



SAFE OPERATION OF FORK LIFT TRUCKS

TD 07/15/E

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TABLE OF CONTENTS

1. INTRODUCTION	5
2. SCOPE AND PURPOSE	5
2.1. <u>Scope</u>	5
2.2. <u>Purpose</u>	5
3. DEFINITIONS	5
4. LEGISLATION	6
4.1. <u>National / International Directives</u>	6
4.2. <u>ISO Standards</u>	6
5. TECHNICAL SAFETY FEATURES	7
5.1. <u>Fork Lift Trucks</u>	7
5.2. <u>Pallet Trucks</u>	8
6. GENERAL SAFETY INSTRUCTIONS	8
6.1. <u>The Mangers Shall:</u>	8
6.2. <u>The Drivers Shall:</u>	8
7. FLT OPERATIONS-EXAMPLE INCIDENTS FROM THE INDUSTRIAL GASES INDUSTRY	8
7.1. <u>Examples of incidents involving unsafe driving or maneuvering</u>	10
7.2. <u>Examples of incidents due to unsafe access or egress from FLT</u>	13
7.3. <u>Examples of incidents due to unsafe loading or unloading from FLT</u>	13
8. FLT OPERATIONS – KEY HAZARDS AND PREVENTIVE MEASURES	13
8.1. <u>Forklift Trucks</u>	13
8.1.1. Falling Loads	13
8.1.2. Falling Driver	14
8.1.3. Forklift Stability	14
8.1.4. Overturning Forklift Truck	14
8.1.5. Vehicle Collision and Pedestrian	15
8.1.6. Falling Transported Persons	16
8.1.7. Machine Guarding	17
8.1.8. Climate	17
8.1.9. Environmental and Occupational Noise	17
8.1.10. Vibrations	17
8.1.11. Atmosphere Pollution	17
8.1.12. Fire and Explosions	17
8.2. <u>Pallet Trucks</u>	18

9. DRIVER HIRING AND TRAINING	19
10. MAINTENANCE AND INSPECTION	20
10.1. <u>Daily Inspection</u>	21
10.2. <u>Maintenance</u>	22
10.2.1. Charging the Battery	23
10.2.2. Fuelling	24
10.2.3. Forklift Trucks Inspection (ISO Standard 5057)	24
11. SAFETY CHECKLIST EXAMPLES	24
11.1. <u>Daily Inspection Checklist</u>	24
11.2. <u>Audit Checklist</u>	27
11.2.1. The Management System and Policy	27
11.2.2. The FLT Driver	27
11.2.3. The FLT	28
11.2.4. The Premises	28
12. REFERENCES	29
ANNEX	29

1. INTRODUCTION

Forklift trucks and mechanically operated pallet trucks are becoming increasingly important elements in mechanical handling practices as the gases industry seeks to improve safe working conditions and reduce manual handling practices.

In recent years the number of forklifts and mechanically operated pallet trucks has increased as a result of this search for greater efficiency and safer work practices.

Handling loads with forklift trucks and pallet trucks makes the hardest tasks easier, such as moving, lifting or handling loads. Particular attention to safety rules and standards is essential, as the tasks done with these mechanical or automotive machines entail particular hazards, but using these machines should not entail a risk to the operator, to the persons present in the work area where mechanical handling equipment is operating or all other operators working around them in the same premises.

Preventing accidents is a task we all have to attend to. This can only be achieved by making sure that all workers are aware of the risks of forklift truck use, so that they can react appropriately in case of an undesirable event, and through training workers to use the machinery they operate appropriately, to prevent unnecessary risks

Forklift trucks and pallet trucks shall only be operated by trained and qualified personnel. These measures are the best guarantees to protect the operators of these machines and those around them.

2. SCOPE AND PURPOSE

2.1. Scope

The scope of this document is to describe the minimum safe practices required to operate forklift trucks and mechanically operated pallet trucks in the industrial gases industry.

2.2. Purpose

For many years, MEGA has received reports of severe and even fatal accidents involving forklift trucks.

The purpose of this document is to help prevent and reduce the number of accidents that occur by providing recommendations on risk prevention, suitable maintenance practices and correct driver selection and training.

