NEBRASKA DEPARTMENT OF TRANSPORTATION LIFT TRUCK TRAINING

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Major Parts of Powered Industrial Lift Truck



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i. Instructors Introduction

- Hand out the agenda page and participant's training guide to Operating Forklifts Safely.
- Course Introduction
- Explain the course objectives for training.
- Present the course materials
- Give written QUIZ & road test.

ii. {Optional}

Note: This CBT based course is free of charge and is available to anyone wanting on line forklift training. No account number is needed. It can be used to enhance forklift certification training.

Free Forklift CBT (OSHA) training is available on line at:

http://www.free-training.com/osha/forklift/forkmenu.htm

iii. Scope and Purpose

- Train and inform lift truck operators to the types and operation of the various types/classes of lift trucks commonly referred to forklifts they may be called upon to operate during the course of their work.
- To prevent accidents, injuries, and possible death associated with the unsafe use of forklifts in construction and maintenance work.

PART 1 – Understanding Powered Industrial Trucks (Forklifts)

I. (OSHA) Standards to Operate a Forklift

- Forklift operators must receive forklift training prior to operating any type of forklift they may use.
- It is the responsibility of each district to provide forklift training for every forklift operator.
- Forklift operators must receive refresher or re-training and evaluation when;
 - 1. New equipment is introduced.
 - 2. Existing equipment is modified to receive forks or personnel lifts.
 - 3. Operating conditions and environment change.
 - 4. The operator's performance is unsatisfactory.
 - 5. The operator is involved in an accident, injury or fatality.
- Each forklift operator's performance and training must be evaluated and documented at least once every three years by an authorized lift truck operator/supervisor/trainer.

 Documentation of training and evaluation will be recorded on an "SAFETY MEETING FORM" paper or electronically, and kept until the next evaluation.
- **II.** Video: show "J.J. Keller FORKLIFT Safety for Construction" or any other forklift training video. Showing time is 22 minutes.
 - Video discusses all terrain forklifts on the construction site, but the concepts are similar to forklifts used in warehouses and maintenance yards.

III. Classes of Powered Forklifts (Powered Industrial Trucks)

The operator may be required or have the opportunity to operate any of one these classes of forklifts.

Forklift Class		
Class I - Electric Motor Rider Truck	r Rider Class I forklifts are electric-motor rider trucks, either stand-up operator or seated three-wheel units are counterbalanced and may have cushion or pneumatic wheels.	
Class II - Electric Motor Narrow Aisle Truck	Class II forklifts are electric-motor trucks for narrow aisle or inventory stock/order picking applications. They may have extra reach or swing-mast functions.	
Class III - Electric Motor Hand Truck	Class III forklifts are electric-motor trucks, either walk-behind or standing-rider operated. Automated pallet lift-trucks and high lift models are often counterbalanced.	
Class IV - Internal Combustion Truck / Cushion Tires	Class IV forklifts are rider fork trucks, with cabs and seated controls, internal combustion engines, and solid or "cushion" tires. They are usually counterbalanced.	
Class V - Internal Combustion Truck / Pneumatic Tires	Class V forklifts are rider fork trucks, with cabs and seated controls, internal combustion engines, and pneumatic tires. They are typically counterbalanced.	
Class VI - Electric and Internal Combustion Tractor	Class VI forklifts are sit-down rider, tow tractor lifts. They are supplied with electric or internal combustion engines.	
Class VII - Rough Terrain Fork Lift Truck	Class VII forklifts are designed for use on rough terrain. Typical applications include agriculture, logging and construction.	
Class VIII - Hand Pallet Truck	Class VIII forklifts include all personnel and burden carriers.	
Other	Other unlisted forklift classes.	
Narrow Aisle	Equipment is designed for size and maneuverability within narrow aisles.	
Side loader	A side loader is a type forklift specially designed with the lifting forks perpendicular to the drive direction. They are balanced to lift and maneuver long loads.	
Search Logic:	"Required" and "Must Not Have" criteria limit returned matches as specified. Products with optional attributes will be returned for either choice.	
Stacker / Walkie	Stackers or walkies are movable lifting devices with a high level of maneuverability. They are a lighter-duty version of a forklift. Typically, stackers are used internally for storing and retrieving palletized loads.	

IV. Key Forklift Terms and Definitions

Lift truck commonly known as forklifts — vehicles used to lift, move, stack, rack, or otherwise manipulate loads. Material handling workers use a lot of terms to describe lift trucks; some terms describe specific types of vehicles, others are slang terms or trade names that people often mistakenly use to describe trucks. Terms include, industrial truck, forklift, reach truck, motorized pallet trucks, turret trucks, counterbalanced forklift, walkies, rider, walkie rider, walkie stacker, straddle lift, side loader, order pickers, high lift, cherry picker, Jeep, Tow motor, Yale,

- Authorized employee lift truck operator who has completed safety training to operate forklifts, and has permission from the department to operate forklifts.
- Qualified person attended DOR (OJT) "On the Job Training" training and, has experience operating powered industrial trucks and or has, attended and completed a Powered Industrial forklift course.
- Counter balance forklifts with counter weight in the back for stability lifting heavy materials.
- Rough terrain forklift (RTF) used for uneven terrain to move material or supplies.
- Modified truck- can accept forks and is used as a lift truck.
- Center of gravity the point on an object at which all of the objects weight is concentrated. For symmetrical loads the center of gravity is at the middle of the load.
- Counterweight weight that is built into the trucks basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.
- Dynamic stability the weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting and lowering loads etc.
- Grade slope of a surface, usually measured as the number of feet of rise or fall over a hundred foot horizontal distance (expressed as a percent).
- Lateral stability a truck's resistance to overturning sideways.
- Load center the horizontal distance from the load's edge (or the fork's) or other attachments vertical face) to the line of action through the load's center of gravity.
- Longitudinal stability the truck's resistance to tipping forward or backwards.
- Operation instructions limitations, warnings & precautions for the type of truck.

