

# OCCUPATIONAL RISK PREVENTION MANUAL TRANSPALET (electric/manual) and STACKERS



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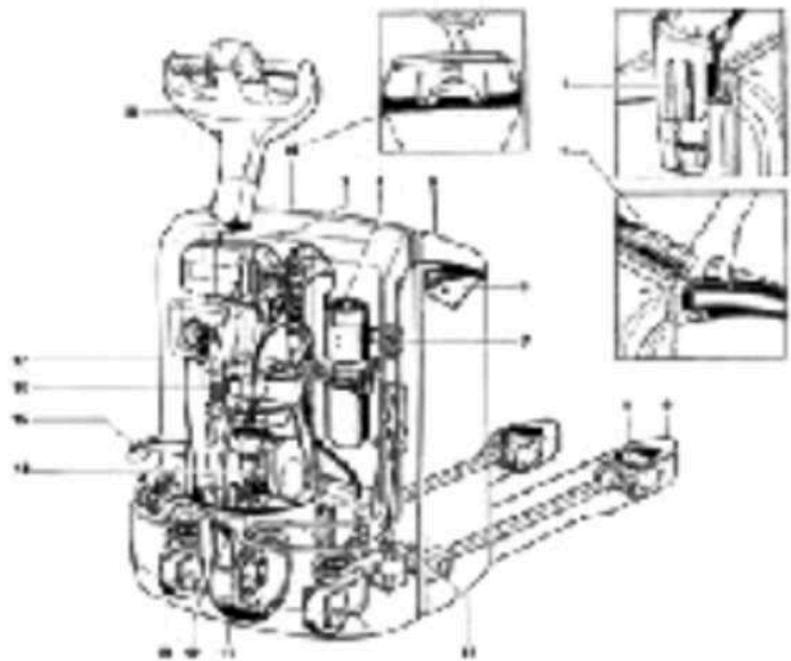
**ELECTRIC PALLET TRUCK**

## DEFINITION

The electric pallet truck is a self-propelled electric traction equipment, with a short lifting distance, equipped with a fork formed by two supporting arms, which can be raised by means of an electro-hydraulic mechanism, suitable for the horizontal transport of palletised goods.

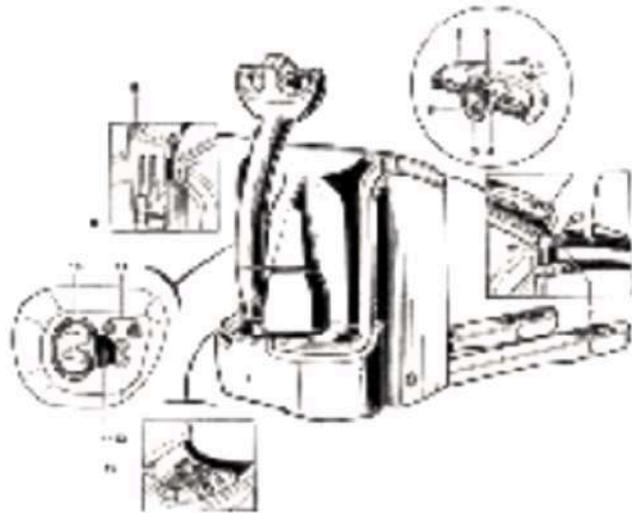
### MAIN PARTS:

1. Battery connector handle
2. Battery cover opening handle
3. Inverter platen
4. Pump motor group
5. Battery cover
6. Battery
7. Horn
8. Carrier Wheels
9. Fork Arms
10. Lifting Cylinders
11. Drive wheel
12. Gearbox
13. Stabiliser wheels
14. Drive motor
15. Mains power cord housing
16. Built-in charger
17. Front bonnet
18. Rudder
19. Document compartments



## COMMANDS AND CONTROLS

1. Ignition key
2. Horn control
3. Safety reverser
4. Reversing gear / Accelerator
5. Lift control
6. Lowering control
7. Battery bonnet release handle
8. Battery connector handle
9. Battery connector
10. Hourmeter / Discharge indicator
11. Built-in charger Les
12. Charger safety connector
13. Supplementary ignition key



# OPERATION

## FORWARD TRAVEL

Press gently and progressively with your thumb on the lower part of the control throttle. The speed of the pallet truck is proportional to the pressure exerted.

To start on a slope, operate the throttle in the desired direction, with the tiller in the braked trolley position. The motor is supplied with reduced voltage and current. To unbrake and start, tilt the tiller to the driving position.