3. DEFINITIONS

Forklift or Forklift Truck	A small industrial vehicle with a power operated forked platform in front that can be inserted under loads to lift and move them. The driver of the forklift truck sits in a cabin mounted on the forklift truck.
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FLT	In this document FLT is used to mean both forklift truck and pallet truck.
Pallet truck	A manually operated, mechanically assisted device for lifting and moving loads where the operator usually stands on the ground adjacent to the truck. A pallet truck is power assisted to enable the operator to physically guide the forks into the opening on the pallet, lift the load on the forks and transport the load on the truck. A pallet truck generally has only a short lifting height.
Motors	<p>Forklift Motors can be classified into two groups:</p> <ul style="list-style-type: none"> • Combustion engines: with petrol, diesel or LPG as fuel. • Electric motors: a group of batteries supplies electric current to a central motor or to several motors mounted on the driving wheels. <p>Both types of motors have specific safety requirements for refuelling or recharging and when they are to be used in zoned areas where there is a risk of flammable gases being present.</p>
Steering	Forklifts have front driving wheels, with the driving axle near the forks, and rear wheel steering with the directional wheels next to the counterweight. This means that a forklift can turn on its axis describing a very small turning circle.
Mast	The mast supports and raises the forks. Movement of the mast and forks is operated hydraulically and supported by a chain or some other mechanical element.
Forks	The pronged arms that are introduced under the load in order to move it. The forks are normally of fixed length but they may also be designed to be extended from the forklift cab by means of a mechanical or a hydraulic system
Cockpit or Cabin (Cab)	The position where the fork lift truck driver sits and controls the vehicle. The design of the cab and equipment is important to the safety of the operator.
Centre of the Load	The distance from the centre of gravity of the load to the heels of the forks.
Leverage	The stability of forklifts is based on the leverage principle. In a forklift the point of support is the contact of the front wheels with the floor.

4. LEGISLATION

4.1. National / International Directives

Local / National directives to be followed for the purchase and maintenance of the forklifts. Template provided in annexe1 can be used for declaration of conformity of the machinery.

ATEX Directive - Directive 94/9/EC, Equipment and protective systems intended for use in potentially explosive atmospheres

4.2. ISO standards

ISO 2328, Forklift trucks: Fork arms and coupling fork bearing deck - Assembly dimensions

ISO 2330: Vertical movement systems

ISO 5057: Industrial trucks - Inspection and repair of fork arms in service on forklift trucks.

5. TECHNICAL SAFETY FEATURES

5.1. Forklift trucks

The list highlights the different parts of fork lift trucks that are important for safe operations:



Figure 1 typical Fork Lift Truck

- Safety canopy: Protects the driver from falling loads.
- Shock-absorbing ergonomic seat: This seat is fitted with shock absorbing systems that absorb vibrations.
- Exhaust pipe silencer: Insulating device that wraps around the exhaust pipe preventing it from coming into contact with materials or persons thus avoiding potential burn injuries or fires.
- Fork arms: The fork arms shall be sufficiently long to stick out slightly from the load they are handling and shall be adjusted to suit the width of the load.
- Emergency safety stop: Stops the engine automatically during emergencies or abnormal situations.
- Immobilisation brake: Protects against unintended movement.
- Reversing acoustic and visual signals: to alert others to the presence of a reversing fork lift truck, especially when the visibility of the driver may not be good.
- Doors: Protect the driver if the vehicle overturns
- Safety belt: Fitted to the seat to ensure driver safety, especially in case the vehicle overturns (mandatory in some countries).
- Reversing mirrors: allow the driver to have a good view of the area behind him before reversing. Some trucks also use rear mounted cameras.
- Load handling accessories: Implements (such as; clamps, lateral movement devices, buckets, hoists, etc.) that aid load handling movements such as; grabbing and setting down the load at the operator's desired height and position.
- Speed limiters are recommended.

5.2. Pallet trucks



Figure 2 typical pallet truck and controls

- Forks: The forks on a pallet truck differ from those on a forklift truck in that support wheels are mounted at the front of the fork and that the forks can only be raised a short distance. These forks are usually positioned manually.
- Horn: device to produce an acoustic signal to warn of any dangers. It is located in the upper part or head of the steering rudder.
- Lifting/Lowering control: Located on the rudder. Its function is to lift the loads up or down when picking them up and depositing them.
- Safety gear inverter: Push button used to stop the pallet truck immediately and drive it in the opposite direction for a few centimetres.

6. GENERAL SAFETY INSTRUCTIONS

6.1. The manager shall:

- Make sure that operators receive documented training and information for operating forklift trucks and pallet trucks safely.
- Ensure resources are available to maintain forklift trucks and pallet trucks in accordance with manufacturers' recommendations and operating company standards.
- Establish traffic rules on the site and communicate them clearly to staff and visitors.
- Make sure the work tasks can be safely completed in the time allowed.

6.2. The driver shall:

- Before using the FLT, make sure that the daily pre use inspection and condition monitoring of the FLT has been completed.
- Inform the manager in case of a problem with the FLT and prevent its use.

