

# Stackers Training

*Our business is picking up*

## LIFT TRUCK OPERATOR COURSE MANUAL

**Please bring this with you to your course**



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# TRAINING AND SAFETY

## Why is Training Necessary?

As our national economy expands we must make increased use of modern handling techniques so that costs are reduced, however if the equipment is misused or used in an unsafe manner the resultant damage and injury will far exceed the savings achieved.

Accidents involving lift trucks figure prominently in accident statistics, both in damage to property and injury to personnel. Many of these accidents should never occur since they are caused directly as a result of lack of knowledge and skill - the obvious answer is TRAINING. It is a fact that most accidents are caused by the lack of training or inadequate training of operators of these machines and their supervisors.

As you will learn during your training there is a legal requirement for all lift truck operators to be properly trained - tested - and certificated, and then for their employer to issue written authorisation for the operation of the particular machines on which an operator has received adequate training and certification.

However, in addition to the important aspects of safety in the operation of these type of machines, it must be remembered that a typical fork lift truck can cost more than an expensive car, and should be operated in a professional and careful manner, not only to reduce damage, but also to obtain the maximum efficiency and value from an expensive investment.

It should be noted that training is only the *first step* towards safety and efficiency in the workplace, for by the operator putting the training into practice at *all times* both competence and confidence is developed to a professional level resulting in greater productivity.

You will find the training which you receive during this course is of a very high standard and meets all the relevant legal requirements. The training is also an expensive investment for your employer, so for your own part it is essential that after YOUR COURSE the training is practised at all times, thus ensuring your own safety and that of your fellow workers.

## **REMEMBER**

**PRACTICE DOES MAKE PERFECT PROVIDING THE PRACTICE IS RIGHT**

# THE NEED TO TRAIN

Objectives of this course are:

1. ***To teach*** the basic skill requirements and job safety knowledge necessary for the safe and efficient operation of the fork lift truck.
2. ***To encourage*** the operator to maintain and promote these skills by the continued use of GOOD PRACTICE.
3. ***To create*** a safe working environment within the working area of the machine and it's operator.
4. ***To meet*** the legal duties and responsibilities of the employer and employee under the relevant section of the Health & Safety at Work Act, and to comply with the standards laid down in the Health & Safety Commission Approved Code of Practice and Supplementary Guidance for Lift Truck Operator Training.
5. ***To provide*** an appreciable cost saving through the training by reducing damage to the machine, it's load and surrounding plant and equipment.

It is a fact that by applying good standards of training, and the operator and the supervisor maintaining these standards, both the confidence and competence of the operator will be developed to a high professional level. This will then lead to safety and efficiency in the work place being assured so far as can be reasonably expected.

## **HEALTH AND SAFETY AT WORK ACT**

The Health and Safety at Work Act (HASAWA), places certain responsibilities and duties on both employers and employees which do have a direct bearing on the use and maintenance of lift trucks at work, in the training, authorisation to operate, and the supervision of lift truck operators.

The duties of the Employer under Section 2 of the Act include the following:

### **IT SHALL BE THE DUTY OF THE EMPLOYER TO ENSURE SO FAR AS IS REASONABLY PRACTICABLE**

- a) The health, safety and welfare of all employees whilst at work.
- b) The provision and maintenance of plant and systems of work that are safe and without risks to health.
- c) Safety and absence of risk in the use, handling, storage and transporting of articles, goods and substances.
- d) The provision of adequate information, instruction, **training** and **supervision**.
- e) A safe workplace, working environment, safe access to and from the place of work.

## **THE NEED TO TRAIN (Continued)**

### **THE DUTIES OF EMPLOYEES UNDER SECTION 7 & 8 OF THE HEALTH AND SAFETY AT WORK ARE AS FOLLOWS:**

#### Section 7 HASAWA

- a) To take reasonable care of themselves and of other persons who may be affected by their ACTS or OMISSIONS at work.
- b) To co-operate with their employer and other persons in ALL matters relating to Health and Safety at work.

