

## **FORKLIFT/POWERED INDUSTRIAL TRUCK SAFETY**

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(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

Forklift/Powered Industrial Truck (PIT) operators must be trained, evaluated, and certified before independently operating a PIT. This SOP highlights the scope of the program; roles and responsibilities; as well as operational safety information presented through UNL's training program. This SOP is not a substitute for participation in the formal PIT training program administered by EHS.

### **Scope**

The term *Powered Industrial Truck (PIT)* refers to a motorized, power-driven vehicle used to carry, push, pull, lift, stack, or tier material. This definition generally includes vehicles that are commonly referred to as high lift trucks, counterbalanced trucks, cantilever trucks, rider trucks, forklift trucks, high lift platform trucks; low lift trucks, low lift platform trucks; **motorized** hand trucks; narrow aisle rider trucks; high lift order picker rider trucks;; and counterbalanced front/side loader lift trucks. *The term PIT does NOT include hand trucks that are not motorized; compressed air or nonflammable compressed gas-operated industrial trucks; vehicles intended primarily for earth moving or over-the-road hauling; or farm vehicles, agricultural tractors, and skid loaders equipped with buckets used to move seed/feed/manure/soil/material. However, operators of vehicles that are excluded must be appropriately trained in safe operation.*

### **Responsibilities**

- **Supervisors**
  - ✓ Ensure that all employees under their direction who are designated to operate a PIT are trained, evaluated, and certified prior to operation of the equipment.
  - ✓ Ensure that certification is kept current (e.g., re-evaluation/driving test and refresher training, as applicable) and notify EHS of employees who are no longer employed with their department or whose job has changed and are no longer assigned to operate a PIT as part of their duties.
  - ✓ Notify EHS when new PIT equipment or attachments are put into service or retired, and when changes occur to information documented in the EHS PIT Hazard Assessment which may trigger the need for refresher training.
  - ✓ Notify EHS of accidents and near-misses involving PIT operation.
  - ✓ Ensure that PITs and attachments are appropriate for the use conditions and maintained in safe operating condition. Immediately remove defective equipment from service until repaired or replaced.
  - ✓ To the extent feasible, reduce operational hazards presented by the use location and loads.

- **Employees**
  - ✓ Complete all components of training at the required intervals.
  - ✓ Conduct pre-operational inspections prior to start of each shift (See Appendix C). Do not operate a PIT that does not successfully pass the pre-operational checklist.
  - ✓ Immediately stop operating any defective PIT or attachment and report the situation to the supervisor.
  - ✓ Observe all precautions discussed in training and the recommendations of the manufacturer of the PIT.
  
- **Environmental Health and Safety**
  - ✓ Administer and maintain the UNL PIT training program and associated procedures.
  - ✓ Conduct, document, and maintain PIT Hazard Assessments and program audits.
  - ✓ Conduct or arrange for appropriate PIT training.

### **General PIT Operational Safety Precautions**

- All newer PITs in operation at UNL should be equipped with a seatbelt. Older equipment should be retrofitted with a seatbelt, if feasible.
- All newly-acquired PITs should meet the design and construction requirements of the relevant American National Standards Institute standard (Part II, ANSI B56.1), and should bear a label or other identifying mark indicating approval by a nationally recognized testing laboratory. Every effort should be made to replace equipment that does not meet ANSI requirements.
- Modifications to PITs are not allowed without express written approval from the manufacturer or authorized representative (maintain file documentation).
- PITs must have the correct designation (D, DS, DY, E, ES, EE, EX, G, GS, LP, or LPS) for the location of operation, rated for the intended loads, used with approved attachments, and compatible with operating surface load limits.
- Passengers are not permitted on or in the forklift or load. Operators must not put any part of their body (e.g., fingers, arms, or legs) between the uprights of the mast, or beyond the contour of the forklift.
- Pedestrians always have the right-of-way.

