

FORKLIFT

safety guide



WRITTEN BY CREATIVE SAFETY SUPPLY | ©2013

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Forklift Safety: A Lifesaving Guide



NEW! FORKLIFT SAFETY TRAINING DVD

Give your forklift safety a boost. This training course covers basic forklift operating procedures intended to increase safety and help prevent the most common forklift accidents. This course includes important information required by OSHA's general industry standards (29 CFR 1910.178) as well as best practices on operating powered industrial trucks. This course can be used as an introduction to forklift safety and operation or as a refresher on forklift basics.

Included in this DVD:

- How a forklift works and moves
- The importance of performing inspections
- Safe methods of forklift operation
- Safe procedures for working around pedestrians and other equipment
- Common forklift hazards

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INTRODUCTION TO FORKLIFTS

The forklift is a commonly used and driven tool that helps people lift and move heavy loads with very little physical effort and excellent precision. Using a forklift lessens the risk of injuries caused by lifting or carrying heavy items. For this reason many companies employ forklift and forklift operators to do this kind of labor. These machines are powerful and there is always risk involved when they are used by people who have not been trained on operating them safely.

The National Traumatic Occupational Surveillance System registered 1530 worker deaths from forklift accidents between the years 1980 and 2001. Of these accidents the biggest portion, 22% were caused by a forklift overturn. Collisions between workers on the ground where the ground worker died accounted for 20% of deaths. Another 16% of deaths were caused by someone being crushed by the forklift and 9% by an operator falling from the forklift. In fact, each year almost 100 people are killed and another 20,000 injured from forklift accidents. With proper training and diligent safety practices most of these deaths could have been prevented. If you work around forklifts or are a forklift operator you should learn all you can about using these machines safely to prevent injury or death.

All forklifts fall under the category of 'powered industrial trucks,' but they are not all the same. Forklifts can be either battery powered or run on gas or diesel fuel. They also come in different sizes and have different functions according to the kind of work in which they will be used. Each type of lift is characterized by a class. Knowing which class of forklift you will work with should help you to understand its safety features and potential hazards.

POWERED INDUSTRIAL TRUCK CLASSIFICATIONS

Class 1 - Counter-balanced truck having both solid and pneumatic tires, with an electric motor, rider occupied.

Class 2 - Solid tires, narrow aisle truck with an electric motor.

Class 3 - Hand truck or hand/rider truck with electric motor and solid tires.

Class 4 - Internal combustion engine truck with solid tires.

Class 5 - Internal combustion engine truck with pneumatic tires.

Class 6 - No forklifts fall into this class of electric and internal combustion engine tractors with solid and pneumatic tires.

Class 7 - Forklift trucks for rough terrain with pneumatic tires.

In addition to these classifications, forklifts also have special attachments to do specific jobs. It is extremely dangerous to use unapproved attachments with a forklift because of the balanced nature of the machine. Using an attachment that is not approved will upset this balance and cause the forklift to overturn, which can result in serious injury or death. Some approved attachments include a drum grabber, jib crane, hoist, carpet lift attachment, and a personnel platform.

Forklifts work by counterbalancing the weight on one end of the beam, the load which is supported by a fulcrum with the weight on the other end which is the body of the lift and a counterweight that is built in to the design. In order to safely determine if a forklift can carry a specific load you must figure out the 'moment' which is the distance from the fulcrum to the center of gravity times the weight. This equation will give you the moment and let you know if it is safe to carry a load. All forklifts have a capacity plate which helps the operator determine which loads he or she may safely lift.

SAFETY FEATURES OF FORKLIFTS

Although you might think that driving a car would prepare you to operate a forklift, they do not work in the same way. In most automobiles the front wheels provide steering, but in a forklift the steering is done by the rear wheels. This allows the front end to be used to carry the load, but requires room for the rear of the forklift to swing around to make turns. Forklifts are also not as quick to respond to your actions as the operator as cars. Stopping quickly and swerving are hard to do without losing control of the forklift. The same is true of driving downhill with a load, it is very easy to lose control on inclines. In order to minimize risks you should always keep the load on the uphill side, which requires the operator to drive in reverse, sometimes for long stretches.

