



**Texas Department
of Insurance**

Powered Industrial Trucks

29 CFR 1910.178



Forklifts

Provided by

**Division of
Workers'
Compensation**

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Powered Industrial Trucks

Forklifts

Purpose

On March 1, 1999 the revised Powered Industrial Truck Standard, 29 CFR 1910.178, went into effect. The Occupational Safety and Health Administration (OSHA) revised this standard in an effort to “reduce the number of injuries and deaths that occur as a result of inadequate operator training.” OSHA estimates that this revision will prevent 11 deaths and 9,422 injuries per year. The revision applies to all industries (general industry, construction, shipyards, marine terminals, and longshoring operations) in which powered industrial trucks are being used, except agricultural operations.

The Industrial Truck Association has categorized powered industrial trucks (PIT) into seven (7) classes. They are as follows: Class I – Electric Rider Counter-balanced, Class II – Electric Rider Narrow Aisle, Class III - Electric Motor Hand/Walkie (motorized pallet jacks), Class IV – Internal Combustion Cushion Tires, Class V – Internal Combustion Pneumatic Tires, Class VI – Internal Combustion & Electric Tractors (baggage cart tugs), and Class VII – Rough Terrain (construction forklifts). For simplicity’s sake, in the body of this document, the term “forklift” will apply to all seven classes of powered industrial trucks. The purpose of this program is to outline the safety requirements relating to fire protection, design, maintenance, and the use of powered industrial trucks. The requirements outlined in this document do not pertain to the operation of automobiles or truck type vehicles within the workplace.

The use of PITs is subject to certain hazards that cannot be completely eliminated, but exercising intelligence, care, and common sense can minimize the risks. It is therefore essential to have competent and careful operators, physically and mentally fit, and thoroughly trained in the safe operation of the equipment and the handling of the loads. Serious hazards include overloading, the instability of the load, obstruction

to the free passage of the load, collision with objects and pedestrians, poor maintenance, and use of equipment for a purpose for which it was not intended or designed.

Only trained and authorized operators shall be permitted to operate a PIT. To obtain a forklift operator’s certificate, each employee must demonstrate his or her knowledge of general forklift safety information as well as site-specific information that is contained in their employer’s written forklift program. The assessment of this knowledge is usually in the form of a written test (see Appendix A). Once the employee successfully completes the classroom portion of the training, he or she is required to demonstrate operational proficiency. This is a two-step process. First, the employee must successfully navigate a forklift driving obstacle course (see Appendix B). Then the employee is observed while performing his or her forklift related job assignments by an authorized evaluator. Once the evaluator deems the employee competent to operate their assigned forklift the employee will be issued a forklift driver’s certificate.

Operator certification is site-specific as well as truck specific. It is the sole responsibility of the employer to certify that each operator has been trained and evaluated as required by the standard. Outside sources may be used to deliver training or even develop the PIT program, but only the employer is allowed to certify their PIT operators. The certification documentation often takes the form of a wallet card or badge. Information that must be listed on the certificate is as follows: operator’s name, training date, evaluation date, and trainer/evaluator’s name (see Appendix C). It is best practice to also list the trucks that the operator is qualified to drive. In terms of the current OSHA PIT standard, there is no such thing as a “forklift operator’s license.”

A qualified trainer must deliver the PIT training. The trainer's qualifications, according to 29 CFR 1910.178(l)(2)(iii), are as follows: knowledge of the subject matter; training on the subject matter; and experience with PIT. The qualified trainer may also perform the function of authorized evaluator. However, it is often the employee's supervisor who evaluates the employee's performance of forklift related job assignments, since it is the supervisor who is most familiar with the employee's work area and functional job assignments.

Operator refresher training is mandatory and it must be delivered according to the following criteria:

- once every three (3) years at a minimum;
- when unsafe operation is observed;
- when a near-miss or accident occurs;
- when an evaluation reveals unsafe operation;
- when assigned to a new type of truck; and
- when site conditions change.

New hire training is handled in two different ways. New hires that have no experience operating PITs must successfully complete the entire training course, including both the classroom and hands-on portions. New hires that have experience and training in PIT operation will receive a shorter course that discusses general safety and operating protocol; site-specific rules of operation; and a driving practicum.

The classroom portion of PIT operator training may be delivered using several different modes and media, including: lecture, video, written text, and interactive computer learning. Training topics should include, but not be limited to the following:

- operating instructions, warnings, and precautions (truck-type specific);
- differences between PIT and auto;
- PIT controls and instrumentation:
 - Where they're located;
 - What they do;
 - How they work;
- engine or motor operation;
- steering and maneuvering;
- visibility;

- forks and other load engaging attachments:
 - Adaptation;
 - Operation;
 - Use limitations;
- vehicle capacity;
- vehicle stability;
- operator-performed vehicle inspection and maintenance;
- procedure for initiating repairs when truck defects are found;
- refueling and/or battery handling/charging;
- general truck loading practices;
- forklift rules including:
 - Traveling speeds;
 - Cornering speeds;
 - Pedestrian safety;
 - Truck and load clearances;
 - Backing procedures;
- mandatory use of seat belts and/or personal fall arrest system (see Appendix D);
- determining whether a load is safe to handle;
- correct piling/stacking of materials;
- procedure to follow when leaving a PIT unattended;
- working in hazardous environments or with hazardous materials; and
- specific hazards of the PIT operators' prospective tasks.

