

**State of California, Dept. of Industrial Relations, Cal-OSHA**

Subchapter 7. General Industry Safety Orders  
Group 4. General Mobile Equipment and Auxiliaries

Article 25. Industrial Trucks, Tractors, Haulage Vehicles, and Earthmoving Equipment

**Note: The following material is for FORKLIFT OPERATOR Training purposes only.**

California publishes Forklift Safety Law as General Industry Safety Orders 3649-3669. These GISO are not included in their entirety. They have been abridged (shortened) because they are usually not necessary in Forklift OPERATOR Training Classes. The hypertext links are left in so if you are Online on the Internet, you can access and read the original complete Safety Order.

§3649. Definitions.

§3650. Industrial Trucks. General.

(c) All name plates and model number, type designation and load capacity markings on industrial trucks, shall be maintained in a legible condition by the employer.

(d) If the truck is equipped with front-end attachments other than factory installed attachments, the truck shall be marked to identify the attachments and show the approximate weight of the truck and attachment combination, and capacity of the truck and attachment combination at maximum elevation of the load engaging means with the load laterally centered.

(e) Major modifications and structural changes to high lift trucks, industrial trucks and rider trucks that affect the capacity and safe handling of the vehicles shall not be performed by the employer or user without prior written approval from the manufacturer unless the modification is designed, manufactured, and installed in accordance with recognized good engineering and manufacturing principles. The capacity, operation and maintenance instruction plates shall be changed accordingly.

(f) 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 as defined in Chapter 1-3, of NFPA 505-1987, which is herein incorporated by reference. Such conversion equipment shall be approved.

(1) When a conversion kit is installed, the original type designation shall be removed or obliterated and replaced with a durable, corrosion-resistant plate permanently mounted on the truck indicating the type designation of the converted truck.

(g) Powered industrial trucks shall not be operated in atmospheres containing more than 20 percent of the Lower Explosive Limit of flammable gas or vapor unless approved for the area as provided in (h).

Note: Concentrations below 20 percent of the Lower Explosive Limit may still require mandatory use of air-supplied respiratory protection. (See Section 5144.)

(h) Only industrial trucks approved for the exposure may be operated in atmospheres containing hazardous quantities of combustible dusts and ignitable fibers. Approval and area designation shall be based on NFPA 505-1982 with appropriate labeling.

(i) Approved trucks shall bear a permanent legible label or some other identifying mark indicating approval by the testing laboratory.

(j) When industrial trucks operate in areas where general lighting is less than 2 footcandles per square foot, directional lighting shall be provided on the truck.

(k) Trailers disconnected from their tractor shall be secured to prevent them from up-ending during loading or unloading operations. This may require utilization of auxiliary jacks designed for that purpose.

(l) Industrial trucks shall not be operated in areas that expose the operator to the hazard of collision with overhead obstructions unless the truck is equipped with overhead guards. (See Section 3655.)

(m) Loads of excessive width, length or height shall be so balanced, braced, and secured as to prevent tipping and falling.

(n) Batteries installed in trucks shall be secured in suitable racks which are secured to the truck.

(o) After April 1, 1979, motorized hand and hand/rider trucks shall be designed so that the brakes are applied and the power to the drive motor shut off when the operator releases his grip on the control tongue, or the device used to control travel.

Exception: Vehicles designed for use in order picking operations are exempt from the braking requirements, provided the speed of the vehicle does not exceed 3.5 mph while the operator is walking the vehicle.

(p) Radio remote control vehicles shall be equipped with positive means which restrict the speed of the vehicle to 3.5 mph while the equipment is being operated with radio remote control.

(q) Steering knobs shall not be used unless the truck is equipped with power steering.

(r) When cargo is being towed on pipe trucks or similar equipment, a safe means shall be provided to protect the driver from sliding loads.

(s) Counterweights shall be so affixed that they cannot be accidentally dislodged.

(t) Forks, fork extensions and other attachments shall be secured so that they cannot be inadvertently dislodged, and shall be used only in accordance with the manufacturer's recommendations.

§3651. Agricultural and Industrial Tractors.

