

Forklifts	S.O.P. 4B		Page 1 of 13
	10/01	Rev. 1	
	Review Date:		
	10/01		
Approved by:			
STANDARD OPERATING PROCEDURE			

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I. SCOPE AND PURPOSE

- A. To prevent industrial incidents resulting from industrial fork trucks. This procedure also applies to all operations of the Company.
- B. Procedures include training and certification of operators, general and specific use requirements, rules, inspection and maintenance.

II. RELATED PROCEDURES AND RESOURCES

- A. S.O.P. 2B, Project Human Resource Management
- B. S.O.P. 3P, Lifting, Rigging and Signaling
- C. CFR 1910.178, Powered Industrial Trucks
- D. Safe Operations of Forklift Training
- E. Appendix Attachment Form 4B.1a, Forklift Daily Inspection Sheet

III. PERSONNEL RESPONSIBILITY

- A. Supervisor shall ensure that all persons operating forklift trucks on their jobsite meet and operate forklift trucks in accordance with the procedures contained within this S.O.P.
- B. Forklift Truck Operators shall perform all operator functions in accordance with BIST "Safe Operations of Forklift" training, applicable state and federal regulations.
- C. Employees shall not operate forklift trucks without proper training and authorization.

IV. GENERAL

- A. Rated Capacity
 - 1. Rated capacity is the maximum weight that the truck can transport and stack at a specified load center and for a specified load elevation.
 - 2. Trucks shall not be used or tested above their rated capacities.
 - 3. Details are found in ANSI/ASME B56.1
- B. Truck Nameplate
 - 1. Every truck shall have appended to it a durable, corrosion-resistant nameplate with the model or serial number and appropriate weight of the truck legibly inscribed. The serial number shall also be stamped on the frame of the truck. The truck must be accepted by a recognized national testing laboratory and the nameplates shall so state. The truck shall meet all other nameplate requirements of ANSI/ASME B56.1.
- C. Attachments
 - 1. If the forklift truck is equipped with front-end attachment(s) (OTHER THAN FACTORY INSTALLED ATTACHMENTS) the rated capacity for a specified load elevation shall be established by the truck manufacturer at a specified load center.
 - 2. The user shall ensure that the truck is marked to identify the attachments, show the approximate weight of the truck/attachment combination, and the capacity of the truck with attachments at maximum elevation with load centered laterally.
 - 3. The rated capacity of the front-end attachment forklift truck combination shall not be exceeded.
 - 4. Every removable attachment (excluding fork extensions) shall have a durable corrosion-resistant nameplate installed with the following information legibly and permanently inscribed:
 - a. Serial Number
 - b. Rated capacity of attachment.
- D. Modifications
 - 1. Modifications, alterations or additions, which affect capacity and/or safe operations, shall not be performed without prior written approval from the forklift truck manufacturer.
 - 2. Capacity, operation and maintenance instruction plates, tags or decals shall be changed accordingly.
- E. Fire Hazard Areas
 - 1. Powered forklift trucks for operation in fire hazardous areas shall be of the type as recommended in ANSI/NFPA 505.
- F. Work Atmosphere
 - 1. Concentrations of carbon monoxide and oxygen in the work location are affected by the operation of forklift trucks. Concentrations of these materials in the work location must meet the requirements of OSHA (29

CFR 1910.178.

- G. Electric-Battery-Operated Trucks
 - 1. Use of electric-battery-operated trucks is restricted to those trucks that meet the requirements of ANSI/UL 583.
- H. Internal-Combustion Trucks
 - 1. Use of internal-combustion-powered forklift trucks is restricted to those trucks that meet the requirements of ANSI/UL 558.
- I. Fork Arm
 - 1. For forklift trucks bought after December 1984, each fork arm shall be clearly stamped with its individual rated capacity and an area readily visible and not subject to wear. For example, 1500 x 24, meaning 1500 pounds capacity at 24-inch load center.
- J. Design Standards
 - 1. Structural, mechanical, and electrical components shall be such that all requirements of ANSI/ASME B56.1.
 - 2. The safety features and operation shall conform, as a minimum, to the provisions of ANSI/ASME B56.1.

