Safety Training Reduces

- **ACCIDENTS**
  - by teaching correct methods of avoiding accidents
- **PRODUCT DAMAGE**
  - by teaching best load handling techniques
- **EQUIPMENT DAMAGE**
  - by giving instruction in correct operation and handling
- **LOST TIME**
  - by reducing accidents, and unplanned work stoppages
Safety Training Increases

- **OPERATOR CONFIDENCE**
  - by showing correct methods of operation

- **PRODUCTIVITY**
  - by increasing operator skills

- **EMPLOYEE MORALE**
  - by showing management’s concern for employee health

- **EQUIPMENT LIFE**
  - by indicating safety check lists that help spot problems early
What’s This Course All About?

4.19.3 The training program shall inform the trainee that:

(a) The primary responsibility of the operator is to use the powered industrial truck safely following the instructions given in the training program.

(b) Unsafe or improper operation of a powered industrial truck can result in: death or serious injury to the operator or others; damage to the powered industrial truck or other property.
Forklift Fatalities, 1992-1996

- Source: Bureau of Labor Statistics,
- Job Related Fatalities Involving Forklifts
# Industries Where Powered Industrial Truck Accidents Occurred

<table>
<thead>
<tr>
<th>Industry</th>
<th># Accidents Investigated by OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>4</td>
</tr>
<tr>
<td>Construction</td>
<td>25</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>95</td>
</tr>
<tr>
<td>Transportation, Communication, Utilities</td>
<td>22</td>
</tr>
<tr>
<td>Wholesale Trades</td>
<td>25</td>
</tr>
<tr>
<td>Retail Trades</td>
<td>18</td>
</tr>
<tr>
<td>Service</td>
<td>7</td>
</tr>
<tr>
<td>Public Administration</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>200</strong></td>
</tr>
</tbody>
</table>

- Source: OSHA Fatality/Catastrophe Reports, complied by OSHA Office of Electrical/Electronic and Mechanical Engineering Safety Standards.
Nonfatal Occupational Injuries and Illnesses by Source, 1996

<table>
<thead>
<tr>
<th>Type of Forklift</th>
<th>Total Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forklift, unspecified</td>
<td>14,096</td>
</tr>
<tr>
<td>Hand/rider forklift truck</td>
<td>373</td>
</tr>
<tr>
<td>Order picker</td>
<td>126</td>
</tr>
<tr>
<td>Pallet lift truck</td>
<td>1,194</td>
</tr>
<tr>
<td>Platform lift truck</td>
<td>260</td>
</tr>
<tr>
<td>Straddle rider lift truck</td>
<td>131</td>
</tr>
<tr>
<td>Forklift, other types</td>
<td>1,182</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>17,362</strong></td>
</tr>
</tbody>
</table>

Since a large percentage of accidents and fatalities were due to operator inexperience, OSHA mandated that operators must be trained and competent.
Forklift Fatalities
by Age Group 1992 -1996

- Source: Bureau of Labor Statistics

- Under 20: 12%
- 20 - 24: 5%
- 25 - 34: 3%
- 35 - 44: 10%
- 45 - 54: 22%
- 56 - 64: 21%
- 65 & over: 10%
Forklift Accidents
By Percentage

- Tipover
- Struck by powered industrial truck
- Struck by falling load
- Elevated employees on truck
- Ran off loading dock
- Improper maintenance
- Lost control

April 21, 2012
Forklift Accidents
By Percentage

Injuries Comparing Frequency to Cost

Hands/Fingers
Backs
Eyes
Legs
Truck

Cost
Frequency
Forklift Fatalities
By Percentages

- Crushed by tipping vehicle: 42
- Crushed between vehicle and a surface: 25
- Crushed between two vehicles: 11
- Struck or run over by vehicle: 10
- Struck by falling material: 8
- Fall from platform on forks: 4
- Accidental activation of controls: 2
## Fatalities/Injuries Potentially Averted Annually by New Standard