What type of forklift (lift truck) will you operate? List the class, type and fuel source for forklifts your operators are going to operate	

V. Examples of Lift Trucks

A. Electric - powered 3 wheel Class I Counterbalanced



Figure 1

B. Order Picker Class II Counterbalanced

This type of powered truck is designed to allow the operator to ride up and down with the load so that individual items can be pulled from the rack or shelf storage. Order pickers are used for fast and efficient material handling in operations that require pulling orders or taking inventory. Order pickers can lift at heights up to 15 to 20 feet, and some heavy-duty units can lift as high as 30 feet



Figure 2

C. Reach truck Class III Counterbalanced

This type of powered industrial truck is designed for picking and placing of loads. The carriage of the truck is articulated to reach into rack locations, and the operator stands to operate the truck.



Figure 3

D. Powered Pallet Jack Class III Counterbalanced

This type of powered industrial truck is designed to move pallets of materials. There are two types of pallet jacks, the walkie, which the operator walks alongside, and the pedestrian-controlled pallet jack.



E. Counter Balance Forklift Class IV solid tires or V pneumatic tires Counterbalanced This industrial truck has a set of forks or other material handling attachment mounted to the carriage at the front of the vehicle, and a counter weight in the rear of the vehicle. The operator sits to operate the vehicle.



F. Class VI electric or gas powered forklift.



G. Rough Terrain Forklift Class VII

RTF is designed specifically for the rigors of uneven grades or rough terrain, particularly associated with construction activities.



H. Rough Terrain Forklift Class VII

The front-end loader is a self-contained unit mounted on rubber tires or tracks, and is one of the most versatile and capable pieces of equipment used in the NDOR. The front-end loader can be equipped to operate as a loader, dozer, scraper, clamshell, forklift, backhoe, crane, auger, or a sweeper.



VI. Forklift Type Designations

- A. Powered Forklifts that are used in non-hazardous environments
 - Type D Forklift diesel-powered having minimal acceptable safeguards against inherent fire hazards.
 - Type E Forklift electrically-powered having minimal safeguards against fire and electrical shock hazards.
 - Type G Forklifts gasoline-powered having minimum acceptable safeguards against inherent fire hazards.
 - Type LP Forklifts liquefied-petroleum-gas-powered having minimum safeguards against inherent fire hazards.
 - Type G/LP Forklifts operates on higher gasoline or liquefied petroleum gas having minimum acceptable safeguards against inherent fire hazards.

B. Classification of Atmospheres Considered Hazardous

- Class I Locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.
- Class II Locations are hazardous because of the presence of combustible dust.
- Class III Locations where easily ignitable fibers or filings are present but not likely to be suspended in quantities sufficient to produce ignitable mixtures.
- Unclassified Locations not possessing atmospheres defined as Class I, II, III locations.

C. Powered Forklifts that are suitable to be used in hazardous locations

- Type DS Forklift diesel-powered that, in addition to all the requirements for type D units is provided with additional safeguards to the exhaust, fuel, and electrical systems.
- Type DY Forklift diesel-powered have all the safeguards that type DS have in addition, do
 not have any electrical equipment, including ignition. They are equipped with temperature
 limitation features.

- Type ES Forklift electrically-powered that in addition to all the requirements for Type E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperature.
- Type EE Forklift electrically-powered that have all the requirements for Type E and ES units with the electric motor and all electrical equipment completely enclosed.
- Type EX Forklifts electrically-powered that differ from E, ES, or EE units that the electrical fittings and equipment are so designed, constructed, and assembled that the units may be used in atmospheres containing specifically named flammable vapors, dusts, and under certain conditions, fibers. Type EX units are specifically tested and classified for use in Class I, Group D or for Class II, Group G locations defined in NFPA 70, national Electric Code.
- Type GS gasoline-powered units that, in addition to all the requirements Type G units, are provided with additional safeguards to the exhaust, fuel and electrical systems.
- Type GS/LP Forklifts operate on either gasoline or liquid petroleum and addition to all the requirements for Type G/LP units are provided with additional safeguards to the exhaust, fuel, and electrical systems.
- Type LPS Forklifts liquefied-petroleum-gas-powered units that in addition to the requirements for Type LP units are provided with additional safeguards to the exhaust, fuel, electrical systems.

VII. Operation of Forklifts

A. Comparing Forklifts to Autos

Forklifts are heavier and are usually smaller than a car, and since they have a counterweight in the back they weigh more.







Figure 10 (3000 lb.)

How much does the forklift you will operate weigh?

Note: You can find the information on the forklift identification plate.

B. Steering

- Automobiles use the front wheel to steer. Forklifts usually use the rear wheels to steer. This allows them to turn in a much shorter radius.
- Rough terrain vehicles have different steering modes, some with select steering, two wheel steering or crab steering (all four wheels).
- Telescopic handlers usually have all-wheel steering with different maneuvering modes available. Loaders usually have front wheel steering and skid steers are different yet. Example of a counter balance rear steering

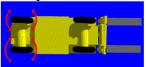


Figure 11

How does your forklift steer all-wheel or rear two wheels?

C. Suspension systems

Automobiles use a four-point suspension (4 wheels), and forklifts use a three point system. A forklift will remain stable if the center of gravity remains inside the triangle formed by three-points A, B, C.

