



Powered Industrial Trucks

(OSHA 1910.178 & MIOSHA Part #21)

Operators- Students' Manual

A Program of the

Health & Safety Department

International Union, UAW

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Course Goal

Course Goal – *The aim of this program is to provide comprehensive training to operators of powered industrial trucks and high-risk workers (i.e. skilled trades, janitors, utility, etc..) and management on the requirements of Sub Part N, and the prevention of serious injuries involving powered industrial trucks (PIT) at their worksites. Participants will develop an understanding of the requirements of OSHA Sub Part “N” and recommendations from the manufacturer (Operators Manual). The course will identify risks associated with working on or near powered industrial trucks (PIT) and assist employers and operators to eliminate, reduce or control PIT hazards in their workplace.*

Section	Content	Objective
1	Introduction to PIT Training	Participants will be able to: <ul style="list-style-type: none"> • Identify different “types” of Powered Industrial Trucks(PIT)
2	Identifying the Hazards	Participants will be able to: <ul style="list-style-type: none"> • Identify different hazards faced by PIT Operators <ul style="list-style-type: none"> ○ Causes of overturned PIT ○ Slick floors and speed ○ Visibility issues ○ Ramps and open pits ○ Pedestrians ○ No one on or under raised forks ○ Sounding horn at cross aisles and intersections • Recall differences between a PIT and the automobile
3	OSHA Requirements	Participants will be able to: <ul style="list-style-type: none"> • Identify requirements specified in OSHA 29 CFR 1910.178 (L) • Determine training for workers in accordance with OSHA Sub Part N requirements. • Recognize when additional training is required
4	Working On or Near Powered Industrial Trucks (Forklifts)	Participants will be able to: <ul style="list-style-type: none"> • Assist with developing Pedestrian Awareness Training on the hazards of working on or near Powered Industrial Trucks.
5	Action Planning and Course Wrap-up	Participants will be able to: <ul style="list-style-type: none"> • Recognize the potential hazards from an operator and pedestrian point of view • Outline an Action Plan to achieve compliance with OSHA Subpart N.



Health & Safety Department Powered Industrial Trucks, 1910.178

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REPORTED OCCUPATIONAL FATALITIES AMONG **NON-SKILLED**
TRADES WORKERS IN UAW-REPRESENTED WORKPLACES
2004 – December 2011

1. **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.
2. **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.
3. **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.
4. **November 18, 2004 – Joyce Williams, 43**, Engineer Assistant I, 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.
5. **February 3, 2005 – Robert Zell; 35** years old; Maintenance Worker; two months seniority; **Indiana Department of Transportation**; Lafayette, Indiana; **LU 9212, Region 3**. The victim was working along side a road when he was struck by a vehicle.
6. **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.
7. **June 13, 2005 – Ronald Ward, 46** years old, Maintenance Worker, five years seniority, **Indiana Department of Transportation**, Siberia, Indiana, **LU 9212, Region 3**. The victim was collecting debris from a roadway when struck by a vehicle.
8. **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.
9. **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.

- 10. 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.
- 11. 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.
- 12. 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.
- 13. 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.
- 14. 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.
- 15. 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.
- 16. March 13, 2008 – Hiram Torres: 61** years old; Warehouse Worker; 9 years seniority; **Jose Santiago**; Catano, Puerto Rico; **LU 3401, Region 9A**. The victim was assigned as a helper to deliver food products and materials to a second floor cafeteria at a customer location. His normal job was in the warehouse and he was filling in for the regular worker that day. The driver and

victim unloaded material from the delivery truck, placed it on a powered lift platform using a two-wheeled hand truck, closed the lift doors and activated the lift. Both workers walked to the second floor and opened the lift doors to unload materials. The victim stepped onto the lift platform to position himself behind the hand truck and fell through an unguarded 28" x 78" opening between the lift platform and the back wall. The second floor area has poor lighting and this was both workers first time delivering to this location.

- 17. May 9, 2008 – Luis Ruiz Otero:** 37 years old; Road Worker; 4 years seniority; **Department of Transportation and Public Works (DTOP);** Yauco, Puerto Rico; **Local 2341, Region 9A.** The victim was working on an asphalt patching crew in the left lane of eastbound PR-2 when he and another worker were struck by a car. He sustained a skull fracture at the scene and died as a result of his injuries. Highway PR-2 is a 4-lane divided highway separated by a guard rail on a narrow median. Initial investigation revealed the work zone safety plan was inadequate. The work zone was condensed, traffic control devices such as barricades and barriers were not in use and DTOP workers assigned to roadway operations received little or no training.
- 18. May 22, 2008 – Abel J. Gonzales** (died 6-6-08): 55 years old; Truck Driver 300; 7 years seniority; **City of Lansing;** Lansing, MI: **Local 2256, Region 1C.** The victim was assigned to drive a tandem-axle dump truck to remove material from a 'dig-down' site on a public roadway. When he arrived at the site, another dump truck (single-axle) was present in the work zone. The dump trucks had to back up to the 'dig-down' site one at a time to be loaded. The route through the work zone to the loading location was curved and slightly up hill. The victim had difficulty maneuvering the truck backwards up the route and was unable to reach the loading location. He normally drove a smaller, single-axle, dump truck. The job site supervisor instructed the drivers to switch trucks. The drivers parked the trucks side by side near the entrance to the work zone and in position to back up to the loading site. The victim gathered personal items, exited his truck and walked around behind both trucks as they switched. As he passed behind the second truck he was switching to, witnesses observed him drop some papers which blew behind the vehicle he just left. As he went to retrieve the papers, the other truck, which had just started to back up, struck him and knocked him to the ground.
- 19. January 5, 2011** (died 1-18-2011) – **Anthony Marshall:** 45 years old; Machine Operator; 5 years seniority; **Allied Metals;** Troy, Michigan; **LU 155, Region 1.** The victim was operating a metal washing/sorting system. His workstation was positioned beside a belt conveyor and a shaker table and regular job tasks included reaching into the shaker table to remove non conforming metal. While performing this task the victim's clothing became entangled in the end of a belt conveyor and he was pulled head first into the equipment between the belt conveyor and a reciprocating conveyor. He was trapped for approximately 10 minutes as coworkers, police and fire rescue attempted to extract him. The victim suffered strangulation and was unconscious by the time rescue personnel extracted him from the machinery. Emergency stop pull cords on the side rails of the conveyor were disconnected at the time of the incident.
- 20. March 10, 2011** (died 3-13-2011) – **Talmadge Sadler:** 68 years old; Heavy Truck Driver; 45 years seniority; **Triumph Aerosystems-Vought Aircraft;** Dallas, Texas; **LU 848, Region 5.** The victim and a co-worker were preparing a modified flatbed trailer to transport an airplane wing. The victim's task was to fasten down fixture components and a rolled up tarp prior to driving on the highway. He completed securing the fixture and tarp and was walking toward the mid-point of the flatbed intending to descend by stepping down onto the bumper of a small van. The victim

tripped on a contoured part of a rib structure designed to secure the wing in place and fell approximately six (6') feet to the ground, landing on his head. The walking path was obstructed by the fixture used to cradle the wing and the rails to hold the tarp and a mobile platform normally used for accessing flatbed trailers was not available at the time of the incident because this trailer was parked in a different location than normal.

21. March 23, 2011 (died 3-24-2011) – **John Bernady: 51** years old; Production worker; 3 years seniority; **Fairfield Manufacturing**; Lafayette, Indiana.; **LU 2317, Region 3**. The victim was found unconscious in the door area of a turning machine. He was caught between a door panel and a slide table and had likely been removing metal shavings and chips using an air gun at the time of the incident. The victim suffered cardiac arrest was taken to the hospital where he was pronounced dead. The interlock safety device on the machine doors was inoperable and had been bypassed. Several more interlock safety devices were found bypassed in the facility. The victim was working alone at the time of the fatal incident.

