



Health & Safety Department

Powered Industrial Truck Training

(OSHA 1910.176; 1910.178 & 1910.30)



This material was produced under grant number 46EO-HT08 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U.S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

Revised 7/22/08



Health & Safety Department Powered Industrial Trucks, 1910.178

| <u>Page#:</u> | <u>Table of contents:</u> |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3. | PIT Exercise |
| 6. | 2000 – 2007 Non-Skilled Trades Fatalities |
| 14 (A). | 2000 – 2007 Skilled Trades Fatalities |
| 19. | 1973 – 2006 Powered Industrial Truck Fatalities |
| 21. | 1910.176 Material Handling & Storage |
| 22. | 1910.178 Paragraphs |
| 23. | 1910.178 PIT Standard |
| 36. | John Hopkins PIT Study |
| 39. | 1910.30 Other Working Surfaces |
| 41. | Difference in PIT & Automobile |
| 42. | Stopping Distances |
| 43. | Stability Triangle |
| 44. | 1910.178 “A” |
| 48. | Hierarchy of Controls Chart |
| 49. | PIT Evaluation Form |
| 51. | Pre-operation Check List |
| 52. | NIOSH Publication #2001-109 |
| 62. | Rules of the Road |
| 68. | OSHA Letters of Interpretation: <ul style="list-style-type: none">a) Fork Inspection Interpretationb) Secure Battery, vertical & horizontal Interpretationc) Workplace environmental and lift changes Interpretationd) Bulldozing Interpretation |
| 74. | Compliance Assistance 1910.178 |
| 86. | PIT Operator Training |
| 90. | Sample PIT Training Outline |
| 93. | MIOSHA PIT Standard (Part 21) |
| 103. | PIT Instructors Guide (Federal OSHA & MIOSHA) |



UAW Health & Safety Department

Powered Industrial Trucks.....CFR 1910.178

EXERCISE #1

List any near miss/hit with your plants Powered Industrial Trucks that you have heard about, observed or experienced. **Circle the (*)** if it could have or did result in a serious injury or death.

* _____

* _____

* _____

* _____

* _____

* _____

* _____

* _____

* _____

Exercise #2

In your groups answer the following discussion questions. There may be more than one correct response! (**Circle** your groups response[s] and **explain** why you choose them.)

A.) Anyone can just jump on a forklift and take right off. It is not much different than driving a car! **TRUE or FALSE**

B.) If the break area is a long way off, it is OK to let someone ride on the lift with you. **TRUE or FALSE**

C.) If there isn't enough room on the lift, they can ride on the forks
 TRUE or FALSE



UAW Health & Safety Department

D.) If I can't see around the load I can lean over to one side and keep a clear view of travel. **TRUE or FALSE**

E.) What conditions in the plant affects the handling of a forklift?
1.-water 2.-oil 3.-steel shot 4.-dust 5.-holes in the floor 6.-Narrow aisles

F.) A forklift weighs (**MORE or LESS**) than a full-size car.

G.) If the back of the lift raises up while you are picking up a load, you should:
1.-set it back down 2.-ask a co-worker to sit on the back of the lift 3.-get a bigger lift 4.-try again

H.) Powered Industrial Trucks should be inspected at least once a day.
TRUE or FALSE

I.) If the brakes on the lift are bad you can still drive it. Throwing it in reverse will stop it
TRUE or FALSE

J.) It is OK to walk under the forks of a lift if it is blocking the aisle. **TRUE or FALSE**

K.) All forklifts have seatbelts on them. **TRUE or FALSE**

L.) Seatbelts do not have to be worn, it is up to the individual. **TRUE or FALSE**



OCCUPATIONAL FATALITIES IN UAW REPRESENTED WORKPLACES- Non Skilled Trades

2000-September 2007

1. **February 9, 2000 – Steve Schneider; 48** years old; Machine Operator; 28 years seniority; **John Deere Dubuque Works**, Dubuque, Iowa; **LU 94; Region 4**; The victim was crushed between the head of a drilling fixture and the frame of the adjacent station on an engine block transfer line.
2. **February 27, 2000 – James Hunt; 53** years old; Truck Driver; 34 years seniority; **Ford Lorain Assembly**, Lorain, Ohio; **LU 425; Region 2**; The victim had pulled off a highway to provide assistance at an accident scene. He and a local police officer were injured when a pickup truck sped through the accident scene.
3. **April 14, 2000 – William Marsh; 51** years old; Crane Operator; 14 months seniority; **Bing Steel**, Melvindale, Michigan; **LU 155; Region 1**; The victim was crushed by steel coils as he was preparing coils for cutting.
4. **April 19, 2000 – Gwendolyn Blackwell; 35** years old; Checker; 12 years seniority; **DaimlerChrysler Twinsburg Stamping**, Twinsburg, Ohio; **LU 122; Region 2**; A fork truck was pushing two sets of baskets and two sets of boxes up a ramp and into the building. The lead set of boxes struck a rack causing the victim to be crushed against another fork truck. The victim was checking bar code labels on boxes in the aisle when the incident occurred.
5. **July 31, 2000 – James R. Sanson; 56** years old; Heat Treat Operator, Production; 31 years seniority; **Fairfield Manufacturing**, Lafayette, Indiana; **LU 2317; Region 3**; The victim and another heat treat operator were moving a punch press with a powered hand truck. The victim was on the operator side of the press and the other employee was operating the powered hand truck facing the opposite side of the press. The press tipped and fell onto the victim as it was being positioned in front of the press platform.
6. **September 13, 2000 – Janis Ruston; 53** years old; Stacker, Production; 7 years seniority; **Unique Fabricating, Inc.**, Rochester Hills, MI; **LU 9699; Region 1**; The victim died of crushing injuries when caught between the platens of a clam shell press. She was apparently removing debris when the operator cycled the press.
7. **September 17, 2000 – Barry Gerber; 52** years old; Forklift Operator; two months seniority; **Americold Logistics, Nesquehoning, PA**; **LU 677, Region 9**; The victim was pinned between the forklift he was operating and shelves in a frozen food warehouse.
8. **September 19, 2000 – Dwayne Smith; 42** years old; Production Material Handling, 1 month seniority; **Sennett Steel Corporation**, Madison Heights, MI; **LU 417; Region 1**; The victim was crushed by rolls of steel in a staging area.

9. **October 18, 2000 – Bishop Jenkins; 42** years old; Facility Technician; 9 months seniority; **New Haven Foundry**; New Haven, Michigan; **LU 429; Region 1**; The victim was moving four racks with a fork truck, that had the overhead guard removed. The racks snagged an overhead guide wire for a phone line causing the top rack to fall back and crush him.
10. **November 16, 2000 – Michael Spears; 28** years old, Grounds Maintenance Worker, 6 years seniority, **Chrysler Proving Grounds**, Chelsea, Michigan; **LU 1284; Region 1A**; The victim fell off of the back of a truck as he was picking up traffic cones from the driving course.
11. **January 25, 2001 – Gary Hool; 48** years old; Cupola Operator; 30 years seniority; **General Motors Saginaw Metal Castings Operations**; Saginaw, MI; **LU 668; Region 1D**. The victim was crushed when the brick inside the furnace collapsed during a re-bricking procedure. There was no written procedure on how this task should be performed. There was no formal training for this task. A written SOP was put in place with training to ensure workers safety.
12. **February 2, 2001 – Frank Sepich; 39** years old; A-Fabricator Welder; 19 years seniority; **Rohn Industries, Inc.**; Bellevue, Illinois; **LU 1494; Region 4**. The victim sustained fatal head injuries when a weld on a homemade jib crane broke causing the crane to fall. The company had fabricated many of the jib cranes that were in use. They did not follow ANSI recommendations for crane construction. After the incident all cranes used in house were purchased from a crane manufacturer.
13. **March 10, 2001 – Don Tafoya; 61** years old; Chipper/Hand Tool Operator; 27 years seniority; **Ford Cleveland Casting**; Brook Park, OH; **LU 1250; Region 2**. The victim died as a result of contracting Legionnaires Disease. Local Health Department officials along with the National Center for Disease Control investigated and made recommendations. The company closed the facility until the recommendations were met. The source of the bacteria was never found.
14. **March 13, 2001 – Ronald Imel; 38** years old; INDOT Equipment Mechanic II; 16 years seniority; **Indiana Department of Transportation**; Madison, IN; **LU 9212; Region 3**. The victim was killed as a trailer broke loose from an oncoming vehicle and struck the INDOT vehicle that he was a passenger in.
15. **March 16, 2001 – David Hinderman; 53** years old; Core Machine Operator; 32 years seniority; **Ford Cleveland Casting**; Brook Park, OH; **LU 1250; Region 2**; The victim died as a result of contracting Legionnaires Disease. Local Health Department officials along with the national Center for Disease Control investigated and made recommendations. The company closed the facility until the recommendations were met. The source of the bacteria was never found.
16. **May 6, 2001 – William Leroy Beckett; 57** years old; Lift Truck Shipper; 39

- years seniority; **Armstrong Air Conditioning Inc**; Bellevue, Ohio; **LU 1623; Region 2B**. The victim was injured on April 12, 2001 when a stack of 4 air conditioners fell in an outside yard during windy conditions. He was unloading an order on a fork truck and had one unit on the fork truck. He was standing near units stacked 4 high when the top 3 fell over, crushing him. The units reportedly weigh 600 lbs. each.
17. **July 3, 2001 – Johnie Brooks Jr.; 57** Years old; Coach Service Attendant; 2 months seniority; **SMART Transit Authority, Oakland Terminal**, Troy, Michigan; **LU 417; Region 1**; The victim was walking through a parking area when he was struck by a car exiting the lot.
18. **July 21, 2001 – Randy Wark; 52** years old; Die Setter Leader; 32 years seniority; **GM Metal Flint Metal Center**; Flint, Michigan; **LU 659; Region 1C**; The victim was crushed during an automatic die change on a 2000 ton stamping machine. It is believed that the victim entered an unguarded area to pick up some material from the floor. The company is addressing the unguarded area.
19. **July 24, 2001 – James Redman; 54** years old; Machine Operator; 5 years seniority; **Kinney Vacuum**, Canton Massachusetts; **LU 1596; Region 9A**; The victim was crushed in a machining operation while performing maintenance.
20. **October 1, 2001 – Ben Shahan; 46** years old; Material Trainer; 4 years seniority; **VPI Mirrex**, Delaware City, Delaware; **LU 1756; Region 8**; The victim was directing the operation of a hoist when a sling failed. This caused the boom to hit the victim in the head. The operator of the crane had not been trained on safe crane operation. There also should have been a "Load Limiting Device" for the type of condition they were operating under.
21. **October 5, 2001 – Jason Furll; 32** years old; Fork Lift Operator; 3 years seniority; **American Axle**, Detroit, Michigan; **LU 262; Region 1**; The victim was using a fork truck to pick up the top two racks of a stack of four. The racks were loaded with axles and stored on three percent grade. The weight and imbalance of the load caused the fork lift to tip over. The victim was pinned between the floor and the overhead cage.
22. **May 2, 2002 – Thomas Carter; 67** years old; Engineering Assistant; 16 years seniority; **Indiana Department of Transportation**; Clarksville, Indiana; **LU 9212, Region 3**. The victim was killed by a pickup truck, driven by a sub-contractor while working on improvements being made on I-65. They were in the process of setting safety cones in place for a de-acceleration lane and the victim was bent over on the right side of the truck as the driver backed up. The back-up warning system was operational on the truck at the time of the incident.
23. **July 17, 2002 – Bonnie Pellegrino; 53** years old; Maintenance 3; 23 years seniority; **Indiana Department of Transportation**; Roselawn, Indiana; **LU 9212, Region 3**. The victim was flagging at a construction site when backed over by a truck driven by a co-worker. The victim died on July 26, 2002.

- 24. August 16, 2002 – Tony Johnson; 34** years old; Laborer; two years seniority; **INTAT Precision, Inc.;** Rushville, Indiana; **LU 2339, Region 3.** The victim was relieving an operator on the jet blast machine. The jet blast machine has a conveyor that dumps containers onto a conveyor table. When the machine cycled, the pivot head arm swung around and caught the victim's head between the pivot head and the conveyor, killing him instantly.
- 25. August 22, 2002 – Gary Petty; 62** years old; Maintenance Worker 3; 17 years seniority; **Indiana Department of Transportation;** Washington, Indiana; **LU 9212, Region 3.** Two Indiana Department of Transportation workers were struck by a panel van on State Road 57. Both workers were airlifted to Davies County Hospital. Mr. Petty died in the hospital.
- 26. August 29, 2002 – Mary Henderson; 58** years old; Toll Booth Operator; 9 years seniority; **Indiana Department of Transportation;** Fremont, Indiana; **LU 9212, Region 3.** The victim was leaving a tollbooth when she slipped and fell under the wheels of a semi-truck tractor.
- 27. October 14, 2002 – Aron L. Stanwood; 26** years old; Mold Operator; 6 years seniority; **Venture Industries;** Seabrook, New Hampshire; **LU 1913, Region 9A.** The victim was removing a part from an injection molding machine when one half of the mold came loose causing crushing injuries. The victim died on October 18, 2002.
- 28. January 16, 2003 – David W. Borgmann; 45** years old; Maintenance Worker II; 22 years seniority; **Indiana Department of Transportation;** Indianapolis, Indiana; **LU 9212, Region 3.** The victim was temporarily assigned to snow removal and was assisting in unloading salt from a truck. A front-end loader was moving the unloaded salt back to a "Salt Dome" shed, when it backed up and ran over the victim. The victim died on January 17, 2003 from multiple injuries.
- 29. June 4, 2003 – Thomas Hanlon; 56** years old, Machine Operator; 16 years seniority; **Eaton Corporation, Truck Clutch Division;** Auburn, Indiana; **LU 164, Region 3.** A machine operator suffered fatal crushing injuries when caught in a clutch testing machine. The machine was designed to cycle in the automatic mode whenever the operator cleared the 32-inch vertical light curtain. The light curtain was located 11 inches from the machine table frame. The operator was standing alongside the machine, past the light curtain, and leaning into the machine when the carrier plate lowered crushing him against the base table.
- 30. November 7, 2003 – Concepcion Rodriguez; 55** years old: Arc Wash Welder; 16 years seniority; **Chicago Castings;** Cicero, Illinois; **Local 477, Region 4.** The victim was electrocuted while attempting to turn on a welding machine with the breaker switch mounted on the side of the equipment. Operators had experienced shocks from the equipment previously and maintenance had performed work on the equipment the previous day.
- 31. February 4, 2004 – Karen Algren; 59** years old; Spot Welder; 26 years seniority; **International Truck;** Springfield, Ohio; **LU 402, Region 2B.** The victim was walking along an outside roadway on her way to an appointment in another building when she

was struck by a semi truck tractor that was backing up.

32. **September 15, 2004 - Gregory Spranger, 49** years old; Job Setter; 7 years seniority; **DaimlerChrysler**, Detroit, Michigan, **LU 51, Region 1**. The victim was using a cell phone while walking outdoors during his break when he was struck by a fork truck carrying a chip bin. The victim was in the driver's blind spot when he was struck.
33. **October 4, 2004 – Brian Bongiorno, 31** years old: Facility Technician, 2 years seniority; **Accuride**, Erie, Pennsylvania, **LU 1186, Region 9**. The victim was crushed as he was assisting a two man crew that was in the process of removing a ball screw mechanism from a wheel forming machine. Electrical power had been locked out, but it appears motion was caused by stored hydraulic energy.
34. **November 18, 2004 – Joyce Williams, 43**, Construction Inspector, 10 years seniority; **Indiana Department of Transportation**; Edinburg, Indiana; **LU 9212, Region 3**. The victim was crushed when she was standing about 5 feet in front of an asphalt roller when the machine lunged forward.
35. **May 13, 2005 - Jeffrey Mankowski, 38** years old, Semi-Truck Driver, five years seniority; **DaimlerChrysler**, Detroit, Michigan, **LU 212, Region 1**. The victim was on the Ohio Turnpike near Castalia, Ohio when he veered off the road and struck another truck that was on the roadside for a flat tire. The incident occurred at about 3:30 p.m.
36. **December 14, 2005 – James Beach (died 5/12/06), 61** years old, General Assembler 3, 15 years seniority, **IC Corporation**, Conway, Arkansas, **LU 1762, Region 5**. The victim was checking under the bus chassis to determine if a differential plug was tight. At that time, a co-worker moved the chassis from one station to another, and the victim was run over.
37. **February 17, 2006 – Ronald “Ronnie” Rodriguez; 46** years old: Utility Operator; six months seniority; **NSK**; Ann Arbor, Michigan; **LU 38, Region 1A**. The victim was killed when the forklift he was driving backed through and fell off a vacant truck well on a shipping-receiving dock. The well opening was not guarded.
38. **March 9, 2006 – Hector Rivas; 57** years old; Bus Mechanic; 12 years seniority, **First Student Inc.**, Boston, MA, **LU 1596, Region 9A**. The victim was apparently overcome by carbon monoxide while seated in a school bus service vehicle. Carbon monoxide was generated by an un-vented gasoline powered generator mounted inside the vehicle.
39. **August 30, 2006 – James Palmatier, 59** years old; Semi-Truck Driver; 29 years seniority, **Automotive Component Carrier Inc.**, Flint, Michigan, **LU 659, Region 1C**. The victim was assisting another driver on a shipping/receiving dock, when he was pinned between the trailer and the overhead door jam causing fatal injuries.
40. **February 2, 2007 – Francisco Fraticelli: 59** years old; Core Tech/Utility; 32 years seniority; **Ford Motor Company – Cleveland Casting Plant**; Brook Park, Ohio; **LU 1250, Region 2B**. The victim was found lying face down inside a core machine. He had relieved the regular operator approximately 20 minutes earlier. There were no witnesses to the incident and it is unclear why the victim entered the machine. Core machine operators routinely perform tasks in this area and it appeared that a perimeter barrier (railing) had been removed to gain access. The victim was working alone at the time of the incident

- 41. September 13, 2007- Neil McMichael: 61** years old; Machine Operator; 43 years seniority; PPG Incorporated; Crestline, OH; **LU (not assigned - newly organized); Region 2-B.** Victim was crushed and killed when he was caught in a glass washing machine while un-jamming glass from the machines roller conveyor.
- 42. September 22, 2007- Jon Kelley Wright: 48** years old; Machine Operator; 21 year seniority; Chrysler Corporation-Kokomo Transmission: Kokomo, IN; **LU 1166, Region 3.** The victim was working on Die Cast Machine 403 making visual checks of parts and removing overflows and flash from bell housings at the time of the incident. At approximately 2 am. he notified his supervisor of problems with an ejector limit switch which he had tightened a bolt on earlier in the shift. He further stated if the bolt came loose again skilled trades would need to be called. A co-worker found the victim in the machine near the ejector limit switch at approximately 5 am. fatally injured. He had apparently entered the machine through an access door equipped with a basic safety interlock. He was crushed between the slide and die block when the machine cycled.
- 43. December 7, 2007 – Jesse A. Brown II: 40** years old; Production, 18 years seniority; Federal Mogul Corporation, Powertrain Energy Systems; Sparta MI; **LU 8, Region 1D.** The victim, assigned to the shakeout job on #6 Line, was found shortly after the start of overtime with his body pinned across the shoulder and chest by the hydraulic powered lid of a shot blast machine. No fixed guarding or presence sensing devices safeguard this area. The equipment, found in the automatic mode, allows the lid, weighing approximately 1000 lbs., to close automatically on a time delay. A plastic insert designed to prevent smaller parts from falling through openings onto the shakeout conveyor may not have been in place at the time of the incident. The victim was apparently reaching down into the machine to collect parts that had fallen onto the shakeout conveyor when the lid came down and crushed him.

Sorted by "Cause of Fatality"

| <u>Cause:</u> | <u>Age:</u> | <u>Seniority:</u> (Years) |
|-----------------------|--------------------|-------------------------------------|
| Electrocution | 55 | 16 |
| Guarding/LOTO | 48 | 28 |
| Guarding/LOTO | 52 | 32 |
| Guarding/LOTO | 54 | 5 |
| Guarding/LOTO | 34 | 2 |
| Guarding/LOTO | 26 | 6 |
| Guarding/LOTO | 56 | 16 |
| Guarding/LOTO | 31 | 2 |
| Guarding/LOTO | 61 | 15 |
| Guarding/LOTO (F) | 53 | 7 |
| Highway | 53 | 34 |
| Highway | 38 | 16 |
| Highway | 57 | .1 |
| Highway | 67 | 16 |
| Highway | 62 | 17 |
| Highway | 45 | 22 |
| Highway | 38 | 5 |
| Highway | 46 | 5 |
| Highway (F) | 53 | 23 |
| Highway (F) | 58 | 9 |
| Highway (F) | 59 | 26 |
| Highway (F) | 43 | 10 |
| Illness | 61 | 27 |
| Illness | 53 | 32 |
| Material Handling | 51 | 1.2 |
| Material Handling | 56 | 31 |
| Material Handling | 56 | .2 |
| Material Handling | 42 | .1 |
| Material Handling | 42 | .8 |
| Material Handling | 28 | 6 |
| Material Handling | 48 | 30 |
| Material Handling | 39 | 19 |
| Material Handling | 57 | 39 |
| Material Handling | 46 | 4 |
| Material Handling | 32 | 3 |
| Material Handling | 49 | 7 |
| Material Handling (F) | 35 | 12 |
| CO2 | 57 | 12 |
| Material Handling | 59 | 29 |
| Machine Guarding/LOTO | 59 | 32 |
| Machine Guarding/LOTO | 61 | 43 |
| Machine Guarding/LOTO | 48 | 21 |
| Machine Guarding/LOTO | 40 | 18 |

Sorted by "Age"

| | | |
|-----------------------|----|-----|
| Guarding/LOTO | 26 | 6 |
| Material Handling | 28 | 6 |
| Guarding/LOTO | 31 | 2 |
| Material Handling | 32 | 3 |
| Guarding/LOTO | 34 | 2 |
| Material Handling (F) | 35 | 12 |
| Highway | 38 | 16 |
| Highway | 38 | 5 |
| Material Handling | 39 | 19 |
| Machine Guarding/LOTO | 40 | 18 |
| Material Handling | 42 | .1 |
| Material Handling | 42 | .8 |
| Highway (F) | 43 | 10 |
| Highway | 45 | 22 |
| Highway | 46 | 5 |
| Material Handling | 46 | 4 |
| Guarding/LOTO | 48 | 28 |
| Material Handling | 48 | 30 |
| Machine Guarding/LOTO | 48 | 21 |
| Material Handling | 49 | 7 |
| Material Handling | 51 | 1.2 |
| Guarding/LOTO | 52 | 32 |
| Guarding/LOTO (F) | 53 | 7 |
| Highway | 53 | 34 |
| Highway (F) | 53 | 23 |
| Illness | 53 | 32 |
| Guarding/LOTO | 54 | 5 |
| Electrocution | 55 | 16 |
| Guarding/LOTO | 56 | 16 |
| Material Handling | 56 | 31 |
| Material Handling | 56 | .2 |
| Highway | 57 | .1 |
| Material Handling | 57 | 39 |
| CO2 | 57 | 12 |
| Highway (F) | 58 | 9 |
| Highway (F) | 59 | 26 |
| Material Handling | 59 | 29 |
| Machine Guarding/LOTO | 59 | 32 |
| Guarding/LOTO | 61 | 15 |
| Illness | 61 | 27 |
| Machine Guarding/LOTO | 61 | 43 |
| Highway | 62 | 17 |
| Highway | 67 | 16 |

