

FORKLIFT TRAINING MANUAL

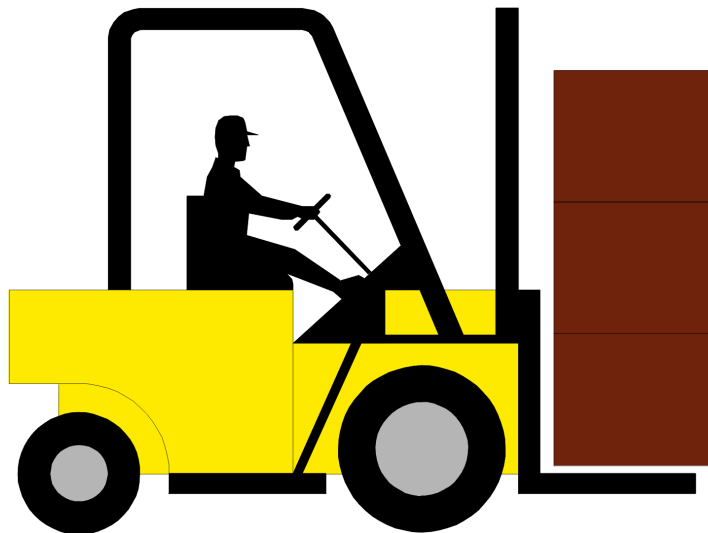


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DISCLAIMER

Information provided in this written material should not be considered as all encompassing, or suitable for all situations, conditions or environments. Each organization is responsible for implementing their own safety / injury / illness prevention program and should consult with their legal, medical or other advisors as to the suitability of using the information in this manual.

Application of this information does not guarantee you will be successful in your safety efforts, or that the information will meet all State or Federal OSHA standards or requirements. (State or Federal OSHA Consultants will not guarantee their services will meet all applicable State or Federal OSHA regulations, or by implementing their recommendations that your company will be in OSHA compliance).

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During the course of this manual, feel free to make changes or delete any information that may not be applicable to your operations. The company policy statement herein, may or may not be suitable for your company's policy statement, so you may want to change the wording of your policy statement, as well as other parts of the program.

VIDEOS AVAILABLE FOR USE IN TRAINING

1001G	FORKLIFT OPERATOR SAFETY	English and Spanish
1002G	FORKLIFT INSTRUCTOR TRAINING	English and Spanish
1003G	FORKLIFTS/PEDESTRIAN SAFETY	English only
1004G	YOU'RE THE ONE (humorous)	English only
1005G	SUPERVISORS AND FORKLIFTS (humorous)	English only
1006G	FORKLIFT MECHANIC SAFETY	English only
1007G	SAFETY OF PEOPLE/EQUIPMENT WAREHOUSE	English only
1008G	POWERED PALLET JACK (WALKIE STACKERS)	English and Spanish
1009G	SAFE HANDLING OF WOODEN PALLETS.	English and Spanish
1010G	BATTERY CHARGING SAFETY	English and Spanish
1011G	PROPANE SAFETY.	English and Spanish
1012G	ORDER STACKER SAFETY	English and Spanish
1013G	ELECTRIC PALLET JACK (RIDER & MANUAL)	English and Spanish
1016G	FORKLIFT 2000 "the new rules"	English and Spanish
1017G	"SITE SPECIFIC" TRAINING MODULES	English and Spanish
7035A	FORKING AROUND-WHAT'S WRONG WITH THIS PICTURE	English only

FORKLIFT OPERATOR TRAINING MANUAL

A company that is able to stay in business and prosper isn't always the one that sells the most goods or services. It is the one that is able to do the best job at controlling costs. No company can lose a little on each sale, but make a profit with volume.

Cost control is a major factor in the economic health of a company. To a great extent, this important matter is not in the hands of top management. In most companies it depends almost entirely on the skill and resourcefulness of first line supervisors. These employees are on the firing line. First line supervisors see and identify the problems firsthand and must take immediate steps to find solutions.

First line supervisors, in charge of forklift operations, have an unusual opportunity to reduce costs. Unnecessary expenses are usually related to employees rather than to equipment or facilities. In forklift operations, costs come down when operators are properly trained, motivated and supervised. Unnecessary expenses are related to low productivity, property damage, personal injuries, improper operation, and poor maintenance of the equipment. To reduce costs in other operating areas, it may be necessary for the company to make capital investments in new machines or remodeled buildings.

This Forklift Operator Manual provides the first line supervisor with an inexpensive, easy-to-understand program to control cost through training and motivation. The general objectives of the forklift operator course are:

1. Increase productivity
2. Reduce property damage
3. Eliminate personal injuries
4. Develop operators who use their forklifts properly and maintain them correctly
5. Meet OSHA requirements

An experienced first line supervisor can act as the Instructor. The forklift operators training should take approximately four to six hours to complete. This Forklift Operator Manual may be modified, as necessary, to fit the requirements of each company.

HOW TO USE THE FORKLIFT OPERATOR MANUAL

Read the Forklift Operator Manual and make notes that reflect the company's particular kind of operations, policies and procedures that may differ from the information contained in the Manual.

Every forklift system is different because of their operators and tasks. The Instructor will need to modify the Forklift Operator Manual as necessary to reflect the specific needs of the company.

SECOND

Read the Forklift Operator Manual and plan the course thoroughly. It is suggested that a copy of the Forklift Operator Manual be given to each employee that participates in the forklift operator training program. If the Manual is not used as a workbook, duplicate important material and give it to the operators for further reference.

THIRD

Read the Forklift Operator Manual and set priorities. Some of the forklift problems may be more severe and more costly than others. For example, property damages may be very high and personal injuries rather low. In that case, the course will be tilted toward the reduction of property damage accidents. The Forklift Operator Manual will provide training material for different forklift operator problems.

FOURTH

Obtain the approval and assistance of upper management. Have skilled forklift operators participate in the teaching procedure. It is easier to get employee co-operation when they become involved in the training process.

FIFTH

Present the Forklift Operator Manual as a training opportunity for improvement rather than as a remedial process. Motivation and wanting to learn is the most important factor in this Forklift Operator Safety Program.

CHAPTER I

PLANNING THE FORKLIFT OPERATOR COURSE

- I. HOW TO ESTABLISH OBJECTIVES
- II. HOW TO DO RESEARCH ABOUT OPERATORS
- III. HOW TO DEVELOP A BUDGET
- IV. HOW TO SCHEDULE SESSIONS
- V. HOW TO CHOOSE AND SET UP TRAINING SITES
- VI. HOW TO OUTLINE THE TRAINING COURSE

I. HOW TO ESTABLISH OBJECTIVES

Objectives are statements that describe what goals the trainees will achieve as a result of completing the forklift operator training course. The objectives will be clear, specific, meaningful, and in written form. Well-chosen objectives make statements about behavior, such as:

Trainees will be able to demonstrate the correct way to drive a loaded forklift up and down ramps. The key word in that objective is demonstrate. The operator must be able to show what he or she has learned by performance. When establishing objectives for the course, be specific by identifying and writing understandable and measurable goals.

There are two other factors to consider when establishing course objectives. One is the conditions under which the operator's performance is to be judged. For example, an operator who has to drive a lift outside when there's snow or ice on the ground might be required to demonstrate performance under such conditions. The other factor is the measurable goals for performance. An established quota for the number of pallets that should be moved during a particular time period is a performance goal that would be established as an objective of the course.

The following are some objectives to be included in the training course:

- A. Demonstrate the operation and material handling techniques that will increase productivity (specify those techniques).
- B. Demonstrate operation and handling techniques that will prevent damage to both the material being handled and the work area (specify those techniques).
- C. Demonstrate operation techniques that are required to insure safe operation of the forklift (specify those techniques).
- D. Demonstrate operating procedures that will prevent damage to the forklift (specify those techniques).
- E. Demonstrate the maintenance techniques that are required to insure the forklift will be kept in proper working condition (specify those techniques).

Specific information about the proper techniques related to each of these objectives is contained in the lessons.

II. HOW TO DO RESEARCH ABOUT OPERATORS

Decide which employees are going to attend the training sessions. Either divide new and experienced operators into two groups, or mix them so that the newer people can learn from the more experienced operators. In any case, avoid singling out the operators with the worst records and putting them in a group by themselves. They will know why they've been selected, resent the fact, and make the teaching job more difficult.

Complete a short profile on selected trainees. Have each trainee fill out a Forklift Employee Registration Questionnaire similar to the one below.

FORKLIFT EMPLOYEE REGISTRATION QUESTIONNAIRE

Name: _____

Years with Company _____

Years of Forklift Experience _____

Present Job _____

Last grade completed in school _____

What is OSHA? _____

What are the Safe Operating Rules for Forklift Operations? _____

Name the basic mechanical deficiencies that will make a Forklift unsafe to drive: _____

Answer the following questions:

A load center is: _____

The stability triangle is: _____

You discover that your parking brake doesn't work. You should then: _____

Fire prevention is especially important to Forklift Operations because: _____

FORKLIFT EMPLOYEE REGISTRATION QUESTIONNAIRE - ANSWERS

Last grade completed in school not necessarily critical, but gives an Instructor an idea of the level of instruction to conduct.

What is OSHA? Occupational Safety and Health Act, a Federal law establishing specific safety rules for employers and employees.

What are the Safe Operating Rules for Forklift Operations?

Do they really know these rules? 90% of Forklift Operators have never received this training.

Name the basic mechanical deficiencies that will make a Forklift unsafe to drive:

1. Horn 2. Brakes 3. Parking Brakes 4. Leaks in the fuel, oil, hydraulic systems 5. Steering

Answers for the questions:

A load center is the distance measured from the center of a load to the vertical face of the forks.

The stability triangle is created by the pivot pin on the rear steer axle (forming the top of the triangle) to the two front tires (forming the base of the triangle). When the combined center of gravity moves outside these lines the vehicle turns over.

You discover that your parking brake doesn't work. You should then: notify your supervisor and not operate the equipment until it is repaired.

Fire prevention is especially important to Forklift Operations because a fire is dangerous anytime, but Forklift Operators must react quickly to any emergencies they may be the only person in the area.

It is possible for the Instructor to be faced with the problem of dealing with employees who aren't (and may never be) qualified forklift operators. This can happen if the company has never developed proper job descriptions for operators, or determined what entry-level requirements they should meet. Obviously, the forklift operator that does not meet the requirements must be reassigned or terminated before they cause injury to themselves or other employees. The best way to avoid this problem is to establish job descriptions and entry level requirements as part of the company policy. Prospective employees must be screened, and those who won't be able to perform properly and/or safely must be rejected. Once this policy is implemented, the Instructor will be provided with qualified employees to train.

The Rookie vs. the Old Pro

Forklift operator trainee profiles will identify the rookie with little or no experience. They will need extra training and assistance, and the best teachers are often the old pros who have been operating forklifts for a number of years.

Consider creating teams consisting of one or two rookies and an old pro as team leader. There are a number of benefits gained from teams working together during training exercises. First, the team concept will increase interest. Second, the newer operators will get valuable information from those with more experience. Third, the old pros will get refresher training under circumstances that will make participation more palatable. Fourth, additional Instructors will help with the sessions.

III. HOW TO DEVELOP A BUDGET

Make a written estimate of how much this training is going to cost. Include such things as employee and supervisor time at the appropriate wage scales, overtime, fuel and materials. While this course has been designed to minimize training cost by requiring both employees and supervisors to be away from their regular jobs for the shortest possible time, there is still some expense involved.

Management will want to see a budget before approving the training program. Don't only include costs in that budget; also show the anticipated financial return, or ROI, Return on Investment. Indicate what can be accomplished through increased productivity, reduced property damage, personal injury prevention. This benefits statement in the budget proposal should also include the fact that forklift training will meet the requirements of OSHA and other regulatory agencies.

IV. HOW TO SCHEDULE THE SESSIONS

This course is designed for presentation in 4 hours (if necessary the course can be extended to 6 hours for employees that need further training), with a maximum of 3 hours in the classroom and 3 hours working with the forklift at a performance area. The sessions can be scheduled in a number of different ways, depending upon the availability of operators and the training sites:

- A. (4) 1-hour sessions
- B. (2) 2-hour sessions
- C. (1) 4-hour session

The general approach is to explain theory in the classroom, then demonstrate it in the performance area. This requires that the classroom sessions be held prior to those in the performance area. But it is not necessary to be in the classroom for about 2 hours before moving to the performance area. For example, divide the training program into 4/1-hour increments, with the first and third in the classroom, the second and fourth at the performance site. In developing the training schedule, minimize the amount of operator down time, the time away from regular assignments. Consider other factors that could have an impact: work schedules, peak periods, vacations, sick leave, holidays, potential layoffs, and possible conflict with other management plans.

When developing the training schedule, confer with other managers and supervisors. Good coordination will reduce the amount of inconvenience to those concerned. Discuss the schedule with the heads of all departments that will be affected. Don't forget about night shift employees and others who will be difficult to accommodate. Arrange a schedule that will be convenient for as many employees as possible.

V. HOW TO CHOOSE AND SET UP TRAINING SITES

There are several factors to consider in setting up training sites.

First, two sites will be needed, one for the classroom and the other for performance training. They'll have to be large enough to accommodate the size of the group and the planned activities.

Second, there's the need to create a physical environment that will make training easy. The sites should be reasonably comfortable, close to the materials and equipment needed, and free of distractions or interruptions.

The third factor is availability. The sites will have to be available when needed, but the schedule will depend on the ratio of classroom vs. performance training rotation.

The easiest way to set up a classroom is by using the schoolroom technique: students facing the instructor. Chairs can be in rows or placed in a semi-circular fashion. Check the lighting, heating, and/or air conditioning to make sure the room will be comfortable. If a slide projector is used, the room may have to be darkened. Student chairs will have to be placed so they relate properly to the screen. If possible, seat the trainees at tables so they'll have a place to write and take notes.

Plans for the obstacle course layouts are shown in the chapter on Performance Testing. In order to avoid wasting valuable time, have the site set up before the sessions begin.

Trainees can't sit in chairs for two solid hours and learn all the training material. That's especially true if the classroom is uncomfortable. A group can't stand in the hot sun at a performance training site and enjoy the experience. Consider the physical problem when selecting site's and that must include the proximity to bathrooms. Don't leave anything to chance.

VI. HOW TO OUTLINE THE TRAINING COURSE

Read through the Forklift Operator Manual and create a written outline of the course. Start with Objectives, and then include Student Research, Budget, Schedule, Training Sites, etc. A good course training outline can be used by another Instructor to present the course. It will also be extremely handy the second time the course is presented; most of the work will already be done. The outline should answer these questions:

What will trainees learn?

Why is it important?

Who will be trained?

When will sessions be held and where will the training sites be?

How will the subjects be taught?

CHAPTER II

ASSIGNING RESPONSIBILITIES

- I. SUPERVISOR RESPONSIBILITIES
- II. FORKLIFT OPERATOR RESPONSIBILITIES
- III. TRAINING RESPONSIBILITIES

In forklift operations all managers, first line supervisors and operators must recognize and accept the responsibilities assigned them as part of their job descriptions. This responsibility cannot be delegated. Neglecting assigned responsibility is the major cause of failure in job performance.

Two of the most important positions in forklift operations are the first line supervisor and the operator. It is essential that their responsibilities are understood by all employees in order to have an effective Forklift Operator Safety Program.

I. SUPERVISOR RESPONSIBILITIES

First line supervisors are the backbone of the organization. They are the persons responsible for the performance of forklift operators. Their role in leadership, training and developing the efficiency of production is extremely important. The first line supervisors in charge of forklift operations are in the best position to know what is happening in their departments, and how each operator is performing. A supervisor's successful performance, therefore, depends on the successful performance of their operators.

KNOW THE EMPLOYEES - THEIR CAPABILITIES AND LIMITATIONS

One of the key criteria for a successful first line supervisor is knowing each jobs requirements and matching each job with a forklift operator with the right experience and ability. Problems arising from having the wrong operator on the wrong job are the responsibility of the supervisor. Therefore, supervisors must know the capabilities and limitations of each employee. This is most effectively done by measuring the performance of each forklift operator against the performance criteria established in the training course.

The supervisor must know the equipment, how it works, why it works, and the methods for using the equipment in a safe and efficient manner.

ORGANIZE EQUIPMENT, EMPLOYEES, AND OPERATIONS FOR EFFICIENCY AND SAFETY. PLAN FOR UNEXPECTED EMERGENCIES SO THEY CAN BE SOLVED AS THEY OCCUR.

First line supervisors must be able to organize, plan, schedule, assign, and control the resources available in their departments. Assigning two forklift operators when one can easily handle a job is a costly waste of time, labor, and equipment. Conserve resources by planning for each job. Anticipate when and where problems could occur and be able to solve them without disrupting the entire operation.

A properly trained and supervised forklift operator is least likely to have an accident. When training and supervision are neglected, employee accidents may well be the responsibility of the supervisor. Remember, a supervisor has been given the authority and responsibility for the training and supervision of their employees. Be an effective supervisor.

THE SUPERVISOR IS THE MOST IMPORTANT ELEMENT IN ESTABLISHING AND MAINTAINING A SUCCESSFUL FORKLIFT SAFETY PROGRAM.

THE SUPERVISOR LEADS THE SAFETY PROGRAM BY:

1. ANALYZING THE FORKLIFT OPERATION-SELECTING THE BEST METHOD & THE MOST QUALIFIED OPERATOR

2. TEACHING THE SAFEST WAY TO PERFORM THE FORKLIFT OPERATION
3. KNOWING AND ENFORCING THE RULES
4. INSPECTING FOR HAZARDS-MAKING NECESSARY THE CORRECTIONS
5. SETTING AN EXAMPLE BY PERSONAL BEHAVIOR

II. FORKLIFT OPERATOR RESPONSIBILITIES

Employees assigned to operate forklift equipment must be properly trained to effectively handle their responsibilities. The forklift operator must become familiar with the equipment, engineering principles, safe operating rules, material handling procedures, their own capabilities and limitations, operator maintenance procedures, and the specialized requirements necessary for the safe and efficient operation of the equipment. This is provided by:

PROFESSIONAL TRAINING

RESPONSIBLE SUPERVISION

PERIODIC REFRESHER TRAINING

Training and supervision result in improved efficiency and the safe operation of equipment by employees. OSHA-mandates that forklift operators be trained and certified to operate this equipment. Not only must they be trained on the general forklift operating rules, "site specific" training is required on potential hazards to which they are exposed in the workplace. You must determine what the "site specific" hazard exposures are and provide training on those potential hazards. This is a MINIMUM requirement. However, companies train and certify forklift operators, not merely because the law requires it, but also because it produces professional, safe, efficient, and productive employees.

FORKLIFT OPERATOR ACCEPTANCE OF RESPONSIBILITIES

1. All equipment operators must be adequately trained and understand the information provided during training.
2. The organization must provide training programs, safety rules, procedures, and requirements, and these need to be implemented and enforced in an impartial manner.
3. There must be adequate documentation of the Forklift Operator Safety Program, certification, license, and training provided for each equipment operator.
4. There must be immediate enforcement of rules and appropriate discipline by the first line supervisor.

ASSUMING RESPONSIBILITY IS THE KEY TO SUCCESS

Forklift operators will assume responsibility for the implementation of the basic elements of the Forklift Operator Safety Program. The forklift operator's attitude is extremely important. Training and responsible supervision will create a positive attitude toward the company, personal responsibility, and safety.

Often, safety and other specialized procedures evolve around management or organizational responsibilities. OSHA mandates safety and the employer is responsible to provide a safe and healthful place to work.

Forklift safety requires that everyone - management, supervisors, pedestrians, selectors, material handlers and anyone working AROUND forklift equipment be personally responsible. Safety and efficiency are a team effort and individual responsibility is a prime requirement.

III. TRAINING RESPONSIBILITIES

It's not how many years of experience a person possesses, but how much knowledge a person gains from the years of experience.

It is the first line supervisor's responsibility to provide the training necessary for employees to effectively perform their responsibilities. Supervisors, managers and employees **MUST** have first-hand knowledge, before operating the equipment and training others.

CHAPTER III

PREVENTING FORKLIFT ACCIDENTS

- I. SIX COMMON CAUSES OF ACCIDENTS
- II. SPEEDING: GOING NOWHERE FAST
- III. THE COST OF ACCIDENTS
- IV. HOW TO REDUCE THE RATE OF ACCIDENTS
- V. MOST COMMON POWER TRUCK ACCIDENTS
- VI. A LOOK AT WALKIE ELECTRICS

The simplest method of preventing forklift accidents is the development, implementation and enforcement of an effective Forklift Operator Safety Program.

I. SIX COMMON CAUSES OF ACCIDENTS

Experience has demonstrated that property damage and employee injuries occur most frequently from the following causes:

- A. Operator Inattention. Property damage resulting from the operator driving with blocked vision, raised loads or failure to exercise caution when engaging or extracting a load from the forks.
- B. Parking Violations. The parking brake is not engaged or is not working properly. The mast is not vertical and the forks not lowered to the floor. Parking with the forks of a lift extending into an aisle or walkway is a parking violation.
- C. Operator Training. Accidents, injuries, property damage are a result of the following forklift operations:
 1. Inadequate training or experience when handling cargo;
 2. Lack of knowledge of hydraulics, instruments and levers;
 3. Lack of understanding of equipment principles and operating rules;
 4. Lack of training and enforcement of safety procedures related to material handling, hazardous materials, chemicals, etc.
- D. Personal Protection. Operators who do not wear basic personal protection such as safety hats, adequate footwear, gloves or proper clothing. Another cause is the lack of a non-slip material on forklift equipment running boards where an operator puts his foot to enter or exit the forklift.
- E. Inexperience. The damaging of pallets by hitting them with forks, spilling loads due to fast, sharp turns or improperly stacked loads and/ or carrying forks too low or too high when traveling. Damage to the merchandise results from the forks extending past the lines of a pallet. In general, unless properly trained and supervised, inexperienced operators have poor material handling techniques.
- F. Ancillary Training. The lack of training in the areas of fire extinguishers, sprinkler systems, flammable liquids and chemicals results in many employee accidents and injuries.

II. SPEEDING: GOING NOWHERE FAST

The faster I go, the further behind I get. Speeding is one of the most common causes of forklift and material damage. Forklift operators and, unfortunately, many supervisors believe that driving fast will increase productivity. The exact opposite is true.

BY SLOWING FORKLIFTS TO A SAFE OPERATING SPEED, PRODUCTIVITY AND EFFICIENCY WILL INCREASE 10% TO 50%. DECREASE THE OPERATORS SPEED BY 30% AND INCREASE PRODUCTIVITY BY 40%. FORKLIFT TRAINING PROGRAM RESULTS IN THE FOLLOWING:

- A. Training and motivation.
- B. Knowledge of why forklift operators need to reduce speed.
- C. Enforcement of forklift rules discipline.
- D. Adequate employee supervision.
- E. Installing speed recorders, such as those available for commercial trucks.
- F. Installing wooden or metal blocks under the accelerator to obtain the desired maximum speed.

III. THE COST OF ACCIDENTS

One of the most effective methods of reducing accidents and injuries is through discipline and the enforcement of forklift operating rules. Research shows that substantial time and money are wasted due to accidents, injuries and property damage. Every time an operator stops to pick up a spilled load that operator is non-productive.

1. How many hours do supervisors use up completing accident related paperwork?
2. What happens when an employee is injured and a replacement is required?
3. Is the replacement forklift operator trained, efficient and productive from the minute they punch the time clock?
4. What does it cost the company to replace overhead doors, broken pallets, sprinkler heads and other damaged property? These are the hidden dollar losses due to accidents.
 - A. Injured employee's loss of time results in loss of income dollars.
 - B. Other employees, who stop work, cost the company employee time and dollars.
 1. Due to curiosity
 2. Due to sympathy
 3. To aid the injured employee
 4. For other reasons
 - C. Foremen, supervisors or management personnel cost time and dollars as follows:
 1. Aiding injured employee
 2. Determining the cause of the accident
 3. Making arrangements for some other employee to perform injured employees job.
 4. Selecting, training, or breaking in a new employee to replace the injured employee.
 5. Preparation of state or federal accident reports, or attending hearings before board, courts, arbitration, etc.
 - D. First aid attendants and other medical personnel spend time on the case and are not always paid by insurance carrier.
 - E. Dollars lost due to damage of the machine, tools, stock or other property or due to spoilage of material.

- F. Incidental dollars lost due to interruption of job, failure to complete orders on a timely basis, customer good will, etc.
- G. Worker compensation and benefit experience programs cost increases in premiums for employer.
- H. Loss of dollars to employers to that need to continue the wages of the injured employee in full, after their return even though the services of the employee may not be worth full value because they may not be fully recovered.
- I. Loss of dollars due to decrease in profit as a result of the injured employees productivity and idle machinery.
- J. Overhead loss of dollars per injured employee. The expense of light, heat, rent and other similar items when are fixed expenses even though the injured employee is non-productive.

DISCIPLINE AND ENFORCEMENT OF FORKLIFT OPERATING RULES CAN SAVE TIME AND MONEY.

IV. HOW TO REDUCE THE RATE OF ACCIDENTS

Reducing the rate of accidents can be a very simple procedure provided an effective training program is implemented. Accidents and injuries are controlled through:

- A. Establishing specific, safe operating rules.
- B. Training operators in these rules.
- C. Enforcing the rules. Administering the forklift operator's rules in an equal, impartial manner.
- D. Effective supervision, leadership and discipline. First line supervisors are the keys to successful forklift operations. Forklift equipment operators will follow rules when they know them and have been properly motivated to work and act in a safe, efficient manner.

Note: Obstacle course training will reduce most accidents, the majority of which are caused by intricate maneuvering close to people, property and materials. Without developed skills, forklift operators cannot be expected to perform efficiently. Skill courses outlined later are very effective in achieving necessary performance skills.

SUPERVISORS ORGANIZE THE EQUIPMENT, EMPLOYEES AND OPERATIONS FOR SAFETY

V. MOST COMMON POWER TRUCK ACCIDENTS

The majority of lift truck accidents are caused by violation of safety rules, carelessness or negligence. These items in their most frequent order of occurrence.

POWERED TRUCK ACCIDENTS 1972-1975 (Wisconsin Study)

All Powered Trucks
 Total: 3,079
 Sit down rider 2,523
 End loader/Pay loader 236
 Stand-up riders 224
 Walk trucks 96

Most Common Accidents

Struck pedestrian 23%
Struck by moving forklift 16%
Caught between moving and stationary object 14%
Bumped into or fell against 10%
Struck by material from 7%
Collision with stationary object 7%
Overexertion 5%
Overturn or tip fork lift 1%

Deaths

Pedestrian struck by forklift
Fall with truck
Caught in or struck by mechanical part of truck
Struck by another vehicle
Struck by material from lift truck

Note: These statistics should be used only as a reference or guide. Forklift accidents may result from other causes not listed in this survey.