<table>
<thead>
<tr>
<th>Sector</th>
<th># Fatalities</th>
<th>Estimated # Fatalities Averted</th>
<th># Injuries</th>
<th>Estimated # Injuries Averted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>0</td>
<td>0</td>
<td>47</td>
<td>5</td>
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<tr>
<td>Mining</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Construction</td>
<td>16</td>
<td>2</td>
<td>2,380</td>
<td>237</td>
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<tr>
<td>Manufacturing</td>
<td>35</td>
<td>4</td>
<td>44,976</td>
<td>4,481</td>
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<tr>
<td>Transportation</td>
<td>16</td>
<td>2</td>
<td>10,698</td>
<td>1,066</td>
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<tr>
<td>Longshoring &amp; Marine Terminals</td>
<td>3</td>
<td>0</td>
<td>275</td>
<td>27</td>
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<tr>
<td>Wholesale &amp; Retail Trade</td>
<td>23</td>
<td>2</td>
<td>31,649</td>
<td>3,153</td>
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<tr>
<td>Finance, Insurance &amp; Real Estate</td>
<td>0</td>
<td>0</td>
<td>79</td>
<td>8</td>
</tr>
<tr>
<td>Services</td>
<td>7</td>
<td>1</td>
<td>4,466</td>
<td>445</td>
</tr>
<tr>
<td>All Covered Industries</td>
<td>101</td>
<td>11</td>
<td>94,570</td>
<td>9,422</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis, 1997
What’s This Course All About?

Scope of This Training from Historical Perspective:

OSHA Adopted ASME 56.1 in 29 CFR 1910.718 in 1970. It is the basic starting point for training requirements in the United States for those in General Industry. Employees in Shipyards are covered by 1915.120, Marine Terminals by 1917.1, Longshoring by 1918.1, and Construction by 1926.602, but training requirements are the same as 1910.178(l). Somewhat minor additions are added, mainly related to the types of forklifts used and their attachments.

There is a separate Section in CFR regarding Industrial Batteries at 1926.403, but the material in 1910.178 regarding industrial batteries is sufficient.

On May 29, 1971 (36 FR 10466), OSHA adopted many existing Federal standards and national consensus standards as OSHA standards under Section 6(a) of the Occupational Safety and Health Act (OSH Act) (29 U.S.C. 655 et al.).

One of the consensus standards that was adopted under the Section 6(a) procedure was the American National Standards Institute (ANSI) B56.1-1969, Safety Standard for Powered Industrial Trucks. Among the provisions adopted from that consensus standard was the operator training requirement subsequently codified by OSHA at 29 CFR 1910.178(l). That requirement states:

"Only trained and authorized operators shall be permitted to operate a powered industrial truck. Methods shall be devised to train operators in the safe operation of powered industrial trucks."
What’s This Course All About?

Scope of This Training from Historical Perspective:

About 25 states have OSHAs approved by U.S. federal OSHA. Only California, Kentucky, Maryland, Michigan and Washington add a significant amount about of safety law.

States may add to CFR but may not delete anything. This is very important, because it allows us to use the state codes with confidence, knowing that CFR is included in its entirety and we are complying with all U.S. federal safety requirements.

In California, forklift safety is covered in GISO – General Industry Safety Orders 3656 – 3664. They will be the basis for most of our training today.
What’s This Course All About?

The only major change in United States forklift safety law since 1970 is the OSHA Final Rule of 1998, but it has now been incorporated into CFR 1910.178, mostly in paragraph (l), adding specific details regarding Training Program Content required by OSHA. We will cover these items in the next Module “Training Program Content.” When you finish this Modules, please go to that one, and complete it.

Since promulgation of the OSHA safety and health standards in 1971, the consensus standard (ANSI B56.1-1969) (now ASME B56.1) on which the general industry powered industrial truck standard was based has undergone four complete revisions (dated 1975, 1983, 1988, and 1993). The current edition standard, ASME B56.1-1993 (Ex. 3-1), addresses truck operator training as follows.
OSHA Code Prior to March 1, 1999 states:

- Only trained and authorized operators
- shall be permitted to operate a powered industrial truck.
- Methods shall be devised to train operators in the safe operation of powered industrial trucks.
The OSHA Code

- as Modified by Final Rule,
- Effective March 1, 1999, specifies:

- the type of training required,
- under what circumstances refresher training is required, and
- when operator evaluations are required.
OSHA Final Rule

- Effective March 1, 1999
- mandates a training program
- that bases the amount and type of training required on:
  - the operator’s prior knowledge and skill,
  - the types of equipment the operator will be operating,
  - the hazards present in the workplace, and
  - the operator’s demonstrated ability
to operate a forklift safely
Refresher Training is required if:

- the operator is involved in an accident
- or near-miss,
- the operator has been observed to be unsafe,
- evaluation indicates need for additional training,
- changes in the workplace
- affect safe forklift operation,
- or the operator is assigned
- to a different type of truck.
Evaluations of each operator’s performance are required:

- as part of the initial and refresher training
- and at least once every three years.