Since the observance of PIT safety practices is critical to the well being of all employees, individuals who violate safe operating rules for forklifts, or who drive forklifts without authorization, or supervisors who allow unauthorized employees to drive forklifts should be subject to strict disciplinary action up to and including termination, depending upon the severity of the infraction.

Inspecting the truck prior to use:

Forklift trucks shall be examined before being placed in service and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle.

- Such examination shall be made at least daily before each shift.
- Industrial trucks used on a round-the-clock basis shall be examined before each shift.
- Defects, when found, shall be immediately reported and corrected.

Establishing and implementing an inspection program:

- At the start of each shift, the operator should check their assigned forklift truck to assure that it is in safe working order.
- If for any reason the operator believes that the forklift truck is unsafe to drive or operate, it should be immediately reported to the supervisor.
- Among the items to check (see Appendix E) are:
 - operator controls;
 - brakes;
 - fluid lines and levels;
 - lights;
 - filters;
 - safety devices (horn, fire extinguisher, etc.);
 - backup horns (required for construction operations);
 - movements of the forks; and seat belts.

Unless qualified, the operator should not attempt to make any repairs. Only qualified and authorized personnel should be permitted to maintain, repair, and adjust forklift trucks.

Modifications and additions which affect capacity and safe operation shall not be performed by the employer without the manufacturer's prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

If the forklift truck is equipped with front-end attachments, other than factory installed attachments, the employer shall request that the truck be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

The user shall see that all nameplates and markings are in place and are maintained in a legible condition.

Procedure When Truck Defects are Found

Any forklift truck not in safe operating condition shall be removed from service.

- All repairs shall be made by authorized personnel.
- Remove the truck from service and tag it out of service until the defect can be repaired or the truck can be replaced.

Establish and implement an inspection and preventive maintenance program to minimize the possibility of employees using unsafe forklift trucks.

- Operating and safety instructions outlined in manufacturers manuals must be followed.
- Forklift truck dealers also can provide sound advice on proper lubricants, parts, tools, and procedures, and may also perform truck maintenance under contract.

No repairs shall be made in Class I, II, and III locations. (See Appendix F and G.)

No forklift truck shall be operated with a leak in the fuel system until the leak has been corrected.

- Those repairs to the fuel and ignition systems of forklift trucks which involve fire hazards shall be conducted only in locations designated for such repairs.
- Fuel tanks shall not be filled while the engine is running.
- Spillage of oil or fuel should be avoided and shall be carefully removed and the fuel tank cap replaced before restarting the engine.
- Open flames shall not be used for checking gasoline level in fuel tanks or for checking electrolyte levels in storage batteries.

Forklift trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.

All parts of any such forklift truck requiring replacement shall be replaced only by manufacturer approved replacement parts.

Forklift trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer.

- Forklift trucks shall not be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts without the manufacturer's written authorization.
- Additional counter-weighting of forklift trucks shall not be done unless approved by the forklift truck manufacturer.

Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service and not returned to service until the cause for the emission of such sparks and flames has been eliminated.

- Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity.
- Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged.

When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service. The truck shall not be returned to service until the cause for such overheating has been eliminated.

Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100° F) solvents shall not be used. High flash point (at or above 100° F) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be consonant with the agent or solvent used.

Industrial trucks originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a truck which embodies the features specified for LP or LPS designated trucks. The conversion equipment shall be approved in writing by the manufacturer.

General Loading Practices

Portable and powered dockboards shall be strong enough to carry the load imposed on them.

Portable dockboards shall be secured in position, either by being anchored or equipped with devices that will prevent slippage.

Powered dockboards shall be designed and constructed in accordance with Commercial Standard CS202-56 (1961) "Industrial Lifts and Hinged Loading Ramps" published by the U. S. Department of Commerce.

Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.

Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridgeplates are in position.

Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations.

The brakes of highway trucks shall be set and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.

Nose jacks shall be used to support a semi trailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor.

Brakes shall be set and wheel blocks shall be in place to prevent movement of railroad cars while loading or unloading.

The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.

Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.

Only loads within the rated capacity of the forklift truck shall be handled.

The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.

Forklift trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.

Forks or other load engaging attachments shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.

Extreme care shall be used when tilting the load forward or backward, particularly when high tiering.