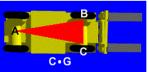


Figure 12

While some new rough terrain vehicles are being designed with four points by locking the rear axle, most continue to be manufactured using a <u>three-point suspension system</u>, meaning the vehicle is supported at three points. An imaginary line-drawn between these three points- (the two front tires and the pivot point of the rear axle)-makes up what's known as the stability triangle

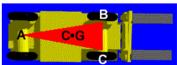


Figure 13

The stability triangle is a reference point. As long as the center of gravity remains within the imaginary area the vehicle will remain stable

D. Longitudinal stability refers to the resistance of a forklift overturning forward or reverse.

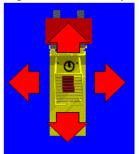


Figure 14

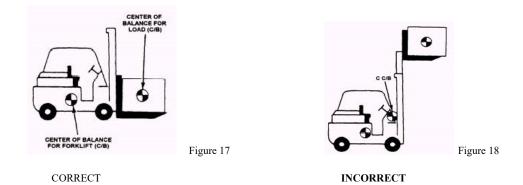
Side stability refers to the forklifts ability to resist tipping over sideways. Front stability the resistance to tip forward or backwards.

- Stability (center of gravity) from the sides or front/rear can change by:
- How high the load is lifted.
- Turning the unit with a load.
- The level of a surface the truck is operating on.
- The track of a forklift. (Distance between the wheels on the same axle)



• If the Center of Gravity is outside the triangle, the forklift loses lateral stability and can tip over when turning sharply.

If the load is carried too high the truck becomes unstable while moving and can fall off the lift truck.



When the center of gravity does not stay within the stability triangle, the lift truck has a greater potential to tip over, especially if the load is heavy and carried high.

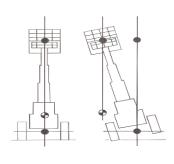
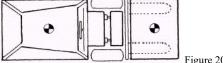
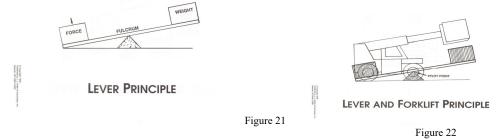


Figure 19

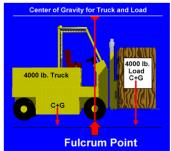
- Acceleration, braking or taking corners too fast can shift the point of gravity outside the triangle causing the forklift to tip over. Keep the Center of gravity inside the triangle and between the forks. Carrying the center of the load on the forks can easily cause a tip over
- Load is centered between the two forks.

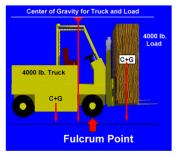


With the counter weight in the rear and load in the front, think of the front wheels like the fulcrum point of a teeter tooter, on one end of the teeter tooter and the load at the forks as the other end.



E. How does a 4000 lb. Load affect a 4000 lb. Lift truck's stability? When will the truck become unstable?





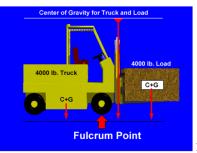


Figure 23





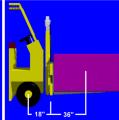
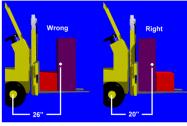




Figure 24

Truck load limit is 4000 lbs



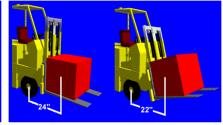


Figure 25

Reducing the load center of gravity to 24" or less

F. To figure a load center greater than 24 inches total, use the following formula. A forklift rated capacity is usually based on a load center of 24 inches. If the load center is more than 24 inches the rated capacity is reduced.

 $(A+B) \times C$

A = distance in inches from the center of the front wheels to the forklift fence.

B = from the forklift fence to the center of the load.

C = forklift truck capacity at the rated load center in pounds.

18 "+ 24 " = 42 " x 4000 lbs. (rated load capacity) = 168000 inch pounds.

168000 is the key number in pound inches for load centers greater than 24".

Load center is now 54" not 42"

18" + 36" = 54" take 168000/54" = 3,111 lbs. load limit of the forklift.

G. Operating the mast to know its height limitations.

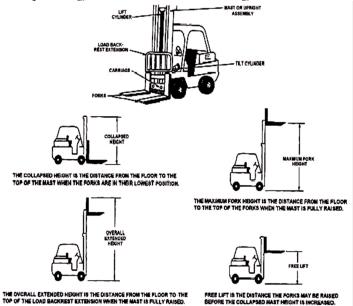


Figure 26

How high will the mast on your lift truck reach?

H. Identifying the forklift components



Figure 27 chassis

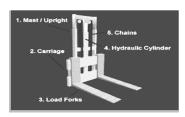


Figure 28 mast and forks



Figure 29 protective cage



Figure 30 forks

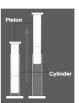


Figure 31 cylinder

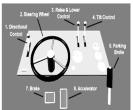


Figure 32dash controls



Figure 33 clutch, brake and accelerator



Figure 34 fuel gauge



Figure 35 temperature gauge



Figure 36 amperes gauge



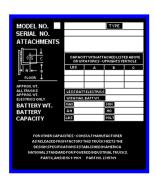
Figure 37 oil pressure gauge



Figure 38 electric charge gauge

I. Lift Trucks Rated Capacity:

• All forklifts have its weight and the amount of weight it can lift on the identification plate. *Lift trucks must have the identification plate.*



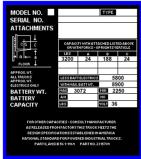


Figure 39 identification plate 3200 pounds maximum lift weight

- The load centers the distance from the fence to the load center of gravity.
- Discuss each section the identification plate covers.

VIII. Part 2 – Operators Responsibility

A. Pre-Operational Inspection:

- Must be done before every shift. This is not an option. It is to ensure the safety of the operator and pedestrians.
- Fluid levels: check oil, coolant, and fuel levels. If the levels are low fill them before continuing inspections. Also check the floor under the vehicle for signs of leaks.
- Tires: check for excessive wear along with splitting and missing tire material. Make sure the rubber isn't separated from the rim. Check the wheel nuts for tightness. If the tires are pneumatic, check the air pressure and make sure you have the air pressure and type of tire for the surface you will be operating on.
- Hoses/belts/cables/hydraulics: lose fittings and leaks. Also check the lift and tilt cylinders for damage or leaking fluid. Inspect the mounting hardware on the cylinders to make sure it is secure.