## REVERSE GEAR

Press gently and progressively with your thumb on the upper part of the control butterfly. The pallet truck accelerates backwards in proportion to the pressure exerted.

## REVERSING THE DIRECTION OF TRAVEL

Release the control throttle and operate it in the opposite direction. Reversing direction can be done while the machine is running. First, it is electrically braked to a standstill, and then it leaves in the opposite direction.

To protect the worker from the risk of being trapped between an obstacle and the machine, the end of the tiller is fitted with a safety button. When the hinge is pressed, the machine stops immediately, as the direction of travel is automatically reversed.

## BRAKE

When the tiller is released, the machine is braked. Braking is progressive, depending on the position of the rudder.

To obtain counter-current braking, tilt the power shuttle in the opposite direction until the machine comes to a complete stop, then release the power shuttle.

When the throttle butterfly is released, counter-current braking is automatically engaged until the machine comes to a complete stop.

## MAINTENANCE

It may only be carried out by trained and authorised personnel. When carrying out maintenance work, place the machine on level ground, chock the wheels, remove the ignition key and disconnect the battery. When working in extreme temperatures or in dusty environments, the time between maintenance work should be reduced.

Before cleaning the machine, disconnect the battery. Use with caution the steam jet or very degreasing products, as they dissolve the grease in the bearings and cannot be re-greased afterwards. If pressure washing is used, the electrical circuit, motors and insulating panels must be protected. Do not expose them to direct spray. Remove any wires that get caught in the axle or wheel bearings.

Check the electrolyte level and the condition of the battery cables, terminals and connector.

## CONDITIONS OF USE

The ambient temperature must be between  $-10^{\circ}\text{C}$  and  $+40^{\circ}\text{C}$  and the relative humidity must be less than 95%.

The maximum recommended slope over a short distance is 10% for braking and stability reasons. The ground shall be level and of the correct hardness.

The loads should be homogeneous and of a maximum recommended height of 2 metres.

## BEFORE STARTING, THE FOLLOWING ITEMS SHALL BE CHECKED:

- ▶ Steering rod.
- ▶ Horn.
- ▶ Braking systems.
- ▶ Fork up/down control.
- ▶ Speed control and direction selection control.
- ▶ No oil leakage.
- ▶ Battery charging and connection check.

## FOR DRIVING AND HANDLING:

- ▶ Check that the weight of the load to be lifted does not exceed the load capacity of the work equipment.
- ▶ Ensure that the pallet or platform is suitable for the load to be handled and that it is in good condition.
- ▶ Before starting a journey, check the stability of the load.
- ▶ Lift the load centred with the load forks.
- ▶ Never drive the equipment while standing on the forks or sitting on the battery box.
- ▶ Drive in the direction that guarantees the correct visibility of the route to be followed. If the load is bulky and obstructs your view, drive in reverse.
- ▶ When reversing, make sure that the route is clear of obstacles.
- ▶ Monitor the load when turning, paying particular attention if it is bulky and/or unstable.
- ▶ Adapt the speed to the characteristics of the working space, load and the dexterity of the operator. Do not make sudden movements. Check for the absence of people.
- ▶ Do not operate the pallet truck with hands and/or shoes that are wet or with residues of substances, which could cause falls due to slipping.
- ▶ On slopes, always drive in a straight line, without making turns that could cause the machine to tip over.

- ▶ If driving behind another vehicle, keep a safe distance.
- ▶ When taking breaks at work, park the machine in a safe place, never on ramps.
- ▶ Check at the beginning and end of the working day that the safety button, by reversing the direction of travel is working correctly.
- ▶ Do not drive around dragging the pallet.
- ▶ When depositing a load, do not obstruct fire protection elements, (fire extinguishers, fire hydrants, etc.), emergency exits, first-aid kits, etc.
- ▶ Always look in the direction of travel.
- ▶ Do not transport people.
- ▶ Do not place feet or hands under the lifted load.