- Tilting forward with forks (or other load engaging attachments) elevated shall be prohibited except to pick up a load.
- An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack.

- When stacking or tiering, only enough backward tilt to stabilize the load shall be used.

Forklift Truck Operating Rules

The operator shall:

- maintain a safe distance (recommended 3–5 feet) from the edge of ramps or platforms while on any elevated dock, platform, or freight car;
- ensure sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.;
- observe all traffic safety rules, including authorized plant speed limits;
- maintain a safe distance, approximately three truck lengths from the truck ahead; keep the truck under control at all times;
- yield the right-of-way to pedestrians;
- yield the right-of-way to ambulances, fire trucks, or other vehicles in emergency situations;
- slow down and sound the horn at cross aisles and other locations where vision is obstructed;
- look in the direction of, and keep a clear view of, the path of travel;
- travel with the load trailing if the load being carried obstructs forward view;
- cross railroad tracks diagonally wherever possible; and
- ascend or descend grades slowly.
 - When ascending or descending grades in excess of 10%, loaded trucks shall be driven with the load upgrade.
 - When ascending or descending grades in excess of 10%, unloaded trucks shall be driven with the forks pointed downgrade.
 - On all grades the load and forks (or other load engaging attachments) shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

The operator shall also:

- operate at a speed, under all travel conditions, that will permit the forklift truck to be brought to a stop in a safe manner;
- slow down for wet and slippery floors;
- properly secure dockboard or bridgeplates before they are driven over. Dockboard or

bridgeplates shall be driven over carefully and slowly and their rated capacity never exceeded; and

- approach elevators slowly, and then enter squarely after the elevator car is properly leveled.
 - On the elevator, the controls shall be neutralized, power shut off, and the brakes set.
 - Motorized hand trucks must enter elevator or other confined areas with load end forward.
 - Note any oil or fuel leakage from any forklift truck and report the deficiency to supervisors immediately.

The operator shall not:

- operate a forklift truck under the influence of prescription or over-the-counter medications that may interfere with safe operation of the forklift truck in any manner (i.e., drowsy, dizzy, loss of attention);
- drive forklift trucks up to anyone standing in front of any fixed object;
- run over loose objects on the roadway surface;
- allow persons to stand or pass under the elevated portion of any truck, whether loaded or empty;
- park closer than eight feet from the center of railroad tracks;
- allow any person to ride on forklift trucks except the operator, unless the forklift truck has provisions (additional seating authorized by the manufacturer) for passengers;
- place arms or legs between the uprights of the mast or outside the running lines of the truck;
- use a forklift truck for opening or closing freight car doors or moving freight cars
- block fire aisles, access to stairways, or fire equipment with the forklift truck or the load being handled.
- pass other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations;
- participate in stunt driving or horseplay; or
- push or tow other forklift trucks.



An overhead guard shall be used as protection against falling objects.

Note: Overhead guards are intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.

A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling to the rear.

Only approved industrial trucks shall be used in hazardous locations.

When lifting personnel with a forklift truck equipped with vertical only, or vertical and horizontal controls capable of being elevated with the lifting carriage or forks, the following additional precautions shall be taken for the protection of the personnel being elevated:

- use of a safety platform firmly secured to the lifting carriage and/or forks;
- personnel on the safety platform shall be provided with a means of shutting off the power to the truck as an emergency precaution;
- the driver of the truck shall remain at the controls of the truck as long as personnel are occupying the elevated platform; and
- protection from falling objects, as indicated, necessary by the operating conditions shall be provided.

Determining Whether The Load is Safe to Handle

Forklift truck operators should know the weight of the load prior to moving the load.

Standing on a truck or adding counterweights to compensate for an overload will not be permitted.

Operators should never attempt to operate a truck with an overload. Such a load is dangerous because it removes weight from the steering wheels, which affects the steering.

Correct Piling/Stacking of Materials in Stock

Approach to within a foot or so of a stack or tier with load held low.

- Stop truck and raise load slowly while inching forward.

- When load reaches desired height, tilt upright forward until it is vertical.
- Position load over stack so it lines up squarely.

Lower the load slowly. When it is resting solidly on the stack and forks are free, back machine away slowly.

Extreme care must be taken when the mast and load are raised high.

- The heavier the load and the higher it is raised, the higher the forklift truck's center of gravity is forced, reducing stability.
- When lifting a load, always check for any overhead obstructions that might be damaged or cause the load to spill or topple the truck.

Always heed instructions about stacking height.

- Stacking right to the ceiling may block the sprinkler system and may overload the floor.
- Allow 18 inches clearance below sprinkler heads or piping.
- Allow 24 inches clearance below roof if not equipped with sprinklers.
- Never allow other workers to stand nearby when you stack materials.
- Do not stack material in aisles or roadways.