V. **TYPE DESIGNATIONS AND AREAS OF USE**

- A. Type Designation
 - 1. The following system shall be used to identify types of powered forklift trucks for operation in non-hazardous and hazardous locations:
 - a. Non-Hazardous Locations
 - i. Type D Forklift - diesel-powered units having minimal acceptable safeguards against inherent fire hazards.
 - ii. Type E Forklift - electrically powered units having minimum acceptable safeguards against inherent fire and electrical shock hazards.
 - iii. Type G Forklift - gasoline-powered units having minimum acceptable safeguards against inherent fire hazards.
 - iv. Type LP Forklift - liquefied-petroleum-gas-powered units having minimum acceptable safeguards against inherent fire hazards.
 - v. Type G/LP Forklifts - operates on higher gasoline or liquefied petroleum gas having minimum acceptable safeguards against inherent fire hazards.

NOTE: The above units are not suitable for use in hazardous areas since they include minimum safeguards against inherent fire hazards.

- b. Hazardous Locations
 - i. Type DS Forklift - diesel-powered units that, in addition to all the requirements for type D units, are provided with

- additional safeguards to the exhaust, fuel, and electrical systems.
- ii. Type DY Forklift - diesel powered units that have all the safeguards of the type DS units and in addition, do not have any electrical equipment, including ignition. They are equipped with temperature limitation features.
 - iii. Type ES Forklift - electrically powered units that, in addition to all the requirements for the type E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.
 - iv. Type EE Forklifts - electrically powered units that have, in addition to all of the requirements for the type E and ES units, the electric motors and all other electrical equipment completely enclosed.
 - v. Type EX Forklifts - electrically powered units that differ from type 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 atmospheres containing specifically named flammable vapors, dusts, and under certain conditions, fibers. Type EX units are specifically tested and classified for use in Class I, Group D or for Class II, Group G locations as defined in NFPA 70, National Electrical Code.
 - vi. Type GS Forklifts - gasoline-powered units that, in addition to all the requirements for the type O units, are provided with additional safeguard to the exhaust, fuel, and electrical systems.
 - vii. Type GS/LPS Forklifts - operate on either gasoline or liquefied petroleum gas and in addition to all requirements for the type G/LP units, are provided with additional safeguards to the exhaust, fuel, and electrical systems.
 - viii. Type LPS Forklifts - liquefied-petroleum-gas-powered units that, in addition to the requirements for the type LP units, are provided with additional safeguards to the exhaust, fuel and electrical systems.

NOTE: The above units are suitable, for use in hazardous areas since they are equipped with safeguards, i.e., special exhaust, fuel, or electrical systems against inherent fire hazards.

B. Specific Areas of Use

1. The atmosphere or location where the powered forklift is to be used shall be classified by the responsible industrial safety organization as to whether

it is a hazardous or non-hazardous location. Location classifications are described as follows:

- a. Class I - Locations in which flammable gases or vapors are, or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.
 - b. Class II - Locations that are hazardous because of the presence of combustible dust.
 - c. Class III - Locations where easily ignitable fibers or filings are present but not likely to be suspended in quantities sufficient to produce ignitable mixtures.
 - d. Unclassified - Location not possessing atmospheres defined as Class I, II or III locations.
2. Forklift trucks for use in hazardous areas shall be selected by a qualified person in accordance with the requirements of ANSI/NFPA 505.
- C. Forklift Truck Makers
1. The use of proper equipment in hazardous areas is essential for the safety/protection of personnel and property. Trucks approved for use in hazardous areas shall have the truck manufacturer's label or some other identifying mark indicating approval for the intended use by a recognized national testing laboratory, i.e., Underwriter's Laboratories (UL) or Factory Mutual (FM).
 2. Durable markers indicating the designation of the type of truck for use in hazardous areas shall be applied to each side of the vehicle in a visible but protected area. These markers shall be distinctive in shape.