- Check that acoustic and visual alarms and signals are in good working condition at all times.
- Ensure that they have good visibility at all times, using mirrors or looking over their shoulder when reversing.
- Pay full attention to the driving activity, especially when reversing.
- Respect traffic rules (speed limits, pedestrian crossings, etc.).
- Travel with caution, respecting pedestrian areas.
- Avoid sudden manoeuvres or changes in direction.
- Slow down when turning.
- Respect the FLT operating rules (load weight, handling rules.).
- Check the loading and unloading area for tidiness and cleanliness.
- Drive with the load down, and not manoeuvre with the load raised.
- Drive with the load behind when travelling down a slope.
- Avoid travelling across a slope.
- Avoid the edges of loading docks, potholes, trenches and road shoulders.
- Only adjust or exchange mobile elements such as; the fork arms or attachments if trained and authorised.
- Not handle mobile elements of the vehicle while the motor is running.
- Comply with good parking practices, such as: not blocking emergency or safety equipment, parking in a safe area, lowering the fork arms, etc.
- Wear a seat belt, or if not fitted ensure that the cab doors are closed or side restraints are in position.



Figure 3 Warning sign

7. FLT OPERATIONS – EXAMPLE INCIDENTS FROM THE INDUSTRIAL GASES INDUSTRY

Incidents related to FLT use primarily occur in three circumstances. When driving or manoeuvring an FLT, particularly in the vicinity of pedestrians, getting into or out of an FLT and the unsafe loading and/or unloading of the forks.



Figure 4: an unsafe use of an FLT

As the following event reports show, the improper use of forklift trucks has the potential for serious or even fatal injuries if not appropriately managed.

7.1. Examples of incidents involving unsafe driving or manoeuvring

- A plant foreman (on foot) engaged an FLT driver (in cab) in conversation and when finished both moved off at the same time. The rear of the FLT moved towards the foreman knocking him over and the left rear wheel ran over the right foot/big toe. The foreman was wearing protective shoes. The foreman's foot was badly bruised and big toe broken.



Figure 5 injured foot

- An operator was struck by a reversing forklift truck while crossing a zone identified for forklift truck movements. The FLT was transferring cylinder pallets from storage to vehicles. The operator suffered a double fracture of the tibia with an open wound and was taken to hospital.



Figure 6 FLT reversing into path of a pedestrian

- A collision between a forklift and another vehicle not seen. The driver fractured his leg.
- A forklift tipped over around a corner and the forklift load was damaged.

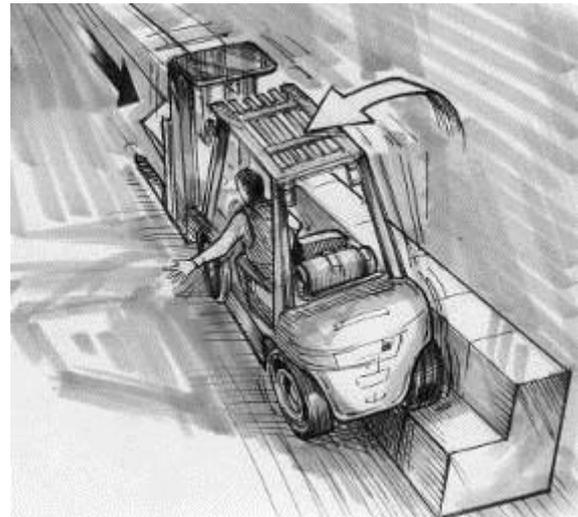


Figure 7 FLT turned over and simulation of accident

- An operator in a filling plant did not look both ways before crossing a forklift truck route in a warehouse. The forklift ran over his foot which caused a fracture.
- An FLT ran over and fractured a contractor's foot as the FLT was manoeuvring to pick up a pallet of cylinders from a truck.
- A contractor driver was delivering LOX at a customer site when an FLT lost control on the slippery ground and hit the tractor, fracturing the FLT driver's hand.
- An operator's toe was fractured when an FLT hit him from behind.
- After leaving a pallet in a sorting area the FLT driver was reversing in a curved path when a fork struck the foot of an operator inspecting a cylinder load, resulting in a sprain.
- While moving a cylinder pallet, a forklift truck hit an insufficiently marked fire water hydrant causing its breakage, resulting in the loss of fire-fighting water.

- Whilst loading dry ice containers using an FLT, one of the containers started to roll on the lorry hydraulic lift platform. The FLT driver's corrective action resulted in the container striking the lorry driver who was standing on the platform, injuring his ankle.



Figure 8 reconstruction of an incident

- A stock controller approached a forklift truck to talk to the driver. The forklift truck had stopped with the engine running, whilst the driver checked the loading schedule. The driver didn't notice the controller walking behind the FLT as it moved forward. A wheel went over the controller's left leg and the back of the FLT hit his right leg which was broken. His left foot was not injured because he was wearing his safety shoes.
- While manoeuvring backwards with a hand pallet truck an operator crushed his foot between the pallet truck and a cylinder basket. This forced his foot to bend upward at the level of the toe guard in his safety shoe, causing fractures of four toes.