Precautions When Leaving a Truck Unattended

When a powered industrial truck is left unattended:

- fully lower the fork (or other load engaging attachments)
- neutralize controls;
- shut off power;
- set brakes; and
- block wheels if the truck is parked on an incline.

A powered industrial truck is unattended when:

- the operator is 25 feet or more away from the vehicle which remains in his view; or
- the operator leaves the vehicle and it is not in his view.

When the operator of an industrial truck is dismounted and within 25 feet of the truck still in his view:

- the forks (or other load engaging attachments) shall be fully lowered;
- controls neutralized; and
- brakes set to prevent movement.

If the load must remain elevated, the operator must

remain on the forklift truck at the controls.

Working in Hazardous Environments or With Hazardous Materials

Concentration levels of carbon monoxide gas created by powered industrial truck operations shall not exceed the levels specified in 29 CFR 1910.1000.

Where general lighting is less than 2 lumens per square foot, auxiliary directional lighting shall be provided on the truck.

Refueling or Recharging Operations

Battery charging installations shall be located in areas designated for that purpose.

Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.

A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling

batteries.

Reinstalled batteries shall be properly positioned and secured in the truck.

- A carboy tilter or siphon shall be provided for handling electrolyte.
- When charging batteries, acid shall be poured into water; water shall not be poured into acid.

Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.

Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat and hydrogen gas.

Smoking shall be prohibited in charging and refueling areas and “No Smoking” signs posted in these areas.

Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

Tools and other metallic objects shall be kept away from the top of uncovered batteries.



APPENDICES

Appendix A

Training Quiz

Trainee Name _____ Date _____

Circle the letter which best completes the statement.

1. Repairs to your forklift should be made:
 - a. Before you use the forklift for work
 - b. Whenever you get a break from the work you are presently doing
 - c. When your company has a scheduled maintenance time
 - d. By someone who has time to look it over

2. Who can operate forklifts?
 - a. Supervisors
 - b. Trained and certified workers
 - c. Friends
 - d. Anybody

3. Operators are required to inspect their forklifts:
 - a. Monthly
 - b. Daily
 - c. Weekly
 - d. Before each shift

4. If your vision is obstructed when traveling with a load:
 - a. Raise the load so you can see under it
 - b. Lower and tilt the load forward so you can see over it
 - c. Travel forward
 - d. Travel in reverse

5. Who has the right-of-way?
 - a. Your forklift
 - b. Someone else's forklift
 - c. Things approaching from the left
 - d. Pedestrians

6. Riders are allowed on a forklift:
 - a. If they are strapped in
 - b. On the forks, within a safety platform
 - c. Never
 - d. Towed behind the unit

7. During the pre-operational inspection you should check:
 - a. Hydraulic system
 - b. Brakes
 - c. Tires
 - d. All of the above

8. Travel down a ramp:
 - a. Avoid this, if possible
 - b. Travel with the load upgrade
 - c. Forward
 - d. Only without loads

9. How far should forks enter the pallet?
 - a. Half way
 - b. Three quarters
 - c. One fourth
 - d. All the way

10. It is permissible to push one forklift with another forklift:
 - a. If it is broken down
 - b. If it is in your way
 - c. If the forklift truck in front is driving too slow
 - d. Never

11. The maximum allowable load should be clearly marked on the nameplate of the forklift truck.
- True
 - False
12. It is permissible to overload the truck by 25% if additional counterweights are used.
- True
 - False
13. It is good practice to keep the load back against the truck mast as much as possible.
- True
 - False
14. Maintenance personnel may be lifted on the forks to reach their work.
- True
 - False
15. Smoking is permissible in refueling and recharging areas provided you see no leaking fuel.
- True
 - False
16. Parking trucks is ok for a few minutes in front of fire extinguishers, or exit doors.
- True
 - False
17. It is permissible to let someone else operate your truck if he says he knows how.
- True
 - False
18. When traveling with a load, the mast should be tilted back.
- True
 - False
19. A professional operator checks each load for stability before moving it.
- True
 - False
20. When loading a highway truck or trailer, its wheels should be chocked or blocked even though the driver says he set the brakes.
- True
 - False

Test Score _____ Instructor Signature _____ Date _____

Quiz Key

- | | |
|-------|-------|
| 1. a | 11. a |
| 2. b | 12. b |
| 3. d | 13. a |
| 4. d | 14. b |
| 5. d | 15. b |
| 6. b | 16. b |
| 7. d | 17. b |
| 8. b | 18. a |
| 9. d | 19. a |
| 10. d | 20. a |

Appendix B

Driving Test Card

Operator's Name: _____

Date: _____

General Explanations:

Each operator must be able to thoroughly explain the following:

1. Yes No Truck nameplate and related information.
2. Yes No Load center distance and rated load capacity.
3. Yes No Three point suspension and stability triangle.
4. Yes No Rear wheel steering.
5. Yes No All instruments, controls, and body components.
6. Yes No Pre-operation check.