Forklifts are equipped with rear extensions to keep the load from falling on to the operator. These extensions are required any time loads are lifted high and could fall to the rear when driving on uneven surfaces or in the case of acceleration or sudden stops. Forklifts that can be used to lift loads over the operator are also required to have an overhead guard. These guards are meant to protect the operator from small packages being dropped but are not effective against the loss of a full load.

Restraints for operators are standard requirements for all forklifts built since 1992. Those that were made prior to 1992 can often be retrofitted with operator restraints. As a forklift operator it is important to always use the restraint because it can prevent you from being thrown out of the protective cage should your forklift overturn. Many fatalities occur because operators attempt to jump from the machine when it overturns. The nature of forklifts caused them to at first turn very slowly, then the center of gravity shifts and the turn speeds up rapidly. The slow turn gives operators the false sense that they have time to jump out, when in reality they do not.

There are other safety features that include a horn, to indicate when a forklift is coming through an intersection or when the operators vision is obscured. They also have backup alarms that will sound whenever the forklift operates

in reverse. All forklifts should have a fire extinguisher on board, especially those that are gas powered. The warning, directional, and brake light must be in working order. Mirrors are also used to help the driver maintain a visual on his surrounding to avoid collisions with other equipment and people.

FORKLIFT OPERATOR TRAINING

Any person who operates a forklift is required, by [OSHA](#) to take a training program set forth by their employer. It is up to the employer to ensure that this training factors in general safe principles of truck operation, the types of trucks used, the hazards of the vehicle, and the safety requirements of the [OSHA compliance manual](#) standard. This training must include both formal instruction in the form of lectures or [forklift safety videos](#) and practical instruction in the form of demonstrations and practical exercises. The employer has to certify that every operator has gotten the proper training and must evaluate operators at least one time every three years. The following content should be included in all beginner training of powered industrial truck operators unless safety conditions preclude employers from doing so.

Operator Training Topics

- Operating instructions, precautions, and warnings for the specific kinds of truck the operator will use.
- Automobile and forklift differences.
- Electric motor or engine operations
- Steering
- Maneuvering
- Visibility and visibility restrictions due to loads

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- Limitations, operation, and adaptation of fork and attachments
- Capacity of vehicle
- Stability of vehicle
- Maintenance and vehicle inspections that will be performed by the operator.
- Charging and recharging of batteries or refueling.
- Limitations of operating.
- Surface conditions
- Load stability
- Pedestrian traffic
- Narrow aisles
- Ramps and sloped surfaces
- Ventilation in closed environments
- Any other potentially hazardous environmental conditions.

Operators who are not adequately trained in forklift operations are at great risk for injury due to their lack of understanding. All operators should have knowledge of the principles of physics that allow a forklift to lift heavy loads. They should also know how to deal with their specific type of forklift and all of its safety features. Each operator must know how to maintain the vehicle and be aware of any malfunctioning parts so they do not use it when it is unsafe.

In order to qualify to operate a forklift one must meet certain requirements. They must be at least 18 years old and have a high school diploma or equivalency degree. All operators must be able to read and understand English so they can decipher the labels on equipment and loading instructions. They must also be able to write legibly. While there are no height and weight requirements it is important that the operator be mobile enough to turn and drive backwards without hindrance.

FORKLIFT MAINTENANCE

All employers must be diligent about maintaining high levels of safety in the workplace. This goes for everything from training, to operations, to maintenance, and [forklift safety kits](#). The operator is also responsible for managing his or her equipment and to never operate machinery that is defective in any way. The first step in avoiding dangerous situations is proper inspection of the equipment whenever it is used. Some forklifts are used constantly in 24 hour operations, others are only used sporadically. In both cases inspections need to be done at reasonable intervals. Those that are used occasionally should be inspected before each use and those that are used constantly should be inspected at the start of each shift.

Forklift Inspection

The following checklist will help you make sure your forklift will be operated in a safe environment. Lowering common risk factors is the most important aspect of keeping forklifts safe for all the people involved in its operations. The combination of using common sense, coupled with caution will assure top level safety.