VI. A LOOK AT WALKIE ELECTRICS

Although the Wisconsin study shows sit-downs involved in far more accidents than the walkie trucks, this is not the case when equal numbers of trucks are involved. When comparing the safe operation of 100 walkies with 100 sit-down riders, you will find that the accident rate for walkies to be nearly four times greater. Sit-down Rider Forklift's Predominant Accident Types:

Rank

1. Struck by material
 2. Caught between forklift
 3. Struck by moving part
 4. Truck strikes pedestrian
 5. Forklift tips
 6. Collision with stationary object
 7. Fell from forklift
 8. Over-exertion
 9. Caught in mechanical parts
 10. Bumped into or fell against
-
1. Pedestrian struck by walkie
 2. Overexertion
 3. Fell onto or against truck
 4. Struck by object handled
 5. Collision with stationary object

There are some important considerations when choosing a walkie truck.

- A. When pedestrians are struck with a walkie, their injuries are more serious than sit-down trucks. The occurrence of these accidents is far above the average for all lift truck accidents. Injuries to the lower extremities are predominant.
- B. Overexertion of the operator appears to result from the normal operation of the truck, not necessarily from manipulating the non-powered steering mechanism or pushing a stuck vehicle.

- C. Falls onto or against the truck are third in importance. The majority of the accidents in this category occur to the vehicle operator, primarily caused by falling on a slippery floor.
- D. Drivers being struck by their own truck accounts for a variety of injuries Primary causes include poor housekeeping (slippery or uneven floors, litter, etc.), close quarters, and maneuvering in tight spaces.

COMMON PROBLEMS INVOLVED IN OPERATING WALKIES

Walkie trucks cause a number of injuries when backing up. The driver can be easily pinned between the truck and merchandise or a stationary object. When other moving vehicles are involved, the incidence rate of injuries increases. Walkies are not as maneuverable as other types of equipment.

Common Problems (all types)

1. Backing up The major cause of injuries and damage
 - a) Truck hitting a pedestrian.
 - b) Driver hitting a stationary object injuring themselves or damaging property.
 - c) Truck knocking objects onto someone else
 2. Riding on forks
 - a) Falling from heights.
 - b) Hands getting caught on hoist mechanism.
 3. Littered or uneven floors
 - a) Falls getting off the truck.
 4. Drivers feet tangled in controls
 - a) Falls getting out of the truck.
- b) Hitting stationary objects.

Overall, mechanical or hydraulic failure appears to cause very few forklift truck accidents.

VIOLATION OF SAFETY RULES, CARELESSNESS AND NEGLIGENCE CAUSE ACCIDENTS

CHAPTER IV

SAFETY TRAINING PROGRAM

- I. TRAINING EMPLOYEES
- II. LICENSING
- III. CERTIFICATION
- IV. DOCUMENTATION
- V. INTRODUCTION TO LESSONS
- VI. TRAINING COURSE OVERVIEW

THE SUPERVISOR IS THE MOST IMPORTANT ELEMENT IN ESTABLISHING AND MAINTAINING A SUCCESSFUL FORKLIFT SAFETY PROGRAM

OSHA mandates that any person operating forklift equipment must be trained and certified. Training provides the operators with the knowledge they need to properly carry out the mandated forklift operator safety requirements.

I. TRAINING EMPLOYEES

The first step is Instructor preparation. Review the lesson plans and audio visual materials. OSHA recognizes that there are a variety of methods for training in the academic requirements of the forklift, such as lecture, video, interactive, slide programs and others. Instructor credibility IS extremely important. Employees must have confidence in the Instructor. The Instructor is the expert on forklift operations. The Instructor will complete the exams and practice driving the performance course until thoroughly familiar with the entire program

A. HOW TO INSTRUCT

- 1. Using the Forklift Operator Manual, decide what the employee must be taught in order to do the job efficiently, safely, economically and intelligently.
- 2. Have the right tools, equipment, supplies and material ready.
- 3. Have the work place properly arranged just as the worker will be expected to keep it.

B. TRAINING IS ORGANIZED INTO FOUR BASIC STEPS

Step 1: PREPARATION FOR THE EMPLOYEE

- A. Put the employees at ease. Make the learning environment as comfortable as possible.
- B. Find out what the employee already knows about the forklift operations.
- C. Motivate the employees. Get them interested and involved in the training program
- D. Involve the employee in the discussions and demonstrations of forklift operations.

Step 2: PRESENTATION OF THE OPERATIONS AND KNOWLEDGE

- A. Use audio visual material or actual demonstrations to convey new information, operating techniques and/or procedures.
- B. Instruct slowly, clearly, completely, and patiently, one point at a time. Be organized and know what points are to be taught.
- C. Check effectiveness of training material by asking employees questions about forklift operations.

- D. Make sure the employees learn. Ask them to repeat and explain key points.

Step 3: PERFORMANCE TRY-OUT

- A. Test the employee's performance using the forklift obstacle course.
- B. Ask questions that begin with why, how, when or where.
- C. Observe each employees performance, correct errors, and repeat instructions if necessary.
- D. Continue the training until each employee knows and understands the material and is competent in operating a forklift through the obstacle course.

Step 4: FOLLOW-UP

- A. Put employees on their own. Use the rookie-old pro approach.
- B. Check frequently to be sure they follow instructions.
- C. Taper off extra supervision until employees are qualified to work with normal supervision.

FORKLIFT EQUIPMENT OPERATORS HAVE RESPONSIBILITIES AND THE COMPANY RECOGNIZES THIS THROUGH TRAINING, TESTING, PERFORMANCE EVALUATIONS AND CERTIFICATION. ISSUING A LICENSE IS NOT REQUIRED; BUT MANY COMPANIES HAVE FOUND THIS TO BE PRODUCTIVE.

C. TYPES OF TRAINING USED IN THE FORKLIFT OPERATIONS PROGRAM

Classroom Training. This training is conducted through the use of lectures, demonstration audio visual materials and discussion methods or a combination of materials. Total classroom training normally requires approximately 2 to 3 hours to complete. It can be modified, according to operational requirements, schedules and experience of the employees being trained. When possible, four hours of training would be desirable.

Hands-on Training. This is the training conducted after the classroom training and gives the employee an opportunity to actually operate the forklift equipment.

D. TRAINING PROGRAM OUTLINE

1. Instructor Preparation. Review the contents of the manual, background information provided, assemble the forms, checklists and handout materials needed to teach and implement the program.
2. Classroom Training. The time allotted for classroom training is normally 2 hours (it may take 3 classroom hours to cover all the material). However, each lesson can be taught without the support of the other lessons and if the availability of the employees is limited, one or two lessons can be taught at a time.

- Lesson #1 Engineering Principles - 20 min.
- Lesson #2 Safety Operations & OSHA Requirements - 20 min.
- Lesson #3 Material Handling - 20 min.
- Lesson #4 Operator Maintenance - 20 min.
- Lesson #5 Fire Prevention - 20 min.
- Instructor Review and Written Exam - 20 min.
- Evaluation and Certification process

3. Application Training. After the employees have been screened, trained according to the lesson plans and have passed the written examination, then the all-important on-the-job training will begin.

Program #1 (Experienced Operators)

This program reduces the actual hands-on training to an absolute minimum. Some operators may have been operating forklifts for months or years, but have never received formal training. Teaching the rudiments of driving to these employees would be a waste of time; however, old pros sometimes cannot properly maneuver the course. When it is discovered that an operator has trouble with the obstacle courses, additional training and closer supervision is indicated.

Measuring the experienced operator's proficiency by a performance test is both a legal and moral responsibility. Have the operators first line supervisor conduct the test and record the results on the performance examination form. The supervisor will observe the operator during normal work times and complete the performance exam according to routine work performance. The completed form is then returned to the forklift program coordinator or safety department for retention in the employee's files fulfilling OSHA requirements for documentation.

Program #2 (Inexperienced Operators)

The time required to train each operator depends upon the skill and experience of the operator. Theoretically, training time could range from 30 minutes to 30 days. Generally, 2 hours is needed for a novice equipment operator to maneuver through these obstacle courses with sufficient skill to pass the performance test. Review each case individually. More training time will be devoted to those employees who really need it.

II. LICENSING

After all screening, training and testing have been completed, issue licenses to those employees who have successfully completed the program. Newly hired operators should be issued probationary licenses. Usually 30 days is sufficient probation, although some companies prefer 90 days. Permanent licenses can be issued after probationary periods. Updated training and testing should be provided on a scheduled basis (at 6-month intervals).

Although issuing a license is not a formal OSHA requirement, it is suggested in order to keep track of an employee's level of performance. The awarding of a license means the person receiving the license has met certain requirements. The company has chosen select employees to become equipment operators, which implies employee trust and respect. Forklift equipment operators have responsibilities and the company recognizes this by training, testing and licensing qualified employees as forklift equipment operators.

WE HAVE PROVIDED LICENSES AND CERTIFICATES THAT CAN BE DOWNLOADED AND PRINTED FOR THESE PURPOSES.

A forklift equipment operator should have a written job description outlining the specific requirements of the position. If an operator fails to perform these duties in an acceptable manner, then that person no longer qualifies for the job. A licensed forklift operator can be disqualified for a number of reasons. By suspending or revoking a license, in effect, the employee is disqualified from performing these duties as outlined in the job description.

- A. Issue a permanent license upon successful completion of all training, examinations performance examinations and probationary periods.
- B. Maintain records of all licenses issued, to whom and the expiration dates (every 6 months). Operators, by signing the licenses and license issuance record, acknowledge receipt and understanding of the training, safe operation rules and responsibility for operating the equipment safely. (FORM: 1 - License Issuance; FORM: 2 - Operator Permit).

III. CERTIFICATION

It is recommended that every operator, successfully completing the program, be provided with a Certificate of Completion. Also, each operator should be provided with a letter of completion or a letter of training issued by the company to the employee.

Providing operators with certificates for completing the training is an effective morale booster. Simple adhesive decals that attach to their safety hat displaying that they are a certified forklift operator reinforces the importance of the forklift operator's position within the organization. A certification program has many beneficial results.

- A. Provides documentation for OSHA, union arbitration, legal and regulatory agencies that training was conducted and that each forklift equipment operator is a responsible, safe employee.
- B. Enhances the employee's professionalism, instills pride, motivation and a sense of accomplishment.
- C. Reinforces the company dedication and support of the safety program.
- D. Provides employees with the feeling they have gained a skill that will ensure their job security and this in turn increases morale, motivation and responsibility.

CERTIFICATION BENEFITS BOTH EMPLOYER AND EMPLOYEE

IV. DOCUMENTATION

Documentation provides useful employee records and is a legal requirement for the forklift program. Develop a complete file or set of records for forklift operations which should be retained in a central location if possible which allows for better control and follow-through. These records should include:

- A. Certificate of Training. This certificate outlines the course requirements completed for forklift equipment operator. Retain in files during the operators employment.
- B. License Issuance Form. This form identifies who received the training, their license number and the signature of the operator acknowledging receipt of the Forklift Operator Manual. Retain this form in the employee's files for the duration of an operator's employment. (FORM: 1 - License Issuance).
- C. Medical Forms. These forms should be included with the results of the medical examinations of the operator. Be aware that the keeping of these records should be consistent with legal requirements for confidentiality of information. A minimum requirement would be to include the type of examination or evaluation conducted and restrictions found, if any, of the operator's medical findings. Include the results of any vision color blindness depth perception or ear examinations. Retain these records during an operator's employment (Refer to company physician for required forms).
- D. Examinations. Maintain copies of the results of the written examinations (the actual corrected copy of the exam) and the results of the performance examination as certified by the first line supervisor. Retain these in employee's files during an operator's term of employment. Retain copies of the review quiz administered at the end of each training.
- E. Maintenance Records. It is extremely important that all operator maintenance records, mechanic or service vendor records and other pertinent maintenance records be maintained for a minimum of one year (optional-retain for 5 years). In the event of an accident involving injury or disciplinary action, retain the involved vehicles maintenance records for a period of at least 5 years.

- F. Supervisors Checklist. Periodically, each supervisor should inspect the equipment to determine if it meets OSHA requirements and is being properly maintained. Keep records of these inspections in the business files for a minimum of one year (optional-retain for 5 years) (FORM: 8 - Supervisors Checklist).
- G. Safety Counseling. Designed to provide written documentation of counseling to employees who violate safety rules.

Documentation requires work and administrative effort. Providing effective training to equipment operators is a fundamental requirement of OSHA. It will reduce accidents, improve the efficiency and productivity of the equipment operators and enhance the professionalism of the organization and its employees. It is extremely important, legally for the documentation of the training program to include:

1. Type of training provided
2. Who received the training
3. Special requirements and/or restrictions (medical, visual, performance exams)
4. What information was contained in the training program?
5. Background and experience of the trainer/instructor.
6. Performance Evaluations

Safety training, in order to be effective, must be an ongoing program. Five to ten minute safety talks conducted every week by supervisors will ensure safety awareness, hazard alertness and up-to-date knowledge of forklift safety.

DOCUMENTATION MAKES THE FORKLIFT TRAINING PROGRAM LEGAL AND PROVIDES USEFUL RECORDS

V. INTRODUCTION TO LESSONS

The average automobile weighs between 2,500 and 3,500 LB. A 6,000-LB capacity lift truck, unloaded, weighs two or three times more than the average automobile. An operator is maneuvering a mass weighing approximately 12,000 LB. with a normal capacity load. Six tons of moving mass can cause tremendous damage, inflict serious injury and inhibit production. The best preventative measure available today is operator training and effective supervision.

The productivity of any forklift truck is directly related to the efficiency of the operator. The operator must know and understand the safety rules, engineering principles and routine preventive maintenance requirements of the equipment.

During the expected life-use of a lift truck, the normal maintenance cost will approximate the original purchase price. The total expenditure can be increased considerably by misuse, damage or lack of routine maintenance of the vehicle. A properly trained operator will help control these costs and keep them to a minimum.

The Operator

1. Safety: Safe equipment and safe working conditions are vital. The operator of the vehicle must follow the rules of safety. A forklift operator is much more than just a driver. They must possess the skills to operate the forklift vehicle and its attachments efficiently and safely. Operators are trained to use this valuable equipment, to minimize damage and to protect themselves and co-workers from personal injury. Safety requires operator diligence, knowledge, responsibility and supervision.
2. Safe Work Practices: Many accidents which result in personal injury and material damages have occurred because of unsafe work practices and conditions. An operator who understands basic

lift truck use and corrects unsafe work practices will reduce accidents and injuries. Safety is not an employee benefit, it is a right equally demanded by employee and employer.

3. Experience: The skilled operator studies powered motor vehicles and their use. This knowledge is gained from combining study and actual experience with the equipment. It may take weeks, months or even years to become a professional forklift operator and the learning process is never-ending. The Person Selected to be a Forklift Operator:
 - A. Must be in good physical health. Their eyesight, depth perception and hearing must be adequate to enable them to safely operate the vehicle.
 - B. Must be emotionally stable. They must be intelligent, have some mechanical aptitude and be reasonably agile.
 - C. Should possess a valid automobile driver's license, although it is not required. Some companies require a demonstrated good driving record before issuing forklift licenses. Company requirements will meet all State and Federal regulatory requirements. Safety and efficiency will be the guidelines. Specific job descriptions outlining the duties, responsibilities and expectations of equipment operators will be established by the company.

VI. TRAINING COURSE OVERVIEW

The Instructor has studied the information in this Forklift Operator Manual and is prepared to teach others. Arrangements have been made for the training space, and personnel availability has been coordinated by all departments. Teaching materials are available. The Instructor will need to motivate the employees and answer their questions about forklift operations. The two to three hours in the classroom will teach the basic information needed to develop an effective Forklift Operator Safety Program.

The Instructor can teach one lesson then demonstrate the key points of the lesson on a forklift or teach all the lessons and then put them into application in the next phase of training called performance testing or obstacle course.

The teaching portion can be accomplished with a few short sessions each day, to accommodate production or work schedules. Review the lesson plans thoroughly before teaching. Once the first phase of the program is completed, the employees should be given the written examinations. It is recommend the Instructor grades all examinations after class. Never let employee's grade exams.

Certificate of Training will include the following Lessons:

Lesson #1: Principles of Forklift Engineering

This essential information teaches the reasons why certain rules must be enforced. When the employee understands the reasoning behind a rule, they will more than likely observe it. When telling employees not to tilt a load, it is essential to tell them why it is dangerous to tilt a load. It is a natural tendency for operators to believe that accidents won't happen to them.

Lesson #2: Safe Operations and OSHA Requirements

Unless the operators are trained, they wouldn't know the rules. This lesson presents basic safety information that complies with OSHA, and teaches employees those things they really need to know to prevent accidents.

Lesson #3: Material Handling

This lesson explains forklift safety as required in material handling operations. Forklift operators are material handlers and should understand their jobs. There is more to being a forklift operator than just being a driver.

Lesson #4: Operator Maintenance

Equipment abuse and damage is one area of skyrocketing costs. Operators that know and understand how to maintain their vehicles will save their company thousands of dollars. Operator maintenance will eliminate unsafe vehicles from operation, reduce the amount of down time and number of emergency repairs commonly found in many forklift operations.

Lesson #5: Fire Protection

Fire protection is included in the program because operators are operating throughout the facilities on a daily basis. They are in the best position to react to fire emergencies. Additionally, they may handle flammable liquids or fuels. If they accidentally damage a sprinkler head, they will know what measures must be taken to minimize water damage.

"SITE SPECIFIC HAZARDS TRAINING MUST BE CONDUCTED, AS WELL AS THE SPECIFIC FORKLIFT EQUIPMENT EACH OPERATOR WILL OPERATE.

CHAPTER V

- I. HELPFUL HINTS
- II. INCENTIVE PROGRAM OPERATOR POOL
- III. INCENTIVE PROGRAM TEAM EFFORT
- IV. INCENTIVE PROGRAM QUARTERLY PROGRAM
- V. CASE STUDIES
- VI. REVIEW

Some of the effective methods for improving morale, productivity and the professionalism of the company's employees involve an incentive program. These programs have been developed from the experience of other successful programs. These are guides and the company may want to develop programs that are personally tailored and, possibly more effective for their operations.

INCENTIVE PROGRAMS MERELY STIMULATE INTEREST IN SAFETY. THEY ARE NOT SUBSTITUTES FOR A FORKLIFT OPERATOR SAFETY PROGRAM

I. HELPFUL HINTS

Incentive programs can be detrimental if used improperly, are not controlled, lack publicity or are not administered equally and impartially. Good judgment and caution should be exercised when using these programs. It is also wise to discuss these programs with the company legal department (taxes on cash incentives) and unions (where it applies).

Employees must be aware of the incentive program, its goals, and how the employee will benefit from it. Frequent reminders and publicity are required to maintain interest. Publish names and department of winners.

Don't compare office workers with warehousing personnel. Develop a handicap system. One method is using the worker compensation rate book for occupations.

An office worker rate might be 2.5. A warehouse worker rate might be 5.0. This is a 50% increase in the hazard. Therefore, arrange a handicap for those employees engaged in jobs that are considered more hazardous. Review the accident statistics and the goal's then decide what program to implement.

One key point, don't make an award unless the employee attains their goal. No results, no award.

Incentive programs can save thousands of dollars. Determine how much property damage, accidents and operator inefficiency costs the organization. This will give actual figures and statistics from which to develop a budget for the incentive program.

Example: If the company spends \$5,000 a month due to these costs, would the company be willing to spend \$1,000 a month to guarantee a \$4,000 savings?

II. INCENTIVE PROGRAM OPERATOR POOL

1. Review the company accident statistics and determine how much money is being spent on forklift related accidents?
2. Set the company goals. If it is determined the company is spending \$5,000 a month on property damage, material or goods damage, injuries, worker compensation, etc., and then set a goal utilizing this base figure.

\$5,000 Expense
50% Decrease Desire
<hr/>
\$2,500 Expected Savings

This \$2,500 is an expected savings resulting from a 50% decrease in accidents. This is a guaranteed savings. Therefore, if the company develops an incentive program that costs \$2,500, the companies guaranteed a \$2,500 savings. A less ambitious incentive program which would depend upon the size of the operations would use a \$1,000 incentive program cost, with a \$4,000 guaranteed savings. \$1,000 becomes the incentive award for the reduction of property damage and injury costs. This \$1,000 becomes a pool for the employees operating lift equipment.

If the company has 10 equipment operators, they could easily accumulate \$5,000 in damage or injury costs each month. At the beginning of the month, allot \$1,000 for the operator pool. If, at the end of the month, there have been no injuries or property damage, the \$1,000 will be evenly distributed among the 10 operators (\$100 each).

If there have been costs, the actual cost will be subtracted from the pool.

\$1,000 Pool
 200 Overhead Door Repair
 \$800 Remaining in Pool

Forklift operators control their own bonus awards by not causing accidents, injuries or property damage. Experience has shown that forklift operators do not want to spend their own money (cash) on damages and injuries.

A word of caution: Do not penalize the equipment operator causing the loss. The pool must be penalized, not the individual. The operators must function as a team, not as individuals. Peer pressure and team spirit is much more effective than action against one individual.

If the team damages \$1,000 worth of goods, the company hasn't paid out a penny more than they normally do each month. However, when the company does award the entire \$1,000 to the operator's the company has realized a savings of \$4,000. This incentive program has created \$4,000 profit. Pure profit!

III. INCENTIVE PROGRAM TEAM EFFORT

Team effort is a very effective method of developing cooperation and competition among employees everyone wants to belong to a winning team. That's why attendance at football or baseball games increase as the team's number of wins increase. Everyone wants to say that's my team!

Here is another simple incentive program that can be used:

1. Put all employees' names in a hat. This can be done by the entire company, by departments, or by any other company breakdown. Include all forklift operators, regardless of department.
2. Depending upon the number of employees, divide the employees into teams of about 5 members each. Team members are selected by drawing names out of a hat, not by pairing up with their friends or work mates! Some employees will not like their team members. However, this is an excellent method of improving relations and overcoming morale problems. They must act as a team to achieve an award.
3. Develop, set, and then announce the company's goals. They can include the reduction of accidents, injuries, lost workdays, absenteeism, tardiness, property damage, etc. Set attainable goals such as a 25% or 50% reduction in accidents. Make sure each team member knows and understands what is expected and outline the specific rules of the contest.
4. What are the incentives? They can be money, certificates, trophies, or recognition. Decide what the company can afford to provide to the winning teams as incentives for achieving the stated goals. Incentives could be anything the company decides that will motivate the equipment operator's. How about that \$1,000 from the operator pool program?

5. Explain that each team member's performance will affect the entire team. If the company is going to award \$100 to each team (\$20 per person for 5-person team), they must achieve the stated goals. If one employee does not achieve the goal, then the entire team is disqualified. This peer pressure will be very effective in creating an atmosphere of cooperation.
6. The company needs to control the incentive program. Publicize the team winners. If the company consistently experiences problems with one or two teams, investigate the problem. With this program the company can isolate the employee problems and eliminate it.

Since the company now has 5 employees who must work together to protect each other, the team concept works. By random selection the company eliminates cliques and having the good operators on one team with the bad operators on the other teams.

Team Effort Example: \$1,000 Pool

Team 1 Team 2 Team 3 Team 4 Team 5

Any team member causing damage or injuries or fails to achieve the stated goal disqualifies the entire team. If a team member from team #3 causes an accident, team #3 is eliminated. Teams 1, 2, 4 & 5 then share the \$1,000 equally, or the company can subtract the cost of the accident (\$200) from the pool and teams 1, 2, 4 & 5 will share \$800. Peer pressure from team #3 will be increased and teams 1, 2, 4 & 5 will also be affected. There are many variations to these award programs. Develop one that best meets the company needs.

IV. INCENTIVE PROGRAM QUARTERLY PROGRAM

Perhaps the company is not having \$5,000 damage or injury costs each month. Nevertheless, these costs are significant. Even \$1,000 per month comes to \$12,000 a year. That's \$12,000 lost in profits. The company goal is to reduce this \$12,000 annual expense by 50%, or \$6,000. Implement the following program:

1. Place \$1,000 into a pool. This is a quarterly award program. In other words the award will total of \$4,000 during the year if the operators achieve their goal.
2. This \$1,000 award can be distributed equally at the end of each quarter based upon the procedure outlined in the previous programs or the company can increase the competition in the following manner:
 - A. A record will be maintained on all equipment operators. Only those operators working safely, efficiently and without damage or injury are allowed to compete for the awards. (Individual or team concept.)
 - B. Those operators working the past 3 months without damage or injuries will be allowed to compete for the quarterly award prizes:

First prize	\$500
Second prize	\$300
Third prize	\$200

The quarterly competition could include written examinations, obstacle course driving competition or any number of competitive combinations the company feels will improve safety, productivity or efficiency.

If for some reason the company is not able to provide financial awards, hold the competition and provide certificates, trophies or other tangible, inexpensive awards such as hats, jackets, patches, coffee mugs or gift certificates.

Post the standings on a chart, displaying the names of the competitors and the winners. Here's one example that works very well.

**SHIPPING DEPARTMENT 1999
PROFESSIONAL FORKLIFT EQUIPMENT OPERATORS
WE TAKE PRIDE**

The employees listed below have demonstrated their professionalism, skill and knowledge in the safe, efficient operation of forklift equipment and are considered the best forklift equipment operators in the company.

Monthly Award Winners

**January - February - March - April - May - June
July - August - September - October - November - December**

Forklift Operator of the Year

Employees will respond to effective supervision, discipline and productive job assignments. People have an innate desire to belong to a group, to excel and to achieve. Competition is a strong motivation and should be used to stimulate safety, efficiency and productivity.

Some forklift operations have been improved dramatically by installing a forklift equipment operators name on the vehicle. Pride is a great motivation.

V. CASE STUDIES

The president of a manufacturing company visited the production plant about 45 minutes before the day shifts quitting time. He asked how much material was moved by forklift equipment operators during the shift. At the end of the day shift, he was given the figures. He simply went to the plant bulletin board and wrote the figures in bold numbers. No other explanation, no other information. Then he left the plant. Naturally, the night shift wanted to know what those figures were and what they meant. Oh, those were the production figures for the day shift forklift operators, boasted the day shift supervisor. That sparked quite a bit of activity and the challenge was answered. The rest of the story . . . the night shift exceeded those day shift figures, the day shift responded and so on.

The competition was fierce, no rewards, no incentive bonuses were indicated. Pride and recognition was the motivator's. This attitude resulted in fewer accidents, fewer injuries, more productivity and a lot of teamwork

PRIDE CAN'T BE BOUGHT - BUT IT CAN CERTAINLY BE INSTILLED. PRIDE THROUGH LEADERSHIP, SUPERVISION AND IMPLEMENTATION RESULTS IN EFFECTIVE FORKLIFT SAFETY AND TRAINING PROGRAMS.

One company with 100 employees wanted to initiate an incentive program but could only afford \$500 a month as an incentive. \$500 per person, per month is not much of an incentive, unless the company adds in a good measure of imagination.

This company began a very inexpensive lunch time barbecue with \$500 worth of food and soft drinks, during a lunch break once a month.

At the first barbecue there was an announcement that the lunch was, in effect, a thank you for doing a good job. There was a casual mention that the company was launching a campaign to cut accident costs as much as possible and that everyone's help was needed.

