

# Powered Industrial Truck Program

IAW 29CFR1910.178

Powered Industrial Trucks

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## Overview

Material handling is a significant safety concern. There are numerous opportunities for injuries and property damage during the movement of products and materials. Powered industrial trucks, or PITs, are essential tools in handling materials. PITs include forklifts, pallet jacks and stand-up riding reach trucks.

This document has been created to minimize the risk of injury to operators and bystanders, and to avoid damaging university property. Departments assigned to this equipment will utilize this program to increase operator awareness of recognized safety standards.

Qualified trainers will be used in all training activities. Written records will be kept in the respective departments and by Environmental Health and Safety, or EHS, to document all training. Specific responsibilities for monitoring the effectiveness of this program are assigned to departments, supervisors, operators and EHS.

## Scope and application

This program has been developed to reduce the risk of physical injury and property damage in areas where PITs are in operation. It also brings the university into compliance with federal, state, and local laws. This program applies to the operation of all PITs. It applies to forklifts, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines by university employees and contractors, engaged in university projects.

Departments assigned to PITs must ensure that supervisors and operators comply with all aspects of this safety program. All university employees must successfully complete this training program, and receive certification prior to the operation of any PIT. Contractors operating PITs on university projects are expected to meet or exceed the requirements found in this program and comply with all applicable statutes and regulations governing the use of powered industrial trucks.

- ANSI/ISTDF B56.1 – 2009: Safety Standard for Low Lift and High Lift Trucks.
- OSHA Standard 29CFR [1910.178](#): Powered Industrial Trucks.

## Roles and responsibilities

### EHS responsibilities

The overall responsibility to develop and implement occupational health and safety programs for the university falls with EHS. Although it is the overall responsibility of EHS to develop these programs, it is ultimately up to each department or unit supervisor to ensure that employees are provided the vital support and means to

adequately carry out the provisions of each program and achieve regulatory compliance with all OSHA requirements. Responsibilities of EHS related to PITs include:

- Develop, implement and administer the Arizona State University PIT program and written plan.
- Evaluate designated areas for forklift use.
- Identify atmospheric hazard classification where combustion engine PITs are used to ensure and to determine the need for additional monitoring and the choice of an appropriate PIT.
- Inspect work areas and equipment when notified to provide the user training and to ensure safe operator practices are implemented and adhered to.
- Maintain training records of all PIT operators.
- Monitor the effectiveness of the program by receipt of copies of inspection checklists.
- Observe the operation of powered industrial trucks, and report unsafe practices to the appropriate supervisor.
- Provide orientation and initial training as requested by university departments
- Provide recommendations concerning the choice of PITs.
- Provide the technical expertise and training necessary to identify safe operator practices and equipment where PITs are used.
- Review the PIT program as necessary for compliance and effectiveness.

### **Departments**

- Make recommendations for revisions if necessary.
- Maintain written records of the frequent and annual inspections performed by the powered industrial truck owner, including the date any problems were found, the date when fixed and the name of the person performing the repairs.
- Maintain written records of operator training on each model of a PIT and the name of the trainer.
- Maintain written records of the inspections performed by the PIT owner, including the date any problems were found, the date when fixed, and the name of the person performing the repairs.
- Must implement and administer the PIT program.
- Verify that all employees who operate or work near PITs are properly trained.

