



# Occupational Safety Program

## Forklift Safety Program Manual

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## **Purpose**

The purpose of the program is to maintain a safe and healthful environment for forklift operators, other vehicle operators, and pedestrians on campus. All employees who utilize forklifts at Towson University must adhere to this program.

## **Scope**

This scope of the program relates to the maintenance and use of forklifts and other powered industrial trucks on campus. The program applies to all employees that operate these vehicles, regardless of the frequency in their use. Such employees will be trained and authorized to use said vehicles prior to use. Non-operators should be aware of their surroundings with respect to powered industrial truck use at all times.

The scope provisions of 29 CFR 1910.178(a)(1), which are based on ANSI B56.1-1969, remain in effect and cover the following: fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. It does not apply to compressed air or nonflammable compressed gas-operated industrial trucks, farm vehicles, nor vehicles intended primarily for earth moving or over-the-road hauling. This program applies to lift truck operations indoors, dock platforms and inclines, trailers, and road operations on campus.

## **Definitions**

*Center of gravity:* The point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

*Counterweight:* The weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

*Fulcrum:* The truck's axis of rotation when it tips over.

*Grade:* The slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred-foot horizontal distance (the slope is expressed as a percent).

*Lateral stability:* Truck's resistance to overturning sideways.

*Line of action:* An imaginary vertical line through an object's center of gravity.

*Load center* is the horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity.

*Longitudinal stability:* The truck's resistance to overturning forward or rearward.

*Moment:* The product of the object's weight times the distance from a fixed point (usually the fulcrum). In the case of a powered industrial truck, the distance is measured from the point at

which the truck will tip over to the object's line of action. The distance is always measured perpendicular to the line of action.

*Powered industrial truck (PIT):* A mobile, power-propelled truck used to carry, push, pull, lift, stack or tier materials.

*Track:* The distance between the wheels on the same axle of the truck.

*Wheelbase:* The distance between the centerline of the vehicle's front and rear wheels.

## **Responsibilities**

### **A. Environmental Health & Safety (EHS)**

1. EHS will ensure training and certify employee competency in PIT operation through classroom and hands-on training.
2. EHS will maintain safe workplace conditions through random inspections.
3. EHS will make scheduling arrangements and notify departments of scheduled training.
4. EHS will monitor employee re-training.
5. EHS will conduct periodic re-monitoring of identified at-risk employees.

### **B. Supervisors**

1. Supervisors will assist EHS in identifying new PITs, new employees, and in scheduling safety training.
2. Supervisors will ensure that employees wear PPE and operate in a safe manner.
3. Supervisors will know the hazards in their areas and maintain safe workplace conditions.
4. Supervisors will maintain PITs and forklift inspection records.
5. Supervisors will notify EHS of accidents, illnesses, injuries, and/or near misses related to PIT use.
6. Supervisors will prohibit and prevent PIT use by non-authorized individuals (untrained employees, individuals under the age of 18, and contractors).
7. Supervisors will ensure that employees follow all safety training requirements.

### **C. Employees**

1. Employees will complete PIT inspections daily or before use during their shift.
2. Employees will contact their Supervisor and/or EHS for any hazards observed which cannot be corrected by the employee.
3. Employees will maintain PITs in accordance with manufacturer recommendations.
4. Employees will notify their Supervisor, Facilities Management, and EHS, if PIT accident occurs involving personnel or other individuals, the building structure, or equipment.
5. Employees will operate PITs in a safe manner, in accordance with TU Policy, EHS training, and manufacturer's instructions.

6. Employees will place a PIT out of service, immediately, if it fails pre-operational inspection or becomes inoperable or unsafe during use.
7. Employees will request clarification from their Supervisor or EHS about any health or safety issue(s) related to PIT use.
8. Employees will schedule and complete initial and refresher training and re-certify every 3 years thereafter.
9. Employees will wear appropriate PPE.

## **Introduction**

A powered industrial truck is defined as a mobile, power-driven vehicle used to carry, push, pull, lift, stack, or tier material. Forklifts are one type of powered industrial truck or PIT; there are many different types of PITs covered by the OSHA standard. Commonly used types include the following: High lift trucks, counterbalanced trucks, cantilever trucks, rider trucks, forklift trucks, high lift platform trucks, low lift trucks, motorized hand trucks, pallet trucks, straddle trucks, reach rider trucks, high lift order picker trucks, motorized hand/rider trucks, and counterbalanced front/side loader lift trucks. A single type of truck can only be described by calling it by all of its characteristics, (e.g., a high lift, counterbalanced, sit down rider truck). The Industrial Truck Association has placed powered industrial trucks into 7 classes:

- 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

Note that this classification refers to commonly-used vehicles and does not include all powered industrial trucks covered by the OSHA standard.

## **Comparison Between Automobiles and Forklifts**

Forklifts and automobiles operate differently in the following respects. Forklifts steer with their rear wheels and are powered by their front wheels, the opposite is true for most automobiles. Unlike automobiles whose loads tend to be relatively stable with respect to the body, forklifts can move loads up and down, and forward and backward, which affects their center of gravity. There is less stability when turning a forklift due to the fact that the track for forklifts is short compared to autos. This can lead to a rollover, if the center of gravity shifts too quickly or too far from side to side.

Forklifts are difficult to stop quickly and are more dangerous to swerve or to turn quickly. They are also often 2-3 times as heavy as an automobile, so they require more force to stop, and as already mentioned, loads can be moved, and they may shift on the forks dependent upon the balance and positioning of the load due to momentum. Lastly, forklifts have no suspension. Suspension in automobiles helps to stabilize the load when surfaces are uneven. Hazards such as rough terrain, potholes, etc. shift the center of gravity, which again, could cause a rollover.

## **Capacity and Stability**

Capacity and stability are each important to the handling and movement of the forklift. The center of gravity is the average location of the weight of an object, which has vertical (top-to-bottom), longitudinal (back-to-front), and lateral (side-to-side) components. The load center is the distance from the center of gravity for the load to the backplate (or backrest) for the forks and the body of the forklift. The load capacity is the maximum weight that can be safely handled by the forklift under normal conditions and is based on this load center. The load capacity of the vehicle should never be exceeded.

As the load center increases (i.e. the distance from the backplate increases), the load capacity decreases. The further away a load is from the forklift's body, the higher the likelihood of the forklift tipping over, due to the shift in the center of gravity. The forklift is designed to carry loads on the forks, and this load weight must be counterbalanced, which is why it has a counterweight on its rear. This keeps the truck stable when under load. The balancing point is the fulcrum, which is at the front axle and through the front wheels. Unloaded forklifts may be even less stable than when loaded.

## **Accidents and Injury Information**

In 2017, the Bureau of Labor Statistics reported that pedestrians were involved in 20% of nonfatal forklift accidents and 13% fatal ones. 35,000-62,000 injuries per year involve forklifts, and 25% of accidents are due to overturned forklifts. There are an average of 87 forklift fatalities per year; 36% of those deaths are pedestrians. Forklift work is hazardous due to the weight, height, and structure of the vehicle; its forks and other attachments; its fuel and exhausts (including carbon monoxide); the varying weight and nature of loads; and the workload, pace, and repetitive nature of work with forklifts; and the characteristics of the workplace itself and materials therein may also be hazardous.

The following types of accidents are most common with forklifts:

- Forklift or load tipping over; the forklift striking person(s) or object(s);
- Forklift load or a stack within the work area falling onto someone;
- Operator injury from a collision with body part(s) outside of the forklift;
- Operator injury from a collision of the forklift;
- Passenger falling from a vehicle-attached lift platform or its forks;
- Operator injury getting into or out of the vehicle;
- Body part(s) caught in vehicle mechanisms; and
- Forklift falling off the dock or an incline.

