Northern Illinois University

Powered Industrial Truck Safety Program

Department of Environmental Health and Safety

Version 5.0

11/11/2019

Date	Reviewed by	Changes Made
9/1/15	Mary Schlagel	Multiple updates throughout the program
6/23/16	Mary Schlagel	Updated forms, Responsibilities, Battery Charging & Changing.
8/14/17	Mary Schlagel	Updated program name, Responsibilities, Scope, Training section.
8/3/18	Mary Schlagel	Updated Responsibilities, Applicable Regulations & Standards, Operator Training, Appendix
11/11/19	Mary Schlagel	Annual review, in-house trainers & training firms

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Purpose

The Powered Industrial Truck Operator Safety Program (Program) establishes requirements for employees to safely operate powered industrial trucks (PITs) at Northern Illinois University (NIU). These guidelines are established in order to:

- Provide a safe working environment.
- Govern safe operator use of PITs.
- Ensure proper care and maintenance of PITs.

The procedures herein establish uniform requirements designed to ensure that PIT safety training, operation, and maintenance practices are communicated to and understood by affected employees. These requirements also are designed to ensure that procedures are in place to safeguard the health and safety of all employees.

Applicable Regulations and Standards

This Program is designed to comply with applicable policies and codes as adopted by NIU and Illinois Occupational Safety and Health Administration (IOSHA) as well as best practices outlined by the American National Standards Institute (ANSI) and the National Fire Protection Association (NFPA). These include:

- NIU Health and Safety Policy
- Facilities Management and Campus Service (FMCS) Safety Policy
- 29 CFR 1926.600 (Equipment)
- 29 CFR 1926.602(c) (Lifting and Hauling Equipment)
- 29 CFR 1926.441 (Batteries and Battery Handling)
- 29 CFR 1910.176 (Handling Materials, General)
- 29 CFR 1910.178 (Powered Industrial Truck)
- 29 CFR 1910.441 (Battery Changing and Charging)
- ASME/ANSI B56.1-1969 (Safety Standard for Low Lift and High Lift Trucks)
- NFPA 30 (Flammable and Combustible Liquids Code)

Scope

This program applies to all PITs operated by NIU personnel regardless of location. Types of PITs are:

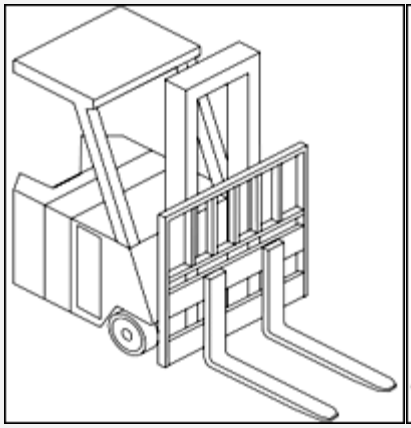
- Class I: Electric Motor Rider Trucks
- Class II: Electric Motor Narrow Aisle Trucks
- Class III: Electric Motor Hand Trucks or Hand/Rider Trucks
- Class IV: Internal Combustion Engine Trucks (Solid/Cushion Tires)

- Class V: Internal Combustion Engine Trucks (Pneumatic Tires)
- Class VI: Electric and Internal Combustion Engine Tractors
- Class VII: Rough Terrain Forklift Trucks

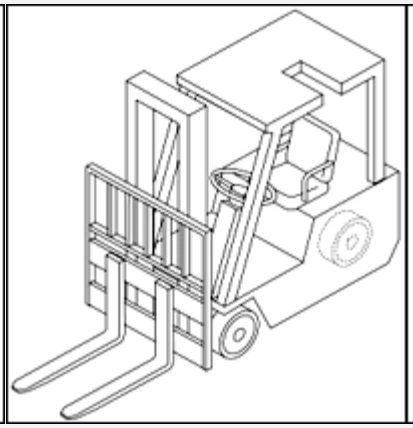
Forklifts are PITs but not all PITs are forklifts as depicted in the pictorial diagram below. NIU uses many but not all of these types of PITs.

Class I: Electric Motor Rider Trucks

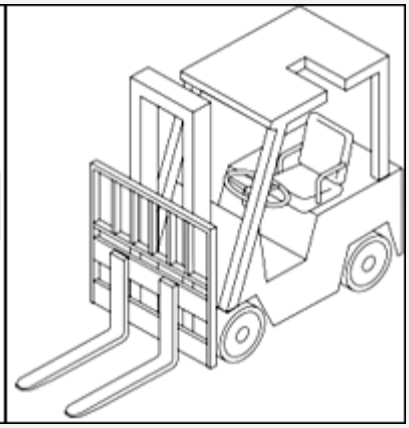
The following are examples of Class I powered industrial trucks.



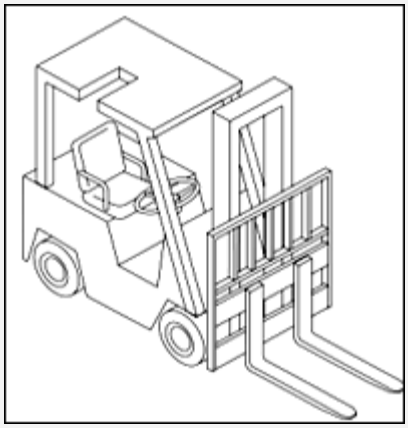
Lift Code 1: Counterbalanced Rider Type, Stand Up.