Driving Test:

Under a qualified instructor's supervision, each operator must complete the following, demonstrating smoothness and positive control when operating the truck.

1. Yes No Adjustment of forks.
2. Yes No Pick up load.
3. Yes No Start and stop with load.
4. Yes No Drive with load straight and around corner (forward and reverse)
5. Yes No Deposit load in designated area.
6. Yes No Stack load in a rack and un-stack.
7. Yes No Double stack a load.
8. Yes No Maneuver load in narrow aisle.

Appendix B

Sample PIT Driver's Obstacle Course Instructions

This is one example of how a driver's test course may be constructed. The test course shape, length, and difficulty are at the discretion of the trainer. The course should offer "real life/site-specific" material handling situations.

The driver's performance will be recorded on the driving test card.

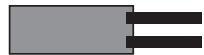
The following is an explanation of the symbols that are used on the sample test course.



This is a pallet that is turned on its side and is being used as a barrier/cone.



This is a test load that is on a pallet. This test load will be manipulated by the PIT operator as he or she negotiates the test course.



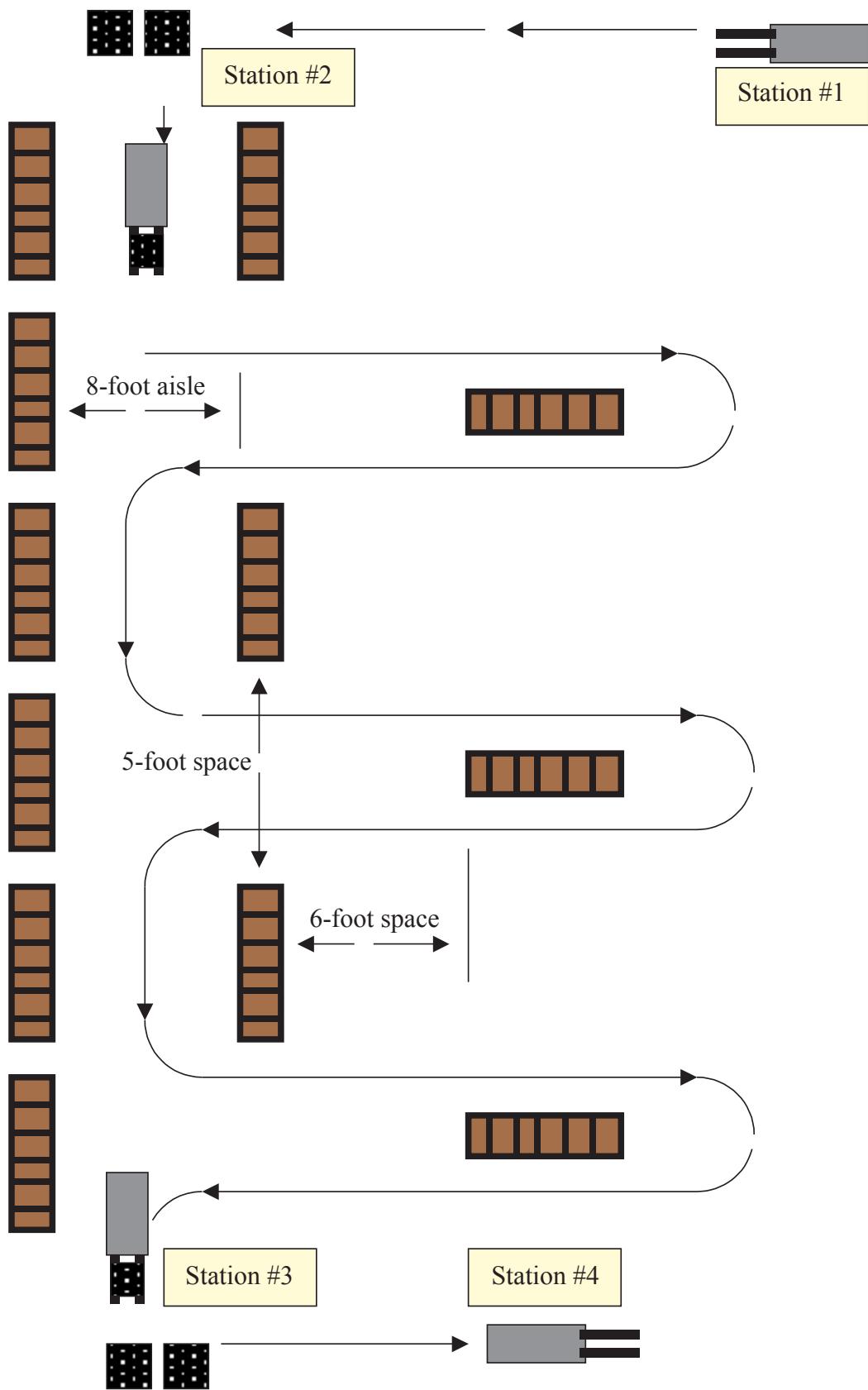
This is a powered industrial truck that will be operated by the driver.

