

Policy Subject: Forklift Safety	Effective: 9/1/12
Affected Area: All Departments who use powered industrial trucks/forklifts	Reviewed/Revised: 9/1/12

1.0 Purpose, Applicability, and Scope

- 1.1 Purpose-The purpose of this procedure is to ensure that the use of powered industrial trucks and forklifts are operated on the University of Tennessee Knoxville following OSHA, NFPA, and other federal, state and local regulations.
- 1.2 Applicability- This policy applies to all faculty, staff and students who operate or anticipate operating a powered industrial truck or forklift on campus must complete forklift safety training and comply with this policy.
- 1.3 Scope- This policy is intended to provide guidance to faculty, staff and students regarding use of powered industrial trucks, which include: forklifts, fork trucks, motorized pallet jacks, and motorized power jacks. It does not, however, apply to compressed air or nonflammable compressed gas-operated industrial trucks, farm vehicles, nor to vehicles intended primarily for earth moving or over-the-road hauling.

2.0 Abbreviations, Acronyms, and Definitions

- 2.1 CFR-Code of Federal Regulations
 OSHA-Occupational Safety and Health Administration
 NFPA-National Fire Protection Association
 PIT: Powered Industrial Truck
 TOSHA-Tennessee Occupational Safety and Health Administration

2.2 Definitions

Powered Industrial Trucks: Any mobile power-propelled truck used to carry, push, pull, lift, stack or tier materials. Powered industrial trucks can be ridden or controlled by a walking operator. Earth moving and over the road haulage trucks are not included in the definition. Equipment that was designed to move earth but has been modified to accept forks are also not included. All powered industrial trucks are required to meet the design and construction requirements for powered industrial trucks established in the American National Institute (ANSI) Standard for PITs, Part II, ANSI B 56.1.

3.0 Roles and Responsibilities

- a. Forklift Operators shall :

- i. Attend and pass forklift training and evaluation before operating a powered industrial truck/forklift and receive recertification training every three years.
 - ii. Operate and maintaining vehicles in a safe manner and according to the training provided.
 - iii. Report all vehicle problems to their supervisor.
- b. Supervisors shall:
- i. Designate and identify employees responsible for operating powered industrial trucks/forklifts.
 - ii. Ensure that all employees under their direction operates a powered industrial truck/forklift without proper certification
 - iii. Ensure that forklifts are repaired when malfunctioning and maintained.
- c. EHS shall:
- i. Provide program oversight.
 - ii. Annually review the Powered Industrial Truck/Forklift Safety Training.
 - iii. Provide forklift safety training upon request from the supervisor.
- d. Visitors shall
- i. Ensure they have passed forklift training and evaluation before operating a powered industrial truck/forklift on campus.
 - ii. Comply with UT's Powered Industrial Truck/Forklift safety policy.

4.0 Procedure

I. INSPECTIONS

A. PRE-USE INSPECTION

A pre-use inspection identifies potential hazards that may be encountered from a damaged forklift and should be performed at least daily by the operator. If at any time a forklift is found to be in need of repair, defective, or in any way unsafe, the forklift shall be removed from service until it has been restored to safe operating condition.

The pre-use inspection process is as follows.

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 should 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 tire.

B. POWER SOURCE INSPECTION

1. Battery Power

Batteries contain acid, so protective gloves, goggles, and long sleeves must be worn when working with batteries

Batteries should be inspected for:

- (1) cracks or holes,
- (2) securely sealed cells,
- (3) frayed cables,
- (4) broken insulation,
- (5) tight connections, and
- (6) clogged vent caps.

2. Propane Power

Before replacement, all LP-gas containers should be examined by the operator for the following defects or damage:

- a) dents, scrapes, and gouges of the pressure vessel;
- b) damage to the various valves and liquid level gauge;
- c) debris in the relief valve;
- d) damage to or loss of the relief valve cap;
- e) Indication of leakage at the valves or threaded connections.