22. June 7, 2011 – **Ben Alcorn: 22** years old; Rack/Unrack Crane Shuttle Operator; 3 months seniority; **Acme Galvanizing**, Milwaukee, Wisconsin; **LU 1092, Region 4**. The victim was moving an empty “production bar” (a large rack used for carrying parts through the galvanizing dip process) from one bar stand to another using an overhead gantry crane equipped with two hoists operated by a single pendant control. The production bar is 28 feet long X 5 feet wide and weighs 2,500 lbs. The stands used to hold production bars overhead are approximately 10 feet high. As he was attempting to unhook and move the crane away, the bar suddenly shifted, sliding off the stand and falling on top of him. It is likely one of the hooks had not completely cleared the production bar, snagging it as the crane moved away, pulling it off the bar stand. The attachment points used to hook the bar are narrow and very difficult to see from the ground. Also, there were reports that one of the hoists on the gantry crane had been traveling up faster than the other. Little formal training is provided for crane operators and the victim had only been on the job about four weeks at the time of the fatal incident.

23. August 13, 2011 (died 8-14-2011) **Frances E. Buckner: 58** years old; Semi-Truck Driver; 16 years seniority; **Chrysler Transport**, Detroit, Michigan; **LU 212, Region 1**. The victim was fueling her tractor (over-the-road truck) with diesel fuel shortly after the start of her shift (4 a.m.). According to a witness working nearby; the victim heard the pump “click off” and proceeded to pull out the pump nozzle to place it back on the pump. As she pulled the nozzle out, diesel fuel was still flowing and she was doused with fuel on her face, eyes, chest, thighs and feet. Her clothing and shoes were wet with fuel and she took her glasses, off dropping them to the ground. The victim proceeded to a location where an emergency eyewash was located and found it disabled. She then went into the terminal building, told the shift supervisor she had fuel on her and proceeded to the women’s restroom to wash off. She returned and asked for a change of clothes; was initially provided a T-shirt by the shift supervisor and was later provided a pair of work pants just prior to being transported to medical. The victim showered at the medical facility and her condition was evaluated. Medical staff determined she could return to work. The victim asked if she could go home and change her undergarments because they were wet with fuel. Medical staff advised they could not make that decision and she would have to ask her supervisor. The victim began hyperventilating during the conversation and an ambulance was called to transport her to a nearby hospital. She was later airlifted to a Regional Hospital and died there on August 14, 2011. The causes of death were listed as Acute Respiratory Distress; Possible Diesel Inhalation; and Clinical Chronic Obstructive Pulmonary Disease (COPD)

Sorted by "CAUSE":

Cause:	Age:	Seniority:
Chemical	57	12
Chemicals	58	16
Fall	61	9
Fall	68	45
Forklift overturned	46	.5
Guarding	59	32
Guarding	61	43
Highway Accident	38	5
LOTO	31	2
LOTO	61	15
LOTO	48	21
LOTO	40	18
LOTO	45	5
LOTO	51	3
Material Handling - Crane	22	.3
Struck by motorized vehicle	59	26
Struck by motorized vehicle	49	7
Struck by motorized vehicle	43	10
Struck by motorized vehicle	35	.2
Struck by motorized vehicle	46	5
Struck by motorized vehicle	59	29
Struck by motorized vehicle	37	4
Struck by vehicle	55	7

Sorted by "AGE":

Cause:	Age:	Seniority:
Material Handling - Crane	22	.3
LOTO	31	2
Struck by motorized vehicle	35	.2
Struck by motorized vehicle	37	4
Highway Accident	38	5
LOTO	40	18
Struck by motorized vehicle	43	10
LOTO	45	5
Forklift overturned	46	.5
Struck by motorized vehicle	46	5
LOTO	48	21
Struck by motorized vehicle	49	7
LOTO	51	3
Struck by vehicle	55	7
Chemical	57	12
Chemicals	58	16
Guarding	59	32
Struck by motorized vehicle	59	26
Struck by motorized vehicle	59	29
Fall	61	9
Guarding	61	43
LOTO	61	15
Fall	68	45

Sorted by "SENIORITY":

Cause:	Age:	Seniority:
Struck by motorized vehicle	35	.2
Material Handling - Crane	22	.3
Forklift overturned	46	.5
LOTO	31	2
LOTO	51	3
Struck by motorized vehicle	37	4
Highway Accident	38	5
LOTO	45	5
Struck by motorized vehicle	46	5
Struck by motorized vehicle	49	7
Struck by vehicle	55	7
Fall	61	9
Struck by motorized vehicle	43	10
Chemical	57	12
LOTO	61	15
Chemicals	58	16
LOTO	40	18
LOTO	48	21
Struck by motorized vehicle	59	26
Struck by motorized vehicle	59	29
Guarding	59	32
Guarding	61	43
Fall	68	45



**REPORTED OCCUPATIONAL FATALITIES AMONG SKILLED TRADES WORKERS IN UAW-REPRESENTED WORKPLACES
2002 – December 2011**

- 1. 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.
- 2. 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.
- 3. 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.
- 4. 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 the victim in the head and ultimately dragging him 12 feet.
- 5. 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.
- 6. 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.
- 7. 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.
- 8. 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.
- 9. 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.**

10. **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.
11. **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.
12. **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.
13. **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.
14. **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)**
15. **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.
16. **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.
17. **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.
18. **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.
19. **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.

- 20. 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.
- 21. January 8, 2008 – William D. LaVanway (died 2-4-08): 54** years old; Electrician; 14 years seniority; Robert Bosch Corp. Chassis Systems; St. Joseph, Michigan; **LU 383, Region 1D**. The victim was assigned to investigate a “hot spot” found by thermograph scans on a power distribution panelboard in Dept. 48. He was working on a fusible switch bucket to determine the problem in the fuse block. The victim followed established procedures placing the disconnect switch in the off position prior to opening the bucket door and tested to verify power was off to both the load side and line side of the fuse block. The fusible switch bucket is an older design which does not have visible switch blades for positive identification of their position. He was using a screw driver to demonstrate to his supervisor that the fuse clip had good compression and was not loose when an arc fault explosion occurred.
- 22. February 20, 2008 – David Wentz: 38** years old; Maintenance Mechanic; 11 years seniority; AK Steel Coshocton Works; Coshocton, Ohio; **LU 3462, Region 2B**. The victim was assigned to check torque on a nut in the fan assembly at the base of a bell furnace prior to the loading of coiled flat steel. The bell furnace base is located in an 11 foot deep pit. This task had become necessary before each load cycle because preventive maintenance resources have been reduced. Also, prior to the reductions two Maintenance Mechanics were assigned to perform this task. As the victim bent over tightening the bolt, an overhead trolley crane positioned and lowered a 17 ton roll of steel on to the base, crushing him. The victim was **working alone** at the time of the incident.
- 23. July 23, 2008 – Frederick A. Todd: 39** years old; Die Setter; 19 years seniority; Ford Woodhaven Stamping; Trenton, MI; **Local 387, Region 1A**. The victim and other maintenance workers were preparing four dies for placement into a transfer press. The dies are moved using transfer bolsters. The transfer bolster in use was positioned in a staging area near the press doors, and parallel to a second transfer bolster. The transfer bolsters are air driven and controlled by a two-button pendant with directional movement set by three air valves. The pendant had been set down on the bolster work platform. The victim walked on the platform path (approximately 1' wide) between the two transfer bolsters to the air supply valve located 14-feet away. He turned the valve, located between the bolsters, to the on position. The transfer bolster he was working on unexpectedly moved toward the second, stationary bolster trapping the victim. He died of crushing injuries when he was caught between the pillars of the two transfer bolsters.
- 24. May 20, 2009 – Jeff Malins: 51** years old; Toolmaker; 7 years seniority; Detroit Diesel Corp.; Redford, Michigan; **LU 163, Region 1A**. The victim was working inside a machine, assisting two other toolmakers un-jamming a parts feeder, when the machine cycled, striking and trapping his head. The machine was not locked out and an access gate equipped with an interlock device was open. The interlock device was bypassed with a “cheat key” (actuator). The use of “cheat keys” to bypass interlock devices was a common, well known and accepted practice in this facility.