Injuries and deaths may result from misuse and unsafe use of the forklift. Permanent injuries such as dismemberment or crushed limbs leading to medically-necessary amputation may be occur if caution is not taken. The force and pressure of the vehicle or its loads can cause other damage such as broken bones, muscle and nerve damage, or other maladies. The common causes for such incidents are as follows:

- Carrying passengers on the forks;

- Improper maintenance;
- Inadequate training;
- Obstructed views or daydreaming;
- Speeding;
- Unstable loads, overloading/improper loading; and
- Vehicles falling from platforms, curbs, trailers, or other surfaces.

Each of these types of injuries and accidents are avoidable by following standard operating procedures for use and maintenance of the forklift.

### **Hazard Controls**

As there are many hazards associated with forklift use, there are engineering controls to protect the operator from some of them. These include the overhead guard or cage, which is used to protect against falling loads and direct blows to the operator from above. The backrest is used to guide and cradle the load to be carried and lifted, protect the load from damaging the lift mechanisms and mast, prevents injury to the operator from the front and above. A deadman switch is a safety feature that disengages the forklift and automatically stops the vehicle when an operator does not have the switch depressed; the switch is typically engaged when the operator is not seated in the cab. The feature is meant to prevent further injury or damage to the facility by stopping an uncontrolled forklift or its parts. The vehicle key/ignition and parking brake may also be considered an engineering control in this regard, with turning off the vehicle preventing release of noxious exhaust.

Administrative controls for forklifts include having safety training through EHS and proper authorization by your department or a supervisor before being permitted to use a vehicle in your facility, which is TU policy. There are other policies and procedures to follow such as practicing good housekeeping, reducing surface hazards to the forklift, increasing the distance from pedestrians and obstructions to avoid accidents, and performing inspections and preventative maintenance of the equipment. Other administrative controls include reduction of time in the area by taking breaks, making schedule adjustments, and rotation of work areas, to avoid prolonged exposures and fatigue; the use of signs and signals such as alarms, safety decals, and sounding horn; and turning off the vehicle when not in use and use of ventilation in the workplace to reduce exhaust exposure.

Personal protective equipment (PPE) should be utilized based on the task and environment. Ear protection such as earplugs or muffs, should be worn to reduce noise hazards over time; they will not reduce the requirement for listening for alerts, pedestrians, or other traffic. Eye protection may consist of safety glasses for general use and in addition, these and a face shield are used for refueling with LPG or propane cylinders. Foot protection (steel-toed work boots) should be worn for forklifts and their loads. Head protection can be a hard hat. Hand protection involves well-fit work gloves; cotton and leather are acceptable for this purpose. Leather or neoprene are considered acceptable for LPG/propane refueling. On a related note, long sleeves are also a requirement for this type of refueling. Long pants and a reflective safety vest are also necessary PPE. Restraints such as harnesses with lanyards, and seat belts are also considered PPE for powered industrial truck use.

## **Applicable Regulations**

- 29 CFR 570.58 - Occupations Involved in the Operation of Power-Driven Hoisting Apparatus (Order 7)
- 29 CFR 1910.178 - Powered Industrial Trucks
- NFPA 30 - Flammable and Combustible Liquids Code
- NFPA 58 - Liquefied Petroleum Gas Code

## **Procedure**

### **A. Authorization Policy**

#### **1. Employees**

- a) It is the policy of Towson University (TU) to permit only trained and authorized personnel to operate TU-owned powered industrial trucks.
- b) Training (covered in Step H) is provided by EHS and is verified through certification.
- c) Authorization for operating such vehicles is provided by the employee's Supervisor and Department. However, authorization may be revoked by these parties, TUPD, or EHS if an individual is shown to be in violation of equipment use.
- d) This policy is applicable to both daily operators and those who occasionally use a powered industrial truck.

#### **2. Non-Authorized Individuals**

- a) Non-authorized individuals are prohibited from use of TU-owned powered industrial trucks. Such individuals include untrained employees, any individual under the age of 18 regardless of employment status with TU, and contractors (or other nonaffiliated individuals).

### **B. Equipment, Controls, and Instrumentation**

#### **1. Forklifts**

- a) Forklift types available include the following:
  - i. LPG counterbalanced sit-down rider forklift*
  - ii. Gasoline counterbalanced sit-down rider forklift*
- b) Multiple vehicles of each type are available on campus.
- c) Authorized employees will be advised of the storage and use locations by their Supervisor(s).

#### **2. Parts**

- a) The following figures illustrate the different parts of the forklift that an operator will need to understand in order to safely operate the vehicle.
- b) Figure 1
  - i. Forks and backrest are used to engage the load or for use with attachments.*
  - ii. The mast is used to lift, lower, and position loads.*



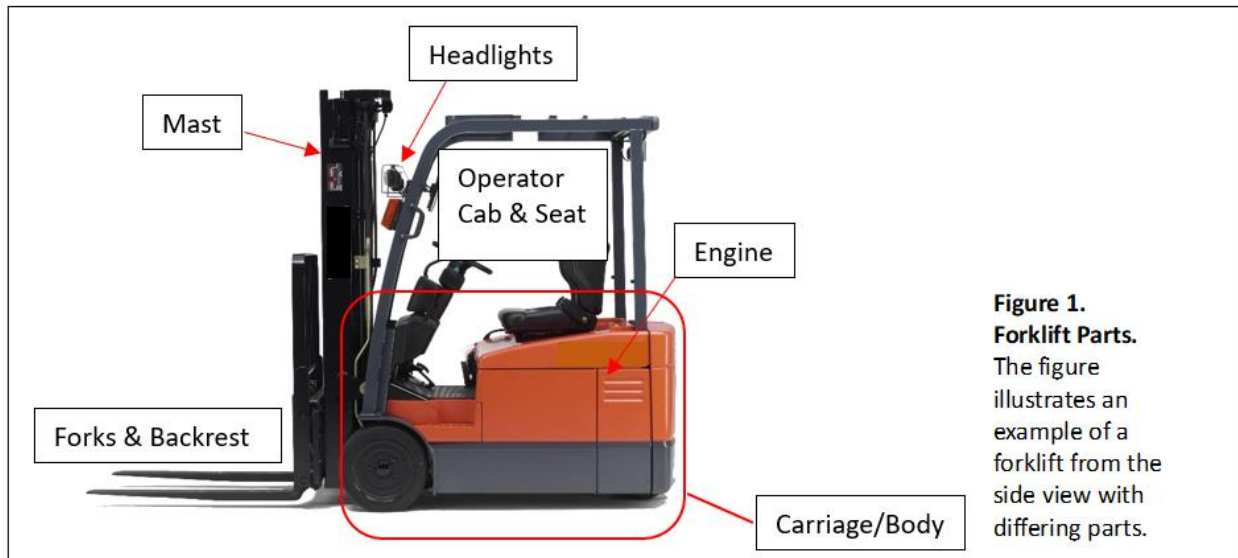
- iii. *Headlights illuminate the workplace and trailers where operations take place. They are helpful for others to identify active vehicles.*
- iv. *Operator cab and seat are where the operator controls forklift operations.*
- v. *The engine provides motion and power to controls and instrumentation.*
- vi. *The carriage or body protects the engine, battery, and internal components.*