VI. INSPECTIONS

- A. Daily Preoperational Check
1. Prior to operating the forklift, a check of the following items should be made by the operator:
 - a. Horn, lights, battery, tire condition/inflation, brakes, steering mechanism, and operating controls. If at any time a forklift is in need of repair, is defective, or shows any condition adversely affecting the safety of the vehicle, the condition shall be reported immediately to the designated authority. The unit shall be taken out of service until it has been restored to safe-operating condition.
- B. Periodic Inspection Requirements
1. Prior to initial use, all new, altered, modified, or extensively repaired forklifts shall be inspected by a qualified inspector to assure compliance with the provisions of this section.
 2. Forklifts shall be inspected when assigned to service and at least once every six months thereafter by a qualified inspector. NDE of the forks shall be made at 12-month intervals. Inspection records shall be kept on file and readily available.

3. Brakes, steering mechanisms, belts, control mechanisms, warning devices, fire extinguisher, lights, governors, lift-load devices, guards, and safety devices shall be inspected regularly and maintained in a safe-operating condition.
4. All parts of lift and tilt mechanisms shall be regularly inspected and maintained. All fluid levels shall be checked and maintained as required.
5. Fuel systems shall be checked for leaks and condition of parts. Extra-special consideration shall be given in the case of a leak in the fuel system. Action shall be taken to prevent the use of the truck until the leak has been corrected.
6. All hydraulic systems shall be regularly inspected and maintained in conformance with good practice. Tilt cylinders, valves, and other similar parts shall be checked to assure that “drift” or leakage has not developed to the extent that it would create a hazard.
7. Capacity, operation, and maintenance-instruction plates, tags, or decals shall be maintained in legible condition.
8. Batteries, motors, controllers, limit switches, protective devices, electrical conductors, and connections shall be inspected and maintained in conformance with good practice. Special attention shall be paid to the condition of electrical insulation.

VII. TESTING

- A. Load Test Requirements
 1. Prior to initial use, all forklifts in which load sustaining parts have been altered, replaced, or repaired shall be load tested by or under the direction of a qualified inspector.
 - a. Test loads shall not exceed 100% of the rated capacity.
 - b. Test weights shall be accurate to within -5%, +0% of stipulated values.
 - c. Load slippage shall not be greater than 3” vertically and 1” horizontally at the cylinder during a static test period of at least 10 minutes in duration.
 - d. A written report shall be furnished by the inspector, showing test procedures and confirming the adequacy of repairs or alterations. Test reports shall be kept on file and readily available to appointed personnel.
 2. Load test shall not be conducted in locations such that the lift meets the definition of critical lift.

VIII. OPERATING PRACTICES

- A. General
 1. An appointed person shall classify each lift into one of the DOE categories

prior to planning the lift.

2. The operator shall not engage in any practice, which will divert attention while operating the forklift.
3. The operator shall not operate the forklift when physically or mentally incapacitated.
4. The operating area shall be kept free of water, snow, ice, oil, and debris that could cause the operator's hand and feet to slip from the controls.
5. Special consideration should be given to the proper functioning of tires, horn, lights, battery, brakes, steering mechanisms, and operating controls. If at any time a forklift is in need of repair, defective, or is in any way unsafe, the matter shall be reported immediately to the designated authority. The unit shall be taken out of service until it has been restored to safe-operating condition or a determination has been made by the Logistics and Support manager that the discrepancy will not adversely affect the safe operation of the unit.
6. A 5BC or larger fire extinguisher shall be installed on the forklift and shall be maintained in an operable condition.

B. Conduct of Operator

1. Before operation of electric powered machines, check location of the battery plug for quick disconnection in case of a short circuit.
2. Avoid sudden stops.
3. Face in the direction of travel, except as follows:
 - a. For better vision with large loads, operate the truck in reverse gear.
 - b. When ascending or descending grades in excess of 5% loaded rider trucks shall be driven with the load upgrade.
 - c. Unloaded trucks should be operated on all grades with the load engaging means downgrade.
4. Stop and sound the horn at all blind corners and intersections and when going through.
5. Operate at safe speeds:
 - a. In-plant "buildings and Units" - 5mph maximum.
 - b. In-plant "roads" - 15 mph maximum.
6. Go slow around curves.
7. Use low gear or slowest-speed control when descending ramps.
8. Riders are prohibited on forklift trucks, unless the truck is specifically built with passenger seating.
9. Know the rated capacity of the truck and stay within it.
10. Consider both truck and load weight when traveling in areas where there are floor-loading requirements.
11. Watch overhead clearance. If in doubt, measure.
12. Keep clear of edge of loading docks.
13. Watch rear-end swing.
14. Before handling, assure that stacks and loads are stable. Block and lash

them as necessary.