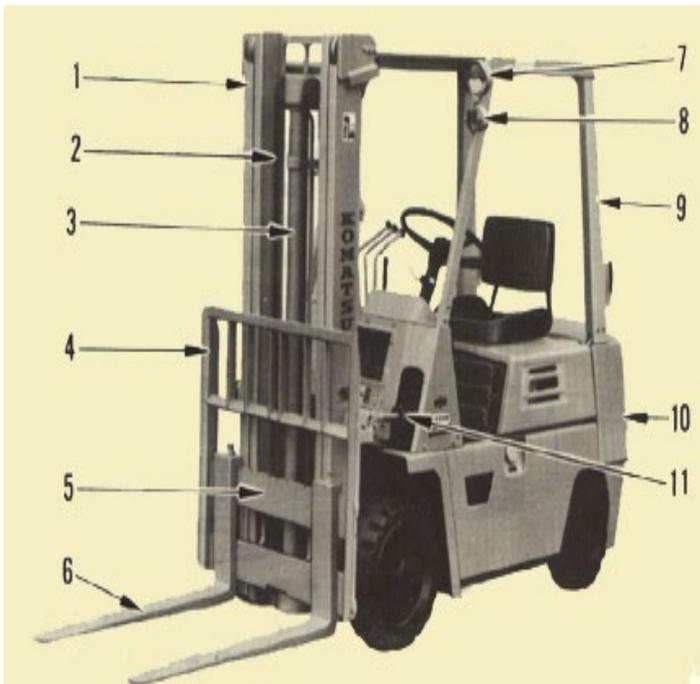
### **Supervisors**

- Coordinate employee training, and certify that all operators receive refresher training every three years.
- Ensure no one under the age of 18 operates a PIT.
- Ensure that only trained and qualified individuals use powered industrial trucks.

- Observe the operation of powered industrial trucks in your department and correct unsafe practices.
- Prohibit operators to utilize a PIT who are involved in a PIT incident until refresher training is completed.
- Provide specific operational training for each forklift in their department.
- Verify employee compliance with the principles and practices outlined in this program.

## Operators

- Attend refresher training every three years.
- Complete the Daily Pre-Use Inspection Checklist before operating any powered industrial truck.
- Complete the Forklift Safety Training Program.
- Comply with all OSHA regulations while operating a powered industrial truck.
- Operate all powered industrial trucks in a safe manner consistent with their training.
- Observe the operation of powered industrial trucks in your department, and report unsafe practices to your supervisor.
- Report all equipment malfunctions or maintenance needs to their supervisor.



1. **Mast:** The mast is the vertical assembly on the front of the forklift that does the work of raising, lowering and tilting the load. Most masts are 'three stage' meaning there are three channels on each side.

2. **Lift chain.**
3. **Lift cylinder:** The amount of vertical lift, raised or lowered, of the mast, forks and carriage is controlled by the hydraulic lift cylinder.
4. **Backrest:** The load backrest is designed to keep the load from falling toward the driver. The load rests against a flat surface and allows for safe loading and unloading.
5. **Fork carriage:** The carriage mounts the forks to the mast and serves as a support structure for the forklift.
6. **Fork:** The forks are long extensions (like arms) that are attached to the carriage. They are used to support the load from the bottom. They come in a variety of widths and adjust from right to left on the carriage.
7. **Head lamp.**
8. **Turn signal lamp.**
9. **Overhead guard:** The overhead guard is the frame around the cab of the forklift. It prevents large objects from falling onto the driver. Since the overhead guard is a grate design, it does not prevent smaller objects from falling from elevated heights. Any modifications must receive written approval from the manufacturer.
10. **Counterweight:** The counterweight is located at the back of the forklift and is installed by the manufacturer. It prevents the forklift from tilting forward when it is loaded.
11. **Tilt cylinder:** The amount of forward and backward tilt of the mast, forks and carriage are controlled by the tilt cylinder.

## Procedures

### Pre-use inspection

- Prior to the operation of any forklift a visual inspection shall be completed. This applies at the beginning of every work period, and whenever a new equipment operator takes control of the forklift. Any safety defects, i.e. hydraulic fluid leaks, defective brakes, steering, lights or horn, missing fire extinguisher, seat belt or backup alarm must be reported for immediate repair. The forklift shall be locked and tagged, and taken out of service until repairs have been made.

### Operation

- A load backrest extension must be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.
- A safe distance must be maintained from the edge of ramps or platforms while on any elevated dock, platform or freight car. Trucks must not be used for opening or closing freight doors.
- All forklifts shall be equipped with a multi-purpose dry chemical fire extinguisher.