Lift Code 4: Three Wheel Electric Trucks, Sit Down.



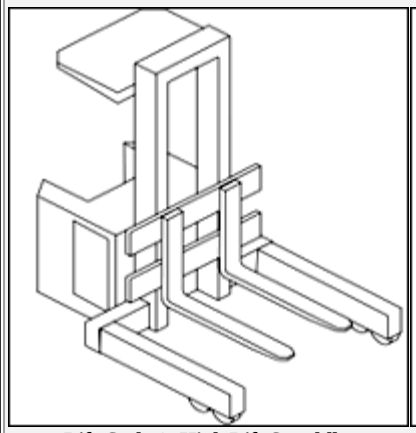
Lift Code 5: Counterbalanced Rider, Cushion Tires, Sit Down.



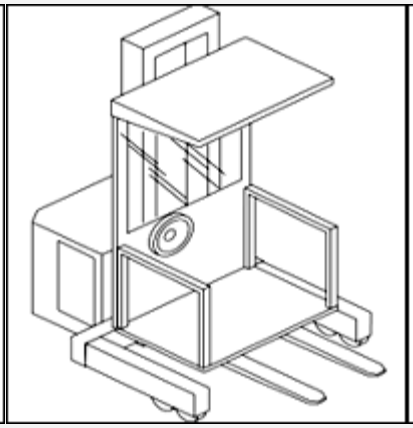
Lift Code 6: Counterbalanced Rider, Pneumatic or Either Type Tire, Sit Down.

Class II: Electric Motor Narrow Aisle Trucks

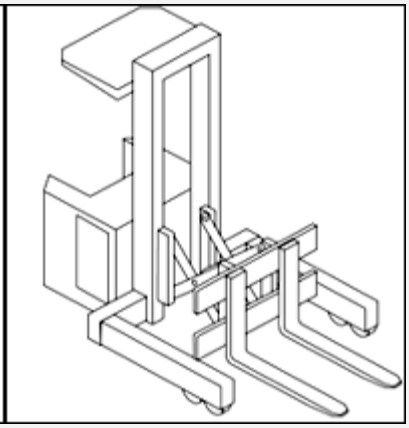
The following are examples of Class II powered industrial trucks.



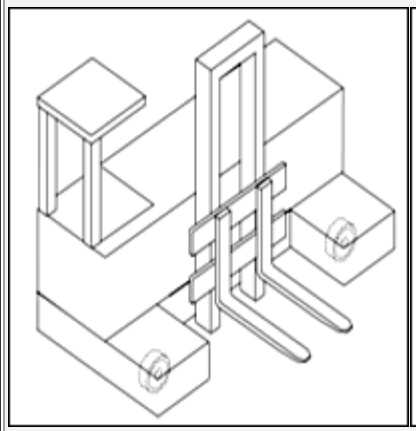
Lift Code 1: High Lift Straddle.



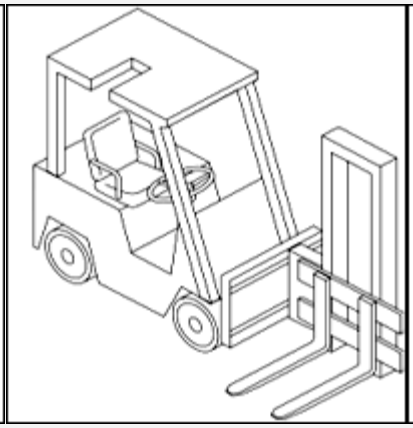
Lift Code 2: Order Picker.



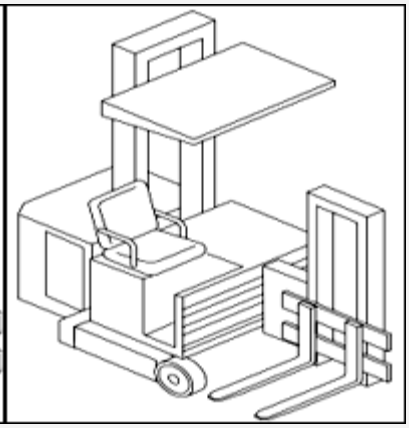
Lift Code 3: Reach Type Outrigger.



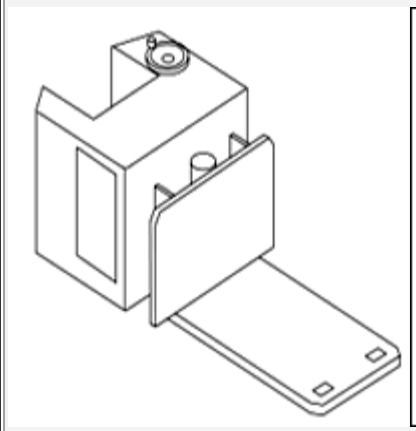
Lift Code 4: Side Loaders: Platforms.