15. Always spread the forks to suit the load width.
16. Lower and raise the load slowly. Make smooth gradual stops.
17. Lift and lower loads only while the vehicle is stopped.
18. Use special care when high-tiering. Return the lift to a vertical position before lowering load.
19. Lift, lower, and carry loads with the upright vertical or tilted back; never forward. On all grades, the load and load- engaging means shall be tilted back.
20. To avoid personal injury, keep arms and legs inside the operator's area of the machine.
21. Never travel with forks raised to unnecessary heights. Approximately 4 to 6 inches above floor level is adequate.
22. When loading trucks or trailers, see that the wheels are chocked and the breaks set. Operate in front end of the semi trailer only if the tractor is attached, or adequate trailer (railroad) jacks are in place.
23. Inspect floors on trucks, boxcars, unfamiliar ramps, or platforms before start operation.
24. Be sure bridge plates into trucks or freight cars are sufficiently wide, strong, and secure. Portable and powered duckboards shall be conspicuously marked with carrying capacity.
25. Never butt loads with forks or rear end of truck.
26. Forklift trucks should not be used as tow trucks unless a towing hitch approved by the manufacturer is used.
27. Stop engine before refueling.
28. Use only approved explosion-proof lights to check gas tank and battery water levels. *Smoking is not permitted* during this operation.
29. Place forklifts flat on the floor when truck is parked.
30. Report evidence of faulty truck performance.
31. When exiting or leaving the truck, step down-do not jump.
32. Report all accidents promptly to Supervisor.
33. The final responsibility for the handling of a truck remains with the driver. Use guides and signalers as much as possible. If in doubt, check personally before proceeding.
34. Never lift with one fork without an engineering analysis and approval from your supervisor.

C. Lifting Personnel

1. Whenever a forklift truck is used to elevate personnel, the following precautions shall be taken:
 - a. A lift platform manufactured for the purpose of lifting personnel with a forklift truck and meeting the requirements of ANSI/ASME B56.1 Para 7.35 shall be used.
 - b. Restraining means (capable of withstanding a force of 200 pounds in any direction) i.e., handrails or chains, shall be provided. If no

restraining means is provided, a body harness with lanyard or deceleration device shall be worn by personnel on the platform. The responsible safety organization shall be consulted prior to making the lift.

- c. When being supported by a forklift, the personnel platform shall be attached in such a manner that it cannot inadvertently slide or bounce off the forks.
- d. The operator shall remain in the control position of the forklift truck or means shall be provided whereby personnel on the platform can shut power off to the forklift truck.
- e. Overhead protection as indicated necessary by operating conditions, shall be provided.
- f. Means shall be provided to protect personnel from moving parts of the forklift truck that present a hazard when their personnel platform is in the normal working position.
- g. Personnel shall not be transported from one location to another while on the work platform.
- h. Four-inch (100 mm) toe boards shall be provided on the work platform.
- i. Whenever a truck (except for high lift order picker trucks) is equipped with vertical hoisting controls that elevates with the lifting carriage or forks, the following additional precautions shall be taken for the protection of personnel:
 - i. Means shall be provided whereby personnel on the platform can shut off power to the truck.
 - ii. Means shall be provided to render inoperative all operating controls, other than those on the elevating platforms, when the controls on the elevating platform have been selected for use. Only one location of controls shall be capable of being operated at a time.
 - iii. Emergency lowering means available at ground level should be provided. Such means, when provided, shall be protected against misuse.

D. Standard Signals:

- 1. Standard hand signals for use at DOE locations shall be as specified in the latest edition of the American National Standards Institute (ANSI) chapters, for the particular forklift being used.
- 2. The operator shall recognize signals only from the designated signaler **except that a STOP signal shall be obeyed no matter who gives it.**

E. Size of Load

- 1. Since the load rating for forklifts may be based on stability, or hydraulic or structural competence, the rated capacity shall not be exceeded in operational application.
- 2. No forklift shall be loaded beyond the rated capacity.