- 25. December 26, 2009 - Ron Cassidy** – 54 years old; Pipefitter; 16 years seniority – Ford; Louisville, KY; **Local 862, Region 3** Final Assembly at KTP was killed this morning when struck by an 11 foot piece of I beam. A team was in the process of removing the piece of I beam from the ceiling. Cassidy who was on the ground spotting was struck when the final cut was made and the beam slid off the lift.
- 26. March 19, 2010 – Roger Brooner:** 58 years old; Maintenance Mechanic; 3 years seniority (30 year diesel mechanic) ; **Spirit AeroSystems**; Tulsa, Oklahoma; **LU 952, Region 5.** The victim was working on a semi-tractor outside the maintenance shop when the vehicle went into motion striking and trapping him underneath. The vehicle was being serviced for a leak in the air system and the victim had finished replacing the “air brake DOT” fitting just prior to the fatal incident. The final step in repair is to charge the air system by starting the vehicle and letting it run for a short time; turning the truck off and listening for air leaks. It appears the truck did not start properly and the victim used a battery booster in an attempt to jump-start the engine. At some point the victim was either standing just in front of or positioned laying under the truck as it took off dragging him approximately three hundred feet. The vehicle was chocked and the victim was **working alone** at the time of the incident.
- 27. Dec. 31, 2010 - Claude Brock Jr. of, 61,** was a millwright with 16 years of seniority at **Chrysler LLC’s Kokomo Casting; Kokomo, IN., LU 1166, Region 3.** The victim and another millwright were assigned to troubleshoot and repair an incline scrap conveyor in a die cast area. The conveyor transports scrap castings from a recovery system located in a basement area to a scrap gondola (also known as a roll-off container) on the first floor. They had just finished welding reinforcements to the side chutes on the conveyor when Brock walked around the back to look at the completed work. Brock lost his footing, fell backward toward the lubrication system and over a guardrail protecting an opening to the basement area – about 20 feet to the basement floor below.

Sorted by "CAUSE":

Cause:	Age:	Seniority:
Arc Flash	54	14
Fall	52	32
Fall	55	34
Fall	64	31
Fall	44	25
Fall	44	13
Fall	57	38
Fall	64	6
Fall	61	16
LOTO	57	29
LOTO	54	29
LOTO	42	15
LOTO	53	33
LOTO	52	6
LOTO	41	12
LOTO	58	31
LOTO	51	32
LOTO	39	19
LOTO	51	7
LOTO	58	30
LOTO/C.S	38	11
Material Handling - Crane	62	33
Material Handling - Forklift	59	39
Material Handling - Forklift	64	35
Material Handling - Forklift	54	16
Material Handling - JLG	55	32

Sorted by "AGE":

Cause:	Age:	Seniority:
LOTO/C.S	38	11
LOTO	39	19
LOTO	41	12
LOTO	42	15
Fall	44	25
Fall	44	13
LOTO	51	32
LOTO	51	7
Fall	52	32
LOTO	52	6
LOTO	53	33
LOTO	54	29
Arc Flash	54	14
Material Handling - Forklift	54	16
Fall	55	34
Material Handling - JLG	55	32
LOTO	57	29
Fall	57	38
LOTO	58	31
LOTO	58	30
Material Handling - Forklift	59	39
Fall	61	16
Material Handling - Crane	62	33
Fall	64	31
Fall	64	6
Material Handling - Forklift	64	35

Sorted by "SENIORITY":

Cause:	Age:	Seniority:
LOTO	52	6
Fall	64	6
LOTO	51	7
LOTO/C.S	38	11
LOTO	41	12
Fall	44	13
Arc Flash	54	14
LOTO	42	15
Material Handling - Forklift	54	16
Fall	61	16
LOTO	39	19
Fall	44	25
LOTO	57	29
LOTO	54	29
LOTO	58	30
Fall	64	31
LOTO	58	31
Fall	52	32
Material Handling - JLG	55	32
LOTO	51	32
Material Handling - Crane	62	33
LOTO	53	33
Fall	55	34
Material Handling - Forklift	64	35
Fall	57	38
Material Handling - Forklift	59	39



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

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**

M.) I have seen/or read my trucks owners manual. **TRUE or FALSE**

N.) Labels on forklifts indicate:

- 1.-TYPE OF LIFT
- 2.-WEIGHT OF PIT
- 3.-CAPACITY OF LIFT
- 4.-IF ATTACHMENTS ARE OK TO BE USED
- 5.-LOAD CENTER

O.) All Powered Industrial Trucks operate the same way, once you have been trained you can operate any of them.

True or False

P.) I can push containers up to an operator working on a machine, as long as I am careful.

True or False

Q.) How many forklift related fatalities happen each year in the United States?

45

85

100

How many are injured? 20,000-----10,000-----3,500

R.) Once a license has been issued, it is good for life. **True or False**

S.) Pedestrians are always visible to the Powered Truck operator. **True or False**

T.) Refresher training must be done when:

- 1- Observed operating in an unsafe manner
- 2- Assigned to use a different type lift
- 3- Evaluation indicates a problem
- 4- New environmental hazard introduced into the workplace



WARNING IMPROPER OPERATION OR MAINTENANCE COULD RESULT IN INJURY OR DEATH.

MODEL [REDACTED] SERIAL No. **3FM 000000**

TYPE **LPS** TRUCK WT. **8,680** lbs

CAPACITY OF STANDARD TRUCK WITH SIMPLEX MAST AND FORKS: **5,000** lbs AT 24 IN. LOAD CENTER WITH MAXIMUM HEIGHT OF 130 IN. RATED CAPACITY WITH OPTIONAL MAST AND/OR ATTACHMENT LISTED BELOW.

A	B	FORKS ONLY	ATTACH
in.	in.	lbs.	lbs.
156	24		4,500

MAST : VERTICAL

ATTCH/MODEL **Sideshifter**

MEETS DESIGN SPECS ANSI B56.1

OSHA 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]

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

Powered Industrial Trucks (PIT) - 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:*

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

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

(l)(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.

(l)(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.

(l)(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.

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

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

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

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

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

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

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

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

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

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

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

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

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

(l)(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

semi-trailer during loading or unloading when the trailer is not coupled to a tractor. **The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven 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.