Figure 9 reconstruction of an incident

- A contractor driver walked across the yard with a company dispatcher to count the amount of cylinders. They took the shortest route across an area where an FLT was operating. As they approached the FLT, it reversed and hit the contractor driver, breaking his leg.



Figure 10 reconstruction of an incident

7.2. Examples of incidents due to unsafe access or egress from FLT

- A forklift driver got out of his vehicle while it was not completely stopped. The driver twisted his ankle.
- A forklift driver got out of his vehicle without using the designated steps. He twisted his ankle.

7.3. Examples of incidents due to unsafe loading or unloading from FLT

- An operator unloading a forklift dropped a gas cylinder on his foot, crushing his toes.
- A forklift driver manually unloaded a gas cylinder from a suspended lift. It was stuck in that position. He injured his back.



Figure 11 result of handling incident

- A worker was handling a cylinder pallet, with a manually operated FLT, when he drove it over his own foot crushing it.

8. FLT OPERATIONS – KEY HAZARDS AND PREVENTATIVE MEASURES

As can be seen from the previous sections, there are a number of significant hazards associated with FLT operations.

There are a number of well established controls within industry which aim to reduce the risk of FLT incidents to a minimum. This section summarises the relevant preventative measures which can be employed to prevent incident, injury (including fatalities and permanent disability) and property damage. Operators shall be trained and competent in the awareness of these hazards and controls (refer to section 9.).

8.1. Forklift trucks

8.1.1. Falling loads

- Secure the load appropriately (cylinders safely inserted in pallets, etc.).
- Position the loads safely on the forks.

- Maintain the forklift truck operating areas in good condition.
- Pay attention to good visibility and lighting.
- Use containers (boxes, pallets) suitable for the load.
- Avoid overfilling containers.
- Make sure the driver cabin is equipped with mesh, guards or racks to protect the driver.

8.1.2. Falling driver

- Ensure the driver fastens the seat belt (where fitted) or is protected against falling out of the cabin

Note: some countries have mandatory requirements for driver restraint.

- Ensure the driver never leans outwards from the vehicle or that any part of their body is outside the forklift's clearance area.
- Ensure access steps have anti-slip treatment.
- Make sure vertical handholds are suitably placed along the mast to help access to and from the cab.

8.1.3. Forklift truck stability

- Maintain solid, flat, horizontal and well defined passageways for the FLT.
- Do not get too close to dock edges.
- Verify the position, stability, capacity and condition of any loading bridges.
- Verify suitability of blocking mechanism for the vehicle (trucks, wagons, etc.) before loading or unloading.

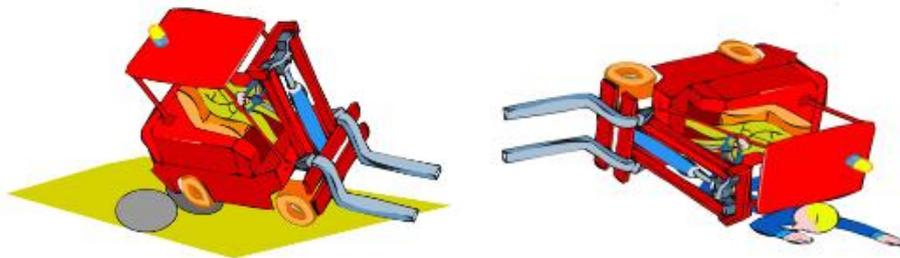




Figure 12 FLT incidents

8.1.4. Overturning forklift truck

- Do not drive too fast, particularly when turning as this may cause the forklift to overturn.
- Choose a forklift that is laterally and longitudinally stable.
- Avoid sudden changes of direction, particularly when crossing slopes.
- Avoid short radius turns at excessive speed.
- Do not travel diagonally on a slope. It is safer to follow the line of the greater slope.
- When moving, travel with the fork down as far as possible.
- Do not manoeuvre with the load held up high.
- Respect the instructions and restrictions indicated on the load information plate.
- Do not lift a load weighing more than the allowed nominal capacity of the forklift truck.
- Do not lift loads in a manner that risks raising the rear part of the forklift truck.
- Lower loads slowly rather than suddenly.

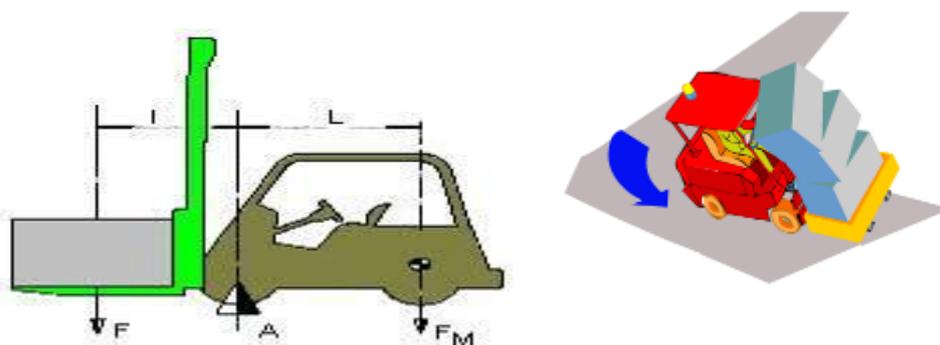


Figure 13 FLT Load diagrams

8.1.5. Vehicle collisions and pedestrian injuries

- Make sure the forklift driver has maximum visibility in all directions.