## FOR LOADING-UNLOADING

- ▶ Never overload the pallet truck. Know the maximum load weight of the work equipment, consulting the load plate.
- ▶ Make sure that the pallet or platform is suitable for the load it must support and that it is in good condition.
- ▶ Ensure that the load is perfectly balanced, palletised and wrapped if necessary.
- ▶ Never lift the load with a single fork.
- ▶ Insert the fork through the narrowest part of the pallet to the bottom underneath the load, making sure that the two forks the load, making sure that the 2 forks are well centred.
- ▶ Make sure that the forks of the pallet truck do not protrude from the pallet, as their ends could damage installations or goods and cause injury to other workers. As a rule, it can be stated that for 1,200 mm pallets, 1150 mm forks should be used and for 1,000 mm pallets, 910 mm forks should be used. For other sizes, a similar criterion shall be applied.
- ▶ When unloading; look around to check that there are no persons or objects that could damage or destabilise the load when depositing it on the ground.
- ▶ Deposit the load without encroaching on passageways, and correctly on the shelves.
- ▶ When loading or unloading a lorry, ensure that it is immobile and that it does not start up unexpectedly (chocks, alternative mechanisms).

## FOR BATTERY CHARGING

- ▶ Open the battery cover.
- ▶ Turn off the pallet truck with the key before disconnecting the battery.
- ▶ Connect the battery to the charger and then operate the charging cycle start knob.
- ▶ Once charged, switch off the charger, disconnect the battery from the charger and connect it to the machine, close the battery box cover, turn the start key and check that the charging has been carried out correctly, observing the state of the charge indicator.
- ▶ When the battery cover is open, do not handle metal objects on top of the battery.
- ▶ Check that the cables and connector are not visibly damaged.
- ▶ The charger connector must not be left on the ground. Place it in the accessory provided for this purpose.
- ▶ Smoking and open flame devices must not be used in the vicinity of the batteries.

## AT THE END OF THE WORK

- ▶ Park the pallet truck in the place provided for this purpose (safe place, out of the way of traffic, without blocking emergency facilities, it must not be parked on ramps).
- ▶ The fork must rest on the ground.
- ▶ Do not leave the engine running, switch off the pallet truck.
- ▶ Remove the keys from the pallet truck, if available, and hand them over to the person in charge.

## MAIN RISKS

- ➔ Knocks and entrapment by falling materials.
- ➔ Crashes or collisions with other vehicles and obstacles.
- ➔ Knocks, trapping and being run over by pallet trucks.
- ➔ Injuries due to overexertion.
- ➔ Falls to the same level due to slipping or sliding.
- ➔ Falls from the loading dock to different levels.
- ➔ Contact with corrosive substances and battery explosion.

## PREVENTIVE MEASURES

- ➔ The use of self-propelled pallet trucks shall only be permitted to personnel duly trained and authorised by the company.
- ➔ Knows and respects the safety regulations established in each work area.
- ➔ Circulate on floors and tracks that are in good condition and aisles that are sufficiently wide.
- ➔ Respect and use the protections and safety devices of the pallet truck. Under no circumstances exceed the maximum load established by the manufacturer.
- ➔ In case of anomaly or malfunction, report it to the foreman and, if necessary, point out the fault and the prohibition to use the pallet truck.
- ➔ Use the pallet truck only and exclusively for the functions and work for which it was designed.
- ➔ Never carry or lift people when loaded or unloaded.

- ➡ Do not access lifts, hoists, etc. without making sure that they can support the weight and volume of the machine and its load.
- ➡ Check that the loading dock is properly secured and that the vehicle to which the dock is attached cannot move.
- ➡ Mark the limits of the loading bay correctly (with yellow and black stripes).
- ➡ Always wear non-slip safety footwear with a reinforced toe cap.
- ➡ Follow the manufacturer's instructions when recharging and maintaining the battery. Respect polarities, never reverse the connections.
- ➡ Keep the battery cover open during charging, wait for one hour after charging, adequately ventilate the charging area, avoid sources of ignition in the vicinity, keep the battery parts in good condition (breathing caps, electrolyte level, terminals, etc.).
- ➡ Use of face shield, gloves, arm covers and suitable clothing. In case of splashes, wash immediately with water.



**HAND PALLET TRUCK**

The hand pallet truck is a type of hand pallet truck which is a basic piece of equipment, due to its simplicity and efficiency, and which is widely used in the handling and horizontal transfer of unit loads on pallets (pallets), from the places of operation, generally the machines to the places of storage or vice versa.

The purpose of this manual is to describe the characteristics and applications of hand pallet trucks as well as the risks of accidents related to their use and the preventive measures to be taken to avoid them.

## **DEFINITION**

The hand pallet truck is a forklift truck with a small lifting distance, movable by arm, equipped with a fork made up of two parallel horizontal arms solidly joined to a vertical head with wheels at three points on the ground, which can lift and transport pallets or containers specially designed for this use.