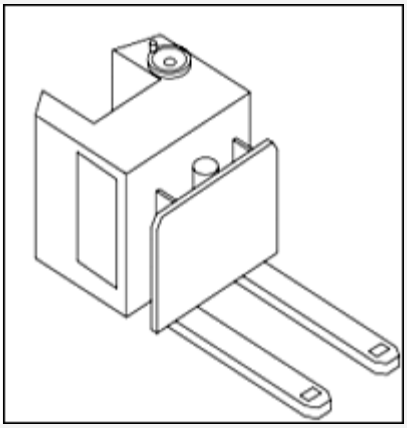
Lift Code 4: Side Loaders: High Lift Pallet.



Lift Code 4: Turret Trucks.



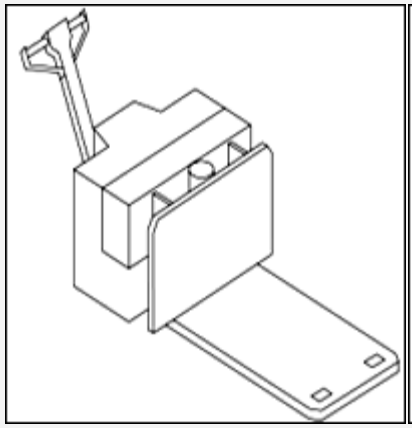
Lift Code 6: Low Lift Platform.



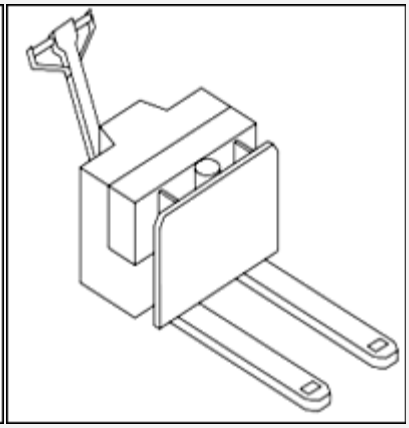
Lift Code 6: Low Lift Pallet.

Class III: Electric Motor Hand Trucks or Hand/Rider Trucks

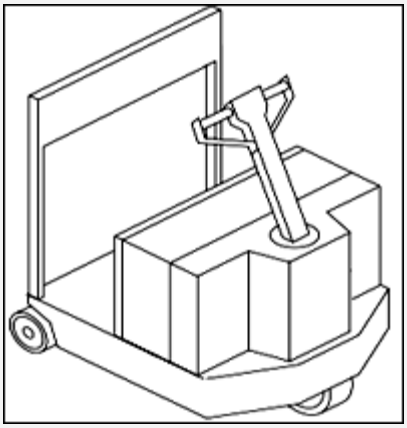
The following are examples of Class III powered industrial trucks.



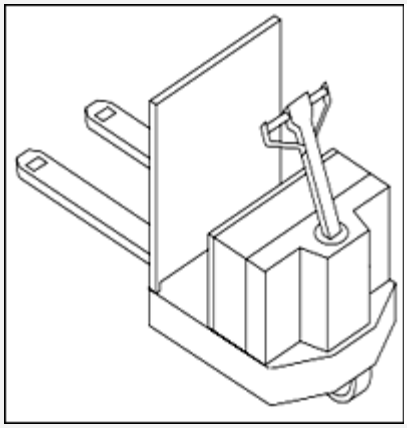
Lift Code 1: Low Lift Platform.



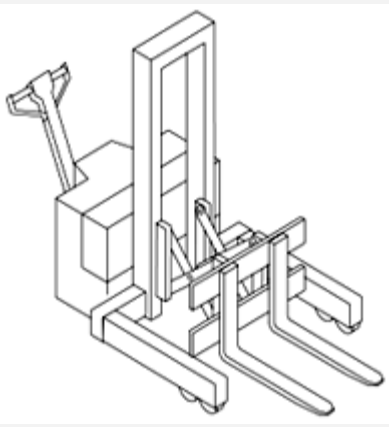
Lift Code 2: Low Lift Walking Pallet.



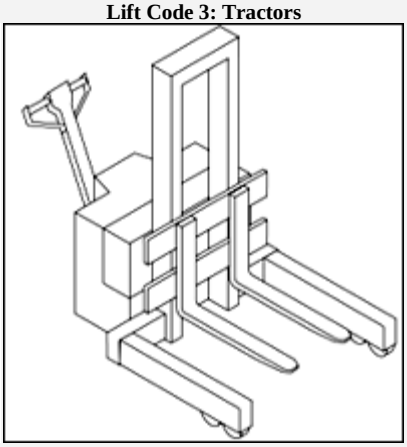
Lift Code 3: Tractors



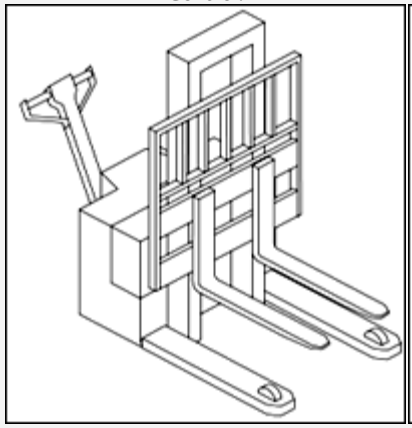
Lift Code 4: Low Lift Walking/Center Control.



