Telescopic Handler Safety Training
Student Manual
Introduction

Welcome to the Hard Hat Training Series!
During this training, we’ll take a look at the functionality and components of telescopic handlers. We’ll also show you how to conduct a thorough inspection before using the machine. Additionally, we’ll discuss safe usage and OSHA standards related to telescopic handlers. Finally, we’ll review the most common hazards associated with telescopic handlers and ways to prevent falls and other accidents.

By the time you complete this training and take both the written and practical exams, you should be ready to safely use a telescopic handler. You will be familiar with the equipment used by your company, have an increased knowledge of how to set up and safely use it, and be able to recognize and avoid the most common hazards.

Types of Forklifts

The following are the main types of forklifts:

- **Rough terrain**
- **Sit-down counterbalance**
- **Stand-up**
- **Industrial forklifts**

Each of these can have numerous other attachments helping them to accomplish many tasks. Telescopic handlers, the focus of this training, have extendable booms that can allow an operator to reach out and place loads in areas inaccessible to mast-type forklifts. They are popular in the construction industry because of their versatility and the numerous attachments that they can be fitted with.
Did you know?
29 CFR 1910.178 specifies that an operator must take a refresher course if any of the following apply:

- The operator is observed operating the equipment in an unsafe manner
- The operator is involved in an accident or a near miss
- The operator is required to use a different type of machine or equipment
- Workplace conditions have changed

Additionally, 1926.64(g)(2) states that “The employer…shall determine the appropriate frequency of refresher training.”
- The operator received a poor evaluation for performance

Initial training and evaluations or refresher courses must be documented with the name of the instructor(s). OSHA doesn’t require onsite proof of training, but many companies do. In case of an investigation, OSHA will require proof of proper and consistent training.
Anatomy

**Interior**

These are some of the main interior components of a telehandler. However, control names and locations will vary due to the many differences in forklifts. Always use a checklist specific to your forklift to guide you through any pre-operation checks. This kind of checklist is often provided by the manufacturer.

**Operator’s Manual**

Familiarity with the telehandler begins with the operator’s manual and warning labels. The operator’s manual is required to be on the machine at all times and everyone who operates it should be familiar with the safe operations portion of it. This manual also has guides for inspection and maintenance. Usually it is found in a compartment behind the seat.

**The Capacity Plate**

The capacity plate is also required to be on the machine and on any attachments. It must be in a legible condition. Like the operator’s manual, if the plates are illegible or missing you must replace them.
Anatomy

Warning Labels
The manufacturer also requires certain warning labels be on and in the machine and attachments at all times. The operator’s manuals should have a list of the required decals and labels. These labels need to be in a legible condition. Replacements can likewise be reordered from the manufacturer.

Load Chart
Load charts, too, are required to be on the machine at all times and in a legible condition. On the load chart, there will be information regarding how much weight it can lift safely at a certain radius. For example, loads that are near the maximum capacity of the machine can only be lifted a short distance out from the front wheels rather than the full length of the boom.

The Cab
The cab floor should be kept clean so nothing gets in the way of the brakes or interfere with operation. Your seatbelt should always be fastened as soon as you are in the cab. A fire extinguisher should be present, tested, and accessible. The operator should know how to use it in case of emergency.
Anatomy

**Instrument Panel**
The control levers, dials, gauges, buttons and switches need to all be tested regularly to make sure they operate smoothly. Each operator should be familiar with what each of these indicators represent and that they are working as intended. The horn is one of your most important safety devices. Do not rely on just backup alarms or flashing lights.

**More Interior**
Locate the Frame Level Indicator which is typically above the operator’s head on the crossbar of the falling object protective structure. Check the brakes by driving forward and braking and then backward and braking. The parking brake should also be checked to make sure it holds. Check that the steering wheel smoothly turns completely in both directions. Check the windshield for cracks or glares. Make sure the mirrors are in place.
**Anatomy**

**Exterior**
These are the main components of a telescopic handler that you should be familiar with. Since there are so many different types and models of forklifts, it is important to receive specific training to the machine you will be operating.

![Diagram of a telescopic handler](image)

**The Chassis**
This is the foundation of the lift and should not be overlooked when it comes to inspection. Look for damage or excessive corrosion.

Check the tightness and quality of the existing bolts. They might not always be reliable because of thread corrosion. The welds between structural components of the forklift needs to be checked for cracks. Cracked paint can indicate that a weld is failing.
Anatomy

Hoses
There can be a lot of hoses and cylinders on a telehandler so take your time inspecting them. Check for cracks, leaking, signs of excessive wear and remove any dirt that prevent them from functioning properly. Never use a machine that is leaking hydraulic fluid, even if it is a small amount.