The next month, another lunch was held as a thank you for helping reduce accidents. Some departments were mentioned for special recognition. As time progressed, the accident rate decreased tremendously, productivity increased, morale was quite high and everyone was part of a good team.

The program was inexpensive, yet very effective. These incentive awards can be very beneficial. There are a wide variety of incentive program's, point systems, awards, etc. Develop a program suited to the

company operations, personnel and budget restrictions. Awards do not have to be expensive to be effective.

INCENTIVE PROGRAMS ARE NOT SAFETY PROGRAMS. THEY ARE SUPPLEMENTS AND ADDITIONAL MOTIVATION FOR THE SAFETY PROGRAMS. RECOGNITION, PRAISE AND PRIDE WILL GO A LONG WAY.

CHAPTER VI

- I. THE PERFORMANCE TEST
- II. OBSTACLE COURSES
- III. REVIEW

After the employee has received the necessary classroom instruction, passed the written or oral examination, the most important aspect of training is practical application. This allows the forklift operator to demonstrate their knowledge and abilities by applying their mechanical skills to the safe operation of a forklift. It provides the instructor with several pieces of information:

1. How effective was the classroom training?
2. Have the employees learned as much as the Instructor thought they did?
3. Is the employee really prepared to operate the equipment safely?
4. Does the employee have the mechanical skills and coordination necessary to be a safe forklift operator?

I. THE PERFORMANCE TEST

A Performance Test (FORM 6) has been provided to assist the supervisor in evaluating the employees operating performance.

Using the Performance Test, each supervisor makes their own evaluation as to the operator's ability and skill needed to safely operate the forklift.

After the employee passes the Performance Test, the testing supervisor signs the performance examination and returns it to the forklift records or personnel file for documentation.

II. OBSTACLE COURSES

A. Design Guidelines

Design the test course with the following guidelines:

1. The test course should be away from normal plant operations to allow full concentration with minimum interruptions.
2. Isolate the test course to prevent accidents. Remember, while testing employees, accidents can occur.
3. Allow the employees time to familiarize themselves with the equipment before starting the test course.
4. Demonstrate how and what the employee will need to accomplish during the testing procedure. Show them first; give them time to practice, then test.

5. Exercise close supervision, especially to those employees who have never operated forklifts nor have minimum experience. The forklift is easy to drive and an inexperienced operator easily can become over confident and turn the forklift over or cause an accident.
6. Develop a training course that compliments the operations of the business. Don't set up a course designed to teach rail car loading and unloading if you don't have any rail cars.
7. Make the obstacle course as simple or as difficult as desired. It should be simple and easy for inexperienced operators to give them confidence and to develop their expertise. Difficult course tests can finely tune the skills of experienced operators Experience has shown that forklift operators become overconfident quite easily. Their jobs become routine and it appears to be a very easy job. Competition among forklift operators has a tendency to be a strong motivation in removing the feeling of overconfidence. Even experienced operators need a monthly or quarterly tune-up and an obstacle course that can test their skills. The use of a stopwatch on a difficult course will show who the professional forklift operators are.

B. Simple Stacking, Adding, Unloading

Use stacks of pallets for this test. Make several high stacks and issue instructions to move these stacks to a new location.

ISSUE NO OTHER INSTRUCTIONS

Observe the forklift operator, utilize more than one operator during this testing procedure, and watch for the following:

1. Leading too many pallets at one time (none higher than backrest).
2. Difficulty in judging distances between pallets and forks.
3. Forks extending past the edge of the pallets
4. Pallet stacks may be uneven on forks when re-stacked.
5. Difficulty using lifts and tilt levers.
6. Pallets or loads not brought to 4-6 inches off the ground before traveling.
7. Improper starting, stopping, riding the clutch, poor driving habits, etc.

NOTE: As the employee masters this course move quickly into more difficult courses. The degree of difficulty can be increased by using other materials or placing material in storage racks.

C. Skill Course

This course is very effective in teaching the rear end swing, maneuvering, eye-hand coordination and control.

Increase the difficulty of the test course by moving the pallets closer together. Make the course as long or short as desired. Set it up as follows:

Step 1

Place 8 pallets (end on end) in a straight line. Small pieces of lumber or nails may be used to hold them together so that they are able to stand alone.

Step 2

Bring the forklift to the test area. Use forklifts of different sizes that fit the width of the course. Place one pallet about 8 feet apart from the 1st pallet in the base line of pallets. Move the forklift's right front wheel as close to the single pallet as possible. Turn the forklift slowly around the single pallet until such time as the rear end comes as close to the base line of pallets as possible. Stop the vehicle in this position. The proper distance between the two rows of pallets is now complete.

Step 3

Repeat Step 2, keeping the pallets already placed in position. Turn your vehicle slowly around that first pallet. Measure the distance where the forks will hit the next pallet if one were placed in line with the first pallet. This will then give the proper distance for the remaining pallet placement. Use the figures of 8 feet and 6 feet as distances.

Step 4

As the vehicle is turned past the first pallet, missing the 2nd pallet with the fork and the rear end swing clearing the base line, add one more pallet. After determining this distance, place other pallets in the same position between the other pallets. Demonstrate the course to the forklift operator and how it should be maneuvered.

Some Observation Tips:

1. The front drive tire must be as close to the pallet as possible before turning.
2. When turning around the pallets, the right tire must be close to the pallet and the turn should aching the end of the pallet. This allows the forklift to continue moving forward, yet still having room for the turn. If the operator waits until the edge of the pallet is reached before starting the turn, the forks or the rear end swing may knock down a pallet.
3. Observe the operators handling of the machine, controls, brakes, eye-hand coordination, distance judgment and confidence.
4. The degree of difficulty depends upon how close the pallets are positioned to each other.

This particular course tests the skill of the operator but it also provides excellent practice in maneuvering and handling the equipment and controls.

Add variations to this test course:

1. Raising and lowering the forks while maneuvering through course.
 2. Driving through from the reverse direction. From exit to entrance.
 3. Adding loads.
 4. Placing obstacles (rocks, trash, lumber) in the path of the operator. This checks how the operator reacts, parking brake set when exiting vehicle, forks lowered to floor, safe lifting technique, etc.
 5. Tightening the distances, using a stopwatch to time the operator.
 6. Having other operators evaluate the employee navigating the course.
- D. Controls and Levers

The following demonstrations teach the operator a few techniques and principles of the forklift levers, controls and engineering of the forklift.

Step 1 Demonstration

With the engine running slowly, raise the forks (without a load) approximately 2/3 of the maximum height (notice the speed at which the forks move), explain that the forklifts hydraulic system requires pressure to function. In most cases, when a load is raised, the pressure must be increased. Increase this pressure by accelerating the engine as the load is lifted. Bring the forks to the floor. With the engine still idling slowly, raise the forks approximately 1/2 the way. Stop and explain that to increase the speed of the fork being raised, the operator must accelerate the engine. Demonstrate how the forks raise when the engine is being revved up.

Caution:

1. Make sure the forklift has been braked and the transmission is in neutral for demonstration purposes.
2. Never allow anyone near the forks during the demonstration. Review with the operators that the engine does not have to be running fast to lower the forks. Accelerating the engine won't lower the forks any quicker. The forks lower by a decrease of pressure and/or an increase of gravity. Emphasize that while a load is raised or a person is lifted on a safety platform, the engine must be running and an operator must be at the controls. In case of hydraulic failure, at least the engine might maintain enough pressure to safely lower the load or platform.

Step 2

The same hydraulic pressure operates the tilt controls. However, this demonstration is used to show the operator how heavy the mast is and how tilting affects the load center.

This simple, safe demonstration can be used to effectively show how tilting can be dangerous. Keep the mast vertical and raise the forks to the maximum height. With the maximum capacity load at a 24 load center and the forks tilted, the forklift will have an extended load center. Use a tape measure and mark off 24 and use chalk on the ground to mark the position.

Tilting an Elevated Load Forward is Hazardous

Tilt the forks as far forward as possible. Measure the load center now and compare the measurements. Tilting can quickly reduce the maximum load capacity of the vehicle.

Tilting can also cause extra weight to be placed forward of the fulcrum point to such a degree that it too could overturn the vehicle. With the forks tilted back toward the vehicle, move the tilt control lever so the forks will shift forward as quickly as possible. Doing this, the forklift will move and bounce around a bit to demonstrate exactly how heavy that mast really is. The operators will experience this mild earthquake. It makes a lasting impression.

III. REVIEW

Performance testing should be an important part of the forklift operator program. Document, for legal and OSHA purposes, how each operator has been trained, tested and performance results.

These guides can be used to develop the forklift training program. The only limitations will be resources, time available and the Instructors ingenuity. Make the program fit the needs for your company. Remember, it makes no difference how much or how little experience an employee has operating forklifts. If they can't pass the tests, obviously something is wrong that needs correcting. Be able to document these testing procedures and maintain training records as required.

FORKLIFT - LESSON # 1

PRINCIPLES OF FORKLIFT EQUIPMENT

- I. LEVER PRINCIPLE
- II. FULCRUM PRINCIPLE
- III. DATA PLATE
- IV. LOAD CENTERS
- V. CENTERS OF GRAVITY
- VI. MOMENTUM
- VII. STABILITY TRIANGLE
- VIII. HYDRAULICS
- IX. REVIEW

Forklift equipment operators must understand forklift safety rules and their enforcement as they face a wide variety of situations requiring immediate decisions on a daily basis.

A professional forklift operator knows the equipment, follows the safety rules and prevents property damage. Operating a forklift safely and efficiently requires more than just being a driver. Knowledge of the following essential engineering fundamentals of forklift equipment is needed to make correct decisions while operating the equipment. Odd size loads, heavy materials and unusual situations can be handled safely.

I. LEVER PRINCIPLE

Levers are used as it applies to forklifts with the following illustration.

When changing a flat tire, the car is jacked up and a small amount of force is exerted over a long distance. The jack handle moves a large distance, but the car moves upward only a short distance. A small amount of force is used to push the jack handle down, but a large amount of force raises the car.

Every time the jack handle is moved down 25 inches, the car raises only one hundredth as far, but with 100 times as much force. A 20-pound force moves 25 inches and this moves a 2,000-pound car a quarter of an inch. That's one application of the lever principle.

A forklift raises heavy loads using this principle. However, it is the hydraulic system that applies the force to lift the loads. It is important to understand the lever principle before beginning to discuss load centers, gravity and the other fundamentals of the forklift.

II. FULCRUM PRINCIPLE

The forklift operates according to the fulcrum principle two weights balanced by a fulcrum. The forklift has a counterweight, which is composed of the engine and heavy metal parts on the rear of the vehicle. The other weight is the load, which is picked up by the forks and this load is balanced by the counterweight on the rear of the forklift.

Where is the fulcrum?

The fulcrum is the front tires, which is the point where the load is balanced by the counterweight of the vehicle.

The counterweight balances the load with the front tires as the fulcrum point.

III. DATA PLATE

SERIAL # 12345678

MODEL # XYZ

MAXIMUM LIFTING CAPACITIES:

1. _____
2. _____
3. _____

A data plate is installed on the forklift by the manufacturer. This data plate gives the serial and model numbers which are very helpful when ordering parts or servicing the forklift. The data plate also provides information as to the amount of weight that can be safely lifted with the weight of the forklift. This data plate usually shows three different weights that can be safely lifted as it relates to the load centers.

IV. LOAD CENTERS

The data plate may read: MAXIMUM LIFTING CAPACITY: 5,000 lb. at a 24 inch LC at 104 inches. What does it mean - LC, 104 inches? LC means load center and 104 inches indicates how high a load can be safely raised.

Most data plates provide more than one safe lifting weight. The reason for this is that the operator will probably be lifting many odd sized and shaped loads. Therefore, understanding how these odd- size loads can affect the safe lifting capacity of the forklift is an important part of safe operating practices.

The data plate shows how the operator can safely lift a 5,000 lb. load utilizing a 24 inch load center which can be raised to the maximum height of the forklift. In this case it is 104 inches. The data plate also shows how to safely lift 4,000 lb. at a 36 inch LC at 104 inches and 3,000 lb. at a 42 inch LC at 104 inches.

DATA PLATE

SERIAL # 12345678

MODEL # XYZ

MAXIMUM LIFTING CAPACITIES:

1. 5,000 LB. at 24" LC - 104"
2. _____
3. _____

The load center of a forklift is the distance measured from the center of the load to the vertical face of the forks. As the load center increases, the lifting capacity of the vehicle decreases, the load center is the distance measured from the center of the load to the vertical face of the forks. A standard size pallet size is 48 x 48 inches. Measure from the center of the load to the vertical face of the forks and obtain 24 inches measurement. Therefore, an evenly distributed load on a 48 x 48 inches pallet would be considered a 24 inch load center.

If the data plate tells the maximum safe lifting capacity is 5,000 lb. at a 24 inch load center, then the operator can safely lift 5,000 pounds of an evenly distributed load measuring 24 inches. This 5,000 pounds load can be safely lifted to the maximum height of the forklift.

What about different load centers such as 36 and inches? When the load center is extended, the operator can't safely lift as much weight. When two people lift a 50-lb. weight, one person holds the weight close

to their body and the other person has their arms extended, and has difficulty holding the weight. The forklift has the same problem.

Extended load centers decrease the maximum safe lifting capacity. It is the responsibility as equipment operator to review the data plate, determine the safe lifting capacity load center and not exceed these rated limits or capacities.

Operators are required to have the maximum safe lifting capacity posted on the forklift mast or on the rear of the mast in view of the operator. This capacity, however, depends upon the load center being used by the operator. Most equipment operators use the 24 inches load center as the maximum and are careful not to exceed that limit.

If the lift loads have extended load centers, understand that extended load centers decrease the safe lifting capacity of the truck. If the operator is not sure, check with the supervisor. Remember the phrase, when in doubt, check it out.

V. CENTER OF GRAVITY

Another thing that affects safe lifting capacity is the center of gravity. As the load is raised, the center of gravity shifts away from the truck and towards the forks.

The forklift has been engineered for this. Therefore, the maximum safe lifting capacity has been calculated using this shifted center of gravity. However, when equipment operators exceed the maximum safe lifting capacity and try to lift excessive loads, the forklifts engineered safety limits can be exceeded, resulting in an accident, injury or equipment damage.

Overloading a forklift puts stress and strain on other parts of the equipment such as the hydraulic system, steering system and other metal parts. It is very possible that the truck would overturn.

Tilting a load can also adversely affect the center of gravity.

Tilt loads only when necessary for positioning loads onto racks or other material-handling equipment.

What happens to a 2,000 pounds maximum capacity forklift that has its load raised to the maximum height and the load is tilted?

First, there would no longer be a 24-inch load center because the load is being extended much farther. The added weight of the heavy mast also decreases the safe lifting capacity. Loads should be lifted with the mast in a vertical or straight up position.

Remember the fulcrum? What happens to a seesaw when you add an extra weight to one end? The same thing happens to a forklift. Tilting a load can be very dangerous when these principles are not followed.

VI. MOMENTUM

Momentum affects forklift operations when the forklift starts moving and can't seem to stop. When the operator is driving a forklift and quickly puts on the brakes, what happens? Does the forklift stop immediately or does it take time before it stops?

Yes, it takes time to stop. The faster the forklift is traveling, the longer and more distance it takes to stop. The friction of the brakes acts upon the wheels and after some distance they stop turning.

The truck's weight puts force on the brakes and the brakes apply force to the truck's weight. The engine is trying to maintain the present momentum of the truck. Something has to give.

The truck's center of gravity will continue to shift toward the direction of travel until the brakes stop the momentum of the truck. Hopefully, they both stop at the same time.

When the forklift is at maximum capacity and as the center of gravity shifts even further toward the fulcrum, it is easy to see how a forklift can be overturned. A narrow wheel base and a high center of gravity tells the operator immediately that the forklift can be easily overturned.

A forklift is NOT engineered to make fast, sharp turns. Several things happen to a forklift turning a corner. The momentum of the truck is trying to keep it moving in a straight line and the steering wheel has to counteract the force of momentum exerted on it by the floor or road surface. The lesson to be learned is very simple: slow down and turn slowly.

Another reason for making slow turns has to do with the steering and stability points of a forklift. These points are part of what we call the stability triangle.

VII. STABILITY TRIANGLE

Since forklifts do not have shock absorbers, engineers have made a three-point suspension system. The rear end is supported by a pivot pin in the center of the axle, which allows for the up and down movement of the rear tires when going over bumps and uneven surfaces. This, combined with the two front wheels, makes up the three point system known as the stability triangle.

When the combined center of gravity of the truck and load move outside the lines of this triangle, the forklift will turn over. There are many situations in which this can occur. One of them is fast, sharp turns. Another is lifting a heavy load and tilting the mast backward.

The center of gravity would shift to the rear which would put it very close to the edge of the stability triangle. An operator in this condition over an inclined surface ramp or over a large piece of wood or a hole would shift the forklift's center of gravity outside the stability triangle causing it to tip over sideways.

The forklift will not tip over if a few safety rules are observed. Exercise caution when tilting loads, tilt the load only for stability and when traveling always keep the forks and load close to the floor. Drive slowly.

There are many things to remember while operating a forklift, tilting, overloading, stability triangles, momentum, load centers, gravity. Operating a forklift can be very safe when the safety rules are observed.

VIII. HYDRAULICS

Forklifts can move heavy loads easily because of the efficiency of the hydraulic systems. Hydraulic systems cause tremendous forces to be applied simply by using the light touch of a control lever. When lifting a load, tilt it or shift from side to side, using hydraulics.

An important fact about hydraulics is fluid pressure. Applying an increase in hydraulic fluid pressure at one part of the system will increase fluid pressure to other parts of the system.

The force exerted on the left piston increases the pressure in the fluid and is transmitted to the right piston. By applying a 5-lb. load on the left piston, the pressure in the liquid increases by 5-lb. per square inch on each inch of the right piston producing a lifting force of 50-lbs.; therefore, heavy loads can be lifted with little force.

The most important thing to remember is that forklift hydraulic systems use small forces on pistons, which exert larger forces to produce a very effective method of lifting, moving and shifting heavy loads.

Remember that hydraulic systems are under pressure. Worn or cracked hoses can rupture, causing a hydraulic failure. Hydraulic leaks must be corrected because they indicate worn seals, pistons or other mechanical failure. Report hydraulic deficiencies to the supervisor before they cause accidents.

IX. REVIEW

1. The fulcrum principle: A load balancing a counterweight on a forklift with the front tires as the fulcrum of the load.
2. The trucks center of gravity shifts toward the fulcrum as a load is raised. The forklift is engineered for lifting a certain capacity load to the maximum height of a forklift.
3. A critical factor affecting the safe lifting capacity is the load center. A load carried close to the forklift is much safer than one with the load center extended away from the forklift.
4. A forklift attachment affects the load center and safe lifting capacity of a 5,000-lb. capacity forklift. The load center would be extended, greatly reducing the maximum safe lifting capacity.
5. Tilting a load or driving with a load raised can be dangerous. A tilted load extends the load center plus the extra weight of the mass increases the weight of the load being lifted. Driving with a raised load increases the mass of the truck. If the forklift stops quickly, the momentum of the truck and load could cause the truck to overturn.
6. The center of gravity is very high on forklifts because the wheels are close together and the weight of the engine sits several inches off the ground. A forklift can easily be overturned, particularly if the operator is driving too fast or the load is raised. This is the principle of the stability triangle.
7. The hydraulic system is under tremendous pressure. If a hose bursts, the entire system could fail. This could result in a serious accident or personal injury. Replace worn, cracked or damaged parts or hoses.

FORKLIFT - LESSON # 2

SAFE OPERATIONS AND OSHA REQUIREMENTS

- I. OSHA REQUIREMENTS FOR FORKLIFT OPERATIONS
- II. SAFE OPERATING RULES
- III. EMPLOYEE FORKLIFT OPERATOR TRAINING QUESTIONS

The Occupational Safety and Health Act of 1970 includes a provision that states, only trained, authorized and certified operators will be permitted to operate a powered industrial truck.

The employer is charged with the responsibility of developing an effective safety training program. This manual covers the necessary OSHA rules and regulations pertaining to forklift equipment and operations and provides a recommended program that will exceed Federal or State OSHA training requirements. OSHA regulations as outlined in Title 29, Code of Federal Regulations, Part 1910.178. (These regulations are in the CD-ROM of Written Materials with your package.)

I. OSHA REQUIREMENTS FOR FORKLIFT OPERATIONS

There are a variety of OSHA requirements that are directly related to forklift operations. The following list has been developed under the guidance of The Technical Information Development Branch, National Institute for Occupational Safety and Health (NIOSH). The NIOSH publication No. 78-199 Outline for Training can be obtained free of charge by writing:

**NIOSH
Division of Technical Services
4676 Columbia Parkway
Cincinnati, Ohio 45226**

II. SAFE OPERATING RULES

This chapter outlines the minimum Safety Standards for forklift operators as required by OSHA. Forklift safety should exceed these requirements. The explicit purpose of forklift safety is to eliminate:

1. Accidents and Injuries
2. Property Damage
3. Equipment Abuses and Damage

Meeting OSHA requirements requires understanding and enforcement of these standards with the implementation of training programs for forklift operators. The following safe operating rules include all the rules required by OSHA and State OSHA. It is recommended that the employee forklift training program include these operating rules.

Issue each forklift operator a copy of these OPERATING RULES, and have each operator acknowledge them by signing that they have received a copy of these rules and understand them. Post a copy on the bulletin board near forklift operations to satisfy OSHA and State OSHA requirements.

Remember, training requires documentation. Undocumented training has the same basic legal effect as no training. The forklift operator must acknowledge receipt of these rules for documentation to occur under OSHA and State OSHA requirements.

OPERATING RULES

1. Only drivers authorized by the employer, licensed and trained in the safe operation of industrial trucks, pallet jacks or industrial tow tractors will be permitted to operate such vehicles. Methods will be devised to train operators in safe operation of powered industrial trucks.
2. Drivers will check the vehicle at least once per shift, and if it is found to be unsafe, the matter will be reported immediately to a supervisor, foreman or mechanic, and the vehicle will not be put in service again until it has been made safe. Attention will be given to the proper functioning of tires, horn, lights, battery, controller, brakes, steering mechanism, and the lift system of forklifts (forks, chains, cable, and limit switches). Electric pallet jacks must include the proper functioning of the horizontal and vertical emergency stop systems.
3. Vehicles will not exceed 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 will be observed.
4. 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. A turn will never be made at such a speed that will cause the fork lift or pallet jack to overturn, due to the centripetal force of gravity. A forklift and pallet-jack have a very high center of gravity and will turn over when a turn is made at excessive speed.
5. NO RIDERS PERMITTED ON VEHICLES. No riders. A person may not ride anywhere on the forklift or be elevated on the forks of a lift truck or pallet jack without the use of a safety platform.

A safety platform is defined as:

- A. Having 42' high guard rails around all sides.
- B. Having a mid rail, midway between the guard-rails and platform.

C. Having 4' high toeboards around the platform, if tools are used on the platform.

D. Having chain, or other devices, securing the platform to the mast of the fork lift.

****SOME STATE JURISDICTIONS REQUIRE A GUARD 7' HIGH TO PROTECT PEOPLE RAISED ON THE PLATFORM FROM THE CRUSHING ACTION OF THE MAST AND BACKREST. (THIS IS NOT AN OSHA REQUIREMENT, BUT CAN BE A "STATE" OSHA REQUIREMENT.**

6. Stunt driving and horseplay are prohibited.
7. A loaded vehicle will not be moved until the load is safe and secure.
8. When leaving a vehicle unattended, the power will be shut off, brakes set, the mast brought to the vertical position, and the load-engaging means left in the down position. When left on an incline, the wheels will be blocked Note: A powered industrial truck is unattended when the operator is 25 feet or more away from the vehicle which remains in his view, or whenever the operator leaves the vehicle and it is not in his/her view.
9. When the operator of an industrial truck is dismounted and within 25 feet of the truck still in his view, the load engaging means will be fully lowered, controls neutralized, and the brakes set to prevent movement.
10. Trucks will 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.
11. Operators will look in the direction of travel and will not move a vehicle until certain that all persons are in the clear. Pedestrians have the right of way at all times.
12. Vehicles will not be run onto any elevator unless the driver is specifically authorized to do so. Before entering an elevator, the driver will make sure that the capacity of the elevator will not be exceeded. Once on an elevator, the power will be shut off and the brakes set.
13. Motorized hand trucks will enter elevators or other confined areas with the load end forward.
14. Vehicles will not be driven in and out of highway trucks and trailers at unloading docks until such trucks are securely blocked and brakes set.
15. Vehicles will not be operated on floors, sidewalk doors, or platforms that will not safely support the loaded vehicle.
16. Employees will never be allowed to ride on the forks or on the sides or backs of lift trucks and pallet jacks.
17. No riders will be permitted on vehicles unless provided with adequate safety platform.
18. The forks will always be carried as low as possible, consistent with safe operations, usually 4 inches off the floor.
19. Extreme care will be taken when tilting loads. Loads may fall or forklifts can easily be turned over while tilting moderate loads.
20. Fork lifts and pallet jacks will not be driven in and out of highway trucks and trailers at unloading/loading docks until such trucks are securely blocked and brakes set. Chock trucks and trailers.
21. Employees will 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.

22. Employees will 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.
23. Railroad tracks will be crossed diagonally, wherever possible. Parking closer than 9 feet from the center line of railroad tracks is prohibited.
24. The width of one tire on the powered industrial truck will be the minimum distance maintained from the edge by the truck while it is on any elevated dock, platform, freight car or truck.
25. When powered industrial trucks are used to open and close doors, the following provisions will be complied with:
 - A. A device specifically designed for opening or closing doors will be attached to the truck.
 - B. The force applied by the device to the door will be applied parallel to the direction of travel of the door.
 - C. The entire door opening operation will be in full view of the operator.
 - D. The truck operator and other employees will be clear of the area when the door might fall while being opened.
26. Prior to driving onto trucks, trailers and railroad cars, their flooring will be checked for breaks and other structural weaknesses.
27. Other trucks traveling in the same direction will not be passed at intersections, blind spots, or dangerous locations.
28. The driver will 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 will be required to travel in reverse, with the load trailing.
29. The driver will 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 will be required to travel with the load trailing.
30. Grades will be ascended or descended slowly.
 - A. When ascending or descending grades in excess of 10 percent, loaded trucks will be driven with the load upgrade (drive-up and back-down).
 - B. On all grades, the load and load-engaging means will be tilted back if applicable, and raised only as necessary to clear the road surface.
 - C. Motorized hand and hand/rider trucks will be operated on all grades with the load-engaging means downgrade.
 - D. Electric pallet jacks will be operated on all grades or ramps with the load down grade, preventing a runaway jack from crushing the operator.
31. Trucks will not be loaded in excess of their rated capacity. The rated capacity of the truck/jack must be clearly visible by the operator. On fork lifts, it is recommended the maximum capacity be stenciled on both sides of the mast and on the inside, directly opposite of the operator as he/she sits on the seat.
32. Pallet jacks will enter elevators or other confine areas with the load end forward. Operators of hand jacks and electric jacks not designed for riding will not ride on the jack. This includes using the jack as a scooter.