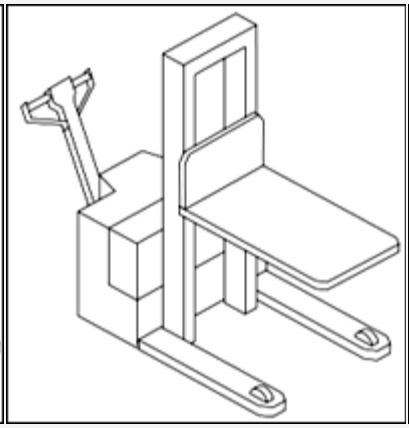
Lift Code 5: Reach Type Outrigger.



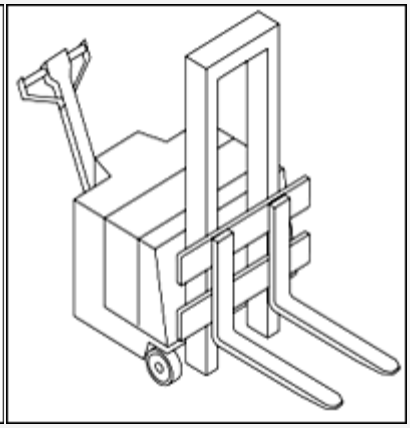
Lift Code 6: High Lift Straddle.



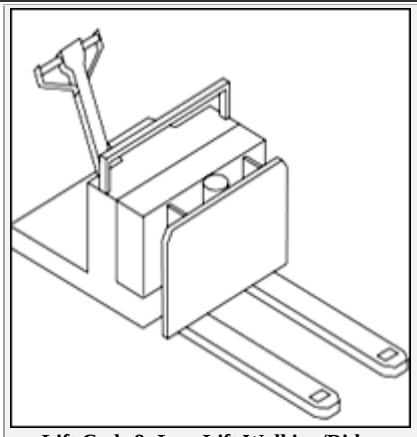
Lift Code 6: Single Face Pallet.



Lift Code 6: High Lift Platform.



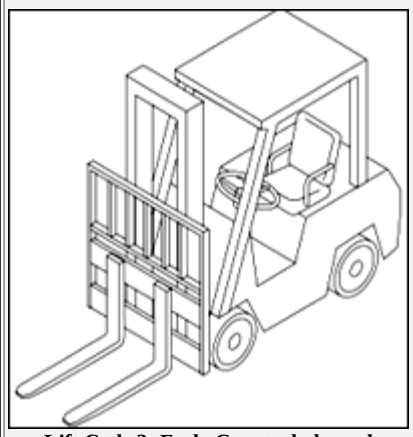
Lift Code 7: High Lift Counterbalanced.



Lift Code 8: Low Lift Walking/Rider Pallet and End Control.

Class IV: Internal Combustion Engine Trucks (Solid/Cushion Tires)

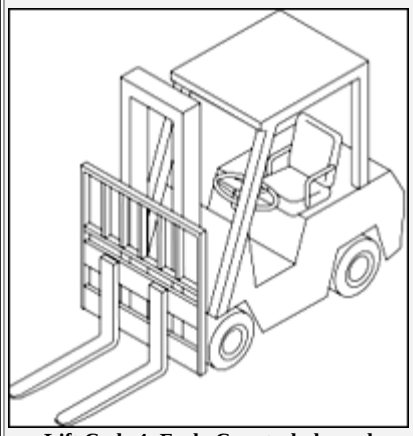
The following are examples of Class IV powered industrial trucks.



Lift Code 3: Fork, Counterbalanced (Cushion Tire).

Class V: Internal Combustion Engine Trucks (Pneumatic Tires)

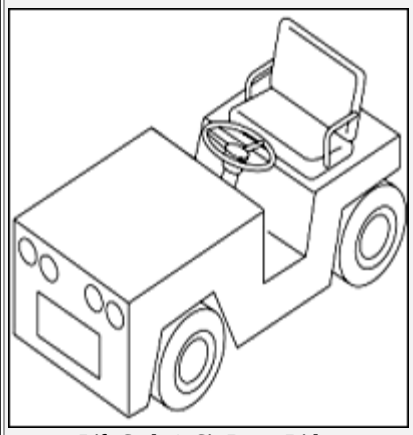
Example of Class V powered industrial trucks.



Lift Code 4: Fork, Counterbalanced (Pneumatic Tire).

Class VI: Electric and Internal Combustion Engine Tractors

Example of Class VI powered industrial trucks.

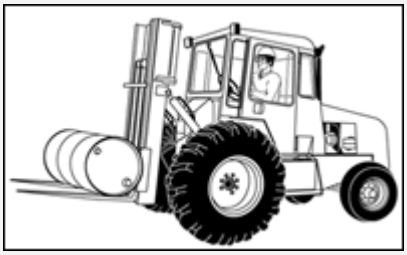


Lift Code 1: Sit-Down Rider (Draw Bar Pull Over 999 lbs.).