- Maintain visibility when carrying a load.
 - For example, it could be necessary for the driver to reverse when carrying tall cylinder pallets.
- Maintain good lighting that avoids blinding effects and exaggerated contrasts.
- Maintain traffic lanes and ensure they are free of obstacles.
- Signal fixed obstacles appropriately.
- Make sure brakes are well maintained.
- Ensure floors are clean and are not slippery.



Figure 14: poor visibility when carrying cylinders pallets or bundles

- Travel with the fork lift truck forks set with minimum ground clearance (typically 15 cm above the ground/floor level) to avoid collision with raised surfaces.
- Ensure a traffic management system is implemented and should include at least:
 - Separate normal vehicle traffic lanes from those allocated to forklift truck traffic.
 - Ensure traffic lanes are wide enough to avoid collisions, particularly two way corridors.
 - Reduce the number of intersections and optimize stops, one-ways and good signalling.
 - Established speed limits and make sure they are respected.
 - Use sound alarms before going through a crossing and reduce speed when approaching hazardous intersections, corners or other areas.
 - Avoid passing and keep a safe distance between moving vehicles.
 - Avoid operating at night without sufficient lighting.
 - Be extra-vigilant when crossing railroad tracks.

8.1.6. Falling transported persons

The transport of a person other than the vehicle's driver is prohibited unless the vehicle is specially adapted for this use (has a passenger seat), in which case the second person shall comply with the same safety rules imposed on the operator e.g. fastening seat belt.



Figure 15 misuse of an FLT

8.1.7. Machine guarding

FLTs contain many moving mechanical parts:

- Make sure that mechanical moving elements are protected (grills or transparent shields).
- Only repair or inspect the engine while switched off and adequately isolated.

8.1.8. Climate

To avoid distractions through operator discomfort, the vehicle should be equipped with rain / sun protection roof that does not restrict visibility.

8.1.9. Environmental and occupational noise

The forklift truck should meet requirements of for noise restrictions for industrial equipment, for example by using effective exhaust silencers.

8.1.10. Vibrations

- FLTs should be assessed and meet requirements set by the 2002/44.
- An ergonomic driver' seat, where height and distance from the steering wheel can be adjusted, is recommended.
- Depending on surface conditions, seat comfort and design, the driver may need to wear additional lumbar support.

8.1.11. Atmospheric pollution

- Areas where combustion engine forklifts are used shall be well ventilated.
- Electrically powered fork lift truck should be used in areas which are poorly ventilated.
- Vehicles should be maintained according to manufacture instructions to reduce atmospheric pollution.

8.1.12. Fire and explosions

- Forklift trucks should be equipped with a fire extinguisher.
- Fuel systems shall be maintained to ensure their integrity.

- All pipe work and silencers shall be maintained in good operating condition.
- Forklift trucks intended to be used in areas with potentially explosive atmosphere shall comply with the ATEX Directive n°1999/94.
- Fill the fuel tank outdoors and prohibit all potential ignition sources during refuelling (e.g. no smoking or use of cell phones, pagers and radios etc.)

8.2. Pallet trucks

Pallet trucks are involved in a considerable number of work related accidents resulting in lower back injuries, hernias, leg and ankle wounds and incidents where hands and feet are caught or crushed.

These accidents can injure both the machine operators and those in the surroundings.



Figure 16 example of potential incident

The most frequent risks encountered are:

- Overstraining due to:
 - Transporting loads too heavy for the machine and/or the operators moving them.
 - Trying to hoist an excessive load requiring over-pumping effort.
 - Work surface in bad condition.
 - Driving or load bearing wheels obstructed by debris, such as small stones, litter.
- Lower and upper limbs getting trapped, crushed or impacted due to:
 - Falling or dislodged loads.
 - Inappropriate use of the pallet truck.
 - Collision between the pallet truck's traction bar and another object.
 - Failure to have all guards in place and in good order.
 - Slips, trips and falls.
 - Collisions with other vehicles.

- Collisions with objects or installations because the working areas are too small or inadequate for proper operation, or because of poor visibility.
- Pallet truck falling from an elevated working area. For example, working areas being too small or inadequate to be able to properly load or unload a truck from an elevated loading dock.

When assessing risks it is important to determine the training and skills required of drivers.

