



**Lifting**

**Guidelines**

**GUIDELINES**

**Guidelines for the safe management and  
the thorough examination of lift trucks**

# FOREWORD

The purpose of these Guidelines is twofold. Firstly they aim to provide information to those with responsibilities for the safe use and management of lift trucks about their statutory health and safety obligations. The provision of this information will help those with such responsibilities to consider inter-dependencies such as the adequacy of maintenance and inspection with regard to the ongoing safe use and reliability of their lift trucks.

The second purpose of these Guidelines is to define the scope and extent of a lift truck thorough examination with the aim of helping to ensure a continuity of approach by those competent persons who undertake such thorough examinations.

**© The Safety Assessment Federation Ltd 2003**

All rights reserved. Except for normal review purposes, no part of this publication may be reproduced, utilised, stored in a retrieval system or transmitted in any form by any means electronic or mechanical, including photocopying, recording or by any information, storage or retrieval system without the written permission of the publisher

# CONTENTS

- 1 RESPONSIBILITIES OF OWNERS**
    - 1.1 Legal Commentary**
    - 1.2 Safety Management - Practical Considerations**
      - 1.2.1 Managing lift truck operations**
      - 1.2.2 Training**
      - 1.2.3 Environmental conditions**
      - 1.2.4 Maintenance and inspection**
      - 1.2.5 Thorough examination**
  - 2 SCOPE OF THE THOROUGH EXAMINATION**
    - 2.1 Introduction**
    - 2.2 Scope**
      - 2.2.1 General**
      - 2.2.2 Specific**
        - 2.2.2.1 Overall assessment and method**
        - 2.2.2.2 Rating details**
        - 2.2.2.3 Strength**
        - 2.2.2.4 Stability**
        - 2.2.2.5 Motive power and transmission**
        - 2.2.2.6 Safety critical components**
        - 2.2.2.7 Hydraulic system**
        - 2.2.2.8 Electrical system, including batteries**
        - 2.2.2.9 Controls**
        - 2.2.2.10 Steering**
        - 2.2.2.11 Braking**
        - 2.2.2.12 Gauges and instrumentation**
- 3 SOURCES OF FURTHER INFORMATION**

# 1 RESPONSIBILITIES OF EMPLOYERS

## 1.1 Legal Commentary

Employers have a duty under health and safety law to ensure, as far as is reasonably practicable, the health, safety and welfare of their employees. The main legislation applicable to lift trucks are as follows:

- The Health and Safety at Work Act 1974
- The Management of Health and Safety at Work Regulations 1999 (*MHSWR*)
- The Provision and Use of Work Equipment Regulations 1998 (*PUWER 98*)
- The Lifting Operations and Lifting Equipment Regulations 1998 (*LOLER*)
- The Workplace (Health, Safety and Welfare) Regulations 1992
- The Construction (Health, Safety and Welfare) Regulations 1996

*The MHSWR* require a risk assessment to be carried out to identify the nature and level of risks associated with a work activity. Appropriate precautions need to be taken to eliminate or control these risks. A proportionate response according to the risk is required. The higher the level of risk identified through the assessment, the greater the measures that will be needed to reduce it.

*PUWER 98* applies to all work equipment, a lift truck is an item of work equipment. The regulations require that:

- Work equipment should be suitable for the purpose for which it is used or provided, and should be properly maintained and inspected at suitable intervals
- Where the use of work equipment is likely to involve specific risks, the use, maintenance etc. of that equipment is restricted to people given the task of using and/or maintaining it
- Users, supervisors and managers have received adequate training for purposes of health and safety

The regulations also require that any mobile work equipment which has a seated ride-on operator should be fitted with a restraining system, such as a seat belt, if a risk assessment indicates that there is a risk of the work equipment rolling over and the operator falling from the operating position and being crushed between the work equipment and the ground.