## **DIMENSIONAL CHARACTERISTICS**

The dimensional characteristics of the pallet trucks according to UNE 58-427-78 are as follows:

- ➡ Height of fork arms
- ➡ Clearance between fork legs.
- ➡ Fork leg lengths (mm)
- ➡ Swivel angle of the front wheels. The steering angle of the front wheels (or castor) is set to at least 90° on both sides of the longitudinal axis of the pallet truck.

## TECHNICAL DESCRIPTION

The pallet truck consists of a cold bent, welded and machined metal chassis.

A drawbar is hinged to the head, which is used to drive the pallet truck's lift pump and to steer the pallet truck. The fork frame can be raised above ground level by means of a small, manually operated hydraulic pump.

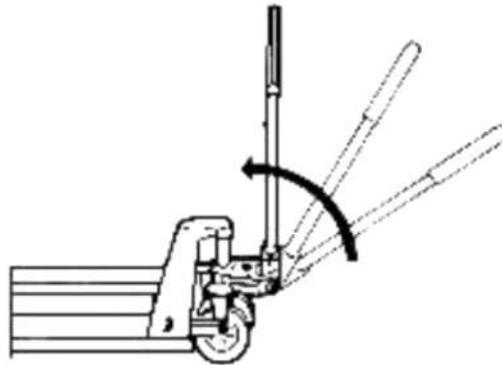


Figure: The reciprocating motion of the tiller drives the lift pump.

The hydraulics control lever has three positions for raising, lowering and neutral or idle.

The part of the machine where the lifting pump, the drawbar joint, the brake, the transverse axle with the anchorage of the roller tie rods and the twin or double steering wheel are located constitutes the front part of the machine, while the fork with the load rollers is called the rear part of the machine.

The rollers can be made of four basic materials: steel, nylon, rubber and special plastic derivatives.

The own weight ranges from 60 to 90 kg, with a rated load capacity from 1,000 to 3,000 kg.

Some pallet trucks have an auxiliary electronic system located at the front of the truck, which provides information to the operator on the weight of the load to be transported and can complement the existence of a load limiting valve in the hydraulic system.

## **OPERATION**

The chassis of the pallet truck in working position, which leaves the forks 85 mm above the ground, is inserted under the pallet or unit load to be lifted, then by placing the valve control in the lifting position and by means of the alternating movement of the drawbar, the lifting pump is activated in a variable way that goes from 12 strokes for a nominal load of about 2000 kg. For lifting loads of up to 200 kg, there is a quick lift system which, with one or two strokes, is sufficient to lift the load and only works in these cases; in this way, the pallet and its load lose contact with the ground and the entire weight is supported by the chassis.

In this position, the pallet and its load are transported and guided by means of the traction bar on which the operator pulls.

Once the pallet has been moved, the lowering operation is normally carried out by manual control by means of a lever located at the upper end of the traction bar, this operation being independent of the weight of the load being transported.

## MAIN RISKS

Pallet trucks are the cause of many accidents at work, resulting in back pain, hernias, leg and ankle injuries, and crushing and pinching of feet and hands, both to the operators and to others in the vicinity.

The most frequent risks are the following:

- ➡ Overexertion due to:
  - ▶ Transport of loads that are too heavy, either for the forklift truck itself or for the person who has to move them.
  - ▶ Lifting an overload resulting in too high a pumping force.
  - ▶ Working surface in poor condition.
  - ▶ Blockage of the steering or carrying wheels.
  
- ➡ Crushes and blows to lower and upper extremities due to:
  - ▶ Falling or detachment of the transported load.
  - ▶ Incorrect use of the pallet truck that allows impacts or trapping with the chassis or guide wheels when these are unprotected.
  
- ➡ Trapping of persons or shearing of fingers or hands when the drawbar of the pallet truck collides with an obstacle.
  
- ➡ Falls to the same level due to slipping or sliding of the operator during the operation of the pallet truck due to the poor condition of the working surface.
  
- ➡ Collisions with other vehicles.
  
- ➡ Collisions with objects or installations due to reduced or insufficient movement surfaces.

➡ Falls to a different level due to:

- ▶ Reduced evolution space for loading or unloading a lorry fitted with a tailgate lift or from an elevated unloading dock.

It is important to consider both the material aspects of insecurity and the lack of training of operators in their use.

## DESIGN CONDITIONS

The upper end of the drawbar must be suitably shaped so that it can be held by the operator's hand, either on the right or on the left side of the machine. The design of the handle must be closed to prevent it from slipping out of the operator's hands and at the same time protect the valve control and the brake from possible knocks.