§3652. Haulage Vehicles and Earthmoving Equipment.

§3653. Seat Belts.

§3654. Deflector Guards.

§3655. Overhead Guards for High-Lift Rider Trucks.

(2) The operator is protected from all overhead hazards other than falling loads.

§3656. Order Pickers and Stock Pickers.

(a) When the operator's platform height exceeds 36", the maximum horizontal speed shall not exceed 2.5 miles/hr. (1.12 meters/sec).

(b) Trucks shall not travel when the operator's platform is elevated over 152" in height (3.86 meters).

Exceptions:

Trucks designed to travel within rails or trucks that are electronically guided.

Trucks controlled by a constant pressure inching button which will return to neutral when released by the operator.

(c) A flashing or rotating warning light shall be mounted on the nonelevating portion of the truck at not less than 4 feet nor more than 6 feet elevation and shall be so wired that the light will be activated automatically when the platform is 6 feet or higher and the truck is moved.

(d) A safe work platform not less than 20 inches wide with standard guardrails on all open or exposed sides of the platform shall be securely attached to the lifting carriage and/or forks.

(e) Where a clearance restriction or the nature of the work prohibits the use of standard guardrails, and the employee is exposed to a fall of 4 feet or more, a personal fall arrest system, a personal fall restraint system or positioning device system as defined in Section 3207 of these Orders shall be used in accordance with the requirements of Section 1670 of the Construction Safety Orders as an alternative means of protecting employees from falling. The lanyard length for a personal fall arrest system shall be such that the operator has freedom of movement in the working area, but shall be rigged such that an employee can neither free fall more than 4 feet nor contact any lower level. Lanyards shall be so arranged as not to cause a condition where the operator could trip on the lanyard.

(f) Where only stock pickers, order pickers or side loaders are used in storage access aisles (as defined in section 3207), means such as guide rails, electronic guidance systems, or other means offering equivalent protection, shall be provided to prevent the vehicle from colliding with the storage racks or stored material.

#### §3657. Elevating Employees with Lift Trucks.

(a) When it is necessary to elevate employees using an industrial truck, the following shall be accomplished:

(1) The platform shall be of sufficient size, but not less than 24" x 24" (.61 meters x .61 meters) to accommodate the employee and material being elevated.

(2) The platform shall be secured to the forks or mast to prevent tipping, slipping or falling.

(3) The platform shall meet the guardrail and toeboard requirements of section 3210.

(4) The platform floor shall have no spaces or holes greater than one inch; and

(5) The platform floor shall have a slip resistant surface.

(6) Lift trucks used to elevate employees after the effective date of this subsection shall be equipped with a means to prevent the raised platform from lowering at a rate in excess of 135 feet per minute in case of a failure in the load supporting hydraulic control circuits.

(b) Where a clearance restriction or the nature of the work prohibits the use of guardrails, a safety belt, or harness, with lanyard shall be used as described in section 3656(e).

(c) Wherever the truck is operated under conditions which expose the operator to danger from falling objects, the truck shall be equipped with overhead protection.

(d) There shall be an operator in the control position on the truck while employees are on the elevated platform.

(e) Whenever a truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks, means shall be provided whereby personnel on the platform can shut off the motive power of the truck.

(f) Means shall be provided to render inoperative all operating controls other than those on the elevatable platform when the controls on the elevatable platform have been selected for use. Only one location of controls shall be capable of being operated at one time.

(g) All bridge cranes or other moving or motorized equipment which could overrun or otherwise injure the elevated worker shall be shut down or locked out.

(h) Operating Rules Whenever Elevating Personnel. Before elevating personnel, employees shall be instructed to:

(1) Use a securely attached safety platform.

(2) Make sure the lifting mechanism is operating smoothly.

(3) Make sure that the mast is vertical. The mast shall not be tilted forward or rearward while persons are elevated.

(4) Place truck in neutral and set parking brake.

(5) Lift and lower smoothly and with caution.

(6) Watch for overhead obstructions.

(7) Keep hands and feet clear of controls other than those in use.