- Forks: make sure the forks are equally spaced and free from cracks along the blade and the heels.
- Mast: check for broken or cracked weld points and any obvious damage. Make sure the roller tracks are greased and chains are free to travel.
- Steering: turn the steering wheel, and make sure the wheels turn completely and quietly. Any noise or hesitation may indicate a problem, which should be checked.
- Brakes: to test the brakes, travel forward and stop. Verify the brakes are working properly.
- Gauges: after starting the truck, check all gauges and indicators for normal readings. Turn off the motor and report any problems to your supervisor.
- Back up alarm: make sure the alarm is audible above the background noise when the truck is operating in reverse.
- Horn and lights: test the horn and see if the lights work.
- Emergency brakes: must be able to prevent the truck from moving in the parked position.
- Control levers. Check to see that all control levers return to the neutral position after use.
- Carriage operations: with the truck running and all gauges indicating normal, lift the carriage to the maximum height. This will verify that it goes up to the maximum height and is operating smoothly.
- Tilt the mast to full forward, return it to the normal position then lower it all the way down. Listen for unusual grinding, squealing, or metal-to-metal sounds that might indicate a problem.
- Safety equipment: check all safety equipment such as the fire extinguisher.

B. Operators General Operating Procedures:

- 1. Before operating an electric powered lift truck, check location of the battery plug for quick disconnection in case of a short circuit.
- 2. Avoid sudden stops
- 3. Face in the direction of travel except as follows:
 - a. For better vision with large loads, operate the truck in reverse gear.
 - b. When ascending or descending grades in excess of 5% loaded lift trucks shall be driven with the load upgrade.
 - c. Unloaded trucks should be operated on all grades with the forks pointed downgrade.
- 4. Stop and sound horn at all blind corners and intersections and when going through them.
- 5. Operate at safe speeds.
- 6. Go slow around curves.
- 7. Use low-gear or slowest speed control when descending ramps.
- 8. Riders are not permitted on forklifts, unless the truck is specifically built with passenger seating.
- 9. Know the rated capacity of the truck and stay with it.
- 10. Consider both truck and load weight when traveling in areas where there are floor loading requirements.
- 11. Watch and know the overhead clearance. If in doubt measure it.
- 12. Keep clear of the edge of loading docks.
- 13. Always be aware of the rearward swing.
- 14. Before handling, assure that stacks and loads are stable. Block them if necessary.
- 15. Always spread the forks to suit the load width.
- 16. Lower and raise the load slowly. Make smooth gradual stops.
- 17. Lift and lower loads only with the lift stopped.

- 18. Use special care when high-tiering. Return the lift to vertical position before lowering the load.
- 19. Lift, lower or carry with the mast vertical or tilted back; never forward. On all grades, the mast and forks shall be tilted back.
- 20. To avoid injury, keep arms and legs inside the protected area on the lift truck.
- 21. Never travel with the forks raised to unnecessary heights. Keep them 4" to 6" above ground level.
- 22. When loading trucks or trailers, it's the forklift operators' responsibility to ensure the trailer wheels are chocked and brakes set. Operate in front end of the semi-trailer only if the tractor is attached, or adequate trailer jacks are in place.
- 23. Inspect the floor on trucks, unfamiliar ramps, or platforms before driving the forklift on it
- 24. Be sure the bridge plates into the truck are wide enough, strong, and secure. Portable and powered dock-boards are conspicuously marked with the carrying capacity.
- 25. Never butt loads with forks or rear of the truck.
- 26. Forklifts should not be used as tow trucks unless a towing hitch is approved by the manufacturer is used.
- 27. Stop the engine before refueling.
- 28. Use only approved explosion proof lights to check gas tank and battery water levels. Smoking is prohibited.
- 29. Place forks flat on the floor when the truck is parked.
- 30. Report accidents or faulty truck performance to the supervisor.
- 31. Never leave the forklift running unattended. When more than 25 feet from the truck or if it is out of the operators view shut it off and take the keys.

C. Lifting Personnel

Whenever a forklift is used to elevate personnel, the following precautions will be taken.

- 1) Platform manufactured for the purpose of lifting personnel with a forklift truck and meeting the requirements of ANSI/ASME B56.1 Para 7.35 shall be used.
- 2) Restraining means (capable of withstanding a force of 200 pounds in any direction) i.e., and rails or chains will be provided.
- 3) If no restraining means is provided, a body harness with lanyard shall be worn by personnel on the platform.
- 4) When being supported by a forklift, the personnel platform shall be attached in such a manner that it cannot inadvertently slide or bounce off the forks.
- 5) The operator will remain in the control position of the forklift or means will be provided whereby personnel on the platform can shut the power off to the forklift.
- 6) Overhead protection as needed by operating conditions will be provided.
- 7) Means will be provided to protect personnel from moving parts of the forklift that present a hazard when their personnel platform is in the normal working position.
- 8) Personnel will not be transported from location to another while on the work platform.
- 9) Four inch toe boards will be provided on the work platform.

D. Size of the Load

- 1) No forklift will be loaded beyond the rated capacity.
- 2) The operator shall ascertain that the weight of a load approaching the rated capacity has been determined within 10% +/- before it is lifted.

E. Moving the load

- 1) The nature of the terrain, or surface upon which the forklift is to operate, is a very important factor in the stability of the forklift system. The operator will make sure that the proper lift truck has been selected to operate on the available surface.
- 2) The operator will assure the load is well secured and properly balanced before it is lifted.
- 3) During hoisting, care should be taken that there is no sudden acceleration of the load. And the load does not contact any obstruction.