c) Figure 2

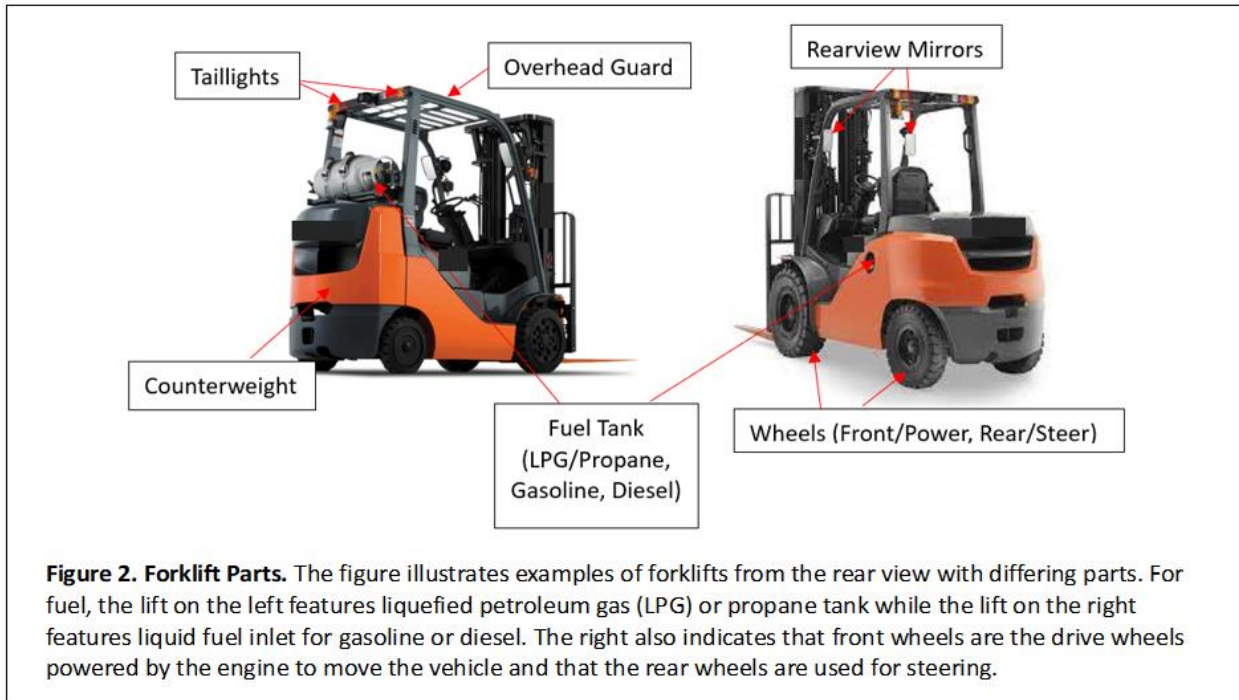
- i. *The overhead guard can protect the operator from most falling loads.*
- ii. *The counterweight is used to counterbalance loads.*
- iii. *Taillights are helpful for others to identify active vehicles.*
- iv. *Rearview mirrors provide extra side vision for operators.*
- v. *Fuel compartments are where vehicles may be refueled.*
- vi. *Wheels provide motion to the vehicle, the front acting as drive wheels provide power while rear wheels are used to steer.*

d) Figure 3

- i. *Chains, cylinders, and hydraulic lines are parts of the mast.*
- ii. *The nameplate is used for determining load center and load capacity for forklift. It must be present, legible, and undamaged to use the forklift.*



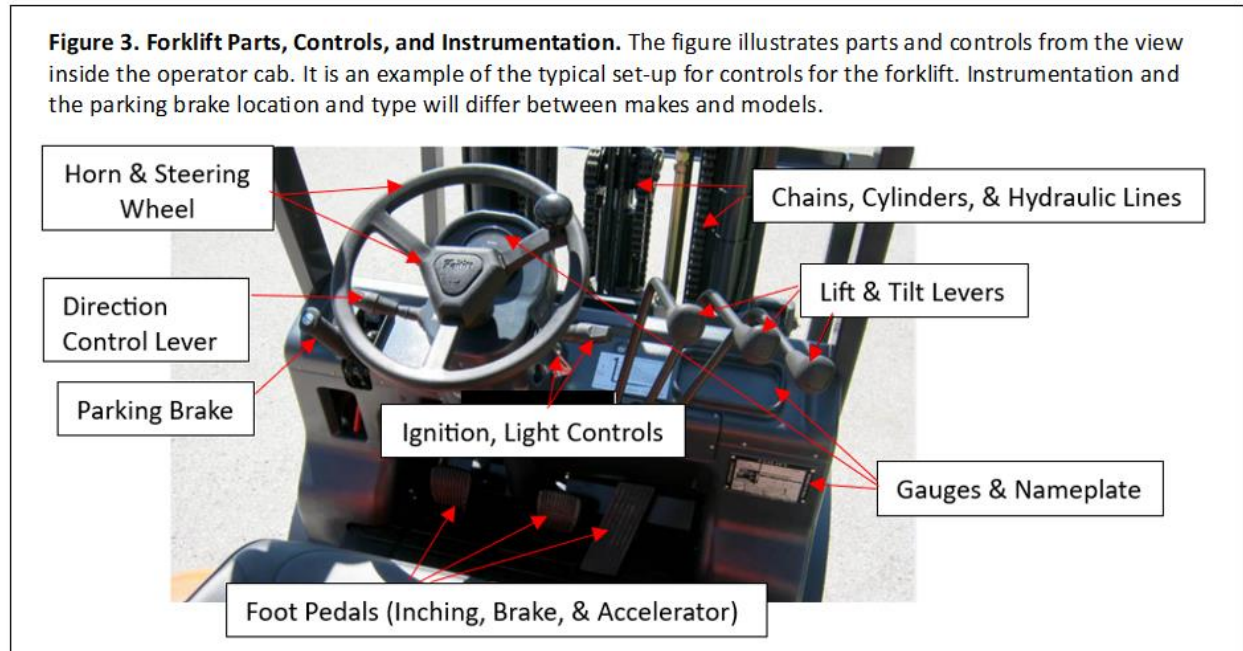
**Figure 1. Forklift Parts.**  
The figure illustrates an example of a forklift from the side view with differing parts.



### 3. Controls & Instrumentation

- a) For all forklifts, familiarize yourself with their controls and instrumentation by visual inspection and reading the operator manual prior to operation.
- b) The controls and instrumentation for a forklift to be used are typically found as on a diagram in the operator manual for the vehicle.
- c) For clarity, Figure 3 is provided to illustrate the forklift controls from the point of view of an operator in the cab, and listed below from left to right are controls and their function:
  - i. *Steering wheel and horn for turning and warning pedestrians and other operators in the area, respectively, with tilt steering adjust lever just below for moving the steering wheel to the appropriate height for use*
  - ii. *Direction Control Lever for parking and fork/attachment use (neutral [N] position), putting the vehicle into motion for forward (F) and reverse (R).*
  - iii. *Ignition switch (with key) for engine operation*
  - iv. *Light control switch for operating lamps and turn signal*
  - v. *Lift & Tilt Levers for forks/attachment movement, listed from left to right:*
    - 1) *Lift lever for up/down*
    - 2) *Tilt lever for forward/backward*
    - 3) *Tilt lever for right/left*
  - vi. *Gauges for monitoring vehicle performance, this may include a combination meter which displays engine and battery gauges, power/fuel gauge, warnings, and other vital information. This meter may illuminate when the light control is on*
  - vii. *Foot pedals for affecting speed of vehicle/forks, listed from left to right:*

- 1) *Inching Brake for extra stopping power, moving the forklift slowly and giving the operator better control to position or angle it, and slowly moving loads on forks*
  - 2) *Service Brake (or brake) for stopping the vehicle and parking*
  - 3) *Accelerator for moving the vehicle faster*
- viii. *Parking brake for emergency braking and parking, which may be located on either side of the operator cab and configured as a pedal or handle, dependent upon the forklift model*



#### 4. Attachments & Approved Use

##### a) Fork Guidelines

- i. *Forks will be the primary tooling used for forklifts.*
- ii. *Only adjust forks as necessary.*
- iii. *Lift each fork lock.*
- iv. *Adjust the forks to the position most appropriate for load (as wide as possible).*
- v. *Make sure weight of load is centered.*
- vi. *Set fork locks to keep forks in place.*

##### b) Alternate Attachments

- i. *Other attachments for forklifts include clamps, cranes, side shifters, door openers, and lifting platform.*

##### c) Lift Platform Guidelines

- i. *A lift platform, approved for lifting personnel, is available. It is known as a cage platform, alternatively. Using this platform is the only way a forklift may be used for lifting personnel.*

- ii. *All personnel on the platform must wear a harness and lanyard. The PPE must be secured to a lanyard at all times during operation of the unit.*
  - iii. *The maximum capacity of the lift platform cannot be exceeded.*
  - iv. *Follow the safety precautions listed on the platform or check with the manufacturer.*
  - v. *Platform Precautions*
    - 1) *Apply the parking brake before lifting.*
    - 2) *Do not tilt the mast forward.*
    - 3) *Secure the harness to platform with lanyard.*
    - 4) *Operate on level ground.*
    - 5) *Capacity is 1000 lbs.*
    - 6) *Do not move forklift while platform is elevated.*
    - 7) *The platform changes the forklift's load capacity.*
    - 8) *The platform changes the maneuverability and dimensions of truck.*
    - 9) *Do not modify without written approval from the manufacturer.*
- d) All attachments must be lowered when not in use including forks.
  - e) Follow all pertinent procedures for attachment use.
  - f) Maintenance and inspection must take place for attachment as required.
  - g) Change the load capacity for the forklift to reflect the addition of the attachment.
  - h) Change the maneuverability and assumed dimensions of the forklift to reflect the addition of the attachment.
  - i) Do not modify attachments without written approval from manufacturer.