#### Section 8 HASAWA

- a) Not to interfere with or recklessly misuse anything provided in the interests of health, safety or welfare.

#### **PLEASE NOTE**

Criminal proceedings may be taken against the employer or employee in cases where these duties are breached or not observed.

It should be noted that the training which you receive during your course meets all relevant requirements of the Health and Safety at Work Act and the HSC Approved Code of Practice.

**IT IS THEREFORE THE DUTY OF THE OPERATOR THAT HAVING BEEN TRAINED IT IS ESSENTIAL FOR THEM TO PUT THIS TRAINING INTO PRACTICE AT ALL TIMES AND ONLY OPERATE THE TYPES OF MACHINES ON WHICH THEY HAVE BEEN TRAINED, AND FOR WHICH THEY HAVE WRITTEN AUTHORISATION FROM THEIR EMPLOYER TO OPERATE.**

# DAILY CHECKS

## Introduction

It is the responsibility of the fork lift truck operator to carry out a daily check at the start of each shift, or at any time they take over a machine.

Under section 2, sub-section 2(a) of the Health and Safety at Work Act, the employer does have a duty to provide and maintain safe plant and systems of work, and the employee has a duty of reasonable care of himself and others under section 7 of the Act, each employee also has a duty to co-operate with their employer under this section.

The purpose of daily checks is to *ensure that the fork lift is in a safe and sound condition prior to being used*, and only by carrying out these checks is the operator able to make certain that the machine is safe for use.

The checks may also highlight minor faults which if repaired at an early stage, will prevent them from developing into costly major repairs.

All faults found during the checks must be recorded and immediately reported to supervision and **UNDER NO CIRCUMSTANCES SHOULD ANY MACHINE BE USED IF FOUND TO BE IN AN UNSAFE CONDITION.**

Likewise should any fault develop during the shift, the operator should park the truck as safely as possible, remove the key and report the fault to supervision.

**A specified daily checklist is provided and must be kept for at least six months.**

## DAILY CHECKS (Continued)

1. **Electrolyte level:** The correct protective clothing must be worn when topping up or checking electrolyte levels.
2. **Fuel, Oil and Water levels (if applicable):** Fuel, Oil and Water levels are correct - top up where necessary.
3. **Visual check of forks, carriage, mast:** Check for distortion, wear, obvious damage.
4. **Hydraulic hoses:** Check for damage, cracks or signs of leakage.
5. **Lifting Chains:** Check load chain for missing pins, broken links, rust, grit or swarf, etc.
6. **Wheels/Tyres:** Correct pressure, worn, damaged or split tyres, wheel nuts.
7. **Visual all round check:** Check guards, covers, overhead guards, seat, seat adjuster. Check for any missing covers, loose bolts, nuts, etc.

*It should be noted that checks carried out so far are carried out before mounting and starting the machine.*

*Having carried out these checks the operator should mount the truck and commence carrying out the rest of the daily checks.*

8. **Safety devices, including audible warning and horn:** Check for correct operation.
9. **Hydraulics:** Hydraulic controls - hoist, tilt, reach are all working correctly.
10. **Foot brake:** Check foot brake in both forward and reverse directions. Check for smooth operation on the forwards and reverse action.
11. **Check parking/emergency brake:** Check parking brake holds the truck when parked and stops the truck in an emergency. Check that the emergency brake is in the correct working order.
12. **Steering:** Check for excessive play, tightness, looseness in steering wheel linkage.
13. **Check floor for leaks:** Check floor for leaks from any hydraulic hoses, engine compartment, etc.

**All checks should be carried out in accordance with the Manufacturer's instructions and recommended workplace procedures.**

# COMPONENT PARTS OF THE FORK LIFT TRUCK

It is important that operators understand the principles relating to the construction of their particular machine, and are also able to identify the major component parts of the machine, and give a brief description of the function of each component listed.