II. FUEL

FUEL HANDLING AND STORAGE

1. Liquid fuels such as gasoline and diesel not stored in underground or aboveground tanks should be stored in approved safety cans.
2. The engine should be stopped, and the operator should not be on or inside the truck during refueling.
3. A soap solution should be used to check for leaks. A match or open flame should not be used.
4. Smoking is prohibited in the container refilling area and in the exchange area during the exchange of containers.
5. Cylinders for liquefied petroleum gas (LPG) shall be stored in the following manner:
 - a. Cylinders in storage having individual LPG capacity greater than 1-pound shall be positioned so that the relief valve is in direct contact with the vapor space of the cylinder.
6. Cylinders not in use shall be protected by:
 - a) screw-on-type caps;
 - b) collars; or
 - c) closed, plugged, or capped cylinder outlet valves.
7. Cylinders stored within buildings shall not be located:
 - a. near exits, stairwells, or in areas normally intended to be used for the safe egress of occupants, or
 - b. near athletic fields, or other areas of public gathering.
8. Cylinders stored within buildings frequented by the public shall:
 - a. not exceed an LPG capacity of 1 pound per cylinder, and

- b. limited to a total combined capacity for all cylinders of less than 20 pounds of LPG.
9. Cylinder storage within buildings not frequented by the public shall be limited to a total maximum quantity of no more than 300 pounds of LPG per storage location.
10. Empty cylinders that have been in LPG service shall be considered as if full for the purposes of determining the maximum permissible quantity of LPG cylinders emptied.
11. Cylinders storage locations outside of buildings shall:
 - a. be at least 5 feet from any doorway or openings in a building, or, for buildings with only one means of egress cylinders, be no closer than 10 feet from any doorway or opening;
 - b. be at least 20 feet from any automotive fuel dispenser;
 - c. be enclosed with at least a 6-foot high industrial-type fence, chain link fence, or equivalent protection;
 - d. have at least two means of egress from the enclosure, unless the enclosure is not over 100 square feet in area, the containers are not filled within the enclosure, and the point of transfer is within 3 feet of the gate; and have lighting provided to illuminate storage containers, containers being loaded, control valves, and other equipment if operations are normally conducted during hours other than daylight

III. BATTERY HANDLING AND STORAGE

A. DESIGNATED CHARGING AREAS

1. Battery charging installations should be located in designated charging areas that provide flushing and neutralizing of spilled electrolyte, fire protection, protection of charging apparatus from damage by trucks, and adequate ventilation for dispersal of battery gassing fumes.
2. Facilities for quick drenching or flushing of the eyes and body (approved emergency eyewash and safety shower) must be provided at or near (within 10 seconds) the charging area.
3. Smoking and other ignition sources are prohibited in the charging area. "No Smoking" signs must be posted. Additional precautions must be taken to prevent open flames, sparks or electric arcs in battery charging areas.

B. CHARGING BATTERIES

1. Properly position forklift and apply brake before attempting to change or charge batteries.
2. Rubber gloves must be worn when handling lead/acid batteries. Eye or face protection must also be worn when connecting a charger to a battery.
3. Chargers must be turned off when leads are being connected or disconnected.
4. All leads and cables must be checked and in good condition.
5. When moving batteries, vent caps must be kept firmly in place to avoid electrolyte splashing. When charging batteries, ensure vent caps are functioning and the battery (or compartment) cover(s) are open to dissipate heat. When charging is complete, be sure to replace the vent cap firmly.
6. Keep tools and other metallic objects away from the top of uncovered batteries.
7. Properly position and secure reinstalled batteries in the forklift.
8. Reinstalled batteries or new batteries shall be equivalent to, or shall be rated higher than, the battery type indicated on the truck nameplate.
9. Any additional safety requirements or operating procedures specified by the manufacturer of the forklift, battery or charging system must be followed.

VI. MAINTENANCE

1. Do not use open flames to check for electrolyte level in batteries or liquid fuel level in tanks
2. Do not conduct repairs to fuel and ignition systems of forklifts in areas where fire hazards exist.
3. Disconnect batteries prior to repairing electrical systems.
4. Use only replacement parts equivalent with those in the original design.
5. Do not alter the relative positions of various parts from how they were received from the manufacturer. Do not add any parts not supplied by the manufacturer nor delete any parts supplied by the manufacturer. No additional counterweighting of forklifts is permitted unless approved by the manufacturer.
6. Keep forklift mufflers in proper working condition and free of debris.
7. Keep the forklift in clean condition, free of lint, excess oil, and grease.
8. When antifreeze is used in the engine-cooling system, only glycol-based material should be used.