### **C. Inspections & Maintenance**

1. Inspections must be completed as instructed in Steps D2a and E2a.
2. A completed Forklift Inspection Record must be present on the PIT during the shift for the operator. It will contain checklists for pre-operational and operational inspections for the vehicle.
  - i. *The inspection record should be completed at least daily prior to forklift use, if not for each shift.*
3. If the forklift is safe to operate, place the completed inspection record in its holder on the forklift during the shift. This serves as a visual notice that no further inspections are required during the shift, and it may be requested at any time.
4. At the end of the shift, turn record in to the Supervisor (each is kept for 20 years).
5. Out-of-Service (OOS) or Unsafe Forklifts
  - i. *If the forklift is out-of-service or otherwise unsafe, the operator must note this on the inspection record and notify their Supervisor.*
  - ii. *Remove the key, and place a DANGER DO NOT OPERATE tag on the steering wheel or direction control lever.*
  - iii. *Take the completed inspection record to the TU Auto Shop or provide it to Auto Shop staff when the vehicle is removed.*
  - iv. *The Supervisor will file the inspection record once the work order is written.*
  - v. *It is against TU Policy to operate vehicle with DANGER DO NOT OPERATE tag.*

## D. Pre-Operational Procedures

### 1. Precautions

- a) Inspect the work area where the vehicle is located and where it will travel for obstructions and defects.
- b) Be aware of your surroundings and pedestrians.
- c) Know pedestrian paths and entryways.
- d) No use of drugs or alcohol prior to use of the forklift (known as impaired driving).

### 2. Forklift Pre-Inspection

- a) Perform forklift pre-inspection prior to mounting completing the Forklift Inspection Record in the **Pre-Inspection, Visual Checklist** section.
- b) If problems are found or unusual sounds are heard, they should be reported and the forklift not operated until repairs are completed.

## E. Operational Procedures

### 1. Precautions

- a) Use three-point contact to enter/exit the operator cab (two hands and one foot or one hand and two feet, while facing the cab). Never jump from the cab.
- b) Wear your seatbelt and remain seated appropriately.
- c) All body parts (hands, arms, head, feet, legs, etc.) are prohibited outside the operator cab, between the uprights of the mast, or within the reach mechanism or other attachments of the truck.
- d) Never allow someone to put their limbs near the forks or the mast when the vehicle is running.
- e) Pay attention to all warning labels and safety decals attached to the forklift.
- f) Do a 360° look around you before moving.
- g) Note and follow all traffic signs.
- h) No horseplay is allowed.
- i) No cell phones or other distractions allowed while operating the forklift.
- j) Take breaks as necessary to avoid fatigue.
- k) Never allow anyone to stand on or ride forks. No passengers on forklifts.
- l) Lift trucks shall not be used for any purpose other than what they were designed.
- m) Lift trucks shall not be started or any of its functions or attachments operated from any position other than from the designated operator's position.

### 2. Forklift Inspection

- a) Perform an inspection with the forklift running by completing the Forklift Inspection Record in the **Inspection, Operational Checklist** section.
- b) If problems are found or unusual sounds are heard, they should be reported and the forklift not operated until repairs are completed.

### 3. Engine Use

- a) Start the engine
  - i. *Insert the key, turn the key forward, and release it.*
  - ii. *The lift must be in neutral and the parking brake engaged prior to start.*
  - iii. *Press the brake pedal, pull the parking brake release lever, and use the direction control lever to put the vehicle into motion.*
- b) Shut off the engine (to park)
  - i. *Shift the direction lever to neutral*
  - ii. *Press brake pedal, set the parking brake, turn the key backward to turn off the vehicle, and remove it.*

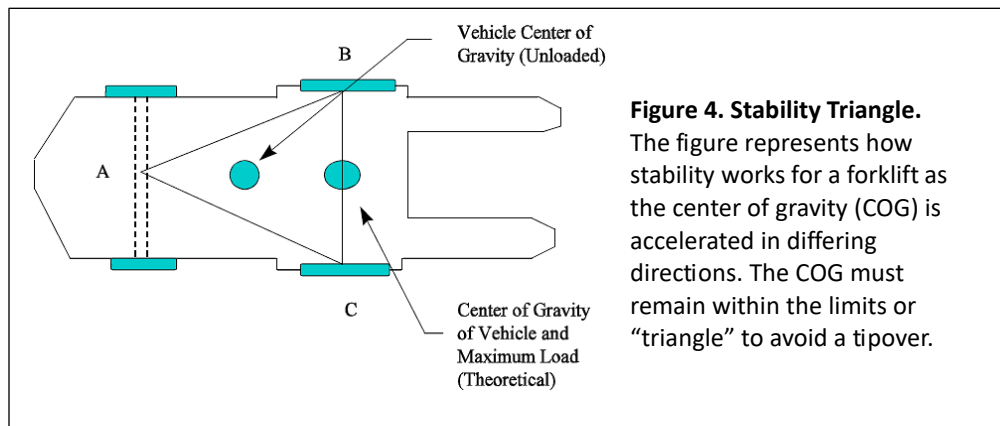
### 4. Forklift Steering & Maneuvering

- a) The operator shall observe all traffic regulations and under normal traffic conditions, keep to the right.
- b) Operators shall slow down and sound the horn at intersections, aisles, blind corners, and other locations where vision is obstructed, including when backing up.
- c) The operator shall use the following backup procedure and sequence:
  - i. *Pivot at the waist and inspect the area of operation in the rear of the fork truck, watching for obstructions and pedestrians.*
  - ii. *Sound the horn to alert any pedestrians that may or may not be visible.*
  - iii. *Engage the directional lever to the reverse position.*
- d) The operator must keep a clear view of the path of travel and observe for other traffic, personnel, and safe clearances. If the load being carried obstructs forward view, travel with the load trailing.
- e) Maintain forklift direction with both hands on the steering wheel to avoid unnecessary veering.
- f) Turning is sharp, so turn just enough to avoid excess tail swing. Speed is a factor in tail swing, so move slowly.
- g) Always keep forks low. Keep the forks low to the ground when traveling with or without load.
- h) Stop before raising or lowering forks.
- i) Do not push loads with forks.
- j) Lift loads only high enough to clear obstacles, and lower the load as soon as possible. If the load is coming off of a trailer, avoid hitting the ceiling or any debris that is on the floor, or if in a warehouse and pulling from a storage rack, only lift high enough to clear the rack where the pallet sits and avoid striking the racks above or posts at the sides. It is also important to not push the pallet back into the stack, as this may push pallets that are stored behind the one you are picking, and make them unstable.
- k) Forks must be long enough to handle load. The forks must be 2/3 of the way under the load.
- l) Never travel or turn with the load elevated as this may lead to a rollover.