IX. Training

- A. Checking the Electric Power Sources prior to operating.
 - 1) Battery
 - 2) Look for obvious damage (cracks, holes, etc.)
 - 3) Make sure there is no corrosion or splits.
 - 4) Check each cell to make sure it's sealed securely, and check cables for frayed ends or broken insulation.
 - 5) Make sure terminal post connections are tight.
 - 6) Each ventilation cap should be secure and the holes clear or dust and debris, which may prevent adequate ventilation.
 - 7) At the end of your shift, park the forklift in the charging area, turn off the motor and
 - 8) Batteries contain sulfuric acid, so when handling acid or electrolyte you must wear Personal Protective Equipment (PPE) such as, gloves, face shields, and aprons.
 - 9) Make sure the area is adequately ventilated and washing facilities are nearby in the case of an acid splash. Have fire extinguishers on hand as well as baking soda solution or approved solution to neutralize any spill, or to clean battery terminals. When a battery is being charged, battery cells produce explosive hydrogen gas. Prohibit Smoking in battery charging areas and post "NO SMOKING": signs.
 - 10) Keep metal tools and objects away from the top of uncovered batteries this includes rings and watches.
 - 11) Batteries when they are charging produce heat, keep the compartment lid open to relieve heat and gas.

B. Gasoline, Propane or Diesel

- 1)) Inspect the fuel tanks for cracks, broken welds and other damage.
- 2) Make sure all valves and nozzles are secure and have no leaks.
- 3) If you have any problems, consult your supervisor.
- 4) Only handle fuel tanks outside and away from buildings and other employees.
- 5) "NO SMOKING" or open lames and hot work are prohibited around propane tanks.
- 6) For Warning LP fumes are heavier than air.
- 7) Have a fire extinguisher nearby.
- 8) Wear proper PPE when fueling.
 - a. Gloves
 - b. Face shields
 - c. Aprons
- 9) Do not over fill the tank leave room enough for expansion of the fumes.
- 10) Do not fuel with the engine running.

C. Operation:

- 1) <u>Consult the operator's manual and load capacity</u> of the vehicle to determine if it can handle the type and size of the load you will be moving.
- 2) Get familiar with the vehicle before you use it.
- 3) Use the proper way to mount or dismount any powered industrial truck (forklift). Mount or dismount the truck using three points of contact.
- 4) Two hands one foot or two feet and one hand. Never jump on or off a powered industrial truck.
- 5) Wear the seat belt and snug it up tight. This will keep you inside the protective cage. If you attempt to jump off the forklift during a tip over, you can be crushed.
- 6) When operating a rough terrain forklift on a construction site wear your hardhat, safety shoes, gloves, hearing and eye protection. These will protect you from worksite hazards.
- 7) All inspections must follow the forklifts inspection checklist.
- 8) An inspection and maintenance log should be kept for each forklift. The forklift must be tested and approved by a person authorized to do so by the organization after repairs are made.
- D. Discuss Carbon Monoxide hazards from Gasoline or diesel powered equipment. Emphasize the need to read and refer to the operator's manual. This is a source of valuable vehicle specific information from the manufacturer.



Figure 34





E. Common hazards include

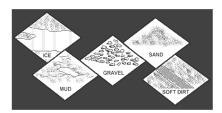


Figure 35

- Rough, uneven terrain, including holes, mud, wet surfaces, sand, railroad tracks. Pedestrians.
- Overhead power lines and other overhead obstacles.
- Blind spots.
- Large loads that interfere with your view.
- The truck tipping over.
- The truck tipping off a dock or out of a semi-trailer. Operator or other personnel being struck by falling load.
- Other person being struck by industrial truck.
- Having a forklift strike other equipment or material.
- Injury to the operator from putting their head or arms outside the vehicle. Exceeding load limitations.

- Having limited visibility when traveling with a load.
- Being unfamiliar with different controls on different makes and models of powered industrial trucks.

F. Driving:

- Always start the vehicle from the driver's seat.
- If the load is large enough to obstruct your view, you may have to drive in reverse. Ask for help in maneuvering.
- Never drive with the forks or attachments in the raised position. Travel with as close to the vehicle as possible to avoid tip-over and keep the center of gravity under maximum control. This keeps the load stabilized and easier to manage.
- Discuss the departments approved hand signals and have someone demonstrate them to the group.
- Remind drivers to drive slowly and cautiously-to keep the center of gravity "quiet" while
 driving over rugged terrain, whether loaded or unloaded, and to avoid sudden starts and
 stops.
- Address the use of mirrors. Many vehicles may not be equipped with mirrors, but if your vehicle has them make you use them and keep them maintained and clean.
- Watch out for pinch points and keep your body parts inside the cage area.
- Address the placement of hands and feet when inspecting the vehicle.

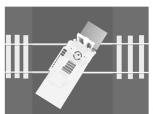


Figure 36

Drive over obstacles one wheel at a time to avoid tipping over and losing your load.



Figure 37

Picking up round objects the wrong way can damage the load or cause the load to get away.

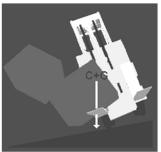


Figure 38

Driving on a slope with a load sideways can cause the load to shift and possible tip over.



Figure 40

Driving with a full load or too heavy of a load on a surface that is damaged or can't hold the weight can cause the power truck to break through the floor.



Figure 41

Most forklifts are designed to operate with a 24" or less center from the pivot point to the center for the load for maximum stability carrying the load.



Figure 41

Tilting the load backwards will minimize the distance of the center of the load to the pivot point.

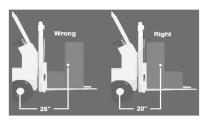


Figure 42

DON'T

- Use the forks and mast as a personal elevator or work platform.
- Stand in the area of an operating forklift. The driver cannot see because of the load being carried.
- Stand under the forks while they are elevated.
- Extend any part of your hands, feet, head or other parts of your body outside the protection of the cage.



