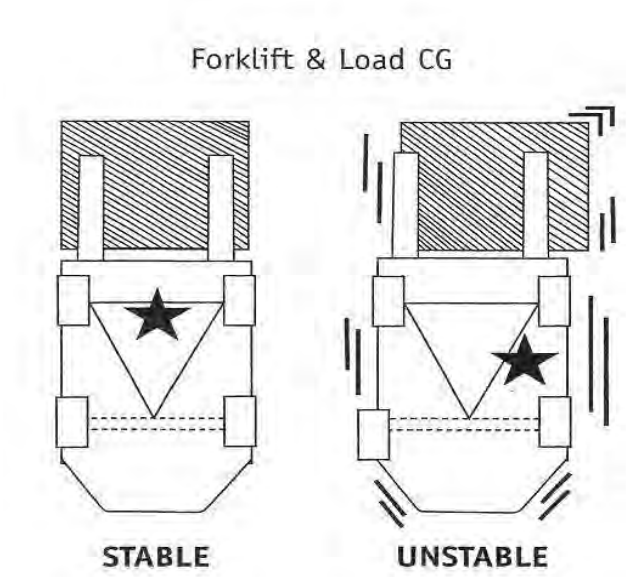
In addition to balancing both ends of the forklift, we must also balance in all directions. Balancing in all directions is better known as the *center of gravity*. The center of gravity is that point where all parts of a load or truck are balanced in all directions and will remain at rest. As a driver, it is important to remember that a new center of gravity is created when you're handling a load (as opposed to an empty load) -- one that combines both the load's and the truck's center of gravity. Think of it like riding a tricycle. If you peddle a tricycle around a corner and shift the center of gravity forward over the narrowest part of the tricycle, you are likely to turn over. But, if you shift your weight on the rear and place the center of gravity over the widest part of the tricycle, you are less likely to tip over.

A load can become unstable when carrying a load too high, tilting a forklift too much or driving on decline. When transporting a load, do not raise forks more than 2-4 inches from the ground.



Stability triangle

That brings us to the *stability triangle*, the triangle on wheels. Think of the stability triangle as three imaginary lines that are connected by the center axle to the front wheels of the forklift. In order to maintain a stable forklift, you must keep the center of gravity within the stability triangle.



The most stable area while handling a load is close to the base of the forklift. If the load you are carrying moves too far forward from the forklift's base, it will more than likely tip forward. For that reason, never give someone a ride on your lift truck.

Some factors that could cause instability are:

- Carrying the load too high.
- Excessively tilting the load forward.
- Operating on a decline.
- Heavy braking.
- Inappropriate use of forklift attachments.
- Off-center loads.
- Uneven terrain.
- Quick turns.

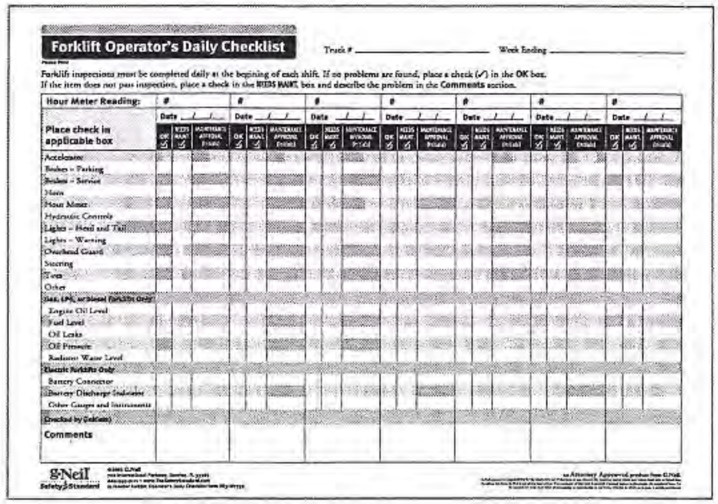
However your potential to turn over can be reduced if you follow a few safety rules:

- Make sure the load is stable and safely arranged on the forks.
- Do not tilt the forks forward except when picking up or depositing a load.
- Keep the load low just above the pavement with the forks tilted back when traveling.
- Enter tractor-trailers or elevators squarely when picking up or depositing loads.
- Drive at a slow enough speed to allow you to stop safely.
- Drive slowly on wet or slippery surfaces.
- Avoid driving on unstable surfaces or where there are loose objects on the surface.