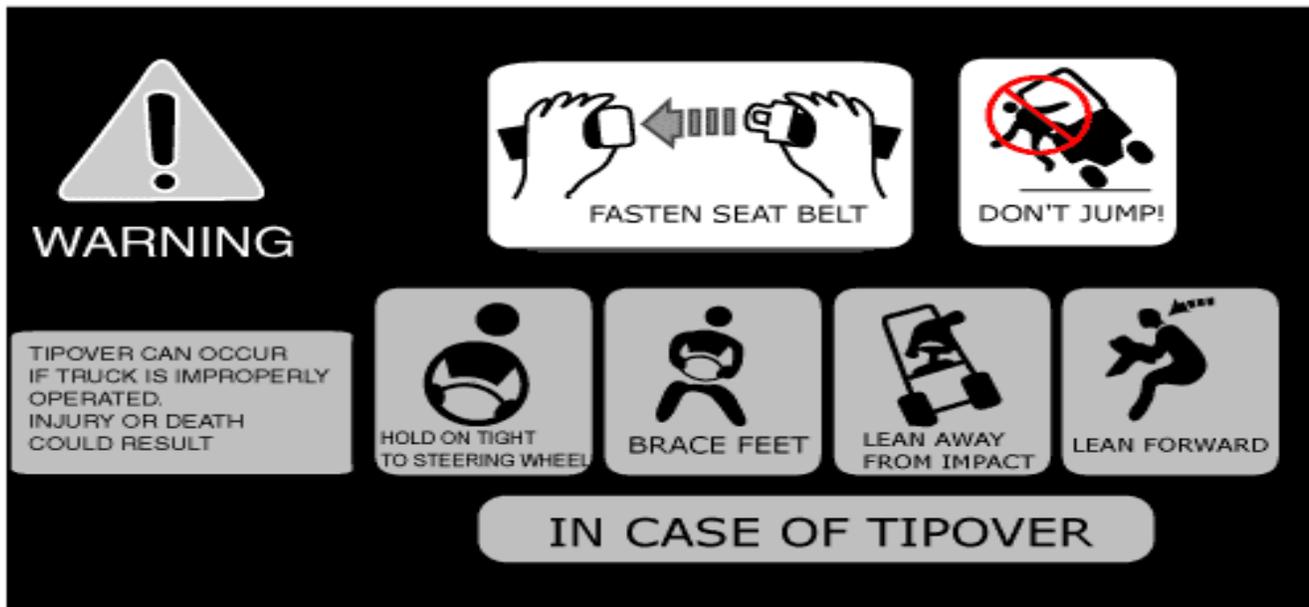
(q)(8) Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged. 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." 63 FR 66270, Dec. 1, 1998]



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.

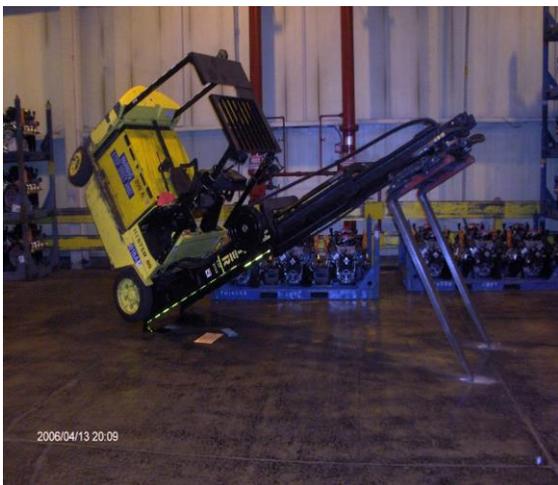
A-6.2. Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

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]



What's the Difference??

Automobile



Forklift



1. . Good vs Poor Visibility _____
2. . _____
3. . _____
4. . _____
5. . _____
6. . _____
7. . _____
8. . _____

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 P.I.T.'s and pedestrians.
- * Storage at cross-aisles obstruct your view, stop and look in both directions before entering aisleways.
- * Pedestrians think if they see you, you must see them.....FALSE!



November 4, 2004

Mr. William Overby
2932 Hazel Ave.
Dayton, OH 45420

Dear Mr. Overby:

Thank you for your letter to the Occupational Safety and Health Administration (OSHA). The Directorate of Enforcement Programs (DEP) received your letter on May 10. This letter constitutes OSHA's interpretation only of the requirements discussed and may not be applicable to any question or scenario not delineated within your original correspondence. You had specific concerns about 29 CFR 1910.178(n)(8) and 29 CFR 1910.178(n)(15).

Background: 29 CFR 1910.178(n)(8), requires that "[u]nder 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."

29 CFR 1910.178(n)(15), requires that "[w]hile 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."

Question: What does OSHA consider a "safe speed" to be for the operation of a powered industrial truck?

Reply: OSHA **does not have specific speed limits set for the safe operation of a powered industrial truck.** However, in determining what is a safe speed, OSHA would take a variety of factors into consideration. These factors include, but are not limited to, the type of truck itself, the manufacturer's limitations on the truck, the load being carried, adequate stopping distances, operating surface conditions, pedestrian traffic, and other safety issues. While specific speed limits are not available, OSHA would consider the totality of the circumstances surrounding the operation of the powered industrial truck in determining whether safe travel speeds are practiced at a workplace. For additional assistance in determining safe travel speeds, an employer could look to consensus standards such as ASME B56.1-2000 *Safety Standard For Low Lift and High Lift Trucks*. For example, paragraph 4.3.2 of ASME B56.1 contains a Stopping Distance formula which may be useful in determining approximate theoretical stopping distances where certain variables are known. This information, along with other factors, can then be used to calculate a maximum safe speed.

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 Enforcement at (202) 693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Enforcement Programs

The Hierarchy of Health & Safety Controls

A heated debate often occurs between labor and management in the health and safety arena that is sometimes referred to as the “**Do we fix the workplace or the worker?**” issue.

Management’s tendency, given its focus on workers’ behavior and short-term cost reduction, is to argue for “fixing the worker” solutions: protective gear and discipline for failure to follow procedures. The Union considers this to be “blaming the victim” and advocates for solutions that “fix the workplace.”

Research indicates that the latter approach is actually more effective and less expensive in the long run. One reason is that human behavior can never be completely regulated and controlled, so solutions based on compliance with procedures will always lead to mishaps. Machine controls and replacement of hazardous materials are much more capable of guaranteeing safety and health. The UAW’s and OSHA’s analysis of control effectiveness is captured in the graph below.

MOST EFFECTIVE	1. Elimination or Substitution	<ul style="list-style-type: none"> • substitute for hazardous material • 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 • back-up alarms • beepers • horns • labels
↓	4. Training & Procedures	<ul style="list-style-type: none"> • Safe job procedures • Safety equipment inspections • Hazard Communications Training • Lock-out • Confined Space Entry, etc...
LEAST EFFECTIVE	5. Personal Protective Equipment	<ul style="list-style-type: none"> • safety glasses • ear plugs • face shields • safety harnesses and lanyards • knee pads

1. What is the most effective way to fix “blind corners”? _____
2. What is the most effective way to keep pedestrians from walking out in front or behind you as an operator?

3. What is the most effective way to enforce the speed limit of a powered industrial truck? _____

Automotive Industry Action Group-Excerpts OHS-2

AIAG - Pedestrian and Vehicle Safety Guideline

Facility Assessments

In general, powered industrial trucks, other in-plant powered vehicles, and pedestrian traffic should be separated wherever possible. In areas where this is not possible, added safety controls (physical and visual) should be required to reduce pedestrian risks. It is important to realize that on-site facility assessments are necessary in order to identify those areas requiring pedestrian/vehicular safety controls and to ensure that the process is consistently implemented.

A detailed facility assessment should focus on:

- 1) High pedestrian traffic areas (e.g., adjacent to offices, cafeterias, locker rooms, employee entrances, etc.)
- 2) High powered industrial-truck and/or finished- product traffic areas (e.g., receiving/shipping docks, warehouses and marketplaces (stock storage), pre-delivery areas, etc.).

The following elements from this Guideline are addressed in more detail:

- Facilities - On-site facilities assessments are necessary to identify areas requiring pedestrian/vehicular safety controls. Consistency in marking and separating these areas is a key to improved awareness of and conformance to the guidelines.
- Equipment - Equipment specifications have an impact on how readily a vehicle is observed by pedestrians. For example, recent studies have shown that certain paint colors can make a vehicle up to four times more visible to the human eye.