Class VII: Rough Terrain Forklift Trucks

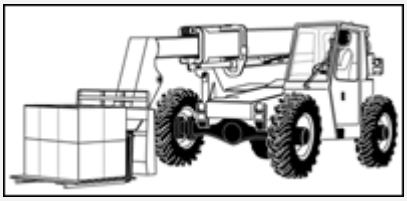
Class VII – Rough terrain forklift is a generic term used to describe forklifts typically intended for use on unimproved natural terrain and disturbed terrain construction sites. However, the term "rough terrain" does not imply that the forklift can be safely operated on every conceivable type of terrain.

There are three basic types of rough terrain forklift:



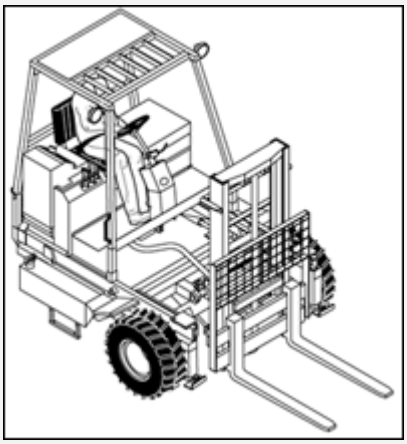
Vertical mast type.

This is an example of a ruggedly constructed forklift and is designed to be used primarily outdoors.



Variable reach type.

This is an example of a vehicle equipped with a telescoping boom, which enables it to pick and place loads at various distances and lift heights in front of the machine. The ability to reach out in front of the forklift allows the operator flexibility in the placement of a load.



Truck/trailer mounted.

This is an example of a portable self-propelled rough terrain forklift that is typically transported to the job site. It is mounted on a carrier to the back of a truck/trailer and is used to unload heavy items from the truck/trailer at the job site. Note that not all truck/trailer mounted forklifts are rough terrain forklifts.

(Drawings courtesy of OSHA website https://www.osha.gov/SLTC/etools/pit/forklift/types/classes.html.)

Responsibilities

Environmental Health and Safety Department (EH&S)

- Review and update this Program as needed.
- Arrange for initial operator training as requested by campus departments.
- Arrange for refresher operator training for all trained operators on a three-year cycle.
- Report unsafe practices to the appropriate supervisors.
- Periodically audit departments who are required to implement this Program.

Foremen and Supervisors

- Ensure all employees using PITS are properly trained and qualified.
- Keep records to document that each operator has successfully completed operator training. Such records should include the types of PITs on which the operator has been familiarized.
- Keep track of when operators are due for refresher training and contact EH&S to schedule training.
- Provide operators with specific familiarization on each PIT in which the operator will be assigned. Record on the PIT Operator Evaluation Review Form (See Appendix).
- Correct unsafe behaviors and practices quickly and contact EH&S for assistance with initiating re-training where necessary.
- Ensure operators inspect the PIT before operation or before each shift.
- Ensure the operators complete the Daily Pre-Use Checklist before operating PITs.
- Keep daily inspection sheets for six months per applicable industry best practice.
- Ensure electrolyte solution levels are maintained in PIT batteries. Insufficient fluid can result in damage to the battery or cause a fire or explosion.
- Ensure that proper personal protective equipment (PPE) is available and that operators use properly when checking and maintaining PIT batteries.
- Place "Out of Service" signs on PITs that do not pass daily inspection or are otherwise unsafe to operate. (See Appendix for sign. "Out of Service" hangtags are appropriate too.)
- Remove "Out of Service" signs/tags once repaired, inspected and found safe to use.
- Schedule for the PITs in each shop's inventory to be repaired and tested in accordance with manufacturer instructions. Keep and maintain such records available for inspection.

Operators

- Complete PIT operator training.
- Read and comply with this Program.
- Review the operating instructions and safety guidelines and complete the Daily PIT Checklist before operating any PIT. (Please refer to the Appendix for reference.)
- Notify the supervisor of any deficiencies noted during the daily inspection of the PIT.
- Notify the supervisor of any problems, malfunctions or unsafe practices noted during the operation of the PIT.

- Use proper personal protective equipment (PPE) when checking and maintaining batteries.
- Do not use a PIT that has an "Out of Service" sign or tag displayed.

Contractors

Contractors may provide their own PITs to use on campus property. The NIU project managers or supervisors coordinating the contractor work reserve the right to request proof of training for contractor employees before working on NIU property. Contractor employees are not allowed to use PITs owned by NIU. The contractor may coordinate with the NIU project manager or supervisor, to use NIU-owned PITs only if it is operated by an NIU PIT-trained operator.

Operator Training

Initial Training

During operator training the employee will receive both classroom instruction and "hands-on" practical training. Classroom instruction may include lecture, discussion, interactive computer learning, videos, and exams, and cover the following topics:

PIT Operations:

- Identification of the various types of PITs.
- Differences in the operation of the PIT and a typical automobile.
- Operating instructions, warnings, and precautions for the types of PITs.
- Any PIT inspection and maintenance that the operator will be required to perform.
- Operating limitations.
- Any other operating instructions, warnings, or precautions listed in the PIT operator's manual.