### **Before Operating a PIT**

- Only trained personnel with current EHS authorization are allowed to operate PITs. Authorization requires successful completion of initial classroom training, hands-on work-area specific training (practical), and a driving test (evaluation). The driving test must be repeated at least every three years. Formal classroom instruction, practical training, and a driving test (as appropriate) must be completed anytime that: (1) the operator has an accident or near-miss with a PIT; (2) the operator is observed operating a PIT in an unsafe manner; (3) the operator is assigned to drive a different type of PIT; (4) workplace conditions changes significantly in a manner that affects safe operation of the PIT.

- The operator must be familiar with and adhere to all recommendations and warnings provided by the manufacturer with regard to the vehicle and all attachments.
- The operator must conduct a visual inspection of the PIT and attachments at the start of each shift. Employees may not operate an unsafe forklift at any time. Deficiencies should be reported to the designated person or supervisor. See Attachment A to this SOP. Operators should also inspect the work area and remove debris or obstacles prior to operating a PIT. Operators should take note of other hazards in the area of operation, such as slick or uneven surfaces, inclines, etc.
- Operators must wear seatbelts on all such equipped trucks.
- Horseplay is prohibited.
- Make sure your hands are dry and clean – you can slip while entering, dismounting, or operating a PIT if your hands are wet or greasy.
- Fueling and/or charging operations must be conducted in the designated safe manner and location. See Attachment B.

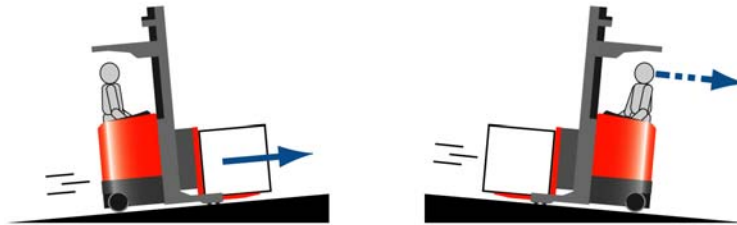
### **Picking Up a Load with a PIT**

- Do not exceed the safe load capacity of a forklift at any time. The rated load limit shall be decreased as necessary to account for load sizes. Do not counterweight a forklift to increase its lifting capacity. See Attachment C.
- Compensate for loads with an off-center point of gravity. Position the load such that the distance from the front wheels to the load center is minimized, and the heaviest portion of the load is closest to the mast.
- Position the load in a way that will shorten the load center distance.
- Approach the load squarely and position the forks under the load as far as possible. Lift the load before moving the vehicle, but lift only the minimum amount necessary to safety maneuver. Do not lift a load with one fork.
- No load should be moved unless it is absolutely safe and secure.
- When unloading trucks or trailers, the brakes on the vehicle must be set (locked) and the wheels chocked.
- No person is permitted to stand or walk under elevated forks.

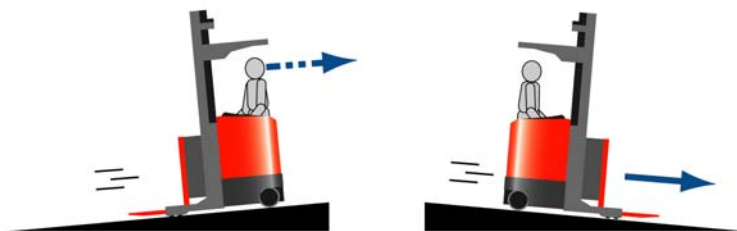
### **Moving a Load with a PIT**

- PITs should be driven on the right side of the road or aisle-way, and operated at a safe speed with due regard for traffic and conditions (slippery surfaces, obstructed vision, cross aisles, etc.).
- Operators should avoid making jerky starts, quick turns, or sudden stops. The operator is not permitted to use reverse as a brake
- The operator must look in the direction of travel and their view should not be obstructed by the load. The operator should turn and drive facing away from the load when their view is blocked.
- Operators must not drive toward any person who is in front of a fixed object or wall.