**LOLER** deals with specific hazards/risks associated with lifting equipment and lifting operations. A lift truck is an item of lifting equipment. **LOLER** replaces most sector-specific legislation on lifting to create a single set of regulations that apply to all sectors. The regulations require that every lifting operation is:

- Properly planned by a competent person
- Appropriately supervised
- Is carried out in a safe manner.

**The Workplace (Health, Safety and Welfare) Regulations 1992** require that workplaces should be organised to ensure that the interaction between vehicles and pedestrians can be achieved in a safe manner.

## **1.2 Safety Management -Practical Considerations**

Lift trucks are widely used throughout industry for moving materials from one place to another. They undertake lifting and travelling operations, in some cases simultaneously. The safety of such operations is dependent on a number of factors, some of which are outlined below. Failure to effectively manage such operations can lead to accidents which may result in death or serious injury.

### **1.2.1 Managing lift truck operations**

Identifying and managing the risks associated with lift truck operations is a fundamental requirement.

An employer's risk assessment, as required under the **MHSWRs**, should identify all foreseeable risks associated with the ongoing integrity and use of a lift truck. The risk assessment should provide a basis for implementing practical work systems and processes which, when adopted, will eliminate or at least reduce risks as far as possible. Such work systems and processes will include:

- Adopting safe systems of work
- The provision of adequate training for operators, supervisors and managers
- Selecting a suitable lift truck for the work activity to be undertaken
- Laying out premises in such a way as to ensure that lift trucks can move safely
- Ensuring that lift trucks and premises are maintained properly and that work systems are periodically reviewed.

**LOLER** requires lifting operations to be planned and adequately supervised. For most lift truck operations, planning will usually be a matter for the operator, who should therefore have the appropriate training, knowledge and expertise.

While experienced lift truck operators may not need to be under direct supervision every time they carry out routine lifts, they may need to be supervised if required to lift an unusual load, or to lift in potentially hazardous conditions.

[Note: Safe systems of work are formal procedures which should be followed to ensure that work is carried out safely. They are necessary where risks cannot be controlled adequately by other means. Employers must ensure that the systems of work to be followed are properly implemented and monitored, and that details have been given to those at risk.]

## **1.2.2 Training**

Users, supervisors and managers should receive adequate training for the purposes of health and safety in relation to the use of lift trucks, including:

- The methods which may be adopted
- Any associated risks
- Precautions to be taken

## **1.2.3 Suitability – Lift truck selection**

Lift trucks should be suitable for the purpose for which they are intended to be used. They should have adequate strength and stability for the proposed loads to be lifted. Operators of lift trucks should be provided with adequate protection, for example if there is a risk of the lift truck coming to an abrupt stop, or, tipping over, adequate precautions should be taken to safeguard the operator. Such precautions may include the installation of seat belts and/or fully enclosed cabs and or roll-over protection devices.

If adequate driver protection is not adopted or installed on a lift truck for reasons of design, they should not be used in areas that present such risks.

## **1.2.4 Environmental considerations**

Whilst the risk assessment undertaken under the *MHSWRs* should identify specific risks for a given work place, in general terms all work places should be organised to ensure that lift trucks and pedestrians can move around safely. This includes:

- Sufficient lighting to enable people to work and move around safely (including not obscuring lights by stacking goods in front of them)
- Construction of floors and traffic routes to ensure that they are suitable for the purpose for which they will be used and do not expose users to health and safety risks
- Organisation of traffic routes to enable pedestrians and lift trucks to circulate safely
- The need to ensure that doors or gates which can be pushed open from either side give a clear view, when shut, of the direct area beyond them of any potential traffic.

### 1.2.5 Maintenance and inspection

The ongoing suitability for a given lift truck depends proportionally on the levels of maintenance and ongoing inspection to ensure the truck is safe for continued use at all times.

All lift trucks will deteriorate over time and if left unchecked safety critical components will deteriorate to the point where dangerous conditions will occur. The extent, scope and level of periodic maintenance and inspection must be considered as being proportional to the rate of deterioration or foreseeable failure. In all cases lift trucks should be maintained and inspected in accordance with manufacturer's instructions.