Workplace-Related Topics:

- Surface conditions where the PIT will be operated.
- Composition of loads to be carried and load stability.
- Ramps and other sloped surfaces that could affect the vehicle's stability.

Hands-On Practical Training

This training may include demonstrations and classroom instruction by the trainer and hands-on practical exercises by the trainee. All PIT operators shall be trained and tested on the type of equipment they will

be driving before they begin their job. This training covers the following:

PIT Operations:

- PIT controls and instrumentation - Where they are located, what they do, and how they work.
- Engine or motor operation.
- Steering and maneuvering.
- Visibility (including restrictions due to loading and unloading).
- Fork and attachment adaptation, operation, and use limitations.
- Vehicle capacity.
- Vehicle stability.
- Refueling and/or charging of batteries.
- Operating limitations.

Workplace-Related Topics

- Load manipulation, stacking, and unstacking.
- Narrow aisles and other restricted places where the PIT will be operated.
- Hazardous (classified) locations where the PIT will be operated.
- Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust and associated potential health effects.
- Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

Each type of PIT has a different "feel" to it, which makes operating it slightly different from operating other industrial trucks. Assigned work areas where PITs are being used may also present specific hazards. For these reasons, it is impractical to develop a single "generic" training program that fits all PITs. Accordingly, the operational hazards of PITs are covered during training and include:

- General hazards that apply to the operation of all or most PITs.
- Hazards associated with the make and model of the PIT.
- Hazards of the workplace in general.
- Hazards of the workplace where the PIT is operated.

If an operator has received training in any of the elements of the training program, can provide

proof of training by means of an unexpired training certificate and is evaluated to be competent, they need not be retrained in those elements before initial assignment in the workplace. The operator will receive refresher training on a three-year cycle from last certified training.

Training Certification

After a trainee has completed the training program, the instructor will determine whether the trainee can safely operate the PIT. The trainee will take a performance test or practical exercise through which the instructor will decide if the training has been adequately understood. All PIT trainees are tested on the type of the equipment they will be driving.

Performance Evaluation

Each certified PIT operator is evaluated at least once every three years to verify that the operator has retained and uses the knowledge and skills needed to drive safely. If the operator is observed to be lacking the appropriate skills and knowledge, the department supervisor shall perform an evaluation. If the operator fails the evaluation, the operator will need to be re-trained. There is a copy of the PIT Operator Evaluation Review Form in the Appendix.

Refresher Training

The refresher training cycle is every three years, but operators may require more frequent refresher training based upon any of the following situations:

- If the operator is involved in an accident or a near-miss incident.
- If the operator has been observed driving the PIT in an unsafe manner.
- When the operator is assigned to a different type of PIT. (This can be familiarization training instead of the full class.)
- If it has been determined during an evaluation that the operator needs additional training.
- When there are changes in the workplace that could affect the safe operation of the PIT. This could include but not be limited to: a different type of paving, reconfiguration of the storage racks, new construction leading to narrower aisles, or restricted visibility.

Inspection and Maintenance

Pre-Operational Inspection Procedures

Operators are required to perform pre-operational equipment checks each day or shift before operating at PIT to ensure the safe operating condition of the vehicle. Please reference the Appendix for a copy of the Daily Powered Industrial Truck Checklist form. These forms should also be located in each PIT battery charging and parking area. Daily checklist forms should be retained for at least six months as evidence these checks are being completed.

Periodic Inspection Procedures

Periodic inspections are done in conjunction with the PIT's maintenance or service schedule. Maintenance schedules are normally expressed in days and operating or running hours. Most

manufacturers' operator instruction manuals contain the recommended maintenance schedule. Inspections and maintenance or repair beyond the manufacturer's recommended service schedules are to be performed by authorized, certified service technicians.

Maintenance

Investing time and effort into the proper upkeep of equipment results in day-to-day reliability. Keeping up with the manufacturers' recommended maintenance and lubrication schedules, ensuring batteries have sufficient electrolyte and completing the proper records will also increase the PIT's longevity and reliability.

Operators shall complete an initial "break-in" inspection upon delivery of a PIT in accordance with the manufacturer's instructions. Operators are required to follow the manufacturer's operator instruction manual for daily or weekly maintenance.

Manufacturer recommended periodic maintenance (monthly, semi-annual, or annually) shall be performed by a factory-certified expert or a dealer. The supervisor shall retain all maintenance records.

Safe Operating Procedures

Use of PITs can create certain hazards that only safe operation can prevent. To encourage this the following general operating procedures are established.

Driving

Driving a PIT is fundamentally different than driving a car or other trucks. In fact, PITs

- Are usually steered by the rear wheels.
- Steer more easily loaded than empty.
- Are driven in reverse as often as forward.
- Are often steered with one hand.
- Have a center of gravity toward the rear, shifting to the front as forks are raised.