Facility Design

- Aisle widths and color-coded demarcation lines
- Personnel access doorway locations
- Service doorway locations
- Material storage locations (e.g., marketplaces, material warehouse, line side storage, etc.)
- Plant floor office locations including personnel access doorways
- Individual departmental locations including supervisory locations
- Employee service locations (e.g., shop floor entrances, break rooms, cafeterias, canteens, locker rooms, main entrances for employees and non-employees, medical, parking lot entrances, restrooms, secured accesses for employees and non-employees)
- Powered industrial-truck repair staging
- Shipping dock locations (e.g., loading bays, personnel access doorways, shipping offices, etc.)
- Receiving dock locations (e.g., unloading bays, personnel access doorways, shipping offices, etc.)
- Stairwell locations
- Permanent ladder locations
- Drinking fountain locations

Facility Layout

Pedestrian walkways should be marked with widths of no less than 3 feet wide, using demarcation stripe widths of 4-inch minimum.

Shared “vehicular and pedestrian” aisles are to include a marked pedestrian aisle/walkway with boundaries striped yellow.

Pedestrian Barriers

Barriers/railings painted Target Yellow should be installed at pedestrian access points to aisles in which powered industrial truck traffic is present (e.g., from stairways, vestibules, offices, canteens, cafeterias, locker rooms, employee entrances, etc.). The purpose of such barriers is to impede forward momentum for pedestrians entering powered industrial-truck traffic aisles or zones. Note: Barriers shall comply with local/state/federal zoning ordinances.

Mirrors

- 360-degree dome (spherical) mirrors and/or convex mirrors (Figure 1.9) are to be installed at powered industrial-truck/pedestrian intersections to enhance visibility.
- When possible, mirrors should be mounted a maximum of 12 feet above the floor to the bottom of the dome.

Powered Industrial-Truck Application

Every powered industrial-truck main chassis/frame should be painted a high-visibility color.

Powered Industrial-Truck Operator

Operators should avoid creating blind corners and intersections due to staging tall piles of stock at these locations.

Company radio dispatch systems installed in powered industrial trucks should be used only when the powered industrial truck is brought to a complete stop.

In operations where two-way traffic (or the potential for passing) exists, it is suggested that all vehicles that tow carts be equipped with some type of cone or other device that provides passing drivers a warning to give clearance.

If you stop your vehicle to talk to a pedestrian, the “2-Foot Rule” should be enforced. This rule requires an operator to maintain a minimum distance of 2 feet (or outstretched arm’s length) between the vehicle and the pedestrian being communicated with. In the case of a high-lift powered industrial truck, the load engaging means should be completely lowered, the directional control placed in neutral, and the power supply to either motor or engine turned off before the pedestrian is allowed closer than two feet to the vehicle.

Operators should wear high visibility safety vests in all designated powered industrial-truck traffic areas, restricted zones, and any other congested areas as determined by each facility assessment. Examples might include shipping/receiving docks, cafeteria perimeters, battery charging/changing areas, security gate personnel entrances, etc.

Pedestrians should be instructed that they possess the “*right-of-way*” only when they are in the pedestrian walkway or an identified crosswalk.

Pedestrians should maintain a distance of 2 feet (or outstretched arm's length) from any powered industrial truck in operation.

Pedestrians should cross at designated crossings, when available.

Pedestrians should wear high-visibility fluorescent green safety vests in all designated, powered industrial-truck traffic areas, restricted zones, and any other congested areas as determined by each facility assessment.

Material Flow and Storage

Material stored at all line side workstation areas that is stacked more than 4feet high should have some type of guard (e.g., wire/synthetic mesh or screen) on the workstation side to prevent accidental falling of any stored material.

Material should not be stored within the demarcation lines of any aisle or walkway.

Powered industrial trucks should not be used to push material along any aisle way or storage area.

Incident Tracking and Categorization

A uniform, consistent means by which to track ongoing events involving the Pedestrian and Vehicles Safety Program.

- Powered Industrial Truck and Dock Incident Severity - By Category
- Equipment Type Involved in Incidents – By Truck Classification
- Pedestrian Severity – By Category
- Equipment Involved in Serious/Fatal Pedestrian Incidents
- Dock/Hi-way Trailer Related Incident Severity – By Category
- Industrial Truck Incident Types – By Category

Follow-Up Training

Follow-up training must be required when:

- The operator has been observed to operate the vehicle in an unsafe manner. The observation may be made by anyone.
- The operator has been involved in an accident. The accident may be reported by anyone.
- The operator has been involved in a near-miss incident. The incident may be reported by anyone.
- The operator has received an evaluation that reveals that the operator is not operating the truck safely.
- A condition in the workplace changes in a manner that could affect safe operation of the powered industrial truck.
- The operator is assigned to a powered industrial truck with operating functions not provided in previous operator training.
- The existing powered industrial truck in operation has been modified.

Facility Assessments

Benchmarks for designing the optimum plant layout include but are not limited to the following guidelines:

- Design for optimum pedestrian aisle space and crosswalks. Completely segregate pedestrian from powered industrial truck traffic wherever possible.
- Locate drinking fountains away from active aisles.
- Do not store any material within 8 feet of aisle intersections, thus improving visibility of the approaching intersection.
- Use 360-degree dome mirrors or convex mirrors at blind/congested intersections.
- Locate all personnel access doors away from the main aisles for powered industrial-truck traffic. Access from doors should not lead immediately into an aisle.
- Wherever possible, dedicate aisles as material flow traffic aisles only.
- Identify space at dock locations as non-pedestrian areas only.
- Define tool operator space with an escape path and protection from equipment encroachment.
- Identify potential problem areas and mark them with signs, paint, or cross-hatching to alert powered-equipment operators and pedestrians of potential hazard areas (e.g., use stop signs, foot paths on floor, flashing light at intersections, etc.).
- Provide safe clearance between pedestrians and powered overhead equipment (e.g., conveyors, etc).
- Provide railings around corners and high pedestrian areas to protect from trailing dollies being towed. Ensure that railings do not result in tripping hazards.
- Provide dedicated zones for dolly drop-off.
- Provide adequate lighting for existing working conditions.
- Provide windows on each corner of all inter-plant offices located at aisle intersections to eliminate blind corners.
- Dedicate one personnel access door for over-the-road truck drivers to enter/exit. Access should lead directly to and from Shipping and Receiving offices. The personnel access door should be located close to the respective offices to eliminate drivers walking across loading/unloading bays. Install information signs instructing drivers to proceed to holding areas (canteen, break room, waiting room, etc.) until summoned.
- Stairs located near powered industrial-truck traffic aisles and descending from elevated floor levels should exit pedestrians parallel to the aisle, never perpendicular.
- Locate information signs stating "Place No Stock" in areas where storage of such material will create blind spots.
- Wherever possible, provide aisles that can safely support two-way traffic and a separate pedestrian aisle (twice the width of the maximum load handled + 18 inches load-to-load clearance + a 3-foot pedestrian walkway). Aisle demarcation lines should be painted in accordance with the mandatory requirements of Section 1.2.
- Fire extinguishers and related fire-fighting equipment should be mounted to the inside of vertical structural support columns and not directly on the column adjacent to powered industrial-truck traffic aisles.
- Picnic tables, rest areas, vending machines, etc., should be located away from powered industrial- truck traffic aisles. If this is not possible, protective guards/barriers should be installed as needed.
- Eliminate "pedestrian flow shortcuts" in production line areas. Design to prevent pedestrians from cutting through production lines and into main powered industrial traffic aisles

Facility Layout

Minimum Aisle Widths			
	Assembly / Machining	Body shop	Stamping
Aisles along building perimeter wall	15 feet (4.6m)	15 feet (4.6m)	20 ft. (6.1m)
Cross aisles and storage areas	12 feet (3.7m)	15 feet (4.6m)	15 feet (4.6m)
Service aisles	8 feet (2.4m)	8 feet (2.4m)	8 feet (2.4m)

The truck dock apron and aisles that are used to service the truck unloading process should be classified as "Authorized Personnel Only"

The minimum aisle width for aisles servicing the truck dock apron is two times the widest load handled, plus 3 feet (0.9m).