Figure 43

When you go up a slope with a load and when you back down with a load.

Drive forward going up and drive backward going down. See Figures 45 and 46.

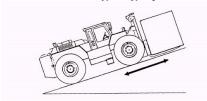


Figure 44



Figure 45

Back up a slope when unloaded. Go forward down a slope when unloaded. Keep the forks slanted upwards and about 8" so you don't catch the forks into the ground



Figure 46



Figure 47

Chock the wheels of your forklift if you must park on a slope or uneven ground.



Figure 48

Make sure the wheels are chocked and the trailer secured before driving into it with a load.



Figure 49

Before driving a forklift into an elevator, check if the elevator car can support the total load and weight of the truck.



Figure 50





Figure 51

Is the floor of the truck in good condition and will support the weight of your forklift with your load?



Figure 52

Properly adjust the distance between your forks to handle the size of the load.



Figure 53

When carrying a load, keep the load as low as possible, tilted upward and around 8" off the ground to prevent the forks from catching on irregular driving surfaces. Always keep the load as low as possible to keep the truck stable.

Secure the load properly and move the load safely.

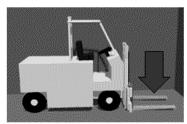


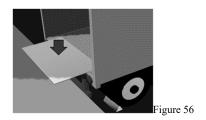
Figure 54

When leaving a forklift unattended or when you park it lower the forks all the way to the ground.



Figure 55

When the truck is parked put the gearshift in neutral and set the parking brake.



Solid are for warehouse and pneumatic for all terrain.

Make sure the dock plate is in place and secure before driving into the parked trailer.

Chock the wheels before driving a forklift into the trailer.



Figure 57

Use the proper tires for the terrain you are going to operate your truck. Solid tires for smooth surfaces and warehouse work. Pneumatic tires are for rough terrain and outside work.

When stacking or moving barrel, use the proper attachments. Below is an example of special attachments for moving and stacking 55-gallon drums.

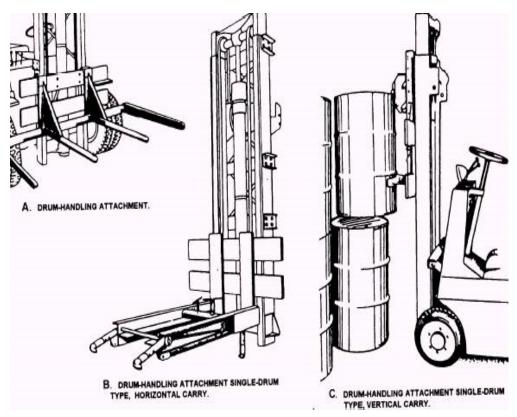
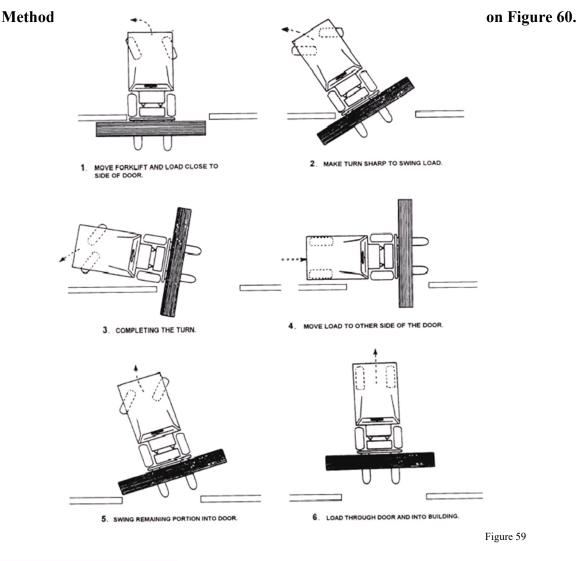


Figure 58



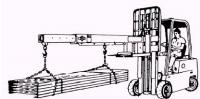


Figure 60

Using a truss beam telescoping attachment to move large materials.

G. Loading and unloading:

Inspect all loads before moving them.

- Approach the load slowly with the forks or attachments level.
- When loading or unloading-stop, stabilize the vehicle, and then raise the forks.
- If the unit has a telescoping boom, the last step is to extend the boom horizontally to reach the loading zone.
- Get as close to the loading zone as possible before extending the boom. This will keep the combined center of gravity close to the vehicle and decrease the risk of tip over.
- Use extreme caution when working around scaffolding. Such platforms must be equipped with guardrails, but a safe and knowledgeable operator will consider the safety of the people on the scaffolding by knowing the rated capacity of the scaffold before placing the load.
- Never travel with the load up. Keep the load as low as possible with the boom retracted.

- Never leave your vehicle unattended while a load is in the raised position.
- Never use any load attachment for anything other than its intended purpose.
- For example, you should never use a truss boom to carry anything other than trusses, or allow someone to be lifted to a working level by the forks.
- You may only position people with a properly attached work platform specifically manufactured for that purpose.

Unsecured loads can cause tip-over. Don't stand under the forks.





H. How to pick up a load:

Picking up a load safely involves more than just pulling up to a pallet and lifting. You should follow specific steps to help ensure that loads are lifted safely. Doing so will prevent damage to the load, the forklift and other property but will avoid injury to you and your co-workers, as well. To safely pick up a load from the floor, follow these steps:

- Square up on the center of the load, approaching it straight on.
- Stop with the fork tips about one foot from the load.
- Make sure no one is standing near the load.
- Level the forks, and then slowly drive forward until the load contacts the carriage.
- Lift the load carefully and smoothly until it's high enough to clear whatever is under it.
- Tilt the mast back slightly to stabilize the load.
- If there is another load in front of the one you are picking up, lift the load without tilting it. Back out about I foot, and then tilt the mast back to avoid catching or hooking the material in front of the load being lifted.
- When backing up, look over both shoulders to make sure you are clear.
- Always look in the direction the powered industrial truck is moving.
- Lower to travel height.