Load Center

Keep the *load center* in mind when trying to remain stable or achieve stability. The load center of a forklift is simply the distance from the front face of the forks to the center of the load. The most important thing to remember is that the further you move from the load center when hauling a load, then the lower capacity your truck will be able to handle. Check with your instructor to determine the maximum capacity that your company’s forklift can handle. This can be found on the data plate located on the front of the forklift.

Pre-Inspection



Forklift Operator's Daily Checklist

Truck # ______ Week Ending ______

Forklift inspections must be completed daily at the begining of each shift. If no problems are found, place a check (✓) in the OK box. If the item does not pass inspection, place a check in the NEEDS MAINT. box and describe the problem in the Comments section.

Hour Meter Reading:	#	#	#	#	#	#	#
Place check in applicable box	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /	Date / /
	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)	OK / NEEDS MAINT. / MAINTENANCE APPROVAL (Initials)
Accelerator							
Brakes – Parking							
Brakes – Service							
Horn							
Hour Meter							
Hydraulic Controls							
Lights – Head and Tail							
Lights – Warning							
Overhead Guard							
Steering							
Tires							
Other							
Gas, LPG, or Diesel Forklifts Only							
Engine Oil Level							
Fuel Level							
Oil Leaks							
Oil Pressure							
Radiator Water Level							
Electric Forklifts Only							
Battery Connector							
Battery Discharge Indicator							
Other Gauges and Instruments							
Checked by (Initials)							
Comments							

G-Neil Safety Standard

It is recommended that you conduct your daily pre-operation inspection with the help of a pre-op inspection form to ensure that you do not overlook certain hazards. Your forklift should be inspected for defects every day prior to your shift, and after your shift has been completed.

Never use an unsafe forklift. Immediately take it out of service.

You should conduct your inspection as follows:

- Look around the forklift completely for any signs of defects. .
- Inspect the general condition and cleanliness of the forklift.
- Check your oil, fuel and radiator level. (If you forklift is electric, check the electrolyte level, battery plug, and connections).
- Look for evidence of any damage (e.g. missing of loose bolts, nuts, chains, etc.)
- Observe condition of wheels and tires.
- Honk the horn to ensure it is working properly.
- Make sure the forks are in working condition.
- Determine whether the chain anchor pins are worn, loose, or bent. .
- Look for fluid leaks, damp spots, or drips.
- Make sure hoses are held securely in place.
- If authorized, check the battery cables and water levels.
- Look for objects on the floor or overhead that could lead to an accident.

Never use an unsafe forklift. If you discover that the forklift needs repair, do not try to fix it yourself unless authorized to do so. Immediately take the forklift out of service and report it to an authorized employee. The damage it can cause if driven puts your safety and the safety of others at risk.

Operation

Mounting/Dismounting

Special precaution should be taken when mounting and dismounting a forklift so that you don't slip, trip or fall. The correct way to mount the forklift requires you to use three points of contact which acts as a support system to prevent falling. This means that both of your hands and one foot should be in contact with the forklift at all times. Additionally,

you should always mount and dismount the forklift on the side without the gearshift. Never jump on or off of the forklift.

Safety Features

If your forklift has a restraint such as a seatbelt or a lap bar, you must use it. The restraints will hold you in the seat if you strike an object or if the forklift overturns. Failure to wear a seat belt can result in you being thrown outside of the forklift cage causing serious injury so protect yourself by buckling up.

Also, for your own safety, never start a forklift or attempt to operate it from outside the vehicle. You must always start the engine and operate the forklift from the driver's seat to ensure the forklift does not jump out of gear and cause an accident. Failure to do so could cause injury to others or yourself, and damage to your surroundings.

Forks

Once the engine is started, but before you drive the forklift, make sure the forks are low to the ground. Forks should be positioned approximately 2-4 inches high while you are driving. However, you may need to adjust the forks if the planned route you are taking contains bumps or uneven terrain. Never allow anyone to walk or stand under the elevated forks (even if the forks are not loaded and/or the engine is off) because it may result in injury or accident.