Suggested obstacle activities

1. At station #1:
 - a. Perform all portions of "general explanations" section of driving test card
 - b. Board PIT & start truck
 - c. Proceed, driving forward, to station #2
2. At station #2
 - a. Pick up test load
 - b. Proceed, driving forward, through the obstacle course
3. At station #3
 - a. Place test load on stack
 - b. Proceed, driving forward, to station #4
4. At station #4 park PIT, but do not turn off the truck's engine
5. At station #4, put PIT in reverse and proceed, driving in reverse to station #3
6. At station #3
 - a. Pick up test load
 - b. Proceed, driving in reverse, through the obstacle course
7. At station #2
 - a. Place the test load on stack
 - b. Proceed, driving in reverse, to station #1
8. At station #1
 - a. Park PIT and turn off the truck's engine

Appendix B

Sample PIT Driver's Obstacle Course



Appendix C

Forklift Driver's Card

Operator's Name: _____

Company Name: _____

Date Issued: _____

Date Expires: _____

Trucks Authorized to Operate:

Certifying Agent's Signature:

Forklift Driver's Certificate

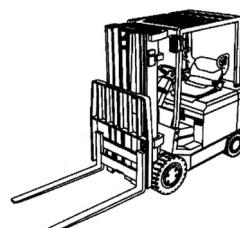
Operator's Name: _____

Company Name: _____

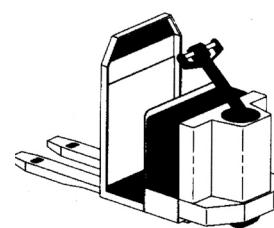
Date Issued: _____

Date Expires: _____

Trucks Authorized to Operate:



Certifying Agent's Signature:



Appendix D

Standard Number 1910.178

Subject Clarification of whether the OSHA general industry powered industrial truck standard requires forklift operators to wear seat belts.

Information Date October 09, 1996

October 9, 1996

Mr. George R. Salem, P.C.
Akin, Gump, Strauss, Hauer, & Feld, L.L.P.
133 New Hampshire Avenue, N.W.
Suite 400
Washington, D.C. 20036

Dear Mr. Salem:

Thank you for your letter dated September 5, requesting clarification of whether the Occupational Safety and Health Administration (OSHA) general industry powered industrial truck standard, 29 CFR 1910.178, requires forklift operators to wear seat belts while operating forklifts.

American National Standards Institute (ANSI) B56.1-1969 Safety Standard for Powered Industrial Trucks, was adopted by OSHA under the procedures described in section 6(a) of the Occupational Safety and Health Act (OSH Act). OSHA's general industry standard for powered industrial trucks does not contain any provision which requires the use of seat belts. However, Section 5(a)(1) of the OSH Act requires employers to protect employees from serious and recognized hazards. Recognition of the hazard of powered industrial truck tip over and the need for the use of an operator restraint system is evidenced by consensus standards for powered industrial trucks; ASME/ANSI B56.1a-1989 Addenda to ASME/ANSI B56.1-1988, and ASME B56.1-1993 – Safety Standard for Low Lift and High Lift Trucks. These consensus standards require the use of an active operator protection device or system when provided on a powered industrial truck. In addition, seat belts have been supplied by many manufacturers of counterbalanced, center control, high lift trucks which have a sit-down nonlevitating operator position. Also, some manufacturers have instituted retrofit programs for the installation of operator restraint systems to older trucks.

OSHA's position in regard to the use of seat belts on powered industrial trucks is that employers are obligated to require operators of powered industrial trucks which are equipped with operator restraint devices or seat belts to use the devices. OSHA may also cite Section 5(a)(1) of the OSH Act if an employer has not taken advantage of a manufacturer operator restraint system or seat belt retrofit program.

With regard to your comments concerning 1910.178(a)(2), ANSI B56.1-1969 contains three parts:
Part I – Introduction; Part – II For Manufacturer; and
Part III – For User. 1910.178(a)(2) requires powered industrial trucks to meet the design and construction requirements established in Part II, ANSI B56.1-1969. Part III of ANSI B56.1-1969, which covers general safety practices, operating safety rules and practices, and maintenance for powered industrial trucks, was adopted by OSHA.

Thank you for your interest in occupational safety and health. If we can be of any further assistance, please contact Mr. Wil Epps of my staff at (202) 219-8041.