**FORKS:** To support the load and should be adjusted to take an equal weight on each fork with the fork locating pins locked in position, they should be equally spaced on the carriage to ensure maximum lateral stability.

**CARRIAGE:** To enable the forks to be adjusted. It has slots in the top edge for locating and locking fork pins. The carriage also enables various special attachments to be fitted to the machine.

**MAST:** The mast allows the forks, carriage and load to be adjusted to the required height when stacking or de-stacking. Usually fitted with partial free lift to enable loads to be lifted clear of the ground without affecting the height of the machine.

**LOAD GUARD/BACKREST EXTENSIONS:** Usually attached to the carriage to assist in load stability and prevent loads from falling back into the mast and lifting mechanism.

**LOAD CHAIN:** A most important part of the load lifting mechanism, since the load chain takes the entire weight of the load, forks and carriage. This chain is anchored at fixed points behind the carriage and mast. It works in conjunction with the hoist ram and mast linkage to elevate and lower the load. IT IS SUBJECT TO A STATUTORY INSPECTION BY A COMPETENT PERSON AT LEAST ONCE EVERY SIX MONTHS (Factories Act 1964, Section 26).

**HOIST CYLINDER/RAM:** Elevates the mast, carriage, forks and load, fitted with load chain pulleys at the top of the hoist ram, and mechanical linkage to enable mast in elevating/lowering.

**TILT CYLINDER/RAMS:** The tilt ram allows the mast to be tilted forwards for ease of entering or withdrawing the forks from a pallet or load, and for safe parking of the machine. NOTE!! FORWARDS TILTING OF AN ELEVATED LADEN MAST WILL SERIOUSLY AFFECT THE STABILITY OF THE MACHINE AND SHOULD BE AVOIDED AT ALL TIMES.

Backwards tilt is used to increase the stability of the truck and its load whilst travelling, and to select the safe travelling position of the mast and forks.

**REACH CYLINDER/RAM:** On reach trucks a reach cylinder enables the mast and forks to be reached out to pick up and deposit loads, and reached in for safe travelling and parking positions.

**DRIVE/LOAD WHEELS:** On most rider counterbalance machines the drive wheels and main load bearing wheels are at the front of the machine, and on this type of fork lift truck the braking system is also activated on these wheels. However, in the case of the reach truck the drive wheels are at the rear of the machine directly under the operator, with the braking system acting either on these wheels or on the transmission.

**REAR STEER WHEELS:** Conventional fork lift trucks steer through their rear wheels, which means that there is a considerable degree of rear end swing when turning in a forward direction, and fork and load swing when turning in reverse.

SPECIAL CARE MUST ALWAYS BE TAKEN BY THE OPERATOR TO CHECK BOTH FRONT AND REAR END SWING WHEN STEERING THE MACHINE AND TO AVOID TURNING AT SPEED, WHICH COULD SERIOUSLY AFFECT THE STABILITY OF THE MACHINE.

**TYRES:** The machine will be fitted with either solid or pneumatic tyres, all tyres should be in a serviceable condition, secure on the wheel rim, free from tears or any debris that may be stuck in the tyre.

SPECIAL CARE SHOULD BE TAKEN TO ENSURE THAT PNEUMATIC TYRES ARE INFLATED TO THE CORRECT PRESSURE AS RECOMMENDED BY THE MANUFACTURER.

**OVER HEAD GUARD:** The operator is protected from large falling objects such as pallets or loads by the overhead guard, if carrying small objects which could possibly fall through the guard it is advisable for the operator to wear a hard hat.

**DRIVING SEAT:** On rider type fork lift trucks all controls should only be operated from the driving seat, which should be correctly adjusted to suit the operator.

PASSENGERS ARE NOT PERMITTED ON FORK LIFT TRUCKS UNLESS SPECIAL SEATING PROVISIONS FOR THIS PURPOSE ARE FITTED BY THE MACHINE MANUFACTURER.