Many manufacturers include guidance on operators daily, weekly and monthly checks which should be undertaken and documented as proof to confirm such work has been undertaken in practice. In certain circumstances extra risk control measures to ensure ongoing integrity of a lift truck may need to be undertaken. These may depend on a number of factors in particular the design or configuration of the lift truck and the environment in which it is operated. In such circumstances the risk assessment may identify the need for special tests or opening out of component parts periodically to be included in the maintenance regime.

History of breakdown, repairs and results of thorough examinations may also give an indication as to whether the periodic maintenance and inspection regime that is actually being undertaken is in fact sufficient.

### 1.2.6 Thorough examination

In accordance with **LOLER**, lift trucks must be thoroughly examined by a competent person at intervals not exceeding 6 months if used for lifting or lowering persons. This is applicable even when the lifting of persons is undertaken only occasionally. Thorough examinations of lift trucks which are used for lifting or lowering goods only must be undertaken at intervals not exceeding 12 months. **LOLER** also provides the option for thorough examinations to be conducted in accordance with an examination scheme irrespective of whether the lift truck is used for lifting or lowering persons.

The competent person undertaking the thorough examination should be able to display appropriate practical and theoretical knowledge and experience to enable them to detect defects or weaknesses and to assess their importance in relation to the safety and continued use of the lift truck.

It is essential that the competent person is sufficiently independent and impartial to allow objective decisions to be made. This does not mean that the competent person must necessarily be employed from an external company. If employers have within their own organisations persons with the appropriate competence then they can carry out the thorough examination. However, if employers do use someone from within their organisation to conduct thorough examinations they must ensure that the person has a genuine authority and independence to ensure that thorough examinations are properly carried out and that necessary recommendations arising from them are made without fear or favour.

Competent persons who undertake thorough examinations also have duties under **LOLER** with regard to the scope of the thorough examination and also the information that must be contained in the report of thorough examination. In cases where the report contains details of

a defect which could result in the immediate or imminent risk of injury to a person or persons, the competent person has a legal duty to send a copy of the report to the appropriate enforcing authority.

## 2 SCOPE OF THE THOROUGH EXAMINATION

### 2.1 Introduction

The scope of thorough examination covered by these Guidelines is applicable to lift trucks which are either powered or manually driven. The scope covers the following types of lift truck:

- Counterbalanced
- Reach
- Side loading
- Rough terrain
- Pedestrian controlled
- Remote controlled

It excludes pallet trucks, telescopic handlers and fork lift truck handling attachments.

The scope identifies generically the various sub-assemblies and systems which contribute to the overall design of the lift truck and the technical attention to be applied by the competent person during periodic thorough examinations. Lift truck design has been perfected to a point where many parts are interdependent and contribute in some way to the overall integrity of the truck. Thus, because of the low level of “redundancy” in the related parts and systems, a thorough examination needs to consider these parts, not merely the clearly identifiable lifting aspects.

For the purposes of these Guidelines, a thorough examination means a thorough visual examination of all parts supplemented with functional testing of controls and comparative measurements of strategic load bearing elements. Thorough examinations do not absolve an employer from their duty to “inspect” a lift truck between thorough examinations as required by *LOLER* or to undertake “maintenance” as required by *PUWER 98*.

The competent person who undertakes a thorough examination of a lift truck should, under all circumstances, carry out an assessment of the condition of those components, parts or systems, which could through deterioration lead to a dangerous situation.

The scope and extent of a thorough examination of a lift truck will depend on an assessment of the risks associated with the probability and consequences of deterioration or failure of the parts, components or systems under consideration. The competent person undertaking the lift truck thorough examination will also need to consider its type and configuration, the environment in which it is operated and in some cases records of maintenance, repairs, inspections etc.