V: FORKLIFT OPERATING GUIDELINES

- A. Only trained and authorized personnel eighteen (18) years old and older are permitted to operate a forklift.
- B. Do not operate a gasoline-powered or diesel-powered forklift in an inside area.
- C. Do not stand or pass under the elevated portion of any forklift.
- D. Passengers are prohibited from riding on forklifts.
- E. Do not place arms or legs between the uprights of the mast or outside the running lines of the truck.
- F. When mounting or dismounting a forklift:
 - a. face the vehicle,
 - b. never jump off,
 - c. use a three-point stance (always have both hands and one foot or vice-versa in contact with the unit),
- G. wear proper shoes (oil resistant and non-slippery),
- H. wear proper clothing (do not wear loose clothing or dangling jewelry), and restrain long hair.
- I. After mounting the vehicle, fasten the seat belt, apply the brake, and shift to neutral. Also, check around the forklift for clearance and pedestrians before moving.
- J. A forklift is considered unattended when the operator is 25 feet or more away from the vehicle and it remains in his view, or whenever the operator leaves the vehicle and it is not in his/her view. When a forklift is left unattended:
 1. fully lower load engaging means,
 2. neutralize controls,
 3. shut off power,
 4. set brakes, and
 5. remove the key.
- K. Maintain a safe distance from the edge of ramps or platforms while on any elevated dock or platform.
- L. Forklifts are not to be used to open or close freight doors.

- M. Forklifts should not be used in areas of poor lighting (less than two lumens per square foot) unless they are equipped with auxiliary directional lighting and the lighting is turned on.
- N. Fixed jacks may be necessary to support a semitrailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor.
- O. Set brakes and block wheels with wheel chocks to prevent movement of trucks and trailers while loading or unloading when they are boarded by forklifts.
- P. Check the flooring of trucks and trailers for breaks and weakness before loading or unloading.
- Q. Check for sufficient headroom under overhead hazards such as lights, pipes, or sprinkler systems.
- R. Do not lift personnel or allow personnel to be lifted or work from the fork lift without a properly attached lifting carriage. Whenever a truck is equipped with a lifting carriage or forks for lifting personnel, take the following precautions:
 - a. use safety platform firmly secured to the lifting carriage and/or forks,
 - b. provide means whereby personnel on the platform can shut off power to the truck,
 - c. provide protection from falling objects, and
 - d. keep fire aisles, access to stairways, and fire equipment clear.

VI: HANDLING AND MOVING LOADS

A. TO PICK UP A LOAD

- 1. Only pick up stable and safely arranged loads within the rated capacity of the forklift,
- 2. Adjust long or high (including multiple tiered) loads which may affect capacity.
- 3. Square up on the center of the load and approach it straight with forks in traveling position.
- 4. Stop when the tips of the forks are about a foot away from the load.
- 5. Level the forks and slowly drive forward until the load is resting against the backrest.
- 6. Lift the load high enough to clear whatever is under it.
- 7. Carefully tilt the mast back to stabilize the load.

B. DRIVING WITH A LOAD

- 1. Starts and stops should be gradual.
- 2. Observe all traffic regulations and keep forklift under control at all times.
- 3. Reduce speed and sound horn at cross aisles and other locations where vision is obstructed
- 4. Pedestrians have the right-of-way. Always be aware of their presence especially in aisles and doorways.
- 5. Do not drive forklift up to anyone standing in front of a bench or other fixed object
- 6. Keep a clear view of the path of travel. Always look in the direction of travel.
- 7. Always travel with a load tilted slightly back for added stability. Do not lift or
- 8. lower the load when the forklift is in motion.
- 9. Travel with the load at a height of four to six inches at the tips and two inches at the heels to clear most uneven surfaces and avoid debris.
- 10. Horse play is not permitted.
- 11. Slow down for wet, slippery or uneven floors.

12. Avoid running over loose objects on the roadway surface.
13. Properly secure dock boards and bridge plates before driving over them. Drive over slowly and never exceed their rated capacity.
14. Drive in reverse rather than looking around the load if you are unable to see over it.
15. Travel down inclines in reverse and up inclines going forward. Ascend or descend grades slowly. Drive loaded trucks with the load up grade when ascending or descending grades in excess of 10%. On all grades, tilt the forks back and raise only as far as necessary to clear the road surface. Use low gear or the slowest speed when descending a grade.