The minimum overhead clearance is 18 feet (5.5m) throughout the dock apron and 12 feet (3.6m) overhead clearance in adjacent aisles.

Facilities for over-the-road truck drivers and the shipping office should be provided so that non-company personnel are contained.

The dock apron should contain no building columns.

The minimum spacing between docks is 15 feet (4.6m), center to center.

For docks where full-length in-plant trailer trains are to be used, the distance from the dock the opposite side of the apron should be: [8 feet (2.4m) dock plate, plus 15 feet (4.6m)

Point-of-use docks should not unload directly into the building perimeter aisle. The dock area should be isolated from other traffic and marked as such according to the Pedestrian and Vehicle Safety Guideline. The minimum depth of the unloading area is 35 feet (10.7m) from the dock face to the perimeter aisle [8 feet (2.4m) dock plate, 27 feet (8.2m) apron].

The rail dock apron is the interior area, which extends from the edge of the rail well to the edge of the main plant aisle parallel to the rail spur. The apron should be a minimum of 20 feet (6.1m) wide [2 feet (0.6m) clear, plus 18 feet (5.5m) maneuvering zone], although a wider apron may be required if the rack length is greater than 108 inches.

Shared Pedestrian and PMHV Aisles - Minimum Aisle Width Considerations and General Rules of Thumb

Aisles of adequate width should be provided for efficient material handling operations. Note that 3-foot dedicated pedestrian aisles and in-plant trailer drop-off zones are incremental to these numbers.

General Aisle Recommendations

Pedestrians entering the aisle from critical areas, including stairways, vestibules, offices, canteens, cafeterias, locker rooms, restrooms, employee entrances, etc., should enter the aisle moving parallel to aisle traffic. Using barriers such as railings or guardrails may accomplish this. Under no condition should this impede emergency egress from the building.

Cross aisles should be provided at least every 500 feet (152.4m).

Perimeter aisles should be located a minimum of 4 feet (1.2m) away from the wall to permit safe pedestrian access to the aisles and access to emergency fire-fighting equipment (e.g., hoses and extinguishers, mains, plumbing, power boxes, light switches, etc.) that may be located on a perimeter wall.

Service aisles permit egress for mobile service equipment. They are not designated for the movement of materials. Service aisles are typically 8 feet (2.4m) wide but may be wider if needed for service requirements.

Overhead clearance in aisles used for the movement of production materials should be a minimum of 12 feet to allow for the unobstructed movement of trailer trains

Visual Factory (A Place for Everything and Everything in its Place)

- Establish and identify Pedestrian-only Aisles and Pedestrian/Powered Industrial-Truck Shared Aisles.
- Establish Powered Industrial-Truck only Aisles.

Identify Pedestrian restricted areas

Identify vehicle and equipment parking and charging areas, (with yellow markings, department number and powered industrial truck number).

It is recommended that all in-plant vehicles operate with headlights on.

"No stock" signs should be posted near aisle intersections and in areas where dunnage creates blind spots.

Pedestrian

All pedestrians gaining access to a production facility using powered industrial trucks should be given a brief training session.

Facility Assessments

In-plant office structures located at aisle intersections should not create blind spots for approaching powered industrial trucks or pedestrians. Corner walls should not be solid. Long, rectangular windows should be installed to all corner walls. Office structures should be set back from the intersecting aisles to open up visibility from the aisles.

[For more information www.aiag.org](http://www.aiag.org)



Developing a One Year Plan

<u>Month # 1</u>	<u>Month # 2</u>	<u>Month # 3</u>	<u>Month # 4</u>	<u>Month # 5</u>	<u>Month # 6</u>
<u>Month # 7</u>	<u>Month # 8</u>	<u>Month # 9</u>	<u>Month # 10</u>	<u>Month # 11</u>	<u>Month # 12</u>



OSHA's Most Frequently Asked Questions on PIT's

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

1. What is the definition of a powered industrial truck?

Any mobile power-propelled truck used to carry, push, pull, lift, stack or tier materials. Powered industrial trucks can be ridden or controlled by a walking operator. Earth moving and over the road haulage trucks are not included in the definition. Equipment that was designed to move earth but has been modified to accept forks are also not included.

2. What does the standard require?

The standard requires employers to develop and implement a training program based on the general principles of safe truck operation, the types of vehicle(s) being used in the workplace, the hazards of the workplace created by the use of the vehicle(s), and the general safety requirements of the OSHA standard. Trained operators must know how to do the job properly and do it safely as demonstrated by workplace evaluation. Formal (lecture, video, etc.) and practical (demonstration and practical exercises) training must be provided. Employers must also certify that each operator has received the training and evaluate each operator at least once every three years. Prior to operating the truck in the workplace, the employer must evaluate the operator's performance and determine the operator to be competent to operate a powered industrial truck safely. Refresher training is needed whenever an operator demonstrates a deficiency in the safe operation of the truck.

3. Does OSHA provide a list of topics to include in my training program?

Yes. The standard provides a list of training topics; however, the employer may exclude those topics which are not relevant to safe operation at the employee's work location.

4. Who should conduct the training?

All training and evaluation must be conducted by persons with the necessary knowledge, training, and experience to train powered industrial truck operators and evaluate their competence. An example of a qualified trainer would be a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has demonstrated the ability to train and evaluate powered industrial truck operators.

There are many resources available to the employer if he/she chooses not to perform the training himself. Truck manufacturers, local safety and health safety organizations, such as the National Safety Council local chapters, private consultants with expertise in powered industrial trucks, local trade and vocational schools are some available resources.



One important thing to remember is that simply by showing employees a video or videos on some aspect of forklift safety does not meet the full requirements of the OSHA standard. Site specific information must be conveyed as well as a method to evaluate the employee's acquired knowledge subsequent to the training.

5. If my employees receive training from an outside consultant, how will I know that these employees have been adequately trained?

Outside qualified training organizations can provide evidence that the employee has successfully completed the relevant classroom and practical training. However, each employer must ensure that each powered industrial truck operator is competent to operate a truck safely, as demonstrated by the successful completion of the training and evaluation.

6. My employees receive training from the union on the use of powered industrial trucks. Will I have to provide any additional training?

When a worker reports to work, the employer must evaluate the employee to ensure that he/she is knowledgeable about the operation of the powered industrial trucks he/she will be assigned to operate. This evaluation could be as simple as having a person with the requisite skills, knowledge and experience observe the operator performing several typical operations to ensure that the truck is being operated safely and asking the operator a few questions related to the safe operation of the vehicle. If the operator has operated the same type of equipment before in the same type of environment that he/she will be expected to be working, then duplicative or additional training is not required.

7. Is testing required?

No. The standard does not specifically require testing; however, some method of evaluation is necessary.

8. Does OSHA require the employer to issue licenses to employees who have received training?

No. The OSHA standard does not require employees to be licensed. An employer may choose to issue licenses to trained operators. (Some state plans, like Michigan OSHA does require licenses)

9. What type of records or documentation must I keep?

The OSHA standard requires that the employer certify that each operator has received the training and has been evaluated. The written certification record must include the name of the operator, the date of the training, the date of the evaluation, and the identify of the person(s) performing the training or evaluation.