**MOTIVE POWER:** The machine will be powered either by internal combustion engine, or by electric motive power which is provided by the traction battery. On electrically powered machines the traction battery provides valuable counterweight, and any battery fitted to the machine must conform to the battery weight requirements as laid down by the machine manufacturer.

**COUNTERWEIGHT:** A large counterweight is usually fitted to the machine to counteract against the weight of the load.  
UNDER NO CIRCUMSTANCES SHOULD A WEIGHT BE ADDED OR REMOVED UNLESS CARRIED OUT BY THE MACHINE MANUFACTURER.

**CONTROLS:** There are two sets of controls, one set for driving the machine around the workplace including forward/reverse gears, steering and brakes. The other set are the hydraulic controls for the handling of loads, and comprise of hoist and tilt levers, and in the case of reach trucks a reach lever. Other hydraulic levers may be fitted where special attachments are used.

ALL CONTROLS SHOULD ONLY BE OPERATED FROM THE DRIVING SEAT.

# ENGINEERING PRINCIPLES

## THE COUNTERBALANCE PRINCIPLE

### Introduction

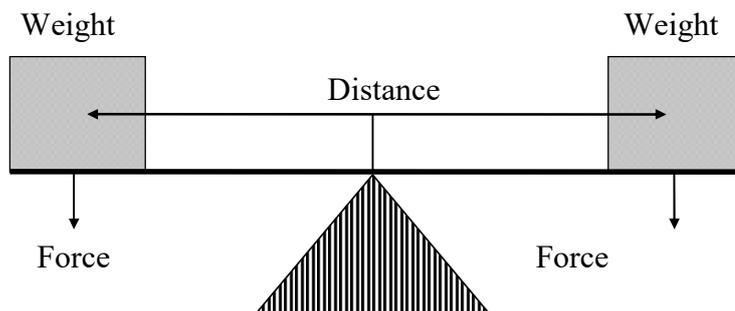
The counterbalance fork lift truck is designed on the principle of a child's simple see-saw, the weight of the load being counterbalanced by the weight of the bulk of the machine behind the front axle.

The balancing point is referred to as the FULCRUM, and on the fork lift truck this can be related to as the centre point of the front wheels of the machine.

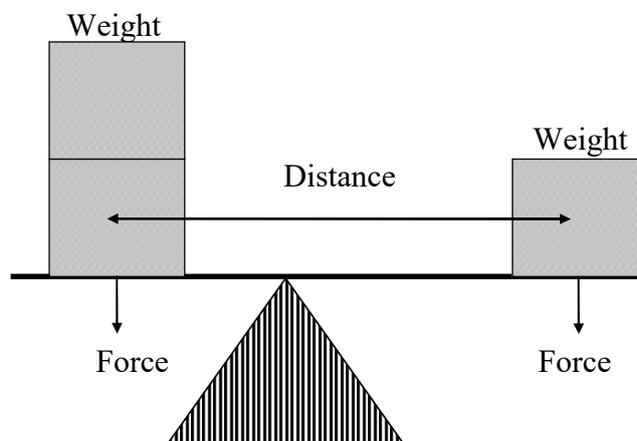
The principle of counterbalance also applies to reach trucks when the mast is reached out to pick up or deposit loads.

The factors affecting balance are WEIGHT-DISTANCE-FORCE, in short weight and distance when combined produce force, the following diagrams will help explain this in principle.

In the diagram below, we can see that equal weight at equal distance produces equal force, this causes a state of balance which if allowed to happen on a fork lift truck would be potentially dangerous, since as well as the steering being affected, the truck could possibly tip up.

