

## FORKLIFT/POWERED INDUSTRIAL TRUCK SAFETY

---

Forklift/Powered Industrial Truck (PIT) operators must be trained, evaluated, and certified before independently operating a PIT. This SOP highlights the scope of UNL's PIT 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. PIT training consists of formal instruction (See EHS Web based training, **Powered Industrial Truck Training**, <http://ehs.unl.edu/onlinetraining>), and hands-on instruction with a driver demonstration of competency.

### 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 independent 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 or a new hazard assessment.
- ✓ 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 use location and loads.
- **Employees**
  - ✓ Complete all components of training at the required intervals, including EHS Web-based Powered Industrial Truck Training, hands-on training, and demonstration of competency in operation.
  - ✓ Conduct pre-operational inspections prior to start of each shift (see Attachment A). 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.
  - ✓ Read the manufacturer's operator's manual. Observe all precautions discussed in training and the recommendations of the manufacturer of the PIT.
- **Environmental Health and Safety**
  - ✓ Administer and maintain UNL's 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 sit-down style 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, authorized representative, or qualified Professional Engineer (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**

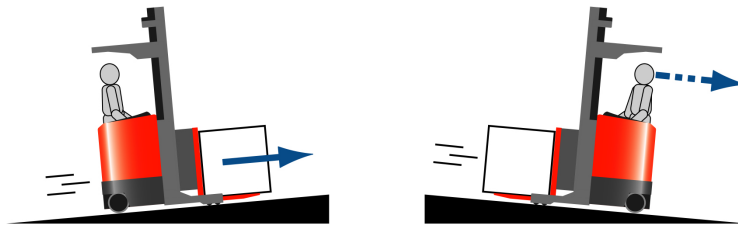
- Only trained personnel with current EHS authorization are allowed to operate PITs. Authorization requires successful completion of initial web-based (or classroom equivalent) training, hands-on work-area specific training (practical), and a driving test (evaluation). The driving test must be repeated at least every three years. Refresher training is required when: (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 change in a manner that significantly 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. 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. See Attachment A to this SOP.
- Operators must wear seatbelts on all such equipped trucks.
- Horseplay is prohibited.
- Hands and shoes should be dry and clean to minimize the risk of slips and falls while entering, dismounting, or operating a PIT.
- 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**

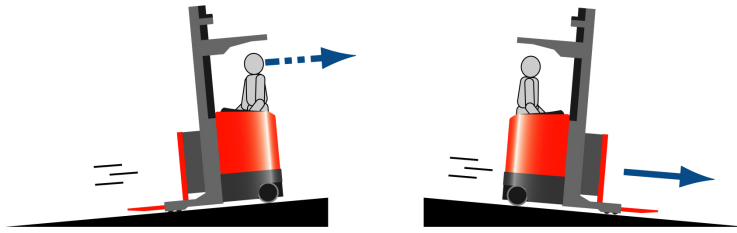
- Do not exceed the safe load capacity of a forklift at any time. The rated load limit shall be decreased as necessary to account for load sizes. Do not counterweight a forklift to increase its lifting capacity. See Attachment C.
- Compensate for loads with an off-center point of gravity. Position the 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 safely 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; confirm 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. Personal fall protection (e.g., full body harness, self-retracting lifeline (SRL), etc.) is required.
- The PIT may be used only to raise and lower a person- it shall not travel with a person on the platform. Order pickers designed to raise and lower the operator while in motion are exempt.

## 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 condition 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. Several inspection forms follow to account for various types of PITs (PIT/Forklift, Powered Pallet Jack, Order Picker). General inspection items found in these forms 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, Deadman's switch 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>

## PIT/FORKLIFT INSPECTION CHECKLIST

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

Operators are required to inspect their trucks at the beginning of their shift. Regulations do not require a record of inspection; but, EHS encourages it. This form can be used to record operator inspections. 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							
Deadman's Brake functions properly (travel circuits disabled), if equipped							
Load handling attachments							
Propane tank/hose							
Engine oil							
Engine coolant							
Transmission fluid							
Windshield wipers							
Attachments							