The handle should be covered with a non-slip plastic material to make it easier to hold and to prevent it from slipping out of the operator's hands during the transfer phase.

Another necessary accessory would be the inclusion of load measuring systems or load limiting valves to prevent overexertion.

The guide wheels should be protected by some form of fairing to prevent accidental entrapment of the operator's own feet or those of others in the vicinity.

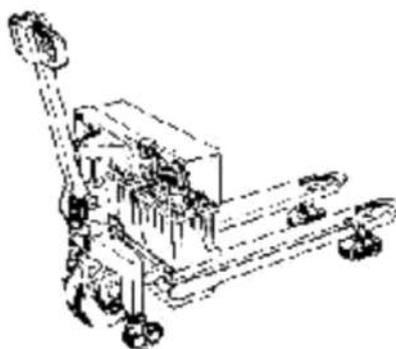


Figure: Protective fairing for steered wheels

## CONDITIONS OF USE

The pallet truck must not be used in workplaces where there are ramps or in certain unfavourable conditions such as bad, uneven or slippery surfaces.

The maximum capacity of hand pallet trucks indicated by the manufacturer must be respected, but it must be borne in mind that above a certain load the efforts required to pull the load are clearly greater than human possibilities.

In addition, it must be taken into account that the effort to be made on the rudder to lift the load depends on:

- ▶ Weight of the load to be transported.
- ▶ Design of the hydraulic unit and drawbar.
- ▶ Kinematics of the lifting device.

On the other hand, the rolling stress depends on the following parameters:

- ▶ Wheel characteristics, diameters, type and condition, as well as the degree of wear of the rolling system.
- ▶ Weight of the load being transported.
- ▶ Nature and condition of the ground.

Accordingly, it is considered advisable to limit the use of this type of equipment to the transport of loads not exceeding 1500 kg and only to be carried out by operators in good physical condition. For heavier loads, pallet trucks equipped with an electric motor or other mechanical handling devices should be used.

## OPERATING CONDITIONS

### FITTING OUT OF THE PREMISES

The surfaces of the work premises must be sufficiently strong, flat and free of irregularities.

Circulation aisles must be delimited and free of objects and designed rationally and of sufficient width (the pallet truck and the operator handling it must fit between the rows of pallets).

A space of at least 20 cm must be left between stored pallets.

Places where there may be overlaps must be adequately signposted and, if possible, mirrors must be installed to facilitate vision.

### **REMEMBER!!**

Keep the areas and places where the pallet trucks pass through in a good state of cleanliness to avoid slipping of the pallet trucks or the operator who is handling them.

### PREVIOUS VERIFICATIONS

Although the manufacturers do not require periodic checks, it is recommended that before using the pallet truck, the operator checks the good condition of the pallet truck, mainly its bearing system, and the correct operation of the brake.

## RULES FOR LOADING OPERATIONS

Before lifting a load, the following checks must be carried out:

- ➡ Check that the weight of the load to be lifted is appropriate for the load capacity of the pallet truck; to avoid overloading, it is advisable for the hydraulic lifting system to be fitted with a load limiting valve that acts when the weight of the loaded pallet exceeds the load capacity of the machine.
- ➡ Ensure that the pallet or platform is suitable for the load to be carried and that it is in good condition.
- ➡ Ensure that the loads are perfectly balanced, chocked or tied to their supports.
- ➡ Check that the length of the pallet or platform is greater than the length of the forks, as the ends of the forks must not protrude as this could damage the pallet or platform. It would not be possible to leave two pallets together at the end and the rollers may not be free at the bottom of the pallet, which would cause the corresponding lower cross member to come loose when the pallet is lifted. As a rule, it can be stated that for 1200 mm pallets, 1150 mm forks should be used and for 1000 mm pallets, 910 mm forks should be used. For other sizes, a similar approach shall be used.
- ➡ Insert the forks through the narrowest part of the pallet to the bottom under the loads, making sure that both forks are well centred under the pallet.
- ➡ Always avoid attempting to lift the load with only one fork leg. In the event that it is necessary to load pallets of different lengths or on either the wide or narrow side, there is a type of accessory that is mounted on the chassis and which, once folded down, limits the entry of the pallet truck under the pallet, allowing the rollers to exit through the correct space under the machine.