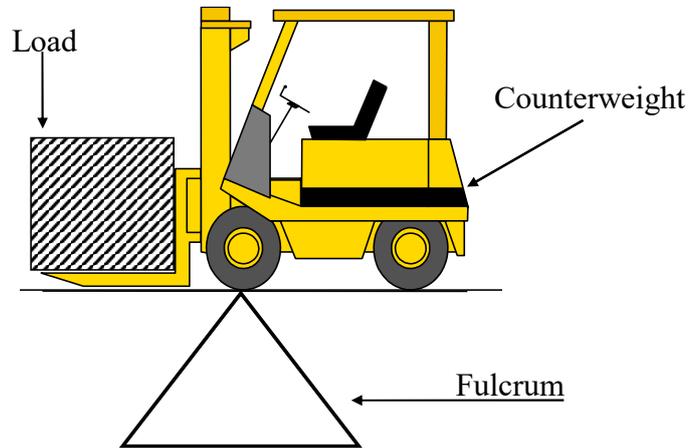


We see, from the diagram below, that unequal weight can still be balanced by adjusting the distance until the force is equal.



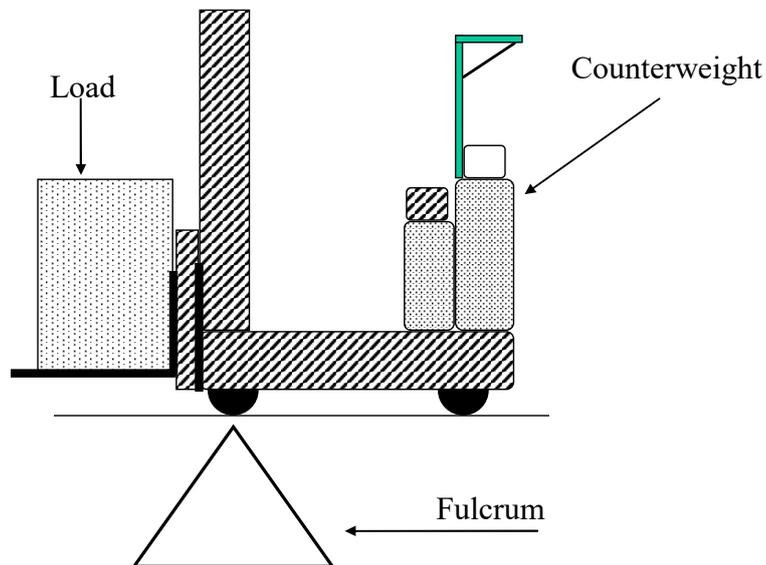
## COUNTERBALANCE FORK LIFT TRUCKS

If we look at the diagram below we can see how the principles of counterbalance (see-saw) relates to the conventional counterbalance truck. The weight of the load being counterbalanced by the weight of the machine behind the front wheels (fulcrum). If the weight of the load, or the distance of the load from the front wheels were increased the stability of the truck would be decreased.



## REACH TRUCKS

The principles of counterbalance also applies to Reach Trucks when the mast is extended to full reach as we can see in the diagram below. The front wheels are acting as the Fulcrum. It should be noted however, that when travelling with a reach truck whether laden or unladen, the mast should be fully retracted at all times.



**AT NO TIME SHOULD ANY FORK LIFT TRUCK BE ALLOWED TO REACH A BALANCED LOAD CONDITION SINCE THE STABILITY AND STEERING WILL BE SERIOUSLY AFFECTED.**

# THE RATED CAPACITY PLATE

All fork trucks will have a rated capacity plate. The plate will tell the driver three basic requirements. He must familiarise himself with these before using the truck:

1. The weight the truck will lift.
2. The stacking height.
3. The load centre.

***It should be noted that whenever an attachment is fitted, the lifting capacity of the truck will be reduced.***

## STABILITY AND INSTABILITY

Many accidents, (some fatal), and much damage has happened in the past as a direct result of instability of the fork lift truck, it is therefore of utmost importance for all operators to understand the limitations of their machines so far as both stability and instability are concerned.