- At blind intersections, the operator should: STOP, SOUND THE HORN, LOOK BOTH WAYS, PROCEED SLOWLY.
- Operators may not overtake and pass another forklift traveling in the same direction, at intersections, blind spots, or hazardous locations.
- The forks should not be operated while the forklift is traveling and kept as low as possible when traveling (whether loaded or unloaded). The load should be kept level or slightly cradled (tilted back).
- When traveling on slopes, keep the heavy end uphill. On a downgrade, the forklift should be driven in reverse, and the forks raised only enough to clear the surface.



- Use extra care when handling long lengths of bar stock, pipe, or other materials.
- Compressed gas cylinders must be moved only with special pallets designed for this purpose.
- Operators must cross railroad tracks diagonally whenever possible.
- If using a service elevator with a PIT, the operator must: verify that the elevator capacity can support the weight of the lift truck plus the load; that the dimensions of the elevator (width and height) are sufficient to accommodate the PIT and load; approach the elevator slowly and stop at a safe distance before entering, then proceed slowly and squarely; shut off the motor and apply the brakes while on the elevator.
- If operating on ramps or loading docks, verify that the dockboard is secure and of adequate capacity; proceed slowly when approaching or leaving; do not turn or park on a ramp or dockboard, and; keep the forks downgrade.



### Parking a PIT

- PITs must be safely parked in the designated area when not in use. The controls must be neutralized, power shut off, brakes set, key removed, and the forks

secured in a lowest position, flat on the surface, and not obstructing walkways or aisles.

- A forklift may not be left on an incline unless it is safely parked and the wheels blocked.
- Forklifts may not be parked in areas that will block exits, stairways, fire extinguishers or any other emergency equipment.

### **Lifting People with a PIT**

- A forklift may not be used to elevate a platform or pallet with persons on it, except work platforms specifically designed and marked for this purpose.
- Work platforms must have standard guard rails and toe boards; and must be securely fastened to the forks. Fall protection must be worn if any part of a person's body will reach outside the guard rails.
- The PIT may be used only to raise and lower a person- it shall not travel with a person on the platform.

## Attachment A - Operator's Daily Checklist

The purpose of the operator's inspection is to ensure that the PIT and its attachments are in safe operating order prior to use. The inspection must be conducted prior to each shift. While the regulations do not require documentation of operator inspections, such documentation is strongly encouraged as a means of verifying an adequate and complete inspection. A form similar to that shown on the next page may be used to guide the operator in conducting a pre-use inspection. Inspection items are further described below.