I. How to put down a load:

- Like picking up a load, safely putting down a load requires the following steps.
- Safely drive to the location.
- Make sure there is sufficient clearance for the load.
- If placing the load on a stack, make sure the material in the stack can safely support the load.
- Make sure no one is standing near the location.
- Square up to the bottom, and stop about one foot away.
- Level the forks, and drive the rest of the way in.
- Lower the load to the floor or rack.
- Tilt the forks slightly forward to avoid hooking the load while backing out.
- Look over both shoulders to make sure you are clear.
- Back straight out until the forks have cleared.

J. How to Stack and Un-stack a Load:

In some workplaces, materials are piled in stacks to save floor space. In these situations, forklifts are used to stack and un-stack materials. The same safety steps for picking up and putting down a load apply, but there are some additional safety factors. These extra measures are needed because the higher you lift a load, the more unstable a forklift becomes. Also when stacking a load, make sure that the load will not crush the material in the stack.

K. How to Travel with a Load:

To travel safely with a load keep these points in mind

- Never raise the load or forks while traveling.
- Always keep the load slightly back.
- Keep the forks as low as possible to clear uneven surfaces or debris.
- Never speed or perform dangerous maneuvers around the load.
- When operating a forklift, think about the front wheel as point around which the entire forklift pivots because turning causes the back to swing wide.
- Slow down to turn.
- Stay wide when turning into an aisle. Never exceed the load capacity of your forklift.
- Spread the forks to the widest possible adjustment for maximum stability.
- Make sure the load is stable and won't shift while traveling. Always check for loose or slippery items. And make sure the load is secure before moving.
- Don't pick up broken pallets or boxes in poor condition. Transfer the load to a new pallet or box before lifting.
- Don't push boxcars or other vehicles with a forklift.
- ALWAYS KEEP YOUR ARMS AND LEGS INSIDE THE FORKLIFTS TO PREVENT cuts, scrapes, snagging clothing and amputation.
- Apply even pressure to brakes, and come to a gradual stop. Don't slam on the brakes. You could lose control.
- Observe traffic rules, warning signs, floor load limits and overhead clearances.
- "NO RIDERS" ARE PERMITTED ON YOUR FORKLIFT unless a seat is provided
- Sound the horn at cross aisles or blind intersections and pedestrians.
- Stop at blind corners, look both ways and sound the horn. Pass through doorways when you can see it is clear.
- Slow down at when approaching cross aisles, ramps, dips, uneven or slippery surfaces or congested areas.
- Travel with the load facing uphill on inclines and downgrades. Maintain a safe distance when following other forklifts. Follow the two-three second rule. Drive backwards if you can't see over the load. Never try to drive by looking
- When using a forklift to load or unload a truck or trailer, make sure that the trucks or trailer wheels are chocked or that it's bumper—locked.
- Communicate with the truck driver to ensure that the driver of the truck doesn't drive off with the forklift inside.

L. How to Park a Forklift:

Fully lower the forks.

- Neutralize the controls.
- Set the brakes.
- Turn off the motor.
- If parked on an incline, block the wheels
- Park only in authorized areas.
- Never park in front of an emergency exit.
- Do not park in front of doorways.

Lift Truck Written Test (QUIZ)

1.

True
 False

It is part of your job to complete a report after inspecting your forklift truck:

2.	Information about load capacity of your lift truck can be found: 1) In your DOR policy 2) On the MSDS 3) On the identification plate and in the operator's manual 4) All of the above
3.	Rough terrain vehicles that fall under the forklift regulation include: 1) Telescopic handlers 2) Wheel loaders with fork attachments 3) Standard mast forklifts 4) All of the above
4.	It is safe to give someone a ride on your lift truck: 1) True 2) False
5.	Center of gravity is: 1) Always at the center of the load 2) The point which all the objects weight is concentrated 3) Greatest at the pivot point 4) All of the above
6.	The most important safety devise on your forklift is: 1) Horn 2) Seat belt 3) Warning light 4) Backup alarm 5) You
7.	Lateral stability: 1) Provides resistance to overturning sideways 2) Provides resistance to overturning forward or rearward 3) Provides counterbalance to unbalanced loads 4) Provides balance for lifting
8.	Rear wheel steering is used on forklifts because it gives the operator greater control when using the forks: 1) True 2) False

- 9. Rough terrain vehicles are different than other vehicles due to: 1) Three point of suspension 2) Oscillation rear axle 3) Tight steering 4) All of the above 10. You can drive a lift truck over any type of surface: 1) True 2) False If you find something wrong with a forklift during the pre-operational inspection you 11. should: 1) Use the vehicle and report the problem at the end of the day 2) Notify your supervisor immediately 3) Attempt to repair the problem yourself 4) Avoid using the affected part of the mechanism 12. Lift trucks use a hydraulic cylinder attached to chains to raise and lower the forks: 1) True 2) False 13. Pre-operation inspections include: 1) Electrical systems 2) Hydraulics 3) Physical condition of the forklift 4) All of the above The stability triangle is an invisible figure connecting: 14. 1) The counterbalance, the pivot point and the rear axle 2) The two front tires and the pivot point of the rear axle 3) The four wheel of the vehicle 4) The fulcrum, the counterbalance and the center of gravity You can stand under the forks if the truck is turned off: 15. 1) True 2) False
- 16. All lift trucks are equipped with controls which allow you to raise or lower and tilt the forks:
 - 1) True
 - 2) False
- 17. If your truck starts to tip over:
 - 1) Don't jump
 - 2) Stay in your seat
 - 3) Grip the wheel securely
 - 4) Brace yourself with your feet
 - 5) All of the above