ROPS/FOPS
The roll over protective structure (ROPS) and falling object protective structure (FOPS) should be inspected for bends, cracks, excessive corrosion or other signs of damage. A roll-over can place severe strain on these structures so they should be replaced immediately after such an incident.

Tires
To help with stability, rough terrain tires are used. These pneumatic tires are typically air-filled but foam filling is becoming more popular in an effort to make them more durable. Check these tires for proper inflation, cracks, leaks, missing lug nuts, and bent rims.

Some rough terrain forklifts have liquid filled tires to give the machine better traction, more counterweight, and more capacity.
Anatomy

Lights
Lights, too, need to be inspected and fixed if they are damaged, burned out, or missing. Check all brake, indicator, tail, head, spot and warning lights. Never deliberately disable a backup alarm or warning light. As noted before, along with the horn, they are vital to making other workers aware of your presence.

Outriggers
Some telescopic handlers have outriggers/stabilizers to increase their capacity while picking or placing a load. Check for bent pads or floats, dents in the beam or lift cylinders, worn or damaged pins, hydraulic leaks, damaged hoses, cracks in the welds, or loose bolts that attach the outriggers to the truck chassis. You should also test to make sure the outriggers can be deployed and retracted completely.

Boom
The main parts of the boom are the separate boom sections, slide pads, and angle indicators. While there are many components that work together to make the boom operational, the main parts of the boom are the separate boom sections, the boom chain, the slide pads, and the angle indicator. Check for dents, creases, or twists. To check the slide pads for wear, raise then extend the boom. From the cab, move the boom tip back and forth abruptly. Doing so will help you see if there is excessive movement in the boom sections.
Anatomy

Chain
The chains that extend and retract the boom must be inspected and cleaned. Also, the chains should be measured for wear and properly lubricated. Follow the manufacturer’s guidelines for when to lubricate. Most often it is based off of hours run, so you should always make sure to log hours and any maintenance done.

Boom Angle Indicator
This is located on the boom and measures the boom angle in relation to the frame. Check the angle indicator to make sure the arrow swings freely.

Forks
Before picking up a load, make sure that the forks (tines) are adjusted to the correct width and that the bar is lubricated properly so the forks slide across easily and tilt up, down, right and left as needed.

There are two basic types of forks: hook forks and shaft forks. Typically, as opposed to a sit down counterbalance fork truck, a telescopic handler relies on shaft forks, meaning a shaft on each fork end slips through a central bar that is then secured on each end by pins. The fork tips should be examined for cracks, chips, or other signs of blunt force that might impede your ability to slide under a load. Tips can easily be damaged if you use them to push a load. Never cut a hole in the end of the forks for towing and never weld an attachment to them for lifting.
Anatomy

Carriage
The carriage or backrest should be inspected and any significant damage should be addressed. If the frame of the backrest is several bent, it could lead to an unstable load or attachment whenever the forks are tilted up.

Attachments
Telehandlers are seen using any number of attachments. All attachments must be inspected and approved by the telehandler manufacturer. Refer to the operator’s manual for these specific inspection instructions. All attachments should come with their own operator’s manuals and capacity plates. These should both be present.

Wire Rope, Rigging
If you will be using a jib with a winch to hoist a load, you need to inspect the drum for proper spooling of the wire rope. Bad spooling is usually the cause of side loading or slack in the line when the hook is laid on the ground. You also need to inspect the wire rope for breaks, kinking, or other signs or rope failure. All other types of rigging gear, including slings, shackles, and hooks also need to be inspected before use to ensure they have legible capacity tags, are load rated and are free from damage. The safety latch is a small thing, but it is vital to safe operations. Without it, it is far too easy for a load to slip off the hook and come crashing down. Make sure that the safety latch is not bent and that it snaps shut. Never use a hook that is missing its safety latch or has it taped back.
Anatomy

Engine and Refueling

The engine compartment should be checked for proper fluid levels, leaks and damaged hoses or wiring. This should be someone who is trained and authorized. The hydraulic fluid level should be checked each day. Check it with the boom lowered and fully retracted.

Liquid Propane: Liquid propane is very common fuel for telescopic handlers. It is extremely cold and contact with skin can cause frostbite. Always use gloves and a face shield when changing or refueling. Propane is extremely flammable. Never park near a confined space or near a high heat source. Turn off the service valve on the tank when parked for extended periods of time. Never attempt to refuel a propane tank in you have not been trained. Refuel when the engine is cool. Never refuel or change the tank in a confined space. Always have a fire extinguisher nearby.

With the engine running, close the service valve on the tank. Try to restart on the engine. Disconnect the fuel line and replace the tank. This method keeps fuel from escaping.