There are two types of stability:

### **LATERAL STABILITY (WIDTHWAYS)**

Lateral stability is the stability across the width of the machine, and lateral instability can occur due to the following factors:

***Turning at speed or turning with an elevated load.***

***Driving across slopes or inclines, particularly with elevated mast.***

***Lifting loads off centre or with one fork.***

***Flat or damaged tyres.***

***Potholes or hitting an obstruction with one wheel.***

***Excessive use of backwards tilt with an elevated load.***

### **LONGITUDINAL STABILITY (LENGTHWAYS)**

Longitudinal stability refers to the stability along the length of the machine and a number of factors can cause longitudinal instability of the fork lift truck, such as:

***Overloading or undercutting the load with forks.***

***Travelling incorrectly on slopes and inclines, both laden and unladen.***

***Harsh braking or acceleration.***

***Harsh or jerky movement of hydraulic controls.***

***Travelling with an elevated load.***

***Incorrect use of tilt controls.***

***Travelling with reach extended on laden reach truck.***

***Crossing gullies or other parallel obstructions incorrectly.***

***Rough or uneven ground.***

Whilst your practical training will place great emphasis on machines stability always remember **INSTABILITY IS DANGEROUS!!!**

# THE HYDRAULIC SYSTEM

The term "hydraulics" is used to describe the power of liquid, under pressure, passed through pipes.

In the lift truck this power is harnessed in cylinders to provide the force needed to raise the forks, tilt the mast, and extend the reach. It is also used to operate the many different types of attachments found on lift trucks.

The liquid in this case is a special hydraulic oil, which is non-corrosive within the system, and has lubricating properties.

The pressure created in the system is approximately 1,800 lbs per square inch.

The hydraulic oil is contained in a reservoir fitted to the truck. The oil is fed from the reservoir to the pump, either by gravity or suction. From the pump the oil is passed under high pressure to the control valve block. A pressure relief valve is fitted in the control valve block to allow excess pressure to be relieved by permitting the passage of oil back to the tank. The valves in the control block are operated by levers which are moved by the truck operator. There is a control valve and lever for each separate function of the system. Each lever has three positions, they are moved either forward or backward, to open the valve in either direction. In the central position the valve is closed.

From the control valve the oil is passed to the operator cylinders, i.e. hoist cylinder (single acting), tilt cylinder (double acting), or reach cylinder (double acting), as and when required by the operator. The speed of operation of the cylinders is determined by the amount of movement applied to the levers by the operator.

As the hoist cylinder is the single acting type, oil under pressure from the pump is used to raise the load. On descent, the weight of the mast, carriage, forks and load, bearing down on the hoist piston force the oil out of the mast cylinder, into the reservoir, allowing the mast to descend. The rate of descent is governed by a flow restrictor valve situated at the bottom of the hoist cylinder. This prevents the load falling at an uncontrolled rate during normal operations. It also acts as a safety valve in the event of a pipeline fracture.

# OPERATING PROCEDURES

## Stacking and De-stacking

The mast should always be vertical or just slightly tilted back when elevated or lowering loads, the *parking brake and neutral gear should also be applied* when lifting and lowering. Before elevating the mast, forks and load, the operator should always check that there is sufficient overhead clearance, and that the forks or load will not foul the stack or racking whilst elevating or lowering.

When stacking or de-stacking with a reach truck the mast should only be reached out when ready to deposit or pick up a load.

All loads should be securely stacked and the forks clear when entering or withdrawing from loads.

The hydraulic controls should be operated smoothly and gently at all times, and most particularly when the mast and forks are raised, harsh or jerky movements will upset the stability of both the truck and its load.

## NEVER TURN WITH RAISED FORKS OR RAISED LOADS

## Ramps and Inclines

Where the truck is laden always keep the load facing uphill when travelling on ramps and inclines, remember that the forks and loads will arrive at the ramp before the wheels, so if necessary adjust the tilt and hoist to make allowances for this. If the truck is unladen the general rule is that forks face downhill, this is most essential where a ramp or slope may be severe, or when travelling with a reach truck, as reach trucks also have the potential to tip over backwards.