Sorted by "Seniority"

| | | |
|-----------------------|----|----|
| Highway | 57 | .1 |
| Material Handling | 42 | .1 |
| Material Handling | 56 | .2 |
| Material Handling | 42 | .8 |
| Material Handling | 51 | 01 |
| Guarding/LOTO | 34 | 02 |
| Guarding/LOTO | 31 | 02 |
| Material Handling | 32 | 03 |
| Material Handling | 46 | 04 |
| Guarding/LOTO | 54 | 05 |
| Highway | 38 | 05 |
| Highway | 46 | 05 |
| Guarding/LOTO | 26 | 06 |
| Material Handling | 28 | 06 |
| Guarding/LOTO (F) | 53 | 07 |
| Material Handling | 49 | 07 |
| Highway (F) | 58 | 09 |
| Highway (F) | 43 | 10 |
| Material Handling (F) | 35 | 12 |
| CO2 | 57 | 12 |
| Guarding/LOTO | 61 | 15 |
| Electrocution | 55 | 16 |
| Guarding/LOTO | 56 | 16 |
| Highway | 38 | 16 |
| Highway | 67 | 16 |
| Highway | 62 | 17 |
| Machine Guarding/LOTO | 40 | 18 |
| Material Handling | 39 | 19 |
| Machine Guarding/LOTO | 48 | 21 |
| Highway | 45 | 22 |
| Highway (F) | 53 | 23 |
| Highway (F) | 59 | 26 |
| Illness | 61 | 27 |
| Guarding/LOTO | 48 | 28 |
| Material Handling | 59 | 29 |
| Material Handling | 48 | 30 |
| Material Handling | 56 | 31 |
| Guarding/LOTO | 52 | 32 |
| Illness | 53 | 32 |
| Machine Guarding/LOTO | 59 | 32 |
| Highway | 53 | 34 |
| Material Handling | 57 | 39 |
| Machine Guarding/LOTO | 61 | 43 |



REPORTED OCCUPATIONAL FATALITIES AMONG SKILLED TRADES WORKERS IN UAW-REPRESENTED WORKPLACES 2000-2007

1. **February 24, 2000 – Daniel Schonmeier; 58 years old; Electrician (S/T); 18 years seniority; General Motors Saginaw Metal Casting Operations, Saginaw, Mi.; LU 668; Region 1D;** The victim was pinned between the back of a sand distribution car and the sand hopper while replacing reflective tape on the board at the sand dump.
2. **May 17, 2000 – Lazaro Fuentes; 50 years old; Machine Repair (S/T); 12 years seniority; DaimlerChrysler Jeep Assembly Plant, Toledo, Ohio; LU 12; Region 2B;** The victim and another machine repairman were replacing an air valve on a robot spot welder on the side body line. The victim walked across the line to get the replacement valve from another skilled tradesman and as he was walking back the transfer rails returned crushing him.
3. **September 18, 2000 – Larry Green; 56 years old; Plumber-Pipefitter (S/T); 29 years seniority; Visteon Corporation, Sterling Axle Plant, Sterling Heights, Mi.; LU 228; Region 1;** The victim was crushed while installing a pneumatic cylinder on a parts loading station of an automatic machining line. Maintenance activity initiated the loader cycle while the victim was between the conveyor and the automatic gantry loader.
4. **October 13, 2000 – Kenneth Hudgens; 54 years old; Millwright (S/T); 12 years seniority; Visteon Nashville Glass; Nashville, TN; LU 737; Region 8;** The victim was crushed as he was performing preventative maintenance work when the machine was cycled inadvertently.
5. **November 24, 2000 – David Lyons; 51 years old, Electrician (S/T) , 28 years Seniority, Delphi Chassis, Dayton, Ohio; LU 696; Region 2-B;** The victim was crushed by a semi-truck trailer as he was working on a shipping/ receiving dock. (Working alone)
6. **November 13, 2001-Richard Robbins; 54 years old; Electrician (ST), 25 years seniority; General Motors, Arlington, Texas; LU 276; Region 5;** The victim received fatal injuries when a burden carrier he was driving struck a building column.
7. **March 7, 2002 – John Aue; 52 years old; Millwright (S/T); 32 years seniority; Federal Mogul; Sparta, MI; LU 8, Region 1D.** The victim was checking for leaking bags in an unlighted dust collector with an ultraviolet (black) light, when he fell 30 feet down an unguarded 60-inch clean air duct.
8. **July 30, 2002 – Samuel R. Heckman: 55 years old, Refrigerator and Air Conditioning Maintenance Journeyman (S/T); 34 years seniority (24 years in classification); GM Allison Transmission, Indianapolis, IN; LU 933, Region 3.** The victim was repairing a fan on the roof when he stumbled backwards and fell over a parapet wall, falling 20 feet to his death.
9. **September 2, 2002 – Harold Moyle; 64 years old; Electrician (S/T) 31 years seniority; General Motors; Linden, New Jersey; LU 595, Region 9.** The victim fell 8' through a drop ceiling panel down to a steel floor adjacent to a paint spray booth. The victim was assigned to repair lights and apparently was tracking electrical lines. The ceiling panel the victim fell through was not secured to any structural beams.
10. **March 18, 2003 – Drago Ilisevich; 57 years old; Toolmaker (S/T); 29 years seniority; DaimlerChrysler, McGraw Glass; Detroit, Michigan; LU 227, Region 1A.** The victim crawled onto the #4 Roller Hearth Furnace to perform a routine maintenance task of replacing screen meshing used to assist the cooling process. While performing this task, the shuttle cycled, striking Brother Ilisevich in the head and ultimately dragging him 12 feet.

11. **August 2, 2003 – Raul R. Martinez; 54** years old; Caster Mechanical Team (Pipefitter) S/T 29 years seniority; **Rouge Steel**; Dearborn, Michigan; **LU 600, Region 1A**. The victim was removing a cracked roller on a continuous support roller assembly located on a rebuild stand. The victim had removed two one-inch bolts from the bearing block on one side and was removing the second bolt from the opposite side when the roller separated and fell. One of the parts fell striking the victim causing fatal injuries.
12. **October 23, 2003 – John Foster; 42** years old; General Maintenance (S/T); 15 years seniority; **Mitsubishi Manufacturing**; Normal, Illinois; **Local 2488, Region 4**. The victim was performing routine preventive maintenance, prior to the start of the day shift, on automated seat/tire carriers when he was caught between two carriers. He was working alone and had entered the area through an unguarded opening.
13. **October 30, 2003 - Douglas A. Mellom; 44** years old; Millwright (S/T); 25 years seniority; **General Motors**; Janesville, Wisconsin; **Local 95, Region 4**. The victim was on the roof of a freight elevator realigning the safety gate. After he had aligned the gate and as he was attempting to enter the access opening to return to ground level, he fell over the edge of the elevator roof 18 feet to the floor below.
14. **November 3, 2003 – Ed Steinke; 55** years old; Electrician (S/T); 32 years seniority; **Ford Motor**; Livonia, Michigan; **Local 182, Region 1**. The victim was on a JLG aerial lift removing old conduit from the overhead steel structure when he was caught between the upper guardrail of the basket and a six inch pipe.
15. **November 22, 2003 – Jeff West; 44** years old; General Welder (S/T); 13 years seniority; **Ford Motor Company**; Dearborn, Michigan; **Local 600, Region 1A**. The victim fell approximately twenty (20) feet to a basement area during the installation of a stamping machine. He had received numerous injuries including head injuries and **died on December 22, 2003**.
16. **June 22, 2004 – Gerald F. Storey, 62** years old; Millwright (S/T); 33 years seniority; **Ford Motor Company**, Woodhaven, Michigan, **LU 387, Region 1A**. The victim was troubleshooting a 50-ton overhead crane when there was a catastrophic failure of the hoisting system causing traumatic head injuries.
17. **October 29, 2004- Marcel Chagnon, 53** years old, Machine Repair (S/T), 33 years seniority: **General Motors**; Warren, Michigan, **LU 909, Region 1**. The victim was crushed during maintenance of a pick and place robot. There was a failure of the rigging allowing a temporarily unblocked weight suspended over the victim to fall.
18. **February 10, 2005 – Rodney Windish, 52** years old; Electrician (S/T); six years seniority; **EaglePicher**, Traverse City, Michigan, **LU 3032, Region 1D**. The victim was troubleshooting a machining operation inside a guarded area when motion was initiated, causing crushing injuries.
20. **July 16, 2005 – Wayne Mueth (died 7/17/05), 42** years old, Millwright (S/T), 21 years seniority, **DaimlerChrysler**, Fenton, Missouri, **LU 110, Region 5**. Victim was ejected from a work platform basket elevated on hi-lo forks while pulling conveyor chain, which was attached to the basket. Investigation indicates that a weld securing the restraining chain attaching the basket to the mast failed, causing the basket to slide on the forks and then fall.
21. **July 28, 2005 – Brett Maggart, 41** years old, Electrician (S/T), 12 years seniority, **DaimlerChrysler Kokomo Transmission**, Kokomo, Indiana, **LU 685, Region 3**. Victim was servicing equipment when it cycled and he was crushed. (Working alone)

- 22. February 2, 2006 – William “Bill” Neill; 59 years old; Millwright; 39 years seniority; Ford Motor Company; Sterling Heights, Michigan; LU 228, Region 1.** The victim was struck by a falling conveyor section while he and a co-worker were unloading a conveyor system and components from a flatbed truck trailer. After the co-worker had removed a skid containing components with a forklift, an unrestrained adjacent section of roller conveyor, which weighed about 800 pounds, toppled and struck the victim who was standing adjacent to the trailer.
- 23. February 26, 2006 (deceased April 3, 2006) - Michael A Kruszka; 57 years old; Millwright, 38 years seniority; DaimlerChrysler Sterling Stamping Plant, Sterling Heights, Michigan, LU 1264, Region 1.** The victim suffered a head injury after falling five feet from a temporary maintenance platform in a press basement while securing a cushion to a press.
- 25. November 28, 2006 - Allen Randleman, 58 years old; Maintenance Technician, 31 years seniority, Mayflower Vehicle Systems (CVG Inc.), Norwalk, Ohio, LU 1379, Region 2B.** The victim suffered a head injury while troubleshooting doors that were jammed on a vehicle body in a sealer-curing oven.
- 26. January 16, 2007 – James Bains: 64 years old; Electrician; 6 years seniority; CC Metal and Alloys; Calvert City, Kentucky; LU 523, Region 3.** The victim was found mortally injured near the base of a manlift vertical conveyor used to travel up and down 4 levels of an electric arc furnace. He had apparently fallen while descending on the manlift. The victim had been assigned to change light bulbs at the top of the eight story furnace and was **working alone** at the time of the incident. The victim fell from the 8th floor to 4th floor, a distance of approximately 66 feet.
- 27. February 12, 2007 – Michael Tiller: 51 years old; Electrician; 32 years seniority; DaimlerChrysler – Toledo North Assembly; Toledo, Ohio; LU 12, Region 2B.** The victim was found lying on the roller bed of a Hydra-Handler battery changing truck, fatally injured, with his arm pinned in the battery washer door. He was assigned to change, charge and maintain batteries for powered industrial vehicles at the facility. There were no witnesses to the incident and it is unclear why the victim was on the roller bed in front of the battery washer. The victim was **working alone** at the time of the incident. Initial investigation indicates the washer door may have mis-cycled and closed on the victim’s arm causing him to fall to the roller bed.
- 28. April 21, 2007 - Anthony J. Dier: 64 years old; Mechanic; 35 years seniority; Kohler Company; Kohler, Wisconsin; LU 833, Region 4.** The victim and another mechanic were assigned to disassemble the lid of an electric arc furnace, which included a shaft and yoke assembly, and remove it from the building. After disassembly, the mechanics moved the lid by fork truck to a second story access door and dropped it to the yard below. They could not separate the yoke and shaft as planned so a decision was made to move it in one piece. At this point, the second mechanic went down to the first floor. It is likely the victim used a fork truck to move the shaft and yoke assembly to the second story access door and attempted to transfer it to the yard using a 10 ton, pendulum controlled, overhead crane located nearby. The shaft and yoke assembly apparently fell, striking the victim in the head and pinning him to the floor. The victim was **working alone** at the time of the incident.

Skilled Trades Fatalities, 2000-2007

Sorted by "CAUSE":

| Cause: | Age: | Seniority: |
|------------------------|-------------|-------------------|
| C.S. | 52 | 32 |
| CRANE-Trouble-shooting | 62 | 33 |
| FALL | 55 | 34 |
| FALL | 64 | 31 |
| FALL | 44 | 25 |
| FALL | 44 | 13 |
| FALL | 57 | 38 |
| FALL | 64 | 06 |
| JLG-LIFT-Crushing | 55 | 32 |
| LOTO | 58 | 18 |
| LOTO | 50 | 12 |
| LOTO | 56 | 29 |
| LOTO | 54 | 12 |
| LOTO | 51 | 28 |
| LOTO | 57 | 29 |
| LOTO | 54 | 29 |
| LOTO | 41 | 12 |
| LOTO | 42 | 15 |
| LOTO | 42 | 21 |
| LOTO | 53 | 33 |
| LOTO | 52 | 06 |
| LOTO | 58 | 31 |
| LOTO | 51 | 32 |
| PIT | 54 | 25 |
| Material Handling | 59 | 39 |
| Material Handling | 64 | 35 |

Sorted by "AGE":

| Cause: | Age: | Seniority: |
|------------------------|-------------|-------------------|
| LOTO | 41 | 12 |
| LOTO | 42 | 15 |
| LOTO | 42 | 21 |
| FALL | 44 | 25 |
| FALL | 44 | 13 |
| LOTO | 50 | 12 |
| LOTO | 51 | 32 |
| LOTO | 51 | 28 |
| C.S. | 52 | 32 |
| LOTO | 52 | 06 |
| LOTO | 53 | 33 |
| LOTO | 54 | 12 |
| LOTO | 54 | 29 |
| PIT | 54 | 25 |
| FALL | 55 | 34 |
| JLG-LIFT-Crushing | 55 | 32 |
| LOTO | 56 | 29 |
| FALL | 57 | 38 |
| LOTO | 57 | 29 |
| LOTO | 58 | 18 |
| LOTO | 58 | 31 |
| Material Handling | 59 | 39 |
| CRANE-Trouble-shooting | 62 | 33 |
| Material Handling | 64 | 35 |
| FALL | 64 | 31 |
| FALL | 64 | 06 |

Skilled Trades Fatalities, 2000-2007

Sorted by "SENIORITY":

| Cause: | Age: | Seniority: |
|------------------------|------|------------|
| FALL | 64 | 06 |
| LOTO | 52 | 06 |
| LOTO | 50 | 12 |
| LOTO | 54 | 12 |
| LOTO | 41 | 12 |
| FALL | 44 | 13 |
| LOTO | 42 | 15 |
| LOTO | 58 | 18 |
| LOTO | 42 | 21 |
| FALL | 44 | 25 |
| PIT | 54 | 25 |
| LOTO | 51 | 28 |
| LOTO | 56 | 29 |
| LOTO | 57 | 29 |
| LOTO | 54 | 29 |
| FALL | 64 | 31 |
| LOTO | 58 | 31 |
| LOTO | 51 | 32 |
| C.S. | 52 | 32 |
| JLG-LIFT-Crushing | 55 | 32 |
| CRANE-Trouble-shooting | 62 | 33 |
| LOTO | 53 | 33 |
| FALL | 55 | 34 |
| Material Handling | 64 | 35 |
| FALL | 57 | 38 |
| Material Handling | 59 | 39 |

1. What is the # 1 cause of fatalities in skilled trades?
2. What is the #2 cause of fatalities in skilled trades?
3. The younger skilled trades are not careful enough? True___ False___
Why or why not?
4. The majority of skilled trades fatalities have 15 or more years seniority. What, in your groups opinion, is the reason(s) that may lead to the fatality?
5. Review the 6 "Fall Fatalities" (# 7, 8, 9, 13, 15 and 23). How could these have been prevented?

UAW POWERED INDUSTRIAL TRUCK



FATALITIES 1973 - 2005

| | Date | Job Title | Incident Description |
|----|----------|---------------------------|---------------------------------------------------------------------------|
| 1 | 03/27/73 | Utility Man | Caught between overhead guard & ground |
| 2 | 03/18/74 | Material Handler | Crushed by lift truck falling onto him |
| 3 | 03/18/74 | Material Handler | Fell down elevator shaft - from fourth floor |
| 4 | 06/13/74 | Assembler | Struck by falling basket of parts |
| 5 | 11/27/74 | Millwright | Crushed by crate falling from fork lift |
| 6 | 02/01/75 | Unknown | Fell from elevated skid |
| 7 | 07/23/75 | Production Checker | Struck by falling press die |
| 8 | 03/10/76 | Janitor | Crushed between stationary rack and rack being moved by fork truck |
| 9 | 07/12/76 | Production Welder | Crushed under forks of moving lift truck |
| 10 | 01/17/77 | Crane Operator | Crushed against trailer by unattended lift truck |
| 11 | 09/13/77 | Stock Dispatcher | Crushed by falling containers |
| 12 | 03/12/79 | Receiving Inspector | Crushed between stationary racks and racks moved by lift truck |
| 13 | 03/30/79 | General Maintenance | Crushed by falling lift truck |
| 14 | 04/05/79 | Millwright | Struck by falling elevator door |
| 15 | 05/24/79 | Lift Truck Mechanic | Struck by falling forks of lift truck |
| 16 | 07/20/79 | Fork Truck Operator | Crushed between fork truck guard and floor when truck was overturned |
| 17 | 08/08/79 | Lift Truck Driver | Crushed between fork truck overhead guard support and wire basket |
| 18 | 05/14/81 | Fork Truck Driver | Crushed when fork truck overturned and electric battery fell on him |
| 19 | 11/05/82 | Power Truck Driver | Crushed between stationary bin & bins being moved by fork truck |
| 20 | 01/10/84 | Material Technician | Struck by baskets falling from fork truck |
| 21 | 11/07/84 | Bushing Fixture Assembler | Struck by falling steel parts container |
| 22 | 08/23/85 | Material Handler | Struck by moving fork truck |
| 23 | 09/19/85 | Trucker | Crushed between steel building column and stack of shipping racks |
| 24 | 06/04/86 | Die Setter | Crushed by upper die sliding onto legs |
| 25 | 06/22/86 | Millwright | Struck against work platform when knocked by falling electrical panel |
| 26 | 07/14/86 | Material Handler | Stuck and run over by the fork truck |
| 27 | 1/11/86 | Ford Truck Driver | Crushed by overhead guard of overturning fork truck |
| 28 | 12/03/86 | Sealer Operator | Crushed under fork truck body after being struck to the ground |
| 29 | 05/12/87 | Bench Hand | Crushed under load when stuck by fork truck |
| 30 | 10/26/87 | Machine Operator | Crushed between fork truck guard upright & floor when truck fell off dock |
| 31 | 02/06/88 | Craftsman | Struck by oil tank falling from raised forks of lift truck |
| 32 | 09/13/88 | Pattern Service | Crushed after being struck by fork lift truck |
| 33 | 07/09/89 | Machine Repair | Crushed between overhead scrap chute and truck steering wheel |
| 34 | 05/17/90 | Storage Attendant | Crushed under forks of fork truck |
| 35 | 05/21/90 | Apprentice Electrician | Crushed beneath falling electrical panel box |
| 36 | 06/12/90 | Material Handler | Crushed between fork truck counterweight and sweeper housing |
| 37 | 08/15/90 | Material Technician | Struck by fork truck |
| 38 | 12/18/90 | High-Lift Driver | Struck by tubular arm protruding into aisle |
| 39 | 01/30/91 | Truck Driver | Struck by metal plate attached to steel cable which was under tension |
| 40 | 12/04/91 | Material Handler | Struck by forward moving fork truck |
| 41 | 06/24/93 | Weld Console Operator | Struck by fork truck |
| 42 | 06/16/94 | Electrician Trainee | Crushed under mast upright when fork truck tipped over |

| | | | |
|----|----------|----------------------|---------------------------------------------------------------------------|
| 43 | 12/12/94 | Fork Truck Driver | Crushed between fork truck overhead guard & ground when truck tipped over |
| 44 | 01/26/95 | Shipper/Tow Operator | Crushed by lift truck guard when truck fell off loading dock |
| 45 | 12/16/96 | Steel Receiver | Crushed by a 6,000 lb steel coil while checking material in warehouse |

| | Date | Job Title | Incident Description |
|----|----------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 46 | 12/19/96 | Material Handler | Crushed by falling parts bins stacked near her work area that tipped over |
| 47 | 01/08/97 | Millwright | Crushed between a large gondola & the back rest of a fork truck while attempting to chain the gondola to the fork truck |
| 48 | 06/17/97 | Fork Truck Driver | Struck by a fork truck |
| 49 | 10/17/97 | Truck Repairman | Crushed under the forks, mast and backrest extension while attempting to repair a main cylinder hydraulic leak. |
| 50 | 04/01/98 | Fork Lift Operator | Crushed when trying to reposition double-stacked steel basket stands. |
| 51 | 03/27/99 | Machine Repairman | While attempting to remove shipping skids that were fastened to the bottom legs of a storage cabinet, the cabinet that was elevated 4 inches with a hand truck, tipped over crushing the victim. |
| 52 | 04/19/00 | Checker | Crushed between forklift she was working beside while checking bar codes and containers being "bulldozed" by a forklift |
| 53 | 07/31/00 | Heat Treat Operator | Crushed by falling press being moved with a powered hand cart |
| 54 | 09/17/00 | Forklift Operator | Pinned between the forklift he was operating and shelves in a frozen food warehouse |
| 55 | 10/18/00 | Facility Technician | Crushed by falling parts rack when the racks were snagged by an overhead guide wire for the phone line. (Overhead guard had been removed) |
| 56 | 05/06/01 | Lift Truck Shipper | Crushed by air conditioning units while loading one for shipping. The units were stacked 4 high (600 pounds each) and a gust of wind blew one of the stacks over on top of him |
| 57 | 10/05/01 | Forklift Operator | The victim was moving two racks loaded with axels, on a ramp, when the load center shifted causing the forklift to tip over. He was pinned between the floor and the overhead guard |
| 58 | 11/13/01 | Electrician | Victim struck a building column with the electric flat bed cart he was driving. He was reaching behind himself to locate a cardboard box to throw away in a dumpster that he was approaching. Estimated speed at time of impact—10 miles per hour. |
| 59 | 09/15/04 | Assembler | Victim walking on storage pad, talking to his wife on a cell phone when ran over by forklift. carrying a scrap gondola. |
| 60 | 07/16/05 | Millwright | Ejected from work platform basket while pulling conveyor chain—pulled basket off forks |
| 61 | 02/17/06 | Utility Operator | Victim was crushed under the overhead guard when he backed through and fell off a vacant truck well on a shipping dock. |

*** 61 Powered Industrial Lift fatalities out of 500 total UAW Fatalities in 32 years (1973-2006) (12% of total)**

**** This list does not include hoist/crane fatalities!***



UAW Health & Safety Department..Highlighted

Regulations (Standards - 29 CFR)

Handling materials - general. - 1910.176

- **SubPart Number:** N
- **SubPart Title:** Materials Handling and Storage

(a) **Use of mechanical equipment.** Where mechanical handling equipment is used, **sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. *Permanent aisles and passageways shall be appropriately marked.***

(b) **Secure storage. *Storage of material shall not create a hazard.*** Bags, containers, bundles, etc., stored in tiers shall be stacked, blocked, interlocked and limited in height so that they are **stable and secure against sliding or collapse.**

(c) **Housekeeping.** Storage areas shall be **kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage.** Vegetation control will be exercised when necessary.

(d) [Reserved]

(e) **Clearance limits.** Clearance signs to warn of **clearance limits shall be provided.**

(f) **Rolling railroad cars.** Derail and/or bumper blocks shall be provided on spur railroad tracks where a rolling car could contact other cars being worked, enter a building, work or traffic area.

(g) **Guarding. *Covers and/or guard- rails shall be provided to protect personnel*** from the hazards of open pits, tanks, vats, ditches, etc.

[39 FR 23052, June 27, 1974, as amended at 43 FR 49749, Oct. 24, 1978]

c:\my documents\19100176rev.doc

January 12, 2002
3:40 PM



UAW Health & Safety Department

1910.178 Powered Industrial Truck Standard:

Paragraph---- Subject:

(a)....General Requirements

(b)....Designations

(c)....Designated Locations

(d)....Converted Lift Trucks

(e)....Safety Guards

(f)....Fuel Handling & Storage

(g)...Changing & Charging Storage Batteries

(h)...Lighting for Operating Areas

(i)....Control of Noxious Gases & Fumes

(j)....Dockboards

(k)...Trucks & Railroad Cars

(l)....Operator Training

(m)...Truck Operations

(n)....Traveling

(o)....Loading

(p)...Operation of the Truck

(q)...Maintenance of Industrial Truck

F:\DEPT\H&S\HOME\MLEE\DOCS\178PARAGRAPH.DOC



UAW Health & Safety Department..Highlighted

Regulations (Standards - 29 CFR)

Powered industrial trucks. - 1910.178

- **SubPart Number:** N
- **SubPart Title:** Materials Handling and Storage

(a) General requirements

(a)(1) This section contains safety requirements relating to fire protection, design, maintenance, and use of fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. This section does not apply to compressed air or nonflammable compressed gas-operated industrial trucks, nor to farm vehicles, nor to vehicles intended primarily for earth moving or over-the-road hauling.