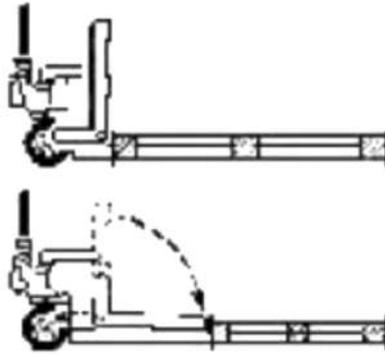


Figure: Pallet truck inlet limiter attachment under the loading pallet

In the case of handling platforms with a ground clearance twice that of a pallet, a metal frame is placed on the fork to supplement this height; this removable frame is hinged to the machine head.

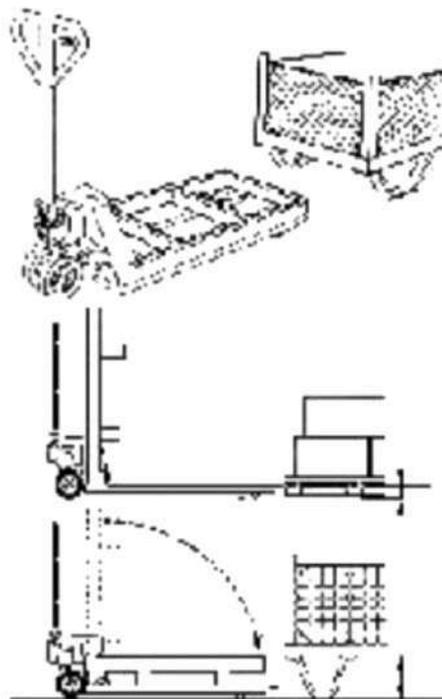


Figure: Frame to supplement the height of forks

For loads with a ground clearance of less than 80 mm, low profile machines with a fork height of 50/58 mm should be used.

## DRIVING AND TRAFFIC RULES

The operator of the pallet truck must follow the following driving and driving rules:

- ➔ Drive the forklift truck by pulling it by the handle with the control lever in the neutral or neutral position. The operator moves forward by pulling the equipment with one hand while standing either to the right or left of the machine. The operator's arm and the drawbar form a straight line during pulling, which requires sufficient clearance during transport.



Figure: Traction in working position

- ➔ Look in the direction of travel and always keep a good view of the route.
- ➔ If reversing is unavoidable, it should be checked that there is nothing in its path that could cause an incident.
- ➔ Supervise the load, especially when turning and particularly if it is very bulky, by checking its stability.
- ➔ Do not use the pallet truck on wet, slippery or uneven surfaces.
- ➔ Do not handle the pallet truck with wet or greasy hands or shoes.
- ➔ The signs and traffic regulations in force in the company must be observed, following only the routes laid down.
- ➔ In the event that a slight slope must be descended, this must only be done if there is a brake and the operator must always be behind the load. brakes and the operator must always position himself behind the load. The maximum recommended slope to be negotiated shall be 5 %.

When loading and unloading work is to be carried out on a loading bridge, the following precautions must be taken:

- ➔ Check that it is well positioned and suitably fixed.
- ➔ Check that the vehicle to which the bridge is attached cannot move.
- ➔ Check that the bridge can support the maximum intended loading or unloading load, taking into account the weight of the machine.
- ➔ Never place the pallet truck on a gangway, platform, lift or forklift without having made sure that they can the weight and volume of the loaded pallet truck and without having checked that it is in good condition.

Stopping the forklift:

- ➔ The forklift must not be stopped in a place that hinders traffic.
- ➔ At the end of the working day or at the end of the use of the machine, it must be left in a designated parking place with the brake on.

### RULES FOR UNLOADING

Before lowering the load, look around to make sure that there is nothing that could damage or destabilise the load when it is placed on the ground. Also check that there is no one in the vicinity who could be trapped by the pallet during the lowering operation.

### MAINTENANCE INSTRUCTIONS

The maintenance rules indicated by the manufacturers must always be followed, especially with regard to the operation of the hydraulic system, drawbar and wheels.

The operator must, in the event of any fault that may occur, put the pallet truck out of use by means of a warning sign and inform the maintenance service so that it can be repaired.

## **BIBLIOGRAPHY**

VICENTE RIPOLL .

Technical manual. Forklift trucks

Ediciones JS. Madrid. 1991

MICHEL AUMAS.

FICHE PRACTIQUE DE SECURITE ED 35. TRANSPALETTES MANUELS

Travail & Sécurité magazine no 499. 1992 UNE STANDARD 58-427-78.

Forklift trucks. FORKLIFT TRUCKS.

Dimensional characteristics. 1978

Sources INSHT, 319 NTP.



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