9. DRIVER HIRING AND TRAINING

The competence of drivers operating forklift trucks and/or mechanically operated pallet trucks is essential and therefore all drivers shall receive specific training. The considerations when hiring drivers and operators for these machines have to reflect their responsibilities and skills.

The following points should be considered during the selection process:

- Physical and psychological characteristics:
 - drivers should be physically fit in accordance with national legal standards for commercial vehicle drivers,
 - sufficient vision to meet national legal standards for commercial vehicle drivers,
 - hearing (able to hear audible warnings and signals) and,
 - no underlying medical conditions which may affect ability to perform the role.
- Demonstrated ability to acquire relevant skills, e.g. working knowledge of all the controls and functions of the FLT and ability to identify and report malfunctions.



Figure 17 driver training

Non-authorized persons are not permitted to drive or operate forklift trucks and/or pallet trucks.

Vehicles and keys should be secured to ensure there is no unauthorised vehicle use.



Figure 18 key location

General safety rules should be followed at the worksite. Drivers are responsible for any situations that their actions may create or provoke when using the machinery inappropriately or unsafely.

FLT drivers shall hold a current proof of competence in accordance with relevant national standards, e.g. certificate, license or permit. Legal requirements may vary in each country. Companies shall, as a minimum, implement specific, practical and theoretical training courses addressing the issues in this document. Completion should be documented. Competence should be reviewed periodically, ideally at an interval of no longer than 5 years.



Figure 19 pallet truck

If used on public roads, forklift trucks and/or pallet trucks shall be classified and operated in compliance with traffic rules.

10. MAINTENANCE AND INSPECTION

FLTs shall be maintained, as a minimum, in accordance with manufacturers' recommendations and local regulations.

10.1. Daily inspection (See 11.1)

At the beginning of each shift, nominated persons, preferably the FLT operators should carry out pre-operating checks to ensure that the FLT is safe to use.



Figure 20 FLT training

The pre-operating checks are made up of a visual inspection of the forklift and parts and an operational check of all equipment and controls (with the power on).

The daily inspection should include checking the FLT safety equipment.

This inspection should at least cover: brakes, tyres, steering wheel, fork condition, lights, flashing lights, reversing alarm, horn, hydraulic hoses and leaks, hour meter, fluid levels for combustion engines and battery condition for battery powered FLT's.

A typical inspection includes the following steps:

- Test the **brakes** which should depress smoothly and should not require excessive force to operate. If they make noise they need attention.
- Check also the **parking brake**.
- Look for missing bolts, wear, and any kind of damage to **tyres**. Check the air pressure in pneumatic tyres according to a predefined frequency.
- Check the free play in steering that should comply with manufacturer's recommendations in either direction when you turn the **steering wheel**.
- Check the **fork condition** looking for any broken, worn or misaligned part in the chains, masts, hydraulic jacks, levers or forks.
- Test the lights including the **flashing light** and **reversing alarm** as well as the horn.
- Make sure the **rear-view mirrors** are in place and in good condition
- Check for **leaks** around fittings; make sure the hoses are in good condition. Brake fluid, transmission oil, fuel, battery electrolyte or radiator coolant can leak from the FLT. Do not work with a leaking FLT.
- In case of a **combustion engine** FLT, check oil level and pressure, water level, fan belt and fuel level.

- In case of **battery powered** FLT, check battery charge, battery pods condition and battery plug connection.
- In case of FLT equipped with **seat belt**, be sure the belt and securing mechanisms are in good condition.
- Note the reading **FLT hour meter** to determine if any preventive maintenance is required or needs to be planned.
- It is the job of the FLT driver to report daily in the **FLT log book** any defect found
 - to have it repaired before using the FLT,
 - to more organize appropriate maintenance,
 - to show it on request by authorities or insurance companies.

Additional checks are required on flameproof forklifts to ensure that they remain safe to use at all times. Flameproof protection should be part of the condition monitoring checks carried out in accordance with the manufacturer recommendations.

Very important: Before using the FLT, **any anomaly detected** on the tyres, the brakes, the engine (noise, fumes), the steering wheel as well as any kind of leak should be reported immediately to the competent manager.

10.2. **Maintenance**

FLTs shall be maintained so that they do not present a risk to the safety and health of the operator or other persons at any time. Before operating them all protection and operating elements shall be checked to ensure they are ready to be appropriately used and that connecting or operating them does not pose a danger for operators or third parties.

Whether the FLTs belong to the industrial gas company or are rented or leased, the site manager shall ensure maintenance operations are carried out on schedule.

The maintenance operations shall be performed according to manufacturer's recommendations. Additional or more frequent maintenance may be required based on internal experience (e.g. incident reporting).