Pedestrians

While you are driving, be sure to keep a safe distance away from pedestrians as they always have the right of way. In aisles where your vision is reduced, you should slow down at the cross aisle, and sound your horn to notify potential pedestrians that you are entering the area. Similar to the rules of the road, you should also yield the right of way to approaching pedestrians. Stop and allow them to pass before driving is resumed.

Loading Docks

Another safety precaution that you must take is to drive a safe distance from the edge of loading docks or ramps. Driving too close to the edge of a loading dock or ramp may reduce your chance of stopping the forklift quickly due to slippery surfaces and/or the vehicle's weight. Also, drag racing or stunt driving should never be permitted as it could lead to a possible fatal accident.

Loads

Forklifts are often driven onto trucks, trailers, or railroad cars over a dock board (better known as a "bridge plate") at loading docks. Prior to entering a truck, trailer or railroad car, check the flooring for any breaks or weaknesses. Also make sure the trailer, truck or car has been properly secured. The truck brakes should be set and wheel chocks placed under the rear wheels to prevent the truck from rolling while the forklift driver is aboard. Never depend on anyone to make sure the

vehicle is secured to the dock. Check it out for yourself to ensure your own safety!

Transporting loads can also involve a certain amount of danger, so it is imperative that you take special care when handling loads. You should always inspect a load before picking it up to determine whether the load is stable. Ensure the parts will not slide or fall off during transit --- no matter how pressed for time you are. Then ask yourself whether the weight of the load exceeds the amount that your forklift can handle. If the load is too heavy, you should break the load into smaller parts. When transporting a load up an incline, drive up the incline with the load in front of you. When exiting, drive back down with the forks still facing the incline. This will help prevent the forklift from tipping.

After inspecting the load, you can safely pick up the load by doing the following:

- Move squarely into position.
- Position the forks wide apart to keep the load balanced.
- Drive the forks fully under the load.
- Tilt the mast backward slightly to stabilize the load and lift.
- If the load you are carrying obstructs your view, carefully travel in reverse, with the load trailing.

There are additional rules of thumb that will protect you and others while operating a forklift:

- Keep your feet, arms, and head inside of the forklift at all times to avoid an injury from unknown objects in the pathway.
- Do not allow anyone but the operator to ride on the forklift, unless the forklift is designed to carry more than one person.
- Stay alert to changing or unusual conditions so you can react to them.

Post Operation

When you are finished operating the forklift there are several precautions that should be followed to ensure the vehicle is securely shut down. When you are finished operating the forklift, lower the forks to the ground so that they cannot injure pedestrians. Set the gearshift to neutral, turn off the power (don’t forget to remove the key), and set the brakes to avoid movement. Finally, dismount by holding onto the forklift with both hands and stepping down, one foot at a time, to give yourself the support to dismount safely. Also, chock wheels if necessary.

Maintenance

In addition to the daily pre-operation inspection you will perform, check the vehicle after usage to determine if any new defects exist. A forklift in need of repair can lead to many safety issues if it is not serviced in a timely manner. If you discover that a forklift is unsafe, immediately remove the forklift from operation so that no one attempts to operate it until it is repaired. Notify your supervisor or authorized person about the maintenance issue(s) as soon as possible.

A forklift should be kept clean, free of lint, excess oil, and grease to ensure that the controls and the vehicle operate properly. Your company may authorize an individual to make sure the forklift is clean. Check with your instructor to determine who is assigned to this task.

Fueling/Charging

Fueling or charging a forklift is an important step in the operation of a forklift. There are many hazards involved, such as exposure to chemicals and flammable materials, so it is imperative for you to take all of the necessary precautions. If you are authorized to refuel or charge a forklift, be sure to:

- Identify where your eyewash station is located in case you are exposed to hazardous materials.
- Not smoke or allow any open flames in the refueling/charging area.
- Make sure there is sufficient ventilation in case of fumes.
- Verify there is a fire extinguisher nearby.
- Put a barrier in place that protects the pump or charger against damage.

Changing a Battery

- Do not attempt to remove a battery, unless you have been trained and authorized to do so.
- Only change the battery in a designated area to reduce the risk of injury.
- Always wear goggles and personal protective equipment to protect against acid burns.
- Turn the forklift off and set the break before changing the battery.
- Secure the battery before lifting it out.
- Only remove the battery by using a conveyor, overhead hoist or equivalent machine that is designed for this purpose.
- Stand clear when removing the battery from the forklift.
- Make sure that the new battery is properly positioned and secured in the forklift.