- Check to be sure the horn is working properly.
- Check for leaks of hydraulic fluid. Leaks can cause slipping accidents or point to potential failure of the hydraulic system.
- Check that there are no sparks or flames coming from the exhaust.
- Be sure the vehicle is free of lint, oil, grease or any other flammable materials.
- Look to see that all fuel connections are tight.
- Check the battery terminals to make sure they are covered.
- Low tire pressure can cause a forklift to tip while too much pressure can cause it to fall, make sure the pressure in all tires is correct.

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- Test all controls to make sure they are functioning properly and labeled correctly.
- Make sure there are no cracks or other deformities on the mast, overhead guard, backrest, or the forks.
- Check the brakes.
- Check all lights.
- Check the steering.
- Test all restraints to make sure they are working properly.
- Clean off the load capacity plate so that all numbers are readable.
- Test back up alarm to make sure it is working properly.

SAFE OPERATIONS

Along with maintaining the vehicle any forklift operator must use safety precautions while driving it. You must remind yourself of how dangerous these vehicles can be and avoid situations that put you and other employees at risk. This includes any kind of horseplay on or around the equipment. There is always temptation to fool around and play games at work, but the potential for disaster is too great to give in to these temptations. Instead operators must remain completely focused on the vehicle and the job at hand.

At the end of the day, it is the forklift driver who holds the keys to avoiding disasters. He or she has to understand how the forklift works and how to react in a given situation in order to avert an accident.. These skilled drivers have to pay attention to many factors while operating their trucks. One of the things that must be paid close attention to is the type of terrain on which the truck is operating. Any loose objects, holes, or bumps on the road surface can cause a loss of control.

This can cause you to drop the load or sink and destabilize. The surface you drive on must be rated for four times the amount of weight you will carry. For example if your forklift weighs 6,000 pounds and is carrying a 4,000 pound load you multiply the total, 10,000 pounds by four which means the floor must be able to hold 40,000 pounds. Keep in mind that the weight on forklifts is not completely even, so if just one wheel goes off onto a surface that is not rated for that weight it could cause the whole thing to destabilize.

Operator Safety Tips

- Operator should wear the proper restraint at all times.
- Obey all speed limits and stop signs, using extra caution on inclines and ramps.
- Avoid turning while on ramps or inclines.

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- Double check to make sure the break is set and the forks are completely lowered and in neutral before stepping off of the forklift.
- Unless there is an extra seat with a seat belt and footrest there should be no other passengers on the forklift.
- Moving people on pallets or forks is very dangerous and should not be allowed in any workplace.
- Moving people should only be done with a proper platform attachments. All persons being lifted must wear a full body harness as well as a shock absorbing lanyard that has been attached to an anchor point.
- Should the forklift begin to rollover or roll to the side the operator should never jump. The must stay in the vehicle and hold on to the truck leaning in to the direction of the turn.
- If you are in a stand up forklift involved in a lateral tip over you should step backwards to exit the vehicle.
- Only operate the forklift from the operators seat, not while standing beside it.
- Never put any part of your body outside of the frame while traveling
- Never put any part of your body between the uprights.
- Maintain a clear view of your travel path at all times. If the load obstructs your view travel in reverse.
- Obey all speed limits, drive no faster then a quick walking pace
- Just like driving a car there should be three forklift length distances between you and another forklift.
- Do not drive a forklift up to a person.
- Never allow people to stand under the elevated forks, whether they are holding a load or not.
- Watch for clearance from beams, sprinkles, lights, or pipes in your travel path.
- Tilt backward only when stabilizing a load.
- Tilt forward only when dropping off a load.
- When possibly cross railroad track diagonally.

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- Keep load as low as possible, just above the ground when moving it.
- Make turns slowly.
- Go very slow on wet or slippery surfaces.
- Never leave the forklift unattended, this means the operator should never be more than 25 feet away or out of line of site when the truck is powered.

While the forklift operator is ultimately responsible for the safety of the machine it is also necessary that other employees understand safe operating procedures. You should never take part in anything that is unsafe or encourage other employees to take part in risky behavior. Keep in mind the number of serious injuries and deaths that occur each year. You do not want to become one of the statistics.

TRAFFIC AND LOADING SAFETY

Another way to avoid incidents with forklifts is to maintain a clear traffic plan for the forklifts and pedestrians. If at all possible pedestrians should never have to walk in the path of the forklift nor should it have to move through pedestrian traffic. Managers should look at the forklift and pedestrian traffic to see where there is interaction and how it can be minimized. They should maintain [forklift safety kits](#) that are accessible to all employees. Obviously, forklifts should be prohibited completely from areas where employees congregate, like around the time clock and the soda machine, coffee pot, or break room. They should also have traffic patterns that keep them away from pedestrian exits and entrances as much as possible.