## Large or Bulky Loads

All operators must have clear visibility when transporting loads.

When carrying large or bulky loads and forward visibility is impeded the operator must either travel in reverse or try to reduce the load.

When travelling up an incline or in cases where the operator has to travel forwards and the load cannot be reduced in size, a Banksman or Signal person must guide the operator at all times.

**The lift truck must at all times be driven and operated in accordance with best practice laid out in the training and manufacturers handbook.**

## **OPERATING PROCEDURES (continued)**

### **Racking Systems**

When stacking or de-stacking in racking systems ensure the racking is in good condition and that the cross beams are properly located and safety locking pins are present, the racking should also be securely fastened to the floor.

All loads placed in the racking system should conform to the specific load weight limitations of the racking system (SWL, Safe Working Load). The load should be the correct dimensions so as not to foul the cross beam above and should be of sufficient length so as to locate correctly on the cross beam, but not so long as to cause an obstruction when stacking at other levels in the racking.

***Racking must not be used if it has any damage or distortion which may render it dangerous.***

When racking is seen to be damaged it must be immediately de-stacked and reported. A temporary sign should be displayed stating "Do Not Use Awaiting Repair". It must remain empty until an approved contractor has inspected it and repaired any damage.

***Racking may only be moved, adjusted or dismantled by approved contractors.***

## **OPERATORS SAFETY CODE**

1. ALWAYS carry out a pre-shift inspection of the truck before using for the first time each day (using the checklist provided). Report any faults that you find to your duty manager.
2. ALWAYS look and think before moving off. Know that pedestrians are clear and check the space around you.
3. ALWAYS keep your body well inside the safety cage of a moving truck.
4. ALWAYS slow down and sound your horn at corners, doorways, or when exiting aisles and wherever your view is restricted.
5. ALWAYS avoid sudden stops (except in an emergency). Drive at a safe speed consistent with type of load and general working conditions.
6. ALWAYS maintain at least three truck lengths between you and the truck in front.
7. ALWAYS look for overhead obstructions and other hazards. Remember the height of your mast and the load.
8. ALWAYS lower your load as soon as it is clear of the stack before starting to travel.
9. ALWAYS lower loads slowly and smoothly.
10. ALWAYS travel with the forks/load between 4" and 6" off the ground and mast tilted back sufficiently enough to cradle the load.
11. ALWAYS leave your truck in the 'parked position' ie. mast tilted forward, forks on the ground.
12. ALWAYS report any accidents with stock and clean up any spillages.
13. ALWAYS report any accidents involving damage to the truck or racking, it could cause the truck or racking to become unsafe, resulting in injury to yourself or others.
14. ALWAYS switch off and remove key when leaving the truck.

## **OPERATORS SAFETY CODE (Continued)**

- To improve stability, traction and adhesion when driving on a gradient always follow these rules:
- Whether carrying a load uphill or downhill, the load should face uphill. When no load is carried the forks should face downhill.
- The safety and security of the load is the operator's responsibility.
- Operators are to ensure that the hand brake is applied and neutral selected before operating the hydraulic controls.
- Forks are to be inserted fully before travelling with a load.
- Head protection should be worn when handling pallets containing small objects such as nuts and bolts.
- Stacks/loads are not to be bumped or pushed into position.
- Do not turn on inclines.
- Controls should only be used from the correct position.
- Do not day dream keep your mind constantly on the job.
- Do not use the Lift Truck if you have consumed alcohol or have taken drugs or are on any medication which might affect your ability to drive the truck safely.