Gasoline and Diesel: Before refueling a gasoline or diesel forklift, turn off the engine. Use the correct type of fuel. Avoid topping off the tank, which could result in a spill. Clean up any spill and replace the gas cap before restarting the engine. Always have a fire extinguisher nearby.
Stability

Loaded or empty, a telehandler can tip over if not level or if mishandled. So to begin the discussion on stability, outside of any electronic devices designed to determine leveling and boom angles, it’s important to recall the two main leveling indicators standard on all telehandlers:

1. the boom angle indicator which measures the vertical (up and down) angle of the boom relative to the frame,

2. and the frame level indicator which measures the lateral (side-to-side) angle of the frame relative to ground.

Above all, it is vital that you refer to your operator’s manual and strictly observe the manufacturer’s rules for traveling and working up, down, and across slopes. They are not suggestions; rather, the maximum grades allowed for traveling, parking, and placing or retrieving loads have been determined by a series of engineers through a series of tests. Exceeding these limits—whether on a 4 degree slope or a 12 degree slope—can easily lead to tip over and may inflict serious injury or even death.
The stability of the telescopic handler forklift is based on the principle of balance and leverage. It is not difficult once you understand a few basic principles. These are the main factors to keep in mind:

- The wheelbase, which is the distance from the front wheel to the back wheel
- The track, which is the side-to-side distance of the wheels
- The height of the vehicle
- The balancing point, which is the front wheels or outriggers
- The radius of the load
- The off-setting weight of the vehicle, which is the weight of everything from the front wheels or outriggers to the back

**Balancing Point**

**Perfect balance**: A teeter-totter is a good way to illustrate this. To be in perfect balance, the leverage or torque on each side of the tipping point must be equal.
On a forklift, the front wheels are the fulcrum or balancing point and the combined weight of the load, and that part of the forklift in front of this point, is offset by the weight of the rest of the forklift in back.

The principle off-setting weight is the counterweight, which is basically a lot of thick, heavy steel in the back. The farther back the counterweight, the more leverage the machine has.

**Center of Gravity (C.O.G.)**

The center of gravity (C.O.G.) of the forklift is different than the balancing point. Rather than just side-to-side, the C.O.G. is the point in the forklift around which its’ weight is evenly distributed in every direction.

The C.O.G. of the load or load center is also very important because the capacity of the machine is based on where it is located when it is lifted on the forks. The capacity of most forklifts is based upon the load center being 24 inches from the back rest.

If a load is substantially heavier on one side, that side should be up against the backrest for better stability.
The stability pyramid is formed by imaginary lines between the front and back wheels of the forklift and the highest point of the forklift. When the forks or a load is lifted the center of gravity (C.O.G.) of the forklift moves up and the forklift becomes more unstable.

When the forks or a load is lifted, the C.O.G. of the forklift moves up and the forklift becomes a little more unstable. When the load is lifted, its C.O.G. becomes part of the forklifts C.O.G. The combines centers of gravity will then be somewhere on a straight line between the two depending on how heavy the load is.

The heavier the load or the longer the radius, the closer the C.O.G. will be to the balancing point or fulcrum. Moving the C.O.G. past the fulcrum will cause an imbalance resulting in a tip over.
Stability

**Raising the Boom:** When the boom is raised without telescoping out, the forklift becomes more stable because now much of the boom and load is closer to the forklift's side of the balancing point. If there is a load on the forks, the load center will also be closer.

**Lowering the Boom:** Always use extreme caution when lowering the boom as this makes the forklift less stable since it moves the forks and load center away from the balancing point. On loads that are close to capacity, it could tip the forklift over.

**Level the Machine:** Always level the machine before raising the boom to place loads at heights. While some telehandlers have frame leveling capabilities that can level the machine 10 to 15 degrees in either direction, others do not. Keep in mind that if a machine does not have those capabilities, it cannot be used to lift personnel.

When on a slope and if the machine is not leveled, it may seem stable with the load low to the ground. However, as the load is lifted, the machine’s center of gravity will move closer to the tipping point, making it not level and more unstable.
**Stability**

**Dynamic Conditions**

Dynamic conditions must be considered when the machine and load are put into motion.

**Turning:** When a forklift is moving forward and abruptly turns to the right, the mass of the forklift still wants to go forward. Turning the wheels only makes the forklift turn sideways, not the load. If the forklift is going too fast then its momentum could cause it to tip over.

**Braking:** If an operator is moving forward with the load raised high, braking abruptly could cause a tip over. The closer the load is to capacity, the less braking action it takes. Hitting a pothole or small object could also cause a tip over.

Remember that dynamic forces can be created anytime the machine is moving, cornering, braking, lifting, tilting, and lowering loads. Only operate at speeds that permit the forklift to be stopped in a safe manner and always keep the travel path clear of potholes, loose objects, and debris.