Charging a Battery

- You should only charge or service the battery if you are authorized to do so.
- Review the forklift manufacturer’s manual for recommendations before charging or maintaining the battery.
- When adding fluid to the battery, wear safety glasses and a face shield for protection against electrolyte splash or spray.
- Properly position the forklift and apply the brakes before charging the battery.
- Remove any tools and other metal objects away from the top of uncovered batteries to prevent an explosion due to the short-circuited terminals.
- Know where the nearest eyewash station or shower is located in order to flush out neutralized spilled electrolyte.
- If acid is spilled on your clothes, wash it off immediately with water.
- Make sure the ventilation system is working in the designated changing area before charging the battery.
- If you are charging the battery on the forklift, be sure to uncover the battery compartment to prevent a build-up of heat and hydrogen gas.
- Make sure that battery vent caps are not plugged and the battery covers are open to dissipate heat.
- Unplug or turn the charger off before attaching or removing the clamp connections.
- Carefully attach the clamps to the battery in proper polarity (red to positive and black to negative).
- Always use proper safety procedures when cleaning up any spilled electrolyte.

FORKLIFT QUIZ Forklift Employee Name: _____

1. **If you have a valid driver's license, you are qualified to operate a forklift?**
   True or False?

2. **Operating a forklift is different than driving a car in the following ways:**

a. A forklift has rear wheel steering and most cars are front wheel steering.
b. A forklift is much heavier than a car.
c. A forklift has 3-point suspension and a car has a 4-point suspension.
d. All of the above

3. **The front wheels of a lift truck serve as the _____ between the weight of the truck and the weight of the load being carried.**

a. Balance Point
b. Seesaw Center
c. Center of gravity
d. Fulcrum point

4. **Factors that would cause a forklift to become unstable includes:**

a. Carrying a load too high
b. Tilting a forklift too much
c. Driving on decline
d. All of the above

5. **What is wrong with the illustration on the right?**

a. Driving in the wrong direction
b. Load too high
c. Nothing

6. **Operators should inspect their forklifts before and after each shift.**
   True or False?

7. **It is safe to give someone a ride on your lift truck.**
   True or False?

8. **You can place your hands and feet outside of the operator's compartment, as long as your head and body are protected.**
   True or False?

9. **If your truck starts to tip over, jump out immediately.**
   True or False?

10. **When traveling across aisles or around blind corners:**

a. Yell "Coming Through"
b. Slow down and honk the horn
c. Look in all directions
d. B and C

11. **The load capacity of a truck can be found on its data plate.**
    True or False?

12. **You can stand under the forks if the engine of the lift truck is turned off.**
    True or False?

13. Before loading and unloading a trailer at a loading dock, you should:
a. Inspect the floor of the trailer to ensure it will support the lift truck and load.
b. Chock the wheels of the trailer.
c. Make sure the dock plates, boards, and ramps are in place and secure.
d. All of the above

14. **When transporting a load, you should not raise your load more than 2-4 inches from the ground.**
    True or False?

15. **Off-center loads must NEVER be handled by a forklift.**
    True or False?

16. When parking or leaving your truck, you should:
a. Park or leave your truck in a safe area away from traffic.
b. Lower the forks until they are flat on the floor.
c. Turn off the engine.
d. Set the parking brake and set the directional control to neutral.
e. All of the above

17. **If the lift mechanism on your lift fails, you should try to repair the chains or hydraulic system yourself.**
    True or False?

18. When changing or charging a forklift battery, always:
a. Ensure you are fully trained in the procedures.
b. Wear personal protective equipment
c. Set the brake before starting.
d. All of the above

19. Which of the following should you NOT do during the refueling and recharging process?
a. Park your truck in a designated refueling/recharging area.
b. Do not block doorways or access to production or emergency equipment.
c. Keep a flame burning nearby to burn off unwanted vapors or gases.
d. Check to see that there is a fire extinguisher nearby.

20. The most important safety device on your lift truck is:
a. Seat belt
b. Warning Light
c. Backup Alarm
d. YOU!