Forklift Traffic Safety Procedures

- Set up clear zones that are forklift only and pedestrian only,
- Protect pedestrian walking areas with barriers between them and the forklift areas.
- Make designated crossing areas, maximize safety with overhead walkways or boom gates wherever possible.
- Set up and instruct all employees on the right of way procedures.
- Put up warning and traffic signs.
- Have employees wear reflective vests or other high visibility clothing.
- Always makes sure the forklift warning devices and flashing lights are working properly.
- Keep the work environment well lit and put visibility marks on the forklift.

Should your employees have a forklift accident it is important that you have procedures in place to deal with it. Proper training and refresher safety briefs can go a long way toward keeping people on their toes and aware of the potential dangers of the forklifts they work on or around. You must not wait

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until an accident occurs to put these safety precautions into practice. The best offense in any safety plan is a good defense. Empowering your employees to manage their own safety will greatly reduce the risk of incidents.

Loading and Unloading Safely

The whole purpose of using a forklift is to help with lifting and carrying large loads. Think of the time and effort it would take to hand stack warehouses full of products. The forklift allows this work to be done quickly and relatively safely as long as all employees understand the basic principles of forklift operations. Before moving any load you should make sure that the load is stable so that it does not slide or fall while it is transported from one spot to another spot. Many warehouses store and move objects of different sizes and shapes so you should familiarize yourself with the safest ways to stack items.

Block - Items that are square may be stacked in a cube and secured with wires or other strapping.

Brick - Each level of the stack should be turned 90 degrees.

Pinwheel - If a brick pattern is unstable, each quadrant is turned 90 degrees.

Irregular - Items that are irregularly shaped like bags or cylinders can be layered with plywood or strong cardboard to keep them stable.

As you inspect the load make sure that it does not exceed the forklift capacity rating. Be sure to check the rating at whatever the furthest extension you will use and the highest elevation. If the weight is too much see if you are able to break it into a few smaller loads that will be safer for the forklift to handle.

The forklift should be set squarely in front of the load, placing it unevenly will cause the load to be unbalanced and tip over. The forks should be wide apart to maintain this balance and be driven under the load completely. Once under the load the mast should be tipped back a bit to stabilize and then lift the load to move it.

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Once you have safely lifted and moved the load it is time to drop it at the new location. This spot should also have been inspected to make sure it is free of any debris and capable of holding the load. The cartons might have maximum stacking quantities or orientation instructions that you should note and follow.

Remember that you can not safely stack heavy loads on top of lighter loads. If the rack you intend to put the load on is damaged in any way it should not be used. Whatever part of the rack is broken should be repaired before anything is placed on it.

Once something falls into disrepair you can not determine how much weight it can safely hold, instead of taking risks fix it first.

CONCLUSION

The forklift is a great workhorse. They save time and money by allowing workers to move large, heavy loads quickly. They do also help workers stay safe by doing the heavy lifting and reducing the risk of injuries associated with manual labor. That being said, anyone who works on or around forklifts needs to be aware of the potential dangers that these trucks hold. The design of a forklift allows it to do the necessary tasks, but it also allows for no error in operating procedures.

Anyone who uses these machines needs to be trained properly according to OSHA standards. The training should be refreshed often so that procedures continue to be followed and improved no matter how comfortable or experienced an operator is with the equipment. Safety training is also necessary for employees who work around these machines. Employees should learn to be respectful of forklifts and know what a forklift operator can and cannot do to avoid collisions.

While it may seem like a lot of work to develop traffic patterns and traffic signs, do maintenance checks, and provide constant training it will be worth all of the effort. An operator with a good driving record has the potential to make a great deal of money. Likewise a company that has a good safety record and procedures will save loads of money over time. Employees are any companies most valuable asset, so train them properly to keep them with your company for a long time.

Creative Safety Supply

Phone: 1-866-777-1360

Email: info@CreativeSafetySupply.com

Web: www.CreativeSafetySupply.com