(a)(2) All new powered industrial trucks acquired and used by an employer after the effective date specified in paragraph (b) of 1910.182 shall meet the design and construction requirements for powered industrial trucks established in the "American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969", which is incorporated by reference as specified in Sec. 1910.6, except for vehicles intended primarily for earth moving or over-the-road hauling.

(a)(3) Approved trucks shall bear a label or some other identifying mark indicating approval by the testing laboratory. See paragraph (a)(7) of this section and paragraph 405 of "American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969", which is incorporated by reference in paragraph (a)(2) of this section and which provides that if the powered industrial truck is accepted by a nationally recognized testing laboratory it should be so marked.

(a)(4) Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

(a)(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.

(a)(6) The user shall see that all nameplates and markings are in place and are maintained in a legible condition.

(a)(7) As used in this section, the term, "approved truck" or "approved industrial truck" means a truck that is listed or approved for fire safety purposes for the intended use by a nationally recognized testing laboratory, using nationally recognized testing standards. Refer to 1910.155(c)(3)(iv)(A) for definition of nationally recognized testing laboratory.

(b) Designations. 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.

(b)(1) The D designated units are units similar to the G units except that they are diesel engine powered instead of gasoline engine powered.

(b)(2) 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.

(b)(3) 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.

(b)(4) The E designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(b)(5) 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.

(b)(6) 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.

(b)(7) 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.

(b)(8) The G designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(b)(9) 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.

(b)(10) The LP designated unit is similar to the G unit except that liquefied petroleum gas is used for fuel instead of gasoline.

(b)(11) 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.

(b)(12) *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 paragraph (d) of this section for such location.*

(c) Designated locations.

(c)(1) The industrial trucks specified under subparagraph (2) of this paragraph are **the minimum types required but industrial trucks having greater safeguards may be used if desired.**

(c)(2) For specific areas of use see Table N-1 which tabulates the information contained in this section. References are to the corresponding classification as used in subpart S of this part.

Note: Complete Table N-1 is NOT included.

TABLE N-1. -- SUMMARY TABLE ON USE OF INDUSTRIAL TRUCKS
IN VARIOUS LOCATIONS

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

(d) Converted industrial trucks. Power-operated industrial trucks that have been originally approved for the use of gasoline for fuel, when converted to the use of liquefied petroleum gas fuel in accordance with paragraph (q) of this section, may be used in those locations where G, GS or LP, and LPS designated trucks have been specified in the preceding paragraphs.

(e) Safety guards.

(e)(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.

(e)(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.

(f) Fuel handling and storage.

(f)(1) The storage and handling of liquid fuels such as gasoline and diesel fuel shall be in accordance with NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1969), which is incorporated by reference as specified in Sec. 1910.6.

(f)(2) The storage and handling of liquefied petroleum gas fuel shall be in accordance with NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1969), which is incorporated by reference as specified in Sec. 1910.6.

(g) Changing and charging storage batteries.

(g)(1) Battery charging installations shall be located in areas designated for that purpose.

(g)(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.

(g)(3) Reserved]

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

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

(g)(6) A carboy tilter or siphon shall be provided for handling electrolyte.

(g)(7) When charging batteries, acid shall be poured into water; water shall not be poured into acid.

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

(g)(9) Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.

(g)(10) Smoking shall be prohibited in the charging area.

(g)(11) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

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

(h) Lighting for operating areas.

(h)(1) [Reserved]

(h)(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.

(i)(1) Concentration levels of carbon monoxide gas created by powered industrial truck operations shall not exceed the levels specified in 1910.1000.

(j) Dockboards (bridge plates). See 1910.30(a).

(k) Trucks and railroad cars.

(k)(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.

(k)(2) Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations.

(k)(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.

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

(l) Operator training.

(l)(1) Safe operation.

(l)(1)(i) The **employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely**, as demonstrated by the successful completion of the training and evaluation specified in this paragraph (l).

(l)(1)(ii) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this paragraph (l), except as permitted by paragraph (l)(5).

(l)(2) Training program implementation.

(l)(2)(i) Trainees may operate a powered industrial truck only:

(1)(2)(i)(A) Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and

(1)(2)(i)(B) Where such operation does not endanger the trainee or other employees.

(1)(2)(ii) Training shall consist of a combination of **formal instruction** (e.g., lecture, discussion, interactive computer learning, video tape, written material), **practical training** (demonstrations performed by the trainer and practical exercises performed by the trainee), **and evaluation** of the operator's performance in the workplace.

(1)(2)(iii) All operator training and evaluation shall be conducted by persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

(1)(3) Training program content. Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

(1)(3)(i) Truck-related topics:

(1)(3)(i)(A) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;

(1)(3)(i)(B) Differences between the truck and the automobile;

(1)(3)(i)(C) Truck controls and instrumentation: where they are located, what they do, and how they work;

(1)(3)(i)(D) Engine or motor operation;

(1)(3)(i)(E) Steering and maneuvering;

(1)(3)(i)(F) Visibility (including restrictions due to loading);

(1)(3)(i)(G) Fork and attachment adaptation, operation, and use limitations;

(1)(3)(i)(H) Vehicle capacity;

(1)(3)(i)(I) Vehicle stability;

(1)(3)(i)(J) Any vehicle inspection and maintenance that the operator will be required to perform;

(1)(3)(i)(K) Refueling and/or charging and recharging of batteries;

(1)(3)(i)(L) Operating limitations;

(1)(3)(i)(M) Any other operating instructions, warnings, or precautions listed in the operator's manual

for the types of vehicle that the employee is being trained to operate.

(l)(3)(ii) Workplace-related topics:

(l)(3)(ii)(A) Surface conditions where the vehicle will be operated;

(l)(3)(ii)(B) Composition of loads to be carried and load stability;

(l)(3)(ii)(C) Load manipulation, stacking, and unstacking;

(l)(3)(ii)(D) Pedestrian traffic in areas where the vehicle will be operated;

(l)(3)(ii)(E) Narrow aisles and other restricted places where the vehicle will be operated;

(l)(3)(ii)(F) Hazardous (classified) locations where the vehicle will be operated;

(l)(3)(ii)(G) Ramps and other sloped surfaces that could affect the vehicle's stability;

(l)(3)(ii)(H) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;

(l)(3)(ii)(I) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

(l)(3)(iii) *The requirements of this section.*

(l)(4) Refresher training and evaluation.

(l)(4)(i) Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by paragraph (l)(4)(ii) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

(l)(4)(ii) Refresher training in relevant topics ***shall be provided to the operator when:***

(l)(4)(ii)(A) The operator has been **observed to operate the vehicle in an unsafe manner;**

(l)(4)(ii)(B) The operator has been **involved in an accident or near-miss incident;**

(l)(4)(ii)(C) The operator has received an **evaluation** that reveals that the operator is **not operating the truck safely;**

(l)(4)(ii)(D) The operator is assigned to **drive a different type of truck;** or

(l)(4)(ii)(E) A **condition in the workplace changes in a manner that could affect safe operation of the truck.**

(l)(4)(iii) An **evaluation** of each powered industrial truck operator's performance shall be conducted **at least once every three years**.

(l)(5) Avoidance of duplicative training. If an operator has previously received training in a topic specified in paragraph (l)(3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.

(l)(6) Certification. The employer shall certify that each operator has been trained and evaluated as required by this paragraph (l). The certification shall include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

(l)(7) Dates. The employer shall ensure that operators of powered industrial trucks are trained, as appropriate, by the dates shown in the following table.

| | |
|---------------------------------------|-------------------------------------------------------------------------------|
| If the employee was hired: | The initial training and evaluation of that must be completed: |
| Before December 1, 1999 ... | By December 1, 1999. |
| After December 1, 1999 | Before the employee is assigned to operate a powered industrial truck. |

(l)(8) Appendix A to this section provides non-mandatory guidance to assist employers in implementing this paragraph (l). This appendix does not add to, alter, or reduce the requirements of this section.

(m) Truck operations.

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

(m)(2) No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

(m)(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.

(m)(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.**

(m)(5) Unattended

(m)(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.

(m)(5)(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.

(m)(5)(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.

(m)(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.

(m)(7) Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semitrailer 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 onto.**

(m)(8) There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

(m)(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.

(m)(10) A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

(m)(11) Only approved industrial trucks shall be used in hazardous locations.

(m)(12) [Reserved]

(m)(13) [Reserved]

(m)(14) Fire aisles, access to stairways, and fire equipment shall be kept clear.

(n) Traveling.

(n)(1) **All traffic regulations shall be observed**, including authorized plant speed limits. A safe distance shall be maintained approximately **three truck lengths from the truck ahead, and the truck shall be kept under control at all times.**

(n)(2) The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.

(n)(3) Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations **shall not be passed.**

(n)(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.

(n)(5) Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

(n)(6) The **driver shall be required to look in the direction of, and keep a clear view of the path of travel.**

(n)(7) Grades shall be ascended or descended slowly.

(n)(7)(i) When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.

(n)(7)(ii) [Reserved]

(n)(7)(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.

(n)(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.

(n)(9) Stunt driving and horseplay shall not be permitted.

(n)(10) The driver shall be required to **slow down for wet and slippery floors.**

(n)(11) Dockboard 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.**

(n)(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.

(n)(13) Motorized hand trucks must enter elevator or other confined areas with load end forward.

(n)(14) Running over loose objects on the roadway surface shall be avoided.

(n)(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.

(o) Loading.

(o)(1) Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.

(o)(2) Only loads within the rated capacity of the truck shall be handled.

(o)(3) The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.

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

(o)(5) A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.

(o)(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 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.

(p) Operation of the truck.

(p)(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.

(p)(2) Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.

(p)(3) Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.

(p)(4) No truck shall be operated with a leak in the fuel system until the leak has been corrected.

(p)(5) Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

(q) Maintenance of industrial trucks.

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

(q)(2) No repairs shall be made in Class I, II, and III locations.

(q)(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.

(q)(4) Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.

(q)(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.

(q)(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 counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.**

(q)(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.

(q)(8) 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. 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.

(q)(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.

(q)(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 deg. F.) solvents shall not be used. High flash point (at or above 100 deg. F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be consonant with the agent or solvent used.

(q)(11) [Reserved]

(q)(12) 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. Such conversion equipment shall be approved. The description of the component parts of this conversion system and the recommended method of installation on specific trucks are contained in the "Listed by Report."

[39 FR 23502, June 27, 1974, as amended at 40 FR 23073, May 28, 1975; 43 FR 49749, Oct. 24, 1978; 49 FR 5322, Feb. 10, 1984; 53 FR 12122, Apr. 12, 1988; 55 FR 32015, Aug. 6, 1990; 61 FR 9227,

March 7, 1996; 63 FR 66270, Dec. 1, 1998]

The Powered Industrial Vehicle Study: An Overview
by James Collins, Ph.D. & Susan Baker,
Johns Hopkins University

Why was the Study Done?

An analysis of injuries in all Chrysler facilities by Prof. Susan Baker at the Johns Hopkins University, showed that an in-depth evaluation of PIV injuries might determine the factors that contributed to these events. Powered industrial vehicles were defined as mobile, power driven vehicles that are used to push, carry, pull, lift, stack or tier material. PIVs included forklift trucks, high lift trucks, low lift trucks, order picker trucks, mules, personnel carriers, jitneys, man lifts, sweepers, automated guided vehicles and rider trucks. This study did not examine incidents associated with tractor trailer trucks, Chrysler production vehicles, or work savers (pedestrian operated lifts/pallet jacks).

How was the Study Done?

The study examined 916 PIV incidents in 54 Chrysler facilities over the three-year period from July 1989 to June 1992. A follow-up study in eight plants to examined the characteristics of the PIV, the PIV operator, and the factory environment for 171 PIV collision incidents. Incidents included moving PIVs striking pedestrians, other PIVs, and obstructions; and PIV overturning or falling from loading docks or tractor trailer trucks.

The Chrysler Occupational Medical and Safety Surveillance System (COMSS) was used to identify the 171 PIV collision incidents. Site visits were conducted at three assembly plants, three stamping plants, one transmission plant, and one parts depot to examine incident sites and interview drivers involved in the incidents. These data were compared with data collected from a random sample of comparison work sites, PIVs and PIV operators who had not been involved in a PIV-related incident in the three years prior to the study.

What did the Study Find?

Analysis of the 916 PIV-related incidents identified in the COMSS (July 1989-June 1992) indicated the following:

Over a three-year period, 916 injuries to UAW-Chrysler employees were associated with PIVs;

Of the 916 PIV-related incidents, 373 (40.6%) resulted in lost workdays. These

372 incidents resulted in a total of 22,730 lost workdays, an average of 61 days per incident. Sixty-six workers were off work for more than 100 days;

Three deaths occurred, (half of all fatalities among Chrysler employees), during these 3 years.

The most common type of incident occurred when a pedestrian was struck, by either a PIV, the load being carried by the PIV, or when the PIV collided with a rack, bin, or table that subsequently struck a worker (n=322, 35% of all incidents). Of these 322 PIV-pedestrian incidents, 146 (45%) resulted in lost workdays, averaging 71 lost days per lost workday incident. The three types of pedestrian-related incidents that resulted in the most lost workdays per incident included:

Incidents where **a pedestrian was struck by an object struck by a PIV** resulting in 2796 lost workdays, an average of 175 lost workdays per lost workday incident;

Incidents where **the load of a PIV fell or was lowered onto a pedestrian** resulting in 2218 lost workdays, averaging 106 lost workdays per lost workday incident;

11 incidents where **a pedestrian was pinned between a PIV & fixed object**, resulting in 947 lost workdays, an average of 86 lost workdays per lost workday incident.

The second most common type of incident involved PIV collisions with fixed objects, other PIVs, or the operator's foot striking an object outside the travel line of the vehicle.

Eight Plant Comparison Study:

171 PIV-related incidents were investigated at 8 UAW-Chrysler facilities.

65% of injury sites had obstructions either in the aisle or at the edge of the aisle, thus narrowing the aisle and/or restricting the view of the operator or pedestrian. In contrast, only 50% of comparison sites had such obstructions.

Of the obstructions at the incident sites, 67% were temporary obstructions and one-third were permanent-fixed obstructions.

Overhead dome mirrors were significantly fewer at incident sites than comparison sites (Only 8% of incident had overhead dome mirrors within 50 feet of the site, versus 19% of the comparison sites).

51% of the vehicles involved in an incident (case vehicles) were carrying a load,

versus 41% of comparison vehicles.

Comparison drivers had significantly more years of experience; 67% had been employed at Chrysler for more than 20 years, compared to 44% of case drivers.

What Should We Do?

Training on the hazards of working near PIVs should be provided to all employees, improving pedestrian awareness of hazards associated with PIVs.

Increase separation of pedestrians from forklifts and PIVs, such as limiting PIV traffic during times of shift changes, meal breaks, and other employee breaks; PIV traffic planning should include the path and ultimate destination of pedestrian flow, such as time clocks, plant exits, cafeterias, etc. Planning should include restricting PIV traffic in such areas when there are large numbers of pedestrians.

Consider aisles assigned only to PIVs and paths available only to pedestrians.

Design new workstations and redesign old work areas, attempting to keep permanent-fixed obstructions, such as control panels, equipment and machinery, **as far from aisles and intersections, as possible**. In general, fixed equipment and machinery did not restrict the width of the aisle, but obstructed the visibility of PIV driver and pedestrians due to close proximity to aisles and intersections.

Assess the use of flashing lights and audible warning devices in order to alert pedestrians and other PIV operators when a PIV operator is in the area. Since one of the most common injury scenarios occurred at the main aisle, where PIVs may travel at high speeds and pedestrians enter the aisle at random spots in the aisle, every effort should be made to alert pedestrians when a PIV is in the area. Inspection of the PIV fleet should continue to ensure adequate repairs, operation and use of warning devices.

Compare this data with current trends in PIV utilization and related injury rates to determine any benefits from upgrading and/or leasing PIV fleets and/or implementing any of the suggested changes.

Reducing the risk of powered industrial vehicle incidents requires a combination of a safe work environment, comprehensive training for drivers of all types of PIVs, and implementing and enforcing systematic traffic management. The ongoing evaluation of PIV-related injuries and the development of preventive programs should continue to be implemented in order to maximize workplace safety.



UAW Health & Safety Department Regulations (Standards - 29 CFR)

Other working surfaces. - 1910.30

- SubPart Number: D
- SubPart Title: Walking-Working Surfaces

(a) "Dockboards (bridge plates)."

(a)(1) Portable and powered dockboards shall be strong enough to carry the load imposed on them.

(a)(2) Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.

(a)(3) 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, which is incorporated by reference as specified in Sec. 1910.6.

(a)(4) Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.

(a)(5) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position.

(b) "Forging machine area."

(b)(1) Machines shall be so located as to give:

(b)(1)(i) enough clearance between machines so that the movement of one operator will not interfere with the work of another,

(b)(1)(ii) ample room for cleaning machines and handling the work, including material and scrap. The arrangement of machines shall be such that operators will not stand in aisles.

(b)(2) Aisles shall be provided of sufficient width to permit the free movement of employees bringing and removing material. This aisle space is to be independent of

working and storage space.

(b)(3) Wood platforms used on the floor in front of machines shall be substantially constructed.

(c) "Veneer machinery."

(c)(1) Sides of steam vats shall extend to a height of not less than 36 inches above the floor, working platform, or ground.

(c)(2) Large steam vats divided into sections shall be provided with substantial walkways between sections. Each walkway shall be provided with a standard handrail on each exposed side. These handrails may be removable, if necessary.

(c)(3) Covers shall be removed only from that portion of steaming vats on which men are working and a portable railing shall be placed at this point to protect the operators.

(c)(4) Workmen shall not ride or step on logs in steam vats.

[39 FR 23502, June 27, 1974, as amended at 49 FR 5322, Feb. 10, 1984; 61 FR 9227, March 7, 1996]



UAW Health & Safety Department

What's the Difference??

AUTOMOBILE & POWERED INDUSTRIAL **(CAR) TRUCK (P.I.T.)**



1. No comfortable place to sit!!

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____



UAW Health & Safety Department Powered Industrial Trucks

TRAVEL SPEEDS

1. Internal Combustion Lift Trucks.....Top Speed 9 MPH (13' Per Second)
2. Electric Lift Trucks.....Top Speed 6 MPH (10' Per Second)
3. Walker Pallet Trucks.....Top Speed 3 MPH (5' Per Second)

STOPPING DISTANCE

- REACTION TIME:
 1. **YOUNG**-----Under 1 Second
 2. **OLDER**-----Over 1 Second
- BRAKE APPLIED DISTANCE TRAVELED:
 1. I.C.....15—17 FEET
 2. ELECTRIC.....8---12 FEET
 3. WALKER.....4---6 FEET
- TOTAL STOPPING DISTANCE:
 1. I.C.....30 FEET
 2. ELECTRIC....20 FEET
 3. WALKER.....10 FEET

Note: *Expect the unexpected from pedestrians and other P.I.T.'s.
* Most plants share the aisles for both PIT's and pedestrians.
* Storage at cross-aisles obstruct your view..slow down & sound horn!
* Pedestrians think if they see you, you must see them.....FALSE!



UAW Health & Safety Department



Powered Industrial Truck



UAW Health & Safety Department Highlighted

Regulations (Standards - 29 CFR)

Powered Industrial Trucks - 1910.178AppA

- **SubPart Number:** N
- **SubPart Title:** Stability of Powered Industrial Trucks (Non-mandatory Appendix to Paragraph (I) of this section)

Appendix A -- Stability of Powered Industrial Trucks (Non-mandatory Appendix to Paragraph (I) of This Section)

A-1. Definitions.

The following definitions help to explain the principle of stability:

Center of gravity is 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 is 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 is the truck's axis of rotation when it tips over.

Grade is 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 is a truck's resistance to overturning sideways.

Line of action is 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 is the truck's resistance to overturning forward or rearward.

Moment is 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.

Track is the distance between the wheels on the same axle of the truck.

Wheelbase is the distance between the centerline of the vehicle's front and rear wheels.

A-2. General.

A-2.1. Determining the stability of a powered industrial truck is simple once a few basic principles are understood. There are many factors that contribute to a vehicle's stability: the vehicle's wheelbase, track, and height; the load's weight distribution; and the vehicle's counterweight location (if the vehicle is so equipped).

A-2.2. The "stability triangle," used in most stability discussions, demonstrates stability simply.

A-3. Basic Principles.

A-3.1. Whether an object is stable depends on the object's moment at one end of a system being greater than, equal to, or smaller than the object's moment at the system's other end. This principle can be seen in the way a see-saw or teeter-totter works: that is, if the product of the load and distance from the fulcrum (moment) is equal to the moment at the device's other end, the device is balanced and it will not move. However, if there is a greater moment at one end of the device, the device will try to move downward at the end with the greater moment.

A-3.2. The longitudinal stability of a counterbalanced powered industrial truck depends on the vehicle's moment and the load's moment. In other words, if the mathematic product of the load moment (the distance from the front wheels, the approximate point at which the vehicle would tip forward) to the load's center of gravity times the load's weight is less than the vehicle's moment, the system is balanced and will not tip forward. However, if the load's moment is greater than the vehicle's moment, the greater load-moment will force the truck to tip forward.

A-4. The Stability Triangle.

A-4.1. Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1 depicts the stability triangle.

A-4.2. When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicle/ load combination falls outside the stability triangle, the vehicle is unstable

and may tip over.

A-5. Longitudinal Stability.

A-5.1. The axis of rotation when a truck tips forward is the front wheels' points of contact with the pavement. When a powered industrial truck tips forward, the truck will rotate about this line. When a truck is stable, the vehicle-moment must exceed the load-moment. As long as the vehicle-moment is equal to or exceeds the load-moment, the vehicle will not tip over. On the other hand, if the load moment slightly exceeds the vehicle-moment, the truck will begin to tip forward, thereby causing the rear to lose contact with the floor or ground and resulting in loss of steering control. If the load-moment greatly exceeds the vehicle moment, the truck will tip forward.

A-5.2. To determine the maximum safe load-moment, the truck manufacturer normally rates the truck at a maximum load at a given distance from the front face of the forks. The specified distance from the front face of the forks to the line of action of the load is commonly called the load center. Because larger trucks normally handle loads that are physically larger, these vehicles have greater load centers. Trucks with a capacity of 30,000 pounds or less are normally rated at a given load weight at a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated at a given load weight at a 36- or 48-inch load center. To safely operate the vehicle, the operator should always check the data plate to determine the maximum allowable weight at the rated load center.

A-5.3. Although the true load-moment distance is measured from the front wheels, this distance is greater than the distance from the front face of the forks. Calculating the maximum allowable load- moment using the load-center distance always provides a lower load- moment than the truck was designed to handle. When handling unusual loads, such as those that are larger than 48 inches long (the center of gravity is greater than 24 inches) or that have an offset center of gravity, etc., a maximum allowable load-moment should be calculated and used to determine whether a load can be safely handled. **For example, if an operator is operating a 3000 pound capacity truck (with a 24-inch load center), the maximum allowable load-moment is 72,000 inch-pounds (3,000 times 24). If a load is 60 inches long (30-inch load center), then the maximum that this load can weigh is 2,400 pounds (72,000 divided by 30).**

A-6. Lateral Stability.

A-6.1. The vehicle's lateral stability is determined by the line of action's position (a vertical line that passes through the combined vehicle's and load's center of gravity) relative to the stability triangle. When the vehicle is not loaded, the truck's center of gravity location is the only factor to be considered in determining the truck's stability. As long as the line of action of the combined vehicle's and load's center of gravity falls within the stability triangle, the truck is stable and will not tip over. However, if the line

of action falls outside the stability triangle, the truck is not stable and may tip over.

A-6.2. Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

A-7. Dynamic Stability.

A-7.1. Up to this point, the stability of a powered industrial truck has been discussed without considering the dynamic forces that result when the vehicle and load are put into motion. The weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting, and lowering loads, etc., are important stability considerations.