10. How long must I keep the certification records?

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

11. If my employees receive training, but accidents still continue to occur, what should I do?

Refresher training in relevant topics is necessary when the operator has been involved in an accident or near-miss incident.

12. Is annual training required?

No. An evaluation of each powered industrial truck operator's performance is required to be conducted after initial training, after refresher training, and at least once every three years.

13. How often must refresher training be given?

The standard does not require any specific frequency of refresher training. Refresher training must be provided when:

1. The operator has been observed to operate the vehicle in an unsafe manner.
2. The operator has been involved in an accident or near-miss incident.
3. The operator has received an evaluation that reveals that the operator is not operating the truck safely.
4. The operator is assigned to drive a different type of truck.
5. A condition in the workplace changes in a manner that could affect safety operation of the truck.

14. If my employees have already received training, or have been operating trucks for many years, must I retrain them?

No. An employer does not need to retrain an employee in the operation of a powered industrial truck if the employer certifies that the operator has been evaluated and has proven to be competent to operate the truck safely. The operator would need additional training in those elements where his or her performance indicates the need for further training and for new types of equipment and areas of operation.

15. How do I evaluate my employee's competency to operate a truck safely?

Evaluation of an operator's performance can be determined by a number of ways, such as:

- a discussion with the employee
- an observation of the employee operating the powered industrial truck
- written documentation of previous training
- a performance test

16. Does OSHA provide training to my truck operators?

No. It is the employer's responsibility to train the employees.



17. Do I have to train all employees in my workplace?

Any employee that operates a powered industrial truck must be trained.

18. Do I have to ensure that my operator's are physically capable of driving a powered industry truck?

The new standard does not contain provisions for checking vision, hearing or general medical status of employees operating powered industrial trucks. 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 which are necessary to assure 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.

19. I have three different types of trucks in my workplace. Can I provide training on just one type of truck?

If an operator will be expected to operate all three types of vehicles, then training must address the unique characteristics of each type of vehicle the employee is expected to operate. When an attachment is used on the truck to move odd-shaped materials, then the operator training must include instruction on the safe conduct of those operations so that the operator knows and understands the restrictions or limitations created by each vehicle's use.

20. I only have powered hand trucks in my workplace. Do the training requirements cover the operators of this type of vehicle? The operator walks alongside the unit while holding onto the handle to guide it.

Yes. The use of powered hand trucks present numerous hazards to employees who operate them and those working in the area where they are used.

21. I employ drivers from a temporary agency. Who provides them training - the temporary service or me?

OSHA has issued several letters of interpretations on the subject of training of temporary employees. Basically, there is a shared responsibility for assuring employees are adequately trained. The responsibility for providing training should be spelled out in the contractual agreement between the two parties. The temporary agency or the contracting employer may conduct the training and evaluation of operators from a temporary agency as required by the standard; however, the host employer (or other employer who enters into a contract with the temporary agency) must provide site-specific information and training on the use of the particular types of trucks and workplace-related topics that are present in the workplace.



22. Should my training include the use of operator restraint devices (e.g. seat belts)?

Employers are required 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 when it is addressed in the operating instructions.

23. What does OSHA expect to achieve as a result of improved operator's training?

OSHA's goal is to reduce the number of injuries and illnesses that occur to workers in the workplace from unsafe powered industrial truck usage. By providing an effective training program many other benefits will result. Among these are the lower cost of compensation insurance, less property damage, and less product damage.

QUESTIONS & ANSWERS SPECIFIC TO GENERAL INDUSTRY

1. What OSHA standards apply to the training of powered industrial truck operators in general industry?

The OSHA standard for the training of truck operators is located in 29 CFR 1910.178(l).

2. What types of equipment are covered by the standard?

Vehicles covered include:

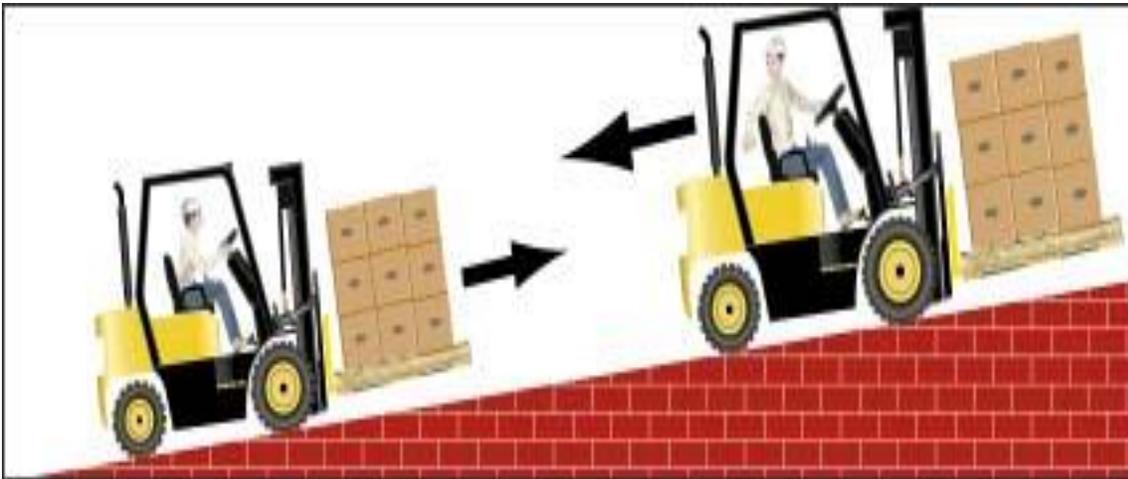
- High lift trucks
- Counter-balanced trucks
- Cantilevered trucks
- Rider trucks
- Forklift trucks
- High lift platform trucks
- Low lift trucks
- Low lift platform trucks
- Motorized hand trucks
- Pallet trucks
- Narrow aisle rider trucks
- Straddle trucks
- Reach rider trucks
- Single side loader rider trucks



- High lift order picker rider trucks
- Motorized hand/rider trucks
- Rough terrain trucks

3. What types of industries are covered by the standard?

Every type of establishment (except agricultural operations) that has employees who operate powered industrial trucks will have to comply with the requirements of the standard. Powered industrial trucks are used in a wide variety of workplaces, including but not limited to retail establishments, warehousing and distribution operations, and manufacturing establishments.





UNITED STATES
DEPARTMENT OF LABOR

OSHA Home

• **Standard Number:** 1910.178; 1910.178(l)(4)

August 1, 2005

Mr. Robert Hearne
1448 SR 333
Russellville, AR 72802

Dear Mr. Hearne:

Thank you for your April 12 letter to the Occupational Safety and Health Administration's (OSHA) Directorate of Enforcement Programs (DEP). Your letter has been referred to DEP's Office of General Industry Enforcement for an answer to your question regarding OSHA's powered industrial truck standard, 29 CFR 1910.178. Your question has been restated below for clarity.

Background: 29 CFR 1910.178(l)(4)(iii) requires that an evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

Question: Would a written exam alone (i.e., without practical operation of the truck) **suffice for the evaluation requirement stated above?**

Reply: The "evaluation" of "performance" required by the standard *cannot be met by a written exam alone*. A written exam by itself does not indicate whether the operator is operating the powered industrial truck safely. In most cases, the person conducting the evaluation would do two things: first, **observe the powered industrial truck operator during normal operations to determine if the operator is performing safely**, and second, ask pertinent questions to ensure that the operator has the knowledge or experience needed to operate a truck safely. In some cases, because of the danger or complexity of the operation, the extent of the change in conditions, or the operator's need for additional skills, the evaluation will need to be lengthier and more detailed. The triennial evaluation ensures that the operator has retained the necessary knowledge and **skills** for safe operation of the vehicle. Therefore, a written exam alone would not be adequate to ensure that the operator has retained the necessary **skills** for safe vehicle operation.