- [Remember to document your Safety Training, including evaluations.
- Make copies and file them for future reference, with names and dates, etc.]
What’s This Course All About?

4.19 Operator Training

4.19.1 Personnel who have not been trained to operate powered industrial trucks may operate a truck for the purposes of training only, and only under the direct supervision of the trainer. This training should be conducted in an area away from other trucks, obstacles, and pedestrians.

4.19.2 The operator training program should include the user's policies for the site where the trainee will operate the truck, the operating conditions for that location, and the specific truck the trainee will operate. The training program shall be presented to all new operators regardless of previous experience.
Training must consist of a combination of:

1. Formal Instruction
2. Practical Training
3. Evaluation

Practical Exercise by Student
Training Module®

- Formal Instruction

- OSHA regulations for Powered Industrial Trucks
- Materials adapted from 29 CFR 1910.178
- Note: OSHA requires training to be adapted to your specific personnel, equipment and facilities.
29 CFR 1910.178 contains the following paragraphs, which apply to most forklifts, with minor exceptions.

- (a) General Requirements
- (b) Designations
- (c) Designated Locations
- (d) Converted Trucks
- (e) Safety Guards
- (f) Fuel Handling & Storage
- (g) Storage Batteries
(h) Lighting Operations  
(i) Noxious Gases & Fumes  
(j) Dockboards, Bridgeplates  
(k) Trucks & Railroad Cars  
(l) Operator Training  
(m) Truck Operations  
(n) Traveling  
(o) Loading  
(p) Operation of the Truck  
(q) Maintenance of Industrial Trucks
(2) All new powered industrial trucks ...

- shall meet the design and construction requirements ...
- established in the “American National Standard for Powered Industrial Trucks,
  Part II, ANSI B56.1-1969”...

(3) Approved trucks shall bear a label or some other identifying mark
- indicating approval by the testing laboratory.
29 CFR (N) 1910.178
(a) General Requirements

(4) Modifications and additions

- which affect capacity and safe operation
- shall not be performed by the customer or user
- without manufacturer’s prior written approval
- Capacity, operation and maintenance instruction plates, tags, or decals
- shall be changed accordingly.
(5) If the truck is equipped with front-end attachments

- other than factory installed attachments,
- the user 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.

(6) The user shall see that all name-plates and markings are in place and are maintained in a legible condition.
(4) The E designated units are electrically powered units that have
- minimum acceptable safeguards against inherent fire hazards.

(5) The ES units ... are provided with
- additional safeguards to prevent emission of hazardous sparks
- and to limit surface temperatures.

(6) The EE units ...
- in addition to all the requirements for E and ES units ...
- [have] the electric motors and all other electrical equipment
- completely enclosed …
29 CFR (N) 1910.178
(e) Safety Guards

(1) High lift rider trucks shall be fitted with an overhead guard

- manufactured in accordance with paragraph (a) (2) of this section,
- unless operating conditions do not permit

(2) If the type of load presents a hazard,

- the user shall equip fork trucks with a vertical load backrest extension
- manufactured in accordance with paragraph (a) (2) of this section.
29 CFR (N) 1910.178
(f) Fuel Handling & Storage

1. The storage and handling of liquid fuels such as gasoline and diesel fuel shall be in accordance with

2. The storage and handling of liquefied petroleum gas fuel shall be in accordance with
29 CFR (N) 1910.178
Lighting/ Fumes

(h) Lighting for Operating Area

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

(i) Control of Noxious Gases and Fumes

(1) Concentration levels of carbon monoxide gas created by powered industrial truck operations

➢ shall not exceed the levels specified in Section 1910.1000.
(1) Battery charging installations shall be located in areas designated for that purpose.

(2) 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.
(4) A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.

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

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

(8) Trucks shall be properly positioned
   - and brake applied before attempting to change or charge batteries

(9) Care shall be taken to assure that vent caps are functioning.
   - The battery (or compartment) cover(s) shall be open to dissipate heat.
(10) Smoking shall be prohibited in the charging area.