- m) If the forklift is “unattended”, that is greater than 25 feet away, OSHA says you must do the following things as listed:
  - i. You need to fully lower the load engaging means (in this case, forks);
  - ii. Put the controls in neutral;
  - iii. Set the brake, turn off the power; and
  - iv. Chock the wheels if the forklift is on an incline, BUT avoid parking on an incline whenever feasible. It is recommended to do these things if you are less than 25 feet away as well, and if it can be avoided, do not park on an incline.
- n) Never lift people on an unapproved platform. Never go below a raised load or allow anyone else to.
- o) Always look for obstacles or pedestrians in your blindspot. Blindspots can be created by the load, mast, and overhead guard support.
- p) Never pass vehicles traveling in same direction. Leave 3 vehicle lengths of space between you and them.

5. Forklift Capacity & Stability

- a) The stability triangle is an imaginary triangle that illustrates forklift stability with respect to the center of gravity. This represents the acceptable range for the center of gravity (COG) and its load to avoid tipping, as the center of gravity must remain inside the triangle for stability. As illustrated in Figure 4, the front axle is one leg of the triangle, the other two legs are lines drawn from the ends of the front axle (between the front tires) to the middle of the back axle, where the main load support is located.

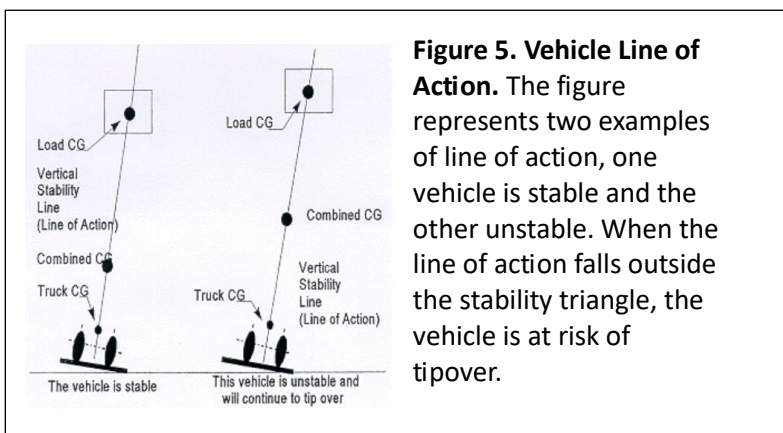


**Figure 4. Stability Triangle.** The figure represents how stability works for a forklift as the center of gravity (COG) is accelerated in differing directions. The COG must remain within the limits or “triangle” to avoid a tipover.

- b) A stable vehicle will have a low center of gravity that keeps towards the middle of the forklift. Factors that affect center of gravity are load weight (the center of gravity’s front to back component tending to move toward the load), the load balance (the center of gravity’s side-to-side component, moving the load toward the side where the load is heavier), and the load height (the center of gravity’s vertical component tends to move toward the load where it is highest).
- c) Any sudden bump, turn, tilt (of forks), start, or stop can tip over the forklift. Inclined or uneven surfaces move the center of gravity in the downward

direction (because of gravity). Momentum is a greater factor when the truck is in motion which means the weight, direction, and speed of the load matter. Acceleration moves the center of gravity to the rear, while with deceleration towards the front toward the load. A turn moves the center of gravity toward the outside (or opposite direction of turn), the faster the turn, the more unstable it becomes.

- d) Figure 5 shows the separate centers of gravity for the forklift and for the load, as well as the combined center of gravity. When the combined center of gravity is not in aligned with the vertical stability line or line of action, the vehicle becomes unstable and can tip over.



- e) Figure 5 shows the separate centers of gravity for the forklift and for the load, as well as the combined center of gravity. When the combined center of gravity is not in aligned with the vertical stability line or line of action, the vehicle becomes unstable and can tip over.

**Table 1. Load Capacities and Forklift Weights.** The table displays attributes for vehicles affecting capacity and stability. Total for maximum load capacity and forklift weight should be consulted for traveling over a given surface or trailer.

Forklift Make & Model	Load Capacity at Load Center	Forklift Weight	Maximum Load Capacity & Forklift Weight Total
Clark GPX25	4,625 lb @ 24 in	8,727 lb	13,352 lb
TCM FCG25 VFHM 480-486	4,300 lb @ 24 in	8,290 lb	12,590 lb
Toyota 7FGU35	7,300 lb @ 24 in 6,450 lb @ 30 in	13,600 lb	20,900 lb
Toyota 8FGU25	4,200 lb @ 24 in 3,650 lb @ 30 in	8,870 lb	13,070 lb
Toyota 8FGU30	5,820 lb @ 24 in 5,170 lb @ 30 in	10,140 lb	15,960 lb

- f) The nameplate (also known as a data plate or specification plate) is permanently affixed by the manufacturer to the instrument panel of the forklift and is made of metal. It will display the truck model number and serial number, load capacity



and load center ratings, truck weight, and certification. Do not use the forklift, if the nameplate is damaged, illegible, or missing.

g) Load Center and Load Capacity

- i. *The load centers and their respective load capacities for the vehicle are listed on the nameplate.*
- ii. *The load capacity for the forklift is dependent upon the load center (see Table 1). Note the load capacities and forklift weights. Then note the load capacity and weight of the truck combined. This is the minimum weight capacity requirement that a floor must be able to sustain, whether entering a trailer or driving over any surface, to avoid falling through, causing injury or damage.*
- iii. *Always make sure trailer wheels are chocked to avoid creeping or shifting during forklift operation. Trailers must be chocked so they do not pull away from the dock while the forklift enters it.*
- iv. *Be aware of where you are driving, because if the floor cannot handle the weight of the forklift and the load capacity, combined, you may fall through the floor.*
- v. *For example, the center of gravity for a given forklift is at 24 inches from the backplate and 24 inches from the top of the forks, and its stated load capacity is 5000 lb at a height of 198 inch (or 16.5 ft). If the load center changes to 30 in, this is further away from the forklift and slightly further away from the surface of the forks, which makes the truck less stable. Given the same height, the load capacity will be less than 5000 lb. If the given vehicle weight of the forklift is listed at 10000 lb, together with the highest rated load capacity (5000 lb), the total capacity of any floor or incline where the forklift operates will need to be 15000 lb, the sum of these two quantities.*

6. Parking

a) Precautions

- i. *Never block emergency exits or access to emergency equipment such as fire extinguishers, eyewashes/safety showers, first aid kits, or electrical panels.*
- ii. *Never park with an elevated load. Under the best conditions, the hydraulics can shift over time and lead to a tip over or cause a load to drop. Some vehicles are equipped with a key-lift interlock system, which means when the ignition is off, the forks will not operate, even if the lever is moved. This presents a hazard whether or not the forks are loaded.*
- iii. *Do not block entryways or heavy traffic corridors if it can be avoided as there is the potential for unsuspecting pedestrians to be harmed. Do not block other vehicles when you park.*
- iv. *Always park with the rear of the forklift being at least one foot away from flammable or combustible materials including dry grass or paper scraps, veneer board, and paper products. The forklift has a hot exhaust system and which releases hot gases, either of which can ignite such materials.*

b) Parking Diesel/Gasoline Forklifts

- i. *For parking a forklift with a gasoline or diesel fuel system:*
  - 1) *Stop the forklift in the designated area for parking.*
  - 2) *Make sure to press the brake pedal.*
  - 3) *Shift the direction lever to neutral.*
  - 4) *Set the parking brake.*  
*Lower the forks and tilt them forward using the levers.*
  - 5) *Turn the ignition off and remove the key.*

c) **Parking LPG/Propane Forklifts**

- i. *For parking a forklift with an LPG or propane fuel system:*
  - 1) *Stop the forklift in the designated area for parking.*
  - 2) *Make sure to park the forklift with the engine running.*
  - 3) *Depress the brake pedal.*
  - 4) *Shift the direction lever to neutral.*
  - 5) *Set the parking brake.*
  - 6) *Lower the forks and tilt them forward using the levers.*
  - 7) *Gently close the valve on the propane tank. This will starve the engine of fuel.*
  - 8) *Let the engine run until it stops.*
  - 9) *Turn the ignition off and remove the key.*