Unlike cars, some PITs have a greater chance of tipping over when suddenly turned. They have a very short rear wheel swing. Speed can cause the center of gravity to shift dramatically, so at high speeds sudden turns can tip them resulting in serious injury and damage. Similarly, speeding over rough surfaces can increase the chance of tipping.

Although structurally different than cars, PITs like cars can collide with property and people. Therefore, operators are required to follow these driving procedures:

- Observe all traffic regulations.
- Always look in the direction of travel.

- Avoid trying to talk with those around while driving the PIT.
- Keep to the right whenever possible.
- Always drive with the load only as high as necessary to avoid ground obstructions.
- Use the horn only as a warning signal. Do not sound the horn to attract the attention of other employees.
- No not extend arms or legs beyond the cab or sides of the vehicle.
- Always keep your head, hands and feet out of the lift uprights.
- Do not drive with wet or greasy hands or feet. This will hinder the ability to maintain control of the PIT.
- Avoid running over any loose objects.
- Always keep an eye out for overhead obstructions.
- Avoid sudden starts and stops.
- Never use the reverse as a brake and never reverse direction while in motion (unless specified by written manufactures' instruction).
- Always come to a complete stop before shifting gears.
- Never use a PIT to tow objects such as rail cars. The PIT will not be able to brake the movement of the other object and it will end up shoving and possibly crushing the PIT.
- Always be alert.
- Do not use the PIT as a personnel lift.
- No riders – Ever!

Load Lifting and Carrying

Powered industrial trucks can only lift up to their designated load capacity. Each PIT has its own load capacity indicated on the rating plate. Powered industrial trucks also have a three-point suspension that forms an imaginary triangle from the left front wheel to the right front wheel to the point between the two back wheels. The center of gravity must lie somewhere within this triangle otherwise the PIT will tip over. The load and its position on the forks as well as traveling speed and slopes all affect the center of gravity. Loads need special care so that they do not fall. In order to prevent tipping and load-falling hazards, the following load-lifting and carrying procedures have been established:

Lifting:

1. Determine the nature of the load. Make sure it will not exceed the capacity limitations of the PIT.

2. Adjust the forks appropriately. Spread the forks as far as possible while still allowing both to fit comfortably under the load.

3. Approach the load slowly, straight on, and with the forks parallel to the floor.

4. Place the forks under the load as far as possible.

5. Slowly lift the load a few inches and tilt the mast back slightly.

6. If lifting the load from a stack, slowly back away to clear the stack and then slowly lower the load to the lowest position where it will still clear ground obstructions.

Carrying:

- Remember that the way the load is handled affects its stability.

- Always drive in such a manner as to give the maximum possible stability to the load. Avoid fast starts and stops and quick, sharp turns.

- If the PIT has multiple gears, always start out in low gear when carrying a load. Starting in high gear can damage the vehicle.

- Only raise the forks high enough to clear obstructions. Never drive with the load raised excessively. This is extremely dangerous and can cause serious injuries and damage.

- Avoid running over any obstruction, no matter what the size. Running over even a small obstruction can cause the load to spill or tip the PIT. Avoid driving over railroad tracks when carrying a load. If you must, drive slowly, approach the tracks at a forty-five-degree angle, and grasp the steering wheel firmly.

- Always look in the direction which the PIT is traveling and be aware of any possible vision obstructions. If the load obstructs forward view, the operator should travel with the load trailing. Never drive while experiencing personal vision obstruction. If this occurs, stop the vehicle immediately and correct the problem.

- Watch closely for overhead obstructions. Keep an eye out for overhead sprinkler systems, door frames, fire lines, bus bars and lighting fixtures. Hitting one can cause damage to the facility as well as damage to the load or vehicle.

- Exercise extreme caution when driving over "non-standard" surfaces. These include elevated surfaces, inclines, grates, dock-boards, bridge-plates, railroad grade crossings, and truck, semi-trailer, or railcar floors. Make sure to follow the safety procedures for these surfaces as outlined in the training.

Fuel Handling and Storage

Some fuel sources may be highly flammable and combustible. Therefore, operators who handle, store or use flammable liquids and gases shall be educated in their safe handling and use in accordance with NFPA 30 Flammable and Combustible Liquids Code during PIT operator training

Battery Charging and Changing

Batteries present a hazard because they contain corrosive chemical solutions. During recharging an operator may be exposed not only to the acid solution but also to hydrogen gas that is produced during the recharging process. Hydrogen gas can be explosive in high concentrations. Inspection and filling of batteries is covered in operator training. Always use appropriate PPE when checking or filling batteries.

Personnel authorized to charge and change batteries include those who have been trained as well as the Physical Plant Electrical Shop. It may be necessary to use a certified PIT repair technician to change batteries used in battery-powered PITs. In such cases the supervisor shall provide the PIT repair technician a temporary work space away from PIT operations to remove and replace the battery as needed.

The PIT maintenance area should consist of the following:

- Located away from main aisleways.
- Kept clean and free of any flammable/combustible materials or sources of ignition.
- Contain an accessible and maintained emergency eyewash station.
- Contain appropriate PPE which is accessible and maintained.
- Contain a corrosive spill clean-up kit which is accessible and maintained.
- Contain environmental conditions (i.e temperature, humidity, ventilation and lighting, etc.) which are maintained suitable for battery maintenance.
- Contain operable fire suppression equipment (i.e. sprinkler systems, fire extinguishers, etc.)