**Load Charts**

Load charts on telescopic handlers help to determine the capacity at a specific radius, height, and angle. The main information you need to determine this is the weight of the load and the radius and height of the pick and placement spot.
Stability

**Radius**: Knowing the radius of the pick and placement of the load is essential for a safe pick and prevents you from having to re-setup the forklift if you estimated wrong. Many tipovers from overload have been traced to trying to exceed the limits of the load chart rather than move closer or use a machine with more reach and capacity.

**Height of Placement**: If you are lifting a load onto a building or some other structure, then the height and radius of the pick needs to be taken into consideration. The height of the building will prevent you from booming down very far to increase the radius.

**Weight**

If you do not know the weight of the load then the load chart is not going to do you much good. If you are unsure of the weight, then your best estimate is that it is half of the capacity of the forklift or more for the radius. You should weigh the load or find out for sure how much it weighs.

Many recently manufactured telescopic handlers have weight indicators that will give you this information and not allow it to lift more than what it is rated for. These instruments need to be in good working condition and calibrated on an annual basis at least.

Approved calculations can also help you to estimate the weight. Always remember to overestimate and if those calculations show that it is going to be 80% or more of the capacity then you should weigh it or get a bigger crane.
In order to estimate the weight of an object you need to know its volume and the unit weight of the material it is made from.

For example, if you had an ecology block that was 2’ wide x 2’ high x 6’ long to get the volume you would just multiply 2 x 2 x 6, which would give you a 24 cubic feet of concrete.

The unit weight of reinforced concrete is 150 pounds per cubic foot. If you multiply the unit weight by the volume of the ecology block you will get 3,600 pounds which is a pretty good ball park figure. The actual weight will probably be a little less depending on how much rebar was used when making the block.

Here are the unit weights of some other materials. This is the weight per cubic foot. Notice that steel is 480 lbs per cubic foot. Wood can be anywhere from 26 lbs to 64 lbs per cubic foot depending on the type. Water is around 64 lbs per cubic foot or 8.8 lbs per gallon.

Weight tables will also aid you in estimating the weights of many types of materials. For example, one inch steel plate is 40 lbs per square foot. So if you had a 8’ x 12’ x 1’ steel plate you would multiply 8 x 12 to get the area which is 96 square feet and then multiply that number by 40 lbs to get the weight which will be 3,840 lbs.
Once you know the radius and height of the pick and the weight of the load, you can plot this information on the load chart to determine if the lift can be made.

We will use the following example: You need to place a load of 4’ x 8’ sheets of plywood on top of a 22 foot building. The closest the front wheels can get to the building is six feet so the closest the load can be placed is eight feet. The height of the plywood is four feet and the unit weight is 36 lbs.

When we multiply the volume of the plywood by the unit weight, the load weight is approximately 4600 lbs.
To plot this information on the load chart we will first draw an imaginary vertical line 8 feet from the front wheels which represents the radius of the pick.

Draw a horizontal line next at 22 feet that represents the height of the building. Where these two lines intercept is the pick or placement location. Now check the weight of the load to see if the forklift can lift and place it safely. Can this load be placed safely using this forklift?

According to the load chart the pick can be made safely but a pick this close to capacity is referred to as a critical lift. It is important that all of the figures for this pick are accurate, especially the weight. It may be safer to use a larger telescopic handler or crane if you are not completely certain.
Stability

Critical Lifts

All lifts require some planning but there are some lifts that, because of a few factors or conditions, need more planning than others. These are some times referred to as critical lifts.

Some companies simply consider a critical lift as one that is near the maximum capacity of the machine. A common figure used is 75% of the capacity. However, there could be some other situations that would make a lift more dangerous than others. If any of the following conditions are present, the lift should be planned and precautions put in place.

- Wind speeds or gusts that exceed 20 mph or less if the load is already near capacity.
- The location is near power lines.
- Temperatures well below freezing.
- Wet, dark, fogging conditions.
- The load must pass over an area where pedestrians normally travel.
- The load is very valuable or the placement area is near very costly or sensitive equipment.
- Working in soft soils or near banks that are not shored or fortified.
- The exact weight of the load is not known and the best estimate puts the weight at over half of the capacity of the crane.

Can you think of any other conditions that might make a lift a critical lift?
Pre-lift meetings can be held to make sure that everyone involved in the lift is on the same page and is instructed properly as to how the lift will be accomplished.

These meetings can be held as part of your regular safety meetings and are great opportunities for training less-experienced operators.

Some companies have a critical lift plan that must be filled out before each lift that qualifies as such. This plan forces everyone involved in the lift to consider and document each part of the lift before proceeding. Some of the things that must be filled out are:

- Known weight of the load and how it was determined
- Type of rigging that will be used and a brief sketch of the rigging configuration and capacity of slings, shackles etc.
- Names of those involved in the lift and their responsibilities
- Picking and placement locations and path of travel
- Will taglines be needed
- Will the load be hoisted over critical locations or work areas and
- The center of gravity of the load
Forklift safety begins with being completely familiar with the machine you are using and what it can and cannot do.