(8) Never travel with personnel on the work platform other than to make minor movements for final positioning of the platform.

§3658. Operator Platforms.

(a) Every end control, reach, narrow aisle and motorized hand/rider truck shall be equipped with an operator platform of sufficient size to contain the operator's feet within its periphery and strong enough to withstand a compression load equal to the weight of the loaded truck applied longitudinally against a flat vertical surface.

(b) When installed, operator enclosures shall not restrict movement to and from the operating position.

NOTE: Operator enclosures are not recommended on hand/rider trucks because of interference with the steering handle and with rapid and unobstructed egress.

#### §3659. Back Guards.

(a) The side of the platform nearest the mast frame truss shall be guarded on every high-lift industrial truck where employees ride up or down. This guard shall consist of a substantial frame covered with 1/2 inch expanded metal, laminated safety glass, or equivalent providing effective guarding to a height of 7 feet.

(b) If the type of load presents a hazard, high-lift industrial trucks shall be equipped with a load backrest extension high enough to reach above the center of the top row of the maximum height load handled or other positive means acceptable to the Division shall be used to prevent parts of the load falling onto the operator or into the operator's compartment. The openings shall not be greater than the smallest parcel carried.

#### §3660. Rated Capacity.

(a) The rated capacity of all industrial lift trucks and industrial tractors shall be displayed at all times on the vehicle in such a manner that it is readily visible to the operator.

(b) Industrial lift trucks and industrial tractors equipped with forks shall not be loaded beyond their designated capacity.

#### §3661. Brakes and Warning Devices.

(a) Every industrial truck and tractor shall be equipped with brakes or other effective devices adequate to bring the vehicle to a complete safe stop while fully loaded.

(b) Every industrial truck and tractor shall be equipped with a parking brake or other effective device to prevent the vehicle moving when unattended.

(c) Every industrial truck and industrial tow tractor, except those guided or controlled by a walking operator, shall be equipped with a warning horn, whistle, gong, or other

device which can be heard clearly above the normal industrial noises in the places of employment.

#### §3662. Internal Combustion Engines.

Internal combustion engine-driven equipment shall be operated inside of buildings or enclosed structures, only when such operation does not result in harmful exposure to concentrations of dangerous gases or fumes. (See Section 5146.)

#### §3663. Maintenance of Industrial Trucks.

(a) Industrial truck repair operations involving open flames or which may produce sparks or other sources of ignition shall not be performed in Class I, II and III locations, unless and until tests show that atmospheric concentrations of flammable or combustible vapors do not exceed 20 percent L.E.L. of such flammable or combustible materials and until precautions are taken to maintain the atmosphere at or below 20 percent L.E.L. Such precautions could include, but not be limited to removal of flammable material, provision for adequate ventilation, etc.

(b) 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.

(c) Industrial trucks shall be kept in a clean condition free of debris, oil, and grease.

(d) Batteries on all powered trucks shall be disconnected during repairs to the primary electrical system unless power is necessary for testing and repair. On trucks equipped with systems capable of storing residual energy, that energy shall be safely discharged before work on the primary electrical system begins.

(e) Replacement parts for industrial trucks shall be equivalent in safety to the original parts.

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

#### §3664. Operating Rules.

California Posting Requirements

(a) Every employer using industrial trucks or industrial tow tractors, shall post and enforce a set of operating rules including the appropriate rules listed below:

(1) Only drivers authorized by the employer and trained in the safe operations of industrial trucks or industrial tow tractors shall be permitted to operate such vehicles. Methods shall be devised to train operators in safe operation of powered industrial trucks.

(2) Stunt driving and horseplay are prohibited.

(3) No riders shall be permitted on vehicles unless provided with adequate riding facilities.

(4) Employees shall not ride on the forks of lift trucks.

(5) Employees shall not place any part of their bodies outside the running lines of an industrial truck or between mast uprights or other parts of the truck where shear or crushing hazards exist.

(6) Employees shall not be allowed to stand, pass, or work under the elevated portion of any industrial truck, loaded or empty, unless it is effectively blocked to prevent it from falling.