33. No truck will be operated with a leak in the fuel, oil and hydraulic systems.
34. Tilting forward with the load engaging means elevated will be prohibited except when picking up a load. Elevated loads will not be tilted forward except when the load is being deposited onto a storage rack or equivalent. When stacking or tiering, backward tilt will be limited to that necessary to stabilize the load. Even though the load is not heavy, by tilting forward the fork lift can be overturned, due to the change in the trucks center of gravity.
35. The load engaging device will be placed in such a manner that the load will be securely held or supported.
36. Special precautions will be taken in securing and handling of loads by trucks equipped with attachments and during the operation of these trucks after the loads have been removed. Any attachment changes the center of gravity and the maximum capacity rating of the lift.
37. The engine must remain running and the operator at the controls, when a person is elevated in a safe platform. In case of hydraulic failure, the running pumps will afford some degree of protection in descending the person safely to floor level.
38. Fork lift and electric pallet jack operators may not smoke while operating this equipment. Sparks, open flames or smoking are not allowed in an area within 50 feet of any battery charging or refueling operation. Never connect or disconnect a charger to a battery, unless the charger is in the off position.
39. Spinner knobs or similar devices on the steering wheel are prohibited.
40. Spinning tires or causing tire skids on floors is prohibited. When changing directions, forward or reverse, the fork lift must be braked to a stop, gears changed, then proceed without spinning the drive tires.
41. Report immediately every accident, injury, near miss or unsafe condition to your supervisor or manager. Obey all safety rules and practice safe working habits every day.

III. EMPLOYEE FORKLIFT OPERATOR TRAINING QUESTIONS (1)

- Q. Why is training required?
 - A. Accidents involving powered industrial trucks are both numerous and severe. Training is intended to clarify the differences in handling between a truck and a car, to develop safe operating habits, to explain the consequences of taking certain kinds of chances, and to reduce the risk of injury to pedestrians as well as operators. (Pedestrians are involved in 1/3 to 1/2 of truck accidents resulting in injuries.)
- Q. What if the company doesn't own the trucks, such as those rented for special jobs?
 - A. The operator's employer is the person responsible for operator training. If the employee drives a truck, the supervisor must see to it that the employee is trained.
- Q. Can other professionals perform the training?
 - A. Yes, but make sure all the applicable training elements mentioned in this manual are covered, and that the training includes any hazards that apply to the particular workplace.
- Q. What if an item on the list of operating rules doesn't apply to the company workplace (for example, no railroad cars handled)?
 - A. Do not include it in the training program.

- Q. Must employees who only run powered industrial trucks occasionally be trained?
- A. Yes. All persons who operate trucks must be trained. Persons operating them only occasionally are as frequently injured as any other group of drivers.
- Q. What if operators are hired with previous training, or with extensive experience?
- A. Supervisors should at least test operating proficiency of these drivers. In addition, all drivers new to the plant should receive thorough instruction in the hazards of their prospective tasks, in the right-of-way rules of the plant, and in the way the truck maintenance system works.
- Q. If OSHA asked for evidence that the employee is a trained operator, will they want to see certain types of training materials or that the company used professional trainers?
- A. The OSHA training requirement gives businesses the opportunity to develop their own training programs. A log should be kept as evidence of operator training. During an inspection, OSHA compliance officers may check this information by questioning employees to verify that sufficient training has been given to the employee.
- Q. Should training be performed on company time?
- A. Yes, training should be performed on company time. Employees should practice thoroughly before they go out on the floor or in the yard with a truck.
- Q. Is that any need for an observation period after training is completed?
- A. A 30-day probationary period after the training is completed should be required for all new operators and they should be assigned to easier tasks and be closely supervised.

FORKLIFT - LESSON # 3

MATERIAL HANDLING

- I. MATERIAL HANDLING CHECKLIST
- II. MATERIAL HANDLING EQUIPMENT

The objective of material handling is to move, store, separate and handle material in a safe, efficient and productive manner which reduces:

1. Material handling costs
2. Production costs of the materials big handled
3. Property damage, wasted time
4. Injury and accident costs

Safe, efficient, productive material handling increases:

1. Production capacity
2. Morale, cooperation, professionalism
3. Profits of the organization analyze the current material handling techniques and procedures to eliminate wasted time, effort and costs. Analyze the material handling efforts to eliminate unsafe acts and conditions. Because they have an intimate knowledge of what's happening, seek the

assistance and recommendations of the forklift operators. It is important to include the operators in the planning phase of new space layouts, new procedures or new methods of operations. If they help plan the program, the program will have much greater acceptance when it finally is implemented. Analyze the material handling operations, review the following checklist and take action.

I. MATERIAL HANDLING CHECKLIST

The following indicators can assist in determining the effectiveness of the Forklift Operator Safety Program. If any answers are YES, investigate that portion of the forklift operator system and institute improvements.

MATERIAL HANDLING CHECKLIST

1. Poor housekeeping (trash, dirty floors, tools adrift, etc.)
2. Crowded conditions, aisles blocked.
3. Empty floor space (poor utilization of space).
4. Too much temporary storage. Items improperly stored because no space has been allotted for certain materials/merchandise.
5. Materials piled directly on floor. Non-palletized, non-containerized. (Results in excessive damage and handling costs.)
6. Wasted cube. Storage space wasted by not utilizing full height of floor space.
7. Damaged equipment, facilities, materials.
8. Equipment operators must maneuver excessively, making long (unnecessary) trips, traffic jams.
9. Excessive manual labor. Reduce labor costs and accidents with equipment.
10. Wrong equipment for the job (i.e. 10,000-lb. capacity forklift to lift 500-lb. loads).
11. Ineffective utilization of equipment. Use of attachments on forklifts to reduce time, labor and increase productivity.
12. No logical flow of traffic or materials.
13. Excessive pedestrian traffic around pallet jacks and forklift equipment.
14. Employee accidents and injuries.
15. Tall-tale or too much equipment. (Many times, safety and efficiency can be increased by reducing the amount of equipment being used.)

Housekeeping is a word everyone uses to mean sloppy, lazy, indifferent, lack of discipline, and just plain unorganized. Poor housekeeping can cause many problems. Housekeeping can be improved in the following ways:

1. Floors must be kept clean, non-slip and free of trash, debris, broken pallets, cardboard and other hazards.

Note: You must have an organized and supervised system between janitors, employees, supervisors and sweepers to ensure this does occur.

2. Provide adequate lighting. If an operator has difficulty seeing, their accident rate will increase.
3. Repair faulty equipment that is dripping oil/fluids on the floor. Position absorbent materials to clean up oil/fluid leaks throughout the area for use by anyone observing a spill.
4. Provide sufficient containers for trash, scrap and other unwanted materials. For oily rags, use metal containers with metal tops.
5. For all departments, brooms, mops, squeegees, tools and other small equipment must be properly stored to prevent employee tripping over these hazards.
6. Special attention must be devoted to keeping locker rooms, restrooms, lunchrooms, and offices clean and sanitary. Sufficient supplies should be available (toilet paper hand towels, rags soap, etc.).
7. Have an effective rodent and pest control program.
8. Perimeter and outside areas must be kept clean and surfaces free from holes or other hazards.
9. Clearly defined aisles walkways must be kept clean and well lighted.
10. Enforce rules, encourage teamwork among all employees and department supervisors to keep areas clean and in a safe condition.

II. MATERIAL HANDLING EQUIPMENT

There are several pieces of ancillary equipment forklift operators use in material handling operations. A few of the more commonly used items are the following:

1. Chocks. Before a forklift can be driven onto trucks trailers or rail cars the wheels must be chocked to prevent the wheels from moving which could result in an unsafe condition for the operator when entering or exiting the vehicle.
2. Blue stop sign. A blue stop sign is required to be placed approximately 10 feet from either or both ends of the rail car as necessary to afford protection from any approaching railroad equipment. The sign should have blue background with white lettering bearing the word STOP in letters not less than 4 inches high. The sign should be at least 12" by 15" in size. If rail cars are being loaded or unloaded at night, a blue light is also required to warn approaching railroad equipment operators.
3. Rail car door openers. If forklifts are used to open rail car doors, a device must be used on the forklift to ensure that force or pressure on the rail car door is applied parallel and not diagonally. Such a device is shown below:
4. Trailer stabilizing jack. The trailer took a nose dive when the forklift operator stacked material in the front end of the trailer. The weight of the material and forklift over loaded the front end, causing it to tip over. The forklift operator was injured. To prevent such accidents, a stabilizing jack or other means must be used to prevent nose diving.
5. Dock plates. Dock plates provide a stable surface over which forklifts can drive onto trailers, trucks and rail cars from loading docks. These dock plates must be in good condition and of sufficient capacity to safely support the weight of the forklift and load.

OSHA requires the maximum load capacity be posted on the dock plate; some means for moving, carrying or lifting the dock plate into position (handholds or lifting chains); and the dock plates must be free of cracks, stresses or defects.

A separator or gusset on the bottom of the dock plate prevents the dock plate from moving away from the dock or vehicle. Some dock plates utilize stave pins or bolts to prevent the plate from missing. In any event, some method must be utilized to prevent the plate from slipping between the dock and vehicle.

There is more equipment utilized in material handling operations; however, it's not necessary to list them all. Determine the company requirements, ask the forklift operators for suggestions and recommendations and improve the operations for safety, efficiency and productivity. Experience has demonstrated that an efficient and productive organization is a safe one.

FORKLIFT - LESSON # 4

OPERATOR MAINTENANCE

- I. CRITICAL MAINTENANCE ITEMS
- II. DAILY INSPECTION CHECKLIST
- III. INSPECTION AT DRIVING OFF
- IV. OPERATOR MAINTENANCE (ELECTRICS)

Operator maintenance will improve safety, increase productivity and cut maintenance costs. The majority of organizations do not have good operator maintenance programs. They rely upon their mechanics or outside service organizations for maintenance. That is a very expensive method of forklift maintenance. A good operator maintenance program is designed to prevent major maintenance problems, down time, putting out fires type maintenance and excessive expenditures for spare parts.

AN EXAMPLE: Michelle, the operator for forklift #23, inspects her forklift and notices the rubber on the left front drive wheel is tearing apart from the metal rim. It is not a safety hazard and it doesn't affect her driving, but she knows that these tires should be replaced. She promptly notes the deficiency on her daily operator's checklist and she also notifies her supervisor. The supervisor in turn notifies the mechanic and he verifies that the tire is getting worn and should be replaced. The mechanic schedules the tire replacement at the same time the forklift will be in the shop for a 100-hour service. Because Michelle reported this deficiency before the tire became a safety hazard, the mechanic had plenty of time to:

- 1. Order the necessary parts.
- 2. Schedule the tire replacement at the same time as other maintenance. (This reduces down time and extra labor charges.)
- 3. Schedule workloads, mechanic availability to keep the shop running in a smooth orderly manner and reducing the amount of emergency repairs.

Operators must be trained to perform operator maintenance and then that training must be enforced.

The majority of operator maintenance programs are ineffective or non-existent because supervisors do not follow up or control the program. It is not enough to train operators, follow up supervision is equally, if not more, important. Listed below are the items that should be inspected by operators before they operate the forklift. Noted deficiencies must be reported to the supervisor for correction.

I. CRITICAL MAINTENANCE ITEMS

Critical items are those that must be in good repair before the forklift can be safely operated. If any of these items are deficient the forklift cannot be operated until the repair has been made:

- 1. Brakes. Check the brakes to make sure they stop the forklift as intended. If the brake pedal has to be pushed more than 2 inches down before the brakes engage, then the brakes need adjusting and should be done as soon as possible. If the brakes are defective do not operate the forklift until these repairs are made.

2. Parking Brake. Engage the parking brake. Start the engine move the accelerator forward while the forklift is in a forward gear. If the brake holds, then it is in good working order. If it doesn't hold, don't operate the forklift until it has been repaired.
3. Steering. Inspect the steering by turning the steering wheel while observing the steering tires. If there is play in the wheel (steering wheel turns a short distance before the tires start to turn) the steering could be defective A mechanic or supervisor should inspect the forklift before it is operated in this condition.
4. Horn. If the horn doesn't work, the forklift is unsafe to operate. Have it repaired.
5. Leaks. Inspect the fuel lines, hydraulic hoses and other parts of the forklift for leaks. Do not operate a forklift that has a leak in the fuel, oil, hydraulic or transmission systems.

Each of the above items is the same as combustion engines. Electrics have a few more safety features that are considered critical safety items.

6. Deadman Brake. On sit down rider forklifts, the deadpan brake is the seat that springs up when a person leaves the seat. A contactor interrupts the electrical circuit and the forklift stops and will not go forward or reverse until someone sits down in the seat. This prevents a run away forklift in case someone falls off the seat. Stand up rider electric also has a deadpan brake that is activated when someone steps off the spring loaded brake pedal, located on the floor where a person stands as they operates the forklift.
7. Electrical Cables. Electrical cables that are worn, cracked or frayed can short out or cause the ignition or explosion of the battery vapors due to sparking across metal parts of the forklift. Inspect all wires and cables before operating the forklift.
8. Voltmeter. Inspect the voltmeter to make sure the main motor battery is charged. Never operate electric forklifts below 80% of the capacity of the battery. This is usually the red area indicated on your voltage meter (voltmeter). Discharging batteries completely reduce the life of the battery and renders the forklift unsafe to operate.

The critical maintenance items are considered critical factors in determining the safe operating condition of forklift equipment. A deficiency in any of the categories requires that the forklift be deadline (taken out of service).

Note: The company may include other items as critical, these items are MINIMUM requirements.

To place a forklift in deadline or out of service place a tag on the steering wheel and remove the key. Make sure the forklift is not creating a hazard. Park it away from aisles or other walkways and check if the forklift has:

1. Mast in vertical position
2. Forks lowered to floor
3. Parking brake engaged
4. Engine off, key removed.

II. DAILY INSPECTION CHECKLIST (1)

MAKE _____ CAPACITY _____ SERIAL # _____ HR. METER _____

1. Previously noted deficiency: Has the deficiency been corrected?
YES___ NO___ ACTION TAKEN
2. Forklift posture and loose parts: Is the forklift in tilted posture? Sign of oil or water leakage? Any loose or rattling component?
YES___ NO___ ACTION TAKEN
3. Wheel tire: Damaged or excessively worn? Is the wheel rim free from distortion? Are all hub nuts tight?
YES___ NO___ ACTION TAKEN
4. Lamps and lights: Any failed bulb? Broken glass or lens?
YES___ NO___ ACTION TAKEN
5. Rearview mirror: Is the mirror clean and free from damage?
YES___ NO___ ACTION TAKEN
6. Hydraulic oil: Is the oil clean? Is the system full?
YES___ NO___ ACTION TAKEN
7. Radiator: Is the water up to level?
YES___ NO___ ACTION TAKEN:
8. Engine: Is the engine oil clean? Do not over fill. Causes over pressurization and can damage the oil seals and system. Any abnormal engine noise? Are the exhaust gases normal?
YES___ NO___ ACTION TAKEN
9. Fan Drive Belt: Is the belt properly tensioned, free from damage?
YES___ NO___ ACTION TAKEN

DAILY INSPECTION CHECKLIST (2)

10. Battery Electrolyte: Is the electrode up to level in each cell?
YES___ NO___ ACTION TAKEN
11. Brake fluid: Is the oil up to level in the reservoir?
YES___ NO___ ACTION TAKEN

12. Clutch pedal: Is the pedal effective with a proper stroke and play?

YES___ NO___ ACTION TAKEN

13. Automatic Transmission: Is its oil clean? Is the oil up to level?

YES___ NO___ ACTION TAKEN

14. Instruments: Are all instruments in good working condition?

YES___ NO___ ACTION TAKEN

15. Fuel tank: Enough fuel in the tank?

YES___ NO___ ACTION TAKEN

16. Mast and Hydraulic Drive: A leakage of hydraulic oil? Any cracks in the mast structure? Do all moving parts work properly?

YES___ NO___ ACTION TAKEN:

17. Mast Chains: Are chains equally tensioned? (Check with forks raised 4-6' of ground). Uneven tension or too much slack in the lifting can cause damage to the equipment or an accident.

YES___ NO___ ACTION TAKEN:

INSPECTOR: _____ DATE: _____ SHIFT: _____

SPECIAL NOTES:

The Daily Inspection Checklist items must be explained to the operators so they will understand the purpose of these checks and why they are so important.

III. INSPECTION AT DRIVING OFF

Engine

During and after the warming-up operation of the engine, observe its running condition for evidence of abnormal vibration, noise or exhaust color. The color of exhaust smoke is a good indicator of the quality of fuel combustion within the engine and may be interpreted as follow:

1. Colorless or slightly: Fuel is being completely burned.
2. Black smoke. Incomplete fuel combustion.
3. White smoke. Oil pumping meaning that engine lube oil is in the process of getting into combustion chambers. Fuel Just before placing the forklift in overnight outage, fill up the fuel tank to minimize the air space inside the tank. This will minimize the amount of water condensation from the air. Keep the fuel tank cap tight or water may leak in. Water in the fuel will foul up the fuel injection system. LP gas cylinders must be turned off and protected from excess heat or cold.

Hot weather precautions for the engine cooling system are the following:

1. Keep the radiator fins clean. Use a vacuum to remove dirt from the fins. When cleaning, check the cores for water leakage. Engine overheating is often caused by radiator fins being clogged with dirt or debris.
2. Keep the fan drive belt properly tensioned, so that the fan will run without any slipping, producing a full draft of cooling air through the radiator cores.
3. Shutting down the engine in "overheated" condition is not advisable: instead of shutting it down, let it idle and wait for the coolant temperature to drop, with the engine hood kept wide open to allow air circulation around the engine. Stop the engine when it has sufficiently cooled. Never add water to an overheated engine unless the engine is running. Cool water can crack the engine block.

Hydraulic Oil Level

To obtain a true level reading, the forks must be brought down to the lower most position. As in other oil level checks, use a piece of clean cloth to wipe the oil off the gauge rod. Never allow dirt or dust particles to enter the hydraulic, oil or transmission systems.

Freezing Weather Precautions

Cold weather is harder on the forklift than hot weather in many respects, especially in regard to fuel, engine starting and coolant. Precautions are necessary, such as using LONG LIFE COOLANT or anti-freeze in the cooling system, keeping the battery fully charged to avoid electrolyte freeze-up, making provisions for avoiding entry of water into the fuel, etc.

After the Day's Work

Before placing the forklift in overnight storage, clean its exposed parts and give the following servicing attention to the forklift:

1. Check various water and oil containing parts for evidence of leakage.
2. Inspect and, as necessary, clean the air cleaner element.
3. Some grease lubricated parts may need re-lubrication. Using a grease gun, give a fresh charge of grease to such parts. (The forklift is still in warmed-up state - just right for re-lubrication.)
4. Operate the mast just for one cycle of full-stroke lifting motion, making the forks reach the highest level. This is for wetting the entire wall of the lift cylinder bore with oil.

Write down the description of each deficiency, if any, noted during and after the day's work. These are some of the more important aspects of operator inspection and maintenance services. The operators must understand the purpose of these checks and this program must have this function as an absolute requirement.

IV. OPERATOR MAINTENANCE (ELECTRICS)

Electric forklifts require less maintenance than combustion engine forklifts. However, whatever maintenance is required must be accomplished daily and without fail.

Electric forklifts are very durable and will give good service if they are properly maintained. Following are some specific items operators must inspect before operating electric forklift equipment. Additionally, forklift operators should be trained in the following "tricks of the trade" information that will prevent forklift damage and significantly reduce forklift abuse and down time.

Tricks of the Trade

1. Do not turn the key switch on until the gear shift is in neutral and the accelerator pedal is off.
2. Avoid excessive heavy towing, forced insertion of the forks and over capacity grade climbing (steep ramps or inclines). Fuses can be easily blown or the electrical motor burned out.
3. Clean motors, electrical parts with compressed air. Do not use solvent, water or other liquids on wiring or motors.
4. Special precautions for refrigerator specification forklifts or cold weather operations:
 - A. Do not leave the forklift standing idle in the refrigerator.
 - B. Observe the specified temperature and time.
 - C. After working the specified time inside the refrigerator, allow the forklift to stand outside the warehouse for at least 30 minutes.
 - D. Since battery capacity is reduced under low temperature, give frequent boosting charges during rest periods.
 - E. Always charge the battery outside the refrigerator.
 - F. Refrigerator specification forklifts have been manufactured specifically for operation inside refrigerators so that they should not be used for regular service outside the refrigerator.
 - G. Make sure to perform the before operation and after operation inspections without fail.
5. Do not over discharge the battery. Continued use of the battery until the forklift will no longer run will shorten the battery life. If the voltage drops below 61.5 V when the fork is raised without a load, charge the battery without delay. Keep away from fire. Never allow open flames to come near the battery (explosive gases are always present within the battery). Do not allow battery fluid to drop low. The water portion of the battery fluid (dilute sulfur acid) becomes less when the battery is charged.

Therefore, be sure to add pure water up to the prescribed level before starting to charge the battery. About one hour after completing the charge, check the fluid level once more and add water if required. Keep the battery clean. The battery should always be kept clean and dry, especially the top surface. Also make sure that the filler plugs are screwed in tightly.

6. Electric lift forklift batteries are extremely heavy. Operators and supervisors must ensure that means are provided for retaining the battery if the forklift were to overturn. This is a safety precaution because many forklift operators have been seriously injured when their electric forklift overturned and the battery was not sufficiently held in place by a bar. Stop locks or retainers to prevent the battery from crushing the operator should be in place and working order. Inspect the forklifts, as many older models do not have sufficient retainers to hold the battery in place. It is recommended that the manufacturer or service agency inspect and certify these forklifts.

There are many methods of preventing batteries from crushing operators if the forklift overturns, such as:

1. Metal bar or straps across top of battery case cover.
2. Strong nylon webbing across battery case cover.
3. Retaining nuts/bolts positioned against battery (professional installation).

FORKLIFT - LESSON # 5

FIRE PREVENTION

- I. TWO GENERAL RULES
- II. EXTINGUISHERS
- III. SPRINKLER SYSTEMS
- IV. PREVENTION
- V. TERMINOLOGY
- VI. REVIEW

Fire prevention is an important part of the training program. Forklift operators handle a wide variety of flammable fuels, chemicals and other hazardous cargo. Trained forklift operators can be the nucleus of a fire brigade or emergency action team, although fire prevention training is essential for all employees, supervisors and management personnel. This training can be utilized on and off the job and will serve to enhance the professionalism, motivation and morale of the company.

The prevention of one fire makes the Forklift Operator Training Program very worthwhile, not to mention cost effective. Just one fire could ultimately cost a life or loss of employment. Keep in mind, fire prevention is NOT the job of the fire department. It is everyone's responsibility.

I. TWO GENERAL RULES

1. Human life is more important than trying to extinguish a fire. There is something about a fire that tends to bring out the hero instinct in people. Don't be a hero. This behavior gets people burned or killed trying to put out a fire. If the fire is small and can be safely extinguished, go ahead and put out the fire. Have someone call the fire department because the fire could get out of hand while extinguishing it. Always call the fire department.
2. Be aware that smoke injures more people than does the actual flames of fires. Thick smoke can easily and quickly cause panic, disorientation, unconsciousness and death. Smoke is the greatest hazard in most fires.

II. EXTINGUISHERS

Being able to put out a small fire safely presumes the operator knows how to use an extinguisher. But, when it comes right down to it do operators really know how to operate a fire extinguisher? Do they know which extinguisher to use on what types of fire? Using a fire extinguisher is simple only when employees have been trained in their proper use.

There are several types of extinguishers and each one serves a special purpose.

1. Silver finish extinguishers are usually water or soda acid extinguishers. Water cools the temperature of the fire until it is extinguished. Water extinguishers are used on Class A fires such as wood, paper, cardboard and similar materials. A word of caution. . . . don't use water on electrical fires, a person could get electrocuted.
2. A dry chemical extinguisher is for use on Class ABC fires. ABC means the extinguisher is an all-around general purpose extinguisher that can be used on most types of fires. The dry chemical covers the fire and smothers it.
3. Another type of extinguisher is the carbon dioxide or CO₂ extinguisher. CO₂ removes the oxygen from the fire and this extinguishes it. Carbon dioxide can be used on liquids, grease and electrical fires.

4. Another class of fire extinguisher is the D class or those used on metal fires. Metals such as magnesium, zirconium and sodium can catch on fire and require a special class D extinguisher. It is usually painted yellow. Be especially careful with metal fires. Always be sure to use the correct type of extinguisher. Using the wrong type could cause an explosion and cause the fire to spread rapidly.

The fire department or the company's safety department has placed the appropriate type of extinguishers throughout the company's facilities.

If the operator isn't sure how to use the extinguisher, ask the supervisor or safety department to explain the proper procedures.

Review of the basic points of fighting a fire with an extinguisher includes the following:

- A. Have someone notify the fire department while the operator gets an extinguisher and transport it to the fire.
- B. Set the extinguisher down and remove the plastic seal which is usually wrapped around the handle. It is easy to break off and remove.
- C. Remove the safety pin. This pin prevents the handle from being pushed down and activating the extinguisher.
- D. Remove the hose and nozzle from its holder on the extinguisher. The next step requires good judgment.
- E. Depending on the extinguisher and type of fire, stand 3 to 5 feet away from the fire and aim the nozzle at the fire according to the instructions on the extinguisher.
- F. Never stand too close to the fire because the pressure from the extinguisher actually can spread the fire. That's why hand-on training and following instructions is so important.
- G. Once the fire has been extinguished, double check that the fire is completely out. Carefully sift through the rubble because some materials can smolder for hours before starting up again. However, the fire department should check out any fire.
- H. Always replace extinguishers that have been used with extra extinguishers until the used ones can be serviced and recharged. If an extinguisher is used, even for a second, it must be recharged. The pressure will leak out and the extinguisher will be useless when needed.

SHOULD FIRE EXTINGUISHERS BE MOUNTED ON FORKLIFTS? Follow your organization's policies and procedures, but if you mount fire extinguishers on forklifts and you have a fire on the forklift, how are you going to get to the extinguisher to put out the fire?

III. SPRINKLER SYSTEMS

Most buildings have an automatic sprinkler system that will activate in the event of a fire. Sprinkler heads are strategically placed to be most effective during a fire. These sprinkler heads have fusible links that melt at a certain temperature. Most systems are under pressure so when the link melts, water flows through the head spraying water on the fire.

When there is a malfunction in the system or a forklift operator knocks a sprinkler head off, both could result in almost as much damage from water as there would from a fire. Therefore, it is important to know what to do in the event an accident or malfunction occurs.