Having a license to drive a car will aid you as you learn to operate a forklift but does not qualify you. There are many differences that must be understood.

Forklifts typically weigh much more than a car. A 5,000 lb. capacity telescopic handler could weigh as much as 15,000 lbs. whereas a medium sized car will only weight 2-3,000 lbs. It is not hard to imagine which will do the most damage if it runs over your foot or pins you against a wall.

Unlike cars, many telescopic handlers have three modes of steering: two-wheel, four-wheel and crab. Another difference is if you let go of the steering wheel in a car, it will straighten out, but on telescopic handlers it will not.

Unless there is a passenger seat, which would be rare, telescopic handlers are not for transporting people. Never allow anyone to ride on the back or side of the machine and never on the forks.
Audible and discernible voice communication should be kept with the operator at all times. When this is not possible, a signal system should be used. Standard signals will be shown in this training, but in certain circumstances it may be necessary to create special signals.

Everyone using the forklift or guiding the load must agree on the signals beforehand.

A hand signal chart should be posted on the forklift, or in the immediate work area.

The following hand signals are some of the most common associated with telescopic handler operations.
Operations

Retract the Boom: Position both hands in front of your body with the thumbs facing in.

Extend the Boom: Position both hands in front of your body with the thumbs facing out.

Shift Forks Right or Left: When signaling the operator to shift the forks, point in the direction of movement desired (either across the body or by extending your arm out away from body.)
Operations

**Raise the Boom**: Position your hand in front of your body with your thumb pointing up.

**Lower the Boom**: Position your hand in front of your body with your thumb pointing down.

**Rotate Forks Right or Left**: To give the rotate the forks signals, extend your arms away from each other at a 45-degree angles with the uppermost hand representing the desired direction of the tilt.
Operations

**Tilt Forks Up:** Extend your arm and point up.

**Tilt Forks Down:** Extend your arm and point down.

To signal the operator to dog everything, or pause, firmly clasp your hands in front of your body.
**Operations**

**Stop:** Bend your arm inward across your chest, then, with the fingers open, extend your arm outward away from your body.

**Emergency Stop:** The emergency stop hand signal is similar to the stop signal but with two hands. With both arms bent inward across your chest, extend your arms away from you. Repeat this signal rapidly until operations have ceased.
Operations

Load Lifting

Forklifts are meant for lifting loads that are free and clear. Never attempt to lift a load or object that is wedged or frozen to the ground.

Using forklifts to push loads can put undue stresses on the transmission or clutch. Pulling trailers or boats with a trailer ball on the end of one fork could damage the forks or carriage through side loading.

If you intend to use an attachment such as a jib boom or personnel platform, make sure that it is load rated and the manufacturer allows its’ use. Forklifts equipped with attachments should be operated as partially loaded when not handling a load.

Work-Site Safety

It is important to be familiar with the worksite where you will be operating the forklift. As stated earlier, OSHA requires refresher training if a condition in the workplace changes in a manner that could affect safe operation of the machine.

Be familiar with your company’s forklift safety policy and obey all rules and safety procedures. Obey all traffic signals and signs. Follow normal traffic patterns and stay in approved areas.
**Operations**

**Pedestrians:** Be aware of high pedestrian-use areas. Know locations of pedestrian cross walks, paths and convex mirrors that will allow both you and the pedestrian to see around the corner.

**Safe Distance:** Maintain a safe distance from the edge of ramps, platforms, docks, slopes, or inclines.

**Headroom:** Make sure there is sufficient headroom under overhead installations such as lights, pipes, sprinkler system, air conditioning units, power lines.

**Travel:** Insure the path of travel is clear of loose objects or debris. Remove them if possible. Use caution on slopes or inclines. Cross railroad tracks, small curbs, or bumps at an angle.

**Parking**

Park your forklift in appropriate locations. Never park in an area that would block fire lanes, emergency equipment, or access to stairways, entrances, or exits.

**Attended Parking:** OSHA states: “When the operator of an industrial truck is dismounted and within 25 ft. of the truck still in his view, the load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement.” This is called attended parking.

**Unattended Parking:** A forklift is considered unattended when the operator is 25 feet or more away from the vehicle which remains in his view or whenever the operator leaves the vehicle and it is not in his view. When the forklift is left unattended, the forks should be fully lowered, controls put in neutral, power shut off, and brakes set. If the machine is on an incline the wheels should be blocked.
Operations

Forklift Travel

When climbing on and off of the lift, use the 3-point contact method: two hands and one foot or one hand and two feet. Avoid grabbing the steering wheel. Never leave a machine while it is still moving. Always engage the parking brake before leaving the machine.