- All modifications must be approved by the manufacturer, and new rated load capacities determined and posted on the forklift. Written approval is required.
- An overhead guard must be used as protection against falling objects.
- Arms or legs may not be placed between the uprights of the mast or outside the running lines of the truck.
- Forklifts must not be driven up to anyone standing in front of a fixed object.
- If forklifts are used to elevate persons then an appropriate man lift platform, i.e., cage with standard rails and toe-boards, that is attached to the mast shall be used and pre-approved by the manufacturer.
- Lift capacity must be marked on all forklifts. Operators must ensure the load does not exceed rated weight limits.
- Maintain sufficient headroom under overhead installations such as lights, pipes, sprinkler systems, etc.
- Operators must report all incidents or near misses, regardless of fault or severity, to their supervisor.
- Operators must sound the horn and use extreme caution when meeting pedestrians, making turns and cornering.
- Operators must wear a seatbelt at all times.
- Operators must wear hard hats in areas where overhead hazards exist.
- Operators should review instructions, warnings and precautions for the type of truck being operated.
- Passengers are not allowed to ride on an industrial truck unless the truck has an extra seat that allows the passenger to buckle up while riding
- Persons are not allowed to stand or pass under any elevated portion of a truck.
- Rail cars and trailers must be parked squarely to the loading area and have wheels chocked in place. Operators must follow established docking and undocking procedures.
- Travel ways must be maintained free from obstructions. Aisles must be marked, and wide enough (six-foot minimum) for vehicle operation.
- When a forklift is left unattended (more than 25ft. away or out of sight), load-engaging means must be fully lowered, controls neutralized, power shut off, and brakes set. Wheels must be blocked if the truck is parked on an incline.

### **Loading**

- A load engaging means must be placed under the load as far as possible and against the backrest to help stabilize the load. Always place the larger or heaviest part of the load closest to the backrest. The mast must be carefully tilted backward to stabilize the load.
- Loads should be safely arranged, stable, and centered. Always use caution when handling loads. Adjust long or high, including multiple-tiered, loads that may affect capacity.
- Only handle loads within the rated capacity of the truck.

- Trucks equipped with attachments must be operated as partially loaded trucks even when not handling a load.
- Use extreme care when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevating is prohibited except to pick up a load. An elevated load may not be tilted forward except when the load is in a deposit position. Use only enough backward tilt to stabilize the load when stacking or tiering.

## Traveling

- A safe distance must be maintained, approximately three truck lengths from the truck ahead, and the trucks must be kept under control at all times.
- All traffic regulations must be observed, including authorized speed limits and yielding to pedestrians.
- Avoid running over loose objects on the roadway surface.
- **Do not** pass other forklifts traveling in the same direction at intersections, blind spots, or other dangerous locations.
- Dock board or bridge plates must be driven over carefully and slowly and their rated capacity never exceeded.
- Dock board or bridge plates must be properly secured before they are driven over.
- Grades must be ascended and descended slowly. Position the load uphill relative to the operator when ascending or descending grades.
- If the load being carried obstructs the forward view, the driver must travel with the load trailing.
- Loads must be tilted back and carried no more than four to six inches above the ground.
- Railroad tracks must be crossed diagonally wherever possible. Parking closer than eight feet from the center of railroad tracks is prohibited.
- Reduce speed and turn the hand steering wheel in a smooth, sweeping motion while negotiating turns. The hand steering wheel must be turned at a moderate, even rate except when maneuvering at a very low speed.
- Stunt driving and horseplay are prohibited.
- The driver must look in the direction of and keep a clear view of the path of travel.
- The driver must slow down and sound the horn at cross aisles and other locations where vision is obstructed.
- The right of way must be yielded to ambulances, fire trucks or other vehicles in emergency situations.

## Fueling

Appropriate personal protective equipment, or PPE, shall be worn.

- Contact ASU EHS for proper disposal of any spill clean-up debris.

- Fuel tanks may not be filled while the engine is running. Avoid spillage. Liquefied petroleum gas, or LPG, is cold and can cause thermal burns. Use the appropriate gloves and eye protection.
- No truck can be operated with a leak in the fuel system.
- Open flames are not to be used when checking electrolyte levels in storage batteries, or gasoline levels in fuel tanks.
- Shut off the engine, set the parking brake and put the controls in neutral while refueling.
- Spillage of oil or fuel must be absorbed using an oil absorbent or vermiculite, the affected area carefully washed and the fuel tank cap replaced before restarting the engine.