A-7.2. When determining whether a load can be safely handled, the operator should exercise extra caution when handling loads that cause the vehicle to approach its maximum design characteristics. For example, if an operator must handle a maximum load, the load should be carried at the lowest position possible, the truck should be accelerated slowly and evenly, and the forks should be tilted forward cautiously. However, no precise rules can be formulated to cover all of these eventualities.

[63 FR 66270, Dec. 1, 1998]

c:\my documents\19100178apparev.doc

January 12, 2002
6:03 PM

Hierarchy of Health and Safety Controls

Most Effective

| | |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) Elimination or Substitution | <ul style="list-style-type: none"> • substitute for hazardous material • reduce energy; speed, pressure, voltage, sound level, force • change process to eliminate noise • perform task at ground level • automated material handling |
| 2) Engineering Controls | <ul style="list-style-type: none"> • ventilation systems • machine guarding • sound enclosures • circuit breakers • platforms and guard railing • interlocks • lift tables, conveyors, balancers |
| 3) Warnings | <ul style="list-style-type: none"> • computer warnings • odor in natural gas • signs • backup alarms • beepers • horns • labels |
| 4) Training and Procedures Administrative Controls | <ul style="list-style-type: none"> • safe job procedures • rotation of workers • safety equipment inspections • hazard communication training • lockout • confined space entry |
| 5) Personal Protective Equipment | <ul style="list-style-type: none"> • safety glasses • ear plugs • face shields • safety harnesses and lanyards • back belts |

Least Effective



UAW Health & Safety Department

EMPLOYEE _____ DATE _____ TIME _____ a.m./p.m.

- 1. Shows familiarity with truck controls.
- 2. Arms, legs, head and inside running lines of P.I.T..
- 3. Slowed down at intersections.
- 4. Sounded horn at intersections.
- 5. Obeyed signs.
- 6. Kept a clear view of direction of travel.
- 7. Turned corners correctly - was aware of rear end swing.
- 8. Yielded to pedestrians.
- 9. Drove under control and within proper traffic aisles.
- 10. Approached load properly.
- 11. Lifted load properly.
- 12. Maneuvered properly.
- 13. Traveled with load at proper height.
- 14. Lowered load smoothly/slowly.
- 15. Stops smoothly/completely.
- 16. Load balanced properly.
- 17. Forks under load all the way.
- 18. Carried parts/stock in approved containers.
- 19. Checked bridgeplates/ramps.
- 20. Did place loads within marked area.

- 21. Did stack loads evenly and neatly.
- 22. Did drive backward when required.
- 23. Did check load weights.
- 24. Unattended lift, forks, controls neutralized and shut off
- 25. Followed proper instructions for checklist at beginning of shift.

Total
Rating _____ **Date** _____ **Evaluator** _____

Note: This sample test was developed by the State of Michigan Department of Consumer and Industry Services, Safety Education and Training Division. (MiOSHA)

Fork Truck Pre-Operation Inspection Checklist

Date _____ Shift _____ Truck Number _____

Operator _____

Beginning of shift inspection:

(Place an "X" in the box that needs attention and explain below the problem.
Put a check mark in the box if OK).

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Service Brake <input type="checkbox"/> Parking Brake <input type="checkbox"/> Steering <input type="checkbox"/> Horn <input type="checkbox"/> Lights <input type="checkbox"/> Tires and Wheels <input type="checkbox"/> Overhead Guard <input type="checkbox"/> Forks, Mast, Chains, Stops, Backrest | <input type="checkbox"/> Lift Control <input type="checkbox"/> Fluid Levels <input type="checkbox"/> Tilt Control <input type="checkbox"/> Limit Switches <input type="checkbox"/> Hydraulic Cylinders <input type="checkbox"/> Hydraulic Hoses and Fittings <input type="checkbox"/> Battery connection condition OTHER.... _____ |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Explain any "X" that has been marked above.*

Supervisor _____ **Date** _____

Service Requested date _____



UAW Health & Safety Department

Reprinted by UAW H&S Department

NOTICE TO THE READER

The first edition of this Alert applied only to forklifts operated in a sitting position. However, this new edition includes a recommendation for employers and operators of stand-up forklifts with rear-entry access (see tear-out sheet and pages 6 and 7). In addition, the revised Alert contains several minor changes in wording to improve clarity.

DHHS (NIOSH) Publication No. 2001-109

June 2001

Preventing Injuries and Deaths of Workers Who Operate or Work Near Forklifts

WARNING!

Workers who operate or work near forklifts may be struck or crushed by the machine or the load being handled.

Workers: **If you operate or work near forklifts, take these steps to protect yourself:**

- **Do not operate a forklift unless you have been trained and licensed**
- **Use seatbelts if they are available**
- **Report to your supervisor any damage or problems that occur to a forklift during your shift**
- **Do not jump from an overturning, sit-down type forklift. Stay with the truck, holding on firmly and leaning in the opposite direction of the overturn**
- **Exit from a stand-up type forklift with rear-entry access by stepping backward if a lateral tipover occurs**
- **Use extreme caution on grades or ramps**
- **On grades, tilt the load back and raise it only as far as needed to clear the road surface**
- **Do not raise or lower the forks while the forklift is moving**

- Do not handle loads that are heavier than the weight capacity of the forklift
- Operate the forklift at a speed that will permit it to be stopped safely
- Slow down and sound the horn at cross aisles and other locations where vision is obstructed
- Look toward the travel path and keep a clear view of it
- Do not allow passengers to ride on forklift trucks unless a seat is provided
- When dismounting from a forklift, set the parking brake, lower the forks or lifting carriage, and neutralize the controls
- Do not drive up to anyone standing in front of a bench or other fixed object
- Do not use a forklift to elevate workers who are standing on the forks
- Elevate a worker on a platform only when the vehicle is directly below the work area
- Whenever a truck is used to elevate personnel, secure the elevating platform to the lifting carriage or forks of the forklift
- Use a restraining means such as rails, chains, or a body belt with a lanyard or deceleration device for the worker(s) on the platform
- Do not drive to another location with the work platform elevated



The National Institute for Occupational Safety and Health (NIOSH) requests assistance in preventing injuries and deaths of workers who operate or work near forklifts. Most fatalities occur when a worker is crushed by a forklift that has overturned or fallen from a loading dock.

NIOSH investigations of forklift-related deaths indicate that many workers and employers (1) may not be aware of the risks of operating or working near forklifts and (2) are not following the procedures set forth in the Occupational Safety and Health Administration (OSHA) standards, consensus standards, or equipment manufacturer's guidelines.

This Alert describes seven incidents resulting in the deaths of seven workers who were either operating or working near forklifts. In each incident, the deaths could have been prevented by using proper safety procedures and equipment and by following the provisions of the OSHA standards.

NIOSH requests that editors of trade journals, safety and health officials, industry associations, unions, and employers in all industries bring the recommendations in this Alert to the attention of all workers who are at risk.

BACKGROUND

Forklifts, also known as powered industrial trucks, are used in numerous work settings, primarily to move materials. Each year in the United States, nearly 100 workers are killed and another 20,000 are seriously injured in forklift-related incidents [BLS 1997, 1998].

Forklift overturns are the leading cause of fatalities involving forklifts; they represent about 25% of all forklift-related deaths.

FATALITY DATA

The following paragraphs summarize information about fatalities involving forklifts. The information is from databases that identify work-related fatalities in the United States.

National Traumatic Occupational Fatalities (NTOF) Surveillance System

In the United States, **1,021 workers died from traumatic injuries suffered in forklift-related incidents from 1980 to 1994**. The NTOF Surveillance System uses death certificates to identify work-related deaths. These fatalities resulted from the following types of incidents:

Type of Incident:
% of Total victims:

| | |
|----------------------------------------------|-----|
| 1. Forklift overturns..... | 22% |
| 2. Worker on foot struck by forklift..... | 20% |
| 3. Victim crushed by forklift..... | 16% |
| 4. Fall from forklift..... | 9% |

Census of Fatal Occupational Injuries (CFOI)

The Bureau of Labor Statistics CFOI identified **94 fatal injuries associated with forklifts in 1995** [BLS 1997].

CURRENT STANDARDS

Occupational Safety and Health Administration (OSHA)

Training

OSHA has promulgated the Final Rule for Powered Industrial Truck Operator Training [29 CFR 1910.178(l)], which became effective March 1, 1999. The standard requires operator training and licensing as well as periodic evaluations of operator performance. The standard also addresses specific training requirements for truck operation, loading, seat belts, overhead protective structures, alarms, and maintenance of industrial trucks. Refresher training is required if the operator is observed operating the truck in an unsafe manner, is involved in an accident or near miss, or is assigned a different type of truck.

Forklift Maintenance

OSHA requires that industrial trucks be examined before being placed in service. They 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. When industrial trucks are used around the clock, they shall be examined after each shift. When defects are found, they shall be immediately reported and corrected [29 CFR 1910.178(q)(7)].

Forklift Operation

OSHA requirements for forklift operation are as follows:

- On all grades, the load and load engaging means shall be tilted back, if applicable, and raised only as far as needed to clear the road surface. The forks shall not be raised or lowered while the forklift is moving [29 CFR 1910.178 (n)(7)(iii)].
- Under all travel conditions, the truck shall be operated at a speed that will permit it to be brought safely to a stop [29 CFR 1910.178 (n)(8)].
- The operator shall slow down and sound the horn at cross aisles and other locations where vision is obstructed [29 CFR 1910.178 (n)(4)].
- The operator is required to look toward and keep a clear view of the travel path [29 CFR 1910.178(n)(6)].
- Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where the riding of trucks is authorized [29 CFR 1910.178 (m)(3)].
- Forklift trucks shall not be driven up to anyone standing in front of a bench or other fixed object [29 1910.178 (m)(1)].

Fair Labor Standards Act (FLSA) and Youth Employment

The FLSA [29 USC[†] 201 et seq.] (the primary law governing the employment of youth under age 18) includes work declared hazardous for youth by the Secretary of Labor. Hazardous Order No. 7, *Power-Driven Hoisting Apparatus Occupations*, prohibits workers under age 18 from using forklifts and similar equipment in nonagricultural industries [29 CFR 570.58]. In agricultural industries, minors under age 16 are prohibited from using forklifts [29 CFR 570.71 (a)(3)(ii)].

Not all working minors are covered by the FLSA. The regulations in agriculture do not apply to minors working on their parents' farms. Also exempted are youths aged 14 and 15 who are working under carefully regulated conditions in a bona fide vocational agriculture program.

American Society of Mechanical Engineers (ASME)/American National Standards Institute (ANSI)

ASME/ANSI B56.1–1993 requires the following [ASME 1993].

Maintenance and Safety Equipment

- Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, guard and safety devices, lift and tilt mechanisms, articulating axle stops, and frame members shall be carefully and regularly inspected and maintained in a safe condition (ASME/ANSI B56.1–1993m 6.2.7) [ASME 1993].
- When work is being performed from an elevated platform, a restraining means such as rails, chains, etc., shall be in place, or a body belt with lanyard or deceleration device shall be worn by the person(s) on the platform (ASME/ANSI B56.1, §4.17.1[b]) [ASME 1993].

Operation

- An operator should avoid turning, if possible, and should use extreme caution on grades, ramps, or inclines. Normally the operator should travel straight up and down (ASME/ANSI B56.1, §5.3.8[d]) [ASME 1993].
- The operator of a sit-down type forklift should stay with the truck if lateral or longitudinal tipover occurs. The operator should hold on firmly and lean away from the point of impact (ASME/ANSI B56.1, §5.3.18[d]) [ASME 1993].

In addition to the above regulations, employers and workers should follow operator's manuals, which are supplied by all equipment manufacturers and describe the safe operation and maintenance of forklifts.

CASE REPORTS

The cases presented here were investigated by the NIOSH Fatality Assessment and Control Evaluation (FACE) Program. The case reports were selected to represent the most common types of fatal forklift incidents: (1) forklift overturns, (2) workers struck, crushed, or pinned by a forklift, and (3) falls from a forklift.

Case 1—Forklift Overturn

On September 18, 1996, the 43-year-old president of an advertising sign company was killed while using a sit-down type forklift to unload steel tubing from a flatbed trailer. He was driving the forklift about 5 miles per hour beside the trailer on a concrete driveway with a 3% grade. The victim turned the forklift behind the trailer, and the forklift began to tip over on its side. The victim jumped from the operator's seat to the driveway. When the forklift overturned, the victim's head and neck became pinned to the concrete driveway under the falling-object protective structure (overhead guard). An inspection of the forklift revealed that the right-side rear axle stop was damaged before the incident and was not restricting the lateral sway of the forklift when it turned. Also, slack in the steering mechanism required the operator to turn the steering wheel slightly more than half a revolution before the wheels started to turn. The forklift was not equipped with a seat belt [NIOSH 1996b].

Case 2—Forklift Overturn

On April 25, 1995, a 37-year-old shop foreman was fatally injured after the sit-down type forklift he was operating overturned. The victim was turning while backing down an incline with a 4% grade. The forklift was transporting a 3-foot-high, 150-pound stack of cardboard with the forks raised approximately 60 inches off the ground. No one witnessed the incident. The victim was found with his head pinned under the overhead guard. The forklift was not equipped with a seat belt [California Department of Health Services 1996].

Case 3—Forklift Overturn

On November 25, 1996, a 41-year-old male laborer was fatally injured when the sit-down type forklift he was operating fell off a loading dock and pinned him under the overhead guard. The forklift was not equipped with a seat belt. The loading dock had large cracks in the surface and was in need of extensive repair. It was raining when the victim left the storage building to lift a load from the back of a pickup truck. Evidence indicates that either the victim's forklift was too close to the outer edge of the loading dock (which crumbled) or the right front tire was caught in a large crack in the loading dock, causing the forklift to overturn [Indiana State Department of Health 1996].

Case 4—Worker Struck by Forklift

On October 19, 1995, a 39-year-old female punch press operator at a computer components manufacturer was fatally injured while performing normal work tasks at her station. A forklift was traveling in reverse at high speed toward the victim's work station.

A witness observed the forklift strike a metal scrap bin (about 3 by 5 by 3½ feet), propelling it toward the punch press station. The bin hit the press and rebounded toward the forklift. There it was hit once again and shoved back against the corner of the press, striking and crushing the victim against the press [NIOSH 1996c].

Case 5—Fall from Forklift

On July 21, 1997, a 36-year-old male electric-line technician was fatally injured after falling from and being run over by a forklift. While the operator was driving the forklift, the victim was riding on the forks. As the operator approached an intersection, he slowed down and turned his head to check for oncoming traffic. When he turned his head back, he could not see the victim. He stopped the forklift, dismounted, and found the victim underneath the right side of the forklift [NIOSH 1997a].

Case 6—Fall from Forklift

On September 24, 1997, a 61-year-old male maintenance manager of a shelter for the homeless died after falling 7 feet from a safety platform that had been elevated by a forklift. The victim had been raised in a steel-framed, cage-type safety platform that had not been secured to the forklift. The victim removed a fluorescent light bulb from its fixture and stepped to one side of the safety platform. When the victim shifted his weight from the center of the platform to the outer edge, the safety platform toppled off the forks. The victim fell about 7 feet, struck his head on a concrete floor, and was subsequently struck by the steel safety platform [NIOSH 1997b].

Case 7—Fall from Forklift

On September 6, 1995, a 47-year-old male assistant warehouse manager was fatally injured while working with a forklift operator to pull tires from a storage rack. The two workers had placed a wooden pallet on the forks of the forklift, and the victim then stood on the pallet. The operator raised the forks and victim 16 feet above a concrete floor to the top of the storage rack. The victim had placed a few tires on the pallet when the operator noticed that the pallet was becoming unstable. The victim lost his balance and fell, striking his head on the floor [NIOSH 1996a].

CONCLUSIONS

National fatality data indicate that the three most common forklift-related fatalities involve forklift overturns, workers on foot being struck by forklifts, and workers falling from forklifts. The case studies indicate that the forklift, the factory environment, and actions of the operator can all contribute to fatal incidents involving forklifts. In addition, these fatalities indicate that many workers and employers are not using or may be unaware of safety procedures and the proper use of forklifts to reduce the risk of injury and death.

RECOMMENDATIONS

Reducing the risk of forklift incidents requires a safe work environment, a safe forklift, comprehensive worker training, safe work practices, and systematic traffic management.

NIOSH recommends that employers and workers comply with OSHA regulations and consensus standards, maintain equipment, and take the following measures to prevent injury when operating or working near forklifts.

Employers:

Worker Training:

- Make sure that workers do not operate a forklift unless they have been trained and licensed.
- Develop, implement, and enforce a comprehensive written safety program that includes worker training, operator licensure, and a timetable for reviewing and revising the program. A comprehensive training program is important for preventing injury and death. Operator training should address factors that affect the stability of a forklift—such as the weight and symmetry of the load, the speed at which the forklift is traveling, operating surface, tire pressure, and driving behavior.
- Inform operators of sit-down type forklifts that they can be crushed by the overhead guard or another part of the truck after jumping from the overturning forklift. The operator of a sit-down type forklift should stay with the truck if lateral or longitudinal tipover occurs. The operator should hold on firmly and lean away from the point of impact.
- Train operators of stand-up type forklifts with rear-entry access to exit from the truck by stepping backward if a lateral tipover occurs.
- Ensure that operator restraint systems are being used on sit-down type forklifts. Since 1992, forklift manufacturers have been required to equip new sit-down type forklifts with operator restraint systems. Many manufacturers of these forklifts offer restraint systems that can be retrofitted on older forklifts. Many of the fatalities resulting from overturns of sit-down type forklifts might have been prevented if the operator had been restrained. The overhead guard of the forklift is generally the part that crushes the operator's head or torso after he or she falls or jumps outside of the operator's compartment. The risk of being crushed by the overhead guard or another rigid part of the forklift is greatly reduced if the operator of a sit-down type forklift remains inside the operator's compartment. Because many forklifts are not equipped with a restraint system and operator compliance is less than 100% on forklifts equipped with a restraint system, ***operators of sit-down type forklifts should be instructed not to jump from the operator's compartment but to stay inside by leaning in the opposite direction of the overturn.***
- Train operators to handle asymmetrical loads when their work includes this activity.

Forklift Inspection and Maintenance:

- Establish a vehicle inspection and maintenance program.
- Retrofit old sit-down type forklifts with an operator restraint system if possible.

Lifting:

- Ensure that operators use only an approved lifting cage and adhere to general safety practices for elevating personnel with a forklift. Also, secure the platform to the lifting carriage or forks.
- Provide means for personnel on the platform to shut off power to the truck whenever the truck is equipped with vertical only or vertical and horizontal controls for lifting personnel.

Workers on Foot:

- Separate forklift traffic and other workers where possible.
- Limit some aisles to workers on foot only or forklifts only.
- Restrict the use of forklifts near time clocks, break rooms, cafeterias, and main exits, particularly when the flow of workers on foot is at a peak (such as at the end of a shift or during breaks).
- Install physical barriers where practical to ensure that workstations are isolated from aisles traveled by forklifts.
- Evaluate intersections and other blind corners to determine whether overhead dome mirrors could improve the visibility of forklift operators or workers on foot.
- Make every effort to alert workers when a forklift is nearby. Use horns, audible backup alarms, and flashing lights to warn workers and other forklift operators in the area. Flashing lights are especially important in areas where the ambient noise level is high.

Work Environment:

- Ensure that workplace safety inspections are routinely conducted by a person who can identify hazards and conditions that are dangerous to workers. Hazards include obstructions in the aisle, blind corners and intersections, and forklifts that come too close to workers on foot. The person who conducts the inspections should have the authority to implement prompt corrective measures.
- Install the workstations, control panel, and equipment away from the aisle when possible. Do not store bins, racks, or other materials at corners, intersections, or other locations that obstruct the view of operators or workers at workstations.
- Enforce safe driving practices such as obeying speed limits, stopping at stop signs, and slowing down and blowing the horn at intersections.
- Repair and maintain cracks, crumbling edges, and other defects on loading docks, aisles, and other operating surfaces.

Workers:

- Do not operate a forklift unless you have been trained and licensed.
- Use seatbelts if they are available.
- Report to your supervisor any damage or problems that occur with a forklift during your shift.
- Do not jump from an overturning, sit-down type forklift. Stay with the truck if lateral or longitudinal tipover occurs. Hold on firmly and lean in the opposite direction of the overturn.
- Exit from a stand-up type forklift with rear-entry access by stepping backward if a lateral tipover occurs.
- Use extreme caution on grades, ramps, or inclines. Normally you should travel only straight up and down.
- On all grades, tilt the load back if applicable, and raise it only as far as needed to clear the road surface.
- Do not raise or lower the forks while the forklift is moving.
- Do not handle loads that are heavier than the rated weight capacity of the forklift.
- Operate the forklift at a speed that will permit it to be stopped safely.
- Slow down and sound the horn at intersections and other locations where vision is obstructed.
- Look toward the path of travel and keep a clear view of it.
- Do not allow passengers to ride on forklift trucks unless a seat is provided.
- When dismounting from a forklift, always set the parking brake, lower the forks, and neutralize the controls.
- Do not drive up to anyone standing in front of a bench or other fixed object.
- Do not use a forklift to elevate workers who are standing on the forks.
- Do not elevate a worker on a platform unless the vehicle is directly below the work area.
- Whenever a truck is used to elevate personnel, secure the elevating platform to the lifting carriage or forks of the forklift.
- Use a restraining means such as rails, chains, or a body belt with a lanyard or deceleration device for the person(s) on the platform.
- Do not drive to another location with the work platform elevated.

Copies of this and other NIOSH documents are available from
 National Institute for Occupational Safety and Health
 4676 Columbia Parkway
 Cincinnati, OH 45226-1998

Fax number: (513) 533-8573
 Telephone number: 1-800-35-NIOSH (1-800-356-4674)
 E-mail: <http://www.cdc.gov/niosh/nioshmail.html>



UAW Health & Safety Department
Powered Industrial Truck----Operators' *"Rules of the Road"*

These general rules apply to **all** operators of a Powered Industrial Truck (P.I.T.). ***These rules are a reflection of the PIT OSHA Standard 1910.178 requirements:***

(a) General Requirements

- **Shall meet the design and construction requirements of ANSI B56.1-1969**
- **Modifications and additions to PIT shall not be done by the customer without prior written approval of the manufacturer of the PIT**
- **User shall see that all nameplates and markings are in place and maintained in a legible condition**

(b) Designations

- **There are 11 different designations for types of PIT's**
- **These let you know how each one is constructed and their safeguards.**

(c) Designated Locations

- **Guides you to the minimum type PIT to use in that area**

(e) Safety Guards

- **Overhead guard required to protect from falling small packages**
- **Vertical backrest required to protect PIT Operator from packages falling into drivers' compartment**

(g) Changing and Charging storage batteries

- **Located in designated area for that purpose**
- **Eyewash/shower**
- **Fire protection**
- **Adequate ventilation for dispersal of fumes from gassing batteries**

- Conveyor, hoist or equivalent material handling equipment shall be provided for handling batteries
- Reinstalled batteries shall be properly positioned and secured in the truck
- Means provided for handling acid shall be provided (carboy or siphon) and never pour water into acid
- Check vent caps—are they there and properly working
- Keep anything that may spark away from the uncovered battery

(h) Lighting for operating areas

- Forklift shall be equipped with directional lighting if the general lighting is less than 2 lumens per square foot

(i) Control of noxious gases and fumes

- Concentration levels of carbon monoxide gas created by the PIT shall not exceed the Permissible Exposure Limits (PEL) which is 50 ppm

(j) Dockboards (bridge plates)

- Know the capacity of the dockplates
- Never exceed the capacity
- Make sure securely in place

(k) Trucks/railroad cars

- Wheel chocks in place and tractor brakes set before driving into the trailer
- Fixed nose jacks in place to prevent upending of the trailer when tractor not attached to trailer

(l) Operator Training

(m) Truck operations

- Shall not be driven up to anyone standing in front of a bench or fixed object
- No person shall be allowed to stand or pass under raised forks..loaded or unloaded
- No passengers
- Arms and legs inside running line of the PIT

- Forks shall be fully lowered, controls neutralized, power shut off and brakes set before getting off the PIT
- Maintain safe distance from edge of ramps and other elevated docks or platforms
- The flooring of trucks, trailers and railroad cars shall be checked for breaks and weakness before they are driven into
- Know the height of your PIT and the ceiling height where you may be traveling
- Fire aisles, access to stairways and fire equipment shall be kept clear

(n) Traveling

- All plant traffic regulations shall be observed
- Maintain three (3) truck lengths from the truck ahead
- Keep PIT under control at all times
- Slow down and sound horn at cross aisles and where vision is obstructed
- Drive with load trailing when clear view of forward travel is obstructed
- (n)(6) The driver shall be required to look in the direction of...and keep a clear view of the path of travel
- Stunt driving and horseplay shall not be permitted
- Slow down while negotiating turns

(o) Loading

- Only stable and safely arranged loads shall be handled
- Only loads within the rated capacity of the PIT shall be handled
- Long/high loads shall be adjusted if it affects capacity
- Place forks as far as possible under load
- Tilting forward prohibited when raised except to pickup load

(p) Operation of the PIT

- If, at any time, a PIT is found to be in need of repair, defective or in any way unsafe the PIT shall be taken out of service until repaired

(q) Maintenance of PIT

- Repairs made by authorized personnel

- **All parts of any PIT requiring replacement shall be with parts equivalent, as to safety, with those used in the original design.**
- **Additional counterweighting of PITs shall not be done unless approved by the PIT manufacturer**
- **PITs inspection at least daily...Where they are used on a round-the-clock basis the inspection must be done on all three shifts**

F:DEPT/H&S.HOME/MLEE/OTHER/PITROADRULES



UAW Health & Safety Department Highlighted

Standards Interpretation and Compliance Letters

Fork inspection requirements for powered industrial trucks.