OSHA requires seat belts to be used whenever the operator is in the seat unless you are working on a dock above water. The seat belt will save your life if the lift tips over.

Operate only from the operator’s compartment. Keep all body parts inside. Don’t lean out to see around a wide load. Travel in reverse if forward vision is blocked.

Always maintain at least three vehicle lengths when following another forklift. Maintain a clear view of travel. Use the horn when approaching intersections, blind corners, pedestrians or other vehicles. Check convex mirrors.

On all grades, the load and load-engaging means should be tilted back if applicable, and raised only as far as necessary to clear the road surface. Never drive with empty forks more than a few inches off the ground.

Keep the forklift under control at all times. Only operate at speeds that will permit the forklift to be stopped in a safe manner. Do not spin the tires. Stunt driving or horseplay must never be permitted.
Pedestrians

Pedestrians have the right of way but that does not mean that they are always right. It is your responsibility to be aware of all people on foot.

Be especially aware of pedestrians when working in tight quarters. Never drive a forklift up to or turn your forklift near a pedestrian who is next to a fixed object. Watch rear end swing of the forklift so as not to clip someone or something.

Your horn is one of the most important safety tools on a forklift and should be used to alert pedestrians of your presence. Establish eye contact with pedestrians and operators of other vehicles. Make sure they are aware of your intent. Signal them to stop. Wave them on when you are finished. Wait until they are safely out of the way.

No person should ever be allowed to stand or pass under the elevated portion of any forklift, whether it is loaded or empty. Never allow someone to ride beside you unless there is a designated seat for passengers. Never allow someone to ride on the forks or hang on the side while you are driving.
Loading/Unloading

Only loads within the rated capacity of the truck should be handled. If you pick up a load and the forklift starts to feel light then you are probably overloaded and you need to remove some of the product or get a bigger forklift. Keep near-capacity loads close to the ground and never lower a maximum capacity load without retracting the boom. Lowering the boom will extend the radius of the load possibly overloading the machine.

Only stable or safely arranged loads should be transported. Some loads may need to be shrink-wrapped or secured before moving. Make sure there are no parts of the load sticking out that could catch on something. Always apply parking brake before lifting or placing a load. Adjust the frame until the machine is level using the sway control. Loads should be centered on the forks with the heavy side up against the backrest rather than on the end of the forks. This will give the forklift better stability.

Always exercise caution when handling off-center loads which cannot be centered. Squarely engage the load. Maneuver boom and forks under load until it touches the carriage or backrest. Don’t slam into loads or push them around with your forks.

Squrely engage the load. Maneuver boom and forks under load until it touches the carriage or backrest. Maintain control of your forklift at all times. Start, turn, and brake smoothly. Watch rear end swing when executing turns and stay close to the inside corner. Keep a clear view of travel. If the load blocks your forward vision then you should travel in reverse or use a spotter.

If you are handling hazardous materials you must be trained in what they are, how to handle them and how to clean them up in case of a spill. Refer to the appropriate MSDS sheet for more information.
Operations

Elevating Personnel

The use of personnel work platforms (also called man-baskets) is commonplace on virtually every construction site. Elevating personnel is best done with aerial platforms such as scissor lifts or boom supported aerial lifts. But if this is not possible, then many telehandler manufacturers allow their forklifts to be used for this purpose.

Some manufacturers do not allow the use of personnel work platforms on their forklifts at all. Others do. As a result, you must get authorization from the forklift manufacturer before using any personnel lifting attachments. This means that if you have several brands of forklifts using attachments, each forklift must have individual authorization from its specific manufacturer. You should never alter the basket in any way.

Each basket should also have an operator’s manual specific to man-basket operations that is stored in a compartment at all times. If it is missing or illegible, replace it with one from the manufacturer. The platform must be built to OSHA/ANSI standards.
Operations

There should be a manufacturer’s plate and labels that show the weight of the platform, the maximum number of occupants, and the safe working capacity.

Other manufacturer-issued warning labels and operator instruction decals should be present and in a legible condition.

The platforms must be securely attached to the lifting carriage or forks. All components, including any chains, bolts, and pins must also be inspected prior to use and replaced if damaged or excessively corroded.

Regarding stability when personnel are lifted, the machine must rest on firm footing, and the drive controls in the cab must be in neutral with the parking brake set. Elevating personnel when the forklift is on a slope is prohibited unless the machine can be leveled.

The basket floor should be kept free from clutter, garbage, tools, and supplies that might cause you to slip or trip. Gates should be inspected and used as intended. Never manipulate or tie back these safety devices in any manner.
Never drive the forklift with the platform elevated. Always use the agreed upon hand signals or another form of communication. As far as protecting the elevated worker, never tie off to an adjoining structure or an unapproved object. Do not use ladders or any other object to extend your height or reach. Stay inside the platform; always keep both feet firmly planted on the platform floor; never lean over, sit on, or climb onto the platform railing.