Maintenance operations shall check and if necessary repair, as a minimum the following items: (See 11.2 The inspection check-list)

- Brakes, steering system, warning signals (flashing lights or audible alerts), lights, regulators, valves and pipe work for the lifting circuit and tilting and lifting mechanisms. Maintenance routines shall be followed for all other hydraulic systems, particularly in terms of identifying internal or external leaks.
- Protection and safety devices.
- Batteries, engines, controls, limit switches, cable protection devices, connections and particularly the condition of the electrical system insulation should be checked periodically.
- Tyres shall be checked to detect any deterioration of the sides and rims.
- Tyre pressure shall be checked and kept to manufacturer's specifications.

In case of a combustion engine FLT the oil should be changed, the water level and antifreeze product concentration checked, the fan belt and other drive belts, if any, checked or changed. In case of battery powered FLT, the battery, its electrolyte and all cables and plug connections shall be verified.



Figure 21 maintenance

During maintenance operations, make sure a suitable isolation procedure (e.g. Lock Out-Tag Out) is implemented.

10.2.1. Charging the battery

Batteries should be charged at regular intervals, preferably at the end of the work day, taking care to ensure they are not overcharged.

Hydrogen is produced in all battery-charging stations, and therefore the area shall be adequately ventilated and any type of ignition source shall be avoided:

Typical controls to reduce or eliminate hazards include:

- A non-smoking sign and a warning against open flames in the battery-charging area.
- Avoiding contact of hoisting chains or their links or hooks with the battery cables or terminals.
- Checking the battery charging cable is disconnected before getting the forklift truck or pallet truck ready to work.
- Reporting immediately when the battery has not completed its charging cycle at the beginning of the work shift.
- Never operating forklift trucks and/or pallet trucks with the battery lid off or removed.
- The electrolyte contained inside the batteries is a highly corrosive substance. The worksite shall be equipped with water washing stations to neutralize any acid spill.
- All battery charging and handling stations shall be equipped with a multipurpose powder fire extinguisher (12 kg capacity) and an emergency shower with an eye-washing station.
- All battery charging and handling stations shall have sufficient and suitable ventilation to prevent battery-produced smoke and gas from concentrating.
- The devices used to charge batteries shall be protected from any accidental collision with the forklift trucks.

- Personnel shall wear the required personal protective equipment (PPE) for protection against acid splashes and contact with falling batteries (face shield, gloves, apron, safety footwear, etc.).
- Never place tools or metal parts on open batteries to prevent electric arcs from forming and igniting the hydrogen.
- Do not wear rings, watches or any other items of jewellery to prevent accidental contact with electric parts that may cause electrical arcs and severe burns.



Figure 22 FLT battery

- Do not replace the FLT battery with one having weight, size or electric characteristics different from the one provided by the manufacturer without first consulting the manufacturer of the FLT.

10.2.2. Fuelling

The following precautions to be taken while filling the fuel tank:

- Turn off the forklift truck motor before starting the fuelling operation.
- Never start or operate a motor while fuelling, not even when fuel is leaking. The vehicle should be pushed away from the fuelling area to allow the spill to be cleaned immediately.
- Prohibit smoking as well as the use of cell phone in the vicinity of the fuelling area.

10.2.3. Forklift trucks inspection (ISO Standard 5057)

All forklift truck forks should be subjected to annual inspections including the following actions:

- Visual inspection of all forks.
- Non-destructive test to detect cracks. Non-destructive tests to be carried out with penetrating liquids, ultrasound or magnetic particle testing depending on the fork's geometry and characteristics. The results thus obtained shall be documented.



Figure 23 – Forks

11. SAFETY CHECKLIST EXAMPLES

11.1. Daily inspection checklist

DAILY FORKLIFT INSPECTION CHECKLIST

“Gasoline, Diesel and LPG”

Location: _____ Unit: _____

Mark box OK or NR (needs repair) before operation and initial bottom

In case of NR (needs repair) contact your manager for decision.

OPERATOR: Check before each shift:	Shift 1 2 3 (circle)	Shift 1 2 3 (circle)				
Date	/ /	/ /	/ /	/ /	/ /	/ /
Hour Meter Reading						
Oil Level						
Coolant Level						
Battery Level						
Brakes						
Steering						
All Hydraulics (limit switch) (lift & tilt mast to maximum)						
Check for Leaks (oil, fuel, coolant, acid)						
Back up Alarm						
Lights						
Horn						
Tyres/Lug Nuts						
Overhead Protection						
Seat Belt						
Cables/chains/Pulley s						
Forks, (locking pins)						
Capacity Sticker						
Other						
Inspector Initials						

(Place this completed form in the forklift file)

Remarks:

DAILY FORKLIFT INSPECTION CHECKLIST

"Electric"

Location: _____ Unit # _____

Mark box OK or NR (needs repair) before operation and initial bottom

In case of NR (needs repair) contact your manager for decision.