- **Standard Number:** 1910.178(a)(2) ;1910.178(l) ;1910.178(q)(7)
- **Subject:** Fork inspection requirements for powered industrial trucks.
- **Information Date:** 10/22/1999

Thank you for your September 1, 1999 letter to the Office of General Industry Compliance Assistance (GICA). You have questions regarding fork inspection requirements for powered industrial trucks. **These questions are being answered in terms of the employer being the user of the powered industrial truck not the manufacturer.** 29 CFR 1910.178(a)(2) requires that powered industrial trucks meet the design and construction requirements established in ANSI B56.1 - 1969 American National Standard for Powered Industrial Trucks, Part II which is incorporated by reference.

Question 1. Must the fork inspectors be certified by a metallurgy board like the American Society for Non-Destructive Testing? If so, do they need to be re-certified on a periodic basis?

Reply. There is currently no specific OSHA requirement for fork inspectors to be certified. However, under 29 CFR 1910.178(l) **Powered Industrial Truck Operator Training, the employer would need to provide the operator with training on truck-related topics such as, but not limited to: fork and attachment adaptation, operation, and use limitations; and any vehicle inspection and maintenance that the operator will be required to perform.**

Question 2. Does OSHA require the fork inspection procedure as defined by ANSI B56.1?

Reply. 1910.178(q)(7) does have a general requirement that all powered industrial

trucks be examined before being placed in service. This examination is required daily or after each shift if the trucks are used on a round-the-clock basis. ANSI B56.1 - 1993 Safety Standard for Low and High Lift Trucks has specific procedures for inspecting and repairing of forks in service on forklift trucks at section 6.2.8. These specific inspection procedures have not been adopted by OSHA. However, **an employer does have the responsibility to determine that forks are properly inspected. The failure to properly inspect forks on powered industrial trucks may in some circumstances be a recognized hazard and therefore warrant the use of the general duty clause in enforcement.**

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, or correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance provided herein remains current, you may consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at (202) 693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Compliance Programs

c:\my documents\pitforkinsprev.doc

January 12, 2002
3:05 PM



UAW Health & Safety Department Highlighted

Standards Interpretation:

Batteries in electric powered industrial trucks must be secured horizontally and vertically.

- **Standard Number:** 1910.178(g)(5)
- **Subject:** Batteries in electric powered industrial trucks must be secured horizontally and vertically.
- **Information Date:** 09/11/2000



September 11, 2000
Material Handling of Tennessee, Inc.
P.O. Box 1207
Mt. Juliet, TN

Thank you for your January 6, 2000 letter to the Occupational Safety and Health Administration's (OSHA's) Directorate of Compliance Programs. You have questions regarding **OSHA's requirements for vertical battery restraints in electric powered industrial trucks**. Your several questions can be answered as follows:

In General Industry, safety requirements for reinstalling batteries in electric powered industrial trucks are found at 29 CFR §1910.178(g)(5). This paragraph requires that ***"reinstalled batteries shall be properly positioned and secured in the truck"***. Batteries in all electric powered industrial trucks covered by the standard must be secured in place **both** horizontally and vertically when the truck is in use.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, and correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance herein remains current, you may consult OSHA's website at <http://www.osha.gov/>. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at 202-693-1850.



UAW Health & Safety Department Highlighted

Standards Interpretation and Compliance Letters

Powered industrial truck training: different types of trucks/workplace conditions.

- **Standard Number:** 1910.178(l)
- **Subject:** Powered industrial truck training: different types of trucks/workplace conditions.
- **Information Date:** 10/08/1999

October 8, 1999
American Trucking Associations
Alexandria, VA

Thank you for your July 8, 1999 letter to the Occupational Safety and Health Administration's (OSHA's) Directorate of Compliance Programs. You have questions regarding the Powered Industrial Truck Operator Training, Final Rule, December 1, 1998, 29 CFR 1910.178(l). We appreciate the opportunity to provide you with clarification on this matter.

Question #1. At what point does the final training rule require employers to conduct training on different makes and models of powered industrial trucks?

Response. Operators who have successfully completed training and evaluation as specified in 1910.178(l) (in a specific type of truck) **would not need additional training** when they are assigned to operate **the same type of truck** made by a different manufacturer. **However**, operators would **need additional training if the applicable truck-related and workplace-related topics listed in 1910.178(l)(3) are different for that truck.**

Question #2. Is the required training weight and brand specific?

Response. The extent of required **training is determined** not by the differences in brand

or rated capacity but **by whether the trucks which an operator may operate differ with respect to any one or more of the "truck-related" topics**. If, however, the only significant difference between two trucks is that they have different capacities, then an operator trained on the larger capacity truck need only receive additional training on the lesser capacity of the other truck.

Question #3. As the standard applies to site-specific training, can employers establish broad categories of site/establishment specificity that could include freight docks, dirt yards, warehouses, etc.?

Response. Whether an operator trained and evaluated at one of an employer's facilities must receive additional training at another facility on "workplace-related topics" will depend on whether the two facilities significantly differ with respect to any one or more of the topics set out at 1910.178(I)(3)(ii). If, as you state, all of the potential hazards addressed in the workplace-related topics are the same, then no additional training or evaluation would be necessary. Thus, for example, where all of an employer's facilities have substantially similar ramps or narrow aisles, no additional training on those topics would be required. To take another example, however, **additional training would be required if the loads to be carried at different facilities significantly differ in composition or stability**. It should not be thought that an operator generally trained in, for example, warehouse operations has been fully trained to operate in all warehouse situations. The key factor is whether the other situations are substantially the same as that in which the operator has been trained.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, or correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance provided herein remains current, you may consult OSHA's website at <http://www.osha.gov/>. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at 202-693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Compliance Programs

c:\my documents\powered industrial truck training different types of trucks-workplace conditions.doc
January 12, 2002
2:53 PM



Standards Interpretation:

Powered industrial truck requirements regarding "split-forking" and "bulldozing."

- **Standard Number:** 1910.178(o)(1) ;1910.178(l)(3)(i)(M)
- **Subject:** Powered industrial truck requirements regarding "split-forking" and "bulldozing."
- **Information Date:** 11/02/1999
Industrial Hygiene Supervisor
Parts & Service Support Center
Morton, Il

Thank you for your August 27, 1999 letter to the Occupational Safety and Health Administration's (OSHA's) Regional Administrator in Chicago. Your letter has been referred to the Directorate of Compliance Programs for an answer to your question regarding work practices commonly known as "split-forking" and "bulldozing." You question whether such practices are in compliance with 29 CFR §1910.178(o)(1) of OSHA's powered industrial truck standard when used in a large parts warehouse and distribution center.

You explain that "split-forking" is when the operator moves two palletized loads by inserting one fork in each pallet. On trucks with hydraulically adjustable forks, the operator may then bring the forks as close to each other as possible, clamping the pallets together, prior to lifting and transporting the palletized loads. Alternatively, with hydraulically adjustable forks or not, the operator may just push the split-forked pallets across the floor.

When bulldozing, the operator would have one pallet on the forks, then use that load to push other pallets out ahead of the truck. Bulldozing may involve having two pallets arranged vertically on the forks (provided the height is not so tall as to obstruct vision), plus pushing up to six pallets (single or double stacked) out in front of the truck.

You specifically ask two questions:

Q. #1. Does OSHA consider these practices [to] violate §1910.178(o)(1),

which states only stable or safely arranged loads shall be handled?

Response: Certainly, if the loads that are being split-forked or bulldozed result in a hazardous condition because they are *not stable or safely arranged, there would be a violation of §1910.178(o)(1)*. Conversely, **if these work practices are done safely, there would be no violation.**

These two work practices, however, are potentially hazardous for the forklift drivers and for any pedestrians who may be in the area. The forklifts also are probably not designed to be used to lift and move loads in the split-forking or bulldozing manner you described. In addition, §1910.178(l)(3)(i)(M) requires that employees receive training on any operating instructions, warnings, or precautions listed in the operator's manual. If the truck's manual has warnings against these types of practices then this must be included in the training program content.

Loads that are lifted and/or pushed by split-forking or bulldozing can cause hazards in several ways, including: (1) compromising the forklift's capacity; (2) damaging the forks; (3) damaging the floor; (4) causing the load, or part of the load, to tip; (5) interfering with the maneuverability of the forklift; and (6) causing the driver less control of the loads during turns and stopping. As applied to a particular workplace, these practices may produce additional hazards, depending upon the specific workplace conditions such as: weather, lighting, space restraints, training, supervision, truck maintenance, and the job production schedule.

Q. #2. If not, would OSHA consider these practices to violate Section 5(a)(1) of the OSH Act? In other words, would OSHA issue a citation for violating Section 5(a)(1) to an employer for permitting these practices?

Response: Although OSHA does not have any specific regulations addressing these work practices, §1910.178 would probably apply. **Certainly if the load was unstable or not safely arranged there would be a violation of 1910.178 (o)(1).**

An employer has general responsibilities, delineated under Section 5(a)(1) of the OSH Act, to furnish to each employee a workplace free from recognized hazards that are causing or likely to cause death or serious physical harm. OSHA can use the General Duty Clause only if an OSHA standard does not apply.

Depending upon the facts of a particular workplace, there may be situations in which §1910.178 would not apply, and it would be appropriate to issue a citation based on the General Duty Clause.

Frequently when the workers are on incentive pay, shortcuts will be used to get the work done faster. Faster does not necessarily mean unsafe, but there is generally a high correlation between speed and injuries. Just because a work practice is

common in an industry, does not mean that the practice is safe and should be used.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. Please be aware that OSHA's enforcement guidance is subject to periodic review and clarification, amplification, or correction. Such guidance could also be affected by subsequent rulemaking. In the future, should you wish to verify that the guidance provided herein remains current, you may consult OSHA's website at <http://www.osha.gov>. If you have any further questions, please feel free to contact the Office of General Industry Compliance Assistance at (202) 693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Compliance Programs

c:\my documents\osha interpbulldozrev.doc

January 12, 2002
2:35 PM



Health & Safety Department



Compliance Assistance for the Powered Industrial Truck Operator Training Standards

- **Subject:** Compliance Assistance for the Powered Industrial Truck Operator Training Standards
- Information Date: 11/30/2000

| | |
|----------------------------------------------------------------------------------------------------|------------------------------------------|
| DIRECTIVE NUMBER: CPL 2-1.28A | EFFECTIVE DATE: NOVEMBER 30, 2000 |
| SUBJECT: Compliance Assistance for the Powered Industrial Truck Operator Training Standards | |

ABSTRACT

Purpose: This instruction updates compliance assistance for the revised powered industrial truck operator training standard.

Scope: OSHA-wide.

By and Under the Authority of Charles N. Jeffress, Assistant Secretary

Significant Changes

This update of Instruction CPL 2-1.28 is needed since OSHA is reviewing the appropriate training and coverage of personnel and burden carriers. Reference to this type of powered industrial truck has been deleted from Appendix A, page A-4, Question 12, of the Instruction. Therefore, OSHA Offices are not to enforce the powered industrial truck operator training standard for Personnel and Burden Carriers, ASME B56.8.

-
- I. Application. These standards apply to all industries except agricultural operations.

- II. Background. The previous powered industrial truck operator training standard in part 1910 was adopted from the national consensus standard, American National Standards Institute (ANSI) B56.1-1969, Safety Standard for Powered Industrial Trucks. The previous standard required that only trained operators who were authorized to do so could operate powered industrial trucks and that methods of training in the safe operation of powered industrial trucks be devised.

Since promulgation of the OSHA standard, the powered industrial truck consensus standard (B56.1) has undergone five complete revisions. The B56.1 consensus standard has substantially upgraded its recommended training requirements. In view of this fact, interested persons requested that OSHA improve its training requirements for powered industrial truck operators.

The revised training requirements (63 FR 66237, 12/1/98) incorporate performance requirements that provide flexibility to employers in developing methods of training for powered industrial truck operators. These standards require the development of a training program that bases the amount, type, degree, and sufficiency of training on the knowledge of the trainee and the ability of the vehicle operator to acquire, retain, and use the knowledge and skills necessary to safely operate the truck. These standards also require a periodic evaluation of each operator's performance; and refresher training based primarily on unsafe operation, an accident or near miss, deficiencies found in a periodic evaluation of the operator, the introduction of different equipment, or a change in a workplace condition that affects safe operation.

The revised training requirements are intended to enhance the safe operation of powered industrial trucks in the workplace. Compliance with these revised training requirements will significantly decrease the number of injuries and fatalities resulting from unsafe powered industrial truck operations.

- III. Standard Overview. The training requirement found in 29 CFR 1910.178(l) for operators of powered industrial trucks and the same requirement for operators of powered industrial trucks in the construction [1926.602(d)] and maritime [1915.120, 1910.16(a)(2)(x), 1910.16(b)(2)(xiv), 1917.1(a)(2)(xiv), 1918.l(b)(10)] industries specify that the employer must develop a complete training program. OSHA requires that operators of powered industrial trucks be trained in the operation of such vehicles before they are allowed to operate them independently. The training must consist of instruction (both classroom-type and practical training) in proper vehicle operation, the hazards of operating the vehicle in the workplace, and the requirements of the OSHA standard for powered industrial trucks. Operators who have completed training must then be evaluated while they operate the vehicle in the workplace. Operators must also be periodically evaluated (at least once every three years) to ensure that their skills remain at a high level and must receive refresher training whenever there is a demonstrated need. To maximize the effectiveness of the training, OSHA will not require training that is duplicative of other training the employee has previously received if the operator has been evaluated and found competent to operate the truck safely. Finally, the training provisions require that the employer certify that the

- training and evaluations have been conducted.
- IV. General Inspection Guidelines. The following guidelines will assist the CSHO in determining compliance with the revised powered industrial truck operator training standard during compliance inspections.
- A. Inquire about the employer's method of powered industrial truck operator training program implementation (formal instruction, practical training), and evaluation of the operator's performance in the workplace. Ensure that all training is conducted by a person who has the knowledge, training and experience to train operators and evaluate their competence.
 - B. Determine whether the employer has trained employees in the applicable topics listed in 1910.178(l)(3).
 - C. Determine whether powered industrial truck operators have received training in the operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate, including operator's instructions, warnings, or precautions regarding seat belt use (operator restraint systems). Employers not providing training in the operating instructions, warnings, or precautions listed in the manufacturer's operator's manual related to seat belt use may be cited under 1910.178(l)(3)(i)(M).

Seat belts in forklift trucks are a component part of an operator restraint system that is designed to reduce the incidence and severity of injuries to the operator in the event of a tipover accident. Forklift trucks are particularly susceptible to tipovers. Failure to wear the seat belt that is provided in the forklift increases the risk of injury to the operator in the event of such an accident. Section 1910.178 does not currently contain requirements for the use of operator restraint systems. However, Section 5(a)(1) of the OSH Act requires employers to protect employees from serious and recognized hazards. Recognition of the hazard of forklift tipover and the need for operators to use an operator restraint system is evidenced by certain requirements in the more current version of ANSI B56.1 consensus standard for powered industrial trucks, and ASME B56.1-2000 - Safety Standard for Low Lift and High Lift Trucks. In addition, seat belts have been supplied by many manufacturers of counterbalanced, center control, high lift trucks that have a sit-down nonelevating operator position. OSHA's enforcement policy on the use of seat belts on powered industrial trucks is that employers are obligated to require operators of powered industrial trucks that are equipped with operator restraint devices, including seat belts, to use the devices. CSHOs will enforce the use of such devices under Section 5(a)(1) of the OSH Act in accordance with the October 9, 1996 Seat Belt Enforcement Memorandum.

- D. When possible, observe powered industrial truck operations to determine if trucks are being operated safely, and conduct employer/employee interviews to verify training program implementation.
- E. Determine whether the employer has certified that all required training and evaluations have been conducted. In accordance with OSHA Instruction CPL

2.111, Citation Policy for Paperwork and Written Program Requirement Violations, the following will apply when citing 1910.178(l)(6): When the employer has properly trained and evaluated powered industrial truck operators, but has failed to certify that the action was taken, no citation will be issued. The requirement for certification and the reasons for the requirement will be explained to the employer and the action noted in the case file. The employer will also be informed of possible penalties for subsequent violations.

- F. When employers are cited for violations of the powered industrial truck operator training standard, the Area Director will be responsible for determining the classification of violations cited under the powered industrial truck operator training standard in accordance with the FIRM (OSHA Instruction CPL 2.103).
- G. APPENDIX A provides a list of questions and answers to assist in compliance with the powered industrial truck operator training standards. APPENDIX B provides a copy of the October 9, 1996 Seat belt enforcement memorandum and APPENDIX C provides a copy of the July 14, 2000 National Maritime Safety Association Settlement Agreement.

- H. Training, Evaluation and Certification by a Third Party. The person or persons who conduct training, refresher training, evaluations, and certification of operators under 1910.178(l) need not be employed by the employer of those operators. Such third-party training, including appropriate on-the-job training, may be provided by an employers' association, a labor union, joint labor-management training organization, or any other organization meeting the requirements of the standard. However, citations for failure to train will always be issued to the **employer**.
 - 1. The employer may rely on a third-party trainer's certification that an employee has been trained and evaluated to operate a particular type of powered industrial truck in accordance with the standard if the training entity presents to the employer verification that the training program conforms to the standard and includes a list of topics covered by the training. The employer must make the verification available to OSHA upon request.
 - 2. If a powered industrial truck operator is certified under the preceding paragraph, the employer must provide additional training in any of those topics only when its powered industrial truck operators will be potentially exposed to hazardous workplace-related conditions that could not reasonably have been foreseen when the training took place. Before employees operate powered industrial trucks under these conditions, the employer must brief them about the conditions and how to operate the powered industrial truck safely under those conditions.
- I. Three-Year Evaluations and Certification Records. An employer may comply with the requirement of 1910.178(l)(4)(iii) that an operator has been evaluated at three-year intervals if it knows that a third party has conducted the required

evaluation and the third party certifies the evaluation pursuant to 1910.178(l)(6). If such evaluations, which can be based on the review of records by an existing entity, such as a joint labor-management committee, are made in the normal course of business, they need not be repeated for purposes of this paragraph.

1. The certification required by 1910.178(l)(6) may be performed, and the records of such certification maintained, by a third-party trainer. The certification records must identify the types of equipment on which the operator has been trained and evaluated.
2. If an employer does not regularly employ the same operators, such as where powered industrial truck operators are assigned by a hiring hall, the employer does not need to maintain the records at its own worksite. The employer must know where the records are located, and they must be accessible to an OSHA compliance officer during an inspection. Failure of an employer to provide the certification records under these conditions would be cited under 1910.178(l)(6).

J. Avoidance of Duplicative Training of Experienced Operators. An employee who, prior to December 1, 1998, has regularly operated a particular type of powered industrial truck in a marine terminal or longshoring operation, which operation can be determined by an existing entity such as a joint labor-management committee, may be certified under 1910.178(l)(6) to operate that type of powered industrial truck if one of the following provisions has been met:

1. Written documentation establishes that the employee has previously been trained and evaluated on all of the training topics listed in 1910.178(l)(3) that are applicable to that type of powered industrial truck; or
2. The employee's operation of the type of powered industrial truck is evaluated under circumstances that typically prevail in the marine terminal and/or longshoring workplaces in which the operator normally works by a person or entity with the requisite knowledge, skills, and experience to perform evaluations, and the employee is found competent to perform the operator's duties safely. If the evaluations, which can be based on the review of records by an existing entity, such as a joint labor-management committee, are conducted during the normal course of business, they need not be repeated for purposes of this paragraph.

K. Refresher Training and Evaluation.

1. A powered industrial truck operator must receive refresher training under 1910.178(l)(4)(ii)(A) or (C) if a workplace observation by a supervisor or other qualified person indicates that the operator is deficient in some of the requisite knowledge and skills needed to operate the vehicle safely. If the observer determines that the deficiencies in the operator's knowledge and skills can be corrected by on-the-job instruction, the observer or another qualified person may immediately provide such instruction. After such instruction, the

observer or other qualified person may reevaluate the operator's performance in the workplace and, if the operator demonstrates that he or she possesses the knowledge and skills to operate the equipment safely, the operator may continue to operate the powered industrial truck without any further training and without affecting his or her certification. If on-the-job instruction is not sufficient to obviate the deficiencies in the operator's knowledge and skills, the operator must receive such additional refresher training and evaluation as is necessary to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

2. An operator must receive refresher training and evaluation under 1910.178(l)(4)(ii)(B) when the operator has been involved in an incident in which the operator's operation of the powered industrial truck caused or contributed to personal injury or property damage or provided other clear evidence that the operator operated the equipment unsafely. In the event that an OSHA inspection of the incident is conducted, the CSHO will include in the case file and account for any facts and conclusions developed by an independent inquiry of the factors underlying the incident which are made available to the CSHO during the inspection or within 14 days of the incident, whichever is later.
- L. Generic Training. An operator who has been trained on a particular type of powered industrial truck may, without additional training, operate other makes and models of the same type of truck that have fundamentally similar operating characteristics and placement of operating controls. Similarly, an employee who has been trained to use a particular type of powered industrial truck attachment need not receive additional training to use a fundamentally similar make or model of the same type of attachment for the same type of truck.
- M. Seat belt Training. Powered industrial truck operator training programs must cover equipment manufacturers' recommendations as to the use of seat belts under 1910.178(l)(3)(i); such programs may also address the hazards, if any, in the opinion of the training provider, that seat belt use could cause in a particular work situation in the marine cargo handling industry.

APPENDIX A

1910.178(l) - Questions and Answers

Paragraph (l)(1)(i) requires that each powered industrial truck operator have the competency to operate a powered industrial truck safely.

1. **Can an employee be allowed to operate a powered industrial truck if the**

employee can't read?

Yes, during training and evaluation, a determination must be made whether the employee has the knowledge and skills to perform the job. For example, if the employee cannot read and comprehend the operator's manuals for the types of trucks the employee will operate, then this information would have to be taught by means other than having the employee try to read the truck manuals. Information obtained during the initial employee evaluation can be used to, among other things, determine how best to train the employees.

2. Can an employee with poor vision in one eye or a hearing impairment be allowed to operate a powered industrial truck?

The employer has the responsibility under this training standard to ensure that each operator is capable of performing the duties that are required of the job.

The Americans with Disabilities Act (ADA) addresses the issue of whether employers may impose physical qualifications upon employees or applicants for employment. The ADA permits employers to adopt medical qualification requirements necessary to ensure that an individual does not pose a "**direct threat to the health or safety of other individuals in the workplace**," provided all reasonable efforts are made to accommodate otherwise qualified individuals. The employer should consult with appropriate medical personnel to assist in determining operator physical qualifications.

Paragraph (I)(2)(i) allows trainees to operate a powered industrial truck.