Under no circumstances should anyone be raised on just the forks, a pallet, or a homemade man-basket.

**Fall Protection**

Fall protection is a major concern at virtually every worksite. If you are in a work platform attached to a forklift, fall protection is required. Appropriate fall protection is made up of three components that should never be excluded: a full body harness, a lanyard, and an anchorage point. These need to be inspected before use and replaced if damaged. Always wear a harness with a lanyard that is connected to the designated and labeled anchorage point. Anchorage points are load rated.
Hazards

Job site safety is everyone’s responsibility. When performing operations with a telescopic handler, the operator of the machine and those assisting him on the ground need to work together as a team. Workers on the ground need to notify the operator if they notice anything out of order with the machine. Likewise, the operator needs to be aware of workers on the ground and stop operations when anyone comes within range of the machine. Every person on the job site is responsible for his or her own safety and the safety of everyone else.

We will discuss six of the more common hazards associated with forklift operations and show you how to recognize these hazards and avoid or minimize them.

Struck by Forklift

Being struck by a forklift is the number one cause of injuries and deaths involving telescopic handlers. Both operators and pedestrians need to be aware on any work site. Here are some of the causes of pedestrians being struck by the forklift:

- Driving with a load obstructs the vision of the operator
- Going too fast in high pedestrian-use areas
- Rear end swing of forklift when making turns
- Walking along the side of a forklift and in the blind spot
- Backing up
Hazards

**Hit by Falling Load**

A very common accident involving all types of forklifts is caused by falling loads hitting someone. Often this can be attributed to:

- Long, wide loads that are not secured to the forks
- Loads that are not shrink-wrapped
- Loads that are stacked too high, or
- Overhanging loads that catch when trying to put them into a limited space

**Tip overs**

Tip overs of telescopic handlers are very common and they occur when the capacity of the machine is exceeded while telescoping out or booming down. They tip over sideways when working on slopes or raising the boom on uneven ground. Other causes are turning or stopping abruptly with the forks or a load in the air. Overloading is the number one cause of a tipover.

For some reason when the forklift begins to tip over sideways, a high percentage of operators attempt to leave the forklift in the same direction that it is tipping.

This may be due to the initial stages of a tip over rate feeling comparatively slow and it may seem possible to escape before it pins you. This is not true.
Hazards

Elevating Personnel

Rough terrain forklifts should not be used to lift personnel unless there is no other practical way to do it. Most manufacturers of telescopic handlers prohibit it. Check the operator’s manual.

Many of elevating personnel accidents happen while lifting someone while they were just standing on the forks. Others used a pallet or a poorly constructed man basket. Some did not attach the man basket to the backrest to keep it from coming off the forks.

Using rough terrain forklifts that are not specifically designed to elevate personnel can be hazardous unless precautions are taken to ensure the safety of the person being elevated and those in the area. Here are some guidelines from the ANSI standard.

- Use an approved man basket that is securely attached to the carriage.
- The operator must remain at the controls and only operate them when so instructed by the person in the basket.
- Before repositioning, lower the person to the floor, move to the new location and then raise them back up.
- The area below should be marked or barricaded.
- The weight of the basket, materials, tools and personnel should never exceed 1/3 of the maximum capacity of the lift.
- If the forks have a rotation feature, those should be disabled.
- The operator should not touch any controls unless he is using them.
Hazards

Obstruction of View

Obstruction of the vision of the operator constitutes a serious hazard with telescopic handlers. There are many blind spots that prevent the operator from seeing everything around him.

The boom makes it very difficult to see immediately to the right when it is lowered unless it is raised high enough to see around it. It is also very difficult to completely see everything behind you, especially down low and to the right because of where the boom is mounted.

Well-placed mirrors can assist you in seeing these areas. Just because mirrors don’t come with the machine does not mean you cannot add them later.

The load can also obstruct your vision. If you have the load low, it may prevent you from seeing you travel path and if you raise it up to see under it, it will obstruct your vision of any overhead obstacles including power lines. Use a spotter if you are unable to see your travel path.

Power Line Contact

Power line contact is the inadvertent contact of any metal part of a machine with a high-voltage power line. A single contact can result in multiple deaths and/or crippling injuries.

Most power line contacts occur when moving materials adjacent to or under energized power lines and the load, forks or boom touches a power line.

Before anyone begins work at a new site, all hazards such as power lines, should be identified and de-energized or at least marked and barricaded.
Hazards

No part of the forklift should come within 10 feet of a 50,000-volt power line. The area within a radius of 10 feet in any direction from power lines is an unsafe work area and must be clearly marked off on the ground by caution tape, fences, barriers, etc. If any part of the boom can reach it, even if you are not working on that side, then you should use a spotter to make sure that you do not.