<b>Date</b>	<b>Item of Concern</b>	<b>Corrective Action Taken</b>



## POWERED PALLET JACK INSPECTION CHECKLIST

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

Operators are required to inspect their trucks at the beginning of their shift. Regulations do not require a record of inspection; but, EHS encourages it. This form can be used to record operator inspections. 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>							
Foot Protection worn							
Steering Arms, move easily & freely							
Horn							
Backup Alarm							
Brakes							
Forward/Reverse Controls							
Lift Controls							
Speed Control Switch							
Emergency Control Function							
Lift Controls							
Speed Controls							
Forks							
Load Wheels/Tires, no flat spots							
Battery Cover, secure & in place							
Battery Charged							
Safety Signs & Labels							
No Leaks or Corrosion							
Gauges & Meters							
<i>For rider type vehicles: The standing platform has non-skid surface.</i>							
Attachments: List							

Date	Item of Concern	Corrective Action Taken

## ORDERPICKER INSPECTION CHECKLIST

TRUCK ID	MAKE/MODEL

Operators are required to inspect their trucks at the beginning of their shift. Regulations do not require a record of inspection; but, EHS encourages it. This form can be used to record operator inspections. 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>VISUAL INSPECTION, KEY OFF ↓</b>					
Tires have no gouges, chunking or bond failure. Adequate tread, if applicable					
Battery is fully charged and correct water level					
Battery and gates properly installed					
Emergency disconnect functions properly					
Lift/Lower System has no damage to chains, hoses or limit switches					
Controls move smoothly without binding. Return to neutral when released					
Guards and covers installed. Decals in place (warning, safety, operational)					
Mast guard not cracked or chipped (if glass)					
Check floor under lift truck for any leaks					
Checks magnetic rails in warehouse for damage.					
Fall protection equip. in good shape & worn properly (Must have full body harness sized to fit each operator and self-retracting lanyard)					
<b>OPERATIONAL INSPECTION, KEY ON ↓</b>					
Horn works when depressed					
Steering smooth without binding or excess play					
Directional/Speed Control moves smoothly without binding, returns to neutral when released, and controls speed and direction properly.					
Plugging functions properly, speed limits functions properly					
Lift/Lower Controls move freely, return to neutral when released, and perform their functions as indicated.					
Hour Meter records all hours of lift truck operation					
Brake Pedal moves freely and stops lift truck quickly.					
Deadman's Brake functions properly (travel circuits disabled)					
Emergency Disconnect shuts down travel and lift functions when depressed.					
All warning and working lights are working, all limit switches function properly.					

<b>Date</b>	<b>Item of Concern</b>	<b>Corrective Action Taken</b>

## **Attachment B – Safe Fueling/Charging**

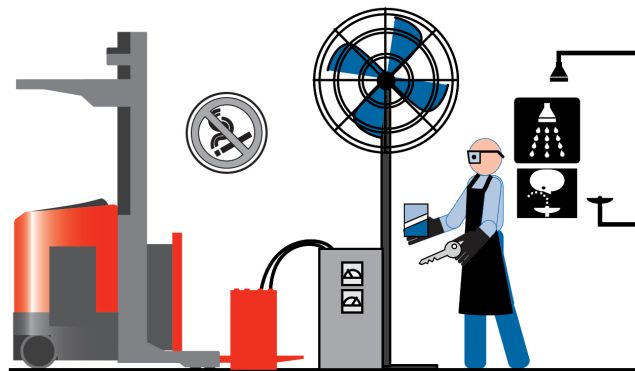
*In all cases, follow all manufacturer's instructions. The precautions in this attachment are general in nature. Persons must be authorized by their supervisor to conduct re-fueling/re-charging operations.*

### **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, goggles, 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.

### **Battery Charging using a Pigtail-style Cord**

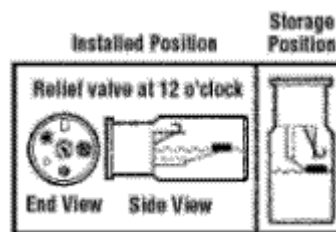
- Set the parking brake while servicing.
- Both the truck and the charger should be turned off when connecting or disconnecting the charging cord.
- Do not service the battery when it is being charged.
- Keep open flames away from the battery. Do not smoke in battery charging areas.
- Only qualified and experienced personnel should perform maintenance, remove or repair batteries.
- No additional personal protective equipment nor is an eyewash station required in the charging area if the battery is only serviced by an outside vendor.



## 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.
- 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.*

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