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards, and regulations. Our interpretations letters explain the requirements, and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. In addition, from time to time we update our guidance in response to new information. To keep apprised of such developments, you can consult OSHA's website at www.osha.gov. If you have any further questions, please feel free to contact the Office of General Industry Enforcement at (202) 693-1850.

Sincerely, Richard E. Fairfax, Director

Directorate of Enforcement Programs



UNITED STATES
DEPARTMENT OF LABOR

• **Standard Number:** 1910.178(q)(7); 1910.178(p)(1); 1910.178(q)(5)

August 13, 2004

Mr. William Overby
2932 Hazel Ave.
Dayton, OH 45420

Dear Mr. Overby:

Thank you for your May 7, 2004 letter to the Department of Labor, Occupational Safety and Health Administration (OSHA). This letter constitutes OSHA's interpretation only of the requirements herein, and may not be applicable to any question(s)/scenario not delineated within your original correspondence. You had a specific questions regarding the sound level of a warning device (horn) located on a forklift. We apologize for the delay in responding to your request.

Question: When a forklift has a **weak sounding horn**, what determines whether it should be replaced or not?

Reply: OSHA's standard 29 CFR 1910.178(q)(7) requires that industrial trucks be inspected at least daily and not be placed into service if the examination shows any condition that may adversely affect the safety of the industrial truck. Additionally, §1910.178(p)(1) states, "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." If the industrial truck is equipped with a horn as its warning device, then **OSHA would consider the truck as being unsafe if the sound level of the horn has deteriorated to a level that can no longer be heard above the ambient noise in the workplace.**

In addition, the employer must meet the requirements in §1910.178(q), *Maintenance of industrial trucks*. Specifically, §1910.178(q)(5) states, "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."

Thank you for your interest in occupational safety and health. We hope you find this information helpful. OSHA requirements are set by statute, standards, and regulations. Our interpretation letters explain these requirements and how they apply to particular circumstances, but they cannot create additional employer obligations. This letter constitutes OSHA's interpretation of the requirements discussed. Note that our enforcement guidance may be affected by changes to OSHA rules. To keep apprised of such developments, you can 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 Enforcement at (202) 693-1850.

Sincerely,

Richard E. Fairfax, Director
Directorate of Enforcement Programs



SAMPLE ~~-----~~Fork Truck Pre-Operation Inspection Checklist

Date _____ Shift _____ Truck Number _____

Supervisor's Name _____

The fork truck that I was assigned is unsafe to operate because of the following safety defects:

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

Operator's Name _____

This vehicle should not be operated with these defects. What do you want me to do?

(White) Employee ● (Yellow) UAW Safety Committee ● (Pink) Supervisor



PART 21. POWERED INDUSTRIAL TRUCKS
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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 counter-balanced or noncounterbalanced truck equipped with cantilever load engaging means. (Appendix A, 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 A, 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 tine-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 A, 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 A, 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 A, 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.** (1) “**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 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 A, 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 A, 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 A, 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 A, 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 A, 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 A, 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 A, 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 A, 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 A, 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 A, 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 1 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 of 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.

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 Laterally	clockwise	rearward or up
		counterclockwise forward or down
Rotate Longitudinally	rearward	*rearward or up
		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

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

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 is 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 408.13301 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, O.H. 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. (1) 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 R 408.12111, 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. (1) 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. (1) 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

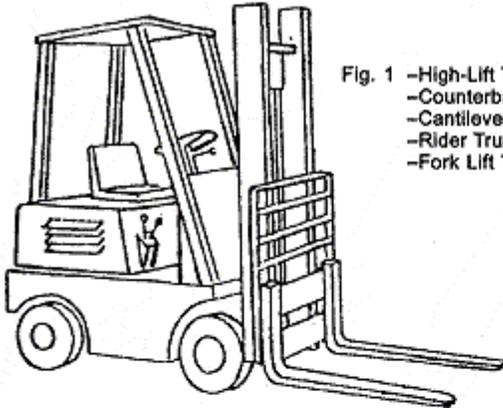


Fig. 1 -High-Lift Truck
-Counterbalanced Truck
-Cantilever Truck
-Rider Truck
-Fork Lift Truck

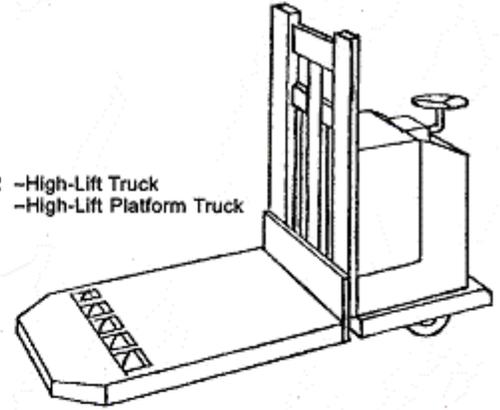


Fig. 2 -High-Lift Truck
-High-Lift Platform Truck

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

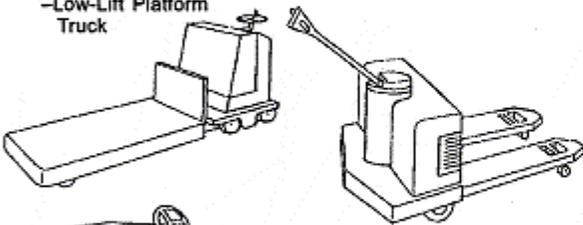


Fig. 4 -Motorized Hand Truck
-Pallet Truck

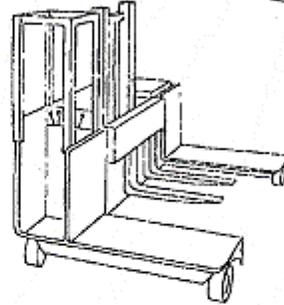


Fig. 8 -Side-Loader Truck

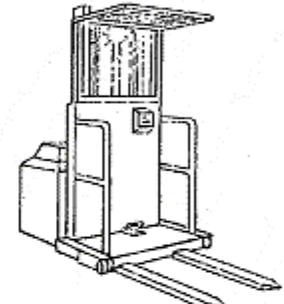


Fig. 9 -Order Picker Truck High Lift



Fig. 5 -Industrial Tractor

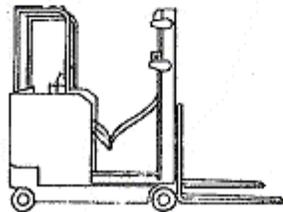


Fig. 7 -Reach Truck

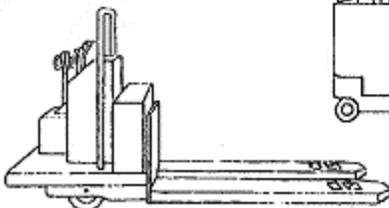


Fig. 6 -Motorized Hand/Rider Truck

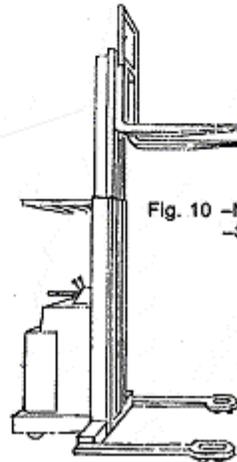


Fig. 10 -Narrow-Aisle Truck
-Straddle Truck



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 _____

<u>Checklist</u>	<u>O.K.</u>	<u>Needs Repair</u>
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		

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