In general terms a thorough examination will include a condition assessment of:

- All parts or components in line of stress  
*e.g. load bearing components*
- All operational safety components or devices  
*e.g. those parts or components which contribute to the safe operation under normal use, operational controls, operational travel limits, operational brakes etc.*
- All secondary safety components or devices  
*e.g. those parts or components which function only when the lifting equipment operates, for whatever reason, outside its normal working envelope. Such parts may include overload devices, emergency stop, driver protection systems etc.*

The extent of the condition assessment for a given part, component or system will be proportional to the consequences of malfunction or failure, special attention must be paid to those Safety Critical Components (SCCs) where failure could result in death or serious injury.

## **2.2 Scope**

### **2.2.1 General**

The thorough examination should include:

- All lifting components
- Integrity and effectiveness of guarding of all dangerous parts
- Controls, for raising, lowering, emergency stopping and normal operation, or for making significant changes to operating conditions
- Control systems, including isolation from sources of energy
- Functionality of working and hazard lighting systems, and other driver aids for visibility
- Markings and warnings, to include clear identification of controls, capabilities and any prohibitions
- Protective devices, for reducing risks to operators from falling from the driving position or from being struck by falling objects

In addition to the above, the competent person should consider the overall effectiveness of routine maintenance and repairs undertaken on the lift truck.

### **2.2.2 Specific**

#### **2.2.2.1 Overall assessment and method**

- The thorough examination shall be conducted with the lift truck under the direction of the competent person at all times ensuring the safety of himself and others

- A preliminary viewing of the lift truck and the area in which it is to be thoroughly examined shall be conducted. This is to identify any matters which would preclude the completion of a thorough examination
- The thorough examination shall be conducted with the lift truck both in a static and a functioning condition, the examination shall not be attempted if both conditions cannot be attained

#### 2.2.2.2 Rating details

- **Safe working load (SWL)** - The lift truck should have a plate or other marking which shows the SWL in combination with the radius and the height at which that SWL is applicable. The forks should be marked with their SWL which should be equal to or exceed that for the lift truck. The mast assembly should be similarly marked and compatibility with the SWL of the lift truck considered.
- **CE marking** - This marking signifies that the manufacturer or importer of a lift truck which has been placed on the market post 1<sup>st</sup> January 1995 has declared that the lift truck meets with the essential safety requirements of the Machinery Directive.  
[Note: Failure of a lift truck which was placed on the market post 1<sup>st</sup> January 1995 to have CE marking should not prevent a thorough examination from being completed.]
- **Identification** - Details of the make, model and year of manufacture should be taken to allow the competent person to fully identify the lift truck which is the subject of the thorough examination. The rating plate should be suitably mounted and legible.

#### 2.2.2.3 Strength

- **Chassis** – So far as is practicable, the thorough examination should cover the integrity of the chassis and sub-frame. The connection points for ancillary parts should be examined for integrity, for example loose fastenings, misaligned brackets etc. Other defects such as severe deformities, plate tearing, excessive corrosion, weld fractures should also be considered.

#### 2.2.2.4 Stability

- **Wheels and tyres** – These should be examined to ensure that suitable wheels and tyres are fitted and on multi wheel axles that the correct number of wheels are in place. The security of wheel fastenings should be confirmed and the degree of wear or other degradations experienced by the tyres should be considered.
- **Counterweight** – This should be examined to ensure that it is secure and where counterweighting is assisted by batteries, their security should be confirmed. Any other ballast weights, such as skirt weights, should be confirmed to be in their correct place and to be secure.

#### 2.2.2.5 Motive power and transmission

The condition and security of the power unit, transmission and ancillaries should be ascertained along with the mechanical integrity of the electrical earthing and components of the motor.

It should be confirmed that electrical motors run without excessive heat, vibration, sound or other emission.