### **Changing and charging storage batteries**

Appropriate PPE shall be worn.

- A carbon filter or siphon must be provided for handling electrolytes.
- A conveyor, overhead hoist or equivalent material handling equipment must be provided for handling batteries.
- Acid must be poured into water, not water into acid when changing batteries.
- Battery charging installations must be located in areas designated for that purpose.
- Care must be taken to ensure that vent caps are functioning. The battery (or compartment) covers must be open to dissipate heat.
- Distracted operating such as, but not limited to, cell phone use is prohibited.
- Employees charging and changing batteries shall be authorized to do the work, trained in the proper handling, and required to wear protective clothing, including face shields, long sleeves, rubber boots, aprons and gloves.
- Facilities must provide for flushing and neutralizing spilled electrolytes, fire protection, protection of charging apparatus from damage by trucks and adequate ventilation for the removal of vapors.
- Precautions must be taken to prevent open flames, sparks or electric arcs in battery charging areas.
- Reinstalled batteries must be properly positioned and secured in the truck.
- Smoking is prohibited in the charging area.
- Tools and other metallic objects must be kept away from the top of uncovered batteries.
- Trucks must be properly positioned and the brake applied before attempting to change or charge batteries.

### **Maintenance**

- Any powered industrial truck, or PIT, must be removed from service if not in safe operating condition. Repairs to the fuel and ignition systems of forklifts

that involve fire hazards must only be conducted in locations designated for such repairs.

- Authorized personnel must perform all repairs.
- Forklifts must be examined before being placed into service, and must not be placed into service if the examination shows any condition adversely affecting the safety of the vehicle. Such examinations must be made at least daily. Forklifts must be examined before each shift where they are used on a round-the-clock basis. Any defects must be immediately reported and corrected.
- Forklifts shall be kept in a clean condition, free of lint, excess oil and grease. Noncombustible agents must be used for cleaning trucks. Low flash point (below 100 degrees F) solvents must **not** be used. High flash point (at or above 100 degrees F) solvents may be used.
- Only use replacement parts that are currently recommended by the manufacturer.
- PITs in need of repairs to the electrical system must have the battery disconnected before such repairs.

The vehicle must be removed from service and not returned to service until the overheating cause has been eliminated when the temperature of any part of any forklift is found to be in excess of its normal operating temperature, thus creating a hazardous condition.

### **Training requirements**

Employees who are authorized to operate forklifts must receive training prior to engaging in their duties, and at least every three years thereafter. The training is to ensure that the PIT program is understood. The supervisor will also ensure that authorized forklift operators have acquired the necessary practical skills required for safe operation. Training is offered by EHS, equipment manufacturers, safety professionals or vendors who specialize in forklift training.

Operational training will consist of a combination of general safety instruction, practical and operational training (demonstrations performed by the trainer, and practical exercises performed by the trainee) and an evaluation of the operator's performance in the workplace. All operational training must be conducted under close supervision.

### **Initial training**

- All training and evaluation must be completed before an operator is permitted to use a forklift without continual and close supervision.
- Be informed of the forklift operating limitations and restrictions defined by the manufacturer.
- Receive instruction on the intended purpose and function of each control

- Trainees may operate a PIT only under the direct supervision of authorized trainers during operational training, and where such operation does not endanger the trainee or other employees.
- The trainee will read and understand the manufacturer's operating instructions and user's safety rules prior to operating any PIT. The trainee may also receive training by a qualified person on the contents of the manufacturer's operating instructions and user safety rules.
- Understand all decals, warnings and instructions displayed on the PIT by reading or by a qualified explanation.

### **Refresher training**

Refresher training is required when:

- A condition in the workplace changes in a manner that could affect the safe operation of the truck.
- An incident has occurred involving the removal of the operator's license.
- Operator has had no training for three years.
- The operator has been observed operating the vehicle in an unsafe manner.
- The operator has received an evaluation that reveals that the operator is not operating the truck safely.
- The operators appear unfamiliar with their equipment, procedures or appear to have inadequate knowledge concerning what is required by this program.
- There is a change in job assignments, change in equipment or process, or whenever there is a change in the PIT.