Follow these procedures:

- A. Never shut off the water to a sprinkler system in case of fire. That decision is to be made only by the fire department. However, know how to shut off the sprinkler system in case a sprinkler head is broken off or the system malfunctions.
- B. Two of the most common sprinkler system shutoffs are the post indicator and the outside screw and yoke valve or OS and Y valve.
- C. The post indicator valve is usually located outside a building and is normally in line with the inside riser. These valves must be kept locked to protect against tampering. In case of emergency, know where the key to the lock is located or have a bolt cutter handy.
- D. After removing the lock, insert the handle into the top of the valve. Turn the handle until the water is turned off. It may take 10 or 15 turns to shut the valve completely. The indicator window will read shut when the valve is closed.
- E. If the sprinkler system has an OS and Y valve installed on the riser or is located outside the building, this is the shutoff valve. Remove the chain and lock. Turn the wheel until it shuts off the water. Remember don't shut off the water if there is a fire, only in the case of an accident or malfunction of the system.
- F. Check the sprinkler system. If it is different from the two discussed, ask the supervisor for more information. Practice emergency procedures.

IV. PREVENTION

In order to prevent fires, be aware of what it takes to start a fire.

Basically, three elements must combine before a fire can occur. They are fuel, heat, and oxygen.

- 1. Oxygen is supplied by the air. Fuel could be any material that will burn such as wood or gasoline. The heat source could be sparks, matches or any hot surface. All of these items combined under the proper conditions can cause a fire. Remove any one of them and your fire goes out.
- 2. Extinguishers are designed to put out fires by removing one of these elements.
- 3. Housekeeping is a word used to mean keeping all work and storage areas neat, clean and organized. An orderly work area prevents accidents and certainly is an aid in preventing fires.
- 4. Don't store anything in electrical panel rooms, closets, small rooms or other out of the way places. Never block emergency exits, fire equipment or traffic aisles.
- 5. Where smoking is permitted, use only approved ashtrays that will contain a cigarette in case it is allowed to burn down. Don't empty ashtrays into waste cans until the cigarettes are completely extinguished.
- 6. Store oily or soiled rags in metal containers with metal lids. Make sure rubbish and other combustible materials are properly stored or disposed in metal containers.
- 7. Never store any material within 18" of a sprinkler head. In case of a fire, sprinkler needs to cover the fire. If material is stacked too close to the sprinkler head, it won't work effectively. If possible keep materials 3 feet away.
- 8. Know where all fire extinguishers are located and how to use them properly. Know what extinguishers can be used on what types of fires.

9. Know where exits are located and what to do in case of emergency. Make it a habit to look for an emergency exit when entering a room or building.
10. Emergency lighting must be checked frequently and on a scheduled basis. If the battery is out of water or discharged the emergency lights won't work when needed during a power failure or emergency. These little things can mean the difference between safety and disaster.
11. Fire prevention at home includes installing smoke detectors, cleaning out those cluttered garages, keeping a fire extinguisher or two handy in the home.
12. Use only approved containers for gasoline or other flammable liquids. Don't pour gasoline into hot or running engines.

*YOU CAN PREVENT FIRES BY BEING ALERT, OBSERVING SAFETY RULES AND
KEEPING WORK AREAS CLEAN*

V. TERMINOLOGY

1. **FLASH POINT:** A flash point is the lowest temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture when mixed with air near the surface of the liquid. Gasoline has a flash point of minus 45 Fahrenheit.

Exactly what does this mean? It is important to know because some liquids are more hazardous to handle depending upon the flash point. According to the definition, gasoline at - 45 Fahrenheit will give off a vapor that, when properly mixed with air, can be ignited. Ignition can come from a match, a spark or static electricity. Therefore, liquids with low flash points can be classified as flammable liquids.

2. **FLAMMABLE LIQUIDS:** According to OSHA, flammable liquids are those liquids having a flash point below 100 F. Flammable liquids must have this label posted visibly on the container. Keep in mind that both the word flammable and inflammable mean the same thing. Material Safety Data Sheets are provided by manufactures for all their flammable liquids and materials. These MSDS sheets need to be retained by the supervisor at the forklift operator's work place and made available to all employees. The information provided on these sheets, tell the user how to handle the hazardous materials in emergency situations.
3. **STATIC ELECTRICITY:** Static electricity is the result of electrons moving from one place to another and this movement creates electricity. Every time the operator pours liquid, rotate rubber fan belts, tires or other items, to create static electricity. This form of electricity can cause ignition of flammable liquids. Therefore, it would be wise to eliminate static electricity when dispensing gasoline or other flammables. This can be done with bonding and grounding.
4. **GROUNDING:** A ground is an object that makes an electrical connection with the earth. This allows any electricity to escape into the ground, thereby avoiding the build-up of an electrical charge.

AN EXAMPLE: When pumping gasoline from a 55 gallon container into a smaller 5 gallon container, the first thing to do is to ground the 55 gallon container. Attach a copper wire to the metal, not the paint, of the container. The other end of the copper is then secured to a metal water pipe or other suitable ground. If a good ground can't be located, drive a metal rod deeply into the ground.

5. **BONDING:** Use another piece of copper wire and attach it to the metal part of the 55 gallon container. The loose end should have some type of clip or device to attach to the smaller container.

AN EXAMPLE: When a 55 gallon container is grounded and the 5 gallon container is bonded to the drum, static electricity is drained off into the ground and eliminates possible ignition.

6. **APPROVED CONTAINER:** Small gasoline containers must be approved for flammable liquids. An approved container is a heavy duty metal container that won't break or crack if it is dropped. It is not made of plastic or glass. It must have a spring loaded top. The spring tension prevents the liquid

from accidental spills and it also allows any excess pressure to escape. Excess pressure in other containers can cause the container to break or rupture. An approved flammable liquid container also has a flame arrester. It looks like a falter but it keeps the flame or fire from entering the container, preventing explosions.

VI. REVIEW

1. Call the fire department in case of fire. Review the company's procedures check with the supervisor.
2. Extinguish small fires only when this can be safely accomplished. The operator's life and the lives of others are much more important than property.
3. When handling flammable liquids, use safety containers. There should be no smoking or use of other potentially dangerous flames or sparks on, near or around flammable liquids.
4. In the event a sprinkler malfunctions or a sprinkler head is accidentally activated, know how to shut off the water. Never shut off water to a sprinkler system during a fire. That is the fire departments job and responsibility.
5. Prevent static electricity by bonding and grounding. Make sure the copper wires are attached to the metal, not the paint protecting the metal. If necessary, scratch away the paint over the metal surface.
6. One of the most dangerous products of a fire is smoke. More people are injured from smoke than the actual fire.

Know the answers to these questions:

1. How are fires caused?
2. Who is responsible for fire prevention?
3. What are the three basic elements of a fire?
4. Are fires preventable?
5. Is quick action necessary to keep a fire from spreading?
6. Is housekeeping very important in fire prevention?

Fire prevention is so easy All it takes is a little help from every member of the team.

*LIKE SAFETY TRAINING, FIRE PREVENTION IS COMMON SENSE,
AWARENESS AND FAST RESPONSES*

FORKLIFT OPERATOR LICENSE ISSUANCE

By signing this document, I acknowledge that I have received training through the Forklift Operator Manual and understand the companies Forklift Operating Rules that apply to forklifts, electric jacks and hand jacks. I acknowledge that I received a copy of the Safe Operations and OSHA Requirements - OPERATION RULES.

License #

Employees Signature

Date Issued

FORKLIFT LICENSE IS ON THE CD-ROM FOR DOWNLOAD AND PRINTING

POWERED INDUSTRIAL TRUCK OPERATOR PERMIT TO OPERATE (LICENSE) is **not required** by government regulations. See CD-Rom for forklift license, if you choose to use licenses.

FORKLIFT TRAINING PROGRAM WRITTEN TEST

Employee: _____ Date Tested: _____

Before answering any question, be sure to read it carefully.

TRUE OR FALSE QUESTIONS: Circle the correct answer

- T F 1. It is a safety violation to lift anyone on a forklift, unless a safety platform with guard rails is provided.
- T F 2. It is O.K. to smoke while driving a forklift or electric jack.
- T F 3. Before making a turn, a driver must slow down to a very slow speed (usually one or two miles per hour) to prevent the equipment from turning over.
- T F 4. As an operator, you are required to obey company safety regulations.
- T F 5. If no one is nearby, it is O.K. to drive faster than the safe speed of 6 miles per hour (person normally walking).
- T F 6. It is a sign of unsafe practices to cause skid marks on the floor.
- T F 7. All accidents and injuries must be reported to the supervisor immediately.
- T F 8. An operator must stay at least one foot away from the edge of any elevated platform or loading dock.
- T F 9. It is very important to make sure the dock plate is in position and secured before moving onto the dock plate.
- T F 10. When empty, the forks should not be higher than 3 or 4 inches off the floor.
- T F 11. Reporting play in the steering wheel can prevent an accident.
- T F 12. Excessive tilting or fast moves can result in an overturned forklift and spilled load.
- T F 13. When changing the L.P.G. tank, the operator should wear gloves.
- T F 14. When driving an electric forklift, its safe to drive with a low-charged battery.
- T F 15. The operator must keep all portions of their body inside the running lines of the forklift.
- T F 16. When carrying a tall load, the operator should drive backwards.
- T F 17. The pedestrian should have the right of way.

MULTIPLE CHOICE QUESTIONS: Check the correct answer

1. When changing directions

- a. Always stop
- b. Slow down to about 1 mph
- c. Don't worry about the speed; a forklift is built to take the shock

2. When taking a load down a ramp

- a. Drive backwards
- b. Drive front wards
- c. Reduce speed by zigzagging

3. As a driver, it is.

- a. Your responsibility to watch for pedestrians
- b. The pedestrian's responsibility to watch for you
- c. Management's responsibility to keep them out of your work area

4. When unloading a trailer, you should

- a. Check the wheels to be sure they are chocked
- b. Drive at a high speed to get the job done quicker
- c. Leave the door up when you are finished

5. When stacking loads, the correct way to stack the load is

- a. Stack it according to size and weight
- b. Tier the load away from the wall
- c. Stack the load as high as you can get it

6. When left unattended, the forklift should be

- a. Left in the aisle with the engine running and emergency brake set
- b. Left with the controls neutralized, brakes set and engine off
- c. Left in the proper area with all controls neutralized, brake set, engine off, and key removed

FILL-IN QUESTIONS: Fill-in the blank spaces

1. If a safety hazard is observed by a vehicle operator such as a board or rock on the floor, the vehicle operator must stop the vehicle and _____ the hazard.
2. If the forklift does not have safe steering, good brakes, a parking brake that works or has a leak in the fuel or oil system the forklift should

3. List two of the causes for a forklift to overturn

4. There are eight principles of forklift equipment. List five of these forklift equipment principles

TOTAL DEDUCTIONS: (4 points for each incorrect or missing answer)

FINAL SCORE: _____ (100 points less all deductions)

PASSING SCORE IS 70, or as dictated by your company policy.

PERFORMANCE TEST

Operators Name: _____

Department: _____

Date: _____

This performance test/evaluation is to be conducted by an authorized supervisor to determine the operator's ability to safely operate the equipment and to exhibit an acceptable degree of proficiency and knowledge of the operation, controls and basic principles of the equipment.

Before Operation

1. Perform operator maintenance as required? _____
2. Inspects vehicle properly, including frayed, worn fuel lines, hydraulic hoses, and hydraulic/transmission/fuel or oil leaks? _____
3. Knows how to deadline vehicle if it is unsafe to operate? _____
4. Knows how to check oil properly? _____
5. Knows how to check automatic transmission and hydraulic oil levels? _____
6. Sign operator maintenance sheet/card? _____

During Operation

1. Knows clutch operation? _____
2. Knows how to use inching control on automatic vehicle? _____
3. Does not spin tires, jerky starts/stops? _____
4. Does the operator exhibit the proficiency necessary to react to usual or emergency situations? (This is a judgment that the testing supervisor/trainer must make.) _____
5. Does operator understand how lift equipment can easily overturn? _____
6. Does operator move material in a safe, efficient manner? Proper load sizes? _____

7. Does operator drive in reverse if visibility is restricted? _____
8. Does operator know and understand how load centers can affect the maximum load capacity?

9. Does operator know and demonstrate safe driving speeds for the conditions? (crowded warehouse, etc.) _____
10. Is operator familiar with material handling equipment and facilities, such as deck plates, chocks, trailer loading/unloading procedures, ramps, uneven floors, etc.? _____
11. Does operator demonstrate knowledge of proper method of entering/ exiting vehicle to prevent injury? _____
12. Does operator demonstrate knowledge of properly parking vehicle for short periods of time? _____ And leaving vehicle unattended? _____
13. Does operator demonstrate knowledge of tilting lever, hazards of tilting and the principles of tilting a load? _____

After Operation

1. Does operator know how to shut off equipment properly, including?
 - a. Mast vertical _____
 - b. Forks on floor _____
 - c. Break set _____
 - d. Propane valve closed and gas expelled from fuel line before motor shut off. _____
 - e. Inspects vehicle for proper storage (eliminates tripping hazards, fire hazards, etc.) _____
 - f. Removes key (if applicable) _____
 - g. Completes after operation inspection checklist if required. _____

Training Supervisors Comments: (Opinion Summary)

I certify that this Forklift Operator has performed the test items listed on this test form and, in my opinion, this Forklift Operator is:

_____ Qualified to safely operate this equipment.

_____ Not qualified to safely operate this equipment; needs more training.

Supervisor Signature _____ Date: _____

FORKLIFT TRAINING CERTIFICATION (CERTIFICATE ON CD-ROM)

This is to acknowledge that _____ has successfully completed the course requirements for forklift equipment operator. The operator above has been trained in the following:

1. Engineering Principles. Stability triangle, centers of gravity, load centers, raising & lowering loads affecting the center of gravity, centripetal force affecting high centers of gravity, & hydraulic principles.

2. Operator Safety. OSHA forklift safe operating rules, personal protection, personal responsibility, accident reporting responsibilities, safe parking of vehicle.
3. Operator Maintenance. Operator responsibilities, fuels, oils, hydraulics, electrical cables, battery charging & handling safety, unsafe vehicle reporting, preventive maintenance procedures.
4. Material Handling. Containers, stacking, loading, docks, trailers, railcar safety, liquids, transporting a load safely, tilting, rack storage, miscellaneous material handling.
5. Fire Prevention. Classes of fire, extinguishing procedures, flash points, bonding & grounding of flammable liquids, chemical handling safety, storage & stacking of hazardous materials, emergency action procedures and housekeeping.

This employee has demonstrated satisfactory knowledge of this information and has met the training requirements under the State and Federal OSHA programs.

Signature of Forklift Operator Instructor: _____ Date: _____

NOTE: Somewhere in your company's file, the Instructor's Name and other information that qualifies him or her as a forklift instructor should be maintained. The complete forklift training program, videos, lecture lesson plans and other information should be maintained also.

SUPERVISORS CHECK LIST

FORKLIFT-ELECTRIC JACKS-WALKIE TRUCKS-PALLET JACKS

This is a check list for supervisors to quickly inspect material handling equipment for safety, safety procedures, OSHA compliance and general serviceability of equipment.

1. Are all equipment operators
 - A. Properly trained? _____
 - B. Licensed? _____
 - C. Copy of written exam in records? _____
 - D. Copy of performance exam in records? _____
 - E. Operator received copy of safe operating rules and signed license form indicating he/she understands these rules? _____
2. Is copy of the safe OSHA operating rules posted on bulletin board, time clock or in area where equipment is used? _____
3. Do equipment operators perform operator maintenance inspections each shift and complete the require maintenance records? _____
4. Are daily operator maintenance records kept on the equipment? _____
5. Are these completed maintenance records maintained in your files for at least one year? (Retained indefinitely on equipment involved in injuries) _____

6. Is the maximum capacity for a 24-inch load center posted on the equipment in clear view of the operator? (Applicable to all equipment, including pallet jacks.) _____
7. Do all electric forklifts have a metal bar or other suitable retaining device attached across the battery in such a manner that if the equipment were to overturn, the battery could not fall out of the rack? _____
8. Are battery charging areas well ventilated? _____
9. Are emergency eye wash stations available near all battery charging operations? _____
10. Are battery charging safety rules posted and enforced near battery charging operations? _____
11. Is no smoking sign posted and no smoking rule enforced within 50 feet of battery charging operations? _____
12. Adequate chemical protection gear available when handling batteries (Eye protection, hand, body)? _____
13. Are battery chargers turned off prior to connecting or disconnecting battery cables? _____
14. Are charger and tatter cables in good, serviceable condition? _____
15. Adequate fire extinguisher available throughout area? (Fire extinguishers are normally not required on forklift equipment if forklifts operate in read where extinguishers are readily available.) _____
16. Personnel cannot be lifted on forklifts unless:
 - A. Guardrails/Chains _____
 - B. Stable floor, no holes _____
 - C. Chained to mast _____
 - D. Employee protection from crushing/pinching action of mast (7- foot high) _____
17. Are refueling areas clean, in odd condition and safety rules enforced? _____
18. Do operators know how to safely handle, store and use flammable liquids and LPG? _____
19. Damage to equipment noted? If so, investigate to determine cause. _____
20. Are forklift maintenance procedures effective? (Operator and mechanics) _____

COMMENTS:

(Are such items as parking brakes, horns, brakes, etc. deficiencies corrected immediately before operation of equipment is allowed?)

NEW FORKLIFT RULES ADOPTED IN 1998

Included below is information relating to the new training requirements and certification of forklift operators. This information is also developed as your forklift operator booklets, for distributing to forklift operators. The Operator Booklet is located on the CD-Rom, with color pictures in JPEG format, so they can be used if you want to include pictures in your Operator Booklets:

FORKLIFT OPERATOR TRAINING-THE NEW RULES

INTRODUCTION

Over the many years, powered industrial trucks, which are also known as forklifts, have become a widespread staple in almost all industries. Along with the growth of material handling equipment, there has been a wide range of equipment, from battery operated equipment to diesels, gasoline, propane powered in capacities of less than 2,500 pounds to over 100,000 pounds. Included is a wide variety of equipment, such as attachments that can be used to extend forklift capabilities for special uses, lifting or carrying requirements.

The more technology progresses, the more important it is for professional operation of the equipment. In this program we'll discuss forklifts, which are also called powered industrial trucks. Whatever name used they require professionals to operate them. The past 20 years has seen a variety of training programs for forklift operators, ranging from "get on it and don't have accidents", to complete, comprehensive training and performance testing and evaluations. New governmental rules have made training mandatory and that training must be quite specific. Specific to the equipment you operate and specific to the conditions under which they are operated. No two facilities are alike, therefore site-specific training is required. This means anyone required to operate forklifts must be trained and evaluated by knowledgeable and experienced trainers and supervisors. But exactly what does this mean? Anyone required to operate forklifts must be trained in a wide variety of topics, including Engineering Principles, Forklift Operating Rules, Equipment Characteristics, Environmental Hazards, Operator Maintenance, Hazardous Locations, Surface Operating Conditions, Site Specific operations, potential hazards and other information. This program cannot cover all aspects of the required training because new government standards require employers to make the training **site specific** for your workplace and the potential hazards that may exist in your company or area of operations.

Training should include three distinct methodologies. First, there's academic or classroom training. This program covers the majority of the required classroom training, but your company amplifies this training by making your training site specific to your operations. Next, operators must be provided "hands on" training to ensure operators fully understand controls, equipment performance, individual characteristics of each forklift equipment they will be operating and the potential hazards that may be encountered in your work area or organization. The third method of training is evaluation. Through the evaluation process, operators can learn from mistakes and improve their performance. An evaluation means an experienced person, such as a trainer or supervisor who has the knowledge, training and experience to train and evaluate operators' competency in forklift operations. The evaluator observes individuals who operate forklifts to determine their safe operation of the vehicle, how the operator observes safety rules and how the operator knows, understands and handles the equipment. The four primary topics or areas to be covered in the training program must include:

1. The general hazards that apply to the operation of all or most powered industrial trucks.
2. The hazards associated with the operation of particular types of trucks.
3. The hazards of workplaces generally.
4. The hazards of the particular workplace where the forklift is operated. Also called site specific training.

The purpose of this type of training is to make sure potential hazards in each specific location or workplace are identified and forklift operators are more aware of the specific potential hazards. If an operator has previously received training in a topic required by the rules, 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. How that person's competency is evaluated is up to the company. This can be through testing and examination, performance evaluation or other means of evaluating the level of previous training. All forklift operators must be evaluated at least every three years.

CERTIFICATION

Certification of training and competency must be documented for all persons who operate powered industrial equipment. This certification must contain the NAME OF THE OPERATOR, the DATE OF TRAINING, the DATE OF THE EVALUATION AND THE IDENTITY OF THE PERSON OR PERSONS PERFORMING THE TRAINING OR EVALUATION. Documentation is extremely important, for a variety of reasons, therefore, each company should maintain records of what training was conducted, who conducted the training, who was trained, when operators were trained and what was included in the evaluation or performance testing. We cannot stress enough, that proper training documentation be maintained of all forklift operators. Government rules do not require Forklift Operators' Licenses, but many companies have found them useful and helps reduce unauthorized use of forklifts by uncertified persons.

GENERAL TYPES OF EQUIPMENT

There is a wide range of equipment, each designed for specific industries and uses. Powered industrial trucks are classified by their manufacturers according to their individual characteristics. There are seven classes of trucks.

- CLASS ONE:** These are electric motor, sit-down rider, counter-balanced trucks and they use either pneumatic or solid tires.
- CLASS TWO:** Electric motor Narrow Aisle trucks that use only solid tires.
- CLASS THREE:** Electric Motor Hand or Hand/Rider trucks that use solid tires. These are commonly referred to as electric pallet jacks.
- CLASS FOUR:** Internal Combustion Engine trucks, using solid tires. These are the most common types of forklifts. They can be gas, diesel, or propane powered.
- CLASS FIVE:** Internal Combustion Engine trucks, using pneumatic tires.
- CLASS SIX:** Electric and Internal Combustion Engine tractors, with pneumatic tires.
- CLASS SEVEN:** Rough Terrain Forklift trucks, which use pneumatic tires. These are more commonly used in construction.

Each of the different types of powered industrial trucks has its own unique characteristics and some inherent hazards. To be most effective, training must address the unique characteristics of the type of vehicle operators are being training to operate. Before we move on, let's take a quick look at solid and pneumatic tires. Pneumatic tires are tires filled with air, just like your automobile tire. These are designed so the forklift can maneuver in uneven, ungraded terrain. The tires are more flexible and can adjust to the terrain. Solid tires are exactly what their name implies. They are made of solid rubber or other materials. These tires must be used on smooth, fairly even surfaces because they are not flexible. Solid tires provide excellent wear; however, they can be cut or damaged. When solid tires must be replaced, it requires the use of a press, to press the tire onto the forklift wheel. Changing solid tires are performed by technicians who have the proper equipment.

ENGINEERING PRINCIPLES

Perhaps one of the most important, yet misunderstood parts of any forklift-training program is the engineering principles of the equipment. Unless you have this knowledge, it's difficult to understand some of the safety rules relating to forklift operations and certainly detracts from your ability to make good judgements when lifting odd sized and difficult loads. This program focuses on some basic principles, but they are a very necessary part of professional forklift training and operations. You should learn these basic principles and if you are unclear or have any questions, please ask your supervisor or trainer to explain them more fully and answer your questions.

AUTOMOBILES AND FORKLIFTS

Is there any difference in operating or driving an automobile and a forklift? Absolutely. An automobile is steered by turning the steering wheel, which in turn moves the front wheels and tires in the direction in which you're steering. The front tires turn and move the automobile in the direction you want to turn or travel. Forklift steering is just the opposite. When you turn the steering wheel, the REAR TIRES move to change direction. Totally different than operating an automobile, that's why you need training and experience to understand these differences. Automobiles and forklifts generally use hydraulic braking systems. When you step on an automobile brake, hydraulic fluid is compressed through the master cylinder to wheel cylinders, which apply force to the brakes to stop the vehicle. Forklifts with hydraulic brakes operate basically the same way. However, only certain battery operated forklifts, such as the large sit down units use hydraulic brakes.

Others may employ mechanical systems actuated by electronic solenoids, such as Order Selectors. Still others, such as Walkie Pallet Trucks have mechanical systems. When an operator removes his or her foot off the electric forklift accelerator or standing pad, friction stops the electric forklift. It's a different sensation and stopping distances are somewhat different, again pointing to the need for training and getting used to the different type of equipment. An engine must power forklifts, just as an automobile must be powered. Some forklifts use combustion engines, which use gasoline..... diesel..... propane... or can be powered by electrical motors. Propane forklifts are used more often, particularly in warehouses and inside areas. The fuel is cleaner; however, propane does emit carbon monoxide.

Another difference between automobiles and forklifts is that forklifts do not have shock absorbers. An automobile uses shock absorbers or struts to keep the tires firmly on the road surface while the vehicle is in motion. Automobiles also have what is called a four-point suspension system. This means the vehicle is supported on four points of suspension system. Forklift engineers have designed forklifts on a three-point suspension system, even if the forklift has three or four wheels.

Since forklifts don't have shock absorbers, a pivot pin in the center of the axle supports the forklift's rear end. This allows for the up and down movement of the rear tires when traveling over bumps and uneven surfaces. This pivot point and the front tires make up the three-point suspension system. The truck's steer axle is attached to the truck by a pivot pin in the axle's center and when imaginary lines connect the points. This three-point suspension system forms an imaginary triangle called the stability triangle.

The technical definition of the stability triangle is 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 and load combination falls outside the stability triangle, the vehicle is unstable and may tip over. When the combined center of gravity of the truck and load move outside the lines of this triangle, the forklift will overturn. There are many situations in which this can occur. Fast, sharp turns can cause this center of gravity to shift outside the triangle. Lifting a heavy load and tilting the mast backward while moving, then running over a piece of wood or other uneven surface can overturn the vehicle. Many operators get confused in emergencies due to the difference in rear wheel steering and the vehicle being powered by the front wheels.

FULCRUM PRINCIPLE

Let's begin with the lever principle, specifically the FULCRUM principle. Technically, the fulcrum is truck's axis of rotation when it tips over. Simply stated, you have two weights balanced on a fulcrum, like a playground see-saw. On the forklift, one weight is the heavy rear end or counterweight and the weight of the truck. The fulcrum point in this case, is your front tires and the other weight is the load you're carrying. The counterweight balances the load with the front tires as the fulcrum point. The counterweight is the heavy metal part of the forklift that compensates for loads and determines the proper safe lifting capacities. Never add a different or additional counterbalance to any forklift, without the manufacturer's approval. By modifying the forklift, you may have significantly changed a variety of important engineering principles, such as center of gravity, safe lifting capacity, maximum load height and other unsafe conditions.

One of the most important safety considerations when operating forklifts and raising loads, is tilting forward with loads is prohibited, except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load is to be used. We'll discuss raised loads more in a few minutes.

FORKLIFT DATA PLATE

The next important factor is the information contained on the data plate, which is generally located on the front panel of your forklift. This information is developed and provided by the forklift manufacturer. The data plate gives you the make, model and serial number of the equipment. It also states exactly how much weight can be safely lifted and how high the load may be lifted. The data plate generally states the lifting capacity in three different classifications, such as 24-inch load centers, 36-inch load centers and 42-inch load centers, depending upon the size of your equipment. The data plate also specifies how high the load can be lifted, at specific load weights and load centers. Never modify or change the forklift in any manner without approval from the manufacturer. Modifying or changing the forklift can adversely affect safe lifting capacities and other conditions to make the forklift hazardous to operate.