Overhead and hand guard	<ul style="list-style-type: none"> <li>• No broken welds, missing bolts, or other damage</li> </ul>
Hydraulic cylinders	<ul style="list-style-type: none"> <li>• No leaks or damage</li> </ul>
Mast assembly	<ul style="list-style-type: none"> <li>• No broken welds, cracked or bent areas, or worn or missing stops</li> </ul>
Lift chains and rollers	<ul style="list-style-type: none"> <li>• No excessive wear, damage, kinks, rust</li> <li>• Adequate lubrication</li> </ul>
Tow hook	<ul style="list-style-type: none"> <li>• Engage and release smoothly</li> <li>• Safety catch works properly</li> </ul>
Forks	<ul style="list-style-type: none"> <li>• No cracks, gouges, holes, excessive wear</li> <li>• No mismatching</li> </ul>
Tires	<ul style="list-style-type: none"> <li>• No gouges, chunking or bond failure</li> <li>• Adequate tread</li> <li>• Proper inflation</li> <li>• No missing lugs</li> </ul>
Battery	<ul style="list-style-type: none"> <li>• Properly installed and secured</li> <li>• Adequately charged</li> <li>• No leakage</li> <li>• Covers and caps in place</li> <li>• Cables in good condition</li> </ul>
Hydraulic fluid	<ul style="list-style-type: none"> <li>• Proper level</li> </ul>
Gauges	<ul style="list-style-type: none"> <li>• Working properly</li> </ul>
Steering	<ul style="list-style-type: none"> <li>• Smooth, without binding or excess play</li> <li>• Power steering operates properly</li> </ul>
Brakes	<ul style="list-style-type: none"> <li>• Pedal moves freely without binding and does not go all the way to the floor</li> <li>• Parking brake works correctly (vehicle does not move when engaged)</li> </ul>
Lights	<ul style="list-style-type: none"> <li>• All warning and working lights function properly</li> </ul>
Horn	<ul style="list-style-type: none"> <li>• Sounds</li> </ul>
Control lever	<ul style="list-style-type: none"> <li>• Moves smoothly</li> </ul>
Safety seat, belt, switch, doors, and/or interlocks	<ul style="list-style-type: none"> <li>• Operate as intended</li> </ul>
Propane tank/hose	<ul style="list-style-type: none"> <li>• No apparent cracks, checking, kinking, fraying of the hoses</li> <li>• Connector properly seated</li> <li>• Tank secured</li> </ul>
Engine oil	<ul style="list-style-type: none"> <li>• Proper level</li> </ul>
Engine coolant	<ul style="list-style-type: none"> <li>• Proper level</li> </ul>
Transmission fluid	<ul style="list-style-type: none"> <li>• Proper level</li> </ul>
Windshield wipers	<ul style="list-style-type: none"> <li>• Work properly</li> </ul>
Attachments	<ul style="list-style-type: none"> <li>• Operate smoothly with no hesitation</li> </ul>

## Operator's Daily Checklist

<b>TRUCK ID</b>	<b>MAKE/MODEL</b>

Record each inspection in an individual column. Record the date at the top of the column; the time of the inspection in the next row of the column, and; the person conducting the inspection in the third row of the column. For each inspection item, record "OK" if the item is in good and operational condition. Record "NA" if the inspection item does not apply to the particular PIT. Record "BAD" if an item requires maintenance or repair before the PIT can be safely operated. For each "BAD" recorded, provide further explanation of observations and corrective actions in the space following the table.

DATE →								
TIME →								
OPERATOR INITIALS →								
<b>INSPECTION ITEM</b> ↓								
Overhead and hand guard								
Hydraulic cylinders								
Mast assembly								
Lift chains and rollers								
Tow hook								
Forks								
Tires								
Battery								
Hydraulic fluid								
Gauges								
Steering								
Brakes								
Lights								
Horn								
Control lever								
Safety seat, belt, switch, doors, and/or interlocks								
Load handling attachments								
Propane tank/hose								
Engine oil								
Engine coolant								
Transmission fluid								
Windshield wipers								
Attachments								

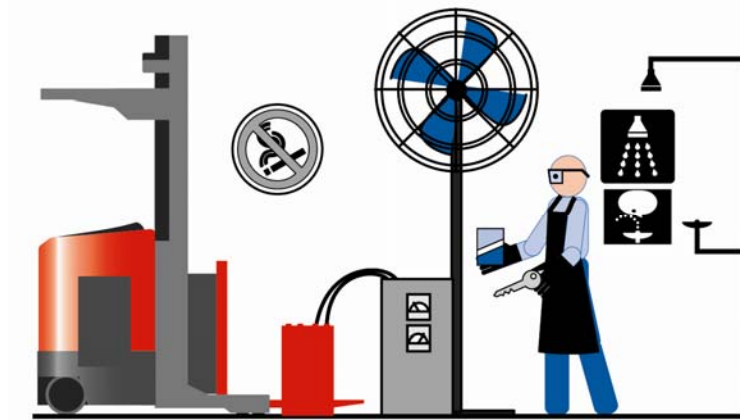
Date	Item of Concern	Corrective Action Taken