### 2.2.2.6 Safety critical components

- **Load chain(s)** – These should be examined taking account of Safety Assessment Federation (SAFed) Guidance MLCC01, ensuring that the degree of chain elongation is just one of the range of acceptance/rejection criteria which is applied. Measurements should be included as part of the thorough examination. The chains should be tensioned equally and arrangements made to expose lengths of chain which might be hidden by design. The chain return rollers should be examined to confirm that they are still fit for purpose.  
[Note: Removal of load chains is not normally a requirement to satisfy thorough examination, but may be necessary at the discretion of the competent person undertaking the examination]
- **Load chain anchorages** – These should be examined including the clevises or anchorage weldments to which they are attached.
- **Load rope(s)** – These should be examined to determine the degree of broken wires, corrosion, wear, lubrication and any other adverse condition. Apply rejection criteria in accordance with ISO 4309 or BS 6570. Rope divertor pulleys should be examined to confirm that they are still fit for purpose.
- **Load rope anchorages** – These should be examined to ensure that wire ropes are terminated in an approved manner and in good condition (pressed ferrules, wedge and socket, conical clevis etc).
- **Load forks** – These should be examined for mechanical damage and for dimensional geometry in accordance with BS ISO 5057.
- **Load fork security** – Fork location latching devices should operate positively and side stops fitted to carriage back plates should be effective. The hanging cleats and lower cleats should be securely welded or bolted and the mating faces should not be excessively worn or distorted. Measurements should be included as part of the examination. Fork end stops should also be checked for their security.
- **Mast** – The lifting framework should be examined for deformities, alignment, weld cracking and for security of bolted connections. The wear between sliding parts and the condition of wear/rubbing strips should be considered. The condition of side and face rollers and the weldments and pinning's which serve them should be considered. The connection between the mast and the chassis should be examined for wear and for security. Stops or restrictions to prevent disengagement of sliding parts should be examined for integrity therefore the mast should be inspected through the full range of movement

- **Carriage** – The carriage and its points of connection to the mast channels should be examined, including stub shaft rollers. The castellations to receive the fork locating pins should be examined at the profiles (or the bar for hanging bar hung forks should be examined). The carriage back plate should be examined to ensure that it is free from excessive distortion and is securely mounted.
  
- **Tilt Mechanism**  
The tilt mechanism should be examined for wear, damage or scoring to the finished surface. The tilt should move in an even and controlled manner.
  
- **Hydraulic lifting cylinder(s)** – The thorough examination should include the trueness of the cylinder, the integrity of its connection to the mast, the integrity of weldments such as bosses. The ram should be examined for alignment, scoring, flaking or corrosion to its surface finish. The ram seals and chevrons should, as far as is practicable, be examined for integrity and also to detect excessive fluid bypass. Associated hydraulic piping should be examined for integrity and condition at the connections.
  
- **Warning devices** – The thorough examination should confirm the functionality of warning horns or klaxons and if fitted, reversing alarms and flashing beacons.
  
- **Guarding** – The integrity and security of the operators guarding (for example Falling Object Protection (FOP), Roll Over Protection (ROP)) and the load back rest should be examined (if fitted). The presence, suitability and condition of guards on road wheels should be considered. If transparent screens are fitted they should be clear and undamaged and not hinder the operators view.
  
- **Operating position** – The operators seat and the structure on which it is mounted should be examined for condition and mechanical integrity. For lift trucks with standing positions, the security of the standing station (fixed or hinged) should be examined. The correct functionality of safety switches should be confirmed.
  
- **Operators restraint** – The provision and condition of operators restraining devices should be considered where fitted.

### 2.2.2.7 Hydraulic system

- **The full hydraulic installation** - The examination should establish that components are secure, guarded, free from excessive fluid leaks and otherwise functioning without generating excessive heat or vibration. Cleanliness, especially around filters and the filling points is important.
- **Prime hydraulic actuators** - In addition to the hydraulic lifting cylinder mentioned previously under SCCs, the hydraulic actuators serving the main functions should be examined.

[Note: The thorough examination should include hydraulic and mechanical integrity with respect to the actuator and its location and should additionally consider synchronisation where actuators are used in parallel. On single acting actuators the effects of overstroking should be considered. If deemed necessary by the competent person a load test may be requested.