Sincerely,

John B. Miles, Jr., Director
Directorate of Compliance Programs

Appendix E

Forklift Inspection Checklist							
Forklift Number _____	Week of _____						
Inspector Name							
Date							
Shift							
Day	SUN	MON	TUE	WED	THU	FRI	SAT
Proper oil level?							
Proper coolant level?							
Proper hydraulic fluid level?							
Proper battery water level?							
Battery connections clean and tight?							
Fuel system free of visible leaks or odors?							
Fuel level 10% or less – change tank							
Foot brake hold?							
Hand brake hold?							
Fire extinguisher in place & charged?							
Horn & back up alarm works properly?							
Steering works properly?							
Lights work properly?							
Do forks raise & lower properly?							
Do forks tilt and/or side shift properly?							
Are lift chains greased & tight?							
Are lifting cylinder seals in tact?							
Are safety hooks, mast, fork locks & forks intact?							
Are tires inflated to correct pressure?							
Are tires in good condition?							
Is nameplate legible?							
Are seat belts in good condition?							
Is forklift free of excess dirt, oil & grease?							
Comments:							

FORKLIFT INSPECTION INSTRUCTIONS

1. Forklifts shall be inspected **EACH SHIFT**.
2. Place date above the day being inspected.
3. Write YES or NO for each inspection point. If NO, state the exact problem below. This should include the date of inspection, type of work request written, and work request number. With this completed information, sign name below.
4. If forklift is out of service, write **OUT OF SERVICE** down column.
5. If forklift is not used during the weekend, write **NO WEEKEND USE** down column.
6. Print name at top of column of inspection form.
7. When inspection sheet is completed for the week, keep on file in area safety records.

Appendix F

Designation

For the purpose of this standard there are eleven different designations of industrial trucks or tractors as follows: **D, DS, DY, E, ES, EE, EX, G, GS, LP, and LPS.**

- The D designated units are units similar to the G units except that they are diesel engine powered instead of gasoline engine powered.
- The DS designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where a D unit may not be considered suitable.
- The DY designated units are diesel powered units that have all the safeguards of the DS units and in addition do not have any electrical equipment including the ignition and are equipped with temperature limitation features.
- The E designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.
- The ES designated units are electrically powered units that, in addition to all of the requirements for the E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures. They may be used in some locations where the use of an E unit may not be considered suitable.
- The EE designated units are electrically powered units that have, in addition to all of the requirements for the E and ES units, the electric motors and all other electrical equipment completely enclosed. In certain locations the EE unit may be used where the use of an E and ES unit may not be considered suitable.
- The EX designated units are electrically powered units that differ from the E, ES, or EE units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.
- The G designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.
- The GS designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of a G unit may not be considered suitable.
- The LP designated unit is similar to the G unit except that liquefied petroleum gas is used for fuel instead of gasoline.
- The LPS designated units are liquefied petroleum gas powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of an LP unit may not be considered suitable.
- The atmosphere or location shall have been classified as to whether it is hazardous or non-hazardous prior to the consideration of industrial trucks being used therein and the type of industrial truck required shall be as provided in this section for such location.

Appendix G

Designated locations

The industrial trucks specified below are the minimum types required, but industrial trucks having greater safeguards may be used if desired.

For specific areas of use see Table N-1. References are to the corresponding classification.

- Power-operated industrial trucks shall not be used in atmospheres containing hazardous concentration of acetylene, butadiene, ethylene oxide, hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas), propylene oxide, acetaldehyde, cyclo-propane, diethyl ether, ethylene, isoprene, or unsymmetrical dimethyl hydrazine (UDMH).
- In hazardous atmospheric conditions:
 - power-operated industrial trucks shall not be used in atmospheres containing hazardous concentrations of metal dust, including aluminum, magnesium, and their commercial alloys; other metals of similarly hazardous characteristics; or in atmospheres containing carbon black, coal or coke dust, except approved power-operated industrial trucks designated as EX may be used in such atmospheres; and
 - in atmospheres where dust of magnesium, aluminum or aluminum bronze may be present, fuses, switches, motor controllers, and circuit breakers of trucks shall have enclosures specifically approved for such locations.
- Only approved power-operated industrial trucks designated as EX may be used in atmospheres containing acetone, acrylonitrile, alcohol, ammonia, benzine, benzol, butane, ethylene dichloride, gasoline, hexane, lacquer solvent vapors, naphtha, natural gas, propane, propylene, styrene, vinyl acetate, vinyl chloride, or xylenes in quantities sufficient to produce explosive or ignitable mixtures and where such concentrations of these gases or vapors exist continuously, intermittently, or periodically under normal operating conditions or may exist frequently because of repair, maintenance operations, leakage, breakdown, or faulty operation of equipment.
- Power-operated industrial trucks designated as DY, EE, or EX may be used in locations where:
 - volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in the case of abnormal operation of equipment;
 - hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation but which might become hazardous through failure or abnormal operation of the ventilating equipment; or
 - location is adjacent to Class I, Division 1 locations, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clear air, and effective safeguards against ventilation failure are provided.
- In locations used for the storage of hazardous liquids in sealed containers or liquefied or compressed gases in containers, approved power-operated industrial trucks designated as DS, ES, GS, or LPS may be used. This classification includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident of some unusual operating condition. The quantity of hazardous material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that should receive consideration in determining whether or not the DS or DY, ES, EE, GS, LPS designated truck possesses sufficient safeguards for the location. Piping without valves, checks, meters, and similar devices