7. **Workplace Guidelines & Procedures**

a) **Carbon Monoxide/Exhaust**

- i. *For internal combustion engines, which include LPG or propane, gasoline, and diesel engines, their exhaust results in the release of carbon monoxide, a poisonous gas that can easily build up in enclosed areas, especially if the vehicle is running continuously. This is another reason why you should turn off the forklift when it is unattended or not in use.*
- ii. *Idling while riding a forklift is still producing combustion and exhaust.*
- iii. *Carbon monoxide is colorless, odorless, and tasteless, so it may not be obvious that it is present. It is best to use adequate ventilation with forklift use. Opening bay doors or use of large fans or ventilation units may also be useful here.*
- iv. *Carbon monoxide can be deadly. Early poisoning symptoms include dizziness or confusion, fatigue or weakness, headache, nausea, shortness of breath, and sleepiness. If you are feeling any of these symptoms, park the forklift and remove yourself to go outside to get fresh air. Call 911 and let your Supervisor know.*

b) **Surface Conditions**

- i. *Forklifts need smooth, level surfaces for safe operation. Make sure that your intended path is clear.*
- ii. *Dirty, rough, and uneven surfaces make the forklift unsteady. Look for any issues with warehouse floors, trailers, docks, the ground, or road surfaces.*

- iii. *Watch for loose materials (debris), open or loose drainage channel covers, posts, or gratings.*
  - iv. *Ice, oil, sand, snow, and water can cause loss of control. Keep the driving surface clean and dry, remove hazards or obstacles quickly, if possible. The operator is responsible for cleaning up all fluid leaks (oil, hydraulic, transmission, etc.) from the floor.*
  - v. *Steer to avoid surface obstructions, if you cannot clean them. If impossible to avoid them (wet road, for example), proceed with caution and go over them slowly. Good housekeeping and surface maintenance will keep you safe.*
- c) **Equipment Infrastructure**
- i. *Hazards from infrastructure include obstructions such as overhead or protruding fixtures such as pipes, sprinklers, and hanging lights indoors. These can come from the ceiling or from walls. Outdoors, this would include overhangs, overhead doors, and power lines as examples. Make sure that the forklift has clearance.*
  - ii. *Always stay at least 10 feet away from high voltage equipment and power lines to avoid an electrical arc.*
  - iii. *Narrow aisles present a hazard for maneuvering forklifts. Give yourself enough room to lift loads.*
  - iv. *Use the right equipment for the job. If a reach truck or order picker is more appropriate, use that instead. Order pickers lift people to pick orders, you must always wear appropriate fall protection on this type of vehicle. Operators must be trained prior to using a safety harness and lanyard.*
  - v. *Check load capacity prior to loading the truck and check clearances and beware of surrounding racks prior to moving.*
- d) **Load Composition and Stability**
- i. *Do not carry loose or unstable loads as this can cause a tipover or loss of the load, restack or stabilize the load if possible.*
  - ii. *Carry all loads lifted just high enough to clear the floor or ground under them. Do not travel with elevated loads, but also make sure not to drag the load along the surface, as this may damage the forks from heat and friction, damage the lift mechanism, and cause a sparking hazard.*
  - iii. *Bring down the load or forks easily when working with elevated loads. Do not strike the surface from moving forks down too fast, as this can cause cracks in the forks, damage the load, and damage the floor.*
  - iv. *Balance the load by making sure to spread the weight evenly and never use only one fork for lifting or moving a load. Uneven use conditions can lead to forks cracks and bending.*
- e) **Load Manipulation, Stacking, and Unstacking**
- i. *To keep the load stable:*

- 1) *Wrap or strap loads of individual items. Having a roll of shrinkwrap near the loading dock is a good idea to wrap items to pallet, if banding is not already done.*
  - 2) *Keep loads close to the drive wheels and carriage, and tilted back on the forks.*
  - 3) *Space the forks as wide as possible.*
  - 4) *Center the load on the pallet.*
  - 5) *Secure loose or slippery items.*
- ii. *Load Weight*
- 1) *The operator should understand the nature of the load to be moved.*
  - 2) *The total load weight should be known or calculated. The total load weight should not be greater than load capacity of vehicle.*
  - 3) *The heavier the load, the harder it is to stop. This makes it harder to stop if something or someone enters your path. If you think you are going too fast, you probably are.*
- iii. *For suspended loads, carrying a load on a chain or cable can introduce dynamics due to swinging that can unbalance a truck or strike a bystander.*
- iv. *Reduce the load if:*
- 1) *The load is tall, wide, or oddly shaped.*
  - 2) *The load must be lifted or stacked high.*
  - 3) *The route is rough or bumpy.*
  - 4) *Tight turns or inclines involved.*
- Loads under these conditions can fall off and be damaged, interfere with a doorway or overhead beam, and tip a truck over or fall onto the operator or a bystander. Sometimes, for example, wide loads must be carried high to be lifted over other stacked material. If so, the minimum load, height, and speed must be used.*
- v. *Working with stacks*
- 1) *Set the top load squarely on the stack.*
  - 2) *Make sure you have enough overhead clearance. Look for electrical lines, pipes, light fixtures, and sprinkler heads.*
  - 3) *Always approach the load straight on and remove it by backing straight back.*
- vi. *Engaging loads*
- 1) *Square the forklift in front of the load.*
  - 2) *Stop about 18-24 inches from the load before fork insertion into the pick area.*
- vii. *Disengaging loads*
- 1) *Before lowering load and placing it, square forklift/load with drop area. If not already done, tilt load backward slightly.*
  - 2) *Move forklift into position and allow for 8-12 inches clearance around all parts of the load. When in position, tilt load forward slightly to balance and lightly lower the load into the drop area.*

f) Pedestrians

- i. *Watch for pedestrians. Look and listen for pedestrians in your area. Think about how people may enter your path, from the dock, doorways, aisles, and intersections.*
- ii. *Yield to pedestrians. When pedestrians are traveling where forklifts operate, the pedestrians have the right-of-way. Make sure that pedestrians are not on your path, but if they are nearby, keep them as far away from your forklift as necessary to do your work. If you have to stop to let them pass, do so. If you can see them, sounding your horn to make sure that they are aware of you. Make eye contact with them so that you are confident that they know you are nearby.*
- iii. *Never drive up to anyone standing in front of a fixed object. You could lose control of your vehicle, the brakes can fail, and the person is either crushed or pinned against the object. If you cannot see them, you should also listen for them. If you need to talk to someone on foot, the minimum distance they should be away from the forklift is four feet. Allow them to walk to you, rather than aiming the forklift in their direction. Or you can park the vehicle, get down from the cab, and talk.*

g) Hazardous Locations

i. *LPG/Propane Storage*

- 1) *LPG cylinders should be limited to a one-month supply.*
- 2) *Cylinders must be stored in safe place away from traffic.*
- 3) *Cylinders must be stored in a way to avoid puncture or damage.*
- 4) *Avoid sources of heat, open flame, sparks, or electrical equipment.*
- 5) *Store the fuels separately from oxidizers.*
- 6) *Take caution: LPG has gas expansion rate of 270 times, is heavier than air, and can cause frostbite.*

ii. *Inclines*

- 1) *Operating on an incline, the steeper the incline, the higher the hazard.*
- 2) *Drive in the center of the incline, avoid the edges on the sides.*
- 3) *Avoid parking on an incline.*
- 4) *Never turn on an incline or approach an incline at a diagonal. This can cause a tipover or rollover. Always approach an incline straight up or down.*
- 5) *For driving on an incline*
  - A. *When the forks are loaded, always drive with the load facing up the incline.*
  - B. *If you are driving down the incline loaded, you must drive backwards.*
  - C. *If you are driving up the incline loaded, you must drive forward. Here, your view may be obstructed, in which case it is good to have a spotter at the side of your path that can guide you. Driving with the load facing up the incline keeps the forklift from tipping over and provides for adequate steering control.*
  - D. *When the forks are unloaded, always drive with the forks down the incline. If you are driving down the incline unloaded, your forks are forward. This is due to the fact*

that more weight is put on the front of the vehicle and it allows for better braking. The weight of the forklift is distributed over the front wheels where the brakes are and less weight is over the back wheels.