3. When can a powered industrial truck operator trainee operate a powered industrial truck in the workplace?

An operator trainee can operate a truck only under the direct supervision of a person who has the knowledge, training, and experience to train operators and evaluate their competence, and where such operation does not endanger the trainee or other employees.

4. What industries are covered by these training requirements?

The powered industrial truck operator training requirements apply to all industries in which the trucks are being used, except agricultural operations.

Paragraph (I)(2)(ii) requires that the training consist of a combination of formal instruction, practical training, and evaluation of the operator's performance in the workplace.

5. Can my powered industrial truck operator training consist only of formal

instruction such as watching a videotape?

No, OSHA requires a combination of formal instruction and practical training. Although formal training is invaluable for teaching the principles of vehicle operation, it is the hands-on training and evaluation of vehicle operation that finally proves the adequacy of the training and the ability of the employee to use that training successfully.

6. Can tool box meetings or informal discussions be considered formal instruction?

Yes, tool box meetings or informal discussions can be considered formal instruction when the principles of safe powered industrial truck operation are covered by the designated trainer.

Paragraph (l)(2)(iii) requires that all operator training and evaluation be conducted by a person who has the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence.

7. How could an employer determine the qualifications of trainers?

An example of a qualified trainer would be a person who, by possession of a recognized degree, certificate, or professional standing, or who by knowledge, training and experience, has demonstrated the ability to train and evaluate powered industrial truck operators.

8. Can the person providing the training come from outside the company?

Yes, the employer may authorize a trainer from outside the company to conduct the training, such as a training consultant or a manufacturer's representative. Nonetheless, the employer must have evidence that the operators have been trained in the required program topics.

Some employers believe they must use an outside training consultant. However, an employer may utilize an employee who has the knowledge, training, and experience to provide training and evaluation.

9. When a Powered Industrial Truck operator is assigned to an employer by a union hiring hall and works for more than one employer over a period of time, which employer is responsible for ensuring that the operator has been trained and evaluated under the standard?

Each employer for whom an employee works is responsible for ensuring that the employee has been trained in accordance with the standard. In hiring hall situations, the training under 1910.178(l)(3)(i), **Truck-related topics**, may be conducted by a labor union, joint labor/management training organization, an association of employers, or another third-party trainer as long as the person(s) conducting the

training have the knowledge, training, and experience to properly conduct the training. An individual employer that relies on such training would not be relieved of the provisions of 1910.178(l)(3)(ii), **Workplace-related topics**, which provides for training on site-specific matters. But, the employer need not duplicate training if the outside training covered all of the employer's site-specific conditions.

Can the evaluation required by (l)(2)(ii) be based entirely on observation of the operator in a training facility outside the workplace?

No. The evaluation must take place in the workplace so that the evaluator can observe the operator under actual workplace conditions.

In paragraph (l)(3) OSHA has provided a list of subjects to ensure that the training contains the appropriate information for the operator.

11. Are employers required to train powered industrial truck operator trainees in all of the topics listed in paragraph (l)(3)?

It is the responsibility of the employer to select the particular items that are pertinent to the type of trucks that the employee will be allowed to operate, and the work environment in which the vehicle will be operated. The employer may leave out elements if the employer can demonstrate that they are not relevant to safe operation in the employer's workplace.

12. Do these training requirements apply only to high lift and low lift trucks?

No, these requirements apply to all types of powered industrial trucks, including specialized powered industrial trucks covered by §1910.178(a). The training standard applies to vehicles covered by volumes of the consensus standard such as: Low Lift and High Lift Trucks, ASME B56.1; Guided Industrial Vehicles, ASME B56.5; Rough Terrain Forklift Trucks, ASME B56.6; Industrial Crane Trucks, ASME B56.7; and Operator Controlled Industrial Tow Tractors, ASME B56.9. The standard does not apply to earth moving equipment or vehicles used for over-the-road hauling. Therefore, equipment that was designed to move earth but has been modified to accept forks is not covered by the powered industrial truck operator training standard.

13. Must an employee receive separate training in each make and model of powered industrial truck that the employee operates?

No. An operator who has been trained on a particular type of powered industrial truck (e.g., a sit-down counterbalanced rider truck) may, without additional training, operate other makes and models of that same type of truck, unless there is a significant difference in the applicable truck-related and workplace-related topics listed in paragraph (l)(3) for the different make and model of truck. In addition, an employee who has been trained to use a particular type of powered industrial truck attachment need not receive additional training to use a fundamentally similar make

or model of the same type of attachment for the same type of truck.

14. Would these training requirements include training operators in the use of operator restraint systems?

Yes. For several years, sit-down counterbalanced powered industrial trucks have been equipped by the manufacturer with operator restraint systems. Manufacturers' operators' manuals instruct and warn operators to use operator restraint systems. Employers are required by paragraph (l)(3) to train employees in all operating instructions, warnings and precautions listed in the operator's manual for the type of vehicle which the employee is being trained to operate. Therefore, operators must be trained in the use of operator restraint systems addressed in the operating instructions.

15. Does OSHA require employers to train operators in vehicle stability?

Employers are required by paragraph (l)(3) to train operators in vehicle stability. Non-mandatory Appendix A to the training standard provides guidance to employers in understanding the basic principles of vehicle stability.

Paragraph (l)(4) specifies that an evaluation be conducted of each powered industrial truck operator's performance.

16. How often are evaluations required to be conducted after training has been successfully completed?

The employer must conduct evaluations at least once every three years and as part of the initial training provided to the operator. In addition, for operators provided refresher training under the standard, an evaluation of the effectiveness of that refresher training must be performed. This evaluation does not have to be formalized but must consist of a person who has the knowledge, training, and experience observing each operator perform all typical operations to ensure that the powered industrial truck is being operated safely. OSHA requires that a more extensive evaluation be conducted at least once every three years.

17. When would refresher training be required?

Refresher training is required when information available to the employer shows that the employee lacks the skills or knowledge to operate the truck safely. If the employee has been observed operating the vehicle in an unsafe manner, has been involved in an accident or near miss, or has received an evaluation that reveals the employee is not operating the truck safely, refresher training is required. In addition, refresher training is required when the employee is assigned to drive a different type of truck or a condition in the workplace changes that could affect the safe operation of the truck. An evaluation of the effectiveness of the refresher training is required.

Paragraph (l)(6) requires that the employer certify that the required training and

evaluations have been conducted.

18. What does OSHA require the employer to include in the certification that the required training and evaluations have been conducted?

The certification consists of the name of the operator, the dates of the training, the date of the evaluation, and the identity of the person(s) conducting the training and evaluation.

Paragraph (l)(5) allows the employer to forgo that portion of the training that an employee has previously received.

19. Is it necessary to retrain powered industrial truck operators if they have already received training in some of the topics listed in paragraph (l)(3)?

The employer must evaluate the applicability and adequacy of an operator's prior training. Employers need not retrain an employee in a training topic if the prior training is appropriate to the truck and working conditions encountered. Additional training in that topic is not required if the operator is evaluated and found to operate the truck safely.

APPENDIX B

**Enforcement of the Use of Seat Belts on Powered Industrial Trucks in General Industry
October 9, 1996**

MEMORANDUM FOR: REGIONAL ADMINISTRATORS

**FROM: JOHN B. MILES, JR.,
 DIRECTORATE OF COMPLIANCE PROGRAMS**

**SUBJECT: Enforcement of the Use of Seat Belts on Powered
 Industrial Trucks in General Industry**

It has come to my attention that clarification is needed to ensure that a uniform approach is taken by all OSHA offices with respect to the enforcement of the use of seat belts on powered industrial trucks in general industry.

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). ANSI B56.1-1969 does not have provisions for the use of seat belts. Therefore, 29 CFR 1910.178 does not contain requirements for the use of seat belts. However, Section 5(a)(1) of the OSH Act require

employers to protect employees from serious and recognized hazards. Recognition of the hazard of powered industrial truck tipover and the need for the use of an operator restraint system is evidenced by certain requirements in the more current versions of ANSI B56.1 consensus standard 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. In addition, seat belts have been supplied by many manufacturers of counterbalanced, center control, high lift trucks which have a sit-down nonelevating operator position. Also, some manufacturers have instituted retrofit programs for the installation of operator restraint systems to older powered industrial trucks.

OSHA's enforcement policy relative 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 should enforce the use of such devices under Section 5(a)(1) of the OSH Act.

After consultation with the Regional Solicitor, 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.

DEVELOPING A TRAINING PROGRAM FOR P.I.T. OPERATORS



UAW Health & Safety Department

(Highlighted and copied by)

This handout is intended to be used for training purposes only. It is not a substitute for any provisions of the Occupational Safety and Health Act of 1970, or for any standards issued by the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA).

HOW DO I DEVELOP A POWERED INDUSTRIAL OPERATOR TRAINING PROGRAM?

Before you begin developing your operator training program you should become familiar with the OSHA standard for powered industrial trucks and any operator's manual pertinent to the equipment you have in your workplace.

- **IDENTIFY YOUR OPERATORS**

First, you need to determine the employees that will be required to operate powered industrial trucks in your workplace. If an employee has other duties, but sometimes operates a powered industrial truck, training must be provided.

- **IDENTIFY THE TYPES OF POWERED INDUSTRIAL TRUCKS YOU HAVE IN YOUR WORKPLACE AND THOSE EMPLOYEES WHO WILL BE REQUIRED TO OPERATE THE VEHICLES.**

There are many different types of powered industrial trucks. Typically, these types of vehicles are known as forklifts or lift trucks. Some types of trucks are not capable of being ridden by the operator. These are also covered by the OSHA standard and training is required. Some trucks are fitted with attachments purchased from the manufacturer. The use of these attachments may affect the manner in which the truck is handled; therefore training on the use of the attachment would also be required. If your employees will be expected to operate several different types of powered industrial trucks, then training is required on the unique handling characteristics of the vehicles.

- **METHODS OF TRAINING**

Once you have identified your truck operators and types of trucks you have in your workplace, you should determine the methods of training you will use.

Training must consist of a combination of formal instruction and practical training. Using both methods is the only way to ensure that the trainee receives and comprehends the instruction and uses the information to safely operate a powered industrial truck. Note that

the formal training need not take place in a classroom. Discussions can consist of the trainer talking to the trainee and explaining the training material, either in the workplace or in another location. The training must, however, include an explanatory element as well as a practical element.

Formal instruction may include lectures, conferences, classroom discussions, demonstrations, and written or oral tests. To enhance the training and make it more understandable to the employee, employers and other trainers may use movies, slides, computers, video tapes and other visual presentations.

Using visual aids has several advantages, including:

- (1) The employees being trained remain more attentive, thereby increasing the training's effectiveness;
- (2) The trainer can use visual presentations to ensure that the necessary information is covered during the training;
- (3) Graphical presentations make better use of the training time by decreasing the need for the instructor to carry on long discussions about the instructional material; and,
- (4) Trainees have greater retention of information learned from graphical presentations.

While some employees can learn instructional material while seated in a classroom, other employees may learn best by observing an operation (demonstration) and/or by personally performing an operation (practical exercise). In most cases, a combination of different training methods provides the best training in the least amount of time.

Once you have selected the method of training, then the content of the training program must be considered to include all pertinent training items.

- **TRAINING PROGRAM CONTENT**

Because each type (make and model) of powered industrial truck has different operating characteristics, limitations, and other unique features, a good employee training program for powered industrial truck operators should be based upon the type of vehicles that the employee will be trained and authorized to operate. The training should also emphasize the workplace's features that will affect how the vehicle must be operated. Finally, the training should include the general safety rules applicable to operating any powered industrial truck.

The following is an outline of a generic powered industrial truck operator training program:

- (1) Characteristics of the powered industrial truck(s) the employee will be allowed to operate:
 - (a) Differences from the automobile;

- (b) Controls and instrumentation: location, what they do, and how they work;
- (c) Engine or motor operation;
- (d) Steering and maneuvering;
- (e) Visibility;
- (f) Fork and/or attachment adaption, operation, and limitations of their use;
- (g) Vehicle capacity;
- (h) Vehicle stability;
- (i) Vehicle inspection and maintenance the operator will be required to perform;
- (j) Refueling or charging and recharging batteries;
- (k) Operating limitations; and
- (l) Any other operating instruction, warning, or precaution listed in the operator's manual for the type of vehicle the employee is being trained to operate.

(2) The operating environment:

- (a) Floor surfaces and/or ground conditions where the vehicle will be operated;
- (b) Composition of probable loads and load stability;
- (c) Load manipulation, stacking, unstacking;
- (d) Pedestrian traffic;
- (e) Narrow aisle and restricted place operation;
- (f) Operating in classified hazardous locations;
- (g) Operating the truck on ramps and other sloped surfaces that would affect the stability of the vehicle;
- (h) Other unique or potentially hazardous environmental conditions that exist or may exist in the workplace; and
- (i) Operating the vehicle in closed environments and other areas where insufficient ventilation and/or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust.

(3) The requirements of the OSHA Standard.

After the training program has been completed, the employer must evaluate the trainee's knowledge and skills and determine that the employee is competent to operate the truck safely.

- **EMPLOYEE EVALUATION**

When the employee completes the training exercises and prior to operating the truck in the workplace, an evaluation of the employee must be performed. This evaluation will determine the adequacy of training and the ability of the employee to perform truck operations safely in the workplace. The OSHA standard also requires that an evaluation of the operator's performance be conducted at least once every three years and after refresher training.

The employer should then complete a certification of training record containing the name of the operator, the date of the training, the date of the evaluation, and the identity of the

person(s) performing the training or evaluation.

- **REFRESHER TRAINING**

During the course of truck operation, the supervisor may observe the employee performing an unsafe act, such as riding with the load too high or traveling at an unsafe speed. The person making the correction should point out the incorrect manner of operation of the truck or other unsafe act being conducted, tell the employee how to do the operation correctly, and then ensure the employee does the operation correctly. When there have been multiple on-the-spot corrections, the employer may decide to conduct a more structured retraining program which would include the following information:

- (1) Common unsafe situations encountered in the workplace;
- (2) Unsafe operating methods observed or known to be used;
- (3) The need for constant attentiveness to the vehicle, the workplace conditions, and the manner in which the vehicle is operated.

The above subject areas need to be taught so that the trainee receives all the information needed for safe vehicle operation. Specific details of the above subject areas may be found in the vehicle manufacturers' literature, the national consensus standards [e.g., the ASME B56 series of standards (current revisions)], and the OSHA standards relating to powered industrial truck operator training.



Health & Safety Department



SAMPLE POWERED INDUSTRIAL TRUCK (PIT) OPERATOR TRAINING PROGRAM OUTLINE

1. Introduction

- a. Overview of the program
- b. Goal of the program: to provide a training program based on the trainee's prior knowledge, the types of vehicles used in the workplace, and the hazards of the workplace.
- c. Course will utilize video, group discussion and hands-on practice. Each operator must obtain the knowledge and skills needed to do their job correctly and safely.

2. Types, Features, and Physics

- a. Familiarize each operator with the basic types and functions of powered industrial trucks.
- b. Develop an understanding of the information shown on a data plate.
- c. Understand the critical truck measurements that affect safety.
- d. Understand the forces that cause tipovers, and the truck design considerations and safety ratings that help prevent them, including the "stability triangle."

3. Inspecting the vehicle

- a. Understand the purpose and importance of pre-operational checkouts.
- b. Provide a basic understanding of areas covered during a pre-operational checkout.
- c. Familiarize each operator with a checklist for pre-operational checkouts, and what to do if a problem is discovered.

4. Driving the Truck

- a. Understand the elements of safe movement of a powered industrial truck.
- b. Understand the differences between an automobile and a powered industrial truck.
- c. Recognize the safety hazards associated with operating a powered industrial.

5. Load Handling

- a. Understand the elements of load lifting safety.
- b. Understand the safe operating procedures for raising and lowering loads in aisles.

6. LPG for Lift Trucks

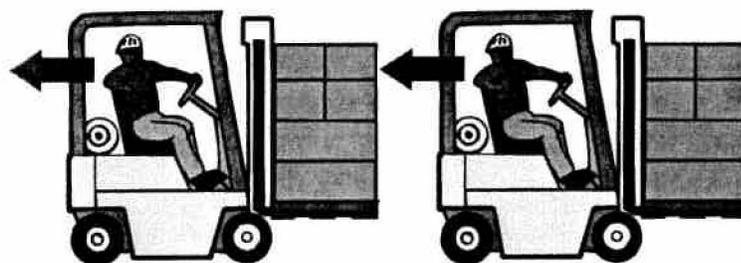
- a. Discuss LPG and its properties.
- b. Understand the elements and procedures of safely refueling internal combustion vehicles.
- c. Describe tank components: service valve, surge valve, relief valve, etc.
- d. Discuss related safety issues.

7. Battery and Charging

- a. Understand the elements and procedures of safely changing and charging batteries.
- b. Discuss filling procedures and maintenance.
- c. Discuss related safety issues.

8. Safety Concerns

- a. Review/reinforce potential of serious injury
- b. Review/reinforce safety procedures in your facility.

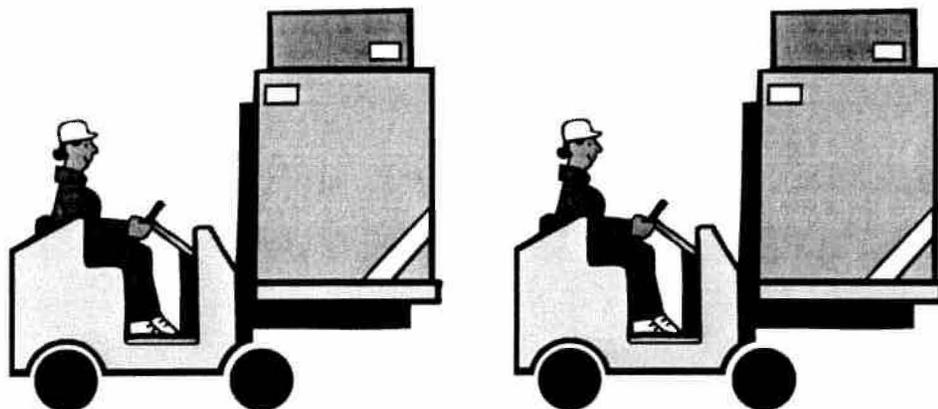


9. Specific Truck and Workplace Training/Hands-On

- a. Review features of specific PIT's to be operated.
- b. Review operating procedures of specific PIT's to be operated.
- c. Review safety concerns of specific PIT's to be operated.
- d. Review workplace conditions and safety concerns of areas where PIT's will be operated.
- e. Learn/practice actual operation of specific PIT's to be operated and specific workplace conditions where PIT's will be operated.
- f. Demonstrate proficiency performing the powered industrial truck operator duties specific to the trainee's position and workplace conditions.

10. Certification of Completion of the Course

*This outline is intended as a resource in implementing a powered industrial truck operator training program. OSHA's Office of Training and Education wishes to acknowledge Material Handling Services for contributing some of the information used in this outline.



DEPARTMENT OF CONSUMER AND INDUSTRY SERVICES
DIRECTOR'S OFFICE
GENERAL INDUSTRY SAFETY STANDARDS

Filed with the Secretary of State on December 28, 1970 (as amended October 25, 1972) (as amended November 1, 1974) (as amended October 28, 1976) (as amended April 2, 1979) (as amended November 7, 1980) (as amended March 2, 1983), (as amended April 11, 2000)

These rules take effect 15 days after filing with the Secretary of State

(By authority conferred on the director of consumer and industry services by sections 16 and 21 of Act No. 154 of the Public Acts of 1974, as amended, and Executive Reorganization Order No. 1996-2, being §§408.1016, 408.1021, and 445.2001 of the Michigan Compiled Laws)

R 408.12103, R 408.12105, R 408.12106, R 408.12109, R 408.12110, R 408.12111, R 408.12132, R 408.12134, R 408.12136, R 408.12137, R 408.12138, R 408.12151, R 408.12152, R 408.12154, R 408.12155, R 408.12163, R 408.12164, R 408.12171, R 408.12172, R 408.12173 and R 408.12176 of the Michigan Administrative Code are amended and R 408.12104, R 408.12121, R 408.12130 and R 408.12135 of the Michigan Administrative Code are rescinded as follows:

Bureau of Safety and Regulation, Standards Division Web-Site: www.cis.state.mi.us/bsr/divisions/std

PART 21. POWERED INDUSTRIAL TRUCKS

TABLE OF CONTENTS

Table listing various sections of the standards and their corresponding rule numbers, such as Scope (R 408.12101), Definitions (A to C, D to F, H to I, L, M and N, O, P, R to U), Adoption of Standards, Approved labels, Warning devices and lights, Modifications, Parking brakes, tires, Operator platforms, Steering control, Load handling controls, Dockboards and plates, Order picker trucks, Fork lift truck platforms, Load backrest extensions, Spinner knobs, Daily checks, General operating rules, Position of arms and legs, Parking, Towing and pushing, Loading trucks, trailers and railcar, Surveying path of travel, Operations in hazardous areas, Reporting accidents, Clear access, Making repairs, Flammables, Operation, Slow down at crossings and obstructions, Clear view, Ascending and descending grades, Traveling, Starts, stops and turns, Horseplay, Wet floors, dockboards and bridgeplates, Entering elevators, Running over loose objects, Operators' loading rules.

GENERAL PROVISIONS

R 408.12101. Scope.

Rule 2101. The purpose of this part is to provide, in or about places of employment, minimum safety rules for the care and use of powered industrial trucks and to provide for operator safety and specifications of equipment.

R 408.12103. Definitions; A to C.

Rule 2103. (1) "Attachment" means a device, other than conventional forks or load backrest extension, mounted permanently or removed on the elevating mechanism of a truck for handling the load. Popular attachments are fork extensions, clamps, rotating devices, side shifters, load stabilizers, rams and booms.

(2) "Cantilever truck" means a self-loading counterbalanced or noncounterbalanced truck equipped with cantilever load engaging means. (Appendix, Fig. 1).

- (3) "Capacity" when referring to trucks, means:
(a) The capacity of a truck equipped with a load carriage and forks, or with attachments, is the maximum weight in pounds, at a specified load center which the truck, based on the strength of its various components and applicable stability, can lift to the maximum elevation of the load engaging means. Alternate capacities may be established at the same specified load center and at less than maximum elevation of the load engaging means.
(b) The capacity of a truck equipped with a platform is the maximum weight in pounds, at a specified load center which the truck, based on the strength of its various components, can lift to the maximum elevation of the load engaging means.
(4) "Carriage" means a support structure for forks or attachment, generally roller mounted, traveling vertically within

the mast of a cantilever truck.

(5) "Center-control truck" means a truck in which the operator's control position is located near the longitudinal center of the truck.

(6) "Counterbalanced truck" means a truck equipped with load engaging means wherein all the load during normal transporting is external to the polygon formed by the wheel contacts. (Appendix, Fig. 1).

R 408.12104. Rescinded.

R 408.12105. Definitions; D to F.

Rule 2105. (1) "Drift" means to move without control.

(2) "Electric truck" means a truck in which the principal energy is transmitted to motors in the form of electricity from a power source such as, but not limited to, a battery or motor generator.

(3) "End-control truck" means a truck in which the operator's position is located at the end opposite the load.

(4) "Fixed platform truck" means a truck equipped with a load platform which is non-elevating.

(5) "Forks" means horizontal line-like projections, normally suspended from the carriage, for engaging and supporting loads.

(6) "Fork height" means the vertical distance from the floor to the load carrying surface adjacent to the heel of the forks with mast vertical, and in the case of a reach truck, with the forks extended.

(7) "Fork-lift truck" means a light-lift self-loading truck equipped with load carriage and forks for transporting and tiering loads.

(8) "Free play" means an uncontrolled movement.

R 408.12106. Definitions; H to I.

Rule 2106. (1) "High-lift truck" means a self-loading truck equipped with an elevating mechanism designed to permit tiering. Popular types are high-lift fork trucks, high-lift ram trucks, high-lift boom trucks, high-lift clamp trucks and high-lift platform trucks. (Appendix, Fig. 1).

(2) "High-lift platform truck" means a self-loading truck equipped with a load platform, intended primarily for transporting and tiering loaded skid platforms. (Appendix, Fig. 2).

(3) "Industrial crane truck" means a truck intended primarily for pick and carry use in warehousing, yarding, or industrial plant operation over improved or hard surfaced roads and yards, including maintenance within these areas.