C. SAFE STEERING

1. Never make a turn at normal traveling speed, always slow down to maintain balance.
2. Stay wide when turning into an aisle to help clear the sides and square up with the destination.
3. Allow enough room for forks to clear the sides before turning, when backing out of an aisle.
4. When negotiating turns, turn the steering wheel in a smooth sweeping motion. At very low speeds, turn the steering wheel at a moderate, even rate.
5. Never turn a forklift with the load lifted higher than the travel height (four to six inches at the tips and two inches at the heels).

D. TO PUT A LOAD ON AN ELEVATED SURFACE

1. Square up and stop about a foot away from the rack on which the load is to be placed.
2. Raise load 5-10 inches above the unloading point (space permitting).
3. Drive forward stopping 3-4 inches in front of deposit point.
4. Tilt mast forward to a right angle position so load is level.
5. Drive forward until load is aligned with the deposit point. Stop.
6. Lower load to resting-place.
7. Stack pallets loaded with cases, cartons straight and square. Stagger the top tier to "tie-in place".
8. Tilt the forks slightly forward to avoid hooking the load
9. Look over both shoulders and back straight out until the forks clear the rack. Stop.
10. Lower the forks to about 2-4 inches above the ground, then continue to backup or turn to proceed to the next location. Do not turn with elevated forks.

E. TO PUT A LOAD DOWN

1. Square up and stop about a foot away.
2. Level the forks and then drive the rest of the way in.
3. Lower the load.
4. Tilt the forks slightly forward to avoid hooking the load.
5. Look over both shoulders and back straight out until the forks clear the pallet

VII: TRAINING

Each Powered Industrial Truck operator must be determined to be competent to operate a powered industrial truck safely, as demonstrated by the successful completion of training and evaluation.

Training shall consist of a combination of formal instruction (lecture, discussions, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee) and evaluation of the operator's performance in the workplace. Operator training and evaluation will be conducted by EHS personnel who have the knowledge, training, and experience to train forklift operators and evaluate their competence.

All powered industrial trucks/forklift operators shall receive initial training in the following topics:

- 1) Operating instruction, warning and precautions for the types of trucks the operator will be authorized to operate.
- 2) Truck controls and instrumentation
- 3) Differences between a PIT/forklift and an automobile
- 4) Engine and motor operation
- 5) Steering and maneuvering
- 6) Visibility (including restrictions due to loading)
- 7) Vehicle Capacity
- 8) Any vehicle inspection and maintenance that the operator will be required to perform
- 9) Refueling and or changing of batteries
- 10) Operating limitations, and any workplace related topics (e.g. surface conditions, narrow aisles, pedestrian traffic, hazardous locations).

Refresher training in all of the able listed Refresher training in all the above listed topics, and other relevant topics, will be provided to all OU powered industrial truck/forklift operators:

- 1) when the operator has been observed to operate the vehicle in an unsafe manner;
 - 2) when the operator has been involved in an accident or near-miss incident;
 - 3) when the operator has received an evaluation that reveals that the operator is not operating the truck safely;
 - 4) when the operator is assigned to drive a different type of truck, or a condition in the
 - 5) the workplace changes in a manner that would affect the safe operations of a forklift; and/or least every three years.
- Upon completion of the training program, all operators must be evaluated for performance of proper procedures prior to receipt of an operator certificate.
 - All training and evaluation must be conducted by persons with the necessary knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.
 - Outside qualified training organizations can provide evidence that the employee has successfully completed the relevant classroom and practical training. However, each employer must ensure that each powered industrial truck operator is competent to operate a truck safely, as demonstrated by the successful completion of the training and evaluation.
 - The OSHA Powered Industrial Trucks standard requires additional training for forklift operators who change and charge batteries; handle propane tanks; fuel diesel or gasoline engines; and repair and maintain powered industrial trucks.

5.0 Recordkeeping

Employers who evaluate the operator's performance more frequently than every three years may retain the most recent certification record; otherwise, certification records must be maintained for three years.

An individual training record shall be maintained for each employee and kept for period of employment + 5 years. The training instructor will document/certify the training and evaluation and will include in the documentation the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

6.0 Attachments

None

7.0 Associated Standards

OSHA: 29 CFR 1910.178 (Powered Industrial Trucks)

OSHA: 29 CFR: 1926.602 (Material Handling Equipment)

NFPA: 505 (Fire Safety Standard for Powered Industrial Trucks)