### 2.2.2.8 Electrical system, including batteries

- **Wiring** - The routing and condition of wiring and wiring looms should be included in the examination, as far as is practicable.
- **Switches** – These should be confirmed for positive operation. The thorough examination should establish that where necessary interlocking of switches is complete such that uncovented motions cannot be activated.
- **Electrical panels** - Panels should be opened to observe the condition of components, as far as is practicable.
- **Batteries** – These should be examined for physical integrity, security of location, cell interconnections and an assessment of electrolyte levels. The means of power connection/disconnection should be considered. The proximity of covers with respect to air circulation and possible contact with battery terminals should also be considered.

#### 1.1.1.1 Controls

- **Pedals and levers** - The effects of activating control pedals or levers should be considered. Linkages (such as rods, pins, springs etc) should be examined to ascertain integrity and security, as far as is practicable) and verify with the correct operation. They should be clearly marked and securely mounted.

#### 1.1.1.2 Steering

- **Direct linkages** - Where the steering wheel is connected to the steered wheels by mechanical linkages (including the power steering actuator), components should be examined to determine their condition, as far as is practicable. These components can include gearing, sprockets, chains, steering rods, drop arm linkages, king pins, bushings, the steering axle and its pivot and damping mechanism.
- **Indirect linkages** - Where the steering wheel activates a hydraulic valve which then causes steering motion, both the hydraulic aspect and the associated mechanical linkages direct to the steering

axle and the steered wheels should, as far as is practicable, be examined

- Finger tip steering - Where steering is activated by touch sensitive hand controls the examination should confirm effectiveness.
- Tiller control – The thorough examination should confirm the effectiveness of the steering mechanisms and include an assessment of the limiting switches which bring the tiller into and out of use.

#### 1.1.1.3 Braking

The braking methods should always incorporate two independent systems. A degree of interlocking of the systems is required. The braking process should operate as expected. Components to be included in the examination to include hydraulic / pneumatic connections, mountings, linkages, controls, pedals and levers.

- Service brakes - The thorough examination should confirm the method deployed and its efficiency. The method can be:
  - Mechanical
  - Electro/mechanical
  - Electronic
  - Hydro/mechanical
- Parking brakes – All parking brakes should be examined to ensure their effectiveness.
- Interlocking devices / safety equipment – Any interlocking devices which are fitted to prevent unintentional movements should be examined to ensure that they function effectively. This may include seat switches, if fitted. Emergency lowering technique should be verified when using the order picking type fork lift truck.

#### 1.1.1.4 Gauges and instrumentation

Whenever the safety of persons might be dependant on the effectiveness or accuracy of fitments such as relief valves, warning lights or other indicators then the thorough examination should consider those items.

### 3. SOURCES OF FURTHER INFORMATION

Health and Safety at Work etc. Act 1974 – Available from The Stationary Office Management of Health and safety at Work Regulations 1999 Approved Code of Practice L21  
– Available from HSE Books

Provision and Use of Work Equipment Regulations 1998 Approved Code of Practice L22 - Available from HSE Books

Lifting Operations and Lifting Equipment Regulations 1998 Approved Code of Practice L113  
- Available from HSE Books

Work Place (Health Safety and Welfare at Work) Regulations 1992 Approved Code of Practice L24 - Available from HSE Books

Rider Operated Lift Trucks – Operator Training Approved Code of Practice L117  
Available from HSE Books

Safety in Working with lift trucks HSG(6) - Available from HSE Books - NOW REMOVED  
INCORPORATED WITHIN L117

Working Platforms (Non Integrated) on fork lift trucks PM28 Version 4 - Available from HSE Books  
Five steps to risk assessment INDG163 (Rev 4) - Available from HSE Books

Workplace transport safety: Guidance to employers HSG136 - Available from HSE Books

Lift truck operator training

HSE recognised accrediting bodies:

- Association of Industrial Truck Trainers (AITT)
- Construction Industry Training Board
- Lantra National Training Organisation Ltd
- National Plant Operators Registration Scheme Ltd
- RTITB Ltd (formerly the Road Transport Industry Training Board)