(4) "Industrial tractor" means a truck designed primarily to draw 1 or more nonpowered trucks, trailers or other mobile loads. (Appendix, Fig. 5).

(5) "Internal combustion engine truck" means a truck in which the power source is a gas, LP gas, gasoline or diesel type engine.

(6) "Issuing authority" means an employer or his designated representative who instructed and trained the operator.

R 408.12107. Definitions; L.

Rule 2107. "Liquefied petroleum gas (LP gas)" means a fuel which is composed predominantly of any of the following hydrocarbons, or mixtures of them: propane, propylene, butanes (normal butane or iso-butane) and butylenes.

(2) "Load-axle" means the truck axle nearest the load.

(3) "Load backrest extension" means a device extending vertically from the fork carriage frame.

(4) "Load center" means the horizontal longitudinal distance from the intersection of the horizontal load-carrying surfaces and vertical load-engaging faces of the forks, or equivalent load positioning structure, to the center of gravity of the load.

(5) "Load engaging means" means a load handling device attached to a powered industrial truck for the purpose of

handling a load.

(6) "Low-lift truck" means a self-loading truck equipped with an elevating mechanism designed to raise the load sufficiently to permit horizontal movement. Popular types are low-lift platform trucks and pallet trucks. (Appendix, Fig. 3).

(7) "Low-lift platform truck" means a self-loading truck equipped with a load platform intended primarily for transporting loaded skid platforms. (Appendix, Fig. 3).

R 408.12108. Definitions; M and N.

Rule 2108. (1) "Mast" means a support member providing the guideways permitting vertical movement of the carriage. It is usually constructed in the form of channels or similar sections providing the supporting pathway for the carriage rollers.

(2) "Motorized hand truck" means a truck designed to be controlled by a walking operator and used to lift, tow, carry, stock and tier materials. (Appendix, Fig. 4).

(3) "Motorized hand or rider truck" means a dual purpose truck designed to be controlled by a walking operator or by a riding operator. (Appendix, Fig. 6).

(4) "Narrow aisle truck" means a self-loading truck primarily intended for right angle stacking in aisles narrower than those normally required by counterbalanced trucks of the same capacity. (Appendix, Fig. 10).

(5) "Non-elevating truck" means a noncounterbalanced truck designed primarily for burden-carrying and not capable of self-loading.

R 408.12109. Definitions; O, P.

Rule 2109. (1) "Operator" means an employee who has been trained, tested, and authorized by the present employer to operate a powered industrial truck.

(2) "Order picker truck, high-lift" means a high-lift truck controlled by the operator stationed on a platform movable with the load engaging means and intended for manual stock selection. The truck may be capable of self-loading or tiering or both. (Appendix, Fig. 9).

(3) "Overhead guard" means a framework fitted to a truck over the head of a riding operator.

(4) "Overall lowered mast height" means the maximum vertical dimension from the ground or floor to the extreme top point of the mast with the fork carriage in the fully lowered position and unloaded.

(5) "Pallet truck" means a self-loading low-lift truck equipped with wheeled forks of dimensions to go under a single faced pallet or between the top and bottom boards of a double faced pallet and having wheels capable of lowering into spaces between the bottom boards so as to raise the pallet off the floor for transportation. (Appendix, Fig. 4).

(6) "Parking brake" means a device to prevent the movement of a stationary truck.

(7) "Powered industrial truck" or "truck" means a mobile, power driven vehicle used to carry, push, pull, lift, stack, or tier material.

R 408.12110. Definitions; R to U.

Rule 2110. (1) "Reach truck" means a self-loading truck, generally high-lift, having load engaging means mounted so the means can be extended forwardly under control to permit a load to be picked up and deposited in the extended position and transported in the retracted position. (Appendix, Fig. 7).

(2) "Rough terrain forklift truck" means a wheeled-type truck which is designed primarily as a fork truck that has a vertical mast or pivoted boom, or both, which has variable fixed length reach and which may be equipped with attachments and that is intended for operation on unimproved natural terrain as well as the disturbed terrain of construction sites. A machine that is designed primarily for earth-moving, such as a loader or dozer, even though its buckets and

blades are replaced with forks or a machine that is designed primarily as an over-the-road truck that has a lifting device, is not a rough terrain forklift truck.

(3) "Self-loading" means the capability of a truck to pick up, carry, set down and, in the case of high-lift types to stack or tier its load without the aid of external means.

(4) "Service brake" means a device designed to bring a moving truck to a halt.

(5) "Side loader" means a self-loading truck, generally high-lift, having load engaging means mounted in such a manner that the means can be extended laterally under control to permit a load to be picked up and deposited in the extended position and transported in the retracted position. (Appendix, Fig. 8).

(6) "Straddle truck" means a general class of cantilever truck with horizontal structural wheel supported members extending forward from the main body of the truck, generally high-lift, for picking up and hauling loads between its outrigger arms. (Appendix, Fig. 10).

(7) "Tire" means a tire which may be standard solid, cushion solid, pneumatic or solid pneumatic style.

(8) "Tiering" means a process of placing a load on or above another load.

(9) "Unattended truck" means one which is beyond the vision or more than 25 feet from the operator, whichever is less.

R 408.12111 Adoption of standards.

Rule 2111. (1) A powered industrial truck manufactured after January 15, 1971, but before 1993, shall be certified by the manufacturer that the truck covered by this part has been produced according to the mandatory requirements of section 3 and 4, except subsection 421 of section 4, of the ANSI standard B56.1-1969 "Safety Standards For Powered Industrial Trucks."

(2) A low lift or high lift truck manufactured after the effective date of this part shall be in compliance with the requirements of the ANSI standard B56.1-1993 "Safety Standard For Low Lift And High Lift Trucks", except as noted in subrule (1) of this rule.

(3) A rough terrain fork lift truck manufactured after the effective date of this part shall be in compliance with the requirements of ANSI standard B56.6-1992 "Rough Terrain Fork Lift Trucks."

(4) A industrial crane truck manufactured after the effective date of this part shall be in compliance with ANSI standard B56.7-1987 "Safety Standard For Industrial Crane Trucks."

(5) A tow tractor manufactured after the effective date of this part shall be in compliance with ANSI standard B56.9-1992 "Operator Controlled Industrial Tow Tractors."

(6) A manually propelled high lift industrial truck manufactured after the effective date of this part shall be in compliance with ANSI standard B56.10-1992 "Manually Propelled High Lift Industrial Trucks."

(7) The standards specified in this rule are adopted by reference. These standards may be purchased from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado, 80112, USA, telephone number: 1-800-854-7179 and web-site global@ihs.com, at a cost of respectively, \$97.00, \$77.00, \$56.00, \$56.00, and \$70.00, as of the time of the adoption of these rules, or from the Michigan Department of Consumer and Industry Services, Standards Division, 7150 Harris Drive, Box 30643, Lansing, Michigan, 48909.

R 408.12121. Rescinded.

NAMEPLATES AND MARKINGS

R 408.12122. Approved labels.

Rule 2122. (1) A powered industrial truck which has been accepted by an approved testing laboratory shall bear a label or marking indicating such acceptance.

(2) A nameplate, label or tag provided on such a truck shall be maintained in place and in legible condition.

R 408.12130. Rescinded.

EQUIPMENT

R 408.12131. Warning devices and lights.

Rule 2131. (1) A truck, except a motorized hand truck, shall be equipped with an audible device to warn of approach.

(2) A truck used in areas where general lighting is less than 2 foot-candles shall be equipped with auxiliary lights that illuminate work in process.

R 408.12132 Modifications.

Rule 2132. (1) The employer shall not install an additional counterweight without written assurance from the manufacturer of the truck that the truck will meet the stability requirements of ANSI standard B56.1-1993 "Safety Standard For Low Lift And High Lift Trucks."

(2) An employer shall not make other modifications affecting capacity or safety without written approval of the manufacturer or an engineer knowledgeable on the subject. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

(3) If the truck is equipped with front end attachments, the name plate shall be marked to show all of the following:

- (a) Identification of the attachments.
- (b) The approximate weight of the truck and attachment.
- (c) The load capacity of the truck and attachment combination at maximum elevation of the load engaging means with load laterally centered.

R 408.12134. Parking brakes, tires.

Rule 2134. (1) The parking brake on a sitdown rider truck shall be capable of holding the truck on the maximum grade which the truck can negotiate with rated load, or on a 15% grade, whichever is lesser. The parking brake shall be manually or automatically applied and shall remain applied until released by the operator.

(2) Tires shall be used as recommended by the truck manufacturer.

R 408.12135. Rescinded.

R 408.12136. Operator platforms.

Rule 2136. (1) An end control, reach, narrow aisle, order picker high-lift, order picking and stacking, and motorized hand rider truck shall be equipped with a platform extended beyond the operator's position, and shall withstand a compression load equal to the weight of the loaded vehicle applied along the longitudinal axis of the truck with the outermost projection of the platform against a flat vertical surface. The back protective guard where provided shall permit rapid and unobstructed ingress or egress from the platform.

(2) On a double end control baggage type truck or a truck which may be transported on short elevators, means should be provided to prevent accidental folding of the operator's folding platform.

(3) All the following apply to an order picker truck, high-lift:

- (a) A removable operator platform shall be provided with a device that attaches the platform to the lifting means.
- (b) The operator platform shall be equipped with side guard rails.

- (c) When the platform is elevated, the horizontal travel speed of the truck shall be automatically reduced to a degree necessary to maintain stability under maximum braking load and turning.
- (d) Paragraphs (a) and (c) pertain only to a truck manufactured after the effective date of this part. (Note: The effective date was January 15, 1971.)

R 408.12137. Steering control.

Rule 2137. (1) An employer shall assure that, except on a motorized hand and motorized hand or rider truck, the steering control of a powered industrial truck is contained within the outlines of the planes of the truck, or guarded to prevent injury to the operator during movement of the controls when passing an obstacle such as a wall, post, equipment, box, or other truck.

(2) An employer shall assure that on a motorized hand and motorized hand or rider truck, the steering handle is provided with a guard or device to protect the operator's hands from injury when passing an obstacle such as a wall, post, equipment box, or another truck.

R 408.12138. Load handling controls, general.

Rule 2138. (1) All of the following apply to a load handling control on a truck:

- (a) Is preferably, located for right hand operation.
- (b) Is a single lever used to perform more than one function. Push button or pre-selected controls shall be properly identified.
- (c) Is clearly and durably identified to indicate function and direction of motion of load or equipment.
- (d) Is self-centering.

R 408.12139. Load handling controls; direction of motion and guards.

Rule 2139. (1) A lever or handle type control, including a toggle switch, shall be in accordance with the following table:

**TABLE 1
DIRECTION OF MOTION**

| Function | Of Load Or Equipment | Of the Operator's Hand When Actuating the Control Handle While Facing the Load |
|----------------|----------------------|--------------------------------------------------------------------------------|
| Hoist | up | rearward or up |
| | down | forward or down |
| Tilt | rearward | *rearward or up |
| | forward | forward or down |
| Reach | retract | *rearward |
| | extend | forward |
| Clamp | clamp | rearward or up |
| | release | forward or down |
| Side Shift | right | rearward or up |
| | left | forward or down |
| Rotate | clockwise | rearward or up |
| Laterally | counterclockwise | forward or down |
| | rearward | *rearward or up |
| Longitudinally | forward | forward or down |

*The Sense of rotation of the control handle is intended to be in the same direction as the desired motion of the mast or load.

(2) Moving parts that represent a hazard from the operator's position shall be protected by suitable guards.

R 408.12143. Overhead guard on high-lift truck.

Rule 2143. (1) Except as provided in subrule (3), a high-lift truck shall be fitted with an overhead guard. The overhead guard shall be capable of supporting a uniformly distributed static load in accordance with the following table. The

overhead guard is not intended to withstand the impact of a falling capacity load.

(2) Table 2 reads as follows:

**TABLE 2
OVERHEAD GUARD TEST**

| Truck Capacity Rating (in pounds) | Static Test Load as a% of Truck Capacity Rating |
|-----------------------------------|---------------------------------------------------------------|
| Through 5,000 | 200% of truck rating |
| Over 5,000 through 10,000 | 10,000 pounds plus 100% of increment rating over 5,000 pounds |
| Over 10,000 through 20,000 | 15,000 pounds plus 50% increment rating over 10,000 pounds |

(3) An overhead guard may be omitted from a high-lift truck if the truck is never used to lift or raise material or objects more than 72 inches measured from the floor to the forks and if all of the following are complied with:

- (a) The load is limited to a single rack or pallet.
- (b) The truck is not operated in an area where material or objects are stacked above the operator's head.
- (c) A sign with lettering not less than 1/2-inch high is securely attached and the area of the operator's controls stating, "This truck shall not be used to lift materials above the operator's head or in an area where materials are stacked above the operator's head."

(4) A low-lift rider truck which is used to lift material stacked higher than the head of the operator, and which would likely vibrate and fall back onto the operator, shall be provided with an overhead guard.

(5) The overhead guard shall be capable of withstanding the impact of a 100-pound solid hardwood cube, or equivalent, dropped a distance of 5 feet 10 times, without failure or without permanent deflection exceeding 3/4 inch.

(6) The overhead guard shall be constructed in a manner that does not interfere with visibility. Openings in the top shall not exceed 6 inches in 1 of the 2 dimensions, width or length. The guard shall be large enough to extend over the operator under all normal circumstances of truck operation, including forward tilt.

(7) A fork truck equipped with a single-tilt cylinder shall be made to avoid injury to the operator by the overhead guard resulting from failure of this cylinder or associated parts.

(8) On a truck where the operator is seated, a vertical clearance of not less than 39 inches should be maintained from the point of maximum depression of the seat under the operator to the underside of the section of the overhead guard under which the operator's head moves during normal operation.

(9) On a powered industrial truck where the operator stands on a platform, a vertical clearance of not less than 74 inches should be maintained from the platform to the underside of the section of the overhead guard under which the operator's head moves during normal operation.

(10) Where head room conditions limit the overall lowered height of the truck, a normal overhead guard height may be reduced.

(11) An overhead guard is intended to offer protection from the impact of small packages, boxes, and bagged material representative of the job application, but not to withstand the impact of a falling capacity load.

EMPLOYER RESPONSIBILITIES

R 408.12151. Operator selection.

Rule 2151. (1) An employer shall assure that an employee assigned to operate a powered industrial truck shall meet

the following minimum requirements, except as noted in subrule (3) of this rule:

- (a) Have corrected vision that meets the same requirements as those for a valid Michigan driver's license. Evidence of meeting this requirement shall be a Michigan driver's license or a doctor's certificate.
 - (b) Have effective use of all 4 limbs, unless the powered industrial truck has been modified, as prescribed in R 408.12132, to permit operation with fewer than 4 limbs. A prosthetic device is considered a limb when capable of being used to effectively operate the controls.
 - (c) Be of a height sufficient to operate the controls and have an unobstructed view over the controls and dashboard.
 - (d) Have coordination between eyes, hands, and feet.
 - (e) Have freedom from known convulsive disorders and episodes of unconsciousness for a period of 1 year before obtaining a powered industrial truck operator's permit or a lesser time with the assurance from a neurologist that the disorders or episodes are under control.
 - (f) Have the ability to understand signs, labels, and instructions.
- 2) An employer shall assure that an employee assigned to operate a powered industrial truck shall meet the minimum requirements stated in this rule and shall be retested not less than every 3 years.
- (3) Requirements listed in subdivisions (b) and (c) of subrule (1) of this rule and of subrule (2) of this rule are optional for operators of a motorized hand low lift truck.
- (4) An employee who was operating a powered industrial truck before November 9, 1972, but does not meet the requirements of subdivisions (a), (b), (c), and (d) of subrule (1) of this rule and of subrule (2) of this rule, may be continued as an operator if the handicap or inability does not prove detrimental to the assigned task.

R 408.12152. Training.

Rule 2152. (1) An employer shall provide training to the employee before the employee's assignment as an operator of a powered industrial truck. Instruction shall include all of the following:

- (a) Capacities of the equipment and attachments.
 - (b) Purpose, use, and limitations of controls.
 - (c) How to make daily checks.
 - (d) Practice and operating assigned vehicles through the mechanical functions necessary to perform the required job.
 - (e) State safety standard rules 2171 to 2193 of Part 21 "Powered Industrial Trucks," being R 408.12171 to R 408.12193 of the Michigan Administrative Code.
 - (f) Hazards associated with exhaust gases produced by fossil fuel powered industrial trucks (e.g. carbon monoxide, components of diesel exhaust), and hazards associated with the handling of electrolyte chemicals used for battery operated trucks (e.g. sulphuric acid), shall be provided in accordance with the Michigan Right To Know Law, "Hazards Communications" standards 29 C.F.R. §1910.1200 as adopted by R 408.19202 and R 325.77002.
- (2) Training shall consist of a combination of formal instruction (e.g. lecture, discussion, interactive computer learning, videotape, written material), practical training, and testing of the operator's performance in the workplace as required in R 408.12153.
- (3) Refresher training in relevant topics shall be provided to an operator under any of the following conditions:
- (a) An operator has been observed to operate the vehicle in an unsafe manner.
 - (b) An operator has been involved in an accident or a near-miss incident.

- (c) An operator has received an evaluation that reveals that the operator is not operating the truck safely.
 - (d) An operator is assigned to a different type of truck.
 - (e) A condition in the workplace changes that could affect safe operation of the truck.
- (4) An evaluation of each operator's performance shall be conducted before renewal of a truck operator permit. An individual who is authorized by the employer and who has the knowledge, training, and experience to train and evaluate the competence of the operator shall provide training and evaluation.

R 408.12153. Testing.

Rule 2153. (1) An employer shall test an employee before authorizing the employee to operate a powered industrial truck, except a motorized hand truck. The test shall check the employees:

- (a) Operating ability.
 - (b) Knowledge of the equipment.
 - (c) Knowledge of state safety standard rules 2171 to 2193 of Part 21. "Powered Industrial Trucks," being R 408.12171 to R 408.12193 of the Michigan Administrative Code.
 - (d) Knowledge of daily checks.
- (2) A performance test shall be given to determine whether the employee can operate the assigned powered industrial truck through the functions necessary to perform the required work.
- (3) An employee who has a valid permit to operate a powered industrial truck issued by another employer may be tested as prescribed in this rule without meeting the training requirements of R 408.12152.

R 408.12154. Permits.

Rule 2154. (1) An employer shall provide the employee with a permit to operate a powered industrial truck only after meeting the requirements prescribed in R 408.12151, R 408.12152, and R 408.12153. A permit is optional for operators of motorized hand low lift trucks.

(2) An employee being trained is exempt from the permit requirement for a period of not more than 30 days, provided the employee is under the supervision of an individual who is authorized by the employer and who has the knowledge, training, and experience to train operators and to evaluate their competence, and that the training period does not endanger the trainee or other employees.

(3) A permit shall be carried by the operator or be available upon request by a department representative at all times during working hours.

(4) A permit shall indicate the type of truck an operator has been trained on and is qualified to operate.

(5) A permit to operate a powered industrial truck shall be valid only with the employer who issued the permit, and the permit shall be issued for a period of not more than 3 years and shall be consistent with subrule (2) of R 408.12151. An employee who is exempt under subrule (4) of R 408.12151 may continue to operate a powered industrial truck if the employee's handicaps or disabilities do not prove detrimental to his or her task.

(6) A permit shall contain the following information (see sample permit):

- (a) Firm name.
- (b) Operator's name.
- (c) Operator I.D. number, if any.
- (d) Name of issuing authority.
- (e) Type of truck authorized to operate.
- (f) Operator restrictions, if any. The permit shall state the nature of the restriction.
- (g) Date issued.
- (h) Date expiring.

(7) A sample permit is set forth as follows:

SAMPLE PERMIT

| |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>INDUSTRIAL TRUCK OPERATOR PERMIT (firm name)</p> <p>OPERATOR'S NAME OPERATOR'S NUMBER IS AUTHORIZED TO OPERATE: (insert type of truck(s) authorized)</p> <p>RESTRICTIONS: (explanation of restrictions) DATE ISSUED: (month - day- year) DATE EXPIRING: (month - day- year)</p> <p>BY ISSUING AUTHORITY: _____ TITLE</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

R 408.12155 Restriction of use.

Rule 2155. (1) A powered industrial truck used in an environment containing the following substances shall be equipped as prescribed in the National Fire Protection Association standard, 505-1996, "Type Designations, Areas Of Use, Conversions, Maintenance, And Operation Of Powered Industrial Trucks," incorporated herein by reference:

- (a) Gases or vapors, such as but not limited to acetylene, hydrogen, oxygen, ether, gasoline, naphtha, or acetone, which may be present in quantities sufficient to produce an explosive or ignitable mixture.
- (b) Combustible mixtures of dusts such as, but not limited to, metal dust, coal dust, coke dust, grain dust, flour dust, or organic dust.
- (c) Ignitable fibres such as, but not limited to, baled waste, cocoa fibre, cotton, excelsior, kapok, or oakum.

The standard is available for inspection at the Lansing office of the department of consumer and industry services. This standard may be purchased from the National Fire Protection Association, 11 Tracy Drive, Avon, Massachusetts, 02322, telephone number: 1-800-344-3555 and web-site www.nfpa.org, at a cost as of the time of adoption of this rule of \$19.50, or from the Michigan Department of Consumer and Industry Services, Standards Division, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909.

R 408.12161. Mechanical condition and maintenance.

Rule 2161. (1) An employer shall not permit a powered industrial truck to be used if:

- (a) The service and parking brakes do not perform their intended function.
 - (b) The fuel system leaks.
 - (c) A lift cylinder of a load engaging means allows a downward drift of the load engaging means loaded or unloaded in excess of 5 inches in 5 minutes.
 - (d) A tilt cylinder of a mast allows a forward drift of the mast in excess of 2 degrees in 5 minutes with the mast in a vertical position and a capacity load on the fork or load engaging means.
 - (e) The steering mechanism allows free play of the steering wheel of more than 1/4 turn on trucks capable of speeds up to 8 miles per hour and more than 1/8 turn on trucks capable of speeds over 8 miles per hour.
 - (f) A hydraulic system leaks and creates a hazard for an employee and equipment in the area.
- (2) Repairs to a fuel and ignition system which involve a fire hazard shall be made only in a designated location. Repairs shall not be made in a location made hazardous by:
- (a) Flammable gases or vapors.
 - (b) Combustible dusts.
 - (c) Ignitable fibers.
- (3) Repairs to the truck electrical system shall be made only after the battery has been disconnected.

(4) A replacement part shall have not less than the equivalent safety of the original part.

(5) A water muffler shall have the water maintained at not less than 75% of capacity. A water muffler equipped with a screen shall have the screen maintained to accomplish its intended purpose. When an exhaust system of this type emits sparks or flames, the truck shall be removed from service and repaired.

(6) A truck running in excess of normal operating temperature which creates a hazardous condition shall be removed from service and repaired.

(7) A truck shall be maintained in a condition, reasonably free of lint, excess oil and grease. Solvent with a flash point of less than 100 degrees Fahrenheit shall not be used to clean the truck. Precautions regarding ventilation, fire and toxicity shall be observed when using a cleaning agent.

(8) A truck approved for use of 1 type of fuel may be converted to another type of fuel if the conversion qualifies the truck to its new designation, such as GS, LP or LPS. Only approved parts shall be used. The conversion shall be as prescribed in subrule (2) of rule 2132.

(9) All repairs shall be made by authorized personnel.

R 408.12162. Blocks and safety stands for maintenance.

Rule 2162. (1) An employer shall provide the following:

- (a) Chock blocks, support blocks, or jack stands for the maintenance department's use when repairing powered industrial trucks or their components.
- (b) Blocks or safety stands as a means of support for powered industrial trucks elevated from the floor by a hoist or chain fall.

(2) When repairing a powered industrial truck, an employee shall use chock blocks, support blocks, or jack stands if there is a hazard from movement.

(3) An employee shall not place his or her body under a powered industrial truck unless the powered industrial truck is supported by properly arranged blocks or jack stands capable, in total, of supporting a minimum of 1 1/2 times the weight of the component of the truck to be repaired.

R 408.12163. Fuel.

Rule 2163. (1) An employer shall provide safety fuel cans where trucks are refueled with gasoline at other than a gas pump area.

(2) An employer shall provide a special area for refueling that is not less than 25 feet from a source of open flame or spark and the area shall be posted to this effect.