The battery charging area may be separate from the PIT maintenance area. The charger apparatus should be:

- Away from main aisle ways.
- Kept in a protected area to prevent damage.
- Outfitted with appropriate PPE that is accessible and maintained.
- Kept clean and free of any flammable/combustible materials or sources of ignition.
- Outfitted with a corrosive spill clean-up kit that is accessible and maintained.
- Installed in an area in which there is operable fire suppression equipment (i.e. sprinkler

systems, fire extinguishers, etc.).

Personal Protective Equipment (PPE)

There are a multitude of potential hazards in the PIT work environment in which operators may be exposed. Therefore, PIT operators should don PPE appropriate to the field conditions when operating the PIT. Such PPE may include, but not be limited to: hard hats, safety glasses, gloves and safety shoes. The use of protective apron, gloves, safety glasses and a face shield are recommended when charging or maintaining the battery. Operators should also wear long sleeves, pants and closed-toe shoes whenever inspecting, cleaning, filling or otherwise working on PIT batteries.

Pedestrians

PIT operators must maintain situational awareness at all times including being aware of pedestrians and other bystanders operating in the same work environment. Therefore, PIT operators must:

- Always watch for pedestrians and be prepared to give them the right of way.
- Drive defensively. Maintain a safe distance from pedestrians and all workers that are near the path of travel.
- Never drive up to anyone standing in front of a bench or other fixed object.
- Never allow anyone to pass beneath an elevated fork, either loaded or unloaded.
- Never allow bystanders near the PIT when the PIT is in operation.
- Never allow anyone to hitch a ride on the PIT or ride the forks.
- Never use the PIT as a personnel lifting device.
- Never use the PIT as a crane.

All pedestrians shall remain in designated pedestrian walkways as much as possible and be alert to PIT operations in the area.

Appendices

Please note these forms can also be found on the NIU EH&S website

- Daily Powered Industrial Truck Checklist
- Evaluation Review Form
- Out-of-Service Tag

Daily Powered Industrial Truck Safety Checklist

Date: **Operator:** **Shift:**

Model: **Serial Number:** **Truck Number:**

Hour Meter Reading at Shift Start: **Operator Signature**

Check the appropriate box for each item listed.

Visual Checks	OK	FAIL	Comments
Tire and Wheel Condition			
Forks and Load Backrest			
Overhead Guard & Battery Retainer			
Leaks (hydraulics, brakes, drive unit)			
Radiator Water Level (check cold)			
Engine Oil Level			
Fuel Level			
Hydraulic Sump Tank, Hyd. Level			
Battery Condition & Water Level			
Battery Connector Condition			
Head, Tail & Warning Lights			
Hour Meter			
Gauges and Instruments			
Obvious Damage			
Seat Belt (check operation)			
Data plate (missing or not readable?)			
Warning Labels & Decals			
Operator's Manual on board			

Operational Checks			
Horn			
Steering Mechanism			
Running Brakes			
Parking Brake			
Hydraulic Controls			
Power Disconnect			
Limit Switches			
Battery Charge & Discharge Indicator			
Battery Load Test *			

* Check battery indicator while holding tilt lever on full forward tilt. If needle falls into the "red" area, battery does not have enough charge to operate the truck properly.

REMARKS: (Items needing repair or adjustments)

CAUTION: Any time any truck is found to be unsafe, contributing to unsafe conditions or in need of repair it must be removed from service and the supervisor notified.

updated 8/14/17

Northern Illinois University

Powered Industrial Truck Operator Evaluation Review Form

Name: _____ **Date:** _____

Supervisor: _____ **Dept.:** _____

Equipment: _____

	Not Acceptable	Acceptable
Completes the Daily Powered Industrial Truck Checklist		
Refueling and battery checking/recharging		
Demonstrates Proper Use of Controls		
Directional Controls		
Steering Mechanism		
Starts the vehicle		
Tilt forward/Tilt back		
Raise/Lower		
Special Attachments		
Driving forward and backward		
Arms and legs kept in truck at all times		
Demonstrates Competency in Driving with a Load		
Travels with load close to ground		
Pedestrian traffic awareness		
Horn usage		

Entering and exiting the aisle		
Drives in reverse with oversized load		
Maintains a safe speed		
Demonstrates Competency in Stacking a Load		
Approached load squarely		
Deposits load safely and squarely		
Withdraws forks without binding		
Demonstrates Competency in Loading/Unloading Trailer		
Checks the dock plate		
Checks the condition of the trailer floor		
Checks the trailer chocks, jack stand & brakes		
Driving on a ramp with a loaded truck		
Properly Secures "Unattended" Vehicle		

Explain all items needing attention and/or additional training on back of this page.

Northern Illinois University

OUT OF SERVICE

Powered Industrial Truck

is unsafe for operation.

Please contact the department owning this equipment for more information.