18.	Which of the following should NOT be allowed during the refueling or recharging process. 1) Park your lift truck in a designated refueling/recharging area 2) Do not block doorways or access to production or emergency equipment 3) Keep a flame burning nearby to burn off unwanted vapors 4) Check to see if a fire extinguisher is nearby.
19.	Common hazards on the construction site include: 1) Pedestrians 2) Overhead power lines 3) Uneven grade and changing surface condition 4) All of the above
20.	If the load obstructs your view: 1) Drive in reverse if appropriate 2) Drive with extreme care 3) Use a spotter and company approved hand signals 4) All of the above
21.	The front wheel serve as the between the weight of the truck and the weight of the load being carried: 1) Balance point 2) Fulcrum point 3) Center of gravity 4) Seesaw center
22.	Operators should inspect their vehicles: 1) Once every three years 2) Once every week 3) Before each shift 4) Before every performance evaluation
23.	On an incline while carrying a load you would: 1) Back up the incline 2) Drive straight up the incline forward 3) Raise the forks as high as you can 4) Get a spotter
24.	You can place your hands and feet outside the operator's compartment as long as your head and body are protected: 1) True 2) False
25.	Wide loads are more stable than other types of loads: 1) True 2) False

- 26. Carbon monoxide is:
 - 1) Odorless poisonous gas
 - 2) Is of no concern while the vehicle is moving
 - 3) Not dangerous around the work area
 - 4) Produced by electric powered forklifts
- 27. Anyone with a driver's license can drive a forklift:
 - 1) True
 - 2) False
- 28. Before loading or unloading a trailer at a loading dock, you should:
 - 1) Inspect the floor of the trailer
 - 2) Chock the wheels of the trailer
 - 3) Make sure the dock plates, boards, and ramps are in place and secure
 - 4) All of the above
- 29. The three major parts of a lift truck are the body (truck), overhead guard, and hydraulic lift.
 - 1) True
 - 2) False
- 30. Which is not a type of lift truck?
 - 1) Gasoline powered
 - 2) Diesel powered
 - 3) Air-cooled powered
 - 4) Electric powered

Lift Truck Written Test (QUIZ). Instructor's Key DO NOT HAND OUT THIS KEY



It is part of your job to complete a report after inspecting your forklift truck: 1) True 2) False Information about load capacity of your lift truck can be found: 1) In your DOR policy 2) On the MSDS 3) On the identification plate and in the operator's manual 4) All of the above Rough terrain vehicles that fall under the forklift regulation include: 1) Telescopic handlers 2) Wheel loaders with fork attachments 3) Standard mast forklifts 4) All of the above It is safe to give someone a ride on your lift truck: 1) True 2) False Center of gravity is: 1) Always at the center of the load 2) The point which all the objects weight is concentrated 3) Greatest at the pivot point 4) All of the above The most important safety devise on your forklift is : 1) Horn 2) Seat belt 3) Warning light 4) Backup alarm 5) You Lateral stability: 1) Provides resistance to overturning sideways 2) Provides resistance to overturning forward or rearward 3) Provides counterbalance to unbalanced loads 4) Provides balance for lifting Rear wheel steering is used on forklifts because it gives the operator greater control when using the forks: 1) True

2) False

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 - 1) Gasoline powered
 - 2) Diesel powered
 - 3) Air-cooled powered
 - 4) Electric powered

Nebraska Department of Transportation

Forklift Operators Pre-operational Checklist

Complete before the start of each shift or operation.

Date:	Location:			
Unit Number Description:	Serial Number:	Job Number:		
Internal Combustion:	Electric:			
Hour Meter: Start:	End:	Total Hours:		
Operator's Signature:				
Supervisor's Signature:				
	(Required if any item is checked as de			

Check any defective item found with an X and give the details on other side. **NA** for Non-Applicable ----- **OK** if no defects is found.

Accelerator	Engine Oil Level	Oil Pressure
Air Cleaner	Fork/Attachment Condition	Mast and Chain
Backup signal	Frame Leveling	Operator's Manual
Battery Connector	Fuel Filter	Overhead Guard
Battery Discharge Indicator	Gauges	Battery Condition
Radiator Level	Brakes-Parking	Brakes Service
Coolant Level	Leaks	Hour Meter
Cab	Hydraulic Controls	Horn
Clean	Hydraulic Fluid Levels	Steering
Mirrors	Lights	Tires
Windows	Head	Transmission
Chassis Lubrication	Tail	Fluid Level
	Warning	Leaks
Unusual Noises	Controls	Load Capacity Chart
Outriggers	Lower/Raising	Lift
	Contracting/Extending	Extend
Seat Belt	Oil Leaks	
	·	•

(Details are on other side)

Details:	

Nebraska Department of Transportation

Forklift Evaluation and Test Scores

Date:	OE:	Employee's Name:		
☐ Permanent Status ☐ Temporary Status				
Equipment Model		Card Issued: (Copy of	eard here)	
Fuel Type				
Electric				
Operating Ed	quipment Performance			
Control Locations				
Mast				
Tilt				
Direction				
Gauges				
Forward				
Backward				
W/Load Forward				
W/Load Backwards		Picking and stacking up a load and moving it to		
Parking		and from the		
Up a Slope		Ground		
Down a Slope		Height		
Walk Around		Loaded Truck		
		Fueling the Forklift		
Incidents:			Passing test score is 80% or better.	
			Please circle:	
			Passed / Failed	
Operator's Signature:				
Trainer's Name: (Prin	t)			
Trainer's Signature:				
Evaluator's Name: (Print)				
Evaluator's Signature) :			

Note: To be filled out by the trainer or evaluator for each type of forklift operated on the job or location.

The test score stands for any type of equipment operated.

Each type, if different in fuel type or model type, must be evaluated on the operator's understanding of

its operation.