(3) Use and storage of LP gas shall be as specified by 29 C.F.R. §1910.110, "Storage And Handling Of Liquefied Petroleum Gases," which was adopted by reference in general industry safety standard part 56 "Storage And Handling Of Liquefied Petroleum Gases," being R 408.15601 et seq. This standard is available from the Michigan Department of Consumer and Industry Services, Standards Division, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909.

(4) Handling and storage of fuel, such as gasoline and diesel fuel, shall be as prescribed by 29 C.F.R. §1910.106, "Flammable And Combustible Liquids," which was adopted by reference in general industry safety standard part 75 "Flammable And Combustible Liquids," being R 408.17501 et seq. This standard is available from the Michigan Department of Consumer and Industry Services, Standards Division, 7150 Harris Drive, Box 30643, Lansing, Michigan 48909.

(5) Smoking while refueling is prohibited.

(6) Fuel level shall not be checked by use of an open flame.

(7) An employer shall ensure that an employee is protected from exposure to airborne contaminants created in exhaust gases (e.g. carbon monoxide) of fossil fuel powered industrial trucks, as required by R 325.51101 et seq. "Air Contaminants".

R 408.12164. Electric trucks.

Rule 2164. (1) Where electric trucks are used, an employer shall provide a designated area for battery changing, charging or both which shall be performed by a trained and authorized employee.

(2) Provisions shall be made in a battery charging area where batteries are removed from the truck for flushing and neutralization of spillage, for fire protection and for air movement sufficient to disperse fumes from gassing batteries.

(3) Smoking and other sources of ignition shall be prohibited in these areas.

(4) An employer shall assure that an employee shall be trained to position the truck and apply the brake before changing or charging a battery and to position and secure a reinstalled battery before releasing the truck for use.

(5) Material handling equipment, such as, but not limited to, a conveyor or overhead hoist, shall be used for removing and replacing a battery. A spreader bar or an equivalent device shall be used with any overhead battery hoist so that the lifting stresses are vertical. A chain type powered battery hoist shall have a container to accumulate the excess lifting chain. When a hand hoist is used, an uncovered battery shall be covered to prevent the hand chain from shorting on cell connectors or terminals. Tools and other metallic objects shall be kept away from the terminals.

(6) When mixing electrolyte for a battery, an employer shall ensure the use of a carboy tilter or siphon for handling electrolyte. Acid concentrate shall be poured into water; water shall not be poured into acid concentrate.

(7) The following apply to charging a battery:

- (a) The vent cap shall be kept in place and functioning.
- (b) The battery or compartment covers where provided shall be kept open to dissipate heat and gases.

(8) The electrolyte level shall not be checked with an open flame.

(9) Where there is a potential for employee exposure to injurious corrosive electrolyte solutions (e.g. sulfuric acid) associated with battery powered industrial trucks, the employer shall provide both of the following:

- (a) Personal protective equipment in accordance with occupational health part 433, R 325.60001 et seq. "Personal Protective Equipment" or general industry part 33, R 401.13301 et seq. "Personal Protective Equipment".
- (b) Suitable facilities for quick drenching or flushing of eyes and body within the work area for immediate emergency use in accordance with occupational health part 440, R 4401 "Medical Services And First Aid".

R 408.12165. Dockboards and plates.

Rule 2165. (1) An employer shall provide dockboards and plates designed to carry the load imposed on them. The carrying capacity shall be marked on a dockboard or plate purchased after the effective date of this part.

(2) The dockboard or plate shall be secured in position, either by being anchored or equipped with a device which will prevent its slipping out of position.

(3) Hand holds, or other effective means, shall be provided to permit safe handling. Where a fork truck is used, fork loops, pockets or lugs shall be provided for safe handling.

(4) A dockboard or plate shall have a slip-resistant surface, such as but not limited to tread plate, designed to reduce the possibility of slipping by an employee or truck.

(5) A dockboard or plate shall be designed and maintained so the end edges will have a sufficient contact with the dock or loading platform and the carrier to prevent the dockboard or plate from rocking or sliding out of position.

(6) A portable dockboard or plate used by a powered industrial truck to bridge an opening in excess of 18 inches shall have curbs. The height of the curb on the dockboard

or plate used by a powered industrial truck with solid or cushion tires shall be not less than 15% of the diameter of the largest tire of the truck, however, the maximum curb height need not exceed 3 inches.

R 408.12166. Order picker trucks, high-lift-platforms.

Rule 2166. Whenever an order picker truck, high-lift is equipped with vertical only or vertical and horizontal controls traveling with the lifting carriage or forks for lifting an employee, an employer shall assure that the following is provided:

- (a) A platform equipped with railing or other limiting device, including but not limited to a chain, strap or tether.
- (b) A control device whereby the employee on the platform can shut off the power to the truck.
- (c) Protection from falling objects as indicated necessary by the operating conditions.

R 408.12167. Fork lift truck platforms.

Rule 2167. (1) An employee shall not be lifted or transported except when a platform is attached to the forks by enclosed sleeves, a safety chain or a mechanical device in such a manner that the platform cannot tip or slip.

(2) A platform shall be equipped with a railing not less than 36 inches or more than 42 inches high and a toeboard. The railing shall consist of 1 of the following materials:

- (a) Wood posts of at least 2 x 4 inch nominal stock; the top rail shall be made of 2 right angle pieces of not less than 1 x 4 inch nominal stock and an intermediate rail of 1 x 4 inch nominal stock.
- (b) Steel or aluminum pipe posts and rails of not less than 1 inch inside diameter and an intermediate rail of 3/4 inch inside diameter pipe.
- (c) Structural steel or aluminum posts, rails and intermediate rail of angle iron of not less than 1 x 1 x 3/16 inch size or other shapes of equal strength.
- (3) The intermediate rail may be omitted from 1 side.

(4) A toeboard shall be made of not less than 1 inch x 4 inches nominal wood stock or a material of equal strength.

R 408.12168. Load backrest extensions.

Rule 2168. A load backrest extension, manufactured in accordance with rule 2121, shall be used whenever necessary to minimize the possibility of a load, or part of it, falling rearward.

R 408.12169. Spinner knobs.

Rule 2169. A spinner knob shall not be attached to a steering handwheel of a truck unless originally equipped with such; the truck is equipped with power steering; or the truck is equipped with an anti-kickback device on the steering mechanism. The knob shall be installed within the periphery of the handwheel.

EMPLOYEE RESPONSIBILITIES

R 408.12171. Daily checks.

Rule 2171. (1) At the start of each shift, the operator of a powered industrial truck or a qualified employee shall perform daily checks of the equipment as required by the employer. See appendix B for suggested inspection checklist.

(2) An employer shall ensure that any defects that would affect the safe operation of the equipment shall be repaired before use.

(3) An operator shall promptly report any defect on the powered industrial truck to the employer.

R 408.12172. General operating rules.

Rule 2172. (1) An operator shall safeguard other employees at all times.

(2) An operator shall not drive a truck up to anyone who is standing in front of a fixed object.

(3) An operator shall not allow anyone to stand or pass under the elevated portion of any powered industrial truck, whether loaded or empty.

(4) No employee except the operator, shall ride on a powered industrial truck unless the truck is provided with a passenger seat. Passenger seats on a fork lift truck shall be under the overhead guard.

R 408.12173. Position of arms and legs.

Rule 2173. An employee shall not place his or her arms or legs in either of the following positions:

- (a) Between the uprights of the mast.
- (b) Outside the running lines of a moving truck.

R 408.12174. Parking.

Rule 2174. (1) When leaving a powered industrial truck unattended, an operator shall fully lower the forks flat to the floor, neutralize the controls, set the brakes and shut the power off.

(2) Whenever it is necessary to leave a truck on an incline, the truck wheels shall be blocked and the steering wheels turned toward the curbing, wall or railing.

R 408.12175. Towing and pushing.

Rule 2175. A truck shall not be used to tow or push railroad cars, unless it is specifically designed for that purpose. Freight car doors shall not be opened or closed by using a powered industrial truck unless it is equipped with attachments designed for that purpose.

R 408.12176. Loading trucks, trailers, and railcars.

Rule 2176. (1) An employer shall ensure that a highway truck and trailer shall not be boarded by a powered industrial truck, before the highway truck and trailer has its brakes set and not less than 2 wheels blocked or be restrained by other mechanical means installed in a manner that will hold the trailer from movement.

(2) An employer shall ensure that wheel stops, hand brakes, or other approved positive protection to prevent railroad cars from moving during loading or unloading operations are provided, and before and while dockboards or bridge plates are in position.

(3) Provisions shall be made to isolate rail cars during switching operations as required by R 408.10026, "General Provisions."

(4) An employer shall ensure that the landing gear of all semi-trailers are visually inspected immediately before the trailer is uncoupled from the tractor to assure ability of the landing gear to support the imposed load.

(5) A semitrailer less than 30 feet in length, when not coupled to a tractor and being loaded or unloaded with a powered industrial truck, shall be provided a support capable of sustaining the load at the front.

(6) An employer shall ensure that the flooring of trucks, trailers, and railroad cars are checked for breaks and weakness before they are driven onto.

R 408.12177. Surveying path of travel.

Rule 2177. Before moving or stacking, an operator shall survey the path of travel in order to avoid obstacles, such as, but not limited to, pipes, light fixtures, and sprinkler systems. A safe distance shall be maintained from the edge of ramps or platforms while on an elevated dock.

R 408.12178. Operations in hazardous areas.

Rule 2178. When operating a powered industrial truck in a hazardous area, only a truck specifically equipped for such operation shall be used. See rule 2155.

R 408.12179. Reporting accidents.

Rule 2179. A powered industrial truck operator shall report all accidents involving injury to an employee, or damage to buildings and equipment to the employer.

R 408.12180. Clear access.

Rule 2180. An operator shall maintain clear access of fire aisles, to stairways and fire equipment when depositing loads.

R 408.12181. Making repairs.

Rule 2181. Operators shall not make any repairs or adjustments unless specifically authorized to do so.

R 408.12182. Flammables.

Rule 2182. A fuel tank shall not be filled while the engine is running. Spilled fuel shall be carefully washed away or completely evaporated, and the fuel tank cap replaced before restarting the engine.

MOVING TRUCKS

R 408.12183. Operation.

Rule 2183. (1) An operator shall operate a powered industrial truck according to the rules of this part and in accordance with local traffic rules when on a public road.

(2) When following another truck, a safe distance shall be maintained approximately 3 truck lengths from the vehicle ahead and the vehicle shall be kept under control at all times.

(3) An operator shall give the right of way to ambulances, fire trucks, or other emergency vehicles.

(4) An operator of a rider-type powered industrial truck shall not pass another truck traveling in the same direction at intersections, blind spots, or other dangerous locations.

(5) An operator shall cross railroad tracks diagonally whenever possible and shall not park closer than 8 1/2 feet from the center of a railroad track.

R 408.12184. Slow down at crossings and obstructions.

Rule 2184. An operator shall slow down and sound the warning device at cross aisles and other locations where the operator's vision is obstructed by fixed objects.

R 408.12185. Clear view.

Rule 2185. An operator shall look in the direction of and keep a clear view of the direction of travel. When moving loads blocking the forward visibility, for safe handling an operator shall drive the truck with the load trailing.

R 408.12186. Ascending and descending grades.

Rule 2186. (1) An operator shall ascend and descend grades of 10% or more at a speed of not more than 2 miles per hour.

(2) When ascending or descending a grade that exceeds the back-tilt of the mast, the load shall be facing upgrade.

(3) On all grades, unloaded trucks shall be driven with the load engaging means downgrade, tilted back and raised only as far as necessary to clear the floor or road surface.

R 408.12187. Traveling.

Rule 2187. In level areas an operator shall travel with the load engaging means elevated only sufficiently to clear obstacles on floor or roadway.

R 408.12188. Starts, stops and turns.

Rule 2188. Starts, stops and turns shall be made in a manner which will prevent a load from shifting or overturning the truck.

R 408.12189. Horseplay.

Rule 2189. Stunt driving and horseplay shall not be permitted.

R 408.12190. Wet floors, dockboards, and bridgeplates.

Rule 2190. (1) An operator shall drive at a slow speed over wet or slippery floors.

(2) Before driving over a dockboard or bridgeplate, an operator shall observe that the dockboard or bridgeplate is secured.

R 408.12191. Entering elevators.

Rule 2191. (1) An operator shall drive onto elevators only when authorized to do so.

(2) An elevator shall be entered squarely after it is leveled to the floor. Once on the elevator an operator shall neutralize the controls, set the brakes and shut off the power.

(3) Motorized hand trucks shall enter an elevator and other confined areas with the load end forward.

(4) A truck shall not enter an elevator if the combined weight of the load and truck exceeds the capacity of the elevator.

R 408.12192. Running over loose objects.

Rule 2192. An operator of a truck shall avoid running over loose objects.

LOADING SAFETY

R 408.12193. Operators' loading rules.

Rule 2193. An operator shall:

- (a) Operate a truck equipped with attachments as a partially loaded truck when not transporting a load.
- (b) When loading a fork lift truck, place the load engaging means under the load as far as possible and tilt the mast backwards to cradle the load.
- (c) Exercise caution when tilting loads especially when they are segmented.
- (d) Lift or transport only a load that is within the rated capacity of the truck.
- (e) Lift or transport only a load that cannot fall out of a basket or container, or off the load engaging means during the normal movements of the truck.
- (f) Tilt an elevated load forward only when in a deposit position over a rack or stack.

APPENDIX A

TYPES OF TRUCKS

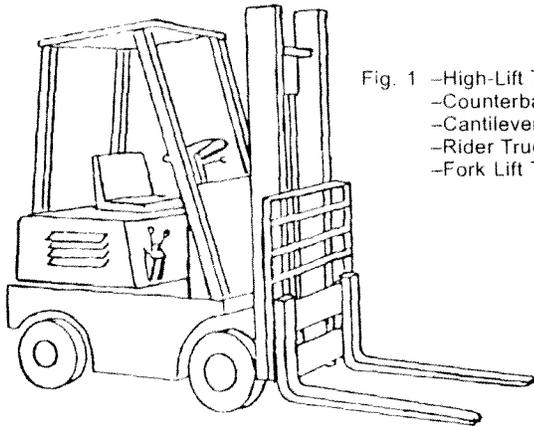


Fig. 1 -High-Lift Truck
-Counterbalanced Truck
-Cantilever Truck
-Rider Truck
-Fork Lift Truck

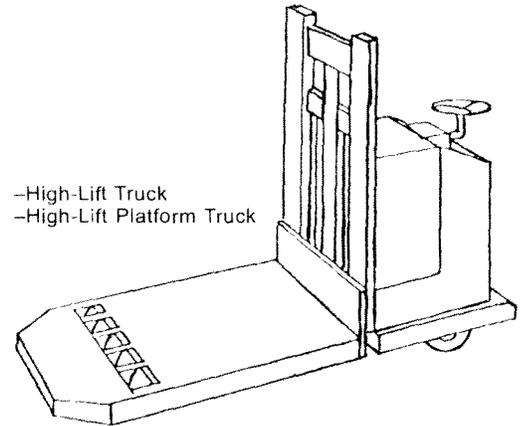


Fig. 2 -High-Lift Truck
-High-Lift Platform Truck

Fig. 3 -Low-Lift Truck
-Low-Lift Platform Truck

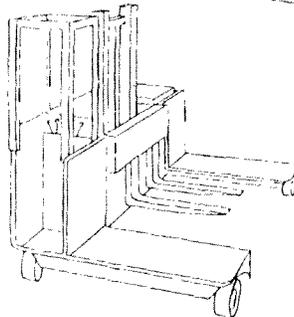
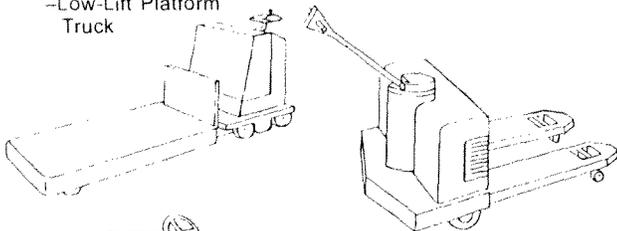


Fig. 8 -Side-Loader Truck

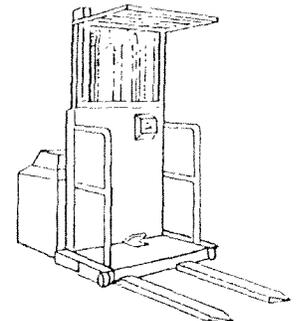


Fig. 9 -Order Picker Truck High Lift

Fig. 4 -Motorized Hand Truck
-Pallet Truck

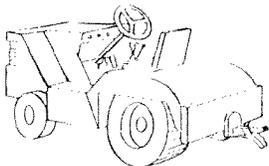


Fig. 5 -Industrial Tractor

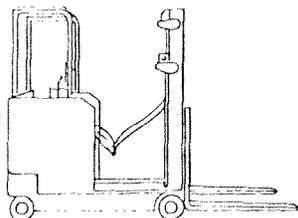


Fig. 7 -Reach Truck

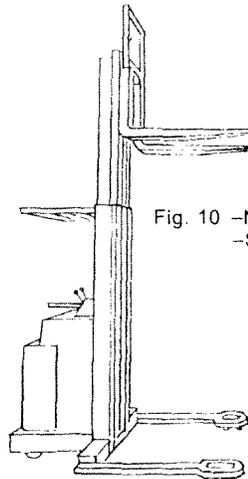


Fig. 10 -Narrow-Aisle Truck
-Straddle Truck

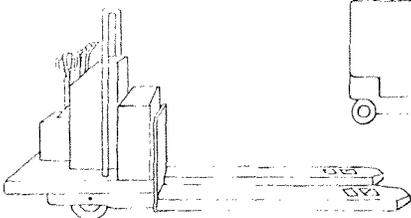


Fig. 6 -Motorized Hand/Rider Truck

| | |
|----------------------|----------|
| Total Units Printed: | 3,000 |
| Total Printing Cost: | \$540.30 |
| Cost Per Unit: | \$0.180 |

Appendix "B"

**FORK TRUCK
PRE-OPERATION INSPECTION CHECKLIST**

Complete the pre-operation checklist with one of the following responses after each item.

- If working properly, enter an X in the "O.K." column.
- If not working properly, enter an X in the "Needs Repair" column and explain the condition.

Turn the checklist in to the appropriate person.

Truck No. _____ Operator _____

Date ____/____/____ Type of Truck _____

Shift 1 2 3 Department _____

| Checklist | O.K. | Needs Repair |
|--------------------------------------|------|--------------|
| Accessory Control | | |
| Battery Indicator | | |
| Brakes | | |
| Fluid Levels | | |
| Forks, Mast, Chains, Stops, Backrest | | |
| Horn | | |
| Hydraulic Cylinders | | |
| Hydraulic Hoses and Fittings | | |
| Lift Control | | |
| Lights | | |
| Limit Switches | | |
| LP Leaks | | |
| Overhead Guard | | |
| Steering | | |
| Tilt Control | | |
| Tires and Wheels | | |



Health and Safety Department
POWERED INDUSTRIAL TRUCKS
Instructors' Guide (4/2/06 revised)

Exercise #1: (Some that may be discussed)

1. Falling off dock or into pit
2. Pedestrians walking out in front of lift without looking
3. Forklift hit another lift or stationary object
4. Falling loads from forks or sliding off forks under braking or turning corners
5. Pushing material towards operator striking them in between workstation and load.
6. Back of forklift raising up from picking up too heavy of a load

Exercise #2:

- A.) False....Page 27 (l)(1)(ii)
- B.) False....Page 30 (m)(3) and (m)(4)
- C.) False....Page 30 (m)(3) and (m)(4)
- D.) False....Page 30 (m)(4) and Page 32 (n)(4) & (n)(6)
- E.) All-----Page 29 (l)(3)(ii)(A-I)
- F.) A 5000 pound capacity fork truck weighs about 11,000 pounds; on the other hand an automobile weighs about 3000-3500 pounds. A forktruck weighs about 3X an automobile. **Do Exercise on Page 41 Lift vs auto**
- G.) #1 set it back down and #3 get a bigger lift..Page 23 (a)(4) and Page 34 (q)(6)
- H.) True...at least once a day unless there is a three shift operation Page 34 (q)(7)
- I.) False...Page 34 (q)(7) and (q)(1) and Page 32 (p)(1)
- J.) False,,Page 30 (m)(2) and Page 20...#49 Fatality
- K.) False....Employers were notified of a retrofit program, but not all took advantage of it. (Page 84)
- L.) False..Page 84 and Page 54....2nd paragraph (overturned trucks leading cause of fatalities with lifts)
Discuss page 43 "Center of Gravity and Stability"
- M.) Individuals answer, but training is required using the operators manual Page 28 (l)(3)(i)(M)
- N.) All..... Page 24..(a)(6) page 23 (a)(3) and (a)(4)
- O.) False....discuss. Standup lift steers the opposite way when turning (Turn wheel left to go right. Discussion with group. Page 29 (l)(4)(ii)(D)
- P.) False...Page 30 (m)(1)

- **Q.)** 100 and 20,000.....Page 54...1st paragraph
- **R.)** False...Page 30 (I)(4)(iii)....note license under the Federal OSHA does not require them, but does require evaluation at least once every three years. Michigan OSHA requires licensing
- **S.)** False...view obstructed with cylinders and overhead guard braces etc..
Discuss ***stopping distances page 42***
- **T.)** All four! Page 29 (I)(4)(ii)(A—>E)



Health and Safety Department

POWERED INDUSTRIAL TRUCKS

Instructors' Guide (for MIOSHA Standard) (4/2/06 revised)

Exercise #1: (Some that may be discussed)

1. Falling off dock or into pit
2. Pedestrians walking out in front of lift without looking
3. Forklift hit another lift or stationary object
4. Falling loads from forks or sliding off forks under braking or turning corners
5. Pushing material towards operator striking them in between workstation and load.
6. Back of forklift raising up from picking up too heavy of a load

Exercise #2: Note "Rules" are MIOSHA Standards (Handout)

- A.) False...**Rules-2109(1) Page 2; 2151 Page 4 & 2154 Page 5**
- B.) False...**Rule 2173 Page 8**
- C.) False...**Rule 2167 Page 7**
- D.) False...**Rules 2173 Page 8 & 2185 Page 8**
- E.) First 5 answers; Narrow aisles make it difficult, but does not affect the handling, the lift still operates the same.
- F.) A 5000 pound capacity fork truck weighs about 11,000 pounds; on the other hand an automobile weighs about 3000-3500 pounds. A forktruck weighs about 3X an automobile. **Do Exercise on Page 41 Lift vs auto**
- G.) #1 set it back down and #3 get a bigger lift. **Rule 2132(1) Page 3**
- H.) True...at least once a day unless there is a three shift operation
Rule 2171 Page 7
- I.) False...**Rule 2161(a) Page 6**
- J.) False, **Rule 2172(3) Page 8** (Page 20--#49 Fatality)
- K.) False...Employers were notified of a retrofit program, but not all took advantage of it. (Page 85)
- L.) False..Page 84 and Page 54.. 2nd paragraph (overturned trucks leading cause of fatalities with lifts)
Discuss page 43 "Center of Gravity and Stability"
- M.) Individuals answer, but training is required using the operators manual
- N.) All **Rule 2122 (2) Page 3; 2132(3) Page 3**
- O.) False...discuss. Standup lift steers the opposite way when turning
(Turn wheel left to go right. Discussion with group) **Rule 2154(6)(e) Page 5**
- P.) False...**Rule 2172 (2) Page 7**

- Q.) 100 and 20,000.....Page 54...1st paragraph
- R.) False.. **Rule 2154(5) Page 5**....note license under the Federal OSHA does not require them, but does require evaluation at least once every three years. Michigan OSHA requires licensing
- S.) False...view obstructed with cylinders and overhead guard braces etc..
Discuss ***stopping distances page 42***. Rule 2131(1) Page 3 Warnings and lights; **Rule 2177 Page 8 Surveying Path of Travel; Rule 2179 Page 8 Reporting Accidents**
- T.) All four! **Rule 2152(3) Page 5**

Note:

1. Spinner Knobs (Barney Knobs) Rule 2169 Page 7 (MIOSHA)
2. Evaluation Form Page 49-50 in workbook
3. Sample Daily Checklist Page 51 of workbook