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

(12) Tools and other metallic objects shall be kept away
- from the top of uncovered batteries.
(1) 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.

(3) Fixed jacks may be necessary to support a semitrailer
- and prevent upending during the loading or unloading
- when the trailer is not coupled to a tractor.
(2) Wheel stops or other recognized positive protection shall be provided
➢ to prevent railroad cars from moving during loading or unloading operations.

(4) Positive protection shall be provided
➢ to prevent railroad cars from being moved
➢ while dockboards or bridge plates are in position.
(m) Truck Operations

(1) Trucks shall not be driven up to anyone
  ➢ standing in front of a bench or other fixed object.

(3) Unauthorized personnel shall not be permitted
  ➢ to ride on powered industrial trucks.
  ➢ A safe place to ride shall be provided
  ➢ where riding of trucks is authorized.
(2) No person shall be allowed to stand or pass under
- the elevated portion of any truck,
- whether loaded or empty.

(4) The employer shall prohibit arms or legs from being placed
- between the uprights of the mast
- or outside the running lines of the truck.
(5) (i) When a powered industrial truck is left unattended,

- load engaging means shall be fully lowered,
- controls shall be neutralized,
- power shall be shut off,
- and brakes set.
- Wheels shall be blocked
- if the truck is parked
- on an incline.

29 CFR (N) 1910.178 (m) Truck Operations
(ii) A powered industrial truck is unattended when
- the operator is 25 ft. or more away from the vehicle
- which remains in his view,
- or whenever the operator leaves the vehicle
- and it is not in his view.

(iii) When the operator of an industrial truck is dismounted
- and within 25 ft. of the truck still in his view,
- the load engaging means shall be fully lowered,
- controls neutralized,
- and the brakes set
- to prevent movement.
(6) A safe distance shall be maintained
- from the edge of ramps or platforms
- while on any elevated dock,
- or platform
- or freight car.

- Trucks shall not be used for
- opening or closing freight doors.
(7) Brakes shall be set in place
- to prevent movement of
- trucks, trailers, or railroad cars
- while loading or unloading.
- Fixed jacks may be necessary
- to support a semi trailer
- during loading or unloading
- when the trailer is not coupled to a tractor.
The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven into.

(8) There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc...
(9) An overhead guard shall be used as protection against falling objects.

- It should be noted that an overhead guard is 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.
(10) A load backrest extension shall be used
➤ whenever necessary to minimize the possibility
➤ of the load or part of it falling rearward.

(11) Only approved industrial trucks shall be used
➤ in hazardous locations.
(12) Whenever a truck is equipped with vertical only, or vertical and horizontal controls, elevatable with the lifting carriage or forks for lifting personnel, the following additional precautions shall be taken for the protection of personnel being elevated.
29 CFR (N) 1910.178
(m) Truck Operations

(i) Use of a safety platform
- firmly secured to the lifting carriage and/or forks.

(ii) Means shall be provided whereby personnel on the platform
- can shut off power to the truck.

(iii) Such protection from falling objects
- as indicated necessary by the operating conditions
- shall be provided.
(n1) All traffic regulations shall be observed,
- including authorized plant speed limits.
- A safe distance shall be maintained
- of approximately three truck lengths from the truck ahead,
- and the truck shall be kept under control at all times.
(n2) The right of way shall be yielded to
- ambulances,
- fire trucks,
- or other vehicles in emergency situations.
- Other trucks traveling in the same direction at
- intersections,
- blind spots,
- or other dangerous locations
- shall not be passed.
(4) The driver shall be required to
- slow down
- and sound the horn
- at cross aisles and other locations
- where vision is obstructed.
- If the load being carried obstructs forward view,
- the driver shall be required to travel
- with the load trailing.
(5) Railroad tracks shall be crossed
- diagonally wherever possible.
- Parking closer than 8 feet from the center
- of railroad tracks is prohibited.

6) The driver shall be required to look
- in the direction of the path of travel.
(7) Grades shall be ascended or descended slowly.

(i) When ascending or descending grades

➤ in excess of 10 percent,
➤ loaded trucks shall be driven with the load upgrade.
(iii) On all grades

- the load and load engaging means
- shall be tilted back
- if applicable,
- and raised only as far as necessary
- to clear the road surface.
(8) Under all travel conditions the truck shall be operated
- at a speed that will permit it
- to be brought to a stop
- in a safe manner.