If you contact power lines with any part of the boom or forks you must not panic. Stay where you are and alert others of the situation and warn them to keep away.

Only when you are certain that the lines have been de-energized by the electric company should you leave the crane or let anyone approach.

If you must leave the machine because it is on fire, then jump clear of the forklift. Never touch the machine and the ground at the same time and be aware that the ground around the machine may also be energized.

Try to land with your feet close together and then shuffle off, keeping both feet close together. If you fall forward when jumping off, roll up into a ball to lessen the chance of creating an electrical path from one leg to the other.
Hazards

Accident Profiles
The following accident profiles are all OSHA-investigated cases. The situations, injuries, and fatalities are real and should serve as a reminder of the importance of obeying all the rules all the time. Only the company and employee names have been changed. Additional and complete reports can be found on OSHA’s website.

Struck by Forklift
Employee #1 was watching a telescopic handler operator put away the machine for the night. Employee #1 was walking too close along the side the forklift and, when the operator made a wide angle turn, the rear tires of the forklift ran over his left foot. He sustained tendon and ligament damage.

Write below what went wrong

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Hit by a Falling Load

Employee #1 was using a telescoping boom forklift to move drill pipes around a storage yard. The pipes were 31 feet long and weighed 20 pounds per feet. Employee #1 backed up with a load of 11 pipes and then dismounted to rearrange boards in front of the forklift in preparation for the next trip to the horizontal pipe rack. He left the load tilted back and elevated about 8 feet. While he was working in front of the forklift, the tilting mechanism bled down, causing the pipes to roll off the forks strike him on the back of the head. He was killed instantly.

Write below what went wrong

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________

__________________________________________________________________________________
Tip Over

A telescopic handler forklift was hoisting a sign into place with the boom fully extended at a 60-degree angle. The load was picked up several feet off the ground and was being moved into position. As it moved forward, an aerial lift followed containing employees #1 and #2, who were to weld the sign in place. The forklift approached a 4-inch curb at a 45-degree angle to its front axle. The right front wheel of the forklift went up on the curb, causing the forklift to tip slightly to its left. The load shifted and the forklift began to tip. The aerial lift that was following the forklift was in the direct path of the falling boom. The boom hit the basket of the lift, and Employee #1 was struck in the head and killed.

Write below what went wrong

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Hazards

Elevating Personnel

Employee #1 was unloading air-conditioning units through a window into a hotel under construction. He was standing in a basket designed to assist in the raising and lowering of scrap material. It was only resting on the forks of a material handler forklift. Employee #1 was removing the A/C units without regard to maintaining an evenly balanced load in the cage. The load became unbalanced and the box fell to the ground. The employee was killed.

Write below what went wrong

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Obstruction of View

Employee #1 was bending over in a sand pile behind a stucco mixer, cleaning his tools. A coworker drove his telescopic handler forklift from the west to the pile of stucco mix and parked next to the mixer. Not able to see Employee #1 kneeling in the sand he extended and lowered his boom across the stucco mix and down to the sand pile, pinning Employee #1 beneath the forks. The operator then turned off the forklift, removed the keys, and left the site. Sometime later, a witness saw the Employee #1 lying in the sand, and another forklift was used to free him. He was killed.

Write below what went wrong

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Hazards

Power Line Contact

Four employees were assigned to dismantle a scaffold and move it to another side of a building. Because they were left without any direct supervision, the employees decided to use a telescopic boom forklift to move the scaffold. They attached a wire rope to the top of the scaffold and used the forklift to lift the scaffold. Two of the employees held the scaffold, with one employee on each side to keep it balanced while it was moving. The forklift operator was moving forward when the load backrest extension contacted a 7200-volt, single-phase overhead power line. The ground was wet and muddy. The two employees guiding the scaffold received electric shocks and were pronounced dead of electrocution.

Write below what went wrong

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
Conclusion

Notes
Notes
Notes
Conclusion

Accidents can happen on any given day and at any work site. There are so many things and situations that can cause injury or even death on the job. While we cannot go over them all here, it is important you take the time to analyze the potential hazards each job, site or machine present.

The telescopic handler, like all equipment, can inflict serious injury or death when misused or abused. Improper training, poor use, failure to perform preventive maintenance, and failure to inspect can have serious consequences.

Safety is the responsibility of everyone involved in construction operations—from operators to maintenance personnel. You can help ensure safe operation by knowing and following all safe work practices and safety regulations that are applicable to your workplace. When in doubt during any phase of an operation, take the time to stop and consult your operator’s manuals, company rules, co-workers or safety supervisor. Time is money, true, but a mistake made to save time can cost money and lives. Good luck and stay safe!