Refresher training must include at least the following:

- Review of the Pre-Use Inspection Checklist.
- Review of the University's written program.
- Updated information on new equipment.

### **Training records**

Each department must maintain a record of all individual training, including:

- Any refresher training conducted.
- Date of training.
- Name of individual trained.
- Name of person providing the training.
- Subject matter of the training, i.e., classroom, test and obstacle course performance.
- Training records must be maintained by the department for a minimum of three years.

## **Program evaluation**

The PIT program shall be evaluated as necessary for compliance and effectiveness, utilizing the protocols set forth by EHS. The evaluation team will consist of a department representative and a designee from EHS. EHS will define the scope of the evaluation.

The final report will be developed by the department representative and OHS utilizing the information received during the evaluation. The deficiencies determined in the report will be documented and corrective action plans will be developed.

# Appendix I

## Prior to use inspection checklist

### Forklift use inspection checklist

Inspector: \_\_\_\_\_

Date: \_\_\_\_\_

| Item  | Pass | Fail | Corrective action |
|---|------|------|-------------------|
| 1. Inspect the mast for broken or cracked weld points and any other obvious damage.   |      |      |                   |
| 2. Ensure roller tracks are greased and that chains are free to travel.   |      |      |                   |
| 3. Forks must be equally spaced and free from cracks along the blade and at the heels.  |      |      |                   |
| 4. Check hydraulic fluid levels.  |      |      |                   |
| 5. Check each hydraulic line and fitting for excessive wear or crimping.  |      |      |                   |
| 6. Check lift and tilt cylinders for damage or leaking fluid.   |      |      |                   |
| 7. Inspect mounting hardware on the cylinders.  |      |      |                   |
| 8. Check tires for excessive wear, splitting or missing tire material.  |      |      |                   |
| 9. Check pneumatic tires for proper pressure indicated on the tires.  |      |      |                   |
| 10. When applicable, inspect batteries for:<br><b>Note:</b> Thick nitrile gloves, splash goggles and long sleeves must be worn when working with batteries. |      |      |                   |
| a. Cracks or holes.   |      |      |                   |
| b. Securely sealed cells.   |      |      |                   |
| c. Frayed cables.   |      |      |                   |
| d. Broken insulation.   |      |      |                   |
| e. Tight connections.   |      |      |                   |
| f. Clogged vent caps.   |      |      |                   |
| 11. When applicable check propane power supplies for:   |      |      |                   |
| a. Tanks having cracks, broken weld points and other damage.  |      |      |                   |

|                                       |  |  |  |
|---------------------------------------|--|--|--|
|                                       |  |  |  |
| b. All valve, nozzle and hose damage. |  |  |  |
| 12. Fire extinguisher.                |  |  |  |
| 13. Lights and horns.                 |  |  |  |

## Appendix II

# Forklift operator evaluation form

### Forklift operator evaluation form

**Instructions:** Use this checklist during the field session to evaluate operator proficiency. It can also be used for period evaluation to ensure that operators are continuing to operate forklifts properly.

|                    |                    |
|--------------------|--------------------|
| Operator name      | Evaluator name     |
| Date of evaluation | Equipment operated |

| Operator behaviors  | Rating                   | Comments |
|---|--------------------------|----------|
| <b>Pre-use inspection</b>   |                          |          |
| 1. Follow the operator's daily checklist.   | Good   Fair   Poor   N/A |          |
| 2. Look for damage.   | Good   Fair   Poor   N/A |          |
| 3. Document all findings on the checklist.  | Good   Fair   Poor   N/A |          |
| <b>Picking up the load</b>  |                          |          |
| 1. Square up on the center of the load.   | Good   Fair   Poor   N/A |          |
| 2. Stop with the fork tips about one foot from the load.                            | Good   Fair   Poor   N/A |          |
| 3. Clear personnel from the area near the load.                                     | Good   Fair   Poor   N/A |          |
| 4. Level the forks; then slowly drive forward until the load contacts the carriage. | Good   Fair   Poor   N/A |          |