ATTACHMENTS

Attachments to forklifts can dramatically change the equipment's safe lifting capacity. Attachments come in a wide variety of uses and sizes. There are side shifters, which allow the load to be moved from side to side....., there are pipe attachments that contain or hold the pipes being lifted. In this case, it can significantly affect the lateral stability of the forklift. There are other specialty attachments designed for specific loads. Next, there are a variety of booms, which extend the ability of the forklift to lift long loads. When using boom attachments, the Longitudinal Stability of the lift truck is affected and greatly decreases the safe lifting capacities of the forklifts. Next, there are other attachments, such as floor sweepers....., tippers or trash hauling attachments. Rams for specific service such as lifting large wire coils and other uses. There are platforms used as attachments to protect people when being lifted on the forklift. Other attachments could include barrel attachments, which are designed primarily for lifting drums and barrels. Regardless of the attachment used, keep in mind.... the equipment manufacturer must approve this equipment. Forklift operators must fully understand how each particular attachment changes the safe lifting capacity of the forklift, the stability of the truck and other potentially hazardous changes to the forklift on which you are using the attachment. Fork extensions, which are inserted over the forklift's existing forks should not be longer than 150 percent of the supporting fork's length. By using forklift extensions, the safe lifting capacity is decreased. Fork extensions and all attachments must be attached to the forklift to prevent unintentional disengagement from the forks.

LOAD CENTERS

Before we explain what all this means, let's explain load center. The load center of a forklift is the distance measured from the center of the load to the vertical face of the forks. If you have a pallet that is 48 inches by 48 inches and you have an evenly distributed load on this size pallet, you have a 24 inch load center. If you have an evenly distributed load on a longer sized pallet, you no longer have a 24 inch load center. If you use attachments extending the load center, obviously the lifting capacity of the forklift can be seriously diminished. The forklift manufacturer must approve forklift attachments. This approval

information must be displayed on the attachment or forklift for the attachment to be legally used on each specific forklift.

Let's go back to the data plate and those three different lifting capacities. Each size forklift has different capacities, but we'll use a capacity of 5,000 pounds at a 24-inch load center that can be safely lifted to a height of 104 inches. Keep in mind, all safe lifting capacities are based upon the load center and the mast being raised in a vertical or straight position. If you tilt the mast forward when lifting, what are you doing to the load center? You're extending the load center because of the extra weight of the mast and the extension of the forks, thereby reducing your safe lifting capacity as stated on the data plate. When lifting anything, think about the load center of the load, the mast position and the weight of the load. Manufacturers provide basic weights and safe lifting capacities on the data plate.

For example, where the forklift is rated at 5,000 pounds on a 24-inch load center, a 36-inch load center may decrease your lifting capacity to 4,000 pounds and a 42-inch load center may decrease your safe lifting capacity to 3,000 pounds. If you add an attachment to the equipment, the safe lifting capacity may be reduced even more dramatically.

CENTERS OF GRAVITY

Another engineering principle that affects your safe lifting capacity is the center of gravity. Technically, the 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. Certainly if you have a forklift unloaded, you have one center of gravity. If you have a forklift with a load, that center of gravity changes, so the entire object, in this case the forklift and load....is the concentration of weight of the forklift and load.

Additionally, as you raise a load, the center of gravity shifts away from the truck and towards the forks. Forklift engineers designed the forklift with this in mind and calculated this center of gravity shift in determining the safe lifting capacities. When equipment operators exceed the safe lifting capacity and try to lift excessive loads, or if they have extended load centers and try to lift heavier loads, the center of gravity can be exceeded and the forklift will tip over towards the load. That's why tilting a load while raised can be a major safety hazard. Tilt loads only when safe to do so and necessary for positioning loads onto racks or other material handling equipment. Of course, you're changing the center of gravity even more when you tilt loads.

Tilting loads changes the center of gravity and this can be very hazardous to your safety, if you exceed the maximum safe lifting capacity of your particular forklift. Moving loads upward, downward, forward and backward causes a shift of the center of gravity and can adversely affect the vehicle's stability. Avoid making jerky starts, quick turns or sudden stops. Never use the reverse gear to stop a forklift truck. Use the brakes to stop the vehicle. When shifting from forward to reverse, the vehicle should be in a stopped position and the appropriate gear engaged before moving in the new direction.

TECHNICAL TERMINOLOGY

We're not expecting you to remember too many technical terms, but you should be aware of some other engineering definitions and how they apply to your particular forklift. First, there's **LONGITUDINAL STABILITY**. This is a fancy word that is the truck's resistance to overturning forward or rearward. This is demonstrated when you use boom attachments.

LATERAL STABILITY is the truck's resistance to overturning sideways, as when using pipe attachments or extremely wide loads. Each class and size of equipment has different longitudinal and lateral stability principles, so it's up to you to remember how these affect your operation. A very short forklift would have less longitudinal stability than a very large or long forklift. Let's say you're driving a small, short forklift and while traveling, you hit a 4-inch curb. Quite possibly, the longitudinal stability of this short forklift may cause you to overturn, whereas a large, long forklift would probably not tip over because it had much greater longitudinal stability. Lateral stability on forklifts can be viewed as wide or narrow equipment.

If you have a wide track vehicle, your lateral stability is much greater than a much narrower type forklift. This means that narrow vehicle has much less lateral stability and can tip over side ways more easily than wide track vehicles. The term TRACK is simply 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. Don't become confused with this terminology; just understand the basic principles of the equipment.

OPERATOR RESPONSIBILITY

By understanding the engineering principles, you can see exactly why safety rules state that forklifts should never be driven with the load raised more than 4 to 6 inches off the traveling surface. A raised load can exceed the stability triangle and create a condition where the forklift can overturn. Speeding and fast turns, making sharp corner turns cause the vehicle's center of gravity to shift outside the stability triangle as well.

Your employer is responsible for providing the proper forklift for the environmental area in which you operate. This means that if there is a hazard of an explosion from certain dusts or combustible atmospheres, a certain type of forklift is required, which is approved for operations in these atmospheres. Additional training and instruction must be provided when operating in potentially hazardous atmospheres or environments.

That certainly isn't all the engineering principles involved in forklift safety, but it gives you a better understanding of why safety rules should be obeyed to the letter. Poor judgement, forgetting to think about the weight of the load, the load center and the truck's center of gravity and stability triangle have caused many accidents and injuries. Being a professional forklift operator is more than just driving. It's being responsible, knowledgeable and of course, applying these engineering principles every time you lift a load, add an attachment or operate your vehicle.

BASIC FORKLIFT OPERATING RULES

When used safely, forklifts save you time and make your job much easier. Anyone operating forklift equipment must be trained and authorized by the company. Once you're trained, evaluated, certified and authorized..., the rest is up to you. You're expected to have the maturity and responsibility to operate this equipment efficiently and safely. Again, we can't cover every forklift safety rule, but let's explain some basic safe operating rules, to provide the basics upon which to build a professional understanding of forklifts and forklift safety rules. Always follow your company's forklift operating procedures, policies and rules.

SPEEDING

Let's begin with the most common hazard and that's speeding on forklifts. Forklifts are designed for operation at the speed of a person walking at a normal pace. You don't have speedometers on forklift equipment, but approximately 5 miles per hour is the maximum speed. You have to use your judgement on proper speed, because in some cases, such as when turning or operating near pedestrians, 5 miles per hour may be too fast. It's O.K. to work hard and not waste time, but when you're operating forklifts, safety is the most important part of your responsibility.

RIDERS

Next, riders. Absolutely no riders allowed on forklift equipment. That includes riding near the operator, on the rear, sides and certainly not on the forks or on a pallet placed on the forks. If you must elevate a person using the forklift, a proper platform must be used.

The minimum safety requirement is the platform must be secured to the mast of the vehicle, to keep it from falling or sliding off the forks. The platform must have adequate flooring for good footing and must have 42-inch high guardrails and mid-rails. Some regulatory agencies (State OSHA) require a seven-foot high protective guard between the person on the platform and the mast, to prevent a person's hand or other body parts being crushed by the mast as it rises and lowers. When anyone is elevated on a platform, the forklift operator must remain at the controls, whether the motor is running or not.

SEAT BELTS AND TURN-OVERS

Forklift manufacturers are not required to install seat belts on forklift equipment. However, if seat belts are installed, your company may require you to wear seat belts. While we're on this subject, let's take a couple of seconds to explain some safety action that the Industrial Truck Association recommends if you are involved in a forklift turnover. It's up to your company to establish a policy relating to the action that you should take to protect yourself in case this occurs. The ITA states that studies on forklift turnovers usually result in minor injuries if the forklift operator stays WITH THE VEHICLE INSTEAD OF JUMPING OFF.

The normal tendency is for a person to jump downward, so the driver lands on the floor or ground, usually directly into the path of the overhead guard. In a tip-over of a sit down truck, the operator should lean away from the direction of fall to minimize injury. The most common result in a tip over, where the operator jumps out is a crushing injury to the head, neck, or back where the overhead guard strikes the operator. Forty two percent of forklift fatalities are caused by the operator trying to jump from a tipping vehicle. To keep this from happening to you, always remember to keep the load as low as possible and stay with the vehicle if it tips over. Wearing your seat belt is the best safety measure. On the other hand, stand-up rider trucks the truck operator can simply step backwards, perpendicular to the direction of fall to minimize the potential for injury.

RAISED LOADS

Driving forklifts with raised loads is unsafe, as the center of gravity of the forklift and load changes as you move. When traveling with a load, keep the load as close to the floor surface as possible, which means the forks are raised about 2 to 6 inches off the floor. This prevents the forks from hitting the floor. Of course if the floor surface is slightly bumpy, 4 to 6 inches off the floor surface may be preferred. In this position, the forks and mast should be tilted back slightly, to help stabilize the load toward the mast and a better center of gravity.

However, when you stop and are ready to elevate the load, move the mast back to the vertical, or straight position. It's hazardous to raise a load when the mast is tilted to the rear or forward since this can disrupt the longitudinal stability of the truck. Never leave a forklift unattended with a raised load. Of course, never allow anyone to walk under a raised load. Keep pedestrians away when you have a raised load. When you have a person raised in a platform, it is recommended that pedestrians stay one foot away from the cage, for every foot the cage is raised. This means if a person is raised 10 feet, pedestrians should stay at least 10 feet away from the raised platform.

When raising a load, such as positioning the load into a rack or storage space, think about the overhead. Will the load hit a sprinkler pipe or other object? Broken doorways, lights and other objects are a result of equipment operators not watching where they are moving with a raised load. The red light should go on anytime that you're raising a load and remember that raised loads should not be tilted forward, except when you're over a rack or tier ready to deposit the load. While we're talking about maneuvering loads, if the load you're carrying is too high and blocks your vision, drive in reverse. Always look in the direction you're traveling. Many accidents have occurred because equipment operators weren't watching where they were going. Forks should always be placed under the load as far as possible and never lift a load with one fork.

STEERING AND OPERATING SURFACES

In tight spaces, watch out for the rear end swing. The rear tires are your steering tires and it's quite easy to bump into walls, doors and people if you're not watching the rear end swing. Be particularly careful when maneuvering in congested or tight spaces. It goes without saying, but let's go ahead and mention it. Keep your arms, legs, head and other body parts inside the running lines of the vehicle. This protects the operator from injury, especially when passing other forklifts and when maneuvering near storage racks and other materials. Never try to pass or overtake another forklift traveling in the same direction. Drive with both hands on the steering wheel and of course, horse play is prohibited. Attachments to the

steering wheel, such as spinner knobs are prohibited. Never operate your equipment with wet or greasy hands.

Naturally, floor surfaces should be clean, but if you encounter wet or damp areas, always slow down. Report any grease or hydraulic fluid leaks, so the floor surface can be cleaned. If you operate forklifts over railroad tracks, always cross the railroad tracks in a diagonal position. This is the most stable position when crossing railroad tracks. Forklifts with solid-type tires may only be operated on asphalt or concrete surfaces. Forklifts with pneumatic-type tires may be operated only on asphalt, concrete or improved surfaces, such as gravel roadways. If forklifts must be driven on public highways, such as crossing from one location to another across the street, follow your company's policies and procedures, while using extreme caution.

DOCKS AND RAMPS

On loading docks, keep the forklifts away from the edge of loading docks. A slight miscalculation can become a nasty accident. Another good rule around loading docks is to always be sure trailer wheels are chocked. If the trailer is disconnected from the truck, you may use a stabilizing jack to prevent the forklift from overturning the trailer. Dock plates provide a smooth surface over which to enter trucks and trailers. Make sure the dock plate is in good condition and is properly placed between the trailer and dock, to prevent movement of the dock plate. The lip of the dock plate must be fully seated onto the trailer bed. You should have good lighting inside trailers and trucks, so you can see what you're doing. On ramps, the forklift safety rule is very simple. Keep the load upgrade when going up or down a ramp. Drive up; back down is the best advice. If you're using a ramp onto a trailer, the weight of the ramp must be on the trailer bed and the bottom base plate of the ramp on the ground. Operators should maintain a safe distance from the edge of the ramp and drive at a "creep" speed. Of course, never overload any ramp or dock plate, so they mean you should know the safe capacity of the ramp that includes the weight of the forklift and the load.

BRAKING AND PARKING

O.K., everyone is driving at a safe speed, watching where they're going, paying attention to others in the area, exercising caution when loading or unloading trailers and trucks, now it's time to stop and park your vehicle. Basically, anytime you stop and get off your vehicle; the forks must be on the floor and the parking brake engaged and set. That's a minimum requirement.

Forks must be on the floor and the parking brake set. If you're going to be away from your vehicle more than 25 feet, shut off the motor. Some companies prefer the key to be removed as well, to prevent unauthorized persons from operating the equipment. Naturally, try to park the vehicle in such a manner as to keep the forks from becoming tripping hazards. Don't block aisles or exit doors with your forklift or materials. Exit doors and electrical panels must remain unblocked at all times. All the things we've just talked about are nothing more than common sense and your good judgement. You're professionals, with experience and knowledge, all you have to do is apply basic safety to your daily operations and work habits, and you'll be on your way to better efficiency, productivity and safety.

PEDESTRIANS

Forklift operators will tell you that one of their major complaints is pedestrians. Pedestrians don't pay attention to forklift operators, they walk out in front of forklifts and in general, are safety hazards to forklift operations and it's not the fault of forklift operators. Of course, these things happen and people who work around or near forklifts, but are not forklift operators, should be trained also. They should be made aware that forklifts are noisy and often operators can't hear pedestrians walking nearby. Pedestrians have safety responsibilities as well and this means paying attention to where you walk and be on the lookout for forklifts. Just as when operating a motor vehicle; pedestrians should be given the right-of-way. If someone walks in front of you, stop and allow them pass. Sound horns around corners and aisle ways.

Operators should never drive toward any person who is in front of a fixed object or wall. Operators should always look in the direction of travel. If the load obstructs your view, drive backwards. Operators entering a building or nearing a blind corner must make their approach at reduced speed and sound the

horn. Safety is a team effort and it requires both the forklift operator and pedestrians to make safety a reality.

FORKLIFT MAINTENANCE

As part of your professional forklift equipment operator's responsibilities, your company may require each operator to inspect and perform operator maintenance at the beginning and end of each shift. Make it a habit to check your vehicle everyday, even if someone else has been using it.

Let's begin with some basic maintenance procedures. If your forklift equipment is unsafe to operate, don't use it. A vehicle is unsafe when the horn doesn't work, brakes and parking brake are defective, or the steering has too much play to allow positive steering. If there are leaks in the fuel, oil, hydraulic or transmission, it should be reported so it can be repaired. Almost all forklifts have some types of minor leaks, but they should be reported so a mechanic can inspect the leak to make a determination if the forklift is safe or unsafe. Follow your company's maintenance procedures and requirements, as there may be more defects that could render your forklift unsafe to operate.

Of course, always check the water, fuel, oil, hydraulic and transmission fluids before you begin operations. Check the level of the electrolyte in the batteries as well. On electric powered forklifts, care and maintenance of the batteries is critical. Electric forklifts must have adequately charged batteries. Operating an electric forklift with insufficient electrolyte in the battery can cause damage to the battery and these batteries are extremely expensive. When charging batteries, be sure the charger is turned off, before connecting the charging cables. Always make sure the water level is above the plates before charging and leave the vent caps on during charging. Vent caps prevent excessive gassing during charging, reducing the chance of excessive hydrogen gas from escaping into the environment. Battery charging areas must have good ventilation. Batteries become quite hot during charging and gas escapes, creating flammable vapors, so proper ventilation must be used in battery charging areas. Batteries should be allowed to cool before using, usually a couple of hours after charging. Again, follow your company's procedures when charging and handling batteries.

Electrical equipment, such as electric forklifts must never be stored outside or exposed to water, to prevent moisture from getting into the electrical motor or electrical parts.

When testing the brakes on fuel powered equipment, if they appear to be spongy or go too far toward the floor, report it to your supervisor. To test the parking brake, start the motor, engage the brake, put the transmission in a forward gear and see if the brake holds. If not, it needs adjusting or repair. Test the steering. Excessive play in the steering wheel is when the steering wheel moves 2 to 3 inches before the rear tires begin to move. Next, inspect the forks for cracks or defects. Inspect the heel of forks, the top of the forks where they attach to the mast and other areas where pressure is applied. Minor cracks can lead to failure of the forks. Raise your forks about 3 to 4 inches off the ground, and then inspect the mast chains to make sure they have equal tension. If one chain is looser or tighter than the other, it could cause a load to shift and fall.

Another good maintenance tip is to run the mast all the way up, then all the way down at the beginning of the shift. Quite often during daily operations, the mast is not always elevated to the maximum height. Without fluid to these areas, it may lead to the hydraulic pistons and rubber parts dry, which can cause premature wear of these parts. Raising and lowering the mast will lubricate these critical areas. Of course, watch the overhead to make sure the mast and forks won't damage or hit any overhead structure.

When you're refueling, there are some important safety tips to follow. Never refuel a forklift propane tank, gasoline or diesel engine inside a building. Whether it's charging electric powered forklifts, or fuel powered forklifts, the motor should be off and smoking prohibited during any refueling or battery charging operations. Small sparks can ignite gasoline, LP gas and hydrogen gas vapors resulting from battery charging. LP gas, in addition to being flammable, is very cold. When handling or refueling propane equipment, proper protective equipment, such as gloves, face and eye protection should be worn. Additional site specific training should be accomplished for refueling propane tanks, forklift equipment and the potential hazards of this flammable gas.

There are many more items relating to vehicle maintenance that we haven't mentioned in this program, but it's important for you to use your good judgement and experience to determine the necessary operator maintenance required on your vehicle. Inspect and make sure the radiator coils are not clogged with dust or debris. Overheated forklifts can be hazardous to the engine, as well as the forklift operator. Keep your vehicle clean, inspecting parts for cracks, leaks, broken parts or other defects.

Each company has different rules relating to operator maintenance. If you are required to perform operator maintenance, you should receive additional training on each forklift you are to operate. As a minimum, you should always check the forklift for safety. If you believe your forklift to be unsafe, report it to your supervisor so it can be inspected and repaired as necessary. The most important part of any safety program is you, the professional forklift equipment operator. If you have a professional attitude, safety will be part of your job. Forklift equipment will provide many years of useful service, but they do need special care and attention from the operator. It may seem like a small price to pay, but operator maintenance is extremely critical to a good maintenance and your safety program.

OPERATOR TEST QUESTIONS AND ANSWERS MAY BE PRINTED FROM THE CD-ROM.

ADDITIONAL INFORMATION RELATING TO FORKLIFTS AND "SITE-SPECIFIC" TRAINING

Truck Marking by the Manufacturer

Every truck shall have a durable, corrosion resistant nameplate(s), legibly inscribed with the following information:

- a. Truck model and truck serial number
- b. Weight of truck
- c. Designation of compliance with the mandatory requirements of ASME B56.1, "Safety Standard for Low and High Lift Trucks," applicable to the manufacturer
- d. Type designation to show conformance with the requirements, such as those prescribed by Underwriters Laboratories, Inc., and Factory Mutual Research Corporation
- e. Rated capacity.

In addition to the above requirements, additional information is required (and allowed) on nameplates on high-lift trucks, electric trucks, and trucks intended for hazardous locations (see ASME B56.1, Section 7.5, "Nameplates and Markings").

Fork Arm Stamping by the Manufacturer

For forklift trucks purchased after December 1984, each fork arm shall be clearly stamped with its rated capacity in an area readily visible and not subject to wear. For example, the designation 1500 □ 24 means 1,500-lb (680-kg) capacity at 24-in. (600-mm) load center.

Attachment(s) Marking

On every removable attachment (excluding fork extensions), a nameplate with the following information is required:

- a. Model number
- b. Serial number on hydraulically actuated attachments
- c. Maximum hydraulic pressure (on hydraulically actuated attachments)
- d. Weight
- e. Capacity
- f. The following instructions (or equivalent); "Capacity of truck and attachment combination may be less than capacity shown on attachment. Consult truck nameplate."

NOTE: The above information should be provided by the attachment manufacturer.

User's Obligation for Truck Marking

The using organization shall ensure that trucks using attachments (including fork extensions) are marked to identify the attachment(s), show the approximate weight of the truck and attachment combination, and show the capacity of the truck with attachment(s) at maximum elevation with load laterally centered. The using organization shall see that nameplates and caution and instruction markings are in place and legible.

Maintain Tags

The forklift truck manufacturer's capacity, operating, and maintenance instruction plates, tags, or decals shall be maintained in legible condition.

ATTACHMENTS AND MODIFICATIONS

Attachments

- a. Attachments almost always affect rated capacity of the truck. When a forklift truck is equipped with an attachment, the rated capacity of the truck/attachment combination shall be established by the truck manufacturer. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

CAUTION: After-market attachments require written approval from the truck manufacturer.

- b. The rated capacity of an attachment/truck combination shall not be exceeded.
- c. Attachments shall be maintained and lubricated as recommended by the manufacturer.
- d. Attachments shall be included in a scheduled maintenance/inspection program at the using facility. Inspection steps shall be tailored for the attachment. Load-bearing components shall be examined for deformation and load-bearing welds shall be visually examined for cracks. Mechanical or hydraulic components shall be inspected and maintained in accordance with the manufacturer's instructions.
- e. Attachments shall be inspected no less than annually and the inspection should be documented.
- f. Hooks that are included as part of attachments shall be inspected, and as specified for hooks on cranes/hoists.
- g. Load capacity of an attachment shall be verified by the manufacturer or by a load test at 100 % capacity that is performed onsite. Load tests are not routinely required since a catalog cut, user's manual, decals on attachment, or other manufacturer's data serves as capacity verification.

Modifications

Modifications or additions that affect capacity or safe operation shall not be performed without prior written approval from the forklift truck manufacturer. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

OVERHEAD GUARDS

High-lift rider trucks, order-picker trucks and rough-terrain forklift trucks shall be equipped with an overhead guard that is manufactured in accordance with ASME B56.1, "Safety Standard for Low and High Lift Trucks," unless an exception is approved in writing by the responsible industrial safety organization. Rough-terrain forklift trucks shall be fitted with an overhead guard that is manufactured in accordance with ASME B56.6, "Safety Standard for Rough Terrain Forklift Trucks."

WARNING DEVICES

- a. Every truck shall be equipped with an operator-controlled horn, whistle, gong, or other sound producing device(s).
- b. The using organization shall determine if operating conditions require the truck to be equipped with additional sound producing or visual devices (such as lights or blinkers), and shall be responsible for providing and maintaining such devices. Backup or motion alarms that sound continuously may be warranted in special cases but generally are less effective than operator-controlled devices.

Note: back up alarms are not required for forklifts, nor are red or yellow blinking lights. The only exception is platform lift trucks, where the operator is raised to the working height; also known as "order selectors". When a person is lifted, a flashing red light attached to the forklift near the ground shall be activated.)

FIRE HAZARD AREAS

Powered forklift trucks for operation in fire hazard areas shall be of the type that is recommended in ANSI/NFPA 505, Powered Industrial Trucks, Type Designation and Areas of Use.

WORK ATMOSPHERE

The operation of forklift trucks affects the concentrations of carbon monoxide and oxygen at indoor work locations. The atmosphere in the work locations must meet the requirements of 29 CFR 1910, "Occupational Safety and Health Standards for General Industry."

TRUCK UNSAFE OR NEEDS REPAIR

If during pre-use inspection or during operation the truck is found to need repair or is in anyway unsafe, the operator shall immediately report the matter to his/her supervisor. The truck shall not be operated until it has been restored to safe operating condition.

NO REPAIR BY OPERATOR

Do not make repairs or adjustments unless specifically authorized to do so.

REFUELING

When refueling the truck, move to the refueling area, if one is designated at your facility, and always stop the engine before refueling. Don't refuel vehicles inside buildings. Company and facility-specific refueling and spill prevention/response procedures shall be followed.

MAINTENANCE AND INSPECTION

Maintenance and inspection of powered forklift trucks shall be performed in conformance with the following practices:

- a. A scheduled planned maintenance, lubrication, and inspection program shall be followed; consult the manufacturer's recommendations.
- b. Only trained and authorized personnel shall be permitted to maintain, repair, adjust, and inspect forklift trucks; these services shall be provided in accordance with manufacturer's specifications.
- c. No repairs shall be made while the truck is in a hazardous (explosive/classified) area.

INSPECTION OF NEW AND RENTED EQUIPMENT

For new equipment (or newly arrived rental equipment), an initial inspection shall verify that requirements of the purchase order (or rental agreement) have been met and that the equipment is suitable for its intended use. This inspection shall be documented and retained in the forklift truck's history file.

CAUTION: For forklift trucks on rental, ensure that a suitable maintenance and inspection program is established for the duration of the rental period.

MODIFIED OR EXTENSIVELY REPAIRED EQUIPMENT

For modified or repaired equipment, an inspection shall ensure that the equipment is in good condition and suitable for its intended use. This inspection shall be documented and retained in the history file.

REPLACEMENT PARTS

All parts that require replacement shall be replaced only with parts that are equivalent, in regards to safety, to those used in the original design.

INSPECTION OF FORKS

Fork Inspection Frequency. Forks in use (single shift operation) shall be inspected at intervals of not more than 12 months or whenever any defect or permanent deformation is detected. Severe applications require more frequent inspection at an interval set by facility management.

Fork Load Rating. Forks used in pairs (the normal arrangement) have a rated capacity of each fork at least half the manufacturer's truck rated capacity at the center distance shown on the forklift truck nameplate.