- Stunt driving and horseplay
- shall not be permitted.
(10) The driver shall be required
- to slow down for wet and slippery floors.

(11) Dockplates or bridgeplates
- shall be properly secured
- before they are driven over.
- Dockboard or bridgeplates shall be driven over
- carefully and slowly
- and their rated capacity never exceeded.
(12) Elevators shall be approached slowly,
- and then entered squarely
- after the elevator car is properly leveled.
- Once 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.
(14) Running over loose objects on the roadway surface
- shall be avoided.

(15) While negotiating turns, speed shall be reduced to a safe level
- by means of turning the hand steering wheel in a smooth, sweeping motion.
- Except when maneuvering at a very low speed,
- the hand steering wheel shall be turned at a moderate, even rate.
OSHA Final Rule

(i) Truck Related Topics

(i) Truck-related topics: Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;

(B) differences between the truck and the automobile

Study the 2 drawings to the right to see the difference.
(o) Loading

(1) Only stable or safely arranged loads shall be handled.
   - Caution shall be exercised when handling
   - off-center loads which cannot be centered.
(2) Only loads within the rated capacity of the truck shall be handled.
(3) The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.
29 CFR (N) 1910.178
(o) Loading

(4) Trucks equipped with attachments
   - shall be operated as partially loaded trucks
   - when not handling a load.

(5) A load engaging means shall be placed under the load

(6) as far as possible;
   - the mast shall be tilted backward
   - to stabilize the load
(6) Extreme care shall be used when tilting the load forward or backward,

- particularly when high tiering.
- Tilting forward with load engaging means elevated shall be prohibited
- 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.
(1) If at any time a powered industrial truck is found to be in

- need of repair,
- defective
- or in any way unsafe,
- the truck shall be taken out of service
- until it has been restored
- to safe operating condition.
(2) Fuel tanks shall not be filled while the engine is running.
- Spillage shall be avoided.

(3) Spillage of oil or fuel shall be carefully washed away
- or completely evaporated
- and the fuel tank cap replaced
- before restarting the engine.
(4) No truck shall be operated with a leak in the fuel system until the leak has been corrected.

(5) Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.
29 CFR (N) 1910.178
(q) Maintenance of Industrial Trucks

(1) Any power-operated industrial truck not in safe operating condition
   ➢ shall be removed from service.
   ➢ All repairs shall be made by authorized personnel.

(2) No repairs shall be made in class I, II, and III locations.
29 CFR (N) 1910.178
(q) Maintenance of Industrial Trucks

(3) Those repairs to the fuel and ignition systems of industrial trucks
   - which involve fire hazards shall be conducted only
   - in locations designated for such repairs.

(4) Trucks in need of repairs to the electrical system
   - shall have the battery disconnected
   - prior to such repairs.
(5) All parts of any such industrial truck requiring replacement shall be replaced only by parts

- equivalent as to safety with those used in the original design.

(6) Industrial 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
nor shall they be altered either by the addition of extra parts not provided by the manufacturer
or by the elimination of any parts,
except as provided in paragraph (q)(12) of this section.
Additional counter-weighting of fork trucks shall not be done
unless approved by the truck manufacturer.
(7) Industrial 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.
- Where industrial trucks are used on a round-the-clock basis,
- they shall be examined after each shift.
- Defects when found shall be immediately reported and corrected.
(8) Vehicles having screens or other parts that may become clogged
➢ shall not be operated while such screens or parts are clogged.
➢ 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.
(9) 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
- and not returned to service
- until the cause for such overheating
- has been eliminated.
(10) 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 degrees F) solvents shall not be used.
- Precautions regarding
- toxicity,
- ventilation,
- and fire hazard
- shall be consonant with the agent or solvent used.
(12) Industrial trucks originally approved for the use of gasoline for fuel may be

- converted to LPG fuel provided
- the complete conversion results in a truck which embodies
- the features specified for LP or LPS designated trucks.
- Such conversion equipment shall be
- approved.
Congratulations!

You have completed the Basic Forklift Operator Training Module®

This Module® covers most of the federal law you need to become a certified operator.

Thank-you for joining us!
We hope you enjoyed and benefited from this form of instruction.

Please send me your comments and/or suggestions to
Tom's Email