### **Remember**

**ACCIDENTS DON'T JUST HAPPEN, THEY ARE CAUSED**

## **OPERATORS SAFETY CODE (Continued)**

- NEVER attempt repairs or tamper with safety devices.  
Tampering with safety devices would be regarded as gross misconduct and could lead to dismissal.
- NEVER carry passengers on the fork lift truck.
- NEVER leave a roller shutter door partially open.
- NEVER block fire doors or extinguishers by parking trucks or loads in front of them.  
Leave access clear wherever it is needed.
- NEVER lift loads that exceed the trucks maximum rated capacity. This could make the truck unstable and overturn.
- NEVER travel forward with bulky loads that obscure your view. If your view is unavoidably obscured, travel in reverse and look in the direction of travel.
- NEVER allow anyone to walk under or over the forks.

**REMEMBER**

**NEVER TAKE CHANCES**

# BATTERY CARE

## Introduction

The performance of an Electric Fork Lift Truck is largely determined by the efficiency of its traction battery. This battery is an extremely costly part of the truck and generally carries a long term guarantee by the battery manufacturer. A neglected battery will result in a considerable increase in truck down-time and a loss of its guarantee. It is usually an engineer's responsibility to maintain the battery and its charging equipment, but it is often the truck operators responsibility to carry out the simple day-to-day tasks involved in battery care.

## General Safety Points

- Do not smoke in the charging area and never use a naked flame as a light when checking batteries.
- The battery cells contain acid, therefore a supply of water (clean) must be available so that should a person come into contact with the acid it can be washed off immediately.
- Disconnect the battery from the truck or the charger before commencing any maintenance inspection of the battery.
- Make sure that loose objects such as tools, or metal wrist straps cannot accidentally fall onto or come into contact with the top of the battery.
- Before opening the vent caps, protective goggles, rubber gloves and rubber/plastic apron must be worn.

## Charging procedure

At the end of the day or shift the battery will generally require charging.

- Disconnect the battery from the truck and **lift the cover**. Check the electrolyte levels in the cells, the liquid should completely cover the plates. Top up if necessary with distilled water until the plates are just covered. Dry off any spillage immediately and ensure all cell tops are replaced.
- Ensure the charger is switched off, and examine the charger cable and plugs for damage, then connect the charger cable plug to the battery plug.
- Switch on the current and ensure that the ammeter is registering the charge current.
- When disconnecting the battery on completion of charge switch off the charger before disconnecting the charger lead from the battery. Hang the lead up off the floor.
- Ensure the battery tops are dry and cell tops are secure. Connect the battery to the truck and replace the cover.
- **IMPORTANT:** When batteries are charging a slight amount of hydrogen gas is produced. **This is highly flammable. The cover must remain open when charging is in progress** to allow this gas to disperse harmlessly into the atmosphere.

# **DIESEL/GAS LIFT TRUCK REFUELLING**

## **Diesel:**

1. Always switch off the engine before refuelling or topping up.
2. Use only clean and recommended grades of fuel or oil when refuelling or topping up oils.
3. Never over fill when refuelling.
4. No smoking or naked lights, to prevent fire or explosion.
5. Always wear protective gloves to avoid contact with the fuel.

## **Replacing LPG (Liquid Propane Gas) Cylinders:**

1. No smoking or naked lights when handling LPG cylinders.
2. Always replace cylinders in open air to allow adequate ventilation and any gas leakage to disperse.
3. Turn off valve on cylinder before disconnecting the coupling.
4. Ensure cylinder is correctly located and retaining straps are securely fastened when replacing new cylinders.
5. Ensure that the sealing washer is in good condition and correctly positioned before reconnecting the coupling.
6. Make sure that the coupling is correctly located and tightened when reconnecting.
7. Check for leaks after replacing cylinder.
8. Avoid breathing in LPG fumes.
9. Return empty cylinder to storage compound.
10. Always turn off valve if you are leaving the truck for any long period.
11. Handle all LPG cylinders with extreme care whether empty or full.

**All refuelling should be carried out in accordance with the manufacturers instructions and recommended workplace procedures.**