- would not ordinarily be deemed to introduce a hazardous condition even though used for hazardous liquids or gases. Locations used for the storage of hazardous liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.
- Only approved power operated industrial trucks designated as EX shall be used in atmospheres in which combustible dust is or may be in suspension continuously, intermittently, or periodically under normal operating conditions, sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such mixtures to be produced.
 - The EX classification usually includes the working areas of grain handling and plants, rooms containing grinders or pulverizers, cleaners, graders, scalpers, open conveyors or spouts, open bins or hoppers, mixers, or blenders, automatic or hopper scales, packing machinery, elevator heads and boots, stock distributors, dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust producing machinery and equipment in grain processing plants, starch plants, sugar pulverizing plants, malting plants, hay grinding plants, and other occupancies of similar nature; coal pulverizing plants (except where the pulverizing equipment is essentially dust tight); all working areas where metal dusts and powders are produced, processed, handled, packed, or stored (except in tight containers); and other similar locations where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.
 - Only approved power-operated industrial trucks designated as DY, EE, or EX shall be used in atmospheres in which combustible dust will not normally be in suspension in the air or will not be likely to be thrown into suspension by the normal operation of equipment or appa-

ratus in quantities sufficient to produce explosive or ignitable mixtures but where deposits or accumulations of such dust may be ignited by arcs or sparks originating in the truck.

- Only approved power-operated industrial trucks designated as DY, EE, or EX shall be used in locations which are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures.
- Only approved power-operated industrial trucks designated as DS, DY, ES, EE, EX, GS, or LPS shall be used in locations where easily ignitable fibers are stored or handled, including outside storage, but are not being processed or manufactured. Industrial trucks designated as E, which have been previously used in these locations may be continued in use.
- On piers and wharves handling general cargo, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements for these types may be used.
- If storage warehouses and outside storage locations are hazardous only the approved power-operated industrial truck specified for such locations in this paragraph (c) (2) shall be used. If not classified as hazardous, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements for these types may be used.
- If general industrial or commercial properties are hazardous, only approved power-operated industrial trucks specified for such locations in this paragraph (c) (2) shall be used. If not classified as hazardous, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements of these types may be used.

Table N-1

Summary Table on Use of Industrial Trucks in Various Locations

Classes	Description of Classes
Unclassified	Locations not possessing atmospheres as described in other columns
Class I locations	Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures
Class II locations	Locations which are hazardous because of the presence of combustible dust
Class III locations	Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.

Table N-1 (cont)

Groups in Classes	None	A	B	C	D	E	F	G	None
Examples of locations or atmospheres in classes and groups.	Piers and wharves inside and outside general storage, general industrial or commercial properties.	Acetylene	Hydrogen	Ethyl ether	Gasoline Naphtha Alcohols Acetone Lacquer solvent Benzene	Metal dust	Carbon black, coal dust, coke dust	Grain dust flour dust starch dust organic dust	Boiled waste cocoa fiber cotton, excelsior, hemp isile, jute kapok, okum, sisal Spanish moss synthetic fibers tow
Divisions (nature of hazardous conditions)	None	Above condition exists continuously, intermittently, or periodically under normal operating conditions.	1	2	1	2	1	2	
			Above condition may occur accidentally due to a puncture of a storage drum.	Above condition may occur accidentally due to a puncture of a storage drum.	Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.	Location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).		

Table N-1 (cont)

		Authorized Uses of Trucks By Types in Groups of Classes and Divisions																
Groups in Classes		None	A	B	C	D	A	B	C	D	E	F	G	E	F	G	None	None
Type of truck authorized																		
Diesel:																		
Type D	✓**	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	—	✓✓	
Type DS	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	✓	—	
Type DY	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	✓	—	
Electric:																		
Type E	✓**	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	—	✓	
Type ES	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	✓	—	
Type EE	—	—	—	—	—	✓	—	—	✓	—	—	—	—	—	—	✓	—	
Type EX	—	—	—	—	—	✓	—	—	✓	—	✓	—	—	—	—	✓	—	
Gasoline:																		
Type G	✓**	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	✓	—	
Type GS	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	—	✓	—	
LP-Gas:																		
Type LP	✓**	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	—	
Type LPS	—	—	—	—	—	—	—	—	—	✓	—	—	—	—	—	✓	—	

* * Trucks conforming to these types may also be used—see subdivision (c)(2)(x) and (c)(2)(xi) of 29 CFR 1910.178