Fork Inspection Procedures. Fork inspection shall be carried out carefully by trained personnel with the aim of detecting any damage, failure, deformation, or other condition that might impair safe use. A fork that shows any of the following defects shall be withdrawn from service, and shall not be returned to service until it is satisfactorily repaired by the fork manufacturer or an expert of equal competence:

- a. **Surface Cracks.** The forks shall be thoroughly examined visually for cracks and, if considered necessary, are subject to non-destructive crack detection, with special attention to the heel and to the welds that attach the mounting components to the fork blank. Inspection for cracks shall include any mounting mechanisms of the fork blank to the fork carrier. Forks shall not be returned to service if surface cracks are detected.
- b. **Straightness of Blade and Shank.** Straightness of the upper face of the blade and the front face of the shank shall be checked. If deviation from straightness exceeds 0.5% of the length of the blade and/or the height of the shank, respectively, the fork shall not be returned to service until it has been repaired in accordance with para 6.10.5.
- c. **Fork Angle (Upper Face of Blade to Load Face of the Shank).** Any fork with a deviation greater than 3 % from the original specification shall not be returned to service. The rejected fork shall be reset and tested in accordance with manufacturer's recommendations.
- d. **Difference in Height of Fork Tips.** If the difference in height of one set of forks when mounted on the fork carrier exceeds 3 % of the length of the blade, the set of forks shall not be returned to service until repaired **Positioning Lock (When Provided).** It shall be confirmed that the positioning lock is in good repair and in correct working order. If any fault is found, the fork shall be withdrawn from service until satisfactory repairs are made.
- f. **Fork Blade and Shank Wear.** The fork blade and shank shall be thoroughly checked for wear, with special attention to the vicinity of the heel. If thickness is reduced to 90 % of the original thickness, the fork shall not be returned to service.
- g. **Fork Hooks Wear.** When fork hooks are provided, the support face of the top hook and the retaining faces of both hooks shall be checked for wear, crushing, and other local deformations. If

clearance between the fork and the fork carrier becomes excessive, the fork shall not be returned to service until repaired.

- h. Legibility of Fork Marking. When fork marking is not clearly legible, it shall be renewed. Marking shall be renewed per instructions from the original fork supplier.

Fork Repair

Only the manufacturer of the fork or an expert of equal competence shall decide if a fork may be repaired for continued use, and the repairs shall only be carried out by such authorities. Surface cracks or wear should not be repaired by welding. When resetting repairs are required, the fork shall be subject to heat treatment.

Fork Load Test

A fork that has undergone repair, other than repair or replacement of positioning locks or marking, shall be subject to a load test as described in ASME B56.1, Section 7.25, "Forks," Item 3, which lists loading and method of test for forks; except for the test load, which shall correspond to 2.5 times the rated capacity marked on the fork.

Forklift Truck Load Test

Forklift truck load tests are not routinely required. Load tests shall be performed after major repair or modification to components that affect the load-carrying ability of the truck. The manufacturer should be consulted if questions arise as to whether a load test is appropriate. Forklift trucks shall be load tested by or under the direction of a qualified person and in accordance with the manufacturer's recommendations.

Verify Maintenance/Inspection is Current

Load tests shall be conducted only after confirmation that inspection and maintenance is up to date.

Test Weight Accuracy

Test weights shall be accurate within -5 %, +0 % of stipulated values.

Load Test Report

After a load test is performed, a written report shall be furnished by the qualified person that shows test procedures and confirms the adequacy of repairs or alterations. Test reports shall be retained in the truck's history file.

CONDUCT OF OPERATOR

- a. Be certain the truck has been subjected to pre-use inspection.
- b. If the truck is equipped with a seat belt, use it.
- c. Never exceed rated capacity. NOTE: Rated capacity is the weight established by the manufacturer at a required load center at an established height.
- d. Before handling, ensure that the stacks and loads are stable. Block and lash them if necessary.
- e. Do not attach rigging (e.g. slings, chain, shackles, etc.) directly to forks without written management approval.
- f. Prohibit riders on forklift trucks, unless the truck is built with passenger seating.
- g. To avoid personal injury, keep head, arms, and legs inside the operator's area of the machine.
- h. Under all travel conditions, operate the truck at a speed that will permit it to be brought to a stop in a safe manner.
- i. Stop and sound the horn at blind intersections and doorways. Watch out for blind corners, stop and/or sound horn if appropriate.
- j. Use low gear or slowest speed control when descending ramps.
- k. Always spread the forks to suit the load width.

- l. Prohibit any person from standing or passing under the elevated forks, whether forks are loaded or empty.
- m. Lift, lower, and carry loads with the mast vertical or tilted back; never forward.
- n. Avoid reaching through the mast for any purpose.
- o. Lower and raise the load slowly, and only while the vehicle is stopped. Make smooth gradual stops.
- p. Use special care when high-tiering. Return the lift to a vertical position before lowering load.
- q. Avoid sudden stops and starts.
- r. Watch overhead clearance. If in doubt, measure.
- s. Never travel with forks raised to unnecessary heights. Approximately 4 to 6 in. (10 to 15 cm) above floor level is adequate.
- t. Drive slowly over railroad tracks and rough surfaces. Cross tracks at an angle whenever possible.

CAUTION: Parking closer than 8 ft (2.4 m) from the center of railroad tracks is prohibited.

- u. Consider both the truck and load weight when operating in railcars and semi-trailers.
- v. When loading trucks or trailers, ensure that the wheels are chocked and the brakes are set. Operate in front end of the semi-trailer only if the tractor is attached or adequate trailer jacks are in place.

CAUTION: Semi-trailers not coupled to a tractor may require supports (e.g., fixed jacks) to prevent upending or corner dipping.

- w. Inspect floors on trucks, boxcars, unfamiliar ramps, or platforms before start of operation.
- x. Ensure that the bridge plates into trucks or freight cars are sufficiently wide, strong, and secure. Check them frequently.
- y. While turning, be cautious of rear end swing and keep clear of the edge of loading docks.
- z. If the load being carried obstructs the forward view, travel with the load trailing, except when ascending a ramp or incline.
- aa. When ascending or descending grades in excess of 5 %, drive a loaded rider truck with the load upgrade.
- ab. Operate unloaded forklift trucks on grades with the forks downgrade.
- ac. Avoid turning, if possible, and use extreme caution on grades, ramps, or inclines; normally travel straight up and down.
- ad. Unless a towing hitch is supplied by the manufacturer, do not use forklift trucks as tow trucks. When a towing hitch is provided, use tow bars rather than wire rope for towing.
- ae. Never butt loads with forks or rear end of truck.
- af. Do not drive forklift trucks onto any elevator unless specifically authorized and instructed to do so by a written, approved procedure.
- ag. Safeguard pedestrians at all times. Do not drive a truck up to anyone who is standing in front of a fixed object.
- ah. Before leaving a forklift truck unattended, fully lower the forks, neutralize the controls, shut off the power, and set brakes. If parked on an incline, block the wheels. (A forklift truck is unattended when the operator is 25 ft (7.6 m) or more away from the truck, or whenever the truck cannot be viewed directly by the operator.)
- ai. If the operator is dismounted, is less than 25 ft (7.6 m) away, and is within view of the truck, the operator shall first fully lower the forks, neutralize the controls, and set the brakes before dismounting.
- aj. At the end of the operator's shift, return the forklift truck to its assigned parking place, set brakes, lower forks flat on the floor, place controls in neutral position, turn ignition off, and secure the key.
- ak. Report all accidents and "near misses" promptly to the operator's supervisor.
- al. Do not attach or operate any attachment that has not been approved for use on that forklift truck.
- am. Never lift with one fork without an engineering analysis and approval.
- an. Use guides and signalers as necessary; if in doubt, check the conditions personally before proceeding.
- ao. The final responsibility for the handling of a truck remains with the operator.

HISTORY FILE

The truck custodian shall ensure a history file is maintained for each truck under his/her jurisdiction. This file shall be kept while the truck is in service on site. It is permissible for a base file to reference the location and responsible person who has particular information at other file locations or to reference computer data file.

Recommended Contents of History File

The history file shall contain information necessary to operate, maintain, test, and evaluate the forklift truck. A typical history file should contain the following types of documentation, as applicable:

- a. Manufacturer's operation and maintenance manuals
- b. Waivers applicable to the forklift truck
- c. Documentation for replacement forks
- d. Documentation from the manufacturer authorizing modifications to the forklift truck
- e. Inspection procedures and the results of inspections
- f. Records of repair, modification, and overhaul.
- g. Fork inspection records, including record of fork repair.
- h. Authorization from truck manufacturer to use specifically identified attachments.

Forklift Trucks in Hazardous (Explosive) Atmospheres. (SITE-SPECIFIC INFORMATION)

- It is essential to use proper equipment in hazardous (explosive) areas. Trucks approved for use in hazardous areas shall have the manufacturer's label or some other identifying mark indicating approval for the intended use by a recognized national testing laboratory [e.g., Underwriters Laboratories (UL) or Factory Mutual (FM)].
- 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.
- Hazardous-Area Signs. The entrance to hazardous areas shall be posted with a sign to identify the type of forklift truck permitted.
- Hazardous Area Classification. The responsible industrial safety organization shall classify hazardous locations where a powered forklift truck is to be used. Location classifications are described as follows:

Class I:	locations in which flammable gases or vapors are present or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.
Class II	locations that are hazardous because of the presence of combustible dust.
Class III	locations where easily ignitable fibers or filings are present but are not likely to be suspended in quantities sufficient to produce ignitable mixtures.

Unclassified locations not possessing atmospheres defined as Class I, II, or III locations.

Nonhazardous Areas. The following units are not suitable for use in hazardous areas since they include only minimum safeguards against inherent fire hazards:

- a. Type D Forklifts - diesel-powered units having minimum acceptable safeguards against inherent fire hazards
- b. Type E Forklifts - electrically powered units having minimum acceptable safeguards against inherent fire and electrical shock hazards
- c. Type G Forklifts - gasoline-powered units having minimum acceptable safeguards against inherent fire hazards
- d. Type LP Forklifts - liquefied-petroleum-gas-powered units having minimum acceptable safeguards against inherent fire hazards

- e. Type G/LP Forklifts - gasoline- or liquefied-petroleum-gas-powered units having minimum acceptable safeguards against inherent fire hazards
6. Hazardous Areas. The following units are suitable for use in hazardous areas since they are equipped with additional safeguards (i.e., special exhaust, fuel, or electrical systems) or other modifications against inherent fire hazards:
- a. Type DS Forklifts - diesel-powered units that are provided with all the requirements for the type D units and that have additional safeguards to the exhaust, fuel, and electrical systems
 - b. Type DY Forklifts - diesel-powered units that have all the safeguards of the type DS units except that they do not have any electrical equipment, including ignition; they are equipped with temperature-limitation features.
 - c. Type ES Forklifts - electrically powered units that are provided with all the requirements for the type E units and that have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures
 - d. Type EE Forklifts - electrically powered units that are provided with all the requirements for the type E and ES units, and that also have electric motors and all other electrical equipment completely enclosed
 - e. Type EX Forklifts - electrically powered units that differ from type E, ES, or EE units in that the electrical fittings and equipment are designed, constructed, and assembled so 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
 - f. Type GS Forklifts - gasoline powered units that, in addition to all the requirements for the type G units, are provided with additional safeguards to the exhaust, fuel, and electrical systems
 - g. Type GS/LPS Forklifts - gasoline- or liquefied-petroleum-gas-powered units that, in addition to all the requirements for the type G/LP units are provided with additional safeguards to the exhaust, fuel, and electrical systems
 - h. 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.

**OSHA REGULATION INTERPRETATIONS RELATING TO FORKLIFT EQUIPMENT ARE
INTERPRETATIONS FROM LETTERS WRITTEN TO OSHA ABOUT A SPECIFIC REQUIREMENT**

THESE TWO LETTERS REFERS TO OPERATORS WEARING SEAT BELTS:

April 8, 1998

U.S. Department of Labor
OSHA
Attn: Director of Compliance
200 Constitution Ave, N.W.
Washington, D.C. 20210

Dear Sir:

I have been reading your interpretation letters and have found them to be of great help:

I know that seatbelts are required to be worn by forklift operators according to AMSE. I have union labor in my operation and their job entails them getting off and on the forklifts to align loads for each load. They are saying that our industry is a unique industry and that they should be excluded from the seatbelt law. I disagree. I would like to have your interpretation of the law, in writing so that I can present them with it. I have the letter from 1996 but they feel that the trade show industry was not considered when this letter of interpretation was written.

October 9, 1996

Mr. George R. Salem, P.C.
Akin, Gump, Strauss, Hauer & Feld, L.L.P.
1333 New Hampshire Avenue, N.W.
Suite 400
Washington, D.C. 20036

Dear Mr. Salem:

Thank you for your letter dated September 5, requesting clarification of whether the Occupational Safety and Health Administration (OSHA) general industry powered industrial truck standard, 29 CFR 1910.178, require forklift operators to wear seat belts while operating forklifts.

American National Standards Institute (ANSI) B56.1-1969 Safety Standard for Powered Industrial Trucks, was adopted by OSHA under the procedures described in section 6(a) of the Occupational Safety and Health Act (OSH Act). OSHA's general industry standard for powered industrial trucks does not contain any provision which requires the use of seat belts. However, Section 5(a)(1) of the OSH Act requires employers to protect employees from serious and recognized hazards. Recognition of the hazard of powered industrial truck tip-over and the need for the use of an operator restraint system is evidenced by certain requirements in the more current versions of ANSI B56.1 consensus standards for powered industrial trucks; ASME/ANSI B56.1a-1989 Addenda to ASME/ANSI B56.1-1988, and ASME B56.1-1993 - Safety Standard for Low Lift and High Lift Trucks. These consensus standards require the use of an active operator protection device or system when provided on a powered industrial truck. In addition, seat belts have been supplied by many manufacturers of counterbalanced, center control, high lift trucks which have a sit-down non-elevating operator position. Also, some manufacturers have instituted retrofit programs for the installation of operator restraint systems to older trucks.

OSHA's position in regard to the use of seat belts on powered industrial trucks is that employers are obligated to require operators of powered industrial trucks which are equipped with operator restraint devices or seat belts to use the devices. OSHA can enforce the use of such devices under Section 5(a)(1) of the OSH Act. OSHA may also cite Section 5(a)(1) of the OSH

Act if an employer has not taken advantage of a manufacturer operator restraint system or seat belt retrofit program.

With regard to your comments concerning 1910.178(a)(2), ANSI B56.1-1969 contains three parts: Part I - Introduction; Part II - For the Manufacturer; and Part III - For the User. 1910.178(a)(2) require powered industrial trucks to meet the design and construction requirements established in Part II, ANSI B56.1-1969. Part III of ANSI B56.1-1969, which covers general safety practices, operating safety rules and practices, and maintenance for powered industrial trucks, was adopted by OSHA.

Thank you for your interest in occupational safety and health. If we can be of any further assistance, please contact Mr. Will Epps of my staff at(202)219-8041.

Sincerely,

John B. Miles, Jr.
Director
Directorate of Compliance Programs

OSHA STANDARDS/MATERIAL HANDLING/FORKLIFT

A complete list of the OSHA standards, relating to Material Handling Equipment and Forklifts can be found on their website at:

http://www.osha-slc.gov:80/OshStd_data/1910_0178.html

You may download these and other standards that apply to your specific operations. Additional OSHA “interpretation letters” relating to forklift standards are also available for download.

The remaining sections refer to a variety of information that can be used for “SITE-SPECIFIC” training. This means if you have potential hazards, equipment and other “site-specific” information that relates only to your operations, training must be conducted to cover these items. Site-specific items not covered in this FORKLIFT TRAINING PACKAGE, must be identified and operators must be trained in these identified items.

FORKLIFT OPERATOR EVALUATIONS:

The objective of this rating sheet is to ensure that employees understand the mechanics of the lift truck as well as all of those items that involve standard checking prior to driving the lift truck.

The operator should be familiar with the features of the lift truck. This can be evaluated by having the operator demonstrate and describe the following:

1. Proper use of tilt.
2. Proper use of raise and lower.
3. Proper use of horn.
4. Check for oil leaks.
5. Check mast chains.
6. Check tilt and lift cylinders for wear and/or leakage.
7. Check brakes.
8. Check tires and wheels.
9. Check hour meter.
10. Check scissors reach.
11. Check warning light.
12. Check rear view mirror.
13. Check battery retainer.
14. Check discharge indicator.

15. Check back up alarm.
16. Check hose and hose reel.
17. Check overhead guard's light.
18. Know capacity of lift truck.

The operator is asked to identify many safety items at the dock and battery recharging area, as well as overall safety.

Dock	Battery Charging Area
Wheel chocking	Protective equipment
Dock plate	Acid neutralizing
Trailer lighting	MSDS
Condition of trailer floor	No smoking
Keep clear of dock loading area	Plug/unplug procedures
Be aware of signs	Clean-up procedures
Correct height of empty pallets	Eyewash station
Commercial battery rules	
Fire and Safety	Personal Safety
Location of extinguishers	Use of eye protection
How to use extinguisher	during banding operations
Type of extinguisher to use	
Eye protection during banding	

Operating Skills Evaluation

Determine the operating skills of employees by making a full evaluation while they are driving the lift truck.

1. Did the operator pull forward toward the designated section of racking without endangering anyone?
2. Did the operator place the forks under the pallet properly?
3. Did the operator raise or tilt the load properly?
4. Did any part of the container strike any section of racking while removing the pallet?
5. Did the operator lower the pallet before moving or backing out? (Don't drive and lower the pallets at the same time.)
6. Did the operator drive at a safe speed?
7. Did the operator slow down or stop at cross aisles?

8. Did the operator sound his/her horn at blind intersections?
9. Did the operator pull into the racking area properly to place the pallet back in the racking?
10. Did the operator strike any racking on the way up or going into the rack?
11. Did the operator back out and lower his/her forks before moving?
12. Did the operator always look behind before backing up?
13. Was the operator wearing protective equipment?
14. Did the operator drive around the block of wood or obstacle on the floor, or did he/she get out of the truck and remove it?
15. Did the operator set the load flat on the floor before getting out of the truck?
16. Did the operator put on a hardhat before getting out of the truck?
17. Did the operator perform any moves that were potentially dangerous?

IT MAY SEEM THAT MANY OF THE CHECKLISTS WE PROVIDE IN THIS MANUAL ARE REDUNDANT; HOWEVER, DIFFERENT COMPANIES NEED DIFFERENT CHECKLISTS. WE ARE SIMPLY TRYING TO COVER AS MANY "SITE-SPECIFIC" NEEDS AS POSSIBLE. IF SOMETHING DOES NOT FIT YOUR OPERATIONS, JUST DELETE THEM.

PROPANE SAFETY (IF YOU USE PROPANE, TRAINING IS REQUIRED)

Liquified petroleum gas, commonly called LPG or LP gas is a mixture of several hydrocarbon gases. Propane and butane, used separately or in mixtures, are the principal LP-gases. Propane is the LP gas most widely used in the USA. Propane is a vapor at normal temperatures and atmospheric pressure. Your gas supplier converts propane to a liquid by a combination of compression and cooling, which greatly reduces space requirements. Approximately 270 gallons of vapor can be converted to one gallon of liquid. Moderate pressure holds the propane in liquid form until needed and of course, a pressure tank is necessary to maintain this pressure. Propane has been a common fuel in homes and businesses since the early 1920's. Today, propane is used extensively for forklifts operating in warehouses because propane's clean burning properties eliminate sludge, carbon and gum deposits, resulting in lower maintenance and operation costs, as well as reducing harmful exhaust emissions.

Without going into great detail, let's quickly review some basics of a propane dispensing tank. The dispenser is a complete system consisting of the fuel supply tank, hose coupling and all fixtures necessary to complete the system. It's important that any person using the propane dispenser unit to transfer propane liquid into portable cylinders. Learn what inspections and preventative maintenance are required and if you have any questions about the safety features of the system; be sure to ask your supervisor. This program is designed to provide basic safety knowledge of proper cylinder refueling operations by vehicle operators. The most important consideration is safety, so always follow your company's policies and procedures relating to refueling propane cylinders and other safety regulations recommended by the Propane supplier or equipment manufacturer. The very first step is to make sure the cylinder is approved by the markings on the cylinder, such as DOT, ICC or ASME nameplates. Inspect the cylinder to determine if there is any damage to the cylinder, before filling and never use a damaged or if defects are found. A protective ring or housing is required on all approved cylinders to prevent physical damage to the valves. The next step is to make sure there are no open flames, sparks or other sources of ignition near the refueling tank or area. Naturally, no smoking is allowed near the refueling area. The vehicle must be shut off during refueling and it is recommended the forklift propane cylinder remain on the vehicle during refueling.

All propane cylinders should be considered under pressure, therefore, should be handled in a safe manner to prevent damage. Let's now take a look at the refueling of a forklift propane cylinder from a

dispensing unit. In addition to inspecting the cylinder for proper marking and identification, a check should be made to detect any gouges, dents, bulges or other damage. Check for leaks. All seams and openings should be inspected. Check that the relief valve will discharge directly into the atmosphere and will not impinge on the tank, structural members or adjacent objects. A protective cover should be installed on the piping to prevent entrance of moisture or debris into the relief valve. Always wear proper protective gloves and eye/face protection as required by your company safety regulations. Remove the protective plastic cap on the tank filler valve. Connect the hose coupling to the tank filler valve. Open the main liquid valve at the storage tank. Turn on the transfer pump. Open the valve on the tank to be filled is so equipped. Slowly open the hose end valve, no more than two turns. Check the entire system for leaks. Open maximum liquid level outage bleeder valve approximately one quarter turn until the gas starts to vent. Fill the tank until liquid vents from the outage valve. When liquid vents, there will be a visible cloud and this indicates the cylinder is full. When liquid vents, close the hose end of the valve immediately. Shut off transfer pump and close the outage valve.

A word of caution: DO NOT OVERFILL THE TANK. Adequate vapor space must be left in the tank to allow for expansion of the liquid. If over filled, bleed off excess LP gas in a safe location. Close the valve on the tank if so equipped. Open the bleeder valve on the filler hose from the filler tank and partially loosen the hose coupling at the tank filler valve and bleed off trapped liquid. When depressurized, disconnect the hose coupling. Replace the protective plastic cap on the tank filler valve. Check that the outage gauge is closed tight, close the main liquid valve at the storage tank and store the hose properly. Forklifts normally have another safety relief valve located behind the driver's seat on most equipment. In the event the tank is overfilled and expansion occurs, the cylinder's safety valve would vent the over fill, however, if that valve does not function properly, an additional safety relief valve on the forklift will allow the gas to escape. This points out the need for forklift operators to inspect the entire fuel system on the vehicle. Inspect fuel hoses, connections and the safety relief valve for any sign of wear, damage or leaks.

Quite frequently, fuel connections from the cylinder to the forklift become loose and should be checked periodically to make sure they are properly tightened. Certainly, there may be different systems, different types of cylinders and other configurations of propane systems, but it's important that you follow the equipment manufacturer's recommendations, your propane supplier's recommendations and of course, your company's safety policies and procedures. Right now, let's take a look at some of the characteristics of propane, to give you a better understanding of the liquid and vapor.

As a liquid, propane is easily transported and stored, but requires special handling and safety procedures. Propane burns cleanly, has a high heat value and has a high octane number. Propane is not poisonous. Propane liquid is colorless and odorless in its natural state. A rotten egg odor is added to propane for your protection and to aid in detection. You should always be able to smell this odor if a small amount of vapor is vented into the air. Propane liquid is extremely volatile and will vaporize quickly if spilled. Propane liquid leaking into the atmosphere can often be detected by a white fog caused by freezing of moisture in the air. Propane vapor is heavier than air and can accumulate in low spots. Escaping propane could lead to one or more of the following incidents:

1. Fire due to burning of the gas.
2. Explosion due to ignition of combustible mixture of gas and air in a confined space.
3. Asphyxiation due to the lack of oxygen.
4. Freeze burn from direct contact of propane liquid with the skin. Where escaping gas is encountered, all possible sources of ignition must be considered and eliminated or controlled.

Do not remain in a propane rich atmosphere for any prolonged length of time for the following reasons:

1. Propane vapors are non-toxic, but they can reduce the oxygen content in a vapor cloud or enclosed space.
2. In an atmosphere of pure propane vapor, a person would rapidly become unconscious and die in several minutes if not removed from this atmosphere. Oxygen starvation often develops slowly and the victim is generally unaware that anything is wrong until it's too late.

3. Direct contact with propane liquid produces rapid freezing of skin tissue because of the high rate of heat transferred. This freezing causes a "chemical burn" very similar to frostbite. Gloves which will not absorb propane liquid should be used when handling propane. The wearing of clothing which will repel or partially absorb liquid is the best way to avoid exposure to your skin from propane liquid. Immediately remove any clothing, which has been saturated with propane liquid to reduce the extent and severity of skin burns.
4. Safety glasses and a full face shield are recommended when filling propane tanks and cylinders, due to the same exposure as your skin. If you need or want more information regarding propane, consult your company's Material Safety Data Sheet for propane. This MSDS provides additional information on the Hazardous Ingredients, Physical Data, Fire and Explosion Hazards, Health Hazard Data, Reactivity Data, Spill or Leak procedures, Special Protection Information and any Special Precautions.

As a review, let's quickly list some of the basics when handling propane. First of all, it's flammable and can explode if the proper mixture of air and vapor is ignited by an ignition source. Propane can cause chemical burns, similar to frost bite, so always wear proper clothing and personal protective equipment. When using a filling tank, make sure you know and understand all the safety features and manufacturer's instructions and have been properly trained for this job. When filling cylinders, make sure there is no damage or leaks in the cylinder and it is an approved type cylinder or tank. Be sure to open the vapor valve when filling the tank, so you'll know when the tank is full. A white fog or cloud from the tank indicates the tank is full. Do not overfill any propane cylinder, to allow for expansion. Be sure to inspect fuel lines, safety relief valves and the fuel system of your equipment for leaks or damage. When handling cylinders, use proper safe lifting techniques to prevent back injuries and safe handling to prevent damage to cylinders. The most important aspect of propane handling and refueling is to follow your company's policies and procedures. Each company is unique, with different systems and operating rules. If you want or need more information on propane, ask your supervisor for the MSDS or Material Safety Data Sheets. Proper training and a good safety attitude will go a long way to making your job and the handling of propane much safer.

BATTERY CHARGING SAFETY (required if you charge batteries)

Regardless of the type of electric material handling equipment you use, such as forklifts, pallet jacks, rider pallet jacks, walkie stackers, personnel carts or others, one thing is certain and that's battery charging. In this program we want to emphasize that each equipment and battery manufacturer has its own specific maintenance and operating procedures and these should be followed at all times. **Your company** has specific rules and procedures and these should also be followed. The information in this program has been taken from a variety of sources, a variety of manufacturers and information used by many companies with excellent maintenance practices. It's a review of the basics of charging batteries, regardless of the type equipment used; however, it's up to each individual to follow your company's rules and procedures when charging batteries.

Basic tips for handling industrial equipment batteries.

The first rule is to always wear personal protective equipment, which includes rubber apron, gloves, boots and face/eye protection when handling, checking, filling, charging or repairing batteries. Electrolyte used in the batteries is a mixture of sulfuric acid and water and is quite caustic which can easily burn your skin. Keep open flames away from batteries and never try to check the electrolyte level with a cigarette lighter or match. Use a non-sparking flashlight or other approved lighting and do not smoke or create sparks near batteries. The space between the underside of the cover and the top of the electrolyte in the cell usually contains a hydrogen-oxygen mixture, which is explosive when ignited. Make sure you charge batteries only in those areas approved for battery charging and is well ventilated.