- E. If you are driving up the incline unloaded, you must drive in reverse and your forks will be behind you. This is to avoid crashing the forks into the incline, damaging the incline, the forklift, and the operator potentially being injured. It also prevents the hazard of forks facing up as you approach the platform above the incline, a similar hazard to having raised forks when driving on flat ground.

### iii. Trailers

- 1) *For operating forklifts in a trailer, check the trailer for any structural defects that might compromise the forklift.*
- 2) *Make sure that the trailer capacity can handle the weight of the forklift and the load.*
- 3) *Make sure that the trailer's truck parking brake is on, wheels of the trailer you are pulling items from are chocked properly to limit any movement, and if available use a dock lock.*
- 4) *To drive the forklift from the dock into the trailer, use a ramp or dock plate. Secure the ramp or dock plate in place after opening the trailer door. The ramp or plate must be rated for the forklift.*
- 5) *The trailer must be stable, so watch for any shifting of the trailer or the plate during forklift operation.*
- 6) *Watch the overhead clearance for the trailer to make sure the mast can fit under it and keep loads low before exiting the trailer.*
- 7) *Turn on your lamps for improved visibility in the trailer.*
- 8) *Focus on the task at hand.*
- 9) *Sound the horn as you exit the trailer to alert any pedestrian that may be nearby on the dock.*
- 10) *Drive slowly into and out of warehouses or truck trailers. Going from bright daylight into a darkened warehouses or trucks will blind drivers just long enough to run into somebody or some-thing. And stay as far away from dock drop-offs or edges as possible, as this can lead to injury or death.*
- 11) *For operating forklift in trailer without tractor, the front and rear of trailer must be held up by jacks when necessary.*

## F. Fueling

### 1. Electric

- a) At this time, there are no electric- or battery-powered forklifts owned by Towson University. If in the future an electric forklift is purchased, the following precautions should be followed for battery-powered forklifts:
  - i. *Batteries contain acid, so protective gloves, goggles, and long sleeves must be worn when working with batteries.*
  - ii. *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. Diesel/Gasoline

- a) There must be a dedicated area for refueling.
- b) There should be no smoking or sparking hazard nearby.
- c) Wear personal protective equipment such as long sleeves, insulated neoprene or leather gloves, safety glasses, and a face shield.
- d) To refuel the tank:
  - i. *Park the forklift and set it in neutral.*
  - ii. *Lower the forks.*
  - iii. *Set the parking brake.*
  - iv. *Shut off the engine.*
  - v. *Make sure that correct fuel is used.*
  - vi. *Open the fuel cap.*
  - vii. *Fill the tank slowly and clean up any spilled fuel with the appropriate spill kit. Let your Supervisor and EHS know if this occurs.*
  - viii. *Close the fuel cap. The forklift is ready for operation.*

3. LPG/Propane

- a) There must be a dedicated area for refueling.
- b) There should be no smoking or sparking hazard nearby.
- c) Wear personal protective equipment such as long sleeves, insulated neoprene or leather gloves, safety glasses, and a face shield.
- d) To change gas cylinder/tank:
  - i. *Stop the forklift with the engine running, making sure to put it in neutral, lowering the forks, and using the parking brake. Then close the valve on the tank.*
  - ii. *Let the engine run until it stops, in order to relieve the gas pressure, and then shut off the forklift properly. Put on PPE and disconnect the hose and straps from the tank.*
  - iii. *Remove the empty tank and put it where empty cylinders should be stored.*
  - iv. *Ensure that the replacement tank is of the correct type and size, and that it is closed to avoid an accidental spill or discharge.*
  - v. *Inspect the replacement tank for damage such as dents, scrapes, or gouges. If damaged, do not use the tank. Let your Supervisor and EHS know if there is any accidental discharge of fuel.*
  - vi. *Place the full tank onto the forklift and reattach the straps and hose.*
  - vii. *Position the tank so that the locating pin or dowel on the truck is inserted into position on the new tank. This is from the bottom, typically and is helpful for positioning the safety relief valve away from the operator.*

- viii. *Open the valve slightly and assure that there are no leaks from the connection.*
- ix. *Then open the valve fully to allow gas to the engine. The forklift is ready for operation.*

#### **G. Emergency Procedures**

1. Emergency vehicles in your vicinity or path, always have the right-of-way, similar to driving a road vehicle.
2. In case of an accident or spill, report it to your Supervisor, Facilities Management, and EHS immediately. Operators are required to report all lift truck accidents involving personnel, building structures, and equipment to these parties. Call 911 and TUPD if anyone is injured, including yourself.
3. In case of forklift rollover/tipover:
  - a) Remain in your seat (stay in the cab);
  - b) Lean away from the floor;
  - c) Brace your arms, legs, and feet; and
  - d) Grip the steering wheel.
4. In case of reach truck or order picker rollover/tipover:
  - a) Keep all body parts inside cab and lift your foot off of the deadman switch in order to stop quickly.
  - b) Retract the vehicle forks whether they are loaded or unloaded.
5. If brakes fail while traveling:
  - a) Press the inching and service brake pedals.
  - b) Steer around hazards and apply the parking brake.
  - c) Shift the control lever to the opposite direction.
8. In case of a breakdown or if the engine stops while traveling, stop the truck as soon as possible. Steering will take much more force to operate than normal.
9. If the forks, mast, or attachment has a hang-up, for example, there is a slack chain or the mast stages lower unevenly, raise the forks and find out why. This will avoid a sudden fall.
10. If the load starts to shift or fall while stacking:
  - a) Lower the load if possible.
  - b) The overhead guard and load backrest should help protect you from most falling loads.
  - c) Sound the horn or shout to warn others in the area.
11. If pedestrians or other machines enter your path:
  - a) Steer or brake to avoid them, sound the horn to alert pedestrians.
  - b) Tag out the vehicle if it is inoperable due to an accident or a breakdown.

#### **H. Recordkeeping**

1. EHS will maintain a roster of trainees who have completed the Powered Industrial Truck Safety Training and other training records associated with said trainees.
2. EHS will maintain an inventory of forklifts available for use on campus.



3. The Supervisor for operators who collects Forklift Inspection Records must maintain such checklists for 20 years.

**I. Training**

1. Under no circumstances shall an employee operate a powered industrial truck or forklift until they have successfully completed Powered Industrial Truck Safety Training through EHS (or equivalent).
2. Employees shall request training for Forklift Safety through EHS by emailing [safety@towson.edu](mailto:safety@towson.edu) or by calling at 410-704-2949.
3. The training program includes classroom instruction and operator evaluation with the employee.
4. Employees who have successfully completed the classroom instruction and operational evaluation will be issued an operator certification from EHS. Appropriate training certificates will be issued upon completion.
5. Re-training is tracked via computer and reviewed once each year. Re-training will be performed under the following conditions:
  - a) Every three years.
  - b) When an employee is involved in an accident or near-miss with a forklift truck.
  - c) When an employee is repeatedly observed operating a forklift in an unsafe manner.
  - d) An evaluation of the employee's skills indicates a need for re-training.
  - e) When a different truck is introduced into the workplace, or an employee uses a forklift for which they have not previously received training.
  - f) New workplace hazards are observed or created.
6. Individuals in the following departments will receive training:
  - a) Facilities Management-Material Management
  - b) Facilities Management-Landscape Services
  - c) Facilities Management-Auto Shop
  - d) Facilities Management-Athletics Grounds
  - e) Facilities Management-Maintenance (as required)
  - f) Facilities Management-Electricians
  - g) Facilities Management-Carpenter Shop (as required)
  - h) Events & Conference Services
  - i) Other individuals as determined by area management
7. The Supervisor will identify all new employees who will be responsible for driving a forklift truck and will notify EHS to schedule training.
8. Training consists of:
  - a) Review of policy by the employee.
  - b) Types of vehicles.
  - c) Review forklift operation and pedestrian safety training videos.
  - d) Successful completion of examination.
  - e) Nomenclature and operating principles of a powered industrial truck.
  - f) Preventive maintenance/safe operating rules.