(7) Drivers shall check the vehicle at least once per shift, and if it is found to be unsafe, the matter shall be reported immediately to a foreman or mechanic, and the vehicle shall not be put in service again until it has been made safe. Attention shall be given to the proper functioning of tires, horn, lights, battery, controller, brakes, steering mechanism, cooling system, and the lift system for fork lifts (forks, chains, cable, and limit switches).

(8) No truck shall be operated with a leak in the fuel system.

(9) Vehicles shall not exceed the authorized or safe speed, always maintaining a safe distance from other vehicles, keeping the truck under positive control at all times and all established traffic regulations shall be observed. For trucks traveling in the same direction, a safe distance may be considered to be approximately 3 truck lengths or preferably a time lapse--3 seconds--passing the same point.

(10) Trucks traveling in the same direction shall not be passed at intersections, blind spots, or dangerous locations.

(11) The driver shall 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.

(12) Operators shall look in the direction of travel and shall not move a vehicle until certain that all persons are in the clear.

(13) Trucks shall not be driven up to anyone standing in front of a bench or other fixed object of such size that the person could be caught between the truck and object.

(14) Grades shall be ascended or descended slowly.

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

(B) 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.

(C) Motorized hand and hand/rider trucks shall be operated on all grades with the load-engaging means downgrade.

(15) The forks shall always be carried as low as possible, consistent with safe operations.

(16) When leaving a vehicle unattended, either:

(A) The power shall be shut off, brakes set, the mast brought to the vertical position, and forks left in the down position. When left on an incline, the wheels shall be blocked; or

(B) The power may remain on provided the brakes are set, the mast is brought to the vertical position, forks are left in the down position, and the wheels shall be blocked, front and rear.

NOTE: When the operator is over 25 feet (7.6 meters) from or out of sight of the industrial truck, the vehicle is "unattended."

(17) When the operator of an industrial truck is dismounted and within 25 feet (7.6 meters) of the truck which remains in the operator's view, the load engaging means shall be fully lowered, controls placed in neutral, and the brakes set to prevent movement.

EXCEPTION: Forks on fork-equipped industrial trucks may be in the raised position for loading and unloading if the forks are raised no more than 42 inches above the level where the operator/loaders are standing, and the power is shut off, controls placed in neutral and the brakes set. If on an incline, the wheels shall be blocked.

(18) Vehicles shall not be run onto any elevator unless the driver is specifically authorized to do so. Before entering an elevator, the driver shall determine that the capacity of the elevator will not be exceeded. Once on an elevator, the power shall be shut off and the brakes set.

(19) Motorized hand trucks shall enter elevators or other confined areas with the load end forward.

(20) Vehicles shall not be operated on floors, sidewalk doors, or platforms that will not safely support the loaded vehicle.

(21) Prior to driving onto trucks, trailers and railroad cars, their flooring shall be checked for breaks and other structural weaknesses.

(22) Vehicles shall not be driven in and out of highway trucks and trailers at loading docks until such trucks or trailers are securely blocked or restrained and the brakes set.

(23) To prevent railroad cars from moving during loading or unloading operations, the car brakes shall be set, wheel chocks or other recognized positive stops used, and blue flags or lights displayed in accordance with applicable regulations promulgated by the Public Utilities Commission.

(24) The width of one tire on the powered industrial truck shall be the minimum distance maintained from the edge by the truck while it is on any elevated dock, platform, freight car or truck.

(25) Railroad tracks shall be crossed diagonally, wherever possible. Parking closer than 8 1/2 feet from the centerline of railroad tracks is prohibited.

(26) Trucks shall not be loaded in excess of their rated capacity.

(27) A loaded vehicle shall not be moved until the load is safe and secure.

(28) Extreme care shall be taken when tilting loads. Tilting forward with the load engaging means elevated shall be prohibited except when picking up a load. Elevated loads shall not be tilted forward except when the load is being deposited onto a storage rack or equivalent. When stacking or tiering, backward tilt shall be limited to that necessary to stabilize the load.