OPERATOR: Check before each shift:	Shift 1 2 3 (circle)	Shift 1 2 3 (circle)				
Date	/ /	/ /	/ /	/ /	/ /	/ /
Hour Meter Reading						
Emergency Disconnect						
Hydraulic Oil Level						
Battery Level						
Brakes						
Steering						
All Hydraulics (limit switch) (lift & tilt mast to maximum)						
Check for Leaks (oil or acid)						
Back up Alarm						
Lights						
Horn						
Tyres/Lug Nuts						
Overhead Protection						
Seat Belt						
Cables/chains/Pulleys						
Forks, (locking pins)						
Capacity Sticker						
Other						
Inspector Initials						

(Place this completed form in the forklift file)

Remarks: _____

11.2. Audit Checklist

An audit should consist of an assessment of management system controls, equipment, driver competence and behaviour and physical conditions, and be regularly conducted.

11.2.1. The Management System and Policy

- Is there a Policy statement? Is it known by all the drivers?
- Are there specific action plans with targets?
- What are the requirements for recruiting and selecting drivers?
- What are the requirements for choosing contractors and hired drivers?
- Are the procedures applied?
- Are the detected defects recorded?
- Are the repairs recorded?
- Are the planned maintenance operations recorded?
- Do the worksite personnel walk under the suspended load?
- Is there a specific driving FLT training program for drivers?
- Is it an approved training course?
- Is medical ability to drive a FLT (mandatory in several countries) checked?
- Is driver behaviour evaluated?
- Is there training on products properties, hazards, marking?
- Is there training on site safety rules and emergency procedures?
- Are the pedestrians informed on the site safety rules?
- Is the driver qualified in written by the site manager?
- Is training and qualification renewed at a predetermined frequency?
- Is there a maintenance procedure?
- Is it compliant with local regulations?
- Is there a maintenance log book or a data base?

11.2.2. The FLT driver

- Does the driver have a forklift truck driver's license or permit?
- Does the driver have proper training?
- Does the driver receive freshen up courses?
- Is the load being lifted well distributed between BOTH fork arms?
- Are the forks centred in relation to the axis?
- Is the load properly distributed?
- Does the way the load has been placed block the fire extinguishers, wall mounted fire equipment boxes or emergency exits?

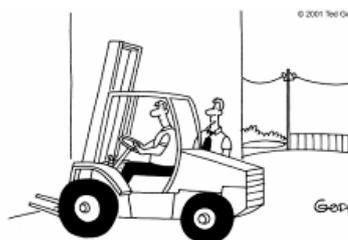
- Does the driver have visibility to manoeuvre in that position?
- Is the driver wearing the safety seat belt? (mandatory in several countries)
- Is the driver using the personal protective equipment (PPE)?
- Is there anyone else on board the forklift truck besides the driver?
- Is the forklift truck parked at the assigned parking place? Is this place totally flat?
- Is the engine off, the keys off the ignition and the parking brake engaged?
- Are the forks down at the lowest position?

11.2.3. The FLT

- Has the battery been disconnected from the battery charger? (electric forklift trucks)
- Are there stains under the forklift truck suggesting fluid leaks?
- Have the levels of fuel, water, anti-freeze, oil, etc., been checked? (thermal forklift trucks)
- Are the wheels in good operating condition (pressure and tread)?
- Is the battery charged properly? (electric forklift trucks)
- Are the tyres in good operating condition? (general condition and pressure)
- Is the lights system in good operating condition?
- Is there a fire extinguisher in the forklift truck?
- Has the maximum load indicator been verified?
- Does the acoustic back up signal work correctly?
- Is the forklift truck bearing a load above the manufacturer's limit?
- Are the keys taken out when the FLT is parked?

11.2.4. The premises

- Are there ramps at the worksite with slopes angles above 10%?
- Are the through ways and lanes suitably signalled?
- Do doors and corridors have sufficient width and clearance?
- Are there any obstacles preventing the forklift truck's passage?
- Are there forklift trucks in areas classified as at explosion risk?
- Are more than one forklift trucks and/or pallet trucks being used simultaneously to lift the same one load?



"We don't have the manual, so just start pushing buttons and things until you know what you're doing."

This situation is never acceptable.

12. REFERENCES

- EIGA Document – SAC Doc 165/10/E, Safe Operation of Fork Lift Trucks.
www.eiga.eu

ANNEX I: TEMPLATE FOR CONFORMITY CERTIFICATE

MANUFACTURER (OR IMPORTER) CONFORMITY CERTIFICATE FOR FORKLIFT TRUCKS

By issuing this document the undersigned _____ name / last name

company _____

(Title and address number)

Certifies that the FLT specified below complies with the requirements of the national regulations:

1) Category: _____

2) Manufacturer: _____

3) Type: _____

4) Serial / type number of the forklift truck:

5) Year of manufacture: _____

6) Other relevant complementary information: _____