- g) Pre-operational inspection checklist procedures (see Appendix B – Forklift Inspection Record).
- h) Operational review of each powered industrial truck the employee is expected to operate. (see Appendix B – Forklift Inspection Record). This will include the following:
  - i. *Proper use of controls*
  - ii. *Maneuvering skills*
  - iii. *Selecting and picking up loads*
  - iv. *Stacking and moving loads*
  - v. *Dock/Incline safety*
  - vi. *Re-fueling/charging operations*
- i) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate.
- j) Differences between the truck and the automobile.
- k) Truck controls and instrumentation, engine, or motor operation, steering and maneuvering, fork, and attachment adaptation.
- l) Visibility (including restrictions due to loading).
- m) Vehicle capacity and stability.
- n) Inspection and maintenance and refueling and/or charging and recharging of batteries.
- o) Any other operating instructions, warnings or precautions listed in the operator's manual for the types of vehicles that the employee is being trained to operate.
- p) Surface conditions, narrow aisles, other restricted places, and pedestrian traffic where the vehicle will be operated.
- q) Composition of loads to be carried and load stability including load manipulation, stacking, and un-stacking.
- r) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust and other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

9. Compressed Gas Cylinder Use

- a) Trainees will be encouraged to complete training for Compressed Gas Safety. Those who use LPG- or propane-powered forklifts must complete this training for safe operation and handling of this type of fuel.
- b) Training may be accessed virtually through Vector Solutions SafeColleges found at the following URL: <https://towsonehs-md.safecolleges.com/training/home>. Employees shall request training by emailing [safety@towson.edu](mailto:safety@towson.edu) or by calling the Environmental Health & Safety (EHS) office at 410-704-2949.

## **Resources**

### **A. Request Training**

Employees shall request training for Forklift Safety through EHS by emailing [safety@towson.edu](mailto:safety@towson.edu) or by calling at 410-704-2949.

### **B. Requests for Documentation and Reviews**

To request documents, reviews for procedures or equipment, or general inquiries, contact EHS by emailing [safety@towson.edu](mailto:safety@towson.edu) or by calling the Environmental Health & Safety (EHS) office at 410-704-2949.

## Appendix A: Powered Industrial Truck Standards & Regulations

**29 CFR 570.58: Occupations Involved in the Operation of Power-Driven Hoisting Apparatus (Order 7)**


<https://www.ecfr.gov/current/title-29/subtitle-B/chapter-V/subchapter-A/part-570#570.58>

**29 CFR 1910.178: Powered Industrial Trucks**

<https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.178>

<https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.178AppA>

## Appendix B: Forklift Inspection Record

	Occupational Safety Program	<b>Forklift Inspection Record</b>		Prepared by:	
	Forklift Safety Program			FHB	
	Form			1/15/2025	
Inspect Forklift Before the Start of Each Shift ( At Least Once Daily , When In Use )		Date	Time	Shift	
Truck ID/Model No.	Operator/Inspector	Hour Meter Reading <small>(Turn key one "position" forward to check Hour Reading)</small>			
		Start:		End:	
Check Appropriate Boxes Below:		<input type="checkbox"/> Ok	<input type="checkbox"/> Needs Attention or Repair		
Pre-Inspection - Visual Checklist (Prior to Mount)			Inspection - Operational Checklist (In Operator Cab)		
Tire Condition (No excessive wear/splitting, good rim condition, tight wheel nuts, no separation of rubber and rim, proper tire pressure.)			Hydraulic Fluid Level & Master Cylinder Fluid Level (Reservoirs found under Kick Plate below accelerator.)		
Forks (No cracks or other damage, locking pins work correctly.)			Parking Brake (Set parking brake and accelerate - parking brake prevents the forklift from moving.)		
Carriage, Mast & Backrest (No broken welds, mounted securely, no visible damage.)			Service Brake (Brakes slow forklift without jerking or locking, brakes are not too soft.)		
Guards (No broken welds, mounted securely, no visible damage.)			Steering (Steering wheel turns while stopped, turns forklift smoothly and precisely, no strange noise or hesitation.)		
Chains (Clean, lubricated, no visible wear, equal tension.)			Head & Tail Lights (If applicable, check that lights are operational.)		
Specification Plate (Present, Legible, Undamaged)			Back Up Light & Alarm (Lights up & sounds when moving in reverse.)		
Cylinders & Hydraulic Controls (Hydraulic lines ok, hoses ok, secure connections at fittings, no damage to or fluid leaking from lift and tilt cylinders.)			Gauges/Instrument Panel: Battery Power Level, Engine Oil Level, Radiator Water Level, Fuel Level, Warning Lights (Check Gauges/Instruments)		
Damage/Leaks (No damage to forklift or puddles of fluid around or under the forklift.)			Battery Water Level (If applicable, check each battery's water level - located under seat.)		
Remarks:			Forks Movement (Check lifting up/down, tilting forward/backward, and shifting left/right.)		
			Horn (Sounds when pressed)		

## Appendix C: Material Management Equipment Procedures

Aside from forklifts used by Material Management, there are other PITs assigned for its use. Examples include electric pallet jacks, pallet stacker, and straddle stackers used for material handling.

### **A. General Guidelines for Pallet Jack Use**

1. Periodic maintenance of pallet jacks is needed to operate the devices with the minimum amount of hand, arm, and finger force.
2. Over time, solid rubber wheels of pallet jacks can develop wear, resulting in unstable loads and poor handling. And in turn, workers can experience stress to the hands and arms because of difficulty steering and stopping, so always inspect your device before use.
3. For battery charging, be aware of any acids and related fumes, know the electrical requirements for charging, and use the proper PPE for any maintenance and handling.
4. Use similar guidance to forklift use for safe handling, such as the following:
  - a) Check the floor for ruts, bumps and other imperfections on the work surface;
  - b) If your view is obstructed, have a co-worker guide the load;
  - c) Never exceed a pallet jack's load capacity;
  - d) Don't use a pallet jack for human transportation;
  - e) When going down an incline, push, don't pull;
  - f) Stick to correct traffic lanes, and be alert to avoid collisions around corners;
  - g) Never place your feet under a pallet jack;
  - h) Be aware of pinchpoint hazards to your hands; and
  - i) Use proper lifting techniques when loading and unloading;
  - j) Store pallet jacks where they will not create tripping hazards; and
  - k) Make sure that the devices do not block entryways or emergency equipment, such as fire extinguishers or eyewashes/safety showers.

### **B. General Guidelines for Personnel Lift (Personal Platform Lift)**

1. Use caution with personnel lift use in the following ways:
  - a) Always close its gate;
  - b) Be careful of shifting weight;
  - c) Do not overload the vehicle [*Weight capacities: 1) Operator platform – 300 lb; 2) Load deck (area around operators' feet) – 250 lb; 3) Load Tray – 200 lb*];
  - d) Keep all body parts inside the operator area;
  - e) Be aware of surface (floor) conditions;
  - f) Operate slowly to avoid jerky motions;
  - g) Be aware of overhead and protruding objects;
  - h) Be aware of pedestrians; and
  - i) Know the various weight limits.

**C. General Guidelines for Wesco StairKing**

1. Use caution with the device in the following ways:
  - a) Strap to secure the load;
  - b) Be aware of the center of gravity over rollers; and
  - c) Assure that the leading edge of wheel is equal with the front of the step.