(29) The load engaging device shall be placed in such a manner that the load will be securely held or supported.

(30) Special precautions shall be taken in the securing and handling of loads by trucks equipped with attachments, and during the operation of these trucks after the loads have been removed.

(31) When powered industrial trucks are used to open and close doors, the following provisions shall be complied with:

(A) A device specifically designed for opening or closing doors shall be attached to the truck.

(B) The force applied by the device to the door shall be applied parallel to the direction of travel of the door.

(C) The entire door opening operation shall be in full view of the operator.

(D) The truck operator and other employees shall be clear of the area where the door might fall while being opened.

(32) If loads are lifted by two or more trucks working in unison, the total weight of the load shall not exceed the combined rated lifting capacity of all trucks involved.

(b) Every employee who operates an agricultural or industrial tractor shall be instructed in the following procedures and in any other practices dictated by the work environment. Such information shall be provided at the time of initial assignment and at least annually thereafter. Copies of these instructions, printed in a language understood by the majority of the employees, shall be conspicuously posted at a place frequented by the drivers.

#### EMPLOYEE OPERATING INSTRUCTIONS

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly--no jerky turns, starts, or stops.

8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.

9. When tractor is stopped, set brakes securely and use park lock if available.

(c) Every employee who operates an agricultural or industrial tractor shall be required to check the tractor prior to operation each day and if it is unsafe report the matter immediately to a foreman or mechanic and shall not use the tractor again until it has been made safe.

(d) Employees shall be prohibited from stunt driving or horseplay while operating an agricultural or industrial tractor.

(e) No repairs shall be performed on any agricultural or industrial trucks or tractors until arrangements have been made to reduce the probability of injury to repairmen or others caused by sudden movement or operation of such equipment or its parts.

#### §3665. Wheel Guards.

Shop transfer cars, equipment carriages, stock pickers, and similar equipment operating on rails or drawn by chains or cables shall be equipped with wheel guards or bumpers constructed and installed for the purpose of preventing a person's feet being crushed under the wheels. When the body or bed of trucks, carriages, or cars of this type extends over the wheels to the sides and both ends such a distance as will prevent a person's feet being crushed, said equipment shall be considered to be in compliance with this Order.

NOTE: This Order does not apply to cars used in trains.

#### §3666. Haulage Vehicles and Earthmoving Equipment.

#### §3668. Powered Industrial Truck Operator Training.

(a) Safe Operation.

(1) 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 subsection.

(2) 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 subsection, except as permitted in subsection (e).

(b) Training program implementation. Trainees may operate a powered industrial truck only:

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

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

(3) 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.

(4) 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.

(c) 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 the safe operation of the truck in the employer's workplace.

(1) Truck-related topics:

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

(B) Differences between the truck and the automobile;

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

(D) Engine or motor operation;

(E) Steering and maneuvering;

(F) Visibility (including restrictions due to loading);

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

(H) Vehicle capacity;

(I) Vehicle stability;

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

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

(L) Operating limitations;

(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.

(2) Workplace-related topics:

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

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

(C) Load manipulation, stacking, and unstacking;

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

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

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

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

(H) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a build-up of carbon monoxide or diesel exhaust;

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

(d) Refresher training and evaluation. Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by subsection (d)(1) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

(1) Refresher training in relevant topics shall be provided to the operator when:

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

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

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

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

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

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

(e) Avoidance of duplicative training. If an operator has previously received training in a topic specified in subsection (c) 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.

(f) Certification. The employer shall certify that each operator has been trained and evaluated as required by this section. 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.

(g) Dates. The employer shall ensure that operators of powered industrial trucks are trained, as appropriate, in accordance with the following dates:

(1) If the employee was hired before July 15, 2000, the initial training and evaluation of that employee must be completed by July 15, 2000;

(2) If the employee was hired after July 15, 2000, the initial training and evaluation of that employee must be completed before the employee is assigned to operate a powered industrial truck.

EXCEPTION: Agricultural operations as defined in Section 3437 of the General Industry Safety Orders are exempt from the requirements of Section 3668.

§3669. Operating Rules. (No Content)