Be prepared for an electrolyte spill and have adequate water available to flush your skin or other affected area with water. Volumes of water applied quickly and continuously will prevent serious injury to the skin. Quick medical attention is necessary to assure proper care and treatment. Splashes to the eyes can be avoided by wearing proper eye/face protection, however, if electrolyte is splashed into the eyes, wash the eyes with water for 15 minutes and get immediate medical attention.

Spills should be cleaned up immediately by using a strong neutralizer such as baking soda. The baking soda will neutralize the acid and make it safe to clean or flush from the floor or other surfaces. When changing or repairing plugs or receptacles that are connected to the charging equipment, be sure to shut off the power first. This will prevent a short circuit and arcing of an electrical spark. Arcing can cause an explosion and fire. When mixing acid to prepare electrolyte, ALWAYS POUR THE ACID SLOWLY INTO WATER and never pour water into the acid. If water is added to acid it will not readily mix and will splash the acid due to the great difference in the specific gravity of the two liquids. Always store acid in plastic or glass containers.

Always lift batteries with mechanical equipment such as a hoist, crane or lift truck. Move batteries horizontally with power trucks, conveyors or rollers. Make sure that hoist hooks, spreader bars and other tools are of ample strength and properly installed. Cover the top of batteries with a rubber mat or other insulating material to prevent external short circuits from chains or cables falling onto the top of the battery. Proper handling of batteries is essential to prevent injuries and to prevent battery damage or electrolyte spills. Make sure that charging plugs and receptacles are properly locked and all other connections tight, secure and free from friction. A loose connection may mean sparking or arcing near highly explosive gas mixtures. Enclose all bare wires and bus bars in the battery room by wire guards, guard rails or other means of isolation from general plant traffic, as any open, high current transmission equipment is a possible hazard to you, other workers and the equipment. Double check to make sure the charger being used matches the voltage and amperage of the equipment battery. Voltages and amperages are found on the equipment data plate and on the charger data plate. Before disconnecting or connecting batteries to a charger, make sure the charger is in the OFF position. If an attempt is made to do this while the charger is ON, serious injury to you, the battery and charger could result.

Before charging, make sure the battery cells contain the correct amount of water. Charging batteries with a low water level might result in damage to the cells. Keep in mind that battery fumes are explosive and to check the cells with a flashlight or other approved light. Before connecting the battery cable to the equipment's receptacle, make sure the key switch is off and all controls are in the off position and the brakes are locked. The battery cable must be fully connected before the equipment is used. If the plug is not making good contact, heat will weld the two parts of the battery connector together, making it difficult to remove and necessary to replace. Battery terminals should be checked and cleaned of any corrosion. Good battery terminal contact is essential not only for operation, but also for proper charging of the battery. The battery cover should be closed except when charging, then it must be left open.

Disconnect the battery from the truck when doing maintenance and repair work on the motor or electrical system. Obviously, live current may cause arcing or short circuiting. Never lay metal tools such as wrenches or other material on top of an open battery. Sparking and short circuiting will occur and can quickly discharge the battery or may explode. Check batteries for cracks or leaks and repair them when detected.

If batteries are not in use, they should be kept charged. A freshening charge of about 3 to 4 hours at the finish rate may be necessary if the specific gravity has fallen 30 points or more. When recharging a fully discharged battery, the starting charge rate may be 3 to 5 times higher than the finish charge rate indicated on the battery nameplate. The charge rate should taper down to the finish charge rate by the time the battery is 85 percent charged and may be even lower when fully charged. High "on charge" temperatures or frequent need to add water are indications of overcharging. Be sure to follow the equipment manufacturer's instructions on proper battery charging.

The top of the battery should be kept clean and dry. Keep vent caps in place during use and when charging. Let's stop here a minute because there have been questions and confusion in the past about the practice of leaving vent caps on or off during charging. Many years ago, safety rules dictated that vent caps must be left off during charging, to help dissipate the heat during charging. However, in the past 15 or so years, engineers and other safety professionals have determined that vent caps must remain on during charging. Most manufacturers today also state that vent caps should remain on during charging. Vent caps must be checked to make sure the vent holes are not plugged and are functioning properly. The vent caps dissipate heat during charging and allow small volumes of gas mixtures to escape. If the vent caps are left off, a large volume of hydrogen gas could escape and build up, creating

a greater explosive hazard. It is clear however, that battery compartment covers must remain open during charging.

When batteries are not mounted on equipment, they should be placed in proper storage areas, but never stored directly on a cement floor. If necessary, place them on wooden pallets and store in a dry, moderately cool area. Lead acid batteries will slowly "self discharge" over a period of time due their chemical makeup. If the self-charge is left uncontrolled, excessive sulfation can occur which is difficult to reduce and may damage the plates. If a greasy film forms on the top of batteries, this is acid and should be neutralized with a baking soda solution. Keep all batteries in a clean condition.

How about the type of water you should use when filling the battery? The answer is to always use distilled water. The reason for this is simple. Distilled water removes impurities in water. Using regular tap water in batteries causes these impurities to attach themselves to the battery plates during charging, or chemical action and can cause the battery to decrease its normal life expectancy. Use distilled or other approved water when filling batteries. Don't use tap water because it will cause the life of the battery to be decreased over time. Always follow your equipment manufacturer's recommendations.

Some manufacturers recommend that when your battery is discharged 85 percent, it's time to get it recharged. Some manufacturers don't have charge/discharge meters on their equipment. The moral of the story is to follow the manufacturer's recommendations. Equipment, battery and charger manufacturer's instructions, combined with your company's policies and procedures are the best sources of information for safety and long life of the equipment. If you're not sure about something, ask your supervisor. The job and the equipment you use are too important to be left to chances.

RIDER PALLET JACK (required if you use pallet jacks)

A very important piece of equipment in the warehouse and material handling areas is the electric pallet jack. It's an economical and versatile unit, designed to move stacks of materials from one place to another, safely and without injury or product damage. Because it's easy to use and provides such durable service, it's natural to take them for granted, but there are basic safety rules and operating procedures required when using this type of equipment. Maintenance of the equipment is equally important.

Be sure to follow your organization's policies and procedures when using or operating this type of equipment. Each electric pallet jack manufacturer has different operating procedures and safety rules, so be sure to read and understand the rules for each type of equipment used. Keep in mind each manufacturer's vehicle may be slightly different than the ones we use in our demonstration, but the basic principles apply to most equipment.

The vehicle itself is composed of Directional and Speed control levers, horn, lift and lower... and high speed controls. A T-Bar support handle, battery, pallet forks for the load, load wheels and tires. A skid runner, rider platform, drive unit cover and steering and brake control handles.

You'll become familiar with all the controls and levers through on the job training by your supervisor and as you gain experience with this equipment. It's important to know and understand the operating rules, maintenance procedures and all the safety rules used with this type of equipment. Take a look at the data plate on your specific vehicle. It will provide some specific data about the vehicle, such as serial number, make, model, but more importantly, it will provide the maximum safe load capacity of the vehicle. Never exceed the safe lifting capacity of the vehicle at any time.

Basic operating rules for this type of equipment:

1. Know your equipment. Do not operate the equipment until you have been trained and authorized by your company. Read all warnings and instructions in the operator's manual the information on the vehicle's data plate and other areas. If your vehicle is found to be in need of repair, defective, or in any way unsafe to operate, the vehicle should be taken out of services until it has been restored to a safe operating condition.

1. No riders. Passengers are not allowed to ride on this type of equipment. Be sure you never permit anyone to stand in the area where the load is being positioned or deposited, as foot injuries can easily occur.
2. Make sure your loads are stable and are not stacked too high. Loose or unstable loads can fall and cause serious injury. Use special care when handling long, high or wide loads to avoid losing the load, striking bystanders or tipping the vehicle. Carry the load flush against the load stop.
3. Center your load. When using forks, space the forks as far apart as the load will permit. Before lifting, be sure loads are centered and forks are completely under the load. Of course, never overload the vehicle. Do not hit or bump anything with the ends of your forks, as this can damage the vehicle. Never lift a load with only one fork engaged.
4. Keep the load low to the floor. Travel with the load or lifting mechanism low to keep the center of gravity low, but make sure the load is lifted high enough to insure adequate floor clearance. Never lift or lower the load while the vehicle is in motion.
5. Avoid sudden movement. Start, stop, travel, steer and brake smoothly. Use special care when traveling without the load, as the risk of overturning the vehicle is greater when unloaded.
6. Exercise caution on ramps and inclines. Travel slowly and do not angle or turn on ramps. Always travel with the load downhill when using pallet jacks. Be extremely cautious when operating the vehicle near the edge of a loading dock or ramp.
7. Secure bridge plates. Drive carefully and slowly across dockboards and bridgeplates. Never exceed these dock boards or bridge plates' rated capacity and make sure they are secured before driving on these plates.
8. Do not operate this equipment with greasy hands or shoes. It's too easy to slip off the controls and create an unsafe condition.
9. Come to a complete stop before changing directions.
10. Do not push extra loads or other pallet jacks. Pushing another vehicle or extra loads is damaging to the vehicle's working parts. Never allow your vehicle to be pushed or towed by another vehicle. Should a truck become disabled and require moving, notify management for the proper procedures.
11. When traveling, keep your hands, feet and other parts of your body inside the running lines of the vehicle. Always look in the direction of travel and keep a clear view of the path of travel. When visibility is impaired, operate the vehicle with the opposite end in the travel direction and use caution. Be careful of drive end swing when turning while operating the vehicle in reverse. This could result in damage to material or equipment, specifically to the drive end of your vehicle. Another very important safety tip is to keep your feet well away from the front skirt and rider platform when maneuvering the vehicle.
12. Before entering trucks or trailers, be certain the brakes on the truck or trailer are applied and the wheel chocks are in place. If trailers are not coupled to a tractor, supports may be needed to prevent upending or corner dipping of the trailer. Inspect the flooring of trucks, trailers and rail cars for breaks and weakness before driving onto them. Make sure you know the weight of the load and vehicle, compared to the maximum load rating of the floor onto which you are driving.
13. When approaching cross aisles, slow down, sound your horn and if vision is obstructed, keep to the right side. Operate the truck under all conditions at a speed that will permit it to be brought to a stop in a safe manner. Of course, yield the right of way to all pedestrians.

14. When parking your vehicle for an extended period of time, be sure the lifting mechanism is lowered, controls are placed in neutral and the brake is applied. Shut off the power and disconnect the battery connection. Keep your vehicle clear of exits and access to stairs and fire equipment and don't block aisles.
15. SPEEDING. Electric pallet jacks don't have speedometers. Generally, the rule of thumb is to go slow. If you're going fast and have to make a sudden stop, you can be thrown off the vehicle. The vehicle appears to be lightweight, however, when you're operating the vehicle, it has a tremendous amount of force and weight and if you run into a person or stationary object or another piece of moving equipment, the damage and injuries can be quite substantial. Don't speed, go slow and be prepared to stop.

On some electric pallet jacks, they have several safety features you should look for and become familiar with for safety. A reversing switch may be located on the T-Bar. This reversing switch is provided to protect the operator from being pinned between the truck and an immovable object. When pushed, this button will reverse the direction of the truck away from the operator, whenever the steering arm is in the operating position. Many models have an automatic brake, designed to stop the vehicle when the handle is moved to a completely vertical position, or a completely horizontal position.

If you are operating a walk only type vehicle, then no one should ever ride on this type vehicle. They have special features and are not designed for riders or passengers.

Each manufactured vehicle has special features and requirements and these basic safety tips may or may not apply to your equipment. Use the manufacturer's safety recommendations, operating instructions and other information as the basis for operating your vehicle safely. Follow your company's operating rules and instructions.

How to inspect your equipment before you use it.

We won't discuss anything about batteries, as this is covered in another training program; however, there are some basic maintenance checks that operators should conduct before operating any electric pallet jack equipment.

Before each shift...every 8 hours, it is the operator's responsibility to carry out the following checks and inspections before beginning operation. Do not operate the vehicle if it is need of repair. If it's in an unsafe condition, remove the key and report the condition to the proper authority. If the truck becomes unsafe in any way while you're operating it, STOP operating the equipment and report the unsafe condition to your supervisor.

Ok, let's quickly check the vehicle. Make sure the load backrest extension and any other safety devices are properly attached and in good working condition. Make sure capacity, safety and warning plates are decals are installed and visible. Inspect the vehicle for damage that may have occurred during the previous shift. Inspect the vehicle before and after your shift for any signs of external leaking, such as the battery or hydraulic system. Operate the service/parking brakes, all hydraulic controls, accelerator switch, forward and reverse directional switch and steering. Make sure they operate freely and return to their proper positions. Inspect the condition of the tires. Inspect the forks for cracks or broken parts. Test the horn, lights and all other accessories. Make sure they are properly mounted and in good working order. Operate the vehicle and make sure all gauges and meters are functioning properly. In other words, inspect all areas of the vehicle, all accessories and verify that there are no leaks, damage or defects. That's your job and responsibility. This equipment will serve you safely and efficiently, however, it's important that you maintain the equipment in a safe and serviceable condition at all times.

Manual pallet jacks require the same care, handling and operating as do electric pallet jacks. Inspect the equipment before you use it and make sure all the safety and operating features are working properly. Never, under any circumstances should you use the pallet jack as a scooter, or in any way ride on this equipment. Do not carry passengers on the equipment. **When going up or down ramps, the operator must remain upgrade. This means the load will be carried downgrade, with the operator upgrade. The reason for this is quite simple. If the load or the pallet jack becomes a runaway from the**

weight or the angle of the ramp, the operator will be protected by being upgrade. The rule is different for forklifts, as safety rules require the load to be upgrade. (the pallet jack rules are different than using a forklift).

The most important consideration in using any type of equipment is to use your good judgement and don't take chances. The time you try to save by speeding, taking short cuts or not following the rules isn't worth it. One accident will wipe out any benefit you get by taking chances, so don't take chances.

WOOD PALLET SAFETY

Regardless of your job in a warehouse environment, you're going to be using and handling wooden, plastic or metal pallets. Pallets are very useful in the material handling business because they allow us to stack and move materials safely and quickly.

Pallets are very common and used in so many different places, we often tend to forget that pallet safety is part of the safety program. To help you become more familiar with pallet safety, let's review the basics because many people, all over the world, experience injuries from mishandling and misusing pallets. Wooden pallets are the most common, so we'll use wooden pallets as our examples in this training program.

First of all, pallets come in different sizes; however the most common size pallet is 48 inches by 48 inches. It's quite versatile and can be used by both pallet jacks and forklifts.

Next, we have a 40 inch by 48 inch pallet. The same versatility applies to this pallet; however, it's somewhat different in how it can be handled. On a 40 by 48 inch pallet, both forklifts and pallet jacks may pick up the pallet from the 40 inch side. However, only forklifts should be used to pick up this size pallet from the 48 inch side. As you can see, pallets have different measurements, specifications, stringers and different weight capacities. If you mishandle, misuse or overload pallets, you're creating a potential injury. Rarely do equipment handlers pay attention to the specifications of pallets, however, each size pallet has different load and weight ratings and must be used according only to your company's rules and regulations. If you're not sure about a pallet's specifications and load limits, ask your supervisor.

The size of the pallet can also affect the forklift or other material handling equipment. Let's say you have a 48 by 48 inch pallet. The load center of an evenly stacked load is 24 inches. The load center is measured from the center of the load, to the vertical face of the forks. This load center is extremely important because the load center directly affects the lifting capacity of the forklift. If the forklift's maximum capacity load limit is 5,000 pounds when lifting a 24 inch load center, if you extend the load center to say 30 inches, this forklift cannot safely lift the same 5,000 pounds. A 60 inch pallet, evenly loaded would have a load center of 30 inches, which greatly decreases the safe lifting capacity of the forklift.

You don't have to remember all this, but you must be aware that different size pallets do have an effect upon the safe lifting capacity of lift equipment.

Right now, let's look at some basics when handling and using pallets. Certainly, each company has specific rules and standards for handling pallets, however, the information provided here can give you the basics of pallet handling and adding to your knowledge and safety awareness, to help prevent pallet injuries. The first rule is when handling pallets, always wear appropriate gloves, to help prevent hand injuries.

Before you use a pallet, check it to be sure it can be safely stored in a rack, with a heavy load. It should be in good condition, with top and bottom boards in place. Boards should be the proper thickness, at least 5/8ths of an inch and solid. Boards should not be cracked or have any pieces missing. Stringers, as shown here, must be in good repair and if they are damaged, they should be properly repaired with plugs or mending plates. There must be no protruding nails or slivers of wood on the pallet. This may look like a lot to inspect; however, as you gain experience, a quick glance can tell you if the pallet is in a safe condition. If you determine that a pallet is unsafe to use, take it out of service until it can be repaired.

When moving pallets across the floor, stand it up on its edge and slide it, pulling it from the end, then lay it down. Don't lift and carry pallets as they weigh approximately 65 pounds and are quite awkward to carry. **DO NOT THROW PALLETS.** Several bad things can happen when you throw pallets. Obviously, back and ligament injuries can occur and the pallets can be damaged. Don't throw pallets.

DO NOT STORE PALLETS ON ITS EDGE OR END. So many injuries are caused by pallets falling, so don't store pallets on edges or ends. Stack them properly. When positioning a pallet on the floor, don't drop or throw it because it can be damaged. A damaged pallet can break when a heavy load is put on the pallet and can be quite dangerous, especially if the damaged pallet is stored in a rack.

Don't walk on pallets. Walk around a pallet because the chances of slips, trips and falls increases on a pallet. Boards can break, your feet can slip between the openings and other hazards. Don't walk on pallets. In some cases, you may have to step on pallets if you're loading them by hand or for other reasons, but when you do, try to use only one foot on the pallet and the other one on the floor, for good traction and stability. In some cases the floor may be slippery and when you step on a pallet, the entire pallet moves, causing you to fall.

When you've finished stacking product off a pallet, stand the pallet on its side and pull it to the area for stacking empty pallets. There should be two stacking areas. One for serviceable and reusable pallets, the other area for pallets that need repair. Don't mix unsafe pallets with serviceable pallets. Another safety tip is how to safely lift pallets onto stacks. Don't stack pallets more than 7 or 8 high. That's about the maximum safe stack for people to reach. Naturally, you'll eventually stack pallets about 15 feet high to save room, but that's the job of a forklift. You can manually stack 7 to 8 pallets high, and then use forklifts to make higher stacks.

When sorting pallets, this is a 2 person job. Be sure both persons use gloves and one person stands on each end of the pallets in the stack being sorted. The stack being sorted is in the center, with a sort-to stack on each side. One stack for reusable pallets, the other for pallets requiring repair. With one person on either end of the pallet, carefully inspect the top surface for broken/missing boards, cracks, chunks missing, proper thickness and proper repair. Turn the pallet up on the edge and inspect the bottom boards. Then both people pick up the pallet and move it to the proper stack. Simple, efficient and safe.

To properly and safely stack pallets, slide the pallet up to the side of the stack. Stand facing the pallet. The deck boards will be vertical, facing you. Firmly grasp the deck boards and with the proper lifting motion, slide the pallet up the side of the stack, over the top and lay it onto the stack, then square the stack. Let's look at that again, specifically the safe lifting motion. Your back is in its natural curvature, knees are bent and you lift with your leg power, not your back muscles. It takes practice, but it's the safe way to lift pallets onto stacks. Remember to manually stack pallets only 7 or 8 high and let forklifts make larger stacks.

Naturally, pallets are used on a daily basis and material handlers don't take the time to think about pallet safety. In your experience, you may think of hundreds of other safety tips relating to pallet safety. Forklift operators in a hurry can easily damage a pallet and continue to use it. Pallet jacks are notorious for breaking the bottom boards of pallets, so when you use pallet jacks, be careful not to break off the bottom boards, making the pallet unsafe to use.

As we have stated, pallet safety is important and it isn't given the attention to safety it deserves. Take the time and effort to think about a 2500 pound load, raised to heights of 15 to 20 feet and make sure the pallet is safe, sturdy and has been properly handled to prevent an injury. Will the pallet be safe enough to hold the load? If you handle, store or use pallets, you're the only person who can answer the question. It takes an effort on everyone's part to make pallet safety a part of your everyday operations.

Forklift and Pedestrian Safety (required training)

More injuries are experienced by pedestrians or persons not operating equipment, than actual forklift operators. Let's quickly review some safety tips you can use to help prevent forklift injuries.

The first tip is the most important. Forklift operators are prohibited from carrying passengers on forklift. ABSOLUTELY NO RIDERS. This means near the driver on the rear of the equipment, on the sides and of course, not on the forks. ABSOLUTELY NO RIDERS, at any time.

Now, we've all seen people being elevated on the forks, using a platform secured to the vehicle. If you meet the safety requirements, it's ok to lift people on forklifts. Here are the rules:

The platform SHOULD have guardrails and a 7 foot high guard protecting the rider from the lifting mast, chains and mechanisms. Some state jurisdictions require the 7 foot high guard, OSHA does not.

The platform must be secured to the vehicle to prevent it from falling off.

An operator must remain at the controls while a person is being lifted.

When traveling, the forks must be kept low – about 2-6" off the floor.

Ok, what do you do about those wild, crazy, fast driving forklift operators, who seem to terrorize pedestrians? Hopefully, you don't have those people working with you, but if it happens, the best thing to do is talk to the operator about the unsafe actions. Don't argue - just bring it to their attention. If that doesn't work, let management handle the problem. One thing pedestrians don't always understand is, forklift operators are usually busy and they can't always see or hear pedestrians. Certainly, pedestrians should have the right of way, but don't rely upon that to prevent accidents. It's as much your responsibility to watch out for forklifts as it is theirs. Safety requires a team effort.

Next, we need everyone's help spotting safety hazards. Relating to forklifts, there always seems to be oil leaks - transmission oil, hydraulic fluid or motor oil leaks. Certainly driver maintenance is the operator's responsibility, but minor oil leaks might not be detected until several oil spots appear on the floor. If you notice an oil leak, wipe it up, and then let management know so the leak can be repaired.

Don't smoke around or near forklift equipment. The obvious hazard is fuel on propane lift trucks, gasoline and diesel fuel, but the hidden hazard is electric forklifts. The large batteries on electric forklifts emit highly flammable hydrogen gas and can cause explosions. Don't smoke around forklifts.

These simple safety tips will help you, help forklift operators prevent accidents. There is one more important rule to remember. Until you have been properly trained, evaluated and authorized by management, you are not permitted to operate forklift equipment. You may have 25 years of experience and be the best forklift operator in the world, but if you haven't been trained and authorized by management - DON'T OPERATE FORKLIFT EQUIPMENT.

There are many safety rules forklift operators must know and obey, but it's just like anything else, it's the safe behavior of the operator and the pedestrian. If you don't watch where you drive or walk, plan on having an accident. If you're alert, take the time for safety, and have a safe attitude - you've got it made.

Truck Type Designations (different locations)

* D--Units that have minimum accepted safeguards against inherent fire hazards.

* DS--Diesel-powered units with additional safeguards to the exhaust, fuel, and electrical systems. These units may be used in some locations where a D unit may not be considered suitable.

*DY--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.

*E--Electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

*ES--Electrically powered units that, in addition to all of the requirements for the E units, have additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface

temperatures. These units may be used in some locations where the use of an E unit may not be considered suitable.

*EE--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.

*EX--Electrically powered units that differ from the E, ES, or EE units in that the electrical fittings and equipment are designed, constructed and assembled so that the units may be used in certain atmospheres containing flammable vapors or dusts.

*G--Gasoline-powered units having minimum acceptable safeguards against inherent fire hazards.

*GS--Gasoline-powered units that have additional safeguards to the exhaust, fuel, and electrical systems. These units may be used in some locations where the use of a G unit may not be considered suitable.

*LP--This unit is similar to the G unit, except that liquefied petroleum gas is used for fuel instead of gasoline.

*LPS--Liquefied petroleum gas-powered units that have additional safeguards to the exhaust, fuel, and electrical systems. These units may be used in some locations where the use of an LP unit may not be considered suitable.

Hazards and Effects (site specific training required)

Many hazards associated with the operation of powered industrial trucks are the result of common operator mistakes. For instance, collisions between trucks and stationary objects often occur while trucks are backing up--usually while turning and maneuvering. Unless care is exercised, operators can cause damage to overhead fixtures (e.g., sprinklers, piping, electrical conduits) while traveling and maneuvering under them.

Accidents often occur when an operator leaves a truck so that it obstructs a passageway and an unauthorized (untrained) worker tries to move it. Other common hazards include carrying unstable loads, tipping over trucks, dropping loads on operators or others, running into or over others, and pinning others between the truck and fixed objects.

Unauthorized passengers are often seriously injured from falling off trucks. Unless space is provided, do not allow passengers to ride on the trucks.

Dangerous misuse of trucks includes bumping skids, moving piles of material out of the way, moving heavy objects by means of makeshift connections, and pushing other trucks. All these activities can cause accidents or injuries; they also indicate poor operator training.

Factors that can influence stability (resistance to overturning) must be considered.

These include:

- Weight, weight distribution, wheel base, tire tread, truck speed, and mast deflection under load.
- Improper operation, faulty maintenance, and poor housekeeping.
- Ground and floor conditions, grade, speed, and judgment of the operator.

(BE SURE AND ADD ALL POTENTIAL HAZARDS THAT EXIST IN YOUR OPERATIONS ARE IDENTIFIED, AS THEY ARE CONSIDERED REQUIRED "SITE-SPECIFIC" TRAINING.)

Protective Devices

The use of protective devices is an important factor in safe forklift operation. Safety specialists can assist supervisors in determining what protective devices are necessary. Although forklifts need not be equipped alike, there are some similarities such as lights. Also, manufacturers are required by federal standards to equip forklifts with certain mandatory features such as back-up alarms. The requirement exists to warn others when the truck is reverse. Some other protective devices include:

- * Overhead protection to guard the operator from falling objects.
- * Wheel plates to protect the operator from objects picked up and
- * On-board fire extinguishers. Not required, but ok if that is your company policy.
- * Horns to warn others when the truck is moving forward.

Other protective devices that might be seen in the work area or specifically designed for the operator include:

- * Signs--such as stop, caution, danger, and speed limits--to inform operators of conditions.
- * Gloves and safety shoes.
- * Eyewash stations.
- * Concave mirrors.
- * Eye protection devices.
- * Hardhats to protect operators when there is an overhead hazard.

POSTERS

There are required posting for a variety of State and Federal jurisdictions. Forklift operating rules posted where forklift operators may read them, is but one requirement.

If you need more information on POSTERS and mandated postings, contact:

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If you just take this manual and “put your name on it”, it’s not going to meet your needs. The manual must be changed and written to reflect your policies and procedures. We have provided TWO manuals. One is formatted in Microsoft™ WORD. We also have provided the same manual in ASCII Text file, which can be read by almost any word processor. We cannot guarantee the formatting, as when you change from Word to Text file, some of the formatting is lost and words, phrases and other formatting can be lost in the transfer. As a minimum, the information will still be there.

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