|   |      |      |      |     |  |
|---|------|------|------|-----|--|
| 5. Lift the load carefully and smoothly until it is clear.                              | Good | Fair | Poor | N/A |  |
| 6. Tilt the mast back slightly to stabilize the load.                                   | Good | Fair | Poor | N/A |  |
| 7. Look over both shoulders.  | Good | Fair | Poor | N/A |  |
| 8. After the load is out and the forklift is stopped, lower the load to travel height.  | Good | Fair | Poor | N/A |  |
| <b>Traveling</b>  |      |      |      |     |  |
| 1. Do not raise or lower the load and forks while traveling.                            | Good | Fair | Poor | N/A |  |
| 2. Maintain a safe speed.   | Good | Fair | Poor | N/A |  |
| 3. Observe all traffic rules, warning signs, floor load limits and overhead clearances. | Good | Fair | Poor | N/A |  |
| 4. Keep arms and legs inside the forklift.  | Good | Fair | Poor | N/A |  |
| 5. Follow other vehicles at a safe distance.  | Good | Fair | Poor | N/A |  |
| 6. Slow down when cornering.  | Good | Fair | Poor | N/A |  |
| 7. Use the horn to alert others.  | Good | Fair | Poor | N/A |  |
| 8. Travel with the load facing uphill while on a ramp or incline.                       | Good | Fair | Poor | N/A |  |
| 9. Stop smoothly.   | Good | Fair | Poor | N/A |  |
| <b>Putting down a load</b>  |      |      |      |     |  |
| 1. Make sure there is sufficient clearance for the load.                                | Good | Fair | Poor | N/A |  |
| 2. Clear personnel from the area near the load.   | Good | Fair | Poor | N/A |  |

|  |      |      |      |     |  |
|--|------|------|------|-----|--|
| 3. Square up to the location; then stop about 1 foot away.                         | Good | Fair | Poor | N/A |  |
| 4. Raise the load to the placement level.  | Good | Fair | Poor | N/A |  |
| 5. Move slowly forward.  | Good | Fair | Poor | N/A |  |
| 6. If the load is on a pallet, lower it into position and lower the forks further. | Good | Fair | Poor | N/A |  |
| 7. Look over both shoulders before backing out.                                    | Good | Fair | Poor | N/A |  |
| 8. Back straight out until the forks have cleared.                                 | Good | Fair | Poor | N/A |  |
| 9. Lower the forks to the traveling position.                                      | Good | Fair | Poor | N/A |  |
| <b>Parking</b>   |      |      |      |     |  |
| 1. Fully lower the forks.  | Good | Fair | Poor | N/A |  |
| 2. Neutralize the controls.  | Good | Fair | Poor | N/A |  |
| 3. Set the brakes.   | Good | Fair | Poor | N/A |  |
| 4. Turn off the power.   | Good | Fair | Poor | N/A |  |
| 5. If parked on an incline, block the wheels.                                      | Good | Fair | Poor | N/A |  |
| 6. Park only in authorized areas.  | Good | Fair | Poor | N/A |  |
| <b>Fueling and battery recharging</b>  |      |      |      |     |  |
| 1. Engine off.   | Good | Fair | Poor | N/A |  |
| 2. Fire extinguisher nearby.   | Good | Fair | Poor | N/A |  |
| 3. Proper personal protective equipment worn.                                      | Good | Fair | Poor | N/A |  |

|   |      |      |      |     |
|---|------|------|------|-----|
|   |      |      |      |     |
| 4. Safe fueling and battery recharging procedures followed. | Good | Fair | Poor | N/A |
| 5. Spills cleaned up immediately.                           | Good | Fair | Poor | N/A |

- Based on my evaluation, the operator has successfully completed the evaluation and is qualified to operate the following equipment:
- Based on my evaluation, the operator has not demonstrated competence in operating the following equipment:

Comments:

|                    |                   |
|--------------------|-------------------|
| Trainer name       | Trainer signature |
| Employee name      | ASU ID number     |
| Employee signature | Date              |