## Attachment B – Safe Fueling/Charging

*In all cases, follow all manufactures instructions. The precautions in this attachment are general in nature. Persons must be authorized by their supervisor to conduct re-fueling/re-charging operations.*

### Battery Charging/Maintenance

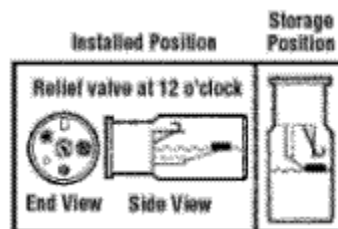
- Set the parking brake when servicing.
- Use a battery stand and puller if the battery is to be removed.
- Ensure that the battery is secured when installed in the vehicle.
- Keep metal objects away from the battery.
- Keep open flames away from the battery. Use a flashlight to check fluid level. Do not smoke in battery charging areas.
- Keep battery caps on and the vent holes clear.
- Battery charging areas should be mechanically ventilated and equipped with a means of flushing and neutralizing spills as well as a plumbed eye wash station.
- Wear a face shield, apron, and rubber gloves when servicing the battery.
- In the event that battery acid contacts the skin, flush the affected area with water for 15 minutes and seek medical attention as necessary. In the event that battery acid contacts the eye, flush the eye for 15 minutes with water and seek medical attention.



### Refueling a Propane Lift Truck

#### When handling propane fuel:

- Position the tank so the liquid propane does not come into contact with the relief valve.



(Created 5/03; Revised 1/08)

- Make sure the locking pin engages into the cylinder.
- Make sure the valve is closed tightly.
- Store the propane outside, in an upright position, in an area where it can be secured and is protected from being struck.
- Put the cylinder down gently. Do not drop, dent or damage it.
- Always protect the valve from any damage.
- Avoid contact with liquid propane, as it can cause frostbite. Wear thermal protective gloves while making or breaking connections.
- Exchange removable cylinders outdoors or in well-ventilated areas, away from sources of ignition. Indoor storage of LPG is limited to 40 pounds by fire regulations.
- Close the valve before breaking connections.

#### **Procedures for changing propane cylinders:**

- Wear eye protection and thermal gloves.
- Close the valve on the cylinder.
- Run the engine until it stops. This ensures that the connection hose is empty.
- Shut off the engine. Engage the parking brake.
- Open the connecting nut. **DO NOT** use metal tools.
- Disconnect the hose.
- Disconnect the holding straps.
- Remove the empty cylinder.
- Replace with a full cylinder in the proper position.
- Connect the holding straps.
- Tighten the connecting nut (wiggle hose).
- Open the valve on the cylinder slowly and check for leaks. Use solution of soap and water. Smell – listen – look.
- Slowly open the valve to its fully open position.
- Secure the hose in an inward and downward direction.
- Secure the cylinder.
- Start the engine and resume operation.

#### **Refueling a Gasoline or Diesel PIT**

**NO smoking or open flames** are permitted within 25 feet of the re-fueling station.

- Allow the engine to cool before refueling.

## Attachment C – Load Rating Reduction

For symmetrical loads, the center of gravity is at the middle of the load in terms of the load's length, width, and height. The rated capacity of a forklift is generally based on a load that simulates a cube, measuring 48" in all directions with the center of gravity in the middle (24"). The rated capacity of the vehicle must be decreased to accommodate loads that are not symmetrical or exceed the rated load center. Failure to account for load variations with respect to the rated capacity of the PIT increases risk of tipover, loss of steering control, and instability of the load.

If available, use the manufacturer's instructions for reducing load capacities. In the absence of such instruction, follow the procedure described below.

*Divide the rated load center by the actual load center and multiply by the stated capacity. For example, consider a forklift with a rated capacity of 5,000 pounds at a 24" (48" cube) load center that will be used to move a load with an actual load center of 28" (56" cube). The estimated load capacity is reduced to 4,285 pounds.*

$$(24/28)(5000) = 4,285$$