3. The designated person shall ascertain that the weight of a load approaching the rated capacity (combination of weight and location of the center of gravity) has been determined within $\pm 10\%$ before it is lifted.
- F. Moving the Load
1. The nature of the terrain, or surface upon which the truck is to operate, is a very important factor in the stability of load-truck system. The designated person shall assure that a proper truck has been selected to operate on the surface available. In general, small, three-wheeled trucks are to be operated on smooth, hard surfaces only, and are not suitable for outdoor work.
 2. The designated person shall assure that the load is well secured and properly balanced before it is lifted.
 3. During hoisting, care should be taken that:
 - a. There is no sudden acceleration of the load.
 - b. The load does not contact any obstruction.
- G. Forklift Truck-Inspection
1. Prior to initial use all new, altered, modified, or extensively repaired forklifts shall be inspected to assure compliance with the provisions of this section.
 2. Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift-overload devices, guards, and safety devices shall be inspected regularly and maintained in a safe-operating condition.
 3. All parts of lift/tilt mechanisms and frame members shall be carefully and regularly inspected and maintained in a safe operating condition.
 4. Special trucks or devices, designed and approved for operation in hazardous areas, shall receive special attention to ensure that the original, approved safe-operating features are preserved by maintenance.
 5. Fuel system shall be checked for leaks and condition of parts. Special consideration shall be given in the case of a leak in the fuel system. Action shall be taken to prevent the use of the truck until the leak has been corrected.
 6. All hydraulic systems shall be regularly inspected and maintained in conformance with good practice. Tilt cylinders, valves, and other similar parts shall be checked to assure that "drift" has not developed to the extent that it would create a hazard.
 7. Capacity, operation, and maintenance-instruction plates shall be maintained in legible condition.
 8. Batteries, motors, controllers, limit switches, protective devices, electrical conductors, and connections shall be inspected and maintained in conformance with good practice. Special attention shall be paid to the condition of electrical insulation.

IX. TRAINING

- A. Operator training
1. Safe operation: Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the Safety Department shall ensure that each operator has successfully completed the training required by this S.O.P., except as permitted by section (IX)(C)(1).
 2. Training program implementation.
 - a. Trainees may operate a powered industrial truck only:
 - i. Under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and
 - ii. Where such operation does not endanger the trainee or other employees.
 - b. 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.

NOTE: Only persons who have the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence shall conduct all operator training and evaluation.

3. Training program content.
 - a. Powered industrial truck operators shall receive initial training in the following topics, except in topics that the Safety department/Trainer can demonstrate are not applicable to safe operation of the truck in the employee's workplace.
 - i. Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;
 - ii. Differences between the truck and the automobile;
 - iii. Truck controls and instrumentation: where they are located, what they do, and how they work;
 - iv. Engine or motor operation;
 - v. Steering and maneuvering;
 - vi. Visibility (including restrictions due to loading);
 - vii. Fork and attachment adaptation, operation, and use limitations;
 - viii. Vehicle capacity;
 - ix. Vehicle stability;
 - x. Any vehicle inspection and maintenance that the operator will be required to perform;
 - xi. Refueling and/or charging and recharging of batteries;
 - xii. Operating limitations;
 - xiii. 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.

- xiv. Workplace-related topics:
- xv. Surface conditions where the vehicle will be operated;
- xvi. Composition of loads to be carried and load stability;
- xvii. Load manipulation, stacking, and un-stacking;
- xviii. Pedestrian traffic in areas where the vehicle will be operated;
- xix. Narrow aisles and other restricted places where the vehicle will be operated;
- xx. Hazardous (classified) locations where the vehicle will be operated;
- xxi. Ramps and other sloped surfaces that could affect the vehicle's stability;
- xxii. Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;
- xxiii. Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.
- xxiv. The requirements of this section.

B. Refresher training and evaluation.

- 1. Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by section (IX)(B)(2) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.
- 2. 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.
- 3. An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.

C. Avoidance of duplicative training.

- 1. If an operator has previously received training in a topic specified in paragraph (A)(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.

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D. Certification Identification (ID) Card

1. The Safety department/Trainer shall certify that each operator has been trained and evaluated as required by this S.O.P.
2. The certification ID card 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.